Elevator overload control system

EOS

Technical passport

2025

Contents

1. Delivery set

Kit designation EOS-_____ Indicator serial № _____

	2	3	4
Indicator model			

	A	B	B1	C	CS	R	R1	W	W1	V2	V3
Load cell model											

	1	2	3	4	5	6	7	8
Number of load cells in kit								

Load cell serial №:

	No	M10	M12
Nuts			
Bolts			

	1	2	3	4	5	6	7	8
Number of nuts in kit								
Number of bolts in kit								

	Yes	No
Junction box with cable		

Quality control _____

Release date _____

2. Introduction

This passport contains information about technical parameters, information on setting up, connecting and starting up the elevator overload system (EOS).

EOS consists of a primary and secondary converter. The primary converter consists of weight load cells, a junction box (if present) and a cable for connection to the secondary converter. The secondary converter is an electronic device EOS indicator (control unit).

EOS is not a measuring instrument. EOS is designed to control the load of the elevator cabin by analog-digital conversion of load cells signals into numerical values with their subsequent display on the device display, as well as the generation of discrete signals in relay outputs with the "dry contact" type connectors for signaling load levels or other digital or analog signal for elevator control system.

EOS is installed in places protected from corrosive gases and vapors.

EOS is installed on passenger, freight and other elevators, as well as elevators manufactured according to individual projects.

Before using EOS, you must carefully read this passport and undergo safety instructions.

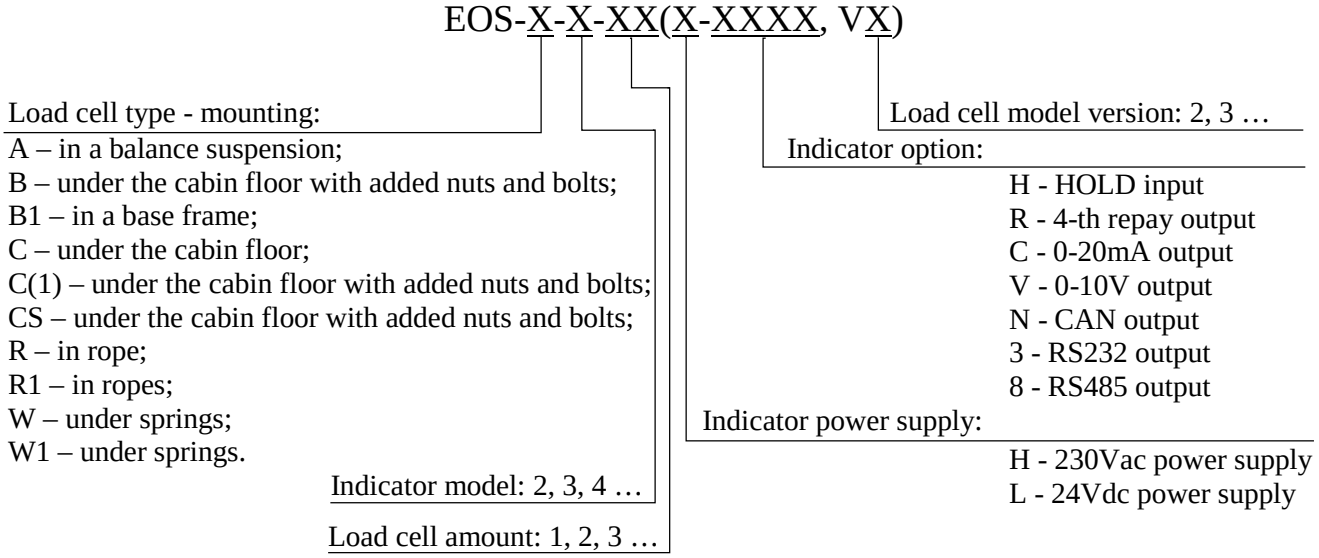
All work must be carried out by authorized personnel.

3. Labeling

Labeling is applied to the front panel of the EOS control unit and should contain the following data:

- name and model of the device;
- the trademark and company name of the manufacturer;
- symbols of function keys;
- identification of indicating LEDs;
- power parameters;
- factory number.

EOS kits designations



4. Indication of safety measures

To work with the EOS, workers should know the safety rules when working with high voltage and are allowed to work with voltage up to 1000V.

It is forbidden to:

- operate an ungrounded appliance;
- open the case of EOS control unit or other parts of EOS, connect or disconnect the cables with the connected power supply to EOS control unit;
- apply to the load more than permissible.

5. Preparation for work

Unpack and make a visual inspection for the integrity of the component parts of the device, as well as check the equipment. After unpacking, it is necessary to maintain the components of EOS at a temperature from +10℃ to +35℃ for at least 6 hours.

6. Quick start-up

For kits with under the elevator cabin load cells the manufacturer made the calibration of EOS control unit on an exemplary force measuring machine. Recalibration of the EOS control unit device is required in case of replacing the load cells.

The quality control department (QCD) of the manufacturer carried out acceptance tests for compliance with the requirements of this passport, as recorded in section 1.

If it is necessary to recalibrate EOS control unit at the site of operation, it should be carried out with control weights (cargoes). The recommended total weight of reference cargo is not less than 20…50% F.S. Recalibration should be carried out according to the requirements of this manual.

With the power supply turned off, all the output contacts of the EOS control unit relays are in the state corresponding to the truth tables (see Table 1 and Table 2), all the LEDs are off.

Install load cells according to this manual section 13, connect load cells and indicator according to section 12 and section 13.

Turn on the EOS control unit.

With an empty elevator cabin, you must reset the weight. To do this, in the current weight display mode, press the buttons ⏶ + ► to enter the user menu.

To zero the weight of the empty cabin, when the display shows an inscription **«Zero»** click the button ↵. The ten-second countdown starts with an audible alarm. After nine short and one long signal, the weight of the empty cabin will be reset and exit to the user menu (the display will show "zero").

It is necessary to check the installed nominal elevator capacity, in case of a mismatch, change the parameter according to the procedure.

Setup capacity (min 0kg, max is according to load cells F.S.). In user menu. Press ⏶ to find **“CAP”** (setting the values of the set capacity in kilograms). To edit this

parameter, press the button ↵, the current set value of capacity will be displayed on the screen. If editing is not required, press the button ↵. To change the set capacity, use the button ► to select the required digit of the number (the selected digit will flash) and the button ▲ to change it. After setting the set capacity, press the button ↵ to confirm the set value. After setting the capacity, relay thresholds values will automatically set for the operation of the passenger's presence relay (h15 - 15 kg), loading 90% (h90 - ninety percent of capacity) and overload (h110 - capacity plus 10% but not less than 75 kg).

In the process of loading the elevator, when the set values are reached, the corresponding relay contacts of the device are triggered, as evidenced by the illuminated indication LEDs.

Note. To exclude "bouncing" of relay contacts, each of them is triggered when the corresponding threshold (value) is reached, reverse triggering - when the load of the elevator decreases to a threshold level minus 5 kg.

7. Indicator information

7.1. General description

The EOS control unit is equipped with sound indication of power on, buttons operations and overload. Designation of buttons and connections are described at section 12 of this manual.

EOS control unit provides zeroing of the elevator cabin mass (value equal to F.S. minus elevator capacity). Also presented a function of automatic zeroing of the acquired weight in the specified range.

At the customer’s request, the indicator can be manufactured with several options:

- HOLD - This option allows the overload control system to work better so that acceleration from starting and stopping the cabin does not introduce error into the weight measurement. HOLD option is not configurable. In order to use this function, the signal voltage must be applied to corresponding input terminals (connection is described in section 12 of this manual). **The HOLD signal voltage must correspond with indicator power supply voltage parameter! For models with 230VAC power supply the allowed signal voltage is 0-230VAC. For model with 24VDC power supply the allowed signal voltage is 0-24VDC. Connecting an incorrect voltage value signal will cause the damage of the device!** This signal can be received from the door closing sensor if the elevator design allows it. When the cabin door is open, no external voltage is applied between the 2 HOLD pins, the weight detection is enabled. When the cabin door is closed, external voltage is applied between the 2 HOLD pins, the weight detection is stopped.
- 4-th relay - If this option is ordered, the indicator will have additional 4th relay that will add a threshold of 50% from maximum capacity of elevator. If needed, the user is able to edit the threshold value by editing the H50 parameter in menu (indicator menu is described in section 7.2. of this manual).

- Analog outputs – The indicator can have the current or voltage terminals to output a signal of 0-20mA or 0-10V correspondingly. The connection is described in section 12, the indicator menu with settings of this output is described in section 7.2. of this manual.
- Digital outputs – The indicator can have the RS-232, RS-485 or CAN digital output to send a digital signal. The connection is described in section 12, the indicator menu with settings of this output is described in section 7.2. of this manual.

7.2. System configuration

If it necessary, EOS control unit allows you to configure with the help of the service menu. The instrument is adjusted by the function buttons located on the front panel.

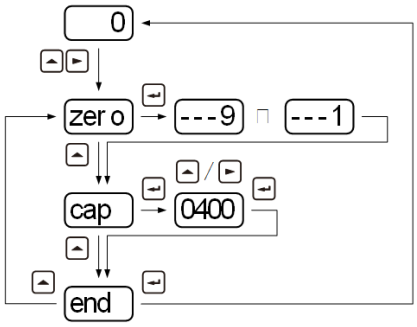
To access the user menu, in the current weight display mode, simultaneously press and hold the buttons ⏶ and ►. Block diagram of the operation with the user menu shown below.

Working mode

Zero weighting of the cabin

Set elevator capacity

Exit to the working mode



Parameters customizable in the user menu:

- **«Zero» - Zero weighting of the empty cabin**. To zero the weight of the empty cabin, when the display shows an inscription «zero» press the button ↵. The ten-second countdown starts with an audible alarm. After nine short and one long signal, the weight of the empty cabin will be reset and exit to the user menu (the display will show "zero").
- **«*CAP*» - setting the values of the set capacity in kilograms.** To edit this parameter, press the button ↵, the current set value of capacity will be displayed on the screen. If editing is not required, press the button ↵. To change the set capacity, use the button ► to select the required digit of the number (the selected digit will flash) and the button ⏶ to change it. After setting the set capacity, press the button ↵ to confirm the set value. After maintaining capacity, automatic calculation and setting of the threshold values for the operation of the passenger's presence relay, loading 90% and overload (h15 - 15 kg, h90 - ninety percent of capacity, h110 - capacity plus 10% of it (but not less than 75 kg).
- ***«End»* - exit from the user menu.** To exit the user menu, press ↵, the exit will be carried out and the display shows the measured weight.

