renova
WE NEVER LOSE CONTROL

sensorex

TENSION LOAD CELLS

sensorex

load cells for web tension regulation

To be used in combination with rollers to precisely detect the tension of a web, the Sensorex load cells are designed for the web tension control in closed loop systems. A wide range of models are available, all tested, calibrated and provided with certificate.

- Strain gauges technology
- Extreme precision and reliability
- Compact design to fit narrow spaces
- Simple to use and easy to mount

Send us your application requirements and we will work with you to find the model that suits your needs.

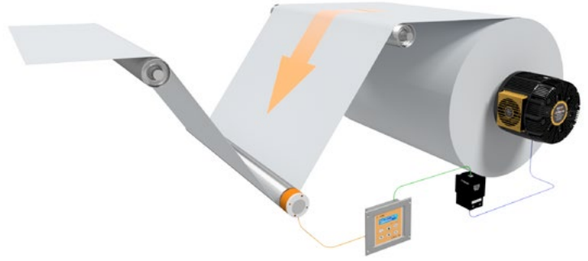
CLOSED LOOP TENSION CONTROL

1. Load cells (or dancer roller) – detect the web tension and send an input signal to the control panel.

2. Control panel – compares the web tension detected with the ‘set point’ and send the input to the brake (or motor). In case of pneumatic brake, an electropneumatic converter would be necessary in order to convert the electronic signal into compressed air signal to the brake.

3. Brake (or motor) – adjust the torque (or rpm if a motor) in order to obtain the web tension required.

REGULATION WITH LOAD CELLS



REGULATION WITH DANCER ROLLER

OPEN LOOP TENSION CONTROL

1. Ultrasonic sensor – by emitting an ultrasonic pulse towards the reel and reading the signal reflected, detects the reel diameter.

2. Control panel – receives the reel diameter information from the ultrasonic sensor and gives to the brake an automatic signal.
   a) In case of pneumatic brake, an electropneumatic converter would be necessary in order to convert the electronic signal into compressed air signal to the brake.
   b) In case of magnetic powder brake, a power supply module can replace the control panel.

3. Brake (or motor) – adjust the torque (or rpm if a motor) in order to obtain the web tension required.

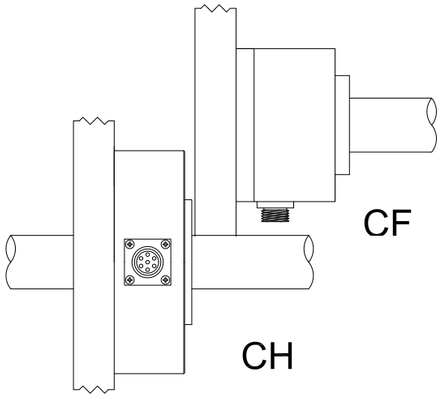
REGULATION WITH ULTRASONIC SENSOR

REGULATION WITH POTENTIOMETER OR PRESSURE REGULATOR

LOAD CELL SELECTION GUIDE

MODEL

Select the load cell type according to the specifications of your machine. Flange load cell or flange load cell with clearance hole are available.

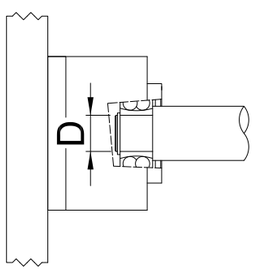


LOAD CAPACITY

Select the load that the cell should support according to the web tension and the roll weight

HOLE DIAMETER

Select the cell's hole diameter according to the pilot of the roll.



Legend

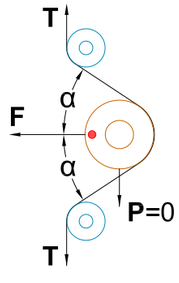
T = tension
P = roll weight
F = resultant on load cells

LOAD CAPACITY CALCULATION

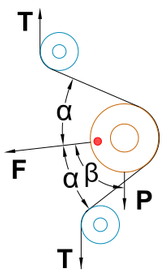
To determine the cell's load it is necessary to calculate the total of the forces that gravitate on it, that is the sum of the components of the laminate and the roll weight.

