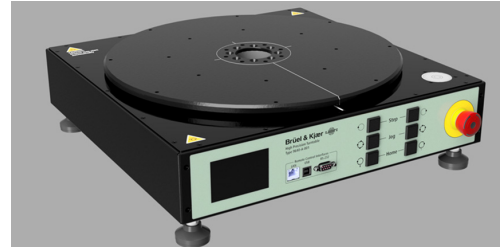


## BRÜEL & KJÆR® Electroacoustic Solutions

### High Precision Turntable System Type 9640-A-001

High Precision Turntable System Type 9640-A-001 is designed to rotate a test object, such as a loudspeaker, a microphone, a hydrophone, a television, or any kind of telecommunication or conferencing device.

Used in combination with a personal computer, Type 9640-A-001 becomes part of a system capable of automatically recording the directional characteristics of a variety of test objects.



#### Uses

- Controlling test object orientation during:
  - Directional response measurements
  - Sound power measurements
  - Directional noise radiation measurements

#### Features

- Rotation of up to 100 kg load, supported or suspended
- Continuous, relative, or absolute rotation
- Controllable from PC over USB, RS-232 or LAN interface
- Adjustable turntable speed, acceleration, and torque
- Connection of test object power supply and signals through the central bore of the turntable
- Readout of current test object angle on LCD touchscreen
- Reset to factory settings, and reset to user-defined settings
- Integrated spirit level for alignment of the turntable
- Support of commands for legacy Turntable System Type 9640

#### Applications

Type 9640-A-001 can be used to measure directivity by means of frequency-response test methods. The test object can be accurately rotated using the turntable system so that it is located at the desired angle to a measurement microphone. The response of the test object can then be obtained for any direction using proper directivity and polar plot applications.

#### Controlling the Turntable

On the front panel of Type 9640-A-001 there are three pushbuttons that allow you to manually control the turntable:

- **Step** – press this to rotate the turntable clockwise, or counter-clockwise to the required angle
- **Jog** – press this to continuously rotate the turntable, release the button to stop
- **Home** – press this to rotate the turntable clockwise, or counter-clockwise, to the 0° mark

Softkeys, which are available on the touchscreen (left side of front panel, see main photo and Fig. 1) enable you to rotate and control the turntable through a wide range of measurement scenarios.

Type 9640-A-001 offers three modes of remote operation:

- *Turn\_Rel* – allows you to perform a relative rotation of the turntable (specified in degrees)
- *Turn\_Abs* – allows you to perform an absolute rotation of the turntable (specified in degrees)
- *Cont* – allows you to rotate the turntable at a constant speed (for example, when the polar plot of a single frequency is required)

In addition, dedicated commands for controlling the turntable are available, for example, *Set 0°*, *Acc*, and *Max\_360*.

Fig. 1 Type 9640-A-001 touchscreen – displays the actual position of the turntable. Its also used to set up various turntable parameters via softkeys



As test objects have different inertia, you can control the acceleration and deceleration in the start and stop phases using the *Acc* command. The acceleration of the turntable can be adjusted to accommodate different test object masses, up to 100 kg.

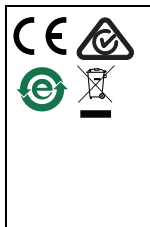
Use the *Set 0°* command to set the 0° mark that will be the reference for a given test. To prevent cable wrapping, you can use the *MAX\_360* command to limit the rotations between 0° and 360°. Alternatively, you can feed the cables through the central bore of the turntable, allowing multiple rotations. All functions can be controlled via the USB, RS-232 or LAN interface.

#### Emergency Stop

An emergency stop is provided on the front of Type 9640-A-001, but an external emergency stop is also available as an optional accessory. It can be placed near the operator in situations where the turntable is placed some distance from the operator, for example, in an anechoic chamber.

# Specifications – High Precision Turntable System Type 9640-A-001

## COMPLIANCE WITH STANDARDS

|  |  |
|--|--|
|  | <p>The CE marking is the manufacturer's declaration that the product meets the requirements of the applicable EU directives. RCM mark indicates compliance with applicable ACMA technical standards – that is, for telecommunications, radio communications, EMC and EME. China RoHS mark indicates compliance with administrative measures on the control of pollution caused by electronic information products according to the Ministry of Information Industries of the People's Republic of China. WEEE mark indicates compliance with the EU WEEE Directive</p> |
| <p>Safety</p>  | <p>EN/IEC 61010-1: Safety requirements for electrical equipment for measurement, control and laboratory use.<br/>ANSI/UL 61010-1: Safety requirements for electrical equipment for measurement, control and laboratory use<br/><b>Note:</b> Emergency Stop and stall detection compliant with EU-directive 2006/42/EC (machine directive). When rotation is stalled (no movement is detected) you must clear the stall condition to restart motion. When in motion, pressing any of the keys on the front panel will cause the motion to stop</p>                      |
| <p>EMC Emission</p>  | <p>EN/IEC 61000-6-3: Generic emission standard for residential, commercial and light industrial environments.<br/>CISPR 32: Radio disturbance characteristics of information technology equipment. Class B Limits.<br/>FCC Rules, Part 15: Complies with limits for a Class B digital device.</p>  |
| <p>EMC Immunity</p>  | <p>EN/IEC 61000-6-1: Generic standards – Immunity for residential, commercial and light industrial environments.<br/>EN/IEC 61326: Electrical equipment for measurement, control and laboratory use – EMC requirements.<br/><b>Note:</b> The above is only guaranteed using accessories listed in this Product Data</p>  |
| <p>Temperature</p>   | <p>IEC 60068-2-1 &amp; IEC 60068-2-2: Environmental Testing. Cold and Dry Heat.<br/>Operating Temperature: +5 to +50 °C (41 to 122 °F).<br/>Storage Temperature: +5 to +50 °C (41 to 122 °F)</p>   |
| <p>Humidity</p>  | <p>IEC 60068-2-78, Damp Heat: 93% RH (non-condensing at 40 °C (104 °F))</p>  |
| <p>Enclosure</p>   | <p>According to IEC 529: IP 23</p>   |

