

Quartz Transverse Measuring Pin for indirect force measurement in machines and tools

Type 9240AA3, 9240AB3,
9240AC3

Piezoelectric sensor for indirect force measurement in machine structures, tools, etc. in industrial monitoring tasks.

- Preloading allows measuring compression and tension forces
- Can be fixed in any direction and depth in the mounting bore
- Ground-isolated

Description

The front part of the sensor is sensitive to transversal forces. Shaped as a cylindrical pin, all it needs for its installation is a 8 mm borehole. An integrated clamping system is used to preload the sensor in the borehole enabling it to detect tensile and compressive forces in the machine structure. The ceramic-coated body sleeve allows to mount the sensor ground insulated.

Application

The sensor is easily mountable and allows to measure forces within a machine part or a tool.

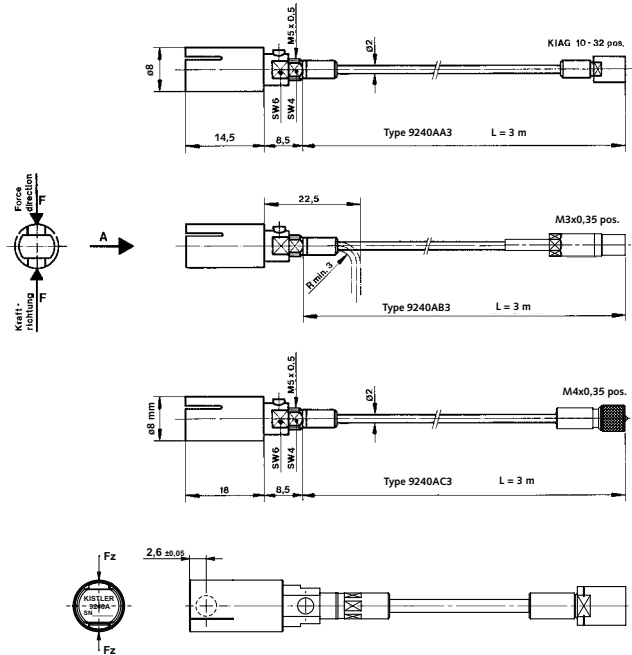
Once installed, the sensor can be calibrated by comparative measurement, e.g. with a calibrating force sensor.

The main application field is the industrial monitoring of machine forces (machine monitoring, tool monitoring, etc.).

In combination with a ControlMonitor (maXYmos) it can be used to monitor limit values of forces that are decisive in the safety and reliability of machines and tools.

Technical data

Range			
with preload	510 N	$\mu\epsilon$	0 ... 500
with preload	850 N	$\mu\epsilon$	-140 ... 350
with preload	1 190 N	$\mu\epsilon$	-285 ... 210
Overload			
with preload	510 N	$\mu\epsilon$	850
with preload	850 N	$\mu\epsilon$	700
with preload	1 190 N	$\mu\epsilon$	570
Threshold in test object		$\mu\epsilon$	0,005
Sensitivity in test object		pC/ $\mu\epsilon$	$\approx -9,5$



Force sensitivity for preload	pC/N	≈ -4
Linearity	% FSO	$\leq \pm 1$
Hysteresis	% FSO	$\leq 1,5$
Repeatability of sensitivity after demounting and remounting	%	± 2
Acceleration sensitivity (measuring direction) 10 g RMS	$\mu\epsilon/g$	$\leq 0,02$
Operating temperature range	$^{\circ}\text{C}$	-40 ... 200
Insulation resistance at 20 $^{\circ}\text{C}$	Ω	$\geq 10^{13}$
Ground insulation	Ω	$\geq 10^8$
Capacitance	pF	338
Protection class		IP 64
Weight	g	34

1 $\mu\epsilon$ = 1 microstrain = 10^{-6} m/m;
1 N (Newton) = $1 \text{ kg}\cdot\text{m}\cdot\text{s}^{-2}$ = 0,1019... kp = 0,2248... lbf,
1 kp = 1 kgf = 9,80665 N

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Mounting

By adjusting the nut the sensor is preloaded using a charge amplifier and a display unit.

