



# Buhler ADB81/91 Series

ADJUSTABLE DEPTH BEARING  
TEMPERATURE SENSORS



INSTALLATION INSTRUCTIONS

## OPERATION MANUAL

Part No.'s - ADB81xV3AI/B, ADB91xV3AI/B

[www.go4b.com](http://www.go4b.com)

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Dear 4B Customer:

Congratulations on your purchase. 4B appreciates your business and is pleased you have chosen our products to meet your needs.

Please read in its entirety and understand the literature accompanying the product before you place the product into service. Please read the safety precautions carefully before operating the product. With each product you purchase from 4B, there are some basic but important safety considerations you must follow to be sure your purchase is permitted to perform its design function and operate properly and safely, giving you many years of reliable service. Please read and understand the Customer Safety Responsibilities listed below. Failure to follow this safety directive and the Operation Manuals and other material furnished or referenced, may result in serious injury or death.

### **SAFETY NOTICE TO OUR CUSTOMERS**

- A. In order to maximize efficiency and safety, selecting the right equipment for each operation is vital. The proper installation of the equipment, and regular maintenance and inspection is equally important in continuing the proper operation and safety of the product. The proper installation and maintenance of all our products is the responsibility of the user unless you have asked 4B to perform these tasks.
- B. All installation and wiring must be in accordance with Local and National Electrical Codes and other standards applicable to your industry. The installation of the wiring should be undertaken by an experienced and qualified professional electrician. Failure to correctly wire any product and/or machinery can result in the product or machine failing to operate as intended, and can defeat its design function.
- C. Periodic inspection by a qualified person will help assure your 4B product is performing properly. 4B recommends a documented inspection at least annually and more frequently under high use conditions.
- D. Please see the last page of this manual for all warranty information regarding this product.

### **CUSTOMER SAFETY RESPONSIBILITIES**

#### **1. READ ALL LITERATURE PROVIDED WITH YOUR PRODUCT**

Please read all user, instruction and safety manuals to ensure that you understand your product operation and are able to safely and effectively use this product.

#### **2. YOU BEST UNDERSTAND YOUR NEEDS**

Every customer and operation is unique, and only you best know the specific needs and capabilities of your operation. Please go to [www.go4b.com](http://www.go4b.com) or call the 24-hour hotline at +1-309-698-5611 for assistance with any questions about the performance of products purchased from 4B. 4B is happy to discuss product performance with you at any time.

### **3. SELECT A QUALIFIED AND COMPETENT INSTALLER**

Correct installation of the product is important for safety and performance. If you have not asked 4B to perform the installation of the unit on your behalf, it is critical for the safety of your operation and those who may perform work on your operation that you select a qualified and competent electrical installer to undertake the installation. The product must be installed properly to perform its designed functions. The installer should be qualified, trained, and competent to perform the installation in accordance with local and national electrical codes, all relevant regulations, as well as any of your own standards and preventive maintenance requirements, and other product installation information supplied with the product. You should be prepared to provide the installer with all necessary installation information to assist in the installation.

### **4. ESTABLISH AND FOLLOW A REGULAR MAINTENANCE AND INSPECTION SCHEDULE FOR YOUR 4B PRODUCTS**

You should develop a proper maintenance and inspection program to confirm that your system is in good working order at all times. You will be in the best position to determine the appropriate frequency for inspection. Many different factors known to the user will assist you in deciding the frequency of inspection. These factors may include but are not limited to weather conditions; construction work at the facility; hours of operation; animal or insect infestation; and the real-world experience of knowing how your employees perform their jobs. The personnel or person you select to install, operate, maintain, inspect or perform any work whatsoever, should be trained and qualified to perform these important functions. Complete and accurate records of the maintenance and inspection process should be created and retained by you at all times.

### **5. RETAIN AND REFER TO THE OPERATION MANUAL FOR 4B'S SUGGESTED MAINTENANCE AND INSPECTION RECOMMENDATIONS**

As all operations are different, please understand that your specific operation may require additional adjustments in the maintenance and inspection process essential to permit the monitoring device to perform its intended function. Retain the Operation Manual and other important maintenance and service documents provided by 4B and have them readily available for people servicing your 4B equipment. Should you have any questions, please call go to [www.go4b.com](http://www.go4b.com) or call the 24-hour hotline at +1-309-698-5611.

### **6. SERVICE REQUEST**

If you have questions or comments about the operation of your unit or require the unit to be serviced please contact the 4B location who supplied the product or send your request go to [www.go4b.com](http://www.go4b.com) or call the 24-hour hotline at +1-309-698-5611. Please have available product part numbers, serial numbers, and approximate date of installation. In order to assist you, after the product has been placed into service, complete the online product registration section which is accessed via our website [www.go4b.com](http://www.go4b.com).

