

## Plug-in Signal Conditioners K-UNIT

### D/A CONVERTER

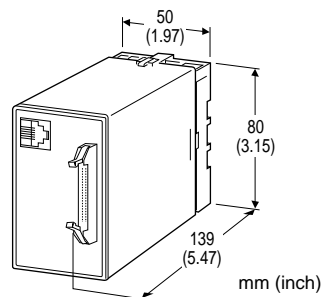
(16-bit resolution; programmable with programming unit)

#### Functions & Features

- Converts parallel digital signal into a DC output
- BCD, binary, offset binary, two's complement, reflected binary inputs
- Positive or negative logic selectable
- Scalable DC output range
- Programming Unit (PU-2x) used for setting

#### Typical Applications

- Interface of analog signal for computers and PLC



## MODEL: KDA3-[1][2]-[3][4]

### ORDERING INFORMATION

- Code number: KDA3-[1][2]-[3][4]
- Specify a code from below for each [1] through [4].  
(e.g. KDA3-V11-M2/A/Q)
- Specify the specification for option code /Q  
(e.g. /C01/S01)
- Use Ordering Information Sheet (No. ESU-3646) for specifying programmable variables. Default setting will be used if not specified.

### [1] OUTPUT

#### Current

Z1: Range 0 - 20 mA DC (Load resistance 600Ω max.)

#### Voltage

V1: Range -1 - +1 V DC (Load resistance 1000Ω min.)

V2: Range -10 - +10 V DC (Load resistance 10kΩ min.)

### [2] RESPONSE TIME

1: 400 msec.

2: 10 msec.

### [3] POWER INPUT

#### AC Power

M2: 100 - 240 V AC (Operational voltage range 85 - 264 V, 47 - 66 Hz)

#### DC Power

R3: 12 - 24 V DC

(Operational voltage range 10.8 - 26.4 V, ripple 10 %p-p max.)

P: 110 V DC

(Operational voltage range 85 - 150 V, ripple 10 %p-p max.)

### [4] OPTIONS (multiple selections)

#### Input

Blank: TTL level

/A: 24 V DC

#### Other Options

blank: none

/Q: Option other than the above (specify the specification)

### SPECIFICATIONS OF OPTION: Q (multiple selections)

#### COATING (For the detail, refer to M-System's web site.)

/C01: Silicone coating

/C02: Polyurethane coating

/C03: Rubber coating

#### TERMINAL SCREW MATERIAL

/S01: Stainless steel

### FACTORY DEFAULT SETTING

CONTENTS	DEFAULT
Display code	0: BCD (decimal)
Available number of bits	0: 16 bits
0% scaling value	-9999 BCD input
100% scaling value	9999
Data input logic	1: Negative
LOAD input	0: LOAD at Low or shortcircuit
POL input	1: Available (used)
POL input	1: Negative at Low or shortcircuit
Parity check	0: Disable
Odd or even parity	0: Odd
Delay buffer (seconds, 0 - 90%)	0.0
0% output	V1: -1.00
	V2: -10.0
	Z1: 4.0
100% output	V1: 1.00
	V2: 10.0
	Z1: 20.0

### RELATED PRODUCTS

- Connector terminal block (model: CNT)
- Special cable (model: MCN26)
- Programming Unit (model: PU-2x)



## GENERAL SPECIFICATIONS

**Construction:** Plug-in

**Connection**

**Input:** 26-pin connector(OMRON XG4A-2634)

**Paired connector:** OMRON XG4M-2630-T, XG5M-263x-N

**Cover:** OMRON XG5S-2612

**Output, power:** M3.5 screw terminals

**Screw terminal:** Chromated steel (standard) or stainless steel

**Housing material:** Flame-resistant resin (black)

**Isolation:** Input to output to power

**Overrange output:** Approx. -15 to +115 %

**Setting:** Programming Unit (model: PU-2x)

- Scaled range
- Input code
- Available number of bits
- POL input
- Data input logic
- LOAD input
- Parity check

For detailed information, refer to the instruction manual.

## INPUT SPECIFICATIONS

■ **Input Code:** Code, logic and scaling are user-selectable.

