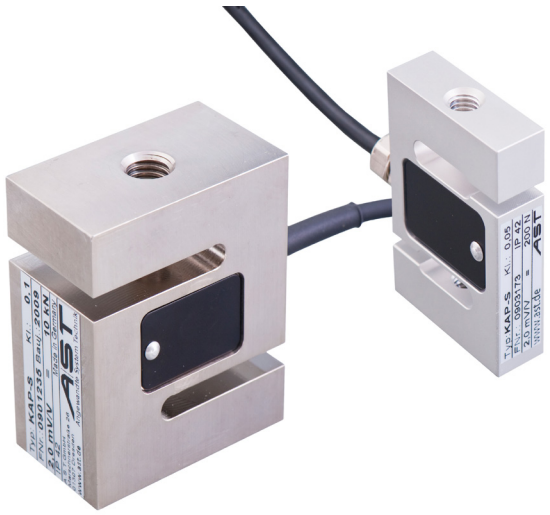
AST Gruppe
Angewandte System Technik

KAP-S, KAP-E
Force Transducer

Application

- For measuring tensile and compressive forces
- Perfect for material testing machines



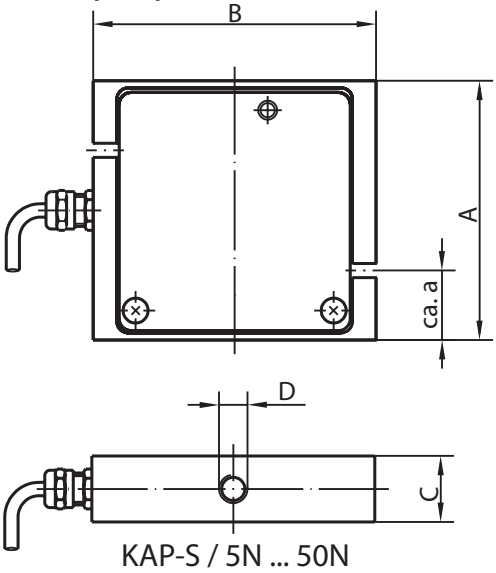
Features

- High accuracy
- 5N up to 50kN (KAP-S)
- With integrated overload protection up to 50N
- Versions with integrated amplifier (KAP-E up to 2kN)
- Environmental protection IP 42

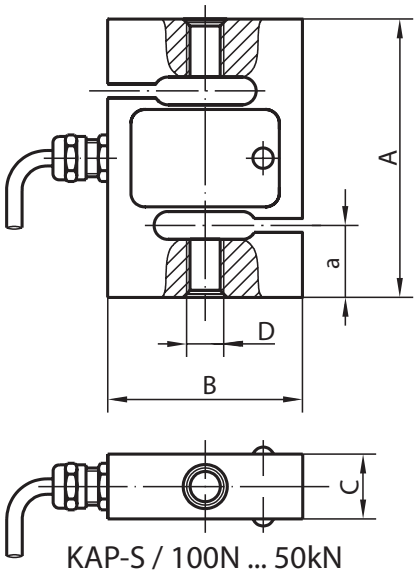
Options

- CANopen interface up to 2kN

Dimensions (mm)

