

HLCi

Load cell with integrated electronics

SPECIAL FEATURES

- Interfaces
 - IO-Link
 - Current output (4 ... 20 mA)
 - Voltage output (0 ... 10 V)
- Hermetically encapsulated (IP68, IP69K)
- Maximum capacities: 110 kg ... 4.4 t
- Stainless materials
- Low height of construction
- Filters with short settling times and scaling of the measurement signal

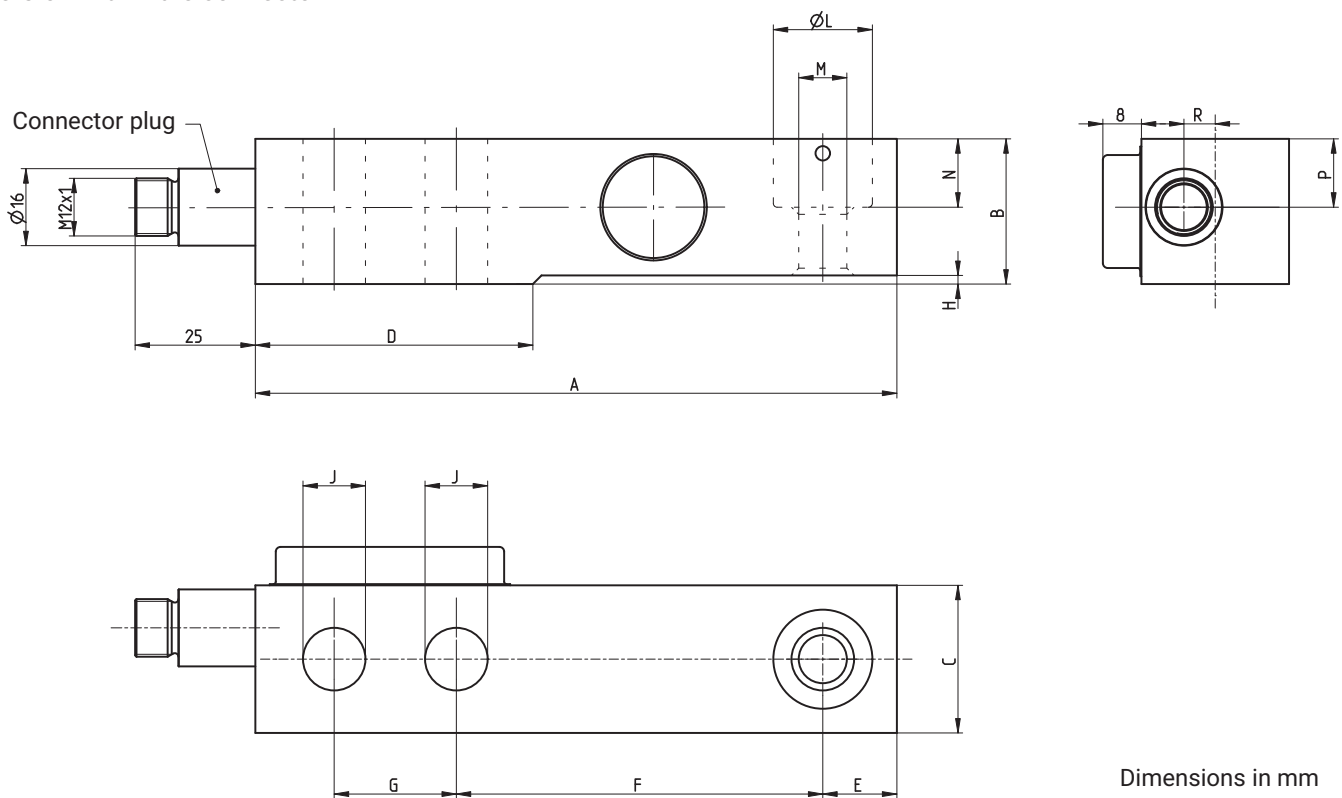


MEASURING AMPLIFIERS

Option	Interface (electronics)	Characteristics
RMIO	IO-Link	Digital transducer electronics with one IO-Link interface, 2000 measured values/s
RM42	4 ... 20 mA	Analog electronics with current output
RM43	0 ... 10 V	Analog electronics with voltage output

