

PARAMETER GENERATOR
(with digital displays)

MODEL **ABS3**

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:

Parameter generator
(incl. watertight packing and mounting bracket).....(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.

POINTS OF CAUTION

■ CONFORMITY WITH EU DIRECTIVES

- This equipment is suitable for Pollution Degree 2 and Installation Category II. Reinforced insulation (signal input or output to power input: 300V) and basic insulation (signal input to output: 300V) are maintained. Prior to installation, check that the insulation class of this unit satisfies the system requirements.
- The actual installation environments such as panel configurations, connected devices, connected wires, may affect the protection level of this unit when it is integrated in a panel system. The user may have to review the CE requirements in regard to the whole system and employ additional protective measures to ensure the CE conformity.
- Altitude up to 2000 meters.
- The equipment must be installed such that appropriate clearance and creepage distances are maintained to conform to CE requirements. Failure to observe these requirements may invalidate the CE conformance.
- In order to enable the operator to turn off the power input immediately, install a switch or a circuit breaker according to the relevant requirements in IEC 60947-1 and IEC 60947-3 and properly indicate it.

■ 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
 4VA at 100V AC
 5VA at 200V AC
 6VA at 264V AC

24V DC rating: 24V±10% ≤3W

■ GENERAL PRECAUTIONS

Before you remove the unit 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 10 to 90% RH in order to ensure adequate life span and operation.

■ REQUIREMENTS TO ENSURE IP66

- Observe the designated panel cutout size (W45 × H45 mm).
- The watertight packing included in the product package must be placed behind the front cover.
- Both mounting brackets must be fastened tightly until they hit the panel.
- Confirm visually that the packing is not contorted or excessively run off the edge after installation.

■ WIRING

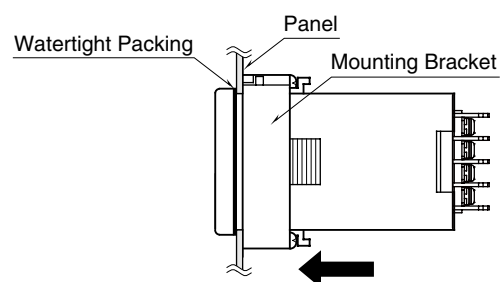
- Do not install cables (power supply, input and output) close to noise sources (relay drive cable, high frequency line, etc.).
- Do not bind these cables together with those in which noises are present. Do not install them in the same duct.

■ AND

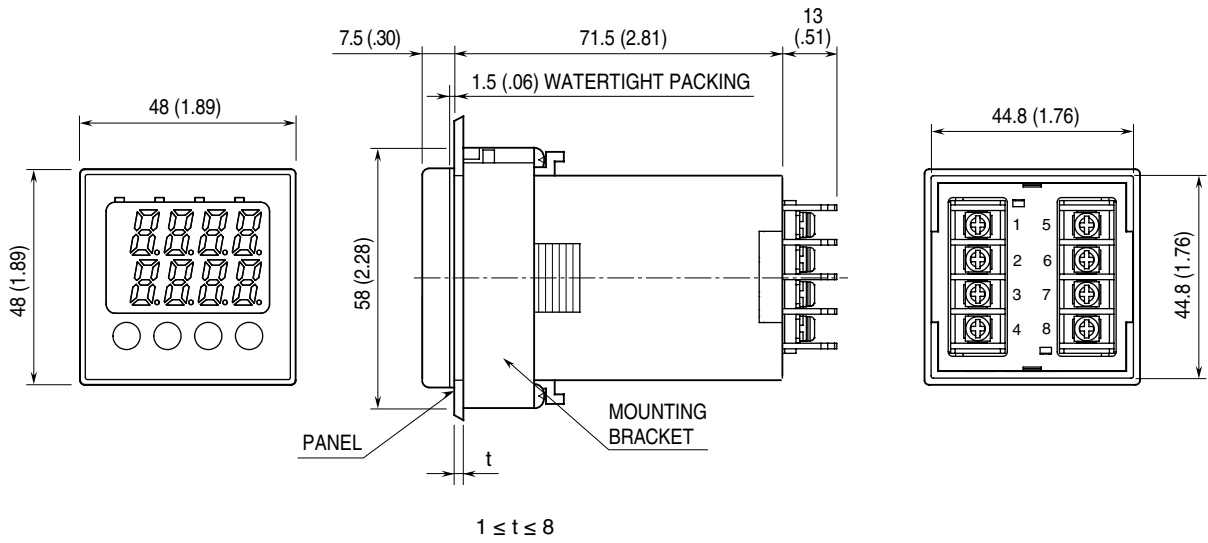
The unit is designed to function as soon as power is supplied, however, a warm up for 10 minutes is required for satisfying complete performance described in the data sheet.

