Pressure calibration

mobile calibration devices

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HIGH PRECISION ON-SITE MEASUREMENT AND CALIBRATION

The KAL range from halstrup-walcher comprises three pressure calibration devices that offer outstanding value for money and can be used either for stationary (e.g. in a customer's own laboratory) or mobile applications. They combine the following features:

- integrated pressure generation (for setting the calibration point)
- high precision pressure measurement (for recording the calibration value)

In the KAL 84, the pressure is generated using a manual pump and integrated pressure bellows. In the KAL 100/200, the calibration point (target pressure) is entered via a keyboard/display and automatically generated using a high precision pump. With these devices, the user can select not only the display language but also the unit of pressure. In addition, the KAL 200 has a USB interface so that pressure sequences can be programmed using supplied PC software. This makes it possible to produce time-optimised calibration sequences.

	KAL 200	**KAL 100**	**KAL 84**
Details on	**p. 38**	**p. 38**	**p. 39**
			
Pressure generation	Automatic		Manual
Applications	Mobile or stationary (laboratory)		
Measurement ranges	0..100 Pa (0..1 mbar)/0..500 Pa 0..1 kPa (0..10 mbar)/0..5 kPa 0..10 kPa (0..100 mbar)/0..50 kPa 0..100 kPa (0..1 000 mbar) ±100 Pa ±1 kPa ±10 kPa ±100 kPa		0..100 Pa (0..1 mbar) 0..1 kPa (0..10 mbar) 0..10 kPa (0..100 mbar) 0..100 kPa (0..1 000 mbar) 0..300 mmHg (0..400 mbar) 0..750 mmHg (0..1 000 mbar)
Margin of error	0.1 % of max. value ± 1 digit Measurement ranges 1, 10 and 100 kPa 0.3 % of max. value ± 1 digit Measurement range 100 Pa	0.2 % of max. value ± 1 digit Measurement ranges 1, 10 and 100 kPa 0.5 % of max. value ± 1 digit Measurement range 100 Pa	0.2 % of max. value ± 1 digit Measurement ranges ≥ 1 kPa - ≤ 50 kPa 0.5 % of max. value ± 1 digit
Interface	USB (standard)	USB (optional)	-
Analog measurement input for test object	✓	optional	-
Battery life (rechargeable)	8 h	8 h	2 h
Factory calibration certificate	✓	Accessory	Accessory

ACCESSORIES

	Order no.
Carrying bag KAL 84	9062.0001 (1)
Hand pump KAL 84	9601.0036 (2)
Transport case KAL 100/200	9220.0001 (3)
Carrying bag KAL 100/200	supplied as standard
DAkkS calibration certificate, German	9601.0003
DAkkS calibration certificate, English	9601.0004
ISO factory calibration certificate	9601.0002 (included for KAL 200)

Hand pump KAL 84
Order no. 9601.0036

Carrying bag KAL 84
Order no. 9062.0001

Transport case KAL 100/200
Order no. 9220.0001


Carrying bag KAL 100/200
supplied as standard

halstrup walcher

KAL 100/200

Margin of error KAL 100	0.2 % of max. value ± 1 digit only for 1, 10 and 100 kPa measurement ranges 0.5 % of max. value ± 1 digit Measurement range 100 Pa
Margin of error KAL 200	0.1 % of max. value ± 1 digit only for 1, 10 and 100 kPa measurement ranges 0.3 % of max. value ± 1 digit Measurement range 100 Pa
Hysteresis	0.1 % of max. value
Overload capacity	600 kPa measurement ranges 10 kPa, 100 kPa 200 x for measurement ranges 100 Pa, 1 kPa
Temperature effect (zero-point)	± 0 % (cyclical zero-point correction)
Temperature effect (span)	KAL 100: 0.04 % of max. value/K (10..50 °C) KAL 200: 0.03 % of max. value/K (10..50 °C)
Calibration temperature	22 °C
Medium	Air, all non-aggressive gases
Measurement input/ supply voltage (test object)	0-10 V, 0/4-20 mA Accuracy: 0.2 % of max. value 24 V DC/100 mA
Display	Alphanumeric display with 2 x 20 characters, backlighting
Operating temperature	10..40 °C
Storage temperature	-10..70 °C
Weight	approx. 4.5 kg
Pressure ports	Ø 6 mm, for tubing NW 5 mm
Certificates	CE

Model	**A**
KAL 100	100
KAL 200	200

Measurement ranges	**B**
0..100 Pa (0..1 mbar)	0
0..500 Pa	05
0..1 kPa (0..10 mbar)	1
0..5 kPa	5
0..10 kPa (0..100 mbar)	10
0..50 kPa	50
0..100 kPa (0..1 000 mbar)	100
± 100 Pa	0A
± 1 kPa	1A
± 10 kPa	10A
± 100 kPa	100A

