

MOTORIZED ROTATIONAL POSITIONERS

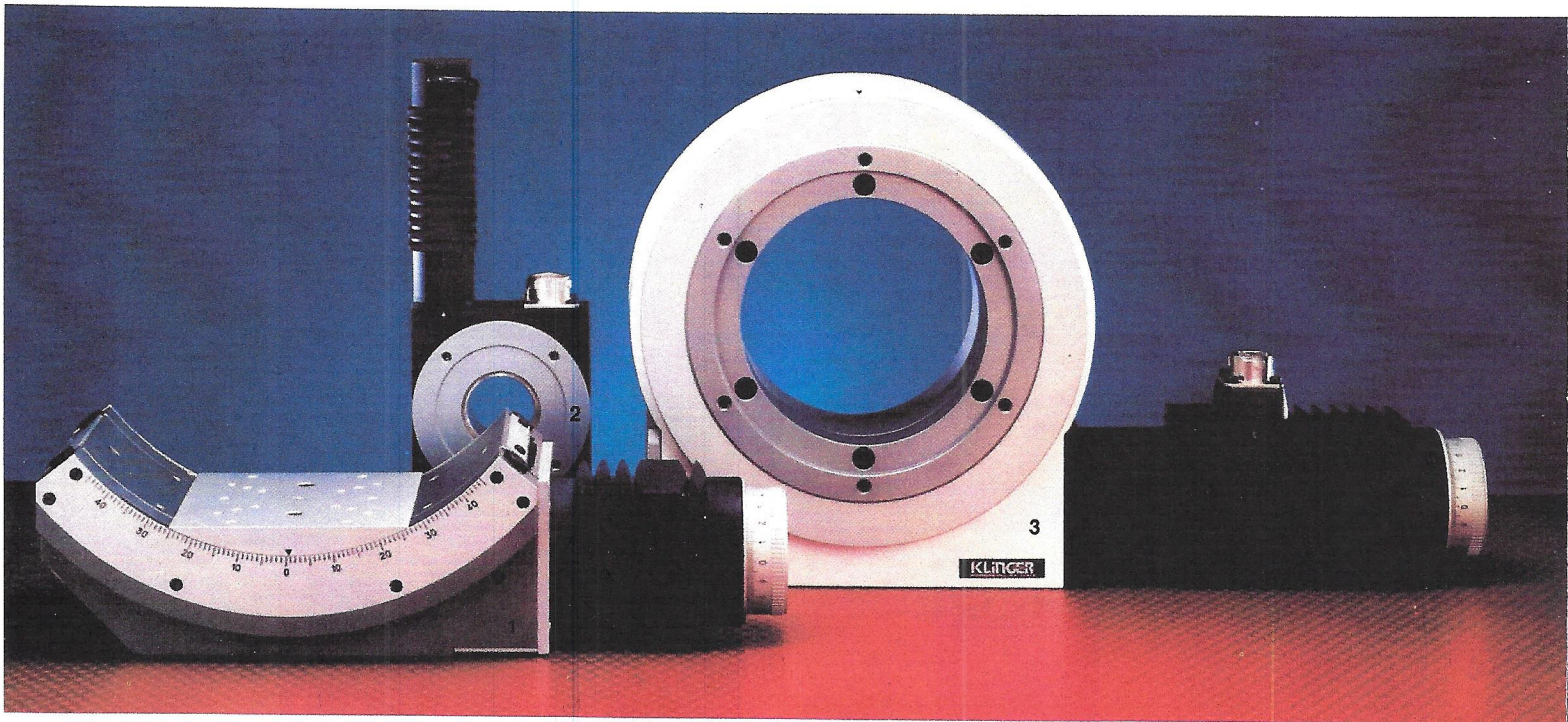
All of the UR, RT, and BG systems can be motorized for remote controlled applications. Preparation for vacuum or other operating environments is available upon request. Motor options include either stepper or DC drive. Other options include encoders for position verification and return to origin circuitry.

2. UR rotation stages

- 2 available sizes
- Wobble: 10 Arc seconds
- Eccentricity: $\leq 2.5 \mu\text{m}$

Type	Res	Load Capacity KgF	□ LxW mm	H	Weight kg	Catalog #
UR 80 PP	0.01°	20	80	35	1.13	354 381
UR 80 PP	0.001°	20	80	35	1.13	354 382
UR 100 PP	0.01°	30	105	35	1.63	354 481
UR 100 PP	0.01°	30	105	35	1.63	354 482

Available options include incremental encoder, potentiometer, end of run switch, DC motor drive and origin search.