To access the service menu, in the current weight display mode, simultaneously press and hold the buttons ⏶ and ↵. Using ⏶ and ► input password **“0258”** and press ↵.

Working mode

Entering the service menu

Passenger presence relay limit

Relay detection limit 50% (optional)

Relay detection limit 90%

Relay detection limit 110%

Zero-tracking time set (sec.)

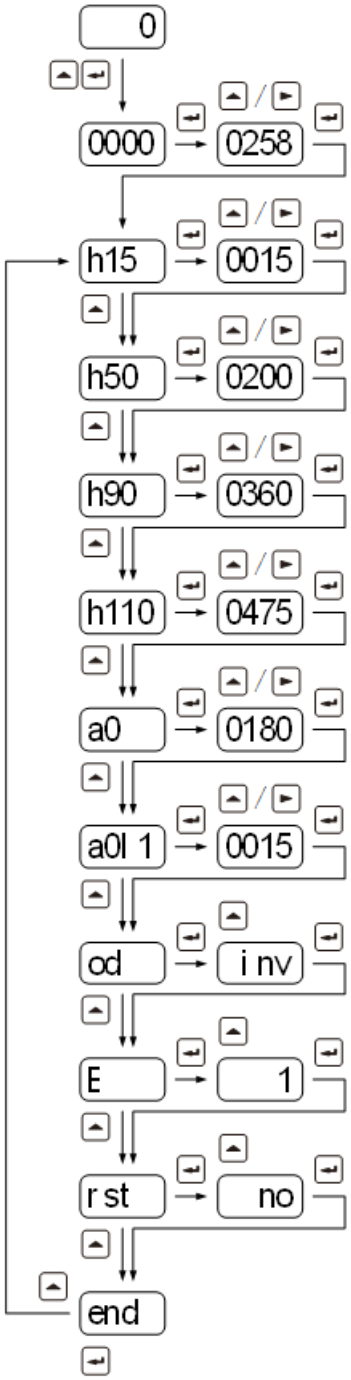
Zero-tracking weight set (kg)

Relay output mode

Discreteness of the displayed weight (kg)

Factory reset

Exit the service menu



- **«*H15*» - setting the detection threshold weight** (min 0kg, max 50kg, default value 15kg)**.** To edit this parameter, press the button ↵, the current set value will be displayed on the screen. If editing is not required, press the ↵ button. To change the set capacity, use the button ► to select the required digit of the number (the selected digit will flash) and the button ▲ to change it. After setting the set capacity, press the button ↵ to confirm.
- **«*H50*» - setting the detection threshold for 50%F.S. (optional, might be hidden for some models). (**min 0kg, max 9999kg, default value 200kg)**.** To edit this parameter, press the button ↵, the current set value will be displayed on the screen. If editing is not required, press the ↵ button. To change the set capacity, use the button ► to select the

required digit of the number (the selected digit will flash) and the button ⏶ to change it. After setting the set capacity, press the button ↵ to confirm.

- **«*H90*» - setting the detection threshold for 90%F.S.** (min 0kg, max 9999kg, default value 360kg)**.** To edit this parameter, press the button ↵, the current set value will be displayed on the screen. If editing is not required, press the ↵ button. To change the set capacity, use the button ► to select the required digit of the number (the selected digit will flash) and the button ⏶ to change it. After setting the set capacity, press the button ↵ to confirm.
- **«*H110*» - setting the detection threshold for 110%F.S.** (min 0kg, max 9999kg, default value 475kg)**.** To edit this parameter, press the button ↵, the current set value will be displayed on the screen. If editing is not required, press the ↵ button. To change the set capacity, use the button ► to select the required digit of the number (the selected digit will flash) and the button ⏶ to change it. After setting the set capacity, press the button ↵ to confirm.

The relay set operation thresholds must satisfy the following condition: h15 < h50 < h90 < h110. If an incorrect threshold is set or the value exceeds the permissible limit, when it is saved, the display will briefly show **"Err"** and will return to the setting of this value. A similar message will appear if other parameters are out of range during setup.

- **«*A0*» - setting the Zero-tracking time** (by default the function is disabled, range 0-180 seconds)**.** The indicator's Zero-tracking function will enhance system temperature drift and drifting performance, if properly set. To edit this parameter, press the button ↵, the current set value will be displayed on the screen. If editing is not required, press the ↵ button. To change the set value, use the button ► to select the required digit of the number (the selected digit will flash) and the button ⏶ to change it. After setting the set value, press the button ↵ to confirm. When the value is set to 0s, the **Zero-tracking function is disabled**.
- **«*A0L1*» - setting the Zero-tracking range** (min 5kg, max 50kg, default value 15kg)**.** To edit this parameter, press the button ↵, the current set value will be displayed on the screen. If editing is not required, press the button ↵. To change the set value, use the button ► to select the required digit of the number (the selected digit will flash) and the button ⏶ to change it. After setting the set value, press the button ↵ to confirm.
- **«*od*» - relays output mode** (normal logic or inverted logic, default value is inverted logic)**.** In **normal** logic mode, relay works in **NC** way. When load is greater than set-point, the corresponding relay will open, otherwise it is closed. In **inverted** logic mode, relay works in **NO** way. When load is greater than set-point, the corresponding relay will close, otherwise it is open. To edit this parameter, press the button ↵, the current set value will

be displayed on the screen ***("nor"*** or ***"inv")***. If editing is not required, press the button ↵. To change the set value, use the button ▲ to change it. After setting the set value, press the button ↵ to confirm.

Table of truth of logical levels of relay outputs in inverted mode is given in Table 1, where 1- relay is closed, 0 - relay is open.

Table 1

Inverse mode									
Normally closed					Normally open				
H	15	50	90	110	H	15	50	90	110
No power	1	1	1	1	No power	0	0	0	0
There is a power, level is not reached	0	0	0	0	There is a power, level is not reached	1	1	1	1
Limit passenger	1	0	0	0	Limit passenger	0	1	1	1
Limit 50%	1	1	0	0	Limit 50%	0	0	1	1
Limit 90%	1	1	1	0	Limit 90%	0	0	0	1
Limit 110%	1	1	1	1	Limit 110%	0	0	0	0

Table of truth of the logic levels of relay outputs in the normal mode is given in Table 2, where 1- relay is closed, 0 - relay is open.

Table 2

Inverse mode									
Normally closed					Normally open				
H	15	50	90	110	H	15	50	90	110
No power	1	1	1	1	No power	0	0	0	0
There is a power, level is not reached	1	1	1	1	There is a power, level is not reached	0	0	0	0
Limit passenger	0	1	1	1	Limit passenger	1	0	0	0
Limit 50%	0	0	1	1	Limit 50%	1	1	0	0
Limit 90%	0	0	0	1	Limit 90%	1	1	1	0
Limit 110%	0	0	0	0	Limit 110%	1	1	1	1

- **«*E*» – selection of discreteness of the displayed weight** (1 or 5 kg)**.** To select, press ↵, the display will show the current value **"5"** - 5kg or **"1"** - 1kg. Use the key ▲ to select the required value and press the key ↵ to confirm.
- **«*rSt*» - system reset** (YES or NO)**.** Is used to reset all configurable parameters to their default value. To reset all parameters, press the button ↵, press ▲ to set "YES" and confirm reset or "NO" to cancel reset. After setting the parameter, press the button ↵ to confirm.
- **«*End*» - exit the service menu.** To exit the service menu, press ↵, the exit will be carried out and the display will show the measured weight.

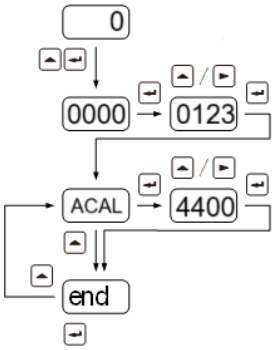
To access the analog output menu, in the current weight display mode, simultaneously press and hold the buttons ▲ and ↵. Using ▲ and ► input password **"0123"** and press ↵.

Working mode

Entering the analog output menu

Adjust the correction coefficient

Exit to the working mode



Parameters customizable in the analog output menu:

- ***«ACAL»* - Analog calibration coefficient**. To calibrate the full scale of Current or Voltage analog output signal, connect the measuring tool to the analog output terminals. Adjust the value of parameter "ACAL" using ▲ and ► buttons to receive the maximum output value of 20mA or 10V correspondingly on measuring tool and press ↵ to confirm and save the value.
- ***«End»* - exit the analog output menu.** To exit the analog output menu, press ↵, the exit will be carried out and the display will show the measured weight.

To access the digital output menu (for RS 232 and RS 485), in the current weight display mode, simultaneously press and hold the buttons ▲ and ↵. Using ▲ and ► input password **"0101"** and press ↵.

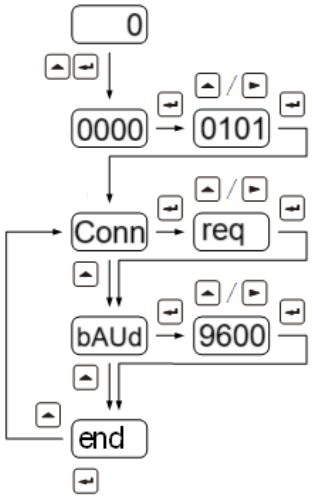
Working mode

Entering the digital output menu

Select communication output mode

Select the baudrate

Exit to the working mode



Parameters customizable in the digital output menu:

- ***«Conn»* - Communication output mode**. User can select one of 3 output modes using ▲ button: **"req" –** indicator outputs one frame of data right after ASCII code 'r' (0x72) or 'R' (0x52) is received (the Request mode); **"cont"** - indicator outputs data frame by frame (the Continuous mode); **"diS"** - serial communication is disabled. Press ↵ to confirm and save selected mode.

- ***«bAUd»*** **- select baudrate**. Select the needed baudrate using ⏶ button. Available values: 1200, 2400, 4800 or 9600 bps. Press ↵ to confirm and save the needed value.
- **«*End*» - exit the digital output menu.** To exit the digital output menu, press ↵, the exit will be carried out and the display will show the measured weight.

Byte Format for RS 232 and RS 485

The output data is in the 8N1 format, which is 1-bit start flag, 8-bit data, 1-bit stop flag, and no checking bit.

Frame Protocol for RS 232 and RS 485

The indicator outputs data frame by frame. One frame is consisted of 11 bytes.

