Mess-, Regel- und
Überwachungsgeräte
für Haustechnik,
Industrie und Umweltschutz

Lindenstraße 20
74363 Güglingen
Telefon +49 7135-102-0
Service +49 7135-102-211
Telefax +49 7135-102-147
info@afriso.de
www.afriso.de

Instruction Manual

Digital Pressure Gauge
DIM 20

☞ Read manual before use!

☞ Observe all safety information!

☞ Keep manual for future use!

06.2011 0
854.001.0467

Contents

1 About this instruction manual

This instruction manual is part of the product.

- ▶ Read this manual before using the product.
- ▶ Keep this manual during the entire service life of the product and always have it readily available for reference.
- ▶ Always hand this manual over to future owners or users of the product.

1.1 Structure of warning

WARNING TERM The type and source of danger is shown here.

- ▶ Precautions to take in order to avoid the danger are shown here.

There are three different levels of warning:

Warning term	Meaning
DANGER	Imminent danger! Failure to observe the information will result in death or serious injuries.
WARNING	Possible imminent danger! Failure to observe the information may result in death or serious injuries.
CAUTION	Dangerous situation! Failure to observe the information may result in minor or serious injuries as well as damage to property.

1.2 Explanation of symbols and typeface

Symbol	Meaning
☑	Prerequisite for an activity
▶	Activity consisting of a single step
1.	Activity consisting of several steps
↳	Result of an activity
•	Bulleted list
`Text`	Indication on a display
Highlighting	Highlighting

2 Safety

2.1 Intended use

The digital pressure gauge DIM 20 is exclusively suitable for measuring the pressure of gaseous or liquid, not highly viscous, not crystallising and not curing media which are not aggressive to the specified materials. The digital pressure gauge DIM 20 is designed for applications in the hydraulics, pneumatics as well as the process plant and machinery sectors.

- ▶ The digital pressure gauge may only be used within the specified pressure shown on the type designation plate.
- ▶ Observe the directives, safety requirements and selection criteria according to EN 837-2 for the respective application cases.

Any use other than the use explicitly stated in this instruction manual is not permitted.

2.2 Predictable incorrect application

The digital pressure gauge DIM 20 must never be used in the following:

- Hazardous areas (ex)
  If the device is operated in hazardous areas, sparks may cause deflagrations, fires or explosions
- Applications involving persons or animals
- As a dynamometer

2.3 Safe handling

The digital pressure gauge DIM 20 represents state-of-the-art technology and is manufactured in accordance with the pertinent safety regulations. Each unit is subjected to a function and safety test prior to despatch.

- ▶ Operate the digital pressure gauge DIM 20 only when it is in perfect condition. Always observe the instruction manual, all pertinent local and national directives and guidelines as well as health and safety regulations and directives regarding the prevention of accidents.
- ▶ Install the instrument only when it is not under pressure and switched off.

Shock, humidity and extreme ambient conditions have an adverse effect on the proper functioning of the digital pressure gauge.

- ▶ Protect DIM 20 from shock.
- ▶ Use DIM 20 only inside rooms.
- ▶ Protect DIM 20 from humidity.

Increased danger

The danger increases in case of gases or liquids under high pressure. If parts under pressure become leaky or burst, staff in front of the digital pressure gauge must not be endangered by leaking medium of parts of the device.

All pertinent guidelines and directives must be observed if dangerous media such as the media listed below are measured:

- Oxygen
- Acetylene
- Flammable media
- Toxic media

This also applies to refrigerating plants, compressors, etc.

2.4 Qualification of personnel

The product may only be installed, commissioned, operated, maintained, shut down and disposed of by qualified, specially trained personnel.

Electrical work may only be carried out by qualified electricians in accordance with local and national regulations.

2.5 Modifications to the product

Changes or modifications made to the product by unauthorised persons may lead to malfunctions and are prohibited for safety reasons.

2.6 Use of spare parts and accessories

Use of unsuitable spare parts and accessories may cause damage to the product.

▶ Use only the manufacturer's genuine spare parts and accessories (refer to chapter 0, page 19).

2.7 Liability information

The manufacturer shall not be liable for any direct or consequential damage resulting from failure to observe the technical instructions, guidelines and recommendations.

The manufacturer and the sales company shall not be liable for costs or damages incurred by the user or by third parties in the use or application of this device, particularly in case of improper use of the device, misuse or malfunction of the connection, malfunction of the device or of connected devices. The manufacturer or the sales company shall not be liable for damages resulting from any use other than the use explicitly stated in this instruction manual.

