



Mess-, Regel- und
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Industrie und Umweltschutz

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Operating instructions

Pressure transducers

DMU

DMU 02 Vario ...




-  Read instructions before using device!
-  Observe all safety information!
-  Keep instructions for future use!



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1 This instruction manual

These operating instructions are 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 Precautions



This is the general safety alert symbol. It alerts to injury hazards or equipment damage. Comply with all safety instructions in conjunction with this symbol to help avoid possible death, injury or equipment damage.

There are three different levels of warnings:

Warning word	Meaning
DANGER	DANGER indicates a hazardous situation, which, if not avoided, will result in death or serious injury.
WARNING	WARNING indicates a potentially hazardous situation, which, if not avoided, can result in serious injury or equipment damage.
CAUTION	CAUTION indicates a hazardous situation, which, if not avoided, can result in injury or equipment damage.



2 Security

2.1 Product identification

The nameplate is used to identify the product. The most important data are shown on the nameplate. The serial number uniquely identifies your product.



Fig. 1: Example nameplate DMU 02 Vario ...

1	Type designation	5	Pin assignment
2	Part number	6	Supply voltage
3	Serial number	7	Output signal
4	Recycling	8	Measuring range

NOTICE

The nameplate must not be removed from the product.

2.2 Intended use

The pressure transducers of the series DMU 02 Vario ... may only be used to measure the pressure in systems with gaseous and liquid media.

2.3 Predictable incorrect application

This product must never be used in the following cases:

- Applications involving persons and animals



2.4 Safe handling

This product represents state-of-the-art technology and is made according to the pertinent safety regulations. Each product is subjected to a function and safety test prior to shipping.

- ▶ Operate the product only when it is in perfect condition. Always observe the operating instructions, all pertinent local and national directives and guidelines as well as the applicable safety regulations and directives concerning the prevention of accidents.

Extreme environmental conditions have negative effects on the function of the product.

- ▶ Protect the product from shocks.
- ▶ The operator must provide suitable overvoltage protection.

2.5 Qualification of personnel

The product may only be mounted, commissioned, operated, maintained, decommissioned and disposed of by qualified, specially trained staff.

Electrical work may only be performed by trained electricians and in compliance with all applicable local and national directives, regulations and electrical code requirements.

2.6 Modifications to the product

Only perform work on and with the product which is explicitly described in these operating instructions. Do not make any modifications to the product which are not described in these operating instructions.

2.7 Liability information

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

The manufacturer or the sales company shall not be liable for costs or damages incurred by the user or by third parties in the usage or application of this product, in particular in case of improper use of the product, misuse or malfunction of the connection, malfunction of the product or of connected products. The manufacturer or the sales company shall not be liable for any damage whatsoever resulting from any use other than the use explicitly permitted in these operating instructions.

The manufacturer shall not be liable for misprints.



3 Product description

3.1 Scope of delivery

NOTICE

Do not remove the packaging and the protective cap of the product until immediately prior to mounting to help avoid damage to the diaphragm. A supplied protective cap must be kept.

Verify that all listed parts are undamaged and that the scope of delivery is complete as per your order:

