

# control systems



INDUSTRIAL SOLUTIONS

FICOBA (Recinto Ferial Gipuzkoa)  
AVDA. IPARRALDE, 43 - ROOM 3  
20302 IRUN-GIPUZKOA (SPAIN)

☎ 00 34 646 211965  
✉ [RCC@RCCINDUSTRIAL.COM](mailto:RCC@RCCINDUSTRIAL.COM)  
📍 RCCINDUSTRIAL

[WWW.RCCINDUSTRIAL.COM](http://WWW.RCCINDUSTRIAL.COM)

 **Renova**  
WE NEVER LOSE CONTROL

Made in Italy



## control systems

*Integrated systems for the web tension regulation*

We know that producing quality laminates require very high web tension control.

For this reason we provide a very wide range of integrated systems for the web tension regulation in closed-loop system or open-loop system that stand out for their maximum:

- Accuracy
- Linearity
- User-friendliness
- Precision
- Flexibility

Load cells, amplifier, control panel, transducer. Their function is crucial as they keep constant the desired web tension, avoiding the possibility of material breakings in any phase of web processing.

On unwinders, they are ideal with our pneumatic brakes or magneting powder brakes.

All Renova's products are managed by TUV ISO 9001



## 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



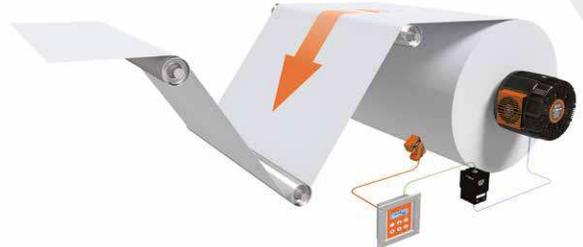
### Regulation with DANCER ROLLER



## 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



# sensorex

## Load cells

Applied on 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



### load cell selection guide

#### 1. Model selection

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

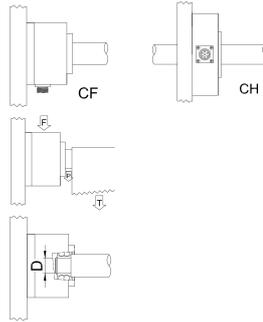
#### 2. Load capacity selection

Select the capacity of the load cell according to the web tension and the roller weight.

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

#### 3. Hole diameter selection

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



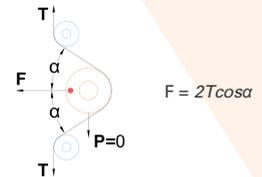
## load cell sizing

It is necessary to calculate the total of the forces applied on the load cell. These forces are related to the roller weight and the web tension.

#### Legend:

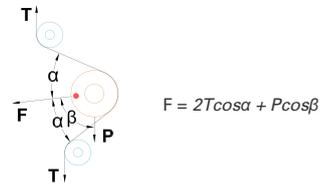
- = resultant direction
- a = winding angle
- F = resultant on load cell (daN)
- T = max tension (daN)
- P = roller weight (daN)

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



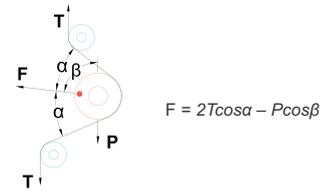
#### Resultant downward direction

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 setting of the control panel.



#### Resultant 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 setting of the control panel.



|  |               |
|--|---------------|
| ACCURACY CLASS                                 | 0,5%          |
| LOAD F MAX                                     | 300 Kg        |
| SENSITIVITY (OUTPUT)                           | 1,6 mV/V      |
| OUTPUT FOR LOAD CELL WITH INTEGRATED AMPLIFIER | 4 ± 20 mA     |
| RECOMMENDED EXCITATION                         | 5 ± 10 DC     |
| ALIMENTATION FOR AMPLIFIER PCB                 | 12 V DC       |
| MAXIMUM EXCITATION                             | 15V           |
| INPUT RESISTANCE                               | 368 Ohm       |
| NON LINEARITY                                  | 351 Ohm       |
| REPEATABILITY                                  | ≈ 5 G Ohm     |
| WORKING TEMPERATURE                            | < 0,05 %      |
| PROTECTION CLASS                               | < ± 0,03      |
| MATERIAL                                       | -20°C ± +70°C |
| TEMPERATURE EFFECT ON RATED OUTPUT (5')        | IP 60         |
| ACCEPTED OVERLOAD                              | steel         |
| MAXIMUM SAFE LOAD                              | < 0,0015%     |

