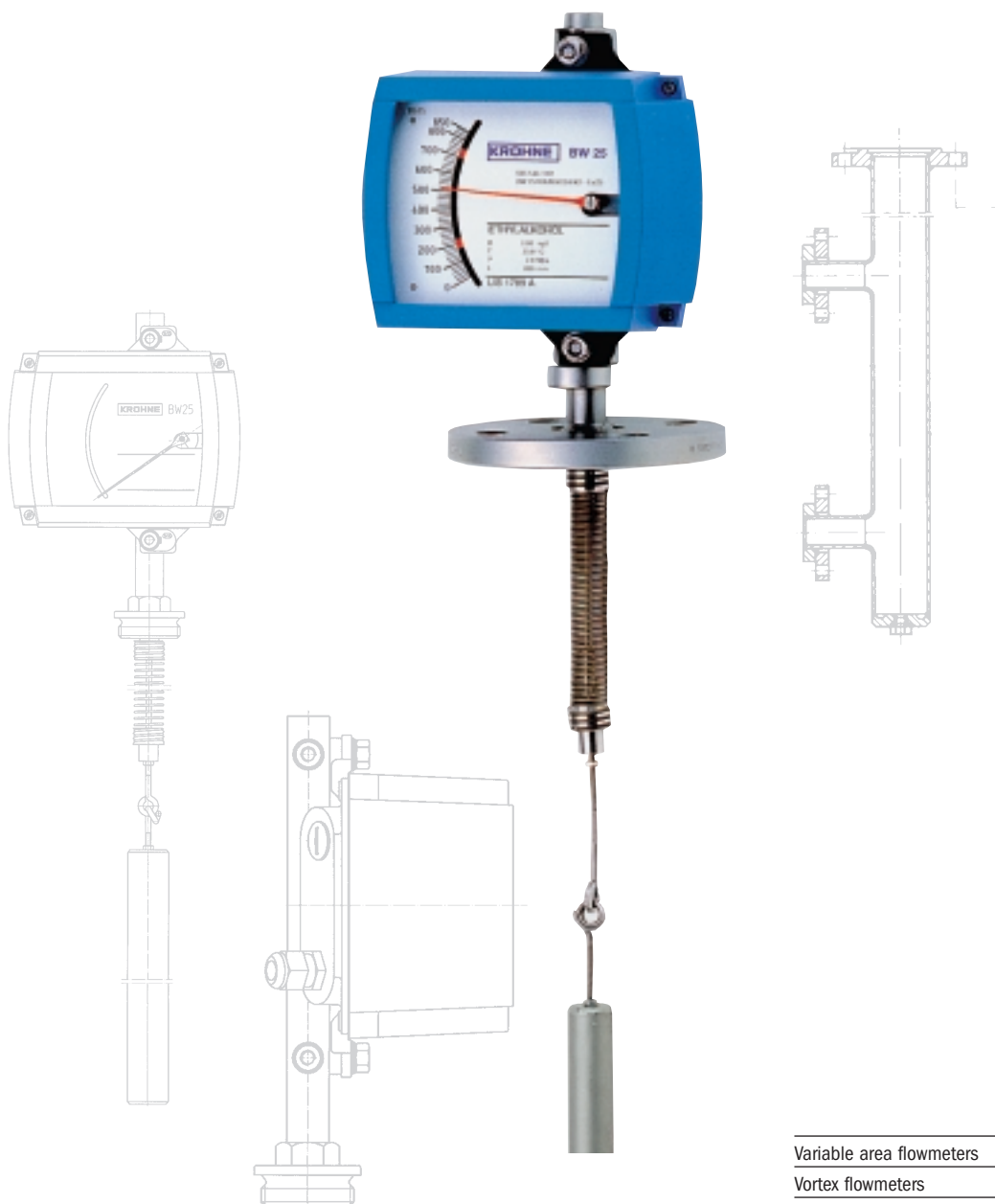


Liquid level indicator BW 25



Variable area flowmeters

Vortex flowmeters

Flow controllers

Electromagnetic flowmeters

Ultrasonic flowmeters

Mass flowmeters

Level measuring instruments

Communications engineering

Engineering systems & solutions



Liquid level indicator BW 25

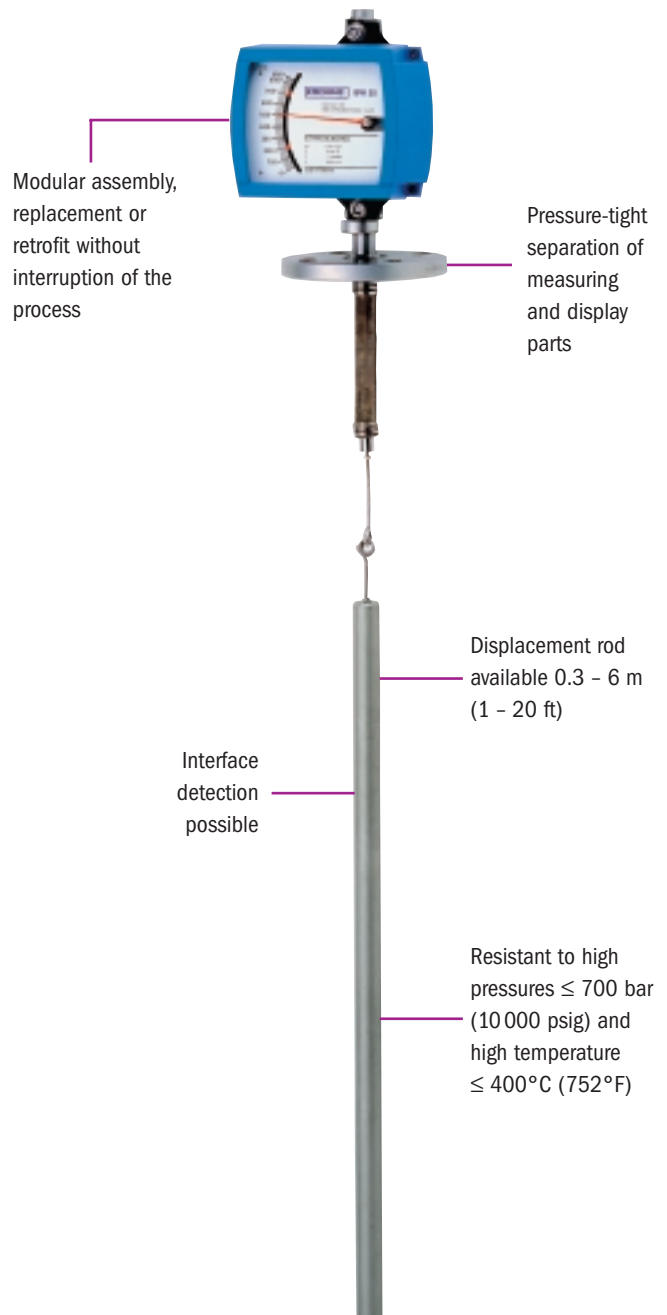
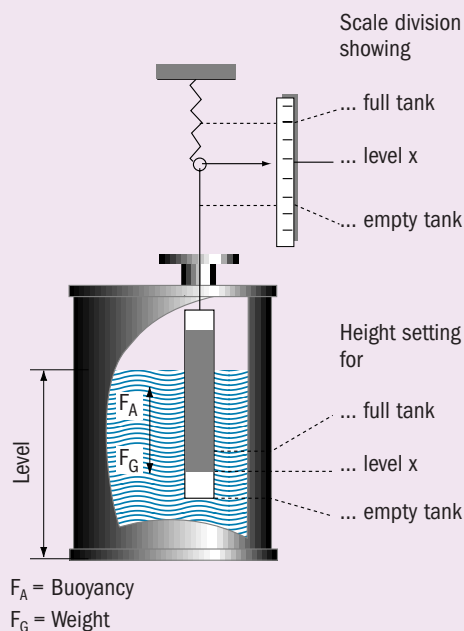
Level measurement of liquids, even at high pressures using the displacement principle

Operating principle

The BW 25 liquid level indicator operates on the displacement principle.

The length of the displacement rod corresponds to the measuring range.

A displacement body suspended on a measuring spring is immersed in the liquid and is subjected to an upthrust based on Archimedes' principle, this being proportional to the mass of the liquid displaced. Every change in the weight of the rod corresponds to a certain change in the length of the spring, and is therefore an indication of the liquid level. Extension of the spring is transmitted by magnetic coupling from the measuring zone to an indicator. This transmission method permits pressure-tight separation of the measuring spring system and the scale.



Application range

The limit switch can be used for various materials.

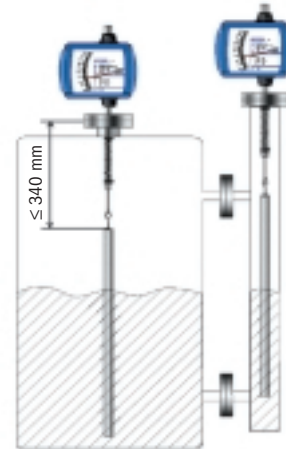
This device is suitable for extreme ambient conditions.

