

# WEIGHING LOAD CELLS



[www.sensy.com](http://www.sensy.com)

LOAD CELL  
MANUFACTURER



# TECHNICAL DATA

## Accuracy class

	SL	1	0.5	0.25	0.1	C1 (1000 d OIML)	0.05 (2000 d)	A3	0.03 (3000 d)	C3 (3000 d OIML)	0.02 (5000 d)
Combined error *	±0.5 ... 1	< ±1	< ±0.5	< ±0.25	< ±0.1	< ±0.03	< ±0.05	< ±0.03	< ±0.025	< ±0.020	< ±0.015
Non-repeatability	< ±0.25	< ±0.5	< ±0.25	< ±0.1	< ±0.03	< ±0.02	< ±0.02	< ±0.015	< ±0.015	< ±0.01	< ±0.01
Creep error over 30 min	< ±0.3	< ±0.25	< ±0.1	< ±0.075	< ±0.06	< ±0.04	< ±0.04	< ±0.03	< ±0.025	< ±0.020	< ±0.015
Reference temperature	23										
Temperature coefficient of sensitivity per 10°C	< ±0.2	< ±0.2	< ±0.1	< ±0.05	< ±0.05	< ±0.02	< ±0.035	< ±0.05	< ±0.015	< ±0.009	< ±0.008
Temperature coefficient of zero signal per 10°C	< ±0.2	< ±0.2	< ±0.1	< ±0.035	< ±0.035	< ±0.03	< ±0.03	< ±0.05	< ±0.023	< ±0.015	< ±0.013
Nominal sensitivity	1 ... 1.5		1 ... 2		1 ... 3		2 ... 3				
Sensitivity tolerance	< ±0.3										
Nominal range of the excitation voltage	5 to 10 if input resistance = 350 Ω; 5 to 18 if input resistance = 700 Ω										
Maximum excitation voltage	15 if input resistance = 350 Ω; 20 if input resistance = 700 Ω										

\* Combined error = non-linearity + hysteresis.  
 The temperature coefficient of sensitivity and the combined error are balanced in such a way that their sum is less than 70 % of the error limit of the scale, class III, according to the OIML R60 and EN 45501 standards.  
 F.S.: Full Scale  
 g= 9.8107 m/s<sup>2</sup> (Jumet, Belgium)  
 Specifications are subject to change without notice.



## 2000S

## HERMETICALLY SEALED BENDING BEAM LOAD CELL

Load cell combining high accuracy and resistance in harsh environment.



### Features

- o Material: stainless steel
- o Protection class: IP67 (welded sealing)
- o Complies with OIML / R 60 up to 3000 d for scales in class III according to EN 45501
- o Standardised dimensions
- o Cable length: 3 m (other lengths available on request)
- o Whole range of mounting kits available

Most popular options (see more in ANNEX)



Ex i



IP68

Model 2000S - 50 kg



**Application(s)** SENSY's load cell 2000S is perfectly designed for the following applications:

- OIML certified and industrial scales,
- Packaging, batching and filling machines,
- Reactors, tanks, vessels or hopper weighing.

### Capacities

2000S: 10 - (15) - 20 - (30) - 50 - (75) - 100 - (150) - 200 kg

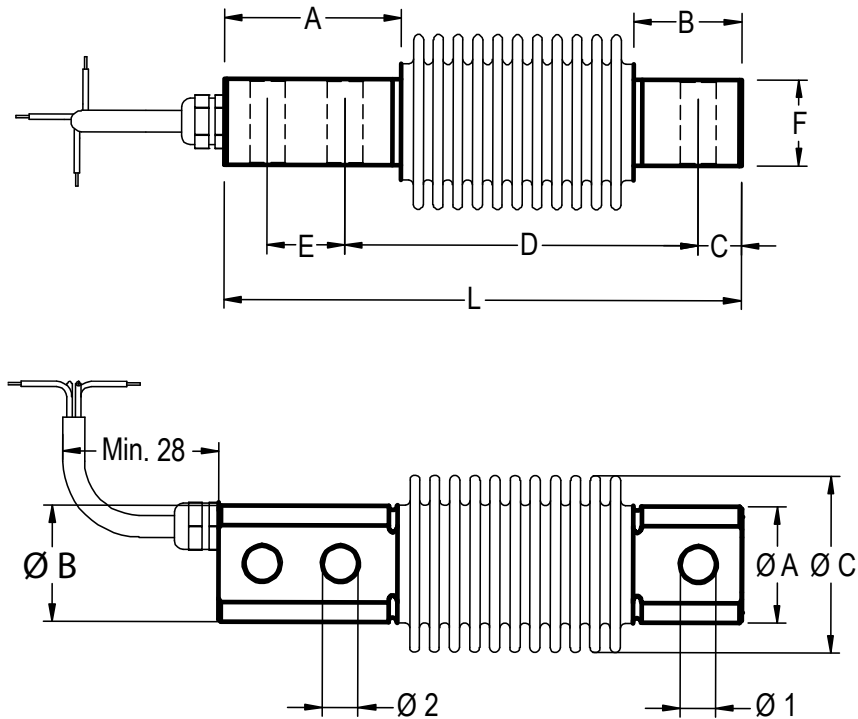
Specifications	A3	0.03 %	C 3	
Accuracy class	0.03 %** F.S.*	0.03% F.S.*	3000 d OIML	-
Repeatability error	<± 0.015	<± 0.015	<± 0.01	% F.S.*
Creep error over 30 min.	<± 0.03	<± 0.025	<± 0.02	% F.S.*
Reference temperature	23	23	23	°C
Compensated temperature range	-10...+45	-10...+45	-10...+45	°C
Service temperature range	-25...+70	-25...+70	-25...+70	°C
Storage temperature range	-50...+85	-50...+85	-50...+85	°C
Temperature coefficient of the sensitivity	<± 0.05	<± 0.015	<± 0.009	% F.S.*10°C
Temperature coefficient of zero signal	<± 0.05	<± 0.023	<± 0.013	% F.S.*10°C
Zero balance	± 0.02	± 0.02	± 0.02	mV/V
Sensitivity tolerance	<± 0.2	<± 0.2	<± 0.1	%
Input resistance	350 ± 2	350 ± 2	350 ± 2	ohm(s)
Output resistance	350 ± 2	350 ± 2	350 ± 2	ohm(s)
Insulation resistance (50 V)	> 5000	> 5000	> 5000	Mohm(s)
Reference excitation voltage	10	10	10	VDC
Permissible nominal range of excitation voltage	3..12	3...12	3...12	VDC
Safe load limit	150	150	150	% F.S.*
Breaking load	>300	>300	>300	% F.S.*
Permissible dynamic loading	60	60	60	% F.S.*
Static lateral force limit	100	100	100	% F.S.*

\* F.S. : Full Scale.

\*\* : except thermal drifts.

Specifications subject to change without notice..

2000S > STANDARD DIMENSIONS

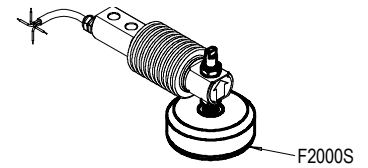
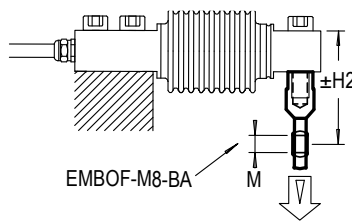
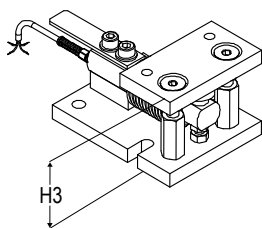


Ref. Item	Capacities	A	B	C	D	E	F	L	Ø1	Ø2	ØA	ØB	ØC	H1	H2	H3	ØM	Max. Deflexion (mm)	Weight (kg)
2000S-A	10 - 200 kg	40	20	10	82	18	20	120	8.2	8.2	± 26.7	32 max	45 max	78	56	80	8	0.2 to 0.3	0.48

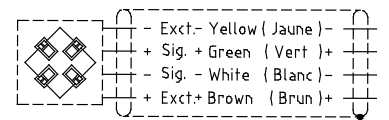
Other capacities and dimensions available on request

Dimensions in mm

Accessories

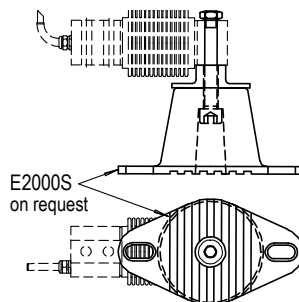
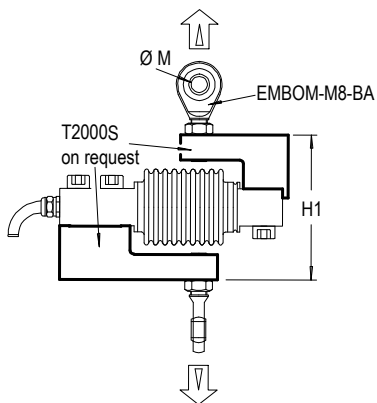
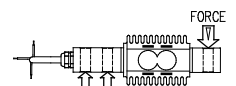
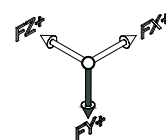


Wiring

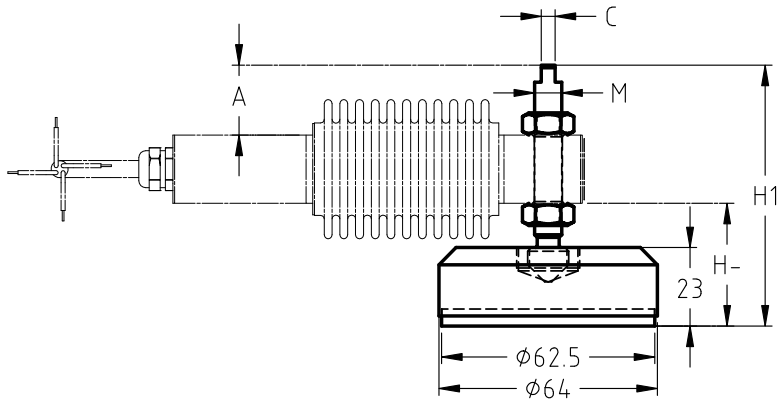
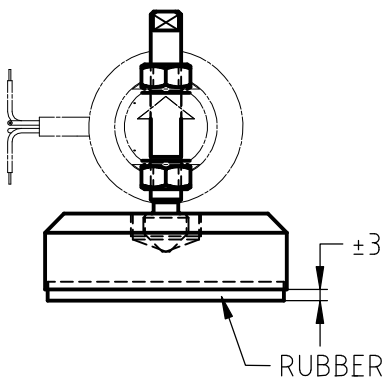
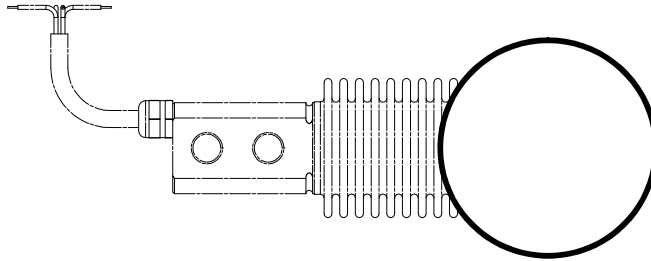
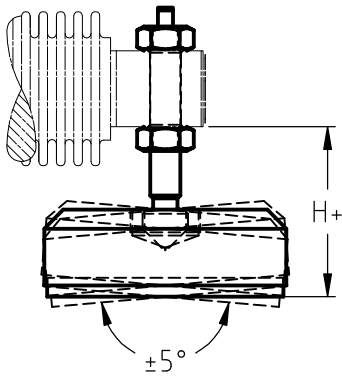


Standard : Cable screen not connected to transducer  
Faradisation non connectée au capteur

Load direction



F2000S > STANDARD DIMENSIONS



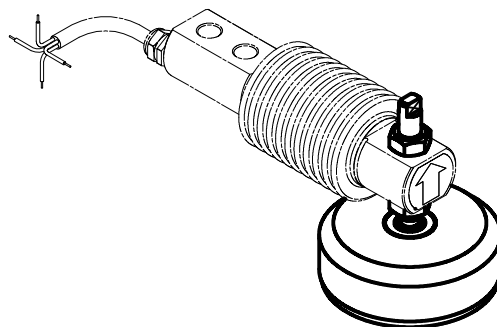
Ref. Item*	Capacities	A	C	M	H-	H+	H1
F2000S-A	10 - 200 kg	20.5	4	8	36	45	76.5

\* Material: stainless steel

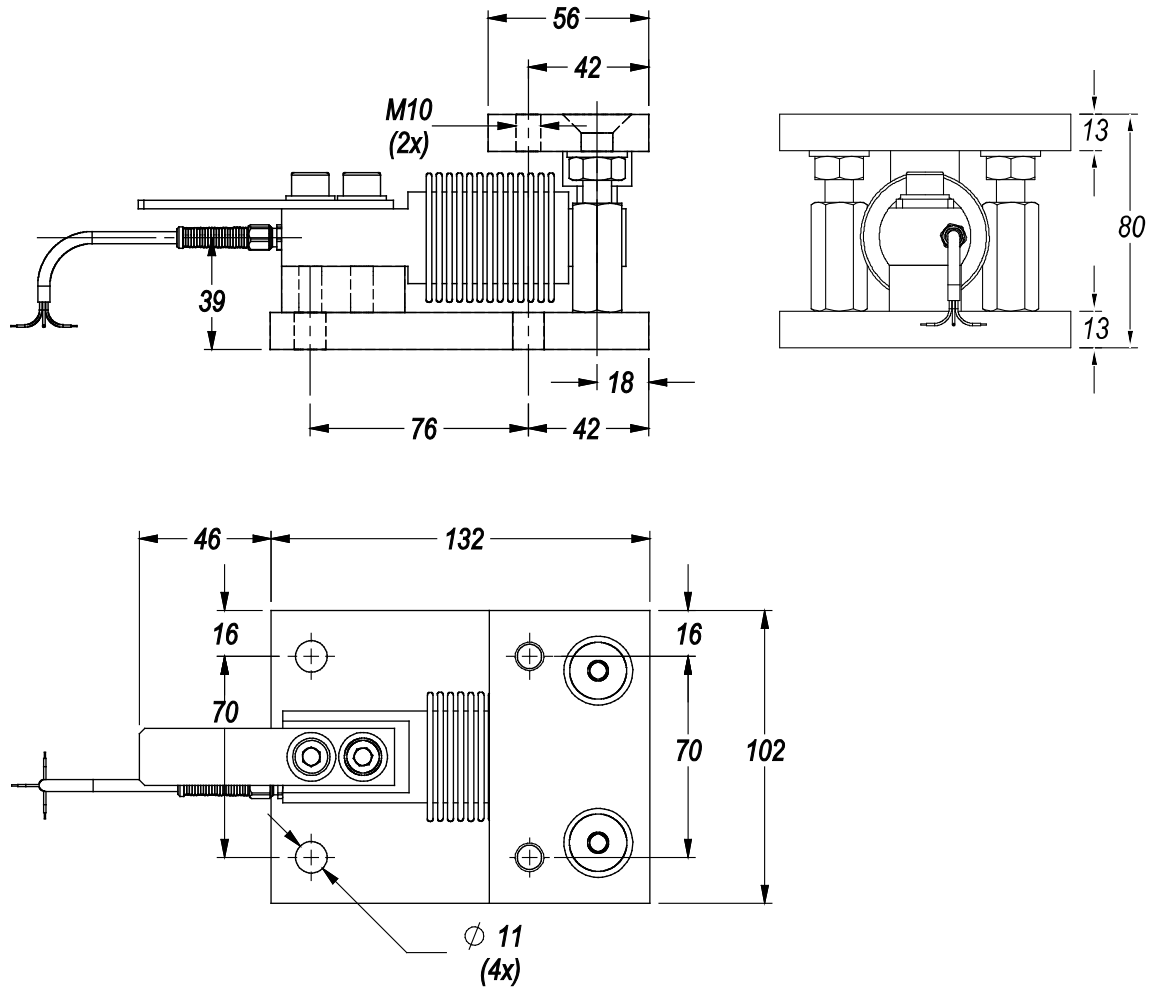
→ Other capacities and dimensions available on request

Dimensions in mm

Other view



I2000S-I2005S > STANDARD DIMENSIONS

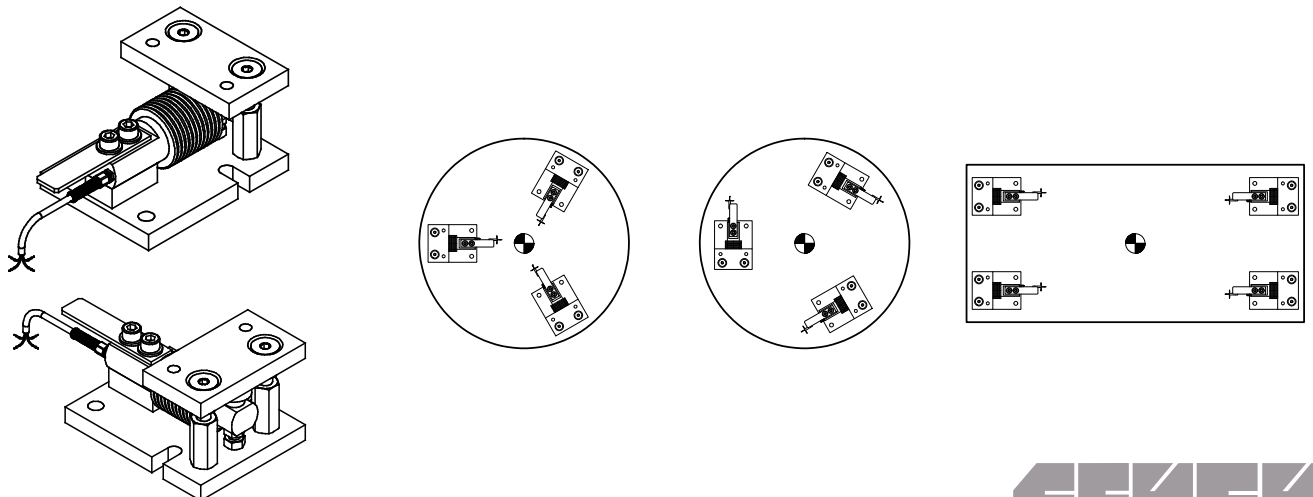


Ref. Item*	Capacities
I200xS-A	10 - 200 kg
* x=Material: I2000S - stainless steel; I2005S - nickel-plated steel	

→ Other capacities and dimensions available on request

Dimensions in mm

Other views





Single point load cell specially designed for platform and hopper weighing.



Features

- o Designed for off-center load
- o Maximum platform size: 800 x 800 mm
- o Material: anodised aluminium alloy
- o Protection class: IP64
- o Easy to install
- o Complies with OIML / R60 up to 3000 d for scales in class III according to EN 45501
- o Cable length: 3 m (other lengths available on request)

Most popular options (see more in ANNEX)



Ex i



Model 2022/2022-F - 300 kg



Application(s) SENSY's load cell 2022 is perfectly designed for the following applications:

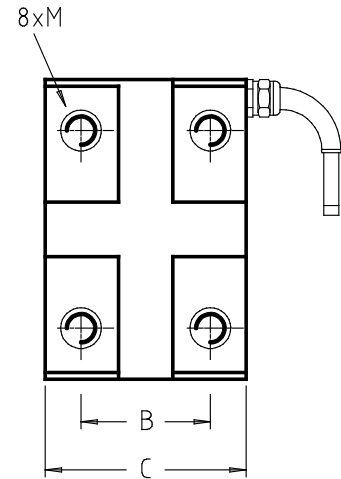
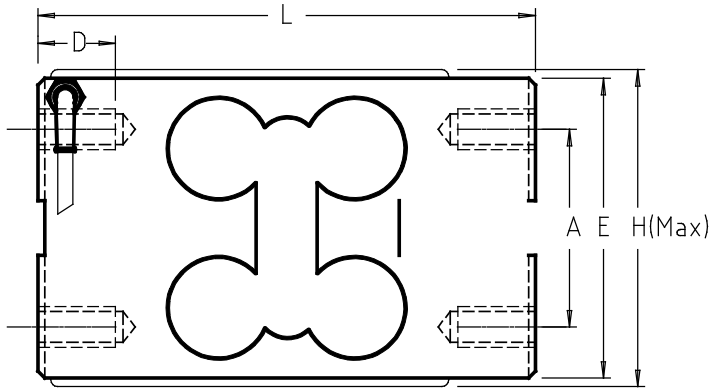
- Industrial scales and platforms, retail and computing scales, airport weighing scales.
- Medium-sized hoppers weighing, filling, packaging and batching applications.

Capacities

2022: 100 - 150 - (200) - 300 - 500 kg

Specifications	0.03 %	C 3	
Accuracy class	0.03% F.S.*	3000 d OIML	-
Combined error (non-linearity + hysteresis)	<± 0.03	<± 0.02	% F.S.*
Repeatability error	<± 0.015	<± 0.01	% F.S.*
Creep error over 30 min.	<± 0.025	<± 0.02	% F.S.*
Zero shift after loading	<± 0.0075	<± 0.005	% F.S.*
Reference temperature	23	23	°C
Compensated temperature range	-10...+45	-10...+45	°C
Service temperature range	-30...+70	-30...+70	°C
Storage temperature range	-50...+85	-50...+85	°C
Temperature coefficient of the sensitivity	<± 0.015	<± 0.009	% F.S.* / 10°C
Temperature coefficient of zero signal	<± 0.023	<± 0.013	% F.S.* / 10°C
Zero balance	± 0.02	± 0.02	mV/V
Nominal sensitivity	2	2	mV/V
Sensitivity tolerance	<± 0.2	<± 0.1	%
Input resistance	350 ± 2	350 ± 2	ohm(s)
Output resistance	350 ± 2	350 ± 2	ohm(s)
Insulation resistance (50 V)	> 5000	> 5000	Mohm(s)
Reference excitation voltage	10	10	VDC
Permissible nominal range of excitation voltage	3...12	3...12	VDC
Safe load limit	150	150	% F.S.*
Breaking load	>300	>300	% F.S.*
Permissible dynamic loading	60	60	% F.S.*
Static lateral force limit	100	100	% F.S.*

\* F.S. : Full Scale.  
Specifications subject to change without notice..



Note: Correct torque for fixing bolts:  
 30 N·m (M12 100-500 kg)  
 70 N·m (M16 750-1000 kg)  
 (don't touch bottom of tapped holes)

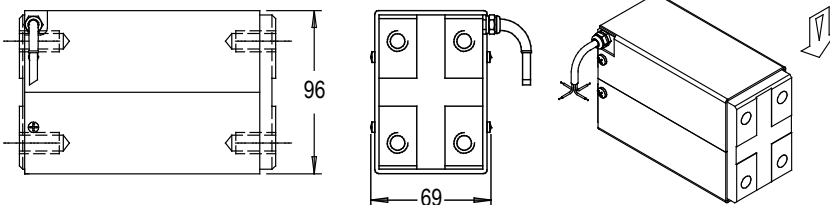
Ref. Item	Capacities	A	B	C	D	E	H	L	M	Max. Platform Size	Max. Deflexion (mm)	Weight (kg)
2022-A	100 - 500 kg	58	38	58	25	88	90	146	12	800x800	0.6 to 1	0.48

→ Other capacities and dimensions available on request

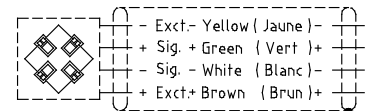
Dimensions in mm

Other views

F = COVER OPTION (mandatory for Ex i version)

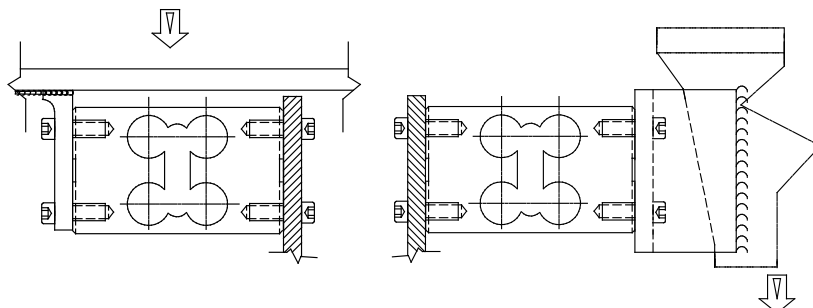
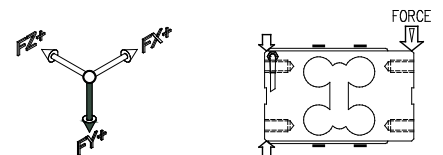


Wiring



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

Load direction



Small-sized single point load cells.



Features

- o Designed for off-center load
- o Maximum platform size: 250x250 / 400x400 mm (depending on capacity)
- o Small sized
- o Material: anodised aluminium alloy
- o Protection class: IP63
- o Competitive price
- o Cable length: see drawing table - CL (other lengths available on request)
- o Easy to install

Most popular options (see more in ANNEX)



Model 2052 - 5 kg



Application(s) SENSY's load cells 2052 are perfectly designed for the following applications:

- Bench scales,
- Small hopper weighing,
- Filling, packaging and batching applications.

Capacities

2052: 2 - (3) - 5 - 10 - 20 - 30 - 40 - 50 - 100 - (150) - 200 kg

Specifications	A3	0.03 %	
Accuracy class	0.03 %** F.S.*	0.03% F.S.*	-
Combined error (non-linearity + hysteresis)	<± 0.03	<± 0.03	% F.S.*
Repeatability error	<± 0.015	<± 0.015	% F.S.*
Creep error over 30 min.	<± 0.03	<± 0.025	% F.S.*
Reference temperature	23	23	°C
Compensated temperature range	-10...+45	-10...+45	°C
Service temperature range	-30...+70	-30...+70	°C
Storage temperature range	-50...+85	-50...+85	°C
Temperature coefficient of the sensitivity	<± 0.05	<± 0.015	% F.S./10°C
Temperature coefficient of zero signal	<± 0.05	<± 0.023	% F.S./10°C
Nominal sensitivity	1.6...2.7	1.6...2.7	mV/V
Sensitivity tolerance	<± 0.2	<± 0.2	%
Input resistance	400 ± 10	400 ± 10	ohm(s)
Output resistance	350 ± 3	350 ± 3	ohm(s)
Insulation resistance (50 V)	> 5000	> 5000	Mohm(s)
Reference excitation voltage	10	10	VDC
Permissible nominal range of excitation voltage	3..12	3...12	VDC
Safe load limit	150	150	% F.S.*
Breaking load	>300	>300	% F.S.*
Permissible dynamic loading	60	60	% F.S.*
Static lateral force limit	100	100	% F.S.*

\* F.S. : Full Scale.

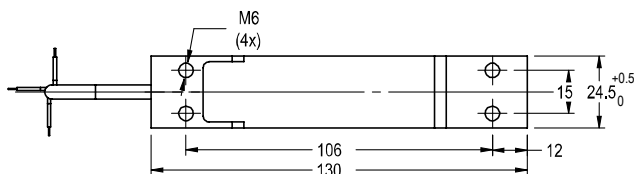
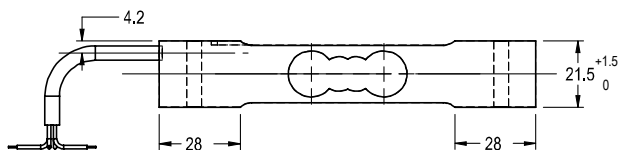
\*\* : except thermal drifts.

