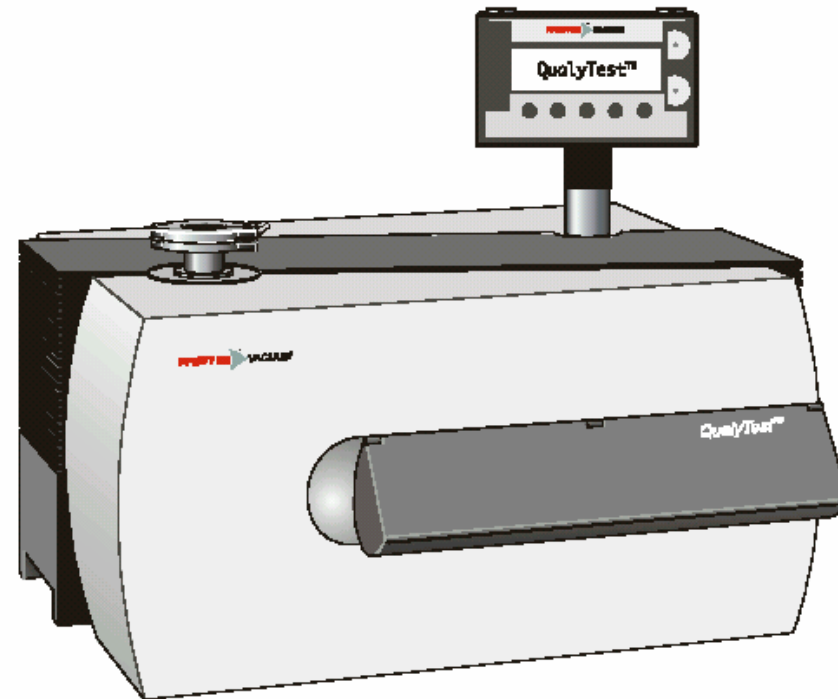


QualyTest™
QualyTest™ Select
QualyTest™ Dry
QualyTest™ Dry+

Helium leak detector

HLT 260
HLT 265
HLT 270
HLT 275



氦氣測漏儀性能的考量

- 操作簡單，堅固耐用
- 可偵測之最小漏氣量 (smallest detectable leak rate)
- 抽氣率 (pumping speed at the ion source)
- 反應時間 (response time)
- 容許之最大氣流量 (Maximum permissible)
- 氦氣清除時間 (Clean up time)

爲何使用氦氣

- 質量最輕的惰性氣體(**4 a.m.u**)，能穿透微小的細縫或細孔
- 易被質譜偵測到，即易和質量相近的氣體分開
- 在大氣中存量很少，只有**5 ppm**
- 價格合理
- 無破壞性、危險性、不燃或無爆炸性
- 不具毒性

氦氣測漏儀 HLT260 之特點

- 靈敏度 **sensitivity**
- **vacuum mode : $5 \cdot 10^{-12}$ mbar l/s**
- **sniffer mode : $5 \cdot 10^{-8}$ mbar l/s**
- 量測範圍 **measuring range**
- **$1 \cdot 10^{-12}$ mbar l/s**

- 量測方式 **measuring type**
- **vacuum type**
- **sniffer type**
- 抽氣速率 **pumping speed**
- **turbo pump : Air 70 l/s , He 53 l/s**
- **rotary pump : 84 l/s**
- 進氣口氦氣之抽氣速率 **pumping speed for helium at inlet**
- **2.1 l/s**

氦氣測漏儀 HLT260 之特點

- 最大進氣口之壓力 **max. inlet pressure**
- **Max. 25 mbar**
- **Counter flow 15 mbar**
- **Twin-flow low 5 mbar**
- **Twin-flow high 0.5 mba**
- 燈絲 **filament**
- **Yttrium coated Iridium * 2**
- 線控制器顯示模式 **display type of remote control**
- **Leak rate as number and barograph**
- **Leak rate V.S time**
- **Comparison consecutive leak rate**
- 內置校正標準氦氣瓶 **internal test leak**
- **Yes**
- 反應時間 **respond time**
- **0.5 sec**

