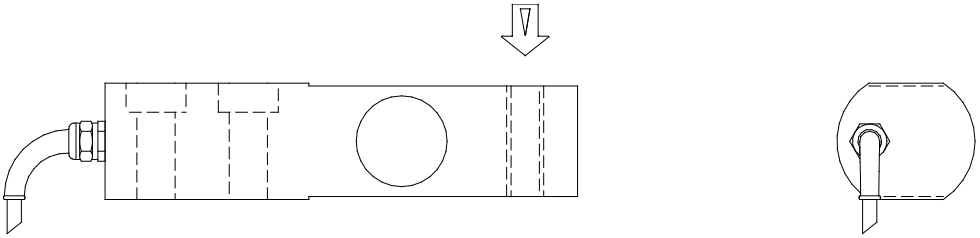
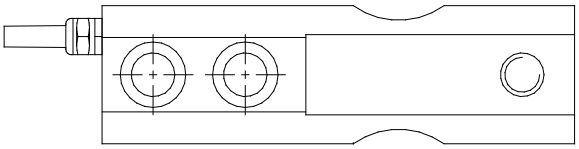


5510 CELL SERIES

INSTALLATION MANUAL



Rev.	Date	Reason
1	27/03/2019	Adding point 4, 5, 6, 7, 8 and 9 (EU Declaration of Conformity)
2	25/02/2021	Adding drawings and diagrams (pages 10 on 13) and modification of label on page 8 (CE 0 418 becomes CE 2813)

1. GENERAL INFORMATION

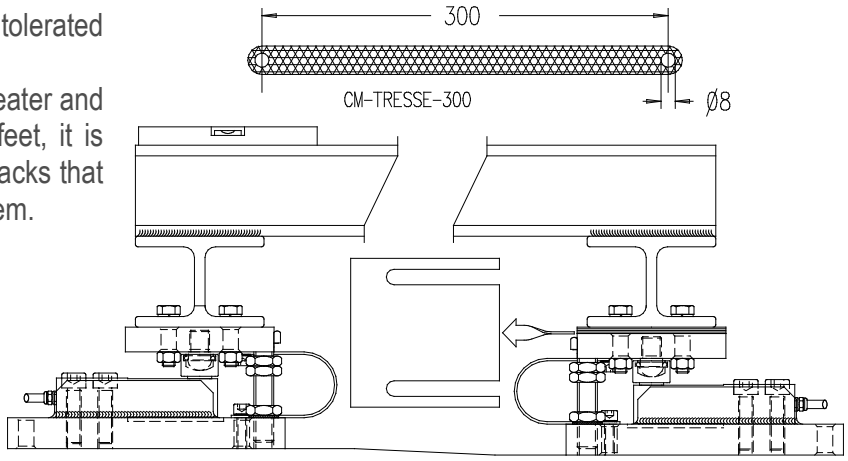
1.1. Placement at level

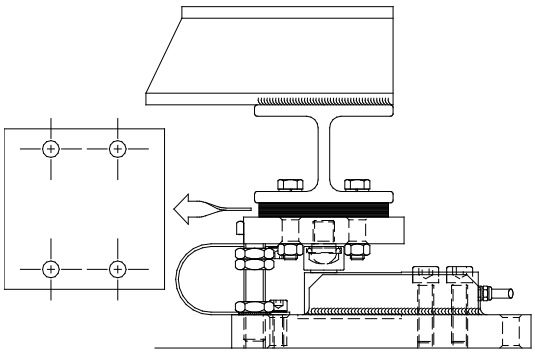
Differences of a few tenths can usually be tolerated with the 5510 bending cell series.
Nevertheless, when the differences are greater and when the mounting is higher than three feet, it is important, for correct use, to install shim packs that ensure equal force distribution between them.
The references of these shim packs are:

e.g. G5510-0.6-XX
G5510-1 -XX
G5510-2 -XX

where 0.6/1/2 mm = thickness
XX =load

e.g. for a 0.5-2 t EASY-MOUNT
REF: G5510-0.6-0.5 t



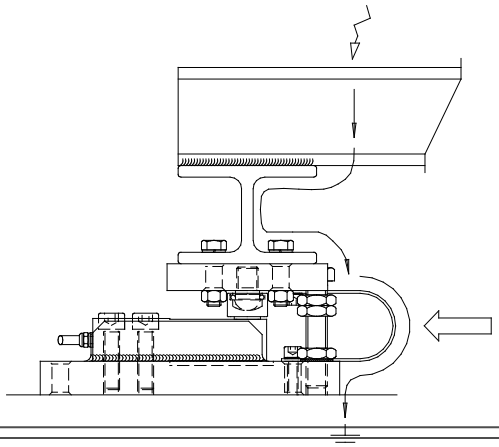


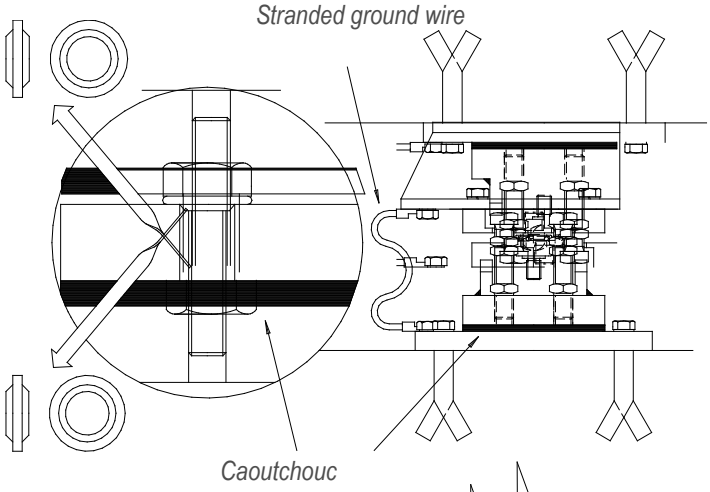
1.2. Shocks

If shocks are to be expected, it is preferable to install a shock absorber between the load and the cell. The former is made from a stack of rubber and metal plates.

