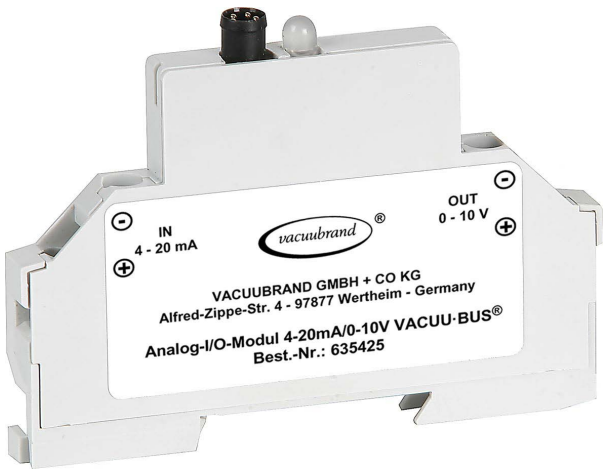
vacuubrand

Technology for Vacuum Systems

ANALOG MODULE

Analog I/O Module 4-20 mA/0-10 V VACUU·BUS®



Instructions for use

Original instructions_EN

N°: 20901205

Original instructions
Keep for further use!

This manual is only to be used and distributed in its complete and original form. It is strictly the users' responsibility to check carefully the validity of this manual with respect to his product.

Manufacturer:
VACUUBRAND GMBH + CO KG
Alfred-Zippe-Str. 4
97877 Wertheim
GERMANY

Phone:
- Head office +49 9342 808-0
- Sales +49 9342 808-5550
- Service +49 9342 808-5660

Fax: +49 9342 808-5555
E-Mail: info@vacuubrand.com
Web: www.vacuubrand.com

Thank you for purchasing this product from **VACUUBRAND GMBH + CO KG**. *You have chosen a modern and technically high quality product.*

TABLE OF CONTENT

1 Introduction

This manual is part of your product.

1.1 User information

Safety

Instructions for use and safety

- Read this manual thoroughly and completely before using the produkt.
- Keep this manual in an easily accessible location.
- Proper use of the product is essential for safe operation. Comply with all safety instructions provided!
- In addition to this manual, adhere to any relevant local accident prevention regulations and comply with industrial safety regulations.

General

General information

- Instead of the term ***Analog I/O module*** mostly the term ***Analog module*** is used in this manual, in order to make the text more readable.
- The illustrations in this manual are provided as examples.
- They are intended to aid in your understanding of the proper use of the product.

Contact

Contact us

- Please ask for replacement in case of an incomplete manual. or download instructions for use on our web page: www.vacuubrand.com
- Contact us regarding any questions about this product, if you need further information, or to provide us with feedback.
- When contacting our Customer Service Department give us the name of your product → *see the label on the product.*

Copyright

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1.2 About this document

1.2.1 Display conventions

Warning instruction

Display conventions

	**DANGER** **Indicates an imminent hazardous situation.** Disregarding the situation will result in serious and even fatal injury or death. ⇨ Take appropriate action to avoid dangerous situation!

NOTICE
Notice for a potentially harmful situation. Disregarding the notice could lead to material damage.

Additional notes

IMPORTANT!

⇨ Information or specific use recommendation, which must be observed.

⇨ Important information for the proper operation.

⇨ Helpful tips and tricks

⇨ Additional information

1.2.2 Handling instructions (action steps)

Action step (single step)

Additional display conventions

⇨ Do the described step.

☑ Result of action

Handling instructions(multiple steps)

1. first step

2. next step

☑ Result of action

Follow steps in the described order.

1.2.3 Symbols and icons

Symbols and icons

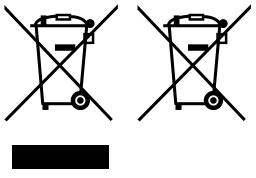
This manual includes symbols and icons. Safety symbols indicate special danger in handling the product. Icons shall help to identify the danger directly and easier.

Safety symbols

	general warning symbol		danger: electricity

Additional icons

	positive example – **Do!** result – **o. k.**		negative example – **Do not!**
	refers to content of this manual.		refers to content of other documents.
	suitable for application in hazardous areas (Ex).		not suitable for application in hazardous areas (Ex).



