

DL 01

Battery Powered Precision Digital Gauge for Leak Testing

Stainless Steel Sensor

class 0.1

Nominal pressure

from 0 … 100 mbar up to 0 ... 400 bar

Special characteristics

- modular sensor concept
- data logger
- graphic display
- stainless steel housing Ø100 mm
- communication interface USB 2.0

Optional

- accredited calibration certificate according to DKD / DAkkS
- IS-version zone 0/1
- software incl. USB converter
- service case with various accessories

Functions

- data logger interval 1 s … 99 days or fixed time
- default values for time / test duration
- zero point calibration
- backlight and much more

The digital pressure gauge DL 01 is a precision device fulfilling highest demands. It was conceived especially for leak testing or pipeline monitoring.

In the leakage mode the device shows the pressure decrease during an adjustable time. After finishing of measurement, the result is shown in the display.

Outstanding measuring qualities, an intuitive operation, as well as an integrated data logger characterize the DL 01. In addition, the graphic display provides the handling and the clear presentation of the measuring procedure.

The gathered data and the relevant information (TAG or serial number, etc.) are recorded and can be read out and processed over the integrated interface via USB and PC software.

Preferred areas of use are

Plant and machine engineering

- Pipeline monitoring
- Leak testing

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Input pressure											
Nominal pressure gauge [bar]	-1…0	0.10	0.16	0.25	0.40	0.60	1	1.6	2.5	4	6
Nominal pressure absolute [bar]	-	-	-	-	0.40	0.60	1	1.6	2.5	4	6
Overpressure [bar]	5	1	1	1	2	5	5	10	10	17.5	35
Burst pressure ≥ [bar]	7.5	1.5	1.5	1.5	3	7.5	7.5	15	15	25	50

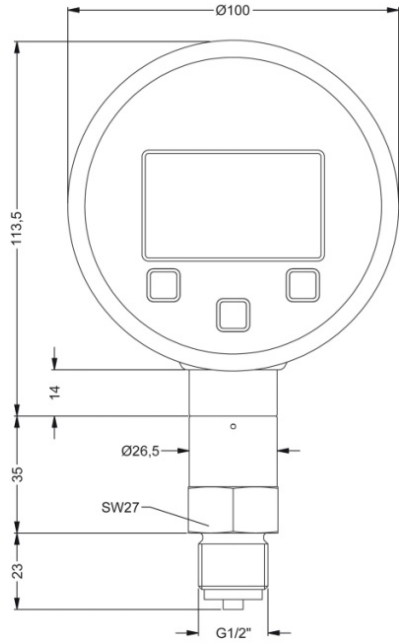
Nominal pressure gauge / absolute [bar]	[bar]	10	16	25	40	60	100	160	250	400
Overpressure	[bar]	35	80	80	105	210	600	600	1000	1000
Burst pressure ≥	[bar]	50	120	120	210	420	1000	1000	1250	1250
Vacuum resistance		p_N ≥ 1 bar: unlimited vacuum resistance; p_N < 1 bar: on request								

