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DISPLAY PANELS

PANELS FOR DISPLAYING, ALERTING, NETWORKING

Many companies (e.g. from the Life-Sciences area) have to monitor their critical production processes with a monitoring system. This is about recording systems that have a high degree of data safety to record, transfer and save quality-relevant measuring data.

Professional providers of monitoring systems, as well as validation service providers offer systems that are aligned with GAMP 5 for this task. GAMP means Good Automated Manufacturing Practice; GAMP 5 is a quasi-standard that describes the requirements to setup and validation of computer-aided systems in a regulated pharmaceutics environment as a *"guideline"*.

One important task of monitoring is making measured data visible in the locations where local decisions depend on them. The halstrup-walcher display panels are the best solution for this.

	PUC 44	PUC 24	PUC 28 (K)
Details on	**p. 18 + 19**	**p. 24**	**p. 25**
Special features	Multi-channel process display with touch screen - Values, curves, bar graph, vector can be displayed - 4 alarms per channel - Modbus connection	Cleanroom panel with integrated differential pressure sensor for climate data display, temperature/humidity measuring transmitter can be connected	Process panel with integrated differential pressure sensor for climate data display, temperature/humidity measuring transmitter can be connected
Application	Process monitoring for cleanrooms and control cabinets (machines, plants)	Process monitoring for cleanrooms (Pa, °C, % rF)	Process monitoring panel (optional: with calibration connection) (Pa, °C, % rF)
Measurement Range	Up to 4 external analogue values of any phys./chem. values	± 100 or ± 250 Pa, freely scalable within this range, % rF/°C: Depending on the connected measuring transmitter	
Degree of measurement uncertainty	Depending on the connected measuring transmitters	0.5 % of max. value (standard) (differential pressure on board)	
Display	Touch-display (TFT), coloured, 3,5", 320 x 240 pixels	LED-display, 3 lines	
Alerting	Visually/acoustically, cf. p. 18	Relay outputs, acoustic alarm	
Networking	Modbus RTU, BACnet (being prepared)	RS 232, PROFIBUS DP (both optional)	

ACCESSORIES

Accessories for PUC 24 and PUC 28 (K) on p. 21.

Parameterisation PUC 44 [1]   **Order-No.**
On-site parameterisation (PUC 44)   in the order key
according to customer specifications   cf. p. 19

Installation PUC 44 [2]
Flush-mounted box   9601.0188
for masonry wall installations

[1] The parameterisation of the PUC 44 takes place via the intuitive touch menu and can be performed by the commissioner without further training.

[2] All devices of the PUC series have been specifically designed for installation on cleanroom walls and therefore have the matching minimum installation depth, as well as the hygienic design in the versions PUC 44-2/-3 and PUC 24. A recessed socket is not required in these cases (cleanroom wall installations). It is used for types PUC 44-1 and -2 of the exposed installation.
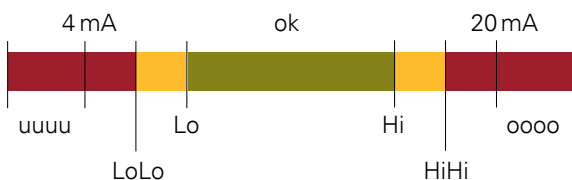
PROCESS MONITORING FOR CLEANROOMS AND CONTROL CABINETS WITH THE PUC 44

For best integration into the cleanroom wall, the cleanroom panel PUC 44 is delivered with two different stainless steel fronts. Both are installed in the cleanroom wall thanks to their low construction depth. In addition to a standard model, a very high-quality, very well cleanable model with magnetic holder is available as an alternative. For installation sites outside of the clean room environment and in control cabinet fronts, a simple aluminium front version can be used as well.
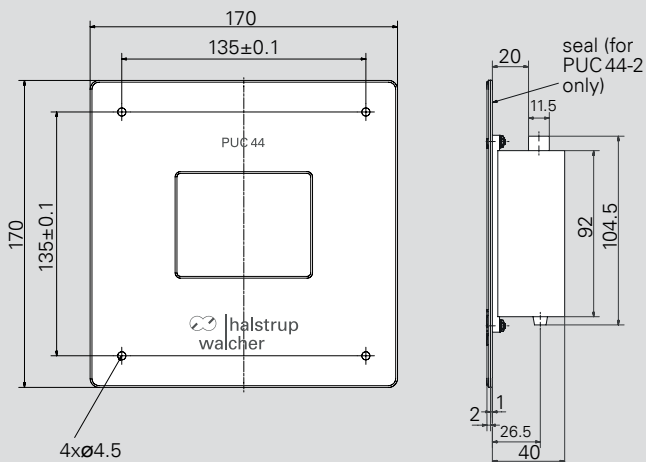

