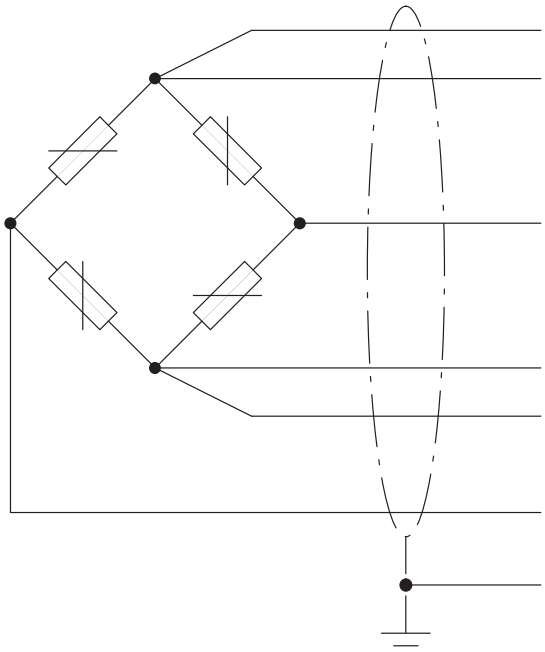
DATA SHEET

C16A...
Self-centering pendulum load cell

SPECIAL FEATURES

- Self-restoring function
- Maximum capacities: 20 t ... 100 t
- Easy installation
- Stainless materials, laser welded, IP68/IP69K
- Legal for trade
  - up to 5000 d (OIML R60)
  - 3000 d NMIA (Australia)
- Optimized for parallel connection
- Explosion protection versions as per ATEX, IECEx and FM (US/CA)

CABLE ASSIGNMENT (6-WIRE CONFIGURATION)



(gray)	Sensing element (-)
(black)	Bridge excitation voltage (-)
(white)	Signal (+)
(blue)	Bridge excitation voltage (+)
(green)	Sensing element (+)
(red)	Signal (-)
(-)	Cable shield / drain wire, connected to enclosure ground

SPECIFICATIONS

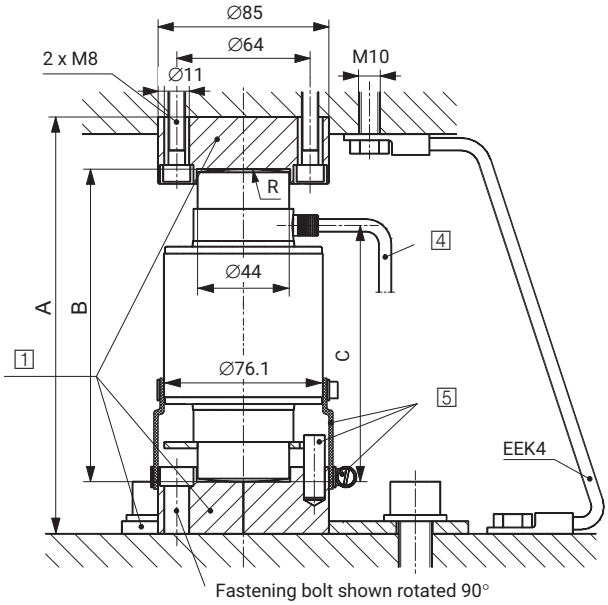
Type			C16A													
Accuracy class (OIML R60)			**D1**					**C3**					**C4**		**C5**	
Number of load cell verification interval	n_{LC}		1000					3000[1]					4000		5000	
Maximum capacity	E_{max}	t	20	30	40	60	100	20	30	40	60	100	30; 40	60	30; 40	60
Minimum load cell verification interval of the load cell	v_{min}	% of E_{max}	0.0200					0.0100			0.0083	0.0167	0.0100	0.0083	0.0100	0.0083
								[Option: 0.0050]								
Ratio of minimum verification interval	Y		5000					10000			12000	5988	10000	12000	10000	12000
								[Option: 20,000]								
General specifications																
Rated output (nominal)	C_n	mV/V	2													
Rated output tolerance[2]		%	±0.5[2]													
Temperature coefficient of the rated output[3]	TC_S	% of C_n / 10 K	±0.0250[3]					±0.0080[3]					±0.0070[3]		±0.0060[3]	
Temperature coefficient of zero signal	TC_0		±0.0285					±0.0140			±0.0116	±0.0234	±0.0140	±0.0116	±0.0140	±0.0116
Relative reversibility error[3]	d_{hy}	% of C_n	±0.0330[3]					±0.0170[3]					±0.0140		±0.0120	
Non-linearity[3]	d_{lin}		±0.0300[3]					±0.0180[3]					±0.0120		±0.0100	
Creep upon loading over 30 min.	d_{cr}		±0.0330					±0.0167					±0.0125		±0.0100	
Minimum dead load output return, 30 min.	DR		±0.0330 (±0.0150 NTEP III LM)					±0.0167					±0.0125		±0.0100	
Repeatability error (max. variation in the load cell output with repeat loading)			±0.005													
Input resistance (black-blue)	R_{LC}	Ω	700 ±20													
Output resistance[2] (red-white)	R_0		706 ±3.5[2]													
Reference excitation voltage	U_{ref}	V	5													
Nominal (rated) range of the excitation voltage	B_U		0.5 ... 12													
Insulation resistance	R_{is}	GΩ	> 5													
Nominal (rated) range of the ambient temperature	B_T	°C	-10 ... +40													
Operating temperature range	B_{tu}		-50 ... +70													
Storage temperature range	B_{tl}		-50 ... +85													

