YK06-0044-EQ-003-10

ULVAC

G-TRAN Series
1-Channel Display Unit
Model ISG1
Quick Manual

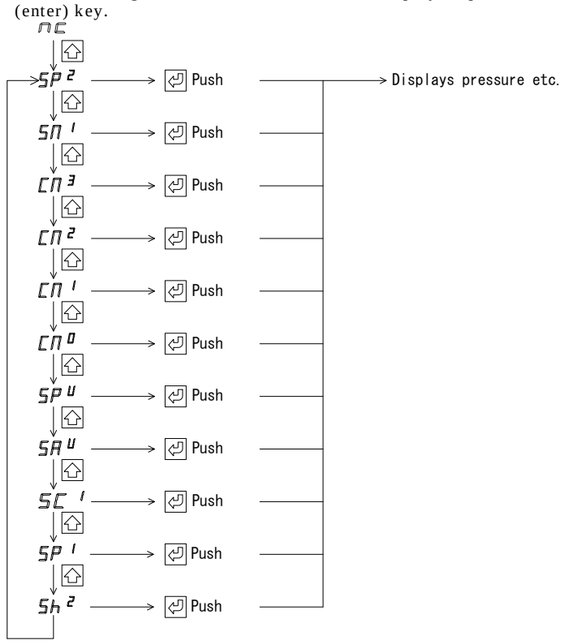
Introduction

This quick manual is for quick check of operation and display of the product. Please refer to instruction manual in the ULVAC website (https://www.ulvac.co.jp/download/en/instruction-manual/?category=1009) in advance for detailed information about operation, precautions and safety for proper use.
This manual is for the following gauges. Serial No. 09501 and higher.

Model	Serial numbers
ST2-1 Multi Ionization Gauge	00901～
SH2-1 Multi Ionization Gauge	06001～
ST200-A Multi Ionization Gauge	00001～
SH200-A Multi Ionization Gauge	00001～
SC1 Cold-Cathode Ion Gauge	02300G～
SW100-A Pirani Vacuum Gauge	00001～
SW1-1 Pirani Vacuum Gauge	00001～
SP1 Pirani Vacuum Gauge	00001～
CCMT-D series Ceramic Capacitance Manometer	00001～

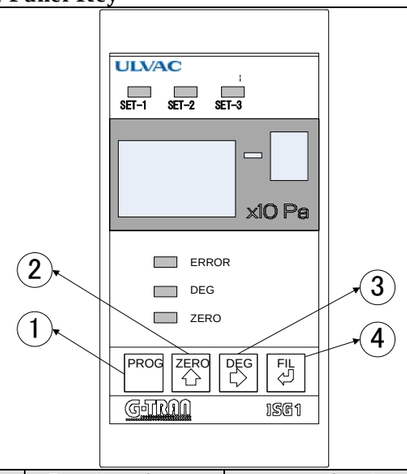
1. Selection of Sensor Unit: PLEASE CHECK

The currently selected sensor unit blinks for 3 seconds after power is applied to this unit. Press the ⇧ (up arrow) key while the sensor unit is blinking and, when the sensor unit is displayed, press the ⏎ (enter) key.



nC	nc	not set
SP 2	SP2	Pirani vacuum gauge SW100-A, SW1-1
SN 1	Sn1	Hot cathode gauge BMR2
CN 3	Cn3	Capacitance manometer CCMT-1000A/1000D, CCMH-1000A
CN 2	Cn2	Capacitance manometer CCMT-100A/100D, CCMH-100A
CN 1	Cn1	Capacitance manometer CCMT-10A/10D, CCMH-10A
CN 0	Cn0	Capacitance manometer CCMT-1D, CCMH-1A
SP U	SPU	Multi-Ionization SH200-A/ST200-A, SH2-1/ST2-1 (SPU Combination mode)
SA U	SAU	Multi-Ionization SH200-A/ST200-A, SH2-1/ST2-1 (SAU/SWU Combination mode)
SC 1	SC1	Cold cathode gauge SC1
SP 1	SP1	Pirani vacuum gauge BPR2, SP1
Sh 2	Sh2	Multi-Ionization SH200-A/ST200-A, SH2-1/ST2-1

