

# Miniature Charge Amplifier

Type 5177A...

## For Onboard Applications

The compact charge amplifiers of Type 5177A are specifically developed for onboard operation on racing circuits or test sites. It converts the charge from piezoelectric cylinder pressure sensors into a proportional voltage.

- Power supply 9 ... 16 VDC
- Fixed time constant
- Fixed sensitivity
- Output signal 0,5 ... 4,5 VDC
- Operating temperature 0 ... 120 °C
- Deutsch ASDD Motorsport connector
- FIA homologated



### Description

Compact dimensions, IP67 protection and operating temperatures up to 120 °C are ideal features for onboard applications, allowing In-Cylinder pressure measurements under real driving conditions.

The charge amplifier is equipped with 3 or 4 inputs for piezoelectric cylinder pressure sensors; it can operate with a power supply in the 9 ... 16 VDC range, and it delivers an analog output signal from 0,5 ... 4,5 VDC.

Regarding time constant and dimensions, the 3-channel version is optimized for the requirements of a 6-cylinder racing engine.

### Application

Compact dimensions allow positioning close to the sensor for minimized interferences on the signal path of the charge cable. The piezoelectric cylinder pressure sensors are connected with a cable, which features a 10-32UNF connector with a swivel nut (see accessories page 3).

In conjunction with a suitable indication system, the Type 5177A delivers precise signals to optimize the MFB 50 % point, to determine the indicated mean effective pressure (IMEP), to monitor peak pressure or to detect knocking combustion.

### Technical Data

Charge Amplifier		5177A1300	5177A0400
Number of channels		3	4
Measuring range	pC	4 500	
Sensitivity	pC/V	1 125	
	mV/pC	0,889	
Output signal (FSO)	V	4	
Zero point (ZMO)	V	0,55 (±0,05)	
Noise (0,1 Hz ... 1 MHz)	mVpp	<10	
Output current max.	mA	±2	
Signal source resistance	Ω	10	
Time constant	s	≈0,44	≈2,00
Frequency range (-3dB)	Hz	≈0,4 ... >50 000	
<b>Power Supply</b>			
Power supply	VDC	9 ... 16	
Current consumption (at 14 VDC)	mA	<50	<60
<b>General</b>			
Operating temperature range	°C	0 ... 120	
Vibration resistance (22,5 ... 2 000 Hz/sweep 1 octave/min)	g	10	
Shock resistance (<1 ms)		50	
Weight	grams	≈60	≈80
Degree of protection		IP67	
<b>Connections</b>			
Input (charge)	Type	KIAG 10-32 neg.	
Output (voltage)	Type	Deutsch ASDD006-09PN	
EMV emission		EN61000-6-3	
EMV immunity		EN61000-6-2	