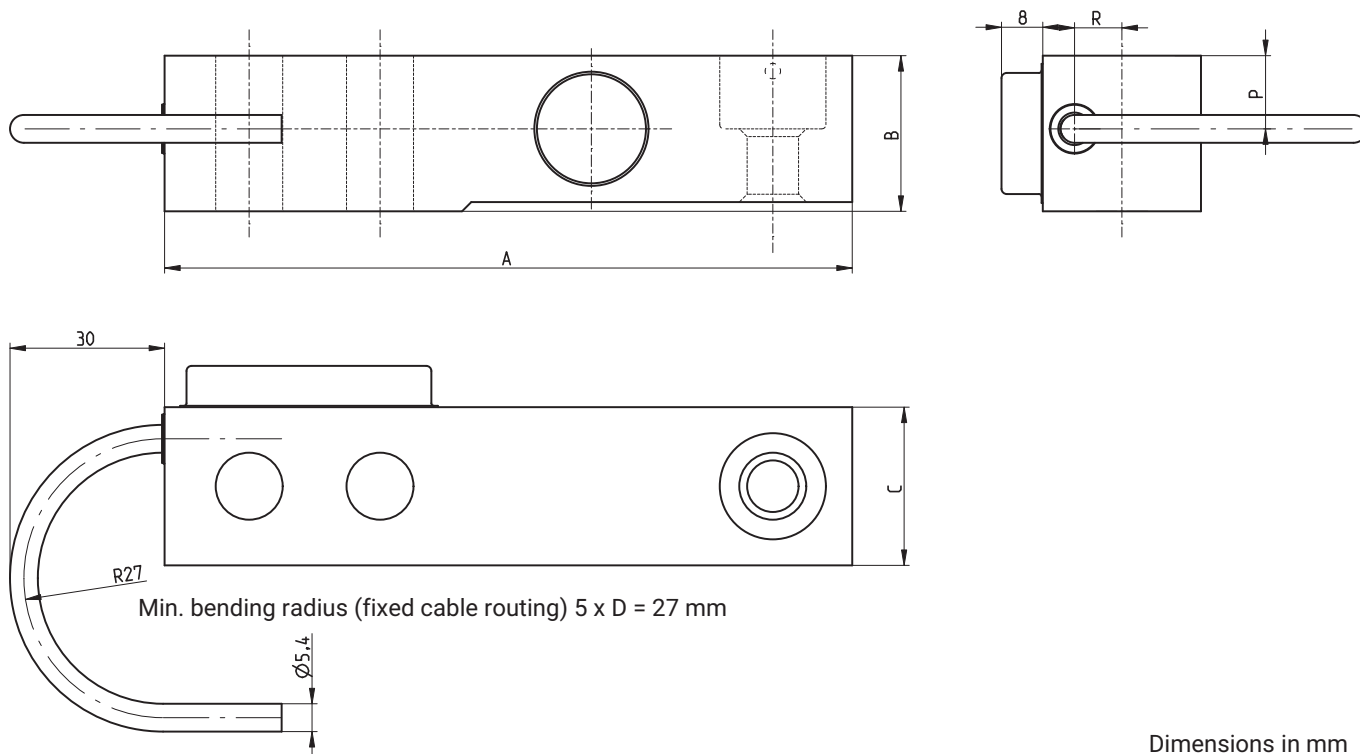
DIMENSIONS

Version with male connector



Maximum capacity ($E_{\max}$)	A	B	C	D	E	F	G	H	J	$\varnothing L$	M	N	P	R
110 kg; 220 kg; 550 kg; 1.1 t	133.4	30.2	30.7	51.7	15.4	76.2	25.4	1.7	13	20.6	M12	14.2	14.2	6.5
1.76 t	133.4	30.2	30.7	51.7	15.4	76.2	25.4	1.7	13	20.6	M12	14.2	14.2	6.5
2.2 t	171.5	36.5	36.8	76.2	19.1	95.3	38.1	2.5	20.5	30.2	M20	17.0	17	9.7
4.4 t	171.5	42.9	42.9	76.2	19.1	95.3	38.1	2.5	20.5	30.2	M20	20.1	20.2	12.7

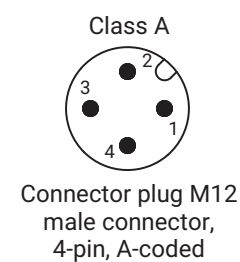
Version with fitted cable RM42 (current output), RM43 (voltage output)



Maximum capacity ($E_{\max}$)	A	B	C	P	R
110 kg; 220 kg; 550 kg; 1.1 t	133.4	30.2	30.7	14.2	6.5
1.76 t	133.4	30.2	30.7	14.2	6.5
2.2 t	171.5	36.5	36.8	17	9.7
4.4 t	171.5	42.9	42.9	20.2	12.7

