HEAVY DUTY FLAT AIR BEARINGS

HRA

INTENDED USE

Flat air bearings for heavy duty applications called HRA series (High Resistance Aluminum) are a midway solution between the standard high precision flat air bearing (see MAGER's HP series) and the lifting air bag systems used for carrying heavy loads. HRA series is the perfect choice when it is important to overcome the resistance to movements in applications where environmental conditions are tougher than those of a typical metrological application in a laboratory and, at the same time, the stiffness of the support must be kept with an air gap range between 15 µm and 40µm.

What do we mean by "tougher conditions"?

• relatively high errors on sliding guides (flatness, straightness, roughness, etc.)
• presence of pollutants as dusts and scraps, oils and greases, process and protection gases
• high temperatures

BENEFITS
Zero friction No wear
Smooth and silent without vibrations
High accelerations and speed
Maintanance-free
High precision movements
Suitable for tougher environmental conditions

INDUSTRIAL SECTORS
METROLOGY
MACHINING
LOGISTIC AND TRANSPORT

APPLICATIONS
Shop-Floor Coordinate Measuring Machines
Laser Cut and Welding
Milling And Turning Machines
Additive Manufacturing
Support of Heavy Machine Organs
Guidance for High Forces Applications
Heavy Load Transport

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FEATURES

HRA series flat air bearings are made of aluminum alloy for the best lightness/stiffness ratio.
They are equipped with a thick air distribution network on the work surface: this feature makes the air pad extremely efficient, even on nonuniform surfaces.

Each flat air bearing of HRA series is equipped with **integrated air gap sensor nozzles** (working on pneumatic principle) with the aim to easily set up air gap calibration, and to constantly check the height of the air gap during operations. This prevents from malfunctioning due to external events.

HRA series air bearings are available:

1. **with two methods for interfacing:**
   - with stationary assembly, based on 4 interfacing square at the corners, or a central square
   - with mounting kit (P-KIT option): the spherical coupling between the ball pin and the air pad allows the perfect self-alignment between the air bearing and the sliding surface, compensating local form errors of the surface. By screwing the threaded pin, the functioning air gap can be finely adjusted, especially in the case of opposite air pads with air-on-air preload, and axis alignments: after having finished this adjustment, the locking ring nut stops the assembly. The anti-rotation pin must enter a specific hole on the pad: this prevents the air bearing from rotation.

2. **with two kinds of coatings for the aerostatic surface:**
   - standard coating with hard anodize coating
   - coating with anti-seizure material, to resist overloading or the temporary absence of air in unexpected operating conditions.

3. **with or without wipers** (R-KIT option) for keeping guideways cleaned from dust and small particles

HOW TO ORDER

AIRPAD HRA – □□□□ □ □ □

WIPERS
- N without wipers
- W with wipers (R-KIT option)

