

automated production
technology
intelligent design
signalling
complete range
unsurpassed quality



advanced production technology
measurement
circuit protection
intelligent design
command

TemDin

DIN Modular devices

*January 2003
Catalogue*

More than 80 years

providing Protection solutions

From its inception, in 1923, the Terasaki group has been intrinsically linked with the development and production of protection equipment. This has led to the group establishing itself as a world class leader in protection technology, pioneering in:

- Development of the worlds first Current Limiting Circuit Breaker
- Development of the worlds first Electronic Moulded Case Circuit Breakers



We are one of only three global manufacturers with its own technology in:

- ACBs
- MCCBs
- DIN MCBs
- NEMA MCBs



technology applied to protection

Based in Granollers, Barcelona, our Centre Of Excellence Terasaki España S.A.U., manufacture a complete range of DIN modular products which are distributed world wide. From our completely modernised manufacturing facility in Barcelona,

our state of the art production line allows for an almost 100% automated manufacturing process. This flexibility in production technology allows us to accommodate the production of up to 12 MCB types simultaneously.



circuit protection



MCBs

4kA
1P+N, 2P
C - 3A-40A
Standard: IEC 60 898

10kA
1P, 2P, 3P, 4P
B, C and D - 0,3A-63A
Standard: IEC 60 898

10kA (In 80-100-125A)
1P, 1P+N, 2P, 3P, 3P+N, 4P
C
Standards: IEC 60 898, IEC 60 947-2

6kA
1P, 1P+N, 2P, 3P, 3P+N, 4P
1P+N in 1 module
B, C and D - 0,3A-63A
Standard: IEC 60 898

15kA
1P, 2P, 3P, 4P
B, C and D - 0,3A-63A
Standard: IEC 60 947-2

25kA
1P, 2P, 3P, 4P
B, C and D - 1-63A
Standard: IEC 60 947-2

Shunt, UVT and auxiliary contacts are common for both MCBs and RCCBs

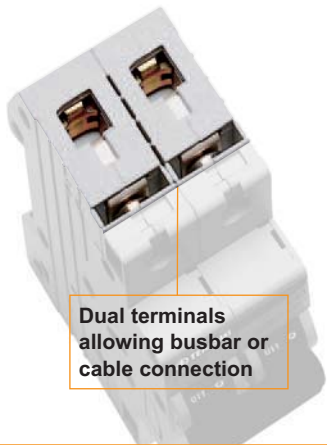


IP20 protection

Combined auxiliary and alarm switch available

Contact position indicator

earth leakage protection



Dual terminals allowing busbar or cable connection

Accessories:
Shunt trip
Under voltage trip
Auxiliary contacts



RCBOs
2 mod. (1P+N)
6 - 40A
30 and 300mA
6 kA, types AC and A
B and C
Standard: IEC 61009



Single Module RCBO + Neutral Tail (1P+N)
6 - 32A
30mA
10kA, type A
B and C
Standard: BS EN 61009-1

RCDs
2 and 4 mod.
2P=16, 25, 40, 63, 80 and 100A
4P= 25, 40, 63, 80 and 100A
10, 30 and 300 mA
Types AC, A and A-S
Standard: IEC 61008

TemDin

innovation



• Integrated quality control for all components throughout the production process

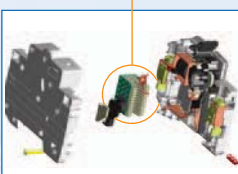


• All contacts throughout the TemDin range are silver plated, providing excellent electrical and mechanical endurance

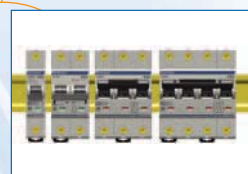
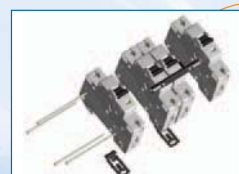
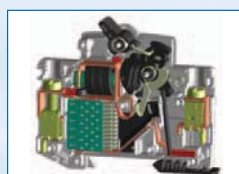
• Trip indication / true contact status



• Efficient and effective production technology utilising KANBAN material management system



• Maximum arc extinction from power arc chutes throughout the range



control



Switch disconnectors

1NO, 2NO, 3NO and 4NO
1 module

20A

Changeover switches

With 1-0-2 or without 1-2 intermediate position
1 and 2 pole

Push buttons

20A
Single or double push button + pilot neon lamp
green/red/clear

Impulse switches

2 pole - 16A and 32A
With additional pole blocks to
make up 3 or 4 pole arrangements

Contactors

Normal version and special type
available with
3-position handle
2 pole - 25A and 32A
With additional pole blocks to
make up 3 or 4 pole arrangements
4pole compact contactor
4 NO - 25A, 40A and 63A



Mains disconnect switches

32, 63 and 100A
1, 2, 3 and 4 pole

measurement

Universal digital analyser

4 module device with 3 selectors,
monitoring of up to 24 electrical
parameters: line voltage, phase
effective values, power factor, instant
active and reactive power, KWh/KVarh
consumption and KWh/KVarh energy
meter

Active energy meter

With indication LEDs: red
for load consumption and
green for supply input



Analogue Ammeters and Voltmeters

3 module



Digital wattmeter

Automatic selection of decimal
point position up to 999kW

Digital Voltmeter/Ammeter

One instrument for either current or voltage
measurement

Frequency meter

Automatic selection of decimal point position
Measurement range from 4 to 1000Hz

Current Transformers

Primary current conversion -max. 1000A- to 5A
secondary for analogue and digital measurement
devices



command

Light sensitive switch

Easy to use timer. Adjustable setting 2 – 10,000 Lux. ON and OFF time delay facility for occasional drops in light intensity

Digital time switches - Auto/hour

1 and 2 channels
Automatic summer/winter time change



Time relay

5 timing functions. Stair lighting timed management or permanent function allowing the timed control of lights, small motors, pumps or fans

Staircase lighting time switch

3 and 4 wire connection
3 positions changeover: time switch, OFF and permanent light
Timing adjustment from 30 sec. to 15 min.
Recycling option

Week digital time switch In 1 module

Easy to programme buttons with clear display, the single module time switch can be programmed for up to 672 steps within a 7 day period



Analogue time switches

Simple control of electrical circuits by manual adjustment of the setting dial

signalling devices

Pilot lamps

Neon lamps, 3 colours: green, red and clear
Double pilot: red and green

Bell/Buzzer

Changeover bell or buzzer function
With IT 230/12V incorporated



special protection

Manual motor starters

Up to 25A at AC3
Wide range of accessories:
Auxiliary contact blocks, shunt trip, under voltage trip,
Enclosures and padlocking and emergency devices

Surge arresters

Imax of 20, 45, 65 and 80kA
Plug-in single pole and multi-pole monoblock
All with or without voltage free signalling contact





Safety fuse holders


For cylindrical fuses of 20A, 25A, 50A and 100A
Light indicator lamp for 20A and 25A types


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 **Short-circuit capacity**
6kA (EN 60898)

 **Tripping characteristic**
C

 **Application**
Domestic distribution

 **Technical Data**

Rated voltage	230V / 400V~ 240V / 415V~
Frequency	50 / 60 Hz
Calibration temperature	30°C
Terminal capacity	35 mm ²
Electrical endurance	30,000
Mechanical endurance	40,000
Poles	1p 1p+N 2p
Mounting	35mm symmetrical DIN rail (EN 50022-DIN 46277)
Standards	EN-60898

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Miniature circuit breakers R


Nominal current ratings from 10 to 40A


Miniature circuit breakers designed for protection of electrical installations against overloads and short circuits.

Poles	In (A)	DIN mod.	Reference
1	10	1	C06N10010
1	16	1	C06N10016
1	20	1	C06N10020
1	25	1	C06N10025
1	32	1	C06N10032
1	40	1	C06N10040
1+N	10	2	C06N11010
1+N	16	2	C06N11016
1+N	20	2	C06N11020
1+N	25	2	C06N11025
1+N	32	2	C06N11032
1+N	40	2	C06N11040
2	10	2	C06N20010
2	16	2	C06N20016
2	20	2	C06N20020
2	25	2	C06N20025
2	32	2	C06N20032
2	40	2	C06N20040

 **Type**
AC

 **Sensitivity**
30mA

 **Application**
Domestic distribution

 **Technical Data**

	Serie FI	Serie FIE
Rated voltage	230V / 400V~	230V~
Frequency	50 / 60 Hz	
Rated current	25 and 40 A	
Rated residual current	30 mA	
Residual tripping characteristic	AC	
Tripping time	< 30 ms	
Terminal capacity	35 mm ²	
Poles	2p	
Mounting	35mm symmetrical DIN rail (EN 50022-DIN 46277)	
Standards	EN 20383-75 CEE27	EN 61008

- Technical details: page: 41
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Residual current circuit breakers FI - FIE

Nominal current ratings from 25 to 40A

Residual current circuit breakers protect people against electrocution from direct or indirect contact. They also protect property from fires caused by the breakdown of insulation of conductors.

FIE series


Poles	In (A)	DIN mod.	Residual current I _{dn} (mA)	Reference
2	25	2	30	FIE25/2/003
2	40	2	30	FIE40/2/003

FI series

Poles	In (A)	DIN mod.	Residual current I _{dn} (mA)	Reference
2	25	4	30	FI25/2/003
2	40	4	30	FI40/2/003

Field fittable accessories

 **Short-circuit capacity**
4.5kA (EN 60898)

 **Tripping characteristic**
C

 **Application**
Domestic distribution

 **Technical Data**

Rated voltage	230/400V~
Frequency	50 / 60 Hz
Calibration temperature	30°C
Terminal capacity	35 mm ²
Electrical endurance	30,000
Mechanical endurance	40,000
Poles	1p+N 2p
Mounting	35mm symmetrical DIN rail (EN 50022-DIN 46277)
Standards	EN 60898, EN 60947-2 EN 20317

NOTE: Suitable for use at 240/415V.

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Nominal current ratings from 3 to 40A

The TemDin2 range of Miniature Circuit Breakers have been designed for protection of electrical installations against overload and short circuits.

Tripping curves

The TemDin 2 series of Miniature Circuit Breakers are manufactured in accordance with EN 60898 (tripping characteristics B, C and D)

- Curve C: magnetic trip threshold = 5 – 10 In

Poles	In (A)	DIN mod.	Type C
1+N	3	2	DE06C11003
1+N	6	2	DE06C11006
1+N	10	2	DE06C11010
1+N	16	2	DE06C11016
1+N	20	2	DE06C11020
1+N	25	2	DE06C11025
1+N	32	2	DE06C11032
1+N	40	2	DE06C11040
2	3	2	DE06C20003
2	6	2	DE06C20006
2	10	2	DE06C20010
2	16	2	DE06C20016
2	20	2	DE06C20020
2	25	2	DE06C20025
2	32	2	DE06C20032
2	40	2	DE06C20040

Field fittable accessories



Short-circuit capacity
6kA (EN 60898)



Tripping characteristic
B, C, D



Application
Domestic and commercial distribution



Technical Data

Rated voltage	230V / 400V~
Frequency	50 / 60 Hz
Calibration temperature	30°C
Terminal capacity	35 mm ²
Electrical endurance	30,000
Mechanical endurance	40,000
Poles	1p 1p+N 2p 3p 3p+N 4p
Mounting	35mm symmetrical DIN rail (EN 50022-DIN 46277)
Standards	EN 60898, EN 60947-2 EN 20317

NOTE: Suitable for use at 240/415V.

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Nominal current ratings from 0.3 to 63A

The TemDin2 range of Miniature Circuit Breakers have been designed for protection of electrical installations against overload and short circuits.

Tripping curves

The TemDin 2 series of Miniature Circuit Breakers are manufactured in accordance with EN 60898 (tripping characteristics B, C and D)

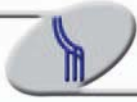
- Curve B: magnetic trip threshold = 3 – 5 In
- Curve C: magnetic trip threshold = 5 – 10 In
- Curve D: magnetic trip threshold = 10 – 20In

Poles	In (A)	DIN mod.	Type		
			B	C	D
1	0.3	1	-	-	DS06D100V3
1	0.5	1	-	-	DS06D100V5
1	0.75	1	-	-	DS06D100V7
1	1	1	-	-	DS06D10001
1	1.6	1	-	-	DS06D101V6
1	2	1	-	-	DS06D10002
1	2.5	1	-	-	DS06D102V5
1	3	1	-	-	DS06D10003
1	3.5	1	-	-	DS06D103V5
1	4	1	-	-	DS06D10004
1	6	1	DS06B10006	DS06C10006	DS06D10006
1	10	1	DS06B10010	DS06C10010	DS06D10010
1	16	1	DS06B10016	DS06C10016	DS06D10016
1	20	1	DS06B10020	DS06C10020	DS06D10020
1	25	1	DS06B10025	DS06C10025	DS06D10025
1	32	1	DS06B10032	DS06C10032	DS06D10032
1	40	1	DS06B10040	DS06C10040	DS06D10040
1	50	1	DS06B10050	DS06C10050	DS06D10050
1	63	1	DS06B10063	DS06C10063	DS06D10063
1+N	0.3	2	-	-	DS06D110V3
1+N	0.5	2	-	-	DS06D110V5
1+N	0.75	2	-	-	DS06D110V7
1+N	1	2	-	-	DS06D11001
1+N	1.6	2	-	-	DS06D111V6
1+N	2	2	-	-	DS06D11002
1+N	2.5	2	-	-	DS06D112V5
1+N	3	2	-	-	DS06D11003
1+N	3.5	2	-	-	DS06D113V5
1+N	4	2	-	-	DS06D11004
1+N	6	2	DS06B11006	DS06C11006	DS06D11006
1+N	10	2	DS06B11010	DS06C11010	DS06D11010
1+N	16	2	DS06B11016	DS06C11016	DS06D11016
1+N	20	2	DS06B11020	DS06C11020	DS06D11020
1+N	25	2	DS06B11025	DS06C11025	DS06D11025
1+N	32	2	DS06B11032	DS06C11032	DS06D11032
1+N	40	2	DS06B11040	DS06C11040	DS06D11040
1+N	50	2	DS06B11050	DS06C11050	DS06D11050
1+N	63	2	DS06B11063	DS06C11063	DS06D11063

Field fittable accessories



Short-circuit capacity
6kA (EN 60898)



Tripping characteristic
B, C, D



Application
Domestic and commercial distribution



Poles	In (A)	DIN mod.	Type		
			B	C	D
2	0.3	2	-	-	DS06D200V3
2	0.5	2	-	-	DS06D200V5
2	0.75	2	-	-	DS06D200V7
2	1	2	-	-	DS06D20001
2	1.6	2	-	-	DS06D201V6
2	2	2	-	-	DS06D20002
2	2.5	2	-	-	DS06D202V5
2	3	2	-	-	DS06D20003
2	3.5	2	-	-	DS06D203V5
2	4	2	-	-	DS06D20004
2	6	2	DS06B20006	DS06C20006	DS06D20006
2	10	2	DS06B20010	DS06C20010	DS06D20010
2	16	2	DS06B20016	DS06C20016	DS06D20016
2	20	2	DS06B20020	DS06C20020	DS06D20020
2	25	2	DS06B20025	DS06C20025	DS06D20025
2	32	2	DS06B20032	DS06C20032	DS06D20032
2	40	2	DS06B20040	DS06C20040	DS06D20040
2	50	2	DS06B20050	DS06C20050	DS06D20050
2	63	2	DS06B20063	DS06C20063	DS06D20063
3	0.3	3	-	-	DS06D300V3
3	0.5	3	-	-	DS06D300V5
3	0.75	3	-	-	DS06D300V7
3	1	3	-	-	DS06D30001
3	1.6	3	-	-	DS06D301V6
3	2	3	-	-	DS06D30002
3	2.5	3	-	-	DS06D302V5
3	3	3	-	-	DS06D30003
3	3.5	3	-	-	DS06D303V5
3	4	3	-	-	DS06D30004
3	6	3	DS06B30006	DS06C30006	DS06D30006
3	10	3	DS06B30010	DS06C30010	DS06D30010
3	16	3	DS06B30016	DS06C30016	DS06D30016
3	20	3	DS06B30020	DS06C30020	DS06D30020
3	25	3	DS06B30025	DS06C30025	DS06D30025
3	32	3	DS06B30032	DS06C30032	DS06D30032
3	40	3	DS06B30040	DS06C30040	DS06D30040
3	50	3	DS06B30050	DS06C30050	DS06D30050
3	63	3	DS06B30063	DS06C30063	DS06D30063
3+N	0.3	4	-	-	DS06D310V3
3+N	0.5	4	-	-	DS06D310V5
3+N	0.75	4	-	-	DS06D310V7
3+N	1	4	-	-	DS06D31001
3+N	1.6	4	-	-	DS06D311V6
3+N	2	4	-	-	DS06D31002
3+N	2.5	4	-	-	DS06D312V5
3+N	3	4	-	-	DS06D31003
3+N	3.5	4	-	-	DS06D313V5
3+N	4	4	-	-	DS06D31004
3+N	6	4	DS06B31006	DS06C31006	DS06D31006
3+N	10	4	DS06B31010	DS06C31010	DS06D31010
3+N	16	4	DS06B31016	DS06C31016	DS06D31016
3+N	20	4	DS06B31020	DS06C31020	DS06D31020
3+N	25	4	DS06B31025	DS06C31025	DS06D31025
3+N	32	4	DS06B31032	DS06C31032	DS06D31032
3+N	40	4	DS06B31040	DS06C31040	DS06D31040
3+N	50	4	DS06B31050	DS06C31050	DS06D31050
3+N	63	4	DS06B31063	DS06C31063	DS06D31063
4	0.3	4	-	-	DS06D400V3
4	0.5	4	-	-	DS06D400V5
4	0.75	4	-	-	DS06D400V7
4	1	4	-	-	DS06D40001
4	1.6	4	-	-	DS06D401V6
4	2	4	-	-	DS06D40002
4	2.5	4	-	-	DS06D402V5
4	3	4	-	-	DS06D40003
4	3.5	4	-	-	DS06D403V5
4	4	4	-	-	DS06D40004
4	6	4	DS06B40006	DS06C40006	DS06D40006
4	10	4	DS06B40010	DS06C40010	DS06D40010
4	16	4	DS06B40016	DS06C40016	DS06D40016
4	20	4	DS06B40020	DS06C40020	DS06D40020
4	25	4	DS06B40025	DS06C40025	DS06D40025
4	32	4	DS06B40032	DS06C40032	DS06D40032
4	40	4	DS06B40040	DS06C40040	DS06D40040
4	50	4	DS06B40050	DS06C40050	DS06D40050
4	63	4	DS06B40063	DS06C40063	DS06D40063

Field fittable accessories



Short-circuit capacity
10kA (EN 60898)



Tripping characteristic
B, C, D



Application
Industrial and commercial distribution



Technical Data

Rated voltage	230V / 400V~
Frequency	50 / 60 Hz
Calibration temperature	30°C
Terminal capacity	35 mm ²
Electrical endurance	30,000
Mechanical endurance	40,000
Poles	1p 1p+N 2p 3p 3p+N 4p
Mounting	35mm symmetrical DIN rail (EN 50022-DIN 46277)
Standards	EN 60898, EN 60947-2 EN 20317

NOTE: Suitable for use at 240/415V.

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Nominal current ratings from 3 to 63A

The TemDin2 range of Miniature Circuit Breakers have been designed for protection of electrical installations against overload and short circuits.

Tripping curves

The TemDin 2 series of Miniature Circuit Breakers are manufactured in accordance with EN 60898 (tripping characteristics B, C and D)

- Curve B: magnetic trip threshold = 3 – 5 I_n
- Curve C: magnetic trip threshold = 5 – 10 I_n
- Curve D: magnetic trip threshold = 10 – 20I_n

Poles	In (A)	DIN mod.	Type		
			B	C	D
1	0.3	1	-	-	DH06D100V3
1	0.5	1	-	-	DH06D100V5
1	0.75	1	-	-	DH06D100V7
1	1	1	-	-	DH06D10001
1	1.6	1	-	-	DH06D101V6
1	2	1	-	-	DH06D10002
1	2.5	1	-	-	DH06D102V5
1	3	1	-	-	DH06D10003
1	3.5	1	-	-	DH06D103V5
1	4	1	-	-	DH06D10004
1	6	1	DH06B10006	DH06C10006	DH06D10006
1	10	1	DH06B10010	DH06C10010	DH06D10010
1	16	1	DH06B10016	DH06C10016	DH06D10016
1	20	1	DH06B10020	DH06C10020	DH06D10020
1	25	1	DH06B10025	DH06C10025	DH06D10025
1	32	1	DH06B10032	DH06C10032	DH06D10032
1	40	1	DH06B10040	DH06C10040	DH06D10040
1	50	1	DH06B10050	DH06C10050	DH06D10050
1	63	1	DH06B10063	DH06C10063	DH06D10063
1+N	0.3	2	-	-	DH06D110V3
1+N	0.5	2	-	-	DH06D110V5
1+N	0.75	2	-	-	DH06D110V7
1+N	1	2	-	-	DH06D11001
1+N	1.6	2	-	-	DH06D111V6
1+N	2	2	-	-	DH06D11002
1+N	2.5	2	-	-	DH06D112V5
1+N	3	2	-	-	DH06D11003
1+N	3.5	2	-	-	DH06D113V5
1+N	4	2	-	-	DH06D11004
1+N	6	2	DH06B11006	DH06C11006	DH06D11006
1+N	10	2	DH06B11010	DH06C11010	DH06D11010
1+N	16	2	DH06B11016	DH06C11016	DH06D11016
1+N	20	2	DH06B11020	DH06C11020	DH06D11020
1+N	25	2	DH06B11025	DH06C11025	DH06D11025
1+N	32	2	DH06B11032	DH06C11032	DH06D11032
1+N	40	2	DH06B11040	DH06C11040	DH06D11040
1+N	50	2	DH06B11050	DH06C11050	DH06D11050
1+N	63	2	DH06B11063	DH06C11063	DH06D11063

Field fittable accessories



Short-circuit capacity
10kA (EN 60898)



Tripping characteristic
B, C, D



Application
Industrial and commercial distribution



Poles	In (A)	DIN mod.	B	Type C	D
2	0.3	2	-	-	DH06D200V3
2	0.5	2	-	-	DH06D200V5
2	0.75	2	-	-	DH06D200V7
2	1	2	-	-	DH06D20001
2	1.6	2	-	-	DH06D201V6
2	2	2	-	-	DH06D20002
2	2.5	2	-	-	DH06D202V5
2	3	2	-	-	DH06D20003
2	3.5	2	-	-	DH06D203V5
2	4	2	-	-	DH06D20004
2	6	2	DH06B20006	DH06C20006	DH06D20006
2	10	2	DH06B20010	DH06C20010	DH06D20010
2	16	2	DH06B20016	DH06C20016	DH06D20016
2	20	2	DH06B20020	DH06C20020	DH06D20020
2	25	2	DH06B20025	DH06C20025	DH06D20025
2	32	2	DH06B20032	DH06C20032	DH06D20032
2	40	2	DH06B20040	DH06C20040	DH06D20040
2	50	2	DH06B20050	DH06C20050	DH06D20050
2	63	2	DH06B20063	DH06C20063	DH06D20063
3	0.3	3	-	-	DH06D300V3
3	0.5	3	-	-	DH06D300V5
3	0.75	3	-	-	DH06D300V7
3	1	3	-	-	DH06D30001
3	1.6	3	-	-	DH06D301V6
3	2	3	-	-	DH06D30002
3	2.5	3	-	-	DH06D302V5
3	3	3	-	-	DH06D30003
3	3.5	3	-	-	DH06D303V5
3	4	3	-	-	DH06D30004
3	6	3	DH06B30006	DH06C30006	DH06D30006
3	10	3	DH06B30010	DH06C30010	DH06D30010
3	16	3	DH06B30016	DH06C30016	DH06D30016
3	20	3	DH06B30020	DH06C30020	DH06D30020
3	25	3	DH06B30025	DH06C30025	DH06D30025
3	32	3	DH06B30032	DH06C30032	DH06D30032
3	40	3	DH06B30040	DH06C30040	DH06D30040
3	50	3	DH06B30050	DH06C30050	DH06D30050
3	63	3	DH06B30063	DH06C30063	DH06D30063
3+N	0.3	4	-	-	DH06D310V3
3+N	0.5	4	-	-	DH06D310V5
3+N	0.75	4	-	-	DH06D310V7
3+N	1	4	-	-	DH06D31001
3+N	1.6	4	-	-	DH06D311V6
3+N	2	4	-	-	DH06D31002
3+N	2.5	4	-	-	DH06D312V5
3+N	3	4	-	-	DH06D31003
3+N	3.5	4	-	-	DH06D313V5
3+N	4	4	-	-	DH06D31004
3+N	6	4	DH06B31006	DH06C31006	DH06D31006
3+N	10	4	DH06B31010	DH06C31010	DH06D31010
3+N	16	4	DH06B31016	DH06C31016	DH06D31016
3+N	20	4	DH06B31020	DH06C31020	DH06D31020
3+N	25	4	DH06B31025	DH06C31025	DH06D31025
3+N	32	4	DH06B31032	DH06C31032	DH06D31032
3+N	40	4	DH06B31040	DH06C31040	DH06D31040
3+N	50	4	DH06B31050	DH06C31050	DH06D31050
3+N	63	4	DH06B31063	DH06C31063	DH06D31063
4	0.3	4	-	-	DH06D400V3
4	0.5	4	-	-	DH06D400V5
4	0.75	4	-	-	DH06D400V7
4	1	4	-	-	DH06D40001
4	1.6	4	-	-	DH06D401V6
4	2	4	-	-	DH06D40002
4	2.5	4	-	-	DH06D402V5
4	3	4	-	-	DH06D40003
4	3.5	4	-	-	DH06D403V5
4	4	4	-	-	DH06D40004
4	6	4	DH06B40006	DH06C40006	DH06D40006
4	10	4	DH06B40010	DH06C40010	DH06D40010
4	16	4	DH06B40016	DH06C40016	DH06D40016
4	20	4	DH06B40020	DH06C40020	DH06D40020
4	25	4	DH06B40025	DH06C40025	DH06D40025
4	32	4	DH06B40032	DH06C40032	DH06D40032
4	40	4	DH06B40040	DH06C40040	DH06D40040
4	50	4	DH06B40050	DH06C40050	DH06D40050
4	63	4	DH06B40063	DH06C40063	DH06D40063

Field fittable accessories

 **Short-circuit capacity**
10kA (EN 60947-2)

 **Application**
Industrial and commercial distribution

 **Technical Data**



Rated voltage	1pole	230V / 240V~
	2, 3 and 4 poles	400V / 415V~
Frequency	50 / 60 Hz	
Rated insulation voltage	440 V~	
Calibration temperature	40°C	
Terminal capacity	70 mm ²	
Electrical endurance	10,000	
Mechanical endurance	10,000	
Poles	1p	2p 3p 4p
Mounting	35mm symmetrical DIN rail (EN 50022-DIN 46277)	
Standards	EN 60947-2	

NOTE: Suitable for use at 240/415V.

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Miniature Circuit Breakers TH

Nominal current ratings from 80 to 125A

The TH range of Miniature Circuit Breakers have been designed for protection of electrical installations against overload and short circuits.

Tripping curves


The TH series of Miniature Circuit Breakers are manufactured in accordance with EN 60947-2.

- Curve B: magnetic trip threshold = 3.2 – 4.8 I_n
- Curve C: magnetic trip threshold = 6 - 9 I_n
- Curve D: magnetic trip threshold = 10 – 15 I_n

Poles	I _n (A)	DIN mod.	Trip		
			B	C	D
1	80A	1.5	THB10 I 80	THC10 I 80	THD10 I 80
1	100A	1.5	THB10 I 100	THC10 I 100	THD10 I 100
1	125A	1.5	THB10 I 125	THC10 I 125	THD10 I 125
2	80A	3	THB10 II 80	THC10 II 80	THD10 II 80
2	100A	3	THB10 II 100	THC10 II 100	THD10 II 100
2	125A	3	THB10 II 125	THC10 II 125	THD10 II 125
3	80A	4.5	THB10 III 80	THC10 III 80	THD10 III 80
3	100A	4.5	THB10 III 100	THC10 III 100	THD10 III 100
3	125A	4.5	THB10 III 125	THC10 III 125	THD10 III 125
4	80A	6	THB10 IIII 80	THC10 IIII 80	THD10 IIII 80
4	100A	6	THB10 IIII 100	THC10 IIII 100	THD10 IIII 100
4	125A	6	THB10 IIII 125	THC10 IIII 125	THD10 IIII 125

Field fittable accessories

 **Short-circuit capacity**
10kA (EN 60898)

 **Tripping characteristic**
C

 **Application**
Industrial and commercial distribution

 **Technical Data**



Rated voltage	230V / 400V~		
Frequency	50 / 60 Hz		
Rated insulation voltage	500 V		
Calibration temperature	30°C		
Terminal capacity	50 mm ²		
Electrical endurance	20,000		
Mechanical endurance	20,000		
Poles	1p	2p	3p 4p
Mounting	35mm symmetrical DIN rail (EN 50022-DIN 46277)		
Standards	EN 60898, EN 60947-2		

NOTE: Suitable for use at 240/415V.

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Miniature Circuit Breakers DH125(*)





Nominal current ratings from 80 to 125A

The TemDin2 range of Miniature Circuit Breakers have been designed for protection of electrical installations against overload and short circuits.

Poles	I _n (A)	DIN mod.	Reference
1	80A	1.5	DH12C10080
1	100A	1.5	DH12C10100
1	125A	1.5	DH12C10125
2	80A	3	DH12C20080
2	100A	3	DH12C20100
2	125A	3	DH12C20125
3	80A	4.5	DH12C30080
3	100A	4.5	DH12C30100
3	125A	4.5	DH12C30125
4	80A	6	DH12C40080
4	100A	6	DH12C40100
4	125A	6	DH12C40125

(*) Available soon

1+N (1 mod.)
Field fittable accessories

- 
Short-circuit capacity
6kA (EN 60898)
- 
Tripping characteristic
B, C
- 
Application
Domestic and commercial distribution
- 
Technical Data

Rated voltage	230V~
Frequency	50 / 60 Hz
Calibration temperature	30°C
Terminal capacity	16 mm ² flexible / 25 mm ² rigid
Electrical endurance	30,000
Mechanical endurance	40,000
Poles	1p+N
Mounting	35mm symmetrical DIN rail (EN 50022-DIN 46277)
Standards	EN 60898

NOTE: Suitable for use at 240/415V.

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Nominal current ratings from 6 to 40A

This series has been designed for protection and control of electrical installations against overload and short circuits within domestic and commercial distribution applications with the advantage of saving space and cost.

Tripping curves


The TemDin 2 series of Miniature Circuit Breakers are manufactured in accordance with EN 60898 (tripping characteristics B, C and D)

- Curve B: magnetic trip threshold = 3 – 5 I_n
- Curve C: magnetic trip threshold = 5 – 10 I_n

Poles	I _n (A)	DIN mod.	Type	
			B	C
1	6	1	DS041NC006	DS041NB006
1	10	1	DS041NC010	DS041NB010
1	16	1	DS041NC016	DS041NB016
1	20	1	DS041NC020	DS041NB020
1	25	1	DS041NC025	DS041NB025
1	32	1	DS041NC032	DS041NB032
1	40	1	DS041NC040	DS041NB040

Field fittable accessories

 Short-circuit capacity
6kA

 Tripping characteristic
C

 Type
A, AC

 Sensitivity
30, 300 mA

 Technical Data

Rated voltage	230V / 240V~
Frequency	50 / 60 Hz
Calibration temperature	30°C
Tripping curve	C
Sensitivity	30 and 300 mA
Type	A and AC
Terminal capacity	25 mm ² flexible / 35 mm ² rigid
Electrical endurance	20,000
Mechanical endurance	20,000
Standards	EN 61009

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 Short-circuit capacity
10kA

 Tripping characteristic
B, C

 Type
A

 Sensitivity
30 mA

 Technical Data

Rated voltage	230V / 240V~
Frequency	50 / 60 Hz
Calibration temperature	30°C
Tripping curve	B, C
Sensitivity	30 mA
Type	A
Terminal capacity	Incoming 25 mm ² / Outcoming 10 mm ²
Standards	EN 61009-1

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ZDS RCBO

Nominal current ratings from 6 to 40A

Residual current circuit breakers with overcurrent protection designed for total safety.

- Residual current circuit breakers protect people against electrocution from direct or indirect contact (30mA). They also protect property from fires caused by the breakdown of insulation of conductors (300mA)
- ZDS RCBOs also protect circuits against overloads and short circuits

The device has a residual current trip indicator.

Type AC

Protection against sinusoidal leakage current. Applied in domestic and commercial installations.

Type A

Protection against sinusoidal and rectified leakage currents with or without a DC component. Applied in commercial and industrial installations.



Poles	In (A)	DIN mod.	Sensitivity mA	Type	Reference
2	6	2	30	AC	ZDS046/2/003-AC
2	10	2	30	AC	ZDS0410/2/003-AC
2	16	2	30	AC	ZDS0416/2/003-AC
2	20	2	30	AC	ZDS0420/2/003-AC
2	25	2	30	AC	ZDS0425/2/003-AC
2	32	2	30	AC	ZDS0432/2/003-AC
2	40	2	30	AC	ZDS0440/2/003-AC
2	6	2	300	AC	ZDS046/2/03-AC
2	10	2	300	AC	ZDS0410/2/03-AC
2	16	2	300	AC	ZDS0416/2/03-AC
2	20	2	300	AC	ZDS0420/2/03-AC
2	25	2	300	AC	ZDS0425/2/03-AC
2	32	2	300	AC	ZDS0432/2/03-AC
2	40	2	300	AC	ZDS0440/2/03-AC
2	6	2	30	A	ZDS046/2/003-A
2	10	2	30	A	ZDS0410/2/003-A
2	16	2	30	A	ZDS0416/2/003-A
2	20	2	30	A	ZDS0420/2/003-A
2	25	2	30	A	ZDS0425/2/003-A
2	32	2	30	A	ZDS0432/2/003-A
2	40	2	30	A	ZDS0440/2/003-A
2	6	2	300	A	ZDS046/2/03-A
2	10	2	300	A	ZDS0410/2/03-A
2	16	2	300	A	ZDS0416/2/03-A
2	20	2	300	A	ZDS0420/2/03-A
2	25	2	300	A	ZDS0425/2/03-A
2	32	2	300	A	ZDS0432/2/03-A
2	40	2	300	A	ZDS0440/2/03-A

*Type A and curve B available soon.