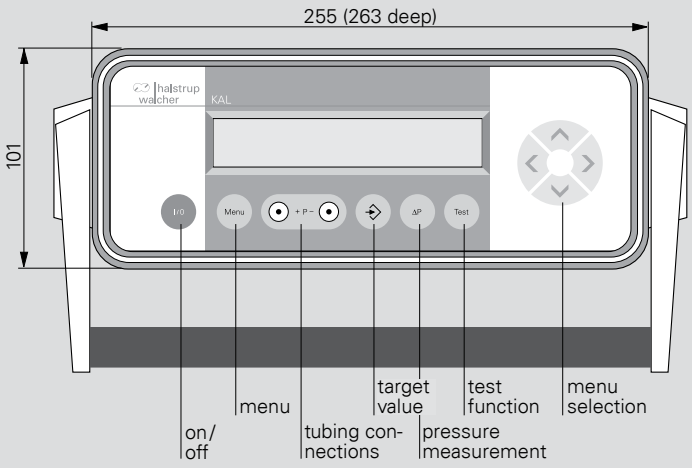
Power supply	**C**
115 V AC, +6 %/-15 % (50/60 Hz)	1
230 V AC, +6 %/-15 % (50/60 Hz)	2
115 V AC, +6 %/-15 % (50/60 Hz) and rechargeable lithium ion battery	1A
230 V AC, +6 %/-15 % (50/60 Hz) and rechargeable lithium ion battery	2A

Data interface	**D**
None	0
USB + measurement input (standard for KAL 200)	1

Order code	**A**	**B**	**C**	**D**
KAL	–	–	–	–

Features

- High precision measurement and calibration device in one
- Runs on mains supply or battery, highly flexible (optional)
- Battery life approx. 8 hours, ideal for mobile applications
- Automatic zero-point calibration provides high zero-point stability
- Internal pump quickly and accurately generates negative or positive differential pressures of up to 100 kPa
- Optional USB interface available (Standard for KAL 200)
- Unit conversion (e.g. mmHg, mmH_2O, psi, etc.)
- Multilingual menu (German/English/Italian/French/Spanish)
- With power supply and measurement input for the external test object (transmitter being calibrated)

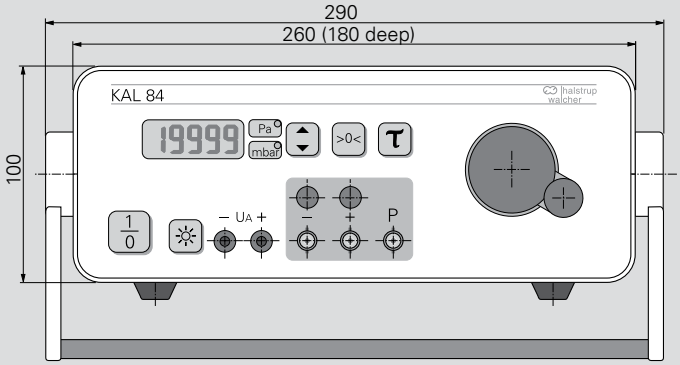


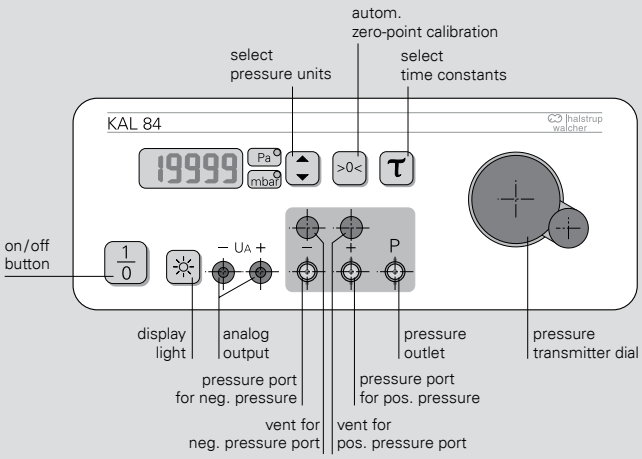
User software

KAL 84

Features

- Highly accurate, reproducible results
- Internal pressure generation using pressure transmitter dial
- Very rugged and light
- Excellent for service applications
- Unit conversion, e.g. mmHg/kPa, mbar/kPa
- Rechargeable battery allows for portable operation





Margin of error*	0.2 % of max. value ± 1 digit or for measurement ranges 1 .. 50 kPa 0.5 % of max. value ± 1 digit
Hysteresis	0.1 % of max. value
Temperature effect (zero-point)	Not applicable Panel button for resetting zero-point
Temperature effect (span)	0.04 % of max. value/K (10 .. 50 °C)
Calibration temperature	22 °C
Medium	Air, all non-aggressive gases
Displacement volume	approx. 100 cm^3 (1, 10, 100 kPa) approx. 200 cm^3 (100 Pa)
Analog output	0 .. 1 V (R_L ≥ 2 kΩ) 2 connectors Ø 4 mm
Display	4 1/2 - digit LCD character height = 10 mm
Time constants	toggles between 0.1 s; 1 s
Operating temperature	10 .. 40 °C
Storage temperature	-10 .. 70 °C
Power supply	NiCd rechargeable 9 V battery with AC adaptor
Weight	approx. 3 kg
Pressure ports	for tubing NW 6 mm
Certificates	CE

* All measurement ranges have a 99 % overrange.

