



> >> 04



5. Technical data  
5.1 Parameters

| NM8 circuit breaker Thermal-magnetic type                                         |                                  |  | NM8-125                                                                            |    |           |     |           |     | NM8-250                           |    |           |     |            |     | NM8-400            |     |             |    |             |    | NM8-630                 |     |             |     |             |     | NM8-800         |    |             |    |             |   | NM8-1250                  |     |    |     |   |    |     |   |    |     |   |  |   |  |
|-----------------------------------------------------------------------------------|----------------------------------|--|------------------------------------------------------------------------------------|----|-----------|-----|-----------|-----|-----------------------------------|----|-----------|-----|------------|-----|--------------------|-----|-------------|----|-------------|----|-------------------------|-----|-------------|-----|-------------|-----|-----------------|----|-------------|----|-------------|---|---------------------------|-----|----|-----|---|----|-----|---|----|-----|---|--|---|--|
| 4 Frames                                                                          |                                  |  | Frame 1                                                                            |    |           |     |           |     | Frame 2                           |    |           |     |            |     | Frame 3            |     |             |    |             |    | Frame 4                 |     |             |     |             |     | Frame 4         |    |             |    |             |   |                           |     |    |     |   |    |     |   |    |     |   |  |   |  |
| Electric characteristics as per IEC 60947-2 and EN60947-2                         |                                  |  | 16, 20, 25, 32, 40, 50, 63, 80, 100, 125                                           |    |           |     |           |     | 100, 125, 160, 180, 200, 225, 250 |    |           |     |            |     | 250, 315, 350, 400 |     |             |    |             |    | 250, 315, 350, 400, 500 |     |             |     |             |     | 630, 700, 800   |    |             |    |             |   | 630, 700, 800, 1000, 1250 |     |    |     |   |    |     |   |    |     |   |  |   |  |
| Rated current(A) In                                                               |                                  |  | 750                                                                                |    |           |     |           |     | 750                               |    |           |     |            |     | 750                |     |             |    |             |    | 750                     |     |             |     |             |     | 750             |    |             |    |             |   | 750                       |     |    |     |   |    |     |   |    |     |   |  |   |  |
| Rated insulation voltage (V) Ui                                                   |                                  |  | 8                                                                                  |    |           |     |           |     | 8                                 |    |           |     |            |     | 8                  |     |             |    |             |    | 8                       |     |             |     |             |     | 8               |    |             |    |             |   | 8                         |     |    |     |   |    |     |   |    |     |   |  |   |  |
| Rated impulse withstand voltage (kV) Uimp                                         |                                  |  | 690                                                                                |    |           |     |           |     | 690                               |    |           |     |            |     | 690                |     |             |    |             |    | 690                     |     |             |     |             |     | 690             |    |             |    |             |   | 690                       |     |    |     |   |    |     |   |    |     |   |  |   |  |
| Rated operational voltage (V) Ue                                                  |                                  |  | 500                                                                                |    |           |     |           |     | 500                               |    |           |     |            |     | 500                |     |             |    |             |    | 500                     |     |             |     |             |     | 500             |    |             |    |             |   | 500                       |     |    |     |   |    |     |   |    |     |   |  |   |  |
| Number of poles                                                                   |                                  |  | 2                                                                                  |    | 3         |     | 4         |     | 2                                 |    | 3         |     | 4          |     | 3                  |     | 4           |    | 3           |    | 4                       |     | 3           |     | 4           |     | 3               |    | 4           |    |             |   |                           |     |    |     |   |    |     |   |    |     |   |  |   |  |
|  |                                  |  |  |    |           |     |           |     |                                   |    |           |     |            |     |                    |     |             |    |             |    |                         |     |             |     |             |     |                 |    |             |    |             |   |                           |     |    |     |   |    |     |   |    |     |   |  |   |  |
| Breaking capacity code                                                            |                                  |  | H                                                                                  |    | S         |     | H         |     | R                                 |    | S         |     | H          |     | H                  |     | S           |    | H           |    | R                       |     | S           |     | H           |     | S               |    | H           |    | R           |   | S                         |     | H  |     | S |    | H   |   | R  |     | S |  | H |  |
| Rated ultimate short-circuit breaking capacity (kA RMS) Icu                       | AC 220V/230V/240V                |  | 100                                                                                | 85 | 100       | 150 | 85        | 100 | 100                               | 85 | 100       | 150 | 85         | 100 | 85                 | 100 | 150         | 85 | 100         | 85 | 100                     | 150 | 85          | 100 | 85          | 100 | 150             | 85 | 100         | 65 | 100         | — | 65                        | 100 | 65 | 100 | — | 65 | 100 | — | 65 | 100 |   |  |   |  |
|                                                                                   | AC 380V/400V/415V                |  | 100                                                                                | 50 | 100       | 150 | 50        | 100 | 100                               | 50 | 100       | 150 | 50         | 100 | 70                 | 100 | 150         | 70 | 100         | 70 | 100                     | 150 | 70          | 100 | 50          | 70  | —               | 50 | 70          | 50 | 70          | — | 50                        | 70  | 50 | 70  | — | 50 | 70  |   |    |     |   |  |   |  |
|                                                                                   | AC 440V                          |  | 100                                                                                | 50 | 100       | 130 | 50        | 100 | 100                               | 50 | 100       | 130 | 50         | 100 | 50                 | 85  | 130         | 50 | 85          | 50 | 85                      | 130 | 50          | 85  | 50          | 85  | 130             | 50 | 85          | 35 | 65          | — | 35                        | 65  | 35 | 65  | — | 35 | 65  |   |    |     |   |  |   |  |
|                                                                                   | AC 500V                          |  | 50                                                                                 | 35 | 50        | 70  | 35        | 50  | 50                                | 35 | 50        | 70  | 35         | 50  | 35                 | 50  | 70          | 35 | 50          | 35 | 50                      | 70  | 35          | 50  | 30          | 50  | —               | 30 | 50          | 30 | 50          | — | 30                        | 50  | 30 | 50  | — | 30 | 50  |   |    |     |   |  |   |  |
|                                                                                   | AC 660V/690V                     |  | 6                                                                                  | 5  | 6         | 8   | 5         | 6   | 8                                 | 6  | 8         | 10  | 6          | 8   | 10                 | 12  | 15          | 10 | 12          | 10 | 12                      | 15  | 10          | 12  | 10          | 20  | —               | 10 | 20          | 10 | 20          | — | 10                        | 20  | 10 | 20  | — | 10 | 20  |   |    |     |   |  |   |  |
| DC 250V (1P)                                                                      |                                  |  | 35                                                                                 | 25 | 35        | 50  | 25        | 35  | 35                                | 25 | 35        | 50  | 25         | 35  | 25                 | 35  | 50          | 25 | 35          | 25 | 35                      | 50  | 25          | 35  | —           | —   | —               | —  | —           | —  | —           | — | —                         | —   | —  | —   | — | —  | —   | — | —  |     |   |  |   |  |
|                                                                                   | DC 500V (2P)                     |  | 35                                                                                 | 25 | 35        | 50  | 25        | 35  | 35                                | 25 | 35        | 50  | 25         | 35  | 25                 | 35  | 50          | 25 | 35          | 25 | 35                      | 50  | 25          | 35  | —           | —   | —               | —  | —           | —  | —           | — | —                         | —   | —  | —   | — | —  | —   | — | —  |     |   |  |   |  |
| Rated service breaking capacity Ics= (%Icu)                                       |                                  |  | 100                                                                                |    |           |     |           |     | 100                               |    |           |     |            |     | 100 <sup>①</sup>   |     |             |    |             |    | 100 <sup>①</sup>        |     |             |     |             |     | 50              |    |             |    |             |   | 50                        |     |    |     |   |    |     |   |    |     |   |  |   |  |
| Suitability for isolation                                                         |                                  |  | ■                                                                                  |    |           |     |           |     | ■                                 |    |           |     |            |     | ■                  |     |             |    |             |    | ■                       |     |             |     |             |     | ■               |    |             |    |             |   | ■                         |     |    |     |   |    |     |   |    |     |   |  |   |  |
| Utilization category                                                              |                                  |  | A                                                                                  |    |           |     |           |     | A                                 |    |           |     |            |     | A                  |     |             |    |             |    | A                       |     |             |     |             |     | A               |    |             |    |             |   | A                         |     |    |     |   |    |     |   |    |     |   |  |   |  |
| Safety of insulation                                                              |                                  |  | ■                                                                                  |    |           |     |           |     | ■                                 |    |           |     |            |     | ■                  |     |             |    |             |    | ■                       |     |             |     |             |     | ■               |    |             |    |             |   | ■                         |     |    |     |   |    |     |   |    |     |   |  |   |  |
| Life(CO recycle)                                                                  | Mechanical                       |  | 20,000                                                                             |    |           |     |           |     | 20,000                            |    |           |     |            |     | 15,000             |     |             |    |             |    | 15,000                  |     |             |     |             |     | 10,000          |    |             |    |             |   | 10,000                    |     |    |     |   |    |     |   |    |     |   |  |   |  |
|                                                                                   | Electrical                       |  | 20,000                                                                             |    |           |     |           |     | 20,000                            |    |           |     |            |     | 6,000              |     |             |    |             |    | 6,000                   |     |             |     |             |     | 6,000           |    |             |    |             |   | 6,000                     |     |    |     |   |    |     |   |    |     |   |  |   |  |
| Protection                                                                        |                                  |  | Thermo-magnetic                                                                    |    |           |     |           |     | Thermo-magnetic                   |    |           |     |            |     | Thermo-magnetic    |     |             |    |             |    | Thermo-magnetic         |     |             |     |             |     | Thermo-magnetic |    |             |    |             |   | Thermo-magnetic           |     |    |     |   |    |     |   |    |     |   |  |   |  |
| Release units                                                                     |                                  |  | ■                                                                                  |    |           |     |           |     | ■                                 |    |           |     |            |     | ■                  |     |             |    |             |    | ■                       |     |             |     |             |     | ■               |    |             |    |             |   | ■                         |     |    |     |   |    |     |   |    |     |   |  |   |  |
| Over-load protection                                                              |                                  |  | ■                                                                                  |    |           |     |           |     | ■                                 |    |           |     |            |     | ■                  |     |             |    |             |    | ■                       |     |             |     |             |     | ■               |    |             |    |             |   | ■                         |     |    |     |   |    |     |   |    |     |   |  |   |  |
| Short-circuit protection                                                          |                                  |  | ■                                                                                  |    |           |     |           |     | ■                                 |    |           |     |            |     | ■                  |     |             |    |             |    | ■                       |     |             |     |             |     | ■               |    |             |    |             |   | ■                         |     |    |     |   |    |     |   |    |     |   |  |   |  |
| Residual current protection                                                       |                                  |  | —                                                                                  |    |           |     |           |     | —                                 |    |           |     |            |     | —                  |     |             |    |             |    | —                       |     |             |     |             |     | —               |    |             |    |             |   | —                         |     |    |     |   |    |     |   |    |     |   |  |   |  |
| Added on residual current protection module                                       |                                  |  | —                                                                                  |    |           |     |           |     | —                                 |    |           |     |            |     | —                  |     |             |    |             |    | —                       |     |             |     |             |     | —               |    |             |    |             |   | —                         |     |    |     |   |    |     |   |    |     |   |  |   |  |
| Mounting and connection                                                           |                                  |  |                                                                                    |    |           |     |           |     |                                   |    |           |     |            |     |                    |     |             |    |             |    |                         |     |             |     |             |     |                 |    |             |    |             |   |                           |     |    |     |   |    |     |   |    |     |   |  |   |  |
| Fixed                                                                             | Front connection                 |  | ■                                                                                  |    |           |     |           |     | ■                                 |    |           |     |            |     | ■                  |     |             |    |             |    | ■                       |     |             |     |             |     | ■               |    |             |    |             |   | ■                         |     |    |     |   |    |     |   |    |     |   |  |   |  |
|                                                                                   | Rear connection                  |  | ■                                                                                  |    |           |     |           |     | ■                                 |    |           |     |            |     | ■                  |     |             |    |             |    | ■                       |     |             |     |             |     | —               |    |             |    |             |   | —                         |     |    |     |   |    |     |   |    |     |   |  |   |  |
| DIN rail                                                                          | Front connection                 |  | ■                                                                                  |    |           |     |           |     | ■                                 |    |           |     |            |     | —                  |     |             |    |             |    | —                       |     |             |     |             |     | —               |    |             |    |             |   | —                         |     |    |     |   |    |     |   |    |     |   |  |   |  |
|                                                                                   | Rear                             |  | ■                                                                                  |    |           |     |           |     | ■                                 |    |           |     |            |     | ■                  |     |             |    |             |    | ■                       |     |             |     |             |     | —               |    |             |    |             |   | —                         |     |    |     |   |    |     |   |    |     |   |  |   |  |
| Plug-in                                                                           | Front connection                 |  | ■                                                                                  |    |           |     |           |     | ■                                 |    |           |     |            |     | ■                  |     |             |    |             |    | ■                       |     |             |     |             |     | —               |    |             |    |             |   | —                         |     |    |     |   |    |     |   |    |     |   |  |   |  |
|                                                                                   | Rear connection                  |  | ■                                                                                  |    |           |     |           |     | ■                                 |    |           |     |            |     | ■                  |     |             |    |             |    | ■                       |     |             |     |             |     | —               |    |             |    |             |   | —                         |     |    |     |   |    |     |   |    |     |   |  |   |  |
| Manual                                                                            | Handle                           |  | ■                                                                                  |    |           |     |           |     | ■                                 |    |           |     |            |     | ■                  |     |             |    |             |    | ■                       |     |             |     |             |     | —               |    |             |    |             |   | —                         |     |    |     |   |    |     |   |    |     |   |  |   |  |
|                                                                                   | Direct or extended rotary handle |  | ■                                                                                  |    |           |     |           |     | ■                                 |    |           |     |            |     | ■                  |     |             |    |             |    | ■                       |     |             |     |             |     | ■               |    |             |    |             |   | ■                         |     |    |     |   |    |     |   |    |     |   |  |   |  |
| Motor-driven mechanism                                                            |                                  |  | ■                                                                                  |    |           |     |           |     | ■                                 |    |           |     |            |     | ■                  |     |             |    |             |    | ■                       |     |             |     |             |     | ■               |    |             |    |             |   | ■                         |     |    |     |   |    |     |   |    |     |   |  |   |  |
| Manual, remote operated automatic source changeover systems                       |                                  |  | ■                                                                                  |    |           |     |           |     | ■                                 |    |           |     |            |     | ■                  |     |             |    |             |    | ■                       |     |             |     |             |     | ■               |    |             |    |             |   | ■                         |     |    |     |   |    |     |   |    |     |   |  |   |  |
| Shunt and under-voltage release                                                   |                                  |  | ■                                                                                  |    |           |     |           |     | ■                                 |    |           |     |            |     | ■                  |     |             |    |             |    | ■                       |     |             |     |             |     | ■               |    |             |    |             |   | ■                         |     |    |     |   |    |     |   |    |     |   |  |   |  |
| Auxiliary and alarm contact                                                       |                                  |  | ■                                                                                  |    |           |     |           |     | ■                                 |    |           |     |            |     | ■                  |     |             |    |             |    | ■                       |     |             |     |             |     | ■               |    |             |    |             |   | ■                         |     |    |     |   |    |     |   |    |     |   |  |   |  |
| Pad locking system                                                                |                                  |  | ■                                                                                  |    |           |     |           |     | ■                                 |    |           |     |            |     | ■                  |     |             |    |             |    | ■                       |     |             |     |             |     | —               |    |             |    |             |   | —                         |     |    |     |   |    |     |   |    |     |   |  |   |  |
| Mounting and connection accessories                                               |                                  |  |                                                                                    |    |           |     |           |     |                                   |    |           |     |            |     |                    |     |             |    |             |    |                         |     |             |     |             |     |                 |    |             |    |             |   |                           |     |    |     |   |    |     |   |    |     |   |  |   |  |
| Connection terminal                                                               |                                  |  | ■                                                                                  |    |           |     |           |     | ■                                 |    |           |     |            |     | ■                  |     |             |    |             |    | ■                       |     |             |     |             |     | ■               |    |             |    |             |   | ■                         |     |    |     |   |    |     |   |    |     |   |  |   |  |
| Front connection plate                                                            |                                  |  | ■                                                                                  |    |           |     |           |     | ■                                 |    |           |     |            |     | ■                  |     |             |    |             |    | ■                       |     |             |     |             |     | ■               |    |             |    |             |   | ■                         |     |    |     |   |    |     |   |    |     |   |  |   |  |
| Rear connection plate                                                             |                                  |  | ■                                                                                  |    |           |     |           |     | ■                                 |    |           |     |            |     | ■                  |     |             |    |             |    | ■                       |     |             |     |             |     | —               |    |             |    |             |   | —                         |     |    |     |   |    |     |   |    |     |   |  |   |  |
| DIN rail adaptor                                                                  |                                  |  | ■                                                                                  |    |           |     |           |     | ■                                 |    |           |     |            |     | —                  |     |             |    |             |    | —                       |     |             |     |             |     | —               |    |             |    |             |   | —                         |     |    |     |   |    |     |   |    |     |   |  |   |  |
| Plug-in type connection accessories                                               |                                  |  | ■                                                                                  |    |           |     |           |     | ■                                 |    |           |     |            |     | ■                  |     |             |    |             |    | ■                       |     |             |     |             |     | —               |    |             |    |             |   | —                         |     |    |     |   |    |     |   |    |     |   |  |   |  |
| Terminal covers                                                                   |                                  |  | ■                                                                                  |    |           |     |           |     | ■                                 |    |           |     |            |     | ■                  |     |             |    |             |    | ■                       |     |             |     |             |     | ■               |    |             |    |             |   | ■                         |     |    |     |   |    |     |   |    |     |   |  |   |  |
| Interphase barrier                                                                |                                  |  | ■                                                                                  |    |           |     |           |     | ■                                 |    |           |     |            |     | ■                  |     |             |    |             |    | ■                       |     |             |     |             |     | ■               |    |             |    |             |   | ■                         |     |    |     |   |    |     |   |    |     |   |  |   |  |
| Dimension and weight                                                              |                                  |  |                                                                                    |    |           |     |           |     |                                   |    |           |     |            |     |                    |     |             |    |             |    |                         |     |             |     |             |     |                 |    |             |    |             |   |                           |     |    |     |   |    |     |   |    |     |   |  |   |  |
| Dimension(mm)W×H×L                                                                |                                  |  | Fixed type-front connection                                                        |    | 62×140×79 |     | 90×140×79 |     | 120×140×79                        |    | 70×157×88 |     | 105×157×88 |     | 140×157×88         |     | 140×255×113 |    | 185×255×113 |    | 140×255×113             |     | 185×255×113 |     | 210×370×196 |     | 280×370×196     |    | 210×370×196 |    | 280×370×196 |   |                           |     |    |     |   |    |     |   |    |     |   |  |   |  |
| Weight(kg)                                                                        |                                  |  | Fixed type-front connection                                                        |    | 0.85      |     | 1.2       |     | 1.6                               |    | 1.5       |     | 2.1        |     | 2.8                |     | 7.5         |    | 10          |    | 7.5                     |     | 10          |     | 17.5        |     | 23              |    | 17.5        |    | 23          |   |                           |     |    |     |   |    |     |   |    |     |   |  |   |  |



| NM8M circuit breaker                                      |            | Magnetic only |
|-----------------------------------------------------------|------------|---------------|
| 4 Frame                                                   |            |               |
| Electric characteristics as per IEC 60947-2 and EN60947-2 |            |               |
| Rated current(A)                                          | In         |               |
| Rated insulation voltage (V)                              | Ui         |               |
| Rated impulse withstand voltage (kV)                      | Uimp       |               |
| Rated operational voltage (V) Ue                          | AC 50/60Hz |               |
|                                                           | DC         |               |
| Number of poles                                           |            |               |



| Breaking capacity code                                      |                                  |
|-------------------------------------------------------------|----------------------------------|
| Rated ultimate short-circuit breaking capacity (kA RMS) Icu | AC 220V/230V/240V                |
|                                                             | AC 380V/415V                     |
|                                                             | AC 440V                          |
|                                                             | AC 500V                          |
|                                                             | AC 660V/690V                     |
|                                                             | DC 250V (1P)                     |
| Rated service breaking capacity Ics= (%Icu)                 | DC 500V (2P)                     |
|                                                             | DC 750V (3P)                     |
| Suitability for isolation                                   |                                  |
| Utilization category                                        |                                  |
| Safety of insulation                                        |                                  |
| Life(CO recycle)                                            | Mechanical                       |
|                                                             | Electrical                       |
| Protection                                                  |                                  |
| Release units                                               |                                  |
| Short-circuit protection                                    |                                  |
| Residual current protection                                 | Added on residual                |
|                                                             | current protection module        |
| Mounting and connection                                     |                                  |
| Fixed                                                       | Front connection                 |
|                                                             | Rear connection                  |
| DIN rail                                                    | Front connection                 |
|                                                             | Rear connection                  |
| Plug-in                                                     | Front connection                 |
|                                                             | Rear connection                  |
| Auxiliaries for control and indication                      |                                  |
| Manual                                                      | Handle                           |
|                                                             | Direct or extended rotary handle |
| Motor-driven mechanism                                      |                                  |
| Manual, remote operated automatic source changeover systems |                                  |
| Shunt and under-voltage release                             |                                  |
| Auxiliary and alarm contact                                 |                                  |
| Pad locking system                                          |                                  |
| Mounting and connection accessories                         |                                  |
| Connection terminal                                         |                                  |
| Front connection plate                                      |                                  |
| Rear connection plate                                       |                                  |
| DIN rail adaptor                                            |                                  |
| Plug-in type connection accessories                         |                                  |
| Terminal covers                                             |                                  |
| Interphase barrier                                          |                                  |
| Dimension and weight                                        |                                  |
| Dimension (mm)W×L×H                                         |                                  |
| Weight (kg)                                                 |                                  |

| NM8M-125                                                                          |     |     |                                 |     | NM8M-250                                                                            |     |     |                                                                                     |  |  |
|-----------------------------------------------------------------------------------|-----|-----|---------------------------------|-----|-------------------------------------------------------------------------------------|-----|-----|-------------------------------------------------------------------------------------|--|--|
| Frame 1                                                                           |     |     |                                 |     | Frame 2                                                                             |     |     |                                                                                     |  |  |
| 16,20,25,32,40,50,63,80,100,125                                                   |     |     | 16,20,25,32,40,50,63,80,100,125 |     | 125,160,180,200,250                                                                 |     |     |                                                                                     |  |  |
| 750                                                                               |     |     | 750                             |     | 750                                                                                 |     |     |                                                                                     |  |  |
| 8                                                                                 |     |     | 8                               |     | 8                                                                                   |     |     |                                                                                     |  |  |
| 690                                                                               |     |     | 690                             |     | 690                                                                                 |     |     |                                                                                     |  |  |
| 500                                                                               |     |     | 500                             |     | 500                                                                                 |     |     |                                                                                     |  |  |
| 3                                                                                 |     |     | 4                               |     | 3                                                                                   |     |     |                                                                                     |  |  |
|  |     |     |                                 |     |  |     |     |  |  |  |
| S                                                                                 | H   | R   | S                               | H   | S                                                                                   | H   | R   |                                                                                     |  |  |
| 85                                                                                | 100 | 150 | 85                              | 100 | 85                                                                                  | 100 | 150 |                                                                                     |  |  |
| 50                                                                                | 100 | 150 | 50                              | 100 | 50                                                                                  | 100 | 150 |                                                                                     |  |  |
| 50                                                                                | 100 | 130 | 50                              | 100 | 50                                                                                  | 100 | 130 |                                                                                     |  |  |
| 35                                                                                | 50  | 70  | 35                              | 50  | 35                                                                                  | 50  | 70  |                                                                                     |  |  |
| 8                                                                                 | 10  | 20  | 8                               | 10  | 8                                                                                   | 10  | 20  |                                                                                     |  |  |
| -                                                                                 | 50  | -   | -                               | -   | -                                                                                   | 50  | -   |                                                                                     |  |  |
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| 20,000                                                                            |     |     | 20,000                          |     | 20,000                                                                              |     |     |                                                                                     |  |  |
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## Moulded Case Circuit Breakers NM8, NM8S

| NM8M-250            | NM8M-400, 630       |                     | NM8M-800, 1250        |                       |
|---------------------|---------------------|---------------------|-----------------------|-----------------------|
| Frame 2             | Frame 3             |                     | Frame 4               |                       |
| 125,160,180,200,250 | 250,315,350,400,500 | 250,315,350,400,500 | 630,700,800,1000,1250 | 630,700,800,1000,1250 |
| 750                 | 750                 | 750                 | 750                   | 750                   |
| 8                   | 8                   | 8                   | 8                     | 8                     |
| 690                 | 690                 | 690                 | 690                   | 690                   |
| 500                 | 500                 | 500                 | 500                   | 500                   |
| 4                   | 3                   | 4                   | 3                     | 4                     |



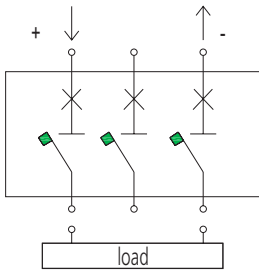
| S                  | H   | S                 | H   | R   | S                 | H   | S                 | H   | R | S                 | H   |
|--------------------|-----|-------------------|-----|-----|-------------------|-----|-------------------|-----|---|-------------------|-----|
| 85                 | 100 | 85                | 100 | 150 | 85                | 100 | 65                | 100 | - | 65                | 100 |
| 50                 | 100 | 70                | 100 | 150 | 70                | 100 | 50                | 70  | - | 50                | 70  |
| 50                 | 100 | 50                | 85  | 130 | 50                | 85  | -                 | -   | - | -                 | -   |
| 35                 | 50  | 35                | 50  | 70  | 35                | 50  | -                 | -   | - | -                 | -   |
| 8                  | 10  | 10                | 20  | 35  | 10                | 20  | -                 | -   | - | -                 | -   |
| -                  | -   | -                 | 50  | -   | -                 | -   | -                 | -   | - | -                 | -   |
| -                  | -   | -                 | 50  | -   | -                 | -   | -                 | -   | - | -                 | -   |
| -                  | -   | -                 | 50  | -   | -                 | -   | -                 | -   | - | -                 | -   |
| 100                |     | 100               |     |     | 100               |     | 50                |     |   | 50                |     |
| ■                  |     | ■                 |     |     | ■                 |     | ■                 |     |   | ■                 |     |
| A                  |     | A                 |     |     | A                 |     | A                 |     |   | A                 |     |
| ■                  |     | ■                 |     |     | ■                 |     | ■                 |     |   | ■                 |     |
| 20,000             |     | 15,000            |     |     | 15,000            |     | 15,000            |     |   | 15,000            |     |
| 20,000<br>magnetic |     | 6,000<br>magnetic |     |     | 6,000<br>magnetic |     | 6,000<br>magnetic |     |   | 6,000<br>magnetic |     |
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| 140×157×88         |     | 140×255×133       |     |     | 185×255×133       |     | 210×370×196       |     |   | 280×370×196       |     |
| 2.8                |     | 7.5               |     |     | 10                |     | 17.5              |     |   | 23                |     |

### 5.2 Special applications

#### Use of DC apparatus

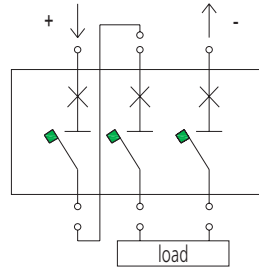
To obtain the number of poles in series needed to guarantee the required breaking capacity at the various operating voltages, suitable connection diagrams must be used. For the breaking capacity ( $I_{cu}$ ), according to the voltage and the number of poles connected in series with reference to the connection diagrams. Protection and isolation of the circuit with three-pole circuit-breakers  $I_{cs}=I_{cu}=10kA$  with any one connection in the following diagrams.

Diagram A: Interruption with one pole for polarity



Note: Without negative polarity connected to earth, the installation method must be such as to make the probability of a second earth fault negligible.

Diagram B: Interruption with two poles in series for one polarity and one pole for the other polarity.



Note: Without negative polarity connected to earth, the installation method must be such as to make the probability of a second earth fault negligible.

Diagram C: Interruption with three poles in series for polarity.

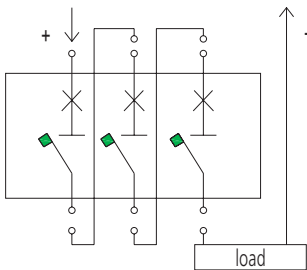


Diagram D: Interruption with four poles in series for one polarity (4C, 4D)

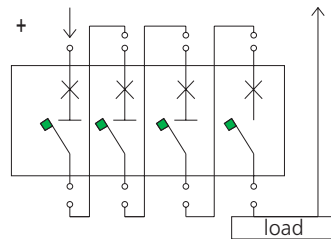
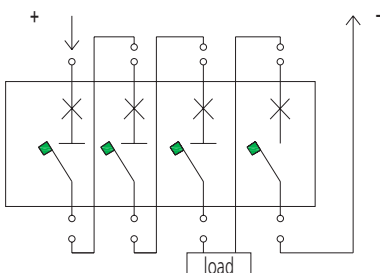
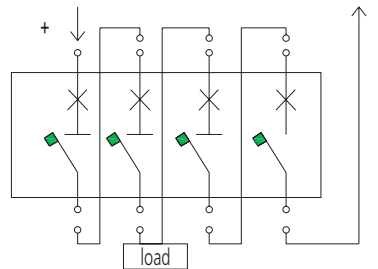


Diagram E: Interruption with three poles in series on one polarity and one pole on the other polarity (4C, 4D)



Note: Without negative polarity connected to earth, the installation method must be such as to make the probability of a second earth fault negligible.