ZDH RCBO (single module RCBO + neutral tail)


Nominal current ratings from 6 to 32A

Residual current circuit breakers with overcurrent protection designed for total safety.


- Residual current circuit breakers protect people against electrocution from direct or indirect contact (30mA). They also protect property from fires caused by the breakdown of insulation of conductors.
- ZDH RCBOs also protect circuits against overloads and short circuits

In (A)	DIN mod.	Sensitivity mA	Type	Trip curve	
				B	C
6	1	30	A	ZDH041P/06B/003-A	ZDH041P/06C/003-A
10	1	30	A	ZDH041P/10B/003-A	ZDH041P/10C/003-A
16	1	30	A	ZDH041P/16B/003-A	ZDH041P/16C/003-A
20	1	30	A	ZDH041P/20B/003-A	ZDH041P/20C/003-A
32	1	30	A	ZDH041P/32B/003-A	ZDH041P/32C/003-A


Field fittable accessories



**Type
A, AC**



**Sensitivity
30, 300 mA**



**Technical
Data**

Nominal current ratings from 16 to 100A

Residual current circuit breakers designed to interrupt the circuit when there is a direct or indirect contact or an earth leakage between live conductors and earth greater than 30 or 300mA. RCCBs must be protected by an MCB or fuse that protects against overloads and short circuits.

Type

Type AC 

Protection against sinusoidal leakage current. Applied in domestic and commercial installations.

Type A 

Protection against sinusoidal and rectified leakage currents with or without a DC component. Applied in commercial and industrial installations. Type A-S has a time delayed trip to provide selectivity with downstream earth leakage devices. Applied in commercial and industrial installations.

Rated voltage	2 poles	230V / 400V~	
	4 poles	400V / 415V~	
Frequency	50 / 60 Hz		
Calibration temperature	30°C		
Rated making and breaking capacity	Im=Idm		
	In	2p	4p
	16-25-40	500	500
	63	630	630
	80	800	500
	100	1000	630
Sensitivity	30 and 300 mA		
Type	AC and A		
Terminal capacity	25 mm ² flexible / 35 mm ² rigid		
Electrical endurance	10,000		
Mechanical endurance	20,000		
Standards	EN 61008-1		



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Poles	In (A)	DIN mod.	Sensitivity mA	Type	Reference
2	25	2	30	A	ZFI25/2/003-A
2	40	2	30	A	ZFI40/2/003-A
2	63	2	30	A	ZFI63/2/003-A
2	80	2	30	A	ZFI80/2/003-A
2	100	2	30	A	ZFI100/2/003-A
2	25	2	300	A	ZFI25/2/03-A
2	40	2	300	A	ZFI40/2/03-A
2	63	2	300	A	ZFI63/2/03-A
2	80	2	300	A	ZFI80/2/03-A
2	100	2	300	A	ZFI100/2/03-A
4	25	4	30	A	ZFI25/4/003-A
4	40	4	30	A	ZFI40/4/003-A
4	63	4	30	A	ZFI63/4/003-A
4	25	4	300	A	ZFI25/4/03-A
4	40	4	300	A	ZFI40/4/03-A
4	63	4	300	A	ZFI63/4/03-A
4	80	4	300	A	ZFI80/4/03-A
4	100	4	300	A	ZFI100/4/03-A
2	40	2	300	A-S	ZFI40/2/03-S
2	63	2	300	A-S	ZFI63/2/03-S
4	40	4	300	A-S	ZFI40/4/03-S
4	63	4	300	A-S	ZFI63/4/03-S
2	16	2	10	AC	ZFI16/2/001-AC
2	25	2	30	AC	ZFI25/2/003-AC
2	40	2	30	AC	ZFI40/2/003-AC
2	63	2	30	AC	ZFI63/2/003-AC
2	80	2	30	AC	ZFI80/2/003-AC
2	100	2	30	AC	ZFI100/2/003-AC
2	25	2	300	AC	ZFI25/2/03-AC
2	40	2	300	AC	ZFI40/2/03-AC
2	63	2	300	AC	ZFI63/2/03-AC
2	80	2	300	AC	ZFI80/2/03-AC
2	100	2	300	AC	ZFI100/2/03-AC
4	25	4	30	AC	ZFI25/4/003-AC
4	40	4	30	AC	ZFI40/4/003-AC
4	63	4	30	AC	ZFI63/4/003-AC
4	25	4	300	AC	ZFI25/4/03-AC
4	40	4	300	AC	ZFI40/4/03-AC
4	63	4	300	AC	ZFI63/4/03-AC
4	80	4	300	AC	ZFI80/4/03-AC
4	100	4	300	AC	ZFI100/4/03-AC




Auxiliar contacts for residual current circuit breakers ZFI.

Right side add-on


CA: Signal changeover contact

CD: Alarm changeover contact


DIN mod.	Description	Reference
1/2	1 CA/CD	AUXZF1
1/2	1 CA + 1 CA/CD	AUXZF2



Type
AC



Sensitivity
10, 30, 100
300, 500mA



Technical
Data

Nominal current ratings from 25 to 63A

Residual current circuit breakers designed to interrupt the circuit when there is a direct or indirect contact or an earth leakage between live conductors and earth greater than 10, 30, 100, 300 or 500mA. RCCBs must be protected by an MCB or fuse that protects against overloads and short circuits.

Type

Type AC 

Protection against sinusoidal leakage current. Applied in domestic and commercial installations.

Residual current circuit breakers are designed to interrupt electrical circuits when earth leakage currents greater than 10,30,100,300 or 500mA are present, thus reducing the hazards associated with direct or indirect electrical contact.

Rated voltage	2 poles 230V 4 poles 400V
Frequency	50 / 60 Hz
Calibration temperature	30°C
Sensitivity	10, 30, 100, 300 and 500 mA
Trip time	< 30ms
Poles	2 and 4
Type	AC
Terminal capacity	25 mm ² flexible / 35 mm ² rigid
Electrical endurance	10,000
Mechanical endurance	20,000
Standards	EN 20383-75, CEE27

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Poles	In (A)	DIN mod.	Sensitivity mA	Type	Reference
2	25	2	10	AC	FI25/2/001
2	40	2	10	AC	FI40/2/001
2	25	2	30	AC	FI25/2/003
2	40	2	30	AC	FI40/2/003
2	63	2	30	AC	FI63/2/003
2	25	2	100	AC	FI25/2/01
2	40	2	100	AC	FI40/2/01
2	63	2	100	AC	FI60/2/01
2	25	2	300	AC	FI25/2/03
2	40	2	300	AC	FI40/2/03
2	63	2	300	AC	FI63/2/03
2	25	2	500	AC	FI25/2/05
2	40	2	500	AC	FI40/2/05
2	63	2	500	AC	FI63/2/05
4	25	4	30	AC	FI25/4/003
4	40	4	30	AC	FI40/4/003
4	63	4	30	AC	FI63/4/003
4	25	4	100	AC	FI25/4/01
4	40	4	100	AC	FI40/4/01
4	63	4	100	AC	FI63/4/01
4	25	4	300	AC	FI25/4/03
4	40	4	300	AC	FI40/4/03
4	63	4	300	AC	FI63/4/03
4	25	4	500	AC	FI25/4/05
4	40	4	500	AC	FI40/4/05
4	63	4	500	AC	FI63/4/05





Application
Industrial and
commercial distribution



**Technical
Data**

Rated voltage	230V / 400V~		
Rated current	6A		
Frequency	50 / 60 Hz		
Calibration temperature	30°C		
Performance			
AC14	Ue	230V	400V
	Ie	8A	5A
AC15	Ue	230V	400V
	Ie	5A	3A
Terminal capacity	2.5 mm ²		
Electrical endurance	30,000		
Mechanical endurance	40,000		
Standards	EN 62019		
	EN 60947-5-1		

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Add on devices for visual or audible indication of circuit status, or remote control of electrical circuits (MCB/RCD)

YDA alarm or auxiliary contact

Two change over contacts that include both functions described below:

- Auxiliary contact: for monitoring the status of the protective device (open/closed)
- Signal or auxiliary contact: for signalling the automatic tripping of the protective devices (overload or short-circuit for MCB's and earth leakage tripping for RCD's)

The user can easily change the switch application between auxiliary or alarm functions. The device has a test facility allowing the circuit to be checked without actuating the main device. Up to 3 modules can be stacked on the left side of the MCB or RCD (YDA Aux/Alarm, YDU undervoltage release and YDS shunt trip).

DIN mod.	Description	Reference
1	Changeover contact Aux/AI	YDA40



**Technical
Data**

Shunt trip YDS	
Rated voltage	12-48V~= 110-415V~ 110-125V=
Frequency	50 / 60 Hz
Calibration temperature	30°C
Rated voltage	70-110% Ue
Terminal capacity	2.5 mm ²
Standards	EN60947-1

Undervoltage release YDU	
Rated voltage	24V~/= 48V~/= 230V~
Frequency	50 / 60 Hz
Calibration temperature	30°C
Performance	
	Tripping voltage 0.55Ue(+/-10%)
	Resetting voltage >=0.55 Ue(+/-10%)
	Tripping time adjustable 0-300 mseg
Terminal capacity	2.5 mm ²
Standards	EN 60947-1

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YDS shunt trip

YDS shunt trip allowing remote opening of the circuit via a pushbutton or other control device.

YDU undervoltage release

YDU undervoltage release enables the automatic trip of the MCB, RCBO or RCCB if the supply voltage drops below 45~65% of Ue. Time delay function allows a delay of up to 300 msec.

Up to an additional 3 modules can be stacked on the left side of the MCB or RCD (YDA Aux /Alarm, YDU undervoltage release and YDS shunt trip).

DIN mod.	Description	Reference
1	Shunt trip 12-48 Vac/dc	YDS04
1	Shunt trip 110-415 Vac and 110-125 Vdc	YDS40
1	Undervoltage release 24Vac/dc Ajst.0-300msg	YDU02
1	Undervoltage release 48Vac/dc Ajst.0-300msg	YDU04
1	Undervoltage release 230Vac Ajst.0-300msg	YDU23



Application
Industrial and
commercial distribution



**Technical
Data**

Rated current	5A to 250V~ (AC11) 0.5A to 220V= (DC11)
Calibration temperature	30°C
Terminal capacity	2.5 mm ²
Electrical endurance	20,000
Mechanical endurance	20,000

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TH miniature circuit breaker auxiliaries and accessories

Add on devices for visual or audible indication of circuit status, or remote control of electrical circuit.

AUXTH alarm or auxiliary contact

1/2 module device for monitoring the status of TH breakers (open /closed), or trip condition on overload operation. Can be stacked on the right side of the MCB.

DIN mod.	Description	Reference
1/2	1 CA/CD	AUXTH1
1/2	1 CA + 1CA/CD	AUXTH2

- Note:** CA: Changeover signal contact
CD: Changeover alarm contact



**Technical
Data**

Shut trip

	THSHT60	THSHT415
Rated voltage	24-60V~ 110-415V~	24-48V= 110-125V=
Performance	Rated voltage	Rated current
	110V~	0.3A
	230V~	0.6A
	400V~	1.0A
Terminal capacity	2.5 mm ²	

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THSHT shunt trip

THSHT shunt trip allowing remote opening of the circuit via a push button or similiar device. Can be stacked on either side of the mcb.

DIN mod.	Description	Reference
1	Shunt trip 110-415 Vac and 110-125 Vdc	THSHT415
1	Shunt trip 24-60 Vac and 24-48 Vdc	THSHT60



CNP spacer 1/2 module

CNP spacers can be fitted on either side of the TemDin 2 device and allow the safe dissipation of heat when several devices are mounted side by side on the same rail.

DIN mod.	Description	Reference
1/2	Spacer	CNCP



Application
Industrial and
commercial distribution



Technical
Data

Standards	DE 0660 part 500 DIN EN 60439-1; 1994
Material busbars	E-CU-F25
Material of insulation	PC/ABS-Blend UL 94-VO
Cross-section of busbars	10, 12, 16 and 20 mm ²
Maximum operating voltage	500 V
Nominal voltage	415 V
Surge voltage	4 kv.
Short-circuit strength	25 kA
Climate stability	DIN 40046 IEC 68-2
Group of insulation	VDE0110, part 1; 4/1997 (IEC 664)
- overvoltage category	III
- degree of soiling	2

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Busbar systems



Insulated fork type busbar

Poles	Description	Reference
12	Fork type busbar 1p 210mm s=12mm ²	G1L-210/12
57	Fork type busbar 1p 1000mm s=20mm ²	G1L-1000/20
6x2	Fork type busbar 2p 210mm s=10mm ²	G2L-210/10
28x2	Fork type busbar 2p 1000mm s=16mm ²	G2L-1000/16
4x3	Fork type busbar 3p 210mm s=10mm ²	G3L-210/10
4x3	Fork type busbar 3p 210mm s=16mm ²	G3L-210/16
19x3	Fork type busbar 3p 1000mm s=16mm ²	G3L-1000/16
3x4	Fork type busbar 4p 210mm s=16mm ²	G4L-210/16
14x4	Fork type busbar 4p 1000mm s=16mm ²	G4L-1000/16
27x2	Fork type busbar 3p phase/N 1000mm s=16mm ²	GRST+N-1000/16
	Fork type terminal s=25mm ²	AS/25-GN
1	Protection cover pin/fork (5 units)	CTPH5
	End cap busbar 2p/10	EK-C-2
	End cap busbar 3p/10	EK-C-3
	End cap busbar 2p and 3p/16	EK-C-2+3
	End cap busbar 4p/16	EK-C-4



Insulated pin type busbar

Poles	Descripción	Referencia
12	Pin type busbar 1p 210mm s=10mm ²	S1L-210/10
56	Pin type busbar 1p 1000mm s=16mm ²	S1L-1000/16
6x2	Pin type busbar 2p 210mm s=10mm ²	S2L-210/10
28x2	Pin type busbar 2p 1000mm s=16mm ²	S2L-1000/16
4x3	Pin type busbar 3p 210mm s=10mm ²	S3L-210/10
4x3	Pin type busbar 3p 210mm s=16mm ²	S3L-210/16
19x3	Pin type busbar 3p 1000mm s=16mm ²	S3L-1000/16
3x4	Pin type busbar 4p 210mm s=16mm ²	S4L-210/16
14x4	Pin type busbar 4p 1000mm s=16mm ²	S4L-1000/16
	Pin type terminal s=25mm ²	AS/25-SN
1	Protection cover pin/fork (5 units)	CTPH5
	End cap busbar 2p/10	EK-C-2
	End cap busbar 3p/10	EK-C-3
	End cap busbar 2p and 3p/16	EK-C-2+3
	End cap busbar 4p/16	EK-C-4

Current carrying capacity

	1 pole				2, 3, 4 poles	
Feed-in from the end cross section mm ²						
max. current I _s /phase (A)	10	12	16	20	10	16
	63	65	80	90	63	80
Feed-in from the middle						
max. current I _s /phase (A)						
max. feed-in current I _E /phase	100	110	130	150	100	130
	Depends on the cross section for connection					

$I_E = I_s$

$I_E = \sum I_s$

If you feed-in from the middle you have to observe that the sum of the outgoing in not higher than the max. current of the busbars I_s/phase.



Technical Data

Rated current AC1	25A	32A
Rated voltage	250 V	
Frequency	50 / 60 Hz	
Min/max.ambient T° at installation point	-20 / 45 °C	
Terminal capacity	1.5 mm ² min. / 10mm ² max.	
Coil specifications		
- Command voltage	230V~	
- Supply voltage range %Un	85-110%	
- Consumption AC (VA)		
Coil power loss	4	4.5
Pick up power	4	4.5
- Maximum coil holding voltage time	unlimited	
Standards	EN 60947-4-1	

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CDR contactors

Used for the remote switching of circuits up to 32A, with double rectified coil, ensuring silent operation whilst increasing electrical endurance. Visual indication of the contactor switch position via front indication. Sealable clamping terminal with captive screw.

Main contact and auxiliary contact blocks can be clipped on to the left-hand side of the contactor without any necessary tooling, in the following combination:

Auxiliary contact block + Main contact block + Contactor

Contactor		Main contact block CDC	Total N° of poles	DIN mod. CDR+CDC	Aux. contact block CDA (max)
1 Pole	2 Poles	2 Poles			
1	-	-	1	1	2
-	1	-	2	1	2
1	-	1	3	2	1
-	1	1	4	2	1



In (A)	DIN mod.	N° contacts	Reference
25 250V~	1	1 NO	CDR103/25
32 250V~	1	1 NO	CDR103/32
25 250V~	1	2 NO	CDR203/25
32 250V~	1	2 NO	CDR203/32

CDC main contact block for CDR

CDC main contact blocks are 2 pole and rated at 16 or 32A. If you fit a CDC block with a CDR or CDO 1pole contactor, you get a 3 poles contactor and if you use a 2 poles CDR or CDO contactor you get a 4 poles contactor. The CDC block is clipped on the left side of the contactor, without need of any screw or additional wiring.



In (A)	DIN mod.	N° contacts	Reference
25 400V~	1	2 NO	CDC2520
32 400V~	1	2 NO	CDC3220

CDA auxiliary contact block

CDA ½ module auxiliary blocks allow additional contacts for signalling and synchronisation with other devices. Auxiliary contact blocks can be fitted to CDR, CDO contactors and ID impulse relays without any necessary tools. A maximum of 2 blocks can be fitted to the contactor depending on the type and number of main contact blocks.



In (A)	DIN mod.	N° contacts	Reference
5 250V~	1/2	1 Changeover	CDA0510
5 250V~	1/2	1NO+1NC	CDA0520



Technical Data

Rated current AC1	25A / 32A
Rated voltage	400 V~
Frequency	50 / 60 Hz
Min/max.ambient T° at installation point	-20 / 45°C
Terminal capacity	1.5 mm ² min. / 10mm ² max.
Standards	EN 60947-4-1



Technical Data

Rated current AC1	5 A
Rated voltage	250 V~
Frequency	50 / 60 Hz
Min/max.ambient T° at installation point	-20 / 45°C
Terminal capacity	6mm ² max.
Standards	EN 60669-2-2



Technical Data

Rated current AC1	25A	32A
Rated voltage	250 V	
Frequency	50 / 60 Hz	
Min/max.ambient T° at installation point	-20 / 45°C	
Terminal capacity	1.5 mm ² min. / 10mm ² max.	
Coil specifications		
- Command voltage	230V~	
- Supply voltage range %Un	85-110%	
- Consumption AC (VA)		
Coil power loss	4	4.5
Pick up power	4	4.5
- Maximum coil holding voltage time	unlimited	
Standards	EN 60947-4-1	

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CDO contactors

Contactors with a tool-manageable 3-position front handle which allows override, on and off switching of the devices up to 32A:

- STOP - Contacts permanently open
- AUTO - Normal operation
- PERM. - Contacts permanently closed

Double rectified coil ensures silent operation whilst increasing electrical endurance. Visual indication of the contactor switch position via front indicator. Sealable clamping terminal with captive screw. Main contact and auxiliary contact blocks can be clipped on to the left-hand side of the contactor without any necessary tooling, in the following combination:

Auxiliary contact block + Main contact block + Contactor

Contactor		Main contact block CDC	Total N° of poles	DIN mod. CDR+CDC	Aux. contact block CDA (max)
1 Pole	2 Poles	2 Poles			
1	-	-	1	1	2
-	1	-	2	1	2
1	-	1	3	2	1
-	1	1	4	2	1

In (A)	DIN mod.	N° contacts	Reference
25 250V~	1	2 NO	CDO203/25
32 250V~	1	2 NO	CDO203/32



Technical Data

Rated current AC1	25A / 32A
Rated voltage	400 V~
Frequency	50 / 60 Hz
Min/max.ambient T° at installation point	-20 / 45°C
Terminal capacity	1.5 mm ² min. / 10mm ² max.
Standards	EN 60947-4-1



CDC main contact block for CDO

CDC main contact blocks are 2 pole and rated at 16A or 32A. If you fit a CDC block with a CDR or CDO 1pole contactor, you get a 3 poles contactor and if you use a 2 poles CDR or CDO contactor you get a 4 poles contactor. The CDC block is clipped on the left side of the contactor, without need of any screw or additional wiring.

In (A)	DIN mod.	N° contacts	Reference
25 400V~	1	2 NO	CDC2520
32 400V~	1	2 NO	CDC3220



Technical Data

Rated current AC1	5 A
Rated voltage	250 V~
Frequency	50 / 60 Hz
Min/max.ambient T° at installation point	-20 / 45°C
Terminal capacity	6mm ² max.
Standards	EN 60669-2-2



CDA auxiliary contact block

CDA ½ module auxiliary blocks allow additional contacts for signalling and synchronisation with other devices. Auxiliary contact blocks can be fitted to CDR, CDO contactors and ID impulse relays without any necessary tools. A maximum of 2 blocks can be fitted to the contactor depending on the type and number of main contact blocks.

In (A)	DIN mod.	N° contacts	Reference
5 250V~	1/2	1 Changeover	CDA0510
5 250V~	1/2	1NO+1NC	CDA0520



Technical Data

Rated current AC1	25A	40A	63A
Rated voltage	400 V		
Frequency	50 / 60 Hz		
Min/max.ambient T° at installation point	-20 / 45°C		
Terminal capacity	1.5 mm ² min. / 10mm ² max.		
Coil specifications			
- Command voltage	220/240 V		
- Supply voltage range %Un	85-110%		
- Consumption AC (VA)			
Coil power loss	4.4-8.4	7	7
Pick up power	14-18	33-35	33-35
- Fuse protection	35 A	63 A	80 A
Standards	EN 60947-4-1		

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CDI contactors

Used in commercial and industrial applications for loads up to 25A and between 63A, with visual indication of contactor position. Sealable clamping terminals with captive screws.

4 poles contactor	Total N° of poles	DIN mod. CDI+CDI	Block CDI (max)
1	4	2 or 3 + 1/2	1



In (A)	DIN mod.	Contacts	Reference
25 400V~	2	4 NO	CDI406/25
40 400V~	3	4 NO	CDI406/40
63 400V~	3	4 NO	CDI406/63



Technical Data

Rated current AC1	6 A
Rated voltage	400 V~
Frequency	50 / 60 Hz
Min/max.ambient T° at installation point	-20 / 45°C
Terminal capacity	6mm ² max.
Standards	EN 60669-2-2

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Auxiliary contact block

CDI ½ module auxiliary blocks allow additional contacts for signalling and synchronisation with other devices. Auxiliary contact blocks can be fitted to CDI contactors without any necessary tools.



In (A)	DIN mod.	Contacts	Referencia
6 400V~	1/2	1NO+1NC	CDI0620



Technical Data

Rated current AC1	16A / 32A	
Rated voltage	250 V	
Frequency	50 / 60 Hz	
Min/max.ambient T° at installation point	-20 / 45°C	
Maximum load	16 A	32A
-Incandesc.&hallogen		
(40 to 200W lamps)	3000W	4000W
-Fluorescence, compensated (cosφ=0,9)		
serial	3000VA	4000VA
parallel	2500VA	3200VA
-Fluorescence, non compensated (cosφ=0,5)		
	1800VA	2200VA
Terminal capacity	1.5 mm ² min. / 10mm ² max.	
Coil specifications		
- Command voltage	230V~ / 115V=	
- Supply voltage range %Un	90-110%	
- Consumption AC (VA)		
Coil power loss	11	11.5
Pick up power	14.5	16.5
- Consumption DC (W)	7.5	8
- Maximum coil holding voltage time	unlimited	
Standards	EN 60669-2-2	

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ID impulse relays

Impulse relays are used in the control of electrical circuits for heating, lighting or air conditioning applications by the activating the circuit via a pulsed signal. Front handle allows manual operation and indicates contact position..

Main contact and auxiliary contact blocks can be clipped on to the left-hand side of the contactor without any necessary tooling, in the following combination:

Auxiliary contact block + Main contact block + Impulse relay

Impulse relay ID	IDT Block	Total	DIN mod.	Blocks CDA	
1 Pole	2 Poles	2 Poles	N° of poles	ID+IDT	
1	-	-	1	1	2
-	1	-	2	1	2
1	-	1	3	2	1
-	1	1	4	2	1



In (A)	DIN mod.	Contacts	Reference
16	250V~	1NO	ID103/16
32	250V~	1NO	ID103/32
16	250V~	2 NO	ID203/16
32	250V~	2 NO	ID203/32
16	250V~	1 Changeover	ID303/16



Technical Data

Rated current AC1	16A / 32A	
Rated voltage	400 V~	
Frequency	50 / 60 Hz	
Min/max.ambient T° at installation point	-20 / 45°C	
Terminal capacity	1.5 mm ² min. / 10mm ² max.	
Standards	EN 60669-2-2	



IDT main contact block

Main contact blocks are 2 pole and rated at 16A or 32A. If you fit a IDT block with a ID 1pole impulse relay, you get a 3 poles impulse relay and if you use a 2 poles ID impulse relay you get a 4 poles impulse relay. The IDT block is clipped on the left side of the contactor, without need of any screw or additional wiring.

In (A)	DIN mod.	Contacts	Reference
16	400V~	2 NO	IDT1620
32	400V~	2 NO	IDT3220



Technical Data

Rated current AC1	5 A	
Rated voltage	250 V~	
Frequency	50 / 60 Hz	
Min/max.ambient T° at installation point	-20 / 45°C	
Terminal capacity	6 mm ² max.	
Standards	EN 60669-2-2	



CDA auxiliary contact block

CDA ½ module auxiliary blocks allow additional contacts for signalling and synchronisation with other devices. Auxiliary contact blocks can be fitted to CDR, CDO contactors and ID impulse relays without any necessary tools. A maximum of 2 blocks can be fitted to the contactor depending on the type and number of main contact blocks.

In (A)	DIN mod.	Contacts	Reference
5	250V~	1 Changeover	CDA0510
5	250V~	1NO+1NC	CDA0520



Technical Data

Rated current AC12	20 A
Rated voltage	230 V
Frequency	50 / 60 Hz
Terminal capacity	1 mm ² min. / 10mm ² max.
Insulation voltage	250V
Inpulse withstand test voltage	4KV
Standards	EN 60669-1 / EN 60947-5-1

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PD & PDL pushbuttons

A wide range of pushbuttons and pushbuttons with signalling lamp indication, used for the manual control of electrical circuits. The pushbutton allows the momentary disconnection or connection of the control circuit in use.

PD pushbutton

Description	Contacts	DIN mod	Reference
Pushbutton	1NO	1	PD11A
Pushbutton	1NC	1	PD11B
Pushbutton	2NO	1	PD12A
Pushbutton	1NO/NC	1	PD12C
Double pushbutton	1NO + 1NC	1	PD22C



PDL pushbutton with neon signal lamp

Description	Contacts	DIN mod	Reference
Pushbutton+ Pilot neon green 230V	1NO	1	PDL11AG
Pushbutton+ Pilot neon red 230V	1NO	1	PDL11AR
Pushbutton+ Pilot neon white 230V	1NO	1	PDL11AW
Pushbutton+ Pilot neon green 230V	1NC	1	PDL11BG
Pushbutton+ Pilot neon red 230V	1NC	1	PDL11BR
Pushbutton+ Pilot neon white 230V	1NC	1	PDL11BW



Technical Data

Rated current AC12	20 A
Rated voltage	230 / 400 V
Frequency	50 / 60 Hz
Terminal capacity	1 mm ² min. / 10mm ² max.
Insulation voltage	400V
Inpulse withstand test voltage	4KV
Standards	EN 60669-1

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WDM switches and changeover switches

Wide range of switches and changeovers with 2 and 3 positions for a manual control of electrical devices. All the devices have 1 DIN mod. dimension.

Description	Contacts	DIN mod	Reference
Switch 1 pole	1NO	1	WDM11A
Switch 2 pole	2NO	1	WDM12A
Switch 3 pole	3NO	1	WDM13A
Switch 4 pole	4NO	1	WDM14A
Changeover 1-2 1 pole		1	WDM21C
Changeover 1-2 2 pole		1	WDM22C
Changeover with zero position 1-0-2 1 pole		1	WDM31C
Changeover with zero position 1-0-2 2 pole		1	WDM32C

Field fittable accessories (*)



Technical Data

Rated voltage	230V / 400V~		
Frequency	50 / 60 Hz		
Insulation voltage	660V~		
	DDF 32A	DDF 63A	DDF 100A
Rated current In	32A	63A	100A
Rated making and breaking capacity	3Ie		
Short-circuit capacity Icm	700A		
Category	AC-22		
Temperature	30°C		
Terminal capacity	35 mm ² ≤ 63A		
	50 mm ² > 63A		
Mounting	35mm symmetrical DIN rail (EN 50022-DIN 46277)		
Standards	EN 60947-3		



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(*) Accessories up to 63A

DDF mains disconnect switches

Nominal current ratings from 32 to 100A

Mains disconnect switches allow switching and isolation of main circuits. They must be used in conjunction with a protective device, i.e. a fuse or MCB, enabling protection against overload or short circuit conditions.

Poles	In (A)	DIN mod	Reference
1	32A	1	DDF1010032
1	63A	1	DDF1010063
1	100A	1	DDF1010100
2	32A	2	DDF1020032
2	63A	2	DDF1020063
2	100A	2	DDF1020100
3	32A	3	DDF1030032
3	63A	3	DDF1030063
3	100A	3	DDF1030100
4	32A	4	DDF1040032
4	63A	4	DDF1040063
4	100A	4	DDF1040100



Technical Data

Rated voltage	230 V
Frequency	50 / 60 Hz
Max. Switched current rating	16 (3)A / 250V~
Minimum ON/OFF setting	30 minutes
Consumption	1,5 W
Time accuracy	+/- 5 min/year
Charge reserve	150 h
Temperature range	-10 / 50°C
Ingress protection degree	
- without clamps-cover	IP20
- with clamps-cover	IP30
- panel mounting	IP40
Terminal capacity	1.5 mm ² min. / 2.5mm ² max.

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RDA24 analogue timer (daily)

Analogue time switches allow the pre-programmed switching of electrical circuits from user defined settings. Programming is made through manual adjustment of the timers slide tappet. Modular casing for din or wall mounted applications using a panel clip. (Supplied separately)
Manual ON/OFF

Description	DIN mod	Reference
Analogue Time switch 24h	2	RDA24
Analogue Time switch 24h reserve time	2	RDA24R
Kit for panel mount		KITPANEL



Technical Data

Rated voltage	230 V
Frequency	50 / 60 Hz
Max. Switched current rating	16 (3)A / 250V~
Minimum ON/OFF setting	15 minutes
Precision	+/- 0.5 sec/day
Quartz frequency	32.768 Hz
Operating temperature	0 / 50°C
Storing temperature	-10 / 50°C
Battery reserve (for date and hour)	15 days
Recharge time to needed save data	72 hours
Pretection degree	IP40
Terminal capacity	1mm ² min. / 2.5mm ² max.

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RDD07 single module digital timer (weekly)

Digital timers allow the pre programmed switching of electric circuits through a weekly time programme. The LCD display shows the present time, in year, month and day, programmed switching interval, relay ON / OFF status and manual operation. Key on relay's front panel is used for manual ON/ OFF.

Description	DIN mod	Reference
Digital weekly time switch 1 circuit	1	RDD07



Technical Data

Rated voltage	230 V
Frequency	50 / 60 Hz
Max. Switched current rating	16 (3)A / 250V~
Change over contact	voltage free
Number of programs	20 On and 20 off
Time intervals programmable	1 sec. - 99 sec.
	1 min. - 59 min.
	1 h - 24 h
	1 day - 7 days
Variable and programs updated	every minute
Channel activation	end of minute
Precision	+/- 0.5 sec./day
Quartz frequency	32.768 Hz
Operating temperature	0 / 50°C
Storing temperature	-10 / 50°C
Battery reserve (for date and hour)	15 days
Minimum recharge time	72 hours
Ingress protection degree	
- without clamps-cover	IP20
- with clamps-cover	IP30
- panel mounting	IP40
Terminal capacity	1.5 mm ² min. / 2.5mm ² max.

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RDD07A digital time switch

Digital time switch with automatic summer and winter time saving adjustment for set dates. Digital timers allow the pre programmed switching of 1 or 2 electric circuits through a weekly time programme. LCD display shows current program status, current date and time. Modular casing for Din or wall mounted applications using a panel clip. (Supplied separately)



Description	DIN mod.	Reference
Digital weekly time switch auto 1 circuit	2	RDD07A
Digital weekly time switch auto 2 circuits	2	RDD07A2
Kit for panel mount		KITPANEL



Technical Data

Rated voltage	230 V
Frequency	50 / 60 Hz
Max. Switched current rating	16 (3)A / 250V~
Maximum pilotable power	
- tungsten lamp (18x60w)	2000w/230Vac /cosφ=1
- fluorescent lamp	720w/230Vac /cosφ=0,8
- DUO type lamp	200w/230Vac /cosφ=0,9
Activation threshold	2 ~ 100 lux
	2 ~ 1000 lux
	2 ~ 10000 lux
Delay time	
- switching ON	8 seconds +/- 10%
- switching OFF	38 seconds +/- 10%
Operating temperature limit of the module	0 / +55 °C
Operating temperature limit of the photocell	-30/+65°C
Storing temperature of the module	-10/+65°C
Storing temperature of the photocell	-40 / +75 °C
Terminal capacity	1 mm ² min. / 2.5mm ² max.

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RDA24P light sensitive switch

Light sensitive switches allow the control of electric circuits by measuring ambient light intensity. Detected via a separate photocell, the switch changes state when the light intensity drops below a preset level. Connected to the switch through a 4 ~9mm diameter wire, the photocell is suitable for IP65 application.

The switch has an ON/OFF time delay avoiding nuisance operation via unstable light sources such as headlights or lightning flashes. Modular casing for Din or wall mounted applications using a panel clip. (Supplied separately)



Description	DIN mod.	Reference
Light sensitive switch	2	RDA24P
Photocell (spare unit)		RDAP
Kit for panel mount		KITPANEL



Technical Data

	SDS016A	SDS016B
Rated voltage	230V~	220/230V
Frequency	50/60Hz	
Max. Switched current rating	16A	
Contact type	NO (not potential-free)	NO
Time lag adjustable	20seg~10min	30seg~15min
Nº máximo de pulsadores luminosos	50mA	
Switching capacity		
- incandescents lamps	2300 w	3500 w
- fluorescence serial compensated	3500 VA	
- fluorescence parallel compensated	1300 w	2500 VA
- resistive load $\cos\phi=1$	4000 w	
Terminal capacity	4 mm ²	10 mm ²



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SDS staircase switches

Staircase switches allow the timed management of lighting or ventilation circuits used in stairwells or hallways.