Features / Use

- Multi-channel process display with touch screen
  a) For *high-end cleanroom* applications (PUC 44-3)
  b) For *standard cleanroom* applications (PUC 44-2)
  c) For *control cabinet* installation (PUC 44-1)
- Display of up to **four values** (any phys./chem. values) in one display, free designation of the channels
- The configuration takes place in multiple languages, menu-controlled and via touch operation (without parameterisation software). It can be performed in the factory or by the commissioner.
- Values, curves (time axis adjustable, max. 7 days), vector and bar
- 4 individual alarms LowLow/Low/High/HighHigh for any input can be defined. Signalling takes place as a text and optionally with colour change. The individual alarms are retained while the triggering criterion for the alarm is pending.
- If the signal of a sensor is in the forbidden range (below the alarm "LoLo" or above the alarm "HiHi"), a background colour that can be freely parameterised (e.g. red) will be displayed.
- For a warning, due to the sensor signal threatening to run out of the permitted range (i.e. signals below "Lo" or above "Hi"), another background colour that can be chosen freely will be displayed (e.g. yellow).

- If the sensor value is OK, the background colour is not noticeable. A small bar graph in addition to the alphanumeric value shows how many percent of the defined measured range are currently utilised.
- A collective alarm (of previously defined individual alarms) triggers the acoustic signal. The acoustic alarm is switched off by touching the screen.
- The user only has the right to change the released views and to switch off the collective alarm. The user needs no password for this.
- A one-level password system with at least 6 digits according to GAMP 5 permits access to the configuration by the commissioner or the process officer.
- Recording of data is not intended (no logging function). This facilitates validation.
- The respective current values of the inputs and the condition of the alarms are available via modbus RTU at all times (BACnet being prepared).
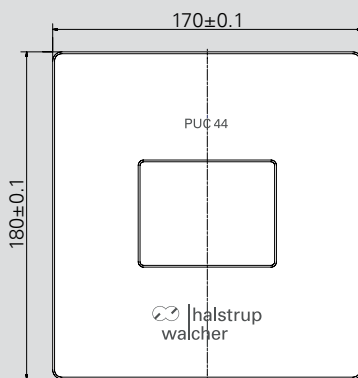
PUC 44

PUC 44 - 3

PUC 44 - 1 / 2

170
135±0.1
170
135±0.1
PUC 44
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4 x Ø4.5

20
11.5
seal (for PUC 44-2 only)
92
104.5
1
2
26.5
40

PUC 44 - 3 [2]

170±0.1
180±0.1
PUC 44
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[2] a side view and a technical drawing of the magnetic frame are available on request

Inputs (adjustable)	Up to four analogue inputs (4..20 mA, galvanically separated, Ra = 400 - 1750 Ω), without transmitter feed
Scaling (adjustable)	deactivated, linear or polygonal (max. 20 points)
Filter	deactivated or with dampening/ filter coefficient
Touch-display	TFT, coloured, 3.5", 320 x 240 px
Available views (adjustable)	Values, bar graph, curve chart, vector diagram
View change	manually or automatically
Time axis curve chart	19 s / 48 s / 95 s / 3 min / 6 min / 12 min / 30 min / 1 h / 2 h / 4 h / 8 h / 16 h / 24 h / 3 d / 7 d
Alarm configuration (adjustable)	LoLo .. Lo .. Hi .. HiHi for all channels
	Thresholds: Constant, lower threshold, upper threshold, hysteresis
	Timing: Delay ON / OFF, retention time ON / OFF
	acoustic collective alarm freely parameterisable
Alarm display (adjustable)	Deactivated, permanent, flashing (period, retention time, alarm source, texts / colours adjustable)
Languages (menu)	German, English, French, Italian, Spanish
Date and time	Time zone and summer time can be set
Brightness	20 .. 40 .. 60 .. 80 .. 100 %
Screen saver	Deactivated or after 1 .. 5 .. 10 .. 30 min
Access protection	Password 6-digit (GAMP 5)
Current consumption	500 mA
Bus communication	Modbus RTU (RS 485-based) BACnet being prepared
Baud rate	1 200 bit/s to 115 200 bit/s
Connections	1x USB-host on the rear for transfer of configuration files, screw terminals for 4 analogue inputs, bus and supply
Power supply	24 V DC ± 5 %
Housing	Wall recessing
Protection class	IP 65 (front side), IP 20 (housing and terminals)

