

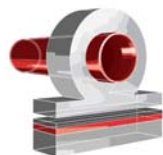
VARIABLE SPRING UNITS

TECHNICAL DESCRIPTION

incorporating

INSTALLATION and

OPERATING/MAINTENANCE INSTRUCTIONS



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Installation instructions and product description variable spring hangers

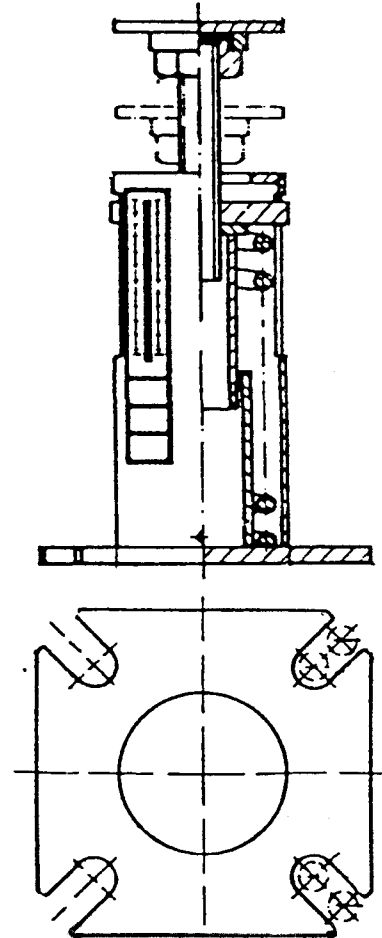
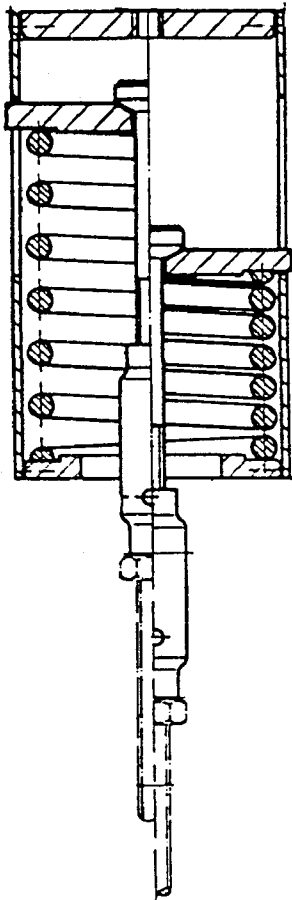
1. Application

Spring hangers and spring supports are used *where vertical movements of the piping are not allowed to be restricted by rigid hangers.*

In general spring hangers are used to carry the weight of the piping or the components resp.

2. Function

The variable spring hanger consists of a pre-compressed spring coil in a cylindrical casing with a load-and-travel indicator. *The load changes proportionally to the travel corresponding to the spring rate.*



3. Spring hanger selection

The main selection criterion is the *deviation between the cold and the hot load*.

The allowable deviation differs in the individual rules and project specification.

Two design criterion are generally accepted:

- a) The deviation between *cold load* and *hot load* is limited to **25%** of the operating load (MSS SP 58).
- b) **The total travel S_n** must exceed the calculated travel S_s (theoretical travel) **by at least 40%**. A reserve = 0,2 S_s is to be provided for each final position (VGB rules).

The cold load and the hot load must be within the working range of the respective size.
(See catalogue 1988)

Figure / size selection

The spring hanger is selected by the support load. The figure is selected by the travel of the support point.

PSS Pipe Support Systems offers three different spring hangers (depending on the spring rate).

Fig. 82 Movement range 0-46 mm **High spring rate**

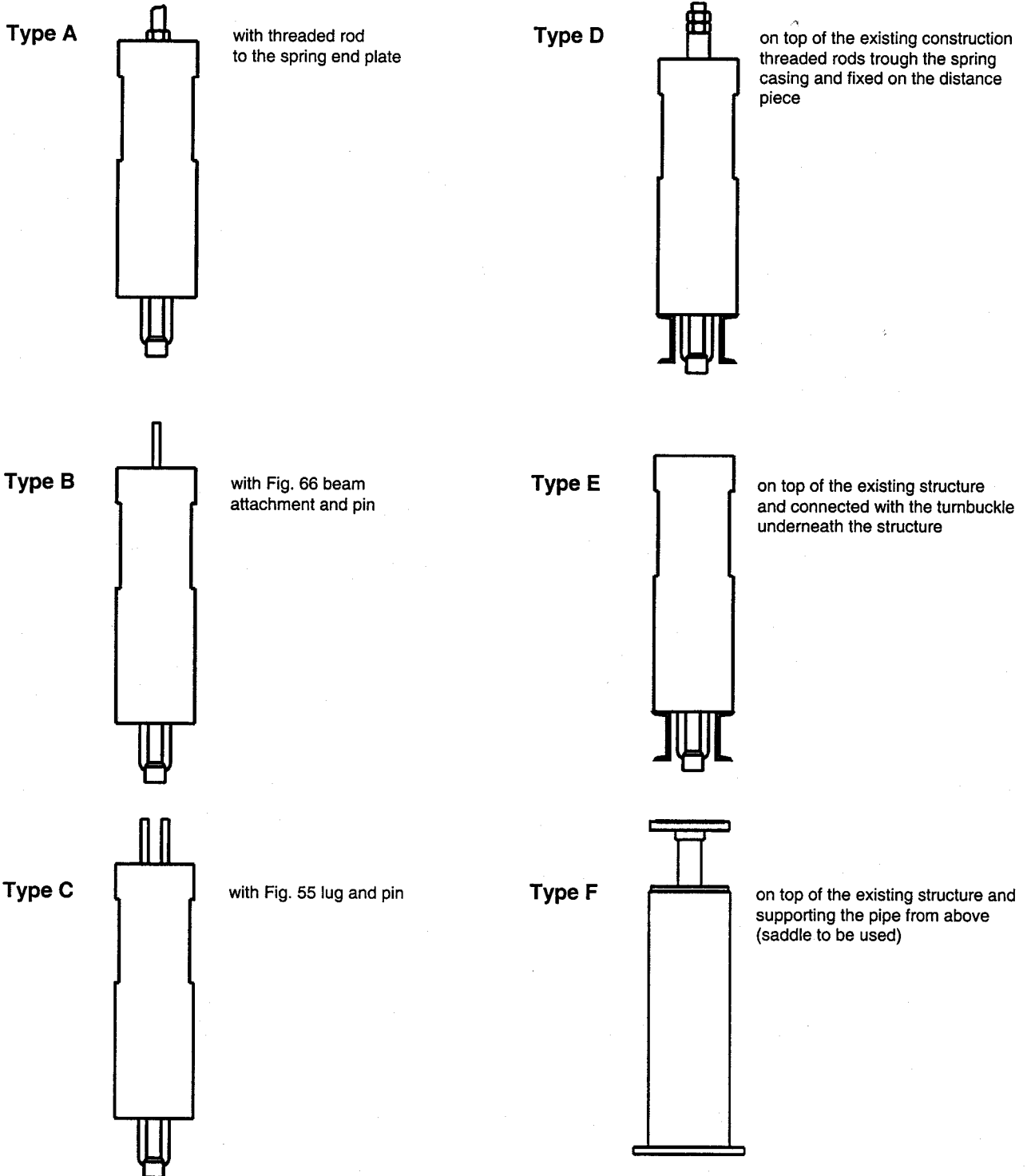
Fig. B268 Movement range 0-92 mm **Medium spring rate**