The manufacturer shall not be liable for misprints.

3 Product description

The digital pressure gauge DIM 20 can be installed simply and quickly on site. The instrument housing is rotatable and as such ensures good readability even under unusual connection conditions.

DIM 20 can be operated and configured via a menu system and a 3 key pad. The adjusted parameters are memorized in an EEPROM (electronic memory) and remain memorized even when the battery is changed.

In addition to the indication of information about the measuring range, different pressure units as well as the number of decimal points can be configured. The starting value and full scale value of the measurement range can be re-calibrated by the customer on site. The original factory calibration can also be re-instated, if required. Excess over- or under-pressure is indicated.

Product identification

The instrument is identified by its type designation plate. This shows the most important data. The order code identifies the product in detail. The programme version of the operating software is shown on the display for approx. 1 second after the instrument has been switched on.

▶ In case of any query, please have the programme version and order code information readily available.

Fig. 1: Type designation plate

1 Specified pressure

2 Order number

3 Serial number

4 Specifications

Table 1: Specifications

Parameter	Value
General	
Mechanical connections	EN 837
Dimensions (W x H x D)	75 x 133 x 49 mm P_N = 400 bar: Height + 13.5 mm
Weight	Approx. 300 g
Display	LC-Display, 45 x 20 mm 4.5-digit 7-segment main display for indication of the measured value, digit height 9.5 mm, measuring range ±19999 6-digit 14-segment additional display for unit indication, digit height 6.8 mm
Mounting	As required. The upper housing part with display can be turned through 330°
Mechanical stability	Vibration: 5 g RMS (20-2000 Hz) Shock: 100 g/11 ms
Wetted parts	Pressure connection, gaskets, diaphragm seal
Supply	3.6 V lithium battery
Life expectancy of battery	Max. 8 years (depending on use)
Mechanical life expectancy	> 100 x 10^6 load cycles
Data storage	EEPROM (stable)
AD-converter resolution	14 Bit
Materials	
Display housing	PA6, glass-reinforced
Materials (wetted parts)	
Gaskets	FKM (others on request)
Pressure connection	Stainless steel 1.4301
Diaphragm seal	Ceramic Al_2O_3 96%

Parameter	Value
Signalverhalten	
Accuracy	≤ ± 0,5 % FSD Deviation according to BSFL (includes non-linearity, hysteresis and reproducibility)
Measurement speed	5/s
Operating temperature range	
Temperature error	≤ ± 0,5 % FSD/10 K in compensated range 0 °C to +70 °C
Ambient	-20 °C to +45 °C
Medium	-20 °C to +125 °C
Storage	-30 °C to +80 °C
Electrical safety	
Protection	IP 51 EN 60529
Electromagnetic compatibility (EMC)	
Noise suppression	According to EN 61326
Noise immunity	According to EN 61326

Table 2: Input value

Parameter	Value [bar]			
Nominal pressure rel./abs.	-1…0	1	400	700
Permissible overpressure	3	3	650	1.200
Burst pressure	4	4	700	1.500

4.1 Approvals, tests and conformities

DIM 20 conforms to the Pressure Equipment Directive (97/23/EC).and the EMC Directive (2004/108/EC).

5 Transportation and storage

CAUTION **Damage to the device due to improper transportation.**

- ▶ Do not throw or drop the device.

CAUTION **Damage to the device due to improper storage.**

- ▶ Protect the device against shock when storing it.
- ▶ Store device in a clean and dry environment.
- ▶ Store device only within its permissible temperature range.

6 Installation and commissioning

☑ The process connection must not be under pressure and the DIM 20 is switched off.

CAUTION **Damage to the instrument and its diaphragm through incorrect handling.**

- ▶ Handle DIM 20 very carefully in its packed as well as unpacked state.
- ▶ Remove packaging and protective cap of the instrument only just prior to installation in order to prevent damage to the diaphragm.
- ▶ Keep the protective cap in a safe place for future use.
- ▶ Treat the unprotected diaphragm with great care. It is very easily damaged.
- ▶ After removal or disconnection of the unit refit the protective cap over the diaphragm.
- ▶ Do not use force when connecting the instrument.
- ▶ The display and the plastic housing are fitted with a rotation limiter. Do not apply excessive force to the display or housing when rotating the instrument.

1. Check the measuring range shown on the type designation plate. Make sure the maximum pressure at the process connection is within the allowed measuring range.
2. Remove instrument carefully from its packaging.

