



## C16A...

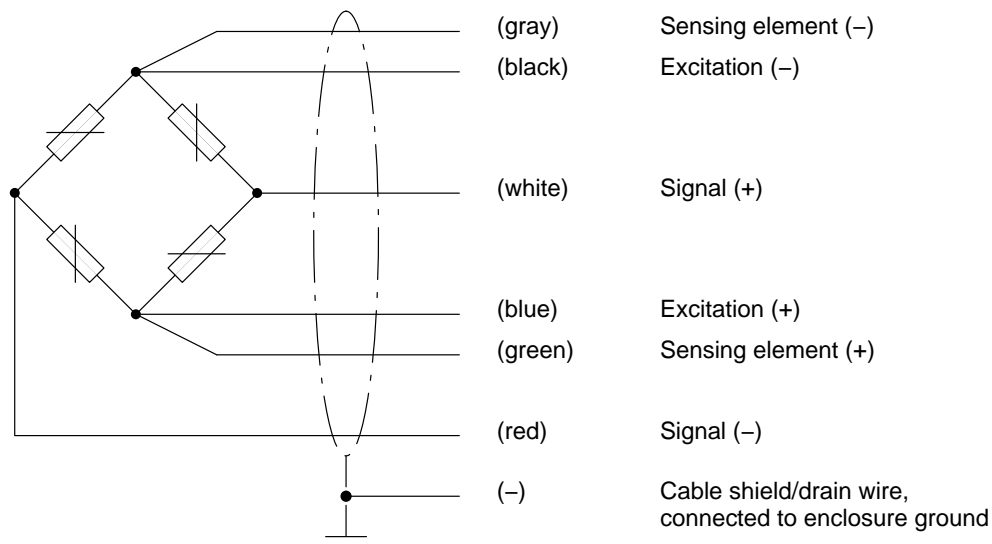
### Self-restoring pendulum load cell

#### Special features

- Self-restoring function
- Maximum capacities: 20 t ... 100 t
- Simple installation
- Rust-resistant materials, laser-welded, IP68/IP69K
- Legal for trade
  - up to 5000 d (OIML R60)
  - up to 10000 d (NTEP class III LM)
- Optimized for parallel connection by off-center load compensation
- Meets EMC requirements as per EN 45 501:2015
- Ex protection versions per ATEX and IECEx, FM and EAEU

#### Cable assignment

Cable assignment (6-wire configuration):



