

KSBX

Kit for SBX and SBK series shear beam load cells to weigh silos, conveyor belts and rigid structures.



CONTENTS

1.	INTRODUCTION	3
	Benefits	3
	Main parts of the kit	3
	Dimensions	4
	Technical features	5
2.	INSTALLATION	6
	Installing the kit	6
	Additional settings and features	9
	Cell removal	11
	Installation tips	12
	Earth connection	13
	“Dummy load cell” configuration	14
	Tensioners for lateral forces	15

INTRODUCTION

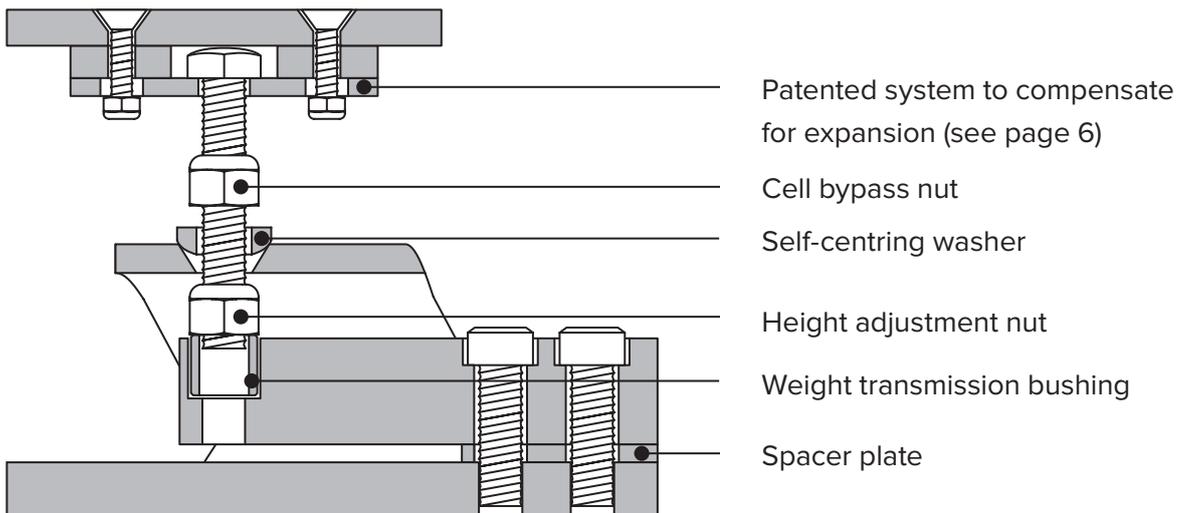
The KSBX kit is a mechanical assembly entirely made of STAINLESS STEEL, designed to speed up and simplify the installation of the SBX/SBK series shear beam load cells up to 2500 kg under silos, hoppers, tanks and other rigid structures.

BENEFITS

The KSBX kit offers a number of benefits:

- It makes the cell easier to install and remove.
- It protects the cell when the structure is moved and transported.
- It is height-adjustable to offset any differences in level of the structure weighed.
- It compensates for any expansion of the structure (within the limits reported in the table on page 5).
- When blocked, it can serve as a false load cell (within the limits reported in the table on page 5).

MAIN PARTS OF THE KIT

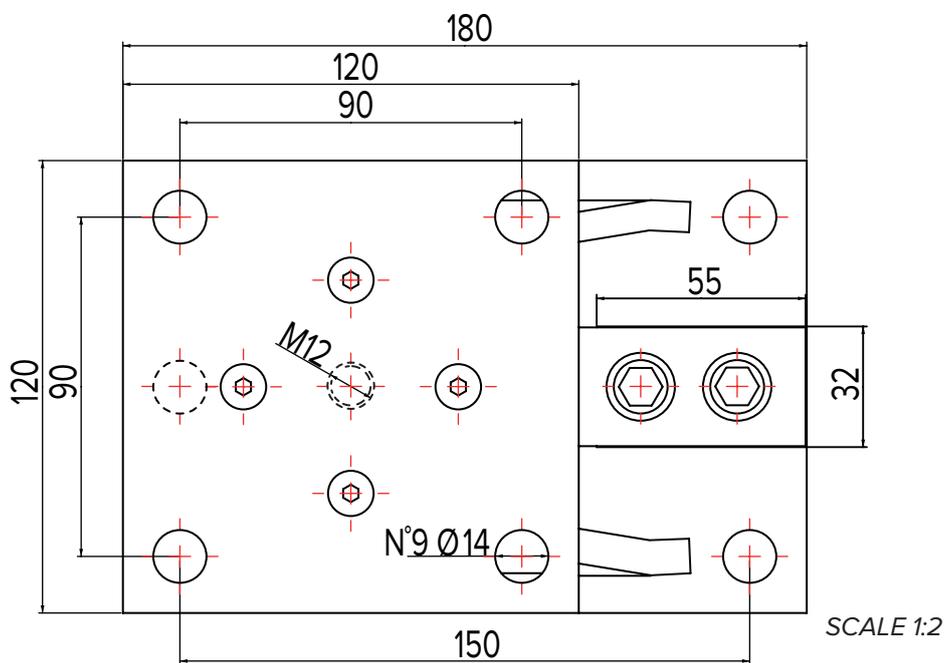
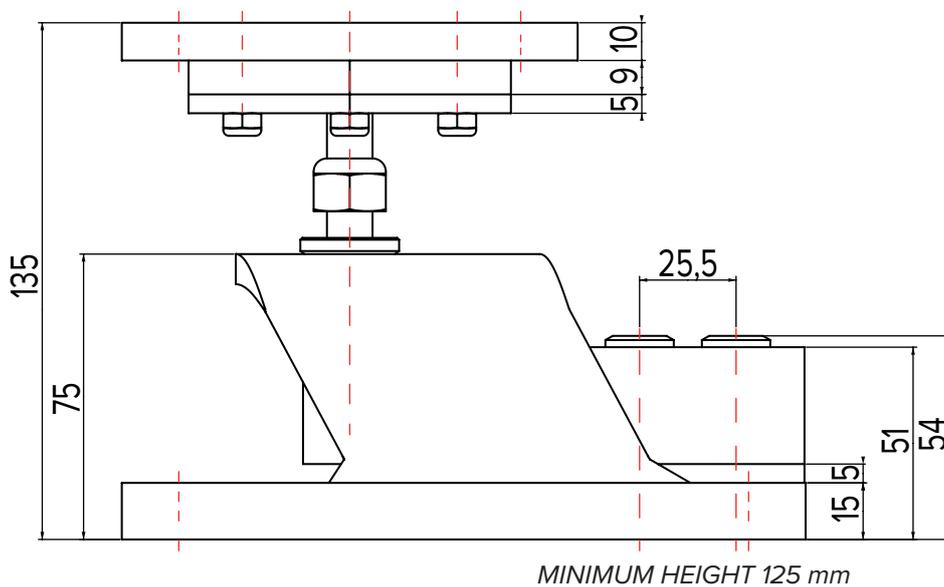


Use the following to assemble and adjust the kit:

