

DYNAMOMETRIC AXLE NOT IN USE FOR HOISTING

TYPES 5000, 5050, 5300 et 5600



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APPENDIXES :

- For models 5000: Control + diagnostic data sheet
- For models 5050: Control + diagnostic data sheet
- For models 5300: Certificate of verification + diagnostic data sheet
- For models 5600: Control + diagnostic data sheet

Rev.	Date	Reason
1	24/09/2014	IECEX et CSA (in preparation) + ATEX d certifications are added
2	24/03/2015	Modifications of the paragraphs 1.3 and 1.5 and the DOC for ATEX T2 & CSA
3	4/11/2015	Modifications of the paragraphs 1.7 for standards revision
4	23/06/2016	Model 5050 addition
5	10/04/2018	Update of the DECLARATION OF CE CONFORMITY
6	19/03/2019	Insertion of an EU Declaration Of Conformity
7	12/11/2020	Labels modification on page 4 (CE0 518 becomes CE 2813)
8	07/12/2021	Adding of specific conditions of use indicated in certificate SIRA 13ATEX2365X
9	06/10/22	Adding of UKCA and EU + new certificate, update of conditions accordingly

1. CONDITIONS OF USE OF A DYNAMOMETRIC AXLE

1.1. Settings

1. The reference axle has to be used in the defined conditions of its technical data and according to described conditions.
2. The effort on the axle has to be applied according to its preferential direction materialized by the arrow. A variation of $\pm 3^\circ$ is tolerated.
3. Verify that the effort to the centre of the axle is well directed in the senses of the arrow affixed on the dynamometer.
The provided descriptive form resumes this information too.
4. The axle has to be installed freely in its seating (tolerance H9/h9 sufficient for load limitation; tolerances H7/h7 better for load measurements). If pulley is rotating, we firmly recommend mounting with bearings (tolerance h6 required in option on load pins 5000/5050/5600, standard on 5300), mounting with bushing could be good for low rotation speeds (tolerance h7 in option). In this case, specific pressures are recommended by constructors.
5. The axle has to work only in shearing. It should not normally be subject to parasitic constraints such as: torsion, flexion, traction or axial compression.
It is therefore necessary to uncouple efforts by an appropriate setting (ex: use of rolls, or rings of well lubricated bronze).
6. The setting of the axle cannot be done using force or by giving violent knocks.
Nevertheless, you can use a wooden mallet to insure the adjustment.
7. After blocking the axle, it cannot keep a clearance on its axis of more than 1° compared to its blockage position.
8. The delivered cable cannot be lengthened; but well shortened. It is mandatory to connect the axle to its electronic device according to the colour codes specified on the axle data sheet, exclusively and conform to the specifications of the used electronic device. The technician in charge of installation will ensure the integrity of the cable after setting on site. All injury of this cable or one of the conductors implies its replacement by SENSY.
9. The load is uniformly distributed on at least 80% of the distance between the junction plates.
A written agreement by the manufacturer is mandatory for particular use conditions.

1.2. During service:

1. A dynamometric axle is designed to support an occasional static overload, without injury, up to 1,5 x the Nominal Load.
In no case, a superior overload is (static or dynamic) acceptable.
2. In case of rotation of the bore on the axle (pulley), precautions will be taken to avoid the seizing of the axis:
 - self lubricated rings;
 - greasing;
 - placement of a ball bearing.
 In case of seizing, the axle has to be returned to us for control.
3. Make sure that the deformation of the axle is not restrained.
4. The handled load has to be free and adapted to the nominal load of the system:
 - no anchorage to the ground or support;
 - no collision with another load or structure;
 - no jamming;
 - no shock produced by the fall of another load on the handled load.
5. The axle should not undergo shocks linked to the conditions of utilisation.

1.3. Periodic inspections

1. Make sure by appropriate means that the axle has not been seizing. (annually)
2. Check output for zero load (annually)

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

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

1.4. Calibration

If it's not possible to hoist the nominal load for calibration, hoist at least 60% of the nominal load.

1.5. Use features

(The exact characteristics are systematically given in the control sheet delivered with every load cell!)