Specifications subject to change without notice..

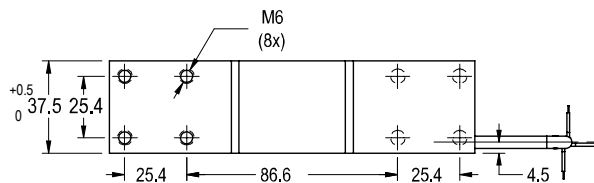
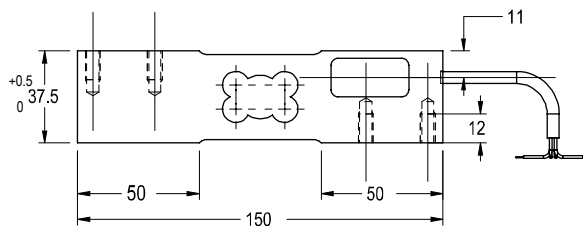
2052 > STANDARD DIMENSIONS



2052-A



2052-B

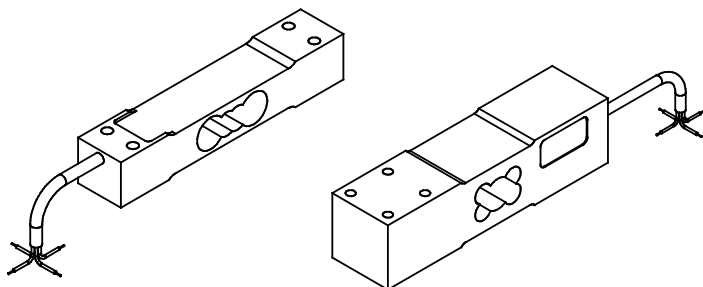


Ref. Item	Capacities	Max. Platform Size (mm)	CL (m)	Weight (kg)
2052-A	2 - 40 kg	250 x 250	0.5	0.15
2052-B	50 - 200 kg	400 x 400	1.5	0.52

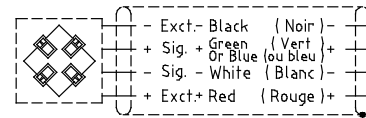
Other capacities and dimensions available on request

Dimensions in mm

Accessories

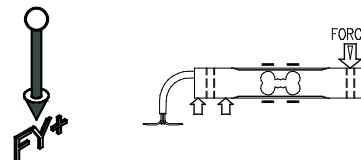


Wiring



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

Load direction



## 2162L

## SINGLE POINT LOAD CELLS "OFF CENTER"

Economical single point load cells specially designed for small platform and hopper weighing.



### Features

- o Designed for off-center load
- o Maximum platform size: 400 x 400 mm
- o Material: anodised aluminium alloy
- o Protection class: IP63
- o Competitive price
- o Easy to install
- o Weight: 0.35 kg
- o Cable length: 2 m (other lengths available on request)

Most popular options (see more in ANNEX)



Ex i



Model 2162 - 10 kg



**Application(s)** SENSY's load cells 2162L are perfectly designed for the following applications:

- Single point load cells for industrial scales and weighing systems,
- Small hopper weighing,
- Filling, packaging and batching applications.

### Capacities

2162L: 10 - 15 - 20 - (30) - 50 - 75 kg

### Specifications

A3

Specifications	A3	
Accuracy class	0.03 %** F.S.*	-
Combined error (non-linearity + hysteresis)	<± 0.03	% F.S.*
Repeatability error	<± 0.015	% F.S.*
Creep error over 30 min.	<± 0.03	% F.S.*
Reference temperature	23	°C
Compensated temperature range	-10...+45	°C
Service temperature range	-30...+70	°C
Storage temperature range	-50...+85	°C
Temperature coefficient of the sensitivity	< ± 0.1	% F.S./10°C
Temperature coefficient of zero signal	< ± 0.05	% F.S./10°C
Zero balance	± 0.02	mV/V
Nominal sensitivity	2 ± 10%	mV/V
Sensitivity tolerance	<± 0.2	%
Input resistance	350 ± 2	ohm(s)
Output resistance	350 ± 2	ohm(s)
Insulation resistance (50 V)	> 5000	Mohm(s)
Reference excitation voltage	10	VDC
Permissible nominal range of excitation voltage	3..12	VDC
Safe load limit	150	% F.S.*
Breaking load	>300	% F.S.*
Permissible dynamic loading	60	% F.S.*
Static lateral force limit	100	% F.S.*

\* F.S. : Full Scale.

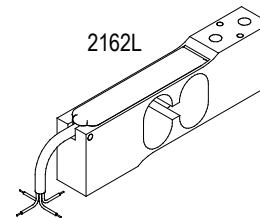
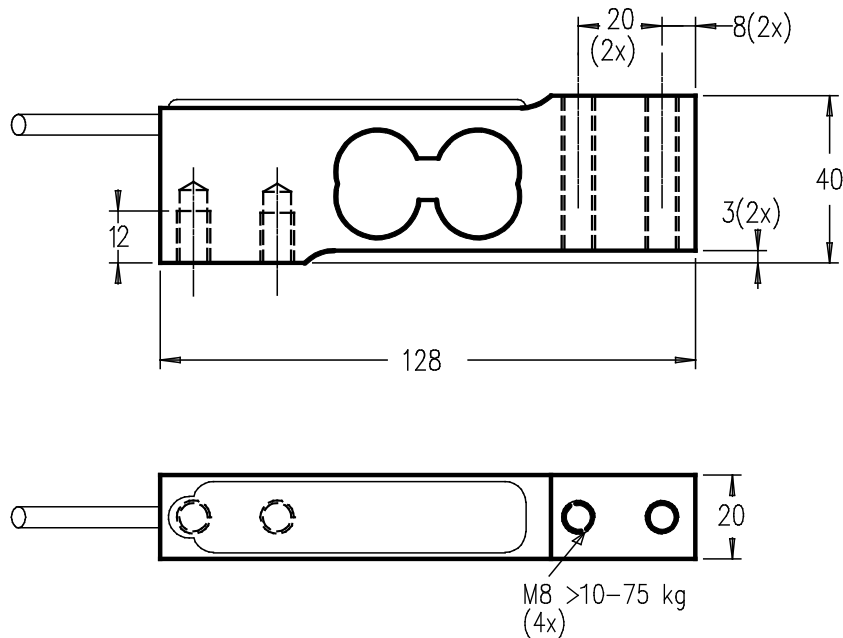
\*\* : except thermal drifts.

Specifications subject to change without notice..



ISO 9001 certified

2162L > STANDARD DIMENSIONS



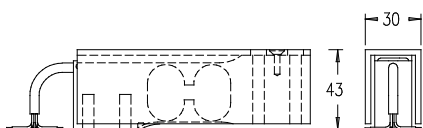
Note: correct torque for fixing bolts: 10 N-m if M8; 50 N-m if M10 (do not touch bottom of tapped holes)

Ref. Item	Capacities	Weight (kg)	Note
2162L-A	10 - 75 kg	0.35	-
2162L-Ex-A	10 - 75 kg	0.35	Cover and cable gland mandatory for Ex i version

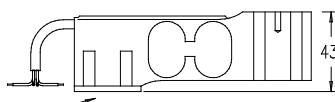
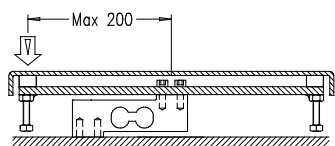
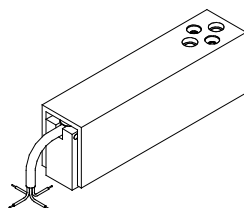
Other capacities and dimensions available on request

Dimensions in mm

Accessories

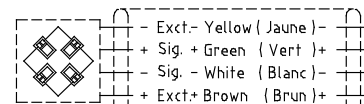


F- COVER OPTION



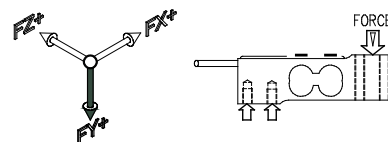
Polyethylene plate

Wiring



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

Load direction



Load cells for silo weighing combining a sturdy design with easy installation.



Features

- o Material: stainless steel
- o Protection class: IP67
- o Mounting kits available with following properties:
  - stabilisation without tension rods
  - compensation of thermal dilatations
  - compensation of defective alignment
- o Cable length: see drawing table - CL (other lengths available on request)

Most popular options (see more in ANNEX)



Model 2600 - 10 t + 12600



Application(s) SENSY's load cells 2600 are perfectly designed for the following applications:

- High-capacity silos, tanks or hopper weighing (indoor and outdoor),
- Reactors and mixers weighing (vibrating),
- Weighing in potentially seismic areas.

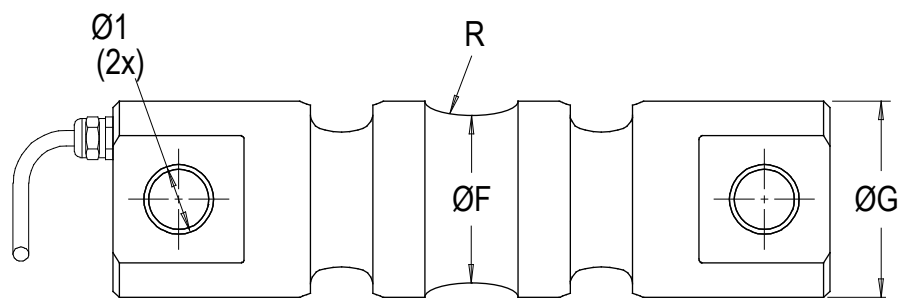
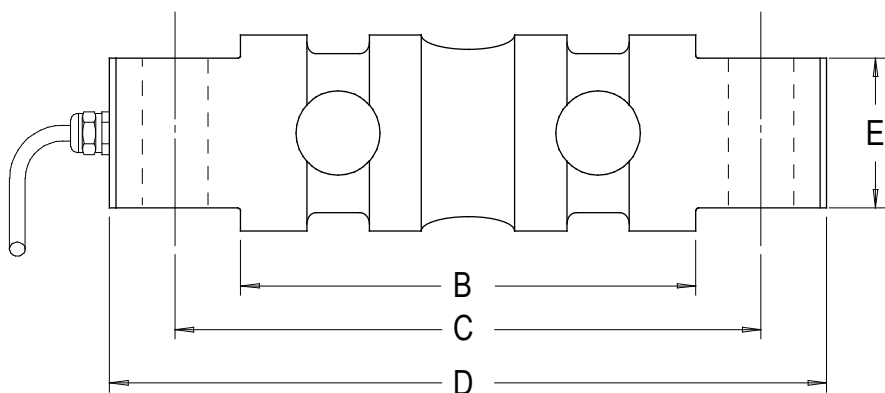
Capacities

2600: 10 - (15) - 20 - 30 - 50 - 75 t

Specifications	0.25 %	0.1 %	
Accuracy class	0.25 % F.S.*	0.1% F.S.*	-
Combined error (non-linearity + hysteresis)	<± 0.25	< ± 0.1	% F.S.*
Repeatability error	<± 0.1	<± 0.03	% F.S.*
Creep error over 30 min.	<± 0.1	<± 0.06	% F.S.*
Zero shift after loading	<± 0.025	<± 0.015	% F.S.*
Reference temperature	23	23	°C
Compensated temperature range	-10...+45	-10...+45	°C
Service temperature range	-30...+70	-30...+70	°C
Storage temperature range	-50...+85	-50...+85	°C
Temperature coefficient of the sensitivity	<± 0.05	<± 0.05	% F.S.*10°C
Temperature coefficient of zero signal	<± 0.035	<± 0.035	% F.S.*10°C
Nominal sensitivity	2	2	mV/V
Sensitivity tolerance	<± 0.3	<± 0.3	%
Input resistance	350 ± 2	350 ± 2	ohm(s)
Output resistance	350 ± 2	350 ± 2	ohm(s)
Insulation resistance (50 V)	> 5000	> 5000	Mohm(s)
Reference excitation voltage	10	10	VDC
Permissible nominal range of excitation voltage	3...12	3...12	VDC
Safe load limit	150	150	% F.S.*
Breaking load	>300	>300	% F.S.*
Permissible dynamic loading	50	50	% F.S.*

\* F.S. : Full Scale.  
Specifications subject to change without notice..

2600 > STANDARD DIMENSIONS

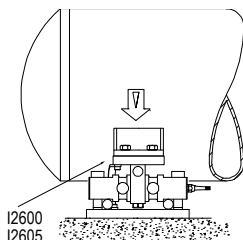
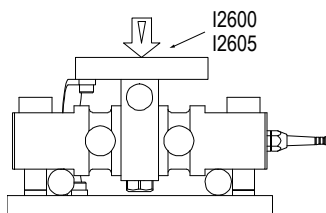
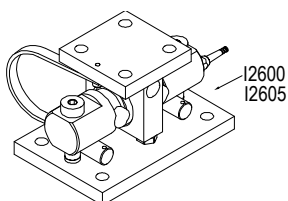
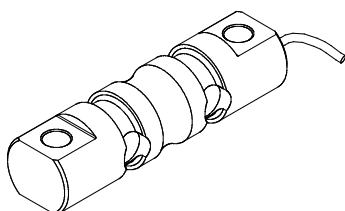


Ref. Item	Capacities	B	C	D	E	ØF	ØG	R	Ø1	CL (m)	Weight (kg)
2600-A	10 - 20 t	118	188	230	51	55	63	30	21	10	4.3
2600-B	30 t	130	220	270	55	57	74	50	24.5	12	7
2600-C	50 t	134	240	290	70	80	89	40	31	12	11
2600-D	75 t	222	300	360	88	103	109	45	34	20	24.6

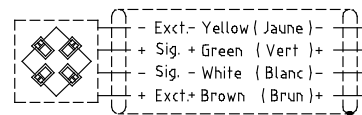
→ Other capacities and dimensions available on request

Dimensions in mm

Accessories

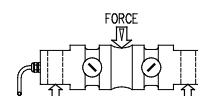
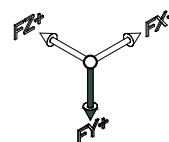


Wiring



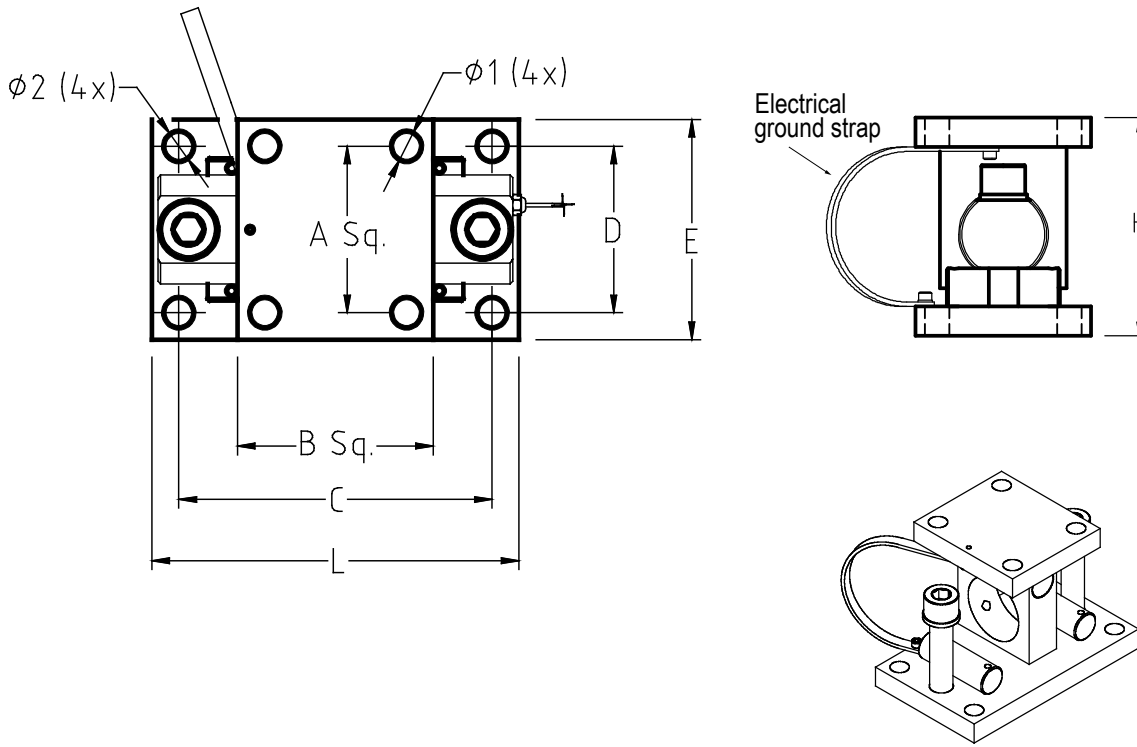
Standard : Cable screen not connected to transducer  
Faradisation non connectée au capteur

Load direction





I2600-I2605 > **STANDARD DIMENSIONS**



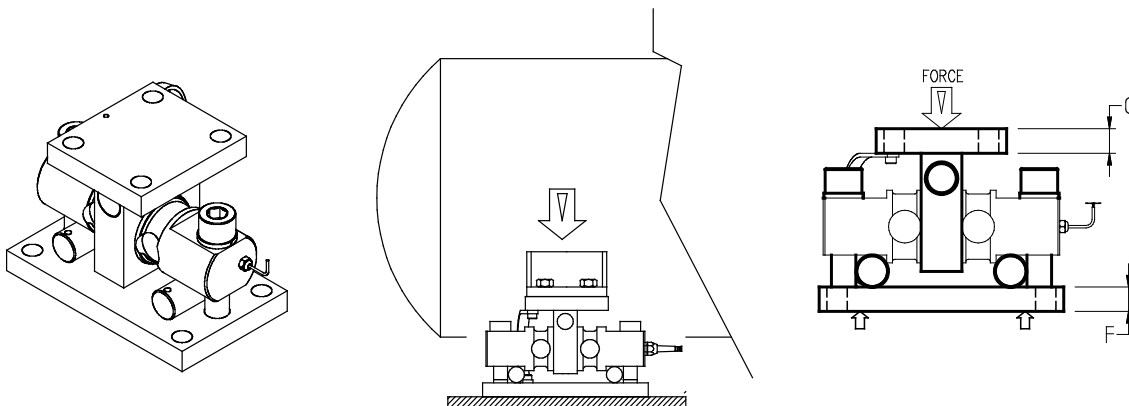
Ref. Item*	Capacities	A	B	C	D	E	F	G	H	L	Ø1	Ø2	Weight (kg)
I260x-A	10 - 20 t	80	120	190	110	150	20	20	145	230	17	17	10.5
I260x-B	30 t	110	150	240	110	150	25	25	184	280	21	21	16.5
I260x-C	50 t	136	180	256	136	180	30	30	224	300	25	25	25
I260x-D	75 t	180	250	440	160	250	40	30	327	520	23	34	86

\* x=Material: I2600 - stainless steel; I2605 - alloy steel

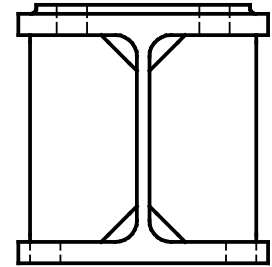
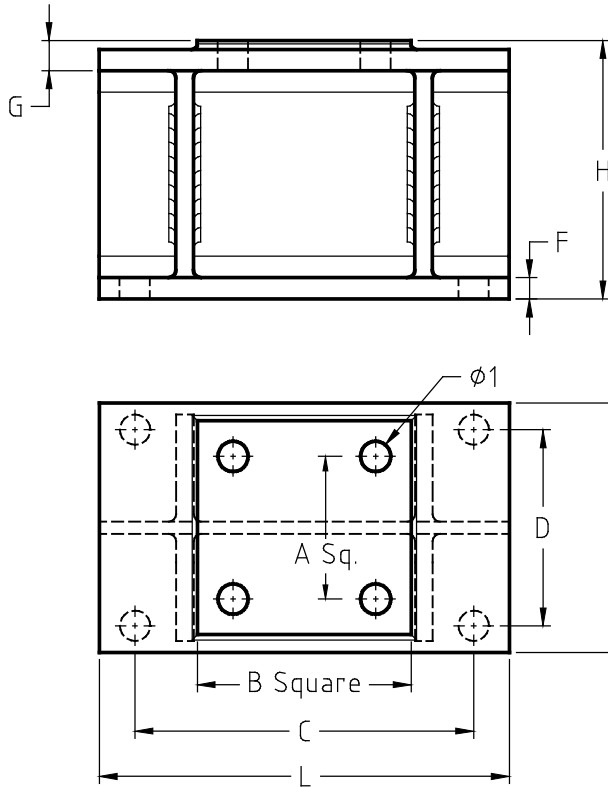
→ Other capacities and dimensions available on request

Dimensions in mm

Other views



D2600-D2605 > **STANDARD DIMENSIONS**



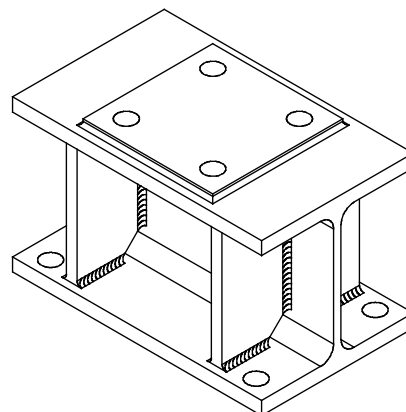
Ref. Item*	Capacities	A	B	C	D	E	F	G	H	L	Ø1	Weight (kg)
D260x-A	10 - 20 t	80	120	190	110	140	12	17	145	230	17	10.2
D260x-B	30 t	110	150	240	110	180	14	184	184	280	18	18.4
D260x-C	50 t	136	180	256	136	220	16	224	224	300	20	26.23
D260x-D	75 t	According to customer's design specifications										

\* x=Material: D2600 - stainless steel; D2605 - alloy steel

→ Other capacities and dimensions available on request

Dimensions in mm

Other view



Load cells specially designed for on-board weighing on trucks.



Features

- o Very sturdy design
- o High resistance against shocks
- o Protection class: IP67
- o Low-cost solution
- o Material: alloy steel
- o Easy to install (no stabilisation system needed)
- o Screws and blocks to be welded available
- o Cable length: see drawing table - CL (other lengths available on request)

Most popular options (see more in ANNEX)



Ex i



Model 2645 - 10 t



**Application(s)** SENSY's load cells 2625-2645 are perfectly designed for the following applications:

- 'On-board' weighing system on trucks, lorries or agricultural trailers,
- 'On-board' overload preventing system,
- Railways weighing.

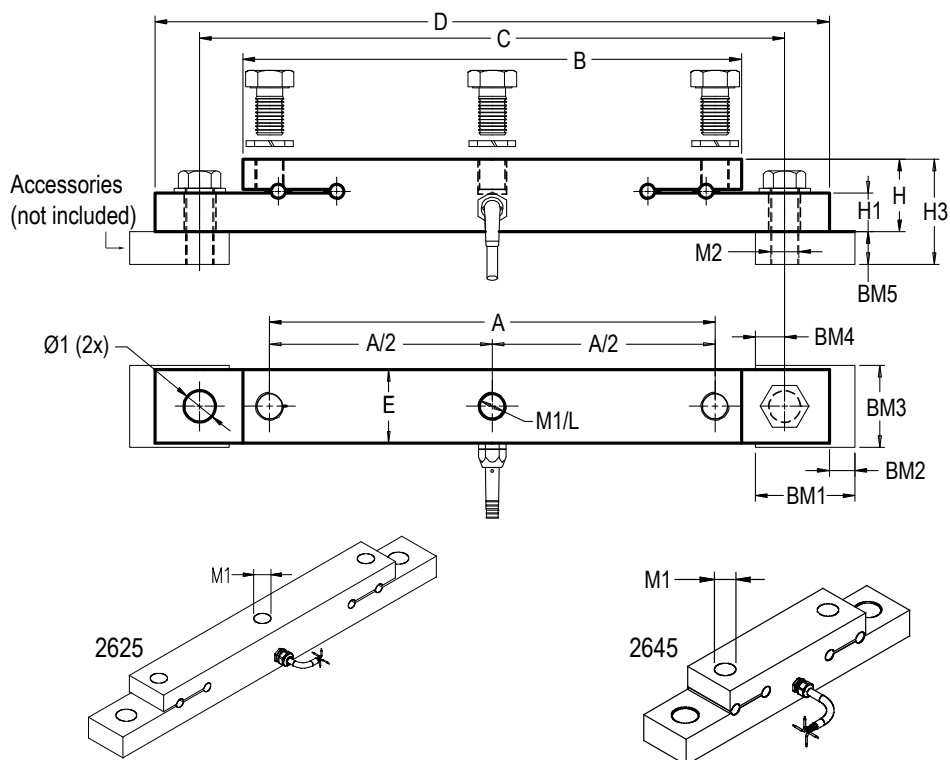
Capacities

2625: 10 t  
2645: 10 - 50 t

Specifications	0.5 %	
Repeatability error	< ± 0.25	% F.S.*
Creep error over 30 min.	< ± 0.2	% F.S.*
Reference temperature	23	°C
Compensated temperature range	-10...+45	°C
Service temperature range	-25...+70	°C
Storage temperature range	-50...+85	°C
Temperature coefficient of the sensitivity	< ± 0.1	% F.S./10°C
Temperature coefficient of zero signal	< ± 0.1	% F.S./10°C
Zero balance	± 0.02	mV/V
Nominal sensitivity	1	mV/V
Input resistance	352 ± 2	ohm(s)
Output resistance	352 ± 2	ohm(s)
Insulation resistance (50 V)	> 5000	Mohm(s)
Reference excitation voltage	10	VDC
Permissible nominal range of excitation voltage	3...12	VDC
Safe load limit	120	% F.S.*
Breaking load	>250	% F.S.*
Permissible dynamic loading	50	% F.S.*
Static lateral force limit	100	% F.S.*

\* F.S. : Full Scale.  
Specifications subject to change without notice.

