

# Torque QTR 105 series



QTR-A-105 Stator and rotor shown with a height of 17 mm

| Parameter          | Remarks                                   | Symbol                   | Unit                   | QTR-A-105-17         |                     |          | QTR-A-105-25 |          |          | QTR-A-105-34 |          |          | QTR-A-105-60 |           |
|--------------------|---|--------------------------|------------------------|----------------------|---------------------|----------|--------------|----------|----------|--------------|----------|----------|--------------|-----------|
|                    |   |                          |                        | N                    | Y                   | Z        | N            | Y        | Z        | N            | Y        | Z        | N            |           |
| <b>Performance</b> | Winding type                              |                          |                        | N                    | Y                   | Z        | N            | Y        | Z        | N            | Y        | Z        | N            |           |
|                    | Motor type max. voltage ph-ph             | 3-phase synchronous      | $V_{ac\ rms} (V_{dc})$ | 230 (325)            |                     |          |              |          |          |              |          |          |              | 420 (600) |
|                    | Ultimate torque @ 20°C/s increase         | magnet @ 25°C            | $T_u$                  | Nm                   | 2.9                 | 3.3      | 3.3          | 6.1      | 7.5      | 6.9          | 10.6     | 11.3     | 10.4         | 28.4      |
|                    | Peak torque @ 6°C/s increase              | magnet @ 25°C            | $T_p$                  | Nm                   | 1.9                 | 2.2      | 2.2          | 3.9      | 4.4      | 4.4          | 6.7      | 6.6      | 6.6          | 18.1      |
|                    | Continuous torque                         | coil @ 100°C             | $T_c$                  | Nm                   | 1.4                 | 1.4      | 1.4          | 3.2      | 3.3      | 3.3          | 5.4      | 5.2      | 5.2          | 12.0      |
|                    | Maximum speed <sup>(3)</sup> @ 48 Volt    | @ $T_c$                  | $n_{max}$              | rpm                  | 784                 | 1761     | 3300         | 240      | 783      | 1623         | 0        | 444      | 1028         | 0         |
|                    | Maximum speed @ max. voltage              | @ $T_c$                  | $n_{max}$              | rpm                  | 6890                | 12286    | 16500        | 3625     | 6534     | 11399        | 1928     | 4439     | 7833         | 1455      |
|                    | Motor torque constant                     | up to $I_c$              | $K_t$                  | Nm/A <sub>rms</sub>  | 0.30                | 0.17     | 0.10         | 0.60     | 0.33     | 0.19         | 1.07     | 0.50     | 0.29         | 2.86      |
|                    | Motor constant                            | coils @ 25°C             | $K_m$                  | (Nm) <sup>2</sup> /W | 0.021               | 0.022    | 0.022        | 0.061    | 0.065    | 0.065        | 0.127    | 0.115    | 0.120        | 0.40      |
| <b>Electrical</b>  | Ultimate current                          | magnet @ 25°C            | $I_u$                  | A <sub>rms</sub>     | 13.8                | 28.2     | 48.8         | 13.8     | 28.2     | 48.8         | 13.3     | 28.2     | 48.8         | 13.5      |
|                    | Peak current                              | magnet @ 25°C            | $I_p$                  | A <sub>rms</sub>     | 7.6                 | 15.4     | 26.7         | 7.6      | 15.4     | 26.7         | 7.3      | 15.4     | 26.7         | 7.37      |
|                    | Maximum continuous current <sup>(1)</sup> | coils @ 100°C            | $I_c$                  | A <sub>rms</sub>     | 4.6                 | 8.5      | 14.7         | 5.3      | 9.8      | 17.0         | 5.1      | 10.3     | 17.9         | 4.2       |
|                    | Back EMF phase-phase <sub>peak</sub>      |                          | $K_e$                  | V/krpm               | 25                  | 14       | 8            | 51       | 28       | 16           | 92       | 43       | 25           | 244       |
|                    | Back EMF phase-phase <sub>RMS</sub>       |                          | $K_e$                  | V/krpm               | 18                  | 10       | 6            | 36       | 20       | 12           | 65       | 30       | 17           | 173       |
|                    | Coil resistance per phase                 | coils @ 25°C ex. cable   | R                      | Ω                    | 1.38                | 0.43     | 0.14         | 1.93     | 0.57     | 0.19         | 3.02     | 0.74     | 0.24         | 6.84      |
