BA578E
Two input
General purpose
Timer or Clock
Issue 6

Product label

Status output annunciator

Reset annunciator

Push buttons

Elapsed or remaining time

Scale card

Lower display

Annunciators for optional control outputs

CONTENTS

1. DESCRIPTION

The BA578E is a general purpose, panel mounting instrument with two inputs that can be configured on-site as a Timer or as a Clock.

As a Timer the BA578E can measure and display the elapsed time between external events, or control external events via the status output or control outputs.

When configured as a Clock, the instrument can display time in a variety of formats and the control outputs may be configured to turn *on* and *off* at preset times.

This instruction manual is divided into three sections.

Common features
2. System design
3. Installations
4. Accessories

Timer
5. Operation as a timer
6. Configuration example
7. Maintenance

Clock
8. Operation as a clock
9. Configuration example
10. Maintenance

This instruction manual supplements the abbreviated instruction sheet supplied with each instrument.

2. SYSTEM DESIGN

Fig 1 illustrates the basic circuit that is used for all BA578E Timer installations. BA578E Clock installations are the same, except that the two input terminals are not used. For simplicity the status output and the control outputs are described separately in sections 2.4 and 2.5 of this manual.

Sensor output	Input A	Input b
Proximity detector Switch Contact Open collector	Link 3 & 4	Link 7 & 8
Voltage pulse Magnetic pick-off	Don't link 3 & 4	Don't link 7 & 8

Fig 1 BA578E connections

2.1 Power supply

The BA578E requires a supply of 10 to 30V dc between terminal 1 & 2 and consumes:

	10mA	without optional backlight
plus	16mA	for optional backlight
plus	6mA	when terminals 3 & 4 are linked
plus	6mA	when terminals 7 & 8 are linked

2.2 Sensor inputs

When configured as a Timer both inputs may be connected to a wide variety of sensors as shown in Fig 1. The two BA578E inputs are not used when the instrument is configured as a Clock.

The following table shows the instrument's input switching thresholds when configured to operate with various sensors. For reliable operation the BA578E input must fall below the lower threshold and rise above the upper threshold.

Sensor	Switching thresholds	
	Lower	Upper
Switch	100Ω	1000Ω
Proximity detector	1.2mA	2.1mA
Open collector	2kΩ	10kΩ
Magnetic pick-off	0	40mV peak
Voltage pulse low	1.0V	3.0V
Voltage pulse high	3.0V	10.0V

Switch contacts, proximity detectors and open collector sensors require energising which is achieved by linking two BA578E terminals together for each input, see Fig 5.

2.2.1 Switch contact input
Any switch contact may be directly connected to input terminals 5 & 6 or 9 &10. The BA578E contains a separate configurable debounce circuit for each input to prevent false triggering. Three levels of debounce protection are available See section 5.5.6.

2.2.2 Open collector input
Any sensor with an open collector output such as a opto-isolator may be directly connected to input terminals 5 & 6 and 9 &10.

2.2.3 2-wire proximity detector input
Most NAMUR 2-wire proximity detectors may be connected to a BA578E input, providing the minimum operating voltage of the proximity detector is less than 7.5V. The BA578E contains a separate configurable debounce circuit for each input to prevent false triggering. Three levels of debounce protection are available See section 5.5.6.

2.2.4 Magnetic pick-off input
Coil in the input configuration menu is a low level voltage pulse input intended for use with a magnetic pick-off sensor. The BA578E contains a separate configurable debounce circuit for each input to prevent false triggering. Three levels of debounce protection are available See section 5.5.6.

2.2.5 Voltage pulse input
Two voltage pulse input ranges are independently selectable for each input in the BA578E Timer configuration menu, VoltS L and VoltS H allowing almost any sensor with a voltage output to be used: The BA578E contains a separate configurable debounce circuit for each input to prevent false triggering. Three levels of debounce protection are available See section 5.5.6.

2.3 Remote reset
Connecting the external reset terminals RS1 and RS2 together will reset the BA578E when configured as a Timer and synchronise the displayed time to a preset time when configured as a Clock.

Note: When used as a Timer the BA578E may also be reset from the display mode by operating the ▼ and ▲ push buttons simultaneously for more than two seconds. See 5.5.20

2.4 Status output
All BA578E instruments have an opto-isolated open collector output which can be configured to indicate the status of the instrument, or to perform simple control functions. The output has the following electrical parameters:

$$R_{on} = 60Ω + 3V$$
$$R_{off} = 1MΩ$$
$$I_{max} = 10mA$$

The status output is a passive circuit i.e. un-powered open collector, but it is totally isolated from all other circuits. Terminals P1 and P2 may be connected to another instrument that can accept an open collector input.

Fig 2 shows how the status output may be used to produce a voltage output.. The positive terminal of the status output P1 is connected to the instrument's positive supply terminal 1. When the status open collector output is activated, the voltage on terminal P2 rises to the supply voltage less 3V and a current flows through the resistor R1. This current is defined by R1 which should be chosen to limit the current to less than 10mA. For a 24V supply R1 should be greater than 2,200Ω.
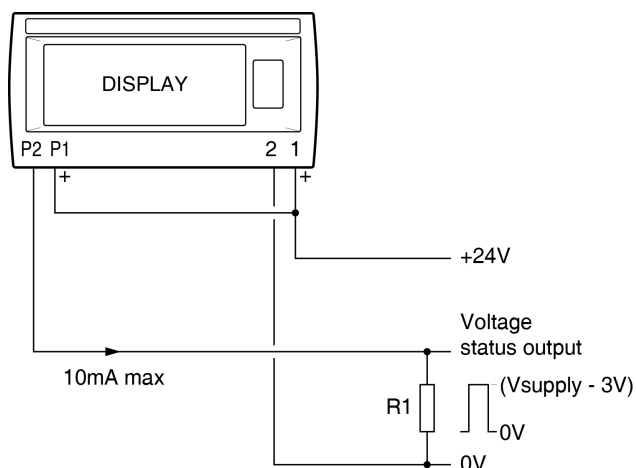
Fig 2 Generating a voltage status output

2.5   Control outputs

Each of the two control outputs is a galvanically isolated single pole solid state switch as shown in Fig 3. The outputs are polarised and current will only flow in one direction. Terminals A1 and A3 should be connected to the positive side of the supply.

Note: Because of the series protection diode some test meters may not detect a closed alarm output.
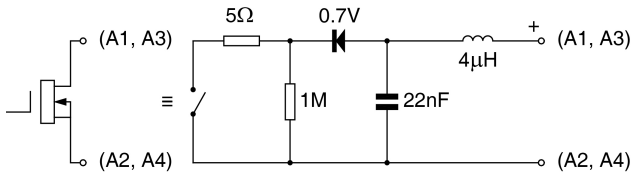
Fig 3 Equivalent circuit of each control output

The solid state output of each control output may be used to switch any dc circuit with parameters of:

$$V \text{ max} \quad = \quad 30V$$
$$I \text{ max} \quad = \quad 200mA$$
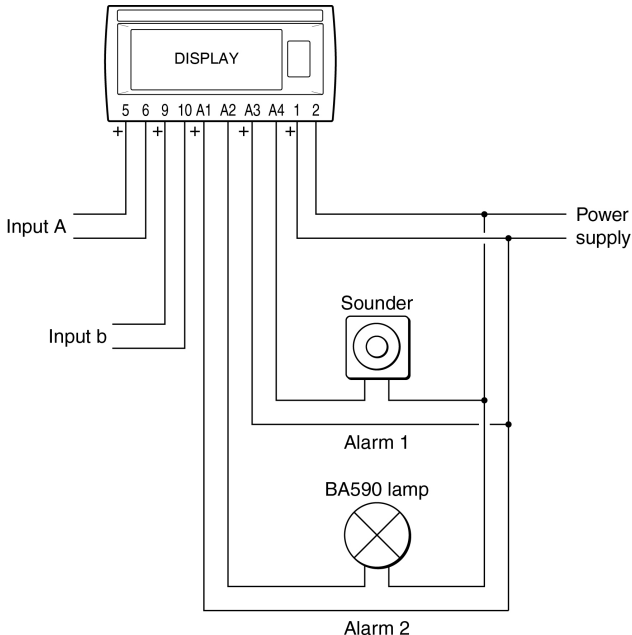
Fig 4 Typical control output application

3.   INSTALLATION

3.1   Location

The BA578E has a robust glass reinforced Noryl enclosure with a toughened glass window. The front has IP66 ingress protection and a gasket seals the joint between the instrument enclosure and the panel, the rear of the instrument has IP20 ingress protection.

The BA578E may be installed in any panel providing that the operating temperature is between -40°C and +70°C. At temperatures below -20°C the display digits will change more slowly and the contrast will be reduced, but the instrument will continue to function

Fig 5 shows the overall dimensions of the instrument together with the recommended panel cut-out dimensions. To achieve an IP66 seal between the instrument enclosure and the instrument panel the smaller tolerance aperture must be used, and the instrument must be secured with four panel mounting clamps.

Although the front of the BA578E has IP66 protection it should be shielded from continuous direct sunlight and severe weather conditions.

3.2   EMC

The BA578E complies with the requirements of the European EMC Directive 2014/30/EU and UK Electromagnetic Compatibility Regulations UKSI 2016:1091 (as amended). For specified immunity all wiring should be in screened twisted pairs, with the screens earthed at one point.

**Recommended panel cut-out
dimensions for all installations**

Mandatory to achieve an IP66 seal
between instrument and panel

136 +0.5/-0.0 x 66.2 +0.5/-0.0

DIN 43700
138.0 +1.0/ -0.0 x 68 +0.7 -0.0

Panel cut-out

65

7.5

144

DISPLAY

72

| A1 | A2 | A3 | A4 | Terminals for control outputs |

+
Control
output 1

+
Control
output 2

| 1 | 2 | | RS1 | RS2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | P1 | P2 |

+
Power
supply
10 to 30V dc

Reset

Add link
to energise
pulse
input A

+
Pulse
input
A

Add link
to energise
pulse
input b

+
Pulse
input b

+
Status
output
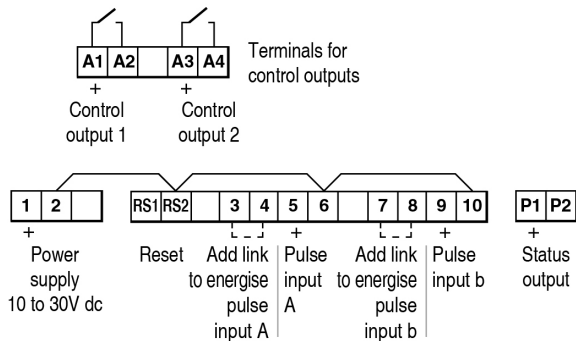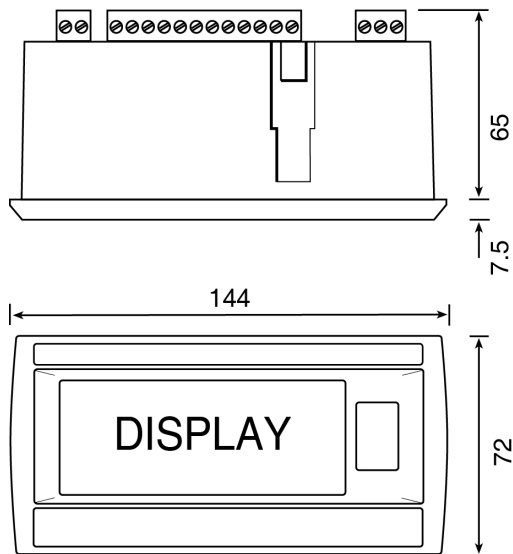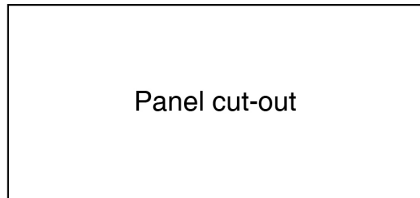
Support panel wiring to prevent vibration damage

Note: Optional backlight is internally powered

Fig 5   BA578E dimensions & terminals

3.3 Installation Procedure

a. Cut the specified aperture in the panel. To achieve an IP66 seal between the instrument enclosure and the instrument panel the aperture must have the tighter tolerances specified in Fig 5.

b. Slide the gasket over the body of the BA578E before inserting the instrument into the panel aperture.

c. Firstly ensure that all the panel mounting clamps are closed by turning the knurled screws fully anti clockwise until the two pips in the clamp foot align with holes in the clamp body.

d. Place a clamp in the recess on each side of the instrument, pulling gently to slide it onto the dovetail as shown in Fig 6.   Push the knurled screw slightly forward to engage the thread and tighten by turning clockwise until it is just finger tight.   When the clamps are fitted ensure that the gasket behind the front panel bezel is correctly positioned before fully tightening the clamps to secure the instrument. The maximum recommended clamp tightening torque is 22cNm (1.95 lbf in) which is approximately equivalent to finger-tight plus one half turn. **Do not over tighten**.

e. Four panel mounting clamps are required to achieve an IP66 seal between a BA578E and the instrument panel.

f. Connect the panel wiring to the rear terminal block(s) as shown in Fig 5.   To simplify installation, the terminals are removable so that the panel wiring can be completed before the instrument is installed.   In areas subject to vibration wiring should be secured to prevent damage to the connectors.

Align foot and body by
turning screw anticlockwise

Position gasket
behind instrument
bezel

Insert panel clamp into recess
and gently pull it onto the dovetail.
Engage screw & turn clockwise
to tighten clamp

Insert instrument
into the panel ⟶
from the front
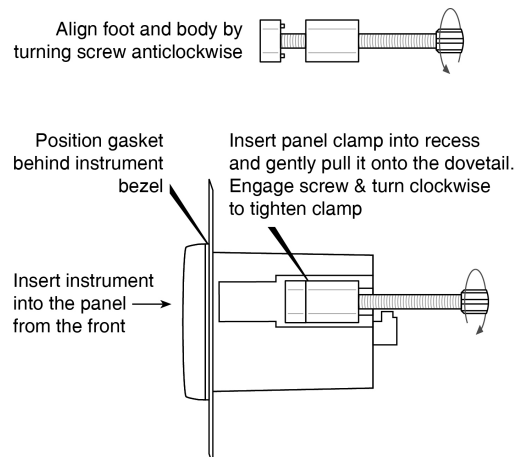
Fig 6 Fitting panel mounting clamps

3.4   Scale card

The BA578E's units of measurement are shown on a printed scale card visible through a window at the right hand side of the display. The scale card is mounted on a flexible strip that is inserted into a slot at the rear of the instrument as shown in Fig 7. Thus the scale card can easily be changed without removing the BA578E from the panel or opening the instrument enclosure.

New instruments are supplied with a printed scale card showing the requested units of measurement, if this information is not supplied when the instrument is ordered a blank card will be fitted.

A pack of self-adhesive scale cards printed with common units of measurement is available as an accessory from BEKA associates. Custom printed scale cards can also be supplied - see 4.3

To change a scale card, unclip the tapered end of the flexible strip at the rear of the instrument by gently pushing it upwards and pulling it out of the enclosure. Peel the existing scale card from the flexible strip and replace it with a new printed card, which should be aligned as shown below. Do not fit a new scale card on top of an existing card.

Install the new scale card by gently pushing the flexible strip into the slot at the rear of the instrument, when it reaches the internal end-stop secure it by pushing the end of the flexible strip downwards so that the tapered section is held by the rear panel.