- 10 spanner
- 19 spanner
- 4 Allen wrench
- 10 Allen wrench

DIMENSIONS in mm

■ KSBX



TECHNICAL FEATURES

		KSBX	
COMPATIBLE LOAD CELLS		SBK/SBX SERIES UP TO 2500 kg	
MATERIAL		STAINLESS STEEL AISI304	
WEIGHT (kg)	WITH LOAD CELL	6,2	
	WITHOUT LOAD CELL	5,1	
SAFETY LOAD IN COMPRESSION	 WITH LOAD CELL	120% F.S.	
	 WITHOUT LOAD CELL	2500 kg	
BREAKING LOAD IN COMPRESSION	 WITH LOAD CELL	300% F.S.	
	 WITHOUT LOAD CELL	3000 kg	
SAFETY LOAD IN TRACTION	 WITH LOAD CELL	1000 kg	
	 WITHOUT LOAD CELL	1000 kg	
BREAKING LOAD IN TRACTION	 WITH LOAD CELL	1500 kg	
	 WITHOUT LOAD CELL	1500 kg	
MAXIMUM ANGLE OF THE SUPPORTING LEVEL			+/- 1°
EXPANSION COMPENSATION		+/- 2.5 mm	
		+/- 2.5 mm	
ATEX EX MARKING (upon request)		ATEX II 2GD c IIC T6 85°C	

INSTALLATION

INSTALLING THE KIT

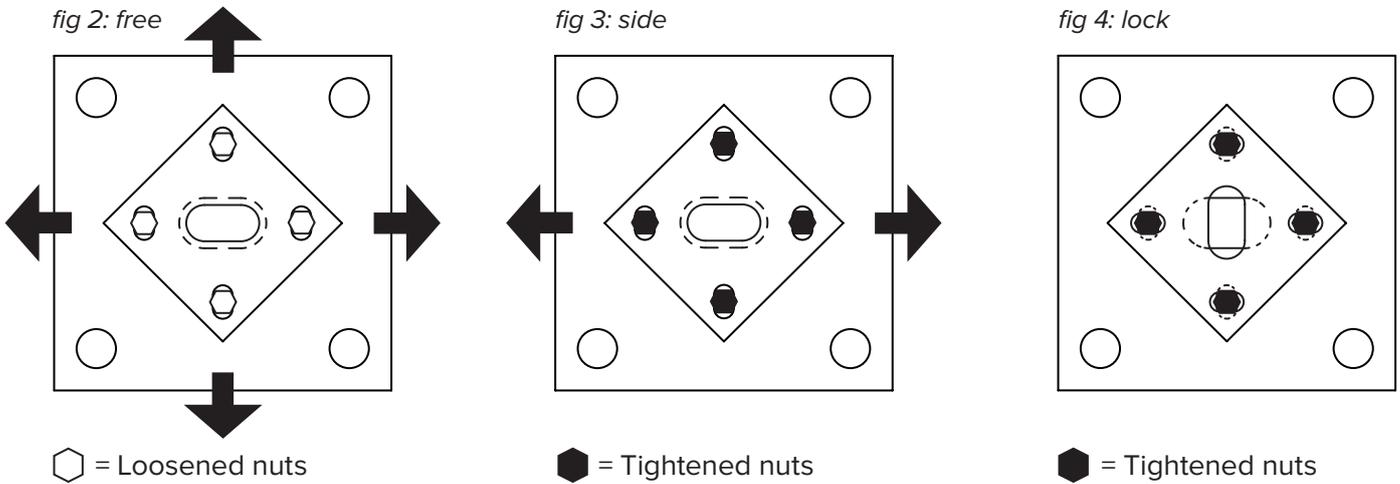
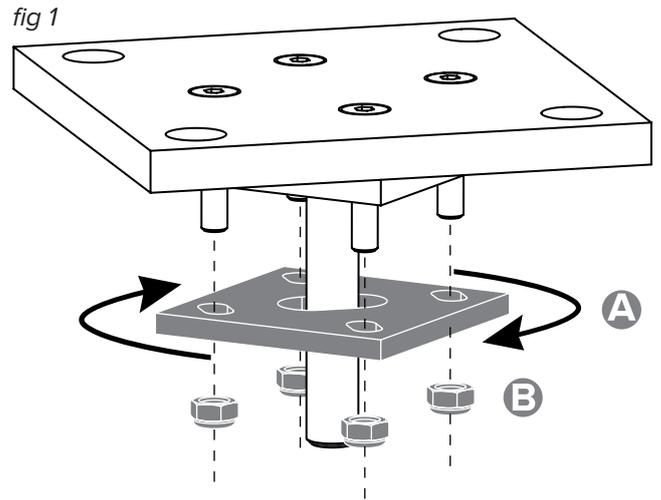
The KSBX kit is installed in three simple steps:

1. CONFIGURE THE UPPER PLATE

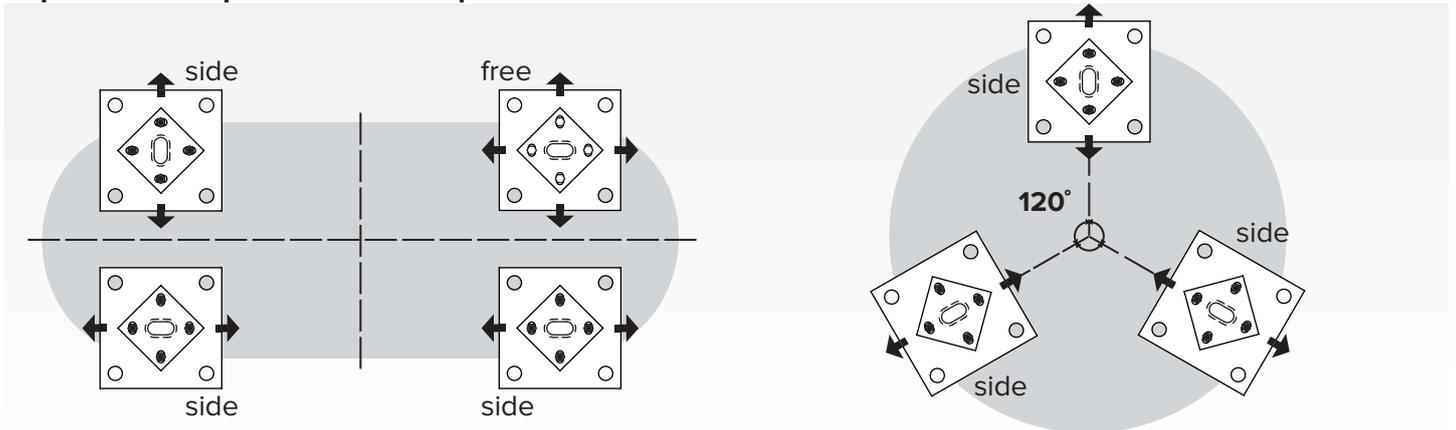
The plate can be fully or partially blocked or fully released in order to counter or compensate for any expansions of the weighed structure within the limits reported on the table on page 5. Higher values require additional solutions like tie rods, limit switches, etc.

By turning the bottom plate (part A, fig 1) and tightening or loosening the 4 bottom nuts (part B, fig 1), one can obtain the following configurations:

- "free": compensation in both directions. (fig 2)
- "side": compensation in one direction. (fig 3)
- "lock": no compensation. (fig 4)

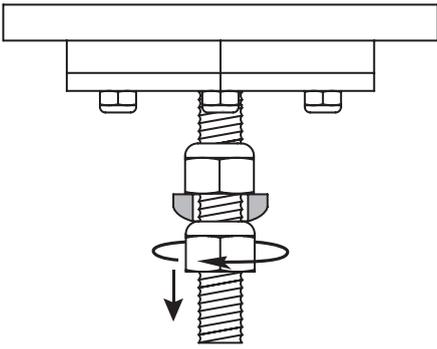


Expansion compensation: examples on silos with 3 and 4 feet.