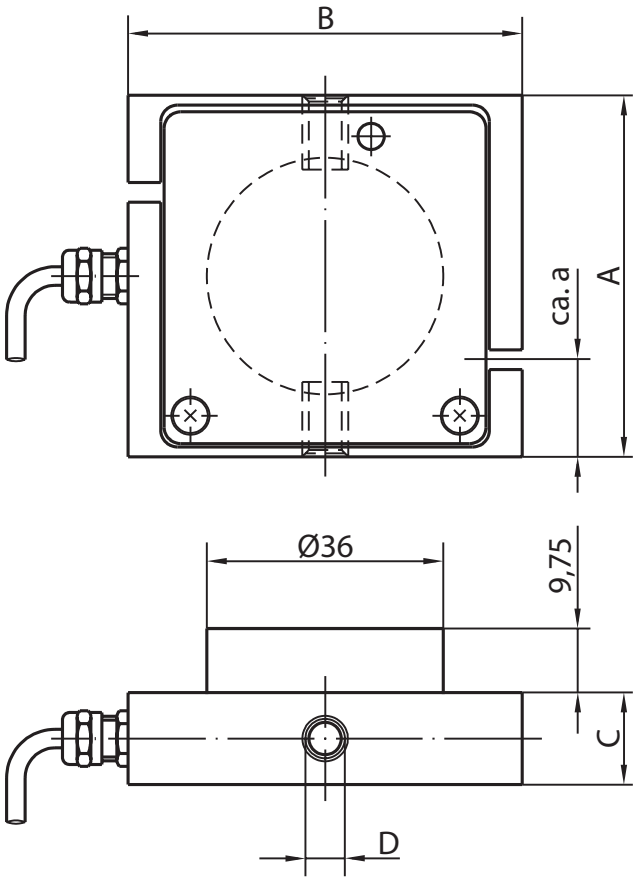


KAP-S / 5N ... 50N

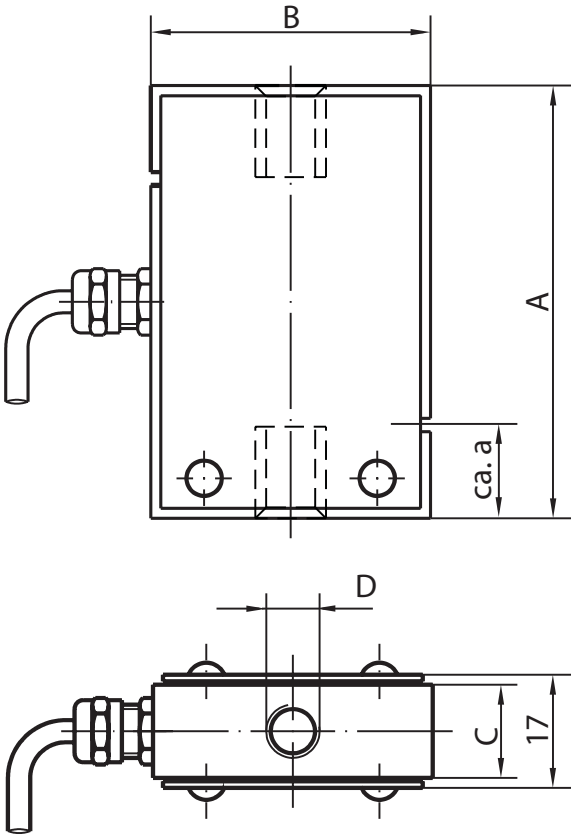


KAP-S / 100N ... 50kN

KAP-S Rated Force	A	B	C	D	approx. a	Weight	Rated Displacement ± 0.05mm	Material
5N	55	98	14	M6	14.6	200g	0.8	aluminium
10N/ 20N/ 50N	55	60	14	M6	14.4/14/13.2	100g	0.4/ 0.3/ 0.25	aluminium
100N/ 200N	60	42	14	M8	15.7/15.2	80g	0.08/ 0.06	aluminium
500N	60	42	14	M8	16.2	250g	0.05	stainless steel
1kN/ 2kN/ 3kN	60	42	14	M8	15.6/14.6/13.6	250g	0.08/ 0.12/ 0.22	stainless steel
5kN	70	60	26	M12	19.1	750g	0.15	stainless steel
10kN	70	60	35	M12	18.1	1kg	0.20	stainless steel
20kN	78	68	38	M20x1.5	21.5	1.3kg	0.25	stainless steel
50kN	78	68	38	M24x2	22.5	1.3kg	0.55	stainless steel



KAP-E / 10N ... 50N



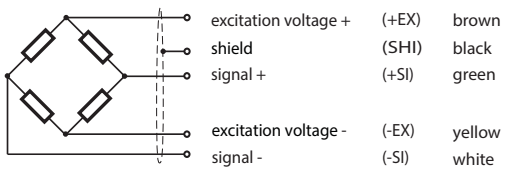
KAP-E / 100N ... 2kN

KAP-E Rated Force	A	B	C	D	approx. a	Weight	Rated Displacement ± 0.05mm	Material
10N/ 20N/ 50N	55	60	14	M6	14.4/14/13.2	100g	0.4/ 0.3/ 0.25	aluminium
100N/ 200N	65	38	14	M8	14	250g	0.08/ 0.06	stainless steel
500N/ 1kN/ 2kN	65	42	14	M8	14	250g	0.05/ 0.08/ 0.12	stainless steel

Wiring Code

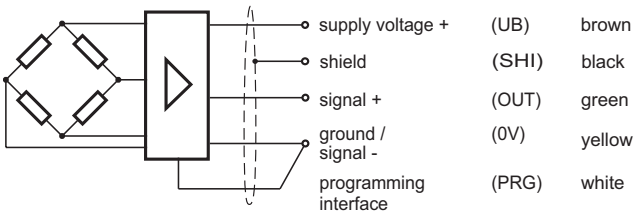
Cable length 3m with free cable end

KAP-S



Compressive load is positive change of signal.

