

2704VC

MODEL



Vacuum Furnace Controller/ Programmer

Specification Sheet

- **Direct interface to “active” vacuum gauges**
- **Integrated temp/vacuum control**
- **Diagnostic features**
- **Maths and logic functions**
- **Open communications**

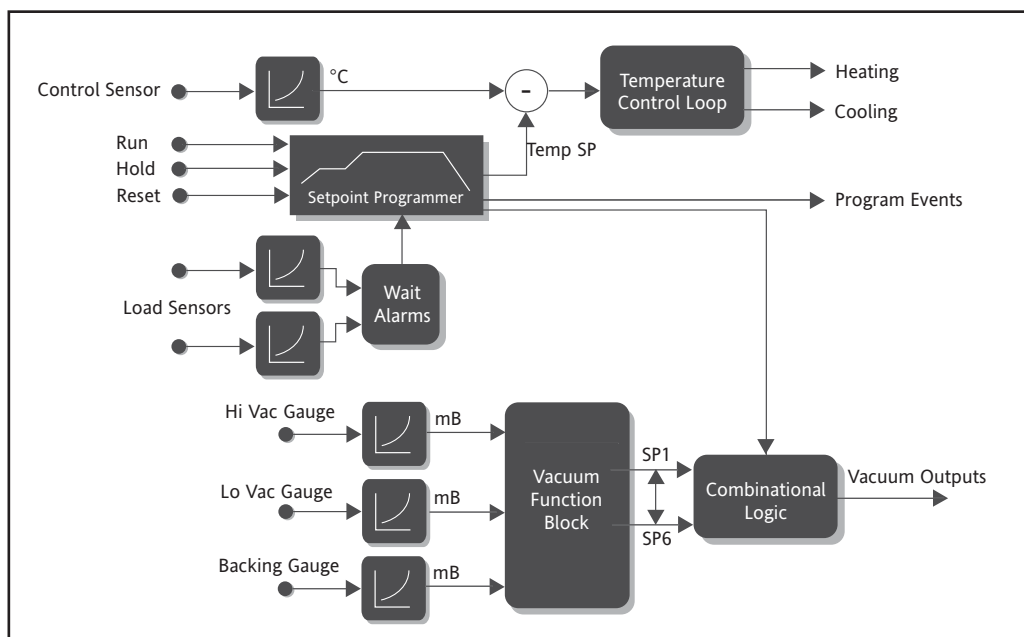
The 2704VC is a fully programmable controller suitable for precision temperature, and vacuum control in heat treatment applications.

Capable of being used to control the vacuum pump down sequence of a furnace and as an integrated controller where both temperature and vacuum are controlled. Additional features provide maths and combinational logic functions.

At the heart of the vacuum controller is a specially designed function block capable of accepting up to three vacuum inputs. Standard features include automatic and bumpless switchover between the high and low vacuum gauges and an additional input that can be used for inputs such as backing vacuum or backfill pressure. Six switched outputs are available and other features include a gauge enable signal for high vacuum, roughing pump timeout alarm and a leak detection routine.

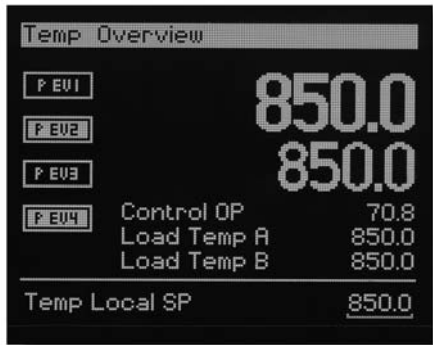
For standard applications, controllers are shipped pre-configured to the users specification, using a simple to complete order code. User customisation can be achieved by reconfiguring the controller via its front panel interface or Eurotherm iTools configuration software.

The 2704VC is fully compatible with the standard 2704 three loop controller data sheet number HA026669.



