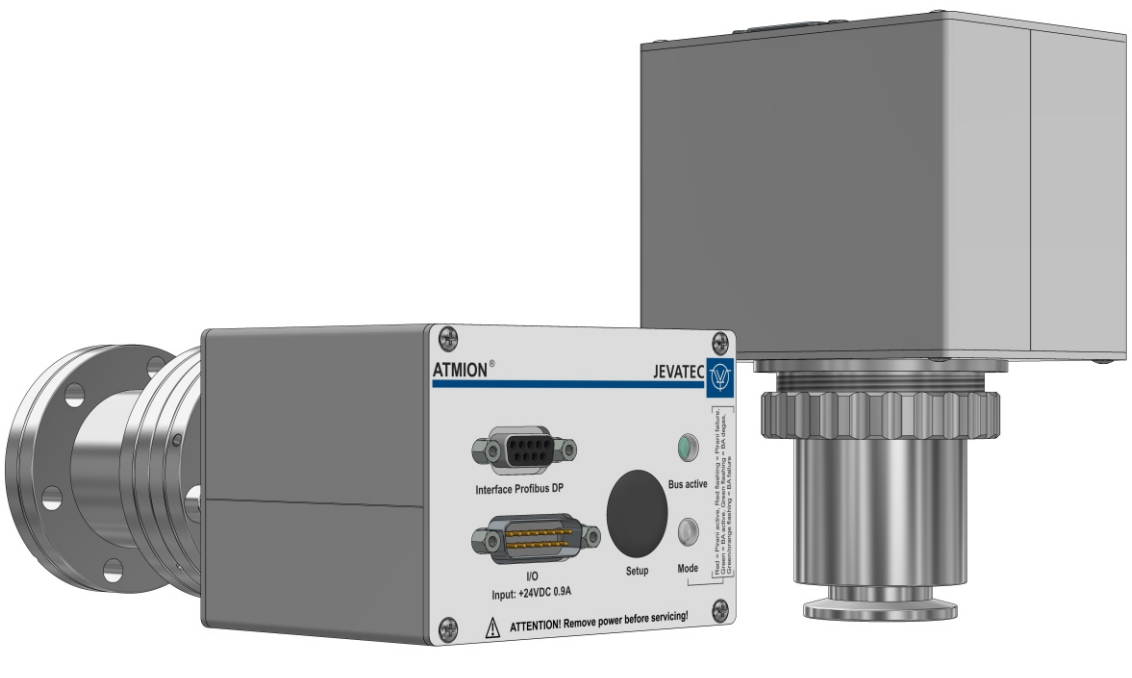
JEVATEC
Ideen in der Vakuumtechnik

ATMION®

Wide range vacuum gauge

Instruction Manual



0. Contents

0.1 List of Figures

0.2 List of Tables

1. Legal Instructions

1.1 Validity

This document is valid for the following products:

Article number	Product	Version	Serial number
100050	ATMION® compact	4.60 et seq.	4000 et seq.
100052	ATMION® compact-DP	4.60 et seq.	4000 et seq.
100053	ATMION® compact-DP-S	4.60 et seq.	4000 et seq.
100054	ATMION® compact-DP-B	4.60 et seq.	4000 et seq.
100051	ATMION® standard	4.60 et seq.	4000 et seq.
100055	ATMION® standard-DP	4.60 et seq.	4000 et seq.

Table 1 – Catalog numbers

When communicating with the JEVATEC GmbH, stating the information of article number and serial number is necessary. This information takes you please from the name plate on the side panel of the device.

1.2 Scope of Delivery

Description	Quantity
ATMION®	1
Allen key (hexagon) SW 1.5 mm (only for ATMION® standard and ATMION® standard-DP)	1
Operating instructions (DE and EN each)	1

Table 2 – Scope of delivery

1.3 Conforming Utilisation

The ATMION® is a wide-range vacuum meter. The compact version allows vacuum measurement of gases in the range $1 \cdot 10^{-8}$ – 1000 mbar and the standard version in the range $1 \cdot 10^{-10}$ – 1000 mbar by combining a Pirani heat conduction vacuum gauge with a Bayard-Alpert ionisation vacuum gauge.
It can be connected to a suitable operating and display device, such as the JEVAmet® VCU vacuum controller, or, depending on the terminal assignment, it can be operated with a customer's own evaluation device or via PC or system control.
On the vacuum side, the compact version has a DN25KF small flange connection, the standard version has a DN40CF flange according to the CF standard and can therefore be connected to suitable flange connections.

DANGER:
The measuring instrument shall not be used for the measurement of highly flammable or combustible gases mixed with an oxidising agent (e.g., atmospheric oxygen) within the explosion limits.

NOTICE:
Based on the technical data please check first whether your measuring instrument is suited to your kind of application.

NOTICE:
Before using the device for the first time or after changing the place of use, ensure that there is sufficient temperature equalisation between the unit temperature and the ambient temperature.

NOTICE:
The protection provided by the device may be impaired if the device is used in the manner not specified by the manufacturer.

1.4 Nonconforming Utilisation

The ATMION® wide-range vacuum meter has been designed and constructed exclusively for the purpose specified in chapter 1.3 - Conforming Utilisation, page 7 and may only be used in this way.

The use for purposes not covered above is regarded as improper, in particular:

- the connection of unauthorized or inappropriate sensors and components
- the application of impermissible voltages.

Any use not in accordance with the conforming utilisation is considered inadmissible. Any resulting damage will void all liability and warranty claims. The risk for this is borne solely by the operator.

1.5 Warranty

We provide a warranty of one year for the proper functioning of the device. During this period, material and manufacturing defects will be eliminated free of charge.

JEVATEC GmbH accepts no responsibility or warranty if the operator or third parties

- disregard this document,
- do not use the product as intended,
- carry out any kind of intervention on the product (modifications, repairs, e.g.),
- operate the product with accessories that are not listed in the associated product documentation.

The responsibility in connection with the process media used lies with the operator. Malfunctions of the measuring device that are due to contamination or wear and tear, wearing parts (e.g., Pirani element or filaments) or damage due to improper use (e.g., deformation of the sensor structure) are not covered by the warranty.

Technical changes without prior notice are reserved. The illustrations are not binding.

1.6 Transport Damages

- Check the packaging for visible damages.
- Send an advice of damage to the carrier and to the insurer in case of damage.
- Retain the packaging material, because the reconsignment in the original packaging of the manufacturer is prerequisite for warranty claims.
- Check the consignment for completeness.
- Check the instrument for visible damages.

2. Safety

2.1 General Information

The ATMION® is delivered ready for operation. We recommend that you read these operating instructions carefully in order to ensure optimum working from the very beginning. These operating instructions contain important information for understanding, installation, commissioning, operation and troubleshooting.

2.2 Signs and Symbols

DANGER or WARNING:
Information on the prevention of injury.

DANGER:
Information on the prevention of injury by electrical impact.

REFERENCE:
General lead on further information and articles respectively.

2.3 Basic Safety Regulations

- When handling the process media used, observe the relevant regulations and comply with the protective measures. Consider possible reactions between materials and process media. Take into account possible reactions (e.g. explosion) of the process media due to self-heating of the product.
- All work is only permitted if the relevant regulations are observed and protective measures are complied with. Please also observe the safety notes in this document.
- Inform yourself about possible contamination before starting work. Observe the relevant regulations when handling contaminated parts and observe the protective measures.

WARNING: Improper usage
Improper usage can damage the instrument. Use the instrument only in accordance to the manufacturers' instructions.

WARNING: Incorrect connection and operation data
Incorrect connection and operation data can damage the instrument. Comply with all prescribed connection and operation data.

3. Technical Product Description

3.1 Function

The ATMION® allows the vacuum measurement of gases in the range $1 \cdot 10^{-8}$ – 1000 mbar and the standard version in the range $1 \cdot 10^{-10}$ – 1000 mbar by combining a Pirani heat conduction vacuum gauge with a Bayard-Alpert ionisation vacuum gauge.
The measuring device must not be used for the measurement of highly flammable or combustible gases in a mixture with an oxidising agent (e.g. atmospheric oxygen) within the explosion limits.
It can be connected to a suitable display unit or, depending on the pin assignment, operated with a customer's own evaluation unit. The device is equipped with an analogue output, a serial interface RS232, digital control inputs and optionally a Profibus-DP interface.
On the vacuum side, the compact version has a DN25KF small flange connection, the standard version has a DN40CF flange according to the CF standard and can therefore be connected to suitable flange connections.

WARNING: Application area
Please check by means of the technical data whether the measuring device is suitable for your application.

3.2 Measuring Principle

The ATMION® combines a Pirani thermal conduction vacuum meter (Pirani measuring branch) with a Bayard-Alpert ionisation vacuum meter (BA measuring branch).

The Pirani thermal conduction vacuum meter is based on the pressure and gas type dependent heat emission of a very thin wire through which an electric current flow. The heat is released by four processes:

- Thermal conduction through the gas
- Convection of the gas
- Thermal radiation
- Thermal conduction into the connecting wires

Heat radiation and heat conduction are disturbance variables which limit the measuring range towards low pressures. In order to keep these as small and constant as possible, a very thin wire is used as a sensor and is worked at a constant temperature of the wire. For this purpose, the resistance of the wire is measured in a Wheatstone bridge and kept constant by a control system. The power supplied to the wire is measured.

The pressure dependence of the heat conduction through the gas predominates between $1 \cdot 10^{-3}$ and 100 mbar, above 100 mbar there is mainly convection. Falsifications of the measurement result are mainly caused by dirt deposits on the Pirani wire and by an increase of the ambient temperature, as the amount of heat emitted changes as a result. This is counteracted constructively and electronically. Shocks and mechanical vibrations can lead to an increased heat emission of the Pirani wire and thus to the indication of an apparently higher pressure.

The Bayard-Alpert ionisation vacuum gauge uses the ionisation of gas atoms or gas molecules by electrons. These are emitted from a heated cathode, accelerated to the grid and ionise the gas. The ions generated within the grid are accelerated towards the collector and produce the measuring current. This collector current is proportional to the gas pressure over a wide range, whereby it also depends on the ionisation probability of the gas. Towards low pressures the limit of the measuring range is mainly determined by the tube geometry and is in the range of 10^{-11} mbar for the sensor of the ATMION®. At higher pressures the measuring limit is 10^{-1} mbar, here the switch-over to the Pirani vacuum gauge takes place. Due to the sensor heating caused by the cathode heating, the measured value of the Pirani vacuum gauge deviates from the specification for a short time until the thermal equilibrium is set.
Increases and fluctuations in the pressure indication of the Bayard-Alpert ionisation vacuum gauge are caused by contamination (increased gas emission in the tube). It is then recommended to heat the tube by electron bombardment by degassing at a pressure of ≤ 10^{-5} mbar and thus to clean it. The pressure indication during degassing serves as an orientation about the cleaning process, but is outside the accuracy specification of the wide-range vacuum gauge. The degassing of the sensor largely eliminates contamination.

WARNING: Measured value falsification by foreign electrons or ions
If electrons or ions generated by other vacuum processes reach the ion collector or in turn generate ions again, the measured value can be considerably falsified.

WARNING: Measured value falsification due to magnetic fields
Strong magnetic fields, e.g., from ion getter pumps, lead to a diffraction of the electron orbits and thus possibly to measurement errors. An increase of the distance between the ATMION® and the magnet is then useful.

3.3 Gas Dependence

The measuring principles used for the ATMION® are gas type dependent.

3.3.1 Correction Factors for the Bayard-Alpert Ionisation Gauge

In the measuring range of the Bayard-Alpert ionisation vacuum meter, the actual pressure can be determined by multiplying the displayed pressure value by a correction factor if the gas composition is known. For the ATMION®, the corresponding correction factors for frequently used gases or gas mixtures have been included (☞🕮 Table 3, page 12). If you need correction factors for other gas types, please contact JEVATEC.

Gas or gas mixture	Correction factor
Helium (He)	5.0
Argon (Ar)	0.7
Nitrogen (N_2)	1.0
Air	1.0

Table 3 – Correction factors for gas type correction of the Bayard-Alpert ionisation vacuum gauge

3.3.2 Correction Curves for the Pirani Gauge

Since no uniform correction factor can be determined for heat conduction vacuum gauges according to the Pirani principle due to the physical properties with regard to thermal conductivity, the correction is made on the basis of a correction curve (☞🕮 Figure 1, page 13).

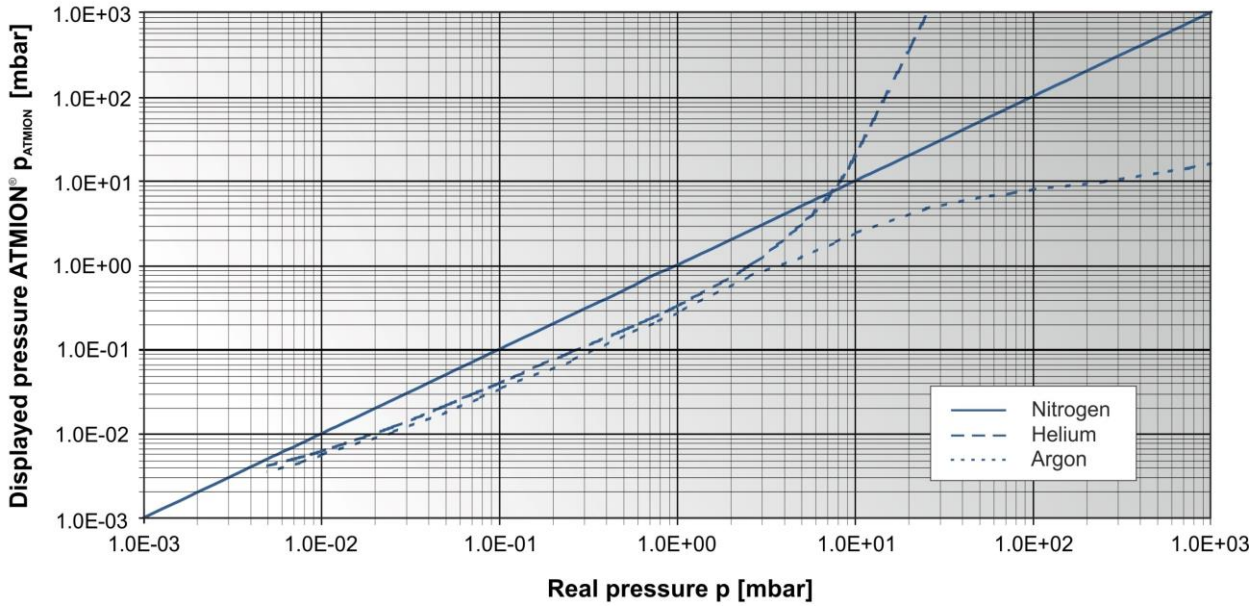


Figure 1 – Correction curves for Pirani gauge

3.4 Display and Operating Devices

The ATMION® is compatible with display and operating devices from JEVATEC and VACOM (☞🕮 Chapter 4.3 Identification, page 17).

