Rubber Design
vibration and noise control

DOCUMENTATION SHEET

Seismic Isolators
Installation instruction SO6X

INSTALLATION INSTRUCTION

Inhoud

1. Fundamental safety indications

It is advisable to read the instructions completely, before starting to design and / or fit the Seismic isolators. There are several possible ways to fit the seismic isolators to the suspended equipment and / or foundation, the final choice being with the end user.

1.1 Danger indications

Although the components of the seismic isolators should be free from burrs, we strongly advise to wear gloves by handling the seismic isolators. For reason of weight, we advise to apply appropriated lifting material, taking into consideration the available safety rules and instructions for such tools.

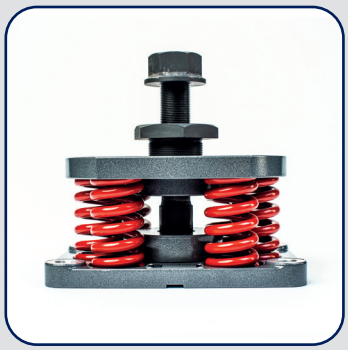
1.2 Symbols

Although the components of the seismic isolators should be free from burrs, we strongly advise to wear gloves by handling the seismic isolators. For reason of weight, we advise to apply appropriated lifting material, taking into consideration the available safety rules and instructions for such tools.

Marking of an endangerment with risk for injuries or damage to properties, if advice is not followed.

Marking of special measures to environmental protection.

Marking of special and other important or particularly useful information.



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2. Purpose of seismic isolators

The purpose of the Seismic isolators is to provide an optimum vibration attenuation under normal running conditions of the suspended equipment and to limit movement in the case of a seismic event.

Seismic isolators are used for a variety of equipment such as i.e. elastic suspensions, generator sets, emergency power supplies, DC-AC converters, air handling units, air conditioning machines, compressor packages, electrical equipment, chiller units, pumps and other applications, subject to the specified operational limitations.

2.1 Specification

The characteristics of the seismic isolators are determined by steel coil springs designed to carry the vertical load in a combination with a horizontal load.

According quality protocol of Rubber Design a random sample size is chosen to check the batch of steel coil springs. Beside the random sample tests every isolator will be tested by Rubber Design. The isolator castings are manufactured in steel. An adjustable central buffer (spindle), manufactured in high tensile steel, controls the displacements of the mounted equipment due to seismic forces, both vertically and horizontally within defined limits and so eliminates the need for separate stoppers. The groove in the base casting allows the buffer adjustment to be checked.

