

Electronic Measuring and Calibration Instruments



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Our electronic instruments and calibration equipment product area features instruments with long-term reliability, innovative calibration technology, and a comprehensive range of services from our own DKD laboratory for temperature, pressure and standardised electrical signals.

Tried and tested components for instrumentation and control equipment and systems help our customers ensure the consistent long-term quality of their products and the efficiency of their production processes. Our strength is our flexibility in developing customised solutions, based on our wealth of experience.

Standard Signals

Temperature

Pressure

% r.F. **bar** **Ω**

mA **°C** **psi** **°F** **mbar**



Manual pressure pumps

Mobile and simple

Pressure is one of the most commonly measured quantities in engineering, which is why exact and reliable pressure measurement is especially important.

However, the characteristics of the even best sensor or transducer can be altered by a wide variety of factors. This drift cannot be prevented, and it leads to incorrect readings.

Calibration allows these deviations to be measured and documented in a certificate. All pressure measuring devices that significantly affect processes or activities should be calibrated before being used.

Good reasons for proper and reliable calibration:

- Maintaining consistently high product quality
- Fulfilling industrial requirements
- Fulfilling quality assurance requirements
- Process optimisation
- Increasing productivity
- Avoiding unexpected production downtimes
- Employee and customer safety
- Environmental requirements / ecological aspects
- Profit optimisation / economic aspects

SIKA's mobile test and calibration devices are effective aids for performing the necessary test and calibration tasks quickly.



Requirements for pressure sources

The essential requirements for manual pressure generation are:

- Easy connection to test samples
- Simple and easy pressure generation
- Maintenance free operation

These aspects have been taken into account and implemented in the design of our test pumps and pressure generators.



Test pumps or pressure generators

SIKA portable pressure generators are the first choice for stationary use. Unlike complicated and sensitive plate scales, there is no need to take gravity into account or perform complicated alignment, since measurements are based on direct comparison. Another advantage of pressure generators is one-hand operation, which makes repetitive test runs more ergonomic.

A single pump for a variety of requirements

Hydraulic or pneumatic

Air, water and oil are used as pressure media. Especially in application areas in which wetting of the test sample is not allowed or the use of aggressive or ionising substances must be avoided, air is the ideal test medium.

SIKA's pneumatic test pump fulfils requirements that in many cases can only be covered by several pumps from other suppliers.

- ❶ Manual pressure generation in the medium pressure range up to 60 bar using a handle is unique – no other pump can do this.
- ❷ Integrated negative pressure capability enables operating with vacuum down to -950 mbar. A changeover valve enables switching from positive pressure to negative pressure with no need for special tools.
- ❸ A large-volume pressure regulator with ultrafine thread pitch is used for precise pressure adjustment in the low mbar range, enabling accurate settings in the low pressure region.

The easily operated hydraulic test pumps and pressure generators are specifically designed for the medium to high pressure range. They have a built-in reservoir for the hydraulic fluid. Pressures up to 350 bar, 700 bar or 1000 bar can be generated, depending on the model.



OEM version and full version

Depending on the model a matching pressure hose is part of the basic configuration of the OEM version of the test pump. The hydraulic hoses are fitted with a self-sealing quick coupling. Inch, conical or metric adapters for all commonly used connection threads are available in the full version. A matching seal kit is also included with the pump. All of the equipment is held in a carrying case with a foam-rubber insert.



Adapter kits

Standard adapter kit										
G ¹ / ₈	G ¹ / ₄	G ³ / ₈	G ¹ / ₂	1/8 NPT	1/4 NPT	1/2 NPT	M12 x 1.5	M20 x 1.5	G ¹ / ₈ A	G ¹ / ₄ A

Pneumatic pressure pumps

Type P 4



Type	P 4
OEM version	
Pressure medium	Air
Dimensions	Approx. 225 x Ø 55 mm
Weight	Approx. 980 g
Pressure ranges	
Negative pressure	-0.3 bar [depending on test sample / reference]
Positive pressure	4 bar
Connections	
Reference	G $\frac{1}{4}$ with Quick-Snap Y-plug-connection with PA hose (2 x 1m)
Test sample	G $\frac{1}{4}$ with quick coupling and pressure hose (1m)
Full version	
Adapter kit	Chrome-plated brass
Gasket kit	Teflon® Seals and O-rings
Dimensions	Approx. 450 x 370 x 110 mm
Weight	Approx. 4.2 kg