SDS016A has permanent time function, or preset timed illumination function. 5 different wiring arrangements are possible: time reset, without time reset, simultaneous operation, consecutive operation and timing off delay.

SDS016B with 3 position handle for automatic, stop and permanent duty. The switching function is contactor enabled and offers silent operation, high switching capacity and good endurance values for incandescent or fluorescent loads. Suitable for 3 or 4 wire systems.

In (A)	DIN mod.	Reference
16A 230V	1	SDS016A
16A 230V	1	SDS016B



Technical Data

Rated current AC12	20 A
Rated voltage	230 V
Frequency	50 / 60 Hz
Lamp	Neon 230V
Lamp power	0.6w
Insulation voltage	250V
Rated impulse voltage	4KV
Terminal capacity	1 mm ² min. / 10mm ² max.
Standards	EN 60947-5-1



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LD pilots

Used to signal the status of the electric circuits: motors, fan, pump, heater, etc. Available with different coloured lenses.

Description	Reference
Pilot green neon 230V	LD1G
Pilot red neon 230V	LD1R
Pilot white neon 230V	LD1W
Pilot double red&green neon 230V	LD2C



Technical Data

Primary voltage	230V~
Secondary voltage	12V~
Frequency	50 / 60 Hz
Terminal capacity	4 mm ²
Mounting	Rail DIN simetric 35mm
Standards	EN 60742



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TDB bell + buzzer + transformer

TDB Bell/buzzer is used for audible signalling in domestic and commercial installations

The device has a double insulated envelope by construction and complies with EN 60 742, which can be used be classified as 'transformers for bells'. This means it is conceived to power bells or similar intermittent warning devices.

Primary voltage	DIN mod.	Reference
230 V~	1	TDB23R



Technical Data

	Ammeter/Voltmeter	Frequency meter	Wattmeter
Rated voltage	230 V~		
Frequency	50 / 60 Hz		
Description	3 digits red display LED 7 segments - h= 9mm		
Precision @ 25°C (%)	+/-0.5% f.s.d. +/- 1 digit	+/-0.2% f.s.d. +/- 1 digit	2% f.s.d. +/- 2 digit Cosφ≤0,7
Input			
- Current	Tl/5A a.c.	—	Tl/5A a.c.
- Voltage	<500 Vac	10-500Vac	<500 Vac
Overload	1.2 In/Vn		
Position of the decimal point	minidip switch	automatic	minidip switch
Primary capacity	minidip switch	—	minidip switch
Power consumption	4 VA		
Operating temperature	0 / 50°C (R.H.<90% no condensation)		
Storing temperature	-10/ 60°C (R.H.<90% no condensation)		
Terminal capacity	1.5 mm² min./ 4mm² max.		
Standards	EN 61010-1, EN 50081-1, EN 50082-1		

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Technical Data

Rated voltage	230 V~
Frequency	50 / 60 Hz
Description	LCD display backlight green colour - h= 13mm 3 digit display for instant measurement 6 digit display for energy measurements
Resolution	10 bits
Visual variable	once a time
Precision @ 25°C (%)	1% f.s.d. Cosφ=1
Input	
- Current	5A a.c. (48-62 Hz)
- Voltage	230 Vac (L-N) / 400 Vac (L-L)
Output	
- Type	Open collector transistor
- Von (max.)	0.6 Vdc/ Ic=4mA (max)
- Voff (max.)	26 Vdc
- Number of pulses	settable pulses for 1 Kwh/1kVARh
- Duration pulse	Ton=20 ms (+/- 1ms) Toff=19 ms (min)
Indications	min.0 / max.999 (for instant measurements) min.00000.0 / max.99999.9 (for energy measurements)
Overload	1.2 In/Vn
Power consumption	5 VA
Operating temperature	0 / 50°C (R.H.<90% no condensation)
Storing temperature	-10/ 60°C (R.H.<90% no condensation)
Standards	EN 61010-1, EN 50081-1, EN 50082-1

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MDD digital measurement instruments

A wide range of measurement equipment allowing the measurement of electrical parameters including: voltage, current, active power, reactive power, energy and power factor. Voltmeters and Ammeters within the range are available in either digital or analogue versions. Universal digital analysers allow the measurement of a wide range of electrical parameters within one device. Units have modular casing for Din or wall mounted applications using a panel clip. (Supplied separately)

Digital ammeter/ voltmeter

One device suitable for voltage or current measurement. Double input selection on the unit allows connections to determine usage as either a voltmeter or ammeter.

Digital frequency meter

This device allows the monitoring of frequencies from 1 to 999Hz and is equipped with automatic load selection.

Digital wattmeter

Measurement of active power circuits in single or three phase systems, with balanced / non-balanced load characteristics. Primary load selection by front dip switch, automatic decimal point selection.

Description	DIN mod.	Reference
Digital Ammeter/Voltmeter	2	MDD06B
Digital Frequency meter	2	MDD00F
Digital Wattmeter	2	MDD06W
Kit for panel mount		KITPANEL

Universal digital analyser

One simple device for monitoring electrical parameters in single phase or three phase systems with balanced / non-balanced load characteristics, 5 module width.

Three key enquiry system measuring 24 system parameters: current, voltage, active power, reactive power, power factor, active and reactive energy.

Description	DIN mod.	Reference
Universal digital analyser	5	MDD06P



MDA analogue ammeters and voltmeters

Current and voltage measurement for a.c. circuits. Easy scale change for different transformer ratios.



Technical Data

	Ammeter	Voltmeter
Rated voltage	—	300 and 500 Vac
Rated current	15, 25 and 40A direct 50 to 1000A / CT	—
Frequency	15~100 Hz	
Precision @ 25°C (%)	1.5 f.s.d.	
Overload		
- Permanent	1.5 Ie	1.2 Ve
- 5 seconds	10 Ie	2 Ve
Consumption	0.3~1 VA	1.5~3 VA
Operating temperature	-25 / 40°C	
Testing voltage	2000V 50Hz during 1 minute	
Standards	IEC-51, VDE-0410, DIN 43780, EN-21318, BS-89, EN 50081, EN 50082, CEI 1010, EN 61010	

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Description	DIN mod.	Reference
Analogue voltmeter 300V	3	MDA03V
Analogue voltmeter 500V	3	MDA05V
Analogue Ammeter 15A	3	MDA01A
Analogue Ammeter 25A	3	MDA02A
Analogue Ammeter 40A	3	MDA04A
Analogue Ammeter X/5 A	3	MDA06A

MDA06A interchangeable scales for analogue meters

Description	Reference
Scale 50 A	MDC050A
Scale 75 A	MDC075A
Scale 100 A	MDC100A
Scale 150 A	MDC150A
Scale 200 A	MDC200A
Scale 250 A	MDC250A
Scale 300 A	MDC300A
Scale 400 A	MDC400A
Scale 500 A	MDC500A
Scale 600 A	MDC600A
Scale 800 A	MDC800A
Scale 1000 A	MDC1000A

Active energy meter

Single phase energy meter with 6-digit display and 0.1k w resolution. Green LED indication for power input and flashing red LED for load consumption (640 imp/kwh). Units have modular casing for Din or wall mounted applications using a panel clip. (Supplied separately).



Technical Data

Rated voltage	230 V~
Frequency	50 / 60 Hz
Description	Display mechanical 5+1 digit - h=4mm
Precision @ 25°C (%)	2% f.s.d. +/- 2 digit Cosφ≤0,7
Input	
- Current	16A a.c. (48~62 Hz)
- Voltage	230 Vac (+10/-15%) by voltmetric input
Overload	1.2 In/Vn
Consumption	6 VA 1.5w (capacitive)
Operating temperature	0 / 50°C (R.H.<90% no condensation)
Storing temperature	-10/ 60°C (R.H.<90% no condensation)
Terminal capacity	1.5 mm² min / 4mm² max
Standards	EN 61010-1, EN 50081-1, EN 50082-1

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Description	DIN mod.	Reference
Active Energy meter	2	MDA00E
Kit for panel mount		KITPANEL



Technical Data

Rated voltage	720V max.
Primary rated current	from 50 to 1000A
Secondary rated current	5A
Frequency	50 / 60 Hz
Test voltage	3 kV (1min/50Hz)
Rated short-time thermal current	I _{th} : limited to primary bar
Rated dynamic current	I _{din} = 2.5 I _{th}
Continuous overload	1.2 I _n
Standards	IEC 185 ; UNE21088-1; VDE0414; IEC801/1-3,4

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TDC current transformer

Current transformers allow measurement of high line currents of up to 1000A with 5A secondary output ratios for use with low input range meters.

The CT are cable/bus-bar type. The self-extinguish plastic case offers excellent resistance to mechanical and thermal stress. Every CT enclose a fastening system to rail DIN as standard.

Description		Reference
I _{prim} =50A	bus-bar: 20x5mm cable: ø 16mm	Class 3 - 1VA TDC050
I _{prim} =75A		Class 1 - 1VA Class 3 - 2VA TDC075
I _{prim} =100A		Class 1 - 2.5VA Class 3 - 3.75VA TDC100
I _{prim} =150A	bus-bar:30x10mm cable:ø 22mm	Class 0.5 - 1.5VA Class 1 - 2.5VA TDC150
I _{prim} =200A		Class 0.5 - 2.5VA Class 1 - 3.75VA Class 1 - 5VA TDC200
I _{prim} =250A	bus-bar:40x10mm cable:ø 30mm	Class 0.5 - 5VA Class 1 - 7.5VA Class 1 - 10VA TDC250
I _{prim} =300A		Class 0.5 - 7.5VA Class 1 - 10VA Class 1 - 15VA TDC300
I _{prim} =400A	bus-bar:60x10mm cable:ø 51mm	Class 0.5 - 10VA Class 1 - 15VA Class 1 - 20VA TDC400
I _{prim} =500A		Class 0.5 - 15VA Class 1 - 20VA Class 1 - 30VA TDC500
I _{prim} =600A	bus-bar:80x10mm cable:ø 65mm	Class 0.5 - 15VA Class 1 - 20VA Class 1 - 30VA TDC600
I _{prim} =800A		Class 0.5 - 15VA Class 1 - 20VA Class 1 - 30VA TDC800
I _{prim} =1000A		Class 0.5 - 15VA Class 1 - 20VA Class 1 - 30VA TDC000
Fastening system to rail DIN		TDCKIT



Technical Data

Primary voltage	230V~
Frequency	50 / 60 Hz
Terminal capacity	4 mm ²
Standards	EN 60742

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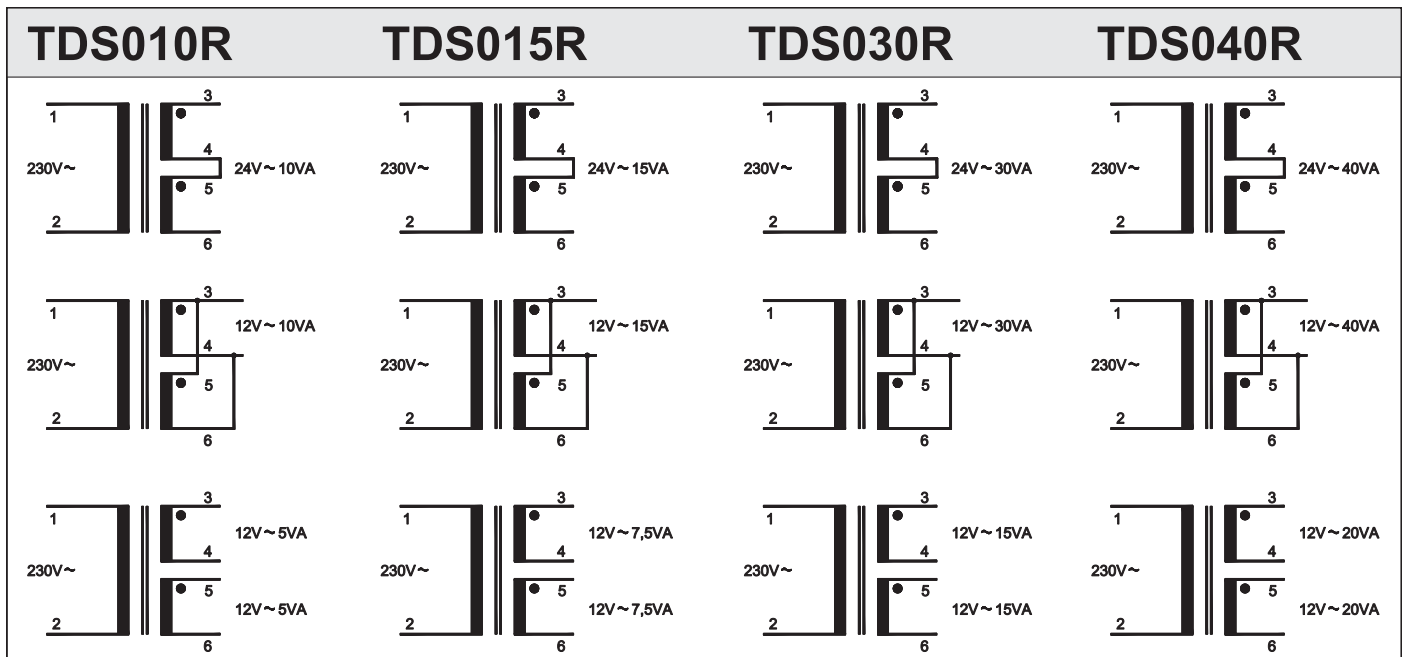
TDS safety transformer

Safety transformers are used for the distribution of very low voltages: this guarantees high protection against electrocution. Short-circuit proof and failsafe transformers offer great reliability in terms of their galvanic separation between primary and secondary circuits. Short-circuit proof transformers are protected from the over temperatures consequent in overload and short circuit conditions, by their own incorporated protective device. When normal operating conditions are returned and the transformer temperature is returned to within operating limits, the transformer will function correctly. Failsafe transformers on the other hand can no longer function, following anomalous use or fault.

Primary voltage	Secondary voltage	Nominal power	DIN mod.	Reference
230V~	12V~	10 VA	2	TDS010F
230V~	12V~	15 VA	2	TDS015F
230V~	12/24V~	10 VA	2	TDS010R
230V~	12/24V~	15 VA	2	TDS015R
230V~	12/24V~	30 VA	4	TDS030R
230V~	12/24V~	40 VA	4	TDS040R

= F Failure-proof

= R Short circuit proof





Technical Data

Rated voltage	690V
Impulse withstand voltage	6 kV
Thermal overload release	In from 0.1 to 25A setting range
Magnetic release	setting at 12 x In
Frequency	50 / 60 Hz
Electric and mechanical	
endurance	100.000 cycles
Maximum switch	30 manoeuvre/hour
Impact resistance	20g (impact duration of 20ms)
Operating temperature	
- open	-25°C / 55°C
- enclosed	-25°C / 40°C
Terminal capacity	0.75 mm ² / 4 mm ²
Torque main contacts	1.2 Nm
Weight approx.	250 g
Standards	IEC 947, EN 60947
	EN 60204, VDE 0113, VDE 0660

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GD25 manual motor starter

Manual motor starters are designed for the operation and protection of small electrical motors (start /stop procedure and overload protection for single or three phase applications).



Rated current	Setting ranges of thermal overload release	Reference
0.16A	0.1-0.16A	GD25016
0.25A	0.16-0.25A	GD25025
0.4A	0.25-0.4A	GD2504
0.63A	0.4-0.63A	GD25063
1A	0.63-1A	GD251
1.6A	1-1.6A	GD251V6
2.5A	1.6-2.5A	GD252V5
4A	2.5-4A	GD254
6.3A	4-6.3A	GD256V3
10A	6.3-10A	GD2510
16A	10-16A	GD2516
20A	16-20A	GD2520
25A	20-25A	GD2525



Technical Data

Rated voltage	500V
Current Ith	6A
Rated current AC15	
	230V 400V 500V
	3.5 A 2 A 1.5 A
Frequency	50 / 60 Hz
Electric endurance AC3	100,000 cycles
Maximum switch	30 manoeuvre/hour
Impact resistance	20g (impact duration of 20ms)
Terminal capacity	0.75 mm ² / 2.5 mm ²
Torque auxiliary contacts	1 Nm
Weight approx.	35g

Manual motor starter accessories

Accessories for the visual or audible indication of circuit status, or remote control of electrical circuits.

Auxiliary contact blocks

For remote monitoring of the manual motor starters status.



DIN mod.	Contact	Reference
1/2	1NO+1NC	GDPS11
1/2	2NO	GDPS20
1/2	1NO	GDPS10
1/2	1NC	GDPS01

GD shunt trip and undervoltage release

Shunt trips allow the remote tripping of the manual motor starters on applied voltage. Under voltage releases allows the remote tripping of the circuit when coil voltage is removed, or when the system voltage drops below a pre-determined level.



Technical Data

	GDUVT	GDSHT
Rated voltage	24, 110, 230 and 400 V~	
Frequency	50 / 60 Hz	
Trip range	0.35~0.7 Ue	—
Operation range	0.85~1.1 Ue	0.7~1.1 Ue
Weight approx.	65g	



Nominal power	Description	Reference
50-60 Hz	Undervoltage release	GDUVT
50-60 Hz	Shunt trip	GDSHT

(1) Nominal voltage and frequency must by indicated.



Enclosures

Range of flush mount or surface mount enclosures for the installation of GD manual motor starters. Auxiliary contacts can be fitted on the manual motor starter.

Description	Ingress protection degree	Reference
Surface mounting	IP-41	GDO41
Surface mounting	IP-55	GDO55
Flush mounting	IP-41	GDCP44
Flush mounting	IP-55	GDCP55



Other accessories

Enclosure padlocking facility allows up to 3 padlocks to be fitted, for lock in off facility. Emergency stop button, 35 mm diameter with IP55 protection. Unlocked by turning movement.

Description	Reference
Enclosure padlocking facility	GDZ
Emergency stop button	GDNAT



Technical Data

	FDS08/FDI08	FDS10/FDI10	FDS14	FDS22
Utilization category	AC-22B			AC-21B
Rated voltage	400V		690V	
Rated impulse withstand voltage Uimp	8kV			
Rated current	20A	25A	50A	100A
Rated making breaking capacity	60A	75A	150A	150A
Rated short time withstand current Icw	240A	300A	600A	1200A
Rated conditional short circuit current	50kA	100kA	100kA	100kA
Frequency	50 Hz			
Maximum power dissipation	2.6w	3w	5w	9.5w
Terminal capacity	25mm ² max.		35mm ² max.	50mm ² max.
Fuse size	8x31	10x38	14x51	22x58
Standards	IEC 947-1, IEC 947-3			

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FD fuse holder

Fuses guarantee a high level of protection against overload and short circuit conditions, in control, signalling and installation networks. FD fuseholders are suitable for gL, gG and aM type fuses.



Poles	In (A)	Voltage (V)	DIN mod.	Indicator	Reference
1P	20A	400V~	1	-	FDS0810
1P+N	20A	400V~	2	-	FDS0811
2P	20A	400V~	2	-	FDS0820
3P	20A	400V~	3	-	FDS0830
3P+N	20A	400V~	4	-	FDS0831
1P	20A	400V~	1	LED	FDI0810
1P+N	20A	400V~	2	LED	FDI0811
2P	20A	400V~	2	LED	FDI0820
3P	20A	400V~	3	LED	FDI0830
3P+N	20A	400V~	4	LED	FDI0831
1P	25A	690V~	1	-	FDS1010
1P+N	25A	690V~	2	-	FDS1011
2P	25A	690V~	2	-	FDS1020
3P	25A	690V~	3	-	FDS1030
3P+N	25A	690V~	4	-	FDS1031
1P	25A	690V~	1	LED	FDI1010
1P+N	25A	690V~	2	LED	FDI1011
2P	25A	690V~	2	LED	FDI1020
3P	25A	690V~	3	LED	FDI1030
3P+N	25A	690V~	4	LED	FDI1031
1P	50A	690V~	1.5	-	FDS1410
1P+N	50A	690V~	3	-	FDS1411
2P	50A	690V~	3	-	FDS1420
3P	50A	690V~	4.5	-	FDS1430
3P+N	50A	690V~	6	-	FDS1431
1P	100A	690V~	2	-	FDS2210
1P+N	100A	690V~	4	-	FSD2211
2P	100A	690V~	4	-	FDS2220
3P	100A	690V~	6	-	FDS2230
3P+N	100A	690V~	8	-	FDS2231



Technical Data

	TM20I	TM20IS	TM20II	TM20IIII
Rated voltage (V~)		230V		400/230V
Maximum voltage (V~)		270		540/270V
Frequency	50/60 Hz			
I _{max} (8/20μs)	20kA			
Protection level V _p ⁽¹⁾	960V			
Poles	1	1	2	4
Type	Single pole plug-in		Multi-pole monoblock	
Thermal fuse healthy indication	LED	LED + S ⁽²⁾	LED	LED
Operating temperature	-30°C / 70°C			
Connection	In parallel			
Response time	5ns			
Terminal capacity	50mm ²			
Replacement module	TM20IR	TM20IR	—	—

Note:

- (1) V_p: Residual voltage value when a transient current (8/20μs) is equal to the rated current.
- (2) References with «S» indicated that have double indication: LED + dry contact (remote signal).

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Poles	Rated voltage	I _{max} (8/20μs)	DIN mod.	Type	Reference
1	230V	20kA	1	plug-in	TM20I
1	230V	20kA	1	plug-in	TM20IS
	Replacement module				TM20IR
2	230V	20kA	2	monoblock	TM20II
4	400/230V	20kA	5	monoblock	TM20IIII



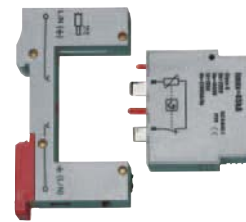
Technical Data

	TM45I	TM45IS	TM45II	TM45IIIIIS
Rated voltage (V~)		230V		400/230V
Maximum voltage (V~)		270		540/270V
Frequency	50/60 Hz			
I _{max} (8/20μs)	45kA			
Protection level V _p ⁽¹⁾	1000V			
Poles	1	1	2	4
Type	Single pole plug-in		Multi-pole monoblock	
Thermal fuse healthy indication	LED	LED + S ⁽²⁾	LED	LED + S ⁽²⁾
Operating temperature	-30°C / 70°C			
Connection	In parallel			
Response time	5ns			
Terminal capacity	50mm ²			
Replacement module	TM45IR	TM45IR	—	—

Note:

- (1) V_p: Residual voltage value when a transient current (8/20μs) is equal to the rated current.
- (2) References with «S» indicated that have double indication: LED + dry contact (remote signal).

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Poles	Rated voltage	I _{max} (8/20μs)	DIN mod.	Type	Reference
1	230V	45kA	1	plug-in	TM45I
1	230V	45kA	1	plug-in	TM45IS
	Replacement module				TM45IR
2	230V	45kA	2	monoblock	TM45II
4	400/230V	45kA	5	monoblock	TM45IIIIIS



Technical Data

	TM65I	TM65IS	TM80IIIS	TM35SPI ⁽³⁾
Rated voltage (V~)	230V		400/230V	230V
Maximum voltage (V~)	270V		540/270V	255V
Frequency	50/60 Hz			
I _{max} (8/20μs)	65kA		80kA	35kA(10/350)
Protection level V _p ⁽¹⁾	1200V			<4kV
Poles	1	1	4	1
Type	Single pole plug-in		Multi-pole monoblock	spark-gap
Thermal fuse healthy indication	LED	LED + S ⁽²⁾	LED + S ⁽²⁾	—
Operating temperature	-30°C / 70°C			
Connection	In parallel			
Response time	5ns			
Terminal capacity	50mm ²			
Replacement module	TM65IR	—	—	—



Note:

- (1) V_p: Residual voltage value when a transient current (8/20μs) is equal to the rated current.
- (2) References with «S» indicated that have double indication: LED + dry contact (remote signal).
- (3) Spark gap type: follow current=1,5kA, Insulation resistance ≥ 1000MΩ.

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Poles	Rated voltage	I _{máx} (8/20μs)	DIN mod.	Type	Reference
1	230V	65kA	1	plug-in	TM65I
1	230V	65kA	1	plug-in	TM65IS
	Replacement module				
4	400/230V	80kA	5	monoblock	TM80IIIS
1	230V	35kA(10/350)	1	spark gap	TM35SPI

Telecommunication line protection

Protect telecommunications installations against overvoltage surge.



Technical Data

	TMT10RJ45	TMT101DIN	TMT102DIN	TMT104DIN	TMTV10
Rated voltage (V~)		150V=			5V=
Peak transient current (8/20μs)			10kA		
Connection		Serial (up 400mA)			Serial (up 500mA)
Response time			5ns		

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Nº lines	Rated voltage	Connection	Fixing type	Reference
1	150V=	Serial (up 400mA)	screws	TMT10RJ45
1	150V=	Serial (up 400mA)	DIN	TMT101DIN
1	150V=	Serial (up 400mA)	DIN	TMT102DIN
1	150V=	Serial (up 400mA)	DIN	TMT104DIN
1	5V=	Serial (up 500mA)	—	TMTV10

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Normal service conditions

The TemDin series of Miniature Circuit Breakers are designed to operate at ambient temperatures between -5°C and +40°C. For specific applications at ambient temperatures values other than the ones mentioned above, please, use the correction factors in table 6 and 7.

The upper limit for relative humidity is 50% at a maximum temperature of +40°C, although the breakers can operate at higher relative humidities for lower temperatures (e.g.: a relative humidity of the 90% at +20°C ambient temperature would be acceptable).



TemDin MCB specifications throughout this catalogue are for installations where the altitude does not exceed 2000m above sea level. For installations above at higher altitudes, it is necessary to take into account the reduction of the dielectric strength and of the cooling effect of the air.

The ambient temperature during transport and storage must not exceed the interval between -25°C and +70°C. For short periods not exceeding 24 hours up to +85°C can be reached with a relative humidity of 30%. During this period it is important to avoid water condensation inside the breakers, otherwise, oxidation and stain spots might appear affecting thus the normal operation of the breaker.

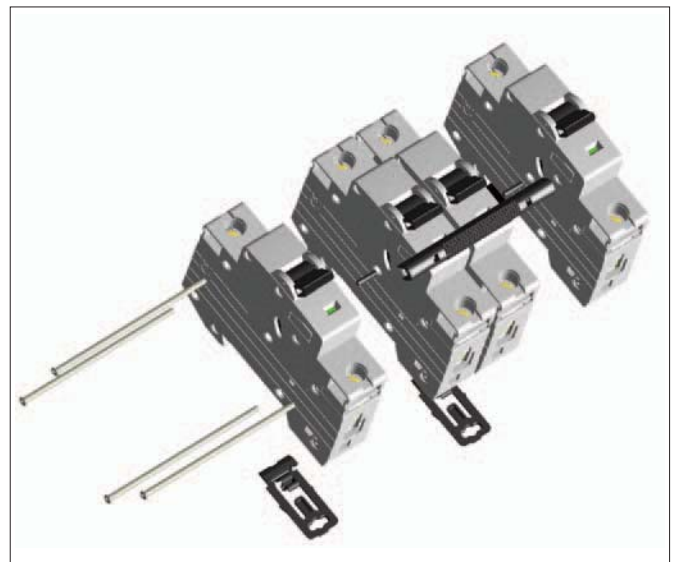
Installation

In accordance with EN 50022, TemDin devices are designed for mounting directly on to 35 mm DIN rail. The adjustable fastening device allows easy installation and removal on to pan assemblies or systems using comb busbar for distribution

TemDin breakers have dual terminal arrangements allowing the connection of cable, busbar or crimp. Cable terminations are of the stirrup type and the terminal screw can be tightened using a Philips head screwdriver or 5mm flat blade screwdriver. The design characteristics of the MCB terminal allow for up to 35mm² wire section (rigid or flexible) to be connected, as well as grouped conductors of various sections or connecting busbar.

The recommended torque for the MCB terminal is between 1.7 to 2 Nm. If torque levels higher than the specified limit are applied deformation to MCB terminal may occur. It is recommended that MCB terminals are checked on a regular basis, thus reducing any risk of overheating through loss of connection.

TemDin breakers can be line fed from either the top or bottom end of the device



DE, DS, DH and R series

Standards

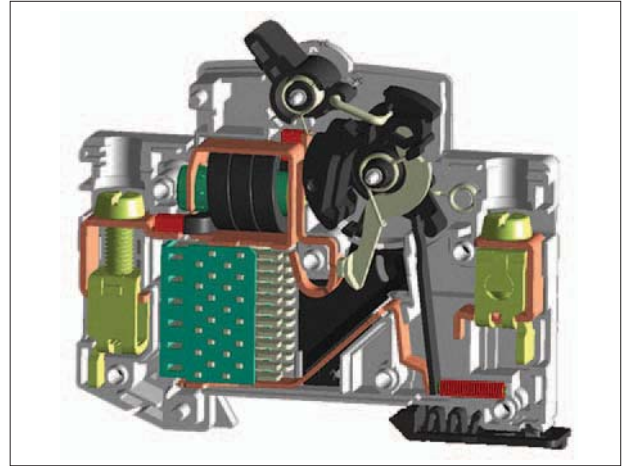
Manufactured in accordance with EN 60 898 and EN 60 947 where applicable.
Conforming with low voltage directive (72/23/CEE)

Rated Voltage (Ue)

The rated operational voltage (Ue) for TemDin MCBs are as follows:

N° Poles	Type B, C and D
Single pole	230/400 V~
Single pole with neutral	230 V~
Two, three and four pole	400 V~

NOTE: Suitable for use at 240/415V.



Protection

The degree of protection afforded by the TemDin range of MCB is IP2X, as defined in EN 60 529.

Rated insulation voltage (Ui)

The rated insulation voltage for the TemDin MCBs is 660V AC. Dielectric testing and earth leakage path tests have been carried on this voltage.



Rated current (In)

The following ratings are established for alternating currents at supply frequencies of 50/60Hz and with the subsequent tripping characteristics shown below:

Types B and C

6 - 8 - 10 - 13 - 16 - 20 - 25 - 32 - 40 - 50 - 63 A

Type D

0.3 - 0.5 - 0.75 - 1 - 1.6 - 2 - 2.5 - 3 - 3.5 - 4 - 6 - 8 - 10 - 13 - 16 - 20 - 25 - 32 - 40 - 50 - 63 A

Tripping time

The magnetic tripping time of the TemDin2 breaker ranges between 8 and 20ms depending on the overcurrent value.

Impulse withstand test voltage U_{imp}

The impulse withstand test voltage is 4kV
Shock wave 1.2/50 μ s

DE, DS, DH and R series

Insulating distance

Minimum clearance distances must be maintained between the circuit breakers upper side and any earthed metal within its vicinity. Clearance distances of 40mm have been established for the R and DS series, and 80mm for the DH MCB series

Energy limiting class

TemDin MCB energy classifications are as follows:

R series	DS series	DH series
Tripping curve C / Class 2	Tripping curve C / Class 3	Tripping curve B / Class 3

The maximum real let-through energy values (I^2t) of the TemDin2 breakiers are stated in tables of pages 48 and 49.

Breaking capacity

The Tem Din series of MCB has three ranges, R, DS and DH.

By application of the standard EN 60 947, higher assigned short circuit values can be obtained, therefore the breaking capacity of the DS range increases up to 10,000A.

MCBs to EN 60898

The R and DS series of miniature circuit breaker are designed for operation in domestic, commercial and industrial sectors:
Breaking Capacity: 6Ka of I_{CN} and I_{CS} witch $\cos\varphi=0.65-0.7$

The DH series of miniature circuit breaker are designed for operation in commercial and industrial sectors:
Breaking Capacity: 10Ka I_{CN} witch I_{CS} 7.5A up to 32A and 6Ka I_{CN} and I_{CS} for 40, 50 and 63A, in both cases $\cos\varphi=0.45-0.5$

Endurance

Electrical endurance: 30,000 operations
Mechanical endurance: 40,000 operations

Mechanical shock and impact

The TemDin breakers have been subjected to accelerations of up to 22g without provoking the mechanical tripping of the breaker.

Temperature rise

Maximum permitted temperature rise is as stipulated by EN 60 898. TemDin breakers comply as follows:

Type B,C and D	
Terminals for external connections	60°C + ambient temperature
External parts which can be touched	40°C + ambient temperature
other external parts	60°C + ambient temperature

Protection of Motors

The protection of motors against the effects of an internal short circuit must be ensured, allowing at the same time the presence of short duration overcurrents (starting) without causing tripping of the protection element.

This element must also ensure protection of the line, of the contactor and of the thermal relay associated to the motor.

Table 1
TemDin series selection
table for 4 pole squirrel
cage motors.

