CSM_M7E(14mm)_DS_E_2_1

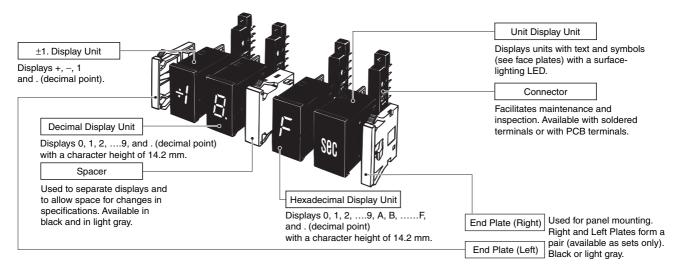
New Models with Blanking Function Added to the Series

- Single-color (red or green) and two-color (red or green selectable) displays with a character height of 14 mm are available for a variety of applications and locations.
- Miniature design with a 43-mm depth is perfect for saving space in equipment and devices.
- Wide-range power supply from 12 to 24 VDC.
- Negative sign (–) display with signal codes is possible for Decimal-display Models.
- Models with zero suppression function available.



Model Configuration

■ Unit Configuration



OMRON 1

Ordering Information

■ List of Models

Display	Display	Туре	Mo	odel
contents	color		Model with Zero Suppression (See note 1.)	Model with Blanking (See note 2.)
±1	Red	Positive		M7E-01BRP2
15 A.		Negative		M7E-01BRN2
		Dynamic output		M7E-01BRD2
+1	Green	Positive		M7E-01BGP2
		Negative		M7E-01BGN2
		Dynamic output		M7E-01BGD2
Decimal	Red	Positive	M7E-01DRP2	M7E-01DRP2-B
15 A		Negative	M7E-01DRN2	M7E-01DRN2-B
		Dynamic output	M7E-01DRD2	M7E-01DRD2-B
8. 1,2	Green	Positive	M7E-01DGP2	M7E-01DGP2-B
		Negative	M7E-01DGN2	M7E-01DGN2-B
		Dynamic output	M7E-01DGD2	M7E-01DGD2-B
	Red/green (two colors)	Negative	M7E-01DRGN2	M7E-01DRGN2-B
Hexadeci- mal	Red	Positive	M7E-01HRP2	M7E-01HRP2-B
mai		Negative	M7E-01HRN2	M7E-01HRN2-B
	Green	Positive	M7E-01HGP2	M7E-01HGP2-B
F		Negative	M7E-01HGN2	M7E-01HGN2-B

Connectable PLCs

M	M7E model		PLC output method			
Display	Type	Static output		Dynamic		
contents		PNP output	NPN output	output		
±1, decimal	Positive	0	Δ	Δ		
decimai	Negative	×	О	×		
	Dynamic output	×	×	О		
Hexa- decimal	Positive	0	Δ	Δ		
decimai	Negative	×	О	×		
Unit		O (only	voltage ir	nposed)		

- O: Connectable
- ×: Not connectable
- \triangle : Connectable (See note.)

Note: Connectable but an external resistor is required and only 24 VDC must be supplied.

Refer to External Connections on page 9 and 10 for details.

Display contents	Display color	Logic	Model
Unit	Red		M7E-01UR2-□ (See note 3.)
sec	Green		M7E-01UG2-□ (See note 3.)

- **Note: 1.** Models with zero suppression are blank only when the display is $\mathcal Q$ and the decimal is OFF by wiring as shown on page 12.
 - 2. Models with blanking enable turning OFF a user-specified display (G to S, R to F) by inputting a signal to the blank input terminal.
 - 3. The symbol in the box (□) indicates the code for the display contents. Refer to page 13.

■ Accessories (Order Separately)

End Plate

Case color	Item	Model
Light gray		M7E-012M
Black		M7E-012M-1

Note: The Right and Left Plates form a pair.

<u>Spacer</u>

Case color	Item	Model
Light gray		M7E-012PA
Black		M7E-012PA-1

Connector

Te	erminal	Model
Solder terminal	At the hard hard was a second of the second	NRT-C
Solder terminal	A UP COMMON TO THE PROPERTY OF	NRT-CN
PCB terminal	The Common of th	NRT-CP

Mother Board

Туре	Number of digits	Model
Static	4	M7E-01MB4-S2
Static	3	M7E-01MB3-S2
Static	2	M7E-01MB2-S2

Note: Refer to M7E Mother Board for Display Units (Character Height: 14 mm) for details.

