

### Special features

- Precision “S” beam type sensor
- Mechanical design identical to EMS110 type
- Compression / Tension
- Built-in signal conditioner, 3 versions:
  - Power supply 24 V, voltage output
  - Power supply 24 V, current output
  - Power supply 5 V, voltage output

### General specifications

Rated capacity (F <sub>n</sub> )	0.2, 0.5, 1, 2, 5, 10	kN
Overload		
- Safe	120	% F <sub>n</sub>
- Ultimate	150	% F <sub>n</sub>
- Permanent static load <sup>1</sup>	75	% F <sub>n</sub>
- Dynamic load <sup>1</sup>	50	% F <sub>n</sub>
Max error		
- Non-linearity	0.1	% F.S.
- Hysteresis	0.1	% F.S.
- Creep (30 min)	0.05	% F.S.
Temperature effect		
- On zero	0.15	% F.S./10 °C
- On output	0.15	% F.S./10 °C
Temperature range		
- Nominal	0 ... + 50	°C
- Operating	- 10 ... + 50	°C
Protection	IP54	
Body material		
- Range 0.2 and 0.5 kN	Aluminium	
- Range 1, 2, 5, 10 kN	Stainless steel	
Cable, Type / Length <sup>2</sup>		
- Range 0.2 and 0.5 kN	LifYDY 7 x 0.05 / 2	m
- Range 1, 2, 5, 10 kN	LifYDY 7 x 0.1 / 2	m

Notes:

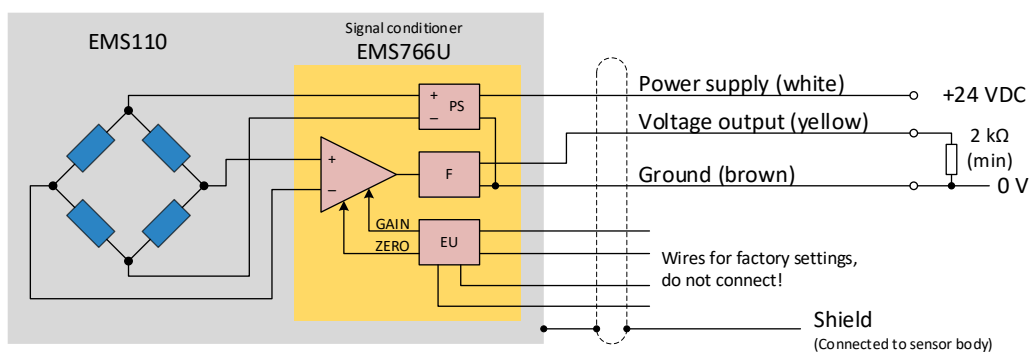
<sup>1</sup> Recommended value

<sup>2</sup> Only 3 wires are accessible, the others are for factory settings used

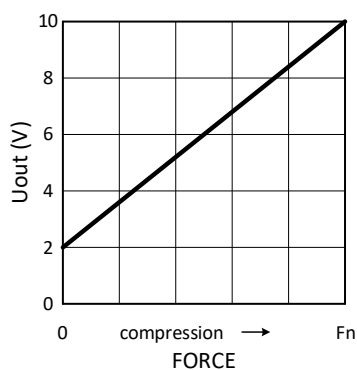
## 1. Power supply 24 V, voltage output

Voltage output		
- Standard	2 ... 10	V
- With zero offset	6 ... $\pm 4$	V
- Customer design (Max range)	0.5 ... 10	V
Min. load impedance	2	k $\Omega$
Output setting tolerance	$\pm 0.1$	V
Power Supply		
- Range	24 $\pm$ 10 %	VDC
- Current consumption (Max)	20	mA

