



Distributed by: Reliant EMC LLC, 3311 Lewis Ave, Signal Hill CA 90755 408-916-5750,
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| 10 | CUSTOMIZED POSITIONERS

The high qualified innco systems design team has huge capabilities to realize customer specific requests.

With more than 20 years' experience in development of positioning systems according to customer specification and new measurement standards / applications a large range of customized systems has been developed and manufactured.

innco systems use only the very best quality materials and the latest technological designs in its products.

The control of the system, singular or complex can be realized with our standard CO 3000 Controller, which allows connections to your measurement systems by GPIB or LAN.

| 10.1 | PRODUCT OVERVIEW

SWIVEL ARM ANTENNA POSITIONER (SAP)

- 1500...7000 mm radius
- Max. 220° turning range
- Up to 10 kg load



HORIZONTAL POSITIONER (HP)

- 4500 mm moving range
- 1000 mm height adjustment
- Electro-pneumatic polarisation



THREE AXIS POSITIONER (XYZ)

- Three axis positioning
- Metal free design
- Up to 2 kg load



C-SHAPE ANTENNA POSITIONER (CP)

- 1500 mm radius
- Two independent movable trolleys, each 0.5 kg load



TRANSMISSION RANGE MEASURING ROBOT (TRMR)

- 135 m moving range
- Pneumatic polarisation
- Internal battery for 30 h testing





| 10.2 | SWIVEL ARM ANTENNA POSITIONERS (SAP)

The SAP Antenna Positioners are designed for atomised record of spherical antenna pattern in electromagnetic absorption chambers. The positioning system provides precise rotational positioning of antennas around vehicles or other EUT's.

AS-PP type the SAP is equipped with a pneumatic driven polarisation unit which is operated as separate device.

Adapters for all commercially available antennas are available. Special designs are available on request. All antennas rotate around their axis to eliminate elevation errors. Absolute value encoders on height and swing axis in combination with limit switches in

each direction and the general mechanical design ensure a reliable system operation.

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

SWIVEL ARM ANTENNA POSITIONERS (SAP)

Type	Description	Article No.
SAP1500-PP-2kg-PP	1500 mm radius, 2 kg load PP= Pneumatic Polarisation	80004100
SAP5000-SL-10kg-PP	5000 mm radius, 10 kg load	80006627
SAP6000-SL-10kg-EP	6000 mm radius, 10 kg load	80006626

ACCESSORIES

Description	Article No.
Electrical polarisation	On request
Degree-wise polarisation electrical	On request
Manual polarisation	On request
Decreased / increased payload	On request
Other swivel radii	On request
Other heights	On request
Precise positioning ($\pm 0.1^\circ$)	On request
Holder for routing cables behind the drive	On request
110 V version	On request
Various adaptors	On request

SCOPE OF DELIVERY

Type	Quantity
Fiber optic cable	1 x 5 m, 1 x 10 m
FSMA	2 x
Service unit for compressed air	1 x
Operating manual	1 x

TECHNICAL DATA

TYPE	SAP1500-PP-2KG	SAP5000-SL-10KG-PP	SAP6000-SL-10KG-EP
Nominal swivel radius	1500 mm	5000 mm	6000 mm
Incl. free space until tip of polarisation rod of	200 mm	–	–
Working range in height	–	2500 mm	2500 mm
Antenna weight	max. 2 kg	max. 10 kg	max. 10 kg
Height of swivel axis1	800 / 1000 / 1200 / 1500 mm	–	–
Height requirement above rotation axis	2000 mm	–	–
Height speed adjustable	–	7.5 mm / s	7.5 mm / s
Swivel speed adjustable	0.1 ... 15 ° / sec	1.0 ° / sec	1.0 ° / sec
Size of base plate	650 × 850 mm	700 × 1000 mm	700 × 1000 mm
Material of arm	RFP	RFP with Rohacell® core	RFP with Rohacell® core
Other material except drive	RFP, PVC, Kömacel®, POM, PA, ... (all metal free)	RFP, PVC, Rohacell®, POM, PA, ... (all metal free)	RFP, PVC, Rohacell®, POM, PA, ... (all metal free)
Positioning accuracy	better ± 1°	± 0.5°	± 0.5°
Rotating angle	-110°...+110° OR -10°...+190°	-90°...+90°	-90°...+90°
Polarisation	0 / 90°	0 / 90°	0...360°
Carried out	pneumatic	pneumatic	electric drive
Compressed air supply needed	min. 6 bar		
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 or 400 V)		
Current consumption	approx. 1.6 A	max. 32 A	max. 32 A
Temperature range	+8 °C...+40 °C		