## PRODUCT OVERVIEW

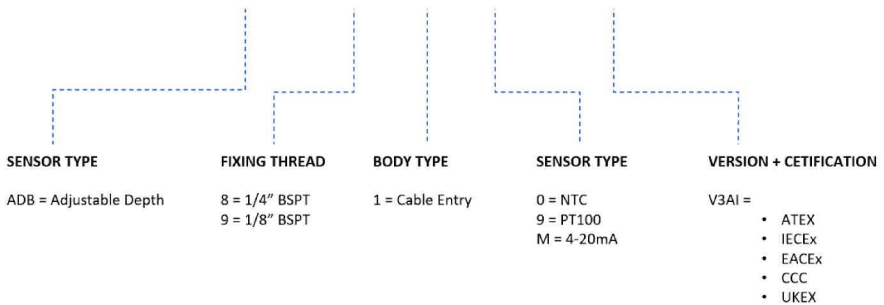
The ADB series can be used on any application where bearing temperature monitoring is required. They have been designed to allow the depth of the probe to be adjustable depending on the application. Probes are available in 50, 100, 200 and 300mm length (special order lengths available on request).

The sensors screw directly into the bearing housing using the existing grease zerk. The body of the ADB has a grease zerk, allowing lubrication of the bearing without the need to remove the sensor. The ADB style sensors are available with a standard NTC thermistor for 4B's Hotbus and Watchdog systems, or a PT100 - RTD type for PLC and DCS systems. Both types allow for continuous temperature monitoring.

ADB cable connections are not polarity sensitive, so no special connection requirements are needed.

## PRODUCT SELECTION

# ADB X X X V3AI/B



# SPECIFICATIONS

## ADBx10V3AI - NTC Sensors

Resistance at 25° C -	10,000 Ohms
Resistance at 60° C -	3,043 Ohms
Resistance at 90° C -	1,264 Ohms
Sensing Voltage -	5 to 24 VDC
Current Draw -	1 mA (Max. Recommended)
Maximum Power -	120 mW at 25° C (77° F)
Body Housing -	304 Stainless Steel
Fixing Thread -	ADB8 = 1/4" BSPT, ADB9 = 1/8" BSPT
Cable -	3m; 2 conductors; custom length available on request
Operating Temperature -	Minimum: -30° C (-22° F) Maximum: 105° C (220° F)

## ADBx19V3AI - PT100 / RTD Sensors

Resistance at 25° C -	109.73 Ohms
Resistance at 60° C -	123.24 Ohms
Resistance at 90° C -	134.70 Ohms
Temp. Coefficient -	3850 PPM/K (385)
Sensing Voltage -	5 to 24 VDC
Current Draw -	1 mA (Max. Recommended)
Maximum Power -	1mW
Body Housing -	304 Stainless Steel
Fixing Thread -	ADB8 = 1/4" BSPT, ADB9 = 1/8" BSPT
Cable -	3m; 4 conductors; custom length available on request
Operating Temperature -	Minimum: -30° C (-22° F) Maximum: 105° C (220° F)

## SPECIAL CONDITIONS FOR SAFE USE

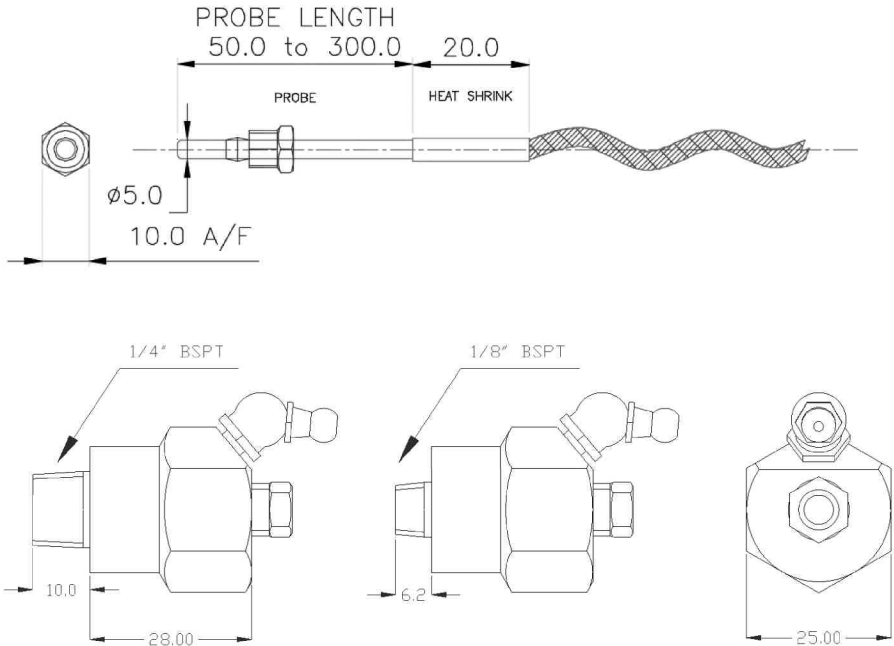
If not used with the ATEX approved 4B temperature monitors the power supply to the sensor shall be rated for a prospective short circuit current of 10 KA.