4. Technical Data

4.1 General Data

4.1.1 Mechanical Data ATMION® compact

Dimensions:	Length:	155.0 mm
	Width:	105.0 mm
	Height:	74.0 mm
Weight:	0.8 kg	

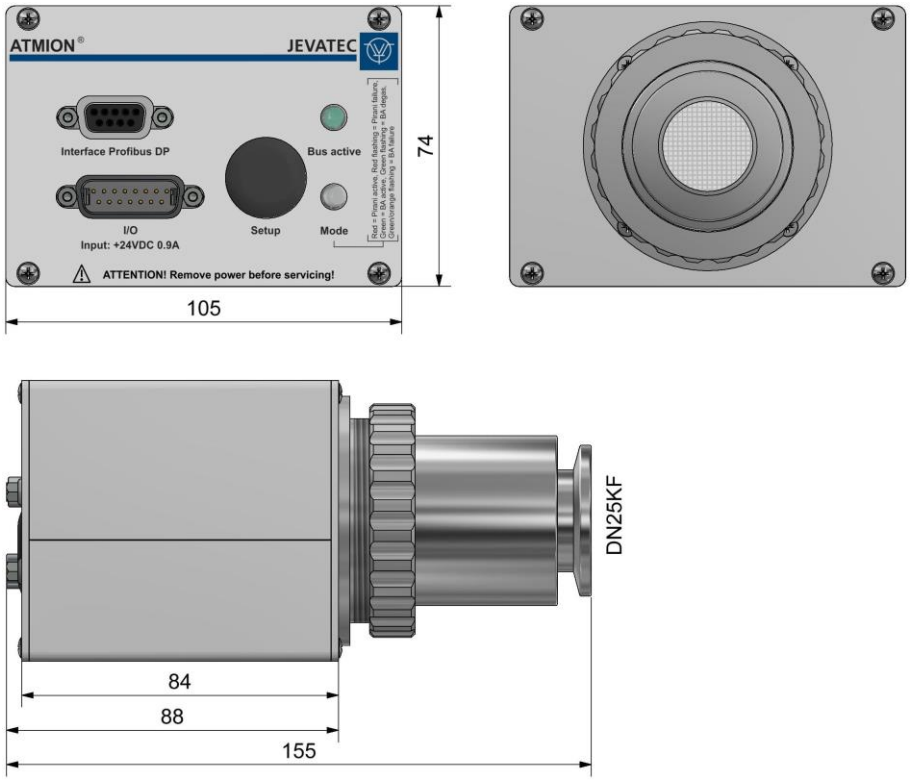


Figure 2 – Dimensions of the ATMION® compact (in mm)

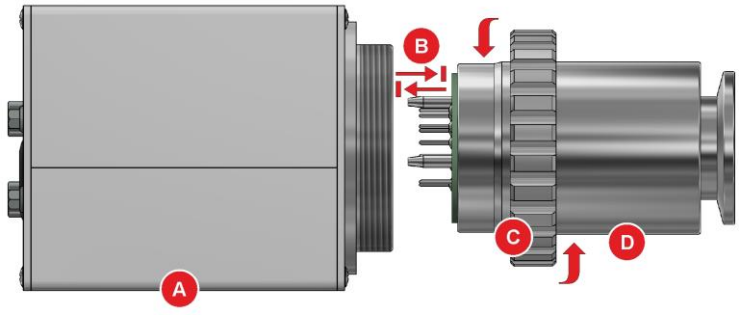


Figure 3 – Schematic structure of the ATMION® compact

A ATMION® Electronic Box
B Plug connection of the ATMION® compact sensor for connection to the ATMION® Electronic Box
C Union nut
D ATMION® compact-Sensor with flange DN25KF

4.1.2 Mechanical Data ATMION® standard

Dimensions:	Length:	197.0 mm
	Width:	105.0 mm
	Height:	74.0 mm
Weight:	1.6 kg	

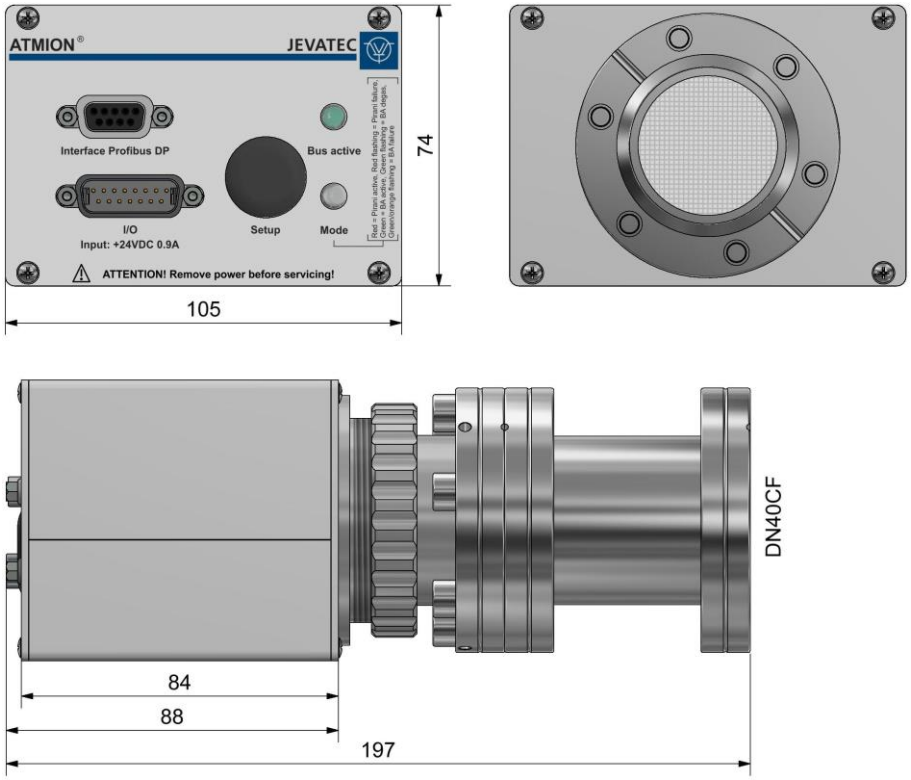


Figure 4 – Dimensions of the ATMION® standard (in mm)

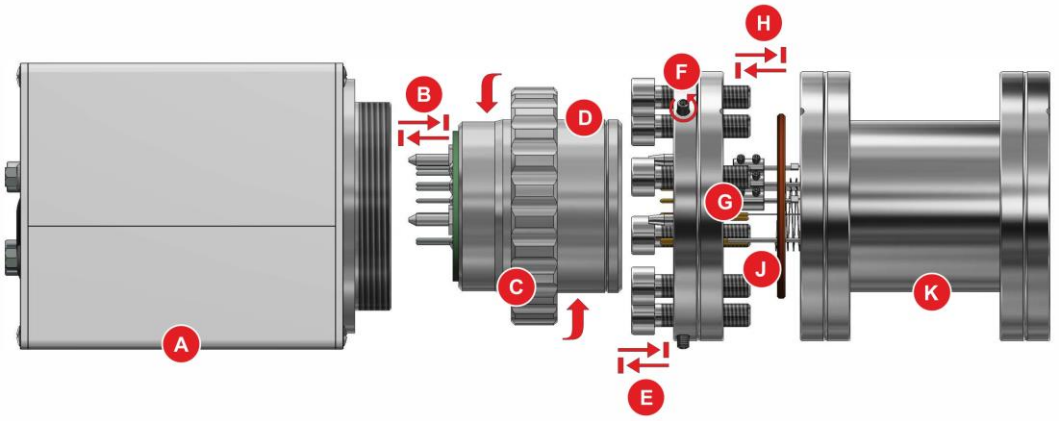


Figure 5 – Schematic structure of the ATMION® standard

A	ATMION® Electronic Box
B	Plug connection of the ATMION® Adapter with the ATMION® Electronic Box
C	Union nut
D	ATMION® Adapter
E	Plug connection of the ATMION® Adapter with the ATMION® standard-Sensor
F	Fixing of the ATMION® Adapter to the ATMION® standard-Sensor with three grub screws M3
G	ATMION® standard-Sensor with flange DN40CF
H	Flange connection DN40CF
J	Copper sealing ring DN40
K	Sensor tube of the ATMION® standard-Sensor with flange DN40CF

4.1.3 Environment

Use:	Only indoors (altitude 2000 m above sea level)	
Monting position:	any	
Temperature:	Storage:	-20 – +65 °C
	Operation:	+10 – +40 °C
Bakout temeperature:	ATMION® compact:	max. 180°C at flange (without measuring electronics)
	ATMION® standard:	max. 250°C at flange (without measuring electronics)
Relative humidity:	max. 80 % (to 30 °C) decreasing to max. 50 % (over 40 °C)	
Protection class:	IP40	
Contamination class:	2	

4.1.4 Standards

Directives:

- Conformity with the EMC Directive 2014/30/EU
  (EU EMC Directive, EU Office Journal, L 96/79 of 29-March-2014)
- Conformity with RoHS Directive 2011/65/EU
  (EU RoHS Directive, EU Office Journal, L 174/88 of 1-July-2011)
  In accordance with
  - Commission Delegated Directive (EU) 2015/863 of 31-March-2015 amending Annex II to Directive 2011/65/EU of the European Parliament and of the Council as regards the list of restricted substances.
  - Commission Delegated Directive (EU) 2018/740 of 1-March-2018 amending, for the purposes of adapting to scientific and technical progress, Annex III to Directive 2011/65/EU of the European Parliament and of the Council as regards an exemption for lead as an alloying element in aluminum
  - Commission Delegated Directive (EU) 2018/741 of 1-March-2018 amending, for the purposes of adapting to scientific and technical progress, Annex III to Directive 2011/65/EU of the European Parliament and of the Council as regards an exemption for lead as an alloying element in copper
- Conformity with the WEEE Directive 2012/19/EU
  (EU WEEE Directive, EU Official Journal L 197/38 of 24-July-2012)
- Conformity with the Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18-December-2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

International/national standards as well as specifications:

- DIN EN 61010-1:2020-03 (VDE 0411-1:2020-03)
  Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 1: General requirements (IEC 61010-1:2010 + COR:2011 + A1:2016, modified + A1:2016/COR1:2019); German version EN 61010-1:2010 + A1:2019 + A1:2019/AC:2019
- DIN EN 61326-1:2013-07 (VDE 0843-20-1:2013-07)
  Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 1: General requirements (IEC 61326-1:2012); German version EN 61326-1:2013

4.2 Mains Connection

Operation voltage:	+24 VDC (SELV-E according to EN 61010)	
Current consumption:	Normal operation:	max. 0,4 A
	Degassing:	max. 0,9 A
Power consumption:	Normal consumption:	max. 10 W
	Degassing:	max. 36 W
Anschluss:	SUB-D plug, 15-pin	

DANGER:
The vacuum meter may only be connected to supply or evaluation devices which meet the requirements of a protective low voltage with safe isolation from the mains (SELV-E according to DIN EN 61010).