# SX-CF

## Flange load cells

- ▶ Available in different models with loads from 0 to 500 daN.
- ▶ Shaft diameter from 15 up to 25 mm.
- ▶ Output 0-16 mV voltage or 4-20 mA.

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

- ▶ output signal 4 ± 20mA
- ▶ input signal 12 VDC



# SX-CH

## Flange load cells with clearance hole

Ideal to work in environments where space is limited and sensor rollers are applied with cross shafts.

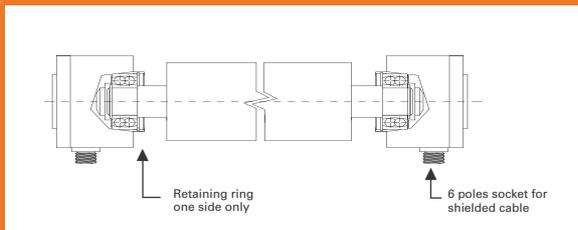
- ▶ Compact design
- ▶ Available with loads from 25 to 3000 daN

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

- ▶ output signal 4 ± 20mA
- ▶ input signal 12 VDC

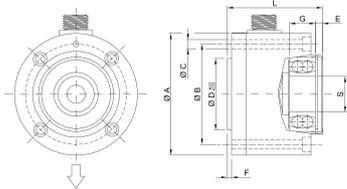
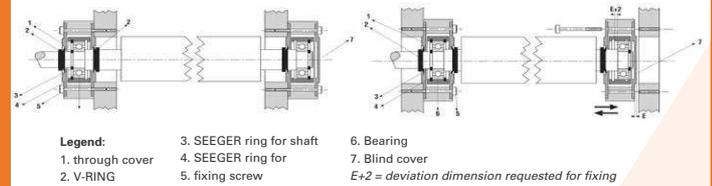


### Mounting



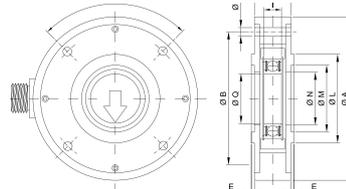
### Mounting on shoulder external side

### Mounting on shoulder internal side



code for order **SX-CF 0. 0. 0. 0.**

- Ø load cells
- range
- Ø shaft
- A: with integrated amplifier



code for order **SX-CH 0. 0. 0. 0.**

- Ø load cells
- range
- Ø shaft
- A: with integrated amplifier

| MODEL         | Range (N) | A   | B   | C    | D  | E | F | Ø pivot S   | L  |
|---------------|-----------|-----|-----|------|----|---|---|-------------|----|
| SX-CF.85.15   | 150       | 85  | 70  | 6,5  | 50 | 5 | 3 | 15-17-20-25 | 63 |
| SX-CF.85.25   | 250       | 85  | 70  | 6,5  | 50 | 5 | 3 | 15-17-20-25 | 63 |
| SX-CF.85.50   | 500       | 85  | 70  | 6,5  | 50 | 5 | 3 | 15-17-20-25 | 63 |
| SX-CF.85.100  | 1000      | 130 | 108 | 10,5 | 75 | 5 | 5 | 25-30-35    | 85 |
| SX-CF.130.100 | 1000      | 130 | 108 | 10,5 | 75 | 5 | 5 | 25-30-35    | 85 |
| SX-CF.130.250 | 2500      | 130 | 108 | 10,5 | 75 | 5 | 5 | 25-30-35    | 85 |
| SX-CF.130.500 | 5000      | 130 | 108 | 10,5 | 75 | 5 | 5 | 25-30-35    | 85 |

