RF02-N Rotary type / Limit rotation specification

### Ordering method

- **Model**
  - RF02
  - N

- **Return-to-origin method**
  - N: Linear Origin & Linear Lifting
  - L: Return to Origin

- **Torque**
  - N: Standard torque
  - L: High torque

- **Rotation direction**
  - CW: Clockwise
  - CCW: Counterclockwise

- **Rotation range**
  - 310°

### Basic specifications

- **Motor**
  - 20 [Step motor]

- **Resolution (Pulse/rotation)**
  - 4096

- **Repeatability**
  - +/-0.05

- **Drive method**
  - Special warm gear + belt

- **Maximum speed**
  - 420 [°/sec]

- **Rotating torque**
  - 0.32 Nm

- **Max. pushing torque**
  - 0.11 Nm

- **Backlash**
  - +/-0.5

- **Max. moment of inertia**
  - 0.0018 [kgm²]

- **Cable length**
  - 1 m

- **Cable entry location**
  - Left side

### Moment of inertia Acceleration/deceleration

- **Allowable radial load (N)**
  - Standard model: 78
  - High rigidity model: 86

- **Allowable thrust load (N)**
  - Standard model: 78
  - High rigidity model: 107

- **Allowable moment (Nm)**
  - Standard model: 2.4
  - High rigidity model: 2.9

### Effective torque vs. speed

- **Controller**
  - Operation method:
    - TS-S2: Visual point trace / Remote command
    - TS-SH: Remote control
    - TS-SD: Pulse train control

### Allowable load

- **Cross-sectional drawing A-A**
  - Origin mark
    - Origin position in CW rotation direction
    - Origin position in CCW rotation direction
  - Manual operation screw (both sides)
  - Cross-sectional drawing A-A

### RF02-NN Limit rotation specification – Standard model

1. Table movable range by return-to-origin operation.
2. Be careful not to interfere with the workpiece or equipment around the table.
3. Values and characters in [ ] show those when the return-to-origin direction is changed.

---

Note 1. The robot cable is flexible and resists bending.
Note 2. See P.500 for DIN rail mounting bracket.
Note 3. This drawing is output under the conditions below.

---

**Controller**

- TS-S2: 492
- TS-SH: 492
- TS-SD: 502
RF02-N Limit rotation specification – High rigidity model

1) Table movable range by return-to-origin operation.
2) Be careful not to interfere with the workpiece or equipment around the table.
3) Values and characters in [ ] show those when the return-to-origin direction is changed.

Note 1. This drawing is output under the conditions below.
Bearing: High rigidity
Torque: Standard/High torque

Note 2. The minimum bending radius of the motor cable is R30.

Note 3. The motor cable exit direction is only the left side.
RF02-S  Rotary type / Sensor specification

### Ordering method

<table>
<thead>
<tr>
<th>Model</th>
<th>Specification</th>
<th>Motor</th>
<th>Controller</th>
</tr>
</thead>
<tbody>
<tr>
<td>RF02</td>
<td>S</td>
<td>20</td>
<td>TS-S2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Step</td>
<td>TS-S2</td>
</tr>
</tbody>
</table>

Note 1. The robot cable is flexible and resists bending.
Note 2. See P.500 for DIN rail mounting bracket.
Note 3. Select this selection when using the gateway function. For details, see P.62.

### Basic specifications

- **Motor**: 20 [Step motor]
- **Resolution (Pulse/rotation)**: 4096
- **Repeatability**
  - Standard: +/-0.05
  - High: +/-0.03
- **Drive method**: Special warm gear + belt
- **Torque type**: Standard/High torque
- **Maximum speed**
  - Standard: 360°/sec
  - High: 390°/sec
- **Rotating torque (N•m)**: 0.11
- **Backlash**: +/-0.5
- **Max. moment of inertia** (kg•m²): 0.0015
- **Cable length**: Standard: 1 Option: 3, 5, 10
- **Rotation range**: 360°

Note 1. Positioning repeatability in one direction.
Note 2. The maximum speed may vary depending on the moment of inertia. Check the maximum speed while referring to the “Moment of inertia vs. Acceleration/Deceleration” graph and the “Effective torque vs. speed” graph (reference).
Note 3. For moment of inertia and effective torque details, see P.506.

