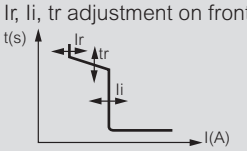
## Settings of the electronic protection units

### MP4 LI

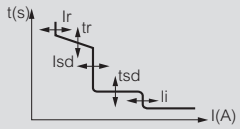
Ir, Ii, tr adjustment on front panel




- **Long time delay protection against overloads**
Ir from 0.4 to 1 x In (6 + 6 steps) on two selectors
(0.4 ÷ 0.9, by steps of 0.1 and 0.0 ÷ 0.1, by steps of 0.02)
- **Long delay protection operation time**
tr - at 6 x Ir (4 + 4 steps)
tr = 5-10-20-30 s (MEM ON) 30-20-10-5 s (MEM OFF)
- **Instantaneous protection against very high short circuits**
Ii from 2 to 15 x In or Icw (9 steps) Ii = 2-3-4-5-6-8-10-12-15 x In or Icw
- **Neutral protection:** IN = I-II-III-IV x Ir (0-50-100-100 %)

### MP4 LSI

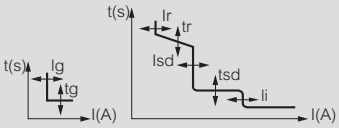
Ir, tr, Isd, tsd, Ii adjustment on front panel




- **Long time delay protection against overloads**
Ir from 0.4 to 1 x In (6 + 6 steps) on two selectors (0.4 ÷ 0.9, by steps of 0.1 and 0.0 ÷ 0.1, by steps of 0.02)
- **Long delay protection operation time**
tr - at 6 x Ir (4 + 4 steps) tr = 5-10-20-30 s (MEM ON) 30-20-10-5 s (MEM OFF)
- **Short time delay protection against short circuits**
Isd from 1.5 to 10 x Ir (9 steps) Isd = 1.5-2-2.5-3-4-5-6-8-10 x Ir
- **Short time delay protection operation time**
tsd from 0 to 0.3 s (4 + 4 steps) tsd = 0-0.1-0.2-0.3 s (t=cost), 0.3-0.2-0.1-0.01 s ($I^2t$=cost)
- **Instantaneous protection against very high short circuits**
Ii from 2 to 15 x In or Icw (9 steps) Ii=off-2-3-4-6-8-10-12-15 x In or Icw
- **Neutral protection:** IN = I-II-III-IV x Ir (0-50-100-100 %)

### MP4 LSIg

Ir, tr, Ii, Ig, tg, Isd, tsd, adjustment on front panel




- **Long time delay protection against overloads**
Ir from 0.4 to 1 x In (6 +6 steps) on two selectors
(0.4 ÷ 0.9, by steps of 0.1 and 0.0 ÷ 0.1, by steps of 0.02)
- **Long delay protection operation time**
tr - at 6 x Ir (4 + 4 steps) tr = 5-10-20-30 s (MEM ON)
30-20-10-5 s (MEM OFF)
- **Short time delay protection against short circuits**
Isd from 1.5 to 10 x Ir (9 steps) Isd = 1.5-2-2.5-3-4-5-6-8-10 x Ir
- **Short time delay protection operation time**
tsd from 0 to 0.3 s (4 + 4 steps) tsd = 0-0.1-0.2-0.3 s (t=constant), 0.3-0.2-0.t01 s (I2t=constant)
- **Instantaneous protection against very high short circuits**
Ii from 2 to 15 x In or Icw (9 steps) Ii = 2-3-4-6-8-10-12-15 x In or Icw
- **Earth fault current**
Ig from 0.2 to 1 x In (9 steps) Ig = 0.2-0.3-0.5-0.6-0.7-0.8-1 x In : OFF
tg from 0.1 + 1 s (4 steps) tg = 0.1-0.2-0.5-1 s (both t = k and I2t = k)
- **Neutral protection:** IN = I-II-III-IV x Ir (0-50-100-100 %)

