

Limit switch box

bar-valve&switch

Installation and operating manual



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General information

This operating manual is a part of the unit. The operating manual must be kept over the entire lifetime of the unit. The operating manual must be passed to any subsequent owner of the unit.

In addition to this operating manual, the generally applicable, statutory and other regulations and legal provisions – as well as those of the operator's land – and all valid environmental protection regulations must also be observed! The locally applicable regulations of the professional association or other supervisory authorities must be always observed!

Reference documents

This manual, the data mentioned and design data sheets, additional assembly and maintenance instructions as well as further information also in other language versions, can be obtained from:

bar pneumatische
Steuerungssysteme GmbH

Auf der Hohl 1
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Fax: +49 (0)2644-960735

Email: bar-info@wattswater.com
www.bar-gmbh.de

Safety instructions and warnings

Read this operating manual carefully before the commissioning and follow all instructions. In this manual, various kinds of safety instructions and warnings are used:

DANGER

... indicates an immediate danger. Failure to observe this instruction can result in death or serious injury.

WARNING

... indicates a threatening danger. Failure to observe this instruction may result in serious injuries or property damage.

CAUTION

... indicates a threatening danger. Failure to observe this instruction may result in serious injuries or property damage.

NOTE

... indicates notes and tips for a better understanding of the instruction or an improved handling of the device.

Scope of application

This operating manual applies to the bar-valve&switch, a module of Valve-Controlsystems bar-vacotrol. It is addressed to the user of the device, that is the person that works on and with the device. This is not a technical manual. For questions that go beyond the contents of this manual, please call our customer service.

Copyright

The unit and this manual are protected by copyright. Reproduction without permission will be prosecuted. We reserve all rights to this operating manual, even the rights of reproduction and/or duplication in any imaginable way, e.g., by photocopying, printing, on any data recording media or in translated form. Reproduction of this manual is only permitted with the written authorization of bar GmbH.

The technical status at the time of delivery of the unit and manual is decisive, if no other information is given. We reserve the right to make technical changes without special announcement. Previous manuals become invalid. The general conditions of sales and delivery of bar GmbH are applicable.

Exclusion of liability

We guarantee the faultless functioning of our product in accordance with our advertising, with the product information given by us and with these instructions. Further product properties are not guaranteed. We assume no liability for the efficiency and error-free operation if the product is used differently than described in the section „Intended use“.

Compensations for damages are generally excluded, unless the intent or gross negligence on the part of bar GmbH is proven, or if promised product features are not available. If this product is used in environments for which it is not appropriate or do not comply with the technical standards, then bar GmbH is not responsible for the consequences.

We accept no liability for damage to equipment and systems in the surroundings of the product, which is caused by a defect of the product or in this manual. We are not responsible for the infringement of patents and/or other rights of third parties outside the Federal Republic of Germany.

We are not liable for damages caused by improper operation and non-compliance with the instructions in this manual. We are not liable for lost profits and consequential damages caused by non-compliance with safety and warning notes. We accept no liability for damage caused by the use of accessories and/or wearing parts that have not been delivered or certified by bar GmbH.

The products of bar GmbH are designed for a long service life. They correspond to the state of the art in science and technology and were individually checked in all functions. before delivery. The electrical and mechanical design meets the applicable standards and guidelines. bar GmbH performs constantly tests of the products and the market in order to stimulate the continuous development and improvement of their products.

In the event of faults or technical problems, please contact the customer service listed on the last page. Appropriate actions will be taken immediately. The warranty conditions of bar GmbH shall apply, which we would be pleased to send to you on request.

Designated use

The end position indicator valve&switch is a device for the optical display and electrical feedback of end positions of rotary actuators that operate industrial valves. Shortly before reaching the end positions,

an electrical signal, e.g., for feedback to the process control center, is generated.

Any other use of this device is considered to be improper use. If you have questions, or want to use the device for any other purpose, please contact our customer service. We can help you with any possible necessary configurations.

Warranty

The warranty conditions of bar GmbH shall apply, which we would be pleased to send to you on request in the frame of our general terms of business.

bar GmbH performs constantly studies of the products and the market in order to stimulate the continuous development and improvement of their products. The products of bar GmbH are designed for a long service life. They correspond to the state of the art in science and technology and were individually checked in all functions before delivery. The electrical and mechanical design meets the applicable standards and guidelines.