## Specifications

Type		C16A D1					C16A C3					C16A C4	
		20 t	30 t	40 t	60 t	100 t	20 t	30 t	40 t	60 t	100 t	30 t 40 t	60 t
Maximum capacity ( $E_{max}$ )													
Accuracy class according to OIML R60		D1 (0.0330 %)					C3 (0.0170 %)					C4	
Number of load cell verification intervals ( $n_{LC}$ )		1000 (10000 NTEP III LM)					3000					4000	
Minimum load cell verification interval ( $v_{min}$ )	% of $E_{max}$	0.0200 (0.0068 NTEP III LM)					0.0100	0.0083	0.0167	[Option: 0.0050]			
Nominal (rated) sensitivity ( $C_n$ )	mV/V	2											
Sensitivity tolerance <sup>1)</sup>	%	$\pm 0.5$ <sup>1)</sup>											
Temperature coefficient of sensitivity ( $TC_S$ ) <sup>2)</sup>	% of $C_n/10$ K	$\pm 0.0250$ <sup>2)</sup>					$\pm 0.0080$ <sup>2)</sup>					$\pm 0.0070$ <sup>2)</sup>	
Temperature coefficient of zero signal ( $TC_0$ )		$\pm 0.0285$					$\pm 0.0140$	$\pm 0.0116$	$\pm 0.0234$	$\pm 0.0140$	$\pm 0.0116$		
Relative reversibility error ( $d_{hy}$ ) <sup>2)</sup>	% of $C_n$	$\pm 0.0330$ <sup>2)</sup>					$\pm 0.0170$ <sup>2)</sup>					$\pm 0.0140$	
Non-linearity ( $d_{lin}$ ) <sup>2)</sup>		$\pm 0.0300$ <sup>2)</sup>					$\pm 0.0180$ <sup>2)</sup>					$\pm 0.0120$	
Creep upon loading ( $d_{cr}$ ) over 30 min.		$\pm 0.0330$					$\pm 0.0167$					$\pm 0.0125$	
Minimum dead load output return (DR), 30 min.		$\pm 0.0330$ ( $\pm 0.0150$ NTEP III LM)					$\pm 0.0167$					$\pm 0.0125$	
Repeatability error (max. change in load cell output for repeated loading)		$\pm 0.005$											
Input resistance ( $R_{LC}$ ) (black-blue)	$\Omega$	700 $\pm 20$											
Output resistance ( $R_0$ ) <sup>1)</sup> (red-white)		706 $\pm 3.5$ <sup>1)</sup>											
Reference excitation voltage ( $U_{ref}$ )	V	5											
Nominal (rated) range of the excitation voltage ( $B_U$ )		0.5 ... 12											
Insulation resistance ( $R_{is}$ )	G $\Omega$	> 5											
Nominal (rated) range of the ambient temperature ( $B_T$ )	$^{\circ}C$	-10 ... +40											
Operating temperature range ( $B_{tu}$ )		-50 ... +70											
Storage temperature range ( $B_{tl}$ )		-50 ... +85											
Limit load ( $E_L$ )	% of $E_{max}$	150											
Breaking load ( $E_d$ )		> 350											
Relative permissible oscillatory stress ( $F_{srel}$ ) (oscillation bandwidth as per DIN 50100 with 10,000,000 load changes)		70											
Maximum capacity ( $E_{max}$ )		20 t	30 t	40 t	60 t	100 t							
Deflection at $E_{max}$ ( $s_{nom}$ ), approx.	mm	0.65	0.75	0.85	1.22	1.57							
Weight (G) with cable, approx.	kg	2.1	2.3	2.9	3.7	8							
Degree of protection per EN60529 (IEC529)		IP68 (test conditions 2 m water column/1000 h) IP69 K (water at high pressure, steam jet cleaning)											
Material: Measuring body + housing Cable entry Seal Cable sheath		stainless steel <sup>3)</sup> stainless steel <sup>4)</sup> ( $E_{max}$ 100 t: nickel-plated brass) Viton <sup>®</sup> ( $E_{max}$ 100 t: silicone) thermoplastic elastomer											

<sup>1)</sup> Because of the off-center load compensation, the sensitivity and output resistance are matched in such a way that when there is eccentric loading, the scale display is within the permissible error limits.

<sup>2)</sup> The values for non-linearity ( $d_{lin}$ ), relative reversibility error ( $d_{hy}$ ) and temperature coefficient of sensitivity ( $TC_S$ ) are recommended values. The sum of these values is within the cumulated error limit for  $p_{LC} = 0.7$  according to OIML R60 or NTEP.

<sup>3)</sup> As per EN 10088-1

## Options for C16A

- **Ex protection versions per IECEx, ATEX, and FM**

AI1/21 IECEx+ATEX zone 1/21 + FM intrinsically safe, II 2G Ex ia IIC T6/T4 Gb, II 2D Ex ia IIIC T125°C Db\*  
AI2/21\*\* IECEx+ATEX zone 2/21 not intrinsically safe, II 3G Ex nA IIC T6/T4 Gc, II 2D Ex tb IIIC T125°C Db\*

\* with EU type examination certificate (BVS13ATEX E 108 X) and IECEx Certificate of Conformity (IECEx BVS 13.0109 X)

\*\* IECEx zone 2/21 includes option ATEX2/22 and also offers the additional customer benefit of usage with conductive dust as well.

