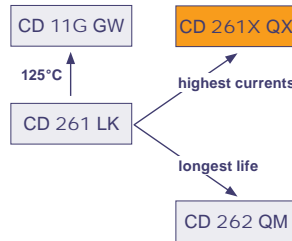


# CD 261X QX Series



7000 - 12000h at 105°C

- Extra high Ripple Current
- Down sized
- Electronic Ballast, Lighting



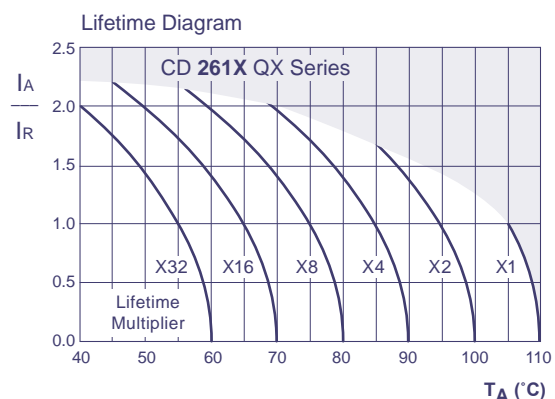
| Item  | Characteristics   |      |     |     |     |      |     |
|---|---|------|-----|-----|-----|------|-----|
| Operating Temperature Range (°C)                        | -25 ~ +105  |      |     |     |     |      |     |
| Voltage Range (V)                                       | 160 ~ 450   |      |     |     |     |      |     |
| Capacitance Range (µF)                                  | 1,0 ~ 220   |      |     |     |     |      |     |
| Capacitance Tolerance (20°C, 120Hz)                     | ± 20%   |      |     |     |     |      |     |
| Leakage Current (µA)                                    | After 1 minute at 20°C application of rated voltage, leakage current is not more than 0,04CV + 100.<br>C: Nominal Capacitance (µF) V: Rated Voltage (V) |      |     |     |     |      |     |
| Dissipation Factor (20°C, 120Hz)                        | Rated Voltage (V)   | 160  | 200 | 250 | 350 | 400  | 450 |
|   | Tan δ (max)   | 0,10 |     |     |     | 0,12 |     |
| Stability at Low Temperature (Impedance Ratio at 120Hz) | Rated Voltage (V)   | 160  | 200 | 250 | 350 | 400  | 450 |
|   | Z <sub>-25°C</sub> / Z <sub>+20°C</sub>   | 3    |     |     |     | 6    |     |

|                            | Useful Life   |                      | Load Life   | Endurance Test  | Shelf Life   |
|----------------------------|---|----------------------|---|---|--|
| <b>Lifetime</b>            | Ø 10x12,5 : 7 000h<br>Ø 10x16 ~ : 10 000h<br>Ø 10x20 : 12 000h<br><b>Ø ≥ 12 : 12 000h</b> | >100 000h            | Ø 10x12,5 : 5 000h<br>Ø 10x16 ~ : 8 000h<br>Ø 10x20 : 10 000h<br>Ø ≥ 12 : 10 000h | Ø 10x12,5 : 4 000h<br>Ø 10x16 ~ : 6 000h<br>Ø 10x20 : 8 000h<br>Ø ≥ 12 : 8 000h | 1 000h   |
| <b>Leakage Current</b>     | Not more than specified value   |                      | Not more than specified value   | Not more than specified value   | Not more than specified value  |
| <b>Capacity Change</b>     | Within ± 50% of initial value   |                      | Within ± 30% of initial value   | Within ± 20% of initial value   | Within ± 20% of initial value  |
| <b>Dissipation Factor</b>  | Not more than 500% of specified value   |                      | Not more than 300% of specified value   | Not more than 200% of specified value   | Not more than 200% of specified value  |
| <b>Condition:</b>          | U <sub>R</sub>  | U <sub>R</sub>       | U <sub>R</sub>  | U <sub>R</sub>  | U <sub>R</sub> = 0   |
| <b>Applied Voltage</b>     | I <sub>R</sub>  | 1,6 x I <sub>R</sub> | I <sub>R</sub>  | I <sub>R</sub> = 0  | I <sub>R</sub> = 0   |
| <b>Applied Current</b>     | 105°C   | 50°C                 | 105°C   | 105°C   | 105°C  |
| <b>Applied Temperature</b> | ≤ 1% Failure Rate   |                      | guaranteed  |   |  |
| <b>Failure Rate Level</b>  | ≤ 1% Failure Rate   |                      |   |   | After test:<br>U <sub>R</sub> to be applied<br>for 30min<br>>24h before<br>measurement |

