

PRODUCT DATA

Instrument Controller



A compact instrument controller with a large clear graphical display, an intuitive user interface and serial communications providing full remote control and data logging functions via a new Windows™ based PC programme.

The controller supports and automatically recognizes up to three gauges from the BOCE range (excluding IGC and Barocels), with coverage from 2000 to 6.6×10^{-10} mbar. Low pressure gauges may be controlled and protected by high pressure gauges and there are three open collector set point outputs. An optional relay box uses these outputs to control three 250V ac 3A changeover relays.

The TIC instrument controller may be either rack or bench mounted and provides a useful hub for the flexible operation of a wide range of vacuum system configurations.

FEATURES & BENEFITS

- **Universal vacuum gauge controller**

TIC automatically recognizes and controls up to three active gauges including Pirani, linear Pirani, thermocouple, strain, inverted magnetron, wide range and active ion gauges.

- **Relay options**

TIC has three pressure related set points, which operate open collector outputs rated at 24V dc 50mA. Using the optional relay box, these may be linked to three 250V ac 3A changeover relays to provide a useful accessory control capability. All relay boxes include a logic bypass facility for further system integration.

- **Simple system configuration**

In most instances, TIC systems may be simply and quickly configured using the range of standard cables on offer, there is therefore no need for the customer to prepare loom assemblies or relay boxes and special interfaces.

- **Direct pressure readout**

TIC includes lookup tables for a range of commonly encountered process gasses (N₂, He, Ar, CO₂, Kr & Ne). Selecting the appropriate gas enables direct readout of the correct pressure without the need to apply conversion factors.

- **Compact instrument**

TIC is packaged in a compact case and may be panel or rack (1/4 19" rack 3U) mounted. With the addition of the bezel it becomes an attractive bench-top instrument.

- **Clear, easy to use graphical user interface**

The large 128 x 64 pixel backlit graphics LCD and mobile phone style menu system simplifies programming and with a choice of summary screens excellent visibility of displayed parameters is assured.

- **Universal power supply**

TIC will operate from mains supplies with voltages between 90 and 264V ac, and frequencies between 47 and 63Hz. No user intervention being required.

- **Serial communications**

To enable complete integration into PC and PLC controlled processes, all TIC variants include RS232 and RS485 interfaces as standard.

- **Windows™ PC programme**

TIC is supplied with a new Windows™ PC programme which enables full setup and control from a PC using the RS232 interface.

- **Software upgrades**

As new compatible products are released, TIC software may be simply upgraded using the special utility supplied with the Windows™ PC programme TIC software upgrades will be made available via e-mail and the Internet.

CONFIGURATION EXAMPLES

FIGURE 1

Figure 1 represents the simplest TIC Instrument Controller system configuration available. In this set-up TIC is monitoring the outputs of three gauges in an industrial process involving Argon. Selection of the appropriate lookup tables enables direct pressure readout from the APGX and AIGX gauges. The chamber door may be interlocked via a set point output to the output of the ASG, which is gas independent.

ITEM	DESCRIPTION	PART NUMBER
A	TIC Inst Cont 3 Head RS232	D397-00-000
B	2m UK Mains Cable	D400-13-025
C	APGX-M-NW16 AL	D021-71-000
D	AIGX-S-NW25	D048-50-000
E	ASG NW16 2000 mbar	D357-28-000
F	0.5m ASG Adaptor Cable	D400-03-060
G	3m Active Gauge Cable	D400-01-030

