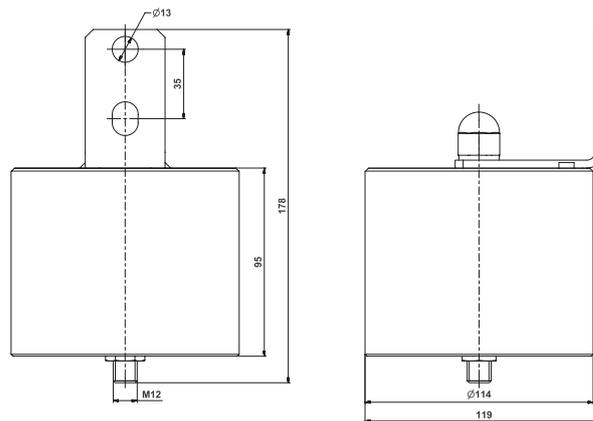


Low voltage limiter for railway application



HL120



HL120* is a low voltage limiter (LVL acc. to EN 50122-1 ed. 2) intended for the protection of non-live parts of metal structures in AC or DC traction systems. It is used for the effective protection of people who might come into contact with these parts during a lightning stroke or in the case a fault of traction lines. HL is installed directly on the protected construction structure (using two M12 bolts) so that if it is activated it creates a conductive connection between this structure and the tracks. The principle of the HL construction is based on the parallel connection of three non-linear elements (1 high power metal oxide varistor MOV plus 2 high-performance thyristors) built into a stainless steel cover. If the HL is activated by lightning current or current from the contact of the protected metal structure with for example a fallen trolley line, this current is instantly shorted to the track by the fast reaction of the MOV (the standardly given time of its reaction is 25 nsec). The maximum value of this current's amplitude may be 40kA (10/350). For the duration of activation of the MOV a voltage protection level about 500V is formed on it. So that the heat released in the MOV does not damage its structure, a delay element is built into the HL hardware which for approximately 1msec ignites both the built-in high performance thyristors, and this moment is derived from the VPL on the varistor. According to the polarity of voltage on the MOV, the relevant thyristor from the built-in pair is activated and it takes up current which to that time have been conducted by the activated MOV. Depending on the immediate current value of the passing current, the voltage level on this thyristor can be in the range $1\pm 3V$. If the arising activation current is significantly lower than the maximum working current of the used thyristor, this process can last up to tens of seconds (for the HL120 this process is characterised by the typical value 300A/60sec... reversibly), which corresponds to the charge passing through of 18000 Asec. A large power loss is on the thyristor for the time of its activation, and so the construction of the HL sleeve is based on the principle of conducting the released heat to its metal outer casing and then via this casing to the construction building structure. One important requirement of the HL is the assumption of the creation of an internal short circuit in the case of the voltage, current or heat overloading of the built-in MOV, which is met in the case of the HL internal construction described above.

Advantages - vandal resistant, weather proof, long lifetime

Type	HL 120
Class to EN 50526-2	2.2
Maximum withstand voltage U_w	60 VAC
Maximum spark voltage U_s	120 VDC
Nominal short-term withstand current	10 kA / 0,01 sec
Reversible current I_{rev}	300 A for 60 s
Long-term current impulse L_w without guaranteed reversibility	500 A for 1800 s
Technical data of built-in metal-oxide varistors acc. to EN 61643-11 ed. 2 and EN 60099-4 ed. 2	
Nominal discharge current I_n	40 kA (8/20 μ s)
Surge impulse current I_{hc}	100 kA (4/10 μ s)
Lightning impulse current I_{imp}	40 kA (10/350 μ s)
Maximum operational voltage U_c	115 VAC
Varistor voltage $U_v@ 1mA$	180 VDC
Residual voltage U_p at nominal discharge current I_n	500 V
Long current impulse	6 x 3 x 1500 A (2000 μ s)
Operating conditions:	
Temperature	-40°C to + 55°C
Tightening torque	16 Nm
Height above sea level	without restriction
Protection type	IP 67
Weight / Dimensions	c. 4,65 kg / \varnothing 114 mm, l = 95 mm
Article number	10 240