1	2	3	4	5	6	7	8	9	10	11
>	N	X	X	X	X	X	k	g	CR	LF

The 1st byte is always fixed to ASCII code 0x3E (‘>’).

The 2nd byte indicates the load status:

- ‘U’: underload;
- ‘N’: normal;
- ‘M’: mid-load;
- ‘O’: overload.

From 3rd to 7th bytes are the weight value.

The 8th and 9th bytes indicates measurement unit:

- ‘k’’g’: kilo gram;
- ‘%’’ ’: percentage.

The 10th byte is fixed to ASCII code 0x0D, carriage return (CR).

The 11th byte is fixed to ASCII code 0x0A, line feed (LF).

7.3. Calibration

For calibration prepare the **calibration weight not less than 20…50%** of the elevator capacity.

To access the calibration menu, in the current weight display mode, simultaneously press and hold the buttons ⏶ and ↵. Using ⏶ and ► input password **“8416”** and press ↵.

Working mode

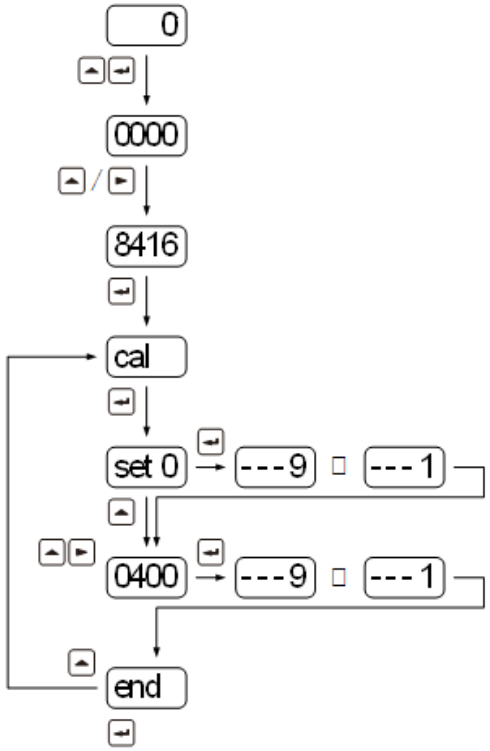
Enter password

Calibration menu

Set empty weight of the cabin

Put the weight in the cabin and set calibration weight value

Exit the calibration menu



- In the calibration menu when **“CAL”** is displayed, press ↵ for start calibration. When **“Set0”** shows, make sure the elevator cabin is empty (without any load) and press ↵ to start zero calibration. Indicator will count down from 9 to 0. After nine short and one long signal, the weight of the empty cabin will be reset. When **“400”** shows, apply the calibration weight and set the value, using the button ► to select the required digit of the number (the selected digit will flash) and the button ⏶ to change it. After setting the calibration value, press the button ↵ to confirm. Indicator will count down from 9 to 0. After nine short and one long signal, the calibration is successfully done.
- **«*End*» - exit the calibration menu.** To exit the calibration menu, press ↵, the exit will be carried out and the display will show the measured weight.

7.4. Possible malfunctions and methods of their elimination

In case of a malfunction, try to eliminate them using Table 3. If the fault is not found in the table, contact the manufacturer's service center. Independent changes in the design or self-elimination of other malfunctions that require intervention in the design of the device may result in failure of the warranty service. Possible faults and methods for their elimination are given in Table 3.

Table 3

Malfunction	Possible reason	Method of elimination
The device does not turn on	No power supply	Check if power is applied, if not, turn on the power
	Power options do not meet the requirements	Supply the required voltage and frequency
With an empty elevator cabin, the weight is different from 0	Zeroing not performed	Reset the empty cabin weight
Incorrect weight readings	Incorrect calibration	Perform calibration
	Bad contact between connecting wires and load cells / indicator	Reconnect wires to connector
Relays are triggered at incorrect value of the measured weight	Incorrect set for relay thresholds	Reset the relay detection thresholds
The device does not react to loading the cabin	Load cells commutation is wrong	Recheck commutation of load cells according to this passport.
	Load cell(s) is broken	Replace a load cell(s)
	The voltage signal is applied to HOLD terminals	Check the voltage supplied to the HOLD terminals of the indicator from the signal source and the operating algorithm of the signal source. If a malfunction is detected, make changes to the signal source.
Incorrect operation of the relay	Wrong commutation	Check commutation, change if it's necessary
	Wrong relay output mode is selected	Change relay output mode
Automatic zero don`t work, cabin empty weight accumulated	Range of automatic zero are not enough	Range of automatic zero should be increased
	Friction between cabin and rails	Eliminate friction
The weight in the cabin changes randomly	Incorrect calibration	Perform calibration with known weight

8. Maintenance

Maintenance of EOS must be carried out in accordance with the requirements of this passport and in the manner prescribed by the operating instructions for the elevator in which it is used. All work related to maintenance should be carried out with strict adherence to safety regulations.

9. Storage conditions

EOS must be stored in a closed warehouse. Storage conditions must comply with IEC 62435 for general electronic devices.

10.Delivery

Delivery must be carried out according to the requirements of the contract.

11.Manufacturer’s warranty

The manufacturer guarantees that the EOS complies with the data in this Passport if the consumer complies with the required storage, installation and operation conditions.

The warranty period is 36 months from the date of purchase. Guaranteed shelf life is 60 months from the date of manufacture. During the warranty period, the manufacturer is obliged to replace or repair the EOS free of charge, if the customer finds any failures in operation or any inconsistency with the parameters specified in this Passport.

During the warranty period, in case of EOS failure or regular failures in operation, the consumer informs the manufacturer (manufacturer's representative):

- the nature of the failure;
- the consequences of failure;
- probable causes that could lead to failure or malfunction.

Complaints should be sent to the official representative (supplier) of the manufacturer.

Supplier contact information:
LIMITED LIABILITY COMPANY VAGAR
(VAGAR SPÓŁKA Z OGRANICZONĄ ODPOWIEDZIALNOŚCIĄ)
Address: Office 35, 3, Franchishkanska Street, Warsaw, Poland, 00-233

tel.: +48 222 304 536

email: info@vagarload.com

12.Description of the indicator models

EOS-2 control unit

№	Parameter name	Value
1	Power supply	230±20 VAC 50±1 Hz 24±4 VDC (optional)
2	Power consumption, no more than	6 W
3	Maximum current switched by relay outputs at voltage 220VAC or 24 VDC	10 A
4	Operating mode	continuous
5	Number of programmable relay outputs	3 or 4 (optional)
6	Setting threshold range loading presence of a passenger 50% (optional) 90% 110%	Set in kg 0-50 kg 0-9999 kg 0-9999 kg 0-9999 kg
7	Number of digits of the display	4
8	Operating temperature range	-10…+50℃
9	Humidity	15…95%
10	Degree of protection for IEC 60529 (DIN 40050)	IP54
11	Average full-service life, not less than	10 years
12	Lower limit of transformations	1 or 5 kg
13	Maximum duration of the conversion cycle	2 s
14	Limits of permissible additional error EOS caused by deviation of supply voltage from nominal 230 VAC in the operating range	± 0.1% (F.S.)
15	Limits of permissible additional error EOS caused by the deviation of the ambient temperature from 20℃ to any temperature within the operating temperature range for every 10℃	± 0.2% (F.S.)
16	Overall dimensions	140x96x40 mm

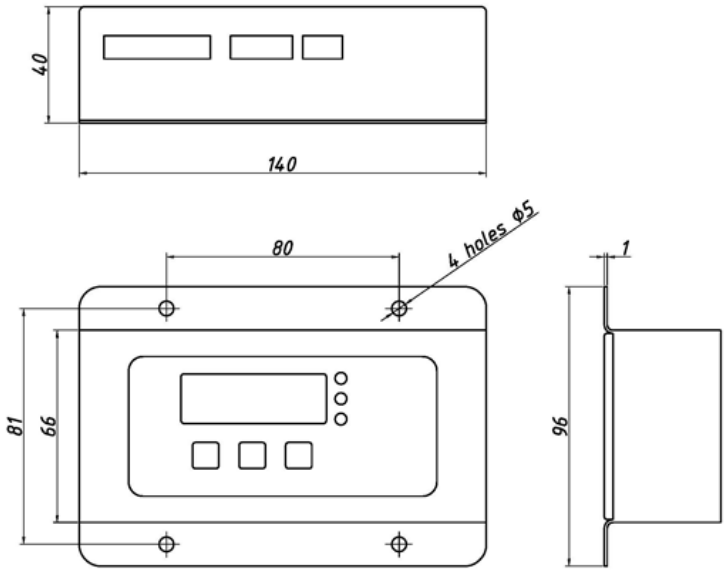


Figure 1

The instrument is adjusted by the function buttons located on the front panel, the general view of which is shown in Figure 2.