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

⁰ Min value depends on option

EX-D option: min = -35°C, others on request non Ex d: -55°C

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

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

³ 9-28VDC for EX-I C6 options

⁴ 15 to 27VDC with a 1000 Ω bridge

* The compensated and operating temperature ranges may be extended with the right option for your environment.

See the control sheet delivered with your load cell for the exact temperature ranges and certificate for option chosen if applicable.

2. USE IN POTENTIALLY EXPLOSIVE ATMOSPHERE (OPTION)

2.1. Intrinsic safety protection

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

ATEX:

EU ATEX certificate number :	CML UKEX certificate number :
CML 22ATEX2429X	CML 22UKEX2430X
Sira13ATEX2365X	

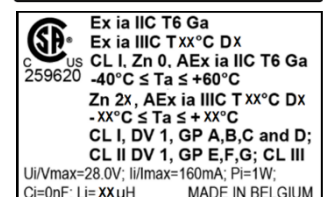
CSA: Master Contract 259620

IECEX: IECEX SIR 13.0148X

All issued by accredited organizations. Sensors must be used with appropriate safety material (Zener barrier or galvanic isolator) corresponding to the requested requirements mentioned in the certificate.

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

ATEX	CSA	IECEX
EN 60079-0	CAN/CSA-C22.2 No. 0	IEC 60079-0
EN 60079-26	CAN/CSA C22.2 61010	IEC 60079-11
EN 60079-11	CAN/CSA-C22.2 No. 60079-0	IEC 60079-26
	CAN/CSA-C22.2 No. 60079-11	
	ANSI/UL 508	
	ANSI/UL Standard 913	
	ANSI/UL 60079-0	
	ANSI/UL 60079-11	



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

2.2. Specific conditions of use indicated in certificate for hazardous area

When the apparatus is used in dust atmospheres, connectors, plugs and cable glands used shall have an ingress protection of at least IP6X.

The equipment is not capable of withstanding the 500V dielectric strength requirement in accordance with clause 6.3.13 of EN 60079-11.

Some enclosure for specific options might be manufactured from sparking material (see certificate).

In rare cases, ignition sources due to impact and friction sparks could occur.

This shall be considered during installation.

2.3. Explosion-proof safety (Ex d)

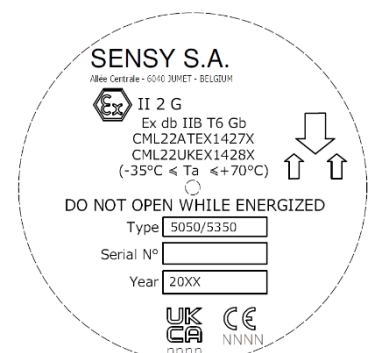
SENSY has developed an IP6X explosion-proof ATEX d load pins to operate in zones 1 & 2 and in rough environments. The use of Ex d sensors can only be done with Ex d marked sensors delivered with the official certificates.

For more information, please refer to our certificate, issued by an accredited organization:

EU ATEX certificate	UKEX Certificate Number
CML22ATEX1427X	CML22UKEX1428X

Ex d explosion-proof load cells comply with the following standards:
EN IEC 60079-0 and EN-IEC 60079-1

SENSY can also supply explosion-proof junction boxes to operate in hazardous zones.



3. GUARANTEE

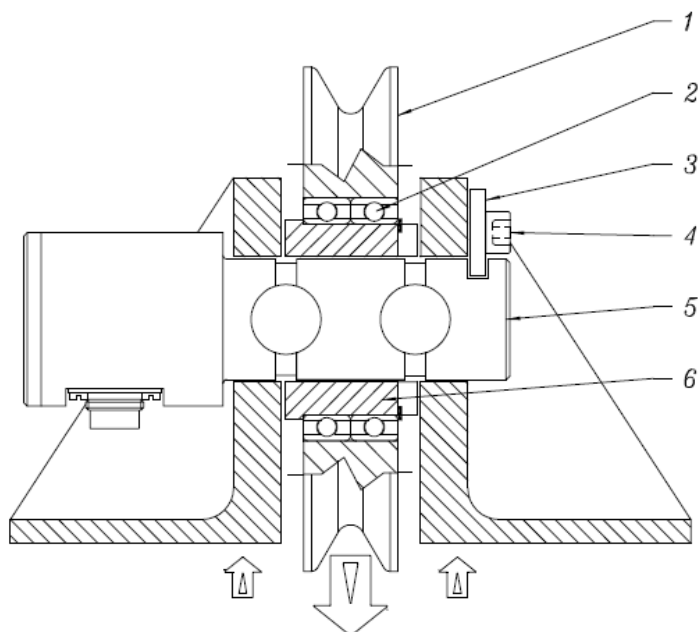
The constructor guarantee is applicable if mounting recommendations and general use principles are respected.