- **Ex protection versions per EAC (Eurasian economic union with the member states: Russia, Belarus, Armenia, Kazakhstan, Kyrgyzstan)**

R1/21 EAEU zone 1/21 TR ZU 012/2011 Ex certificate, 1 Ex ia IIC T6/T4 Gb X / Ex ia IIIC T125°C Db X\*\*\*  
R2/21 EAEU zone 2/21 TR ZU 012/2011 Ex certificate, 2 Ex ia IIC T6/T4 Gc X / Ex tb IIIC T125°C Db X\*\*\*

\*\*\* with certificate "СЕРТИФИКАТ СООТВЕТСТВИЯ № ТС RU С-ДЕ.ГБ08.В.01138"

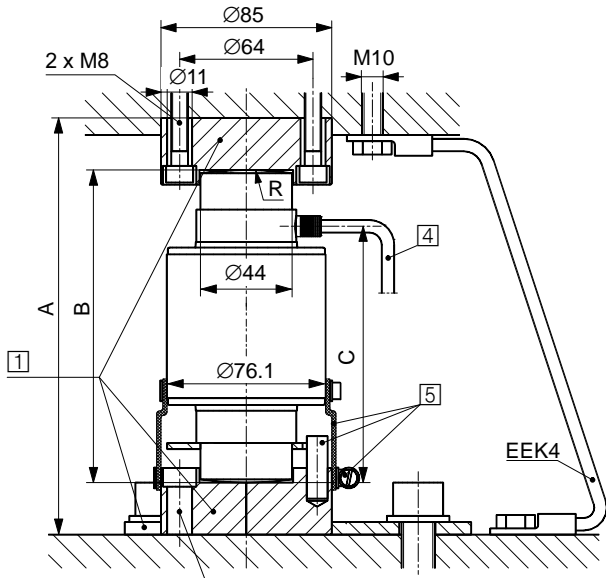
- **Ex protection in "flameproof enclosure Ex d" version, see separate data sheet**
- **Overvoltage protection**
- $v_{min} = 0.0050\%$  ( $Y=20000$ )
- **Accuracy class C5 (OIML) on request**
- **Cable length 20 m ( $E_{max} = 20 \text{ t} + 30 \text{ t}$ ) / • Cable length 40 m ( $E_{max} = 20 \text{ t} \dots 100 \text{ t}$ )**
- **20 m cable with braided wire ( $E_{max} = 20 \text{ t} \dots 100 \text{ t}$ )**

# Dimensions and fittings for maximum capacities 20 t ...60 t

Dimensions in mm (1 mm = 0.03937 inches)

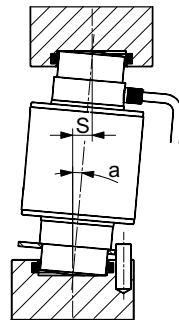
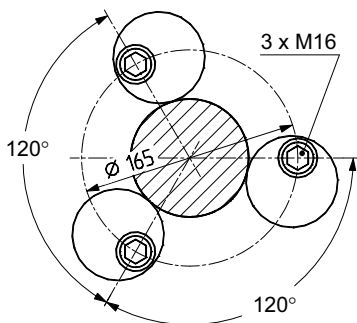
## Installation variant 1:

C16.../≤60 t + C16/ZOU44A (max. load per load cell = 40 t)



