

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.

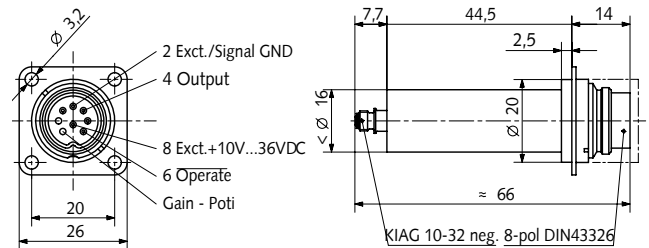
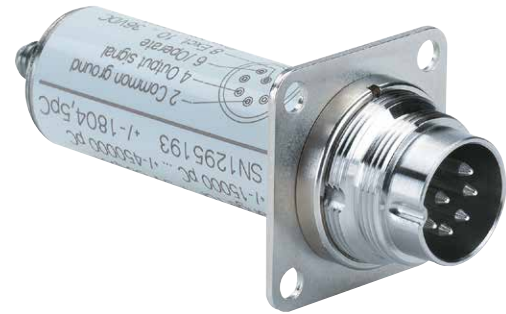
The single-channel charge amplifier can be supplied either calibrated or uncalibrated in three measuring ranges.

Applications

The In-Line Amp charge amplifier is particularly suitable for signal conditioning of piezo sensors. 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



Technical data

Charge amplifier

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

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Control inputs for reset/operate

Control connection for (PIN 6)	
Operate	Connection to GND or <math><0,8\text{ V}/0,1\text{ mA}</math>
Reset	Input open or >2 V
Input impedance (pull-up) on +7,5 V	k Ω 100
Operate-reset time Residual charge <math><0,5\% \text{ FS}</math> (depends on quantity of charge)	ms <math><10 \dots 500</math>

Power supply

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

General data

Operating temperature range	$^{\circ}\text{C}$	0 ... 60
Temperature min/max	$^{\circ}\text{C}$	-10/70
Case material		stainless steel
Degree of protection (EN 60529)	IP65	
Vibration resistance	g_p	10
Shock resistance, over 1 ms	g	200
Connections		
Charge input	Type	KIAG 10-32 neg.
Charge output, supply	Type	8-pol DIN 45326
Weight	gramm	≈ 45

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

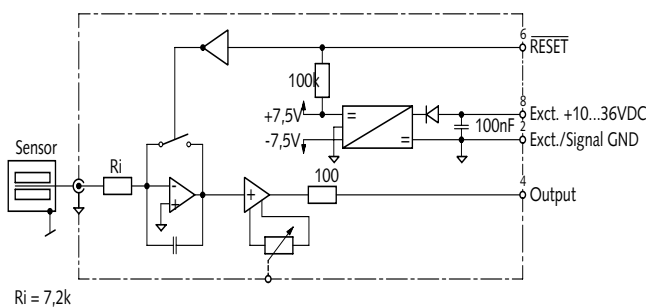


Fig. 1: Block diagram In-Line Charge Amplifier Type 5027A...

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.

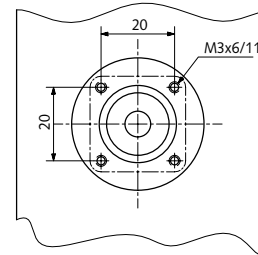
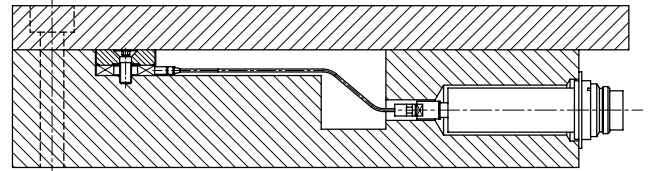


Fig. 2: Whole pattern of fixing thread

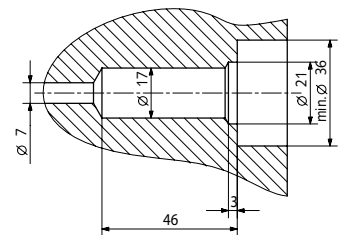


Fig. 3: Mounting bore for installation in structure

In-Line Charge Amplifier Type 5027A...

Sensor e.g. Charge amplifier Round connector
Type 913xB2x Type 5027A... Type 1500A57

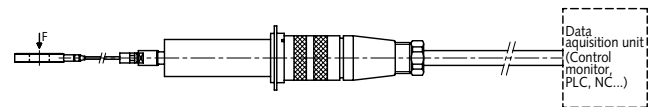


Fig. 4: Example of an industrial measuring chain

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.