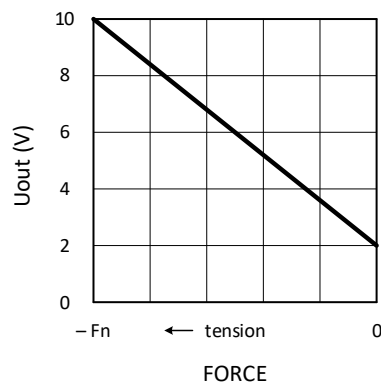
### Wiring diagram



### Output characteristics



Load direction COMPRESSION



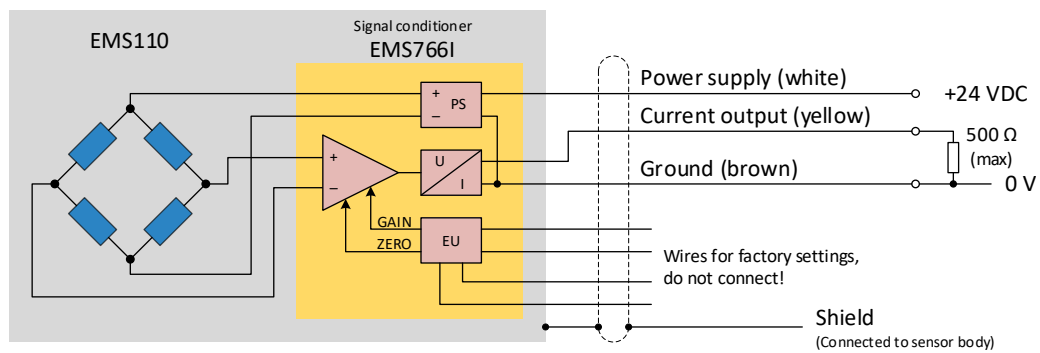
Load direction TENSION

- If the sensor is loaded in both COMPRESSION and TENSION direction, the COMPRESSION direction is taken as positive and the TENSION direction as negative. This means that when the load is applied in the COMPRESSION direction, the output voltage increases. It decreases in the direction of the TENSION. If it is loaded only in the TENSION direction, the output voltage rises with increasing force.

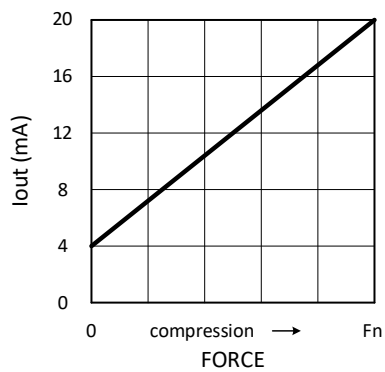
## 2. Power supply 24 V, current output

Current output		
- Standard	4 ... 20	mA
- With zero offset	12 ... $\pm 8$	mA
- Customer design (Max range)	1 ... 20	mA
Max. load impedance	500	$\Omega$
- Output setting tolerance	$\pm 0.2$	mA
Power Supply		
- Range	$24 \pm 10 \%$	VDC
- Current consumption (Max)	40	mA

