

In-Line Charge Amplifier

Type 5027A...

Industrial Charge Amplifier for Installation in Machine Structures

Industrial one channel amplifier which converts the charge produced by quartz sensors into a proportional voltage.

- Extremely small dimensions
- Measuring range up to 450 000 pC
- Supplied calibrated or uncalibrated
- Handy accessories for on-site calibration
- Suitable for installation in machine structure
- Output ± 5 V

Description

The In-Line Amp industrial, single-channel charge amplifier Type 5027A... contains a capacitive negative feedback amplifier at the signal input in hybrid construction with an extremely high isolation resistance. An unstabilized DC voltage of 10 ... 36 V is sufficient to supply the In-Line Amp.

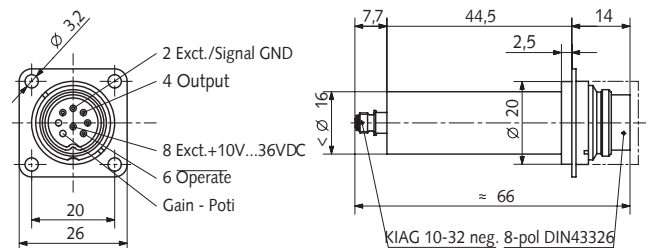
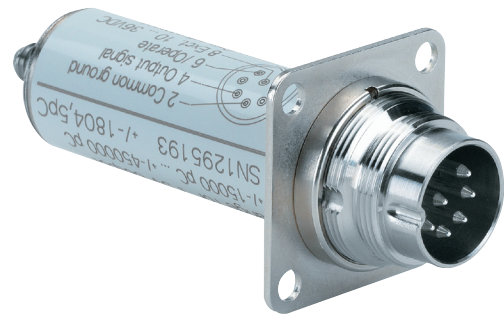
A potentiometer incorporated in the 8-pole plug connection allows simple on-site calibration to the maximum output voltage of ± 5 V. It can be operated during calibration by using the Remote Control service unit or by directly connecting the calibration cable to the machine control system (see page 3, Accessories for calibrating the In-Line Amp).

The single-channel charge amplifier can be supplied either calibrated or uncalibrated in three measuring ranges.

Applications

The In-Line Amp charge amplifier is particularly suitable for monitoring duties on machinery and machine tools, e.g. for force shunt measurements, in which calibration on the machine is required.

Incorporation in their structures allows measuring of process parameters close to the sensor.



Examples of General Areas of Application

- Located in robotic systems of assembly plant
- Monitoring of forces or stresses in crossbeams
- Installation of electronic systems in force plates
- Installation in linearly moving machine parts, e.g. piston rods
- Measurement of forces, stresses and torques in rotating shafts (low impedance signal transmission on non-rotating part)
- Mobile (portable) measuring instruments: Periodic checking of machine parameters

Technical Data

Charge Amplifier

No. of channels	1	
Measuring ranges FS		
optional	pC	±150 ... ±4 800
	pC	±4 800 ... ±145 000
	pC	±145 000 ... ±450 000
Frequency range (-3 dB)	kHz	≈0 ... >10
Setting tolerance	%	<±1
Drift (at 25 °C)	pC/s	<±0,05
Reset/Operate transition	pC	<±3
Output signal	V	±5
Output current	mA	±2
Output impedance	Ω	100
Output noise signal	mV _{pp}	<5
Zero point error (Reset)	mV	<±10
Frequency range	Hz	≈0 ... 10 000
Time constant	s	>50 000

Control Inputs for Reset/Operate

Operate/Reset control connection for (PIN 6)		
Operate	Connection to GND or <0,8 V/0,1 mA	
Reset	Input open or >2 V	
Input impedance (pull-up) on +7,5 V	kΩ	100
Operate-Reset time		
Residual charge <0,5 % FS (depends on quantity of charge)	ms	<10 ... 500

Power Supply

Supply voltage	VDC	10 ... 36
Current consumption without load	mA	≈10

General Data

Operating temperature range	°C	0 ... 60
Temperature min/max	°C	-10/70
Case material	stainless steel	
Degree of protection (EN 60529)	IP65	
Vibration resistance	g _p	10

Test conditions:

20 ... 2 000 Hz in 2 minutes
continuously run through
8x within 16 minutes

Shock resistance, over 1 ms	g	200
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Connections

Charge input	Type	KIAG 10-32 neg.
Charge output, supply	Type	8-pol DIN 45326

Weight	g	≈45
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The device is CE-conform to the **CE** Directives 89/3336/EEC and complies with the EMC standards for industrial and laboratory equipment.