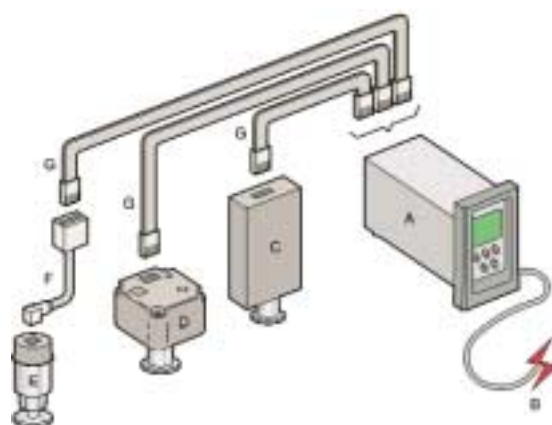
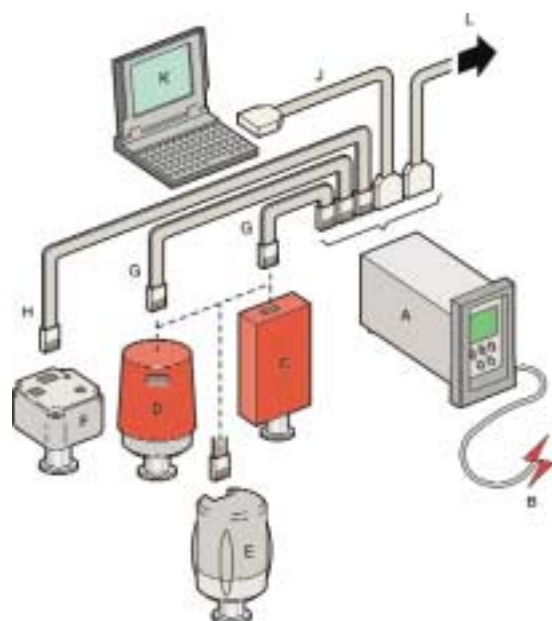


FIGURE 2

Figure 2 illustrates the use of APG and AIM gauges, which may be replaced by a single WRG. The logic interface (L) is connected to a system controller and the TIC has been configured using the Windows™ PC programme over the serial link from the PC.

ITEM	DESCRIPTION	PART NUMBER
A	TIC Inst Cont 3 Head RS232	D397-00-000
B	2m UK Mains Cable	D400-13-025
C	APG-M-NW16 AL	D021-71-000
D	AIM-S-NW25	D146-41-000
E	WRG-S-NW25	D147-01-000
F	AIGX-S-NW25	D048-50-000
G	2m Active Gauge Cable	D400-01-020
H	5m Active Gauge Cable	D400-01-050
J	TIC RS232 Interface Cable 2m (optional)	D297-00-834
K	PC with RS232 Interface (optional)	N/A
L	TIC Logic Interface Cable 2m	D397-00-833



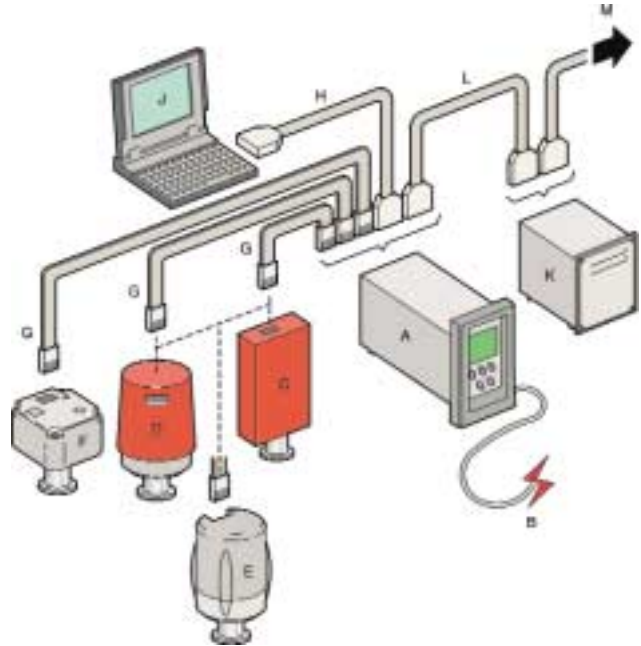
CONFIGURATION / SPECIFICATION

FIGURE 3

Figure 3 is as Figure 2, but a relay box (K) has been included which allows mains changeover relays to be activated by the TIC open collector set point outputs. These in turn operate other accessories.

The TIC system is connected to a system controller by the logic interface (M).