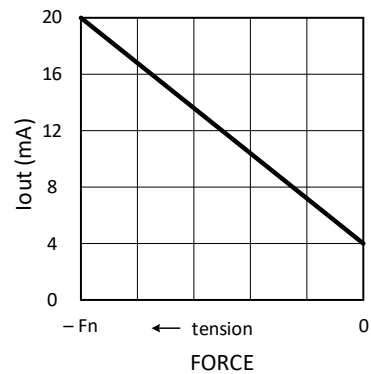
### Wiring diagram



### Output characteristics



Load direction COMPRESSION

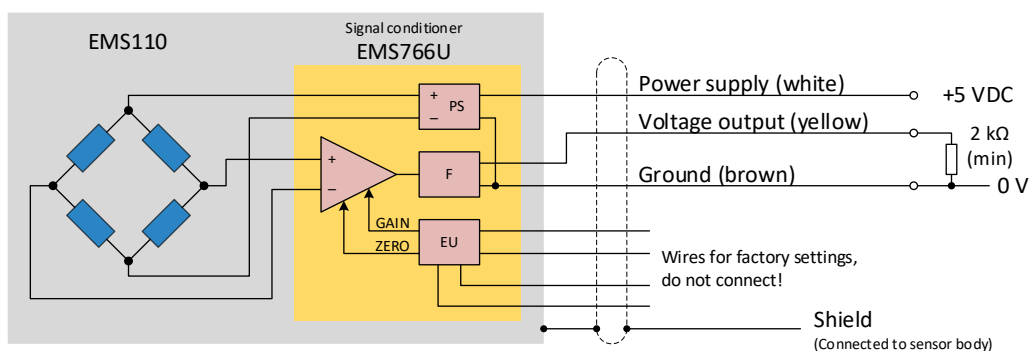


Load direction TENSION

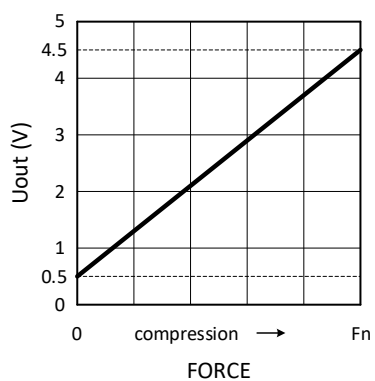
### 3. Power supply 5 V, voltage output

Voltage output		
- Standard	0.5 ... 4.5	V
- With zero offset	2.5 ... $\pm 2$	V
Min. load impedance	2	k $\Omega$
Output setting tolerance	$\pm 0.1$	V
Power Supply		
- Range	$5 \pm 5 \%$	VDC
- Current consumption (Max)	20	mA