F = HORIZONTAL DIRECTION

A configuration with horizontal resultant isn't affected by the roll weight. It offers a better precision when the web tension is low.



F = 2Tcosα



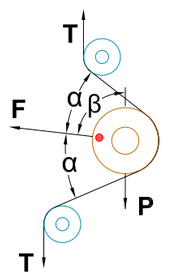
F = 2Tcosα + Pcosβ

F = DOWNWARD DIRECTION

A configuration with downward resultant enhances the load on the cell due to the component of the roll weight. This component has to be canceled in the control panel settings.

F = UPWARD DIRECTION

A configuration with upward resultant reduces the load on the cell due to the component of the roll weight. This component has to be canceled in the control panel settings.



F = 2Tcosα – Pcosβ

Legend

• = resultant direction
α = winding angle
T = tension
P = roll weight
F = resultant on load cells

LOAD CELLS MODELS

SX.CF

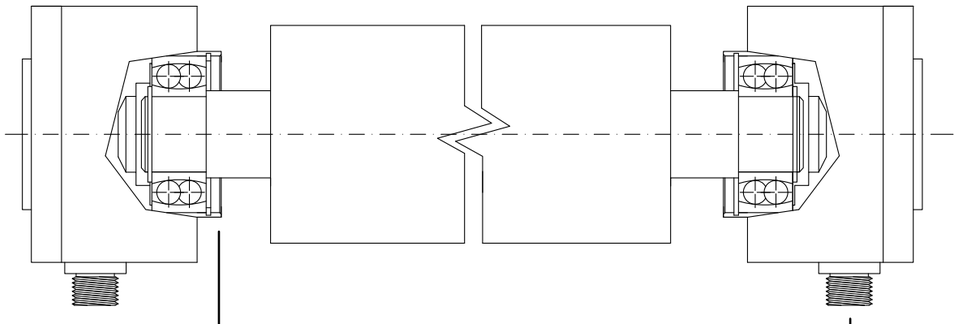
FLANGE LOAD CELLS

- Available in different models with loads from 50 to 4000 N
- Shaft diameter from 15 up to 35 mm
- Input signal maximum 18 VDC
- Output signal 1,8 mV

SX-CF load cells are available also with integrated amplifier to obtain a greater stability of the signal or for cable length > 5 meters.
- Input signal 12 VDC
- Output signal 4 ÷ 20mA

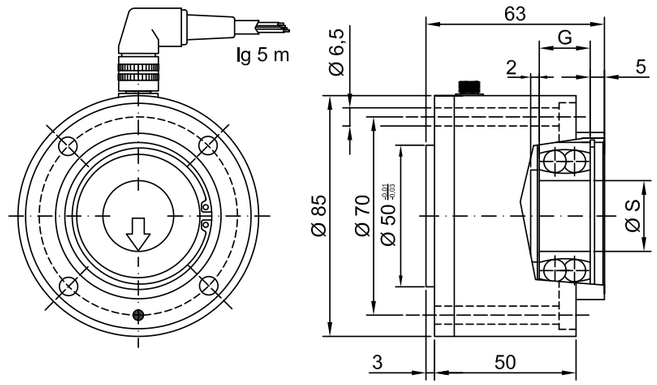
code	Ø load cell [mm]	load [N]	Ø shaft [mm]	amplifier
SX-CF	X	X	X	X
SX-CF	85	50 - 2000	15-35	- without integrated amplifier)
	120			A (with integrated amplifier)
	125			

MOUNTING



SX-CF.85

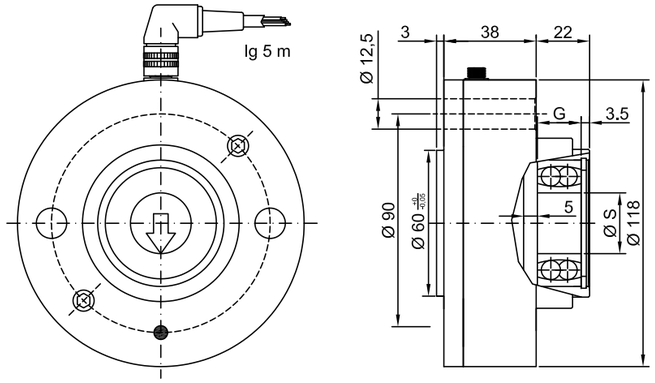
code	load [N]
SX-CF.85.05	50
SX-CF.85.15	150
SX-CF.85.25	250
SX-CF.85.35	350
SX-CF.85.50	500
SX-CF.85.75	750
SX-CF.85.100	1000