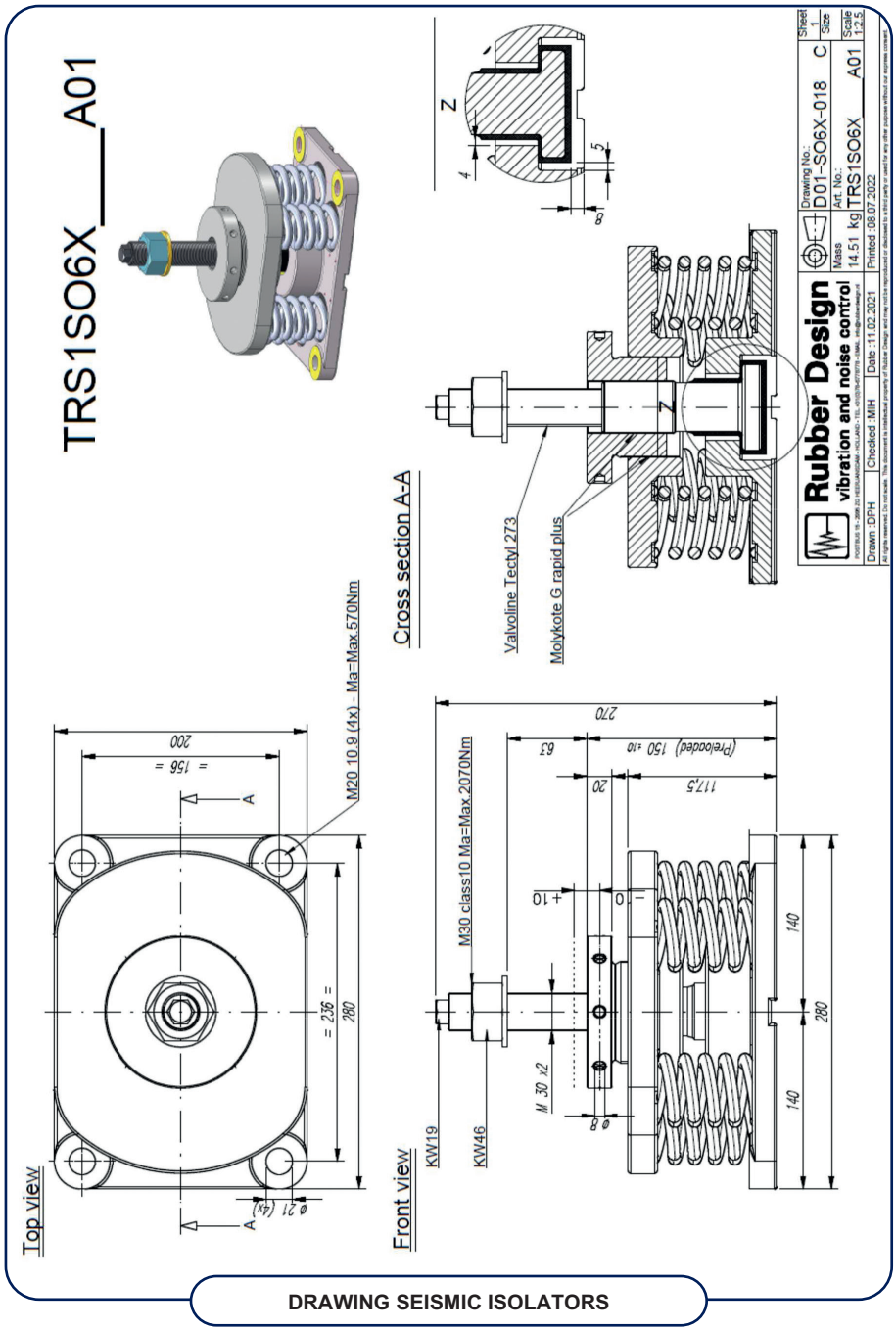
2.2 Shock

For the maximum allowed shock loads of the SO6X please contact Rubber Design. The shock load is for every seismic region different, this means that the seismic forces has to be calculated for every different location.

