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Thank you for purchasing the BA11 Active Junction Box. Please read this Instruction Manual carefully before installing and using the BA11 Active Junction Box.

Please also read the instructions that are associated with the sensors and devices you are connecting the junction box to. The purpose of these user’s manuals is not to warrant that the product is well suited to any particular purpose but rather to describe the functional details of the product.

No part of the user’s manuals may be transferred or reproduced without prior written consent from Yokogawa Process Analyzers (hereafter simply referred to as YOKOGAWA). YOKOGAWA reserves the right to make improvements in the user’s manuals and product at any time, without notice or obligation. If you have any questions, or you find mistakes or omissions in the user’s manuals, please contact our sales representative or your local distributor. Some drawings may be partially emphasized, simplified, or omitted, for the convenience of description.

1. Introduction

1-1. Unpacking and Checking
Upon delivery, unpack the BA11 Active Junction Box carefully and inspect it to ensure that it is not damaged during shipment. If damage is found, retain the original packing material and immediately notify the owner and the relevant local Yokogawa Sales office. Make sure the Model Code and Serial Number on the BA11 are the same as on the packing list. Also check if option(s) that were ordered, are included and correct.

1-2. Warranty and Service
Yokogawa products are guaranteed free from defects in workmanship and materials under normal use and service for a period of (typically) 12 months from the date of shipment from the manufacturer. Individual Sales organizations can deviate from the typical warranty period, and the conditions of sale relating to the original purchase order should be consulted. Damage caused by wear and tear, inadequate maintenance, corrosion, or by the effects of chemical processes is excluded from this warranty coverage. In the event of a warranty claim, the defective goods should be sent (freight paid) to the Service Department of the relevant Yokogawa Sales office for replacement (at Yokogawa’s discretion).

The following Information must be included in the letter accompanying the returned goods:
• Model Code and Serial Number
• Original Purchase Order and Date
• Length of time in service
• Description of the fault and circumstances of the failure
• Process/environmental conditions that may be related to the failure of the sensor.
• Statement as to whether warranty or non-warranty service is requested
• Complete shipping and billing instructions for return of material, plus the name and phone number of a contact person that can be reached for further information

1-3. Serial Number definition
The Serial Number is defined by nine (9) alphanumeric characters:
\[ X_1, X_2: \text{Production Location} \]
\[ X_3, X_4: \text{Year/Month code} \]
\[ X_5, X_6, X_7, X_8, X_9: \text{Tracking number} \]

Example: N3P600028
See table 1 and 2.
Table 1: Production Year code

<table>
<thead>
<tr>
<th>Year</th>
<th>Year code</th>
<th>Year</th>
<th>Year code</th>
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</thead>
<tbody>
<tr>
<td>2014</td>
<td>P</td>
<td>2027</td>
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<td>2015</td>
<td>R</td>
<td>2028</td>
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<tr>
<td>2016</td>
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<td>2017</td>
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</tr>
<tr>
<td>2026</td>
<td>3</td>
<td>2039</td>
<td>G</td>
</tr>
</tbody>
</table>

Table 2: Production Month code

<table>
<thead>
<tr>
<th>Month</th>
<th>Month code</th>
</tr>
</thead>
<tbody>
<tr>
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<td>February</td>
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<td>3</td>
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<tr>
<td>August</td>
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<tr>
<td>September</td>
<td>9</td>
</tr>
<tr>
<td>October</td>
<td>A</td>
</tr>
<tr>
<td>November</td>
<td>B</td>
</tr>
<tr>
<td>December</td>
<td>C</td>
</tr>
</tbody>
</table>

1-4. Safety Precautions

In order to protect the system controlled by the product and the product itself and ensure safe operation, observe the safety precautions described in this user’s manual. We accept no liability for safety if users fail to observe these instructions when operating the product. If this instrument is used in a manner not specified in this user’s manual, the protection provided by this instrument may be impaired. If any protection or safety circuit is required for the system controlled by the product or for the product itself, prepares it separately.