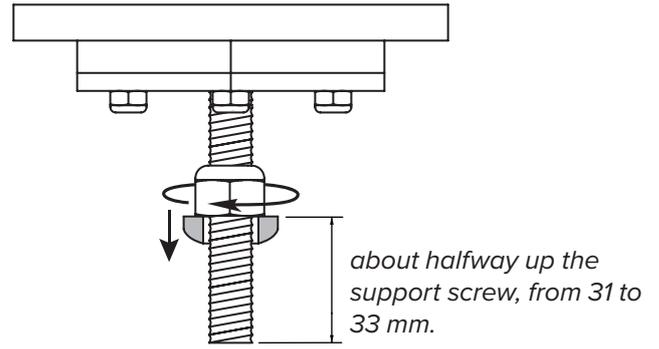


■ 2. ASSEMBLE THE KIT

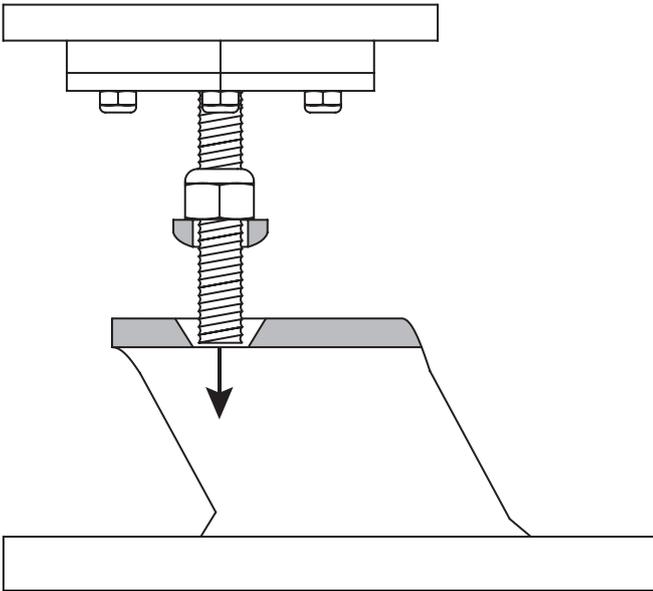
1.



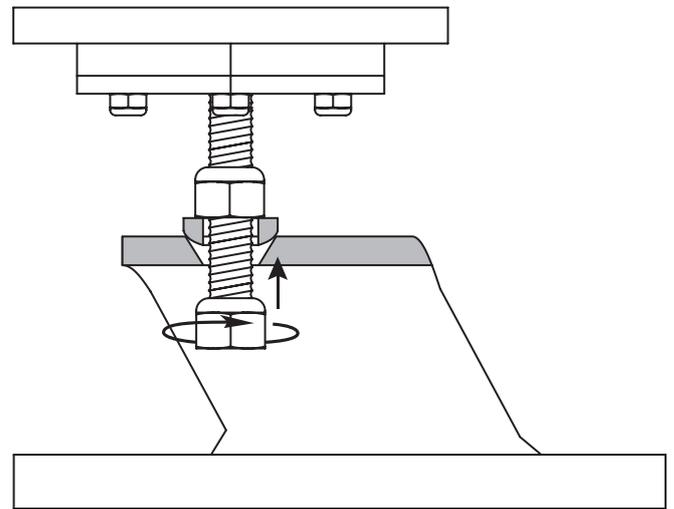
2.



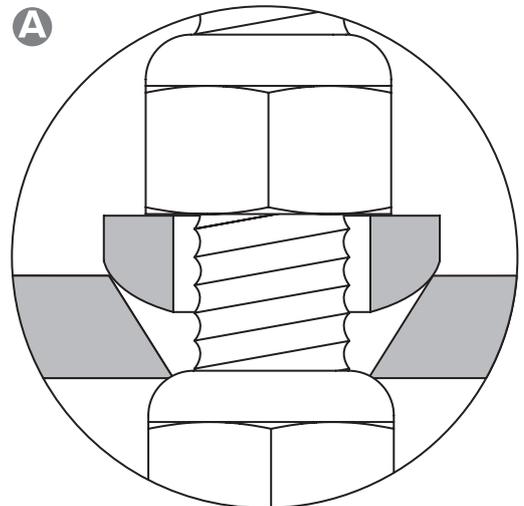
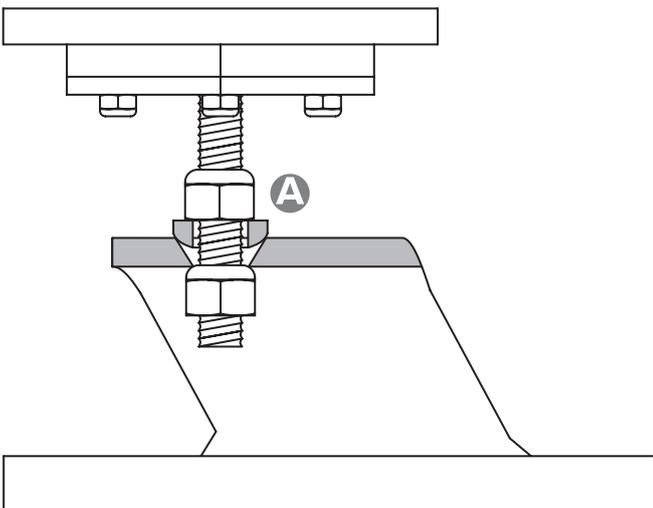
3.



4.

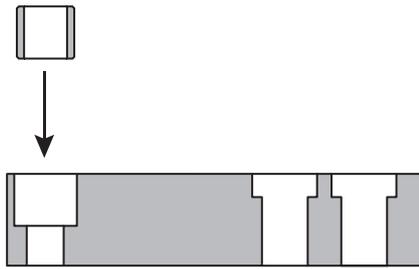


5.

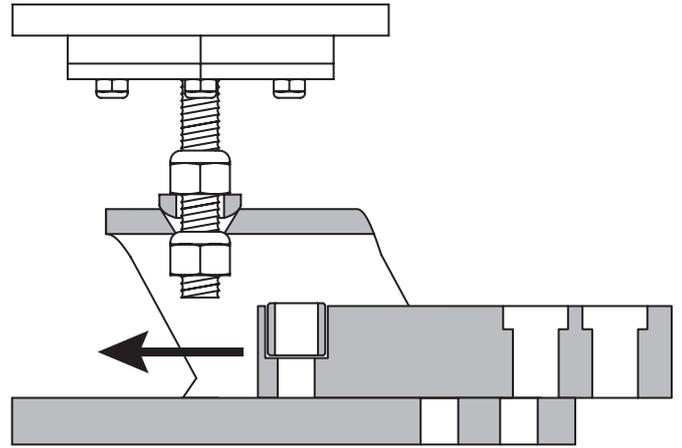


■ 3. INSTALLING THE CELL

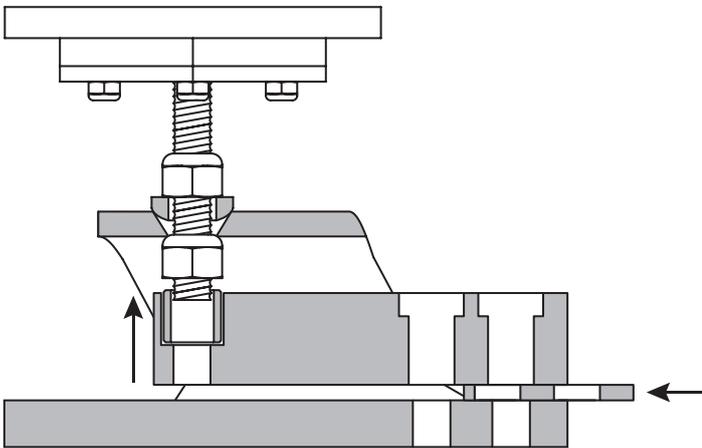
1.