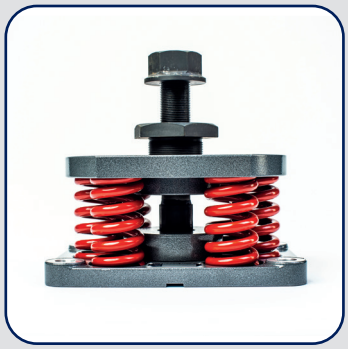
INSTALLATION INSTRUCTION

3. Technical data

3.1 Drawing seismic isolators TRS1SO6X____A01



DRAWING SEISMIC ISOLATORS



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3.2 Weights and torques

Weights and key widths central buffers and nuts seismic isolators

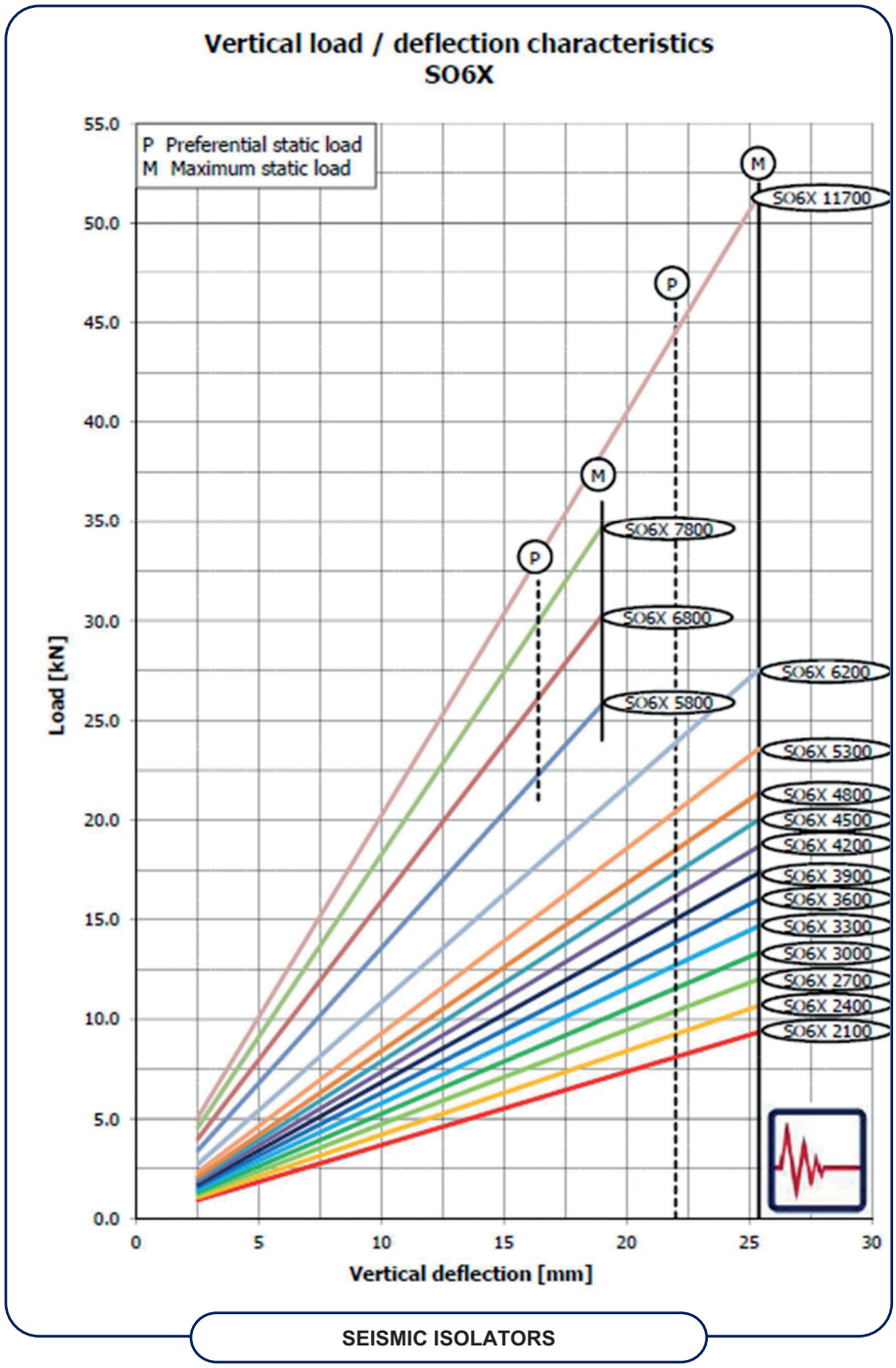
Mounting type	Configuration	Material	Approximate weight	Thread	Key widths Central buffer	Nut
SO6X	Height adjustable	Steel	24.5 kg	M30 x 2	19	46
SO6X	Height adjustable	Steel	24.5 kg	M22 x 1.5*	15	34

Tightening torques bolts and nuts seismic isolators

Mounting type	Configuration	Material	Bolts	Tightening torque (max)
SO6X	Height adjustable	Steel	M 30 (spindle)	2070Nm
			M 22 (spindle)*	855Nm