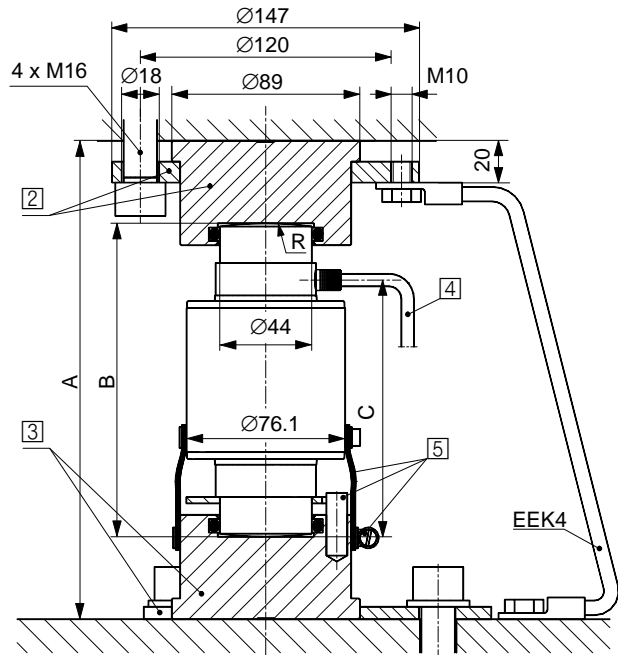
Fastening bolt shown rotated by 90°

### View from above



## Installation variant 2:

C16.../≤60 t + EPO3/50 t + C16/EPU44A



- 1 C16/ZOU44A
- 2 EPO3/50 t
- 3 C16/EPU44A
- 4 **Cable length (standard):**  
20 t + 30 t = 12 m;  
40 t + 60 t = 20 m
- 5 Dowel pin  $\varnothing 10 \times 30$  (rotation stop),  
sealing sleeve and hose clamp included in  
load cell scope of supply

Cable:  
 $\varnothing 5.4$  mm (standard)  
 $\varnothing 6.4$  mm with braided wire option (20R)

Installation variant 1	$E_{max}$ C16...	Thrust pieces above + below (1 set = 2 pieces)		A	B	C	R Ball	$a_{max}^{2)}$	$S_{max}^{3)}$	$F_R^{4)}$ (% of applied load)	
										at $S_{max}$	at $S = 1$ mm
Installation variant 1	20 t	C16/ZOU44A 1)		200	150	123	130	5°	13	6.4	0.49
	30 t			200	150	123	160	5°	13	9.9	0.76
	40 t			200	150	123	180	5°	13	12.2	0.94
	60 t			260	210	157	220	3°	11	5.7	0.52
Installation variant 2	$E_{max}$ C16...	Thrust pieces above   below		A	B	C	R Ball	$a_{max}^{2)}$	$S_{max}^{3)}$	$F_R^{4)}$ (% of applied load)	
										at $S_{max}$	at $S = 1$ mm
Installation variant 2	20 t	EPO3/50 t	C16/EPU44A	229	150	123	130	5°	13	6.4	0.49
	30 t			229	150	123	160	5°	13	9.9	0.76
	40 t			229	150	123	180	5°	13	12.2	0.94
	60 t			289	210	157	220	3°	11	5.7	0.52

