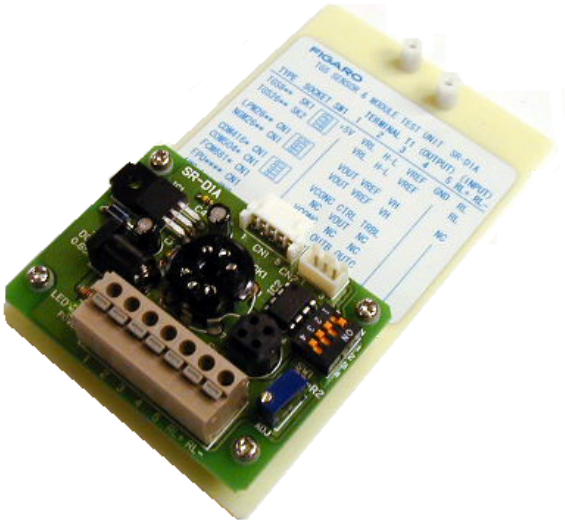
1. Function of SR-D1A Test Unit

The SR-D1A Test Unit is designed to perform the testing and evaluation of both TGS Gas Sensors and Figaro Gas Sensor Modules. By connecting this unit to a 100~240V (AC) power supply, a sensor output signal (V_{RL}) can be obtained which corresponds to a concentration of test gas in ambient air. From this output voltage, sensor resistance (Rs) can be calculated. In addition, by setting a reference voltage (Vref), an H-L level signal can be output. By using an H-L output signal, this unit can be used to control an external apparatus.



2. Dimensions

The dimensions of SR-D1A can be seen in Figure 1.

3. Specifications

Item	SR-D1A
Product Name	Test unit
Power	100~240V AC
Power consumption	Sensors : approx 1.6W Modules: approx. 1.6W
Power output	Internal: 5V ±5% 300mA
R_L	Variable
Reference Voltage (V_{REF})	1.0~4.5V DC
Operating temperature	-10˚~+50˚C
Dimensions	125 x 74 x 32mm
Weight	Main unit: approx 76g AC adaptor: approx 70m

Table 1 - Specifications of SR-D1A

NOTE: *Please specify plug type when ordering:*
A-type - North America, Japan
C-type - Europe

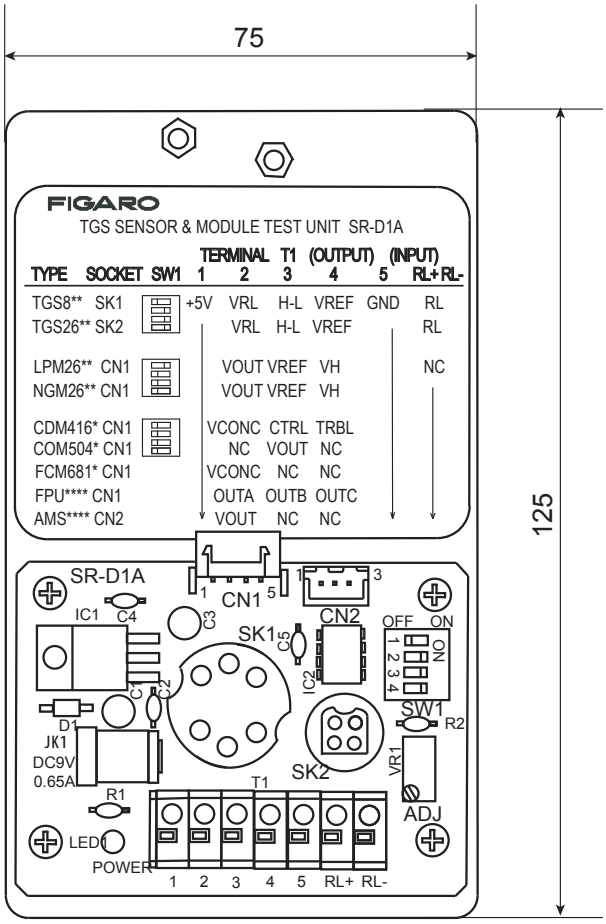


Fig. 1 - Dimensions of SR-D1A
(u/m = mm)

4. Dip Switch (SW1) Settings

According to the type of item to be tested, dip switches (SW1) should be set according to Table 2:

Test Sample	Socket	Dip Switch Settings	T1						
			1	2	3	4	5	RL+	RL-
TGS8xx	SK1	1 = OFF 2,3,4 = ON	+5V	VRL	H-L	VREF	GND	Connect RL	
TGS26xx	SK2								
LPM2610, NGM2611	CN1	1 = ON 2,3,4 = OFF		VOUT	VREF	VH (GND)		No RL connection	
Other modules*	CN1	1,2,3,4 = OFF		Refer to spec of each module					
AMSxxxx	CN2			VOUT	NC	NC			

Table 2 - Dip switch (SW1) settings for SR-D1A

5. Circuit Diagram

The circuit diagram of SR-D1A is sown in Figure 2.

