

5 DIGITAL MICRO-PROCESS PULSE INPUT FLOW METER

with 2~4 ALARMS / ANALOG OUTPUT / RS-485

KFM-R

FEATURES

- Accuracy: $\pm 0.03\%$ F.S.
- High brightness 0.8" LED display: 0~99999; decimal point selectable
- Flow unit selectable: Liter / Gal / C.C. / m³
- K factor programmable for pulse output per liter
- 2~4 alarms programmable (Hi or Lo) / Analog output (15 bit resolution) / RS-485 communication optional (The above option can exist together)
- High stability, non-flammable case (PC), high safety
- CE approval



ORDER INFORMATION: KFM-R - Code 1 - Code 2 - Code 3 Code 4 Code 5

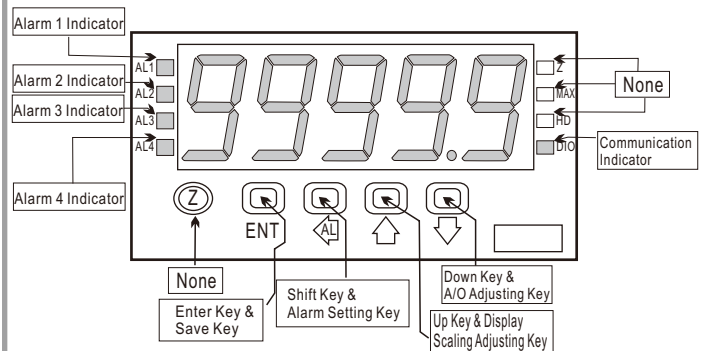
Code 1	Input Signal	Code 1	Input Signal	Code 2	Aux. Power	Code 3	Alarm Output	Code 4	Analog Output	Code 5	RS-485
N5	NPN(5V)	VA	AC 2~60V	A	AC/DC 100~240V	N	None	N	None	N	None
N2	NPN(12V)	VB	AC 60~600V	D	AC/DC 22~60V	R2	2 Relays	A	4~20mA	Y	Yes
P5	PNP(5V)	VC	Pick-up 50mV~1.5V			R3	3 Relays	V	0~10V		
P2	PNP(12V)	VD	Pick-up 500mV~15V			R4	4 Relays	O	Option		
CT	Contact	VE	DC 24Vp			O2	2 Open Collect				
		O	Option			O3	3 Open Collect				
						O4	4 Open Collect				

**1: NPN(5V), PNP(5V) offers excitation power DC5V; NPN(12V), PNP(12V) offers excitation power DC12V for flow sensors using. 2: Please use PNP/NPN(5V/12V) or DC24Vp for DC pulse input.