### LOAD

Max 100 kg (220 lb.) on centre, 25 kg (55 lb.) on periphery, when table plate is lined up perfectly in horizontal plane. Same loads apply with turntable hung upside down. The plate has tapped holes that will accept M6 and 1/4"-20 UNC screws.  
**Note:** Applying excessive torque to the plate can cause damage, hence the applied torque should always be below 140 Nm (103 lb-ft)

### CONTROL INTERFACES

#### User Interface

- **Control:** using pushbuttons
- **Set up:** using touchscreen

## Ordering Information

### Type 9640-A-001 High Precision Turntable System

Includes the following:

|               |   |
|---------------|---|
| AO-0728-D-020 | Cable, USB 2.0, USB-A (M) to USB-B (M) black, 2.0 m (6.6 ft) max. +70 °C (158 °F) |
| DF-7070       | Foot for turntable (1 piece)  |
| ZG-0489       | Power supply  |

### OPTIONAL ACCESSORIES

|               |  |
|---------------|--|
| AO-0728-D-020 | Cable, USB 2.0, USB-A (M) to USB-B (M) black, 2.0 m (6.6 ft) max. +70 °C (158 °F)  |
| AO-1442-D-030 | Cable RS-232 null modem, sub-D 9-pin (F) to sub-D 9-pin (F) + adapter 9-pin (M) to 25-pin (F), 3.0 m (10 ft), max. +70 °C (158 °F)     |
| AO-1442-D-100 | Cable RS-232 null modem, sub-D 9-pin (F) to sub-D 9-pin (F) + adapter 9-pin (M) to 25-pin (F), 10.0 m (33.30 ft), max. +70 °C (158 °F) |

### USB Interface

- **Connector:** USB 2.0, Type B, female
- **Speed:** 1.5 Mbits/s
- **Protocol:** USB 2.0

**Note:** Firmware update is supported via USB interface. Please see the user manual for more information

### RS-232 Interface

- **Connector:** Standard female 9-pin, DB9, RS-232 serial connector
- **Speed:** 9600 bits per second
- **Protocol:** Serial communication using DCE signals

### LAN Interface

- **Connector:** RJ-45 Auto-MDIX. Shielded cable of 'CAT 6' type (or better) to be used
- **Speed:** 10 Mbps
- **Protocol:** TCP/IP

**Note:** REST API over HTTP is supported. This will enable applications created by the user to control the turntable as well as remote control from a smart device. Please see the user manual for more information

### MOTION SETTING

**Torque:** 5 Nm to 20 Nm (3.7 lb-ft to 14.7 lb-ft). Electronically limited.

**Torque Accuracy:** ±15%

**Angle Accuracy:** 0.5°

**Angle Resolution:** 0.1°

**Speed of Rotation:** 22.7 to 720 seconds per revolution. Electronically limited

### COMMANDS

**Set 0 Deg:** Sets the reference angle

**Acc.:** Sets the acceleration

**Turn\_rel:** Sets the relative rotation in degrees

**Turn\_abs:** Sets the absolute rotation in degrees

**Max\_360 On/Off:** Turns max. 360° on or off – 'On' prevents cables from tangling

**Note:** A full set of commands and their detailed functional descriptions are available in the user manual

### ACOUSTIC NOISE LEVEL

**Typical Idle Noise Level:** <30 dBPa(A)

**Typical Noise Level during Operation:** <50 dBPa(A)

### POWER REQUIREMENTS

**External DC Power Input**

- **DC Input:** 12 – 30 V DC

- **Connector:** Ø2.5 mm × Ø5.5 mm × 11 mm barrel connector

- **Power Consumption DC Input:** <2.4 W (idle) and <72 W (max)

- **Internal E-fuse:** automatic reset

### Mains Supply

- Supported via Mains Adaptor ZG-0498 (included), 90 – 264 V AC, 47 – 64 Hz

### DIMENSIONS

**Height (without feet):** 100 mm (3.9")

**Width:** 437 mm (17.2")

**Depth:** 437 mm (17.2")

**Table plate diameter:** 400 mm (15.7")

**Central bore:** 50 mm (1.9")

### WEIGHT

12 kg (26.5 lb)

|               |  |
|---------------|--|
| AO-1442-D-300 | Cable RS-232 null modem, sub-D 9-pin (F) to sub-D 9-pin (F) + adapter 9-pin (M) to 25-pin (F), 10.0 m (33.30 ft), max. +70 °C (158 °F) |
| AO-1450-D-100 | Cable, Cat.6 S/FTP up to 250 MHz, RJ-45 (M) to RJ-45 (M), green PVC, 10 m (33 ft), +70 °C (158 °F)                                     |
| AO-1450-D-300 | Cable, Cat.6 S/FTP up to 250 MHz, RJ-45 (M) to RJ-45 (M), green PVC, 30 m (100 ft), +70 °C (158 °F)                                    |
| UA-4158       | Remote emergency stop for Type 9640-A-001 with extension cable 15 m (49.21 ft)   |
| UL-0250       | Adapter, USB 2.0 (M) to RS-232 serial sub-D 9-pin (M) with extension cable USB-A (M) to (F)  |
| UL-0265       | 10-port network switch with PoE and PTPv2 support  |

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