2. Front Panel Key



Name		Functions of menu	functions
①	PROG	Enters into the program mode	
②	⇧	Upward arrow key	Changes a value
	ZERO	Zero key	Zero point adjustment ON/OFF switch
③	⇨	Rightward arrow key	Changes a numeric value.
	DEG	Degassing key	Switch that turns ON/OFF degassing
④	⏎	Enter key	Enter key
	FIL	Filament key	Switch that turned ON/OFF the filament SW100-A/SW1-1 zero point/atmospheric pressure switch

3. Key Operation in Measurement

Nota-tion	Sensor unit name					
	SP1 BPR2	SW100-A SW1-1	SC1	SH200-A, ST200-A, SH2-1,ST2-1 BMR2	SH200-A/ST200-A, SH2-1/ST2-1 (SPU,SWU,SAU Combination mode)	CCM series
ZERO	-	-	-	-	-	Zero point adjustment
DEG	-	-	-	Degas	Degas	-
FIL	-	adjustment	HV ON	FIL ON	FIL OFF	-

3.1. SP1, BPR2

Not use the key

3.2. SW100-A, SW1-1

Adjustment: Hold down the “FIL” switch for 1 second or more.
Adjustment reset: Hold down the “FIL” switch for 5 seconds or more.

3.3. SH200-A, ST200-A, SH2-1, ST2-1, BMR2

The first press on the key turns on the filament and a second press turns it off. The first press on the key turns on degassing and a second press turns it off.

3.4. SH200-A, ST200-A, SH2-1, ST2-1 (SPU / SAU / SWU Combination mode)

The first press on the key turns off the filament and a second press turns it on. The first press on the key turns on degassing and a second press turns it off.

3.5. SC1

The first press on the key turns on the High Voltage and a second press turns it on.

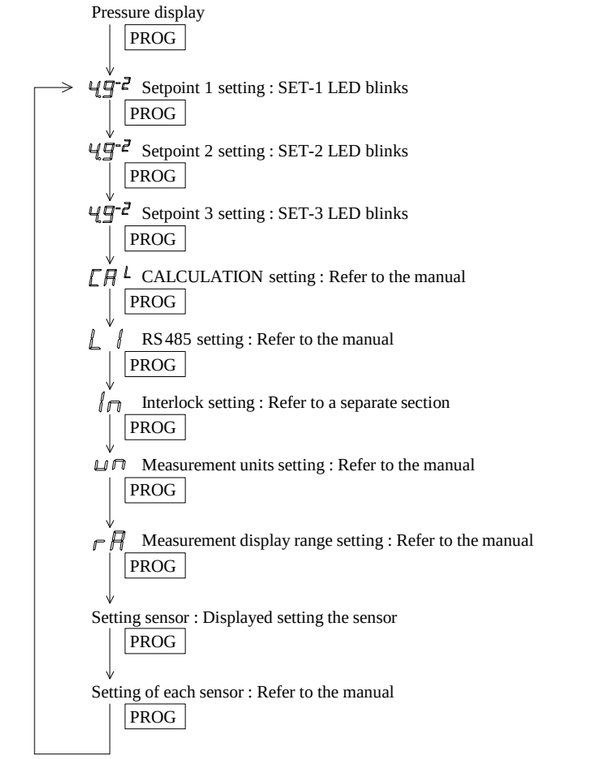
3.6. CCM

Adjustment: Hold down the “ZERO” switch for 1 second or more.
Adjustment reset: Hold down the “ZERO” switch for 3 seconds or more.