The mounting tool Type 1300A161A... is used for deep hole mounting.

Mounting examples

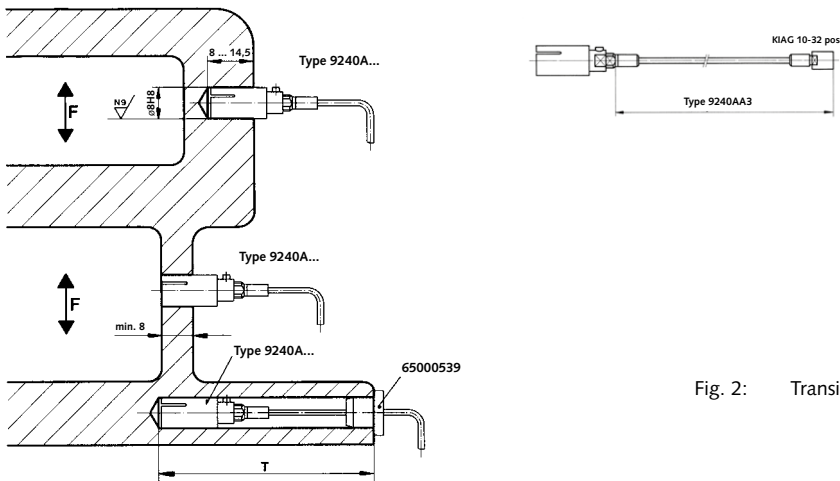


Fig. 1: T = 10 ... 118 mm mounting tool with Type 1300A161A100
T = 10 ... 318 mm mounting tool with Type 1300A161A300

Transition coupling for Type 9240AA...