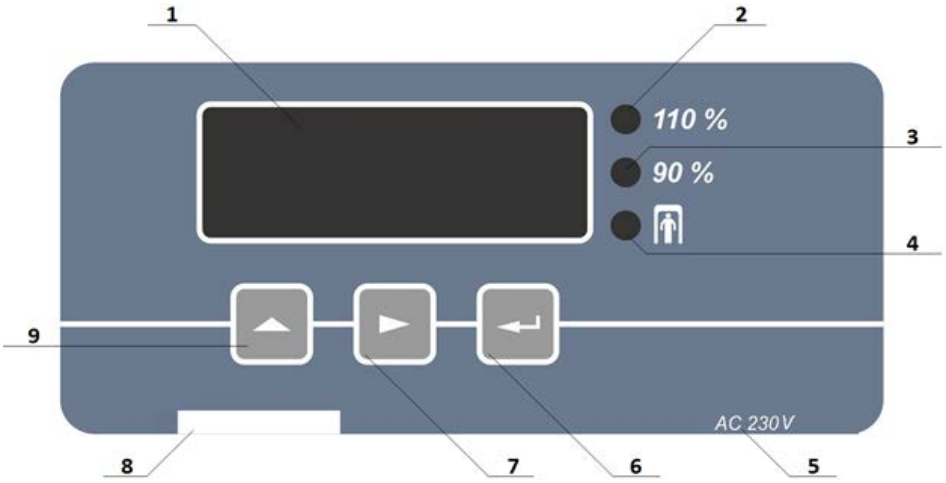


Figure 2

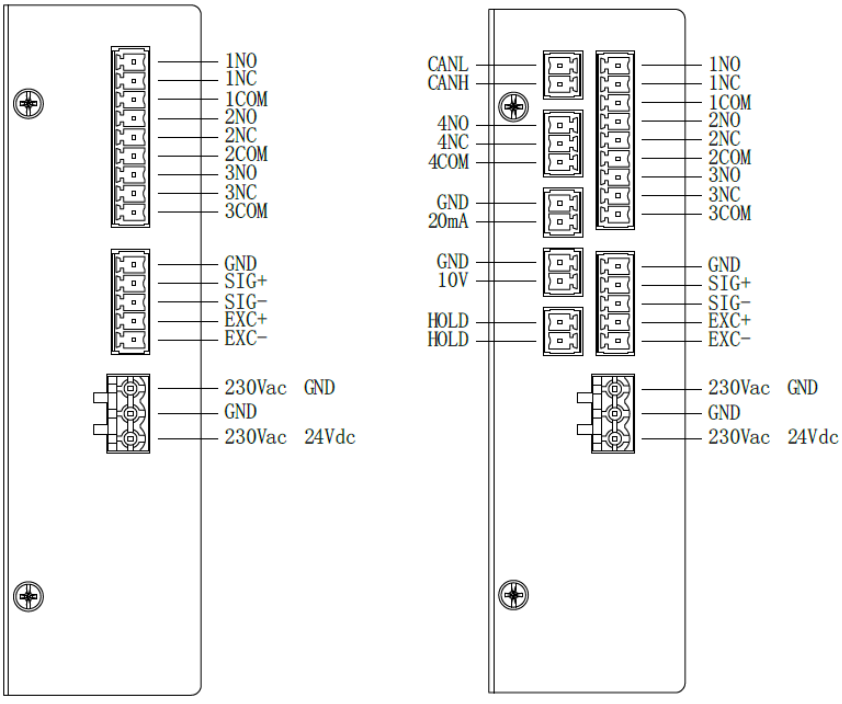
The purpose of the front panel elements is shown in Table 4.

Table 4

№	Name
1	LED Display
2	Overload LED indicator
3	90% load LED
4	Passenger presence LED
5	Power supply information
6	Parameter selection / Enter
7	Move flashing digit to right
8	Serial number
9	Increasing the flashing digit / Go to the next parameter / Perform Zeroing

The purpose of the terminals of the connection block is shown in Figure 3.

Standard option connections: Optional additional connections:



NO: Normal Open; NC: Normal Close.

Figure 3

The pin markings are printed on the case under the connectors. The pin assignments on the terminal block are given in Table 5.

Table 5

Designation	Connector	Description
1NO	NO relay PP	Normally open output of the relay “passenger presence”
1NC	NC relay PP	Normally closed output of the relay “passenger presence”
1COM	Input relay PP	Input of the relay “passenger presence”
2NO	NO relay 90%	Normally open relay 90% of the nominal capacity
2NC	NC relay 90%	Normally closed relay 90% of the nominal capacity
2COM	Input relay 90%	Input relay 90% of the nominal capacity
3NO	NO relay 110%	Normally open relay 110% of the nominal capacity
3NC	NC relay 110%	Normally closed relay 110% of the nominal capacity
3COM	Input relay 110%	Input relay 110% of the nominal capacity
GND	Ground of load cells	Ground of load cells
SIG+	Load cell signal +	Load cell signal (positive polarity)
SIG-	Load cell signal -	Load cell signal (negative polarity)
EXC+	Load cell power +	Load cell power (positive polarity)
EXC-	Load cell power -	Load cell power (negative polarity)
230Vac / GND	Power supply / GND	Power supply (for 230VAC) / GND (for 24VDC)
GND	Ground	Main ground
230Vac / 24Vdc	Power supply	Power supply (for 230VAC) / Power supply (for 24VDC)
Options:		
CANL	CAN bus (-)	CAN interface (low level)
CANH	CAN bus (+)	CAN interface (high level)
4NO	NO relay 50%	Normally open relay 50% of the overweight
4NC	NC relay 50%	Normally closed relay 50% of the overweight
4COM	Input relay 50%	Input relay 50% of the overweight
GND	Analog output (-)	Analog current output interface (0-20mA), signal -
20mA	Analog output (+)	Analog current output interface (0-20mA), signal +
GND	Analog output (-)	Analog voltage output interface (0-10V), signal -
10V	Analog output (+)	Analog voltage output interface (0-10V), signal +
HOLD	Disabling input	Input of disabling signal (24VDC/240VAC)
HOLD	Disabling input	Input of disabling signal (24VDC/240VAC)

EOS-4 control unit

№	Parameter name	Value
1	Power supply	230±20 VAC 50±1 Hz 24±4 VDC (optional)
2	Power consumption, no more than	5 W
3	Maximum current switched by relay outputs at voltage 220VAC or 24 VDC	10 A
4	Operating mode	continuous
5	Number of programmable relay outputs	3 or 4 (optional)
6	Setting threshold range loading presence of a passenger 50% 90% 110%	Set in kg 0-50 kg 0-9999 kg 0-9999 kg 0-9999 kg
7	Number of digits of the display	5
8	Operating temperature range	-10…+40℃
9	Humidity	15…95%
10	Degree of protection for IEC 60529 (DIN 40050)	IP20
11	Average full-service life, not less than	10 years
12	Lower limit of transformations	1 or 5 kg
13	Maximum duration of the conversion cycle	2 s
14	Limits of permissible additional error EOS caused by deviation of supply voltage from nominal 230 VAC in the operating range	± 0.1% (F.S.)
15	Limits of permissible additional error EOS caused by the deviation of the ambient temperature from 20℃ to any temperature within the operating temperature range for every 10℃	± 0.2% (F.S.)
16	Overall dimensions	93x89x28 mm

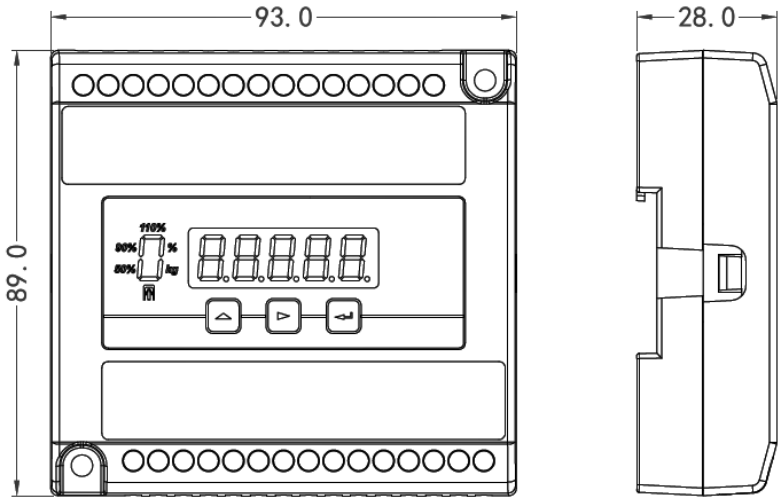


Figure 4

The instrument is adjusted by the function buttons located on the front panel, the general view of which is shown in Figure 5.

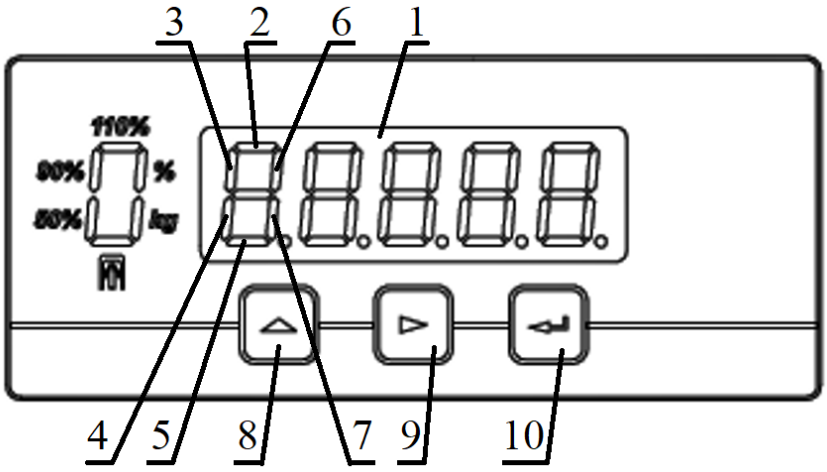


Figure 5

The purpose of the front panel elements is shown in Table 6.

Table 6

№	Name
1	LED Display
2	Overload LED indicator
3	90% load LED
4	50% load LED
5	Passenger presence LED
6	Load displayed in “%” from elevator capacity
7	Load displayed in “kg”
8	Increasing the flashing digit / Go to the next parameter / Perform Zeroing / Change displayed value “kg” or “%”
9	Move flashing digit to right
10	Parameter selection / Enter

The purpose of the terminals of the connection block is shown in Figure 6.

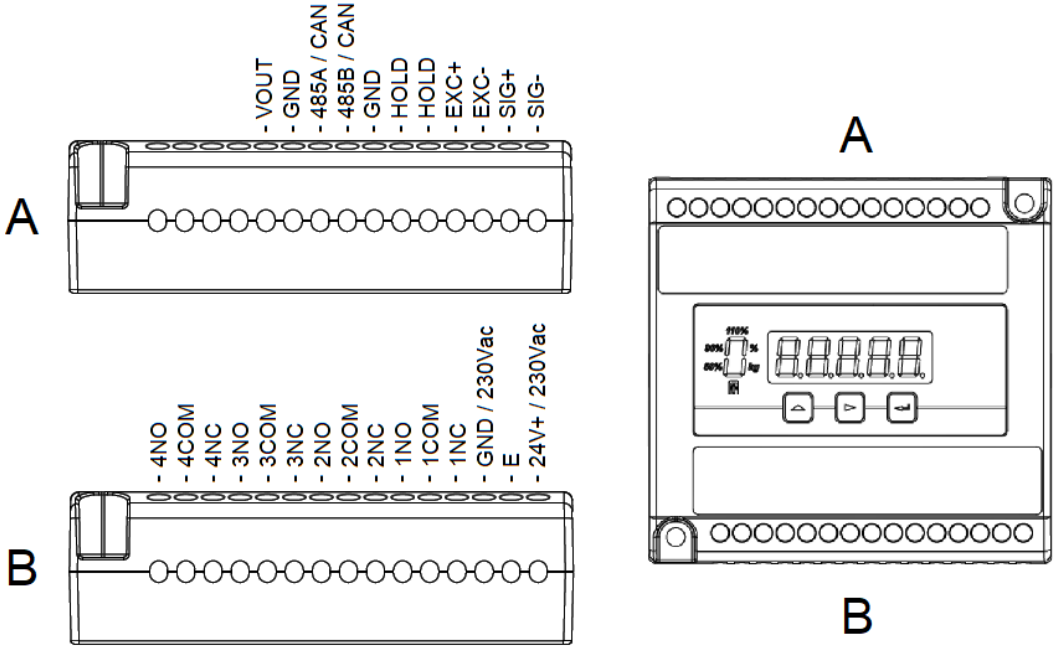


Figure 6

The pin markings are printed on the case under the connectors. The pin assignments on the terminal block are given in Table 7.