We guarantee the faultless functioning of our product in accordance with our advertising, with the product information published by us and with these instructions. Further product properties are not guaranteed. We assume no liability for the efficiency and error-free operation if the product is used differently than described in the operating manual.

For this device, we assume the guarantee for faultless quality for a period of twelve months as part of our warranty conditions. Wearing parts are excluded from this warranty. The claim expires if interventions are made by unauthorized persons who have

not been authorized for this purpose by bar GmbH. If this product is used in environments for which it is not appropriate or do not comply with the technical standards, then we are not responsible for the consequences.

Within the warranty period we repair damages or defects, without charge, which can be traced back to faulty manufacturing, if they are reported immediately to us after their discovery, at the latest however within twelve months after delivery. The service takes place at our discretion by free repair of defective parts or replacement by faultless parts.

Compensation for damages are generally excluded, unless the intent or gross negligence on the part of bar GmbH is proven, or if promised product features are not available.

If the purchaser is entitled to claim compensation for damages, it expires at the end of the applicable period of limitations. The same applies to claims from the customer in connection with measures to prevent damage (e.g., product recalls). In case of claims for damages under the Product Liability Act, the legal provisions for limitation periods apply.

bar GmbH accepts no liability for damage to equipment and systems in the surroundings of the product, which is caused by a defect of the product or in this manual. We are not responsible for the infringement of patents and/or other rights of third parties outside the Federal Republic of Germany.

In the event of faults or technical problems, please contact our customer service. We assure you that appropriate actions will be taken immediately.

Send the units for which a guarantee is claimed, freight prepaid, and with a copy of the invoice or delivery note to bar GmbH. Contact our customer service before returning.

Obligations of the customer

The operator of this unit must ensure that only persons who

- know the rules of occupational safety and accident prevention
- have been trained in the operation of this unit
- have read and understood this manual completely

Persons who operate this unit are obliged

- to observe all the rules of occupational safety and accident prevention
- to read this manual completely.

Authorised personnel

Persons are regarded as authorized, who have a completed professional training, technical experience, and knowledge of relevant standards and guidelines, and are able to assess the tasks assigned to them and to recognize dangers early.

Operator of the valve&switch:

Persons are regarded as authorized, who were trained in the operation of the bar-valve&switch and have read and understood this manual completely.

Personnel for installation and maintenance:

Persons are regarded as authorized, who were trained in all matters of the end position feedback and have read and understood this manual completely.

Functional description

The opto-electrical position indicator bar-valve&switch is self-adjusting. The device was specially designed for direct installation.

The electrical connection is made to terminal strips inside the device.

The pneumatic connection of the valve&switch is made directly on the housing due to the internal solenoid valves.

The valve&switch is built on the top of the drive

- with bridge on drives with interface according to VDI/VDE 3845 by means of tubing or piping on the air connections of the drive
- or directly on the actubar drive type.

Technical data

Technical data	
Materials	<ul style="list-style-type: none"> • Housing: GD-ALSi 10 Mg (die-cast aluminum) • Screws: A2-70 (stainless steel) • Inspection window: PC • Light guide: TPE • Cable connection: PA
Pivoting angle	up to 180°
Connection voltage	<ul style="list-style-type: none"> • Mechanical switch: Max. 250 V/AC, continuous current max. 1 A • Inductive switch: 10–36 V/DC • Solenoid valves: 24 V/DC
Switch function	<ul style="list-style-type: none"> • Mechanical: CO-contact • Inductive: 3-wire connection, PNP, N/O contact, 2-wire connection, DC PNP/NPN, N/O-N/C contacts, programmable
Mounting dimensions	80 x 30 mm (2xM5) or 130 x 30 (2xM5)
Protection type	IP67
Mounting position	any
Ambient temperature	-10 °C to +50 °C
Ambient humidity	10 – 90 %, not condensing
Weight	approx. 1.1 kg
Cable entry	Cable gland: M20x1.5 ø 7–13 mm, 1.5 mm ² , Any cable length Optional: 5-pole M12 connector
Pneumatic connection	G-1/8"
Operating pressure	2.5 to 8 bar
Air quality	Filtered air according to DIN ISO 8573-1/class 4