### Allowable load

- **Allowable radial load (N)**: 68
- **Allowable thrust load (N)**: 68
- **Allowable moment (Nm)**: 68

### Controller

- **Controller**: TS-S2/TS-SHS
- **Operation method**: I/O point trace / Remote command

Note. When purchasing the product, set the controller acceleration while carefully checking the “Moment of inertia vs. Acceleration/Deceleration” and “Effective torque vs. speed” graphs.
For details, please refer to the TRANSERVO Series User’s Manual.
RF02-S  Sensor specification – High rigidity model

Weight (kg)  0.55

Note 1. This drawing is output under the conditions below.
Bearing: High rigidity
Torque: Standard/High torque

Note 2. The minimum bending radii of the motor cable and sensor cable are R30.

Note 3. The motor cable exit direction is only the left side.
RF03-N Rotary type / Limit rotation specification

- CE compliance
- Rotation range: 320°

### Ordering method

**RF03 N**

- **Model**: RF03
- **Return-to-origin method**: Limit rotation
- **Bearing**: Standard
- **Torque**: High torque
- **Cable entry location**: From the left
- **Rotation direction**: CW
- **Cable length**: 5m

### Basic specifications

- **Motor**
  - 28: Step motor
- **Resolution (Pulse/rotation)**: 4096
- **Repeatability**: +/-0.05°
- **Drive method**: Special warm gear + belt
- **Torque type**: Standard
- **Maximum speed**: 420 / 280 rpm
- **Rotating torque**: 0.8 / 1.2 N•m
- **Max. pushing torque**: 0.012 / 0.027 N•m
- **Max. moment of inertia**: 0.012 / 0.027 kg•m²
- **Cable length**: Standard / Option: 1, 3, 5, 10
- **Table movable range**

### Moment of inertia Acceleration/deceleration

- **Effective torque vs. speed**

### Effective torque vs. speed

Note 1. The robot cable is flexible and resists bending.
Note 2. Specified speed may vary depending on the moment of inertia. Check the maximum speed while referring to the "Moment of inertia vs. Acceleration/Deceleration" graph and the "Effective torque vs. speed" graph (reference).
Note 3. For moment of inertia and effective torque details, see P.606.

### Controller

- **Controller**: TS-S2, TS-SH, TS-SD
- **Operation method**: Pulse train control
- **Robot positioner I/O**: Robot positioner I/O
- **Robot driver I/O cable**: Robot driver I/O cable
- **Robot positioner I/O**: Robot positioner I/O
- **Robot driver I/O cable**: Robot driver I/O cable

### Controllers

- **Controller**: TS-S2, TS-SH, TS-SD
- **Operation method**: Pulse train control
RF03-NH Limit rotation specification – High rigidity model

1. Table movable range by return-to-origin operation.
2. Return-to-origin position
3. Values and characters in [ ] show those when the return-to-origin direction is changed.

Note 1. This drawing is output under the conditions below.
- Bearing: High rigidity
- Torque: Standard/High torque
- Note 2. The minimum bending radius of the motor cable is R50.

Controller TS-S2 ▶ 492 TS-SH ▶ 492 TS-SD ▶ 502
**RF03-S**  
Rotary type / Sensor specification

### CE compliance  
- Limitless rotation

#### Ordering method

<table>
<thead>
<tr>
<th>Model</th>
<th>RF03</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return-to-origin method</td>
<td>Standard</td>
<td>Limitless rotation</td>
</tr>
<tr>
<td>Bearing</td>
<td>1</td>
<td>Standard</td>
</tr>
<tr>
<td>Torque</td>
<td>High torque</td>
<td></td>
</tr>
<tr>
<td>Cable entry location</td>
<td>Motor side</td>
<td></td>
</tr>
<tr>
<td>Rotation direction</td>
<td>Left</td>
<td></td>
</tr>
<tr>
<td>Cable length (m)</td>
<td>3.6</td>
<td></td>
</tr>
</tbody>
</table>