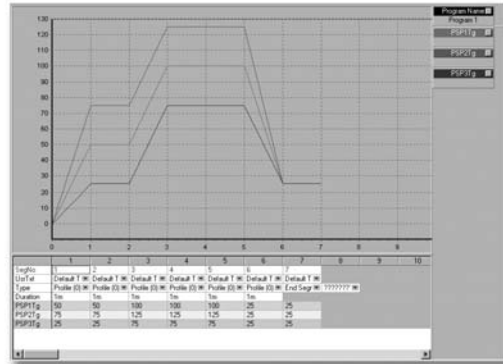
Temperature

- 0.1% Accuracy, 0.25µV resolution
- Multiple PID sets
- 60 Setpoint profiles
- 16 Program event outputs
- Load thermocouples



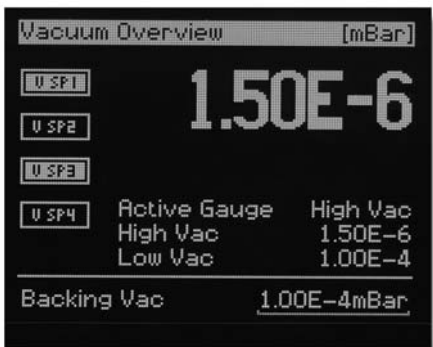
Trending enables the user to view, both current and historical information on the process variable and setpoint of each control loop.

The 2704 user interface offers the user an extremely easy method of editing, selecting and running programs and all programs can be given a meaningful name. Its programmer functions are very advanced and can be easily interfaced to remote instruments including specialised Mass Flow controllers. Program editing can be achieved using a PC running the iTools Setpoint Program Editor.



Vacuum

- Auto Hi/Lo gauge selection
- Six setpoint outputs
- Roughing pump timeout
- High vacuum enable output
- Leak detection



The 2704VC can interface directly to active vacuum gauges that output signals in the range of 0-10Vdc. Special linearisation tables have been created for many industry standard gauges and additional gauge linearisations can be created upon request.

Two inputs are used for the high and low main chamber vacuums and a third input is available for inputs such as backing, foreline or backfill. Total number of vacuum inputs can be as much as five.

Switchover between chamber gauges is automatic and bumpless. To prevent damage to the high vacuum gauge, power is not applied until a preset vacuum level has been achieved. Six vacuum setpoint outputs are available, each of which can operate on any gauge.

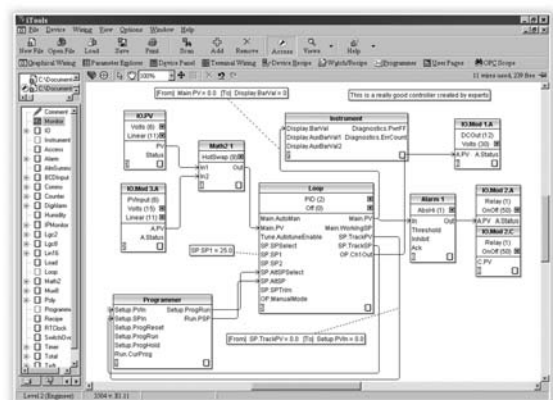
When the roughing pump starts, a diagnostic timer is started that generates an output if the backing vacuum does not achieve a preset vacuum level within a specified time. A leak detection routine can also be implemented.

Toolkit functions

- Mathematical calculations
- Combinational logic
- Real time clock
- Timer functions

Operators include; Add, Subtract, Log, Exp, SQRT, AND, OR, Max, Min, Select and many more

Toolkit blocks allows the user to create custom solutions by internally wiring analogue and digital operations together in flexible ways. 32 analogue and 32 digital operations are available. Other functions are available including timers, totalisers and a real time clock.



iTools Graphical Wiring Editor

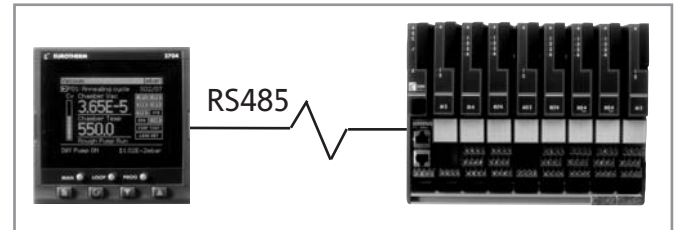
Vacuum furnace control system

- Vacuum control
- Temperature profiling
- Multiple temperature zones
- Load thermocouple monitoring

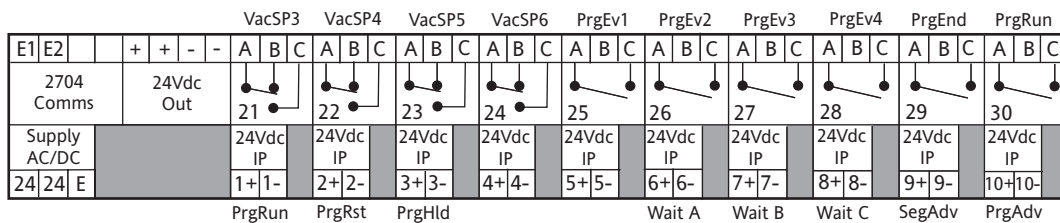
In combination with the 2500DIN rail controller, a very powerful and low cost vacuum furnace system can be implemented. The 2704VC acts as the master vacuum controller, temperature programmer and user interface for the 2500.