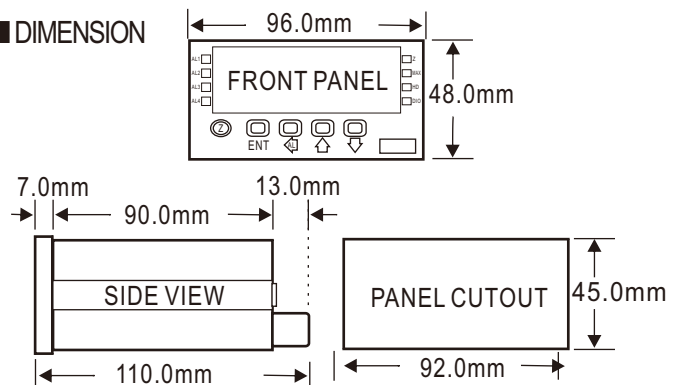
SPECIFICATION

- ◆ Accuracy: $\pm 0.03\%$ F.S.
- ◆ Display Screen: High brightness red LED; 20.3mm(0.8")
- ◆ Sampling Time: 10 cycles / sec: >10Hz
f cycles / sec: <10Hz
- ◆ Display Range: 0~99999
- ◆ Over Range Indication: doFL / ioFL
- ◆ Polarity Indication: Automatic with "-" indication
- ◆ Parameters Setting: Push buttons
- ◆ Back Up Memory: EEPROM
- ◆ Alarm Action: " \geq (Hi) on" or "< (Lo) on"
- ◆ Alarm Run Delay Time: 0~99 sec
- ◆ Relay Contact: AC 277V / 7A; DC 30V / 7A
- ◆ Analog Output Resolution: 15 bit
- ◆ Output Response Time: <250 msec (0~90%)
- ◆ Output Capability: Voltage Output: <20mA
Current Output: <10V
- ◆ Communication: RS-485 Modbus RTU mode
- ◆ Baud Rate: 38400 / 19200 / 9600 / 4800 bps
- ◆ Temperature Coefficient: 100ppm / °C (0~60°C)
- ◆ Operating Temperature: 0~60°C
- ◆ Operating Humidity: 20~90% RH (non-condensing)
- ◆ Storage Temperature: -10~70°C
- ◆ Storage Humidity: 20~90% RH (non-condensing)
- ◆ Power Supply: AC/DC 100~240V; AC/DC 22~60V
- ◆ Power Consumption: 8.5VA (all functions output)
- ◆ Surge Test: 1.5KVac / 1min (Input / Power)

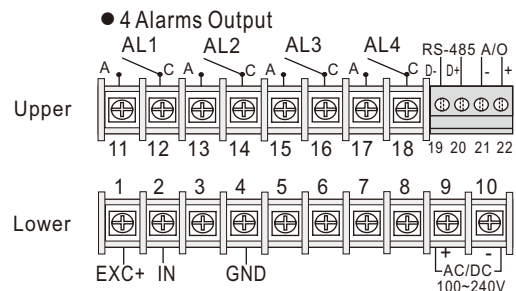
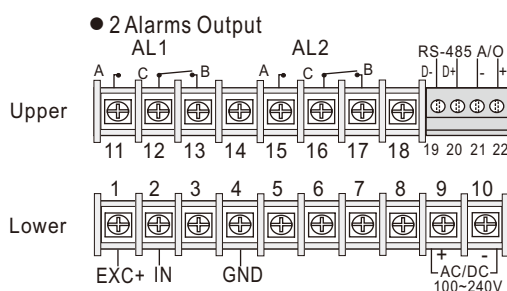
FRONT PANEL & KEY FUNCTIONS



DIMENSION

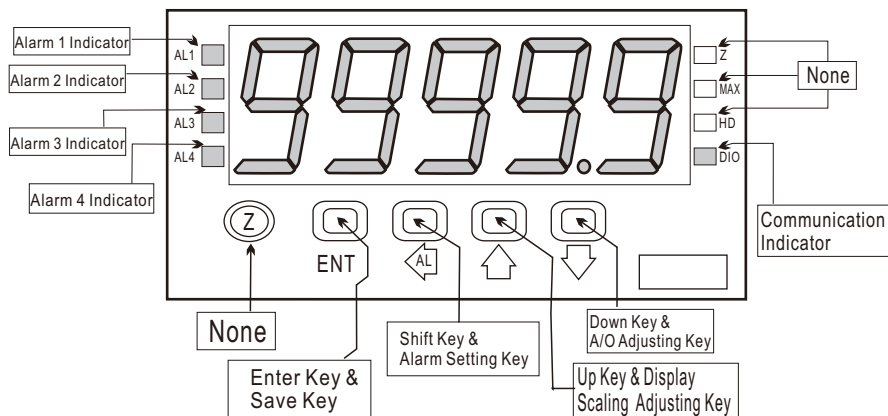


WIRING CONNECTION



* Please understand key indicators & functions at the first operation.