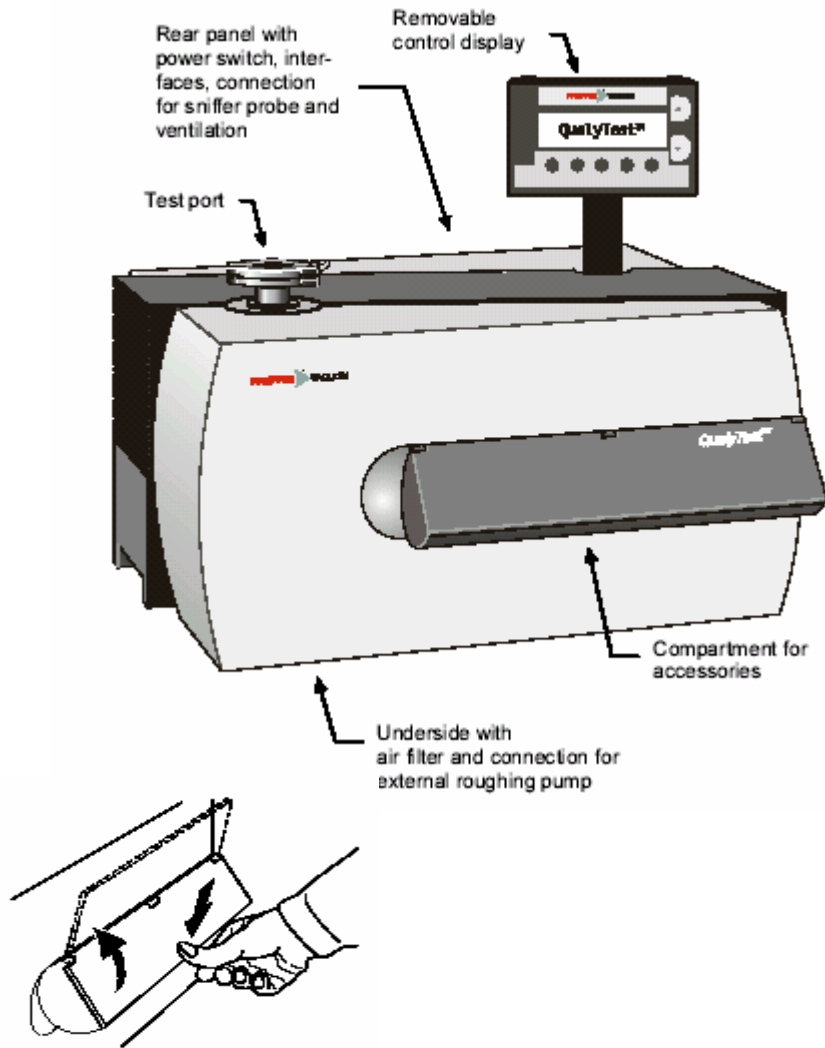
氮氣測漏儀 HLT260 之特點

- 各式界面與連接 **interface and connection**
 - **1. Relay : 2 * 230 VAC 3A**
 - **2. Analog output : 2 * 0-10 V log./lin**
 - **3. Analog input : pressure gauge**
 - **4. Digital output : zero, start/stop, calibration**
 - **5. Digital input : zero, start/stop, calibration**
 - **6. RS-232-C * 2 :**

- 開機至待機完成 **ready for operation in**
 - **3 min**

| | | | | | |
|---|---------------------|--|--|--|---|
| TwinFlow Principle | | QualyTest™ HLT 260 | QualyTest™ HLT 260 | QualyTest™ HLT 260 | QualyTest™ HLT 260 |
| Roughing pump | | Rotary vane, 5 m³/h | Diaphragm , 1.3 m³/h | Scroll, 28 m³/h | User's pump |
| Application | | For most applications Virtually no contamination of test object | Completely oil free For small volumes | Completely oil free For large volumes For fast cycles | Optimum configuration for any application;free choice of roughing pump |
| Pump down time to ready-for-test | | | | | Dependant on external roughing pump |
| 0.5 l test volume | s | 1 | 1 | <1 | |
| 10 l test volume | s | 45 | 125 | 16 | |
| 100 l test volume | s | 590 | 1300 | 160 | |
| Amb. Temperature in operation | °C | +10 - +35 | +10 - +45 | +10 - +45 | +10 - +35 |
| Power consumption | VA | 400 | 300 | 900 | 150 |
| Weight | kg | 44 | 44 | 140 | 34 |
| Smallest detectable leak rate | | | | | |
| (according to AVS 2.1) | mbar l/s | 5 · 10⁻¹² | 5 · 10⁻¹² | 5 · 10⁻¹² | 5 · 10⁻¹² |
| Vacuum mode | mbar l/s | 5 · 10⁻⁸ | 5 · 10⁻⁸ | 5 · 10⁻⁸ | 5 · 10⁻⁸ |
| Sniffer mode | | | | | |

HLT260 外觀介紹



Quality Test™ 是乙部微處理控制的氮氣測漏儀，所有內部程式都是自動控制。

- 機台前方：附屬延長線收置盒（按收置盒中心，即可打開）。
- 機台後方：電源開關、應用介面接點、Sniffer接點和通氣設備。
- 機台上方：控制顯示器RC260、測試口
- 機台下方：有空氣過濾裝置和外部前置泵浦連接口。