1. BG goniometric cradles

- Combining 2 BG units of sequential size modules will provide rotation about a common point
- Range: $\pm 45^\circ$
- Selection of 5 available sizes

Model	Res.	Load Capacity KgF	Rotation Axis mm	L mm	W mm	Weight kg	Catalog #
BG 50 PP 1/100	0.01°	4	15	78	50	1.0	354 533
BG 50 PP 1/1000	0.001°	4	15	78	50	1.0	354 534
BG 80 PP 1/100	0.01°	12	57.5	125	80	2.0	354 509
BG 80 PP 1/1000	0.001°	12	57.5	125	80	2.0	354 510
BG 120 PP 1/100	0.01°	20	100	200	120	6.0	354 511
BG 120 PP 1/1000	0.001°	20	100	200	120	6.0	354 512
BG 160 PP 1/100	0.01°	30	156	350	160	15.4	354 513
BG 160 PP 1/1000	0.001°	30	156	350	160	15.4	354 514
BG 200 PP 1/100	0.01°	50	235	520	200	19.0	354 516
BG 200 PP 1/1000	0.001°	50	235	520	200	19.0	354 517

Available options include incremental encoder, DC motor drives and origin search.

3. RT rotation stages

- 4 available sizes
- Wobble: 2 Arc seconds
- Eccentricity: $\leq 1.5 \mu\text{m}$

Type	Res	Load Capacity KgF	∅ ext. mm	H	Weight kg	Catalog #
RT 120 PP 1/100	0.01°	40	120	62	3.6	354 502
RT 120 PP 1/1000	0.001°	40	120	62	3.6	354 503
RT 200 PP 1/100	0.01°	100	200	92	13.0	354 521
RT 200 PP 1/1000	0.001°	100	200	92	13.0	354 522
RT 300 PP 1/100	0.01°	300	312	92	19.4	354 523
RT 300 PP 1/1000	0.001°	300	312	92	19.4	354 524
RT 660 PP 1/100	0.01°	500	660	222	95.0	354 526
RT 660 PP 1/1000	0.001°	500	660	222	95.0	354 527

Available options include incremental encoder, potentiometer and origin search.

angular and rotational positioning devices

BG goniometric cradles

The BG type goniometric cradles are unique rotating devices which have their axis of rotation located above the body of the stage. They are designed so that orthogonal mounting of two adjacent size BG cradles will provide two orthogonal axes of rotation about the same external point in space. A third rotation through the same point may be provided by a TR or RT rotation stage mounted underneath to form a system with several degrees of freedom. The travel range on BG type cradles is limited to 90° (±45°). When the 45° mounting surface is used, the carriage moves from a horizontal to a vertical position.

BG cradles are available in several sizes with different methods of driving the stage as follows:

- Direct manual drive by knurled knob
- DC motor
- Stepping motor

The command motions are transmitted to the system by means of a worm and gear. Travel is limited by mechanical stops, augmented in motorized systems by limit

switches which cut power to the motor before the carriage reaches its mechanical limit of travel. The position of the carriage is given by an index which is read against a scale marked in 1° increments on the side of the stage. Finer indication of position is available through the following:

- graduated scale engraved on the drive knob (type MS)
- incremental encoder (type GS)

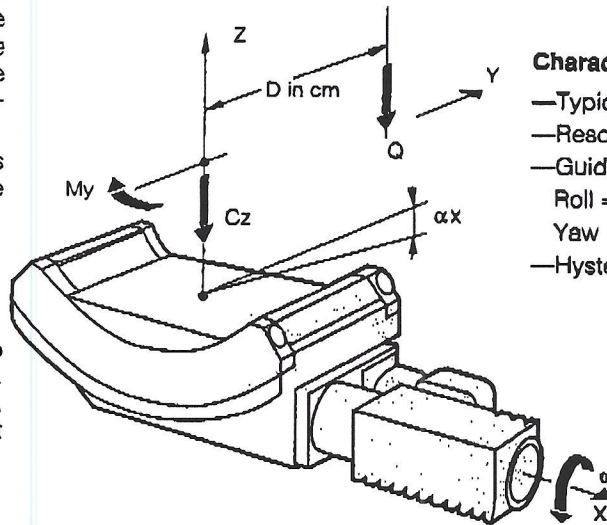
Options

The BG goniometric cradles can be supplied with:

- Encoder: for position information and verification of proper motor operation
- Origin search "homing": allows the stage to be returned to a predetermined home position