Diagram F: Interruption with two poles in series for polarity (4C, 4D)



Note: Without negative polarity connected to earth, the installation method must be such as to make the probability of a second earth fault negligible.

The following table shows which connection diagram to use according to the number of poles to be connected in series to obtain the required breaking capacity, in relation to the type of distribution network:

| Rated voltage V | protection function | Isolation | Earth-insulated network | Network with one polarity <sup>(1)</sup> earthed | Network with a middle point earthed |
|-----------------|---------------------|-----------|-------------------------|--------------------------------------------------|-------------------------------------|
| ≤250            | ■                   | ■         | A                       | A                                                | A                                   |
|                 | ■                   | -         | -                       | -                                                | -                                   |
| ≤500            | ■                   | ■         | A                       | B                                                | A                                   |
|                 | ■                   | -         | -                       | C                                                | -                                   |

Note:

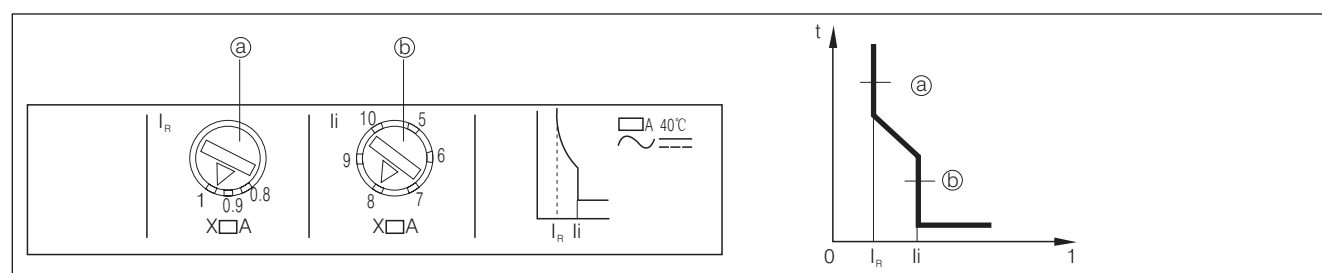
a The risk of double earth fault is nil, therefore the fault current only involves a part of the interruption poles.

b For connection with four poles in series, circuit-breakers with neutral at 100% of the phase settings must be used.

## 6. Release

### 6.1 Thermo-magnetic release

6.1.1 Thermo-magnetic release of NM8-125, 250, 400, 630, 800 and 1250 breakers can be set to meet protection requirements



Adjustable setting of over-load protection (a)

Adjustable setting of short-circuit protection or fixed (b)

| Thermo-magnetic release                | NM8-125                                                                                               | NM8-250                                                                                  | NM8-400                                                                                  | NM8-630                                                                                  | NM8-800                                                                                  | NM8-1250                                                                                 |
|----------------------------------------|-------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| Rated value (A)<br>I <sub>n</sub> 40°C | 16, 20, 25, 32, 40, 50,<br>63, 80, 100, 125                                                           | 100, 125, 160, 180,<br>200, 225, 250                                                     | 250, 315,<br>350, 400                                                                    | 250, 315, 350,<br>400, 500                                                               | 630, 700,<br>800                                                                         | 630, 700, 800,<br>1000, 1250                                                             |
| Over-load protection                   | Thermo protection                                                                                     |                                                                                          |                                                                                          |                                                                                          |                                                                                          |                                                                                          |
| Tripping current I <sub>R</sub> (A)    | Adjustable range<br>0.8~1XI <sub>n</sub>                                                              | Adjustable range<br>0.8~1XI <sub>n</sub>                                                 | Adjustable range<br>0.8~1XI <sub>n</sub>                                                 | Adjustable range<br>0.8~1XI <sub>n</sub>                                                 | Adjustable range<br>0.8~1XI <sub>n</sub>                                                 | Adjustable range<br>0.8~1XI <sub>n</sub>                                                 |
| N-pole protection (A)                  | Without protection                                                                                    | Without protection                                                                       | Without protection                                                                       | Without protection                                                                       | Without protection                                                                       | Without protection                                                                       |
| 4A, 4B                                 | 1.0XI <sub>n</sub>                                                                                    | 1.0XI <sub>n</sub>                                                                       | 1.0XI <sub>n</sub>                                                                       | 1.0XI <sub>n</sub>                                                                       | 1.0XI <sub>n</sub>                                                                       | 1.0XI <sub>n</sub>                                                                       |
| 4C, 4D                                 | 0.5 XI <sub>n</sub>                                                                                   | 0.5 XI <sub>n</sub>                                                                      | 0.5 XI <sub>n</sub>                                                                      | 0.5 XI <sub>n</sub>                                                                      | 0.5 XI <sub>n</sub>                                                                      | 0.5 XI <sub>n</sub>                                                                      |
| 4E, 4F                                 |                                                                                                       |                                                                                          |                                                                                          |                                                                                          |                                                                                          |                                                                                          |
| Short-circuit protection               | Magnetic protection                                                                                   |                                                                                          |                                                                                          |                                                                                          |                                                                                          |                                                                                          |
| Tripping current I <sub>i</sub> (A)    | 10I <sub>n</sub> (for power<br>distribution protection)<br>12I <sub>n</sub> (for motor<br>protection) | Adjustable range<br>5~10 XI <sub>n</sub><br>8~12I <sub>n</sub> (for motor<br>protection) | Adjustable range<br>5~10 XI <sub>n</sub><br>8~12I <sub>n</sub> (for motor<br>protection) | Adjustable range<br>5~10 XI <sub>n</sub><br>8~12I <sub>n</sub> (for motor<br>protection) | Adjustable range<br>5~10 XI <sub>n</sub><br>8~12I <sub>n</sub> (for motor<br>protection) | Adjustable range<br>5~10 XI <sub>n</sub><br>8~12I <sub>n</sub> (for motor<br>protection) |

### 6.1.2 Characteristic of thermo protection operation of thermo-magnetic release for power distribution

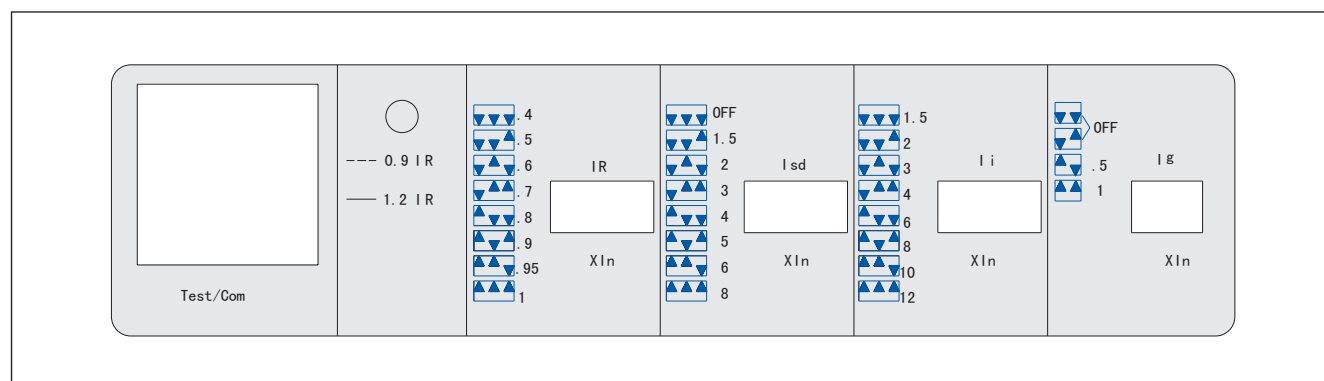
| Serial No. | Test current                      | I/I <sub>n</sub> | Conventional time                                        | Initial status     |
|------------|-----------------------------------|------------------|----------------------------------------------------------|--------------------|
| 1          | Conventional non-tripping current | 1.05             | > 1h (I <sub>n</sub> ≤63A)<br>> 2h (I <sub>n</sub> >63A) | Cold status        |
| 2          | Conventional tripping current     | 1.3              | ≤ 1h (I <sub>n</sub> ≤63A)<br>≤ 2h (I <sub>n</sub> >63A) | Right after test 1 |

## 6.1.3 Characteristic of thermo protection operation of thermo-magnetic release for motor protection

| Serial No. | Test current                      | I/I <sub>n</sub> | Conventional time | Initial status     |
|------------|-----------------------------------|------------------|-------------------|--------------------|
| 1          | Conventional non-tripping current | 1.0              | >2h               | Cold status        |
| 2          | Conventional tripping current     | 1.2              | ≤2h               | Right after test 1 |
|            |                                   | 1.5              | ≤4min             |                    |
|            |                                   | 7.2              | 4s ≤ T ≤ 10s      |                    |

## 6.2 Electronic Release

6.2.1 NM8S-125, 250 electronic release is an universal module. It is of 11 current specifications: 40A, 50A, 63A, 80A, 100A, 125A, 160A, 180A, 200A, 225A and 250A to adjust setting values and to meet protection requirements.

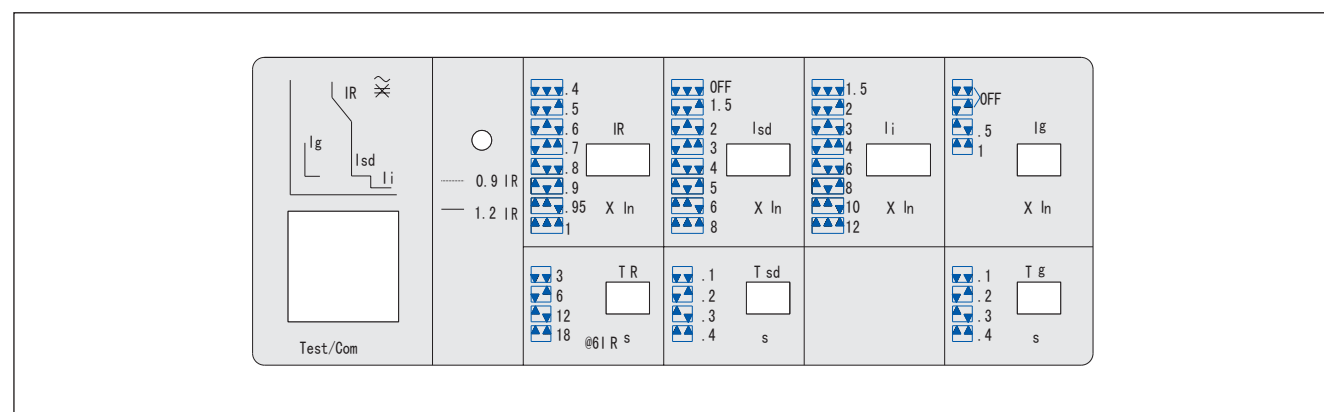


The indicator light flashes, when single-phase operational current is ≤90% I<sub>R</sub>.

The indicator light is always lit, when single-phase operational current is ≥115% I<sub>R</sub>.

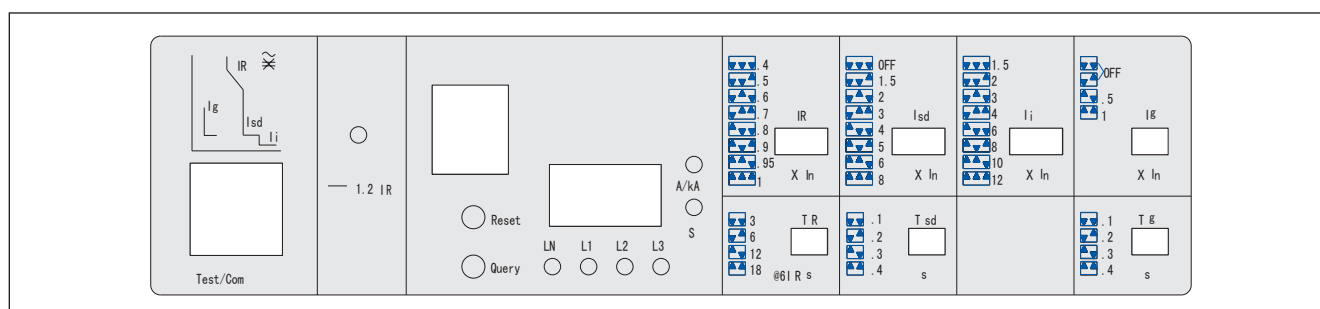
| Electronic release                                                         | NM8S-125                                                               | NM8S-250                                                               |
|----------------------------------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------|
| Rated value I <sub>n</sub> (A) 20~70°C                                     | 40, 50, 63, 80, 100, 125                                               | 100, 125, 160, 180, 200, 225, 250                                      |
| Over-load protection                                                       | Thermal protection                                                     |                                                                        |
| Tripping current I <sub>R</sub>                                            | Adjustable range 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 0.95, 1X I <sub>n</sub> | Adjustable range 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 0.95, 1X I <sub>n</sub> |
| Tripping time                                                              | >2h non tripping<br>≤1h<br>96s<br>6s                                   | >2h non tripping<br>≤1h<br>96s<br>6s                                   |
| N-line protection tripping current I <sub>g</sub>                          | Adjustable range<br>OFF, 0.5, 1X I <sub>n</sub>                        | Adjustable range<br>OFF, 0.5, 1X I <sub>n</sub>                        |
| Tripping current I <sub>i</sub>                                            | Adjustable range<br>1.5, 2, 3, 4, 6, 8, 10, 12X I <sub>n</sub>         | Adjustable range<br>1.5, 2, 3, 4, 6, 8, 10, 12X I <sub>n</sub>         |
| Short time-delay short current protection tripping current I <sub>sd</sub> | Adjustable range<br>OFF, 1.5, 2, 3, 4, 6, 8X I <sub>n</sub>            | Adjustable range<br>OFF, 1.5, 2, 3, 4, 6, 8X I <sub>n</sub>            |

6.2.2 NM8S-400, 630 electronic release is an universal module. It is of 6 current specifications: 250A, 315A, 350A, 400A, 500A, and 630A to adjust setting values and to meet protection requirements. The release is of wide setting range and multi-functional modules can be selected. NM8S-400, 630 electronic release.





6.2.3 NM8S-800, 1250 electronic release is an universal module. It is of 5 current specifications: 630A, 700A, 800A, 1000A, and 1250A to adjust setting values and to meet protection requirements.  
The release is of wide setting range and multi-functional modules can be selected.



Tripping current  $I_R$ ,  $I_{sd}$ ,  $I_i$  should be set with three-digit switch or rotary knob as per current.

●  $I_R$  setting of over-load protection

$I_R$  could be adjusted as per customers' requirements,  
and TR, tripping time at the status of 6IR can be set as per customers' requirements.

| Model          | $1.05 I_R$       | $1.3 I_R$    | $1.5 I_R$ (s)       | $2.0 I_R$ (s)       | $6 I_R$ (s)     |
|----------------|------------------|--------------|---------------------|---------------------|-----------------|
| NM8S-400, 630  | >2h non-tripping | <1h tripping | 48,96,<br>192, 288  | 27, 54,<br>108, 162 | 3, 6,<br>12, 18 |
| NM8S-800, 1250 | >2h non-tripping | <1h tripping | 48, 96,<br>192, 288 | 27, 54,<br>108, 162 | 3, 6,<br>12, 18 |

●  $I_i$  indicator light for over-load status indication

The indicator light flashes, when single-phase operational current is  $<90\% I_R$

The indicator light is always lit, when single-phase operational current is  $\geq 115\% I_R$

●  $I_{sd}$  setting of short-circuit protection and tripping time

Setting value of current  $I_{sd}$  could be adjusted as per customers' requirements and OFF stands for status without ST protection;  
 $T_{sd}$ , the tripping time could be adjusted as per customers' requirements.

●  $I_i$  setting of short-circuit protection

Value of setting current could be adjusted as per customers' requirements

●  $I_g$  setting of protection operations

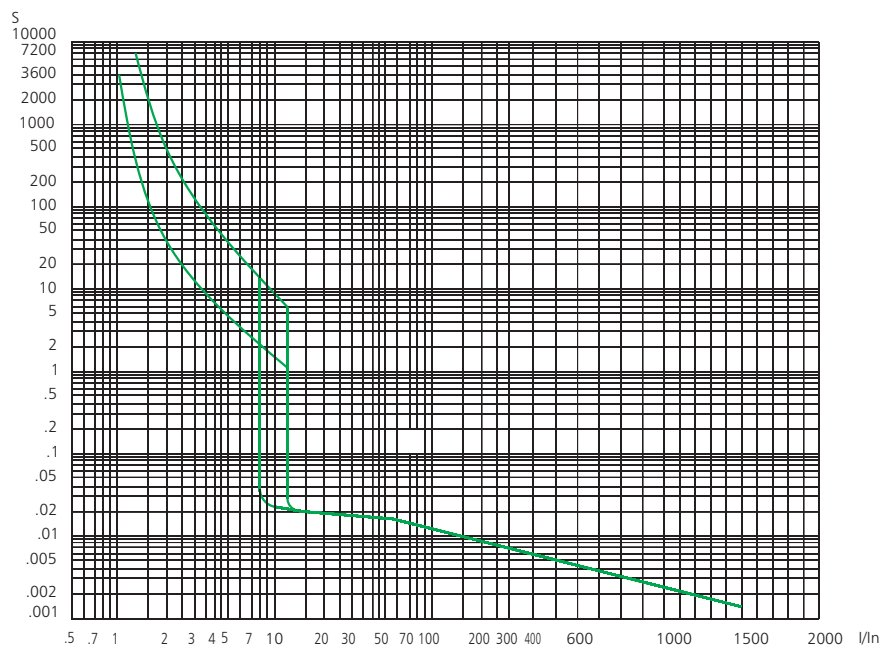
As a 4P circuit breaker with N-line protection, setting value of current  $I_g$  could be adjusted as per customers' requirements and OFF stands for status without protection of N-pole;  $T_g$ , the operating time of N-pole could be adjusted as per customers' requirements.

| Electronic release                                        | NM8S-400                                                                        | NM8S-630                                                                        | NM8S-800                                                                        | NM8S-1250                                                                       |
|-----------------------------------------------------------|---------------------------------------------------------------------------------|---------------------------------------------------------------------------------|---------------------------------------------------------------------------------|---------------------------------------------------------------------------------|
| Rated value A In 20~70°C                                  | 250, 315, 350, 400                                                              | 250, 315, 350, 400, 500, 630                                                    | 630, 700, 800                                                                   | 630, 700, 800, 1000, 1250                                                       |
| long time-delay over-load protection (thermal protection) |                                                                                 |                                                                                 |                                                                                 |                                                                                 |
| Tripping current $I_R$ (A)                                | Adjustable range 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 0.95, 1XIn                       | Adjustable range 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 0.95, 1XIn                       | Adjustable range 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 0.95, 1XIn                       | Adjustable range 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 0.95, 1XIn                       |
| Tripping time $6I_R$ (s)                                  | Adjustable range<br>3, 6, 12, 18                                                | Adjustable range<br>3, 6, 12, 18                                                | Adjustable range<br>3, 6, 12, 18                                                | Adjustable range<br>3, 6, 12, 18                                                |
| short time-delay short-circuit protection                 |                                                                                 |                                                                                 |                                                                                 |                                                                                 |
| Tripping current $I_{sd}$ (A)                             | Adjustable range<br>OFF, 1.5, 2, 3, 4, 5, 6, 8XIn                               | Adjustable range<br>OFF, 1.5, 2, 3, 4, 5, 6, 8XIn                               | Adjustable range<br>OFF, 1.5, 2, 3, 4, 5, 6, 8XIn                               | Adjustable range<br>OFF, 1.5, 2, 3, 4, 5, 6, 8XIn                               |
| Tripping time $T_{sd}$ (s)                                | Adjustable range<br>0.1, 0.2, 0.3, 0.4                                          | Adjustable range<br>0.1, 0.2, 0.3, 0.4                                          | Adjustable range<br>0.1, 0.2, 0.3, 0.4                                          | Adjustable range<br>0.1, 0.2, 0.3, 0.4                                          |
| (Instantaneous) short-circuit protection                  |                                                                                 |                                                                                 |                                                                                 |                                                                                 |
| Tripping current $I_i$ (A)                                | Adjustable range<br>1.5, 2, 3, 4, 6, 8, 10, 12XIn<br>12In(for motor protection) | Adjustable range<br>1.5, 2, 3, 4, 6, 8, 10, 12XIn<br>12In(for motor protection) | Adjustable range<br>1.5, 2, 3, 4, 6, 8, 10, 12XIn<br>12In(for motor protection) | Adjustable range<br>1.5, 2, 3, 4, 6, 8, 10, 12XIn<br>12In(for motor protection) |
| (N-line) protection                                       |                                                                                 |                                                                                 |                                                                                 |                                                                                 |
| Tripping current $I_g$ (A)                                | Adjustable range<br>OFF, 0.5, 1XIn                                              | Adjustable range<br>OFF, 0.5, 1XIn                                              | Adjustable range<br>OFF, 0.5, 1XIn                                              | Adjustable range<br>OFF, 0.5, 1XIn                                              |
| Tripping time $T_g$ (s)                                   | Adjustable range<br>0.1, 0.2, 0.3, 0.4                                          | Adjustable range<br>0.1, 0.2, 0.3, 0.4                                          | Adjustable range<br>0.1, 0.2, 0.3, 0.4                                          | Adjustable range<br>0.1, 0.2, 0.3, 0.4                                          |

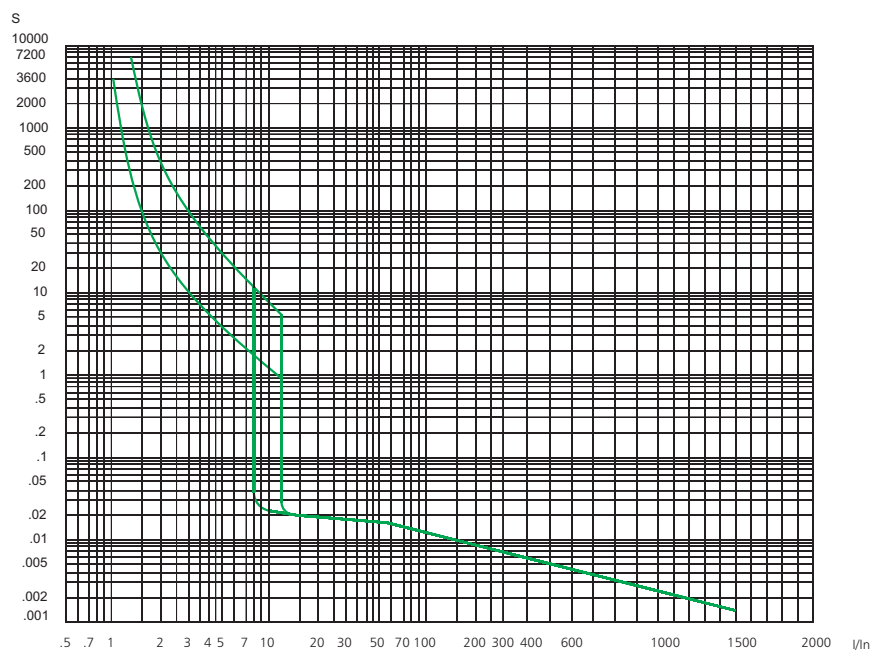
## 7. Curves

### 7.1 Tripping curve (ambient temperature +40°C)

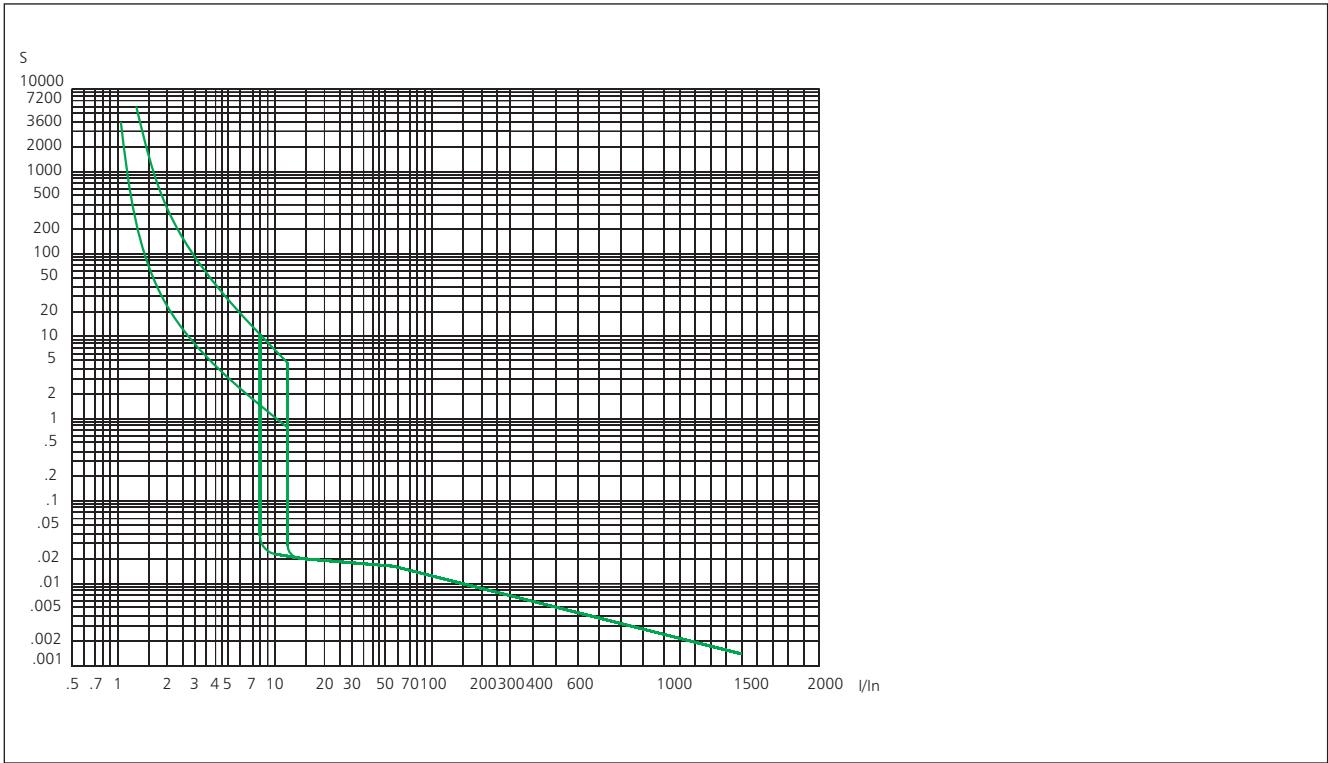
NM8-125 (16A, 20A)



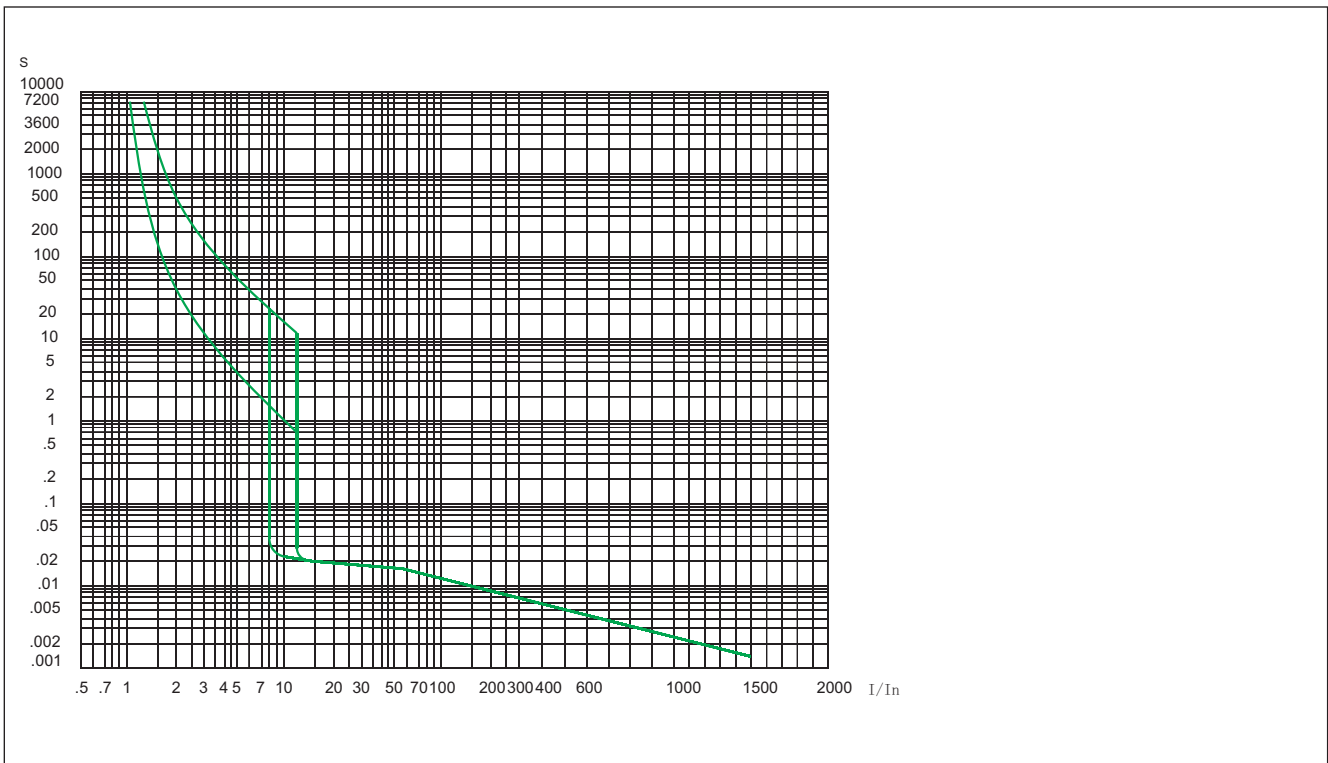
NM8-125(25A, 32A)