- Pressure transducers
- Operating instructions



3.2 Overview pressure transducers

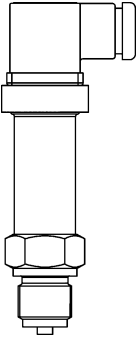


Fig. 2: DMU 02 Vario,
G $\frac{1}{2}$ B

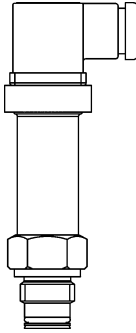


Bild 3: DMU 02 Vario
FBO flush with O ring

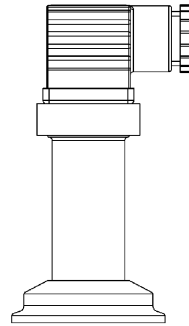


Fig. 4: DMU 02 Vario CP,
Clamp

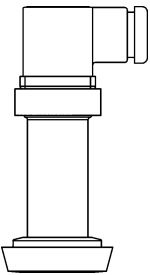


Fig. 5: DMU 02 Vario
MR, dairy fitting

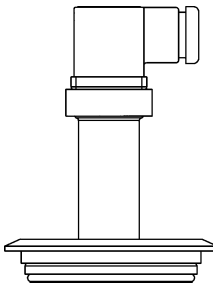


Fig. 6: DMU 02 Vario VT,
VARIVENT® / VARIN-
LINE®

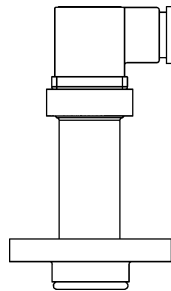


Fig. 7: DMU 02 Vario BC,
NEUMO BioControl®

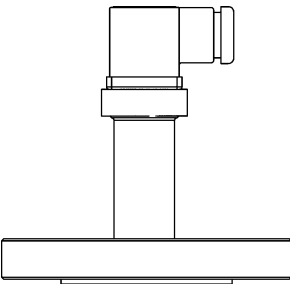


Fig. 8: DMU 02 Vario FL,
flange



4 Technical specifications

Table 1: Technical specifications

Parameter	DMU 02 Vario
Measuring principle	
	Piezo-resistive polysilicon stainless steel measuring cell (thin-film)
Measuring accuracy	
	<±0.3 % FSO*
Overpressure safety	
	≤ 250 bar, min. 2 x FS (burst pressure at least 3 x FS)
	> 250 bar, min. 1.5 x FS (burst pressure at least 2 x FS)
	≥ 1000 bar, min. 1.2 x FS (burst pressure at least 1.5 x FS)
Operating temperature range	
Ambient (DMU 02 Vario G½B)	-40 °C ... 105 °C
Ambient (DMU 02 Vario FBO/CP/MR/VT/BC/FL)	-10 °C ... 105 °C
Medium (DMU 02 Vario G½B)	-40 °C ... 125 °C
Medium (DMU 02 Vario FBO/CP/MR/VT/BC/FL)	-10 °C ... 125 °C
Temperature error band	
In compensated range	-10 ... 80 °C < 0.15 % FSO/10 K
DMU 02 Vario FBO	0 ... 70 °C < 1.5 % FSO/10 K
Dynamic characteristics	
Response time	< 4 ms (without flush diaphragm) < 20 ms (with flush diaphragm)
Offset error compensation	
	Subsequent zero calibration via magnet from the outside

* Deviation from the characteristic curve according to IEC 60770 – limit point calibration (non-linearity, hysteresis, repeatability)



Electrical	DMU 02 Vario
Supply voltage	DC 10 - 32 V
Output signal	
2-wire	4 - 20 mA
Load	$4-20 \text{ mA} \leq (U_B - U_{Bmin})/0.02 \text{ A}$
Current input	
2-wire	< 25 mA
Electrical protection	
	Short circuit proof and protected against reverse polarity
Electrical connection/degree of protection	
Standard	Connector and junction box as per ISO 4400 (DIN 43650-A), IP 65

Measuring range	DMU 02 Vario						
	G½B	FBO	CP	MR	VT	BC	FL
-1/0 bar	•	•	•	•	•	•	•
-1/-1.5 bar	•	•	•	•	•	•	•
-1/+3 bar	•	•	•	•	•	•	•
-1/+5 bar	•	•	•	•	•	•	•
-1/+9 bar	•	•	•	•	•	•	•
-1/+24 bar	•	•	•	•	•	•	•
0/0.6 bar	•						
0/+1 bar	•	•	•	•	•	•	•
0/+1.6 bar	•	•	•	•	•	•	•
0/+2.5 bar	•	•	•	•	•	•	•
0/+4 bar	•	•	•	•	•	•	•
0/+6 bar	•	•	•	•	•	•	•
0/+10 bar	•	•	•	•	•	•	•
0/+16 bar	•	•	•	•	•	•	•
0/+25 bar	•	•	•	•	•		•
0/+40 bar	•	•	•	•			•
0/+60 bar	•	•					A*



Measuring range	DMU 02 Vario						
	G½B	FBO	CP	MR	VT	BC	FL
0/+100 bar	•	•					A*
0/+160 bar	•	•					A*
0/+250 bar	•	•					A*
0/+400 bar	•	•					
0/+600 bar	•	•					
0/+1000 bar	•						

A* = available on request

Process connection	DMU 02 Vario						
	G½B	FBO	CP	MR	VT	BC	FL
G½B (EN 837-1/7.3)	•						
G½B (DIN 3852-A)		•					
ISO 2852 1" – 2½" (DIN 11864-3)			•				
DIN 11851 DN25- DN80 (DIN 11864-1)				•			
Varivent® F (DN25/1") / Varivent® N (DN40 – 125 / 1½" – 6")					•		
BioControl® DN25 – DN80						•	
EN 1092-1 type B1 DN25 PN 40 – DN100 (DIN 11864-2)							•
ASME B 16.5 DN1" – DN4" Class 150							•



