# G-TRAN Series Multi Ionization Gauge [SH2-1/SH2-2]

ULVAC, Inc. has developed and commercialized the G-TRAN Series "Multi ionization Gauge" (patent pending). A transducer type that can connect gauge heads with different measurement ranges. The newly developed G-TRAN Series "Multi ionization Gauge" has advantages such as wide range measurement, lower running cost and low environmental burden.

SH2-1

SPU

SAU

## Features

- **Wide-range Measurement**
  Wide pressure measuring range from atmospheric pressure to high vacuum range ($10^{+5}$ to $5\times10^{-8}$Pa, 760 to $3.75\times10^{-10}$ Torr, 1013 to $5\times10^{-10}$ mbar). (when SPU and SAU are used together)
- **Possible to Connect Gauge Heads with Different Measurement Ranges**
  With Multi Ionization Gauge (patent pending), a gauge head is selected depending on the usage.
- **Precise Measurement of Atmospheric Pressure**
  Confirming atmospheric pressure easily and accurately (when SAU is used together)
- **Low Environmental Burden**
  Capable of reducing the running costs as only failed gauge heads are replaced
- **Improvement in Visibility**
  With high visible LED for error verification
- **Maintenance**
  Easy sensor head replacement
- **Measured Value Output Signal**
  Pressure output in 0 to 10V (Log output)
- **Control Output Signal**
  3 setpoint output (only SH2-1)
- **Serial Communication**
  RS232C / RS485 communication (only SH2-2)
- **Applicable Standard**
  Conforms with CE

## Applications

- Process control in high vacuum processes such as for photovoltaic field, FPD, semiconductor, optics and electronic parts manufacturing systems
- Ultimate pressure measurement in high vacuum range in manufacturing systems with multiple process chambers such as in-line and single wafer processing system
- For pressure measurement in high and ultra high vacuum equipments

ULVAC SOLUTIONS

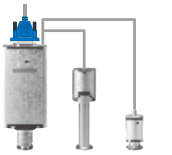
# G-TRAN Series Multi Ionization Gauge [SH2-1/SH2-2]

## Specifications

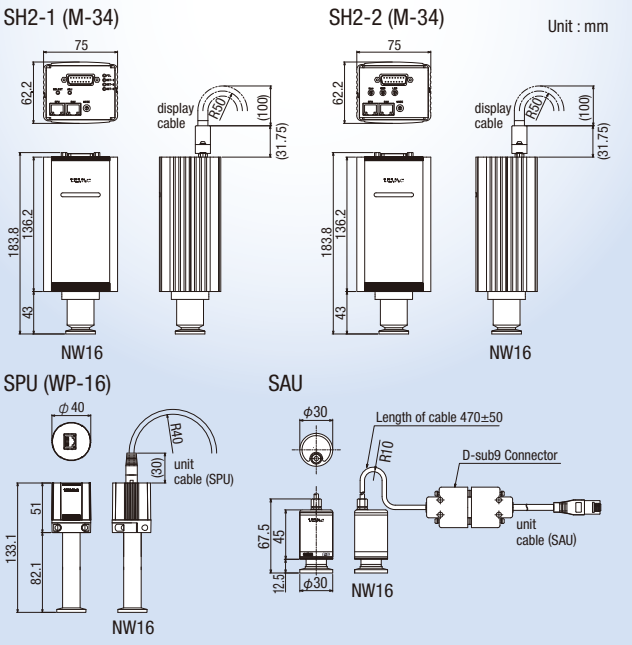
| Model | SH2-1 | SH2-2 |
|---|---|---|
| Type | Standard type | Serial communication type |
| Compatible sensor head | M-34 (NW16), M-35 (NW25) | |
| Compatible measuring unit | Multi Ionization Gauge : 1pc.<br>Pirani Vacuum Gauge SPU : 1pc. (Option)<br>Pressure switch SAU : 1pc. (Option) | |
| Sampling time | 4 times in 70ms running average | |
| Value output | Output voltage DC 0 to 10V, Logarithmic output 0.75V/1decade<br>Pressure conversion formula V=7.25+0.75× (LogP-2) P=10^ { (V-7.25) /0.75+2}<br>* Also serves as output voltage for set point adjustment (SH2-1 only) | |
| Update time | 50ms | |
| Control input signal | FIL ON/OFF, FIL 1/2, DEGAS ON/OFF<br>Open collector input, Negative logic<br>* Various use of FIL ON/OFF signal for different modes | |
| Control output signal | Error signal, Setpoint1/2/3, Emission valid<br>Watch of electric power of filament<br>Rating : 24V$_{MAX}$、50mA$_{MAX}$、Saturation voltage 1V | |
| Serial communication type | | RS232C/RS485 |
| LED display | POWER/ERROR: Power, ERROR LED (Blinking changes depending on each mode)<br>FIL : Emission valid LED | |
| | SET1: Setpoint 1 LED<br>SET2: Setpoint 2 LED<br>SET3: Setpoint 3 LED | |
| Emission current | 1mA (1×10$^{-3}$Pa or less) 、10$\mu$A | |
| Degas Method | Electron bombard type 1mA, 350V | |
| Maximum pressure of sensor | 2×10$^{+5}$ Pa (1.5×10$^{+3}$ Torr, 2×10$^{+3}$ mbar) (Absolute pressure)<br>* Need separate measures as a capacity to resist pressure, such as flange and clamp | |
| Internal volume of sensor | 34cm$^3$ (M-34) | |
| Operating temperature range | 10 to 50℃ (50 to 122℉) | |
| Operating humidity range | 15 to 80% (not condensing) | |
| Storage temperature | -20 to 65℃ (-4 to 149℉) (At non-energizing, not condensing) | |
| IP rating | IP30 | |
| Power supply voltage | DC20 to 28V (Ripple, Noise 1% or less) 19W (156W w/power input) | |
| Input/output connector | D-sub15-pin (M2.6 screw) | |
| Weight | Sensor unit : 530g, B-A sensor gauge (M-34) : 63g | |
| Dimension | 144×75×62mm (max.) (Power supply) | |
| Applicable standard | CE | |
| Options: Multi Ionization Sensor head | M-34 (NW16), M-35 (NW25)<br>Material of gas contacting sections : 1-filament･Ir/$Y_2O_3$, 2-filament･W, Another-PtC･Mo, SUS, W | |
| Options: Pirani Vacuum Gauge | SPU | |
| Options: Pirani Vacuum Sensor head | WP-16 (NW16)<br>Material of gas contacting sections : Filament-Pt, Another-BS/Ni, Plating, Ni, Solder | |
| Options: Pressure switch | SAU (NW16) Material of gas contacting sections : SUS316L | |
| Options: Unit cable | 0.5m for SPU<br>0.5m for SAU | |
| Options: Display unit | 1CH Model ISG1 (DC24V) | |
| | 4CH Model IM1R1 (DC24V)<br>Model IM2R1 (AC100V) | |
| Options: Display cable | Cable between SH2 and Display unit<br>2m, 5m, 10m, 15m | |

