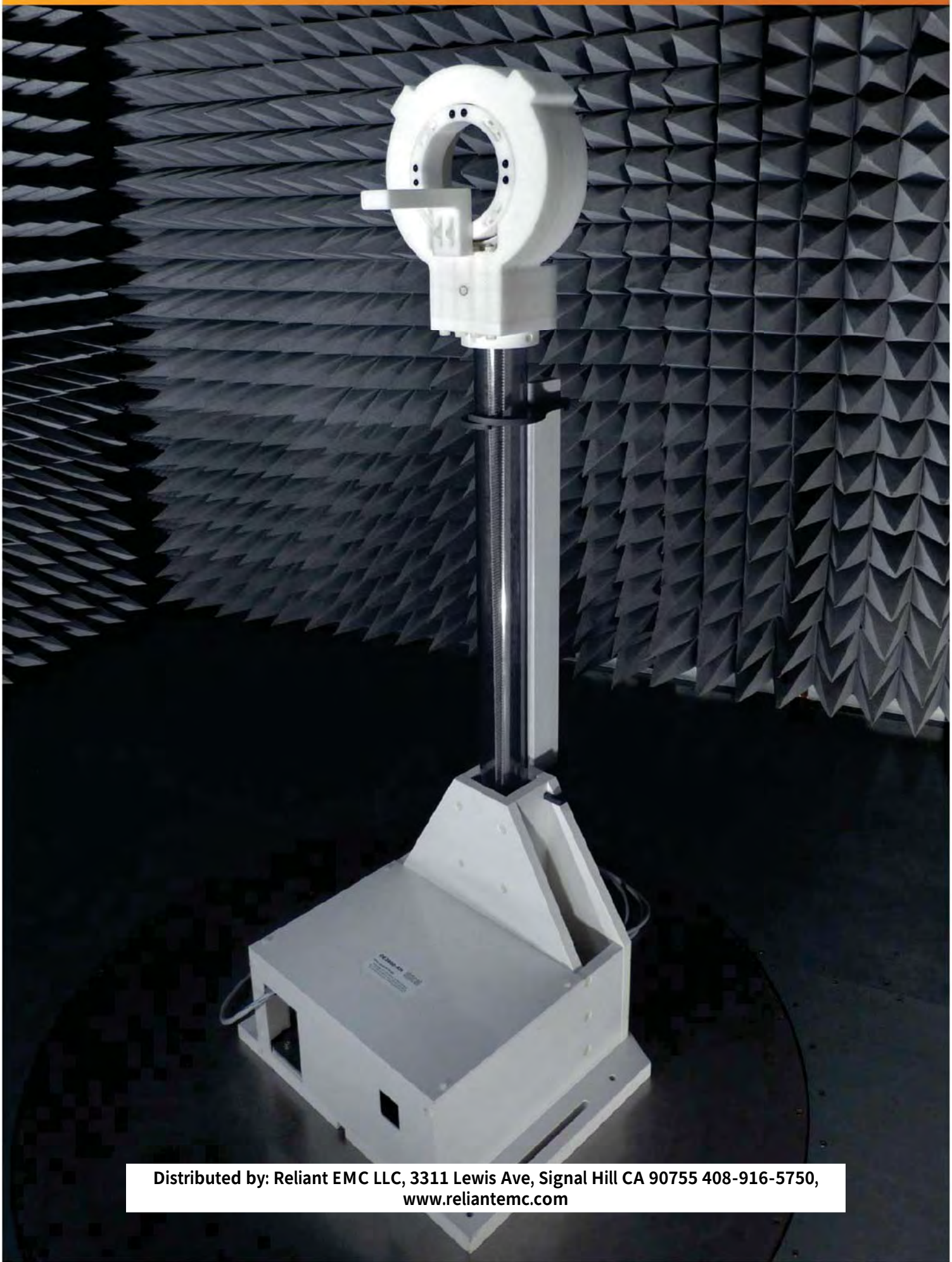

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| 9 | TURNDEVICES

Measurement systems for mobile phones, laptops, tablets and other specific electronic equipment, can be achieved using hi-tech materials, such as Rohacell® (as used in aerospace industry). innco systems 2D and 3D positioning systems are custom designed to meet each new challenge, for mobile phones to wireless network equipment.

