Particulate Matter(PM) Transmitter

PMX125W series
User Manual

DOTECH
SENSING & CONTROL

Features

· Real time particulate matter(PM) monitoring and control
· Precision measurements and stability
· PM1.0, PM2.5, PM4.0, PM10 4-CH
· 268 * 128 mono graphic LCD
· Particulate matter(PM), Temp., Humidity
  measurements are displayed at the same time.
· Wi-Fi (Modbus TCP protocol)
· 2-CH Digital alarm output
· 3-CH 4..20mA Analog output
· RS485 modbus RTU
· Wall mount (Bracket)

Applications

· Measurement and monitoring of particulate matter(PM)
  in schools or hospitals.
· Measurement and monitoring of particulate matter(PM)
  in public and multi-purpose facilities.
· Measurement and monitoring of particulate matter(PM)
  in public transportation facilities such as subways and buses.

PM-2.5
Other than
first grade

Certification of a simple measuring instrument for particulate matter(PM)

· Authentication number: LS20-00041
· Certification Authority: Korea Conformity Laboratories
· Date: October 23, 2020

⚠ Cautions for safety

Please read cautions for safety carefully before use the product.

Cautions for safety shall be observed because such cautions are to use the product safely and correctly in order to prevent accident or danger in advance.
– When this product is used for controlling of device which may affect life or property (such as controlling of nuclear power, medical instrument, vehicle, railroad, aviation, burner, entertainment device or safety device), double safety devices must be installed before use.
– This product shall be installed on a panel or at where safety is secured before use.
– Do not connect lines or check or repair when power is applied.
– For power connection, verify the terminal number before connection.
– Do not modify product by unauthorized person other than our service technician.
– Do not use this product at outdoor. Product life time may be shortened.

– In wire connection, tighten the terminal screw with sufficient torque.

– Use this product within its rated/performance range. Product life time may be shortened.
– Do not use water or organic solvents when cleaning, and clean with a dry, non-moisture towel.
– Do not use in direct sunlight, radiant heat, vibration, or shock.
– Do not allow dust or wiring debris to enter the inside of this product.
– Please check the polarity of the terminal when connecting the sensor and connect the wiring accurately.

Information for product warrant

The original purchaser who procured product or license from Dotech with get warrant as follows:

Warrant condition

Warrant for Dotech product is 1 year and within this period support is provided to product trouble.
Even in warrant period, Dotech will not provide warrant for damaged product if:
– Product is used without following the instruction of product manual and specified digital input/output rating or product failure is caused by external anthropogenic impact or environmental fact where product is installed.

In the event of product trouble within product warrant period, please contact Dotech head office immediately.

When the original purchaser claims product trouble within warrant period, product trouble will be examined in purchaser area or such product will be returned to us for verification, and repair or replacement service will be provided. When the warrant period is expired or product trouble does not meet the warrant condition, repair/replacement and transportation shall be made at original purchaser's cost.

Unless the limitations in performing of warrant conditions stated below conflict to applicable laws, Dotech shall not be liable to – regardless of contracting, indemnification, warrant or illegal action [including mistake or no-fault liability] –any consequent damage or loss caused from special, indirect, accidental, legal and company liquidation in relation to procured product including cease of business, loss from product use or profit issue of the original purchaser against any legal requirement and assertion.

Limitation in performing of warrant conditions

Excluding customer requirements arising from non-fulfillment of above warrant conditions, Dotech shall not be liable to any claim asserted by the original purchaser, its related person, agent or contractor for the loss, damage or expenses caused or resulted from the sold product. Above warrant conditions are exclusive right of original purchaser. Dotech refuses to execute any other expressed or implied warrant conditions – including warrant condition of product modification and implied warranty condition by product seller, warranty condition without legal infringement – other than our warrant conditions.

Performing of warrant condition is not applied to the product trouble caused by user's failure in observing our instruction for product operation and maintenance, replacement, accident, misuse, abuse or carelessness.
In the system design of original purchaser, technical support provided by Dotech personnel and its agent is only a proposal, not suggestion. Original purchaser shall be responsible to make decision in accepting of such proposal, and it shall be tested by original purchaser.
Original purchaser shall be responsible to make decision of the fitness of the product and application meeting customer's purpose.
The contents described in the warrant condition will be applied actually, and any person or personnel of agent, company or other entity, Dotech or other company shall have no authorization to modify, correct or extend the warrant conditions at any reason.