## Multiplier for Ripple Current

Frequency Coefficient

| Frequency   | 50Hz | 120Hz | 1kHz | 10kHz | 100kHz |
|-------------|------|-------|------|-------|--------|
| Coefficient | 0,35 | 0,50  | 0,85 | 0,90  | 1,00   |



I<sub>A</sub> = actual ripple current at 100kHz, I<sub>R</sub> = rated ripple current at 100kHz, 105°C  
Multiplier of Useful Life as a function of ambient temperature and ripple current load

Radial

## Ratings for CD 261X QX Series

| V <sub>DC</sub><br>(Surge Voltage)<br>Code | Rated Capacitance           | Max ESR<br>20°C, 120Hz | Typ ESR<br>20°C, 120Hz | Max Ripple Current<br>105°C,<br>100kHz | Size<br>Ø D x L |           |
|--|-----------------------------|------------------------|------------------------|--|-----------------|-----------|
| (V)  | (µF)                        | (Ω)                    | (Ω)                    | (mArms)                                | (mm)            |           |
| <b>160<br/>(200)<br/>2C</b>                | 10                          | 13,3                   | 7,0                    | 320                                    | 10 x 16         |           |
|  | 22                          | 6,0                    | 3,5                    | 500                                    | 10 x 20         |           |
|  | 33                          | 4,0                    | 2,5                    | 650                                    | 10 x 20         |           |
|  | 47                          | 2,8                    | 1,7                    | 750                                    | 10 x 20         |           |
|  | 68                          |                        | 2,0                    | 1,1                                    | 1 180           | 12,5 x 20 |
|  |                             |                        | 2,0                    | 1,1                                    | 1 180           | 16 x 20   |
|  | 100                         |                        | 1,3                    | 0,70                                   | 1420            | 12,5 x 25 |
|  |                             |                        | 1,3                    | 0,70                                   | 1420            | 16 x 20   |
|  | 150                         | 0,90                   | 0,48                   | 1 890                                  | 16 x 25         |           |
|  | 220                         | 0,60                   | 0,32                   | 2 370                                  | 18 x 25         |           |
| <b>200<br/>(250)<br/>2D</b>                | 4,7                         | 28,2                   | 15,0                   | 200                                    | 10 x 12,5       |           |
|  | 6,8                         | 19,5                   | 10,5                   | 220                                    | 10 x 16         |           |
|  | 10                          | 13,3                   | 7,0                    | 320                                    | 10 x 16         |           |
|  | 22                          | 6,0                    | 3,2                    | 500                                    | 10 x 20         |           |
|  | 33                          | 4,0                    | 2,2                    | 650                                    | 10 x 20         |           |
|  | 47                          | 2,8                    | 1,5                    | 980                                    | 12,5 x 20       |           |
|  | 68                          |                        | 2,0                    | 1,1                                    | 1 300           | 12,5 x 25 |
|  |                             |                        | 2,0                    | 1,1                                    | 1 300           | 16 x 20   |
|  | 100                         | 1,3                    | 0,70                   | 1420                                   | 16 x 20         |           |
|  | 150                         | 0,90                   | 0,48                   | 1 890                                  | 16 x 25         |           |
| <b>250<br/>(300)<br/>2E</b>                | 4,7                         | 28,2                   | 15,0                   | 200                                    | 10 x 12,5       |           |
|  | 6,8                         | 19,5                   | 10,5                   | 250                                    | 10 x 16         |           |
|  | 10                          | 13,3                   | 7,0                    | 320                                    | 10 x 16         |           |
|  | 22                          | 6,0                    | 3,2                    | 500                                    | 10 x 20         |           |
|  | 33                          | 4,0                    | 2,2                    | 800                                    | 12,5 x 20       |           |
|  | 47                          | 2,8                    | 1,5                    | 980                                    | 12,5 x 20       |           |
|  | 68                          | 2,0                    | 1,1                    | 1 300                                  | 16 x 20         |           |
|  | 100                         | 1,3                    | 0,70                   | 1 530                                  | 16 x 25         |           |
|  | 150                         | 0,90                   | 0,48                   | 1 940                                  | 18 x 25         |           |
|  | <b>350<br/>(400)<br/>2V</b> | 1,5                    | 106                    | 60,0                                   | 100             | 10 x 12,5 |
| 2,2  |                             | 72,4                   | 41,0                   | 140                                    | 10 x 12,5       |           |
| 3,3  |                             | 48,3                   | 28,0                   | 180                                    | 10 x 12,5       |           |
| 4,7  |                             | 33,9                   | 19,0                   | 220                                    | 10 x 16         |           |
| 5,6  |                             | 28,4                   | 16,0                   | 250                                    | 10 x 16         |           |
| 6,8  |                             | 23,4                   | 13,0                   | 280                                    | 10 x 20         |           |
| 10   |                             | 15,9                   | 9,0                    | 350                                    | 10 x 20         |           |
| 22   |                             | 7,2                    | 4,1                    | 650                                    | 12,5 x 20       |           |
| 33   |                             | 4,8                    | 2,7                    | 900                                    | 16 x 20         |           |
| 47   |                             | 3,4                    | 1,9                    | 1 080                                  | 16 x 20         |           |
| 68   | 2,3                         | 1,3                    | 1 470                  | 18 x 25                                |                 |           |