Electric/electronic devices must not be disposed of in the domestic waste at the end of their service life.

1.2.4 Term definition

Product specific terms

...-I/O module	An I/O module is an interface for an external peripheral device to connect with a ***VACUU·BUS***® capable vacuum gauge or -controller. Analog peripherals, e. g., sensors, valves, etc., can be integrated as client into the ***VACUU·BUS***® network by **VACUUBRAND** by connecting to a ...- I/O module.
ATEX VARIO®	Precise vacuum control by motorspeed control for ATEX ***VARIO***® chemistry diaphragm pumps.
CVC 3000	Vacuum controller, controller
VACUU·BUS®	BUS system by **VACUUBRAND** for communication of peripherals with ***VACUU•BUS***® compatible gauges and controllers.
VARIO® **control**	Precise vacuum control by motorspeed control for ***VARIO***® diaphragm pumps.

2 Safety instructions

The complete information of this chapter must be observed by all persons working with the herein described product.

Use the product only when it is in proper working condition.

2.1 Intended use

Intended use

The ***Analog I/O module 4-20 mA/0-10 V VACUU·BUS®*** is an accessory for the vacuum controller CVC 3000. It is intended as interface connection, e. g., for an Ex vacuum sensor with signal output 4–20 mA and one ATEX ***VARIO®*** pump via 0–10 V/4–20 mA signal conditioner to integrate those components into the ***VACUU·BUS®*** system.

The analog module may only be used in non-explosive areas and indoor. Only connect allowed and suitable components.

Any other use is considered to be improper use.

2.2 Improper use

Improper use

Improper use includes:

- Using the product contrary to its intended use.
- Operation with obvious malfunctions.
- The connection of unauthorized equipment.
- Operation at inadmissible operating conditions.

2.3 General safety instructions

2.3.1 Safety precautions

Safety precautions

- ⇨ Use the device only if you have understood its function and this manual.
- ⇨ Interconnect an additional, intrinsically safe supply via EX power isolation amplifier, if you require to use the analog module for intrinsically safe EX devices.
- ⇨ Repairs are only allowed by the Service Department or your local supplier.
- ⇨ Always be conscious of safety, and work in a safe manner.

- ⇨ Observe the owners‘ directives at work, the national accident prevention regulations and occupational safety provisions.

2.3.2 Target group

Personnel and qualifications

Installation and assembly of electrical equipment must be performed by a qualified electrician.

Changes about the address assignment in the controller must be carried out only by a person who is authorized for this activity by the operator.

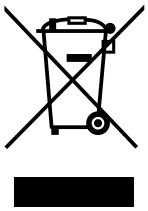
2.4 Proper disposal

NOTE

Incorrect disposal of electronic components can cause environmental pollution.

Used electronic devices contain harmful substances that can cause damage to the environment or human health. Disused electrical devices also contain valuable raw materials, which can be recovered for reuse if the device is disposed of correctly within the recycling process.

End users are legally obliged to take used electric and electronic devices to a licensed collection point.



- ⇨ Correctly dispose of all electronic scrap and electric components at the end of their service life.
- ⇨ Observe the national regulations regarding disposal and environmental protection.

