

## GP 84 series

### General purpose capacitors Cylindrical Aluminum Case

GP84 single-phase, cylindrical AC & DC Capacitors are the ideal solution for most AC Filter requirements as well as special PFC projects.

The sturdy construction with Aluminum case and plastic lid, the wide range of available connections and the safety features based on the integrated UL-approved overpressure disconnecter and DRY resin impregnation ensure GP84 can be easily and reliably integrated into any application and environmental condition.

Main characteristics:


- Self-Healing Metallized Polypropylene Film
- UL-Approved Overpressure Safety Device
- Aluminum Case
- DRY Resin filling
- Wide range of connections with high current capability

Main applications:

- AC Filtering
- High-Performance PFC (high harmonics, voltage and RMS/surge current)
- UPS and Wind-Power Applications



#### General Characteristics

|   |  |
|---|--|
| RMS Voltage range   | 250 ÷ 1000 V   |
| Capacitance range   | 10 ÷ 600 µF  |
| Capacitance tolerance   | ±5% / ±10%   |
| Max. RMS current  | 80 A   |
| Series resistance (Rs)  | < 8 mΩ   |
| Thermal resistance natural cooling (R <sub>THC</sub> )  | < 3.0 °C/W   |
| Max. voltage raise of rise (dV/dT)  | ≤ 100 V/µs   |
| Terminals   | M6 or M10 screw-type bolts or double tag 6.3 x 0.8 mm                              |
| Operating temperature   | -40 / +85 °C   |
| Storage temperature   | -40 / +85 °C   |
| Test voltage  | U <sub>tc</sub> = 3 kVac / 6 kVac @50 Hz 10 s<br>U <sub>tt</sub> = 1.5 x UnDC 10 s |
| Filling   | Dry polyurethane resin   |
| Dielectric  | Metallized PPMh film   |
| Cylindrical case  | Aluminum   |
| Life expectancy   | 100.000 h (*)  |
| Failure quota   | 50 / 10E9  |
| Reference standards   | IEC 1071-1/2 - UL 810  |
| UL-CSA approved (  )<br>-10 kA AFC | File n. E102953 (**)   |
| M6 Screw Terminals  | 3 Nm   |
| M10 Screw Terminals   | 6 Nm   |
| M12 fixing bolt   | Max 10 Nm  |

| Life expectancy          | 4.16.84.2xxx Series | 4.16.84.3xxx Series | 4.16.84.4xxx Series | 4.16.84.5xxx Series | 4.16.84.6xxx Series | 4.16.84.9xxx Series |
|--------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| <b>100.000 h (rated)</b> | 250 V               | 330 V               | 450 V               | 550 V               | 690 V               | 930 V               |
| 50.000 h                 | 275 V               | 360 V               | 500 V               | 575 V               | 760 V               | 1025 V              |
| 25.000 h                 | 300 V               | 400 V               | 540 V               | 630 V               | 830 V               | 1120 V              |
| 12.500 h                 | 330 V               | 450 V               | 600 V               | 690 V               | 930 V               | 1250 V              |

(\*) Life Derating at operating voltage (according to the chart on page 10)

(\*\*) UL Approved for A, C and F solution (excepted series 690 V - 930 V solution A).