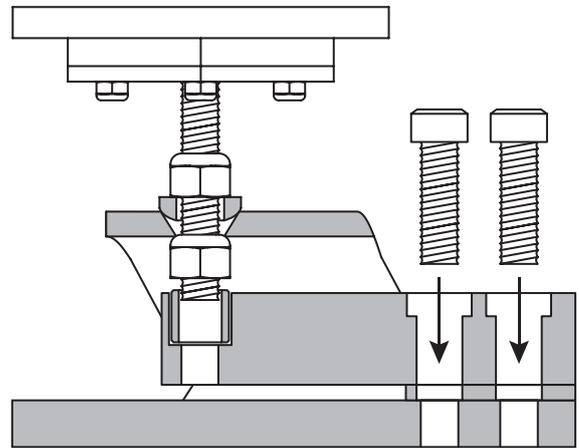
2.



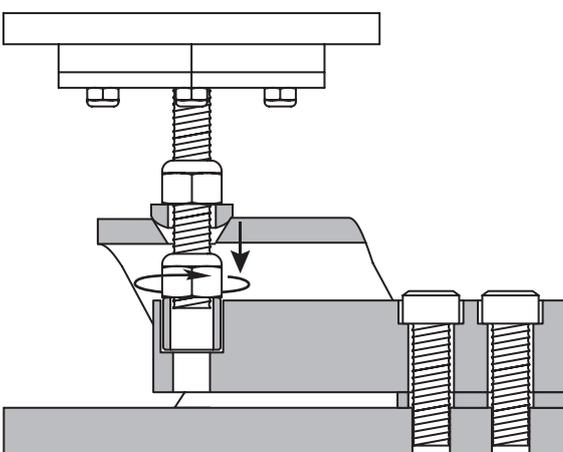
3.



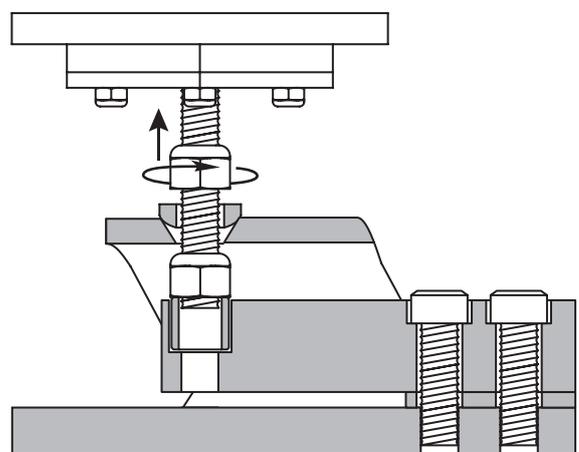
4.



5.



6.



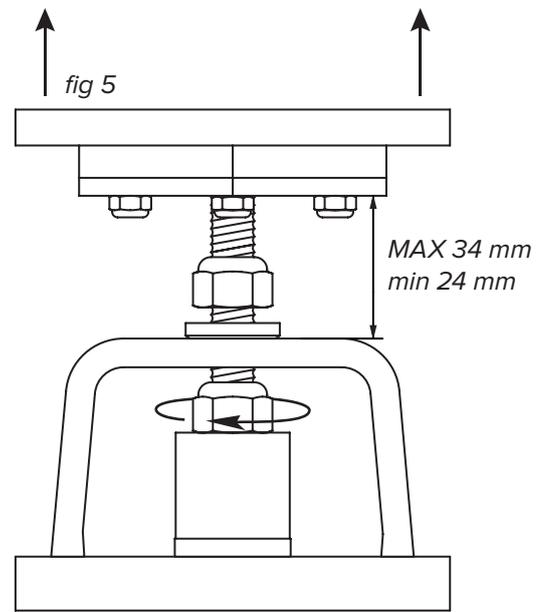
ADDITIONAL SETTINGS AND FEATURES

1. KIT HEIGHT ADJUSTMENT

The height of the kit can be adjusted to correct any differences in level:

- by screwing the adjustment nut against the bushing, the loading surface moved up (fig 5).
- by unscrewing the nut, the loading surface moved down (you might need to lift the bypass nut).

For any operation, you might need the help of a lifting system.

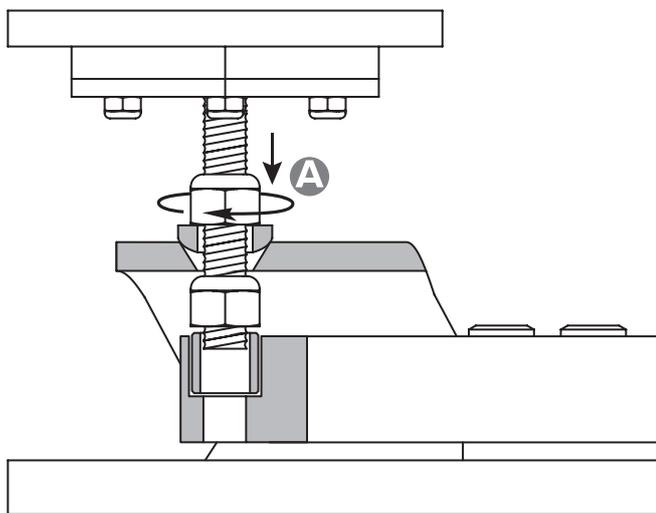


2. CELL BYPASS

Thanks to this feature, the weight of the structure is discharged directly on the kit, thereby bypassing the load cell.

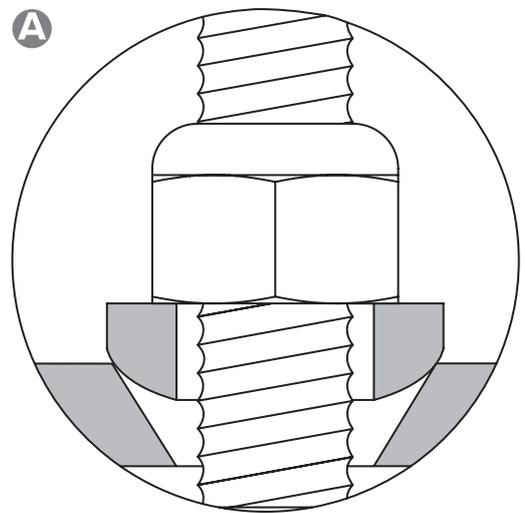
To bypass the cell (fig 6), ensure the bypass nut touches the self-centring washer and move away the adjustment nut from the bushing.

fig 6



BENEFITS

- Effective solution to protect the load cell when the structure is moved and transported.
- Safety when maintenance is conducted on the cell and the latter is replaced.



■ 3. LIMIT SWITCH ADJUSTMENT

A simple and effective solution to withstand overloading by moving the weight of the cell to the kit supporting structure.