Mechanical connection procedure

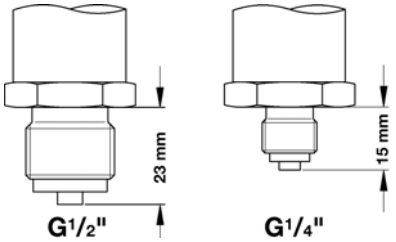


Fig. 2: Connection according to EN 837

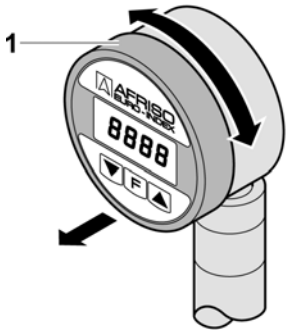
1. Seal the connection of the DIM 20 with a suitable gasket, e.g. copper gasket or similar, which is compatible with the medium and pressure to be measured. The sealing gasket is not part of our scope of supply.
2. Ensure that the sealing surface of the connection part is in perfect condition.
3. Screw in the DIM 20 by hand into the connection thread.
4. Tighten DIM 20 with an open ended spanner SW24 with max. 20 Nm.

6.1 Connecting the battery

CAUTION **Tearing of cables when removing the upper part of the housing.**

▶ Carefully remove the upper housing part.

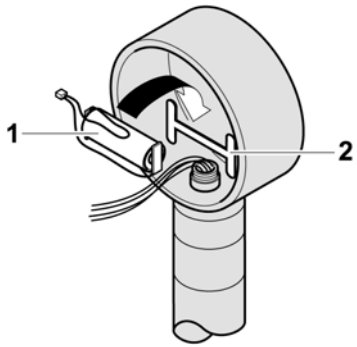
1. Turn the upper housing part (**1**) clockwise or counter-clockwise and remove it from the housing at the same time.



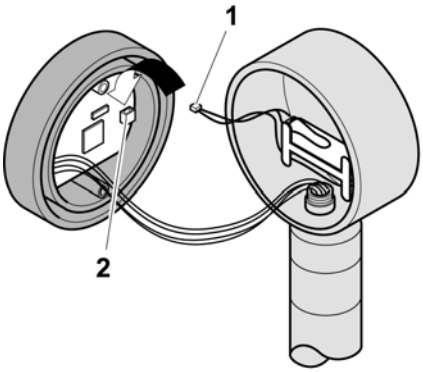
WARNING **Danger of explosion in case of short circuit of the lithium battery.**

▶ Do not short-circuit the lithium battery.