Version overview

VH2-	D2-	3L-	D-	HN-	XXX
	D2 = inductive proximity switch 10–36 V DC PNP N/O contact / M2 = microswitch (CO-contact)	3L = switch design 3-wire connection / 2L = switch design 2-wire connection	D = 5/2-way valve for double-acting actuators / E = 3/2-way valve for single-acting actuators	Optional: manual override	Optional: DAE – Pressure compensation element / M12 – Sensor/ actuator socket Specific customer designs

Conformity

The end position feedback bar-valve&switch conforms to the applicable European directives

- 2014/65/EU Niederspannungsrichtlinie / Low voltage directive
- 2011/63/EU Beschränkung bestimmter gefährlicher Stoffe / Restriction of certain hazardous substances (RoHS)

is provided with the CE mark. We will be happy to send you the full declaration of conformity on request.

Delivery and unpacking

Delivery check

The device is delivered by bar GmbH and transported by an appropriate transport company or parcel service. At the time of delivery to you, you must check:

- Does the number of delivered transport containers correspond to the delivery note of bar GmbH?
- Is the packaging free of visible damage?
- Are the unit and accessories free of visible damages?
- Are there evidences of not gentle handling during the transport (e.g., burns, scratches, colour)?

To have all the right for claim against the transport company, you have to document the possible transport damages (e.g., with photographs and a written protocol) before unpacking the unit. bar GmbH is not responsible for transport damages and can take over no liability for that.

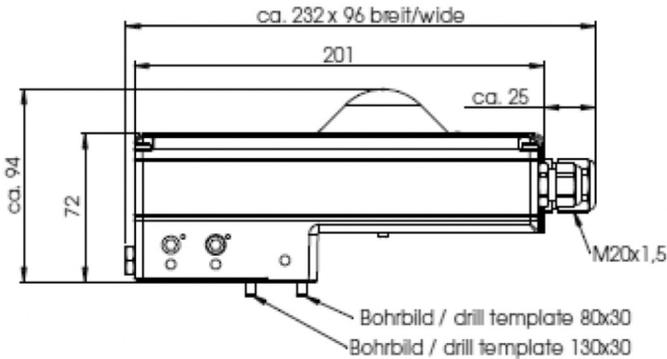
Scope of delivery

Carefully remove the transport packaging. Please observe all laws and regulations regarding the disposal of packaging materials.

Check the delivery against the delivery note and the order documents. Report any differences immediately to bar GmbH. Later complaints with regard to incomplete delivery cannot be accepted.

Installation, pneumatic connection, electrical connection and commissioning

Installation of the valve&switch



⚠ WARNING

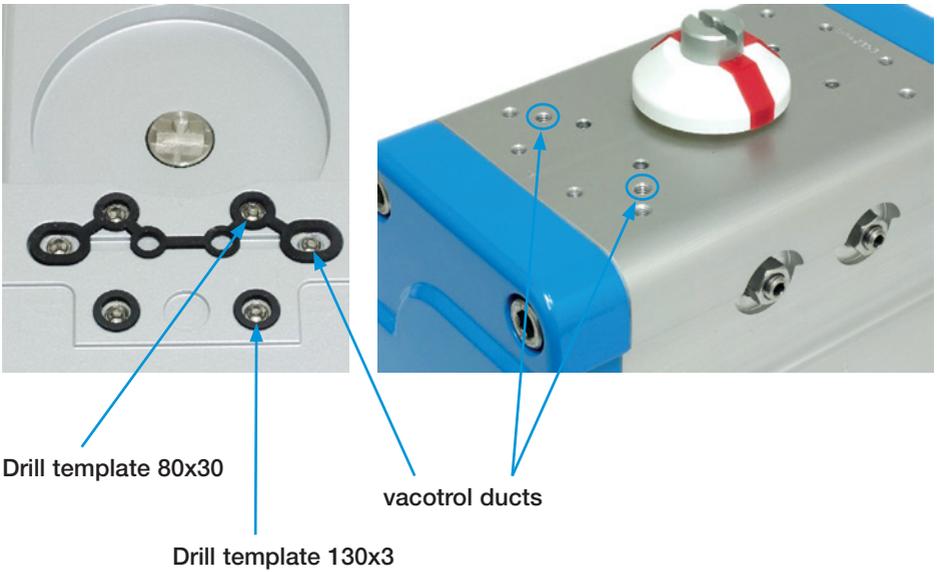
The installation must be carried out by qualified personnel. Otherwise there is a risk of incorrect installation.