Quality Test™ 機台依不同的應用，可附加：

- 外部的́前置泵浦。
- 運輸用台車。

HLT260 基本結構

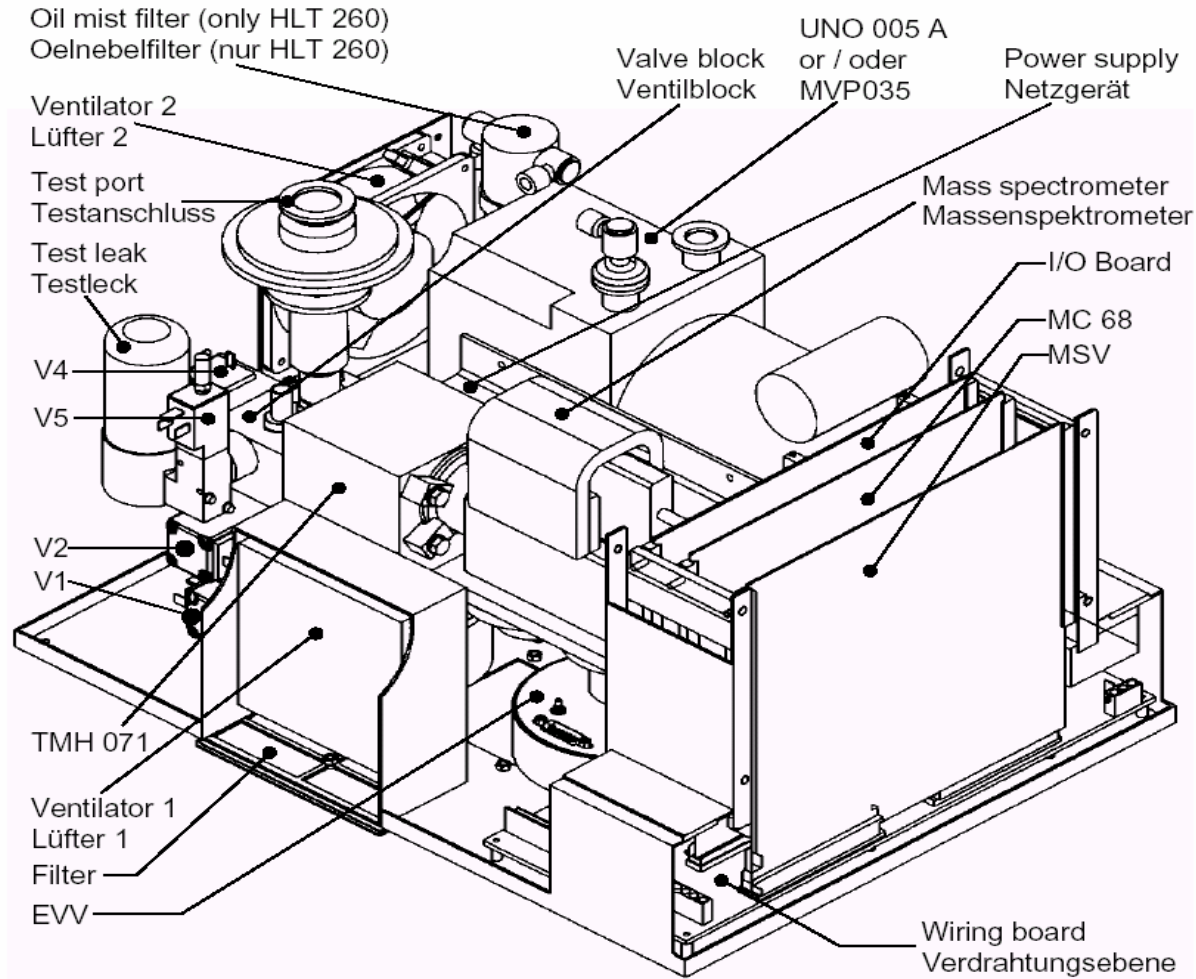
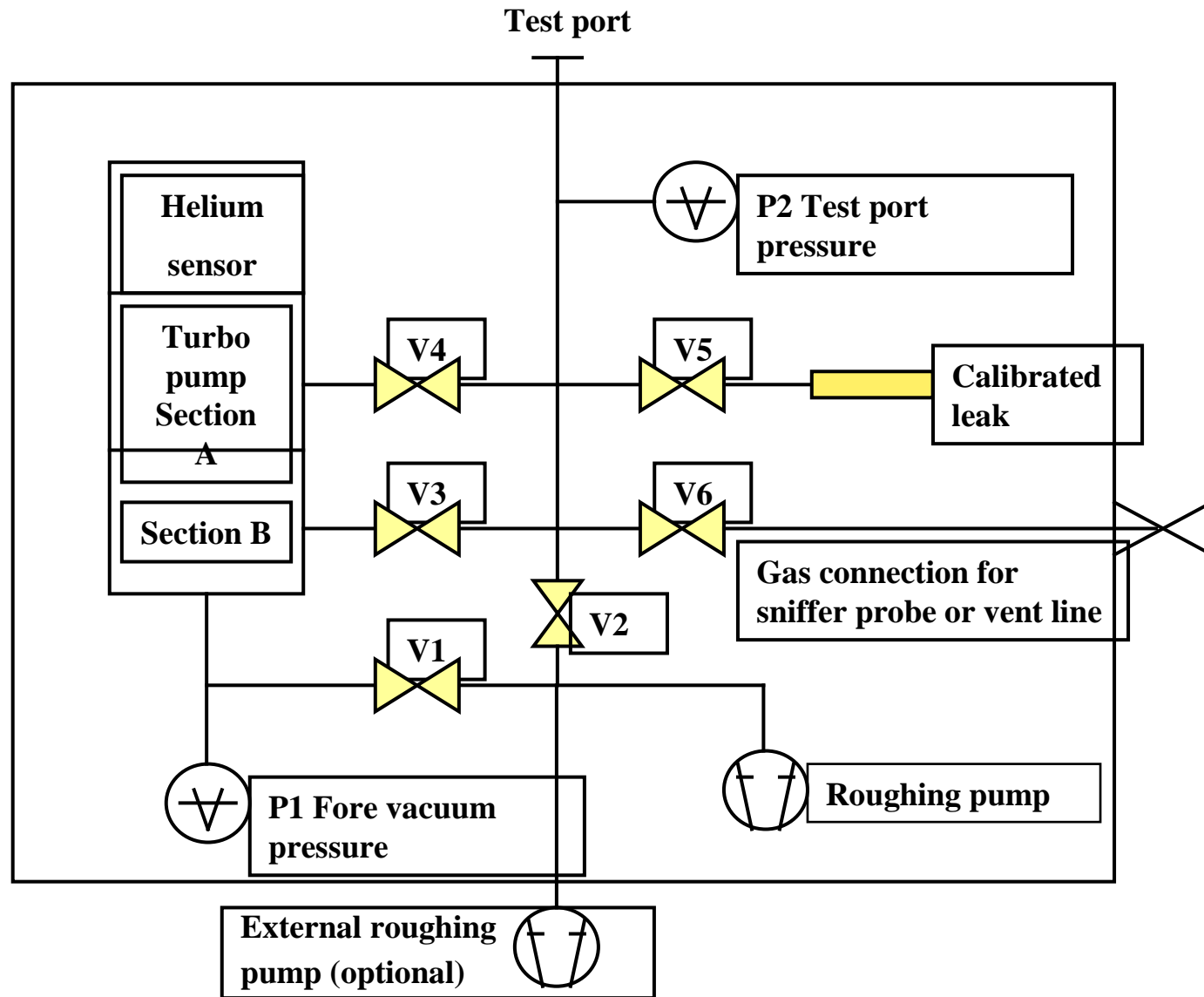