Table 7

Designation	Connector	Description
1NO	NO relay PP	Normally open output of the relay “passenger presence”
1NC	NC relay PP	Normally closed output of the relay “passenger presence”
1COM	Input relay PP	Input of the relay “passenger presence”
2NO	NO relay 50%	Normally open relay 50% of the overweight
2NC	NC relay 50%	Normally closed relay 50% of the overweight
2COM	Input relay 50%	Input relay 50% of the overweight
3NO	NO relay 90%	Normally open relay 90% of the nominal capacity
3NC	NC relay 90%	Normally closed relay 90% of the nominal capacity
3COM	Input relay 90%	Input relay 90% of the nominal capacity
SIG+	Load cell signal +	Load cell signal (positive polarity)
SIG-	Load cell signal -	Load cell signal (negative polarity)
EXC+	Load cell power +	Load cell power (positive polarity)
EXC-	Load cell power -	Load cell power (negative polarity)
24V+ / 230Vac	Power supply	Power supply 230Vac or 24Vdc(+) (optional)
E	Power ground	Power ground
GND / 230Vac	Power supply	Power supply 230Vac or 24Vdc(-) (optional)
Options:		
4NO	NO relay 110%	Normally open relay 110% of the nominal capacity
4NC	NC relay 110%	Normally closed relay 110% of the nominal capacity
4COM	Input relay 110%	Input relay 110% of the nominal capacity
485A / CAN	Data output	Data connection (options: RS-485, RS-232 or CAN)
485 B / CAN	Data input	Data connection (options: RS-485, RS-232 or CAN)
GND	Data GND	Data connection (options: RS-485, RS-232 or CAN)
VOUT	Analog output (+)	Analog voltage output interface (0-10V), signal +
GND	Analog output (-)	Analog voltage output interface (0-10V), signal -
AOUT	Analog output (+)	Analog current output interface (0-20mA), signal +
GND	Analog output (-)	Analog current output interface (0-20mA), signal -
HOLD	Disabling input	Input of disabling signal (24VDC/240VAC)
HOLD	Disabling input	Input of disabling signal (24VDC/240VAC)

13.Description of the load cells models

EOS-A load cell

Technical information

№	Parameter name	Value
1	Maximum load (F.S.) on individual load cell	1000 kg
2	Degree of protection for IEC 60529 (DIN 40050)	IP67
3	Average full-service life, not less than	10 years
4	Upper conversion limit (F.S.) – for a set of 2 load cells	2000 kg
5	Limits of permissible reduced basic conversion error	± 0.5% (F.S.)
6	Overall dimensions	140xØ30 mm
7	Cable length: From load cell to junction box From junction box to indicator	 1000 mm 5000 mm

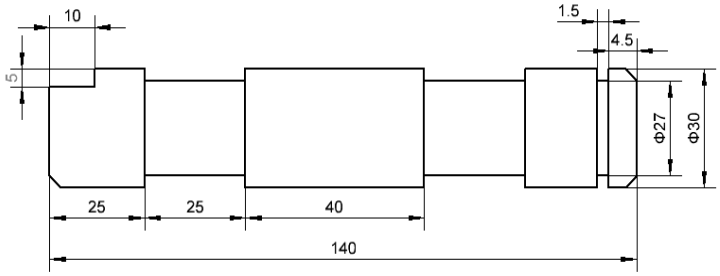


Figure 7

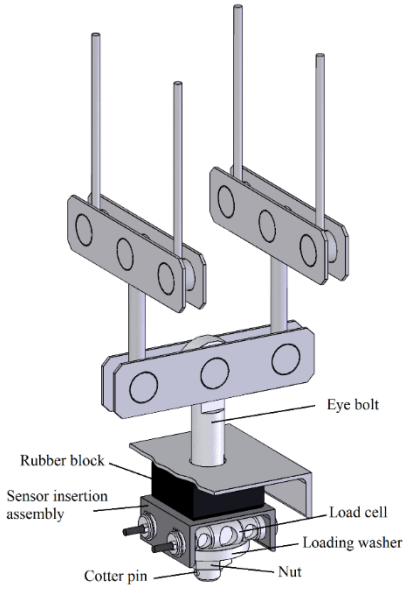


Figure 8

Installation

The location of the load cell in a balance suspension is shown in Figure 8.

Install the load cells into the sensor insertion assembly and fix it with the fixing plates. Install the insertion assembly with the load cells on the central balancing eye bolt under the shock-absorbing rubber block. Fix the installation unit with a loading washer. Tighten the loading washer with counter nut. Install the safety cotter pin in the eye bolt. Lower the elevator cabin onto the sensor insertion assembly.

Insertion assembly, eye bolt, loading washer, counter nut and cotter pin are not included in the delivery set.

Wires color marking from junction box shown in Table 8.

Table 8

Color marking	Function	Designation
Red	Power supply +	(+U_{in})
Black	Power supply -	(-U_{in})
Green	Output signal +	(+U_{out})
White	Output signal -	(-U_{out})

EOS-B load cell

Technical information

№	Parameter name	Value
1	Maximum load (F.S.) on individual load cell	800 kg
2	Degree of protection for IEC 60529 (DIN 40050)	IP67
3	Average full-service life, not less than	10 years
4	Upper conversion limit (F.S.) – for a set of 4 load cells	3200 kg
5	Limits of permissible reduced basic conversion error	± 0.5% (F.S.)
6	Overall dimensions	190x45x47.5 mm
7	Cable length: From load cell to junction box From junction box to indicator	 2500 mm 5000 mm

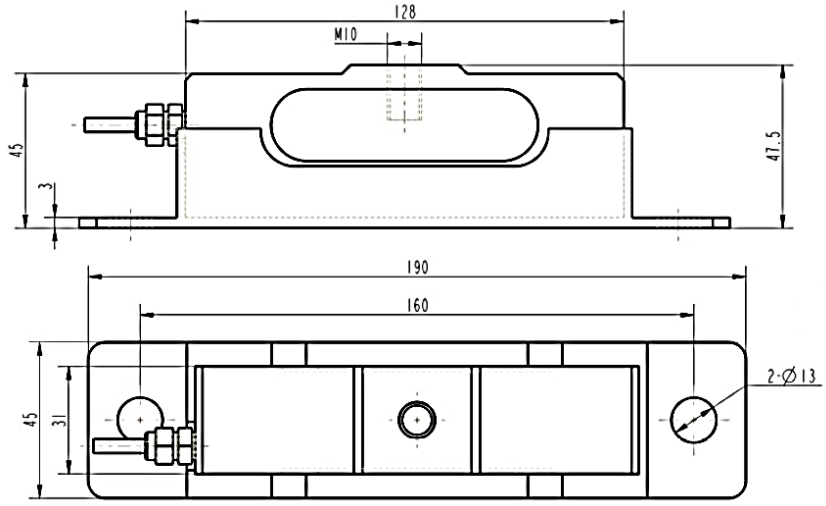


Figure 9

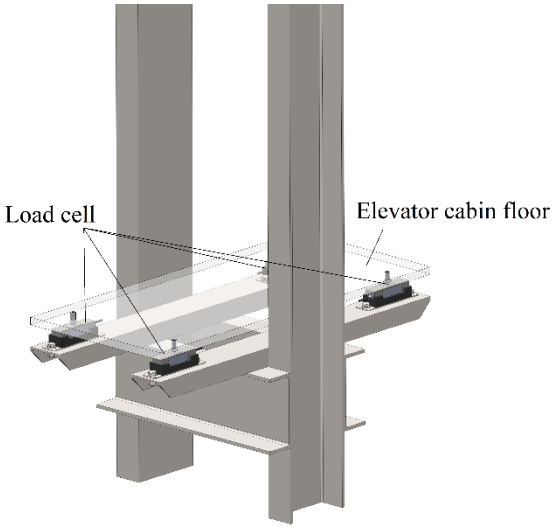


Figure 10

Installation

After carrying out preparatory work, it is necessary to install the load cells on the support frame of the elevator and fasten them with M12 bolts, without tightening them to the end.

The location of the load cell is shown in Figure 10.

Mount the elevator cabin on the load cells in such a way that the mounting holes of the cabin line up with the mounting holes of the load cells. In case of mismatch of the mounting holes, change the location of the load cell in the horizontal plane on the support frame until they completely match and fix to the elevator cabin by screwing the studs all the way into the load cells, and then fix the stud with a locknut. Securely tighten all bolts on the support frame that hold the load cell.

Wires color marking from junction box shown in Table 9.

Table 9

Color marking	Function	Designation
Red	Power supply +	(+U_{in})
Black	Power supply -	(-U_{in})
Green / Blue	Output signal +	(+U_{out})
White	Output signal -	(-U_{out})

EOS-B1 load cell

Technical information

№	Parameter name	Value
1	Maximum load (F.S.) on individual load cell	2500 kg
2	Degree of protection for IEC 60529 (DIN 40050)	IP67
3	Average full-service life, not less than	10 years
4	Upper conversion limit (F.S.) – for a set of 1 load cell	2500 kg
5	Limits of permissible reduced basic conversion error	± 0.5% (F.S.)
6	Overall dimensions	130x31.8x31.8 mm
7	Cable length: From load cell to indicator	2500 mm

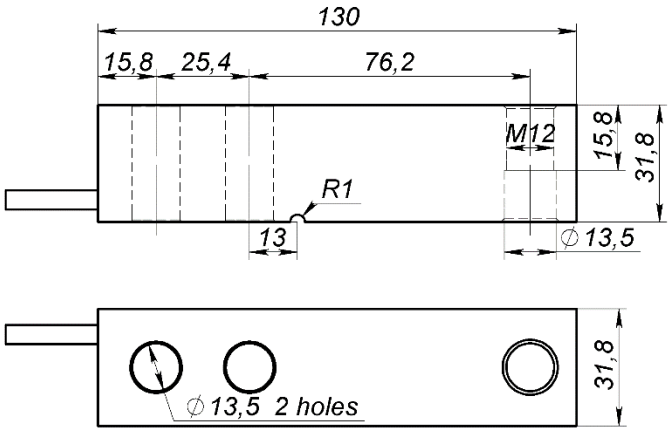


Figure 11

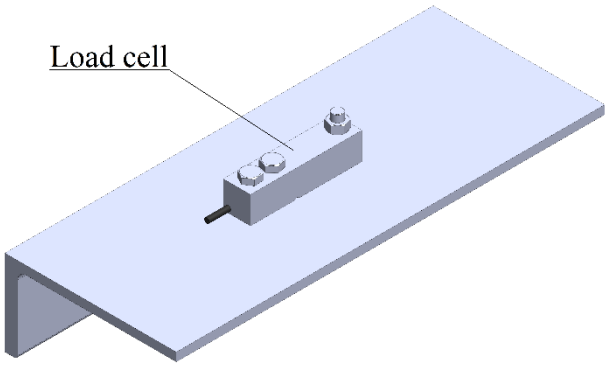


Figure 12

Installation

Choose the location on the base frame of elevator that should experience loading. Usually it is main top beam and the place is located in the middle of this beam but not closer than 50 mm to the ropes fixing area or main cross structural element of top beams. Install the load cell on a base frame, as shown in Figure 12 and fix tightly with bolts and nuts. Secure the lead cables and the junction box (if present).