* M30 / M22 spindles available, see calculation

3.3 Seismic isolators - Load deflection TRS1SO6X____



SEISMIC ISOLATORS

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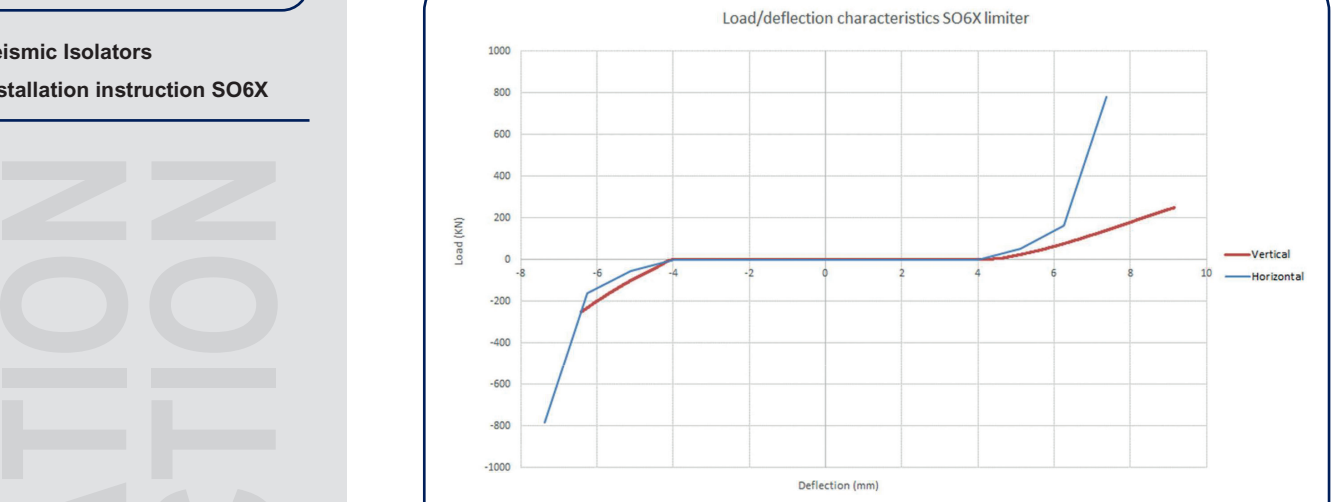


S06X LIMITER

4. Transport

The delivery has to be examined upon receipt for any possible shipping damage. If there is any shipping damage, this must be reported immediately to the carrier. If any shipping damage may lead to dysfunction of the regular operation limits, parts have to be rejected.

Lifting and transporting the product may only be performed by persons who:

- Have the permission to operate cranes.
- Have the permission to drive motorized lifting machines.

Risk of accidents due to falling over

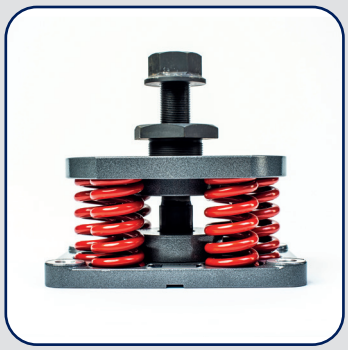
- During transport of the seismic isolators , due to its size and weight, accidents can occur.
- Be careful when lifting not to damage the seismic isolators otherwise it has to be reported.
- Use only appropriate means of transport and lifting equipment with sufficient capacity.
- Don't stand or work underneath suspended loads.
- Wear appropriate protective clothing.

4.1 Unpacking the consignments

Observe the guidelines for environmental protection. As well as environmental friendly disposal of the packaging.

4.2 Cleaning

The cleaning of the seismic isolators should be done with a normal (household) cleansing agent. It is also advisable to use a glycerine-alcohol mixture (1:10). Do not use a solvent cleansing agent.



