

# SMART Gas Detector/Transmitter(4~20mA)

## DA - 750

built-inLCD-Suction Type



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## **[Introduction]**

DA-750 detects leakage of various toxic or combustible gases leaked from industrial areas for gas producers, gas users, gas reservoirs, gas by-producers, and so on, in order to prevent any accidents in advance. Built-in micro pump suctions gas continuously which is effective gas sampling especially for closed area. DA-750 converts digital signal into the 4-20<sup>mA</sup> standard current signal for output signal which can be transmitted to various external devices such as PLC, DDC, RECORDER, and so on to construct the gas monitoring system more extensive as well as more comprehensive. DA-750 provides RS-485 communication signal and gas leakage alarm signal by relay contact output. Besides, DA-750 has DC 4-20mA standard output which realizes max 2500m long distance output signal transmission from sensor to receiver and RS-485 communication signal which realizes max 1000m long distance signal transmission.

## **[Features]**

### **◆ Auto-Suction Type**

Built-in micro pump suctions gas continuously which is effective gas sampling especially for closed area.

### **◆ Digital Process**

Digital processor based on built in micro processor realizes various artificial intelligent functions which result in more convenient, more accurate, and more efficient gas detection environment.

### **◆ LCD Display with Back-Light**

LCD offers real-time display of gas density and back light offers easy reading even in dark area.

### **◆ Isolation Circuit**

Built-in isolation circuit prevents electrical noise to secure stable sensor operation.

### **◆ 4-20mA Transmitter**

4-20mA output enables stable and long distance (maximum 2.5km) signal transmission.

### **◆ RS-485**

RS-485 enables stable and long distance (maximum 1.2km) signal communication.

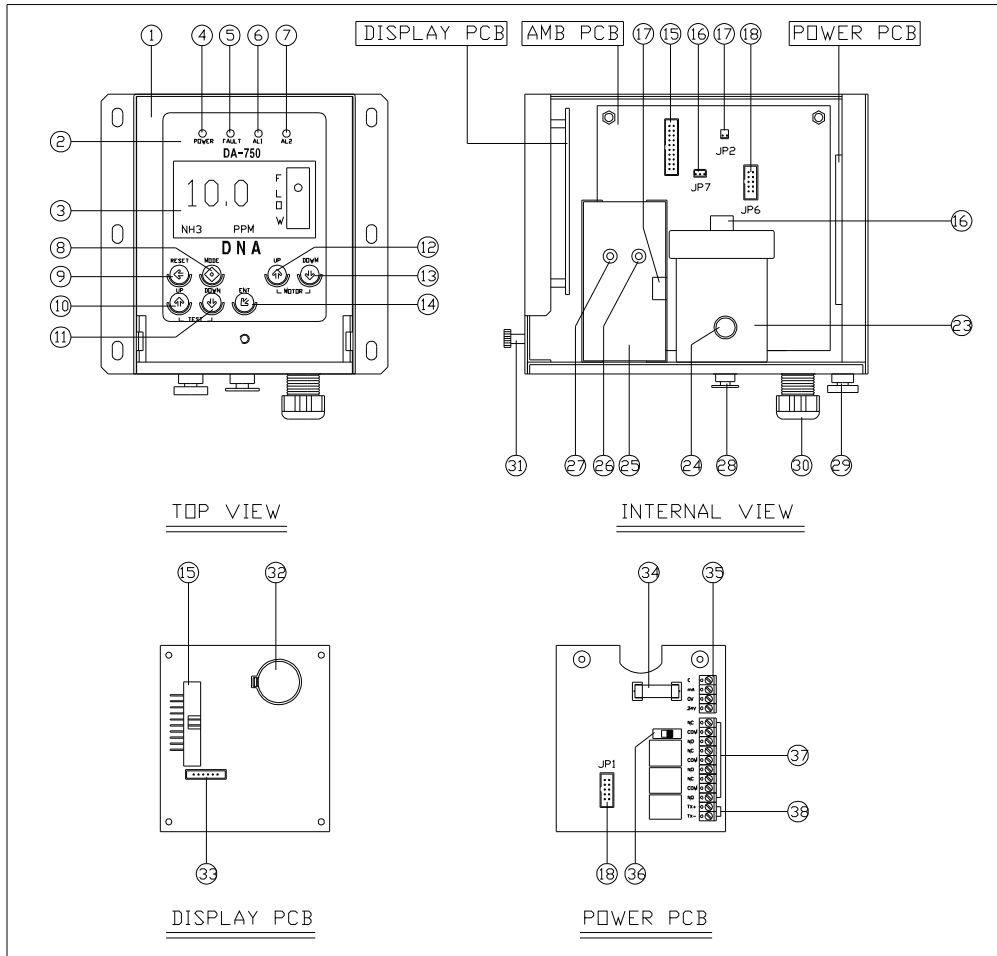
### **◆ Alarm output**

SPST 2 step relay contacts (AL1/AL2).