Wires color marking from load cell (or from junction box for sets of more than 1 load cell) shown in Table 10.

Table 10

Color marking	Function	Designation
Red	Power supply +	(+U_{in})
Black	Power supply -	(-U_{in})
Green	Output signal +	(+U_{out})
White	Output signal -	(-U_{out})

EOS-C load cell

Technical information

№	Parameter name	Value
1	Maximum load (F.S.) on individual load cell	1000 kg
2	Degree of protection for IEC 60529 (DIN 40050)	IP67
3	Average full-service life, not less than	10 years
4	Upper conversion limit (F.S.) – for a set of 4 load cells	4000 kg
5	Limits of permissible reduced basic conversion error	± 0.5% (F.S.)
6	Overall dimensions	200x80x47 mm
7	Cable length: From load cell to junction box From junction box to indicator	 1500 mm 5000 mm

Studs and nuts are included in the kit EOS-C(1). Kit EOS-C is fully the same, but without studs and nuts.

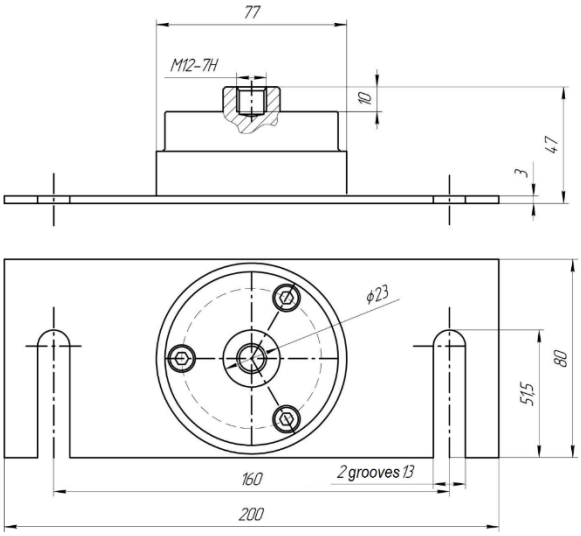


Figure 13

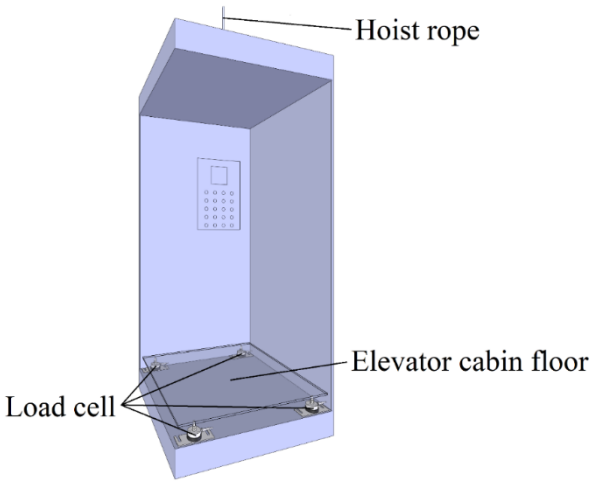


Figure 14

Installation

After carrying out preparatory work, it is necessary to install the load cells on the support frame of the elevator and fasten them with M12 bolts, without tightening them to the end.

The location of the load cell is shown in Figure 14.

Mount the elevator cabin on the load cells in such a way that the mounting holes of the cabin line up with the mounting holes of the load cells. In case of mismatch of the mounting holes, change the location of the load cell in the horizontal plane on the support frame until they completely match and fix to the elevator cabin by screwing the studs all the way into the load cells, and then fix the stud with a locknut. Securely tighten all bolts on the support frame that hold the load cell.

Wires color marking from junction box shown in Table 11.

Table 11

Color marking	Function	Designation
Red	Power supply +	(+U_{in})
Black	Power supply -	(-U_{in})
Green	Output signal +	(+U_{out})
White	Output signal -	(-U_{out})

EOS-CS load cell

Technical information

№	Parameter name	Value
1	Maximum load (F.S.) on individual load cell	1000 kg
2	Degree of protection for IEC 60529 (DIN 40050)	IP67
3	Average full-service life, not less than	10 years
4	Upper conversion limit (F.S.) – for a set of 4 load cells	4000 kg
5	Limits of permissible reduced basic conversion error	± 0.5% (F.S.)
6	Overall dimensions	200x60x46 mm
7	Cable length: From load cell to junction box From junction box to indicator	 1500 mm 5000 mm

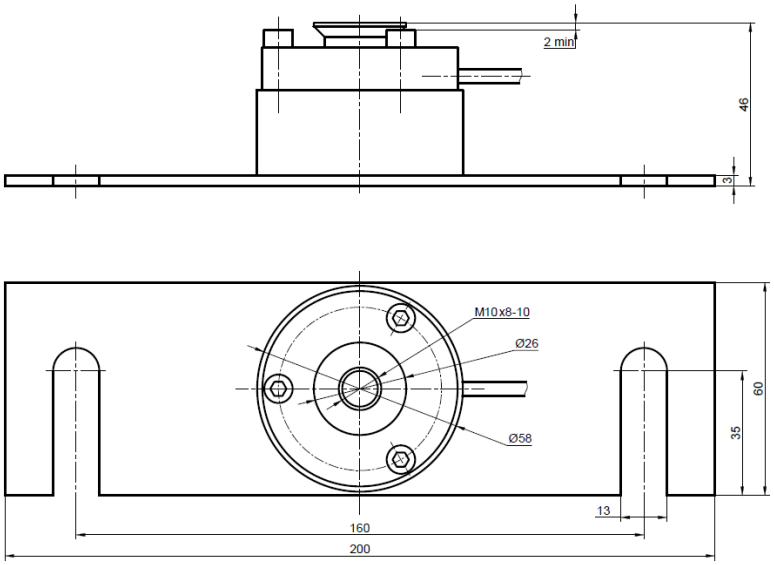


Figure 15

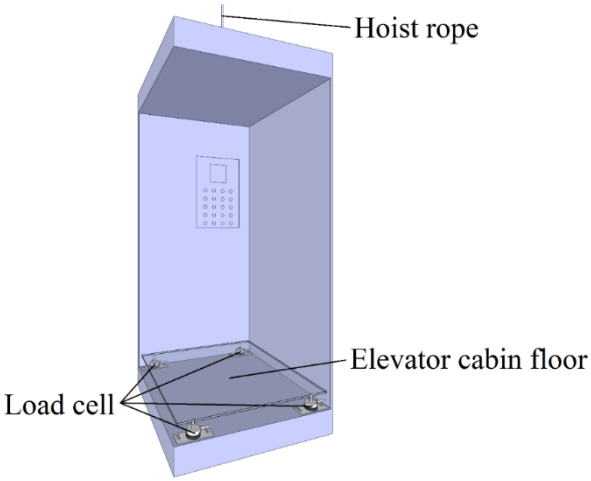


Figure 16

Installation

After carrying out preparatory work, it is necessary to install the load cells on the support frame of the elevator and fasten them with M12 bolts, without tightening them to the end.

The location of the load cell is shown in Figure 16.

Mount the elevator cabin on the load cells in such a way that the mounting holes of the cabin line up with the mounting holes of the load cells. In case of mismatch of the mounting holes, change the location of the load cell in the horizontal plane on the support frame until they completely match and fix to the elevator cabin by screwing the studs all the way into the load cells, and then fix the stud with a locknut. Securely tighten all bolts on the support frame that hold the load cell.

Wires color marking from junction box shown in Table 12.

Table 12

Color marking	Function	Designation
Red	Power supply +	(+U_{in})
Black	Power supply -	(-U_{in})
Green	Output signal +	(+U_{out})
White	Output signal -	(-U_{out})

EOS-R load cell

Technical information

№	Parameter name	Value
1	Maximum load (F.S.) on individual load cell	3000 kg
2	Degree of protection for IEC 60529 (DIN 40050)	IP67
3	Average full-service life, not less than	10 years
4	Upper conversion limit (F.S.) – for a set of 3 load cells	9000 kg
5	Limits of permissible reduced basic conversion error	± 0.5% (F.S.)
6	Overall dimensions	125x52x34 mm
7	Suitable rope diameter	4-16mm
8	Cable length: From load cell to junction box From junction box to indicator	 1500 mm 5000 mm

