

# SP4MAC3 – 1...200KG

Célula de carga Single Point

## SP4M...

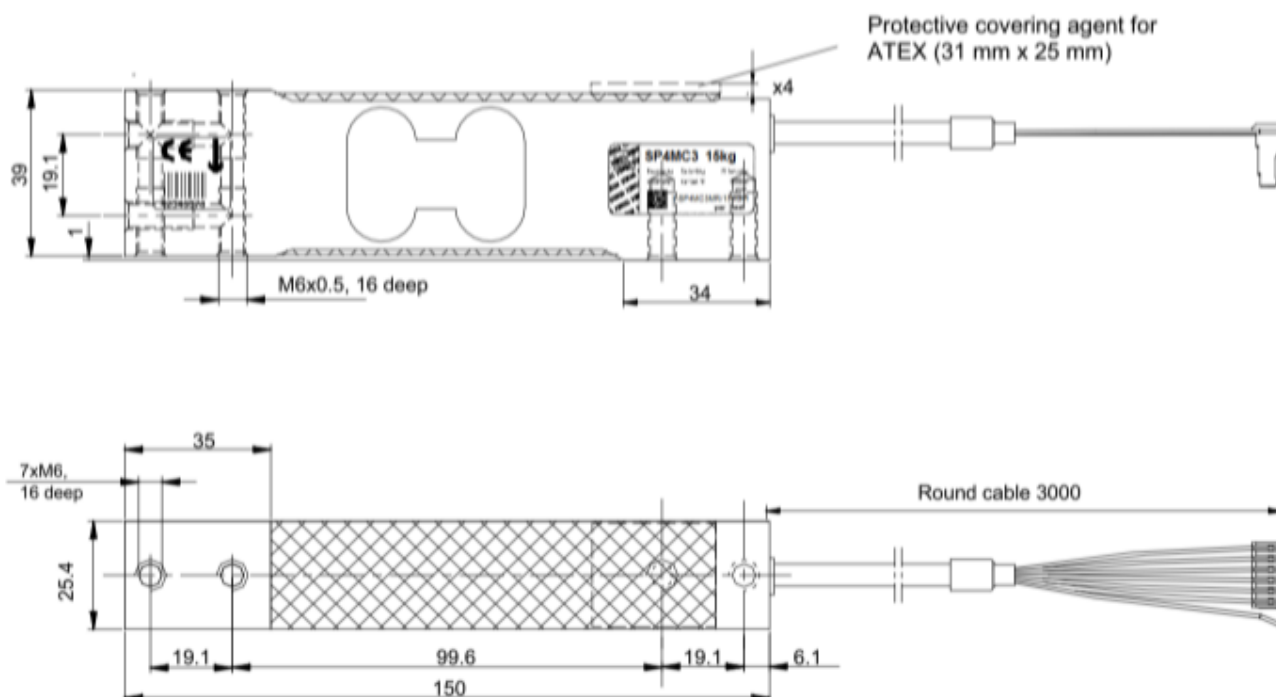
Single point load cells

### Special features

- Maximum capacities: 1 kg ... 200 kg
- Aluminum
- High ratio of minimum verification interval Y
- Off-center load compensation
- Shielded connection cable
- Ex protection designs as per IECEx, ATEX and FM (optional)



Dimensions in mm (1 mm = 0.03937 inches)