**[Specifications]**

<b>Detection principle</b>	Catalytic, electro-chemical, NDIR, or PID
<b>Gas sampling</b>	Suction Type
<b>Input power</b>	DC 20~30V
<b>Sample gas volume</b>	1.0 Liter/min ~ 2.5 Liter/min
<b>Accuracy</b>	≤ ±2% / full scale
<b>Output signal</b>	DC 4-20mA / full scale
<b>Memory</b>	4,000 records
<b>Density indication</b>	LCD Display - PPM, %LEL, %, or PPb
<b>Alarm</b>	AL1 Alarm – AL1 LED (RED)
	AL2 Alarm – AL2 LED (RED)
<b>Setting of alarm value</b>	AL1/AL2 2 stages Alarm-User can optionally set.
<b>Alarm delay time</b>	0~99 seconds with user adjustable
<b>Alarm clearing</b>	Manually or automatically
<b>Alarm output</b>	2 step alarm relay contact (AL1/AL2)
<b>Operating temperature</b>	-10 °C ~ 50 °C
<b>Operating humidity</b>	5 ~ 95%RH (Non-Condensing)
<b>How to install</b>	Wall Mounting Type
<b>Signal cable</b>	CVVS & CVVSB 1.25sp*3 Wire-Shield Type
<b>Gas inhaling</b>	6Ø Tube
<b>Output option</b>	RS-485

## [Parts & Description]



NO	Description	NO	Description
1	Cover Case	13	Motor DOWN S/W
2	Body Case	14	ENT Switch
3	LCD Display	15	JP3
4	Power LED	16	JP7
5	Fault LED	17	JP2
6	AL1 LED	18	JP6
7	AL2 LED	19	
8	MODE Switch	20	
9	RESET Switch	21	
10	UP Switch	22	
11	DOWN Switch	23	Sensor Cap
12	Motor UP S/W	24	Sensor Out

NO	Description	NO	Description
25	Pump	37	Alarm TB
26	Pump In	38	RS485 TB
27	Pump Out		
28	Sample Gas Inlet		
29	Sample Gas Vent		
30	Cable Grand		
31	Cover Fixed Screw		
32	Battery Socket		
33	JP1		
34	Fuse		
35	Power/mA TB		
36	Power Switch		

### 1. Cover Case

2. Body Case
3. LCD Display (128\*64 dot graphic LCD)
4. Power LED (Green)
  - ◆ In case of normal power supply, LED on.
5. Fault LED (Yellow)
  - ◆ In case of fault circuit, parameter setting error, clogging of gas flow, the Fault LED on and contact output signal transmits.
6. AL1 LED (RED)
  - ◆ If the density of measured gas is higher than ALARM1, the LED blinks in 0.5 seconds interval, and relay contact output signal transmits.
7. AL2 LED(RED)
  - ◆ If the density of measured gas is higher than ALARM2, the LED blinks in 0.25 seconds interval, and relay contact output signal transmits.
8. MODE Switch
  - ◆ Enter into setting mode from measuring mode. Please push MODE switch longer than 3 seconds to enter setting mode.
9. RESET Switch
  - ◆ Clear relay contact output signal (In manual reset).
  - ◆ In setting mode, please push RESET switch to enter into measuring mode.
10. UP Switch
  - ◆ Increase the parameter value in setting mode.
11. DOWN Switch
  - ◆ Decrease the parameter value in setting mode.
- <11.1> UP+DOWN (TEST function)**
  - ◆ Please hold down UP & DOWN switch more than 3 seconds to check the status of measured value, alarm relay, alarm LED, & 4~20mA output.
12. Motor UP Switch
  - ◆ Increase sample gas volume.
13. Motor DOWN Switch
  - ◆ Decrease sample gas volume.
14. ENT Switch
  - ◆ Storing the parameter value in setting mode.
15. JP3 Connector
  - ◆ 40PIN connector connecting display PCB and AMP PCB.
16. JP7 Connector
  - ◆ 3PIN connector connecting the output signal cable at gas sensor.
17. JP2 Connector
  - ◆ 2 PIN connector connecting the output electric signal cable at pump motor.