| 10.3 | HORIZONTAL POSITIONERS (HP)

The HP4510-4kg is a horizontal positioner to move small antennas over absorber fields in electromagnetic absorption chambers. Two rails are placed between / in absorbers, with the drive moving the superstructure on main rail and support dolly on secondary rail for exact antenna movement in low tolerances and free from shivering,

A cable management capable for power and signals allows also flexible antenna cable.

The height of the antenna can be adjusted by controller and also the antenna orientation (hor/vert).

Metal parts are only used for the shielded drive which is close to the floor and behind the antenna.

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

HORIZONTAL POSITIONERS (HP)

Type	Description	Article No.
HP4510-4kg	4500 mm moving range, 1000 mm height adjustment, max. load 4 kg	80004202

ACCESSORIES

Description	Article No.
Different moving ranges	On request
Heights	On request
Other payloads	On request
Pneumatic polarisation	On request

SCOPE OF DELIVERY

Type	Quantity
Power supply cable	1 x 5 m
Fiber optic cable	2 x 5 m, 2 x 15 m
FSMA	4 x
Operating manual	1 x

TECHNICAL DATA

TYPE	HP4510-4KG
Height of antenna	1500 ... 2500 mm
Moving range and accuracy of ...	
... back / forward	electric, 4500 mm / ± 5 mm
... up / down	electric, 1000 mm / ± 2.5 mm
Permissible load	4 kg
Material of the structure	fiber glass, PVC, PC, PTFE, ... all non conductive
Total length / height	5990 mm / 2690 mm
Polarisation of the antenna	electro-pneumatic
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. 3.6 A
Temperature range	+8 °C...+40 °C





| 10.4 | THREE AXIS POSITIONERS (XYZ) – XYZ120815

The 3 Dimensional Positioner XYZ120815 is designed to support the automation of RFID Transponder measuring in continues or step by step movement. The base is specifically designed for the size of a EURO-pallet 1200 x 800 mm (L x W)

All three axis can be operated independent and at the same time to shorten the measurement.

Metal parts are located only in the drive mechanism (max. 300 mm above ground level). Limit switches and the general mechanical design ensure a reliable system operation.

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

THREE AXIS POSITIONERS (XYZ)

Type	Description	Article No.
XYZ120815	Three axis positioner, 2 kg load	80005609

ACCESSORIES

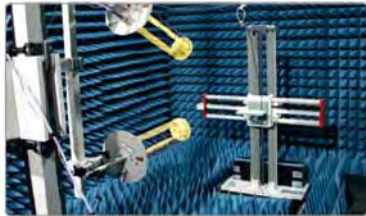
Description	Article No.
Different moving ranges	On request
Other heights	On request
Separate position feedback in realtime	On request

SCOPE OF DELIVERY

Type	Quantity
Interface to CO 3000	3 x
Power supply cable	1 x 5 m
Fiber optic cable	3 x 5 m, 3 x 15 m
FSMA	6 x
Operating manual	1 x

TECHNICAL DATA

TYPE	XYZ120815
Height / width when moving	1500 mm / 1000 mm
Permissible load	2 kg
Material of the structure	fiber glass, PVC, PC, PTFE, ... all non conductive
Moving range and accuracy of ...	
... X-Axis (left/right)	700 mm / ± 5 mm
... Y-Axis (back/forward)	1200 mm / ± 5 mm
... Z-Axis (up/down)	1000 mm / ± 5 mm
Repeatability of positioning	± 2 mm
Base (L x W)	1194 mm x 800 mm
Positioning speed	max. 5 cm/s
Polarisation of the antenna	manually
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. 3.6 A
Temperature range	+8 °C...+40 °C





| 10.4 | THREE AXIS POSITIONERS (XYZ) – XYZ 030503

The XYZ030503 is a movable positioner to move small antennas independent in three orthogonal axes. The complete design is made for using in electromagnetic absorption chambers.

