KP3000 SERIES

DIGITAL PROGRAM SETTER

PS PERFORMANCE SPECIFICATION
CHINO

The KP3000 series is a 96x96mm digital program setter with the analog output accuracy of ±0.1% and maximum 30 program patterns (maximum 19 steps/pattern).

Output signal can be specified from analog output type and digital output type. By combination with a digital indication controller with digital input, the configuration of low cost program control system is enabled.

■ FEATURES

● **Program pattern**
Settings of maximum 19 steps per pattern and maximum 30 sets of patterns are enabled. Repeating of a whole program pattern, linking of program patterns and repeating of a specific step in a program pattern are enabled, too.

● **Analog output type and digital output type**
Output of setting unit is selected from high accuracy (0.1%FS) analog output type and digital output type which has no setting error by using communications function.

● **Communications 2-port type provided**
Models with 2 communications ports are available. In addition, speeding up and highly-functionalization of communications have been realized. For example, you can use 1 port for high order communications with a personal computer and another port for the communications remote (digital remote) function. The communications protocol can be arbitrarily selected from [MODBUS] and [PRIVATE].
In the digital output type, however, 1-port type of communications is only available.

● **DI/DO arbitrarily-allocation**
When the digital input (DI) or the digital output (DO) is added, arbitrarily-allocation for assigning functions to those DI/DO's is enabled. It is the function enabling allocations such as [External drive input] to DI1 to DI3 and [Pattern selecting input] to DI4 to DI6.

● **Conforming to international safety standards and European directives (CE)**
The controller is conformity with European directives (CE), and is UL and c-UL approved.

● **Conforming to RoHS**
The controller is an environmental consideration product which does not contain directed hazardous substances such as lead, etc.

■ MODELS

KP3─☐0C☐☐☐─☐☐☐

Output signal
1: Digital output (RS422A)
2: Analog output (4 to 20mA)
4: Analog output (0 to 10V)
5: Analog output (0 to 1V)
6: Analog output (Others)
7: Digital output (RS485)

1st zone*
0: None
P: 6 Digital inputs
T: 6 Digital outputs

2nd zone*
0: None
P: 6 Digital inputs[*1]
T: 6 Digital outputs[*1]

3rd zone*
0: None
R: Communications 1 port (RS232C) + 3 Digital inputs[*2]
A: Communications 1 port (RS422A) + 1 Digital input[*3]
S: Communications 1 port (RS485) + 3 Digital input[*2]
B: Communications 2 ports (RS232C + RS232C) + 1 Digital input[*4]
C: Communications 2 ports (RS232C + RS422A) + 1 Digital input[*4]
D: Communications 2 ports (RS232C + RS485) + 1 Digital input[*4]
E: Communications 2 ports (RS485 + RS232C) + 1 Digital input[*4]
F: Communications 2 ports (RS485 + RS422A) + 1 Digital input[*4]
G: Communications 2 ports (RS485 + RS485) + 1 Digital input[*4]
P: 6 Digital inputs[*4]
T: 6 Digital outputs[*4]
U: 8 Digital inputs[*4]
W: 8 Digital outputs[*4]
Y: 3 Digital inputs + 5 Digital outputs[*4]
Z: 4 Digital inputs + 4 Digital outputs[*4]

Case color
G: Gray
B: Black

Panel sealing and terminal cover*
0: None
1: Terminal cover
2: IP54 panel sealing
3: IP54 panel sealing + Terminal cover