4.3 Identification

The ATMION® is compatible with the following display and operating devices:

- JEVATEC – JEVAmet® VCU-A0, JEVAmet® VCU-AM
- VACOM – MVC3-A0, MVC3-AM (previous device of the JEVAmet® VCU)

4.4 Vacuum Measurement

Measuring principle:	Thermal conduction according to Pirani (temperature compensated)		
	Hot cathode ionisation according to Bayard-Alpert		
Measuring range:	ATMION® compact:	$1 \cdot 10^{-10}$ – 1000 mbar	
	ATMION® standard:	$1 \cdot 10^{-8}$ – 1000 mbar	
Switchover point:	Pirani / Bayard-Alpert:	$1 \cdot 10^{-2}$ mbar	
	Bayard-Alpert / Pirani:	$1 \cdot 10^{-1}$ mbar	
Emission current:	Normal operation:	> $5 \cdot 10^{-6}$ mbar	2 µA
		< $5 \cdot 10^{-6}$ mbar	2 mA
	Degassing:		20 mA
Accuracy (N_2):	10 – $1 \cdot 10^{-2}$ mbar	± 25 % of the measured value	
	$1 \cdot 10^{-2}$ – $1 \cdot 10^{-8}$ mbar	± 10 % of the measured value	

4.5 Sensor

Pirani:	Platin-Draht	
Bayard-Alpert:	ATMION® compact:	2 yttria-coated iridium hairpin filaments
	ATMION® standard:	2 replaceable yttria-coated iridium straight filament
Materials in contact with media:	Stainless steel 1.4301, 1.4307, 1.4319, 1.4401, 1.4404 tungsten, platinum, glass, glass ceramic, yttria-coated iridium	
Overpressure resistance:	1,5 bar abs. (☞🕮 Assembly instructions on page 21)	
Vacuum connection:	ATMION® compact:	DN25KF
	ATMION® standard:	DN40CF

Contact assignment:

ATMION® compact-Sensor with union nut

ATMION® standard-Sensor with adapter and union nut

ATMION® standard-Sensor without adapter

Figure 6 – Contact assignment of the ATMION® compact-Sensor and the ATMION® standard-Sensor

1	Pirani wire	6	Filament 1	A	Guide pin
2	Pirani wire	7	Filament Com	B	Guide pin
3	Anode grid	8	Filament 2		
4	Collektor	9	Pirani precompilation		
5	Anode grid	10	Pirani precompilation		

4.6 Inputs and Outputs

4.6.1 Analog Output

Measurement signal:	0 – +10.0 VDC
Error signal:	0 – 0.625 VDC, 9.375 – 10.0 VDC
Relation between measure-ment signal and pressure:	logarithmic linear with 0.625 V per decade $p = 10^{-12} \cdot 10^{(U/0.625)}$ $U = 0.625 \cdot \log(p/10^{-12}\ \text{mbar})$
Connection:	SUB-D plug, 15-pin

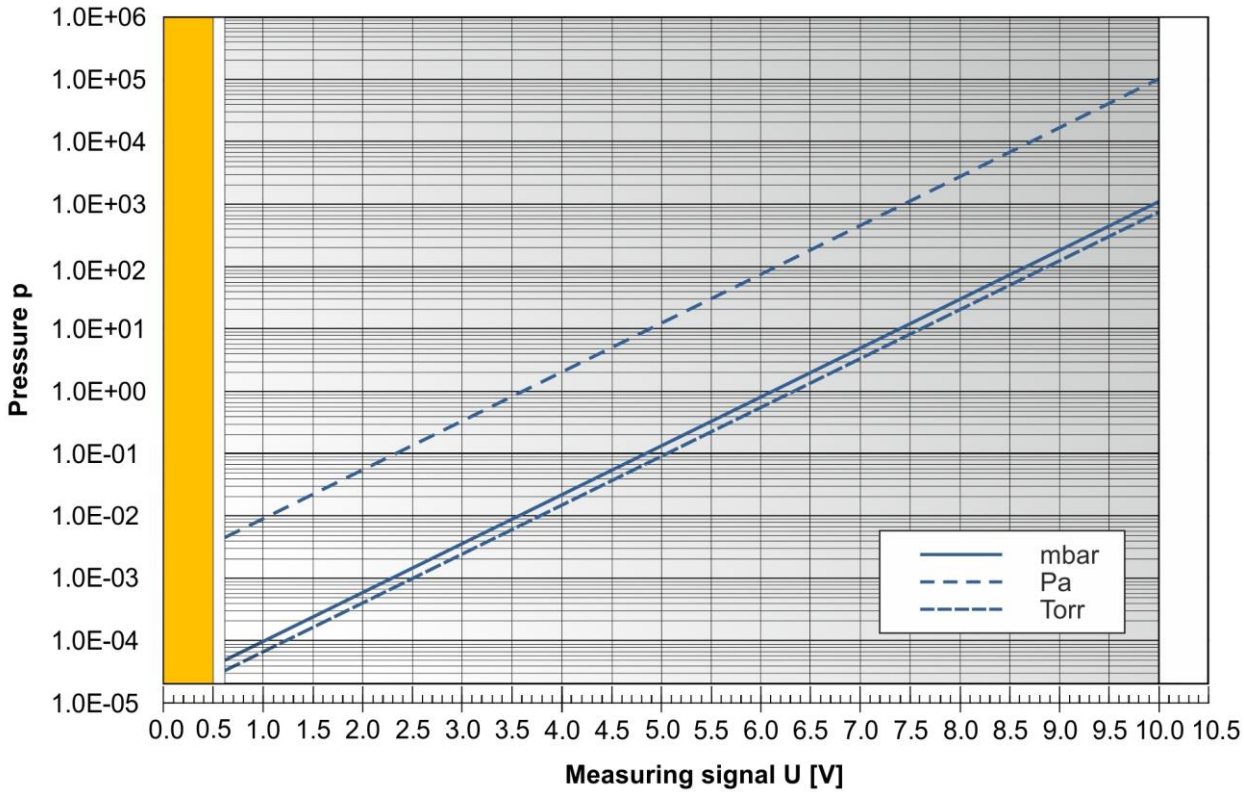


Figure 7 – Relationship between measurement signal and pressure

4.6.2 Serial Interface RS 232

Standard:	RS 232
Parameters:	8 data bits,1 stop bit, no parity, no protocol
Signals:	RXD and TXD
Baud rate:	19200, 38400 baud
Connection:	SUB-D plug, 15-pin

4.6.3 Fieldbus Interface Profibus-DP (optionally)

Standard:	Profibus-DP
Connection:	SUB-D socket, 9-pin

4.6.4 Extern Control

Use:	AUTORANGE on / off Pirani calibration Degas function
PLC compatible logic level:	Digital inputs are not connected to low level
Input resistance:	10 kΩ
Connection:	SUB-D plug, 15-pin

External enable	Control 1	Control 2	Function
1	1	0	PIRANI - vacuum meter only works in the Pirani measurement branch
1	0	0	AUTORANGE - Automatic switching between Pirani measuring branch and BA measuring branch
1	1	1	ATM - Adjustment of full-scale Pirani measuring branch at atmospheric pressure
1	0	1	VAC - Adjustment of zero-point Pirani measuring branch at pressure < $1 \cdot 10^{-4}$ mbar

Table 4 – Meaning for Control 1 and Control 2 when using the external control

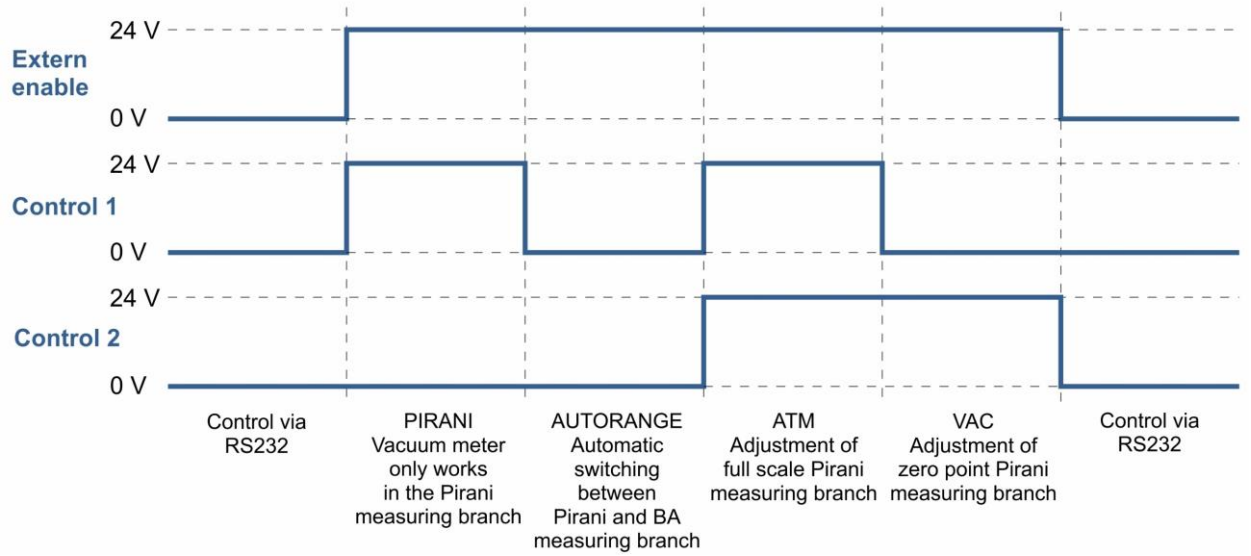


Figure 8 – Illustration of the function of Control 1 and Control 2

For further functional descriptions, please refer to the Figure 13, page 24.

4.7 Swiching Functions

Number of switching functions:	1 TTL switching point, potential-free
Load (ohmic):	Switching current: max. 0.1 A Switching voltage: max. 24 V DC
Connection:	SUB-D plug, 15-pin

5. Installation

5.1 Mechanical Installation

The ATMION® is mounted directly on the vacuum system via a suitable flange connection.

Basically, the ATMION® works in any possible installation position. To prevent condensates and particles from getting into the sensor, a horizontal to upright installation position is preferable and a seal with centring ring and filter may be used. For adjustments in the installed state, accessibility to the vacuum meter must be ensured.

It is recommended to choose an installation location with free air flow. If the vacuum chamber is baked out to achieve a very low pressure, the ATMION® must be mounted in such a way that the convection heat of the heated recipient does not significantly heat the device. In principle, the ambient temperature during operation must not exceed +40°C.

The most frequent cause of vacuum gauge failures is contamination of the vacuum gauge. Contamination can occur through reaction of process gases with sensor components or as accumulation of material on the sensor components from the process. Possible consequences of sensor contamination are noisy or incorrect measured values or complete sensor failure. Device faults caused by contamination are not covered by the warranty.
Especially for vacuum applications which tend to condensate or other deposits, a hanging mounting (vacuum flange upwards) should be avoided. In vacuum applications with material sources (evaporator, etc.) or if there is a danger of oil contamination, protect the sensor from contamination.
If necessary, the vacuum meter can be protected by choosing an uncritical installation site or by using a baffle, pipe bend, shut-off valve, etc.

NOTICE:
Proceed with the necessary care when installing the vacuum gauge.

WARNING: Overpressure in the vacuum system > 1 bar
Opening of clamping elements in the event of excess pressure in the vacuum system can lead to injuries from flying parts and damage to health from escaping process medium. Do not open the clamping elements as long as there is excess pressure in the vacuum system. Use clamping elements suitable for overpressure.

WARNING: Switch off
Mount the vacuum meter so that an interruption of the power supply is possible at any time.

CAUTION: Vacuum component
Dirt and damage impair the function of the vacuum gauge. When handling vacuum components, observe the rules regarding cleanliness and protection against damage.

CAUTION: Area sensitive to soiling
Touching the vacuum gauge or parts of it with bare hands increases the desorption rate. Wear lint-free gloves and use clean tools.

WARNING: Danger from contaminated parts
Contaminated parts can cause health and environmental damage. Inform yourself about possible contamination before starting work. When handling contaminated parts, observe the relevant regulations and comply with the protective measures.

- Remove the protective cap and keep it for possible return in case of service.
- Mount the vacuum meter on a suitable flange of the vacuum chamber. Observe the previously mentioned installation instructions and warnings.

5.2 Design of the Measuring Electronic

5.2.1 Front of the Instrument

Die Figure 10, page 23 shows the front side of the ATMION® Electronic Box, which is connected to the sensor by means of a plug system and union nut.

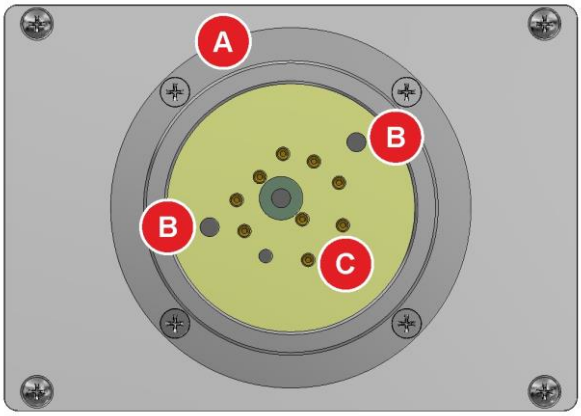


Figure 9 – Front side of the device

A Sensor holder with external thread for union nut to lock the sensor
B Holder for the guide pins of the sensor
C Contact sockets

5.2.2 Rear of the Instrument

The Figure 10, Page 23 shows the back of the ATMION® Electronic Box in different states.