The supply to the equipment MUST NOT exceed +24 VDC.

If the supply leads are terminated in a hazardous area, the termination arrangement must comply with the Zone/Category/EPL of the hazardous area that it is to be installed.

## DIMENSIONS

The dimensions that appear in the image below represents the Sensor Adjustable Depth Probe. Regarding the Sensor Body size, it is describe in the bottom image.



### WARNING

Rotating machinery can cause serious injury or death  
Always lockout and tagout the machine prior to installation

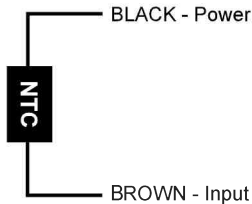


## STANDARD WIRING DIAGRAM

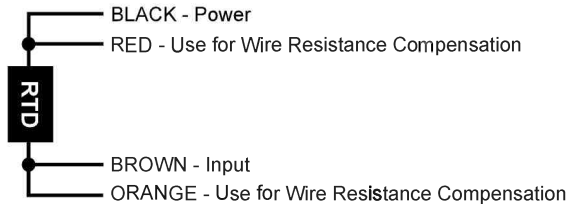
All wiring must be in accordance with local and national electrical codes and should be undertaken by an experienced and qualified electrician.

Always use dust/liquid tight flexible metal conduit with approved fittings to protect the sensor cables. Use rigid metal conduit to protect the cables from the sensors to the control unit. Conduit systems can channel water due to ingress and condensation directly to sensors and sensor connections which over time will adversely affect the performance of the system. As such, the installation of low point conduit drains is recommended for all sensors.

All ADB sensors are non-polarity sensitive, however 4B recommends wiring the sensors as outlined below. For PT100 - RTD sensors, the resistance compensation wire used will be dependent on the application. For example some PLC's may require three wires, others may use all four.



**NTC WIRING**






**PT100 - RTD WIRING**

### **WARNING**

Do not wire the sensor across the voltage source directly. Always ensure that the sensor is wired into a signal conditioning circuit for the temperature measurement. Please note that if the power applied across the sensor exceeds the specified maximum rated power or current, then the sensor may be damaged beyond repair. When properly wired to 4B controllers, the power rating across the sensors is kept at a safe level.

## APPROVALS

ATEX	Baseefa09ATEX0231X  II 1D Ex ta IIIC T <sub>200</sub> 125°C Da IP65/66* Tamb -40°C to +60°C*
IECEX	IECEX BAS 09.0111X Ex ta IIIC T <sub>200</sub> 125°C IP65/66* Tamb -40°C to +60°C*
CCC	CQC-2020012315351289 Ex tD A20 IP65 T125°C
EACEX	RU C-GB.Aж58.B.00330/20  Ex ta IIIC T125°C Da X OT -40 до +60 IP65
UKEX	BAS21UKEX0308X  II 1D Ex ta IIIC T <sub>200</sub> 125°C Da IP65/66* Tamb -40°C to +60°C*

\* Dependant on product.

## INSTALLATION

1. Remove the existing grease zerk from the bearing housing.
2. Loosen the ADB probe nut and remove the sensor probe.
3. Screw the ADB sensor body in to the 1/8" BSPP threaded hole in the bearing housing.
4. Re-insert the temperature probe into sensor body, and adjust the probe depth to suit the bearing. For optimum temperature monitoring, the probe should be as close to the outer race as possible without touching (Figures A and B).