Temperatures -60 ... +400°C (-76 ... +752°F)

Pressure Up to 700 bar (10 000 psig)

If the display cannot be installed from above, e.g. there is an agitator in the container, it is possible to install it lateral with the special reference chamber.

In both cases it is important to note that the non-measurable depth is 340 mm because of the spring mounting.



With special versions it is possible to measure the level of the interface between two immiscible liquids of different densities. The displace rod must be covered completely with liquid. The difference in density should be min. 100 g/l.

Typical products are:

- Water, aqueous liquids
- Acids/alkalis
- Organic and inorganic solvents

Typical application in the chemical industry



Modularity

The M9 indicator is of modular design.

This offers the following advantages:

- Electrical functions can be retrofitted
- Installation without interrupting the process
- No re-calibration necessary
- Easy and quick to replace through plug-in-technology



| | |
|------------------------|---------------------|
| Product | Ammonia |
| Pressure | 450 bar (6525 psig) |
| Temperature | 70°C (158°F) |
| Measuring range | 1500 mm (4.9 ft) |

Technical data

Operating conditions

| | |
|---------------------|---------------------------------------------------------|
| Product | Liquids |
| Density | ≥ 0.45 kg/l |
| Measuring range | 0.3 – 6 m (1 – 20 ft) |
| Measuring accuracy | ± 1.5 % of full scale range |
| Temperature | -60 ... +400°C (-76 ... +752°F) |
| Ambient temperature | ≤ 60°C (≤ 40°F) |
| Operating pressure | |
| Standard | 40 bar (580 psig) |
| Optional | 700 bar (10 000 psig) |
| Indication | Linear scale markings mm, cm, m, inch, ft, %, volume |

Material

| | |
|----------------------------|---------------------------------|
| Housing | Die-cast aluminium |
| Displacement rod | |
| Standard | Stainless steel 1.4571 (316 Ti) |
| Optional | Titanium |
| Spring | |
| Standard | Stainless steel 1.4571 (316 Ti) |
| Optional (> 100°C / 212°F) | ATS 340 |
| Flange with pressure gland | Stainless steel 1.4571 (316 Ti) |

Connection

| | |
|----------|-------------------------------------------------------------------------|
| Flange | DIN 2501 or ANSI 16.5 |
| Standard | DN 50, PN 40 |
| Optional | DN 40/50/80/100, PN 40; DN 50, PN 64/100 1½"/ 2"/ 3"/ 4", 150/300 lb |
| Screw | G 1½" Others on request |

| | |
|-------------------------------------------------|-------|
| Protection category (EN 60529 / IEC 529) | IP 65 |
|-------------------------------------------------|-------|

| | |
|--------------------------------------------|------------------------|
| Electromagnetic compatibility (EMC) | EN 50081-1, EN 50082-2 |
|--------------------------------------------|------------------------|

Limit switches and electrical signal output

One or two limit switches can be built into the indicators.

Limit switches SC 3.5 N0

2-wire limit switches are connected in conformity with DIN 19234 (NAMUR). For operation, an isolation switching amplifier is required.

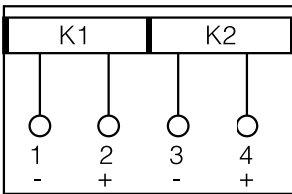
| Technical data | SC 3.5-N0 |
|-------------------------------------------|---------------------------------|
| Connection | 2-wire |
| Voltage | 8 V DC |
| Ambient temperature | -25 ... +100°C (-13 ... +212°F) |
| Protection category to EN 60529 / IEC 529 | IP 67 |
| Self-inductance (L _i) | 150 µH |
| Self-capacitance (C _i) | 100 nF |
| Electromagnetic compatibility (EMC) | EN 50081-2, EN 50082-2 |
| Spark protection | EEx ia IIC T6, EEx ib IIC T6 |
| Approval | PTB No. Ex-95.D.2195 X |
| Technical Data | Auto cut-off |
| No-load voltage U _i | 16 V |
| Short-circuit current I _i | 52 mA |
| Output P _i | 169 mW |

Connection diagram

SC 3.5-N0

K1 = 1 Limit switch

K2 = 2 Limit switches



Limit switches SB 3.5-E2-Y

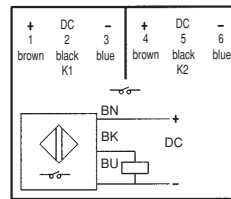
This 3-wire limit switch has a 10 – 30 V DC connection. The switching point is visible on the scale.