|                    | Coil induction per phase                  | $l < 0.6 I_p$            | L                      | mH                   | 2.58                | 0.83     | 0.28         | 4.05     | 1.29     | 0.43         | 7.93     | 1.75     | 0.59         | 25.3      |
|                    | Electrical time constant                  | coils @ 25°C             | $\tau_e$               | ms                   | 1.9                 | 2.0      | 1.9          | 2.1      | 2.3      | 2.2          | 2.6      | 2.4      | 2.4          | 3.7       |
|                    | Poles                                     |                          | $N_{mgn}$              | nr                   | 20                  | 20       | 20           | 20       | 20       | 20           | 20       | 20       | 20           | 20        |
| <b>Thermal</b>     | Continuous power loss                     | coils @ 100°C            | $P_c$                  | W                    | 115                 | 115      | 115          | 214      | 214      | 214          | 300      | 300      | 300          | 469       |
|                    | Thermal resistance <sup>(2)</sup>         | coils to mount. sfc.     | $R_{th}$               | °C/W                 | 0.65                | 0.65     | 0.65         | 0.35     | 0.35     | 0.35         | 0.25     | 0.25     | 0.25         | 0.16      |
|                    | Thermal time constant                     | up to 63% max. coiltemp. | $\tau_{th}$            | s                    | 21                  | 25       | 25           | 16       | 18       | 18           | 17       | 17       | 17           | 25        |
|                    | Temperature cut-off / sensor              |                          |                        |                      | PTC 1kΩ / KTY83-122 |          |              |          |          |              |          |          |              |           |
| <b>Mechanical</b>  | Stator OD                                 |                          | $OD_s$                 | mm                   | 105                 |          |              |          |          |              |          |          |              |           |
|                    | Rotor ID                                  |                          | $ID_R$                 | mm                   | 56                  |          |              |          |          |              |          |          |              |           |
|                    | Motor height                              |                          | $H_{motor}$            | mm                   | 17                  |          |              | 25       |          |              | 34       |          |              | 60        |
|                    | Lamination stack height                   |                          | $H_{arm}$              | mm                   | 8                   |          |              | 16       |          |              | 24       |          |              | 48        |
|                    | Rotor inertia                             |                          | $J_R$                  | kg*m <sup>2</sup>    | 8.0E-05             |          |              | 1.5E-04  |          |              | 2.2E-04  |          |              | 4.3E-04   |
|                    | Stator mass                               | excluding cables         | $M_s$                  | g                    | 299                 |          |              | 472      |          |              | 746      |          |              | 1476      |
|                    | Rotor mass                                |                          | $M_R$                  | g                    | 79                  |          |              | 146      |          |              | 218      |          |              | 433       |
|                    | Total mass                                | excluding cables         | $M_T$                  | g                    | 378                 |          |              | 618      |          |              | 964      |          |              | 1909      |
|                    | Cable mass                                | all cables               | m                      | g                    | 63                  | 90       | 90           | 63       | 90       | 90           | 63       | 90       | 90           | 95        |
|                    | Cable type (power)                        | length 0.5 m             | d                      | mm (AWG)             | 6.5 (20)            | 6.7 (14) | 6.7 (14)     | 6.5 (20) | 6.7 (14) | 6.7 (14)     | 6.5 (20) | 6.7 (14) | 6.7 (14)     | 9.6 (18)  |
|                    | Cable type (sensor)                       | length 0.5 m             | d                      | mm (AWG)             | 4.3 (26)            |          |              |          |          |              |          |          |              |           |