Types P 40.2 and P 60



Type	P 40.2	P 60
OEM version		
Pressure medium	Air	
Dimensions	Approx. 240 x 170 x 50 mm	
Weight	Approx. 1.1 kg	
Pressure ranges		
Negative pressure	-0.95 bar	-0.95 bar
Positive pressure	40 bar	60 bar
Connections		
Reference	G $\frac{1}{4}$	
Test sample	G $\frac{1}{4}$ with quick coupling and pressure hose (1m)	
Full version		
Adapter kit	Chrome-plated brass	
Gasket kit	Teflon® Seals and O-rings	
Dimensions	Approx. 450 x 370 x 110 mm	
Weight	Approx. 4.2 kg	

Type P 700.2


Type	P 700.2
OEM version	
Pressure medium	Distilled water or hydraulic fluid
Dimensions	Approx. 255 x 225 x 85 mm
Weight	Approx. 1.7 kg
Pressure ranges	
With distilled water	0...700 bar
With hydraulic fluid	0...700 bar
Connections	
Reference	G¼
Test sample	G¼ with quick coupling and pressure hose (1m)
Full version	
Adapter kit	Stainless steel
Gasket kit	Teflon® Seals and O-rings
Dimensions	Approx. 450 x 370 x 125 mm
Weight	Approx. 4.8 kg

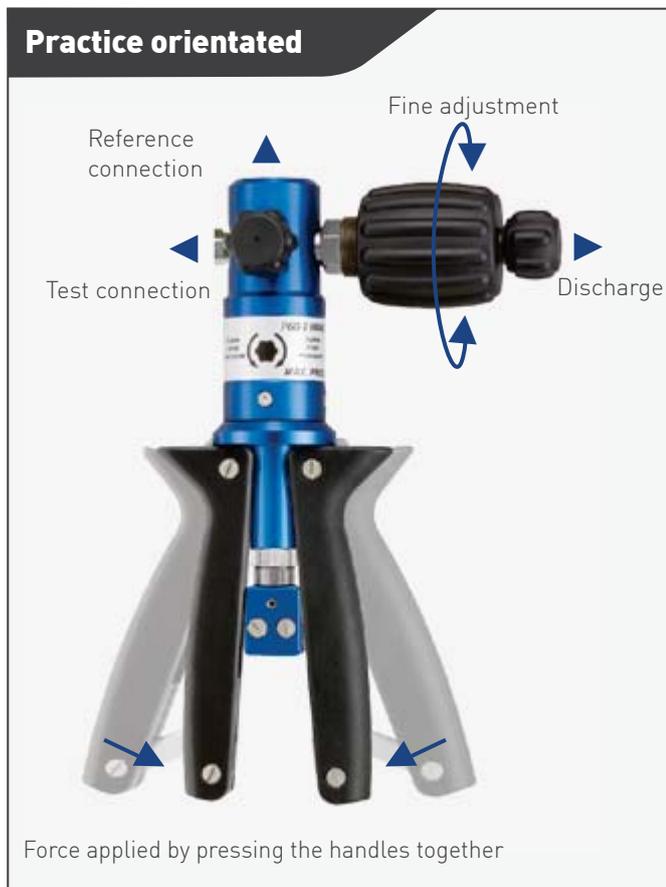
Type P 700.2 - 1000

Type	P 700.2 - 1000
OEM version	
Pressure medium	Distilled water or hydraulic fluid
Dimensions	Approx. 255 x 225 x 85 mm
Weight	Approx. 1.9 kg
Pressure ranges	
With distilled water	0...700 bar, test pressure 1000 bar
With hydraulic fluid	0...700 bar, test pressure 1000 bar
Connections	
Reference	G $\frac{1}{4}$
Test sample	G $\frac{1}{4}$ with quick coupling and high pressure hose (1 m), 1000 bar
Full version	
Adapter kit	Stainless steel
Gasket kit	Teflon® Seals and O-rings
Dimensions	Approx. 450 x 370 x 125 mm
Weight	Approx. 5 kg

Practical and independent

Practical

The test pumps and pressure generators are designed to enable the direct connection of all pressure systems to be tested using adapters. The test sample is easily connected using the rugged industrial hose with integrated quick coupling and supplied adapters. The reference is fitted directly at the top of the pump using a positioning adapter.