: Specification

Particulate Matter(PM)

Mass concentration size range	PM1.0 0.3 ... 1.0μm PM2.5 0.3 ... 2.5μm PM4.0 0.3 ... 4.0μm PM1 0 0.3 ... 1 0μm
Flow rate	0.45LPM
Mass concentration range	0 ... 1,000μg/㎥
Mass concentration resolution	1μg/㎥
Measuring Capability	min 0.3μg
Linearity	90% @ 0...500μg/㎥(PM2.5)
Sampling interval	1 sec
Start-up time	〈 15sec
Chamber cleaning	Auto cleaning(1week cycle)

Relative Humidity

Measurement range	0 ... 100%RH
Humidity Accuracy	±2.0%RH (0 ... 80%RH)
Repeatability	±0.2%RH
Hysterisis	〈 ±1%RH
Humidity resolution	0.01%RH
Response time, t63	〈 8sec
Long term drift	〈 0.25%RH/year

Temperature

Temperature measuring range	−10 ... +60℃
Temperature accuracy	±0.3℃ (−10 ... 60℃)
Repeatability	±0.2℃
Temperature resolution	0.015℃
Response time, t63	〉2sec
Long term drift	〈 0.05℃/year
Long term drift	〈 0.25%RH/year

### Inputs and Outputs

Operating voltage	24Vdc ±10% (DC Adapter plug : internal diameter 2.1, external diameter 5.5PIE)
Current consumption	max. 400mA @24Vdc
Relay output	2-CH, 5A, 250VAC
Current output	4-20mA 3-CH
Digital Output	RS485 Modbus RTU
Wi-Fi output (option)	Frenqency : 2.4GHz, 5GHz
	Standards : 802.11 b,g,n(2.4GHz) 802.11a(5GHz)
	Data rate : 1Mbps to 70Mbps
	Transmit Power : up to +16dbm (Average)
	Receiver sensitivity : −93 to −70dbm @ 25℃, 〈10% PER
	Protocol : Modbus TCP
Connector	Pluggable Screw Termminal block (cable : max. 1.5mm²)

Usage Environment

Operating Temperature	−10 ... +60 ℃ (non condensation)
Storage Temperature	−20 ... +70 ℃

Mechanics

Housing	PC Plastic + Aluminum
Dimension (W*H*D)	160*80*40 mm (Exclude Temp., Humidity module and Wi-Fi antenna)
Weight	400g
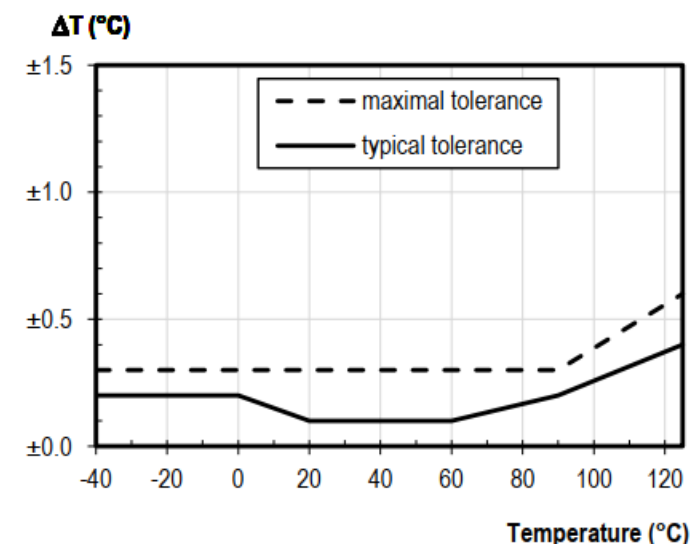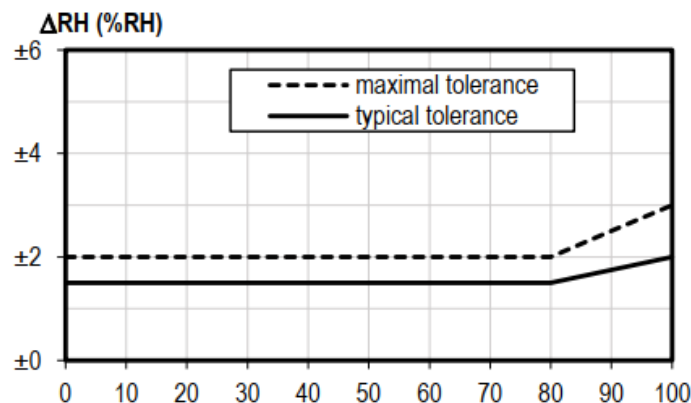
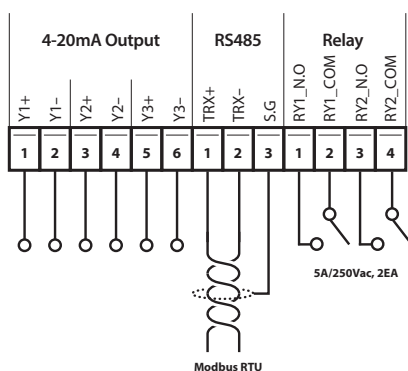## : Ordering guide