	TECHNICAL DATA
material	stainless steel
nominal load	50-1000 N
Ø bearings	15 - 17 - 20 - 25 - 30 - 35 mm
limit load	300% full scale
breaking load	1000% full scale
supply voltage	maximum 18 VDC
output signal	1,8 mV/V
linearity	0.1% of full scale
input resistance	350 - 360 Ω
output resistance	350 - 353 Ω
operating temperature	- 20 °C / + 70 °C | - 4 °F / 158 °F
protection class	IP 54

SX-CF.120

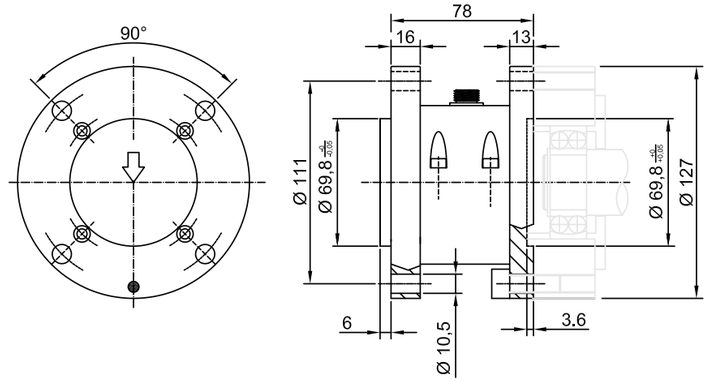
code	load [N]
SX-CF.120.25	250
SX-CF.120.50	500
SX-CF.120.100	1000
SX-CF.120.200	2000
SX-CF.120.400	4000



TECHNICAL DATA	
material	stainless steel
nominal load	250-4000 N
Ø bearings	15 - 17 - 20 - 25 - 30 - 35 mm
limit load	150% full scale
breaking load	300% full scale
supply voltage	maximum 18 VDC
output signal	2 mV/V
linearity	0.1% of full scale
input resistance	350 - 360 Ω
output resistance	350 - 353 Ω
operating temperature	- 20 °C / + 70 °C | - 4 °F / 158 °F
protection class	IP 54

SX-CF.125

code	load [N]
SX-CF.125.50	500
SX-CF.125.100	1000
SX-CF.125.175	1750
SX-CF.125.250	2500



TECHNICAL DATA	
material	aluminum / steel
nominal load	500-2000 N
limit load	300% full scale
breaking load	500% full scale
supply voltage	maximum 18 VDC
output signal	1,8 mV/V
linearity	0.02% of full scale
input resistance	350 - 360 Ω
output resistance	350 - 353 Ω
operating temperature	- 20 °C / + 70 °C | - 4 °F / 158 °F
protection class	IP 54

SX.CH

FLANGE LOAD CELLS WITH CLEARANCE HOLE

Compact design, ideal to work in environments where space is limited and sensor rollers are applied with cross shafts.

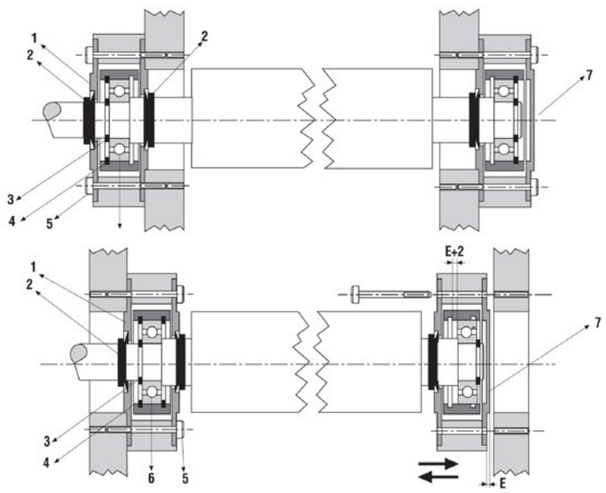
- Available with loads from 150 to 3000 N
- Shaft diameter from 15 up to 35 mm
- Input signal maximum 18 VDC
- Output signal 1,8 mV