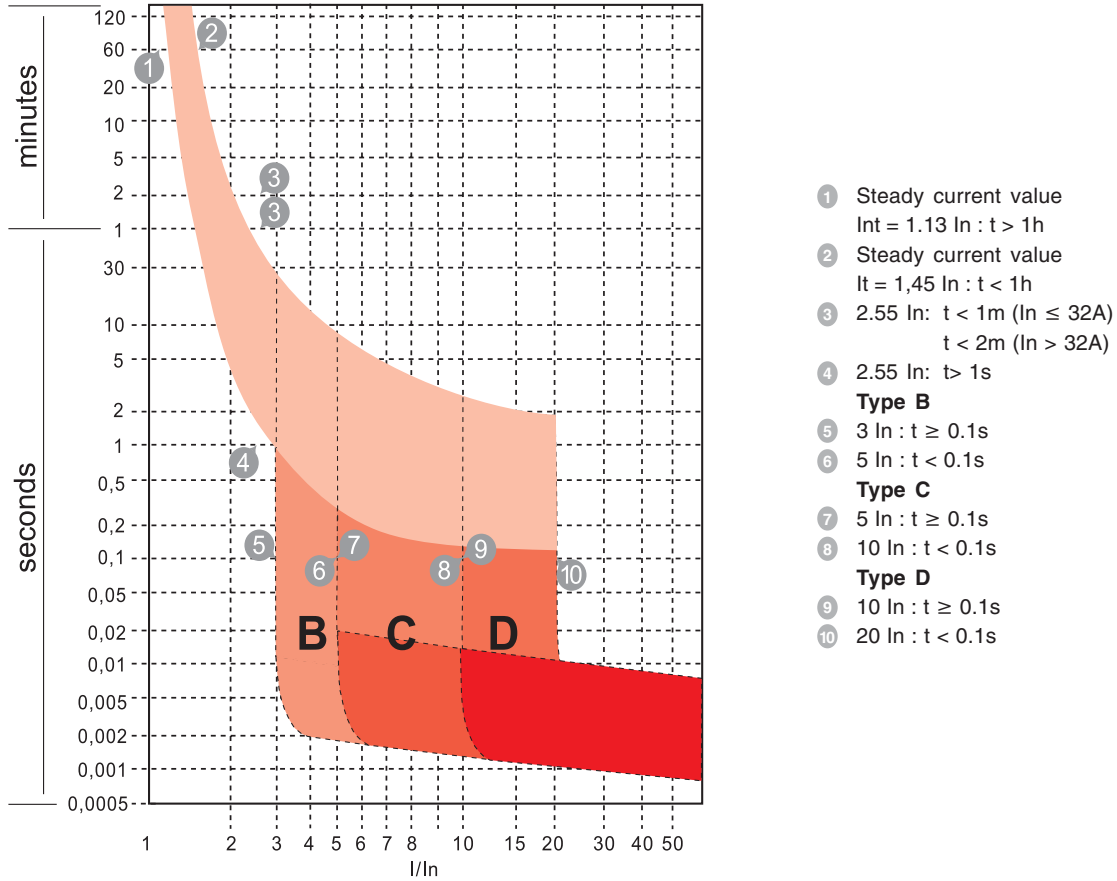
380 / 415 V Kw	50/60 Hz HP	Type D In	Magnetic trip
0.37	0.5	1.6	20
0.55	0.75	2	25
0.75	1	2.5	31.5
1.1	1.5	3	37.5
1.5	2	4	50
2.2	3	6	75
3.7	5	10	125
4	5.5	10	125
7.5	10	20	250
9	12	20	250
10	13.5	25	313
11	15	25	313
15	20	32	400
18.5	25	40	500
22	30	50	625
25	34	50	625
30	40	63	788

DE, DS, DH and R series

Tripping Characteristics

MCB tripping characteristics comply with EN 60 898

B, C and D tripping characteristics according EN 60898



Application selection for MCB tripping characteristics

Type B characteristics are suitable for moderately inductive loads having that have little or no switching surges i.e. electric heating, water heating, ovens etc.

Type C characteristics MCBs can be used in general applications such as lighting, ring/ radial socket outlets and small motors.

Installations where the equipment is likely to produce abnormally high inrush currents, such as transformers, welding machines or induction motors are suited to type D characteristics.

Power loss

Power loss values as defined by EN 60 898 .Per pole values shown.

DE, DS and DH series

In		Drop voltage		Power loss		Maximum power loss by Standard	
0.3	A	3.032	V	0.91	W	3	W
0.5	A	2.309	V	1.15	W	3	W
0.75	A	1.114	V	0.84	W	3	W
1	A	1.062	V	1.06	W	3	W
1.6	A	0.745	V	1.19	W	3	W
2	A	0.449	V	0.90	W	3	W
2.5	A	0.489	V	1.22	W	3	W
3	A	0.412	V	1.24	W	3	W
3.5	A	0.333	V	1.17	W	3	W
4	A	0.325	V	1.30	W	3	W
6	A	0.326	V	1.96	W	3	W
10	A	0.185	V	1.85	W	3	W
16	A	0.147	V	2.35	W	3.5	W
20	A	0.148	V	2.96	W	4.5	W
25	A	0.135	V	3.38	W	4.5	W
32	A	0.102	V	3.26	W	6	W
40	A	0.082	V	3.28	W	7.5	W
50	A	0.073	V	3.65	W	9	W
63	A	0.113	V	7.12	W	13	W

Table 2

R series

In		Drop voltage		Power loss		Maximum power loss by Standard	
0.3	A	4.050	V	1.22	W	3	W
0.5	A	2.7	V	1.35	W	3	W
0.75	A	1.95	V	1.46	W	3	W
1	A	1.125	V	1.13	W	3	W
1.6	A	0.595	V	0.95	W	3	W
2	A	0.5	V	1.00	W	3	W
2.5	A	0.42	V	1.05	W	3	W
3	A	0.3	V	0.90	W	3	W
3.5	A	0.34	V	1.19	W	3	W
4	A	0.185	V	0.74	W	3	W
6	A	0.280	V	1.68	W	3	W
10	A	0.167	V	1.67	W	3	W
16	A	0.149	V	2.38	W	3.5	W
20	A	0.178	V	3.56	W	4.5	W
25	A	0.139	V	3.48	W	4.5	W
32	A	0.136	V	4.35	W	6	W
40	A	0.097	V	3.88	W	7.5	W
50	A	0.067	V	3.35	W	9	W
63	A	0.089	V	5.61	W	13	W

Table 3

Protection of cables and conductors against short circuits

Protection of conductors against the effects of an overcurrent is ensured when the following is fulfilled:

$$I^2t < K^2q^2$$

- I = current r.m.s. (A) short circuit conditions
- t = breaking time (sec.)
- K = material factor
- q = cable section (mm)

Example:

$K^2q^2 = 29,756A^2s$ for an electrical line with a copper conductor (1.5 mm²) PVC covered. If we want to protect this line with a TD-B 6kA, its I²t must be lower than the conductor K^2q^2 ; 6A at 16A

Values for isolated conductor

mm ²	Copper conductor (Cu)		
	K ² q ² (A ² s)	PVC K=115	Rubber K=141
0.5	3.306	4.970	5.112
0.75	7.439	11.183	11.503
1	13.225	19.881	20.449
1.5	29.756	44.732	46.010
2.5	82.656	124.256	127.806
4	211.600	318.096	327.184
6	476.100	715.716	736.164
10	1,322.500	1,988.100	2,044.900
16	3,385.600	5,089.536	5,234.900
25	8,265.625	12,425.625	12,780.625
35	16,200.625	24,354.225	25,050.025

Table 4

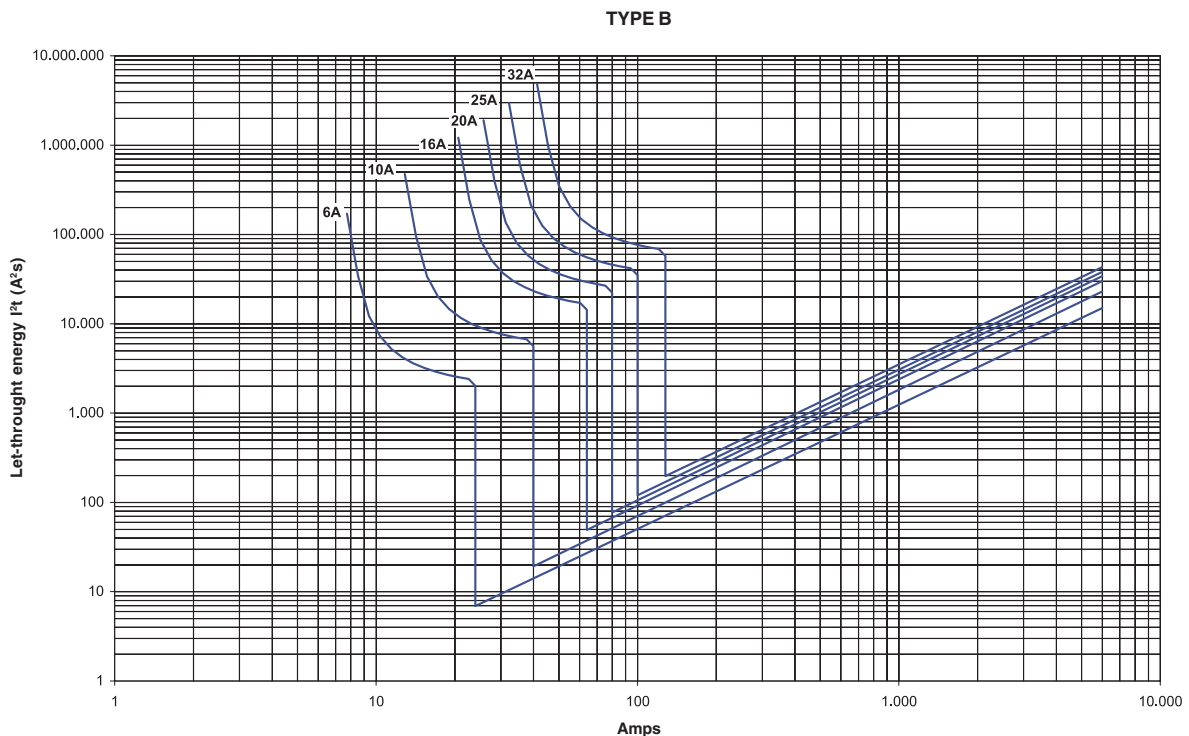
R series

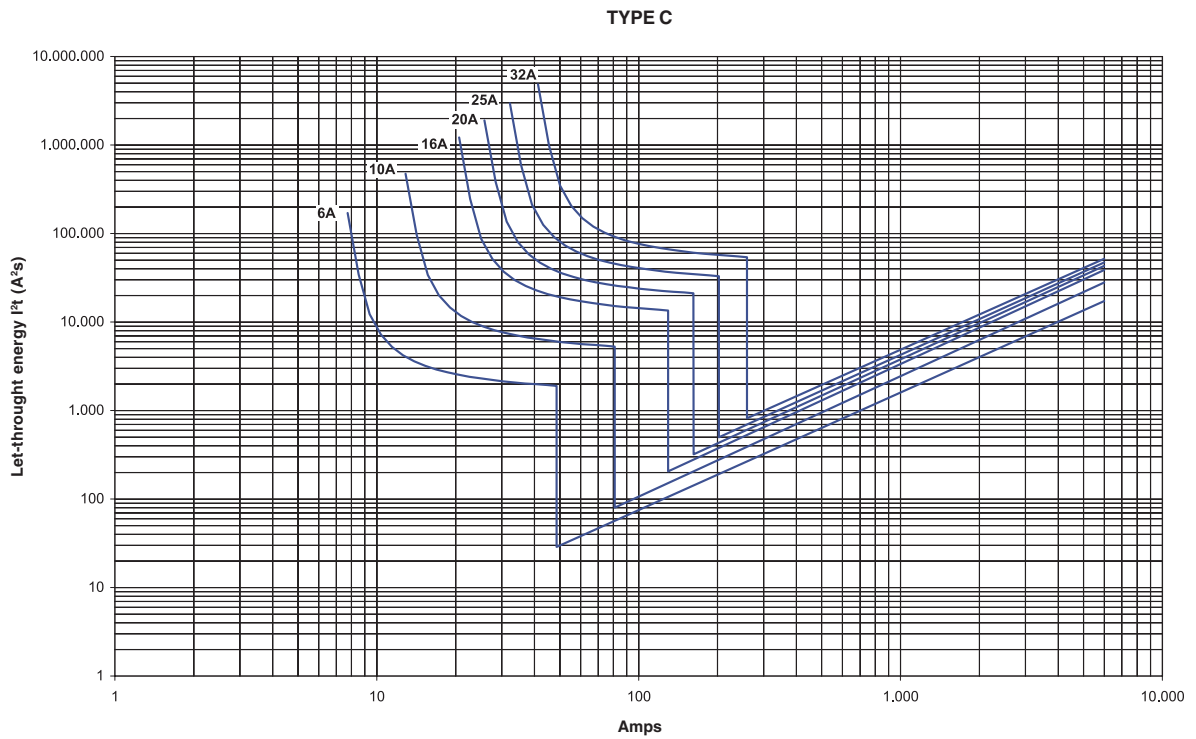
I²t value obtained from a TemDin TD (A²s)

In (A)	TD-B6kA	TD-C 4-5kA	TD-C6kA	TD-D6kA
0.3				9
0.5				70
0.75				80
1				210
1.6				430
2				600
2.5				720
3				900
3.5				1,200
4				15,000
6	18,000	29,000	48,000	49,000
10	22,000	37,000	56,000	57,000
16	25,000	46,000	67,000	68,000
20	30,000	52,000	70,000	71,000
25	34,000	59,000	72,000	74,000
32	37,000	69,000	74,000	76,000
40	43,000	72,000	76,000	78,000
50	48,000	74,000	78,000	81,000
63	55,000	75,000	80,000	85,000

Table 5

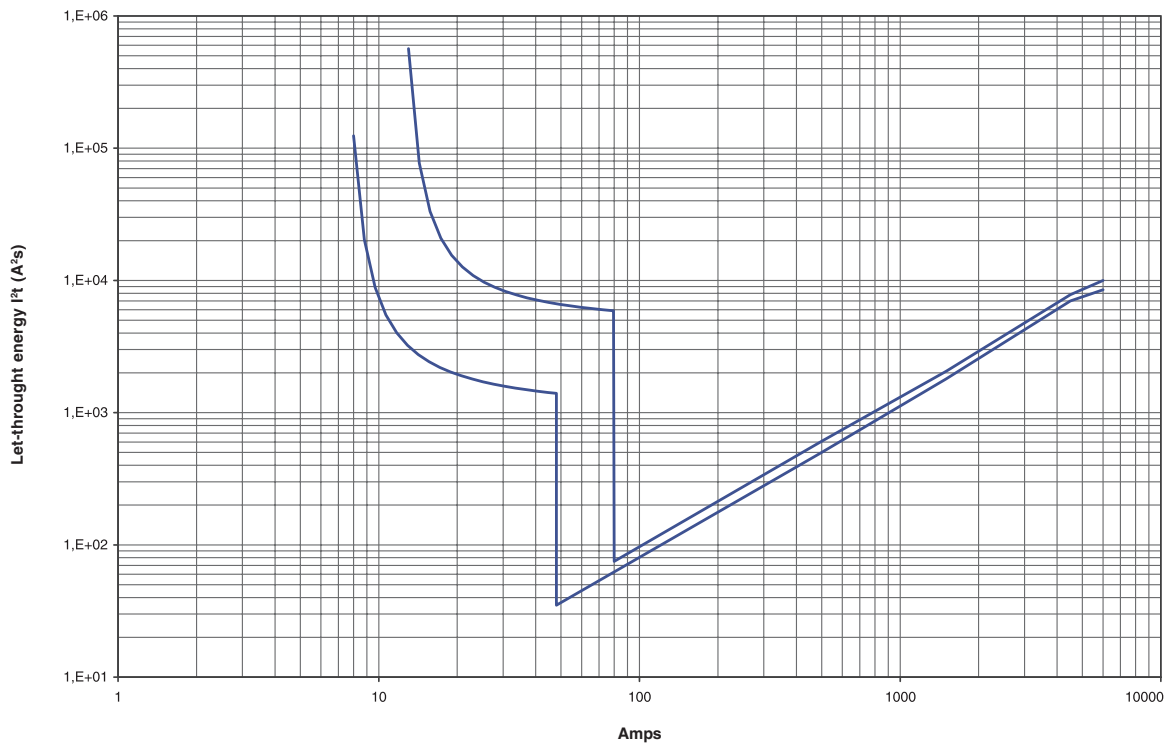
DE and DS series



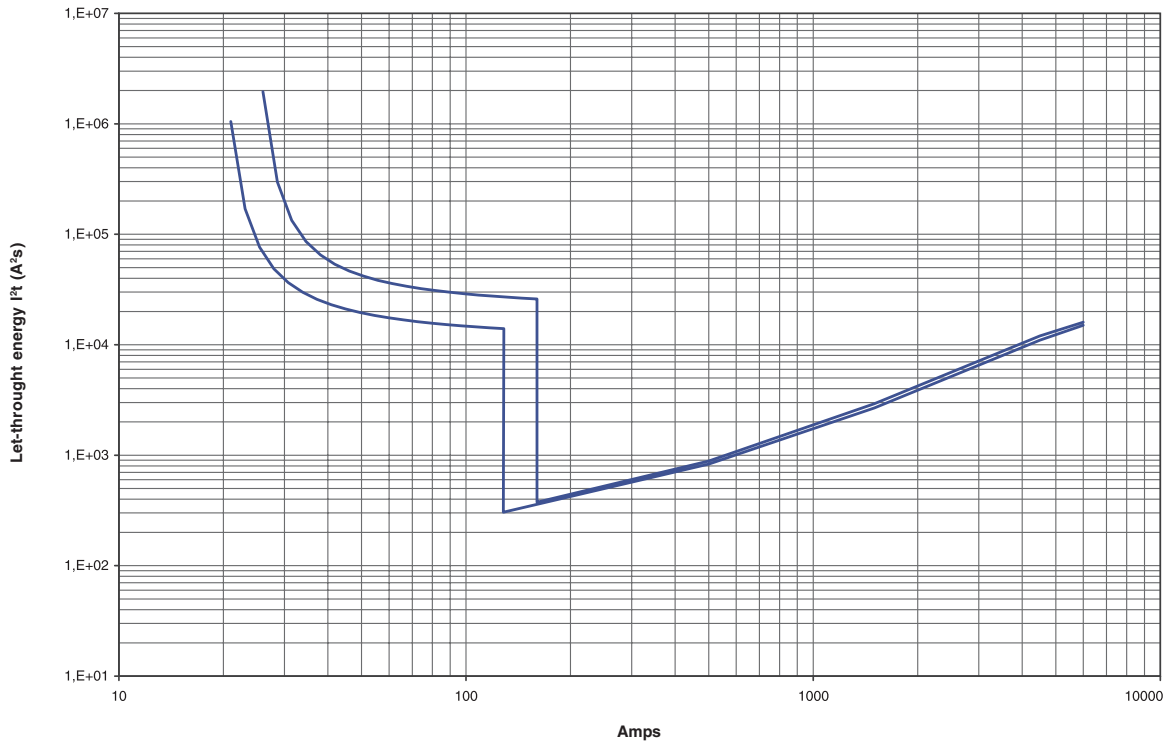


DS1 series

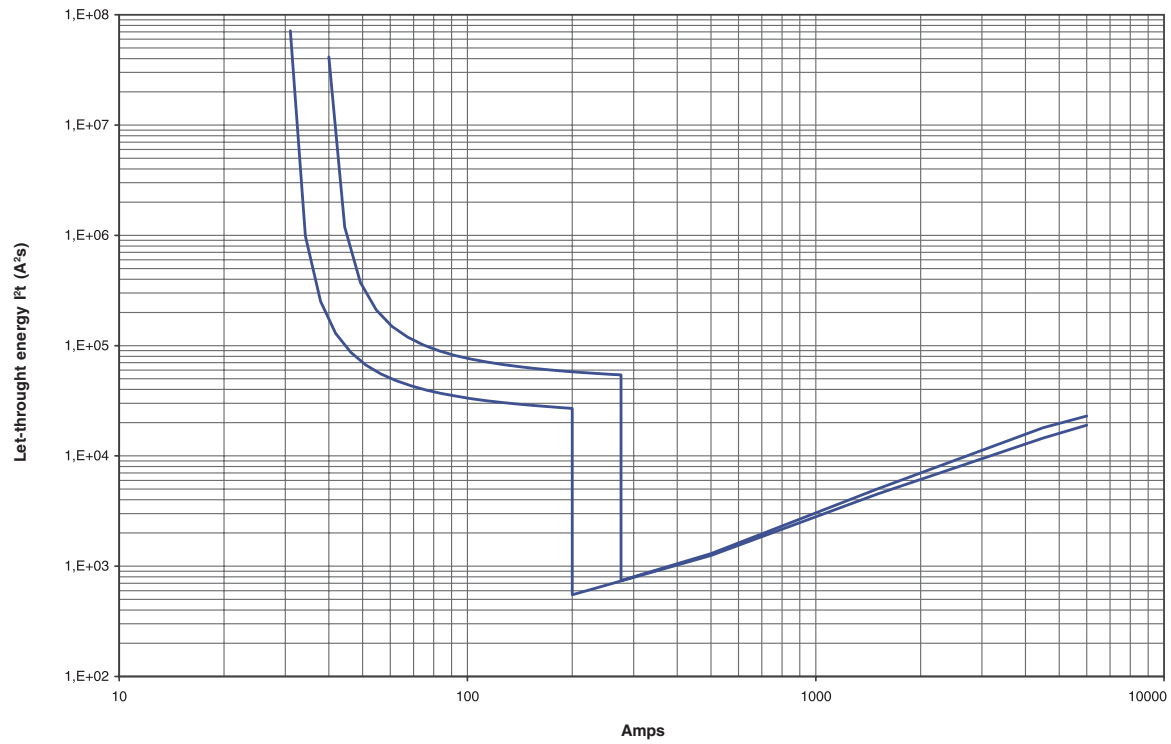
6-10A



16-20A



25-32A



DE, DS, DH and R series

Ambient compensation

At temperatures out with the breakers calibrated value (30 °C), the load capacity of the device will vary inversely as a function of its operating ambient temperature. Therefore operation at temperatures higher than 30 °C will reduce the MCB's loading capacity.

If the operational temperature is expected to be different from the reference temperature, this must be taken into account when choosing the breaker rated current. Table 6 and 7 are of general application.

DE, DS and DH series

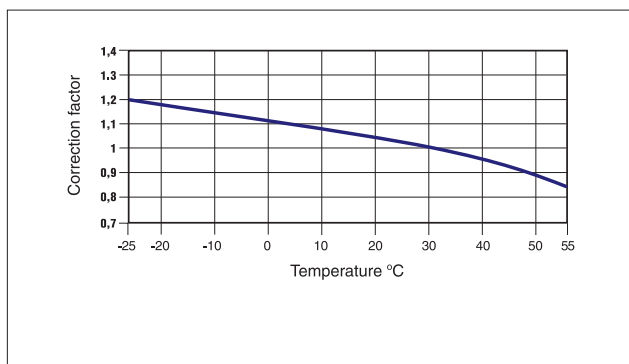


Table 6

R series

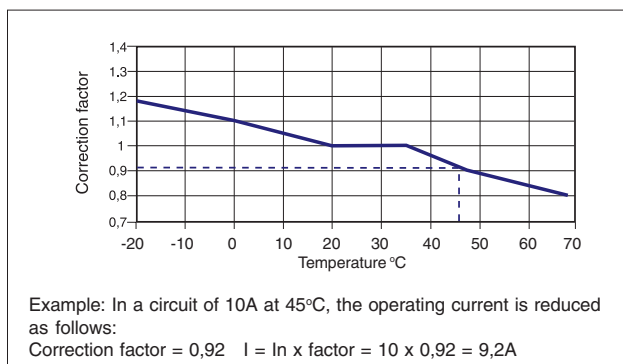


Table 7

Influence of height (altitude)

If the height of the installation site exceeds 2,000m, the reduction of the dielectric strength and the cooling effect of the air should be considered. NEMA and ANSI Standards establish some specific values that can be taken as a reference:

Height	Permanent max. I	Clearance rated U
< 2,000m	1.00	1.00
< 2,600m	0.99	0.95
< 3,900m	0.96	0.80

Load compensation for breaker grouping

Breakers mounted side by side and subject to near, or full loading simultaneously can generate high temperatures in small or poorly ventilated enclosures. Load reduction must be taken into account. The following tables are guidelines to prevent potential overloading:

- For a single row the table 8 and 9 can be used
- In two-row distribution boards the reduction is approximately of a 25%
- In three-row distribution boards the reduction is approximately of a 30%

DE, DS and DH Series

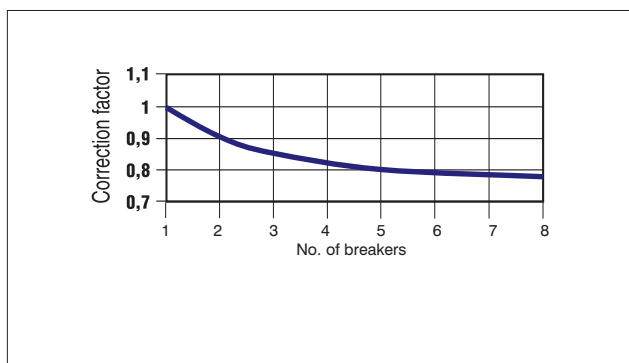


Table 8

R series

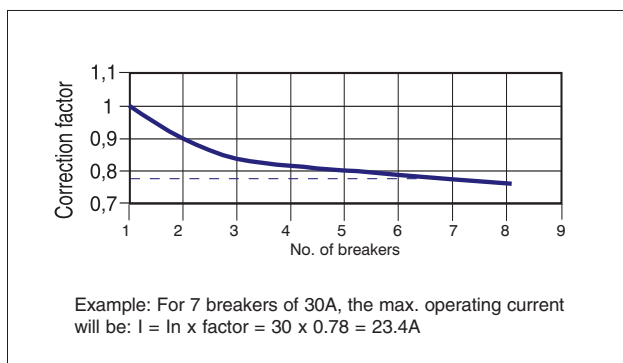


Table 9

Discrimination or selectivity exists between two protective devices connected in series when the operation of the downstream device is such that the fault condition is cleared without operation of the upstream device

The characteristics of the downstream device should be that clearance of the fault condition limits the current (let through value) to a value below the magnetic threshold of the upstream device.

Partial selectivity is said to occur when the selective operation of the downstream device is at a value between the threshold of the upstream device's magnetic trip setting but not exceeding the downstream device's rated breaking capacity. At values above this both devices may operate.

Full selectivity is said to occur when it is selective up to a prospective value of fault current equal to the downstream devices breaking capacity.

Limit value of the selectivity MCB/MCB

Up DS"C" - Down DS"C", DS"B", DS"D"

		Type DS"C" up									
		In (A)	6	10	16	20	25	32	40	50	63
Type DS"C" down	6				5.1	8.3	8.3	8.3	8.3	8.3	8.3
	10						5.1	7.1	7.1	7.1	7.1
	16								5.1	7.0	7.0
	20									6.1	6.5
	25										5.1

Table 10

		Type DS"C" up									
		In (A)	6	10	16	20	25	32	40	50	63
Type DS"B" down	6			8.0	8.0	8.1	8.1	8.2	8.2	8.3	8.3
	10				7.1	7.1	7.5	7.5	7.6	7.6	7.7
	16					7.0	7.0	7.5	7.5	7.6	7.6
	20						5.4	5.5	5.6	5.7	5.7
	25							5.4	5.5	5.6	5.7
	32								5.1	5.2	5.3
	40									5.1	5.1
	50										5.1
63											

Table 11

		Type DS"C" up									
		In (A)	6	10	16	20	25	32	40	50	63
Type DS"D" down	0.3		5.7	5.8	6.1	6.2	6.3	6.4	6.5	6.6	6.7
	0.5		5.7	5.7	5.8	5.8	5.9	6.0	6.1	6.2	6.3
	0.75		5.6	5.6	5.7	5.8	5.8	5.9	6.0	6.1	6.2
	1		5.5	5.5	5.5	5.6	5.7	5.8	5.9	6.0	6.1
	1.6		5.4	5.4	5.5	5.5	5.6	5.7	5.8	5.9	6.0
	2			5.3	5.3	5.4	5.4	5.5	5.6	5.7	5.8
	2.5			5.1	5.2	5.2	5.3	5.4	5.5	5.6	5.7
	3			5.0	5.1	5.1	5.2	5.3	5.4	5.5	5.6
	3.5				5.0	5.0	5.1	5.2	5.3	5.4	5.5
	4				4.9	4.9	5.0	5.1	5.2	5.3	5.4
	6					4.9	4.9	5.0	5.1	5.2	5.3
	10						4.8	4.8	4.9	5.0	5.1
	16									4.8	4.9
20										4.8	

Table 12

Up DS"D" down DS"C", DS"B", DS"D"

Type DS"D" up
In (A) 6 10 16 20 25 32 40 50 63

Type DS"C" down	6		12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5
	10			12.1	12.1	12.1	12.1	12.1	12.1	12.1
	16				10.1	10.1	10.1	10.1	10.1	10.1
	20					10.1	10.1	10.1	10.1	10.1
	25						10.2	10.2	10.2	10.2
	32							10.2	10.2	10.2
	40								10.2	10.2
	50									10.2
	63									

Table 13

Type DS"D" down
In (A) 6 10 16 20 25 32 40 50 63

Type DS"B" down	6	10.2	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
	10	10.0	10.2	10.5	10.5	10.5	10.8	10.8	10.8	10.8
	16		10.0	10.2	10.5	10.5	10.8	10.8	10.8	10.8
	20			10.0	10.2	10.5	10.5	10.8	10.8	10.8
	25				10.0	10.2	10.5	10.5	10.8	10.8
	32					10.0	10.2	10.5	10.5	10.8
	40						10.0	10.2	10.5	10.5
	50							10.0	10.2	10.5
	63								10.0	10.2

Table 14

Type DS"D" up
In (A) 6 10 16 20 25 32 40 50 63

Type DS"D" down	0.3	11.1	11.1	11.1	11.5	11.5	11.5	11.5	11.5	11.5
	0.5	11.1	11.1	11.1	11.5	11.5	11.5	11.5	11.5	11.5
	0.75	11.0	11.0	11.0	11.0	11.5	11.5	11.5	11.5	11.5
	1	10.9	10.9	10.9	10.9	11.5	11.5	11.5	11.5	11.5
	1.6	10.8	10.8	10.8	10.8	11.0	11.4	11.4	11.4	11.4
	2	10.7	10.7	10.7	10.7	10.9	11.3	11.3	11.3	11.3
	2.5	10.6	10.6	10.6	10.6	10.6	10.8	10.9	11.0	11.0
	3	10.5	10.5	10.5	10.5	10.5	10.6	10.7	10.8	10.9
	3.5	10.4	10.4	10.4	10.4	10.4	10.5	10.6	10.7	10.8
	4		10.3	10.3	10.3	10.3	10.4	10.5	10.6	10.7
	6		10.2	10.2	10.2	10.2	10.3	10.4	10.5	10.6
	10			10.2	10.2	10.2	10.2	10.3	10.4	10.5
	16					10.2	10.2	10.2	10.3	10.4
	20						10.2	10.2	10.2	10.3
	25							10.2	10.2	10.2
	32								10.2	10.2
40										
50										
63										

Table 15

The limit value of the selectivity is referred to the number of times of the up breaker rated current value (In).

Example: Up TD-D 10A, Down TD-C 1A
corresponds to **10.9**
10.9In x 10A = 109A

 Non selective zone

Selectivity Chart for MCCB/MCB combination at 415v

MCCB Frame rating	125	125	125	160	250
MCB/MCCB Current rating	63	100	125	160	250
6	T	T	T	T	T
10	T	T	T	T	T
16	T	T	T	T	T
20	1000	T	T	T	T
25	1000	T	T	T	T
32	1000	1500	T	T	T
40	1000	1500	2000	T	T
50	1000	1500	2000	3000	T
63	1000	1500	2000	3000	T

Notes

- 1.The letter ' T ' means total selectivity up to breaking capacity of MCCB
- 2.The numerical values indicate the partial selectivity level and is shown in Amps.
- 3.The above table is in accordance with IEC 947-2 appendix A

MCCB Types	125	160	250
XS125CJ	XS160NJ	XS250NJ	
XS125NJ	XS160HJ	XS250PJ	
XH125NJ	XS160PJ	XH250NJ	
XH125PJ		XH250PJ	

Cascade Chart for MCCB/MCB combination at 415v

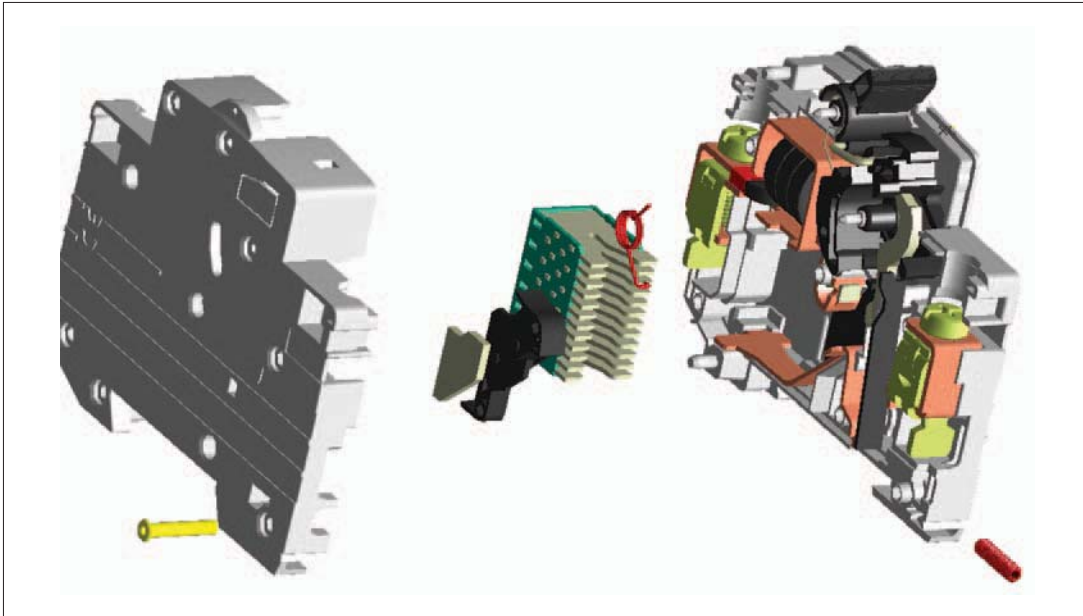
Cascade Chart for MCCB/MCB combination at 415v

UPSTREAM MCCBS		XE100NS 15kA	XS125CJ 18kA	XS125NJ 30kA	XH125NJ 50kA	XS160NJ 35kA	XH160NJ 50kA	XS250NJ 35kA	XH250NJ 50kA
DOWNSTREAM MCBs									
TYPE	In (A)								
TDC-E Icn 4.5kA	6	6000	7000	10000	10000	7000	10000	7000	7000
	10	6000	7000	10000	10000	7000	10000	7000	7000
	13	6000	7000	10000	10000	7000	10000	7000	7000
	16	6000	7000	10000	10000	7000	10000	7000	7000
	20	6000	7000	10000	10000	7000	10000	7000	7000
	25	6000	7000	10000	10000	7000	10000	7000	7000
	32	6000	7000	10000	10000	7000	10000	7000	7000
	40	6000	6000	6000	8000	6000	6000	6000	6000
TDC-S Icn 6kA	50	6000	6000	6000	8000	6000	6000	6000	6000
	63	6000	6000	6000	8000	6000	6000	6000	6000
	6	10000	11000	12000	14000	11000	12000	11000	11000
	10	10000	11000	12000	14000	11000	12000	11000	11000
	13	10000	11000	12000	14000	11000	12000	11000	11000
	16	10000	11000	12000	14000	11000	12000	11000	11000
	20	10000	11000	12000	14000	11000	12000	11000	11000
	25	10000	11000	12000	14000	11000	12000	11000	11000
TDC-R Icn 10kA	32	10000	11000	12000	14000	11000	12000	11000	11000
	40	10000	10000	10000	12000	10000	10000	10000	10000
	50	10000	10000	10000	12000	10000	10000	10000	10000
	63	10000	10000	10000	12000	10000	10000	10000	10000
	6	11000	12000	13000	30000	12000	25000	12000	20000
	10	11000	12000	13000	30000	12000	25000	12000	20000
	13	11000	12000	13000	30000	12000	25000	12000	20000
	16	11000	12000	13000	30000	12000	25000	12000	20000
20	11000	12000	13000	30000	12000	25000	12000	20000	
25	11000	12000	13000	30000	12000	25000	12000	20000	
32	11000	12000	13000	30000	12000	25000	12000	20000	
40	10000	10000	12000	25000	10000	23000	10000	18000	
50	10000	10000	12000	25000	10000	23000	10000	18000	
63	10000	10000	12000	25000	10000	23000	10000	18000	

The use of breakers in DC circuits

The thermal characteristics for TemDin breakers are unaffected by the type of current applied, that is either direct current or alternating current. The magnetic trip value increases by 40%. For example, in the case of a breaker of tripping characteristic B and 10A rated current, its magnetic tripping value will be between 30A and 50A in alternating current. The magnetic tripping value for this very same breaker in direct current will be between 42.4A and 70.7A.