Power supply voltage
A: 100 to 240V (AC)
D: 24VAC/24VDC

* Option
*1 It can be selected when the control signal is 1 or 7 only.
*2 The digital input is 1 point for the control signal of 1 or 7.
*3 It can be selected when the control signal is 2, 4, 5, 6 or 7 only.
*4 It can be selected when the control signal is 2, 4, 5 or 6 only.
Note: For options common to 1st zone, 2nd zone and 3rd zone, assign them in order of [P] and [T] from 3rd zone first
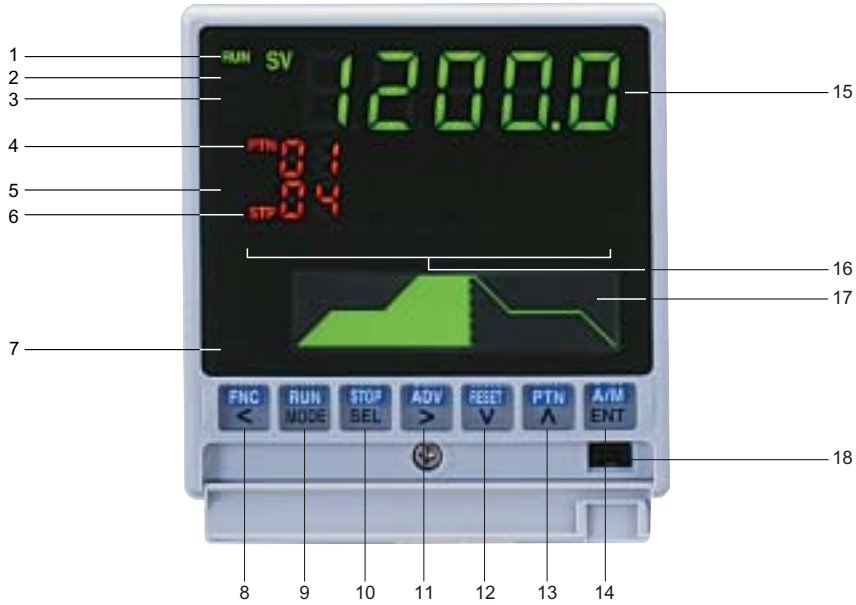
PSE-360A

KP3000 SERIES

■ SCREENS

Upper display

1. Operation status (RUN) indication
   Lights in operation.

2. Operation stop (STOP) indication
   Lights in the state of operation stop.

3. RESET indication
   Lights when operation is cancelled and returns to the start point.

4. Pattern No. (PTN) indication

5. Program remote (REM) indication
   Lights when operation is executed by digital input.

6. Executing step number (STP) indication
   The step No. being executed is indicated.

7. Function (FNC) operation indication
   Lights when the function key is operated.

15. Set value (SV) indication

16. Time signal (TS1 to TS8) indication

Function keys

8. FNC key
   With the operation screen displayed, pressing it puts the controller in the operation key mode. With the settings screen displayed, pressing it puts the controller in the setting key mode and it operates to move the cursor backwards.
9. RUN key
   In the operation key mode, it operates as Run key. With the settings screen displayed, pressing it puts the controller in the setting key mode and it is used for switching between the operation screen and the mode screen of Mode 0, or for switching from the settings screen to the mode screen.
10. STOP key
    In the operation key mode, it operates as Stop key. With the settings screen displayed, pressing it puts the controller in the setting key mode and it is used to switch the settings screen.
11. ADV key
    In the operation key mode, it operates as Advance key. With the settings screen displayed, pressing it puts the controller in the setting key mode and it is used for moving the cursor and for selecting a parameter.
12. RESET key
    In the operation key mode, it operates as Reset key. With the settings screen displayed, pressing it puts the controller in the setting key mode and it is used for changing a setting value (or selecting a parameter) in descending order.
13. PTN key
    In the operation key mode, it operates as Pattern key. With the settings screen displayed, pressing it puts the controller in the setting key mode and it is used for changing a setting value (or selecting a parameter) in ascending order.
14. ENT key
    It is used for registering the settings.

18. Engineering port

Lower display

17. A wide variety of operation screens are prepared and arbitrarily-selection is enabled.
    On the whole program pattern display screen, the simultaneous display of the shape of whole program pattern and the progressed pattern position has been realized.

Time screen

Pattern screen

■ OUTPUT SPECIFICATIONS

Output signal: Analog output 4 to 20mA, 0 to 1V, 0 to 10V
                   Digital output RS422A, RS485
Accuracy rating: ±0.1% of full scale
Output updating cycle:
                   Analog output Approximately 0.1 seconds
                   Digital output Approximately 1 second
Resolution: Approximately 1/30000
Output impedance: Voltage output Approximately 10Ω
Load resistance: Current output 400Ω or less
                   Voltage output 50kΩ or more