2625-2645 > STANDARD DIMENSIONS



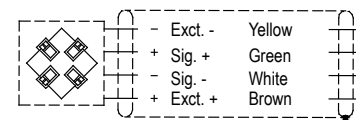
Ref. Item	Capacities		A	B	C	D	E	H	H1	H3	Ø1	M1 / L	CL (m)	Weight (kg)
	Static	Dynamic												
2625-A	10 t	5 t	380	425	499	575	63	62	33	90	27	3xM24x1.5/26	10	14.8
2645-A	10 t	5 t	152	200	270	330	63	62	33	90	27	2xM24x1.5/26	10	7.5
2645-B	50 t	30 t	150	250	510	600	97	97	53	147	38.5	2xM36x3/42	10	31.2

—> Other capacities and dimensions available on request

Dimensions in mm

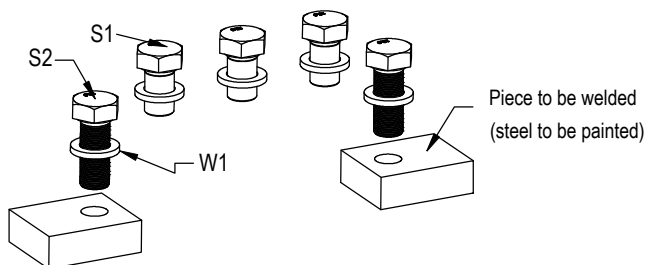
Accessories										
Ref. Item	BM1	BM2	BM3	BM4	BM5	M2	S1 (DIN 961)	S2 (DIN 961)	W1 (DIN 127)	Weight (kg)
K-BM2625-A	85	22	70	25	28	M24x1.5	3x M24x1.5 L40 10.9	2xM24x1.5 L60 10.9	5x A24	4
K-BM2645-A	85	22	70	25	28	M24x1.5	2x M24x1.5 L40 10.9	2xM24x1.5 L60 10.9	4x A24	3.75
K-BM2645-B	145	50	97	50	50	M36x3	2x M36x3 L70 10.9	2xM36x3 L100 10.9	4x A36	15.3

Wiring

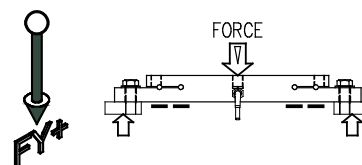


Standard: Cable screen not connected to the transducer

Accessories kit mounting blocks:



Load direction



# 3100P

# PENDULAR COMPRESSION LOAD CELLS

Compression load cells



### Features

- o Canister, high-capacity load cell (up to 500 t)
- o Made completely of stainless steel
- o Protection class: IP67
- o Pendular technology - Self-restoring
- o Available in C1.5 (1500 d) OIML / R 60 (EN 45501)
- o Matched impedance and sensitivity (for parallel connection)
- o Whole range of mounting accessories is available
- o Cable length: 12 m (500 t: 20 m) (other lengths available on request)

Most popular options (see more in ANNEX)



Ex i



IP68

Model 3100P - 20 t



**Application(s)** SENSY's load cells 3100P are perfectly designed for the following applications:

- Weighbridges, high-capacity reactor weighing,
- Silos, tanks or hoppers weighing.

### Capacities

3100P: (5) - (7.5) - 10 - (15) - 20 - 30 - 50 - (75) - 100 - (150) - 200 - 300 - 500\*\* t

Specifications	0.25 %	0.1 %	C 1.5	0.03 %	
Accuracy class	0.25 % F.S.*	0.1% F.S.*	1500 d OIML	0.03% F.S.*	-
Combined error (non-linearity + hysteresis)	<± 0.25	<± 0.1	<± 0.035	<± 0.03	% F.S.*
Repeatability error	<± 0.1	<± 0.03	<± 0.015	<± 0.015	% F.S.*
Creep error over 30 min.	<± 0.1	<± 0.06	<± 0.035	<± 0.025	% F.S.*
Reference temperature	23	23	23	23	°C
Compensated temperature range	-10...+45	-10...+45	-10...+45	-10...+45	°C
Service temperature range	-30...+70	-30...+70	-30...+70	-30...+70	°C
Storage temperature range	-50...+85	-50...+85	-50...+85	-50...+85	°C
Temperature coefficient of the sensitivity	<± 0.05	<± 0.05	<± 0.017	<± 0.015	% F.S./10°C
Temperature coefficient of zero signal	<± 0.035	<± 0.035	<± 0.025	<± 0.023	% F.S./10°C
Nominal sensitivity	1.5	1.5	1.5	1.5	mV/V
Sensitivity tolerance	<± 0.3	<± 0.3	<± 0.2	<± 0.2	%
Input resistance	350..700 ± 2	350..700 ± 2	350..700 ± 2	350..700 ± 2	ohm(s)
Output resistance	350..700 ± 2	350..700 ± 2	350..700 ± 2	350..700 ± 2	ohm(s)
Insulation resistance (50 V)	> 5000	> 5000	> 5000	> 5000	Mohm(s)
Reference excitation voltage	10	10	10	10	VDC
Permissible nominal range of excitation voltage	3...12	3...12	3...12	3...12	VDC
Safe load limit	150	150	150	150	% F.S.*
Breaking load	>300	>300	>300	>300	% F.S.*
Permissible dynamic loading	50	50	50	50	% F.S.*
Static lateral force limit	15	15	15	15	% F.S.*

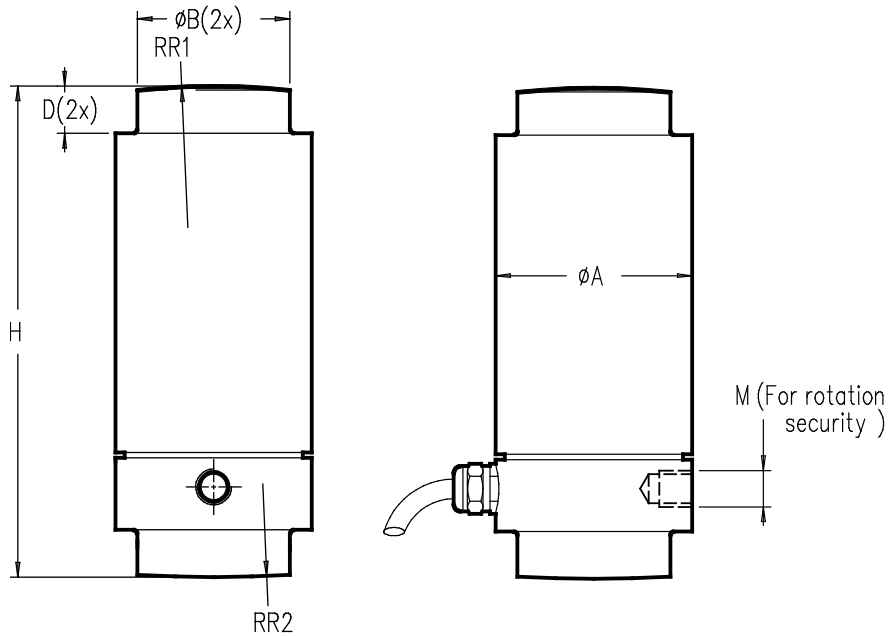
\* F.S. : Full Scale.

\*\* : 2 mV/V

Note: C 1.5 only available for capacities between 5 and 100 t.

Specifications subject to change without notice..

3100P > STANDARD DIMENSIONS

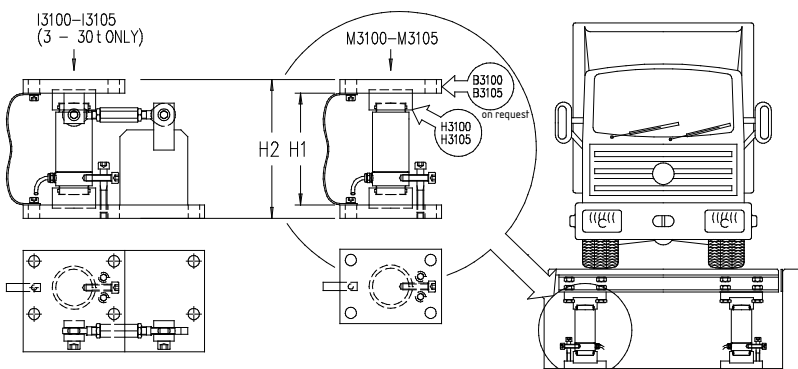


Ref. Item	Capacities	ØA	ØB	D	H	M	RR1	RR2	H1	H2	Max. Deflexion (mm)	Weight (kg)
3100P-A	5 - 30 t	54	42	13	135	M10	200	250	165	205	0.03 - 0.1	2.2
3100P-B	50 - 100 t	±89	64	30	190	M12	300	300	234	294	0.26 - 0.34	5
3100P-C	150 - 200 t	115	90	20	210	M16	400	400	290	370	0.33	15
3100P-D	300 t	136	110	20	240	M16	400	400	338	418	0.4	23
3100P-E	500 t	180	130	25	350	M12	600	600	610	594	0.57	46

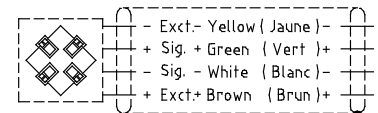
Other capacities and dimensions available on request

Dimensions in mm

Accessories

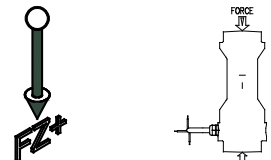


Wiring code

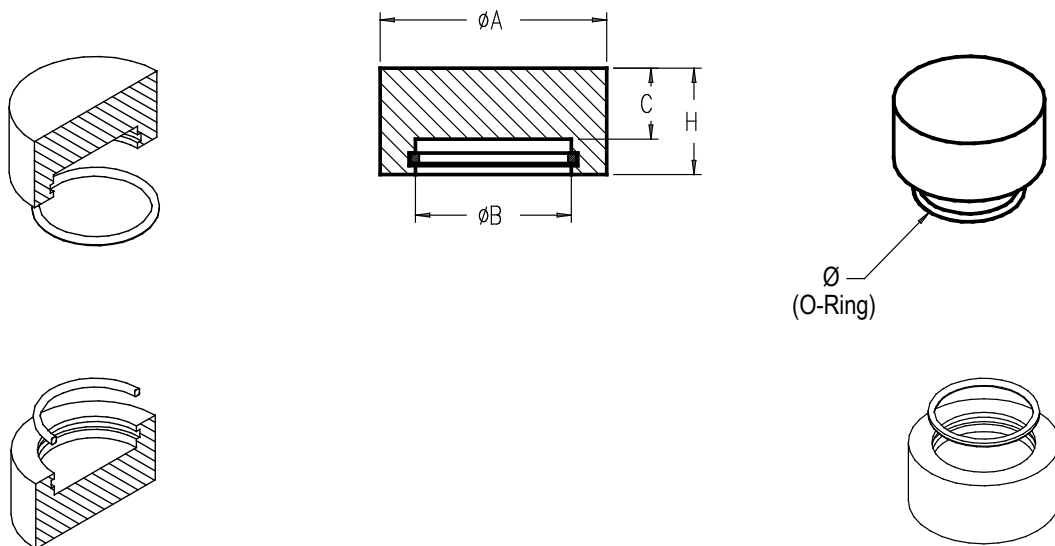


Standard : Cable screen not connected to transducer  
Faradisation non connectée au capteur

Load direction



H3100P > STANDARD DIMENSIONS



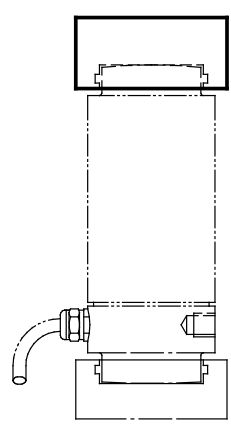
Ref. Item*	Capacities	Ø A	Ø B	C	H	Ø (O-Ring)	Weight (kg)
H3100P-A	5 - 30 t	64	44	20	30	42 x 3	±0.65
H3100P-B	50 - 100 t	99	66	32	43	64 x 4	±2.3
H3100P-C	150 - 200 t	128	92	50	65	90 x 5	±6
H3100P-D	300 t	148	112	59	75	110 x 5	±9
H3100P-E	500 t	178	132	90	105	130 x 5	±19.3

\*Material: stainless steel

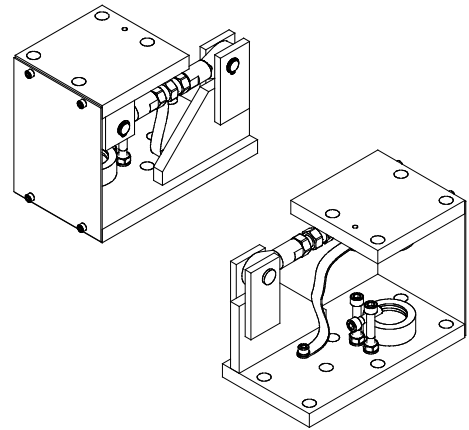
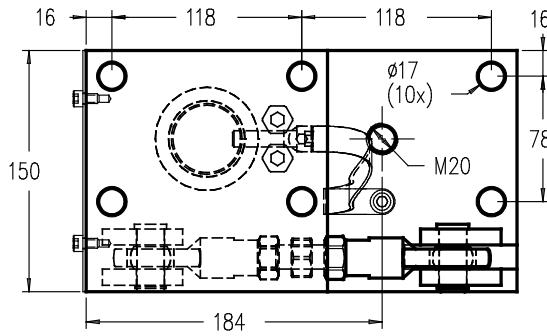
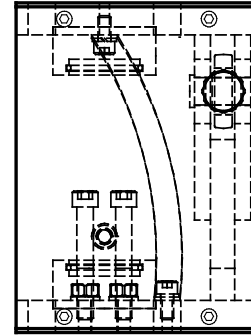
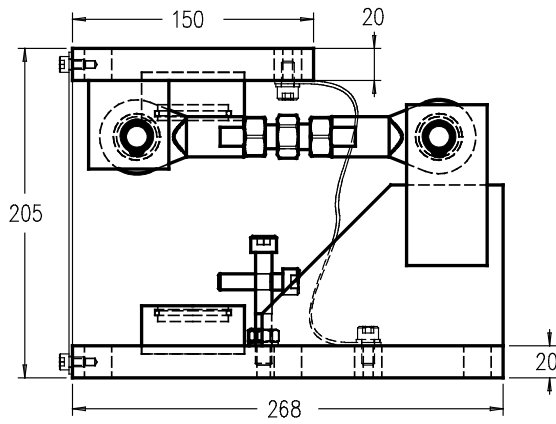
→ Other capacities and dimensions available on request

Dimensions in mm

Other view



I3100P-I3105P > STANDARD DIMENSIONS

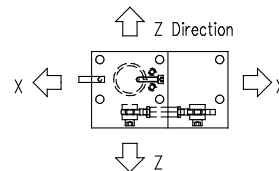
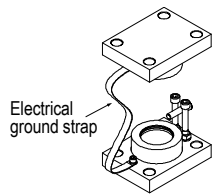
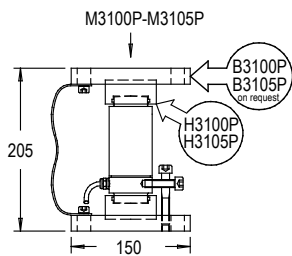


Ref. Item*	Capacities
I310xP-A	5 - 30 t
* x=Material: I3100P - stainless steel; I3105P - alloy steel	

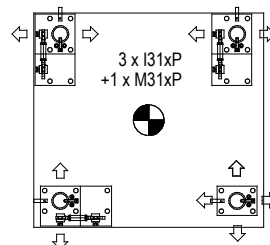
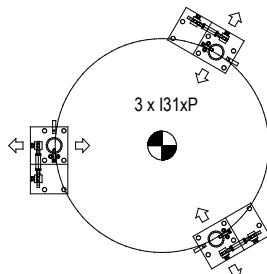
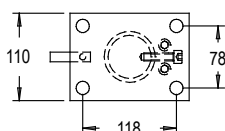
— Other capacities and dimensions available on request

Dimensions in mm

Other views



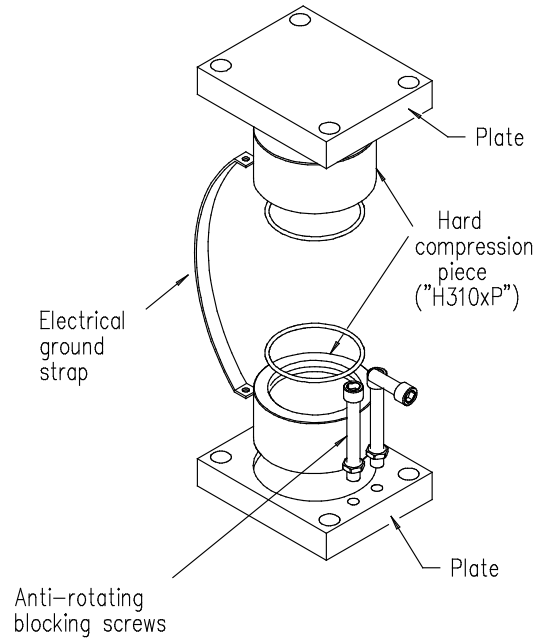
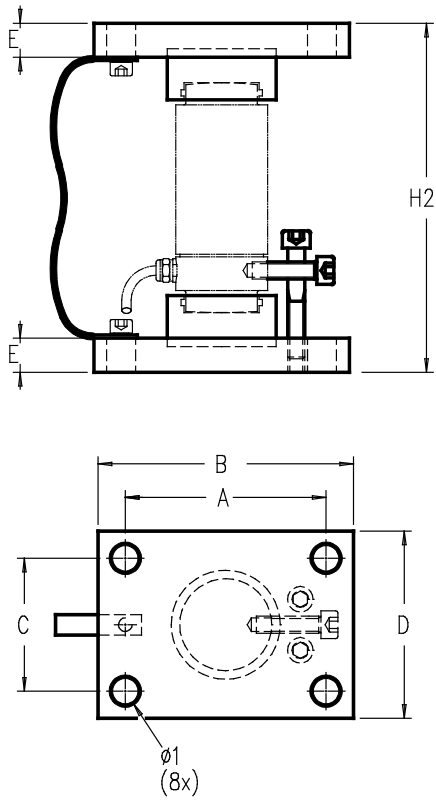
X Direction  
 (MAX. 5200 kg STAT.  
 2240 kg DYN.)  
 Stainless steel  
 (MAX. 2100 kg STAT.  
 800 kg DYN.)





This page was intentionally left blank

M3100P-M3105P > STANDARD DIMENSIONS



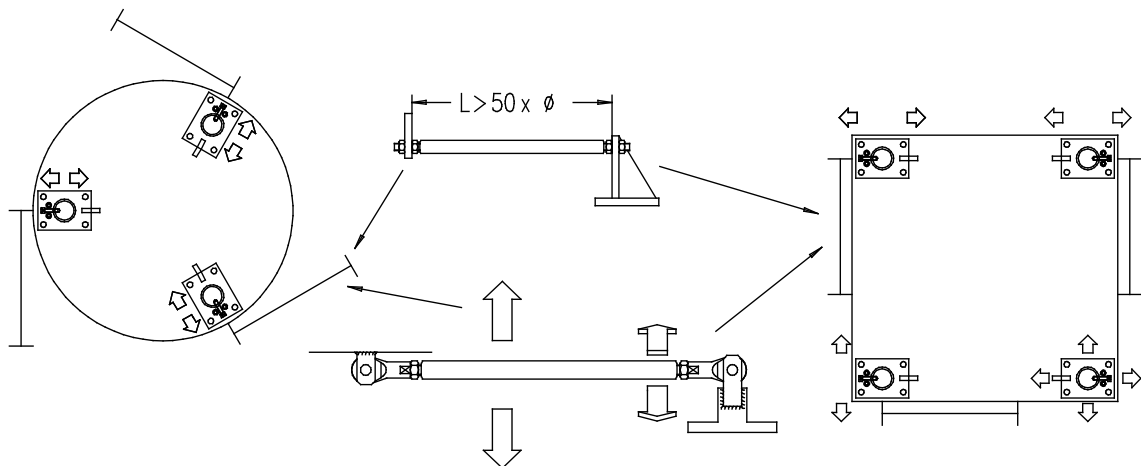
Ref. Items	Capacities	A	B	C	D	E	Ø1	H2	Weight (kg)
M310xP-A	5 - 30 t	118	150	78	110	20	17	205	±5.7
M310xP-B	50 - 100 t	130	170	90	130	30	21	294	±13
M310xP-C	150 - 200 t	185	235	135	185	40	25	370	±35.5
M310xP-D	300 t	185	235	135	185	40	25	418	±41
M310xP-E	500 t	200	260	200	260	40	27	594	±78

\*x=Material: M3100P - stainless steel; M3105P - alloy steel

→ Other capacities and dimensions available on request

Dimensions in mm

Other view



3300

## INSERTABLE STRAIN SENSOR - INSERTGAGE®

Insertable extensometer designed to measure the force in a structure



### Features

- o Designed to measure:
  - tension, compression shear and bending force
  - torque
- o One unique model regardless of the capacity range
- o Material: stainless steel
- o Protection class: IP67
- o Very competitive prices
- o Easy to install (one hole to drill)
- o Accuracy in the structure: 2 to 5 %
- o Cable length: 0.25 or 5 m (other lengths available on request)

Most popular options (see more in ANNEX)

Ex i



Model 3300



**Application(s)** SENSY's insertable strain sensor 3300 is perfectly designed for the following applications:

- Silos, hoppers, tanks, reactors or containers weighing,
- Level measurement,
- Stress measurement on machines,
- Force distribution control,
- Rail weighing,
- Set-point detection.

### Capacities

3300: 40 to 120 N/mm<sup>2</sup>

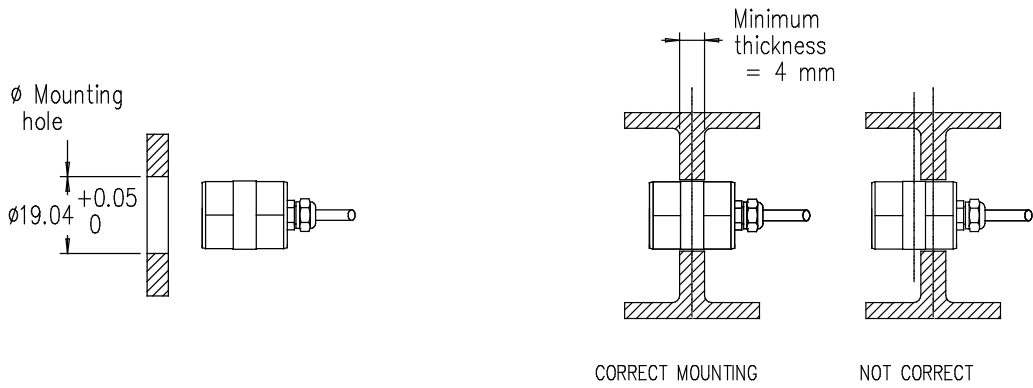
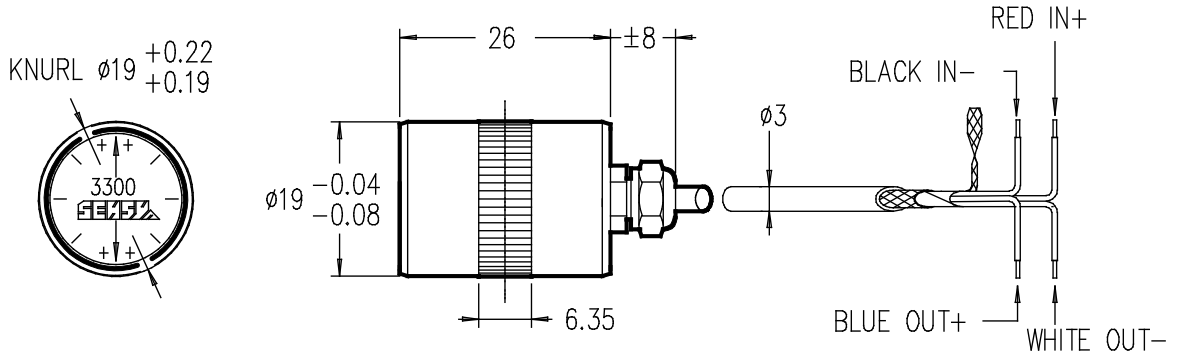
Specifications	2 - 5 %	
Reference temperature	23	°C
Compensated temperature range	-10...+45	°C
Service temperature range	-30...+60	°C
Storage temperature range	-50...+85	°C
Nominal sensitivity	± 1 **	mV/V
Input resistance	700 ± 2	ohm(s)
Output resistance	700 ± 2	ohm(s)
Insulation resistance (50 V)	> 5000	Mohm(s)
Reference excitation voltage	10	VDC
Permissible nominal range of excitation voltage	3...12	VDC

\* F.S. : Full Scale.

\*\* : for a stress of ± 10 kg/mm<sup>2</sup>

Specifications subject to change without notice..