SX-CH load cells are available also with integrated amplifier to obtain a greater stability of the signal or for cable length > 5 meters.

- Input signal 12 VDC
- Output signal 4 ÷ 20mA

code	Ø load cell [mm]	load [N]	Ø shaft [mm]	amplifier
SX-CH	X	X	X	X
SX-CH	105	150 - 3000	15 - 35	- without integrated amplifier)
	125			A (with integrated amplifier)
	175			

MOUNTING

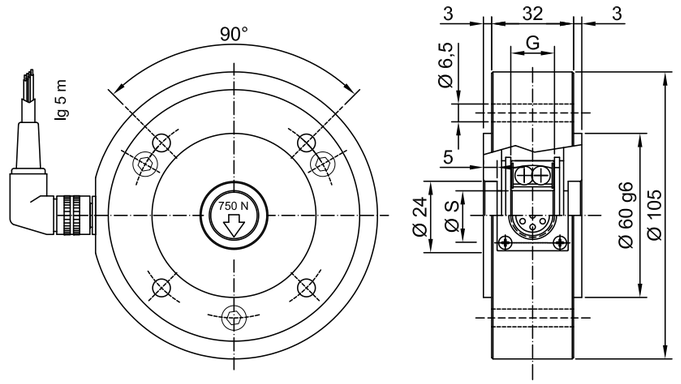


Legend

1 = through cover
2 = v-ring seal
3 = seeger ring for shaft
4 = seeger ring for hole
5 = fixing screw
6 = bearing
7 = blind cover
E+2 = deviation dimension requested for fixing

SX-CH.105

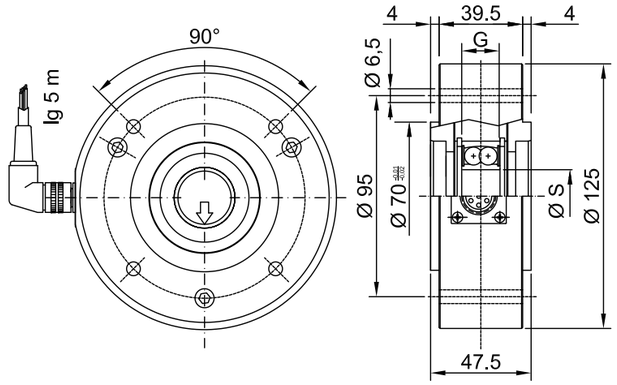
code	load [N]
SX-CH.105.15	150
SX-CH.105.25	250
SX-CH.105.35	350
SX-CH.105.50	500
SX-CH.105.75	750
SX-CH.105.100	1000



TECHNICAL DATA	
material	aluminum / stainless steel
nominal load	150-1000 N
Ø bearings	15 - 17
limit load	300% full scale
breaking load	2000% full scale
supply voltage	maximum 18 VDC
output signal	1,8 mV/V
linearity	0.2% of full scale
input resistance	350 - 360 Ω
output resistance	350 - 353 Ω
operating temperature	- 20 °C / + 70 °C | - 4 °F / 158 °F
protection class	IP 54 / IP 65