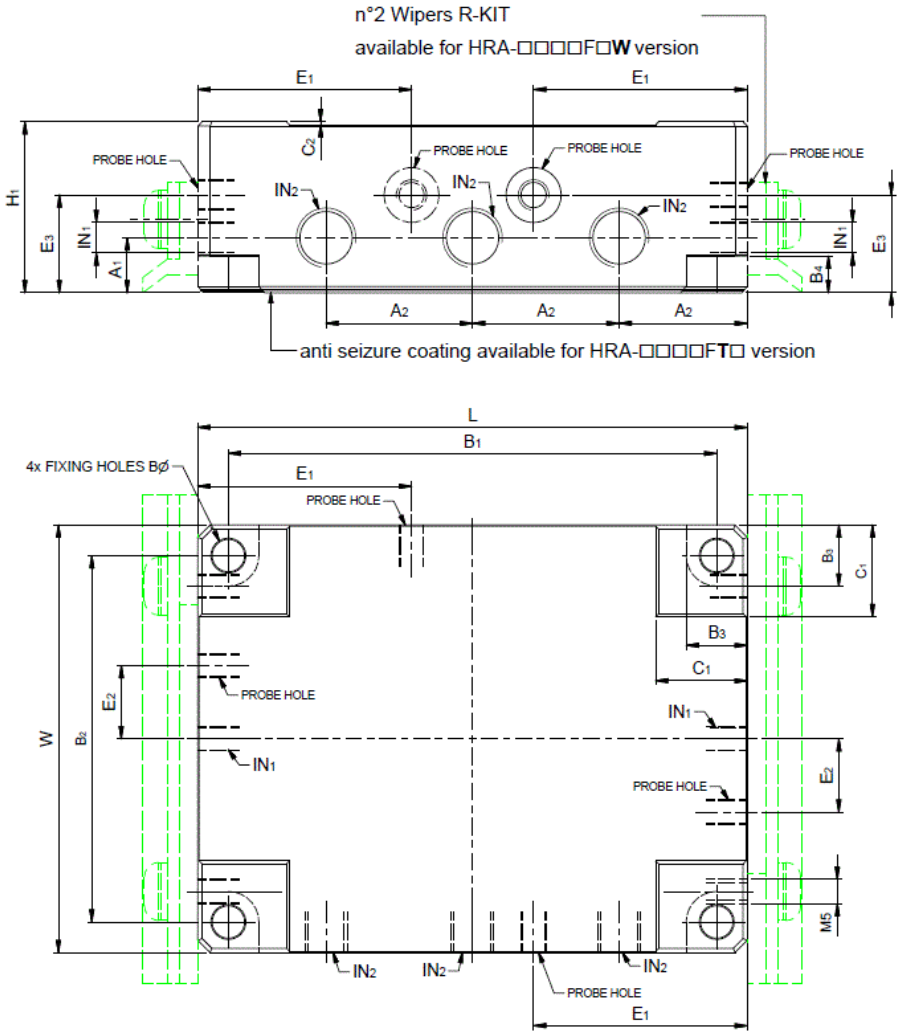
COATING OF THE AEROSTATIC SURFACE
- A hard anodized aluminum
- T anti-seizure coating

INTERFACING
- F stationary assembly - with square interfaces at the corners
- P mounting kit (P-KIT option)
- S stationary assembly - with central square interface | only for 6030 and 7010 size

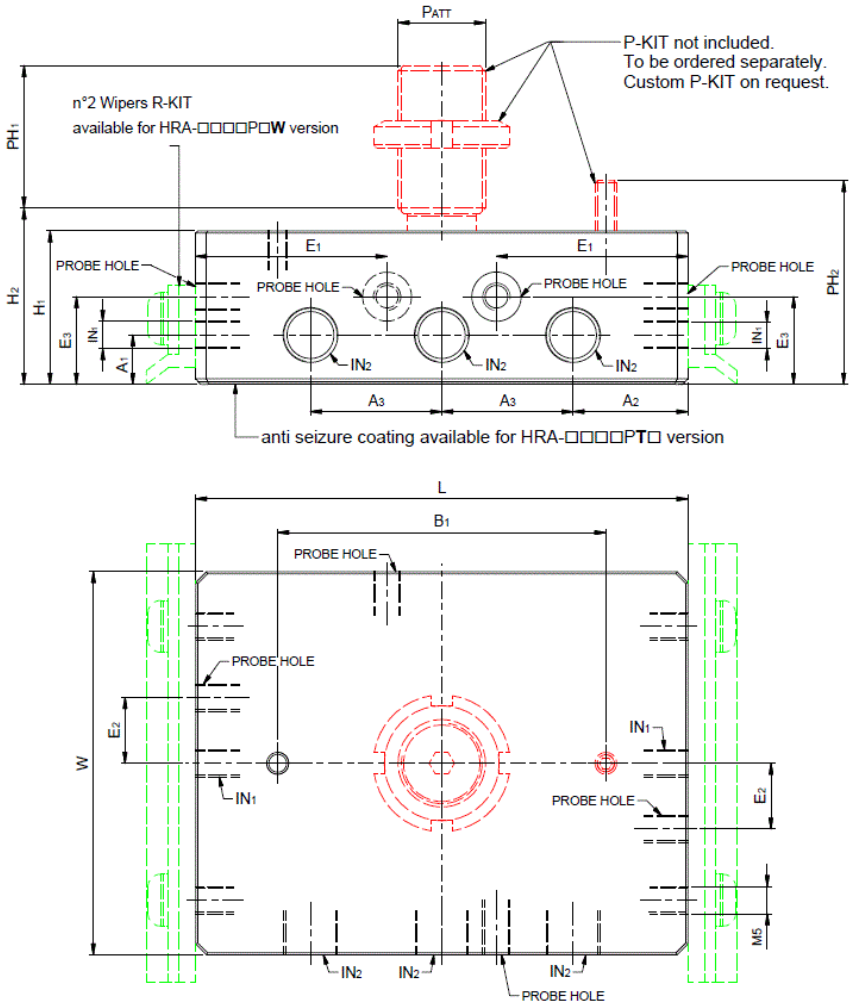
please contact MAGER's technical assistance for detailed drawing