FRONT PANEL & KEY FUNCTIONS



Key Name	Symbol	Descriptions
Enter Key & Save Key	ENT	1. In the measuring status, press this key can enter to parameter pages. 2. In the parameter setting, press this key can save the value & go to next parameter.
Shift Key & Alarm Setting Key	AL	1. In the measuring status, press this key for 3 sec can enter to alarm setting page (The selecting digit will be flashed) 2. In the parameter setting, press this key can move the cursor left.
Up Key & Display Scaling Adjusting Key	↑	1. In the measuring status, press this key for 3 sec can enter to display scaling adjustment 2. In the parameter setting, press this key can increase the digits.
Down Key & A/O Adjusting Key	↓	1. In the measuring status, press this key for 3 sec can enter to analog output adjustment. 2. In the parameter setting, press this key can decrease the digits.

- **1. The following block charts are parameters codes, parameter codes & parameters will alternate flashing if the parameters can be modified.
 2. To modify the parameters, please press \leftarrow \rightarrow , and press ENT to save the parameter after the modification.
 3. Please don't forget the new pass code after modification.
 4. In any pages, press \uparrow & \downarrow , or don't press any keys for 2 minutes that will back to measuring status.

GENERAL MODE OPERATING PROCEDURES

Block Charts	Display	Descriptions	Default
Power ON		Alarm Setpoint	
10000	Measuring Status	Present value for measurement.	
Press \leftarrow for 3 sec	AL 1	Alarm 1 Setpoint (AL1)	00000
Press ENT	AL 2	Alarm 2 Setpoint (AL2)	00000
Press ENT	AL 3	Alarm 3 Setpoint (AL3)	00000
Press ENT	AL 4	Alarm 4 Setpoint (AL4)	00000
Press ENT		Scaling Adjustment	
10000	Measuring Status	Present value for measurement.	
Press \uparrow for 3 sec	SCALE	Scale Coefficient Adjustment (SCALE)	1.0000
Press ENT		Analog Output: "ZERO" & "SPAN" Adjustment	
10000	Measuring Status	Present value for measurement.	
Press \downarrow for 3 sec	APEro	A/O Zero Adjustment (AZero)	00000
Press ENT	ASPA n	A/O Span Adjustment (ASPA n)	00000
Press ENT			

- Remark: 1. There are 4 parameter groups of "System Setting Group(SYS)", "Alarm Setting Group(roP)", "Analog Output Setting Group (AoP)" & "RS485 Setting Group(doP)" for modification.
 2. Press \leftarrow to select each group page, and press ENT to enter each group or parameter page for modification or saving the parameters.
 3. Some of optional functions of parameter pages still exist, but the functions are disable.

PROGRAMMING MODE OPERATING PROCEDURES

Block Charts	Display	Descriptions	Default
Power ON		Parameter Group Setting Procedures	
10000	Measuring Status	Present value for measurement.	
Press ENT	P.Cod	Pass Code (P.Cod)	00000
Press ENT	P.Code Correct	Pass code is correct that will enter to parameter groups. Pass code is wrong that will back to measuring status.	
NO			
YES			
Press \leftarrow	SYS	System Setting Group (SYS)	
Press ENT	roP	Alarm Setting Group (roP)	
Press ENT	AoP	A/O Setting Group (AoP)	
Press ENT	doP	RS485 Setting Group (doP)	