ITEM	DESCRIPTION	PART NUMBER
A	TIC Inst Cont 3 Head RS232	D397-00-000
B	2m UK Mains Cable	D400-13-025
C	APG-M-NW16 AL	D021-71-000
D	AIM-S-NW25	D146-41-000
E	WRG-S-NW25	D147-01-000
F	AIGX-S-NW25	D048-50-000
G	1m Active Gauge Cable	D400-01-010
H	TIC RS232 Interface Cable 2m (optional)	D397-00-834
J	PC with RS232 Interface (optional)	N/A
K	TIC Relay Box Instruments	D397-00-804
L	TIC Logic Interface Cable 2m	D397-00-833
M	TIC Logic Interface Cable 2m	D397-00-833








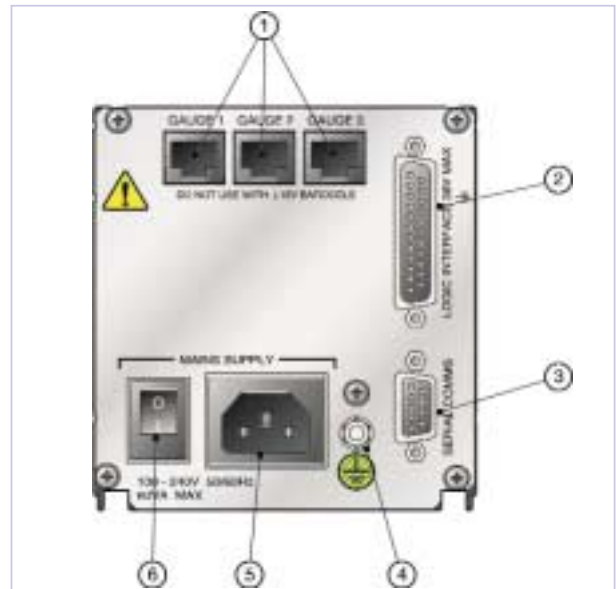
EXTERNAL INTERFACES



Display - 128 x 64 pixel backlit graphics LCD

Front panel keypad control functions include:

-  Scroll up button
-  Scroll down button
-  Enter/Select button
-  Menu/Back button
-  Cycle button



- 1 Gauge inputs
- 2 Logic Interface
- 3 RS232/485
- 4 Earth stud
- 5 Mains input
- 6 Mains on/off switch
- FCC68 (RJ45)
- 25-way 'D' socket
- 9-way 'D' socket
- M4
- CEE/IEC 320 plug

SPECIFICATION

EXTERNAL INTERFACES AND CONFIGURATION OPTIONS IN DETAIL

- **Display Interface**

TIC software is structured through a series of easily accessible screens, similar to a mobile telephone.

TIC automatically recognises which gauges are connected and displays the appropriate information on the default summary screen. Scrolling and selecting accesses the control and set-up menus for that item.

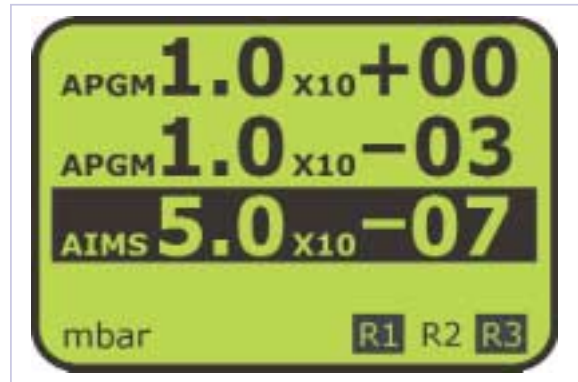
Gauge status is displayed, giving a clear indication of what is currently happening in the vacuum system.

There are a number of display options for maximum clarity. In addition, two levels of password protection may be applied, effectively restricting or preventing unauthorised intervention

In the event of an error occurring, TIC will display either a WARNING or flash an ALARM. A warning advises of a condition outside normal parameters, requiring no action, but an alarm must be cleared before normal operation may resume.

Display units may be in mbar, Torr, Pa or Volts.

The three setpoint relays, which are highlighted when tripped, may be linked to any gauge.