SIZE INDEX (see table)

AIR PAD HRA – □□□□ F □□
stationary assembly



AIR PAD HRA – □□□□ P □□
interfacing with mounting kit (P-KIT)



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The aerostatic performances mentioned in the table are referred to **5 bar (relative) air supply pressure**.

TECHNICAL DATA	performances @ maximum stiffness *R**				DIMENSIONS							HRA-□□□□-F□□							HRA-□□□□-P□□	
DESCRIPTION	AIR GAP h* [µm]	LOAD L* [N]	STIFFNESS R* [N/µm]	AIR FLOW Q* [l/min ANR]	W [mm]	L [mm]	H_1 [mm]	mass [kg]	IN	A_1 [mm]	R-KIT	$B_Ø$ [mm]	B_1 [mm]	B_2 [mm]	B_3 [mm]	B_4 [mm]	C_1 [mm]	C_2 [mm]	P-KIT standard	P_{ATT} [mm]
AIR PAD **HRA-1010□□□** 70x 90x 28	21	1,300	90	28	70	90	**28**	**0.45**	M5	9	[A]	5,3	80	60	10	6	15	0,5	[C1]	M16×1
AIR PAD **HRA-2010□□□** 90x120x 33	22	2,200	130	48	90	120	**33**	**0.90**	G1/8	9	[B]	6,4	108	78	12	7	20	0,5	[D1]	M25×1,5
AIR PAD **HRA-2030P□□** 90x180x 30	22	3,200	210	58	90	180	**30**	**1.13**	G1/8	9	[B]								[D2]	M25x1,5
AIR PAD **HRA-3020□□□** 110x180x 36	22	4,000	230	65	110	180	**36**	**1.84**	G1/8	9	[C]	6,4	138	98	12	7	20	0,5	[E1]	M30×1,5
AIR PAD **HRA-4020□□□** 130x210x 36	25	5,200	260	72	130	210	**36**	**2.71**	G1/8	9	[D]	6,4	198	118	12	7	20	0,5	[D2]	M25×1,5.
AIR PAD **HRA-5030□□□** 150x240x 42	28	8,400	315	125	150	240	**42**	**3.95**	G1/8	12	[E]	8,5	224	134	16	9	25	0,5	[E1]	M30×1,5.
AIR PAD **HRA-6030STN** 180x280x 50	26	11,500	430	135	150	280	**50**	**6.70**	G1/4	12										
AIR PAD **HRA-7010STN** 220x320x 60	28	13,000	500	170	220	320	**60**	**11.2**	G1/4*											

TOLERANCES FOR VALUES OF LOAD, STIFNESS, AIR CONSUMPTION: ±10% | VALUES REFERRED TO TEST ON STAINLESS STEEL PLANE | R_a = 0,4 µm

(*) AIR INLET ON TOP FACE

Compressed air quality must refer to **ISO 8573-1:2010**:

minimum requested:	**Class 2.4.1**	Class 2: particulate	Class 4: water	Class 1: oil
recommended:	**Class 1.3.0**	Class 1: particulate	Class 3: water	Class 0: oil

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