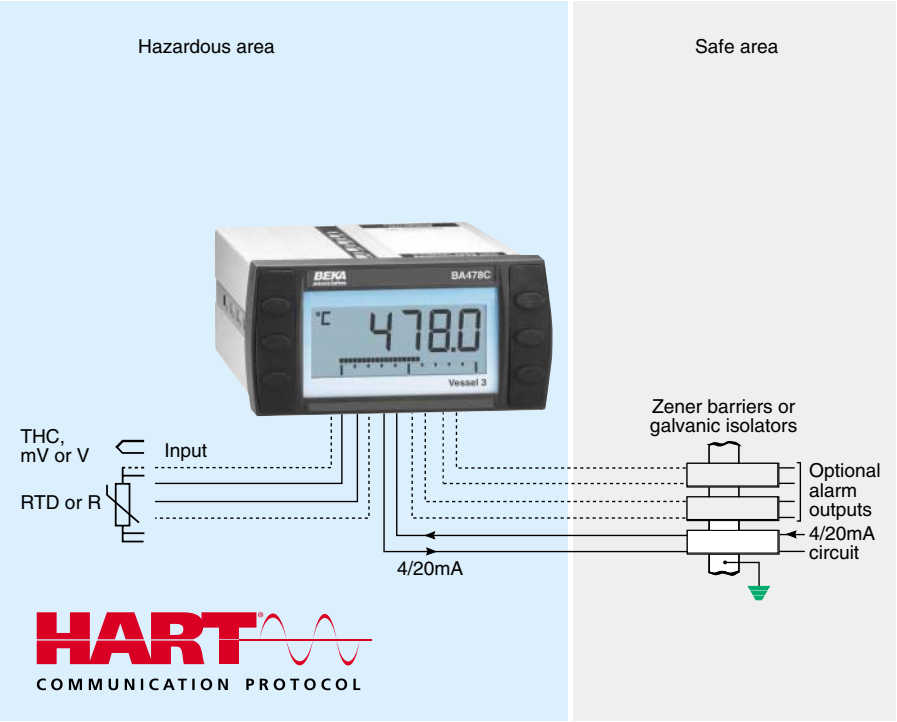

BA478C

Indicating temperature transmitter

Intrinsically safe for use in all gas hazardous areas

- **Large display with bargraph**
- **4/20mA loop powered**
- **HART® communication & sensor diagnostics**
- **Intrinsically safe ATEX, FM cFM & IECEx**
- **RTD, THC, voltage or resistance input**
- **Optional:**
  Loop powered backlight
  Dual alarms
- **144 x 72mm DIN enclosure with IP66 front**
- **3 year guarantee**

The new BA478C is a second generation panel mounting intrinsically safe loop powered indicating temperature transmitter which replaces the BA378C. It provides an accurate local digital temperature display, plus a 4/20mA output that may be scaled to represent any temperature range. Although incorporating new facilities such as HART® digital communication, diagnostics and a robust enclosure with an IP66 front, the BA478C remains electrically and mechanically compatible with the earlier model.

The main application of the BA478C is to display temperature in a hazardous process area and to transmit a linearised 4/20mA current to the safe area. The digital display may be in ˚C or ˚F with the units of measurement shown on the display. A separately programmable 31 segment bargraph provides an easy to read analogue indication of the process value and trend.

Calibration and conditioning may be performed via HART® communication or the front panel push buttons. All instrument functions and calibration, including the type of input, are configurable on-site thus reducing the instrument inventory. The transmitter will operate with three or four wire resistance thermometers and with most common types of thermocouple. Differential measurements can also be made. The BA478C accepts voltage and resistance inputs allowing pressure, weight or position tranducer outputs to be displayed in engineering units and transmitted as a 4/20mA current and HART® signal.

HART® digital communication provides the primary temperature measurement in a digital format plus diagnostic information indicating the health of the sensor and the transmitter.

Sensor diagnostics are continuously performed by the BA478C transmitter, generally as specified by NAMUR standard NE107 and transmitted via the HART® communications link. Faults may also be indicated by outputting an under or over range current and flashing the transmitter display.

International intrinsic safety certification allows the BA478C and the associated sensor to be installed in most gas hazardous areas. The transmitter may be powered from a certified Zener barrier, or from a certified galvanic isolator that must be a 'smart' device if HART® communication is used.

The front panel is a robust Noryl moulding containing an armoured glass window which provides IP66 protection. A neoprene gasket seals the joint between the BA478C and the mounting panel allowing the transmitter to be installed in areas that will be cleaned with a hose.

An optional loop powered backlight produces green background illumination enabling the display to be read at night and in poor lighting conditions. It does not require additional field wiring or a power supply, but the transmitter minimum operating voltage is increased.

Dual Alarms are available as an option. Each has a galvanically isolated, solid state, single pole output that may be independently conditioned as a high or low alarm with a normally open or closed output. Annunciators on the instrument display show the status of both alarms.

Degrees Centigrade or Fahrenheit may be shown on the instruments display when thermocouple or resistance thermometer inputs are selected. Other units of measurement and tag or applicational information can be economically marked onto the display escutcheon prior to despatch or after installation on-site.