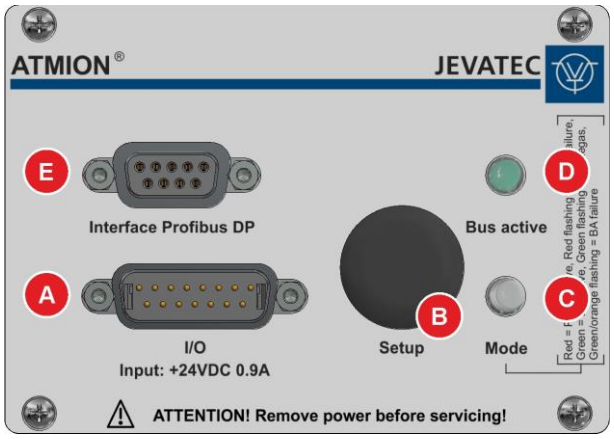


Figure 10 – Closed back of the device

A Connection for power supply, analogue output, external control, relay output and serial interface RS 232
B Cover cap (opening for setting the correction factor for the sensitivity and optionally the Profibus address for Profibus-DP)
C Multicoloured LED for indication of operating and error status
D Green status LED for Profibus-DP (optionally)
E Connection Profibus-DP (optionally)

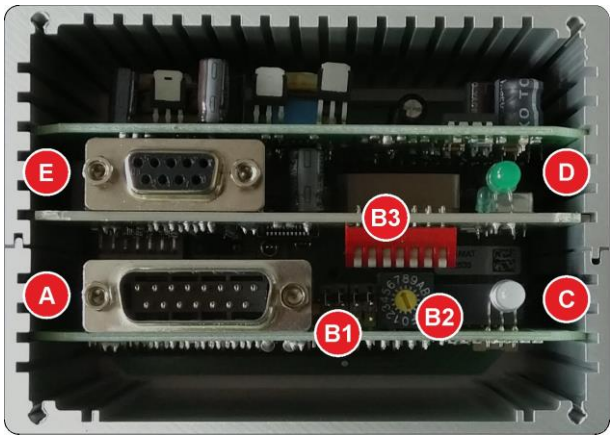


Figure 11 – Rear of the device with cover plate removed

A Connection for power supply, analogue output, external control, relay output and serial interface RS 232
B1 Jumper for setting the operating parameters
B2 Switch for sensitivity correction
B3 Switch for address of Profibus-DP (optionally)
C Multicoloured LED for indication of operating and error status
D Green status LED for Profibus-DP (optionally)
E Connection Profibus-DP (optionally)

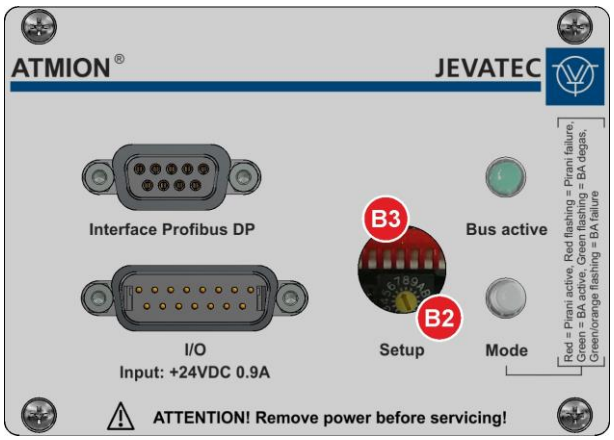


Figure 12 – Rear of the device with protective cap removed

B2 Switch for sensitivity correction
B3 Switch for address of Profibus-DP (optionally)

5.2.3 Input and Output (I/O)

The connection I/O for power supply, analogue output, external control, relay output and serial interface RS232 (☞🕮 Figure 10, A, Page 23 and Figure 13, Page 24) combines all connections necessary for operating the vacuum gauge.

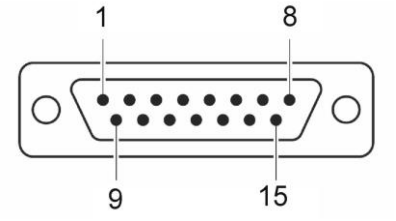


Figure 13 – I/O connector (SUB-D, 15-pin)

1	Enable external control High level 24 VDC enables operation via external control inputs PIN 4, 5 and 6
2	Send RS232
3	Receive RS232
4	External control (Control 1)
5	External control (Control 2)
6	Degassing High level 24 VDC starts degassing process, automatic switch-off after 2 min
7	+24 VDC
8	+24 VDC
9	Status set point or degassing High level 24 VDC via external load = set point Low level 0 VDC = degassing
10	Status filaments High level 24 VDC via external load = filament 1 Low level 0 VDC = filament 2
11	Ground
12	Ground
13	not available
14	Analog output (0 – 10 VDC logarithmic linear with 0.625 V per decade, $U = 0.625 \cdot \log(p/10^{-12})$; measuring signal 0.625 – 9.375 VDC)
15	Analog ground

Connect:

- Use a shielded cable to connect the connector of your controller or the corresponding connectors of the system to the I/O connector at the rear of the ATMION® Electronic Box.

ATTENTION: Protective low voltage
The power supply must meet the requirements of a safety extra-low voltage (SELV-E) according to EN 61010.

DANGER: Touching dangerous voltage
Voltages above 60 VDC or 30 VAC are dangerous to touch. They must not be connected to the contacts for external control and degassing (☞🕮 Figure 13, Page 24, PIN 1, 4, 5 and 6) only switch voltages of 24 VDC. This voltage must meet the requirements of a safety extra-low voltage (SELV-E) according to EN 61010.

NOTICE: Serial interface RS232
The RS232 serial interface is available via the I/O connector. If a separate output is required, a corresponding adapter is available as an accessory.

5.2.4 Fieldbus Interface Profibus-DP (Interface Profibus-DP)

The Profibus DP interface connection (☞🕮 Figure 10, E, Page 23 and Figure 14, Page 25) enables the device to be integrated into a Profibus-DP bus system. It is optionally available.

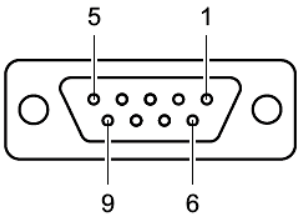


Figure 14 – Connection socket Interface Profibus DP (SUB-D, 9-pin)

1	not used	6	+ 5 VDC
2	not used	7	not used
3	RxD / TxD-P	8	DGND
4	CNTR	9	DGND
5	DGND		

Connect:

- Connect the bus system with an appropriate bus cable to the Profibus DP interface connector on the rear of the ATMION® Electronic Box.

ATTENTION:
A bus cable conforming to standards is required for the use of the Profibus DP interface.

5.2.5 LED for Displaying the Operating and Error States

The multi-coloured LED Mode signals the respective active operating and error states of the ATMION®.

LED display	Description
Off	Operating voltage missing
Red shining	Pirani measuring branch active
Red flashing	Pirani measuring branch or Pirani wire of the sensor defective
Green shining	BA measuring branch active
Green flashing	Degas function of the sensor active
Yellow flashing	BA measuring branch or both filaments of the sensor defective (Safety shutdown of the BA measuring branch has been effected; only operation of the Pirani measuring branch is still possible)

Table 5 – Display of operating and error conditions

5.2.6 Status LED Profibus-DP (Bus active)

The green LED Bus active indicates the respective status of the ATMION® in the Profibus network.

LED display		Description
○	Off	Profibus interface of the device is not active
●	Green shining	Profibus interface of the device is activated

Table 6 – Status display for Profibus-DP

5.2.7 Jumpers for Setting the Operating Parameters

There are four jumpers in the measuring electronics for setting certain operating parameters.

Figure 15 – Jumper for setting the operating parameters with cover plate removed

Jumper	Function	OFF (open)	ON (plugged in)
J1	Transistor output for switching point or degassing	Degassing (factory setting)	Switching point
J2	Transistor output for inverted switching point	Normal switching point (factory setting)	Switching point inverted
J3	Emission current switching	automatic switchover to the higher emission current range of 2 mA in the pressure range < 10^{-5} mbar (factory setting)	only low emission current of 2 µA; no automatic switching to the higher emission current range (only recommended for measurements in pressure ranges > 10^{-6} mbar)
J4	Baud rate	19200 Baud (factory setting)	38400 Baud

Table 7 – Jumper assignments for operating states of the ATMION®

The jumpers can only be configured when the cover plate is removed, as these are one-off presettings. Proceed as follows:

- Disconnect the ATMION® from the power supply and remove the cover plate of the ATMION® Electronic Box.
- Make the desired jumper configuration.
- Mount the cover plate and reconnect the unit to the power supply.

5.2.8 Switch for Sensitivity Correction

The coding switch with the 16 positions 0 to F is used to set the correction factor for sensitivity determined for the connected sensor. The correction factor is determined at the factory and indicated on the sensors. It compensates the manufacturing tolerances and ensures that the measuring accuracy for the BA measuring branch is maintained.

On new devices, the correction factor is already set. However, if you replace the sensor, please set the coding switch to the value indicated on the sensor. Proceed as follows:

- Disconnect the ATMION® from the power supply and remove the protective cap of the ATMION® Electronic Box.
- Set the encoding switch to the value indicated on the sensor.
- Fit the protective cap and reconnect the unit to the power supply.

5.2.9 Switch for Setting the Slave Address of the Profibus-DP

The slave address is set using the address setting switch (☞🕮 Figure 20, Page 45). The addresses 0 to 125 can be assigned. The setting is binary-coded. Switch 0 (right) corresponds to the value $2^0 = 1$, switch 6 (left) to the value $2^6 = 64$. The switch positions up (to the number closed) corresponds to logical 1, down to logical 0. If all switches are set to zero, this corresponds to address zero.

The factory setting is address 11 (switch 0, 1 and 3 set to ON = 1).

Figure 16 – Switch for setting the slave address with back plate removed

6. Operation

6.1 Operational Readiness and Measuring Operation

Put the vacuum meter ready into operation as follows:

- Connect the connection of your JEVAmet® VCU-A0 or AM controller or the corresponding connections of the system via a shielded cable to the I/O connection (☞📖 Figure 10, A, Page 23) on the back of the ATMION®.
  - The LED Mode (☞📖 Figure 10, C, Page 23) on the back of the ATMION® lights up according to the operating status (☞📖 Table 5, Page 25).
  - Pressure value and operating status are output on the controller display or via the corresponding outputs on the ATMION®.
  - The ATMION® is in measuring mode (factory setting in AUTORANGE and AUTFIL mode).

NOTICE: Stabilisation time
Observe a stabilisation time of at least 10 minutes. The vacuum gauge should always remain switched on regardless of the pressure applied.

NOTICE: Zero point and full scale
The vacuum meter is calibrated ex works. Long-term operation and soiling can lead to a shift of zero point and final value of the heat conduction vacuum meter. Carry out the adjustment of zero and full scale of the Pirani measuring branch periodically (☞📖 6.2 Calibrate Measuring Instrument, Page 29).

To end the operational readiness, disconnect the vacuum meter from the operating voltage.

NOTICE:
For all possibilities of operating the ATMION® via the JEVAmet® VCU display and operating unit, please refer to the relevant sections of the controller operating manual. The complete operating instructions for the JEVAmet® VCU controller can be downloaded free of charge from the Internet.

6.2 Calibrate Measuring Instrument

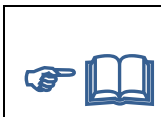
The ATMION® is delivered in the adjusted state. However, due to transport influences, long-term operation or after changing the filaments or the sensor, a new calibration of the Pirani measuring branch may be necessary. In principle, the adjustment is carried out in two steps. The adjustment of the final value of the Pirani measuring branch is carried out under atmospheric pressure, the adjustment of the zero point at a pressure $<1 \cdot 10^{-4}$ mbar. There are various possibilities for carrying out the adjustment, which are described in the following sections.

6.2.1 Adjustment via Controller JEVAmet® VCU

Use the parameter AdJ Pir in the parameter group PArA SEn if you operate the ATMION® with a JEVAmet® VCU-A0 or JEVAmet® VCU-AM controller. This function is used for final value and zero-point adjustment of the Pirani measuring branch of the ATMION®.

To do this, proceed as follows:

- Select the desired measuring channel on the JEVAmet® VCU by pressing the CHANNEL key several times.
- Press and hold the CONFIG key for about 2 seconds.
  - The unit is now in configuration mode.
- Use the arrow keys to enter the parameter group SEn.
- Press the CONFIG key to select the desired parameter.
  - The name and value of the parameter are displayed.
- Select the parameter AdJ Pir.
- Use the arrow keys to enter the mode for adjusting the final value AdJ AtM at a pressure of 1000 mbar or for adjusting the zero-point AdJ_VAC at a pressure $< 1 \cdot 10^{-4}$ mbar.
  - The AdJ AtM or AdJ VAC mode is displayed.
- Press the CONFIG key to start the selected adjustment.
  - During the adjustment, the message AdJ run is displayed.
  - The calibration procedure ends automatically and the unit returns to the measuring mode.



NOTICE:
The complete operating instructions for the JEVAmet® VCU controller can be downloaded free of charge from the Internet.

6.2.2 Adjustment via Serial Interface RS232 or Profibus-DP

Calibration via the RS232 serial interface (☞🕮 Table 10, Page 40) or the Profibus-DP field bus interface is performed by entering the appropriate commands or control bits (☞🕮 Table 14, Page 47). The specified control bits for input via the RS 232 serial interface correspond to the 3rd output word (from the master's point of view) for Profibus.

Follow the steps below:

Setting the final value of the Pirani gauge at atmospheric pressure

- The pressure in the vacuum chamber must be 1000 mbar (atmospheric pressure).
- Enter the command `SC_0002`.
  - The vacuum meter works only with the Pirani measuring branch and checks the current final value of the Pirani measuring branch.
- Enter the command `SC_4002`.
  - The correction of the final value of the Pirani measuring branch is automatically carried out.
- Enter the command `SC_0002`.
  - The vacuum meter works only with the Pirani measuring branch and stores the corrected final value.
- Enter the command `SC_0009`.
  - The vacuum gauge is now again in AUTORANGE and AUTOFIL modes and switches automatically between the Pirani gauge and the hot cathode ionisation vacuum gauge when the vacuum chamber is pumped down and the switch-over point is reached. The filament is selected automatically.

Adjusting the zero point of the Pirani gauge at a pressure < $1 \cdot 10^{-4}$ mbar

- The pressure in the vacuum chamber must be < $1 \cdot 10^{-4}$ mbar.
- Enter the command `SC_0002`.
  - The vacuum gauge works only with the Pirani gauge branch and checks the current value for the Pirani gauge branch zero point.
- Enter the command `SC_4002`.
  - The zero point of the Pirani measuring branch is automatically corrected.
- Enter the command `SC_0002`.
  - The vacuum meter works only with the Pirani measuring branch and stores the corrected value for the zero point.
- Enter the command `SC_0009`.
  - The vacuum gauge is now back in AUTORANGE and AUTOFIL modes and automatically switches to the hot cathode ionisation vacuum gauge. The filament is selected automatically.

6.2.3 Adjustment via the External Control Inputs

When calibrating via the external control inputs, the inputs at PIN 4 (Control 1) and PIN 5 (Control 2) of the I/O connector (☞🕮 Figure 10, A, Page 23) at the rear of the ATMION® are used.