Align the self-adhesive printed scale card onto the flexible strip and insert the strip into the instrument as shown below.
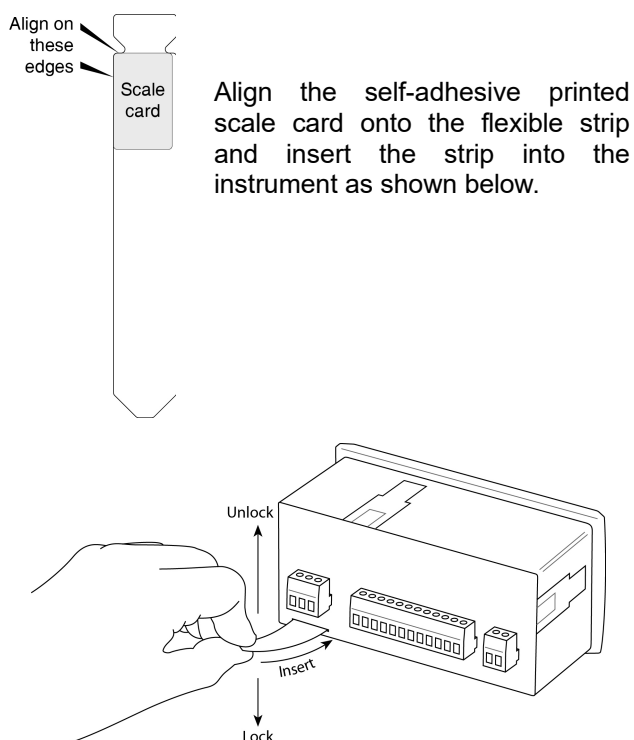
Fig 7   Inserting the flexible strip carrying the scale card into slot at the rear of the instrument.

4.   ACCESSORIES

4.1   Display backlight

The BA578E Timer or Clock can be supplied with a factory fitted backlight that produce green illumination enhancing display contrast and enabling it to be read at night or in poor lighting conditions. The backlight is internally powered from the instrument power supply so no additional wiring is required, but the supply current increases as shown below.

	BA578E configured as Timer current consumption
BA578E Timer or Clock	10mA
Additional for backlight	16mA
Addition with terminals 3 & 4 linked	6mA
Addition with terminals 7 & 8 linked	6mA

Total current	38mA max

	BA578E configured as Clock current consumption
BA578E Timer or Clock	10mA
Additional for backlight	16mA

Total current	26mA max

4.2   Control outputs

BA578E Timer or Clocks despatched by BEKA associates before 1st January 2025 were only fitted with control outputs when requested by the purchaser.

Control outputs are no longer considered an accessory. All BA578E Timer or Clocks despatched by BEKA associates after 1st January 2025 are fitted with two control outputs.

4.3   Scale card
The BA578E has a window on the right hand side of the display through which a scale card showing the units of measurement such as hours can be seen. New instruments are fitted with a scale card showing the units of measurement specified when the instrument was ordered, if the units are not specified a blank scale card will be fitted.   A pack of scale cards   pre-printed   with   common   units   of measurement is available as an accessory.   These can easily be fitted on-site to the BA578E without opening the instrument enclosure or removing it from the panel. See section 3.4 of this instruction manual.

Custom scale cards for applications requiring less common units of measurement are also available.

4.4 Tag information
New instruments can be supplied with a tag number or application information printed onto the rear panel adjacent to the terminals.   This information is not visible from the front of the instrument after installation.

5. OPERATION AS A TIMER

When configured as a Timer the BA578E can measure and display the elapsed time between external events. The Timer can be started and stopped by remote sensors, or from the front panel push buttons.

The isolated control outputs allows the Timer to control external events such as opening a valve for a predetermined time. Again the Timer can be started and stopped by remote sensors, or from the front panel push buttons. Timed events can be repeated using the CYCLE function which enables the BA578E Timer to repeat the timing period up to 99 times, or continuously, with a configurable delay between timed periods of up to 100 hours.

The BA578E may be configured to time-up from zero to the set time SEt t, or to time-down from the set time to zero. Times may be entered and displayed in hours, minutes or in seconds, or in a combination of units. Elapsed or remaining time is continuously displayed and a separate display may be activated to show the target set time SEt t. Throughout the timing cycle the instrument can be paused and restarted without changing the cycle time. Resetting is accomplished via the front panel push buttons or a remote contact.

A grand total time is maintained by the instrument which can be viewed by operating the front panel push buttons and reset from the display mode or from within the configuration menu.

Fig 8 shows a simplified block diagram of the BA578E when configured as a Timer. The two separate inputs A and b can be individually configured to accept inputs from a wide variety of sensors. When the sensor requires energising to detect its state, such as a switch contact, open collector or a two wire proximity detector, a link connected between external terminals of the BA578E supplies power to the sensor input terminals.

The optically isolated open collector status output is intended for monitoring the Timer's status, but may also be used for simple control applications.

For use in poorly illuminated areas the instrument can be supplied with an internally powered backlight.

5.1 Initialisation

Each time power is applied to a BA578E initialisation is performed. After a short delay the following display sequence occurs:

All segments of the display are activated

BA578E is ready to start functioning using the configuration information stored in the instrument's permanent memory.
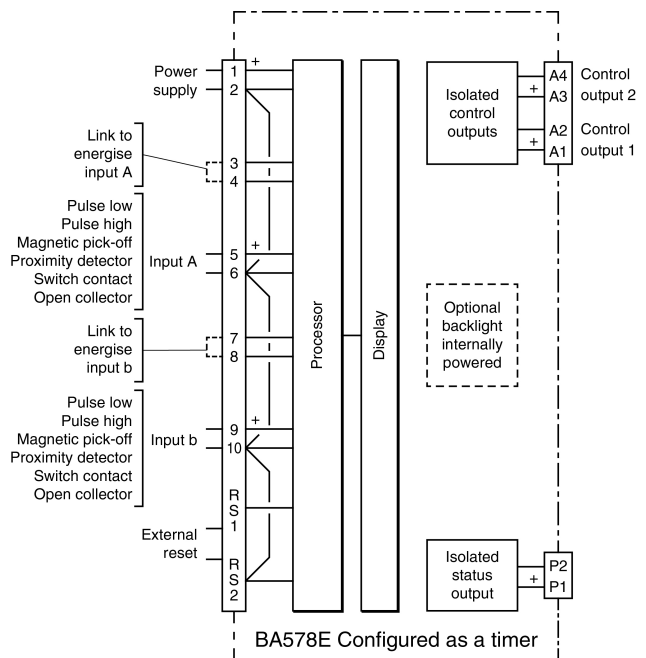

Fig 8   BA578E block diagram with Timer configuration.

5.2 Controls when configured as a Timer

The BA578E is controlled and configured via four front panel push buttons. In the display mode i.e. when the instrument is timing the push button functions are:

Push Button Functions

▼   When local control is enabled starts the Timer. See 5.5.9

▲   When local control is enables stops the Timer. See 5.5.9

E + ▲   Shows the grand total (run time) in hours and tenths of an hour irrespective of Timer configuration. If buttons are held for longer than ten seconds the grand total may be reset to zero if the grand total reset sub-function ᗞLr ᗞᴵoᴵ is enabled in the Loᗞᴵᴵ rᴵEᴵ configuration function. See 5.5.21

To reset the grand total to zero from the display mode press the E + ▲ buttons for ten seconds until ᗞLr.no is displayed. Using the ▼ or ▲ button change the display to ᗞLr.YEᴵ and press E.

▼ + ▲   Resets the Timer to zero or to the set time ᴵEᴵ ᴵ depending on whether the Timer is configured to *time-up* or *time-down* when the two buttons are operated simultaneously for more than three seconds. This is a configurable function. See 5.5.20

P + ▲   When enabled in the configuration menu, operating these two buttons simultaneously provides direct access from the display mode to the set time ᴵEᴵ ᴵ and, if the repeat timing cycle is enabled, to the restart delay rᴵᴵ dELᴵ See 6.5.16

P + ▼   Shows in succession, firmware version number, instrument function ELᴵᴵᴵE and confirms that control outputs are fitted:

-ᴵ   Dual Control Outputs

P + E   Accesses the configuration menu

5.3 Displays when configured as a Timer

The BA578E has two digital displays and associated annunciators as shown on front cover of this manual.

Elapsed time   The upper display shows the elapsed time since the Timer was started when *timing-up from zero* and the remaining time when *timing-down* from the set time. Display may be formatted as hh:mm:ss; hh:mm; mm:ss or ss.

Lower display   The display options available on the lower display depend on whether the Timer repeat cycle function ᗞYᗞLEᴵ, which can repeat the timing period up to 99 times with a configurable delay between periods, is enabled.

ᗞYᗞLEᴵ disabled
The lower display shows the set time ᴵEᴵ ᴵ or the lower display may be disabled if not required. See 5.5.8

ᗞYᗞLEᴵ enabled
The lower display shows the total number of repeat cycles requested together with the number of the current cycle. Each operation may be briefly named at it's start or periodically throughout the cycle.
Alternatively the lower display may be disabled if not required. See 5.5.8

Reset annunciator   Activated while elapsed time is being reset to zero or to the set time ᴵEᴵ ᴵ.

Status output annunciator   RTx shown while status output is activated.

Grand total annunciator   Activated when the grand total time is being shown on the upper display.

Control output annunciators   Show status of both control outputs.
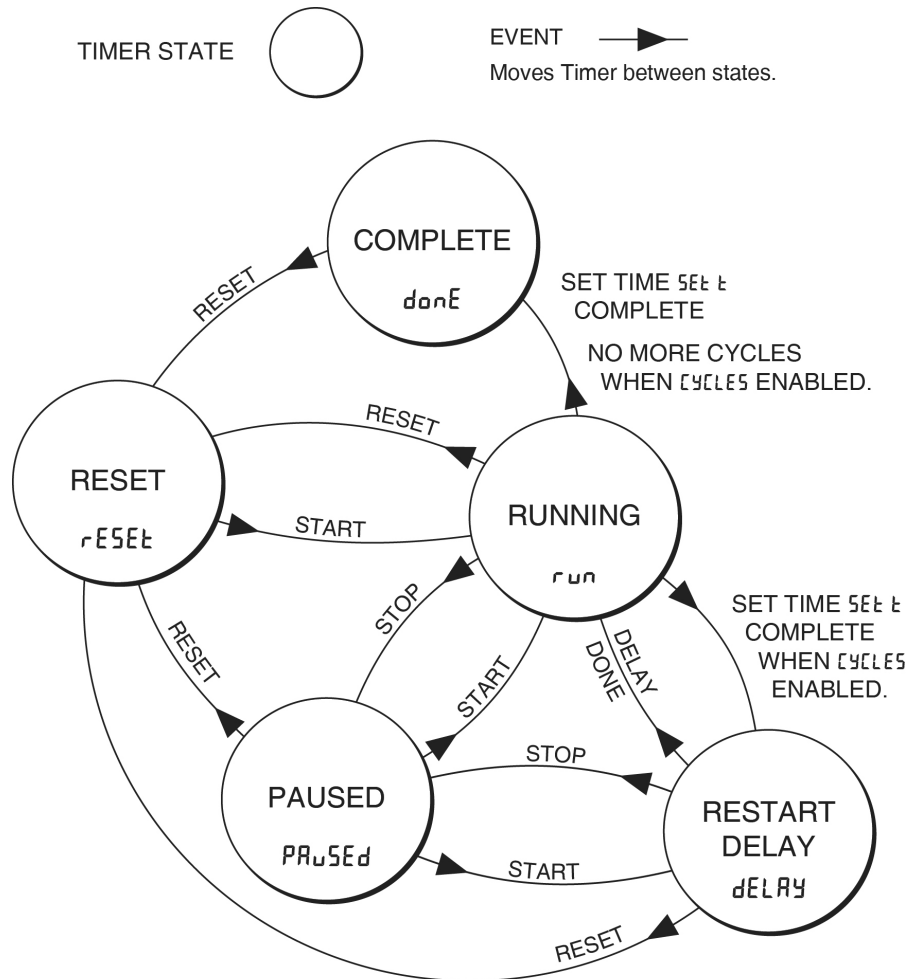
Fig 9 Timer structure showing states and events

5.4 Timer structure

Fig 9 illustrates the Timer structure and function as a state diagram. It applies when the instrument is measuring the time between events or is controlling external events.

The circles in Fig 9 represent the five Timer states, *Reset, Running, Restart-delay, Paused* and *Complete*. The lines between the circles represent the event required to move the Timer between states. e.g. to initiate timing the Timer is moved from the *Reset* state to the *Running* state by a start event. This could be an input signal at input A or operation of the ▼ button. Similarly, to pause the Timer while it is timing, the Timer must be moved from the *Running* state to the *Pause* state by a stop event which could be an input on input b or operation of the ▲ button.

Reset

In this state the Timer is readied for operation. The Timer is stopped and loaded with zero for timing-up or 5Et t for timing-down.

Running

Entered by a start event from the Reset or Paused states. The Timer times-up to 5Et t or times-down to zero depending upon it's configuration.

Pause

Entered by a stop event from *Running* or *Restart-delay*. Timer is stopped, a start event returns the timer to it's previous state.

Restart-delay

Entered automatically from *Running*. At the end of the delay time automatically returns to *Running*.

Complete

Entered automatically from *Running* when there are no more timing cycles to perform.

When the CYCLE5 function is enabled the timing cycle can be specified to repeat up to 99 times, or can be configured to repeat continuously.

5.5 Configuration as a Timer

The BA578E is configured via the four front panel push buttons. All the configuration functions are contained in an easy to use intuitive menu that is shown diagrammatically in Fig 10.

Each menu function is summarised in section 5.5.2 of this manual and each summary includes a reference to more detailed information.

All new BA578E instruments are supplied configured as requested at the time of ordering. If configuration is not requested, the BA578E will be supplied with default Timer configuration as shown below, but the instrument can easily be re-configured on-site.

| Function	Display	Default
Access code	CodE	0000
Function	FunCtion	ELAPSE
Input A	inPut-A	oP.CoL
Input b	inPut-b	oP.CoL
Debounce (each input)	dEbounCE	dEFAuLt
Display 2	diSP-2	Std
Start stop	StArStoP	LoCAL
Units	unitS	12:00:00
Set time	SEt t	00:00:00
Enable repeat cycle	CYCLES	oFF
Access set time from display mode.	RESEt t	oFF
Direction of count	uP or dn	dn
Recovery from power supply failure.	P-FAiL	idLE
Local total reset	t-rESEt	on
Local grand total reset	Gt-rESEt	oFF
External reset	E-rSEt	Std
Enable status output	EnbL	oFF
Enable control output 1	EnbL	oFF
Enable control output 2	EnbL	oFF

5.5.1 Accessing configuration functions

Throughout this manual front panel push buttons are shown as ▼, ▲, P and E. Legends displayed by the instrument are shown in a seven segment font just as they appear on the instrument e.g. inPut-A and CLr GtoL.

Access to the configuration menu is obtained by operating the P and E push buttons simultaneously. If the instrument is not protected by an access security code the first parameter FunCtion will be displayed. If a security code other than the default code 0000 has already been entered, the instrument will display CodE. Press P to clear this prompt and enter the security code for the instrument using the ▼ or ▲ push button to adjust the flashing digit and the P push button to transfer control to the next digit. If the correct code has been entered pressing E will cause the first parameter FunCtion to be displayed. If an incorrect code is entered, or a push button is not operated within ten seconds, the instrument will automatically return to the display mode.

All configuration functions and prompts are shown on the upper eight digit display.

Once within the main configuration menu the required parameter can be selected by scrolling through the menu using the ▼ or ▲ push buttons. The Timer configuration menu is shown diagrammatically in Fig 10.

