OMRON

D6FZ-FGX21

Air Flow Station

INSTRUCTION SHEET

Thank you for selecting OMRON product. This sheet primarily describes precautions required in installing and operating the product. Before operating the product, read the sheet thoroughly to acquire sufficient knowledge of the product. For your convenience, keep the sheet at your disposal.

TRACEABILITY INFORMATION:

Importer in EU:
Omron Europe B.V.
Wegalaan 67-69
2132 JD Hoofddorp,
The Netherlands

Manufacturer:
Omron Corporation,
Shiokoji Horikawa, Shimogyo-ku,
Kyoto 600-8530 JAPAN

The following notice applies only to products that carry the CE mark:
Notice:
This is a class A product. In residential areas it may cause radio interference, in which case the user may be required to take adequate measures to reduce interference.

■ Perchlorate regulations by the State of California, USA

This product uses a lithium battery that contains perchlorate that is regulated by California State Law. Appropriate measures must be taken to comply with regulations.
For details, refer to the URL as below:
www.dtsc.ca.gov/hazardouswaste/perchlorate

PRECAUTIONS ON SAFETY

■ Meanings of Signal Words

⚠ WARNING	Indicates a potentially hazardous situation which, if not avoided, will result in minor or moderate injury, or may result in serious injury or death. Additionally there may be significant property damage.
⚠ CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or in property damage.

■ Meaning of Precaution Symbols

	Mandatory Requirement Indicates a general mandatory requirement.
	Prohibition Indicates general prohibition.
	Explosion Warning Warns against an explosion under specific conditions.
	Disassembly Prohibition Indicates the possibility of accidents such as an electric shock caused by unit disassembly.

■ Warning Indications

⚠ WARNING	
The mounting magnets provided with the product have strong magnetism. If the product is mounted using these magnets, anyone wearing a heart pacemaker must not operate the product; or the product must not be in proximity of such a person.	
This product contains lithium batteries. Serious injury may occur due to fire or explosion. Do not attempt to disassemble the product, deform it by applying pressure, heat it in a high temperature (100°C°C or more), or burn it for disposal.	

⚠ CAUTION	
Tighten the terminal screws at a recommended torque: 0.69 to 0.88N·m. Make sure that the screws are not slanted away from the center after tightened.	
A minor or moderate injury or property damage may occur due to explosion. Do not use the product in an environment containing an inflammable or explosive gas.	
An electric shock may occur. Do not replace the batteries when the unit is clamped to a conductor for measurement.	

PRECAUTIONS FOR SAFE USE

Observe the following precautions to ensure safe operation.
· Do not install the product in the places subject to exposure to water, oil, or chemical splashes.
· Do not use the product for the safety circuits in nuclear power or life-critical applications.
· When disposing of the product, treat as industrial waste.
· Do not let the product drop or subject it to a shock, which may cause its damage or malfunction. Use screws to secure the product when mounting it on the wall. Stop using the product if it has been applied with a strong impact.
· When inserting or removing an SD memory card, securely hold the product to prevent it from dropping, which may cause a damage. Do the same when inserting or detaching an alarm output cable or connector.
· Do not bring the product close to magnetic products (e.g. magnetic cards), sensitive electronics equipment (e.g. computers or clocks), when the product is attached with the mounting magnets.
· Small pieces may be chipped off the mounting magnets when they are attracted to the surface. Make sure the pieces do not enter the eyes. Consult a medical doctor if this happens.
· When using the mounting magnets to install the product, take caution not to allow a finger to be caught between the product(s) and the magnetic surface.
· Do not install the product at a high place when using the mounting magnets.
· Apply an appropriate load to the alarm output terminals to prevent possible smoking.
· If liquid crystal leaks due to a damage to the LCD panel, take caution not to allow it to contact your skin, to be inhaled or swallowed. If it has contacted your skin or entered your mouth, seek medical attention.
· Take anti-static electricity measures (e.g. touching grounded metal object) when handling the product.
• Applicable standards
  • EN61326-1
  • Electromagnetic environment : Industrial electromagnetic environment
    (EN/IEC 61326-1 Table 2)

