Damping Reactor

Capacitor switching

SA , SB and Sc type

Capacitor **damping reactors** are able to withstand a rated inrush current, which must be high enough to cover all recognized cases of switching the capacitor battery or battery sections. The system planner must provide information to the reactor supplier regarding the relevant inrush resonant frequency. The reactor supplier supplies information about the Q-factor (the ratio reactance to resistance) of the damping reactor at this frequency.

Damping Reactors SA, SB and SC series Damping reactors are an ironless (air core) reactors and used for damping transients and inrush currents. When connected in series with the capacitor the reactor reduces the inrush peak current into the components to a value which cannot stress the insulation and does not damage the internal connections of the capacitor elements. Such reactors remain connected after energization of the capacitor.

Consequently these must be designed in accordance with the continuous load current that the capacitor is exposed to. Unless otherwise specified Mangoldt will typically design these reactors for 43 % current overload and a fault level which is 25 times the nominal current

Type	Air core single-phase dry-type reactor (without magnetic core)
Rated voltage	3.6 kV up to 36 kV
Rated frequency	50 Hz or 60 Hz
Rated current	Up to 650 A
Inductance	Up to 1000 µH
Rated insulation level	3.6/10/40 kV up to 36/70/170 kV
Rated short-circuit current	43 x In A/1s (25 x In A/3s) up to 16 kA/1s
Dynamic current	2.5 x Ith
Construction	Cast resin (reactors are encapsulated in epoxy resin)
Winding material	Copper
Mounting arrangement	Indoor or outdoor
Temperature class	A
ent temperature	-40 °C up to +70 °C
Cooling	Air natural
Surface protection	Against UV and pollution class IV areas
Standards	IEC 60289

The damping reactors SA, SB and Sc type limit the current transients to acceptable values for the capacitor units and reduce surge currents to acceptable values for the corresponding control devices.

Damping reactors are necessary in the following cases:

- Capacitor banks formed by several steps
- Several capacitor banks connected in the same busbar
- Very high network short-circuit power in relation to the power of the capacitor bank to be connected
- Frequent capacitor bank control operations

The main advantage of using damping reactors is the increase of equipment and capacitor units' life

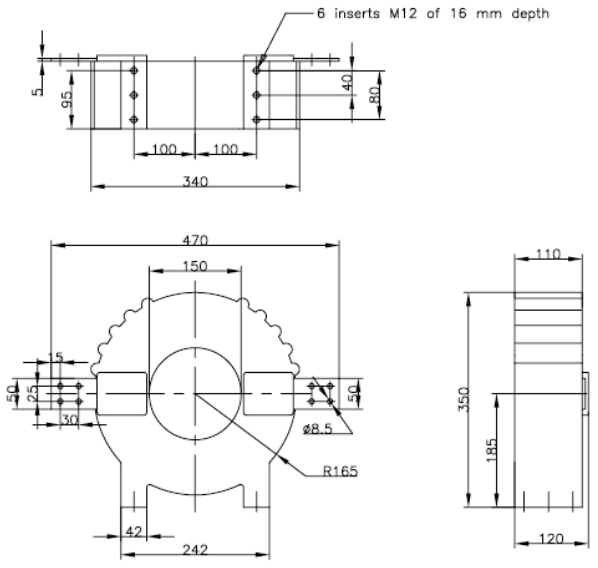
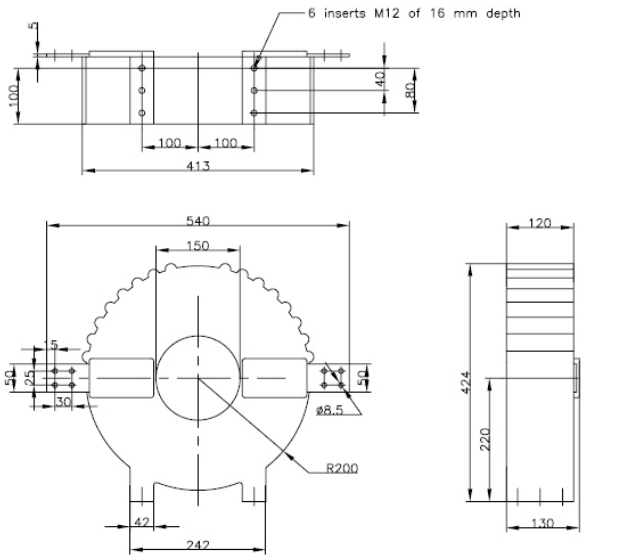
The damping reactors are suitable for:

- **Indoor use:**

- Up to 12 kV without the need of using support insulators.
- For higher voltage levels the damping reactors are provided with support insulators.

- **Outdoor use:**

- The use of appropriate outdoor post insulators is compulsory, no matter
- What is the service voltage.

SA type	SB type
	

The reactors have six M12 inserts for mounting purposes. The tightening torque to use for the M12 bolts or studs (when support insulators are used) is 25 Nm.

The design of the damping reactors is maintenance-free.

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