3300 > STANDARD DIMENSIONS

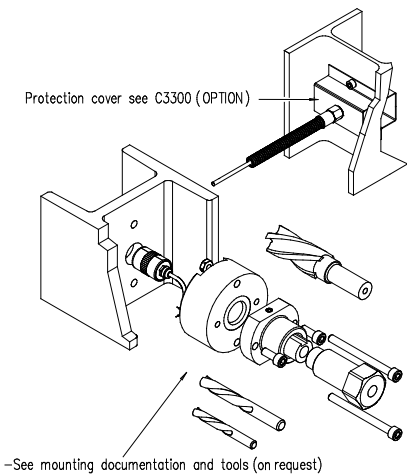


Ref. Item	Capacities	
3300-A	40 to 120 N/mm <sup>2</sup>	One unique model regardless of the capacity range

→ Other capacities and dimensions available on request

Dimensions in mm

Accessories

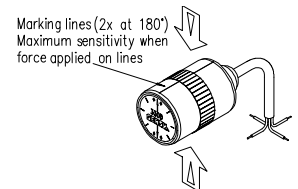


Wiring

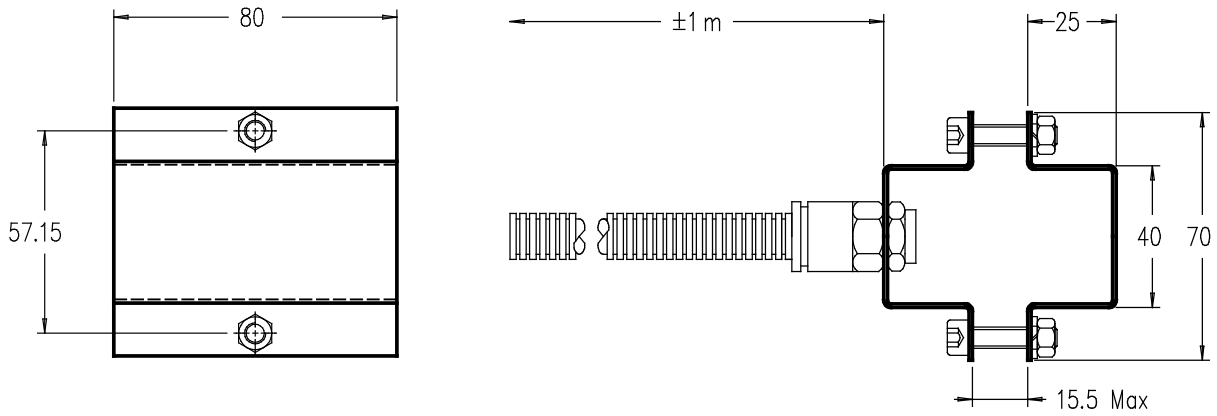


Standard : Cable screen not connected to transducer  
Faradisation non connectée au capteur

Load direction



C3300 > STANDARD DIMENSIONS



Ref. Item\*

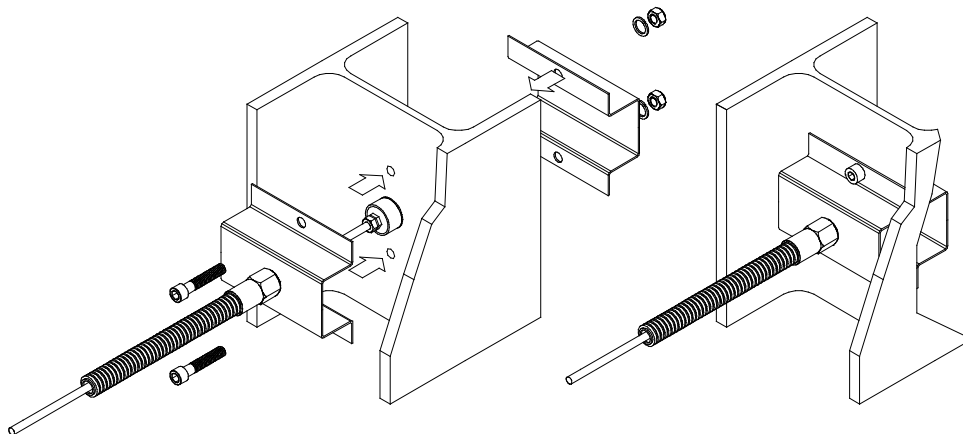
C3300-A

\* Material: stainless steel

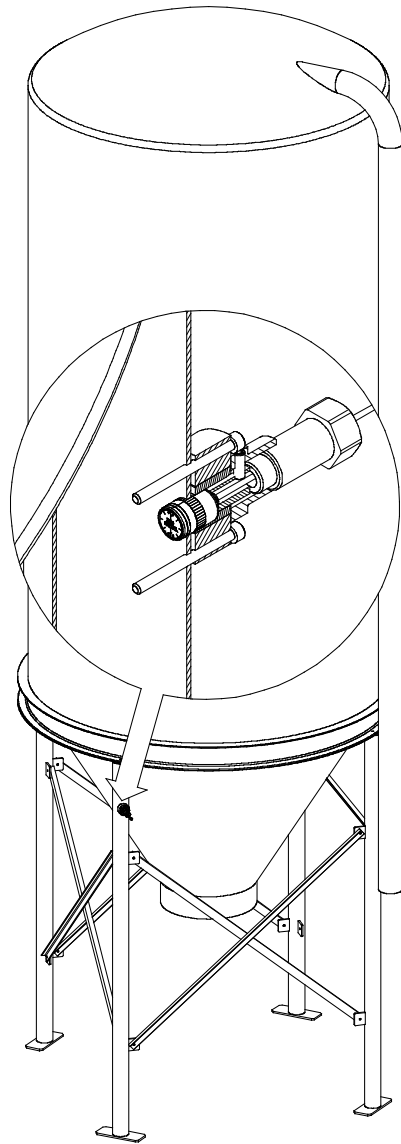
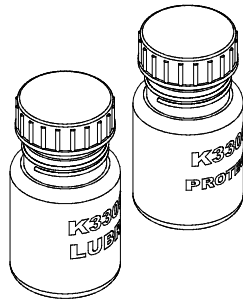
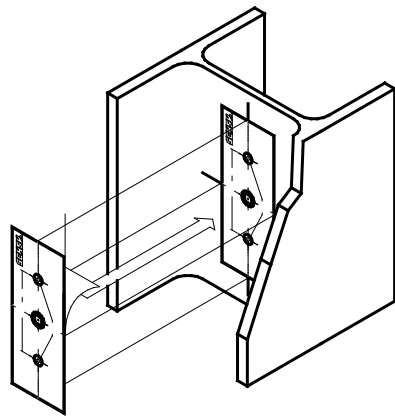
→ Other capacities and dimensions available on request

Dimensions in mm

Other views



↳ K3300 > STANDARD DIMENSIONS



Included:

K3300 LUBRI (lubricant)

K3300 PROTECT (protection grease)

K3300 D6 & S10 (drills Ø6.5 & Ø10)

Ref. Item\*

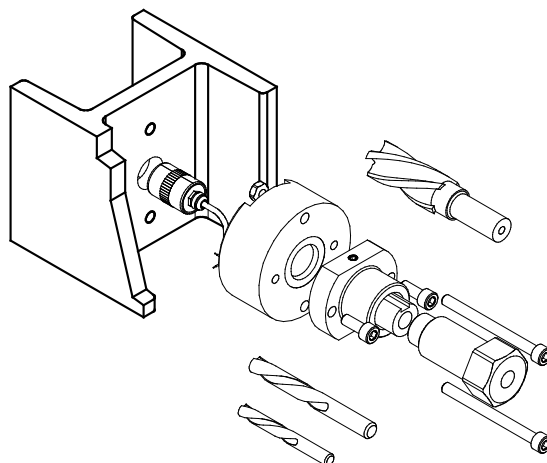
K3300-A

\* Material: stainless steel

→ Other capacities and dimensions available on request

Dimensions in mm

Other view



3500

## SHEAR BEAM LOAD CELLS

Universal load cells combining sturdy design, high accuracy and low cost.



### Features

- o Material: stainless steel
- o Protection class: IP67
- o Sturdy design
- o Mounting kits available with following properties:
  - stabilisation without tension rods
  - compensation of defaults of parallelism
- o Cable length: see drawing table (other lengths available on request)

Most popular options (see more in ANNEX)



Ex i



Model 3500 - 10 t



**Application(s)** SENSY's load cells 3500 are perfectly designed for the following applications:

- Low-profile scales, pallets, platform scales,
- Packaging, batching and filling machines,
- Reactors, tanks, vessels or hoppers weighing.

### Capacities

3500: 3 - 5 - (7.5) - 10 t

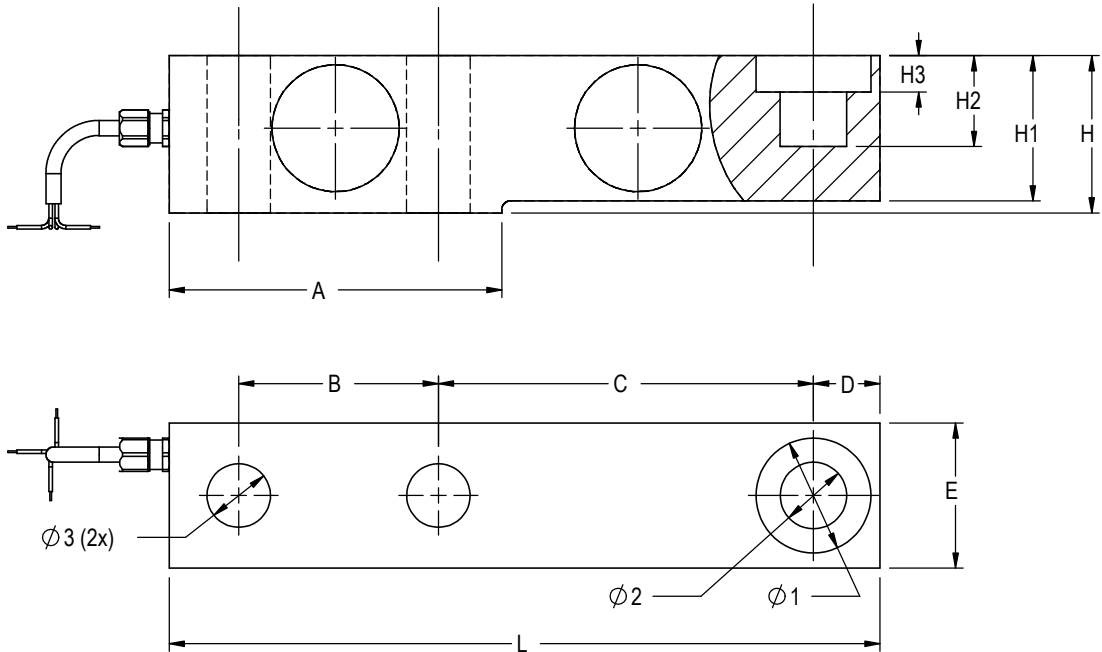
Specifications	A3	0.03 %	
Accuracy class	0.03 %** F.S.*	0.03% F.S.*	-
Combined error (non-linearity + hysteresis)	<± 0.03	<± 0.03	% F.S.*
Repeatability error	<± 0.015	<± 0.015	% F.S.*
Creep error over 30 min.	<± 0.03	<± 0.025	% F.S.*
Reference temperature	23	23	°C
Compensated temperature range	-10...+45	-10...+45	°C
Service temperature range	-30...+70	-30...+70	°C
Storage temperature range	-50...+85	-50...+85	°C
Temperature coefficient of the sensitivity	<± 0.05	<± 0.015	% F.S./10°C
Temperature coefficient of zero signal	<± 0.05	<± 0.023	% F.S./10°C
Nominal sensitivity	2	2	mV/V
Sensitivity tolerance	<± 0.2	<± 0.2	%
Input resistance	400 ± 10	400 ± 10	ohm(s)
Output resistance	350 ± 3	350 ± 3	ohm(s)
Insulation resistance (50 V)	> 5000	> 5000	Mohm(s)
Reference excitation voltage	10	10	VDC
Permissible nominal range of excitation voltage	3..12	3..12	VDC
Safe load limit	150	150	% F.S.*
Breaking load	>300	>300	% F.S.*
Permissible dynamic loading	50	50	% F.S.*
Static lateral force limit	100	100	% F.S.*

\* F.S. : Full Scale.

\*\* : except thermal drifts

Specifications subject to change without notice..

3500 > STANDARD DIMENSIONS

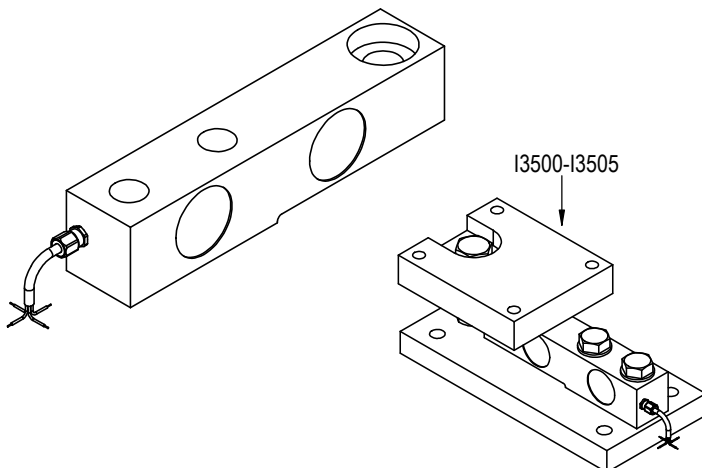


Ref. Item	Capacities	L	A	B	C	D	E	H	H1	H2	H3	Ø 1	Ø 2	Ø 3	CL (m)	Weight (kg)
3500-A	3 t	203	95	64	98	22	36.6	43	36.6	30.5	8	32	16	13	3	2.15
3500-B	5 - 7.5 t	235	110	66	124	22	48	52	48	30	12	38	22	21	5	4.01
3500-C	10 t	279	133	82	140	32	60	67	60	20	8.5	48	32	28	6	7.26

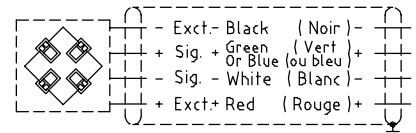
→ Other capacities and dimensions available on request

Dimensions in mm

Accessories

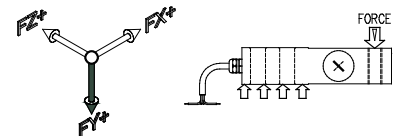


Wiring



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

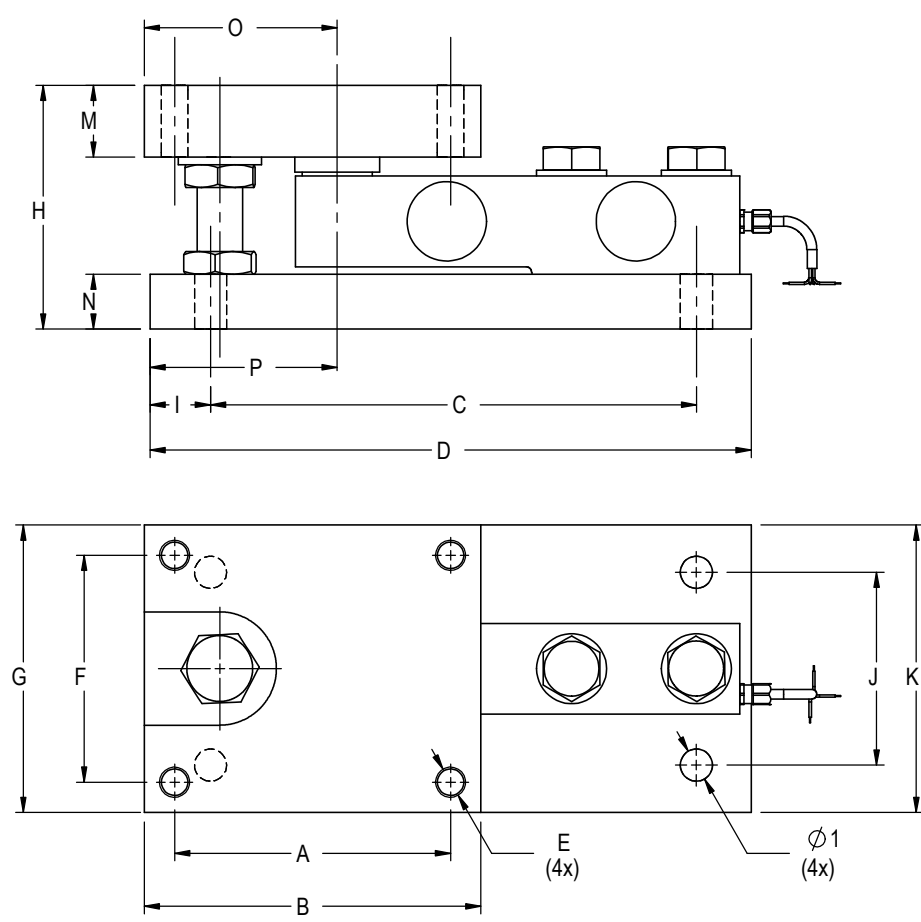
Load direction





This page was intentionally left blank

I3500-I3505 > **STANDARD DIMENSIONS**



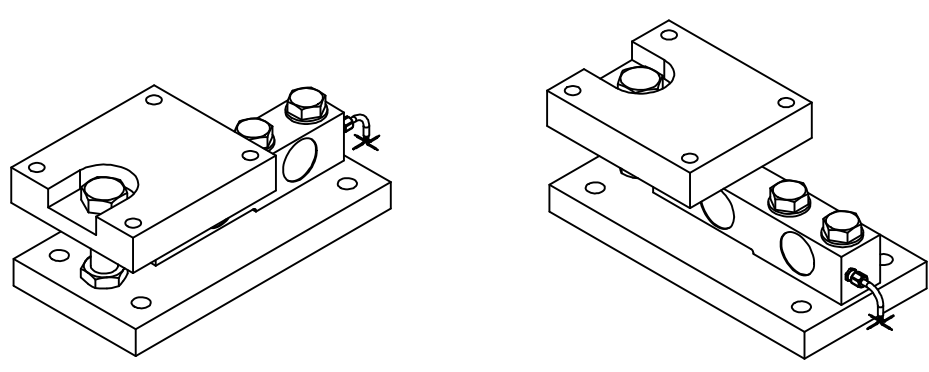
Ref. Item*	Capacities	A	B	C	D	E	F	G	H	I	J	K	M	N	O	P	Ø1
I350x-A	3 t	124	150	226	286	M10	102	112	102	32	80	112	28	23	99	96	13
I350x-B	5 - 7.5 t	146	178	257	318	M16	120	152	129	32	102	152	38	29	102	99	17
I350x-C	10 t	152	184	295	360	M20	122	154	166	32	106	154	44	44	108	105	21

\* Material : I3500 - stainless steel ; I3505 - alloy steel

—> **Other capacities and dimensions available on request**

Dimensions in mm

Other views



# 4500

# SHEAR BEAM LOAD CELLS

Load cells for silo weighing combining a sturdy design with easy installation.



### Features

- o Material: stainless steel
- o Protection class: IP67
- o Easy to install, cost-effective solution, sturdy design
- o Cable length: see drawing table - CL (other lengths available on request)
- o Mounting kits available with following properties:
  - stabilisation without tension rods
  - anti-lift-off device
  - compensation for thermal dilatations and defective alignment

### Most popular options (see more in ANNEX)



Ex i



IP68



Model 4500 - 3 t



**Application(s)** SENSY's load cells 4500 are perfectly designed for the following applications:

- Silo and tank weighing,
- Reactor or hopper weighing,
- Mixers (vibrating).

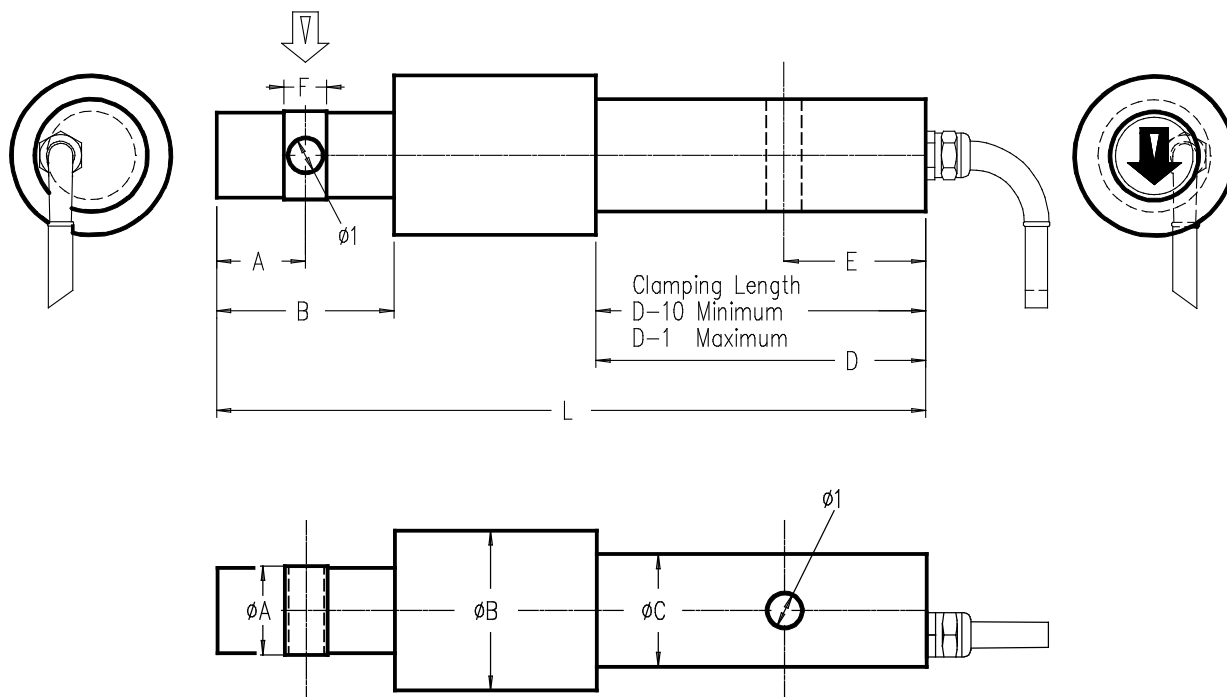
### Capacities

4500: (0.5)- (0.75) - 1 - 1.5 - 2 - 3 - 5 - 7.5 - 10 - 15 - 20 - 30 t

Specifications	0.1 %	
Accuracy class	0.1% F.S.*	-
Combined error (non-linearity + hysteresis)	< ± 0.1	% F.S.*
Repeatability error	<± 0.03	% F.S.*
Creep error over 30 min.	<± 0.06	% F.S.*
Reference temperature	23	°C
Compensated temperature range	-10...+45	°C
Service temperature range	-25...+70	°C
Storage temperature range	-50...+85	°C
Temperature coefficient of the sensitivity	<± 0.05	% F.S./10°C
Temperature coefficient of zero signal	<± 0.035	% F.S./10°C
Nominal sensitivity	2	mV/V
Sensitivity tolerance	<± 0.3	%
Input resistance	350 ± 2	ohm(s)
Output resistance	350 ± 2	ohm(s)
Insulation resistance (50 V)	> 5000	Mohm(s)
Reference excitation voltage	10	VDC
Permissible nominal range of excitation voltage	3...12	VDC
Safe load limit	150	% F.S.*
Breaking load	>300	% F.S.*
Permissible dynamic loading	50	% F.S.*
Static lateral force limit	100	% F.S.*

\* F.S. : Full Scale.  
Specifications subject to change without notice..

4500 > STANDARD DIMENSIONS

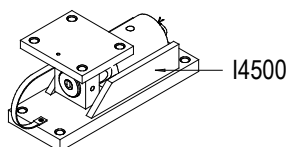
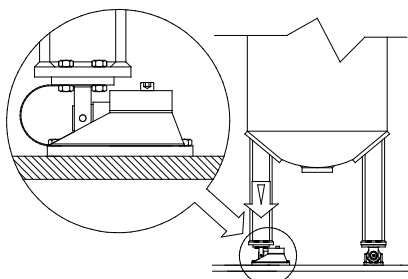
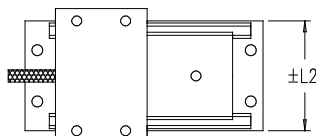
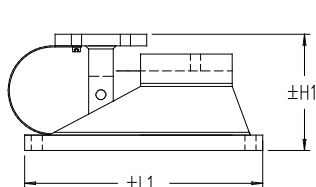


Ref. Item	Capacities	A	B	D	E	F	L	Ø1	ØA	ØB (MAX)	ØC	CL (m)	H1	L1	L2	Weight (kg)
4500-A	0.5 - 3 t	25	50	93	40	8	200	10	25	40	31.75	6	125	285	120	1.48
4500-B	5 - 7.5 t	25	50	93	40	12	200	10	40	49	49	6	125	285	120	3
4500-C	10 - 15 t	25	50	105	20	24	200	16	60	62	62	12	174	405	150	3.4
4500-D	20 t	25	50	145	60	24	240	16	60	62	62	12	174	405	150	4.3
4500-E	30 t	25	50	145	60	30	240	16	60	78	78	12	206.5	450	200	8

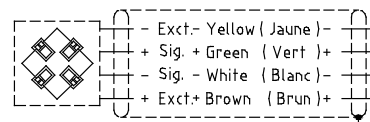
→ Other capacities and dimensions available on request

Dimensions in mm

Accessories

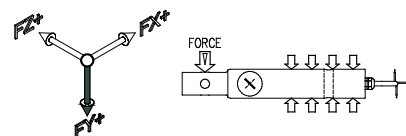


Wiring



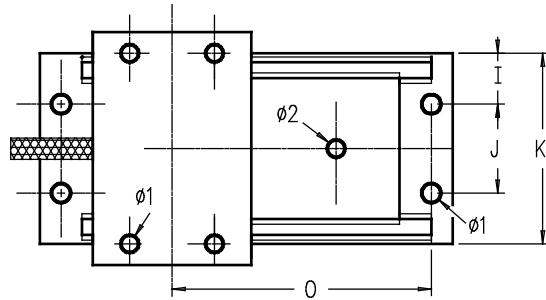
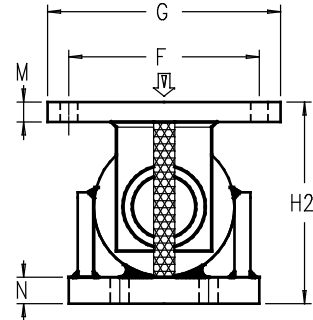
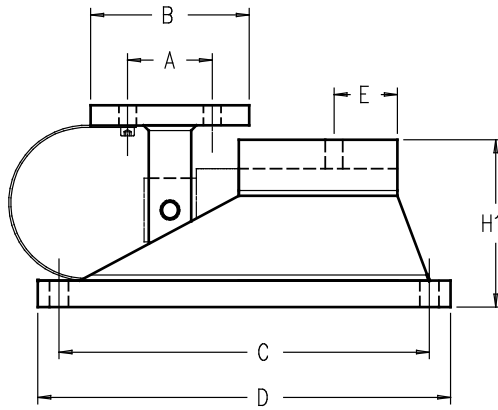
Standard : Cable screen not connected to transducer  
Faradisation non connectée au capteur

Load direction



This page was intentionally left blank

I4500-I4505 > STANDARD DIMENSIONS



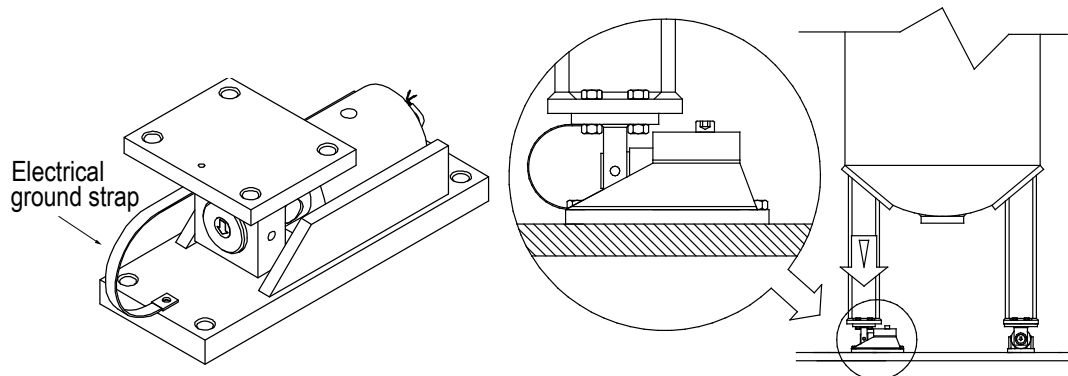
Ref. Item*	Capacities	A	B	C	D	E	F	G	I	J	K	M	N	O	Ø1	Ø2	H1	H2	Weight (kg)
I450x-A	0.5 - 3 t	60	90	255	285	40	90	120	15	90	120	15	20	200	12.5	10.5	100	125	10.6 (I4505 Ni plated)
I450x-B	5 - 7.5 t	60	90	255	285	40	90	120	15	90	120	15	20	200	12.5	10.5	100	125	11.2 (I4505 Ni plated)
I450x-CD	10 - 20 t	110	150	365	405	60	140	180	20	110	150	20	30	260	17	16.5	134	174	23.5 (I4505 painted)
I450x-E	30 t	110	150	407	450	60	157	200	30	157	200	30	30	273.5	21.5	16.5	160	206.5	48 (I4505 painted)

\*x=Material: I4500 - stainless steel; I4505 - alloy steel

— Other capacities and dimensions available on request

Dimensions in mm

Other views



## 5000M-WI

## WIRELESS LOAD SHACKLES

Wireless load-measuring shackles designed to measure tension force.



Model 5000M-WI - 20 t



### Features

- o Sturdy design
- o Protection class: IP65
- o Easy to install
- o Load pin material: stainless steel
- o Standard dimensions
- o Frequencies: from 2.4000 to 2.4835 GHz
- o Power: 10 mW, licence: exempted
- o Range: 500 m open field (antenna integrated)
- o Sleep mode, remote wake-up mode, remote control of batteries
- o Not appropriate for overload protection

Most popular options (see more in ANNEX)



Ex i



**Application(s)** SENSY's wireless load shackles 5000M-WI are perfectly designed for the following applications:

- Load display on hoisting devices and EOT cranes,
- Industrial weighing / force measurement on test benches,
- Theater rigging equipment,
- Mooring - tow forces measurement / Winches monitoring, agriculture machinery, general machinery, test benches.