| Type              | Range (N) | A   | B   | C      | D    | E | F    | I  | L (Ø) | H  | O  |
|-------------------|-----------|-----|-----|--------|------|---|------|----|-------|----|----|
| SX-CH 100-25-12   | 250       | 100 | 70  | 4x6,5  | 30,5 | 3 | 36,5 | 14 | 50    | 16 | 12 |
| SX-CH 105-50-17   | 500       | 105 | 75  | 4x6,5  | 30,5 | 3 | 36,5 | 16 | 60    | 22 | 17 |
| SX-CH 105-100-17  | 1000      | 105 | 75  | 4x6,5  | 30,5 | 3 | 36,5 | 16 | 60    | 22 | 17 |
| SX-CH 125-100-25  | 1000      | 125 | 95  | 4x6,5  | 39,5 | 4 | 47,5 | 18 | 70    | 31 | 25 |
| SX-CH 125-150-25  | 1500      | 125 | 95  | 4x6,5  | 39,5 | 4 | 47,5 | 18 | 70    | 31 | 25 |
| SX-CH 175-300-35  | 3000      | 175 | 135 | 4x6,5  | 57   | 4 | 65   | 23 | 100   | 44 | 35 |
| SX-CH 265-3000-65 | 30000     | 265 | 220 | 4x10,5 | 72   | 4 | 80   | 23 | 160   | 88 | 80 |

# 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 in the same time, with high long-term stability and excellent linearity.

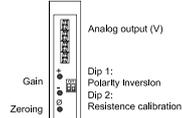
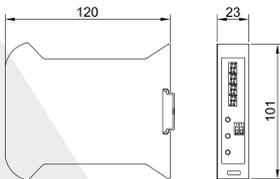
It is equipped with a 24-bit acquisition circuit with programmable gain, of 3 analog outputs to a control unit and a digital input for a reset of the outputs from remote.



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

code for order **ADS-R** family identifier

standard solution  
 D with RS485 interface  
 F with Profibus interface (DPV1)  
 C with CANopen interface (DS404)



## LINEARITY

# isomatic

control panel

The Isomatic is suitable for various applications in both closed-loop systems and the open-loop systems.

The Isomatic reads the input signal from the load cells (or dancer roller), compares the web tension value with the predetermined reference "set point" and give the input to the brake (or motor) to adjust the web tension.

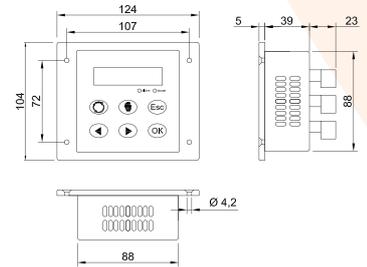
The Isomatic control panel particularly stands out for its user-friendliness; compact and easy to use, it is extremely versatile to meet all requested feature with the highest reliability.

- ▶ A Complete management of PID functions
- ▶ Compensation of reels inertia in different stages
- ▶ Programmable acceleration and deceleration time instead of the set point
- ▶ Management program for rolls change no-stop



### technical data

|                      |                                      |
|----------------------|--------------------------------------|
| SUPPLY               | 24 VDC                               |
| CAPACITY             | 5W max (no load)                     |
| CELLS ANALOGUE INPUT | 0-10 mV (type 1,6mV/V)               |
| ANALOGUE INPUT       | 0-10 V / -20mA                       |
| ANALOGUE OUTPUT (2X) | 10V                                  |
| CAPACITY OUTPUT      | 0-24V / 10A                          |
| DIGITAL INPUT (2X)   | 24V (PNP)                            |
| OUTPUT INPUT (2X)    | 24V (PNP, max 100 mA)                |
| DEGREE OF PROTECTION | IP 20 (cassio), IP54 (frontal panel) |



## e/p converter transducer

Converts the electrical signal provided by the Control Panel into a compressed air and provides the input to the pneumatic brake.

