

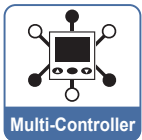
# KP400E SERIES

# Multi-Controller

## Features

- Main / Sub-Display, 4 ½ digital 7 segment LCD display
- Multifunctional sub-display
- Selectable unit :  
kPa, MPa, kgf / cm<sup>2</sup>, bar, psi, inHg, mmHg, mmAq, mL, L, mA, V
- Digital filter function
- Switchable voltage output  
( 1 ~ 5 V or 0 ~ 10 V )
- Sensor input : 0 ~ 10 V, 1 ~ 5 V, 4 ~ 20 mA
- 17 ranges for transducer
- Pirani gauge or pressure / flow transducer available

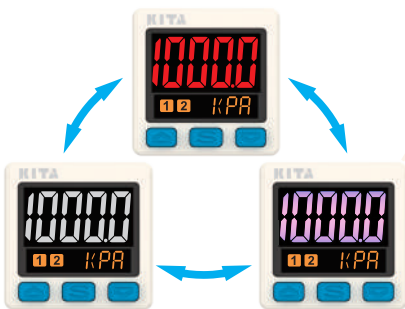
RS485 MODBUS CONTROL



## Features Highlight

### 1 4-Color Display

- Choose the desired backlight to highlight different setting states



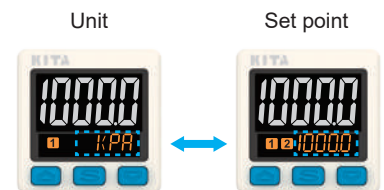
### 2 Selectable Unit

- Unit conversion easy to read

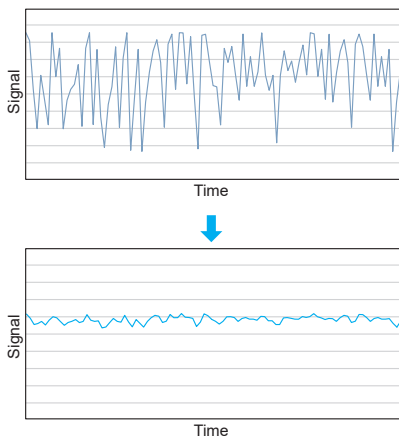


### 3 Multifunctional Sub-Display

- The display can be switched between pressure unit or set points

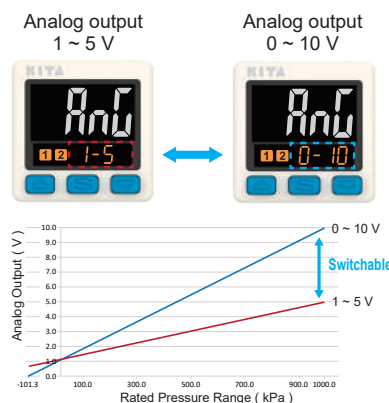


### 4 Digital Filter Function

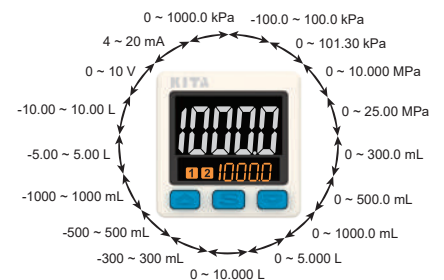


### 5 High-Resolution

- Flexibly switch the voltage output range



### 6 17 Ranges for Transducer



## Specifications

MODEL		KP400E				
Pirani Gauge Brand and Model		Self-Setting	INFICON : VGC501	Leybold : TTR 91 N	EDWARDS : APG100 / 200	EDWARDS : WRG200
Formula and Parameter	Formula	$10^{((V-a)/b)}$				
	Parameter a - mbar	5.000 ~ 8.083	6.143	6.143	6	8
	Parameter a - pa	5.000 ~ 8.083	3.572	3.572	4	6.666666666
	Parameter a - Torr	5.000 ~ 8.083	6.304	6.304	6.125	8.0833333
	Parameter b	1.000 ~ 1.286	1.286	1.286	1	0.666667
Power Supply Voltage		15 ~ 24 V DC, Ripple ( P-P ) ≤ 10 %				
Current Consumption		≤ 40 mA ( with no load )				
Sensor Input		0 ~ 10 V				
Switch Output		2 NPN open collector outputs Max. Load Current : 150 mA Max. Supply Voltage : 30 V DC Residual Voltage : ≤ 1 V		2 PNP open collector outputs Max. Load Current : 150 mA Max. Supply Voltage : 24 V DC Residual Voltage : ≤ 1 V		
