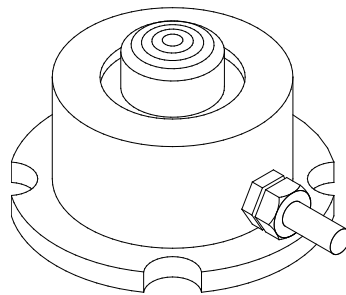


5950 LOAD CELL SERIES

INSTALLATION MANUAL



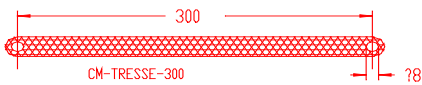
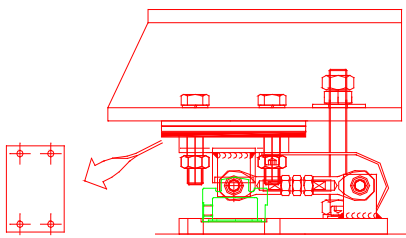
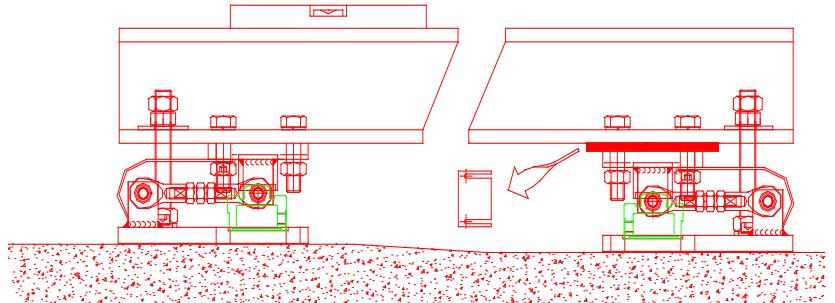
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Rev.	Date	Reason
1	29/03/2019	Adding points : 5, 6, 7, 8, 9 and 10-EU Declaration of conformity

1. GENERAL INFORMATION

1.1. Placement at level

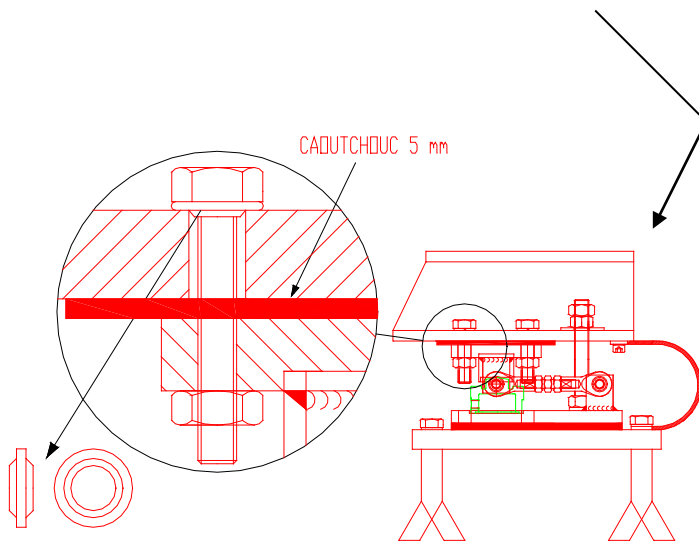
This operation guarantees a good distribution of the loads and the uprightness of the effort.
 Make sure you check the placement at level of the sensors and of the supporting parts. Use wedges for thickness if necessary.



1.3. Electrical weldings

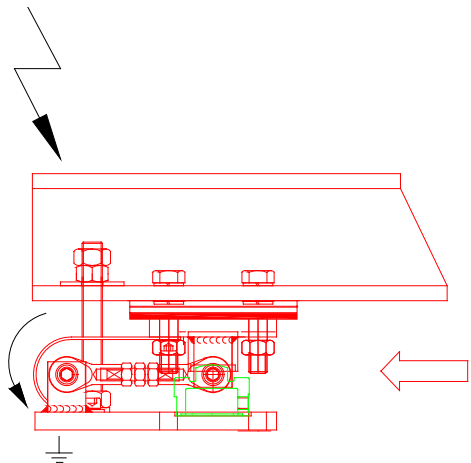
When arc welding must be done on the structure, it would be advised to install stranded ground wire in order that the derived current could not pass through the cell, damaging it. It would also be advised to disconnect the cells of the measuring instrument.

Stranded ground wire directly linking the structure to the earth.



1.2. Shocks, vibrations and overloads

The sensor can take overloads of 150% without being damaged.
 If it is likely to undergo shocks and vibrations, you need to mount it with a shock absorber and it is sometimes necessary to oversize the sensor.