The ultra-low permittivity of the materials used, ensures that no distortion of measurement accuracy will be seen during testing.

innco systems have designed and developed a number of unique positioning systems such as Tire-Pressure-Sensors-Positioner and SAR systems.

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| 9.1 | PRODUCT OVERVIEW

TURNDEVICE (DE)

- Head material Rohacell®
- Up to 10 kg load
- Various holders for EUTs

COMBINED TURNDEVICE (DK)

- Turning plat made of Rohacell®
- Up to 5 kg load
- Two turning axis

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| 9.2 | TURNDEVICES (DE) – DE3250-E

The DE 3250-E light duty turn device is specifically designed for measurements of medium sized equipment with cable assembly. With the exception of the drive only plastic and Rohacell® components are used. The turning plate is equipped with holes and fixing bolts, cables and equipment can be mounted within the rotating axis.

The turn device DE 3250-E exists of a steady bottom plate containing the drive unit, which is preferably fixed on a support table.

The GPIB (IEEE 488) & LAN (TCP/IP) bus, when operated with the CO 3000 Controller, provides an additional control option for all functions.

TURNDEVICES (DE)		
Type	Description	Article No.
DE3250-E	Plate size 500 x 300mm, height of turning axis 325 mm, max. load 3 kg	80006669

ACCESSORIES		
Type	Description	Article No.
-P	Pneumatic operation (0° or 90°)	80005795
Spare Plate	Rohacell® turning plate	80500196

SCOPE OF DELIVERY	
Type	Quantity
Interface to CO 3000	1 x
Power supply cable	1 x 3 m
Fiber optic cable	1 x 5 m, 1 x 10 m
FSMA	2 x
Operating manual	1 x

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TECHNICAL DATA	
TYPE	DE3250-E
Total height of rotation axis (above base plate)	325 mm
Total weight approx.	15 kg
Max. load	3 kg
Material	Rohacell®, Kömacel®, PVC
Positioning accuracy	± 1°
Rotating angle	0°…360°
Rotating time	max. 1.5 rpm
Driven by	toothed belt (Kevlar® cord reinforced)
Motor	electronic DC motor
Control	microcontroller
Drive unit	shielded and radio interference suppressed 20 dB under Class B
Operating voltage	230 V 50 / 60Hz (optional 110 V)
Current consumption	max. 1.6 A
Temperature range	+8 °C…+40 °C

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| 9.2 | TURNDEVICES (DE) – DE3330-RH

The DE3330-RH light duty turn device is specifically designed for measurements of medium sized equipment with cable assembly. With the exception of the drive only plastic and Rohacell® components are used. The turning plate is equipped with holes and fixing bolts, cables and equipment can be mounted within the rotating axis.

The turn device DE 3330-RH exists of a steady bottom part containing the drive unit, which is preferably fixed on a turntable. The distance of the lower part to the turntable centre is manually adjustable by longholes.

The GPIB (IEEE 488) & LAN (TCP/IP) bus, when operated with the CO 3000 Controller, provides an additional control option for all functions.

TURNDEVICES (DE)		
Type	Description	Article No.
DE3330-RH	Plate dimension 1200 x 1700 mm, height of turning axis: 1500 mm, max. load 2 kg	80004986

ACCESSORIES		
Type	Description	Article No.
-HP	High precision positioning (0.1 °)	80004898

SCOPE OF DELIVERY	
Type	Quantity
Interface to CO 3000	1 x
Power supply cable	1 x 3 m
Fiber optic cable	1 x 5 m, 1 x 10 m
FSMA	2 x
Operating manual	1 x

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TECHNICAL DATA	
TYPE	DE3330-RH
Height over turntable	1702 mm
Total weight approx.	70 kg
Max. load	2 kg
Material	Rohacell®, POM, Kömacel®
Positioning accuracy	± 1°
Rotating angle	-15°...385°
Rotating time	max. 2.3 rpm
Driven by	toothed belt (Kevlar® cord reinforced)
Motor	motor 150 W
Control	microcontroller
Drive unit	shielded and radio interference suppressed 20 dB under Class B
Operating voltage	110 / 230 V (50 / 60Hz)
Current consumption	max. 1.6 A
Temperature range	+8 °C...+40 °C

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| 9.2 | TURNDEVICES (DE) – DE3600-RH

The DE 3600-RH light duty turn device is specifically designed for measurements of mobile phones and small antennas. With the exception of the drive unit are only plastic & Rohacell® components used. Different sized mobile phones or antennas can be mounted and adjusted within the rotating axis.