PRECAUTIONS FOR CORRECT USE

1. Avoid installing the product in the following places:
· Places exceeding the rated ambient temperature
· Places exposed to extreme temperature changes (where condensation occurs)
· Places subject to relative humidity exceeding the rated humidity range
· Places subject to corrosive or flammable gases
· Places subject to mist, droplets, coarse particles, fiber, salt, metal dust, or large amount of particles
· Places subject to direct shock or vibration
· Places subject to direct sunlight
· Places subject to exposure to water, oil, or chemical splashes
· Places subject to strong magnetic field or electric field
· Outdoors
2. Wiring
· Wire the product cable separately from high-voltage or power lines. Placing them in the same wiring or the same duct may cause induction, resulting in the product malfunction or damage.
· Make sure that the I/O terminals are inserted or removed with the power turned OFF. Doing this with the power ON may result in a failure.
3. Mounting screw hole
· The screw holes provided on the product are M3 and 4 mm deep. Do not screw deeper than 4 mm, which may damage the product.

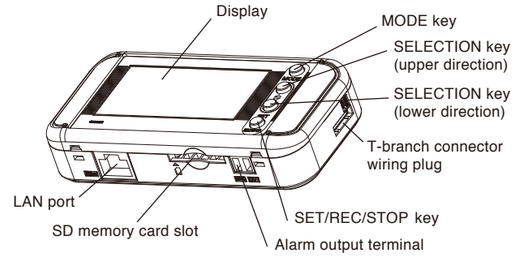
■ Overview and Features

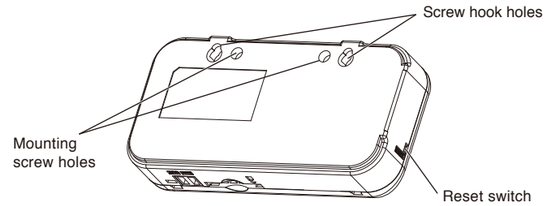
By connecting the Air Flow Sensor D6FZ series (sold separately), the D6FZ-FGX21 allows you to record the measured data of the Air Flow Sensor and set various operations.

● Display and judgment output
The display of the measured data can be switched with the△ and ▽keys. Also, you can select the measurement target of the monitoring target and set the threshold value to output an alarm from the output terminal.

● Data output and viewing
Measurement values can be recorded to the unit's memory and the recorded measurement values can be stored into the SD memory card.
SD memory card (*): Data is in CSV format.
By using the PC software, the measured values recorded with multiple sensors can be converted into graphs and unified into one file.
* The operation has been checked with the HMC-SD291 2GB SD memory card (Separately sold).

■ Names and Functions





Name	Function
MODE key	Switches operating modes
	Releases error and alarm (holding)
	Cancels during settings
SELECTION key (△ key)	Moves setting items (upper direction)
	Switches displayed contents (reverse direction)
	Changes the setting value (increasing)
	Sends Air Flow Sensor IDs in order (holding)
SELECTION key (▽ key)	Moves the setting items (lower direction)
	Switches the displayed contents (forward direction)
	Changes the setting value (decreasing)
SET/REC/STOP key	Confirms the setting value
	Starts/stops record (holding)
	Saves recorded data to the SD memory card.
Mounting screw holes	Used to secure screws (M3x4 mm)
Screw hook holes	For screw head hook
Reset switch	Restarts the unit.*

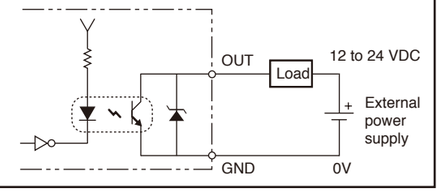
* Used when an SD memory card is not available when recording stops, or when error recovery cannot be made.
This switch does not initialize user's settings.

■ Alarm Output Specifications

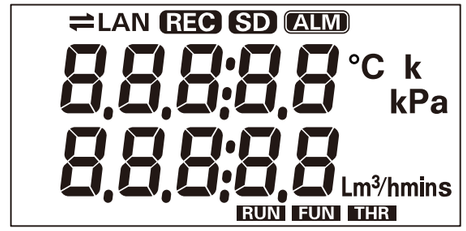
● Terminals

Terminal names are inscribed on the unit.
(1) OUT
Judgment result allocated in THR mode is output.
(2) GND
Common terminal.