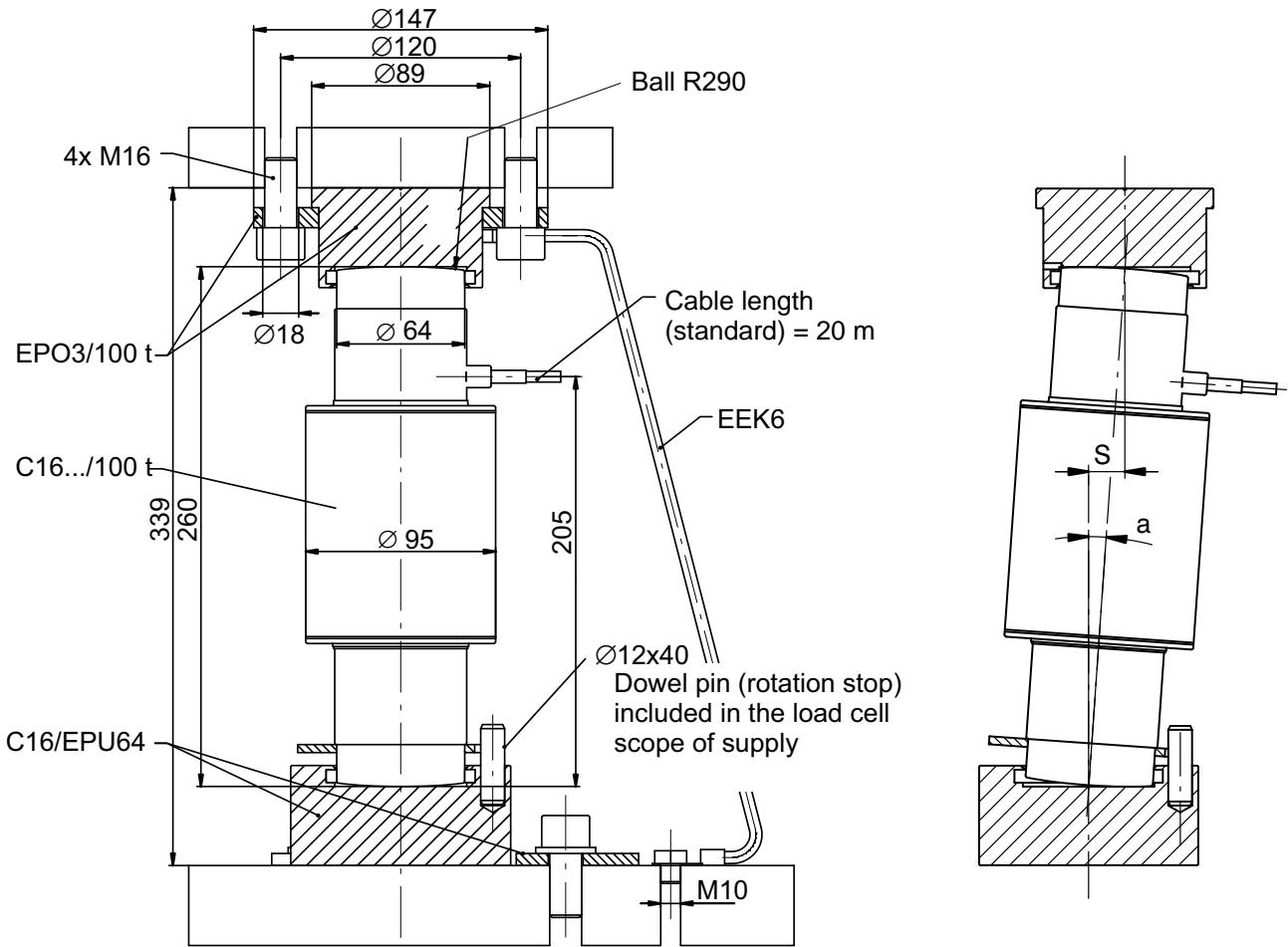
1) Max. load: 40 t  
 2) Max. perm. misalignment

3) Max. permissible lateral displacement of load application  
 4) Restoring force

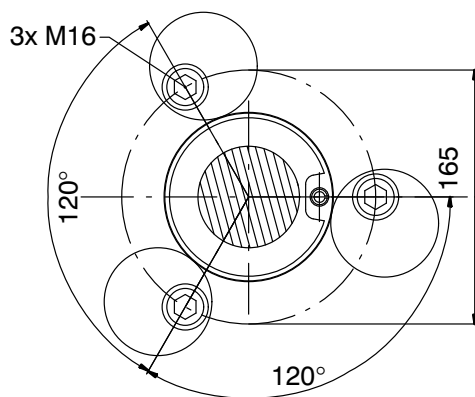
# Dimensions and fittings for 100 t maximum capacity

**C16.../100 t + EPO3/100 t + C16/EPU64**

Dimensions in mm (1 mm = 0.03937 inches)



**View from above**



$a_{max}$ (max. perm. misalignment)	$S_{max}$ (max. permissible lateral displacement of load application)	$F_R$ (restoring force, % of applied load)	
		at $S_{max}$	at $S = 1$ mm
4°	18	8.6	0.48

**Other available maximum capacities: 200 t and 400 t (see separate data sheet)**

## Accessories (to be ordered separately)

### Thrust pieces

#### Maximum capacities 20 t ... 60 t - Installation variant 1:

- **C16/ZOU44A** Thrust pieces (stainless) for above and below (1 set = 2 pieces), can be used with C16.../≤60 t up to a max. load per load cell of 40 t, incl. 3 eccentric discs

