sensorex

SX - CF Series

SX - CH Series

CE

LOAD CELL MANUAL

INSTALLATION AND MAINTENANCE INSTRUCTIONS

Renova
WE NEVER LOSE CONTROL

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introduction

Dear customer,

Thank you for the preference given to this product we are sure is going to satisfy you thanks to its quality of construction and design.

The design has been primarily addressed to use in the web-control field of unrolling coils, applications requiring a precise and stable signal during all the phases of the process, since during the unrolling of the web to the transitory phases, as cutting and bonding, through the material breakage, emergency stop, etc…

So we have created a family of load cells with flange and another one with through shaft, suitable for the majority of the applications, with capacity from 50 to 30000 N.

Particular attention was also reserved to the robust construction and to the control and testing of every cell with their own certification. All electronic components as PCD and strain gauges are protected from dust and dirt.

We recommend the reading of this manual to get familiar with this product as quickly as possible, so to understand its characteristics and required attentions for its long working life.

For a safe and proper use of this product, please pay particular attention to the security precautions.

RENOVA srl

warning

CAREFULLY READ THE INSTRUCTIONS AND WARNINGS IN THIS MANUAL AND KEEP THEM FOR FURTHER REFERENCE FOR ENTIRE PRODUCT LIFE. THEY SUPPLY IMPORTANT INSTRUCTIONS REGARDING OPERATIONS AND SAFETY FOR INSTALLING, USING AND MAINTAINING THE PRODUCT.

PLEASE TAKE THE TIME TO READ AND UNDERSTAND THE INSTRUCTIONS COMPLETELY BEFORE THE INSTALLATION AND USE OF THIS PRODUCT.

IN THE EVENT OF A POSSIBLE BREAKDOWN OF THE PRODUCT, THE OPERATOR SHOULD UNDERSTAND THE MANUFACTURER'S INSTRUCTIONS AND BE AWARE OF THE DANGERS, BEFORE ANY CHECK INTERVENTION OR RECOURSE OF RENOVA'S TECHNICAL ASSISTANCE.

proper use of the product

Our product complies with the following directives:
- 2006/42/CE Machine Directive
• Law n° 129 – 2nd August 2008
• Law n° 133 – 6th August 2008
• Law n°14 - 27th February 2009
• Law n° 88 – 7th July 2009
• Law Decree n° 106 – 3rd August 2009

In accordance with the Decree 224/88 CE n. 85/374, Renova defines the limits of use of our product and its correct use.

The compliance with this Installation and Maintenance Instructions, as well as avoiding costly downtime in production and replacement of damaged parts, can prevent accidents to things and people.

It reminds to respect the rules on the use of equipment suitable of working on the machine, such as helmets, gloves, goggles, accident prevention shoes, jackets, protective ear plugs or headphones in noisy environments.

Our products are designed to operate according to the characteristics defined by our technical specifications that must not be overlooked or passed for production needs.

Our technical department is at your disposal for problems when installing or starting the machine and can offer the right solutions to overcome any problem.

THIS COMPONENT IS EXPRESSLY DESIGNED TO BE MOUNTED IN A MACHINE AND CANNOT WORK INDEPENDENTLY.
IT IS ABSOLUTELY FORBIDDEN THE USE IF THE MACHINE IS NOT IN COMPLIANCE WITH THE LAW.

Particular attention to be given to operations of assembly and maintenance:
Securely block the mounting screws of the flange with a tightening torque recommended by the screw producers.

Screw	M6	M8	M10	M12	M14
Torque [Nm]	10,4	24,6	50,1	84,8	135

assistance

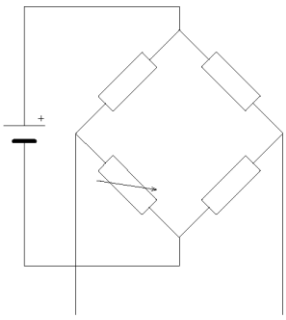
Renova is worldwide present with Agents and Distributors.