For DC service, the MCBs full rated breaking capacity can be achieved without any reduction in performance by connecting protected poles in series. For values up to 48V=, 1 protected pole can be used unimpaired of the breaking capacity value. Between 48 and 110V=, 2 protected poles series connected can be used without reduction in the breaking capacity. Between 110 and 150V=, 3 protected poles series connected must be used, and 4 poles up to 200V=.



Influence of non standard frequencies

For operational frequencies greater than 50/60Hz, the effect of these non-standard frequencies must be taken into consideration. Thermal characteristics are independent from variation in frequency. Magnetic tripping values are directly affected by frequency. As a reference, for frequencies of 100, 200, 300 and 400Hz, the values at which the magnetic tripping occurs become increased in a 10, 20, 30 and 40% respectively.

Use at other voltages

The maximum rated operational voltage for TemDin MCBs is 440v with a reduction in breaking capacity of 10%. Supply voltages lower than the assigned value can be applied.

Phase Imbalance

In three phase circuits designed for single phase distribution through to final load, consideration should be placed for protection of the neutral conductor. TemDin 4 pole MCBs have integral neutral pole protection and offers adequate protection against overloaded neutral conductors, when phase imbalance conditions are present. Commercial installations such as hotels, banks and public buildings are often subject to high neutral currents via equipment consuming non-linear loads and also require protection to be present in the neutral line.

TH series

Standards

In accordance with IEC 947-2. Suitable for isolation. Thermal calibration: 40°C.

Magnetic tripping reference

Type	Tripping
a	of 3.2 to 4.8 times I_n (equivalent to B characteristic)
b	of 6 to 9 times I_n (equivalent to C characteristic)
c	of 10 to 15 times I_n (equivalent to D characteristic)

Rated voltage

N° poles	Voltage
1 pole	230/240 V~
2, 3 and 4 poles	400/415 V~

Maximum rated voltage

The maximum rated voltage between poles is 440V~

Shock resistance

According to IEC77-16.3: 3g

Temperature

TH breakers are manufactured from self extinguishing, tropicalised thermosetting material.

Storage temperature: -55°C up to +55°C as per IEC88

Operating temperature: -25°C up to +55°C

In case of use below 0°C freeze over must be avoid

Dielectric rigidity and insulating resistance

TH series breakers have a dielectric rigidity of 4kV and an insulating resistance >1,000.000 Mohmios

Use at 400 Hz

The magnetic tripping current is approximately a 50% higher than at 50/60Hz

Breaking capacity Icu (KA) according to IEC 947-2

N° poles		1	2	3	4
I_n		from 80 up to 125A			
U_n	230V~	10	20	20	-
	400V~	4.5	10	10	10

Voltage drop and energy loss

I_n (A)	Voltage drop (V)	Energy loss(W)	Internal resistance(Ω)
80	0.075	6	0.9
10	0.075	7.5	0.75
125	0.075	9.5	0.6

Use at DC

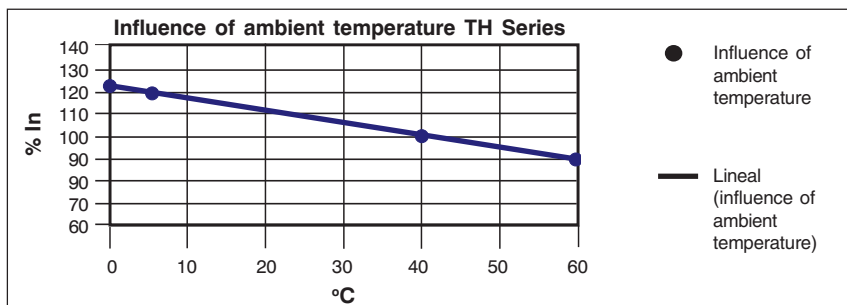
For voltages up to 125V DC, a 2 pole device should be selected and connected in series. Voltages up to 250V DC require a 4 pole device connected in series. No reduction in service is necessary for this wiring configuration.

TH	Max.V=	N° of switching operations I_n /tripping time - $T \leq ms$	kA/tripping time $T \leq ms$
2p 80-125A	125	4000/15	10/15
4p 80-125A	250	4000/15	10/15

Influence of ambient temperature

At temperatures out with the breakers calibrated value (40 °), the load capacity of the device will vary. Ambient temperatures different from 40°C influence the bimetal and this results in earlier or later thermal tripping.

For example: the I_n for a 100A MCB at 20°C would be approx. 110A.



THSHT shunt trip

Material

Self extinguishing, tropicalised thermosetting material.

Dimensions

1 DIN module

Max. tripping time

10ms

Rated voltage

AC
110-415V~ (THSHT415)
24 to 60V~ (THSHT60)
DC
110-125V~ (THSHT415)
24 to 48V~ (THSHT60)

Impedance 50Hz

29Ω

Position

MCB right or left side.

Terminals

Max. cable section of 25mm².

Voltage - Current

Rated voltage	Absorbed current
110V~	0.3A
230V~	0.6A
400V~	1.0A

AUXTH auxiliary contact

Max. current at AC11 and DC11

AC11	DC11
5A up to 250V~	0.5A up to 220V=
	0.7A up to 110V=
	1A up to 60V=
	2A up to 48V=
	4A up to 24V=

Terminals

3 or 6 connections for cable sections of max. 2.5mm².

Dimensions

Width 0.5 modules (9mm).

Position

MCB right side.

Silver plated contacts (gold, on request).

Electrical endurance

10,000 operations

CA auxiliary contact

Auxiliary contact positions shown below for TH MCB status, according to the following table:

Terminals N°	96/22 95/21 98/24
MCB connected	
MCB disconnected	

CD alarm contact

Alarm contact positions shown below for TH MCB status and the disconnection cause, when it is so:

Terminals N°	96 95 98
MCB connected	
MCB manually disconnected	
MCB disconnected by overload or short-circuit	

RCCB Technical principles

The effects of electrical current on the human body

An electrical current applied to the human body produces harmful effects (burns, shock, ventricular fibrillation and even death).

The level of damage an electric shock can cause depend on both the amplitude of current and the duration of time that the conditions persists for. Summarised as follows:

$$\text{Effect} = \text{Current level} \times \text{Time}$$

Figure 1. shows the time – current relationship on the human body, and RCCB response time. The operation of an RCCB reduces the risks associated by these conditions.

RCCB working principle

Fig. 2 shows the schematic of RCCB's components. When a current circulates through the phase, a magnetic flux appears on the toroid core, which is proportional to such current. When this current returns through the neutral conductor the same applies and a flux of the same level but opposite direction is generated.

Operation with no leakage (fig. 2)

When no leakage exists, all the incoming current returns via the neutral conductor. Hence, the total magnetic flux through the toroid core is the result of two equal and opposite fluxes, their sum being 0. This does not induce any voltage in the secondary winding.

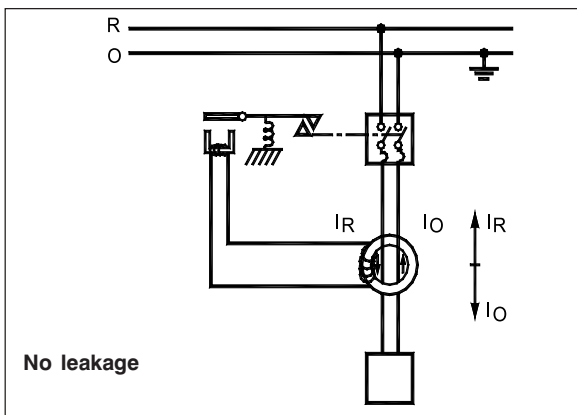


Fig. 2

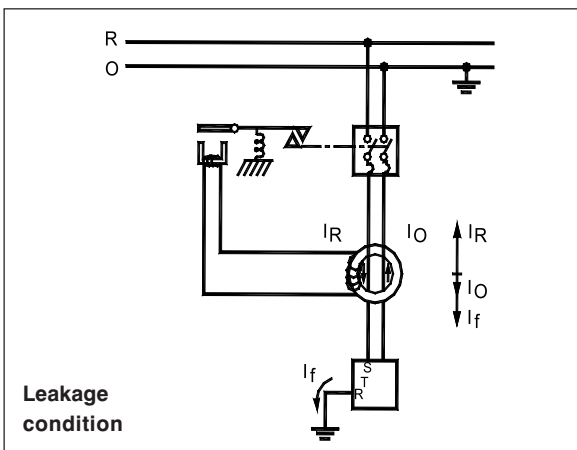


Fig. 3

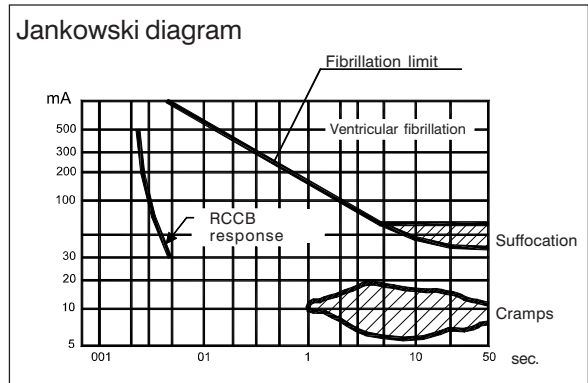


Fig. 1

Operation under leakage condition (fig. 3)

In the case of a leakage of current to earth, the phase conductor will carry the current feeding the load plus the leakage current, while the neutral will carry the load current only.

The current through the RCCB is therefore unbalanced, and, consequently, the magnetic flux through the core will be unbalanced also and a residual flux will circulate, F , so that $F = Fr - Fo$ (where Fr is incoming flow (phase flow) and Fo is Flow through load, F thus being the flow due to leakage.

This resulting flux induces a voltage in the secondary winding of the toroid core transformer which, according to its value and the RCCB sensitivity will be enough to depolarize the relay and therefore trip the RCCB.

The breaking time of RCCB's is usually lower than 15 milliseconds, this figure being the same for all sensitivities: 30, 100, 300 and 500mA.

Circuit equivalents

To simplify matters, the quoted examples refer only to a phase + neutral system. The principle, however, is applicable to any circuit: two phase, two phase + neutral, three phase or three phase + neutral, all systems being normally balanced and a leakage upsetting this balance.

Although the systems are unbalanced, $\sum I_n = 0$. only a leakage will produce a resulting I_o .

What the RCCB does not protect against

The RCCB's work when there is a leakage in the circuit of a level equal at least to their sensitivity. Load currents, whether normal or not, are not detected by the RCCB. To protect circuits against short circuits or overloads, circuits breakers must be added, such that they are adequately rated to the circuit and load conditions.

Figure 4. illustrates a condition where there is accidental contact of a human being with both conductors thereby acting as a load in the circuit, this happening on an insulated surface with a very high value of earthing resistance.

In this case, no earth leakage will appear, with all of the incoming phase current returning through the neutral. Therefore as no imbalance exists, the RCCB will remain in operative and the person will receive the full effect through his or her body.

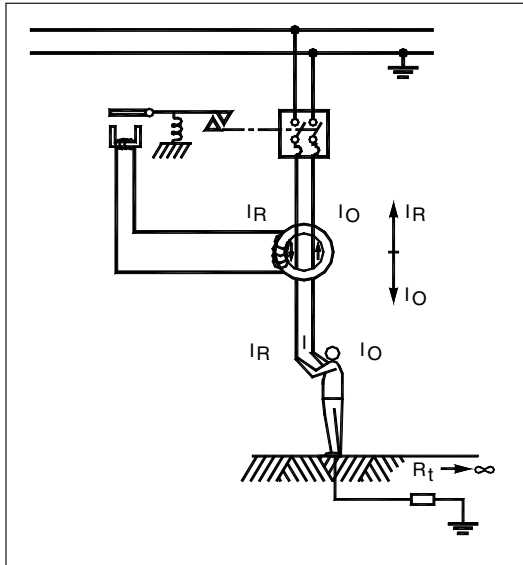


Fig. 4

RCCB selection criteria

Selection criteria for RCCB's depend upon normal circuit current rating, as for selecting all switches to decide about sensitivity, care must be taken to ensure compliance with the appropriate regulations and codes of practice, which determine that indirect contacts are permitted only at 50 or 24V.

The earthing must be properly calculated and serviced, so that in the case of a leakage the contact be at voltages equal to, or lower than the precribed levels.

According to the value of the earthing resistance (R) the sensitivity of the RCCB must be:

$$I_s \leq \frac{50}{R} \quad \left(\text{ó } \frac{24}{R} \right)$$

In correctly earthed installations, 100 to 500mA are sufficient. To protect human beings, sensitivity must be 30mA (Fig. 5).

The true total resistance will be **R1 + R3**. Their total values, according to today's regulations must be:

50V Sensitivity 100mA:	500 ohm
50V Sensitivity 300mA:	166 ohm
50V Sensitivity 500mA:	100 ohm
24V Sensitivity 100mA:	240 ohm
24V Sensitivity 300mA:	80 ohm
24V Sensitivity 500mA:	46 ohm

If, for a leakage voltage of 50 or 24V, the total resistance to earth is adequate to the RCCB sensitivity, as shown above, the current flowing through Rn, will not be damaging to the human body.

Discrimination

There are different protection levels in each circuit, such as mains, trunk and load levels.

At the load level, the RCCB to be fitted is a conventional one. At trunk level, time-delayed action RCCB's can be fitted. This will allow

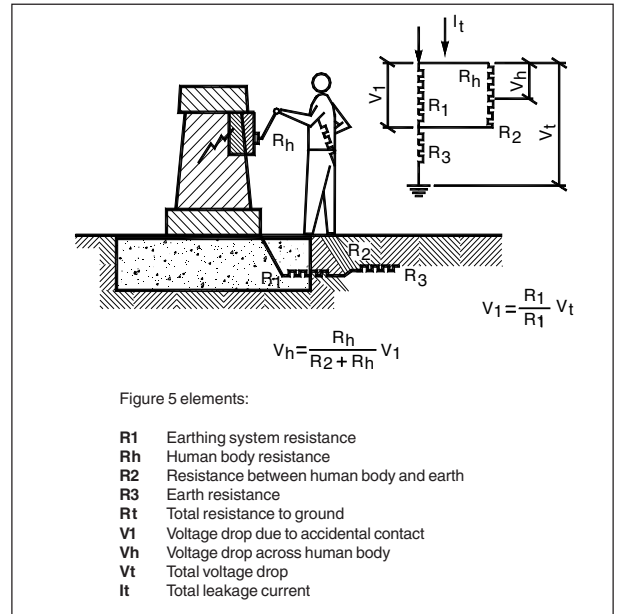


Fig. 5

the trip of the downstream RCCB in case of leakage, without tripping all of them throughout.

Since the protection afforded by an RCCB is a function of the breaking times as well as of the current, the delays are also regulated as follows:

For the rated leakage current IDN (RCCB sensitivity) delay must be shorter than 0.25s.

For twice the rated leakage current IDN, delay must be shorter than 0.1s.

For ten times the rated leakage current IDN, delay must be shorter than 0.04s.

The TERASAKI RCCB's trip in less than 15ms. An adequate delay sequencing would be:

Load RCCB:	15ms
Trunk RCCB:	100ms
Mains RCCB:	200ms

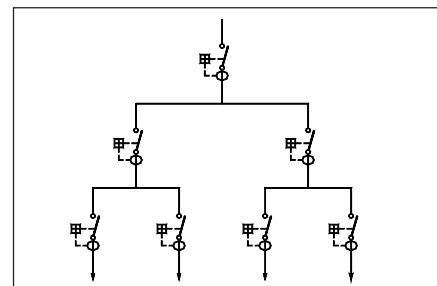


Fig. 6

Protection against nuisance tripping

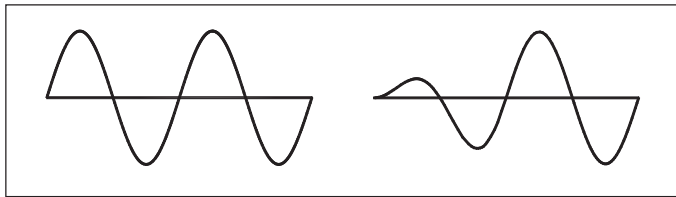
To protect RCCB's against nuisance tripping, due mainly to atmospheric conditions (lightning), a filtering device must be fitted to the RCCB. This will prevent the nuisance tripping by means of discharging the harmonic voltage waves that would result from such atmospheric conditions.

RCCB classification

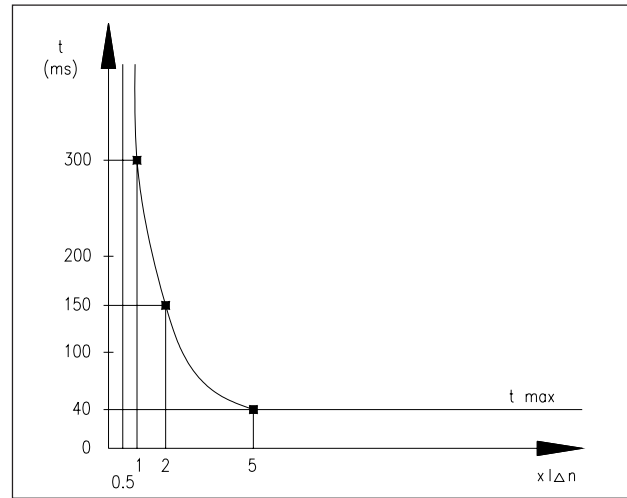
 Type AC

Type AC RCCBs are designed to clear sinusoidal residual current which occur suddenly or slowly rise in magnitude.

Residual current	Tripping time
$0.5 \times I_{\Delta n}$	$t = \infty$
$1 \times I_{\Delta n}$	$t < 300 \text{ ms}$
$2 \times I_{\Delta n}$	$t < 150 \text{ ms}$
$5 \times I_{\Delta n}$	$t \leq 40 \text{ ms}$



Tripping curve type AC



 Type A

Certain devices, during faults, can be the source of non-sinusoidal leakage currents with DC components: diodes, thyristors, etc.

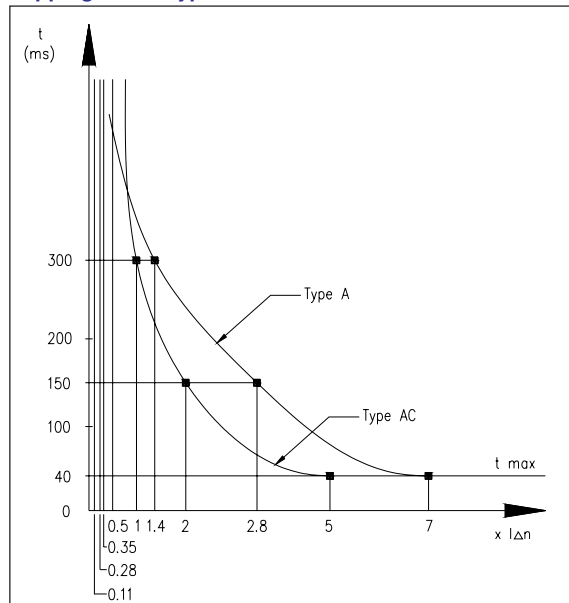
Pulsating direct current is a current of pulsating wave form which assumes, in each period of the rated power frequency, the value 0 or a value not exceeding 6mA DC during one single interval of time, expressed in angular measure, of at least 150° (50Hz).

Precautions must be taken to ensure that the residual current devices can operate under these conditions and maintain safety.

The RCCB type A is designed to guarantee this safety.

The type A will operate on sinusoidal residual currents and also with residual pulsating direct currents which occur suddenly or slowly increase in magnitude.

Tripping curve type A

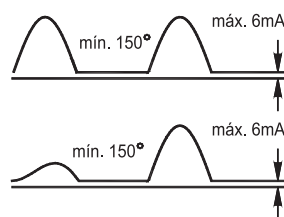


Residual current Tripping time

Sinusoidal residual current

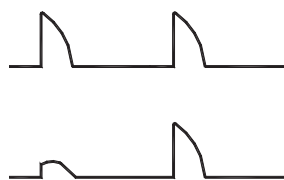
$0.5 \times I_{\Delta n}$	$t = \infty$
$1 \times I_{\Delta n}$	$t < 300 \text{ ms}$
$2 \times I_{\Delta n}$	$t < 150 \text{ ms}$
$5 \times I_{\Delta n}$	$t \leq 40 \text{ ms}$

Residual pulsating direct current



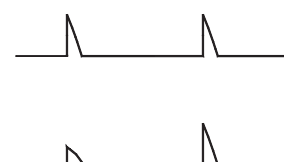
at point on wave 0°

$0.35 \times I_{\Delta n}$	$t = \infty$
$1.4 \times I_{\Delta n}$	$t < 300 \text{ ms}$
$2.8 \times I_{\Delta n}$	$t < 150 \text{ ms}$
$7 \times I_{\Delta n}$	$t \leq 40 \text{ ms}$



at point on wave 90°

$0.25 \times I_{\Delta n}$	$t = \infty$
$1.4 \times I_{\Delta n}$	$t < 300 \text{ ms}$
$2.8 \times I_{\Delta n}$	$t < 150 \text{ ms}$
$7 \times I_{\Delta n}$	$t \leq 40 \text{ ms}$



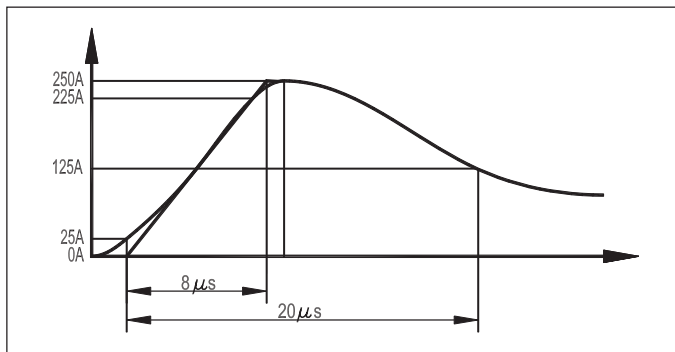
at point on wave 135°

$0.11 \times I_{\Delta n}$	$t = \infty$
$1.4 \times I_{\Delta n}$	$t < 300 \text{ ms}$
$2.8 \times I_{\Delta n}$	$t < 150 \text{ ms}$
$7 \times I_{\Delta n}$	$t \leq 40 \text{ ms}$

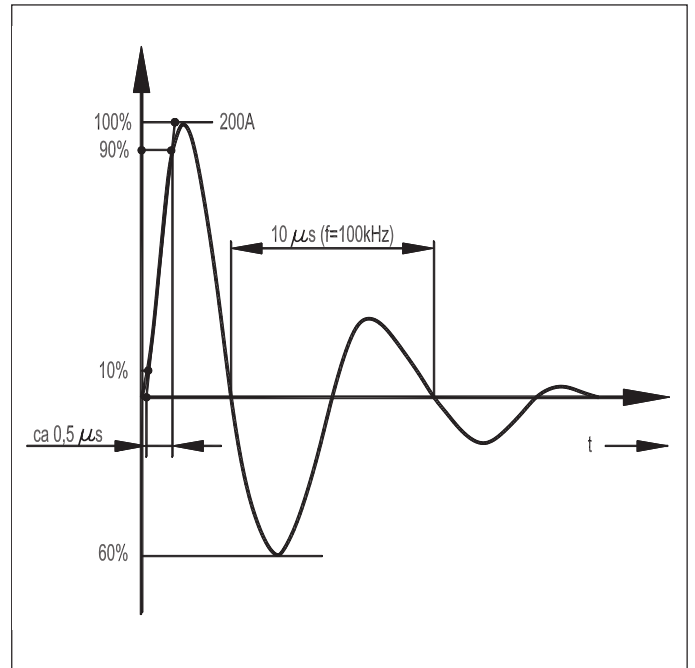
Protection against transient currents

In order to avoid nuisance tripping (unwanted tripping due to an impulse voltage) due to lightning surges, switching on high capacitance circuits and switching surges, Rcd's series have a high level of immunity to transient currents.

Transient current at 250A (peak current) at point on wave 8/20ms (VDE 0664)

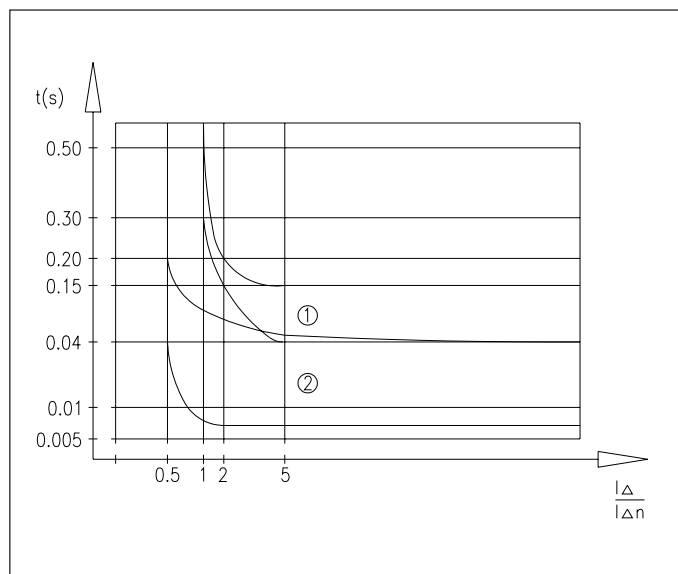


Transient current at 200A (peak current) at minimised point on wave 0.5ms-100kHz (pr EN 61.1008)



Type S S

RCD's type A or AC have instantaneous tripping. In order to provide full people protection in vertical installation with more than one circuit, as well as to ensure the service in the installation in case of earth leakage in one of the circuits or to avoid unwanted tripping because of harmonics, high connection currents due to the use of motors, reactive loads, or variable speed drives, we need to use selective RCD's at the top of the installation. Any RCD type S is selective to any other instantaneous RCD installed downstream with lower sensitivity.

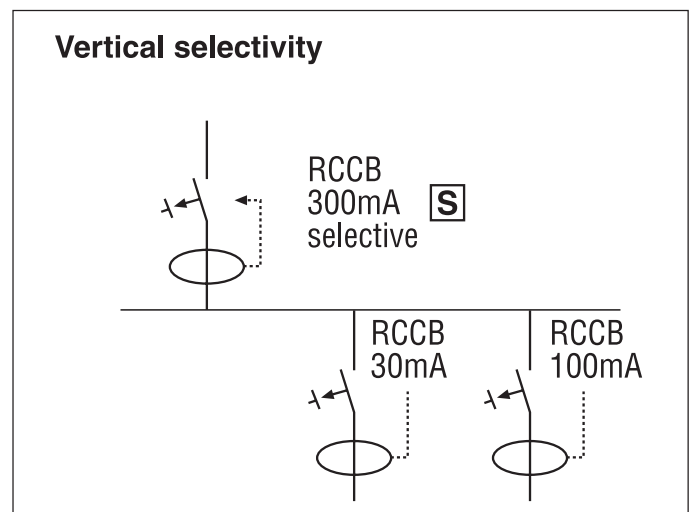


- 1. Selective type RCCB's.
- 2. Standard type RCCB's.

Vertical selectivity

In an installation with RCD's installed in series we need to pay special attention to the vertical selectivity, in order to ensure that in case of earth leakage only the RCD which is immediately upstream of the fault point will operate. Selectivity is ensured when the characteristic time/current of the upstream RCD (A) is above the characteristic time/current of the downstream RCD (B). To obtain vertical selectivity we should take into consideration the following parameters: The RCD placed at the top of the installation shall be Type S. The residual operating current of the RCCB installed downstream shall have a lower residual operatin current than the RCD installed upstream according to:

$$I\Delta n \text{ downstream} < I\Delta n \text{ upstream}/3$$



FI Series**FIE Series****Application**

This range provides the protection against overload and short-circuit currents and protects people against earth fault currents: direct or undirect contacts, fire...

In accordance with

EN 20383-75, CEE27

Rated current

25, 40, and 63A

Rated voltage

2P 230V~, 4P 400V~

Sensitivities

30, 100, 300 and 500mA

No. of poles

2 and 4 pole

Type

Type AC 

Mounting

35mm symmetrical DIN rail (EN50022-DIN46277).

Dimensions

4 DIN modules (1 DIN module=17.8mm)

Terminals

Flexible cable up to 25mm²
rigid cable 35mm², with a degree of protection IP20.

Tripping time

< 30ms.

In accordance with

EN 61.008

Rated current

25 and 40 A

Rated voltage

230V~

Sensitivities

30mA

No. of poles

2

Type

Type AC 

Mounting

35mm symmetrical DIN rail
(EN50022-DIN46277).

Dimensions

2 DIN modules (1 DIN module=17.8mm)

Terminals

Max. section cable of 25mm²

Tripping time

< 30ms.

Mechanical endurance

20,000 operations.

Resistant against unwanted tripping due to surge effect 

Residual making and breaking capacity

$I_m = I_{\Delta m} = 500A$

ZFI Series


Application

This range provides the protection against overload and short-circuit currents and protects people against earth fault currents: direct or indirect contact, fire...

Standards

In accordance with IEC 1008 and suitable for isolation. Sensitivities: 10, 30, and 300mA.

ZFI RCCB's optional use for type A  and type AC .

For 300mA sensitivities available type A with selective  time delay function. Hence, with a selective type mains RCCB, a vertical selectivity is achieved with 30 and 100mA non selective RCCB's downstream.

Resistant against unwanted tripping due to surge effect .

Residual making and breaking capacity

In (A)	Im = IΔm (A)	
	2P	4P
16-25-40	500	500
63	630	630
80	800	500
100	1000	630

Rated current

Range from 16, 25, 40, 63, 80 and 100A

Rated voltage

230/240V~ (2P) and 400/415V~ (4P) at a frequency of 50/60 Hz

Terminals

Max. section cable of 25 mm²

Mounting

35mm symmetrical DIN rail (EN50022-DIN46277).

Operating temperature

Min. operating temperature -25°C.

AUXZFI Auxiliary Contacts

Max. current at AC11 and DC11

AC11	DC11
5A up to 250V~	0.5A up to 220V=
	0.7A up to 110V=
	1A up to 60V=
	2A up to 48V=
	4A up to 24V=

Terminals

3 or 6 connections for cable sections of max. 2.5mm².

Dimensions

Width 0.5 modules (9mm).

Position

MCB right side.

Silver plated contacts (gold, on request).

Electrical endurance

10,000 operations

CA · Auxiliary contact

The auxiliary contact position depends on the associated NFI or FCO state, according to the following table:

Terminals N°	96/22	95/21	98/24
Breaker connected		●	●
Breaker disconnected	●	●	

CD · Alarm contact

The alarm contact position depends on the associated NFI or FCO state and the disconnection cause, when it is so:

Terminals N°	96	95	98
Breaker connected		●	●
Breaker manually disconnected		●	●
Earth leakage fault	●	●	

ZDS Series

Application

This range provides the protection against overload and short-circuit currents and protects people against earth fault currents: direct or indirect contact, fire...

Standards

In accordance with IEC 1009.

Rated voltage

230/240~

Frequency

50/60Hz

Breaking capacity


6kA - class 3

According to EN61009.

Sensitivities

30 and 300mA.

Type

Type A  and AC 

Tripping characteristics

Type C.

No. of poles

I+N (neutral right side)

Rated current

from 6 to 40A

Resistant against unwanted tripping due to surge effect



Terminals

Dual type bottom for cable or busbars connection (fork type).