1.3. Electrical weldings

When arc welding must be done on the structure, it is advised to install stranded ground wire in order that the derived current does not pass through the cell, damaging it.
It is also advised to disconnect the cells of the measurement instrument.





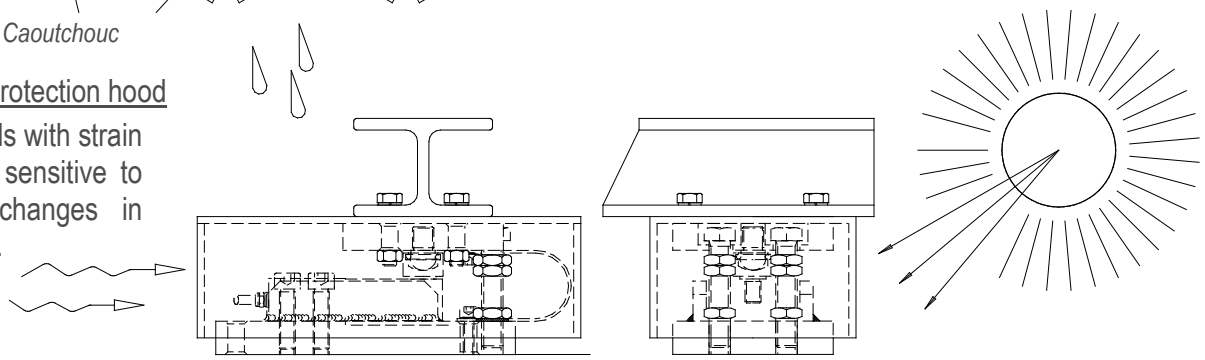
1.4. Lightning

If there is a risk of lightning, it is advised to isolate the cell the best possible and derive the former by stranded wire. In order to do that; place a rubber sheet under the sole and polyamide waterproof washers under the fixing screws.

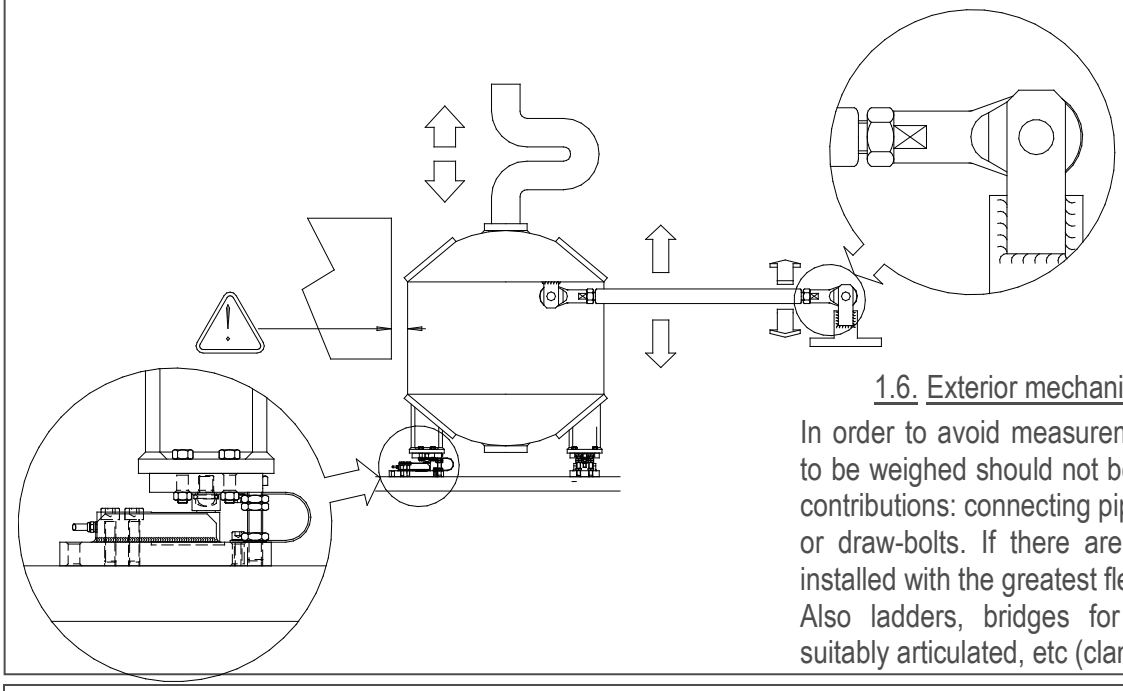
REF:	Washers	VI-NMG-500-12 for M12
		VI-NMG-500-16 for M16
	Rubber	SM-I5510-CA500 (0.5 - 2 t)
		SM-I5510-CA5T (3 - 5 t)
		SM-I5510-CA10T (7.5 - 10 t)

1.5. Protection hood

The load cells with strain gauges are sensitive to differential changes in temperature.



Measurement errors may occur if the temperature changes fast. In which case, it can be useful to install a protecting screen to avoid solar radiation or abrupt thermal convection (strong wind). The hood has another function: to protect against shocks, projections (mud, water, etc.) and to avoid dirt at the level of the cell.
Screws that join the cell to the structure ensure the fixation. It is important that this hood does not hinder the movement during the loading. If necessary, isolate the sides of the hood.