Performance	
Accuracy [1]	nominal pressure p_N ≥ 0.4 bar: ≤ ± 0.1 % FSO nominal pressure p_N < 0.4 bar: ≤ ± 0.25 % FSO
Long term stability	≤ ± 0.1 % FSO / year at reference conditions
Measuring rate / Display	1 or 2 measurements per second
[1] accuracy according to IEC 61298-2 – limit point adjustment (non-linearity, hysteresis, repeatability) – at room temperature 20°C	
Thermal effects (offset and span)	
Temperature error	for nominal pressure ranges p_N ≤ 160 bar: tolerance band ≤ ± 0.2 % FSO for nominal pressure ranges p_N > 160 bar: tolerance band ≤ ± 0.75 % FSO
compensated range	0 ... 50 °C
Permissible temperatures	
Permissible temperatures	medium: -10 ... 55 °C storage: -20 ... 70 °C environment: display module: -10 ... 55 °C / transmitter: -20 … 70 °C (for 1G up to +60 °C)
Materials	
Pressure port / housing	stainless steel 1.4404 (316L)
Display housing	stainless steel 1.4301 (304)
Seals (media wetted)	FKM, without (welded version)
Diaphragm	stainless steel 1.4435 (316L)
Media wetted parts	pressure port, seal, diaphragm
Explosion protection	
AX16-DL01	IBExU12ATEX1108 X variant with standard front foil for zone 1: II 2G Ex ia IIB T4 Gb variant with conductive front foil for zone 0: II 1G Ex ia IIC T4 Ga
Miscellaneous	
Display	graphic LC display: visible area 55 x 46 mm; (resolution 128x64) figure height 5.5 mm (displaying of pressure value) measured value display: max. 7 digits, depending on pressure range temperature display, time, 100-segment-bargraph, potential input value background illumination: illumination period and intensity adjustable
Temperature display range	accuracy: ± 2 K resolution: 0,1 K display: -10 … 55 °C
Adjustable units pressure and temperature	[mbar], [bar], [psi], [mmHg], [cmHg], [inHg], [kPa], [MPa], [hPa], [mmH_2O], [mH_2O], [inH_2O], [kg/cm²], [°C], [°F], [K]
Data logger	modes: single, cyclic, linear, off recording pressure values and sensor temperature measuring value interval adjustable (hrs, min, sec, 20 ms, daily at a defined time) measurement rate adjustable (1/s, 2/s or 50/s only with 20 ms measured value interval) max. 600798 values
Current consumption	without background illumination: approx. 1.3 mA with background illumination: approx. 16 mA (depending on adjusted intensity) standby mode: approx. 1.2 µA
Supply	3x 1.5 V: Duracell Plus battery, DUR087033, AA (LR6)
Ingress protection	IP 66
Installation position [2]	any
Weight	approx. 680 g
A/D-converter resolution	16 bit (module)
Battery life	standard use: > 2.000 h standby mode: at least 5 years (with measurement rate 1/s and 2/s)
Operational life	100 million load cycles
CE-conformity	EMC directive: 2014/30/EU pressure equipment directive: 2014/68/EU (Module A) [3] electromagnetic compatibility: according to EN 61326

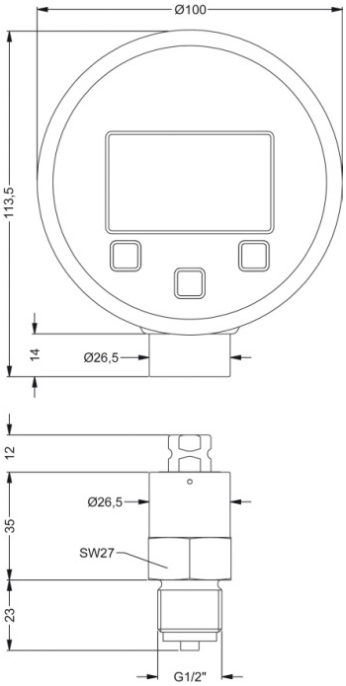
[2] Pressure transmitters are calibrated in a vertical position with the pressure connection down. If this position is changed on installation there can be slight deviations in the zero point for pressure ranges p_N ≤ 1 bar.
[3] This directive is only valid for devices with maximum permissible overpressure > 200 bar.

Dimensions (in mm)

standard

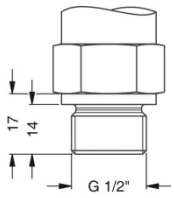


G1/2" EN 837

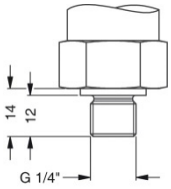


G1/2" EN 837
(pressure transmitter and display separated)