Characteristics

- Typical accuracy: 0.05°
- Resolution: 0.01°, 0.005° or 0.001°
- Guide accuracy:
Roll = 10⁻⁴ rad.
Yaw = 10⁻⁴ rad.
- Hysteresis ≤ 0.02°



load capacity

	BG50	BG80	BG120	BG160	BG200	
$C = Q (1 + \frac{D}{a})$ must be $\leq Cz$, with						
Cz = Nominal load capacity, equivalent to the vertical load capacity	4	12	20	30	50	KgF
C = load capacity Q = actual load in KgF D = distance from center of carriage in cm						
a = a constant defined by the module size and directly related	3	4.5	7	9	12	cm
Transversal deviation for $Q \cdot D = 1$ cmN, $\alpha x =$	15	0.5	0.15	0.05	0.02	10 ⁻⁶ rad
Load capacity, My (1 KgF = 10 N)	500	800	800	2000	3000	cmN
Maximum inertia of the mass rotating around Y, IY	32	400	1500	4500	7000	cm ² kg
Driving torque: $\omega = 5 + b \times 10^{-3} \times My$, in cmN My = torque provided by the load rotating around Y b = constant defined by the module size, and related to the efficiency of the linkage	15	15	10	6	4	
Worm gear ratio, I :	36	36	180	60	60	

angular and rotational positioning devices

BG120 PP and BG120 CCM motorized goniometric cradles

The BG120 PP and CCM are the stepping motor and DC motor versions of the BG120 cradle. Resolutions of 0.01° and 0.001° are available with various speeds depending on the type of motor selected.

Encoders for position verification (included standard on BG120 CCM)

—Encoder for UE71 PP motor full step resolution

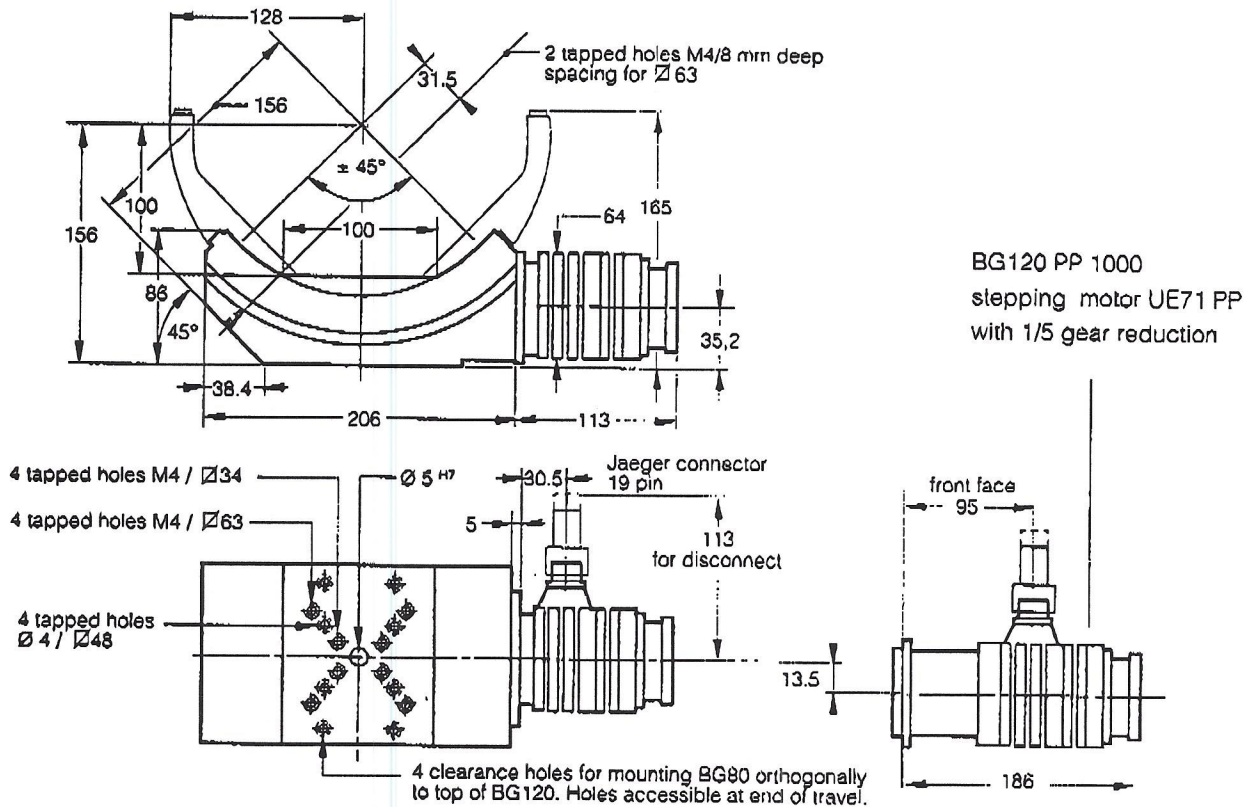
Cat. No. 385 924

—Encoder for UE71 PP motor ministep resolution

Cat. No. 385 923

Origin search "homing" **Cat. No. 385 906**

Compatible electronics, see pages 141 to 158.



Model	Resolution	Motor Type	Maximum Speed	Weight (kg)	Cat. No.
Stepper motor driven					
BG120 PP	0.01°	UE71 PP	40°/sec	6	354 511
BG120 PP	0.001°	UE71 PP	4°/sec	6	354 512
DC motor driven					
BG120 CCM	0.001°	UE42 CC	90°/sec.	6	357 520