Fig. 2 HLT 2xx

主要三大部份

1. 質譜管 (Mass Spectrometer Tube)
2. 抽氣系統 (Pumping Station)
3. 控制電子線路 (Control Electronics)

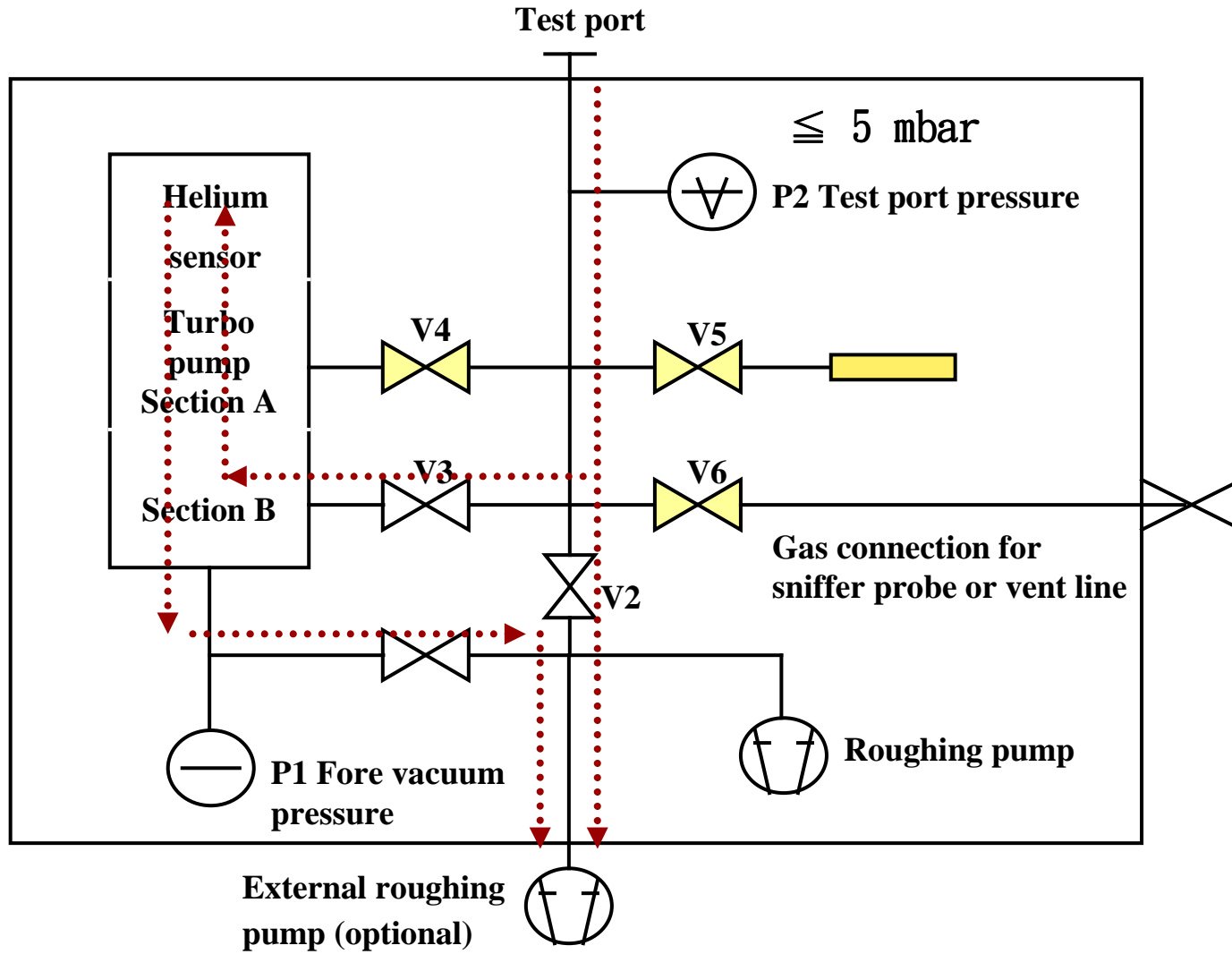
HLT260 量測系統



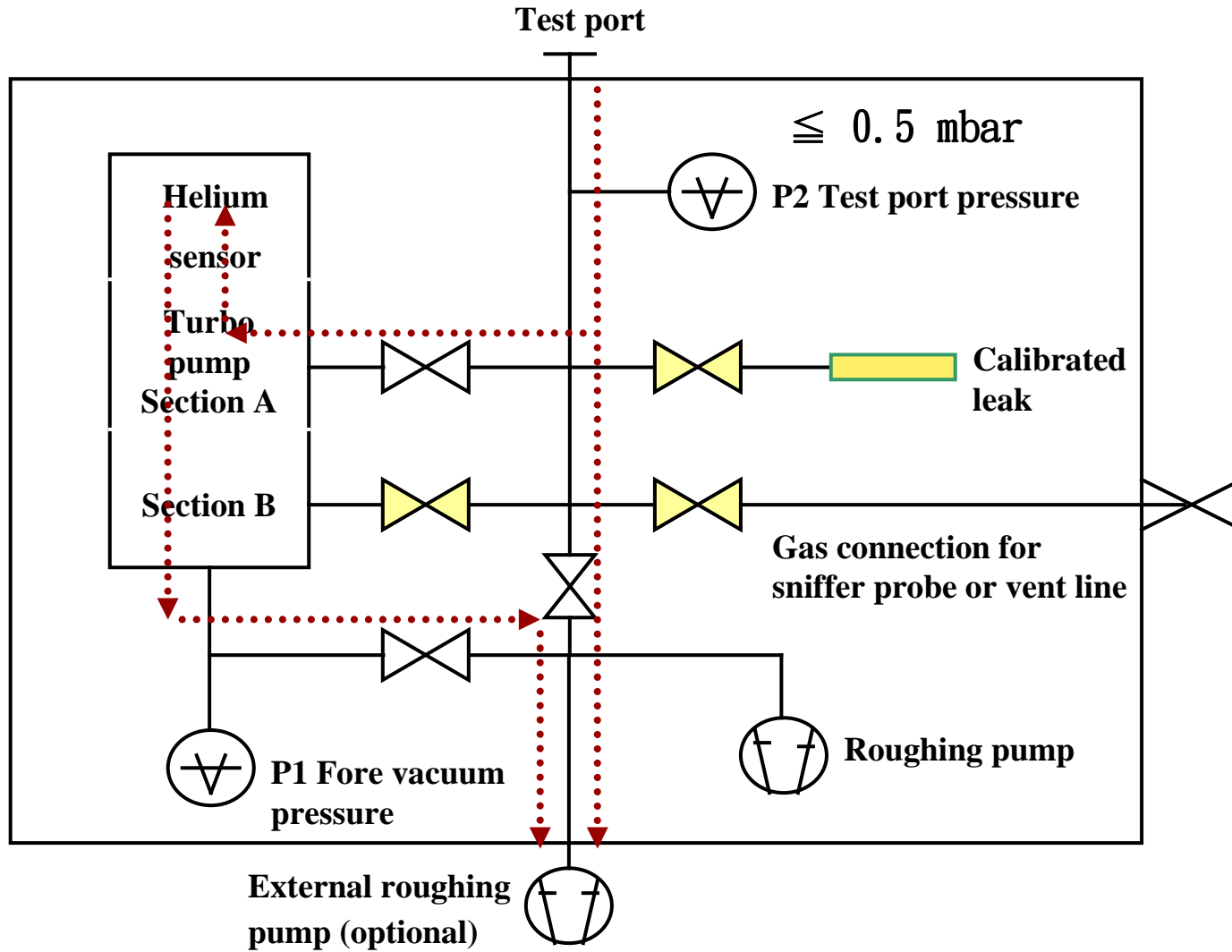
偵測動作原理

- 待測物須以管路與測試口連接，測試經由 V_1 、 V_2 、 V_3 、 V_4 等閥門切換。此種方式不易造成運作或氮氣感應器不當動作的情形。
- 校正時，可經由 V_5 閥門打開內部標準校正瓶。
- 所有閥門都利用電磁及彈簧原理開關。
- 圖中P1為前抽泵浦真空壓力計，P2為測試口真空壓力計。
- Counter flow：採逆流感應方式，當測試口P2壓力，經由前抽泵浦 ≤ 15 mbar時， V_1 閥門打開，逆流至氮氣感應器。