| Cn<br>[μF]   | I <sub>MAX</sub> <sup>*</sup><br>[A] | I <sub>PK</sub> C <sub>w</sub><br>[A] | I <sub>PK</sub><br>I <sub>w</sub><br>[kA] | I <sub>s</sub><br>[kA] | R <sub>THC</sub><br>natural cooling<br>[°C/W] | LESR<br>[nH] | Tan MAX<br>@50Hz<br>[10-4] | Ø<br>[mm] | H<br>[mm] | Weight<br>[g] | Mechanical<br>solution | Part n.<br>416.84. | Pcs. /<br>box | Box<br>type |
|--|--------------------------------------|---------------------------------------|---|------------------------|---|--------------|----------------------------|-----------|-----------|---------------|------------------------|--------------------|---------------|-------------|
| <b>Urms= 250 V Un<sub>AC</sub> = 350 V Un<sub>DC</sub>= 490 V Us= 950 V</b>  |                                      |                                       |   |                        |   |              |                            |           |           |               |                        |                    |               |             |
| 60   | 22                                   | 33                                    | 1.7                                       | 9                      | 2.7   | 130          | 5.0                        | 55        | 115       | 300           | A / C                  | 2.1x.y             | 28            | 1           |
| 80   | 22                                   | 33                                    | 1.7                                       | 9                      | 2.7   | 130          | 5.0                        | 55        | 115       | 340           | A / C                  | 2.1x.y             | 28            | 1           |
| 100  | 25                                   | 38                                    | 1.9                                       | 11                     | 2.2   | 160          | 5.0                        | 55        | 150       | 370           | A / C                  | 2.2x.y             | 21            | 1           |
| 120  | 25                                   | 38                                    | 1.9                                       | 11                     | 2.2   | 160          | 5.0                        | 55        | 150       | 390           | A / C                  | 2.2x.y             | 21            | 1           |
| 150  | 32                                   | 48                                    | 2.4                                       | 13                     | 2.0   | 160          | 5.5                        | 60        | 150       | 450           | A / C                  | 2.3x.y             | 18            | 1           |
| 175  | 36                                   | 54                                    | 2.7                                       | 16                     | 1.8   | 170          | 6.0                        | 65        | 150       | 520           | A / C                  | 2.4x.y             | 16            | 1           |
| 200  | 38                                   | 57                                    | 2.9                                       | 12                     | 1.7   | 180          | 6.5                        | 65        | 165       | 580           | A / C                  | 2.5x.y             | 16            | 1           |
| 230  | 40                                   | 60                                    | 3.0                                       | 20                     | 1.3   | 200          | 7.0                        | 75        | 180       | 820           | F                      | 2.6x.7             | 6             | 2           |
| 250  | 40                                   | 60                                    | 3.0                                       | 20                     | 1.3   | 200          | 7.0                        | 75        | 180       | 830           | F                      | 2.6x.7             | 6             | 2           |
| 300  | 40                                   | 60                                    | 3.0                                       | 20                     | 1.3   | 200          | 7.0                        | 75        | 180       | 860           | F                      | 2.6x.7             | 6             | 2           |
| 350  | 45                                   | 68                                    | 3.4                                       | 20                     | 1.1   | 210          | 7.5                        | 85        | 180       | 980           | F                      | 2.7x.7             | 6             | 2           |
| 400  | 45                                   | 68                                    | 3.4                                       | 20                     | 1.1   | 210          | 7.5                        | 85        | 180       | 1050          | F                      | 2.7x.7             | 6             | 2           |
| 500  | 78                                   | 117                                   | 5.9                                       | 20                     | 0.9   | 230          | 8.5                        | 90        | 210       | 1400          | F                      | 2.9x.7             | 6             | 3           |
| 600  | 80                                   | 120                                   | 6.0                                       | 18                     | 0.8   | 300          | 9.0                        | 85        | 280       | 1700          | F                      | 2.9x.7             | 6             | 4           |
| <b>Urms= 330 V Un<sub>AC</sub> = 470 V Un<sub>DC</sub>= 600 V Us= 1150 V</b> |                                      |                                       |   |                        |   |              |                            |           |           |               |                        |                    |               |             |
| 50   | 22                                   | 33                                    | 1.7                                       | 7                      | 2.7   | 160          | 5.0                        | 55        | 115       | 320           | A / C                  | 3.1x.y             | 28            | 1           |
| 80   | 26                                   | 39                                    | 2.0                                       | 8                      | 2.2   | 160          | 6.0                        | 55        | 150       | 390           | A / C                  | 3.2x.y             | 21            | 1           |
| 100  | 26                                   | 39                                    | 2.0                                       | 8                      | 2.2   | 160          | 6.0                        | 55        | 150       | 400           | A / C                  | 3.2x.y             | 21            | 1           |