NOTICE: Enabling the external control inputs
To work with the control inputs, they must be enabled. For this purpose, PIN 1 (external enable) is set to a high level of 24 VDC. A change at the external control inputs can only be executed as long as a high level of 24 VDC is applied to PIN 1.

NOTICE: Minimum time for single steps
Note a minimum running time of > 2 seconds for each step after changing the control. If this is not observed, the step is not accepted.

Now work according to the following steps, which are also shown systematically in Figure 17, Page 31:

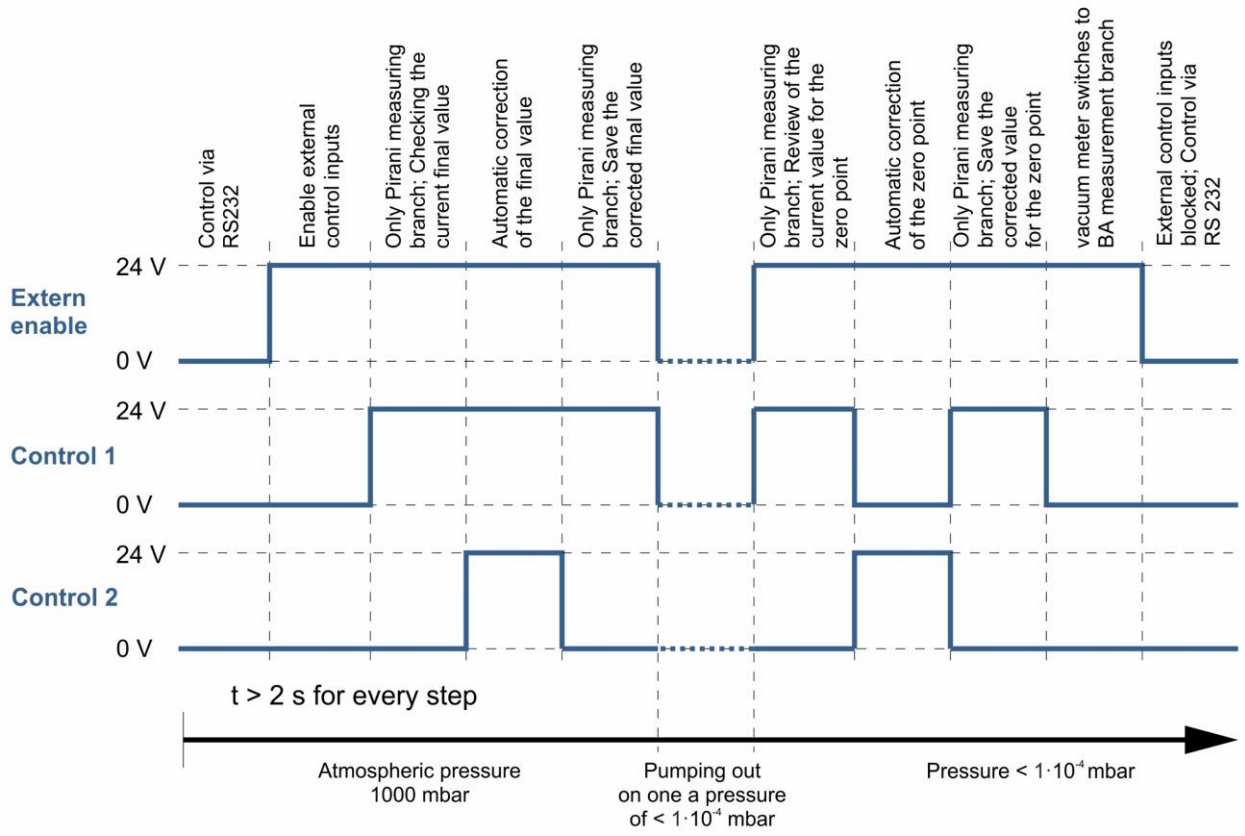


Figure 17 – Systematic representation of the calibration process via the external control inputs

Setting the final value of the Pirani gauge at atmospheric pressure

- The pressure in the vacuum chamber must be 1000 mbar (atmospheric pressure).
- Connect PIN 4 (Control 1) to PIN 7 or 8 (operating voltage 24 VDC).
  - The vacuum meter only works with the Pirani measuring branch and checks the current end value of the Pirani measuring branch.
- In addition to PIN 4 (Control 1), connect PIN 5 (Control 2) to PIN 7 or 8 (operating voltage 24 VDC).
  - The correction of the final value of the Pirani measuring branch is automatically carried out.
- Disconnect PIN 5 (Control 2) from PIN 7 or 8 (operating voltage 24 VDC).
  - The vacuum meter works only with the Pirani measuring branch and stores the corrected final value.
- Disconnect PIN 4 (Control 1) from PIN 7 or 8 (operating voltage 24 VDC).
  - The vacuum gauge is now again in AUTORANGE and AUTOFIL modes and switches automatically between the Pirani gauge and the hot cathode ionisation vacuum gauge when the vacuum chamber is pumped down and the switch-over point is reached. The filament is selected automatically.

Adjusting the zero point of the Pirani gauge at a pressure < $1 \cdot 10^{-4}$ mbar

- The pressure in the vacuum chamber must be < $1 \cdot 10^{-4}$ mbar.
- Connect PIN 4 (Control 1) to PIN 7 or 8 (operating voltage 24 VDC).
  - The vacuum meter only works with the Pirani measuring branch and checks the current end value of the Pirani measuring branch.
- Disconnect PIN 4 (Control 1) from PIN 7 or 8 (operating voltage 24 VDC) and connect PIN 5 (Control 2) to PIN 7 or 8 (operating voltage 24 VDC).
  - The correction of the final value of the Pirani measuring branch is automatically carried out.
- Disconnect PIN 5 (Control 2) from PIN 7 or 8 (operating voltage 24 VDC) and connect PIN 4 (Control 1) to PIN 7 or 8 (operating voltage 24 VDC).
  - The vacuum meter works only with the Pirani measuring branch and stores the corrected final value.
- Disconnect PIN 4 (Control 1) from PIN 7 or 8 (operating voltage 24 VDC).
  - The vacuum gauge is now back in AUTORANGE and AUTOFIL modes and automatically switches to the hot cathode ionisation vacuum gauge. The filament is selected automatically.

6.3 Selecting the Operating Mode

The following operating modes are available for the ATMION®:

AUTORANGE

When the switch-over point is reached, the vacuum meter automatically switches between the Pirani and BA measuring branches. This is the factory setting.

PIRANI

The vacuum meter only uses the Pirani measuring branch and does not automatically switch to the BA measuring branch. This operating mode is, among other things, a necessary prerequisite for adjusting the Pirani measuring branch or as an intermediate step for activating the filament selection.

6.3.1 Selection of the Operating Mode on the JEVAmet® VCU Controller

If you operate the ATMION® with the display and control device JEVAmet® VCU, you can switch the BA measuring branch off and on as follows:

Switching off the BA measuring branch (PIRANI mode)

- Press the CHANNEL button to select channel 1 (CH1) for the ATMION®.
- Press and hold the DOWN key for about 2 seconds.
  - The ATMION® changes from AUTOMODE to PIRANI ONLY mode.
  - The Pir status indicator on the JEVAmet® VCU flashes, the status LED on the back of the ATMION® electronics box lights up red.

Switching on the BA measuring branch (AUTORANGE mode)

- Drücken Sie die Taste CHANNEL, um den Kanal 1 (CH1) für das ATMION® zu wählen.
- Halten Sie die Taste UP etwa 2 Sekunden lang gedrückt.
  - Das ATMION® wechselt vom Modus PIRANI in den Modus AUTORANGE und schaltet automatisch beim Erreichen des Umschaltpunktes in den BA-Messzweig um.
  - Die Statusanzeige Fil1 oder Fil2 am JEVAmet® VCU leuchtet, die Status-LED an der Rückpage der Elektronikbox des ATMION® leuchtet grün beim automatischen Umschalten vom Pirani- in den BA-Messzweig.

NOTICE:
The complete operating instructions for the JEVAmet® VCU controller can be downloaded free of charge from the Internet.

6.3.2 Select Operating Mode via the Serial Interface RS 232

The operating mode can be selected via the serial interface RS 232 (☞🕮 Table 10, Page 40) or the field bus interface Profibus-DP by entering the corresponding commands or control bits (☞🕮 Table 14, Page 47). The specified control bits for the input via the serial interface RS 232 correspond to the 3rd output word (from the master's point of view) for Profibus.

6.3.3 Selection of the Operating Mode via the External Control Inputs

To select the operating mode via the external control inputs, the input at PIN 4 (Control 1) of the I/O connector (☞🕮 Figure 10, A, Page 23) at the rear of the ATMION® is used.

NOTICE: Enabling the external control inputs
To work with the control inputs, they must be enabled. For this purpose, PIN 1 (external enable) is set to a high level of 24 VDC. A change at the external control inputs can only be executed as long as a high level of 24 VDC is applied to PIN 1.

NOTICE: Minimum time for single steps
Note a minimum running time of > 2 seconds for each step after changing the control. If this is not observed, the step is not accepted.

Now work according to the following steps, which are also shown systematically in Figure 8, Page 20:

Switching off the BA measuring branch (PIRANI mode)

- Connect PIN 4 (Control 1) to PIN 7 or 8 (operating voltage 24 VDC).
  - The vacuum meter only works with the Pirani measuring branch, the status LED on the back of the electronics box of the ATMION® lights up red.

Switching on the BA measuring branch (AUTORANGE mode)

- Disconnect PIN 4 (Control 1) from PIN 7 or 8 (operating voltage 24 VDC).
  - The vacuum gauge is now again in the AUTORANGE and AUTOFIL modes and switches automatically to the BA measuring branch when the switch-over point is reached. The filament is selected automatically. The status LED at the back of the electronic box of the ATMION® lights up green when switching automatically from the Pirani to the BA measuring branch.

6.4 Cleaning the Sensor (Degas Function)

Deposits on the sensor structure can lead to falsification of the measurement result. In this case, cleaning the sensor by degassing is recommended. In the ATMION® this is done by electron bombardment of the sensor assembly at a pressure value < $1 \cdot 10^{-5}$ mbar. The frequency of degassing depends on the degree of contamination by various process deposits and the duration of use. We recommend a regular performance of the Degas function in intervals of 1 to 4 weeks.
There are several ways to start the Degas function, which are described in the following sections. During the degassing process the Mode LED of the electronics box flashes green. The Degas function ends automatically after two minutes if it is not cancelled before then.

6.4.1 Degas Function on the JEVAmet® VCU Controller

If you operate the ATMION® with the JEVAmet® VCU display and control device, you can use the Degas function of the controller to clean the sensor assembly.

- The sensor is in measuring mode and is active in the BA measuring branch. The pressure in the vacuum chamber must be < $1 \cdot 10^{-5}$ mbar.
- Press the CHANNEL key to select channel 1 (CH1).
- Press and hold the UP key for about 2 seconds.
  - The Degas function on channel 1 (CH1) is switched on. The status display Fil1 or Fil2 for the filament in operation flashes and the LED Mode of the electronics box flashes green.
  - The procedure ends automatically after 2 minutes or can be ended prematurely by pressing the DOWN key. The sensor is then back in measuring mode.

NOTICE:
The complete operating instructions for the JEVAmet® VCU controller can be downloaded free of charge from the Internet.

6.4.2 Starting the Degas Function via the RS 232 Serial Interface

The Degas function can be used via the serial interface RS 232 (☞🕮 Table 10, Page 40) or the field bus interface Profibus-DP by entering the corresponding commands or control bits (☞🕮 Table 14, Page 47). The specified control bits for input via the RS 232 serial interface correspond to the 3rd output word (from the master's point of view) for Profibus.

6.4.3 Starting the Degas Function via the External Control Inputs

To operate the Degas function via the external control inputs, the input at PIN 6 of the I/O connector (☞🕮 Figure 10, A, Page 23) on the rear of the ATMION®.

NOTICE: Enabling the external control inputs
To work with the control inputs, they must be enabled. For this purpose, PIN 1 (external enable) is set to a high level of 24 VDC. A change at the external control inputs can only be executed as long as a high level of 24 VDC is applied to PIN 1.

NOTICE: Minimum time for single steps
Note a minimum running time of > 2 seconds for each step after changing the control. If this is not observed, the step is not accepted.

Now work according to the following steps:

- The sensor is in measuring mode and is active in the BA measuring branch. The pressure in the vacuum chamber must be < $1 \cdot 10^{-5}$ mbar.
- Connect PIN 6 with PIN 7 or 8 (operating voltage 24 VDC).
  - The Degas function is started and ends automatically after two minutes.
  - The Mode LED of the electronics box flashes green during this time.
- Separate PIN 6 from PIN 7 or 8 (operating voltage 24 VDC).
  - The vacuum meter is now in measuring mode again and is active in the BA measuring branch.

6.5 Filaments of the Ionisation Vacuum Meter

The sensors of the ATMION® have two filaments for the operation of the ionisation vacuum meter. This ensures a longer lifetime of the sensors. In normal measuring mode (AUTOMODE and AUTOFIL) filament 1 is always used first. If there is a fault on filament 1, the system automatically switches over to filament 2.
You also have the option of selecting filament 1 or filament 2 individually and independently of the sequence.

NOTICE:
If the option of direct filament selection is used, automatic switching to the respective other filament does not occur when the selected filament is burned through. In this case, the other filament must also be selected directly.

6.5.1 Filament Selection on the JEVAmet® VCU Controller

Use the FiL parameter in the PArA SEn parameter group if you operate the ATMION® with a JEVAmet® VCU-A0 or JEVAmet® VCU-AM controller. This function is used for the filament selection of the ATMION®.