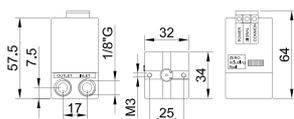
Can be used for the web tension control in closed-loop systems and the open-loop system.



- ▶ Maximum precision and accuracy
- ▶ Very compact dimensions

it can be easily collocated near the brake it is connected to, in order to obtain the maximum performance.

- ▶ Power supply 24 VDC
- ▶ Signal 0-10 V



### technical data

|                                    |  |
|------------------------------------|--|
| MEDIUM                             | oil free, dry air filtered to 5 m  |
| OUTPUT PRESSURE 0-6 BAR (0-90 PSI) | 0-6 BAR (0-90 psi)   |
| SUPPLY PRESSURE                    | minimum 1,5 BAR (22 psi) above maximum output pressure   |
| ELECTRICAL CONNECTION              | 0-10 V   |
| SUPPLY                             | 4-20 mA  |
| FLOW CAPACITY                      | 24 VDC $\pm$ 10%   |
| AIR CONSUMPTION                    | forward: <math>\lt; 200 \text{ l/min (7 scim)} \text{ relief: } \lt; 180 \text{ l/min (6 scim)} \lt;/math> |
| DEGREE OF PROTECTION               | IP 30  |
| ELECTROMAGNETIC COMPATIBILITY      | Compliant with EC requirements   |
| MATERIALS                          | diaphragm: nitrile base: zinc casting spacer: aluminum   |

## isobox control box

Isobox is an integrated system for the automatic tension regulation of the Isomatic control panel and Ep converter transducer.

Isobox is easy to use and ready to mount. Thanks to its high flexibility, it can be customized to suit diverse kind of applications and can be configured to work with load cells, dancer roller or ultrasonic sensor for the web tension control both in the closed-loop system and the open-loop system.



### technical data

|                         |  |
|-------------------------|--|
| INPUT SUPPLY            | 220-240 V %0-60 Hz 3.2 A   |
| INPUT PRESSURE          | Max 8 bar  |
| INPUT LOAD CELLS SIGNAL | 2 X 6-pin connector EN 60529   |
| OUTPUT SUPPLY           | 24V 6,25A  |
| OUTPUT PRESSURE         | 0,6 bar  |
| DRIVES                  | Left brake and Right brake.<br>Manual and automatic mode.  |
| SECURITY                | On/Off electrical button   |
| REGULATION              | Automatic regulation by panel and manometer.<br>Manual regulation by manual regulator and manometer. |
| OPERATING TEMPERATURES  | 0-50°  |

PRECISION

FLEXIBILITY

### Power supply module **AL PWX 5A**

Power supply module with microprocessor and current-controlled output for a precise control of the braking torque, regardless of the temperature of the brake. Analog inputs for torque reference signal and serial communication RS485 for the control and programming with Modbus protocol. Digital inputs and analogue outputs for a wide management of main functions.



|                   |  |
|-------------------|--|
| POWER SUPPLY      | 24 Vdc/5c  |
| OUTPUT            | max 5 A  |
| CONTROL INPUT     | 3 modes:<br>- potentiometer<br>- analog input 0-10V<br>- analog input 4-20mA                                       |
| SIGNAL            | Serial RS485 with Modbus protocol  |
| DIGITAL INPUTS    | 3 digital inputs for:<br>- digital input for brake override<br>- digital input for brake stop<br>- demagnetization |
| ANALOG OUTPUTS    | 2 analog reference outputs:<br>- 0-10 Vdc  |
| OUTPUT FOR SENSOR | 24 VDC - 200 mA  |
| SETTING           | Through dipswitches or numeric on-screen keyboard  |

### Angular sensor **SAX 360**

Non-contact inductive angular sensor with programmable angle of measurement.



|                         |  |
|-------------------------|--|
| POWER SUPPLY            | 15 - 30 Vdc; 100 mA                              |
| ANGLE OF MEASUREMENT    | 0 - 360° programmable                            |
| RESOLUTION              | 12 bit   |
| REPEATABILITY           | ≤ 0.025% full scale                              |
| ENVIRONMENT TEMPERATURE | from -25°C to +70°C                              |
| OUTPUT                  | analog 0-10V or 4-20 mA programmable             |
| LEDs                    | LED for power supply + LED for measurement field |