Material	DMU 02 Vario						
Wetted parts	G½B	FBO	CP	MR	VT	BC	FL
Stainless steel 630 / 316 Ti / 316 L	•						
Stainless steel 316 Ti / FKM / 316 L		•					
Stainless steel 316 Ti / 316 L			•	•	•	•	•

Table 2: Dimensions

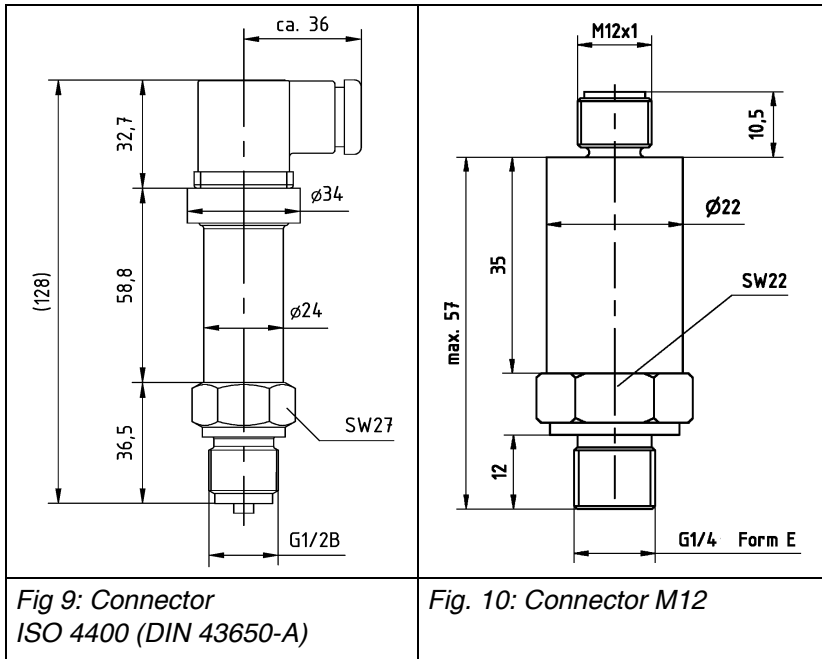




Table 3: Pin assignment table

	ISO 4400 (DIN 43650-A, -C EN 175301-803-A, -C)	M12 x 1 (4-pin) EN 61076-2-101	Cable outlet
2-wire system: Supply + Supply - Earth	1 2 Earth contact	1 3 -	Red Black -
3-wire system: Supply + Supply - Signal Earth	1 2 3 Earth Pin	1 3 4 -	Red Black White -

Table 4: Connection assignment connector

	<p>Connector ISO 4400 (DIN 43650-A)</p>	<p>M12 x 1</p>
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4.1 Approvals, tests and conformities

DMU 02 Vario ... complies with the following directives:

- EMC Directive (2014/30/EU)
- RoHS Directive (2011/65/EU)



5 Transport and storage

NOTICE**INCORRECT HANDLING**

- ▶ Verify compliance with the specified ambient conditions during transport or storage of the product.
 - ▶ Use the original packaging when transporting the product.
 - ▶ Store the product in a clean and dry environment.
 - ▶ Verify that the product is protected against shocks and impact during transport and storage.
-



6 Mounting and commissioning

6.1 Preparing mounting

DANGER**Electric shock caused by live parts**

- ▶ Disconnect the mains voltage supply before performing the work and ensure that it cannot be switched on.
- ▶ Verify that no hazards can be caused by electrically conductive objects or media.

Failure to follow these instructions will result in death or serious injury.

WARNING**Injury caused by escaping medium.**

- ▶ Verify that there is no pressure in the system.

Failure to follow these instructions can result in death, serious injury or equipment damage.

Do not use force when mounting the products to help avoid damage to the product or to the system.

Treat the exposed diaphragm with extreme care as it can be easily damaged.

Verify compliance with the following requirements if the product is installed outdoors or in a humid environment:

- Immediately connect the product electrically after mounting it in order to ensure that no humidity can get into the connector. If this is not possible, use a protective cap to help prevent the ingress of humidity.
- Mount the product in such a way that splash water and condensation water can flow off of the product. Liquid must never remain at the sealing surfaces.
- If you use products with a cable gland or a cable outlet, the outgoing cable must be routed to the bottom. If the line must be routed to the top, you must first route it to the bottom and then to the top in a curve.