The display has 4½ digits and always uses round 10 s, 100 s etc. as the standard measurement ranges, i.e. 1.0000, 10.000, 100.00 oder 1000.0 (exception 0 .. 300 mmHg). The theoretical display range, however, extends not up to 10.000 but 19.999, i.e. for a measurement range of 10.000 kPa, the device can display values of up to 19.999 kPa.

Measurement ranges*	**A**
0 .. 100 Pa (0 .. 1 mbar)	0
0 .. 1 kPa (0 .. 10 mbar)	1
0 .. 10 kPa (0 .. 100 mbar)	10
0 .. 100 kPa (0 .. 1 000 mbar)	100
0 .. 300 mmHg (0 .. 400 mbar)	300
0 .. 750 mmHg (0 .. 1 000 mbar)	750

* others available upon request

Margin of error	**B**
0.5 % of max. value	1
0.2 % of max. value (measurement ranges 1 .. 50 kPa) (optional)	2

Power supply	**C**
230 V AC adaptor	230
115 V AC adaptor	115

Order code	**A**	**B**	**C**
KAL 84	–	–	–

APPLICATIONS FOR THE "KAL" CALIBRATION DEVICE

The high performance rechargeable battery makes the KAL range ideal for on-site applications. "Mobile calibration" removes the need to send pressure measurement devices to an external calibration laboratory and thus saves a great deal of time and expense. Customers can now perform ISO calibrations themselves by using a DAkkS-calibrated KAL device.

The KAL range provides the optimum solution for the following typical applications:

- mobile or stationary calibration of pressure values in cleanrooms (pharma, semiconductors etc.)
- mobile or stationary calibration of blood pressure monitoring equipment in hospitals etc.
- mobile or stationary calibration of differential pressures in air-conditioning systems

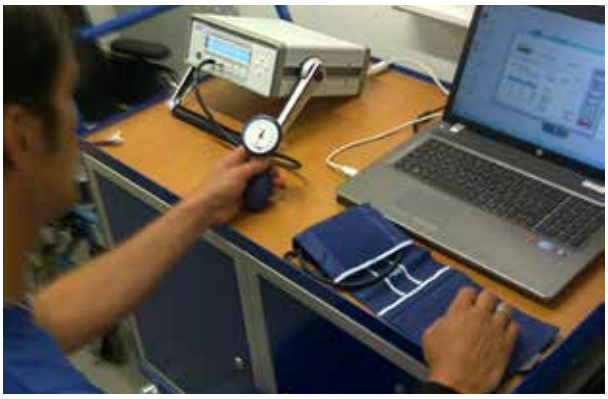
EFFICIENCY AND REGULATORY COMPLIANCE – CALIBRATING BLOOD PRESSURE MONITORS ON-SITE

Every hospital and nursing home now uses blood pressure monitors. It is vital that these instruments operate precisely and reliably. Moreover, the equipment must retain its accuracy over months and years of use. False readings from blood pressure monitors are a matter of life and death. The greatest risk, however, is posed by drug dosage errors, which risk straining the patient's circulatory system. Instruments are calibrated each year to prevent incidents such as these from occurring, a process that involves comparing measured values to highly precise control values.

If measurements are relevant to human health, regular instrument calibration is required by law. The "Ordinance on Medical Devices" stipulates that regular testing be performed and documented. The responsibility for risk assessment lies with the operator.

One legally secure method accepted by auditors is to document the calibration in the facilities management software. But how can a calibration of this type be performed efficiently? On-site calibration by a qualified technical service is more efficient than removing a number of the blood pressure monitors from the wards every few weeks and sending them to an external laboratory for calibration.

The battery powered KAL 200 pressure calibration device from halstrup-walcher is the ideal solution. Pressure sequences can be pre-programmed using the supplied software. The KAL 200 pressure generator then generates each pressure (the target value) with extreme precision and reads the actual value on the test object (blood pressure monitor). The actual value is then entered on-site in standardised test records that are administrated by the facilities management software. The data are now available at any time – ensuring efficiency and regulatory compliance.



In practice: Blood pressure monitors in the nursing home Solina in Spiez (Switzerland) are calibrated by the technician responsible.

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