2. Insert battery (**1**) into holder (**2**).



3. Plug the connector of the battery cable (**1**) into the socket (**2**) on the printed circuit board.



4. Push the upper housing part into position.

7 Operation

7.1 Switching unit on and off

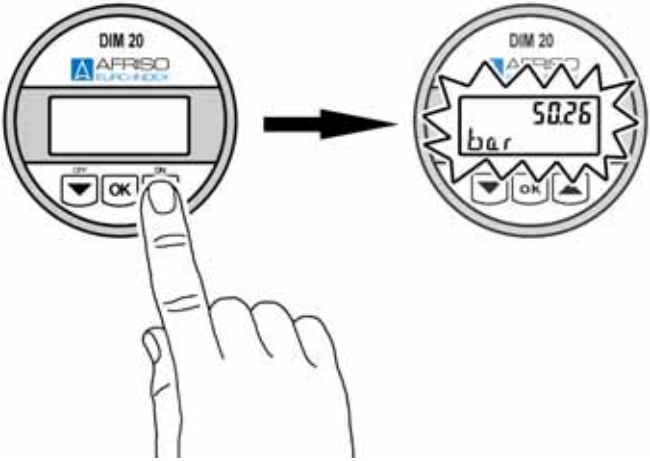


Fig. 3: Switching unit on

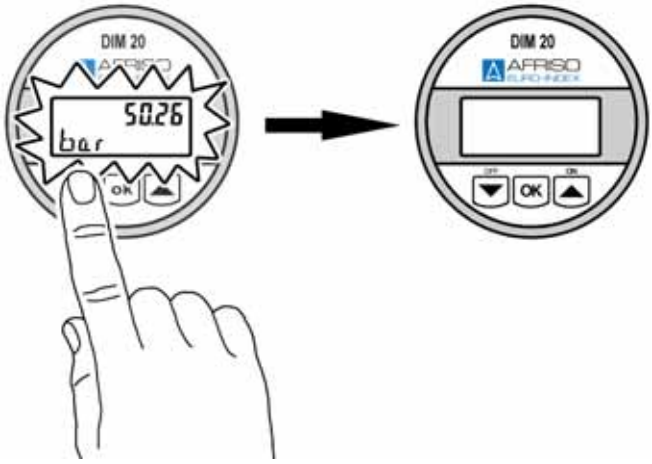
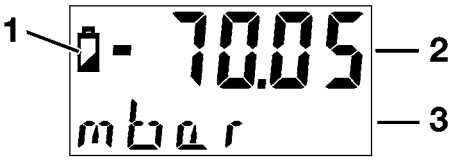


Fig. 4: Switching unit off

7.2 Indication of measured value



1 Battery condition
2 Measured value
3 Unit of measurement

Fig. 5: Indication of the measured value and unit of measurement

When the reading is below the limit of the lower range the message “UNDER” appears in the lower display line and “UPPER” appears, if the range is exceeded.

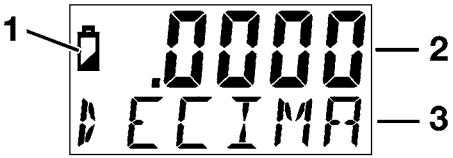
▶ Press **OK** to call up the menu.

7.3 Menu

All adjustments are permanently memorized in an EEPROM and can be viewed also after a battery change.

Changes are only checked and memorized after pressing the OK key and after leaving the menu point.

▶ Press **OK** to call up the menu.



1 Battery condition
2 Adjusted value
3 Menu point

Fig. 6: Indication of the measured value and unit of measurement

▲ Move forward in menu or increase indication value.

▼ Move backwards in menu or decrease indication value.

OK Call up individual menu points or confirm an adjusted value.

Fig. 7: Allocation of keys

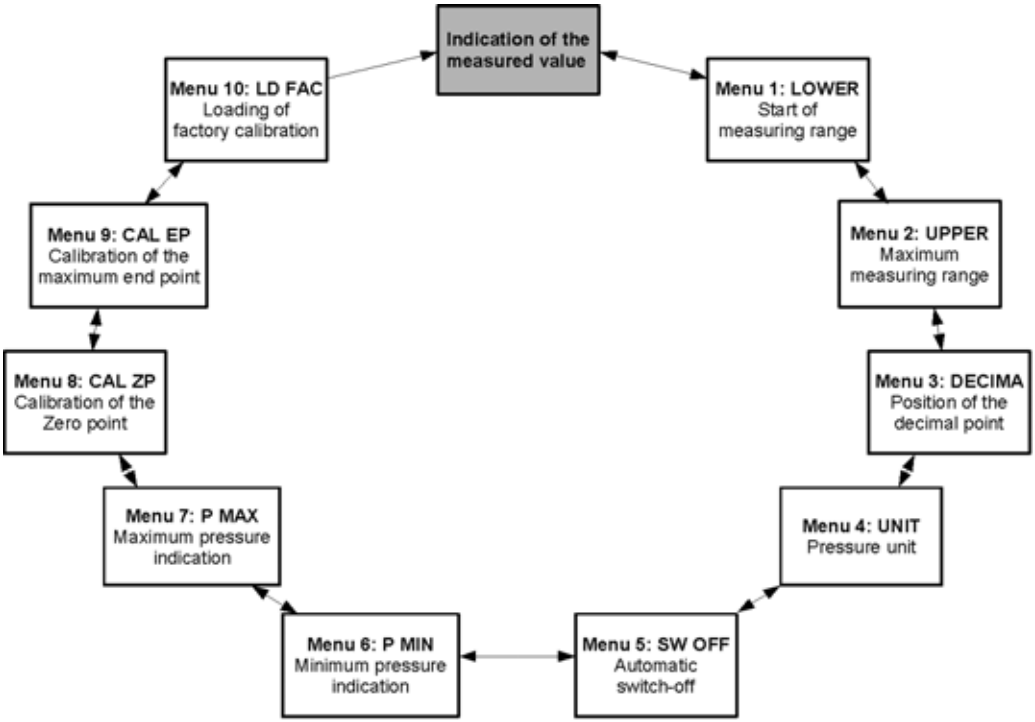


Fig. 8: Menu structure

Menu 1: Indicate start of measuring range

LOWER

▶ Call up menu point “LOWER”.