- Twin-Flow™ low：當測試口P2壓力 < 5 mbar時， V_1 和 V_3 閥門打開，抽氣速率大約40 l/s，測試口壓會下降至較高真空範圍。
- Twin-Flow™ high：測試口壓力P2 < 0.5 mbar時， V_1 和 V_4 閥門打開，氣體經由Section A，直接至氮氣感應器。

Twin Flow™ Low



Twin FlowTM High

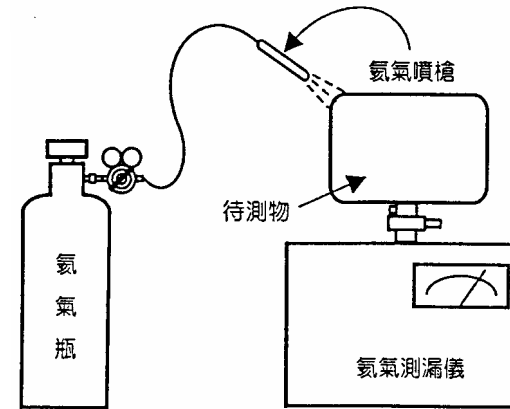


測漏的方式

➤ 真空負壓法 (Vacuum Method)

待測物必須在真空條件下，靈敏度階段：

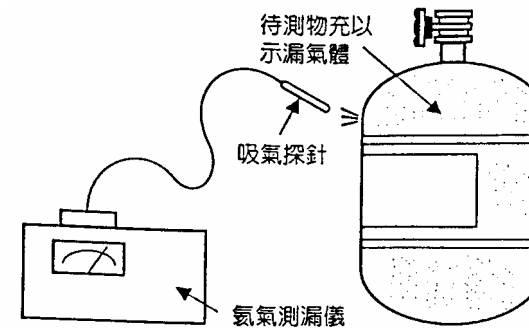
Counter Flow → Twin-Flow™ low → Twin-Flow™ high