Fig. 98 Movement range 0-184 mm **Low spring rate**

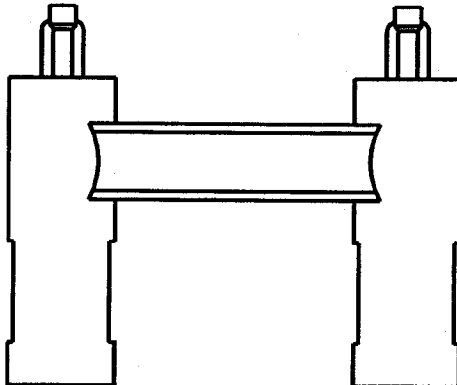
4. types

There are the following *spring hanger types* – depending on the structure connection.

Structure connection:



Type G



with 2 threaded rods connected with the turnbuckle and pipe supported on the traverse (saddle to be used)

5. Qualification

Besides the indicated international design instructions like **ASME III SUBSECTION NF** and **KTA 3205.3**, the spring hangers were subjected to an experimental static and dynamic test program.

The deviation from the indications of the manufacturer before and after the tests was **lower than +/- 5%** at vertical tension and **lower than +/- 6%** at diagonal tension.

The spring hangers **passed all tests without damage.**

6. Travel stop

If indicated in the order, the spring hangers are adjusted at the factory to the specified installation load.

The upper travel stop carries the spring load in the unloaded condition. The lower travel stop carries increased loads (E. G. hydraulic test of a steam line) in the installation position.

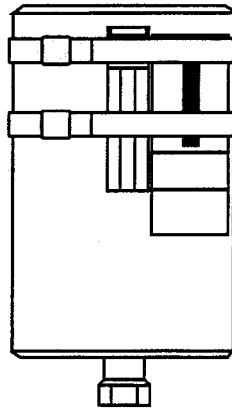
The travel stop must be removed before the piping is put into operation.

The spring hangers type A – E and G are attached to the corresponding connection parts between the building structure and the piping by means of accessories.

By turning the internal spring hanger turnbuckle the spring hanger is now loaded, so that the upper travel stop gets free, i. E.

It can be removed by hand. Please ensure that both travel stops are removed at the spring hanger type F. The load is transferred to the spring until the travel stop gets free by turning the load column.

If for example a water-bearing pipe is emptied, it is recommended to use the upper travel stop in order to carry the difference load (medium weight).



7. Adjustment

Type A, B, C, E and G are adjusted with an integrated turnbuckle. Type D is adjusted by the upper nut at the threaded rod. The adjustment of type F is performed by turning the load column.

The position of the load-and-travel indicator lower edge at the nameplate shows the spring hanger load.

If the load-and-travel indicator rests on the bottom of the pipe, the spring hanger is then indefinitely overloaded and can be damaged or break down.

If the load-and-travel indicator rests on the upper edge of the pipe, please ensure that the min. thread engagement is observed.

8. Installation instruction

Securely attach the hanger to the structure. Turn the turnbuckle until the variable spring hanger or load column of the spring support resp. reaches the desired cold load marking. No other adjustment is necessary. If desired, the variable spring hanger can be delivered locked to the cold load.

It must be ensured that the connected threaded rod is engaged up to the sight opening of the spring hanger turnbuckle.

The load and travel indicator position should be recorded before and after start of operation.

Deviations from the cold load marking (white marking C) and the hot load marking (red marking H) can be corrected according to point 7.

9. Nameplate

Beside the figure number, the size and the type the nameplate must show the following spring hanger data:

- Mark.-N° = Position n°
- H.L. = Hot load
- C.L. = Cold load
- Travel = Calculated travel Ss
- Direction = Travel direction
 - Downward
 - + Upward

At the load scale the cold load (*white marking*) and the hot load (*red marking*) are marked.