The required test pressure is initially generated using the handles and then adjusted precisely with the fine adjustment valve. As a result, the pressure on both instruments is the same.

The pressure relief valve allows continuous pressure reduction and ensures accurate and easy testing, even with decreasing pressure.

In the simplest case, the pressure is indicated by an analogue pressure gauge. An easy to read digital pressure gauge or handheld instrument can also be used. The accuracy or adjustment of the pressure measuring device being tested can be checked by comparing the indicated reference value with the measured value for the device under test.

Mobile and independent

SIKA test pumps and pressure generators are ideal for mobile use. Their low weight and compact design make them easy to transport directly to the measurement site. The instruments can be used immediately and do not require an additional power supply. There is no need to take along nitrogen bottles or connect the equipment to a compressed air network. Wear-free manual pressure generation is simple and easy, regardless of ambient temperature and orientation.



Possible areas of application

SIKA test pumps and pressure generators can be used everywhere, including on site in workshops, test and measurement rooms as well as laboratories. They cover a broad spectrum of industries with diverse applications.

- Assembly and commissioning
- Manufacturing and production
- Maintenance and service
- Quality assurance and test equipment monitoring
- Repair

SIKA test pumps and pressure generators are suitable for testing, adjusting and calibrating pressure sensors, pressure gauges, pressure switches, safety valves and all types of pressure devices. They are optimised in their function and use and assist in the performance of specific tests and inspections.

Digital pressure gauges

Exact and reliable

Digital pressure gauges are particularly suitable for both stationary and mobile measurement and display of pressure. They can be used as reference pressure gauges to simplify the checking, adjustment and calibration of other pressure measurement devices directly on site.

High accuracy in signal acquisition is achieved by using high-performance measuring cells with electronic linearisation of the characteristic curve. Suitable instruments are available for a wide variety of measurement tasks.

Ease of use is assured by innovative design and advanced technology. All essential functions for everyday use can be selected conveniently at the press of a button. Excellent protection against dust and moisture is provided by a membrane keypad or rubber buttons. Integrated supplementary functions make our digital pressure gauges true all-rounders.



Type E2 / D2 and P

Advantages at a glance

- Exact and reliable measurement
- High operational readiness
- Easy and clear readout
- Well suited to difficult on-site tasks
- Easy to assemble and use
- Supplementary functions for extra value
- EX-version available on request

Negative / Positive / and Differential Pressure

Measuring ranges from -1 bar negative pressure to 2500 bar positive pressure with high overpressure protection are available. Very small differential pressures in the millibar range can also be measured. Differential pressure measuring cells or two independent measuring inputs are used for this purpose.

Resolution / Accuracy

It is often necessary to use several mechanical pressure gauges when measurements must be made over a wide pressure range with sufficient accuracy. Digital pressure gauges with high resolution and precision can handle this task with just one instrument.

An indicating accuracy of 0.5% to 0.01% covers the entire spectrum of requirements. This precision is often found only in sensitive laboratory instruments, whereas SIKA digital pressure gauges are designed for use in harsh industrial environments.

Tare / Zero

User-defined zero point setting at the push of a button makes offset adjustment easy and eliminates the need for tedious mechanical adjustment. Single-point adjustment allows the linear characteristic curve to be shifted in positive or negative direction over the entire measuring range.

Linearisation

Multi-point adjustment can be performed if it is necessary to adjust the indicated values at different test points. Two-point adjustment is available for setting the zero point and slope of the measuring cell curve. Some digital pressure gauges allow up to six offset values to be programmed in order to shift the characteristic curve to meet the most stringent customer expectations.