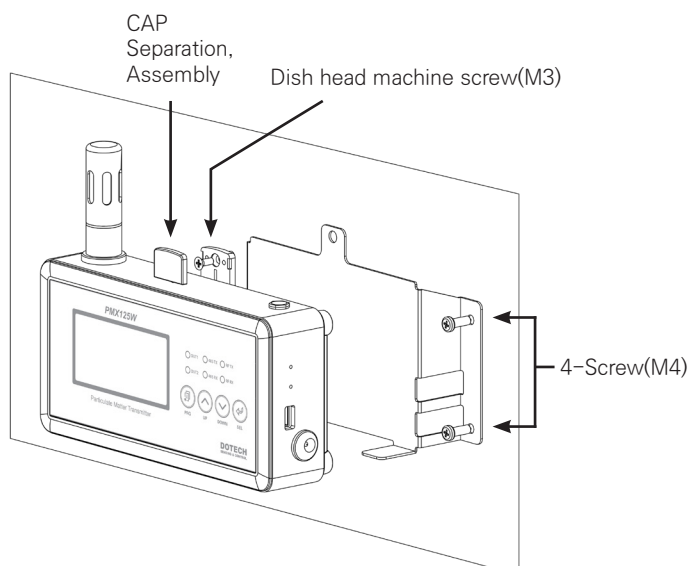| PMX125W −	①	②	③	Description
① Sensor type	A			Particle sensor, Humidity, Temperature
	P			Particle sensor
② Output type		W		Wi−Fi, RS485, 4−20mA, Relay
		R		RS485, 4−20mA, Relay
③ Accessory			B	Wall Mount Bracket
			NIL	None

: Installation

□ Wiring

□ Installation

1: Attaching Screws

① Remove the cap from the bracket on the top of the body.
② Assemble the cap after fixing the wall using
   the M3 plate head screw.