- Mount the product in such a way that it is protected from direct sunlight. Exposure to direct sunlight may cause the maximum permissible operating temperature to be exceeded.

Verify that the product is mounted in such a way as to avoid any mechanical tension and stress at the pressure connection; this may cause a shift of the characteristic. This applies especially to small pressure ranges and products with a plastic pressure connection. In the case of hydraulic systems, arrange the pressure transducer in such a way that the pressure connection points upward (vent). Provide a cooling section if the product is used in steam pipes.

6.2 Mounting the product

Mechanically, pneumatically, hydraulically

- The connection must be sealed with a seal whose material is compatible with the medium.
- ▶ Remove all transport precautions such as protective film, caps or cardboard packaging.
- ▶ Mount the pressure transducer to the connection provided using a suitable open ended spanner.



6.3 Electrical connection

All wiring must comply with local regulations and may only be carried out by authorised personnel.

- ▶ Use a cable that is compatible with the ambient conditions.
- ▶ Connect the pressure transducer in accordance with the operating instructions and the connection assignment printed on the pressure transducer.

Connect the product according to the information on the nameplate and the technical specifications.

6.4 Commissioning the product

- The product has been properly installed
- No damage or defects present
- ▶ Commission the product.



6.5 Zero point adjustment DMU 02 Vario

1. Switch on the power supply.
 2. The new zero point can be saved within a period of 0.5 to 2.5 minutes.
 3. Hold a suitable permanent magnet in the area of the AFRISO logo on the pressure transducer.
- ↪ The pressure present at this point in time is saved as the new zero point if it is less than 12 % of the nominal pressure range.

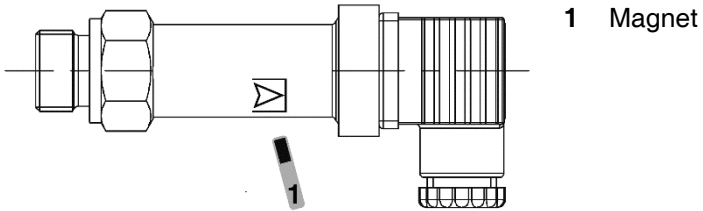


Fig. 11: Zero correction



7 Maintenance

The product is maintenance-free. If required, the housing of the product can be cleaned with a damp cloth and a non-aggressive cleaning solution after the product has been switched off.

Depending on the measured medium, deposits or pollution may form on the diaphragm. If the medium is known to promote deposits, the operator must specify appropriate cleaning intervals.

NOTICE**IINCORRECT CLEANING**

- ▶ Only use a non-aggressive cleaning solution and a soft brush or sponge to clean the diaphragm.
- ▶ If there are scale deposits on the diaphragm, have the product cleaned by the manufacturer.

Failure to follow these instructions can result in equipment damage.

-
- ▶ Dismount the product.
 - ▶ Clean the diaphragm using a non-aggressive cleaning solution and a soft brush or sponge.
 - ▶ If there are scale deposits on the diaphragm, have the product cleaned by AFRISO.



8 Repair

NOTICE INCORRECT HANDLING

► Repairs to the product may only be performed by the manufacturer.

Failure to follow these instructions can result in equipment damage.

Any malfunctions that cannot be removed by means of the measures described in this chapter may only be repaired by the manufacturer.

Table 5: Troubleshooting

Problem	Possible reason	Detection / solution
No output signal	Incorrect connection	Check connections
	Line interruption	Check all lines (including connectors) required to supply the product
	Defective measuring instrument (signal input)	Check ammeter (microfuse) and the analogue input of the signal processing unit
Analogue output signal too small	Load resistance too high	Check the value of the load resistance
	Supply voltage too low	Check the output voltage of the power supply unit
	Defective power supply	Check the power supply unit and the applied supply voltage at the product
Slight shift of the output signal	The diaphragm of the measuring cell is highly polluted	Careful cleaning with non-aggressive cleaning solution and a soft brush or sponge; incorrect cleaning can cause permanent damage to the diaphragm and seals
	Scale deposits or other deposits on the diaphragm of the measuring cell	It is recommended to have the product cleaned by AFRISO
Major shift of output signal	Diaphragm of the measuring cell is damaged (caused by overpressure or mechanical influences)	Inspect the diaphragm; if it is damaged, send it to AFRISO for repair



Problem	Possible reason	Detection / solution
Incorrect output signal or no output signal	Mechanical, thermal or chemical damage to the cable	Check the cable; a possible consequence of a damaged cable is pitting corrosion on the stainless steel housing; in such a case, send the product to AFRISO for repair



9 Decommissioning, disposal

WARNING Ejected parts and escaping medium



Residual medium may escape when the pressure gauge is dismounted.