4. Front Panel Operation

4.1. Description of Front Panel Keys

Notation	Name	Function
PROG	Program key	Enters into the program mode Also a key for shifting to each setting.
⇧	Upper arrow key	Key that changes a numeric value
⇨	Right arrow key	Used when changing settings
⏎	Enter key	Press at the end of an input



5. Setpoint

Setpoint can be set on the front panel or through RS485.

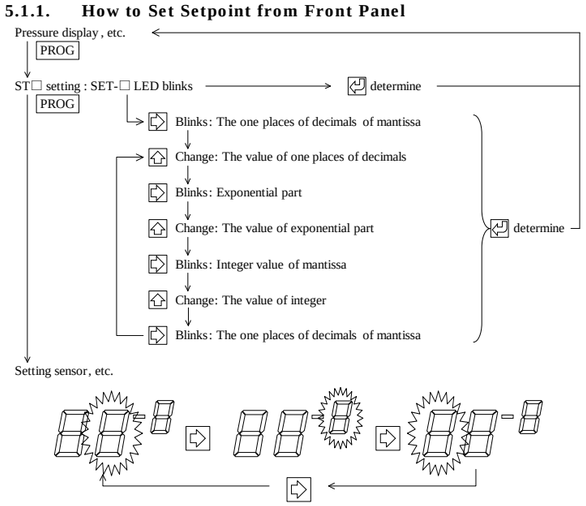
5.1. Setpoint Setting Range

The setpoint setting range of all sensors is the same. The setpoint range assumes the CALCULATION function.

Setpoint setting range: 4.9×10^{-11} to $1.4\times10^{+8}$

10^{-10} is “A (A of capital letter)”, 10^{-11} is “b (B of small letter)”.Please note “b (B of small letter)” to make a mistake as '6' of the figure.

5.1.1. How to Set Setpoint from Front Panel



6. Interlock Function

This function locks the front panel button controls, under certain condition.

6.1. Interlock Setting

Interlock setting can only be changed from the front panel control.

method	Operation
Setting	PROG , set the interlock “In” to “o” When “In” is “F”, interlock is OFF.
unlocking	Hit any key on the front panel while displaying the pressure value so that the numbers start blinking. Hold PROG more than 5 seconds after the blink, in order to reset the interlock.

7. Setting Operation (Example SH200-A, SH2-1, BMR2)

7.1. Setting Overview

The following settings are available for turning on the filament or degassing and for changing over the filament 1/2.

Setting	Overview
RS-485 communication mode	Only RS-485 communication is available
Front panel operation mode	Only front panel operation is available
External I/O operation mode	Only external I/O operation is available

7.2. RS-485 Communication Operation Setting “L1”, “L2”

Selects if filament ON/OFF, degassing ON/OFF or filament 1/2 changeover is to be operated through RS-485 communication. Refer to Section 19 for more information about the detailed setting of RS-485.

Display	Details	Remarks
“L1”	Operation on the front panel and external I/O	RS-485: Pressure reading only
“L2”	Only operation through RS485 communication	

7.3. Front Panel, External I/O Operation Setting

7.3.1. Filament Operation Setting “Fi”

Selects whether filament ON/OFF is to be operated on the front panel or with external I/O. This function will be invalidated if it is set at RS-485 communication.

Display	Detail
“F”	Operation on the front panel only
“o”	Operation of external I/O only

7.3.2. Degas Operation Setting “dE”

Selects whether degassing ON/OFF is to be operated on the front panel or with external I/O. This function will be invalidated if RS485 communication is set.