● Output Specifications
Do not directly connect the external power supply between OUT and GND.
Be sure to connect the load.
For wire used for a terminal block,consider the following.
Wire length：30m and less

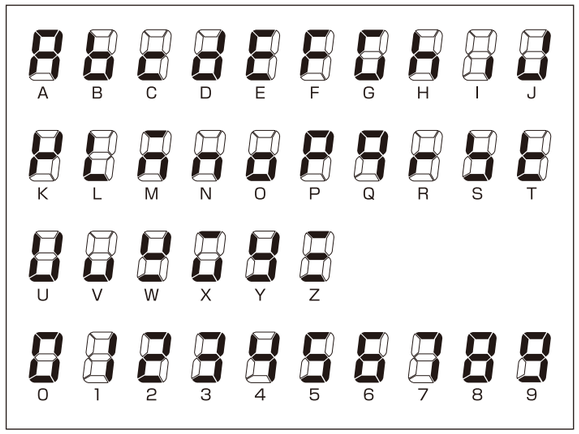
External power supply voltage	12 to 24 VDC ±10%
Load current	45 mA max.
ON residual voltage	1.2 V max.
OFF leakage current	0.1 mA max.
Internal circuit diagram	

■ Display Unit



Display	Meaning and operation when turned on
⇌	Communication with network.
LAN	LAN cable is connected and network communication is possible.
REC	Recording data into the internal memory. Recording start wait using timer when blinking.
SD	SD memory card has been inserted. SD memory card is being accessed while light blinking.
ALM	A total integrated power consumption has exceeded the specified upper threshold value.
RUN	The unit is currently operating in RUN mode.
FUN	The unit is currently operating in FUN mode.
THR	The unit is currently operating in THR mode.

■ 7-segment Display List



■ Ratings

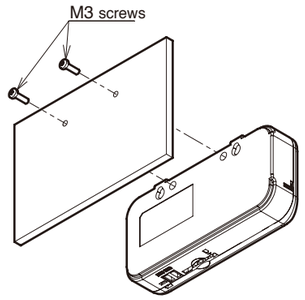
Item \ Model	D6FZ-FGX21
Connectable sensor	D6FZ series
Maximum number of mounted Sensors	8 units *1
Display	7-seg. 5-digit 2-step LCD display, auxiliary information indicator displays
Recording interval	1 s, 2 s, 5 s, 10 s, 20 s, 30 s, 1 min.
Displayed data	Momentary standard flow rate, integrated standard flow rate, pressure, temperature, charge/CO_2 conversion value
Recorded data	Momentary standard flow rate, integrated standard flow rate, volume flow rate, pressure, temperature
Operation function	Conversion of integrated flow rate to charge/CO_2
Recording mode	Continue mode*2, Ring mode *3
External output	Alarm output (Photocoupler output) *4
Communication interface	Ethernet (10BASE-T, 100BASE-TX)
Memory capacity (Internal)	Internal memory: Approx. 4200 data items when 1 unit is connected, Approx. 650 data items when 8 units are connected
Memory capacity (External)	SD memory card with SDHC compatibility (Save measured values, save and read setting values)
Power supply	DC input: 24VDC ±10% ripple (p-p) 10% max.
Current consumption	80 mA max.
Operating temperature	Without Ethernet: -10 to +40°C (no condensation or icing) With Ethernet: 0 to +40°C (no condensation or icing)
Operating humidity	35 to 85%RH (no condensation or icing)
Storage humidity/temperature	-15 to +60°C, 20 to 85%RH (no condensation or icing)
Insulation resistance	20 MΩ (DC500V)
Withstand voltage	1000VAC, 50/60 Hz, 1 min.
Vibration resistance	10 to 150 Hz, double amplitude : 0.7mm, acceleration: 50 m/s^2 in X, Y and Z directions (80 min)
Shock resistance	150 m/s^2 in 6 directions (±X, ±Y, and ±Z directions), 3 times each *5
Material	ABS
Degree of protection	IP30
Mounting	Magnet mounting, screw mounting, hook, free standing
Dimensions	117.2 mm (W) x 24.6 mm (D) x 56.8 mm (H) (Except protruding part)
Weight (in package)	Approx. 150 g (Approx. 500 g)
Accessories	Instruction Sheet (This sheet), Startup Guide, T-branch connector cable *7, Alarm Output Connector*8