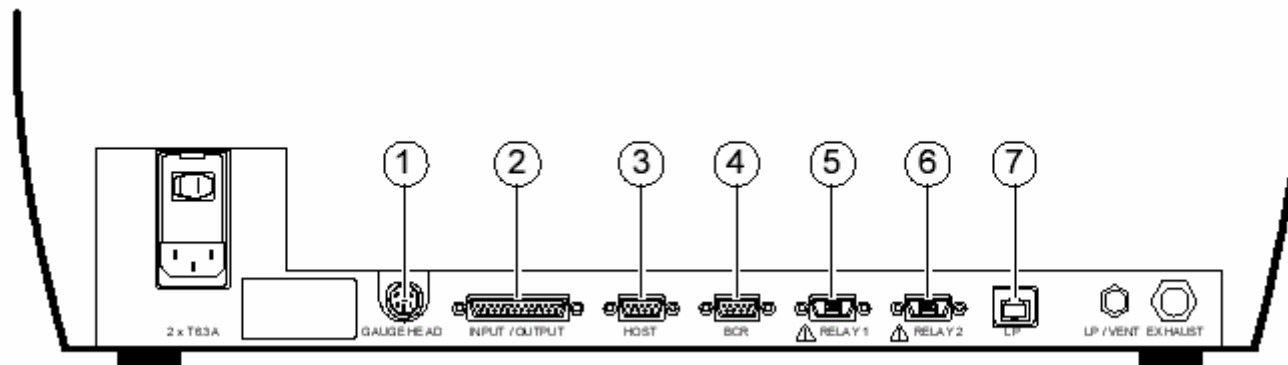


➤ 正壓吸附法 (Sniffer Method)

待測物必須維持高壓條件下，靈敏度階段：

Counter Flow → Twin-Flow™ low

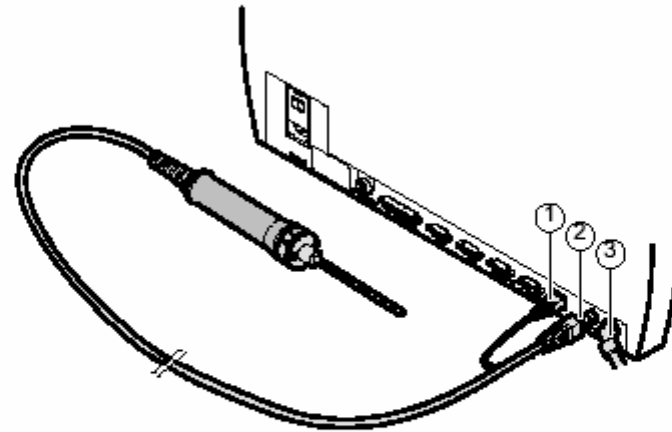




1. Gauge Head Port：真空計連接埠，可連接新式的 Balzers Compact Gauge。
2. Input / Output Port：25Pin輸出入連接埠，可連接電腦並與軟體相結合。
3. Host Port：9Pin主機連接埠，亦可連接 RS 232-C（標準配備）接頭及 RS 485（選購配備）接頭。
4. Connection For Barcode Reader：可連接條碼器與 RS 232-C。
5. Relay 1：輸出設定點 1。
6. Relay 2：輸出設定點 2。
7. LP：連接 sniffer 探針。

Sniffer probe

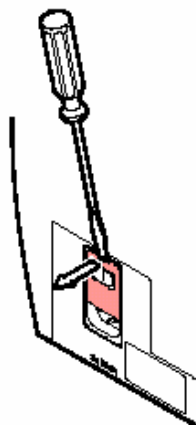
For sniffing mode plug in the sniffer probe as shown.



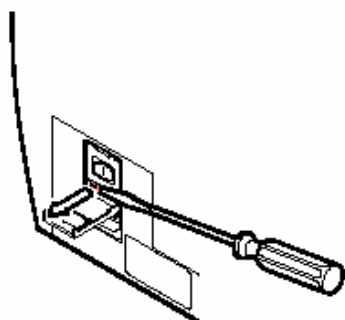
- ① Electrical connection for sniffer probe
- ② Gas connection for sniffer probe or vent line (nipple for hose $\varnothing 6/4$ mm)
- ③ Exhaust port ($1/4$ " quick release coupling for hose $\varnothing 8/6$ mm)

Replacing the fuses

1. Turn the unit off and disconnect it from the AC outlet.
2. Detach the power cable.
3. Unlatch and tilt down the hinged cover of the fuse holders.



4. Remove the fuse holders and replace the defective fuses 6.3 AT (slow), 250 V, $\varnothing 5 \times 20$ mm.



Technical data

General

| | |
|--|--|
| Dimensions | |
| with removable control display | 548×420×457 mm (L×W×H) |
| without removable control display | 548×420×360 mm (L×W×H) |
| Weight | 44 kg HLT 260, HLT 270 34 kg HLT 265 150 kg HLT 275 with cart and pump |
| Max. permissible acceleration in operation | 1 G (horizontal) |
| Test port | DN 25 ISO-KF |
| Cooling air | |
| inlet | on the underside with dust filter |
| outlet | on the side |
| Exhaust port | for hose ø8/6 mm |
| Connection for external roughing pump | DN 16 ISO-KF |
| Vent port (N ₂) | sniffer line connection for hose ø6/4 mm |
| Standards and guidelines | "Declaration of conformity" → 63 |
| Protection | IP 40 |
| Pollution degree | 2 (EN 61010) |