Battery operation / Auto-Off

Power is supplied by long-life batteries (ordinary or rechargeable). An external AC adapter can also be used. To increase battery operating time, a programmable Auto-Off function switches off the power to the instrument after prolonged inactivity. The electronics are designed for extremely low power consumption, which enables a battery life of significantly more than 1000 hours.

Supplementary functions

Data memory

The logger function for local data storage can be used to record pressure curves automatically and perform leak tests. The integrated data memory in digital pressure gauges allows a variety of data sets to be recorded directly. The time interval between samples is programmable and the maximum recording interval is configurable. The stored values can be displayed on a PC. Data import at the press of a button is also possible. In this case the data is shown directly on the display. In this process the values are automatically annotated with the date and time of day using an integrated real-time clock.



Analogue output

An electrical output signal enables remote display on a control console or in a control room as well as the connection of external recorders and indicating instruments.

Relay output / Alarm signalling

Digital pressure gauges allow limit contacts to be closed even at low pressures. There is no need for high actuation forces for magnetic spring or inductive contacts, which makes it easier to signal critical equipment conditions and perform supplementary control tasks. A built-in buzzer generates an alarm when the pressure exceeds the range of the programmed minimum and maximum pressure levels.

Temperature display

Temperature measurement is often required in addition to pressure measurement. For this purpose, a temperature sensor is integrated in the measuring cell to detect the temperature of the medium. The process temperature can be displayed at the press of a button. This allows two quantities to be measured at a single measuring point, which saves costs.

Explosion protection

Explosion-proof versions are also available for use in potentially explosive locations, e.g. oil refineries, chemical plants and drilling platforms.

Example applications

- Continuous or temporary checking of a wide variety of system pressures
- Air density measurement in building shells for the detection and elimination of problem areas and avoiding structural damage
- Monitoring the degree of soiling of filter units in ventilation or air conditioning systems
- Recording pressure drops for the determination of leakage rates in leak tests
- Measurement of barometric air pressure for the determination of weather conditions
- Reference pressure gauge for calibration tasks

Type E2, D2



Type R



Technical data

Accuracy (full scale)	E2 0.5 %	D2 0.1 %
Pressure range	Resolution	
-1...3 bar	1 mbar	
-1...40 bar	10 mbar	10 mbar
-1...60 bar	10 mbar	10 mbar
0...400 bar	100 mbar	100 mbar
0...700 bar	100 mbar	100 mbar
0...1000 bar	100 mbar	100 mbar

Technical data

Accuracy (full scale)	0.2 %
Pressure range	Resolution
-1...1 bar	1 mbar
-1...2.5 bar	1 mbar
-1...5 bar	1 mbar
-1...10 bar	10 mbar
-1...20 bar	10 mbar
-1...40 bar	10 mbar
-1...60 bar	10 mbar
0...100 bar	100 mbar
0...250 bar	100 mbar
0...350 bar	100 mbar
0...500 bar	100 mbar
0...700 bar	100 mbar
0...1000 bar	1 bar
0...1500 bar	1 bar
0...2000 bar	1 bar

Functions		
Type	E2 / D2	R
Adjustment options		
Linearisation		6 points
Tare / Zero	✓	✓
Selectable units		
Pressure	bar, mbar, kPa, MPa, PSI, kg/cm ²	bar
Temperature		°C
Features		
Measuring inputs	1 x direct	1 x direct
PC connection		RS232 (optional)
Analogue output		
Relay output		
Built-in version		
Explosion protection		
Data memory		
Number of memories		60.000 values (auto)
Recording interval		1 sec...10 h
Recording duration		1 min...1000 h
Data sets		Pressure / Temperature
Display / Representation		
Multi-functional LCD	4 ½ digit	4 digit
Bargraph	✓	
Illumination	✓	
Display filter	✓	✓
Min / max value	✓	✓
Measuring rate		
Standard	10 msec.	100 msec.
Peak / Fast	10 msec.	8 msec.
Process connection		
Connection options	G¼	G½
Material	1.4404	1.4542
Medium temperature	-20...80 °C	-10...70 °C
For aggressive media	✓	✓
Housing		
Degree of protection	IP67 (front) / IP67	IP65 (front) / IP40
Dimension	Ø 80 mm T=30 mm H=100 mm	Ø 85 mm T=30 mm H=30 mm
Material	Zinc casting	Aluminium
Operating temperature	0...50 °C	-10...70 °C
Weight	540 g	450 g
Power		
Auto-off function	✓	✓
Battery type	2x 1.5 V AA	2x 1.5 V AAA
Ext. power		
Battery operation	1500 h	8000 h

