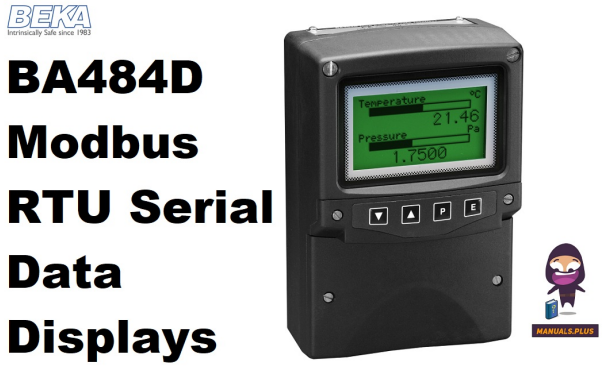


beka BA484D Modbus RTU Serial Data Displays Owner's Manual

Contents

BEKA
Intrinsically Safe since 1983

beka BA484D Modbus RTU Serial Data Displays

Specifications

- **Model:** BA484D, BA488C
- **Mounting:** Field mounting for BA484D, panel mounting for BA488C
- **Material:** BA484D – GFK with separate connection space, IP66; BA488C – Noryl and aluminum with IP66 front panel
- **Power Supply and Communication:** Intrinsically Safe

Product Usage Instructions

Installation for BA484D (Field Mounting):

1. Ensure the area is suitable for field mounting.
2. Securely mount the device, ensuring proper alignment.
3. Connect the necessary cables to the designated ports.

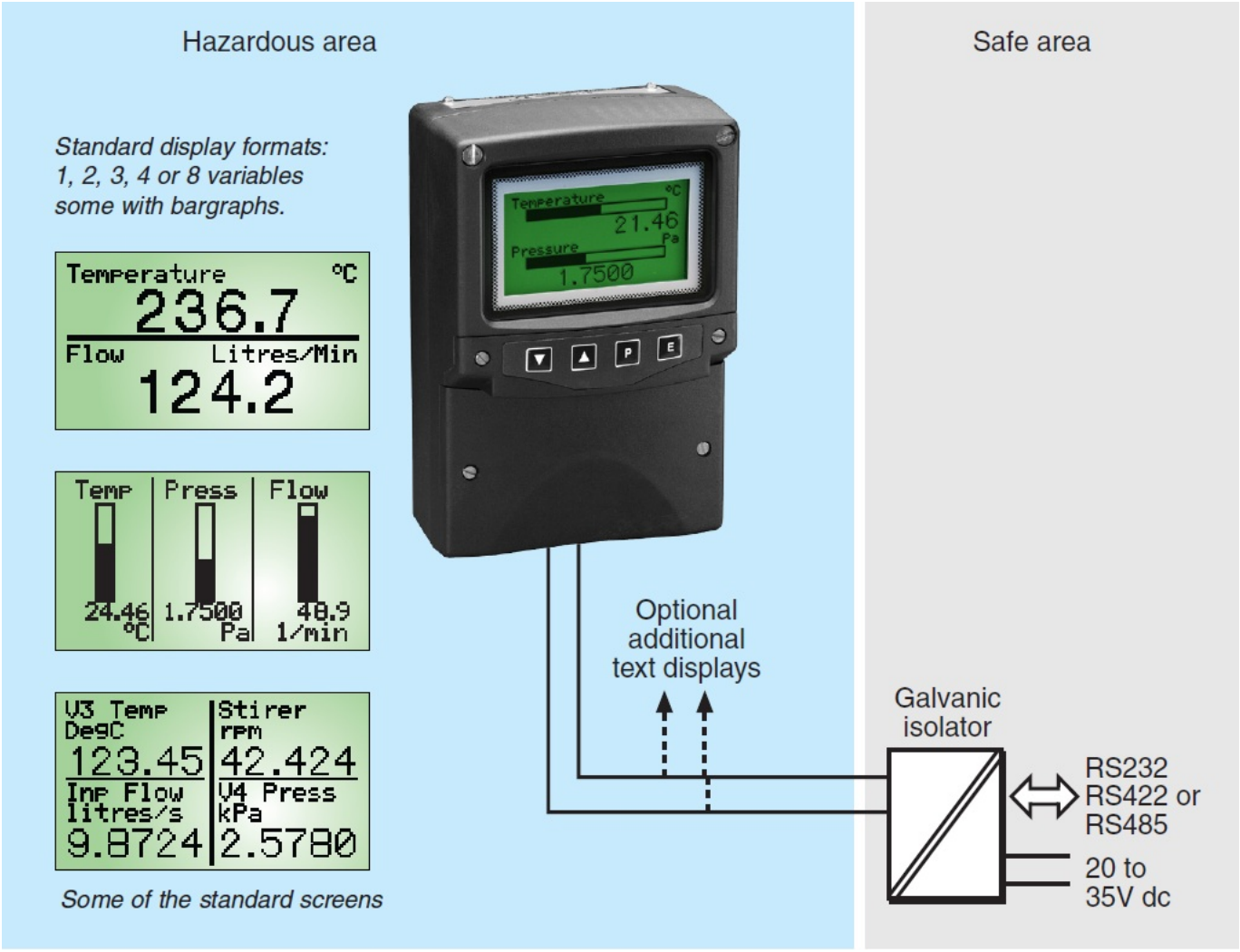
Installation for BA488C (Panel Mounting):

