

<p>D/A CONVERTER (16-bit resolution; programmable with programming unit)</p>	<p>MODEL KDA3</p>
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BEFORE USE

Thank you for choosing M-System. Before use, please check contents of the package you received as outlined below. If you have any problems or questions with the product, please contact M-System's Sales Office or representatives.

■ PACKAGE INCLUDES:

Signal conditioner (body + base socket).....1)

■ MODEL NO.

Confirm Model No. marking on the product to be exactly what you ordered.

■ INSTRUCTION MANUAL

This manual describes necessary points of caution when you use this product, including installation, connection and basic maintenance procedures.

When you need to change software settings, please refer to the Operation Manual for Model PU-2x (EM-9255), Section B.

POINTS OF CAUTION

■ POWER INPUT RATING & OPERATIONAL RANGE

- Locate the power input rating marked on the product and confirm its operational range as indicated below:
 100 – 240V AC rating: 85 – 264V, 47 – 66 Hz, approx. 8VA
 12 – 24V DC rating: 10.8 – 26.4V, approx. 4W
 110V DC rating: 85 – 150V, approx. 4W

■ GENERAL PRECAUTIONS

- Before you remove the unit from its base socket or mount it, turn off the power supply and input signal for safety.

■ ENVIRONMENT

- Indoor use.
- When heavy dust or metal particles are present in the air, install the unit inside proper housing with sufficient ventilation.
- Do not install the unit where it is subjected to continuous vibration. Do not subject the unit to physical impact.
- Environmental temperature must be within -5 to +55°C (23 to 131°F) with relative humidity within 30 to 90% RH in order to ensure adequate life span and operation.

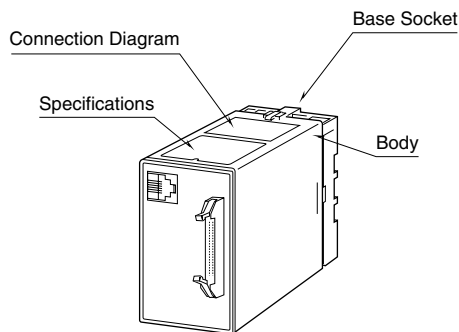
■ WIRING

- Do not install cables close to noise sources (relay drive cable, high frequency line, etc.).
- Do not bind the unit's cables together with cables where high noise levels are present. Do not install them in the same duct.

■ AND

- The unit is designed to function as soon as power is supplied, however, a warm up for 10 minutes is required for satisfying complete performance described in the data sheet.

COMPONENT IDENTIFICATION

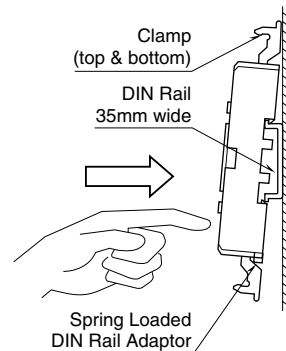


INSTALLATION

Detach the yellow clamps located at the top and bottom of the unit for separate the body from the base socket.

■ DIN RAIL MOUNTING

Set the base socket so that its DIN rail adaptor is at the bottom. Hang the upper hook at the rear side of base socket on the DIN rail and push in the lower. When removing the socket, push down the DIN rail adaptor utilizing a minus screwdriver and pull.



■ WALL MOUNTING

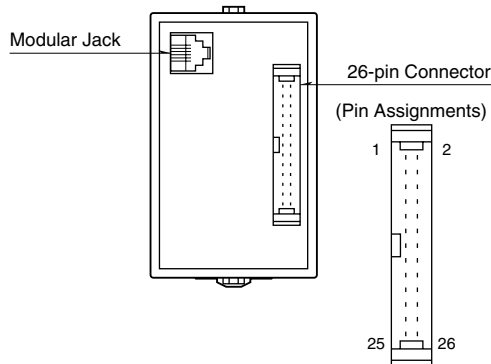
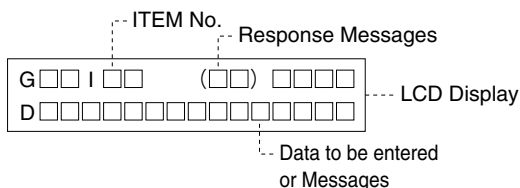
Refer to "EXTERNAL DIMENSIONS."

Shape and size of the base socket are slightly different with various socket types.