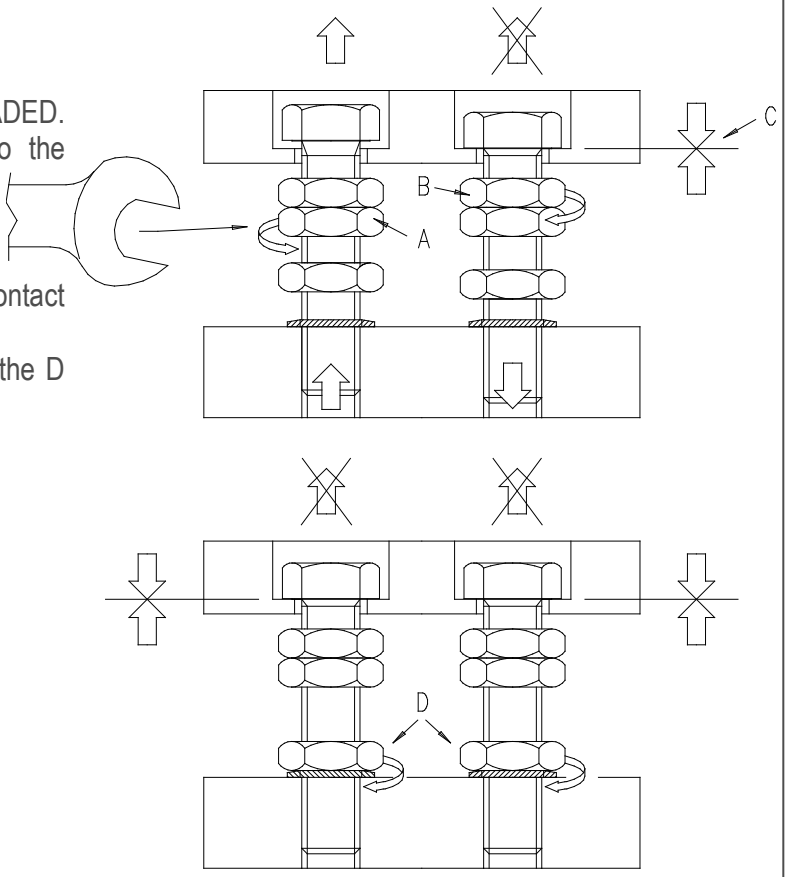
1.6. Exterior mechanical influences

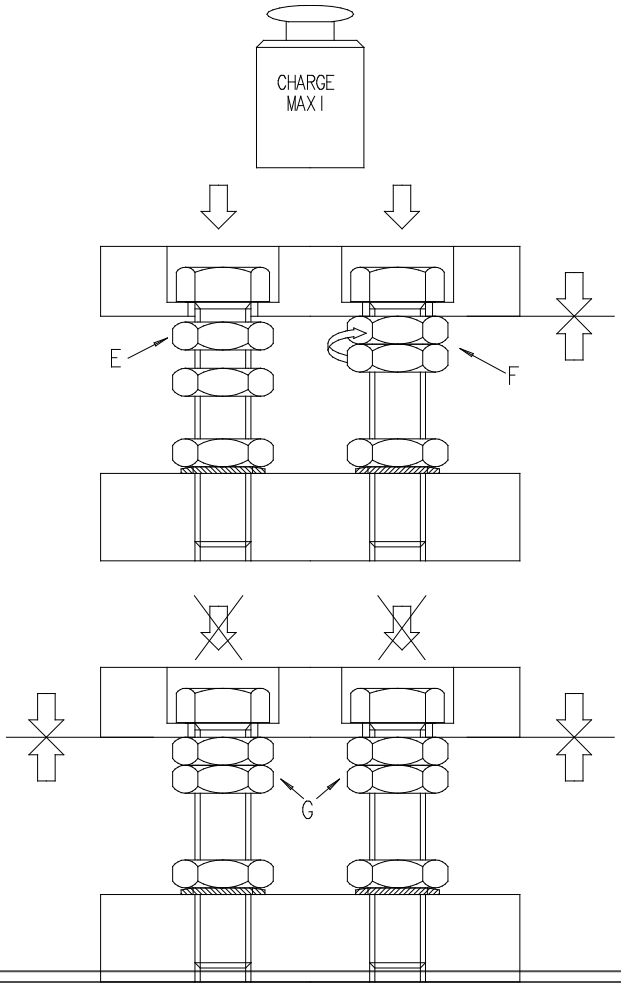
In order to avoid measurement errors, the load to be weighed should not be subject to parasitic contributions: connecting pipes cables and stops or draw-bolts. If there are any, they must be installed with the greatest flexibility.
Also ladders, bridges for access should be suitably articulated, etc (clamping).

2. ADJUSTEMENT THRUST

2.1. Setting of anti-reverse

This setting is done when the cell is UNLOADED.
Using wrenches, lock the central nuts A&B to the middle of the threaded rod.
To turn the stop screw upwards, move nut A.
To go down, move nut B.
The setting is done when the base plate is in contact with the head of the screw.
When the two threaded rods are adjusted, lock the D nuts.





2.2. Setting of overload protection

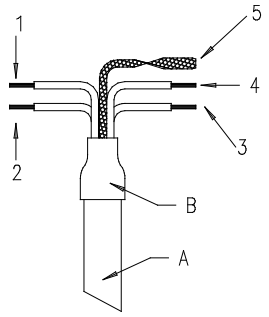
This setting is done when the cell is COMPLETELY loaded.
Unlock the central nuts A + B. Move the upper bolts E upwards until it is against base plate F.
The setting is done when the base plate is in contact with the seat of the nuts.
When the two nuts are adjusted, lock the G nuts.

3. CABLING

3.1. Cable

The cells are delivered with a 4-wire screened cable. The screen (shielded wire) cannot in any case be in contact with the ground, e.g.; in metallic junction boxes, it is necessary to isolate the screen with a sheath (thermal).

