

PACEline

CMC

Piezoelectric force measurement chain

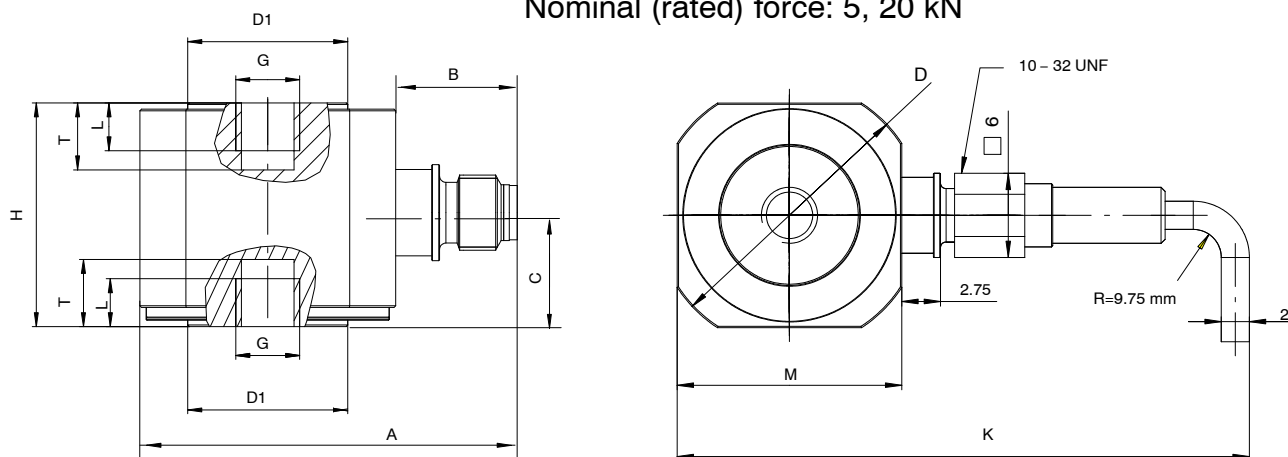


Special features

- Very compact force transducer combined with an industrial charge amplifier
- 2 calibrated measuring ranges of 100% and 20% F_{nom}
- TEDS for each measuring range
- Nominal (rated) forces: 5, 20, 50, 70, 120 kN
- High stiffness
- Electrical isolation
- One-way fitting