FRONT PANEL CONFIGURATION & PROGRAMMING WITH PU-2x

• Response Messages

- OK:** OK
- NG:** No good. Check modular jack connection.
- ER:** Communication error



[GROUP 00]

ITEM	MDF. CODE	INPUT DATA	EXAMPLE (DEFAULT)	CONTENTS
01	S	0, 1	MNTSW : MON MODE	Modification code 0 : Data indication only. 1 : All parameters are modifiable.
02	D		STATUS : 0	Status indication
03	D		DEVICE : 0 DEVICE : 1 DEVICE : 2	Output type 0 : V1 1 : V2 2 : Z1
04	P	0 – 99	POWONDELAY : 5	Power ON-delay time (seconds)
10	D	-15.0 – 115.0	%PV : XXX.X	Output indicated in % (as set in ITEM 26/27)
11	P	-99.99 – 99.99	ZERO : 0.00	Zero adjustment (%) (fine adj. of the value set in ITEM 26)
12	P	-99.99 – 99.99	SPAN : 0.00	Span adjustment (%) (fine adj. of the value set in ITEM 27)
13	D		PV : YYYY	Input indicated in engineering unit (as scaled in ITEM 14/15)
14	P	-9999 – 9999	SCALE 0 : -9999	BCD Scaled range 0%*1
15	P	-9999 – 9999	SCALE 100 : 9999	Scaled range 100%*1
14	P	-7FFF – 7FFF	SCALE 0 : -7FFF	Binary Scaled range 0%*1
15	P	-7FFF – 7FFF	SCALE 100 : 7FFF	Scaled range 100%*1
14	P	0000 – FFFF	SCALE 0 : 0000	Offset binary Scaled range 0%*1
15	P	0000 – FFFF	SCALE 100 : FFFF	Reflected binary Scaled range 100%*1
14	P	8000 – 7FFF	SCALE 0 : 8000	Two's complement Scaled range 0%*1
15	P	8000 – 7FFF	SCALE 100 : 7FFF	Scaled range 100%*1
17	P	0, 1, 2, 3, 4	CODE : 0	Input code 0 : BCD with polarity (decimal) 1 : Binary with polarity 2 : Offset binary 3 : Two's complement 4 : Reflected binary
18	P	0, 1, 2, 3, 4	AV1L_BIT : 0	Available number of bits 0: 16 bits 1: 14 bits 2: 12 bits 3: 10 bits 4: 8 bits
19	P	0, 1	POLAR : 1	POL input 0 : Unavailable (unused) 1 : Available (used)
20	P	0, 1	DATA_LOGIC : 1	Data input logic*2 0 : Positive 1 : Negative
21	P	0, 1, 2	LOAD_LOGIC : 0	LOAD input 0 : LOAD at Low or shortcircuit*3 1 : LOAD at High or opencircuit*4 2 : Unavailable (unused)
22	P	0, 1	POLAR_LOGIC : 1	POL input 0 : Negative at High or opencircuit*4 1 : Negative at Low or shortcircuit*3
23	P	0, 1, 2	PARITY : 0	Parity check 0 : Disable 1 : Enable Parity per each digit 2 : Enable Parity for all digits
24	P	0, 1	PARITY_TYPE : 0	Odd or even parity 0 : Odd 1 : Even

*1. ITEM 14 < ITEM 15. Set after ITEM 17 and 18.

*2. Open collector input logic

LOGIC	ITEM 20 DATA	0 : Positive logic		1 : Negative logic	
		0	1	0	1
TTL level, open collector sink type (TTL level)		Short (LOW)	Open (HIGH)	Open (HIGH)	Short (LOW)
24V DC, open collector source type		Open	Short	Short	Open

*3. "Opencircuit" with 24V DC input

*4. "Shortcircuit" with 24V DC input

ITEM	MDF. CODE	INPUT DATA	EXAMPLE (DEFAULT)	CONTENTS
25	P	0.0 – 60.0	LAG_TIME : 0.0	Delay buffer (seconds, 0 – 90%) When the Response Time model suffix code is specified to 1, the set value is only effective at 5.0 or higher value.
26	P	-1.00 – 1.00	ZERO : -1.00	Output code V1 0% output voltage (V)*5 100% output voltage (V)*5
27	P	-1.00 – 1.00	SPAN : 1.00	
26	P	-10.0 – 10.0	ZERO : -10.00	Output code V2 0% output voltage (V)*5 100% output voltage (V)*5
27	P	-10.0 – 10.0	SPAN : 10.00	
26	P	0.0 – 24.0	ZERO : 4.00	Output code Z1 0% output current (mA)*5 100% output current (mA)*5
27	P	0.0 – 24.0	SPAN : 20.00	
28	N/A	–	KDA3_VER : *.*.*	ROM version

*5. Of the range set in ITEM 14/15, ITEM 26 < ITEM 27.