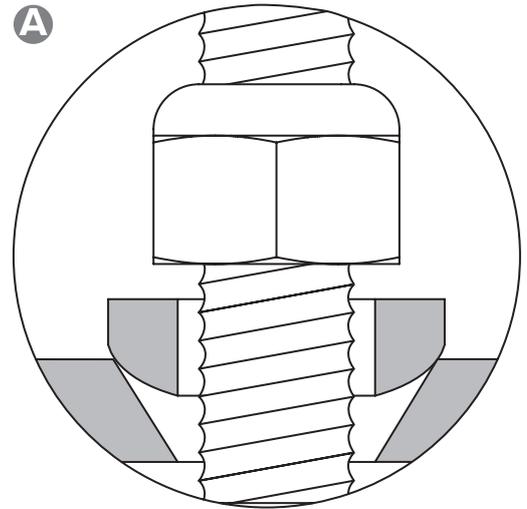
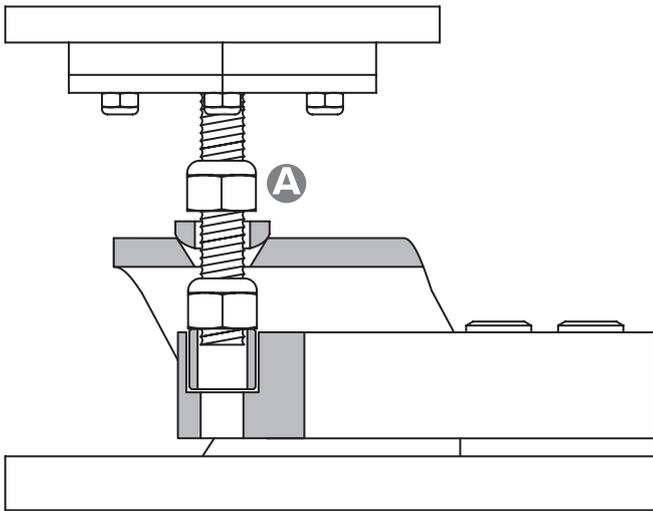
To configure the bypass nut in limit switch mode:

- load the structure according to the maximum pre-set capacity (within the loading limits of the cell)
- adjust the bypass nut (fig 7, part A) by ensuring it touches the self-centring washer
- unscrew the bypass nut by one full turn

BENEFITS

- Protection of the cell against accidental overloads
- In combination with the adjustment nut, it provides an anti-tilting function (within the limits indicated in the table on page 5)

fig 7



■ 4. KIT BLOCK

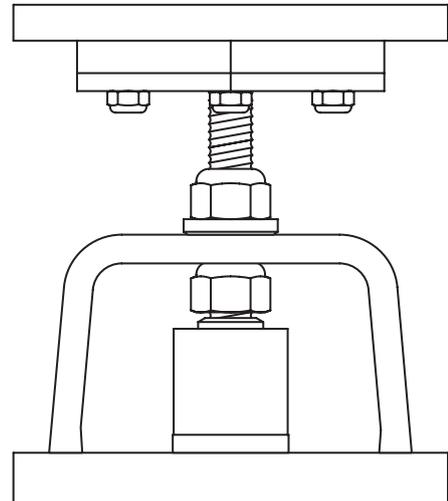
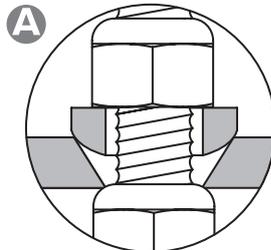
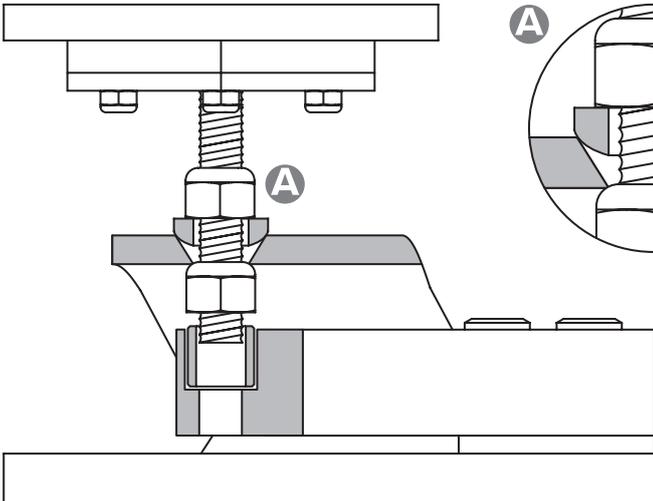
This kit configuration blocks the vertical movement of the support screw, thereby fully bypassing the cell.

Both nuts must be tightened fully home against the main structure.

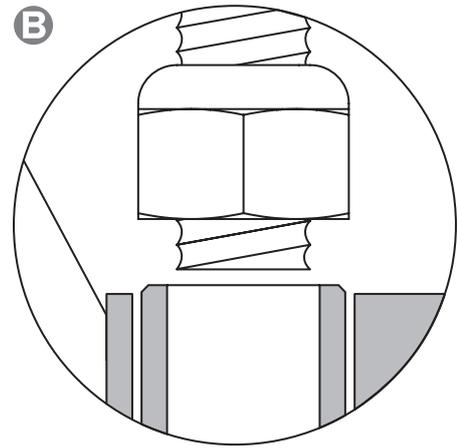
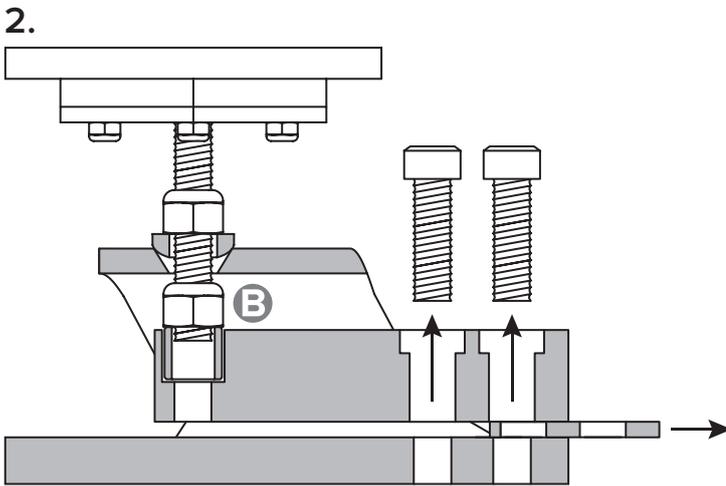
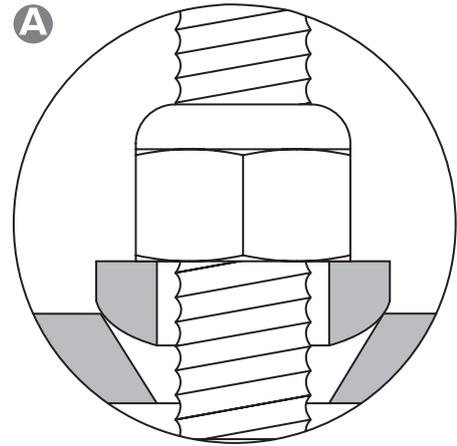
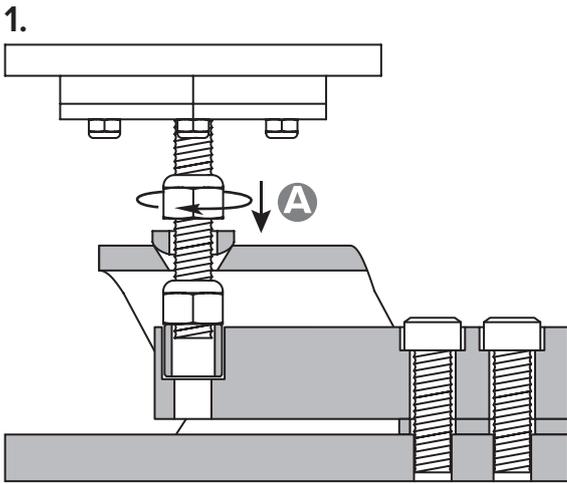
BENEFITS

- Use as a dummy load cell to weigh liquids.
- Protection of the cell/anti-tilting cell when the weighed structure is transported.