1. Prepare the panel for mounting according to the provided dimensions.
2. Mount the device on the panel securely.
3. Connect the required cables to the appropriate ports.

Data Display:

- The BA484D and BA488C models feature a clear display for data visualization.

PRODUCT DISPLAY



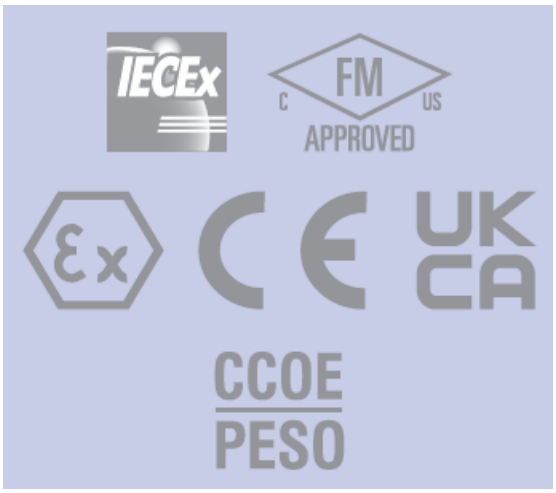
- The BA484D is an intrinsically safe instrument that can display text and simple graphics in a hazardous area. Incorporating six push-buttons and two solid state outputs, the BA484D is a low cost operator interface ideal for simple machine and process control applications. Incorporating Modbus RTU, BEKA and Legacy protocol the instrument may be used for new installations or to upgrade existing intrinsically safe systems.
- Data and power are supplied via a 2 wire serial data link from a BEKA BA201 galvanic isolator in the safe area. The BA201 has RS232 and RS485 ports and can power and communicate with one or two serial text displays, or three displays in a three wire system.
- The high contrast liquid crystal display incorporates a green backlight that is powered by the serial data link enabling the display to be read in all lighting conditions from full sunlight to total darkness.
- Four push-buttons which may be used for operator acknowledgments or controls are included below the display. If larger industrial switches are required, up to six external push-buttons may be connected to the text display. When the remote switches are activated, the front panel push-buttons are automatically disabled.
- Two isolated switch outputs, which are controlled via the serial data link, comply with the requirements for simple apparatus and may be used to switch almost any certified intrinsically safe device such as a sounder, beacon or a valve.
- Eleven selectable standard screen formats display one, two, three, four or eight variables, with units of measurement, tag descriptions and bargraphs on some screens. The use of a standard display screen format greatly simplifies system design.