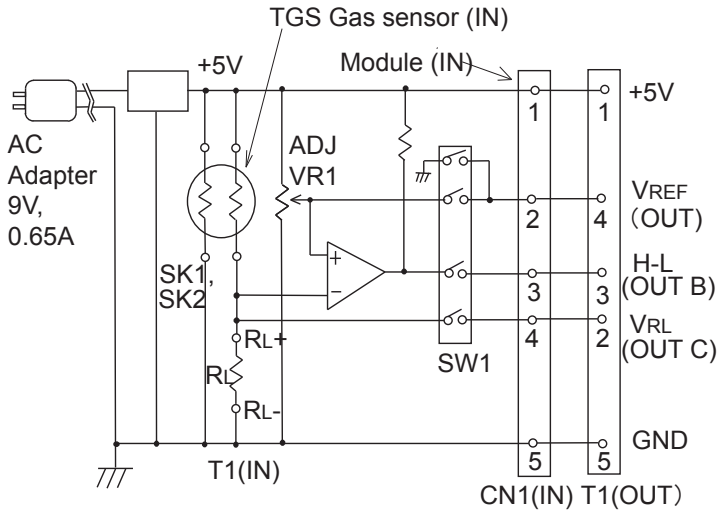


Fig. 2 - Circuit Diagram of SR-D1A

6. Operating Instructions

5-1) *Prepration*

Step 1 - Connect AC power plug to socket JK-1

Step 2 - Set dip switches according to Table 2

Step 3 - Insert test sample into the proper socket as indicated in Table 2 (*Note: multiple test samples cannot be measured at the same time*)

Step 4 - For TGS8xx and TGS26xx, connect a load resistor (RL) between terminals RL+ and RL- of T1. The nearest resistance value to sensor resistance in target gas concentration is recommended for selecting RL.

Step 5 - Connect AC plug to AC power

5-2) *VRL measurement*

After AC power is on, the green LED on the test unit will light and the test sample will be powered. Connect voltage measuring equipment (such as a digital multi-meter) between No. 2 (VRL) and No. 5 of Terminal 1.

Note: The pre-heating period before stabilization is different according to the test sample. For the required pre-heating period, please refer to each sensor's product information.

5-3 *Adjustment of reference voltage (VREF)*
Check that VREF falls within the range of 1.0~4.5V DC. If VREF<1.0V, choose a larger RL value. If VREF>4.5V, choose a smaller RL value.

Once VREF has been checked, connect voltage measuring equipment (such as a digital multi-meter) between No. 4 and No. 5 of Terminal 1. The adjust the VREF to the target thresghold by rotating an adjustable load resistor VR1 (VREF will increase as VR1 is rotated clockwise).

5-4 *H-L signal*
Connect a fixed 1MΩ resistor between No. 3 and No. 4 of Terminal 1 to avoid chattering. Then, connect voltage measuring equipment (such as a digital multi-meter) between No. 3 and No. 5 of Terminal 1. Once this is done, TTL signal of "H" or "L" will be output. If VRL<VREF, 'H" will be output. If VRL>VREF, then "L" will be output.

The H-L signal can be used as a control signal by connecting circuits such as those shown in Figs. 3a-3d to No. 1, No.3, and No. 5 of Terminal 1. In these cases, the control signal will initiate action by each of the circuit components to indicate an "H" signal (e.g. when using an LED, the LED will light up when an "H" signal is output...when using a buzzer, the buzzer will sound when "H" is output).

5-5 *Calculation of sensor resistance (Rs)*
The following formula can be usedto calculate Rs:

$$Rs = \frac{Vc - VRL}{VRL} \times RL$$

In the test unit, it is designed that Vc should be 5.0V±5 DC when AC100-240V is applied. For actual Vc measurement, connect measuring equipment to No.1 and No.5 of Terminal 1.

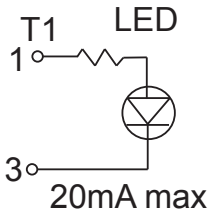


Fig. 3a - Circuit for using LED as a control signal indicator

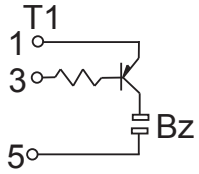


Fig. 3b - Circuit for using buzzer as a control signal indicator

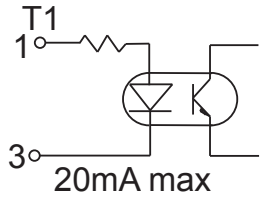


Fig. 3c - Circuit for using a photocouple as a control signal indicator

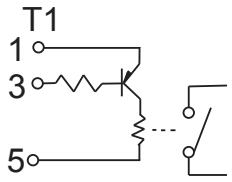


Fig. 3d - Circuit for using relay as a control signal indicator

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