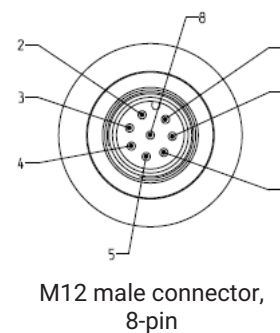
PIN ASSIGNMENT RMIO (IO-LINK)

Pin	Assignment
1	Supply voltage +
2	Digital output (DI/DO pin function)
3	Supply voltage -, reference potential
4	IO-Link data (C/Q)



PIN ASSIGNMENT RM42 (CURRENT OUTPUT), RM43 (VOLTAGE OUTPUT)

Pin	Version RM42 (current output)	Version RM43 (voltage output)	KAB159, KAB192 connection cable wire assignment
1	Supply voltage 0 V (GND)		White
2	Calibration control input		Brown
3	Zeroing control input		Green
4	Vacant		Yellow
5	OUT 4 ... 20 mA	OUT 0 ... 10 V	Gray
6	Vacant	OUT GND	Pink
7	Vacant		Blue
8	Supply voltage		Red



CABLE ASSIGNMENT 6-PIN RM42 (CURRENT OUTPUT), RM43 (VOLTAGE OUTPUT)

Cable wire assignment with fixed cable	Version RM42 (current output)	Version RM43 (voltage output)
White	Supply voltage 0 V (GND)	
Black	Calibration control input	
Green	Zeroing control input	
Gray	OUT 4...20 mA	OUT 0-10 V
Blue	Vacant	OUT GND
Red	Supply voltage	

RMIO SPECIFICATIONS RMIO (IO-LINK)

Type			HLCi
Module type			RMIO (IO-Link)
Maximum capacity	E _{max}		110 kg; 220 kg; 550 kg; 1.1 t; 1.76 t; 2.2 t; 4.4 t
Accuracy			0.03
Temperature coefficient of zero signal	TC ₀	% of Cn/10K	±0.0140
Temperature coefficient of sensitivity	TC _S		±0.0140
Relative reversibility error	d _{hy}	% of Cn	±0.0300
Non-linearity	d _{lin}		±0.0300
Creep upon loading over 30 min.	d _{cr}		±0.0300
Minimum dead load output return	MDLOR		±0.0300
Rated electrical output			
Rated output (nominal)	C _n	d	1000000
Sensitivity tolerance		%	±0.1
Zero signal		d	0 ± 10,000
Output signal; interface			COM3, to IO-Link standard, class A
Min. cycle (max. output rate)		ms	0.9
Sample rate (internal)		Hz	2000
Cut-off frequency (-3 dB)		kHz	2
Reference supply voltage		V	24
Supply voltage range		V	19-30
Max. power consumption		W	1
Filter			
Digital filters, up to 5 cascable		Hz	IIR low pass: 0.1 ... 30 FIR low pass: 3 ... 30 Moving average: 1 ... 100 Comb filter: 1 ... 100
Device functions			
Weighing functions			Filling and batching for filling or emptying, with coarse and fine flow control as well as automatic optimization of target weight
Limit value switches			2 limit value switches. Reversible, freely adjustable hysteresis. Output via process data or digital output
Digital input/output			According to IO-Link Smart Sensor Profile, 1 permanently available digital input/output, 1 output can be set to data output, then no measurement is possible

Type		HLCi	
Module type		RMIO (IO-Link)	
Function for "lagging" display		Yes	
Peak value memory		Yes	
Storage rate peak-to-peak		Yes	
Warning functions		Warning on exceeding of limit load, nominal temperature	
Temperature			
Nominal (rated) range of the ambient temperature	B _T	°C	-10 ... +40
Operating temperature range	B _{tu}		-10 ... +60
Storage temperature range	B _{tl}		-25 ... +85
Characteristic mechanical quantities			
Limit load	E _L	% of E _{max}	150 (for 1.76 t: 171% of E _{max})
Lateral loading limit	E _{lq}		100
Breaking load	E _d		300
Relative permissible oscillation stress (oscillation width (peak-to-peak) as per DIN 50 100)	F _{srel}		70 (for 1.76 t: 600 kg up to 2 t)
Rated displacement at E _{max} , approx.	s _{nom}	mm	0.5 (1.76 t = 1.4 mm)
General information			
Weight, approx.	G	kg	0.9 (110 kg - 1.76 t); 1.6 (2.2 t); 2.2 (4.4 t)
Degree of protection as per EN 60529 (IEC 60529)			IP68 (test conditions 1 m water column /100 h) IP69 K (water at high pressure, steam cleaning)
Measuring body material			Stainless steel, hermetically welded
Male connector			M12, 4-pin, A-coded, male
Max. cable lengths		m	20