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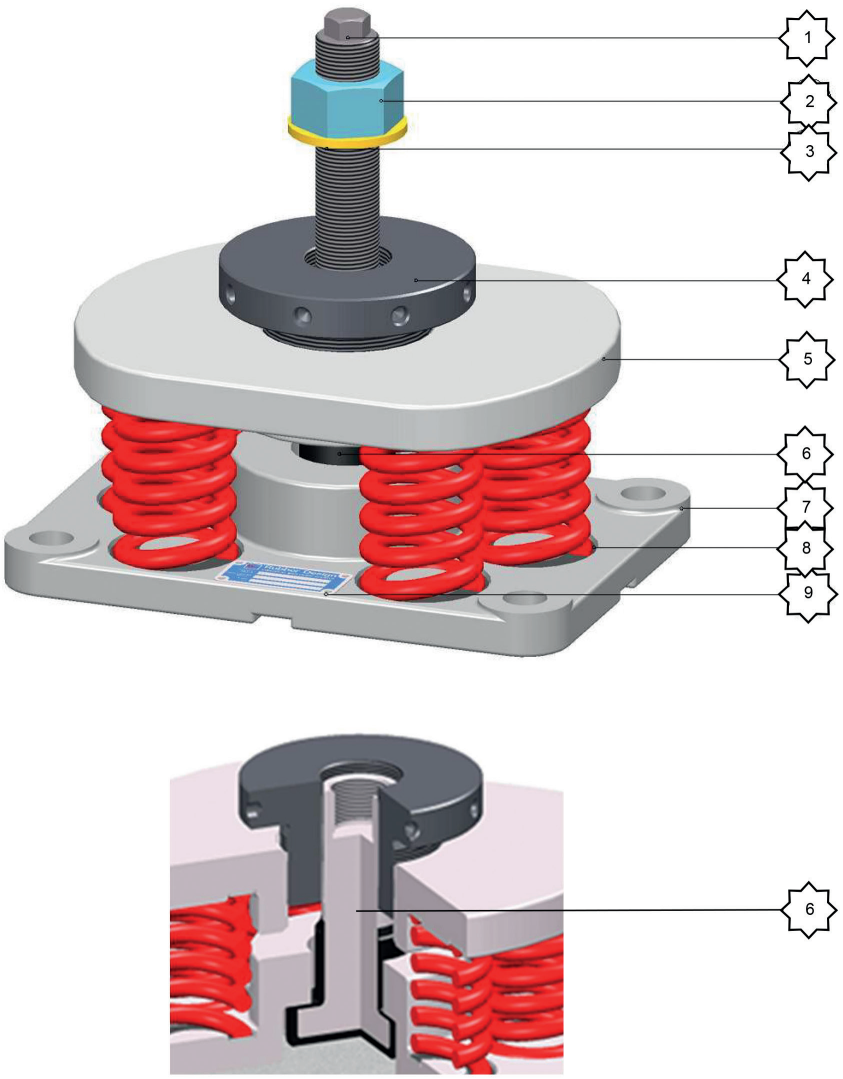
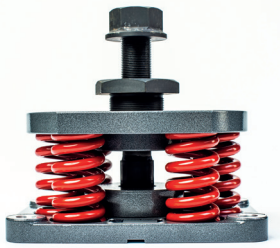
5. Assembly

It is advisable to read the instructions completely, before starting to fit the seismic isolators. See figure below for an overview of the described parts.



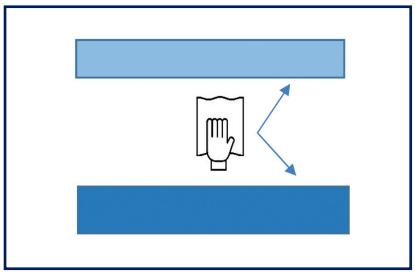
SEISMIC ISOLATORS



1. **Stud**
2. **Nut M30 / M22**
3. **Washer M30 / M22**
4. **Adjusting nut**
5. **Top plate**
6. **Central buffer**
7. **Base plate**
8. **Steel coil springs**
9. **Name plate**

5.1 Preparation

Fig.1: It is critical that the correct seismic mount is installed at the proper position (according to project calculation). Clean the bracket and the seismic mount, especially on the contact surfaces. Clean the upper surface of the foundation from dust, rust, oil, dirt and particles at the intended positions of the seismic isolators.