Each 2500 can implement up to 8 zones of PID control and these control loops can follow the same setpoint profile as the master programmer, additionally the 2704VC can provide the setpoints for other PID loops implemented in the 2500 strategy.

The 2500 can measure up to 32 thermocouple inputs, fully isolated to 250Vac potential. A strategy within the 2500 can monitor all thermocouples to detect the minimum value, which can then be sent via digital or analogue communications to the 2704VC to be used as wait condition ensuring temperature uniformity within the furnace and provide a guaranteed soak. The furnace operator using the 2704VC user interface can at any time deselect any unused or faulty thermocouples.



2000I/O Expansion terminal connections

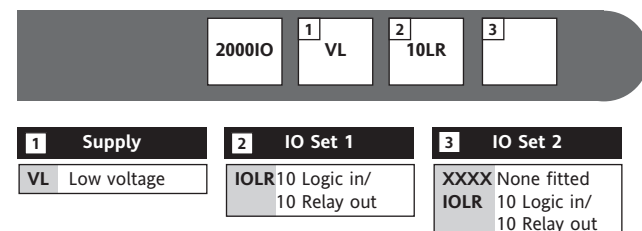


Ordering code

Controller Type	Supply Voltage	Controller Function	Furnace Control Sensor	Load Temp Sensors	Temp Control OP	High Vac IP	Low Vac IP	Backing/Foreline Vac IP	H Comms Slot	J Comms Slot	Toolkit Blocks	Manual

Controller Type	Furnace Control Sensor	Temp Control Output	High Vac IP	H Comms Slot	Toolkit Blocks
2704VC Standard 2704VCF Profibus	Load Temp Sensors K Type K N Type N R Type R S Type S B Type B C Type C Z RTD/Pt100 D D Thermocouple E E Thermocouple 1 Ni/Ni 18%Mo 2 Pt20%Rh/Pt40%Rh 3 W/W26%Re(Eng) 4 W/W26%(Hos) 5 W5%Re/W26%Re(Eng) 6 W5%Re/26%Re(Hos) 7 Pt10%Rh/Pt40%Re Q Custom curve	4mA20 4-20mA 0mA20 0-20mA 0V10 0-10Vdc 0V5 0-5Vdc 1V5 1-5Vdc	High Vac IP Low Vac IP Backing/Foreline Vac IP V000 Edwards AIM-S V020 Edwards APG-M V030 Edwards APG-L V060 Edwards PRM10 V110 Pfeiffer TPR 265 V120 Pfeiffer IKR 251 V130 Pfeiffer PKR 251 V200 Leybold ITR 100D V210 Leybold PTR211/216 V220 Leybold PTR225/237 V230 Leybold TR090 V240 Leybold IR090 V300 Varian Mini BA-IMG V310 Varian CovecTorr Q000 Custom Curve®	XX Not fitted A2 232 Modbus Y2 2 Wire 485 Modbus F2 4 Wire 485 Modbus AE 232 Bisync YE 2 Wire 485 Bisync FE 4 Wire 485 Bisync PB Profibus DN DeviceNet	XX Standard ⁽¹⁾ U1 Toolkit level 1 ⁽¹⁾ U2 Toolkit level 2 ⁽²⁾
Supply Voltage VH High voltage VL Low voltage	Controller Function VXX Vacuum only VTX Vacuum/Temp			J Comms Slot XX Not fitted A2 232 Modbus Y2 2 Wire 485 Modbus F2 4 Wire 485 Modbus M1 232 Master M2 2 Wire 485 Master M3 4 Wire 485 Master	Manual ENG English FRA French GER German