Repeatability		≤ ± 0.1 % F.S. ± 1 digit ( Ambient temperature : 25 ± 3 °C )				
Hysteresis	One Point Set Mode	Adjustable ※1				
	Hysteresis Mode					
	Window Comparator Mode					
Response Time of Digital Filter ※2		oFF, 25 ms, 100 ms, 250 ms, 500 ms, 1000 ms, 1500 ms, 3000 ms selectable				
Overcurrent Protection		Yes				
Display		4 ½ digital, 7 segment LCD display ( Red / White / Pink / Orange ) ( Sampling rate : 0.2, 0.5, 1 sec. / time )				
Indicator Accuracy		≤ ± 0.5 % F.S ± 1digit ( Ambient temperature : 25 ± 3 °C )				
Switch on Indicator		Orange Indicator 1 : OUT1 & Orange Indicator 2 : OUT2				
Analog Output ( Voltage Output )		Output Voltage : 0 ~ 10 V ± 0.5 % F.S. Linearity : ± 0.5 % F.S. Output Impedance 2 KΩ				
Environment	Enclosure	IP40				
	Ambient Temp. Range	Operation : 0 ~ 50 °C ; storage : -10 ~ 60 °C ( No condensation or freezing )				
	Ambient Humidity Range	Operation / Storage : 35 ~ 85 % RH ( No condensation )				
	Withstand Voltage	1000 V AC in 1-min ( between case and lead wire )				
	Insulation Resistance	≥ 50 MΩ ( at 500 V DC, between case and lead wire )				
	Vibration	Total amplitude 1.5 mm or 10 G, 10 Hz ~ 55 Hz ~ 10 Hz scan for 1 minute, 2 hours each direction of X, Y and Z				
	Shock	100 m/s <sup>2</sup> ( 10 G ), 3 times each in direction of X, Y and Z				
Temperature Characteristic		≤ ± 0.5 % F.S. of detected pressure ( 25 °C ) at temp. ( Range of 0 ~ 50 °C )				
Communication Interface ※3		RS485 Modbus RTU				
Lead Wire		Ø4 PVC - 26 AWG ( 0.15 mm <sup>2</sup> ) - 5 cores				
Weight ( with 2 meter lead wire )		Approx. 67 g				

### NOTE

※1 : Hysteresis value is adjustable within 1 ~ 8 digits for one point set mode and window comparator mode.

※2 : When digital filter function is OFF, the response time is 4 ms ~ 6 ms.

※3 : This function is only available for Output Specification 02R and 04R.