- The BA484D is a Modbus RTU slave that can display up to eight process variables together with units of measurement and tag descriptions. When used with one of the eleven standard screen formats, no programming is required apart from setting the
- BA484D communication parameters and writing each Modbus variable into the BA484D Modbus register address map. If a custom screen layout is required in a Modbus system this can be constructed using the BEKA protocol.
- BEKA protocol enables custom screen formats to be designed and stored in non-volatile memory using a wide selection of lines, boxes, bargraphs and fonts. Although screens can be manually designed, free BEKA ScreenWriter software which will run on a PC simplifies the process.
- Legacy protocol enables the BA484D to replace an MTL643 to provide ATEX certification and a display backlight. No software or galvanic isolator changes are required.
- IECEx, ATEX, UKEX , FM, & cFM intrinsic safety certification allows installation in most gas and dust hazardous areas. Both solid state outputs comply with the requirements for simple apparatus and may be used to switch almost any certified intrinsically safe device such as a sounder, beacon or a valve.
- Scripts are a sequence of commands, downloaded to and stored in non-volatile memory by the BA484D text display, that can be executed by the instrument without intervention from the host. For example a routine may be written to monitor the instruments push-buttons and to change the displayed screen or variable depending upon which button has been operated.
- Pattern matching is a powerful feature that allows the BA484D to capture and display data contained in a proprietary ASCII serial string, such as that from a weighing system or barcode reader primarily intended for printing.
- The enclosure which is moulded in glass reinforced polyester (GRP), has stainless steel fittings, silicone gaskets and an armoured glass window. Its robust construction provides IP66 protection. A separate terminal compartment allows the BA484D to be installed and terminated without exposing the display electronics.
- To simplify system design the instruction manual is supplemented by comprehensive Modbus and programming guides plus a free instrument simulator which will run on a PC. All are available from the BEKA sales office or may be downloaded from **www.beka.co.uk**.

FEATURE

BA484D Modbus RTU display Serial Data display
Intrinsically safe for use in gas and dust hazardous areas

- Intrinsically safe
- High contrast display with backlight.
- Modbus RTU slave
- BEKA and Legacy protocols.
- 11 standard screen formats.
- Four operator push-buttons & two switch outputs.
- IP66 field mounting GRP enclosure.
- Free simulator and ScreenWriter software.
- 3 year guarantee **www.beka.co.uk/ba484d**.



SPECIFICATION

- **Display**
  - **Type** 120 x 64 pixel liquid crystal.
  - **Size** 86.5mm x 45mm.
  - **Backlight** Powered from serial link.
- **Screens**
  - **Standard format** 1, 2, 3, 4 or 8 variables plus bargraph can include: units of measurement and tag information
  - **Custom format** See Programming Guide ASCII character set, 5 font sizes
  - **Hidden** screen May be written to at any time and displayed when required.
- **Controls**
  - **Front panel** Four push-buttons which can be software interrogated.
  - **External switches** Control may be transferred to six external switches, front panel buttons are inhibited. Switch cable length 5m max
- **Outputs**
  - **Contacts** Two software controlled switch outputs. Contacts Isolated single pole solid state switch certified as simple apparatus.
  - **Intrinsic safety parameters**
    - **Ron** less than 5Ω + 0.7V
    - **Roff** greater than 1MΩ
    - **Ui** = 28Vdc
    - **Ii** = 200mA
    - **Pi** = 0.85W
- **Data transmission**
  - **Baud rate** 0.3, 0.6, 1.2, 2.4, 4.8, 9.6 or 19.2k bps.*
  - **Cable length 100m** max at Baud rate of 9.6k bps* between isolator(s) & BA484D. *Depends upon configuration & type of cable – see instruction manual.
  - **Format** 1 or 2 stop bits; odd, even or no parity bit; 7 or 8 data bits.
  - **Protocol** Selectable Modbus RTU, BEKA or Legacy that is compatible with the MTL643 & MTL644
- **Address**

Modbus protocol	1 – 247	Zero reserved for single instrument applications
BEKA protocol	0 – 247	
Legacy protocol	0 – 15	

- **Intrinsic safety**
  - **International IECEx**

Code	Ex ia IIC T5 Ga (Tamb = -40 to 60°C)	*Dust option, see How to order*
or	Ex ia IIIC T80°C Db (Tamb = -40 to 60°C) IP66	