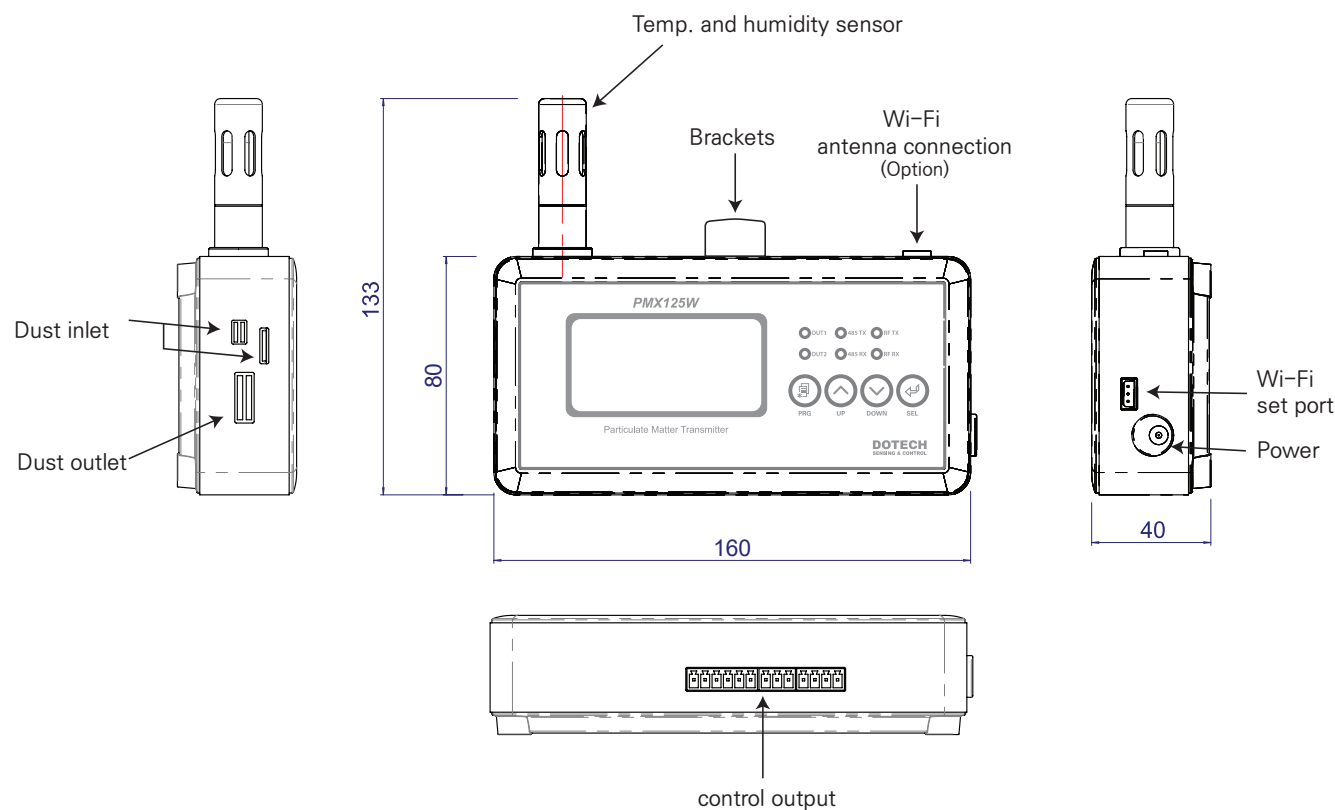CAP Separation, Assembly
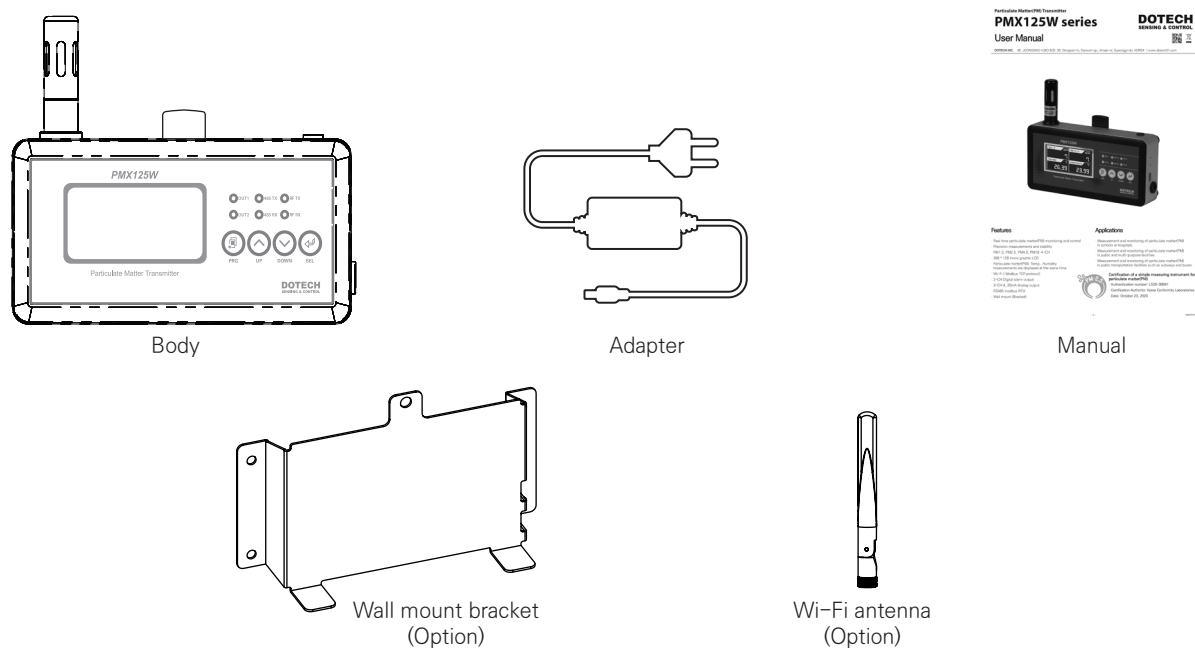
Dish head machine screw(M3)
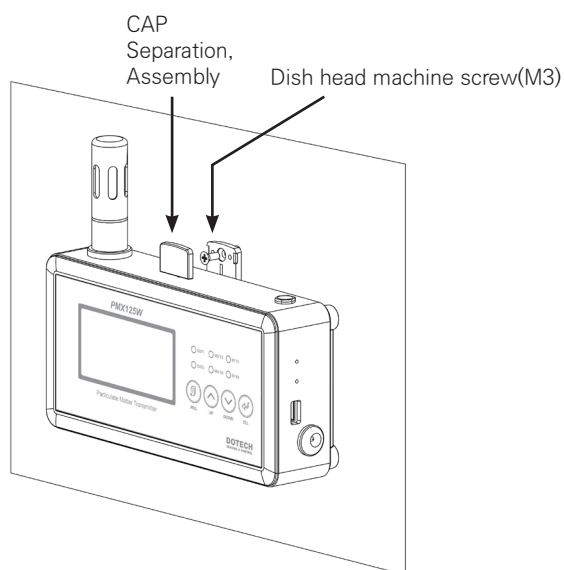
2: Attaching Brackets