## Selectivity in three-phase network 400 V~

### DMX³/DPX

| Downstream \ Upstream | | DMX³ 2500 | | | | | DMX³ 4000 | DMX³ 6300 |
|---|---|---|---|---|---|---|---|---|
| | | 800 A | 1000 A | 1250 A | 1600 A | 2000 & 2500 A | 3200 & 4000 A | 5000 & 6300 A |
| DPX³ 160(1) | | T | T | T | T | T | T | T |
| DPX³ 250(1) | | T | T | T | T | T | T | T |
| DPX³ 630(1) TM and elec. | | T | T | T | T | T | T | T |
| DPX³ 1600(1) thermal magnetic | 630 A | T | T | T | T | T | T | T |
| | 800 A | | T | T | T | T | T | T |
| | 1000 A | | | T | T | T | T | T |
| | 1250 A | | | | T | T | T | T |
| DPX³ 1600(1) electronic | 630 A | | | T | T | T | T | T |
| | 800 A | | | T | T | T | T | T |
| | 1000 A | | | | T | T | T | T |
| | 1250 A | | | | T | T | T | T |
| | 1600 A | | | | | T | T | T |

1: All breaking capacity
T: total selectivity, up to downstream circuit breaker breaking capacity according to IEC 60947-2

### DMX³/DMX³

| Downstream \ Upstream | | DMX³ | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 800 A | 1000 A | 1250 A | 1600 A | 2000 A | 2500 A | 3200 A | 4000 A | 5000 A | 6300 A |
| DMX³ | 800 A | | T | T | T | T | T | T | T | T | T |
| | 1000 A | | | T | T | T | T | T | T | T | T |
| | 1250 A | | | | T | T | T | T | T | T | T |
| | 1600 A | | | | | T | T | T | T | T | T |
| | 2000 A | | | | | | T | T | T | T | T |
| | 2500 A | | | | | | | T | T | T | T |
| | 3200 A | | | | | | | | T | T | T |
| | 4000 A | | | | | | | | | T | T |
| | 5000 A | | | | | | | | | | T |
| | 6300 A | | | | | | | | | | |

T: total selectivity, up to downstream circuit breaker breaking capacity according to IEC 60947-2
Icu of downstream circuit breaker ≤ Icu of upstream circuit breaker
Selectivity values are intended with protection unit properly adjusted