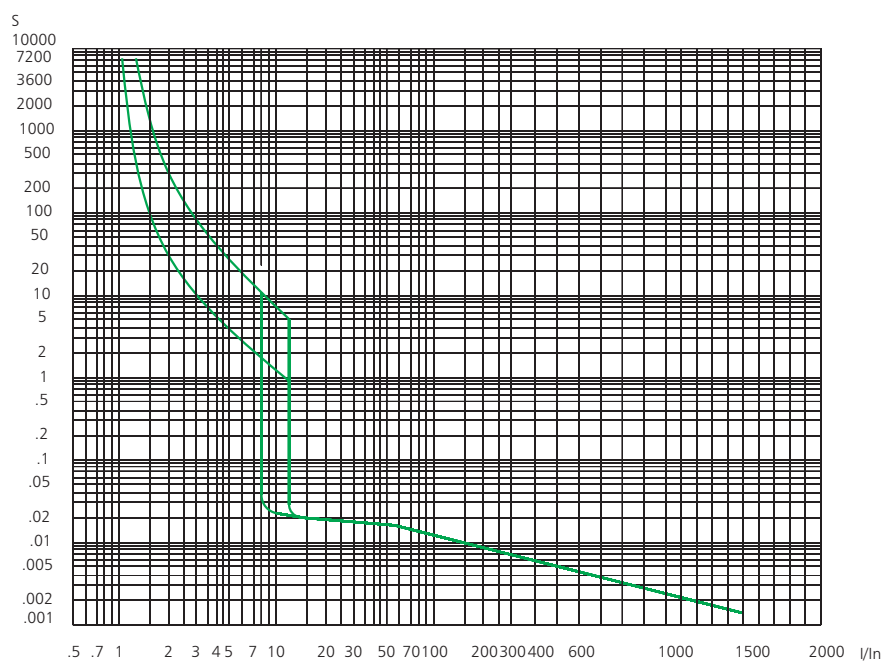
NM8-125 (40A, 50A)



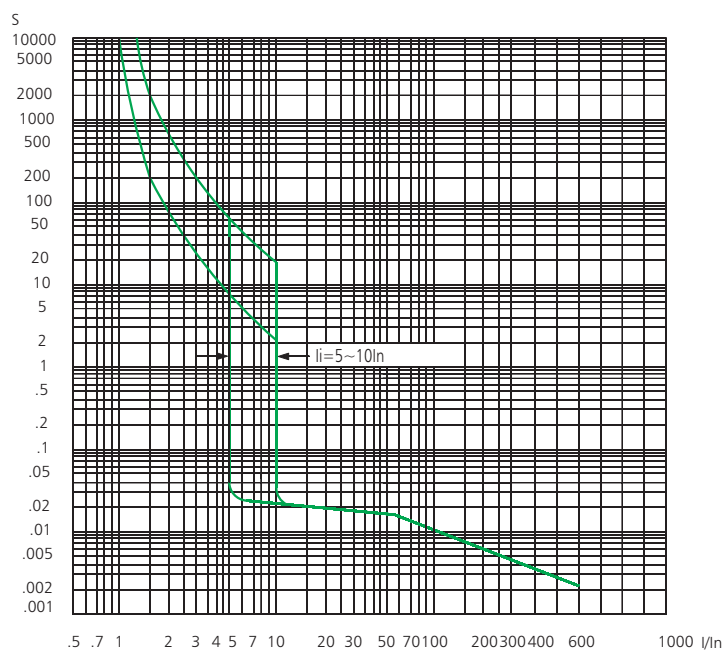
NM8-125 (63A, 80A, 100A)



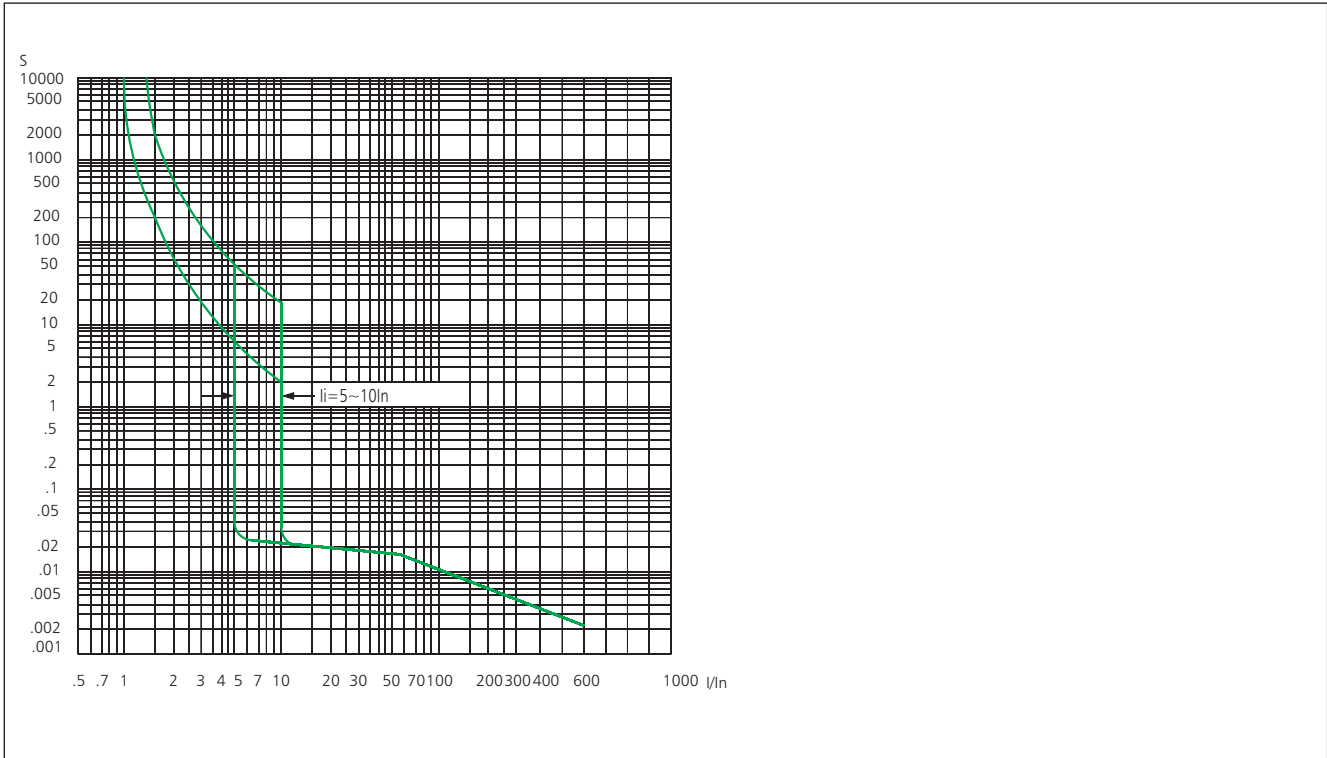
NM8-125 (125A)



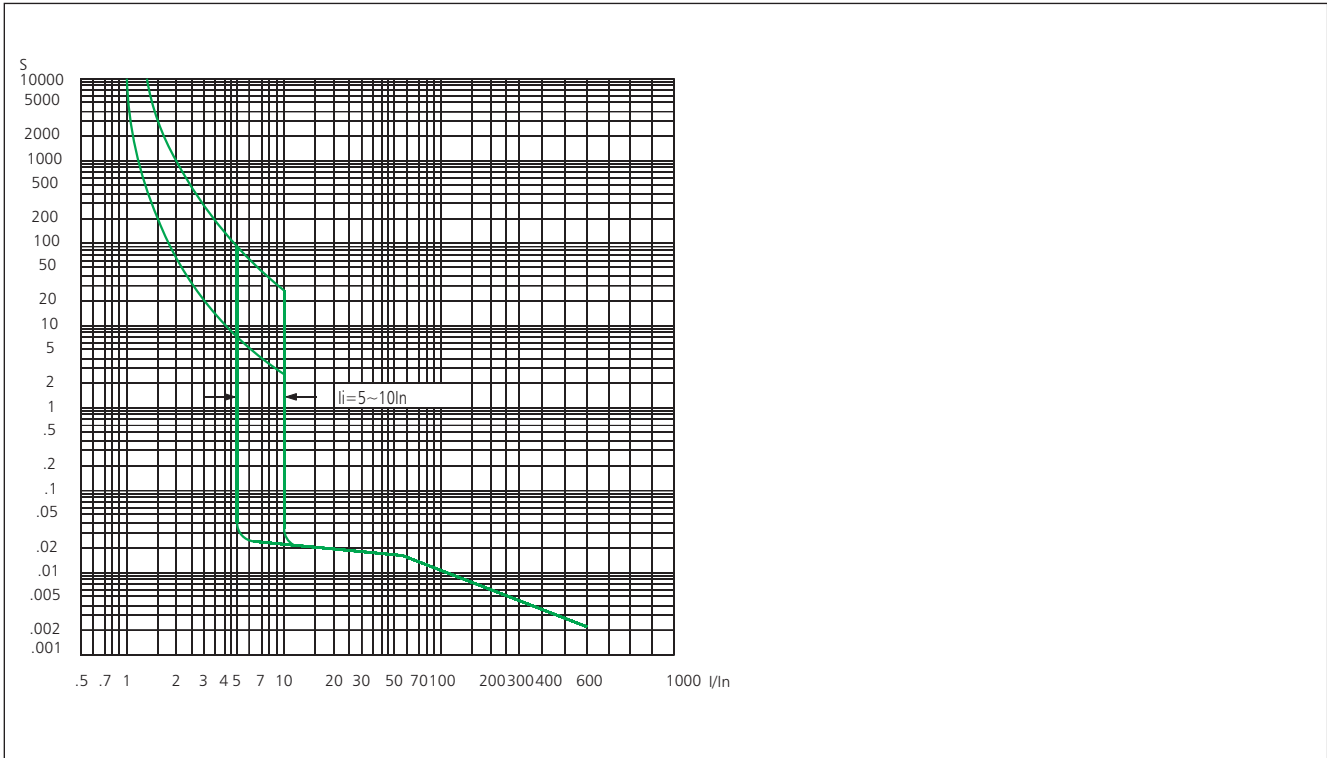
NM8-250 (100A, 125A)



NM8-250 (160A, 180A)

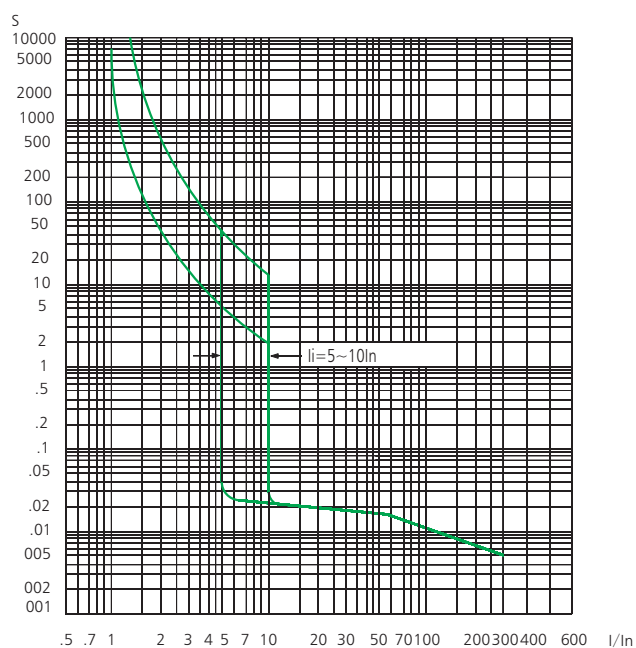


NM8-250 (200A, 225A, 250A)

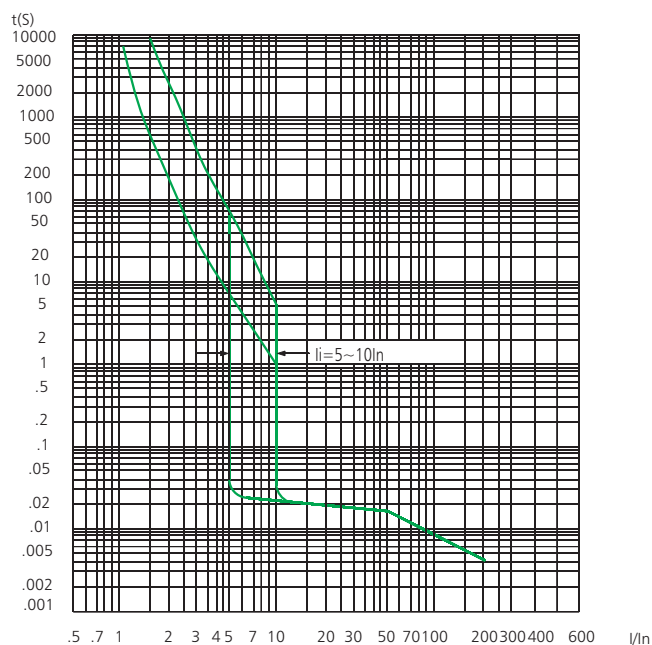




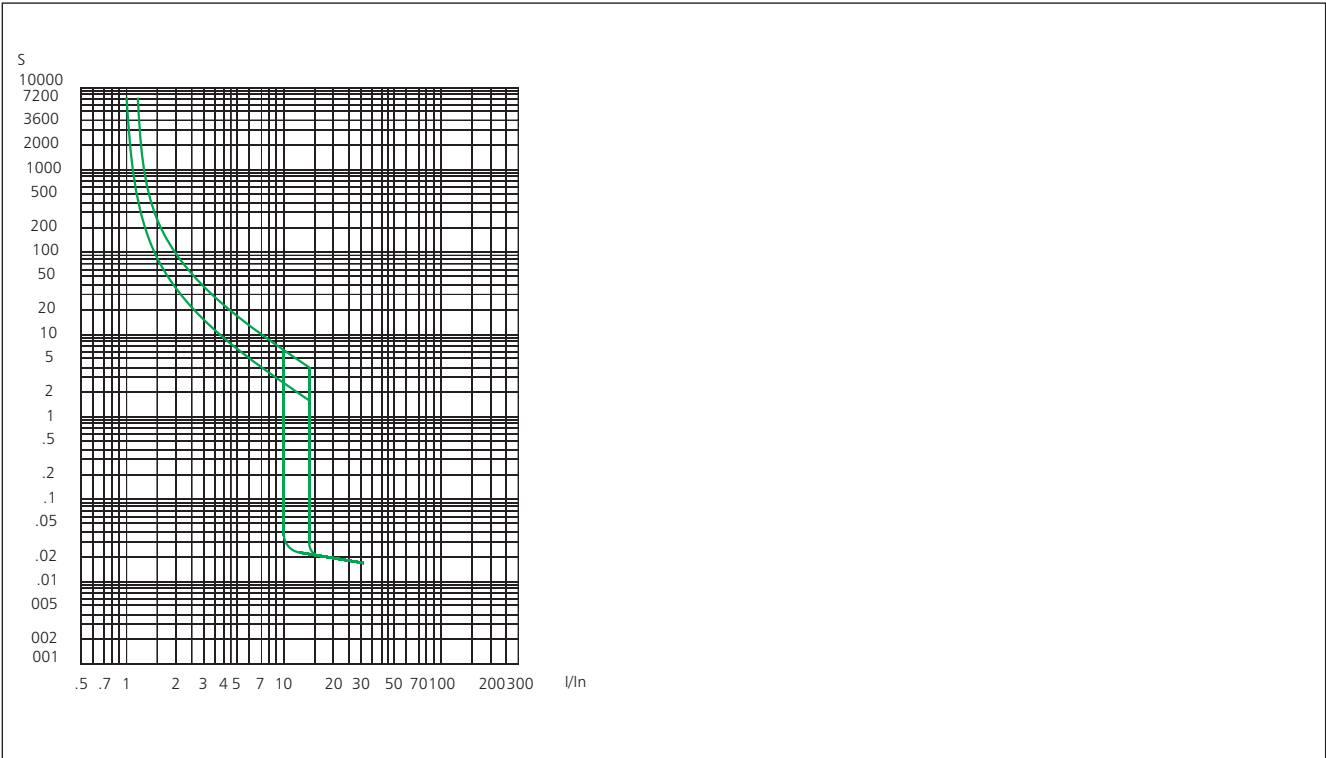
NM8-400, 630 (250A~500A)



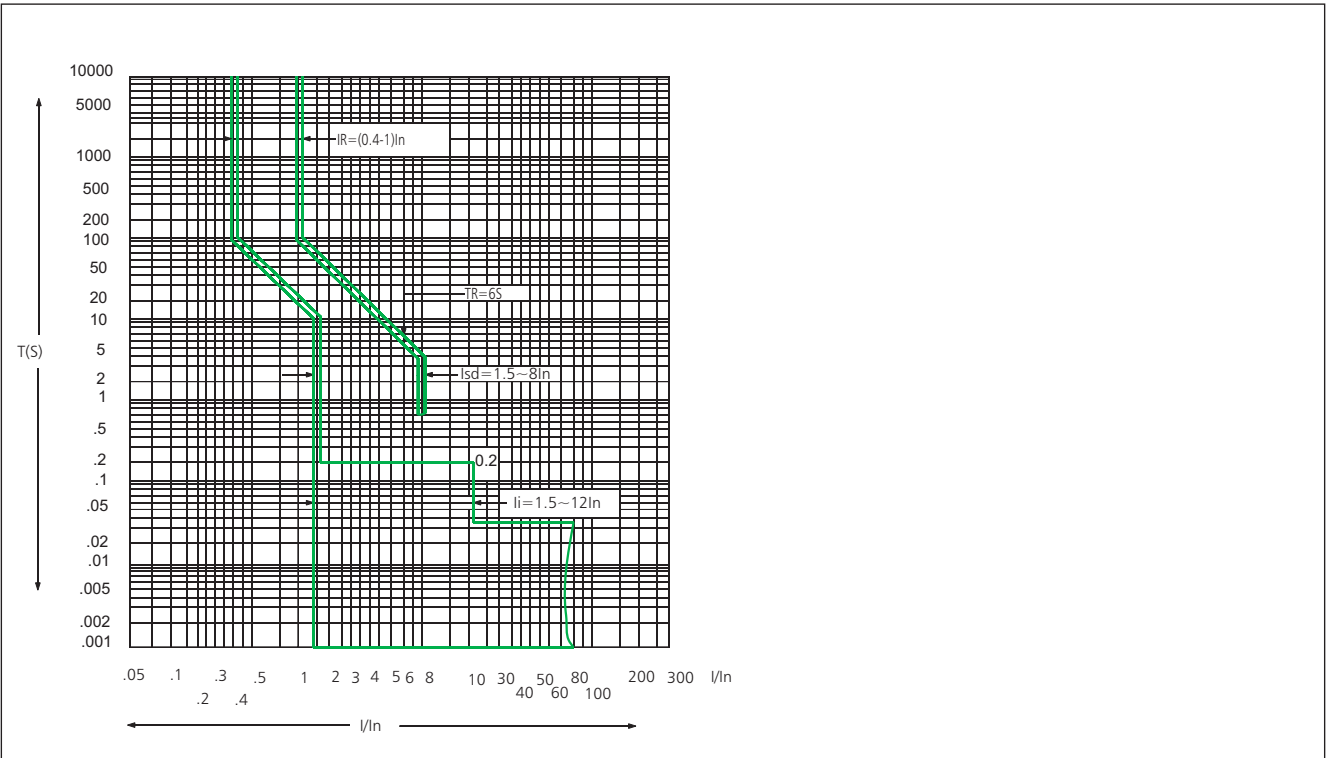
NM8-800 (630A, 700A, 800A)  
NM8-1250(630A, 700A, 800A, 1000A, 1250A)



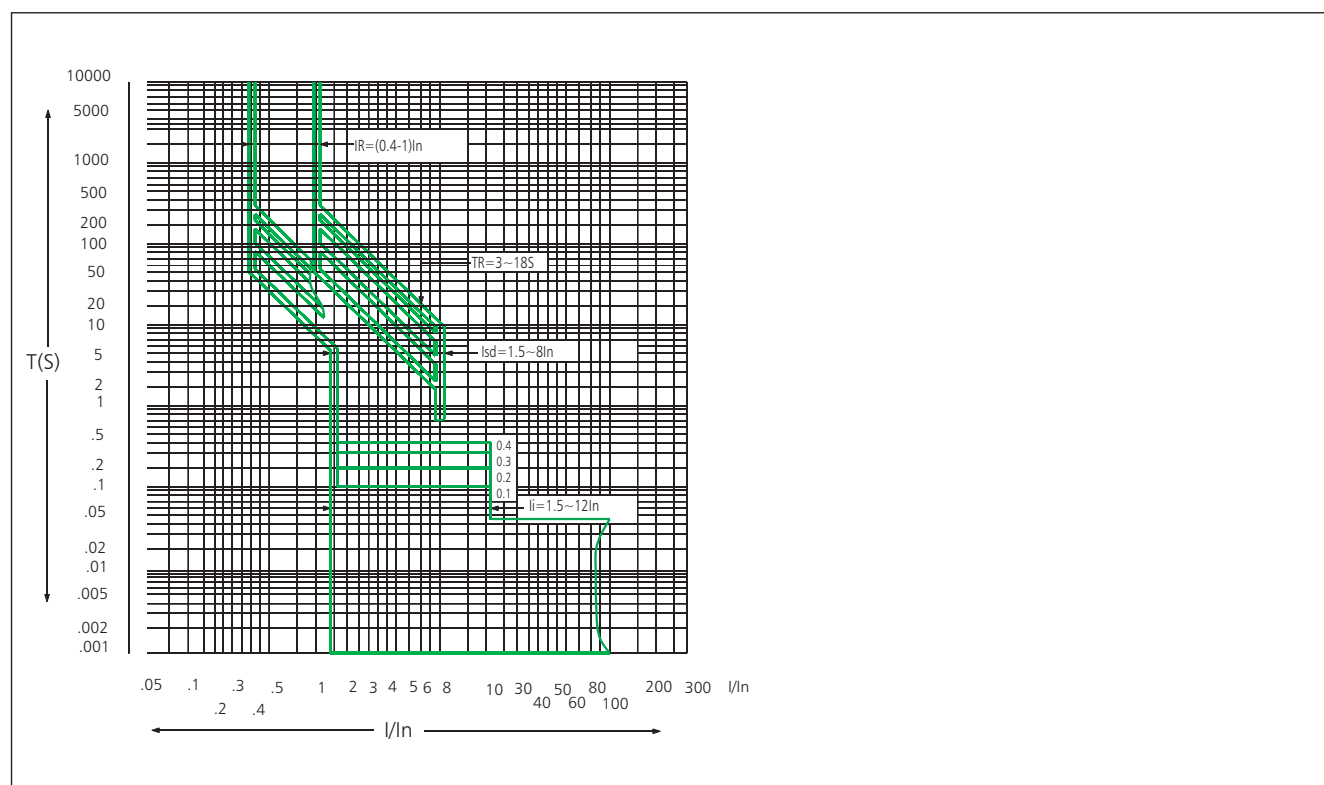
Motor protection release NM8-125, 250, 400, 630 (16A~500A)



Electronic type NM8S-125, 250(16A~250A)



Intelligent release NM8S-400, 630(250A~630A)  
NM8S-800, 1250(630A~1250A)



## 7.2 Temperature compensation

When the ambient temperature slightly changes, tripping characteristics will change as well, please refer to the table below for temperature compensation correction.

7.2.1 Temperature compensation coefficient of breaker with thermo-magnetic release as follows.

| Ambient temperature                  | -40℃ | -35℃  | -30℃ | -25℃  | -20℃ | -15℃  | -10℃ | -5℃   |
|--------------------------------------|------|-------|------|-------|------|-------|------|-------|
| Temperature compensation coefficient | 1.4  | 1.375 | 1.35 | 1.325 | 1.3  | 1.275 | 1.25 | 1.225 |

| Ambient temperature                  | 0℃  | 5℃    | 10℃  | 15℃   | 20℃ | 25℃   | 30℃  | 35℃   | 40℃ | 45℃   | 50℃  | 55℃   | 60℃  | 65℃   | 70℃  |
|--------------------------------------|-----|-------|------|-------|-----|-------|------|-------|-----|-------|------|-------|------|-------|------|
| Temperature compensation coefficient | 1.2 | 1.175 | 1.15 | 1.125 | 1.1 | 1.075 | 1.05 | 1.025 | 1.0 | 0.975 | 0.95 | 0.925 | 0.90 | 0.875 | 0.85 |

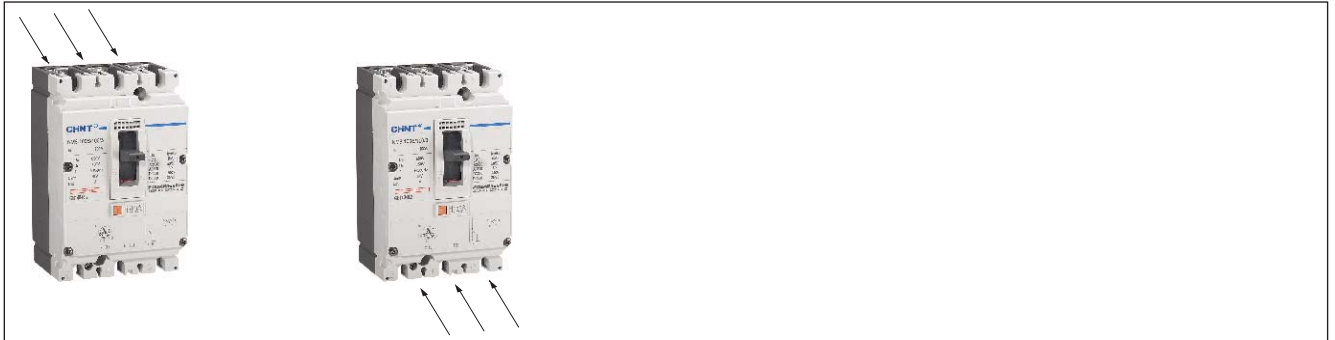
7.2.2 Temperature compensation coefficient of breaker with electronic release as follows

| Frame Level rated current | 0℃ | 5℃ | 10℃ | 15℃ | 20℃ | 25℃ | 30℃ | 35℃ | 40℃ | 45℃ | 50℃   | 55℃   | 60℃   | 65℃  | 70℃   |
|---------------------------|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-------|-------|-------|------|-------|
| NM8S-125S/H(40~125)       | 1  | 1  | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1     | 1     | 1     | 1    | 1     |
| NM8S-250S/H(125~160)      | 1  | 1  | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1     | 1     | 1     | 1    | 1     |
| NM8S-250S/H(200~250)      | 1  | 1  | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1     | 0.95  | 0.95  | 0.90 | 0.90  |
| NM8S-630S/H/R(250~400)    | 1  | 1  | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1     | 0.98  | 0.95  | 0.93 | 0.90  |
| NM8S-630S/H/R(500~630)    | 1  | 1  | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 0.98  | 0.95  | 0.93  | 0.90 | 0.88  |
| NM8S-1250S/H/R(630~800)   | 1  | 1  | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 0.975 | 0.975 | 0.95  | 0.95 | 0.925 |
| NM8S-1250S/H/R(1000~1250) | 1  | 1  | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 0.95  | 0.9   | 0.875 | 0.80 | 0.80  |

## 8. Mounting of circuit breaker

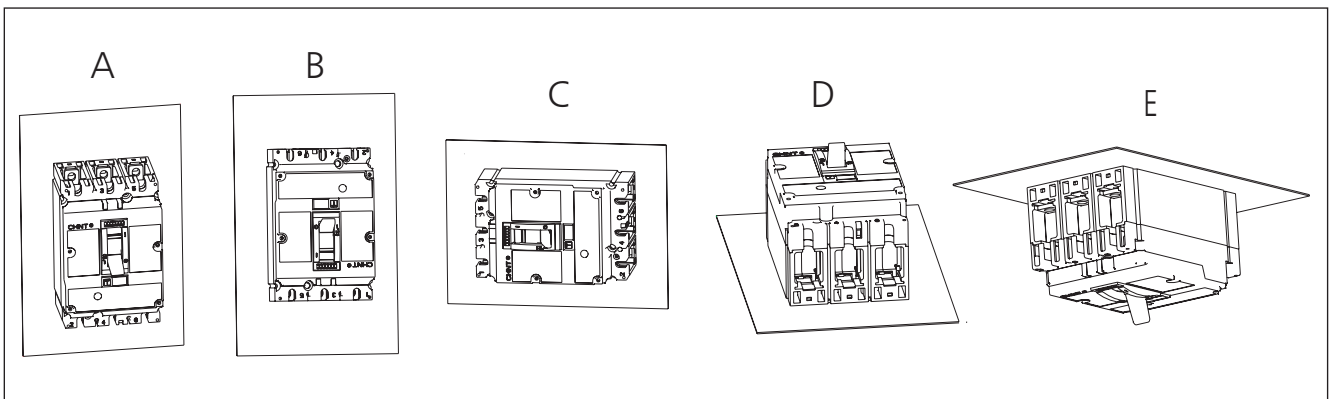
### 8.1 Modes of down-lead

Two modes of upper and lower down-lead are available; adoption of different down-lead modes will not affect normal operation of breaker, in addition, it is no need for derating.



