



環保 · 經濟 · 效率
榮能環保科技
EVERTOP Enviroment

ETAMATIC
技術資料

Advantages: (優點)

- **Burner sequence control**
(具燃燒器順序控制功能)
- **Electronic compound, up to 4 channels**
(多達4組電子電路總成裝置)
- **Connects to control system**
(可連接至控制系統)
- **Simple to program**
(具簡易的程式設計功能)
- **10-bits resolution**
(具10種操作運轉解決方案)
- **Can be operated from PC**
(可用電腦進行運轉設定與操作功能)
- **Integrated load control**
(可結合負載控制器)
- **Integrated leakage test**
(具管路防洩漏測試能力)
- **Integrated O₂ /CO control**
(可結合O₂操作控制)



Sensors and Systems
for Combustion Engineering
燃燒工程的感應器與系統



One thing is of primary importance for modern firing installations: efficiency. That applies to the operation of the equipment as well as to its erection and commissioning.

效率是現代燃燒運轉裝置重要特性中最值得注重的一件事，其應用不僅在設備的運轉作業上，同時設備建造和委託製作也是如此。

LAMTEC has the right solution:
the ETAMATIC

LAMTEC 公司有最正確的答案： 使用ETAMATIC

As the name suggests (ETA is the Greek letter η used in engineering as the symbol for efficiency), the ETAMATIC is characterized by efficiency in every aspect. Its compact form contains everything needed for complete burner control.

ETAMATIC 如同其名稱英文字義的啓示(ETA是希臘語符號(η))，在工程計算方面作為代表效率的符號)，ETAMATIC在各方面均以講求效率為其特點，精巧的外型包含燃燒器操控完整的需求。

It combines the advantages of an electronic firing compound with up to 4 positioning elements with an electronic burner sequence control. Since a output regulator, O_2 controller or CO controller, leakage test and flame monitor are also integrated, you have everything you need to control and monitor your burner in one device. Fail-safe. This gives you the solution to nearly all your firing tasks. Safety interlock circuit and detectors are connected directly to the ETAMATIC. The need for supplementary relays and wiring is vastly reduced. Under the right conditions, the ETAMATIC allows the complete burner control system to be mounted at the burner itself. An integrated device like the ETAMATIC also offers significant advantages during commissioning. Through minimisation of the wiring and the unified user interface, sources of error are minimised from the very beginning, while the search for faults is assisted through appropriate and relevant advice.

它結合了電子操作點火器總成的優點且具多達4種定位器元件的電子操作燃燒器的順序控制模式。這台裝置綜合你想在燃燒器控制和監視的需求，同時整合輸出調整器、 O_2 控制器或CO控制器(燃氣用)、管路洩漏測試裝置和火焰監視器等功能，並有自動防故障機能，這裝置可以提供你在點火任務上完整的解決方案，還有安全裝置的連鎖線路、感知器和檢測器可直接連接ETAMATIC控制器，大幅地降低輔助繼電器和電線使用量。在良好的環境下， ETAMATIC允許在燃燒器上直接安裝燃燒器控制系統。在規劃作業期間ETAMATIC 提供有效的優勢，可透過極少的線路和整體的用戶界面，經過適當和相關的警告尋找故障點使得失誤情形在一開始就被降到最低。

The ETAMATIC is available with 4 three-state step outputs, or with one continuous output (for rotary speed control) and 3 three-state step outputs.

ETAMATIC有4組3態輸出信號，而ETAMATIC S型式提供1組連續的輸出(對旋轉速 控制) 和3組3 態輸出信號。

The firing mechanism and the compound can be parameterised to adapt them to very different firing tasks. Separate settings can be made for oil and gas with and without a pilot burner. The integrated leakage test can optionally be made before ignition or after switch-off.

Start-up without pre-ventilation with gas in accordance with EN676 is possible.

點火燃燒的機械結構和電子總成經過修改參數即可完成許多不同的點火燃燒工作，無論有無引火裝置藉著分散的設定配置可以完全適用在燃油和燃氣為燃料的燃燒器上，在點火之前或者在燃燒機停用後均可隨時進行管路洩漏測試功能。

The compound curves that have been set can be shifted during operation by the integrated O_2 control. This enables compensation for factors that could influence the combustion.

燃燒器控制運轉曲線可結合 O_2 控制，這可以對燃燒控制因子進行補償修正。

If you are burning gas, you can do even more: the LAMTEC CO control is able to run your burner with the maximum of possible efficiency.