*1: Up to 8 units can be connected when the recording cycle is 2 seconds or longer; up to 4 units when the recording cycle is 1 second.
*2: Automatically writes the data to the SD memory card when the internal memory reaches its capacity and continues recording until the capacity of SD memory card reaches its limit.
The unit stops operation if there is no SD memory card inserted when the internal memory reaches its capacity, or when it is write protected. (Recording can be resumed after inserting an SD memory card and outputting the data to it at a press of button.)
The factory default is continue mode. Use a attached software to change the recording mode.
*3: Continues the recording of the latest measured values until the internal memory reaches its capacity. (If the internal memory capacity exceeds the capacity, data is overwritten from the oldest one in the memory.)
*4: Output when the range of upper/lower limit of the air flow that has been set in threshold setting mode is exceeded.
*5: When using a mounting magnet, be sure to install it in a location where shock is not applied.
*6: The PC software operating environment/OS: Windows XP (32-bit version) / Windows Vista (32-bit version) / Windows 7; CPU: Intel-compatible processor 1.5 GHz or higher; Memory: 1 GB or more (Recommended: 2 GB or more)
*7: A connection cable to connect to D6FZ-FC02.
*8: OMRON's XW4B-02B1-H1 connector.

■ Mounting

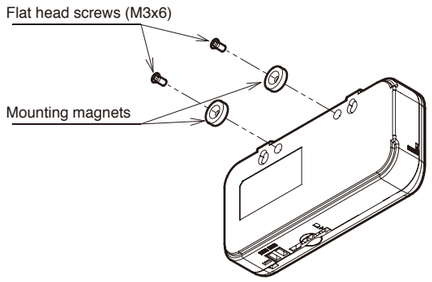
This product is precision equipment. Be careful not to drop the product when mounting it.
Do not drop the product or apply strong impact to the product.
If strong impact is applied to the product, stop using the product.

1. When using mounting holes

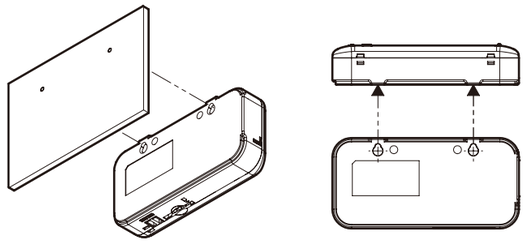


The unit screw hole depth is 4 mm. Be careful not to tighten the screw for more than 4 mm.

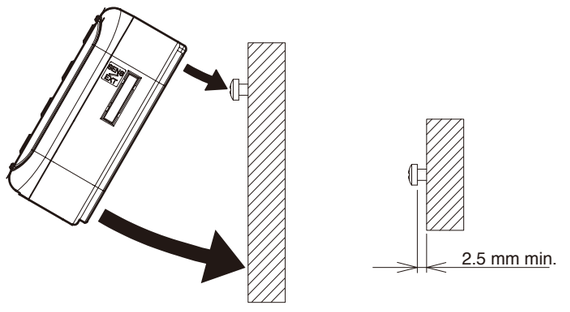
The product can be mounted with magnet by mounting magnets (ZN9-EM01-S, sold separately) to the screw hole. (tightening torque: 0.4 N/cm to 0.6 N/cm)
Do not stress to the sensor head cables, when mounting the magnet.



2. When using screw hook holes



There are two hook holes below the convex section of the upper unit. Use M3 screws to hook the screw head on the screw hook holes. Set an interval of 2.5 mm or more between the bottom of the screw head and the wall surface.



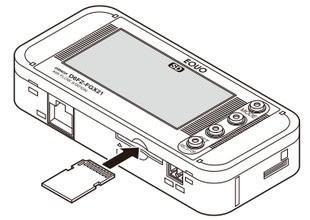
Enlarged view of the hook screw

3. Floor installation

Use the product on a desk, etc.
Be careful of the installation location not to drop the product.

4. Inserting the SD memory card

Insert an SD memory card into the SD memory card connector at the bottom of the unit. Insert it with the terminal side of the SD memory card to the front side of the unit.



5. Mounting the alarm output terminal

Connect OUT and GND to the load according to the output specifications. Insert the signal line to the alarm output connector and tighten it with flathead screwdriver.