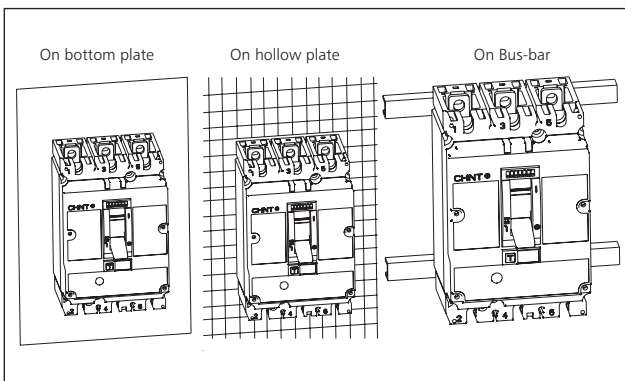
### 8.2 Modes of mounting

Mounting modes following are available for fixed and plug-in type breakers.

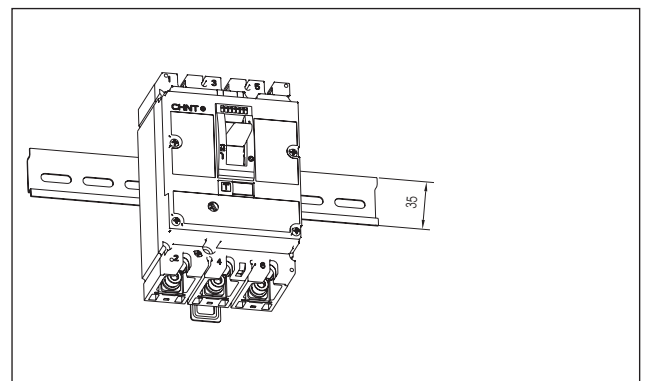


### 8.3 Modes of fixing

8.3.1 Fixing modes following are available for fixed and plug-in type breakers.

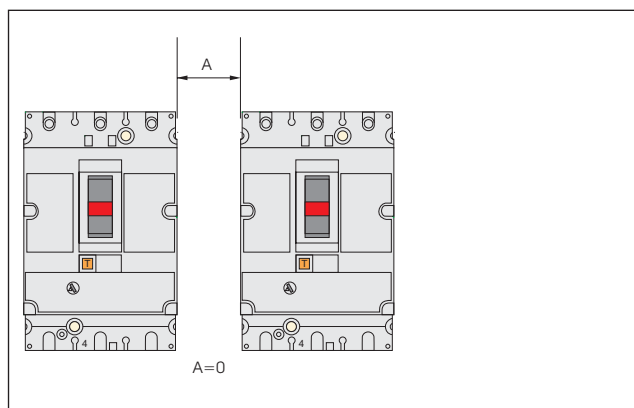


8.3.2 Fixing mode following is available for NM8(S)-125, 250 for fixed type breakers, which adopts DIN rail adaptor of front connection.

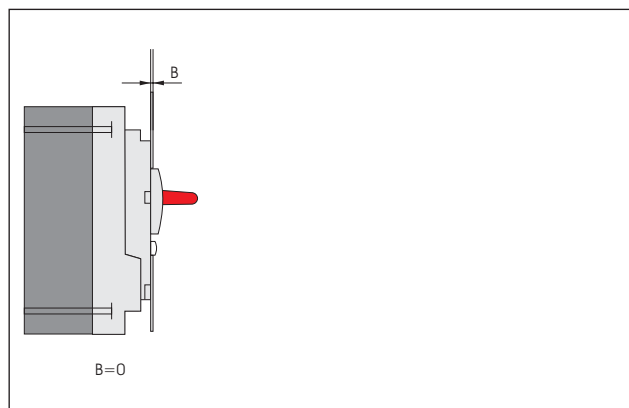


### 8.4 Secured distance

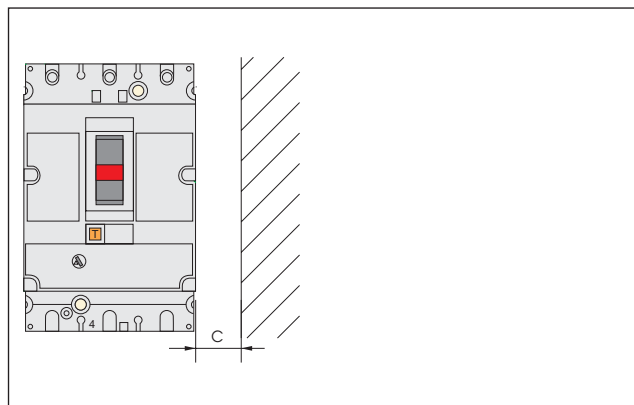
#### 8.4.1 Min. Distance between breakers



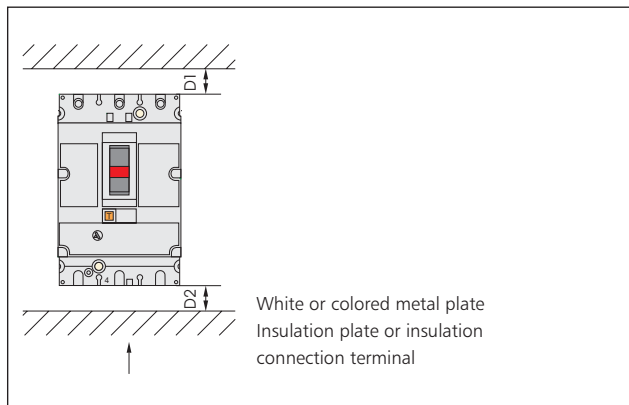
#### 8.4.2 Min. distance between breaker and surface of switchgear where the operation handle is exposed.



#### 8.4.3 Min. distance between breaker and side of switchgear



#### 8.4.4 Min. distance between top and bottom of breaker



| NM8 Breaker                      | Ue              | C  | Insulation plate or insulation connection terminal(mm) |     | White or colored metal plate(mm) |     |
|----------------------------------|-----------------|----|--------------------------------------------------------|-----|----------------------------------|-----|
|                                  |                 |    | D1                                                     | D2  | D1                               | D2  |
| NM8-125<br>NM8S-125              | $U_e \leq 440V$ | 10 | 30                                                     | 30  | 35                               | 35  |
|                                  | $U_e < 600V$    | 20 | 30                                                     | 30  | 35                               | 35  |
|                                  | $U_e \geq 600V$ | 30 | 30                                                     | 30  | 35                               | 35  |
| NM8-250<br>NM8S-250              | $U_e \leq 440V$ | 10 | 30                                                     | 30  | 35                               | 35  |
|                                  | $U_e < 600V$    | 20 | 30                                                     | 30  | 35                               | 35  |
|                                  | $U_e \geq 600V$ | 30 | 30                                                     | 30  | 35                               | 35  |
| NM8-400, 630,<br>NM8S-400, 630   | $U_e \leq 440V$ | 10 | 30                                                     | 30  | 60                               | 60  |
|                                  | $U_e < 600V$    | 20 | 30                                                     | 30  | 60                               | 60  |
|                                  | $U_e \geq 600V$ | 30 | 30                                                     | 30  | 100                              | 100 |
| NM8-800, 1250,<br>NM8S-800, 1250 | $U_e \leq 690V$ | 50 | 130                                                    | 100 | 70                               | 70  |

Note: when voltage is  $\geq 500V$ , extended terminal cover should be mounted

8.5 Modes of connection

8.5.1 Cable connection plug and Copper busbar

a. Screw is used to connect with copper (aluminum) cable connection plug or copper busbar

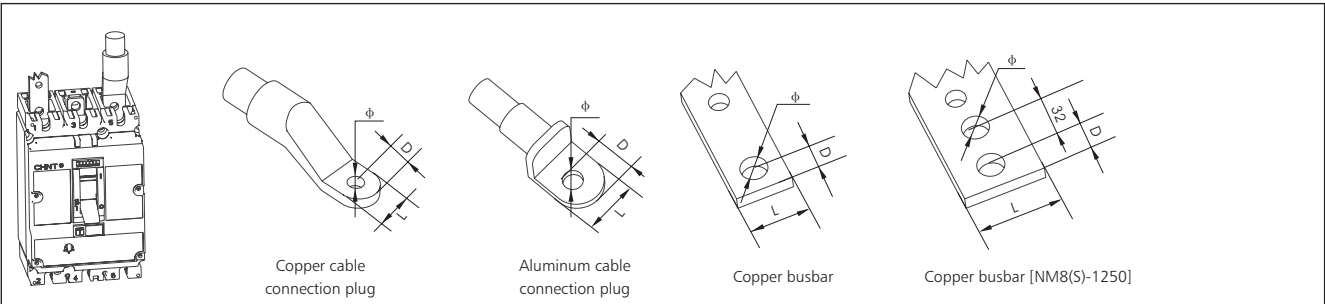
Size of connection screw

NM8-125: M6

NM8S-125、NM8-250、NM8S-250: M8

NM8-400, 630、NM8S-400, 630: M10

NM8-800, 1250、NM8S-800, 1250: M10



| Dimension                            | NM8-125   | NM8S-125<br>NM8-250<br>NM8S-250 | NM8-400, 630<br>NM8S-400, 630 | NM8-800, 1250<br>NM8S-800, 1250 |
|--------------------------------------|-----------|---------------------------------|-------------------------------|---------------------------------|
| Distance between different poles(mm) | 30        | 35                              | 45                            | 70                              |
| L(mm)                                | $\leq 15$ | $\leq 25$                       | $\leq 32$                     | $\leq 50$                       |
| D(mm)                                | $\leq 7$  | $\leq 10$                       | $\leq 16$                     | $\leq 16$                       |
| $\phi$ (mm)                          | $>6$      | $>8$                            | $>10$                         | $>11$                           |

b. With front connection and use screw to connect with copper (aluminum) cable connection plate or copper busbar

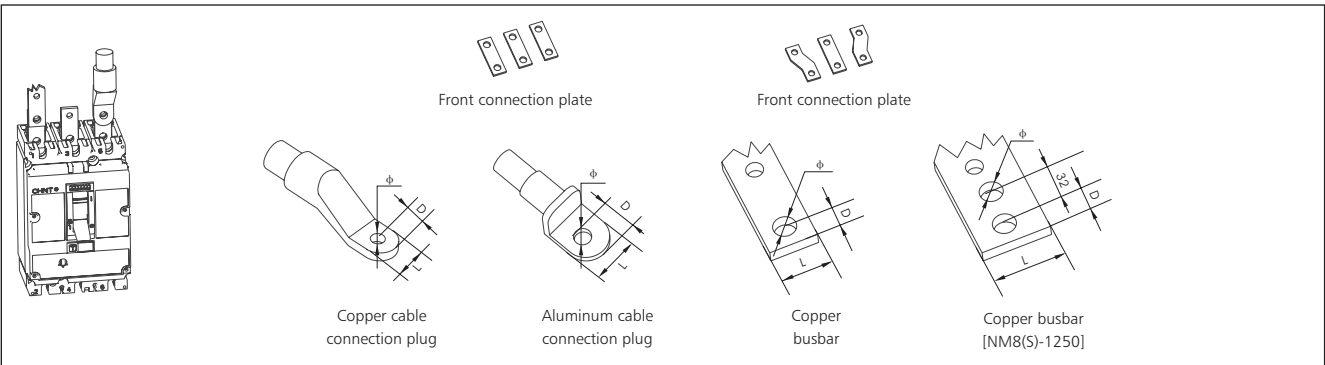
Size of connection screw

NM8-125: M6

NM8S-125, NM8-250、NM8S-250: M8

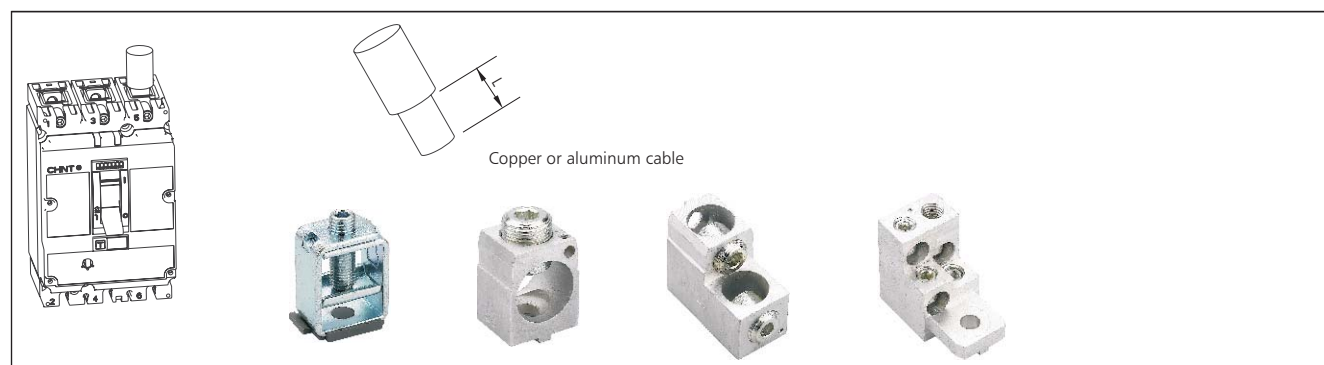
NM8-400, 630, NM8S-400, 630: M12

NM8-800, 1250, NM8S-800, 1250: M10



| Dimension                            | NM8-125 | NM8S-125<br>NM8-250<br>NM8S-250 | NM8-400, 630<br>NM8S-400, 630 |      | NM8-800, 1250<br>NM8S-800, 1250 |
|--------------------------------------|---------|---------------------------------|-------------------------------|------|---------------------------------|
| Distance between different poles(mm) | 30      | 35                              | 52.5                          | 70   | 70                              |
| L(mm)                                | ≤ 15    | ≤ 25                            | ≤ 40                          | ≤ 60 | ≤ 50                            |
| D(mm)                                | ≤ 7     | ≤ 10                            | ≤ 20                          | ≤ 20 | ≤ 16                            |
| Φ (mm)                               | >6      | >8                              | >12                           | >12  | >11                             |

### 8.5.2 Connection of bare cable



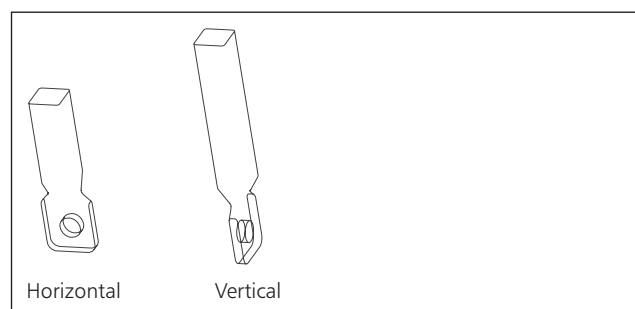
| Dimension             | NM8-125 | NM8S-125<br>NM8-250<br>NM8S-250 |
|-----------------------|---------|---------------------------------|
| L(mm)                 | 16      | 20                              |
| CSA(mm <sup>2</sup> ) | 2.5~70  | 2.5~185                         |

| Dimension             | NM8-400, 630<br>NM8S-400, 630 |        |        |
|-----------------------|-------------------------------|--------|--------|
| Number of cable       | 1                             | 2      | 4      |
| L(mm)                 | 26                            | 30, 60 | 30     |
| CSA(mm <sup>2</sup> ) | 35~370                        | 35~185 | 35~125 |

### 8.5.3 Rear connection

For rear connection, cable connection plug should be used for connection with copper busbar.

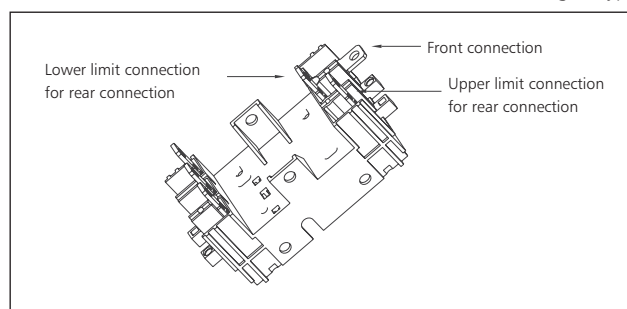
Rear connection



### 8.5.4 Plug-in type connection

Two modes of front and rear connection are available; for rear connection, upper limit or lower limit connection is used.

Plug-in type



### 8.5.5 Standard CSA of copper cable or busbar used for connection

| Rated current(A)                      |               | 16  | 20  | 25  | 32  | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 | 250 | 315 | 350 | 400 | 500    | 630    | 700    | 800    | 1000   | 1250   |
|---------------------------------------|---------------|-----|-----|-----|-----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|--------|--------|--------|--------|--------|--------|
| Cross section area (mm <sup>2</sup> ) | Copper cable  | 2.5 | 2.5 | 4.0 | 6.0 | 10 | 10 | 16 | 25 | 35  | 50  | 70  | 95  | 120 | 185 | 185 | 240 | 2×150  | 2×185  | 2×240  | 2×240  | -      | -      |
|                                       | Copper busbar | -   | -   | -   | -   | -  | -  | -  | -  | -   | -   | -   | -   | -   | -   | -   | -   | 2×30×5 | 2×40×5 | 2×50×5 | 2×50×5 | 2×60×5 | 2×70×5 |

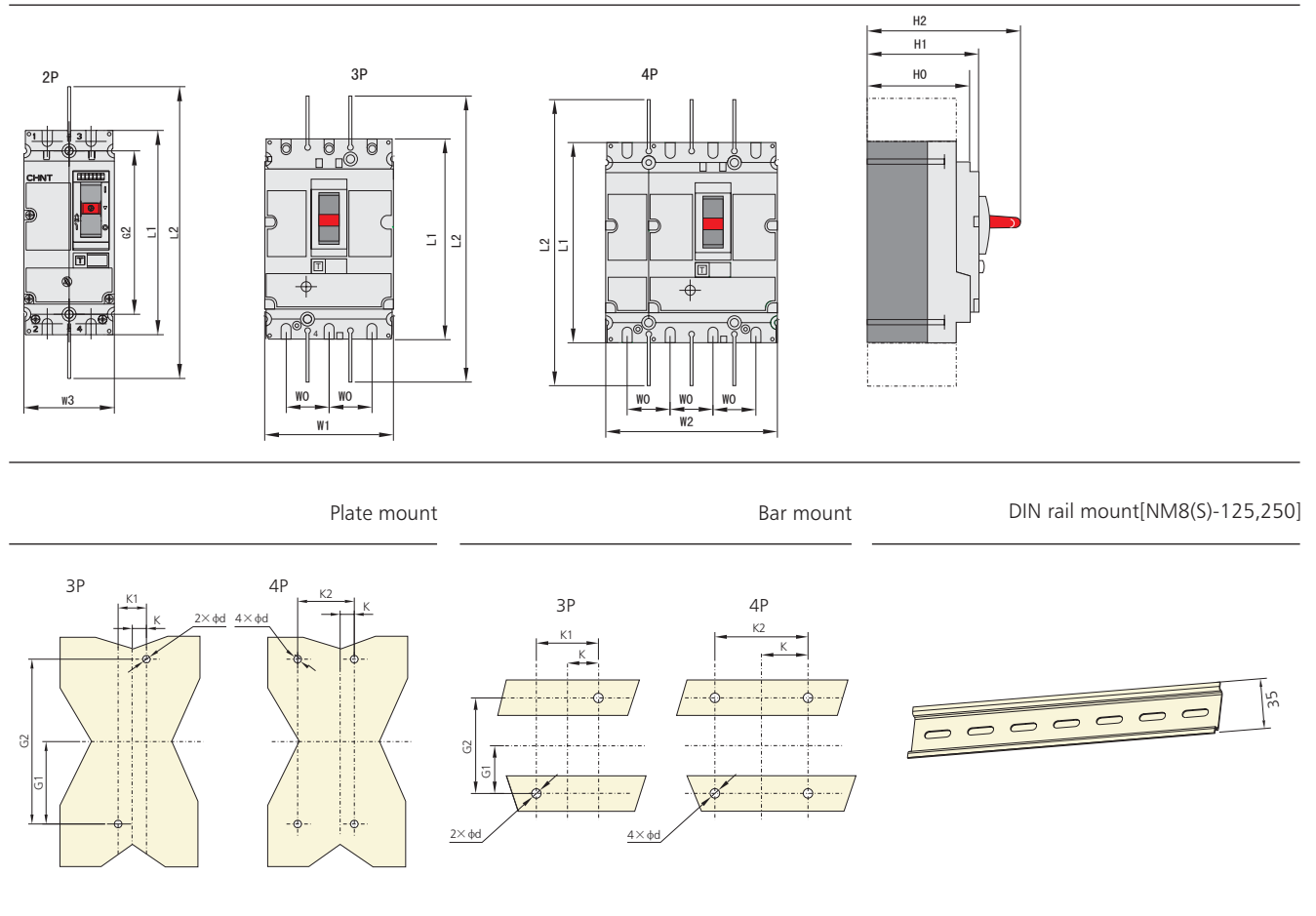


### 8.5.6 Usual cross sections for conductors according intensity

| In(A) | Copper conductors                     | Copper bar                         |
|-------|---------------------------------------|------------------------------------|
|       | Cross Section Area (mm <sup>2</sup> ) | Dimensions Area (mm <sup>2</sup> ) |
| 10    | 1.5                                   | —                                  |
| 16    | 2.5                                   | —                                  |
| 20    | 2.5                                   | —                                  |
| 25    | 4                                     | —                                  |
| 32    | 6                                     | —                                  |
| 40    | 10                                    | —                                  |
| 63    | 16                                    | —                                  |
| 80    | 25                                    | —                                  |
| 100   | 35                                    | —                                  |
| 125   | 50                                    | —                                  |
| 160   | 70                                    | —                                  |
| 200   | 95                                    | —                                  |
| 250   | 120                                   | —                                  |
| 315   | 185                                   | —                                  |
| 400   | 240                                   | —                                  |
| 500   | 2 × 150                               | 2 × 30 × 5                         |
| 630   | 2 × 185                               | 2 × 40 × 5                         |
| 800   | 2 × 240                               | 2 × 50 × 5                         |
| 1000  | —                                     | 2 × 60 × 5                         |
| 1250  | —                                     | 2 × 80 × 5                         |

### 8.6 Overall and Mounting Dimensions

#### 8.6.1 Overall and mounting dimensions of fixed type for front connection

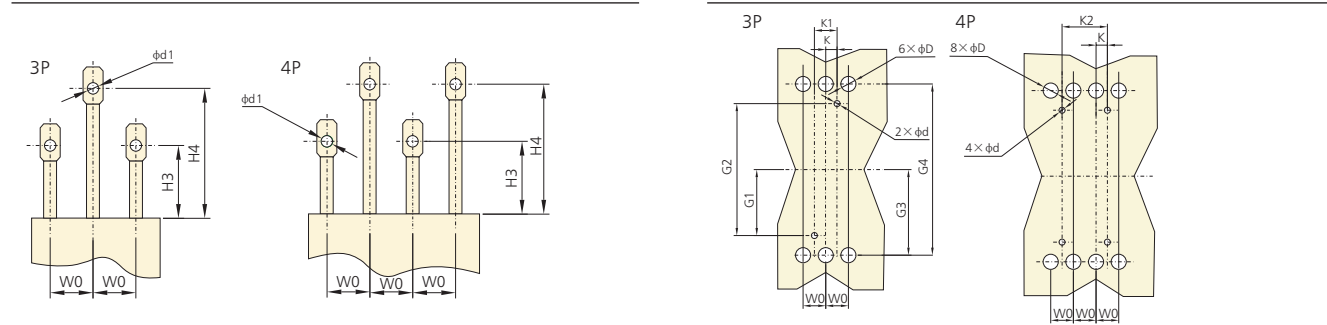


(mm)

| Model                        | L1  | L2  | H0  | H1  | H2  | K    | K1 | K2  | G1   | G2  | W0 | W1  | W2  | W3 | d |
|------------------------------|-----|-----|-----|-----|-----|------|----|-----|------|-----|----|-----|-----|----|---|
| NM8-125                      | 140 | 240 | 72  | 79  | 103 | 15   | 30 | 60  | 56   | 112 | 30 | 90  | 120 | 62 | 6 |
| NM8S-125/NM8-250/NM8S-250    | 157 | 357 | 82  | 88  | 126 | 17.5 | 35 | 70  | 62.5 | 125 | 35 | 105 | 140 | 70 | 6 |
| NM8-400, 630/NM8S-400, 630   | 255 | 474 | 95  | 113 | 168 | 22.5 | 45 | 90  | 100  | 200 | 45 | 140 | 185 | -  | 6 |
| NM8-800, 1250/NM8S-800, 1250 | 370 | 570 | 132 | 144 | 206 | 35   | 70 | 140 | 120  | 240 | 70 | 210 | 280 | -  | 7 |

### 8.6.2 Overall and mounting dimensions of fixed type for rear connection

Plate mount



(mm)

| Model                     | H3 | H4  | W0 | K    | K1 | K2 | G1   | G2  | G3    | G4  | d | d1 | D  |
|---------------------------|----|-----|----|------|----|----|------|-----|-------|-----|---|----|----|
| NM8-125                   | 47 | 87  | 30 | 15   | 30 | 60 | 56   | 112 | 62.5  | 125 | 6 | 6  | 15 |
| NM8S-125/NM8-250/NM8S-250 | 57 | 97  | 35 | 17.5 | 35 | 70 | 62.5 | 125 | 72    | 144 | 6 | 8  | 20 |
| NM8-400/NM8S-400          | 56 | 100 | 45 | 22.5 | 45 | 90 | 100  | 200 | 113.5 | 227 | 6 | 13 | 32 |
| NM8-630/NM8S-630          | 56 | 100 | 45 | 22.5 | 45 | 90 | 100  | 200 | 113.5 | 227 | 6 | 13 | 32 |

### 8.6.3 Overall and mounting dimension of plug-in type

Plate mount

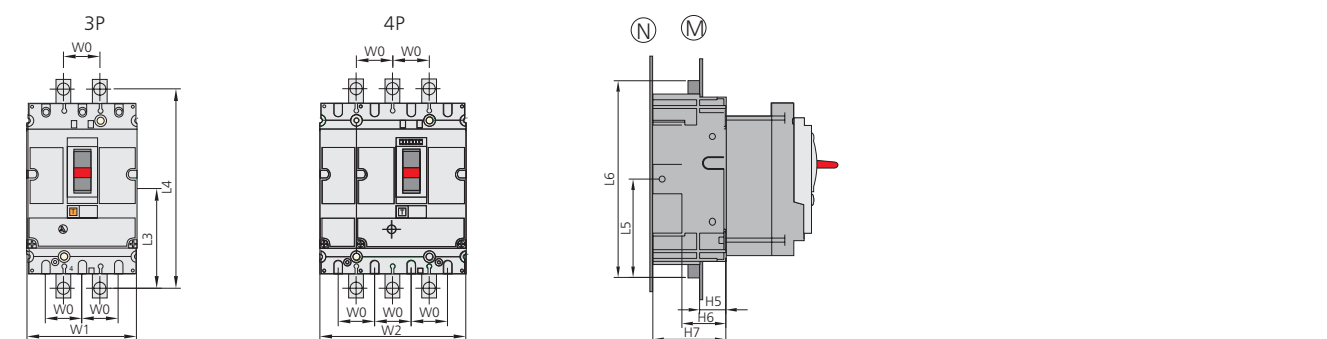
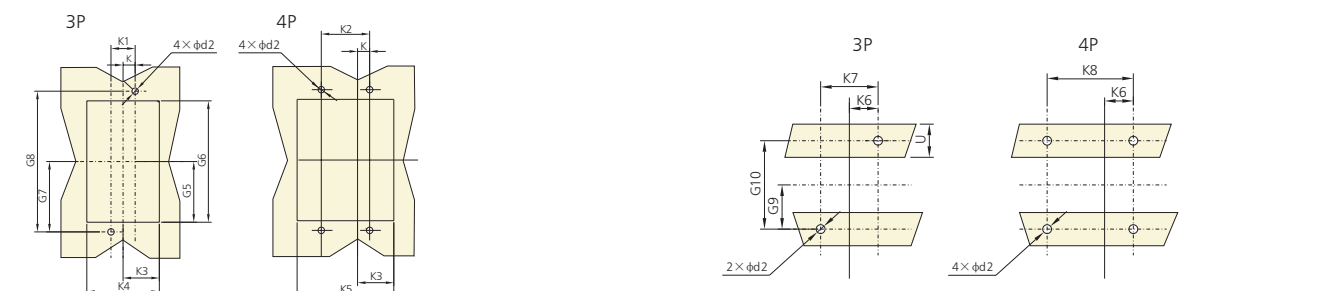


