Expansion Control Hanger

100mm Static Deflection

APPLICATION

For the support of piping where considerable vertical movement is experienced through thermal variations, allowing minimal transfer of loads to anchor points. The EH hanger is generally used on risers in multi-storey buildings and in high temperature piping systems.

FEATURES

- Heavy duty steel cage designed to support the spring through special locators – the spring coils cannot touch the cage
- High deflection for minimal load transfer with thermal variations
- 50% overload capacity
- Springs completely interchangeable
- Deflection scale and pointer

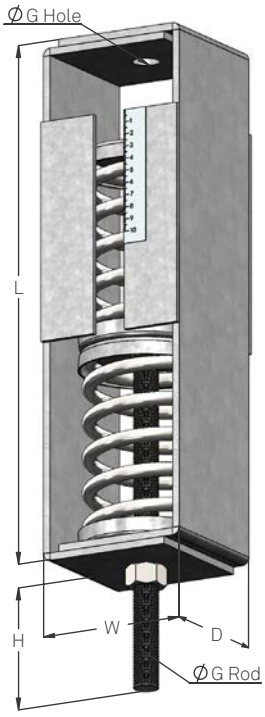
OPTION

- Can be supplied pre-compressed to client's requirements (suffix P in type code)

DESIGN

The hanger cage is constructed so that springs can be removed and replaced, thus facilitating weatherproofing (in component form) and allowing load capacity changes on site if required. A series of springs with special locators provide both versatility in application and protection for the coils – the spring coils cannot run on the side of the cage in operation.

Each spring used conforms to a horizontal to vertical stiffness ratio of between 0.7 and 1.1 at rated load, a ratio of diameter to loaded height minimum 0.8 and a rated maximum operating deflection of 2/3 deflection to solid.



EHL / EHD

EH Dimensions

Type	H mm	L mm	W mm	D mm	G (max) mm
EHL-90 to 96	100	400	78	74	M16
EHL-97 to 100	100	400	78	74	M20
EHD-52 to 53	100	425	120	118	M20
EHD-531 to 593	100	425	120	118	M24

EHL / EHD PRODUCT GUIDE

Type	Max Load kg	Static Deflection mm	Spring Constant kg/mm	Spring Colours	
				Stripe 1	Stripe 2
EHL-90	20	114	0.18	Violet	-
EHL-91	35	105	0.33	Violet	Black
EHL-92	50	99	0.5	Yellow	-
EHL-93	100	99	1	Brown	-
EHL-94	150	90	1.7	Blue	-
EHL-95	200	90	2.2	Black	-
EHL-96	250	84	3	Red	-
EHL-97	300	84	3.6	Green	-
EHL-98	400	75	5.3	Grey	-
EHL-99	550	69	8	Orange	-
EHL-100	650	60	10.8	Orange	Black
				Outer	Inner
EHD-52	225	100	2.3	Red	-
EHD-520	295	100	3	Red	Blue
EHD-521	350	100	3.5	Red	Black
EHD-53	450	100	4.5	Green	-
EHD-531	575	100	5.8	Green	Black
EHD-551	775	100	7.8	Grey	Black
EHD-552	900	100	9	Grey	Red
EHD-553	1,000	100	10	Grey	Green
EHD-593	1,115	90	12.4	Orange	Green

VIBRATION ISOLATION

These hangers are not fully vibration isolating since the higher frequency signals will be transmitted through the cage via the spring locators and lower hanger rod. For a high degree of isolation in the audible band, a second isolating hanger must be placed in series with the EH range (see series RH and RSH) or a fully isolating hanger of the type RSH used instead.

MISALIGNMENT CAPABILITY

Being a guided spring type hanger, horizontal misalignments greater than 2 degrees will induce bending on the lower hanger rod. For installation, ensure the structural support point and attachment point to pipe are in a line parallel to the direction of movement. For piping where a large degree of misalignment occurs, the top fastening must be allowed to pivot using either a spherical seating washer or spherical rod end and clevis.

PRE-COMPRESSION (suffix P in type code)

To aid installation, the hanger maybe supplied with the spring pre-compressed. The standard pre-compression setting is 50% of rated load. In this way the hanger can act as a rigid connection to facilitate installation, the pre-compression nut must be backed off fully to allow the lower rod to move upwards when necessary during operation.

DEFLECTION SCALE

A deflection scale is fitted as standard.

ADJUSTMENT

For this type of hanger, the piping system designer should provide a tabulation of attachment point number, hanger type, maximum rated load, maximum rated deflection, deflection due to mass – pipe empty, displacement due to mass – pipe full, expansion (contraction) deflection and final operating deflection.

The installer must check that loads and deflections on hangers at each stage of installation do not significantly depart from those stated. Any variations at the 'pipe full' stage must be corrected prior to the system operating.

HANGER SELECTION EXAMPLE

A typical 30m long x 200mm diameter steel hot water riser may operate at 85°C. If normal ambient temperature is 25°C, total change in length due to the temperature variation would be 21mm. If 5 pairs of hangers equally spaced are used to support the pipe, the total weight of 2,200kg can be considered to be equally shared by the 10 hangers, i.e. 220kg each, under ambient temperature conditions.

If a rigid reference anchor is used at the top of the pipe, expansion of the pipe with increasing temperature (downwards) will increase deflection of the hanger pairs in proportion to their distance from the anchor.

Preliminary selection of the EH-97 hanger (load capacity 300kg max with spring rate of 3.6kg/mm) will give rise to deflections as follows:

Static deflection due to mass of full riser =220/3.6 =61mm

Imposed deflection due to expansion (at hanger furthest from anchor) =21mm

Total=82mm

With a rated deflection of 84mm, the EHL-97 hanger is therefore suitable.

NOTE:

1. In the above example, thermal expansion of the pipe imposes a further load at each hanger pair in proportion to its distance from the anchor – due to incremental spring deflection at that point.

   The pair closest to the anchor will deflect 4.2mm; second pair 8.4mm; third pair 12.6mm; fourth pair 16.8mm; fifth pair 21mm.

   Therefore the total (upwards) load imposed on the anchor due to the thermal expansion is:
   2 x (4.2 + 8.4 + 12.6 + 16.8 + 21) x 3.6 x 9.8 = 4,445N

2. Where the reference anchor is central to the riser, thermal movement will reduce deflections and hanger loadings above the anchor, in turn offsetting the greater loadings at points below the anchor.

TECHNICAL ASSISTANCE

All Embelton offices can provide detailed technical assistance on the use of this product in specific applications.

CONDITIONS OF SALE

These products are sold subject to the published Embelton General Conditions of Sale, copies of which maybe inspected on request.

SPECIFICATION

Piping expansion hangers shall be of the guided spring type with a 50% overload capacity. The hangers shall be fully corrosion protected and shall have the facility to allow the changing of springs. They should be of type EH as supplied by Embelton.