KAP-E



with integrated amplifier
(0V and PRG to be connectedby the customer)

Specifications

Accuracy Class	% F_{nom}	0.2	0.1	0.05[1)]	0.2[2)] KAP-E	
Rated load (F_{nom})	N	5/ 10/ 20	5/ 10/ 20/ 50	50/ 100/ 200	10/ 20/ 50/ 100/ 200/ 500	
Rated load (F_{nom})	kN		0.1/ 0.2/ 0.5/ 1	0.5/ 1/ 2/ 3/ 5	1/ 2	
Rated load (F_{nom})	kN		2/ 3/ 5/ 10/ 20/ 50	10/ 20/ 50		
Maximum operating force (F_G) up to 50N	% F_{nom}	120 (overload protection)			120 (overload protection)	
Maximum operating force (F_G) from 100N	% F_{nom}	150			150	
Breaking force (F_B) to 50N (overload protect.)	% F_{nom}	> 500			> 500	
Breaking force (F_B) from 100N	% F_{nom}	> 300			> 300	
Lateral force limit (F_Q)	% F_{nom}	10			10	
Rated characteristic value (C_{nom})	mV/V	2.000 ± 0.002; for 10/ 20/ 50N: 2.000 ± 0.005				
Relative deviation of zero signal	%	≤1; for 10/ 20/ 50N: ≤10				
Reference excitation voltage (U_{ref})	VDC	5				
Operating range of excitation voltage ($B_{U, G}$)	VDC	5 ...10				
Input resistance (R_e)	Ω	380 ± 30				
Output resistance (R_a)	Ω	353 ± 3				
Insulation resistance (R_{is})	Ω	> 5 x 10^9				
Relative linearity error (d_{lin}) [1)]	%	≤ 0.2	≤ 0.1	≤ 0.05[1)]	0.1[3)]	
Relative reversibility error (v)[1)]	%	≤ 0.2	≤ 0.1	≤ 0.05		
Temperature effect on zero signal (TK_0)	%/10K	≤ 0.2	≤ 0.1	≤ 0.05	0.2	
Temperature effect on character. value (TK_C)	%/10K	≤ 0.2	≤ 0.1	≤ 0.05		
TK of output signal under load	%/10K				0.1[3)]	
Relative creep over 30 minutes ($d_{cr, F+E}$)	%	≤ 0.2	≤ 0.1	≤ 0.05	0.2	
Tolerance of output signal	%				0.1[3)]	
Tolerance of zero signal	%				≤ 1	
Reference temperature (T_{ref})	°C	+23			+23	
Rated temperature range ($B_{T, nom}$)	°C	-20 ... +60			-20 ... +60	
Operating temperature range ($B_{T, G}$)	°C	-30 ... +70			-30 ... +70	
Storage temperature range ($B_{T, S}$)	°C	-30 ... +70			-40 ... +70	
Environmental protection (EN 60529)		IP 42			IP 42	
Supply voltage	VDC				19 ... 28	11 ... 15
Input current	mA				35(at 24V)	20(at 12V)
Output signal for compression force (0...F_N)						
Alternatively:						
- Voltage output signal (max. load: 5mA)	V				0 ... 10	0 ... 5
- Current output	mA				4 ... 20	4 ... 20
- Max. resistance					300 Ω	100 Ω
Output signal for tension and compression force (-F_N ... +F_N)						
- Voltage output	V				-10 ... +10	-5 ... +5

All data according to VDI/VDE/DKD 2638

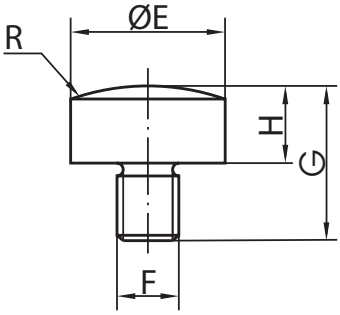
1) at 0.004 F_{nom} is the typical linearity error <1%