To do this, proceed as follows:

- Select the desired measuring channel on the JEVAmet® VCU by pressing the CHANNEL key several times.
- Press and hold the CONFIG key for about 2 seconds.
  - The device is now in configuration mode.
- Use the arrow keys to enter the parameter group SEn.
- Press the CONFIG key to select the desired parameter.
  - The name and value of the parameter are displayed.
- Select the FiL parameter.
- Use the arrow keys to select FiL Auto, FiL 1 or FiL 2 mode.

ACHTUNG:
The selection of the filament becomes valid only after switching off and switching on the sensor again.

NOTICE:
The complete operating instructions for the JEVAmet® VCU controller can be downloaded free of charge from the Internet.

6.5.2 Filament Selection via the Serial Interface RS 232

The selection of the active filament can be used via the serial interface RS 232 (☞🕮 Table 10, Page 40) or the field bus interface Profibus-DP by entering the corresponding commands or control bits (☞🕮 Table 14, Page 47). The specified control bits for the input via the serial interface RS 232 correspond to the 3rd output word (from the master's point of view) with Profibus.

NOTICE:
The selection of the filament is only activated after switching from the Pirani to the BA measuring branch again.

6.6 Switching Function

The ATMION® provides an internal switching point. This is a transistor output, which, depending on the configuration, provides a signal via PIN 9 of the 15-pin connector I/O (☞📖 Figure 13, Page 24) as normal or inverted switching point.

NOTICE:
In order to use the internal switch point function, jumper J1 in the electronic measuring system (☞📖 Figure 15, Page 26) must first be plugged in so that the switch point is activated. This is not the factory setting.

Normal switching point

If the value falls below the set threshold value for the switching point, a signal is output at PIN 9 of the 15-pin connector I/O (☞📖 Figure 13, Page 24.
In order to use the normal switching point, jumper J2 in the electronic measuring system must be open (factory setting) (☞📖 Figure 15, Page 26).

Inverted switching point

If the value falls below the threshold value set for the switching point, no signal is output at PIN 9 of the 15-pin connector I/O (☞📖 Figure 13, Page 24.
To use the normal switching point, jumper J2 in the electronic measuring system must be closed (☞📖 Figure 15, Page 26).

6.6.1 Set Threshold Value

Proceed as follows to set the threshold value for the switching point:

- Activate the switching point function by closing jumper J1.
  (☞📖 5.2.7 Jumpers for Setting the Operating Parameters, Page 26)
- Choose between normal and inverted switching point by configuring jumper J2.
  (☞📖 5.2.7 Jumpers for Setting the Operating Parameters, Page 26)
- Set the pressure values for the switching point in hexadecimal notation via the RS 232 interface (☞📖 Table 9, Page 39).
- Determine the necessary input value as a decimal value according to the following calculation procedure and convert it to a hexadecimal value (☞📖 Table 8, Page 38).

Calculation instruction

Calculation instruction for the input of the switching points:

$$\textbf{Input value} = 49152 + 4096 \cdot \log(\textbf{Pressure value})$$

Pressure value [mbar]	Input value in decimal notation	Input value in hexadecimal notation
1.00E+03	61440	F000
5.00E+02	60207	EB2F
1.00E+02	57344	E000
5.00E+01	56111	DB2F
1.00E+01	53248	D000
5.00E+00	52015	CB2F
1.00E+00	49152	C000
5.00E-01	47919	BB2F
1.00E-01	45056	B000
5.00E-02	43823	AB2F
1.00E-02	40960	A000
5.00E-03	39727	9B2F
1.00E-03	36864	9000
5.00E-04	35631	8B2F
1.00E-04	32768	8000
5.00E-05	31535	7B2F
1.00E-05	28672	7000
5.00E-06	27439	6B2F
1.00E-06	24576	6000
5.00E-07	23343	5B2F
1.00E-07	20480	5000
5.00E-08	19247	4B2F
1.00E-08	16384	4000
5.00E-09	15151	3B2F
1.00E-09	12288	3000

Table 8 – Example values for switching point calculation

Up to six additional switching points are available via the JEVAmet® VCU display and control unit.

NOTICE:
The complete operating instructions for the JEVAmet® VCU controller can be downloaded free of charge from the Internet.

7. Serial Interface RS232

7.1 Connection

The serial interface RS232 is available via the 15-pin sub-D connector (☞🕮 Figure 13, Page 24). If a separate output is required, a corresponding adapter is available as an accessory. The interface can be used with any interface-capable computer.

7.2 Protocol

The following protocol is used for communication:

- 8 data bits
- no parity bit
- 1 stop bit

The baud rate is selectable:

- 19200
- 38400

The end of the string is marked by **<CR>**.

7.3 Command Set

Important and frequently occurring functions of the measuring instrument can be directly output as a command via the RS232 serial interface.

Commands	Description
RV	Reading the print value
RS	Reading the status bits
RP	Read switching point value for SP On and SP Off - Output value in hexadecimal notation (convert to decimal value for input in calculation formula), Calculation instruction for pressure value in mbar: **$p = 10^{(\text{Output value}/4096-12)}$**
RA	Read jumper assignment
RT	Reading the operating time for filament 1 and 2 in hours (output 00000 00000)
RB	Read status bits SPC 3 (Profibus module)
SD	Start degassing for 2 min (automatic switch-off after 2 min)
SC****	Set control bits
SP**** ****	Set switching point value for SP On and SP Off Input format in hexadecimal notation (convert input value from calculation rule to hexadecimal value), Calculation instruction for input value from pressure value in mbar: **Input value = 49152 + 4096 · log (Pressure value)**
SA****	Overwrite jumper assignment (all four jumpers must be set as 0 or 1, but only jumpers J1 - J3 can be changed, jumper J4 cannot be changed in its function)
SX1	Start automatic transmission of print and service values at 500 ms intervals
SX0	Stop automatic sending of print and service values

Table 9 – Read and write commands

7.3.1 Read Out Pressure Value via the Command ‘RV’

The current pressure value can be read out with the command **'RV' <CR>**. The output string contains the following information:

Status: **P** = Pirani
I1 or **I2** = Filament 1 or 2 of the ionisation vacuum meter
D = Degassing
E = Error

Measured value: **0.00E±00** = Pressure value in mbar (mantissa and exponent)

Example string

I2_8.21E-06 (in the BA measuring branch)

or

P_5.3E+01 (in the Pirani measuring branch)

7.3.2 Definition of the Control Bits – SC

Bit	Active	Name	Description
0	1	**AUTORANGE**	Change between Pirani and Bayard-Alpert gauge automatically (condition factory-installed)
1	1	**PIRANI**	Only valid for AUTORANGE = 0: Pirani gauge only, Bayard-Alpert gauge is deactivated
2	1	**IG**	Only valid for AUTORANGE = 0: ion gauge only, Pirani gauge is activated only in case of safety turn-off of the Bayard-Alpert gauge
3	1	**AUTOFIL**	Change between filament 1 and filament 2 automatically (condition factory-installed)
4	1	**FIL1**	Only valid for AUTOFIL = 0: filament 1 is selected, filament 2 is deactivated (Setting is only possible if Pirani gauge is activated)
5	1	**FIL2**	Only valid for AUTOFIL = 0: filament 2 is selected, filament 1 is deactivated (Setting is only possible if Pirani gauge is activated)
6	1	**DEGAS**	Start of degassing, automatically stopped after 2 min
7	1	**E_STROM**	Selection of low emission current
8	1	**SP_MAN**	Only valid for closed jumper J1: output level of PIN 9 can be set manually
9	1	**SP_OUT**	Only valid for closed jumper J1 and SP_MAN = 1: setting of output level of PIN 9
10	1	**SP_AUTO**	Only valid for closed jumper J1 and SP_MAN = 0: output level of PIN 9 is pressure dependent; pressure condition is defined by the set point function
11	1	**EXT_ENABLE**	Not available
12	1	**R_ERROR**	Setting is only possible if PIRANI = 1 and AUTORANGE = 0: reset of error bit of BA measuring branch
13	1	**VAK**	Zero-adjustment of Pirani gauge at vacuum pressure
14	1	**ATM**	Adjustment of Pirani gauge to atmospheric pressure
15	1	**n.a.**	Not available

Table 10 – Data format of the control bits for control of the ATMION®

Examples

Selection of AUTORANGE and AUTOFIL mode **`SC_0009`<CR>**

n. a.	ATM	VAK	R_ERROR	EXT_ENABLE	SP_AUTO	SP_OUT	SP_MAN	E_STROM	DEGAS	FIL2	FIL1	AUTOFIL	IG	PIRANI	AUTORANGE
Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
0				**0**				**0**				**9**			

Starting the degassing process **`SC_0049`<CR>**

n. a.	ATM	VAK	R_ERROR	EXT_ENABLE	SP_AUTO	SP_OUT	SP_MAN	E_STROM	DEGAS	FIL2	FIL1	AUTOFIL	IG	PIRANI	AUTORANGE
Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	1
0				**0**				**4**				**9**			

Filament 2 selection in Autorange mode **`SC_0021`<CR>**

n. a.	ATM	VAK	R_ERROR	EXT_ENABLE	SP_AUTO	SP_OUT	SP_MAN	E_STROM	DEGAS	FIL2	FIL1	AUTOFIL	IG	PIRANI	AUTORANGE
Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
0				**0**				**2**				**1**			

7.3.3 Definition of the Status Bits – RS

Bit	Active	Name	Description
0	1	**AUTORANGE**	Mode of auto range activated
1	1	**PIRANI**	Only Pirani gauge is activated, read out of pressure
2	1	**IG**	Only Bayard-Alpert gauge is activated, read out of pressure
3	1	**AUTOFIL**	Mode of AUTOFIL is activated
4	1	**FIL1**	Filament 1 is selected
5	1	**FIL2**	Filament 2 is selected
6	1	**DEGAS**	Degas activated
7	1	**E_STROM**	Low emission current is selected
8	1	**SP_MAN**	Output level of PIN 9 can be set manually
9	1	**SP_OUT**	Output level of PIN 9 (1 indicates 24 V)
10	1	**SP_AUTO**	Set point function or output of degas status activated
11	1	**EXT_ENABLE**	External control enabled
12	1	**R_ERROR**	Error bit of Bayard-Alpert gauge
13	1	**VAK**	Zero-adjustment of Pirani gauge at vacuum pressure activated
14	1	**ATM**	Adjustment of Pirani gauge to atmospheric pressure activated
15	1	**LEBENSBIT**	Test bit of ATMION® sent every 500 msec

Table 11 – Data format of the status bits for control of the ATMION®

Example

Enquiry by entering the command **`RS`<CR>**
Autorange, BA measuring branch, automatic filament selection and filament 1 are active.
This results in the answer: **“001D“**.

7.4 Service Software

The service software ATMION Monitor serves simple test and service purposes via interface RS232. All commands listed in Chapter 7.3 Command Set, Page 39 ff. can be executed with this program.

NOTICE:
The service software can be downloaded free of charge from the Internet.

Connect:

- Connect the ATMION® Interface Adapter RS232 to the I/O connector of the electronics box.
- Establish a connection with a shielded modem cable between the serial interface of the PC and the RS232 connector of the ATMION® Interface Adapter RS232.
- Connect the machine to the power supply.

7.4.1 Connection Settings

After the programme has been installed on the respective computer, a window for the connection settings of the interface appears when the programme is opened via **Monitor_Atmion.exe** (☞🕮 Figure 18, Page 43). The available interfaces of the computer, e.g. Com1, and the baud rate are entered here and confirmed with **OK**. Confirmation opens the ATMION Service Monitor program window.

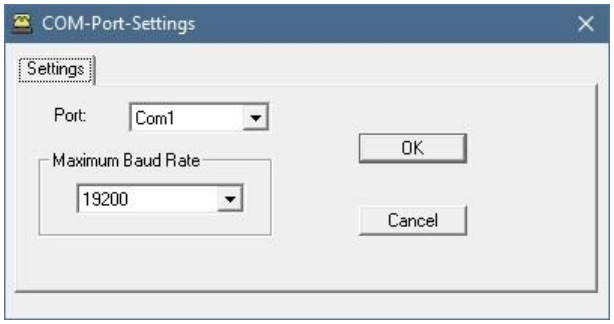


Figure 18 – Com-Port-Settings

7.4.2 Using the Program

All the control words and commands entered as well as all status messages and received data are displayed in the ATMION Service Monitor program window (☞🕮 Table 10, Page 40). The window is divided into five sub-windows which are described briefly below.

Control ATMION

This sub-window shows 13 important control bits (☞🕮 Table 10, Page 40) which can be activated by clicking on the white boxes. Clicking the **Send control word** button sends the command associated with setting the bits to the vacuum gauge. The input of combinations that are not possible is partially prevented by the software.

Status ATMION

The 16 status bits (☞🕮 Figure 19, Page 44) are displayed here. They are displayed in grey when deactivated and in black when activated. The display for the life bit flashes green when a data transfer is taking place between the PC and the vacuum gauge.

Command

In this sub-window it is possible to enter the most important read and control commands (☞🕮 Table 9, Page 39) in the white text field and send them to the measuring system by clicking the **Send** button.

Monitor Send

All transmitted commands and control words are displayed here.

Monitor Receive

This window displays the data returned by the measuring system. If you click on the **Start** button, measurement and service values from the vacuum meter appear at 500 ms intervals. These data are stored in the file **atmionlog.txt** in the directory **C:** and are available for evaluation with common word processing and spreadsheet programs. Output and storage of the values are stopped by clicking the **Stop** button.

Status field

This field is located at the bottom of the programme window and indicates the selected interface, its set parameters, the location of the recorded data and the version number of the service software.