## 18,JP6 Connector

◆ This is a 20PIN Connector connecting POWER PCB with Analog PCB.

## 19. Flow Meter Out.

◆ Outlet of sample gas.

## 20. Flow Meter

◆ Display sample gas volume. The flow velocity can be measured by the position of the ball.

## 21. Flow Meter In

◆ Inlet of sample gas.

## 22. PHOTO TR

◆ Inspect whether sample gas flows or not.

## 23. Sensor Cap

◆ Detect gas leakage.

## 24. Sensor Out

◆ Outlet of sample gas from sensor cap.

## 25. Pump

## 26. Pump In

◆ Inlet of sample gas to pump.

## 27. Pump Out

◆ Outlet of sample gas from pump.

## 28. Sample Gas Out

◆ Sample gas vent port (1/4")

## 29. Sample Gas Inlet

◆ Sample gas inlet port (1/4")

## 30. Cable Grand

◆ Power supply and signal cable

## 31.Cover Fixed Screw

◆ Fix the cover case and body.

## 32. Battery Socket

◆ Power supply for storage of alarm data.

## 33. JP1 Connector

◆ Connector to download CPU firmware.

## 34. FUSE

◆ Protect board against over-current.

## 35. Power/4-20mA Terminal (24V, 0V, mA,E)

◆ Power supply and connecting terminal for 4-20mA output signal.

## 36. Power Switch

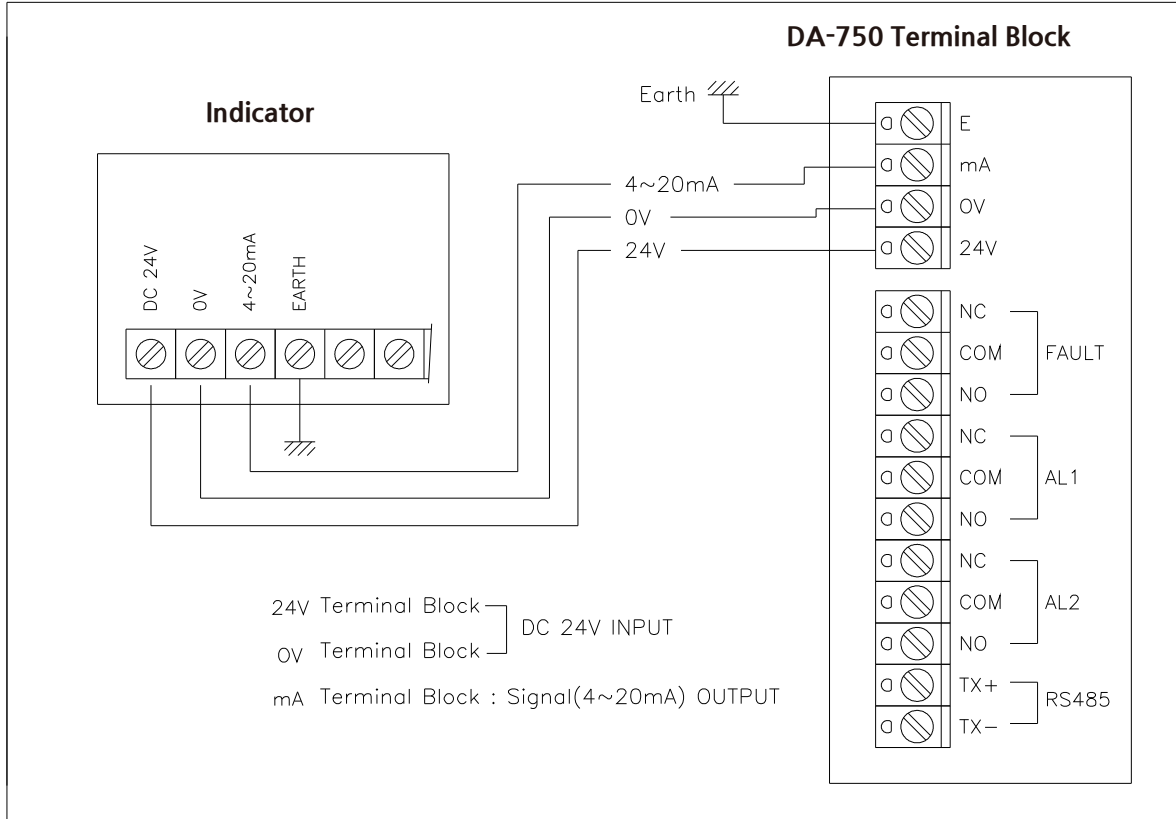
◆ Power on/off switch.

