

# 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  $\pm 5$  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.

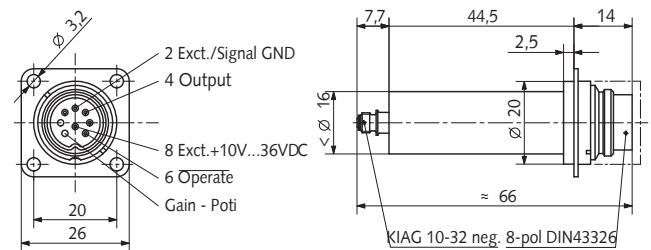
The single-channel charge amplifier can be supplied either calibrated or uncalibrated in three measuring ranges.

### 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	$\pm 5$
Output current	mA	$\pm 2$
Output impedance	$\Omega$	100
Output noise signal	mV <sub>pp</sub>	$< 5$
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 <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 <sub>p</sub>	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.

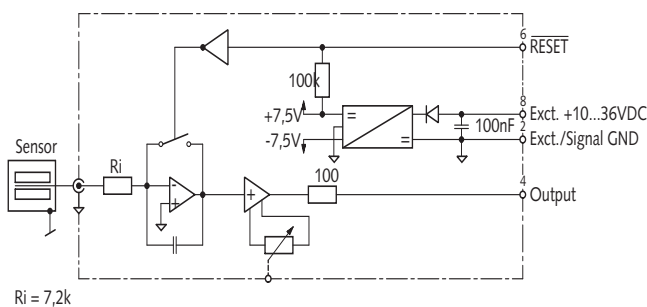


Fig. 1: Block diagram In-Line Charge Amplifier Type 5027A...

**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.

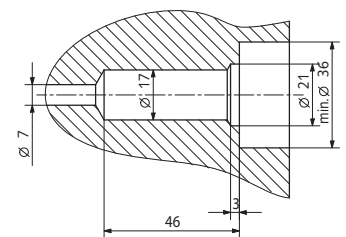
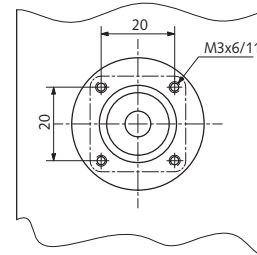
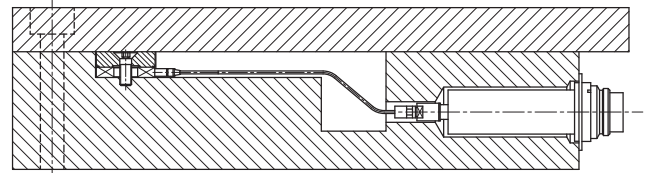


Fig. 2: Whole pattern of fixing thread

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

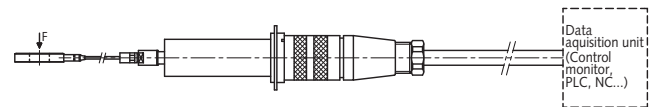


Fig. 4: Example of an industrial measuring chain

### 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.

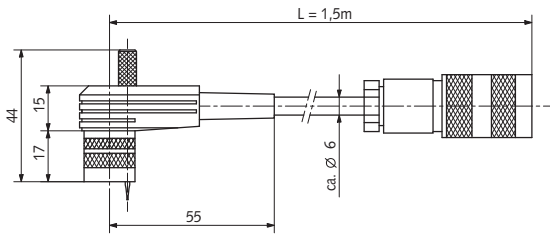


Fig. 5: Calibration Cable Type Z16401

#### 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.

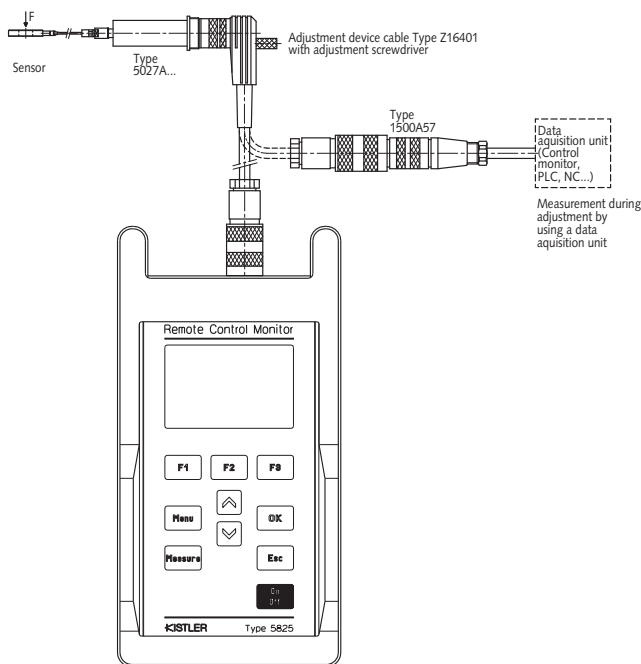


Fig. 6: Adjustment of In-Line charge Amplifier with the Remote Control Monitor Type 5825A1 or with machine control system (PLC)

### 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.

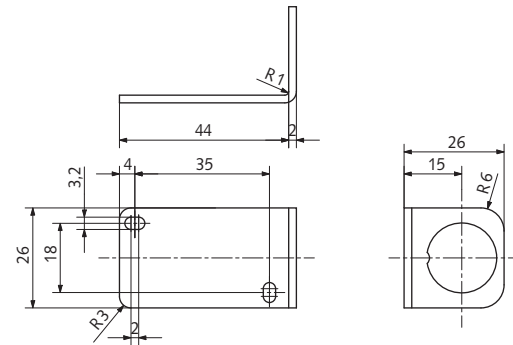


Fig. 7: Mounting bracket, Type 1413

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

Round connector, 8-pole, per DIN 45326.

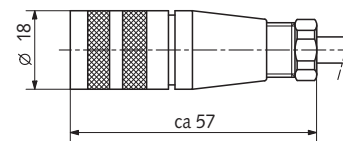


Fig. 8: Round connector, Type 1500A57

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

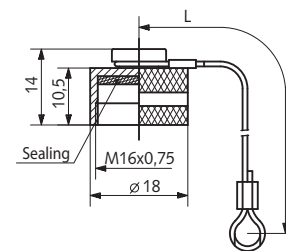


Fig. 9: Aluminum cap, Type 1433

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### Included Accessories

- None

### Optional Accessories

- |                          |                                |
|--------------------------|--------------------------------|
| • Calibration cable      | <b>Type/Art. No.</b><br>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	0 ... ±150 pC up to 0 ... ±4 800 pC	1	↑	↑
Measuring range	±145 000 pC 0 ... ±4 800 pC up to 0 ... ±145 00 pC	2		
Measuring range	±450 000 pC 0 ... ±145 000 pC up to 0 ... ±450 000 pC	3		
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