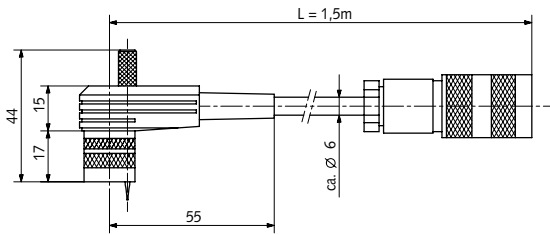


Fig. 5: Calibration Cable Type Z16401

Remote control monitor Type 5825A1

Portable service unit for on-site adjustment.

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.

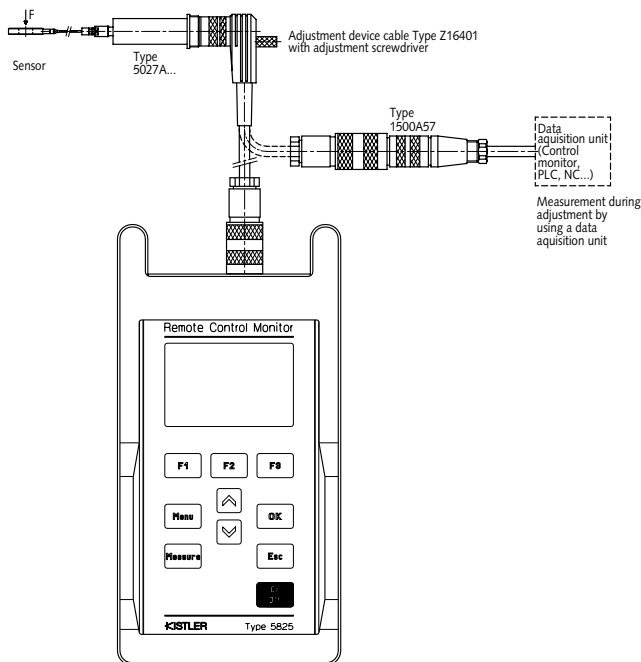


Fig. 6: Adjustment of In-Line charge amplifier with the Remote Control Monitor Type 5825A1 or with machine control system (PLC)

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.

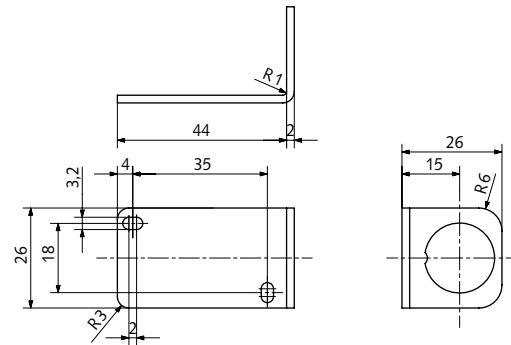


Fig. 7: Mounting bracket, Type 1413

Optional accessories for cable connection of the In-Line Charge Amplifier

Round connector, 8-pole, per DIN 45326.

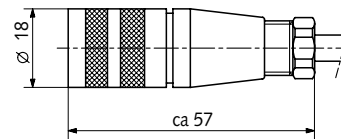


Fig. 8: Round connector, Type 1500A57

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

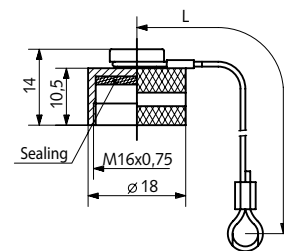


Fig. 9: Aluminum cap, Type 1433

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Included accessories

- None

Optional accessories

- | | |
|--------------------------|--------------------------------|
| • Calibration cable | Type/Art. No.
Z16401 |
| • Remote control monitor | 5825A1 |
| • Mounting bracket | 1413 |
| • Round connector | 1500A57 |
| • Aluminium cap | 1433 |

(For further details, please consult page 3)

Ordering key

		Type 5027A	<input type="checkbox"/>	<input type="checkbox"/>
Measuring range	1			
0 ... ±150 pC up to 0 ... ±4 800 pC				
Measuring range	2			
0 ... ±4 800 pC up to 0 ... ±145 000 pC				
Measuring range	3			
0 ... ±15 000 pC up to 0 ... ±450 000 pC				
Nonadjusted, to be adjusted in situ, max. measuring range ≈±5 V		1		
Calibrated as specified in the order		2		

Ordering example

Type 5027A22, adjusted to ±50 000 pC = ±5 V