SX-CH.125

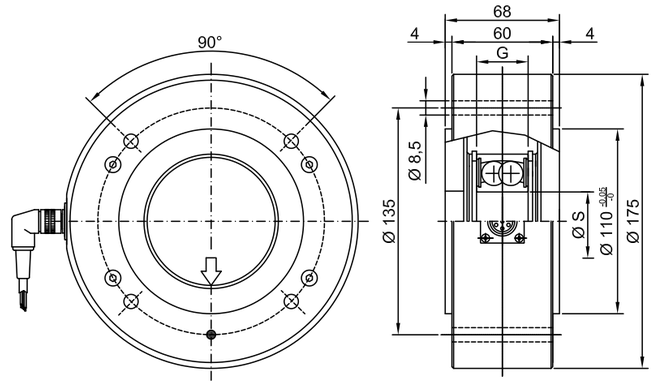
code	load [N]
SX-CH.125.15	150
SX-CH.125.25	250
SX-CH.125.30	300
SX-CH.125.50	500
SX-CH.125.75	750
SX-CH.125.100	1000
SX-CH.125.150	1500



	TECHNICAL DATA
material	aluminum / stainless steel
nominal load	150 - 1500 N
Ø bearings	15 - 17 - 20 - 25
limit load	300% full scale
breaking load	2000% full scale
supply voltage	maximum 18 VDC
output signal	1,8 mV/V
linearity	0.2% of full scale
input resistance	350 - 360 Ω
output resistance	350 - 353 Ω
operating temperature	- 20 °C / + 70 °C | - 4 °F / 158 °F
protection class	IP 54

SX-CH.175

code	load [N]
SX-CH.175.30	300
SX-CH.175.50	500
SX-CH.175.75	750
SX-CH.175.100	1000
SX-CH.175.150	1500
SX-CH.175.200	2000
SX-CH.175.300	3000



	TECHNICAL DATA
material	aluminum / stainless steel
nominal load	300-3000 N
Ø bearings	15 - 17 - 20 - 25 - 30 - 35
limit load	300% full scale
breaking load	2000% full scale
supply voltage	maximum 18 VDC
output signal	1,8 mV/V
linearity	0.2% of full scale
input resistance	350 - 360 Ω
output resistance	350 - 353 Ω
operating temperature	- 20 °C / + 70 °C | - 4 °F / 158 °F
protection class	IP 54 / IP 65

SX.CB

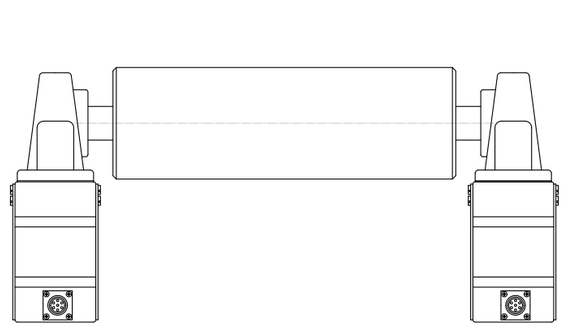
BASE STYLE LOAD CELLS

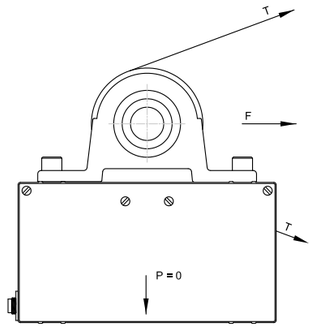
The CB base load cells offer the ideal solution for detecting elevate laminate tension, and for applications where foot fixing is needed. CB series load cells guarantees high resistance to vibrations and overloads, and also reliability, precision and long life span. Installation requires foot bearing support and, related with the load to bear, CB load cells are supplied in aluminium or steel.

CB cells are applied in particular on paper mill, calendering and rolling machines, but also on plants in which laminate must be treated with extreme care and attention.

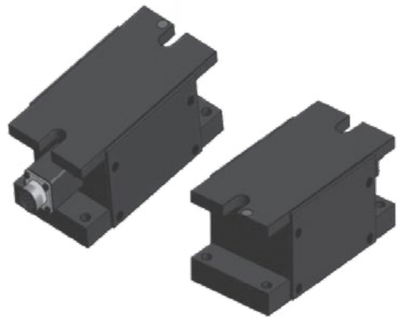
code	size	load [N]
SX-CB	X	X
SX-CB	80	250 - 2500
	200	2500 - 30000