The turn device DE 3600-RH exists of a steady bottom part containing the drive unit, which is preferably fixed on a turntable. The distance of the lower part to the turntable centre is manually adjustable by longholes.

The GPIB (IEEE 488) & LAN (TCP/IP) bus, when operated with the CO 3000 Controller, provides an additional control option for all functions.

TURNDEVICES (DE)		
Type	Description	Article No.
DE3600-RH	Mobile phone positioner, height of turning axis 1500 mm, 2 kg load	80000145

ACCESSORIES		
Type	Description	Article No.
-HP	High precision positioning (0.1 °)	80004898
Holder 36-1	Universal horizontal mobile phone holder L = 240 with longhole	80004940
Holder 36-2	Universal vertical customer holder with longhole	80004941
Holder 36-3	Horizontal mobile phone holder L = 140 with longhole	80004942
Holder 36-4	Horizontal mobile phone holder L = 450 with longhole	80001219
Holder 36-5	Horizontal mobile phone holder L = 200 with longhole	80004943
Holder 36-6	Horizontal mobile phone and clamp holder L = 300 with longhole	80004944
Holder 36-7	Universal vertical phantom handholder with longhole	80004945
Holder 36-8	Universal horizontal mobile phone holder L = 200 with longhole	80004947

SCOPE OF DELIVERY	
Type	Quantity
Interface to CO 3000	1 x
Power supply cable	1 x 3 m
Fiber optic cable	1 x 5 m, 1 x 10 m
FSMA	2 x
Operating manual	1 x

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TECHNICAL DATA	
TYPE	DE3600-RH
Total weight approx.	40 kg
Max. load	2 kg
Material	Rohacell®, Kömacel®, PVC support pipe
Positioning accuracy	± 0.5°
Rotating angle	-15°…385°
Rotating time	max. 2.5 rpm
Driven by	toothed belt (Kevlar® cord reinforced)
Motor	electronic DC motor
Control	microcontroller
Drive unit	shielded and radio interference suppressed 20 dB under Class B
Operating voltage	110 / 230 V (50 / 60Hz)
Current consumption	max. 1.6 A
Temperature range	+8 °C…+40 °C

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| 9.2 | TURNDEVICES (DE) – DE3700-RH

The DE 3700-RH turn device is specifically designed for measurement of notebook pc, mobile phones with or without "artificial head". With exception of the drive unit are only plastic & Rohacell® components used. Different sized mobile phones, "artificial heads" or laptops can be mounted on different additonally available holders.

The turn device DE 3700-RH exists of a steady bottom part containing the drive unit, which is preferably fixed on a turntable. The distance of the lower part to the turntable centre is manually adjustable by longholes.

The GPIB (IEEE 488) & LAN (TCP/IP) bus, when operated with the CO 3000 Controller, provides an additional control option for all functions.

TURNDEVICES (DE)

Type	Description	Article No.
DE3700-RH	DUT positioner, height of turning axis 1500 mm, max. load 10 kg	80000144

ACCESSORIES

Type	Description	Article No.
-HP	High precision positioning (0.1 °)	80004898
Holder 37-0	Mounting adapter for customer holder	80003799
Holder 37-1	Standard mobile phone holder (horizontal)	80003701
Holder 37-2	Universal vertical mounting plate	80003702
Holder 37-3	Universal plate with mobile phone holder and rotary joint	80003703
Holder 37-4	Laptop mounting plate 1000 x 500 mm (Rohacell®)	80003704
Holder 37-5	Laptop mounting plate 500 x 500 mm (Rohacell®)	80003705
Holder 37-6	Laptop mounting plate 800 x 500 mm (Rohacell®)	80003746
Holder 37-8	Tablet mounting plate 300 x 300 mm, height adjustable (Rohacell®)	80006732
Holder 37-9	Laptop mounting plate 500 x 500 mm with longholes and clamps (Rohacell®)	80006725
Holder 37-11	Laptop mounting plate 1000 x 500 mm with longholes and clamps (Rohacell®)	On request