# KP400E SERIES

# Multi-Controller

MODEL		KP410E																	
Sensor Type		S0	S01	S02	S03	S04	S05	S06	S07	S08	S09	S10	S11	S12	S13	S14	S15	S16	S17
Display Range		Self-Setting ※1 0 1000.0 kPa	-100.0 100.0 kPa	0 -101.3 kPa	0 10.000 MPa	0 25.00 MPa	0 300.0 mL	0 500.0 mL	0 1000.0 mL	0 5.000 L	0 10.000 L	-300 300 mL	-500 500 mL	-1000 1000 mL	-5.00 5.00 L	-10.00 10.00 L	0 10 V	4 20 mA	
Set Resolution	kPa	Self-Setting	0.1	0.1	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	MPa		0.0001	0.001	0.001	0.001	0.01	-	-	-	-	-	-	-	-	-	-	-	-
	kgf / cm <sup>2</sup>		0.001	0.001	0.001	0.01	0.1	-	-	-	-	-	-	-	-	-	-	-	-
	bar		0.001	0.001	0.001	0.01	0.1	-	-	-	-	-	-	-	-	-	-	-	-
	psi		0.01	0.01	0.01	0.1	1	-	-	-	-	-	-	-	-	-	-	-	-
	inHg		0.1	0.1	0.1	1	1	-	-	-	-	-	-	-	-	-	-	-	-
	mmHg		1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	mmAq ( mmH <sub>2</sub> O )		1 ※2	1 ※2	1 ※2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	mL		-	-	-	-	-	0.1	0.1	0.1	1	1	1	1	1	1	-	-	-
	L		-	-	-	-	-	0.0001	0.0001	0.0001	0.001	0.001	0.001	0.001	0.001	0.001	0.01	0.01	-
mA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.01	
V	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.001	-	
Power Supply Voltage		15 ~ 24 V DC, Ripple ( P-P ) ≤ 10 %																	
Current Consumption		≤ 40 mA ( with no load )																	
Sensor Input		0 ~ 10 V, 1 ~ 5 V, 4 ~ 20 mA selectable																	
Switch Output		2 NPN open collector outputs Max. Load Current : 150 mA Max. Supply Voltage : 30 V DC Residual Voltage : ≤ 1 V								2 PNP open collector outputs Max. Load Current : 150 mA Max. Supply Voltage : 24 V DC Residual Voltage : ≤ 1 V									
Repeatability		≤ ± 0.1 % F.S. ± 1 digit ( Ambient temperature : 25 ± 3 °C )																	
Hysteresis	One Point Set Mode	Adjustable ※3																	
	Hysteresis Mode																		
	Window Comparator Mode																		
Response Time of Digital Filter ※4		OFF, 25 ms, 100 ms, 250 ms, 500 ms, 1000 ms, 1500 ms, 3000 ms selectable																	
Overcurrent Protection		Yes																	
Display		4 ½ digital, 7 segment LCD display ( Red / White / Pink / Orange ) ( Sampling rate : 0.2, 0.5, 1 sec. / time )																	
Indicator Accuracy		≤ ± 0.5 % F.S ± 1digit ( Ambient temperature : 25 ± 3 °C )																	
Switch on Indicator		Orange Indicator 1 : OUT1 & Orange Indicator 2 : OUT2																	
Analog Output ( Voltage Output )		Output Voltage : 0 ~ 10 V ± 0.5 % F.S. Linearity : ± 0.5 % F.S. Output Impedance 2 KΩ																	
Analog Output ( Current Output )		Output Voltage : 4 ~ 20 mA ± 0.5 % F.S. Linearity : ± 0.5 % F.S. Max. Load Impedance : 250 Ω at power supply of 15 V, 600 Ω at power supply of 24 V Min. Load Impedance : 50 Ω																	
Environment	Enclosure	IP40																	
	Ambient Temp. Range	Operation : 0 ~ 50 °C ; Storage : -10 ~ 60 °C ( No condensation or freezing )																	
	Ambient Humidity Range	Operation / Storage : 35 ~ 85 % RH ( No condensation )																	
	Withstand Voltage	1000 V AC in 1-min ( between case and lead wire )																	
	Insulation Resistance	≥ 50 MΩ ( at 500 V DC, between case and lead wire )																	
	Vibration	Total amplitude 1.5 mm or 10 G, 10 Hz ~ 150 Hz ~ 10 Hz scan for 1 minute, 2 hours each direction of X, Y and Z																	
	Shock	100 m/s <sup>2</sup> ( 10 G ), 3 times each in direction of X, Y and Z																	
Temperature Characteristic		≤ ± 0.5 % F.S. of detected pressure ( 25 °C ) at temp. ( Range of 0 ~ 50 °C )																	
Communication Interface ※5		RS485 Modbus RTU																	
Lead Wire		Ø4 PVC - 26 AWG ( 0.15 mm <sup>2</sup> ) - 5 cores																	
Weight ( with 2 meter lead wire )		Approx. 67 g																	

## NOTE

※1 : S0 : Set the sensor range ( -1999 ~ 15000 ) by self. The decimal place can be adjusted.