Be sure to use the spare parts defined by YOKOGAWA for replacement. Modification of the product is strictly prohibited because it may be hazardous to operate. Please contact Yokogawa before making any repair or modification.

The following safety symbols are used on the product as well as in this manual.

⚠️ **WARNING**

This symbol indicates that an operator must follow the instructions laid out in this manual in order to avoid the risks, for the human body, of injury, electric shock, or fatalities. The manual describes what special care the operator must take to avoid such risks.

Product Disposal

The instrument should be disposed of in accordance with local and national legislation/regulations.

1-5. Warning and Disclaimer

The product is provided on an “as is” basis. YOKOGAWA shall have neither liability nor responsibility to any person or entity with respect to any direct or indirect loss or damage arising from using the product or any defect of the product that YOKOGAWA cannot predict in advance.

1-6. Copyright and Trademark Notices

The copyrights of online manual are reserved. The online manual is protected against modification by the PDF security, however it can be output via a printer. Printing out the online manual is only allowed for the purpose of using the product. When using the printed information of the online manual, check if the version read is the most recent one.

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We do not use TM or ® mark to indicate those trademarks or registered trademarks in this user’s manual.
2. Specifications

The main function of BA11 is auto switching of 120 Ω line termination at RS-485 bus to keep the communication balanced when Modbus slave device is disconnected. The BA11 box detects if a Modbus slave device is connected to the port (J1..J4). If not, the communication terminator is connected. If a Modbus slave is connected to a port (J1..J4), the terminator is disconnected automatically.

2-1. Environment and operational conditions

- Power supply voltage: +2.7 VDC to +5.5 VDC
- Max. power consumption*: < 30 mW (@ +5.5 VDC, without connection of field devices)
- Operational temperature: -20°C to +55°C (-5°F to +130°F).
- Storage Temperature: -30°C to +70°C (-20°F to +160°F)
- Maximum ambient humidity: 93% at +40°C (+100°F) (non-condensing)

**Note:** Total power consumption depends on number of Field Devices and the amount of Modbus registers read from individual Field Device in time.

**Other**
- NEMA classification: Type 4X (acc. NEMA 250:2014)

**Mechanical**
- Size (LxWxH): 150 x 64 x 34 mm (5.9 x 2.5 x 1.3 inch)
- Color: Grey (RAL 7001)
- Material: Aluminium Die Cast housing
- Applicable torque on cover screw (to meet IP66): Min. 1.1 Nm Max. 2.5 Nm
- Applicable torque on conn. screw (to meet IP66): 0.25 Nm
- Mounting options: /UM Universal Mounting

**Connection**
- Bus-Input (BUS-IN): M9 5-pin male connection to Modbus HOST/Master (e.g. FLXA 402).
- Bus-Output (BUS-OUT): M9 5-pin female connection (for future application purpose)
- Field device Inputs (J1..J4): M9 5-pin female connection.

All connections have to be used with the correct Yokogawa WU11 Interconnection cable up to a length of 100 meter (328 ft).
2-2. Regulatory standards

**CE**
(768/2008/EC)
By applying:

**EMC Directive**
(2014/30/EU)
By applying:
- IEC 61326-1:2012 Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 1: General requirements.
  Emission: Class B, control and laboratory use.
  Immunity: For use in industrial locations.
- EN 61326-1:2013 Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 1: General requirements.
  Emission: Class B, control and laboratory use.
  Immunity: For use in industrial locations.
- CISPR 11:2015 Industrial, scientific and medical equipment – Radio-frequency disturbance characteristics Limits and methods of measurement.
  Emission: Radiated emission up to 1 GHz (SAC).
  Emission: Radiated emission up to 1 GHz (SAC).

**LVD Directive**
(2014/35/EU)
By applying:
- IEC/EN 61010-1:2010 Safety requirements for electrical equipment for measurement, control and laboratory use.
- IEC 61010-2-030:2017 Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 2-030: Particular requirements for testing and measuring circuits.
- EN 61010-2-030:2010 Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 2-030: Particular requirements for testing and measuring circuits.