■ DISPLAY SPECIFICATIONS

Upper display: LED
Lower display: LCD (with back light) 108 x 24 dots

■ GENERAL SPECIFICATIONS

No. of program patterns:
                   30 patterns
                   Pattern repetition … Max.9999 times
No. of program step:
                   19 step/pattern
                   Step repetition … Max.99 times
Rated power voltage:
                   General power supply specifications 100 to 240VAC
                   24V Power supply specifications 24VAC/24VDC
Rated power supply frequency:
                   General power supply specifications 50/60Hz
                   24V Power supply specification 50/60Hz (24VAC)
Maximum power consumption:
                   General power supply specifications
                       Without options 100VAC 10VA
                                         240VAC 15VA
                       With options   100VAC 15VA
                                         240VAC 20VA
                   24V Power supply specifications
                       Without options 24VAC 10VA
                                         24VDC 5W
                       With options   24VAC 15VA
                                         24VDC 10W
Power failure countermeasures:
                   Settings stored in EEPROM (Rewrite count: One million
                   times or less) and stored by a lithium battery for 5 years or
                   more
Terminal screws: M3.5
Insulation resistance:
                   Between primary terminals and secondary terminals
                       20MΩ or more (500VDC)
                   Between primary terminals and protective conductor
                   terminal
                       20MΩ or more (500VDC)
                   Between secondary terminals and protective conductor
                   terminal
                       20MΩ or more (500VDC)
Withstand voltage: Between primary terminals and secondary terminals
                       1500VAC (For 1 minute)
                   Between primary terminals and protective conductor
                   terminal
                       1500VAC (For 1 minute)
                   Between secondary terminals and protective conductor
                   terminal
                       500VAC (For 1 minute)
                   *Primary terminal: Terminals for power supply (100
                       to 240VAC)
Casing: Fire-retardant polycarbonate
Color: Gray or black
Mounting: Panel mounting
External dimensions:
                   96 (H) x 96 (W) x 127 (D) mm
                   *The depth from the front panel is 120mm.
Weight: Without options Approximately 450g
                   With options Approximately 580g

■ SAFTY STANDARD

CE directives: EN61326: 1997 +A1+A2+A3
                   EN61010-1: 2001 (Overvoltage category II, pollution
                       degree 2)
                   * Under the test conditions of EMC directives, there may be
                   variation of indication value or output value which is
                   equivalent to maximum ±10% or maximum 2mV, whichever
                   is greater.
UL: UL61010-1 2nd edition
c–UL: CAN/CSA C22.2 No.61010-1-04

■ REFERENCE OPERATION CONDITIONS

Ambient temperature:
                   23°C ± 2°C
Ambient humidity: 55%RH ± 5% (No condensation)
Power voltage: General power supply specifications
                       100VAC ±1%
                   24V power supply specifications
                       24VDC ±1%
Power supply frequency:
                   General power supply specifications
                       50/60Hz ±0.5%
                   24V power supply specifications
                       DC
Mounting angle: Forward or backward ±3°, lateral ±3°
Installation height: Altitude 2000m or below
Vibration: 0m/s²
Impact: 0m/s²
Mounting condition:
                   Single-unit panel mounting (Space above, below, right and
                   left of unit is needed.)
Wind: None
External noise: None
Warm up time: 30 minutes or longer

■ NORMAL OPERATION CONDITIONS

Ambient temperature:
                   -10°C to 50°C (-10°C to 40°C for closed installation)
Ambient humidity: 10 to 90%RH (no condensation)
Power voltage: General power supply specifications 90 to 264VAC
                   24V Power supply specifications 21.6 to 26.4VDC/AC
Power supply frequency:
                   General power supply specifications 50/60Hz ± 2%
                   24V Power supply specifications DC, 50/60Hz ± 2%
Mounting angle: Forward or backward ±10°, lateral ±10°
Installation height: Altitude 2000m or below
Vibration: 2m/s²
Shock: 0m/s²
Mounting condition:
                   Single-unit panel mounting (Space above and below of the
                   unit is needed.)
External noise: None
Rate of ambient temperature change:
                   10°C/hour or less

■ TRANSPORT CONDITIONS

Ambient temperature:
                   -20°C to 60°C
Ambient humidity: 5 to 90%RH (no condensation)
Vibration: 4.9m/s² (10 to 60Hz)
Impact: 392m/s²
                   Under the condition that the unit is packed for shipment by
                   the factory

■ STORAGE CONDITIONS

Ambient temperature:
                   -20°C to 60°C
                   For long term storage, the temperature should be 10°C to
                   30°C.
Ambient humidity: 5 to 90%RH (no condensation)
Vibration: 0m/s²
Impact: 0m/s²
                   Under the condition that the unit is packed for shipment by
                   the factory

■ OPTIONS

● Communications interface

With RS232C, RS422A or RS485, the setting and measured values of the controller can be transmitted to a master CPU and various parameters can be set by the master CPU.