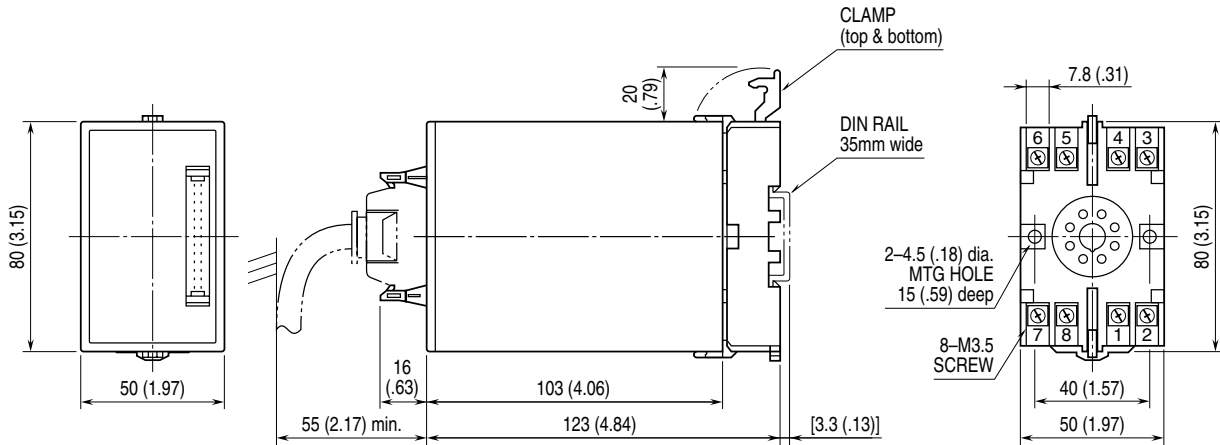
Modification Code

D: No modification (writing) possible. Used only for monitoring (reading).
 S: Modifiable at any time.
 P: Modifiable only when the MAINTENANCE SWITCH is in the “PRG” mode.

TERMINAL CONNECTIONS

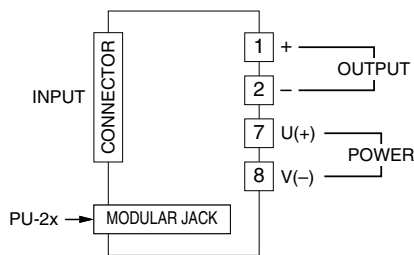
Connect the unit as in the diagram below or refer to the connection diagram on the top of the unit.

EXTERNAL DIMENSIONS unit: mm (inch)



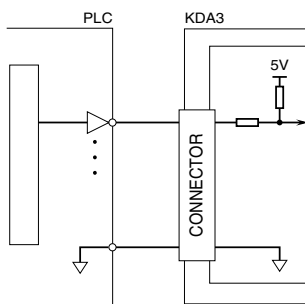
•When mounting, no extra space is needed between units.

CONNECTION DIAGRAM

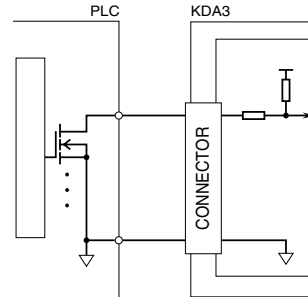


Input Connection Examples

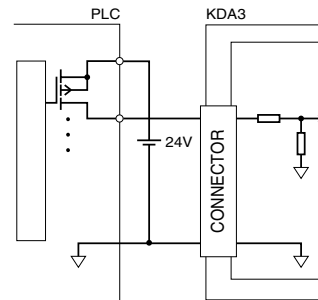
• Standard type
TTL level



Open collector, sink type



• Option /A
24V DC



INPUT CONNECTOR (26-pin)

■ BCD INPUT

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

■ BINARY, TWO'S COMPLEMENT INPUTS

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

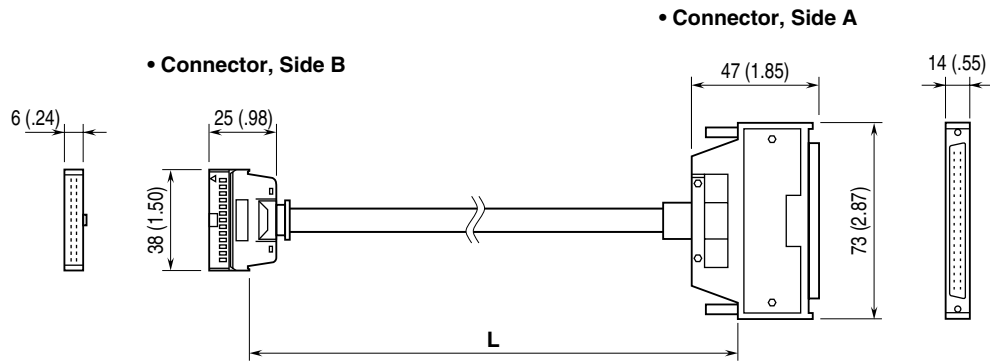
*1. Pin No. 21 and 22 are internally connected.

*2. P⁰ corresponds to n × 10⁰, P¹ to n × 10¹, P² to n × 10², P³ to n × 10³. Only P⁰ corresponds when the parity for all digits are valid.

