Bell's™

EN

Quick start guide

Model BEM22UPG

Model BEM22EPG

Model BEM22GFG/WPG

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1. General information

- This quick start guide contains essential information and safety notes to facilitate commissioning in a concise form. Working safely requires that all safety notes and instructions described are observed. The operating instructions are available on the BELL'S website under → Downloads.
- Skilled personnel must have carefully read and understood the operating instructions prior to beginning any work.
- Subject to technical modifications.
- Further information:

  - Internet address: www.bellengg.com

Model	Model ID	Data sheet
BEM22EPG	A.	1.1
BEM22GFG	B.	1.1
BEM22WPG	C.	1.1
BEM22MTG	D.	1.1
BEM22TPG	E.	1.1

2. Safety

2.1 Intended use

Suitability for use in accordance with model ID

Application	Model ID
Liquid or gaseous medium, group 1 (hazardous), per PED	A, B, C, D, E, F, H, I, J, K, L, M, N, O, P, Q, R
Group 2 medium, per PED	G
For gauge pressure measurement	A, B, C, D, E, F, G, H, I, J, L, M
For absolute pressure measurement	K
For differential pressure measurement	N, O, P, Q, R
For gaseous and liquid media that are not highly viscous or crystallising and will not attack copper alloy parts	A, B, R
For gaseous and liquid aggressive media that are not highly viscous or crystallising, also in aggressive environments	C, D, E, F, H, J, K, N, Q
For gaseous, dry and aggressive media, also in aggressive environments	L, M
For transparent, gaseous, dry, clean, oil- and grease-free media that will not attack copper and aluminium alloy parts	O [1], P
For transparent, gaseous, dry, clean, oil- and grease-free media, also in aggressive environments	O [1]
High dynamic pressure loads and vibrations (only for versions with liquid filling)	B, C, D, E, F, G, H, I, K, L, N, Q, R
With open connecting flange also suitable for contaminated and viscous media	H, I
Increased safety requirements for personal protection	D, E, F [1], G, H [1]
For measuring locations with increased overpressure loads	E, H, I, K, L, M, N, P
For liquid media in high-pressure applications with scale range > 1,600 bar	G

1) Version possible

Classification per EU Pressure Equipment Directive

- Instrument type: Pressure accessory without safety function
- Maximum allowable pressure PS, see chapter 2.5
- Volume of wetted parts: < 0.1 l

The instrument must only be used with media which are not harmful to the wetted parts over the entire range of use of the instrument. Any change in the state of matter or any decomposition of unstable media is not permissible. Only use the instrument in applications that lie within its technical performance limits (e.g. max. ambient temperature, material compatibility, ...).

In order to achieve an optimal service life of the instrument, it is recommended to load the instrument between 1/3 x PS and 2/3 x PS.

Observe the specifications of the instrument and the limit values per data sheet and the respective valid instrument standards, e.g. EN 837 or ASME B40.100. It is assumed that the instrument is handled properly and within its technical specifications. Otherwise, the instrument must be taken out of service immediately and inspected by authorised BELL'S service personnel.

The instrument has been designed and engineered solely for the intended use described here and may only be used accordingly. The manufacturer shall not be liable for claims of any type based on operation contrary to the intended use.

2.2 Improper use

- Any use beyond or different to the intended use is considered as improper use.
- Refrain from unauthorised modifications to the instrument.
- Do not use in safety or emergency shutdown devices.
- Do not use in potentially explosive atmospheres.

2.3 Personnel qualification

Skilled personnel

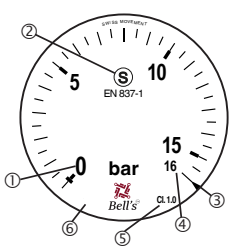
Skilled personnel, authorised by the operator, are understood to be personnel who, based on their technical training, knowledge of measurement and control technology and on their experience and knowledge of country-specific regulations, current standards and directives, are capable of carrying out the work described and independently recognising potential hazards.

2.4 Personal protective equipment

The personal protective equipment is designed to protect the skilled personnel from hazards that could impair their safety or health during work. When carrying out the various tasks on and with the instrument, the skilled personnel must wear personal protective equipment.

2.5 Labelling, safety marks

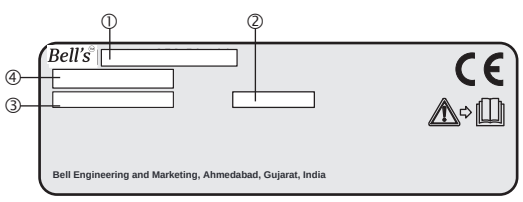
Dial (example)



① Lower scale value
② Instruments with this marking correspond to the safety version "S3" with solid baffle wall (Solidfront) and blow-out back
③ Instruments with this marking are full-scale loadable. PS = full scale value. For instruments without this marking, PS = 3/4 x full scale value applies.
④ Full scale value
⑤ Accuracy class
⑥ QR code with link and serial number

In addition to the dial, some models are also marked with a product label.

Product label (example)



① Model
② Date of manufacture (MM/YYYY)
③ Maximum allowable pressure PS
④ Item number

CE marking in accordance with EU Pressure Equipment Directive

Instruments with PS > 200 bar are marked with the CE symbol. Instruments with PS ≤ 200 bar must not be marked with the CE symbol per Pressure Equipment Directive and are subject to the applicable "sound engineering practice".

3. Commissioning, operation

WARNING!