3 Product description

3.1 Scope of supply

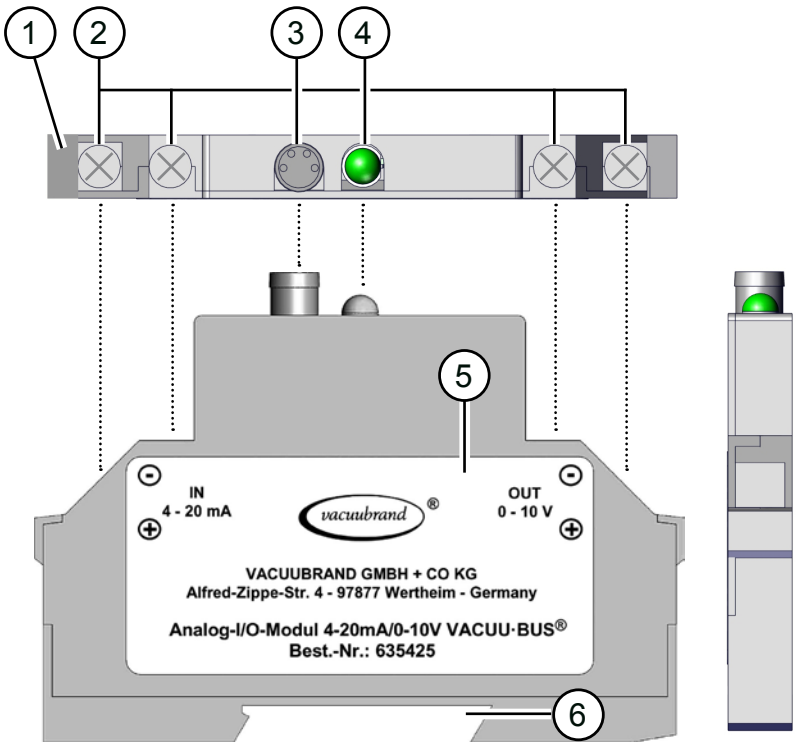
Whats in the box

Analog I/O module 4-20 mA/0-10 V VACUU·BUS®	20635425
VACUU·BUS® extension cable, 2m	20612552
Instructions for use	20901205
Original packaging	------

3.2 Product view

Analog I/O module

Views to analog module



1	Analog I/O module
2	Connection terminals, screw terminals 0,5–2,5 mm² ▸ IN: Input signal 4–20 mA, e. g., vacuum sensor ▸ OUT: Motor control line, e. g., 0–10 V
3	***VACUU·BUS®*** extension cable connection
4	LED – status display ▸ Green Operation ▸ Red: Error
5	Product label with connection sketch
6	Cut-out for assembly on hat rail

3.3 Functioning

3.3.1 Analog interface

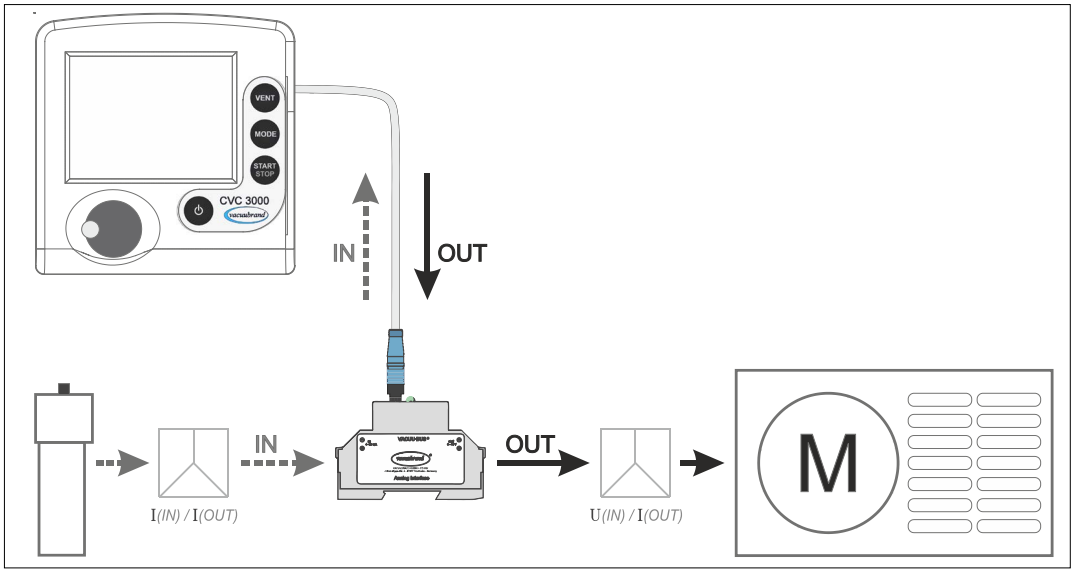
VACUU·BUS® interface to the controller

The analog module is used as signal interface for an analog input signal in the range of 4–20 mA into a ***VACUU·BUS***® signal and simultaneously for signal conversion of a ***VACUU·BUS***® signal into an analog output signal in the range 0–10 V.

On delivery state, with this analog module one chemistry diaphragm pump ATEX ***VARIO***® type can be speed controlled and the measured value of an Ex vacuum sensor can be read out; max. 1 ***VARIO***® pump and 1 vacuum sensor.