## Mode Specifications

➤SH2-1/SH2-2 have three options; simple mode with a multi ionization gauge, combination mode with a multi ionization gauge and a pirani gauge (SPU), and triple combination mode with a multi ionization gauge, a pirani gauge (SPU) and a pressure switch

| Mode | SH2-1/SH2-2 Simple mode | SH2-1/SH2-2+SPU Combination mode | SH2-1/SH2-2+SPU+SAU Triple combination mode |
|---|---|---|---|
| Measurable pressure range | 5×10$^{-8}$ to 1×10$^{+1}$ Pa | 5×10$^{-8}$ to 1×10$^{+4}$ Pa | 5×10$^{-8}$ to 1×10$^{+5}$ Pa |
| Accuracy | 5×10$^{-8}$ to 10 Pa: ±15% | 5×10$^{-8}$ to 1×10$^{+3}$ Pa: ±15%<br>1.0×10$^{+3}$ to 3.0×10$^{+3}$ Pa: ±30%<br>3.0×10$^{+3}$ to 1.0×10$^{+4}$ Pa:<br>No warranty | 5×10$^{-8}$ to 1×10$^{+3}$ Pa : ±15%<br>1.0×10$^{+3}$ to 3.0×10$^{+3}$ Pa: ±30%<br>3.0×10$^{+3}$ to 1.0×10$^{+4}$ Pa:<br>No warranty<br>1.0×10$^{+4}$ to 1.0×10$^{+5}$ Pa: ±3% F.S.<br>(3×10$^{+3}$ Pa/Reference temperature 25℃) |
| | 3.75×10$^{-10}$ to 7.5×10$^{-2}$ Torr: ±15% | 3.75×10$^{-10}$ to 7.5 Torr: ±15%<br>7.5 to 22.5 Torr: ±30%<br>22.5 to 75 Torr: No warranty | 3.75×10$^{-10}$ to 7.5 Torr: ±15%<br>7.5 to 22.5 Torr: ±30%<br>22.5 to 75 Torr: No warranty<br>75 to 760 Torr: ±3% F.S.<br>(23 Torr/Reference temperature 77℉) |
| | 5×10$^{-10}$ to 0.1 mbar: ±15% | 5×10$^{-10}$ to 10 mbar: ±15%<br>10 to 30 mbar: ±30%<br>30 to 100 mbar: No warranty | 5×10$^{-10}$ to 10 mbar: ±15%<br>10 to 30 mbar: ±30%<br>30 to 100 mbar: No warranty<br>100 to 1013 mbar: ±3% F.S.<br>(30 mbar/Reference temperature 25℃) |
| Repeatability | 1×10$^{-6}$ to 1×10$^{-1}$ Pa : ±2% | | |
| Connection diagram (for Example) |  Multi Ion Gauge |  Multi Ion Gauge Pirani Gauge |  Multi Ion Gauge Pressure Switch Pirani Gauge |

## Dimensions





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