The start of measuring range is shown in the upper display line. This value was chosen at the time of ordering and cannot be changed.

Menu 2: Indicate maximum measuring range

UPPER

▶ Call up menu point “UPPER”.

The maximum measuring range is shown in the upper display line. This value was chosen at the time of ordering and cannot be changed.

Menu 3: Changing the position of the decimal point

DECIMA

1. Call up menu point “DECIMA”.
2. Press **OK**.

↳ “DECIMA” starts to blink.

3. Use ▲ or ▼ to select the required position of the decimal point.
4. Press **OK** to confirm the selection.

Attention: Depending on pressure range and selected unit of measurement only a limited number of decimal points may be possible.

Menu 4: Changing the pressure unit

UNIT

1. Call up menu point “UNIT”.
2. Press **OK**.

↳ The currently adjusted unit starts to blink.

3. Use ▲ or ▼ to select the required unit:
   bar, mbar, PSI, InHg, cmHg, mmHg, hPa, kPa, Mpa or mWs.
4. Press **OK** to confirm the selection.

Attention: When changing the unit it may also be necessary to change the decimal point so that the actually present pressure can continue to be displayed correctly. Depending on the pressure range, it is possible that not all of the units can be used.

Menu 5: Changing the automatic switch-off

SW OFF

1. Call up menu point “SW OFF”.
2. Press **OK**.

↳ “SW OFF” starts to blink.

3. Use ▲ or ▼ to select the required figure:
   Figures 0 to 5 are available. With figure 0 the automatic switch-off is disabled. With figures 1 to 5 the automatic switch-off time is determined in number of minutes.
4. Press **OK** to confirm the selection.

Menu 6: Changing the minimum pressure indication

P MIN

1. Call up menu point "P MIN".
2. Press **OK**.

↳ "P MIN" starts to blink.

3. Press ▼ to set the currently present pressure as the minimum value or
   press ▲ in order to set the value to Zero.
4. Press **OK** to exit from this menu point.

Menu 7: Changing the maximum pressure indication

P MAX

1. Call up menu point "P MAX".
2. Press **OK**.
3. "P MAX" starts to blink.
4. Press ▼ to set the currently present pressure as the maximum value or
   press ▲ to set the value to Zero.
5. Press **OK** to exit from this menu point.

Menu 8: Calibrating the Zero point

CAL ZP

Should you notice a deviation of the indicated value in relation to the Zero point, the unit can then be recalibrated. A reference pressure is necessary if the Zero point is different from ambient pressure.

1. Call up menu point "CAL ZP".
2. Press **OK**.

↳ "CAL ZP" starts to blink.

3. If the Offset is different from the ambient pressure, pressurize the unit by applying a reference pressure. This pressure must then correspond to the required starting pressure of the measuring range.
4. Press ▲ to read the pressure.
5. Press **OK** to memorize the displayed signal as the start of the measuring range.

Should this configuration lead to a worsening of the original results, for instance due to lack of a suitable reference pressure, the original factory calibration as per original order can be re-instated via the menu 10 "LD FAC".

Menu 9: Calibrating the maximum end point

CAL EP

Should you notice a deviation of the indicated value in relation to the maximum end point, the unit can be recalibrated. A suitable reference pressure is necessary for this task.

1. Call up menu point "CAL EP".
2. Press **OK**.

↳ "CAL EP" starts to blink.

3. Pressurize the instrument with a reference pressure. This pressure must correspond to the pressure of the maximum end point.
4. Press ▲ to read the pressure.
5. Press **OK** to memorize the currently displayed signal as the maximum end point.

Should this configuration lead to a worsening of the original results, for instance due to lack of a suitable reference pressure, the original factory calibration as per original order can be re-instated via the menu 10 "LD FAC".

Menu 10: Loading of factory calibration

LD FAC

1. Press **OK**.
2. Press ▲ to load the factory calibration according to the original order.

↳ After the loading process, the message "LOADED" appears briefly on the display followed by "OK".

↳ The unit then exits this menu point automatically.

Checking of calibrated values

OK
ERROR

Upon exiting the menu the adjusted parameters are checked in relation to each other and with reference to the basic instrument data. If the message "OK" appears in the left hand bottom of the display, the configuration was successful. If the message "ERROR" appears, then at least one of the adjusted values is outside the permissible range. This is for instance the case when the Digital Pressure Gauge has a nominal pressure range of 400 bar and in the menu "DECIMA" four decimal points were programmed. If the error message appears, the last adjusted and functionally correct parameters are retained. During the configuration of the unit a conversion of the measuring ranges (Menus "UPPER" and "LOWER") to the new units takes place only after exiting the menu system..