3-wire limit switches (with integrated preamplifier) can be connected directly to a PLC.

| Technical data | SB 3.5-E2-Y |
|-----------------------------------------|--------------------------------|
| Electrical connection | 3-wire |
| Voltage | 10 - 30 V DC |
| No-load power consumption | ≥ 15 mA |
| Continuous current | 100 mA |
| Ambient temperature | -25 ... +70°C (-13 ... +158°F) |
| Protection category to EN 60529/IEC 529 | IP 67 |
| Electromagnetic compatibility (EMC) | EN 50081-2, EN 50082-2 |
| Display | LED |

Connection diagram

SB 3.5-E2-Y



Electrical signal output ESK II

The ESK II can be installed in the indicators as an option.

Given an intrinsically safe feed unit, the transmitter may also be used in hazardous areas.

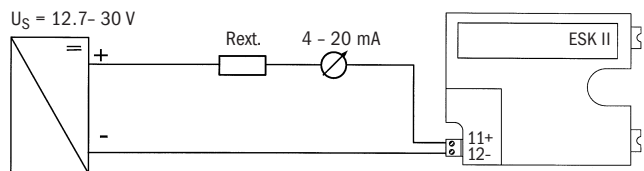
| Technical data | |
|-----------------------------------------|------------------------------|
| Electrical connection | 2-wire |
| Power supply | 12.7 – 30 V DC |
| Current output | 4 – 20 mA |
| Power influence | < 0.1% |
| Load resistance dependence | < 0.1% |
| Temperature drift | ≤ 5 µA/ K |
| Load impedance | (U - 12 V)/20 mA, max. 800 Ω |
| Ambient temperature | -25 ... +85°C |
| Effective inner self-inductance | negligible |
| Effective inner self-capacitance | ≤ 20 nF |
| Protection category to EN 60529/IEC 529 | IP 20 |
| Spark protection | EEx ia IIC T6 |
| Approval | PTB No. Ex-94.C.2067 |

Only for connection to intrinsically safe circuits with the following peak values:

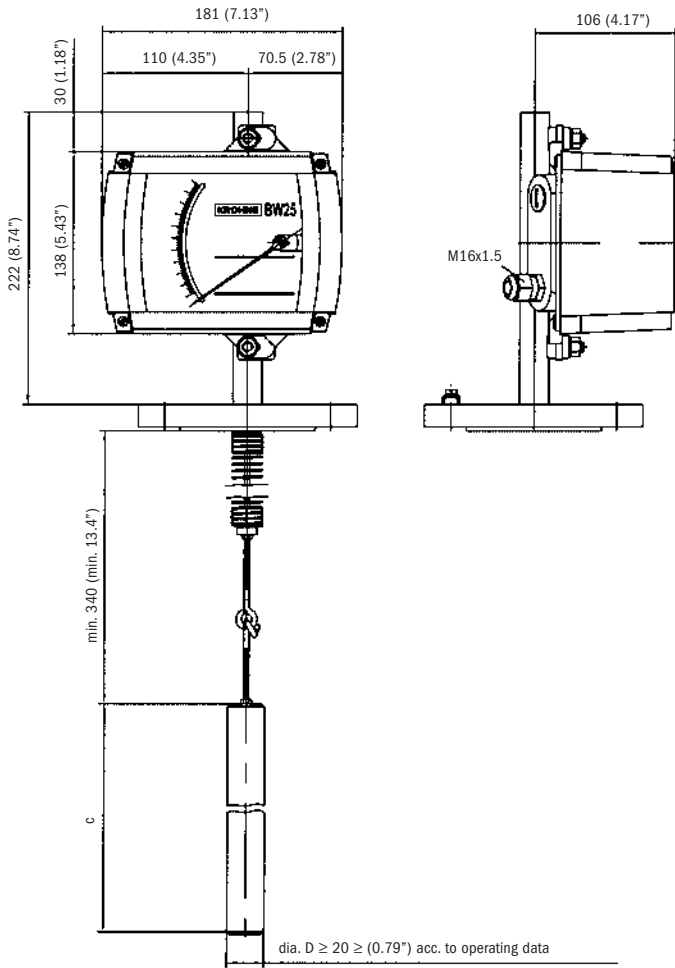
| | |
|--------------------------------------|--------|
| No-load voltage U _i | 30 V |
| Short-circuit current I _i | 100 mA |
| Output P _i | 1 W |