#### Maximum capacities 20 t ... 60 t - Installation variant 2:

- **EPO3/50 t** Thrust piece for above, incl. clamping ring
- **C16/EPU44A** Thrust piece for below, incl. 3 eccentric discs

#### Maximum capacity 100 t:

- **EPO3/100 t** Thrust piece for above, incl. clamping ring
- **C16/EPU64** Thrust piece for below, incl. 3 eccentric discs

#### Ground cable (copper), cross-section: 16 mm<sup>2</sup>

- **EEK4** for maximum capacities 20 t ... 60 t, length 400 mm, ordering number: 1-EEK4
- **EEK6** for maximum capacities 100 t + 200 t, length 600 mm, ordering number: 1-EEK6

## Product numbers

C16A load cells			
Type	C16A(D1)	C16AC3	C16AC4
Accuracy class	D1 (OIML) / III LM (NTEP)	C3 (OIML)	C4 (OIML)
Comments	-	-	-
Maximum capacity	Ordering number	Ordering number	Ordering number
20 t	1-C16A2D1/20T-1	1-C16A3C3/20T-1	
30 t	1-C16A2D1/30T-1	1-C16A3C3/30T-1	1-C16A2C4/30T
40 t	1-C16A2D1/40T-1	1-C16A3C3/30T/L2-1*	1-C16A2C4/40T
60 t	1-C16A2D1/60T	1-C16A2C3/60T	1-C16A2C4/60T
100 t	1-C16A2D1/100T	1-C16A2C3/100T	
200 t	1-C16A2D1/200T		
400 t	1-C16A2D1/400T		

\* With 20 m cable length and overvoltage protection


# C16A load cells, optional versions

Ordering number
<b>K-C16A2</b>

Code	Option 1: Mechanical design
<b>S</b>	Standard

Code	Option 2: Accuracy class
<b>D1</b>	D1 (OIML)
<b>C3</b>	C3 (OIML) [only with option 3 = 20 / 30 / 40 / 60 / 100]
<b>C4</b>	C4 (OIML) [only with option 3 = 30 / 40 / 60]
<b>C5</b>	C4 (OIML) [only with option 3 = 30 / 40 / 60] (on request)

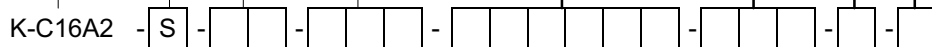
Code	Option 3: Maximum capacity
<b>20</b>	20 t [only with option 2 = D1 / C3]
<b>30</b>	30 t [only with option 2 = D1 / C3 / C4 / (C5 on request)]
<b>40</b>	40 t [only with option 2 = D1 / C3 / C4 / (C5 on request)]
<b>60</b>	60 t [only with option 2 = D1 / C3 / C4 / (C5 on request)]
<b>100</b>	100 t [only with option 2 = D1 / C3]
<b>200</b>	200 t [only with option 2 = D1 and option 6 = N]
<b>400</b>	400 t [only with option 2 = D1 and option 6 = N]

Code	Option 4: Explosion protection
<b>N</b>	no ATEX
<b>AI1/21</b>	IECEX + ATEX 1/21 and FM 
<b>AI2/21</b>	IECEX + ATEX zone 2/21
<b>R1/21</b>	EAEU zone 1/21
<b>R2/21</b>	EAEU zone 2/21

Code	Option 5: Cable length
<b>S12</b>	12 m (standard) [only with option 3 = 20 / 30]
<b>S20</b>	20 m (standard) [only with option 3 = 40 / 60 / 100 / 200]
<b>20</b>	20 m [only with option 3 = 20 / 30]
<b>40</b>	40 m
<b>20R</b>	20 m (braided wire) [only with option 3 = 20 / 30 / 40 / 60]

Code	Option 6: Overvoltage protection
<b>N</b>	None
<b>L</b>	With overvoltage protection

Code	Option 7: Other
<b>N</b>	None
<b>Y</b>	Y=20000 [only with option 2 = C3 + option 3 = 30/40/60]



Subject to modifications.  
All product descriptions are for general information  
only. They are not to be understood as a guarantee  
of quality or durability.

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