Plate mount

Bar mount



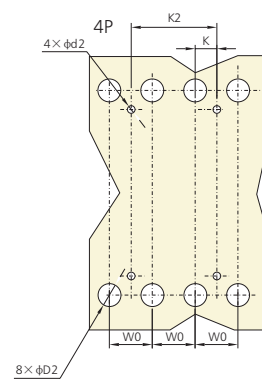
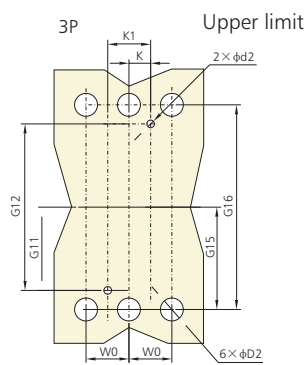
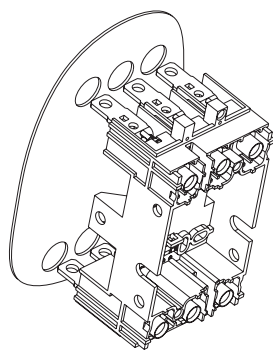
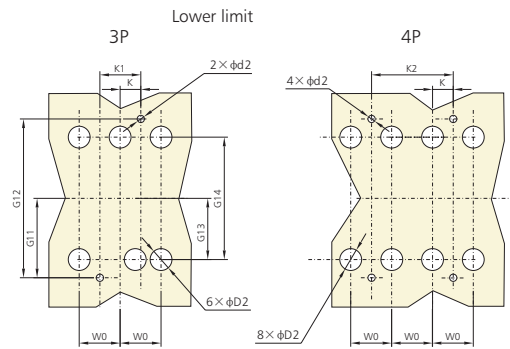
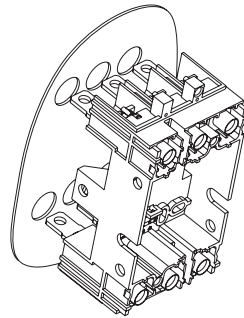
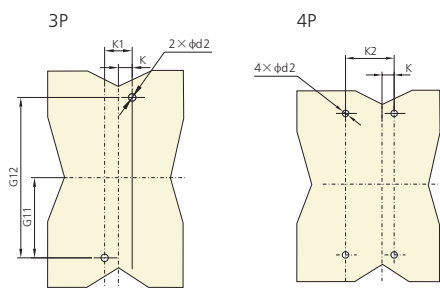
# Moulded Case Circuit Breakers

## NM8, NM8S



Plate mount (N) front connection  
Insulation barrier must be mounted  
between mounting plate and breaker base

Plate mount (N) rear connection  
Insulation barrier must be mounted  
between mounting plate and breaker base

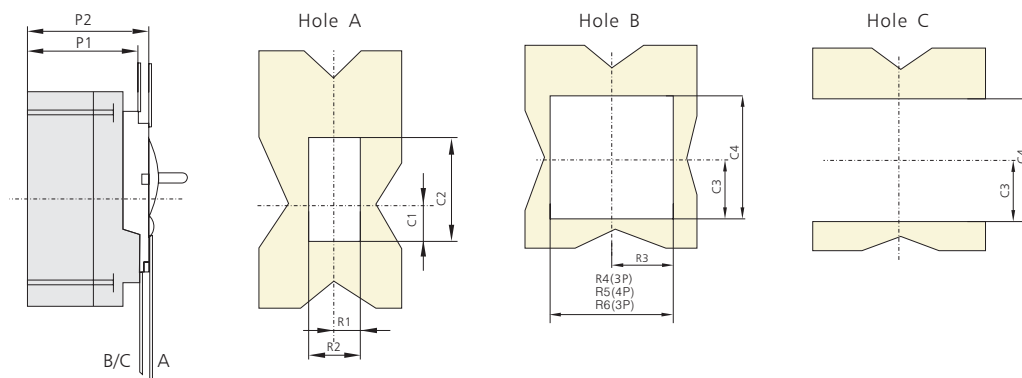


(mm)

| Model                      | W0 | W1  | W2  | L5    | L6  | H5 | H6 | H7 | K    | K1 | K2 | K3   | K4  | K5  | K6 | K7 |
|----------------------------|----|-----|-----|-------|-----|----|----|----|------|----|----|------|-----|-----|----|----|
| NM8-125                    | 30 | 90  | 120 | 90    | 180 | 24 | 40 | 67 | 15   | 30 | 60 | 47   | 94  | 124 | 30 | 60 |
| NM8S-125/NM8-250/NM8S-250  | 35 | 105 | 140 | 102.5 | 205 | 27 | 45 | 75 | 17.5 | 35 | 70 | 54.5 | 109 | 144 | 35 | 70 |
| NM8-400, 630/NM8S-400, 630 | 45 | 140 | 185 | 157.5 | 315 | 27 | 45 | 45 | 22.5 | 45 | 90 | 71.5 | 143 | 188 | 45 | 90 |

| Model                      | K8  | G5  | G6  | G7   | G8    | G9   | G10 | G11  | G12 | G13  | G14 | G15  | G16 | d2 | D2 | U    |
|----------------------------|-----|-----|-----|------|-------|------|-----|------|-----|------|-----|------|-----|----|----|------|
| NM8-125                    | 90  | 77  | 154 | 85.2 | 170.4 | 32.5 | 65  | 68   | 136 | 54.5 | 109 | 70.5 | 141 | 6  | 26 | ≤ 32 |
| NM8S-125/NM8-250/NM8S-250  | 105 | 87  | 174 | 95   | 190   | 37.5 | 75  | 77.5 | 155 | 61   | 122 | 79   | 158 | 6  | 30 | ≤ 32 |
| NM8-400, 630/NM8S-400, 630 | 140 | 137 | 274 | 150  | 300   | 75   | 150 | 125  | 250 | 100  | 200 | 126  | 252 | 6  | 33 | ≤ 32 |

### 8.6.4 Flush type (for fixed or plug-in type)



(mm)

| Model                      | P1  | P2  | R1   | R2 | R3   | R4  | R5  | R6 | C1   | C2  | C3   | C4  |
|----------------------------|-----|-----|------|----|------|-----|-----|----|------|-----|------|-----|
| NM8-125                    | 73  | 80  | 13   | 26 | 46.5 | 93  | 123 | 65 | 26   | 68  | 50.5 | 101 |
| NM8S-125/NM8-250/NM8S-250  | 83  | 90  | 14.5 | 29 | 54   | 108 | 143 | 73 | 33   | 78  | 56.5 | 113 |
| NM8-400, 630/NM8S-400, 630 | 109 | 114 | 26.5 | 53 | 71.5 | 143 | 188 | -  | 41.5 | 116 | 108  | 205 |

### 9. Accessories

#### 9.1 Inner accessories

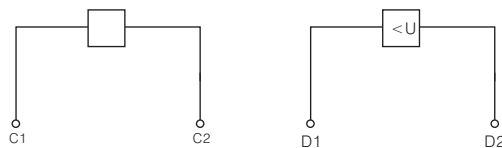
##### 9.1.1 Shunt release

$U_s = 70 \sim 110\%U_n$ , circuit breaker reliably operates  
Long-time electrification is prohibited  
Time of response: pulsive type  $\geq 20\text{ms}$ ,  $\leq 60\text{ms}$

##### 9.1.2 Under-voltage release

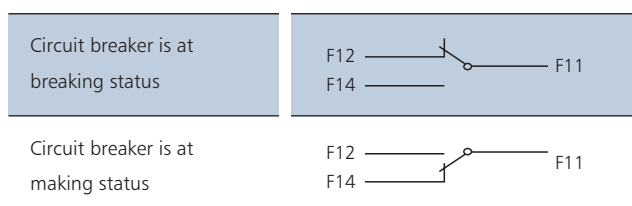
$U_s = 35 \sim 70\%U_n$ , circuit breaker reliably breaks  
 $U_s \geq 85\%U_n$ , circuit breaker reliably closes  
 $U_s < 35\%U_n$ , prevent circuit breaker from making  
Note: With under-voltage release,  $U_s \geq 85\%U_n$ , circuit breaker normally makes and breaks

Shunt release Wiring diagram Under-voltage release Wiring diagram

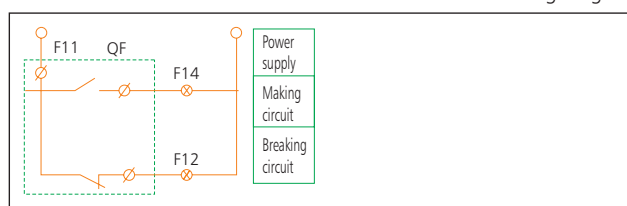


##### 9.1.3 Auxiliary contact

Function: Indication of contacting status



Wiring diagram



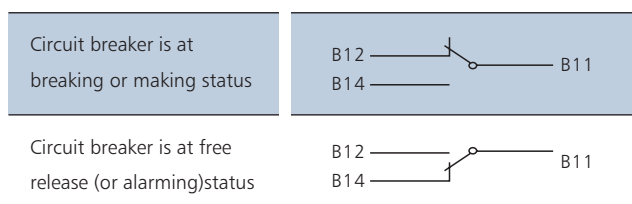
##### 9.1.4 Alarm contact

Function: indication of reason for circuit breaker releasing;

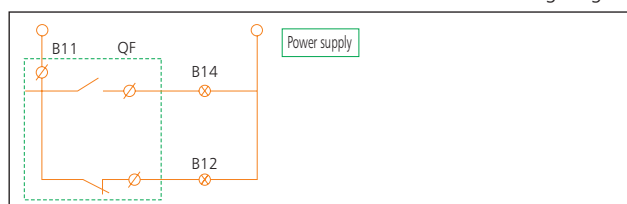
- \* Over-load
- \* Short-circuit
- \* Grounding fault
- \* Operation of under-voltage releasing or free tripping

When circuit breaker normally makes and breaks, alarm contact not operates.

After free tripping(or tripping due to failure), alarm contact operates and after the circuit breaker again normally operates, alarm contact recovers original status.



Wiring diagram



| Accessory                        | Code                                | Mounting and wiring mode      |                               |                                 |
|----------------------------------|-------------------------------------|-------------------------------|-------------------------------|---------------------------------|
|                                  |                                     |                               |                               |                                 |
|                                  |                                     | NM8-125, 250<br>NM8S-125, 250 | NM8-400, 630<br>NM8S-400, 630 | NM8-800, 1250<br>NM8S-800, 1250 |
|                                  |                                     | 3P, 4P                        | 3P, 4P                        | 3P, 4P                          |
| No accessory                     |                                     |                               |                               |                                 |
| Alarm contact                    | AL                                  |                               |                               |                                 |
| Shunt release                    | SM: AC220V, SQ: AC380V<br>SB: DC24V |                               |                               |                                 |
| Auxiliary contact                | AX                                  |                               |                               |                                 |
| Under-voltage release            | UM: AC220V<br>UQ: AC380V            |                               |                               |                                 |
| Shunt release                    | SM: AC220V, SQ: AC380V, SB: DC24V   |                               |                               |                                 |
| Auxiliary contact                | AX                                  |                               |                               |                                 |
| Two groups of auxiliary contact  | AX, AX                              |                               |                               |                                 |
| Auxiliary contact                | AX                                  |                               |                               |                                 |
| Under-voltage release            | UM: AC220V, UQ: AC380V              |                               |                               |                                 |
| Shunt release                    | SM: AC220V, SQ: AC380V, SB: DC24V   |                               |                               |                                 |
| Alarm contact                    | AL                                  |                               |                               |                                 |
| Auxiliary contact                | AX                                  |                               |                               |                                 |
| Alarm contact                    | AL                                  |                               |                               |                                 |
| Under-voltage release            | AL                                  |                               |                               |                                 |
| Alarm contact                    | AL                                  |                               |                               |                                 |
| Shunt release                    | SM: AC220V, SQ: AC380V, SB: DC24V   |                               |                               |                                 |
| Auxiliary contact, alarm         | AX, AL                              |                               |                               |                                 |
| Two groups of auxiliary contact  | AX, AX                              |                               |                               |                                 |
| Alarm contact                    | AL                                  |                               |                               |                                 |
| Auxiliary contact, alarm contact | AX, AL                              |                               |                               |                                 |
| Under-voltage release            | (UM: AC220V, UQ: AC380V)            |                               |                               |                                 |

■-Shunt release      ▲-Under-voltage release      ○-Auxiliary contact      ●-Alarm contact

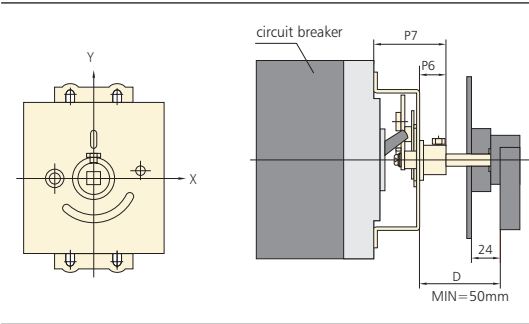
Note: 1: For NM8-125, 250, 400, 630, NM8S-125, 250, 400, 630, under-voltage and shunt release couldn't be simultaneously equipped on one breaker.

2: For NM8-800, 1250, NM8S-800, 1250, at most three auxiliary contacts could be equipped, under-voltage and shunt release could be simultaneously equipped on one breaker, in addition, their positions could be exchanged.

9.2 External accessories

9.2.1 Economic extended rotary handle

Protection degree: IP30  
Functions: Isolation function indication;  
0(breaking), 1(making)and free tripping indication;  
At "OFF" status, the breaker can be fitted with 1-3  
padlocks with a diameter of 5-8mm(by customer),  
This prevents the door of switchgear being opened  
unwantly.

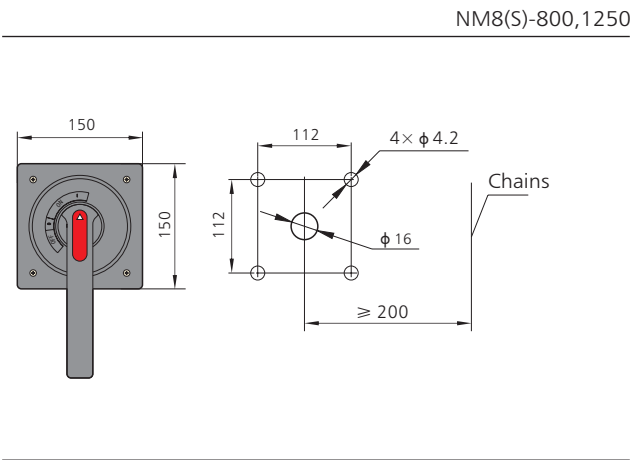
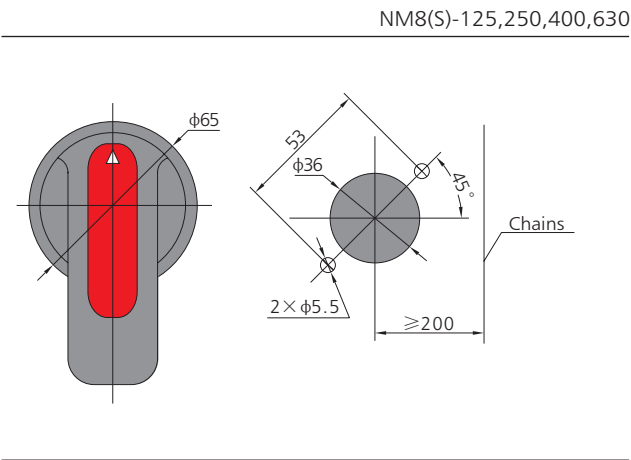


(mm)

| Dimension | NM8-125 | NM8S-125, NM8-250, NM8S-250 | NM8-400, NM8S-400 | NM8-630, NM8S-630 | NM8(S)-800 | NM8(S)-1250 |
|-----------|---------|-----------------------------|-------------------|-------------------|------------|-------------|
| P6        | 14      | 14                          | 20                | 20                | 21         | 21          |
| P7        | 56      | 56                          | 60                | 60                | 103        | 103         |



Handle mounting (mm)



9.2.2 Direct rotary handle

Protection degree: IP40

Functions:

Reliable insulation;

Isolation function indication;

0(breaking), 1(making) and free tripping indication;

Realize free tripping of circuit breaker;

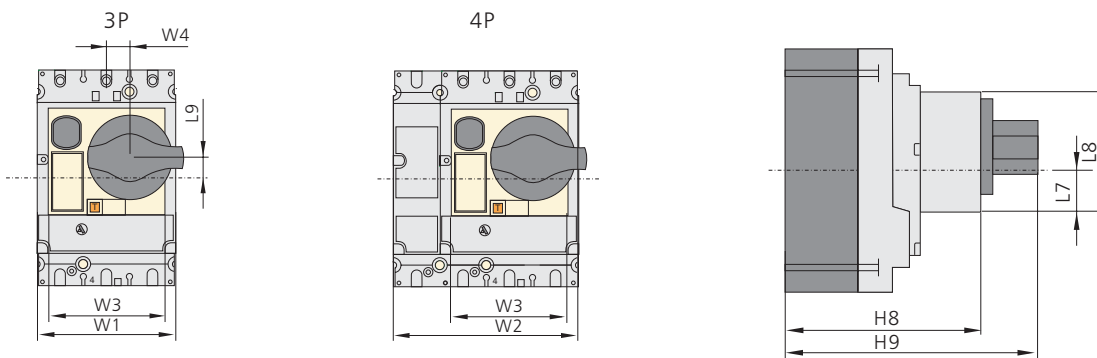
At "OFF" status, the breaker can be fitted with 1-3

padlocks with a diameter of

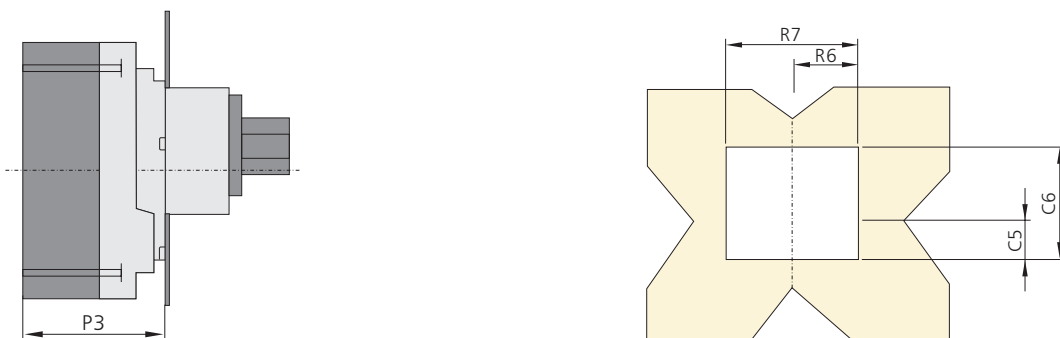
5~8mm (by customer).



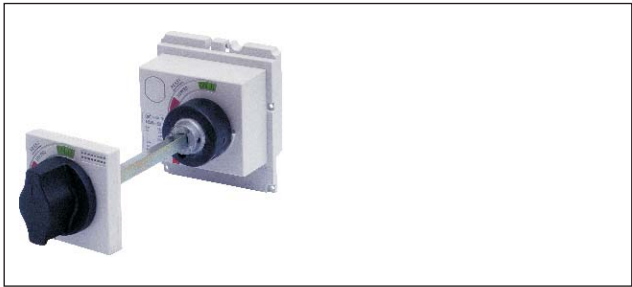
Direct rotary handle



Front boring(fixed or plug-in circuit breaker)



9.2.3 Extended rotary handle  
Protection degree: IP55  
Functions:  
Reliable insulation;  
Isolation function indication;  
0(breaking), 1(making) and free tripping indication;  
When the door is open, the release can be set  
and the breaker will not make;  
At "OFF" status, the breaker can be fitted with 1~3  
padlocks with a diameter of 5~8mm (by customer).  
Then door of the switchgear can be opened.



Front boring(fixed or plug-in circuit breaker)(mm)



(mm)

| Model    | W1 | W2  | W3  | W4    | L7 | L8  | L9   | H8  | H9  | P3  | P4             | R6 | R7  | C5   | C6  | G17 | G18 |
|----------|----|-----|-----|-------|----|-----|------|-----|-----|-----|----------------|----|-----|------|-----|-----|-----|
| NM8-125  | 30 | 90  | 76  | 15.25 | 37 | 70  | 13.3 | 114 | 148 | 80  | ≥ 175<br>≤ 600 | 39 | 78  | 38   | 72  | 36  | 72  |
| NM8S-125 |    |     |     |       |    |     |      |     |     |     |                |    |     |      |     |     |     |
| NM8-250  | 35 | 105 | 93  | 9.25  | 39 | 73  | 9    | 125 | 159 | 90  | ≥ 175<br>≤ 600 | 48 | 96  | 40.5 | 76  | 36  | 72  |
| NM8S-250 |    |     |     |       |    |     |      |     |     |     |                |    |     |      |     |     |     |
| NM8-400  | 45 | 140 | 122 | 5     | 69 | 121 | 24.5 | 148 | 198 | 115 | ≥ 175<br>≤ 600 | 62 | 124 | 70.5 | 124 | 36  | 72  |
| NM8S-400 |    |     |     |       |    |     |      |     |     |     |                |    |     |      |     |     |     |
| NM8-630  | 45 | 140 | 122 | 5     | 69 | 121 | 24.5 | 148 | 198 | 115 | ≥ 175<br>≤ 600 | 62 | 124 | 70.5 | 124 | 36  | 72  |
| NM8S-630 |    |     |     |       |    |     |      |     |     |     |                |    |     |      |     |     |     |



9.2.4 Motor-driven mechanism

Protection degree: IP40

Functions:

Reliable insulation;

Isolation function indication;

0(breaking), 1(making) and free tripping indication;

Free releasing of circuit breaker;

Making and breaking the breaker manually or automatically

Manual operation

Turn "manual/auto" switch to "auto" position and then turn the handle to make and break the breaker.

Automatic operation:

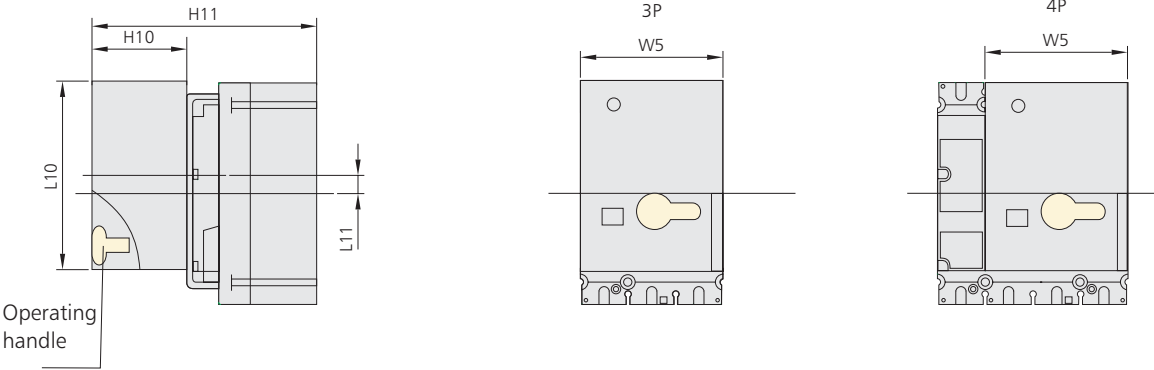
Turn "manual/auto" switch to "manual" position and then push the button to make and break the breaker remotely.

The make/break operation is carried out via pulse or self-retaining type signal control.

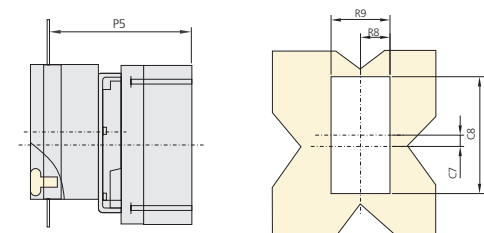
Operational range: 85%Un~110%Un.



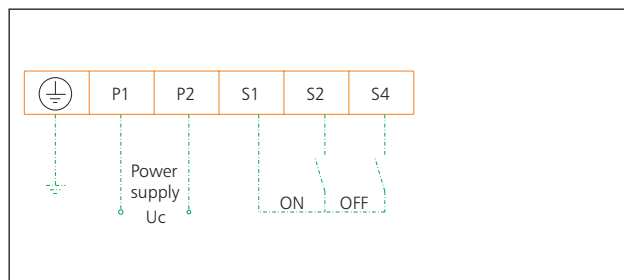
| NM8 circuit breaker                          | Rated control voltage | Electrical life   | Operational current | Power consumption |
|----------------------------------------------|-----------------------|-------------------|---------------------|-------------------|
| NM8-125                                      | 100-240V AC           | 10,000 operations | $\leq 0.5$ A        | 14VA              |
|                                              | 100-220V DC           |                   |                     | 14W               |
|                                              | 24V DC                |                   |                     | 14W               |
| NM8S-125                                     | 100-240V AC           | 10,000 operations | $\leq 0.5$ A        | 14VA              |
| NM8-250                                      | 100-220V DC           |                   |                     | 14W               |
| NM8S-250                                     | 24V DC                |                   |                     | 14W               |
| NM8-400<br>NM8S-400<br>NM8-630<br>NM8S-630   | 230V AC               | 5,000 operations  | $\leq 2$ A          | 35VA              |
|                                              | 110V AC               |                   |                     | 35VA              |
|                                              | 220V DC               |                   |                     | 35W               |
|                                              | 110V DC               |                   |                     | 35W               |
|                                              | 24V DC                |                   |                     | 35W               |
| NM8-800<br>NM8S-800<br>NM8-1250<br>NM8S-1250 | 230V/400V AC          | 3,000 operations  | $\leq 7.5$ A        | 200W              |



Front boring(fixed or plug-in circuit breaker)



Wiring diagram



(mm)

| Model                       | W5  | H10 | H11 | L10 | L11  | R8   | R9  | P5  | C7   | C8  |
|-----------------------------|-----|-----|-----|-----|------|------|-----|-----|------|-----|
| NM8-125                     | 90  | 77  | 164 | 117 | 17.3 | 46.5 | 93  | 144 | 17.3 | 120 |
| NM8S-125, NM8-250, NM8S-250 | 90  | 77  | 175 | 117 | 14.5 | 46.5 | 93  | 155 | 14.5 | 120 |
| NM8-400, NM8S-400           | 107 | 115 | 250 | 174 | 19   | 64   | 128 | 225 | 19   | 177 |
| NM8-630, NM8S-630           | 107 | 115 | 250 | 174 | 19   | 64   | 128 | 225 | 19   | 177 |
| NM8-800, NM8S-800           | -   | -   | -   | -   | -    | -    | -   | -   | -    | -   |
| NM8-1250, NM8S-1250         | -   | -   | -   | -   | -    | -    | -   | -   | -    | -   |

### 9.3 Locking system

Locking the breaker at status of making or breaking.  
The system can be fitted with 1~3 padlocks  
with a diameter of 5~8mm (by customer).

### 9.4 Terminal cover

Protection degree: IP40

Protect from being contacted with main circuit.

Selection of terminal cover:

Fixed breaker (front connection): Long terminal cover;

Fixed breaker (rear connection): Short terminal cover;

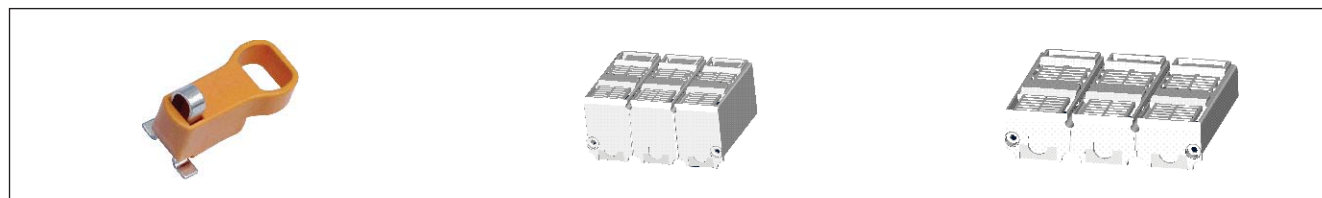
Plug-in breaker: short terminal cover;

When voltage is  $\geq 500V$ , terminal cover selected for definite connection mode

Locking system

Long terminal cover

Short terminal cover



## 10. Complementary technical information

### 10.1 Isolation function

Isolation functions of all the circuit breakers as per IEC60947/EN60947-2; Isolating position of contactors is at 0 (OFF) status. The operating handle will correctly indicate the status of 0(OFF), only if the contactor breaks.

Padlocks could be mounted after the contacts breaks;

Operation of isolation functions will realize following points:

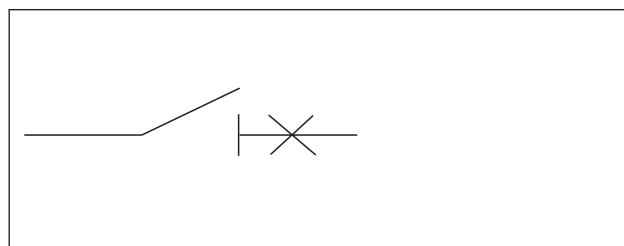
- Contacts operation correctly indicates:
  - operating reliability of interior mechanism;
- No residual current;
- Higher impulse withstands voltage for terminals at the power supply side and on-load side.

### 10.2 Current-limiting

#### 10.2.1 Current-limiting capacity

The current-limiting capacity of a circuit breaker is its aptitude to limit short-circuits current. By occurring of short-circuit, the breaker is able to limit  $I^2t$  in time so as to protect circuits and switchgear at downstream.

The exceptional limiting capacity of NM8 series is due to the rotating double-break technique, which is characterized by very rapid natural repulsion of contacts and the appearance of two arc voltages in series with a very steep wave front.



- a. Exceptional current-limiting capacity is able to greatly reduce power caused by fault current so as to enhance breaking capacity of breaker to  $I_{cs}=100\%I_{cu}$ ;
- b. The capacity has greatly released damages, which short-circuit current lay to apparatus;
- c. The capacity has greatly lowered temperature-rise so as to lengthen service life of the cable;
- d. The capacity has greatly reduced power so as to lessen distortion of contacts and bus bar;
- e. The capacity has greatly decreased interruptions to apparatus nearby.