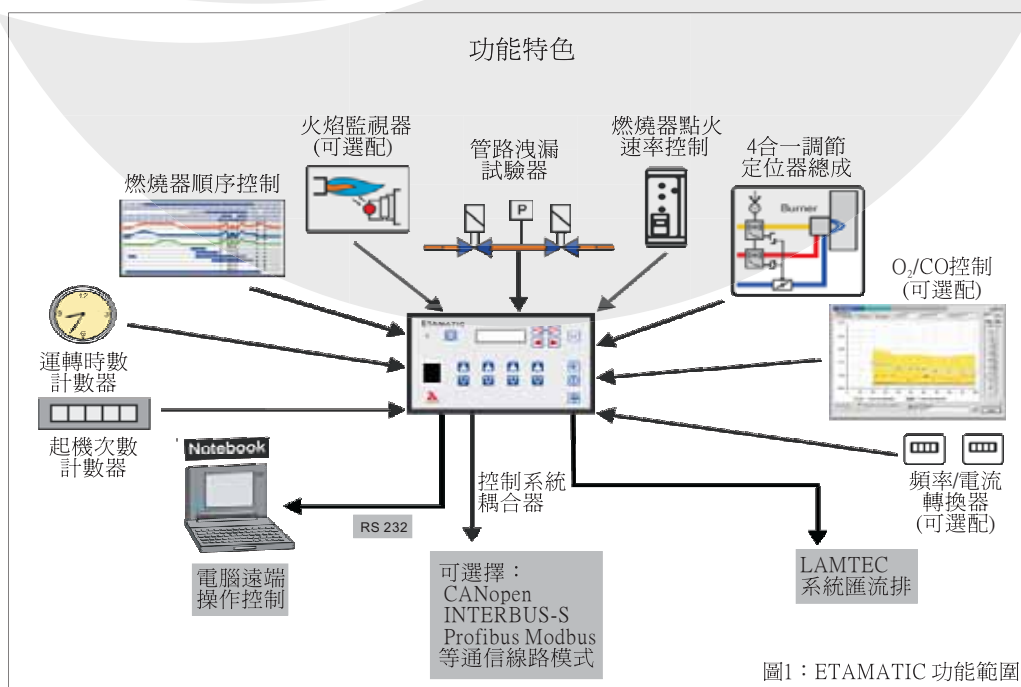
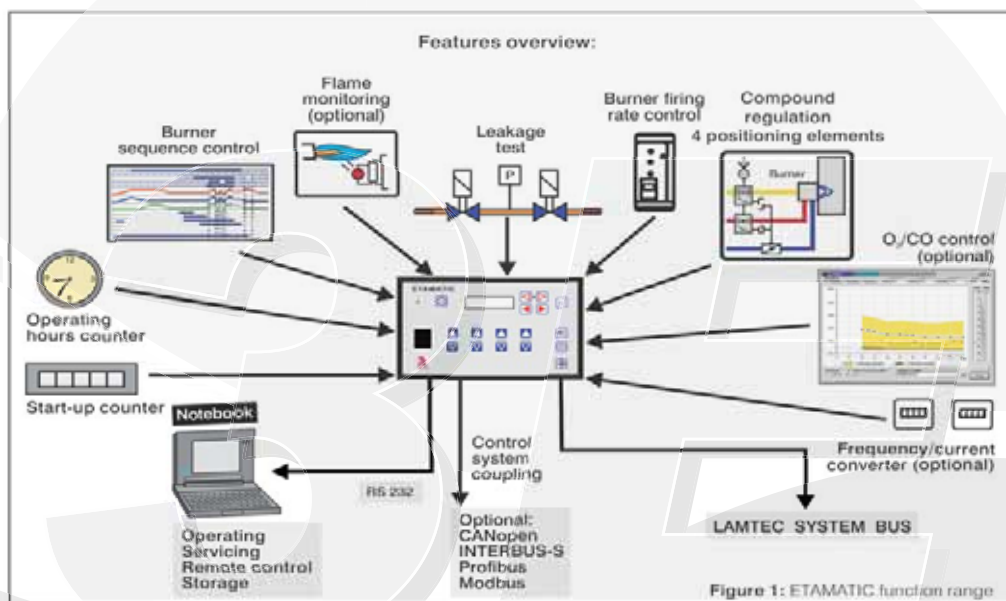
使用燃氣的客戶：LAMTEC公司的CO控制可以使燃燒器的效率達到最大的程度。

Operating and error messages are displayed in plain text in the appropriate language. An operating hours counter is integrated, and also counts the burner operating hours with gas and oil. The start-ups for gas and oil are also separately counted.