6. Connecting the Air Flow Station to Air Flow Sensor D6FZ series and power supply

Connect the Air Flow Station to the Air Flow Sensor and power supply.

For details on connection, refer to the following documents:

“Air Flow Station Startup Guide”

“Air Flow Sensor/Station User’s Manual” (PDF)

“Air Flow Sensor Instruction Sheet”

7. Turning ON the power supply

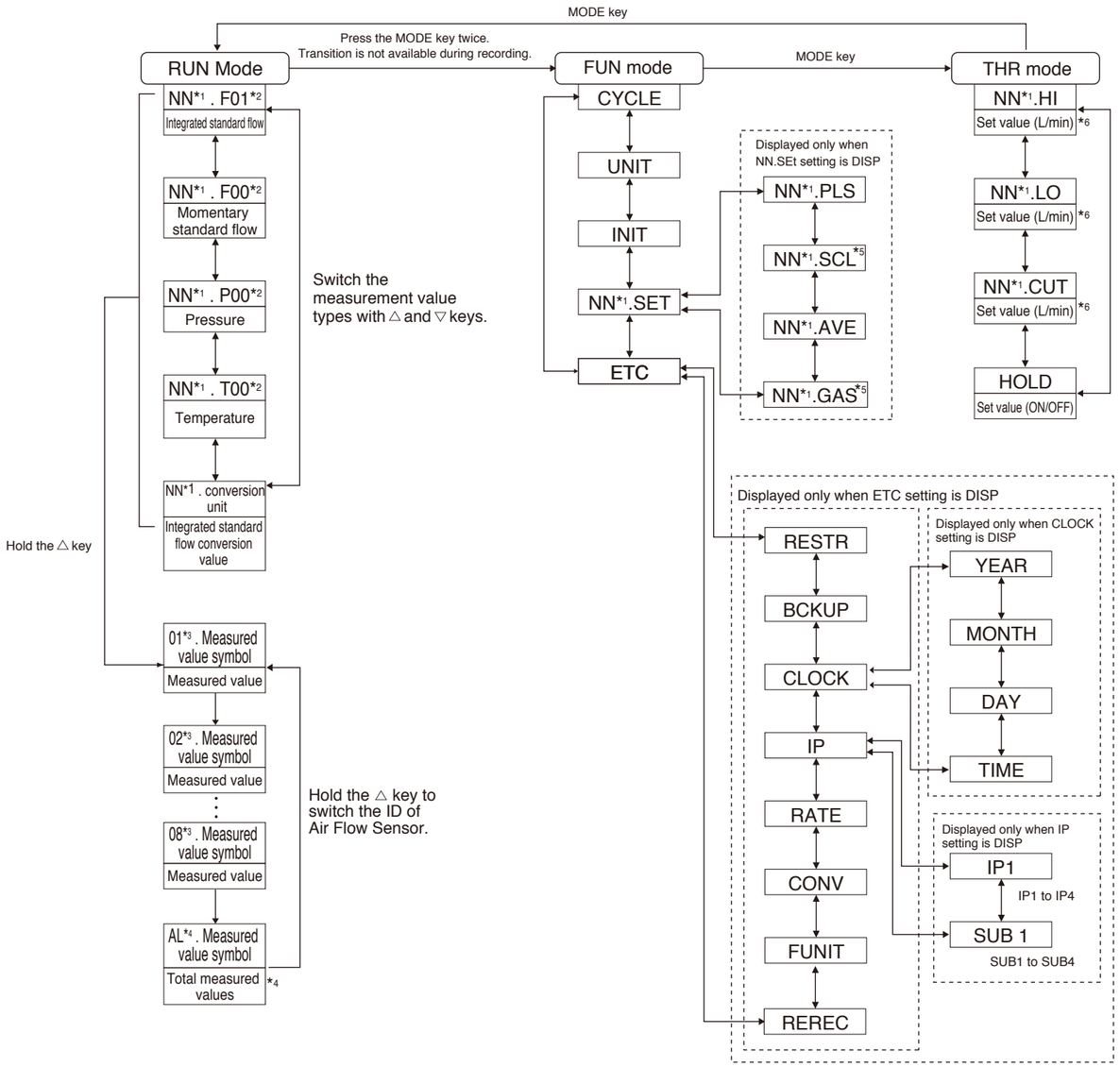
Turn ON the power supply that has been connected.