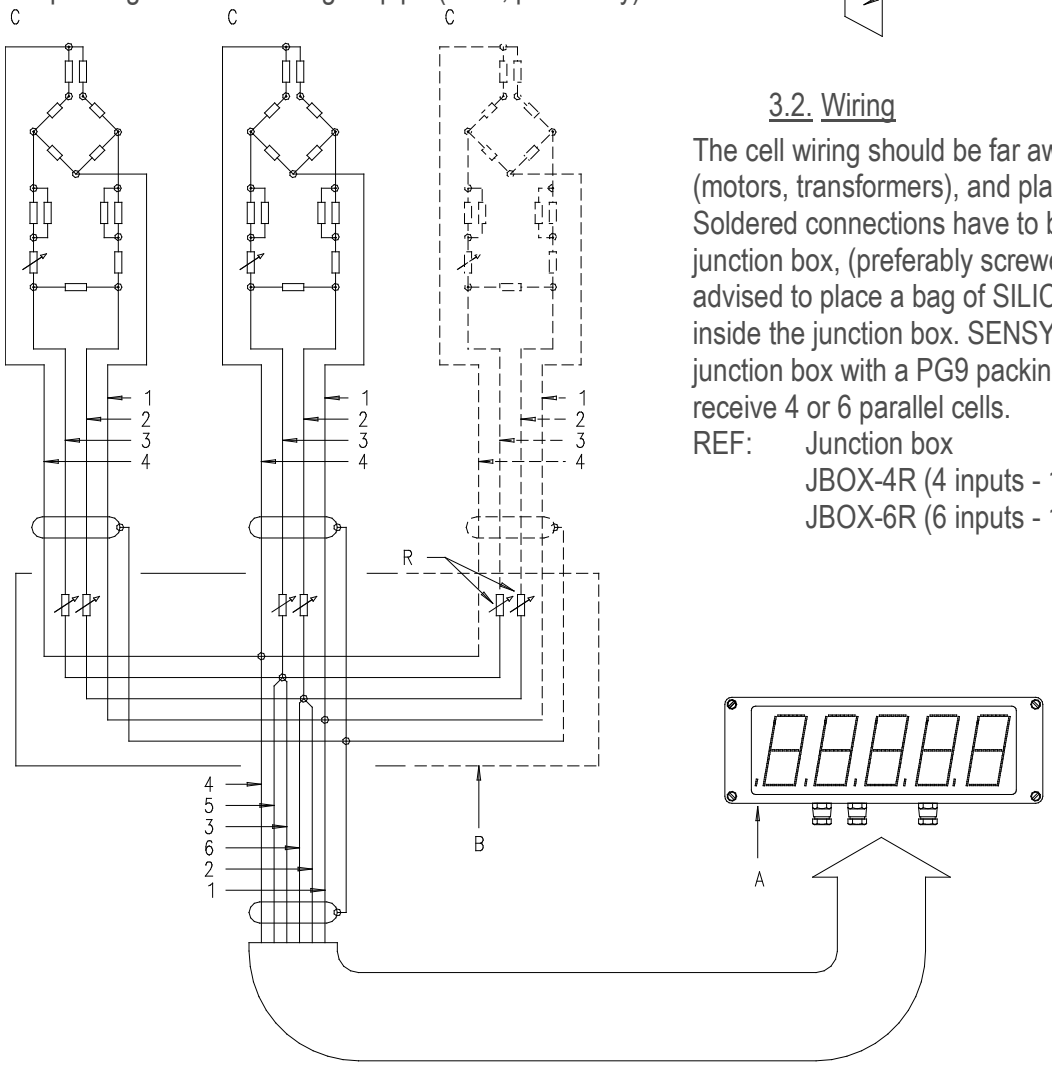
The screen can only be connected to standardized earth. It is advised to install a thermo-retractable sheath (retracted 4x) at the end of the cable inside a waterproof paste in order to avoid any leak. If there is any possible danger of damage along its wiring, it is necessary to use an additional cable protection, passing the cable through a pipe (steel, preferably).



COLOR CODE

1) Excitation- (Yellow)
2) Excitation+ (Brown)
3) Signal+ (Green)
4) Signal- (White)
5) Screen

A) Cable PVC
B) Thermo-retractable sheath



A) Display (ex. dv680)
B) Junction box
C) Cell
R) Adjusting resistance
1) – out measure (green)
2) – in supply (yellow)
3) + in supply (brown)
4) + out measure (green)
5) Ref. (sense) + (pink)
6) Ref. (sense) + (grey)

3.2. Wiring

The cell wiring should be far away from power lines (motors, transformers), and placed in separate pipes. Soldered connections have to be applied in the junction box, (preferably screwed connections). It is advised to place a bag of SILICA GEL to keep dry inside the junction box. SENSY could provide PVC junction box with a PG9 packing-gland, which could receive 4 or 6 parallel cells.

REF: Junction box
JBOX-4R (4 inputs - 1 output)
JBOX-6R (6 inputs - 1 output)

3.3. Parallel wiring

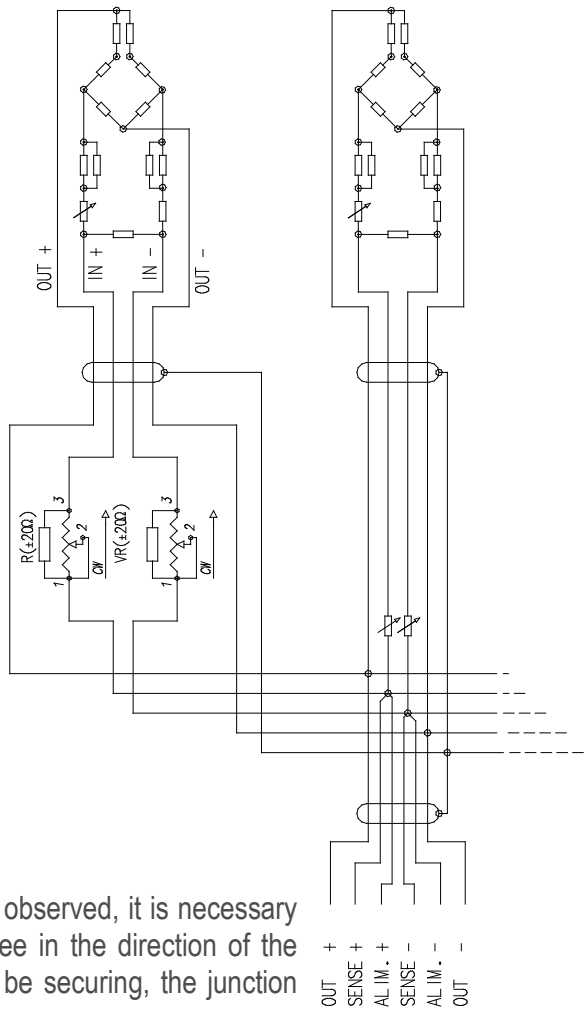
The cells must be installed in parallel, with the stranded mass wire joined to itself. The sense must be joined to the cell supply, before the points of parallel wiring and the stabilising resistances.