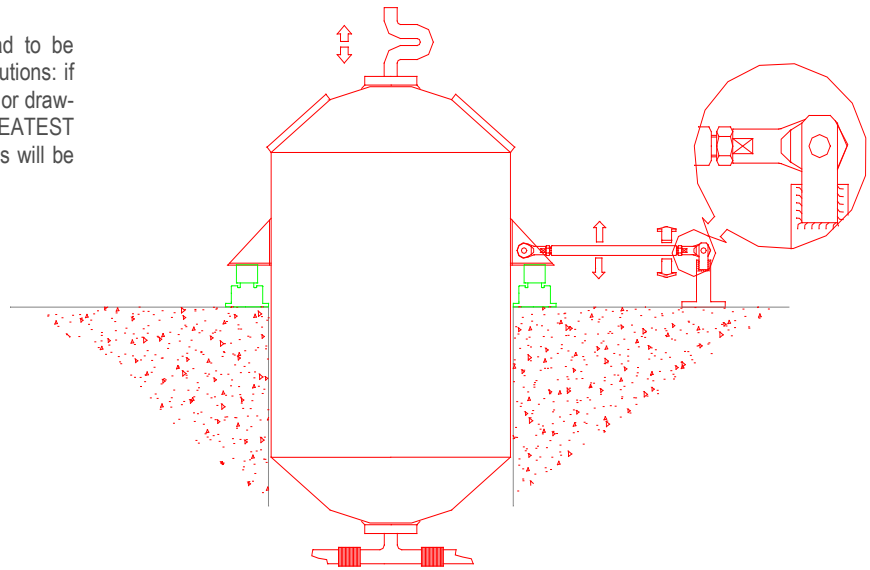


1.4. Lightning

If there is a risk of lightning, it would be advised to isolate the cell completely and derive the current through the stranded wire.
 In order to do that, place a rubber sheet, ceramics or other forms of insulation underneath the sole and polyamide waterproof washers under the fixing screws.

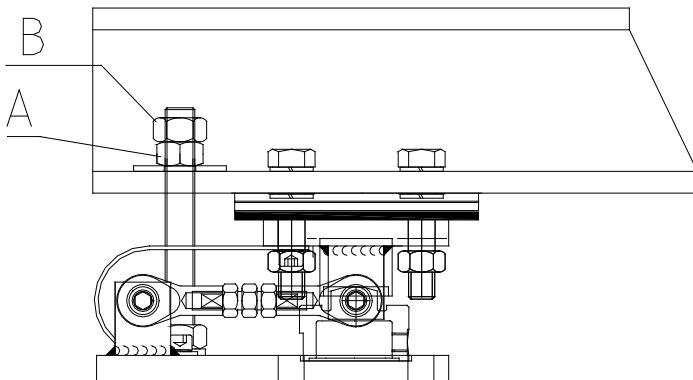
1.5. Exterior mechanical influences

In order to avoid measurement errors, the load to be weighed must not be subject to parasitic contributions: if there are any connecting pipes, cables and balls or draw-bolts, they must be installed with THE GREATEST FLEXIBILITY. Also, ladders or bridges for access will be suitably articulated (clamping).



1.6. Setting of the counter force

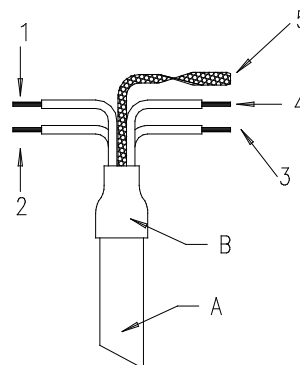
This setting has to be done whilst the sensor is UNLOADED. By hand, bring the nut 1 mm away from the structure, then screw B to A. Finally, using a key, block A onto B so as not to exert any effort on the sensor.



2. CABLING

2.1. Cable

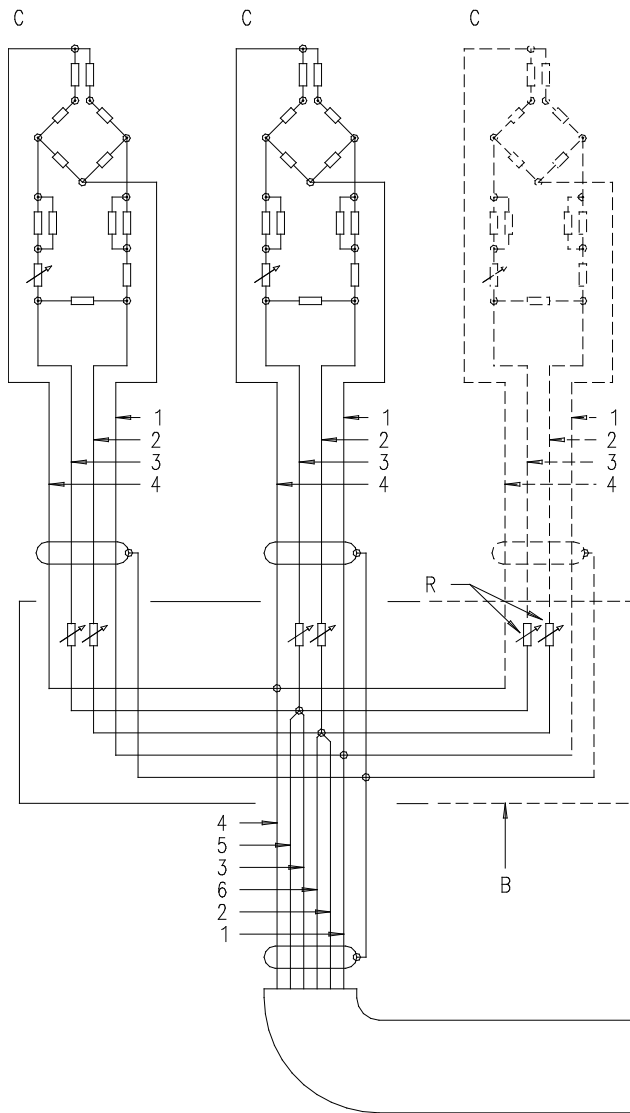
The cells are delivered with a 4-wire screened cable. The screen (shielded cable) cannot in any case be in contact with the ground, e.g.; in metallic junction boxes, it is necessary to isolate the screen with a sheath (thermal). The screen can only be connected to standardized earth. It is advised to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



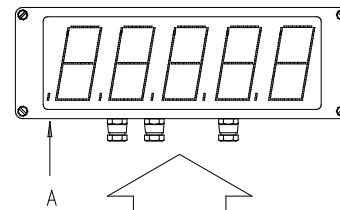
2.2. Wiring

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)