Housing type	A
Aluminium anodised	1
Stainless steel standard	2
Stainless steel with magnetic holder	3

Bus type / data interface	B
Modbus RTU	MB

Parameterisation	C
Customer-site	0
Factory-side [1]	1

[1] according to specified parameter list

Order code	A	B	C
PUC 44	–	–	–

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PUC 24

Measurement ranges	± 100 Pa or ± 250 Pa freely scalable within this range
Margin of error	0.5 % of max. value
Temperature coefficient span	0.03 % of max. value/K (10..50 °C)
Temperature coefficient zero point	± 0 % (cyclical zero-point correction)
Overload capacity	200 x
Medium	Air, all non-aggressive gases
Max. system pressure	10 kPa
Sensor response time	25 ms
Time constants	25 ms..40 s (adjustable)
Input signal humidity/temperature module (galvanically separated)	0..10 V, R_i = 470 kΩ 0/4..20 mA, R_i = 50 Ω adjustable
Operating temperature	10..50 °C
Storage temperature	-10..70 °C
Power consumption	approx. 7 VA
Weight	approx. 1 kg
Pressure ports	for tubing NW 3..6 mm
Protection class	IP 65 (recessed in the wall)
Certificates	CE

Supply voltage

24 V DC, ± 10 % smoothed

Output

0..10 V (R_i > 2 kΩ)
0/4..20 mA (R_i < 500 Ω) adjustable

2 contact points, 6 A, 230 VAC,
may be configured as desired within this pressure range

Measurement range	A
± 100 Pa	0
± 250 Pa	1

Data interface	B
None	0
PROFIBUS DP (optional)	DP
RS 232 (optional)	2

Bus connection	C
None	0
9-pin Sub-D flush type connector [1]	D
Sub-D plug with 150 mm cable	DK
Round pin connector M 12 with 150 mm cable	RK

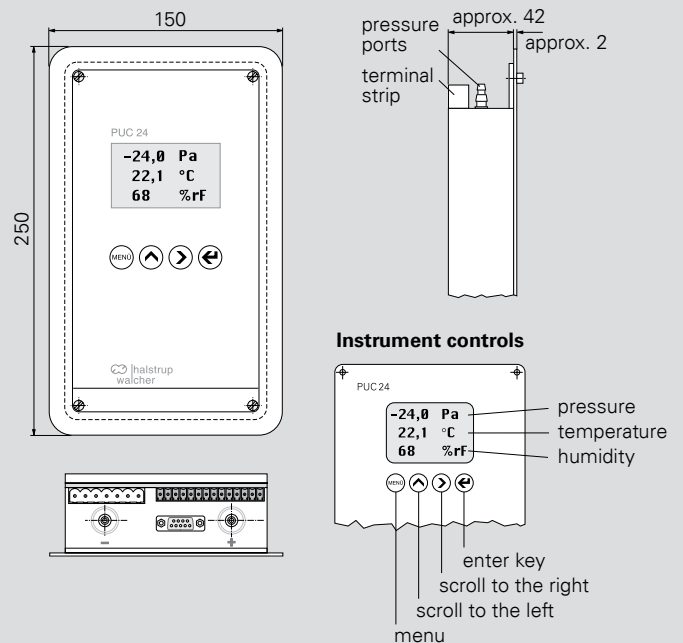[1] not suitable for wall thicknesses greater than 5 mm

Order code	A	B	C
PUC 24	–	–	–

**Can be pre-set on request:
Time constant, relay parameter, analogue output,
deactivation of the cyclic zeroing (only for PROFIBUS DP)**
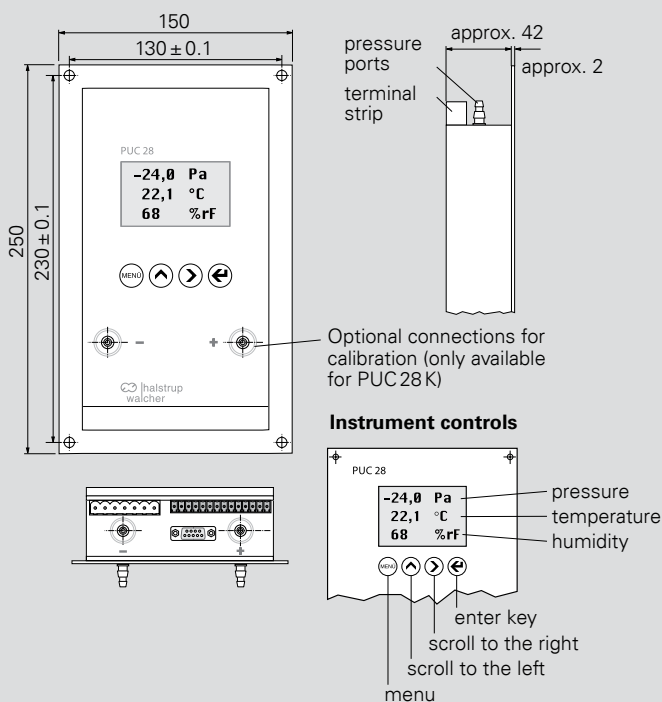
Features