When returning to the display mode following reconfiguration, the Timer will display dAtA followed by SAVE while the new information is stored in permanent memory.

5.5.2 Summary of Timer configuration functions

This section summarises all the Timer configuration functions. When read in conjunction with Fig 10 it provides a quick aid for configuring the Timer. If more detail is required, each section of this summary contains a reference to a full description of the function.

Display	Summary of function
Fun£tı on	**Instrument function**

Defines the function of the instrument. May be set to:

ELRPSE	Timer configuration
£Lo£	Clock configuration

All the entries in this Timer summary assume that the BA578E is configured as a Timer by selecting ELRPSE.
See section 5.5.3

ı nPuٟ-R	**Configuration of Input A**

Contains a sub-menu with two sub-functions:

ı nPٟYPE	Selects input sensor type
dEbounٟE	Defines input debounce

See section 5.5.4

ı nP.ٟYPE
Configures the Timer sensor Input A to accept one of six types of input:

UoLٟ5 L	Voltage pulse <1 >3V
UoLٟ5 H	Voltage pulse <3 >10V
£oı L	Magnetic pick-off
Pr.dEٟ	Proximity detector *
£onٟR£ٟ	Switch contact *
oP.£oL	Open collector *

* Energise input by linking terminals 3 & 4 for Input A.
See section 5.5.5

dEbounٟE
Defines the level of input debounce applied to the input A to prevent false counting:

dEFRuLٟ
HERUY
Lı GHٟ

See section 5.5.6

Display	Summary of function
ı nPuٟ b	**Configuration of input-b**

As configuration of ı nPuٟ R
* Energise input by linking terminals terminals 7 & 8 for Input b.
See section 5.5.7

dı 5P-2	**Lower display**

Configures the lower display to show set time 5Eٟ ٟ or, when the £Y£LE5 repeat function is activated, the restart delay count-down plus the cycle count number.

With £Y£LE5 not enabled:

Select	Lower display shows
5ٟd	Set time 5Eٟ ٟ
oFF	Disables lower display.

See section 5.5.8

With £Y£LE5 enabled:

Select	Lower display shows
5ٟd	Cycle counts requested and counts performed with time-down shown during requested delay period. Brief notification of timer status i.e. £Y£LE or dELRY at start of each period.
LRbEL	Exactly as 5ٟd but with periodic notification of timer status i.e. £Y£LE or dELRY.
oFF	Disables lower display.

See section 5.5.8

5ٟRrٟٟoP	**Starting and stopping the timer**

Defines how the Timer is started and stopped.

	Start	Stop
£onٟroL ١	A input high	b input high
£onٟroL ٢	A input low	b input low
£onٟroL ٣	A input high	A input low
£onٟroL ٤	A input low	A input high
LoٟRL	▼ button	▲ button

High and low inputs are specified for a voltage input. For other types of sensor input, **see section 5.5.9**

Display	Summary of function

unit5 **Units of display**
Enables the format of the displayed time to be selected.

12:00:00	Hours, minutes & seconds
12:00	Hours & minutes
30:00	Minutes & seconds
30	Seconds

Excludes delay of control outputs which is always shown in seconds and the grand total which is always shown in hours.
See section 5.5.10

5Et t **Set time**
This is the BA578E Timer's setpoint. When controlling an external event via the control outputs the BA578E will time-down from the set time to zero or time-up from zero to the set time.
Note: Timer will only start if a non zero value is entered for set time 5Et t.
See section 5.5.11

CYCLE5 **Repeat timing cycle**
Contains a sub-menu with three sub-functions, EnbL, CYCL Cnt and r5t dELA.
See section 5.5.12

Cycle function enable EnbL
Enables or disables the cycles function without changing the parameters.
See section 5.5.13

Cycle count CYCL Cnt
Defines the number of times that the timer cycle is repeated.
See section 5.5.14

Restart delay r5t dELA
Defines the time delay between timer cycles.
See section 5.5.15

ACSEt t **Access 5Et t from display mode**
Contains two sub-functions, EnbL which when activated allows the set time 5Et t and restart delay r5t dELA to be adjusted from the display mode. The second sub-function ACCd defines a separate access code to protect access to 5Et t from the display mode.
See section 5.5.16

Display	Summary of function

uP or dn **Direction of count**
Defines whether the Timer times-up from zero to the set time 5Et t, or times-down from 5Et t to zero.
See section 5.5.17

P-FAiL **Power Failure**
Defines how the Timer functions when power is restored after a power failure. Contains three alternative options idLE, PAu5E and Conti nuE.

Idle idLE
Timer returns in stopped state as if having completed single timing cycle displaying Timer value when power was lost. Timing resumes when reset followed by start instructions are received.

Pause PAu5E
Timer returns in paused state displaying Timer value when power was lost. Timing resumes when start instruction is received.

Continue Conti nuE
Timer will continue without any manual intervention.
See section 5.5.18

LoC r5Et **Local reset**
Contains two sub-functions which when enabled allow the Timer and the grand total, which represents total Timer run-time, to be reset to zero via the front panel push buttons while the Timer is in the display mode.
See section 5.5.19

Local total reset r5Et.EnbL
When on is selected, Timer is reset to zero, or 5Et t if timing-down, when the ▼ and ▲ buttons are operated simultaneously for more than three seconds in the display mode.
See section 5.5.20

Local grand total reset CLr Gtot
When on is selected the grand total, which represents total run-time, may be reset to zero by operating the E and ▲ buttons simultaneously for more than 10 seconds in the display mode.
See section 5.5.21

Display	Summary of function

E-rSEt	**External reset**
	Defines the time taken for closure of external contacts connected to terminals RS1 & RS2 to reset the Timer.
	    Std 1s
	    FASt 2ms
	See section 5.5.22

StAt oP	**Status output** Contains sub-menu with four sub-functions, **EnbL**, **StAt on**, **StAt oFF** and **StAt.dELA** **Note:** Output is an open colletor. **See section 5.5.23**
	Status output enable **EnbL** Enables or disables the status output without changing any of the parameters. **See section 5.5.24**
	Status output *on* **StAt on** Status output turns *on* when the Timer enters the state selected in this function. Output phase can be reversed. **See section 5.5.25**
	Status output *off* **StAt oFF** Status output turns *off* when the Timer enters the state selected in this function. Output phase can be reversed. **See section 5.5.26**
	Status *on* **delay** **StAtdELA** Introduces a specified delay between the *on* condition occurring and the status output being activated. **See section 5.5.27**
oP1	**Control output 1** **oP1** Contains sub-menu with four sub-functions, **EnbL**, **oP1 on**, **oP1 oFF** and **oP1 dELA**. **See section 5.5.28**
	Control output enable **EnbL** Enables or disables control output 1 without changing the parameters. **See section 5.5.29**

Display	Summary of function
	Control output 1 *on* **oP1 on** Control output 1 turns *on* when the Timer enters the state selected in this function. Output phase can be reversed. **See section 5.5.30**
	Control output 1 *off* **oP1 oFF** Control output 1 turns *off* when the Timer enters the state selected in this function. Output phase can be reversed. **See section 5.5.31**
	Control output *on* **delay** **oP1 dELA** Introduces a specified delay between the on condition occurring and control output 1 closing. **See section 5.5.32**
oP2	**Control output 2** **oP2** Functions as control output 1. **See section 5.5.28 to 5.5.32**
CLr Gtot	**Resets grand total to zero** This function resets the grand total, which represents the total Timer run-time, from within the configuration menu when **CLr YES** is selected and **SurE** is entered to confirm the instruction. **Note:** Once reset, the grand total can not be recovered. **See section 5.5.34**
CodE	**Security code** Defines a four digit alphanumeric code that must be entered to gain access to the instrument's configuration menu. Default code **0000** disables the security function and allows unrestricted access to all configuration functions when the **P** and **E** buttons are operated simultaneously in the display mode. **See section 5.5.35**
rSEt dEF	**Reset to factory defaults** Resets the BA578E to the Timer factory default configuration shown in section 5.4 Instruction confirmed by entering **SurE**. **See section 5.5.36**

5.5.3 Instrument function: FunCtion

The BA578E may be configured as a Timer or as a Clock. This section of the instruction manual describes the Timer, for details of Clock configuration see section 8.

To reveal the existing function of the instrument select FunCtion from the configuration menu and press Ⓟ. If ELAPSE is displayed, the instrument is already configured as a Timer therefore press Ⓔ to return to the FunCtion prompt in the configuration menu. If CLoC is displayed, press the ▲ or ▼ button to change the setting to ELAPSE followed by the Ⓟ button which will result in a 0000 prompt being displayed with the first digit flashing. This is a request for the instruction to be confirmed by entering SurE using the ▼ or ▲ button to adjust the flashing digit and the Ⓟ button to move control to the next digit. When SurE has been entered, pressing Ⓔ will change the instrument to a Timer and return the instrument to the display mode. To configure the Timer enter the configuration menu by pressing the Ⓟ and Ⓔ buttons simultaneously until FunCtion is displayed.

5.5.4 Input A: inPut-A

The inPut-A function contains two sub-functions inP.tYPE which defines the type of sensor that may be connected to the input and dEbounCE which adjust the amount of input noise rejection.

5.5.5 Input type: inP.tYPE

inP.tYPE is a sub-menu in the inPut-A function which defines the type of input sensor that may be connected to input A. To check or change the type of input, select inPut-A in the configuration menu and press Ⓟ which will reveal the inP.tYPE prompt, pressing Ⓟ again will show the existing input. If set as required press Ⓔ twice to return to the configuration menu, or repeatedly press the ▲ or ▼ button until the required type of input is displayed, then press Ⓔ twice to return to the configuration menu.

One of following six types of input may be selected:

Display	Input type	Switching thresholds	
		Low	High
oPCol	Open collector[2]	2	10kΩ
UoLtS L	Voltage pulse low[1]	1	3V
UoLtS H	Voltage pulse high[1]	3	10V
Coi L	Magnetic pick-off	0	40mV
Pr.dEt	Proximity detector[2]	1.2	2.1mA
ContACt	Switch contact[2]	100	1000Ω

Notes:
1. Maximum voltage input +30V.

2. For sensors connected to input A that require energising i.e. a proximity detector, a switch contact or an open collector, terminals 3 & 4 of the BA578E Timer should be linked together.

3. To function correctly, the input signal must fall below the lower switching threshold and rise above the higher switching threshold.

5.5.6 Debounce: dEbounCE

dEbounCE is an adjustable sub-menu in the inPut-A function which prevents the Timer misfunctioning when the input has noisy edges, such as those resulting from a mechanical contact closing and bouncing. Three levels of protection may be selected and the amount of debounce applied depends upon the type of Timer input that has been selected in the inP.tYPE function.

The following table shows the minimum time that the input signal must be continuously above the upper input switching threshold and continuously below the lower switching threshold to ensure that the Timer processes the input signal. Input switching thresholds are shown in section 5.5.5.

De-bounce level	Min input pulse width	
	Type of Input	
	Contact	All others
dEFAuLt	1600µs	40µs
HEAUY	3200µs	350µs
LiGHt	400µs	5µs

5.5.7 Input b: inPut-b

The inPut-b function and sub-functions are identical to the inPut-A function & sub-functions described in sections 5.5.4, 5.5.5 and 5.5.6.

Notes:
1. Maximum voltage input +30V.

2. For sensors connected to input b that require energising i.e. a proximity detector, a switch contact or an open collector, terminals 7 & 8 of the BA578E Timer should be linked together.

3. To function correctly, the input signal must fall below the lower switching threshold and rise above the higher switching threshold.

5.5.8 Lower display: di SP-2

The configuration options for the lower display vary depending upon whether the repeat timer function CYCLES is enabled.

CYCLES disabled
When the lower display is enabled it shows the set time SEt t

CYCLES enabled
When the lower display is enabled it shows the total number of repeat cycles requested together with the number of cycles performed. During the delay time between cycles the display shows the time until the next cycle starts.

Menu options allow each part of the cycle to be briefly identified at the start of each part, or periodically throughout the cycle.

To check or change the configuration of the lower display select di SP-2 from the configuration menu and press ⟦P⟧ which will reveal the existing setting which can be changed by pressing the ⟦▲⟧ or ⟦▼⟧ button followed by the ⟦E⟧ button to enter the selection and return to the configuration menu.

If the CYCLES function is not enabled the following two options are available:

Std   Lower display shows the Timer's set time SEt t, to which the BA578E will time-up to, or time-down from, depending upon the direction of count selected in the uP or dn function.

oFF   Lower display disabled.

If the CYCLES function is enabled the following three options are available:

Std   Lower display shows the number of cycles requested together with the current cycle number. During the configurable delay period between cycles the display times-down from the requested delay to zero. A brief notification of timer status i.e. CYCLE or dELRY is shown at the start of each period.

02 - 11

Current cycle number. | Number of cycles requested, not shown when cycle is continuously repeated.

LRbEL   Exactly the same as Std, but timer status i.e. CYCLE or dELRY is shown periodically.

oFF   Lower display disabled.

5.5.9 Starting & stopping the Timer: StRrStoP

The Timer may be started and stopped by signals on Input A and Input b, or by operation of the front panel ⟦▲⟧ or ⟦▼⟧ push buttons.

To check or change the control of the Timer, select StRrStoP from the configuration menu and press ⟦P⟧ which will reveal the existing setting which can be changed by pressing the ⟦▲⟧ or ⟦▼⟧ button followed by the ⟦E⟧ button to enter the selection and return to the configuration menu. The options available are shown in the following tables.

Voltage inputs and control from front panel

Display	Start	Stop
Control 1	A input high	b input high
Control 2	A input low	b input low
Control 3	A input high	A input low
Control 4	A input low	A input high
LoCAL	⟦▼⟧ button	⟦▲⟧ button

Contact and open collector inputs

Display	Start	Stop
Control 1	A open	b open
Control 2	A closed	b closed
Control 3	A open	A closed
Control 4	A closed	A open

Proximity detector input

Display	Start	Stop
Control 1	A low current	b low current
Control 2	A high current	b high current
Control 3	A low current	A high current
Control 4	A high current	A low current

5.5.10 Units of display: uni tS

Defines the format of all displayed times, except the delay time of the status output and control outputs which are always shown in seconds and the grand total which is always shown in hours and tenths of an hour.

To check or change the units of display, select uni tS from the configuration menu and press ⟦P⟧ which will reveal the existing setting which can be changed by pressing the ⟦▲⟧ or ⟦▼⟧ button followed by the ⟦E⟧ button to enter the selection and return to the configuration menu. The options available are shown in the following tables:

Display	
12:00:00	Hours, minutes & seconds
12:00	Hours & minutes*
30:00	Minutes & seconds
30	Seconds

* Only available when time specified in seconds for SEt t and r5t dELR are zero or exactly divisible by 60.

The Timer's maximum elapsed time in any format is equivalent to 99hours, 59 minutes & 59 seconds.