Specifications

■ Ratings

Rated	power supply	upply Wide range from 12 to 24 VDC		
	Ilowable voltage uctuation range 90% to 110% of rated voltage			
Current consumption (per Display Unit)		Red LED:	35 mA max. at 24 VDC 60 mA max. at 12 VDC	
		Greed LED:	40 mA max. at 24 VDC 75 mA max. at 12 VDC	
		Red/green LED:	45 mA max. at 24 VDC 90 mA max. at 12 VDC	
Input level	Positive logic	High: 9.6 V to power supply voltage Low: 0 to 3 V		
	Negative logic	High: 4 V to power supply voltage Low: 0 to 1.5 V Residual voltage: 1.5 V max. OFF leakage current: 0.1 mA max.		
	Dynamic output	t High: 4 V to power supply voltage Low: 0 to 1.5 V		
Ambient temperature		Operating: –10 to 55°C (with no icing) Storage: –25 to 70°C (with no icing)		
Ambient humidity		Operating: 35% to 85% (with no condensation)		

■ Characteristics

Insulation resistance	100 $\mbox{M}\Omega$ min. at 500 VDC (between each terminal and mounting panel)		
Dielectric strength	500 VAC at 50/60 Hz for 1 minute (between each terminal and mounting panel)		
Noise immunity	Power terminal: ±500 V		
(See note 2.)	Input terminal: ±500 V (normal mode) ±1,500 V (common mode)		
Vibration resistance	Destruction: 10 to 55 Hz, 0.75-mm double amplitude		
Shock resistance	Destruction: 300 m/s ²		
Degree of protection	IEC IP40 (portion on panel surface)		
Compatible connector	OMRON NRT-C/NRT-CN/NRT-CP		

Note: 1. The above values are initial values.

2. Impulse conditions

Rise time: 1 ns + 10% max. Pulse width: 100 ms, $1 \mu \text{s}$

Polarity: Positive, negative, asynchronous to power

frequency, 100-Hz repeat frequency.

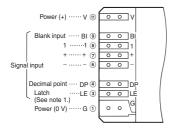
Installation

■ Terminal Arrangements and Functions

Terminal Arrangement

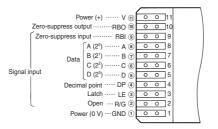
Note: The circled numbers are the connector pin numbers (NRT- \square).

±1. Display Unit M7E-01B□□2

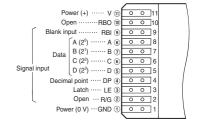


Decimal/Hexadecimal Display Unit (Single Color)

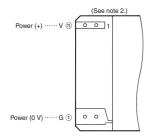
Models with Zero Suppression M7E-01D□□2/M7E-01H□□2



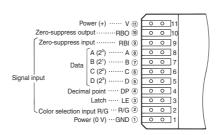
Models with Blanking M7E-01D□□2-B/M7E-01H□□2-B



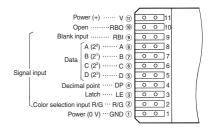
Unit Display Unit M7E-01U□2-□



Decimal Display Unit (Two Colors)
Models with Zero Suppression
M7E-01DRGN2



Models with Blanking M7E-01DRGN2-B

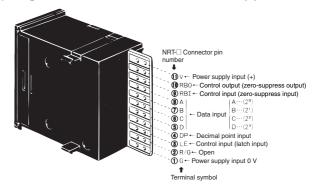


- Note: 1. The latch terminal on ± 1 . Display Units is provided only on Dynamic Output Models.
 - 2. The terminal numbers of the Unit Display Unit are different from the terminal numbers of the connector.