### Capacities

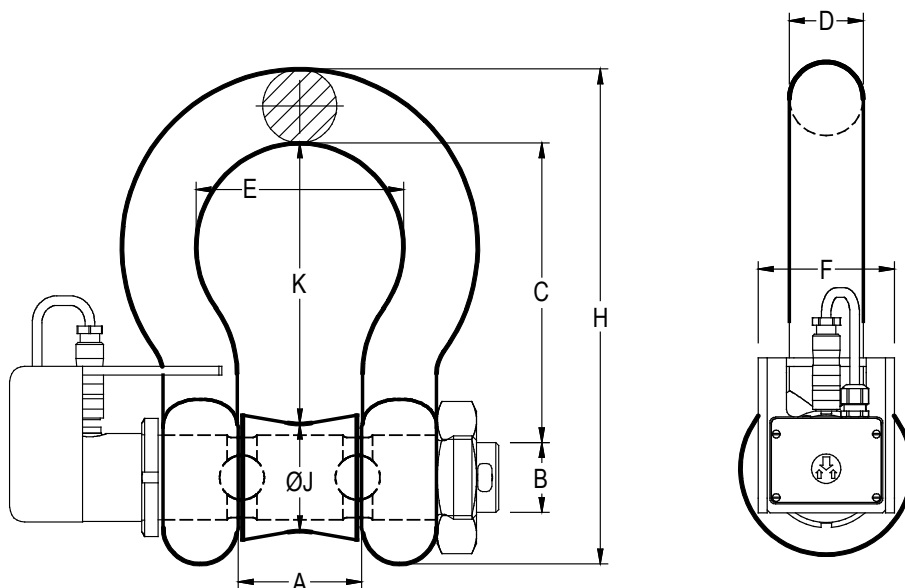
from 1 t to 400 t

Specifications	SL - FORCE	SL - HOIST	
Combined error (non-linearity + hysteresis)	0.25 - 1**	0.5 - 2**	% F.S.*
Repeatability error	<± 0.25	<± 0.25	% F.S.*
Creep error over 30 min.	<± 0.3	<± 0.3	% F.S.*
Reference temperature	23	23	°C
Compensated temperature range	-10...+45	-10...+45	°C
Service temperature range	-25...+70	-25...+70	°C
Storage temperature range	-50...+85	-50...+85	°C
Temperature coefficient of the sensitivity	<± 0.2	<± 0.2	% F.S./10°C
Temperature coefficient of zero signal	<± 0.2	<± 0.2	% F.S./10°C
Nominal sensitivity	± 1.5	± 1	mV/V
Reference excitation voltage	3 VDC (2 x AA batteries)	3 VDC (2 x AA batteries)	-
Consumption	65 mA	65 mA	-
Current @ stand-by mode	20	20	µA
Autonomy @ normal mode (2 batteries)	1 month	1 month	-
Autonomy @ 12 x 5mn/day mode (2 D batteries)	2	2	years
Safe load limit	150	200	% F.S.*
Breaking load	> 300	> 500	% F.S.*
Permissible dynamic loading	50	75	% F.S.*
Static lateral force limit	100	150	% F.S.*

\* F.S. : Full Scale.

\*\* Typical range of accuracy, depending on design and dimensions.  
Specifications subject to change without notice..

5000M-WI > STANDARD DIMENSIONS



Ref. Item	Capacities			D		A	B	C	E	F	H	ØJ	K	Tolerances C & K	Total weight (kg)
	Force		Hoist > 500 %**	(mm)	(inch)										
	Standard > 300 %**	Extended capacity* > 300 %**													
5000M-WI-3/4"	2.5 t	3 t	1.5 t	19	3/4"	31.8±2.2	22.5	71.5	51	93±3	126±8.6	34	65	±6.4	3
5000M-WI-7/8"	4 t	6 t	2.5 t	22	7/8"	36±2.2	25	83	58	93±3	143.5±8.6	35.5	78	±6.4	3.5
5000M-WI-1"	6 t	8 t	4 t	25	1"	43±2.4	28	95	68	93±3	163.5±8.6	37	90.5	±6.4	4
5000M-WI-1" 1/8	8 t	10 t	5 t	28	1 1/8"	47±2.4	32	108	75	93±3	185±8.9	40	104	±6.4	5
5000M-WI-1" 1/2	12 t	15 t	8 t	38	1 1/2"	60±4	42	146	99	93±3	249±9.9	54	140	±6.4	12
5000M-WI-1" 3/4	16 t	25 t	12 t	45	1 3/4"	74±4	50	178	126	106	299.5±11.2	65	171	±6.4	19
5000M-WI-2"	30 t	40 t	20 t	50	2"	83±4.2	57	197	138	122	331±17.5	72	189.5	±12.7	28
5000M-WI-2" 1/2	40 t	50 t	30 t	65	2 1/2"	105±4.7	70	260	180	145	432.5±18.7	90	250	±12.7	52
5000M-WI-3"	60 t	75 t	45 t	75	3"	127±5	83	329	190	165	526.5±26	105	318	±19	90
5000M-WI-3" 3/4	90 t	125 t	60 t	95	3 3/4"	147±5	95	400	238	208	647±25	117	389	±19	150
5000M-WI-4" 1/8	100 t	150 t	75 t	105	4 1/8"	169±5	108	410	275	240	688±18	130	399	±12	190
5000M-WI-5" 1/8	200 t	300 t	120 t	130	5 1/8"	205±6	140	554	305	308	904±22	165	541.5	±14	320
5000M-WI-6" 11/16	300 t	400 t	200 t	170	6 11/16"	231±6	175	668	325	387	1114±27	200	655	±18	585

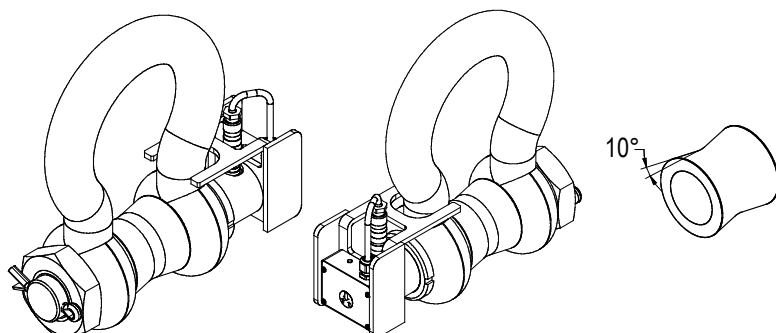
\* Very resistant load cell, special design

\*\* Breaking load (% full scale)

→ Other capacities and dimensions available on request

Dimensions in mm

Other views

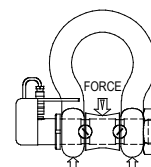


Wiring

Not applicable



Load direction





# 5100L-5105L

# TENSION LOAD CELLS

Robust and easy to install tension load cells.



### Features

- o Wide range of capacities: 2 t up to 100 t
- o Compact design
- o Protection class: IP66
- o Material: stainless steel (5100L), nickel-plated steel (5105L)
- o Cable length: see drawing table - CL (other lengths available on request)

### Most popular options (see more in ANNEX)



Ex i



IP68

Model : 5100L- 50 t



**Application(s)** SENSY's load cells 5100L-5105L are perfectly designed for the following applications:

- Towing force measurement (marine),
- Force measurement on rigging,
- Hanging load weighing,
- Tensile test benches.

### Capacities

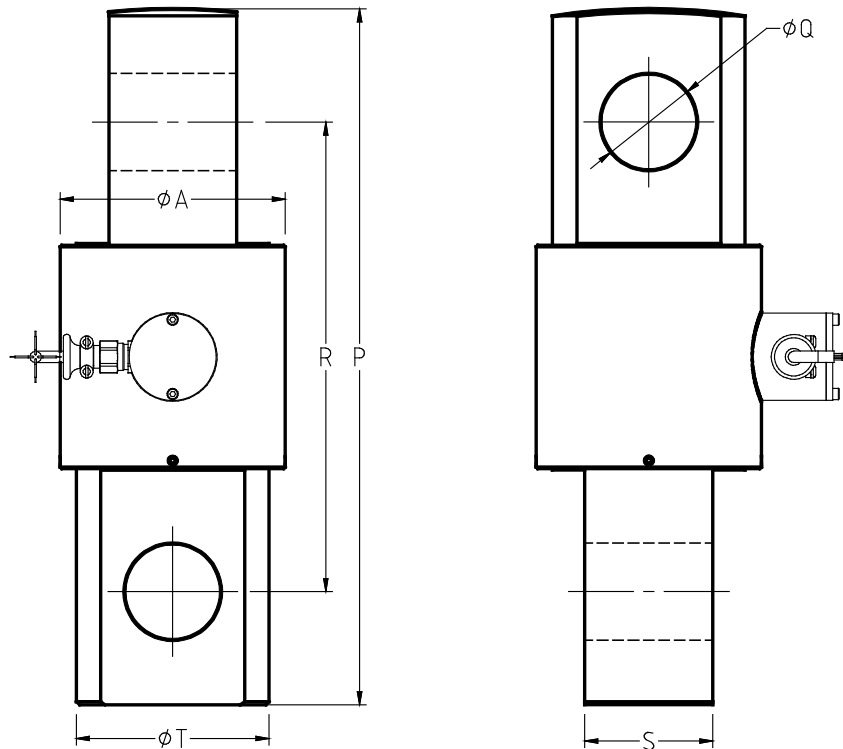
5100L - 5105L: 1 - 2 - 3 - 5 - 7.5 - 10 - 15 - 20 - 30 - 50 - 75 - 100 t

Specifications	SL - HOIST	0.25 %	
Combined error (non-linearity + hysteresis)	0.5 - 2**	<± 0.25	% F.S.*
Repeatability error	<± 0.25	<± 0.1	% F.S.*
Creep error over 30 min.	<± 0.3	<± 0.1	% F.S.*
Zero shift after loading	<± 0.5	<± 0.025	% F.S.*
Reference temperature	23	23	°C
Compensated temperature range	-10...+45	-10...+45	°C
Service temperature range	-25...+70	-25...+70	°C
Storage temperature range	-50...+85	-50...+85	°C
Temperature coefficient of the sensitivity	<± 0.2	<± 0.05	% F.S./10°C
Temperature coefficient of zero signal	<± 0.2	<± 0.035	% F.S./10°C
Zero balance	± 0.02	± 0.02	mV/V
Nominal sensitivity	± 1	1.5	mV/V
Sensitivity tolerance	< ± 0.5	<± 0.3	%
Input resistance	350 ± 2	350 ± 2	ohm(s)
Output resistance	350 ± 2	350 ± 2	ohm(s)
Insulation resistance (50 V)	> 5000	> 5000	Mohm(s)
Reference excitation voltage	10	10	VDC
Permissible nominal range of excitation voltage	3...12	3...12	VDC
Safe load limit	200	150	% F.S.*
Breaking load	> 500	> 300	% F.S.*
Permissible dynamic loading	75	40	% F.S.*
Static lateral force limit	10	10	% F.S.*

\* F.S. : Full Scale.

\*\* Typical range of accuracy, depending on design and dimensions.  
Specifications subject to change without notice..

5100L-5105L > STANDARD DIMENSIONS



Ref. Item*	Capacities		ØA	P	ØQ	R	S	ØT	CL (m)	Weight (kg)
	Hoist > 500 %**	Force > 300 %**								
510xL-A	1 - 2 t	2 - 3 t	50	144	18	108	20	35	3	±1.5
510xL-B	3 t	5 t	60	160	24	112	30	45	3	±2
510xL-C	4 - 7.5 t	7.5 - 10 t	80	240	35	170	44	64	3	± 5.5
510xL-D	10 - 15 t	15 - 20 t	100	310	42	226	52	86	6	±12.8
510xL-E	20 - 30 t	30 - 50 t	139	430	58	290	78	109	6	±25
510xL-F	40 - 75 t	75 - 100 t	180	520	80	348	100	149	12	±65

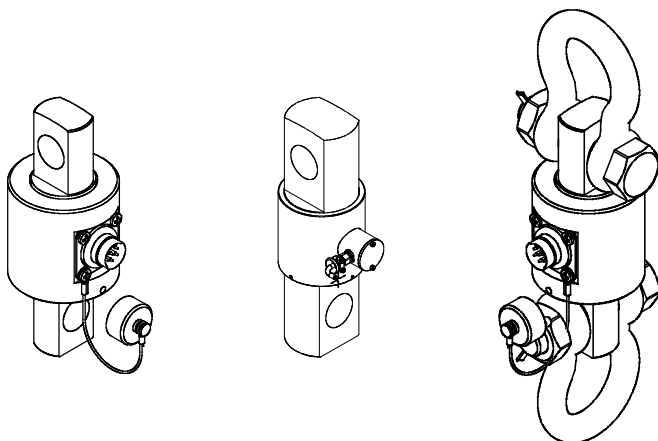
\*x=Material: 5100L - stainless steel; 5105L - nickel-plated steel

\*\* Breaking load (% full scale)

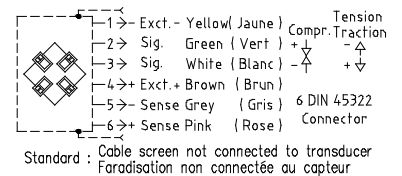
—> Other capacities and dimensions available on request

Dimensions in mm

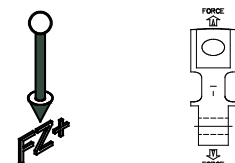
Other views



Wiring



Load direction



5510

## SHEAR BEAM LOAD CELL

Universal load cell combining sturdy design, high accuracy and low cost.



### Features

- o Material: stainless steel
- o Protection class: IP67
- o Sturdy design
- o Complies with OIML / R60 up to 3000 d for scales in class III (EN 45501)
- o Mounting kits available with following properties:
  - stabilisation without tension rods
  - compensation for thermal dilatations and default of parallelism
- o Cable length: 8 m (other lengths available on request)

Most popular options (see more in ANNEX)



Model 5510 - 1 t



**Application(s)** SENSY's load cell 5510 is perfectly designed for the following applications:

- Low-profile scales, pallets, platform scales,
- Packaging, batching and filling machines,
- Reactors, tanks, vessels or hoppers weighing.

### Capacities

5510: 0.5 - (0.75) - 1 - 1.5 - 2 t

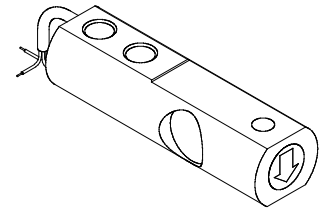
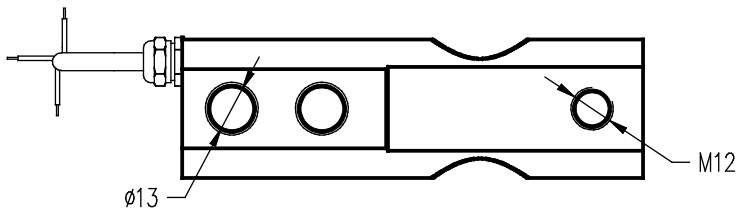
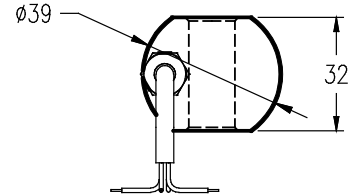
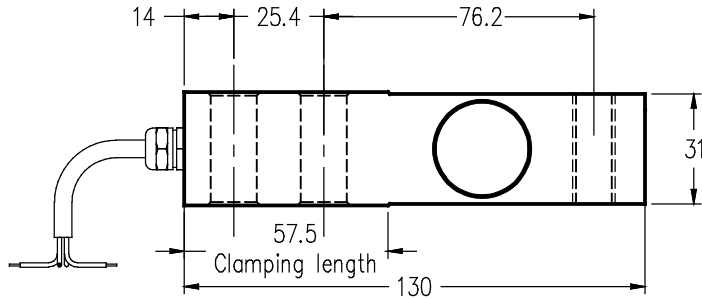
Specifications	A3	0.03 %	C 3	
Accuracy class	0.03 %** F.S.*	0.03% F.S.*	3000 d OIML	-
Combined error (non-linearity + hysteresis)	<± 0.03	<± 0.03	<± 0.02	% F.S.*
Repeatability error	<± 0.015	<± 0.015	<± 0.01	% F.S.*
Creep error over 30 min.	<± 0.03	<± 0.025	<± 0.02	% F.S.*
Reference temperature	23	23	23	°C
Compensated temperature range	-10...+45	-10...+45	-10...+45	°C
Service temperature range	-30...+70	-30...+70	-30...+70	°C
Storage temperature range	-50...+85	-50...+85	-50...+85	°C
Temperature coefficient of the sensitivity	<± 0.05	<± 0.015	<± 0.009	% F.S./10°C
Temperature coefficient of zero signal	<± 0.05	<± 0.023	<± 0.013	% F.S./10°C
Nominal sensitivity	2	2	2	mV/V
Sensitivity tolerance	<± 0.2	<± 0.2	<± 0.1	%
Input resistance	350 ± 2	350 ± 2	350 ± 2	ohm(s)
Output resistance	350 ± 2	350 ± 2	350 ± 2	ohm(s)
Insulation resistance (50 V)	> 5000	> 5000	> 5000	Mohm(s)
Reference excitation voltage	10	10	10	VDC
Permissible nominal range of excitation voltage	3..12	3..12	3..12	VDC
Safe load limit	150	150	150	% F.S.*
Breaking load	>300	>300	>300	% F.S.*
Permissible dynamic loading	50	50	50	% F.S.*
Static lateral force limit	100	100	100	% F.S.*

\* F.S. : Full Scale.

\*\* : except thermal drifts

Specifications subject to change without notice..

5510 > STANDARD DIMENSIONS

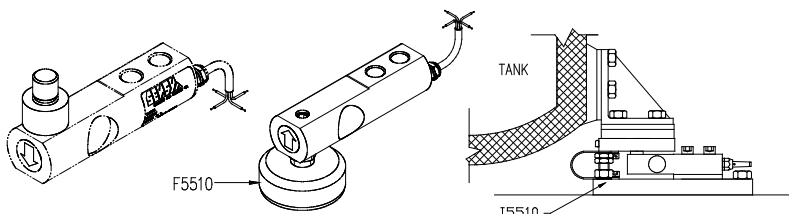
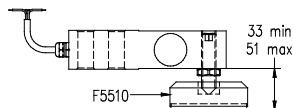
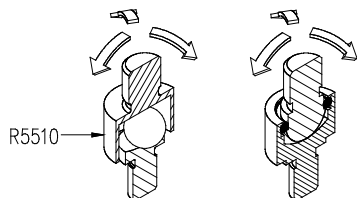


Ref. Item	Capacities	Weight (kg)
5510-A	0.5 - 2 t	0.95

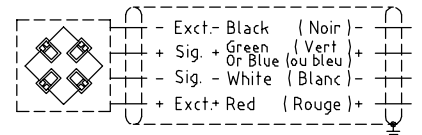
→ Other capacities and dimensions available on request

Dimensions in mm

Accessories

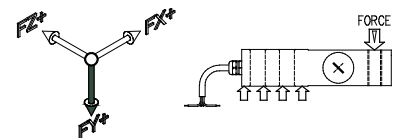


Wiring

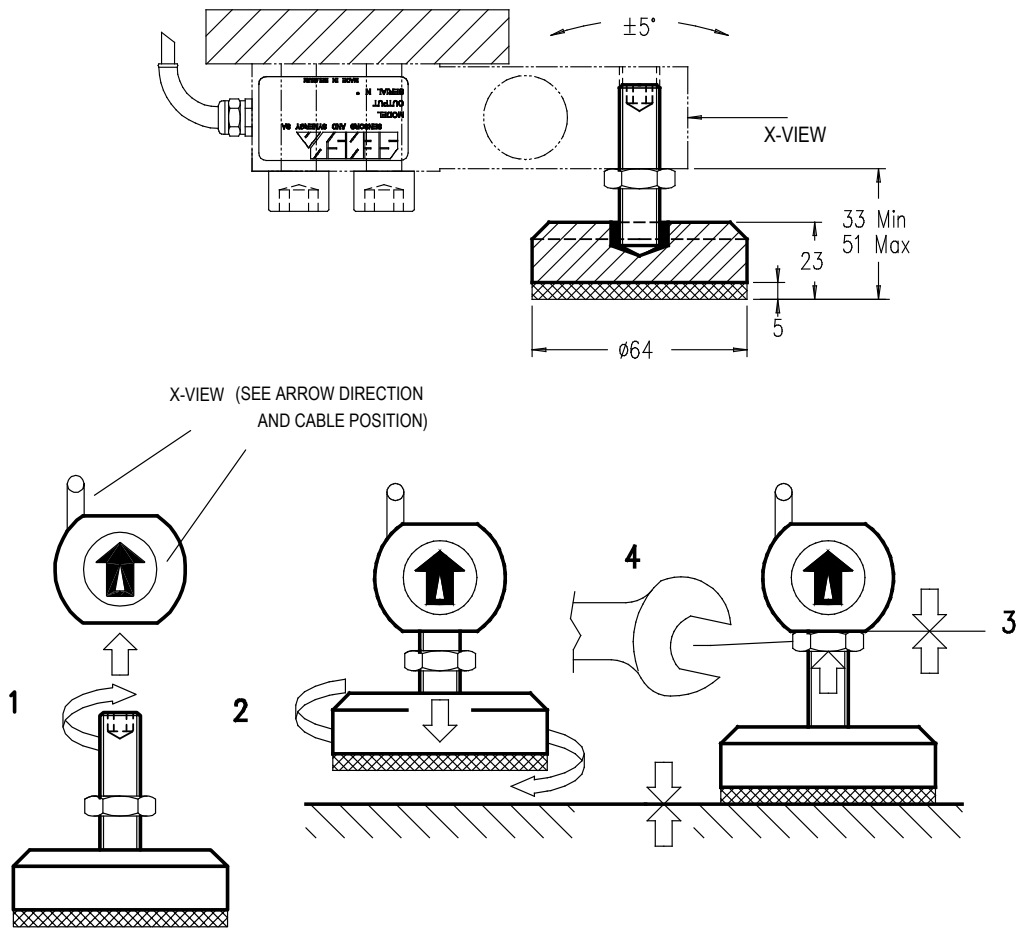


Standard : Cable screen not connected to transducer  
Faradisation non connectée au capteur

Load direction



F5510 > STANDARD DIMENSIONS

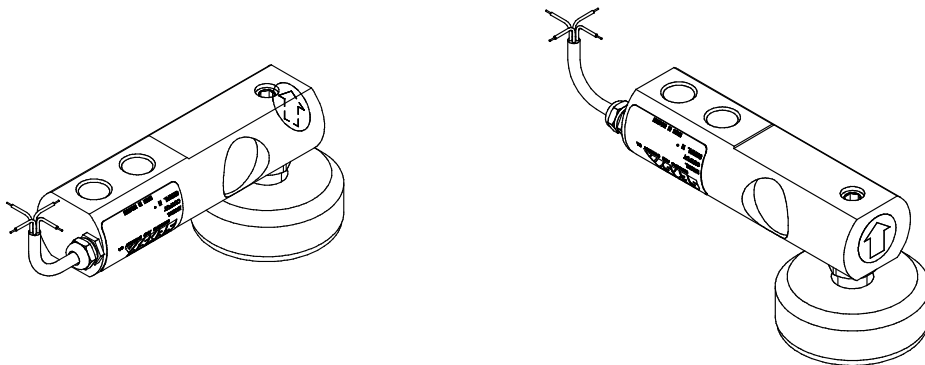


Ref. Item*	Capacities
F5510-A	0.5 - 2 t
* Material: stainless steel	

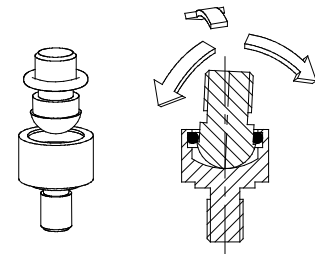
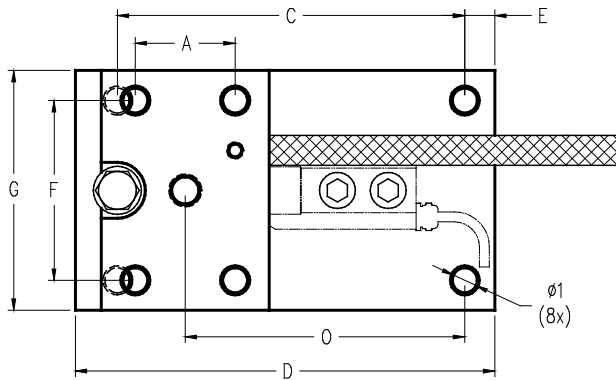
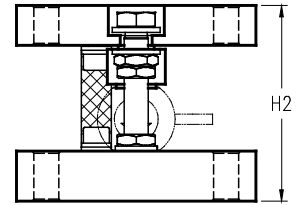
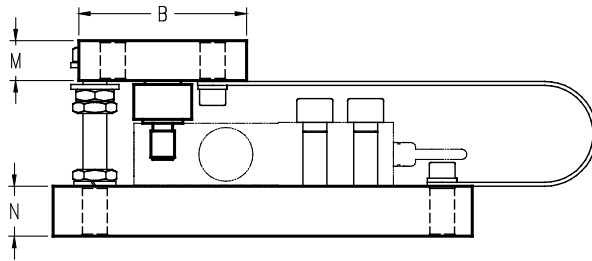
→ Other capacities and dimensions available on request

Dimensions in mm

Other views



I5510-I5515 > STANDARD DIMENSIONS



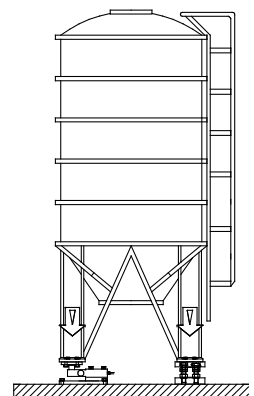
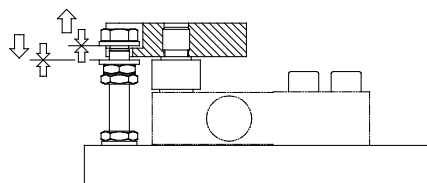
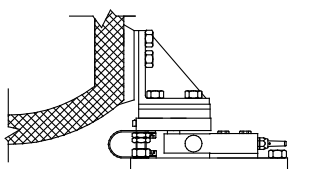
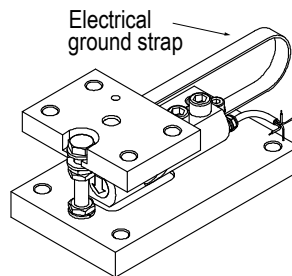
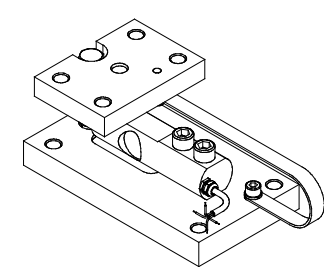
Ref. Item*	Capacities	A	B	C	D	E	F	G	M	N	O	$\phi 1$	H2	Weight (kg)
I551x-A	0.5 - 2 t	50	84	174	210	15	90	120	20	25	140	12.5	98	±6.76