Display mode

DISPLAY

Security Code

Enter code by pressing
▲ or ▼ & P
to move to next digit. Code 0000 allows direct access to the menu

CodE

0000

FunCtion   inPut-A   inPut-b   diSP-2   StArStoP   unitS   SEt t   CYCLES   ACSEt t

ELAPSE   inP.tYPE   dEbounCE   inP.tYPE   dEbounCE   Std   LoCAL   12:00:00   00:00:00   EnbL   ACCd

0000   oP.CoL   dEFAuLt   oP.CoL   dEFAuLt   0000

Function	Input-A	Debounce input-A	Input-b	Debounce input-b	Lower Display	Start & stop timer	Units of display	Set time
▲ or ▼ to select	▲ or ▼ to select	▲ or ▼ to select	▲ or ▼ to select	▲ or ▼ to select	CYCLES not enabled	▲ or ▼ to select how timer is controlled	▲ or ▼ to select	▲ or ▼ to adjust value and P to move control to next digit.
Function of instrument	Input type	level of debounce.	Input type	level of debounce.	▲ or ▼ to select display	LoCAL Start ▼ button Stop ▲ button	hours minutes seconds	
ELAPSE Timer interval measurement	oP.CoL Open Collector.	dEFAuLt HEAUY LiGHt	oP.CoL Open Collector.	dEFAuLt HEAUY LiGHt	Std Set time SEt t		12:00:00 1200 30:00 30	
CLoC Clock time display	UoLt5 L Pulse <1V >3V		UoLt5 L Pulse <1V >3V		oFF lower display disabled.	Control 1 Start A high (open) Stop b high (open)		
Confirm selection by entering SurE by pressing ▲ or ▼ and P to move to next digit	UoLt5 H Pulse <3V >10V		UoLt5 H Pulse <3V >10V		CYCLES enabled	Control 2 Start A low (closed) Stop b low (closed)		
	Coi L Magnetic pick-off.		Coi L Magnetic pick-off.		▲ or ▼ to select display	Control 3 Start A high (open) Stop b low (closed)		
	Pr.dEt Proximity detector.		Pr.dEt Proximity detector.		Std Count No. & total counts with status shown at start of each opperation.	Control 4 Start A low (closed) Stop b high (open)		
	ContACt Switch contact.		ContACt Switch contact.		LAbEL Count No. & total counts with status shown periodically.			
					oFF lower display disabled.			

Enable access to Set Time from display mode

▲ or ▼ to select on or oFF

Security code for direct access to Set Time

Enter code by pressing
▲ or ▼ and P
to move to next digit

Code 0000 allows direct access.

EnbL   CYCL Cnt   rSt dELA

oFF   01   00:00:00

Enable cycle function	Cycle count	Restart delay
▲ or ▼ to toggle between on and oFF	▲ or ▼ to adjust flashing digit and P to move to next digit.	▲ or ▼ to adjust flashing digit and P to move to next digit.
	Sets number of cycles to be performed.	Sets delay between cycles in the same units as SCALE t

Timer repeat cycle function

Fig 10 Timer Configuration menu

Menu flow: uP or dn — P-FAiL — LoC rSEt — E rSEt — StRt oP — oP 1 — oP2 — CLr Gtot — CodE — rSEt dEF

Sub-selections: dn / 0000 ; idLE / on ; rSEtEnbl — CLr Gtot / oFF ; Std ; As oP1 ; CLr.no / Clr Gtot / 0000 ; 0000 ; 0000

Direction of count
▲ or ▼ to select uP or dn

Power fail
▲ or ▼ to select how timer functions when power is restored after failure
idLE Stopped, requires reset & start input.
PAuSE Paused, requires start input.
ContinuE Resumes timing.

Local total reset
▲ or ▼ to turn the local total reset function on or oFF
When on is selected pressing ▲ and ▼ simultaneously for more than 3 seconds in the display mode resets the total display.

Local grand total clear
▲ or ▼ to turn the local grand total reset function on or oFF
When on is selected pressing E and ▲ simultaneously for more than 10 seconds in the display mode resets the grand total.

External reset
▲ or ▼ to toggle between Std 1s FASt 2ms external contact reset time.

Clear grand total
▲ or ▼ to select YES to reset grand total to zero.
Confirm instruction by entering SurE. Press ▼ or ▲ to adjust each digit and P to move to next digit

Define Security Code
Enter by pressing ▼ or ▲ & P to move to next digit.

Reset configuration to Timer factory defaults
Confirm instruction by entering SurE. Press ▼ or ▲ to adjust each digit and P to move to next digit

Output 1 sub-menu: EnbL — oP1 on — oP1 oFF — oP1 dELA
oFF / run / n run / 00000

Enable output 1
▲ or ▼ to toggle between on and oFF

Output on at
▲ or ▼ to select required function
run PAuSE dELAY donE n rESEt n run n PAuSE n dELAY n donE rESEt
Select action that energises output 1.

Output off at
▲ or ▼ to select required function
n run n PAuSE n dELAY n donE rESEt run PAuSE dELAY donE n rESEt
Select action that de-energises output 1.

Output on delay
▲ or ▼ to adjust flashing digit and P to move to next digit
Set delay in seconds before output 1 is energised.

Output 1 configuration
Only included when optional Control Outputs are fitted

Status output sub-menu: EnbL — StRt on — StRt oFF — StRt.dELA
oFF / run / n run / 00000

Enable Stat oP
▲ or ▼ to toggle between on and oFF

Status output on at
▲ or ▼ to select required state
run PAuSE dELAY donE n rESEt n run n PAuSE n dELAY n donE rESEt
Select action that energises output.

Status output off at
▲ or ▼ to select required state
n run n PAuSE n dELAY n donE rESEt run PAuSE dELAY donE n rESEt
Select action that energises output.

Status output on delay
▲ or ▼ to adjust flashing digit and P to move to next digit.
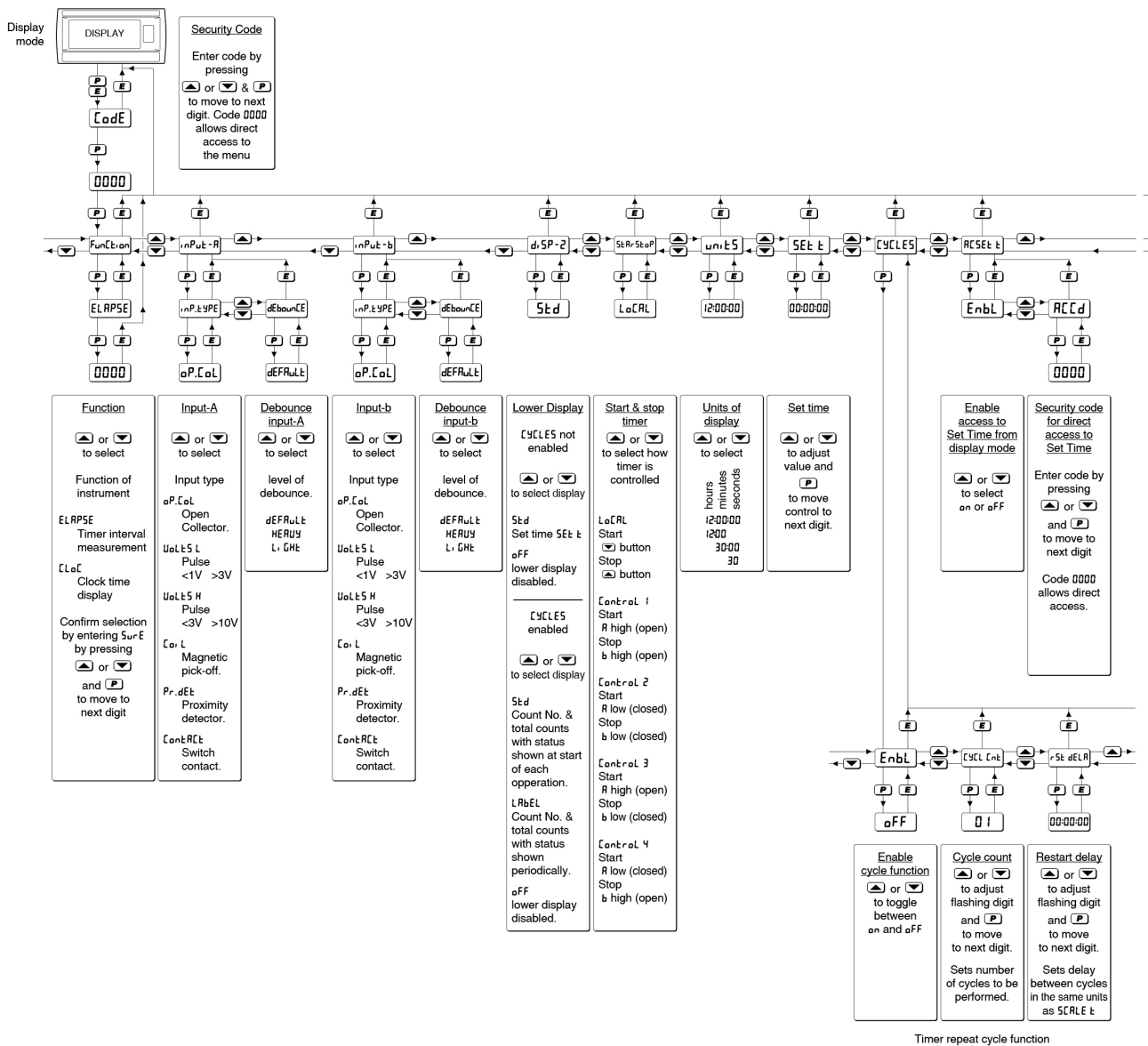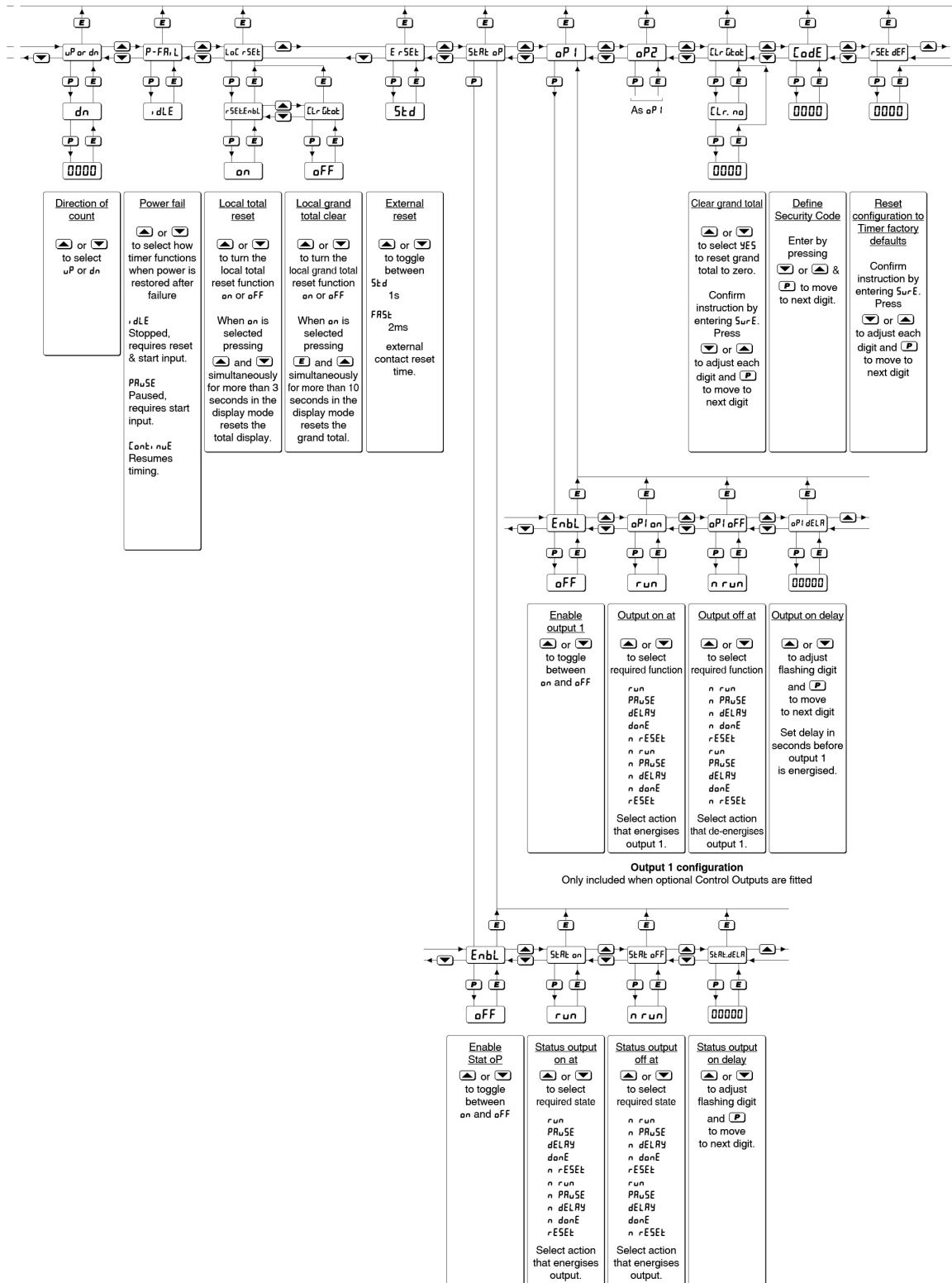
5.5.11 Set time: 5Et t

Set time is the Timer's setpoint. When controlling an external event via the control outputs the BA578E will time-down from the set time to zero or time-up from zero to the set time.

To check or change the set time, select 5Et t from the configuration menu and press P which will reveal the existing setting displayed in the units defined by the uni t5 function with the most significant digit flashing. The flashing digit may be adjusted by pressing the ▲ or ▼ button followed by the P button to transfer control to the next digit. When set as required, enter the selection and return to the 5Et t prompt in the configuration menu by operating the E button.

Can also be adjusted from Timer display mode, see 5.5.16.

Note: If 5Et t is zero the Timer will not function when an external start input is received or the ▼ button is operated.

5.5.12 Repeat timing cycle: CYCLE5

This a powerful function which allows the BA578E timing cycle to be repeated up to 99 times or continuously with a configurable delay between cycles of up to 99hours, 59 minutes & 59 seconds.

To check or adjust the repeat timing cycle, select CYCLE5 from the configuration menu and press P which will enter a sub-menu containing three sub-functions, EnbL, CYCL Cnt and r5t dELA which are described in the following sections.

5.5.13 Cycle function enable: EnbL

This sub-function allows the repeat timing cycle to be enabled or disabled without altering any of the repeat timing cycle parameters. To check or change the function select EnbL from the repeat timing cycle sub-menu CYCLE5 and press P which will reveal if the repeat cycle function is on or oFF. The setting can be changed by pressing the ▼ or ▲ button followed by the E button to return to the repeat timing cycle sub-menu.

5.5.14 Cycle count: CYCL Cnt

This sub-function defines the number of times the timer cycle is repeated. It may be set to any number between 1 and 99, or to 00 for continuous repetition. To check or change the function select CYCL Cnt from the repeat timing cycle sub-menu CYCLE5 and press P which will reveal the number of times the timer cycle is to be repeated with the most significant flashing. The flashing digit may be adjusted by pressing the ▲ or ▼ button followed by the P button to transfer control to the next digit.

When set as required, enter the selection and return to the CYCL Cnt prompt in the sub-menu by operating the E button.

5.5.15 Restart delay: r5t dELA

This sub-function defines the time delay between repeat timing periods. It is shown in the format selected in the units function and may be set to any time between zero and the maximum time allowed in the selected format.

Time format selected in uni t5	Maximum delay
12:00:00	99:59:59
12:00	99:59
30:00	5999 :59
30	359999

To check or change the restart delay time select r5t dELA from the repeat timing cycle sub-menu CYCLE5 and press P which will reveal the delay time in the selected format with the most significant digit flashing. The flashing digit may be adjusted by pressing the ▲ or ▼ button followed by the P button to transfer control to the next digit. When set as required, enter the selection and return to the r5t dELA prompt in the sub-menu by operating the E button.

