

# QR

series

Screw Terminal Type, 85°C High speed charge-discharge



- Suited for high frequency regenerative voltage for AC servomotor, general inverter.
- Suited for equipment used at voltage fluctuating area.
- Suited for rectifier circuit of voltage doubler
- Compliant to the RoHS directive (2002/95/EC).

## QR

Hi speed  
charge-  
discharge  
NX

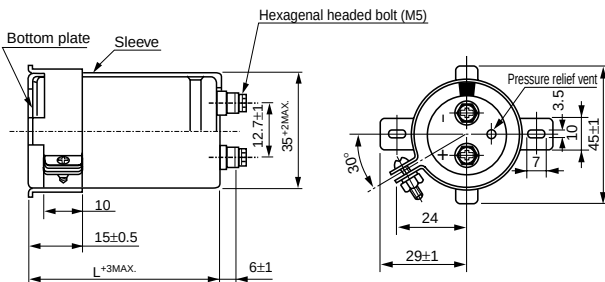


### Specifications

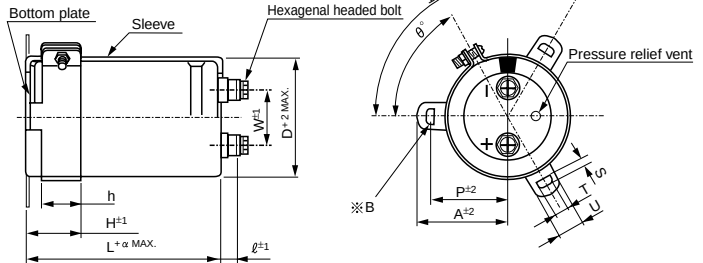
| Item                                   | Performance Characteristics                                                                                                                                                                                                |                                                                 |
|----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|
| Category Temperature Range             | - 25 to +85°C                                                                                                                                                                                                              |                                                                 |
| Rated Voltage Range                    | 350 to 450V                                                                                                                                                                                                                |                                                                 |
| Rated Capacitance Range                | 680 to 15000μF                                                                                                                                                                                                             |                                                                 |
| Capacitance Tolerance                  | ±20% at 120Hz, 20°C                                                                                                                                                                                                        |                                                                 |
| Leakage Current                        | After 5 minutes' application of rated voltage, leakage current is not more than $3\sqrt{C_V}$ (μA) or 5 mA, whichever is smaller (at 20°C).<br>[C: Rated Capacitance(μF), V: Voltage(V)]                                   |                                                                 |
| Tangent of loss angle (tan δ)          | (Measurement frequency: 120Hz at 20°C)                                                                                                                                                                                     |                                                                 |
|                                        | Rated voltage (V)                                                                                                                                                                                                          | 350 400 450                                                     |
| Stability at Low Temperature           | tan δ (MAX.)                                                                                                                                                                                                               | 0.15 0.15 0.15                                                  |
|                                        | Rated voltage (V)                                                                                                                                                                                                          | 350 to 450                                                      |
| Endurance                              | Impedance ratio ZT/Z20(MAX.)                                                                                                                                                                                               | Z - 25°C / Z + 20°C                                             |
|                                        |                                                                                                                                                                                                                            | 8                                                               |
| Shelf Life                             | The specifications listed at right shall be met when the capacitors are restored to 20°C after D.C. bias plus rated ripple current is applied for 5000 hours at 85°C, the peak voltage shall not exceed the rated voltage. |                                                                 |
|                                        | Capacitance change                                                                                                                                                                                                         | Within ±20% of the initial capacitance value                    |
| Endurance of charge-discharge behavior | tan δ                                                                                                                                                                                                                      | 300% or less than the initial specified value                   |
|                                        | Leakage current                                                                                                                                                                                                            | Less than or equal to the initial specified value               |
| Marking                                | Appearance                                                                                                                                                                                                                 | There shall be found to remarkable abnormality on the capacitor |
|                                        | Printed with white color letter on darkbrown sleeve.                                                                                                                                                                       |                                                                 |