Display	Detail
“F”	Operation on front panel only
“o”	Operation of external I/O only

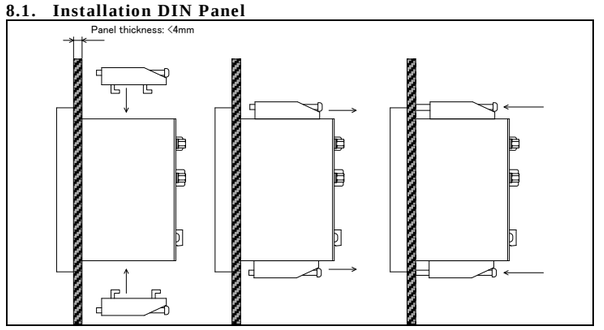
7.3.3. Filament Changeover Setting “FL”

Selects whether selection of filament 1/2 is to be operated on the front panel or with external I/O. This function will be invalidated if it is set at RS-485 communication. Also the filament set on the front panel will be invalidated when operation is changed over to external I/O.

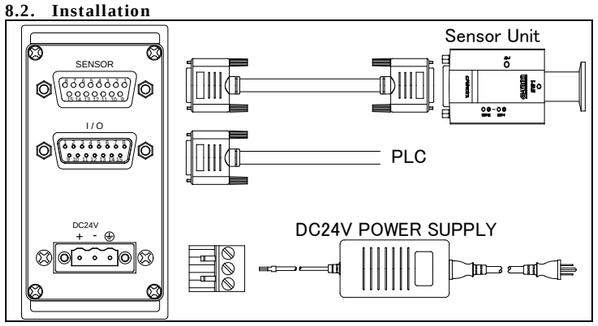
Display	Detail
“0”	Operation of external I/O only
“1”	Setting of filament 1
“2”	Setting of filament 2

8. Installation

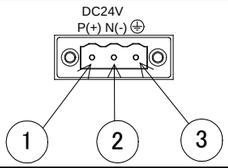
8.1. Installation DIN Panel



8.2. Installation



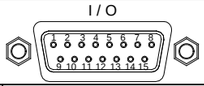
8.3. Power Supply Connector (Phoenix Model MSTB 2.5/3-GF-5.08)



Description (notation)		Function	AC Adaptor Line color
①	+24V power	Pin that supplies DC+24V power	White
②	Power supply GND	GND when DC+24V is supplied	Black
③	Frame GND	Frame ground.	Green

9. External I/O Signal

9.1. I/O Connector (D-sub 15pin connector pin)

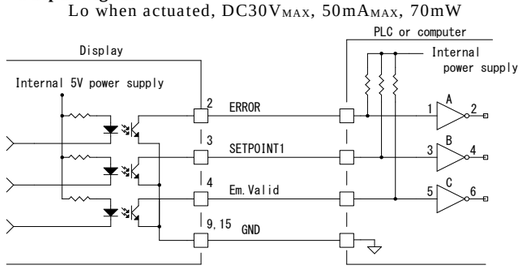


No	Description	Remarks
2	Output signal	Lo when actuated, DC30V_{MAX}, 50mA_{MAX}, 70mW
3	Setpoint 1 signal	Lo when actuated, DC30V_{MAX}, 50mA_{MAX}, 70mW
4	Output signal	Emission Valid, HV check, etc Lo when actuated, DC30V_{MAX}, 50mA_{MAX}, 70mW
5	Input signal	Filament ON, Adjust, etc Actuated when shorted to GND
6	Input signal	Select Filament 1/2, etc Actuated when shorted to GND
7	Setpoint 3 signal	Lo when actuated, DC30V_{MAX}, 50mA_{MAX}, 70mW
8	Pressure signal output+	DC0V to 10 V
9	Signal GND	GND of pressure signal, filament disconnect signal, setpoint, etc.
10	RS485 -	Serial communication RS485 – output
11	Setpoint 2 signal	Lo when actuated, DC30V_{MAX}, 50mA_{MAX}, 70mW
12	RS485 +	Serial communication RS485 + output
13	Input signal	Degas ON Actuated when shorted to GND
15	Signal GND	GND of pressure signal, burnout signal, setpoint, etc.
Case	FG	Frame ground

* Do not wire the No.1 and No.14, which is used for the internal circuit.