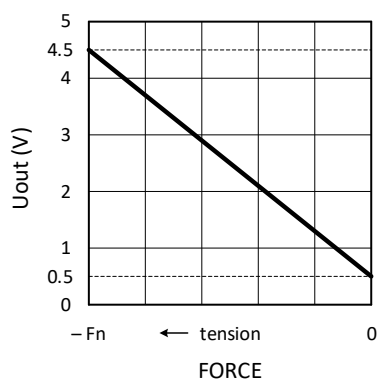
#### Wiring diagram



#### Output characteristics

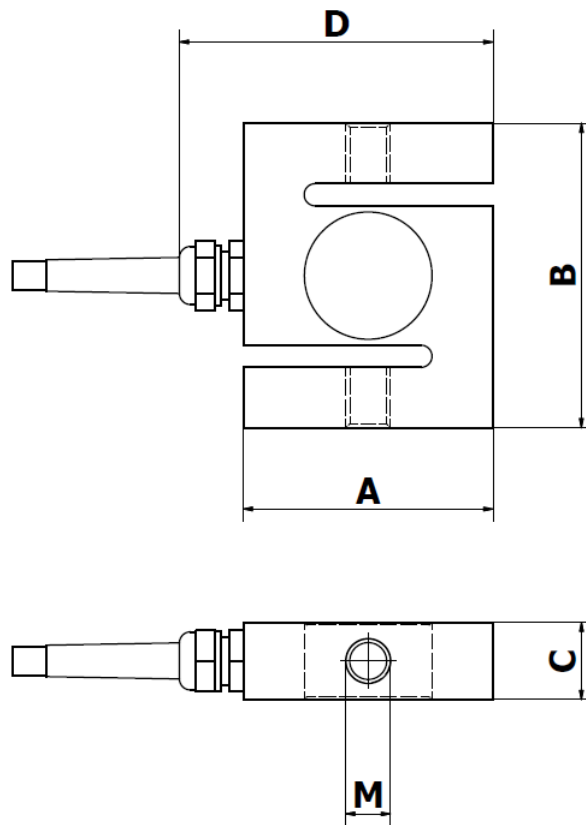


Load direction COMPRESSION



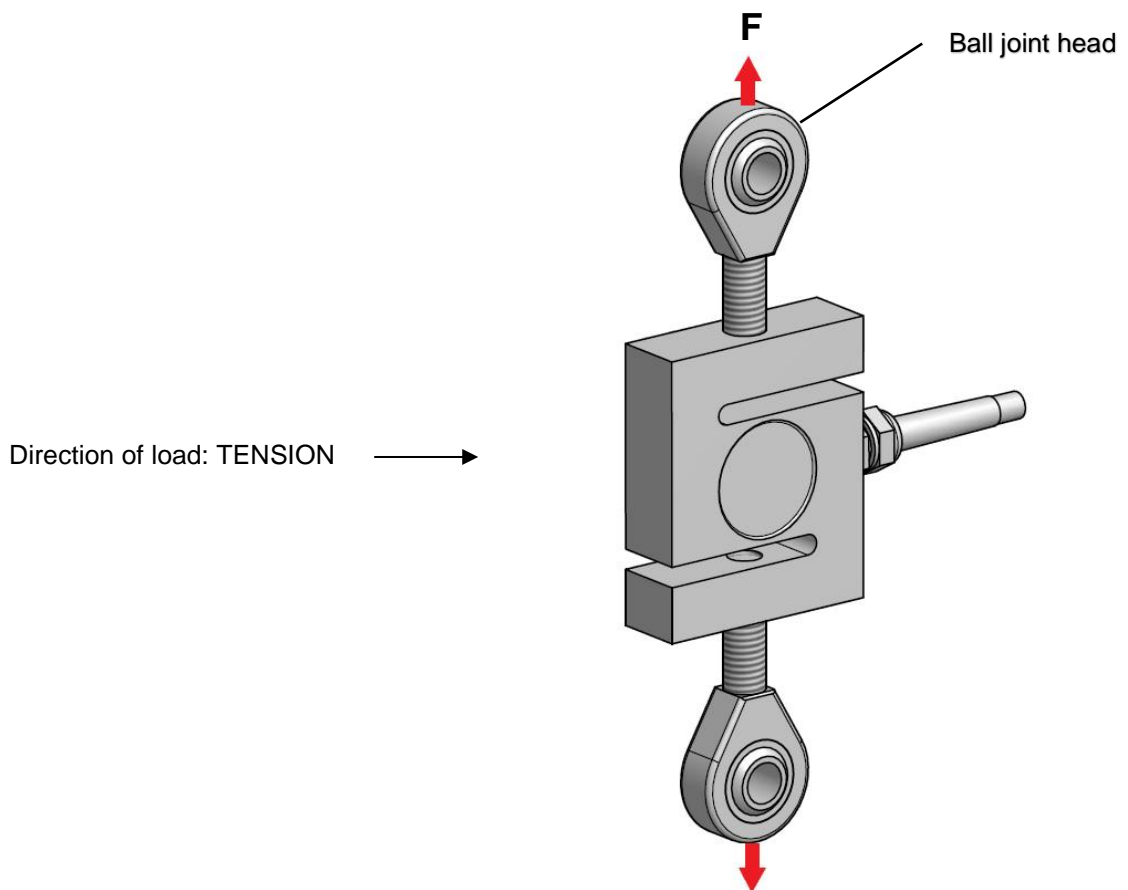
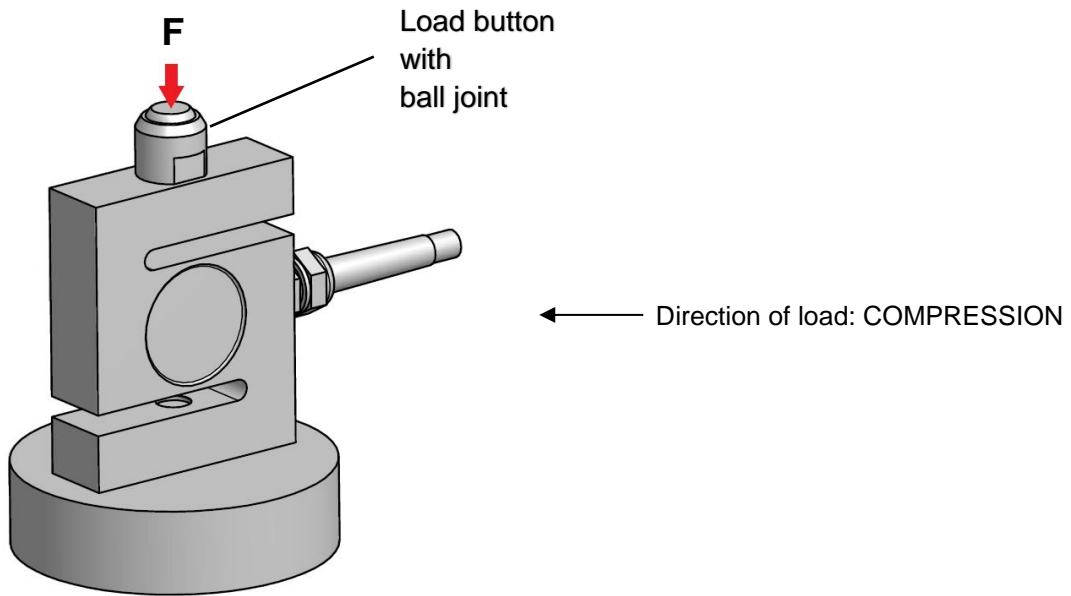
Load direction TENSION