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

MOUNTING 5000

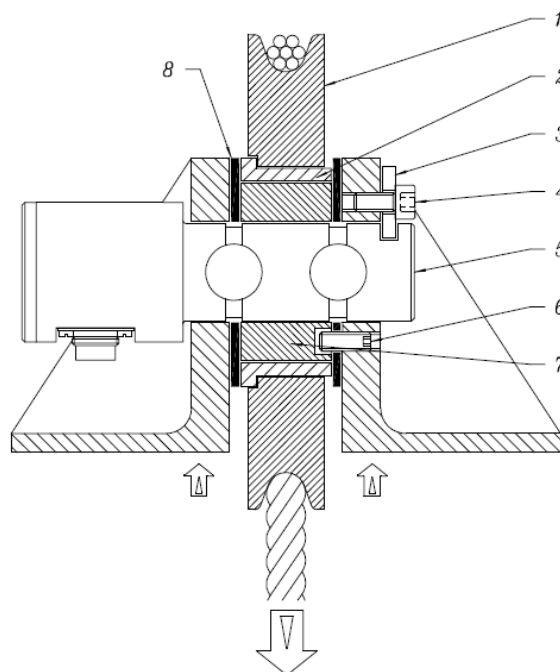
MOUTING ON BEARING

1. Pulley
2. Ball bearing
3. Small plate
4. Screw (stuck or brake washer)
5. Dynamometric axle
6. Ring to hold bearing



MOUNTING WITH SELF-LUBRICATING BRONZE RING

1. Sheave
2. Self-lubricating bronze ring
3. Small plate
4. Screw (stuck or brake washer)
5. Dynamometric axle
6. Anti-rotating screw (brake with glue)
7. Case-hardened steel ring
8. Anti-friction washer (TEFLON...)