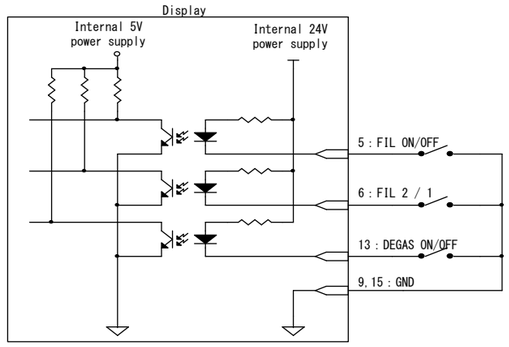
9.2. Output Signal

Lo when actuated, DC30V_{MAX}, 50mA_{MAX}, 70mW



9.3. Input Signal

Actuated when shorted to GND.



10. Specifications and Components

10.1. Specifications

Name	1-channel digital display unit ISG1		
Number of sensor units connected	1 pc.		
Sensor unit	G-Tran series	Pirani sensor unit SP1	4.0×10^{-1} to $3.0\times10^{+3}$ Pa
		Pirani box unit BPR2	
		Pirani sensor unit SW100-A	5.0×10^{-2} to $1.0\times10^{+5}$ Pa
		Pirani sensor unit SW1-1	5.0×10^{-2} to $1.2\times10^{+5}$ Pa
		Cold cathode ionization gauge SC1	1.0×10^{-5} to $1.0\times10^{+0}$ Pa
		Hot cathode ionization gauge BMR2	5.0×10^{-8} to $9.9\times10^{+0}$ Pa
		Multi-Ionization SH200-A, SH2-1	5.0×10^{-8} to $1.0\times10^{+1}$ Pa
		Multi-Ionization SH200-A, SH2-1 (SPU Combination mode)	5.0×10^{-8} to $1.0\times10^{+4}$ Pa
		Multi-Ionization SH200-A, SH2-1 (SAU Combination mode) (SWU Combination mode)	5.0×10^{-8} to $1.0\times10^{+5}$ Pa
		Multi-Ionization ST200-A, ST2-1	1.0×10^{-5} to $1.0\times10^{+0}$ Pa
		Multi-Ionization ST200-A, ST2-1 (SPU Combination mode)	1.0×10^{-5} to $1.0\times10^{+4}$ Pa
		Multi-Ionization ST200-A, ST2-1 (SAU Combination mode) (SWU Combination mode)	1.0×10^{-5} to $1.0\times10^{+5}$ Pa
	Ceramic capacitance manometer	CCMT-1000A/1000D	$0.0\times10^{+1}$ to $1.3\times10^{+5}$ Pa*1
		CCMH-1000A	
		CCMT-100A/100D	$0.0\times10^{+0}$ to $1.3\times10^{+4}$ Pa*1
		CCMH-100A	
		CCMT-10A/10D	0.0×10^{-1} to $1.3\times10^{+3}$ Pa*1
		CCMH-10A	
		CCMH-1A	0.0×10^{-2} to $1.3\times10^{+2}$ Pa*1
		CCMT-1D	
Analog input		Reading the analog signal (voltage) from the sensor	
	Update time	70ms	
	Internal processing	5 times moving average	
	Resolution	0.2mV	
Display		Digital display of mantissa part 2 digits, exponential part 1 digit □.□ × 10□	
	Unit	Pa	
	Pressure range	Pressure range of each sensor unit	
	Update time	200ms	
	Accuracy	±2%±1 digit against the pressure value from the measurement unit * CCM series: 1/10 or less of the full scale ±4 digits	
Analog output		DC0V to 10V pseudo-log. output, log, linear output Note: The output differs with each unit.	
	Update time	70ms	
	Resolution	1mV	
	Output error	±10mV	
	Impedance	100Ω	
	Accuracy	±10mV against the voltage converted value of pressure display	
Control input signal		Actuated by open collector input, negative logic	
		Filament, etc. ON/OFF signal, zero point adjustment signal, etc.	
Control output signal		Open collector output, negative logic [Rating: DC30V_{MAX}, 50mA_{MAX}, 70mW]	
		Signal of error, filament and other on signal and others	
		Setpoints 1, 2, 3	
LED display		ERROR	SET-1
		DGS	SET-2
		ZERO	SET-3
Communication		RS-485	
	Baud rate	9600/19200/38400 bps	
	Number of nodes	32 (including host)	
	Distance	1200m*2	
	Memory function	Set value by communication is backed up by EEPROM.	
CAL function		Arbitrary value [1.0×10^{-3} to $1.0\times10^{+3}$] is multiplied by the measurement value and displayed.	
Line voltage		DC24V±1V Ripple and noise below 1%	
Current consumption		2W (display unit alone) Maximum 30W (when BRM2 is used) Note: Power consumption by other interfaced units is to be added.	
Corresponding standard		CE standard, UKCA standard	
Over-voltage category		Category I: Connected to a circuit that holds down transient over-voltage at a sufficiently low level	
I/O connector			
	Sensor unit side	D-sub15pin connector female M2.6 screw	
	Control host side	D-sub 15pin connector male M2.6 screw	
	Power supply	Phoenix Model MSTB 2.5/3-GF-5.08	
Connected cable length		Length of cable from this unit to the sensor unit, calculated with 24AWG.	
		SP1	up to 50 m
		BPR2	up to 100 m
		SW100-A, SW1-1	up to 100 m
		SC1	up to 100 m
		BMR2	up to 10 m
		SH200-A/ST200-A SH2-1/ST2-1	up to 40 m
		SH200-A/ST200-A SH2-1/ST2-1 (SPU Combination)	up to 40 m
		SH200-A/ST200-A SH2-1/ST2-1 (SAU / SWU Combination)	up to 40 m
		CCMT series	up to 100 m
		CCMH series	up to 15 m
Operating temperature range		10 to 40°C	
Operating humidity range		15 to 80% (not condensing)	
Storage		-20 to 65°C (not condensing)	
Weight		250 g	
Outside dimensions		DIN 48 × 96 mm, basic unit 70 mm deep JIS rack size 50 × 100mm is also available as option.	