- 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)



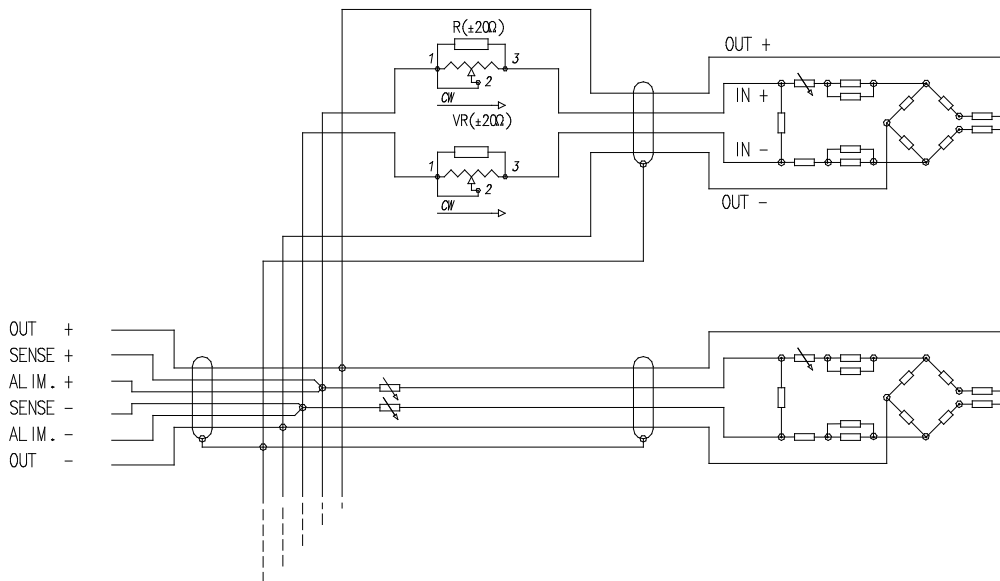
2.3. Parallel wiring

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

2.4. 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 (2×10 ohms).

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.

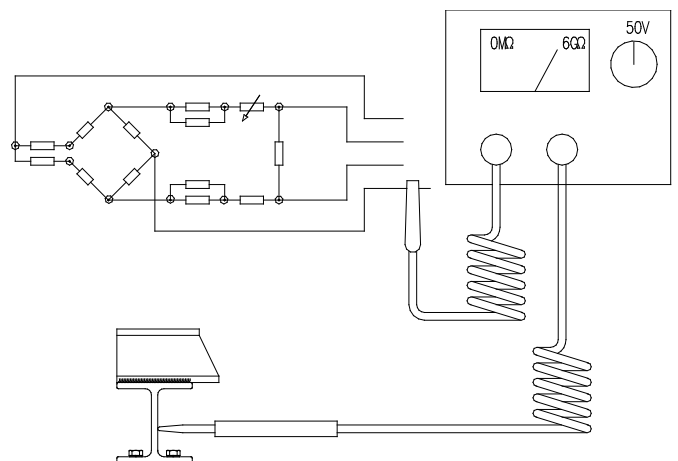


2.5. Measurement errors

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 based on the associated diagnosis sheet provided in the appendix and filled in beforehand.

2.6. 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 locate the leakage with precision. The insulation must not, in any case, be lower than 2 G Ω for a 10 V voltage. This insulation default will generate measurement errors if the insulation resistance is lower than several hundred M Ω . Insulation default can also be generated by environmental conditions (temperature, humidity).



