



## KONDENSATOREN UND BAUELEMENTE

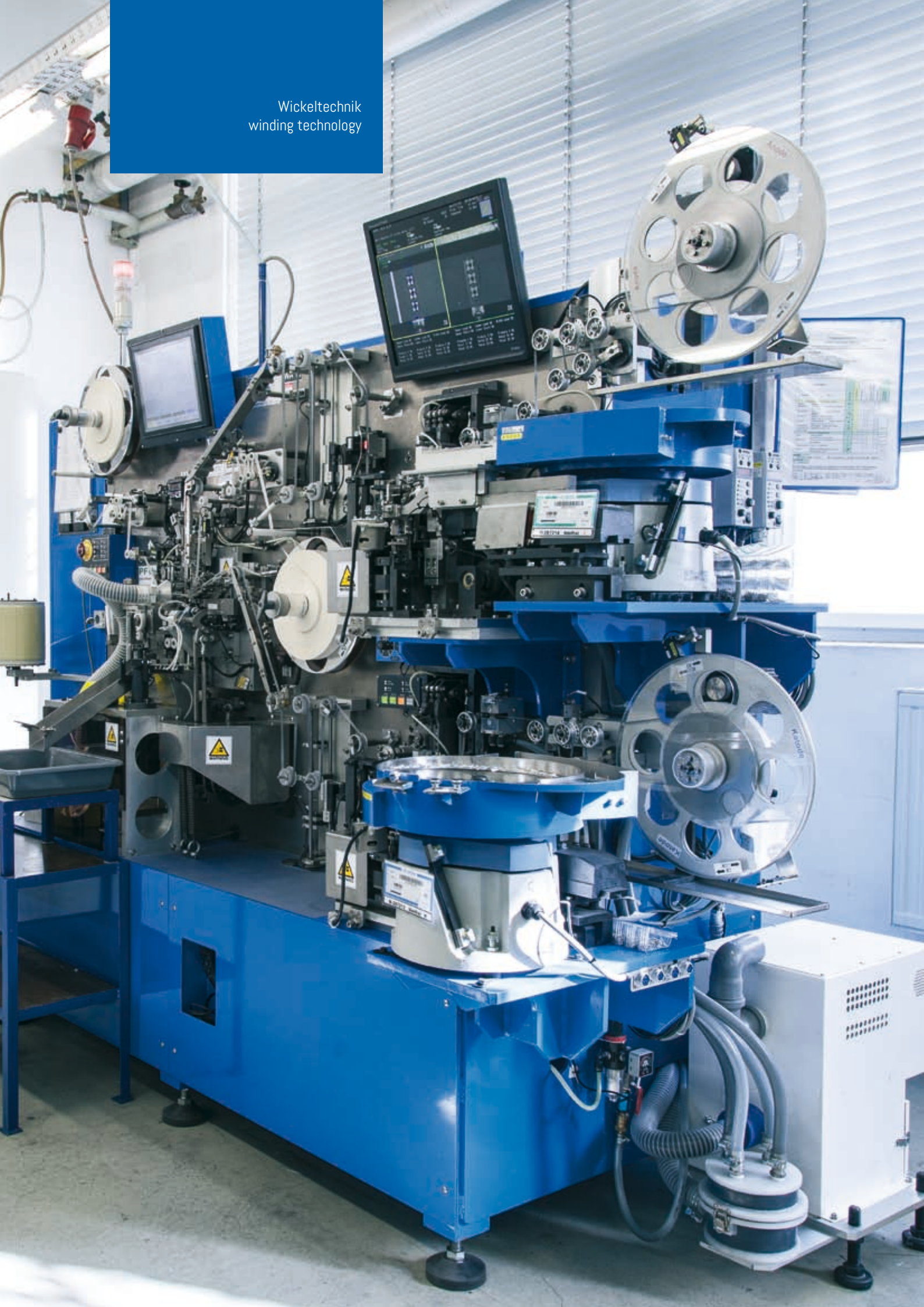
Kondensatoren kommen aus Deutschland!

Capacitors made in Germany!

.....  
Standard-Kondensatoren oder kundenspezifische Lösungen  
capacitors for standard application or according to customer requirements



Wickeltechnik  
winding technology



Wir arbeiten nach ISO 9001 und VDA 6.1.

We work according to ISO 9001 and VDA 6.1.

## Radiale Kondensatoren Radial capacitors

| Baureihe / series                  |  | Anwendungen / features | Standardtyp / standard type  | Miniaturisiert / downsized type | niedriger Z / low impedance | Langlebensdauer / long life | Hochtemperatur / high temperature | Bipolar / non-polarised | Ausführung / terminal type | Lebensdauer bis zu / endurance up to | Spannungsbereich / rated voltage range (V <sub>dc</sub> ) |           |
|------------------------------------|--|------------------------|--|---------------------------------|-----------------------------|-----------------------------|-----------------------------------|-------------------------|----------------------------|--------------------------------------|---|-----------|
| Radiale Bauform / radial lead type | Standardanwendung / general purpose    | EKS                    | Standardanwendung / general purpose  | *                               | *                           |                             |                                   |                         | Radial                     | 105°C / 2.500h                       | 6,3 - 100   |           |
|                                    |  | EKM                    | Standardanwendung / general purpose  | *                               |                             |                             |                                   |                         | Radial                     | 105°C / 1.500h                       | 6,3 - 100   |           |
|                                    |  | EKR                    | low impedance, für/for SMPS  | *                               |                             | *                           |                                   |                         |                            | Radial                               | 105°C / 2.000h  | 10 - 100  |
|                                    |  | ERH                    | Hohes C x U, Langlebensdauer, Hochvolt / High C x U - product, long life, high voltage | *                               |                             |                             |                                   | *                       |                            | Radial                               | 105°C / 5.000h  | 160 - 450 |
|                                    |  | EKSU                   | Standardanwendung, bipolar / general purpose, non-polarised                            | *                               | *                           |                             |                                   |                         | *                          | Radial                               | 105°C / 2.500h  | 6,3 - 100 |
|                                    |  | EKMU                   | Standardanwendung, bipolar / general purpose, non-polarised                            | *                               |                             |                             |                                   |                         | *                          | Radial                               | 105°C / 1.500h  | 6,3 - 100 |
|                                    |  | EKT                    | Für Tonfrequenz / for audio frequency  | *                               |                             |                             |                                   |                         |                            | Radial                               | 105°C / 1.500h  | 40 - 100  |
|                                    | Spezialanwendung / special application | ERY                    | niedrige ESR / Z   |                                 |                             | *                           | *                                 |                         |                            | Radial                               | 105°C / 10.000h   | 10 - 100  |
|                                    |  | ERF                    | niedriger Z, für SNT-Einsatz / low impedance, for SMPS                                 |                                 |                             | *                           | *                                 |                         |                            | Radial                               | 105°C / 10.000h   | 6,3 - 100 |
|                                    |  | EKLM                   | Hochtemperatur, miniaturisiert / high temperature, downsized                           |                                 | *                           |                             |                                   | *                       |                            | Radial                               | 125 °C / 8.000h   | 10 - 63   |
|                                    |  | ERX                    | Langlebensdauer / long life grade  |                                 |                             |                             | *                                 |                         |                            | Radial                               | 105°C / 9.500h  | 10 - 63   |
|                                    |  | ERLL                   | Niedrigstromtyp / low leakage current  |                                 | *                           | *                           |                                   |                         |                            | Radial                               | 105°C / 10.000h   | 6,3 - 100 |
|                                    |  |                        |  |                                 |                             |                             |                                   |                         |                            |                                      |   |           |

## Axiale Kondensatoren Axial capacitors

| Baureihe / series |                                     | Anwendungen / features | Standardtyp / standard type                       | Miniaturisiert / downsized type | niedriger Z / low impedance | Hochtemperatur / high temperature | Ausführung / terminal type | Lebensdauer bis zu / endurance up to | Spannungsbereich / rated voltage range (V <sub>dc</sub> ) |
|-------------------|-------------------------------------|------------------------|---|---------------------------------|-----------------------------|-----------------------------------|----------------------------|--------------------------------------|---|
| Axial             | Standardanwendung / general purpose | EAG                    | Axial, Standardanwendung / axial, general purpose | *                               |                             |                                   | Axial                      | 1.500h / 2500h / 105°C               | 6,3 - 100   |

## SMD Kondensatoren

SMD type

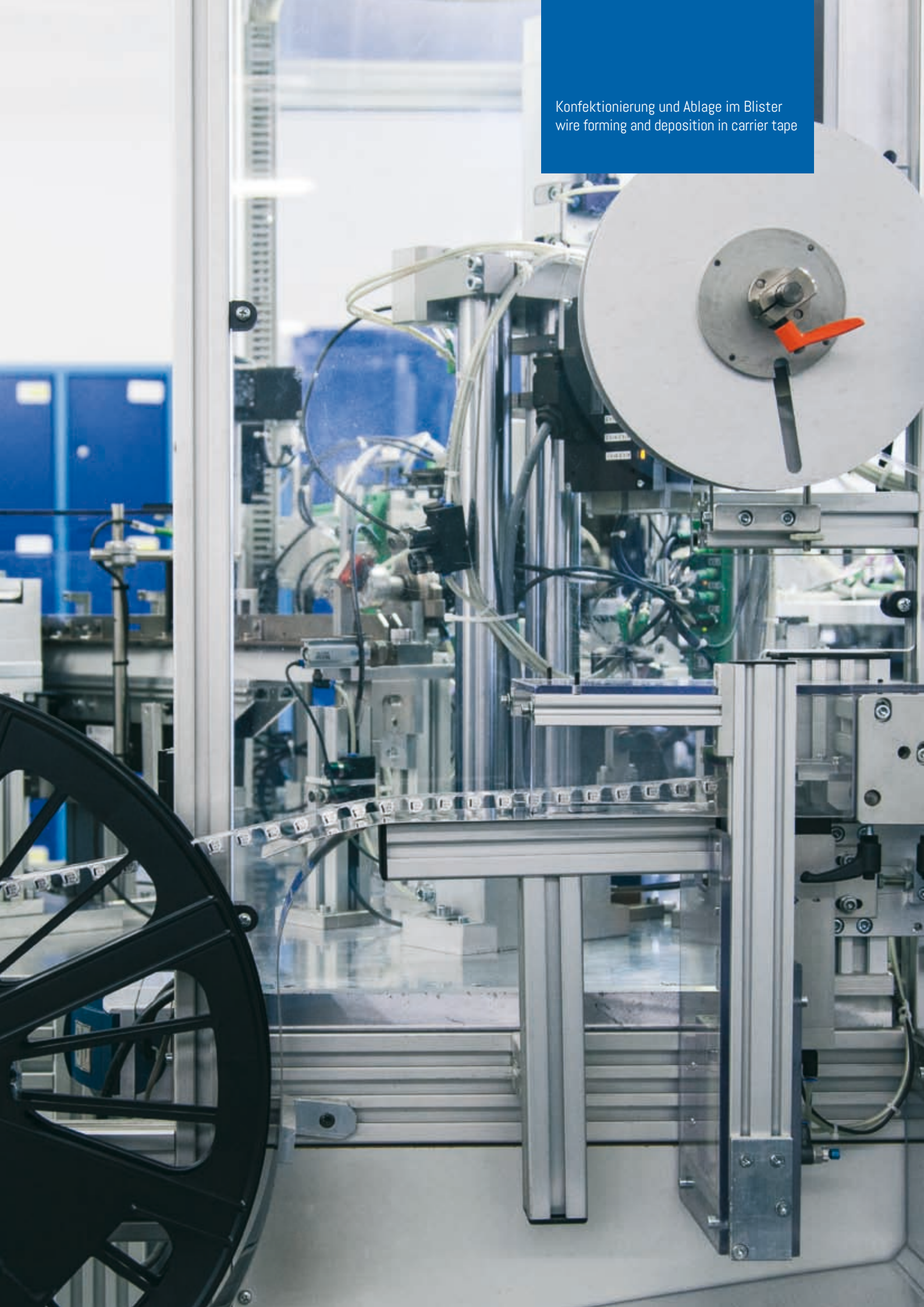
| Baureihe / series                                 |  | Anwendungen / features | Standardtyp / standard type  | Miniaturisiert / downsized type | niedriger Z / low impedance | Hochtemperatur / high temperature | Ausführung / terminal type | Lebensdauer bis zu / endurance up to | Spannungsbereich / rated voltage range (V <sub>dc</sub> ) |
|---|--|------------------------|--|---------------------------------|-----------------------------|-----------------------------------|----------------------------|--------------------------------------|---|
| Oberflächenmontierbare Elkos / surface mount type | Standardanwendung / general purpose    | ERS                    | Standardanwendung zur Oberflächenmontage / standard-SMD for surface mounting | *                               |                             |                                   | SMD                        | 3.000h / 105°C                       | 10 - 100  |
|   | Spezialanwendung / special application | ERSM                   | SMD, hohes C x U / SMD, high C x U - product                                 |                                 | *                           |                                   | SMD                        | 2.000h / 105°C                       | 10 - 100  |
|   |  | ERSH                   | hochtemperaturgeeignet / high temperature resistance                         |                                 |                             |                                   | *                          | SMD                                  | 1.500h / 125°C  |
|   | low impedance                          | ERSY                   | SMD, low ESR / Z   |                                 |                             | *                                 | SMD                        | 3.000h / 105°C                       | 10 - 63   |
|   | Bipolar / non-polarised                | ERSU                   | SMD, bipolar / SMD, non polarised, downsized                                 |                                 | *                           |                                   | SMD                        | 3.000h / 105°C                       | 10 - 100  |

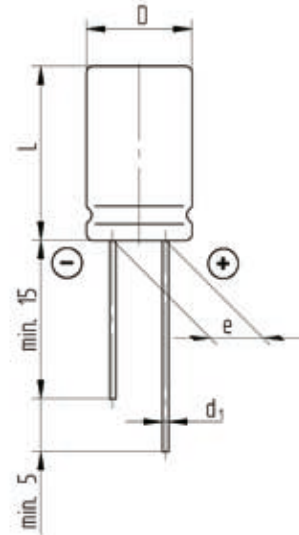
## Hochkapazitive Becherkondensatoren

Large capacitance type

| Baureihe / series                            |                                    | Anwendungen / features | Standardtyp / standard type | Miniaturisiert / downsized type | niedriger Z / low impedance | Hochtemperatur / high temperature | Ausführung / terminal type | Lebensdauer bis zu / endurance up to                                     | Spannungsbereich / rated voltage range (V <sub>dc</sub> ) |
|--|------------------------------------|------------------------|-----------------------------|---------------------------------|-----------------------------|-----------------------------------|----------------------------|--|---|
| Hochkapazitive Becherelkos / large size type | Für Schaltnetzteile / for inverter | EBH                    | 105°C, standard             | *                               |                             |                                   | Schraubanschluß / screw    | $\leq 100V_{dc}$<br>4.000h / 105°C<br>$\geq 160V_{dc}$<br>3.000h / 105°C | 6,3 - 450   |

Konfektionierung und Ablage im Blister  
wire forming and deposition in carrier tape





Um die Vergleichbarkeit mit Wettbewerbern zu erreichen, haben wir die Toleranzen dem Weltstandard angepasst. Die Abmaße der Bauelemente sind unverändert.  
*In order to achieve consistency with its peers, we have adjusted the tolerances of the world standard. The dimension of the components are unchanged.*

### Radiale Kondensatoren

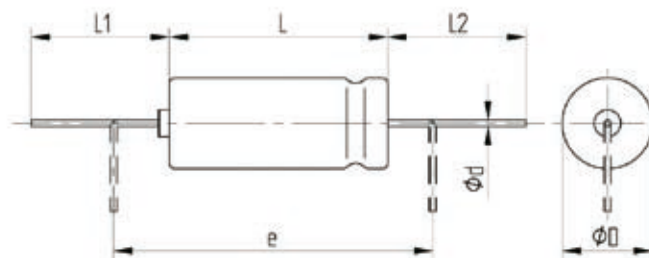
Radial capacitors

| Abmessung<br>dimension | Ø D Toleranz<br>Ø D tolerance | Länge L Toleranz<br>length L tolerance | Raster e ± 0,5<br>lead spacing ± 0,5 | Ø d1 Draht<br>Ø d1 wire | Draht auf<br>Anfrage<br>wire on request |
|------------------------|-------------------------------|--|--------------------------------------|-------------------------|---|
| 5x11                   | + 0,5                         | + 1                                    | 2,0                                  | 0,6                     | 0,5                                     |
| 6,3x11                 | + 0,5                         | + 1,5                                  | 2,5                                  | 0,6                     | 0,5                                     |
| 8,7 x 12,7             |                               |  | 5                                    | 0,6                     |   |
| 10 x 12                | + 0,5                         | + 1,5                                  | 5                                    | 0,6                     |   |
| 10 x 16                | + 0,5                         | + 1,5                                  | 5                                    | 0,6                     |   |
| 10 x 20                | + 0,5                         | + 1,5                                  | 5                                    | 0,6                     |   |
| 12,5 x 20              | + 0,5                         | + 1,5                                  | 5                                    | 0,8                     | 0,6                                     |
| 12,5 x 24              | + 0,5                         | + 1,5                                  | 5                                    | 0,8                     | 0,6                                     |
| 12,5 x 29              | + 0,5                         | + 1,5                                  | 5                                    | 0,8                     | 0,6                                     |
| 16 x 20                | + 0,5                         | + 2                                    | 7,5                                  | 0,8                     |   |
| 16 x 25                | + 0,5                         | + 2                                    | 7,5                                  | 0,8                     |   |
| 16 x 29                | + 0,5                         | + 2                                    | 7,5                                  | 0,8                     |   |
| 16 x 35,5              | + 0,5                         | + 2                                    | 7,5                                  | 0,8                     |   |
| 18 x 20                | + 0,5                         | + 2                                    | 7,5                                  | 0,8                     |   |
| 18 x 25                | + 0,5                         | + 2                                    | 7,5                                  | 0,8                     |   |
| 18 x 29                | + 0,5                         | + 2                                    | 7,5                                  | 0,8                     |   |
| 18 x 35,5              | + 0,5                         | + 2                                    | 7,5                                  | 0,8                     |   |

Abmessung in mm dimension in mm

### Axiale Kondensatoren

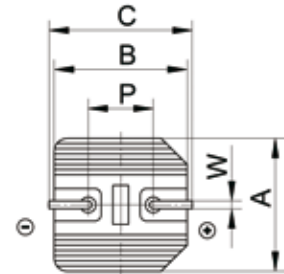
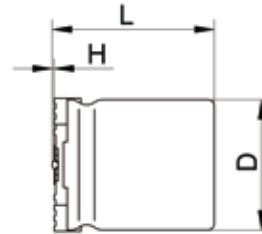
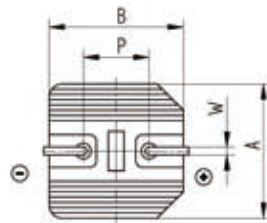
Axial capacitors



| Abmessung<br>dimension | Ø D Toleranz<br>Ø D tolerance | Länge L Toleranz<br>length L tolerance | e minimum | d   | L1       | L2       |
|------------------------|-------------------------------|--|-----------|-----|----------|----------|
| 8,5 x 16               | + 0,5                         | + 1,5                                  | 23,5      | 0,6 | 45 +/- 3 | 38 +/- 3 |
| 8,5 x 20               | + 0,5                         | + 1,5                                  | 27,5      | 0,6 | 45 +/- 3 | 38 +/- 3 |
| 14 x 25,5              | + 0,5                         | + 1,5                                  | 33        | 0,8 | 45 +/- 3 | 38 +/- 3 |
| 14 x 30,5              | + 0,5                         | + 1,5                                  | 37,5      | 0,8 | 45 +/- 3 | 38 +/- 3 |
| 14 x 35,5              | + 0,5                         | + 1,5                                  | 43        | 0,8 | 45 +/- 3 | 38 +/- 3 |

Abmessung in mm dimension in mm

Abmessungen und Rastermaß  
dimension and pitch

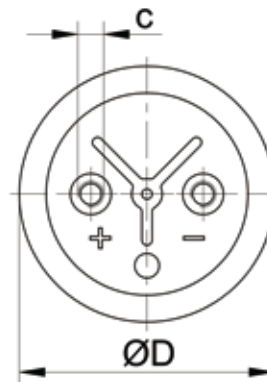
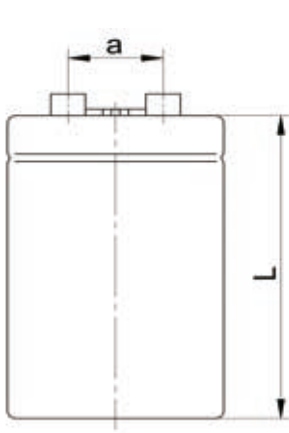


### SMD Kondensatoren SMD type

| Abmessung<br>dimension | Ø D Toleranz<br>Ø D tolerance | Länge L Toleranz<br>length L tolerance | C       | A und B<br>A and B | P           | W           | H       |
|------------------------|-------------------------------|--|---------|--------------------|-------------|-------------|---------|
| 8,9 x 10,0             | + 0,5                         | +/- 0,5                                | +/- 0,2 | +/- 0,2            | 4,5 +/- 0,5 | 0,9 +/- 0,1 | 0 + 0,1 |
| 8,9 x 12,0             | + 0,5                         | +/- 0,5                                | +/- 0,2 | +/- 0,2            | 4,5 +/- 0,5 | 0,9 +/- 0,1 | 0 + 0,1 |
| 10,2 x 10,0            | + 0,5                         | +/- 0,5                                | +/- 0,2 | +/- 0,2            | 4,5 +/- 0,5 | 0,9 +/- 0,1 | 0 + 0,1 |
| 10,2 x 12,0            | + 0,5                         | +/- 0,5                                | +/- 0,2 | +/- 0,2            | 4,5 +/- 0,5 | 0,9 +/- 0,1 | 0 + 0,1 |

Abmessung in mm *dimension in mm*

### Hochkapazitive Becherkondensatoren Large capacitance type



| Abmessung<br>dimension | D max | L max | a            | C  | b (nur Form B)<br>b (only form B) |
|------------------------|-------|-------|--------------|----|-----------------------------------|
| 36 x 58                | 36    | 58    | 13 +/- 0,2   | M5 | M8                                |
| 36 x 83                | 36    | 83    | 13 +/- 0,2   | M5 | M8                                |
| 36 x 103               | 36    | 103   | 13 +/- 0,2   | M5 | M8                                |
| 36 x 123               | 36    | 123   | 13 +/- 0,2   | M5 | M8                                |
| 51 x 83                | 51    | 83    | 22 +/- 0,2   | M5 | M12                               |
| 51 x 103               | 51    | 103   | 22 +/- 0,2   | M5 | M12                               |
| 51 x 123               | 51    | 123   | 22 +/- 0,2   | M5 | M12                               |
| 65 x 103               | 65    | 103   | 28,5 +/- 0,2 | M5 | M12                               |
| 65 x 123               | 65    | 123   | 28,5 +/- 0,2 | M5 | M12                               |

Abmessung in mm *dimension in mm*

# Radiale Elkos / Radial lead type

| Radiale Elkos / Radial lead type                           |  |            |            |               |            |            |
|--|--|------------|------------|---------------|------------|------------|
| Baureihen  | <b>EKR</b><br>Standardausführung, gepolt, isoliert, schaltfest<br><i>Standard, polarized, insulated, pulse-proof</i>       |            |            |               |            |            |
| Anwendung, Besonderheiten<br><i>Applications, features</i> | niedriges Z, für SNT Einsatz<br><i>low impedance, for SMPS</i>   |            |            |               |            |            |
| Temperaturbereich<br><i>Temperature range</i>              | - 40 ... + 105°C   |            |            |               |            |            |
| Lebensdauer<br><i>Endurance</i>                            | Ø = 8,7 mm   | 105°C      |            | min 1 000 h   |            |            |
|  |  | 40°C       |            | min 100 000 h |            |            |
|  | Ø ≥ 10 mm  | 105°C      |            | min 2 000 h   |            |            |
|  |  | 40°C       |            | min 200 000 h |            |            |
| Spezifikation<br><i>Specification</i>                      | DIN EN 60384-1, DIN EN 60384-4<br>ohne Gütebestätigung (GB) / <i>without quality assessment (QA)</i>                       |            |            |               |            |            |
| Kapazitätstoleranz<br><i>Capacitance tolerance</i>         | - 10 ... + 50 %  |            |            |               |            |            |
|  | abweichende Kapazitätstoleranzen sind auf Anfrage lieferbar / <i>other capacitance tolerances are available on request</i> |            |            |               |            |            |
| Kapazität / Capacitance<br>C ( µF)                         | Nennspannung / <i>Rated voltage</i>  |            |            |               |            |            |
|  | 10   | 16         | 25         | 40            | 63         | 100        |
| 0,47   |  |            |            |               |            |            |
| 1  |  |            |            |               |            |            |
| 1,5  |  |            |            |               |            |            |
| 2,2  |  |            |            |               |            |            |
| 3,3  |  |            |            |               |            |            |
| 4,7  |  |            |            |               |            |            |
| 6,8  |  |            |            |               |            | 8,7 x 12,7 |
| 10   |  |            |            |               | 8,7 x 12,7 | 8,7 x 12,7 |
| 15   |  |            |            | 8,7 x 12,7    | 8,7 x 12,7 | 8,7 x 12,7 |
| 22   |  |            | 8,7 x 12,7 | 8,7 x 12,7    | 10 x 12    | 10 x 12    |
| 33   |  | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7    | 10 x 12    | 10 x 16    |
| 47   | 8,7 x 12,7   | 8,7 x 12,7 | 8,7 x 12,7 | 10 x 12       | 10 x 16    | 10 x 20    |
| 68   | 8,7 x 12,7   | 8,7 x 12,7 | 8,7 x 12,7 | 10 x 12       | 10 x 20    | 12,5 x 20  |
| 100  | 8,7 x 12,7   | 10 x 12    | 10 x 12    | 10 x 16       | 12,5 x 20  | 12,5 x 24  |
| 150  | 8,7 x 12,7   | 10 x 12    | 10 x 16    | 10 x 20       | 12,5 x 20  | 12,5 x 29  |
| 220  | 10 x 12  | 10 x 16    | 10 x 20    | 12,5 x 20     | 12,5 x 29  | 16 x 25    |
| 330  | 10 x 16  | 10 x 20    | 10 x 20    | 12,5 x 20     | 16 x 25    | 16 x 29    |
| 470  | 10 x 20  | 12,5 x 20  | 12,5 x 20  | 12,5 x 29     | 16 x 29    | 16 x 35,5  |
| 680  | 10 x 20  | 12,5 x 20  | 12,5 x 24  | 16 x 25       | 16 x 35,5  |            |
| 1 000  | 12,5 x 20  | 12,5 x 29  | 16 x 25    | 16 x 29       |            |            |
| 1 500  | 12,5 x 29  | 16 x 25    | 16 x 29    | 16 x 35,5     |            |            |
| 2 200  | 16 x 25  | 16 x 29    | 16 x 35,5  |               |            |            |
| 3 300  | 16 x 29  | 16 x 35,5  |            |               |            |            |
| 4 700  | 16 x 35,5  |            |            |               |            |            |
| 6 800  |  |            |            |               |            |            |
| 10 000   |  |            |            |               |            |            |
| 15 000   |  |            |            |               |            |            |