| 120  | 30                                   | 45                                    | 2.3                                       | 10                     | 2.0   | 160          | 6.0                        | 60        | 150       | 460           | A / C                  | 3.3x.y             | 18            | 1           |
| 150  | 34                                   | 51                                    | 2.6                                       | 13                     | 1.8   | 170          | 6.5                        | 65        | 150       | 540           | A / C                  | 3.4x.y             | 16            | 1           |
| 175  | 38                                   | 57                                    | 2.9                                       | 10                     | 1.7   | 180          | 7.0                        | 65        | 165       | 600           | A / C                  | 3.5x.y             | 16            | 1           |
| 200  | 40                                   | 60                                    | 3.0                                       | 14                     | 1.3   | 200          | 7.5                        | 75        | 180       | 860           | F                      | 3.6x.7             | 6             | 2           |
| 250  | 40                                   | 60                                    | 3.0                                       | 14                     | 1.3   | 200          | 7.5                        | 75        | 180       | 860           | F                      | 3.6x.7             | 6             | 2           |
| 300  | 45                                   | 68                                    | 3.4                                       | 18                     | 1.1   | 210          | 7.5                        | 85        | 180       | 1100          | F                      | 3.7x.7             | 6             | 2           |
| 350  | 70                                   | 105                                   | 5.3                                       | 16                     | 1.0   | 230          | 8.0                        | 85        | 210       | 1350          | F                      | 3.8x.7             | 6             | 3           |
| 400  | 75                                   | 113                                   | 5.6                                       | 18                     | 0.9   | 230          | 8.5                        | 90        | 210       | 1450          | F                      | 3.9x.7             | 6             | 3           |
| 450  | 80                                   | 120                                   | 6.0                                       | 13                     | 0.8   | 300          | 9.0                        | 85        | 280       | 1750          | F                      | 3.9x.7             | 6             | 4           |
| <b>Urms= 450 V Un<sub>AC</sub>= 630 V Un= 825 V Us= 1600 V</b>               |                                      |                                       |   |                        |   |              |                            |           |           |               |                        |                    |               |             |
| 20   | 20                                   | 30                                    | 1.5                                       | 4                      | 2.7   | 130          | 5.0                        | 55        | 115       | 250           | A / C                  | 4.0x.y             | 28            | 1           |
| 30   | 20                                   | 30                                    | 1.5                                       | 4                      | 2.7   | 130          | 5.0                        | 55        | 115       | 300           | A / C                  | 4.0x.y             | 28            | 1           |
| 40   | 24                                   | 36                                    | 1.8                                       | 4.5                    | 2.2   | 160          | 6.0                        | 55        | 150       | 370           | A / C                  | 4.1x.y             | 21            | 1           |
| 50   | 24                                   | 36                                    | 1.8                                       | 4.5                    | 2.2   | 160          | 6.0                        | 55        | 150       | 400           | A / C                  | 4.1x.y             | 21            | 1           |
| 70   | 28                                   | 42                                    | 2.1                                       | 6.8                    | 1.8   | 170          | 6.5                        | 65        | 150       | 530           | A / C                  | 4.3x.y             | 16            | 1           |
| 80   | 28                                   | 42                                    | 2.1                                       | 6.8                    | 1.8   | 170          | 6.5                        | 65        | 150       | 550           | A / C                  | 4.3x.y             | 16            | 1           |
| 90   | 32                                   | 48                                    | 2.4                                       | 5.2                    | 1.7   | 180          | 7.0                        | 65        | 165       | 590           | A / C                  | 4.4x.y             | 16            | 1           |
| 100  | 38                                   | 57                                    | 2.9                                       | 7.4                    | 1.3   | 200          | 7.5                        | 75        | 180       | 860           | F                      | 4.5x.7             | 6             | 2           |
| 150  | 42                                   | 63                                    | 3.2                                       | 9.9                    | 1.1   | 210          | 8.0                        | 85        | 180       | 1100          | F                      | 4.6x.7             | 6             | 2           |
| 200  | 70                                   | 105                                   | 5.3                                       | 9.7                    | 0.9   | 230          | 8.5                        | 90        | 210       | 1450          | F                      | 4.8x.7             | 6             | 3           |
| 250  | 75                                   | 113                                   | 5.6                                       | 7.9                    | 0.8   | 300          | 9.0                        | 85        | 280       | 1710          | F                      | 4.9x.7             | 6             | 4           |
| 300  | 78                                   | 117                                   | 5.9                                       | 9.1                    | 0.7   | 300          | 9.0                        | 90        | 280       | 1920          | F                      | 4.9x.7             | 6             | 4           |