4. DRAWINGS AND WIRING DIAGRAMS

TECHNICAL DRAWINGS: CUSTOM-MADE LOAD PINS

↳ 5000 > TECHNICAL SPECIFICATIONS

Load pins range



5000 (1 to 2000t)
CUSTOM-MADE LOAD PIN

5050 (1 to 2000t)
SUBSEA LOAD PIN

5300 (0.5 to 125t)
STANDARD LOAD PIN

5600 (0.5 to 14 t)
ECONOMICAL LOAD PIN

TOOLS

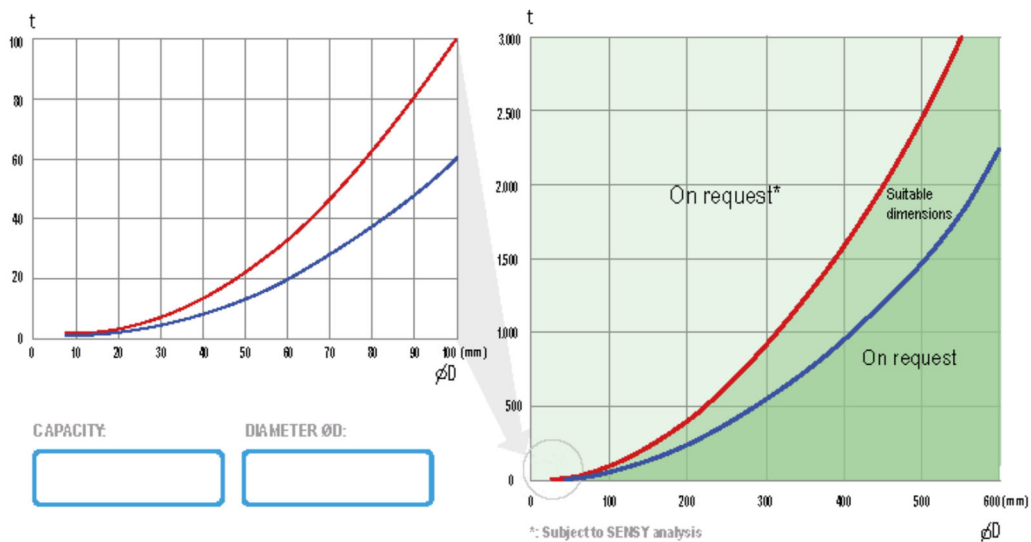
CONFIGURATOR

www.sensy.com/load-pins-configurator#5000

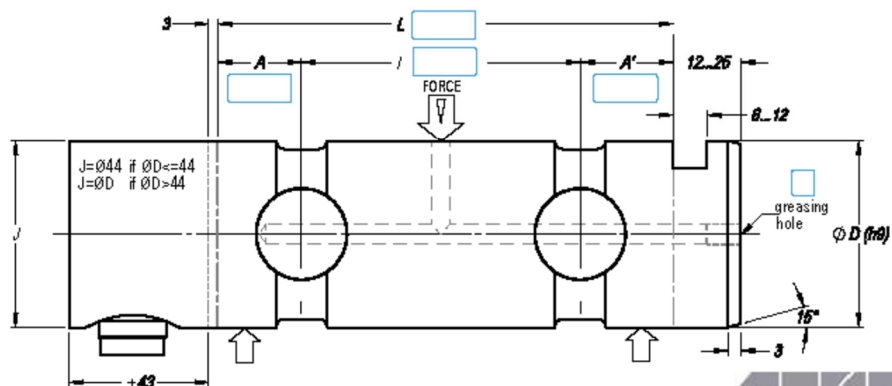
LOAD PIN DESIGN

www.sensy.com/load-pins-configuration/load-pin-design

Load-diameter relationship



Mechanical dimensions



TECHNICAL DRAWINGS: CUSTOM-MADE LOAD PINS

5000 > OPTIONS

Configuration

Example:

C: Connector
B: Cable entry: 180°
H: Fixing plate: 0°
N: Position code

Example:

P: Cable gland
B: Cable entry: 180°
H: Fixing plate: 0°
C: Position code

Example:

P: Cable gland
A: Cable entry: axial
D: Fixing plate: 90°
N: Position code

Cable entry:

Connector

C

Cable Gland

P

Fixing plate nr

if ØD ≤ 100

1

N

if ØD > 100

2

C

4

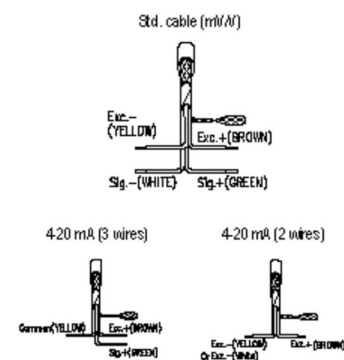
V2, V4, P2, P4, VC, PC

Options

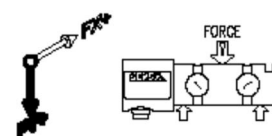
Type of application	FORCE (BL* 500 %)		HOISTING (BL* 500 %)		LIFT (BL* 500 %)	
Environment	IP65	IP66	IP67	IP67 MARINE	IP68	
	NORMAL	INDUSTRIAL	NUCLEAR	AERONAUTICS	Other:	
	SUBSEA		Immerse depth: Immerse time:			
Output signal	mV/V	4-20 mA 2 wires	0-10 V (force)	1-5 V (hoisting)	RS-485 WIRELESS	Other:
Service temperature range	<div style="text-align: center;"> <p>Standard temperature range</p> <p>Temperature range available (option)</p> <p>-50°C to +200°C</p> </div>					
Dual bridge circuit	NO		YES		Redundancy Safety SIL/PL Biaxial load pin, directions X and Y	
Cable length (m)	6	12	20	50	100	Other:
Intrinsically safe	Not applicable	ATEX	IECEX/ATEX	CSA (US/Canada)	Triple certification	

