

# HLC A1 ..., HLC B1 ... Load cells

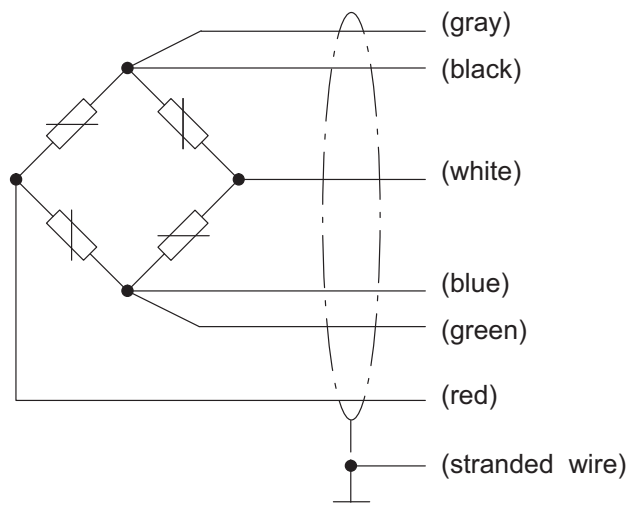
## SPECIAL FEATURES

- Maximum capacities: 110 kg ... 10 t
- Hermetically encapsulated (IP68)
- Rust-resistant materials
- Low height of construction
- Legal for trade per OIML R60 to 6000 divisions
- Legal for trade per NTEP (USA) III M5000
- Explosion protection versions as per ATEX and IECEx, FM (US/CA)

precix 6



## CABLE ASSIGNMENT (SIX-WIRE CONFIGURATION)



Sensing element (-)

Excitation (-)

Signal (+)

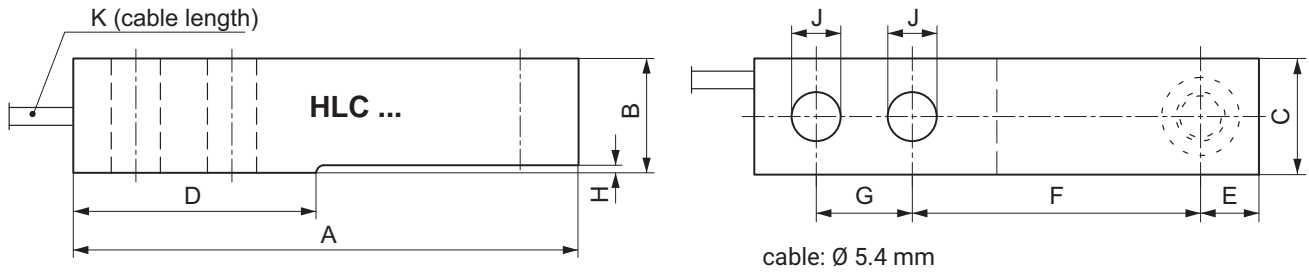
Excitation (+)

Sensing element (+)

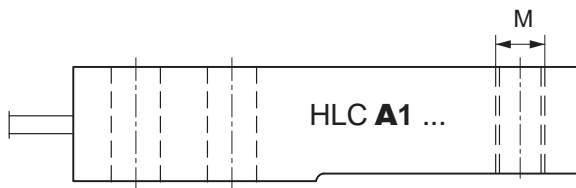
Signal (-)

Cable shield connected to enclosure ground

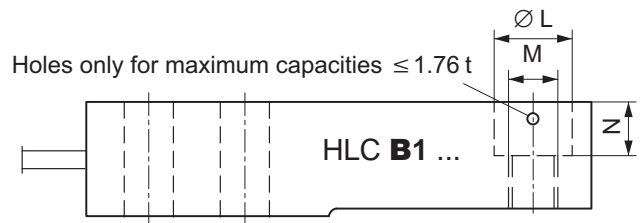
## DIMENSIONS (IN MM; 1 MM = 0.03937 INCHES)