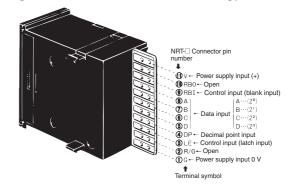
Terminal Functions

Ter-	Name		Function		
minal sym-		Decimal/Hexaded	± Display Unit		
bol		Models with Zero Suppression	Models with Blanking		
V	Power supply	Positive power supply	nput terminal		
RBO	Control output	Zero-suppress output (See note 1.)			
RBI	Control input	Zero-suppress output (See note 1.)	Blanking input (Turns OFF all the displays including decimal point.)		
BI	Control input			Blanking input (Turns OFF all the displays including decimal point.)	
A B C D	Data inputs	A (20) B (21) C (22) D (23) Applicable to Decimal/ Hexadecimal Display Unit •Displays a digit or symbol corresponding to the value of the binary code signal. •Decimal display uses 0 to 9; nothing will be displayed for higher values.			
1+-	Data inputs			Applicable to ±1. Display Unit only For each input terminal, the input of a signal causes a display to light.	
DP	Data inputs	The decimal point lights.			
LE	Control input	Latch input The immediately preceding display condition is retained.			
R/G	Control input	Color selection input (See note 2.) Set low for green display and high for red display.			
G	Power supply	0-V power-supply (grou	und) input terminal (GN	D)	

Decimal/Hexadecimal Display Unit (Single-color Models with Zero Suppression)



Decimal/Hexadecimal Display Unit (Single-color Model with Blanking)



Note: 1. Refer to the input code table for RBO and RBI control.

2. Applicable to the M7E-01DRGN2 and -01DRGN2-B only.

■ Input Codes

Models with Positive or Negative Logic

±1. Display Unit

Positive Logic (M7E-01BRP2/M7E-01BGP2)

		In	Display			
Connector pin No.	9	7	6	8	4	conditions
Terminal symbol	ВІ	+	_	1	DP	
Input signals	L	L	L	L	L	Blank
	Г	Н	L	L	L	+
	Г	L	Н	L	L	-
	L	L	L	Н	L	1
	L	L	L	L	Н	
	Н	*	*	*	*	Blank (See note.)

Note: BI takes precedence over any input signal.

Unit Display Unit

This display lights when voltage is applied to the power supply terminals (V and G).

V-G terminals	Display
Open circuit	Blank
Voltage applied	Lit

Negative Logic (M7E-01BRN2/M7E-01BGN2)

		In	put sign	al		Display
Connector pin No.	9	7	6	8	4	conditions
Terminal symbol	ВІ	+	-	1	DP	
Input signals	Н	Н	Н	Н	Н	Blank
	Н	L	Н	Н	Н	+
	Н	Н	L	Н	Н	-
	Н	Н	Н	L	Н	1
	Н	Н	Н	Н	L	
	L	*	*	*	*	Blank (See note.)

Note: BI takes precedence over any input signal.

^{*} Either high or low.

^{*} Either high or low.

Decimal/Hexadecimal Display Unit

Models with Zero Suppression

Positive logic (M7E-01DRP2/M7E-01DGP2/M7E-01HRP2/M7E-01HGP2)

				Inpu	ıt			Out- put	Display	condition	
Connector pin No.	3	5	6	7	8	4	9	10			
Terminal number	3	5	6	7	8	4	9	10			
Terminal symbol	LE	D	С	В	Α	DP	RBI	RBO	Decimal	Hexadeci- mal	
Input	L	L	L	L	L	L	L	L		0	
signals	L	L	L	L	Н	L	*	L		1	
	L	L	L	Н	L	L	*	L		2	
	L	L	L	Н	Н	L	*	L		3	
	L	L	Τ	L	L	L	*	L		4	
	L	L	Η	L	Ι	L	*	L		5	
	L	L	Τ	Τ	┙	L	*	L		5	
	L	L	Τ	Τ	Ι	L	*	L	7		
	L-	Ι	L-	L	L-	L	*	L	8		
	L	Τ	L	┙	Ι	┙	*	L		9	
	ш	Ι	ш	Ι	ш	L-	*	L	-	R	
	L	Τ	L	Τ	Ι	L	*	L	Blank	ь	
	L	Τ	Η	L	٦	L	*	L	Blank	٤	
	L	Н	Н	L	Н	L	*	L	Blank	d	
	L	Н	Н	Н	L	L	*	L	Blank	Ε	
	L	Н	Н	Н	Н	L	*	L	Blank	۶	
	L	*	*	*	*	Η	*	L		•	
	*	Ь	Ь	L	L	L	Η	Н	Blank (See note.)		
	Н	*	*	*	*	*	*	*	Retains the display conditions of A through D and DP terminals before LE goes high. RBI is not related.		