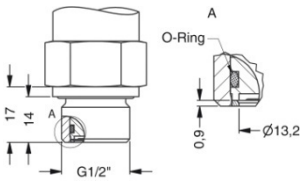
optional



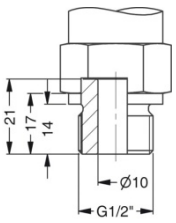
G1/2" DIN 3852



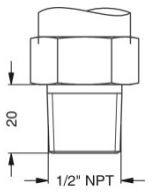
G1/4" DIN 3852



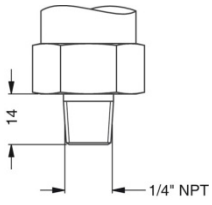
G1/2" DIN 3852
with flush sensor [4]



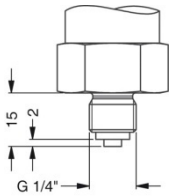
G1/2" DIN 3852
open pressure port [4]



1/2" NPT



1/4" NPT



G 1/4" EN 837

⇨ **metrical threads and other variations on request**

[4] only possible for nominal pressure ranges $p_N \leq 40$ bar

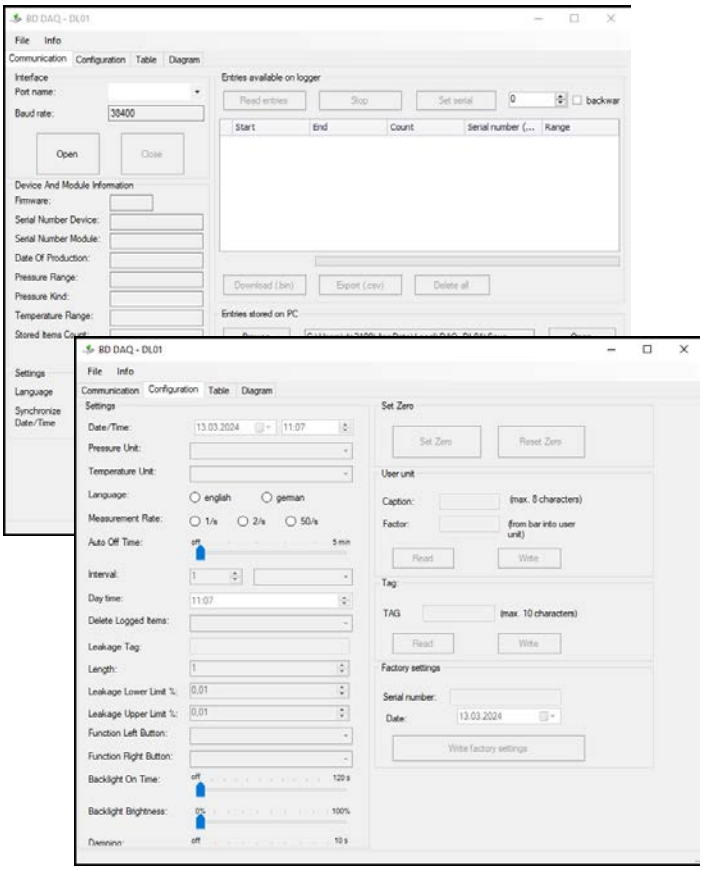
Accessories are not in scope of supply and have to be ordered separately.

BD|DAQ Software

Optionally the software BD|DAQ and an interface cable can be ordered. The software is also available for download on our homepage.

Software (Communication, Configuration):

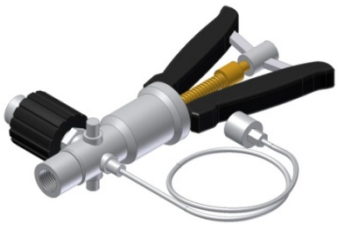
- display of device information
  (serial number, pressure and temperature range, …)
- configuration area for all parameters
- download area for recorded data:
  - date
  - pressure value
  - temperature value
- protected data acquisition
- measured value representation
  in tabular or graphic form
- free scaling of the diagram
- creation of measurement / test report as a PDF file
- data export





Interface cable with integrated convertor USB (type A) to mini connector (3.5 mm)
length: 1.7 m