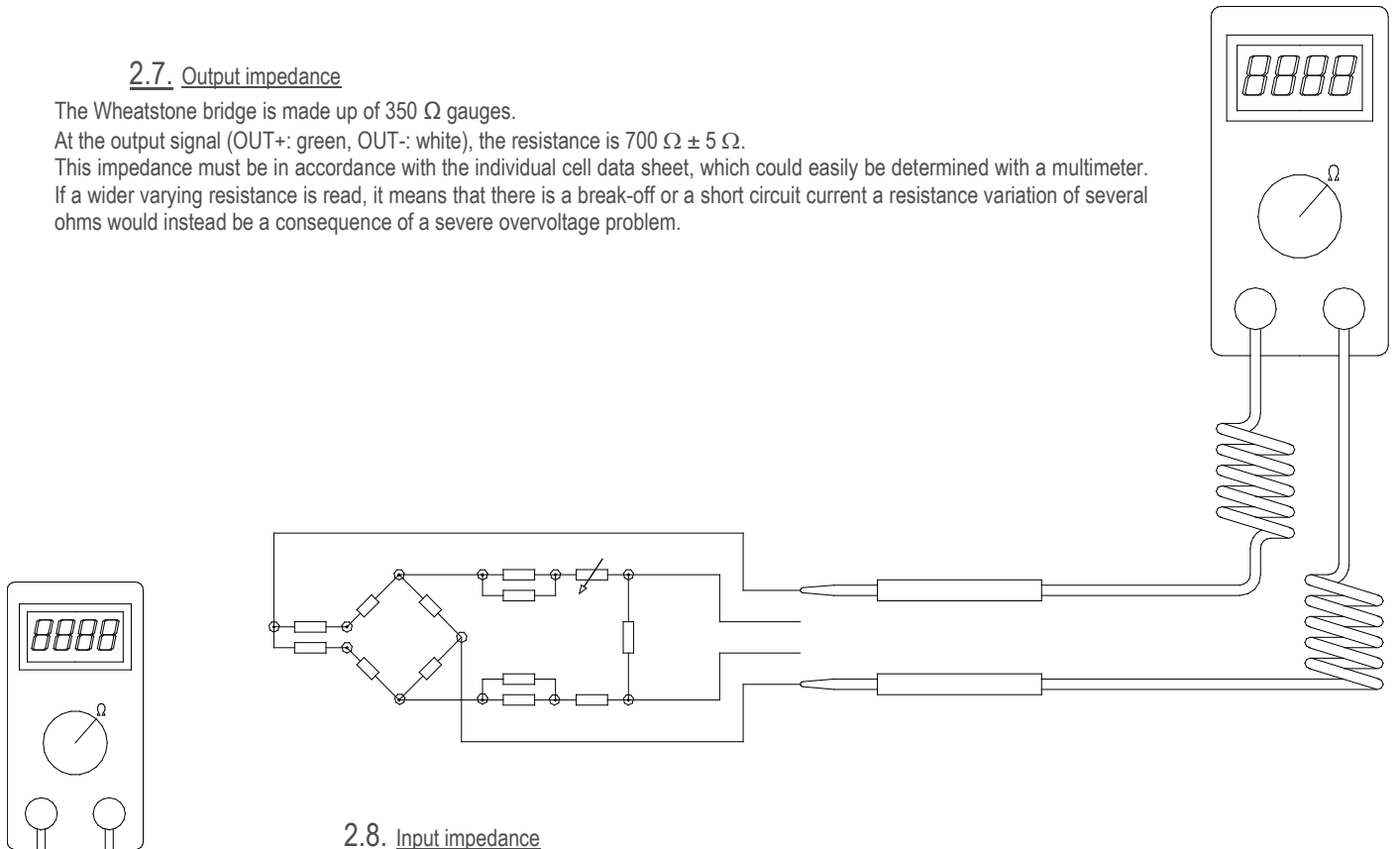
2.7. Output impedance

The Wheatstone bridge is made up of 350 Ω gauges.

At the output signal (OUT+: green, OUT-: white), the resistance is 700 $\Omega \pm 5 \Omega$.

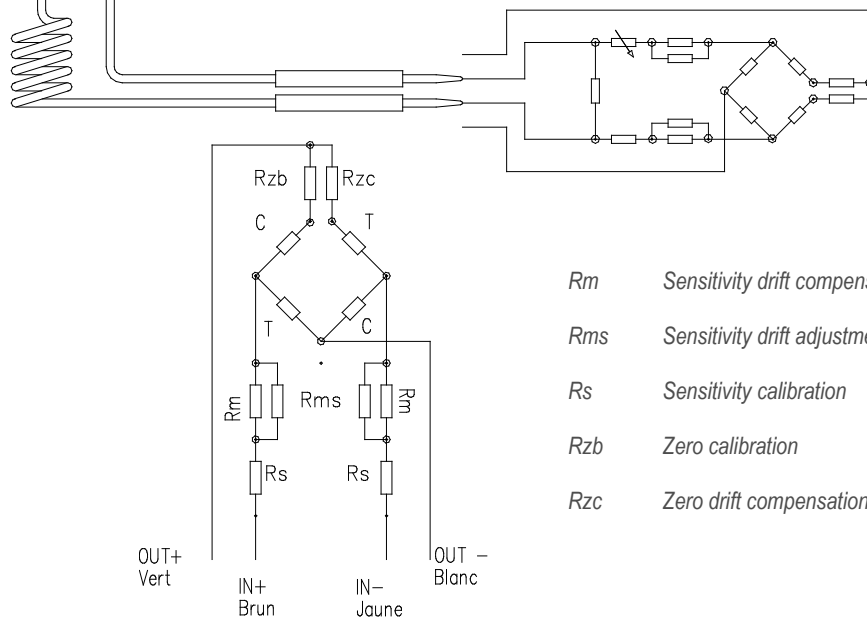
This impedance must be in accordance with the individual cell data sheet, which could easily be determined with a multimeter.

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.



2.8. Input impedance

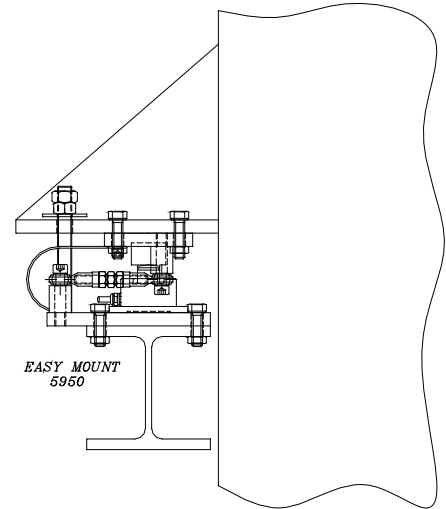
Input signal (IN+: brown, IN-: yellow): its resistance is usually of 700 $\Omega \pm 5 \Omega$, its impedance must be in accordance with the individual cell data sheet. If a different resistance is read, it means that there is a break-off or a short circuit current. It is at the input that one finds drift compensation, slope and sensitivity adjusted resistance.



3. MOUNTING WITH EASY MOUNT

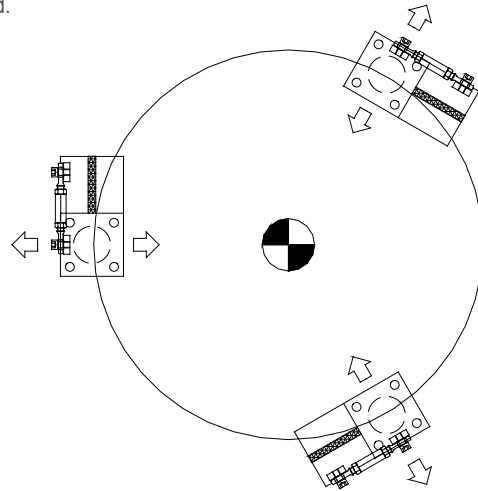
The EASY MOUNT incorporates the fixing plates, the support parts, the counter force and the anti-rotation (displacement) in one direction. This kit with ball joint absorbs forces of up to 20 kN in the direction X and leaves enough freedom of movement in the direction Z for dilatations.