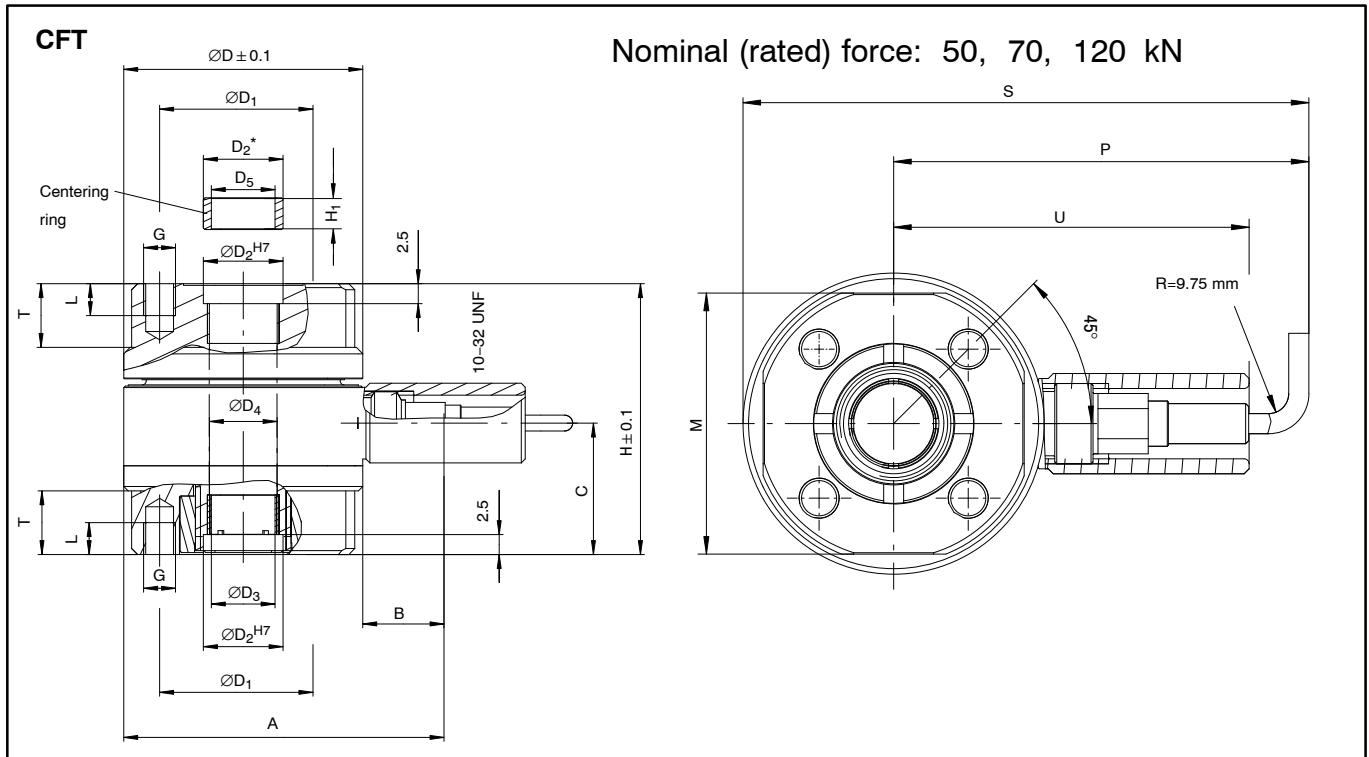
CFT dimensions

Nominal (rated) force: 5, 20 kN

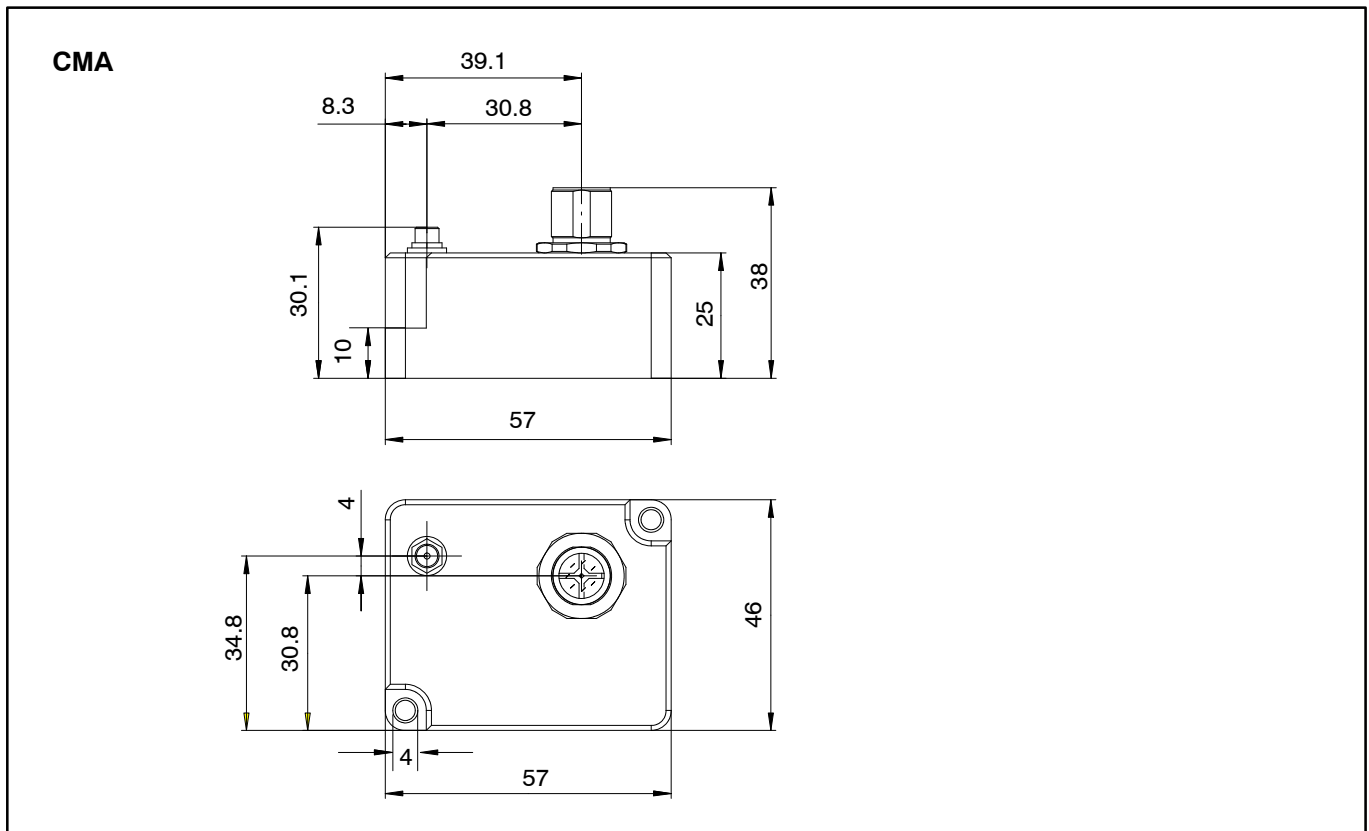


Type	D	D1	M	H	B	G	T	L	K	A	C
CFT / 5 kN	13	5	11	10	7.45	M2.5	3.15	2.25	36	18.45	5.05
CFT / 20 kN	19	10	16	14	7.45	M4	4.35	3	41	23.45	7.13