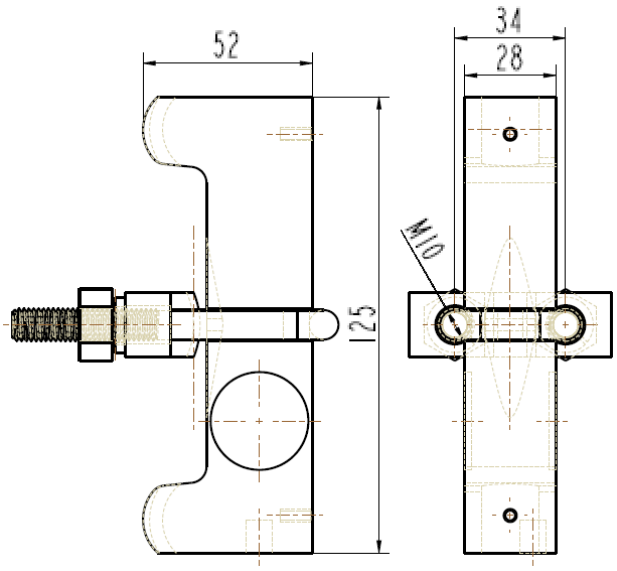


Figure 17

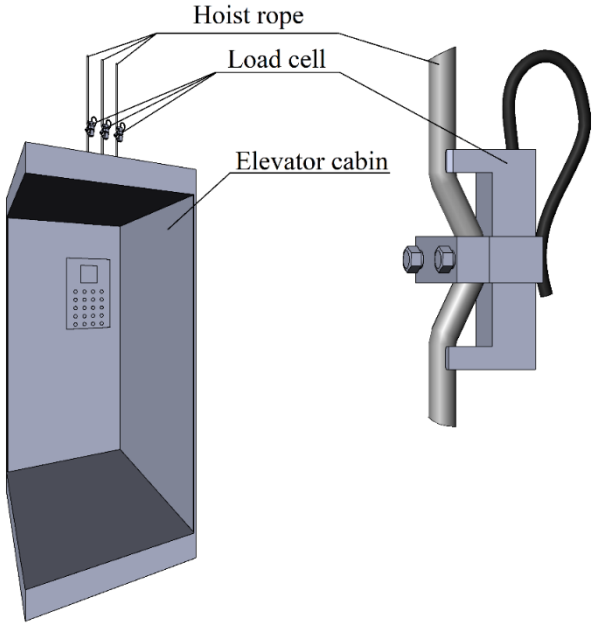


Figure 18

Installation

The location of the load cell on hoist ropes is shown in Figure 18. The recommended minimum distance between the ropes fastening elements and the load cell is 250 mm. Tighten the mounting bolts of the load cells securely to provide contact of the rope to load cell housing as shown in Figure 18 and secure the lead cables and the junction box. When using load cells with installation in ropes users should provide calibration and setup of indicator when the cabin is in the middle of the elevator shaft.

Wires color marking from junction box shown in Table 13.

Table 13

Color marking	Function	Designation
Red	Power supply +	(+U_{in})
Black	Power supply -	(-U_{in})
Green	Output signal +	(+U_{out})
White	Output signal -	(-U_{out})

EOS-R (V2) load cell

Technical information

№	Parameter name	Value
1	Maximum load (F.S.) on individual load cell	1000 kg
2	Degree of protection for IEC 60529 (DIN 40050)	IP67
3	Average full-service life, not less than	10 years
4	Upper conversion limit (F.S.) – for a set of 3 load cells	3000 kg
5	Limits of permissible reduced basic conversion error	± 0.5% (F.S.)
6	Overall dimensions	87x20x20 mm
7	Suitable rope diameter	6-8mm
8	Cable length: From load cell to junction box From junction box to indicator	 1800 mm 5000 mm

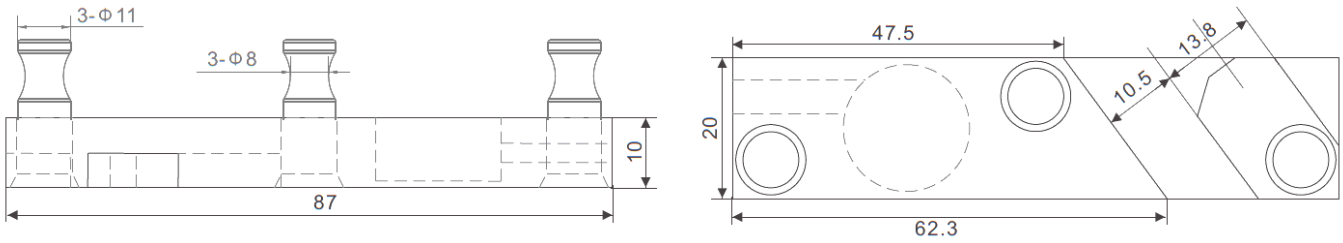


Figure 19

Installation

The location of the load cell on hoist ropes is shown in Figure 20. The recommended minimum distance between the ropes fastening elements and the load cell is 250 mm. Push the bottom pin OUT, thread the rope through the top two pins, use the wrench to turn the load cell and push the bottom pin IN to secure the load cell on the rope. Secure the lead cables and the junction box. When using load cells with installation in ropes users should provide calibration and setup of indicator when the cabin is in the middle of the elevator shaft.

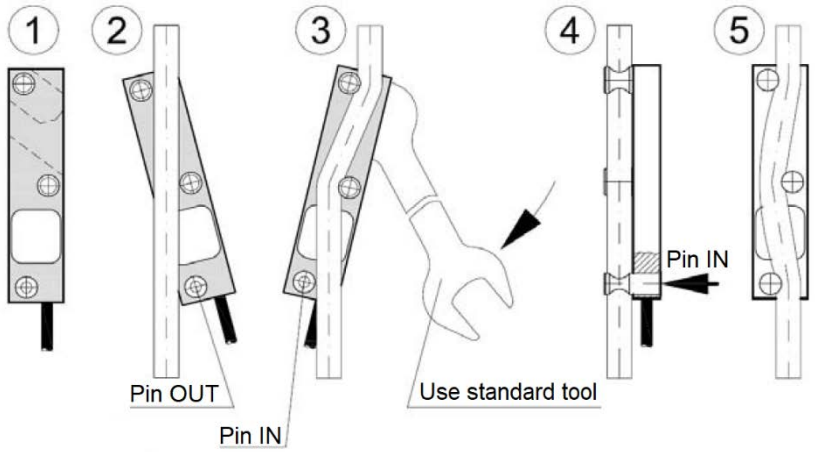


Figure 20

Wires color marking from junction box shown in Table 14.

Table 14

Color marking	Function	Designation
Red	Power supply +	(+U_{in})
Black	Power supply -	(-U_{in})
Green / Blue	Output signal +	(+U_{out})
White	Output signal -	(-U_{out})

EOS-R (V3) load cell

Technical information

№	Parameter name	Value
1	Maximum load (F.S.) on individual load cell	1000 kg
2	Degree of protection for IEC 60529 (DIN 40050)	IP67
3	Average full-service life, not less than	10 years
4	Upper conversion limit (F.S.) – for a set of 3 load cells	3000 kg
5	Limits of permissible reduced basic conversion error	± 0.5% (F.S.)
6	Overall dimensions	110x24.5x65 mm
7	Suitable rope diameter	6-13mm
8	Cable length: From load cell to junction box From junction box to indicator	 1800 mm 5000 mm

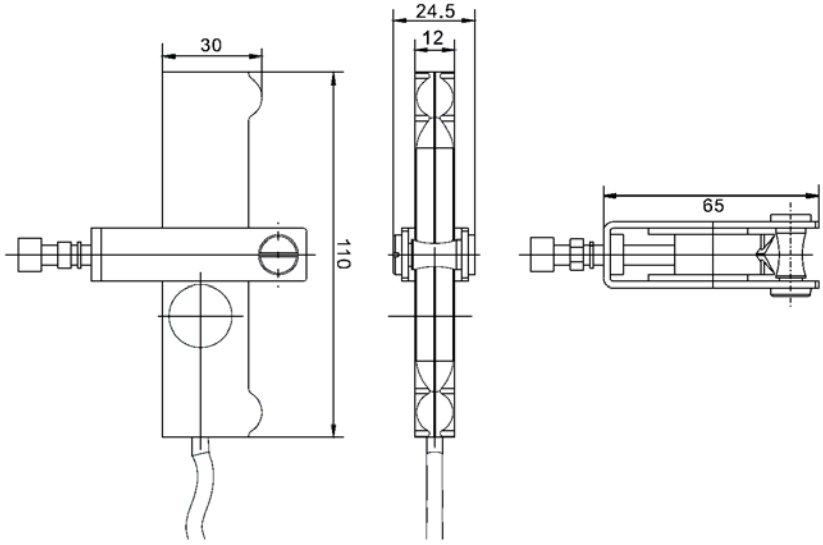


Figure 21

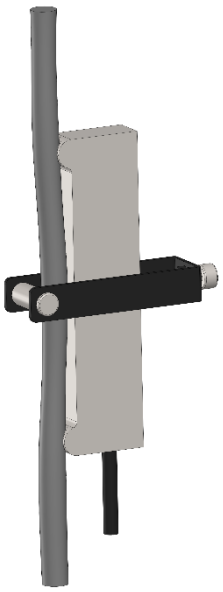


Figure 22

Installation

The location of the load cell on hoist ropes is shown in Figure 22. The recommended minimum distance between the ropes fastening elements and the load cell is 250 mm. Tighten the mounting bolts of the load cells securely to provide contact of the rope to load cell housing as shown in Figure 22 and secure the lead cables and the junction box. When using load cells with installation in ropes users should provide calibration and setup of indicator when the cabin is in the middle of the elevator shaft.

Wires color marking from junction box shown in Table 15.

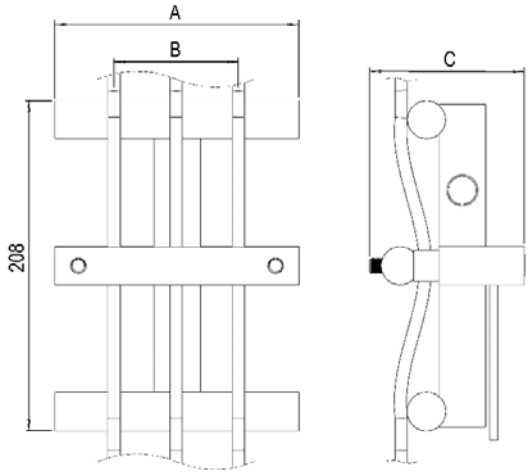
Table 15

Color marking	Function	Designation
Red	Power supply +	(+U_{in})
Black	Power supply -	(-U_{in})
Green / Blue	Output signal +	(+U_{out})
White	Output signal -	(-U_{out})

EOS-R1 load cell

Technical information

№	Parameter name	Value
1	Maximum load (F.S.) on individual load cell	3000 kg (base V1 model)
2	Degree of protection for IEC 60529 (DIN 40050)	IP67
3	Average full-service life, not less than	10 years
4	Upper conversion limit (F.S.) – for a set of 1 load cell	3000 kg (base V1 model)
5	Limits of permissible reduced basic conversion error	± 0.5% (F.S.)
6	Overall dimensions	208x157x103 mm
7	Suitable rope diameter	6-23mm
8	Cable length: From load cell to indicator	2500 mm



Model	R1 (V1)	R1 (V2)	R1 (V3)
A	157	230	306
B	114	187	264
C	103	133	133
Capacity, kg	3000	3000	4500