SPECIFICATIONS RM42 (CURRENT OUTPUT), RM43 (VOLTAGE OUTPUT)

Type			HLCi	
Module type			RM43 (voltage output)	RM42 (current output)
Maximum capacity	E _{max}		110 kg; 220 kg; 550 kg; 1.1 t; 1.76 t; 2.2 t; 4.4 t	
Accuracy			0.05	
Temperature coefficient of zero signal	TC ₀	% of Cn/10K	±0.1	
Temperature coefficient of sensitivity	TC _S		±0.1	
Relative reversibility error	d _{hy}	% of Cn	±0.0500	
Non-linearity	d _{lin}		±0.0500	
Creep upon loading over 30 min.	d _{cr}		±0.0500	
Minimum dead load output return	MDLOR		±0.0500	
Rated electrical output				
Rated output (nominal)	C _n		10 V	16 mA
Sensitivity tolerance		%	±0.1	
Output signal			0 ... 10 V	4 ... 20 mA
Zero signal			0 V ± 0.1 V	4 mA ± 0.16 mA
Output signal range			-0.3 ... 11 V	3 ... 21 mA
Cut-off frequency (-3 dB)		kHz	1000	

Type			HLCi	
Module type			RM43 (voltage output)	RM42 (current output)
Supply voltage		V	19 ... 30	
Nominal (rated) supply voltage		V	24	
Max. power consumption		W	1	
Temperature				
Nominal (rated) range of the ambient temperature		B _T	°C	-10 ... +40
Operating temperature range		B _{tu}		-20 ... +60
Storage temperature range		B _{tl}		-25 ... +85
Characteristic mechanical quantities				
Limit load		E _L	% of E _{max}	150 (for 1.76 t: 171% of E _{max})
Lateral loading limit		E _{lq}		100
Breaking load		E _d		300
Relative permissible oscillation stress (oscillation width (peak-to-peak) as per DIN 50 100)		F _{srel}		70 (for 1.76 t: 600 kg up to 2 t)
Rated displacement at E _{max} , approx.		s _{nom}	mm	0.5 (1.76 t = 1.4 mm)
General information				
Weight, approx.		G	kg	0.9 (110 kg ... 1.76 t); 1.6 (2.2 t); 2.2 (4.4 t)
Degree of protection as per EN 60529 (IEC 60529)			IP 68 (test conditions 1 m water column /100 h) IP 69K (water at high pressure, steam cleaning)	
Measuring body material			Stainless steel, hermetically welded	
Available cable lengths		m		3 m PVC gray
Male connector		M12, 8-pin, A-coded, male		
Max. cable lengths		m		30

ACCESSORIES

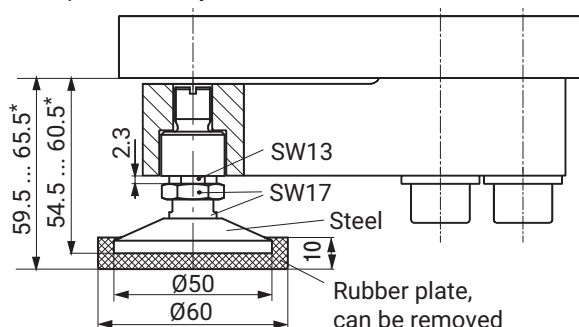
To minimize error effects from load application, HBM offers different tried and tested load application elements for this type of load cell, according to the mounting conditions:

- **HLCB/ZFP/...T** Oscillating loading foot
- **HLCB/PCX/1.76T** Oscillating loading foot (height adjustable)
- **HLCB/...T/ZEL** Elastomer bearing
- **HLCB/ZDP/...T** Elastomer bearing **Easy Top**
- **HLC/ZPU/...T** Mounting base / mounting kit

