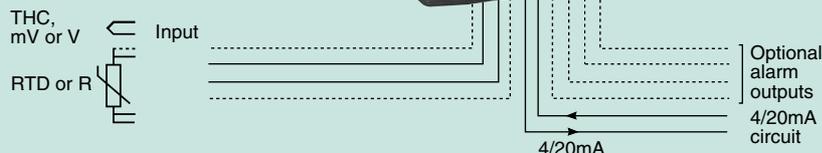


HART
COMMUNICATION PROTOCOL



The new BA674D is a second generation, loop powered indicating temperature transmitter which replaces the BA574C. It provides an accurate local digital temperature display, plus a 4/20mA output, which may be scaled to represent any temperature range. Incorporating new facilities such as HART® digital communication and a robust GRP enclosure with a separate terminal compartment, the BA674D remains electrically compatible with the earlier model.

The main application of the BA674D 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 configurable 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 four push buttons protected from damage and tampering behind a sealed cover. For applications requiring frequent adjustment the transmitter can be supplied with external 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 BA674D also accepts voltage and resistance inputs so that pressure, weight or position transducer outputs may be displayed in engineering units and transmitted as a 4/20mA current.

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 indi-

cating the health of the sensor and the transmitter. HART® communication also enables the BA674D to be configured and calibrated from a portable calibrator or from the system host. If HART® digital communication is not required, the BA674D will function as a traditional 4/20mA analogue loop powered indicating temperature transmitter.

Sensor diagnostics are continuously performed by the BA674D 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.

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 high or low alarm with a normally open or closed output. Annunciators on the instrument display show the status of both alarms.

Tag number and application can be marked onto the display escutcheon prior to despatch or after installation. Alternatively, for customers who prefer an etched stainless steel label, the transmitter can be supplied with a removable blank or custom etched stainless steel legend plate mounted on the front of the enclosure. When the transmitter is conditioned for a resistance thermometer or thermocouple input, degrees Centigrade or degrees Fahrenheit can be shown on the liquid crystal display.

If explosive atmospheres are present either the intrinsically safe BA474D or the Type nL BA474ND should be used. Both have the same features as the BA674D but have been certified for use in gas and dust hazardous areas.

BA674D

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
- ◆ IP66 GRP enclosure with separate terminal compartment
- ◆ Optional:
 - Loop powered backlight
 - External push buttons
 - Dual alarms
- ◆ 3 year guarantee

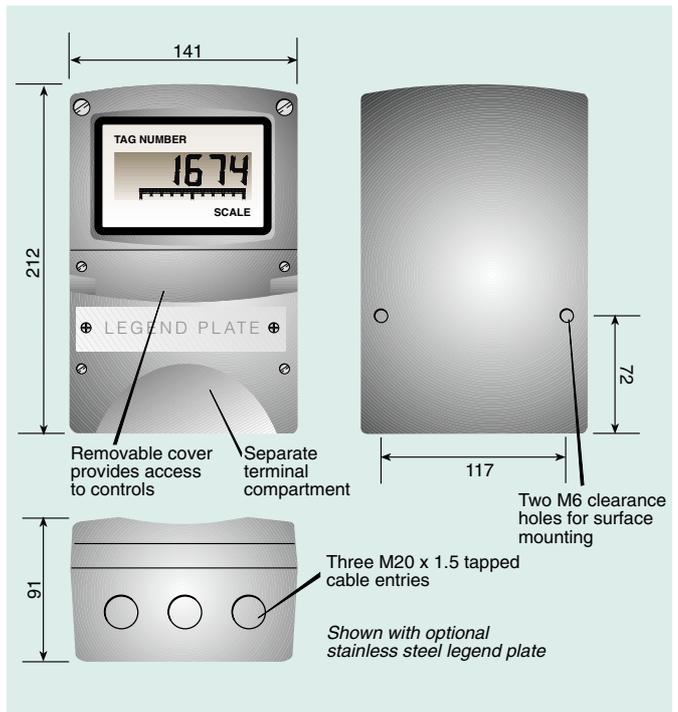
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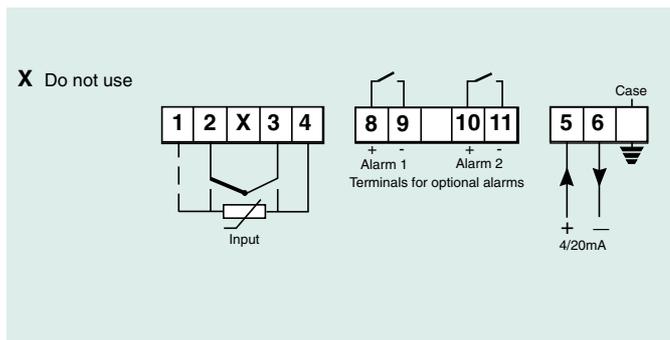
SPECIFICATION

| | |
|--|--|
| 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 2 per second |
| 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 | |
| Min span | Adjustable between 0 & 5kΩ 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 | |
| Minimum span | Adjustable between ±1.9V 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 | -40 to +70°C |
| Storage temp | -40 to +85°C |
| Humidity | To 95% |
| Enclosure | IP66 (see ITS report C871V0383) |
| EMC | In accordance with EU Directive 2004/108/EC |
| Mechanical | |
| Terminals | Screw clamp for 0.5 to 1.5mm ² cable. |
| Weight | 1.6kg |
| Accessories | |
| Loop powered backlight | Green background illumination, increases operating voltage to 15.5V min. |
| Dual alarm | Isolated, solid state single pole |
| Ron | < 8Ω + 1.2V |
| Roff | >180k |
| Rating | 30V dc; 100mA |
| External push buttons | Membrane keypad ~ |
| Scale legend | Units marked onto display escutcheon~ <i>Note: For RTD & THC inputs, °C or °F is shown on the instrument display.</i> |

DIMENSIONS (mm)



TERMINAL CONNECTIONS



Stainless legend plate. Etched with tag number on front of instrument. ~
Pipe mounting kit BA392D or BA393. ~

~ See accessory datasheet for details

HOW TO ORDER

| | |
|------------------------------------|-----------------------------------|
| Model number | Please specify BA674D |
| 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 bargraph: | |
| Starts | XXXXX |
| Finishes | XXXXX |
| Display at which output is: | |
| 4mA | XXXXX |
| 20mA | XXXXX |
| Fault indication | Off; underrange or overrange |
| Accessories | Please specify if required |
| Display backlight | Backlight |
| Dual alarms | Alarms |
| External push buttons | External push buttons |
| Scale legend | Legend |
| Stainless legend plate | Legend |
| Pipe mounting kit | BA392D or BA393 |

* 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.