8. Setting the number of connected Air Flow Sensor units

Set the number of Air Flow Sensor units.

Select UNIT in FUN mode and enter the number of units of Air Flow Sensor that has been connected. To reflect the set value, shift the operation mode from FUN mode -> THR mode -> RUN mode, then the sensor restarts autmatically and confirms the number of Air Flow Sensor that has been connected.

■ Transition of Major Menu Displays



*1 NN : Unit No. of the Air Flow Sensor which is designated by in RUN mode.
*2. Displays a measurement value type by codes.
F01: Integrated standard flow rate
F00: Momentary standard flow rate
P00: Pressure
T00: Temperature
*3 Displays an Unit No. of the connected Air Flow Sensor.
*4 Displays the sum of integrated standard flow rate for all of Air Flow sensors connected.
*5 These values are for only D6FZ-FGS1000, it is settable. Otherwise "----" is displayed.
*6 The unit is shown according to FUNIT setting.

■ List of Major Setting Items

● Operation mode

Mode	Item	Description
RUN	Measurement execution mode	Performs measurement / recording.
FUN	Function setting mode	Sets various parameters.
THR	Threshold setting mode	Sets the threshold of the status indicator of Air Flow Sensor and the upper / lower limit thresholds of Air Flow Sensor for alarm outputs.

● FUN mode

Item	Overview	Description	Setting range	Default
CYCLE	Data collection cycle	Sets an recording interval of the measured value.	1s/2s/5s/10s 20s/30s/1min	10s
UNIT	Number of connected Air Flow Sensors	Sets the number of connected Air Flow Sensors.	1 to 8	1
INIT	Setting initialization	Initializes the unit setting*1 to the factory default value. Holding the SET/REC/STOP key starts initialization. After DONE is displayed, press the MODE key twice to exit THR mode. The unit is restarted and the setting values are initialized.	-	-
NN.SET	Air Flow Sensor display setting	Sets whether displaying the Air Flow Sensor setting items.	OFF/DISP	OFF
NN.PLS	Pulse setting	Sets the integrated flow rate to perform 1-pulse output from Air Flow Sensor.	1.0/10.0/100.0*2 1000.0 (L/Pulse)	10.0
NN.SCL	Flow full-scale value setting	Specifies the flow rate full-scale value for Analog Output 1 from the Air Flow Sensor unit.	0 to 1000 *3	1000
NN.AVE	Averaging count setting	Sets the averaging count when calculating measured values.	1/2/4/8/16/32 (times)	16 *4
NN.GAS	Measurement target gas setting	Sets the measurement target gas of Air Flow Sensor.	Air / N_2 *3	Air
ETC	Display setting for other items	Sets whether displaying other setting items.	-	-
RESTR	Read setting data	Recovers the setting from the SD card in which the setting data of the sensor unit is stored. Insert the SD card and hold the SET/REC/STOP key. After DONE is displayed, press the MODE key twice to exit THR mode. The unit is reset and restarted.	-	-
BCKUP	Write setting data	Writes the setting data of the sensor unit to the SD card as a backup. Insert the SD card and hold the SET/REC/STOP key. Writing completes when DONE is displayed.	-	-
CLOCK	Time setting	Sets whether displaying the time setting item.	OFF/DISP	OFF
IP	IP address display setting	Sets whether performing IP address setting.	OFF/DISP	OFF
RATE	Rate conversion setting	Specifies the rate or CO_2 emission level per 1 m^3 of integrated flow rate.	0.000 to 99.999 (times)	0
CONV	Conversion unit setting	Sets the conversion unit.	JPY/USD/EUR CNY/KRW/CO_2	JPY
FUNIT	Display unit setting	Sets the display unit of momentary standard flow rate.	L/min, m^3/min, L/h m^3/h	L/min
REREC	Auto backup and restarting record setting	The function is auto backup and restarting recording for unexpected power shutdown. When this function is on, if power shutdown happens during the record, the recorded measurement data before the interruption of power is backed up to SD memory card and record is resumed after power is back.	ON/OFF	OFF

*1 The following values are not initialized : NN.PLS, NN.SCL, NN.AVE, NN.GAS, NN.HI, NN.LO, NN.CUT
*2 These values are for D6FZ-FGS1000. For D6FZ-FGT□□□,setting values are 10.0/100.0/1000.0 (L/Pulse) .
*3 These values are for D6FZ-FGS1000. For D6FZ-FGT□□□, it is not available.
*4 These value is for D6FZ-FGS1000. For D6FZ-FGT□□□, default value is "8" .

