DRW171155AA

Autonics

INTELLIGENT DISPLAY UNIT
(Parallel Input)
DS/DA-P Series
INSTRUCTION MANUAL

Thank you for choosing our Autonics products.
Please read the following safety considerations before use.

■ Safety Considerations

※Please observe all safety considerations for safe and proper product operation to avoid hazards.

※Safety considerations are categorized as follows.
⚠**Warning** Failure to follow these instructions may result in serious injury or death.
⚠**Caution** Failure to follow these instructions may result in personal injury or product damage.

※The symbols used on the product and instruction manual represent the following
⚠ symbol represents caution due to special circumstances in which hazards may occur.

⚠ Warning

1. **Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss. (e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc.)** Failure to follow this instruction may result in fire, personal injury, or economic loss.
2. **Install on a device panel to use.** Failure to follow this instruction may result in fire.
3. **Do not connect, repair, or inspect the unit while connected to a power source.** Failure to follow this instruction may result in fire.
4. **Check 'Unit description and function setting' before wiring.** Failure to follow this instruction may result in fire.
5. **Do not disassemble or modify the unit.** Failure to follow this instruction may result in fire.

⚠ Caution

1. **Use the unit within the rated specifications.** Failure to follow this instruction may result in fire or product damage.
2. **Use dry cloth to clean the unit, and do not use water or organic solvent.** Failure to follow this instruction may result in fire.
3. **Do not use the unit in the place where flammable/explosive/corrosive gas, humidity, direct sunlight, radiant heat, vibration, impact, or salinity may be present.** Failure to follow this instruction may result in fire or explosion.
4. **Keep metal chip, dust, and wire residue from flowing into the unit.** Failure to follow this instruction may result in fire or product damage.

■ Model

1) Basic unit

Model	Display method	Size	Model	Display method	Size
DS22-□P	7 Segment	W20×H33mm	**DA22-□P**	16 Segment	W20×H33mm
DS40-□P		W40×H60mm	**DA40-□P**		W40×H60mm
DS60-□P		W60×H96mm	**DA60-□P**		W60×H96mm

2) Expansion unit

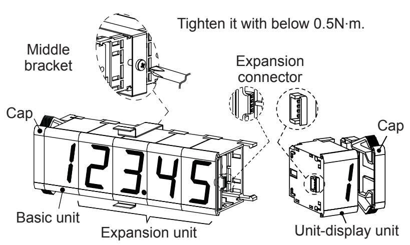
Model	Display method	Size	Model	Display method	Size
DS22-□E	7 Segment	W20×H33mm	**DA22-□E**	16 Segment	W20×H33mm
DS40-□E		W40×H60mm	**DA40-□E**		W40×H60mm
DS60-□E		W60×H96mm	**DA60-□E**		W60×H96mm

※□ indicates color: R(Red), G(Green)

■ Connection of Units

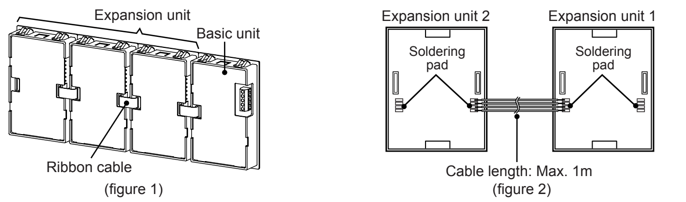
1) D□22

- Connect a basic unit, expansion units, a unit-display unit from the left and connect the caps the end of right and left.
- The middle bracket (sold separately) helps to protect deflection when connecting over 7 units. Use one middle bracket per 7 units.
- The basic unit supplies the power for expansion units and the unit-display unit and DATA input.



2) D□40/D□60

Connect expansion connectors of units using a ribbon cable (accessory) as (figure 1).
If the distance between expansion units is far as (figure 2), you can connect the cable at the soldering pad.
To use a soldering pad, remove the protection cover which only expansion units have.

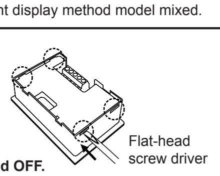


(figure 1) (figure 2)

※You can use both the 7 segment display method model and the 16 segment display method model mixed.

■ Remove of Protection Cover

To operate the function set switch of the D□40, D□60 models, you should remove the protection cover.
Press the connection parts (4 points) of the protection cover at the top/bottom of the product with a flat-head screwdriver and the protection cover is removed.
⚠ **Caution: Before removing the protection cover, power must be turned OFF.**



※The above specifications are subject to change and some models may be discontinued without notice.
※Be sure to follow cautions written in the instruction manual and the technical descriptions (catalog, homepage).