Dimensions



Type	D	D ₁	D ₂	D ₂ *	D ₃	D ₄	D ₅	M	H	H ₁	B	G	T	L	A	C	S	P	U
CFT / 50 kN	30	21	10	10 _{f7}	8	8.5	8 +0.02	26	34	4	10.05	M4	8	4	40.05	16.5	56.35	41.35	35.4
CFT / 70 kN	36	26	14	14 _{f7}	11	12	11 +0.02	32	42	4	10.15	M5	9	5	46.15	21.5	62.35	44.35	38.4
CFT / 120 kN	54	40	21	21 _{f7}	17	18.5	17 +0.02	48	60	4	10.15	M8	13	8	64.15	32	80.35	53.35	47.4



Specifications of the charge amplifier

Charge amplifier		CMA				
Transducers that can be connected		piezoelectric sensors				
Max. charge input	pC	39500	158300	210500	287000	482000
Calibrated measuring ranges	% F_{nom}	100; 20				
Output voltage	V	± 10				
Output span tolerance	%	± 0.5				
Relative reversibility error, $0.5 \times F_{nom}$	%	< 0.05				
Relative linearity error	%	< ± 0.05				
Effect of temperature on output span / 10K	%	< 0.5				
Nominal temperature range	$^{\circ}\text{C}$	0 ... 70				
Drift, at 20 $^{\circ}\text{C}$	pC/s	< 0.5				
Cut-off frequency	kHz	10 (-3dB) 5 (-1dB)				
Supply voltage	V	24 (18 ... 30)				
Power consumption	W	< 1.2				
Output resistance	Ω	< 10				
Permissible load resistance	k Ω	> 5				
Control inputs (electrically isolated)						
Reset/Measure step	pC	< ± 2				
Measure mode	V	MEASURE	0 ... +5 or open			
	V	RESET	12 ... 30			
Measurement range	V	RANGE 1	0 ... +5 or open			
	V	RANGE 2	12 ... 30			
Housing material		Aluminium				
Dimensions (W x H x D)	mm	57 x 46 x 38				
Weight	g	130				
Electrical connection		Sensor 10 – 32 UNF Signal output, supply, M12 x 1, 8-pin (shielded cable recommended)				
Degree of protection		IP 65				

Specifications of the force transducer (data per VDI/VDE 2638 standards)						
Type		CFT/...				
Nominal (rated) force	kN	5	20	50	70	120
Sensitivity, typ. ¹⁾	pC/N	-7,7	-7,7	-4,1	-4,1	-4,0
Permissible lateral force F_q ²⁾	N	80	160	1000	1800	5800
Max. operational force	kN	5.5	22	60	84	144
Permissible bending moment M_b						
at $F_z = 0\%$	Nm	2	4	75	150	650
at $F_z = 100\%$	Nm	0.5	2	20	20	250
Crosstalk						
from F_q to the output signal	N/N	< 0.06	< 0.05	< 0.032	< 0.045	< 0.08
from M_b to the output signal	N/Nm	-8	-6	< 0,3	< 0,3	< 0,25
Breaking force	kN	10	31	160	220	510
Natural frequency	kHz	40	36	54	46	31
Oscillation width	% F_{nom}	100 for compressive force				
Operating temperature	$^{\circ}\text{C}$	-40 ... +120				
Relative reversibility error, $0.5 \times F_{nom}$	%	< 1 (typ. 0.5)				

Relative linearity error	%	< ± 1 (typ. 0.5)				
Effect of temperature on output span / 10K	%	< 0.5				
Nominal (rated) displacement (± 15 %)	µm	11	18	30	30	31
Insulation resistance	Ω	> 10 ¹³				
Degree of protection per DIN EN 60529		IP65				
Tightening torque for the connecting screws	N·m	0.5	1	2	4	21
Weight	g	8	22	137	240	720
Connection		10–32 UNF				

1) each transducer has been individually calibrated in two ranges

2) related to a point of contact on the force application surface

Scope of supply

Order number	
1-CMC / 5 kN	CFT/ 5 kN piezoelectric force transducer , 3 m transducer connection cable CMA / 39 charge amplifier
1-CMC / 20 kN	CFT/ 20 kN piezoelectric force transducer , 3 m transducer connection cable CMA / 158 charge amplifier
1-CMC / 50 kN	CFT / 50 kN piezoelectric force transducer, 3 m transducer connection cable CMA / 210 charge amplifier
1-CMC / 70 kN	CFT / 70 kN piezoelectric force transducer, 3 m transducer connection cable CMA / 287 charge amplifier
1-CMC / 120 kN	CFT / 120 kN piezoelectric force transducer, 3 m transducer connection cable CMA / 482 kN charge amplifier

Accessories:

1-KAB168-5	8–core cable to continuing electronics, 8-wire, M12x1 cable plug, 5 m long, free ends
1-KAB168-20	8–core cable to continuing electronics, 8-wire, M12x1 cable plug, 20 m long, free ends

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