Accuracy class (OIML R60)			D1	C3	C4	C5
Limit load	E_L	% of E_{max}	150			
Breaking load	E_d		> 350			
Relative permissible oscillatory stress (oscillation width (peak-to-peak) as per DIN 50100 with 10,000,000 loading cycles)	F_{srel}		70			

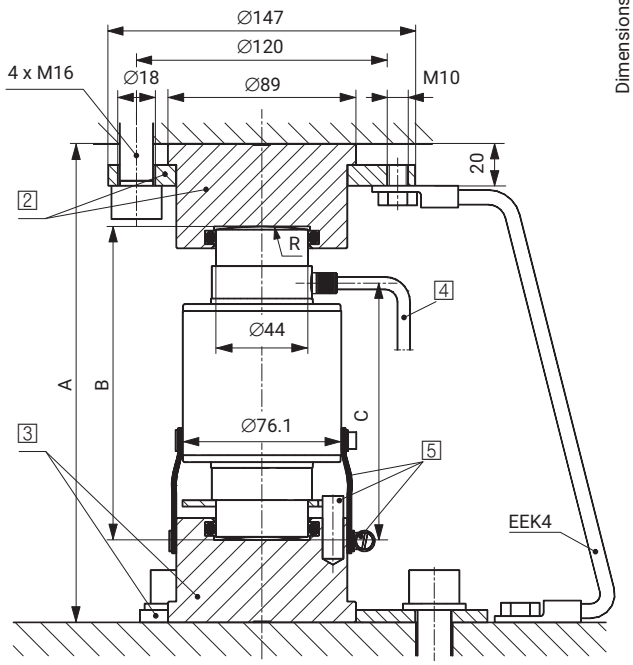
Maximum capacity	E_{max}	t	20	30	40	60	100
Rated displacement at E_{max}, approx.	s_{nom}	mm	0.65	0.75	0.85	1.22	1.57
Weight with cable, approx.	G	kg	2.1	2.3	2.9	3.7	8
Degree of protection per EN60529 (IEC529)			IP68 (test conditions 2 m water column /10,000 h) IP69 K (water at high pressure, steam cleaning)				
Material Measuring body Housing Cable entry Seal Cable sheath			Stainless steel[4)] 20 t to 60 t: 1.4404; 100 t: 1.4301 Stainless steel[4)] (for E_{max} = 100 t: Nickel-plated brass) Viton® (for E_{max} = 100 t: silicone) Thermoplastic elastomer				