# Radiale Elkos / Radial lead type

| <b>EKMU</b>   |  |               |                              |            |            |            |            |    |     |      |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |     |  |  |  |  |  |            |            |     |  |  |  |  |            |            |            |     |  |  |  |            |            |            |            |     |  |  |            |            |            |            |            |     |  |            |            |            |            |            |            |    |            |            |            |            |            |            |            |    |            |            |            |            |            |            |         |    |            |            |            |            |            |            |         |    |            |            |            |         |         |         |         |    |            |            |            |         |         |         |         |    |            |            |         |         |         |           |           |     |            |            |         |         |           |           |           |     |         |         |         |           |           |           |         |     |         |         |         |           |           |         |         |     |         |         |           |           |         |         |           |     |         |           |           |         |           |           |  |     |           |           |         |         |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |       |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |
|---|--|---------------|------------------------------|------------|------------|------------|------------|----|-----|------|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|-----|--|--|--|--|--|------------|------------|-----|--|--|--|--|------------|------------|------------|-----|--|--|--|------------|------------|------------|------------|-----|--|--|------------|------------|------------|------------|------------|-----|--|------------|------------|------------|------------|------------|------------|----|------------|------------|------------|------------|------------|------------|------------|----|------------|------------|------------|------------|------------|------------|---------|----|------------|------------|------------|------------|------------|------------|---------|----|------------|------------|------------|---------|---------|---------|---------|----|------------|------------|------------|---------|---------|---------|---------|----|------------|------------|---------|---------|---------|-----------|-----------|-----|------------|------------|---------|---------|-----------|-----------|-----------|-----|---------|---------|---------|-----------|-----------|-----------|---------|-----|---------|---------|---------|-----------|-----------|---------|---------|-----|---------|---------|-----------|-----------|---------|---------|-----------|-----|---------|-----------|-----------|---------|-----------|-----------|--|-----|-----------|-----------|---------|---------|-----------|--|--|-------|-----------|---------|---------|-----------|--|--|--|-------|---------|---------|-----------|--|--|--|--|-------|---------|-----------|--|--|--|--|--|-------|-----------|--|--|--|--|--|--|-------|--|--|--|--|--|--|--|-------|--|--|--|--|--|--|--|--------|--|--|--|--|--|--|--|--------|--|--|--|--|--|--|
| <b>Baureihen</b>  | <b>Standardausführung, ungepolt, isoliert, schaltfest</b><br><i>Standard, non polarized, insulated, pulse-proof</i>  |               |                              |            |            |            |            |    |     |      |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |     |  |  |  |  |  |            |            |     |  |  |  |  |            |            |            |     |  |  |  |            |            |            |            |     |  |  |            |            |            |            |            |     |  |            |            |            |            |            |            |    |            |            |            |            |            |            |            |    |            |            |            |            |            |            |         |    |            |            |            |            |            |            |         |    |            |            |            |         |         |         |         |    |            |            |            |         |         |         |         |    |            |            |         |         |         |           |           |     |            |            |         |         |           |           |           |     |         |         |         |           |           |           |         |     |         |         |         |           |           |         |         |     |         |         |           |           |         |         |           |     |         |           |           |         |           |           |  |     |           |           |         |         |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |       |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |
| <b>Anwendung, Besonderheiten</b><br><i>Applications, features</i> | <b>allgemeine Anwendung, bipolar</b><br><i>general purpose, non-polarized</i>  |               |                              |            |            |            |            |    |     |      |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |     |  |  |  |  |  |            |            |     |  |  |  |  |            |            |            |     |  |  |  |            |            |            |            |     |  |  |            |            |            |            |            |     |  |            |            |            |            |            |            |    |            |            |            |            |            |            |            |    |            |            |            |            |            |            |         |    |            |            |            |            |            |            |         |    |            |            |            |         |         |         |         |    |            |            |            |         |         |         |         |    |            |            |         |         |         |           |           |     |            |            |         |         |           |           |           |     |         |         |         |           |           |           |         |     |         |         |         |           |           |         |         |     |         |         |           |           |         |         |           |     |         |           |           |         |           |           |  |     |           |           |         |         |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |       |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |
| <b>Temperaturbereich</b><br><i>Temperature range</i>              | - 40 ... + 105°C   |               |                              |            |            |            |            |    |     |      |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |     |  |  |  |  |  |            |            |     |  |  |  |  |            |            |            |     |  |  |  |            |            |            |            |     |  |  |            |            |            |            |            |     |  |            |            |            |            |            |            |    |            |            |            |            |            |            |            |    |            |            |            |            |            |            |         |    |            |            |            |            |            |            |         |    |            |            |            |         |         |         |         |    |            |            |            |         |         |         |         |    |            |            |         |         |         |           |           |     |            |            |         |         |           |           |           |     |         |         |         |           |           |           |         |     |         |         |         |           |           |         |         |     |         |         |           |           |         |         |           |     |         |           |           |         |           |           |  |     |           |           |         |         |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |       |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |
| <b>Lebensdauer</b><br><i>Endurance</i>                            | $\varnothing \leq 12,5 \text{ mm}$   | 105°C<br>40°C | min 1 000 h<br>min 100 000 h |            |            |            |            |    |     |      |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |     |  |  |  |  |  |            |            |     |  |  |  |  |            |            |            |     |  |  |  |            |            |            |            |     |  |  |            |            |            |            |            |     |  |            |            |            |            |            |            |    |            |            |            |            |            |            |            |    |            |            |            |            |            |            |         |    |            |            |            |            |            |            |         |    |            |            |            |         |         |         |         |    |            |            |            |         |         |         |         |    |            |            |         |         |         |           |           |     |            |            |         |         |           |           |           |     |         |         |         |           |           |           |         |     |         |         |         |           |           |         |         |     |         |         |           |           |         |         |           |     |         |           |           |         |           |           |  |     |           |           |         |         |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |       |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |
|   | $\varnothing = 16 \text{ mm}$  | 105°C<br>40°C | min 1 500 h<br>min 150 000 h |            |            |            |            |    |     |      |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |     |  |  |  |  |  |            |            |     |  |  |  |  |            |            |            |     |  |  |  |            |            |            |            |     |  |  |            |            |            |            |            |     |  |            |            |            |            |            |            |    |            |            |            |            |            |            |            |    |            |            |            |            |            |            |         |    |            |            |            |            |            |            |         |    |            |            |            |         |         |         |         |    |            |            |            |         |         |         |         |    |            |            |         |         |         |           |           |     |            |            |         |         |           |           |           |     |         |         |         |           |           |           |         |     |         |         |         |           |           |         |         |     |         |         |           |           |         |         |           |     |         |           |           |         |           |           |  |     |           |           |         |         |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |       |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |
|   |  |               |                              |            |            |            |            |    |     |      |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |     |  |  |  |  |  |            |            |     |  |  |  |  |            |            |            |     |  |  |  |            |            |            |            |     |  |  |            |            |            |            |            |     |  |            |            |            |            |            |            |    |            |            |            |            |            |            |            |    |            |            |            |            |            |            |         |    |            |            |            |            |            |            |         |    |            |            |            |         |         |         |         |    |            |            |            |         |         |         |         |    |            |            |         |         |         |           |           |     |            |            |         |         |           |           |           |     |         |         |         |           |           |           |         |     |         |         |         |           |           |         |         |     |         |         |           |           |         |         |           |     |         |           |           |         |           |           |  |     |           |           |         |         |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |       |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |
|   |  |               |                              |            |            |            |            |    |     |      |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |     |  |  |  |  |  |            |            |     |  |  |  |  |            |            |            |     |  |  |  |            |            |            |            |     |  |  |            |            |            |            |            |     |  |            |            |            |            |            |            |    |            |            |            |            |            |            |            |    |            |            |            |            |            |            |         |    |            |            |            |            |            |            |         |    |            |            |            |         |         |         |         |    |            |            |            |         |         |         |         |    |            |            |         |         |         |           |           |     |            |            |         |         |           |           |           |     |         |         |         |           |           |           |         |     |         |         |         |           |           |         |         |     |         |         |           |           |         |         |           |     |         |           |           |         |           |           |  |     |           |           |         |         |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |       |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |
| <b>Spezifikation</b><br><i>Specification</i>                      | DIN EN 60384-1, DIN EN 60384-4<br>ohne Gütebestätigung (GB) / without quality assessment (QA)  |               |                              |            |            |            |            |    |     |      |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |     |  |  |  |  |  |            |            |     |  |  |  |  |            |            |            |     |  |  |  |            |            |            |            |     |  |  |            |            |            |            |            |     |  |            |            |            |            |            |            |    |            |            |            |            |            |            |            |    |            |            |            |            |            |            |         |    |            |            |            |            |            |            |         |    |            |            |            |         |         |         |         |    |            |            |            |         |         |         |         |    |            |            |         |         |         |           |           |     |            |            |         |         |           |           |           |     |         |         |         |           |           |           |         |     |         |         |         |           |           |         |         |     |         |         |           |           |         |         |           |     |         |           |           |         |           |           |  |     |           |           |         |         |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |       |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |
| <b>Kapazitätstoleranz</b><br><i>Capacitance tolerance</i>         | - 10 ... + 50 %  |               |                              |            |            |            |            |    |     |      |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |     |  |  |  |  |  |            |            |     |  |  |  |  |            |            |            |     |  |  |  |            |            |            |            |     |  |  |            |            |            |            |            |     |  |            |            |            |            |            |            |    |            |            |            |            |            |            |            |    |            |            |            |            |            |            |         |    |            |            |            |            |            |            |         |    |            |            |            |         |         |         |         |    |            |            |            |         |         |         |         |    |            |            |         |         |         |           |           |     |            |            |         |         |           |           |           |     |         |         |         |           |           |           |         |     |         |         |         |           |           |         |         |     |         |         |           |           |         |         |           |     |         |           |           |         |           |           |  |     |           |           |         |         |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |       |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |
|   | abweichende Kapazitätstoleranzen sind auf Anfrage lieferbar / other capacitance tolerances are available on request  |               |                              |            |            |            |            |    |     |      |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |     |  |  |  |  |  |            |            |     |  |  |  |  |            |            |            |     |  |  |  |            |            |            |            |     |  |  |            |            |            |            |            |     |  |            |            |            |            |            |            |    |            |            |            |            |            |            |            |    |            |            |            |            |            |            |         |    |            |            |            |            |            |            |         |    |            |            |            |         |         |         |         |    |            |            |            |         |         |         |         |    |            |            |         |         |         |           |           |     |            |            |         |         |           |           |           |     |         |         |         |           |           |           |         |     |         |         |         |           |           |         |         |     |         |         |           |           |         |         |           |     |         |           |           |         |           |           |  |     |           |           |         |         |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |       |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |
| <b>Kapazität / Capacitance</b><br>C ( $\mu\text{F}$ )             | <b>Nennspannung / Rated voltage</b>  |               |                              |            |            |            |            |    |     |      |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |     |  |  |  |  |  |            |            |     |  |  |  |  |            |            |            |     |  |  |  |            |            |            |            |     |  |  |            |            |            |            |            |     |  |            |            |            |            |            |            |    |            |            |            |            |            |            |            |    |            |            |            |            |            |            |         |    |            |            |            |            |            |            |         |    |            |            |            |         |         |         |         |    |            |            |            |         |         |         |         |    |            |            |         |         |         |           |           |     |            |            |         |         |           |           |           |     |         |         |         |           |           |           |         |     |         |         |         |           |           |         |         |     |         |         |           |           |         |         |           |     |         |           |           |         |           |           |  |     |           |           |         |         |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |       |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |
|   | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 12.5%;">6,3</th> <th style="width: 12.5%;">10</th> <th style="width: 12.5%;">16</th> <th style="width: 12.5%;">25</th> <th style="width: 12.5%;">40</th> <th style="width: 12.5%;">50</th> <th style="width: 12.5%;">63</th> <th style="width: 12.5%;">100</th> </tr> </thead> <tbody> <tr><td>0,47</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>1,5</td><td></td><td></td><td></td><td></td><td></td><td>8,7 x 12,7</td><td>8,7 x 12,7</td></tr> <tr><td>2,2</td><td></td><td></td><td></td><td></td><td>8,7 x 12,7</td><td>8,7 x 12,7</td><td>8,7 x 12,7</td></tr> <tr><td>3,3</td><td></td><td></td><td></td><td>8,7 x 12,7</td><td>8,7 x 12,7</td><td>8,7 x 12,7</td><td>8,7 x 12,7</td></tr> <tr><td>4,7</td><td></td><td></td><td>8,7 x 12,7</td><td>8,7 x 12,7</td><td>8,7 x 12,7</td><td>8,7 x 12,7</td><td>8,7 x 12,7</td></tr> <tr><td>6,8</td><td></td><td>8,7 x 12,7</td><td>8,7 x 12,7</td><td>8,7 x 12,7</td><td>8,7 x 12,7</td><td>8,7 x 12,7</td><td>8,7 x 12,7</td></tr> <tr><td>10</td><td>8,7 x 12,7</td><td>8,7 x 12,7</td><td>8,7 x 12,7</td><td>8,7 x 12,7</td><td>8,7 x 12,7</td><td>8,7 x 12,7</td><td>8,7 x 12,7</td></tr> <tr><td>15</td><td>8,7 x 12,7</td><td>8,7 x 12,7</td><td>8,7 x 12,7</td><td>8,7 x 12,7</td><td>8,7 x 12,7</td><td>8,7 x 12,7</td><td>10 x 12</td></tr> <tr><td>22</td><td>8,7 x 12,7</td><td>8,7 x 12,7</td><td>8,7 x 12,7</td><td>8,7 x 12,7</td><td>8,7 x 12,7</td><td>8,7 x 12,7</td><td>10 x 12</td></tr> <tr><td>33</td><td>8,7 x 12,7</td><td>8,7 x 12,7</td><td>8,7 x 12,7</td><td>10 x 12</td><td>10 x 12</td><td>10 x 12</td><td>10 x 16</td></tr> <tr><td>47</td><td>8,7 x 12,7</td><td>8,7 x 12,7</td><td>8,7 x 12,7</td><td>10 x 12</td><td>10 x 16</td><td>10 x 16</td><td>10 x 20</td></tr> <tr><td>68</td><td>8,7 x 12,7</td><td>8,7 x 12,7</td><td>10 x 12</td><td>10 x 16</td><td>10 x 20</td><td>12,5 x 20</td><td>12,5 x 24</td></tr> <tr><td>100</td><td>8,7 x 12,7</td><td>8,7 x 12,7</td><td>10 x 12</td><td>10 x 16</td><td>12,5 x 20</td><td>12,5 x 24</td><td>12,5 x 29</td></tr> <tr><td>150</td><td>10 x 12</td><td>10 x 12</td><td>10 x 16</td><td>12,5 x 20</td><td>12,5 x 24</td><td>12,5 x 29</td><td>16 x 25</td></tr> <tr><td>220</td><td>10 x 12</td><td>10 x 16</td><td>10 x 20</td><td>12,5 x 24</td><td>12,5 x 29</td><td>16 x 25</td><td>16 x 29</td></tr> <tr><td>330</td><td>10 x 16</td><td>10 x 20</td><td>12,5 x 20</td><td>12,5 x 29</td><td>16 x 25</td><td>16 x 29</td><td>16 x 35,5</td></tr> <tr><td>470</td><td>10 x 20</td><td>12,5 x 20</td><td>12,5 x 24</td><td>16 x 25</td><td>16 x 35,5</td><td>16 x 35,5</td><td></td></tr> <tr><td>680</td><td>12,5 x 20</td><td>12,5 x 24</td><td>16 x 25</td><td>16 x 29</td><td>16 x 35,5</td><td></td><td></td></tr> <tr><td>1 000</td><td>12,5 x 29</td><td>16 x 20</td><td>16 x 29</td><td>16 x 35,5</td><td></td><td></td><td></td></tr> <tr><td>1 500</td><td>16 x 25</td><td>16 x 29</td><td>16 x 35,5</td><td></td><td></td><td></td><td></td></tr> <tr><td>2 200</td><td>16 x 29</td><td>16 x 35,5</td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>3 300</td><td>16 x 35,5</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>4 700</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>6 800</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>10 000</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>15 000</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table> | 6,3           | 10                           | 16         | 25         | 40         | 50         | 63 | 100 | 0,47 |  |  |  |  |  |  |  | 1 |  |  |  |  |  |  |  | 1,5 |  |  |  |  |  | 8,7 x 12,7 | 8,7 x 12,7 | 2,2 |  |  |  |  | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7 | 3,3 |  |  |  | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7 | 4,7 |  |  | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7 | 6,8 |  | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7 | 10 | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7 | 15 | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7 | 10 x 12 | 22 | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7 | 10 x 12 | 33 | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7 | 10 x 12 | 10 x 12 | 10 x 12 | 10 x 16 | 47 | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7 | 10 x 12 | 10 x 16 | 10 x 16 | 10 x 20 | 68 | 8,7 x 12,7 | 8,7 x 12,7 | 10 x 12 | 10 x 16 | 10 x 20 | 12,5 x 20 | 12,5 x 24 | 100 | 8,7 x 12,7 | 8,7 x 12,7 | 10 x 12 | 10 x 16 | 12,5 x 20 | 12,5 x 24 | 12,5 x 29 | 150 | 10 x 12 | 10 x 12 | 10 x 16 | 12,5 x 20 | 12,5 x 24 | 12,5 x 29 | 16 x 25 | 220 | 10 x 12 | 10 x 16 | 10 x 20 | 12,5 x 24 | 12,5 x 29 | 16 x 25 | 16 x 29 | 330 | 10 x 16 | 10 x 20 | 12,5 x 20 | 12,5 x 29 | 16 x 25 | 16 x 29 | 16 x 35,5 | 470 | 10 x 20 | 12,5 x 20 | 12,5 x 24 | 16 x 25 | 16 x 35,5 | 16 x 35,5 |  | 680 | 12,5 x 20 | 12,5 x 24 | 16 x 25 | 16 x 29 | 16 x 35,5 |  |  | 1 000 | 12,5 x 29 | 16 x 20 | 16 x 29 | 16 x 35,5 |  |  |  | 1 500 | 16 x 25 | 16 x 29 | 16 x 35,5 |  |  |  |  | 2 200 | 16 x 29 | 16 x 35,5 |  |  |  |  |  | 3 300 | 16 x 35,5 |  |  |  |  |  |  | 4 700 |  |  |  |  |  |  |  | 6 800 |  |  |  |  |  |  |  | 10 000 |  |  |  |  |  |  |  | 15 000 |  |  |  |  |  |  |
| 6,3   | 10   | 16            | 25                           | 40         | 50         | 63         | 100        |    |     |      |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |     |  |  |  |  |  |            |            |     |  |  |  |  |            |            |            |     |  |  |  |            |            |            |            |     |  |  |            |            |            |            |            |     |  |            |            |            |            |            |            |    |            |            |            |            |            |            |            |    |            |            |            |            |            |            |         |    |            |            |            |            |            |            |         |    |            |            |            |         |         |         |         |    |            |            |            |         |         |         |         |    |            |            |         |         |         |           |           |     |            |            |         |         |           |           |           |     |         |         |         |           |           |           |         |     |         |         |         |           |           |         |         |     |         |         |           |           |         |         |           |     |         |           |           |         |           |           |  |     |           |           |         |         |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |       |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |
| 0,47  |  |               |                              |            |            |            |            |    |     |      |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |     |  |  |  |  |  |            |            |     |  |  |  |  |            |            |            |     |  |  |  |            |            |            |            |     |  |  |            |            |            |            |            |     |  |            |            |            |            |            |            |    |            |            |            |            |            |            |            |    |            |            |            |            |            |            |         |    |            |            |            |            |            |            |         |    |            |            |            |         |         |         |         |    |            |            |            |         |         |         |         |    |            |            |         |         |         |           |           |     |            |            |         |         |           |           |           |     |         |         |         |           |           |           |         |     |         |         |         |           |           |         |         |     |         |         |           |           |         |         |           |     |         |           |           |         |           |           |  |     |           |           |         |         |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |       |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |
| 1   |  |               |                              |            |            |            |            |    |     |      |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |     |  |  |  |  |  |            |            |     |  |  |  |  |            |            |            |     |  |  |  |            |            |            |            |     |  |  |            |            |            |            |            |     |  |            |            |            |            |            |            |    |            |            |            |            |            |            |            |    |            |            |            |            |            |            |         |    |            |            |            |            |            |            |         |    |            |            |            |         |         |         |         |    |            |            |            |         |         |         |         |    |            |            |         |         |         |           |           |     |            |            |         |         |           |           |           |     |         |         |         |           |           |           |         |     |         |         |         |           |           |         |         |     |         |         |           |           |         |         |           |     |         |           |           |         |           |           |  |     |           |           |         |         |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |       |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |
| 1,5   |  |               |                              |            |            | 8,7 x 12,7 | 8,7 x 12,7 |    |     |      |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |     |  |  |  |  |  |            |            |     |  |  |  |  |            |            |            |     |  |  |  |            |            |            |            |     |  |  |            |            |            |            |            |     |  |            |            |            |            |            |            |    |            |            |            |            |            |            |            |    |            |            |            |            |            |            |         |    |            |            |            |            |            |            |         |    |            |            |            |         |         |         |         |    |            |            |            |         |         |         |         |    |            |            |         |         |         |           |           |     |            |            |         |         |           |           |           |     |         |         |         |           |           |           |         |     |         |         |         |           |           |         |         |     |         |         |           |           |         |         |           |     |         |           |           |         |           |           |  |     |           |           |         |         |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |       |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |
| 2,2   |  |               |                              |            | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7 |    |     |      |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |     |  |  |  |  |  |            |            |     |  |  |  |  |            |            |            |     |  |  |  |            |            |            |            |     |  |  |            |            |            |            |            |     |  |            |            |            |            |            |            |    |            |            |            |            |            |            |            |    |            |            |            |            |            |            |         |    |            |            |            |            |            |            |         |    |            |            |            |         |         |         |         |    |            |            |            |         |         |         |         |    |            |            |         |         |         |           |           |     |            |            |         |         |           |           |           |     |         |         |         |           |           |           |         |     |         |         |         |           |           |         |         |     |         |         |           |           |         |         |           |     |         |           |           |         |           |           |  |     |           |           |         |         |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |       |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |
| 3,3   |  |               |                              | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7 |    |     |      |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |     |  |  |  |  |  |            |            |     |  |  |  |  |            |            |            |     |  |  |  |            |            |            |            |     |  |  |            |            |            |            |            |     |  |            |            |            |            |            |            |    |            |            |            |            |            |            |            |    |            |            |            |            |            |            |         |    |            |            |            |            |            |            |         |    |            |            |            |         |         |         |         |    |            |            |            |         |         |         |         |    |            |            |         |         |         |           |           |     |            |            |         |         |           |           |           |     |         |         |         |           |           |           |         |     |         |         |         |           |           |         |         |     |         |         |           |           |         |         |           |     |         |           |           |         |           |           |  |     |           |           |         |         |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |       |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |
| 4,7   |  |               | 8,7 x 12,7                   | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7 |    |     |      |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |     |  |  |  |  |  |            |            |     |  |  |  |  |            |            |            |     |  |  |  |            |            |            |            |     |  |  |            |            |            |            |            |     |  |            |            |            |            |            |            |    |            |            |            |            |            |            |            |    |            |            |            |            |            |            |         |    |            |            |            |            |            |            |         |    |            |            |            |         |         |         |         |    |            |            |            |         |         |         |         |    |            |            |         |         |         |           |           |     |            |            |         |         |           |           |           |     |         |         |         |           |           |           |         |     |         |         |         |           |           |         |         |     |         |         |           |           |         |         |           |     |         |           |           |         |           |           |  |     |           |           |         |         |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |       |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |
| 6,8   |  | 8,7 x 12,7    | 8,7 x 12,7                   | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7 |    |     |      |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |     |  |  |  |  |  |            |            |     |  |  |  |  |            |            |            |     |  |  |  |            |            |            |            |     |  |  |            |            |            |            |            |     |  |            |            |            |            |            |            |    |            |            |            |            |            |            |            |    |            |            |            |            |            |            |         |    |            |            |            |            |            |            |         |    |            |            |            |         |         |         |         |    |            |            |            |         |         |         |         |    |            |            |         |         |         |           |           |     |            |            |         |         |           |           |           |     |         |         |         |           |           |           |         |     |         |         |         |           |           |         |         |     |         |         |           |           |         |         |           |     |         |           |           |         |           |           |  |     |           |           |         |         |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |       |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |
| 10  | 8,7 x 12,7   | 8,7 x 12,7    | 8,7 x 12,7                   | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7 |    |     |      |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |     |  |  |  |  |  |            |            |     |  |  |  |  |            |            |            |     |  |  |  |            |            |            |            |     |  |  |            |            |            |            |            |     |  |            |            |            |            |            |            |    |            |            |            |            |            |            |            |    |            |            |            |            |            |            |         |    |            |            |            |            |            |            |         |    |            |            |            |         |         |         |         |    |            |            |            |         |         |         |         |    |            |            |         |         |         |           |           |     |            |            |         |         |           |           |           |     |         |         |         |           |           |           |         |     |         |         |         |           |           |         |         |     |         |         |           |           |         |         |           |     |         |           |           |         |           |           |  |     |           |           |         |         |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |       |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |
| 15  | 8,7 x 12,7   | 8,7 x 12,7    | 8,7 x 12,7                   | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7 | 10 x 12    |    |     |      |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |     |  |  |  |  |  |            |            |     |  |  |  |  |            |            |            |     |  |  |  |            |            |            |            |     |  |  |            |            |            |            |            |     |  |            |            |            |            |            |            |    |            |            |            |            |            |            |            |    |            |            |            |            |            |            |         |    |            |            |            |            |            |            |         |    |            |            |            |         |         |         |         |    |            |            |            |         |         |         |         |    |            |            |         |         |         |           |           |     |            |            |         |         |           |           |           |     |         |         |         |           |           |           |         |     |         |         |         |           |           |         |         |     |         |         |           |           |         |         |           |     |         |           |           |         |           |           |  |     |           |           |         |         |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |       |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |
| 22  | 8,7 x 12,7   | 8,7 x 12,7    | 8,7 x 12,7                   | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7 | 10 x 12    |    |     |      |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |     |  |  |  |  |  |            |            |     |  |  |  |  |            |            |            |     |  |  |  |            |            |            |            |     |  |  |            |            |            |            |            |     |  |            |            |            |            |            |            |    |            |            |            |            |            |            |            |    |            |            |            |            |            |            |         |    |            |            |            |            |            |            |         |    |            |            |            |         |         |         |         |    |            |            |            |         |         |         |         |    |            |            |         |         |         |           |           |     |            |            |         |         |           |           |           |     |         |         |         |           |           |           |         |     |         |         |         |           |           |         |         |     |         |         |           |           |         |         |           |     |         |           |           |         |           |           |  |     |           |           |         |         |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |       |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |
| 33  | 8,7 x 12,7   | 8,7 x 12,7    | 8,7 x 12,7                   | 10 x 12    | 10 x 12    | 10 x 12    | 10 x 16    |    |     |      |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |     |  |  |  |  |  |            |            |     |  |  |  |  |            |            |            |     |  |  |  |            |            |            |            |     |  |  |            |            |            |            |            |     |  |            |            |            |            |            |            |    |            |            |            |            |            |            |            |    |            |            |            |            |            |            |         |    |            |            |            |            |            |            |         |    |            |            |            |         |         |         |         |    |            |            |            |         |         |         |         |    |            |            |         |         |         |           |           |     |            |            |         |         |           |           |           |     |         |         |         |           |           |           |         |     |         |         |         |           |           |         |         |     |         |         |           |           |         |         |           |     |         |           |           |         |           |           |  |     |           |           |         |         |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |       |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |
| 47  | 8,7 x 12,7   | 8,7 x 12,7    | 8,7 x 12,7                   | 10 x 12    | 10 x 16    | 10 x 16    | 10 x 20    |    |     |      |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |     |  |  |  |  |  |            |            |     |  |  |  |  |            |            |            |     |  |  |  |            |            |            |            |     |  |  |            |            |            |            |            |     |  |            |            |            |            |            |            |    |            |            |            |            |            |            |            |    |            |            |            |            |            |            |         |    |            |            |            |            |            |            |         |    |            |            |            |         |         |         |         |    |            |            |            |         |         |         |         |    |            |            |         |         |         |           |           |     |            |            |         |         |           |           |           |     |         |         |         |           |           |           |         |     |         |         |         |           |           |         |         |     |         |         |           |           |         |         |           |     |         |           |           |         |           |           |  |     |           |           |         |         |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |       |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |
| 68  | 8,7 x 12,7   | 8,7 x 12,7    | 10 x 12                      | 10 x 16    | 10 x 20    | 12,5 x 20  | 12,5 x 24  |    |     |      |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |     |  |  |  |  |  |            |            |     |  |  |  |  |            |            |            |     |  |  |  |            |            |            |            |     |  |  |            |            |            |            |            |     |  |            |            |            |            |            |            |    |            |            |            |            |            |            |            |    |            |            |            |            |            |            |         |    |            |            |            |            |            |            |         |    |            |            |            |         |         |         |         |    |            |            |            |         |         |         |         |    |            |            |         |         |         |           |           |     |            |            |         |         |           |           |           |     |         |         |         |           |           |           |         |     |         |         |         |           |           |         |         |     |         |         |           |           |         |         |           |     |         |           |           |         |           |           |  |     |           |           |         |         |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |       |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |
| 100   | 8,7 x 12,7   | 8,7 x 12,7    | 10 x 12                      | 10 x 16    | 12,5 x 20  | 12,5 x 24  | 12,5 x 29  |    |     |      |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |     |  |  |  |  |  |            |            |     |  |  |  |  |            |            |            |     |  |  |  |            |            |            |            |     |  |  |            |            |            |            |            |     |  |            |            |            |            |            |            |    |            |            |            |            |            |            |            |    |            |            |            |            |            |            |         |    |            |            |            |            |            |            |         |    |            |            |            |         |         |         |         |    |            |            |            |         |         |         |         |    |            |            |         |         |         |           |           |     |            |            |         |         |           |           |           |     |         |         |         |           |           |           |         |     |         |         |         |           |           |         |         |     |         |         |           |           |         |         |           |     |         |           |           |         |           |           |  |     |           |           |         |         |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |       |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |
| 150   | 10 x 12  | 10 x 12       | 10 x 16                      | 12,5 x 20  | 12,5 x 24  | 12,5 x 29  | 16 x 25    |    |     |      |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |     |  |  |  |  |  |            |            |     |  |  |  |  |            |            |            |     |  |  |  |            |            |            |            |     |  |  |            |            |            |            |            |     |  |            |            |            |            |            |            |    |            |            |            |            |            |            |            |    |            |            |            |            |            |            |         |    |            |            |            |            |            |            |         |    |            |            |            |         |         |         |         |    |            |            |            |         |         |         |         |    |            |            |         |         |         |           |           |     |            |            |         |         |           |           |           |     |         |         |         |           |           |           |         |     |         |         |         |           |           |         |         |     |         |         |           |           |         |         |           |     |         |           |           |         |           |           |  |     |           |           |         |         |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |       |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |
| 220   | 10 x 12  | 10 x 16       | 10 x 20                      | 12,5 x 24  | 12,5 x 29  | 16 x 25    | 16 x 29    |    |     |      |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |     |  |  |  |  |  |            |            |     |  |  |  |  |            |            |            |     |  |  |  |            |            |            |            |     |  |  |            |            |            |            |            |     |  |            |            |            |            |            |            |    |            |            |            |            |            |            |            |    |            |            |            |            |            |            |         |    |            |            |            |            |            |            |         |    |            |            |            |         |         |         |         |    |            |            |            |         |         |         |         |    |            |            |         |         |         |           |           |     |            |            |         |         |           |           |           |     |         |         |         |           |           |           |         |     |         |         |         |           |           |         |         |     |         |         |           |           |         |         |           |     |         |           |           |         |           |           |  |     |           |           |         |         |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |       |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |
| 330   | 10 x 16  | 10 x 20       | 12,5 x 20                    | 12,5 x 29  | 16 x 25    | 16 x 29    | 16 x 35,5  |    |     |      |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |     |  |  |  |  |  |            |            |     |  |  |  |  |            |            |            |     |  |  |  |            |            |            |            |     |  |  |            |            |            |            |            |     |  |            |            |            |            |            |            |    |            |            |            |            |            |            |            |    |            |            |            |            |            |            |         |    |            |            |            |            |            |            |         |    |            |            |            |         |         |         |         |    |            |            |            |         |         |         |         |    |            |            |         |         |         |           |           |     |            |            |         |         |           |           |           |     |         |         |         |           |           |           |         |     |         |         |         |           |           |         |         |     |         |         |           |           |         |         |           |     |         |           |           |         |           |           |  |     |           |           |         |         |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |       |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |
| 470   | 10 x 20  | 12,5 x 20     | 12,5 x 24                    | 16 x 25    | 16 x 35,5  | 16 x 35,5  |            |    |     |      |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |     |  |  |  |  |  |            |            |     |  |  |  |  |            |            |            |     |  |  |  |            |            |            |            |     |  |  |            |            |            |            |            |     |  |            |            |            |            |            |            |    |            |            |            |            |            |            |            |    |            |            |            |            |            |            |         |    |            |            |            |            |            |            |         |    |            |            |            |         |         |         |         |    |            |            |            |         |         |         |         |    |            |            |         |         |         |           |           |     |            |            |         |         |           |           |           |     |         |         |         |           |           |           |         |     |         |         |         |           |           |         |         |     |         |         |           |           |         |         |           |     |         |           |           |         |           |           |  |     |           |           |         |         |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |       |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |
| 680   | 12,5 x 20  | 12,5 x 24     | 16 x 25                      | 16 x 29    | 16 x 35,5  |            |            |    |     |      |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |     |  |  |  |  |  |            |            |     |  |  |  |  |            |            |            |     |  |  |  |            |            |            |            |     |  |  |            |            |            |            |            |     |  |            |            |            |            |            |            |    |            |            |            |            |            |            |            |    |            |            |            |            |            |            |         |    |            |            |            |            |            |            |         |    |            |            |            |         |         |         |         |    |            |            |            |         |         |         |         |    |            |            |         |         |         |           |           |     |            |            |         |         |           |           |           |     |         |         |         |           |           |           |         |     |         |         |         |           |           |         |         |     |         |         |           |           |         |         |           |     |         |           |           |         |           |           |  |     |           |           |         |         |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |       |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |
| 1 000   | 12,5 x 29  | 16 x 20       | 16 x 29                      | 16 x 35,5  |            |            |            |    |     |      |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |     |  |  |  |  |  |            |            |     |  |  |  |  |            |            |            |     |  |  |  |            |            |            |            |     |  |  |            |            |            |            |            |     |  |            |            |            |            |            |            |    |            |            |            |            |            |            |            |    |            |            |            |            |            |            |         |    |            |            |            |            |            |            |         |    |            |            |            |         |         |         |         |    |            |            |            |         |         |         |         |    |            |            |         |         |         |           |           |     |            |            |         |         |           |           |           |     |         |         |         |           |           |           |         |     |         |         |         |           |           |         |         |     |         |         |           |           |         |         |           |     |         |           |           |         |           |           |  |     |           |           |         |         |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |       |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |
| 1 500   | 16 x 25  | 16 x 29       | 16 x 35,5                    |            |            |            |            |    |     |      |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |     |  |  |  |  |  |            |            |     |  |  |  |  |            |            |            |     |  |  |  |            |            |            |            |     |  |  |            |            |            |            |            |     |  |            |            |            |            |            |            |    |            |            |            |            |            |            |            |    |            |            |            |            |            |            |         |    |            |            |            |            |            |            |         |    |            |            |            |         |         |         |         |    |            |            |            |         |         |         |         |    |            |            |         |         |         |           |           |     |            |            |         |         |           |           |           |     |         |         |         |           |           |           |         |     |         |         |         |           |           |         |         |     |         |         |           |           |         |         |           |     |         |           |           |         |           |           |  |     |           |           |         |         |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |       |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |
| 2 200   | 16 x 29  | 16 x 35,5     |                              |            |            |            |            |    |     |      |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |     |  |  |  |  |  |            |            |     |  |  |  |  |            |            |            |     |  |  |  |            |            |            |            |     |  |  |            |            |            |            |            |     |  |            |            |            |            |            |            |    |            |            |            |            |            |            |            |    |            |            |            |            |            |            |         |    |            |            |            |            |            |            |         |    |            |            |            |         |         |         |         |    |            |            |            |         |         |         |         |    |            |            |         |         |         |           |           |     |            |            |         |         |           |           |           |     |         |         |         |           |           |           |         |     |         |         |         |           |           |         |         |     |         |         |           |           |         |         |           |     |         |           |           |         |           |           |  |     |           |           |         |         |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |       |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |
| 3 300   | 16 x 35,5  |               |                              |            |            |            |            |    |     |      |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |     |  |  |  |  |  |            |            |     |  |  |  |  |            |            |            |     |  |  |  |            |            |            |            |     |  |  |            |            |            |            |            |     |  |            |            |            |            |            |            |    |            |            |            |            |            |            |            |    |            |            |            |            |            |            |         |    |            |            |            |            |            |            |         |    |            |            |            |         |         |         |         |    |            |            |            |         |         |         |         |    |            |            |         |         |         |           |           |     |            |            |         |         |           |           |           |     |         |         |         |           |           |           |         |     |         |         |         |           |           |         |         |     |         |         |           |           |         |         |           |     |         |           |           |         |           |           |  |     |           |           |         |         |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |       |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |
| 4 700   |  |               |                              |            |            |            |            |    |     |      |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |     |  |  |  |  |  |            |            |     |  |  |  |  |            |            |            |     |  |  |  |            |            |            |            |     |  |  |            |            |            |            |            |     |  |            |            |            |            |            |            |    |            |            |            |            |            |            |            |    |            |            |            |            |            |            |         |    |            |            |            |            |            |            |         |    |            |            |            |         |         |         |         |    |            |            |            |         |         |         |         |    |            |            |         |         |         |           |           |     |            |            |         |         |           |           |           |     |         |         |         |           |           |           |         |     |         |         |         |           |           |         |         |     |         |         |           |           |         |         |           |     |         |           |           |         |           |           |  |     |           |           |         |         |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |       |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |
| 6 800   |  |               |                              |            |            |            |            |    |     |      |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |     |  |  |  |  |  |            |            |     |  |  |  |  |            |            |            |     |  |  |  |            |            |            |            |     |  |  |            |            |            |            |            |     |  |            |            |            |            |            |            |    |            |            |            |            |            |            |            |    |            |            |            |            |            |            |         |    |            |            |            |            |            |            |         |    |            |            |            |         |         |         |         |    |            |            |            |         |         |         |         |    |            |            |         |         |         |           |           |     |            |            |         |         |           |           |           |     |         |         |         |           |           |           |         |     |         |         |         |           |           |         |         |     |         |         |           |           |         |         |           |     |         |           |           |         |           |           |  |     |           |           |         |         |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |       |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |
| 10 000  |  |               |                              |            |            |            |            |    |     |      |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |     |  |  |  |  |  |            |            |     |  |  |  |  |            |            |            |     |  |  |  |            |            |            |            |     |  |  |            |            |            |            |            |     |  |            |            |            |            |            |            |    |            |            |            |            |            |            |            |    |            |            |            |            |            |            |         |    |            |            |            |            |            |            |         |    |            |            |            |         |         |         |         |    |            |            |            |         |         |         |         |    |            |            |         |         |         |           |           |     |            |            |         |         |           |           |           |     |         |         |         |           |           |           |         |     |         |         |         |           |           |         |         |     |         |         |           |           |         |         |           |     |         |           |           |         |           |           |  |     |           |           |         |         |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |       |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |
| 15 000  |  |               |                              |            |            |            |            |    |     |      |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |     |  |  |  |  |  |            |            |     |  |  |  |  |            |            |            |     |  |  |  |            |            |            |            |     |  |  |            |            |            |            |            |     |  |            |            |            |            |            |            |    |            |            |            |            |            |            |            |    |            |            |            |            |            |            |         |    |            |            |            |            |            |            |         |    |            |            |            |         |         |         |         |    |            |            |            |         |         |         |         |    |            |            |         |         |         |           |           |     |            |            |         |         |           |           |           |     |         |         |         |           |           |           |         |     |         |         |         |           |           |         |         |     |         |         |           |           |         |         |           |     |         |           |           |         |           |           |  |     |           |           |         |         |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |       |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |

# Radiale Elkos / Radial lead type

| <b>EKSU</b>   |   |                              |              |                              |                        |               |                              |                          |               |                              |  |  |  |  |          |          |          |   |  |  |  |          |          |          |          |     |  |  |          |          |          |          |          |     |  |  |          |          |          |          |          |     |  |          |          |          |          |          |          |     |          |          |          |          |          |          |          |     |          |          |          |          |          |          |          |    |          |          |          |          |          |          |          |    |          |          |          |          |          |          |            |    |          |          |          |          |          |            |            |    |          |          |          |          |            |            |         |    |          |          |          |          |            |         |         |    |          |          |          |            |         |         |         |     |          |          |            |            |         |         |           |     |          |          |            |         |         |           |           |     |            |            |         |         |           |           |         |     |            |         |         |         |           |         |         |     |         |         |         |           |           |         |           |     |         |         |           |           |         |           |           |       |         |           |           |         |         |           |  |       |           |           |         |           |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |
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| <b>Baureihen</b>  | <b>Standardausführung, ungepolt, isoliert, schaltfest</b><br><i>Standard, non polarized, insulated, pulse-proof</i>   |                              |              |                              |                        |               |                              |                          |               |                              |  |  |  |  |          |          |          |   |  |  |  |          |          |          |          |     |  |  |          |          |          |          |          |     |  |  |          |          |          |          |          |     |  |          |          |          |          |          |          |     |          |          |          |          |          |          |          |     |          |          |          |          |          |          |          |    |          |          |          |          |          |          |          |    |          |          |          |          |          |          |            |    |          |          |          |          |          |            |            |    |          |          |          |          |            |            |         |    |          |          |          |          |            |         |         |    |          |          |          |            |         |         |         |     |          |          |            |            |         |         |           |     |          |          |            |         |         |           |           |     |            |            |         |         |           |           |         |     |            |         |         |         |           |         |         |     |         |         |         |           |           |         |           |     |         |         |           |           |         |           |           |       |         |           |           |         |         |           |  |       |           |           |         |           |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |
| <b>Anwendung, Besonderheiten</b><br><i>Applications, features</i> | <b>allgemeine Anwendung, bipolar</b><br><i>general purpose, non-polarized</i>   |                              |              |                              |                        |               |                              |                          |               |                              |  |  |  |  |          |          |          |   |  |  |  |          |          |          |          |     |  |  |          |          |          |          |          |     |  |  |          |          |          |          |          |     |  |          |          |          |          |          |          |     |          |          |          |          |          |          |          |     |          |          |          |          |          |          |          |    |          |          |          |          |          |          |          |    |          |          |          |          |          |          |            |    |          |          |          |          |          |            |            |    |          |          |          |          |            |            |         |    |          |          |          |          |            |         |         |    |          |          |          |            |         |         |         |     |          |          |            |            |         |         |           |     |          |          |            |         |         |           |           |     |            |            |         |         |           |           |         |     |            |         |         |         |           |         |         |     |         |         |         |           |           |         |           |     |         |         |           |           |         |           |           |       |         |           |           |         |         |           |  |       |           |           |         |           |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |
| <b>Temperaturbereich</b><br><i>Temperature range</i>              | - 40 ... + 85°C für / for $\varnothing \leq 6,3$ mm<br>- 40 ... +105°C für / for $\varnothing \geq 8,7$ mm  |                              |              |                              |                        |               |                              |                          |               |                              |  |  |  |  |          |          |          |   |  |  |  |          |          |          |          |     |  |  |          |          |          |          |          |     |  |  |          |          |          |          |          |     |  |          |          |          |          |          |          |     |          |          |          |          |          |          |          |     |          |          |          |          |          |          |          |    |          |          |          |          |          |          |          |    |          |          |          |          |          |          |            |    |          |          |          |          |          |            |            |    |          |          |          |          |            |            |         |    |          |          |          |          |            |         |         |    |          |          |          |            |         |         |         |     |          |          |            |            |         |         |           |     |          |          |            |         |         |           |           |     |            |            |         |         |           |           |         |     |            |         |         |         |           |         |         |     |         |         |         |           |           |         |           |     |         |         |           |           |         |           |           |       |         |           |           |         |         |           |  |       |           |           |         |           |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |
| <b>Lebensdauer</b><br><i>Endurance</i>                            | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;"><math>\varnothing \leq 6,3</math> mm</td> <td style="text-align: center;">85°C<br/>40°C</td> <td style="text-align: center;">min 4 000 h<br/>min 100 000 h</td> </tr> <tr> <td style="text-align: center;"><math>\varnothing = 8,7</math> mm</td> <td style="text-align: center;">105°C<br/>40°C</td> <td style="text-align: center;">min 1 500 h<br/>min 150 000 h</td> </tr> <tr> <td style="text-align: center;"><math>\varnothing \geq 10</math> mm</td> <td style="text-align: center;">105°C<br/>40°C</td> <td style="text-align: center;">min 2 500 h<br/>min 250 000 h</td> </tr> </table>  | $\varnothing \leq 6,3$ mm    | 85°C<br>40°C | min 4 000 h<br>min 100 000 h | $\varnothing = 8,7$ mm | 105°C<br>40°C | min 1 500 h<br>min 150 000 h | $\varnothing \geq 10$ mm | 105°C<br>40°C | min 2 500 h<br>min 250 000 h |  |  |  |  |          |          |          |   |  |  |  |          |          |          |          |     |  |  |          |          |          |          |          |     |  |  |          |          |          |          |          |     |  |          |          |          |          |          |          |     |          |          |          |          |          |          |          |     |          |          |          |          |          |          |          |    |          |          |          |          |          |          |          |    |          |          |          |          |          |          |            |    |          |          |          |          |          |            |            |    |          |          |          |          |            |            |         |    |          |          |          |          |            |         |         |    |          |          |          |            |         |         |         |     |          |          |            |            |         |         |           |     |          |          |            |         |         |           |           |     |            |            |         |         |           |           |         |     |            |         |         |         |           |         |         |     |         |         |         |           |           |         |           |     |         |         |           |           |         |           |           |       |         |           |           |         |         |           |  |       |           |           |         |           |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |
| $\varnothing \leq 6,3$ mm   | 85°C<br>40°C  | min 4 000 h<br>min 100 000 h |              |                              |                        |               |                              |                          |               |                              |  |  |  |  |          |          |          |   |  |  |  |          |          |          |          |     |  |  |          |          |          |          |          |     |  |  |          |          |          |          |          |     |  |          |          |          |          |          |          |     |          |          |          |          |          |          |          |     |          |          |          |          |          |          |          |    |          |          |          |          |          |          |          |    |          |          |          |          |          |          |            |    |          |          |          |          |          |            |            |    |          |          |          |          |            |            |         |    |          |          |          |          |            |         |         |    |          |          |          |            |         |         |         |     |          |          |            |            |         |         |           |     |          |          |            |         |         |           |           |     |            |            |         |         |           |           |         |     |            |         |         |         |           |         |         |     |         |         |         |           |           |         |           |     |         |         |           |           |         |           |           |       |         |           |           |         |         |           |  |       |           |           |         |           |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |
| $\varnothing = 8,7$ mm  | 105°C<br>40°C   | min 1 500 h<br>min 150 000 h |              |                              |                        |               |                              |                          |               |                              |  |  |  |  |          |          |          |   |  |  |  |          |          |          |          |     |  |  |          |          |          |          |          |     |  |  |          |          |          |          |          |     |  |          |          |          |          |          |          |     |          |          |          |          |          |          |          |     |          |          |          |          |          |          |          |    |          |          |          |          |          |          |          |    |          |          |          |          |          |          |            |    |          |          |          |          |          |            |            |    |          |          |          |          |            |            |         |    |          |          |          |          |            |         |         |    |          |          |          |            |         |         |         |     |          |          |            |            |         |         |           |     |          |          |            |         |         |           |           |     |            |            |         |         |           |           |         |     |            |         |         |         |           |         |         |     |         |         |         |           |           |         |           |     |         |         |           |           |         |           |           |       |         |           |           |         |         |           |  |       |           |           |         |           |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |
| $\varnothing \geq 10$ mm  | 105°C<br>40°C   | min 2 500 h<br>min 250 000 h |              |                              |                        |               |                              |                          |               |                              |  |  |  |  |          |          |          |   |  |  |  |          |          |          |          |     |  |  |          |          |          |          |          |     |  |  |          |          |          |          |          |     |  |          |          |          |          |          |          |     |          |          |          |          |          |          |          |     |          |          |          |          |          |          |          |    |          |          |          |          |          |          |          |    |          |          |          |          |          |          |            |    |          |          |          |          |          |            |            |    |          |          |          |          |            |            |         |    |          |          |          |          |            |         |         |    |          |          |          |            |         |         |         |     |          |          |            |            |         |         |           |     |          |          |            |         |         |           |           |     |            |            |         |         |           |           |         |     |            |         |         |         |           |         |         |     |         |         |         |           |           |         |           |     |         |         |           |           |         |           |           |       |         |           |           |         |         |           |  |       |           |           |         |           |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |
| <b>Spezifikation</b><br><i>Specification</i>                      | DIN EN 60384-1, DIN EN 60384-4<br>ohne Gütebestätigung (GB) / without quality assessment (QA)   |                              |              |                              |                        |               |                              |                          |               |                              |  |  |  |  |          |          |          |   |  |  |  |          |          |          |          |     |  |  |          |          |          |          |          |     |  |  |          |          |          |          |          |     |  |          |          |          |          |          |          |     |          |          |          |          |          |          |          |     |          |          |          |          |          |          |          |    |          |          |          |          |          |          |          |    |          |          |          |          |          |          |            |    |          |          |          |          |          |            |            |    |          |          |          |          |            |            |         |    |          |          |          |          |            |         |         |    |          |          |          |            |         |         |         |     |          |          |            |            |         |         |           |     |          |          |            |         |         |           |           |     |            |            |         |         |           |           |         |     |            |         |         |         |           |         |         |     |         |         |         |           |           |         |           |     |         |         |           |           |         |           |           |       |         |           |           |         |         |           |  |       |           |           |         |           |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |
| <b>Kapazitätstoleranz</b><br><i>Capacitance tolerance</i>         | ± 20%<br>abweichende Kapazitätstoleranzen sind auf Anfrage lieferbar / other capacitance tolerances are available on request  |                              |              |                              |                        |               |                              |                          |               |                              |  |  |  |  |          |          |          |   |  |  |  |          |          |          |          |     |  |  |          |          |          |          |          |     |  |  |          |          |          |          |          |     |  |          |          |          |          |          |          |     |          |          |          |          |          |          |          |     |          |          |          |          |          |          |          |    |          |          |          |          |          |          |          |    |          |          |          |          |          |          |            |    |          |          |          |          |          |            |            |    |          |          |          |          |            |            |         |    |          |          |          |          |            |         |         |    |          |          |          |            |         |         |         |     |          |          |            |            |         |         |           |     |          |          |            |         |         |           |           |     |            |            |         |         |           |           |         |     |            |         |         |         |           |         |         |     |         |         |         |           |           |         |           |     |         |         |           |           |         |           |           |       |         |           |           |         |         |           |  |       |           |           |         |           |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |
| <b>Kapazität / Capacitance</b><br>C ( $\mu$ F)                    | <b>Nennspannung / Rated voltage</b>   |                              |              |                              |                        |               |                              |                          |               |                              |  |  |  |  |          |          |          |   |  |  |  |          |          |          |          |     |  |  |          |          |          |          |          |     |  |  |          |          |          |          |          |     |  |          |          |          |          |          |          |     |          |          |          |          |          |          |          |     |          |          |          |          |          |          |          |    |          |          |          |          |          |          |          |    |          |          |          |          |          |          |            |    |          |          |          |          |          |            |            |    |          |          |          |          |            |            |         |    |          |          |          |          |            |         |         |    |          |          |          |            |         |         |         |     |          |          |            |            |         |         |           |     |          |          |            |         |         |           |           |     |            |            |         |         |           |           |         |     |            |         |         |         |           |         |         |     |         |         |         |           |           |         |           |     |         |         |           |           |         |           |           |       |         |           |           |         |         |           |  |       |           |           |         |           |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |
|   | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">6,3</th> <th style="text-align: center;">10</th> <th style="text-align: center;">16</th> <th style="text-align: center;">25</th> <th style="text-align: center;">35</th> <th style="text-align: center;">50</th> <th style="text-align: center;">63</th> <th style="text-align: center;">100</th> </tr> </thead> <tbody> <tr><td style="text-align: center;">0,47</td><td></td><td></td><td></td><td></td><td style="text-align: center;">5,5 x 11</td><td style="text-align: center;">5,5 x 11</td><td style="text-align: center;">5,5 x 11</td></tr> <tr><td style="text-align: center;">1</td><td></td><td></td><td></td><td style="text-align: center;">5,5 x 11</td><td style="text-align: center;">5,5 x 11</td><td style="text-align: center;">5,5 x 11</td><td style="text-align: center;">5,5 x 11</td></tr> <tr><td style="text-align: center;">1,5</td><td></td><td></td><td style="text-align: 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style="text-align: center;">10 x 12</td></tr> <tr><td style="text-align: center;">47</td><td style="text-align: center;">5,5 x 11</td><td style="text-align: center;">5,5 x 11</td><td style="text-align: center;">6,3 x 11</td><td style="text-align: center;">6,3 x 11</td><td style="text-align: center;">8,7 x 12,7</td><td style="text-align: center;">10 x 12</td><td style="text-align: center;">10 x 16</td></tr> <tr><td style="text-align: center;">68</td><td style="text-align: center;">5,5 x 11</td><td style="text-align: center;">6,3 x 11</td><td style="text-align: center;">6,3 x 11</td><td style="text-align: center;">8,7 x 12,7</td><td style="text-align: center;">10 x 12</td><td style="text-align: center;">10 x 16</td><td style="text-align: center;">10 x 20</td></tr> <tr><td style="text-align: center;">100</td><td style="text-align: center;">6,3 x 11</td><td style="text-align: center;">6,3 x 11</td><td style="text-align: center;">8,7 x 12,7</td><td style="text-align: center;">8,7 x 12,7</td><td style="text-align: center;">10 x 16</td><td style="text-align: center;">10 x 20</td><td style="text-align: center;">12,5 x 20</td></tr> <tr><td style="text-align: center;">150</td><td style="text-align: center;">6,3 x 11</td><td style="text-align: center;">6,3 x 11</td><td style="text-align: center;">8,7 x 12,7</td><td style="text-align: center;">10 x 12</td><td style="text-align: center;">10 x 20</td><td style="text-align: center;">12,5 x 20</td><td style="text-align: center;">12,5 x 24</td></tr> <tr><td style="text-align: center;">220</td><td style="text-align: center;">8,7 x 12,7</td><td style="text-align: center;">8,7 x 12,7</td><td style="text-align: center;">10 x 12</td><td style="text-align: center;">10 x 16</td><td style="text-align: center;">12,5 x 20</td><td style="text-align: center;">12,5 x 24</td><td style="text-align: center;">16 x 25</td></tr> <tr><td style="text-align: center;">330</td><td style="text-align: center;">8,7 x 12,7</td><td style="text-align: center;">10 x 12</td><td style="text-align: center;">10 x 16</td><td style="text-align: center;">10 x 20</td><td style="text-align: center;">12,5 x 24</td><td style="text-align: center;">16 x 25</td><td style="text-align: center;">16 x 29</td></tr> <tr><td style="text-align: center;">470</td><td style="text-align: center;">10 x 12</td><td style="text-align: center;">10 x 16</td><td style="text-align: center;">10 x 20</td><td style="text-align: center;">12,5 x 20</td><td style="text-align: center;">12,5 x 29</td><td style="text-align: center;">16 x 29</td><td style="text-align: center;">16 x 35,5</td></tr> <tr><td style="text-align: center;">680</td><td style="text-align: center;">10 x 16</td><td style="text-align: center;">10 x 20</td><td style="text-align: center;">12,5 x 20</td><td style="text-align: center;">12,5 x 24</td><td style="text-align: center;">16 x 25</td><td style="text-align: center;">16 x 35,5</td><td style="text-align: center;">16 x 35,5</td></tr> <tr><td style="text-align: center;">1 000</td><td style="text-align: center;">10 x 20</td><td style="text-align: center;">12,5 x 20</td><td style="text-align: center;">12,5 x 24</td><td style="text-align: center;">16 x 25</td><td style="text-align: center;">16 x 29</td><td style="text-align: center;">16 x 35,5</td><td></td></tr> <tr><td style="text-align: center;">1 500</td><td style="text-align: center;">12,5 x 20</td><td style="text-align: center;">12,5 x 24</td><td style="text-align: center;">16 x 25</td><td style="text-align: center;">16 x 35,5</td><td style="text-align: center;">16 x 35,5</td><td></td><td></td></tr> <tr><td style="text-align: center;">2 200</td><td style="text-align: center;">12,5 x 24</td><td style="text-align: center;">16 x 25</td><td style="text-align: center;">16 x 29</td><td style="text-align: center;">16 x 35,5</td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">3 300</td><td style="text-align: center;">16 x 25</td><td style="text-align: center;">16 x 29</td><td style="text-align: center;">16 x 35,5</td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">4 700</td><td style="text-align: center;">16 x 29</td><td style="text-align: center;">16 x 35,5</td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">6 800</td><td style="text-align: center;">16 x 35,5</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">10 000</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">15 000</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table> | 6,3                          | 10           | 16                           | 25                     | 35            | 50                           | 63                       | 100           | 0,47                         |  |  |  |  | 5,5 x 11 | 5,5 x 11 | 5,5 x 11 | 1 |  |  |  | 5,5 x 11 | 5,5 x 11 | 5,5 x 11 | 5,5 x 11 | 1,5 |  |  | 5,5 x 11 | 5,5 x 11 | 5,5 x 11 | 5,5 x 11 | 5,5 x 11 | 2,2 |  |  | 5,5 x 11 | 5,5 x 11 | 5,5 x 11 | 5,5 x 11 | 6,3 x 11 | 3,3 |  | 5,5 x 11 | 5,5 x 11 | 5,5 x 11 | 5,5 x 11 | 5,5 x 11 | 6,3 x 11 | 4,7 | 5,5 x 11 | 5,5 x 11 | 5,5 x 11 | 5,5 x 11 | 5,5 x 11 | 5,5 x 11 | 6,3 x 11 | 6,8 | 5,5 x 11 | 5,5 x 11 | 5,5 x 11 | 5,5 x 11 | 5,5 x 11 | 5,5 x 11 | 6,3 x 11 | 10 | 5,5 x 11 | 5,5 x 11 | 5,5 x 11 | 5,5 x 11 | 5,5 x 11 | 6,3 x 11 | 6,3 x 11 | 15 | 5,5 x 11 | 5,5 x 11 | 5,5 x 11 | 5,5 x 11 | 5,5 x 11 | 6,3 x 11 | 8,7 x 12,7 | 22 | 5,5 x 11 | 5,5 x 11 | 5,5 x 11 | 6,3 x 11 | 6,3 x 11 | 8,7 x 12,7 | 8,7 x 12,7 | 33 | 5,5 x 11 | 5,5 x 11 | 5,5 x 11 | 6,3 x 11 | 8,7 x 12,7 | 8,7 x 12,7 | 10 x 12 | 47 | 5,5 x 11 | 5,5 x 11 | 6,3 x 11 | 6,3 x 11 | 8,7 x 12,7 | 10 x 12 | 10 x 16 | 68 | 5,5 x 11 | 6,3 x 11 | 6,3 x 11 | 8,7 x 12,7 | 10 x 12 | 10 x 16 | 10 x 20 | 100 | 6,3 x 11 | 6,3 x 11 | 8,7 x 12,7 | 8,7 x 12,7 | 10 x 16 | 10 x 20 | 12,5 x 20 | 150 | 6,3 x 11 | 6,3 x 11 | 8,7 x 12,7 | 10 x 12 | 10 x 20 | 12,5 x 20 | 12,5 x 24 | 220 | 8,7 x 12,7 | 8,7 x 12,7 | 10 x 12 | 10 x 16 | 12,5 x 20 | 12,5 x 24 | 16 x 25 | 330 | 8,7 x 12,7 | 10 x 12 | 10 x 16 | 10 x 20 | 12,5 x 24 | 16 x 25 | 16 x 29 | 470 | 10 x 12 | 10 x 16 | 10 x 20 | 12,5 x 20 | 12,5 x 29 | 16 x 29 | 16 x 35,5 | 680 | 10 x 16 | 10 x 20 | 12,5 x 20 | 12,5 x 24 | 16 x 25 | 16 x 35,5 | 16 x 35,5 | 1 000 | 10 x 20 | 12,5 x 20 | 12,5 x 24 | 16 x 25 | 16 x 29 | 16 x 35,5 |  | 1 500 | 12,5 x 20 | 12,5 x 24 | 16 x 25 | 16 x 35,5 | 16 x 35,5 |  |  | 2 200 | 12,5 x 24 | 16 x 25 | 16 x 29 | 16 x 35,5 |  |  |  | 3 300 | 16 x 25 | 16 x 29 | 16 x 35,5 |  |  |  |  | 4 700 | 16 x 29 | 16 x 35,5 |  |  |  |  |  | 6 800 | 16 x 35,5 |  |  |  |  |  |  | 10 000 |  |  |  |  |  |  |  | 15 000 |  |  |  |  |  |  |  |
| 6,3   | 10  | 16                           | 25           | 35                           | 50                     | 63            | 100                          |                          |               |                              |  |  |  |  |          |          |          |   |  |  |  |          |          |          |          |     |  |  |          |          |          |          |          |     |  |  |          |          |          |          |          |     |  |          |          |          |          |          |          |     |          |          |          |          |          |          |          |     |          |          |          |          |          |          |          |    |          |          |          |          |          |          |          |    |          |          |          |          |          |          |            |    |          |          |          |          |          |            |            |    |          |          |          |          |            |            |         |    |          |          |          |          |            |         |         |    |          |          |          |            |         |         |         |     |          |          |            |            |         |         |           |     |          |          |            |         |         |           |           |     |            |            |         |         |           |           |         |     |            |         |         |         |           |         |         |     |         |         |         |           |           |         |           |     |         |         |           |           |         |           |           |       |         |           |           |         |         |           |  |       |           |           |         |           |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |
| 0,47  |   |                              |              |                              | 5,5 x 11               | 5,5 x 11      | 5,5 x 11                     |                          |               |                              |  |  |  |  |          |          |          |   |  |  |  |          |          |          |          |     |  |  |          |          |          |          |          |     |  |  |          |          |          |          |          |     |  |          |          |          |          |          |          |     |          |          |          |          |          |          |          |     |          |          |          |          |          |          |          |    |          |          |          |          |          |          |          |    |          |          |          |          |          |          |            |    |          |          |          |          |          |            |            |    |          |          |          |          |            |            |         |    |          |          |          |          |            |         |         |    |          |          |          |            |         |         |         |     |          |          |            |            |         |         |           |     |          |          |            |         |         |           |           |     |            |            |         |         |           |           |         |     |            |         |         |         |           |         |         |     |         |         |         |           |           |         |           |     |         |         |           |           |         |           |           |       |         |           |           |         |         |           |  |       |           |           |         |           |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |
| 1   |   |                              |              | 5,5 x 11                     | 5,5 x 11               | 5,5 x 11      | 5,5 x 11                     |                          |               |                              |  |  |  |  |          |          |          |   |  |  |  |          |          |          |          |     |  |  |          |          |          |          |          |     |  |  |          |          |          |          |          |     |  |          |          |          |          |          |          |     |          |          |          |          |          |          |          |     |          |          |          |          |          |          |          |    |          |          |          |          |          |          |          |    |          |          |          |          |          |          |            |    |          |          |          |          |          |            |            |    |          |          |          |          |            |            |         |    |          |          |          |          |            |         |         |    |          |          |          |            |         |         |         |     |          |          |            |            |         |         |           |     |          |          |            |         |         |           |           |     |            |            |         |         |           |           |         |     |            |         |         |         |           |         |         |     |         |         |         |           |           |         |           |     |         |         |           |           |         |           |           |       |         |           |           |         |         |           |  |       |           |           |         |           |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |
| 1,5   |   |                              | 5,5 x 11     | 5,5 x 11                     | 5,5 x 11               | 5,5 x 11      | 5,5 x 11                     |                          |               |                              |  |  |  |  |          |          |          |   |  |  |  |          |          |          |          |     |  |  |          |          |          |          |          |     |  |  |          |          |          |          |          |     |  |          |          |          |          |          |          |     |          |          |          |          |          |          |          |     |          |          |          |          |          |          |          |    |          |          |          |          |          |          |          |    |          |          |          |          |          |          |            |    |          |          |          |          |          |            |            |    |          |          |          |          |            |            |         |    |          |          |          |          |            |         |         |    |          |          |          |            |         |         |         |     |          |          |            |            |         |         |           |     |          |          |            |         |         |           |           |     |            |            |         |         |           |           |         |     |            |         |         |         |           |         |         |     |         |         |         |           |           |         |           |     |         |         |           |           |         |           |           |       |         |           |           |         |         |           |  |       |           |           |         |           |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |
| 2,2   |   |                              | 5,5 x 11     | 5,5 x 11                     | 5,5 x 11               | 5,5 x 11      | 6,3 x 11                     |                          |               |                              |  |  |  |  |          |          |          |   |  |  |  |          |          |          |          |     |  |  |          |          |          |          |          |     |  |  |          |          |          |          |          |     |  |          |          |          |          |          |          |     |          |          |          |          |          |          |          |     |          |          |          |          |          |          |          |    |          |          |          |          |          |          |          |    |          |          |          |          |          |          |            |    |          |          |          |          |          |            |            |    |          |          |          |          |            |            |         |    |          |          |          |          |            |         |         |    |          |          |          |            |         |         |         |     |          |          |            |            |         |         |           |     |          |          |            |         |         |           |           |     |            |            |         |         |           |           |         |     |            |         |         |         |           |         |         |     |         |         |         |           |           |         |           |     |         |         |           |           |         |           |           |       |         |           |           |         |         |           |  |       |           |           |         |           |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |
| 3,3   |   | 5,5 x 11                     | 5,5 x 11     | 5,5 x 11                     | 5,5 x 11               | 5,5 x 11      | 6,3 x 11                     |                          |               |                              |  |  |  |  |          |          |          |   |  |  |  |          |          |          |          |     |  |  |          |          |          |          |          |     |  |  |          |          |          |          |          |     |  |          |          |          |          |          |          |     |          |          |          |          |          |          |          |     |          |          |          |          |          |          |          |    |          |          |          |          |          |          |          |    |          |          |          |          |          |          |            |    |          |          |          |          |          |            |            |    |          |          |          |          |            |            |         |    |          |          |          |          |            |         |         |    |          |          |          |            |         |         |         |     |          |          |            |            |         |         |           |     |          |          |            |         |         |           |           |     |            |            |         |         |           |           |         |     |            |         |         |         |           |         |         |     |         |         |         |           |           |         |           |     |         |         |           |           |         |           |           |       |         |           |           |         |         |           |  |       |           |           |         |           |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |
| 4,7   | 5,5 x 11  | 5,5 x 11                     | 5,5 x 11     | 5,5 x 11                     | 5,5 x 11               | 5,5 x 11      | 6,3 x 11                     |                          |               |                              |  |  |  |  |          |          |          |   |  |  |  |          |          |          |          |     |  |  |          |          |          |          |          |     |  |  |          |          |          |          |          |     |  |          |          |          |          |          |          |     |          |          |          |          |          |          |          |     |          |          |          |          |          |          |          |    |          |          |          |          |          |          |          |    |          |          |          |          |          |          |            |    |          |          |          |          |          |            |            |    |          |          |          |          |            |            |         |    |          |          |          |          |            |         |         |    |          |          |          |            |         |         |         |     |          |          |            |            |         |         |           |     |          |          |            |         |         |           |           |     |            |            |         |         |           |           |         |     |            |         |         |         |           |         |         |     |         |         |         |           |           |         |           |     |         |         |           |           |         |           |           |       |         |           |           |         |         |           |  |       |           |           |         |           |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |
| 6,8   | 5,5 x 11  | 5,5 x 11                     | 5,5 x 11     | 5,5 x 11                     | 5,5 x 11               | 5,5 x 11      | 6,3 x 11                     |                          |               |                              |  |  |  |  |          |          |          |   |  |  |  |          |          |          |          |     |  |  |          |          |          |          |          |     |  |  |          |          |          |          |          |     |  |          |          |          |          |          |          |     |          |          |          |          |          |          |          |     |          |          |          |          |          |          |          |    |          |          |          |          |          |          |          |    |          |          |          |          |          |          |            |    |          |          |          |          |          |            |            |    |          |          |          |          |            |            |         |    |          |          |          |          |            |         |         |    |          |          |          |            |         |         |         |     |          |          |            |            |         |         |           |     |          |          |            |         |         |           |           |     |            |            |         |         |           |           |         |     |            |         |         |         |           |         |         |     |         |         |         |           |           |         |           |     |         |         |           |           |         |           |           |       |         |           |           |         |         |           |  |       |           |           |         |           |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |
| 10  | 5,5 x 11  | 5,5 x 11                     | 5,5 x 11     | 5,5 x 11                     | 5,5 x 11               | 6,3 x 11      | 6,3 x 11                     |                          |               |                              |  |  |  |  |          |          |          |   |  |  |  |          |          |          |          |     |  |  |          |          |          |          |          |     |  |  |          |          |          |          |          |     |  |          |          |          |          |          |          |     |          |          |          |          |          |          |          |     |          |          |          |          |          |          |          |    |          |          |          |          |          |          |          |    |          |          |          |          |          |          |            |    |          |          |          |          |          |            |            |    |          |          |          |          |            |            |         |    |          |          |          |          |            |         |         |    |          |          |          |            |         |         |         |     |          |          |            |            |         |         |           |     |          |          |            |         |         |           |           |     |            |            |         |         |           |           |         |     |            |         |         |         |           |         |         |     |         |         |         |           |           |         |           |     |         |         |           |           |         |           |           |       |         |           |           |         |         |           |  |       |           |           |         |           |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |
| 15  | 5,5 x 11  | 5,5 x 11                     | 5,5 x 11     | 5,5 x 11                     | 5,5 x 11               | 6,3 x 11      | 8,7 x 12,7                   |                          |               |                              |  |  |  |  |          |          |          |   |  |  |  |          |          |          |          |     |  |  |          |          |          |          |          |     |  |  |          |          |          |          |          |     |  |          |          |          |          |          |          |     |          |          |          |          |          |          |          |     |          |          |          |          |          |          |          |    |          |          |          |          |          |          |          |    |          |          |          |          |          |          |            |    |          |          |          |          |          |            |            |    |          |          |          |          |            |            |         |    |          |          |          |          |            |         |         |    |          |          |          |            |         |         |         |     |          |          |            |            |         |         |           |     |          |          |            |         |         |           |           |     |            |            |         |         |           |           |         |     |            |         |         |         |           |         |         |     |         |         |         |           |           |         |           |     |         |         |           |           |         |           |           |       |         |           |           |         |         |           |  |       |           |           |         |           |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |
| 22  | 5,5 x 11  | 5,5 x 11                     | 5,5 x 11     | 6,3 x 11                     | 6,3 x 11               | 8,7 x 12,7    | 8,7 x 12,7                   |                          |               |                              |  |  |  |  |          |          |          |   |  |  |  |          |          |          |          |     |  |  |          |          |          |          |          |     |  |  |          |          |          |          |          |     |  |          |          |          |          |          |          |     |          |          |          |          |          |          |          |     |          |          |          |          |          |          |          |    |          |          |          |          |          |          |          |    |          |          |          |          |          |          |            |    |          |          |          |          |          |            |            |    |          |          |          |          |            |            |         |    |          |          |          |          |            |         |         |    |          |          |          |            |         |         |         |     |          |          |            |            |         |         |           |     |          |          |            |         |         |           |           |     |            |            |         |         |           |           |         |     |            |         |         |         |           |         |         |     |         |         |         |           |           |         |           |     |         |         |           |           |         |           |           |       |         |           |           |         |         |           |  |       |           |           |         |           |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |
| 33  | 5,5 x 11  | 5,5 x 11                     | 5,5 x 11     | 6,3 x 11                     | 8,7 x 12,7             | 8,7 x 12,7    | 10 x 12                      |                          |               |                              |  |  |  |  |          |          |          |   |  |  |  |          |          |          |          |     |  |  |          |          |          |          |          |     |  |  |          |          |          |          |          |     |  |          |          |          |          |          |          |     |          |          |          |          |          |          |          |     |          |          |          |          |          |          |          |    |          |          |          |          |          |          |          |    |          |          |          |          |          |          |            |    |          |          |          |          |          |            |            |    |          |          |          |          |            |            |         |    |          |          |          |          |            |         |         |    |          |          |          |            |         |         |         |     |          |          |            |            |         |         |           |     |          |          |            |         |         |           |           |     |            |            |         |         |           |           |         |     |            |         |         |         |           |         |         |     |         |         |         |           |           |         |           |     |         |         |           |           |         |           |           |       |         |           |           |         |         |           |  |       |           |           |         |           |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |
| 47  | 5,5 x 11  | 5,5 x 11                     | 6,3 x 11     | 6,3 x 11                     | 8,7 x 12,7             | 10 x 12       | 10 x 16                      |                          |               |                              |  |  |  |  |          |          |          |   |  |  |  |          |          |          |          |     |  |  |          |          |          |          |          |     |  |  |          |          |          |          |          |     |  |          |          |          |          |          |          |     |          |          |          |          |          |          |          |     |          |          |          |          |          |          |          |    |          |          |          |          |          |          |          |    |          |          |          |          |          |          |            |    |          |          |          |          |          |            |            |    |          |          |          |          |            |            |         |    |          |          |          |          |            |         |         |    |          |          |          |            |         |         |         |     |          |          |            |            |         |         |           |     |          |          |            |         |         |           |           |     |            |            |         |         |           |           |         |     |            |         |         |         |           |         |         |     |         |         |         |           |           |         |           |     |         |         |           |           |         |           |           |       |         |           |           |         |         |           |  |       |           |           |         |           |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |
| 68  | 5,5 x 11  | 6,3 x 11                     | 6,3 x 11     | 8,7 x 12,7                   | 10 x 12                | 10 x 16       | 10 x 20                      |                          |               |                              |  |  |  |  |          |          |          |   |  |  |  |          |          |          |          |     |  |  |          |          |          |          |          |     |  |  |          |          |          |          |          |     |  |          |          |          |          |          |          |     |          |          |          |          |          |          |          |     |          |          |          |          |          |          |          |    |          |          |          |          |          |          |          |    |          |          |          |          |          |          |            |    |          |          |          |          |          |            |            |    |          |          |          |          |            |            |         |    |          |          |          |          |            |         |         |    |          |          |          |            |         |         |         |     |          |          |            |            |         |         |           |     |          |          |            |         |         |           |           |     |            |            |         |         |           |           |         |     |            |         |         |         |           |         |         |     |         |         |         |           |           |         |           |     |         |         |           |           |         |           |           |       |         |           |           |         |         |           |  |       |           |           |         |           |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |
| 100   | 6,3 x 11  | 6,3 x 11                     | 8,7 x 12,7   | 8,7 x 12,7                   | 10 x 16                | 10 x 20       | 12,5 x 20                    |                          |               |                              |  |  |  |  |          |          |          |   |  |  |  |          |          |          |          |     |  |  |          |          |          |          |          |     |  |  |          |          |          |          |          |     |  |          |          |          |          |          |          |     |          |          |          |          |          |          |          |     |          |          |          |          |          |          |          |    |          |          |          |          |          |          |          |    |          |          |          |          |          |          |            |    |          |          |          |          |          |            |            |    |          |          |          |          |            |            |         |    |          |          |          |          |            |         |         |    |          |          |          |            |         |         |         |     |          |          |            |            |         |         |           |     |          |          |            |         |         |           |           |     |            |            |         |         |           |           |         |     |            |         |         |         |           |         |         |     |         |         |         |           |           |         |           |     |         |         |           |           |         |           |           |       |         |           |           |         |         |           |  |       |           |           |         |           |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |
| 150   | 6,3 x 11  | 6,3 x 11                     | 8,7 x 12,7   | 10 x 12                      | 10 x 20                | 12,5 x 20     | 12,5 x 24                    |                          |               |                              |  |  |  |  |          |          |          |   |  |  |  |          |          |          |          |     |  |  |          |          |          |          |          |     |  |  |          |          |          |          |          |     |  |          |          |          |          |          |          |     |          |          |          |          |          |          |          |     |          |          |          |          |          |          |          |    |          |          |          |          |          |          |          |    |          |          |          |          |          |          |            |    |          |          |          |          |          |            |            |    |          |          |          |          |            |            |         |    |          |          |          |          |            |         |         |    |          |          |          |            |         |         |         |     |          |          |            |            |         |         |           |     |          |          |            |         |         |           |           |     |            |            |         |         |           |           |         |     |            |         |         |         |           |         |         |     |         |         |         |           |           |         |           |     |         |         |           |           |         |           |           |       |         |           |           |         |         |           |  |       |           |           |         |           |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |
| 220   | 8,7 x 12,7  | 8,7 x 12,7                   | 10 x 12      | 10 x 16                      | 12,5 x 20              | 12,5 x 24     | 16 x 25                      |                          |               |                              |  |  |  |  |          |          |          |   |  |  |  |          |          |          |          |     |  |  |          |          |          |          |          |     |  |  |          |          |          |          |          |     |  |          |          |          |          |          |          |     |          |          |          |          |          |          |          |     |          |          |          |          |          |          |          |    |          |          |          |          |          |          |          |    |          |          |          |          |          |          |            |    |          |          |          |          |          |            |            |    |          |          |          |          |            |            |         |    |          |          |          |          |            |         |         |    |          |          |          |            |         |         |         |     |          |          |            |            |         |         |           |     |          |          |            |         |         |           |           |     |            |            |         |         |           |           |         |     |            |         |         |         |           |         |         |     |         |         |         |           |           |         |           |     |         |         |           |           |         |           |           |       |         |           |           |         |         |           |  |       |           |           |         |           |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |
| 330   | 8,7 x 12,7  | 10 x 12                      | 10 x 16      | 10 x 20                      | 12,5 x 24              | 16 x 25       | 16 x 29                      |                          |               |                              |  |  |  |  |          |          |          |   |  |  |  |          |          |          |          |     |  |  |          |          |          |          |          |     |  |  |          |          |          |          |          |     |  |          |          |          |          |          |          |     |          |          |          |          |          |          |          |     |          |          |          |          |          |          |          |    |          |          |          |          |          |          |          |    |          |          |          |          |          |          |            |    |          |          |          |          |          |            |            |    |          |          |          |          |            |            |         |    |          |          |          |          |            |         |         |    |          |          |          |            |         |         |         |     |          |          |            |            |         |         |           |     |          |          |            |         |         |           |           |     |            |            |         |         |           |           |         |     |            |         |         |         |           |         |         |     |         |         |         |           |           |         |           |     |         |         |           |           |         |           |           |       |         |           |           |         |         |           |  |       |           |           |         |           |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |
| 470   | 10 x 12   | 10 x 16                      | 10 x 20      | 12,5 x 20                    | 12,5 x 29              | 16 x 29       | 16 x 35,5                    |                          |               |                              |  |  |  |  |          |          |          |   |  |  |  |          |          |          |          |     |  |  |          |          |          |          |          |     |  |  |          |          |          |          |          |     |  |          |          |          |          |          |          |     |          |          |          |          |          |          |          |     |          |          |          |          |          |          |          |    |          |          |          |          |          |          |          |    |          |          |          |          |          |          |            |    |          |          |          |          |          |            |            |    |          |          |          |          |            |            |         |    |          |          |          |          |            |         |         |    |          |          |          |            |         |         |         |     |          |          |            |            |         |         |           |     |          |          |            |         |         |           |           |     |            |            |         |         |           |           |         |     |            |         |         |         |           |         |         |     |         |         |         |           |           |         |           |     |         |         |           |           |         |           |           |       |         |           |           |         |         |           |  |       |           |           |         |           |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |
| 680   | 10 x 16   | 10 x 20                      | 12,5 x 20    | 12,5 x 24                    | 16 x 25                | 16 x 35,5     | 16 x 35,5                    |                          |               |                              |  |  |  |  |          |          |          |   |  |  |  |          |          |          |          |     |  |  |          |          |          |          |          |     |  |  |          |          |          |          |          |     |  |          |          |          |          |          |          |     |          |          |          |          |          |          |          |     |          |          |          |          |          |          |          |    |          |          |          |          |          |          |          |    |          |          |          |          |          |          |            |    |          |          |          |          |          |            |            |    |          |          |          |          |            |            |         |    |          |          |          |          |            |         |         |    |          |          |          |            |         |         |         |     |          |          |            |            |         |         |           |     |          |          |            |         |         |           |           |     |            |            |         |         |           |           |         |     |            |         |         |         |           |         |         |     |         |         |         |           |           |         |           |     |         |         |           |           |         |           |           |       |         |           |           |         |         |           |  |       |           |           |         |           |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |
| 1 000   | 10 x 20   | 12,5 x 20                    | 12,5 x 24    | 16 x 25                      | 16 x 29                | 16 x 35,5     |                              |                          |               |                              |  |  |  |  |          |          |          |   |  |  |  |          |          |          |          |     |  |  |          |          |          |          |          |     |  |  |          |          |          |          |          |     |  |          |          |          |          |          |          |     |          |          |          |          |          |          |          |     |          |          |          |          |          |          |          |    |          |          |          |          |          |          |          |    |          |          |          |          |          |          |            |    |          |          |          |          |          |            |            |    |          |          |          |          |            |            |         |    |          |          |          |          |            |         |         |    |          |          |          |            |         |         |         |     |          |          |            |            |         |         |           |     |          |          |            |         |         |           |           |     |            |            |         |         |           |           |         |     |            |         |         |         |           |         |         |     |         |         |         |           |           |         |           |     |         |         |           |           |         |           |           |       |         |           |           |         |         |           |  |       |           |           |         |           |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |
| 1 500   | 12,5 x 20   | 12,5 x 24                    | 16 x 25      | 16 x 35,5                    | 16 x 35,5              |               |                              |                          |               |                              |  |  |  |  |          |          |          |   |  |  |  |          |          |          |          |     |  |  |          |          |          |          |          |     |  |  |          |          |          |          |          |     |  |          |          |          |          |          |          |     |          |          |          |          |          |          |          |     |          |          |          |          |          |          |          |    |          |          |          |          |          |          |          |    |          |          |          |          |          |          |            |    |          |          |          |          |          |            |            |    |          |          |          |          |            |            |         |    |          |          |          |          |            |         |         |    |          |          |          |            |         |         |         |     |          |          |            |            |         |         |           |     |          |          |            |         |         |           |           |     |            |            |         |         |           |           |         |     |            |         |         |         |           |         |         |     |         |         |         |           |           |         |           |     |         |         |           |           |         |           |           |       |         |           |           |         |         |           |  |       |           |           |         |           |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |
| 2 200   | 12,5 x 24   | 16 x 25                      | 16 x 29      | 16 x 35,5                    |                        |               |                              |                          |               |                              |  |  |  |  |          |          |          |   |  |  |  |          |          |          |          |     |  |  |          |          |          |          |          |     |  |  |          |          |          |          |          |     |  |          |          |          |          |          |          |     |          |          |          |          |          |          |          |     |          |          |          |          |          |          |          |    |          |          |          |          |          |          |          |    |          |          |          |          |          |          |            |    |          |          |          |          |          |            |            |    |          |          |          |          |            |            |         |    |          |          |          |          |            |         |         |    |          |          |          |            |         |         |         |     |          |          |            |            |         |         |           |     |          |          |            |         |         |           |           |     |            |            |         |         |           |           |         |     |            |         |         |         |           |         |         |     |         |         |         |           |           |         |           |     |         |         |           |           |         |           |           |       |         |           |           |         |         |           |  |       |           |           |         |           |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |
| 3 300   | 16 x 25   | 16 x 29                      | 16 x 35,5    |                              |                        |               |                              |                          |               |                              |  |  |  |  |          |          |          |   |  |  |  |          |          |          |          |     |  |  |          |          |          |          |          |     |  |  |          |          |          |          |          |     |  |          |          |          |          |          |          |     |          |          |          |          |          |          |          |     |          |          |          |          |          |          |          |    |          |          |          |          |          |          |          |    |          |          |          |          |          |          |            |    |          |          |          |          |          |            |            |    |          |          |          |          |            |            |         |    |          |          |          |          |            |         |         |    |          |          |          |            |         |         |         |     |          |          |            |            |         |         |           |     |          |          |            |         |         |           |           |     |            |            |         |         |           |           |         |     |            |         |         |         |           |         |         |     |         |         |         |           |           |         |           |     |         |         |           |           |         |           |           |       |         |           |           |         |         |           |  |       |           |           |         |           |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |
| 4 700   | 16 x 29   | 16 x 35,5                    |              |                              |                        |               |                              |                          |               |                              |  |  |  |  |          |          |          |   |  |  |  |          |          |          |          |     |  |  |          |          |          |          |          |     |  |  |          |          |          |          |          |     |  |          |          |          |          |          |          |     |          |          |          |          |          |          |          |     |          |          |          |          |          |          |          |    |          |          |          |          |          |          |          |    |          |          |          |          |          |          |            |    |          |          |          |          |          |            |            |    |          |          |          |          |            |            |         |    |          |          |          |          |            |         |         |    |          |          |          |            |         |         |         |     |          |          |            |            |         |         |           |     |          |          |            |         |         |           |           |     |            |            |         |         |           |           |         |     |            |         |         |         |           |         |         |     |         |         |         |           |           |         |           |     |         |         |           |           |         |           |           |       |         |           |           |         |         |           |  |       |           |           |         |           |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |
| 6 800   | 16 x 35,5   |                              |              |                              |                        |               |                              |                          |               |                              |  |  |  |  |          |          |          |   |  |  |  |          |          |          |          |     |  |  |          |          |          |          |          |     |  |  |          |          |          |          |          |     |  |          |          |          |          |          |          |     |          |          |          |          |          |          |          |     |          |          |          |          |          |          |          |    |          |          |          |          |          |          |          |    |          |          |          |          |          |          |            |    |          |          |          |          |          |            |            |    |          |          |          |          |            |            |         |    |          |          |          |          |            |         |         |    |          |          |          |            |         |         |         |     |          |          |            |            |         |         |           |     |          |          |            |         |         |           |           |     |            |            |         |         |           |           |         |     |            |         |         |         |           |         |         |     |         |         |         |           |           |         |           |     |         |         |           |           |         |           |           |       |         |           |           |         |         |           |  |       |           |           |         |           |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |
| 10 000  |   |                              |              |                              |                        |               |                              |                          |               |                              |  |  |  |  |          |          |          |   |  |  |  |          |          |          |          |     |  |  |          |          |          |          |          |     |  |  |          |          |          |          |          |     |  |          |          |          |          |          |          |     |          |          |          |          |          |          |          |     |          |          |          |          |          |          |          |    |          |          |          |          |          |          |          |    |          |          |          |          |          |          |            |    |          |          |          |          |          |            |            |    |          |          |          |          |            |            |         |    |          |          |          |          |            |         |         |    |          |          |          |            |         |         |         |     |          |          |            |            |         |         |           |     |          |          |            |         |         |           |           |     |            |            |         |         |           |           |         |     |            |         |         |         |           |         |         |     |         |         |         |           |           |         |           |     |         |         |           |           |         |           |           |       |         |           |           |         |         |           |  |       |           |           |         |           |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |
| 15 000  |   |                              |              |                              |                        |               |                              |                          |               |                              |  |  |  |  |          |          |          |   |  |  |  |          |          |          |          |     |  |  |          |          |          |          |          |     |  |  |          |          |          |          |          |     |  |          |          |          |          |          |          |     |          |          |          |          |          |          |          |     |          |          |          |          |          |          |          |    |          |          |          |          |          |          |          |    |          |          |          |          |          |          |            |    |          |          |          |          |          |            |            |    |          |          |          |          |            |            |         |    |          |          |          |          |            |         |         |    |          |          |          |            |         |         |         |     |          |          |            |            |         |         |           |     |          |          |            |         |         |           |           |     |            |            |         |         |           |           |         |     |            |         |         |         |           |         |         |     |         |         |         |           |           |         |           |     |         |         |           |           |         |           |           |       |         |           |           |         |         |           |  |       |           |           |         |           |           |  |  |       |           |         |         |           |  |  |  |       |         |         |           |  |  |  |  |       |         |           |  |  |  |  |  |       |           |  |  |  |  |  |  |        |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |

# Radiale Elkos / Radial lead type

| <b>ERX</b>  |   |               |                              |            |            |            |            |
|---|---|---------------|------------------------------|------------|------------|------------|------------|
| <b>Baureihen</b>  | <b>Spezialtypen, gepolt, isoliert, schaltfest</b><br><i>Special types, polarized, insulated, pulse-proof</i>        |               |                              |            |            |            |            |
| <b>Anwendung, Besonderheiten</b><br><i>Applications, features</i> | <b>erhöhte Anforderung, Langlebensdauer</b><br><i>long life grade</i>   |               |                              |            |            |            |            |
| <b>Temperaturbereich</b><br><i>Temperature range</i>              | - 55 ... + 105°C  |               |                              |            |            |            |            |
| <b>Lebensdauer</b><br><i>Endurance</i>                            | Ø = 8,7 mm  | 105°C<br>40°C | min 4 000 h<br>min 400 000 h |            |            |            |            |
|   | Ø = 10 mm   | 105°C<br>40°C | min 4 500 h<br>min 450 000 h |            |            |            |            |
|   | Ø = 12,5 mm   | 105°C<br>40°C | min 6 500 h<br>min 650 000 h |            |            |            |            |
|   | Ø = 16 mm   | 105°C<br>40°C | min 9 500 h<br>min 950 000 h |            |            |            |            |
|   |   |               |                              |            |            |            |            |
| <b>Spezifikation</b><br><i>Specification</i>                      | DIN EN 60384-1, DIN EN 60384-4<br>ohne Gütebestätigung (GB) / without quality assessment (QA)                       |               |                              |            |            |            |            |
| <b>Kapazitätstoleranz</b><br><i>Capacitance tolerance</i>         | ± 20%   |               |                              |            |            |            |            |
|   | abweichende Kapazitätstoleranzen sind auf Anfrage lieferbar / other capacitance tolerances are available on request |               |                              |            |            |            |            |
| <b>Kapazität / Capacitance</b><br>C ( µF)                         | <b>Nennspannung / Rated voltage</b>   |               |                              |            |            |            |            |
|   | <b>10</b>   | <b>16</b>     | <b>25</b>                    | <b>35</b>  | <b>40</b>  | <b>50</b>  | <b>63</b>  |
| <b>0,47</b>   |   |               |                              |            |            |            |            |
| <b>1</b>  |   |               |                              |            |            |            |            |
| <b>1,5</b>  |   |               |                              |            |            |            |            |
| <b>2,2</b>  |   |               |                              |            |            |            |            |
| <b>3,3</b>  |   |               |                              |            |            |            |            |
| <b>4,7</b>  |   |               |                              |            |            |            |            |
| <b>6,8</b>  |   |               |                              |            |            |            | 8,7 x 12,7 |
| <b>10</b>   |   |               |                              |            |            | 8,7 x 12,7 | 8,7 x 12,7 |
| <b>15</b>   |   |               |                              |            | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7 |
| <b>22</b>   |   |               |                              | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7 |
| <b>33</b>   |   |               | 8,7 x 12,7                   | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7 |
| <b>47</b>   |   | 8,7 x 12,7    | 8,7 x 12,7                   | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7 | 10 x 12    |
| <b>68</b>   | 8,7 x 12,7  | 8,7 x 12,7    | 8,7 x 12,7                   | 8,7 x 12,7 | 8,7 x 12,7 | 10 x 12    | 10 x 16    |
| <b>100</b>  | 8,7 x 12,7  | 8,7 x 12,7    | 10 x 12                      | 10 x 12    | 10 x 12    | 10 x 16    | 10 x 20    |
| <b>150</b>  | 8,7 x 12,7  | 8,7 x 12,7    | 10 x 12                      | 10 x 16    | 10 x 16    | 10 x 20    | 12,5 x 20  |
| <b>220</b>  | 8,7 x 12,7  | 10 x 12       | 10 x 16                      | 10 x 20    | 10 x 20    | 12,5 x 20  | 12,5 x 24  |
| <b>330</b>  | 10 x 12   | 10 x 16       | 10 x 20                      | 12,5 x 20  | 12,5 x 20  | 12,5 x 29  | 16 x 25    |
| <b>470</b>  | 10 x 16   | 10 x 20       | 12,5 x 20                    | 12,5 x 24  | 12,5 x 24  | 16 x 25    | 16 x 29    |
| <b>680</b>  | 10 x 20   | 12,5 x 20     | 12,5 x 24                    | 12,5 x 29  | 12,5 x 29  | 16 x 25    | 16 x 29    |
| <b>1 000</b>  | 12,5 x 20   | 12,5 x 24     | 12,5 x 29                    | 16 x 25    | 16 x 25    | 16 x 29    | 16 x 35,5  |
| <b>1 500</b>  | 12,5 x 24   | 12,5 x 29     | 16 x 25                      | 16 x 29    | 16 x 29    | 16 x 35,5  |            |
| <b>2 200</b>  | 12,5 x 29   | 16 x 25       | 16 x 29                      | 16 x 35,5  | 16 x 35,5  |            |            |
| <b>3 300</b>  | 16 x 25   | 16 x 29       | 16 x 35,5                    | 16 x 35,5  |            |            |            |
| <b>4 700</b>  | 16 x 29   | 16 x 35,5     | 16 x 35,5                    |            |            |            |            |
| <b>6 800</b>  | 16 x 35,5   | 16 x 35,5     |                              |            |            |            |            |
| <b>10 000</b>   | 16 x 35,5   |               |                              |            |            |            |            |
| <b>15 000</b>   |   |               |                              |            |            |            |            |

# Radiale Elkos / Radial lead type

| Radiale Elkos / Radial lead type                           |  |                    |                     |
|--|--|--------------------|---------------------|
| Baureihen  | EKT  |                    |                     |
|  | Standardausführung, ungepolt, isoliert, schaltfest<br><i>Standard, non polarized, insulated, pulse-proof</i>               |                    |                     |
| Anwendung, Besonderheiten<br><i>Applications, features</i> | Anwendung für Tonfrequenz<br><i>for audio frequency</i>  |                    |                     |
| Temperaturbereich<br><i>Temperature range</i>              | - 40 ... + 85°C (+ 105°C)  |                    |                     |
| Lebensdauer<br><i>Endurance</i>                            | Ø ≤ 12,5 mm  | 105°C              | min 1 000 h         |
|  |  | 40°C               | min 100 000 h       |
|  | Ø = 16 mm  | 105°C              | min 1 500 h         |
|  |  | 40°C               | min 150 000 h       |
| Spezifikation<br><i>Specification</i>                      | DIN EN 60384-1, DIN EN 60384-4<br>ohne Gütebestätigung (GB) / <i>without quality assessment (QA)</i>                       |                    |                     |
| Kapazitätstoleranz<br><i>Capacitance tolerance</i>         | ± 15 %   |                    |                     |
|  | abweichende Kapazitätstoleranzen sind auf Anfrage lieferbar / <i>other capacitance tolerances are available on request</i> |                    |                     |
| Kapazität / Capacitance<br>C ( µF)                         | Nennspannung / <i>Rated voltage</i>  |                    |                     |
|  | 40 V DC<br>15 V AC   | 63 V DC<br>23 V AC | 100 V DC<br>35 V AC |
| 1  |  |                    |                     |
| 1,5  |  |                    |                     |
| 2,2  | 10 x 12  | 10 x 12            | 10 x 16             |
| 3,3  | 10 x 12  | 10 x 16            | 10 x 16             |
| 4,7  | 10 x 12  | 10 x 20            | 12,5 x 20           |
| 6,8  | 10 x 16  | 12,5 x 20          | 12,5 x 20           |
| 10   | 10 x 20  | 12,5 x 20          | 12,5 x 24           |
| 15   | 12,5 x 20  | 12,5 x 24          | 16 x 25             |
| 22   | 12,5 x 20  | 16 x 25            | 16 x 29             |
| 33   | 12,5 x 24  | 16 x 25            | 16 x 35,5           |
| 47   | 16 x 25  | 16 x 35,5          | 16 x 35,5           |
| 68   | 16 x 25  | 16 x 35,5          |                     |
| 100  | 16 x 35,5  |                    |                     |
| 150  |  |                    |                     |
| 220  |  |                    |                     |
| 330  |  |                    |                     |
| 470  |  |                    |                     |
| 680  |  |                    |                     |
| 1 000  |  |                    |                     |
| 1 500  |  |                    |                     |
| 2 200  |  |                    |                     |
| 3 300  |  |                    |                     |
| 4 700  |  |                    |                     |
| 6 800  |  |                    |                     |
| 10 000   |  |                    |                     |
| 15 000   |  |                    |                     |

# Radiale Elkos / Radial lead type

| Radiale Elkos / Radial lead type                           |  |           |               |           |                              |           |
|--|--|-----------|---------------|-----------|------------------------------|-----------|
| Baureihen  | ERH  |           |               |           |                              |           |
|  | Standardausführung, gepolt, isoliert, schaltfest<br><i>Standard, polarized, insulated, pulse-proof</i>                     |           |               |           |                              |           |
| Anwendung, Besonderheiten<br><i>Applications, features</i> | hohes C x U, lange Lebensdauer<br><i>high C x U - product, long life</i>   |           |               |           |                              |           |
| Temperaturbereich<br><i>Temperature range</i>              | - 40 ... + 105°C   |           |               |           |                              |           |
| Lebensdauer<br><i>Endurance</i>                            | Ø = 10 mm  |           | 105°C<br>40°C |           | min 2 500 h<br>min 250 000 h |           |
|  | Ø ≥ 12,5 mm  |           | 105°C<br>40°C |           | min 5 000 h<br>min 500 000 h |           |
|  |  |           |               |           |                              |           |
|  |  |           |               |           |                              |           |
| Spezifikation<br><i>Specification</i>                      | DIN EN 60384-1, DIN EN 60384-4<br>ohne Gütebestätigung (GB) / <i>without quality assessment (QA)</i>                       |           |               |           |                              |           |
| Kapazitätstoleranz<br><i>Capacitance tolerance</i>         | ± 20%  |           |               |           |                              |           |
|  | abweichende Kapazitätstoleranzen sind auf Anfrage lieferbar / <i>other capacitance tolerances are available on request</i> |           |               |           |                              |           |
| Kapazität / Capacitance<br>C ( µF)                         | Nennspannung / Rated voltage   |           |               |           |                              |           |
|  | 160  | 200       | 250           | 350       | 400                          | 450       |
| 0,47   |  |           |               |           |                              |           |
| 1  |  |           |               |           |                              |           |
| 1,5  |  |           |               | 10 x 12   | 10 x 12                      | 10 x 12   |
| 2,2  |  |           | 10 x 12       | 10 x 12   | 10 x 12                      | 10 x 12   |
| 3,3  |  | 10 x 12   | 10 x 12       | 10 x 12   | 10 x 16                      | 10 x 16   |
| 4,7  | 10 x 12  | 10 x 12   | 10 x 12       | 10 x 16   | 10 x 16                      | 10 x 20   |
| 6,8  | 10 x 12  | 10 x 12   | 10 x 16       | 10 x 16   | 10 x 20                      | 12,5 x 20 |
| 10   | 10 x 12  | 10 x 12   | 10 x 16       | 10 x 20   | 12,5 x 20                    | 12,5 x 24 |
| 15   | 10 x 12  | 10 x 16   | 10 x 20       | 12,5 x 20 | 12,5 x 24                    | 12,5 x 29 |
| 22   | 10 x 16  | 10 x 20   | 12,5 x 20     | 12,5 x 29 | 16 x 25                      | 16 x 29   |
| 33   | 10 x 20  | 12,5 x 20 | 12,5 x 24     | 16 x 25   | 16 x 29                      | 16 x 29   |
| 47   | 12,5 x 20  | 12,5 x 24 | 16 x 20       | 16 x 29   | 16 x 29                      |           |
| 68   | 12,5 x 29  | 12,5 x 29 | 16 x 29       | 16 x 29   |                              |           |
| 100  | 16 x 25  | 16 x 29   | 16 x 29       |           |                              |           |
| 150  | 16 x 25  | 16 x 29   |               |           |                              |           |
| 220  | 16 x 29  |           |               |           |                              |           |
| 330  |  |           |               |           |                              |           |
| 470  |  |           |               |           |                              |           |
| 680  |  |           |               |           |                              |           |
| 1 000  |  |           |               |           |                              |           |
| 1 500  |  |           |               |           |                              |           |
| 2 200  |  |           |               |           |                              |           |
| 3 300  |  |           |               |           |                              |           |
| 4 700  |  |           |               |           |                              |           |
| 6 800  |  |           |               |           |                              |           |
| 10 000   |  |           |               |           |                              |           |
| 15 000   |  |           |               |           |                              |           |