① Wall mount bracket (option) is attached to the wall with
   four M4 screws.
② Remove the cap from the bracket on the top of the body
   and secure the product to the installed wall mount bracket.

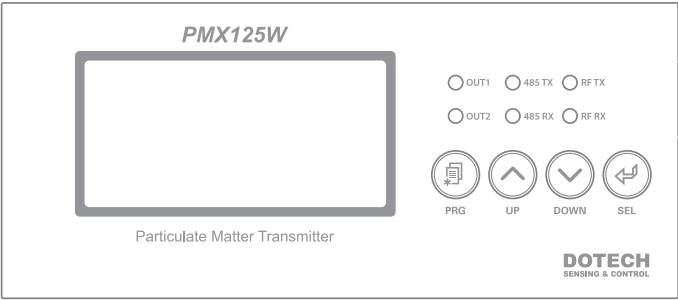CAP Separation, Assembly

Dish head machine screw(M3)

4−Screw(M4)

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□ Dimensions

Temp. and humidity sensor

Brackets

Wi-Fi
antenna connection
(Option)

133

80

PMX125W

OUT1 485 TX RF TX
OUT2 485 RX RF RX

PRG UP DOWN SEL

Particulate Matter Transmitter

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160

Dust inlet

Dust outlet

Wi-Fi
set port

Power

40

control output

□ Components

PMX125W

Particulate Matter Transmitter

Body

Adapter

Manual

Wall mount bracket
(Option)

Wi-Fi antenna
(Option)

: Configuration

□ Configuration

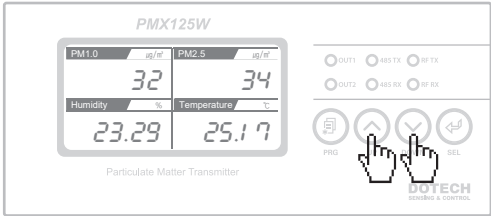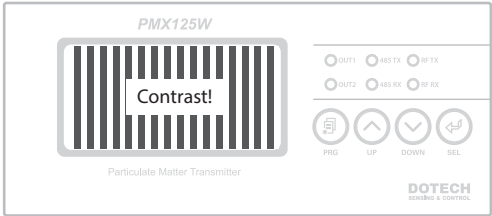|	Name	Description
List	PRG button	Enter the program
	UP button	Move up and increase value
	DOWN button	Move down and decrease value
	SEL button	Select

□ Firmware version
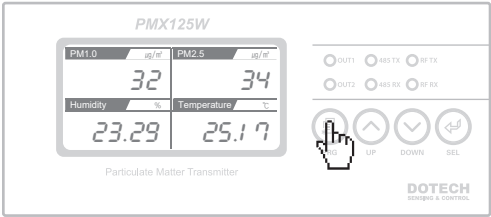
Press the PRG button twice to check the firmware version
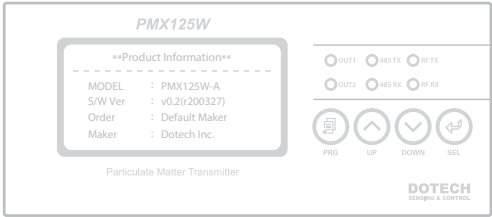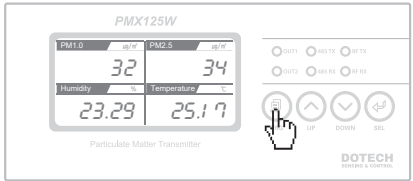
□ Display Contrast Settings