- BCD with polarity
- Binary with polarity
- Offset binary
- Two's complement
- Reflected binary

■ **Input Specifications**

● **TTL Level:** TTL level (5 V-CMOS level) or open collector (sink type), dry contact (saturation voltage  $\leq 1$  V, sink current 1 mA)

**Saturation voltage:**  $\leq 1$  V

**Sink current:** 1 mA

**Common:** Negative

● **24 V DC:** Open collector (source type)

**Rated voltage:** 24 V DC  $\pm 10\%$ , ripple 5 %p-p max.

**ON voltage/current:**  $\geq 18$  V / 2.5 mA DC

**OFF voltage/current:**  $\leq 3$  V / 0.4 mA DC

**Input current:**  $\leq 3.5$  mA @24 V DC

**Input resistance:** Approx. 7.5 k $\Omega$

**Common:** Negative

## OUTPUT SPECIFICATIONS

■ **DC Current:** 0 - 20 mA DC

**Operational range:** 0 - 24.0 mA DC

**Minimum increment:** 0.1 mA

**Default setting:** 4 - 20 mA DC

■ **DC Voltage**

**Code V1:** -1.00 - +1.00 V DC

**Operational range:** -1.15 - +1.15 V DC

**Minimum increment:** 10 mV

**Code V2:** -10.0 - +10.0 V DC

**Operational range:** -11.5 - +11.5 V DC

**Minimum increment:** 100 mV

**Default setting:**

**Code V1:** -1.00 - +1.00 V DC

**Code V2:** -10.00 - +10.00 V DC

## INSTALLATION

**Power consumption**

•AC: Approx. 8 VA

•DC: Approx. 4 W (160 mA at 24 V)

**Operating temperature:** -5 to +55°C (23 to 131°F)

**Operating humidity:** 30 to 90 %RH (non-condensing)

**Mounting:** Surface or DIN rail

**Weight:** 300 g (0.66 lb)

## PERFORMANCE in percentage of span

**Accuracy:**  $\pm 0.1$  %

**Temp. coefficient:**  $\pm 0.015$  %/°C ( $\pm 0.008$  %/°F)

**Resolution:** 16 bits

**Response time:**  $\leq 400$  msec. or  $\leq 10$  msec. (0 - 90 %) as specified by model suffix code, with ITEM 25 set to 0.0.

**Line voltage effect:**  $\pm 0.1$  % over voltage range

**Insulation resistance:**  $\geq 100$  M $\Omega$  with 500 V DC

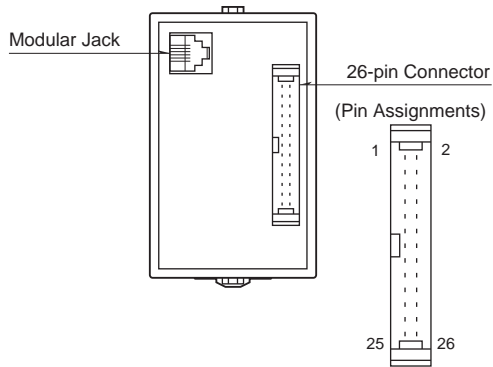
**Dielectric strength:** 1500 V AC @1 minute (input to output to power)

2000 V AC @1 minute

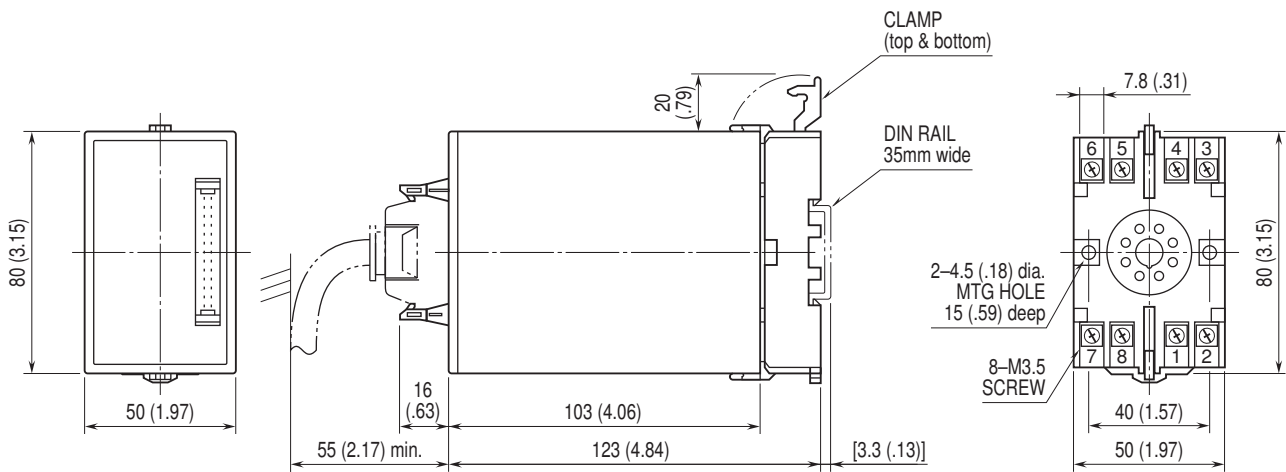
(input or output or power to ground)