5177A\_003-259e-06.16

**Dimensions**

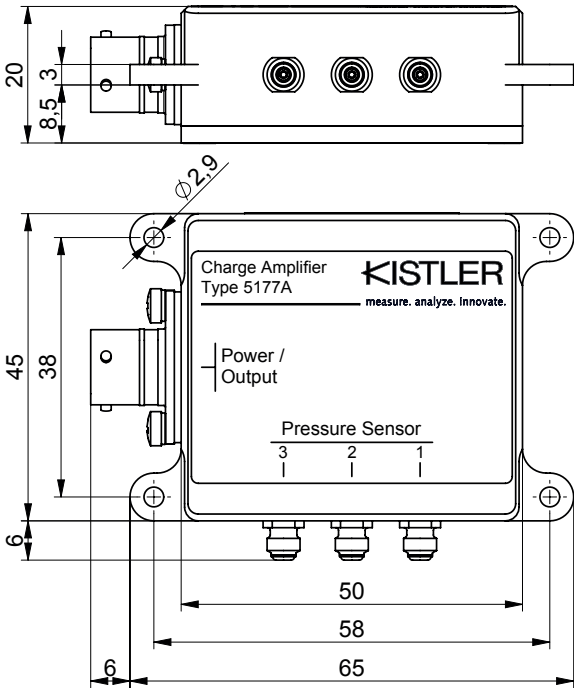


Fig. 1: Dimensions Type 5177A1300

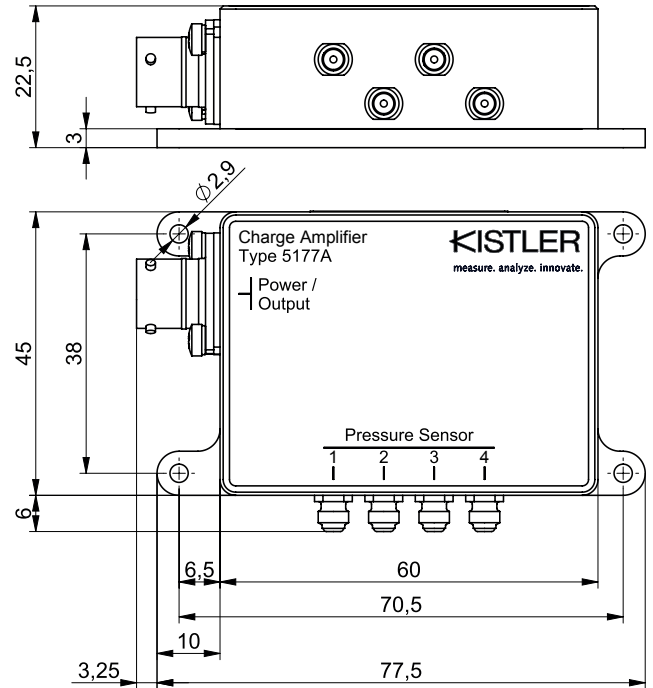


Fig. 2: Dimensions Type 5177A0400

**Block Diagram**

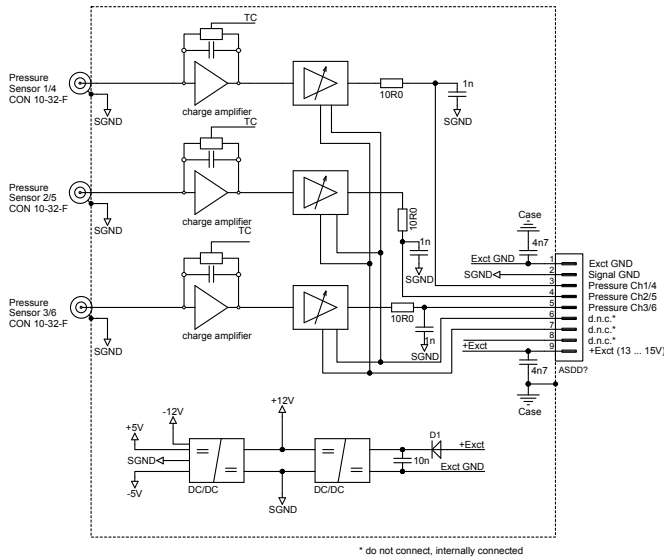


Fig. 3: Block diagram Type 5177A1300

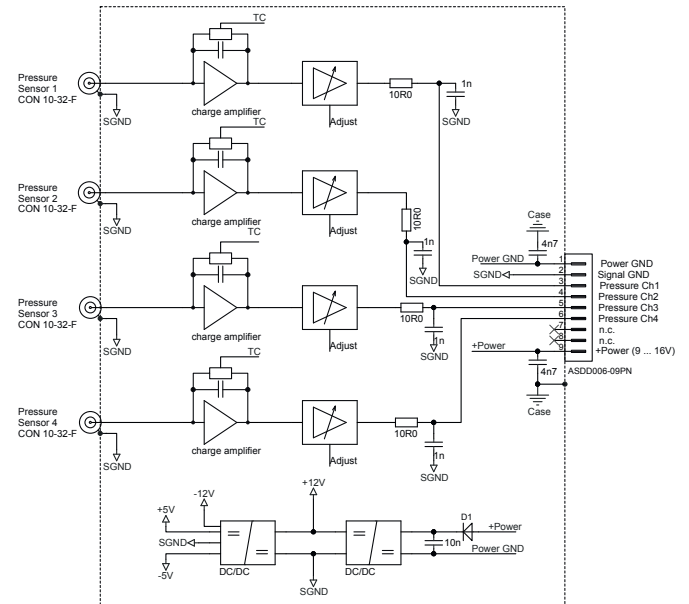


Fig. 4: Block diagram Type 5177A0400

5177A\_003-259e-06.16

**Electrical Connection Output Connector**

Pin	1	Power GND
Pin	2	Signal GND
Pin	3	Pressure Ch 1 (Sensor 1)
Pin	4	Pressure Ch 2 (Sensor 2)
Pin	5	Pressure Ch 3 (Sensor 3)
Pin	6	d.n.c.*
Pin	7	d.n.c.*
Pin	8	d.n.c.*
Pin	9	Power (9 ... 16 VDC)