### Drawing

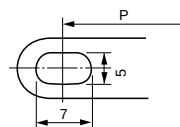
#### φ35 Screw terminal type



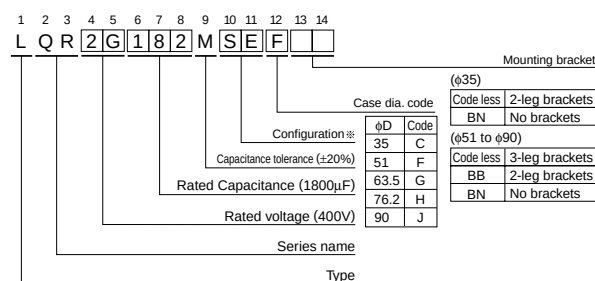
#### φ51 to 90 Screw terminal type



※ B  
3-leg brackets for φ90 capacitors have different hole shapes from the ordinary ones illustrated below.



### Type numbering system (Example : 400V 1800μF)



Please refer to page 282 for schematic of dimensions.  
※Please contact to us if PVCless products are required.

### Dimension of terminal pitch (W) and length (ℓ) and Nominal dia. of bolt (mm)

| φD   | W    | ℓ | α | Nominal dia. of bolt |
|------|------|---|---|----------------------|
| 51   | 22.0 | 6 | 3 | M 5                  |
| 63.5 | 28.6 | 6 | 3 | M 5                  |
| 76.2 | 31.8 | 6 | 3 | M 5                  |
| 90   | 31.8 | 6 | 3 | M 5                  |

### Dimension of mounting bracket (mm)

| Symbol | Leg shape | 3-Leg |      |      |      | 2-Leg |      |      |     |
|--------|-----------|-------|------|------|------|-------|------|------|-----|
|        |           | 51    | 63.5 | 76.2 | 90   | 51    | 63.5 | 76.2 | 90  |
| P      |           | 32.5  | 38.1 | 44.5 | 50.8 | 33.2  | 40.5 | 46.5 | 53  |
| A      |           | 38.5  | 43   | 49.2 | 58.5 | 40    | 46.5 | 53   | 59  |
| T      |           | 7.5   | 8.0  | 7.0  | 8.0  | 6.0   | 7.0  | 6.0  | 6.0 |
| S      |           | 5.0   | 5.0  | 5.0  | 5.0  | 4.5   | 4.5  | 4.5  | 4.5 |
| U      |           | 12    | 14   | 14   | 18   | 14    | 14   | 14   | 14  |
| θ°     |           | 60    | 60   | 60   | 60   | 30    | 30   | 30   | 30  |
| H      |           | 20    | 25   | 30   | 35   | 25    | 35   | 35   | 35  |
| h      |           | 15    | 20   | 24   | 25   | 15    | 20   | 20   | 20  |

• Dimension table in next page.