Number of communications points:

    2 points

Communications type: RS232C, RS422A, RS485

Communication speed: 2400/4800/9600/19200/38400 bps

Protocol: MODBUS (RTU), MODBUS (ASCII), PRIVATE

● Digital signal input

The following switching is enabled by digital input signal.

Input signal: No-voltage contact, open-collector signal

External contact capacity:

    5VDC 2mA

Functions: 1. Selection of pattern No. (6 points)

    2. Run/stop

    3. Advance

    4. Reset

    5. Wait

    6. Fast

● Digital signal output

Time signal or status signal can be outputted externally open-collector signal.

Output signal: Open-collector signal

Capacity: 24VDC, Maximum 50mA

Functions: 1. Time signal (Maximum 8 points)

    2. Run/stop

    3. Advance

    4. Reset

    5. Wait

    6. End

● Panel sealing

By mounting the controller to a panel, it has the panel sealing equivalent to [IP54 compliance].

● Terminal cover

It covers the terminals for safe. The cover is transparent.

■ TERMINAL ARRANGEMENT

Option terminals

100-240V AC
24V AC/DC

Analog output
(Voltage/current)

Digital output

Communications RS422A	Communications RS485
SG	
RDA	SA
RDB	SB
SDA	SG
SDB	
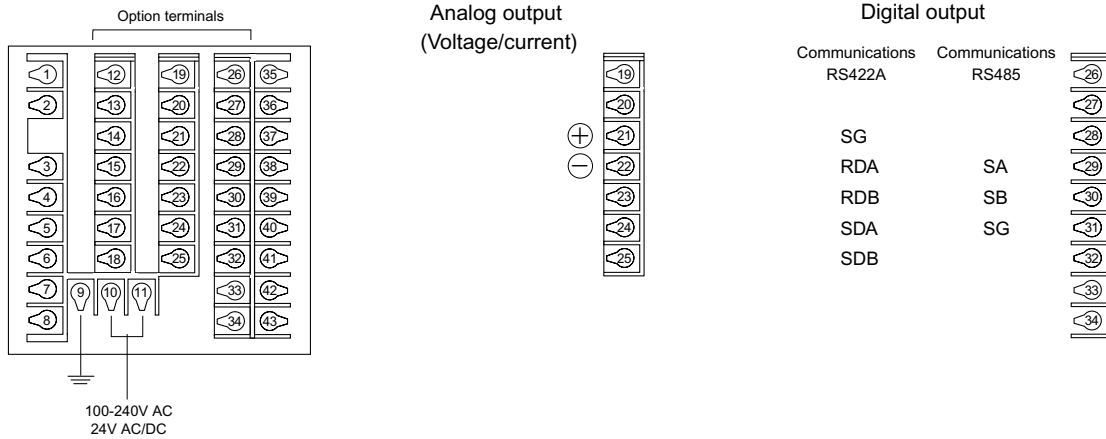
● Digital output + Communications

Communications RS232C + Digital output RS422A + 1 digital input	Communications RS485 + Digital output RS422A + 1 digital input	Communications RS232C + Digital output RS485 + 1 digital input	Communications RS485 + Digital output RS485 + 1 digital input	Digital output RS485 + Communications RS422A + 1 digital input
RD	SA	RD	SA	SA
SD	SB	SD	SB	SB
SG	SG	SG	SG	SG
RDA	RDA	SA	SA	RDA
RDB	RDB	SB	SB	RDB
SDA	SDA	SG	SG	SDA
SDB	SDB			SDB
DI	DI	DI	DI	DI
COM	COM	COM	COM	COM

(Terminals 26–34)

● Option terminals

Options common to each zone

	P	T
	DI	DO
	DI	DO
	DI	DO
	DI	DO
	DI	DO
	DI	DO
	COM	COM

P: 6 digital inputs
T: 6 digital output

1st ← 2nd ← 3rd zone
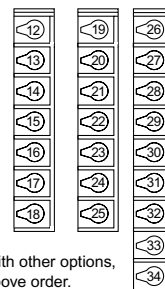
Based on combination with other options, assign the zone in the above order.