Mounting

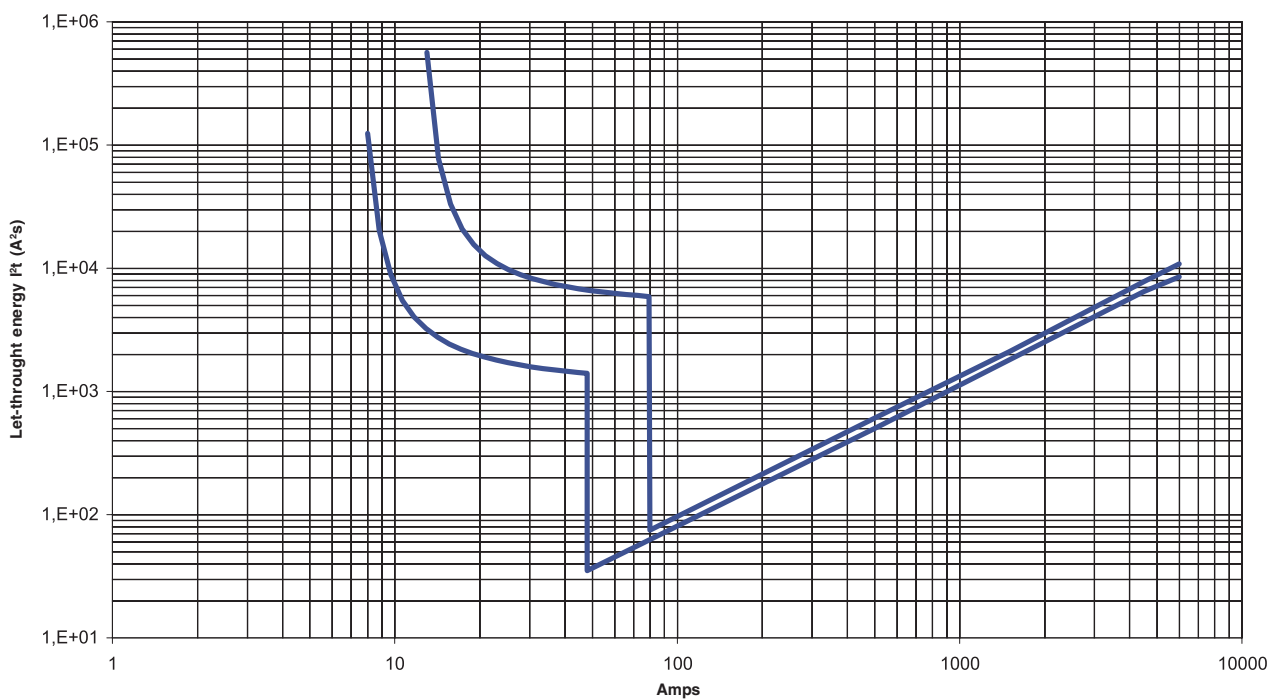
35mm symmetrical DIN rail (EN50022-DIN46277).

No. of modules

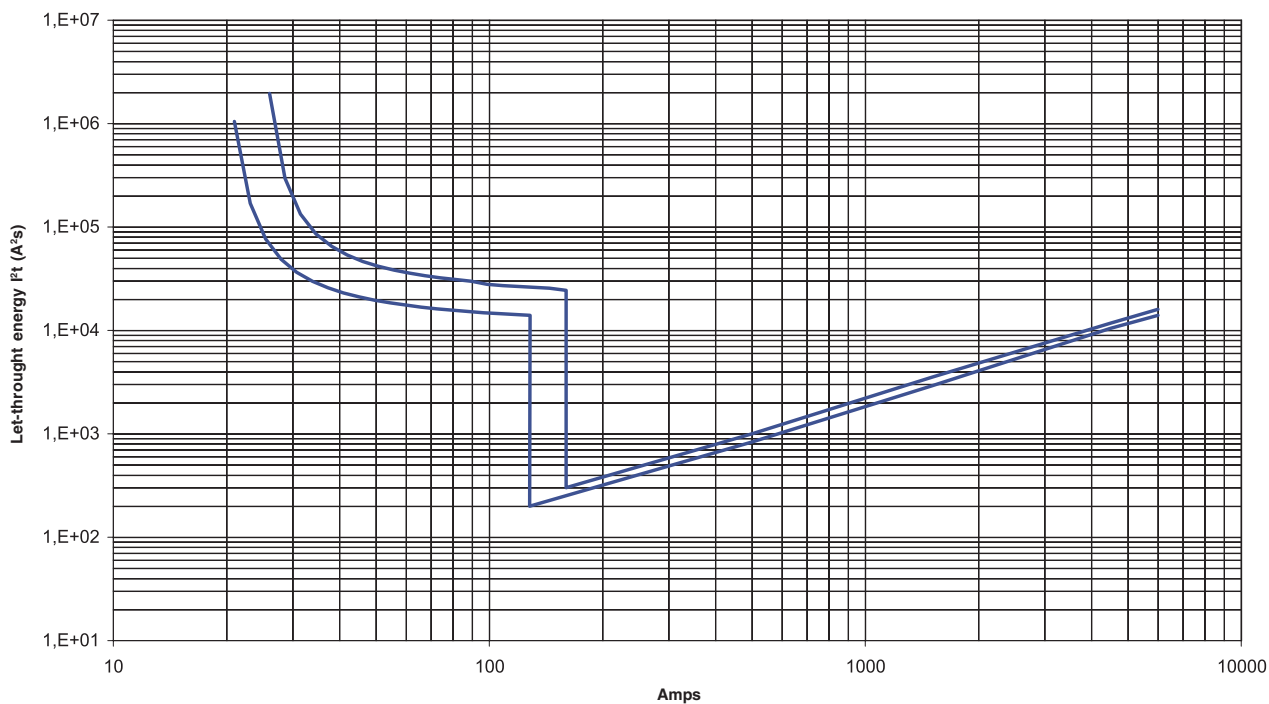
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ZDS Series

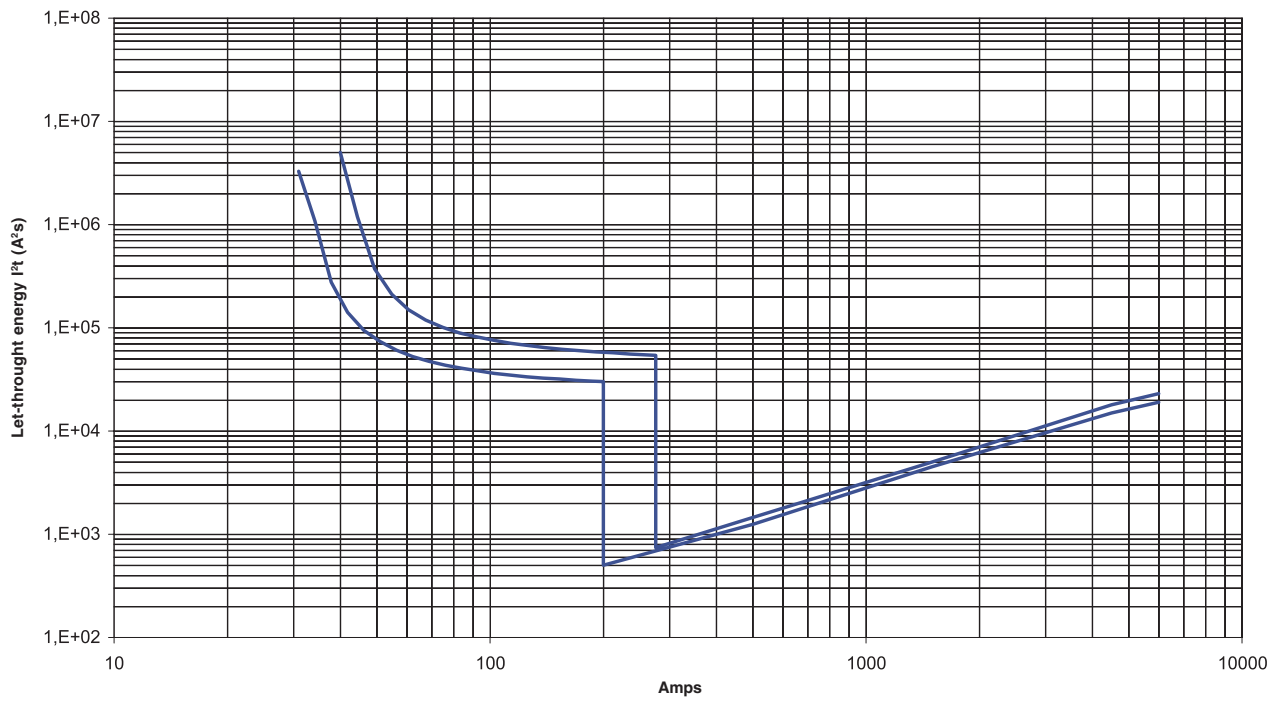
6-10A



16-20A



25-32A



CDR and CDO contactors

Technical Information

Rated current (EN 60947-4-1)	25A (250/400V~)	32A (250/400V~)
Number of poles	1-2 pole	1-2 pole
Coil specifications		
- supply voltage	230/240V~ 50Hz	230/240V~ 50Hz
- supply voltage range (in%Un)	85-110%	85-110%
- Consumption in AC (VA)		
coil power loss	4VA	4,5VA
coil pick-up power	4VA	4,5VA
- maximum coil holding voltage time ⁽¹⁾	Unlimited	Unlimited
Endurance (in number of operations)		
- electrical (in AC1 at full load)	4x10 ⁵	3x10 ⁵
- mechanical	2x10 ⁷	2x10 ⁷
Contact bounce time at closing	< 7ms	< 7ms
Operate and release time (bounce time incl.)		
- pick-up time (from 0 to Un)	< 35ms	< 35ms
- drop-out time (from Un to 0)	< 40ms	< 40ms
Maximum peak current at closing (Ieff)		
- single phase 250V~ cosφ=0.95	60 A	60 A
- 3-phase 250V~ cosφ=0.65	90 A	90 A
Maximum peak current at opening (Ieff)		
- single phase 250V~ cosφ=0.95	90 A	90 A
- 3-phase 250V~ cosφ=0.65	75 A	75 A
Load specifications per phase		
- maximum load AC-1	Contactor	4.5kW - 250V~
	Cont.+contact block	13.5kW - 400V~
- maximum load AC-5b		2.5kW - 250V~
- maximum load AC-7b	Contactor	1.1kW - 250V~
- maximum load AC-3	Cont.+contact block	2.2kW - 250V~/4kW - 400V~
- maximum load per phase (under 5V)		2W
- short circuit fuse protection (gL)		25 A
Maximum lamp load (10³ operations/h)		
- Incandesc. & hallogen (40 to 200W lamps)		3000W
- Fluorescence, compensated(cosφ=0.9)		4000W
- serial compens.		3000VA
- parallel compens.		700VA
- Fluoresc., non compensated(cosφ=0.5)		1400VA
		2200VA

Note:

(1) Whenever the ambient temperature is over 30°C or when several contactors are side-to-side on the same rail, use a spacer CNCP on both sides of each device.

(2) 1 cycle = 2 operations per pole (closing + opening).

CDI contactors

Technical Information

Rated current (EN 60947-4-1)	25A	40A	63A
Number of pole	4 poles	4 poles	4 poles
Rated insulation voltage	440V	440V	440V
Frequency of operation AC-1 AC-3	300 man./h	600 man./h	600 man./h
Coil specifications			
- supply voltage	220/240V~ 50Hz	220/240V~ 50Hz	220/240V~ 50Hz
- supply voltage range %Un	85-110%	85-110%	85-110%
- consumption in AC (VA)			
power loss	4.4-8.4VA	7VA	7VA
pick-up power	14-18VA	33-45VA	33-45VA
- short circuit fuse protection (gL)	35A	63A	80A
Endurance (in number of operations) ⁽¹⁾			
- electrical at full load	AC-1 1x10 ⁵	1x10 ⁵	1x10 ⁵
	AC-3 1.5x10 ⁵	1.5x10 ⁵	1.5x10 ⁵
- mechanical	1x10 ⁵	1x10 ⁵	1x10 ⁵
Maximum load per pole			
- maximum load AC-1	25A	40A	63A
- maximum load AC-3 - rated operational current	9A	27A	27A
- maximum load AC-3 - 3-phase motor			
230/240V	2.5kW	8kW	8kW
380/415V	4kW	12.5kW	12.5kW
- power loss per pole at AC-1	2W	3W	7W
switching of lamps		See below	

Note:

(1) 1 cycle = 2 operations per pole (closing + opening)

Switching of lamps

Lamp type	Power (W)	Max. number of lamp per phase			Lamp type	Power (W)	Max. number of lamp per phase		
		25A	40A	63A			25A	40A	63A
Incandescent	60	28	58	85	Mercury-vapour high pressure (HQL, HPL) uncompensated	50	18	38	55
	100	17	35	51		80	14	28	40
	200	8	17	25		250	5	11	15
	500	3	7	10		700	2	4	6
	1000	1	3	5		1000	1	2	4
Fluorescent uncompensated or serial compensated	18	30	90	140	Mercury-vapour high pressure (HQL, HPL) compensated	50	7	32	46
	24	30	90	140		80	5	25	35
	36	25	70	140		250	2	8	12
	58	17	45	70		700	1	3	4
	85	14	35	60		1000	-	2	3
Fluorescent dual-connection	18	2x55	2x130	2x200	Sodium-vapour high pressure uncompensated	150	6	11	22
	24	2x44	2x110	2x160		250	5	7	13
	36	2x33	2x70	2x100		330	4	6	10
	58	2x22	2x45	2x70		400	2	5	8
	85	2x11	2x30	2x40		1000	1	2	4
Fluorescent parallele compensated	18	20	70	90	Sodium-vapour high pressure compensated	150	2	7	14
	24	15	55	75		250	1	4	8
	36	10	38	51		330	1	3	6
	58	6	25	30		400	1	2	5
	85	4	18	23		1000	-	1	2
Fluorescent with serial electronic	18	40	100	150	Sodium-vapour low pressure uncompensated	55	9	22	30
	36	20	50	75		90	6	13	19
	58	15	30	55		135	4	10	13
	2x18	2x20	2x50	2x60		150	4	10	13
	2x36	2x10	2x25	2x30		180	4	10	13
	2x58	2x7	2x15	2x20		200	4	10	13
Transformers for metal halid LV	50	24	50	80	Sodium-vapour low pressure compensated	55	2	8	14
	75	16	35	54		90	1	5	9
	100	12	27	43		135	1	3	6
	150	9	19	29		150	1	3	6
	300	4	9	14		200	-	2	4

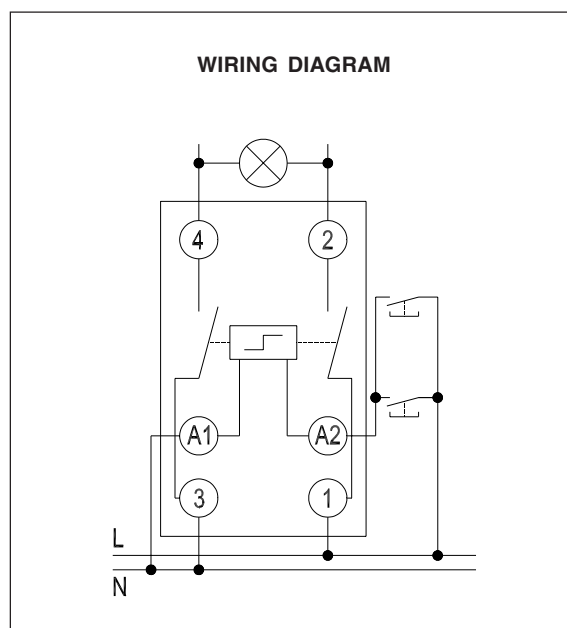
ID impulse relays

Technical Information

Rated current (EN 60669-2-2) (250V~ 1-2p /400V~ 3-4p)	16A	32A
Number of poles	1-4 pole	
Coil specifications		
- supply voltage	230V~50Hz / 115V=	
- supply voltage range %Un	90-110%	
- consumption in AC		
coil power loss	11VA	11.5VA
coil pick-up power	14.5VA	16.5VA
- consumption in DC		
- Maximum coil holding voltage time ⁽¹⁾	unlimited	unlimited
Endurance (in number of operations)		
- electrical (AC1- at full load)	4x10 ⁵	3x10 ⁵
- mechanical	2x10 ⁶	
Impulse time		
- Minimum impulse time (under Un)	50ms	
- Minimum impulse time (90%Un)	100ms	
- Minimum time between impulses	150ms	
- Maximum number of impulses per minute	250	
Load specifications		
- maximum load AC-1	20A	32A
- maximum load DC (30V=)	16A	
- maximum load per phase (under 5V)	2W	
- short circuit fuse protection (gL)	20A	32A
Maximum lamp load (10³ oper /h)		
- Incandesc & hallogen (40 to 200W lamp.)	3000W	4000W
- Fluorescence, compensated (cosφ=0.9)		
- serial	3000VA	4000VA
- parallel	2500VA	3200VA
- Fluorescence, non compensated (cosφ=0.5)		
	1800VA	2200VA

Note:

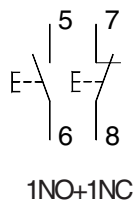
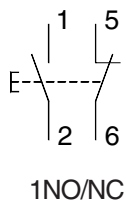
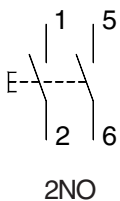
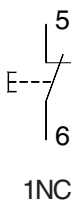
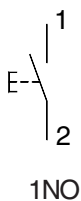
- (1) Whenever the ambient temperature is over 30°C or when several contactors are side-to-side on the same rail, use a spacer CNCP on both sides of each device.
 (2) 1 cycle = 2 operations per pole (closing + opening)



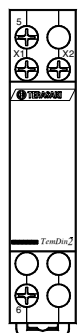
PD pushbuttons



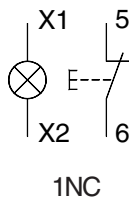
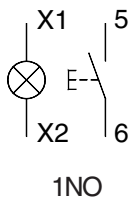
Terminal numerical order



PDL pushbuttons with neon signal lamp



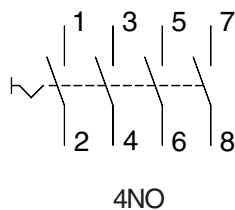
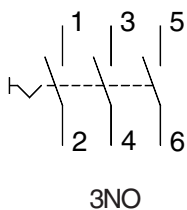
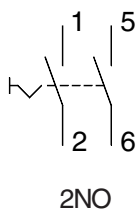
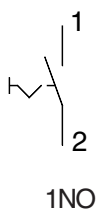
Terminal numerical order



WDM switches



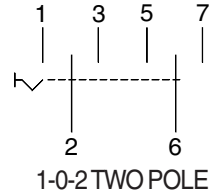
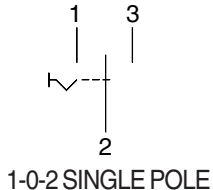
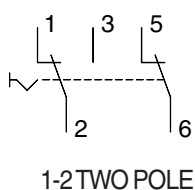
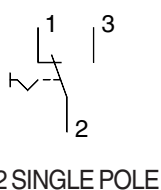
Terminal numerical order



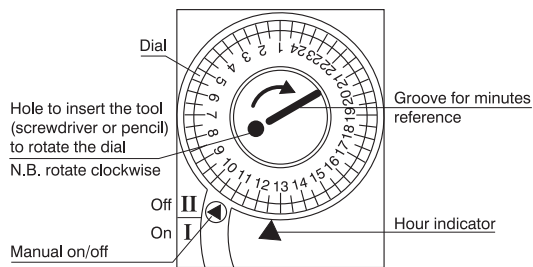
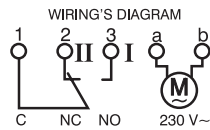
WDM changeovers switches



Terminal numerical order



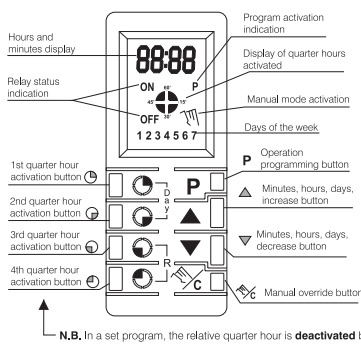
RDA24 analogue timer



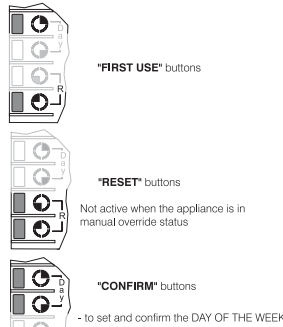
RDD07 single module digital timer

Legend of display and operating buttons

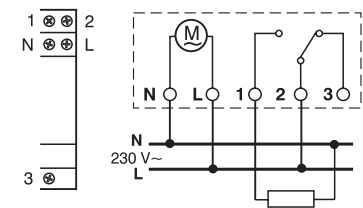
NOTE: in these instructions the following convention is used:
 88 permanently alight
 88 blinking



Key to button combinations

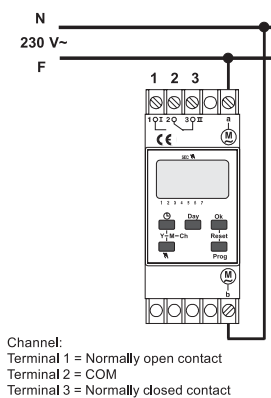


Terminal diagram

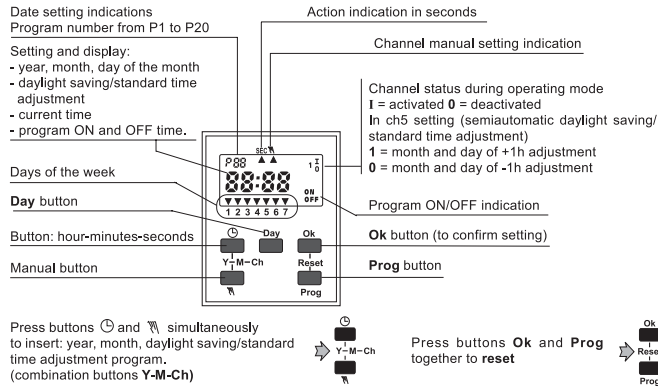


RDD07A digital time switch

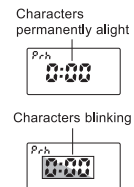
Electrical connections



Key to display and button functions

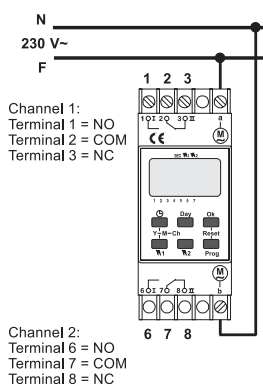


Note: the following meanings are adopted in the instructions:

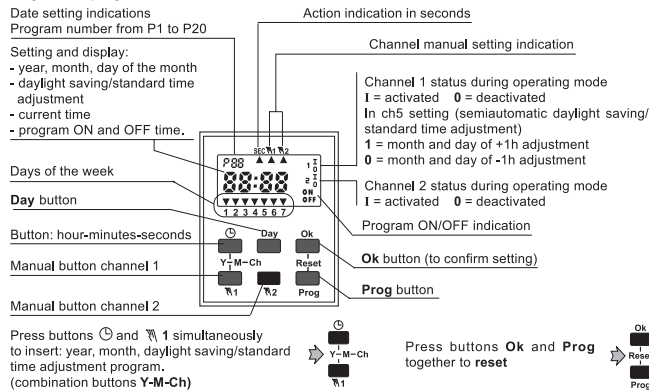


RDD07A2 digital time switch

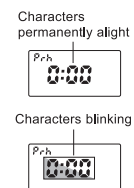
Electrical connections



Key to display and button functions

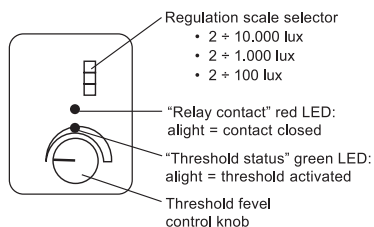


Note: the following meanings are adopted in the instructions:



RDA24P light sensitive switch

Controls and indicators

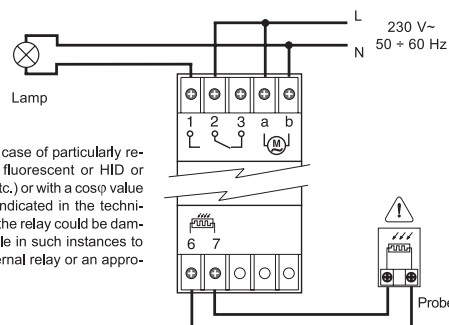


MODULE ELECTRICAL CONNECTIONS

- Turn off the mains supply.
- Connect the 230 V~ supply to the terminals:
 - a (Line)
 - b (Neutral)
- Connect the load as indicated in figure 5:
 - Neutral (N) directly to the lamp
 - terminal 1 (normally open) to the lamp
 - terminal 2 (common) to the line
- Connect the wires coming from the probe to terminals 6 and 7 of the twilight switch.

For special applications the connection that is normally closed at terminal 3 is available.

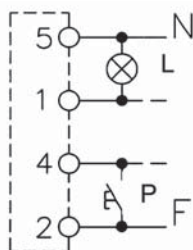
CAUTION: the electrical connection to the separate probe must be made using a twin cable with a minimum external diameter of 4 mm, a maximum of 8 mm and with the section of each conductor 0.75 + 1.5 mm²



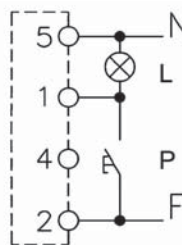
WARNING: in the case of particularly reactive loads (e.g. fluorescent or HID or electronic lamps, etc.) or with a cosφ value lower than those indicated in the technical specifications, the relay could be damaged. It is advisable in such instances to use a suitably external relay or an appropriate contactor.

SDS016A staircase switch

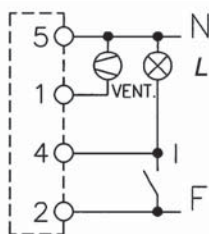
WITH TIME RESET



WITHOUT TIME RESET

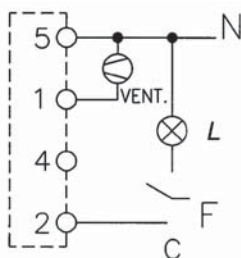


SIMULTANEOUS OPERATION



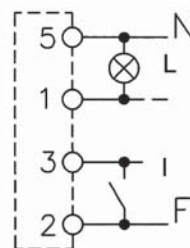
I: SWITCH

CONSECUTIVE OPERATION



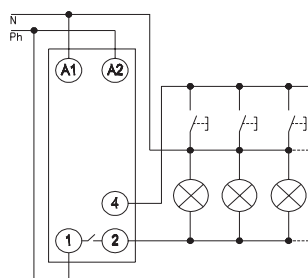
C: CHANGE OVER SWITCH

TIMING OFF DELAY

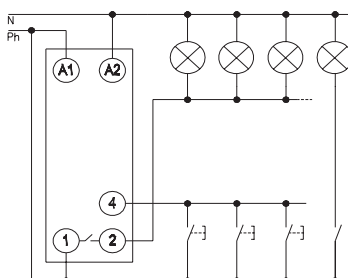


SDA016B staircase switch

3-Wire installation

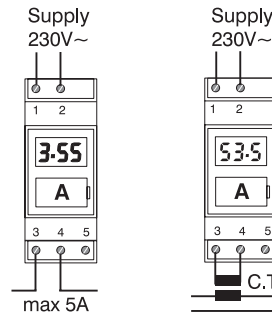
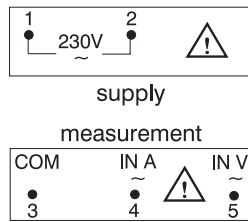


4-wire installation

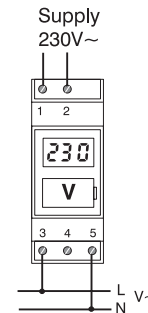
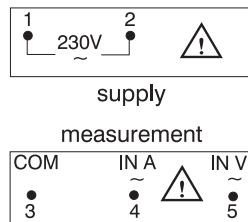


MDD06B ammeter/voltmeter

Wiring diagram for ammeter
(Direct insertion and insertion with C.T.)

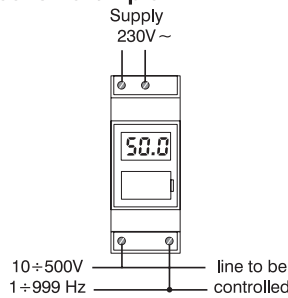


Wiring diagram for voltmeter

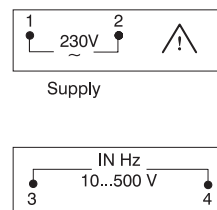


MDD00F frequency meter

Connection example

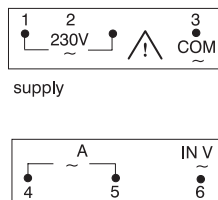


Terminal board connections

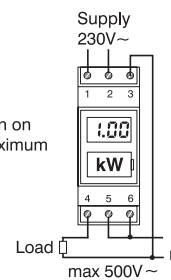


MDD06W wattmeter

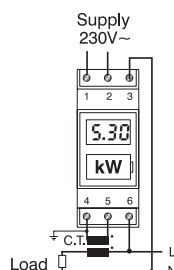
Terminal board connections



Example of direct insertion on single-phase line with maximum current of 5A

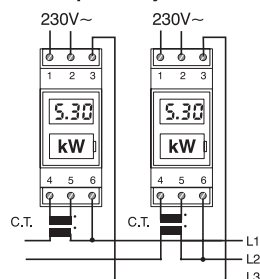


Example of insertion with current transformer on single-phase line

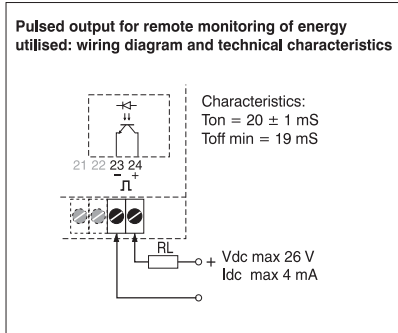


Caution:
max measuring voltage 500 V~

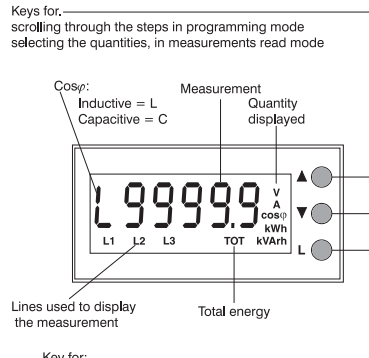
Insertion of 2 single-phase Wattmeters in a balanced three wire tri-phase system



MDD06P universal Digital Analiser

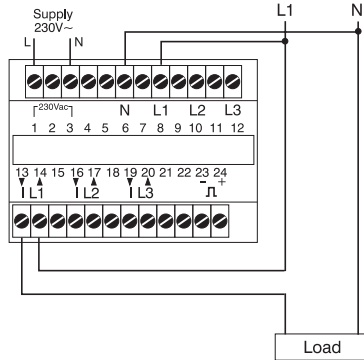


KEY FUNCTIONS AND DISPLAY INDICATIONS

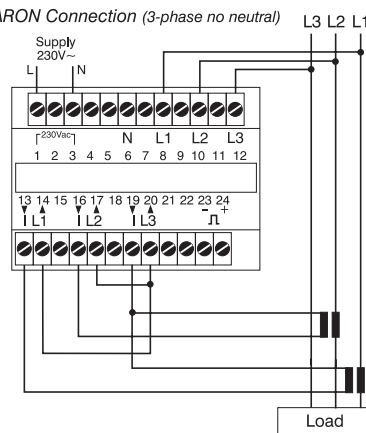


Key for: _____
 Confirming data in programming mode
 Scrolling through measurements in measurement read mode

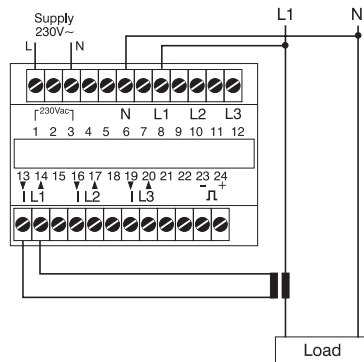
Direct single-phase connection



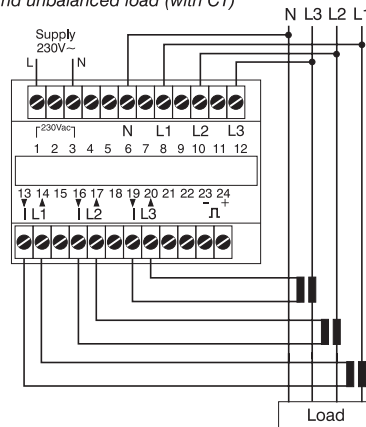
ARON Connection (3-phase no neutral)



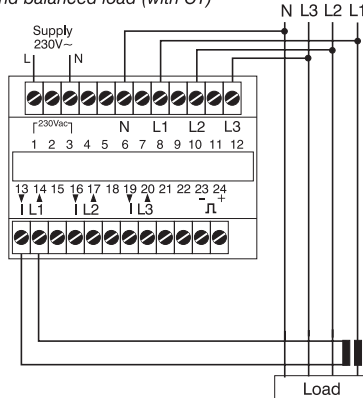
Single-phase connection with Current Transformer



Connection to three-phase system with neutral and unbalanced load (with CT)

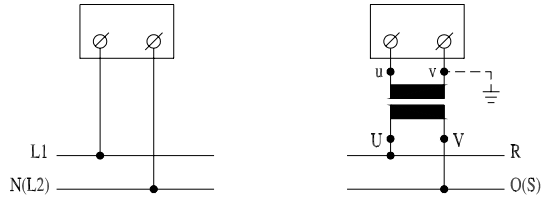


Connection to three-phase system with neutral and balanced load (with CT)

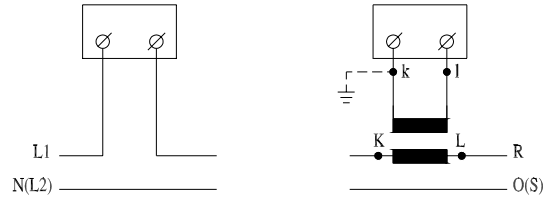


MDA analogue ammeter and voltmeter

VOLTMETER

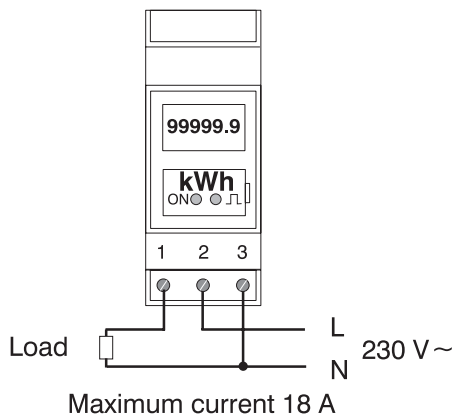


AMMETER

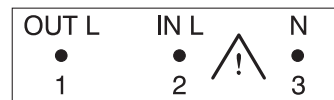


MDA00E active Energy Meter

Example of insertion on single-phase line

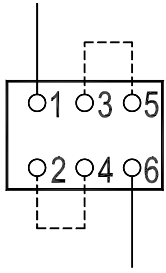


Terminal board connections

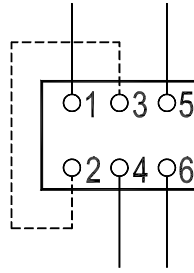


GD25 manual Motor Starter

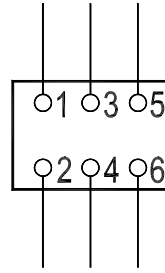
CONNECTION DIAGRAM



1 POLE



2 POLES



3 POLES

Proper operation is subject to three-pole switch load; thus all poles are to be used also when only one-pole or two-pole load is necessary.