## ■ Dimensions

| 350V (2V)          |                                 |                        |               |                         |              |
|--------------------|---------------------------------|------------------------|---------------|-------------------------|--------------|
| Cap.<br>( $\mu$ F) | Size<br>$\phi$ D $\times$ L(mm) | Rated ripple<br>(Arms) | $\tan \delta$ | Leakage Current<br>(mA) | Code         |
| 820                | 35 $\times$ 80                  | 3.3                    | 0.15          | 1.60                    | LQR2V821MSEC |
| 1000               | 35 $\times$ 100                 | 4.3                    | 0.15          | 1.77                    | LQR2V102MSEC |
| 1800               | 51 $\times$ 80                  | 7.2                    | 0.15          | 2.38                    | LQR2V182MSEF |
| 2200               | 51 $\times$ 100                 | 9.1                    | 0.15          | 2.63                    | LQR2V222MSEF |
| 2700               | 51 $\times$ 110                 | 10.8                   | 0.15          | 2.91                    | LQR2V272MSEF |
|                    | 63.5 $\times$ 80                | 10.6                   | 0.15          | 2.91                    | LQR2V272MSEG |
| 3300               | 51 $\times$ 130                 | 12.4                   | 0.15          | 3.22                    | LQR2V332MSEF |
|                    | 63.5 $\times$ 90                | 11.9                   | 0.15          | 3.22                    | LQR2V332MSEG |
| 3900               | 63.5 $\times$ 110               | 14.6                   | 0.15          | 3.50                    | LQR2V392MSEG |
|                    | 76.2 $\times$ 80                | 14.1                   | 0.15          | 3.50                    | LQR2V392MSEH |
| 4700               | 51 $\times$ 170                 | 17.0                   | 0.15          | 3.84                    | LQR2V472MSEF |
|                    | 76.2 $\times$ 90                | 16.4                   | 0.15          | 3.84                    | LQR2V472MSEH |
| 5600               | 63.5 $\times$ 150               | 20.4                   | 0.15          | 4.20                    | LQR2V562MSEG |
|                    | 76.2 $\times$ 110               | 19.7                   | 0.15          | 4.20                    | LQR2V562MSEH |
| 6800               | 63.5 $\times$ 170               | 23.5                   | 0.15          | 4.62                    | LQR2V682MSEG |
|                    | 76.2 $\times$ 130               | 22.9                   | 0.15          | 4.62                    | LQR2V682MSEH |
|                    | 90 $\times$ 100                 | 22.5                   | 0.15          | 4.62                    | LQR2V682MSEJ |
| 8200               | 63.5 $\times$ 190               | 27.1                   | 0.15          | 5.00                    | LQR2V822MSEG |
|                    | 76.2 $\times$ 150               | 26.4                   | 0.15          | 5.00                    | LQR2V822MSEH |
| 10000              | 76.2 $\times$ 170               | 31.1                   | 0.15          | 5.00                    | LQR2V103MSEH |
|                    | 90 $\times$ 130                 | 30.2                   | 0.15          | 5.00                    | LQR2V103MSEJ |
| 12000              | 76.2 $\times$ 190               | 35.7                   | 0.15          | 5.00                    | LQR2V123MSEH |
| 15000              | 90 $\times$ 190                 | 40.5                   | 0.15          | 5.00                    | LQR2V153MSEJ |

| 400V (2G)          |                                 |                        |               |                         |              |
|--------------------|---------------------------------|------------------------|---------------|-------------------------|--------------|
| Cap.<br>( $\mu$ F) | Size<br>$\phi$ D $\times$ L(mm) | Rated ripple<br>(Arms) | $\tan \delta$ | Leakage Current<br>(mA) | Code         |
| 680                | 35 $\times$ 80                  | 3.2                    | 0.15          | 1.56                    | LQR2G681MSEC |
| 820                | 35 $\times$ 100                 | 4.1                    | 0.15          | 1.71                    | LQR2G821MSEC |
| 1500               | 51 $\times$ 80                  | 7.5                    | 0.15          | 2.32                    | LQR2G152MSEF |
| 1800               | 51 $\times$ 90                  | 9.1                    | 0.15          | 2.54                    | LQR2G182MSEF |
| 2200               | 51 $\times$ 110                 | 10.4                   | 0.15          | 2.81                    | LQR2G222MSEF |
| 2700               | 63.5 $\times$ 90                | 11.5                   | 0.15          | 3.11                    | LQR2G272MSEG |
| 3300               | 51 $\times$ 150                 | 13.7                   | 0.15          | 3.44                    | LQR2G332MSEF |
|                    | 63.5 $\times$ 110               | 13.2                   | 0.15          | 3.44                    | LQR2G332MSEG |
| 3900               | 63.5 $\times$ 130               | 16.0                   | 0.15          | 3.74                    | LQR2G392MSEG |
|                    | 76.2 $\times$ 90                | 15.3                   | 0.15          | 3.74                    | LQR2G392MSEH |
| 4700               | 63.5 $\times$ 150               | 18.7                   | 0.15          | 4.11                    | LQR2G472MSEG |
|                    | 76.2 $\times$ 110               | 18.3                   | 0.15          | 4.11                    | LQR2G472MSEH |
| 5600               | 63.5 $\times$ 170               | 22.0                   | 0.15          | 4.49                    | LQR2G562MSEG |
|                    | 76.2 $\times$ 130               | 21.4                   | 0.15          | 4.49                    | LQR2G562MSEH |
| 6800               | 76.2 $\times$ 150               | 25.4                   | 0.15          | 4.94                    | LQR2G682MSEH |
| 8200               | 76.2 $\times$ 170               | 28.6                   | 0.15          | 5.00                    | LQR2G822MSEH |
|                    | 90 $\times$ 130                 | 27.8                   | 0.15          | 5.00                    | LQR2G822MSEJ |
| 10000              | 90 $\times$ 150                 | 32.7                   | 0.15          | 5.00                    | LQR2G103MSEJ |
| 12000              | 90 $\times$ 170                 | 37.6                   | 0.15          | 5.00                    | LQR2G123MSEJ |
| 15000              | 90 $\times$ 220                 | 43.0                   | 0.15          | 5.00                    | LQR2G153MSEJ |