*3. P⁰ corresponds to B⁰ through B³, P¹ to B⁴ through B⁷, P² to B⁸ through B¹¹, P³ to B¹² through B¹⁵. Only P⁰ corresponds when the parity for all digits are valid.

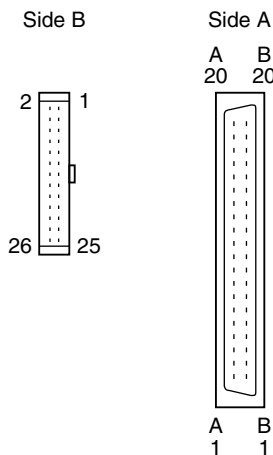
Note: With the number of bits set to 14 (or 12, 10, 8) with ITEM 18, Pin No. 1 – 14 (or 1 – 12, 1 – 10, 1 – 8) are valid.

CABLE (MODEL: MCN26) PIN ASSIGNMENTS

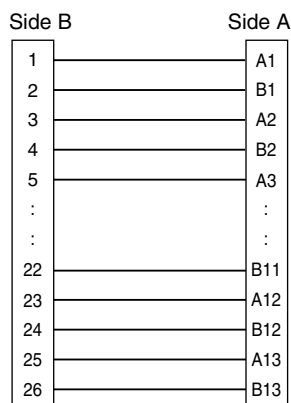


	MCN26-03	MCN26-05	MCN26-10	MCN26-30
L	30 cm (11.8 in.)	50 cm (19.7 in.)	1 m (3.3 ft.)	3 m (9.8 ft.)

■ CONNECTOR PIN ASSIGNMENT



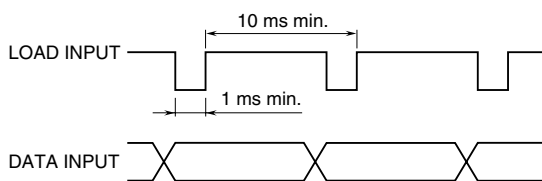
■ WIRING DIAGRAM



Pins No. A14 – B20 on Side A are not connected.

TIMING CHART

• Example: TTL Level Input (factory setting)

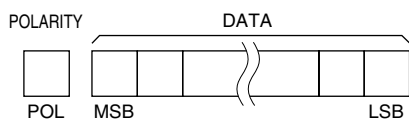


The unit reads data upon detecting a change of LOAD input status.
DO NOT change LOAD input setting when the data input logic is changed.

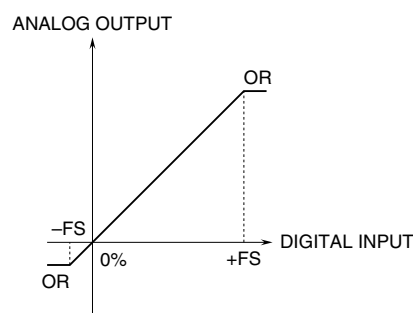
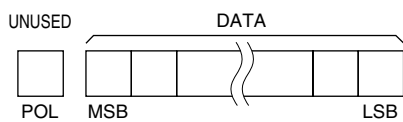
Note: Even if LOAD signal is entered, the unit does not convert into analog and hold previous value until entering next normal data, when error is detected by parity check.

INPUT-OUTPUT RELATION EXAMPLE

■ BCD, BINARY (WITH POLARITY)



■ OFFSET BINARY & TWO'S COMPLEMENT



• FS

-FS stands for -15% of the input range (0 to 100%), which is configured by ITEM 14, display range scaling 0% and ITEM 15, display range scaling 100%. +FS stands for +115% of the input range.

• OR

When one of the following conditions is true, the digital output overflows (OR).

- 1) When the input signal is out of the range between -FS and +FS.
- 2) When the input value exceeds the input range.

The input range differs according to input code. For example, in case of BCD with polarity, it is -9999 to 9999. Please refer to the table in the FRONT PANEL CONFIGURATION & PROGRAMMING WITH PU-2x for detail.

CHECKING

- 1) Terminal wiring: Check that all cables are correctly connected according to the connection diagram.
- 2) Power input voltage: Check voltage across the terminal 7 – 8 with a multimeter.
- 3) Input: Dry contact or open collector. Check the input device meets the following requirements.

TTL level

Sensing: 5V DC @1mA

Threshold voltage of the input circuit: 1V DC

24V DC

Sensing: 24V DC @3.5mA

Threshold voltage of the input circuit: 3V DC

LOAD signal: ON time 1 millisecon.

- 4) Output: Check that the load resistance meets the described specifications.

LIGHTNING SURGE PROTECTION

M-System offers a series of lightning surge protector for protection against induced lightning surges. Please contact M-System to choose appropriate models.