\* do not connect, internally connected

Fig. 5: Electrical connection output connector Type 5177A1300

Pin	1	Power GND
Pin	2	Signal GND
Pin	3	Pressure Ch 1 (Sensor 1)
Pin	4	Pressure Ch 2 (Sensor 2)
Pin	5	Pressure Ch 3 (Sensor 3)
Pin	6	Pressure Ch 4 (Sensor 4)
Pin	7	n.c.*
Pin	8	n.c.*
Pin	9	Power (9 ... 16 VDC)

\* not connected

Fig. 6: Electrical connection output connector Type 5177A0400

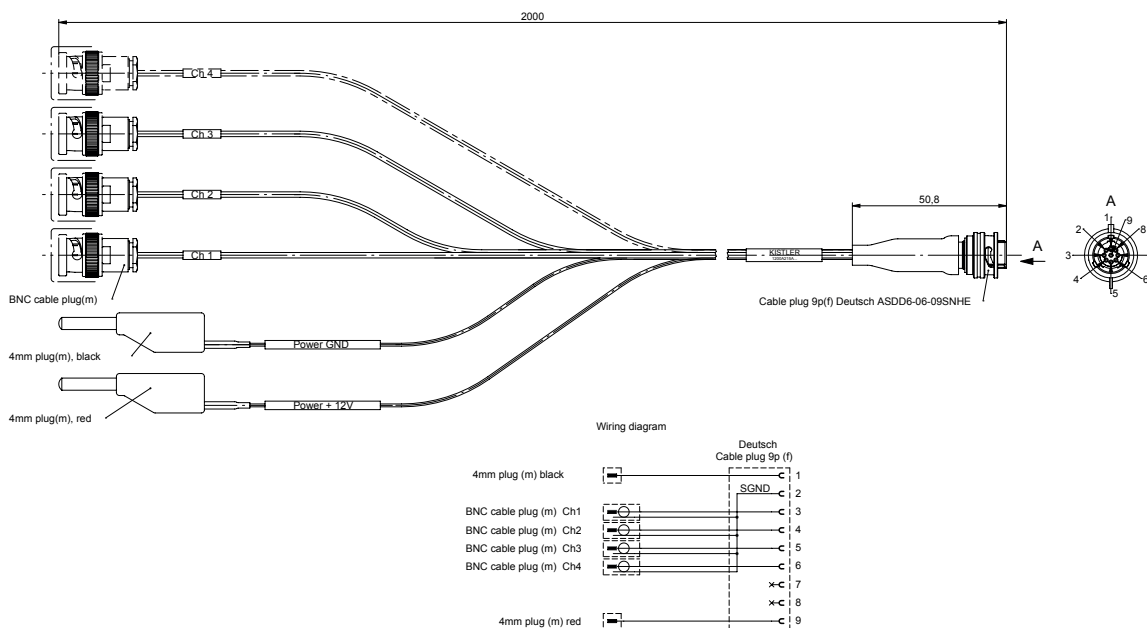


Fig. 7: 3-/4-channel adapter cable Type 1200A215A0\_2

**Included Accessories**

- None

**Optional Accessories**

- |   |              |
|---|--------------|
| • Deutscher connector ASDD6-06-09SNHE                     | 1500A103     |
| • 3-channel adapter cable, L = 2 m                        | 1200A215A032 |
| • 4-channel adapter cable, L = 2 m                        | 1200A215A042 |
| • Sensor PFA connection cable M3 – KIAG 10-32UNF, L = 1 m | 1989A116Q01  |
| • Sensor PFA connection cable M3 – KIAG 10-32UNF, L = sp  | 1989A196Q01  |
| • Sensor FPM connection cable M3 – KIAG 10-32UNF, L = 1 m | 1989A416Q01  |
| • Sensor FPM connection cable M3 – KIAG 10-32UNF, L = sp  | 1989A496Q01  |

**Ordering Examples**

- |  |                  |
|--|------------------|
| • 3-channel charge amplifier, symmetrical housing with analog output | <b>5177A1300</b> |
| • 4-channel charge amplifier, standard housing with analog output    | <b>5177A0400</b> |

5177A\_003-259e-06.16