Can also be adjusted from Timer display mode, see 5.5.16.

5.5.16 Adjusting the set time 5Et t and restart delay r5t dELA from the display mode: ACSEt t

When this function is enabled the Timer's set time 5Et t and restart delay r5t dELA can be adjusted from the display mode by simultaneously operating the P and ▲ push buttons. Thus allowing an operator to adjust these parameters without having access to the instrument's configuration menu. The function contains two sub-functions, EnbL which activates the function and ACCd which defines a separate code for access to 5Et t with the Timer in the display mode.

To check or change the function, select ACSEt t in the configuration menu and press P which will reveal the EnbL prompt, pressing P again will show if the function is on or oFF. If adjustment of the set time from the display mode is not required press the ▲ or ▼ button to select no and then press E twice to return to the configuration menu. If the function is required, select YES and press E to return to the EnbL prompt from which ACCd, which allows a separate access code to be entered, can be selected by pressing the ▲ or ▼ button.

Access to 5EŁ Ł from the display mode may be protected by a four digit alphanumeric security code which must be entered to gain access. Default security code 0000 allows unrestricted access. With R££d displayed, press Ⓟ to enter a new access code. The Timer will display 0000 with one digit flashing. The flashing digit may be adjusted using the ▲ or ▼ push button, when set as required operating the Ⓟ button will transfer control to the next digit. When all the digits have been entered press Ⓔ twice to return to the R£5EŁ Ł prompt in the configuration menu. The revised access code will be activated when the BA578E is returned to the display mode.

Please contact BEKA associates sales department if the access code is lost.

5.5.17 Direction of count: uP or dn

The Timer may be configured to time-up from zero to the set time 5EŁ Ł while displaying elapsed time, or to time-down from the set time 5EŁ Ł to zero while displaying the remaining time.

When the repeat timing cycle function £Y£LE5 is enabled, it is recommended that a down count is selected so that the progress of the timer can be observed with a known completion time i.e. zero. If set as an up counter, elapsed time will be displayed, but the set time 5EŁ Ł at which the timer will stop is not shown.

To check the direction of count, select uP or dn from the configuration menu and press Ⓟ which will reveal the existing setting. This can be changed by pressing the ▲ or ▼ button followed by the Ⓔ button to enter the selection and return to the configuration menu.

5.5.18 Power Fail: P-FR, L

Defines how the Timer powers-up and functions when power is restored after a power supply interruption. Three options are available, , dLE, PRu5E and £onŁ, nuE.

, dLE	The Timer is stopped in the state it achieves when it has timed-up to 5EŁ Ł or timed-down to zero, with the elapsed or remaining time when power was lost shown on the upper display. The Timer must be reset before it can be restarted. If the repeat timing cycle is in use the number of cycles completed will be lost when the Timer is reset.
PRu5E	The Timer is stopped in the state it achieves following receipt of a stop input to pause timing – see Fig 9. The elapsed or remaining time when power was lost is shown on the upper display. Timing resumes when a start instruction is received. If a start input exists when power is restored timing will start immediately.

£onŁ, nuE When power is restored the Timer will continue from where it stopped without any manual intervention.

To check or change the function, select P-FR, L from the configuration menu and press Ⓟ which will reveal the existing setting which can be changed by pressing the ▲ or ▼ button followed by the Ⓔ button to enter the selection and return to the configuration menu.

5.5.19 Local reset: LoE r5EŁ

The Local reset function contains two separate sub-functions r£5EŁ.EnbL and £Lr £ŁoŁ which when enabled allow the Timer and the grand total to be reset via the instrument's front panel push buttons while the Timer is in the display mode.

5.5.20 Local total reset: r£5EŁ.EnbL

r£5EŁ.EnbL is a sub-function in the LoE r5EŁ function which when activated allows an operator to reset the Timer from the display mode by operating the ▲ and ▼ push buttons simultaneously for more than three seconds.

To check or change the local total reset select LoE r5EŁ in the configuration menu and press Ⓟ which will reveal the r£5EŁ.EnbL prompt, press Ⓟ again to show if the local total reset is on or oFF. If set as required operate the Ⓔ button twice to return to the configuration menu, or the ▲ or ▼ button to change the setting followed by the Ⓔ button twice to enter the change and return to the LoE.r5EŁ prompt in the configuration menu.

Note:

The Timer may also be reset remotely by connecting terminals RS1 and RS2 together. See section 2.3

5.5.21 Local grand total reset: £Lr £ŁoŁ

The grand total is the total run-time of the Timer that may be viewed by operating the Ⓔ and ▲ push buttons simultaneously in the display mode. When activated £Lr £ŁoŁ allows an operator to reset the grand total display to zero from the display mode by operating the Ⓔ and ▲ push buttons simultaneously for more than ten seconds.

£Lr £ŁoŁ is a sub-function in the LoE r5EŁ menu. To check or change the setting select LoE r5EŁ in the configuration menu and press Ⓟ which will reveal r£5EŁ.EnbL. Using the ▼ or ▲ button select £Lr £ŁoŁ and press Ⓟ to show if local grand total reset is on or oFF. If set as required operate the Ⓔ button twice to return to the configuration menu, or the ▼ or ▲ button to change the setting followed by the Ⓔ button twice to enter the change and return to the LoE r5EŁ prompt in the configuration menu.

5.5.22 External reset

The Timer may be reset by connecting terminals RS1 and RS2 together. This function defines how long the connection must exist before resetting occurs. When resetting is performed by a manually operated external push button switch, 5td should be chosen. This requires the contact to be closed for one second before resetting occurs which prevents false resetting.

If the Timer is being reset by the a control output or similar apparatus FASt should be selected.

Select	Resetting time
5td	1s
FASt	2ms

5.5.23 Status output: 5tAt oP

The status output of the Timer is an opto isolated open collector that can be used for transmitting the status of the Timer to other instruments. It may also be used for simple control applications. When the Status output is *on* the RTx annunciator on the Timer display is activated.

The status output function contains four sub-functions, EnbL, 5tAt on, 5tAt oFF and 5tAtdELA. To gain access to the sub-menu select 5tAt oP in the configuration menu and press P which will show the EnbL prompt from which the other sub-functions can be accessed using the ▼ or ▲ button.

The status output may be configured to turn *on* when the Timer enters a selected Timer state and to turn *off* when the Timer enters another specified Timer state. e.g. if run is selected in the 5tAt on sub-function and donE is selected the 5tAt oFF function. The status output will turn *on* when the Timer enters the run state and will stay *on* until the Timer enters the donE state. Alternatively, the status output phase may be reversed by selecting the n states such as n rESEt.

If the status output is required to be *on* in only one Timer state, this can be achieved with the following configuration.

5tAt on	state required	e.g.	run
5tAt oFF	n state required	e.g.	n run

In this example when the Timer enters the run state the status output turns *on*. When the Timer moves from the run to any other state, the status output turns *off*.

5.5.24 Status output enable: EnbL

This function allows the status output to be enabled or disabled without altering any other status output parameters. To check or change the function select EnbL from the status output sub-menu and press P to reveal if the status output is on or oFF. The setting can be changed by pressing the ▼ or ▲ button followed by the E button to return to the status output sub-menu.

5.5.25 Status output *on* : 5tAt on

The status output may be configured to turn *on* when the Timer enters any one of the five Timer states. Alternatively, the status output phase may be reversed by selecting an n state. This will cause the status output to turn *on* when the Timer enters any other than the specified Timer state. Timer states are shown in Fig 9.

To define when the status output turns *on* select 5tAt on from the sub-menu and press P to show the existing setting. Pressing the ▼ or ▲ button will scroll through the options:

Display	Status output turns *on* when Timer enters selected state
rESEt	Reset state
run	Running state
PAuSEd	Paused state
dELAY	Restart delay state
donE	Complete state

Display	Status output turns *on* when Timer enters any other than the selected state
n rESEt	Reset state
n run	Running state
n PAuSEd	Paused state
n dELAY	Restart delay state
n donE	Complete state

When the required setting has been selected press E to enter the selection and return to the status output sub-menu.

5.5.26 Status output *off* : 5ɫAɫ oFF

The status output may be configured to turn *off* when the Timer enters any one of the five Timer states. Alternatively, the status output phase may be reversed by selecting an ∩ state. This will cause the status output to turn *off* when the Timer enters any other than the specified Timer state. Timer states are shown in Fig 9.

To define when the status output is *off* select 5ɫAɫ oFF from the sub-menu and press Ⓟ to show the existing setting. Pressing the ▼ or ▲ button will scroll through the options:

Display	Status output turns *off* when Timer enters selected state
rE5Eɫ	Reset state
run	Running state
PAu5Ed	Paused state
dELAY	Restart delay state
donE	Complete state

	Status output turns *off* when Timer enters any other than the selected state
∩ rE5Eɫ	Reset state
∩ run	Running state
∩ PAu5Ed	Paused state
∩ dELAY	Restart delay state
∩ donE	Complete state

When the required setting has been selected press Ⓔ to enter the selection and return to the status output sub-menu.

5.5.27 Status output *on* delay time: 5ɫAɫ.dELA

The status output may be delayed from turning on for a fixed time following the selected condition occurring. e.g. when the timer enters the *Run* state. This delay is useful for many control applications, for example when the status output is connected to the reset terminals RS1 and RS2 to automatically reset the BA578E Timer.

This delay can be adjusted in 1 second increments up to 32,400 seconds, which is 9 hours. If a delay is not required zero should be entered. To adjust the delay select 5ɫAɫ.dELA from the status output sub-menu and press Ⓟ which will reveal the existing delay time with one digit flashing. The flashing digit can be adjusted using the ▼ or ▲ button and the Ⓟ button to move to the next digit. When the required delay has been entered, press Ⓔ to return to the status output sub-menu.

5.5.28 Control output 1: oP1

Control output 1 is a galvanically isolated solid state switch contact which can be configured to turn *on* and *off* when the Timer enters specified states. When control output 1 is *on* the '1' annunciator on the Timer display is activated.

The function contains four sub-functions, EnbL, oP1 on, oP1 oFF and oP1 dELA. To gain access to the sub-menu select oP1 in the configuration menu and press Ⓟ which will show the EnbL prompt from which the other sub-functions can be accessed using the ▼ or ▲ button.

Control output 1 may be configured to turn *on* when the Timer enters a selected Timer state and to turn *off* when the Timer enters another specified Timer state. e.g. if run is selected in the oP1 on sub-function and donE is selected the oP1 oFF function. Control output 1 will turn *on* when the Timer enters the run state and will stay *on* until the Timer enters the donE state. Alternatively, the control output phase may be reversed by selecting the ∩ states such as ∩ rE5Eɫ.

If control output 1 is required to be *on* in only one Timer state, this can be achieved with the following configuration.

oP1 on	state required	e.g. run
oP1 oFF	n state required	e.g. ∩ run

In this example when the Timer enters the run state control output 1 turns *on*. When the Timer moves from the run to any other state, control output 1 turns *off*.

The Timer configuration example in section 6.2 of this manual illustrate the use of the control outputs. Further examples can be found in Application Guide AG374 which is available on the BEKA website.

5.5.29 Control output 1 enable: EnbL

This function allows control output 1 to be enabled or disabled without altering any other control output parameters. To check or change the function select EnbL from the control output 1 sub-menu and press Ⓟ to reveal if control output 1 is on or oFF. The setting can be changed by pressing the ▼ or ▲ button followed by the Ⓔ button to return to the control output 1 output sub-menu.

5.5.30 Control output 1 *on* **:** oP1 on

Control output 1 may be configured to turn *on* when the Timer enters in any one of the five Timer states. Alternatively, the control output 1 phase may be reversed, by selecting an n state which will cause the control output to turn *on* when the Timer enters any other than the specified Timer state. Timer states are shown in Fig 9.

To define when control output 1 turns *on* select oP1 on from the sub-menu and press ⒫ to show the existing setting. Pressing the ⊽ or ⊼ button will scroll through the options:

Display	Control output 1 turns *on* when Timer enters selected state
rESEt	Reset state
run	Running state
PAuSEd	Paused state
dELAY	Restart delay state
donE	Complete state

Display	Control output 1 turns *on* when Timer enters any other than the selected state
n rESEt	Reset state
n run	Running state
n PAuSEd	Paused state
n dELAY	Restart delay state
n donE	Complete state

When the required setting has been selected press ⒠ to enter the selection and return to the status output sub-menu.

5.5.31 Control output 1 *off* **:** oP1 oFF

Control output 1 may be configured to turn *off* when the Timer enters any one of the five Timer states. Alternatively, the phase of control output 1 may be reversed, by selecting an n state which will cause the control output to turn *off* when the Timer enters any other than the specified Timer state. Timer states are shown in Fig 9.

To define when control output 1 turns *off* select oP1 oFF from the sub-menu and press ⒫ to show the existing setting. Pressing the ⊽ or ⊼ button will scroll through the options:

Display	Control output 1 turns *off* when Timer enters selected state
rESEt	Reset state
run	Running state
PAuSEd	Paused state
dELAY	Restart delay state
donE	Complete state

Display	Control output 1 turns *off* when Timer enters any other than the selected state
n rESEt	Reset state
n run	Running state
n PAuSEd	Paused state
n dELAY	Restart delay state
n donE	Complete state

When the required setting has been selected press ⒠ to enter the selection and return to the control output 1 sub-menu.

5.5.32 Control output 1 *on* **delay time:** oP1 dELA

Control output 1 may be delayed from turning on (output closed) for a fixed time following the selected condition occurring. e.g. when the Timer enters the run state.   This delay is useful for many control applications, for example when the control output is connected to the reset terminals RS1 and RS2 to automatically reset the BA578E Timer.

The delay can be adjusted in 1 second increments up to 32,400 seconds, which is 9 hours. If a delay is not required zero should be entered. To adjust the delay select oP1 dELA from the control output 1 sub-menu and press ⒫ which will reveal the existing delay time with one digit flashing. The flashing digit can be adjusted using the ⊽ or ⊼ button and the ⒫ button to move to the next digit.   When the required delay has been entered, press ⒠ to return to the control output 1 output sub-menu.

6.5.33 Control output 2: oP2

Control output 2 is a, galvanically isolated solid state switch contact which can be independently configured to turn *on* and *off* when the Timer is any of it's five states.   It's functions and configuration are identical to control output 1 described in sections 5.5.28 to 5.5.32. When control output 2 is *on* the '2' display annunciator is activated.

5.5.34 Reset grand total from within the configuration menu: CLr GtoT

The grand total is the total run-time of the Timer that may be viewed by operating the Ⓔ and ⒶUP push buttons simultaneously in the display mode.

The grand total can be reset to zero from within the configuration menu using this CLr GtoT function, or from the display mode if CLr GtoT is activated in the local grand total clear function - see 5.5.21

To zero the Timer grand total from within the configuration menu select CLr GtoT and press Ⓟ which will cause the instrument to display CLr.no with no flashing. Operate the Ⓓ or Ⓐ push button until CLr.YES is displayed and then press Ⓟ which will result in a 0000 prompt being displayed with the first digit flashing. This is a request for the instruction to be confirmed by entering SurE using the Ⓓ or Ⓐ button to adjust the flashing digit and the Ⓟ button to move control to the next digit. Pressing Ⓔ will then reset the grand total to zero and return the Timer to the configuration menu.

Note:
> Once reset, the grand total can not be recovered.

5.5.35 Security code: CodE
Access to the instrument configuration menu may be protected by a four digit alphanumeric security code which must be entered to gain access. New instruments are configured with the default security code 0000 which allows unrestricted access to all configuration functions.