*BL = Breaking load

Wiring



Load direction



TECHNICAL DRAWINGS: SUBSEA / SUBMERGED LOAD PINS

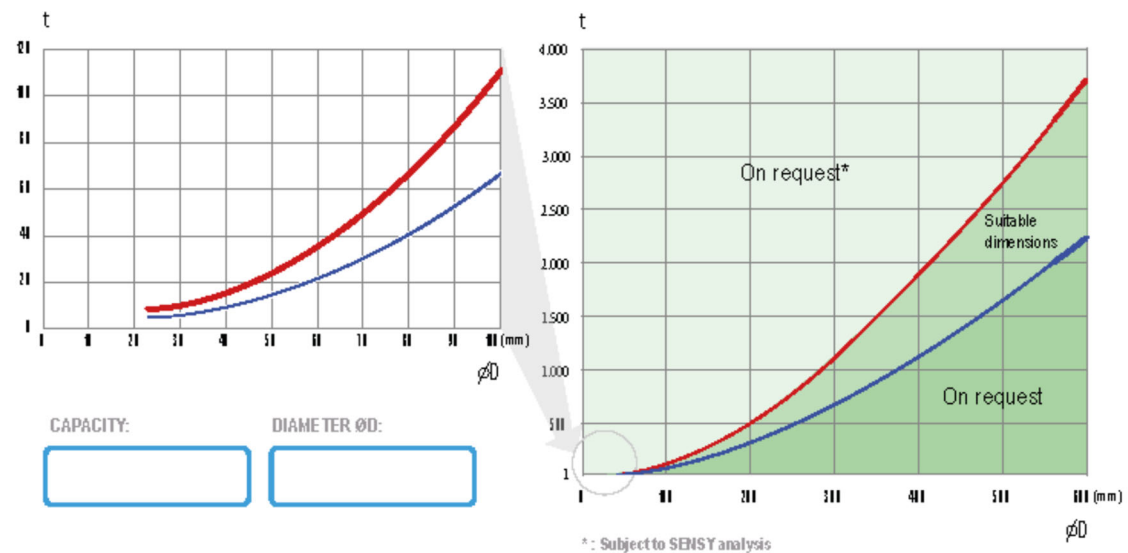
5050 > TECHNICAL SPECIFICATIONS

Load pins range

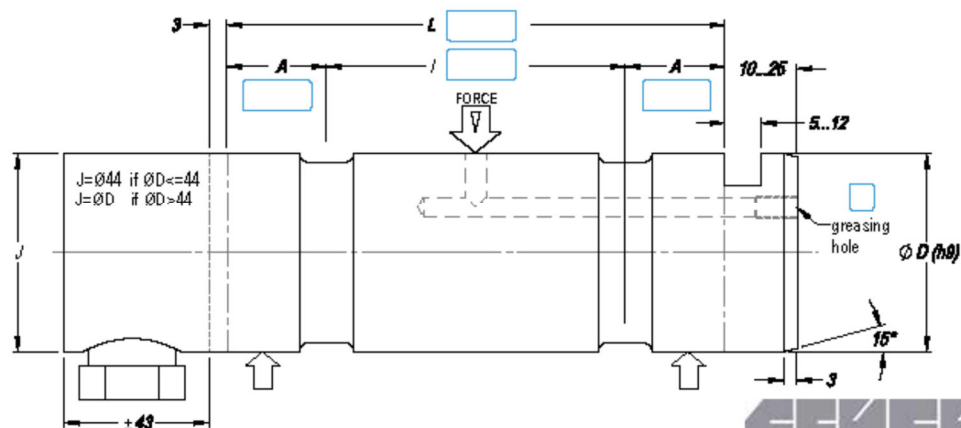
			
5000 (1 to 2000 t) CUSTOM-MADE LOAD PIN	5050 (1 to 2000 t) SUBSEA LOAD PIN	5300 (0.5 to 125 t) STANDARD LOAD PIN	5600 (0.5 to 14 t) ECONOMICAL LOAD PIN