Back-up fuses for $I_{cc} \geq I_{cu}$

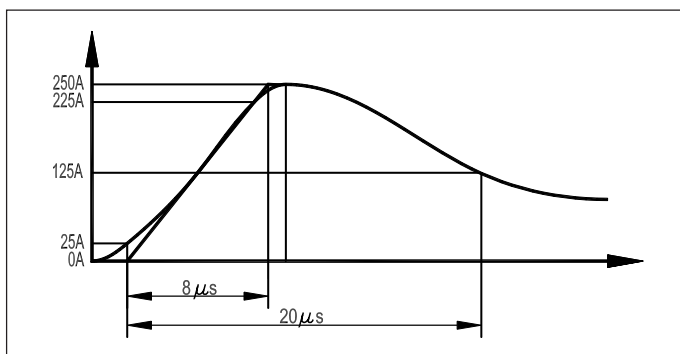
Rated operational current	Fuse (gL, aM) [A]			
	230V	400V	500V	690V
0.16A	No additional protection required			
0.25A				
0.4A				
0.63A				
1A				
1.6A				
2.5A			25A	20A
4A			35A	25A
6.3A			50A	35A
10A		80A	50A	35A
16A	80A	80A	63A	35A
20A	80A	80A	63A	50A
25A	80A	80A	63A	50A

Protection against transient currents

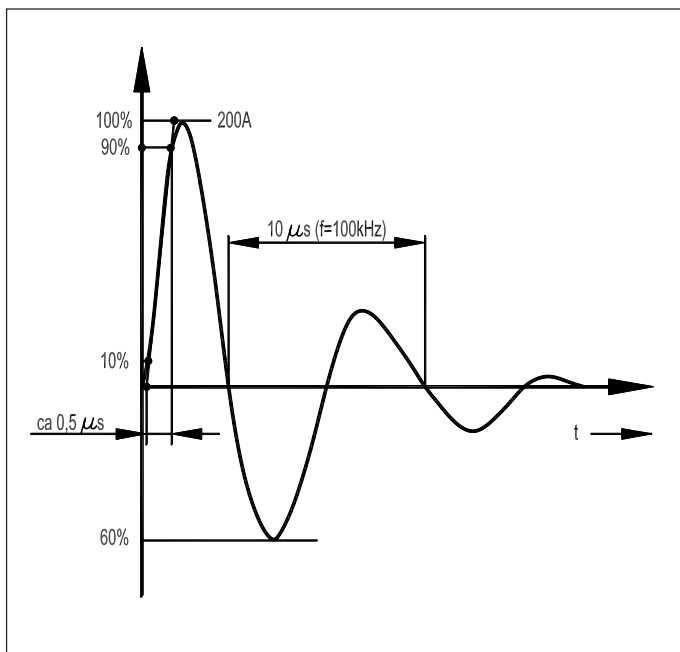
Transients with high energy and short duration (<50ms) are the most dangerous and destructive problems in distribution lines -low energy voltage variations, electromagnetic noise, harmonics, power supply interruptions and ground faults-. Its random nature, short duration and high energy involved make them the most difficult problem to solve. Associated to lightning, either direct impact or induction are the most destructive phenomenon.

Due to these surges or changeover operations, the transients' origin in distribution lines is increasing and it causes serious cost damages to the connected equipment. Furthermore, there is the substitution of the traditional circuits with relay by printed circuits, which are easily affected because of their high sensitivity, typical examples are operative life reduction, malfunction of electronics' logic and destruction.

Transient current at 250A (peak current) at point on wave 8/20µs (VDE 0664)



Transient current at 200A (peak current) at minimised point on wave 0,5µs-100kHz (pr EN 61.1008)



Applications

Electronic equipment becomes more vulnerable to power disturbances with each new generation. Electronic damage, disruption and downtime can be prevented.

Critical loads needing to be protected, with an increasing number of electronic loads are:

- Work stations
- Telephone systems
- Automated assembly
- Medical diagnostic equipment
- Industrial machine tools
- Electronic gas pumps
- Automated integrated controls
- TV & radio broadcasting equipments
- Telephone & communication equipments
- Computers and networks
- Domestic
- ...

Terasaki products incorporate the safest design that allows their application on all micro-processor based equipments.

SELECTION CHART

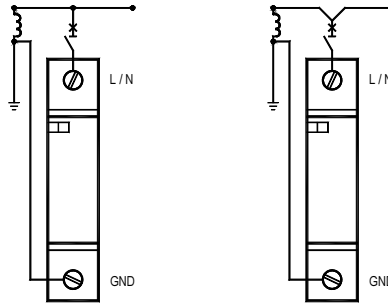
Industrial sector		
	Main panel	Sub panel
High risk	80kA	80kA
Medium risk	80kA	45kA
Low risk	45kA	20kA

Commercial sector		
	Main panel	Sub panel
High risk	80kA	80kA
Medium risk	45kA	20kA
Low risk	20kA	20kA

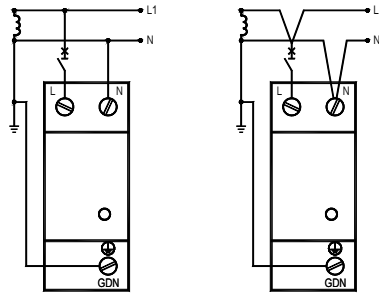
Domestic sector		
	Main panel	Sub panel
High risk	45kA	20kA
Medium risk	20kA	--
Low risk	20kA	--

Surge arresters LS series combined with TemDin2 series provides the perfect solution for absolute protection specifically designed to guarantee safety against both transient and overcurrent in all types of installations.