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

→ Other capacities and dimensions available on request

Dimensions in mm

Other views



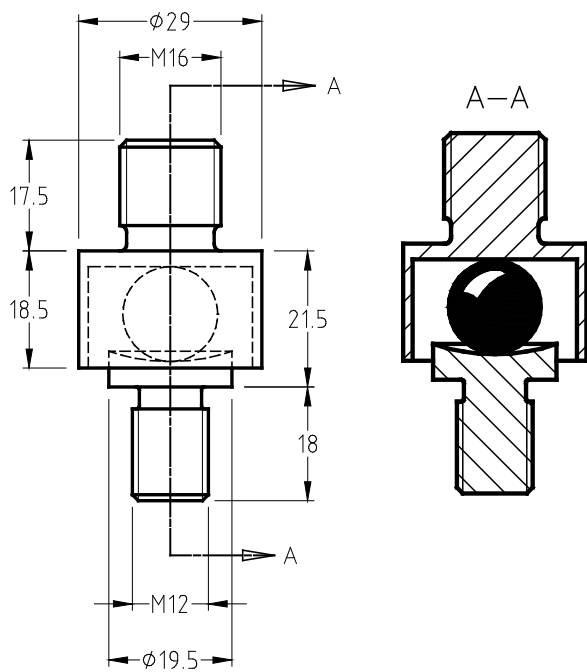
This page was intentionally left blank

R5510 > STANDARD DIMENSIONS



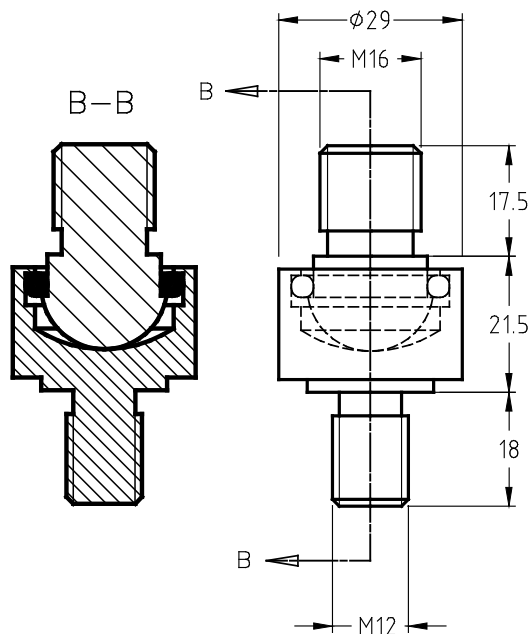
**R5510-A1**

Range: 500 kg - Weight: 0.097 kg



**R5510-A2**

Range: 750 kg - Weight: 0.127 kg



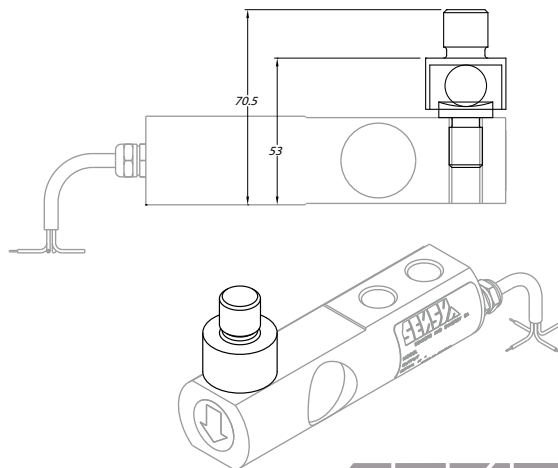
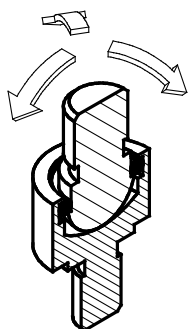
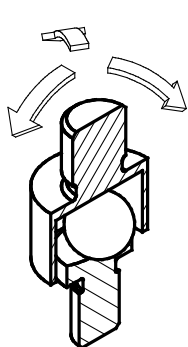
Ref. Item*	Capacities
R5510-A1	500 kg
R5510-A2	750 kg - 2 t

\* Material: R5510 - stainless steel

→ Other capacities and dimensions available on request

Dimensions in mm

Other views





5910

## LOW-PROFILE COMPRESSION LOAD CELL

Load cell combining high capacity with low design.



### Features

- o Material: stainless steel
- o Protection class: IP67
- o Low design
- o Cost-effective solution
- o Sturdy design
- o Easy to install
- o Cable length: 3 m (other lengths available on request)

Most popular options (see more in ANNEX)



Model 5910 - 2 t



**Application(s)** SENSY's load cell 5910 is perfectly designed for the following applications:

- Manufacturing of portable wheel scales,
- Industrial force applications where space is limited,
- Silos, tanks, hoppers or reactors weighing.

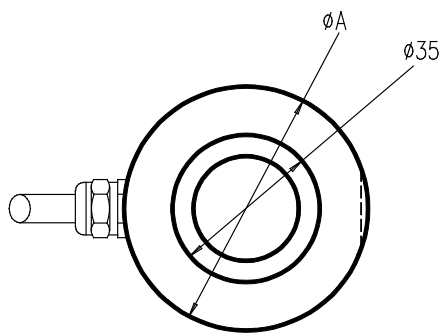
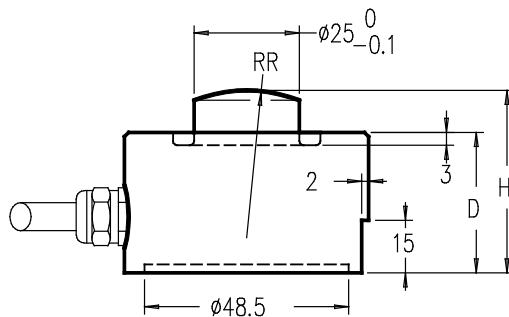
### Capacities

5910: (0.3) - 0.5 - (0.75) - 1 - (1.5) - 2 - 3 - 5 t

Specifications	0.25 %	0.1 %	
Accuracy class	0.25 % F.S.*	0.1% F.S.*	-
Combined error (non-linearity + hysteresis)	<± 0.25	< ± 0.1	% F.S.*
Repeatability error	<± 0.1	<± 0.03	% F.S.*
Creep error over 30 min.	<± 0.1	<± 0.06	% F.S.*
Reference temperature	23	23	°C
Compensated temperature range	-10...+45	-10...+45	°C
Service temperature range	-25...+70	-25...+70	°C
Storage temperature range	-50...+85	-50...+85	°C
Temperature coefficient of the sensitivity	<± 0.05	<± 0.05	% F.S./10°C
Temperature coefficient of zero signal	<± 0.035	<± 0.035	% F.S./10°C
Nominal sensitivity	1.5	1.5	V
Sensitivity tolerance	<± 0.3	<± 0.3	%
Input resistance	700 ± 2	700 ± 2	ohm(s)
Output resistance	700 ± 2	700 ± 2	ohm(s)
Insulation resistance (50 V)	> 5000	> 5000	Mohm(s)
Reference excitation voltage	10	10	VDC
Permissible nominal range of excitation voltage	3...12	3...12	VDC
Safe load limit	150	150	% F.S.*
Breaking load	>300	>300	% F.S.*
Permissible dynamic loading	40	40	% F.S.*
Static lateral force limit	10	10	% F.S.*

\* F.S.: Full Scale.  
Specifications subject to change without notice..

5910 > STANDARD DIMENSIONS

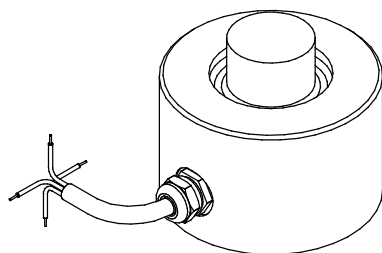


Ref. Item	Capacities	$\phi A$	D	H	RR	CL (m)	Max. Deflexion (mm)	Weight (kg)
5910-A	0.3 - 5 t	59	30	40	35	3	0.04 - 0.07	$\pm 0.6$

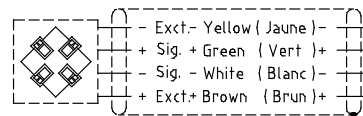
Other capacities and dimensions available on request

Dimensions in mm

Other view

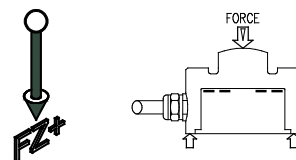


Wiring



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

Load direction



Load cells combining high capacity, low design and cost-effective solution.



Features

- o Material: stainless steel
- o Protection class: IP67
- o Low design
- o Cost-effective solution
- o Sturdy design
- o Easy to install
- o Whole range of mounting kits available
- o Cable length: 6 m (other lengths available on request)

Most popular options (see more in ANNEX)



Ex i



IP68

Model 5950 - 2 t



Application(s) SENSY's load cells 5950 are perfectly designed for the following applications:

- Silos, tanks or hoppers weighing,
- Reactors weighing,
- Industrial force measurement where space is limited.

Capacities

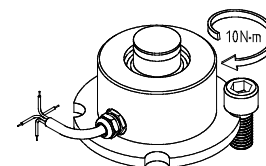
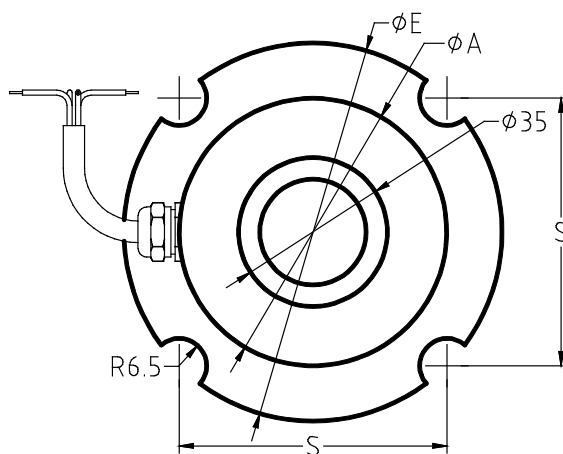
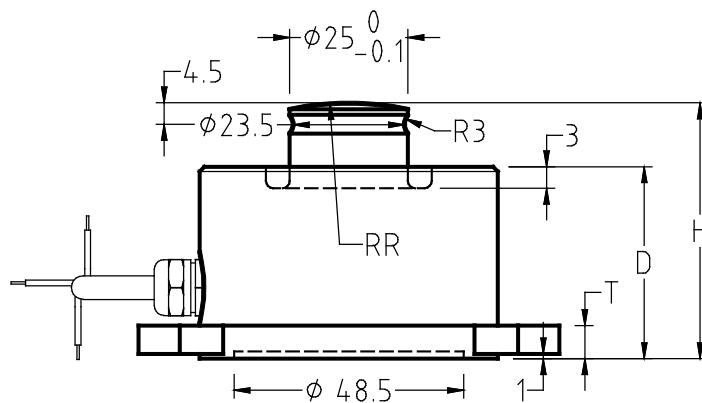
5950: (0.3) - 0.5 - (0.75) - 1 - (1.5) - 2 - 3 - 5 - 7.5 - 10 - 15 - 20\*\* t

Specifications	0.5 %	0.25 %	0.1 %	
Accuracy class	0.5 % F.S.*	0.25 % F.S.*	0.1% F.S.*	-
Combined error (non-linearity + hysteresis)	< ± 0.5	<± 0.25	< ± 0.1	% F.S.*
Repeatability error	< ± 0.25	<± 0.1	<± 0.03	% F.S.*
Creep error over 30 min.	< ± 0.2	<± 0.1	<± 0.06	% F.S.*
Reference temperature	23	23	23	°C
Compensated temperature range	-10...+45	-10...+45	-10...+45	°C
Service temperature range	-25...+70	-25...+70	-25...+70	°C
Storage temperature range	-50...+85	-50...+85	-50...+85	°C
Temperature coefficient of the sensitivity	< ± 0.1	<± 0.05	<± 0.05	% F.S./10°C
Temperature coefficient of zero signal	< ± 0.1	<± 0.035	<± 0.035	% F.S./10°C
Nominal sensitivity	1.5	1.5	1.5	mV/V
Sensitivity tolerance	< ± 0.5	<± 0.3	<± 0.3	%
Input resistance	700 ± 2	700 ± 2	700 ± 2	ohm(s)
Output resistance	700 ± 2	700 ± 2	700 ± 2	ohm(s)
Insulation resistance (50 V)	> 5000	> 5000	> 5000	Mohm(s)
Reference excitation voltage	10	10	10	VDC
Permissible nominal range of excitation voltage	3...12	3...12	3...12	VDC
Safe load limit	150	150	150	% F.S.*
Breaking load	>300	>300	>300	% F.S.*
Permissible dynamic loading	40	40	40	% F.S.*
Static lateral force limit	10	10	10	% F.S.*

\* F.S.: Full Scale.

\*\* : 5950-20 t only available with 0.5 % accuracy class  
Specifications subject to change without notice..

5950 > STANDARD DIMENSIONS

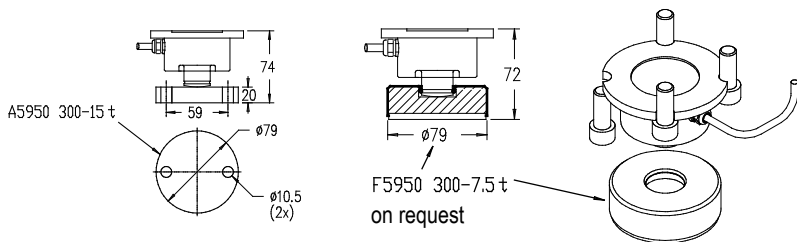


Ref. Item	Capacities	ØA	D	H	S	T	ØE	RR	Max. Deflexion (mm)	Weight (kg)
5950-A	0.3 - 5 t	54.5	38.5	54	62.9	7	89	60	0.04 - 0.07	±1.4
5950-B	7.5 - 15 t	59	38.5	54	62.9	7	89	60	0.08 - 0.15	±1.4
5950-C	20 t	59	38.5	54	62.9	7	89	60	0.2	±1.4

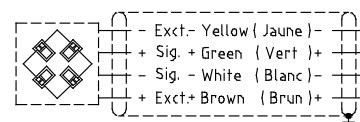
→ Other capacities and dimensions available on request

Dimensions in mm

Accessories

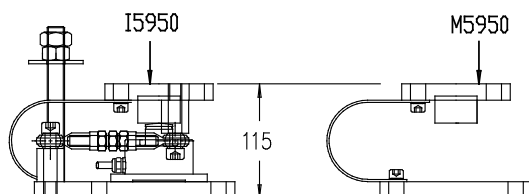
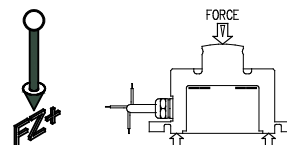


Wiring

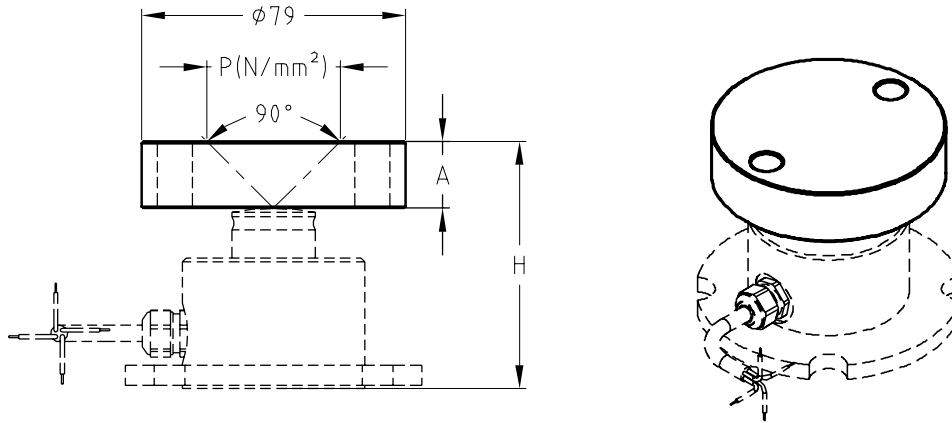


Standard : Cable screen not connected to transducer  
Faradisation non connectée au capteur

Load direction



A5950 > STANDARD DIMENSIONS



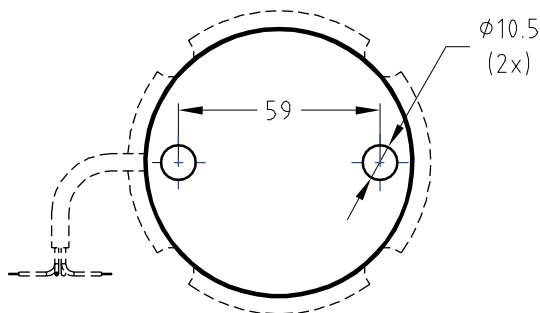
Ref. Item*	Capacities	A	H	P N/mm <sup>2</sup>	Weight (kg)
A5950-AB	0.3 - 15 t	20	74	± 120 (15 t)	± 0.76
A5950-C	20 t	25	79	± 100	± 0.95

\*Material: stainless steel

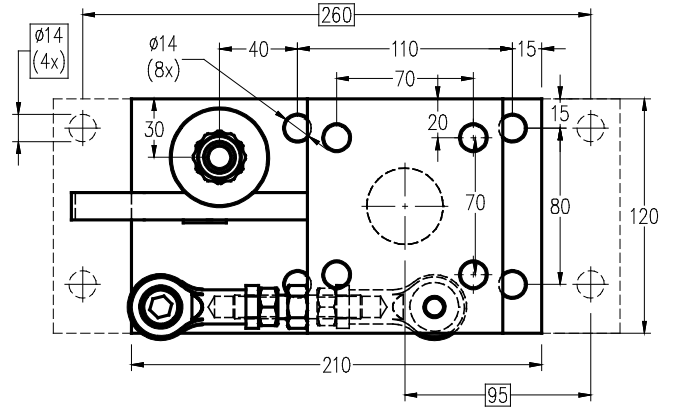
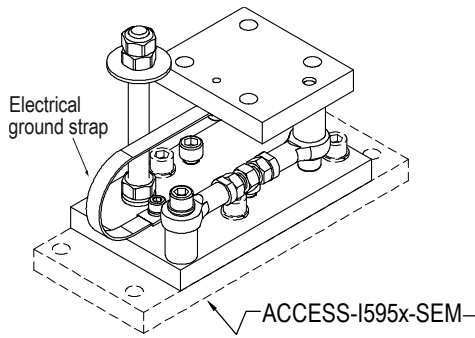
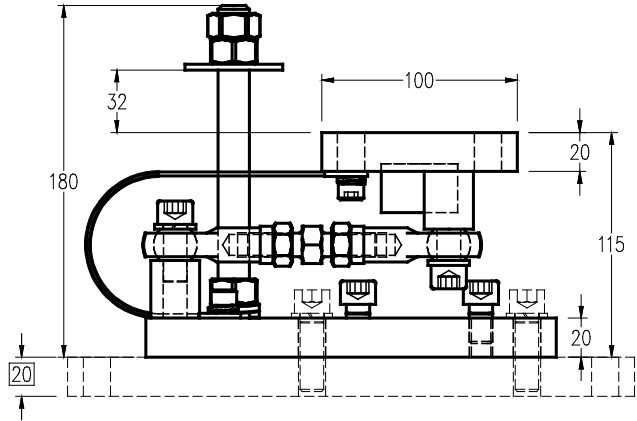
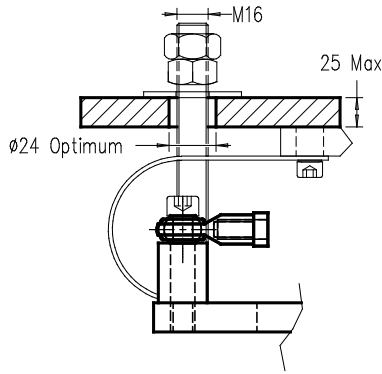
→ Other capacities and dimensions available on request

Dimensions in mm

Other view



I5950-I5955 > STANDARD DIMENSIONS

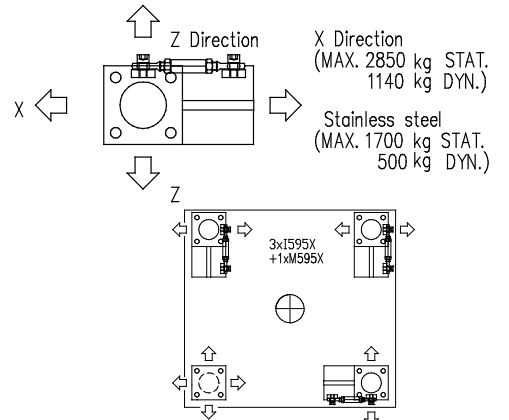
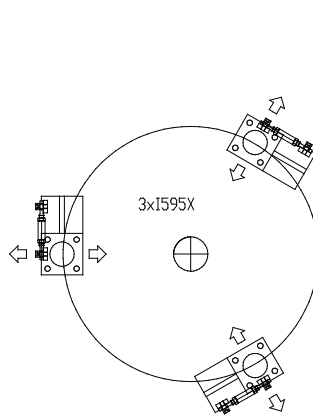
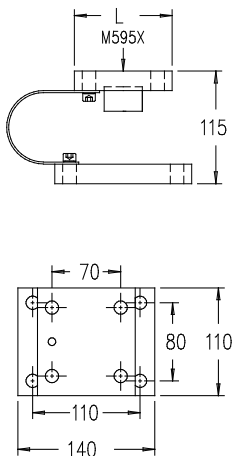


Ref. Item*	Capacities
I595x-A	0.3 - 20 t
*x=Material: I5950 - stainless steel; I5955 - alloy steel	

Other capacities and dimensions available on request

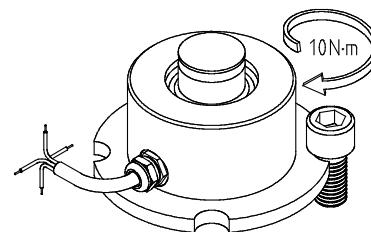
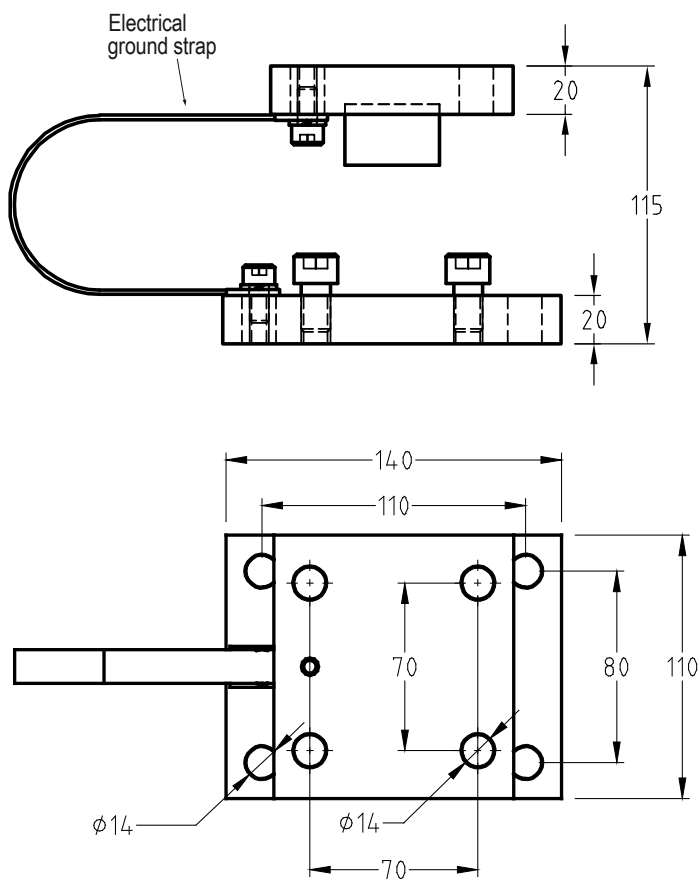
Dimensions in mm

Other views



This page was intentionally left blank

M5950 > STANDARD DIMENSIONS

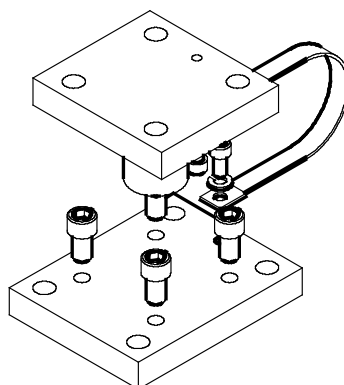


Ref. Item*	Capacities
M595x-A	0.3 - 20 t
*Material: M5950 - stainless steel; M5955 - alloy steel	

→ Other capacities and dimensions available on request

Dimensions in mm

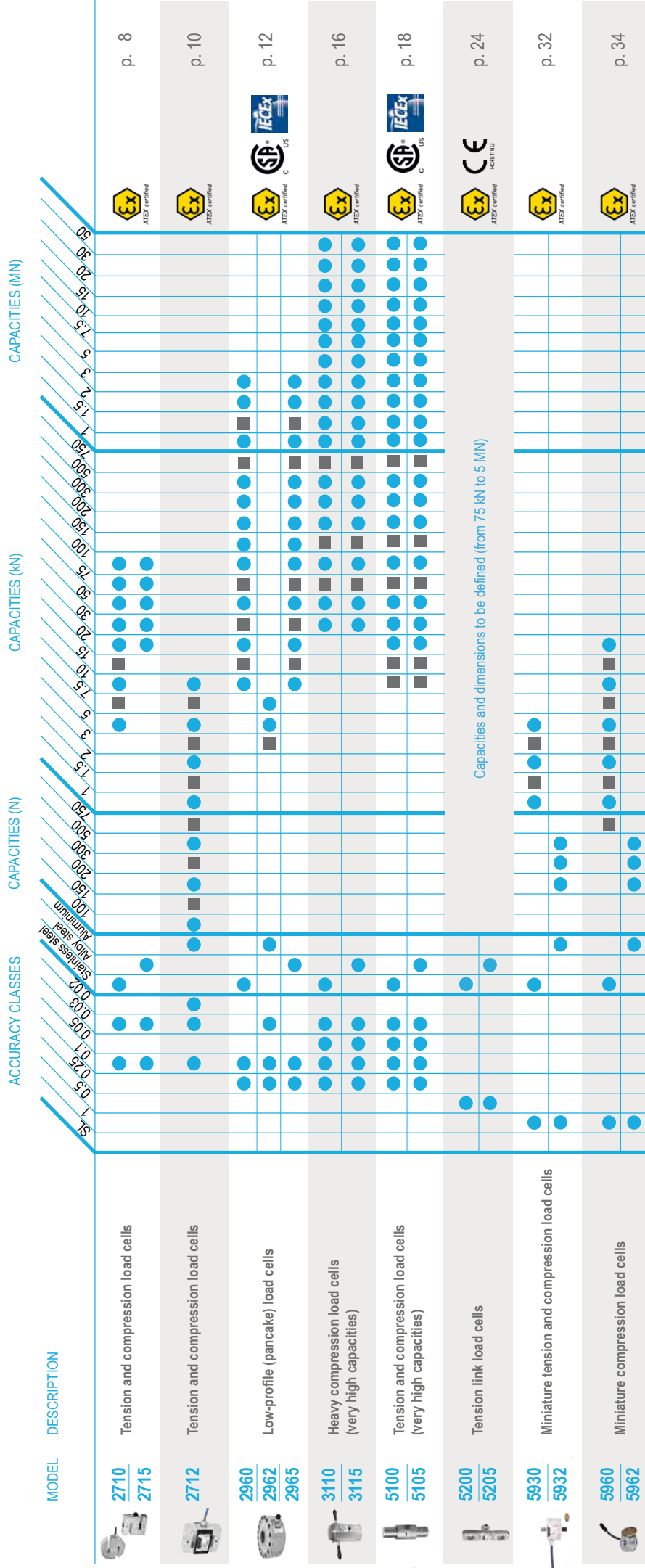
Other view





This page was intentionally left blank

# FORCE TRANSDUCERS ALSO AVAILABLE FOR WEIGHING APPLICATIONS



● Standard ■ Optional

Note: CSA and/or IECEx options are available only for 2960 and 5100 models.