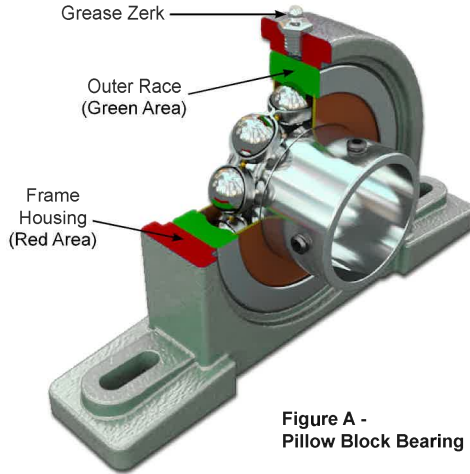


Figure A -  
Pillow Block Bearing Cutaway

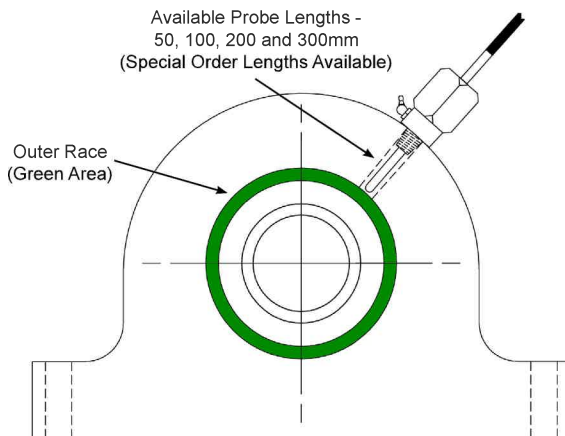


Figure B -  
ADB Sensor Installation

## TESTING & COMMISSIONING

1. Check that the unit is correctly installed.
2. 4B's ADB Sensor Tester can be used as a diagnostic tool to verify the alarm and shutdown sequences of the control unit are functioning as expected.
3. Contact 4B for any questions regarding installation issues if sensor does not perform as expected.



ADB Bearing Sensor Tester

The ADB Sensor Tester has been designed to test 4B adjustable depth bearing (ADB) temperature sensors in the field. This hand held test unit features an integrated heating block specifically designed to have a 4B ADB sensor directly inserted. With integral controls and temperature display, the unit heats the sensor to the desired trip point, and allows quick and easy real life testing of the sensor and temperature monitoring system.

During planned maintenance or periodic testing, the ADB Sensor Tester can be used as a diagnostic tool to verify the alarm and shutdown sequences of the control unit are functioning as expected. To test, the heater block should be set above the control units alarm operating temperature. Remove the ADB bearing sensor probe from the housing and insert it into the heater block. As the heater block reaches the alarm temperature, the ADB sensor will relay this data to the control unit, allowing you to verify that the alarm and shutdown sequences run as expected. When testing is complete, reinstall the probe back into the bearing housing.



### WARNING

If the system does not immediately shutdown as expected or alarm as required, then remove the machine from service until the problem has been diagnosed and corrected.

# PRODUCT WARRANTY

## 1. EXCLUSIVE WRITTEN LIMITED WARRANTY

All products sold are warranted by the company 4B Components Limited, 4B Braime Components Limited, and 4B France herein after referred to as 4B to the original purchaser against defects in workmanship or materials under normal use for one (1) year after date of purchase from 4B. Any product determined by 4B at its sole discretion to be defective in material or workmanship and returned to a 4B branch or authorized service location, as 4B designates, shipping costs prepaid, will be, as the exclusive remedy, repaired or replaced at 4B's option.

## 2. DISCLAIMER OF IMPLIED WARRANTY

No warranty or affirmation of fact, expressed or implied, other than as set forth in the exclusive written limited warranty statement above is made or authorized by 4B. 4B specifically disclaims any liability for product defect claims that are due to product misuse, abuse or misapplications, as authorized by law, 4B specifically disclaims all warranties that the product is fit or merchantable for a particular purpose.

## 3. NO WARRANTY "BY SAMPLE OR EXAMPLE"

Although 4B has used reasonable efforts to accurately illustrate and describe the products in its catalogs, literature, and websites, such illustrations and descriptions are for the sole purpose of product identification and do not express or imply a warranty affirmation of fact, of any kind or a warranty or affirmation of fact that the products will conform to their respective illustrations or descriptions. 4B expressly disclaims any warranty or affirmation of fact, expressed or implied, other than as set forth in the exclusive written limited warranty statement above, including, without limitation, the implied warranties of merchantability and fitness for a particular purpose.

## 4. LIMITATION OF DAMAGES

Any liability for consequential, incidental, special, exemplary, or punitive damages, or for loss of profit whether direct or indirect, is expressly disclaimed.

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With subsidiaries in North America, Europe, China, Asia, Africa and Australia along with a worldwide network of distributors, 4B can provide practical solutions for all your applications no matter the location.



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