5.2 Fitting

Fig.2: Bring the isolators into position. The centre-line from the central buffer = centreline from the mounting hole.

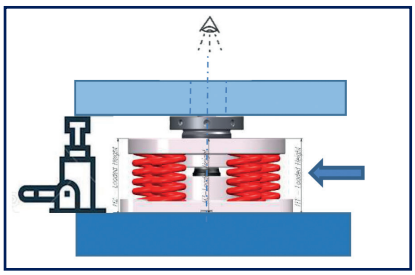


Fig.3: Lower load on the isolator

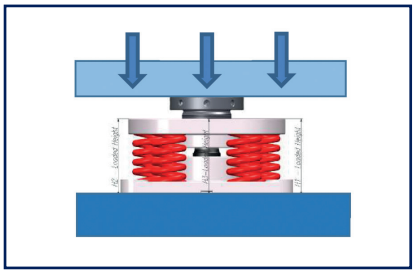
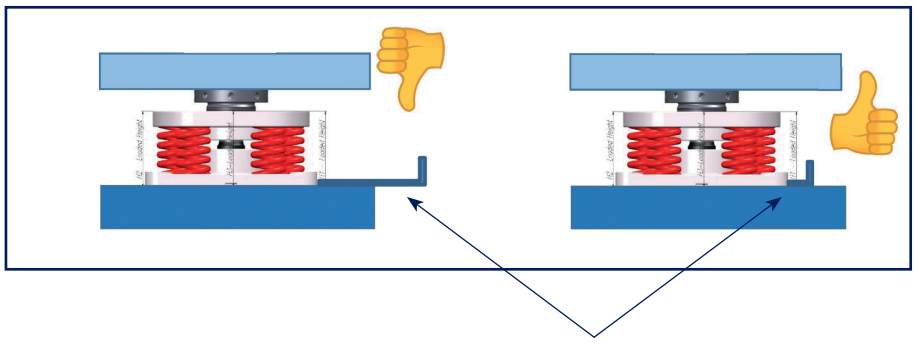


Fig.4: Check if the central buffer is (not) making contact with the foundation by means of a feeler gauge (Ø 3 mm bar).



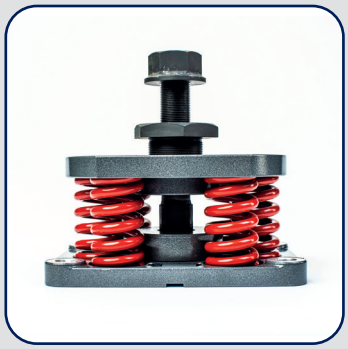


Fig.5: Install the stud (1) by moving clockwise by hand tight. Check that all central buffers (6) can be turned easily by applying a spanner to the stud. If this is not possible it will be necessary to partly remove the installation load, until the buffer assembly can be turned freely.

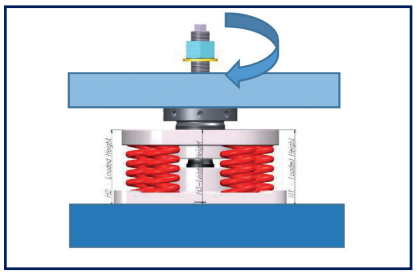
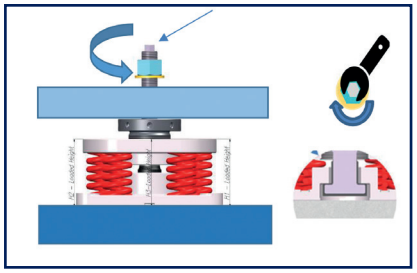


Fig.6: The stud (1) should now be turned anti clockwise (upwards) and the installation re-lowered onto the mountings. Check that the stud and buffer assembly can be turned freely with full installation load on the mountings.



5.3 Fitting

Fig.7: Align the Seismic Open isolators on the foundation floor. The isolator will be adjusted via with an C-wrench till the target height according calculation (wet weight) is reached.