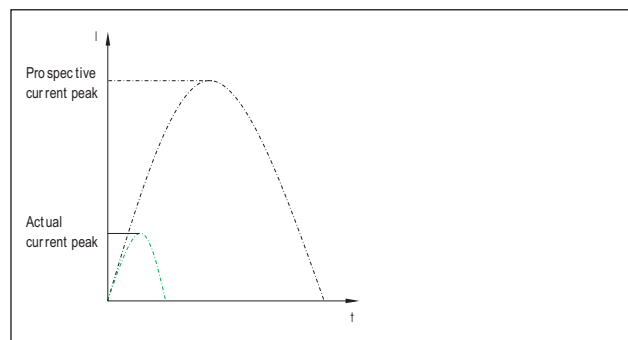
### 10.2.2 Current-limiting curves

The current-limiting capacity of a circuit breaker is expressed by two curves which are the prospective current and the actual short-circuit current.

Thermal stress ( $A^2S$ ), i.e. the energy dissipated by the short-circuit current in a conductor with a resistance of  $1\ \Omega$ .

The table below indicates the maximum permissible thermal stresses for cables depending on their insulation, conductor (Cu or Al) and cross section area (CSA).

CSA values are given in  $mm^2$  and thermal stresses in  $A^2S$ .



| CSA(mm <sup>2</sup> ) |          | 1.5                | 2.5                | 4                  | 6                  | 10                 | 16                 | 25                 | 35                 |
|-----------------------|----------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| PVC                   | Cu K=115 | $2.97 \times 10^4$ | $8.26 \times 10^4$ | $2.12 \times 10^5$ | $4.76 \times 10^5$ | $1.32 \times 10^6$ | $3.40 \times 10^6$ | $8.26 \times 10^6$ | $1.62 \times 10^7$ |
|                       | Al K=76  | $1.30 \times 10^4$ | $3.61 \times 10^4$ | $9.26 \times 10^4$ | $2.08 \times 10^5$ | $5.78 \times 10^5$ | $1.48 \times 10^6$ | $3.16 \times 10^6$ | $7.08 \times 10^6$ |
| Butyl                 | Cu K=131 | $3.86 \times 10^4$ | $1.07 \times 10^5$ | $2.75 \times 10^5$ | $6.18 \times 10^5$ | $1.72 \times 10^6$ | $4.39 \times 10^6$ | $1.07 \times 10^7$ | $2.10 \times 10^7$ |
|                       | Al K=87  | $1.70 \times 10^4$ | $4.73 \times 10^4$ | $1.21 \times 10^5$ | $2.72 \times 10^5$ | $7.57 \times 10^5$ | $1.94 \times 10^6$ | $4.73 \times 10^6$ | $9.27 \times 10^6$ |
| EPR                   | Cu K=143 | $4.60 \times 10^4$ | $1.28 \times 10^5$ | $3.27 \times 10^5$ | $7.36 \times 10^5$ | $2.04 \times 10^6$ | $5.23 \times 10^6$ | $1.28 \times 10^7$ | $2.51 \times 10^7$ |
|                       | Al K=94  | $1.99 \times 10^4$ | $5.52 \times 10^4$ | $1.41 \times 10^5$ | $3.18 \times 10^5$ | $8.84 \times 10^5$ | $2.26 \times 10^6$ | $5.52 \times 10^6$ | $1.08 \times 10^7$ |

| CSA(mm <sup>2</sup> ) |          | 50                 | 70                 | 95                 | 120                | 150                | 185                | 240                |
|-----------------------|----------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| PVC                   | Cu K=115 | $3.31 \times 10^4$ | $6.48 \times 10^4$ | $1.19 \times 10^5$ | $1.90 \times 10^5$ | $2.98 \times 10^6$ | $4.53 \times 10^6$ | $7.62 \times 10^6$ |
|                       | Al K=76  | $1.44 \times 10^4$ | $2.83 \times 10^4$ | $5.21 \times 10^4$ | $8.32 \times 10^4$ | $1.30 \times 10^5$ | $1.98 \times 10^5$ | $3.33 \times 10^5$ |
| Butyl                 | Cu K=131 | $4.29 \times 10^4$ | $8.41 \times 10^4$ | $1.55 \times 10^5$ | $2.47 \times 10^5$ | $3.86 \times 10^5$ | $5.87 \times 10^5$ | $9.88 \times 10^5$ |
|                       | Al K=87  | $1.89 \times 10^4$ | $3.71 \times 10^4$ | $6.83 \times 10^4$ | $1.09 \times 10^5$ | $1.70 \times 10^5$ | $2.59 \times 10^5$ | $4.36 \times 10^5$ |
| EPR                   | Cu K=143 | $5.11 \times 10^4$ | $1.00 \times 10^5$ | $1.85 \times 10^5$ | $2.94 \times 10^5$ | $4.60 \times 10^5$ | $7.00 \times 10^5$ | $1.18 \times 10^6$ |
|                       | Al K=94  | $2.21 \times 10^4$ | $4.33 \times 10^4$ | $7.97 \times 10^4$ | $1.27 \times 10^5$ | $1.99 \times 10^5$ | $3.02 \times 10^5$ | $5.09 \times 10^5$ |

K is quoted from GB-50054 code for design of low voltage electrical installations.

Example:

a. What is the actual current when a prospective short-circuit current of 125kA rms (peak value=275kA) comes through the current-limiting operation circuit breaker at upstream of NM8-125R

Answer: the peak value=23kA; (for details, refer to current-limiting curves)

b. Is a Cu/PVC cable with a CSA of 10mm<sup>2</sup> adequately protected by a NM8-125S circuit breaker

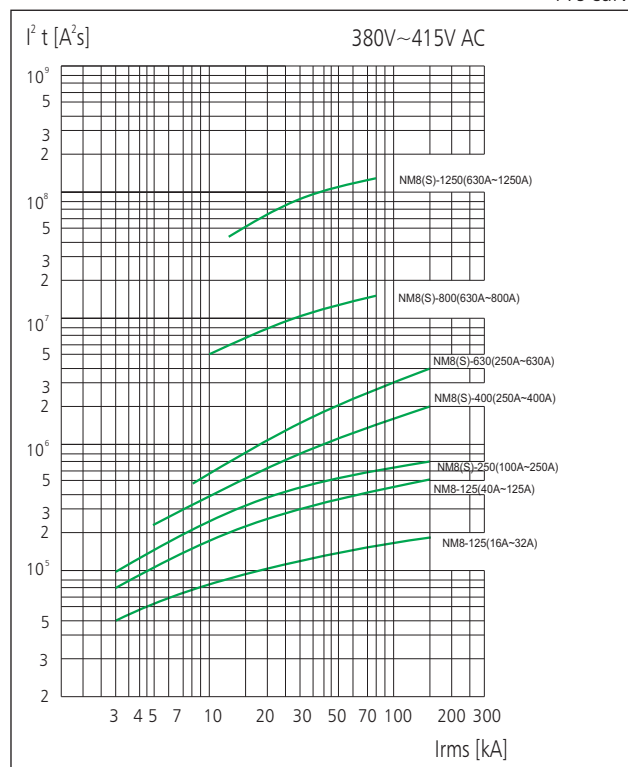
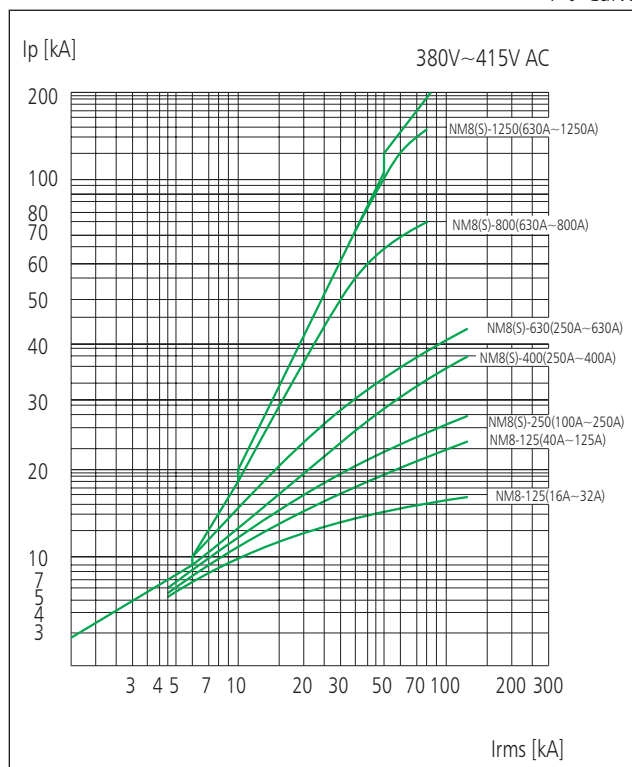
Answer: the table above indicates that the permissible thermal stress is  $1.32 \times 10^6 A^2S$

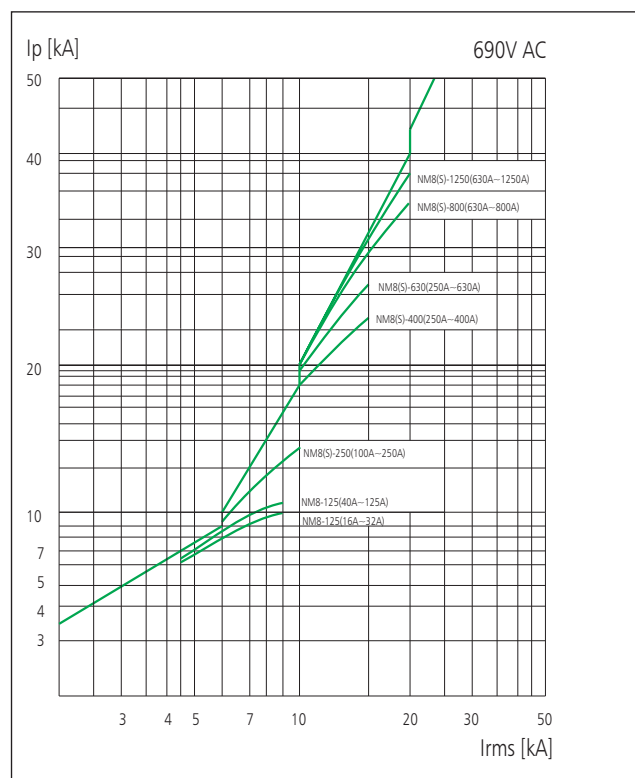
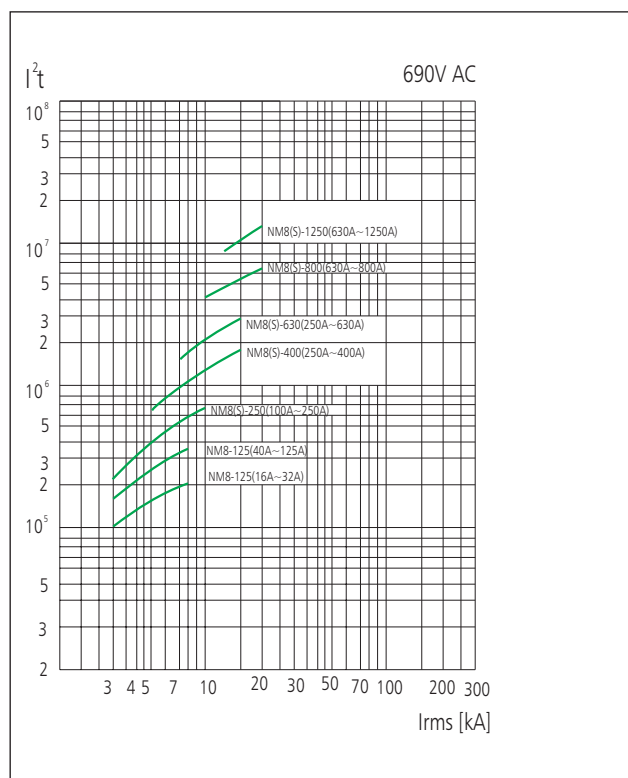
at the point where a NM8-125S ( $I_{cu}=50kA$ ) is installed,

and the short-circuit current is limited within the range of  $1.32 \times 10^6 A^2S$ , therefore the cable could be protected.

$I^2 t$  Curve

$A^2s$  curve



$I^2 t$  Curve $A^2 s$  curve

## 10.3 Power loss per pole

| Resistance/ power loss mΩ/W | NM8-125   | NM8S-125 | NM8-250   | NM8S-250  | NM8-400   | NM8S-400  | NM8-630   | NM8S-630  | NM8-800   | NM8S-800  | NM8-1250  | NM8S-1250 |
|-----------------------------|-----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 16                          | 7.1/1.8   |          |           |           |           |           |           |           |           |           |           |           |
| 20                          | 6.2/2.5   |          |           |           |           |           |           |           |           |           |           |           |
| 25                          | 4.8/3     |          |           |           |           |           |           |           |           |           |           |           |
| 32                          | 3.7/3.8   |          |           |           |           |           |           |           |           |           |           |           |
| 40                          | 2.6/4.2   | 0.85/1.4 |           |           |           |           |           |           |           |           |           |           |
| 50                          | 2.7/6.8   | 0.7/1.8  |           |           |           |           |           |           |           |           |           |           |
| 63                          | 1.7/6.7   | 0.7/2.8  |           |           |           |           |           |           |           |           |           |           |
| 80                          | 1.3/8.3   | 0.7/4.5  |           |           |           |           |           |           |           |           |           |           |
| 100                         | 0.85/8.5  | 0.5/5    | 1.0/10    | 0.5/5     |           |           |           |           |           |           |           |           |
| 125                         | 0.71/11.1 | 0.5/7.8  | 1.0/15.6  | 0.5/7.8   |           |           |           |           |           |           |           |           |
| 160                         |           |          | 0.55/14   | 0.36/9.2  |           |           |           |           |           |           |           |           |
| 180                         |           |          | 0.55/17.8 | 0.36/11.7 |           |           |           |           |           |           |           |           |
| 200                         |           |          | 0.55/22   | 0.36/14.4 |           |           |           |           |           |           |           |           |
| 225                         |           |          | 0.55/27.8 | 0.28/14.2 |           |           |           |           |           |           |           |           |
| 250                         |           |          | 0.55/34.4 | 0.28/17.5 | 0.3/18.8  | 0.15/9.4  | 0.3/18.8  | 0.13/8.1  |           |           |           |           |
| 315                         |           |          |           |           | 0.28/27.8 | 0.15/14.9 | 0.28/27.8 | 0.13/12.9 |           |           |           |           |
| 350                         |           |          |           |           | 0.28/34.3 | 0.15/18.4 | 0.28/34.3 | 0.13/15.9 |           |           |           |           |
| 400                         |           |          |           |           | 0.24/38.4 | 0.15/24   | 0.24/38.4 | 0.13/20.8 |           |           |           |           |
| 500                         |           |          |           |           |           |           | 0.2/50    | 0.13/32.5 |           |           |           |           |
| 630                         |           |          |           |           |           |           |           | 0.13/51.6 | 0.04/15.9 | 0.04/15.9 | 0.04/15.9 | 0.04/15.9 |
| 700                         |           |          |           |           |           |           |           |           | 0.04/19.6 | 0.04/19.6 | 0.04/19.6 | 0.04/19.6 |
| 800                         |           |          |           |           |           |           |           |           | 0.04/25.6 | 0.04/25.6 | 0.04/25.6 | 0.04/25.6 |
| 1000                        |           |          |           |           |           |           |           |           |           |           | 0.04/40   | 0.04/40   |
| 1250                        |           |          |           |           |           |           |           |           |           |           | 0.04/62.5 | 0.04/62.5 |

#### 10.4 Influences which altitude lay to tripping characteristics

To tripping characteristics of circuit breaker, it is no obvious influence, when the altitude does not exceed 2000m.

Once the altitude exceeds the level of 2000m, factors of dielectric stress lowering and cooled air should be taken into consideration.

| Altitude (m)                 | 2000 | 3000   | 4000   | 5000  |
|------------------------------|------|--------|--------|-------|
| Dielectric stress (V)        | 3000 | 2500   | 2100   | 1800  |
| Max. operational voltage (V) | 690  | 550    | 480    | 420   |
| Ratings at 40°C (A)          | 1In  | 0.96In | 0.93In | 0.9In |

#### 10.5 Cascading

##### Definition of Cascading

Current-limiting technique has been adopted for cascading to install downstream circuit breaker with lower breaking capacity (cheaper circuit breakers) at the given point of circuit, and upstream NM8(S) circuit breaker operates to limit short-circuit current. Under the operation of cascading network, circuit breaker with lower breaking capacity compared with prospective short-circuit current at the given point could operate under normal short-circuit status. As the short-circuit current will be limited by upstream circuit breaker with current-limiting operation, cascading network is applicable to all the power distribution apparatus protection at downstream.

In addition, cascading operation is not restricted to operation of two switches in serial, but is applicable in various electric networks, as well.

##### Application of cascading

Through the application of cascading, connected apparatuses could be installed in different switchgears to realize normal operation. Therefore, cascading, in common, refers to various combination of circuit breakers installed at the given point of which the breaking capacity is lower than prospective short-circuit current. And breaking capacity of upstream circuit breakers should be equal to or higher than prospective short-circuit current at the installed point to protect apparatus at downstream. Cascading application is in conformity with IEC60947-2 standards.

Cascading (220/230/240V)

Upstream: NM8-125~1250

Downstream: DZ47, eB, UB, DZ158, DZ267, NB1, NBH8, NM8 (S)-125~1250

| Upstream<br>Breaking capacity<br>(kA rms) → | NM8-125S<br>85             | NM8-125H<br>100 | NM8-125R<br>150 | NM8-250S<br>85 | NM8-250H<br>100 | NM8-250R<br>150 | NM8-400S<br>85 |  |
|---------------------------------------------|----------------------------|-----------------|-----------------|----------------|-----------------|-----------------|----------------|--|
| Downstream ↓                                | Breaking capacity (kA rms) |                 |                 |                |                 |                 |                |  |
| DZ267                                       | 30                         | 80              | 80              | 30             | 40              | 40              |                |  |
| DZ47, eB, UB                                | 30                         | 80              | 80              | 30             | 40              | 40              |                |  |
| NBH8                                        | 30                         | 80              | 80              | 30             | 40              | 40              |                |  |
| NB1(Icn=6000A)                              | 40                         | 100             | 100             | 40             | 50              | 50              |                |  |
| NB1-63(Icn=10000A)                          | 50                         | 100             | 100             | 50             | 65              | 65              |                |  |
| DZ158-100                                   | 50                         | 100             | 100             | 50             | 65              | 65              | 50             |  |
| NM8-125S                                    |                            | 100             | 150             |                | 100             | 150             |                |  |
| NM8-125H                                    |                            |                 | 150             |                |                 | 150             |                |  |
| NM8-250S                                    |                            |                 |                 |                | 100             | 150             |                |  |
| NM8-250H                                    |                            |                 |                 |                |                 | 150             |                |  |
| NM8-400S                                    |                            |                 |                 |                |                 |                 |                |  |
| NM8-400H                                    |                            |                 |                 |                |                 |                 |                |  |
| NM8-630S                                    |                            |                 |                 |                |                 |                 |                |  |
| NM8-630H                                    |                            |                 |                 |                |                 |                 |                |  |
| NM8-800S                                    |                            |                 |                 |                |                 |                 |                |  |
| NM8-800H                                    |                            |                 |                 |                |                 |                 |                |  |
| NM8-1250S                                   |                            |                 |                 |                |                 |                 |                |  |
| NM8-1250H                                   |                            |                 |                 |                |                 |                 |                |  |
| NM8S-125S                                   |                            | 100             | 150             |                | 100             | 150             |                |  |
| NM8S-125H                                   |                            |                 | 150             |                |                 | 150             |                |  |
| NM8S-250S                                   |                            |                 |                 |                | 100             | 150             |                |  |
| NM8S-250H                                   |                            |                 |                 |                |                 | 150             |                |  |
| NM8S-400S                                   |                            |                 |                 |                |                 |                 |                |  |
| NM8S-400H                                   |                            |                 |                 |                |                 |                 |                |  |
| NM8S-630S                                   |                            |                 |                 |                |                 |                 |                |  |
| NM8S-630H                                   |                            |                 |                 |                |                 |                 |                |  |
| NM8S-800S                                   |                            |                 |                 |                |                 |                 |                |  |
| NM8S-800H                                   |                            |                 |                 |                |                 |                 |                |  |
| NM8S-1250S                                  |                            |                 |                 |                |                 |                 |                |  |
| NM8S-1250H                                  |                            |                 |                 |                |                 |                 |                |  |

| NM8-400H<br>100 | NM8-400R<br>150 | NM8-630S<br>85 | NM8-630H<br>100 | NM8-630R<br>150 | NM8-800S<br>65 | NM8-800H<br>100 | NM8-1250S<br>65 | NM8-1250H<br>100 |
|-----------------|-----------------|----------------|-----------------|-----------------|----------------|-----------------|-----------------|------------------|
|                 |                 |                |                 |                 |                |                 |                 |                  |
|                 |                 |                |                 |                 |                |                 |                 |                  |
|                 |                 |                |                 |                 |                |                 |                 |                  |
| 65              | 65              |                |                 |                 |                |                 |                 |                  |
| 100             | 150             |                | 100             | 150             |                | 100             |                 | 100              |
|                 | 150             |                |                 | 150             |                |                 |                 |                  |
| 100             | 150             |                | 100             | 150             |                | 100             |                 | 100              |
|                 | 150             |                |                 | 150             |                |                 |                 |                  |
| 100             | 150             |                | 100             | 150             |                | 100             |                 | 100              |
|                 | 150             |                |                 | 150             |                |                 |                 |                  |
|                 |                 |                | 100             | 150             |                | 100             |                 | 100              |
|                 |                 |                |                 | 150             |                |                 |                 |                  |
|                 |                 |                |                 |                 |                | 100             |                 | 100              |
|                 |                 |                |                 |                 |                | 100             |                 | 100              |
| 100             | 150             |                | 100             | 150             |                | 100             |                 | 100              |
|                 | 150             |                |                 | 150             |                |                 |                 |                  |
| 100             | 150             |                | 100             | 150             |                | 100             |                 | 100              |
|                 | 150             |                |                 | 150             |                |                 |                 |                  |
| 100             | 150             |                | 100             | 150             |                | 100             |                 | 100              |
|                 | 150             |                |                 | 150             |                |                 |                 |                  |
|                 |                 |                | 100             | 150             |                | 100             |                 | 100              |
|                 |                 |                |                 | 150             |                |                 |                 |                  |
|                 |                 |                |                 |                 |                | 100             |                 | 100              |
|                 |                 |                |                 |                 |                | 100             |                 | 100              |

Upstream: NM8S-125~1250

Downstream: DZ267, DZ47, eB, UB, NBH8, NB1, DZ158, NM8(S)-125~1250

| Upstream<br>Breaking capacity<br>(kA rms) → | NM8S-125S<br>85            | NM8S-125H<br>100 | NM8S-250S<br>85 | NM8S-250H<br>100 | NM8S-400S<br>85 | NM8S-400H<br>100 |  |
|---------------------------------------------|----------------------------|------------------|-----------------|------------------|-----------------|------------------|--|
| Downstream ↓                                | Breaking capacity (kA rms) |                  |                 |                  |                 |                  |  |
| DZ267                                       | 30                         | 80               | 30              | 40               |                 |                  |  |
| DZ47, eB, UB                                | 30                         | 80               | 30              | 40               |                 |                  |  |
| NBH8                                        | 30                         | 80               | 30              | 40               |                 |                  |  |
| NB1(Icn=6000A)                              | 40                         | 100              | 40              | 50               |                 |                  |  |
| NB1(Icn=10000A)                             | 50                         | 100              | 50              | 65               |                 |                  |  |
| DZ158-100                                   | 50                         | 100              | 50              | 65               | 50              | 65               |  |
| NM8-125S                                    |                            | 100              |                 | 100              |                 | 100              |  |
| NM8-125H                                    |                            |                  |                 |                  |                 |                  |  |
| NM8-250S                                    |                            |                  |                 | 100              |                 | 100              |  |
| NM8-250H                                    |                            |                  |                 |                  |                 |                  |  |
| NM8-400S                                    |                            |                  |                 |                  |                 | 100              |  |
| NM8-400H                                    |                            |                  |                 |                  |                 |                  |  |
| NM8-630S                                    |                            |                  |                 |                  |                 |                  |  |
| NM8-630H                                    |                            |                  |                 |                  |                 |                  |  |
| NM8-800S                                    |                            |                  |                 |                  |                 |                  |  |
| NM8-800H                                    |                            |                  |                 |                  |                 |                  |  |
| NM8-1250S                                   |                            |                  |                 |                  |                 |                  |  |
| NM8-1250H                                   |                            |                  |                 |                  |                 |                  |  |
| NM8S-125S                                   |                            | 100              |                 | 100              |                 | 100              |  |
| NM8S-125H                                   |                            |                  |                 |                  |                 |                  |  |
| NM8S-250S                                   |                            |                  |                 | 100              |                 | 100              |  |
| NM8S-250H                                   |                            |                  |                 |                  |                 |                  |  |
| NM8S-400S                                   |                            |                  |                 |                  |                 | 100              |  |
| NM8S-400H                                   |                            |                  |                 |                  |                 |                  |  |
| NM8S-630S                                   |                            |                  |                 |                  |                 |                  |  |
| NM8S-630H                                   |                            |                  |                 |                  |                 |                  |  |
| NM8S-800S                                   |                            |                  |                 |                  |                 |                  |  |
| NM8S-800H                                   |                            |                  |                 |                  |                 |                  |  |
| NM8S-1250S                                  |                            |                  |                 |                  |                 |                  |  |
| NM8S-1250H                                  |                            |                  |                 |                  |                 |                  |  |



| NM8S-400R<br>150 | NM8S-630S<br>85 | NM8S-630H<br>100 | NM8S-630R<br>150 | NM8S-800S<br>65 | NM8S-800H<br>100 | NM8S-1250S<br>65 | NM8S-1250H<br>100 |
|------------------|-----------------|------------------|------------------|-----------------|------------------|------------------|-------------------|
|                  |                 |                  |                  |                 |                  |                  |                   |
|                  |                 |                  |                  |                 |                  |                  |                   |
|                  |                 |                  |                  |                 |                  |                  |                   |
| 65               |                 |                  |                  |                 |                  |                  |                   |
| 150              |                 |                  |                  |                 |                  |                  |                   |
| 150              |                 | 100              | 150              |                 | 100              |                  | 100               |
| 150              |                 |                  | 150              |                 |                  |                  |                   |
| 150              |                 | 100              | 150              |                 | 100              |                  | 100               |
| 150              |                 |                  | 150              |                 |                  |                  |                   |
| 150              |                 | 100              | 150              |                 | 100              |                  | 100               |
|                  |                 |                  | 150              |                 |                  |                  |                   |
|                  |                 | 100              | 150              |                 | 100              |                  | 100               |
|                  |                 |                  | 150              |                 |                  |                  |                   |
|                  |                 |                  |                  |                 | 100              |                  | 100               |
|                  |                 |                  |                  |                 |                  |                  |                   |
|                  |                 |                  |                  |                 | 100              |                  | 100               |
| 150              |                 |                  |                  |                 |                  |                  |                   |
| 150              |                 | 100              | 150              |                 | 100              |                  | 100               |
| 150              |                 |                  | 150              |                 |                  |                  |                   |
| 150              |                 | 100              | 150              |                 | 100              |                  | 100               |
| 150              |                 |                  | 150              |                 |                  |                  |                   |
| 150              |                 | 100              | 150              |                 | 100              |                  | 100               |
|                  |                 |                  | 150              |                 |                  |                  |                   |
|                  |                 | 100              | 150              |                 | 100              |                  | 100               |
|                  |                 |                  | 150              |                 |                  |                  |                   |
|                  |                 |                  |                  |                 | 100              |                  | 100               |
|                  |                 |                  |                  |                 |                  |                  |                   |
|                  |                 |                  |                  |                 | 100              |                  | 100               |

Cascading (380/400/415V)

Upstream: NM8-125~1250;