● THR mode

Item		Description	Setting range	Factory default
NN.HI	Upper limit threshold of Air Flow Sensor	Sets the upper limit threshold of Air Flow Sensor for alarm outputs.	0 to 1000 L/min*5	1000 L/min *6
NN.LO	Lower limit threshold of Air Flow Sensor	Sets the lower threshold of Air Flow Sensor for alarm outputs.	0 to 1000 L/min*5	0 L/min *6
NN.CUT	Leak detection flow	Threshold that considers flow as zero. It is set between lower limit threshold and flow zero.	0 to 1000 L/min*5	0 L/min
HOLD	Alarm hold setting	Sets whether an alarm output retains ON state when the measured value went back to within the range of upper/lower limit threshold from out of the range (alarm state) at measurement in RUN mode.	ON/OFF	OFF

*5 The value is for D6FZ-FGS1000. For D6FZ-FGT200, the value is 0 to 200 L/min, for D6FZ-FGT500, the value is 0 to 500 L/min.
*6 The value is for D6FZ-FGS1000. For D6FZ-FGT200, the value is 100 L/min, for D6FZ-FGT500, the value is 250 L/min.

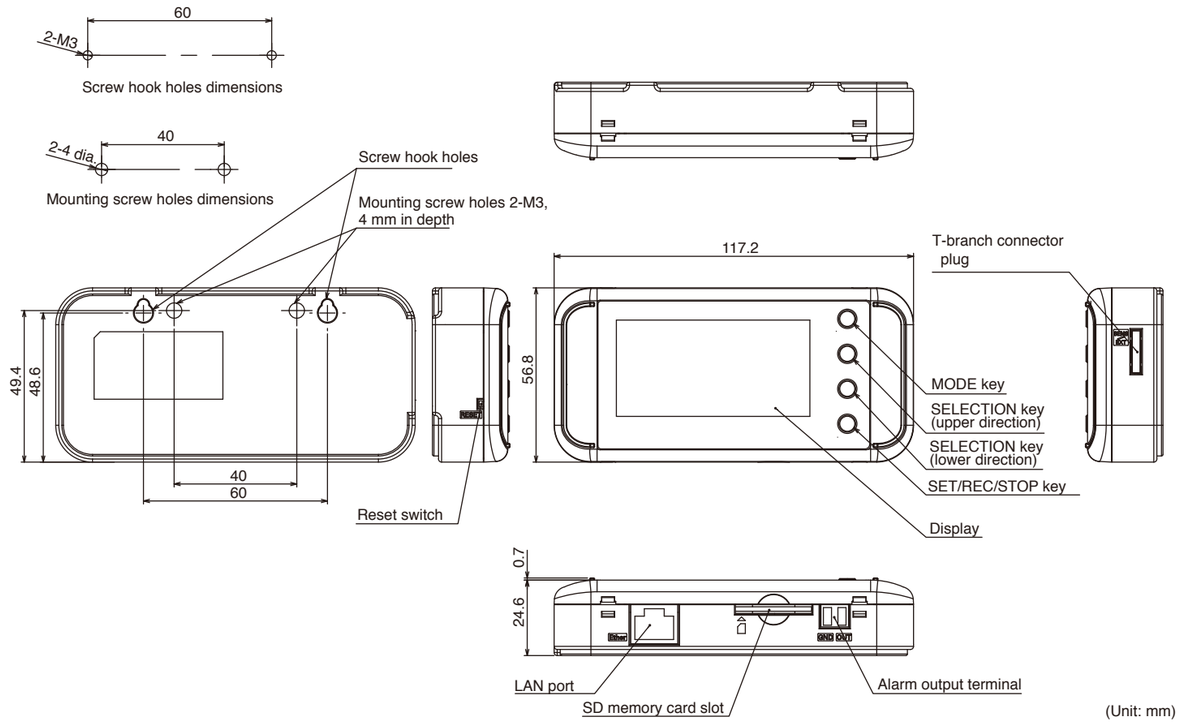
■ Major Error Displays and Countermeasures