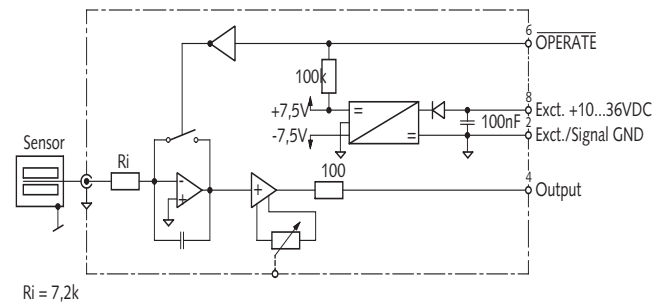


Fig. 1: Block diagram In-Line Charge Amplifier Type 5027A...

Mounting Examples

The single-channel charge amplifier can be installed in the structure in the immediate vicinity of a sensor. The entire measuring chain is then largely protected against environmental influences.

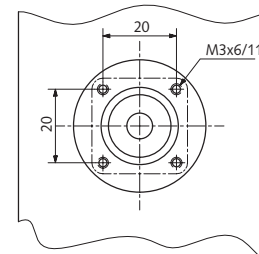
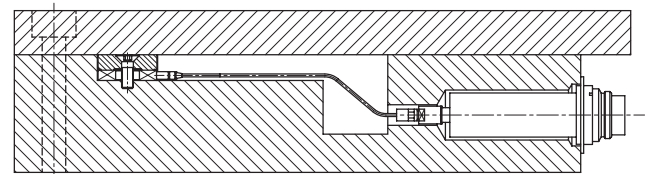


Fig. 2: Whole pattern of fixing thread

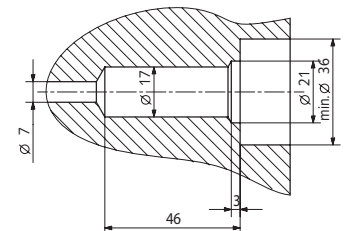


Fig. 3: Mounting bore for installation in structure

In-Line Charge Amplifier Type 5027A...

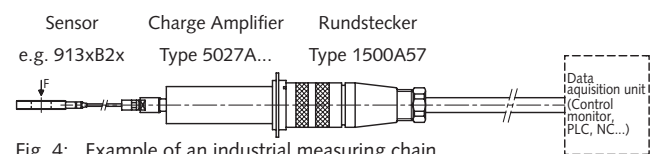


Fig. 4: Example of an industrial measuring chain

Optional Accessories for Calibrating the In-Line Charge Amplifier

Calibration Cable Type Z16401

A screwdriver device is fitted in the connecting plug of calibration cable Type Z16401 in the In-Line Charge Amplifier, allowing mechanical adjustment of a potentiometer in the 8-pole connector of the charge amplifier.

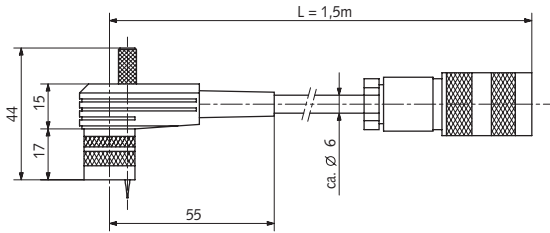


Fig. 5: Calibration Cable Type Z16401

Remote Control Monitor Type 5825A1

Portable service unit for on-site calibration. It can be used in place of the machine control system for calibrating the industrial measuring chain.

The battery-operated unit supplies a constant 18 V current. It can also be used for operating the Reset/Operate mode and output signal indication.