### Basic specifications

**Motor**  
- 28 [ ] Step motor

**Resolution (Pulse/rotation)**  
- 4096

**Repeatability**  
- +/-0.05

**Drive method**  
- Special warm gear + belt

**Torque type**  
- Standard

**Maximum speed**  
- 420 / 280 (sec)

**Rotating torque (N-m)**  
- 0.8 / 1.2

**Max. pushing torque (N-m)**  
- 0.4 / 0.6

**Backlash**  
- +/-0.5

**Max. moment of inertia (kg-m²)**  
- 0.012 / 0.027

**Cable length (m)**  
- Standard / Option: 3, 3.5, 10

**Rotation range**  
- 360°

#### Allowable load

**Allowable radial load (N)**  
- Standard model: 107 / High rigidity model: 196

**Allowable thrust load (N)**  
- Standard model: 343 / High rigidity model: 538

**Allowable moment load (N•m)**  
- Standard model: 4 / High rigidity model: 6.4

### Controller

**Controller Operation method**
- TS-S2S  
- TS-SHS  
- I/O point trace / Remote command

### Moment of inertia Acceleration/deceleration

**Effective torque vs. speed**

**Effective torque**  
- T (N•m)

**Moment of inertia**  
- I (kg•m²)

**Acceleration/deceleration**

**Effective torque vs. Speed**

**Effective torque vs. Acceleration/Deceleration**

#### Effective torque vs. speed

**Effective torque**  
- T (N•m)

**Speed**  
- ω (°/s)

#### Allowable load

**Allowable radial load (N)**

**Allowable thrust load (N)**

**Allowable moment load (N•m)**

### RF03-SN Sensor specification – Standard model

- (a)  
- (b)

**Manual operation screw (both sides)**

**Weight (kg)**  
- 1.2

**Cross-sectional drawing A-A**

- Table movable range by return-to-origin operation. Be careful not to interfere with the workpiece or equipment around the table.

- The return-to-origin position may differ from that shown in this drawing. To align with the position shown in this drawing, refer to the TS Series User's Manual and change the origin coordinates.

---

Note 1. The robot cable is flexible and resists bending.  
Note 2. The maximum speed may vary depending on the moment of inertia. Check the maximum speed while referring to the “Moment of inertia vs. Acceleration/Deceleration” graph and the “Effective torque vs. speed” graph (reference).  
Note 3. For moment of inertia and effective torque details, see P.63.  
Note 3. Select this selection when using the gateway function. For details, see P.62.  
Note 1. This drawing is output under the conditions below.  
- Motor cable exit direction: Exit from left side  
- Sensor cable exit direction: Exit from left side

---

Controller  
- TS-S2  
- 492  
- TS-SH  
- 492

---

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RF03-SH  Sensor specification – High rigidity model

1. Manual operation screw (both sides)
2. Cross-sectional drawing A-A

| Weight (kg) | 1.3 |

Note 1. This drawing is output under the conditions below.
- Bearing: High rigidity
- Torque: Standard/High torque

Note 2. The minimum bending radii of the motor cable and sensor cable are R30.

1 Table movable range by return-to-origin operation. Be careful not to interfere with the workplace or equipment around the table.
2 The return-to-origin position may differ from that shown in this drawing. To align with the position shown in this drawing, refer to the TS Series User's Manual and change the origin coordinates.
**RF04-N**

**Rotary type / Limit rotation specification**

### Ordering method

**RF04-N**

- **Model:** Return-to-origin method (before and after return to origin)
- **Bearing:** Standard / High rigidity
- **Torque:** Standard / High torque
- **Cable entry location:** From the left
- **Rotation direction:** CW
- **Robot positioner:** SH

**S2**

- **Robot positioner:** SH-1
- **Robot positioner I/O:** S1
- **Robot positioner I/O cable:** S2

### Basic specifications

- **Motor:** 42 [Step motor]
- **Resolution (Pulse/rotation):** 20480
- **Repeatability** (*) (+/- 0.05)
- **Drive method:** Special warm gear + belt
- **Maximum speed** (°/sec): 420 [Standard]
- **Rotating torque (N•m):** 6.6 [Standard]
- **Max. pushing torque (N•m):** 3.3 [Standard]
- **Backlash:** (+/- 0.5)
- **Max. moment of inertia:** 0.04 [Standard]
- **Cable length (m):** 3.0 [Standard]

### Moment of inertia Acceleration/deceleration

- **Controller Operation method:** TS-S2 / TS-SH / TS-SD
- **Controller Acceleration/deceleration:** u (°/s²)
- **Effective torque vs. speed**

### Effective torque vs. speed

- **Controller:** TS-S2 / TS-SH / TS-SD

### Allowable load

- **Allowable load (N):** Standard model: 344 / High rigidity model: 378
- **Allowable moment (N•m):** Standard model: 20 / High rigidity model: 25

### Controller

- **Controller Operation method:** TS-S2 / TS-SH / TS-SD

Note 1. When purchasing the product, set the controller acceleration while carefully checking the “Moment of inertia vs. Acceleration/Deceleration” and “Effective torque vs. Speed” graphs.