Connection cable for current and voltage output RM42 (current output) and RM43 (voltage output)	Ordering number
Connection cable with M12 F male connector, 8-pin, IP67, PUR cable sheath, 5 m long	1-KAB168-5
Connection cable with M12 F male connector, 8-pin, IP67, PUR cable sheath, 20 m long	1-KAB168-20
Connection cable with M12 F male connector, 8-pin, IP67, PUR cable sheath, 3 m long, 120 Ω characteristic impedance	1-KAB192-3
Connection cable with M12 F male connector, 8-pin, IP67, PUR cable sheath, 6 m long, 120 Ω characteristic impedance	1-KAB192-6

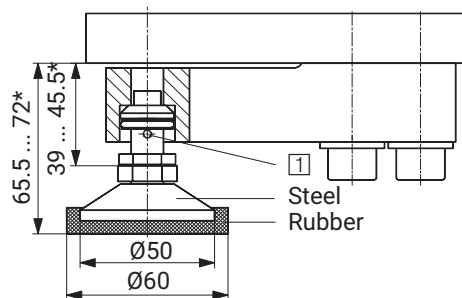
ACCESSORIES FOR HLC B ... (TO BE ORDERED SEPARATELY; DIMENSIONS IN MM)

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



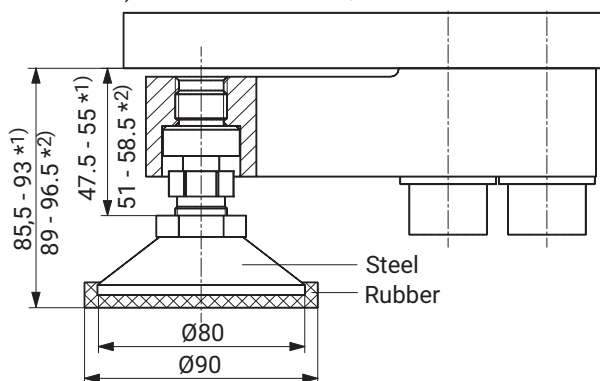
* Height adjustment

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



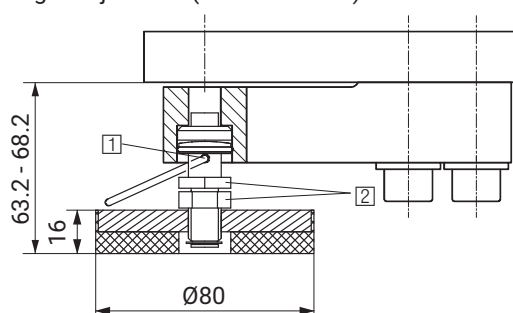
① Loading foot secured in load cell with supplied bracket

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

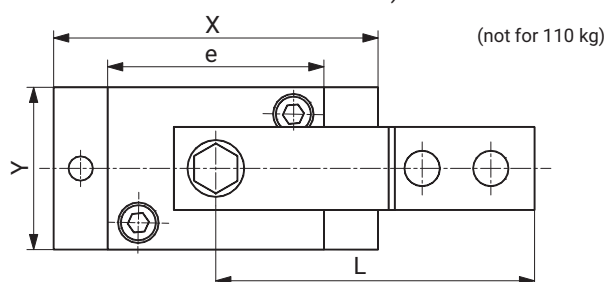
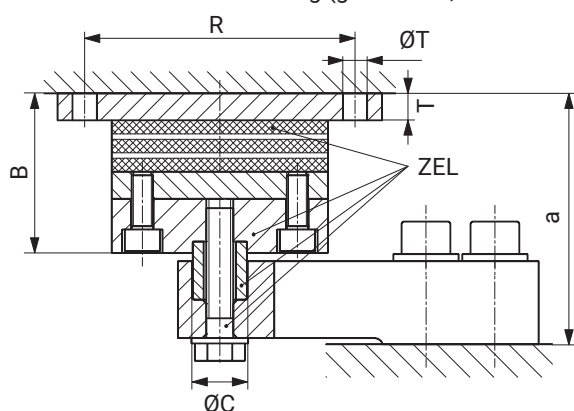
HLCB/ZAK/1.76T - Oscillating loading foot, height adjustable (stainless steel) for HLC B ≤ 1.76 t