## Outline dimensions



Rated capacity $F_n$ , kN	Dimensions in mm					Weight kg	Deflection @ $F_n$ , $\mu\text{m}$
	A	B	C	D	M		
0.2	45	55	10	55	M6	0.07	0.10
0.5	45	55	14	55	M6	0.10	0.17
1	45	55	14	56	M8	0.30	0.12
2	45	55	18	56	M8	0.38	0.14
5	45	55	24	56	M10	0.50	0.24
10	45	55	20	56	M10	0.40	0.40

## Recommended installation



- *Apply the force exactly in the axis of the sensor.*

## How to order

Common formula for ordering:

**Sensor model – Power supply – Type of output (signal conditioner output range) – Force range – Direction of load**

- Sensor model: **EMS111**
- **Power supply: 24 V / 5 V**
- **Type of output (signal conditioner output range)**

Signal conditioner with power supply 24 V, voltage output:

- Standard:  **$U(2 - 10 V)$**
- Zero shifted:  **$U(2 - 6 - 10 V)$**
- Custom  **$U(\text{Output range})$** 
  - *The permissible customer range is from 0.5 V to 10.0 V.*

Signal conditioner with power supply 24 V, current output:

- Standard:  **$I(4 - 20 mA)$**
- Zero shifted:  **$I(4 - 12 - 20 mA)$**
- Custom  **$I(\text{Output range})$** 
  - *The permissible customer range is from 1 mA to 20 V.*

Signal conditioner with power supply 5 V, voltage output:

- Standard:  **$U(0.5 - 4.5 V)$**
- Zero shifted:  **$U(0.5 - 2.5 - 5 V)$**

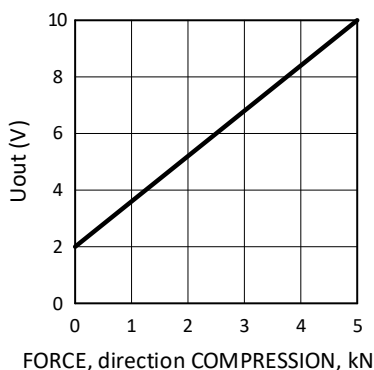
- **Measured force range: 0.2, 0.5, 1, 2, 5, 10 kN**
- **Direction of load:**
  - Direction of load compression only: **Compression**
  - Direction of load tension only: **Tension**
  - Direction of load compression or tension: **Compression / Tension**
    - *If the sensor is loaded in both COMPRESSION and TENSION direction, the COMPRESSION direction is taken as positive and the TENSION direction as negative. This means that when the load is loaded in the COMPRESSION direction, the output voltage increases. It decreases in the direction of the TENSION. If it is loaded only in the TENSION direction, the output voltage rises with increasing force.*

## Examples of orders

- The EMS111 type sensor with a range of 5 kN will be supplied with a voltage of 24 V and loaded in the COMPRESSION direction. A voltage output with a range of 2 to 10V is required.