Contact Renova support
support@renova-srl.it

general instructions

HOW IT WORKS

The load cell is a transducer that converts the force applied by the roller on the bearing, in a proportional electric signal that will be processed by the control system, generally composed by a PLC or a dedicated panel and which adjust the controlled parameters of the unit (brake, clutch, engine, …).
The cell body is an elastic system which bends under load. The elastic part of the cell has the shape of a lamella properly dimensioned in function of the load, to which the strain gauges are glued, made up of small grids of constantan filaments, Wheatstone-bridge connected for a precise calibration.
When, under load, the lamella flexes and stretches, the extensometers accordingly vary their electrical resistance.
When feeding the load cell, the change in the electrical output signal will be proportional to the deformation of the strain gauges, so to the load applied to the cell itself.
The output signal is normally of a few mV: hence, if the load cell is farther than 5 m from the control unit, it may be necessary to amplify the signal through an external amplifier or an ampli-PCD housed in the cell.



LOAD CELL EXPLODED VIEW

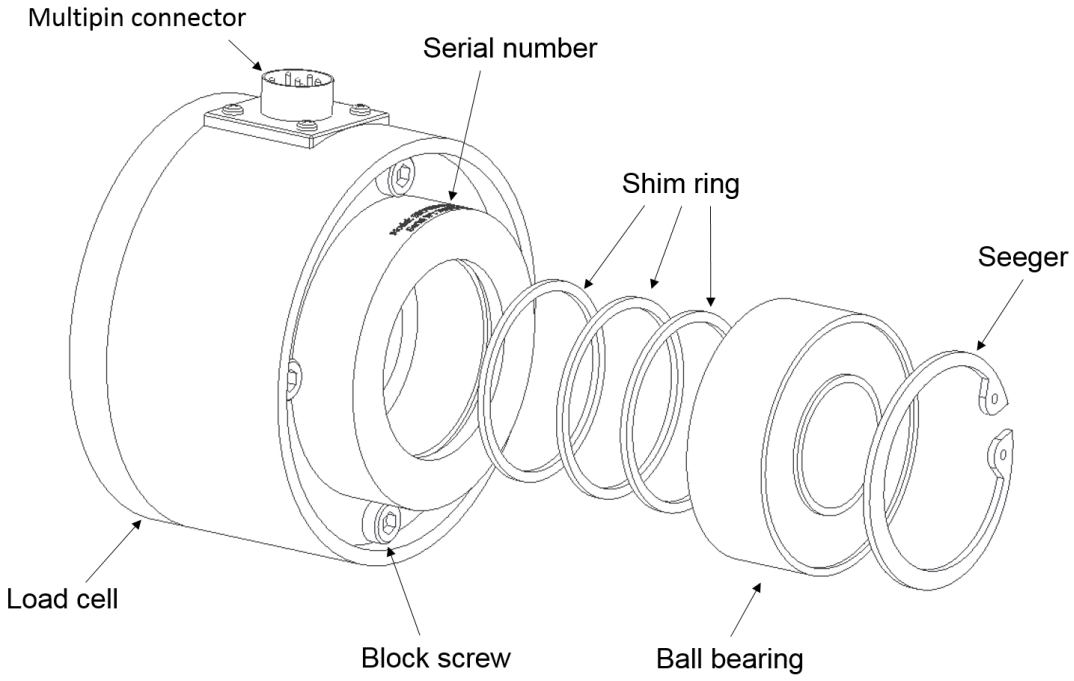
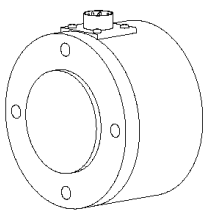
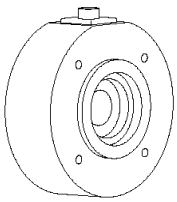
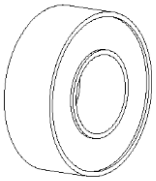
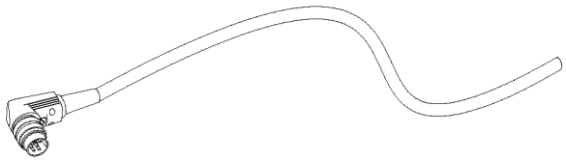
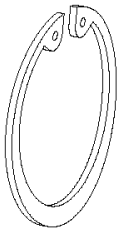
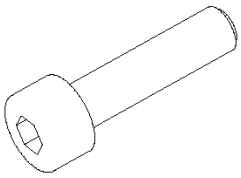


Figure 1

UNPACKING

Check that the package has not been damaged during transport. Verify that the paper box contains the parts listed below and they correspond to the ordered cell, whose code is silk-screened onto the load cell body.