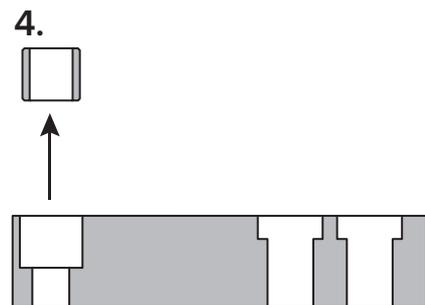
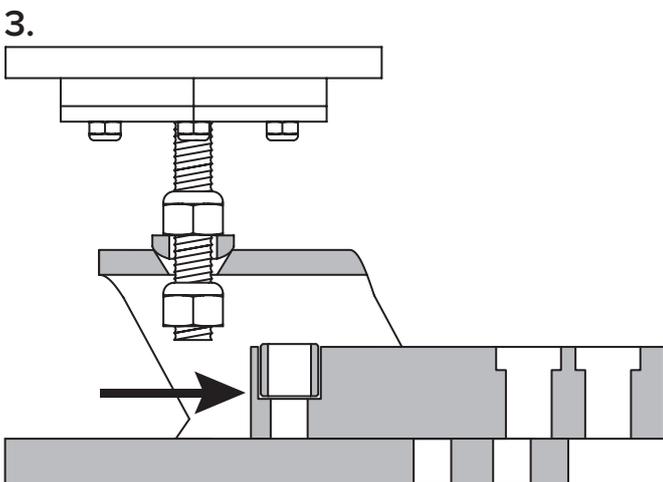
fig 8



CELL REMOVAL



If the supporting screw does not allow for the removal of the cell by taking out the plate, the structure will need to be moved further up by lowering the adjustment nut and then lower the bypass nut. This may require the use of an additional lifting system.



INSTALLATION TIPS

SUPPORTING BASIC FEATURES

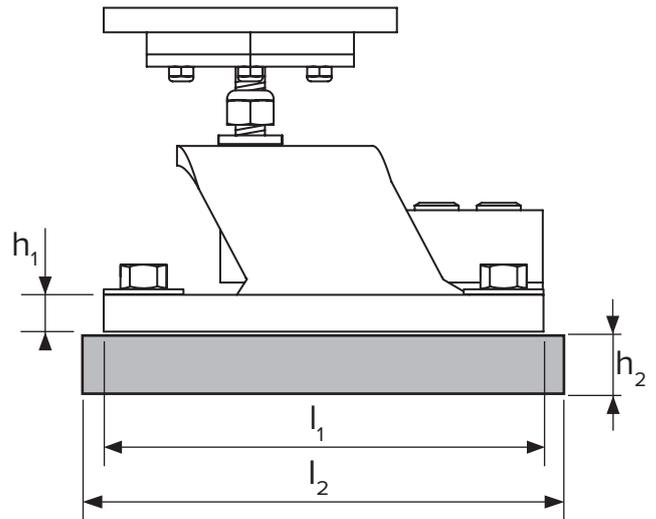
The supporting base of the weighing kit must be extremely rigid and must have a suitable surface and thickness to ensure the lower plate of the KSBX kit works properly.

Calculate the thickness h_2 according to the precision, the structure to be supported and the environmental conditions. You may want to consider the following, at least:

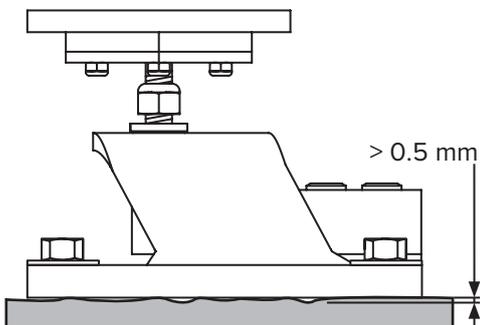
$$h_2 \geq h_1 \quad \text{and} \quad l_2 \geq l_1$$

Recommended dimensions:

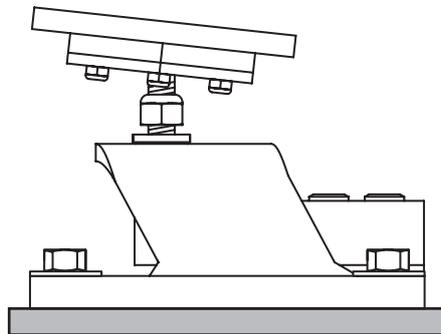
KSBX	$h_2 \geq 15 \text{ mm}$	$l_2 \geq 180 \times 120 \text{ mm}$
-------------	--------------------------	--------------------------------------



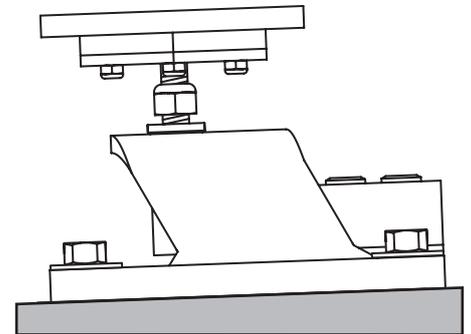
TO BE AVOIDED



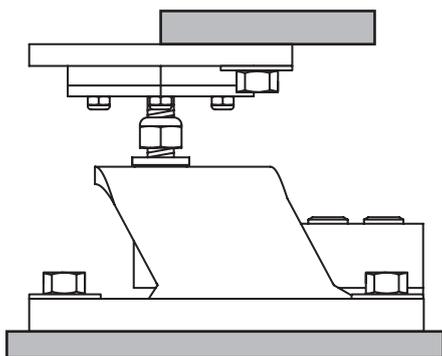
Non-planar and irregular surfaces with roughness greater than 0.5 mm.



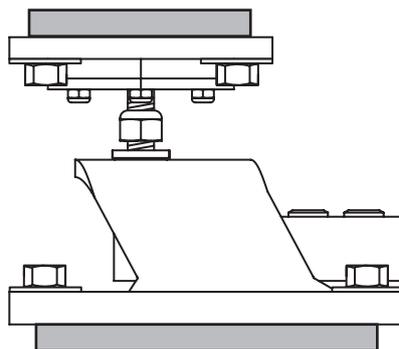
Top plate and bottom plate inclined over the limits allowed.