- Mount/remove the screw plugs according to the desired drill template on the underside of the housing
- Mount/remove the screw plugs of the air ducts if the valve&switch is mounted on an actuator of the actubar type with Vacotrol interface.

⚠ WARNING

Check all screw connections (screw plugs, throttles and silencers) for tight fit before connecting a pressure line. Otherwise there is a risk of parts being thrown out.

- Remove the protective film and glue in the sealing strip and sealing rings as shown in the figure. In order to achieve optimal adhesion, the contact surface should be cleaned and degreased.

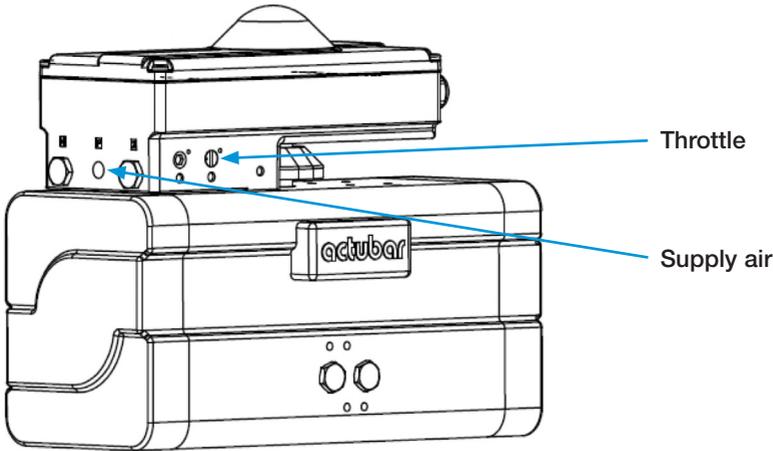


- Open the valve&switch and place it on the rotary actuator.
- Make sure that no dust, dirt and moisture can penetrate into the opened housing of the valve&switch during installation and commissioning.
- Insert the pin of the position indicator into the corresponding groove of the rotary actuator.
- Fix the valve&switch using the supplied mounting material.
- Attach the position indicator and ensure that the symbols and the valve function match.
- When putting on the housing cover, note its installation direction.

Pneumatic connection

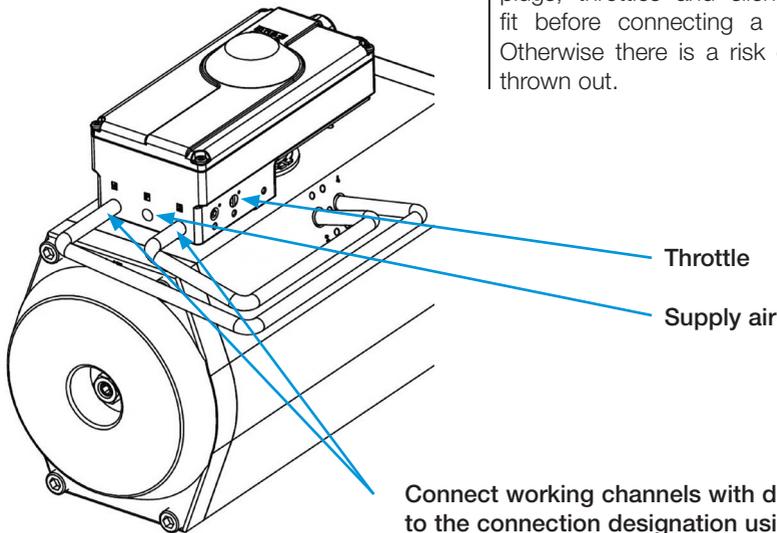
valve&switch on actuator type actubar:

Supply air connection valve&switch G-1/8"



valve&switch on actuator types according to VDI/VDE 3845:

Supply air connection valve&switch G-1/8"



WARNING

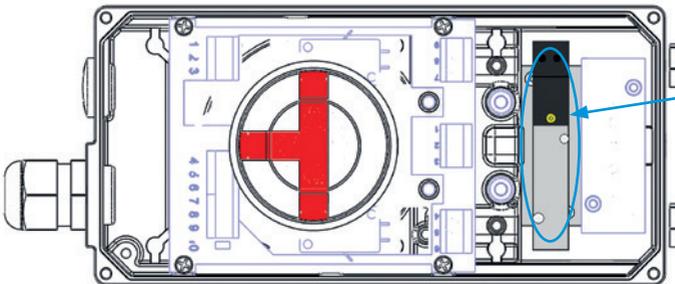
Check all screw connections (screw plugs, throttles and silencers) for tight fit before connecting a pressure line. Otherwise there is a risk of parts being thrown out.