A stable framework carries in its upper region the shielded drive which moves an antenna adaption plate made of foamed plastic. The gadget for polarisation can be used manually or as smart polarisation by moving a certain path. If equipped with vario frame the drive can change the position so that the antenna is scanning at the side of the EUT. In combination with a small turntable many areas/planes/sides (of EUTs surface) can be

covered/scanned without manual changes.

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

THREE AXIS POSITIONERS (XYZ)

Type	Description	Article No.
XYZ 030503 Type C	Three axis positioner, 2 kg load	80006660
XYZ 030503 Type D	Three axis positioner, 2 kg load	80004660

ACCESSORIES

Description	Article No.
Different moving ranges	On request
Other heights	On request
Separate position feedback in realtime	On request

SCOPE OF DELIVERY

Type	Quantity
Interface to CO 3000	3 x
Power supply cable	1 x 5 m
Fiber optic cable	3 x 5 m, 3 x 15 m
FSMA	6 x
Operating manual	1 x

TECHNICAL DATA

TYPE	XYZ 030503 TYPE C	XYZ 030503 TYPE D
Height / width when moving	1900 mm / 900 mm	
Permissible load	2 kg	
Material of the structure	fiber glass, PVC, PC, PTFE, ... all non conductive	
Material of the antenna adaption plate	–	foamed plastic
Moving range and accuracy of ...		
... X-Axis (left/right)	300 mm / ± 2.5 mm	300 mm / ± 1.5 mm
... Y-Axis (back/forward)	500 mm / ± 2.5 mm	500 mm / ± 1.5 mm
... Z-Axis (up/down)	300 mm / ± 2 mm	300 mm / ± 1.5 mm
Space to table ¹	500 ... 800 mm	500 ... 800 mm (others on request)
Base (L x W)	950 x 1160 mm	850 x 1350 mm
Range additionally adjustable	+700 mm (by polarisation tube) ... -1100 mm (by shifting on mast tube)	–
Distance from antenna to vertical pole	850 mm (with standard gibbet superstructure)	–
Positioning speed...		
... X-Axis (left/right)	14 mm/s	
... Y-Axis (back/forward)	14 mm/s	
... Z-Axis (up/down)	11 mm/s	
Polarisation of the antenna ²	manually	manually and smart polarisation (by moving a defined path in max. height)
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. 3.6 A	
Temperature range	+8 °C...+40 °C	

¹ is the space available for EUT and antenna – measured between downside of antenna adaption plate and EUT test table with 800 mm height ² optionally: pneumatic or electric





| 10.5 | C-SHAPE ANTENNA POSITIONER (CP)

The CP1500-MP is an antenna positioner designed for automated measurement of EUT reflection in electromagnetic absorption chambers. It features two independently controllable and radially movable carriages equipped with receptacles for small antennas. Along the theoretical connection line from -90° to $+90^{\circ}$, the entire machine is made metal free. The positioner consists of guide sectors, two swivel carriages with aerial antenna holders and drives.

Two separately controllable drive units, each with a motor power of 150 W, drive the carriage via belt drive. They are located left and right of the positioner. Additionally equipped cable carriers enable a safe guidance of the antenna cables.