Note: The display will go blank when the data input is "0" and the DP is OFF.

Negative logic (M7E-01DRN2/M7E-01DGN2/M7E-01DRGN2/M7E-01HRN2/M7E-01HGN2)

				Inpu	t			Out- put	Display	condition		
Connector pin No.	3	5	6	7	8	4	9	10				
Terminal number	3	5	6	7	8	4	9	10				
Terminal symbol	LE	D	С	В	Α	DP	RBI	RBO	Decimal	Hexadec- imal		
Input	Τ	Τ	Н	Τ	Τ	Н	Η	Н		0		
signals	Н	Н	Н	Н	L	Н	*	Н		1		
	Н	Н	Н	L	Η	Н	*	Н		2		
	Н	Н	Н	L	L	Н	*	Н		3		
	Н	Н	L	Н	Н	Н	*	Н		4		
	Н	Н	L	Н	L	Н	*	Н		5		
	Н	Н	L	L	Н	Н	*	Н	5			
	Н	Н	L	L	L	Н	*	Н	7			
	Н	L	Н	Н	Н	Н	*	Н		8		
	Τ	L	Н	Τ	L	Н	*	Н		9		
	Н	L	Н	L	Н	Н	*	Н	-	Я		
	Η	L	Н	L	L	Н	*	Н	Blank	ь		
	Τ	L	L	Τ	Τ	Н	*	Н	Blank	٤		
	Τ	L	L	Τ	L	Н	*	Н	Blank	d		
	Τ	L_	L		Ι	Н	*	Н	Blank	Ε		
	Τ	┙	L	L.	L	Н	*	Н	Blank	۶		
	I	*	*	*	*	L	*	Н		•		
	*	Н	Н	Н	Η	Н	L	L	Blank (See note.) Retains the display conditions of A through D, DP and R/G terminals before LE goes low. RBI is not related.			
		*	*	*	*	*	*	*				

Note: The display will go blank when the data input is "0" and the DP is OFF.

OMRON

^{*} Either high or low

^{*} Either high or low

Models with Blanking

Positive logic (M7E-01DRP2-B/M7E-01DGP2-B/M7E-01HRP2-B/M7E-01HGP2-B)

			I	nput				Display condition					
Connector pin No.	3	9	5	6	7	8	4						
Terminal number	3	9	5	6	7	8	4						
Terminal symbol	LE	RBI	D	O	В	A	DP	Decimal	Hexa- decimal				
Input	L	١	┙	٦	┙	L	L	8					
signals	L	١	┙	٦	┙	Τ	L	1					
	L	١	┙	٦	Ι	L	L	2					
	L	L	L	L	Н	Η	L	3					
	L	L	L	Н	L	L	L	4					
	L	L	L	Н	L	Н	L	5					
	L	L	L	Н	Н	L	L	8					
	L	L	L	Η	Η	Η	L	7					
	L	L	Н	L	L	L	L	8					
	L	L	Н	L	L	Н	L	9					
	L	L	Н	L	Н	L	L	-	Я				
	L	L	Н	L	Н	Н	L	Blank	ь				
	L	L	Н	Н	L	L	L	Blank	Ĺ				
	L	L	Н	Н	L	Н	L	Blank	d				
	L	L	Н	Н	Н	L	L	Blank	Ε				
	L	L	Н	Н	Н	Н	L	Blank	F				
	*	L	*	*	*	*	Н	•					
	*	Н	*	*	*	*	*	Blank (See note.)					
	Н	L	*	*	*	*	*	Retains the dis conditions of A terminals befor high. DP is not	through D e LE goes				

Note: RBI takes precedence over any input signal.

