

VL160 to VL1600 electronic trip units – Overview of functions

| Order No.<br>supplement | Trip units                 | System protection | Motor protection | Starter protection | Generator protection | Function    | Setting options     |                                               |                                          |                    |                         |
|-------------------------|----------------------------|-------------------|------------------|--------------------|----------------------|-------------|---------------------|-----------------------------------------------|------------------------------------------|--------------------|-------------------------|
|                         |                            |                   |                  |                    |                      |             | L                   | S <sup>1)</sup>                               | I <sup>1)</sup>                          |                    | G                       |
|                         |                            |                   |                  |                    |                      |             | Overload protection | Short-circuit protection (short-time delayed) | Short-circuit protection (instantaneous) |                    | Ground-fault protection |
|                         |                            |                   |                  |                    |                      |             | $I_r = \times I_n$  | $I_{sd} = \times I_r$                         | $t_{sd}$ [s]                             | $I_i = \times I_n$ | $I_g = \times I_n$      |
| DK                      | M                          | --                | --               | ✓                  | --                   | I           | --                  | --                                            | --                                       | 7 ... 15           | --                      |
| DC                      | TM <sup>2)</sup>           | ✓                 | --               | --                 | --                   | LI          | 0.8 ... 1           | --                                            | --                                       | 5 ... 10           | --                      |
| EJ                      | TM <sup>2)</sup>           | ✓                 | --               | --                 | --                   | LI          | 0.8 ... 1           | --                                            | --                                       | 5 ... 10           | --                      |
| EC                      | TM <sup>2)</sup>           | ✓                 | --               | --                 | --                   | LIN         | 0.8 ... 1           | --                                            | --                                       | 5 ... 10           | --                      |
| EM                      | TM <sup>2)</sup>           | ✓                 | --               | --                 | --                   | LIN         | 0.8 ... 1           | --                                            | --                                       | 5 ... 10           | --                      |
| AP                      | ETU 10 M <sup>3)</sup>     | --                | ✓                | --                 | ✓                    | LI          | 0.4 ... 1           | --                                            | --                                       | 1.25 ... 11        | --                      |
| AB                      | ETU 10                     | ✓                 | --               | --                 | --                   | LI          | 0.4 ... 1           | --                                            | --                                       | 1.25 ... 11        | --                      |
| BA                      | ETU 10                     | ✓                 | --               | --                 | --                   | LIN         | 0.4 ... 1           | --                                            | --                                       | 1.25 ... 11        | --                      |
| AC                      | ETU 12                     | ✓                 | --               | --                 | --                   | LIG         | 0.4 ... 1           | --                                            | --                                       | 1.25 ... 11        | 1                       |
| BD                      | ETU 12                     | ✓                 | --               | --                 | --                   | LING        | 0.4 ... 1           | --                                            | --                                       | 1.25 ... 11        | 1                       |
| AE                      | ETU 20                     | ✓                 | --               | --                 | ✓                    | LSI         | 0.4 ... 1           | 1.5 ... 10                                    | 0 ... 0.5                                | 11                 | --                      |
| BF                      | ETU 20                     | ✓                 | --               | --                 | ✓                    | LSIN        | 0.4 ... 1           | 1.5 ... 10                                    | 0 ... 0.5                                | 11                 | --                      |
| AG                      | ETU 22                     | ✓                 | --               | --                 | ✓                    | LSIG        | 0.4 ... 1           | 1.5 ... 10                                    | 0 ... 0.5                                | 11                 | 1                       |
| BH                      | ETU 22                     | ✓                 | --               | --                 | ✓                    | LSING       | 0.4 ... 1           | 1.5 ... 10                                    | 0 ... 0.5                                | 11                 | 1                       |
| AS                      | ETU 30 M <sup>3)</sup>     | --                | ✓                | --                 | ✓                    | LI          | 0.4 ... 1           | --                                            | --                                       | 6/8/11             | --                      |
| CP                      | LCD ETU 40 M <sup>3)</sup> | --                | ✓                | --                 | ✓                    | LI          | 0.4 ... 1           | --                                            | --                                       | 1.25 ... 11        | --                      |
| CH                      | LCD ETU 40                 | ✓                 | --               | --                 | --                   | LI, LSI     | 0.4 ... 1           | 1.5 ... 10                                    | 0 ... 0.5                                | 1.25 ... 11        | --                      |
| CJ                      | LCD ETU 40                 | ✓                 | --               | --                 | --                   | LI, LSIN    | 0.4 ... 1           | 1.5 ... 10                                    | 0 ... 0.5                                | 1.25 ... 11        | --                      |
| CL                      | LCD ETU 42                 | ✓                 | --               | --                 | --                   | LSIG        | 0.4 ... 1           | 1.5 ... 10                                    | 0 ... 0.5                                | 1.25 ... 11        | 0.4 ... 1 <sup>4)</sup> |
| CM                      | LCD ETU 42                 | ✓                 | --               | --                 | --                   | LSIG        | 0.4 ... 1           | 1.5 ... 10                                    | 0 ... 0.5                                | 1.25 ... 11        | 0.4 ... 1 <sup>4)</sup> |
| CN                      | LCD ETU 42                 | ✓                 | --               | --                 | --                   | LSIG, LSING | 0.4 ... 1           | 1.5 ... 10                                    | 0 ... 0.5                                | 1.25 ... 11        | 0.4 ... 1 <sup>4)</sup> |