Depending on the pressure range and the number of displayable figures, it may not be possible to use all measurement units.

8 Maintenance

8.1 Maintenance intervals

Table 3: Maintenance intervals

When	Activity
Battery condition appears in the display.	▶ Change battery, see below.
As required.	▶ Clean instrument with non-aggressive cleaning solution.

8.2 Maintenance activities

Replacing the battery

1. Remove the old battery and replace with a new battery (refer to chapter 6.1, page 11).

2. Batteries may **not** be disposed of together with unsorted household waste. Return empty batteries to a collection point or to your dealer for environmentally compatible disposal.

The memorized instrument adjustments are retained during the battery changing process.

9 Troubleshooting

Repair work may only be carried out by qualified, specially trained personnel.

Table 4: Troubleshooting

Problem	Possible reason	Remedy
“ERR0R” appears in menu during configuration.	At least one of the adjusted values is outside the permissible range.	▶ Check adjusted values, refer to page 14.
Other malfunction.	–	▶ Return the device to the manufacturer (refer to chapter 11, page 19).

10 Shutting down and disposal

☑ The instrument is switched off and under no pressure.

1. Remove the device (see chapter 6, page 9, steps in reverse sequence).

2. To protect the environment, this device must **not** be disposed of together with the normal household waste. Dispose of the device according to local directives or council guidelines.

This device consists of materials that can be reused by recycling firms. The electronic inserts can be removed easily and are constructed from recyclable materials.

If you do not have the opportunity to dispose of the old device in accordance with environmental regulations, please contact us for possibilities to dispose of it or to return it (refer to chapter 11, page 19).

11 Returning the device

In order to protect the environment and our staff, we will transport, check, repair or dispose of returned devices only if this is possible without risk to health and environment.

▶ Always enclose a contamination declaration when returning a device. This declaration confirms that the device does not present a hazard.

▶ The declaration of decontamination can be downloaded at www.afriso.com.

We cannot process your returns without a contamination declaration. Thank you for your understanding.

If the device was used with hazardous media:

1. Decontaminate the device in accordance with all pertinent directives.

↳ The device is free from hazardous media.

2. Enclose proof of decontamination in accordance with all pertinent directives when returning the device.

12 Spare parts and accessories

Part	Part No.
3.6 V lithium battery	68309

13 Warranty

The manufacturer's warranty for this product is 24 months from date of purchase. This warranty applies to all countries in which this product is sold by the manufacturer or its authorised representatives.

14 Copyright

15 Customer satisfaction

Customer satisfaction is our prime objective. Please get in touch with us if you have any questions, suggestions or problems regarding your product.

16 Addresses

The addresses of our worldwide representatives can be found on the Internet at www.afriso.com.

17 Appendix

17.1 Declaration of conformity

EG – Konformitätserklärung
EC-Declaration of Conformity

Formblatt
FB 27 - 03

Name und Anschrift des Herstellers: AFRISO-EURO-INDEX GmbH, Lindenstr. 20, 74363 Güglingen
Name and adress of manufacturer:

Erzeugnis: Digitalmanometer
Product

Typenbezeichnung: DIM 20
Type

Betriebsdaten: 3,6V Lithium Batterie
Techn. Details:

Das bezeichnete Erzeugnis stimmt mit den Vorschriften folgender Europäischer Richtlinien überein:
The above mentioned product meets the requirements of the following european directives

Elektromagnetische Verträglichkeit (89/336/EWG und 92/31/EWG)
EC directive electromagetic compatibility
- EN 61326 (1997), EN 61326/A1 (1998)
- EN 61326/A2 (2001), EN 61326/A3 (2003)

Druckgeräterichtlinie (97/23/EG)
Pressure equipment directive
- Modul A nach Anhang III

Die Anwendung dieser Richtlinie bezieht sich nur auf Geräte mit maximal zulässigem Überdruck > 200 bar.

Unterzeichner: Dr. Aldinger, Geschäftsführer Technik
Signed: Dr. Aldinger, Technical Director

25.2.2008
Datum, *Date*

Unterschrift, *Signature*

Version: 1 / Index: 2 | AFRISO-EURO-INDEX GmbH | D-74363 Güglingen | Seite: 1 von 1