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.
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.
Vacuum furnace control system

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

In combination with the 2500 DN 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.

### 2000I/O Expansion terminal connections

<table>
<thead>
<tr>
<th>Controller Type</th>
<th>Supply Voltage</th>
<th>Controller Function</th>
<th>Load Temp Sensors</th>
<th>Temp Control QP</th>
<th>High Vac IP</th>
<th>Low Vac IP</th>
<th>TechLin Vac IP</th>
<th>H Comm Slot</th>
<th>J Comm Slot</th>
<th>Toolkit Blocks</th>
<th>Manual</th>
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<tbody>
<tr>
<td>2704VC Standard</td>
<td>VH High voltage</td>
<td>VDX Vacuum only</td>
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<tr>
<td>2704VC Profibus</td>
<td>VL Low voltage</td>
<td>VTX Vacuum/Temp</td>
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</tbody>
</table>

**Vacuum/Temp**

**Controller**

- Type K
- Type N
- Type R
- Type S
- Type B
- Type C
- Type C
- Type C
- KTD/P100
- Thermo couple
- F Thermo couple
- Ni/Ni 180M6
- W/W25%Nicol
- W/W25%Hosil
- W5%Re/W26%Re
- Pt10%Rh/Pt40%Re
- Custom curve

**Load Temp Sensors**

- 4mX20
- 4-20mA
- 0-20mA
- 0-10Vdc
- 0-5Vdc
- 0-1Vdc

**Temp Control Output**

- 24Vac IP
- 24Vac dc
- 24Vac dc
- 24Vac dc
- 24Vac dc
- 24Vac dc
- 24Vac dc
- 24Vac dc
- 24Vac dc

**High Vac IP**

- **Vacuum/Temp**
- **Vacuum/Temp**
- **Vacuum/Temp**
- **Vacuum/Temp**
- **Vacuum/Temp**
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- **Vacuum/Temp**

**Low Vac IP**

- **Vacuum/Temp**
- **Vacuum/Temp**
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- **Vacuum/Temp**

**TechLin Vac IP**

- **Vacuum/Temp**
- **Vacuum/Temp**
- **Vacuum/Temp**
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**J Comm Slot**

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**Toolkit Blocks**

- Toolkit level 1
- Toolkit level 2

**Manual**

- **Vacuum/Temp**
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- **Vacuum/Temp**

Notes:

1. 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.
2. Toolkit 2 includes Toolkit 1 plus an extra 16 analogue, 16 digital and 20 user values.
3. Temperature units will be °C unless ordered by USA when units will be °F.
4. Vacuum units will be mB unless ordered by USA when units will be Torr. Other vacuum units can be selected by reconfiguration.
5. Backing/Foreline vacuum can be reconfigured to control Backfill Pressure.
6. Vacuum inputs can be reconfigured to be alternative input types such as thermocouple or pyrometer.
7. Other hardware options of the standard 2704 allow additional vacuum inputs.
8. Other vacuum curves can be created.

### Ordering code

**Controller Type**

- 2704VC Standard
- 2704VC Profibus

**Supply Voltage**

- VH High voltage
- VL Low voltage

**Controller Function**

- VDX Vacuum only
- VTX Vacuum/Temp

**Furnace Control Sensor**

- Type K
- Type N
- Type R
- Type S
- Type B
- Type C
- Type C
- Type C
- KTD/P100
- Thermo couple
- F Thermo couple
- Ni/Ni 180M6
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**High Vac IP**

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**Low Vac IP**

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**TechLin Vac IP**

- **Vacuum/Temp**
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8. Other vacuum curves can be created.
**Dimensional details**

- **2704**
  - **Panel Cut-out**
    - 96mm (3.78in) Width
    - 159mm (6.2in) Height

**Rear terminal connections**

**Isolation**

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