**RoHS 2 Directive**
(2011/65/EU)
By applying:
- EN 50581:2012 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.

**Compliancy**
- AS/NZS CISPR 11
- KC Registration of broadcasting and communication equipment KCC-R-R-YPA-BA11

**Recommendations and guidelines**

**NAMUR**
Precompliance checked by applying:
- NAMUR NE21: 2017 Electromagnetic compatibility (EMC) of industrial process and laboratory.

**NEMA**
Compliance checked by applying:
2-3. External dimensions and pin assignment of connectors

Figure 1. Dimensions BA11 Active Junction Box

<table>
<thead>
<tr>
<th>WU11 cable pin description</th>
<th>Male connector</th>
<th>Female connectors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Data–</td>
<td><img src="image" alt="Male Connector" /></td>
<td><img src="image" alt="Female Connectors" /></td>
</tr>
<tr>
<td>2 Data+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Supply+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Shield</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Supply–</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 2. Connection assignment
3. Notes on Handling

3-1. Safe use of this product

**WARNING**

- The BA11 should only be used with equipment that meets the relevant EU, American, Canadian, and Japanese standards. Yokogawa accepts no responsibility for the misuse of this unit;
- The BA11 is packed carefully with shock absorbing materials, nevertheless, the BA11 may be damaged or broken if subjected to strong shock, such as if the BA11 is dropped. Please handle with care;
- The BA11 contains devices that can be damaged by electrostatic discharge. When servicing the BA11, please observe proper procedures to prevent such damage;
- Do not use an abrasive or organic solvent in cleaning the BA11.

The BA11 is an IEC/EN61326-1 Class A product, and it is tested for use in the industrial environment.

4. Preparation

4-1. Installation

The BA11 Active Junction Box is used to allow multiple Modbus Terminal/Slave units (e.g. SENCOM SA modules) to a Master/Host unit.

Before use, remove the dust caps of the applicable connectors.

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**Figure 3. Example of system configuration**
4-2. Mounting options for BA11 Active Junction Box
The BA11 Active Junction Box can be mounted on a wall, pipe or backside of FLXA402 analyzer. Mounting materials can be ordered as option (/UM) or as spare part (K1548PM).

4-2-1. Instructions for mounting BA11 Active Junction Box on the bracket

1. Open the lid of BA11 by unscrewing the four M4 screws.
2. Fasten BA11-base firmly on the mounting bracket using two M4x16 screws and M4 nuts.
3. Place the lid on the BA11-base and fasten the four M4 screws using 1.1 - 2.5 Nm torque.

4-2-2. Instructions for pipe mounting

Refer to 4-2-1 for bracket mounting. Fasten the assembled BA11 together with the bracket on the pipe using M8 U-bolt, 2x M8 washers and two M8 nuts delivered with /UM mounting set.
8

4-2-3. Instructions for wall mounting

Refer to 4-2-1 for bracket mounting. Fasten the assembled BA11 together with the bracket on
the wall using the set of two 8x50 anchors and 6.3x50 screws delivered with /UM mounting set.

Note: The wall on which BA11 is mounted should be strong enough to bear the weight of
more than 8 kg (17.64 pound).

4-2-4. Instructions for mounting at backside of FLXA402 analyzer

Refer to 4-2-1 for bracket mounting. Fasten the assembled BA11 together with the bracket
on the FLXA402 transmitter (refer to IM document of the exact model of FLXA402 transmitter for
the proper torques at M8 screws).

5. Model code

<table>
<thead>
<tr>
<th>Model</th>
<th>Suffix Code</th>
<th>Option code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA11</td>
<td>-C</td>
<td>-M9</td>
<td>Active Junction Box</td>
</tr>
<tr>
<td>Material</td>
<td></td>
<td>/UM</td>
<td>Aluminium alloy, epoxy coating</td>
</tr>
<tr>
<td>Type</td>
<td>-AA</td>
<td></td>
<td>General purpose</td>
</tr>
<tr>
<td>Connection type</td>
<td>-M9</td>
<td>/UM</td>
<td>M9 male/female connectors, 5 pins</td>
</tr>
<tr>
<td>Options</td>
<td></td>
<td></td>
<td>Universal mounting set</td>
</tr>
</tbody>
</table>