Press the UP/DOWN button by few second at same time can enter the display contrast setting mode.
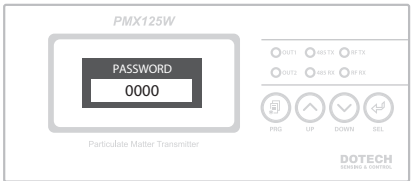
UP / DOWN button : Contrast set
SEL button : Save

: Parameter

□ Enter the Parameter

Press the PRG button 1 time can enter the ACCESS CODE mode
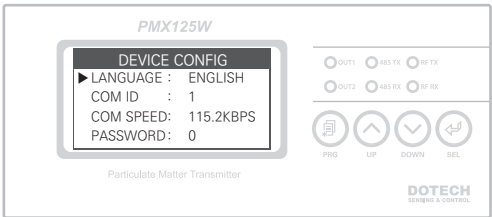
UP / DOWN button : Enter the password (Default: 0000)

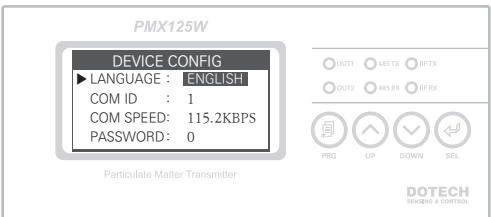Press the SEL button 1 time can enter the Prameter setting mode
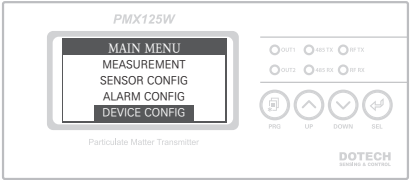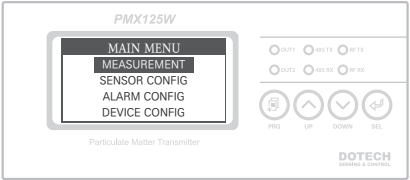
UP / DOWN button : Move
SEL button : Menu select
PRG button : Previous step

□ Parameter setting

UP / DOWN button : Move
SEL button : Menu select
PRG button : Previous step

UP / DOWN button : Set value change
SEL button : Save settings
PRG button : Previous step

□ Parameter table

No.	List	Description	Unit	Step	Min.	Max.	Default
30001	Firmware version	–	–	0.1	–	–	0.0
30002	Communication ID	MODBUS RTU, MODBUS TCP/IP	–	1	1	247	1
30003	Alarm Status	Bit0: Temp. alarm lower limit (1: On, 0: OFF)	–	–	–	–	–
		Bit1: Temp. alarm upper limit (1: On, 0: OFF)					
		Bit2: Humidity alarm lower limit (1: On, 0: OFF)					
		Bit3: Humidity alarm upper limit (1: On, 0: OFF)					
		Bit4: PM1.0 alarm upper limit(1: On, 0: OFF)					
		Bit5: PM2.5 alarm upper limit(1: On, 0: OFF)					
		Bit6: PM4.0 alarm upper limit(1: On, 0: OFF)					
		Bit7: PM10 alarm upper limit(1: On, 0: OFF)					
30004	Current temperature	Real-time measurement temp. display(x100)	℃	0.01	−10.00	60.00	℃
			℉		14.00	140.00	
30005	Current humidity	Real-time measurement humidity display	%RH	0.01	0.00	100.0	%RH
30006	PM1.0 Data	〈 1.0μg Particle	μg/㎥	1	0	1000	–
30007	PM2.5 Data	〈 2.5μg Particle	μg/㎥	1	0	1000	–
30008	PM4.0 Data	〈 4.0μg Particle	μg/㎥	1	0	1000	–
30009	PM10 Data	〈 10μg Particle	μg/㎥	1	0	1000	–