Negative logic (M7E-01DRN2-B/M7E-01DGN2-B/M7E-01DRGN2-B/M7E-01HRN2-B/M7E-01HGN2-B)

			I	nput				Display co	ndition		
Connector pin No.	3	9	5	6	7	8	4				
Terminal number	3	9	5	6	7	8	4				
Terminal symbol	LE	RBI	D	С	В	Α	DP	Decimal	Hexa- decimal		
Input	Η	Н	Τ	Ι	Τ	Τ	Н	0			
signals	Н	Н	Τ	Ι	Τ	L	Н	1			
	Н	Н	Н	Η	L	Η	Н	2			
	Н	Н	Τ	Ι	٦	L	Н	3			
	Н	Н	Τ	L	Τ	Τ	Н	Y			
	Н	Н	Τ	L	Τ	Ы	Н	5			
	Н	Н	Τ	L	L	Τ	Н	5			
	Н	Н	Н	L	L	L	Н	7			
	Н	Н	L	Н	Н	Н	Н	8			
	Н	Н	L	Н	Н	L	Н	9			
	Н	Н	L	Η	L	Η	Н	-	R		
	Н	Н	L	Н	L	L	Н	Blank	ь		
	Н	Н	L	L	Н	Н	Н	Blank	Ľ		
	Н	Н	L	L	Н	L	Н	Blank	d		
	Н	Н	L	L	L	Н	Н	Blank	Ε		
	Н	Н	L	L	L	L	Н	Blank	F		
	*	Н	*	*	*	*	L	•			
	*	L	*	*	*	*	*	Blank (See note.)			
	L	Н	*	*	*	*	*	Blank (See note.) Retains the display conditions of A through D, and R/G terminals before LE goes low. DP is not related.			

Note: RBI takes precedence over any input signal.

Models with Dynamic Outputs

±1. Display Unit

(M7E-01BRD2/M7E-01BGD2)

			Inp	out			Display condition
Connector pin No.	3	9	7	6	8	4	
Terminal symbol	LE	BI	+	-	1	DP	
Input	L	Н	L	L	L	Н	Blank
signals	L	Н	Н	L	L	Н	+
	L	Н	L	Н	L	Н	-
	L	Н	L	L	Н	Н	1
	*	Н	*	*	*	L	
	*	L	*	*	*	*	Blank (See note.)
	Н	Н	*	*	*	*	Retains the display conditions of +, -, and 1 before LE goes high. DP is not related.

Note: BI takes precedence over any input signal.

^{*} Either high or low

^{*} Either high or low

^{*} Either high or low

Decimal Display Unit

Models with Zero Suppression (M7E-01DRD2/M7E-01DGD2)

				Inpu	it			Out- put	Display condition
Connector pin No.	3	5	6	7	8	4	9	10	
Terminal number	თ	5	6	7	8	4	9	10	
Terminal symbol	LE	D	C	В	A	DP	RBI	RBO	
Input	L	L	L	L	L	Τ	L	L	☐ (See note 1.)
signals	┙	L	┙	L	т	Τ	*	L	1
	┙	L	┙	Τ	┙	Τ	*	L	2
	L	L	L	Τ	Ι	Τ	*	L	3
	┙	L	т	L	┙	Τ	*	L	Y
	٦	L	Τ	L	Τ	Η	*	L	5
	L	L	Ι	Τ	L	Τ	*	L	8
	L	L	Н	Н	Н	Н	*	L	7
	L	Н	L	L	L	Н	*	L	8
	L	Τ	L	L	Ι	Τ	*	L	9
	L	Н	L	Н	L	Н	*	L	-
	L	Н	L	Н	Н	Н	*	L	Blank
	L	Н	Н	L	L	Н	*	L	Blank
	L	Н	Н	L	Н	Н	*	L	Blank
	L	Н	Н	Н	L	Н	*	L	Blank
	L	Н	Н	Н	Н	Н	*	L	Blank
	L	*	*	*	*	L	*	L	•
	*	L	L	L	L	Η	Н	Н	Blank (See note 2.)
	Н	*	*	*	*	*	*	*	Retains the display conditions of A through D, and DP terminals before LE goes high. RBI is not related.

Note: 1. Input low for RBI when data "0" is displayed. RBI will go high in open mode and the zero suppression will function.