3.3.2 Control signals

→ Example Principal sketch IN/OUT control signals



- ***IN*** *(4–20 mA)* Input signal from vacuum sensor to the controller.
- ***OUT*** *(0–10 V)* Output signal from controller to the ATEX ***VARIO***® motor.

3.4 System preconditions vacuum controller

Firmware

Firmware version

VACUUBRAND	Version
CVC 3000	from version 2.40

4 Assembly and connection

IMPORTANT!

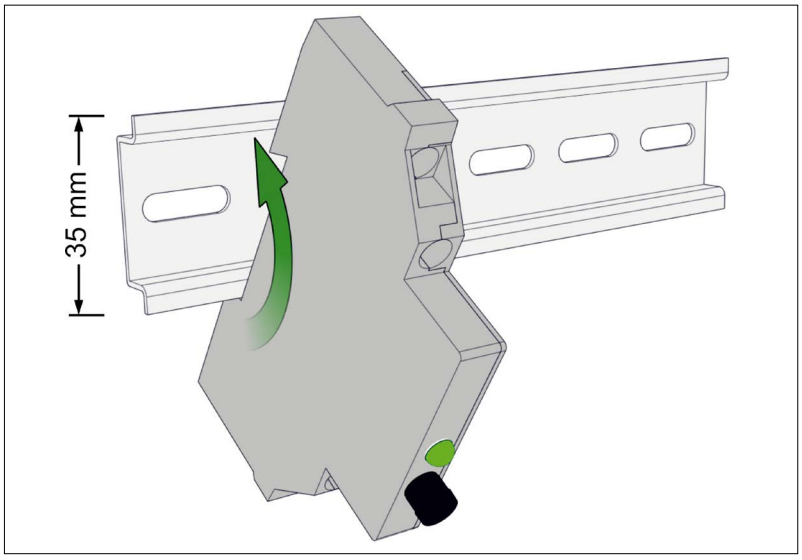
⇨ Assembly and electrical connection must be performed only by qualified electricians.

⇨ Before working on wirings, ensure zero voltage on the device.

4.1 Assembly

Install the analog module

Assembly

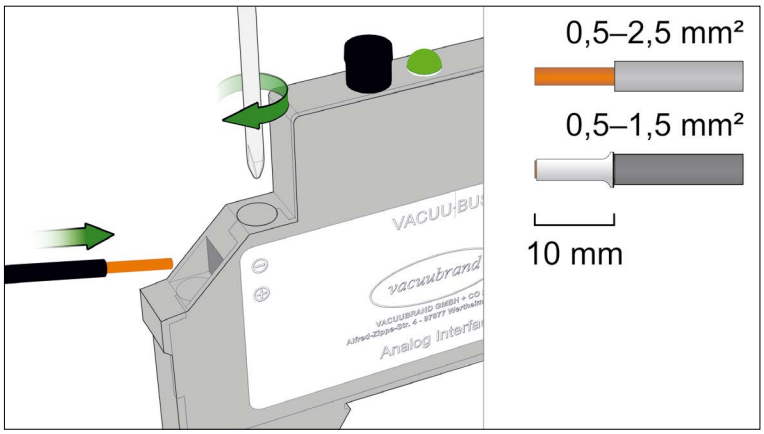


⇨ Clip the analog module onto the 35 mm hat rail, e. g., inside a switch cabinet or a distribution box.

4.2 Connection

Conntect wires to the analog module

Connection



1. Prepare the wires like illustrated.

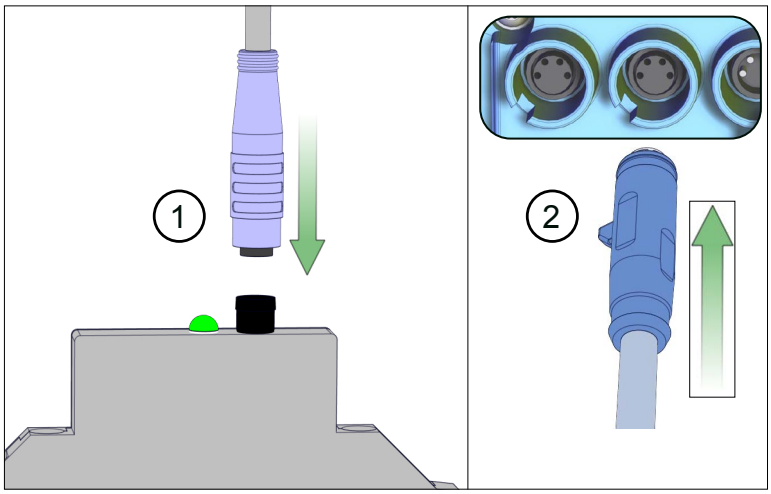
IMPORTANT!