| 450V (2W)          |                                 |                        |               |                         |              |
|--------------------|---------------------------------|------------------------|---------------|-------------------------|--------------|
| Cap.<br>( $\mu$ F) | Size<br>$\phi$ D $\times$ L(mm) | Rated ripple<br>(Arms) | $\tan \delta$ | Leakage Current<br>(mA) | Code         |
| 680                | 35 $\times$ 100                 | 3.5                    | 0.15          | 1.65                    | LQR2W681MSEC |
| 820                | 35 $\times$ 110                 | 3.9                    | 0.15          | 1.82                    | LQR2W821MSEC |
| 1200               | 51 $\times$ 80                  | 5.2                    | 0.15          | 2.20                    | LQR2W122MSEF |
| 1500               | 51 $\times$ 100                 | 6.3                    | 0.15          | 2.46                    | LQR2W152MSEF |
| 1800               | 51 $\times$ 110                 | 7.4                    | 0.15          | 2.70                    | LQR2W182MSEF |
|                    | 63.5 $\times$ 80                | 7.9                    | 0.15          | 2.70                    | LQR2W182MSEG |
| 2200               | 51 $\times$ 130                 | 8.7                    | 0.15          | 2.98                    | LQR2W222MSEF |
|                    | 63.5 $\times$ 100               | 8.6                    | 0.15          | 2.98                    | LQR2W222MSEG |
| 2700               | 51 $\times$ 150                 | 10.2                   | 0.15          | 3.30                    | LQR2W272MSEF |
|                    | 76.2 $\times$ 80                | 10.0                   | 0.15          | 3.30                    | LQR2W272MSEH |
| 3300               | 63.5 $\times$ 130               | 12.4                   | 0.15          | 3.65                    | LQR2W332MSEG |
|                    | 76.2 $\times$ 100               | 11.8                   | 0.15          | 3.65                    | LQR2W332MSEH |
| 3900               | 63.5 $\times$ 150               | 13.7                   | 0.15          | 3.97                    | LQR2W392MSEG |
|                    | 76.2 $\times$ 110               | 14.1                   | 0.15          | 3.97                    | LQR2W392MSEH |
|                    | 90 $\times$ 90                  | 13.6                   | 0.15          | 3.97                    | LQR2W392MSEJ |
| 4700               | 63.5 $\times$ 170               | 16.5                   | 0.15          | 4.36                    | LQR2W472MSEG |
|                    | 76.2 $\times$ 130               | 16.3                   | 0.15          | 4.36                    | LQR2W472MSEH |
|                    | 90 $\times$ 110                 | 15.8                   | 0.15          | 4.36                    | LQR2W472MSEJ |
| 5600               | 63.5 $\times$ 190               | 19.4                   | 0.15          | 4.76                    | LQR2W562MSEG |
|                    | 90 $\times$ 130                 | 19.1                   | 0.15          | 4.76                    | LQR2W562MSEJ |
| 6800               | 76.2 $\times$ 170               | 23.3                   | 0.15          | 5.00                    | LQR2W682MSEH |
| 8200               | 90 $\times$ 150                 | 26.1                   | 0.15          | 5.00                    | LQR2W822MSEJ |
| 10000              | 90 $\times$ 190                 | 31.3                   | 0.15          | 5.00                    | LQR2W103MSEJ |
| 12000              | 90 $\times$ 220                 | 35.5                   | 0.15          | 5.00                    | LQR2W123MSEJ |

Rated ripple current (Arms) at 85° C 120Hz

## ● Frequency coefficient of rated ripple current

| Frequency (Hz) | 50   | 60   | 120  | 360  | 1k   | 10k or more |
|----------------|------|------|------|------|------|-------------|
| Coefficient    | 0.80 | 0.82 | 1.00 | 1.20 | 1.35 | 1.40        |