① Loading foot secured in load cell with supplied bracket

② 19 across flats

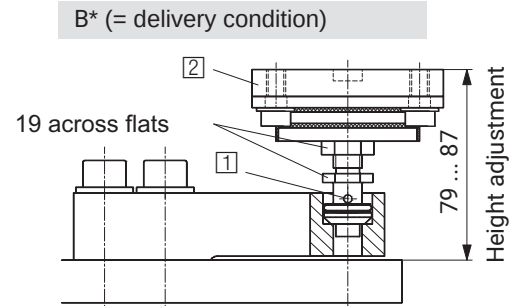
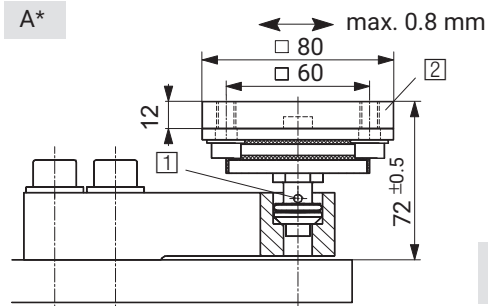
HLCB/...T/ZEL - Rubber-metal bearing (galvanized; HLCB/1.76T/ZELR made of rust-resistant material) for HLC B



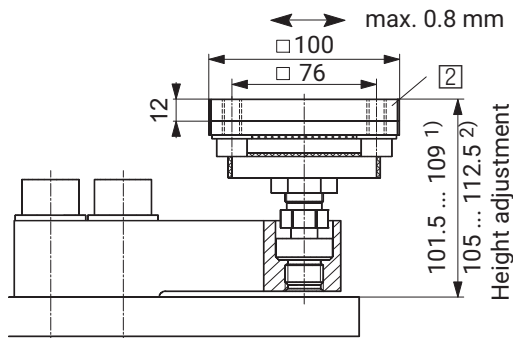
Max. allowed lateral displacement (when loaded with maximum capacity):
HLCB/1.76T/ZEL: 4.5 mm
HLCB/4.4T/ZEL: 8 mm
HLCB/10T/ZEL: 9.5 mm

Type	Maximum capacity	B	ØC _{0.1}	L	R	ØT	X	Y	T	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/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 supplied 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

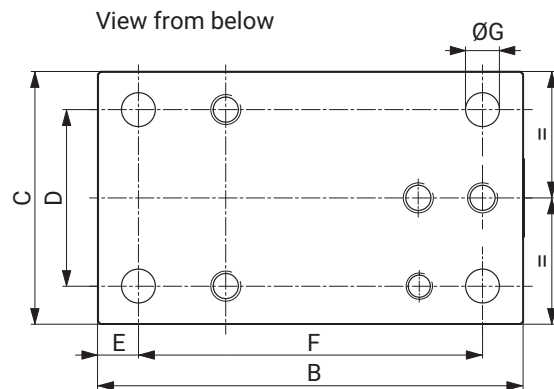
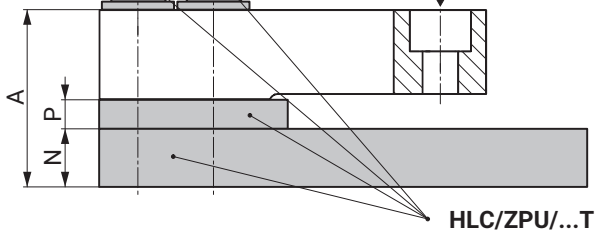
HLC/ZPU/...T - Mounting base / mounting kit (galvanized) for HLC B

Tightening torque M_A :

see table

Load application via:

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



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

PRODUCT DESIGNATION (OVERVIEW)

K-HLCi		
1	Code	Option 1: Material
	B2	HLCB2 (IP68)
2	Code	Option 2: Accuracy class
	3	0.03% [only for option 6 = RMIO] (IO-Link)
	5	0.05% [only for option 6 = RM42, RM43] (current output, voltage output)
3	Code	Option 3: Maximum capacity
	110	110 kg
	220	220 kg
	550	550 kg
	1100	1100 kg
	1760	1760 kg
	2200	2200 kg
	4400	4400 kg
4	Code	Option 4: Explosion protection
	N	No explosion protection available
5	Code	Option 5: Cable
	3	3 m PVC cable [not with option 6 = RMIO]
	M12A4	M12 A-coded, male, 4-pin [only with option 6 = RMIO]
	M12A8	M12 A-coded, male, 8-pin [not with option 6 = RMIO]
6	Code	Option 6: Other
	N	None
7	Code	Option 7: Electronics
	RM42	Analog 4-20 mA
	RM43	Analog 0-10 V
	RMIO	IO-Link
8	Code	Option 8: Firmware version
	N	NA [not with option 6 = RMIO]
	02	RMIO v1.0.7 [only with option 6 = RMIO]

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1 2 3 4 5 6 7 8

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

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