3rd zone

Terminals	R	A	S	B	C	D	E	F	G	U	W	Y	Z
26	RD	RDA	SA	RD1	RD1	RD1	SA1	SA1	SA1	DI	DO	DO	DO
27	SD	SDB	SB	SD1	SD1	SD1	SB1	SB1	SB1	DI	DO	DO	DO
28	SG	SDA	SG	SG1	SG1	SG1	SG1	SG1	SG1	DI	DO	DO	DO
29	DI	SDB	DI	RD2	RDA2	SA2	RD2	RDA2	SA2	DI	DO	DO	DO
30	DI	SG	DI	SD2	RDB2	SB2	SD2	RDB2	SB2	DI	DO	DO	DI
31	DI	DI	DI	SG2	SDA2	SG2	SG2	SDA2	SG2	DI	DO	DI	DI
32	COM	COM	COM		SDB2			SDB2		DI	DO	DI	DI
33				DI	DI	DI	DI	DI	DI	DI	DO	DI	DI
34				COM	COM	COM	COM	COM	COM	COM	DO	COM	COM

R: Communications RS232C + 3 Digital inputs
A: Communications RS422A + 1 Digital input
S: Communications RS485 + 3 Digital inputs
B: Communications RS232C + Communications RS232C
  + 1 Digital input
C: Communications RS232C + Communications RS422A
  + 1 Digital input

D: Communications RS232C + Communications RS485
  + 1 Digital input
E: Communications RS485 + Communications RS232C
  + 1 Digital input
F: Communications RS485 + Communications RS422A
  + 1 Digital input

G: Communications R485 + Communications RS485
  + 1 Digital input
U: 8 Digital inputs
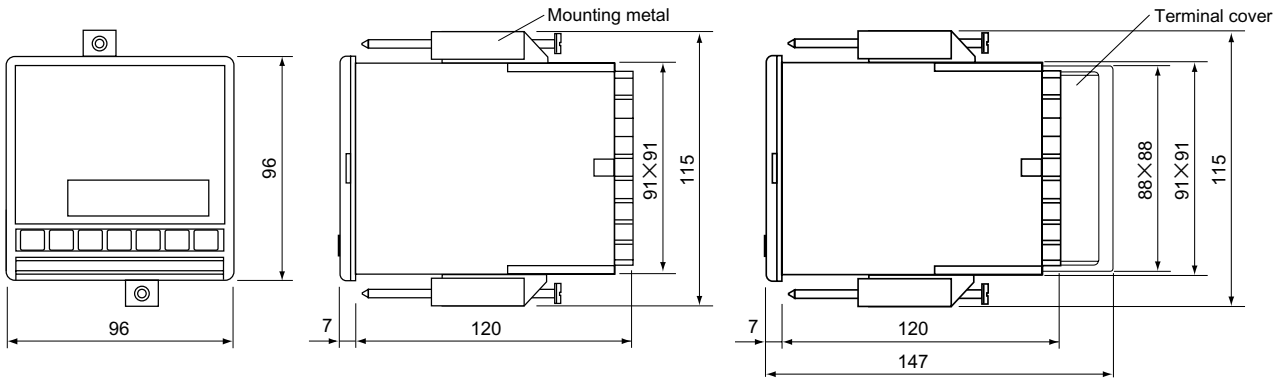W: 8 Digital outputs
Y: 3 Digital inputs + 5 Digital outputs
Z: 4 Digital inputs + 4 Digital outputs
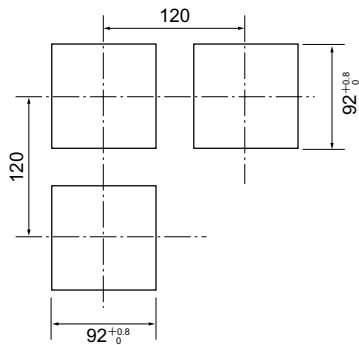
● **ABOUT CRIMP STYLE TERMINALS**

● Ring type

7 or less
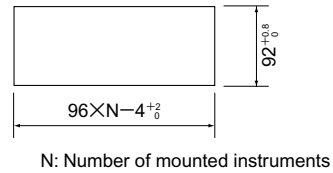ϕ3.7 or less
7 or less

(in pressed condition)

● Spade type

7 or less
ϕ3.7 or less
7 or less

(in pressed condition)

*Use terminal with insulation

■ EXTERNAL DIMENSIONS

Mounting metal

Terminal cover

96
96
91×91
115
7
120

88×88
91×91
115
7
120
147

● **PANEL CUTOUT**

120
120
$92^{+0.8}_{0}$
$92^{+0.8}_{0}$

● **Closed mounting panel dimensions**

$92^{+0.8}_{0}$
$96 \times N - 4^{+2}_{0}$

N: Number of mounted instruments

Unit: mm