Load Cell	1	SX-CF 	SX-CH 
Self-aligning bearing	1		

Multi-pin cable	1	
Seeger	1	
Block screw	4	

* The mounting screws are not included

FLANGED CELL SX-CF ASSEMBLING

Please, carefully follow these assembling steps:

- Mount the cell with the arrow, printed on the body of the cell itself, oriented in the same direction of the resultant of the forces acting on the load cell. A red dot is printed onto the load cell body and has the same role of the arrow, hence helping the correct orientation of the sensor. *Figure 2*
- Fix the flange of the cell onto the machine frame after checking the dimension of the centering and positions of the screws. In case the project foresees the presence of two opposing load cells, check their co-axiality. Lock firmly the mounting screws, following the specified tightening torque for the required type of screw.
  Pay attention in this operation because a mistake in the correct mounting may lead, in case of detachment of the cells, to the break of the machine.

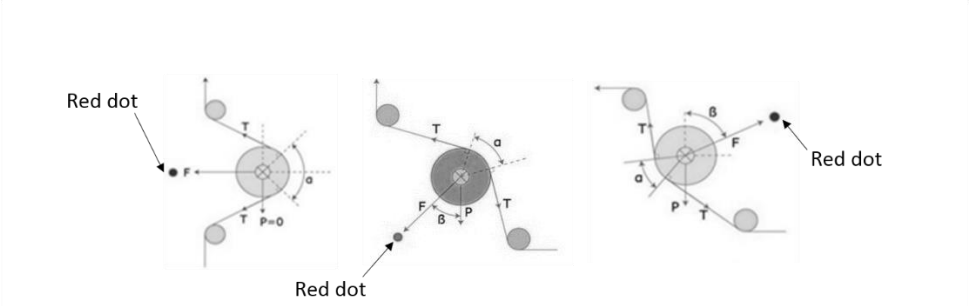


Figure 2

Make sure the following requirements are fulfilled:

- The rolls, where the cells are placed, have to be made by a unique structure with fixed pins, where the self-aligning bearings are set.
- The rolls have to be dynamically balanced not to generate vibrations, which can affect the load cell signal.
- The rolls have to be axially locked only at one end, while at the other end they have to be free to slide. *Figure 3*
- The length of the roll has to be design according to the selected load cell.

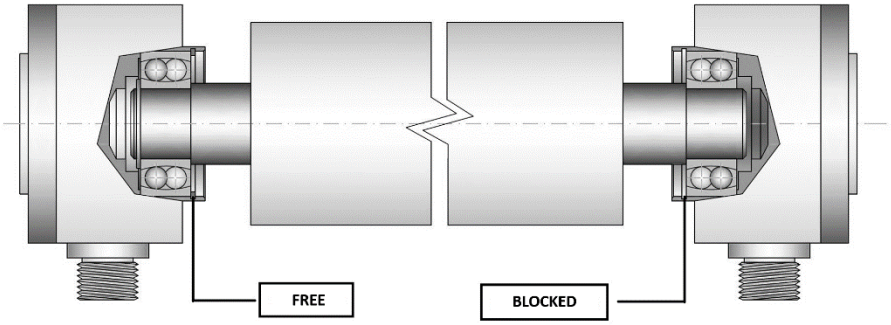


Figure 3

THROUGH SHAFT CELL SX-CH ASSEMBLING

Please, carefully follow these assembling steps:

- Mount the cell with the arrow, printed on the body of the cell itself, oriented in the same direction of the resultant of the forces acting on the load cell. *Figure 2*
- Fix the flange of the cell onto the machine frame after checking the dimension of the centering and positions of the screws. In case the project foresees the presence of two opposing load cells check their co-axiality. Lock firmly the mounting screws, following the specified tightening torque for the required type of screw.
  Pay attention in this operation because a mistake in the correct mounting may lead, in case of detachment of the cells, to the break of the machine.