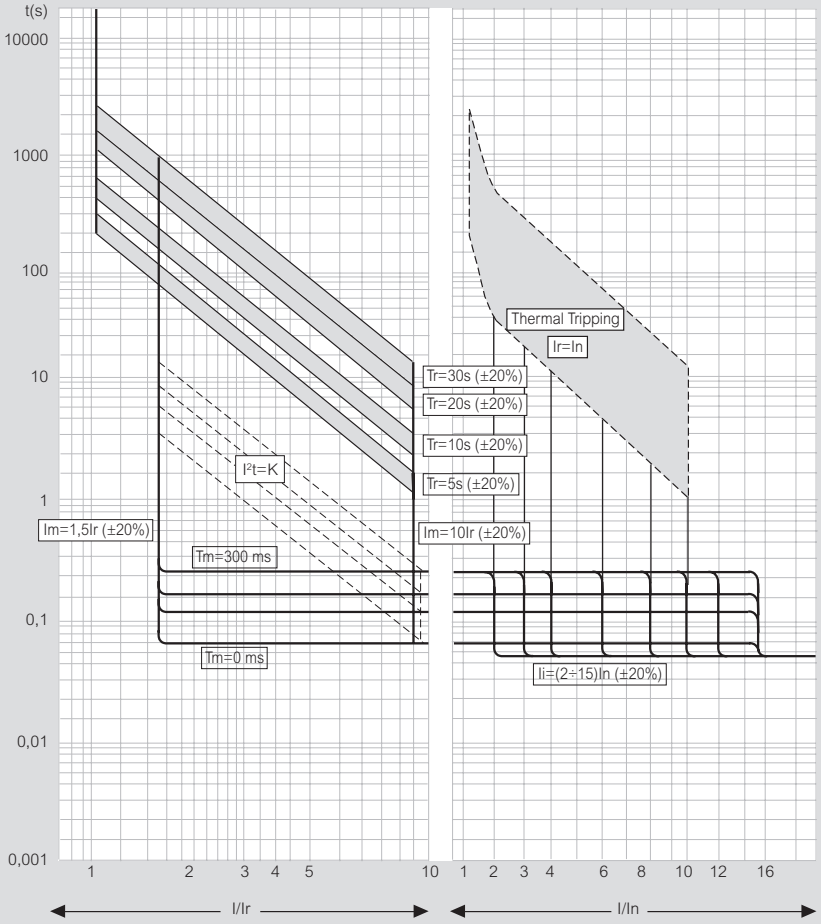
### DMX³/DX³

| | DMX³ 2500 | | | | | | | DMX³ 4000 | | DMX³ 6300 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 630 A | 800 A | 1000 A | 1250 A | 1600 A | 2000 A | 2500 A | 3200 A | 4000 A | 5000 A | 6300 A |
| DX³ 6000 - 10 kA | T | T | T | T | T | T | T | T | T | T | T |
| DX³ 10000 - 16 kA | T | T | T | T | T | T | T | T | T | T | T |
| DX³ 25 kA | T | T | T | T | T | T | T | T | T | T | T |
| DX³ 36 kA | T | T | T | T | T | T | T | T | T | T | T |
| DX³ 50 kA | T | T | T | T | T | T | T | T | T | T | T |

T: total selectivity, up to downstream circuit breaker breaking capacity according to IEC 60947-2

For the settings of MP6 protection units,
**Please, consult us**

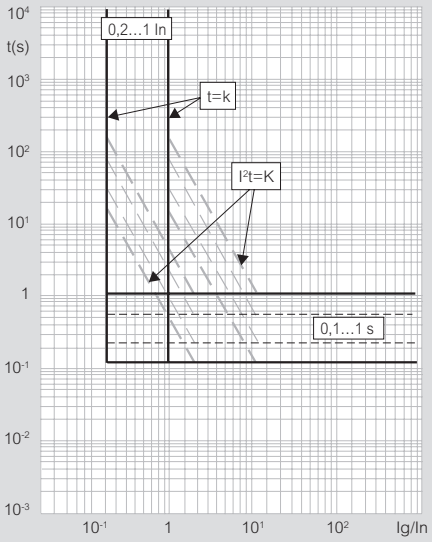
## Selective time-current tripping characteristic for MP4 and MP6 protection units



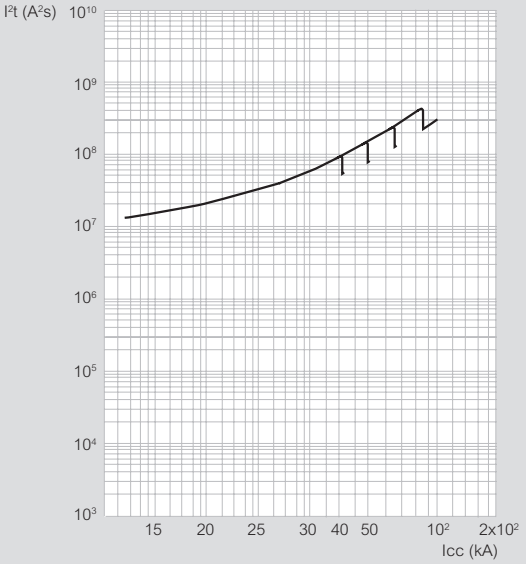

If short-circuit current is higher than Icw value or Ii is setted at Icw position, tripping time is equal to 30ms