Downstream: DZ47,eB, UB, DZ158, DZ267, NB1, NBH8, NM8(S)-125~1250

| Upstream<br>Breaking capacity<br>(kA rms) → | NM8-125S<br>50             | NM8-125H<br>100 | NM8-125R<br>150 | NM8-250S<br>50 | NM8-250H<br>100 | NM8-250R<br>150 | NM8-400S<br>70 |
|---------------------------------------------|----------------------------|-----------------|-----------------|----------------|-----------------|-----------------|----------------|
| Downstream ↓                                | Breaking capacity (kA rms) |                 |                 |                |                 |                 |                |
| DZ47, eB, UB                                | 15                         | 20              | 20              | 15             | 20              | 20              |                |
| NB1(Icn=6000A)                              | 25                         | 30              | 30              | 25             | 30              | 30              |                |
| NB1-63(Icn=10000A)                          | 25                         | 40              | 40              | 25             | 40              | 40              |                |
| DZ158-100                                   | 25                         | 40              | 40              | 25             | 40              | 40              | 25             |
| NM8-125S                                    |                            | 100             | 150             |                | 100             | 150             | 70             |
| NM8-125H                                    |                            |                 | 150             |                |                 | 150             |                |
| NM8-250S                                    |                            |                 |                 |                | 100             | 150             | 70             |
| NM8-250H                                    |                            |                 |                 |                |                 | 150             |                |
| NM8-400S                                    |                            |                 |                 |                |                 |                 |                |
| NM8-400H                                    |                            |                 |                 |                |                 |                 |                |
| NM8-630S                                    |                            |                 |                 |                |                 |                 |                |
| NM8-630H                                    |                            |                 |                 |                |                 |                 |                |
| NM8-800S                                    |                            |                 |                 |                |                 |                 |                |
| NM8-800H                                    |                            |                 |                 |                |                 |                 |                |
| NM8-1250S                                   |                            |                 |                 |                |                 |                 |                |
| NM8-1250H                                   |                            |                 |                 |                |                 |                 |                |
| NM8S-125S                                   |                            | 100             | 150             |                | 100             | 150             | 70             |
| NM8S-125H                                   |                            |                 | 150             |                |                 | 150             |                |
| NM8S-250S                                   |                            |                 |                 |                | 100             | 150             | 70             |
| NM8S-250H                                   |                            |                 |                 |                |                 | 150             |                |
| NM8S-400S                                   |                            |                 |                 |                |                 |                 |                |
| NM8S-400H                                   |                            |                 |                 |                |                 |                 |                |
| NM8S-630S                                   |                            |                 |                 |                |                 |                 |                |
| NM8S-630H                                   |                            |                 |                 |                |                 |                 |                |
| NM8S-800S                                   |                            |                 |                 |                |                 |                 |                |
| NM8S-800H                                   |                            |                 |                 |                |                 |                 |                |
| NM8S-1250S                                  |                            |                 |                 |                |                 |                 |                |
| NM8S-1250H                                  |                            |                 |                 |                |                 |                 |                |

| NM8-400H<br>100 | NM8-400R<br>150 | NM8-630S<br>70 | NM8-630H<br>100 | NM8-630R<br>150 | NM8-800S<br>50 | NM8-800H<br>70 | NM8-1250S<br>50 | NM8-1250H<br>70 |
|-----------------|-----------------|----------------|-----------------|-----------------|----------------|----------------|-----------------|-----------------|
|                 |                 |                |                 |                 |                |                |                 |                 |
|                 |                 |                |                 |                 |                |                |                 |                 |
| 40              | 40              |                |                 |                 |                |                |                 |                 |
| 100             | 150             |                |                 |                 |                |                |                 |                 |
|                 | 150             | 70             | 100             | 150             |                | 70             |                 | 70              |
| 100             | 150             |                |                 | 150             |                |                |                 |                 |
|                 | 150             | 70             | 100             | 150             |                | 70             |                 | 70              |
| 100             | 150             |                |                 | 150             |                |                |                 |                 |
|                 | 150             |                | 100             | 150             |                | 70             |                 | 70              |
|                 |                 |                |                 | 150             |                |                |                 |                 |
|                 |                 |                | 100             | 150             |                | 70             |                 | 70              |
|                 |                 |                |                 | 150             |                |                |                 |                 |
|                 |                 |                |                 |                 |                | 70             |                 | 70              |
|                 |                 |                |                 |                 |                |                |                 |                 |
|                 |                 |                |                 |                 |                | 70             |                 | 70              |
| 100             | 150             |                |                 |                 |                |                |                 |                 |
|                 | 150             | 70             | 100             | 150             |                | 70             |                 | 70              |
| 100             | 150             |                |                 | 150             |                |                |                 |                 |
|                 | 150             | 70             | 100             | 150             |                | 70             |                 | 70              |
| 100             | 150             |                |                 | 150             |                |                |                 |                 |
|                 | 150             |                | 100             | 150             |                | 70             |                 | 70              |
|                 |                 |                |                 | 150             |                |                |                 |                 |
|                 |                 |                | 100             | 150             |                | 70             |                 | 70              |
|                 |                 |                |                 | 150             |                |                |                 |                 |
|                 |                 |                |                 |                 |                | 70             |                 | 70              |
|                 |                 |                |                 |                 |                |                |                 |                 |
|                 |                 |                |                 |                 |                | 70             |                 | 70              |

Upstream: NM8S-125~1250

Downstream: DZ267, DZ47, eB, UB, NBH8, NB1, DZ158, NM8 (S) -125~1250

| Upstream<br>Breaking capacity<br>(kA rms) → | NM8S-125S<br>50            | NM8S-125H<br>100 | NM8S-250S<br>50 | NM8S-250H<br>100 | NM8S-400S<br>70 | NM8S-400H<br>100 |
|---------------------------------------------|----------------------------|------------------|-----------------|------------------|-----------------|------------------|
| Downstream ↓                                | Breaking capacity (kA rms) |                  |                 |                  |                 |                  |
| DZ47, eB, UB                                | 15                         | 20               | 15              | 20               |                 |                  |
| NB1(Icn=6000A)                              | 25                         | 30               | 25              | 30               |                 |                  |
| NB1-63(Icn=10000A)                          | 25                         | 40               | 25              | 40               |                 |                  |
| DZ158                                       | 25                         | 40               | 25              | 40               | 25              | 40               |
| NM8-125S                                    |                            | 100              |                 | 100              |                 | 100              |
| NM8-125H                                    |                            |                  |                 | 100              |                 | 100              |
| NM8-250S                                    |                            |                  |                 | 100              |                 | 100              |
| NM8-250H                                    |                            |                  |                 |                  |                 | 100              |
| NM8-400S                                    |                            |                  |                 |                  |                 | 100              |
| NM8-400H                                    |                            |                  |                 |                  |                 |                  |
| NM8-630S                                    |                            |                  |                 |                  |                 |                  |
| NM8-630H                                    |                            |                  |                 |                  |                 |                  |
| NM8-800S                                    |                            |                  |                 |                  |                 |                  |
| NM8-800H                                    |                            |                  |                 |                  |                 |                  |
| NM8-1250S                                   |                            |                  |                 |                  |                 |                  |
| NM8-1250H                                   |                            |                  |                 |                  |                 |                  |
| NM8S-125S                                   |                            | 100              |                 | 100              |                 | 100              |
| NM8S-125H                                   |                            |                  |                 | 100              |                 | 100              |
| NM8S-250S                                   |                            |                  |                 | 100              |                 | 100              |
| NM8S-250H                                   |                            |                  |                 |                  |                 | 100              |
| NM8S-400S                                   |                            |                  |                 |                  |                 | 100              |
| NM8S-400H                                   |                            |                  |                 |                  |                 |                  |
| NM8S-630S                                   |                            |                  |                 |                  |                 |                  |
| NM8S-630H                                   |                            |                  |                 |                  |                 |                  |
| NM8S-800S                                   |                            |                  |                 |                  |                 |                  |
| NM8S-800H                                   |                            |                  |                 |                  |                 |                  |
| NM8S-1250S                                  |                            |                  |                 |                  |                 |                  |
| NM8S-1250H                                  |                            |                  |                 |                  |                 |                  |

| NM8S-400R<br>150 | NM8S-630S<br>70 | NM8S-630H<br>100 | NM8S-630R<br>150 | NM8S-800S<br>50 | NM8S-800H<br>70 | NM8S-1250S<br>50 | NM8S-1250H<br>70 |
|------------------|-----------------|------------------|------------------|-----------------|-----------------|------------------|------------------|
|                  |                 |                  |                  |                 |                 |                  |                  |
|                  |                 |                  |                  |                 |                 |                  |                  |
| 40               |                 |                  |                  |                 |                 |                  |                  |
| 150              |                 | 100              | 150              |                 | 70              |                  | 70               |
| 150              |                 | 100              | 150              |                 | 70              |                  | 70               |
| 150              |                 | 100              | 150              |                 | 70              |                  | 70               |
| 150              |                 | 100              | 150              |                 | 70              |                  | 70               |
| 150              |                 | 100              | 150              |                 | 70              |                  | 70               |
| 150              |                 | 100              | 150              |                 | 70              |                  | 70               |
|                  |                 | 100              | 150              |                 | 70              |                  | 70               |
|                  |                 |                  | 150              |                 | 70              |                  | 70               |
|                  |                 |                  |                  |                 | 70              |                  | 70               |
|                  |                 |                  |                  |                 | 70              |                  | 70               |
|                  |                 |                  |                  |                 | 70              |                  | 70               |
| 150              |                 | 100              | 150              |                 | 70              |                  | 70               |
| 150              |                 | 100              | 150              |                 | 70              |                  | 70               |
| 150              |                 | 100              | 150              |                 | 70              |                  | 70               |
| 150              |                 | 100              | 150              |                 | 70              |                  | 70               |
| 150              |                 | 100              | 150              |                 | 70              |                  | 70               |
| 150              |                 | 100              | 150              |                 | 70              |                  | 70               |
|                  |                 | 100              | 150              |                 | 70              |                  | 70               |
|                  |                 |                  | 150              |                 | 70              |                  | 70               |
|                  |                 |                  |                  |                 | 70              |                  | 70               |
|                  |                 |                  |                  |                 | 70              |                  | 70               |
|                  |                 |                  |                  |                 | 70              |                  | 70               |
|                  |                 |                  |                  |                 | 70              |                  | 70               |

## 10.6 Protection discrimination(selectivity)

Protection discrimination is a must factor in low-voltage power distribution design so as to ensure reliability and continuity for users' electricity utilization.

Whenever there is fault occurring in the electric network, the upstream breaker where the fault is occurring breaks.

Protection discrimination could be clarified into 3 kinds: Total protection discrimination, partial protection discrimination and no protection discrimination(refer to fig aside):

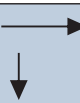
Total protection discrimination: For all kinds of current where the faults occurred, including the overload current and nonresistance current, breaker D2 breaks and breaker D1 keeps making status.

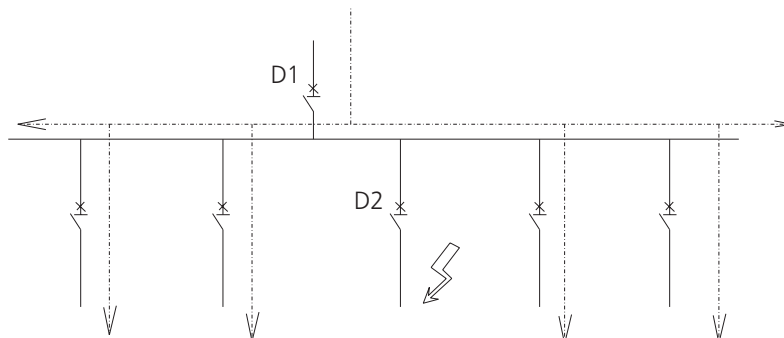
Partial protection discrimination: For a much lower current compared with where the fault occurred (the limit value of protection discrimination), breaker D2 breaks and breaker D1 keeps making status (total protection discrimination).

When the fault current is lower than limit value of protection discrimination, the upstream and downstream breakers are applicable to protection discrimination; when the fault current exceeds limit value of protection discrimination, the upstream and downstream breakers are not applicable to protection discrimination (no protection discrimination). And both of the breakers of D1 and D2 break.

Upstream: NM8-125~1250

Downstream: DZ267, DZ47, eB, UB, NBH8, NB1, DZ158

|  <b>Upstream</b><br><b>Downstream In (A)</b><br><b>Ii (kA)</b> |     | NM8-125 S/H/R |      |     |     |     |     |     |      |     |     | NM8-250 S/H/R |     |     |     |
|-------------------------------------------------------------------------------------------------------------------------------------------------|-----|---------------|------|-----|-----|-----|-----|-----|------|-----|-----|---------------|-----|-----|-----|
|                                                                                                                                                 |     | 16            | 20   | 25  | 32  | 40  | 50  | 63  | 80   | 100 | 125 | 100           | 160 | 200 | 250 |
| DZ267<br>C Curves                                                                                                                               | ≤10 | 0.19          | 0.25 | 0.3 | 0.4 | 0.5 | 0.5 | 0.5 | 0.63 | 0.8 | 1.0 | T             | T   | T   | T   |
|                                                                                                                                                 | 16  |               |      | 0.3 | 0.4 | 0.5 | 0.5 | 0.5 | 0.63 | 0.8 | 1.0 | T             | T   | T   | T   |
|                                                                                                                                                 | 20  |               |      |     |     | 0.5 | 0.5 | 0.5 | 0.63 | 0.8 | 1.0 | T             | T   | T   | T   |
|                                                                                                                                                 | 25  |               |      |     |     |     | 0.5 | 0.5 | 0.63 | 0.8 | 1.0 | T             | T   | T   | T   |
|                                                                                                                                                 | 32  |               |      |     |     |     |     | 0.5 | 0.63 | 0.8 | 1.0 | T             | T   | T   | T   |
| DZ47, eB, UB<br>C Curves                                                                                                                        | ≤10 | 0.19          | 0.25 | 0.3 | 0.4 | 0.5 | 0.5 | 0.5 | 0.63 | 0.8 | 1.0 | T             | T   | T   | T   |
|                                                                                                                                                 | 16  |               |      | 0.3 | 0.4 | 0.5 | 0.5 | 0.5 | 0.63 | 0.8 | 1.0 | T             | T   | T   | T   |
|                                                                                                                                                 | 20  |               |      |     |     | 0.5 | 0.5 | 0.5 | 0.63 | 0.8 | 1.0 | T             | T   | T   | T   |
|                                                                                                                                                 | 25  |               |      |     |     |     | 0.5 | 0.5 | 0.63 | 0.8 | 1.0 | T             | T   | T   | T   |
|                                                                                                                                                 | 32  |               |      |     |     |     |     | 0.5 | 0.63 | 0.8 | 1.0 | T             | T   | T   | T   |
|                                                                                                                                                 | 40  |               |      |     |     |     |     |     | 0.63 | 0.8 | 1.0 | T             | T   | T   | T   |
|                                                                                                                                                 | 50  |               |      |     |     |     |     |     |      | 0.8 | 1.0 | T             | T   | T   | T   |
| NBH8<br>B C Curves                                                                                                                              | ≤10 | 0.19          | 0.25 | 0.3 | 0.4 | 0.5 | 0.5 | 0.5 | 0.63 | 0.8 | 1.0 | T             | T   | T   | T   |
|                                                                                                                                                 | 16  |               |      | 0.3 | 0.4 | 0.5 | 0.5 | 0.5 | 0.63 | 0.8 | 1.0 | T             | T   | T   | T   |
|                                                                                                                                                 | 20  |               |      |     |     | 0.5 | 0.5 | 0.5 | 0.63 | 0.8 | 1.0 | T             | T   | T   | T   |
|                                                                                                                                                 | 25  |               |      |     |     |     | 0.5 | 0.5 | 0.63 | 0.8 | 1.0 | T             | T   | T   | T   |
|                                                                                                                                                 | 32  |               |      |     |     |     |     | 0.5 | 0.63 | 0.8 | 1.0 | T             | T   | T   | T   |
|                                                                                                                                                 | 40  |               |      |     |     |     |     |     | 0.63 | 0.8 | 1.0 | T             | T   | T   | T   |
| NB1<br>B C D Curves                                                                                                                             | ≤10 | 0.19          | 0.25 | 0.3 | 0.4 | 0.5 | 0.5 | 0.5 | 0.63 | 0.8 | 1.0 | T             | T   | T   | T   |
|                                                                                                                                                 | 16  |               |      | 0.3 | 0.4 | 0.5 | 0.5 | 0.5 | 0.63 | 0.8 | 1.0 | T             | T   | T   | T   |
|                                                                                                                                                 | 20  |               |      |     |     | 0.5 | 0.5 | 0.5 | 0.63 | 0.8 | 1.0 | T             | T   | T   | T   |
|                                                                                                                                                 | 25  |               |      |     |     |     | 0.5 | 0.5 | 0.63 | 0.8 | 1.0 | T             | T   | T   | T   |
|                                                                                                                                                 | 32  |               |      |     |     |     |     | 0.5 | 0.63 | 0.8 | 1.0 | T             | T   | T   | T   |
|                                                                                                                                                 | 40  |               |      |     |     |     |     |     | 0.63 | 0.8 | 1.0 | T             | T   | T   | T   |
|                                                                                                                                                 | 50  |               |      |     |     |     |     |     |      | 0.8 | 1.0 | T             | T   | T   | T   |
|                                                                                                                                                 | 63  |               |      |     |     |     |     |     |      | 0.8 | 1.0 | T             | T   | T   | T   |
| DZ158                                                                                                                                           | 63  |               |      |     |     |     |     |     |      | 0.8 | 1.0 | T             | T   | T   | T   |
|                                                                                                                                                 | 80  |               |      |     |     |     |     |     |      |     | 1.0 | T             | T   | T   | T   |
|                                                                                                                                                 | 100 |               |      |     |     |     |     |     |      |     |     |               | T   | T   | T   |

[illegible]

Upstream: NM8S-125~1250

Downstream: DZ267, DZ47, eB, UB, NBH8, NB1, DZ158

| <div> <div>→ Upstream</div> <div>↓ Downstream In (A)</div> <div>li (kA)</div> </div> |     | NM8S-125 S/H |     |     | NM8S-250 S/H |     |     |     | NM8S-400 S/H/R |     |     |     |
|--------------------------------------------------------------------------------------|-----|--------------|-----|-----|--------------|-----|-----|-----|----------------|-----|-----|-----|
|                                                                                      |     | 40           | 100 | 125 | 100          | 160 | 200 | 250 | 250            | 315 | 350 | 400 |
| DZ267<br>C Curves                                                                    | ≤10 | 0.5          | 0.8 | 1.0 | T            | T   | T   | T   | T              | T   | T   | T   |
|                                                                                      | 16  | 0.5          | 0.8 | 1.0 | T            | T   | T   | T   | T              | T   | T   | T   |
|                                                                                      | 20  | 0.5          | 0.8 | 1.0 | T            | T   | T   | T   | T              | T   | T   | T   |
|                                                                                      | 25  |              | 0.8 | 1.0 | T            | T   | T   | T   | T              | T   | T   | T   |
|                                                                                      | 32  |              | 0.8 | 1.0 | T            | T   | T   | T   | T              | T   | T   | T   |
| DZ47, eB, UB<br>C Curves                                                             | ≤10 | 0.5          | 0.8 | 1.0 | T            | T   | T   | T   | T              | T   | T   | T   |
|                                                                                      | 16  | 0.5          | 0.8 | 1.0 | T            | T   | T   | T   | T              | T   | T   | T   |
|                                                                                      | 20  | 0.5          | 0.8 | 1.0 | T            | T   | T   | T   | T              | T   | T   | T   |
|                                                                                      | 25  |              | 0.8 | 1.0 | T            | T   | T   | T   | T              | T   | T   | T   |
|                                                                                      | 32  |              | 0.8 | 1.0 | T            | T   | T   | T   | T              | T   | T   | T   |
|                                                                                      | 40  |              | 0.8 | 1.0 | T            | T   | T   | T   | T              | T   | T   | T   |
|                                                                                      | 50  |              | 0.8 | 1.0 | T            | T   | T   | T   | T              | T   | T   | T   |
| NBH8<br>B C Curves                                                                   | ≤10 | 0.5          | 0.8 | 1.0 | T            | T   | T   | T   | T              | T   | T   | T   |
|                                                                                      | 16  | 0.5          | 0.8 | 1.0 | T            | T   | T   | T   | T              | T   | T   | T   |
|                                                                                      | 20  | 0.5          | 0.8 | 1.0 | T            | T   | T   | T   | T              | T   | T   | T   |
|                                                                                      | 25  |              | 0.8 | 1.0 | T            | T   | T   | T   | T              | T   | T   | T   |
|                                                                                      | 32  |              | 0.8 | 1.0 | T            | T   | T   | T   | T              | T   | T   | T   |
| NB1<br>B C D Curves                                                                  | 40  |              | 0.8 | 1.0 | T            | T   | T   | T   | T              | T   | T   | T   |
|                                                                                      | ≤10 | 0.5          | 0.8 | 1.0 | T            | T   | T   | T   | T              | T   | T   | T   |
|                                                                                      | 16  | 0.5          | 0.8 | 1.0 | T            | T   | T   | T   | T              | T   | T   | T   |
|                                                                                      | 20  | 0.5          | 0.8 | 1.0 | T            | T   | T   | T   | T              | T   | T   | T   |
|                                                                                      | 25  |              | 0.8 | 1.0 | T            | T   | T   | T   | T              | T   | T   | T   |
|                                                                                      | 32  |              | 0.8 | 1.0 | T            | T   | T   | T   | T              | T   | T   | T   |
|                                                                                      | 40  |              | 0.8 | 1.0 | T            | T   | T   | T   | T              | T   | T   | T   |
|                                                                                      | 50  |              | 0.8 | 1.0 | T            | T   | T   | T   | T              | T   | T   | T   |
| DZ158                                                                                | 63  |              | 0.8 | 1.0 | T            | T   | T   | T   | T              | T   | T   | T   |
|                                                                                      | 80  |              |     | 1.0 | T            | T   | T   | T   | T              | T   | T   | T   |
|                                                                                      | 100 |              |     |     |              | T   | T   | T   | T              | T   | T   | T   |
|                                                                                      | 63  |              | 0.8 | 1.0 | T            | T   | T   | T   | T              | T   | T   | T   |
|                                                                                      | 80  |              |     | 1.0 | T            | T   | T   | T   | T              | T   | T   | T   |
|                                                                                      | 100 |              |     |     |              | T   | T   | T   | T              | T   | T   | T   |
|                                                                                      | 125 |              |     |     |              | T   | T   | T   | T              | T   | T   | T   |



[illegible]

Upstream: NM8-125~1250  
Downstream: NM8(S)-125~1250

|  Upstream<br>Downstream In (A)<br>li (kA) |     | NM8-125 S/H/R |    |    |     |     |     |     |      |     |     | NM8-250 S/H/R |      |     |     |  |
|----------------------------------------------------------------------------------------------------------------------------|-----|---------------|----|----|-----|-----|-----|-----|------|-----|-----|---------------|------|-----|-----|--|
|                                                                                                                            |     | 16            | 20 | 25 | 32  | 40  | 50  | 63  | 80   | 100 | 125 | 100           | 160  | 200 | 250 |  |
| NM8-125 S                                                                                                                  | 16  |               |    |    | 0.4 | 0.5 | 0.5 | 0.5 | 0.63 | 0.8 | 1.0 | 2.0           | T    | T   | T   |  |
|                                                                                                                            | 20  |               |    |    |     | 0.5 | 0.5 | 0.5 | 0.63 | 0.8 | 1.0 | 2.0           | T    | T   | T   |  |
|                                                                                                                            | 25  |               |    |    |     |     | 0.5 | 0.5 | 0.63 | 0.8 | 1.0 | 2.0           | T    | T   | T   |  |
|                                                                                                                            | 32  |               |    |    |     |     |     | 0.5 | 0.63 | 0.8 | 1.0 | 2.0           | T    | T   | T   |  |
|                                                                                                                            | 40  |               |    |    |     |     |     |     | 0.63 | 0.8 | 1.0 | 2.0           | T    | T   | T   |  |
|                                                                                                                            | 50  |               |    |    |     |     |     |     |      | 0.8 | 1.0 | 2.0           | T    | T   | T   |  |
|                                                                                                                            | 63  |               |    |    |     |     |     |     |      |     | 1.0 | 2.0           | T    | T   | T   |  |
|                                                                                                                            | 80  |               |    |    |     |     |     |     |      |     |     |               | 1.25 | T   | T   |  |
|                                                                                                                            | 100 |               |    |    |     |     |     |     |      |     |     |               | 1.25 | T   | T   |  |
|                                                                                                                            | 125 |               |    |    |     |     |     |     |      |     |     |               |      |     | T   |  |
| NM8-125 H/R                                                                                                                | 16  |               |    |    | 0.4 | 0.5 | 0.5 | 0.5 | 0.63 | 0.8 | 1.0 | 2.0           | T    | T   | T   |  |
|                                                                                                                            | 20  |               |    |    |     | 0.5 | 0.5 | 0.5 | 0.63 | 0.8 | 1.0 | 2.0           | T    | T   | T   |  |
|                                                                                                                            | 25  |               |    |    |     |     | 0.5 | 0.5 | 0.63 | 0.8 | 1.0 | 2.0           | T    | T   | T   |  |
|                                                                                                                            | 32  |               |    |    |     |     |     | 0.5 | 0.63 | 0.8 | 1.0 | 2.0           | T    | T   | T   |  |
|                                                                                                                            | 40  |               |    |    |     |     |     |     | 0.63 | 0.8 | 1.0 | 2.0           | 3.6  | 3.6 | 3.6 |  |
|                                                                                                                            | 50  |               |    |    |     |     |     |     |      | 0.8 | 1.0 | 2.0           | 3.6  | 3.6 | 3.6 |  |
|                                                                                                                            | 63  |               |    |    |     |     |     |     |      |     | 1.0 | 2.0           | 3.6  | 3.6 | 3.6 |  |
|                                                                                                                            | 80  |               |    |    |     |     |     |     |      |     |     |               | 3.6  | 3.6 | 3.6 |  |
|                                                                                                                            | 100 |               |    |    |     |     |     |     |      |     |     |               | 3.6  | 3.6 | 3.6 |  |
|                                                                                                                            | 125 |               |    |    |     |     |     |     |      |     |     |               |      |     | 3.6 |  |
| NM8S-125 S/H                                                                                                               | 40  |               |    |    |     |     |     |     | 0.63 | 0.8 | 1.0 | 1.25          | T    | T   | T   |  |
|                                                                                                                            | 100 |               |    |    |     |     |     |     |      |     |     |               | 1.25 | T   | T   |  |
|                                                                                                                            | 125 |               |    |    |     |     |     |     |      |     |     |               |      |     | 2.5 |  |
| NM8-250 S                                                                                                                  | 100 |               |    |    |     |     |     |     |      |     |     |               |      |     | 3   |  |
|                                                                                                                            | 160 |               |    |    |     |     |     |     |      |     |     |               |      |     |     |  |
|                                                                                                                            | 200 |               |    |    |     |     |     |     |      |     |     |               |      |     |     |  |
|                                                                                                                            | 250 |               |    |    |     |     |     |     |      |     |     |               |      |     |     |  |
| NM8-250 H/R                                                                                                                | 100 |               |    |    |     |     |     |     |      |     |     |               |      |     | 3   |  |
|                                                                                                                            | 160 |               |    |    |     |     |     |     |      |     |     |               |      |     |     |  |
|                                                                                                                            | 200 |               |    |    |     |     |     |     |      |     |     |               |      |     |     |  |
|                                                                                                                            | 250 |               |    |    |     |     |     |     |      |     |     |               |      |     |     |  |
| NM8S-250 S/H                                                                                                               | 100 |               |    |    |     |     |     |     |      |     |     |               | 1.6  | 2   | 2.5 |  |
|                                                                                                                            | 160 |               |    |    |     |     |     |     |      |     |     |               |      |     | 2.5 |  |
|                                                                                                                            | 200 |               |    |    |     |     |     |     |      |     |     |               |      |     |     |  |
|                                                                                                                            | 250 |               |    |    |     |     |     |     |      |     |     |               |      |     |     |  |
| NM8-400 S/H/R                                                                                                              | 250 |               |    |    |     |     |     |     |      |     |     |               |      |     |     |  |
|                                                                                                                            | 315 |               |    |    |     |     |     |     |      |     |     |               |      |     |     |  |
|                                                                                                                            | 350 |               |    |    |     |     |     |     |      |     |     |               |      |     |     |  |
|                                                                                                                            | 400 |               |    |    |     |     |     |     |      |     |     |               |      |     |     |  |
| NM8S-400 S/H/R                                                                                                             | 250 |               |    |    |     |     |     |     |      |     |     |               |      |     |     |  |
|                                                                                                                            | 315 |               |    |    |     |     |     |     |      |     |     |               |      |     |     |  |
|                                                                                                                            | 350 |               |    |    |     |     |     |     |      |     |     |               |      |     |     |  |
|                                                                                                                            | 400 |               |    |    |     |     |     |     |      |     |     |               |      |     |     |  |
| NM8-630 S/H/R                                                                                                              | 250 |               |    |    |     |     |     |     |      |     |     |               |      |     |     |  |
|                                                                                                                            | 315 |               |    |    |     |     |     |     |      |     |     |               |      |     |     |  |
|                                                                                                                            | 350 |               |    |    |     |     |     |     |      |     |     |               |      |     |     |  |
|                                                                                                                            | 400 |               |    |    |     |     |     |     |      |     |     |               |      |     |     |  |
| NM8-630 S/H/R                                                                                                              | 250 |               |    |    |     |     |     |     |      |     |     |               |      |     |     |  |
|                                                                                                                            | 315 |               |    |    |     |     |     |     |      |     |     |               |      |     |     |  |
|                                                                                                                            | 350 |               |    |    |     |     |     |     |      |     |     |               |      |     |     |  |
|                                                                                                                            | 400 |               |    |    |     |     |     |     |      |     |     |               |      |     |     |  |
| NM8-630 S/H/R                                                                                                              | 250 |               |    |    |     |     |     |     |      |     |     |               |      |     |     |  |
|                                                                                                                            | 315 |               |    |    |     |     |     |     |      |     |     |               |      |     |     |  |
|                                                                                                                            | 350 |               |    |    |     |     |     |     |      |     |     |               |      |     |     |  |
|                                                                                                                            | 400 |               |    |    |     |     |     |     |      |     |     |               |      |     |     |  |

| NM8-400 S/H/R |     |     |     | NM8-630 S/H/R |     |     |     |     | NM8-800 S/H |     |     | NM8-1250 S/H |     |     |      |      |   |
|---------------|-----|-----|-----|---------------|-----|-----|-----|-----|-------------|-----|-----|--------------|-----|-----|------|------|---|
| 250           | 315 | 350 | 400 | 250           | 315 | 350 | 400 | 500 | 630         | 700 | 800 | 630          | 700 | 800 | 1000 | 1250 |   |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | T           | T   | T   | T            | T   | T   | T    | T    |   |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | T           | T   | T   | T            | T   | T   | T    | T    |   |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | T           | T   | T   | T            | T   | T   | T    | T    |   |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | T           | T   | T   | T            | T   | T   | T    | T    |   |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | T           | T   | T   | T            | T   | T   | T    | T    |   |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | T           | T   | T   | T            | T   | T   | T    | T    |   |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | T           | T   | T   | T            | T   | T   | T    | T    |   |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | T           | T   | T   | T            | T   | T   | T    | T    |   |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | T           | T   | T   | T            | T   | T   | T    | T    |   |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | T           | T   | T   | T            | T   | T   | T    | T    |   |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          | 50  | 50  | 50           | 50  | 50  | 50   | T    | T |
| T             | T   | T   | T   | T             | T   | T   | T   | T   | 50          |     |     |              |     |     |      |      |   |

|  Upstream<br> Downstream In (A)<br>Ii (kA) |      | NM8-125 S/H/R |    |    |    |    |    |    |    |     |     | NM8-250 S/H/R |     |     |     |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|---------------|----|----|----|----|----|----|----|-----|-----|---------------|-----|-----|-----|--|
|                                                                                                                                                                                                              |      | 16            | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 100           | 160 | 200 | 250 |  |
| NM8S-630 S/H/R                                                                                                                                                                                               | 250  |               |    |    |    |    |    |    |    |     |     |               |     |     |     |  |
|                                                                                                                                                                                                              | 315  |               |    |    |    |    |    |    |    |     |     |               |     |     |     |  |
|                                                                                                                                                                                                              | 350  |               |    |    |    |    |    |    |    |     |     |               |     |     |     |  |
|                                                                                                                                                                                                              | 400  |               |    |    |    |    |    |    |    |     |     |               |     |     |     |  |
|                                                                                                                                                                                                              | 500  |               |    |    |    |    |    |    |    |     |     |               |     |     |     |  |
|                                                                                                                                                                                                              | 630  |               |    |    |    |    |    |    |    |     |     |               |     |     |     |  |
| NM8-800 S/H                                                                                                                                                                                                  | 630  |               |    |    |    |    |    |    |    |     |     |               |     |     |     |  |
|                                                                                                                                                                                                              | 700  |               |    |    |    |    |    |    |    |     |     |               |     |     |     |  |
|                                                                                                                                                                                                              | 800  |               |    |    |    |    |    |    |    |     |     |               |     |     |     |  |
| NM8S-800 S/H                                                                                                                                                                                                 | 630  |               |    |    |    |    |    |    |    |     |     |               |     |     |     |  |
|                                                                                                                                                                                                              | 700  |               |    |    |    |    |    |    |    |     |     |               |     |     |     |  |
|                                                                                                                                                                                                              | 800  |               |    |    |    |    |    |    |    |     |     |               |     |     |     |  |
| NM8-1250 S/H                                                                                                                                                                                                 | 630  |               |    |    |    |    |    |    |    |     |     |               |     |     |     |  |
|                                                                                                                                                                                                              | 700  |               |    |    |    |    |    |    |    |     |     |               |     |     |     |  |
|                                                                                                                                                                                                              | 800  |               |    |    |    |    |    |    |    |     |     |               |     |     |     |  |
|                                                                                                                                                                                                              | 1000 |               |    |    |    |    |    |    |    |     |     |               |     |     |     |  |
|                                                                                                                                                                                                              | 1250 |               |    |    |    |    |    |    |    |     |     |               |     |     |     |  |
| NM8S-1250 S/H                                                                                                                                                                                                | 630  |               |    |    |    |    |    |    |    |     |     |               |     |     |     |  |
|                                                                                                                                                                                                              | 700  |               |    |    |    |    |    |    |    |     |     |               |     |     |     |  |
|                                                                                                                                                                                                              | 800  |               |    |    |    |    |    |    |    |     |     |               |     |     |     |  |
|                                                                                                                                                                                                              | 1000 |               |    |    |    |    |    |    |    |     |     |               |     |     |     |  |
|                                                                                                                                                                                                              | 1250 |               |    |    |    |    |    |    |    |     |     |               |     |     |     |  |