1) Load cells of accuracy class OIML C3 come with an additional label for the Australian market (No. S370)
2) 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 (mpe).
3) 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 accumulated error limit for p_{LC} = 0.7 as per OIML R60 or NTEP.
4) As per EN 10088-1

Installation variant 1:
C16.../≤60 t + C16/ZOU44A
(max. load per load cell = 40 t)

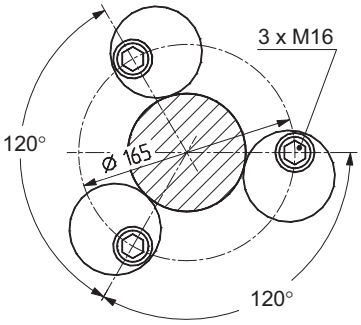


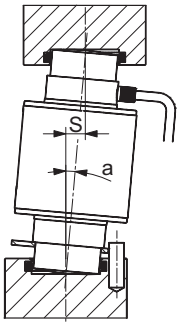
Installation variant 2:
C16.../≤60 t + EPO3/50 t + C16/EPU44A



Dimensions in mm

View from above





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 Ø10 x 30 (rotation stop), sealing sleeve and hose clamp included in load cell scope of supply

Cable:
Ø 5.4 mm (standard)
Ø 6.4 mm with braided wire option (20R)

Installation variant 1	E_{max} C16...	Thrust pieces top + bottom (1 set = 2 pieces)	A	B	C	R ball	a_{max} 2)	S_{max} 3)	F_R 4) (% of applied load) at S_{max}	F_R 4) (% of applied load) at S = 1 mm
	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

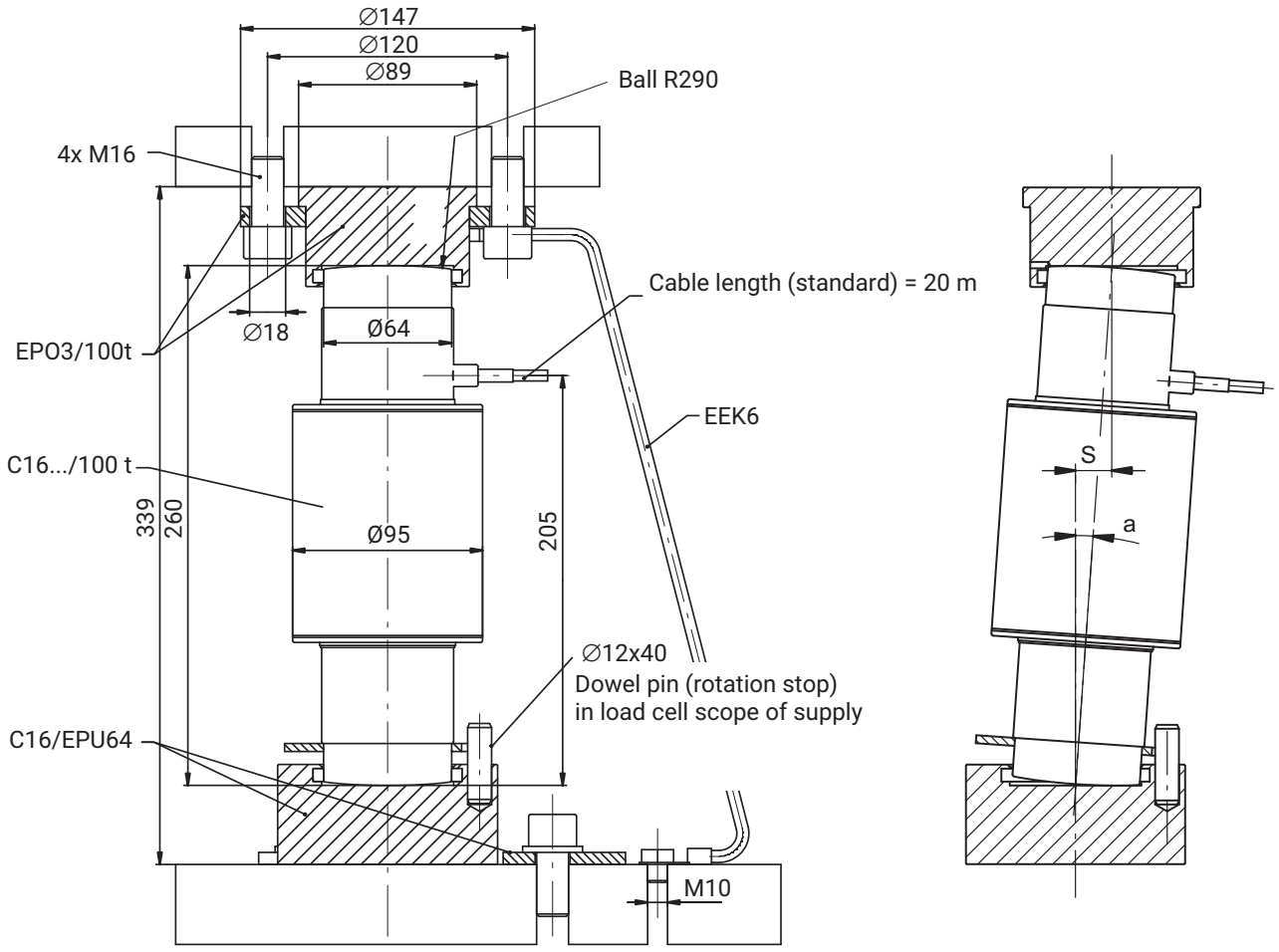
Installation variant 2	E_{max} C16...	Thrust pieces top	Thrust pieces bottom	A	B	C	R ball	a_{max} 2)	S_{max} 3)	F_R 4) (% of applied load) at S_{max}	F_R 4) (% of applied load) at S = 1 mm
	20 t	**EPO3/50 t**	**C16/EPU44 A**	229	150	123	130	5°	13	6.4	0.49
	30 t			229	150	123	160	5°	13	9.9	0.76
	40 t			229	150	123	180	5°	13	12.2	0.94
	60 t			289	210	157	220	3°	11	5.7	0.52