Figure 23

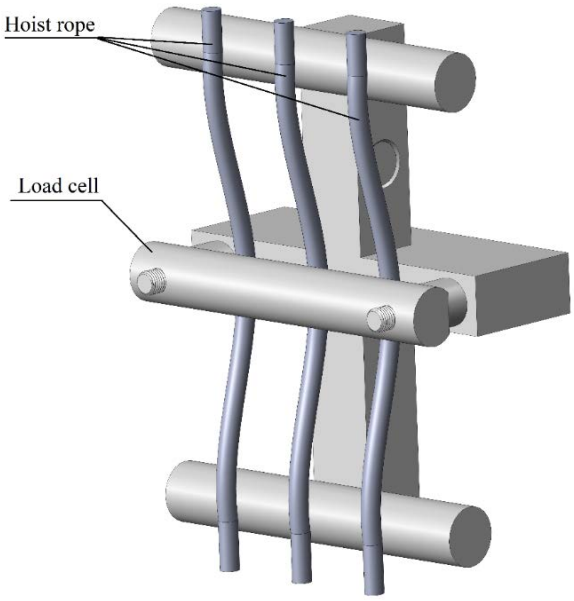


Figure 24

Installation

The location of the load cell on hoist ropes is shown in Figure 24. The recommended minimum distance between the ropes fastening elements and the load cell is 250 mm. The load cells are supplied with a set of 6, 8, 10 and 12 mm height spacers. The height of the spacer is selected to match the required rope diameter, based on the rule that the spacer should be the same height as the rope diameter or up to 2 mm higher than the rope diameter. After choosing and installing needed spacers tighten the mounting bolts of the load cells securely to provide tension of the ropes in load cell as shown in Figure 24 and secure the lead cable. When using load cells with installation in ropes users should provide calibration and setup of indicator when the cabin is in the middle of the elevator shaft.

Wires color marking from load cell (or from junction box for sets of more than 1 load cell) shown in Table 16.

Table 16

Color marking	Function	Designation
Red	Power supply +	(+U_{in})
Black	Power supply -	(-U_{in})
Green / Blue	Output signal +	(+U_{out})
White	Output signal -	(-U_{out})

EOS-W load cell

Technical information

№	Parameter name	Value
1	Maximum load (F.S.) on individual load cell	1000 kg
2	Degree of protection for IEC 60529 (DIN 40050)	IP67
3	Average full-service life, not less than	10 years
4	Upper conversion limit (F.S.) – for a set of 3 load cells	3000 kg
5	Limits of permissible reduced basic conversion error	± 0.5% (F.S.)
6	Overall dimensions	Ø45x20 mm
7	Cable length: From load cell to junction box From junction box to indicator	 1000 mm 5000 mm

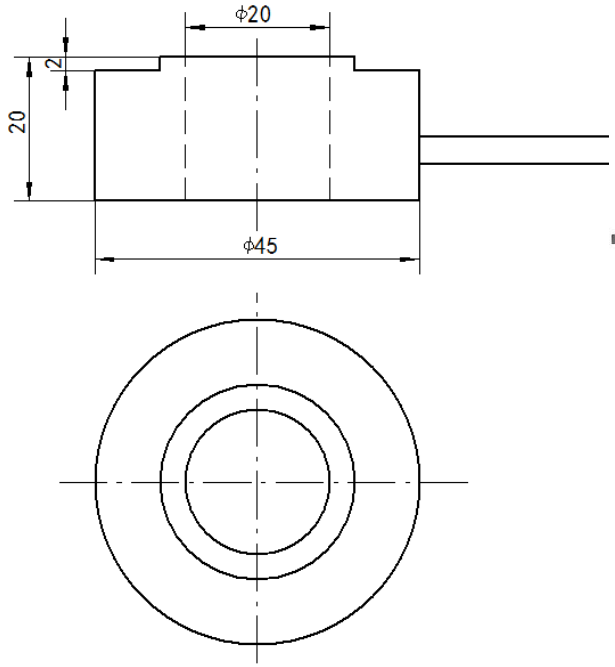


Figure 25

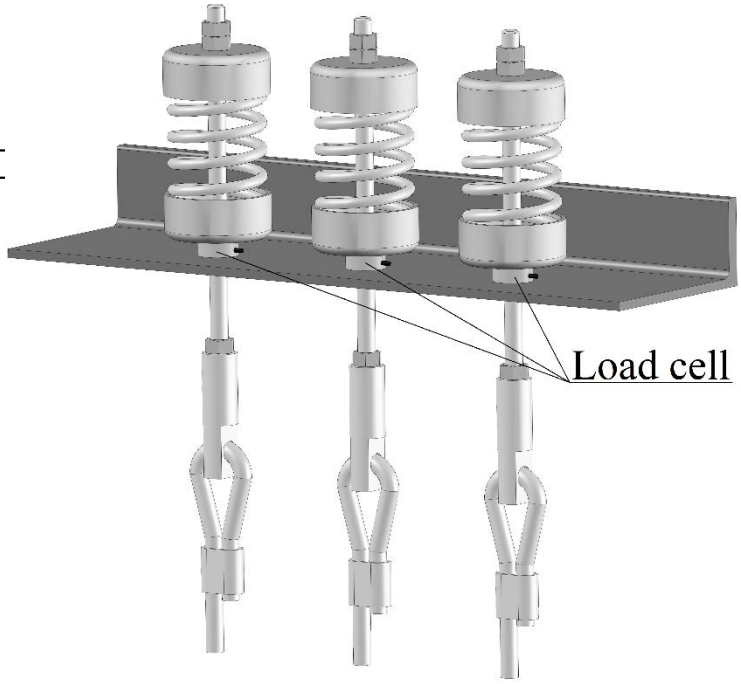


Figure 26

Installation

The location of the load cell under springs is shown in Figure 26.

Secure the elevator cabin and begin installing the load cells under springs one at a time. Release the rope and install the load cells under the spring suspension, an example is shown in the Figure 26. Thread the eye traction bolt into the load cell. Put a set of washers and springs on the bolt. Tighten the nut to equal tension on the ropes and secure the first nut with a second locknut. Proceed further to the next rope and load cell.

Release the elevator cabin onto the load cells, paying attention to the uniform tension of the ropes (weight distribution on the load cells). If the tension of the ropes is uneven, adjust their spring tension with the nuts.

Wires color marking from junction box shown in Table 17.

Table 17

Color marking	Function	Designation
Red	Power supply +	(+U_{in})
Black	Power supply -	(-U_{in})
Green	Output signal +	(+U_{out})
White	Output signal -	(-U_{out})

EOS-W1 load cell

Technical information

№	Parameter name	Value
1	Maximum load (F.S.) on individual load cell	1000 kg
2	Degree of protection for IEC 60529 (DIN 40050)	IP65
3	Average full-service life, not less than	10 years
4	Upper conversion limit (F.S.) – for a set of 4 load cells	4000 kg
5	Limits of permissible reduced basic conversion error	± 0.5% (F.S.)
6	Overall dimensions	Ø40x30x40 mm
7	Cable length: From load cell to junction box From junction box to indicator	 1000 mm 5000 mm

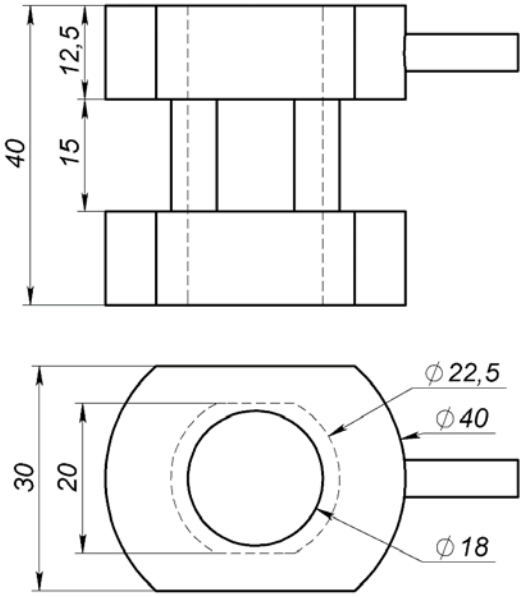


Figure 27

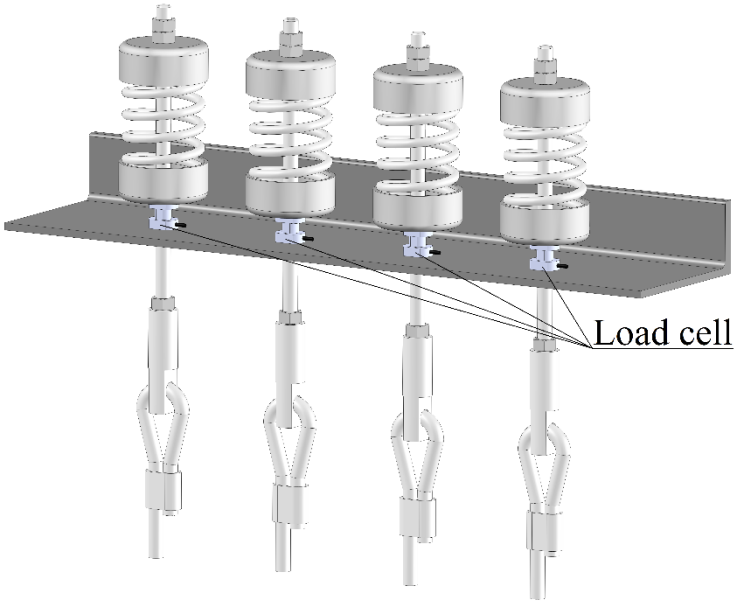


Figure 28

Installation

The location of the load cell under springs is shown in Figure 28.

Secure the elevator cabin and begin installing the load cells under springs one at a time. Release the rope and install the load cells under the spring suspension, an example is shown in the Figure 28. Thread the eye traction bolt into the load cell. Put a set of washers and springs on the bolt. Tighten the nut to equal tension on the ropes and secure the first nut with a second locknut. Proceed further to the next rope and load cell.

Release the elevator cabin onto the load cells, paying attention to the uniform tension of the ropes (weight distribution on the load cells). If the tension of the ropes is uneven, adjust their spring tension with the nuts.

Wires color marking from junction box shown in Table 18.

Table 18

Color marking	Function	Designation
Red	Power supply +	(+U_{in})
Black	Power supply -	(-U_{in})
Green	Output signal +	(+U_{out})
White	Output signal -	(-U_{out})