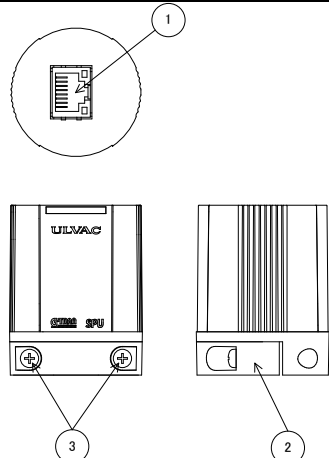


G-TRAN SERIES Pirani Vacuum gauge SPU Quick Manual

Introduction
 This quick manual is for quick check of operation and display of the product. Please refer to instruction manual in advance for detailed information about operation, precautions and safety for proper use. Available for download from ULVAC website. <https://showcase.ulvac.co.jp/ja>
 This manual is for the following gauges. Serial Nos. 00001 and higher.

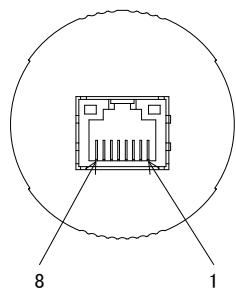
1. Part Names and Functions

1.1. SPU controller section



No.	Name	Function
①	I/O connector	The I/O connector for the power supply and signals (RJ-45 jack connector).
②	Gauge head clamp	The clamp to hold and lock the gauge head.
③	Mating screws	Mating screws (M3) for the clamp hood.

1.2. SPU I/O connector



No	This unit	Signal direction	Connection destination
1	Power supply +5 VDC	←	SH2 Multi-ionization gauge
2	GND	←	
3	Power supply +5 VDC	←	
4	Communication terminal	→	
5	Communication terminal	→	
6	GND	←	
7	Power supply +5 VDC	←	
8	GND	←	

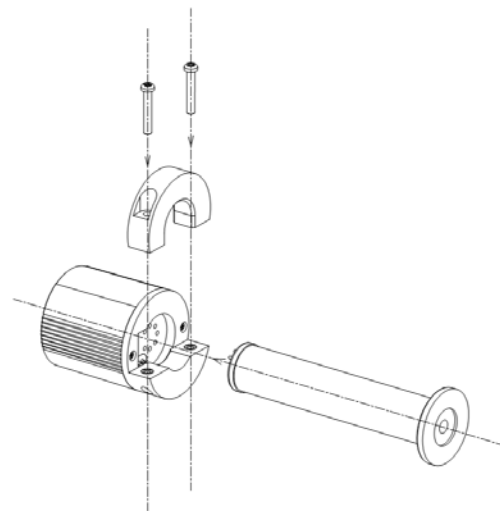
1.3. SPU LED	
Name (symbol)	Function
① POWER/ERROR LED	On : Operating normally Flashing: Error such as a filament break, this unit is malfunctioning Off : Power off, this unit or the SH2 is malfunctioning

2. Attaching the Product

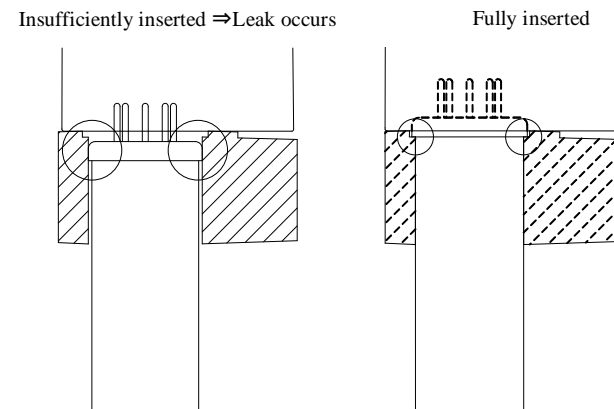
Loosen the clamp locking screws to loosen the clamp. Then attach the gauge head with the procedure below.

- ① Align the pins for the gauge head and push it all the way in
- ② Clamp the gauge head with the clamp

Tighten the locking screws to secure the gauge head



If the gauge head is not fully inserted as shown in the figure below, the gauge head may leak from the constrictive clamp.



3. Handling Precautions

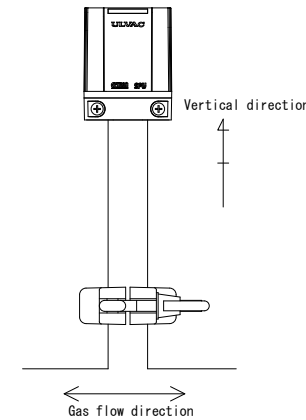
3.1. Precautions related to usage

- Secure cables as much as possible so that force is not applied to cable connectors.
- Firmly insert the RJ-45 connector.
- To perform accurate pressure measurements, allow the pressure sensor to age for 20 minutes or longer before measuring.

3.2. Attaching this unit

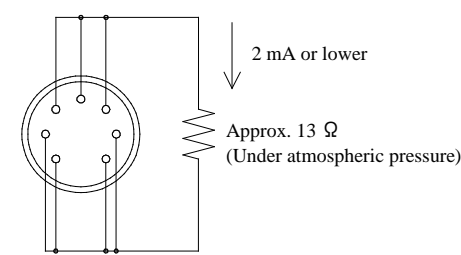
- Attach this unit so that the gauge head attachment opening surface is parallel to the gas flow. In particular, ensure that gases do not enter the gauge head interior like a beam.