**HLC A1...**  
(220 kg; 550 kg; 1.1 t; 1.76 t; 2.2 t; 4.4 t)



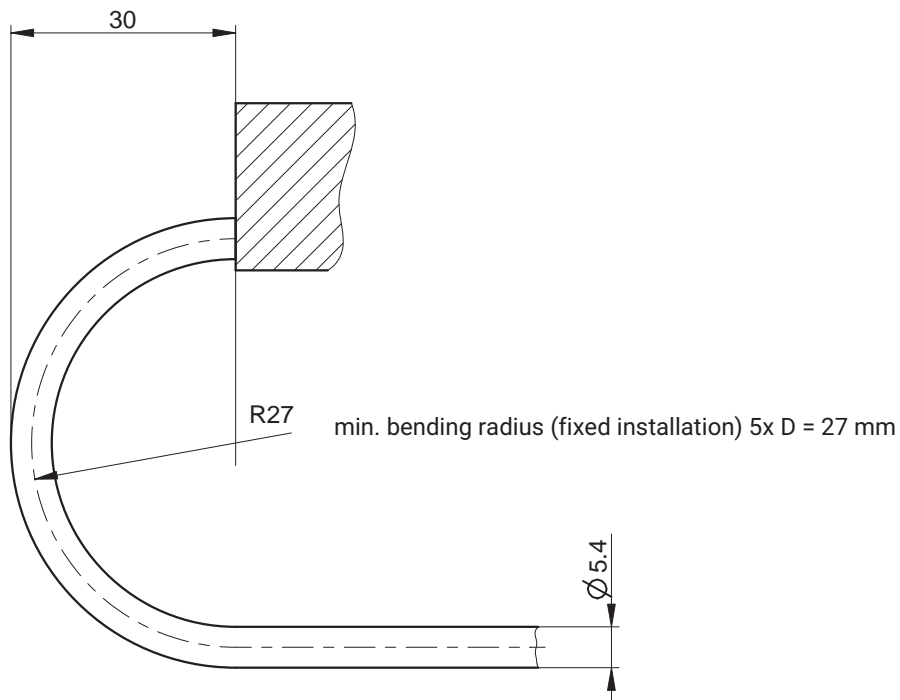
**HLC B1...**  
(110 kg; 220 kg; 550 kg; 1.1 t; 1.76 t; 2.2 t; 4.4 t; 10 t)





Maximum capacity	A	B	C	D	E	F	G	H	J	K	ØL	M	N
<b>110 kg; 220 kg; 550 kg; 1.1 t</b>	133.4	30.2	30.7	57.7	15.4	76.2	25.4	1.7	13	3 m	20.6	M12	14.2
<b>1.76 t</b>	133.4	30.2	30.7	51.7	15.4	76.2	25.4	1.7	13	3 m	20.6	M12	14.2
<b>2.2 t<sup>1)</sup></b>	171.5	36.5	36.8	76.2	19.1	95.3	38.1	2.5	20.5	6 m	30.2	M20	17.0
<b>4.4 t<sup>1)</sup></b>	171.5	42.9	42.9	76.2	19.1	95.3	38.1	2.5	20.5	6 m	30.2	M20	20.1
<b>10 t<sup>2)</sup></b>	245.1	72.9	60	119.9	30.2	134.9	50±0.05	11.2	27	6 m	51+0.2	Ø32	20

1) Maximum capacities 2.2 t and 4.4 t only for HLC A1 ... + HLC B1 ...  
2) Maximum capacity 10 t only for HLC B1 D1 ...