IO Expander

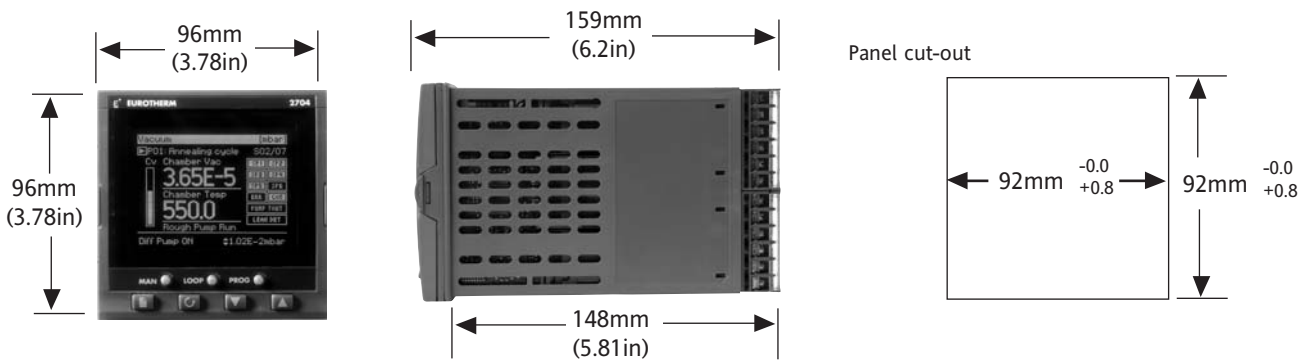


Notes:

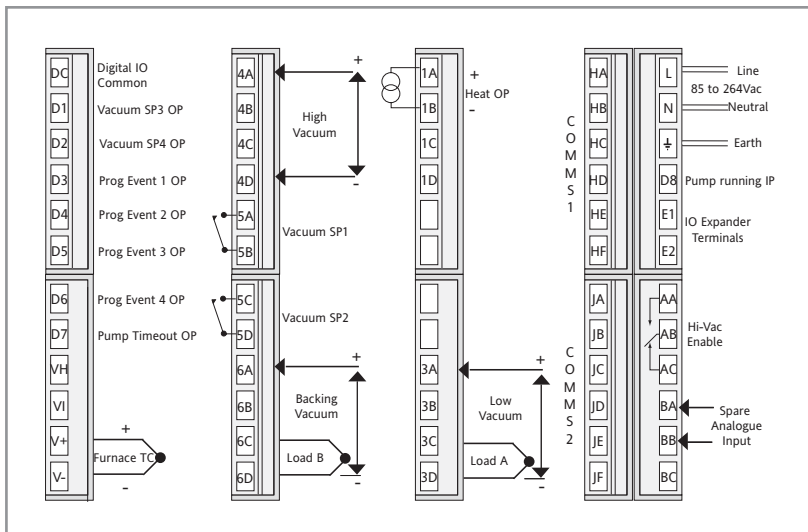
- Basic controller includes 8 digital registers, 10 user values, 4 timers and 4 totalisers. Toolkit 1 includes 16 analogue, 16 digital, pattern generator, digital programmer, analogue switch and 30 user values. Standard configuration uses some digital registers.
- Toolkit 2 includes Toolkit 1 plus an extra 16 analogue, 16 digital and 20 user values.
- Temperature units will be °C unless ordered by USA when units will be °F.
- Vacuum units will be mB unless ordered by USA when units will be Torr. Other vacuum units can be selected by reconfiguration.
- Backing/Foreline vacuum can be reconfigured to control Backfill Pressure.
- Vacuum inputs can be reconfigured to be alternative input types such as thermocouple or pyrometer.
- Other hardware options of the standard 2704 allow additional vacuum inputs.
- Other vacuum curves can be created.

Dimensional details

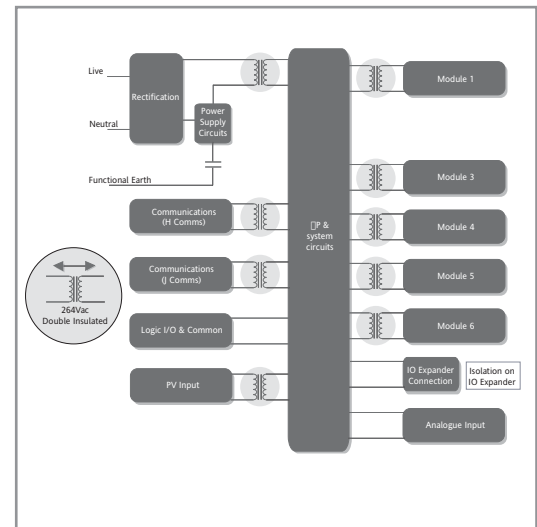
2704



Rear terminal connections



Isolation



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