可選擇使用者熟悉的語言來顯示操作狀態與錯誤訊息，可結合設備運轉時數，以及計算燃燒器使用燃油和燃氣的小時數(計算燃料成本)，對燃油和燃氣亦分開累計啟動次數。

If desired, the ETAMATIC can also perform output regulation of the burner. It is possible to switch between 2 set values, e.g. for reduced night-time power or heat holding operation. External set value adjustment (weather response) and start-up control can be used.

如果需要，ETAMATIC也能進行燃燒器的輸出調節，還可以在2個設定值之間進行切換，例如：降低晚間電力使用或是恆溫的運轉操作等，具外部設定值的調整功能(如外在溫度變化)，也可用在設備起機的控制操作。



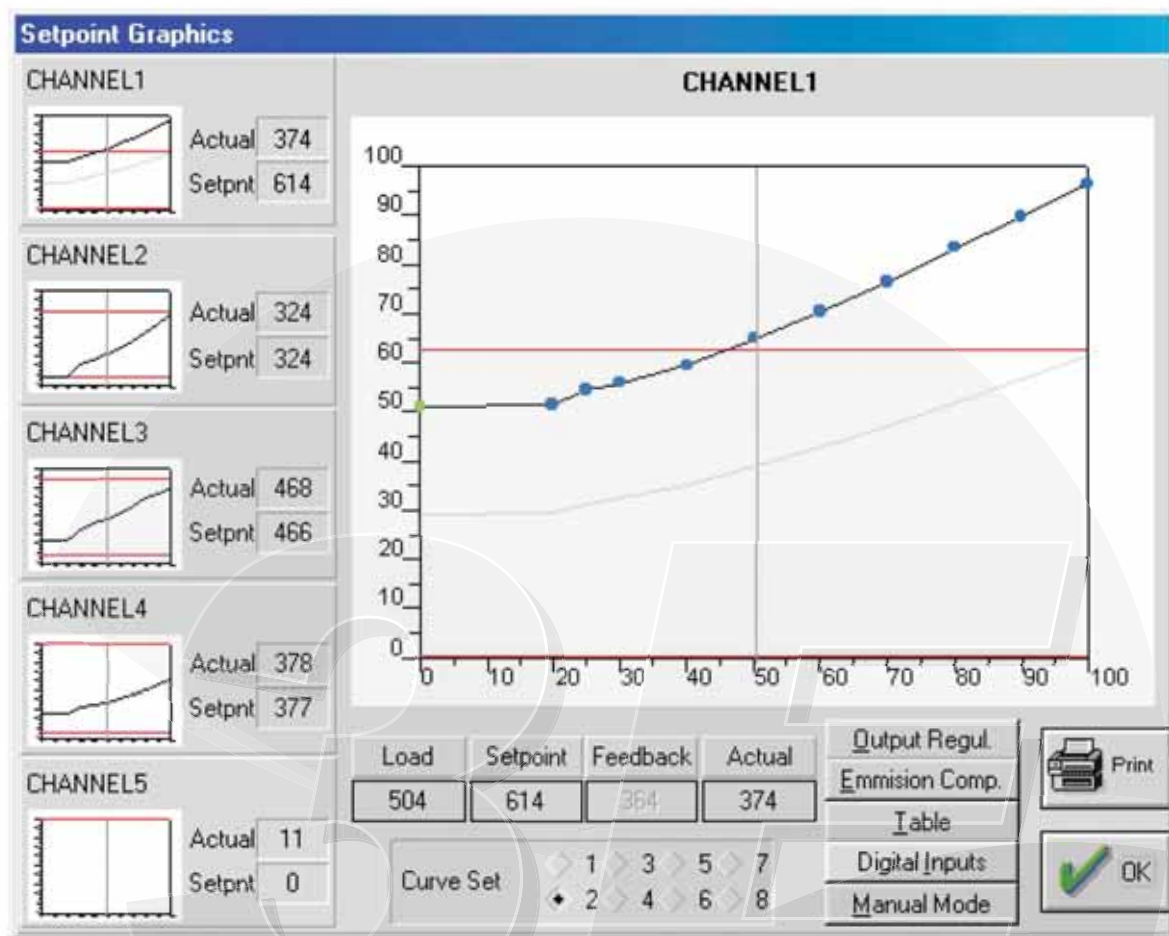


Figure 2: Visualisation of the compound curves through the remote control software
 圖2：經由遠端電腦控制軟體顯示運轉綜合曲線

An ETAMATIC always has a LAMTEC SYSTEM BUS connection on board. The LAMTEC SYSTEM BUS links LAMTEC devices together. Easily, quickly, and without extensive wiring. This allows additional signal outputs to be implemented, and fault indicating devices to be connected.