3.4. Calibration

It must be done after the sensor has been turned on for a while (10-15 minutes) to obtain a uniform temperature of the installation. The cells do not usually need to be adjusted with each other. However, when greater precision is needed, it is sometimes necessary to stabilise the cells individually with the resistances in the junction box. Those resistances are of several ohms (±10) and are installed in the supply circuit.

A parallel adjustable resistance is mounted with a fixed resistance. The most sensitive cell will have its input resistance increased and the least sensitive will have its lowest input resistance. You will see that it is preferable to work on both supply cables: schematic mounting is given for your information and allows a variation of 0 to 20 ohms in series on the input impedance (2x10 Ω).

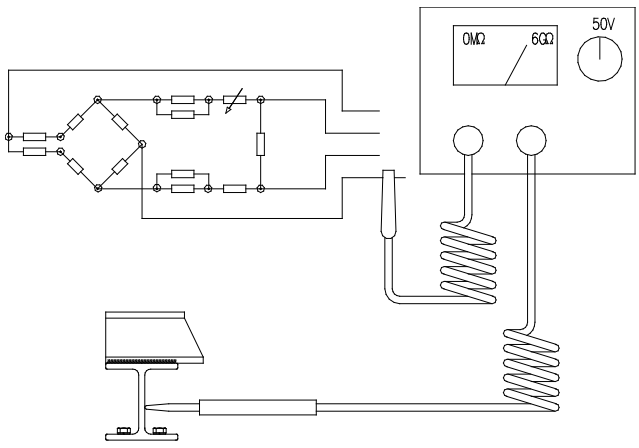
Note: A well known weight of more than 20% of the nominal load of the system can be expected. The calibration error is always much higher than the error made on the evaluation of the load.



3.5. Measurement errors

When the calibration is difficult and measurement errors are observed, it is necessary to check the installation. Mechanically, the cells must be free in the direction of the load and well positioned. Electrically, the connections must be securing, the junction boxes exempt from humidity and the cables intact.

If there is no fault to be seen, it is necessary to verify the internal circuit. SENSY can help to diagnose on the basis of the associated diagnosis sheet provided in the appendix and filled in beforehand.

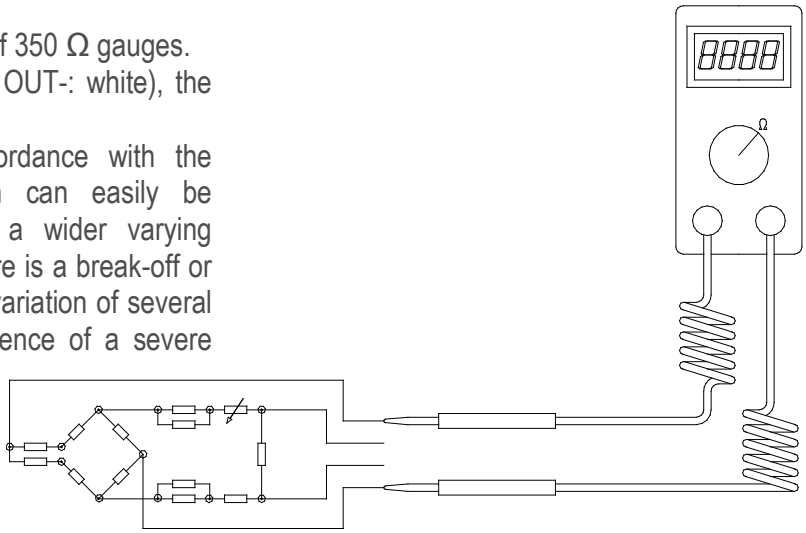


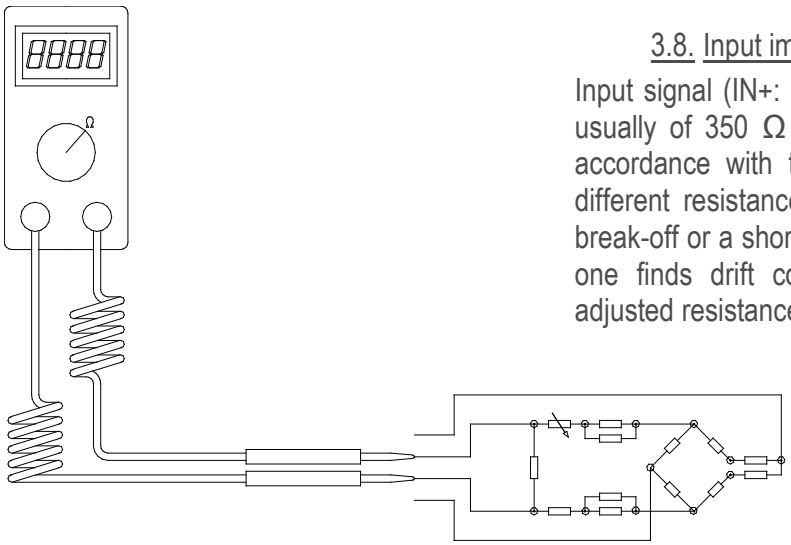
3.6. Insulation test

The measuring of the insulating resistance is done with a multimeter. The standardized testing voltage is 10 V. It is applied to a conductor. It can be determined by disconnecting the measuring instrument and applying voltage between one of the conductors and the metallic mounting structure, or individually, cell by cell to situate the leakage with precision. The insulation must not, in any case, be lower than 2 GΩ for a 10 V voltage. This insulation default will generate measurement errors if the insulation resistance is lower than several hundred MΩ. Insulation default can also be generated by environmental conditions (temperature, humidity).