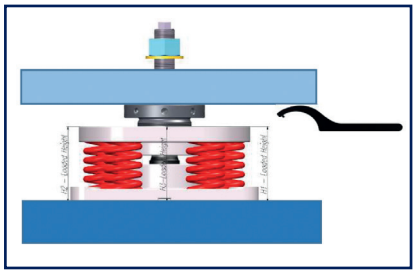


Fig.8: It is advisable to align in steps according sequence in the drawing below.

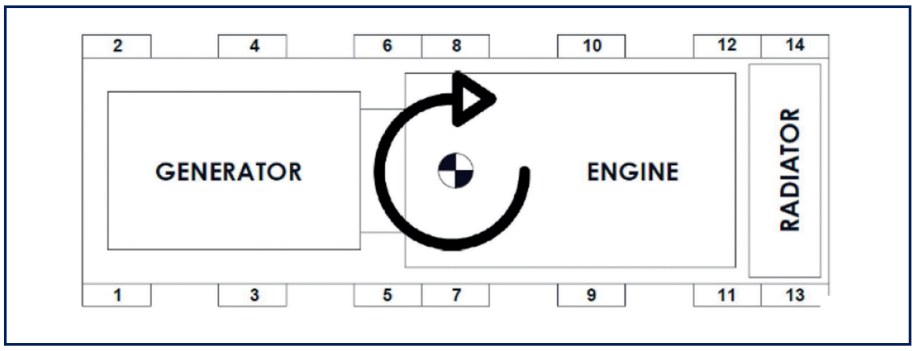
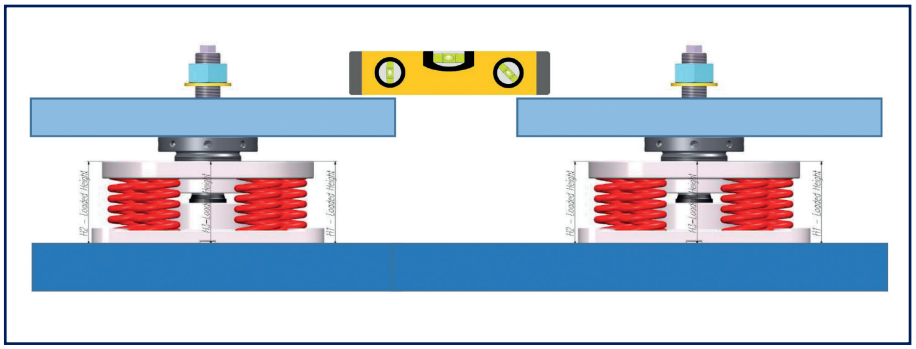
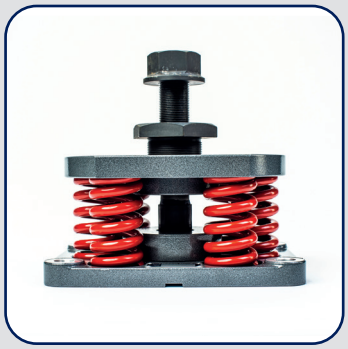


Fig.9: Alignment result.





5.4 Vertical buffer adjustment

We advise that the buffer clearance should be set by means of the number of turns of the central buffer. The pitch of the thread is precisely machined, therefore the working clearance must be correct if the buffer clearance is set as described below.

Fig.10: The central buffer working clearance for each mounting can be set as follows: Turn the stud clockwise (downwards) to the maximum lower position until the central buffer contacts the foundation. The stud can be tightened onto the buffer (max. torque 40 Nm).