| V <sub>DC</sub><br>(Surge Voltage)<br>Code | Rated Capacitance           | Max ESR<br>20°C, 120Hz | Typ ESR<br>20°C, 120Hz | Max Ripple Current<br>105°C,<br>100kHz | Size<br>Ø D x L |           |
|--|-----------------------------|------------------------|------------------------|--|-----------------|-----------|
| (V)  | (µF)                        | (Ω)                    | (Ω)                    | (mArms)                                | (mm)            |           |
| <b>400<br/>(450)<br/>2G</b>                | 1                           | 160                    | 60,0                   | 70                                     | 10 x 12,5       |           |
|  | 1,5                         | 107                    | 40,0                   | 100                                    | 10 x 12,5       |           |
|  | 2,2                         | 72,4                   | 27,0                   | 140                                    | 10 x 12,5       |           |
|  | 3,3                         | 48,3                   | 19,0                   | 180                                    | 10 x 16         |           |
|  | 4,7                         | 33,9                   | 13,5                   | 220                                    | 10 x 16         |           |
|  | 5,6                         | 28,4                   | 11,5                   | 250                                    | 10 x 20         |           |
|  | 6,8                         | 23,4                   | 9,5                    | 280                                    | 10 x 20         |           |
|  | 10                          | 15,9                   | 6,4                    | 350                                    | 10 x 20         |           |
|  | 15                          | 10,6                   | 4,3                    | 550                                    | 12,5 x 20       |           |
|  | 22                          |                        | 7,2                    | 2,9                                    | 760             | 12,5 x 25 |
|  |                             |                        | 7,2                    | 2,9                                    | 760             | 16 x 20   |
|  | 33                          | 4,8                    | 1,9                    | 900                                    | 16 x 20         |           |
|  | 47                          | 3,4                    | 1,4                    | 1 180                                  | 16 x 25         |           |
|  | 68                          | 2,3                    | 0,90                   | 1 470                                  | 18 x 25         |           |
|  | <b>450<br/>(500)<br/>2W</b> | 2,2                    | 72,4                   | 29,0                                   | 150             | 10 x 16   |
| 3,3  |                             | 48,3                   | 19,0                   | 180                                    | 10 x 16         |           |
| 4,7  |                             | 33,9                   | 13,5                   | 220                                    | 10 x 20         |           |
| 5,6  |                             | 28,4                   | 11,5                   | 250                                    | 10 x 20         |           |
| 6,8  |                             | 23,4                   | 9,5                    | 280                                    | 10 x 20         |           |
| 10   |                             | 15,9                   | 6,5                    | 450                                    | 12,5 x 20       |           |
| 15   |                             | 10,6                   | 4,3                    | 600                                    | 12,5 x 25       |           |
| 22   |                             | 7,2                    | 2,9                    | 730                                    | 16 x 20         |           |
| 33   |                             | 4,8                    | 1,9                    | 980                                    | 16 x 25         |           |
| 47   |                             | 3,4                    | 1,4                    | 1 200                                  | 18 x 25         |           |