Display	Descriptions	Default
System Setting Group Procedures		
	System Setting Page (SYS)	
K Factor Decimal Point Setting (dPk)	Press \uparrow \downarrow to select K factor decimal point (0, 1, 2, 3, 4). EX: if the value shows "0.00" that means the decimal point is 2 digits.	00000
K Factor Setting (KF)	Press \leftarrow \rightarrow to modify K factor (0 ~ 99999)	1000
Flow Unit Setting (Unit)	Press \uparrow \downarrow to modify the unit (Liter, Gal, C.C., m ³)	L, tEr
Time Parameter Setting (C.tiME)	Press \leftarrow \rightarrow to modify time parameter (sec / min / hour)	SEC
Decimal Point Setting (dP)	Press \uparrow \downarrow to select decimal point (0, 1, 2, 3, 4). EX: if the value shows "0.00" that means the decimal point is 2 digits.	Customers specify
Sampling Time Base (tbASE)	Press \leftarrow \rightarrow to modify sampling time base (0.1~999.9 sec).	0000.1
Display Average Setting (AvG)	Press \leftarrow \rightarrow to modify display average (1~99). PS: Please use this function for stable display value when input signal is unstable.	00005
Pass Code Setting (CodE)	Press \leftarrow \rightarrow to modify pass code (0~19999). PS: Please don't forget the new pass code after modification.	00000
Key Lock Setting (LoCK)	Press \uparrow \downarrow to lock the keys, using key lock function only can view the parameters, but cannot modify any values. PS: no (unlock), YES ("ENT" unlock, others lock).	no
Alarm Setting Group Procedures		
Alarm Setting Page (roP) The following steps are only available for alarm output.		
	Alarm 1 (ACT1)	Hi
Alarm 2 (ACT2)	PS: 1. There are 4 alarms output optional. 2. This page is exist without alarm output, but the function will be disabled. 3. Press ENT to save the value and go to the next parameter.	
Alarm 3 (ACT3)		
Alarm 4 (ACT4)		
Hysteresis 1 (HYS1)		Press \leftarrow \rightarrow to modify the value, when alarm runs lower or higher display value (depends on alarm action). Alarm setpoint \pm this value (0~999) will turn off the alarm. PS: 1. There are 4 alarms output optional. 2. This page is exist without alarm output, but the function will be disabled. 3. Press ENT to save the value and go to the next parameter.
Hysteresis 2 (HYS2)		
Hysteresis 3 (HYS3)		
Hysteresis 4 (HYS4)		
Delay Time 1 (dEL1)	Press \leftarrow \rightarrow to modify the value, when the display value reach the alarm value that need to wait for this time (0~99 sec) for alarm action. PS: 1. There are 4 alarms output optional. 2. This page is exist without alarm output, but the function will be disabled. 3. Press ENT to save the value and go to the next parameter.	00000
Delay Time 2 (dEL2)		
Delay Time 3 (dEL3)		
Delay Time 4 (dEL4)		

Display	Descriptions	Default
A/O Setting Group Procedures		
	A/O Setting Page (AoP)	The following steps are only available for analog output.
A/O Polarity Setting (PoLAr)	Press \uparrow \downarrow to select output for positive or negative pole. PS: Voltage output, NO: positive pole output (0~+10V) YES: positive & negative pole output (-10~+10V)	no
A/O Low Scale Setting (AnLo)	Press \leftarrow \rightarrow to adjust A/O low scale to correspond to the display value. EX: A/O is 0~10V, the display is 10.0 to output 0V, this value must be set for 10.0.	00000
A/O Hi Scale Setting (AnHi)	Press \leftarrow \rightarrow to adjust A/O hi scale to correspond to the display value. EX: A/O is 0~10V, the display is 90.0 to output 10V, this value must be set for 90.0.	99999
RS485 Setting Group Procedures		
	RS485 Setting Page (doP)	The following steps are only available for RS-485.
Address Setting (Addr)	Press \leftarrow \rightarrow to modify address (0~255).	00000
Baud Rate Setting (bAUd)	Press \uparrow \downarrow to select baud rate (38400/19200/9600/4800).	19200
Parity Setting (PAri)	Press \uparrow \downarrow to select parity (n.8.2/n.8.1/even/odd).	n.8.2
Frame Setting (FrAmE)	Press \uparrow \downarrow to select frame type. (NO:Hi→Lo, YES:Lo→Hi)	no

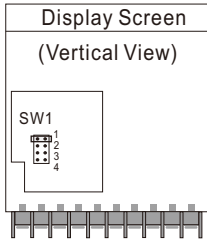
Error Code of Self-Diagnosis

Display	Descriptions
1, oFL	Input signal is over input range (0~100KHz).
doFL	Input signal is over display range (99999).
E-00	EEPROM reading/writing suffers the interference (about 1 million times).

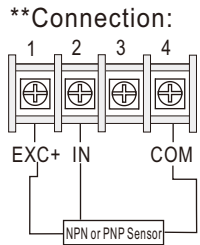
**Please check the wiring connection is correct first, if the problem still exist, please return the meter to the factory.