3.7. Output impedance

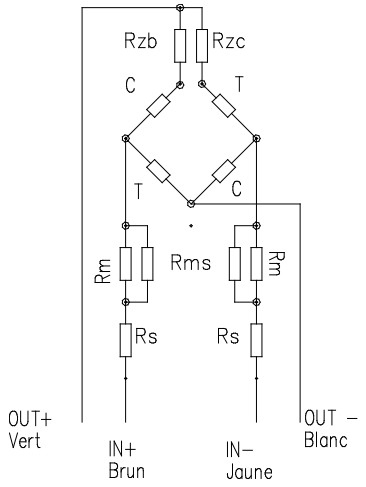
The Wheatstone bridge is made up of 350 Ω gauges.
At the output signal (OUT+: green, OUT-: white), the resistance is 350 Ω ± 3 Ω.
This impedance must be in accordance with the individual cell data sheet, which can easily be determined with a multimeter. If a wider varying resistance is read, it means that there is a break-off or a short circuit current; a resistance variation of several ohms would instead be a consequence of a severe overvoltage problem.





3.8. Input impedance

Input signal (IN+: brown, IN-: yellow): its resistance is usually of 350 Ω ± 3 Ω. Its impedance must be in accordance with the individual cell data sheet. If a different resistance is read, it means that there is a break-off or a short circuit current. It is at the input that one finds drift compensation, slope and sensitivity adjusted resistance.



Rm	Sensitivity drift compensation
Rms	Sensitivity drift adjustement
Rs	Sensitivity calibration
Rzb	Zéro calibration
Rzc	Zéro drift compensation

4. USE IN POTENTIALLY EXPLOSIVE ATMOSPHERE (OPTION)

4.1. Intrinsic safety protection

Use of sensors in hazardous zones can only be done with Ex marked sensors, delivered with one or more of the certificates hereunder:

ATEX: ISSeP07ATEX012X

SENSY's load cells which are marked Ex i comply with the following standards:

ATEX
EN 60079-0: 2012
EN 60079-26: 2007
EN 60079-11: 2012

The use of junction boxes or additional cable lengths must be considered in the choice of protection. The electrical characteristics of the cable being limited (see certification), it is recommended to carefully chose the cable length and avoid any winding of the cable. After having defined all elements, it is mandatory to control if the sensor's output tension is still compatible with the electronic device in use and the requested accuracy.
See certificate for the special conditions for safe use.

5. PERIODIC INSPECTIONS

1. Check output for zero load (annually)
2. Make sure that the axle beam has not been knocked (markings) or chemically attacked (some corrosive greases). If points 1 and 2 are not accounted for, just take preventive measures. (annually)
3. In case of doubt, reply to the diagnostic questionnaire available on Web: www.sensy.com/support.
4. Verify the integrity of the cable.
5. After any serious functioning incident, repeat operations 1 to 4.

Output signal	Min acceptable	Max acceptable
mV/V / 4 wires	-0.15 mV/V	0.15 mV/V
4-20mA / 2 wires	3 mA	6 mA
4-20mA / 3 wires	3 mA	6 mA
0- 5V / 3 wires	0 V	0.8 V
0- 10V / 3 wires	0 V	0.8 V
1-5V / 3 wires	0.5 V	1.5 V
1 -10V / 3 wires	0.5 V	1.5 V
-10 / 0 / + 10V	-1.5 V	1.5 V

6. USE FEATURES

(The exact characteristics are systematically given in the control sheet delivered with every load cell and function of the output signal!)

Output signal:	mV/V	4-20 mA 2 wires	4-20 mA 3 wires	1-5 V 3 wires	0-10 V 3 wires	-10…0…+10 V 3 wires	RS-232 RS-485
Compensated temp. range	-10…+45°C						
Operating temperature range	-30… +70°C[1]						
Storage temperature range	-50…+85°C	-50…+85°C					
Power supply (VDC)	5…10…15[2]	9 – 30[3]	13 – 30	13 – 30		15 - 18[4]	6…12…18
Load impedance e (Ω)	NA	≤ 750	≤ 1.000	> 5k			
Nominal sig. range	0 – 1…2 mV/V	4 - 20 mA	4 - 20 mA	0.1-5 V	0.1-10 V	-10…0…+10 V	
Saturation	> 3 mV/V	> 24 mA	> 24 mA	> 11 V			

[1] Max +60°C for EX-I T4, T6 and C6 options

[2] 5 to 12VDC for EX-I T2 GD, EX-I T4 GD and EX-I T6 GD options

[3] 9-28VDC for EX-I C6 options

[4] 15 to 27VDC with a 1000 Ω bridge

7. GUARANTEE

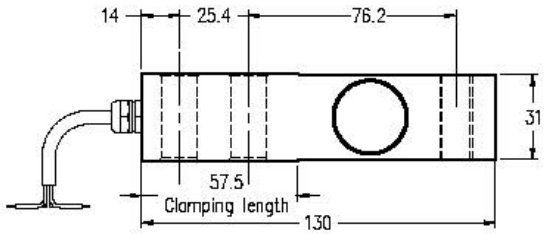
The constructor guarantee is applicable if mounting recommendations and general use principles are respected.

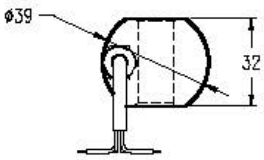
Any particular use not described in the present document should be subject to a prior written agreement from SENSY S.A., mandatory for preserving its conformity.

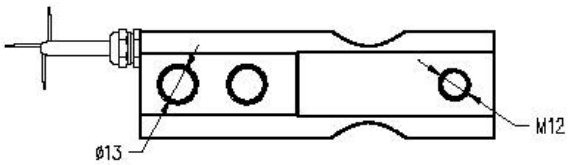
8. DRAWINGS AND WIRING DIAGRAMS

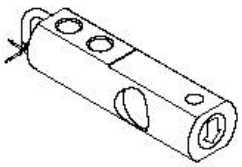
TECHNICAL DRAWINGS: SHEAR BEAM LOAD CELL

5510 > STANDARD DIMENSIONS







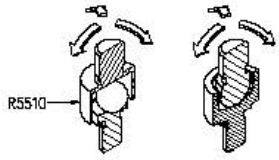


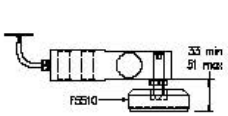
Ref. Item	Capacities	Weight (kg)
5510-A	0.5 - 2 t	0.95