Connection diagram

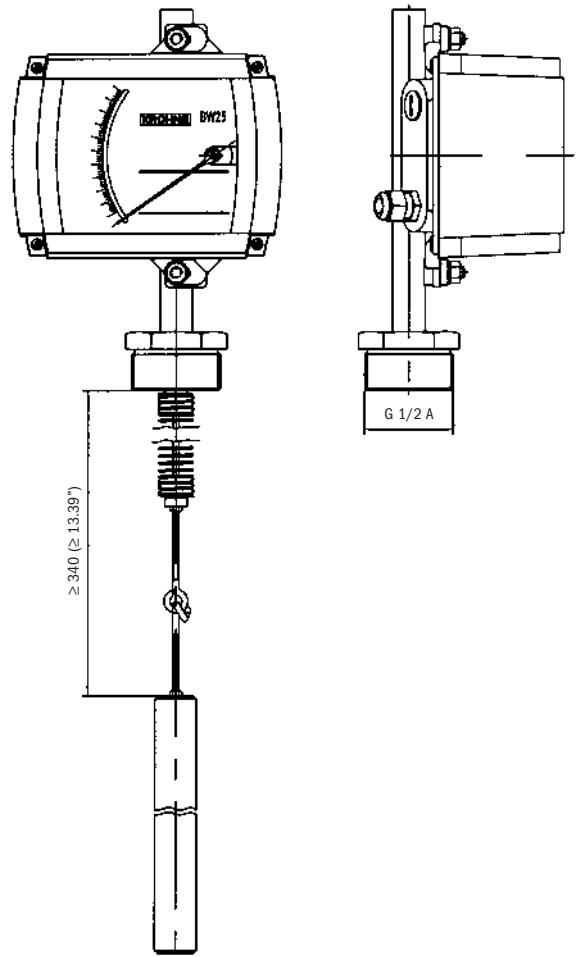
ESK II-wire configuration, 4 – 20 mA



Flange version



Screw version

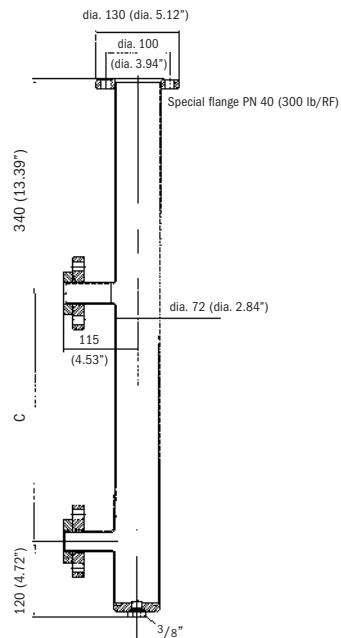


Dimension C = length of displacer rod (measuring range)

Dimensions in mm (inches)

Reference vessel

| | |
|------------------------------|---------------------------------------------------|
| Connection | DIN 2501 or ANSI B 16.5 |
| Flanges | DN 25/50, PN 40 1 1/2" - 2" / Class 150/300 lb |
| Drain | |
| Plug | 3/8" |
| Other connections on request | |



Dimension C = Distance between sockets (measuring range)

Approvals

| Application | Instrument version | Certification mark |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|----------------------|
| With explosion protection: In stationary storage tanks for flammable liquids of dangerous materials classes AI, AII and B, excl. carbon disulphide (CS ₂), in Zone 0. | BW 25 /... /... /... /... - .. / Z0 | PTB No. III B/S 1970 |

Note: Certified devices are not standard versions! Deviations in design and technical data are possible!

Type code

Instrument

BW 25 Liquid level indicator

| | | | | | |
|--------------|--------------------------|----------------------------------------------------------------|--------|--|--|
| | Material (flange) | | | | |
| | R | Stainless steel | 1.4571 | | |
| | | Measuring section | | | |
| | N | No reference vessel | | | |
| | B | Reference vessel | | | |
| | | Top-mounted indicator | | | |
| | M 9 | Indicator M 9 | | | |
| | | Built-in equipment | | | |
| | KI.. | Limit switch SC 3.5-NO with 1-2 contacts | | | |
| | KD.. | Limit switch SB 3.5-E2-Y with 1-2 contacts | | | |
| | ESK | Electrical signal output | | | |
| | ESK/K.. | Electrical signal output and 1-2 limit switches | | | |
| | | Safety function | | | |
| | Ex | Explosion-protected electrical equipment | | | |
| | | Application | | | |
| | N | Non-Ex | | | |
| | Z0 | Flammable liquids of dangerous materials classes AI, AII and B | | | |
| | | Options | | | |
| | TS | Liquid/liquid interface detection | | | |
| BW 25 | | | | | |

Notes