## CONNECTION DIMENSIONS OF THE CABLE (FOR STATIONARY USE)



## SPECIFICATIONS

<b>Type HLC A1 ...</b> Maximum capacity ( $E_{max}$ )  (Load application = tapped through hole)		<b>HLC A1 D1 / ... + HLC A1 C3 / ...</b> 220 kg; 550 kg; 1.1 t; 1.76 t; 2.2 t; 4.4 t					
<b>Type HLC B1 ...</b> Maximum capacity ( $E_{max}$ )  (Load application = sinking + tapped hole) <sup>1)</sup>		<b>HLC B1 D1 / ...</b> 110 kg; 220 kg; 550 kg; 1.1 t; 1.76 t; 2.2 t; 4.4 t; 10 t <b>HLC B1 C3 / ...</b> 110 kg; 220 kg; 550 kg; 1.1 t; 1.76 t; 2.2 t; 4.4 t <b>HLC B1 C4 / ... + HLC B1 C6 / ...</b> 220 kg; 550 kg; 1.1 t					
<b>Accuracy class per OIML R60</b> <b>Number of load cell verification intervals</b>		$n_{LC}$	$n_{LC}$	<b>D1</b> 1000	<b>C3</b> 3000	<b>C4</b> <sup>2)</sup> 4000	<b>C6</b> <sup>2)</sup> 6000
<b>Minimum load cell verification interval</b>		$v_{min}$	% of $E_{max}$	0.0285	0.0100 (220 kg; 1.76 t; 2.2 t; 4.4 t) 0.0090 (110 kg, 550 kg; 1.1 t)		
<b>Y value</b>		Y		3500	10000 (220kg; 1,76 t; 2,2 t; 4,4 t) 11111 (110 kg; 550 kg; 1,1 t)		
<b>Accuracy class per NTEP IIIM (only for type HLC B1 ...)</b>							
<b>Number of load cell verification intervals</b>		$n_{LC}$			5000		
<b>Maximum capacity</b>		$E_{max}$	kg		110; 220; 550; 1100; 1760; 2200		
<b>Minimum load cell verification interval</b>		$v_{min}$	% of $E_{max}$		$E_{max} / 9700$ $E_{max} / 12125$ (550kg)		
<b>General specifications</b>							
<b>Nominal (rated) sensitivity</b>		$C_N$	mV/V	1.94 (10 t = 2.00 mV/V)			
<b>Sensitivity tolerance</b>			%	±0.5	±0.1		
<b>Temperature coefficient of zero signal</b>		$TC_0$	% of $C_n / 10\text{ K}$	±0.0400	±0.0140 (220 kg; 1.76 t; 2.2 t; 4.4 t) ±0.0126 (110 kg; 550 kg; 1.1 t)		
<b>Temperature coefficient of sensitivity</b> <sup>3)</sup>		$TC_s$		±0.0420	±0.0140	±0.0105	±0.0070
<b>Relative reversibility error</b> <sup>3)</sup>		$d_{hy}$	% of $C_n$	±0.0500	±0.0166	±0.0125	±0.0083
<b>Non linearity</b> <sup>3)</sup>		$d_{lin}$		±0.0500	±0.0170	±0.0166	
<b>Creep upon loading over 30 min.</b>		$d_{cr}$		±0.0500	±0.0166	±0.0166	±0.0122
<b>Minimum dead load output return</b>		MDLOR		±0.0500	±0.0166	±0.0125	±0.0083
<b>Input resistance</b>		$R_{LC}$	$\Omega$	350 ... 480			
<b>Output resistance</b>		$R_0$		350 ±2	350 ±0.12		
<b>Reference voltage</b> <sup>4)</sup>		$U_{ref}$	V	5			
<b>Nominal (rated) supply voltage range</b> <sup>4)</sup>		$B_U$		0.5 ... 15 (Ex versions max. 12 V !!!)	5 ... 10		
<b>Insulation resistance</b>		$R_{is}$	G $\Omega$	>5			
<b>Nominal (rated) ambient temperature range</b> <sup>4)</sup>		$B_T$	°C	-10 ... +40	-10 ... +40		
<b>Operating temperature range</b> <sup>4)</sup>		$B_{tu}$		-30 ... +70			
<b>Storage temperature range</b>		$B_{tl}$		-50 ... +85			
<b>Limit load</b>		$E_L$		150			
<b>Limit lateral loading</b>		$E_{lq}$	% of $E_{max}$	100			
<b>Breaking load</b>		$E_d$		300			
<b>Relative perm. vibrational stress (oscillation width per DIN 50100)</b>		$F_{srel}$		70			
<b>Nominal (rated) displacement at <math>E_{max}</math>, approx.</b>		$s_{nom}$		mm	0.5 (1.76 t = 1.4 mm)		

Accuracy class per OIML R60			D1	C3	C4 <sup>2)</sup>	C6 <sup>2)</sup>
Number of load cell verification intervals	n <sub>LC</sub>	n <sub>LC)</sub>	1000	3000	4000	6000
<b>Weight, approx.</b>	G	kg	0.9 (110 kg ... 1.76 t); 1.6 (2.2 t); 2.2 (4.4 t); 6.2 (10 t)			
<b>Degree of protection per EN 60 529 (IEC 529)</b>			IP68			
<b>Material</b>			stainless steel <sup>5)</sup> stainless steel <sup>5)</sup> / seal: Viton® PVC			
Measuring body						
Cable entry						
Cable sheath						

1) Maximum capacity 10 t: Load application = sinking + tapped hole

2) Accuracy classes **C4** and **C6** only for **HLC B1 ... / 220 kg; 550 kg; 1.1 t**

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. The sum of these values is within the cumulated error limit laid down by OIML R60.