■ Specifications

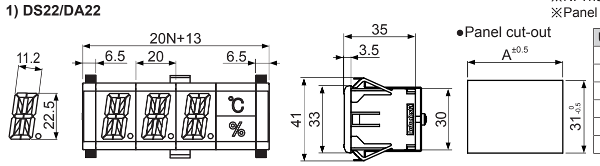
Model		D□22-□P	D□40-□P	D□60-□P
	Basic unit	D□22-□P	D□40-□P	D□60-□P
	Expansion unit	D□22-□E	D□40-□E	D□60-□E
Input method		Parallel (Dynamic Parallel 1, Dynamic Parallel 2)		
Display color		Red, Green (selectable by model)		
Power supply		12-24VDC⎓		
Allowable voltage range		90 to 110% of rated voltage		
Current consumption	Red type	Max. 25mA	Max. 55mA	Max. 65mA
	Green type	Max. 20mA	Max. 40mA	Max. 45mA
Character size		W11.2×H22.5mm	W22.4×H40mm	W33.6×H60mm
Max. clock※1		Dynamic Parallel 1: Max. 3kHz Dynamic Parallel 2: Max. 1.5kHz		
Input logic		Selectable positive logic (PNP), negative logic (NPN) (change by function set switch)		
Input resistance		20kΩ		
Input level		High: 4.5-24VDC⎓, Low: 0-1.2VDC⎓		
Display character		Displays 64 types of character and sign (0 to 9, A to Z, 27 signs, dot)		
The number of max. multi-stage connection		Dynamic Parallel 1: 6 units (4-bit), 4 units (6-bit) Dynamic Parallel 2: 24 units (6-bit)		
Noise resistance		±500V the square wave noise (pulse width: 1μs) by the noise simulator		
Environment	Ambient temp.	-10 to 55℃, storage: -25 to 65℃		
	Ambient humi.	35 to 85%RH, storage: 35 to 85%RH		
Accessory	Basic unit	Right/Left cap: 1 Connector: 1	Connector: 1	
	Expansion unit	—	Ribbon cable (50mm) : 1	
Protection structure		IP40 (front part)		
Approval		CE		
Weight※2	Basic unit	Approx. 58g (approx. 17g)	Approx. 63g (approx. 28g)	Approx. 110g (approx. 60g)
	Expansion unit	Approx. 92g (approx. 17g)※3	Approx. 63g (approx. 28g)	Approx. 110g (approx. 60g)

※1: Max. Clock is for 1:1 of duty ratio (ON, OFF ratio).
※2: The weight includes packaging. The weight in parentheses is for unit only.
※3: This is 3 units' weight as packaging unit and the weight in parentheses is only unit weight.
※Environment resistance is rated at no freezing or condensation.

■ Dimensions

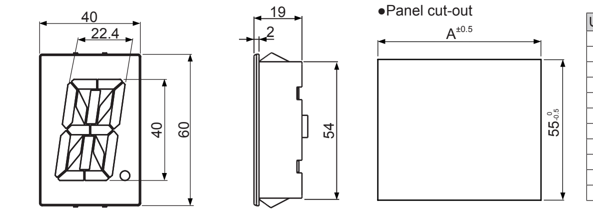
(unit: mm)
※N: The number of units
※Panel thickness: 1.5 to 4mm

1) DS22/DA22



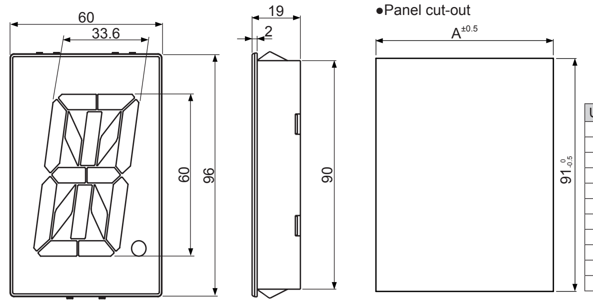
Unit (N)	A (20N+11)
1	31
2	51
3	71
4	91
5	111
:	:

2) DS40/DA40



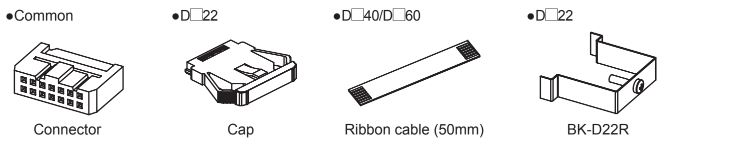
Unit (N)	A (40N-2)
1	38
2	78
3	118
4	158
5	198
6	238
7	278
8	318
9	358
10	398
:	:

3) DS60/DA60



Unit (N)	A (60N-3)
1	57
2	117
3	177
4	237
5	297
6	357
7	417
8	477
9	537
10	597
:	:

4) Accessory **5) Sold separately (middle bracket)**



Connector / Cap / Ribbon cable (50mm) / BK-D22R

■ Unit-display Unit

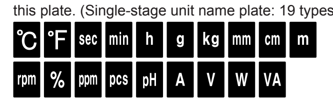
This unit is for displaying unit by inserting a name plate. It has only 22 sizes. (sold separately)

●Model

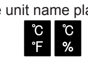
Size \ Color	Red	Green
22mm	DU22-R	DU22-G

1) Unit name plate type

It provides unit-printed name plates as an accessory. You can select the desired unit name plate and insert this plate. (Single-stage unit name plate: 19 types, Dual-stage unit name plate: 2 types)



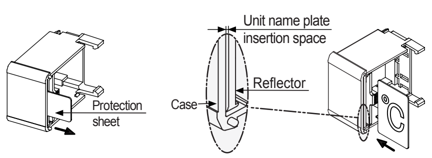
Single-stage unit name plate



Dual-stage unit name plate

2) Unit name plate insertion

Remove the protection sheet and insert the unit name plate at between the case and the reflector.



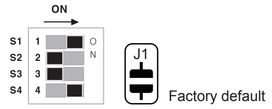
⚠**Caution: Be sure about the correct insert direction.**

■ Unit Description and Function Setting

Only the basic unit model has the function set switch and the input terminal.
The D□22 models have them at the side, and the D□40, D□60 models have them at the rear.

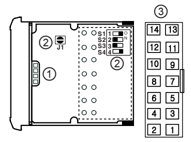
①Expansion connector
Using for connecting units.
Refer to '■ Connection Of Units'.

②Function set switches

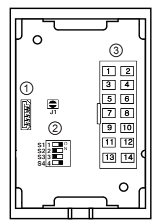


Factory default

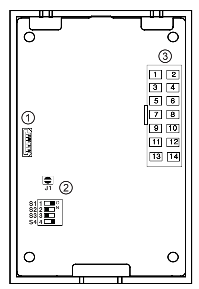
●D□22-□P



●D□40-□P

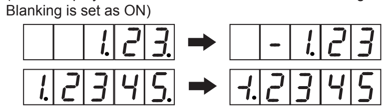


●D□60-□P

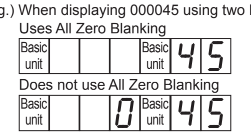


No.	Switch OFF(■)	Switch ON(■)	Function
S1	Pos. logic (PNP)	Neg. logic (NPN)	Input logic
S2	Not used	Used	Zero Blanking
S3	6-bit	4-bit※1,※2	Data input bit
S4	Dynamic 1	Dynamic 2	Dynamic 1/2 selection
J1	(jumper open)	(jumper shorted)	All Zero Blanking※3

※1: 4-bit data input is compatible with Autonics pulse meter (MP5Y, MP5W) and panel meter (MT4Y, MT4W).
※2: 4-bit data input displays "-" or "-1" when dot display data at the lowest display unit.
(Minus display function is available when Zero Blanking, or All Zero Blanking is set as ON)



※3: When every number is '0', it becomes All Zero Blanking.
E.g.) When displaying 000045 using two basic units,



③Input terminals

No.	Dynamic Parallel 1: 4-bit data input Code	Function	Dynamic Parallel 1: 6-bit data input Code	Function	Dynamic Parallel 2※1: 6-bit data input Code	Function
1	VCC	12-24VDC	VCC	12-24VDC	VCC	12-24VDC
2	GND	0V	GND	0V	GND	0V
3	LE5	LATCH 5	LE3	LATCH 3	LATCH	LATCH input
4	LE4	LATCH 4	LE2	LATCH 2	CLOCK	CLOCK input
5	LE3	LATCH 3	LE1	LATCH 1	–	–
6	LE2	LATCH 2	LE0	LATCH 0	UNIT	Unit
7	LE1	LATCH 1	DP	Decimal point	DP	Decimal point
8	LE0	LATCH 0	D5	2^5 data	D5	2^5 data
9	DP	Decimal point	D4	2^4 data	D4	2^4 data
10	D3	2^3 data	D3	2^3 data	D3	2^3 data
11	D2	2^2 data	D2	2^2 data	D2	2^2 data
12	D1	2^1 data	D1	2^1 data	D1	2^1 data
13	D0	2^0 data	D0	2^0 data	D0	2^0 data
14	GND	0V	GND	0V	GND	0V

※1: When selecting Dynamic Parallel 2, 6-bit data input, All Zero blanking OFF are fixed.