- ▶ Verify that you have taken all necessary protective measures before dismounting.
- ▶ Use the personal protective equipment required for the medium.

Failure to follow these instructions can result in death, serious injury or equipment damage.

1. Switch off the supply voltage.
2. Dismount the product (see chapter 6, page 14, reverse sequence of steps).

NOTICE

Refit the protective cap to the diaphragm immediately after dismounting.



3. To protect the environment, this product must **not** be disposed of together with the normal household waste. Dispose of the product according to local directives and guidelines.

This product consists of materials that can be reused by recycling firms. The electronic inserts can be easily separated and the device consists of recyclable materials.

If you do not have the opportunity to dispose of the used device in accordance with environmental regulations, contact us for disposal possibilities (see chapter "Returning the device").



10 Returning the device

Get in touch with us before returning your product (service@af-riso.de).

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

- ▶ Always enclose a declaration of decontamination when returning a device (confirmation that the device is free from hazards).
- ▶ The declaration of decontamination can be downloaded at www.af-riso.com.

Without a declaration of decontamination, we are unable to process your returned device. Thank you for your understanding.

If the product was operated with hazardous substances:

1. Decontaminate the device in accordance with all pertinent directives.
- ↳ The product is free from hazardous substances.
2. Enclose proof of decontamination in accordance with all pertinent directives when returning the device.

11 Warranty

See our terms and conditions at www.af-riso.com or your purchase contract for information on warranty.



12 Appendix

12.1 EU Declaration of Conformity

		
Technik für Umweltschutz Messen, Regeln, Überwachen.		
EU - Konformitätserklärung <i>EU Declaration of Conformity / Déclaration EU de conformité / Declaración de conformidad CE / Declaração de conformidade CE / Deklaracja zgodności UE</i>	 Formblatt FB 27 - 03	
Name und Anschrift des Herstellers: <u>AFRISO-EURO-INDEX GmbH, Lindenstraße 20, 74363 Göggingen</u> <i>Manufacturer / Fabricant / Fabricante / Nome e endereço do fabricante / Product:</i>		
Erzeugnis: <u>Druckmessumformer</u> <i>Product / Produit / Producto / Produto / Produkt:</i>		
Typenbezeichnung: <u>DMU C2 Vario</u> <i>Type / Type / Tipo / Tipo / Typ:</i>		
Betriebsdaten: <u>DC 10-32 V</u> <i>Techn. Details / Caractéristiques / Características / Detalhes técnicos / Dane techniczne:</i>		
Wir erklären in alleiniger Verantwortung, dass das bezeichnete Erzeugnis mit den Vorschriften folgender Europäischer Richtlinien übereinstimmt: <i>We declare under our sole responsibility that the above mentioned product meets the requirements of the following European Directives:</i> <i>Le produit mentionné est conforme aux prescriptions des Directives Européennes suivantes:</i> <i>El producto indicado cumple con las prescripciones de las Directivas Europeas siguientes:</i> <i>O produto indicado cumpre com as prescrições das seguintes Diretivas Europeias:</i> <i>Wymieniony wyżej produkt spełnia wymagania następujących Dyrektyw Europejskich:</i>		
Elektromagnetische Verträglichkeit (2014/30/EU) <i>Directive Electromagnetic Compatibility / Directive compatibilité électromagnétique / Directiva compatibilidad electromagnética / Diretiva sobre compatibilidade eletromagnética / Dyrektywa kompatybilności elektromagnetycznej</i>		
<u>EN 61326-1:2013; EN 61326-2-3:2013</u>		
RoHS-Richtlinie (2011/65/EU) <i>RoHS Directive / Directive RoHS / Directiva RoHS / Diretiva RoHS / Dyrektywa RoHS</i>		
<u>EN IEC 63000:2018</u>		
Unterzeichner: <u>Dr. Spath, Geschäftsführer Technik</u> <i>Signed / Signatário / Firmante / Assinado por / Podpisal:</i> <i>Technical Director / Diretor Técnico / Dyrektor Techniczny</i>		
<u>24 Juni 2024</u> <i>Date / Date / Fecha / Date</i>	 <i>Unterschrift / Signatura / Firma / Assinatura / Podpis</i>	
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