To enter a new security code select CodE from the configuration menu and press Ⓟ which will cause the Timer to display 0000 with one digit flashing. The flashing digit may be adjusted using the Ⓐ or Ⓓ push button, when set as required operating the Ⓟ button will transfer control to the next digit. When the new security code has been entered press Ⓔ to return to the CodE prompt. The revised security code will be activated when the Timer is returned to the display mode.

Please contact BEKA associates sales department if the security code is lost.

5.5.36 Reset configuration to factory defaults rSEt dEF
When the BA578E is configured as a Timer this function resets the instrument to the Timer factory defaults shown in section 5.5.

To reset the configuration select rSEt dEF from the configuration menu and press Ⓟ. The BA578E will display 0000 with the first digit flashing which is a request to confirm the instruction by entering SurE. Using the Ⓐ or Ⓓ button set the first flashing digit to S and press Ⓟ to transfer control to the second digit which should be set to u. When SurE has been entered pressing the Ⓔ button will reset all the configuration functions and return the instrument to the display mode.

Note:
> rSEt dEF does not reset the grand total to zero.

6. TIMER APPLICATION EXAMPLES

This section illustrates two applications for the BA578E when configured as a Timer.

6.1 Measuring the time that a contact is closed.

In this example a BA578E is required to display the time that a process area contact is closed. The display is required in hours and minutes and is to be reset to zero by an exterior push button, not by the instrument front panel push buttons. The operator is required to zero the grand total by operating the Ⓔ + ⏶ buttons simultaneously. No security codes are required to protect access to the configuration menu or to the grand total reset.

Figure 11 shows the BA578E connections. This example illustrates how the Timer may be started and stopped by one input, the second input is not used in this application.
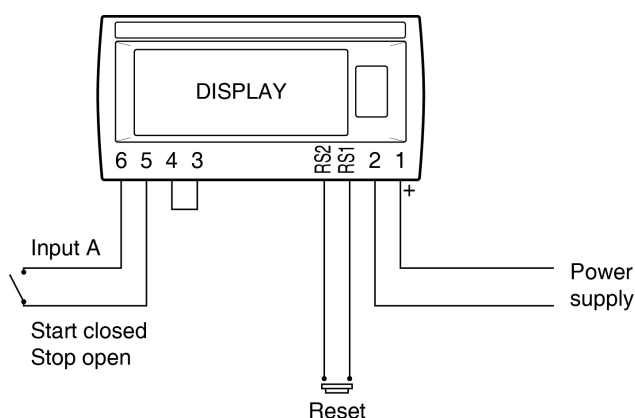
Fig 11 Starting & stopping timer with one input

The required instrument configurations for this example are shown below.

Function	Display	Setting
Access code	CodE	0000
Function	FunCtion	ELAPSE
Input A	inPut-A	ContACt
De-bounce Input A	dEbounCE	dEFAult
Display 2	diSP-2	oFF
Start stop	StArStoP	Control 4
Units	unitS	12:00
Set time	SEt t	9999:59:59
Local total reset	rESE EnbL	oFF
Local grand total reset	CLr GtoL	on

6.2 Controlling a solenoid valve

This example illustrates how a BA578E Timer can open a solenoid valve for 5 minutes each time a start button is operated. The operator needs to pause the process without affecting the total time that the valve is open. At the end of the process the Timer is required to automatically reset within 10 seconds ready for the next timing cycle to be started.

For this application the BA578E Timer requires dual control outputs which are a factory fitted option and should be specified when the instrument is ordered.

Control output 1 is used to switch the intrinsically safe solenoid valve, and control output 2 is wired to the Timer's reset terminals to perform the automatic resetting at the end of the timing cycle, see Fig 12.

The Timer is configured to perform one timing cycle CYCL Cnt with a restart delay rSt dELA of 5s and Set time SEt t is adjusted to 5 minutes the required time that that the valve is to be open.

Control outputs are configured so that control output one is only closed when the timer is in the *Run* state. Control output 2 is configured to only close when the Timer is in the *Done* state which occurs after it has been in the Restart-delay state for 5 seconds. The sequence of events is shown in Fig 12 and the Timer's configuration at the end of this section.

This valve opening process is to be linked to other processes, therefore the status output is required to indicate when the 5 minute valve open period has been completed and when the Timer has been reset and is ready for the next cycle.

When the start button is operated the Timer enters the *Running* state and control output 1 closes for 5 minutes opening the solenoid valve. At the end of the 5 minute period control output 1 opens which closes the solenoid valve and the Timer enters the *Restart-delay* state for 5 seconds followed by the *Done* state. Control output 2 is configured to close when the Timer is in the *Done* state. Control output 2 is externally connected to the Timer's reset terminals which causes the Timer to automatically reset ready to start another cycle when the start button is operated.

If at any time during the cycle the stop button is operated the Timer will enter the Pause state which will stop the process until the start button is operated when it will resume without shortening the total valve open time.
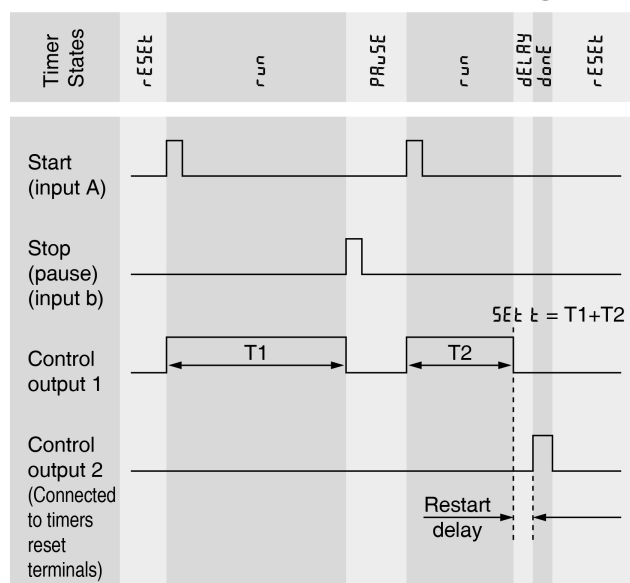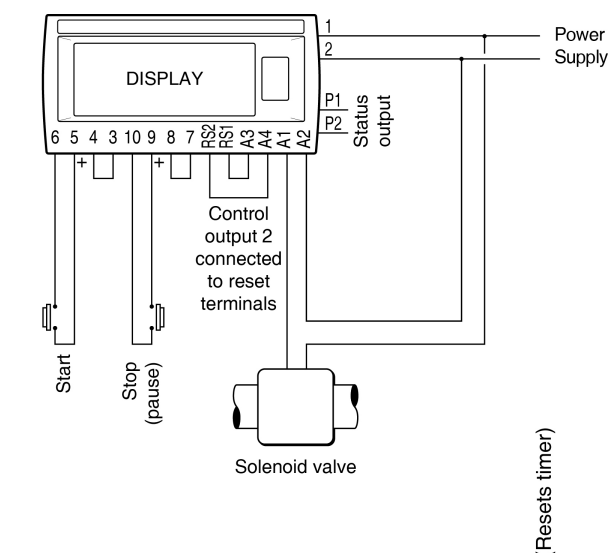
Fig 12 Control of valve in a process area.

The required instrument configurations for this example are shown below.

Function	Display	Setting
Access code	CodE	0000
Function	FunCtion	ELAPSE
Input A	inPut-A	ContACt
Input b	inPut-b	ContACt
De-bounce (both inputs)	dEbounCE	dEFAuLt
Display 2	diSP-2	Std
Start stop	StArStoP	ControL 2
Units	uni tS	12:00:00
Set time	SEt t	00:05:00
Timer repeat cycle	CYCLES	
Enable repeat cycle	EnbL	on
Cycle count	CYCL Cnt	01
Reset delay	rSt dELA	000005
Access set time from display mode.	RESEt - t	oFF
Direction of count	uP or dn	dn
Power failure	P-FAi L	i dLE
Local total reset	rESEt.EnbL	on
Local grand total reset	CLr Gtot	oFF
External reset	E rSEt	FASt
Enable control output 1	EnbL	on
Control output 1 on at	oP1 on	run
Control output 1 off at	oP1 oFF	n run
Control output 1 delay	oP1 dELA	00000
Enable control output 2	EnbL	on
Control output 2 on at	oP2 on	donE
Control output 2 off at	oP2 oFF	n donE
Control output 2 delay	oP2 dELA	00005
Enable status output	EnbL	on
Status output on at	StAt on	rESEt
Status output off at	StAt oFF	n rESEt
Status output delay	StAtdELA	00000

In this example local total reset rESEt.EnbL is on. This enables the Timer to be reset when power is first connected by operating the ▲ and ▼ down button simultaneously for more than 3 seconds.

7. MAINTENANCE when configured as a Timer

7.1 Fault finding during commissioning

If a BA578E fails to function as a Timer during commissioning the following procedure should be followed:

Symptom	Cause	Check:
No display	No power supply, or incorrect wiring. Note: Terminals 2, 6, 10 & RS2 are interconnected within the instrument.	That there is between 10 and 30V on terminals 1 & 2 with terminal 1 positive.
Instrument configuration menu does not correspond with Timer section of this manual.	BA578E may be configured as a clock.	That FunCtion in configuration menu is set to ELAPSE not to CLoC.
Timer will not start.	Timer not reset	Reset timer via external contact or by operating ▲ and ▼ buttons simultaneously if the local total reset rSEt EnbL function has been activated.
	Set time SEt t has not been entered.	Enter time other than zero for SEt t.
Timer will not respond to sensor inputs.	Input A and/or Input b incorrectly configured, or sensor incorrectly connected.	inPut A and inPut b configuration and that input energising link(s) are correctly fitted for selected sensors.
Control output(s) do not function.	Control outputs have not been enabled.	Enable Control Output(s) in the configuration menu.
Unable to enter configuration menu.	Incorrect security code	That the correct security code is being used. Contact BEKA if code is lost.

7.2 Fault finding after commissioning

ENSURE PLANT SAFETY BEFORE STARTING MAINTENANCE

If a BA578E fails after it has been functioning correctly, the following table may help to identify the cause of the failure.

Symptom	Cause	Check:
No display	No power supply	That there is between 10 and 30V on terminals 1 & 2 with terminal 1 positive.
Timer will not start.	Timer not reset	Reset timer via external contact or by operating ▲ and ▼ buttons simultaneously if local total reset rESEt.EnbL has been activated.
Control output(s) do not function.	Control Outputs have not been enabled.	Enable Control Output(s) in the configuration menu.
Unable to enter configuration menu.	Incorrect security code	That the correct security code is being used. Contact BEKA if code is lost.

If this procedure does not reveal the cause of the fault, it is recommended that the instrument is replaced.

Note:

If configuration changes are made to any of the following functions the Timer will be forced into a fail safe idle condition. This stops the Timer in the state it achieves when it has timed-up to SEt t or timed-down to 0000. The Timer must be reset before it can be restarted.

inPut A, inPut b, StArtStoP, CYCLES, uP or dn, oP1 and oP2.

7.3   Servicing

We recommend that faulty BA578E Timers are returned to BEKA associates or to our local agent for repair. It is helpful if a brief description of the fault symptoms is provided.

7.4   Routine maintenance

The mechanical and electrical condition of the instrument should be regularly checked. Inspection frequency should be chosen to suit the environmental conditions.

7.5   Guarantee

Instruments which fail within the guarantee period should be returned to BEKA associates or our local agent. It is helpful if a brief description of the fault symptoms is provided.

7.6   Customer comments

BEKA is always pleased to receive comments from customers about our products and services. All communications are acknowledged and whenever possible, suggestions are implemented.

8.   OPERATION AS A CLOCK

When configured as a clock the BA578E can display local time in a variety of twelve or twenty four hour formats.   The displayed time can be adjusted via the front panel push buttons which may be protected by a user definable four digit security code to prevent unauthorised or accidental adjustment.

The clock may be synchronised to an external time standard via the instrument's reset terminals.   When these two terminals are connected together by an external switch contact, the clock display will be reset to a preconfigured time and will resume running from this time when the contacts are opened.

The optically isolated status open collector output can be used to monitor the clock or to perform simple control functions.

Using the galvanically isolated control outputs the clock can be configured to turn each solid state output *on* and *off* twice during each twenty four hour period.

Fig 13 shows a simplified block diagram of the BA578E configured as a clock.

The instrument can be supplied with an optional internally powered backlight.
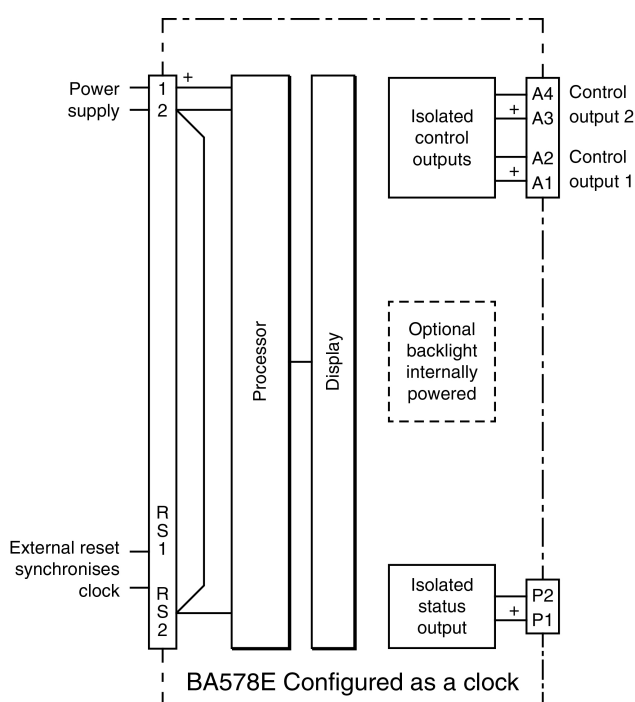
Fig 13   BA578E block diagram with clock configuration.

8.1   Initialisation and loss of power

Each time power is applied to a BA578E initialisation is performed.   After a short delay the following display sequence occurs:

All segments of the display are activated

Instrument starts functioning, using the configuration information stored in the instrument's permanent memory.

Following initialisation, the instrument will have a flashing display which is a request for the local time to be entered.   The clock will not start to function until a display time has been entered, or the remote reset contacts are closed and opened to synchronise the clock to a preconfigured time.

If during normal operation the power supply is interrupted for more than 30ms, the display will return to the flashing condition and the display time will have to be re-entered.   This time may be increased by powering the Clock from a lightly loaded instrument supply with large output capacitance.

8.2   Controls when configured as a clock

The BA578E clock is configured and adjusted via four front panel push buttons.   In the display mode i.e. when the instrument is displaying time, the push button functions are:

Push Button Functions

[P] + [▼]   Shows in succession, firmware version number, instrument function `CLoC` and confirms that control outputs are fitted:

-A   Dual Control Outputs

[P] + [E]   Access to configuration menu

Note: The BA578E clock may be configured to provide direct access to the control outputs from the display mode when the [P] and [▲] push buttons are operated simultaneously. - see section 8.4.16

8.3   Displays when configured as a clock

The BA578E clock has a single digital display plus annunciators.

Time display	Shows time in selected 12 or 24 hour format.
Reset annunciator	Activated while clock is being synchronised and external reset contacts are closed.
Status output annunciator	RTx shown while status output is activated.
Control output annunciators	Show status of both control outputs.

8.4 Configration as a Clock

The BA578E is configured and calibrated via four front panel push buttons. All the configuration functions are contained in an easy to use intuitive menu that is shown diagrammatically in Fig 14.