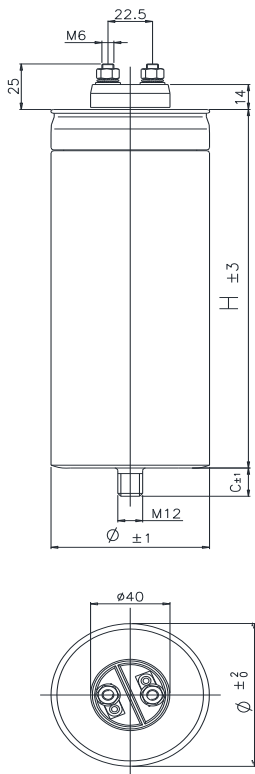




| Cn<br>[μF]   | I <sub>MAX</sub> *<br>[A] | I <sub>PK</sub> C <sub>w</sub><br>[A] | I <sub>PK</sub><br>I <sub>w</sub><br>[kA] | I <sub>s</sub><br>[kA] | R <sub>THC</sub><br>natural cooling<br>[°C/W] | LESR<br>[nH] | Tan MAX<br>@50Hz<br>[10-4] | Ø<br>[mm] | H<br>[mm] | Weight<br>[g] | Mechanical<br>solution | Part n.<br>416.84. | Pcs. /<br>box | Box<br>type |
|--|---------------------------|---------------------------------------|---|------------------------|---|--------------|----------------------------|-----------|-----------|---------------|------------------------|--------------------|---------------|-------------|
| <b>Urms= 550 V Un<sub>AC</sub>= 790 V Un<sub>DC</sub>= 940 V Us= 1800 V</b>  |                           |                                       |   |                        |   |              |                            |           |           |               |                        |                    |               |             |
| 20   | 18                        | 27                                    | 1.4                                       | 2.9                    | 2.7   | 130          | 5.0                        | 55        | 115       | 300           | A / C                  | 5.0x.y             | 28            | 1           |
| 30   | 20                        | 30                                    | 1.5                                       | 3.3                    | 2.2   | 160          | 5.5                        | 55        | 150       | 350           | A / C                  | 5.1x.y             | 21            | 1           |
| 40   | 20                        | 30                                    | 1.5                                       | 3.3                    | 2.2   | 160          | 5.5                        | 55        | 150       | 390           | A / C                  | 5.1x.y             | 21            | 1           |
| 50   | 22                        | 33                                    | 1.7                                       | 4.1                    | 2.0   | 160          | 6.0                        | 60        | 150       | 460           | A / C                  | 5.2x.y             | 18            | 1           |
| 70   | 26                        | 39                                    | 2.0                                       | 3.9                    | 1.7   | 180          | 7.0                        | 65        | 165       | 590           | A / C                  | 5.4x.y             | 16            | 1           |
| 80   | 34                        | 51                                    | 2.6                                       | 5.3                    | 1.3   | 200          | 7.5                        | 75        | 180       | 820           | F                      | 5.5x.7             | 6             | 2           |
| 100  | 38                        | 57                                    | 2.9                                       | 7.2                    | 1.1   | 210          | 8.0                        | 85        | 180       | 950           | F                      | 5.6x.7             | 6             | 2           |
| 125  | 38                        | 57                                    | 2.9                                       | 7.2                    | 1.1   | 210          | 8.0                        | 85        | 180       | 1050          | F                      | 5.6x.7             | 6             | 2           |
| 150  | 70                        | 105                                   | 5.3                                       | 5.7                    | 0.8   | 300          | 8.5                        | 85        | 280       | 1550          | F                      | 5.8x.7             | 6             | 4           |
| 200  | 70                        | 105                                   | 5.3                                       | 5.7                    | 0.8   | 300          | 8.5                        | 85        | 280       | 1700          | F                      | 5.8x.7             | 6             | 4           |
| 250  | 76                        | 114                                   | 5.7                                       | 8.3                    | 0.6   | 320          | 9.0                        | 100       | 280       | 2100          | F                      | 5.9x.7             | 6             | 5           |
| 300  | 76                        | 114                                   | 5.7                                       | 8.3                    | 0.6   | 320          | 9.0                        | 100       | 280       | 2400          | F                      | 5.9x.7             | 6             | 5           |
| <b>Urms= 690 V Un<sub>AC</sub>= 990 V Un<sub>DC</sub>= 1350 V Us= 2600 V</b> |                           |                                       |   |                        |   |              |                            |           |           |               |                        |                    |               |             |
| 10   | 20                        | 30                                    | 1.0                                       | 1.8                    | 2.2   | 160          | 5.0                        | 55        | 150       | 310           | A / C                  | 6.0x.y             | 21            | 1           |
| 15   | 20                        | 30                                    | 1.0                                       | 1.8                    | 2.2   | 160          | 5.0                        | 55        | 150       | 350           | A / C                  | 6.0x.y             | 21            | 1           |
| 20   | 22                        | 33                                    | 1.1                                       | 2.8                    | 1.8   | 170          | 5.0                        | 65        | 150       | 500           | A / C                  | 6.1x.y             | 16            | 1           |
| 30   | 26                        | 39                                    | 1.3                                       | 2.9                    | 1.7   | 180          | 5.0                        | 65        | 165       | 560           | A / C                  | 6.2x.y             | 16            | 1           |