2) Accuracy class 0.1 upon request

3) 0.2 at 4 ... 20mA

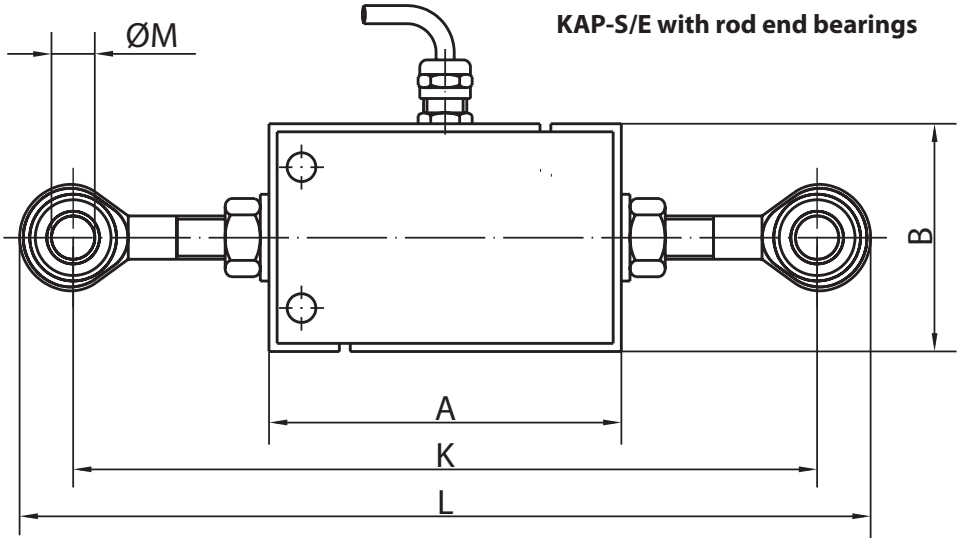
Appliances for Installation and Mounting

Load button



Dimension (mm)

KAP-S/E with rod end bearings



Rated Load	A	B	E	F	G	H	R	K	L	M
KAP-S/5N	55	98	12	M6	14	8	R16	appr. 108	appr.128	6^{H7}
KAP-S/KAP-E 10N ... 50N	55	60	12	M6	14	8	R16	appr. 108	appr. 128	6^{H7}
KAP-S/100N ... 3kN	60	42	12	M8	14	8	R16	appr. 128	appr. 152	8^{H7}
KAP-E/100N ... 200N	60	38	12	M8	14	8	R16	appr. 133	appr. 157	8^{H7}
KAP-E/500N ... 2kN	60	42	12	M8	14	8	R16	appr. 133	appr. 157	8^{H7}
KAP-S/5kN ... 10kN	70	60	30	M12	29	15	R50	appr. 146	appr. 178	12^{H7}
KAP-S/20kN	78	68	30	M20x1,5	40	22	R50	appr. 198	appr. 248	20^{H7}
KAP-S/50kN	78	68	30	M24x2	42	22	R50	appr. 228	appr. 288	25^{H7}

Order Example

Type Code	Description
KAP-E/1kN/0.2/24V/0...10V	Force transducer 1kN with 0.2% accuracy class and integrated amplifier
	Output signal
	Supply voltage
	Accuracy class
	Rated load
	E = Integrated amplifier
	Model

Accessoires / Options

	Type Code	Description
Load button	XKM 029	K6-16 for KAP-S 5N up to 50N / KAP-E 10N up to 50N
	XKM 040	K8-16 for KAP-S / KAP-E 100N up to 3kN
	XKM 019	K12-50 for KAP-S 5kN and 10kN
	XKM 043	K20-50 for KAP-S 20kN
	XKM 044	K24-50 for KAP-S 50kN
Rod end bearings	GKA 6	male threadwith jam nut for KAP-S 5N up to 50N / KAP-E 10N up to 50N
	GKA 8	male threadwith jam nut for KAP-S/ KAP-E 100N up to 3kN
	GKA 12	male threadwith jam nut for KAP-S 5kN up to 10kN
	GKA 20	male threadwith jam nut for KAP-S 20kN
	GKA 25	male threadwith jam nut for KAP-S 50kN
Plug and cable	XKC 041	6-pin plug connected to sensor cable
	XKC 071	6-pin plug connected (TEDS) to force transducer
CANopen interface	KAP-DI	for 10N ... 2kN Please note data sheet „Force Transducer with CANopen Interface“!