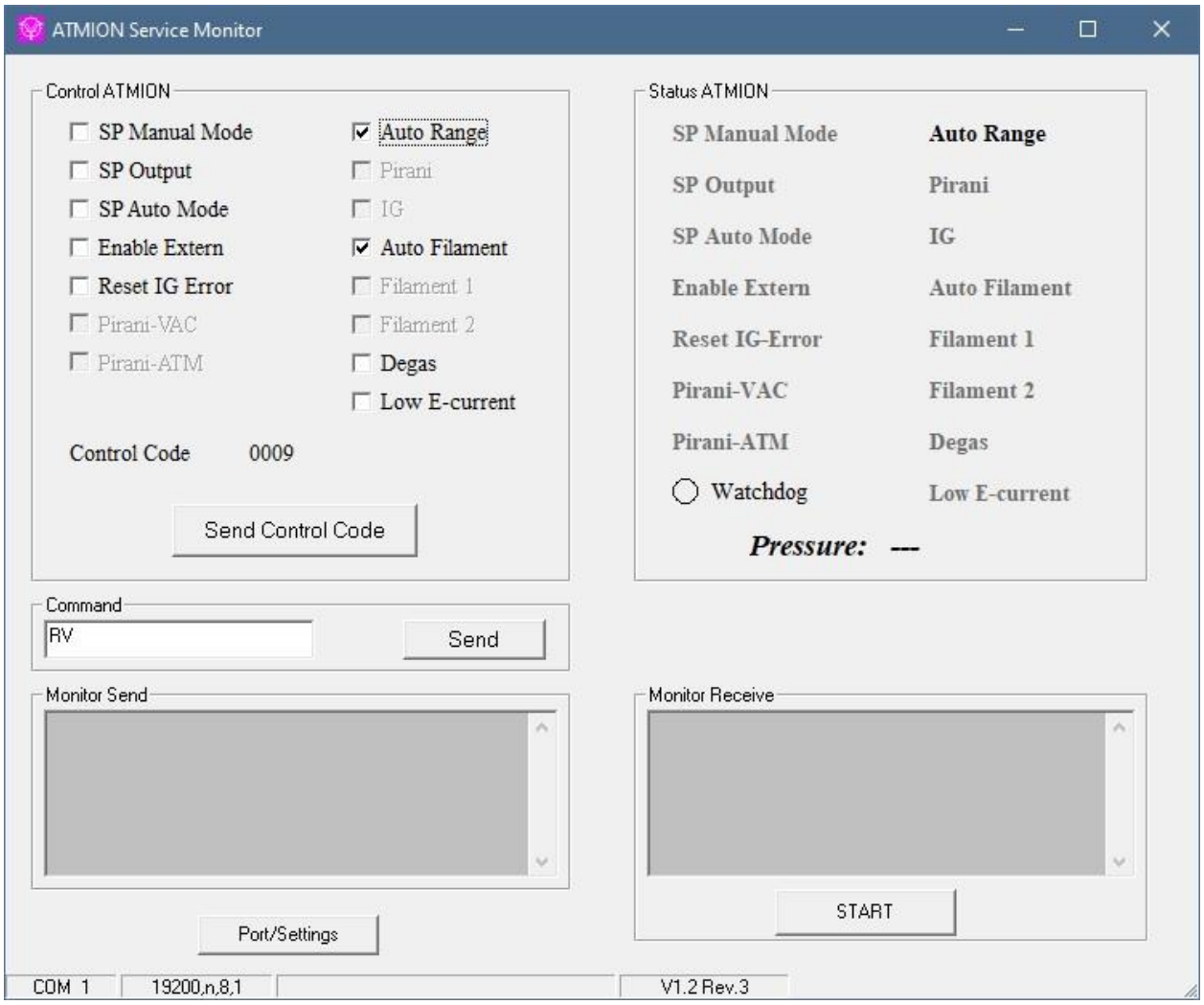


Figure 19 – Program window ATMION Service Monitor of the service software

Clicking the **Port/Settings** button takes you to the Com port settings window (☞🕮 7.4.1 Connection Settings, Page 43).

8. Fieldbus Interface Profibus-DP

8.1 General Information about Profibus-DP

The ATMION® is optionally equipped with a field bus interface Profibus-DP. The technical and functional characteristics of this field bus system are described in the standard DIN EN 61784-1:2015-02. This norm describes the technical and functional features of bus system Profibus-DP.
The vacuum meter represents a slave unit which receives different messages from the Profibus master and outputs corresponding replies in response to the information (commands) from the master.
The properties and the capabilities of a Profibus-DP unit are documented in the GSD-File.

NOTICE:
The GSD file of the ATMION® can be downloaded free of charge from the Internet.

8.2 Operation

NOTICE:
In the following, messages sent by the Profibus master are referred to as output data. Messages sent from the Profibus-Slave to the master are analogously considered as input data. Thus, e.g., measurement data which are output by the ATMION® are input data from the master's point of view.

8.2.1 Setting the Slave Address

The slave address is set with the address setting switch (☞🕮 Figure 20, Page 45). The addresses 0 to 125 can be assigned. The setting is binary-coded. Switch 0 (right) corresponds to the value 20 = 1, switch 6 (left) to the value 26 = 64. The switch position up (to the number closed) corresponds to the logical 1, down to the logical 0. If all switches are set to zero, this corresponds to the address zero.

The factory setting is address 11 (switch 0, 1 and 3 set to ON = 1).

Figure 20 – Switch for setting the slave address when the rear panel is removed

8.2.2 User-specific Parameter Setting

For special applications and processes it can be useful to change the default settings of the ATMION®. With the Profibus interface the following three parameters can be adjusted via the parameterisation telegram (☞🕮 Table 12, Page 46):

Parameter	Default value (recommended)	Minimum value	Maximum value
Switchover point Pirani / BA measuring branch as 16-bit value (pressure value in mbar)	40960 ($1 \cdot 10^{-2}$ mbar)	39727 ($5 \cdot 10^{-3}$ mbar)	47919 ($5 \cdot 10^{-1}$ mbar)
Switchover point BA / Pirani measuring branch as 16-bit value (pressure value in mbar)	45052 ($1 \cdot 10^{-1}$ mbar)	40960 ($1 \cdot 10^{-2}$ mbar)	47010 ($3 \cdot 10^{-1}$ mbar)
Correction of the gas type dependency of the BA measuring branch as 16-bit value (correction factor)	12288 (1.0)	9850 (0.254)	16383 (10.0)

Table 12 – Parameterisation telegram

Calculation instruction

Calculation instruction for the input of the change-over points:

Input value = 49152 + 4096 · log (Pressure value)

Calculation instruction for entering the correction value of the gas type dependency:

Input value = 4096 · log (Correction factor · 1000)

8.2.3 Output Data (Seen from the Master)

Word	Description
1st word	Set point ON notated as 16-bit unsigned integer (2 bytes high to low)
2nd word	Set point OFF notated as 16-bit unsigned integer (2 bytes high to low)
3rd word	**16 control bits of the ATMION®** (☞🕮 Table 14, Page 47)
4th word	Reserved

Table 13 – 4 output words (from the master's point of view)

Bit	Active	Name	Description
0	1	**AUTORANGE**	Change between Pirani and Bayard-Alpert gauge automatically
1	1	**PIRANI**	Only valid for AUTORANGE = 0: Pirani gauge only, Bayard-Alpert gauge is deactivated
2	1	**IG**	Only valid for AUTORANGE = 0: ion gauge only, Pirani gauge is activated only in case of safety turn-off of the Bayard-Alpert gauge
3	1	**AUTOFIL**	Change between filament 1 and filament 2 automatically (condition factory-installed)
4	1	**FIL1**	Only valid for AUTOFIL = 0: filament 1 is selected, filament 2 is deactivated Setting is only possible if Pirani gauge is activated
5	1	**FIL2**	Only valid for AUTOFIL = 0: filament 2 is selected, filament 1 is deactivated Setting is only possible if Pirani gauge is activated
6	1	**DEGAS**	Start of degassing, automatically stopped after 2 min
7	1	**E_STROM**	Selection of low emission current
8	1	**SP_MAN**	Only valid for closed jumper J1: output level of PIN 9 can be set manually
9	1	**SP_OUT**	Only valid for closed jumper J1 and SP_MAN = 1: setting of output level of PIN 9
10	1	**SP_AUTO**	Only valid for closed jumper J1 and SP_MAN = 0: output level of PIN 9 is pressure dependent; pressure condition is defined by the set point function
11	1	**EXT_ENABLE**	Not available
12	1	**R_ERROR**	Setting is only possible if PIRANI = 1 and AUTORANGE = 0: reset of error bit of Bayard-Alpert gauge
13	1	**VAK**	Zero-adjustment of Pirani gauge at vacuum pressure
14	1	**ATM**	Adjustment of Pirani gauge to atmospheric pressure
15	1	**n.a.**	Not available

Table 14 – Data format of the 3rd output word: Control bits for controlling the ATMION®

8.2.4 Input Data (Seen from the Master)

Word	Description
1st word	Measured pressure notated as 16-bit unsigned integer (2 bytes high to low)
2nd word	Set point ON notated as 16-bit unsigned integer (2 bytes high to low)
3rd word	Set point OFF notated as 16-bit unsigned integer (2 bytes high to low)
4th word	**16 status bits of the ATMION®** (☞🕮 Table 11, Page 42)
5th word	**16 status bits of the BA measuring branch** (☞🕮 Table 17, Page 48)
6th word	Reserve

Table 15 – 6 input words (from the master's perspective)

Bit	Active	Name	Description
0	1	**AUTORANGE**	Mode of auto range activated
1	1	**PIRANI**	Only Pirani gauge is activated, read out of pressure
2	1	**IG**	Only Bayard-Alpert gauge is activated, read out of pressure
3	1	**AUTOFIL**	Mode of AUTOFIL is activated
4	1	**FIL1**	Filament 1 is selected
5	1	**FIL2**	Filament 2 is selected
6	1	**DEGAS**	Degas activated
7	1	**E_STROM**	Low emission current is selected
8	1	**SP_MAN**	Output level of PIN 9 can be set manually
9	1	**SP_OUT**	Output level of PIN 9 (1 indicates 24 V)
10	1	**SP_AUTO**	Set point function or output of degas status activated
11	1	**EXT_ENABLE**	External control enabled
12	1	**R_ERROR**	Error bit of Bayard-Alpert gauge
13	1	**VAK**	Zero-adjustment of Pirani gauge at vacuum pressure activated
14	1	**ATM**	Adjustment of Pirani gauge to atmospheric pressure activated
15	1	**LEBENSBIT**	Test bit of ATMION® sent every 500 msec

Table 16 – Data format of the 4th input word: Status bits for ATMION® control

Bit	Active	Name	Description
0	1	**IG_ERROR**	Bayard-Alpert gauge locked – error of ion gauge
1	1	**IG_Time_Off**	Bayard-Alpert gauge locked temporarily – protection of ion gauge
2	1	**FIL1_ERROR**	Filament 1 defective
3	1	**FIL2_ERROR**	Filament 2 defective
4	1	**TIME_DEGAS**	Degassing finished by end of time
5	1	**DEGAS_RS232**	Degassing requested by RS 232 interface
6	1	**E_STROM2**	High emission current selected
7	1	**DEGAS_OFF**	Degas locked
8	1	**UA_ERROR**	Error of anode potential
9	1	**E_STROM_ERROR**	Error of emission current -too high current
10	1	**IG_DRUCK**	Last turn-off of ion gauge due to pressure measurement of Bayard-Alpert gauge
11	1	**P_DRUCK**	Last turn-off of Bayard-Alpert gauge due to pressure measurement of Pirani gauge
12	1	**P_ERROR**	Pirani wire defective
13	1	**RESERVE**	Reserved
14	1	**RESERVE**	Reserved
15	1	**RESERVE**	Reserved

Table 17 – Data format of the 5th input word: Status bits for BA measuring branch ATMION®

Calculation instruction

Calculation instruction for pressure value in mbar:

$$p = 10^{(\text{Output value}/4096-12)}$$

9. Maintenance and Service

9.1 Maintenance

9.1.1 General Maintenance Instructions

For external cleaning, please use a dry cotton cloth. Do not use aggressive or abrasive cleaning agents.

9.2 Regular Inspections

- Visual inspection of the device for damaged or deformed housings and connectors as well as damaged cable insulation

9.2.1 Baking Out the Sensor

The operation of vacuum systems also necessitates the possible baking out of the systems and the components located on them. The ATMION® is designed for different bake-out temperatures depending on the version. The use of a suitable sealing material by the customer is assumed.

The following temperatures are permissible for the area at the connecting flange:

- ATMION® compact max. 180° C at the flange with removed electronics box
- ATMION® standard max. 250° C at the flange with removed electronics box and sensor adapter

ATTENTION: Temperature sensitive components
The electronics box as well as the sensor adapter of the ATMION® standard sensor contain electronic components which may only be heated up to 60 °C!

The removal of the electronics box and the sensor adapter of the ATMION® standard sensor is done according to the following steps. Please use the Figure 5, Page 15 an aid:

- Disconnect the ATMION® from the power supply.
- Loosen the three grub screws of the ATMION® standard and separate the sensor adapter with electronics box from the sensor.
- On the ATMION® compact unscrew the union nut and pull the electronics box off the sensor.

NOTICE:
The sensor must not be turned when it is pulled out. There is a risk of destroying the contact pins of the sensor when turning it!

- The assembly after baking is carried out in the opposite order.

9.2.2 ATMION® standard – Exchange of Filaments

After both filaments have burned through, the sensor of the ATMION® standard offers the possibility to replace them yourself or to send the vacuum meter to JEVATEC for replacement of the filaments.

NOTICE:
The sensors contain mechanically sensitive parts. An incorrect or improper filament change can damage the sensor.
JEVATEC assumes no responsibility and gives no warranty for damage to the filaments or other parts of the sensor or vacuum gauge caused by incorrect or improper replacement of the filaments by the operator or third parties.