Display	Overview	Description
E1100	Recorded data writing failure	Failed to write recorded data to the SD memory card. Insert a write-enabled SD card. Hold the MODE key for at least 3 seconds to cancel the error display. If this error occurs, insert a normal SD card and stop recording. Start recording again after data has been written to the SD card normally.
E22XX	Integrated standard flow clear failure	There is no notification of integrated standard flow reset completion from the sensor of applicable unit at the time of REC start. As a break in a cable or power shutdown may have occurred, check the cable and supply the power again. Holding the MODE key releases the error display. The integrated standard flow of the sensor on which an error occurred is cleared, but recording is continued.
E23XX	Setting parameter reading failure	Failed to read a setting parameter from the sensor for which the settings should be changed when shifting to FUN mode. As a break in a cable, power shutdown to the sensor, or switching to another sensor during power on status may have occurred, check the cable and provide the power again. Holding the MODE key releases the error display. Although the setting values of the sensor at the time of the occurrence of the error is displayed, FUN mode is continued.
E24XX	Setting value update failure	Failed to change the setting values of the sensor in FUN mode and THR mode. As a break in a cable or power shutdown to the sensor may have occurred, check the cable and provide the power again. Holding the MODE key releases the error display. Although the setting values of the sensor at the time of the occurrence of the error is not displayed, FUN mode/THR mode processing is continued.
E25XX	Sensor Error	Failed to read measured value from unit XX due to the sensor error. Remove the cause to error and hold the MODE key for at least 3 seconds to cancel the error . When recording at the time of error occurrence, record is also continued although the error is displayed. And measured data of unit XX is recorded as “ERR”.
E2800	Sensor mode changing failure	Failed to enter setting change mode of the air flow sensor (D6FZ-FGT□□□) to be changed. Hold the MODE key for at least 3 seconds to cancel the error, and switch to RUN mode by MODE key of the air flow sensor. Mode of the air flow station needs to go back to RUN mode, too.
E3000	No SD memory card inserted	The SD memory card is not inserted. Insert a write-enabled SD card. Hold the MODE key for at least 3 seconds to cancel the error display.
E3002	Write-protected SD memory card	The SD memory card is write-protected. Replace it with a write-enabled one. Hold the MODE key for at least 3 seconds to cancel the error display.
E3003	SD card recognition error	Failed to recognize the SD card. Insert a normal SD memory card. Hold the MODE key for at least 3 seconds to cancel the error display.
E5000	Invalid setting file data	The setting data in the SD memory card is invalid. Insert a normal SD memory card. Hold the MODE key for at least 3 seconds to cancel the error display.
E5001	Setting file writing failure	Failed to write setting files to the SD memory card. Insert a write-enabled SD card. Hold the MODE key for at least 3 seconds to cancel the error display.
E5002	Setting file reading failure	There is no setting files contained in the SD memory card. Replace it with an SD memory card with setting files. Hold the MODE key for at least 3 seconds to cancel the error display.
E8100 E8101 E8102 E8103 E8104 E5003	Hardware error	There may be a failure on the hardware. Please contact the distributor or OMRON representative office.

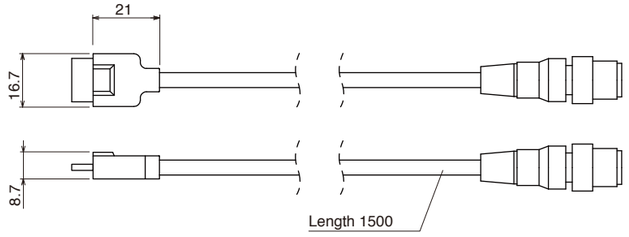
Note1 : "XX" indicates a number of Air Flow Sensor.

Note2 : If an error not listed above occurs, it may be caused by the wrong wiring. Turn OFF the unit and check the wiring again.

■ Dimensions



■ Connection Cable



Suitability for Use

Omron Companies shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in the Buyer’s application or use of the Product. At Buyer’s request, Omron will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer’s application, product or system. Buyer shall take application responsibility in all cases.

NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT(S) IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

See also Product catalog for Warranty and Limitation of Liability.

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