# ANNEXES

- Definitions: Most popular options	p. 296
- Option cards for PAX, CRANE-BOY, INDI-BOY, DISP-BOY family	p. 303
- Definitions: Certifications	p. 304
- Definitions: Technical features	p. 305
- SENSY software	p. 306
- Stainless steel screws: Features and references	p. 310
- IP codes (International Protection Marking)	p. 311

# DESCRIPTION OF MOST USED OPTIONS

## OPTION DESCRIPTION



Amplified output

### Amplified output

Signal conditioners for strain gauges are high-performance amplifiers built into the load cell. They amplify and convert the input signal (mV) into an output signal (mA or V). The current amplifiers make it possible to maintain an accuracy higher than 0.1 % at the different temperatures used. Robust and small in design (with an optional housing), their installation is easy and their temperature range is  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$ . These analogue amplification boards are designed to work in an industrial environment and offer both high stability and fast response. The directly amplified force transducer can be applied where space, weight and cost are limited as well as in areas where there are many electromagnetic signal disturbances.

## OPTION DESCRIPTION



Angle Measurement

### Angle measurement

This allows the angle of rotation to be measured at the same time as the torque. This information is provided in the form of two square waveforms providing 360 periods per revolution and offset by a quarter of a period to determine the direction of rotation.

## OPTION DESCRIPTION



Attachment arm

### Articulated arm

This accessory makes it possible to fix the running line tensiometer to the structure while leaving it sufficient freedom to follow the movements of the rope.

## OPTION DESCRIPTION



ASTM E74

### ASTM E74

The ASTM E74 standard is unique to the USA and serves the same purpose as the international standard ISO 376, i.e.: "Calibration of force measuring instruments used for the verification of uniaxial testing machines". It deals more generally with the calibration methods which can be used to perform the calibration.

Two categories of force transducers are differentiated:

- class AA: for secondary force standard dynamometers, i.e. used as references for calibrating other dynamometers.
- class A: for dynamometers used for checking testing machines.

This distinction introduces differences in the calibration procedure. The results of the calibration are used to define the area of use in the category to which the dynamometer belongs. A key difference from ISO 376 is that the ASTM protocol is based in part on calibration uncertainty.

## OPTION DESCRIPTION



Cable length

### Cable length

Transducers are defined as standard with a typical cable length. (e.g. 8 m for the '5510' model). It is possible to modify this length on request. Note: the maximum length can be limited especially in particular:

- by the presence of electromagnetic disturbances which then require amplification of the signal at the transducer to convey a robust signal of type 4 ... 20 mA / 0...10 V;
- for Ex i-certified transducers for operation in explosive zones for which the solution is to use a local amplification (e.g.: option C6 - model 'ANALOGUE AMPLIFIER' - delivering a signal 4 ... 20 mA 2 wires) enabling the use of a loop insulator accepting longer cables than the Zener barriers.

## OPTION DESCRIPTION



Calculation note

### Calculation note

Calculation note to demonstrate the mechanical strength and technical relevance of the design of a transducer according to its measurement range, its safety factor, the fatigue strength required and the characteristics of the material used.

## OPTION DESCRIPTION



Calibration resistance







### Calibration resistance

A resistor intended to be connected in parallel on one of the Wheatstone bridge branches in order to create a known imbalance and thus to simulate a known force or torque. This makes it possible to calibrate and verify the control electronics without applying a physical quantity to the force transducer or torque meter. A calibration resistor is therefore determined for a specific branch of a specific force transducer.




It can be internal to the transducer and activated by connecting two wires. It can also be external (supplied in a sachet).

# DESCRIPTION OF MOST USED OPTIONS



OPTION	DESCRIPTION
	<p><b>CE hoisting</b></p> <p>CE Hoisting logo is SENSY specific. This means that the material is certified by SENSY to be integrated in the kinematic chain of a lifting system.</p> <p>To do this, SENSY provides a manufacturer folder which guarantees the overload resistance (breaking load coefficient of 5 for lifting systems and 10 for elevators) as well as the fatigue resistance.</p> <p>The CE Hoisting certification is not enough for the use of load cells in an overload protection systems. Indeed, in addition, a load cell used for crane overload protection must be conform to the concept of "fail safe"; namely that it must stop the lifting in case of any anomaly. This is for example not the case for load cells with wireless transmission like models: 5000-WI, 5000M-WI, 5050-WI and 5050M-WI...</p>
 <p>Charpy certificate</p>	<p><b>Charpy certificate</b></p> <p>This type of test makes it possible to control the impact resistance or the ductility of the proof body of a force transducer.</p> <p>The Charpy test is carried out on a specimen in the same material as that of the force transducer accompanied by a test report certified by an approved laboratory.</p>
	<p><b>Connector output</b></p> <p>As the standard, industrial and weighing transducers are generally equipped with a cable gland. This option replaces the latter with a connector so that it easy to disconnect from the cable. These connectors are chosen according to the transducer's environment. Some very specific connectors can also be used underwater (they can even be disconnected and connected underwater) while being subjected to high pressure.</p>
 <p>Digital output</p>	<p><b>Digital output</b></p> <p>The RS-232 and RS-485 options are high-performance digital amplifier boards for analogue / digital signal conversion which are typically used for high-accuracy transducers. The board has been developed for mounting in most of our strain gauge force transducers and provides a very stable RS-232 / RS-485 digital output signal in the MODBUS or ASCII protocol.</p>
 <p>Dual Wheatstone bridge</p>	<p><b>Dual Wheatstone bridge</b></p> <p>A double bridge force transducer is a transducer with two independent Wheatstone bridges equipped with strain gauges. In the context of high-risk industrial applications where, according to the Machine Directive, high levels of SIL (Safety Integrity Levels) or PL (Performance Levels) are required, safety is provided by an independent safety control device. The device's critical point of performance lies in its resistance to defects. This resistance depends on both the quality and reliability of the components, and in particular on its structure (or architecture). These safety devices are essentially built according to the well-known 'measurement signal / control logic / actuator' architecture. High SIL or PL levels can only be achieved by using the redundancy of the parts. Thanks to these double bridge measuring force transducers, SENSY technology enables the redundancy of the required measuring signal to be supplied to the safety control logic device. The monitoring and comparison of these redundant signals, performed by the control logic (safety PLC, configurable logic block 'fail-safe') provides the means of avoiding, detecting or tolerating defects. In this case, a fault in the measurement signal will be detected and processed before the next request for the safety function. Another reason to employ a second bridge is to have a spare bridge for very large capacity transducers or for transducers placed where mounting and accessibility are very difficult in order to facilitate dealing with the problem of signal drift or ripped cable.</p>
 <p>Dye penetrant certificate</p>	<p><b>Dye penetrant certificate</b></p> <p>Dye penetrant test certificate after machining.</p> <p>This type of test makes it possible to check the absence of any micro-cracks likely to cause the rupture of certain fatigue-rated transducers.</p>
<p><b>EN 12390</b></p> <p>Accredited laboratory certificate</p>	<p><b>EN 12390</b></p> <p>The EN 12390 and EN 12350 series of standards deal with concrete tests. The machines used for compressive strength testing of hardened concrete are tested according to the European standard EN 12390-4. The standard transducers manufactured by SENSY, have four separate gauge bridges to identify any parallelism anomaly on the machine. They may also be associated with an ISO 376 qualification and require an official certificate from a certified body based on tests carried out according to EN 12390-4.</p>
<p><b>Ex i</b></p>	<p><b>Ex i</b></p> <p>Type of protection is based on the limitation of electrical energy provided to an equipment and its wiring exposed to explosive atmosphere at a level below that which may cause ignition by a spark or thermal effect.</p> <p>Force transducers and torque meters equipped with this option are considered to be intrinsically safe, which allows them to work in explosives areas. SENSY load cells are ATEX Ex ia IIC T4 and T6, IECEx Ex ia IIC T6 and CSA (Canada and US) Class 1 Div 1 certified.</p>


# DESCRIPTION OF MOST USED OPTIONS


OPTION	DESCRIPTION
<b>Ex d</b>	<p><b>Ex d</b></p> <p>This is an envelope (housing or proof body of the force transducer) enclosing components that can ignite an explosive gaseous atmosphere. The transducer structure is therefore designed to resist the pressure developed during an internal explosion of an explosive mixture and prevents the transmission of this one to the surrounding explosive atmosphere of the envelope.</p> <p>We offer this type of option on our load pin model '5050' or for some of our electronics (displays, load limiters, etc.). In the latter case, these are placed in suitable explosion-proof housings.</p>
 Up to 800 m	<p><b>External antenna</b></p> <p>Options for the wireless transmission of measurements have an internal antenna as standard. Depending on the application, it is sometimes necessary to increase the range of our wireless transmitters.</p> <p>We also offer external antennas for the industrial sector as well as for explosive areas with our Ex i wireless transmitters.</p>
20... 100 kHz Frequency output	<p><b>Frequency output</b></p> <p>This provides a signal in the form of frequency modulation to overcome electromagnetic disturbances.</p>
 High pressure resistance	<p><b>High-pressure resistance</b></p> <p>This option involves design and components (e.g. gaskets) that can withstand high pressures. It is therefore necessary to know the nature of the fluid under pressure (water, air, oil, etc. ...), the maximum pressure to which the transducer will be subjected as well as the duration of exposure to this pressure.</p>
 Hydraulic hose	<p><b>Hydraulic hose</b></p> <p>Mechanical protection of the cable by using a hydraulic sheath. This option is recommended in environments where the cable is subject to mechanical and chemical aggressions.</p>
<b>IP64</b> Not for Angle Sensor	<p><b>IP64</b></p> <p>The protection rating of our force transducers is in accordance with the international standard of the International Electrotechnical Commission for waterproofing.</p>
<b>IP65</b> Not for Angle Sensor	<p><b>IP65</b></p> <p>The protection rating of our force transducers is in accordance with the international standard of the International Electrotechnical Commission for waterproofing.</p> <p>In the case of IP65, this corresponds to total protection against dust and strong jets of water in all directions.</p>
<b>IP67 MARINE</b>	<p><b>IP67 MARINE</b></p> <p>The protection rating of our force transducers is in accordance with the international standard of the International Electrotechnical Commission for waterproofing. In the case of IP67 MARINE, this corresponds to total protection against dust and the effects of immersion (1 m max) with corrosion resistance adapted to marine environments.</p>
<b>IP68</b>	<p><b>IP68</b></p> <p>The waterproofness is such that it is possible to immerse the transducer without altering its performance.</p> <p>In order to optimise the protection techniques, it is necessary to know the depth to which the transducer will be immersed as well as the duration of immersion and the characteristics of the liquid.</p>


# DESCRIPTION OF MOST USED OPTIONS




OPTION	DESCRIPTION
<b>IP69K</b>	<p><b>IP69K</b></p> <p>The protection rating of our force transducers is in accordance with the international standard of the International Electrotechnical Commission for waterproofing.</p> <p>In the case of the IP69K, this corresponds to protection against high-pressure cleaning, at high temperature and coming from several directions.</p>

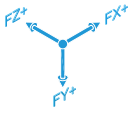
OPTION	DESCRIPTION
 <b>Class 00</b>	<p><b>ISO 376 - class 00</b></p> <p>The purpose of ISO 376 is to calibrate force-measuring instruments used for the static verification of uniaxial testing machines (e.g. tension/compression testing machines). It describes a procedure for classifying these instruments. These high-precision, so-called "transfer" standard transducers make the link between national metrology and testing machines that must be (re)-calibrated.</p> <p>The class of the instrument must be equal to or better than the class for which the machine is to be calibrated according to ISO 7500-1. With this option, these high-accuracy-transducers not only allow the calibration of scale machines in classes 05, 1 or 2 but also enable intercomparison tests between national standards.</p>


OPTION	DESCRIPTION
 <b>Class 0,5</b>	<p><b>ISO 376 - class 0,5</b></p> <p>The purpose of ISO 376 is to calibrate force-measuring instruments used for the static verification of uniaxial testing machines (e.g. tension/compression testing machines). It describes a procedure for classifying these instruments. These high-precision, so-called "transfer" standard transducers make the link between national metrology and testing machines that must be (re)-calibrated.</p> <p>The class of the instrument must be equal to or better than the class for which the machine is to be calibrated according to ISO 7500-1. This option allows for the calibration of scale machines in classes 0,5, 1 or 2.</p>

OPTION	DESCRIPTION
 <b>Class 1</b>	<p><b>ISO 376 - class 1</b></p> <p>The purpose of ISO 376 is to calibrate force-measuring instruments used for the static verification of uniaxial testing machines (e.g. tension/compression testing machines). It describes a procedure for classifying these instruments. These high-precision, so-called "transfer" standard transducers make the link between national metrology and testing machines that must be (re)-calibrated.</p> <p>The class of the instrument must be equal to or better than the class for which the machine is to be calibrated according to ISO 7500-1. This option allows for the calibration of scale machines in classes 1 or 2.</p>



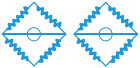
OPTION	DESCRIPTION
<b>ISO 376</b> Accredited laboratory certificate	<p><b>ISO 376 - Accredited laboratory certificate</b></p> <p>The purpose of ISO 376 is the calibration of force-measuring instruments used for the static verification of uniaxial testing machines (e.g. tension/compression testing machines). It describes a procedure for classifying these instruments. These high-precision, so-called "transfer" standard transducers make the link between national metrology and testing machines that must be (re)-calibrated.</p>

OPTION	DESCRIPTION
 Magnetic certificate	<p><b>Magnetoscopic test certificate</b></p> <p>Magnetoscopic test certificate after machining.</p> <p>This method makes possible the detection of the presence of cracks that can cause the transducer to break.</p>

OPTION	DESCRIPTION
	<p><b>Multi-axis load cells</b></p> <p>For some types of proof bodies, it is possible to manufacture load cells with several gauge bridges in order to measure forces in different directions. In particular for load pins, it is allowed to measure the force in two orthogonal directions (Fx, Fy). This allows the resultant force to be calculated, without knowing the direction, by using the formula:</p> $F \text{ Result.} = \sqrt{(F_x^2 + F_y^2)}$

OPTION	DESCRIPTION
	<p><b>Multi-direction</b></p> <p>For some applications it is necessary to know both the forces and the moments in several directions: for example, a torque wrench for which the torque as well as the thrust have to be measured. This can be done using a single transducer equipped with several gauge bridges in an appropriate design.</p>

# DESCRIPTION OF MOST USED OPTIONS

OPTION	DESCRIPTION
	<b>Overload protection</b> <p>Transducers associated with overload protection electronics (crane, EOT crane, lift, nacelle, etc.) are defined as "safety components placed on the market separately" and must comply with the essential requirements of the Machine Directive 2006/42/EC for safety component aspects and the Electromagnetic Compatibility Directive 2014/30/EU.</p> <p>They are the subject of specific strain studies and a choice of appropriate material of aeronautical quality, to prevent any risk of rupture. SENSY S.A. keeps the technical file certifying the said conformity at the disposal of the authorities throughout the legal period (in reality, the documents are kept for more than 30 years, although the lifespan of a transducer may be more than 50 years).</p>
 COVER	<b>Protective cover</b> <p>The cover is designed to improve the mechanical protection of a transducer which, as the norm, only has a silicone layer on the strain gauges.</p>
 Sheaves of synthetic material	<b>REA synthetic option (tensiometer)</b> <p>Use of sheaves made from synthetic materials instead of metal sheaves for particular applications (cable type, cable diameter, weight, etc.).</p>
 SIL 3 COMPLIANT	<b>SIL (Safety Integrity Levels) / EN-61508 compliant</b> <p>In the context of high-risk industrial applications where, according to the Machine Directive, high levels of SIL (Safety Integrity Levels – EN 62061 standard) or PL (Performance Levels – ISO 13849 standard) are required, safety is provided by an independent safety control device. The critical point of the device's performance lies in its resistance to defects. This depends on the quality and reliability of the components, and in particular its structure (or architecture). These safety devices are essentially built according to the well-known architecture (measurement signal / control logic / actuator). High SIL or PL levels can only be achieved by using the redundancy of the parts. Thanks to these double-bridge measuring transducers, SENSY technology enables the redundancy of the required measuring signal to be supplied to the safety control logic device. The monitoring and comparison of these redundant signals, performed by the control logic (safety PLC, configurable logic block 'fail-safe') provides the means of avoiding, detecting or tolerating defects. In this case, a fault in the measurement signal will be detected and processed before the next request for the safety function.</p>
 SOFTWARE AVAILABLE	<b>Software</b> <p>The signals from our force transducers can be used either through industrial displays or via acquisition software. SENSY has developed a range of specialized software either for computers (SOFT-ISO376, SOFT-ISO7500, SOFT-EN12390, ...) or for industrial PLCs. These applications make it possible to acquire the signals of one or more force transducers/load pins via different types of interfaces (RS-232, RS-485, USB, wireless, etc.).</p> <p>For example, when supplying a complete measuring system, we also regularly offer to develop customised applications.</p>
 Special Impedance	<b>Special impedance</b> <p>The force transducers and the torque meters are made from strain gauges connected via a Wheatstone bridge. The impedance of this bridge depends on the type of gauges (usually 350 Ω) and the number of these in each of the branches. As a result, there is a standard impedance for each force transducer which depends on the model, the measurement range and finally the required accuracy.</p> <p>This impedance can be adapted (700, 1000, 5000 Ω) for certain applications: need for low consumption (e.g. battery operation, amplifier 4 ... 20 mA 2 wires) or the need to limit heat dissipation (Ex i certified transducers (intrinsic safety), small transducers).</p>
 Speed sensor	<b>Speed transducer</b> <p>Measurement of the rotation speed.</p> <p>This option is proposed for rotating torque meters and tensiometers to measure the running speed of the cable.</p>
 Spider lubrication hole	<b>Spider lubrication hole</b> <p>In the case of load pins, to avoid wear due to friction, it is possible to provide a lubrication hole(s) to lubricate the areas where the forces are applied to limit wear and avoid seizure. This lubrication hole can be a 'spider' to improve the distribution of the lubricant over the entire contact area.</p>




# DESCRIPTION OF MOST USED OPTIONS



**OPTION**      **DESCRIPTION**

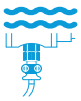
---

 **Stainless steel connector**  
 4 poles miniature standardised connector with mechanical parts made of stainless steel to replace the standard connector (9 pins binder according to DIN 45322 with chromed brass mechanical parts).

STAINLESS STEEL


**OPTION**      **DESCRIPTION**

---

 **Subsea load pin with 'wet mate' connector**  
 This option allows the cable from a transducer to be connected or disconnected under water. This option is obviously expensive but is recommended for underwater applications where the connecting cable must be removable.

**OPTION**      **DESCRIPTION**

---

 **Subsea load pin with 'submersible' connector**  
 Waterproofness of the proof body and connector for immersing the load pin. It is necessary to specify the depth and duration of immersion to optimise the design and life of its components.

Submerged

**OPTION**      **DESCRIPTION**

---

**ANODISING**  
 Surface treatment

**Surface treatment: anodising**  
 Anodising refers to an electrolytic treatment that creates a thin layer of oxide on the surface of a metal body. It is used in particular for aluminum and its alloys on which a layer of alumina of 10 to 50 microns increases its resistance to wear and corrosion. Anodising also improves the visual appearance of the force transducer or accessory.

**OPTION**      **DESCRIPTION**

---

**CHROME PLATING**  
 Surface treatment

**Surface treatment: chrome-plating**  
 Application by electrolysis of a chromium layer on the surface of the proof body of a force transducer or its accessory to improve its resistance to corrosion. This operation enhances the product's visual appearance and makes it easier to clean (e.g. food industry).

**OPTION**      **DESCRIPTION**


---

**NICKEL MARINE**  
 Surface treatment

**Surface treatment: nickel marine**  
 Additional surface treatment to the proof body of a force transducer or its accessory made of alloy steel to increase its corrosion resistance for use in the marine environment.

**OPTION**      **DESCRIPTION**

---

 **Passivation treatment**

**Surface treatment: passivation**  
 Passivation is a surface treatment intended to create a protective film against corrosion on the surface of a metal body. For example, in the case of stainless steel, a tight protective layer of chromium oxide will be formed in the presence of oxygen in the air which is able to regenerate in case of accidental deterioration of the surface.

**OPTION**      **DESCRIPTION**


---

**TEFLON**  
 Surface treatment

**Surface treatment: teflon**  
 Application of a Teflon (PTFE) layer to the surface of the proof body of a force transducer or its accessory to improve its resistance to friction and corrosion, even at high temperatures.

**OPTION**      **DESCRIPTION**


---


 **Teds linearity**


**TEDS (Transducer Electronic Data Sheet)**  
 This technology is not only compatible with force transducers but has been designed to be used with all types of transducers (temperature, pressure, accelerometer, etc.). It consists of a digital circuit for transmitting the information necessary for its calibration to the measurement electronics. Other information is stored in the memory of this chip: for example, transducer type, serial number, year of manufacture, manufacturer, etc. In this way, when the force transducer is connected to a TEDS-compatible indicator, it behaves like a fully 'plug and play' feature with automatic calibration which allows N, kg or t to be displayed directly, rather than mV.


Note: when necessary, and depending on the design of the transducer or application, it is also possible to improve the linearity of the transducer by integrating pairs of points and the corresponding adjustments into the memory.


# DESCRIPTION OF MOST USED OPTIONS


OPTION	DESCRIPTION
 -30°C...+130°C -40°C...+180°C -50°C...+130°C -50°C...+150°C -50°C...+180°C	<b>Temperature range</b> When manufacturing force transducers or torque meters, SENSY takes into account three types of temperature range: <ul style="list-style-type: none"><li>• The compensated temperature range where the thermal drift of the force transducer is corrected, optimised and verified during its manufacturing (standard: -10°C ... +45°C).</li><li>• The nominal operating temperature range (standard: -30°C ... +70°C) for which the transducer has been designed and qualified but which is not subjected to systematic temperature control. Nevertheless, the drift remains substantially the same as over the compensated temperature range. As an option and depending on the models, we propose to extend the operating temperature from to -50°C ... +180°C and, if necessary, to compensate for a part or all these temperatures.</li><li>• The storage temperature range (standard: -50°C ... +85°C) which is always adapted according to the chosen temperature option.</li></ul>


OPTION	DESCRIPTION
 Third inspection	<b>Third inspection</b> A request for an inspection by an authorised third party (e.g. Lloyd's) of an order during production and upon delivery.


OPTION	DESCRIPTION
 US control	<b>US control</b> Ultrasonic testing for fault detection within a material. This is based on ultrasonic waves transmission and reflection inside a material, such as the proof body of a transducer or loading accessory.

OPTION	DESCRIPTION
 USB	<b>USB</b> The COND-USB is a digital conditioner designed to convert the signal from the gauge bridge of our force transducers to a USB-type digital output. This product is totally 'plug and play' since it is directly powered by the USB port and no additional energy source is needed to power the force transducer. Thus, it is sufficient to connect it to a computer or PLC to recover the measurement of the force measured by the force transducer.  The rugged metal housing on the converter equips the device for use in all indoor environments.

OPTION	DESCRIPTION
 Vacuum proof	<b>Vacuum proof</b> This option involves the use of materials capable of withstanding the vacuum in the long term and in particular not to be subjected to degassing. It is necessary to know the value of the vacuum (absolute pressure) as well as the duration of exposure to this vacuum for an optimal definition of the required components.

OPTION	DESCRIPTION
 Tightness certificate	<b>Waterproofness certificate</b> Waterproofness certificate: this type of test makes it possible, for example, to check the waterproofness of a load pin intended for underwater use.

OPTION	DESCRIPTION
 Wireless	<b>Wireless</b> Depending on the application, it may be interesting to recover the signals from force transducers or load pins by replacing the wiring with a wireless link. Our wireless options enable us to provide wireless communications in industrial environments as well as in explosive areas.  The proposed solutions are suitable for measuring force as well as for lifting (for example, recovering the signal from load shackle on a portable indicator), but exclude safety functions such as overload protection. They are available as both single channel and multiplexed options to connect multiple transducers to the same wireless display.

OPTION	DESCRIPTION
 Xray proof	<b>X-ray proof</b> Withstand ionising radiation. This option involves the use of materials resistant to ionising radiation (radioactivity). It is necessary to know the type of radiation (alpha, beta, gamma or X), the dose rate as well as the total dose accumulated during the life of the transducer to obtain an optimal definition of the required components.

# OPTIONAL CARDS

## Communication cards (max. 1 choice)

### CARD-CDC10

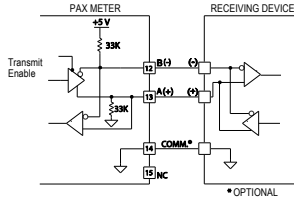


- RS-485 field bus communication interface

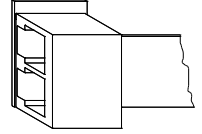
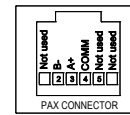
### CARD-CDC1C



### CARD-CDC10



### CARD-CDC1C



### CARD-CDC20

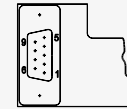
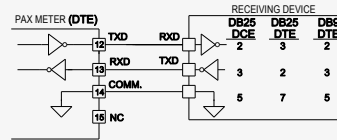


- RS-232 half-duplex communication interface  
Available with crew terminals or DB9 connector

### CARD-CDC2C



### CARD-CDC20



FEMALE  
PIN 2 TXD  
PIN 3 RXD  
PIN 5 COMMON

### CARD-CDC30



- DeviceNet communication interface

### CARD-CDC40



- Modbus communication interface

CARD-CDC40 is not necessary for models:

- INDI-PAXS2 DISP-PAXx2
- INDI-BOYS2 DISP-BOYP2
- CRANE-BOYS2 CRANE-BOYP2
- CRANE-SUMD2 DISP-SUMD2
- DISP-PAXDP, DISP-BOYDP, CRANE-BOYDP

### CARD-CDC50 / CARD-CDC50-CRANE\*



- Profibus-DP (EN 50170) communication interface

\* As the CARD-CDC50 is too long for the housing of the CRANE-BOY, the CARD-CDC50-CRANE is supplied with a spacer to be insert between the front of the electronics and the housing.