■ Input DATA Chart

When selecting 4-bit data input, it displays only shaded part (0 to 9, A to F).
If there is no input data after supplying the power, the basic unit displays 'P'.
※This chart is for positive logic (PNP).

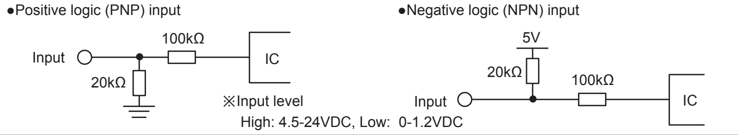
DS Series (7 Segment) D5 L D4 L	D5 L D4 H	D5 H D4 L	D5 H D4 H	DA series (16 Segment) D5 L D4 L	D5 L D4 H	D5 H D4 L	D5 H D4 H	DU Series (unit) D5 X D4 X	D3	D2	D1	D0
0	G	W	]	0	G	W	]	No unit	L	L	L	L
1	H	X		1	H	X	[	Upper-Lower OFF	L	L	L	H
2	I	Y		2	I	Y	+	Upper-Lower ON	L	L	H	L
3	J	Z		3	J	Z	:	Upper ON	L	L	H	H
4	K	-1	°	4	K	-1	;	Lower ON	L	H	L	L
5	L	(	₩	5	L	(	<	Upper-Lower flashes	L	H	L	H
6	M	)	H (h)	6	M	)	>	Upper flashes	L	H	H	L
7	N	'	I	7	N	'	|	Lower flashes	L	H	H	H
8	O	"	J	8	O	"	!	※1	H	L	L	L
9	P	^	K	9	P	^	@		H	L	L	H
A	Q	`	K	A	Q	`	#		H	L	H	L
B	R	/	N	B	R	/	$		H	L	H	H
C	S	?	O	C	S	?	%		H	H	L	L
D	T	-	T	D	T	-	&		H	H	L	H
E	U	_	X	E	U	_	★		H	H	H	L
F	V	=	Blank	F	V	=	Blank		H	H	H	H

(High 2-bit: D5, D4; Low 4-bit: D3, D2, D1, D0)

※1: If this data is not for the unit-display unit, it maintains former state.

■ Input Circuit

●Positive logic (PNP) input ●Negative logic (NPN) input



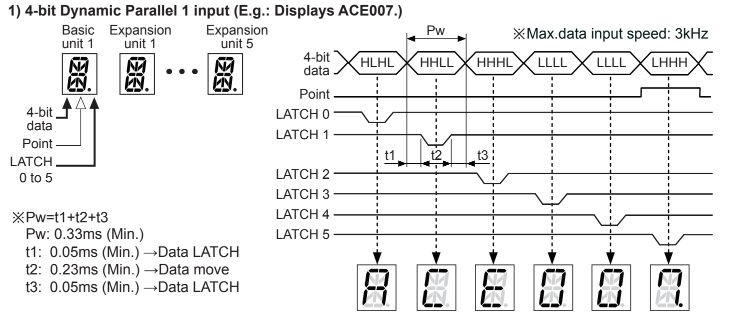
※Input level
High: 4.5-24VDC, Low: 0-1.2VDC

■ Data Input Method

●Example of unit organization by data input

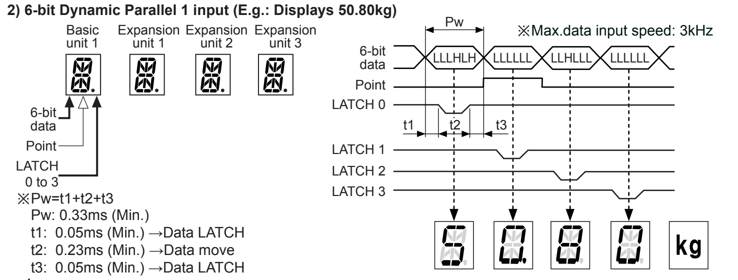
Dynamic Parallel 1	4-bit	Connectable 1 basic unit and 5 expansion units (6 digits) E.g.) 10 digits organization: (1 basic unit + 5 expansion units) + (1 basic unit + 3 expansion units)
	6-bit	Connectable 1 basic unit and 3 expansion units (4 digits) E.g.) 10 digits organization: (1 basic unit + 3 expansion units) × 2 + (1 basic unit + 1 expansion units)
Dynamic Parallel 2	6-bit	Connectable 1 basic unit and 23 expansion units (24 digits) E.g.) 30 digits organization: (1 basic unit + 23 expansion units) + (1 basic unit + 5 expansion units)

1) 4-bit Dynamic Parallel 1 input (E.g.: Displays ACE007.)