| Order No.<br>supplement | Trip units                 | Thermal image | Phase failure    | Communication-capable | Ground-fault protection | Number of poles | N pole protected <sup>1)</sup> | $I^2t$ (ON/OFF) | Trip class ( $I_c$ ) | Time-lag class ( $t_R$ ) | Thermo-magnetic trip unit | Magnetic trip unit | Electronic trip unit | LCD display |
|-------------------------|----------------------------|---------------|------------------|-----------------------|-------------------------|-----------------|--------------------------------|-----------------|----------------------|--------------------------|---------------------------|--------------------|----------------------|-------------|
| DK                      | M                          | --            | --               | --                    | --                      | 3               | --                             | --              | --                   | --                       | --                        | ✓                  | --                   | --          |
| DC                      | TM <sup>2)</sup>           | ✓             | --               | --                    | --                      | 3               | --                             | --              | --                   | --                       | ✓                         | --                 | --                   | --          |
| EJ                      | TM <sup>2)</sup>           | ✓             | --               | --                    | --                      | 4               | --                             | --              | --                   | --                       | ✓                         | --                 | --                   | --          |
| EC                      | TM <sup>2)</sup>           | ✓             | --               | --                    | --                      | 4               | 60 %                           | --              | --                   | --                       | ✓                         | --                 | --                   | --          |
| EM                      | TM <sup>2)</sup>           | ✓             | --               | --                    | --                      | 4               | 100 %                          | --              | --                   | --                       | ✓                         | --                 | --                   | --          |
| AP                      | ETU 10 M <sup>3)</sup>     | ✓             | 40 % $I_R$       | --                    | --                      | 3               | --                             | --              | 10                   | --                       | --                        | --                 | ✓                    | --          |
| AB                      | ETU 10                     | ✓             | --               | --                    | --                      | 3               | --                             | --              | --                   | 2.5 ... 30               | --                        | --                 | ✓                    | --          |
| BA                      | ETU 10                     | ✓             | --               | --                    | --                      | 4               | 50/100 %                       | --              | --                   | 2.5 ... 30               | --                        | --                 | ✓                    | --          |
| AC                      | ETU 12                     | ✓             | --               | --                    | ①                       | 3               | --                             | ✓               | --                   | 2.5 ... 30               | --                        | --                 | ✓                    | --          |
| BD                      | ETU 12                     | ✓             | --               | --                    | ②                       | 4               | 50/100 %                       | ✓               | --                   | 2.5 ... 30               | --                        | --                 | ✓                    | --          |
| AE                      | ETU 20                     | ✓             | --               | --                    | --                      | 3               | --                             | ✓               | --                   | --                       | --                        | --                 | ✓                    | --          |
| BF                      | ETU 20                     | ✓             | --               | --                    | --                      | 4               | 50/100 %                       | ✓               | --                   | --                       | --                        | --                 | ✓                    | --          |
| AG                      | ETU 22                     | ✓             | --               | --                    | ①                       | 3               | --                             | ✓               | --                   | --                       | --                        | --                 | ✓                    | --          |
| BH                      | ETU 22                     | ✓             | --               | --                    | ②                       | 4               | 50/100 %                       | ✓               | --                   | --                       | --                        | --                 | ✓                    | --          |
| AS                      | ETU 30 M <sup>3)</sup>     | ✓             | 40 % $I_R$       | --                    | --                      | 3               | --                             | --              | 10, 20, 30           | --                       | --                        | --                 | ✓                    | --          |
| CP                      | LCD ETU 40 M <sup>3)</sup> | ✓             | 5 ... 50 % $I_R$ | ✓                     | --                      | 3               | --                             | --              | 5, 10, 15, 20, 30    | --                       | --                        | --                 | ✓                    | ✓           |
| CH                      | LCD ETU 40                 | ✓             | --               | ✓                     | --                      | 3               | --                             | ✓               | --                   | 2.5 ... 30               | --                        | --                 | ✓                    | ✓           |
| CJ                      | LCD ETU 40                 | ✓             | --               | ✓                     | --                      | 4               | 50 ... 100 % OFF               | ✓               | --                   | 2.5 ... 30               | --                        | --                 | ✓                    | ✓           |
| CL                      | LCD ETU 42                 | ✓             | --               | ✓                     | ①                       | 3               | --                             | ✓               | --                   | 2.5 ... 30               | --                        | --                 | ✓                    | ✓           |
| CM                      | LCD ETU 42                 | ✓             | --               | ✓                     | ①/③                     | 3               | --                             | ✓               | --                   | 2.5 ... 30               | --                        | --                 | ✓                    | ✓           |
| CN                      | LCD ETU 42                 | ✓             | --               | ✓                     | ②                       | 4               | 50 ... 100 % OFF               | ✓               | --                   | 2.5 ... 30               | --                        | --                 | ✓                    | ✓           |

Ground-fault protection

① Vectorial summation current formation (3-conductor system)

② Vectorial summation current formation (4-conductor system)

③ Direct detection of ground-fault current in the neutral point of the transformer

1) Size-dependent.

2) TM up to  $I_n = 630$  A.

3) Motor protection up to  $I_n = 500$  A.

4)  $t_g$  0.1–0.5 s.