Ir = long time setting current
Tr = long time delay
Im = short time setting current
Tm = short time delay
If = istantaneous intervention current

## Ground fault tripping curve for LSIg protection unit




## Pass-through specific energy characteristic




Icc (kA) = estimated short circuit symmetrical current (RMS value)
I²t (A²s) = pass-through specific energy

# DMX³

## technical characteristics (continued)

## Technical characteristics

### DMX³ 2500

| DMX³ according to IEC 60947-2 | | DMX³ 2500 | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 800 | | | 1000 | | | 1250 | | | 1600 | | | 2000 | | | 2500 | | |
| | | N | H | L | N | H | L | N | H | L | N | H | L | N | H | L | N | H | L |
| Number of poles | | 3P - 4P | | | 3P - 4P | | | 3P - 4P | | | 3P - 4P | | | 3P - 4P | | | 3P - 4P | | |
| Rating In (A) | | 800 | | | 1000 | | | 1250 | | | 1600 | | | 2000 | | | 2500 | | |
| Rated insulation voltage Ui (V) | | 1000 | | | 1000 | | | 1000 | | | 1000 | | | 1000 | | | 1000 | | |
| Rated impulse withstand voltage Uimp (kV) | | 12 | | | 12 | | | 12 | | | 12 | | | 12 | | | 12 | | |
| Rated operational voltage (50/60Hz) Ue (V) | | 690 | | | 690 | | | 690 | | | 690 | | | 690 | | | 690 | | |
| Frame | | 2500 | | 4000 | 2500 | | 4000 | 2500 | | 4000 | 2500 | | 4000 | 2500 | | 4000 | 2500 | | 4000 |
| Ultimate breaking capacity Icu (kA) | 230 V~ | 50 | 65 | 100 | 50 | 65 | 100 | 50 | 65 | 100 | 50 | 65 | 100 | 50 | 65 | 100 | 50 | 65 | 100 |
| | 415 V~ | 50 | 65 | 100 | 50 | 65 | 100 | 50 | 65 | 100 | 50 | 65 | 100 | 50 | 65 | 100 | 50 | 65 | 100 |
| | 500 V~ | 50 | 65 | 100 | 50 | 65 | 100 | 50 | 65 | 100 | 50 | 65 | 100 | 50 | 65 | 100 | 50 | 65 | 100 |
| | 600 V~ | 50 | 60 | 75 | 50 | 60 | 75 | 50 | 60 | 75 | 50 | 60 | 75 | 50 | 60 | 75 | 50 | 60 | 75 |
| | 690 V~ | 50 | 55 | 65 | 50 | 55 | 65 | 50 | 55 | 65 | 50 | 55 | 65 | 50 | 55 | 65 | 50 | 55 | 65 |
| Service breaking capacity Ics (% Icu) | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Short-circuit making capacity Icm (kA) | 230 V~ | 105 | 143 | 220 | 105 | 143 | 220 | 105 | 143 | 220 | 105 | 143 | 220 | 105 | 143 | 220 | 105 | 143 | 220 |
| | 415 V~ | 105 | 143 | 220 | 105 | 143 | 220 | 105 | 143 | 220 | 105 | 143 | 220 | 105 | 143 | 220 | 105 | 143 | 220 |
| | 500 V~ | 105 | 143 | 220 | 105 | 143 | 220 | 105 | 143 | 220 | 105 | 143 | 220 | 105 | 143 | 220 | 105 | 143 | 220 |
| | 600 V~ | 105 | 132 | 165 | 105 | 132 | 165 | 105 | 132 | 165 | 105 | 132 | 165 | 105 | 132 | 165 | 105 | 132 | 165 |
| | 690 V~ | 105 | 121 | 143 | 105 | 121 | 143 | 105 | 121 | 143 | 105 | 121 | 143 | 105 | 121 | 143 | 105 | 121 | 143 |
| Short time withstand current Icw (kA) for t = 1s | 230 V~ | 50 | 65 | 85 | 50 | 65 | 85 | 50 | 65 | 85 | 50 | 65 | 85 | 50 | 65 | 85 | 50 | 65 | 85 |
| | 415 V~ | 50 | 65 | 85 | 50 | 65 | 85 | 50 | 65 | 85 | 50 | 65 | 85 | 50 | 65 | 85 | 50 | 65 | 85 |
| | 500 V~ | 50 | 65 | 85 | 50 | 65 | 85 | 50 | 65 | 85 | 50 | 65 | 85 | 50 | 65 | 85 | 50 | 65 | 85 |
| | 600 V~ | 50 | 60 | 75 | 50 | 60 | 75 | 50 | 60 | 75 | 50 | 60 | 75 | 50 | 60 | 75 | 50 | 60 | 75 |
| | 690 V~ | 50 | 55 | 65 | 50 | 55 | 65 | 50 | 55 | 65 | 50 | 55 | 65 | 50 | 55 | 65 | 50 | 55 | 65 |
| Category of use | | B | | | B | | | B | | | B | | | B | | | B | | |
| Isolation behavior | | Yes | | | Yes | | | Yes | | | Yes | | | Yes | | | Yes | | |
| Endurance (cycles) | mechanical | 10000 | | | 10000 | | | 10000 | | | 10000 | | | 10000 | | | 10000 | | |
| | electrical | 5000 | | | 5000 | | | 5000 | | | 5000 | | | 5000 | | | 5000 | | |