Radial

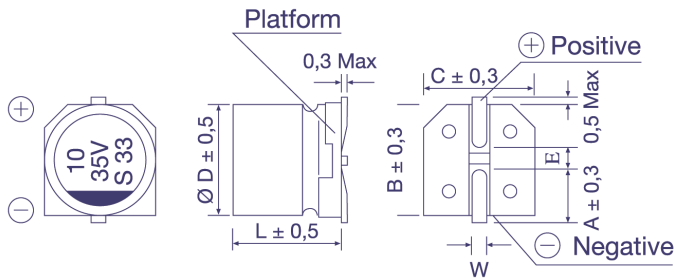
Custom products are available on request.

## Order Code SMD, Radial, Snap-In

| EC                          | R             | 1C  | PT           | 101                                  | M                     | FF  | 25                  | 0611            | JE xxxxx          |
|-----------------------------|---------------|---|--------------|--------------------------------------|-----------------------|---|---------------------|-----------------|-------------------|
| Technology                  | Terminal Type | Rated Voltage Code                              | Series Code  | Capacitance Code (in $\mu\text{F}$ ) | Capacitance Tolerance | Lead Form   | Terminal/Pitch Size | Dimension       | for Specials only |
| EC = Electrolytic Capacitor | SMD = V       | For coding please refer to the pages of ratings | CD VS = BS   | 0,47 = R47                           | $\pm 20\%$ = M        | SMD:  |                     | 4x7 = 0407      |                   |
|                             | Radial = R    |   | CD VH = VH   | 1,0 = 010                            | $\pm 10\%$ = K        | Taped = FF  | Terminal = T2       | 5x11,5 = 0511   |                   |
| PC = Polymer Capacitor      | Snap-In = S   |   | CD VZ = VZ   | 2,2 = 2R2                            | +30 / -10% = Q        | Radial:   |                     | 6,3x11,5 = 0611 |                   |
|                             |               |   | CD 261 = LK  | 100 = 101                            | +50 / -10% = T        | Long Lead = LL  | 2,0mm = 20          | 35x80 = 3580    |                   |
|                             |               |   | CD 261X = QX | 1000 = 102                           |                       | Cut 5,0mm = CB  | 2,5mm = 25          | 45x100 = 45100  |                   |
|                             |               |   | CD 262 = QM  | 10000 = 103                          |                       | Cut 4,5mm = CC  | 3,5mm = 35          |                 |                   |
|                             |               |   | CD 263 = BK  |                                      |                       | Cut 4,0mm = CD  | 5,0mm = 50          |                 |                   |
|                             |               |   | CD 269 = PH  |                                      |                       | Cut 3,5mm = CE  | 7,5mm = 75          |                 |                   |
|                             |               |   | CD 281 = LL  |                                      |                       | Cut 3,0mm = CF  | 10,0mm = 10         |                 |                   |
|                             |               |   | CD 284 = XY  |                                      |                       | on request: alternative lead forms (axial, 90° - angle, others) |                     | 12,5mm = 12     |                   |
|                             |               | CD 287 = GC                                     |              |                                      | Snap-In:              |   |                     |                 |                   |
|                             |               | CD 28L = QL                                     |              |                                      | 4,0mm Pin Length = T4 | 2 Pin = P2  |                     |                 |                   |
|                             |               | CD 293 = BZ                                     |              |                                      | 6,3mm Pin Length = T6 | 3 Pin = P3  |                     |                 |                   |
|                             |               | CD 294 = BW                                     |              |                                      | Soldering Pin = S4    | 4 Pin = P4  |                     |                 |                   |
|                             |               | CD 295 = BC                                     |              |                                      |                       | 5 Pin = P5  |                     |                 |                   |
|                             |               | CD 296 = KC                                     |              |                                      | preferred             |   |                     |                 |                   |
|                             |               | CD 297 = BB                                     |              |                                      |                       |   |                     |                 |                   |
|                             |               | CD 299 = PG                                     |              |                                      |                       |   |                     |                 |                   |
|                             |               | CD 29D = HR                                     |              |                                      |                       |   |                     |                 |                   |
|                             |               | CD 29H = QH                                     |              |                                      |                       |   |                     |                 |                   |
|                             |               | CD 29L = QL                                     |              |                                      |                       |   |                     |                 |                   |
|                             |               | HCP = CP  |              |                                      |                       |   |                     |                 |                   |
|                             |               | HPM = PM  |              |                                      |                       |   |                     |                 |                   |
|                             |               | HVC = VC  |              |                                      |                       |   |                     |                 |                   |