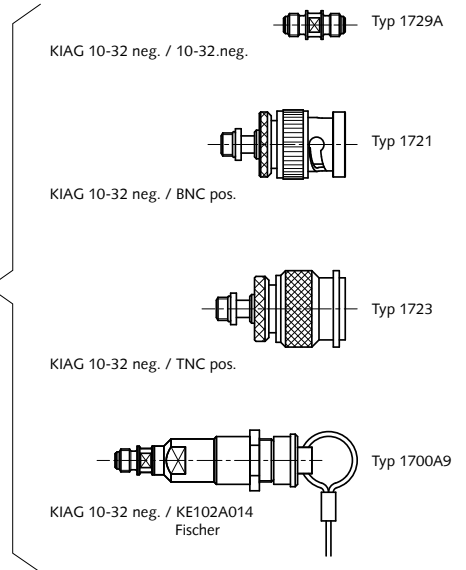


Fig. 2: Transition coupling

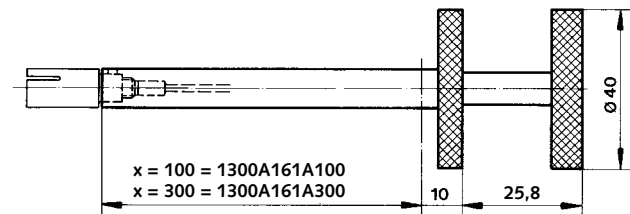


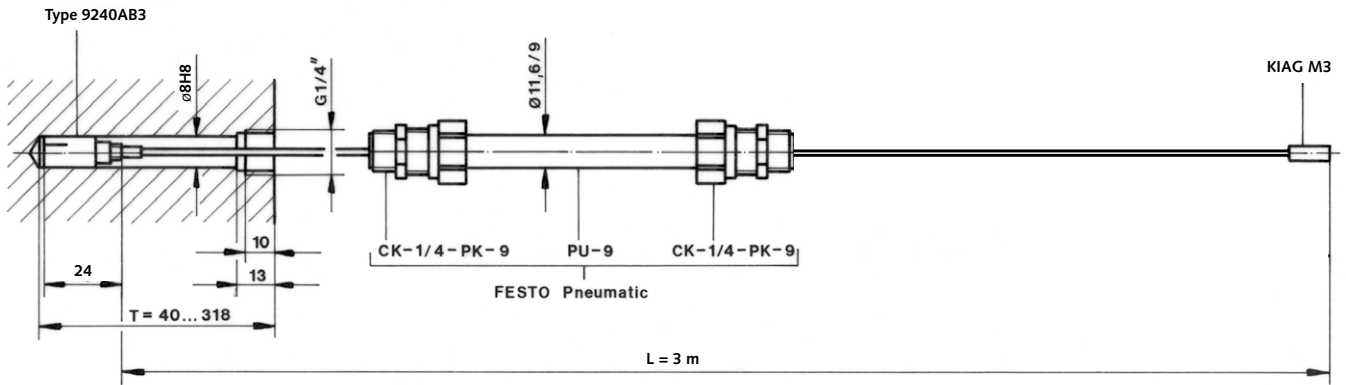
Fig. 3: Mounting tool

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Examples with common protection hoses

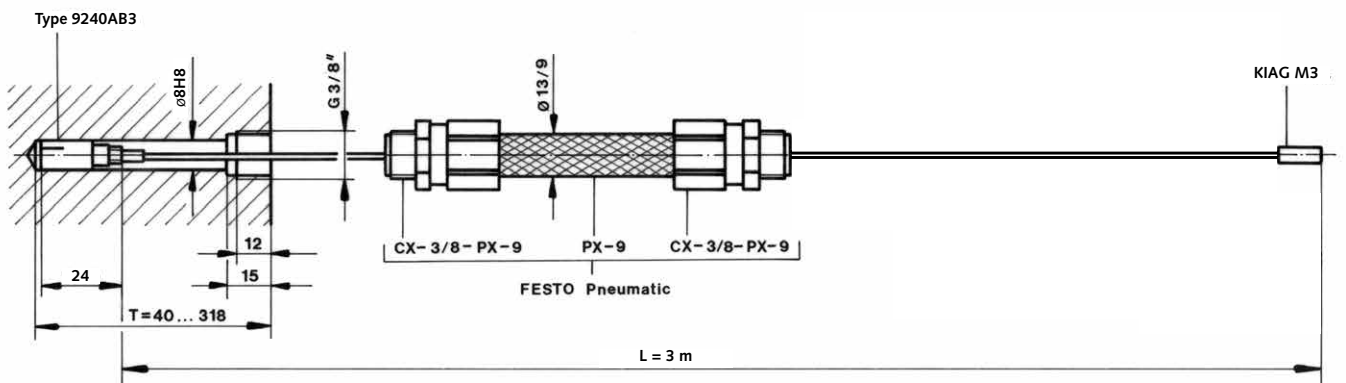
Variant I

Plastic protection hose and fast screwing by FESTO Pneumatic



Variant II

Flexopneu hose with metal braiding and fast screwing by FESTO Pneumatic



Optional accessories

- Mounting tool 100 mm consisting of:
 - Inner part 55143065
 - Outer part 55143066
- Mounting tool 300 mm consisting of:
 - Inner part 55143067
 - Outer part 55143068
- Coupling M3 neg. – BNC pos. 1706
- Coupling M4 neg. – BNC pos. 1705
- Coupling KIAG 10-32 neg. – BNC pos. 1721

Type/Mat. No.
1300A161A100

55143065
55143066
1300A161A300

Ordering key

Sensor with integrated high temperature cable, KIAG 10-32 pos. connector (L = 3 m)	3	Type 9240AA <input type="checkbox"/>
Sensor with integrated high temperature cable, M3 pos. connector (L = 3 m)	3	Type 9240AB <input type="checkbox"/>
Sensor with integrated high temperature cable, M4 pos. connector (L = 3 m)	3	Type 9240AC <input type="checkbox"/>

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