For details, please refer to the TRANSERVO Series User’s Manual.

---

**RF04-NN Limit rotation specification – Standard model**

- **Origin mark:** Manual operation screw (both sides)
- **Weight:** 2.2 kg

Note 1. This drawing is output under the following conditions.

- **Bearing:** Standard
- **Motor torque:** Standard
- **Cable length:** Note 1
- **Rotation range:** 320°

Note 2. The robot cable is flexible and resists bending.

Note 3. See P.500 for DIN rail mounting bracket.

Note 1. This drawing is output under the conditions below.

- **Bearing:** Standard/High torque
- **Motor cable exit direction:** (Motor cable exit direction: Exit from left side)

Note 1. The robot cable is flexible and resists bending.

Note 2. See P.500 for DIN rail mounting bracket.

Note 3. Select this selection when using the gateway function. For details, see P.62.
RF04-NH  Limit rotation specification – High rigidity model

1. Table movable range by return-to-origin operation.
2. Be careful not to interfere with the workpiece or equipment around the table.
3. Values and characters in [ ] show those when the return-to-origin direction is changed.

Note 1. This drawing is output under the conditions below.
Bearing: High Rigidity
Torque: Standard/High Torque

Note 2. The minimum bending radius of the motor cable is R30.
RF04-S 

Rotary type / Sensor specification

Ordering method

<table>
<thead>
<tr>
<th>RF04</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>Return-to-origin method</td>
</tr>
<tr>
<td></td>
<td>Standard (Limitless rotation)</td>
</tr>
</tbody>
</table>

Basic specifications

Motor
- 42 | Step motor
- Resolution (Pulse/rotation): 20480
- Repeatability (°): +/-0.05
Drive method
- Special warm gear + belt
- Maximum speed (°/sec): 420, 280
- Rotating torque (Nm): 6.6, 10
- Max. pushing torque (Nm): 3.3, 5
- Backlash (°): +/-0.05
- Max. moment of inertia (kg•m²): 0.04, 0.1
- Cable length (m): Standard 1 / Option 3, 5, 10
- Rotation range (°): 360

Moment of inertia

- Acceleration: u (°/s²)
- Deceleration: v (°/s²)

Effective torque vs. speed

Controller

- Operation method
- Remote command
- I/O point trace / Remote command
- Controller
- TS-S2S
- TS-SHS

Allowable load

- Allowable radial load (N):
  - Standard model: 314
  - High rigidity model: 378
- Allowable thrust load (N):
  - Standard model: 296
  - High rigidity model: 398
- Allowable moment (Nm):
  - Standard model: 317
  - High rigidity model: 420

Note 1. Positioning repeatability in one direction.
Note 2. The maximum speed may vary depending on the moment of inertia. Check the maximum speed while referring to the “Moment of inertia vs. Acceleration/Deceleration” graph and the “Effective torque vs. Speed” graph (reference).
Note 3. For moment of inertia and effective torque details, see P.606.

RF04-SN Sensor specification – Standard model

Controller connection diagrams

- Controller: TS-S2S, TS-SHS
- I/O point trace / Remote command
- Remote command
- I/O point trace

Note 1. This drawing is output under the conditions below.
- Bearing
- Torque: Standard / High torque

Note 2. The minimum bending radii of the motor cable and sensor cable are R30.

Note 1. The robot cable is flexible and resists bending.
Note 2. See P.500 for DIN rail mounting bracket.
Note 3. Select this selection when using the gateway function. For details, see P.62.
RF04-SH  Sensor specification – High rigidity model

1. Table movable range by return-to-origin operation. Be careful not to interfere with the workplace or equipment around the table.
2. The return-to-origin position may differ from that shown in this drawing. To align with the position shown in this drawing, refer to the TS Series User’s Manual and change the origin coordinates.

Note 1. This drawing is output under the conditions below.
- Bearing: High rigidity
- Torque: Standard/High torque

Note 2. The minimum bending radii of the motor cable and sensor cable are R30.

Weight (kg) 2.5

Controller TS-S2 ➤ 492 TS-SH ➤ 492