Power connection

| | |
|----------------------|--|
| Voltage / frequency | 230 V \pm 10% / 50 Hz 120 V \pm 10% / 60 Hz 100 V \pm 10% / 50/60 Hz |
| Protection class | 1 |
| Overvoltage category | II |
| Current | <10 A |
| Power consumption | <400 VA (HLT 260) <150 VA (HLT 265) <300 VA (HLT 270) <800 VA (HLT 275) |
| Fuses | 2 pieces 6.3 AT (slow), 250 V, \varnothing 5×20 mm |

Environmental data

| | |
|-------------------------------------|---|
| Temperature storage operation | -10 °C ... +70 °C +10 °C ... +35 °C (HLT 260) +10 °C ... +45 °C (HLT 265) +10 °C ... +40 °C (HLT 270, HLT 275) |
| Relative humidity | max. 80% up to +31 °C, decreasing to 50% at +40 °C |
| Utilization | indoors only altitude up to 2000 m NN |
| Noise level | <70 dB/A (according to IEC standard) |


Vacuum method

| | |
|--|---|
| Lowest detectable leak rate ⁴ He, ³ He H ₂ | according to AVS 2.1 <5×10 ⁻¹² mbar l/s <5×10 ⁻⁸ mbar l/s |
| Highest detectable leak rate ⁴ He, ³ He H ₂ | 1 mbar l/s 1×10 ⁻² mbar l/s |
| Measurement range | 10 ⁻¹² ... 1 mbar l/s |
| Displayable units of measurement | mbar l/s, Pa m ³ /s, sccm, sccs |
| Detectable gases | ⁴ He, ³ He, H ₂ |
| Response time (63% of signal) | <0.3 s |
| Pumping speed for helium | >2.1 l/s at p _{inlet} < 0.5 mbar |
| Pumping speed at inlet with large roughing pump (with HLT 265) | depending on external pump |
| Pumping time for high sensitivity | |
| with volume of 0.5 l | 2 s (HLT 260, HLT 270) |
| with volume of 10 l | 70 s (HLT 260) |
| | 200 s (HLT 270) |
| with volume of 100 l | 700 s (HLT 260) |
| | 2100 s (HLT 270) |
| Pumping time to first measurement | |
| with volume of 0.5 l | 2 s (HLT 260, HLT 270) |
| with volume of 10 l | 45 s (HLT 260) |
| | 135 s (HLT 270) |
| with volume of 100 l | 500 s (HLT 260) |
| | 1300 s (HLT 270) |
| Internal calibrated leak | → inside of cover of compartment for accessories |

Sniffing method

| | |
|---|---|
| Lowest detectable leak rate ^4He , ^3He , H_2 | according to AVS 2.1 $<5 \times 10^{-8}$ mbar l/s |
| Highest detectable leak rate ^4He , ^3He H_2 | 1 mbar l/s 1×10^{-2} mbar l/s |
| Measurement range | 5×10^{-8} ... 1 mbar l/s |
| Displayable units of measurement | mbar l/s, Pa m ³ /s, ppm, sccm, sccs, g/a, oz/y |
| Detectable gases | ^4He , ^3He , H_2 |
| Response time | <1 s with 3 m sniffer line |

Removable control display RC 260

| | |
|---------------------------------------|--|
| Dimensions | 180×46×140 mm (L×W×H) |
| Action radius with extension cable | 6 m (standard cable) up to 100 m (accessories →  54) |
| Display | LCD with backlight |
| Headphones connection | jack plug ø 3.5 mm |
| Keylock switch | disables calibration and saving of parameters |

Roughing pumps

| | | |
|-------------------|---|---|
| HLT 260 | Pfeiffer Vacuum UNO 005 A Pumping speed | single-stage rotary vane pump, oil-immersed 4 m ³ /h at 50 Hz, 5 m ³ /h at 60 Hz |
| HLT 265 | To be supplied by the end-user | |
| HLT 270 | Pfeiffer Vacuum MVP 035 Pumping speed | two-stage diaphragm pump, oil-free 1.3 m ³ /h at 50 Hz, 1.5 m ³ /h at 60 Hz |
| HLT 275 | Varian DS 600 Pumping speed | two-stage scroll pump, oil-free 25 m ³ /h at 50 Hz, 30 m ³ /h at 60 Hz |
| Turbo pump | Pfeiffer Vacuum TMH 071 Pumping speed for N ₂ | turbomolecular pump with intermediate suction 60 l/s |