⇨ Ensure correct polarity for connection.

2. Screw cable ends into terminal.

Connect the analog module to the controller

Connection to controller port



1. Plug the ***VACUU•BUS***® extension cable into the port on top of the analog module.
2. Plug the other side of the extension cable into the ***VACUU•BUS***® port on the rear side of the controller.

4.3 Application example

DANGER

Non explosion protected devices can lead to risk of explosion, when operating in hazardous areas.

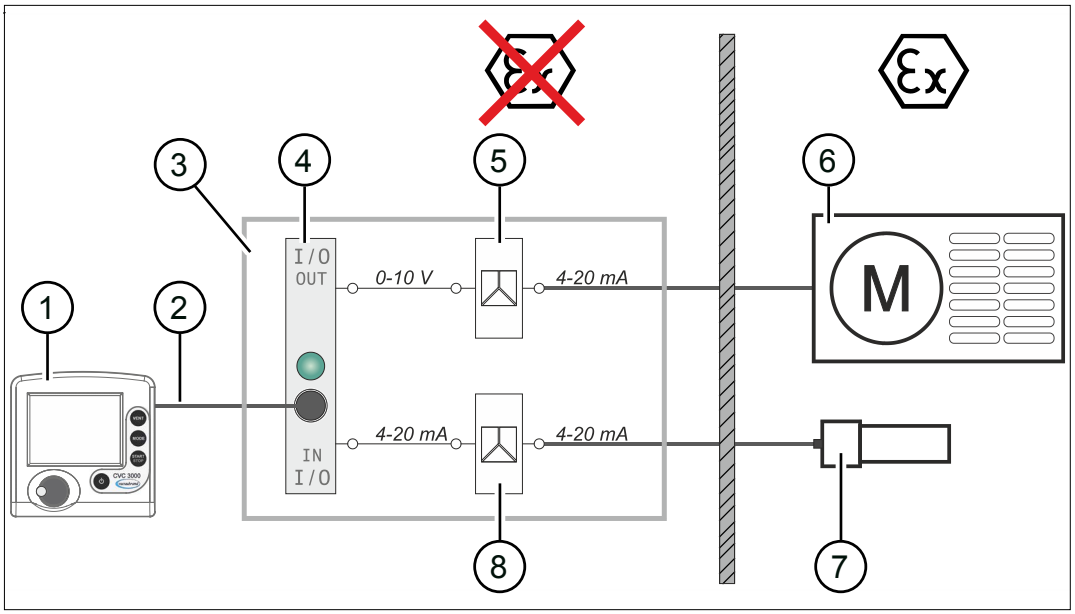
Devices without ATEX approval are not allowed to be installed into an Ex area, e. g., controller CVC 3000 and analog module.

⇨ Only use devices with the respective ATEX approval for operation in Ex-areas.

Realize control for ATEX-VARIO® motor[1]

→ Example

Control principle for devices with ATEX approval the use in hazardous Ex areas



1	Vacuum controller CVC 3000
2	***VACUU·BUS***® cable
3	Switch cabinet with analog module wiring
4	Analog I/O module ▸ IN: Sensor connection via Ex-power input isolation amplifier ▸ OUT: Motor connection via signal conditioner
5	Isolation amplifier 0–10 V/4–20 mA
6	ATEX ***VARIO***® chemistry diaphragm pump
7	ATEX vacuum sensor
8	Supply isolation amplifier*

** not required for a pressure-tight flameproofed Ex-type vacuum sensor*

1 *The described components are available as accessories for ATEX-VARIO® pumps → see also **6.3 Ordering information**.*

5 State and error signals

Meaning LED signals

LED status display

LED	Status	Meaning
 green	**On**	Analog module is operating normally
	Off	Analog module off or not identified by ***VACUU·BUS***® (controller switched-off, power failure etc.)