Sample of order: **EMS111 - 24V - U(2 - 10V) - 5kN - Compression**

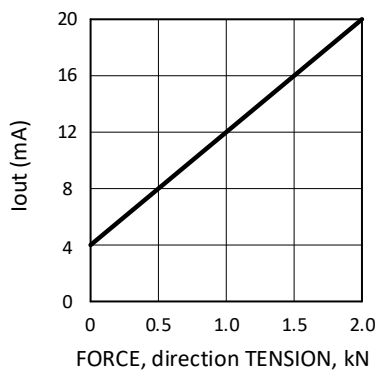
Characteristics:



- The EMS111 type sensor with a range of 2 kN will be supplied with a voltage of 24 V, loaded in the TENSION direction, the output should be current in the range of 4 to 20 mA.

Sample of order: **EMS111 - 24V - I(4 - 20 mA) - 2kN - Tension**

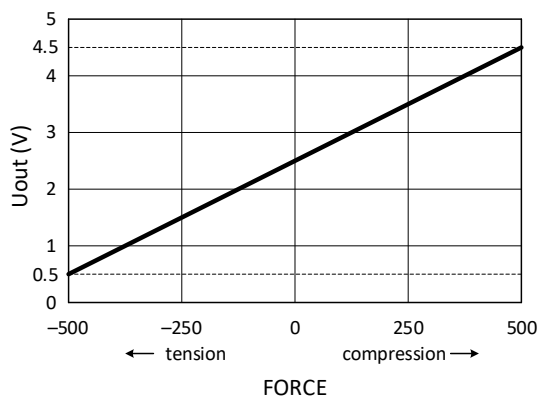
Characteristics:



- The EMS111 sensor with a range of 500 N will be loaded in the direction of COMPRESSION and TENSION. The output should be in the range of 0.5 to 4.5 V, zero shifted to 2.5 V. In this case, the supply voltage can be 5 V (as the output does not exceed 4.5 V) or 24 V.

Sample of order @ 5 V: **EMS111 - 5V - U(0.5 - 2.5 - 4.5 V) - 500 N - Compression/Tension**

Characteristics:

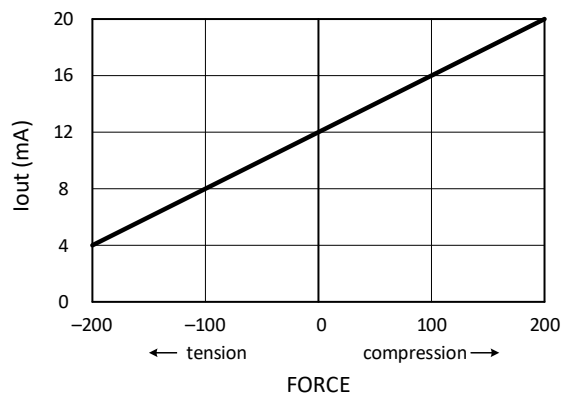




4. The EMS111 sensor with a range of 200 N will be loaded in the direction of COMPRESSION and TENSION. The output should be current in the range of 4 to 20 mA, zero should be shifted to 12 mA, e. g. the output will be symmetrical around 12 mA.

Sample of order: **EMS111 – 24 V – I(4 – 20 mA) – 200 N – Compression/Tension**

Characteristics:



5. The EMS111 type sensor with a range of 5 kN will be loaded in the direction of COMPRESSION and TENSION, the output is defined by the customer. The output should be voltage, in the range of 1 to 5 V, zero should be in the middle, e. g. shifted to 3 V. The supply voltage must be 24 V as the output voltage is greater than 4.5 V.

Sample of order: **EMS111 – 24 V – U(1 – 5 V) – 5 kN – Compression/Tension**

Characteristics:



- Always consult your desired custom output range with the manufacturer.