| 40   | 30                        | 45                                    | 1.5                                       | 4.0                    | 1.3   | 200          | 5.5                        | 75        | 180       | 780           | F                      | 6.3x.7             | 6             | 2           |
| 50   | 30                        | 45                                    | 1.5                                       | 4.0                    | 1.3   | 200          | 5.5                        | 75        | 180       | 850           | F                      | 6.3x.7             | 6             | 2           |
| 70   | 34                        | 51                                    | 1.7                                       | 4.9                    | 1.0   | 210          | 6.0                        | 85        | 210       | 1150          | F                      | 6.5x.7             | 6             | 3           |
| 85   | 36                        | 54                                    | 1.8                                       | 5.5                    | 0.9   | 220          | 6.5                        | 90        | 210       | 1400          | F                      | 6.6x.7             | 6             | 3           |
| 100  | 38                        | 57                                    | 1.9                                       | 7.1                    | 0.8   | 220          | 7.0                        | 100       | 210       | 1680          | F                      | 6.7x.7             | 6             | 5           |
| 125  | 40                        | 60                                    | 2.0                                       | 4.2                    | 0.7   | 300          | 7.5                        | 90        | 280       | 1860          | F                      | 6.8x.7             | 6             | 4           |
| 150  | 45                        | 68                                    | 2.3                                       | 5.3                    | 0.6   | 300          | 8.0                        | 100       | 280       | 2150          | F                      | 6.9x.7             | 6             | 5           |
| 175  | 45                        | 68                                    | 2.3                                       | 5.3                    | 0.6   | 300          | 8.0                        | 100       | 280       | 2360          | F                      | 6.9x.7             | 6             | 5           |
| <b>Urms = 930 V Un<sub>AC</sub> = 1300 V Un = 1700 V Us = 3250 V</b>         |                           |                                       |   |                        |   |              |                            |           |           |               |                        |                    |               |             |
| 10   | 18                        | 27                                    | 0.9                                       | 1.2                    | 2.2   | 160          | 4.5                        | 55        | 150       | 360           | A / C                  | 9.0x.y             | 21            | 1           |
| 15   | 20                        | 30                                    | 1.0                                       | 1.8                    | 1.8   | 170          | 4.7                        | 65        | 150       | 480           | A / C                  | 9.1x.y             | 16            | 1           |
| 20   | 22                        | 33                                    | 1.1                                       | 2.6                    | 1.7   | 180          | 5.0                        | 65        | 165       | 550           | A / C                  | 9.2x.y             | 16            | 1           |
| 30   | 24                        | 36                                    | 1.2                                       | 2.3                    | 1.3   | 200          | 5.3                        | 75        | 180       | 840           | F                      | 9.3x.7             | 6             | 2           |
| 35   | 28                        | 42                                    | 1.4                                       | 3.1                    | 1.1   | 210          | 5.5                        | 75        | 210       | 980           | F                      | 9.4x.7             | 6             | 3           |
| 40   | 30                        | 45                                    | 1.5                                       | 3.1                    | 1.0   | 210          | 5.5                        | 85        | 210       | 1150          | F                      | 9.5x.7             | 6             | 3           |
| 45   | 30                        | 45                                    | 1.5                                       | 3.1                    | 1.0   | 210          | 5.5                        | 85        | 210       | 1220          | F                      | 9.5x.7             | 6             | 3           |
| 50   | 30                        | 45                                    | 1.5                                       | 3.1                    | 1.0   | 210          | 5.5                        | 85        | 210       | 1280          | F                      | 9.5x.7             | 6             | 3           |
| 55   | 34                        | 51                                    | 1.7                                       | 3.5                    | 0.9   | 220          | 5.7                        | 90        | 210       | 1380          | F                      | 9.6x.7             | 6             | 3           |
| 70   | 38                        | 57                                    | 1.9                                       | 4.5                    | 0.8   | 220          | 5.7                        | 100       | 210       | 1720          | F                      | 9.7x.7             | 6             | 5           |
| 85   | 42                        | 63                                    | 2.1                                       | 2.7                    | 0.7   | 300          | 6.0                        | 90        | 280       | 1840          | F                      | 9.8x.7             | 6             | 4           |
| 100  | 45                        | 68                                    | 2.3                                       | 3.4                    | 0.6   | 300          | 6.5                        | 100       | 280       | 2250          | F                      | 9.9x.7             | 6             | 5           |

