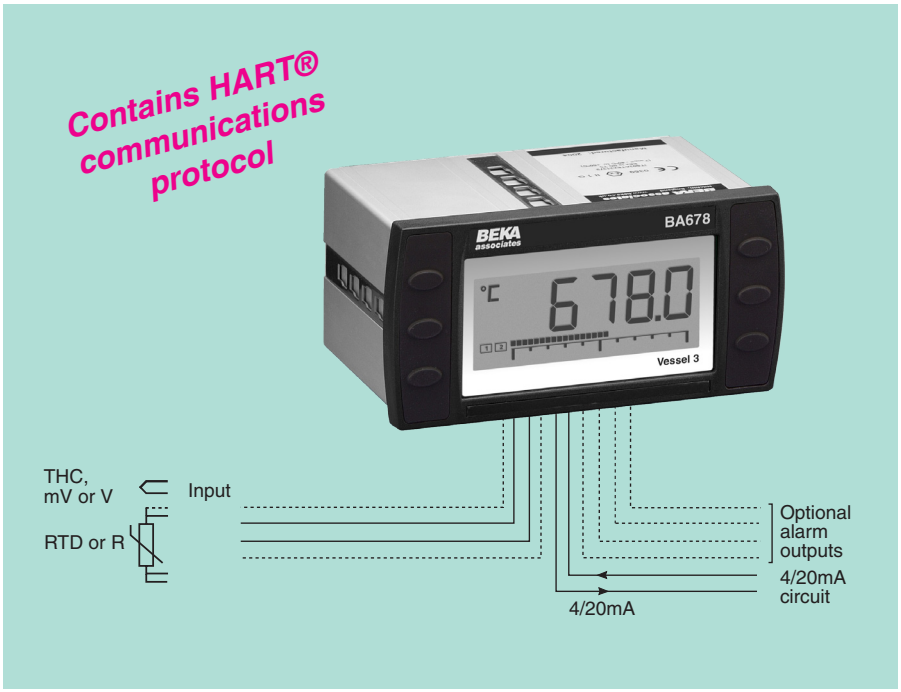
BA678C

Indicating temperature transmitter

General purpose



- **Large display with bargraph.**
- **4/20mA loop powered**
- **HART® communication & sensor diagnostics.**
- **RTD, THC, voltage or resistance input.**
- **Galvanically isolated sensor input.**
- **144 x 72mm DIN enclosure with IP66 front.**
- **Optional:**
  - **Loop powered backlight**
  - **Dual alarm**
- **3 year guarantee**

www.beka.co.uk/ba678c

The new BA678C is a second generation panel mounting, loop powered indicating temperature transmitter which replaces the BA578C. It provides an accurate local digital temperature display, plus a 4/20mA output, which may be scaled to represent any temperature range. Although incorporating new facilities such as HART® digital communication, diagnostics and a robust enclosure with a IP66 front panel, the BA678C remains electrically compatible with the earlier model.

The main application of the BA678C is to display temperature in a process area and to transmit a linearised 4/20mA current to other instruments. 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 and average measurements can also be made. The BA678C 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® digital signal.

Input galvanic isolation eliminates errors caused by common mode voltages up to 250V, allowing accurate measurement from earthed thermocouples in electrically noisy environments. Isolation also allows the transmitter to accurately display the output from earthed bridges.

HART® digital communication provides the primary temperature measurement in a digital format plus diagnostic information indicating the health of the primary element and the transmitter. HART® communication also enables the BA678C to be configured and calibrated from a portable calibrator or from the system host. If HART® digital communication is not required, the BA678C will function as a traditional 4/20mA analogue loop powered indicating temperature transmitter.

Sensor diagnostics are continuously performed by the BA678C transmitter generally as recommended by NAMUR standard NE 107 and the results transmitted via the HART® communication link. Faults may also be indicated by outputting an under or over range current and flashing the transmitter display.

The front panel is a robust Noryl moulding containing an armoured glass window that provides IP66 protection. A neoprene gasket seals the joint between the BA678C 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.

If explosive atmospheres are present the intrinsically safe BA478C should be used, this has the same features as the BA678C but has been certified for use in gas hazardous areas.

BEKA associates

BEKA associates Ltd. Old Charlton Rd. Hitchin, Hertfordshire, SG5 2DA, U.K.
Tel. (01462) 438301 Fax (01462) 453971
e-mail sales@beka.co.uk www.beka.co.uk

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

Galvanic isolation	500V
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 NE 107. 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 50 or 60Hz.

Environmental

Operating temp	-20 to 70°C
Storage temp	-40 to 85°C
Humidity	To 95%
Enclosure	
Front	IP66
Rear	IP20
EMC	Complies with EMC Directive 2014/30/EU

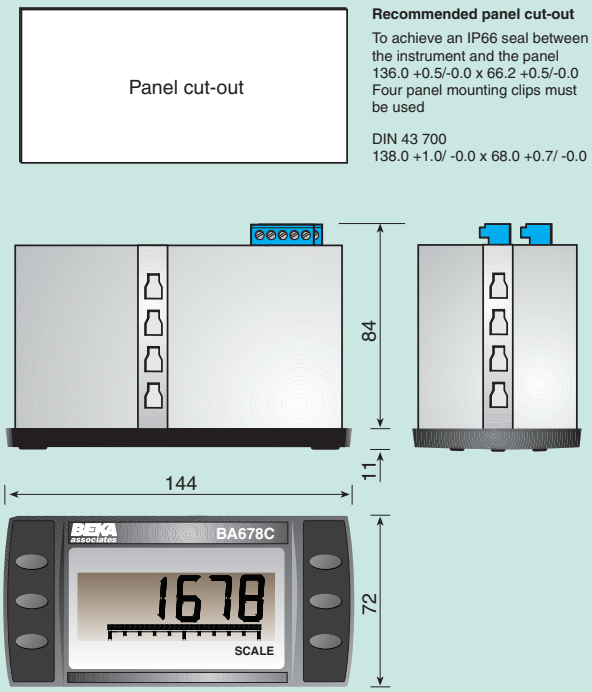
Mechanical

Terminals	Screw clamp for 0.5 to 1.5mm^2 cable.
Weight	0.7kg

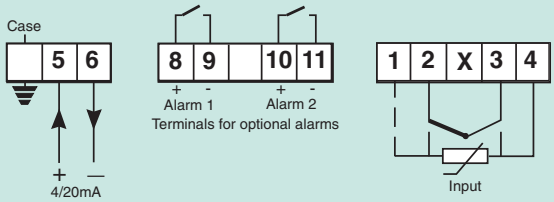
Accessories

Loop powered backlight	Green background illumination, increases operating voltage to 15.5V min.
Dual alarm	Isolated, solid state single pole
Ron	< 5Ω + 0.6V
Roff	>180k
Rating	30V dc; 100mA

DIMENSIONS (mm)



TERMINAL CONNECTIONS



X Do not use

Scale legend	Units 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	BA678C
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 corresponding to a display of 0.0 to 100.0°C.*