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

C-SHAPE ANTENNA POSITIONER (CP)

Type	Description	Article No.
CP1500-MP	1500 mm radius, two antenna trolleys, each 500 g load capacity	80006800

ACCESSORIES

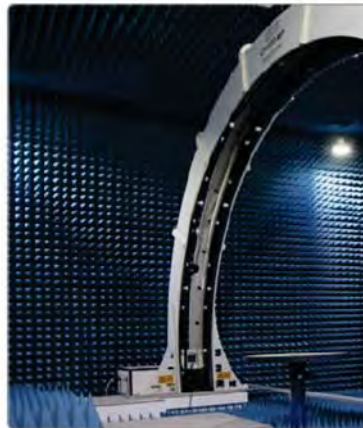
Description	Article No.
Different moving ranges	On request
Other heights	On request
Separate position feedback in realtime	On request

SCOPE OF DELIVERY

Type	Quantity
Interface to CO 3000	2 x
Fiber optic cable	2 x 5 m, 2 x 10 m
FSMA	4 x
Operating manual	1 x

TECHNICAL DATA

TYPE	CP1500-MP
Nominal swivel radius	1500 mm
Height of middle axis for EUT	350 mm
Antenna weight	max. 2 x 0.5 kg
Size of base plate / each side (L x W)	485 x 920 mm
Swivel speed adjustable	0.19 ... 3.8 °/sec
Positioning accuracy	better ± 0.5
Rotating angle	-90°...+96°
Polarisation	0 / 90°
Carried out	manually
Compressed air supply needed	min. 6 bar
Control line	fiber optic (polymer type)
Drive unit	shielded and radio interference suppressed 20 dB below CISPR22 class B
Drive method	toothed RFP
Other material except drive	RFP, PVC, Kömacel®, POM, PA, ... - all metal free
Operating voltage	230 V 50 / 60Hz (optional 110 V)
Current consumption	approx. 2 x 1.6 A
Temperature range	+8 °C...+40 °C





| 10.6 | TRANSMISSION RANGE MEASURING ROBOT (TRMR)

The TRM130 Robot is designed for fully automatically measurement of radio transmitter keys for use in open areas. The integrated high power battery allows measurement without wires or metallic parts on the whole measurement range. The pneumatic driven key actuators (2pcs.) are adjustable to meet almost key dimensions. Adapter holders for specific key dimensions are available on request.

The usual installed phantom water body with key-actuator is easy replaceable by a manual height adjustable antenna stand with automatic pneumatic polarisation unit.

A guiding rail, which is made of weather proved fiberglass, can be installed outside of the measurement area, to enable an easy cleaning or different usage of the moving area.

Metal parts are located only in the drive unit, which is behind the antenna (max. 0.6 m above ground level).

Limit switches and the general mechanical design ensure a reliable system operation.

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

TRANSMISSION RANGE MEASURING ROBOT (TRMR)

Type	Description	Article No.
TRMR130	Movement range of 130 m, with internal battery (no power supply cable needed)	80005561

ACCESSORIES

Description	Article No.
Water body 80 liter volume	On request
Water arm 1.5 liter volume	On request
Phantom hand SPEAG (silicon-carbon mix)	On request
Antenna mast 2 m with pneumatic polarisation	On request
5 Port LAN switch	On request
GPIB to LAN converter	On request
Integrated compressor (8 bar)	On request
Charging unit (8 h charge time)	On request

SCOPE OF DELIVERY

Type	Quantity
Interface to CO 3000	1 x
Fiber optic cable	1 x 140 m, 1 x 20 m
FSMA	2 x
Integrated Battery (220 Ah)	1 x
Charging unit (12 h charge time)	1 x
Integrated 230 V power supply (2000 W)	1 x

TECHNICAL DATA

TYPE	TRMR130
Movement Range	130 m
Cable length	max. 136 m
Positioning accuracy	< 1% of movement area
Speed	max. 5 km/h
Drive	500 W EC motor
Power supply	integrated gel / dry battery 12 V; 220 Ah for approx. 30 h usage
Customer Connectors	2 x 230 V, max. 2000 W
Polarisation	pneumatic
Antenna height	max. 2000 mm
Control	by CO 3000 Controller, handheld control unit by wire
Signal transmission	fiber optic laser, by multiplex method
Tires	6 pcs. air tires Ø 220 mm
Own weight	approx. 450 kg
Temperature range	-5 °C...+40 °C