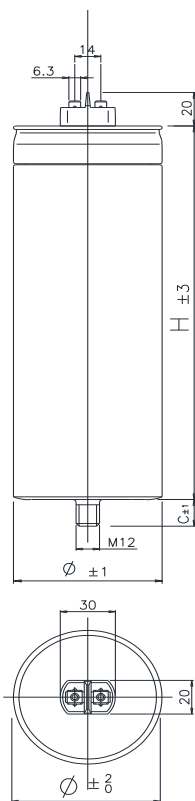
(Cn) Standard values, other values on request. Code "x": internal reference. Code "y": mechanical solution.

(\*) The maximum rms current is referred to A or F solutions. I<sub>max</sub> ≤ 16 A for C solution.



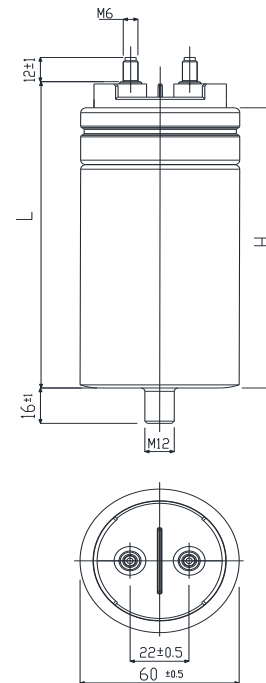
### A SOLUTION

M6 Screw-type bolts  
CODE: 41684.xxx.0  
code "y" = 0



### C SOLUTION

Double tag 6,3x0,8 mm  
CODE: 41684.xxx.2  
code "y" = 2

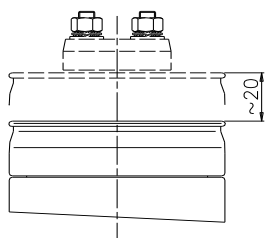


### D SOLUTION (\*) - Ø60

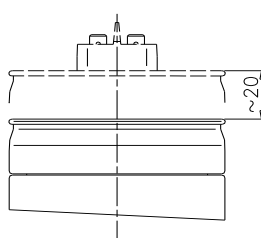
M6 screw -type bolts.  
UL94 V0 plastic cover  
CODE: 41684.xxx.6  
code "y" = 5

### Overpressure safety device

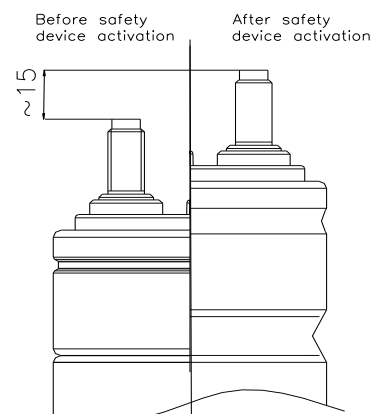
In order to ensure proper device operation, when the capacitor is installed, a clearance of at least the values given on drawing below must be left above terminals.



Dimension with overpressure device activated

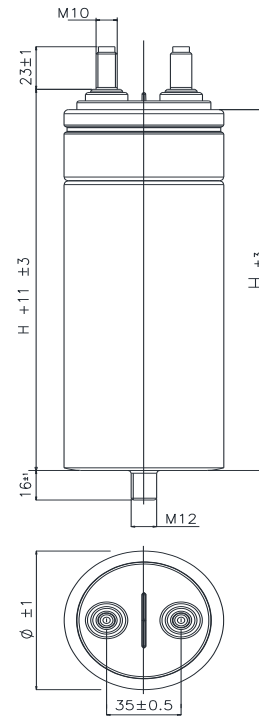
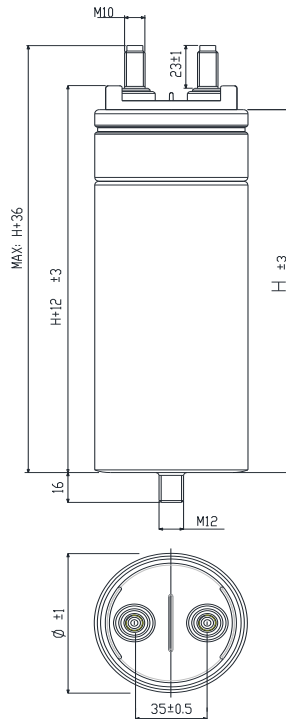
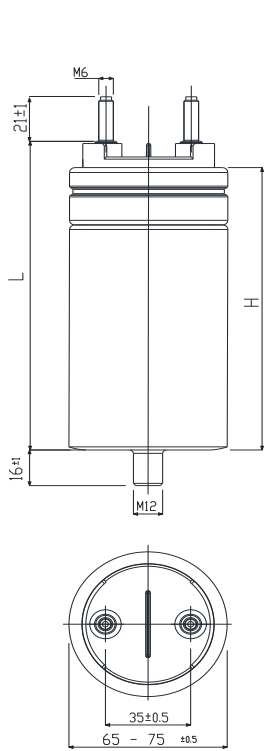


Dimension with overpressure device activated



Dimension with overpressure device activated

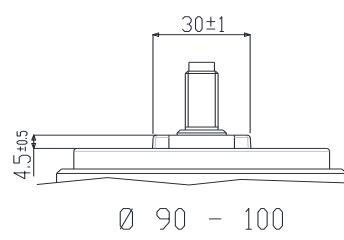
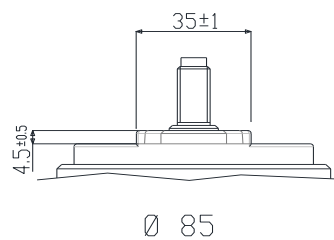
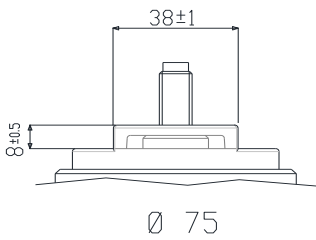