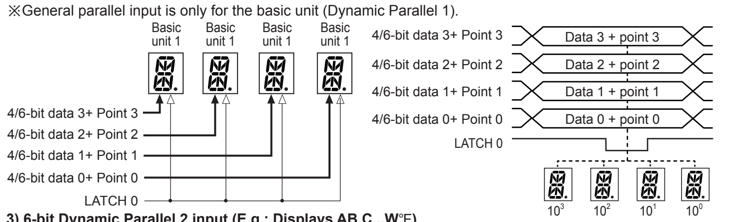
※Pw=t1+t2+t3
Pw: 0.33ms (Min.)
t1: 0.05ms (Min.) →Data LATCH
t2: 0.23ms (Min.) →Data move
t3: 0.05ms (Min.) →Data LATCH

2) 6-bit Dynamic Parallel 1 input (E.g.: Displays 50.80kg)

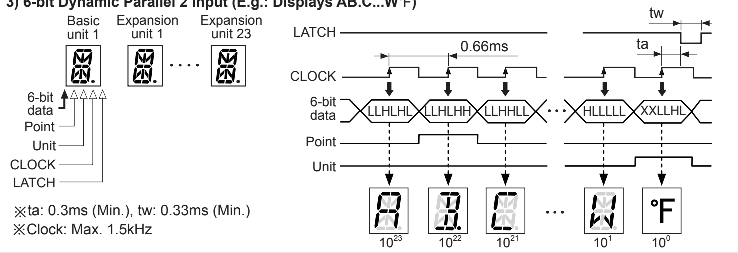


※Pw=t1+t2+t3
Pw: 0.33ms (Min.)
t1: 0.05ms (Min.) →Data LATCH
t2: 0.23ms (Min.) →Data move
t3: 0.05ms (Min.) →Data LATCH

⚠ Caution: The unit-display unit is available only for turning ON. Do not input data to the unit-display unit.
※General parallel input is only for the basic unit (Dynamic Parallel 1).



3) 6-bit Dynamic Parallel 2 input (E.g.: Displays AB.C...W℉)



※ta: 0.3ms (Min.), tw: 0.33ms (Min.)
※Clock: Max. 1.5kHz

■ Cautions during Use

1. Follow instructions in 'Cautions during Use'. Otherwise, It may cause unexpected accidents.
2. 12-24VDC power supply should be insulated and limited voltage/current or Class 2, SELV power supply device.
3. Install a power switch or circuit breaker in the easily accessible place for supplying or disconnecting the power.
4. Keep away from high voltage lines or power lines to prevent inductive noise.
   In case installing power line and input signal line closely, use line filter or varistor at power line and shielded wire at input signal line.
   Do not use near the equipment which generates strong magnetic force or high frequency noise.
5. This unit may be used in the following environments.
   ①Indoors (in the environment condition rated in 'Specifications')
   ②Altitude max. 2,000m
   ③Pollution degree 2
   ④Installation category I

■ Major Products

■ Photoelectric Sensors ■ Temperature Controllers
■ Fiber Optic Sensors ■ Temperature/Humidity Transducers
■ Door Sensors ■ SSRs/Power Controllers
■ Door Side Sensors ■ Counters
■ Area Sensors ■ Timers
■ Proximity Sensors ■ Panel Meters
■ Pressure Sensors ■ Tachometer/Pulse (Rate) Meters
■ Rotary Encoders ■ Display Units
■ Connectors/Sockets ■ Sensor Controllers
■ Switching Mode Power Supplies
■ Control Switches/Lamps/Buzzers
■ I/O Terminal Blocks & Cables
■ Stepper Motors/Drivers/Motion Controllers
■ Graphic/Logic Panels
■ Field Network Devices
■ Laser Marking System (Fiber, CO_2, Nd: YAG)
■ Laser Welding/Cutting System

Autonics Corporation
http://www.autonics.com
■ **HEADQUARTERS:**
18, Bansong-ro 513 beon-gil, Haeundae-gu, Busan, South Korea, 48002
TEL: 82-51-519-3232
■ **E-mail:** sales@autonics.com