CAUTION: this kit of assembly does not rigidify the assembly overall and does not allow to catch up possible buckling of foot. These feet must thus be dimensioned consequently to avoid any risk of buckling following deformation or slight rotation of the body of silo.



3.1. Mounting with 3 load cells

This mounting offers the best properties for the distribution of loads and freedom for the dilatations of the part to be weighed.

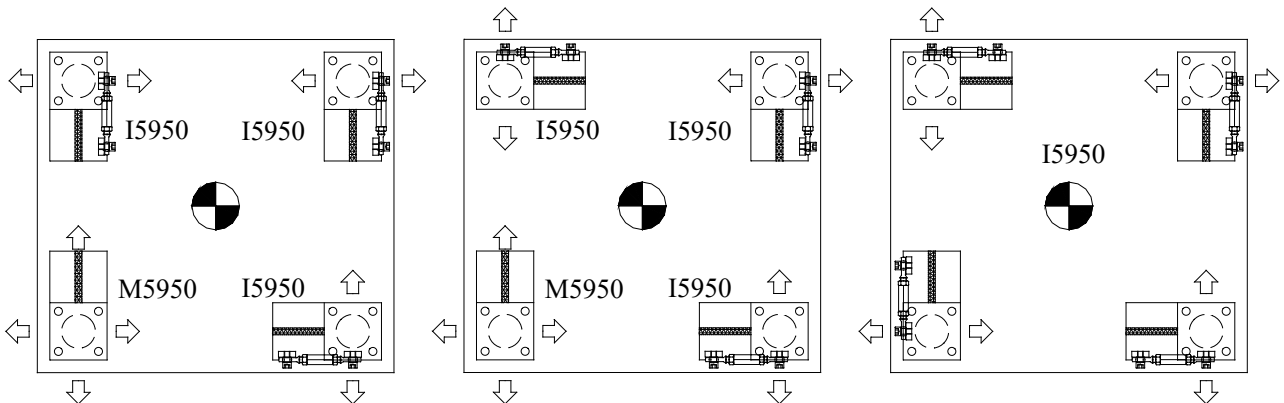


3.2. Mounting with more than 3 load cells:

When more than 3 load cells are used, each one must be placed at the same level to obtain a good equivalent load distribution. Each load cells output signals and the empty part to be weighed must be identical (case of a symmetrical part).

So, to avoid cramping the displacements (dilatation) of the part to be weighed, use only 3 I5950; for the fourth load cells, use the M5950 mounting kit. If dimensional variations are weak, use a mounting with 4 x I5950, giving better characteristics in order to stand up to parasite efforts.

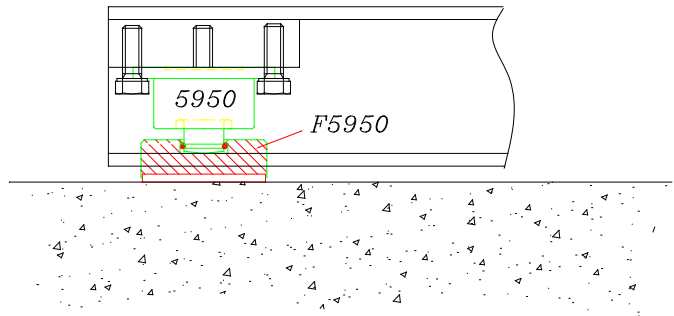
Note: The characteristics of the sensors are guaranteed between -10°C and 45°C without thermal gradient at the level of the sensor and rapid variation of the temperature, use a protective screen insulated to form a barrier between the source of the heat and the load cells (sun, wind, thermal radiation, conduction).



