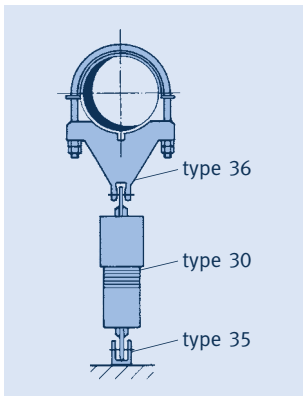


Installation and operating instructions

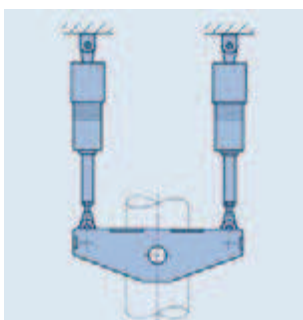
Type 30

Snubbers are precision components of crucial importance for safety. Correspondingly, great care must be taken when dealing with them. Attention to the following points in these instructions is the prerequisite for their proper functioning.



Typical installation situation for type 30

- ① name plate
- ② piston rod casing
- ③ sight glass
- ④ travel indicator
- ⑤ connecting lug



Hanger with snubber type 30 and dynamic clamp type 34 with position-securing plates

1 Transport and storage

LISEGA snubbers are high-precision components of great relevance for safety that must be treated with special care during transport, storage, unpacking and handling before and after installation.

Snubbers and their ancillary components must be stored in enclosed spaces. They must be protected from dirt and damage. It is recommended that they should be left in their original packaging until installation. Any transport damage incurred or damage caused during their handling on installation must be reported at once to the manufacturer.

Snubbers are not suitable in any way as substitutes for steps or ladders. Before work such as sand blasting, welding, painting etc. is carried out in the close vicinity of a snubber, the snubber must be dismantled and removed or protected.



2 Delivery condition

The shock absorbers are supplied as fully operational components including hydraulic fluid. On type 30 the connecting lugs are bolted on one side to the base of the shock absorber and on the other to the piston rod and secured with locking bolts.

LISEGA shock absorbers are manufactured entirely of non-rusting materials. They therefore require no additional surface treatment. The threaded connecting lugs are galvanized and white chromatised.

Weld-on brackets type 35 are supplied separately with the appropriate bolts. The surface protection hereby consists of a weldable primer.

For shipment the type 30 shock absorbers are packed singly with retracted pistons in suitable crates.



Name plate type 30

Stamped on the name plate are:

- type designation
- nominal load
- theoretical travel
- description of hydraulic fluid
- serial number
- order number
- marking and ident. number, if required

3 Installation

The snubbers must be inspected for damage before installation. It must also be ensured that the connecting lugs are firmly attached. The connection components on site and the connecting brackets must be fully welded.

The arrangement of the connection brackets must always be selected so that the maximum deflection angle is in the direction of the greatest operational heat expansion. The lateral displacement is restricted to a maximum of $\pm 6^\circ$. Misalignment of the connection brackets should be prevented, due to the limited possibility of movement.

Any welding at the connections or in their vicinity should take place before installation of the snubbers.

For installation, the type 30 snubbers are to be brought to the required installation dimension (dimension from connection bolt to connection bolt) by extending the piston rods to the necessary installation dimension.

To avoid undesirable blockage of the snubber the rods must be extended slowly, smoothly and below lock-up velocity. The piston rod of the smaller snubbers can be shifted manually. The dead weight of the large-bore snubbers can also be utilized by suspending the snubber from the connecting lug of the piston rod.

The snubbers can be installed in any orientation. The piston rod should be connected to the heat-conducting component so that any radiated heat can be dissipated through the protective casing. When a snubber extension is used, the extension should be connected to the heat source.

The snubbers should be installed in such way that the sight glasses for fluid checks are easily visible from the maintenance walkway.

Connections between components must be form-fit for load actuation. Pin connections in the flow of force must be trakt fit sufficiently.

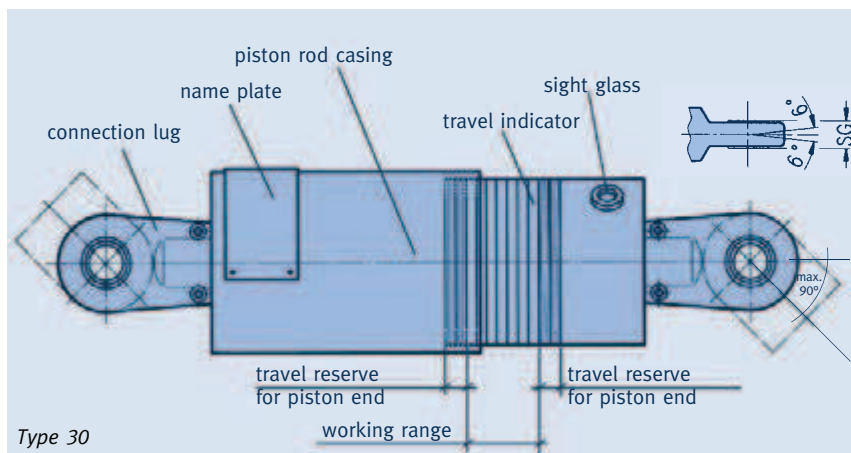
If after installation of the snubber welding work on the connections has to be carried out, care must be taken that no welding current passes through the snubber.

