

FORM 2

THE PATENTS ACT, 1970
(39 of 1970)
AND
THE PATENTS RULES, 2003

**COMPLETE
SPECIFICATION**

(See Section 10; rule 13)

TITLE OF THE INVENTION

“DIRECT CURRENT BREAKER AND ELECTRICAL POWER SYSTEM
COMPRISING SUCH DIRECT CURRENT BREAKER”

APPLICANT

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The following specification particularly describes
the invention and the manner
in which it is to be performed

CLAIMS

1. A direct current breaker (10) for a high voltage direct current application, the direct current breaker (10) comprising:
 - 5 - two high voltage electron tubes (11) arranged in an anti-parallel connection, each high voltage electron tube being provided with an anode and a cathode, and
 - a control circuit (15) for receiving, from a control system (13), infrared pulses comprising control
 - 10 information, the control circuit (15) further comprising means for converting the infrared pulses into electrical control signals, for controlling a switching status of the direct current breaker (10).
2. The direct current breaker (10) as claimed in claim 1,
15 wherein, depending on a DC current flow direction, one electron tube is configured to be active and the other anti-parallel connected electron tube is configured to be non-active as an insulator.
3. The direct current breaker (10) as claimed in claim 1
20 or 2, comprising two or more of the two high voltage electron tubes (11) arranged in an anti-parallel connection connected in series.
4. The direct current breaker (10) as claimed in claim 1,
2 or 3, wherein the control circuit (15) comprises an
25 input device (17) for receiving electrical power from an external power source (16, 14).
5. The direct current breaker (10) as claimed in claim 4,
wherein the input device (17) is arranged to convert AC

power to a DC power or DC power to AC power needed by the control circuit (15).

6. The direct current breaker (10) as claimed in any of the preceding claims, wherein the high voltage electron
5 tubes (11) comprise cold cathode electron tubes.

7. The direct current breaker (10) as claimed in any of the preceding claims, wherein the high voltage current application comprises interruption of fault current of a voltage source converter (5) or a thyristor based line
10 commutated converter of an electrical power system (1).

8. An electrical power system (1) comprising a voltage source converter (5) and DC transmission lines (2, 3), the electrical power system (1) further comprising at least one direct current breaker (10) as claimed in any
15 of the preceding claims, the direct current breaker (10) connected at one end to the voltage source converter (5) and at another end to the transmission line (2, 3).

9. The electrical power system (1) as claimed in claim 8, further comprising a power source (16, 14) for supplying
20 the direct current breaker (10) with electrical power enabling conversion of infrared signals into electrical control signals.

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