4) For use in potentially explosive atmospheres: see Ex safety instructions

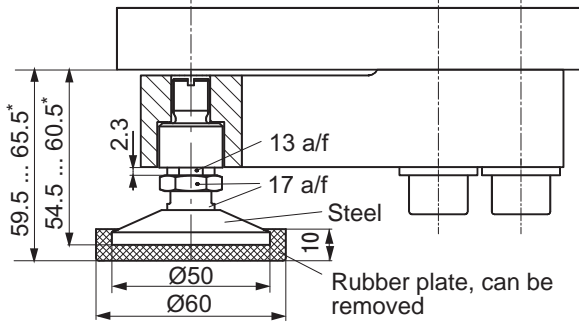
5) As per EN 10088-1

## MOUNTING ACCESSORIES TO BE ORDERED SEPARATELY

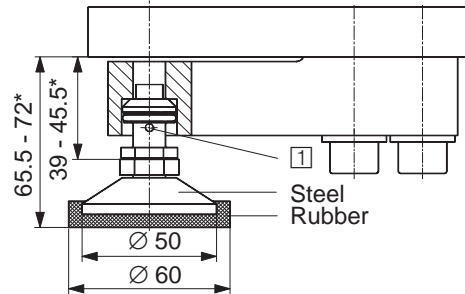
### Dimensions (in mm; 1 mm = 0.03937 inches)

According to the mounting conditions, HBM presents different, tested load applications for load cell type HLC **B1** ..., to minimize the effects of load application errors.

**HLCB/PCX/1.76 t** - Oscillating loading foot (stainless steel) for HLC **B** / 110 kg ... 1.76 t, suitable up to accuracy class C6:



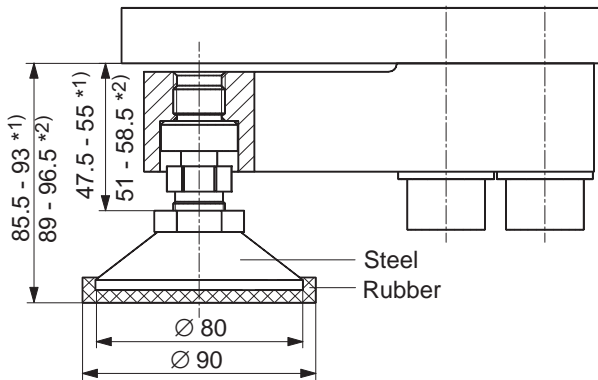
**HLCB/ZFP/1.76 T** - Oscillating loading foot (stainless steel) for HLC **B** / 110 kg ... 1.76 t:



① Loading foot secured in load cell with accompanying bracket

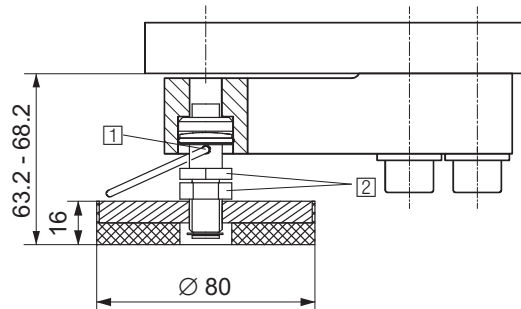
\* Height adjustment

**HLCB/ZFP/4.4 T** - Oscillating loading foot (stainless steel) for HLC **B** / 2.2 t + 4.4 t:



\* Height adjustment, (1) = Maximum capacity 2.2 t / (2) = Maximum capacity 4.4 t