# Radiale Elkos / Radial lead type

| <b>ERF</b>  |  |                                 |                              |                              |            |               |                              |             |               |                              |           |               |                              |           |               |                                 |
|---|--|---------------------------------|------------------------------|------------------------------|------------|---------------|------------------------------|-------------|---------------|------------------------------|-----------|---------------|------------------------------|-----------|---------------|---------------------------------|
| <b>Baureihen</b>  | <b>Spezialtypen, gepolt, isoliert, schaltfest</b><br><i>Special types, polarized, insulated, pulse-proof</i>   |                                 |                              |                              |            |               |                              |             |               |                              |           |               |                              |           |               |                                 |
| <b>Anwendung, Besonderheiten</b><br><i>Applications, features</i> | <b>niedriges Z, für SNT-Einsatz</b><br><i>low impedance, for SMPS</i>  |                                 |                              |                              |            |               |                              |             |               |                              |           |               |                              |           |               |                                 |
| <b>Temperaturbereich</b><br><i>Temperature range</i>              | - 55 ... + 105°C   |                                 |                              |                              |            |               |                              |             |               |                              |           |               |                              |           |               |                                 |
| <b>Lebensdauer</b><br><i>Endurance</i>                            | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">Ø ≤ 8,7 mm</td> <td style="text-align: center;">105°C<br/>40°C</td> <td style="text-align: center;">min 2 500 h<br/>min 250 000 h</td> </tr> <tr> <td style="text-align: center;">Ø = 10 mm</td> <td style="text-align: center;">105°C<br/>40°C</td> <td style="text-align: center;">min 3 000 h<br/>min 300 000 h</td> </tr> <tr> <td style="text-align: center;">Ø = 12,5 mm</td> <td style="text-align: center;">105°C<br/>40°C</td> <td style="text-align: center;">min 5 000 h<br/>min 500 000 h</td> </tr> <tr> <td style="text-align: center;">Ø = 16 mm</td> <td style="text-align: center;">105°C<br/>40°C</td> <td style="text-align: center;">min 8 000 h<br/>min 800 000 h</td> </tr> <tr> <td style="text-align: center;">Ø = 18 mm</td> <td style="text-align: center;">105°C<br/>40°C</td> <td style="text-align: center;">min 10 000 h<br/>min 1 000 000 h</td> </tr> </table> | Ø ≤ 8,7 mm                      | 105°C<br>40°C                | min 2 500 h<br>min 250 000 h | Ø = 10 mm  | 105°C<br>40°C | min 3 000 h<br>min 300 000 h | Ø = 12,5 mm | 105°C<br>40°C | min 5 000 h<br>min 500 000 h | Ø = 16 mm | 105°C<br>40°C | min 8 000 h<br>min 800 000 h | Ø = 18 mm | 105°C<br>40°C | min 10 000 h<br>min 1 000 000 h |
|   | Ø ≤ 8,7 mm   | 105°C<br>40°C                   | min 2 500 h<br>min 250 000 h |                              |            |               |                              |             |               |                              |           |               |                              |           |               |                                 |
|   | Ø = 10 mm  | 105°C<br>40°C                   | min 3 000 h<br>min 300 000 h |                              |            |               |                              |             |               |                              |           |               |                              |           |               |                                 |
|   | Ø = 12,5 mm  | 105°C<br>40°C                   | min 5 000 h<br>min 500 000 h |                              |            |               |                              |             |               |                              |           |               |                              |           |               |                                 |
|   | Ø = 16 mm  | 105°C<br>40°C                   | min 8 000 h<br>min 800 000 h |                              |            |               |                              |             |               |                              |           |               |                              |           |               |                                 |
| Ø = 18 mm   | 105°C<br>40°C  | min 10 000 h<br>min 1 000 000 h |                              |                              |            |               |                              |             |               |                              |           |               |                              |           |               |                                 |
| <b>Spezifikation</b><br><i>Specification</i>                      | DIN EN 60384-1, DIN EN 60384-4<br>ohne Gütebestätigung (GB) / <i>without quality assessment (QA)</i>   |                                 |                              |                              |            |               |                              |             |               |                              |           |               |                              |           |               |                                 |
| <b>Kapazitätstoleranz</b><br><i>Capacitance tolerance</i>         | ± 20 %<br>abweichende Kapazitätstoleranzen sind auf Anfrage lieferbar / <i>other capacitance tolerances are available on request</i>   |                                 |                              |                              |            |               |                              |             |               |                              |           |               |                              |           |               |                                 |
| <b>Kapazität / Capacitance</b><br>C ( µF)                         | <b>Nennspannung / Rated voltage</b>  |                                 |                              |                              |            |               |                              |             |               |                              |           |               |                              |           |               |                                 |
|   | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: center;">6,3</th> <th style="text-align: center;">10</th> <th style="text-align: center;">16</th> <th style="text-align: center;">25</th> <th style="text-align: center;">35</th> <th style="text-align: center;">50</th> <th style="text-align: center;">63</th> <th style="text-align: center;">100</th> </tr> </table>   | 6,3                             | 10                           | 16                           | 25         | 35            | 50                           | 63          | 100           |                              |           |               |                              |           |               |                                 |
| 6,3   | 10   | 16                              | 25                           | 35                           | 50         | 63            | 100                          |             |               |                              |           |               |                              |           |               |                                 |
| 0,47  |  |                                 |                              |                              | 5 x 11     | 5 x 11        | 5 x 11                       |             |               |                              |           |               |                              |           |               |                                 |
| 1   |  |                                 |                              |                              | 5 x 11     | 5 x 11        | 5 x 11                       |             |               |                              |           |               |                              |           |               |                                 |
| 1,5   |  |                                 |                              | 5 x 11                       | 5 x 11     | 5 x 11        | 5 x 11                       |             |               |                              |           |               |                              |           |               |                                 |
| 2,2   |  |                                 | 5 x 11                       | 5 x 11                       | 5 x 11     | 5 x 11        | 5 x 11                       |             |               |                              |           |               |                              |           |               |                                 |
| 3,3   |  | 5 x 11                          | 5 x 11                       | 5 x 11                       | 5 x 11     | 5 x 11        | 5 x 11                       |             |               |                              |           |               |                              |           |               |                                 |
| 4,7   | 5 x 11   | 5 x 11                          | 5 x 11                       | 5 x 11                       | 5 x 11     | 5 x 11        | 5 x 11                       |             |               |                              |           |               |                              |           |               |                                 |
| 6,8   | 5 x 11   | 5 x 11                          | 5 x 11                       | 5 x 11                       | 5 x 11     | 5 x 11        | 6,3 x 11                     |             |               |                              |           |               |                              |           |               |                                 |
| 10  | 5 x 11   | 5 x 11                          | 5 x 11                       | 5 x 11                       | 5 x 11     | 5 x 11        | 6,3 x 11                     |             |               |                              |           |               |                              |           |               |                                 |
| 15  | 5 x 11   | 5 x 11                          | 5 x 11                       | 5 x 11                       | 5 x 11     | 5 x 11        | 6,3 x 11                     |             |               |                              |           |               |                              |           |               |                                 |
| 22  | 5 x 11   | 5 x 11                          | 5 x 11                       | 5 x 11                       | 5 x 11     | 5 x 11        | 6,3 x 11                     |             |               |                              |           |               |                              |           |               |                                 |
| 33  | 5 x 11   | 5 x 11                          | 5 x 11                       | 5 x 11                       | 5 x 11     | 6,3 x 11      | 6,3 x 11                     |             |               |                              |           |               |                              |           |               |                                 |
| 47  | 5 x 11   | 5 x 11                          | 5 x 11                       | 5 x 11                       | 6,3 x 11   | 6,3 x 11      | 8,7 x 12,7                   |             |               |                              |           |               |                              |           |               |                                 |
| 68  | 5 x 11   | 5 x 11                          | 5 x 11                       | 5 x 11                       | 6,3 x 11   | 6,3 x 11      | 8,7 x 12,7                   |             |               |                              |           |               |                              |           |               |                                 |
| 100   | 5 x 11   | 5 x 11                          | 6,3 x 11                     | 6,3 x 11                     | 8,7 x 12,7 | 8,7 x 12,7    | 10 x 12                      |             |               |                              |           |               |                              |           |               |                                 |
| 150   | 5 x 11   | 5 x 11                          | 6,3 x 11                     | 6,3 x 11                     | 8,7 x 12,7 | 10 x 12       | 10 x 16                      |             |               |                              |           |               |                              |           |               |                                 |
| 220   | 6,3 x 11   | 6,3 x 11                        | 8,7 x 12,7                   | 8,7 x 12,7                   | 10 x 12    | 10 x 16       | 10 x 20                      |             |               |                              |           |               |                              |           |               |                                 |
| 330   | 8,7 x 12,7   | 8,7 x 12,7                      | 8,7 x 12,7                   | 10 x 12                      | 10 x 16    | 10 x 20       | 12,5 x 20                    |             |               |                              |           |               |                              |           |               |                                 |
| 470   | 8,7 x 12,7   | 8,7 x 12,7                      | 10 x 12                      | 10 x 16                      | 10 x 20    | 12,5 x 20     | 12,5 x 24                    |             |               |                              |           |               |                              |           |               |                                 |
| 680   | 10 x 12  | 10 x 12                         | 10 x 16                      | 10 x 20                      | 12,5 x 20  | 16 x 20       | 16 x 25                      |             |               |                              |           |               |                              |           |               |                                 |
| 1 000   | 10 x 16  | 10 x 16                         | 10 x 20                      | 12,5 x 20                    | 12,5 x 24  | 16 x 25       | 16 x 29                      |             |               |                              |           |               |                              |           |               |                                 |
| 1 500   | 10 x 20  | 10 x 20                         | 12,5 x 24                    | 16 x 25                      | 16 x 25    | 16 x 29       | 18 x 29                      |             |               |                              |           |               |                              |           |               |                                 |
| 2 200   | 12,5 x 20  | 12,5 x 20                       | 12,5 x 24                    | 16 x 25                      | 16 x 29    | 16 x 35,5     | 18 x 35,5                    |             |               |                              |           |               |                              |           |               |                                 |
| 3 300   | 12,5 x 24  | 12,5 x 24                       | 16 x 25                      | 16 x 29                      | 16 x 35,5  | 18 x 35,5     |                              |             |               |                              |           |               |                              |           |               |                                 |
| 4 700   | 16 x 20  | 16 x 25                         | 16 x 29                      | 16 x 35,5                    | 18 x 35,5  |               |                              |             |               |                              |           |               |                              |           |               |                                 |
| 6 800   | 16 x 25  | 16 x 29                         | 16 x 35,5                    | 18 x 35,5                    |            |               |                              |             |               |                              |           |               |                              |           |               |                                 |
| 10 000  | 16 x 35,5  | 16 x 35,5                       | 18 x 29                      |                              |            |               |                              |             |               |                              |           |               |                              |           |               |                                 |
| 15 000  | 18 x 29  | 18 x 35,5                       |                              |                              |            |               |                              |             |               |                              |           |               |                              |           |               |                                 |
| 22 000  | 18 x 35,5  |                                 |                              |                              |            |               |                              |             |               |                              |           |               |                              |           |               |                                 |



# Radiale Elkos / Radial lead type

| Baureihen  | <b>ERY</b><br>Spezialtypen, gepolt, isoliert, schaltfest<br><i>Special types, polarized, insulated, pulse-proof</i>        |               |            |            |            |            |               |
|--|--|---------------|------------|------------|------------|------------|---------------|
| Anwendung, Besonderheiten<br><i>Applications, features</i> | niedriger ESR / Z<br><i>low ESR / Z</i>  |               |            |            |            |            |               |
| Temperaturbereich<br><i>Temperature range</i>              | - 55 ... + 105°C   |               |            |            |            |            |               |
| Lebensdauer<br><i>Endurance</i>                            | Ø = 8,7 mm   | 105°C<br>40°C |            |            |            |            | min 2 500 h   |
|  | Ø = 10 mm  | 105°C<br>40°C |            |            |            |            | min 250 000 h |
|  | Ø = 12,5 mm  | 105°C<br>40°C |            |            |            |            | min 3 000 h   |
|  | Ø = 16 mm  | 105°C<br>40°C |            |            |            |            | min 300 000 h |
|  | Ø = 18 mm  | 105°C<br>40°C |            |            |            |            | min 5 000 h   |
| Spezifikation<br><i>Specification</i>                      | DIN EN 60384-1, DIN EN 60384-4<br>ohne Gütebestätigung (GB) / <i>without quality assessment (QA)</i>                       |               |            |            |            |            |               |
| Kapazitätstoleranz<br><i>Capacitance tolerance</i>         | ± 20%  |               |            |            |            |            |               |
|  | abweichende Kapazitätstoleranzen sind auf Anfrage lieferbar / <i>other capacitance tolerances are available on request</i> |               |            |            |            |            |               |
| Kapazität / Capacitance<br>C (µF)                          | Nennspannung / <i>Rated voltage</i>  |               |            |            |            |            |               |
|  | 10   | 16            | 25         | 35         | 50         | 63         | 100           |
| 0,47   |  |               |            |            |            |            |               |
| 1  |  |               |            |            |            |            |               |
| 1,5  |  |               |            |            |            |            |               |
| 2,2  |  |               |            |            |            |            |               |
| 3,3  |  |               |            |            |            |            |               |
| 4,7  |  |               |            |            |            |            |               |
| 6,8  |  |               |            |            |            |            |               |
| 10   |  |               |            |            |            |            |               |
| 15   |  |               |            |            |            |            | 8,7 x 12,7    |
| 22   |  |               |            |            |            | 8,7 x 12,7 | 8,7 x 12,7    |
| 33   |  |               |            |            | 8,7 x 12,7 | 8,7 x 12,7 | 10 x 12       |
| 47   |  |               |            | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7 | 10 x 16       |
| 68   |  |               | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7 | 10 x 20       |
| 100  |  | 8,7 x 12,7    | 8,7 x 12,7 | 8,7 x 12,7 | 8,7 x 12,7 | 10 x 12    | 12,5 x 20     |
| 150  | 8,7 x 12,7   | 8,7 x 12,7    | 8,7 x 12,7 | 8,7 x 12,7 | 10 x 12    | 10 x 16    | 12,5 x 24     |
| 220  | 8,7 x 12,7   | 8,7 x 12,7    | 8,7 x 12,7 | 10 x 12    | 10 x 16    | 10 x 20    | 16 x 25       |
| 330  | 8,7 x 12,7   | 8,7 x 12,7    | 10 x 12    | 10 x 16    | 10 x 20    | 12,5 x 20  | 16 x 25       |
| 470  | 8,7 x 12,7   | 10 x 12       | 10 x 16    | 10 x 20    | 12,5 x 20  | 12,5 x 24  | 16 x 29       |
| 680  | 10 x 12  | 10 x 16       | 10 x 20    | 12,5 x 20  | 12,5 x 24  | 16 x 25    | 18 x 29       |
| 1 000  | 10 x 16  | 10 x 20       | 12,5 x 20  | 12,5 x 24  | 16 x 25    | 16 x 29    | 18 x 35,5     |
| 1 500  | 10 x 20  | 12,5 x 20     | 12,5 x 24  | 16 x 25    | 16 x 29    | 18 x 29    |               |
| 2 200  | 12,5 x 20  | 12,5 x 24     | 16 x 25    | 16 x 29    | 16 x 35,5  | 18 x 35,5  |               |
| 3 300  | 12,5 x 24  | 16 x 25       | 16 x 29    | 16 x 35,5  | 18 x 35,5  |            |               |
| 4 700  | 16 x 25  | 16 x 29       | 16 x 35,5  | 18 x 35,5  |            |            |               |
| 6 800  | 16 x 29  | 16 x 35,5     | 18 x 35,5  |            |            |            |               |
| 10 000   | 16 x 35,5  | 18 x 29       |            |            |            |            |               |
| 15 000   | 18 x 35,5  |               |            |            |            |            |               |

# Radiale Elkos / Radial lead type

| Baureihen  | <b>ERLL</b><br>Spezialtypen, gepolt, isoliert, schaltfest<br><i>Special types, polarized, insulated, pulse-proof</i>                |               |                              |                       |               |                              |                         |               |                              |                       |               |                              |                       |               |                                 |
|--|---|---------------|------------------------------|-----------------------|---------------|------------------------------|-------------------------|---------------|------------------------------|-----------------------|---------------|------------------------------|-----------------------|---------------|---------------------------------|
| Anwendung, Besonderheiten<br><i>Applications, features</i> | extrem niedriger $I_R$<br><i>special low <math>I_R</math></i>   |               |                              |                       |               |                              |                         |               |                              |                       |               |                              |                       |               |                                 |
| Temperaturbereich<br><i>Temperature range</i>              | - 55 ... + 105°C  |               |                              |                       |               |                              |                         |               |                              |                       |               |                              |                       |               |                                 |
| Lebensdauer<br><i>Endurance</i>                            | $\varnothing \leq 8,7$ mm   | 105°C<br>40°C | min 2 500 h<br>min 250 000 h | $\varnothing = 10$ mm | 105°C<br>40°C | min 3 000 h<br>min 300 000 h | $\varnothing = 12,5$ mm | 105°C<br>40°C | min 5 000 h<br>min 500 000 h | $\varnothing = 16$ mm | 105°C<br>40°C | min 8 000 h<br>min 800 000 h | $\varnothing = 18$ mm | 105°C<br>40°C | min 10 000 h<br>min 1 000 000 h |
| Spezifikation<br><i>Specification</i>                      | DIN EN 60384-1, DIN EN 60384-4<br>ohne Gütebestätigung (GB) / <i>without quality assessment (QA)</i>                                |               |                              |                       |               |                              |                         |               |                              |                       |               |                              |                       |               |                                 |
| Kapazitätstoleranz<br><i>Capacitance tolerance</i>         | ± 20%<br>abweichende Kapazitätstoleranzen sind auf Anfrage lieferbar / <i>other capacitance tolerances are available on request</i> |               |                              |                       |               |                              |                         |               |                              |                       |               |                              |                       |               |                                 |
| Kapazität / Capacitance<br>C ( µF)                         | Nennspannung / <i>Rated voltage</i>   |               |                              |                       |               |                              |                         |               |                              |                       |               |                              |                       |               |                                 |
|  | 6,3   | 10            | 16                           | 25                    | 35            | 50                           | 63                      | 100           |                              |                       |               |                              |                       |               |                                 |
| 0,47   |   |               |                              |                       |               | 5 x 11                       | 5 x 11                  | 5 x 11        |                              |                       |               |                              |                       |               |                                 |
| 1  |   |               |                              |                       |               | 5 x 11                       | 5 x 11                  | 5 x 11        |                              |                       |               |                              |                       |               |                                 |
| 1,5  |   |               |                              |                       |               | 5 x 11                       | 5 x 11                  | 5 x 11        |                              |                       |               |                              |                       |               |                                 |
| 2,2  |   |               |                              |                       |               | 5 x 11                       | 5 x 11                  | 5 x 11        |                              |                       |               |                              |                       |               |                                 |
| 3,3  |   |               |                              |                       |               | 5 x 11                       | 5 x 11                  | 5 x 11        |                              |                       |               |                              |                       |               |                                 |
| 4,7  |   |               |                              | 5 x 11                | 5 x 11        | 5 x 11                       | 5 x 11                  | 5 x 11        |                              |                       |               |                              |                       |               |                                 |
| 6,8  |   |               |                              | 5 x 11                | 5 x 11        | 5 x 11                       | 5 x 11                  | 6,3 x 11      |                              |                       |               |                              |                       |               |                                 |
| 10   |   |               | 5 x 11                       | 5 x 11                | 5 x 11        | 5 x 11                       | 5 x 11                  | 6,3 x 11      |                              |                       |               |                              |                       |               |                                 |
| 15   |   |               | 5 x 11                       | 5 x 11                | 5 x 11        | 5 x 11                       | 5 x 11                  | 6,3 x 11      |                              |                       |               |                              |                       |               |                                 |
| 22   |   | 5 x 11        | 5 x 11                       | 5 x 11                | 5 x 11        | 5 x 11                       | 6,3 x 11                | 8,7 x 12,7    |                              |                       |               |                              |                       |               |                                 |
| 33   |   | 5 x 11        | 5 x 11                       | 5 x 11                | 5 x 11        | 6,3 x 11                     | 6,3 x 11                | 10 x 12       |                              |                       |               |                              |                       |               |                                 |
| 47   |   | 5 x 11        | 5 x 11                       | 5 x 11                | 6,3 x 11      | 6,3 x 11                     | 8,7 x 12,7              | 10 x 16       |                              |                       |               |                              |                       |               |                                 |
| 68   |   | 5 x 11        | 5 x 11                       | 5 x 11                | 6,3 x 11      | 6,3 x 11                     | 8,7 x 12,7              | 10 x 20       |                              |                       |               |                              |                       |               |                                 |
| 100  | 5 x 11  | 5 x 11        | 6,3 x 11                     | 6,3 x 11              | 8,7 x 12,7    | 8,7 x 12,7                   | 10 x 12                 | 12,5 x 20     |                              |                       |               |                              |                       |               |                                 |
| 150  | 5 x 11  | 5 x 11        | 6,3 x 11                     | 6,3 x 11              | 8,7 x 12,7    | 10 x 12                      | 10 x 16                 | 12,5 x 24     |                              |                       |               |                              |                       |               |                                 |
| 220  | 6,3 x 11  | 6,3 x 11      | 8,7 x 12,7                   | 8,7 x 12,7            | 10 x 12       | 10 x 16                      | 10 x 20                 | 16 x 25       |                              |                       |               |                              |                       |               |                                 |
| 330  | 8,7 x 12,7  | 8,7 x 12,7    | 8,7 x 12,7                   | 10 x 12               | 10 x 16       | 10 x 20                      | 12,5 x 20               | 16 x 25       |                              |                       |               |                              |                       |               |                                 |
| 470  | 8,7 x 12,7  | 8,7 x 12,7    | 10 x 12                      | 10 x 16               | 10 x 20       | 12,5 x 20                    | 12,5 x 24               | 16 x 29       |                              |                       |               |                              |                       |               |                                 |
| 680  | 10 x 12   | 10 x 12       | 10 x 16                      | 10 x 20               | 12,5 x 20     | 16 x 20                      | 16 x 25                 | 18 x 29       |                              |                       |               |                              |                       |               |                                 |
| 1 000  | 10 x 16   | 10 x 16       | 10 x 20                      | 12,5 x 20             | 12,5 x 24     | 16 x 25                      | 16 x 29                 | 18 x 35,5     |                              |                       |               |                              |                       |               |                                 |
| 1 500  | 10 x 20   | 10 x 20       | 12,5 x 24                    | 16 x 25               | 16 x 25       | 16 x 29                      | 18 x 29                 |               |                              |                       |               |                              |                       |               |                                 |
| 2 200  | 12,5 x 20   | 12,5 x 20     | 12,5 x 24                    | 16 x 25               | 16 x 29       | 16 x 35,5                    | 18 x 35,5               |               |                              |                       |               |                              |                       |               |                                 |
| 3 300  | 12,5 x 24   | 12,5 x 24     | 16 x 25                      | 16 x 29               | 16 x 35,5     | 18 x 35,5                    |                         |               |                              |                       |               |                              |                       |               |                                 |
| 4 700  | 16 x 20   | 16 x 25       | 16 x 29                      | 16 x 35,5             | 18 x 35,5     |                              |                         |               |                              |                       |               |                              |                       |               |                                 |
| 6 800  | 16 x 25   | 16 x 29       | 16 x 35,5                    | 18 x 35,5             |               |                              |                         |               |                              |                       |               |                              |                       |               |                                 |
| 10 000   | 16 x 35,5   | 16 x 35,5     | 18 x 29                      |                       |               |                              |                         |               |                              |                       |               |                              |                       |               |                                 |
| 15 000   | 18 x 29   | 18 x 35,5     |                              |                       |               |                              |                         |               |                              |                       |               |                              |                       |               |                                 |

# Radiale Elkos / Radial lead type

| <b>EKLM</b>   |   |                                |               |                              |           |               |                                |             |               |                                |           |               |                                |           |               |                                |
|---|---|--------------------------------|---------------|------------------------------|-----------|---------------|--------------------------------|-------------|---------------|--------------------------------|-----------|---------------|--------------------------------|-----------|---------------|--------------------------------|
| <b>Baureihen</b>  | <b>Spezialtypen, gepolt, isoliert, schaltfest</b><br><i>Special types, polarized, insulated, pulse-proof</i>  |                                |               |                              |           |               |                                |             |               |                                |           |               |                                |           |               |                                |
| <b>Anwendung, Besonderheiten</b><br><i>Applications, features</i> | <b>großer Temperaturbereich, miniaturisiert</b><br><i>high temperature, miniaturized</i>  |                                |               |                              |           |               |                                |             |               |                                |           |               |                                |           |               |                                |
| <b>Temperaturbereich</b><br><i>Temperature range</i>              | - 55 ... + 125°C<br>(+ 150°C auf Anfrage / on request)  |                                |               |                              |           |               |                                |             |               |                                |           |               |                                |           |               |                                |
| <b>Lebensdauer</b><br><i>Endurance</i>                            | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">Ø ≤ 8,7 mm</td> <td style="text-align: center;">125°C<br/>40°C</td> <td style="text-align: center;">min 2 000 h<br/>min 800 000 h</td> </tr> <tr> <td style="text-align: center;">Ø = 10 mm</td> <td style="text-align: center;">125°C<br/>40°C</td> <td style="text-align: center;">min 3 000 h<br/>min 1 200 000 h</td> </tr> <tr> <td style="text-align: center;">Ø = 12,5 mm</td> <td style="text-align: center;">125°C<br/>40°C</td> <td style="text-align: center;">min 5 000 h<br/>min 2 000 000 h</td> </tr> <tr> <td style="text-align: center;">Ø = 16 mm</td> <td style="text-align: center;">125°C<br/>40°C</td> <td style="text-align: center;">min 7 000 h<br/>min 2 800 000 h</td> </tr> <tr> <td style="text-align: center;">Ø = 18 mm</td> <td style="text-align: center;">125°C<br/>40°C</td> <td style="text-align: center;">min 8 000 h<br/>min 3 200 000 h</td> </tr> </table> | Ø ≤ 8,7 mm                     | 125°C<br>40°C | min 2 000 h<br>min 800 000 h | Ø = 10 mm | 125°C<br>40°C | min 3 000 h<br>min 1 200 000 h | Ø = 12,5 mm | 125°C<br>40°C | min 5 000 h<br>min 2 000 000 h | Ø = 16 mm | 125°C<br>40°C | min 7 000 h<br>min 2 800 000 h | Ø = 18 mm | 125°C<br>40°C | min 8 000 h<br>min 3 200 000 h |
| Ø ≤ 8,7 mm  | 125°C<br>40°C   | min 2 000 h<br>min 800 000 h   |               |                              |           |               |                                |             |               |                                |           |               |                                |           |               |                                |
| Ø = 10 mm   | 125°C<br>40°C   | min 3 000 h<br>min 1 200 000 h |               |                              |           |               |                                |             |               |                                |           |               |                                |           |               |                                |
| Ø = 12,5 mm   | 125°C<br>40°C   | min 5 000 h<br>min 2 000 000 h |               |                              |           |               |                                |             |               |                                |           |               |                                |           |               |                                |
| Ø = 16 mm   | 125°C<br>40°C   | min 7 000 h<br>min 2 800 000 h |               |                              |           |               |                                |             |               |                                |           |               |                                |           |               |                                |
| Ø = 18 mm   | 125°C<br>40°C   | min 8 000 h<br>min 3 200 000 h |               |                              |           |               |                                |             |               |                                |           |               |                                |           |               |                                |
| <b>Spezifikation</b><br><i>Specification</i>                      | DIN EN 60384-1, DIN EN 60384-4<br>ohne Gütebestätigung (GB) / without quality assessment (QA)   |                                |               |                              |           |               |                                |             |               |                                |           |               |                                |           |               |                                |
| <b>Kapazitätstoleranz</b><br><i>Capacitance tolerance</i>         | ± 20%<br>abweichende Kapazitätstoleranzen sind auf Anfrage lieferbar / other capacitance tolerances are available on request  |                                |               |                              |           |               |                                |             |               |                                |           |               |                                |           |               |                                |
| <b>Kapazität / Capacitance</b><br>C ( µF)                         | <b>Nennspannung / Rated voltage</b>   |                                |               |                              |           |               |                                |             |               |                                |           |               |                                |           |               |                                |
|   | <b>10      16      25      35      50      63</b>   |                                |               |                              |           |               |                                |             |               |                                |           |               |                                |           |               |                                |
| <b>0,47</b>   |   |                                |               |                              |           |               |                                |             |               |                                |           |               |                                |           |               |                                |
| <b>1</b>  |   |                                |               |                              |           |               |                                |             |               |                                |           |               |                                |           |               |                                |
| <b>1,5</b>  |   |                                |               |                              |           |               |                                |             |               |                                |           |               |                                |           |               |                                |
| <b>2,2</b>  |   |                                |               |                              |           |               |                                |             |               |                                |           |               |                                |           |               |                                |
| <b>3,3</b>  |   |                                |               |                              |           |               |                                |             |               |                                |           |               |                                |           |               |                                |
| <b>4,7</b>  |   |                                |               |                              |           |               |                                |             |               |                                |           |               |                                |           |               |                                |
| <b>6,8</b>  | 6,3 x 11  |                                |               |                              |           |               |                                |             |               |                                |           |               |                                |           |               |                                |
| <b>10</b>   | 6,3 x 11      6,3 x 11  |                                |               |                              |           |               |                                |             |               |                                |           |               |                                |           |               |                                |
| <b>15</b>   | 6,3 x 11      6,3 x 11      8,7 x 12,7  |                                |               |                              |           |               |                                |             |               |                                |           |               |                                |           |               |                                |
| <b>22</b>   | 6,3 x 11      6,3 x 11      6,3 x 11      8,7 x 12,7  |                                |               |                              |           |               |                                |             |               |                                |           |               |                                |           |               |                                |
| <b>33</b>   | 6,3 x 11      6,3 x 11      6,3 x 11      6,3 x 11      8,7 x 12,7  |                                |               |                              |           |               |                                |             |               |                                |           |               |                                |           |               |                                |
| <b>47</b>   | 6,3 x 11      6,3 x 11      6,3 x 11      6,3 x 11      8,7 x 12,7      10 x 12   |                                |               |                              |           |               |                                |             |               |                                |           |               |                                |           |               |                                |
| <b>68</b>   | 6,3 x 11      6,3 x 11      6,3 x 11      8,7 x 12,7      8,7 x 12,7      10 x 12   |                                |               |                              |           |               |                                |             |               |                                |           |               |                                |           |               |                                |
| <b>100</b>  | 6,3 x 11      6,3 x 11      8,7 x 12,7      8,7 x 12,7      10 x 12      10 x 16  |                                |               |                              |           |               |                                |             |               |                                |           |               |                                |           |               |                                |
| <b>150</b>  | 8,7 x 12,7      8,7 x 12,7      8,7 x 12,7      10 x 12      10 x 16      10 x 20   |                                |               |                              |           |               |                                |             |               |                                |           |               |                                |           |               |                                |
| <b>220</b>  | 8,7 x 12,7      8,7 x 12,7      10 x 12      10 x 16      10 x 20      12,5 x 20  |                                |               |                              |           |               |                                |             |               |                                |           |               |                                |           |               |                                |
| <b>330</b>  | 10 x 12      10 x 12      10 x 16      10 x 20      12,5 x 20      12,5 x 24  |                                |               |                              |           |               |                                |             |               |                                |           |               |                                |           |               |                                |
| <b>470</b>  | 10 x 12      10 x 16      10 x 20      12,5 x 20      12,5 x 24      16 x 20  |                                |               |                              |           |               |                                |             |               |                                |           |               |                                |           |               |                                |
| <b>680</b>  | 10 x 12      10 x 20      12,5 x 20      12,5 x 24      16 x 20      16 x 25  |                                |               |                              |           |               |                                |             |               |                                |           |               |                                |           |               |                                |
| <b>1 000</b>  | 10 x 20      12,5 x 20      12,5 x 24      16 x 25      16 x 29      16 x 35,5  |                                |               |                              |           |               |                                |             |               |                                |           |               |                                |           |               |                                |
| <b>1 500</b>  | 12,5 x 20      12,5 x 24      16 x 25      16 x 29      18 x 29      18 x 35,5  |                                |               |                              |           |               |                                |             |               |                                |           |               |                                |           |               |                                |
| <b>2 200</b>  | 12,5 x 24      16 x 25      16 x 29      16 x 35,5      18 x 35,5   |                                |               |                              |           |               |                                |             |               |                                |           |               |                                |           |               |                                |
| <b>3 300</b>  | 16 x 25      16 x 29      16 x 35,5      18 x 35,5  |                                |               |                              |           |               |                                |             |               |                                |           |               |                                |           |               |                                |
| <b>4 700</b>  | 16 x 29      16 x 35,5      18 x 29   |                                |               |                              |           |               |                                |             |               |                                |           |               |                                |           |               |                                |
| <b>6 800</b>  | 18 x 29      18 x 35,5  |                                |               |                              |           |               |                                |             |               |                                |           |               |                                |           |               |                                |
| <b>10 000</b>   | 18 x 35,5   |                                |               |                              |           |               |                                |             |               |                                |           |               |                                |           |               |                                |
| <b>15 000</b>   |   |                                |               |                              |           |               |                                |             |               |                                |           |               |                                |           |               |                                |