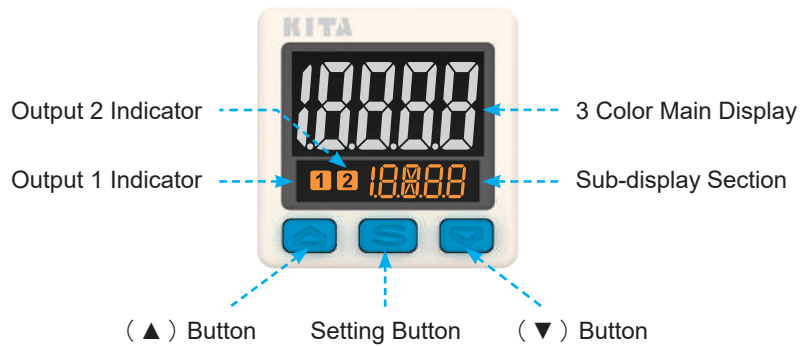
※2 : Actual value is 10 times display value while pressure unit is mmAq.

※3 : Hysteresis value is adjustable within 1 ~ 8 digits for one point set mode and window comparator mode.

※4 : When digital filter function is OFF, the response time is 4 ms ~ 6 ms.

※5 : This function is only available for Output Specification 02R and 04R.

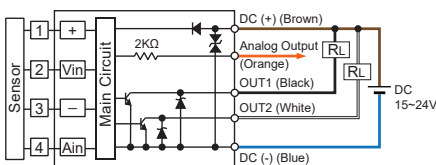
## Panel Description



## Circuit Wiring Diagrams

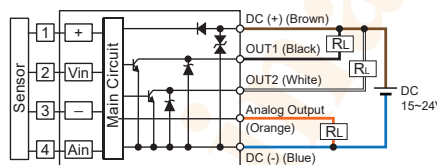
### KP4□0E - 010

2 NPN + Analog Output (0 ~ 10 V)



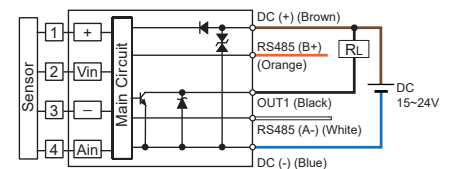
### KP410E - 011

2 NPN + Analog Output (4 ~ 20 mA)



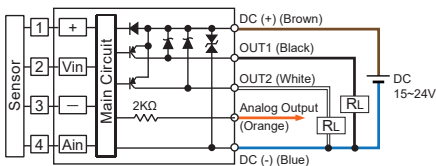
### KP4□0E - 02R

NPN Output + RS485



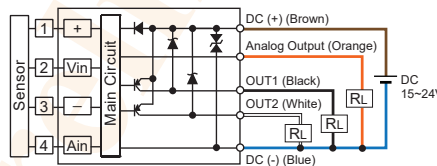
### KP4□0E - 030

2 PNP + Analog Output (0 ~ 10 V)



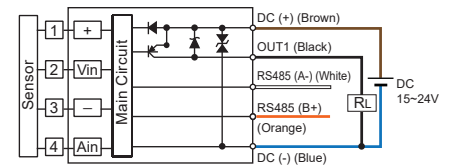
### KP410E - 031

2 PNP + Analog Output (4 ~ 20 mA)



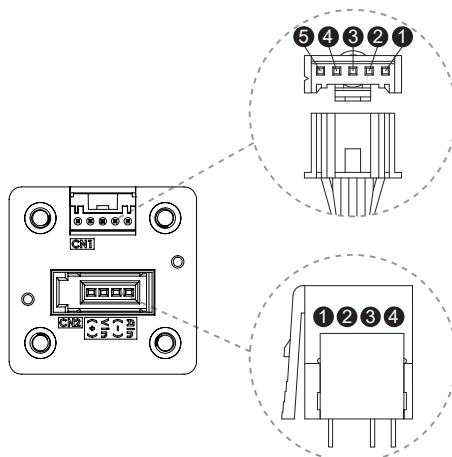
### KP4□0E - 04R

PNP Output + RS485



※ For RS485 MODBUS wiring, please connect RS485 (B+) or (A-) before powering to avoid short circuits resulting in product damage.