1) Max. loading: **40 t**
2) Max. allowed misalignment
3) Max. allowed lateral displacement of load application
4) Restoring force

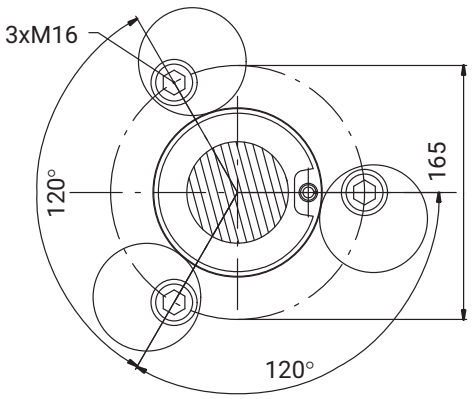
DIMENSIONS AND LOADING FITTINGS FOR MAXIMUM CAPACITY 100 T

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

Dimensions in mm



View from above



a_{max} Max. allowed misalignment	S_{max} Max. allowed 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)

OPTIONS FOR C16A

- Explosion protection versions as per ATEX, IECEx and FM (US/CA)

  AI1/21 ATEX+IECEx+FM Zone 1/21, intrinsically safe;
  - ATEX/IECEx: II 2G Ex ia IIC T6/T4 Gb + II 2D Ex ia IIIC T125°C Db;
  - FM(US/CA): Class I Zone 1 AEx/Ex ia IIC T4 Gb + Zone 21 AEx/Ex ia IIIC T125°C Db;
  - FM(US): Class I, II, III Division 1, Groups A, B, C, D, E, F, G T4

