Functional specification for Type V4H single-phase vacuum recloser

1. Standards
   1.1. The recloser covered by this specification shall be manufactured and tested in accordance with applicable ANSI, IEEE and NEMA Standards.

2. Quality
   2.1. The manufacturing facility shall be independently certified to meet ISO 9001 Standards.

3. Ratings
   3.1. Ratings as a minimum shall be as follows:
      3.1.1. Maximum Design Voltage, kV 15.5
      3.1.2. Nominal Operating Voltage, kV 14.4
      3.1.3. Basic Insulation Level (BIL) 110
      3.1.4. Low frequency withstand voltage
            3.1.4.1. Dry, One Minute, kV 50
            3.1.4.2. Wet, Ten Seconds, kV 45
      3.1.5. Maximum Continuous current, amperes 100
   3.2. Radio influence voltage measured at 1.0 MHz, 9.4 kV, shall not exceed 100 microvolts.

4. Load and interrupting ratings RMS Symmetrical Amperes
   4.1.

<table>
<thead>
<tr>
<th>Trip Coil Ratings Continuous Amps</th>
<th>Minimum Trip Rating Amps</th>
<th>Interrupting Ratings Amps</th>
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</thead>
<tbody>
<tr>
<td>4.8 kV</td>
<td>8.32 kV</td>
<td>14.4 kV</td>
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<tr>
<td>5</td>
<td>10</td>
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<td>200</td>
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<td>3000</td>
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</table>

5. Duty cycle

<table>
<thead>
<tr>
<th>PERCENT OF INTERRUPTING RATING</th>
<th>NUMBER OF OPERATIONS</th>
<th>MAXIMUM CIRCUIT X/R VALUE</th>
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<tr>
<td>15-20</td>
<td>128</td>
<td>2</td>
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<tr>
<td>45-55</td>
<td>96</td>
<td>5</td>
</tr>
</tbody>
</table>

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6. **Mechanical Life**

Minimum of 2500 operations

8. **Operating Requirements**

8.1. Tripping shall be accomplished by series coils, available from 5 to 200 amp rating. These coils shall be interchangeable in the field.

8.2. The recloser shall be available with 1, 2, 3 or 4 operations to lockout. The selection of the number of operations to lockout shall be adjustable in the field.

8.3. Three different delay time-current curves shall be available: B, C and D.

9. **Operating Features**

9.1. The recloser shall be operated by a solenoid-spring operating mechanism.

9.2. The recloser shall be mechanically and electrically trip free.

9.3. The recloser shall be completely self-contained. No auxiliary power source shall be required.

9.4. Non-reclosing operation shall be provided by a hotstick operable handle located under a sleet hood. When operated, the recloser will be programmed for one operation to lockout on the first timing curve selected.

9.5. Recloser operations shall be recorded by a 4-digit mechanical counter located under a sleet hood.

9.6. Phase minimum trip values shall have a tolerance of plus or minus 10%.

9.7. The tolerance for the fast time-current characteristic shall be minus. The tolerance for delayed time-current characteristics shall be plus or minus 10%.

9.8. The nominal reclosing time shall be 1.5 seconds.

10. **Tank and Oil**

10.1. Reclosers shall be of single tank construction with ground connector to accommodate 2 No. 10 SOL through No. 2 STR conductors.

10.2. An O-ring gasket shall be used in a groove in the head casting to provide controlled compression.

10.3. Reclosers shall be shipped with oil filled to the proper level.

10.4. The recloser tank shall be constructed with captive hardware for securing the tanks to the head casting.

11. **Bushings**

11.1. Bushings shall be of wet-process porcelains, not oil filled.

11.2. Bushing terminals shall be universal clamps type to accommodate No. 6 SOL through 350 MCM stranded copper or aluminum conductors in horizontal or vertical position.

12. **Arc Interruption**

12.1. Current interruption shall occur in a vacuum interrupter.

12.2. Each vacuum interrupter shall be serialized.

13. **Solenoid-Spring Operating Mechanism**

13.1. A solenoid-spring operating mechanism shall be located inside the recloser.

13.2. The solenoid shall provide energy for closing and tripping the main contacts.

14. **Manual Control Lever**

14.1. Recloser lockout shall be indicated by an external manual control lever on the recloser located under a sleet hood.

14.3. The recloser shall be reset and closed by operation of the manual control lever.

15. **Service**
   
   15.1. Spare parts are to be provided for a minimum of 15 years after date of purchase.
   
   15.2. The manufacturer will provide technical expertise on system applications, installation, and operation with local Sales and Apparatus Engineers and Customer Service representatives.
   
   15.3. Additional systems and operations support to include video training program, industry seminars, factory training, technical industry papers, maintenance, and commitment to industry via research & development.

16. **Optional Accessories**

   16.1. The following shall be available as optional accessories:
   
   16.1.1. Lock-out indicating switch
   
   16.1.2. 17" creepage bushings
   
   16.1.3. Crossarm mounting hanger

17. **Approved Manufacturers**

   Eaton