### Ultrasonic sensor **USX 500**

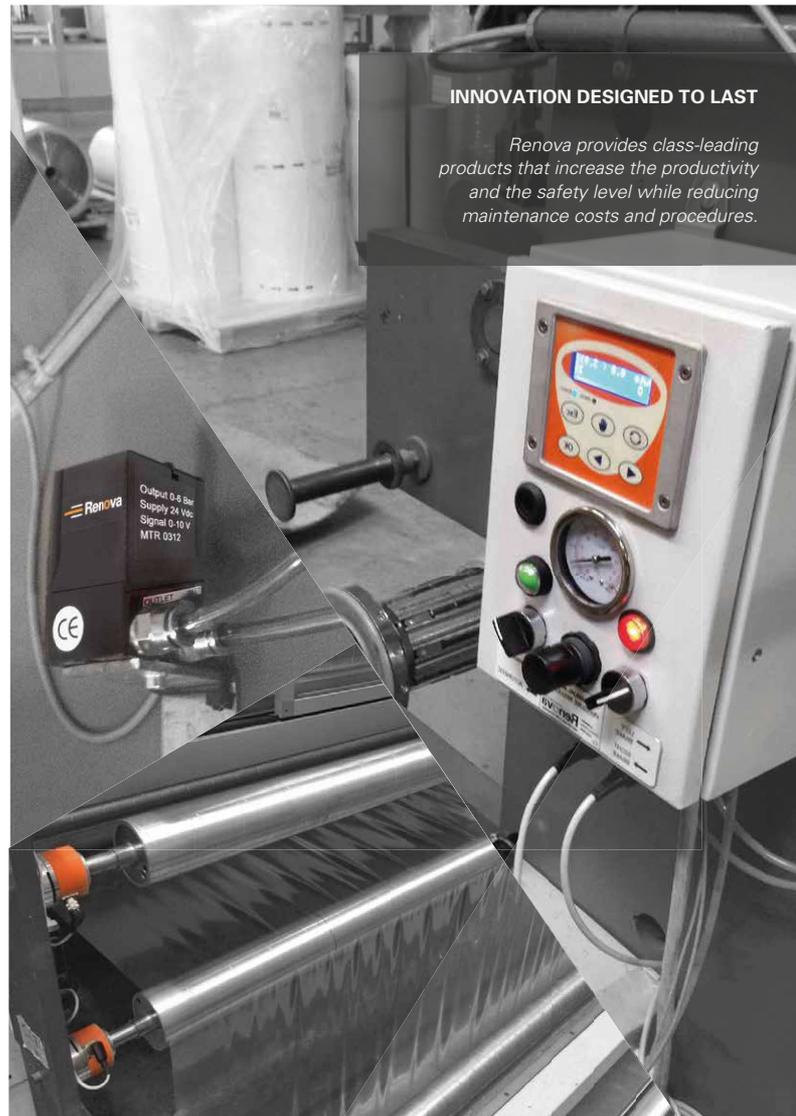
Ultrasonic sensor with programmable measurement field.



|                         |  |
|-------------------------|--|
| POWER SUPPLY            | 12 - 30 Vdc; 100 mA                              |
| ANGLE OF MEASUREMENT    | 100 - 1000 mm programmable                       |
| RESOLUTION              | < 0.3 mm   |
| REPEATABILITY           | < 0.5 mm   |
| TIME OF RESPONSE        | < 80 ms  |
| ENVIRONMENT TEMPERATURE | from -25°C to +65°C                              |
| OUTPUT                  | analog 0-10V or 4-20 mA programmable             |
| LEDs                    | LED for power supply + LED for measurement field |

## INNOVATION DESIGNED TO LAST

*Renova provides class-leading products that increase the productivity and the safety level while reducing maintenance costs and procedures.*





*info@renova-srl.it - www.renova-srl.it*