LED	Status	Meaning
 red	**On**	Input signal more than 10% too high
	Off	No error.

Behaviour in the case of error

What should I do in case of error?

⇨ In case of damage or recognizable malfunction the analog module must be immediately put out of operation.

⇨ Do not repair the analog module yourself, replace it with an equivalent device.

Do not open or modify the device. Repairs may only be made by the manufacturer.

Technical support[1]

Technical support

For technical help or in case of errors you need additional help for, please contact your local supplier or our Service department.

1 -> Phone: +49 9342 808-5660, Fax: +49 9342 808-5555, service@vacuubrand.com

6 Appendix

6.1 Technical information

Designs
Analog I/O Module – ***VACUU·BUS***® interface

6.1.1 Technical data

Technical data

Ambient conditions		(US)
Working temperature	10–40 °C	50–104 °F
Transport- and storage temperature	-10–60 °C	14–140 °F
Operation altitude, max.	3000 m above sea level	9840 ft above sea level
Relative humidity	30–85 %, non condensing	
Avoid condensation or contamination by dust, liquids or corrosive gases.		

Electrical data	
Signal input IN – current passive	4–20 mA
Input impedance	> 240 Ohm
Input current; max.	35 mA
Input voltage; max.	60 VDC
Signal output OUT – voltage	0–10 V
Output current, max.	30 mA
Resolution output	2.5 mV
Input current, max.	50 mA
Power supply via VACUU·BUS®	24 VDC
Protection type	IP20
Interface	VACUU·BUS®
Status display	LED duo red/green

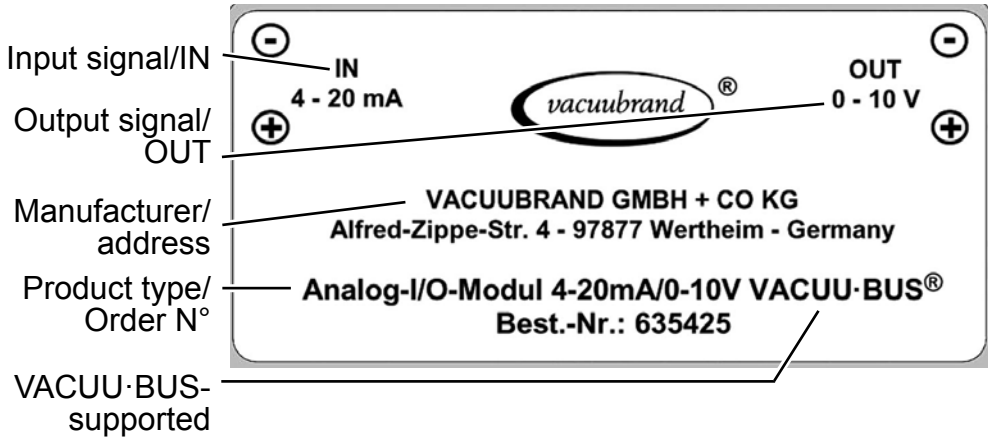
Housing data	
Housing material	PC-GF, light gray
Assemble housing	Snap-on fastener on top hat rail EN 50 022
Outer dimensions	8.8 x 89 x 58 mm
Amount of terminals	4 terminal screws (plus - minus)
Cross section, min.	0.5 mm^2
Cross section, max.	2x 2,5 mm^2, solid 2x 1,5 mm^2, stranded ferruled

6.1.2 Product label

⇨ When contacting our service department, name us product type and a short error description. With this information we can offer selective support and advice for your product.

Product label, in general

Description product label



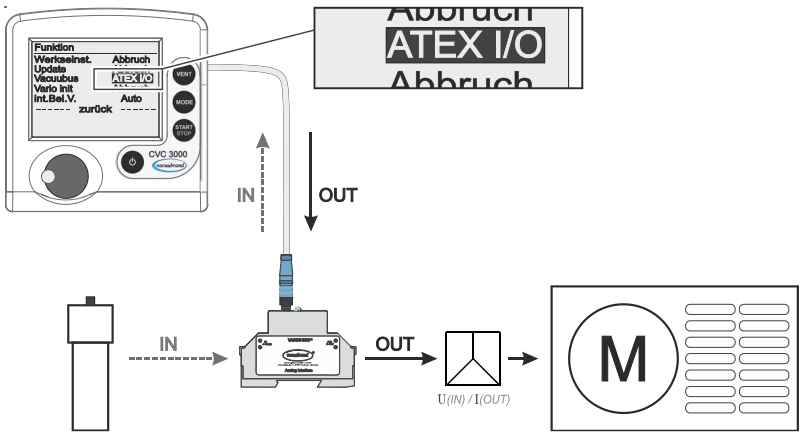
6.2 VACUU·BUS® address assignment

VACUU·BUS® address assignment[1] at the Controller

Address ATEX I/O (delivery state)