*1: Pressure display of CCM series: The minimum digit are 1.0, 2.0 … 9.0, the decimal point is not displayed.

*2: Please check a specification of remote host and an environmental noise if you use the cable of 30m or more.

10.2. Standard Accessories

Power connector	MSTB2.5/3-STF-5.08 (PHOENIX)	1pc.
DIN panel fixing tools	fitting	1set
Quick Manual	this paper	1copy

10.3. Options

AC adapter	OUTPUT:DC24V、INPUT:AC90～264V
JIS rack size type	
Display unit cable	2, 5, 10 m long (between the basic unit and sensor unit)
Sensor unit, sensor head	
D-sub15 pin connector socket	M2.6mm screw, for sensor connector
D-sub15 pin connector pin	M2.6mm screw, for I/O connector
JCSS alibration certificate	Only combination with sensor unit
Calibration certificate	Only combination with sensor unit
Inspection certificate	
Traceability certificate	

11. 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: Within 1 year from the date of delivery.

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 being used (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.

12. Certificate of Decontamination

All material must be certified as decontaminated and this certificate must be submitted to your closest local ULVAC service center or sales office prior to shipment. Please use the Certificate of decontamination format at the end of the ISG1 instruction manual.

13. Network

ULVAC, Inc: http://www.ulvac.co.jp/en/
Service Centers: http://www.ulvac.co.jp/en/support_info/service/
Sales Offices: http://www.ulvac.co.jp/en/support/sales_office/

14. Drawing

Please refer to an ULVAC website.

ULVAC, Inc.
Components Division,
http://www.ulvac.co.jp/en/