6. Spare parts

<table>
<thead>
<tr>
<th>Spare part</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>K1548PM</td>
<td>/UM universal mounting set for BA11</td>
</tr>
</tbody>
</table>
Appendix 1. EU Declaration of Conformity

We: Yokogawa Process Analyzers Europe B.V.
Euroweg 2, 3825 HD Amersfoort
The Netherlands

Herewith declare under our sole responsibility that the product, model: BA11
further specified with model suffix- and option codes: As listed in Annex-1 in this document
is manufactured in accordance with the requirements for CE-marking of products as stated in EC Decision:

768/2008/EC on a common framework for the marketing of products

by applying the following standards:

EN-ISO 9001: 2015 Quality management systems - Requirements

Subject product is:
- Produced according to appropriate quality control procedures. The CE-mark has been affixed on
  the product in 2018 for the first time.
- In compliance with the essential requirements of the specific product legislation:
  - EMC Directive 2014/30/EU by applying the following standards:
    EN 61326-1: 2013 Electrical equipment for measurement, control and laboratory use – EMC
    requirements – Part 1: General requirements.
    Emission: Class B, control and laboratory use.
    Immunity: For use in industrial locations.
    characteristics Limits and methods of measurement.
    Emission: Radiated emission up to 1 GHz (SAC).
  - LVD Directive 2014/35/EU by applying the following standards:
    EN 61010-1: 2010 Safety requirements for electrical equipment for measurement, control and
    laboratory use – Part 1: General requirements.
    EN 61010-2-030: 2010 Safety requirements for electrical equipment for measurement, control, and
    laboratory use - Part 2-030: Particular requirements for testing and measuring
    circuits.
  - RoHS 2 Directive 2011/65/EU by applying the following standards:
    EN 50581: 2012 Technical documentation for the assessment of electrical and electronic
    products with respect to the restriction of hazardous substances.

If applicable, the product is checked against the latest official released revision of the standards mentioned
above; differences do not affect the certified product identified on this declaration.

Amersfoort – April 01, 2019

S. Kiyono
General Manager
Yokogawa Process Analyzers Europe B.V.
Appendix 2. IM Protection of Environment

Protection of Environment (Use in China)

This manual is valid only in China.

产品中有害物质的名称及含量

<table>
<thead>
<tr>
<th>部件名称</th>
<th>砷 (Pb)</th>
<th>汞 (Hg)</th>
<th>铅 (Cr)</th>
<th>六价铬 (Cr VI)</th>
<th>多溴联苯</th>
<th>多溴联苯醚</th>
</tr>
</thead>
<tbody>
<tr>
<td>传导器</td>
<td>X</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>电线</td>
<td>X</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

○：表示该有害物质在该部件所有均质材料中的含量均在SJ/T11364规定的要求限值以下。
X：表示该有害物质在该部件某一均质材料中的含量超出了SJ/T11364规定的限量要求。

环保使用期限：该产品是基于SJ/T11364，在中国（不包括台湾，香港，澳门）销售的电子电器产品适用的环保使用期限。

只要遵守产品上关于安全及使用上的注意事项，从制造之日起计算在该期限内，不会发生电池内部物质外泄，突然爆炸，对环境或人体以及其他财产产生重大影响的情况。

（注）该年限是《环保使用期限》，不是产品的保修期限。另外，关于替换部件的推算替换周期，请阅读使用说明书。

Production date

关于生产日期

生产日期在产品铭牌上9位数的序列号中，用以下形式表示生产日期。

从左数第3位数：生产年份
1:2024; 2:2025; 3:2026，……

从左数第4位数：生产月份
1:1月，2:2月，3:3月，4:4月，9:9月，A:10月，B:11月，C:12月

（示例）N157090001：2016年7月

Subject to change without notice

Yokogawa has an extensive sales and distribution network. Please refer to the European website (www.yokogawa.com/eu) to contact your nearest representative.