ETAMATIC總是與LAMTEC系統匯流排相連接。使用LAMTEC系統匯流排非常容易，迅速，和不需額外線路結合到LAMTEC儀器。並可執行額外的信號輸出以及連接故障指示器。

An O_2 control is integrated into the ETAMATIC. Through the provision of an actual value for O_2 (e.g. from the Lambda Transmitter, LT2) via the LAMTEC SYSTEM BUS, the firing installation can be maintained constantly at the ideal operating point, independently of environmental conditions such as temperature and air pressure. Using the CO probe KS1 in combination with O_2 probe, you get a failsafe CO control. The intelligence of the ETAMATIC reduces the air till CO starts to occur. Then it increases the air only one step and your burner will run with the best possible efficiency.

ETAMATIC控制器整合 O_2 含氧控制。藉著LAMTEC系統匯流排提供 O_2 實際值(例如從Lambda傳送器, LT2)，使點火燃燒裝置能持續維持在理想操作點上，不受制環境條件如溫度和大氣壓力。當使用CO探棒KS1組合到 O_2 探棒，CO控制會失效，聰明的ETAMATIC會減少燃燒的空氣量，直到CO開始產生，僅增加空氣量的一小步驟，而燃燒器可達最好的運轉效率。

The ETAMATIC can be effectively combined with existing control systems. It "speaks" the language of almost every conventional fieldbus.

ETAMATIC可有效與現有的控制系統相結合，幾乎可與市售常見fieldbus通信協定相容。

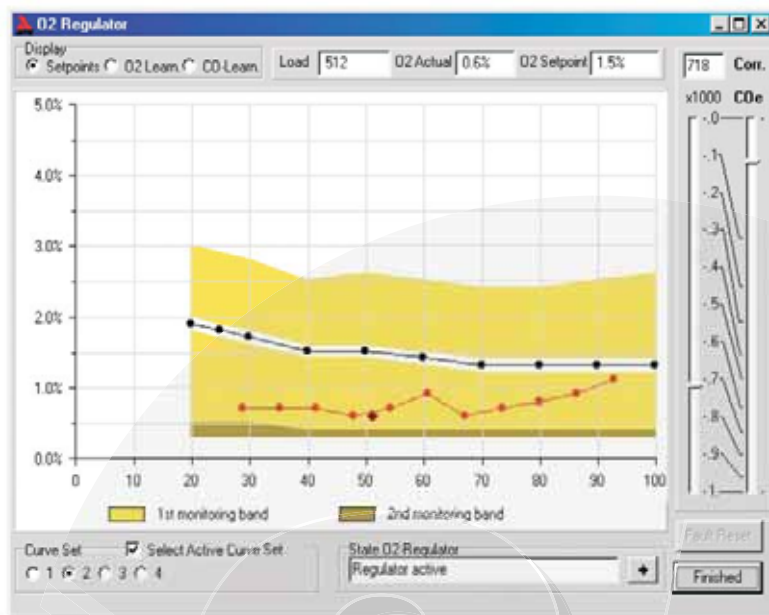


Figure 3: Visualisation of the O₂ and CO setpoint-curve with its monitoring-band-gaps when using the ETAMATIC's integrated O₂ or CO controller
 圖3：ETAMATIC整合O₂或CO控制器後與原設定點運轉，其O₂和CO值曲線變化圖示

The ETAMATIC has been tested by and TÜV satisfies both, the relevant European Standards (EN) and the requirements of TRD 604, for continuous operation. ETAMATIC得到德國 TÜV 測試認證，在連續的運轉操作滿足相關的歐洲標準(EN)以及符合蒸汽鍋爐技術規則 TRD 604的鍋爐24或72小時監控的無管理全自動運行要求。

An additional PC interface provides valuable assistance for the work of commissioning the ETAMATIC. A laptop can be used to control the device remotely, and both, the set configuration and the curve data can be archived. If it should ever be necessary, a replacement unit can be prepared for operation within seconds: the stored data is simply read in.