- As much as possible, attach the gauge head so the filament is vertical to the force of gravity.
- The Pirani vacuum gauge head filament is thin at $\phi 25 \mu\text{m}$, so avoid use in a location with a large amount of vibration as much as possible. The biggest cause of filament breaks is from mechanical shock, so use caution regarding the installation location and handling.
- Use an O-ring to attach the gauge head that releases little gas. There is a risk of measurement errors or the gauge head lifespan will decrease if materials that release a large quantity of gas, such as rubber tubes or grease, are used in the gauge head connection.



4. Checking for a filament break

The Pirani vacuum gauge head filament is wired as shown in the figure below. Check continuity referring to this figure. The filament's resistance is approximately 13Ω at atmospheric pressure.



5. Specifications

Name	Pirani vacuum gauge measuring unit
Model	SPU
Measurement principle	Pirani vacuum gauge that uses thermal conduction by gas molecules
Number of gauge heads	1pc
Applicable gauge head	WP-16
Measurement pressure range	4×10^{-1} Pa to 3×10^{-3} Pa
Output pressure range	1×10^{-1} Pa 1×10^{-4} Pa
Accuracy (N ₂)	1.0×10^{-1} Pa to 4.0×10^{-1} Pa: no accuracy guarantee 4.0×10^{-1} Pa to $1.0 \times 10^{+0}$ Pa: $\pm 30\%$ $1.0 \times 10^{+0}$ Pa to $1.0 \times 10^{+3}$ Pa: $\pm 15\%$ $1.0 \times 10^{+3}$ Pa to $3.0 \times 10^{+3}$ Pa: $\pm 30\%$ $3.0 \times 10^{+3}$ Pa to $1.0 \times 10^{+4}$ Pa: no accuracy guarantee
Repeatability	$\pm 10\%$ (at a constant operating environment temperature)
Sampling time	50 ms, 5x moving average
Measurement value output	Output by serial communication
LED display	POWER/ERROR LED
Gauge head material	Filament: Pt Other: CuZn/Ni plating, Kovar glass, Ni, SnSb
Gauge head withstand pressure	$2 \times 10^{+5}$ Pa (abs) *Take the withstand pressure for flanges, clamps, and other components into account separately.
Operating temperature range	10 to 50°C
Operating humidity range	15% to 85% RH (no condensation)
Storage temperature	-20 to 65°C (no condensation)
IP code	IP30
Power supply voltage	5 VDC
I/O connector	RJ-45 jack connector
Gauge head internal volume	Pirani vacuum gauge head (WP-16): 22 cm ³
Weight	Controller: Approx. 38 g,
External dimensions	$\phi 40 \times 51$ (controller section only)

5.1. Standard Accessories

SPU Pirani vacuum gauge measuring unit	1 pc.
Pirani vacuum gauge head (WP-16)	1 pc.
Quick manual (this manual)	1 copy

6. Warranty

This product was shipped after rigid company inspection. However, in case any failure occurs under ULVAC's responsibility, such as defect in manufacturing and damage during transportation, Buyer shall inform ULVAC, Inc. or the local ULVAC representatives. ULVAC will repair or exchange it at free of charge.

Warrantable Items: This unit

Duration of guarantee: One (1) year after shipping date from ULVAC

Warrantee scope

- 1) Domestic business in Japan: Product, which has damage, caused by a failure on delivery.
- 2) Direct export transaction: Product, which has damage, caused by a failure on delivery. The warrantee scope shall confirm to the new INCOTERMS.
- 3) Products not satisfying meet the standard specifications although the product is used under the normal service conditions such as temperature range and power etc.

Response procedure

- 1) Domestic business in Japan: ULVAC send a replacement or Buyer return the defective items to ULVAC, Inc. or to the local ULVAC representatives for repair. If field service is required, Buyer shall ask ULVAC, Inc. or the local ULVAC representatives.
- 2) Direct export transaction: ULVAC send a replacement or Buyer return the defective items to ULVAC, Inc. or to the local ULVAC representatives for repair. Return charge shall be paid by Buyer.

Disclaimer

- 1) Failure occurred after expiration of warranty period
- 2) Failure caused by force majeure, such as fire, storm and flood damage, earthquake, lightning strike, war etc
- 3) Failure occurred due to carelessness handling or faulty usage
- 4) Products remodeled, disassembled or repaired without ULVAC's acceptance
- 5) Failure occurred under abnormal environment, such as intense electromagnetic field, radiation, high-temperature, high-humidity, flammable gases, corrosive gases, dust etc.
- 6) Failure occurred by noise
- 7) Product deficiency or secondary damnification occurred to Buyer, from law suit to ULVAC by third party for patent infringement.
- 8) Sensor head being used (expiration of life, measurement error, etc.)
- 9) Sensor head cable in use (cable burnout due to improper installation, poor contact, etc.)

Others

- 1) In case, special agreement or memorandum for specifications is made individually, the descriptions are prior to this article "13 Product Warranty".
- 2) Buyer shall inform ULVAC when this product is exported out of Japan. In the meantime, Buyer shall take necessary procedures according to Foreign Exchange and Foreign Trade Law.
- 3) As for the question and consultation, Buyer shall check the model and serial number and ask the local representative or ULVAC, Inc.
- 4) The content of this document is subject to change without notice in future.

7. Certificate of Decontamination

Please enter the operating condition/trouble symptom of your vacuum gauge in this form and submit it to your local ULVAC service station or sales office after signing it. The form is available for download from ULVAC website.

8. Network

ULVAC, Inc: <http://www.ulvac.co.jp/eng/index.html>

Service Centers: <http://www.ulvac.co.jp/eng/support/service/index.html>

Sales Offices: http://www.ulvac.co.jp/eng/support/sales_office/index.html