1. These values are only applicable when the mounting surface is at 20°C and the motor is driven at maximum continuous current. If these values differ in your application, please check our simulation tool or manual.
2. R<sub>th</sub> based on radial mounting of stator lamination stack.
3. MAXIMUM allowable speed for QTR-A 105 series motors is 16.500 rpm. If you plan a high speed application, please contact Tecnotion.

All specifications ±10%

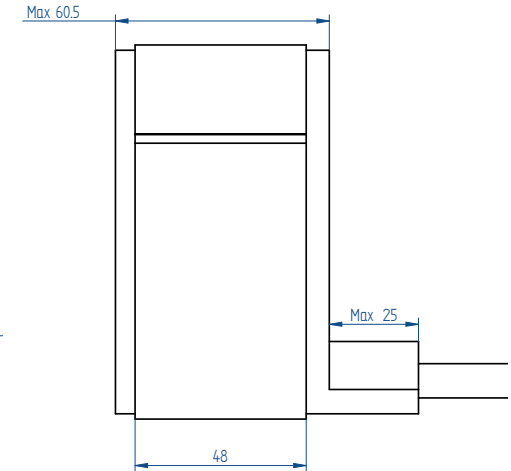
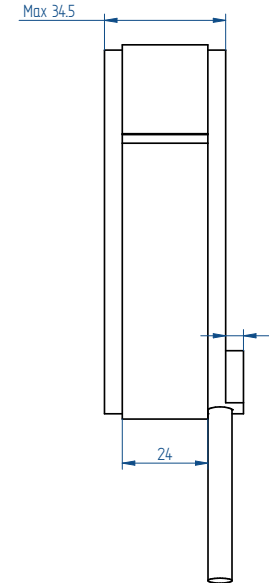
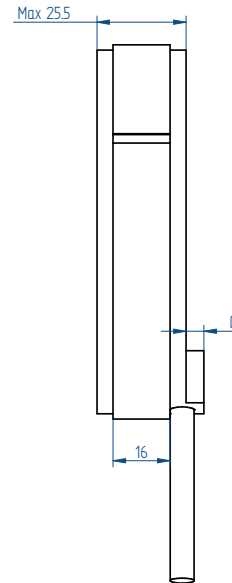
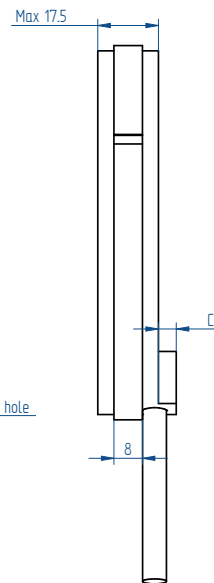
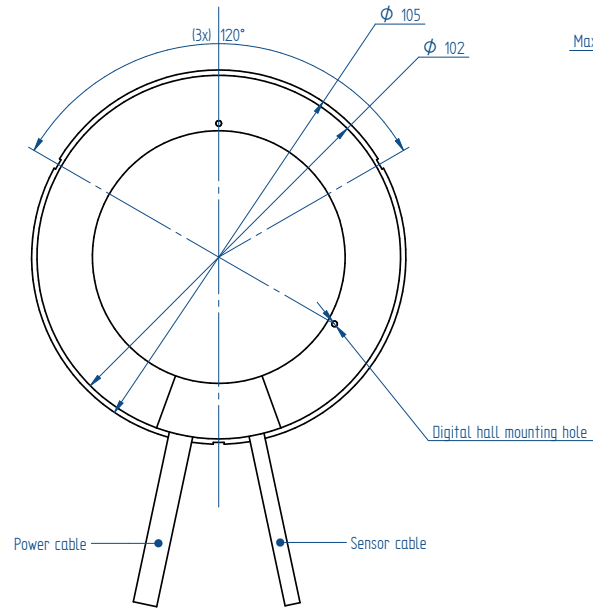
QTR-A 105-17

QTR-A 105-25

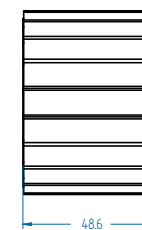
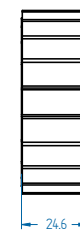
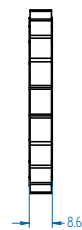
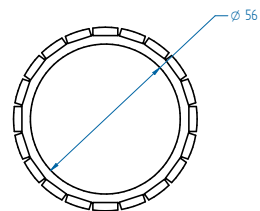
QTR-A 105-34

QTR-A 105-60

**Stator**



**Rotor**



| Winding | C (mm) |
|---------|--------|
| N       | 3.5    |
| Y+Z     | 5.5    |

Mounting instructions and tolerances can be found in the torque installation manual. Manuals and 3D CAD files can be downloaded from our website.

\* All sizes are in mm