Make sure the following requirements are fulfilled:

- The rolls, where the cells are placed, have to be made by a unique structure with fixed pins where the self-aligning bearings are set.
- The rolls have to be dynamically balanced not to generate vibrations which can affect the load cell signal.
- The rolls have to be axially locked only at one end, while at the other end they has to be free to slide. *Figure 3*
- The length of the roller has to be design according to the selected load cell.
- Into the load cell body, two set screws are placed in order to regulate the maximum displacement of the sensor. The position of these screws is calibrated and has not to be modified. If they are excessively screwed down, they limit the deformation of the lamella, hence the strain gauges; on the other side, if they are too untighten, the displacement of the lamella increases, so the risk of going above the yield strength of the material could overcome.

LOAD CELLS AND ROLL MOUNTING

For the correct mounting of roll and load cells, check these points:

- Use roll with fixed end support (without central bar and without bearings)
- A dynamic and static balancing of the roll is required
- Use only self-aligning ball or roller bearings
- Use the seeger only at one end-side; the other end has to let the roller free to axially move.

There are two possible mounting solution, referring both for the SX-CF load cell than for the SX-CH one.
In *Figure 4* the external mounting, in *Figure 5* the internal mounting solution.

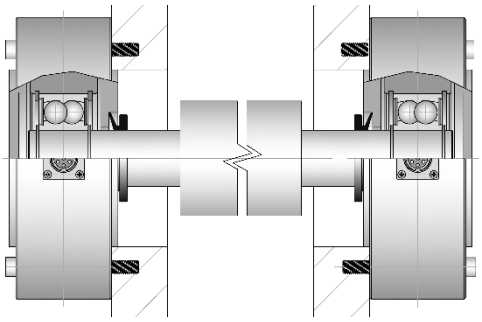


Figure 5 – External mounting

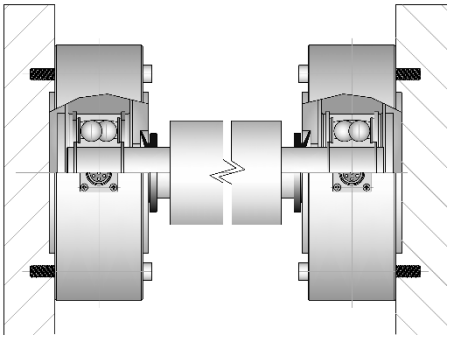


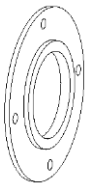
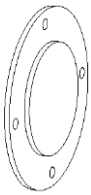
Figure 4 – Internal mounting

LOAD CELL SX-CF MODELS

Cell	Bearing	Bearing code	Seeger	Seeger code	Spacer	Spacer code	Weight
SXCF085.xxx.15	15x35x14 2202-2RS	C30.0015	J35 DIN472	A70.0004	RAM 35	A65.0001	1,2 Kg
SXCF085.xxx.17	17x40x16 2203-2RS	C30.0014	J40 DIN472	A70.0005	RAM 40	A65.0002	1,2 Kg
SXCF085.xxx.20	20x47x18 2204-2RS	C30.0016	J47 DIN472	A70.0003	RAM 47	A65.0003	1,1 Kg
SXCF085.xxx.25	25x52x18 2205-2RS	C30.0023	J52 DIN472	A70.0001	RAM 52	A65.0004	1,0 Kg
SXCF120.xxx.25	25x52x18 2205-2RS	C30.0023	J52 DIN472	A70.0001	RAM 52	A65.0004	2,8 Kg
SXCF120.xxx.30	30x62x20 2206-2RS	C30.0017	J62 DIN472	A70.0007	RAM 62	A65.0005	2,6 Kg
SXCF120.xxx.35	35x72x23 2207-2RS	C30.0018	J72 DIN472	A70.0008	RAM 72	A65.0006	2,4 Kg
SXCF130.xxx.25	25x52x18 2205-2RS	C30.0023	J52 DIN472	A70.0001	RAM 52	A65.00014	3,3 Kg
SXCF130.xxx.30	30x62x20 2206-2RS	C30.0017	J62 DIN472	A70.0007	RAM 62	A65.0005	3,1 Kg
SXCF130.xxx.35	35x72x23 2207-2RS	C30.0018	J72 DIN472	A70.0008	RAM 72	A65.0006	2,9 Kg