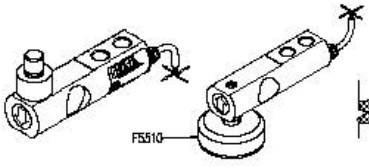
→ Other capacities and dimensions available on request

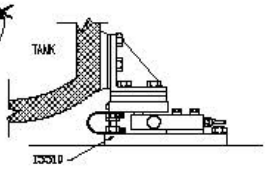
Dimensions in mm

Accessories

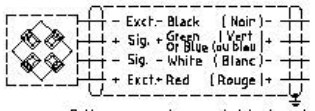






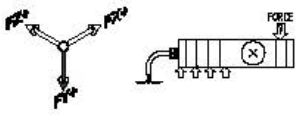


Wiring



Standard : Cable screen not connected to transducer
Foradiation non connectée au capteur

Load direction

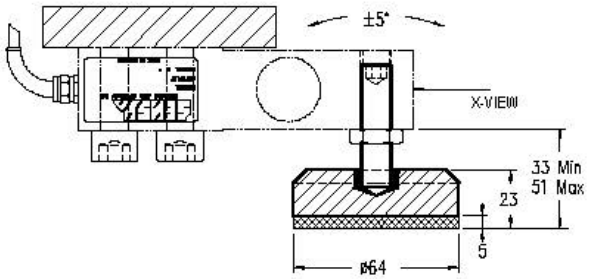


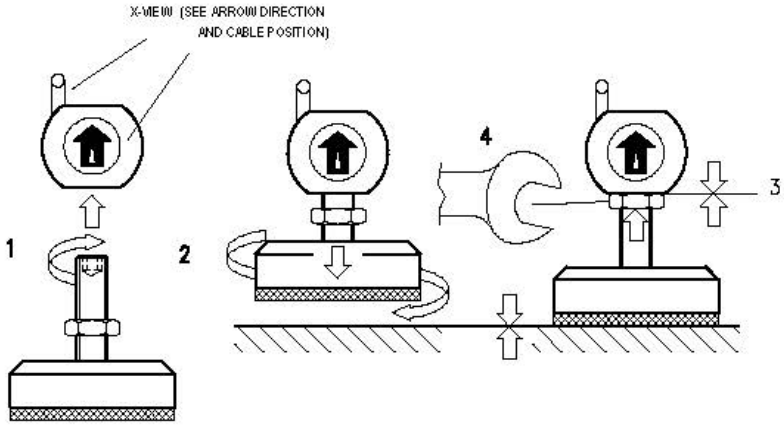
www.sensy.com

Rev. 17.0402.013

TECHNICAL DRAWINGS: MOUNTING ACCESSORIES FOR 5510

F5510 > STANDARD DIMENSIONS



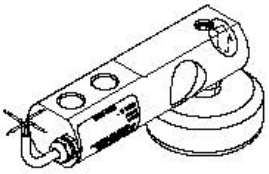


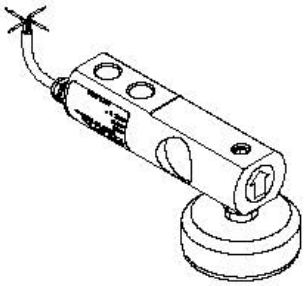
Ref. Item*	Capacities
F5510-A	0.5 - 2 t
* Material: stainless steel	

Other capacities and dimensions available on request

Dimensions in mm

Other views



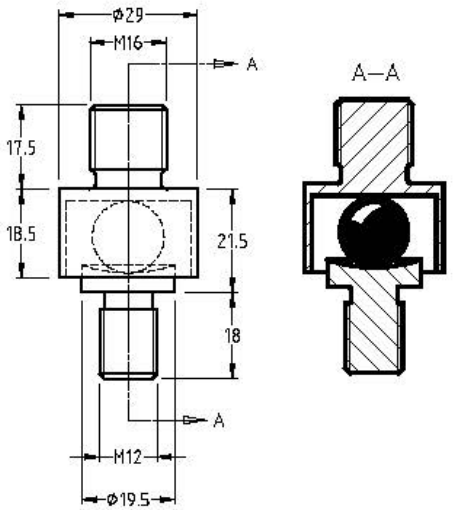


TECHNICAL DRAWINGS: COMPRESSION BALL JOINTS FOR 5510

R5510 > STANDARD DIMENSIONS

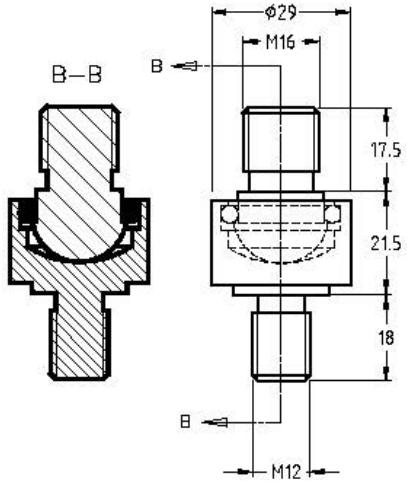
R5510-A1

Range: 500 kg - Weight: 0.097 kg



R5510-A2

Range: 750 kg - Weight: 0.127 kg

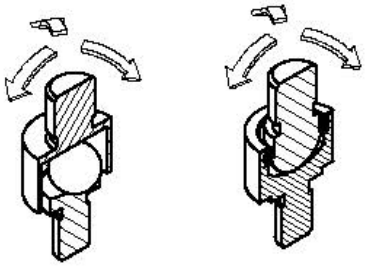


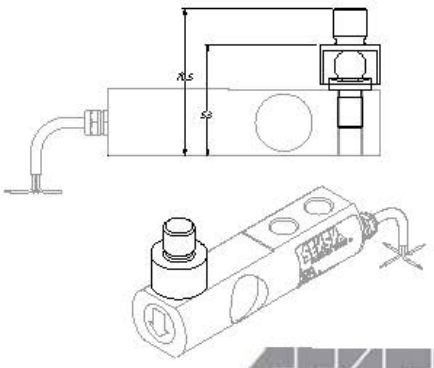
Ref. Item*	Capacities
R5510-A1	500 kg
R5510-A2	750 kg - 2 t
* Material: R5510 - stainless steel	