2. The display will go blank when the data input is "0" and the DP is OFF.

Models with Blanking (M7E-01DRD2-B/M7E-01DGD2-B)

				Input				Display
Connector pin No.	3	9	5	6	7	8	4	condition
Terminal number	3	9	5	6	7	8	4	
Terminal symbol	LE	RBI	D	C	В	Α	DP	
Input	L	Н	L	L	L	L	Н	8
signals	L	Н	L	L	L	Ι	Н	1
	L	Н	L	L	Ι	L	Н	2
	L	Н	L	L	Н	Н	Н	3
	L	Н	L	Н	L	L	Н	ч
	L	Н	L	Н	L	Н	Н	5
	L	Н	L	Н	Н	L	Н	8
	L	Н	L	Н	Н	Н	Н	7
	L	Н	Н	L	L	L	Н	8
	L	Н	Н	L	L	Н	Н	3
	L	Н	Н	L	Н	L	Н	-
	L	Н	Н	L	Н	Н	Н	Blank
	L	Н	Н	Н	L	L	Н	Blank
	L	Н	Н	Н	L	Н	Н	Blank
	L	Н	Н	Н	Н	L	Н	Blank
	L	Н	Н	Н	Н	Н	Н	Blank
	*	Н	*	*	*	*	L	
	*	L	*	*	*	*	*	Blank (See note.)
	Н	Н	*	*	*	*	*	Retains the display conditions of A through D terminals before LE goes high. DP is not related.

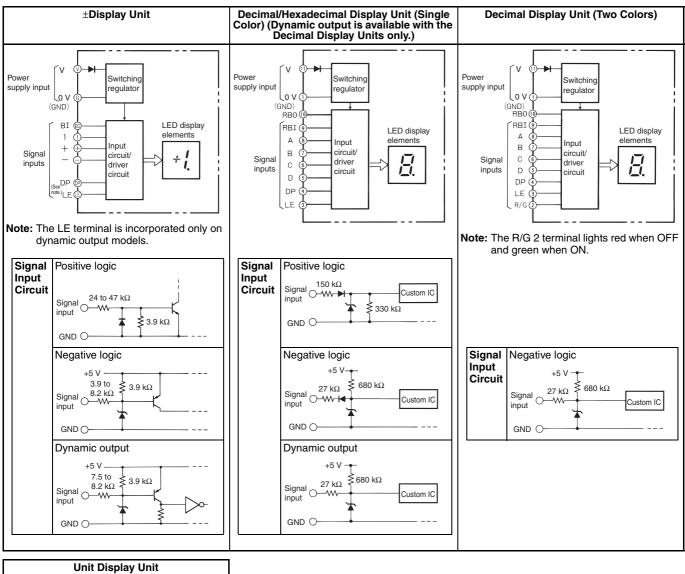
Note: RBI takes precedence over any input signal.

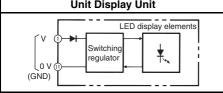
^{*} Either high or low

^{*} Either high or low

■ Block Diagram

Note: Circled numbers are the board terminal numbers.





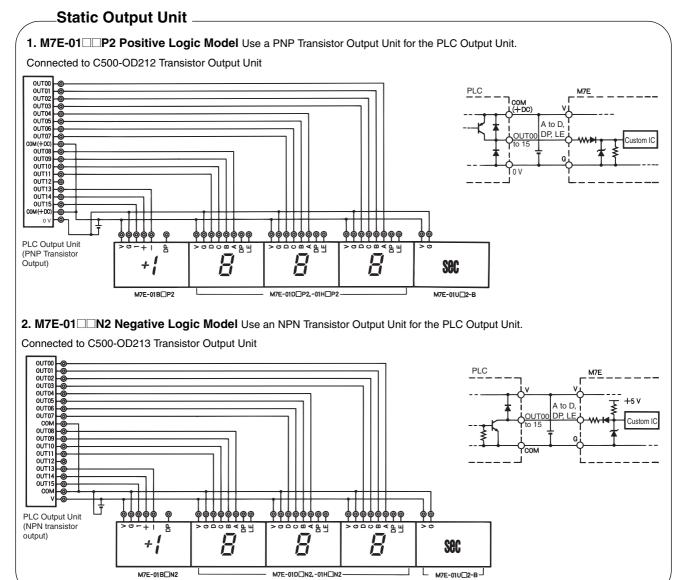
Note: The terminal numbers of the Unit Display Unit are different from the terminal numbers of the connector. Refer to *Terminal Arrangements and Functions* on page 3 for details.