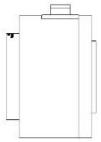
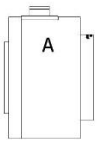
LOAD CELL SX-CH MODELS AND FLANGES

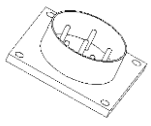
Cell	Bearing	Bearing code	Seeger	Seeger code	V-Ring	V-Ring code	Weight
SXCH100xxx.12	12x32x14 2201-2RS	C30.0019	J32 DIN472	A70.0009	VA 12	G90.0001	1,1 Kg
SXCH100xxx.20	20x47x18 2204-2RS	C30.0016	J47 DIN472	A70.0003	VA 20	G90.0003	1,0 Kg
SXCH105xxx.17	17x40x16 2203-2RS	C30.0014	J40 DIN472	A70.0005	VA 17	G90.0002	1,4 Kg
SXCH105xxx.20	20x47x18 2204-2RS	C30.0016	J47 DIN472	A70.0003	VA 20	G90.0003	1,2 Kg
SXCH125xxx.25	25x52x18 2205-2RS	C30.0023	J52 DIN472	A70.0001	VA 25	G90.0004	3,0 Kg
SXCH125xxx.30	30x62x20 2206-2RS	C30.0017	J62 DIN472	A70.0007	VA 30	G90.0005	2,7 Kg
SXCH125xxx.35	35x80x31 6207-2RS	C30.0024	J72 DIN472	A70.0008	VA 35	G90.0006	2,4 Kg
SXCH175xxx.30	30x62x20 2206-2RS	C30.0017	J62 DIN472	A70.0007	VA 30	G90.0005	8,9 Kg
SXCH175xxx.35	35x80x31 6207-2RS	C30.0024	J72 DIN472	A70.0008	VA 35	G90.0006	8,6 Kg
SXCH175xxx.40	40x80x23 2208-2RS	C30.0022	J80 DIN472	A70.0012	VA 40	G90.0009	8,2 Kg
SXCH265xxx.65	65x120x31 2213-2RS	C30.0020	J120 DIN472	A70.0010	VA 65	G90.0007	15 Kg
SXCH265xxx.80	80x140x33 2216-2RS	C30.0021	J140 DIN472	A70.0101	VA 80	G90.0008	14 Kg

	Flange	Cell size	ϕ Shaft	Code example
	FA	SXCHxxx	yy	FACHxxxyy
	FC	SXCHxxx	yy	FCCHxxxyy

ELECTRICAL CONNECTION

The Sensorex Load Cells are of two types: standard or amplified. The difference consists in the power supply and the output signal. In the following table you can find the characteristics of the two load cell types.

Standard cell		**Amplified cell**	
			
Power supply	2÷10 VDC	Power supply	12 VDC
Output signal	1,6 mV/V	Output signal	4÷20 mA
Standard cell connection		**Amplified cell connection**	
wire	**color**	**wire**	**color**
Supply (+)	RED	Supply (+)	RED
Supply (-)	BLACK	Supply (-)	BLACK
Signal (+)	WHITE	Signal (+)	GREEN
Signal (-)	GREEN		
Technical data			
Precision class	0,5%	Repeatability	<±0,03
Max load	3000 Kg	Temperature	-10°C ÷ 50°C
Input resistance	350 ± 3 Ω	Protection rating	IP 60
Output resistance	350 ± 3 Ω	Material	Aluminum / Steel
Insulation resistance	>5 GΩ	Overload	150%
Non-linearity	< 0,05%	Max overload	200%

	Code	**Description**
	CNTH100P6	Flanged hexa-polar male connector
	CAVOSS5M	Multipolar 5m-long cable with female elbow connector

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