### DMX³ 4000

| DMX³ according to IEC 60947-2 | | DMX³ 4000 | | | | | |
|---|---|---|---|---|---|---|---|
| | | 3200 | | | 4000 | | |
| | | N | H | L | N | H | L |
| Number of poles | | 3P - 4P | | | 3P - 4P | | |
| Rating In (A) | | 3200 | | | 4000 | | |
| Rated insulation voltage Ui (V) | | 1000 | | | 1000 | | |
| Rated impulse withstand voltage Uimp (kV) | | 12 | | | 12 | | |
| Rated operational voltage (50/60Hz) Ue (V) | | 690 | | | 690 | | |
| Frame | | 4000 | | | 4000 | | |
| Ultimate breaking capacity Icu (kA) | 230 V~ | 50 | 65 | 100 | 50 | 65 | 100 |
| | 415 V~ | 50 | 65 | 100 | 50 | 65 | 100 |
| | 500 V~ | 50 | 65 | 100 | 50 | 65 | 100 |
| | 600 V~ | 50 | 60 | 75 | 50 | 60 | 75 |
| | 690 V~ | 50 | 55 | 65 | 50 | 55 | 65 |
| Service breaking capacity Ics (% Icu) | | 100 | 100 | 100 | 100 | 100 | 100 |
| Short-circuit making capacity Icm (kA) | 230 V~ | 105 | 143 | 220 | 105 | 143 | 220 |
| | 415 V~ | 105 | 143 | 220 | 105 | 143 | 220 |
| | 500 V~ | 105 | 143 | 220 | 105 | 143 | 220 |
| | 600 V~ | 105 | 132 | 165 | 105 | 132 | 165 |
| | 690 V~ | 105 | 121 | 143 | 105 | 121 | 143 |
| Short time withstand current Icw (kA) for t = 1s | 230 V~ | 50 | 65 | 85 | 50 | 65 | 85 |
| | 415 V~ | 50 | 65 | 85 | 50 | 65 | 85 |
| | 500 V~ | 50 | 65 | 85 | 50 | 65 | 85 |
| | 600 V~ | 50 | 60 | 75 | 50 | 60 | 75 |
| | 690 V~ | 50 | 55 | 65 | 50 | 55 | 65 |
| Category of use | | B | | | B | | |
| Isolation behavior | | Yes | | | Yes | | |
| Endurance (cycles) | mechanical | 10000 | | | 10000 | | |
| | electrical | 5000 | | | 5000 | | |