## 37.Alarm Terminal

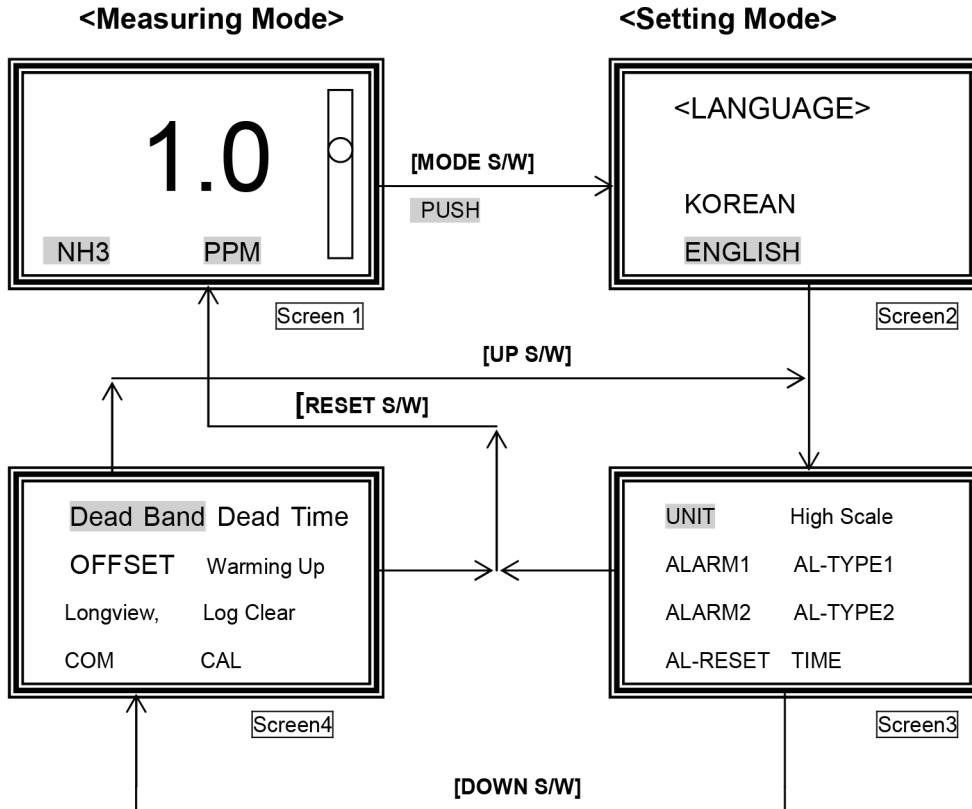
◆ Terminal for fault, alarm1, alarm2, relay contact output signal

38. RS485 Terminal

**[Wiring]**







- ◆ Please press **MODE** key longer than 3 seconds in measuring mode to enter into setting mode. (Screen1)
- ◆ Please press **ENT** key to select language (KOREAN/ENGLISH). (Screen2)
- ◆ Please press **DOWN** key to scroll down menus in below order. (Screen3)
  - UNIT → High Scale → ALARM1 → AL-TYPE1 → ALARM2 → AL-TYPE2 → AL-RESET → TIME →
  - Dead Band → Dead Time → OFFSET → Warming Up → Log View → Log Clear → COM → CAL →
- ◆ Please press **UP** key to scroll up menus in below order. (Screen3)
  - ←UNIT ← High Scale ← ALARM1 ← AL-TYPE1 ← ALARM2 ← AL-TYPE2 ← AL-RESET ← TIME
  - ← Dead Band ← Dead Time ← OFFSET ← Warming Up ← Log View ← Log Clear ← COM ← CAL ←
- ◆ Please press **ENT** key to select menu and change the parameter.
- ◆ Please press **RESET** key to return to measuring mode.