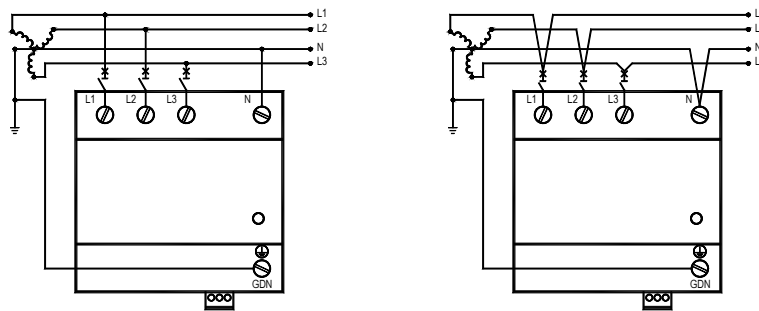
TM....I surge arresters



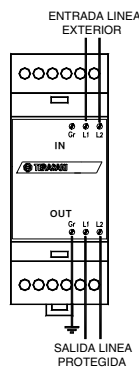
TM....II surge arresters



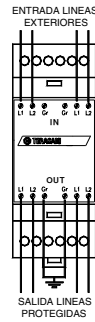
TM...III surge arresters



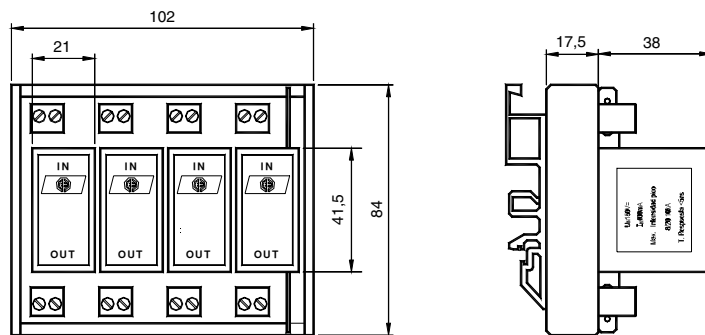
TMT101DIN surge arresters



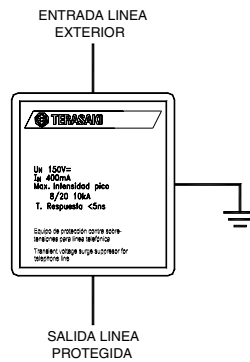
TMT102DIN surge arresters



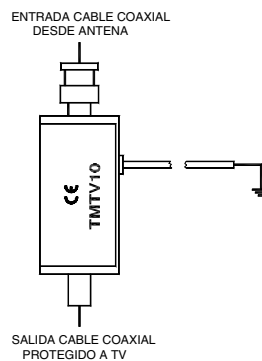
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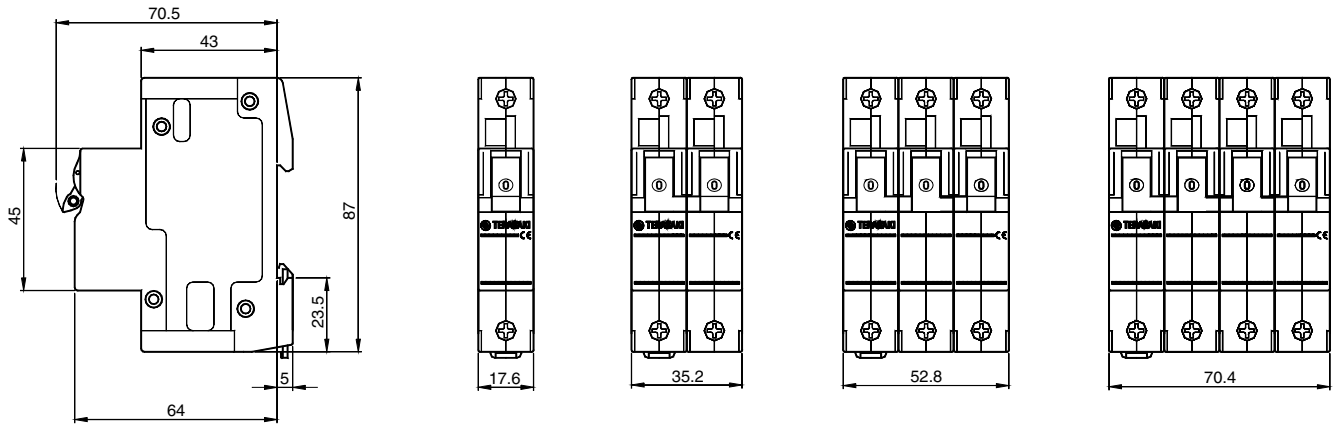
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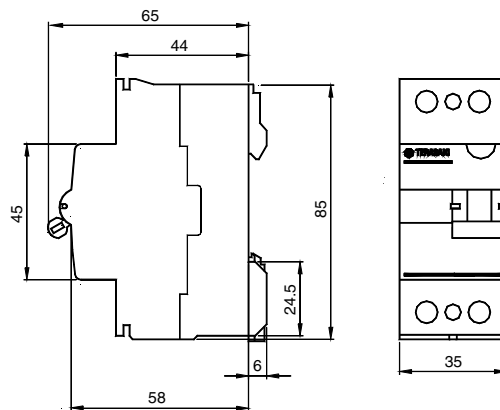
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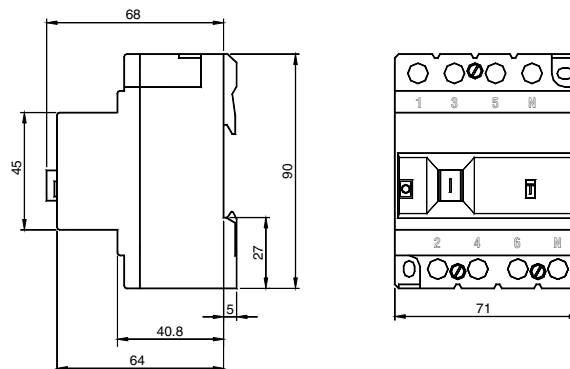
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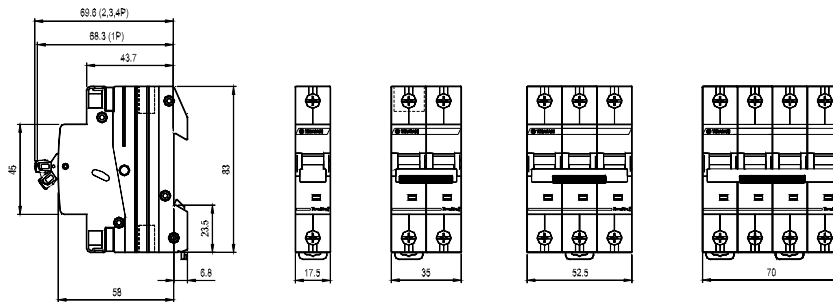
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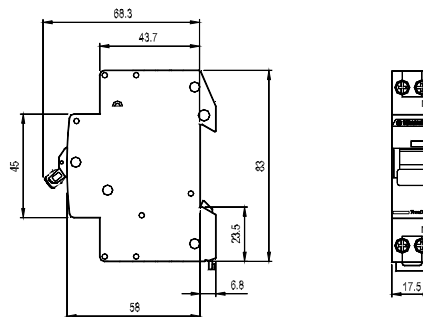
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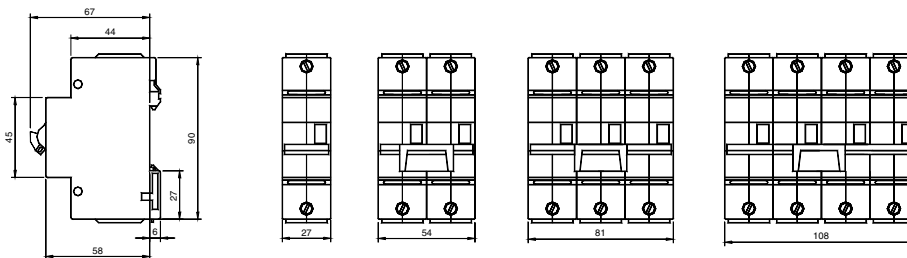
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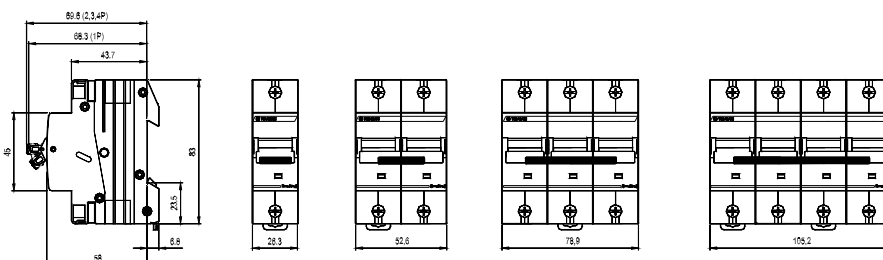
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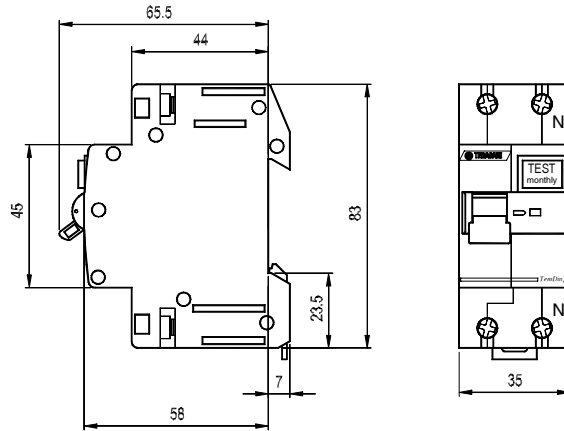
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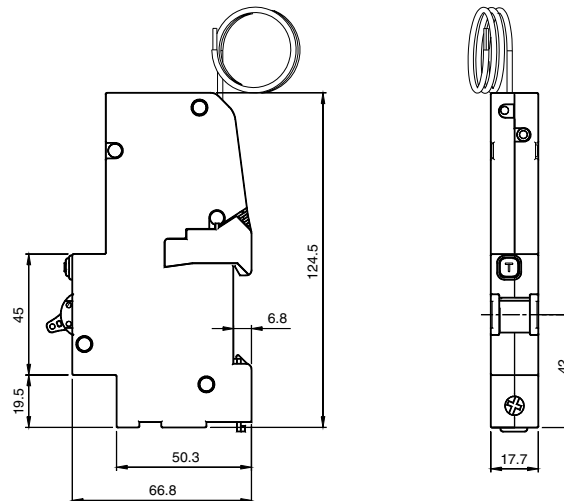
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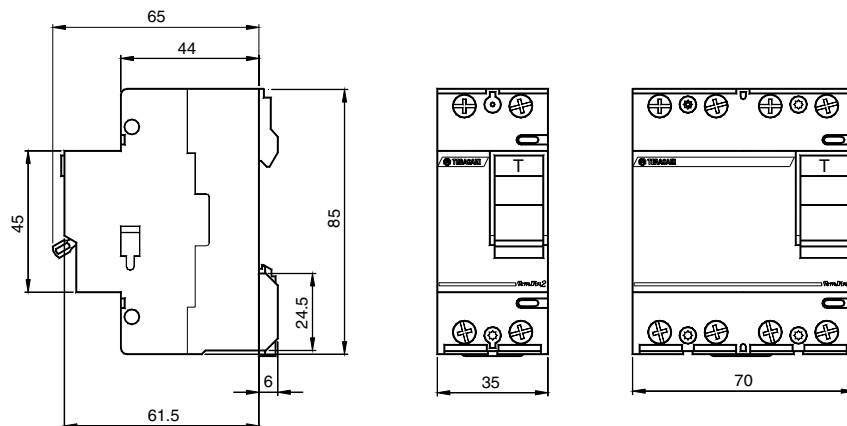
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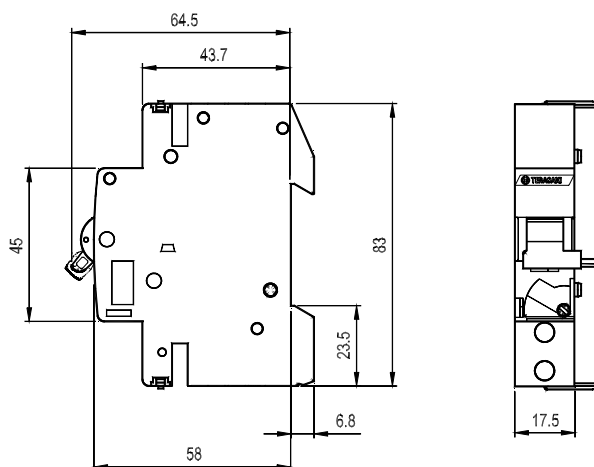
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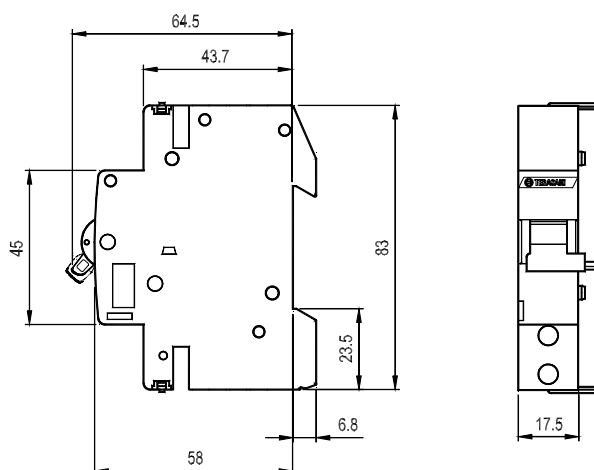
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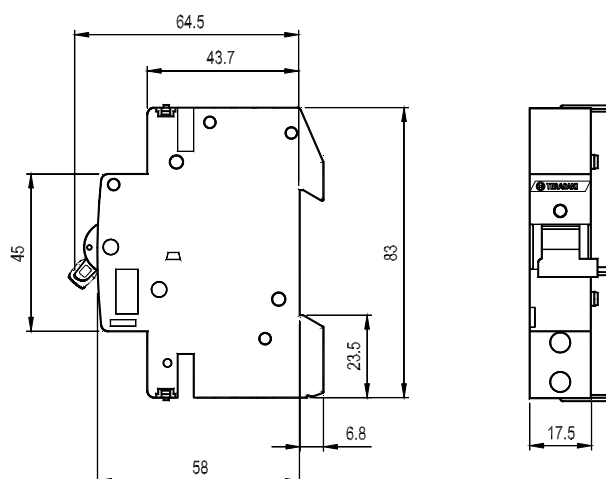
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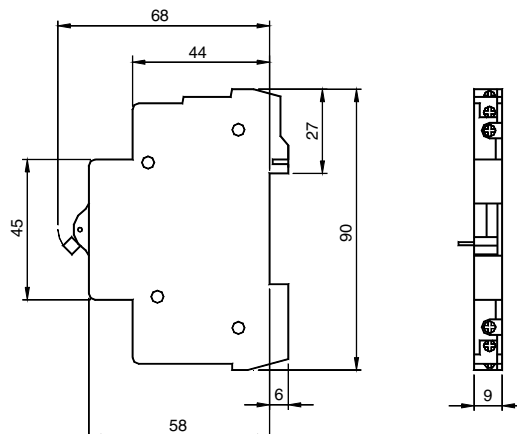
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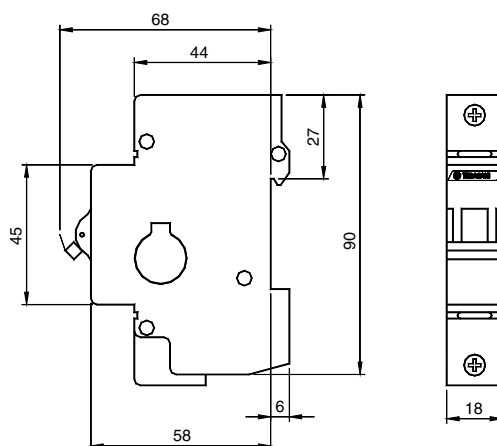
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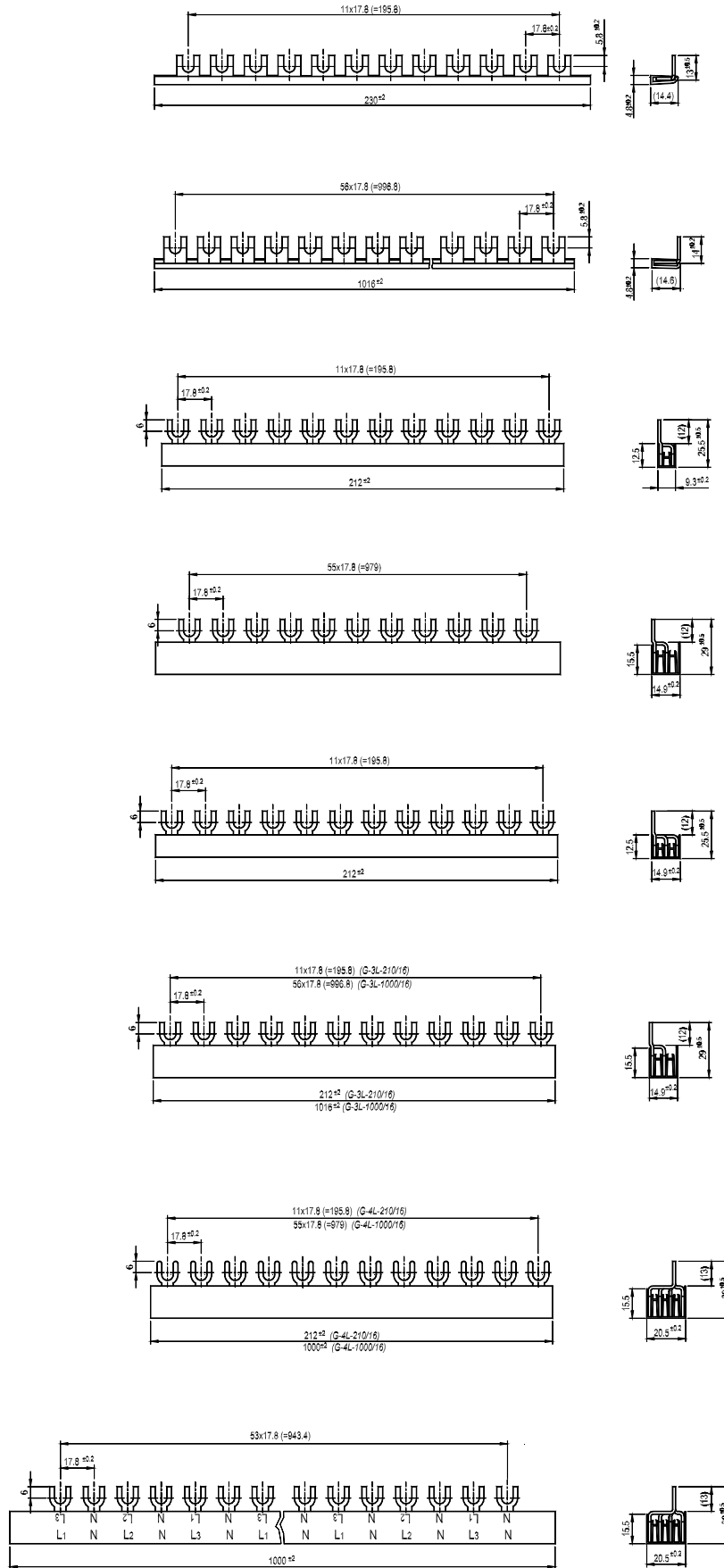
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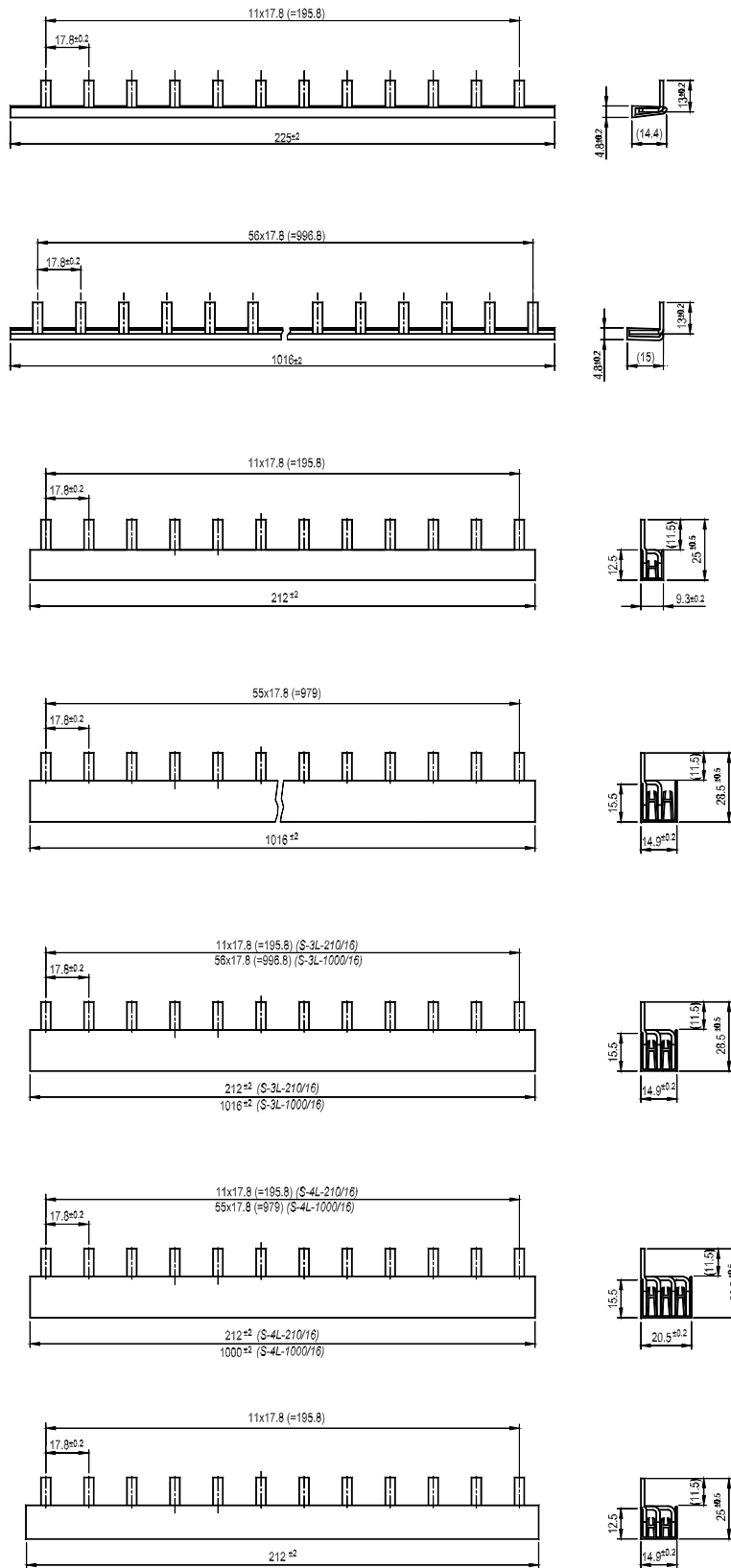
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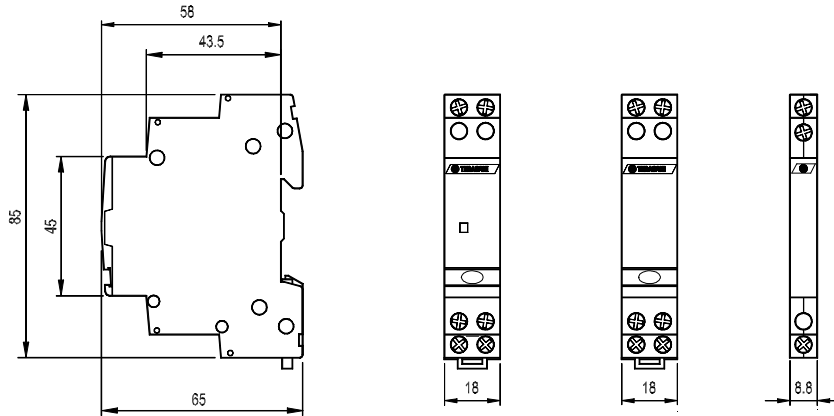
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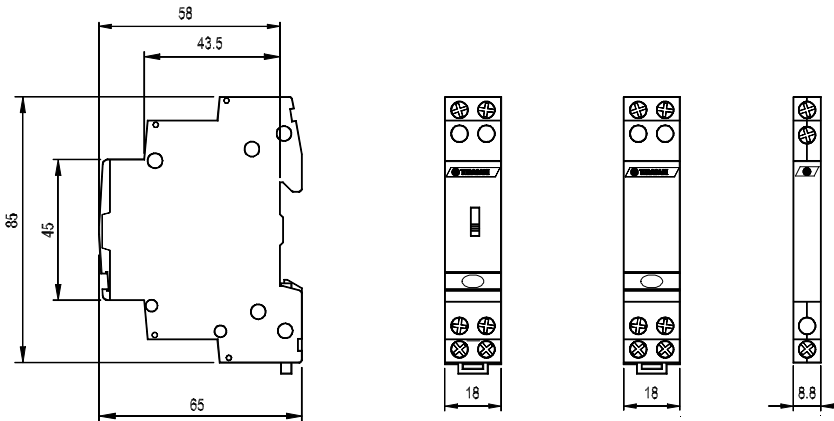
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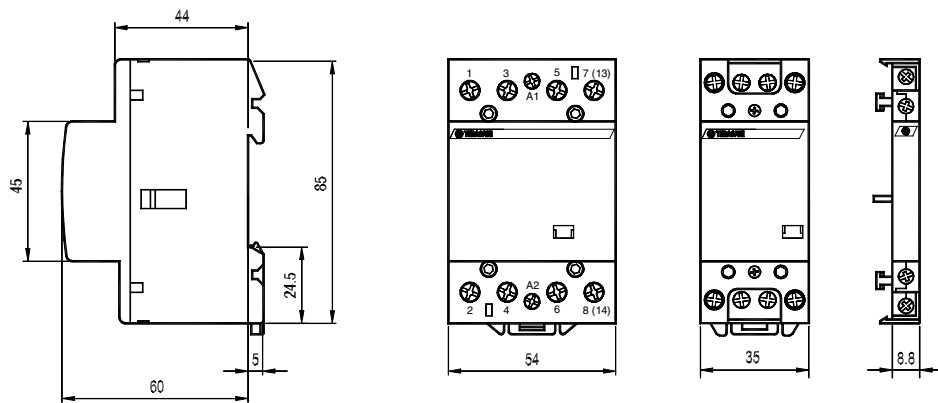
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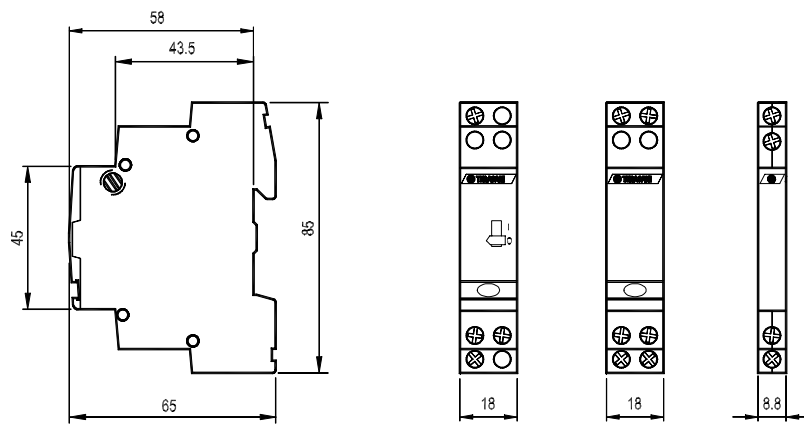
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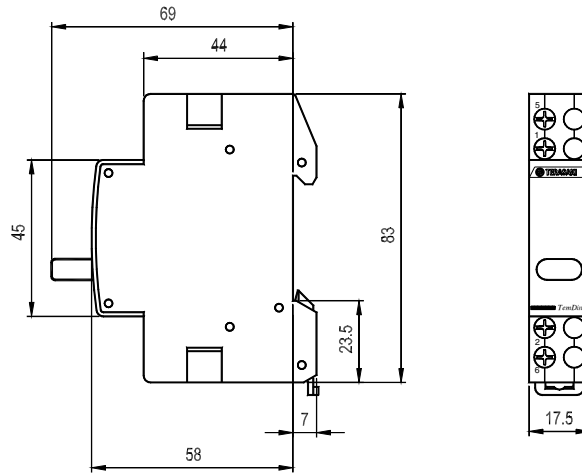
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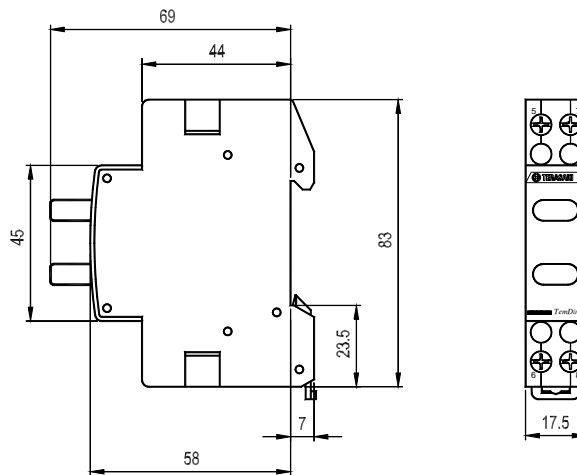
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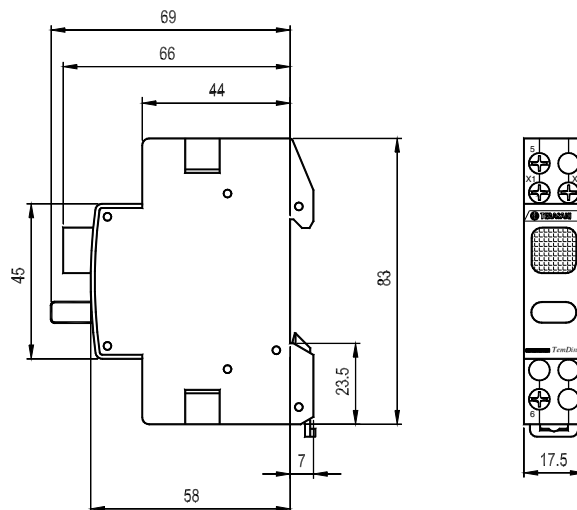
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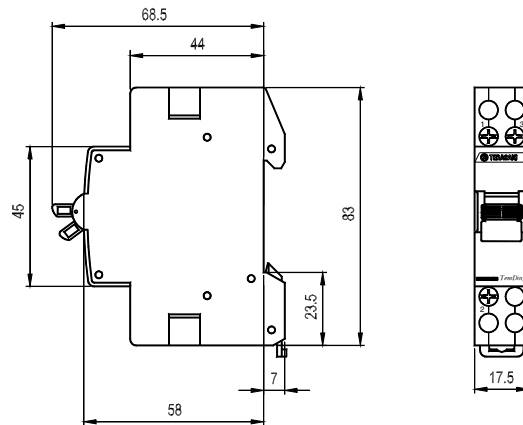
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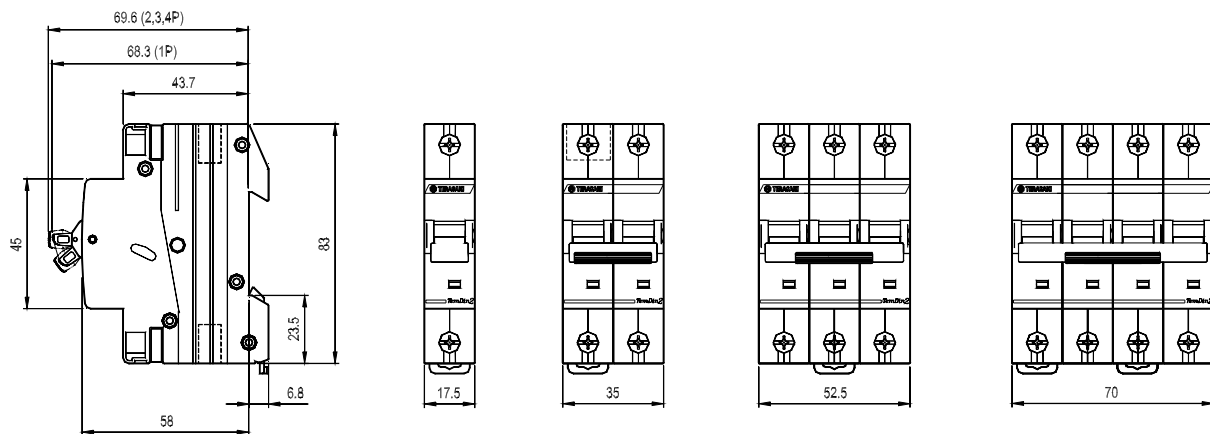
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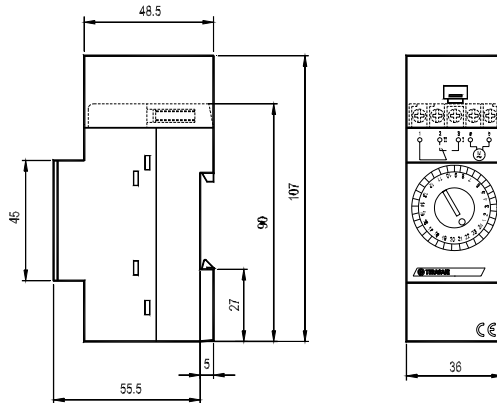
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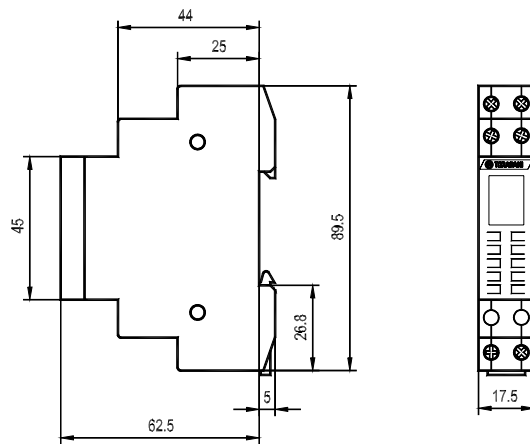
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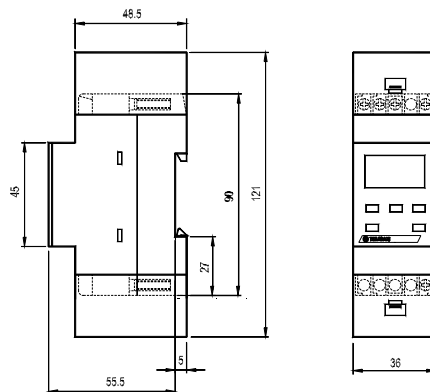
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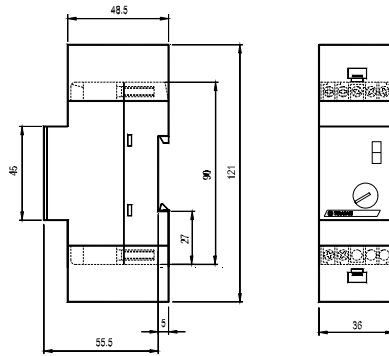
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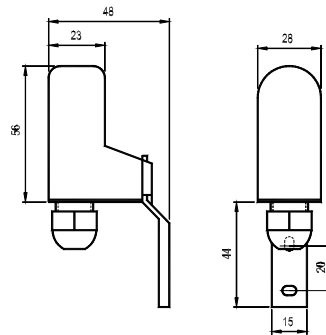
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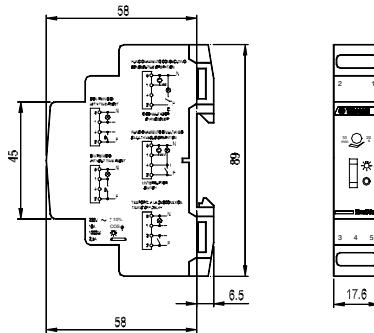
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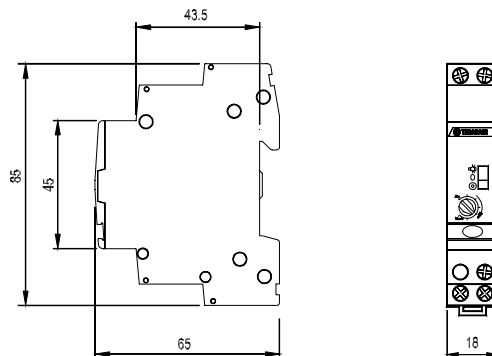
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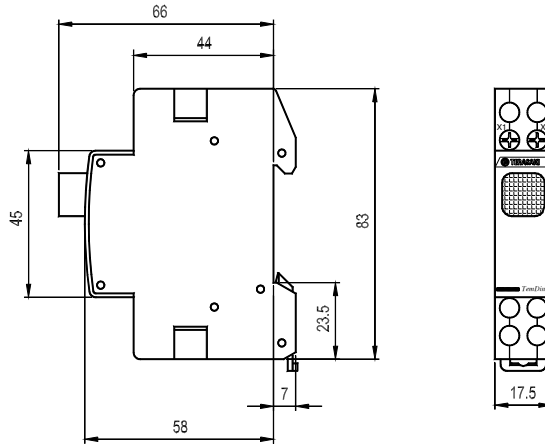
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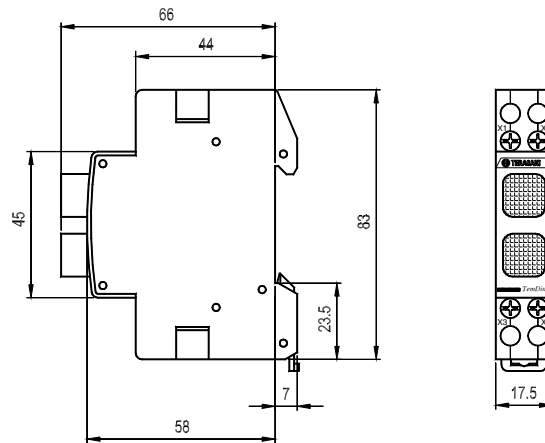
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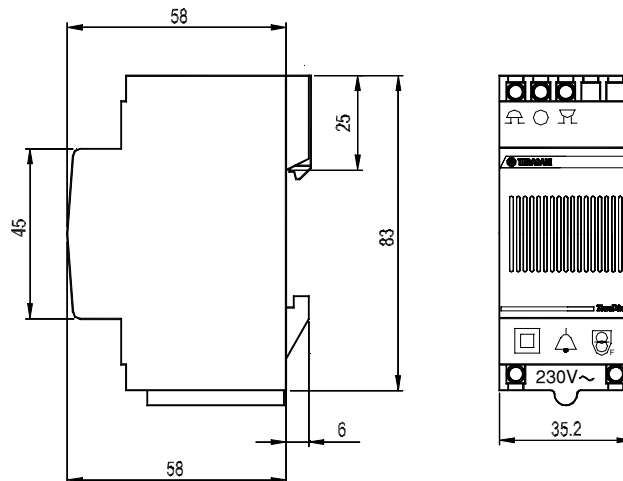
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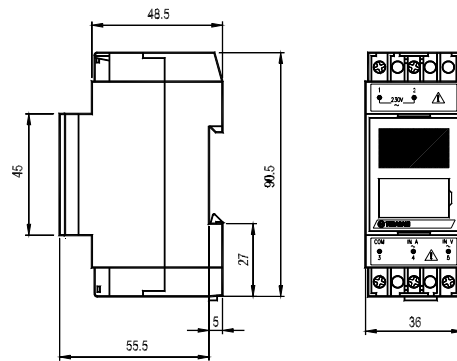
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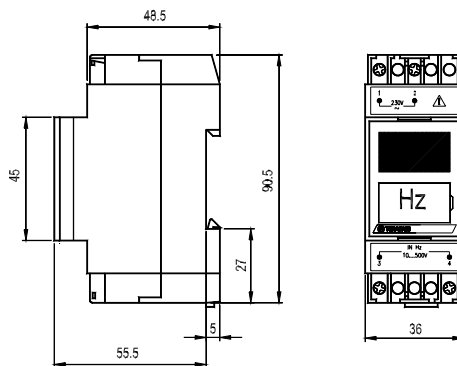
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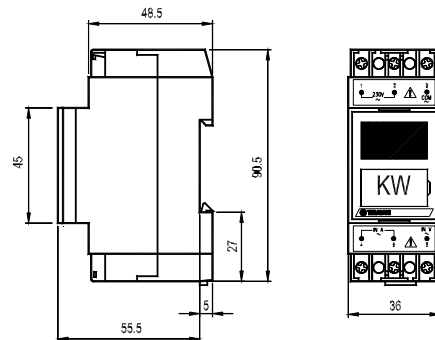
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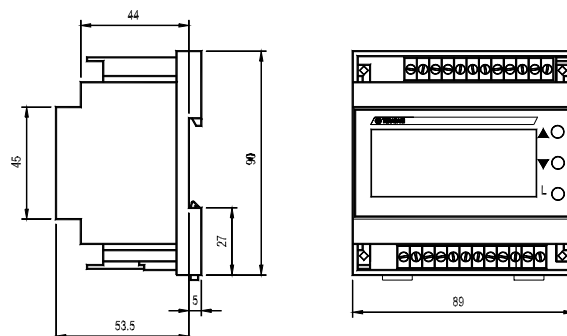
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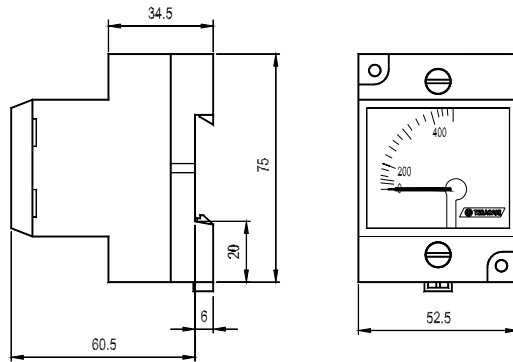
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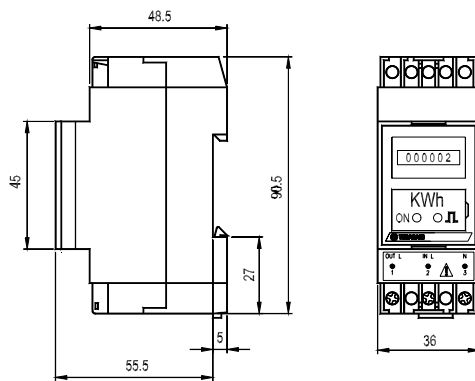
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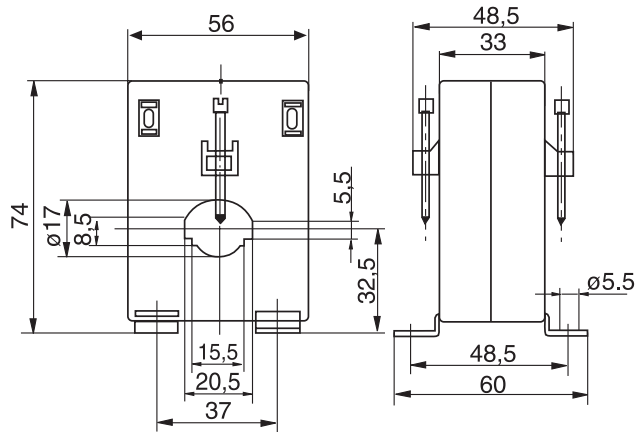
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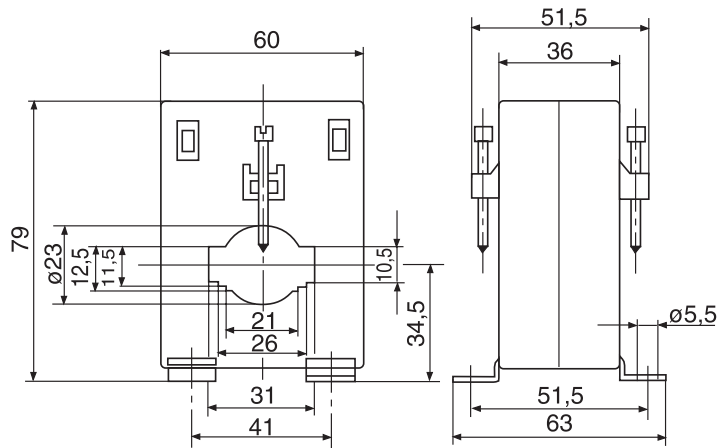
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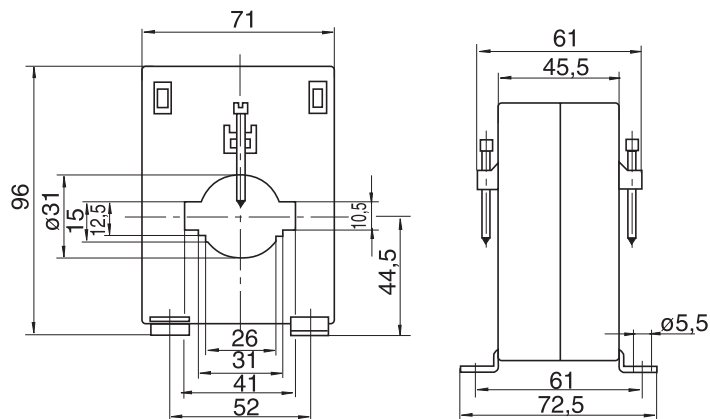
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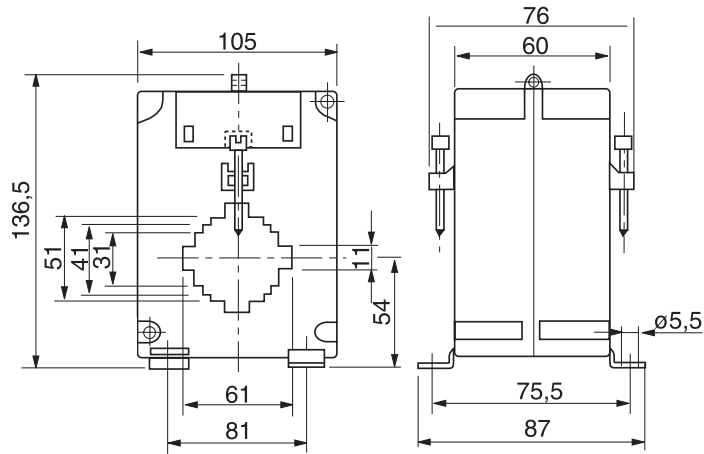
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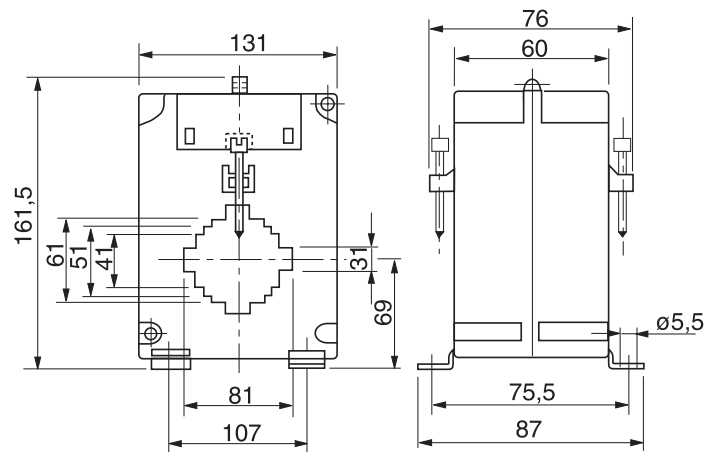
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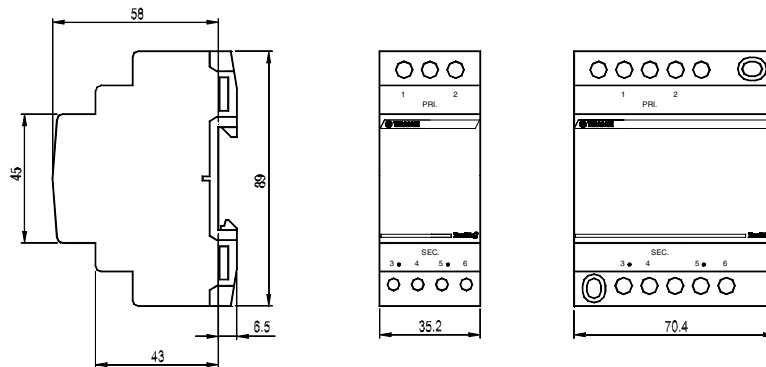
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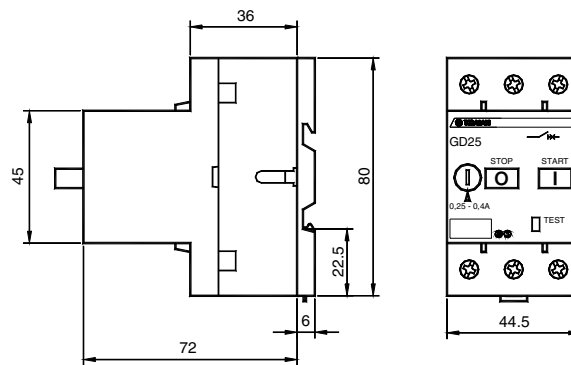
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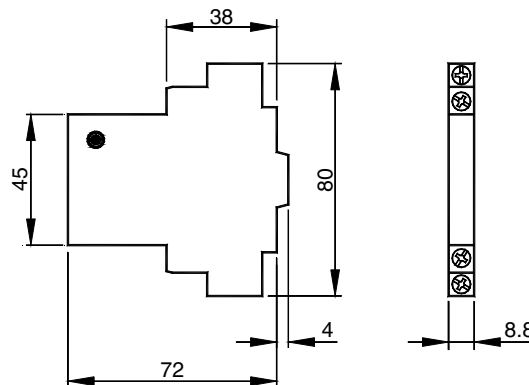
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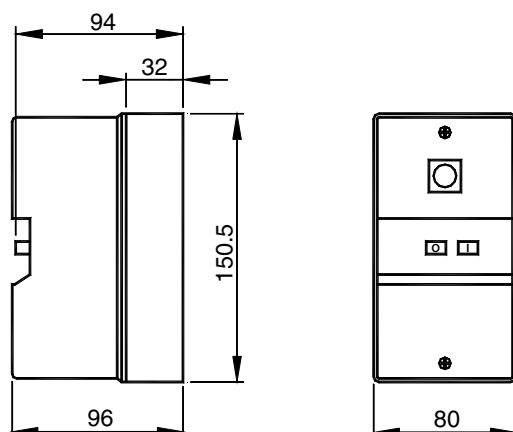
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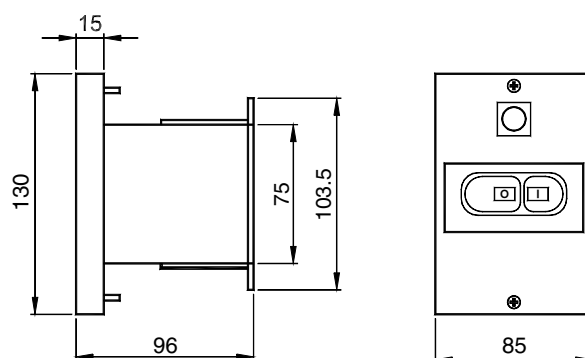
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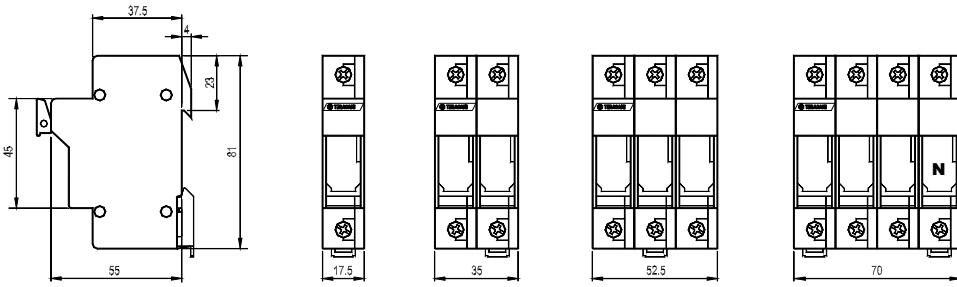
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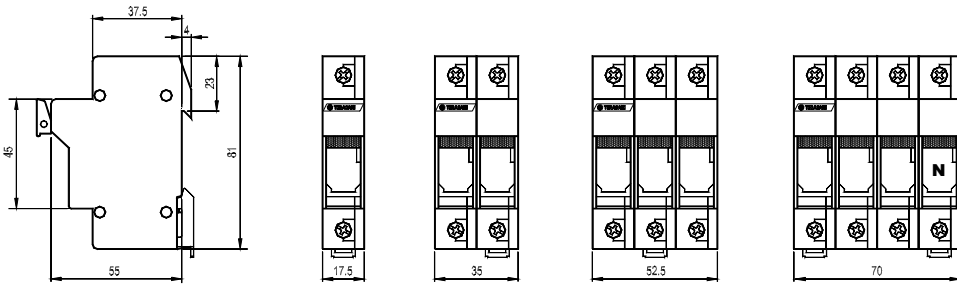
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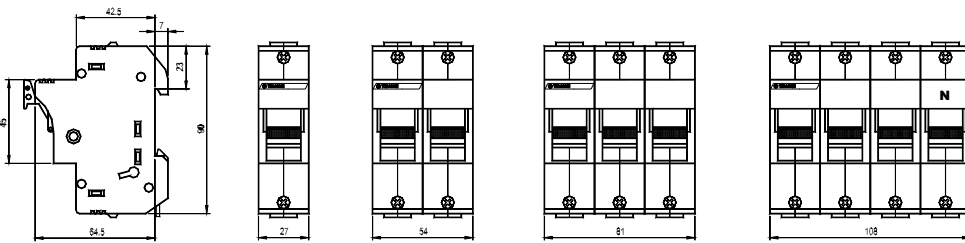
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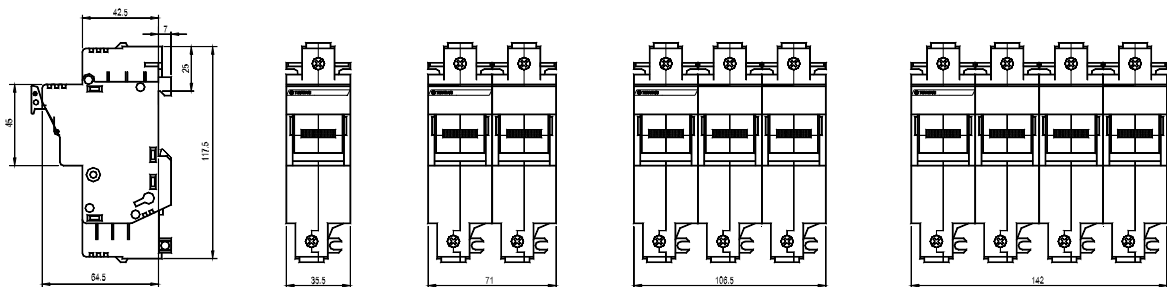
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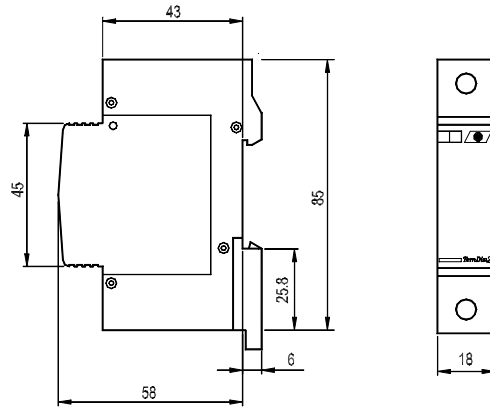
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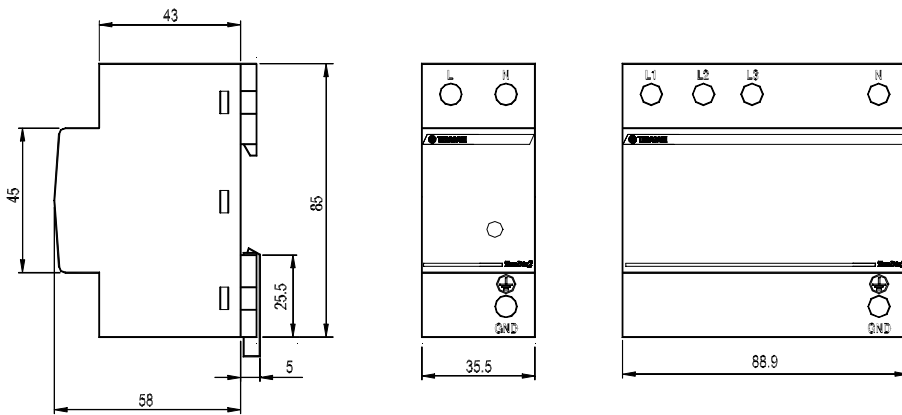
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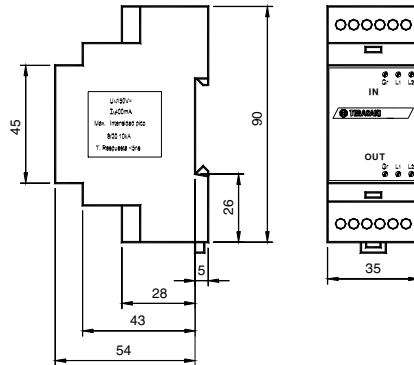
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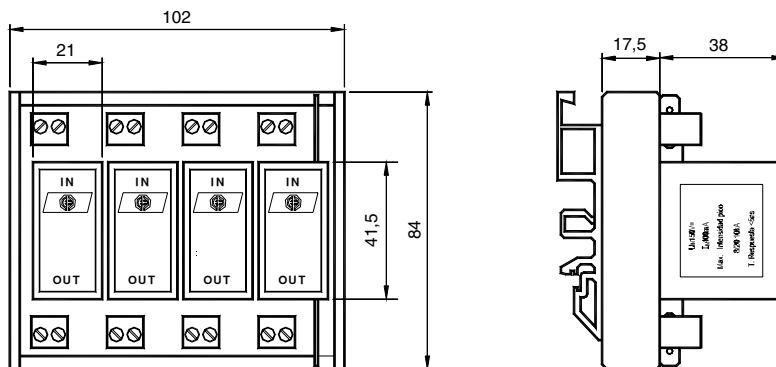
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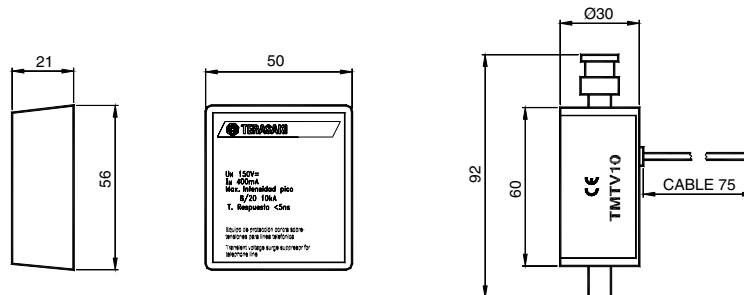
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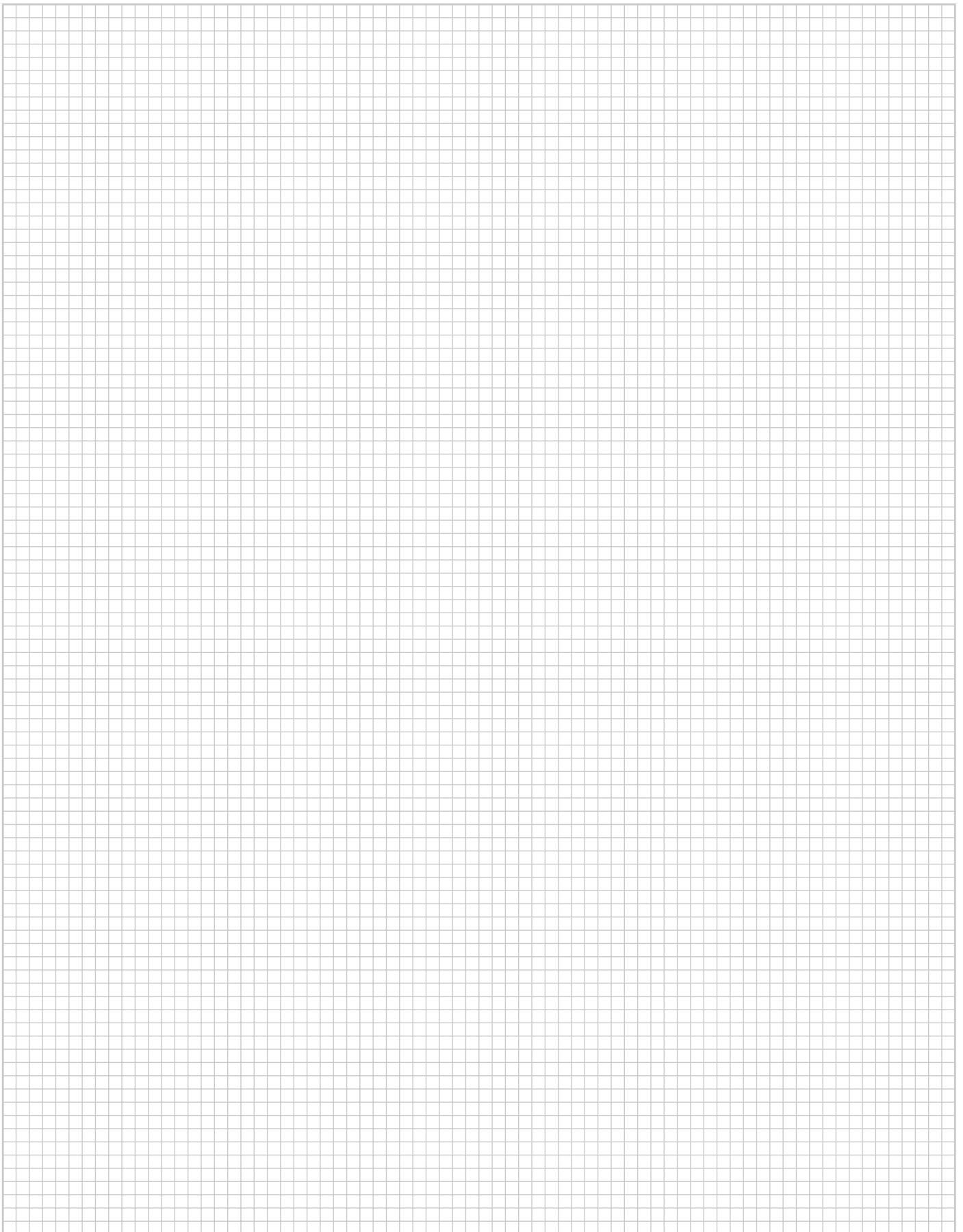
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