## Specifications

Type		SP4M...													
Accuracy class <sup>1)</sup>		C3 Multi Range (MR)													
Number of load cell verification intervals (n <sub>LC</sub> )		3000													
Maximum capacity (E <sub>max</sub> ) <sup>2)</sup>	kg	1	3	5	7	10	15	20	30	50	75	100	150	200	
Minimum load cell verification interval (v <sub>min</sub> )	g	0.1	0.2	0.5	0.5	1	1	2	2	5	5	10	10	20	
Temperature coefficient of zero signal	TC <sub>0</sub> % of C <sub>n</sub> /10 K	±0.0140 +H	±0.0093 +H	±0.0140 +H	±0.0100 +H	±0.0140 +H	±0.0093 +H	±0.0140 +H	±0.0093 +H	±0.0140 +H	±0.0093 +H	±0.0140 +H	±0.0093 +H	±0.0140 +H	
Ratio of minimum verification interval Y	Y	10,000	15,000	10,000	14,000	10,000	15,000	10,000	15,000	10,000	15,000	10,000	15,000	10,000	
Maximum platform size	mm	300 × 300					450 × 450			600 × 600					
Nominal sensitivity Maximum capacity 1 kg Maximum capacities 3 kg...200 kg	C <sub>n</sub> mV/V	1.8 +0.27 -0.18 (Option 6: A1 = 1.8 mV/V±0.1 %) 2.0±0.2 (Option 6: A = 2mV/V±0.1 %)													
Zero signal	mV/V	0 ± 0.1													
Temperature coefficient of sensitivity <sup>3)</sup> Temperature range +20 °C ... +40 °C -10 °C ... +20 °C	TC <sub>S</sub> % of C <sub>n</sub> /10 K	±0.0170 ±0.0110													
Non-linearity <sup>3)</sup>	d <sub>lin</sub>	±0.0166													
Relative reversibility error <sup>3)</sup>	d <sub>hy</sub>	±0.0166													
Minimum dead load output return (MDLOR)	% of C <sub>n</sub>	±0.0166													
Off-center load error <sup>4)</sup> , as per OIML R76		±0.0233													
Input resistance	R <sub>LC</sub> Ω	300...500													
Output resistance	R <sub>0</sub> Ω	300...500 (Option 6: A = 410 Ω ± 0.2 Ω)													
Reference voltage	U <sub>ref</sub> V	5													
Nominal (rated) range of the excitation voltage	B <sub>U</sub> V	1 ... 12													
Max. excitation voltage		15													
Insulation resistance at 100 V <sub>DC</sub>	R <sub>is</sub> GΩ	>2													
Nominal (rated) range of the ambient temperature	B <sub>T</sub> °C	-10 ... +40													
Operating temperature range	B <sub>su</sub> °C	-10 ... +50													
Storage temperature range	B <sub>st</sub> °C	-25 ... +70													
Limit load	E <sub>L</sub> % of E <sub>max</sub>	150													
Limit lateral loading, static	E <sub>sq</sub> % of E <sub>max</sub>	300													
Breaking load	E <sub>d</sub> % of E <sub>max</sub>	300													
Rated displacement at E <sub>max</sub> , approx.	s <sub>nom</sub> mm	< 0.5	< 0.3					< 0.25							
Weight, approx.	m kg	0.45													
Degree of protection <sup>5)</sup>		IP67													
Material: Measuring body Application protection Cable sheath		Aluminum Silicone rubber PVC													

1) As per OIML R60, with P<sub>LC</sub> = 0.7

2) Max. eccentric loading as per OIML R76.

3) If the values for non-linearity (d<sub>lin</sub>), relative reversibility error (d<sub>hy</sub>) and temperature coefficient of sensitivity (TC<sub>S</sub>) are added together, they are within the cumulated error limit specified in OIML R60.

4) As per OIML R76

5) As per EN 60 529 (IEC 529)

## Specifications (continued)

Type			SP4M...												
Accuracy class <sup>1)</sup>			C6 Multi Range (MR)												
Number of load cell verification intervals (n <sub>LC</sub> )			6000												
Maximum capacity <sup>2)</sup>	E <sub>max</sub>	kg	7	10	15	18	20	30	36	50	75	100	150	200	
Minimum load cell verification interval	V <sub>min</sub>	g	0.5	0.5	1	1	1	2	2	2	5	5	10	10	
Temperature coefficient of zero signal	TC <sub>0</sub>	% of C <sub>n</sub> /10 K	0.0100 +H	-0.0070 +H	-0.0093 +H	-0.0070 +H	-0.0070 +H	-0.0093 +H	-0.0070 +H	-0.0056 +H	-0.0093 +H	-0.0070 +H	-0.0093 +H	-0.0070 +H	
Ratio of minimum verification interval Y	Y		14,000	20,000	15,000	18,000	20,000	15,000	18,000	25,000	15,000	20,000	15,000	20,000	
Max. platform size		mm	300 x 300			450 x 450				600 x 600					
Nominal sensitivity	C <sub>n</sub>	mV/V	2.0 ±0.2			1.8 ±0.18	2.0 ±0.2		2.4 ±0.2	2 ±0.2	2 ±0.2	2 ±0.2	2 ±0.2	2 ±0.2	
Zero signal			0 ±0.10												
Temperature coefficient of sensitivity <sup>3)</sup> Temperature range: +20 ... +40 °C -10 ... +20 °C	TC <sub>S</sub>	% of C <sub>n</sub> /10 K							±0.0087 ±0.0058						
Relative reversibility error <sup>3)</sup>	d <sub>hy</sub>	% of C <sub>n</sub>							±0.0083						
Non-linearity <sup>3)</sup>	d <sub>lin</sub>								±0.0083						
Minimum dead load output return (MDLOR)									±0.0083						
Off-center load error <sup>4)</sup>									±0.0116						

1) As per OIML R60, with P<sub>LC</sub> = 0.7

2) Max. eccentric loading as per OIML R76.