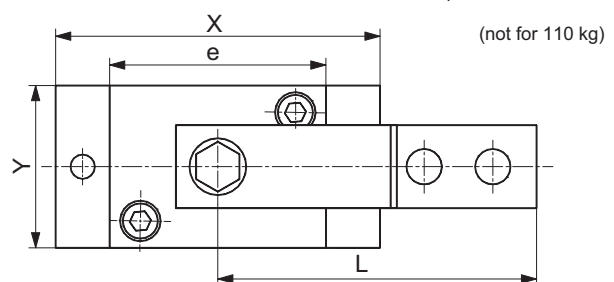
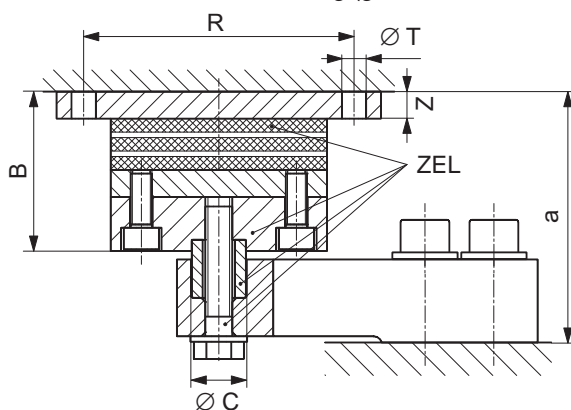
**HLCB/ZAK/1.76T** - Oscillating loading foot, height-adjustable (stainless steel) for HLC **B** ≤ 1.76 t



① Loading foot secured in load cell with accompanying bracket

② 19 across flats

**HLCB/...T/ZEL** - Rubber-metal bearing (galvanized; HLCB/1.76T/ZELR made from rust-resistant material) for HLC **B**



Maximum permissible lateral displacement (when loaded at maximum capacity):

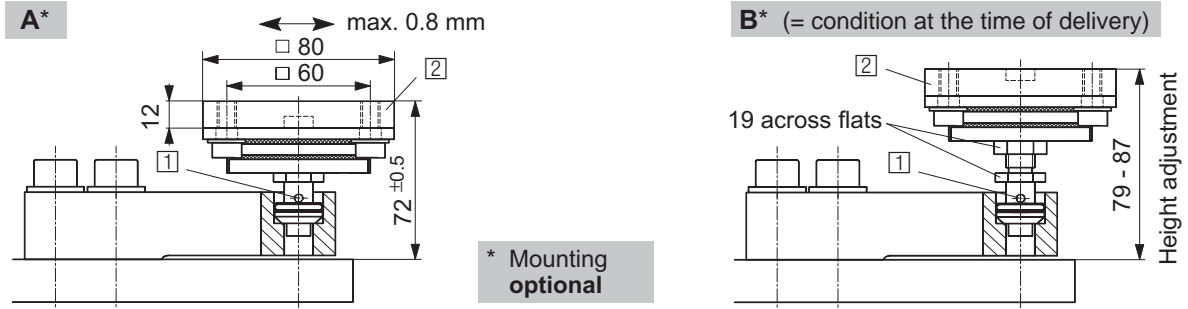
HLCB/1.76T/ZEL: 4.5 mm

HLCB/4.4T/ZEL: 8 mm

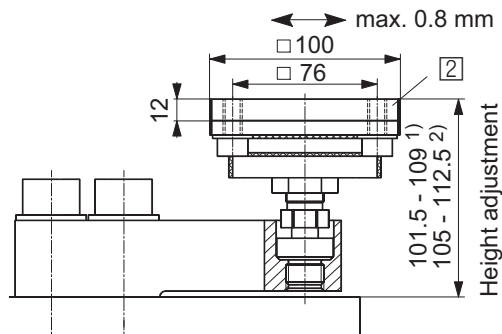
HLCB/10T/ZEL: 9.5 mm

Type	Maximum capacity	B	∅C <sub>0.1</sub>	L	R	∅T	X	Y	Z	a	e
HLCB/1.76T/ZEL HLCB/1.76T/ZELR	220 kg ... 1.76 t	58.8	20	118	100	9	120	60	10	92	80
HLCB/4.4T/ZEL	2.2 t	71.2	30	152.4	125	11	150	100	10	113	100
HLCB/4.4T/ZEL	4.4 t	71.2	30	152.4	125	11	150	100	10	116	100
HLCB/10T/ZEL	10 t	85	50.8	214.9	175	13	200	100	12	167	150