Input Signal Modification

**To Select the pin to modify the input signal for different sensors.
PS: In dual input type, excitation power must be the same.



SW1	JUMPER	DEFINITION
● ●	1	Open: 12V; Close: 5V
● ●	2	Open: 10KHz; Close: 400Hz
● ●	3	Open: NPN; Close: PNP
● ●	4	Open: PNP; Close: NPN



NPN (5V): 0~400 Hz

JUMPER	SW1/SW2
1	● ●
2	● ●
3	● ●
4	● ●

NPN (5V): 0~10 KHz

JUMPER	SW1/SW2
1	● ●
2	● ●
3	● ●
4	● ●

NPN (12V): 0~400 Hz

JUMPER	SW1/SW2
1	● ●
2	● ●
3	● ●
4	● ●

NPN (12V): 0~10 KHz

JUMPER	SW1/SW2
1	● ●
2	● ●
3	● ●
4	● ●

PNP (5V): 0~400 Hz

JUMPER	SW1/SW2
1	● ●
2	● ●
3	● ●
4	● ●

PNP (5V): 0~10 KHz

JUMPER	SW1/SW2
1	● ●
2	● ●
3	● ●
4	● ●

PNP (12V): 0~400 Hz

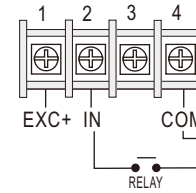
JUMPER	SW1/SW2
1	● ●
2	● ●
3	● ●
4	● ●

PNP (12V): 0~10 KHz

JUMPER	SW1/SW2
1	● ●
2	● ●
3	● ●
4	● ●

**Connection:

Relay Contact: NPN 0~400 Hz



JUMPER	SW1/SW2
1	● ●
2	● ●
3	● ●
4	● ●

**For relay input type, please select NPN 0~ 400 Hz.

Modbus RTU Mode Protocol Address Table

Data: 16Bit/32Bit, +/- is 8000~7FFF (-32768~32767), 80000000~7FFFFFFF(-2147483648~2147483647)