- **Gauge inputs**

Instrument supporting TIC variants recognize and control the following gauges:

APG, APGX, ATC, ASG, AIM, WRG & AIGX*

** No more than one AIGX gauge may be connected to TIC at a time.*

- **Logic Interface**

The logic interface connector includes the functions listed below.

It may be used either to link to system relays, a higher-level control system, or an optional relay box.

By utilising the relay box pass-through connector, a combination of a higher-level control system and relay box may be used.

CONTROL INPUTS	
Gauge enable 1, 2, 3	Closed when Low: < 0.5V dc
System interlock SYSI	Open when High: 4 to 24V dc
STATUS OUTPUTS	
Analogue output (selectable)	0-10V dc
Set point A, B, C	O/C 24V dc 50mA
Alarm	O/C 24V dc 50mA

- **Serial Interface**

The TIC has two built-in communications protocols, RS232 and RS485. These may be used either to interface to a PLC or, using the Windows™ PC software package supplied, connected to a PC for full monitoring and control of a TIC system.

- **Mains input**

Electrical supply	90 to 264V ac 47 to 63Hz
Power consumption (MAX)	55VA
Peak inrush current	4.4A@ 110V ac / 12.0A @ 230V ac
Fuse	TIC is self-protecting and has no user replaceable fuse The unit will recover when the overload is removed
Earth stud	M4

- **Interface Cables**

Use cables as specified in 'Ordering Information'

SPECIFICATION

DIMENSIONS, MOUNTING OPTIONS AND WEIGHT

- Dimensions**

Electronics housing

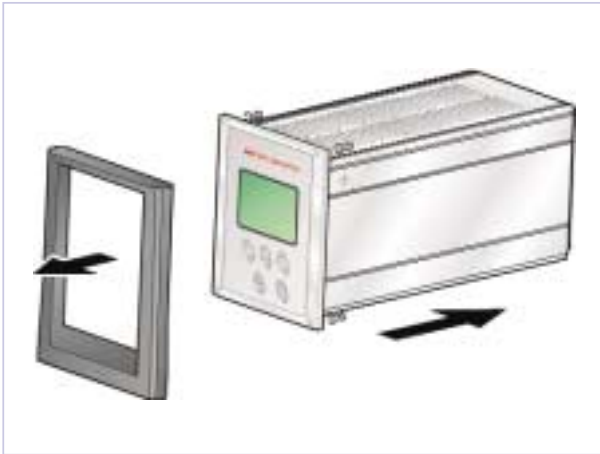
110 mm high x 105 mm wide x 245 mm deep

Front panel

106 mm wide x 128 mm high

Bench and...

...rack mounting options (1/4 19" 3U sub rack)



- Weight**

TIC Instrument Controller RS232 1.31 Kg

COMMON INFORMATION FOR TIC AND RELAY BOXES

OPERATING AND STORAGE DATA

Operating temperature	+0° to +40° C
Storage temperature	-30° to +70° C
Maximum ambient operating humidity	90% RH non-condensing at 40° C
Maximum operating altitude	3000m

STANDARDS

Electrical design	EN 61010-1
Electromagnet compatibility	EN 61326 (Industrial location, Class B Emissions)
Enclosure rating	IP20

RELAY BOX (OPTIONAL)

- General description**

A relay box has been developed to allow the TIC set point outputs to operate three 250V ac 3A (non inductive) changeover relays.

The relay box is connected to the TIC via the logic interface connector, which is also provided with a bypass connector for interfacing with OEM equipment.