Each menu function is summarised in section 8.4.2 of this manual and each includes a reference to more detailed information.

All new BA578E instruments are supplied configured as requested at the time of ordering. If configuration is not requested, the BA578E will be supplied with default Timer configuration as shown in section 5.5.

If a BA578E Clock is requested without detailed configuration information, the instrument will supplied with default Clock configuration as shown below, but can easily be re-configured on-site.

Function	Display	Default
Access code	$CodE$	0000
Function	$FunCti on$	$CLoC$
Display	$di SPLAY$	$12:00$
Set display time	SEt	$A\ 12:00:00$
Syncronise time	$SYnC\ t$	$A\ 12:00:00$
Enable status output	$EnbL$	oFF
Enable control output 1	$EnbL$	oFF
Enable control output 2	$EnbL$	oFF
Enable access alarm times from display mode.	$ACSP$	oFF
Access code for alarm times from display mode.	$ACCd$	0000

8.4.1 Accessing configuration functions

Throughout this manual push buttons are shown as ▼, ▲, P and E and legends displayed by the Clock are shown in a seven segment font just as they appear on the instrument e.g. $di SPLAY$ and $CodE$.

Access to the configuration menu is obtained by operating the P and E push buttons simultaneously. If the instrument is not protected by an access security code the first parameter $FunCti on$ will be displayed. If a security code other than the default code 0000 has already been entered, the instrument will display $CodE$. Press P to clear this prompt and enter the security code for the instrument using the ▼ or ▲ push button to adjust the flashing digit, and the P push button to transfer control to the next digit. If the correct code has been entered pressing E will cause the first parameter $FunCti on$ to be displayed. If an incorrect code is entered, or a push button is not operated within ten seconds, the instrument will automatically return to the display mode.

All configuration functions and prompts are shown on the upper eight digit display.

Once within the main configuration menu the required parameter can be selected by scrolling through the menu using the ▼ or ▲ push button. The Clock configuration menu is shown diagrammatically in Fig 14.

When returning to the display mode following reconfiguration, the Clock will display $dAtA$ followed by $SAUE$ while the new information is stored in permanent memory.

Display mode

DISPLAY

Security Code

Enter code by pressing ▲ or ▼ & P to move to next digit. Code 0000 allows direct access to the menu

[odE

0000

FunCtion | di SPLAY | SEE | SYnC t | SEAE oP

[LoC | 12:00 | A 12:00:00 | A 12:00:00

0000

Function

▲ or ▼ to select

Function of instrument

ELAPSE Timer

[LoC Clock

Confirm selection by entering SurE by pressing ▲ ▼ & P to move to next digit

Format of display

▲ or ▼ to select

12:00
12:00:00
24:00
24:00:00

Set display time

▲ or ▼ to adjust each digit and P to move to the next digit

Clock starts from new time when instrument is returned to the display mode

Set synchronisation time

▲ or ▼ to adjust each digit and P to move to the next digit. Clock is set to synchronisation time when reset terminals RS1 & RS2 are connected together, the clock restarts when the terminals are disconnected

EnbL | SEAE:on1 | SEAE:oFF1 | SEAE:on2 | SEAE:oFF2

oFF | A 12:00:00 | A 12:00:00 | A 12:00:00 | A 12:00:00

Enable Status output

▲ and ▼ to select

oFF output dissabled

on:1 on and off once per 24 nours

on:2 on and off twice per 24 hours

Set first on time

▲ or ▼ to adjust flashing digit and P to move to next digit

Set first off time

▲ or ▼ to adjust flashing digit and P to move to next digit

Set second on time

▲ or ▼ to adjust flashing digit and P to move to next digit

Set second off time

▲ or ▼ to adjust flashing digit and P to move to next digit

Only included when on:1 or on:2 selected in EnbL

Only included when on:2 selected in EnbL

Fig 14 Clock Configuration menu

Top flow row:

oP 1 — oP2 — ACSP — CodE — rSEt dEF

As oP 1

EnbL — ACCd

oFF — 0000

Access Enable

▲ or ▼
to select
on or oFF

Access Code for adjustment of Output on and oFF Times from Display Mode

Enter code by pressing
▲ or ▼
and P
to move to next digit

Code 0000 allows direct access

Define Security Code

Enter code by pressing
▲ or ▼
and P
to move to next digit

Reset configuration to clock factory defaults

Confirm instruction by entering SurE.
Press
▼ or ▲
to adjust each digit and P
to move to next digit

Bottom flow row:

EnbL — oP 1:on 1 — oP 1:oFF 1 — oP 1:on2 — oP 1:oFF2

oFF

A 12:00:00   A 12:00:00   A 12:00:00   A 12:00:00

Enable output 1
▲ or ▼
to select

oFF
output dissabled

on:1
on and off once per 24 nours

on:2
on and off twice per 24 hours

Set first on time
▲ or ▼
to adjust flashing digit
and P
to move to next digit

Set first off time
▲ or ▼
to adjust flashing digit
and P
to move to next digit

Set second on time
▲ or ▼
to adjust flashing digit
and P
to move to next digit

Set second off time
▲ or ▼
to adjust flashing digit
and P
to move to next digit

Only included when on:1 or on:2 selected in EnbL

Only included when on:2 selected in EnbL

8.4.2 Summary of Clock configuration functions.

This section summarises all the Clock configuration functions. When read in conjunction with Fig 14 it provides a quick aid for configuring the Clock. If more detail is required, each section of this summary contains a reference to a full description of the function.

Display	Summary of function
FunCti on	**Instrument function** Defines the function of the instrument. May be set to: ELAPSE Timer CLoC Clock All the entries in this Clock configuration summary assume that the BA578E is configured as a Clock by selecting CLoC. **See section 8.4.3**
di SPLAY	**Display format** Defines the clock display format, four alternatives are available. Select: 12:00 Twelve hours without seconds 12:00:00 Twelve hours with seconds 24:00 Twenty four hours without seconds 24:00:00 Twenty four hours with seconds **See section 8.4.4**
SEt	**Set clock display time** Enables the clock displayed time to be adjusted, the clock resumes operation when the instrument is returned to the display mode. **See section 8.4.5**
SYnC t	**Synchronising time** Defines the time to which the clock display is set when the reset terminals RS1 and RS2 are connected together. The Clock restarts from the synchronising time when terminals RS1 and RS2 are disconnected. **See section 8.4.6**

Display	Summary of function
StAt oP	**Status output** Status output can turn *on* (open collector on) and *off* (open collector off) once or twice in each twenty-four hour period. This function contains five sub-function:

EnbL	Enables Status output and defines if it turns *on* and *off* once or twice in each 24 hours.
StAt:on 1	Time when oP 1 turns *on* 1st time
StAt:oFF 1	Time when oP 1 turns *off* 1st time
StAt:on 2	Time when oP 1 turns *on* 2nd time
StAt:oFF 2	Time when oP 1 turns *off* 2nd time

Note: Output is an optically isolated open collector.
See sections 8.4.7 to 8.4.9

Display	Summary of function
oP 1	**Control output 1** Control output 1 can turn *on* (output closed) and *off* (output open) once or twice in each twenty-four hour period. This function contains five sub-function:

EnbL	Enables output 1 and defines if it turns on and off once or twice in each 24 hours.
oP 1:on 1	Time when oP 1 turns *on* 1st time
oP 1:oFF 1	Time when oP 1 turns *off* 1st time
oP 1:on 2	Time when oP 1 turns *on* 2nd time
oP 1:oFF 2	Time when oP 1 turns *off* 2nd time

See sections 8.4.10 to 8.4.12

Display	Summary of function
oP2	**Control output 2** As control output 1 described above. **See section 8.4.13 to 8.4.15**
ACSP	**Access control output alarm-times from display mode.** Contains two sub-functions, EnbL which when activated allows the control output times to be adjusted from the display mode (displaying time). The second sub-function ACCd defines a four digit alphanumeric access code which may be used to protect access to the control output times from the display mode. Default code 0000 disables this security feature and allows unrestricted access. **See section 8.4.16**

Display	Summary of function

CodE   **Security code**
Defines a four digit alphanumeric code that may be used to protect access to the Clock configuration menu. Default code `0000` disables this security function and allows unrestricted access to all configuration functions when the Ⓟ and Ⓔ buttons are operated simultaneously in the display mode.
See section 8.4.17

rSEt dEF   **Reset to factory defaults**
Resets the BA578E to the Clock factory default configuration shown in section 8.4 Instruction confirmed by entering `SurE`.
See section 8.4.18

8.4.3 Instrument function: FunCtion

The BA578E may be configured as a Timer or as a Clock. This section of the instruction manual describes the Clock, for details of Timer configuration see section 5.4.

To reveal the existing function of the instrument select FunCtion from the configuration menu and press Ⓟ. If CLoC is displayed, the instrument is already configured as a Clock therefore press Ⓔ to return to the FunCtion prompt in the configuration menu. If ELAPSE is displayed, press the ▲ or ▼ button to change the setting to CLoC followed by the Ⓟ button which will result in a `0000` prompt being displayed with the first digit flashing. This is a request for the instruction to be confirmed by entering SurE using the ▲ or ▼ button to adjust the flashing digit and the Ⓟ button to move control to the next digit. When SurE has been entered, pressing Ⓔ will change the instrument to a Clock and return the instrument to the display mode. To configure the Clock enter the configuration menu by pressing the Ⓟ and Ⓔ buttons simultaneously until FunCtion is displayed.

8.4.4 Display format: diSPLAY

The BA578E Clock may be configured to display time in a 12 or 24 hour format with or without seconds. When a 12 hour format is selected, AM is denoted by an A prefix at the left hand side of the display, similarly a P is displayed to denote PM.

To check or change the display format of the Clock, select diSPLAY from the configuration menu and press Ⓟ which will reveal the existing setting which can be changed by pressing the ▲ or ▼ button followed by the Ⓔ button to enter the selection and return to the configuration menu. The options available are shown below:

12:00	Twelve hour format without seconds
12:00:00	Twelve hour format with seconds
24:00	Twenty four hour format without seconds
24:00:00	Twenty four hour format with seconds

8.4.5 Set clock display time: SEt

This function sets the time displayed by the Clock which must be entered each time the BA578E Clock is powered. Until a set time is entered the Clock will display a flashing `00:00:00` or `00:00` depending upon how it has been configured.

To adjust the clock set time, select SEt from the configuration menu and press Ⓟ that will show `00 : 00 : 00` or the existing set time with the hours flashing. When setting the clock display time seconds are always shown. Using the ▲ or ▼ button adjust the flashing hours and then press Ⓟ to transfer control to the minutes display, pressing Ⓟ again will transfer control to the seconds display. When adjustment is complete press Ⓔ to start the Clock and return to the SEt prompt.

8.4.6 Enter synchronising time: 5YnC t

When the external reset terminals RS1 and RS2 are connected together the clock is stopped and the displayed time is set to the synchronising time. When the connection between the reset terminals is removed, the clock restarts from the synchronising time.

To enter the synchronising time, select 5YnC t from the configuration menu and press ⒫ which will reveal the existing synchronising time with the hours flashing. Using the ⏶ or ⏷ button adjust the hours and then press ⒫ to transfer control to the minutes display, pressing ⒫ again will transfer control to the seconds display. When the synchronising time has been set as required, press ⒠ to return to the configuration menu.

8.4.7 Status output: 5tAt oP

The status output is an optically isolated open collector that can be used for transmitting the status of the Clock to other instruments. It may also be used for simple control applications. Status *on* is indicated by the RTx front panel display annunciator. The function contains five sub-functions allowing the Status output open collector to be turned *on* and *off* once or twice in each twenty four hour period.

EnbL	Number of times status output turns *on* & *off* in 24 hours.
5tAt:on 1	First time Status oP turns *on*
5tAt:oFF 1	First time Status oP turns *off*
5tAt:on 2	Second time Status oP turns *on*
5tAt:oFF 2	Second time Status oP turns *off*

To check or change the function of the status output select 5tAt oP from the configuration menu and press ⒫ which will reveal the first sub-function EnbL.

8.4.8 Enable Status output: EnbL

This is a sub-function in the Status output function 5tAt which allows the status output open collector to be enabled or disabled without changing any of the *on* or *off* times and also determines whether the status output turns *on* and *off* once or twice in each twenty four hour period.

Select 5tAt in the configuration menu and press ⒫ which will result in the EnbL prompt being displayed. Pressing ⒫ again will enter the sub-function from which one of the three options may be selected using the ⏶ or ⏷ button:

Display	Status output
oFF	Status output disabled
on: 1	Turns *on* & *off* once per 24 hours
on: 2	Turns *on* & *off* twice per 24 hours

When the required option is displayed operating ⒠ will enter the selection and return to the EnbL prompt from which another sub-function may be selected.

8.4.9 *On* and *off* times: 5tAt:on 1; 5tAt:oFF 1
5tAt:on 2; 5tAt:oFF 2

The status output will have one or two *on* and *off* times depending upon whether it has been configured to turn *on* and *off* once or twice in each 24 hour period. - see 8.4.8.

All of the times are adjusted in the same way. To adjust any of them select 5tAt oP from the configuration menu and press ⒫ which will result in the EnbL prompt being displayed. The ⏶ or ⏷ button will scroll through the sub-functions. Only 5tAt:on 1 and 5tAt:oFF 1 will be present if the status output has been configured to switch *on* and *off* once in a 24 hour period in the EnbL sub-function.

Select the required sub-function

5tAt:on 1	Time status output turns *on* first time
5tAt:oFF 1	Time status output turns *off* first time
5tAt:on 2	Time status output turns *on* second time
5tAt:oFF2	Time status output turns *off* second time

When selected, pressing ⒫ will show the existing time with the hours flashing. Using the ⏶ or ⏷ button adjust the hours and then press ⒫ to transfer control to the minutes display, pressing ⒫ again will transfer control to the seconds display. When the time has been set as required press ⒠ to return to the sub-menu from which another *on* / *off* time may be selected for adjustment. When all the *on* / *off* times have been entered, return to the configuration menu by pressing the ⒠ button twice.

8.4.10 Control output 1: oP 1

Control output 1 is a galvanically isolated solid state switch contact output which can be configured to turn *on* (output closed) and *off* (output open) twice in each twenty-four hour period. The control output status is shown by the 1 control output display annunciator.

Function oP 1 contains a sub-menu with five sub-functions:

EnbL	Number of times output 1 turns *on* & *off* in 24 hours.
oP 1:on 1	First time oP 1 turns *on* (closes)
oP 1:oFF 1	First time oP 1 turns *off* (opens)
oP 1:on 2	Second time oP 1 turns *on* (closes)
oP 1:oFF 2	Second time oP 1 turns *off* (opens)

To check or change the function of Control output 1 select oP 1 from the configuration menu and press ⒫ which will reveal the first sub-function EnbL.

8.4.11 Enable Control output 1: EnbL

This is a sub-function in the Control output 1 function oP1 which allows output 1 to be enabled or disabled without changing any of the *on* or *off* times and also determines whether output 1 turns *on* and *off* once or twice in each twenty four hour period.

Select oP1 in the configuration menu and press (P) which will result in the EnbL prompt being displayed. Pressing (P) again will enter the sub-function from which one of the three options may be selected using the (▲) or (▼) button:

Display	Control output 1
oFF	Control output 1 disabled
on:1	Turns *on* & *off* once per 24 hours
on:2	Turns *on* & *off* twice per 24 hours

When the required option is displayed operating (E) will enter the selection and return to the EnbL prompt from which another sub-function may be selected if control output 1 has not been disabled.