Type P



Technical data

Accuracy (full scale)	0.5 %	0.2 %	0.05 %
Pressure range	Resolution		
-1...1 bar	1 mbar	1 mbar	0.1 mbar
-1...2.5 bar	1 mbar	1 mbar	0.5 mbar
-1...5 bar	1 mbar	1 mbar	0.5 mbar
-1...10 bar	10 mbar	10 mbar	1 mbar
-1...20 bar	10 mbar	10 mbar	2 mbar
-1...40 bar	10 mbar	10 mbar	5 mbar
-1...60 bar	10 mbar	10 mbar	5 mbar
0...100 bar	100 mbar	100 mbar	10 mbar
0...250 bar	100 mbar	100 mbar	20 mbar
0...350 bar	100 mbar	100 mbar	50 mbar
0...500 bar	100 mbar	100 mbar	50 mbar
0...700 bar	100 mbar	100 mbar	50 mbar
0...1000 bar	1 bar	1 bar	100 mbar
0...1500 bar	1 bar	1 bar	200 mbar
0...2000 bar	1 bar	1 bar	500 mbar
0...2500 bar	1 bar	1 bar	

Type L



Technical data

Accuracy (full scale)	0.05 %	0.025 %*	0.01 %*
Pressure range	Resolution		
-1...2 bar	0.1 mbar		
-1...10 bar	1 mbar		
-1...20 bar	1 mbar	1 mbar	1 mbar
0...200 bar	10 mbar	10 mbar	10 mbar
0...400 bar	50 mbar	50 mbar	50 mbar
0...700 bar	100 mbar	100 mbar	100 mbar
0...1000 bar	100 mbar	100 mbar	100 mbar

* 0.01 % is a precision declaration

Functions		
Type	P	L
Adjustment options		
Linearisation	6 points	
Tare / Zero	✓	✓
Selectable units		
Pressure	bar, mbar, kPa, MPa, PSI	bar, mbar, hPa, kPa, MPa, PSI, mmHg, inHg, cmH2O, mH2O, inH2O, ftH2O, Kp/cm ²
Features		
Measuring inputs	1 x direct	1 x direct
PC connection	RS232 (optional)	RS-485
Analogue output	0(4)...20mA / 0...10 V (optional)	
Relay output	2 x 24 VDC/1A (optional)	
Built-in version	✓ (optional)	
Explosion protection (optional)		Ex II 2G Ex ia II C T6
Data memory		
Number of memories		
Recording interval		
Recording duration		
Data sets		
Display / Representation		
Multi-functional LCD	4 digit (0,5 % / 0,1 %), 5 digit (0,05 %)	5 digit
Bargraph	✓	
Illumination		
Display filter	✓	
Min/max value	✓	✓
Measuring rate		
Standard	100 msec.	500 msec.
Peak / Fast		
Process connection		
Connection options	G½	G¼
Material	1.4542	1.4435
Medium temperature	0...50 °C	0...50 °C
For aggressive media	✓	✓
Housing		
Degree of protection	IP65 (front) / IP40	IP65 (front) / IP54
Dimension	80 x 80 mm T=50 mm H=130 mm	Ø 80 mm T=40 mm H=120 mm
Material	Aluminium	ABS plastic
Operating temperature	0...50 °C	0...50 °C
Weight	900 g	210 g
Power		
Auto-off function	✓	✓
Battery type	2x 1,5 V AAA	1x 3 VCR
Ext. power	24 VDC	
Battery operation	8000 h	2000 h



Mechanical Measuring Instruments



Flow Measuring Instruments



Electronic Measuring and Calibration Instruments



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