

Improvements Relating to Electrical Surge ArrestersField of the Invention:

This invention concerns improvements relating to electric surge
5 arresters, also known as surge diverters, as used in electrical power generation
and distribution systems for the safe handling of atmospherically induced
surges, arising from lightning strikes for example, and over-voltages caused
by switching operations.

Background of the Invention:

10 We pioneered the introduction of polymer housed solid-state
distribution class surge arresters, as disclosed in GB-A-2188199 for example,
and in GB-A-2230661 we proposed the utilization of a series parallel
arrangement of a plurality of such distribution class surge arresters as a station
class surge arrester. Distribution class surge arresters generally have voltage
15 ratings of the order of 24 to 36 kV and by coupling together a plurality of
electrically matched such distribution class surge arresters in a series parallel
arrangement as described in GB-A-2230661 much higher voltage ratings of
the order of 120 to 456 kV can be accommodated.

Our series parallel station class surge arrester is designed to replace the
20 conventional porcelain housed station class arrester and has been widely
acclaimed. The present invention concerns improvements in the construction
of the series parallel arrester.



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Summary of the Invention:

According to the present invention there is provided a high voltage surge arrester comprising a plurality of serially connected arrester stages each of which comprises a plurality of electrically matched low voltage surge arresters connected in parallel, as known from GB-A-2 230 661, which is characterized in accordance with the invention in that the low voltage surge arresters of each stage are connected together and to the surge arresters of the or each next adjacent stage by means of a multiple limbed mounting bracket having corona suppression means at the end of each limb.

Whereas in the series parallel surge arrester described in GB-A-2 230 661 the individual distribution class surge arresters of adjacent serial stages were offset from each other, the present invention in a preferred embodiment proposes to provide the arrester units in line throughout the series parallel arrangement. Furthermore, whereas in the surge arrester of GB-A-2 230 661 metal mounting plates formed integrally with corona suppression rings at their peripheries were utilized for interconnecting adjoining stages of the series parallel arrangement, the present invention in the preferred embodiment proposes a more simple and cost effective arrangement employing multiple-limbed brackets (spiders) in place of the mounting plates, the distal ends of the limbs being provided with corona discharge inhibiting surfaces.

The above and further features of the present invention are set forth with particularity in the appended claims and will be well understood from consideration of the following description given with reference to the accompanying drawing.

Description of the Drawing:

The single figure of the accompanying drawing illustrates the upper (top) end of an exemplary series parallel surge arrester according to the present invention in perspective view.

Detailed Description of the Embodiment:

The series parallel surge arrester shown in the accompanying drawing comprises a plurality of series-connected stages I, II, etc (only the top two of which are shown) each made up of four electrically matched surge arresters 1 which can, for example, be of the kind described in GB-A-2188199 but could be otherwise formed so long as they exhibit sufficient structural integrity. The individual surge arresters 1 in each stage I, II, etc are coupled together and to the adjoining arresters of the next adjacent stage by means of cast metal brackets (spiders) 2 having a plurality of limbs 3 extending from a central body portion 4 with even angular spacing of 90°. As can be seen, the individual surge arresters 1 of the different stages are aligned with each other.

The individual surge arresters 1 have externally screw-threaded end fixing studs 5 which enable the surge arresters to be affixed to the ends of the limbs 3 of the brackets 2, for example by provision of a double and oppositely screw-threaded locking nut at the end of each limb 3 which can be turned with a spanner so as to pull the opposite ends of the respective two surge arresters together and into mounting engagement with the end of the respective limb.

Mounted at the ends of the limbs 3, after attachment of the surge arresters 1, are cast metal corona suppression bodies 6 which can for example form a push fit onto the ends of the limbs 3 with close conformance around the ends of the two surge arresters 1 that are attached to the respective limb. The surfaces of the bodies 6 are smoothly curved as shown to avoid giving

rise to excessive field voltages such as might give rise to corona discharge effects.

At the top end of the series parallel arrangement, a corona suppression arrangement comprising parallel spaced-apart rings 7 and 8 which are coupled
5 to the limbs 3 of the uppermost mounting bracket 2 by means of mounting brackets 9.

The illustrated series parallel surge arrester is believed to satisfy electrical requirements and the mounting brackets 2 and their accessories, namely the corona suppression bodies 6 and the arrester fixing nuts (not
10 shown), can be manufactured at lower cost than the electrostatic mounting plates of the series parallel surge arrester described in GB-A-2 230 661. Furthermore, by virtue of the in line connection of the surge arresters of adjacent stages, the overall stiffness of the series parallel surge arrester can be increased as compared to that of GB-A-2 230 661. Otherwise the illustrated
15 surge arrester obtains all of the advantages that are described in GB-A-2 230 661. Modifications and variations are of course possible without departure from the scope of the invention as set forth in the appended claims; for example the brackets 2 could have more or less limbs than the four limbs shown.

CLAIMS:

1. A high voltage surge arrester comprising a plurality of serially connected arrester stages (I,II) each of which comprises a plurality of electrically matched low voltage surge arresters (1) connected in parallel characterized in that the low voltage surge arresters (1) of each stage (I,II) are connected together and to the surge arresters (1) of the or each next adjacent stage (II,I) by means of a multiple limbed mounting bracket (2,3) having corona suppression means (6) at the end of each limb (3).
2. A high voltage surge arrester as claimed in claim 1 wherein at the top of the surge arrester the corona suppression means comprises at least one corona suppression ring (7,8).
3. A high voltage surge arrester as claimed in claim 1 or 2 wherein the corona suppression means (6) at the ends of the limbs of the or each said mounting bracket (2,3) supporting the ends of adjacent serial stages (I,II) of the arrester comprise individual bodies (6) associated each with a respective one of the limbs (3).
4. A high voltage surge arrester as claimed in any of the preceding claims which is adapted for station class operation and wherein the low voltage surge arresters are distribution class surge arresters.

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5. A high voltage surge arrester as claimed in any of the preceding claims wherein the low voltage surge arresters are polymer housed solid state surge arresters.

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6. A high voltage surge arrester substantially as claimed in any of the preceding claims wherein the low voltage surge arresters (1) of adjacent serial stages (I,II) are in line throughout the high voltage surge arrester.