**HLCB/ZDP/1.76 T Easy top** - Rubber-metal bearing for HLC B / 220 kg ... 1.76 t  
 (Load application: stainless steel, welding plate: galvanized)



**HLCB/ZDP/4.4 T Easy top** - Rubber-metal bearing for HLC B / 2.2 t + 4.4 t  
 (Load application: stainless steel, welding plate: galvanized)



1) **Easy top** secured in load cell with accompanying bracket

2) Welding plate (schematic top view)

ZPU/1.76T: 4x M8  
 ZPU/2.2T + 4.4T: 4x M10



1) = maximum capacity 2.2 t

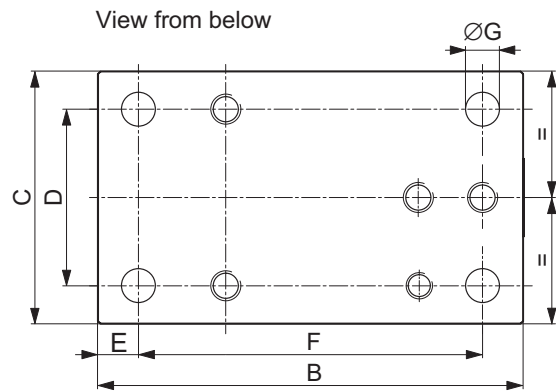
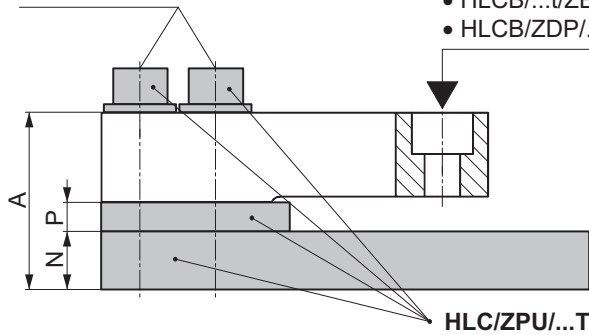
2) = maximum capacity 4.4 t

**HLC/ZPU/...T** - Mounting base / mounting kit (galvanized) for HLC B

Tightening torque  $M_A$ : see table

Load application via:

- HLCB/...t/ZEL
- HLCB/ZDP/...t



Type	Max. capacity	Breaking load	A	B	C	D	E	F	G	N	P	$M_A$
HLC/ZPU/1.76 T	110 kg ... 1.76 t	3.52 t	60.5	168	100	70	16	136	13.5	20	10	130 Nm
HLC/ZPU/2.2 T	2.2 t	4.4 t	81.5	212	120	84	18	175	14	25	20	400 Nm
HLC/ZPU/4.4 T	4.4 t	8.8 t	88	212	120	84	18	175	14	25	20	400 Nm

## PRODUCT NUMBERS

Maximum capacity	Accuracy class	HLCB1 without explosion protection, PVC cable sheath	
		3 m (9.84 ft) cable length	6 m (19.69 ft) cable length
110 kg	D1	1-HLCB1D1/110KG-1	
	C3	1-HLCB1C3/110KG-1	
220 kg	D1	1-HLCB1D1/220KG-1	
	C3	1-HLCB1C3/220KG-1	1-HLCB1C3/220KGA
	C4	1-HLCB1C4/220KG	
	C6	1-HLCB1C6/220KG	
550 kg	D1	1-HLCB1D1/550KG-1	
	C3	1-HLCB1C3/550KG-1	1-HLCB1C3/550KGA
	C4	1-HLCB1C4/550KG	
	C6	1-HLCB1C6/550KG	
1.1 t	D1	1-HLCB1D1/1.1T-1	
	C3	1-HLCB1C3/1.1T-1	1-HLCB1C3/1.1TA
	C4	1-HLCB1C4/1.1T	
	C6	1-HLCB1C6/1.1T	
1.76 t	D1	1-HLCB1D1/1.76T-1	
	C3	1-HLCB1C3/1.76T-1	1-HLCB1C3/1.76TA
2.2 t	D1		1-HLCB1D1/2.2T
	C3		1-HLCB1C3/2.2T
4,4 t	D1		1-HLCB1D1/4.4T
	C3		1-HLCB1C3/4.4T
10 t	D1		1-HLCB1D1/10T