## [User Programming]

NO	MENU	DESCRIPTION
1	<b>LANGUAGE</b>	Select language (KOREAN/ENGLISH)
2	<b>UNIT</b>	Select density unit (% , %LEL, PPM)
3	<b>High Scale</b>	Set value for 20mA output signal
4	<b>ALARM1</b>	Set ALARM1 value
5	<b>AL-TYPE1</b>	Select type of ALARM1 (H&H or L&L)
6	<b>ALARM2</b>	Set ALARM2 value
7	<b>AL-TYPE2</b>	Select type of ALARM2 (H&H or L&L)
8	<b>AL-RESET</b>	Select type of alarm release between auto and manual
9	<b>TIME</b>	Set current time (year, month, day, hour, minute, second)
10	<b>Dead Band</b>	Set alarm delay band
11	<b>Dead TIME</b>	Set alarm delay time
12	<b>OFFSET</b>	Set offset value to compensate the measured value
13	<b>Warming Up</b>	Set initial time for stabilization from power on (0~99 seconds)
14	<b>Log View</b>	Display alarm value records
15	<b>Log Clear</b>	Delete alarm value records
16	<b>COM</b>	Set RS-485 parameters
17	<b>CAL</b>	Calibrate sensor

(1) UNIT

- ◆ Select density unit out of %, %LEL, and PPM

(2) High Scale

- ◆ Set values for 4~20mA output signal.

(ex) If full scale: 0 ~ 100, 4mA output signal displays '0' and 20mA output signal displays '100'.

(3) ALARM1

◆ Set value of ALARM1.

- (ex1) If AL-TYPE1: **H&H** and ALARM1: 20,  
→ when displayed value is more than 20, ALARM 1 operates.
- (ex2) If AL-TYPE1: **L&L**, and ALARM1: 20  
→ when displayed value is less than 20, ALARM1 operates.

(4) AL-TYPE1

- ◆ For combustible or toxic gas:  
H&H (when displayed value is more than the set value, ALARM1 operates)
- ◆ For oxygen gas:  
L&L (when displayed value is less than the set value, ALARM1 operates)

(5) ALARM2

- ◆ Set value of ALARM 2.
- (ex1) If AL-TYPE2: **H&H**, ALARM2: 20  
→ when displayed value is more than 20, ALARM2 operates.
- (ex2) If AL-TYPE2: **L&L**, ALARM2: 20  
→ when displayed value is less than 20, ALARM2 operates.

(6) AL-TYPE2

- ◆ For combustible or toxic gas:  
H&H (when displayed value is more than the setting value, ALARM2 operates)
- ◆ For oxygen gas:  
L&L (when displayed value is less than the setting value, ALARM2 operates)

(7) AL-RESET

- ◆ Set type of alarm release between auto & manual.
- **AUTO**: Alarm releases automatically according to set value.
  - **HAND**: Please press reset switch to release alarm.

(8) Time Adjustment

- ◆ Set current year, month, day, hour, minute, & second.

(9) Dead Band

- ◆ Set alarm delay band
- (ex1) If ALARM1: 20 and AL-TYPE1: H&H and D-BAND: 3,  
→ when displayed value is more than 20, ALARM1 on.  
→ when less than 17, ALARM1 off.

(ex2) If ALARM1: 20, AL-TYPE: L&L, D-BAND: 3

- when displayed value is less than 20, ALARM1 on.
- when more than 23, ALARM1 off.

#### (10) Dead Time

- ◆ Set alarm delay time

(ex) If alarm value: 50 and Dead Time: 5

- only when the measured value keeps more than 50 and longer than 5 seconds, alarm operates.

#### (11) OFFSET

- ◆ Set offset value to compensate the measured value

(ex) If OFFSET: +5,

- when measured value is -5, it displays '0'.

#### (12) Warming Up

- ◆ Set initial time for stabilization from power on (0~99 seconds)

#### (13) Log View

- ◆ Display alarm value records.

#### (14) Log Clear

- ◆ Delete alarm value records.

#### (15) COM

- ◆ Set RS-485 baud rate.
- ◆ Set RS-485 address.

#### (16) CAL

##### (1.1) Zero calibration

Press **ENT KEY** at CAL [ZERO]. → It displays "ZERO GAS READ.<0.0 %>". → Please inject clean air or 100% nitrogen gas during 1 minute. → When the measured value gets stable, please press **ENT KEY** → It displays "SUCCESS". If calibration does not succeed, it displays "FAIL" during 2 seconds.

**<Caution> Please press RESET KEY to cancel the calibration job.**

##### (1.2) Span calibration

Please press **ENT KEY** at CAL [SPAN] → It displays "SPAN RANGE <0.0 %>". → Please

press **UP & DOWN KEY** to set the standard gas value. → Please press **ENT KEY** again to confirm it. → It displays “SPAN GAS READ. [0.0%]”. → Please inject standard gas during 1 minute. → When the measured value gets stable, please press **ENT KEY**. → It displays “SUCCESS”. If the calibration does not succeed, it displays “FAIL” during 2 seconds.

**<Caution> Please press RESET KEY to cancel the calibration job**

**[Dimension]**