SCOPE OF DELIVERY

Type	Quantity
Interface to CO 3000	1 x
Power supply cable	1 x 3 m
Fiber optic cable	1 x 5 m, 1 x 10 m
FSMA	2 x
Operating manual	1 x

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TECHNICAL DATA	
TYPE	DE3700-RH
Total height	max. 1800 mm
Total weight approx.	40 kg
Max. load	10 kg
Material	Rohacell®, PVC transparent
Positioning accuracy	± 0.5°
Rotating angle	-15°…385°
Rotating time	max. 2.5 rpm
Driven by	toothed belt (Kevlar® cord reinforced)
Motor	EC motor 150 W
Control	microcontroller
Drive unit	shielded and radio interference suppressed 20 dB under Class B
Operating voltage	110 / 230 V (50 / 60Hz)
Current consumption	max. 1.6 A
Temperature range	+8 °C…+40 °C

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| 9.2 | TURNDEVICES (DE) – DE3800-RH

The DE 3800-RH turn device is specifically designed for measurement of notebook pc, mobile phones with or without "artificial head". With exception of the drive unit are only plastic & Rohacell® components used. Different sized mobile phones, "artificial heads" or laptops can be mounted on different additonally available holders.

The turn device DE 3800-RH exists of a steady bottom part containing the drive unit, which is preferably fixed on a turntable. The distance of the lower part to the turntable centre is manually adjustable by longholes.

The GPIB (IEEE 488) & LAN (TCP/IP) bus, when operated with the CO 3000 Controller, provides an additional control option for all functions.

TURNDEVICES (DE)		
Type	Description	Article No.
DE3800-RH	DUT positioner, height of turning axis 1500 mm, max. load 10 kg	80004897

ACCESSORIES		
Type	Description	Article No.
-HP	High precision positioning (0.1 °)	80004898
Holder 38-1	Universal base mounting plate	80005101
Holder 38-2	Standard SAM HEAD holder	80005102
Holder 38-3	Standard mobile phone holder (fix hight)	80005103
Holder 38-4	Mobile phone holder (adjustable hight)	80005104
Holder 38-5	Laptop mounting plate 580 x 800 mm	80005105

SCOPE OF DELIVERY	
Type	Quantity
Interface to CO 3000	1 x
Power supply cable	1 x 3 m
Fiber optic cable	1 x 5 m, 1 x 10 m
FSMA	2 x
Operating manual	1 x

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TECHNICAL DATA	
TYPE	DE3800-RH
Total height	max. 1800 mm
Total weight approx.	40 kg
Max. load	10 kg
Material	Rohacell®, PVC transparent
Positioning accuracy	± 0.5°
Rotating angle	-15°…385°
Rotating time	max. 2.5 rpm
Driven by	toothed belt (Kevlar® cord reinforced) and gear wheel
Motor	electronic EC motor 150 W
Control	microcontroller
Drive unit	shielded and radio interference suppressed 20 dB under Class B
Operating voltage	110 / 230 V (50 / 60Hz)
Current consumption	max. 1.6 A
Temperature range	+8 °C…+40 °C

| 9.2 | TURNDEVICES (DE) – DE3900-RH-50KG

The DE 3900-RH turn device is specifically designed for measurement of Tire Pressure Sensors. Therefore the whole tire with the rim could be mounted on the fiberglass turning axis by using the universal fixing kit. The center of the tire could be adjusted on the axle. An optionally available preparation-stand enables preparation of the EUT next to the turnunit. After preparation, the fixed tire could be lifted on the turndevice for the measurement.

With exception of the drive unit are only Rohacell® and plastic components used. The location of the drive unit is up to a height of 250 mm above floor level.

The turn device DE 3900-RH is mounted on a wooden base plate as bottom part containing the drive unit, which could be installed on a turntable. The used lockable rollers enable a quick setup and storage of the device.

The GPIB (IEEE 488) & LAN (TCP/IP) bus, when operated with the CO 3000 Controller, provides an additional control option for all functions.