Ordering number: ZUSBCD02

Hard-shell service case without accessories Service_Case_DM01		Hard shell case. dimension in mm (L x W x H): 432 X 363 X 138
Protective cap Ordering number: Z1002648		Rubber protection
Additional batteries (only in combination with service case)		for IS-version use only 3 x 1.5 V / AA Duracell Power Plus
Seal set (only in combination with service case)		Flat seal copper for mechanical connections according to EN 837
PTFE seal tape Nr. 498.505 (only in combination with service case)		Seal tape for mechanical connections material: PTFE (Teflon) temperature range: -200 ... 280 °C
Wrench (only in combination with service case)		Wrench SW 27
Calibration test pump KHP 4002 including pressure test tube Reference connection: G1/2" EN 837 Test unit connection: G1/4" EN 837 Ordering number: 1002637		The calibration test pump is used to generate pressure and vacuum for checking, adjusting and calibrating mechanical and electronic pressure measuring instruments by comparative measurements. These pressure tests may be carried out in laboratories, workshop or on site at the measuring point. pressure: 0 ... 40 bar vacuum: 0 ... -0.95 bar weight: approx. 510 g dimension: approx. 220 x 105 x 63 mm

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BD|SENSORS pressure measurement

Ordering code DL 01

1. Position: Digital Display for Precision Digital Pressure Gauge DL 01

DL 01-□□□

Digital pressure gauge DL 01					
with communication interface	A	2	1		
IS (zone 1) with communication interface	A	2	E		
IS (zone 0) with communication interface	A	2	G		consult

2. Position: Transmitter for Precision Digital Pressure Gauge DL 01

DL 01 □□□-□□□□-□ - □-□□□-□-□□

Pressure																	
gauge		M	0	P													
absolute	[1]	M	0	Q													
Input	**[bar]**																
0.10	[1]				1	0	0	0									
0.16	[1]				1	6	0	0									
0.25	[1]				2	5	0	0									
0.40					4	0	0	0									
0.60					6	0	0	0									
1.0					1	0	0	1									
1.6					1	6	0	1									
2.5					2	5	0	1									
4.0					4	0	0	1									
6.0					6	0	0	1									
10					1	0	0	2									
16					1	6	0	2									
25					2	5	0	2									
40					4	0	0	2									
60					6	0	0	2									
100					1	0	0	3									
160					1	6	0	3									
250					2	5	0	3									
400					4	0	0	3									
-1 … 0					X	1	0	2									
customer					9	9	9	9									consult
Version																	
standard version (without explosion protection)									0								
IS-version									E								
Accuracy																	
standard for $p_N \geq 0.4$ bar	0.1 % FSO									1							
standard for $p_N < 0.4$ bar	0.25 % FSO									2							
	customer									9							consult
Mechanical connection																	
G1/2" DIN 3852											1	0	0				
G1/2" EN 837											2	0	0				
G1/4" DIN 3852											3	0	0				
G1/4" EN 837											4	0	0				
G1/2" DIN 3852 with flush sensor	[2]										F	0	0				consult
G1/2" DIN 3852 open pressure port	[2]										H	0	0				
1/2" NPT											N	0	0				
1/4" NPT											N	4	0				
customer											9	9	9				consult
Seal																	
FKM														1			
customer														9			consult
Special version																	
standard															0	0	0
customer															9	9	9

Accessories	
USB converter (incl. software BD|DAQ)	ZUSBCD02
service case (without accessories)	Service_Case_DM01
Protective cap	Z1002648
Additional batteries (3 x 1,5 V / AA Duracell Power Plus) [3]	1002798
Seal set [3]	5008886
PTFE seal tape [3]	1002724
wrench [3]	1002722
Calibration test pump (KHP 4002)	1002637

[1] absolute pressure possible from 0.4 bar
[2] only possible for $p_N \leq 40$ bar
[3] only in combination with service case

ordering example:
device DL 01:
position 1: DL01-A21
position 2: M0P-1001-1-200-1-000
only display: position 1: DL01-A21
only transmitter: position 2: M0P-1001-1-200-1-000

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