# Radiale Elkos / Radial lead type

| ERSY   |  |           |           |           |           |               |           |
|--|--|-----------|-----------|-----------|-----------|---------------|-----------|
| Baureihen  | Spezialtypen, oberflächenmontierbare Elkos<br><i>Special types, surface mounted devices</i>                                |           |           |           |           |               |           |
| Anwendung, Besonderheiten<br><i>Applications, features</i> | SMD-Elko, niedriger ESR / Z<br><i>SMD, low ESR / Z</i>   |           |           |           |           |               |           |
| Temperaturbereich<br><i>Temperature range</i>              | - 55 ... + 105°C   |           |           |           |           |               |           |
| Lebensdauer<br><i>Endurance</i>                            | Sockelmaß / Terminal   |           |           |           |           |               |           |
|  | ≥ 8,9 mm   |           | 105°C     |           |           | min 3 000 h   |           |
|  |  |           | 40°C      |           |           | min 300 000 h |           |
| Spezifikation<br><i>Specification</i>                      | DIN EN 60384-1, DIN EN 60384-18, DIN EN 60384-18-2<br>ohne Gütebestätigung (GB) / <i>without quality assessment (QA)</i>   |           |           |           |           |               |           |
| Kapazitätstoleranz<br><i>Capacitance tolerance</i>         | ± 20%  |           |           |           |           |               |           |
|  | abweichende Kapazitätstoleranzen sind auf Anfrage lieferbar / <i>other capacitance tolerances are available on request</i> |           |           |           |           |               |           |
| Kapazität / Capacitance<br>C ( µF)                         | Nennspannung / Rated voltage   |           |           |           |           |               |           |
|  | 10   | 16        | 25        | 35        | 40        | 50            | 63        |
| 0,47   |  |           |           |           |           |               |           |
| 1  |  |           |           |           |           |               |           |
| 1,5  |  |           |           |           |           |               |           |
| 2,2  |  |           |           |           |           |               |           |
| 3,3  |  |           |           |           |           |               |           |
| 4,7  |  |           |           |           |           |               | 8,9 x 12  |
| 6,8  |  |           |           |           |           | 8,9 x 12      | 8,9 x 12  |
| 10   |  |           |           |           | 8,9 x 12  | 8,9 x 12      | 8,9 x 12  |
| 15   |  |           |           | 8,9 x 12  | 8,9 x 12  | 8,9 x 12      | 8,9 x 12  |
| 22   |  |           | 8,9 x 12  | 8,9 x 12  | 8,9 x 12  | 8,9 x 12      | 8,9 x 12  |
| 33   |  | 8,9 x 12  | 8,9 x 12  | 8,9 x 12  | 8,9 x 12  | 8,9 x 12      | 8,9 x 12  |
| 47   | 8,9 x 12   | 8,9 x 12  | 8,9 x 12  | 8,9 x 12  | 8,9 x 12  | 8,9 x 12      | 8,9 x 12  |
| 68   | 8,9 x 12   | 8,9 x 12  | 8,9 x 12  | 8,9 x 12  | 8,9 x 12  | 8,9 x 12      | 8,9 x 12  |
| 100  | 8,9 x 12   | 8,9 x 12  | 8,9 x 12  | 8,9 x 12  | 8,9 x 12  | 8,9 x 12      | 10,2 x 12 |
| 150  | 8,9 x 12   | 8,9 x 12  | 8,9 x 12  | 8,9 x 12  | 10,2 x 12 | 10,2 x 12     | 10,2 x 12 |
| 220  | 8,9 x 12   | 8,9 x 12  | 8,9 x 12  | 10,2 x 12 | 10,2 x 12 | 10,2 x 12     |           |
| 330  | 8,9 x 12   | 10,2 x 12 | 10,2 x 12 | 10,2 x 12 |           |               |           |
| 470  | 8,9 x 12   | 10,2 x 12 | 10,2 x 12 |           |           |               |           |
| 680  | 8,9 x 12   | 10,2 x 12 |           |           |           |               |           |
| 1 000  | 10,2 x 12  |           |           |           |           |               |           |
| 1 500  |  |           |           |           |           |               |           |
| 2 200  |  |           |           |           |           |               |           |
| 3 300  |  |           |           |           |           |               |           |
| 4 700  |  |           |           |           |           |               |           |
| 6 800  |  |           |           |           |           |               |           |
| 10 000   |  |           |           |           |           |               |           |
| 15 000   |  |           |           |           |           |               |           |



# Radiale Elkos / Radial lead type

| <b>ERSH</b>   |  |               |                             |                             |             |               |                             |    |
|---|--|---------------|-----------------------------|-----------------------------|-------------|---------------|-----------------------------|----|
| <b>Baureihen</b>  | <b>Spezialtypen, oberflächenmontierbare Elkos</b><br><i>Special types, surface mounted devices</i>   |               |                             |                             |             |               |                             |    |
| <b>Anwendung, Besonderheiten</b><br><i>Applications, features</i> | <b>Standard SMD, hochtemperaturbeständig</b><br><i>SMD, high temperature resistance</i>  |               |                             |                             |             |               |                             |    |
| <b>Temperaturbereich</b><br><i>Temperature range</i>              | - 55 ... + 125°C (150°C auf Anfrage / on request)  |               |                             |                             |             |               |                             |    |
| <b>Lebensdauer</b><br><i>Endurance</i>                            | <b>Sockelmaß / Terminal</b>  |               |                             |                             |             |               |                             |    |
|   | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">Ø = 8,9 mm</td> <td style="text-align: center;">125°C<br/>40°C</td> <td style="text-align: center;">min 1500 h<br/>min 580 000 h</td> </tr> <tr> <td style="text-align: center;">Ø = 10,2 mm</td> <td style="text-align: center;">125°C<br/>40°C</td> <td style="text-align: center;">min 2500 h<br/>min 960 000 h</td> </tr> </table> | Ø = 8,9 mm    | 125°C<br>40°C               | min 1500 h<br>min 580 000 h | Ø = 10,2 mm | 125°C<br>40°C | min 2500 h<br>min 960 000 h |    |
|   | Ø = 8,9 mm   | 125°C<br>40°C | min 1500 h<br>min 580 000 h |                             |             |               |                             |    |
|   | Ø = 10,2 mm  | 125°C<br>40°C | min 2500 h<br>min 960 000 h |                             |             |               |                             |    |
|   |  |               |                             |                             |             |               |                             |    |
|   |  |               |                             |                             |             |               |                             |    |
| <b>Spezifikation</b><br><i>Specification</i>                      | DIN EN 60384-1, DIN EN 60384-18, DIN EN 60384-18-2<br>ohne Gütebestätigung (GB) / without quality assessment (QA)  |               |                             |                             |             |               |                             |    |
| <b>Kapazitätstoleranz</b><br><i>Capacitance tolerance</i>         | ± 20%<br>abweichende Kapazitätstoleranzen sind auf Anfrage lieferbar / other capacitance tolerances are available on request   |               |                             |                             |             |               |                             |    |
| <b>Kapazität / Capacitance</b><br>C ( µF)                         | <b>Nennspannung / Rated voltage</b>  |               |                             |                             |             |               |                             |    |
|   | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 12.5%;">10</th> <th style="width: 12.5%;">16</th> <th style="width: 12.5%;">25</th> <th style="width: 12.5%;">35</th> <th style="width: 12.5%;">40</th> <th style="width: 12.5%;">50</th> <th style="width: 12.5%;">63</th> </tr> </table>   | 10            | 16                          | 25                          | 35          | 40            | 50                          | 63 |
| 10  | 16   | 25            | 35                          | 40                          | 50          | 63            |                             |    |
| 0,47  |  |               |                             |                             |             |               |                             |    |
| 1   |  |               |                             |                             |             |               |                             |    |
| 1,5   |  |               |                             |                             |             |               |                             |    |
| 2,2   |  |               |                             |                             |             |               |                             |    |
| 3,3   |  |               |                             |                             |             |               |                             |    |
| 4,7   |  |               |                             |                             |             |               |                             |    |
| 6,8   |  |               |                             |                             |             | 8,9 x 12      |                             |    |
| 10  |  |               |                             |                             | 8,9 x 12    | 8,9 x 12      |                             |    |
| 15  |  |               |                             |                             | 8,9 x 12    | 8,9 x 12      |                             |    |
| 22  |  |               |                             | 8,9 x 12                    | 8,9 x 12    | 8,9 x 12      |                             |    |
| 33  |  |               | 8,9 x 12                    | 8,9 x 12                    | 8,9 x 12    | 8,9 x 12      |                             |    |
| 47  |  | 8,9 x 12      | 8,9 x 12                    | 8,9 x 12                    | 8,9 x 12    | 10,2 x 12     |                             |    |
| 68  | 8,9 x 12   | 8,9 x 12      | 8,9 x 12                    | 8,9 x 12                    | 8,9 x 12    | 10,2 x 12     |                             |    |
| 100   | 8,9 x 12   | 8,9 x 12      | 8,9 x 12                    | 8,9 x 12                    | 10,2 x 12   | 10,2 x 12     |                             |    |
| 150   | 8,9 x 12   | 8,9 x 12      | 8,9 x 12                    | 10,2 x 12                   | 10,2 x 12   | 10,2 x 12     |                             |    |
| 220   | 8,9 x 12   | 8,9 x 12      | 10,2 x 12                   | 10,2 x 12                   | 10,2 x 12   |               |                             |    |
| 330   | 8,9 x 12   | 10,2 x 12     | 10,2 x 12                   |                             |             |               |                             |    |
| 470   | 10,2 x 12  | 10,2 x 12     |                             |                             |             |               |                             |    |
| 680   | 10,2 x 12  |               |                             |                             |             |               |                             |    |
| 1 000   |  |               |                             |                             |             |               |                             |    |
| 1 500   |  |               |                             |                             |             |               |                             |    |
| 2 200   |  |               |                             |                             |             |               |                             |    |
| 3 300   |  |               |                             |                             |             |               |                             |    |
| 4 700   |  |               |                             |                             |             |               |                             |    |
| 6 800   |  |               |                             |                             |             |               |                             |    |
| 10 000  |  |               |                             |                             |             |               |                             |    |
| 15 000  |  |               |                             |                             |             |               |                             |    |

# Axiale Elkos / Axial lead types

| <b>EAG</b>  |  |               |                              |           |           |           |           |           |
|---|--|---------------|------------------------------|-----------|-----------|-----------|-----------|-----------|
| <b>Baureihen</b>  | <b>axiale Ausführung, gepolt, isoliert, schaltfest</b><br><i>Axial, polarized, insulated, pulse-proof</i>                  |               |                              |           |           |           |           |           |
| <b>Anwendung, Besonderheiten</b><br><i>Applications, features</i> | <b>allgemeine Anwendung</b><br><i>general purpose</i>  |               |                              |           |           |           |           |           |
| <b>Temperaturbereich</b><br><i>Temperature range</i>              | - 40 ... + 85°C (+ 105°C)  |               |                              |           |           |           |           |           |
| <b>Lebensdauer</b><br><i>Endurance</i>                            | Ø = 8,5 mm   | 105°C<br>40°C | min 1 500 h<br>min 150 000 h |           |           |           |           |           |
|   | Ø = 14 mm  | 105°C<br>40°C | min 2 500 h<br>min 250 000 h |           |           |           |           |           |
|   |  |               |                              |           |           |           |           |           |
| <b>Spezifikation</b><br><i>Specification</i>                      | DIN EN 60384-1, DIN EN 45910-126<br>ohne Gütebestätigung (GB) / <i>without quality assessment (QA)</i>                     |               |                              |           |           |           |           |           |
| <b>Kapazitätstoleranz</b><br><i>Capacitance tolerance</i>         | ± 20%  |               |                              |           |           |           |           |           |
|   | abweichende Kapazitätstoleranzen sind auf Anfrage lieferbar / <i>other capacitance tolerances are available on request</i> |               |                              |           |           |           |           |           |
| <b>Kapazität / Capacitance</b><br>C ( µF)                         | <b>Nennspannung / Rated voltage</b>  |               |                              |           |           |           |           |           |
|   | 6,3  | 10            | 16                           | 25        | 40        | 50        | 63        | 100       |
| 3,3   |  |               |                              |           |           |           | 8,5 x 16  | 8,5 x 16  |
| 4,7   |  |               |                              |           |           | 8,5 x 16  | 8,5 x 16  | 8,5 x 16  |
| 10  |  |               |                              |           | 8,5 x 16  | 8,5 x 16  | 8,5 x 16  | 8,5 x 16  |
| 22  |  |               |                              | 8,5 x 16  | 8,5 x 16  | 8,5 x 16  | 8,5 x 16  | 8,5 x 16  |
| 33  |  |               | 8,5 x 16                     | 8,5 x 16  | 8,5 x 16  | 8,5 x 16  | 8,5 x 16  | 8,5 x 16  |
| 47  |  | 8,5 x 16      | 8,5 x 16                     | 8,5 x 16  | 8,5 x 16  | 8,5 x 16  | 8,5 x 16  | 8,5 x 20  |
| 100   | 8,5 x 16   | 8,5 x 16      | 8,5 x 16                     | 8,5 x 16  | 8,5 x 16  | 8,5 x 16  | 8,5 x 16  | 14 x 25,5 |
| 150   | 8,5 x 16   | 8,5 x 16      | 8,5 x 16                     | 8,5 x 16  | 8,5 x 16  | 8,5 x 16  | 8,5 x 20  | 14 x 25,5 |
| 220   | 8,5 x 16   | 8,5 x 16      | 8,5 x 16                     | 8,5 x 16  | 8,5 x 20  | 8,5 x 20  | 14 x 25,5 | 14 x 25,5 |
| 330   | 8,5 x 16   | 8,5 x 16      | 8,5 x 16                     | 8,5 x 16  | 14 x 25,5 | 14 x 25,5 | 14 x 25,5 | 14 x 25,5 |
| 390   | 8,5 x 16   | 8,5 x 16      | 8,5 x 16                     | 8,5 x 16  | 14 x 25,5 | 14 x 25,5 | 14 x 25,5 | 14 x 30   |
| 470   | 8,5 x 16   | 8,5 x 16      | 8,5 x 16                     | 8,5 x 20  | 14 x 25,5 | 14 x 25,5 | 14 x 25,5 | 14 x 30   |
| 560   | 8,5 x 16   | 8,5 x 16      | 8,5 x 16                     | 8,5 x 20  | 14 x 25,5 | 14 x 25,5 | 14 x 25,5 | 14 x 35,5 |
| 820   | 8,5 x 16   | 8,5 x 16      | 8,5 x 20                     | 14 x 25,5 | 14 x 25,5 | 14 x 25,5 | 14 x 25,5 |           |
| 1 000   | 8,5 x 16   | 8,5 x 20      | 14 x 25,5                    | 14 x 25,5 | 14 x 25,5 | 14 x 25,5 | 14 x 30   |           |
| 1 200   | 8,5 x 20   | 8,5 x 20      | 14 x 25,5                    | 14 x 25,5 | 14 x 25,5 | 14 x 25,5 | 14 x 30   |           |
| 1 500   | 8,5 x 20   | 14 x 25,5     | 14 x 25,5                    | 14 x 25,5 | 14 x 25,5 | 14 x 30   | 14 x 35,5 |           |
| 1 800   | 14 x 25,5  | 14 x 25,5     | 14 x 25,5                    | 14 x 25,5 | 14 x 30   | 14 x 30   |           |           |
| 2 200   | 14 x 25,5  | 14 x 25,5     | 14 x 25,5                    | 14 x 25,5 | 14 x 35,5 | 14 x 35,5 |           |           |
| 3 300   | 14 x 25,5  | 14 x 25,5     | 14 x 25,5                    | 14 x 25,5 |           |           |           |           |
| 4 700   | 14 x 25,5  | 14 x 25,5     | 14 x 25,5                    | 14 x 30   |           |           |           |           |
| 5 600   | 14 x 25,5  | 14 x 25,5     | 14 x 25,5                    | 14 x 35,5 |           |           |           |           |
| 6 800   | 14 x 25,5  | 14 x 25,5     | 14 x 30                      |           |           |           |           |           |
| 8 200   | 14 x 25,5  | 14 x 30       | 14 x 35,5                    |           |           |           |           |           |
| 10 000  | 14 x 30  | 14 x 30       |                              |           |           |           |           |           |
| 12 000  | 14 x 30  | 14 x 35,5     |                              |           |           |           |           |           |
| 15 000  | 14 x 35,5  |               |                              |           |           |           |           |           |

**Eine Vielzahl der axialen Elkos kann auch in bipolarer Ausführung gefertigt werden. Bitte sprechen Sie uns an!**  
*A variety of axial electrolytic capacitors can also be manufactured in bipolar design. Please contact us!*





# Hochkapazitive Becherelkos / Large size type

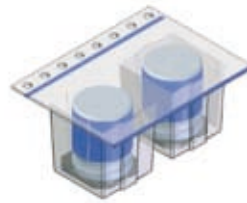
| Baureihen  | <b>EBH-NV</b><br>Schraubanschluss, gepolt, isoliert, schaltfest<br><i>Terminal Pins, polarized, insulated, pulse-proof</i> |                    |                   |                     |                    |
|--|--|--------------------|-------------------|---------------------|--------------------|
| Anwendung, Besonderheiten<br><i>Applications, features</i> | lange Lebensdauer, hohes C x U<br><i>long life grade, high C x U</i>   |                    |                   |                     |                    |
| Temperaturbereich<br><i>Temperature range</i>              | - 40 ... + 105°C   |                    |                   |                     |                    |
| Lebensdauer<br><i>Endurance</i>                            | Ø ≥ 36 mm  |                    | 105°C             | min 4 000 h         |                    |
|  |  |                    | 40°C              | min 400 000 h       |                    |
|  |  |                    |                   |                     |                    |
| Spezifikation<br><i>Specification</i>                      | DIN IEC 60384-1, -4, DIN EN 130 000, DIN EN 130 300<br>ohne Gütebestätigung (GB) / <i>without quality assessment (QA)</i>  |                    |                   |                     |                    |
| Kapazitätstoleranz<br><i>Capacitance tolerance</i>         | - 10 ... + 50 %  |                    |                   |                     |                    |
|  | abweichende Kapazitätstoleranzen sind auf Anfrage lieferbar / <i>other capacitance tolerances are available on request</i> |                    |                   |                     |                    |
| Kapazität / Capacitance<br>C ( µF)                         | Nennspannung / <i>Rated voltage</i>  |                    |                   |                     |                    |
|  | 6,3  | 10                 | 16                | 25                  | 35                 |
| 1 500  |  |                    |                   |                     |                    |
| 1 800  |  |                    |                   |                     |                    |
| 2 200  |  |                    |                   |                     |                    |
| 3 300  |  |                    |                   |                     |                    |
| 3 900  |  |                    |                   |                     |                    |
| 4 700  |  |                    |                   |                     |                    |
| 5 600  |  |                    |                   |                     |                    |
| 6 800  |  |                    |                   |                     |                    |
| 8 200  |  |                    |                   |                     | 36 x 58            |
| 10 000   |  |                    |                   |                     | 36 x 58            |
| 12 000   |  |                    |                   |                     | 36 x 58            |
| 15 000   |  |                    |                   | 36 x 58             | 36 x 83            |
| 18 000   |  |                    |                   | 36 x 58             | 36 x 83            |
| 22 000   |  |                    | 36 x 58           | 36 x 83             | 36 x 83 / 51 x 83  |
| 27 000   |  |                    | 36 x 58           | 36 x 83             | 36 x 103           |
| 33 000   |  | 36 x 58            | 36 x 83           | 36 x 83 / 36 x 103  | 36 x 103           |
| 39 000   |  | 36 x 58            | 36 x 83           | 36 x 103            | 51 x 83            |
| 47 000   | 36 x 58  | 36 x 58            | 36 x 58 / 36 x 83 | 36 x 103 / 51 x 103 | 36 x 123 / 51 x 83 |
| 56 000   | 36 x 58  | 36 x 83            | 36 x 103          | 51 x 83             | 51 x 103           |
| 68 000   | 36 x 83  | 36 x 83            | 36 x 103          | 51 x 83             | 51 x 103           |
| 82 000   | 36 x 83  | 36 x 103           | 51 x 83           | 51 x 103            | 66 x 103           |
| 100 000  | 36 x 83 / 36 x 103   | 36 x 103 / 51 x 83 | 51 x 83           | 51 x 103            | 66 x 103           |
| 120 000  | 36 x 103   | 51 x 83            | 51 x 83           | 66 x 103            | 66 x 123           |
| 150 000  | 51 x 83  | 51 x 83            | 51 x 103          | 66 x 103            |                    |
| 180 000  | 51 x 83  | 51 x 103           | 66 x 103          | 66 x 103            |                    |
| 220 000  | 51 x 83 / 51 x 103   | 51 x 103           | 66 x 103          | 66 x 103            |                    |
| 270 000  | 51 x 103   | 66 x 103           | 66 x 103          |                     |                    |
| 330 000  | 51 x 103   | 66 x 103           | 66 x 103          |                     |                    |
| 390 000  | 66 x 103   | 66 x 103           |                   |                     |                    |
| 470 000  | 66 x 103   | 66 x 103           |                   |                     |                    |
| 560 000  |  | 66 x 123           |                   |                     |                    |

# Hochkapazitive Becherelekos / Large size type

| <b>EBH-NV</b>   |  |
|---|--|
| <b>Baureihen</b>  | <b>Schraubanschluss, gepolt, isoliert, schaltfest</b><br><i>Terminal Pins, polarized, insulated, pulse-proof</i>           |
| <b>Anwendung, Besonderheiten</b><br><i>Applications, features</i> | <b>lange Lebensdauer, hohes C x U</b><br>long life grade, high C x U   |
| <b>Temperaturbereich</b><br><i>Temperature range</i>              | - 40 ... + 105°C   |
| <b>Lebensdauer</b><br><i>Endurance</i>                            | Ø ≥ 36 mm  |
|   | 105°C<br>40°C  |
|   | min 4 000 h<br>min 400 000 h   |
| <b>Spezifikation</b><br><i>Specification</i>                      | DIN IEC 60384-1, -4, DIN EN 130 000, DIN EN 130 300<br>ohne Gütebestätigung (GB) / <i>without quality assessment (QA)</i>  |
| <b>Kapazitätstoleranz</b><br><i>Capacitance tolerance</i>         | - 10 ... + 50 %  |
|   | abweichende Kapazitätstoleranzen sind auf Anfrage lieferbar / <i>other capacitance tolerances are available on request</i> |
| <b>Kapazität / Capacitance</b><br>C ( µF)                         |  |
|   | <b>40</b>  |
|   | <b>50</b>  |
|   | <b>63</b>  |
|   | <b>100</b>   |
| <b>1 500</b>  |  |
| <b>1 800</b>  |  |
| <b>2 200</b>  | 36 x 58  |
| <b>3 300</b>  | 36 x 58  |
| <b>3 900</b>  | 36 x 58  |
| <b>4 700</b>  | 36 x 58  |
| <b>5 600</b>  | 36 x 58  |
| <b>6 800</b>  | 36 x 58  |
| <b>8 200</b>  | 36 x 58  |
| <b>10 000</b>   | 36 x 58  |
| <b>12 000</b>   | 36 x 58  |
| <b>15 000</b>   | 36 x 83  |
| <b>18 000</b>   | 36 x 83  |
| <b>22 000</b>   | 36 x 103 / 51 x 83   |
| <b>27 000</b>   | 36 x 103   |
| <b>33 000</b>   | 51 x 83  |
| <b>39 000</b>   | 51 x 83  |
| <b>47 000</b>   | 51 x 83  |
| <b>56 000</b>   | 51 x 103   |
| <b>68 000</b>   | 51 x 103   |
| <b>82 000</b>   | 66 x 103   |
| <b>100 000</b>  | 66 x 103   |
| <b>120 000</b>  | 66 x 123   |
| <b>150 000</b>  |  |
| <b>180 000</b>  |  |
| <b>220 000</b>  |  |
| <b>270 000</b>  |  |
| <b>330 000</b>  |  |
| <b>390 000</b>  |  |
| <b>470 000</b>  |  |
| <b>560 000</b>  |  |

FROLYT liefert Elektrolytkondensatoren verpackt im Beutel mit Karton, Rollengurt, Mäander-Ammogurt, Blistergurt, Tray und in kundenspezifischen Mehrwegbehältern.

*Frolyt supplies electrolytic capacitors packaged in bags with carton, ammo, tray, reel, carrier tape and in custom reusable containers.*



**Rollengurt**  
*reel*

**Mäander-Ammogurt**  
*ammo*

**Blistergurt**  
*carrier tape*

**Tray**  
*tray*

FROLYT fertigt Elektrolytkondensatoren für besondere Einsatzfälle und konfektionierte Formen für angepasste Baugruppenspezifika. Die Konfektionierung erfolgt auf Spezialmaschinen von FROLYT mit anschließender Konformitätsprüfung. Die Lieferung erfolgt in abgestimmten Verpackungsarten.

*Furthermore, Frolyt offers a service of forming leads according to customer requirement in nearly all forms. Our in-house department of mechanical engineering supports us with corresponding devices. After the forming of the lead we make a compliance audit. The delivery of the capacitors is performed in coordinated packaging types.*

Wir konfektionieren auch Kondensatoren anderer Hersteller für Sie.

We also forming leads of other capacitor producers.