4. EXAMPLE OF MOUNTING WITHOUT EASY MOUNT

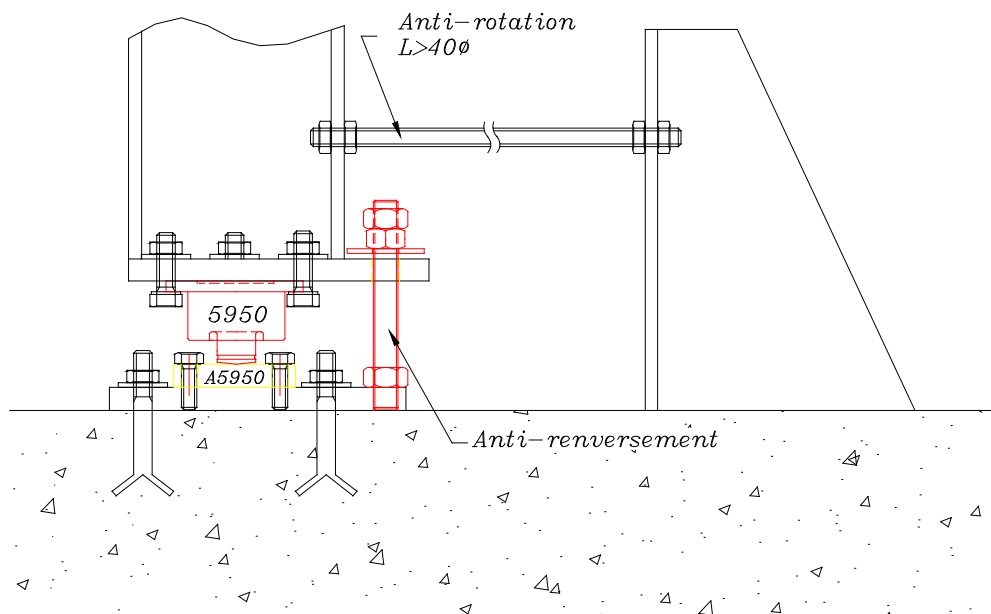
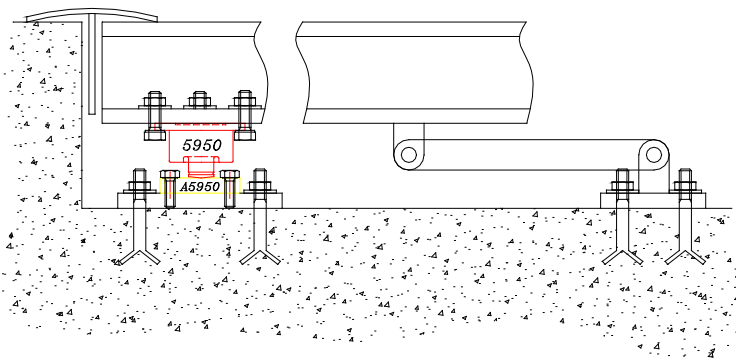
4.1. Mounting with a rubber foot (F5950)

This mounting allows the sensor to be put straight on a levelled ground.
The rubber allows to absorb the shocks and the slight irregularities of the state of the ground surface.



4.2. Mounting with a solid steel base (A5950)

This combination gives an easy solution for the installation when the anti-rotation and counter force parts are incorporated to the structure. The A5950 base has the necessary solidity to support the head of the sensor and allows it to move freely (in the case of great dilatation, for example).



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

7. 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						
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

³ 9-28VDC for EX-I C6 options

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

⁴ 15 to 27VDC with a 1000 Ω bridge

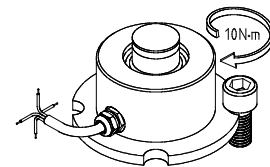
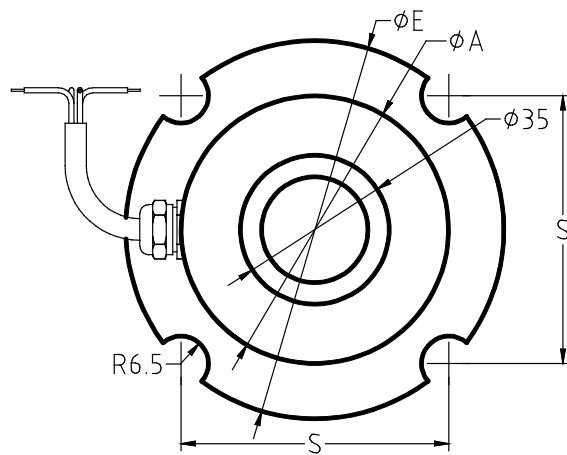
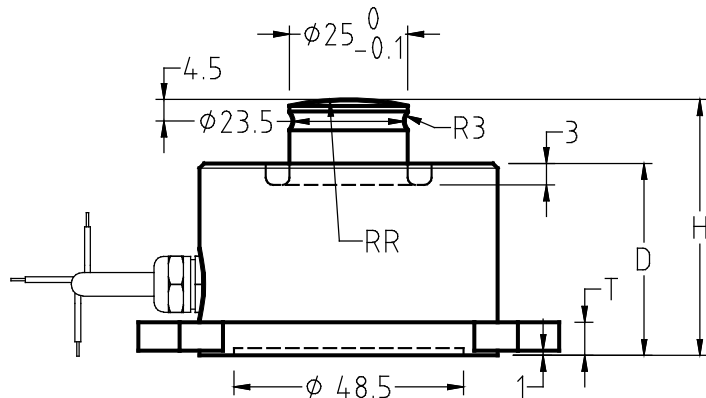
8. GUARANTEE

The manufacturer's guarantee is applicable as far as mounting recommendations and general use principle, like above described, are respected.

For any particular use, not described in this document, it is mandatory to obtain a prior written agreement from SENSY S.A. for the validity of the guarantee.

9. DRAWINGS AND WIRING DIAGRAMS

5950 > STANDARD DIMENSIONS



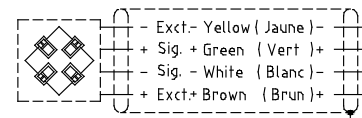
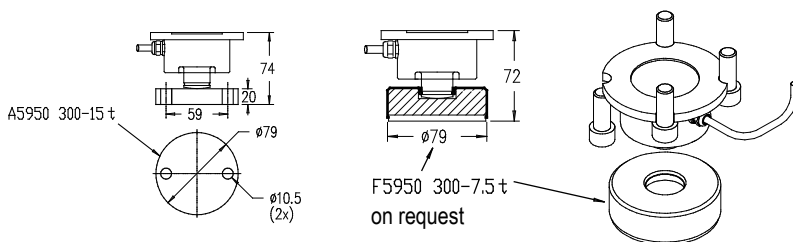
Ref. Item	Capacities	ϕA	D	H	S	T	ϕE	RR	Max. Deflexion (mm)	Weight (kg)
5950-A	0.3 - 5 t	54.5	38.5	54	62.9	7	89	60	0.04 - 0.07	± 1.4
5950-B	7.5 - 15 t	59	38.5	54	62.9	7	89	60	0.08 - 0.15	± 1.4
5950-C	20 t	59	38.5	54	62.9	7	89	60	0.2	± 1.4