Selecting the basic or switching position

The valve&switch for double-acting actuators is equipped with a monostable valve. As standard, channel 2 (inner chamber of the actuator) is vented when the valve is not actuated. For the actuator type actubar, the basic position of the actuator is approached in case of a signal or power failure. If you want to move to the switch position of the actuator in case of a power failure or when the valve is not activated, the switching valve including the mounting plate in the housing must be rotated by 180° and fastened (only valid for double-acting actuators!).

WARNING

Disconnect the compressed air supply beforehand and ensure that the drive and supply line to the valve&switch have been vented. Otherwise there is a risk of parts being thrown out!

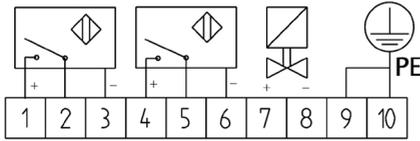


Standard installation position of the valve for double-acting actuators.

Electrical connection

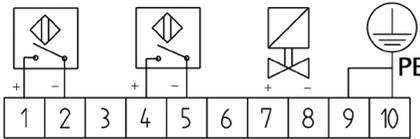
Function circuit diagram

3-wire connection



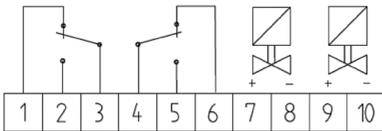
valve closed valve open

2-wire connection



valve closed valve open

Microswitch



valve closed valve open

WARNING

The electrical installation may only be performed by qualified personnel. Otherwise there is a risk of electric shock.

Commissioning

1. Open the lid of the bar-valve&switch.
2. Press the position indicator (a) with your thumbs and pull the plastic washer (b) upwards. The switching cams automatically swivel into the home position. The device is now ready for automatic self-adjustment.
3. Switch the rotary actuator 1 x in each direction.
4. The switching points are now set.
5. Check whether the position indicator corresponds to the valve position. If not, carefully pull the position indicator (a) up and out and put it back into the holder in the correct position.
6. Switch on the supply voltage.
7. Check electrically whether the signals are present at the terminals in the end positions of the drive. If not, repeat steps 1–6 and check all electrical connections.
8. Close the lid, check that the lid seal is correctly seated and tighten the fastening screws on the lid.
9. When all tests have been passed successfully, installation and commissioning are complete.

WARNING

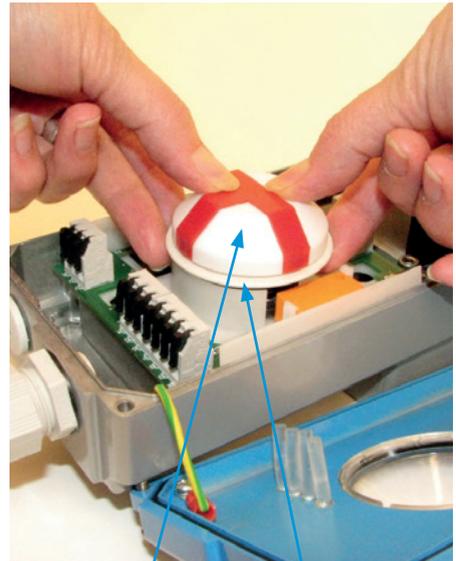
The installation must be carried out by qualified personnel. Otherwise there is a risk of incorrect installation.

WARNING

Check all screw connections (screw plugs, throttles and silencers) for tight fit before connecting a pressure line. Otherwise there is a risk of parts being thrown out.