## EXTERNAL VIEW



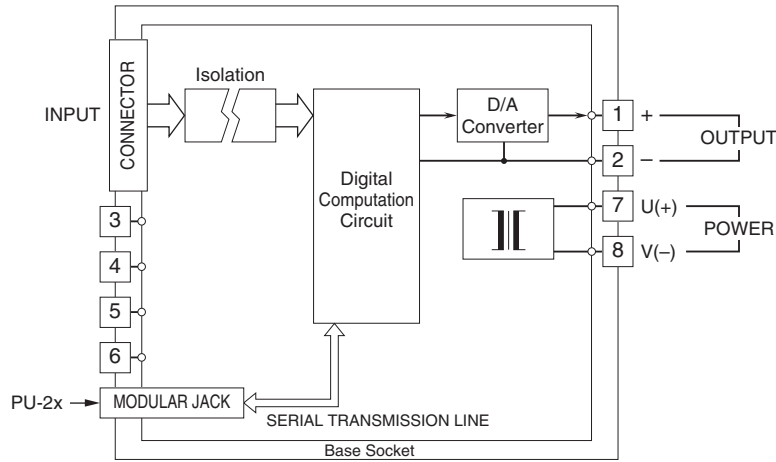
## EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm (inch)



•When mounting, no extra space is needed between units.

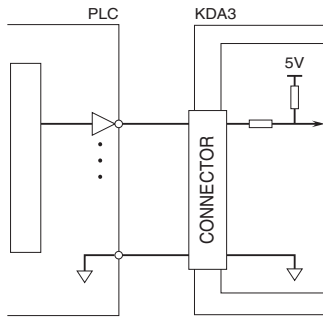


## SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM

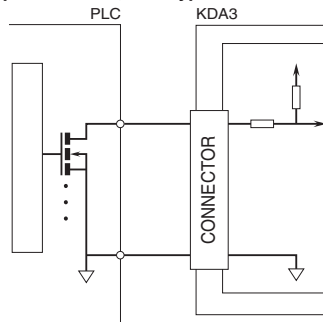


### Input Connection Examples

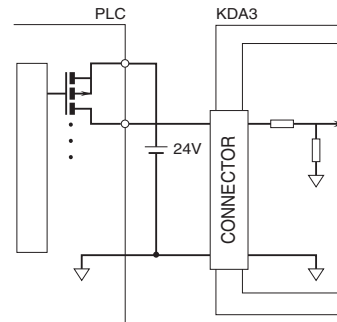
- Standard type
- TTL level



### Open collector, sink type



- Option /A
- 24V DC



## INPUT CONNECTOR (26-pin)

### BCD INPUT

PIN NO.	ASSIGNMENT	PIN NO.	ASSIGNMENT
1	$1 \times 10^0$	17	COM (-)
2	$2 \times 10^0$	18	COM (-)
3	$4 \times 10^0$	19	No connection
4	$8 \times 10^0$	20	POL
5	$1 \times 10^1$	21	LOAD *1
6	$2 \times 10^1$	22	LOAD *1
7	$4 \times 10^1$	23	P <sup>0</sup> *2
8	$8 \times 10^1$	24	P <sup>1</sup>
9	$1 \times 10^2$	25	P <sup>2</sup>
10	$2 \times 10^2$	26	P <sup>3</sup>
11	$4 \times 10^2$		
12	$8 \times 10^2$		
13	$1 \times 10^3$		
14	$2 \times 10^3$		
15	$4 \times 10^3$		
16	$8 \times 10^3$		

\*1. Pin No. 21 and 22 are internally connected.

\*2. P<sup>0</sup> corresponds to  $n \times 10^0$ , P<sup>1</sup> to  $n \times 10^1$ , P<sup>2</sup> to  $n \times 10^2$ , P<sup>3</sup> to  $n \times 10^3$ . Only P<sup>0</sup> corresponds when the parity for all digits are valid.

Note: With the number of bits set to 14 (or 12, 10, 8) with ITEM 18, Pin No. 1 - 14 (or 1 - 12, 1 - 10, 1 - 8) are valid.