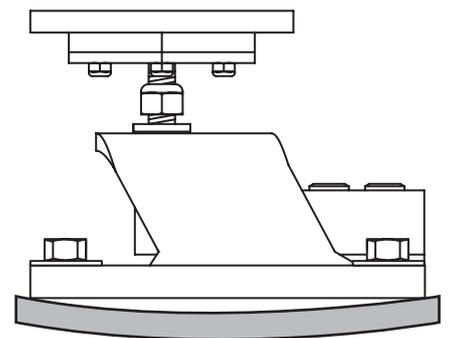
Inclined surfaces over the limits allowed.



Misaligned load.



Supporting base of the kit is too thin and/or short.



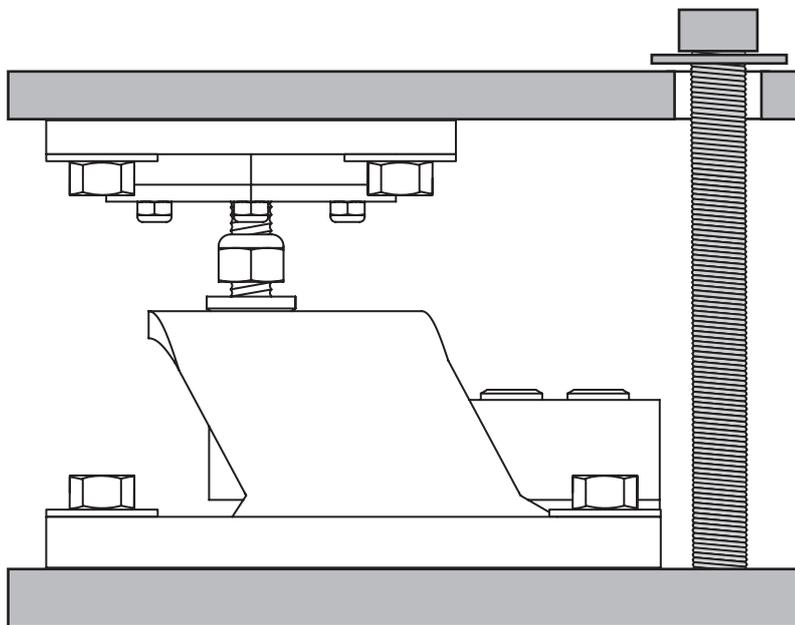
Non-rigid supporting bases, which can deform under a load.

■ ANTI-TILTING SOLUTION

The KSBX kit does not have an anti-tilting function for the forces referred to in the table on page 5.

If the reported values are exceeded, we recommend increasing the protection of the weighing structure by adding adequately sized additional anti-tilting systems. It is good practice to adjust the system so as to leave a stroke of no more than 2 mm.

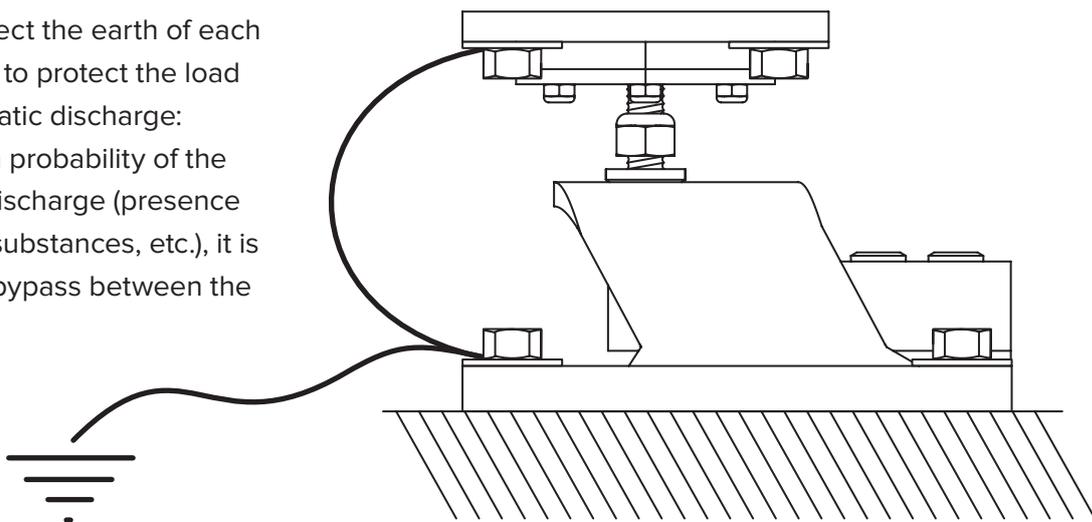
Example layout of anti-tilting solution.



EARTH CONNECTION

It is recommended to connect the earth of each weighing kit properly so as to protect the load cell from parasitic electrostatic discharge:

For environments with high probability of the formation of electrostatic discharge (presence of dust, plastics, synthetic substances, etc.), it is recommended to create a bypass between the top plate and bottom plate:



■ CABLE SECTION

We recommend using a cable of adequate section to withstand the electrical discharges but no less than 16 mm².

Use an eyelet terminal of adequate diameter to connect the cable to the kit.

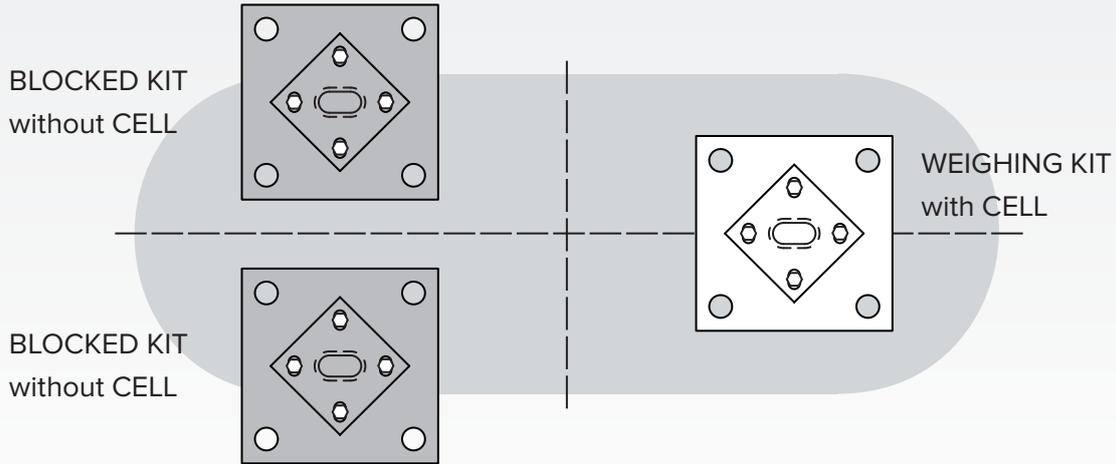
“DUMMY LOAD CELL” CONFIGURATION

Applicable solution to measure levels and the weight of fluids and liquefied gases.

This involves the use of a single KSBX weighing kit with a load cell and n KSBX kit without cell in a blocked configuration, which support the weighing structure and allow the load cells to be added later so as to increase precision.