Other capacities and dimensions available on request

Dimensions in mm

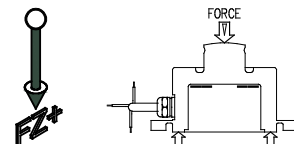
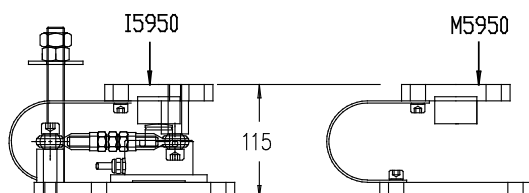
Accessories

Wiring

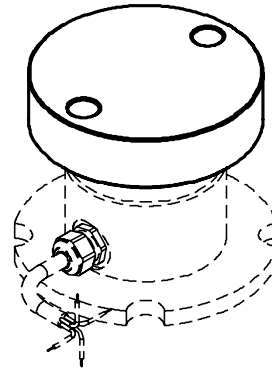
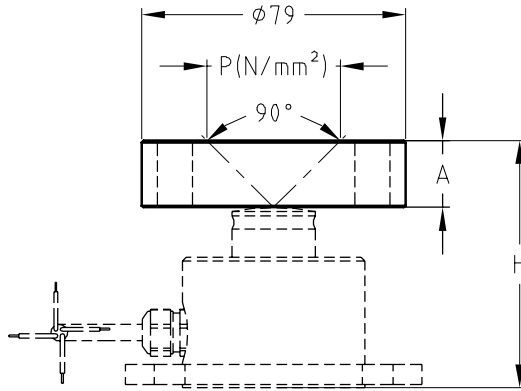


Standard : Cable screen not connected to transducer
Faradisation non connectée au capteur

Load direction



A5950 > STANDARD DIMENSIONS



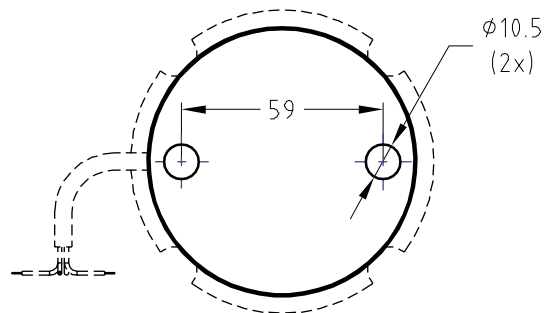
Ref. Item*	Capacities	A	H	P N/mm ²	Weight (kg)
A5950-AB	0.3 - 15 t	20	74	± 120 (15 t)	± 0.76
A5950-C	20 t	25	79	± 100	± 0.95

*Material: stainless steel

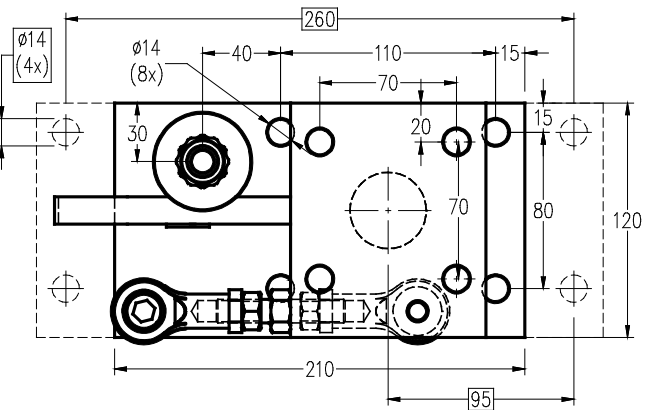
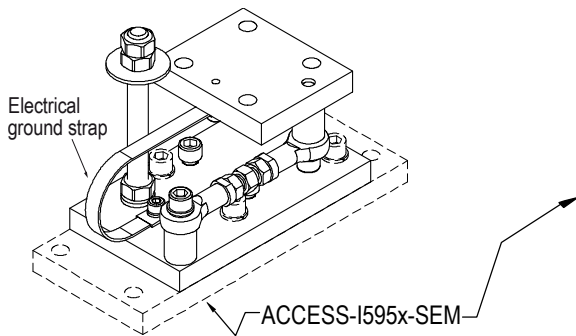
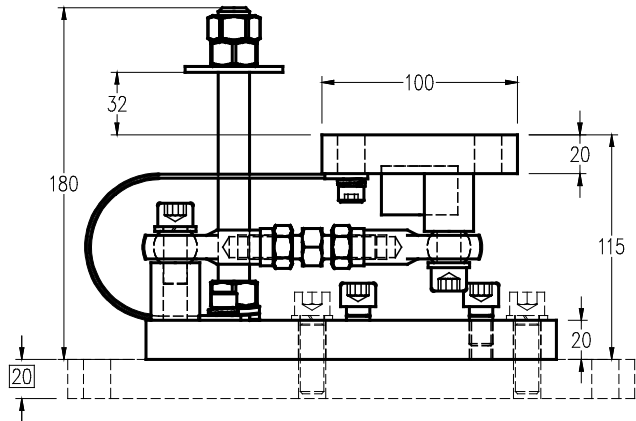
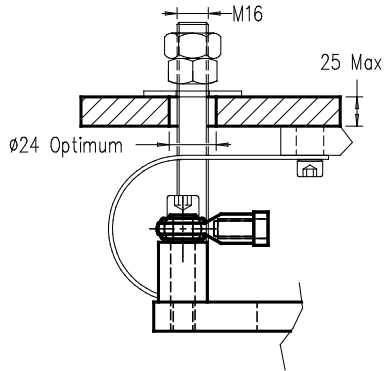
—> Other capacities and dimensions available on request