VACUU·BUS component State of delivery	Adress-N°	Abbreviation at controller
Basic configuration Ex; with ATEX VARIO pump *(1500 U/min)* and Ex vacuum sensor	-	ATEX I/O

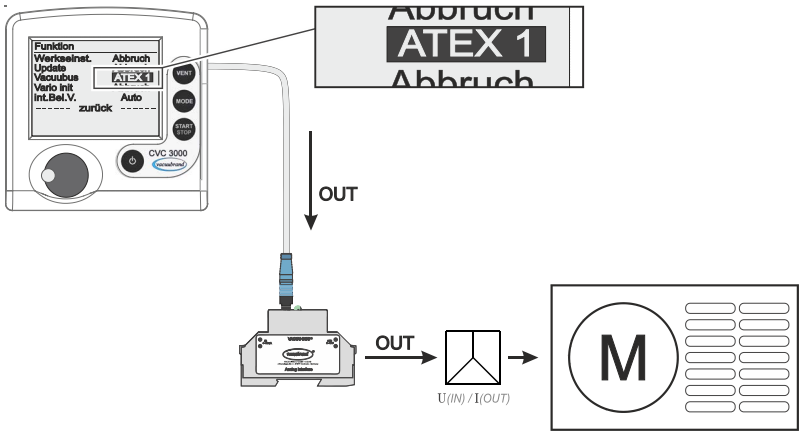
Meaning Output signal for motor speed as analog voltage 0–10 V for ATEX VARIO motor [1500 U/min]
+ Input measure signal 4–20 mA.



Meaning address ATEX 1 (–3)

VACUU·BUS component	Adress-N°	Abbreviation at controller
ATEX VARIO pump *[1500 U/min]*	1 (–3)	ATEX _

Meaning Output signal for motor speed as analog voltage 0–10 V for ATEX VARIO motor [1500 U/min], input signal sensor switched off.



1 → *See online manual 999151 (CVC 3000) for detailed descriptions about address list and assignment.*

By changing the address in the controller the analog module can also be used for other purposes, e. g., as plain motor control.
VACUU·BUS® address assignment for an analog module is only possible via a controller CVC 3000.

6.3 Ordering information

Ordering information

Analog module	Order-N°
Analog I/O module 4-20 mA/0-10 V VACUU·BUS®	20635425
Instructions for use	20901205

Spare parts	Order-N°
Isolation amplifier IN 0–10 V, OUT 4–20 mA	20635426
VACUU·BUS® cable (plug/open wire), 2m	20612586
Supply isolation amplifier IN/OUT 4–20 mA	20635427
ATEX sensor, accuracy 0.1 % FSO	20635423
ATEX sensor, accuracy < 0.5 % FSO	20635424
Vacuum controller CVC 3000 without sensor, without wall power supply	20636559
Wall power supply kit for controller	20612090

Source of supply

International sales offices and specialized trade

Purchase original accessories and spare parts from your specialized distributor or through international sales offices of **VACUUBRAND GMBH + CO KG**.

- ⇨ Information about the complete product range are available in the current product catalog.
- ⇨ For orders, questions about vacuum control and optimal accessories, please contact your specialized distributor or an international sales office of **VACUUBRAND GMBH + CO KG** .