### DMX³ 6300

| DMX³ according to IEC 60947-2 | | DMX³ 6300 | |
|---|---|---|---|
| | | 5000 | 6300 |
| | | L | L |
| Number of poles | | 3P - 4P | 3P - 4P |
| Rating In (A) | | 5000 | 5000 |
| Rated insulation voltage Ui (V) | | 1000 | 1000 |
| Rated impulse withstand voltage Uimp (kV) | | 12 | 12 |
| Rated operational voltage (50/60Hz) Ue (V) | | 690 | 690 |
| Frame | | 6300 | 6300 |
| Ultimate breaking capacity Icu (kA) | 230 V~ | 100 | 100 |
| | 415 V~ | 100 | 100 |
| | 500 V~ | 100 | 100 |
| | 600 V~ | 75 | 75 |
| | 690 V~ | 65 | 65 |
| Service breaking capacity Ics (% Icu) | | 100 | 100 |
| Short-circuit making capacity Icm (kA) | 230 V~ | 220 | 220 |
| | 415 V~ | 220 | 220 |
| | 500 V~ | 220 | 220 |
| | 600 V~ | 165 | 165 |
| | 690 V~ | 143 | 143 |
| Short time withstand current Icw (kA) for t = 1s | 230 V~ | 100 | 100 |
| | 415 V~ | 100 | 100 |
| | 500 V~ | 100 | 100 |
| | 600 V~ | 75 | 75 |
| | 690 V~ | 65 | 65 |
| Category of use | | B | B |
| Isolation behavior | | Yes | Yes |
| Endurance (cycles) | mechanical | 5000 | 5000 |
| | electrical | 2500 | 2500 |

## Temperature derating

### Fixed version

| Temperature | 40°C | | 50°C | | 60°C | | 65°C | | 70°C | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Imax (A) | Ir / In | Imax (A) | Ir / In | Imax (A) | Ir / In | Imax (A) | Ir / In | Imax (A) | Ir / In |
| DMX³ 2500 | 800 | 1 | 800 | 1 | 800 | 1 | 800 | 1 | 800 | 1 |
| | 1000 | 1 | 1000 | 1 | 1000 | 1 | 1000 | 1 | 1000 | 1 |
| | 1250 | 1 | 1250 | 1 | 1250 | 1 | 1250 | 1 | 1250 | 1 |
| | 1600 | 1 | 1600 | 1 | 1600 | 1 | 1600 | 1 | 1600 | 1 |
| | 2000 | 1 | 2000 | 1 | 1960 | 0.98 | 1920 | 0.96 | 1880 | 0.94 |
| | 2500 | 1 | 2450 | 0.98 | 2350 | 0.94 | 2250 | 0.9 | 2150 | 0.86 |
| DMX³ 4000 | 3200 | 1 | 3200 | 1 | 3200 | 1 | 3136 | 0.98 | 3008 | 0.94 |
| | 4000 | 1 | 3920 | 0.98 | 3680 | 0.92 | 3440 | 0.86 | 3120 | 0.78 |
| DMX³ 6300 | 5000 | 1 | 5000 | 1 | 5000 | 1 | 5000 | 1 | 5000 | 1 |
| | 6300 | 1 | 6300 | 1 | 6048 | 0.96 | 5796 | 0.92 | 5544 | 0.88 |