Modbus	HEX	Name	Descriptions	Act
40001	0000	ID	Model number identification; KFM-R is "12"	R
40002	0001	STATUS	Current alarm output status display; range: 0000~00F0 (0~240) (0:OFF, 1:ON) (Bit7:AL4, Bit6: AL3, Bit5: AL2, Bit4: AL1)	R
40003	0002	DP	Decimal point setting; range: 0000~0004 (0~4) 0:10 ⁰ , 1:10 ⁻¹ , 2:10 ⁻² , 3:10 ⁻³ , 4:10 ⁻⁴	R/W
40004	0003	DPK	K factor decimal point setting; range: 0000~0004 (0~4) 0:10 ⁰ , 1:10 ⁻¹ , 2:10 ⁻² , 3:10 ⁻³ , 4:10 ⁻⁴	R/W
40005	0004	CTIME	Total time base setting, range: 0000~0002 (0~2) 0:sec, 1:min, 2:hour	R/W
40006	0005	UNIT	Flow unit setting; range: 0000~0002 (0~2) 0:Liter, 1:c.c., 2:m ³	R/W
40007	0006	LOCK	Key lock setting; range: 0000~0001 (0~1) 0:NO, 1:YES	R/W
40008	0007	FRAME	Frame setting; range 0000~0001(0~1) 0:NO, 1:YES	R/W
40009	0008	ACT1	Alarm 1 act setting; range 0000~0001(0~1) 0:Hi, 1:Lo	R/W
40010	0009	ACT2	Alarm 2 act setting; range 0000~0001(0~1) 0:Hi, 1:Lo	R/W
40011	000A	ACT3	Alarm 3 act setting; range 0000~0001(0~1) 0:Hi, 1:Lo	R/W
40012	000B	ACT4	Alarm 4 act setting; range 0000~0001(0~1) 0:Hi, 1:Lo	R/W
40013	000C	BAUD	Baud rate setting; range: 0000~0003 (0~3) 0:38400, 1:19200, 2:9600, 3:4800	R/W
40014	000D	PARI	Parity setting; range: 0000~0003 (0~3), 0:N.8.2., 1:N.8.1., 2:EVEN, 3:ODD	R/W
40015	000E	POLAR	Analog output polarity setting; range: 0000~0001 (0~1) 0:NO, 1:YES	R/W
40016	000F	AVG	Display average setting; range: 0001~0063 (1~99)	R/W
40017	0010	ADDR	Address setting; range: 0000~00FF (0~255)	R/W
40018	0011	DEL1	Alarm 1 act delay time setting; range: 0000~0063 (0~99)	R/W
40019	0012	DEL2	Alarm 2 act delay time setting; range: 0000~0063 (0~99)	R/W
40020	0013	DEL3	Alarm 3 act delay time setting; range: 0000~0063 (0~99)	R/W
40021	0014	DEL4	Alarm 4 act delay time setting; range: 0000~0063 (0~99)	R/W
40022	0015	TBASE	Sampling time base setting; range: 0001~270F (1~9999)	R/W
40023	0016	HYS1	Alarm 1 hysteresis setting; range: 0000~270F (0~9999)	R/W
40024	0017	HYS2	Alarm 2 hysteresis setting; range: 0000~270F (0~9999)	R/W
40025	0018	HYS3	Alarm 3 hysteresis setting; range: 0000~270F (0~9999)	R/W
40026	0019	HYS4	Alarm 4 hysteresis setting; range: 0000~270F (0~9999)	R/W
40027	001A	AZERO	Analog output zero setting; range: D8F1~270F (-9999~9999)	R/W
40028	001B	ASPAN	Analog output span setting; range: D8F1~270F (-9999~9999)	R/W
40029	001C	CODE	Pass code setting; range: 0000~4E1F (0~19999)	R/W
40030	001D	KF	K factor display; range: 00000001~0001869F (1~99999) Hi Bit	R/W
40031	001E		K factor display; range: 00000001~0001869F (1~99999)Lowi Bit	R/W
40032	001F	SCALE	Display scaling setting; range: 00000001~0001869F (0~199999) Hi Bit	R/W
40033	0020		Display scaling setting; range: 00000001~0001869F (0~199999) Low Bit	R/W
40034	0021	AL1	Alarm 1 setpoint setting; range: 00000000~0001869F(0~99999) Hi Bit	R/W

Modbus	HEX	Name	Descriptions	Act
40035	0022		Alarm 1 setpoint setting; range: 00000000~0001869F(0~99999) Low Bit	R/W
40036	0023	AL2	Alarm 2 setpoint setting; range: 00000000~0001869F(0~99999) Hi Bit	R/W
40037	0024		Alarm 2 setpoint setting; range: 00000000~0001869F(0~99999) Low Bit	R/W
40038	0025	AL3	Alarm 3 setpoint setting; range: 00000000~0001869F(0~99999) Hi Bit	R/W
40039	0026		Alarm 3 setpoint setting; range: 00000000~0001869F(0~99999) Low Bit	R/W
40040	0027	AL4	Alarm 4 setpoint setting; range: 00000000~0001869F(0~99999) Hi Bit	R/W
40041	0028		Alarm 4 setpoint setting; range: 00000000~0001869F(0~99999) Low Bit	R/W
40042	0029	ANLO	Analog output low scale setting; range: 00000000~0001869F (0~99999) Hi Bit	R/W
40043	002A		Analog output low scale setting; range: 00000000~0001869F (0~99999) Low Bit	R/W
40044	002B	ANHI	Analog output hi scale setting; range: 00000000~0001869F (0~99999) Hi Bit	R/W
40045	002C		Analog output hi scale setting; range: 00000000~0001869F (0~99999) Low Bit	R/W
40046	002D	DISPLAY	Current display; range: 00000000~0001869F (0~99999) Hi Bit	R
40047	002E		Current display; range: 00000000~0001869F (0~99999) Low Bit	R