BENEFITS

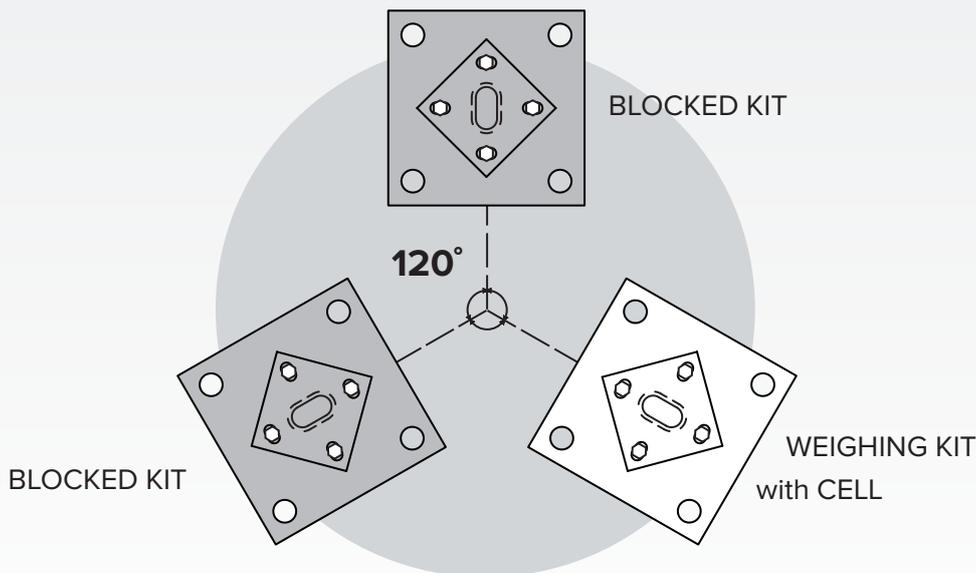
- Reasonable price
- Speed of installation



Perform the theoretical calibration with Dini Argeo indicator, by setting:

$CEL.CAP = \text{capacity of the load cell} \times 2$

$CEL.SE_n = \text{nominal signal of the cell (for example 2mV/V)}$



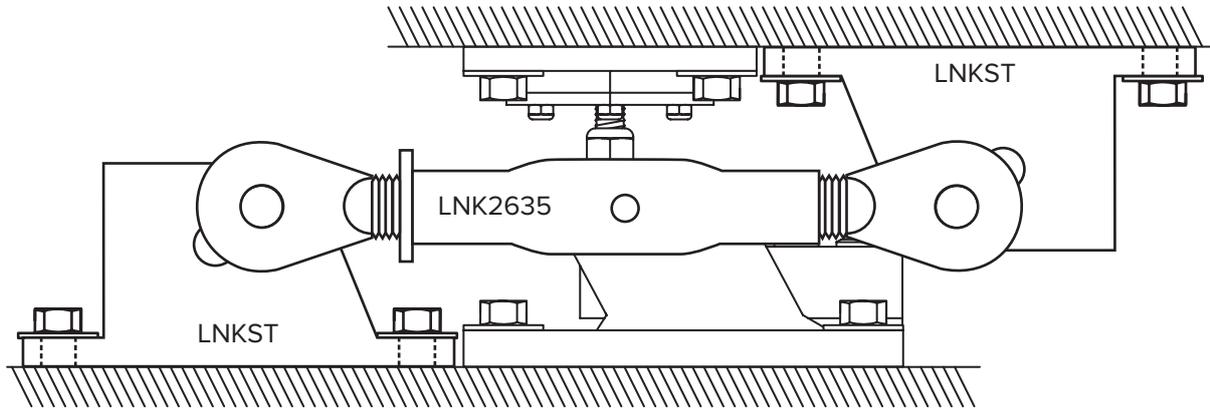
Perform the theoretical calibration with Dini Argeo indicator, by setting:

$CEL.CAP = \text{capacity of the load cell} \times 3$

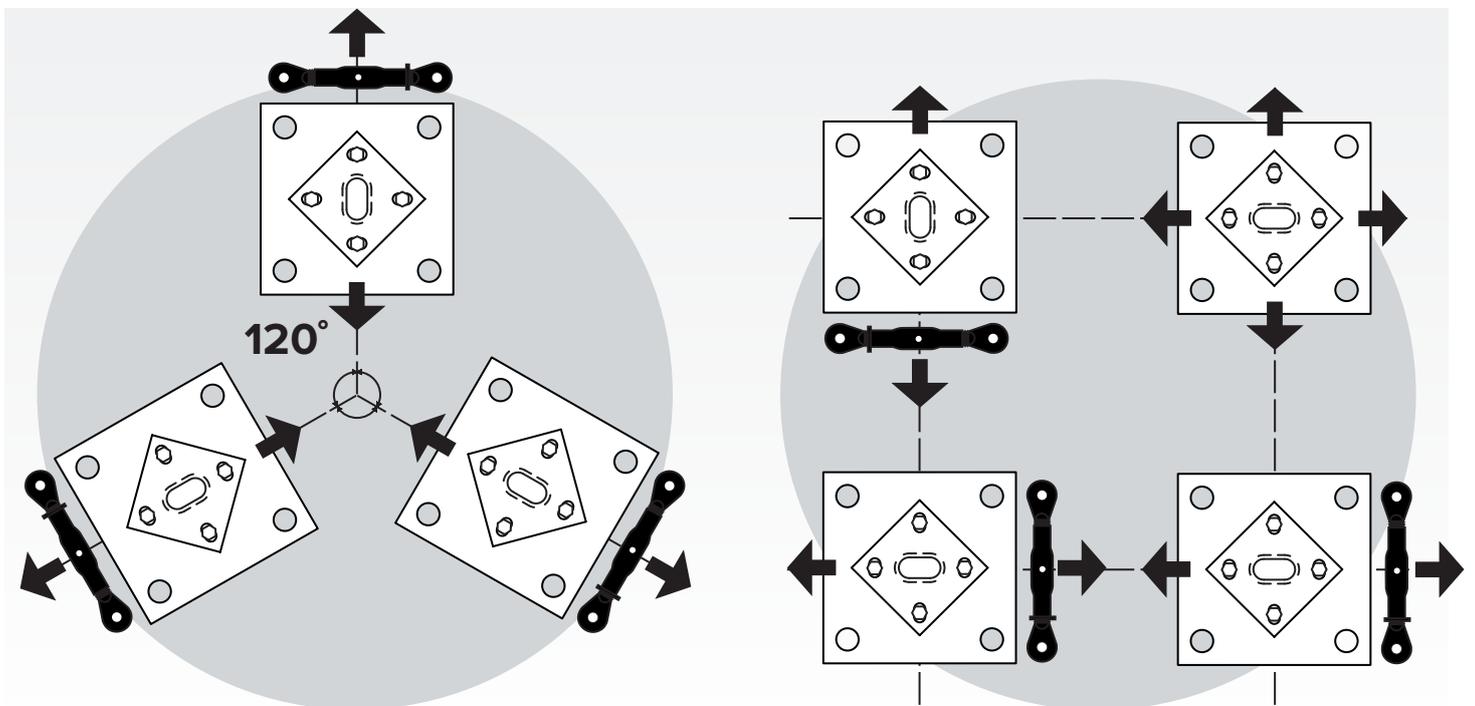
$CEL.SE_n = \text{nominal signal of the cell (for example 2mV/V)}$

TENSIONERS FOR LATERAL FORCES

Ideal to counter any lateral forces such as wind, expansions and accidental impacts that could affect the operation of the weighing kit.



Examples of recommended layout





HEAD OFFICE

Via Della Fisica, 20

41042 Spezzano di Fiorano, Modena - Italy

Tel. +39.0536 843418 - Fax. +39.0536 843521

info@diniargeo.com

SERVICE ASSISTANCE

Via Dell'Elettronica, 15

41042 Spezzano di Fiorano, Modena - Italy

Tel. +39.0536 921784 - Fax. +39.0536 926654

service@diniargeo.com