- Cleanroom panel (stainless steel) for displaying air-conditioning data
- Integrated, high precision measurement of differential pressure
- % rH/° C pressure transmitter, switchable (independent of manufacturer)
- Optimum cleanroom design (TU Munich/Weihenstephan)
- Solvent resistant stainless steel surface
- 3 analog outputs, optional digital interface
- Acoustic alarm when the threshold value is exceeded, acknowledgement via key
- Optical alarm signal if critical values are exceeded; the display values are shown cyclically inversed/normal
- Bilingual menu (German/English) (others on request)
- Two contact points (6 A/230 V AC)
- Two adjustable limit switches permit the connection of signalling devices and save additional wiring (optional)

Instrument controls

pressure
temperature
humidity

enter key
scroll to the right
scroll to the left
menu

PUC 28 / PUC 28 K

Features

- Process panel (Aluminium, anodised) for displaying air-conditioning data
- Integrated, high precision measurement of differential pressure
- % rH / °C pressure transmitter, switchable (independent of manufacturer)
- Anodised, aluminium housing with easy-to-clean front surface
- With external calibration ports *(design "K"),* for on-site calibration without disassembly
- 3 analog outputs, optional digital interface
- Acoustic alarm when the threshold value is exceeded, acknowledgement via key
- Optical alarm signal if critical values are exceeded; the display values are shown cyclically inversed/normal
- Bilingual menu (German/English) (others on request)
- Two contact points (6 A/230 V AC)
- Two adjustable limit switches permit the connection of signalling devices and save additional wiring (optional)

pressure ports
terminal strip
Optional connections for calibration (only available for PUC 28 K)

Instrument controls

pressure
temperature
humidity
enter key
scroll to the right
scroll to the left
menu

Measurement ranges	± 100 Pa or ± 250 Pa freely scalable within this range
Margin of error	0.5 % of max. value
Temperature coefficient span	0.03 % of max. value/K (10 .. 50 °C)
Temperature coefficient zero point	± 0 % (cyclical zero-point correction)
Overload capacity	200 x
Medium	Air, all non-aggressive gases
Max. system pressure	10 kPa
Sensor response time	25 ms
Time constants	25 ms .. 40 s (adjustable)
Input signal humidity/temperature module (galvanically separated)	$0..10$ V, R_i = 470 kΩ $0/4..20$ mA, R_i = 50 Ω adjustable
Operating temperature	10 .. 50 °C
Storage temperature	-10 .. 70 °C
Power consumption	approx. 7 VA
Weight	approx. 1 kg
Pressure ports	for tubing NW 3 .. 6 mm
Protection class	IP 65 (recessed in the wall)
Certificates	CE

Supply voltage
24 V DC, ± 10 % smoothed

Output
$0..10$ V ($R_i > 2$ kΩ)
$0/4..20$ mA ($R_i < 500$ Ω) adjustable

2 contact points, 6 A, 230 V AC, may be configured as desired within this pressure range

Model	Measurement range	A
PUC 28	± 100 Pa	0
PUC 28	± 250 Pa	1
PUC 28 K [1]	± 100 Pa	K 2
PUC 28 K [1]	± 250 Pa	K 3

[1] "K": with externally accessible (no disassembly) pressure calibration ports (see photo)

Data interface	B
None	0
PROFIBUS DP (optional)	DP
RS 232 (optional)	2

Bus connection	C
None	0
9-pin Sub-D flush type connector [2]	D
Sub-D plug with 150 mm cable	DK
Round pin connector M 12 with 150 mm cable	RK

[2] not suitable for wall thicknesses greater than 5 mm

Order code	A	B	C
PUC 28			

**Can be pre-set on request:
Time constant, relay parameter, analogue output, deactivation of the cyclic zeroing (only for PROFIBUS DP)**

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