TURNDEVICES (DE)		
Type	Description	Article No.
DE3900-RH-50kg	Tire positioner, height of turning axis 1250 mm, max. load 50 kg	80005547

ACCESSORIES		
Type	Description	Article No.
-HP	High precision positioning (0.1 °)	80004898
GPR Axle	Spare axle l = 550 mm, up to 50 kg	80005774

SCOPE OF DELIVERY	
Type	Quantity
Interface to CO 3000	1 x
Power supply cable	1 x 3 m
Fiber optic cable	1 x 1 m, 1 x 5 m, 1 x 10 m
FSMA	4 x
Operating manual	1 x

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TECHNICAL DATA	
TYPE	DE3900-RH-50KG
Total height of turning axis (on customer request)	1250 mm
Total weight approx.	50 kg
Max. load	50 kg
Universal fixing kit for rim up to a width of	350 mm
Base L x W	1200 x 750 mm
Material	Rohacell®, POM, fiberglass
Positioning accuracy	± 0.5°
Rotating angle	0°…360°
Rotating time	max. 1.0 rpm
Driven by	toothed belt (Kevlar® cord reinforced) and gear wheel
Motor	EC motor 150 W
Control	microcontroller
Drive unit	shielded and radio interference suppressed 20 dB under Class B
Operating voltage	110 / 230 V (50 / 60Hz)
Current consumption	max. 1.6 A
Temperature range	+8 °C…+40 °C

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| 9.3 | COMBINED TURNDEVICES (DK)

The DK is a combined positioner designed for automated record of spherical pattern in electromagnetic absorption chambers. The setup configuration is like the combined axis system described in the CTIA, the antenna needs only to change hor/vert orientation.

The shielded compact drive at the bottom (up to a height of approx. 30 cm) contains the motors for theta and phi axis rotation. All other parts are metal free to minimize the influence on the chamber.

Since both drives are located fix on the floor the DK can rotate endless in both axles.

A ø 60 mm hole in the centre of the drive can be used to route cables to the EUT.

The GPIB (IEEE 488) & LAN (TCP/IP) bus, when operated with the CO 3000 Controller, provides an additional control option for all functions.

COMBINED TURNDEVICES (DK)		
Type	Description	Article No.
DK3350	Combined positioner, two turning axles, max. load 5 kg	80007023
DK3820	Combined positioner, two turning axles, max. load 5 kg	80007175

ACCESSORIES	
Description	Article No.
Different sizes of the plate (all)	On request
Other heights (all)	On request
Rotary joint in the centre (all)	On request
Separate position feedback in realtime (all)	On request
110 V version (DK3350, DK3820)	On request
Fully Rohacell® structure (DK3350, DK3820)	On request
Grid on the plate (DK3350, DK3820)	On request
Rollers for easy movement (DK3820)	On request
Handles integrated in the structure (DK3820)	On request
Plastic structure (DK3880)	On request

SCOPE OF DELIVERY	
Type	Quantity
Power supply cable	1 x 5 m
Fiber optic cable (DK3350)	1 x 5 m, 1 x 15 m
Fiber optic cable (DK3820)	2 x 5 m, 2 x 15 m
FSMA (DK3350)	2 x
FSMA (DK3820)	4 x
Operating manual	1 x

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TECHNICAL DATA		
TYPE	DK3350	DK3820
Height of turning axis	1500 mm[1]	
Permissible load	5 kg	
Material of the support plate	Rohacel	
Size of the support plate	500 × 300 mm[1]	300 × 300 mm[1]
Plate recessed to turning axis	25 mm*	adjustable 0 / 10 / 20 / 30 mm
Size of the base	ø 800 mm	ø 500 mm
Turning range and accuracy of …		
…turndisc (horizontal / "theta axis"[2])	endless / ± 1 °	
… turn device (horizontal / "phi axis"[2])	endless / ± 1 °	
Rotation of both axles done	independent	
Rotation speed of turndisc / turn device	4 rpm / 1.5 rpm	4 rpm / 3 rpm
Motor	2 pcs. electronic EC motors (max. 150 W)	
Control	microcontroller	
Control line	fiber optic (polymer type)	
Drive unit	shielded and radio interference suppressed 20 dB below CISPR22 class B	
Operating voltage	230 V 50 / 60Hz (optional 110 V)	
Current consumption	approx. 2.8 A	
Temperature range	+8 °C…+40 °C	

[1] others on request [2] acc. CTIA test plan

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