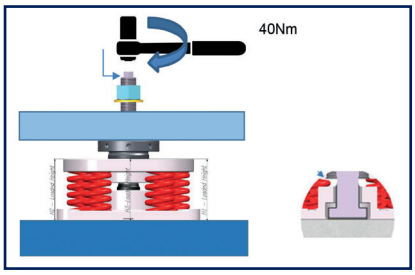
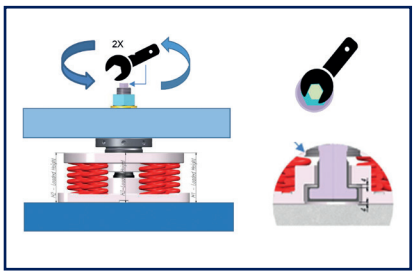
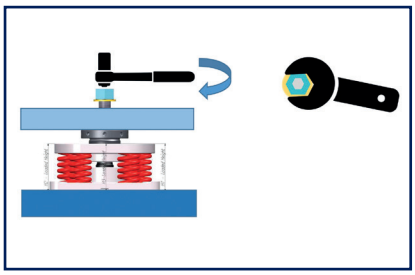


Fig.11: Turn the stud (upward) into its operation position and to set the working clearance (see table). The central buffer clearance can be checked by using a feeler gauge though the groove in the base casting of the seismic isolators. A feeler gauge with a thickness of 3,5 mm has to pass easily under the central buffer. If the stud loosens from the buffer, while turning anti-clockwise, the stud should be tightened again onto the buffer.
The groove in the base is not meant as a guide for setting the buffer clearance, which has to be done by using the pitch of the thread, but only meant as a tool to check whether the central buffer is not in contact with the foundation.



5.5 Final Assembly

Fig.12: The buffer can be fixed means of an M30 / M22 nut , while simultaneously blocking the buffer by applying a spanner to the stud. The nut should be tightened with the maximum torque.



5.8 Table with dimensions / tolerances

Mounting type	Allowable difference per mounting	No. of turns to set working clearance*	Working clearance**
SO6X	2.0 mm	2,0 (anti-clockwise)	4 mm

* Seen from filler plate or foundation - environmental temperature 20°C
** Given values are ideal values, tolerances of +/- 10% are allowed

6. Maintenance

A correctly dimensioned and installed seismic isolator does not require any maintenance. But if some dirt between the windings of the steel coil springs is noticed it is advised to clean this.

6.1 Cleaning

When cleaning the engine or the engine room with a solvent cleansing agent, it is advisable to cover up the seismic isolators.

6.2 Paint

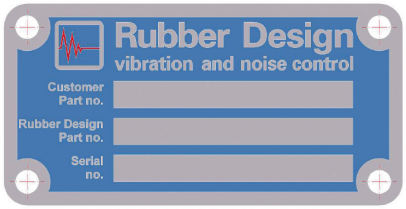
If required, the seismic isolators can be painted by the customer. Be aware that the rubber rings can´t be painted.

6.3 Central buffer clearance

The central buffer clearance should be examined and reset if necessary during normal maintenance programmes. The central buffer clearance can be checked by using a feeler gauge though the groove in the base casting of the mountings. A feeler gauge with a thickness of 3.5 mm has to pass easily under the central buffer.

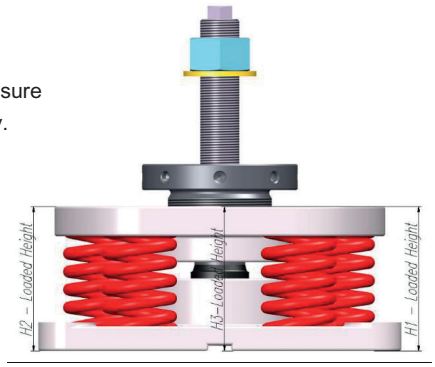
6.4 Traceability by part numbers

Each seismic isolator has a part number. This number is mentioned on the steel ID plate and should be visible.



Loaded condition

Before measuring the loaded height; please make sure that the internal buffer (spindle) can be turned freely.



Pos	Serial number	H1	H2	H3 ((H1+H2)/2)	Levelling (Htad-H3)*	Temperature
1						
2						
3						
4						
5						
6						
7						
8						
9						
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12						
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27						
28						
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30						

Average of Htad*
Space to make a sketch of the locations / positions
Htad = total average deflection

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7. Remarks

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