CAUTION

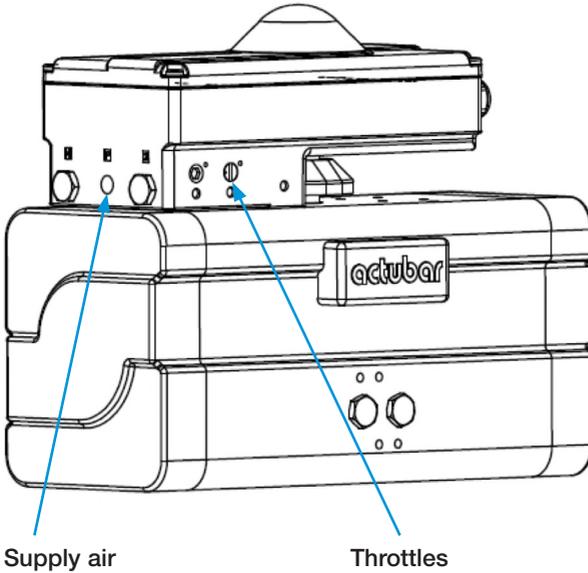
After every change to the end positions and after modifications to the drive, steps 1–9 must always be carried out.



a: Position indicator

b: Plastic washer

Setting the end positions and the actuating speed



Set the actuating speed of the actuator with the throttles on the housing.

Standard setting: at least 5 seconds swivel time for 90° actuating angle

NOTE

Do not close the throttles completely, otherwise the drive cannot function.

CAUTION

Each time the end positions are changed and after modifications to the drive, it must be reinitialized.

Optional accessories

Manual override

The internal solenoid way valve can be operated without opening the cover of the housing, if required during commissioning, in an emergency or in manual mode. For this purpose, the solenoid valve can be activated by touching or latching with a ball lock pin via the guide sleeve embedded in the housing cover.

The guide sleeve is closed with a protective cap when it is not activated.

Ball lock pins and protective caps are secured against loss. If the protective cap is correctly attached, the degree of protection IP67 is maintained.

NOTE

Do not close the throttles completely, otherwise the drive cannot function.



Pressure compensation element DAE

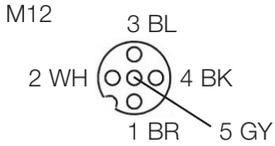
The end position feedback bar-valve&switch has degree of protection IP67 and can be provided with a pressure compensation element for air conditioning the interior.



M12 connector for valve connection

M12 connector can be used for quick connection of the valve.

Standard wiring:



Pin 3 - 24 V DC
Pin 4 + 24 V DC
Pin 5 Earth / GND
Pin 1,2 not connected



Individual wiring possible according to customer requirements.

Troubleshooting

Error description	Possible cause	Troubleshooting
The actuator makes no movement	<ol style="list-style-type: none"> 1. Pressure line not properly connected 2. Solenoid valves not properly connected 3. Control air in the drive cannot escape 	<ol style="list-style-type: none"> 1. Check the pressure line. 2. Check solenoid valve wiring. 3. Reduce the degree of throttling at the throttle screws.
End positions are not displayed	Incorrect initialization of the device	Reinitialize

Cleaning and maintenance

Cleaning	Maintenance
⚠ CAUTION	⚠ CAUTION
Never use abrasive cleaners or substances to clean the housing of the valve&switch. This can cause damages to the inspection window or paint.	Only open the device for installation and adjustment purposes. Violations can cause damages to the device and the loss of any warranty claims.
Clean the casing of the valve&switch with a clean, slightly damp cloth.	The valve&switch is a maintenance-free device.
For persistent dirt, use a mild commercial household cleaners as instructed on the packaging of the cleaner.	For defects occurring within the warranty period, remove the valve&switch and send the device to the address specified at the end of the operating instructions after having arranged this via phone.

The bar products are comprehensively tested. The company bar therefore only guarantees the replacement or – at its sole discretion – the free repair of those components of the delivered products which, in the opinion of bar, have demonstrable manufacturing defects. Warranty claims due to defects or defects of title can be asserted within one (1) year from delivery/transfer of risk. Excluded from the warranty are damages due to normal product use or friction as well as damages due to changes or unauthorized repairs to the products for which bar rejects any claim for damages (direct or indirect). (Please refer to our website for detailed information.) All deliveries are subject to the General Conditions of Sale which can be found at www.bar-gmbh.de.

The descriptions and images contained in this product data sheet are for informational purposes only and are not guaranteed. bar GmbH reserves the right to make technical and constructive changes to its products without prior notice.

Warranty: All purchases and sales contracts expressly require the Purchaser to accept the General Terms and Conditions of Sale and Delivery which can be found on www.bar-gmbh.de/agb. bar GmbH hereby objects to any deviating or additional condition to the General Terms and Conditions of Sale and Delivery which has been communicated to the Purchaser in any form without the written consent of a bar GmbH representative.



A **WATTS** Brand

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