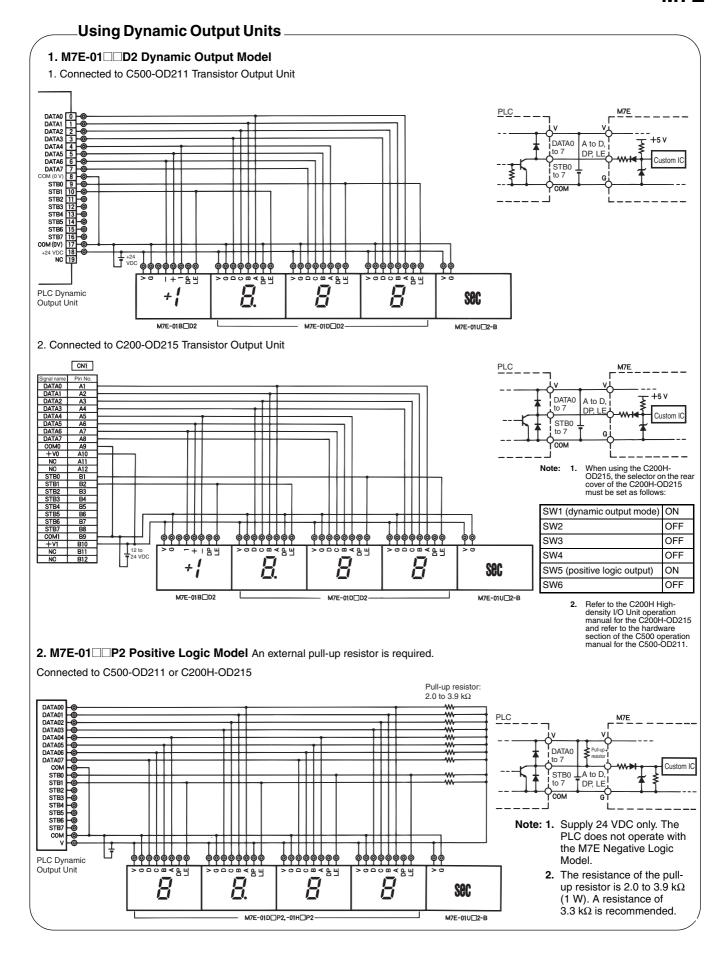
■ External Connections

Refer to the Terminal Arrangement on page 3 and the Block Diagram on page 8 for external connections for each unit.

Example of connection to a PLC.

- Refer to the PLC operation manual before connecting the PLC.
- The number of wires can be reduced by using a PLC with dynamic outputs.

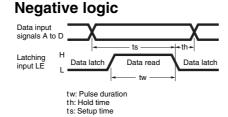




Operation

■ Operation Timing (Input Signal Timing)

Data input signals A to D Latching input LE Latching input LE Latching input LE Latching input LE Latching input LE

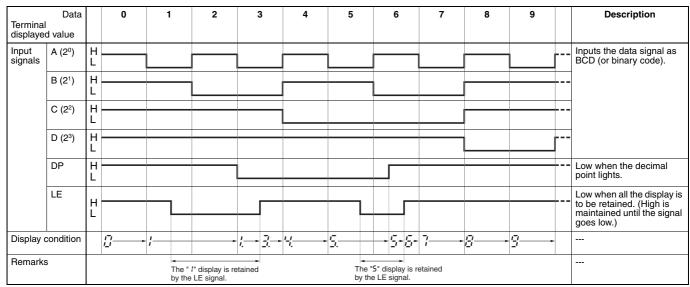


Pulse duration (tw)	1.5 ms min.
Hold time (th)	0.75 ms min.
Setup time (ts)	2.25 ms min.