6.4 Index

6.5 Declaration of Conformity – China RoHS 2

VACUUBRAND GMBH + CO KG has made reasonable efforts to ensure that hazardous materials and substances may not be used in its products.
In order to determine the concentration of hazardous substances in all homogeneous materials of the subassemblies, a “Product Conformity Assessment” (PCA) procedure was performed. As defined in GB/T 26572 the “Maximum Concentration Value” limits (MCV) apply to these restricted substances:

- Lead (Pb): 0.1%
- Mercury (Hg): 0.1%
- Cadmium (Cd): 0.01%
- Hexavalent chromium (Cr(+VI)): 0.1%
- Polybrominated biphenlys (PBB): 0.1%
- Polybrominated diphenyl ether (PBDE): 0.1%

Environmentally Friendly Use Period (EFUP)

EFUP defines the period in years during which the hazardous substances contained in electrical and electronic products will not leak or mutate under normal operating conditions. During normal use by the user such electrical and electronic products will not result in serious environmental pollution, cause serious bodily injury or damage to the user’s assets.
The Environmentally Friendly Use Period for VACUUBRAND products is 40 years.

此表格是按照SJ/T 11364-2014中规定所制定的。
This table is created according to SJ/T 11364-2014.

MATERIAL CONTENT DECLARATION FOR VACUUBRAND PRODUCTS							
	有毒有害物质或元素 Hazardous substances						
部件名称 Part name	铅 Pb	汞 Hg	镉 Cd	六价铬 Cr(+VI)	多溴联苯 PBB	多溴二苯醚 PBDE	环保期限标识 EFUP
包装 Packaging	O	O	O	O	O	O	
塑料外壳 / 组件 Plastic housing / parts	O	O	O	O	O	O	
真空油 Vacuum oil	O	O	O	O	O	O	
电池 Battery	O	O	O	O	O	O	
玻璃 Glass	X	O	O	O	O	O	
电子电气组件 Electrical and electronic parts	X	O	O	O	O	O	
控制器 / 测量设备 Controller / measuring device	X	O	O	O	O	O	
金属外壳 / 组件 Metal housing / parts	X	O	O	O	O	O	
电机 Motor	X	O	O	O	O	O	
配件 Accessories	X	O	O	O	O	O	

注释： 此表格适用于所有产品。以上列出的元件或组件不一定都属于所附产品的组成。
Note: Table applies to all products. Some of the components or parts listed above may not be part of the enclosed product.

O: 表示该有毒有害物质在该部件所有均质材料中的含量均在GB/T 26572规定的限量要求以下。
O: Indicates that the above mentioned hazardous substance contained in all homogeneous materials of the part is below the required limit as defined in GB/T 26572.

X: 表示该有毒有害物质至少在该部件某一均质材料中的含量超出GB/T 26572规定的限量要求。
X: Indicates that the above mentioned hazardous substance contained in at least one of the homogeneous materials of this part is above the required limit as defined in GB/T 26572.

除上表所示信息外，还需声明的是，这些部件并非是有意用铅（Pb）、 汞 （Hg）、铬（Cd）、六价铬（Cr(+VI)）、多溴联苯（PBB）或多溴二苯醚（PBDE）来制造的。
Apart from the disclosures in the above table, the subassemblies are not intentionally manufactured or formulated with lead (Pb), mercury (Hg), cadmium (Cd), hexavalent chromium (Cr+VI), polybrominated biphenyls (PBB), and polybrominated diphenyl ethers (PBDE).

Products manufactured by VACUUBRAND may enter into further devices (e.g., rotary evaporator) or can be used together with other appliances (e.g., usage as booster pumps).
With these products and appliances in particular, please note the EFUP labeled on these products.
VACUUBRAND will not take responsibility for the EFUP of those products and appliances.

Place, date: Wertheim, 06/04/2020

(Dr. F. Gitmans)
Managing Director

i.A.
(Dr. A. Wollschläger)
Regulatory Affairs Manager

VACUUBRAND GMBH + CO KG
Alfred-Zippe-Str. 4
97877 Wertheim
Germany

Tel.: +49 9342 808-0
Fax: +49 9342 808-5555
E-Mail: info@vacuubrand.com
Web: www.vacuubrand.com

vacuubrand

Technology for Vacuum Systems

Manufacturer:
VACUUBRAND GMBH + CO KG
Alfred-Zippe-Str. 4
97877 Wertheim
GERMANY

Phone:
- Head office +49 9342 808-0
- Sales +49 9342 808-5550
- Service +49 9342 808-5660

Fax: +49 9342 808-5555
E-Mail: info@vacuubrand.com
Web: www.vacuubrand.com

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