MOUNTING

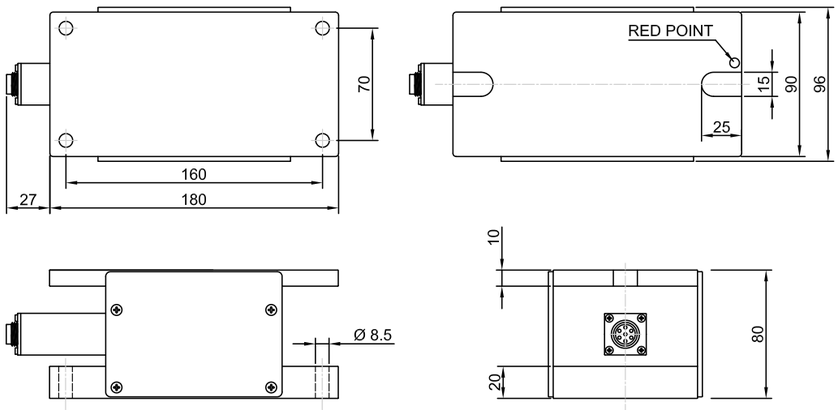




SX-CB.80



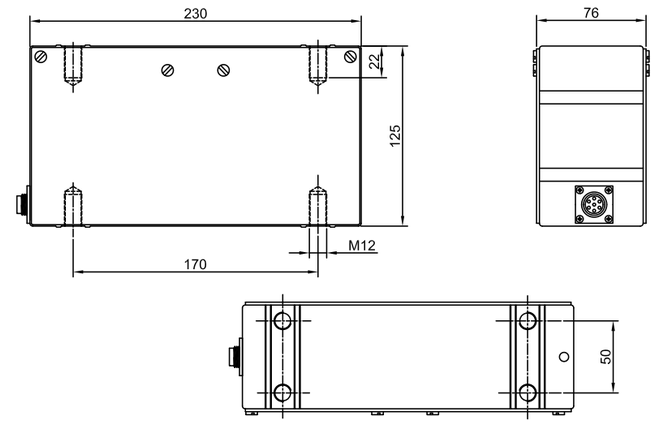
code	load [N]
SX-CB.80.25	250
SX-CB.80.50	500
SX-CB.80.75	750
SX-CB.80.100	1000
SX-CB.80.200	2000
SX-CB.80.250	2500



	TECHNICAL DATA
material	aluminum / steel
nominal load	250-2500 N
limit load	200% full scale
breaking load	500% full scale
supply voltage	maximum 18 VDC
output signal	1,8 mV/V
linearity	0.1% of full scale
input resistance	350 - 360 Ω
output resistance	350 - 353 Ω
operating temperature	- 20 °C / + 70 °C | - 4 °F / 158 °F
protection class	IP 54

SX-CB.200

code	load [N]
SX-CB.200.250	2500
SX-CB.200.500	5000
SX-CB.200.1000	10000
SX-CB.200.2000	20000
SX-CB.200.3000	30000



	TECHNICAL DATA
material	steel
nominal load	2500-30000 N
limit load	200% full scale
breaking load	500% full scale
supply voltage	maximum 18 VDC
output signal	1,8 mV/V
linearity	0.1% of full scale
input resistance	350 - 360 Ω
output resistance	350 - 353 Ω
operating temperature	- 20 °C / + 70 °C | - 4 °F / 158 °F
protection class	IP 54

SX.CCS

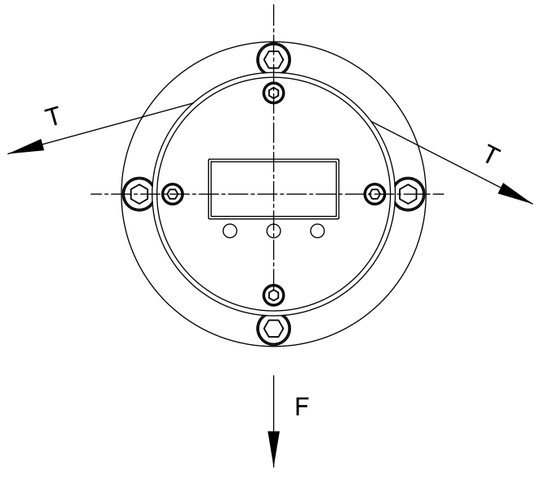
CANTILEVER LOAD CELLS WITH SENSOR

The sensor roller of CCS series is recommended for the web tension reading during the web processing, in cantilever applications. The CCS sensor roller has an high precision in detecting the web tension thanks to the two sensors with double metal foil right inside. This allows a great accuracy in load reading and the position of the material on the roller doesn't affect the reading.