### Draw-out version

| Temperature | 40°C | | 50°C | | 60°C | | 65°C | | 70°C | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Imax (A) | Ir / In | Imax (A) | Ir / In | Imax (A) | Ir / In | Imax (A) | Ir / In | Imax (A) | Ir / In |
| DMX³ 2500 | 800 | 1 | 800 | 1 | 800 | 1 | 800 | 1 | 800 | 1 |
| | 1000 | 1 | 1000 | 1 | 1000 | 1 | 1000 | 1 | 1000 | 1 |
| | 1250 | 1 | 1250 | 1 | 1250 | 1 | 1250 | 1 | 1250 | 1 |
| | 1600 | 1 | 1600 | 1 | 1600 | 1 | 1600 | 1 | 1600 | 1 |
| | 2000 | 1 | 2000 | 1 | 1960 | 0.98 | 1920 | 0.96 | 1875 | 0.94 |
| | 2500 | 1 | 2400 | 0.96 | 2250 | 0.9 | 2100 | 0.84 | 1950 | 0.78 |
| DMX³ 4000 | 3200 | 1 | 3200 | 1 | 3200 | 1 | 3072 | 0.96 | 2880 | 0.9 |
| | 4000 | 1 | 3760 | 0.94 | 3440 | 0.86 | 3200 | 0.8 | 2960 | 0.74 |
| DMX³ 6300 | 5000 | 1 | 5000 | 1 | 5000 | 1 | 5000 | 1 | 5000 | 1 |
| | 6300 | 1 | 6174 | 0.98 | 5985 | 0.95 | 5796 | 0.92 | 5292 | 0.84 |

## Derating at different altitudes

| Air circuit breaker | DMX³ 2500, DMX³ 4000 and DMX³ 6300 | | | |
|---|---|---|---|---|
| Altitude H (m) | < 2000 | 3000 | 4000 | 5000 |
| Rated current (at 40°C) In (A) | In | 0.98 x In | 0.94 x In | 0.90 x In |
| Rated voltage Ue (V) | 690 | 600 | 500 | 440 |
| Rated insulation voltage Ui (V) | 1000 | 900 | 750 | 600 |

## Minimum recommended dimension of busbars per pole

### Frame 2500 - fixed and draw-out versions

| In (A) | Vertical bars (mm) | Horizontal bars (mm) |
|---|---|---|
| 630 | 50 x 10 | 60 x 10 |
| 800 | 60 x 10 | 60 x 10 |
| 1000 | 80 x 10 | 80 x 10 |
| 1250 | 80 x 10 | 2 x 60 x 10 |
| 1600 | 2 x 60 x 10 | 2 x 80 x 10 |
| 2000 | 2 x 80 x 10 | 3 x 80 x 10 |
| 2500 | 3 x 80 x 10 | 3 x 80 x 10 |

### Frame 4000 - fixed and draw-out versions

| In (A) | Vertical bars (mm) | Horizontal bars (mm) |
|---|---|---|
| 630 | 1 x 40 x 10 or 2 x 40 x 5 | 2 x 40 x 5 |
| 800 | 1 x 50 x 10 or 2 x 50 x 5 | 2 x 50 x 5 |
| 1000 | 1 x 50 x 10 or 2 x 50 x 5 | 2 x 50 x 5 |
| 1250 | 2 x 50 x 5 | 1 x 50 x 10 + 1 x 50 x 5 |
| 1600 | 1 x 50 x 10 + 1 x 50 x 5 | 2 x 50 x 10 |
| 2000 | 2 x 50 x 10 | 2 x 60 x 10 |
| 2500 | 3 x 50 x 10 | 3 x 60 x 10 |
| 3200 | 3 x 100 x 10 | 3 x 100 x 10 |
| 4000 | 4 x 100 x 10 | 5 x 100 x 10 |

### Frame 6300 - fixed and draw-out versions

| In (A) | Vertical bars (mm) | Horizontal bars (mm) |
|---|---|---|
| 5000 | 6 x 100 x 10 | 6 x 100 x 10 |
| 6300 | 7 x 100 x 10 | 7 x 100 x 10 |

Note: The tables presenting the minimum recommended dimensions of connection plates and bars per pole should be used solely as a general guideline for selecting products. Due to extensive variety of switchgear constructions shapes and conditions that can affect the behavior of the apparatus, the solution used must always be verified