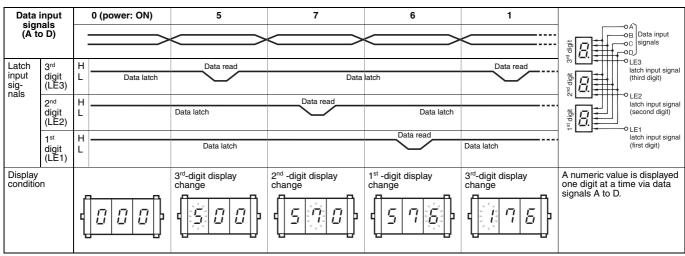
■ Operation Chart

th: Hold time

• The following example shows the relationship between each input terminal signal and the display condition for a Negative-logic Decimal Display Unit with Blanking.



• Using the latch input (LE) terminal for each Unit, the data input terminals (A to D) can be used in common yet still enable display on each Unit (example of a 3-digit dynamic-output model with positive logic).



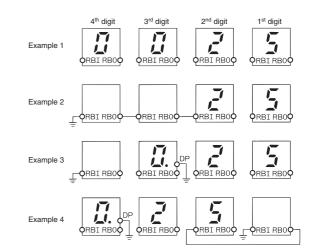
OMRON 11

Example of Zero Suppression Usage: Description Using Negative Logic Model

The zero suppression function operates when the display is \mathcal{Q} , RBI is low and the decimal point is not lit.

- Example 1: The RBI input and RBO output of each digit are open when zero suppression is not being used.
- Example 2: Wired as shown to display only \$\mathbb{I}\$ for the rightmost digit when zero suppression is being used.
- Example 3: Zeros are suppressed only for the digits on the left of the digit where the decimal is lit when both zero suppression and a decimal point are being used.
- Example 4: Zeros are suppressed to the right of the first digit below the decimal point when both zero suppression and a decimal point are being used. If the first-to-fourth-digit values are all 0 and the decimal point is lit at the fourth digit, \$\mathcal{L}\math

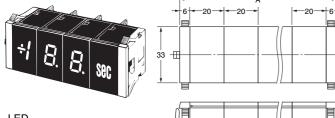
Note: Use RBO output for the RBI input connection only.



Dimensions

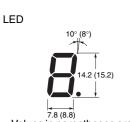
M7E-01 2 2

Note: All units are in millimeters unless otherwise indicated.

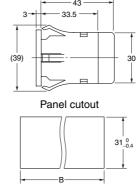


0

B-1



Values in parentheses are for the two-color (red and green) Digital Display Units.



Panel thickness: 1 to 3 mm

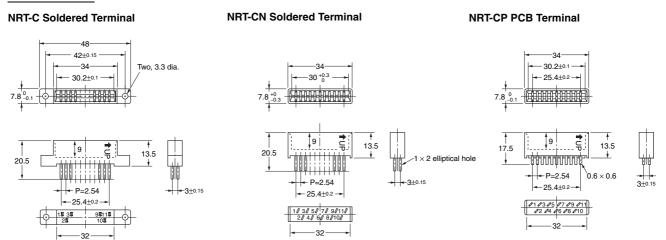
Number of Units (n) Dimensions Dimensions A (n×20+12) B (n×20+10	
1 32±0.4 30±0.4	
2 52±0.4 50±0.4	
3 72±0.4 70±0.4	
4 92±0.4 90±0.4	
5 112±0.8 110±0.8	
6 132±0.8 130±0.8	
7 152±0.8 150±0.8	
8 172±0.8 170±0.8	

- Note: 1. Dimensions A and B include End Plates. Inclusion of spacers increases the length by 10 mm per spacer.
 - 2. Tolerance is ±0.4 mm unless otherwise specified.

■ Accessories (Order Separately)

End Plate M7E-012M(-1) Left End 33.5 Right End 4.5 August 24.5 Note: Tolerance is ±0.4 mm unless otherwise specified.

Connector



Face Plate

- The required face plate is used with the Unit Display Unit, which incorporates a surface-lighting LED.
- The following face plates are available. When ordering the M7E-01U□2-⊛, add the suffix according to your requirement.
- Custom face plates can be made. For the procedure to make face plates, refer to M7E Mother Board for Display Units (Character Height: 14 mm).

Symbol	Α	В	С	D	Е	F	G	Н	J	JC1	K	٧	Z 1	Z2
Display contents	Blank display	sec	min	h	တ	kg	mm	cm	E	m/min	ဇင	rpm	%	ppm

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

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2008.12

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