**E SOLUTION (\*)** - Ø65/75 mm  
M6 screw -type bolts.  
UL94 V0 plastic cover  
CODE: 41684.xxx.5  
code "y"= 6

**F SOLUTION** - Ø75/85 mm  
M10 Screw-type bolts  
UL94 V0 plastic cover  
CODE: 41684.xxx.7  
code "y"= 7

**F SOLUTION** - Ø90/100 mm  
M10 Screw-type bolts  
UL94 V0 plastic cover  
CODE: 41684.xxx.7  
code "y"= 7



**F SOLUTION**  
different mechanical spacing  
M10 screw -type bolts, Ø75-Ø100 mm.  
UL94 V0 plastic cover

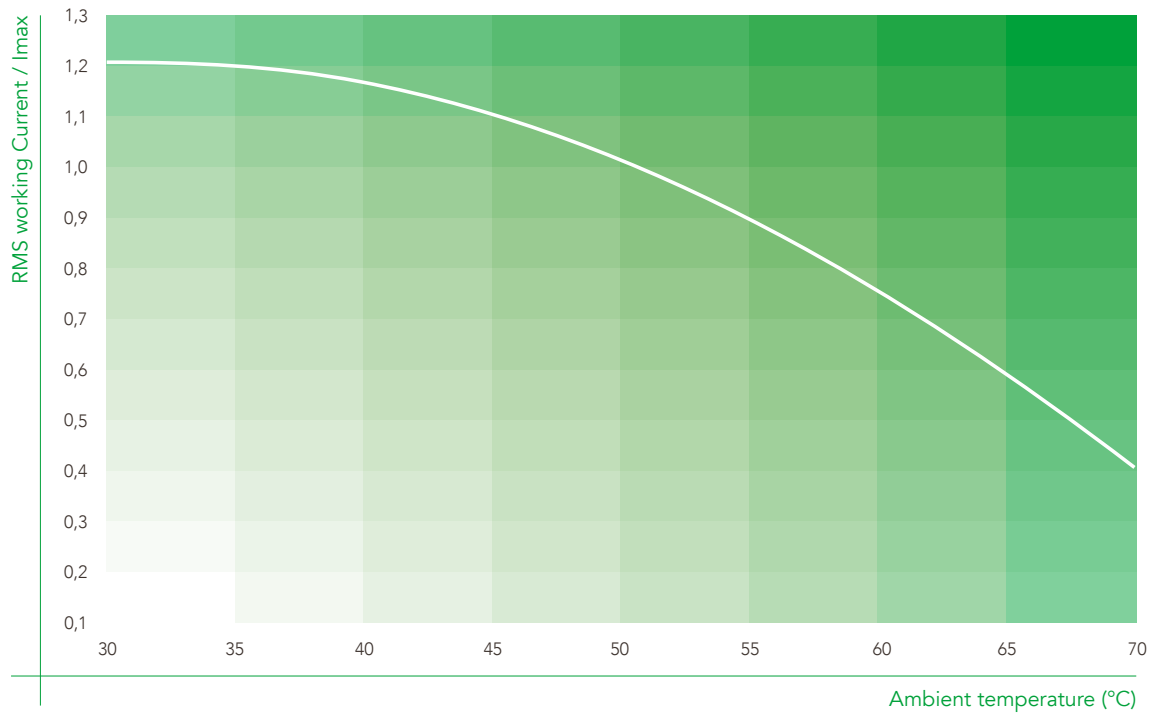
| Box TYPE | Standard box dimensions |
|----------|-------------------------|
| 1        | mm 250 x 386 x 190      |
| 2        | mm 190 x 285 x 265      |
| 3        | mm 190 x 285 x 325      |
| 4        | mm 190 x 285 x 375      |
| 5        | mm 335 x 220 x 375      |

(\*) On request, available also on different diameters.