## Technical Specification SMD Type

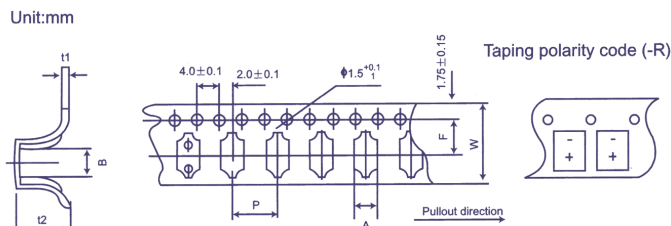
### Dimensions



| Ø D x L | 4x5,4     | 5x5,4 | 6,3x5,4 | 6,3x7,7 | 8x10,5    | 8x11,8 | 10x10,5 | 10x12,7 |
|---------|-----------|-------|---------|---------|-----------|--------|---------|---------|
| A       | 1,8       | 2,1   | 2,4     | 2,5     | 2,9       | 2,9    | 3,2     | 3,2     |
| B       | 4,3       | 5,3   | 6,6     | 6,6     | 8,3       | 8,4    | 10,3    | 10,4    |
| C       | 4,3       | 5,3   | 6,6     | 6,6     | 8,3       | 8,4    | 10,3    | 10,4    |
| E       | 1,0       | 1,3   | 2,2     | 2,2     | 3,1       | 3,1    | 4,5     | 4,5     |
| L       | 5,4       | 5,4   | 5,4     | 7,7     | 10,5      | 11,8   | 10,5    | 12,7    |
| W       | 0,5 - 0,8 |       |         |         | 0,7 - 1,1 |        |         |         |

in mm

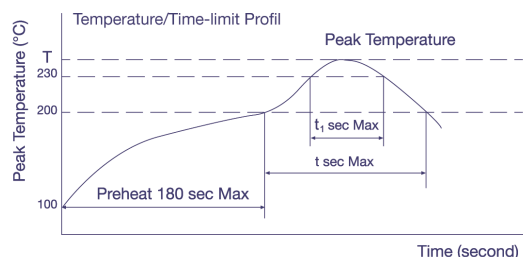
### Taping Dimensions



| Size (DxL) | w ± 0,3 | A ± 0,2 | B ± 0,2 | P ± 0,1 | t2 ± 0,2 | F ± 0,1 | t1 ± 0,1 |
|------------|---------|---------|---------|---------|----------|---------|----------|
| 4 x 5,4    | 12,0    | 5,0     | 5,0     | 8,0     | 5,8      | 5,5     | 0,4      |
| 5 x 5,4    | 12,0    | 6,0     | 6,0     | 12,0    | 5,8      | 5,5     | 0,4      |
| 6,3 x 5,4  | 16,0    | 7,0     | 7,0     | 12,0    | 5,8      | 7,5     | 0,4      |
| 6,3 x 7,7  | 16,0    | 7,0     | 7,0     | 12,0    | 8,4      | 7,5     | 0,4      |
| 8 x 10,5   | 24,0    | 8,7     | 8,7     | 16,0    | 11,0     | 11,5    | 0,5      |
| 8 x 11,8   | 24,0    | 8,7     | 8,7     | 16,0    | 12,3     | 11,5    | 0,5      |
| 10 x 10,5  | 24,0    | 10,7    | 10,7    | 16,0    | 11,0     | 11,5    | 0,5      |
| 10 x 12,7  | 24,0    | 10,7    | 10,7    | 16,0    | 14,0     | 11,5    | 0,5      |

in mm

### Soldering Profile (Aluminium Electrolytic Capacitors)

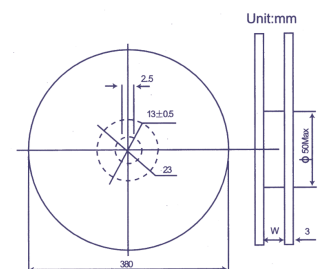


### Allowable Range of Peak Temperature

| Size        | T (°C) | t (second) | t <sub>1</sub> (second) |
|-------------|--------|------------|-------------------------|
| Ø 4 ~ 6,3   | 250    | 90         | 40                      |
| Ø 8 x 10,5  | 240    | 90         | 30                      |
| Ø 10 x 10,5 | 235    | 60         | 30                      |

| Diameter | w      | D      |
|----------|--------|--------|
| 4; 5     | 14 ± 1 | 50 ± 1 |
| 6,3      | 18 ± 1 | 50 ± 1 |
| 8; 10    | 25 ± 1 | 50 ± 1 |
| Polymer  | 25 ± 1 | 80 ± 1 |