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SPECIFICATION

Supply voltage
- Without backlight: 9 to 28V
- With backlight: 15.5 to 28V

Output
- Operating range: 3.8 to 20.5mA
- Resistance: 5MΩ min

Display
- Type: Liquid crystal 20mm high -99999 to 99999 31 segment bargraph
- Reading rate: 2 per second
- Resolution
  - RTD & THC input: Selectable 0.1˚ or 1˚
  - Voltage & Resistance input: Fully selectable

Input
- Resistance thermometer
  - Pt100 or Pt1000: -200 to +850 ˚C
  - Connection: 3 or 4 wires, or differential
  - Excitation current: 175µA
- Resistance: Adjustable between 0 & 5kΩ
  - Min span: 10Ω
- Thermocouple

Type	Range ˚C
B	200 to 1820
E	-200 to 1000
J	-210 to 1200
K	-200 to 1372
N	-200 to 1300
R	-50 to 1768
S	-50 to 1768
T	-200 to 400

- Voltage: Adjustable between ±1.9V
  - Minimum span: 2mV

HART® communication: HART Registered, compliant with HART protocol standard revision 7.

Diagnostics: Generally as NAMUR NE107. Output via HART® and under or over range output current.

Performance
- Accuracy
  - RTD input: ±0.1˚C
  - THC input: ±10µV
- Effect of temperature on display

	Voltage	THC	RTD
Zero drift	<1µV/˚C	<1µV/˚C+0.02˚C/˚C	<20ppm/˚C
Span drift	<30ppm/˚C	<30ppm/˚C	<80ppm/˚C

- Effect of temperature on 4/20mA output
  - Zero drift: <20ppm/˚C
  - Span drift: <50ppm/˚C
- Series mode ac rejection: <0.1% error for 150mV rms 50 or 60Hz
- Common mode ac rejection: <0.1% error for 250V rms 50 or 60Hz

Intrinsic safety

Europe ATEX
- Code: II 1 G, Ga Ex ia IIC T5 Ta = -40 to +70˚C
- Certificate No.: ITS09ATEX26156X

USA FM
- Standard: 3610 Entity
- Code: CL I, II, III; Div 1; GP A, B, C & D T4 @ 70˚C
- File: 3035396
- Standard: 3611 Nonincendive
- Code: CL I; Div 2; GP A, B, C & D T4 @ 70˚C
- File: 3035396

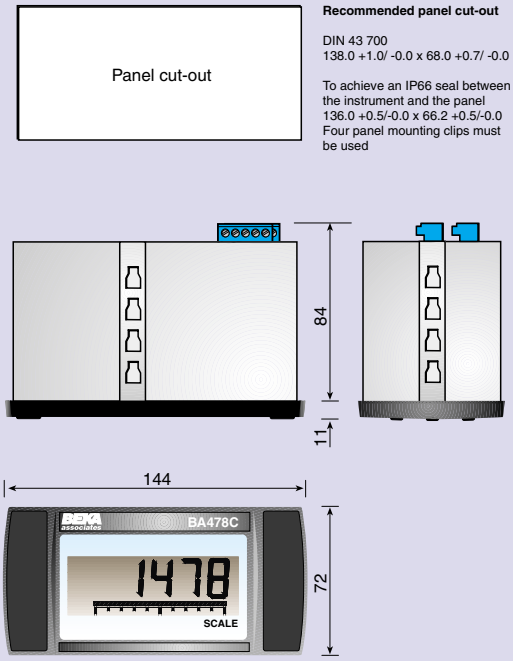
Canada cFM
- File: 3035396C

International IECEx
- Code: Ga Ex ia IIC T5 Ta = -40 to +70˚C
- Certificate No.: IECEx ITS 09.0006X

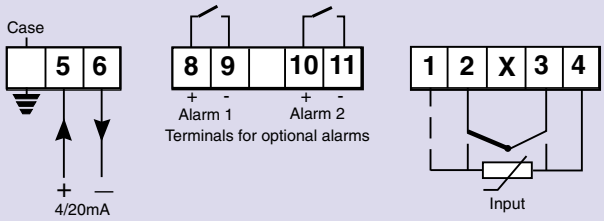
Environmental
- Operating temp
  - Electronics: -40 to +70˚C
  - Display: -20 to +70˚C
- Storage temp: -40 to +85˚C
- Humidity: To 95% non condensing
- Enclosure
  - Front: IP66
  - Rear: IP20
- EMC: In accordance with EU Directive 2004/108/EC

Mechanical
- Terminals: Screw clamp for 0.5 to 1.5mm² cable
- Weight: 0.7kg

DIMENSIONS (mm)



TERMINAL CONNECTIONS



X Do not use

Accessories

Loop powered backlight	Operating voltage increased to 15.5V min.
Dual alarm	Isolated, solid state single pole
Ron	< 5Ω + 0.6V
Roff	> 180k
Scale legend	Units of measurement or application marked onto display escutcheon. ~ *Note: For RTD & THC inputs, ˚C or ˚F is shown on the instrument display.*
Tag strip	Thermally printed legend on rear of instrument

~ See accessory datasheet for details

HOW TO ORDER

	Please specify
Model number	BA478C
Input	RTD; THC & type; V or R*
CJ compensation	On or Off *[THC input only]**
Display units	˚C or ˚F* [RTD or THC inputs]
Display at which output is:	
4mA	XXXXX
20mA	XXXXX
Display at which bargraph:	
Starts	XXXXX
Finishes	XXXXX
Fault indication	Off; under range or over range

Accessories	**Please specify if required**
Display backlight	Backlight
Dual alarms	Alarms
Escutcheon marking	Legend *Note: For RTD & THC inputs, ˚C or ˚F may be shown on the instrument* display.
Tag strip	Legend

** If calibration information is not supplied, instrument will be conditioned for 3 wire Pt100 RTD input with a 4 to 20mA output and bargraph corresponding to a display of 0.0 to 100.0˚C, with no fault indication.*