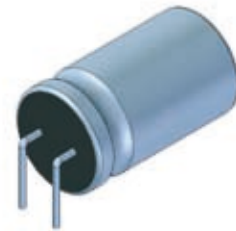
**Konfektionierung**  
*Packaging options*



beschnittene Drähte mit Verpolschutz  
*cutted leads with polarity reversion*



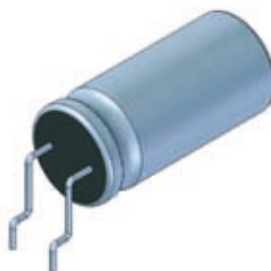
Oberflächenmontage  
*leads prepared for surface-mount*



liegende Montage  
*leads prepared for horizontal assembly*



Anpassung für Kabelbaummontage  
*preparation for wiring harness*



hochgesetzte Montage  
*preparation for raised assembly*



Abweichung von der Mindestbestellmenge (MBM)  
pro Lieferung auf Anfrage. Sonderformen der Drähte und  
Verpackungen sind auf Anfrage möglich.

*Deviations from the minimum order quantity, special types of  
wire and packaging are available on request.*

Mindestbestellmengen  
minimum order quantity

## Lange Drähte

*Long lead wires*

| Kondensator/ capacitor                                       |                         | lange Drähte/ long lead wires |                           |                      | Mindestbestellmenge<br>pro Lieferung<br>Stück/<br>minimum order<br>quantity |
|--|-------------------------|-------------------------------|---------------------------|----------------------|---|
| Nennmaß/<br>nominal value<br>D <sub>N</sub> x L <sub>N</sub> | Raster/<br>lead spacing | Stück/Beutel<br>pcs/bag       | Beutel/Karton<br>bags/box | Stück/VPE<br>pcs/box |   |
| 5 x 11   | 2,0                     | 1 000                         | 5                         | 5 000                | 5 000   |
| 6,3 x 11   | 2,5                     | 1 000                         | 5                         | 5 000                | 5 000   |
| 8,7 x 12,7   | 5,0                     | 1 000                         | 3                         | 3 000                | 3 000   |
| 10 x 12  | 5,0                     | 500                           | 6                         | 3 000                | 3 000   |
| 10 x 16  | 5,0                     | 500                           | 5                         | 2 500                | 2 500   |
| 10 x 20  | 5,0                     | 500                           | 4                         | 2 000                | 2 000   |
| 12,5 x 20  | 5,0                     | 200                           | 6                         | 1 200                | 2 400   |
| 12,5 x 24  | 5,0                     | 200                           | 5                         | 1 000                | 2 000   |
| 12,5 x 29  | 5,0                     | 200                           | 4                         | 800                  | 2 400   |
| 16 x 20  | 7,5                     | 200                           | 3                         | 600                  | 1 800   |
| 16 x 25  | 7,5                     | 200                           | 3                         | 600                  | 1 800   |
| 16 x 29  | 7,5                     | 100                           | 5                         | 500                  | 1 500   |
| 16 x 35,5  | 7,5                     | 100                           | 4                         | 400                  | 1 600   |
| 18 x 20  | 7,5                     | 100                           | 5                         | 500                  | 1 500   |
| 18 x 25  | 7,5                     | 100                           | 5                         | 500                  | 1 500   |
| 18 x 29  | 7,5                     | 100                           | 4                         | 400                  | 1 600   |
| 18 x 35,5  | 7,5                     | 100                           | 3                         | 300                  | 1 500   |

## Verpolschutz

*Protection against polarity reversion*

| Kondensator/ capacitor  |                         | Verpolschutz/ PAPR leads<br>(protection against polarity reversion) |                           |                      | Mindestbestellmenge<br>pro Lieferung<br>Stück/<br>minimum order<br>quantity |
|---|-------------------------|---|---------------------------|----------------------|---|
| Nennmaß D <sub>N</sub> x L <sub>N</sub> /<br>nominal value<br>D <sub>N</sub> x L <sub>N</sub> | Raster/<br>lead spacing | Stück/Beutel<br>pcs/bag   | Beutel/Karton<br>bags/box | Stück/VPE<br>pcs/box |   |
| 5 x 11  | 2,0                     | 1 000   | 8                         | 8 000                | 8 000   |
| 6,3 x 11  | 2,5                     | 1 000   | 8                         | 8 000                | 8 000   |
| 8,7 x 12,7  | 5,0                     | 1 000   | 4                         | 4 000                | 4 000   |
| 10 x 12   | 5,0                     | 500   | 6                         | 3 000                | 3 000   |
| 10 x 16   | 5,0                     | 500   | 5                         | 2 500                | 2 500   |
| 10 x 20   | 5,0                     | 500   | 4                         | 2 000                | 2 000   |
| 12,5 x 20   | 5,0                     | 200   | 6                         | 1 200                | 2 400   |
| 12,5 x 24   | 5,0                     | 200   | 6                         | 1 200                | 2 400   |
| 12,5 x 29   | 5,0                     | 200   | 4                         | 800                  | 2 400   |
| 16 x 20   | 7,5                     | 200   | 3                         | 600                  | 1 800   |
| 16 x 25   | 7,5                     | 200   | 3                         | 600                  | 1 800   |
| 16 x 29   | 7,5                     | 100   | 5                         | 500                  | 1 500   |
| 16 x 35,5   | 7,5                     | 100   | 4                         | 400                  | 1 600   |
| 18 x 20   | 7,5                     | 100   | 5                         | 500                  | 1 500   |
| 18 x 25   | 7,5                     | 100   | 5                         | 500                  | 1 500   |
| 18 x 29   | 7,5                     | 100   | 4                         | 400                  | 1 600   |
| 18 x 35,5   | 7,5                     | 100   | 3                         | 300                  | 1 500   |

Verpolschutz-Standard am Plus-Pol (bei Drahtlänge von 2,7 – 3,2 mm), am Minus-Pol oder andere Drahtlänge auf Anfrage  
*PAPR leads: standard on the positive pole (for wire length of 2.7 to 3.2 mm), at the negative pole or other wire lengths on request*

Mindestbestellmengen  
minimum order quantity

## Beschnittene Drähte

*Cut leads*

| Kondensator/ capacitor  |                         | Beschnittene Drähte/ cut leads |                           |                      | Mindestbestellmenge<br>pro Lieferung<br>Stück/<br>minimum order<br>quantity |
|---|-------------------------|--------------------------------|---------------------------|----------------------|---|
| Nennmaß $D_N \times L_N$ /<br>nominal value<br>$D_N \times L_N$ | Raster/<br>lead spacing | Stück/Beutel<br>pcs/bag        | Beutel/Karton<br>bags/box | Stück/VPE<br>pcs/box |   |
| 5 x 11  | 2,0                     | 1 000                          | 8                         | 8 000                | 8 000   |
| 6,3 x 11  | 2,5                     | 1 000                          | 8                         | 8 000                | 8 000   |
| 8,7 x 12,7  | 5,0                     | 1 000                          | 4                         | 4 000                | 4 000   |
| 10 x 12   | 5,0                     | 500                            | 6                         | 3 000                | 3 000   |
| 10 x 16   | 5,0                     | 500                            | 5                         | 2 500                | 2 500   |
| 10 x 20   | 5,0                     | 500                            | 4                         | 2 000                | 2 000   |
| 12,5 x 20   | 5,0                     | 200                            | 6                         | 1 200                | 2 400   |
| 12,5 x 24   | 5,0                     | 200                            | 6                         | 1 200                | 2 400   |
| 12,5 x 29   | 5,0                     | 200                            | 4                         | 800                  | 2 400   |
| 16 x 20   | 7,5                     | 200                            | 3                         | 600                  | 1 800   |
| 16 x 25   | 7,5                     | 200                            | 3                         | 600                  | 1 800   |
| 16 x 29   | 7,5                     | 100                            | 5                         | 500                  | 1 500   |
| 16 x 35,5   | 7,5                     | 100                            | 4                         | 400                  | 1 600   |
| 18 x 20   | 7,5                     | 100                            | 5                         | 500                  | 1 500   |
| 18 x 25   | 7,5                     | 100                            | 5                         | 500                  | 1 500   |
| 18 x 29   | 7,5                     | 100                            | 4                         | 400                  | 1 600   |
| 18 x 35,5   | 7,5                     | 100                            | 3                         | 300                  | 1 500   |

verfügbare Beschneidlängen:

*cutting lengths:*

4,5 mm (+0,5/-0,5)

3,2 mm (+0,3/-0,2)

3,5 mm (+0,3/-0,3) - 5,0 mm (+0/-0,5)

## Rollen-Gurt

*Reel pack*

| Kondensator/ capacitor  |                         | Rollengurt/ reel pack    |                           |                      | Mindestbestellmenge<br>pro Lieferung<br>Stück/<br>minimum order<br>quantity |
|---|-------------------------|--------------------------|---------------------------|----------------------|---|
| Nennmaß $D_N \times L_N$ /<br>nominal value<br>$D_N \times L_N$ | Raster/<br>lead spacing | Stück/Rolle<br>pcs/ reel | Rollen/Karton<br>reel/box | Stück/VPE<br>pcs/box |   |
| 8,7 x 12,7  | 5,0                     | 700                      | 2                         | 1 400                | 4 200   |
| 10 x 12   | 5,0                     | 500                      | 2                         | 1 000                | 3 000   |
| 10 x 16   | 5,0                     | 500                      | 2                         | 1 000                | 3 000   |
| 10 x 20   | 5,0                     | 500                      | 2                         | 1 000                | 3 000   |
| 12,5 x 20   | 5,0                     | 500                      | -                         | 500                  | 3 000   |
| 12,5 x 24   | 5,0                     | 500                      | -                         | 500                  | 2 500   |
| 12,5 x 29   | 5,0                     | 500                      | -                         | 500                  | 2 500   |
| 16 x 20   | 7,5                     | 380                      | -                         | 380                  | 1 900   |
| 16 x 25   | 7,5                     | 380                      | -                         | 380                  | 1 900   |
| 16 x 29   | 7,5                     | 380                      | -                         | 380                  | 1 900   |
| 16 x 35,5   | 7,5                     | 380                      | -                         | 380                  | 1 900   |

Gurtung Durchmesser 18 mm auf Anfrage

*taping diameter of 18 mm on request*

Mindestbestellmengen  
minimum order quantity

## Mäander/Ammo-Gurt

*Ammo pack*

| Kondensator/ capacitor  |                         | Mäandergurt/ ammo pack                            |                      | Mindestbestellmenge<br>pro Lieferung<br>Stück/<br>minimum order<br>quantity |
|---|-------------------------|---|----------------------|---|
| Nennmaß $D_N \times L_N$ /<br>nominal value<br>$D_N \times L_N$ | Raster/<br>lead spacing | Eingurthöhe/Rastermaß<br>belt height/lead spacing | Stück/VPE<br>pcs box |   |
| 5 x 11  | 2,0                     | $H_0=16,0/5,0$ oder $H=18,0/2,5$                  | 1 800                | 7 200   |
| 6,3 x 11  | 2,5                     | $H_0=16,0/5,0$ oder $H=18,0/2,5$                  | 1 400                | 7 000   |
| 8,7 x 12,7  | 5,0                     | $H=16,0/5,0$ oder $H=18,0/5,0$                    | 700                  | 4 200   |
| 10 x 12   | 5,0                     | $H=16,0/5,0$ oder $H=18,0/5,0$                    | 500                  | 3 000   |
| 10 x 16   | 5,0                     | $H=16,0/5,0$ oder $H=18,0/5,0$                    | 500                  | 3 000   |
| 10 x 20   | 5,0                     | $H=16,0/5,0$                                      | 500                  | 3 000   |
| 10 x 20   | 5,0                     | $H=18,0/5,0$                                      | 700                  | 3 500   |
| 12,5 x 20   | 5,0                     | $H=16,0/5,0$ oder $H=18,0/5,0$                    | 500                  | 3 000   |
| 12,5 x 24   | 5,0                     | $H=16,0/5,0$                                      | 500                  | 3 000   |

H = Höhe von Gurtband-Mitte bis zum Becherboden  $H_0$  = Höhe von Gurtband-Mitte bis zur Drahtbiegung

*H = height from tape center to case bottom  $H_0$  = height from tape center to lead-wire clinch*

## SMD/Pseudo-SMD-Kondensatoren (Oberflächenmontage) und gebogene Drähte im Blister

*Packing units for SMD/Pseudo-SMD capacitors (surface mount devices) and curved wire in the carrier tape*

| Kondensator/ capacitor  | Blistergurt/<br>carrier tape | Mindestbestellmenge<br>pro Lieferung<br>Stück/<br>minimum order<br>quantity |
|---|------------------------------|---|
| Nennmaß $D_N \times L_N$ /<br>nominal value<br>$D_N \times L_N$ | Stück/VPE<br>pcs/box         |   |
| 8,9 x 10,0  | 300                          | 5 400   |
| 8,9 x 12,0  | 300                          | 5 400   |
| 10,2 x 10,0   | 300                          | 5 400   |
| 10,2 x 12,0   | 300                          | 5 400   |
| 10 x 12   | 900                          | 5 400   |
| 12,5 x 20   | 790                          | 3 160   |
| 18 x 35,5   | 320                          | 1 920   |

Mindestbestellmengen  
minimum order quantity

### Becher-Kondensatoren

*Packing units for large size type/cup electrolytic capacitor (screw mount terminal type)*

| Kondensator/ capacitor  | Stück/VPE<br>pcs/box |        | Mindestbestellmenge<br>pro Lieferung<br>Stück/<br>minimum order<br>quantity |
|---|----------------------|--------|---|
|   | Form A               | Form B |   |
| Nennmaß $D_N \times L_N$ /<br>nominal value<br>$D_N \times L_N$ |                      |        |   |
| 36,0x 58,0  | 50                   | 50     | 50  |
| 36,0x 83,0  | 50                   | 50     | 50  |
| 36,0x103,0  | 50                   | 50     | 50  |
| 36,0x123,0  | 50                   | 50     | 50  |
| 51,0x 83,0  | 20                   | 20     | 40  |
| 51,0x103,0  | 20                   | 20     | 40  |
| 51,0x123,0  | 20                   | 20     | 40  |
| 66,0x103,0  | 12                   | 10     | 24/20   |
| 66,0x123,0  | 10                   | 10     | 20  |

### Axiale Kondensatoren, lange Drähte

*Packing units for axial lead capacitors, long lead wires*

| Kondensator/ capacitor  | lange Drähte (lose im Karton)<br>long lead wires (bulk goods) | Mindestbestellmenge<br>pro Lieferung<br>Stück/<br>minimum order<br>quantity |
|---|---|---|
| Nennmaß $D_N \times L_N$ /<br>nominal value<br>$D_N \times L_N$ | Stück/VPE<br>pcs/box  |   |
| 8,5 x 16  | 2 000   | 4 000   |
| 8,5 x 20  | 1 800   | 3 600   |
| 14 x 25,5   | 800   | 2 400   |
| 14 x 30,5   | 800   | 2 400   |
| 14 x 35,5   | 800   | 2 400   |



- Baureihe
- Nennkapazität / Nennspannung
- Kapazitätstoleranz
- Abmessung (Durchmesser x Länge)
- Zusatzforderungen, z.B. Konfektionierungsart, Kundensachnummer bei Detailvereinbarungen

**Bestellbeispiel:** ERF 220/35, + 20 / - 20 %, 10x12 mm, beschnitten mit Verpolschutz

Jede Detailspezifikation für FROLYT-Elektrolytkondensatoren ist mit einer Artikel-Nummer untersetzt (z.B. E-RF3012).

Die vollständige Codierung nach dem internen Erzeugnisschlüssel bzw. die Artikel-Nummer ergeben die Detailspezifikation für die eindeutige Bestell- und Lieferzuordnung. Bei Kundenbestellungen mit Standardspezifikation ohne ausdrückliche Detailvereinbarungen wird die Vorzugsvariante gemäß Einzeldatenblatt geliefert.

Zur automatischen Weiterverarbeitung sind die Kondensatoren auch gegurtet als Ammo oder Rolle bzw. SMD im Blistergurt lieferbar.

Für besondere Einsatzbedingungen werden Bauelemente nach Kundenforderung oder Spezifikationsvereinbarung entwickelt und gefertigt. Weitere Angaben siehe FROLYT-Einzeldatenblätter unter [www.frolyt.de](http://www.frolyt.de).

### Lieferung und Handhabung

Die qualitätserhaltende und vorgeschriebene Transportlage von Verpackungseinheiten für gegurtete Kondensatoren ist gekennzeichnet mit dem Aufdruck „oben“. Starke mechanische Belastungen der Anschlussdrähte bei der Weiterverarbeitung sind zu vermeiden. Aluminium-Elektrolytkondensatoren mit flüssigen Elektrolyten können Chemikalien enthalten, die bei falscher Behandlung gesundheitsschädlich wirken können. Gefährdung besteht jedoch nur bei geöffnetem Gehäuse!

RoHS-Konformität, Umweltaspekte, Entsorgung  
FROLYT produziert RoHS-konforme, bleifreie Elektrolytkondensatoren. Inhaltstoffe sind in Umbrella-Spezifikationen unter [www.frolyt.de](http://www.frolyt.de) dargelegt.

Von FROLYT gefertigte Elektrolytkondensatoren sind frei von den in der RoHS genannten Stoffen Quecksilber, sechswertiges Chrom, polybromierte Biphenyle (PBB), polybromierte Diphenylether (PBDE) und Cadmium. Aluminium-Elektrolytkondensatoren können nach der Abfallschlüssel-Nr. 16 02 16 entsorgt werden.

### Marketing und Vertrieb

Distributoren und Handelsvertreter sowie Gesprächspartner der Firma FROLYT finden Sie im Internet unter [www.frolyt.de](http://www.frolyt.de).

Die Angaben in dieser Bestell- und Lagerinformation verstehen sich ausschließlich als Produktbeschreibung und sind nicht als zugesicherte Eigenschaften aufzufassen. Alle in gedruckter Form vorliegenden Angaben bedürfen für ihre Rechtsverbindlichkeit im Sinne der §§ 463 und 480 II BGB der ausdrücklichen schriftlichen Bestätigung.

- *series*
- *rated capacitance / rated voltage*
- *tolerance of rated capacitance*
- *dimension (diameter x length)*
- *additional requirements, e.g. lead configuration or taping, customer article code with detail declarations*

**order example:** ERF 220/35, + 20 / - 20 %, 10x12 mm, cutted with ptotection against polarity reverse

*Each detailed specification for FROLYT electrolytic capacitors is indicated with an article number (e.g. E-RF3012). The complete coding after the internal product key or the article number results in the detail specification for the unique ordering and delivery allocation. The advantage version is supplied in accordance with data sheet every time if the costumer ordered with standard specification without express detail declarations/agreements.*

*For automatic subsequent treatment electrolytic capacitors can be packed on reels or ammo in boxes or SMD in blister tape available. For special application components can be developed and produced electrolytic capacitors with individual requirements. Special agreements are available on request.*

### Datasheets

*For further specification see [www.frolyt.de](http://www.frolyt.de).*

### Supply and handling

*The quality receiving and prescribed feed position of packing units for taped capacitors is marked by the print "oben/top". Mechanical stress for leads during the subsequent treatment must be avoided. Make sure the capacitors do not come in mechanical stress. Aluminium electrolytic capacitors with liquid electrolytes can contain chemicals, which can work with false handling injurious to health. Endangerment exists however only with opened aluminium case!*

### RoHS conformity, environmental aspect, disposal

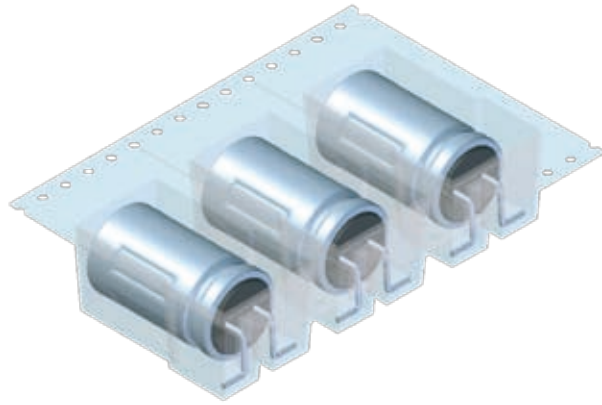
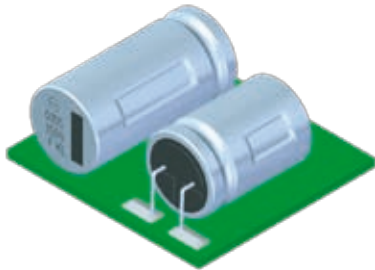
*FROLYT produces lead-free electrolytic capacitors in conformity with the RoHS. Materials are explained in Umbrella specifications under [www.frolyt.de](http://www.frolyt.de). Electrolytic capacitors manufactured by FROLYT are free of the substances mentioned in the RoHS, e.g. mercury, chromium (VI), polybrominated biphenyls (PBB), polybrominated diphenyl ethers (PBDE) and cadmium. Aluminium electrolytic capacitors can be disposed after the wastes key no 16 02 16.*

### Marketing and sale

*You find distributors and sales representatives as well as interlocutors of the company FROLYT on [www.frolyt.de](http://www.frolyt.de).*

*The data contained within product summary represents only a product description and cannot be considered as guaranteed characteristics. All printed materials are only legally binding following by written confirmation according to §§ 463 and 480 II of the German Statute Book.*

## Pseudo - SMD



- Elko für Oberflächenmontage mit bleifreiem Reflowlötverfahren für höchste Anforderungen
- Realisierung großer Schwingungsbelastungen (30g, 3 Ebenen, rascher Temperaturwechsel)
- hohes CxU- Produkt im Spannungsbereich 6,3V- 450V
- Temperaturbereich – 55°C...+ 125°C (135°C)
- Lieferung im Blistergurt auf Rolle
- auf Kundenwunsch mit Mantelisolations Ø 8,7...18 mm
- Kennwertanpassung nach Einsatzspezifik
- Eintrag im Deutschen Patent- und Markenamt
- Nennabmessungen:

- capacitor for surface mounting utilizing lead-free reflow soldering and meeting the highest requirements
- high endurance against stress of vibration (30g, three planes, fast temperature change)
- high capacitance/voltage combinations within the voltage range from 6.3 V to 450 V
- temperature range - 55 °C to + 125 °C (135 °C)
- delivered in carrier tape on reel
- if required with sheath insulation Ø 8.7...18 mm
- customized characteristics for specific end-use possible
- Registered at the German Patent and Trademark Office
- nominal dimensions:

|                |               |               |             |
|----------------|---------------|---------------|-------------|
| Ø 8,7x12,7 mm, | Ø 10x12 mm,   | Ø 10x16 mm,   | Ø 10x20 mm, |
| Ø 12,5x20 mm,  | Ø 12,5x24 mm, | Ø 12,5x29 mm, | Ø 16x20 mm, |
| Ø 16x25 mm,    | Ø 16x29 mm,   | Ø 16x35,5 mm, | Ø 18x20 mm, |
| Ø 18x25 mm,    | Ø 18x29 mm,   | Ø 18x35,5 mm  |             |

## NEU: schwingungsstabile SMD Kondensatoren

### NEW: vibration resistant SMD capacitor

Abmessungen, *dimensions*: Ø 12,5 x 20 mm, 12,5 x 24 mm, 12,5 x 29 mm

weitere Abmessungen auf Anfrage, *other dimensions on request*



## Radiale Kondensatoren von Frolyt entwickelt für PIN-IN-PASTE

*Radial electrolytic capacitors of FROLYT developed for PIN-IN-PASTE*

Mischbestückte Leiterplatten mit SMD- und THT- Komponenten durchlaufen zwei Lötprozesse, Reflow und Welle. **Mit der Einführung von Bauteilen für die „PIN-IN-PASTE“ Technologie können Kosteneinsparungen durch den Wegfall der Wellenlötung erreicht werden.** Standard-THT- Elektrolytkondensatoren sind ungeeignet für bleifreie Reflowprozesse.

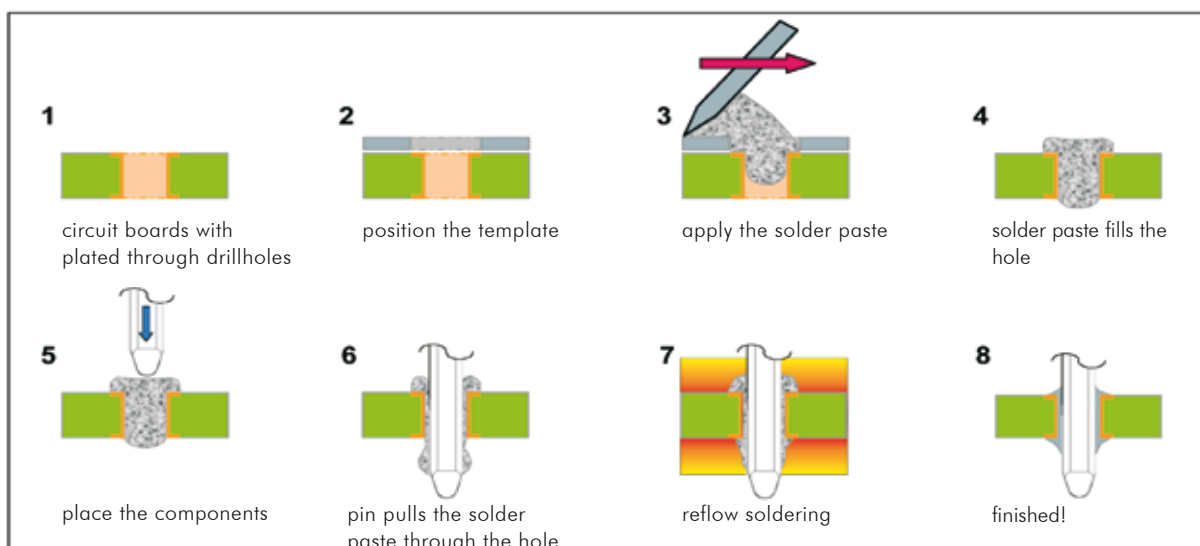
Frolyt hat speziell für die „PIN-IN-PASTE“ Technologie THT- Elektrolytkondensatoren entwickelt, welche es ermöglichen, nach der automatischen Bestückung von SMD und THT Komponenten, die Leiterplatte in einem Reflowprozess fertigzustellen. Die Spezialkondensatoren sind lieferbar in den Abmessungen  $\varnothing 5,5 \times 11 \text{ mm}$  bis  $\varnothing 18 \times 35,5 \text{ mm}$ .

*Heterogeneously printed circuit boards, both SMD and THT components contain, pass through processes of soldering (reflow soldering and wave soldering). In order to save costs the “Pin-IN-PASTE” technology is one of the most efficient solutions. In addition to the SMD components the draw lead component parts were assembled and soldered in a optimized reflow process. Standard electrolytic capacitors which processing in wave soldering are inappropriate for reflow soldering.*

*FROLYT developed electrolytic capacitors with special heat resistance, which also support the application of heat into the throughplatings of the circuit boards during the reflow soldering process. The special capacitors are available in the dimensions  $\varnothing 5,5 \times 11 \text{ mm}$  up to  $\varnothing 18 \times 35,5 \text{ mm}$ .*

### Through-Hole-Technik - Die Schritte des „PIN-IN-PASTE“-Verfahrens

*through-hole-technology - the steps of the “Pin-In-Paste” process*



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