## Pinout



### • CN1 : Cable

Pin No.	Line Color	Content
①	Brown	DC (+)
②	Orange	Analog output or RS485 (B+)
③	White	OUT2 or RS485 (A-)
④	Black	OUT1
⑤	Blue	DC (-)

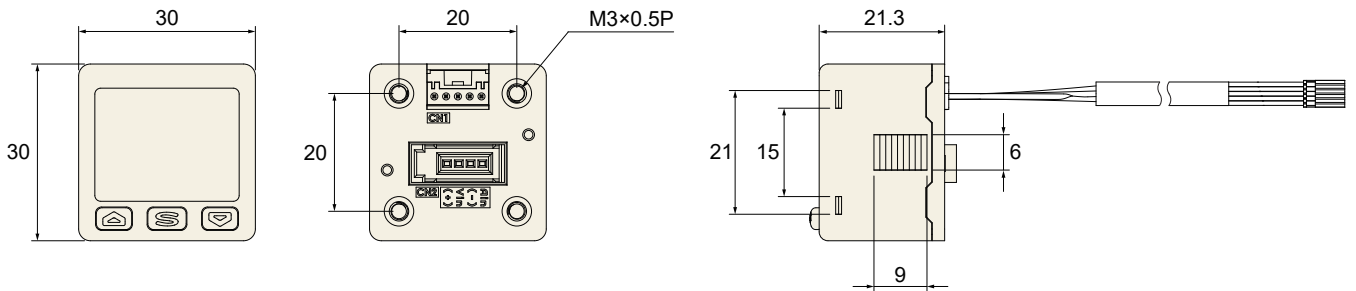
### • CN2 : Sensor connector

Pin No.	Content
①	DC (+)
②	Vin
③	DC (-)
④	Ain

# KP400E SERIES

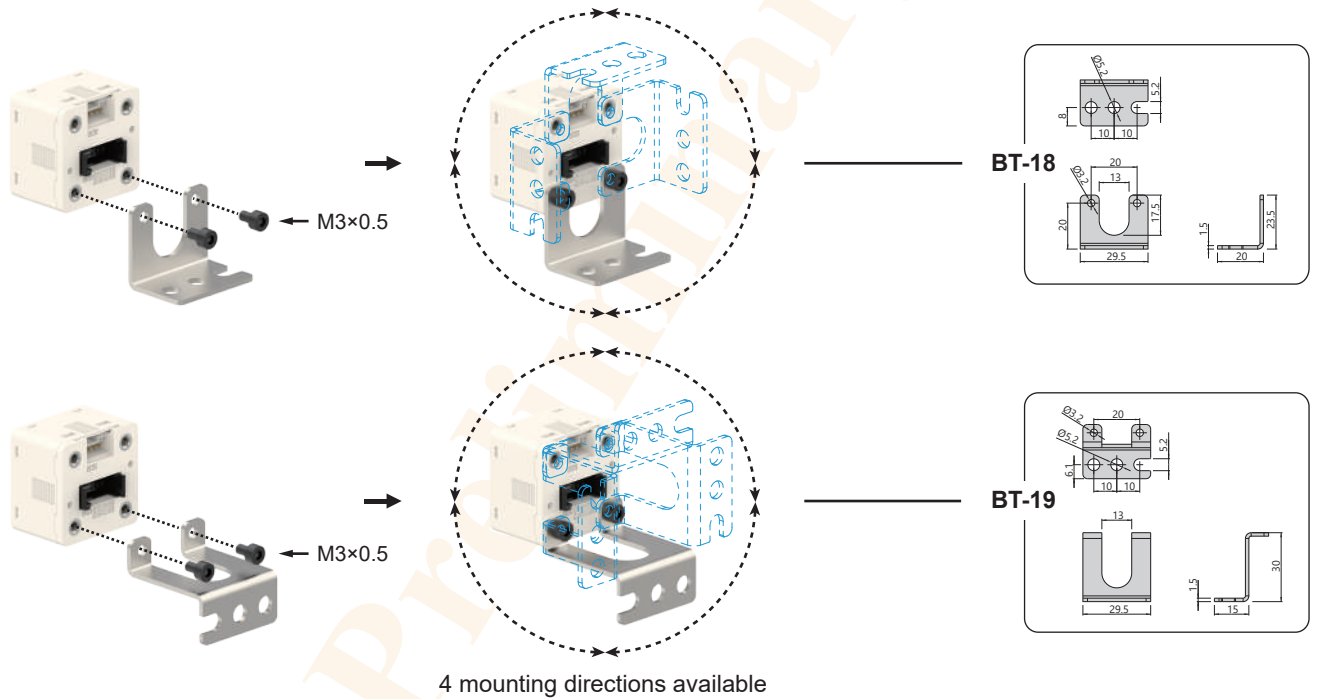
# Multi-Controller

## Dimensions

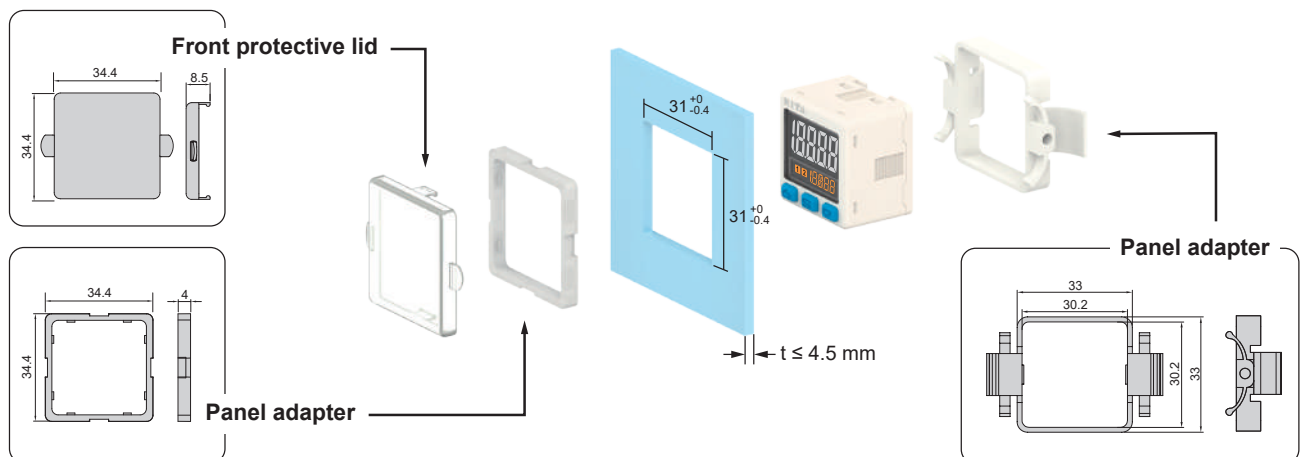


## Optional Parts Dimensions

### 1 Mounting Bracket



### 2 Panel Mount Adapter + Front Protective Lid



Unit : mm

## Ordering Information

**K P 4 1 0 E - 0 1 0**

### Input Specifications

0 : Pirani gauge  
1 : Voltage or current input

### Output Channel

0 : 1 Channel

### Output Specifications

010 : 2 NPN outputs & Analog output ( 0 ~ 10 V )  
011 : 2 NPN outputs & Analog output ( 4 ~ 20 mA ) ( for KP410E )  
030 : 2 PNP outputs & Analog output ( 0 ~ 10 V )  
031 : 2 PNP outputs & Analog output ( 4 ~ 20 mA ) ( for KP410E )  
02R : 1 NPN output + RS485  
04R : 1 PNP output + RS485

### Optional Parts

BT-18 : Mounting bracket	CN-0046A : Sensor connector Ø0.8 ~ Ø1.0 mm, 26 ~ 24AWG
BT-19 : Mounting bracket	CN-0046B : Sensor connector Ø1.0 ~ Ø1.2 mm, 26 ~ 24AWG
PA-C : Panel adapter	CN-0046C : Sensor connector Ø1.2 ~ Ø1.6 mm, 26 ~ 24AWG
PA-D : Panel adapter + Front protective lid	Transducer : KP10 □ - 01, KP2, KFPS, KFS

### Optional Parts

■ Mounting bracket : BT-18 / BT-19



■ Sensor connector  
CN-0046□



■ Transducer  
KP10□ - 01



■ Panel adapter : PA-C



■ Panel adapter + Front protective lid : PA-D



Preliminary