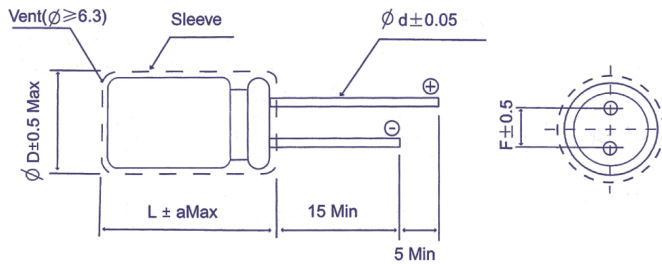
in mm



For more details or Soldering Profiles of Radials or Polymer-Capacitors please contact our local Sales Offices.

## Technical Specification Radial Type

Dimensions for loose, long-lead type, (bulk)  
Order Code: LL



| L                | L ≤ 7 |      |     |     |     |     | L ≥ 11 |     |     |      |     |    |      |    |      |  |
|------------------|-------|------|-----|-----|-----|-----|--------|-----|-----|------|-----|----|------|----|------|--|
|                  | 3     | 4    | 5   | 6,3 | 8   | 5   | 6,3    | 8   | 10  | 12,5 | 16  | 18 | 20   | 22 | 25   |  |
| ∅ D              | 3     | 4    | 5   | 6,3 | 8   | 5   | 6,3    | 8   | 10  | 12,5 | 16  | 18 | 20   | 22 | 25   |  |
| F                | 1     | 1,5  | 2,0 | 2,5 | 3,5 | 2,0 | 2,5    | 3,5 | 5,0 |      | 7,5 |    | 10,0 |    | 12,5 |  |
| ∅ d              | 0,4   | 0,45 |     | 0,5 |     | 0,6 |        | 0,8 |     | 1,0  |     |    |      |    |      |  |
| a <sub>Max</sub> | 1,0   |      |     |     |     |     | 2,0    |     |     |      |     |    |      |    |      |  |

in mm

Dimensions for Ammopack taping  
Order Code: FF (FD)

| Code | Case Range |         | Dimensions |          |         |         | Form | Ammopack |
|------|------------|---------|------------|----------|---------|---------|------|----------|
|      | ∅ D        | L (max) | H ± 0,75   | Ho ± 0,5 | F ± 0,5 | P ± 0,1 |      |          |
| FF   | 4 ~ 6      | 13      | 18,5       | -        | 2,5     | 12,7    | A    |          |
|      | 8          | 13      | 18,5       | -        | 3,5     | 12,7    |      |          |
|      | 4 ~ 8      | 7       | 17,5       | 16       | 5       | 12,7    | B    |          |
|      | 5 ~ 6,3    | 13      | 18,5       |          |         |         |      |          |
|      | 8          | 22      | 20,0       |          |         |         |      |          |
|      | FD         | 10      | 22         | 18,5     | -       | 15,0    | A    |          |
| 12,5 |            | 27      | 18,5       | -        |         |         |      |          |
| FD   | 12,5       | 27      | 18,5       | -        | 25,4    | C       |      |          |
| FF   | 16 ~ 18    | 27      | 18,5       | -        | 7,5     |         |      | 30,0     |

in mm

Dimensions for loose, short cut leads, (bulk)  
Order Code: CC (CB,CD,CE,CF)

| Straight Lead |           |           |           |           |           | Bended Lead |  |
|---------------|-----------|-----------|-----------|-----------|-----------|-------------|--|
|               |           |           |           |           |           |             |  |
| Code          | CB        | CC        | CD        | CE        | CF        |             |  |
| I             | 5,0 ± 0,5 | 4,5 ± 0,5 | 4,0 ± 0,5 | 3,5 ± 0,5 | 3,0 ± 0,5 |             |  |

preferred

in mm