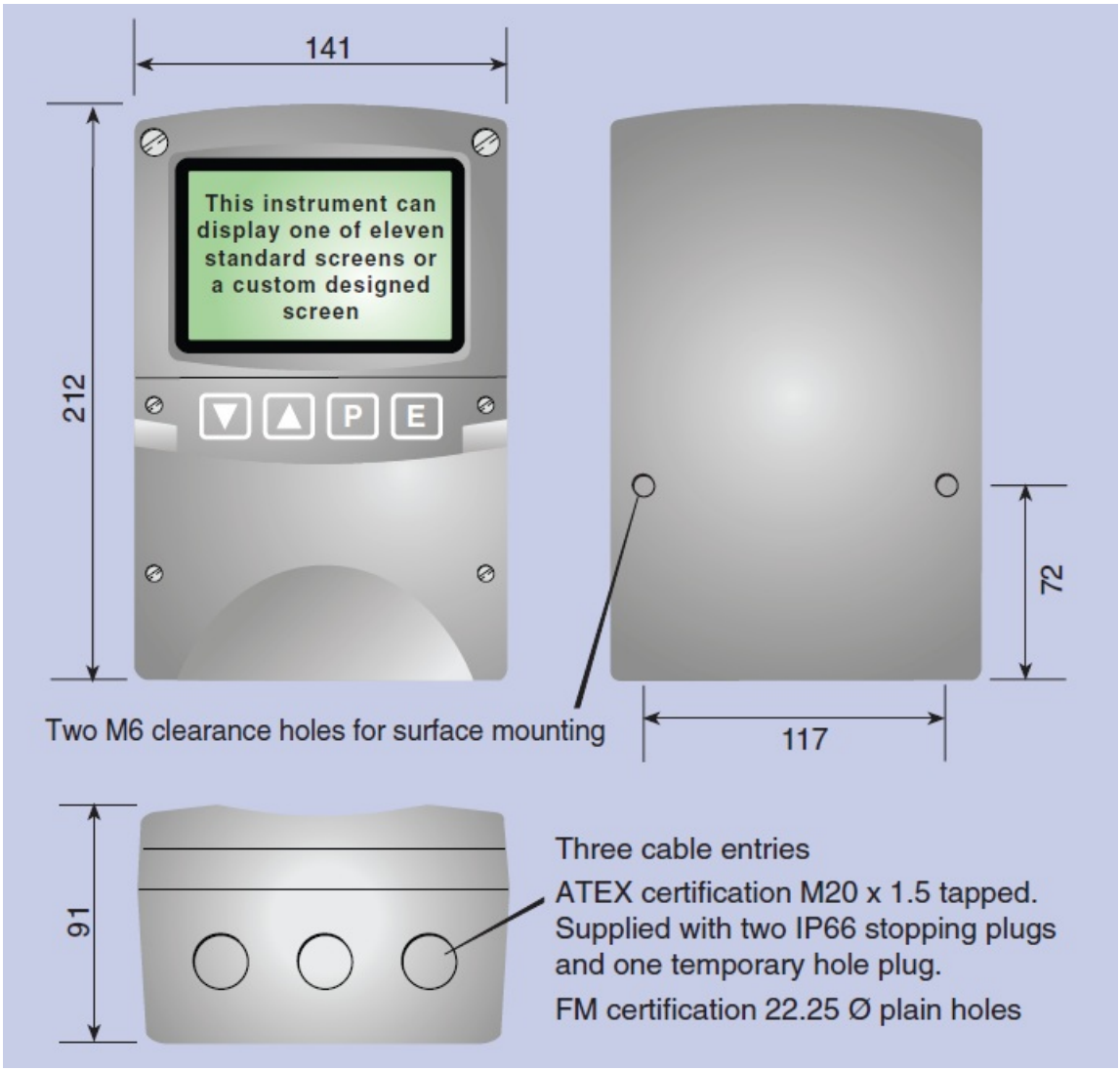
  - **Cert. No.** IECEx ITS 07.0020
- **Europe ATEX and UKEX**

Code	Group II Category 1G Ex ia IIC T5 Ga (Tamb = -40 to 60°C)	*Dust option, see How to order*
or	Group II Category 2D Ex ia IIIC T80°C Db (Tamb = -40 to 60°C) IP66	