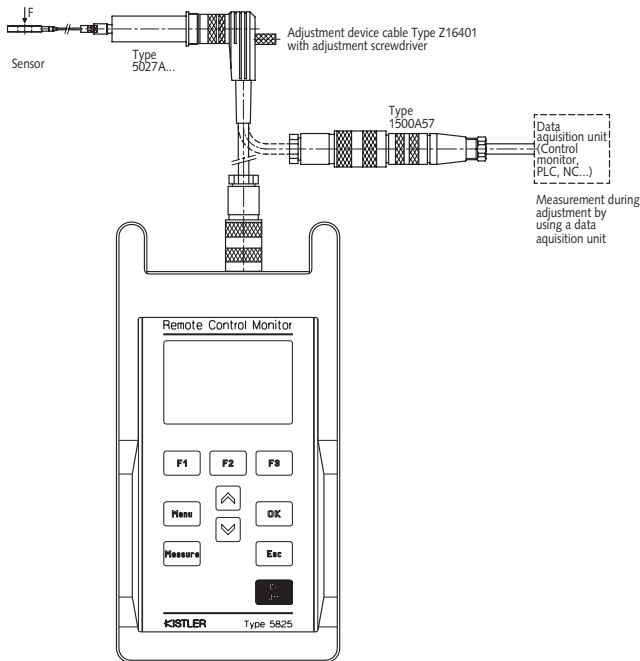


Fig. 6: Adjustment of In-Line charge Amplifier with the Remote Control Monitor Type 5825A1 or with machine control system (PLC)

Optional Accessories for Installing the In-Line Charge Amplifier

Mounting of the charge amplifier on the surface of a structure with the mounting bracket Type 1413.

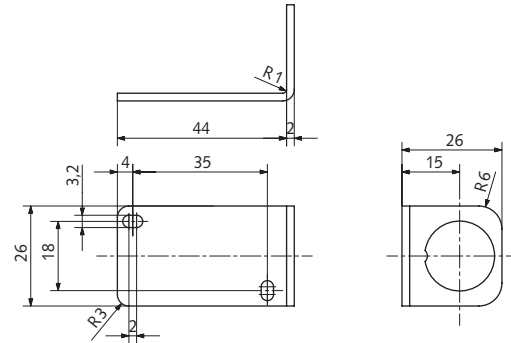


Fig. 7: Mounting bracket, Type 1413

With the assembly wrench of the slotted nut of 8-pole plug connection DIN 45326 can the charge amplifier also be fixed in a steel plate with a 17 mm aperture.

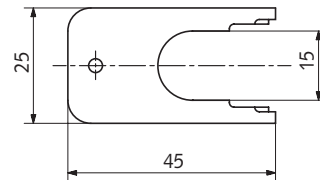


Fig. 8: Assembly wrench, Type 1300A59

Optional Accessories for Cable Connection of the In-Line Charge Amplifier

Round connector, 8-pole, per DIN 45326.

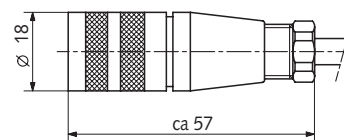


Fig. 9: Round connector, Type 1500A57

Aluminium cap for 8-pole plug connection DIN 45326, degree of protection IP67.

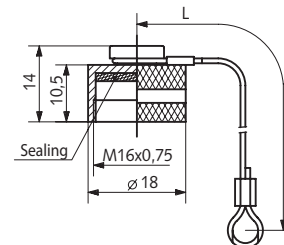


Fig. 10: Aluminium cap, Type 1433

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Included Accessories

- None

Optional Accessories

- Calibration cable
- Remote Control Monitor
- Mounting bracket
- Assembly wrench
- Round connector
- Aluminium cap

Type/Art. No.

Type/Art. No.

Z16401

5825A1

1413

1300A59

1500A57

1433

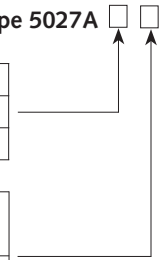
Ordering Key

Measuring range	$\pm 4\,800\text{ pC}$	1
Measuring range	$\pm 145\,000\text{ pC}$	2
Measuring range	$\pm 450\,000\text{ pC}$	3

Nonadjusted, to be adjusted in situ, max. measuring range $\approx \pm 5\text{ V}$	1
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Calibrated as specified in the order	2
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Type 5027A



(For further details, please consult page 3)

Ordering Example

1 Charge Amplifier Type 5027A22 adjusted to $\pm 50\,000\text{ pC} \hat{=} \pm 5\text{ V}$

To specify in the order:

Type 5027A22, adjusted to $\pm 50\,000\text{ pC} = \pm 5\text{ V}$