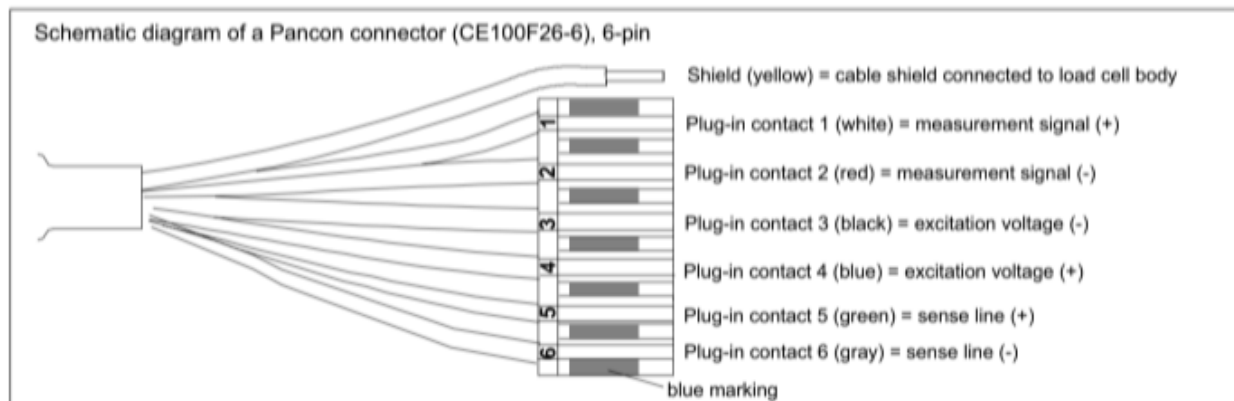
3) The values for non-linearity (d<sub>lin</sub>), relative reversibility error (d<sub>hy</sub>) and temperature coefficient of sensitivity (TC<sub>S</sub>) are recommended values. If these values are added together, they are within the cumulated error limit specified in OIML R60.

4) As per OIML R76

For further specifications, see Table SP4M..., Accuracy class C3 Multi Range (MR) (page 2)

## Cable assignment

6-wire cable connection (24 AWG, available cable lengths: 1.5 m; 3 m; 6 m; 12 m)



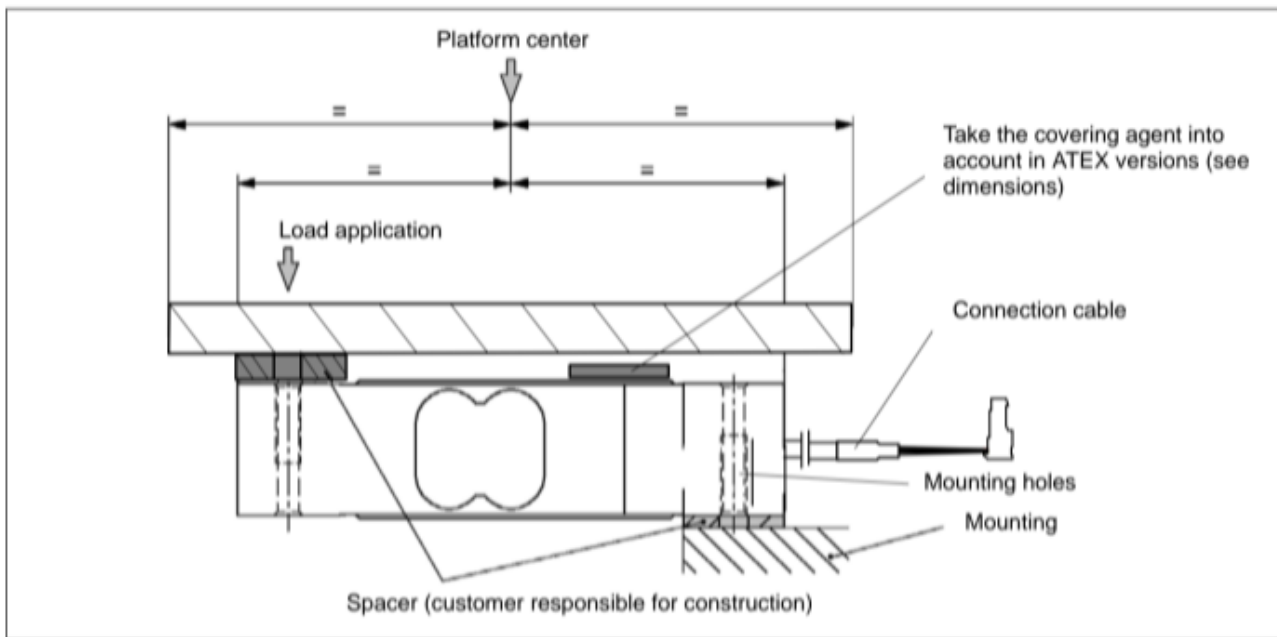
## Mounting and load application

The load cells are firmly clamped at the mounting holes, the load is applied at the other end. The recommended screws and tightening torques can be found in the table below:

Maximum capacities	Thread	Min. property class	Tightening torque <sup>1)</sup>
1...36 kg	M6	8.8	6 N·m
50...200 kg	M6	10.9	14 N·m

1) Recommended value for the specified property class. Please comply with the screw manufacturer's instructions with regard to screw dimensions.

Load must not be applied to the side where the cable connection is located, as this would cause a force shunt.



## Product numbers (overview)

### SP4M... (aluminum)

Type	SP4M	
Accuracy class	C3-MR (OIML) (Multi Range)	C6-MR (OIML) (Multi Range)
Comments	Cable length 3 m (6-wire)	Cable length 3 m (6-wire)
Maximum capacity [kg]	Ordering number	Ordering number
1	1-SP4MC3MR/1KG-1	-
3	1-SP4MC3MR/3KG-1	-
5	1-SP4MC3MR/5KG-1	-
7	1-SP4MC3MR/7KG-1	1-SP4MC6MR/7KG-1
10	1-SP4MC3MR/10KG-1	1-SP4MC6MR/10KG-1
15	1-SP4MC3MR/15KG-1	1-SP4MC6MR/15KG-1
18	-	1-SP4MC6MR/18KG-1
20	1-SP4MC3MR/20KG-1	-
30	1-SP4MC3MR/30KG-1	-
36	-	1-SP4MC6MR/36KG-1
50	1-SP4MC3MR/50KG-1	1-SP4MC6MR/50KG-1
75	1-SP4MC3MR/75KG-1	1-SP4MC6MR/75KG-1
100	1-SP4MC3MR/100KG-1	1-SP4MC6MR/100KG-1
150	1-SP4MC3MR/150KG-1	1-SP4MC6MR/150KG-1
200	1-SP4MC3MR/200KG-1	1-SP4MC6MR/200KG-1

**SP4M... (aluminum), optional versions**

Ordering number
<b>K-SP4M</b>

Code	Option 1: Mechanical design
<b>N</b>	-

Code	Option 2: Accuracy class
<b>C3MR</b>	C3-MR (OIML) (Multi Range)
<b>C6MR</b>	C6-MR (OIML) (Multi Range) [only with Option 3 = 20 / 30]

Code	Option 3: Maximum capacity	Code	Option 3: Maximum capacity
<b>1</b>	1 kg	<b>30</b>	30 kg
<b>3</b>	3 kg	<b>50</b>	50 kg
<b>5</b>	5 kg	<b>75</b>	75 kg
<b>7</b>	7 kg	<b>100</b>	100 kg
<b>10</b>	10 kg	<b>150</b>	150 kg
<b>15</b>	15 kg	<b>200</b>	200 kg
<b>20</b>	20 kg		

Code	Option 4: Explosion protection
<b>N</b>	no explosion protection
<b>A11/21</b>	IECEX+ATEX Zone 1/21+FM, intrinsically safe II2G Ex ia IIC T6/T4 Gb/II2G Ex ia IIIC T125°C Db [only with Option 2 = C3MR]
<b>A12/22</b>	IECEX+ATEX Zone 2/22, not intrinsically safe II3G Ex nA IIC T6/T4 Gc/II3D Ex tc IIIC T125°C Dc [only with Option 2 = C3MR]

Code	Option 5: Cable length
<b>1.5</b>	1.5 m [only with Option 2 = C3MR]
<b>3</b>	3 m
<b>6</b>	6 m [only with Option 2 = C3MR]
<b>12</b>	12 m [only with Option 2 = C3MR]

Code	Option 6: Other
<b>N</b>	none
<b>A</b>	2mV/V ±0,1% / 410 Ω ±0,2 Ω [only with Option 2 = C3MR, Option 3 = 1] (adjusted output, suitable for parallel connection)
<b>A1</b>	1.8mV/V ±0.1% / 410 Ω ±0.2 Ω [only with Option 2 = C3MR, only with Option 3 = 1] (adjusted output, suitable for parallel connection)

<b>K-SP4M</b>	-	<b>N</b>	-																
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Not all codes can be combined with one another. Take note of the conditions in square brackets!