8.4.12 *On* and *off* times: oP1:on1; oP1:oFF1
oP1:on2; oP1:oFF2

The control output will have one or two *on* and *off* times depending upon whether control output 1 has been configured to turn *on* and *off* once or twice in each 24 hour period. - see 8.4.11.

All of the times are adjusted in the same way. To adjust any of them select oP1 from the configuration menu and press (P) which will result in the EnbL prompt being displayed. The (▲) or (▼) button will scroll through the sub-functions. Only oP1:on1 and oP1:oFF1 will be present if control output 1 has been configured to switch *on* and *off* once in a 24 hour period in the EnbL sub-function.

Select the required sub-function

oP1:on1	Time oP1 turns *on* first time
oP1:oFF1	Time oP1 turns *off* first time
oP1:on2	Time oP1 turns *on* second time
oP1:oFF2	Time oP1 turns *off* second time

When selected, pressing (P) will show the existing time with the hours flashing. Using the (▲) or (▼) button adjust the hours and then press (P) to transfer control to the minutes display, pressing (P) again will transfer control to the seconds display. When the time has been set as required press (E) to return to the sub-menu from which another *on* / *off* time may be selected for adjustment. When all the *on* / *off* times have been entered, return to the configuration menu by pressing the (E) button twice.

8.4.13 Control output 2: oP2

Control output 2 is a output which can be configured to turn *on* (output closed) and *off* (output open) twice in each twenty-four hour period. The control output status is shown by the 2 control output display annunciator.

Function oP2 contains a sub-menu with five sub-functions:

EnbL	Number of times output 2 turns *on* & *off* in 24 hours.
oP2:on1	First time when oP 2 turns *on* (closes)
oP2:oFF1	First time when oP 2 turns *off* (opens)
oP2:on2	Second time when oP 2 turns *on* (closes)
oP2:oFF2	Second time when oP 2 turns *off* (opens)

To check or change the function of Control output 2 select oP2 from the configuration menu and press (P) which will reveal the first sub-funtion EnbL.

8.4.14 Enable control output 2: EnbL

This is a sub-function in the Control output 2 function oP2 which allows output 2 to be enabled or disabled without changing any of the *on* or *off* times and also determines whether output 2 turns *on* and *off* once or twice in each twenty four hour period.Select oP2 in the configuration menu and press (P) which will result in the EnbL prompt being displayed. Pressing (P) again will enter the sub-function from which one of the three options may be selected using the (▲) or (▼) button:

Display	Control output 2
oFF	Control output 2 disabled
on:1	Turns *on* & *off* once per 24 hours
on:2	Turns *on* & *off* twice per 24 hours

When the required option is displayed operating (E) will enter the selection and return to the EnbL prompt from which another sub-function may be selected if control output 2 has not been disabled.

8.4.15 *On* and *off* times: oP2:on1; oP2:oFF1
oP2:on2; oP2:oFF2

The control output will have one or two *on* and *off* times depending upon whether control output 2 has been configured to turn *on* and *off* once or twice in each 24 hour period. - see 8.4.14.

All of the times are adjusted in the same way. To adjust any of them select oP2 from the configuration menu and press (P) which will result in the EnbL prompt being displayed. The (▲) or (▼) button will scroll through the sub-functions. Only oP2:on1 and oP2:oFF1 will be present if control output 2 has been configured to switch *on* and *off* once in a 24 hour period in the EnbL sub-function.

Select the required sub-function

oP2:on1	Time oP2 turns *on* first time
oP2:oFF1	Time oP2 turns *off* first time
oP2:on2	Time oP2 turns *on* second time
oP2:oFF2	Time oP2 turns *off* second time

When selected pressing ⓟ will show the existing time with the hours flashing. Using the ⏶ or ⏷ button adjust the hours and then press ⓟ to transfer control to the minutes display, pressing ⓟ again will transfer control to the seconds display. When the time has been set as required press ⒠ to return to the sub-menu from which another *on / off* time may be selected for adjustment. When all the *on / off* times have been entered, return to the configuration menu by pressing the ⒠ button twice.

8.4.16 Access control output *on* and *off* times from display mode: ACSP

This function activates a separate menu that provides direct access to the control output's *on* and *off* times when the Clock is is the display mode (displaying time). An operator may therefore adjust the *on* and *off* times without having access to the instrument configuration menu. Further protection is provided by a separate security code. When this function is enabled the *on* and *off* times of the two control outputs may be adjusted from the display mode by simultaneously operating the ⓟ and ⏶ push buttons. The function contains two sub-functions, EnbL which activates the function and ACCd which defines a separate access code that may be used to prevent the *on* and *off* times being accidentally adjusted from the display mode.

To check or change the function, select ACSP in the configuration menu and press ⓟ which will reveal the EnbL prompt, pressing ⓟ again will show if the function is on or oFF. If adjustment of the control output times from the display mode is not required press the ⏶ or ⏷ button to select oFF and then press ⒠ twice to return to the configuration menu. If the function is required, select on and press ⒠ to return to the EnbL prompt from which ACCd, which allows a separate access code to be entered, can be selected by pressing the ⏶ or ⏷ button.

Access to the control output times from the display mode may be protected by a four digit alphanumeric security code which must be entered to gain access. Default security code 0000 allows unrestricted access. With ACCd displayed, press ⓟ to enter a new access code. The BA578E Clock will display 0000 with one digit flashing. The flashing digit may be adjusted using the ⏶ or ⏷ push button, when set as required operating the ⓟ button will transfer control to the next digit. When all the digits have been adjusted press ⒠ twice to return to the ACSP prompt in the configuration menu. The revised security code will be activated when the BA578E is returned to the display mode.

8.4.17 Security code: CodE

Access to the instrument's configuration menu may be protected by a four digit alphanumeric security code which must be entered to gain access. New instruments are configured with the default security code 0000 which allows unrestricted access to all configuration functions.

To enter a new security code select CodE from the configuration menu and press ⓟ which will cause the Clock to display 0000 with one digit flashing. The flashing digit may be adjusted using the ⏶ or ⏷ push button, when set as required operating the ⓟ button will transfer control to the next digit. When all the digits have been adjusted press ⒠ to return to the CodE prompt. The revised security code will be activated when the Clock is returned to the display mode.

Please contact BEKA associates sales department if the security code is lost.

8.4.18 Reset configuration to factory defaults: rSEt dEF

When the BA578E is configured as a Clock, this function resets the configuration to the Clock factory defaults shown in sections 8.4 of this manual.

To reset the instrument configuration select rSEt dEF from the configuration menu and press ⓟ. The Clock will display 0000 with the first digit flashing which is a request to confirm the instruction by entering SurE. Using the ⏶ or ⏷ button set the first flashing digit to S and press ⓟ to transfer control to the second digit which should be set to u. When SurE has been entered pressing the ⒠ button will reset all the configuration functions to the factory defaults and return the instrument to the display mode as a Clock with default configuration.

9. CLOCK CONFIGURATION EXAMPLE

In this example a BA578E is required to function as a Clock. Time is to be displayed in a 24 hour format including seconds. For external synchronisation the displayed time is required to change to $12:00:00$ when the external reset terminals are connected together.

Both control outputs are required to close and open once in each 24 hour period. Control output 1 ($oP1$) is to turn *on* (close) at $07:30:00$ and *off* (open) at $09:30:00$, control output 2 ($oP2$) is to turn *on* (close) at $18:00:00$ and *off* (open) at $22:30:00$.

For this application the operator needs to adjust the control output *on* and *off* times from the display mode via an access code of 1111. To prevent tampering the instrument configuration menu is to be protected by security code of 1209

9.1 Configuration procedure

The BA578E may be configured as a Clock on-site without disconnection from external wiring.

Step 1 Enter the configuration menu

Enter the configuration menu by simultaneously pressing Ⓟ and Ⓔ. Assuming a security code has not already been entered the instrument will respond by displaying $FunCtion$ which is the first item in the configuration menu.
See Fig 14.

Step 2 Configure instrument as a Clock

With $FunCtion$ displayed press Ⓟ to reveal the existing function of the instrument. If $CLoC$ is displayed no change is required, therefore return to the $FunCtion$ prompt by pressing the Ⓔ button.
If $ELAPSE$ is displayed, press the ▲ or ▼ button to change the setting to $CLoC$ followed by the Ⓟ button which will result in a 0000 prompt being displayed with the first digit flashing. This is a request for the instruction to be confirmed by entering $SurE$ using the ▼ or ▲ button to adjust the flashing digit and the Ⓟ button to move control to the next digit. Pressing Ⓔ will then change the instrument to a Clock and return the display to $FunCtion$ in the configuration menu.
See 8.4.3

Step 3 Select display format

Using the ▲ or ▼ button select $diSPLAY$ in the configuration menu and press Ⓟ which will reveal the current display format. Using the ▲ or ▼ button select $24:00:00$ which is the required 24 hour format with seconds and press Ⓔ to enter the selection and return to the configuration menu.
See 8.4.4

Step 4 Enter the synchronisation time

Using the ▲ or ▼ button select $SYnCt$ in the configuration menu and press Ⓟ to reveal the current synchronisation time with the hours flashing. Using the ▲ or ▼ push button adjust the hours to 12 and press Ⓟ to transfer control to the minutes. Using the ▲ or ▼ push button adjust the minutes to 00 and press Ⓟ to transfer control to the seconds which should be adjusted to 00, in the same way. When the seconds are set enter the selection and return to the $SYnCt$ prompt in the configuration menu by pressing the Ⓔ button.
See 8.4.6

Step 5 Enable control output 1 and enter the *on* and *off* times.

Using the ▲ or ▼ button select $oP1$ in the configuration menu and press Ⓟ to reveal the $EnbL$ prompt in the control output 1 sub-menu.

In this application control output 1 is required to turn *on* and *off* once every 24 hours. With $EnbL$ displayed press Ⓟ and using the ▲ or ▼ button select $on1$ followed by the Ⓔ button to return to the $EnbL$ prompt.

The control outputs *on* time should now be entered by selecting $oP1:on1$ in the control output 1 sub-menu using the ▲ or ▼ button. Pressing Ⓟ will reveal the existing *on* time which should be adjusted to $07:30:00$ using the ▲ or ▼ button and the Ⓟ button to transfer control to the following digits. When entered return to the $oP1:on1$ prompt by pressing the Ⓔ button.

The *off* time should now be entered by selecting $oP1:oFF1$ from the sub-menu and adjusting the time to $09:30:00$. Finally press Ⓔ to return to the $oP1:oFF1$ prompt in the sub-menu and press Ⓔ again to return to $oP1$ in the configuration menu.

Step 6 Enable control output 2 and enter the *on* and *off* times.

Using the ⏶ or ⏷ button select oP2 in the configuration menu and press P to reveal the Enbl prompt in the control output 2 sub-menu.   Follow the procedure described in step 5, but set control output 2 to turn *on* at 18:00:00 and *off* at 22:30:00.

Step 7 Allow control outputs times to be adjusted from the display mode & enter separate security code.

Using the ⏶ or ⏷ button select ACSP in the configuration menu and press P to reveal the Enbl prompt, pressing P again will show if this function is on or oFF. Using the ⏶ or ⏷ button select on followed by E to return to the Enbl prompt.   A separate security code which must be entered to gain access to the alarm times in the display mode, is entered in the ACCd function which may be selected by operating the ⏶ or ⏷ button once.   Pressing E will reveal the existing access code with one digit flashing. This should be changed to the required code of 1111 by adjusting the flashing digit using using the ⏶ or ⏷ button and the P button to transfer control to the next digit.   When 1111 has been entered press E twice to return to the configuration menu.
See 8.4.16

Step 8 Define the configuration menu security code.

Defining a security code prevents unauthorised access to the configuration menu. Using the ⏷ and ⏶ buttons select CodE from the configuration menu and press P which will reveal 0000 with the first digit flashing. This example requires the security code to be 1209, using the ⏷ and ⏶ buttons set the flashing digit to 1 and press P to transfer control to the second digit. When all have been entered press E to return to the main configuration menu.
See 8.4.17.

Step 9 Return to the display mode

The BA578E is now configured as required for this example. Pressing the E button will save the configuration and return the BA578E to the display mode with all the digits flashing indicating that the set time has to be entered.

Step 10 Enter the set time

Finally the current time to be displayed by the Clock should be entered. Re-enter the configuration menu by pressing the P and E buttons simultaneously which will result in CodE being displayed. Pressing P will allow the access code 1209 to be entered using the ⏷ or ⏶ button to adjust the flashing digit and the P button to transfer control to the next digit. When all four digits have been adjusted, press P to enter the configuration menu and using the ⏷ or ⏶ button select SEt and press E which will reveal 00 : 00 : 00 with the hours flashing. Using the ⏷ or ⏶ button adjust the flashing hours digit and press P to transfer control to the minutes and then to the seconds.   When all have been set as required, press E to start the clock from the entered time and return to the display mode.

10. MAINTENANCE when configured as a clock

10.1 Fault finding during commissioning

If a BA578E fails to function as a Clock during commissioning the following procedure should be followed:

Symptom	Cause	Check:
No display	No power supply, or incorrect wiring. Note: Terminals 2 & RS2 are interconnected within the instrument.	That there is between 10 and 30V on terminals 1 & 2 with terminal 1 positive. That there are no connections to terminals 3, 4, 5, 6, 7, 8, 9 & 10.
Configuration menu does not correspond with the Clock section of this manual.	BA578E is configured as a Timer.	That FunCtion in configuration menu is set to CLoC not to ELAPSE.
Clock display flashes 00:00:00	Local time has not been entered.	Enter the local time in the SEt function of the instrument configuration menu.
Control output(s) do not function.	Control outputs have not been enabled.	Enable Control Output(s) in the configuration menu.
Clock will not start	Reset terminals RS1 and RS2 are connected together and the Clock is continuously synchronising.	If reset annunciator on display is activated, disconnect connection between RS1 and RS2.
Unable to enter configuration menu.	Incorrect security code	That the correct security code is being used. Contact BEKA if code is lost.

10.2 Fault finding after commissioning

ENSURE PLANT SAFETY BEFORE STARTING MAINTENANCE

If a BA578E fails after it has been functioning correctly as a Clock, the following table may help to identify the cause of the failure.

Symptom	Cause	Check:
No display	No power supply	That there is between 10 and 30V on terminals 1 & 2 with terminal 1 positive.
Clock display flashes 00:00:00	Instrument power supply has been interrupted and local time has been lost.	Enter the local time in the SEt function of the instrument configuration menu.
Control output(s) do not function.	Control outputs have not been enabled.	Enable Control Output(s) in the configuration menu.
Clock will not start	Reset terminals RS1 and RS2 are connected together and the Clock is continuously synchronising.	If reset annunciator on display is activated, if it is disconnect connection between RS1 and RS2.
Unable to enter configuration menu.	Incorrect security code	That the correct security code is being used. Contact BEKA if code is lost.

If this procedure does not reveal the cause of the fault, it is recommended that the instrument is replaced.

10.3 Servicing

We recommend that faulty BA578E Clocks are returned to BEKA associates or to our local agent for repair.

10.4 Routine maintenance

The mechanical and electrical condition of the instrument should be regularly checked. Inspection frequency should be chosen to suit the environmental conditions.

10.5 Guarantee

Instruments which fail within the guarantee period should be returned to BEKA associates or our local agent. It is helpful if a brief description of the fault symptoms is provided.

10.6   Customer comments

BEKA is always pleased to receive comments from customers about our products and services.   All communications are acknowledged and whenever possible, suggestions are implemented.