The roller is fixed quickly and easily from one side only and the connector can be installed both inside or outside the machine frame.

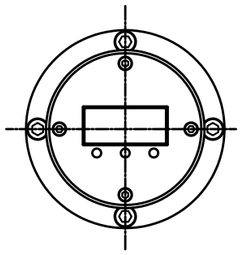
code	load [N]	shaft lenght [mm]	Ø shaft [mm]	amplifier
SX-CCS	X	X	X	X
SX-CCS	50 - 500	250 - 600	84 - 100	- without integrated amplifier)
				A (with integrated amplifier)

MOUNTING



SX-CCS

code	load [N]
SX-CCS.05	50
SX-CCS.20	200
SX-CCS.30	300
SX-CCS.50	500



	TECHNICAL DATA
material	aluminum / steel
nominal load	50-500 N
limit load	300% full scale
breaking load	1000% full scale
supply voltage	maximum 15 VDC
output signal	1,8 mV/V
linearity	0.1% of full scale
input resistance	350 - 360 Ω
output resistance	350 - 353 Ω
operating temperature	- 10 °C / + 50 °C | 14 °F / 122 °F
protection class	IP 40

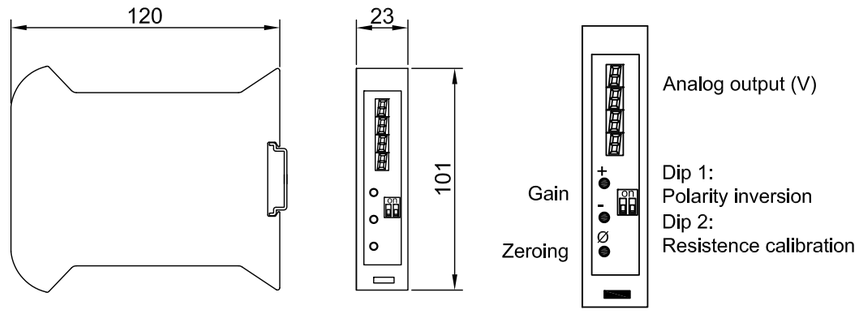
AUXILIARY EQUIPMENT

RESET

AMPLIFIER

Digital measuring amplifier for connecting two load cells with strain gauge bridge.
Its compact size, user-friendliness and easy installation allow the Reset amplifier to be extremely flexible and precise at the same time, with high long-term stability and excellent linearity.
It is equipped with a 24-bit acquisition circuit with programmable gain, of 3 analog outputs to a control unit and a digital input for a reset of the outputs from remote.

- Microprocessor at 24 bit
- Assembling on DIN guide step of 23 mm
- Four digits display
- Also available with RS485, CANopenor Profibus DPV1 DS404 interfaces



family identifier	interface code	description
ADS - R	-	standard solution
	D	with RS485 interface
	P	with Profibus interface (DPv1)
	C	with CANopen interface (DS4D4)

For other auxiliary equipment, please refer to Renova's control systems catalog.

MADE IN ITALY
Our products are 100% designed and made in Italy

INNOVATION
We provide solutions that increase productivity and safety levels while reducing maintenance costs and procedures

SUPPORT
Our staff is always available to answer your questions, also in the after-sales phase

QUALITY
All Renova's products are managed by TUV ISO 9001

CUSTOM PROJECTS
Projects large or small, we work with you to provide the solution that fits

SUSTAINABILITY
Sustainable products, sustainable company.
Renova has joined Erion

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sensorex

TENSION LOAD CELLS