

LOW VOLTAGE LIMITER P60GI, P120GI - (VLD-F) indoor use



P60GI and P120GI – are new types of low voltage limiters Type 1 VLD-F based on requirements of EN 50122-1: 2011, which are designed to protect the non-live parts of metallic structures in DC or AC traction power supply systems. They are used to effectively protect persons who may come into contact with these parts during lightning strikes or in case of a defect of the tractive overhead line. The limiter has a high internal resistance if there is a voltage lower than its specified DC sparkover voltage U_{VDC} and becomes conductive when this level is exceeded. In case of failure due to connection between live part of traction power supply system and the conductive part

unintentionally connected to the return circuit, the limiter protects against impermissible touch voltage by becoming conductive and causing the power to turn off. According to EN 50122-1: 2011, this type of limiter is recommended mainly for the connection between the protected part and return circuit in the overhead line areas (or pantograph areas) that may be in contact with the conductors or damaged current collector, then on the support structures pylons which can become live due to an insulation failure. After the applied voltage drops again below the specified value of its nominal level, the limiter returns into a non-conductive state again.

Type		P60GI	P120GI
Classification acc. EN 50122-1 and EN 61643-11		Type 1 (VLD-F) / Type 1	
DC sparkover voltage	U_{VDC}	$60 V_{DC} \pm 20 \%$	$120 V_{DC} \pm 20 \%$
Service life: 5 operations 50 Hz, 1 sec 1 operation 50 Hz, 0,5 sec 1 operation 50 Hz, 0,25 sec, max. load 20 operations 8/20 $\mu\text{sec}^{(1)}$ 3 operation 10/350 μsec	I_n I_{imp}	$100 A_{rms}$ $200 A_{rms}$ $4 kA_{rms}$ $100 kA$ $50 kA$	
Impulse spark-over voltage at 1 kV/ μsec	U_{res}	$< 700 V$	$< 800 V$
Protection level at $I_{imp} = 50 kA^{(2)}$	U_p	$< 500 V$	
Fail-save reliability test 1 operation 50 Hz, 120 sec		$100 A_{rms}$	
Insulation resistance	R_{iso}	$> 2 G\Omega$ at $25 V_{DC}$	$> 2 G\Omega$ at $50 V_{DC}$
Response time ⁽²⁾		$< 20 \text{ nsec}$	
Protection type		IP62	
Operating temperature range		$- 40^\circ C \div + 90^\circ C$	
Total height including mounting bracket	h	180 mm	
Weight		c. 580 g	
Encapsulation		silicon rubber	
Article number		50800/I	50801/I
⁽¹⁾ $R_{iso} > 107 \Omega$ after completion of loading sequence			
⁽²⁾ Typical value			

Functional part P60GI (P120GI) is made using a special gas-filled gas discharge tube (GDT) with shortened response time 20 nsec, rated for up to 3 consecutive strikes of lightning current 50 kA (10/350). On the outer insulating cover is used a light blue silicone rubber. Working chamber of built GDT is equipped with technically sophisticated fail-save mode hardware that provides an automatically transition to short-circuit mode in the event of longtime overloads above 500 A DC (AC) (this state is non-reversible). On the outer insulating cover is used a blue silicone rubber, which is hydrophobic and has excellent resistance against weathering, pollution and UV rays. Mounting bracket, connecting bolts and nuts are made from stainless steel, suitable for connection of conductors with cross section 16-50 mm² Fe (Cu). The product is delivered with an integrated bracket, allowing direct mounting of P60GI (P120GI) to the protected metal structure (pillar, wall or flange). Recommended

mounting position is vertical bracket up. Limiter is installed directly to a protected building construction (using two bolts M12), so that in the event of its activation was generated a conductive connection between this structure and the return path. The limiter can be activated either by lightning current or current resulting from contact protected metallic structure with a fallen overhead line. In such case there will be a potential difference between these parts, which amounts to more than 60 V (valid for P60GI), or 120 V (valid for P120GI). The in-built GDT ignites instantly (response time is typically 20 ns) and forms a temporary electrical connection between both parts (typical internal resistance of the ignited P60GI (P120GI) is $0.001 \div 0.002 \Omega$). The duration of this transient process is automatically broken up by potential equalization between the protected structures and a return path, when it comes to an automatic switching off GDT due to recombination its gas filling.