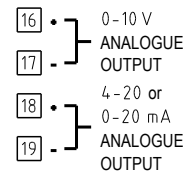
## Analogue output card

### CARD-CDL10



- Analogue output signal: 0-20 mA, 4-20 mA, 0-10 VDC

### CARD-CDL10



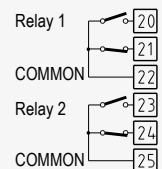
## Relay cards (max. 1 choice)

### CARD-CDS10 & CARD-CDS20

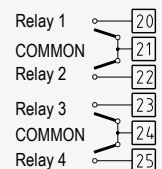


- 2 or 4 set-points activating each an independent relay

### CARD-CDS10



### CARD-CDS20



## Cards already included

- Analogue output card:

### CARD-CDL10

- Relay card:

### CARD-CDS20 (4 set-points)

- Models:

### CABIN-2xB1SUMD; CABIN-4xB1SUMD

- Models:

### INDI-BOY DISP-BOYP; CRANE-BOY CRANE-BOYP; DISP-BOYDP CRANE-BOYDP; CRANE-SUMD DISP-SUMD; CRANE-BOY-Exd; CABIN-2xB1SUMD; CABIN-4xB1SUMD.

# DEFINITIONS: CERTIFICATIONS

OPTION	DESCRIPTION
	<p><b>ATEX</b></p> <p>The ATEX (ATmosphère EXplosive in French) logo is specific to the European market and means that the material can be certified (option) to be used in an explosive environment.</p> <p>Most of the sensors can be Ex i certified (intrinsic safety) and some Ex d certified (explosion proof). The sensors with Ex i certification need to be connected to the electronics (located in a safe area) through Zener barriers or loop insulators that limit the transmitted energy. If the associated electronics need to function in an explosive environment, SENSY can integrate them in an explosion-proof certified housing.</p>
	<p><b>CE</b></p> <p>The CE logo means that the material corresponds to all the essential requirements for the different guidelines that are applicable in the European Union.</p>
	<p><b>CE Hoisting</b></p> <p>The CE Hoisting logo is SENSY-specific. This means that the material is certified by SENSY to be integrated in the kinematic chain of a lifting system.</p> <p>To do this, SENSY provides a manufacturer folder which guarantees the overload resistance (breaking load coefficient of 5 for lifting systems and 10 for elevators) as well as the fatigue resistance.</p> <p>The CE Hoisting certification is not sufficient for the use of load cells in an overload protection system. Indeed, in addition, a load cell used for crane overload protection must conform to the concept of "fail safe"; namely, it must stop the lifting in case of any anomaly. For example, this is not the case for load cells with wireless transmission, such as models: 5000-WI, 5000M-WI, 5050-WI and 5050M-WI...</p>
	<p><b>CSA</b></p> <p>The CSA logo is equivalent to the ATEX logo but is applicable to the North American markets (USA and Canada).</p>
	<p><b>IECEX</b></p> <p>The IECEX logo (International Electrotechnical Commission System for Certification to Standards Relating to Equipment for Use in Explosive Atmospheres) is equivalent to the ATEX logo but is applicable for the global market.</p>
	<p><b>ISO 376</b></p> <p>The purpose of ISO 376 is the calibration of force-measuring instruments used for the static verification of uniaxial testing machines (e.g. tension/compression testing machines). It describes a procedure for classifying these instruments. These high-precision, so-called "transfer" standard transducers make the link between national metrology and testing machines that must be (re)-calibrated.</p>
	<p><b>OIML</b></p> <p>OIML is the International Organization of Legal Metrology.</p> <p>In the SENSY documentation, the OIML logo means that the load cell or the weighing electronics are certified by an internationally recognised Metrology institute (PTB, NMI, NWML, etc.) as compliant to the international recommendation OIML concerning the type of material in order to integrate the sensor into a "legal" weighing system designed to measure the mass in order to determine its price.</p> <p>It is the R60 for the load cells and the R76 for the electronics (non-automatic weighing).</p>
	<p><b>OVERLOAD PROTECTION</b></p> <p>Transducers associated with overload protection electronics (crane, EOT crane, lift, nacelle, etc.) are defined as "safety components placed on the market separately" and must comply with the essential requirements of the Machine Directive 2006/42/EC for safety component aspects and the Electromagnetic Compatibility Directive 2014/30/EU.</p> <p>They are the subject of specific strain studies and a choice of appropriate material of aeronautical quality to prevent any risk of rupture. SENSY keeps the technical file certifying the said conformity at the disposal of the authorities throughout the legal period (in reality, the documents are kept for more than 30 years, although the lifespan of a transducer may be more than 50 years).</p>
	<p><b>EN 12390</b></p> <p>The EN 12390 and EN 12350 series of standards deal with concrete tests. The machines used for compressive strength testing of hardened concrete are tested according to the European standard EN 12390-4. The standard transducers manufactured by SENSY, have four separate gauge bridges to identify any parallelism anomaly on the machine. They may also be associated with an ISO 376 qualification and require an official certificate from a certified body based on tests carried out according to EN 12390-4.</p>



## DESCRIPTION

### Carbon cable

These small-diameter cables are made of carbon-fibre-reinforced materials. As there are many varieties it is essential to specify the characteristics of the cable concerned.

## DESCRIPTION

### Steel cable

A steel cable is an assembly of strands which are themselves an assembly of steel wires arranged in helical form around their respective core and assembled to become one. The cable allows for transmitting, force, movement and energy in an assembly of mechanical parts.

## DESCRIPTION

### Synthetic cable

Cable made from synthetic fibres (high-molecular-weight polyethylene) braided into 12 strands, with a hollow core. Its advantages over steel are: 8 x lighter, easier to handle, can hoist over longer distances, low elasticity, and in case of cutting there is no whiplash so it is safer.

## DESCRIPTION

### Deflection

Deformation along the main axis of a proof body, observed between a situation when no load is applied and nominal loading.

## DESCRIPTION

### Loading accessories

In order to verify the force sensors used in calibration or reference machines, loading wedges are employed to transmit the load to the measuring instrument. In the case of a wedge with two flat surfaces, to avoid any errors during the test they must be flat and parallel. In addition, the pressure on the machine trays must remain at less than 100 N/mm<sup>2</sup>. If necessary, it is possible to install intermediate plates with a force application diameter large enough to better distribute the pressure. Ideally, the effective height of a mounting compression accessory must be greater than or equal to half of the force application diameter of the latter. In addition, the cavity diameter of the accessory should be 0.1 to 0.2 mm greater than the diameter of the force-transmitting motor element to allow this part to be centred in the accessory without generating side contact between both parts.

## DESCRIPTION

### MTTFd

The reliability of components is obviously at the core of a system's ability to perform its security function. The lower the reliability of a component, the more likely it is that this component will cause failures (and therefore will be dangerous). However, it should be noted that it would be inconceivable to consider the reliability of a component as justification for achieving high levels of performance. Standard 13849 also provides a limit on the use of an MTTFd (100 years). This is because an MTTFd value is an average and does not reflect reality. It is therefore likely that a reliable product will fail, despite the small statistical probability. It is particularly true that, in the case of failure, this component will not immediately be identified as the probable cause of that failure.

## DESCRIPTION

### Wheatstone bridge

A Wheatstone bridge is an electrical circuit that can measure very small variations in electrical resistance. This technique is commonly used for strain gauge sensors because it accurately measures relative deformations of a few mm/m. If no force is applied to the sensor, the four gauges have the same resistance and the V. out output signal is zero.

If a force is applied in compression, gauges 1 and 4 become longer and consequently their resistance increases. Conversely, gauges 2 and 3 become shorter and their resistance decreases. As a result, the Wheatstone bridge is unbalanced and a positive V.out voltage can be measured. Conversely, this voltage becomes negative if a tension force is applied. If these relative variations are small (<1 %), we can consider that the relation (Force => Deformation => Resistance of the gauges => Electrical signal) is linear.

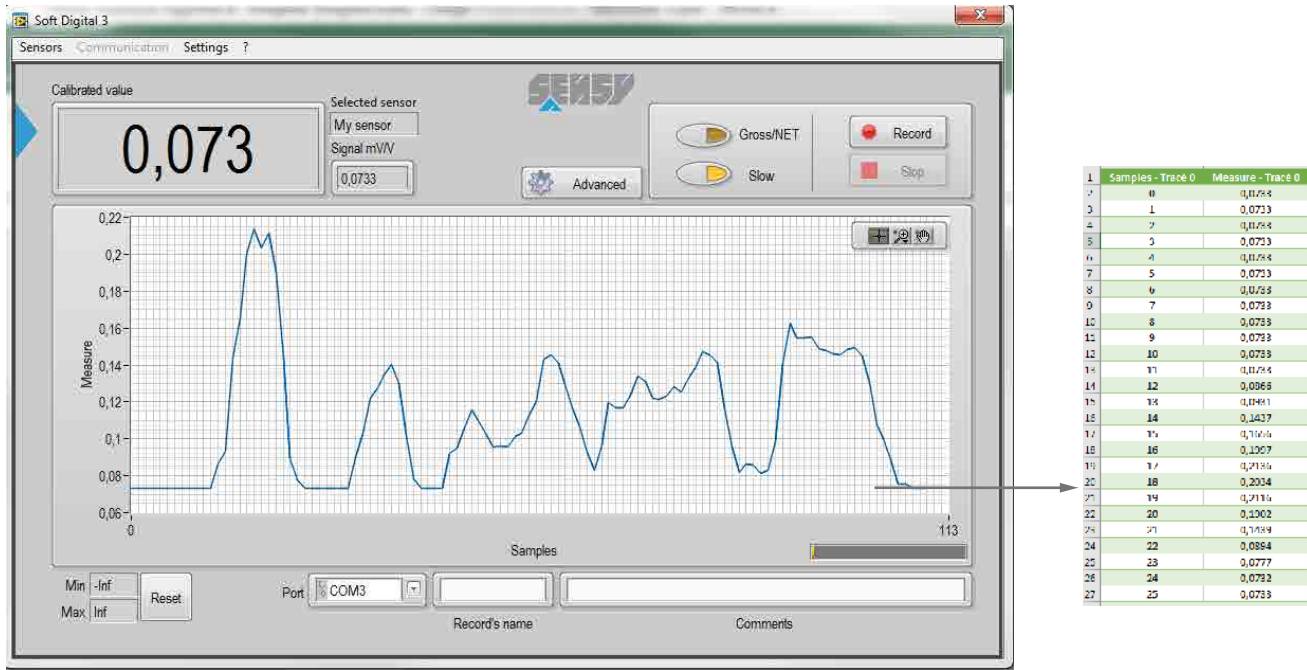
Furthermore, it should be noted that the output signal is also proportional to the supply voltage V. in. The sensitivity of the sensor is therefore expressed in mV/V where the denominator is equal to V. in. Thus for a sensor whose sensitivity is 2 mV/V and is supplied with 10 V, the output signal will evolve from 20 mV between zero and full scale. Typical sensitivities for metal gauge sensors change from 0.5 to 4 mV/V depending on:

- Principle of operation

For some sensors, the four gauges are deformed in the same proportion; for others, some gauges operate at 100 % and others at 30 % (Poisson's ratio).

- The required overload capacity, e.g. the breaking capacity must be 500 % for a hoisting device.
- Fatigue resistance.
- The type of material selected for the proof body.

SOFT-DIGITAL enables the reading, real-time display and recording of measurements of a SENSY load cell transmitted by the indicators for a standard reference force transducer called "INDI-00" and "INDI-ISO376", as well as the range of digital converters (USB, RS-232, RS-485) proposed by SENSY.

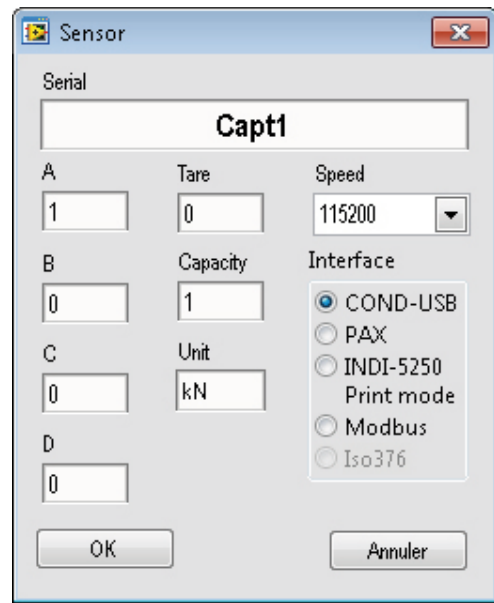
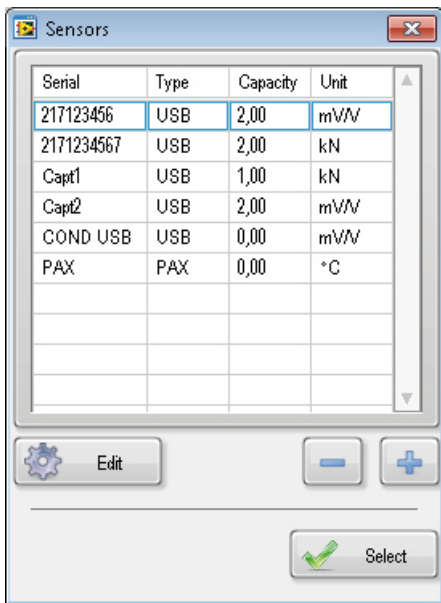


## LOAD CELLS CALIBRATIONS

Define all the coefficients from calibration sheet of several standard reference transducers.

Each one uses the following equation:  $F(x) = a \cdot x + b \cdot x^2 + c \cdot x^3$  Where F = force and x = electrical display signal .

The software calculates the applied force from the digitalised raw analogue signal x(mV/V) using the 3<sup>rd</sup> order function.



This programme has been developed according to ISO 7500-1.

It is intended for certified laboratories carrying out periodic inspection on different force testing machines.

It allows the automatic generation of verification reports of static force uni-axial testing machines.

SOFT-ISO7500 allows all the coefficients to be defined from the calibration sheet of several standard reference transducers.

Each transducer has an equation like the one below:

$$F(x) = a \cdot x + b \cdot x^2 + c \cdot x^3 \text{ where } F = \text{force and } x = \text{electrical display signal.}$$

The software calculates the applied force from the digitalised raw analogue signal  $x(\text{mV/V})$  using the 3rd order function.



Standard reference force transducers

Calibration data of the test cell (see certificate)

Load cell #	Label	Capacity	Unit	Coef A	Coef B	Coef C	Manufacturer	Type	Class	Ref. Certif.	Ref. Conf.	Expiration date
2	1 MN	1.000	kN	0.00000000000000000000	0	0	SENSY	3115	0.5	2001300K	ES/SHD/w	31/06/2009
3	500 kN	500	kN	0.00025113	0.0000000000	0	SENSY	3115	0.5	20002778	ES/SHD/w/M	31/07/2009
4	100 kN	100	kN	0.0006855	0	0	SENSY	3115	0.5	90068000	ES/SHD/w	30/07/2009
5	50 kN	50	kN	0.0002510148	0	0	SENSY	2715	0.5	20004500	ES/SHD/w	29/07/2009
6	0	0	0	0	0	0			0.5			
7	0	0	0	0	0	0			0.5			
8	0	0	0	0	0	0			0.5			
9	0	0	0	0	0	0			0.5			
10	0	0	0	0	0	0			0.5			

Equation:  $F = a \cdot X + b \cdot X^2 + c \cdot X^3$  (values by the order of the numbering)

Display information:

Display no	Label	Manufacturer	Type	Serial number	Ref. Certif.	Expiration date	Incremental
1	IND	IND	IND	200102300	ES/SHD/w/M/2009	29/07/2009	0
2							0



## BENCH CONDITIONING

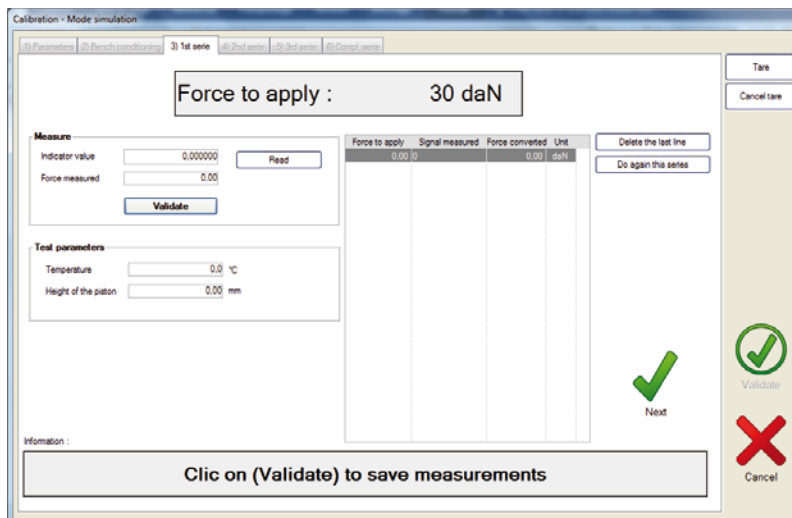


Conditioning machine is defined by the ISO7500-1 standard, point 6.4.3.

In the first step, you must unload the machine. The program then requires you to load the machine until the threshold indicated.

Restart this test 3 times and then you can start to test the machine.

## TESTING PROCEDURE



The test comprises three series of measurements divided by equal steps of loads.

The procedure comprises loading the test machine with the value announced by the program, then taking measurements via the standard reference transducer; these two values will be compared to calculate the errors and determine the machine class.

You have the possibility to do a reversibility test.

This page was intentionally left blank

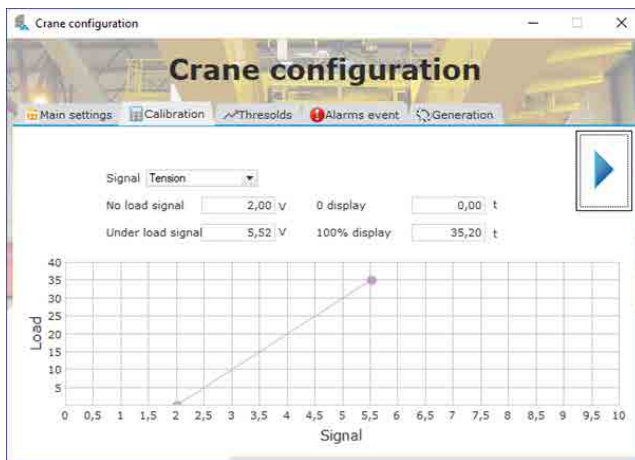


The COACHVIEW software is delivered with the COACH-II (data logger dedicated to hoisting equipment).

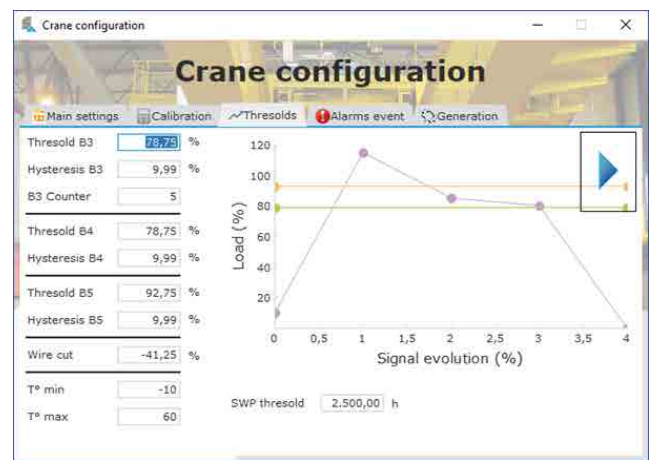
This very-user-friendly program allows for optimisation of the servicing schedule, the detection of downtimes and calculation of the FEM classification of the crane.

## The main functions of COACHVIEW are:

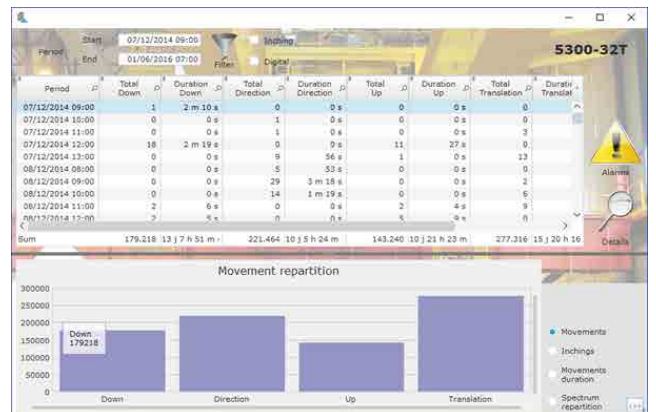
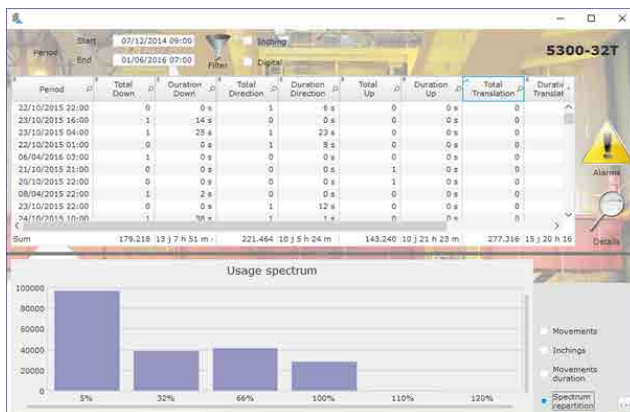
- Creation and management of configuration files for COACH-II (capacity, set-point, alarms, SWP),
- Analysis of the recordings performed by COACH-II,
- Generation of charts and tables.



**Usage spectrum**



**Movement repartition**



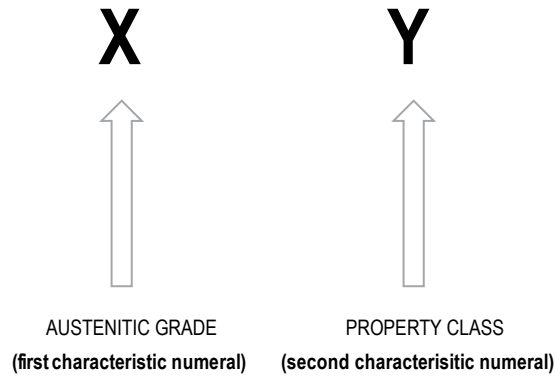
STAINLESS STEEL SCREWS > MECHANICAL AND CHEMICAL PROPERTIES

Mechanical properties of corrosion-resistant stainless steel fasteners:

- bolts, screws and studs (NF EN ISO 3506-2)
- nuts (NF EN ISO 3506-1)

SENSY mainly uses A2 and A4 stainless steels.

Mechanical properties of stainless steel screws are described below:



X: AUSTENITIC GRADE

First characteristic numeral	AISI nb	Properties
A2	A2	Good corrosion resistance in the open air and in fresh water
		Mainly used in food industry, chemical applications
A4	A4	Greater corrosion resistance in marine and coastal environment and chlorine pools
		Alloy steel with higher molybdenum concentration
		High resistance to alkaline and acidic solutions

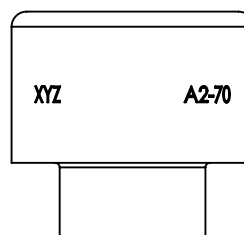
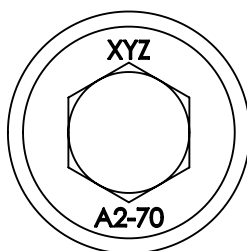
Y: PROPERTY CLASS<sup>(1)</sup>

Second characteristic numeral	Characteristics	Field of use
70	Cold-worked	SENSY standard
80	High tensile strength	SENSY option (mandatory for load cells used in EX d environment)

<sup>(1)</sup> : the class represents the minimum tensile strength of the bolt divided by ten; for example 70 is equal to 1/10 of the minimal tensile strength Rm = 700 MPa (N/mm<sup>2</sup>).

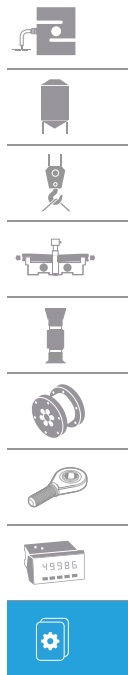
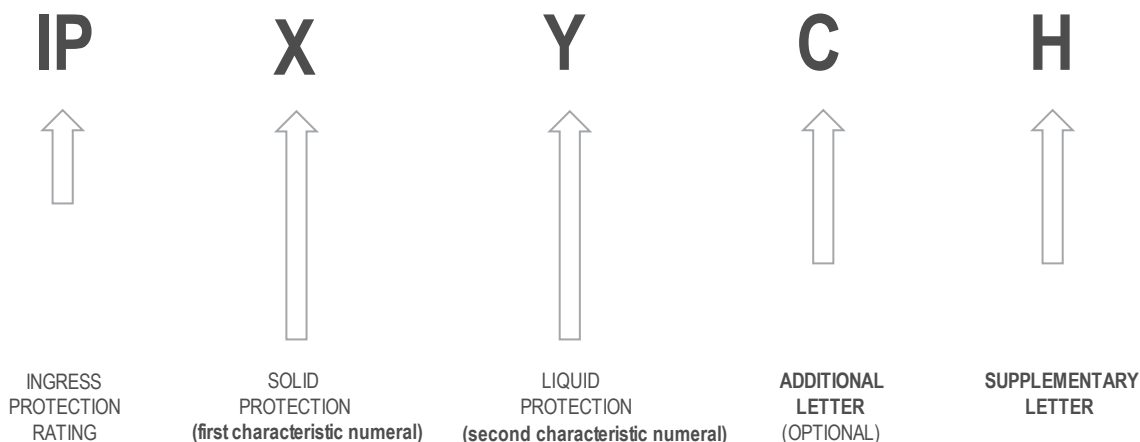
Screw marking:

Marking is mandatory for thread size ≥ 5mm



IP CODES > MEANING

International Protection Marking in accordance with DIN EN IEC 60529



First characteristic numeral	Description
0	Non-protected
1	Protected against solid foreign objects of 50 mm diameter or greater
2	Protected against solid foreign objects of 12.5 mm diameter or greater
3	Protected against solid foreign objects of 2.5 mm diameter or greater
4	Protected against solid foreign objects of 1 mm diameter or greater
5	Dust-protected
6	Dust-tight

Additional letter	Description
A	Protected against access with the back of the hand
B	Protected against access with a finger
C	Protected against access with a tool
D	Protected against access with a wire

Second characteristic numeral	Description
0	Non-protected
1	Protected against vertically falling water drops
2	Protected against vertically falling water drops when enclosure tilted up to 15°
3	Protected against spraying water
4	Protected against splashing water
5	Protected against water jets
6	Protected against powerful water jets
6K <sup>(1)</sup>	Protected against powerful water jets with increased pressure
7	Protected against the effects of temporary immersion in water (≤1m)
8	Protected against the effects of continuous immersion in water (>1m)
9K <sup>(1)</sup>	Protected against the effects of powerful water jets at high temperature

Supplementary letter	Description
H	High-voltage equipment
M	Device moving during water test
S	Device standing still during water test
W	Weather conditions

<sup>(1)</sup> : All tests with letter K are defined by ISO 20653 (replacing DIN 40050-9)