After assembly of a complete system the subsequent inspection of every point of application is recommended:

- A.** Inspection of all connection points for force- and form-fitting attachment (locking- bolts on the connection lugs, securing of all boltings at connections).
- B.** Inspection of the installation position for freedom of movement on expansion. Care must be taken that the connection lugs in the connection brackets remain freely movable and that the piston cannot run into the end of snubber travel.

A travel reserve of min. 10 mm at the end positions is recommended for the piston position. The position can be read off the travel indicator.

Before commissioning of the plant a final visual inspection of all snubbers and their installation positions is recommended.



4 Inspection and maintenance

Under normal operating conditions the snubbers are designed to function trouble-free for the maximum lifespan of a plant. To maintain the operating capacity of the snubbers at all times preventive maintenance is recommended. For this, see p. 47, 'Maintenance recommendations'.



Support of a vertical pipe system section by type 30 snubbers with extension type 33 and dynamic clamp type 34.

Installation and operating instructions

Maintenance recommendations snubbers

Snubbers are crucially important components for the safety of a plant. They serve to protect the piping systems and other components from dynamic overloading from unplanned load cases. As these events occur unpredictably, the full functional safety of the snubbers at all times must be guaranteed.

Under normal operating conditions the service life of the snubbers is designed to match the maximum operational life (60 years) of a plant. The seals and hydraulic fluid should be exchanged at least once during this period, at the latest after 23 years.

Under certain conditions of use (extreme loading), premature aging or increased mechanical wear cannot be excluded. In accordance with the stringent demands concerning reliability, preventive maintenance is recommended. The performance of maintenance work is the responsibility of the plant operator.

Measures

- 1. Regular inspection –**
Visual inspection once a year
- 2. Extended testing –**
Function test, at the latest after 12 years of operation

Implementation

The inspection and maintenance work must be carried out by specially trained personnel.

If required, this work can be performed by specially trained LISEGA service technicians. Fully certified testing facilities are available for dynamic function tests – these mobile test benches can be brought to the plant.

1 Regular inspection

The regular inspection consists of a visual check and should be carried out once a year on all components installed. The first inspection should be directly before commissioning.

In the course of this inspection not only the snubbers but also the installation situation and surrounding conditions must be controlled. The procedure should be carried out with a checklist containing the following information:

- **all positions to be inspected, with details of their locations.**
- **planned, operation-related displacements in connections**
- **special ambient or operational conditions**
- **maintenance measures previously carried out**



Test bench for snubbers

The following points are to be checked at the installation position:

- **name plate data, for conformity with check list**
- **connections at attachment points for force-fitting**
- **freedom of movement for the snubbers on operational deflections**
- **position of piston rod for sufficient stroke, incl. travel reserve (min. 10mm)**
- **external condition for possible signs of damage or leakage**
- **immediate surroundings for any indications of unusual operational stresses, e.g. increased temperature**
- **inspection glass for fluid level**

As long as the reservoir piston is not visible in inspection glass there is sufficient fluid reserve in the reservoir. If the reservoir piston is visible a leakage of fluid must be assumed.

Observations and conclusions must be recorded on the checklist and if necessary supplemented by recommendations for corrective measures.

2 Extended inspection

A supplementary inspection is carried out after an operational period of 12 years in which a small selection of the snubbers installed (min. 2 units per type) are subjected to an additional function test.

After successful testing the snubbers can be re-installed. If any anomalies in behavior are noted, the components in question should be dismantled and the condition of the functionally important individual units examined. The plant management is responsible for any necessary corrective measures and for their documentation.

The scope of the inspections and the selection of the snubbers to be tested should be agreed on between the plant management and the service engineer involved. The different forms of stress (temperature, radiation, loads, operational vibrations) should receive particular attention.

The time-point and scope of the next extended inspection is to be determined on the basis of the recorded test findings.

It is recommended that, after 23 years of operation at the latest, the seals and hydraulic fluid should be exchanged. After the professional execution of this work, the use of original LISEGA spare parts, and successful function testing, the snubbers can go into operation for a further 23 years.



Securing pipe systems with snubbers type 30



Use of snubbers type 30