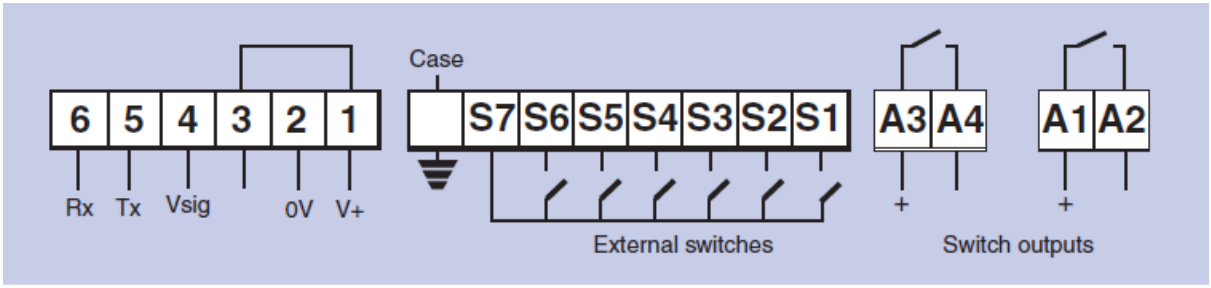
  - **Cert. No.s** ITS02ATEX2035 & ITS21UKEX0078
  - **Location** Gas Zone 0, 1 or 2: Dust Zone 21 or 22
  - **Interface** BA201 (See datasheet)
- **USA** FM Option, see How to order
  - **Standard** 3610 Entity
  - **Code** CL I, II, III: Div 1: GP A, B, C, D, E, F & G T4 @ 60°C
  - **File** 3025514
  - **Standard** 3611 Nonincendive
  - **Code** CL I: Div 2: GP A, B, C & D, T4 @ 60°C
  - **CL II,** III: Div 2: GP E F & G, T4 @ 60°C
  - **File** 3025514
- **Canada cFM**
  - File No. 3032633C
  - India CCOE/PESO As ATEX – see certificate
- **Environmental**
  - **Operating temp** -20 to 60°C (ATEX gas certification -40 to 60°C)
  - **Storage temp** -40 to 85°C
  - **Humidity** To 95% @ 40°C
  - **Enclosure** IP66
  - **EMC** Complies with EU and UK Directives
- **Mechanical**
  - **Terminals** Screw clamp for 0.5 to 1.5mm² cable.
  - **Weight** 1.6kg
- **Accessories**
  - Stainless legend plate Stainless steel plate etched with tagging or applicational information secured to the front of the instrument
  - Pipe mounting kit BA392D or BA393