TOOLS	CONFIGURATOR www.sensy.com/load-pins-configurator/5050	LOAD PIN DESIGN www.sensy.com/load-pins-configurator/load-pin-design
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Load-diameter relationship



Mechanical dimensions



TECHNICAL DRAWINGS: SUBSEA / SUBMERGED LOAD PINS

5050 > OPTIONS

Configuration

Example:

C: Connector
B: Cable entry: 180°
H: Fixing plate: 0°
N: Position code

Example:

P: Cable gland
B: Cable entry: 180°
H: Fixing plate: 0°
C: Position code

Example:

P: Cable gland
A: Cable entry: axial
D: Fixing plate: 90°
N: Position code

Cable entry

Connector: C

Cable Gland: P

Fixing plate nr

if $\phi D \leq 100$: 1

if $\phi D > 100$: 2

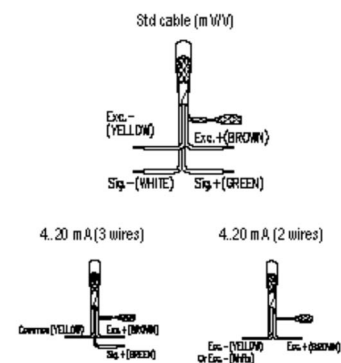
if $\phi D > 100$: 4

Options

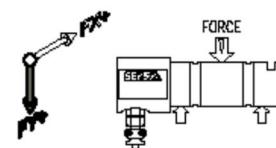
Type of application	FORCE (BL*) 100 %	static dynamic	HOISTING (BL*) 100 %	LIFT (BL*) 100 %
Environment	NORMAL	INDUSTRIAL	NUCLEAR	AERONAUTICS
	SUBSEA		Other:	
	Immersion depth:		Immersion time:	
Output signal	mV/V	4-20 mA 2 wires	0-10 V (force)	1-5 V (hoisting)
		3 wires	RS-485	WIRELESS
	Other:			
Service temperature range	<div style="text-align: center;"> <p>Standard temperature range</p> <p>-20 °C ————— 70 °C</p> <p>-50 °C ————— -200 °C</p> <p>Temperature range available (option)</p> </div>			
Dual bridge circuit	NO	YES	Redundancy Safety SIL / PL	
			Biaxial load pin, directions X and Y	
Cable length (m)	6	12	20	50
				100
	Other:			
Intrinsically safe	Not applicable	ATEX	IECEX/ATEX	CSA (US/Canada)
				Triple certification