1	250V ac 3A changeover relays	12-way Positronic plug
2	Logic interface (from TIC)	25-way 'D' plug
3	Logic bypass (to PC, PLC etc.)	25-way 'D' socket
4	Earth stud	M4

WINDOWS™ PC PROGRAMME

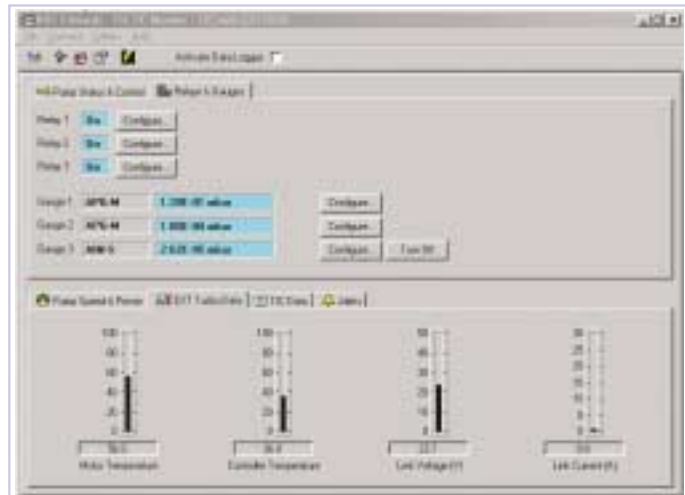
WINDOWS™ PC PROGRAMME



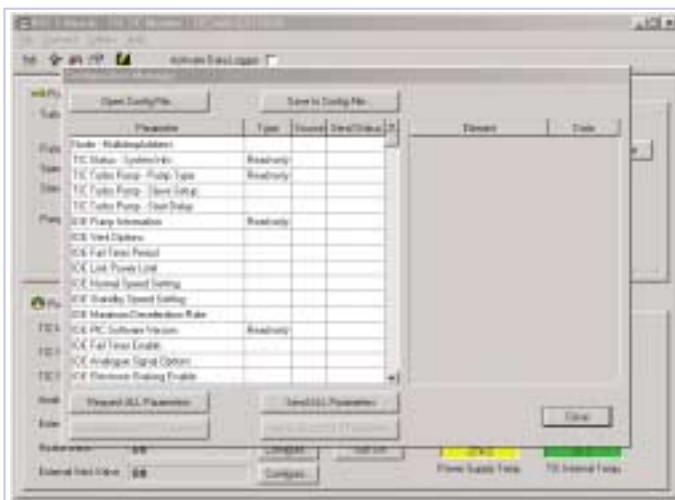
TIC is supplied with a fully functional Windows™ based PC software, which replicates and adds to the TIC embedded control menus.

The PC software enables TIC systems to be configured, controlled and monitored from a single PC.

A useful data logging facility is also included, which saves user selectable parameters to file (in.csv format) for later analysis using suitable software.



TIC system configurations may be created and saved for use at a later date, thus saving programming time.



The PC software includes an upgrade utility, which enables the TIC embedded software to be upgraded over the serial link from files supplied electronically.

ORDERING INFORMATION

ORDERING INFORMATION	
PRODUCT DESCRIPTION	ORDERING INFORMATION
CONTROLLERS (SUPPLIED WITH MANUALS & SOFTWARE)	
TIC Instrument Controller 3 head RS232	D397-00-000
RELAY BOXES (SUPPLIED WITH A SET OF MATING CONNECTORS)	
TIC Relay Box Instruments (3 x 250V ac 3A changeover relays)	D397-00-804
CABLES	
Mains cables (TIC and relay box supply)	
2m UK plug	D400-13-025
2m USA plug	D400-13-120
2m Northern European plug	D400-13-030
Interface cables	
TIC Logic Interface Cable 2m	D397-00-833
TIC RS232 Interface Cable 2m	D397-00-834
ACTIVE GAUGE CABLES (INCLUDE FCC68 COMPATIBLE CONNECTIONS AT BOTH ENDS)	
0.5m Active gauge cable	D400-01-005
1m Active gauge cable	D400-01-010
3m Active gauge cable	D400-01-030
5m Active gauge cable	D400-01-050
10m Active gauge cable	D400-01-100
15m Active gauge cable	D400-01-150
15m Active gauge cable (24 AWG)	D400-05-150
25m Active gauge cable	D400-01-250
30m Active gauge cable (24 AWG)	D400-05-300
50m Active gauge cable	D400-01-500
100m Active gauge cable	D400-01-999
OTHER ACCESSORIES AND SUPPORTING PRODUCTS	
TIC front bezel kit (spare)	D397-00-822

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