Maximum capacity	Accuracy class	HLCA1 without explosion protection, PVC cable sheath	
		3 m (9.84 ft) cable length	6 m (19.69 ft) cable length
220 kg	D1	1-HLCA1D1/220KG-1	
	C3	1-HLCA1C3/220KG-1	
550 kg	D1	1-HLCA1D1/550KG-1	
	C3	1-HLCA1C3/550KG-1	
1.1 t	D1	1-HLCA1D1/1.1T-1	
	C3	1-HLCA1C3/1.1T-1	
1.76 t	D1	1-HLCA1D1/1.76T-1	
	C3	1-HLCA1C3/1.76T-1	
2.2 t	D1		1-HLCA1D1/2.2T
	C3		1-HLCA1C3/2.2T
4.4 t	D1		1-HLCA1D1/4.4T
	C3		1-HLCA1C3/4.4T

## HLC LOAD CELLS, OPTIONAL VERSIONS

K-HLC		
1	<b>Code</b>	<b>Option 1: Design</b>
	<b>A</b>	HLCA [not with option 3 = 110 / 10]
	<b>B</b>	HLCB
2	<b>Code</b>	<b>Option 2: Accuracy class</b>
	<b>D1</b>	D1 (OIML)
	<b>C3</b>	C3 (OIML) [not with option 3 = 10]
	<b>C4</b>	C4 (OIML) [only with option 1 = B + option 3 = 220 / 550 / 1100 + option 5 = S3]
	<b>C6</b>	C6 (OIML) [only with option 1 = B + option 3 = 220 / 550 / 1100 + option 5 = S3]
3	<b>Code</b>	<b>Option 3: Maximum capacity</b>
	<b>110</b>	110 kg [only with option 1 = B]
	<b>220</b>	220 kg
	<b>550</b>	550 kg
	<b>1100</b>	1.1 t
	<b>1760</b>	1.76 t
	<b>2200</b>	2.2 t
	<b>4400</b>	4.4 t
	<b>10</b>	10 t [only with option 1 = B]
4	<b>N</b>	No explosion protection
	<b>AI1/21</b>	ATEX+IECEX+FM Zone 1/21 [not with option 3 = 10]
	<b>AI2/21</b>	ATEX+IECEX Zone 2/21 [not with option 3 = 10]
	<b>AI2/21_F</b>	ATEX+IECEX Zone 2/21 + FM [not with option 3 = 110/2200/4400/10]
5	<b>Code</b>	<b>Option 5: Cable length</b>
	<b>S3</b>	3 m (standard) [only with option 3 = 110/220/550/1100/1760]
	<b>S6</b>	6 m (standard) [only with option 3 = 2200/4400/10]
	<b>6</b>	6 m [only with option 2 = D1/C3+option 3= 110/220/550/1100/1760]
	<b>12</b>	12 m [only with option 2 = D1/C3]
6	<b>Code</b>	<b>Option 6: Other</b>
	<b>N</b>	Without
	<b>AU</b>	With Australian Type label NMIA NO S498 [not with option 3 = 110]

K-HLC -  -  -  -  -  -

1            2            3            4            5            6



## OPTIONS

---

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

- AI1/21 <sup>1), 2)</sup> 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 <sup>1)</sup> 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
- AI2/21\_F <sup>1), 3)</sup> ATEX+IECEx zone 2/21 + FM, not intrinsically safe;  
- ATEX/IECEx: II 3G Ex ec IIC T6/T4 Gc + II 2D Ex tb IIIC T125°C Db  
- FM(US): Class I, II, III Division 2, Groups A, B, C, D, F, G T4

<sup>1)</sup> BVS 13 ATEX E 108 X + IECEx BVS 13.0109 X

<sup>2)</sup> FM 18 US 0176 X + FM 18 CA 0144 X

<sup>3)</sup> FM 17 US 0159