*BL = Breaking load

Wiring



Load direction



TECHNICAL DRAWINGS: STANDARD LOAD PINS

5300 > TECHNICAL SPECIFICATIONS

Load pins range



5000 (1 to 2000 t)
CUSTOM-MADE LOAD PIN



5050 (1 to 2000 t)
SUBSEA LOAD PIN

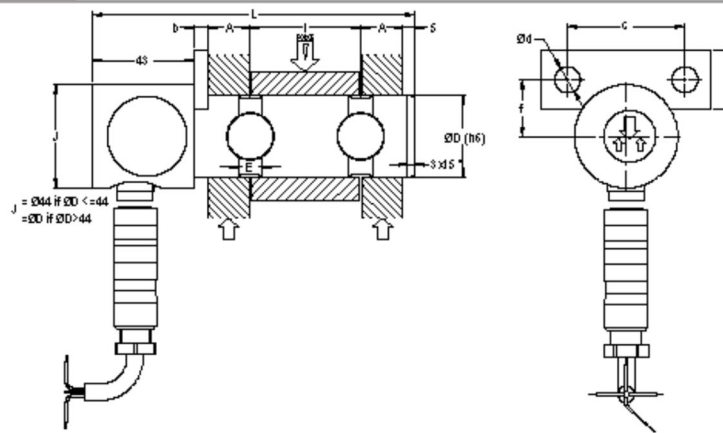


5300 (0.5 to 125 t)
STANDARD LOAD PIN



5600 (0.5 to 14 t)
ECONOMICAL LOAD PIN

5300 drawing



Ref. Item	Capacities			$\varnothing D$	A	E	I	a	b	c	$\varnothing d$	f	L	Weight (kg)
	Force ≥ 300 % ^a	Hoist ≥ 500 % ^a	Lift ≥ 1000 % ^a											
5300-A	0.75 t	0.5 t	0.25 t	25	13.5	8	31	25	6	50	11	20.5	112	0.5
5300-B	1.5 - 3 t	1 - 2 t	0.5 - 1 t	25	13.5	8	31	25	6	50	11	20.5	112	0.6
5300-C	5 - 7.5 t	3 - 5 t	1.5 - 2.5 t	35	18	10	47	25	6	50	11	24	137	1
5300-D	16.6 t	10 t	5 t	50	27	14	66	30	8	70	13	33	176	2.4
5300-E	30 t	20 t	10 t	65	32.5	18	90	30	8	70	13	38	211	5
5300-F	50 t	30 t	15 t	75	40	18	100	40	10	100	17	47	241	7.5
5300-G	75 t	50 t	-	85	49	20	117	40	10	100	17	50.5	271	11.2
5300-H	100 t	75 t	-	100	72.5	35	155	40	10	100	17	56	354	21
5300-I	125 t	100 t	-	120	72.5	35	155	50	12	140	21	65	354	31

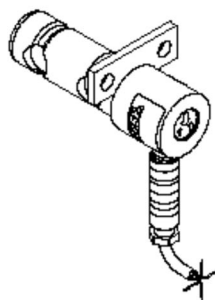
^aBreaking load (% full scale)

→ Other capacities and dimensions available on request

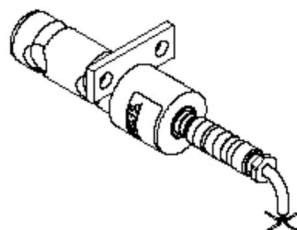
Dimensions in mm

Other views

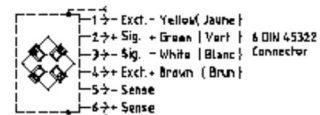
RADIAL OUTPUT (STANDARD)



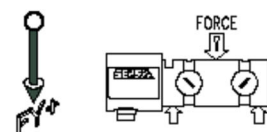
AXIAL OUTPUT (5300A-X) - OPTION



Wiring



Load direction



5600 > TECHNICAL SPECIFICATIONS

5600 (0.5 to 14 t)
ECONOMICAL LOAD PIN

www.sensy.com/load-pins-configuration/load-pin-design

*: Subject to SENSY analysis

L:

Rev. 13042018

5. EU DECLARATION OF CONFORMITY

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

CONCERNED ITEMS: 5000 / 5050 / 5300 / 5600, see calibration certificate related to model and serial number.

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

2014/30/EU Electro-Magnetic Compatibility Directive

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

2014/35/EU Safety / low voltage directive

Conception and compliance of this equipment is made according to all of part of the following standards: EN 61326-1

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

If designed, manufactured and tested for use in potentially explosive atmospheres (option):
see specific and separate certificate EN 60079-0 in compliance with to Directive 2014/34/EU.

Jumet,
July - 19- 2022



Ir Delcambe Sylvia
Technical manager

6. UK DECLARATION OF CONFORMITY

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

CONCERNED ITEMS: 5000 / 5050 / 5300 / 5350/ 5600, see calibration certificate related to model and serial number.

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

UK legislation
equivalent to
2014/30/EU

Electromagnetic Compatibility Regulations 2016

UK legislation
equivalent to
2011/65/EU

The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

UK legislation
equivalent to
2014/35/EU

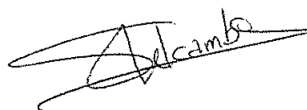
Electrical Equipment (Safety) Regulations 2016

Conception and compliance of this equipment is made according to all of part of the following standards: EN 61326 (2006)

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

If designed, manufactured, and tested for use in potentially explosive atmospheres (option): see specific and separate certificate (EN 60079-0) in compliance with Equipment and Protective Systems Intended for use in Potentially Explosive Atmospheres Regulations 2016.

Jumet,
July - 19- 2022



Ir Delcambe Sylvia
Technical manager