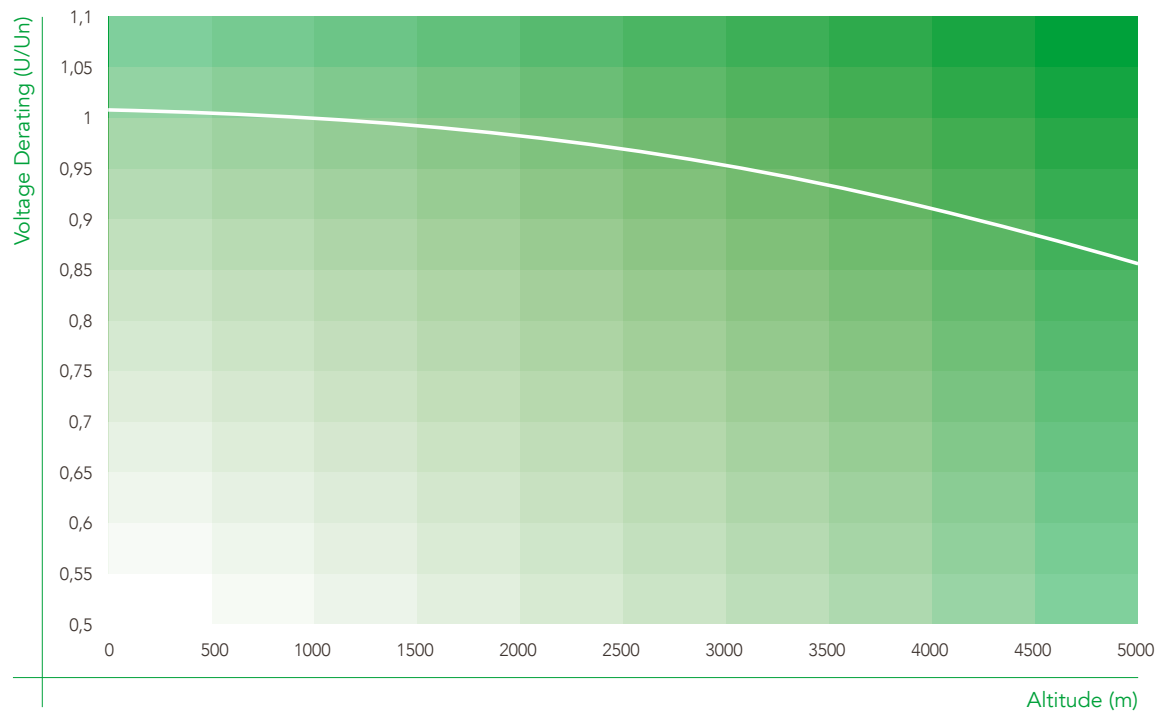




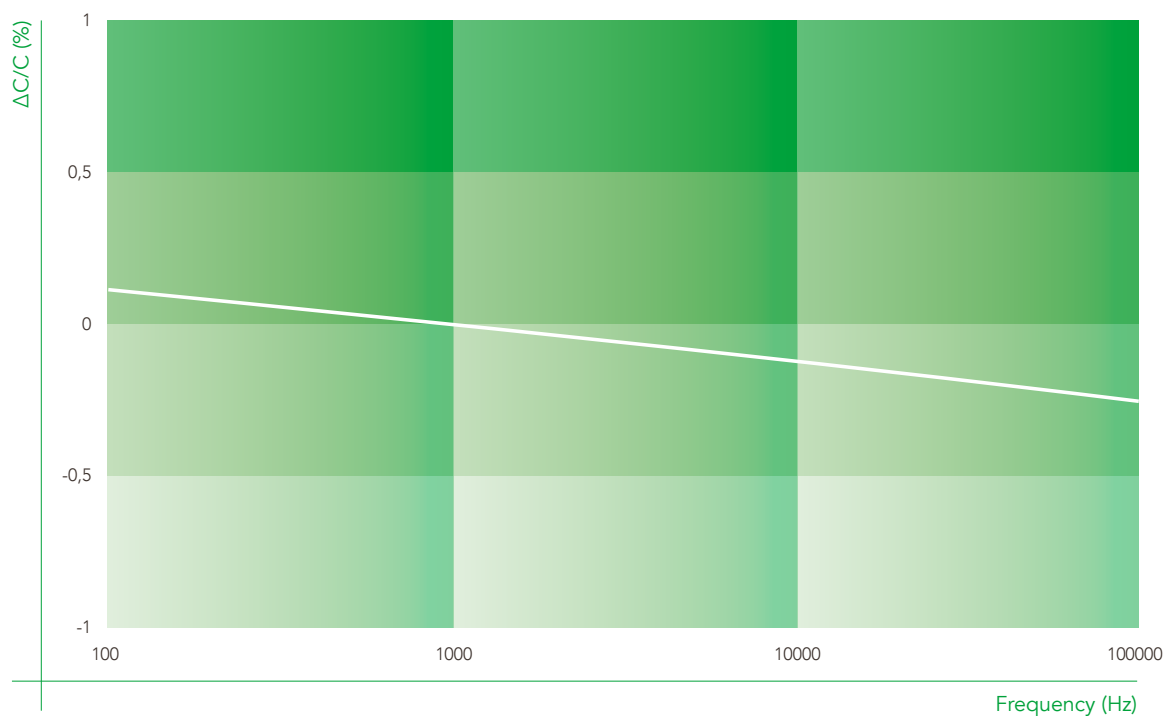
### RMS working current vs Ambient temperature



### Voltage Derating vs Altitude



**Capacitance change vs Frequency (25°C)**



**Dissipation factor change vs Frequency (25°C)**