DIMENSIONS

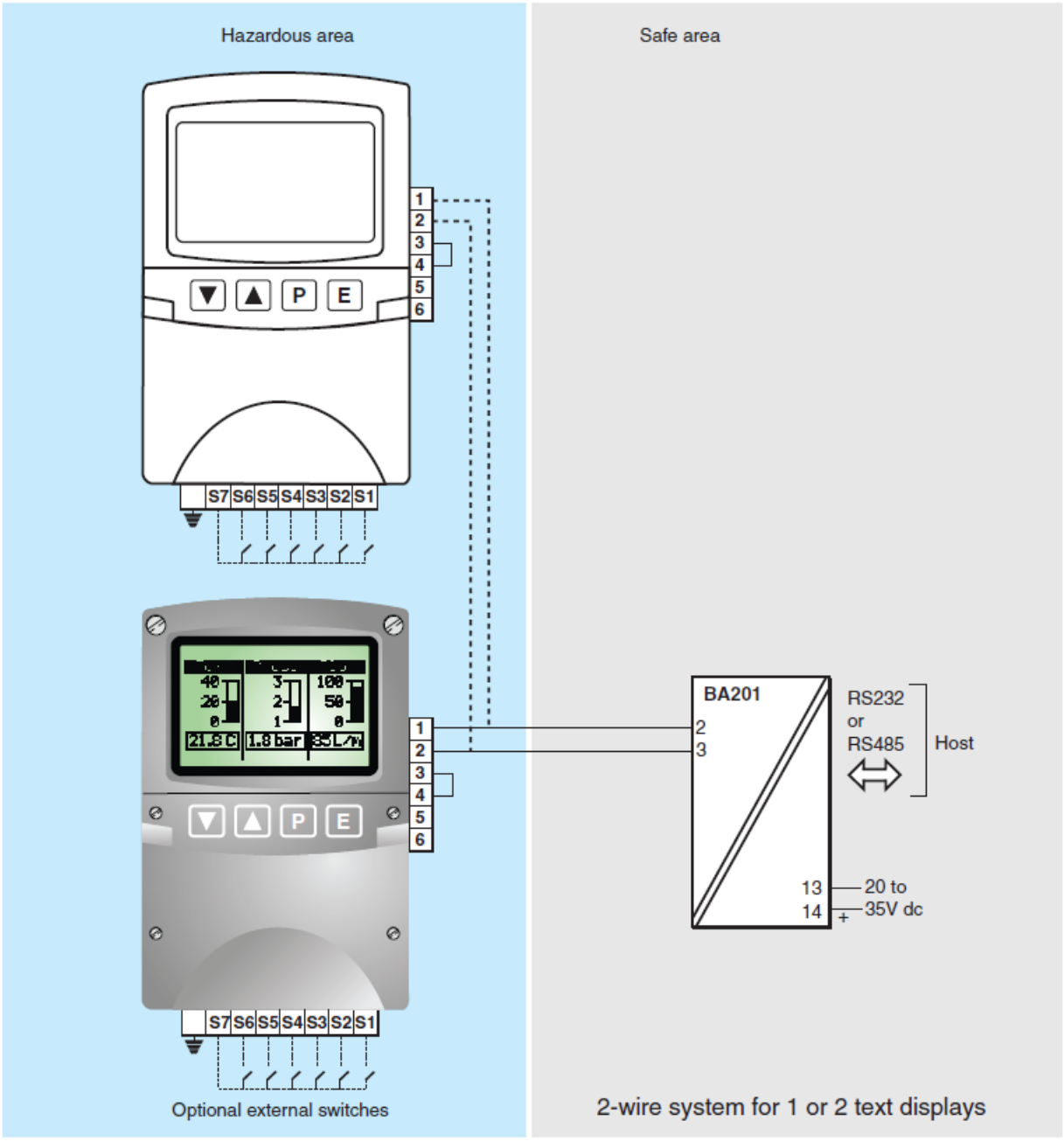
DIMENSIONS (mm)



TERMINAL CONNECTIONS



CONNECTION



Modbus Guide
Programming Guide
Instrument simulator

May be downloaded from www.beka.co.uk

HOW TO ORDER

		Please specify
Model number		BA484D
Certification		ATEX & UKEX gas
	or	ATEX & UKEX gas & dust
	or	ATEX, UKEX, FM & cFM gas

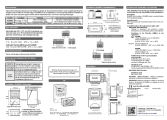
*All versions have IECEx certification. **Note:** Cable entries differ for FM & ATEX versions*

Accessories	**Please specify if required**
Stainless legend plate	Legend
Pipe mounting kit	BA392D or BA393
Modbus Guide	Serial Text Display - Modbus Guide
Programming Guide	Serial Text Display - Programming Guide
Instrument simulator	Instrument simulator for personal computer
BEKA ScreenWriter	Custom screen design aid for personal computer

FAQs

- **Q: What are the dimensions of the display?**
  - **A:** The display dimensions are 212mm x 72mm for BA484D and 72mm x 84mm for BA488C.
- **Q: What are the communication interfaces supported?**
  - **A:** The devices support RS232 and RS485 communication interfaces.
- **Q: What standards do the products comply with?**
  - **A:** The products comply with ATEX, EMC, and RoHS directives as per the provided details.

Documents / Resources

	**beka BA484D Modbus RTU Serial Data Displays** [pdf] Owner's Manual BA484D, BA488C, BA484D Modbus RTU Serial Data Displays, BA484D, Modbus RTU Serial Data Displays, RTU Serial Data Displays, Data Displays, Displays

References

- **User Manual**