Dimensions in mm

Other view



15950-15955 > STANDARD DIMENSIONS

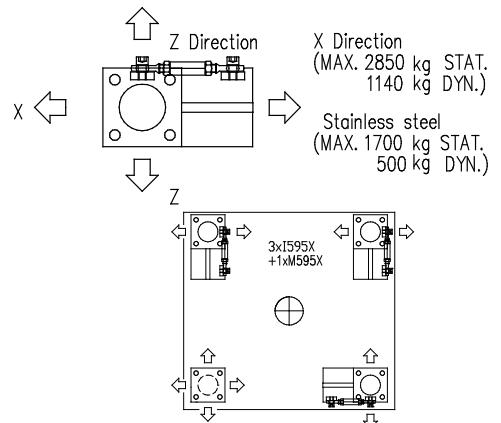
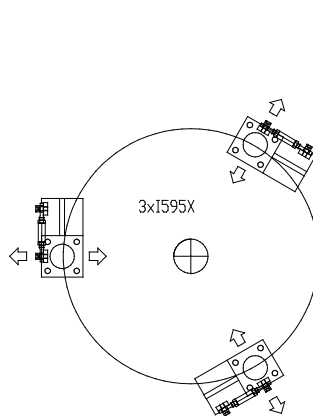
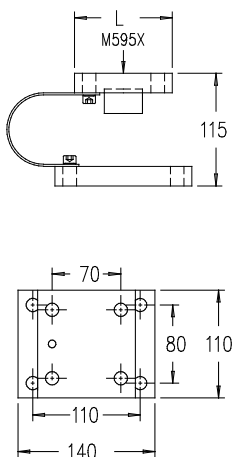


Ref. Item*	Capacities
I595x-A	0.3 - 20 t
*x=Material: I5950 - stainless steel; I5955 - alloy steel	

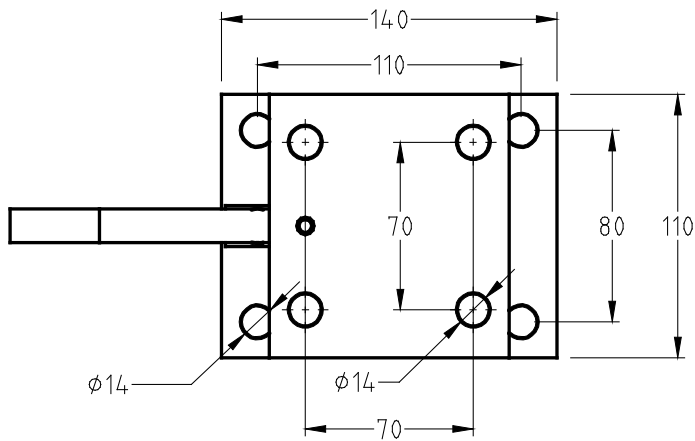
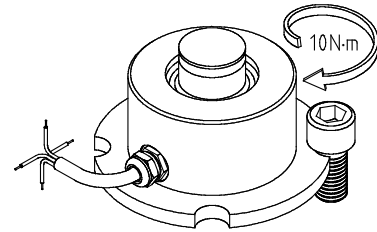
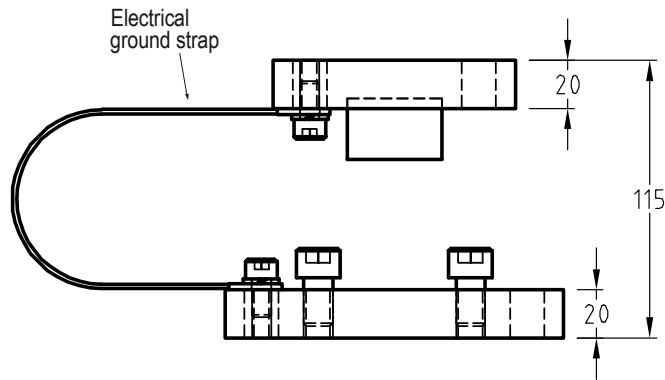
Other capacities and dimensions available on request

Dimensions in mm

Other views



M5950 > STANDARD DIMENSIONS

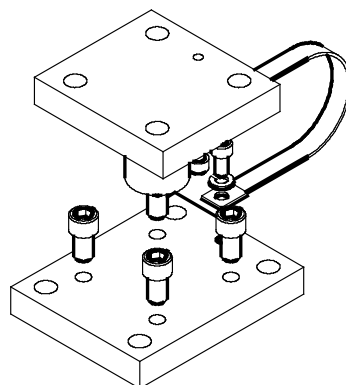


Ref. Item*	Capacities
M595x-A	0.3 - 20 t
*Material: M5950 - stainless steel; M5955 - alloy steel	

→ Other capacities and dimensions available on request

Dimensions in mm

Other view



10. 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: 5950, 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

2011/65/EU Restriction of the use of certain hazardous substances in the electrical and electronic equipment (RoHS)
amended by
directive
2017/2102 / EU

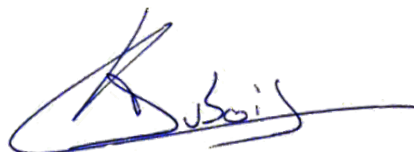
2014/35/EU Safety / low voltage directive

Conception and compliance of this equipment is made according to all of part of the following standards:
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.

Jumet,
March 29th 2019



Augustin DUBOIS
Product Development Division