→ Other capacities and dimensions available on request

Dimensions in mm

Other views

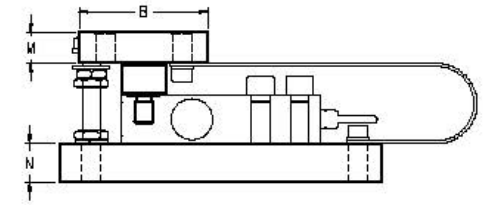


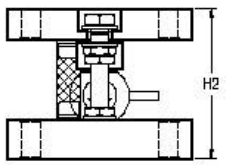


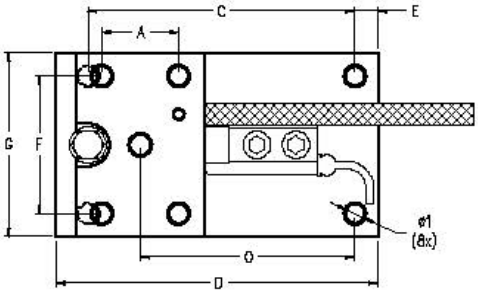
Rev. 16/M42 018

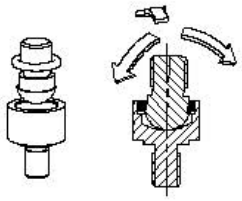
TECHNICAL DRAWINGS: EASY MOUNT FOR 5510

I5510-I5515 > STANDARD DIMENSIONS









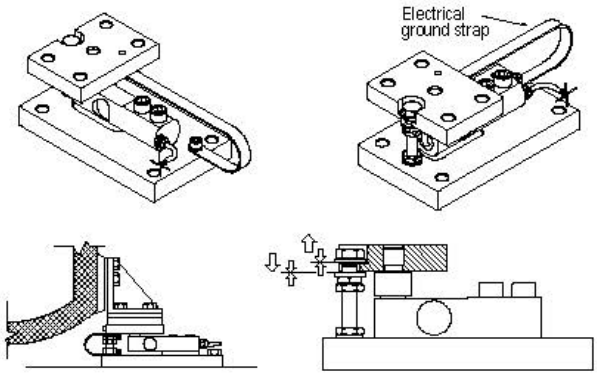
Ref. Item*	Capacities	A	B	C	D	E	F	G	M	N	O	Ø1	H2	Weight (kg)
I551x-A	0.5 - 2 t	50	84	174	210	15	90	120	20	25	140	12.5	98	±6.76

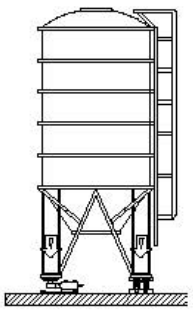
* x=Material: I5510 - stainless steel; I5515 - alloy steel

→ Other capacities and dimensions available on request

Dimensions in mm

Other views





www.sensy.com

Rev. 1 (04/2018)

9. EU DECLARATION OF CONFORMITY

Manufactured by:
SENSY SA
Z.I. Jumet – Allée Centrale
B – 6040 JUMET
Phone: +32 71 25.82.00
Fax: +32 71 37.09.11
Website: http://www.sensy.com

CONCERNED ITEMS: strain gauge sensor, see calibration certificate related to model and serial number.

SENSY S.A. certify that the items described here above have been duly designed, manufactured, and tested for use in accordance with the essential requirements defined in the European Directives listed here under.

2014/30/EU	Electro-Magnetic Compatibility Directive
2006/42/CE	Machinery directive
2011/65/EU amended by directive 2017/2102/EU	Restriction of the use of certain hazardous substances in the electrical and electronic equipment (RoHS)
2014/35/EU	Safety / low voltage directive

Conception and compliance of this equipment is made according to all of part of the following standards:
Rule FEM 9761
NBN 52-010 / 52-011
EN 61326 (2006)

If designed, manufactured and tested safety ref. D-DP SIL3 READY (option):
see specific and separate certificate according to ISO 13849-1 and/or EN 62061

If designed, manufactured and tested for use in potentially explosive atmospheres (option):
see specific and separate certificate (EN/IEC 60079-0) in compliance with 2014/34/EU directive of 26/02/2014

Jumet
July –26 - 2022

Ir Delcambe Sylvia
Technical manager

10. UK DECLARATION OF CONFORMITY

Manufactured by:
SENSY SA
Z.I. Jumet – Allée Centrale
B – 6040 JUMET
Phone: +32 71 25.82.00
Fax: +32 71 37.09.11
Website: http://www.sensy.com

CONCERNED ITEMS

CONCERNED ITEMS: strain gauge sensor, see calibration certificate related to model and serial number.

SENSY S.A. certify that the items described here above have been duly designed, manufactured and tested for use in accordance with the essential requirements defined in the UK regulations listed here under.

UK SI 2016 No. 1091 and amendments	Electromagnetic Compatibility Regulations 2016
UK SI 2008 No. 1597 and amendments	Supply of Machinery (Safety) Regulations 2008
UK SI 2012 No. 3032 and amendments	The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012
UK SI 2016 No. 1101 and amendments	Electrical Equipment (Safety) Regulations 2016
UK SI 2016 No. 1091 and amendments	Electromagnetic Compatibility Regulations 2016

Conception and compliance of this equipment is made according to all of part of the following standards:
Rule FEM 9761
NBN 52-010 / 52-011
EN 61326 (2006)

If designed, manufactured and tested safety ref. D-DP SIL3 READY (option):
see specific and separate document for calculation according to ISO 13849-1 and/or EN 62061.

If designed, manufactured and tested for use in potentially explosive atmospheres (option):
see specific and separate certificate in compliance with regulation “Equipment and Protective Systems Intended for use in Potentially Explosive Atmospheres Regulations 2016”.

Jumet
July – 26 - 2022

Ir Delcambe Sylvia
Technical manager