附加電腦通信界面為ETAMATIC控制的排程工作提供有價值的幫助。一台攜帶型電腦能用來遠端控制設備以及收集歸檔其規劃設定和運轉曲線數據，電腦儲存的資料容易讀取，緊急情形如果要更換儀器僅需極短時間即可完成。

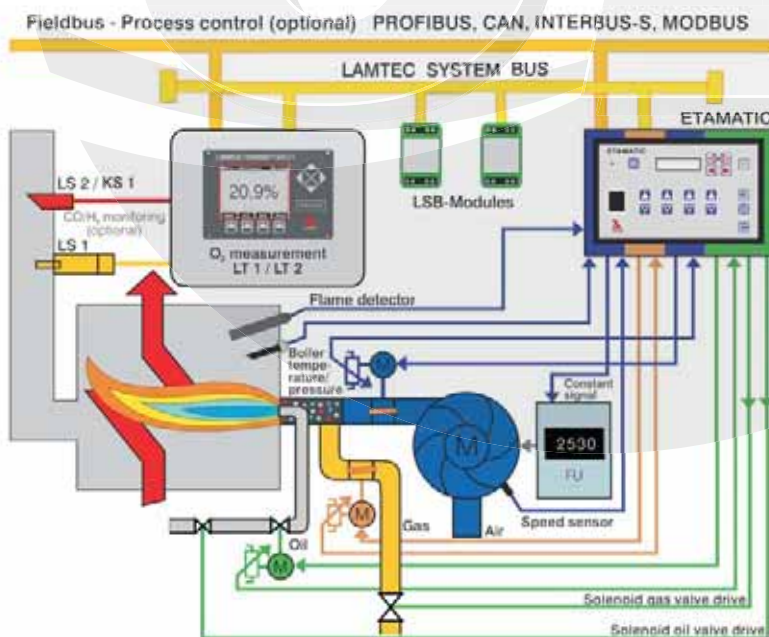


Figure 4: Burner control and firing optimisation via the LAMTEC SYSTEM BUS
 圖4：LAMTEC系統匯流排提供燃燒器的運轉和點火控制達到最佳操作程

The ETAMATIC can even be interrogated from your office if an industrial modem is used. If a malfunction should occur, the cause can be detected without having to be on site. Figure 4: Burner control and firing optimisation via the LAMTEC SYSTEM BUS on site.

可以在辦公室透過使用數據機進行對ETAMATIC監控，在故障發生時，不必到現場，亦可知道事件發生的原因。



Electrical power supply 電源規格	from 115V - 15% to 230 V + 10 %	Analog inputs 類比輸入	Selectable potentiometer 1 - 5 kΩ or 0/4...20 mA current signal. Optional: Direct speed measurement
Power consumption 電源功率	approx. 50 VA	Resolution: 解析能力 per analog input 單一類比輸入信號	999 digits, 10 bits
Ambient temperature 環境溫度 Operation: 運轉溫度 Transport and storage 運輸和儲存環境溫度	+ 0°C...+60°C - 25 °C...+60°C	Three-state-step: 3組態步進 Recommended run time of the positioning drive: 定位器驅動建議時間	30 s...60 s
Display 資訊顯示	Alphanumeric display, 2x16 characters can display value, load value, status, actual feedback value, setpoint outputs: value, digital inputs, constant positioning output value, correction input and correction range or running text display	Feedback outputs: 回饋輸出裝置 Digital outputs: 數位化的輸出裝置	0...10 V > 5 kΩ 0/4...20 mA < 600Ω
Permiss. ambient humidity 周遭環境的濕度	Class F, DIN 40 040	Storage of the set values and variable data: 設定值和變數資料的貯存 in EEPROM, up to 20 (type 11) points per curve with linear interpolation	
Inputs and outputs 輸入和輸出	14 digital inputs, 24V 16 digital outputs, 230V 1 analog outputs (ETAMATIC S) 3 analog inputs	Number of curve-sets: 曲線設定的數量 Number of programmings: 電腦程式的數量	2 per channel (e.g. for oil/gas combined burner) Unlimited (EEPROM)
Digital signal inputs 數位信號輸入	The ETAMATIC's self-tests will not allow the parasitic capacitance on the lines connected to digital inputs to exceed 2.2 pF. The length of the cables should not exceed 100 m	Interface 通信界面	1 serial interface on 25-pole socket, only addressable with adapter, RS 232 (standard s 19200 baud, no parity, 8 da 1 stop bit) and LAMTEC SYST
Load preset 負荷預置	Selectable potentiometer 1 - 5 k Ω, (0/4...20mA) current signal or threestate-step positioning output, direct PT 100 actual line; load regulator is used) 匯流排結合器	Bus coupling 匯流排結合器	Via external adapter connected to LSB for these protocols: Interbus-S Profibus DP Modbus CANopen Ethernet
Dimensional drawings:			