Physical injuries and damage to property and the environment due to hazardous media

Upon contact with hazardous media (e.g. oxygen, acetylene, flammable or toxic substances) and harmful media (e.g. corrosive, toxic, carcinogenic, radioactive), there is a danger of physical injuries and damage to property and the environment.
Should a failure occur, hazardous media with extreme temperatures (over 55 °C [131 °F]), under high pressure or vacuum may escape at the instrument.

- ▸ For these media, in addition to all standard regulations, the appropriate existing codes or regulations must also be followed.
- ▸ Wear the requisite protective equipment, see chapter 2.4.

WARNING!

Physical injuries and damage to property and the environment caused by components blowing out in the event of a failure

In the event of a failure, components can be ejected from the instrument.
Due to the high energy of the components blown out in the event of a failure and the media that can subsequently escape, the possibility of physical injuries and damage to property exists.

- ▸ It must be ensured, e.g. by suitable safety devices or sufficient distance, that in the event of a failure neither personal injury nor damage to property or the environment can occur.

3.1 Requirements for the mounting location

The instruments should always be installed in locations free from vibration load. If necessary, it is possible to isolate the pressure gauge from the mounting location, e.g. by installing a flexible connection lead between the measuring location and the instrument and mounting the instrument on a suitable bracket. If this is not possible, the following vibration limit values must not be exceeded:
Acceleration < 0.5g (approx. 5 m/s²)
Frequency range < 150 Hz

- For outdoor applications, the selected installation location has to be suitable for the specified ingress protection, so that the instrument is not exposed to impermissible weather conditions. Close the vent valve (if present) in order to achieve the specified ingress protection.
- When mounting the pressure gauge it must be ensured that, taking into consideration the influence of convection and heat radiation, no deviation above or below the permissible temperature limits can occur. Observe the temperature effect on the indication accuracy.
- To ensure that the pressure can be safely vented in the case of failure, instruments with blow-out device or blow-out back must keep a minimum distance of 20 mm [0.79 in] from each object.

3.2 Mounting

- After unpacking the instrument, a visual inspection for damage (e. g. pointer, threads, sealing face, pressure port) must be carried out.
- Mounting is only permissible in the depressurised state. Reliably depressurise the instrument using the available valves and protective devices (e.g. shut-off valve, monoflange).
- Nominal position per EN 837: 90° ±5° (⊥), if not stated otherwise in the order documentation.
- With parallel male threads (e.g. G ½ B), use flat gaskets, lens-type sealing rings or Bell's profile sealings.
- With tapered threads (e.g. NPT threads), sealing is made in the threads, using a suitable sealing material (EN 837-2).
- When screwing the instruments in, the force required for sealing must not be applied through the case, but only through the spanner flats provided for this purpose, and using a suitable tool.
- The tightening torque is dependent on the selected process connection.

3.3 Commissioning, operation

- Check the sealing at the process connection over the entire scale range before commissioning.
- Pressure surges must be avoided at all costs, open the shut-off valves slowly.
- The vent valve (if present) equalises the pressure between the internal pressure of the case and the ambient air. This avoids indication errors. After mounting the instrument, briefly open the vent valve (set from CLOSE to OPEN) and then close it again (CLOSE position). To prevent the ingress of water and moisture into the case in the long term, the vent valve should remain closed and only be opened briefly to read the pressure.

- The version of the vent valve depends on the model and can deviate from the representation shown. Observe the effects on the ingress protection, see technical information IN 00.18.
- The instrument must not be subjected to any external loading (e.g. use as a climbing aid, support for objects).
- With critical media, e.g. oxygen, the operator is responsible for the correct mounting situation and compliance with the permissible operating conditions, e.g. "oil- and grease-free for oxygen".

Before reading the pressure, tap the case lightly to release friction in the movement and ensure a precise indication.

4. Faults

If faults occur, read the "Faults" chapter in the complete operating instructions. If faults cannot be eliminated by means of the measures listed there, take the instrument out of operation immediately.

With instruments which do not correspond to the safety version "S3", highly pressurised media might leak out through the possibly bursting window in case of a component failure.

After an external fire, media can leak out, particularly at solder joints. All instruments must be checked and, if necessary, replaced before recommissioning the plant.

5. Maintenance

The pressure gauges are maintenance-free. Regular checks should be carried out to ensure the measurement accuracy.
In the case of pressure gauges with blow-out devices or safety pressure gauges, the safety elements (e.g. blow-out plug or blow-out back) must be replaced after 10 years. The replacement may only be carried out by skilled personnel using original parts and after authorisation of the plant manager.

Filled instruments

The level must be checked at regular intervals. The liquid level must not drop below 75 % of the case diameter.

6. Dismounting, return and disposal

6.1 Dismounting

When dismounting, close the vent valve (if present).

WARNING!

Physical injury

When dismounting, there is a danger from hazardous media and high pressures.

- ▸ Wear the requisite protective equipment, see chapter 2.4.
- ▸ Observe the information in the material safety data sheet for the corresponding medium.
- ▸ Disconnect the instrument once the system has been depressurised and has cooled down.
- ▸ Flush or clean the dismounted instrument (following operation), in order to protect persons and the environment from exposure to residual media.

6.2 Return

Strictly observe the following when shipping the instrument:

- All instruments delivered to Bell's must be free from any kind of hazardous substances (acids, bases, solutions, etc.) and must therefore be cleaned before being returned.
- When returning the instrument, use the original packaging or a suitable transport packaging.

6.3 Disposal

Incorrect disposal can put the environment at risk.
Dispose of instrument components and packaging materials in an environmentally compatible way and in accordance with the country-specific waste disposal regulations.