Sensor setting

No.	List	Description	Unit	Step	Min.	Max.	Default
40010	Temperature unit	Temp. unit setting(0: Celsius, 1: Fahrenheit)	℃	Toggle	0	1	0
			℉				
40011	Temperature Offset	Temp. offset set value(x100)	℃/℉	0.01	−10	10	0
40012	Humidity Offset	Humidity offset set value(x100)	%RH	0.01	−10	10	0
40013	PM1.0 Offset	PM1.0 offset set value	μg/㎥	1	−10	10	0
40014	PM2.5 Offset	PM2.5 offset set value	μg/㎥	1	−10	10	0
40015	PM4.0 Offset	PM4.0 offset set value	μg/㎥	1	−10	10	0
40016	PM10 Offset	PM10 offset set value	μg/㎥	1	−10	10	0
40017	PM1.0 K Factor	PM1.0 correction K Factor	–	0.01	0	10	0
40018	PM2.5 K Factor	PM2.5 correction K Factor	–	0.01	0	10	0
40019	PM4.0 K Factor	PM4.0 correction K Factor	–	0.01	0	10	0
40020	PM10 K Factor	PM1 correction K Factor	–	0.01	0	10	0

Alarm setting

No.	List	Description	Unit	Step	Min.	Max.	Default
40039	Temp. alarm lower limit	Temp. alarm lower limit set value(x100)	℃	0.1	−10.00	60.00	0
			℉		14.00	140.00	23.00
40040	Temp. alarm upper limit	Temp. alarm upper limit set value(x100)	℃	0.1	−10.00	60.00	50.00
			℉		14.00	140.00	122.00
40041	Humidity alarm lower limit	Humidity alarm lower limit set value(x100)	%RH	0.1	0	99.99	10.00
40042	Humidity alarm upper limit	Humidity alarm upper limit set value(x100)	%RH	0.1	0	99.99	90.00
40043	PM1.0 Alarm upper limit	PM1.0 Alarm upper limit set value	μg/㎥	1	0	1000	0
40044	PM2.5 Alarm upper limit	PM2.5 Alarm upper limit set value	μg/㎥	1	0	1000	0
40045	PM4.0 Alarm upper limit	PM4.0 Alarm upper limit set value	μg/㎥	1	0	1000	0
40046	PM10 Alarm upper limit	PM10 Alarm upper limit set value	μg/㎥	1	0	1000	0
40047	Alarm delay time	Alarm delay time	Sec.	1	0	99	3
40048	Turn off the alarm	Turn off the alarm (0: Automatic / 1: Manual)	–	Toggle	0	1	0

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Device Settings

No.	List	Description	Unit	Step	Min.	Max.	Default
40025	Language	Language set (0: Korean, 1: English)	–	Toggle	0	1	0
40026	Communication ID	MODBUS ID	–	1	1	247	1
40027	Communication speed	0: 4800 1: 9600 2: 19200 3: 38400 4: 57600 5: 115200	BPS	1	0	5	5
40028	Communication parity bit	0: NONE 1: EVEN 2: ODD	–	1	0	2	0
40029	Communication stop bit	0: 1Bit 1: 2Bit	–	Toggle	0	1	0
40030	PASSWORD	Password for entering setup mode	–	1	0	9999	0
40031	LCD Light	LCD Light setting(1: ON, 0: OFF)	–	Toggle	0	1	1
40032	Button Sound	0: OFF 1: ON	–	Toggle	0	1	0
40033	Alarm Sound	0: OFF 1: ON	–	Toggle	0	1	0
40034	CH1. 4–20mA Source	0: None 1: Temp. 2: Humidity 3: PM1.0 4: PM2.5 5: PM4.0 6: PM10	–	1	0	0	1
40035	CH2. 4–20mA Source	0: None 1: Temp. 2: Humidity 3: PM1.0 4: PM2.5 5: PM4.0 6: PM10	–	1	0	0	2
40036	CH3. 4–20mA Source	0: None 1: Temp. 2: Humidity 3: PM1.0 4: PM2.5 5: PM4.0 6: PM10	–	1	0	0	3
40037	Relay1Source	0: Temp. alarm lower limit 1: Temp. alarm upper limit 2: Humidity alarm lower limit 3: Humidity alarm upper limit 4: PM1.0 alarm upper limit 5: PM2.5 alarm upper limit 6: PM4.0 alarm upper limit 7: PM10 alarm upper limit	–	1	0	7	1
40038	Relay2 Source	0: Temp. alarm lower limit 1: Temp. alarm upper limit 2: Humidity alarm lower limit 3: Humidity alarm upper limit 4: PM1.0 alarm upper limit 5: PM2.5 alarm upper limit 6: PM4.0 alarm upper limit 7: PM10 alarm upper limit	–	1	0	7	3