  AI2/21 ATEX+IECEx Zone 2/21, not intrinsically safe;
  - ATEX/IECEx: II 3G Ex ec IIC T6/T4 Gc + II 2D Ex tb IIIC T125°C Db
- Overvoltage protection
- Minimum load cell verification interval ($v_{min)}$ = 0.0050 % (Y=20000)
- Accuracy class C5 (OIML) on request
- Cable length 20 m (maximum capacity ($E_{max)}$ = 20 t + 30 t) / • Cable length 40 m (maximum capacity ($E_{max)}$ = 20 t ... 100 t)
- 20 m cable with braided wire (maximum capacity ($E_{max)}$ = 20 t ... 60 t)

PRODUCT NUMBERS

When placing an order please specify the ordering numbers from the tables. If you need other versions (accuracy classes, explosion protection, other cable lengths or materials, overvoltage protection, etc.) for the available products, please look in the overview:" C16A load cells, optional versions". You can generate a specific ordering number there from your individual requirements.

Accuracy class	**D1 (OIML)**	**C3 (OIML)**			**C4 (OIML)**
Version	Standard	Standard	With overvoltage protection	With braided wire cable	Standard
Replaces configurable options			Option 6 (code L)	Option 5 (code 20R)	
Maximum capacities	**Ordering number**	**Ordering number**			**Ordering number**
20t	1-C16A3D1/20T/NN-1	1-C16A3C3/20T-1	1-C16A3C3/20T/L-1	-	-
30t	1-C16A3D1/30T/NN-1	1-C16A3C3/30T-1	1-C16A3C3/30T/L-1 1-C16A3C3/30T/L2-1*	1-C16A3C3/30T/L2R	1-C16A3C4/30T/L-1
40t	1-C16A2D1/40T/NN-1	1-C16A2C3/40T-1	1-C16A2C3/40T/L-1	1-C16A2C3/40T/L2R	1-C16A2C4/40T
60t	1-C16A2D1/60T/NN	1-C16A2C3/60T	-	-	1-C16A2C4/60T
100t	1-C16A2D1/100T/NN	1-C16A2C3/100T	-	-	-

* With cable length 20 m and overvoltage protection

Cable lengths

Maximum capacities 20 t and 30 t: 12 m cable standard
maximum capacities 40 t to 100 t: 20 m cable standard

ACCESSORIES (TO BE ORDERED SEPARATELY)

C16 load corner

Type	C16A	
Accuracy class	C3 (OIML)	
Ordering number	Standard	With overvoltage protection
Maximum capacity	**Ordering number**	**Ordering number**
20 t	1-C16A3C3/20T/CO	1-C16A3C3/20T/L/CO
30 t	1-C16A3C3/30T/CO	1-C16A3C3/30T/L/CO
40 t	1-C16A2C3/40T/CO	1-C16A2C3/40T/L/CO

Each order for the C16A load corner includes a C16A load cell with accuracy class C3 and rack mount kit 1-C16/ZOU44A3.

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. loading per load cell of 40 t, incl. 3 eccentric disks
- Maximum capacities 20 t ... 60 t - installation variant 2:
  - **EPO3/50t** Thrust piece for above, incl. clamping ring
  - **C16/EPU44A** Thrust piece for below, incl. 3 eccentric disks
- Maximum capacity 100 t:
  - **EPO3/100t** Thrust piece for above, incl. clamping ring
  - **C16/EPU64** Thrust piece for below, incl. 3 eccentric disks

Maximum capacity	20 t ... 60 t		100 t
Version	Installation variant 1	Installation variant 2	
Ordering number	1-C16/ZOU44A3	1-EPO3/50T	1-EPO3/100T
		1-C16/EPU44A	1-C16/EPU64

C16A LOAD CELLS, OPTIONAL VERSIONS

Ordering number
K-C16A2

Code	Option 1: Mechanical design
S	Standard

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

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

Code	Option 4: Explosion protection	
N	No explosion protection	
AI1/21	ATEX + IECEx + FM zone 1/21	[only with option 6 = N]
AI2/21	ATEX + IECEx zone 2/21	

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

Code	Option 6: Overvoltage protection
N	None
L	With overvoltage protection

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

K-C16A2 - S - □□ - □□□ - □□□□□□ - □□□ - □ - □

Not all codes can be combined with one another. Take note of the conditions in square brackets!

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