ATTENTION: Measuring accuracy
The original measuring accuracy of the sensors of ± 10% of the measured value can only be achieved by an electronic adjustment by the manufacturer. Non-adjusted sensors achieve a measuring accuracy of ± 20% of the measured value after replacement of the filaments. If you wish to have the original measuring accuracy, have the filament replacement carried out by JEVATEC.

ATTENTION: Shipping of contaminated products
Contaminated products (e.g., radioactive, toxic, corrosive or micro-biological) can cause damage to health and the environment. Submitted products should be free of pollutants wherever possible. Observe the shipping regulations of the countries and transport companies involved. Enclose the carefully filled out contamination declaration with the shipment.

NOTICE: Declaration of contamination form
You will find the form as a copy template in Appendix 1 of these operating instructions or as a free download on the Internet.

The replacement of the sensor is described in chapter 9.2.3 ATMION® compact und ATMION® standard – Sensor Exchange , Page 52.

Use the JEVAmet® Filament Kit to replace the filaments. The filament kit contains a pair of stretched, Y_2O_3 coated iridium filaments, a copper sealing ring (DN40CF) for the feed-through flange and three M2 grub screws for the filament base including Allen key. Before starting the work, have these parts, two spanners SW10, a pair of tweezers and an additional copper sealing ring (DN40CF) for the connecting flange with the vacuum chamber ready. Use lint-free gloves during the work.

The filaments are replaced according to the following steps. Use the Figure 5, Page 15 as an aid:

- Disconnect the ATMION® standard from the power supply.
- Loosen the 3 headless screws and disconnect the sensor adapter with electronic box or rather the connection plug of sensor.
- Loosen the connection screws to vacuum chamber and dismount the sensor from the vacuum chamber.
- Place the sensor on an even base with the electrical connections pointing upwards.
- Loosen and remove the connecting screws (M6) between the sensor and the sensor tube.
- Pull out the sensor carefully upwards from the sensor tube centrically to the tube axis.

ATTENTION:
Keep the sensor flange exactly parallel and centrically to tube axis. An incorrect or improper dismounting may easily damage the sensor. Please be extremely carefully!

- Place the feedthrough flange with the sensor structure to the top on a flat ground.
- Unscrew the 3 upper headless screws of the filament sockets.
- Remove the used or defective filaments carefully with a tweezer.
- Take up the new filaments with tweezers at the support rod in the middle and take them out of the packaging of the JEVAmet® Filament Kit.
- Insert the rod and both filament connectors into the 3 filament sockets.
- Fasten the rod and both filament connectors by tightening the headless screws. Use the 3 new headless screws, whenever required.
- Carefully remove the bond bridge from the new filaments with a tweezer.

ATTENTION:
Not removing the bond bridge between the filaments will lead to a short circuit, which can damage the electronics.

- Check the intactness of the sensor structure visually before sealing the sensor tube.
- Take the new copper seal from the packing and place it onto the sealing surface of the sensor tube with a tweezer.
- Insert the feedthrough flange with the mounted sensor structure carefully into the sensor tube.

ATTENTION:
Keep the sensor flange exactly parallel and centered to tube axis. An incorrect or improper mounting may easily damage the sensor. Please be extremely carefully!

- Make the screw connection between sensor flange and sensor tube.

ATTENTION:
Tighten the nuts in a crosswise fashion to prevent misalignment of the sealing surfaces.

- Mount the sensor to the vacuum chamber and tighten the connection screws evenly. Use a new copper seal.
- Attach electronics unit plus adaptor or the connector plug to the sensor and tighten the 3 headless screws at the sensor flange.
- After the replacement of filaments set the coding switch of wide-range vacuum gauge ATMION® to position 7, which corresponds to a sensitivity of 20 $mbar^{-1}$. (☞🕮 Figure 5, Page 15)
- Connect ATMION® standard with the power supply.
- If necessary, recalibrate the Pirani measuring branch.

NOTICE:
Detailed, illustrated instructions are included with the JEVAmet® Filament Kit or can be downloaded free of charge from the Internet.

9.2.3 ATMION® compact und ATMION® standard – Sensor Exchange

The sensor of the ATMION® can be replaced after contamination or a defect. Proceed according to the following steps and use Figure 5, Page 15 as an aid:

- Disconnect the ATMION® from the power supply.
- Loosen the connecting screws or the clamp flange to the vacuum chamber and disconnect the sensor from the vacuum chamber.
- Replace the defective sensor with a new one.
- Mount the vacuum meter on the vacuum chamber again.
- After replacing the sensor on the ATMION®, set the coding switch of the electronics box to the value indicated on the sensor. (☞🕮 Figure 5, Page 15)
- Connect the ATMION® to the power supply.
- If necessary, recalibrate the Pirani measuring branch.

9.3 Troubleshooting

9.3.1 Errors and Help in Case of Malfunctions

NOTICE:
Malfunctions of the vacuum meter that are due to contamination or wear and tear, as well as wearing parts (e.g., Pirani-element or filaments), are not covered by the warranty.

NOTICE:
JEVATEC assumes no responsibility or warranty if the operator or third parties carry out repair work on the ATMION®.

NOTICE:
If an error has occurred, we recommend switching off the supply voltage and switching it on again after 5 s.

Error	Cause	Remedy
Mode LED does not light up	No operating voltage	Check power supply.
Mode LED flashes red	Pirani wire defective	Perform a continuity measurement between PIN 1 and 2 on the measuring head. If the pirani wire is defective, the sensor must be replaced.
	Electronic fault	Send electronic box or complete vacuum meter to JEVATEC for repair.
Mode LED flashes yellow	Fault in the BA measuring branch	Disconnect the vacuum meter from the power supply, reconnect it and observe whether the error continues to occur.
	Both filaments of the sensor	Perform a continuity measurement between PIN 8 and 9 or 10 and 9 on the sensor. If the filaments are defective, they can be exchanged or the sensor must be replaced, depending on the version.
	Defective Electronic fault	Send electronic box or complete vacuum meter to JEVATEC for repair.
Imprecise measured value at atmospheric pressure	Maladjustment with atmosphere	Carry out end value adjustment of the Pirani measuring branch.
Meter does not switch from the Pirani measuring branch to the BA measuring branch in AUTORANGE mode. The displayed pressure value is > $1 \cdot 10^{-2}$ mbar, the pressure in the vacuum chamber is lower	Zero-point of the Pirani measuring branch drifted	Carry out zero-point adjustment of the Pirani measuring branch.
Wrong measured value in the measuring range of the Pirani measuring branch	Ambient temperature of the measuring system is outside the temperature range of 15 - 40°C.	Increase or decrease ambient temperature.

Error	Cause	Remedy
Measured value in the measuring range of the BA measuring branch too high	Leaky flange connection Sensor dirty	Check vacuum connection for leakage. Perform the degassing function to clean the sensor from dirt.
Measured value in the measuring range of the BA measuring branch too low	Sensor dirty	Perform the degassing function to clean the sensor from dirt.
Measured value fluctuates in the measuring range of the BA measuring branch	Sensor dirty Sensor coated Electronic fault	Perform the degassing function to clean the sensor from dirt. Sensor must be replaced. Send electronic box or complete vacuum meter to JEVATEC for repair.

Table 18 – Errors and help in case of malfunctions

Please also note the displays for operating states and error messages listed in Chapter 5.2.5 LED for Displaying the Operating and Error States, Page 25.

9.3.2 Repair

The ATMION® is not intended for repair by the customer except for the filament change of the ATMION® standard (☞🕮 Chapter 9.2.2 ATMION® standard – Exchange of Filaments, Page 50) or the sensor exchange (☞🕮 Chapter 9.2.3 ATMION® compact und ATMION® standard – Sensor Exchange, Page 52). Defective products must be sent to JEVATEC for repair.

NOTICE:
JEVATEC assumes no responsibility or warranty if the operator or third parties carry out repair work on the ATMION®.

ATTENTION: Shipping of contaminated products
Contaminated products (e.g., radioactive, toxic, corrosive or micro-biological) can cause damage to health and the environment. Submitted products should be free of pollutants wherever possible. Observe the shipping regulations of the countries and transport companies involved. Enclose the carefully filled out contamination declaration with the shipment.

NOTICE: Declaration of contamination form
You will find the form as a copy template in Appendix 1 of these operating instructions or as a free download on the Internet.

10. Shelving and Waste Disposal

10.1 Packaging

Please keep the original packaging. You will need this packaging in case of storing the ATMION® or shipping to JEVATEC.

10.2 Shelving

The ATMION® must only be stored in dry room. During storage, the following ambient conditions need to be maintained:

- Ambient temperature: -20 – +65 °C
- Humidity of the air: As low as possible.
  Preferably in a sealed plastic bag with desiccant.

10.3 Waste Disposal

Regarding waste disposal the branch specific and local waste disposal and environment protection regulation for systems and electronics components are valid.
In case of return JEVATEC will execute the professional resource separation and disposal.

Notes:

JEVATEC Ideen in der Vakuumtechnik	Declaration of Contamination	FB6001
	EN	Seite 1 von 2

The repair and / or servicing of articles of the vacuum engineering (vacuum measuring instruments, vacuum pumps and vacuum components) will be carried out only if a correctly completed declaration has been submitted. Non-completion will result in delay. The manufacturer can refuse to accept any equipment without a declaration. A separate declaration has to be completed for each single article. For diagnosis and shipping by JEVATEC costs will be incurred. **Please consider also the safety information on the back of this declaration!**

This declaration may be completed and signed only by authorized and qualified staff.

1. Description of the article:

Equipment type: .....

Code No.: .....

Serial No.: .....

Invoice No.: .....

Delivery Date: .....

2. Reason of Return:

.....

3. Condition of the Article:

Has the article been used? ☐ yes ☐ no

What kind of oil / liquid was used?

.....

Is the equipment free from potentially harmful substances?

☐ yes go to **5.** ☐ no go to **4.**

4. Process related Contamination of Article:

toxic	☐ yes	☐ no
corrosive	☐ yes	☐ no
microbiological*)	☐ yes	☐ no
explosive*)	☐ yes	☐ no
radioactive*)	☐ yes	☐ no
other harmful substances	☐ yes	☐ no

*) Articles which have been contaminated by biological, explosive or radioactive substances will not accepted without written evidence of decontamination!

All subtances, gases and by-products which may have come into contact with the equipment:

Trade Name Product Name Manufacturer	Chemical Name (chemical formula)	Hazard Group	Measures when harmful substances are released	First Aid for accidents

5. Legally Binding Declaration:

I hereby declare that the information supplied on this form ist complete an accurate. The despatch of the contaminated articles will be accordance with the appropriate regulations covering, packaging, transportation and labeling of dangerous substances.

Company: .....

Street, No.: ..... Phone: .....

Zip Code, City: ..... Fax: .....

Name: ..... E-mail: .....

Date, Signature: ..... Stamp:

Safety information for returning contaminated vacuum engineering
(vacuum measuring instruments, vacuum pumps and vacuum components)

General Information

According to German laws, every employer is held responsible for the health and safety of his employees. This also applies to service personnel performing maintenance and/ or repair of vacuum devices either at the premises of the user or the service company in charge. Any possible contamination of vacuum devices or components must be communicated by sending the following declaration of contamination together with the items to be repaired.

Declaration of Contamination

Any personnel repairing and/ or doing maintenance has to be informed about the condition of contaminated vacuum devices and components before the start of work. This is the purpose of the Declaration of Contamination. The declaration must be sent to the manufacturer or Service Company directly. A copy has to be attached to the dispatch papers outside (mailing bag) of the packaging. **Consignments without the declaration of contamination will not be processed and returned to the sender!**

Shipping

When shipping contaminated vacuum devices or components, all dispatch instructions laid down in the manual must be followed e.g.:

- If necessary: Shipping as „Dangerous Good“ with labeling as such
- Drain all service fluids
- Neutralize pumps by rinsing with gas
- Remove filter elements
- Seal all openings airtight
- Shrink-wrap appropriately
- Ship in appropriate containers for transport

Shipping

If you do not have any facilities to decontaminate the devices in compliance with regulations, we assist you in finding a suitable partner. Please contact us.

JEVATEC
Ideen in der Vakuumtechnik

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CE

EU Declaration of Conformity

We, the JEVATEC GmbH, hereby declare that the products specified and listed below which we have placed on the market, comply with the applicable EU Council Directives. This declaration becomes invalid if modifications are made to the product without agreement with us. Compliance with the EMC Directives requires that the components are installed within a system or machine in a manner adapted to the EMC requirements.

Product designation
Wide-Range Vacuum Gauge

Type designation
ATMION®

The products comply with the following European Council Directives:

- 2014/30/EU EU Directive EMC, EU Office Journal, L 96/79 of 29-March-2014
- 2011/65/EU EU Directive RoHS, EU Office Journal, L 174/88 of 1-July-2011 in accordance with:
  - Commission Delegated Directive (EU) 2015/863 of 31-March-2015
  - Commission Delegated Directive (EU) 2018/740 of 1-March-2018
  - Commission Delegated Directive (EU) 2018/741 of 1-March-2018
- 2012/19/EU EU Directive WEEE, EU Office Journal L 197/38 of 24-July-2012

Applied harmonised, international/national standards and specifications:

- DIN EN 61010-1:2020-03 (VDE 0411-1:2020-03)
  Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 1: General requirements (IEC 61010-1:2010 + COR:2011 + A1:2016, modified + A1:2016/COR1:2019); German version EN 61010-1:2010 + A1:2019 + A1:2019/AC:2019
- DIN EN 61326-1:2013-07 (VDE 0843-20-1:2013-07)
  Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 1: General requirements (IEC 61326-1:2012); German version EN 61326-1:2013

Jena 14-December 2021

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President
JEVATEC GmbH

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