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Display setting

No.	List	Description	Unit	Step	Min.	Max.	Default
40049	Top left display	0: None 1: Temp. 2: Humidity 3: PM1.0 4: PM2.5 5: PM4.0 6: PM10	–	1	0	6	4
40050	Top right display	0: None 1: Temp. 2: Humidity 3: PM1.0 4: PM2.5 5: PM4.0 6: PM10	–	1	0	6	6
40051	Lower left display	0: None 1: Temp. 2: Humidity 3: PM1.0 4: PM2.5 5: PM4.0 6: PM10	–	1	0	6	2
40052	Lower right display	0: None 1: Temp. 2: Humidity 3: PM1.0 4: PM2.5 5: PM4.0 6: PM10	–	1	0	6	1

: Error status

□ Error
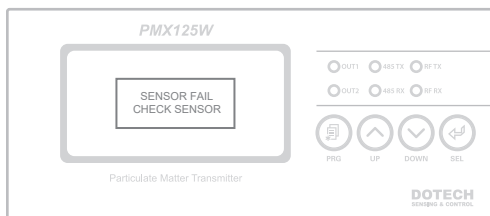
– When the "SENSOR FAIL CHECK SENSOR" is displayed,
it is a message that the sensor is not operating normally.
Please contact the vendor or manufacturer.

: Maintenance

· The PMX125W particulate matter sensor performs automatic cleaning for 10 seconds by every week to minimize chamber contamination due to dust and foreign substances.
However, depending on the installation environment and measurement conditions, it is recommended that the sensor module be replaced as follows.
– Common indoor environment (20㎍/㎥ average concentration below): 6 years
– High concentration of particulate matter environment. (30㎍/㎥ above average concentration): 4 years

· The user cannot arbitrarily clean the inside of the fine dust sensor.
It is recommended that you contact the manufacturer before replacing the sensor module.
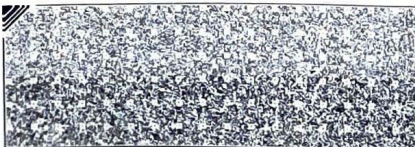
인증번호 제 LS20-00041 호

성능인증서

상 호 (사업장 명칭)	DOTECH	
성 명 (대표자)	최득남	
사업장 소재지	경기도 안산시 단원구 동산로 30 중앙일보빌딩 6층	
인증내용	제작자 (주)두텍	제작국가 대한민국
	기기명칭 미세먼지 트랜스미터	측정방식 광산란방식
	상품명(고유명칭) PMX125W	측정범위 　최소: 0 ㎍/㎥ 　최대: 1 000 ㎍/㎥
	최소눈금(단위) 1 ㎍/㎥	공인측정 오차범위 77.3 % (정확도)
	성능인증 등급	2등급

「미세먼지 저감 및 관리에 관한 특별법」 제24조제1항 및 같은 법 시행규칙 제16조제3항에 따라 위와 같이 성능인증서를 발급합니다.
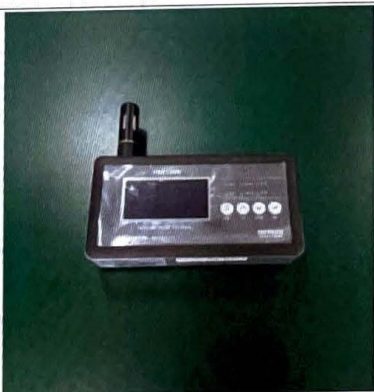
2020년 10월 23일

한국건설생활환경시험연구원장

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인증번호 제 LS20-00041호

성능평가결과

구분	항목	단위	평가결과	인증등급
시험체임버평가	반복재현성	등급	1	2
등가성평가	상대정밀도	등급	1	
	자료획득률	등급	1	
	정확도	등급	2	
	결정계수	등급	1	

※ 인증등급

등급	반복재현성	상대정밀도	자료획득률	정확도	결정계수
1등급	80% 초과	80% 초과	80% 초과	80% 초과	0.8 초과
2등급	70% 초과 80% 이하	70% 초과 80% 이하		70% 초과 80% 이하	0.7 초과 0.8 이하
3등급	60% 초과 70% 이하	60% 초과 70% 이하		50% 초과 70% 이하	0.6 초과 0.7 이하
등급 외	60% 이하	60% 이하	80% 이하	50% 이하	0.6 이하

인증신청자(상호명)		㈜두텍
	제작사	㈜두텍
	기기명칭	미세먼지 트랜스미터
	상품명 (고유명칭)	PMX125W
시험품 정보		<사진>

PM-QP-08-02

R20220804