

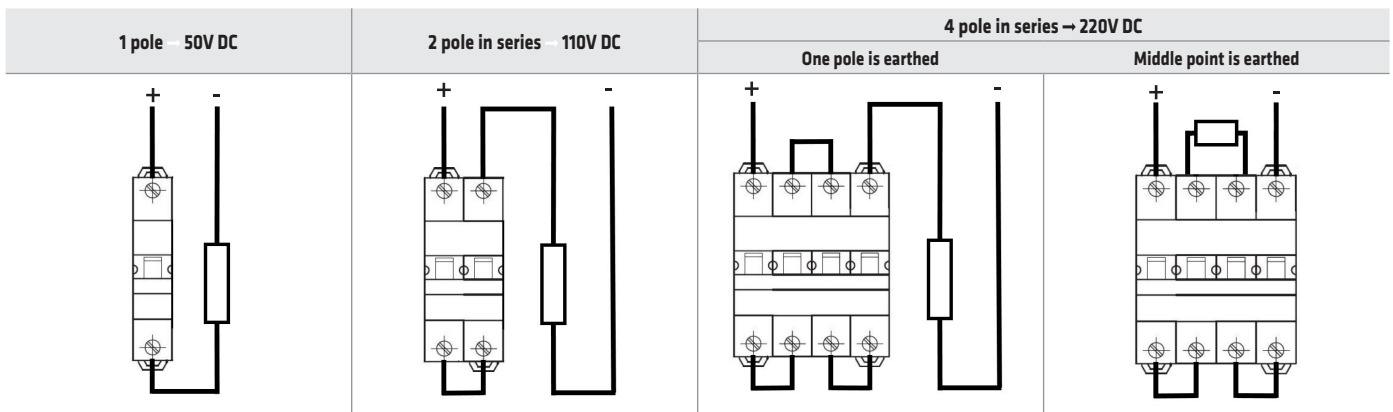
### HOW TO CHOOSE CIRCUIT BREAKERS FOR DIRECT CURRENT APPLICATIONS

The interruption of direct current is more difficult to achieve than the alternating current because the direct current doesn't go through zero at each half cycle. Therefore, it is necessary to connect in series the poles of the same circuit breaker so that the increase of the resistance, thus created, causes the decrease of the current until its cancellation.

Moreover, if the operating voltage of the system increases, also the number of poles connected in series must increase.

For a correct choice of a circuit breaker to protect DC electrical loads, it's suggested to keep in mind these following 3 factors:

- 1. Operating voltage**, which effects the number of poles to be connected in series. The maximum operating voltage in direct current for Gewiss circuit breaker is equal to 220V by connecting 4 poles in series (max 50V per pole).



- 2. Short-circuit current**, alleged in the installation point that effects the choice of circuit breaker type.

Circuit breaker type	BREAKING CAPACITY $I_{cu}$ (kA)		
	Operating voltage (V)		
	50	110	220
MTC 45	6	6	4.5
MTC 60	10	10	6
MTC 100	-	10 (*)	-
MT 45	6	6	4.5
MT 60	10	10	10
MT 100	10	15	15
MT 250	20	25	25
MTHP 160	10	15	15
MTHP 250	25	30	25

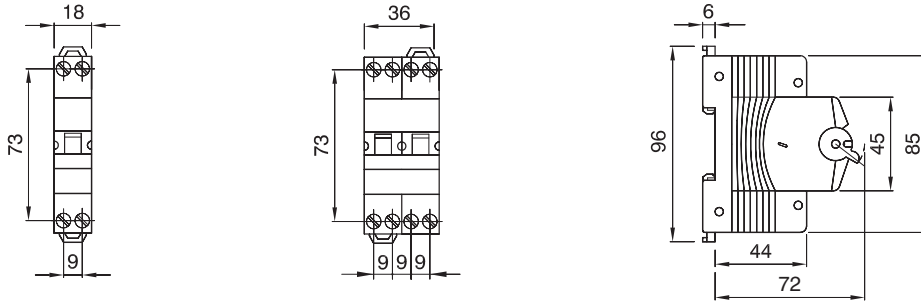
(\*) 15 kA at 50V

- 3. Operating current and the type of electrical load**, which effect the rated current of the circuit breaker and its tripping characteristic. The rated current of the circuit breaker for DC application must be higher than the operating current of electrical load and must be lower or equal to the capacity of the cable, as well as alternating current situation.

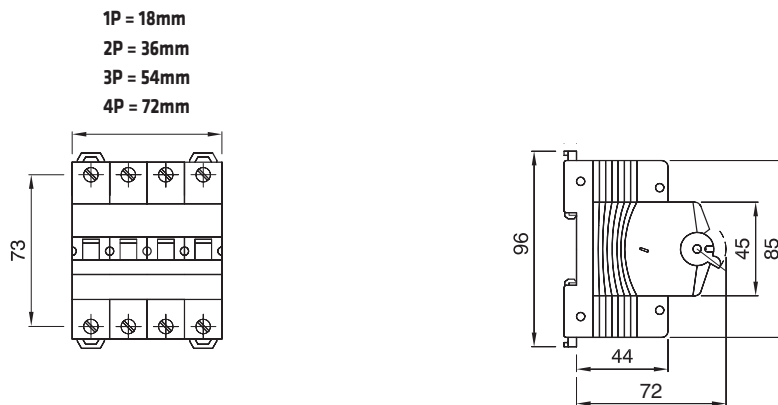
In addition to inrush current, the choice of tripping characteristics must consider that the DC magnetic trip threshold is greater than alternating current. Hereafter the tripping characteristics according to EN 60898 of circuit breakers used in direct current.

### Dimension tables

#### MTC 45 - MTC 60 - MTC 100



#### MT45 - MT 60 - MT 100 - MT 250



#### MTHP 160 - MTHP 250