### BINARY, TWO'S COMPLEMENT INPUTS

PIN NO.	ASSIGNMENT	PIN NO.	ASSIGNMENT
1	B <sup>0</sup>	17	COM (-)
2	B <sup>1</sup>	18	COM (-)
3	B <sup>2</sup>	19	No connection
4	B <sup>3</sup>	20	POL
5	B <sup>4</sup>	21	LOAD *1
6	B <sup>5</sup>	22	LOAD *1
7	B <sup>6</sup>	23	P <sup>0</sup> *2
8	B <sup>7</sup>	24	P <sup>1</sup>
9	B <sup>8</sup>	25	P <sup>2</sup>
10	B <sup>9</sup>	26	P <sup>3</sup>
11	B <sup>10</sup>		
12	B <sup>11</sup>		
13	B <sup>12</sup>		
14	B <sup>13</sup>		
15	B <sup>14</sup>		
16	B <sup>15</sup>		

\*1. Pin No. 21 and 22 are internally connected.

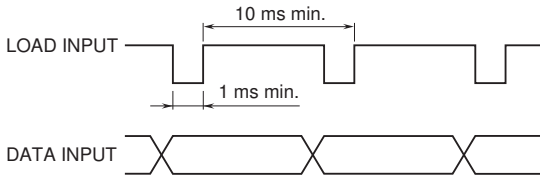
\*2. P<sup>0</sup> corresponds to B<sup>0</sup> through B<sup>3</sup>, P<sup>1</sup> to B<sup>4</sup> through B<sup>7</sup>, P<sup>2</sup> to B<sup>8</sup> through B<sup>11</sup>, P<sup>3</sup> to B<sup>12</sup> through B<sup>15</sup>. Only P<sup>0</sup> corresponds when the parity for all digits are valid.

Note: With the number of bits set to 14 (or 12, 10, 8) with ITEM 18, Pin No. 1 - 14 (or 1 - 12, 1 - 10, 1 - 8) are valid.



**TIMING CHART**

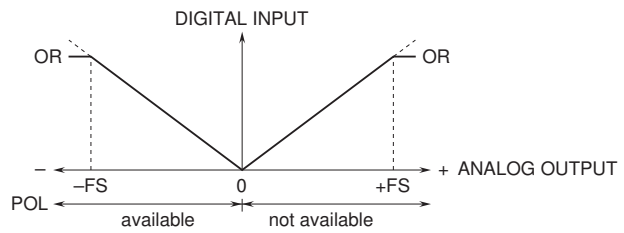
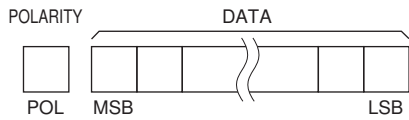
• Example: TTL Level Input (factory setting)



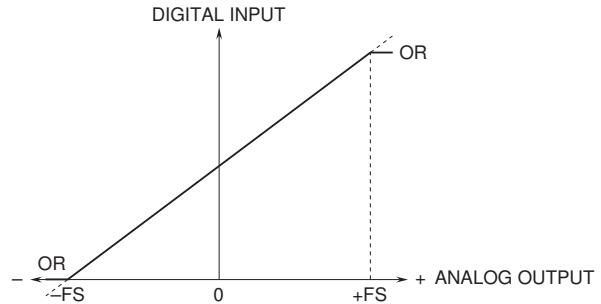
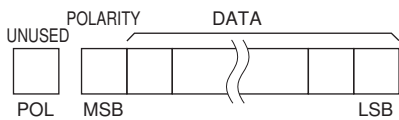
The unit reads data upon detecting a change of LOAD input status.  
DO NOT change LOAD input setting when the data input logic is changed.

**INPUT-OUTPUT RELATION EXAMPLES**

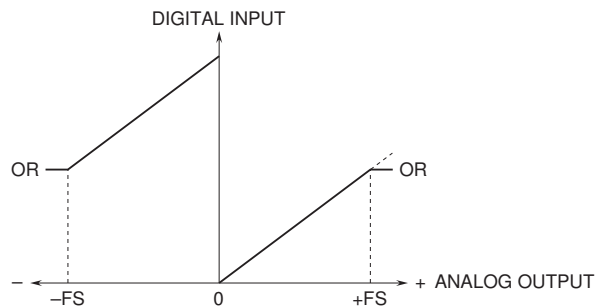
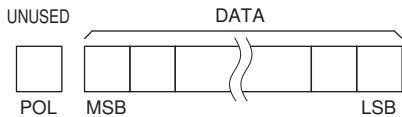
BCD, BINARY (WITH POLARITY)



OFFSET BINARY



TWO'S COMPLEMENT



Specifications are subject to change without notice.