Upstream: NM8S-125~1250

Downstream: NM8(S)-125~1250

|  Upstream<br> Downstream In (A)<br>Ii (kA) |     | NM8S-125 S/H |     |     | NM8S-250 S/H |     |     |     | NM8S-400 S/H/R |     |     |     |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|--------------|-----|-----|--------------|-----|-----|-----|----------------|-----|-----|-----|--|
|                                                                                                                                                                                                                  |     | 40           | 100 | 125 | 100          | 160 | 200 | 250 | 250            | 315 | 350 | 400 |  |
| NM8-125 S                                                                                                                                                                                                        | 16  |              | 1.2 | 1.2 | 1.2          | T   | T   | T   | T              | T   | T   | T   |  |
|                                                                                                                                                                                                                  | 20  |              | 1.2 | 1.2 | 1.2          | T   | T   | T   | T              | T   | T   | T   |  |
|                                                                                                                                                                                                                  | 25  |              | 1.2 | 1.2 | 1.2          | T   | T   | T   | T              | T   | T   | T   |  |
|                                                                                                                                                                                                                  | 32  |              | 1.2 | 1.2 | 1.2          | T   | T   | T   | T              | T   | T   | T   |  |
|                                                                                                                                                                                                                  | 40  |              | 1.2 | 1.2 | 1.2          | T   | T   | T   | T              | T   | T   | T   |  |
|                                                                                                                                                                                                                  | 50  |              | 1.2 | 1.2 | 1.2          | T   | T   | T   | T              | T   | T   | T   |  |
|                                                                                                                                                                                                                  | 63  |              |     | 1.2 | 1.2          | T   | T   | T   | T              | T   | T   | T   |  |
|                                                                                                                                                                                                                  | 80  |              |     |     |              | T   | T   | T   | T              | T   | T   | T   |  |
|                                                                                                                                                                                                                  | 100 |              |     |     |              |     | T   | T   | T              | T   | T   | T   |  |
|                                                                                                                                                                                                                  | 125 |              |     |     |              |     |     | T   | T              | T   | T   | T   |  |
| NM8-125 H/R                                                                                                                                                                                                      | 16  |              | 1.2 | 1.2 | 1.2          | T   | T   | T   | T              | T   | T   | T   |  |
|                                                                                                                                                                                                                  | 20  |              | 1.2 | 1.2 | 1.2          | T   | T   | T   | T              | T   | T   | T   |  |
|                                                                                                                                                                                                                  | 25  |              | 1.2 | 1.2 | 1.2          | T   | T   | T   | T              | T   | T   | T   |  |
|                                                                                                                                                                                                                  | 32  |              | 1.2 | 1.2 | 1.2          | T   | T   | T   | T              | T   | T   | T   |  |
|                                                                                                                                                                                                                  | 40  |              | 1.2 | 1.2 | 1.2          | T   | T   | T   | T              | T   | T   | T   |  |
|                                                                                                                                                                                                                  | 50  |              | 1.2 | 1.2 | 1.2          | 2   | 36  | 36  | T              | T   | T   | T   |  |
|                                                                                                                                                                                                                  | 63  |              |     | 1.2 | 1.2          | 2   | 36  | 36  | T              | T   | T   | T   |  |
|                                                                                                                                                                                                                  | 80  |              |     |     |              | 2   | 36  | 36  | T              | T   | T   | T   |  |
|                                                                                                                                                                                                                  | 100 |              |     |     |              |     |     | 36  | T              | T   | T   | T   |  |
|                                                                                                                                                                                                                  | 125 |              |     |     |              |     |     | 36  | T              | T   | T   | T   |  |
| NM8S-125 S/H                                                                                                                                                                                                     | 40  |              | 1.2 | 1.2 | 2            | 2   | T   | T   | T              | T   | T   | T   |  |
|                                                                                                                                                                                                                  | 100 |              |     |     |              | 2   | T   | T   | T              | T   | T   | T   |  |
|                                                                                                                                                                                                                  | 125 |              |     |     |              |     |     | T   | T              | T   | T   | T   |  |

[illegible][illegible]

|  Upstream<br>Downstream In (A)<br>I <sub>i</sub> (kA) |      | NM8S-125 S/H |     |     | NM8S-250 S/H |     |     |     | NM8S-400 S/H/R |     |     |     |  |
|----------------------------------------------------------------------------------------------------------------------------------------|------|--------------|-----|-----|--------------|-----|-----|-----|----------------|-----|-----|-----|--|
|                                                                                                                                        |      | 40           | 100 | 125 | 100          | 160 | 200 | 250 | 250            | 315 | 350 | 400 |  |
|                                                                                                                                        | 40   |              | 1.2 | 1.2 | 2            | 2   | T   | T   | T              | T   | T   | T   |  |
|                                                                                                                                        | 100  |              |     |     |              | 2   | T   | T   | T              | T   | T   | T   |  |
|                                                                                                                                        | 125  |              |     |     |              |     |     | T   | T              | T   | T   | T   |  |
| NM8-250 S                                                                                                                              | 100  |              |     |     |              |     |     | 3   | 5              | 5   | 5   | 5   |  |
|                                                                                                                                        | 160  |              |     |     |              |     |     |     |                |     | 5   | 5   |  |
|                                                                                                                                        | 200  |              |     |     |              |     |     |     |                |     |     |     |  |
|                                                                                                                                        | 250  |              |     |     |              |     |     |     |                |     |     |     |  |
| NM8-250 H/R                                                                                                                            | 100  |              |     |     |              |     |     | 3   | 5              | 5   | 5   | 5   |  |
|                                                                                                                                        | 160  |              |     |     |              |     |     |     |                |     | 5   | 5   |  |
|                                                                                                                                        | 200  |              |     |     |              |     |     |     |                |     |     |     |  |
|                                                                                                                                        | 250  |              |     |     |              |     |     |     |                |     |     |     |  |
| NM8S-250 S/H                                                                                                                           | 100  |              |     |     |              |     |     | 5   | 5              | 5   | 5   | 5   |  |
|                                                                                                                                        | 160  |              |     |     |              |     |     | 5   | 5              | 5   | 5   | 5   |  |
|                                                                                                                                        | 200  |              |     |     |              |     |     |     |                |     | 5   | 5   |  |
|                                                                                                                                        | 250  |              |     |     |              |     |     |     |                |     |     | 5   |  |
| NM8-400 S/H/R                                                                                                                          | 250  |              |     |     |              |     |     |     |                |     |     |     |  |
|                                                                                                                                        | 315  |              |     |     |              |     |     |     |                |     |     |     |  |
|                                                                                                                                        | 350  |              |     |     |              |     |     |     |                |     |     |     |  |
|                                                                                                                                        | 400  |              |     |     |              |     |     |     |                |     |     |     |  |
| NM8S-400 S/H/R                                                                                                                         | 250  |              |     |     |              |     |     |     |                |     |     |     |  |
|                                                                                                                                        | 315  |              |     |     |              |     |     |     |                |     |     |     |  |
|                                                                                                                                        | 350  |              |     |     |              |     |     |     |                |     |     |     |  |
|                                                                                                                                        | 400  |              |     |     |              |     |     |     |                |     |     |     |  |
| NM8-630 S/H/R                                                                                                                          | 250  |              |     |     |              |     |     |     |                |     |     |     |  |
|                                                                                                                                        | 315  |              |     |     |              |     |     |     |                |     |     |     |  |
|                                                                                                                                        | 350  |              |     |     |              |     |     |     |                |     |     |     |  |
|                                                                                                                                        | 400  |              |     |     |              |     |     |     |                |     |     |     |  |
|                                                                                                                                        | 500  |              |     |     |              |     |     |     |                |     |     |     |  |
| NM8S-630 S/H/R                                                                                                                         | 250  |              |     |     |              |     |     |     |                |     |     |     |  |
|                                                                                                                                        | 315  |              |     |     |              |     |     |     |                |     |     |     |  |
|                                                                                                                                        | 350  |              |     |     |              |     |     |     |                |     |     |     |  |
|                                                                                                                                        | 400  |              |     |     |              |     |     |     |                |     |     |     |  |
|                                                                                                                                        | 500  |              |     |     |              |     |     |     |                |     |     |     |  |
|                                                                                                                                        | 630  |              |     |     |              |     |     |     |                |     |     |     |  |
| NM8-800 S/H                                                                                                                            | 630  |              |     |     |              |     |     |     |                |     |     |     |  |
|                                                                                                                                        | 700  |              |     |     |              |     |     |     |                |     |     |     |  |
|                                                                                                                                        | 800  |              |     |     |              |     |     |     |                |     |     |     |  |
| NM8S-800 S/H                                                                                                                           | 630  |              |     |     |              |     |     |     |                |     |     |     |  |
|                                                                                                                                        | 700  |              |     |     |              |     |     |     |                |     |     |     |  |
|                                                                                                                                        | 800  |              |     |     |              |     |     |     |                |     |     |     |  |
| NM8-1250 S/H                                                                                                                           | 630  |              |     |     |              |     |     |     |                |     |     |     |  |
|                                                                                                                                        | 700  |              |     |     |              |     |     |     |                |     |     |     |  |
|                                                                                                                                        | 800  |              |     |     |              |     |     |     |                |     |     |     |  |
|                                                                                                                                        | 1000 |              |     |     |              |     |     |     |                |     |     |     |  |
|                                                                                                                                        | 1250 |              |     |     |              |     |     |     |                |     |     |     |  |
| NM8S-1250 S/H                                                                                                                          | 630  |              |     |     |              |     |     |     |                |     |     |     |  |
|                                                                                                                                        | 700  |              |     |     |              |     |     |     |                |     |     |     |  |
|                                                                                                                                        | 800  |              |     |     |              |     |     |     |                |     |     |     |  |
|                                                                                                                                        | 1000 |              |     |     |              |     |     |     |                |     |     |     |  |
|                                                                                                                                        | 1250 |              |     |     |              |     |     |     |                |     |     |     |  |

Note:

- a. The area with T indication clarifies total protection discrimination between upstream and downstream circuit breakers;  
 b. The area with numbers clarifies partial protection discrimination between upstream and downstream circuit breakers;  
 c. For partial protection discrimination, the Max. fault current values to ensure time discrimination performance are given in the table; when fault current exceeds this value, upstream and downstream circuit breakers may operate at the same time.

| NM8S-630 S/H/R |     |     |     |     |     | NM8S-800 S/H |     |     | NM8S-1250 S/H |     |     |      |      |
|----------------|-----|-----|-----|-----|-----|--------------|-----|-----|---------------|-----|-----|------|------|
| 250            | 315 | 350 | 400 | 500 | 630 | 630          | 700 | 800 | 630           | 700 | 800 | 1000 | 1250 |
| T              | T   | T   | T   | T   | T   | T            | T   | T   | T             | T   | T   | T    | T    |
| T              | T   | T   | T   | T   | T   | T            | T   | T   | T             | T   | T   | T    | T    |
| T              | T   | T   | T   | T   | T   | T            | T   | T   | T             | T   | T   | T    | T    |
| T              | T   | T   | T   | T   | T   | T            | T   | T   | T             | T   | T   | T    | T    |
|                |     |     | T   | T   | T   | T            | T   | T   | T             | T   | T   | T    | T    |
|                |     |     |     | T   | T   | T            | T   | T   | T             | T   | T   | T    | T    |
|                |     |     |     |     | T   | T            | T   | T   | T             | T   | T   | T    | T    |
| T              | T   | T   | T   | T   | T   | 40           | 40  | 40  | 40            | 40  | 40  | T    | T    |
|                |     |     | T   | T   | T   | 40           | 40  | 40  | 40            | 40  | 40  | T    | T    |
|                |     |     |     | T   | T   | 40           | 40  | 40  | 40            | 40  | 40  | T    | T    |
|                |     |     |     |     | T   | 40           | 40  | 40  | 40            | 40  | 40  | T    | T    |
| T              | T   | T   | T   | T   | T   | T            | T   | T   | T             | T   | T   | T    | T    |
| T              | T   | T   | T   | T   | T   | T            | T   | T   | T             | T   | T   | T    | T    |
|                |     |     | T   | T   | T   | T            | T   | T   | T             | T   | T   | T    | T    |
|                |     |     |     | T   | T   | T            | T   | T   | T             | T   | T   | T    | T    |
|                |     |     | 8   | 8   | 8   | 30           | 30  | 30  | 30            | 30  | 30  | T    | T    |
|                |     |     |     | 8   | 8   | 30           | 30  | 30  | 30            | 30  | 30  | T    | T    |
|                |     |     |     |     | 8   | 30           | 30  | 30  | 30            | 30  | 30  | T    | T    |
|                |     |     |     |     | 8   | 30           | 30  | 30  | 30            | 30  | 30  | T    | T    |
|                |     |     | 8   | 8   | 8   | 12           | 12  | 12  | 12            | 12  | 12  | 15   | 15   |
|                |     |     |     | 8   | 8   | 12           | 12  | 12  | 12            | 12  | 12  | 15   | 15   |
|                |     |     |     |     | 8   | 12           | 12  | 12  | 12            | 12  | 12  | 15   | 15   |
|                |     |     |     |     | 8   | 12           | 12  | 12  | 12            | 12  | 12  | 15   | 15   |
|                |     |     |     | 8   | 8   | 30           | 30  | 30  | 30            | 30  | 30  | T    | T    |
|                |     |     |     | 8   | 8   | 30           | 30  | 30  | 30            | 30  | 30  | T    | T    |
|                |     |     |     |     | 8   | 30           | 30  | 30  | 30            | 30  | 30  | T    | T    |
|                |     |     |     |     | 8   | 30           | 30  | 30  | 30            | 30  | 30  | T    | T    |
|                |     |     |     |     |     |              | 30  | 30  |               | 30  | 30  | T    | T    |
|                |     |     |     | 8   | 8   | 12           | 12  | 12  | 12            | 12  | 12  | 15   | 15   |
|                |     |     |     | 8   | 8   | 12           | 12  | 12  | 12            | 12  | 12  | 15   | 15   |
|                |     |     |     |     | 8   | 12           | 12  | 12  | 12            | 12  | 12  | 15   | 15   |
|                |     |     |     |     |     |              | 12  | 12  | 12            | 12  | 12  | 15   | 15   |
|                |     |     |     |     |     |              |     | 12  |               |     | 12  | 15   | 15   |
|                |     |     |     |     |     |              |     |     |               |     |     | 20   | 20   |
|                |     |     |     |     |     |              |     |     |               |     |     |      |      |
|                |     |     |     |     |     |              |     |     |               |     |     | 15   | 15   |
|                |     |     |     |     |     |              |     |     |               |     |     |      |      |
|                |     |     |     |     |     |              |     |     |               |     |     | 20   | 20   |
|                |     |     |     |     |     |              |     |     |               |     |     |      |      |
|                |     |     |     |     |     |              |     |     |               |     |     |      |      |
|                |     |     |     |     |     |              |     |     |               |     |     |      |      |
|                |     |     |     |     |     |              |     |     |               |     |     | 15   | 15   |
|                |     |     |     |     |     |              |     |     |               |     |     |      |      |
|                |     |     |     |     |     |              |     |     |               |     |     |      |      |

10.7 Selection table of components for motor control or protection  
400V, 50kA, type2, MCCB normal load start-up

| Motor parameters |                   | Circuit breaker parameters |                                    | Contactor parameters |                           | Thermal relay parameters |                   |
|------------------|-------------------|----------------------------|------------------------------------|----------------------|---------------------------|--------------------------|-------------------|
| Rated power (kW) | Rated current (A) | Model                      | Setting of magnetic protection (A) | Model                | Rated heating current (A) | Model                    | Rated current (A) |
| 5.5              | 10.9              | NM8-125S/16M               | 192                                | NC1-12               | 20                        | NR2-25                   | 9~13              |
| 7.5              | 14.4              | NM8-125S/20M               | 240                                | NC1-18               | 32                        | NR2-25                   | 12~18             |
| 11               | 20.9              | NM8-125S/25M               | 300                                | NC1-25               | 40                        | NR2-25                   | 17~25             |
| 15               | 28                | NM8-125S/32M               | 384                                | NC1-32               | 50                        | NR2-36                   | 23~32             |
| 18.5             | 34.1              | NM8-125S/40M               | 480                                | NC1-40               | 60                        | NR2-36                   | 28~36             |
| 22               | 39.4              | NM8-125S/50M               | 600                                | NC1-50               | 80                        | NR2-93                   | 30~40             |
| 30               | 53.4              | NM8-125S/63M               | 756                                | NC1-65               | 80                        | NR2-93                   | 48~65             |
| 37               | 67.9              | NM8-125S/80M               | 960                                | NC1-80               | 110                       | NR2-93                   | 55~70             |
| 45               | 80.5              | NM8-125S/100M              | 1200                               | NC1-95               | 110                       | NR2-93                   | 80~93             |
| 55               | 98.5              | NM8-125S/125M              | 1500                               | NC2-115              | 200                       | NR2-200                  | 80~125            |
| 75               | 133               | NM8-250S/160M              | 1920                               | NC2-150              | 200                       | NR2-200                  | 100~160           |
| 90               | 158.7             | NM8-250S/200M              | 2400                               | NC2-185              | 275                       | NR2-200                  | 100~160           |
| 110              | 192               | NM8-250S/250M              | 3000                               | NC2-225              | 275                       | NR2-200                  | 125~200           |
| 132              | 229               | NM8-400S/315M              | 3780                               | NC2-265              | 315                       | NR2-630                  | 160~250           |
| 160              | 275               | NM8-400S/350M              | 4200                               | NC2-330              | 380                       | NR2-630                  | 200~315           |
| 200              | 343               | NM8-400S/400M              | 4800                               | NC2-400              | 450                       | NR2-630                  | 250~400           |
| 250              | 445               | NM8-630S/500M              | 6000                               | NC2-500              | 630                       | NR2-630                  | 315~500           |
| 290              | 520               | NM8S-630S/630M             | 7560                               | NC2-630              | 800                       | NR2-630                  | 400~630           |
| 315              | 560               | NM8S-630S/630M             | 7560                               | NC2-630              | 800                       | NR2-630                  | 400~630           |

Note:

1. NM8 and NM8S breakers can replace each other with the same capacity in the table above .
2. NRE8 electronic relays and NR2 thermal relays can replace each other with the same capacity in the table above.

400V, 50kA, type2, MCCB heavy-load start-up

| Motor parameters |                   | Circuit breaker parameters |                                    | Contactor parameters |                           | Thermal relay parameters |                   |
|------------------|-------------------|----------------------------|------------------------------------|----------------------|---------------------------|--------------------------|-------------------|
| Rated power (kW) | Rated current (A) | Model                      | Setting of magnetic protection (A) | Model                | Rated heating current (A) | Model                    | Rated current (A) |
| 5.5              | 10.9              | NM8-125S/16M               | 192                                | NC1-18               | 32                        | NR2-25                   | 9~13              |
| 7.5              | 14.4              | NM8-125S/20M               | 240                                | NC1-25               | 40                        | NR2-25                   | 12~18             |
| 11               | 20.9              | NM8-125S/25M               | 300                                | NC1-32               | 50                        | NR2-25                   | 17~25             |
| 15               | 28                | NM8-125S/32M               | 384                                | NC1-40               | 60                        | NR2-36                   | 23~32             |
| 18.5             | 34.1              | NM8-125S/40M               | 480                                | NC1-50               | 80                        | NR2-36                   | 28~36             |
| 22               | 39.4              | NM8-125S/50M               | 600                                | NC1-65               | 80                        | NR2-93                   | 30~40             |
| 30               | 53.4              | NM8-125S/63M               | 756                                | NC1-80               | 110                       | NR2-93                   | 48~65             |
| 37               | 67.9              | NM8-125S/80M               | 960                                | NC1-95               | 110                       | NR2-93                   | 55~70             |
| 45               | 80.5              | NM8-125S/100M              | 1200                               | NC2-115              | 200                       | NR2-93                   | 80~93             |
| 55               | 98.5              | NM8-125S/125M              | 1500                               | NC2-150              | 200                       | NR2-200                  | 80~125            |
| 75               | 133               | NM8-250S/160M              | 1920                               | NC2-185              | 275                       | NR2-200                  | 100~160           |
| 90               | 158.7             | NM8-250S/200M              | 2400                               | NC2-225              | 275                       | NR2-200                  | 100~160           |
| 110              | 192               | NM8-250S/250M              | 3000                               | NC2-265              | 315                       | NR2-200                  | 125~200           |
| 132              | 229               | NM8-400S/315M              | 3780                               | NC2-330              | 380                       | NR2-630                  | 160~250           |
| 160              | 275               | NM8-400S/350M              | 4200                               | NC2-400              | 450                       | NR2-630                  | 200~315           |
| 200              | 343               | NM8-400S/400M              | 4800                               | NC2-500              | 630                       | NR2-630                  | 250~400           |
| 250              | 445               | NM8-630S/500M              | 6000                               | NC2-630              | 800                       | NR2-630                  | 315~500           |
| 290              | 520               | NM8S-630S/630M             | 7560                               | NC2-630              | 800                       | NR2-630                  | 400~630           |

Note:

1. NM8 and NM8S breakers can replace each other with the same capacity in the table above .
2. NRE8 electronic relays and NR2 thermal relays can replace each other with the same capacity in the table above.



400V, 50kA, type2, MCCB star-delta start-up

| Motor parameters |                   | Circuit breaker parameters |                                    | Contactor parameters |                 |                | Thermal relay parameters |                   |
|------------------|-------------------|----------------------------|------------------------------------|----------------------|-----------------|----------------|--------------------------|-------------------|
| Rated power (kW) | Rated current (A) | Model                      | Setting of magnetic protection (A) | Feedback contactor   | Delta contactor | Star contactor | Model                    | Rated current (A) |
| 5.5              | 10.9              | NM8-125S/16M               | 192                                | NC1-09               | NC1-09          | NC1-09         | NR2-11.5                 | 5.5~8             |
| 7.5              | 14.4              | NM8-125S/20M               | 240                                | NC1-12               | NC1-12          | NC1-09         | NR2-11.5                 | 7~10              |
| 11               | 20.9              | NM8-125S/25M               | 300                                | NC1-18               | NC1-18          | NC1-09         | NR2-25                   | 9~13              |
| 15               | 28                | NM8-125S/32M               | 384                                | NC1-25               | NC1-25          | NC1-12         | NR2-25                   | 12~18             |
| 18.5             | 34.1              | NM8-125S/40M               | 480                                | NC1-25               | NC1-25          | NC1-18         | NR2-25                   | 17~25             |
| 22               | 39.4              | NM8-125S/50M               | 600                                | NC1-32               | NC1-32          | NC1-18         | NR2-36                   | 23~32             |
| 30               | 53.4              | NM8-125S/63M               | 756                                | NC1-40               | NC1-40          | NC1-25         | NR2-36                   | 28~36             |
| 37               | 67.9              | NM8-125S/80M               | 960                                | NC1-50               | NC1-50          | NC1-32         | NR2-93                   | 30~40             |
| 45               | 80.5              | NM8-125S/100M              | 1200                               | NC1-65               | NC1-65          | NC1-32         | NR2-93                   | 37~50             |
| 55               | 98.5              | NM8-125S/125M              | 1500                               | NC1-80               | NC1-80          | NC1-40         | NR2-93                   | 48~65             |
| 75               | 133               | NM8-250S/160M              | 1920                               | NC1-95               | NC1-95          | NC1-50         | NR2-93                   | 63~80             |
| 90               | 158.7             | NM8-250S/200M              | 2400                               | NC2-115              | NC2-115         | NC2-65         | NR2-93                   | 80~93             |
| 110              | 192               | NM8-250S/250M              | 3000                               | NC2-150              | NC2-150         | NC2-80         | NR2-200                  | 80~125            |
| 132              | 229               | NM8-400S/315M              | 3780                               | NC2-150              | NC2-150         | NC2-95         | NR2-200                  | 80~125            |
| 160              | 275               | NM8-400S/350M              | 4200                               | NC2-185              | NC2-185         | NC2-115        | NR2-200                  | 100~160           |
| 200              | 343               | NM8-400S/400M              | 4800                               | NC2-225              | NC2-225         | NC2-150        | NR2-200                  | 125~200           |
| 250              | 445               | NM8-630S/500M              | 6000                               | NC2-330              | NC2-330         | NC2-185        | NR2-630                  | 200~315           |
| 290              | 520               | NM8S-630S/630M             | 7560                               | NC2-400              | NC2-400         | NC2-185        | NR2-630                  | 200~315           |
| 315              | 560               | NM8S-630S/630M             | 7560                               | NC2-400              | NC2-400         | NC2-225        | NR2-630                  | 250~400           |

Note:

1. NM8 and NM8S breakers can replace each other with the same capacity in the table above .
2. NRE8 electronic relays and NR2 thermal relays can replace each other with the same capacity in the table above.
3. Breaker is at the power supply side
4. In the delta connection circuit of thermal relay, the setting value is 0.58Ie;
5. The max. start-up time is 20s;
6. When Star type connection is changed into delta connection, the following connection modes of motor are recommended: L1, U1 to V2; L2, V1 to W2; L3, W1 to U2 to lower the impulse current;
7. The interval of star type connection changing into delta connection is 0.1s.