INSTALLATION

Attach the mounting bracket and push it until it hits against the panel. (Do NOT remove the watertight packing as it works as stopper.)
(Panel thickness: 1 to 8 mm)

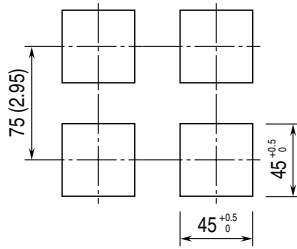


EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm (inch)

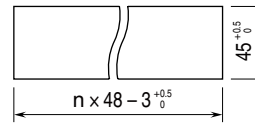


■ PANEL CUTOUT unit: mm (inch)

- Single Mounting
(Conform to degree of protection IP66)



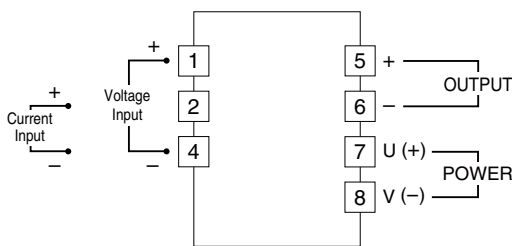
- Clustered Mounting
(Not conform to degree of protection IP66)



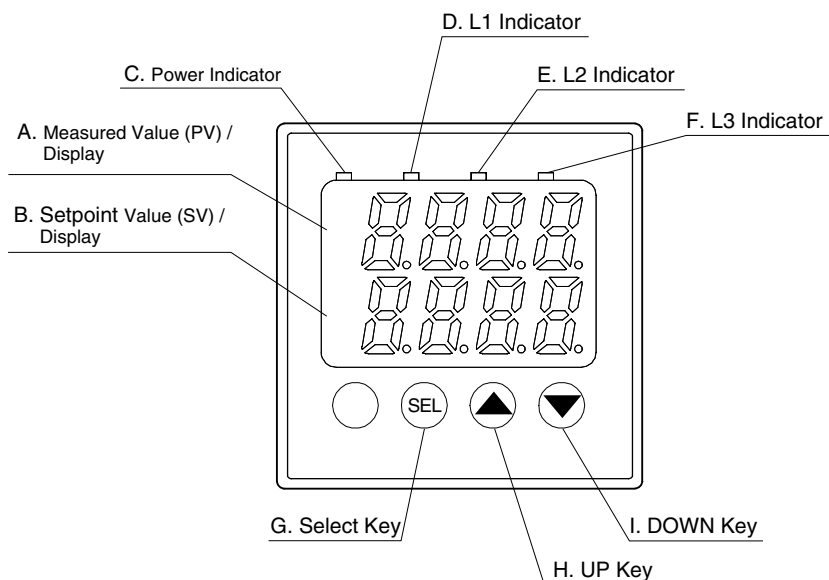
n : number of the units
Panel thickness : 1 to 8 mm

TERMINAL CONNECTIONS

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



FRONT VIEW



No.	COMPONENT	FUNCTION
A	PV display	Red LED indicates the measured value (PV) or parameter types.
B	SV display	Green LED indicates the setpoint value (SV) or parameter values.
C	Power indicator	Green LED turns on while the power is supplied.
D	L1 indicator	Amber LED turns on when setting the parameter block 1.
E	L2 indicator	Amber LED turns on when setting the parameter block 2.
F	L3 indicator	Amber LED turns on when setting the parameter block 3.
G	Select key	Select key used to move between parameter block levels, and to choose and apply parameters.
H	UP key	UP key used to choose parameters and increase the reading value. *1
I	DOWN key	DOWN key used to choose parameters and decrease the reading value. *1

*1. Holding down UP or DOWN key increases incrementing speed, except for controlling SV. In order to slow down, release the key once and then continue.

PROGRAMMING PROCEDURE

■ FACTORY DEFAULT SETTING

PARAMETER BLOCK	PARAMETER	DISPLAY	SELECTIONS & RANGE	FACTORY DEFAULT
0	Setpoint value	SV	Lower output limit ... Upper output limit (%), 1% increments	0
1	Setting lockout	LoC	0 : All parameters are modifiable 1 : All parameters are locked	0
1	Lower output limit *1	PLC	-10% ... Upper output limit (%)	-10
1	Upper output limit *1	PHC	Lower output limit (%) ... 110%	110
2	Input type	P-nc	6 : 1 – 5V DC A : 4 – 20mA DC	A
2	Output type	P-SV	6 : 1 – 5V DC A : 4 – 20mA DC	A
2	PV lower scaling value	P-SL	Input 0% value, -1999 ... 9999	0
2	PV upper scaling value	P-SU	Input 100% value, -1999 ... 9999	1000
2	PV decimal point position	P-dP	0 (_ _ _ _), 1 (_ _ _ .), 2 (_ _ . _), 3 (_ . _ _)	1 (_ _ . _)
3	Input filter time constant	P-dF	0.0 ... 10.0 (seconds)*3	0.0
3	Moving average	P-RU	0, 2, 4, 8, 16, 32, 64	64
3	SV zero adjustment	SRZO	-10 ... +10%	0
3	SV span adjustment	SRUS	-10 ... +10%	0
3	PV zero adjustment	PRZO	±50% of PV scaling upper/lower limit*2	0.0
3	PV span adjustment	PRUS	±50% of PV scaling upper/lower limit*2	0.0
3	Power ON delay time	P-dO	0 ... 20 (seconds)	0
3	Initialize settings	rSt	ON/OFF	OFF
3	Version	-	Display firmware version (setting not available)	-

*1. Modified output limits are applied only when the SV is changed after the modification.

*2. Decimal point position set for the PV is applied.

*3. The time PV display reaches to 63%, when PV input changes from 0 to 100%.

■ SV SETPOINT VALUE

• Setpoint Value

[Example] 0% → 50%

KEY	PROCEDURE / STATUS	DISPLAY
	Shows current SV (0%)	Upper : PV value Lower : 0000
SEL	SV LSD blinking	Upper : SV Lower : 0000
SEL	SV 2nd LSD blinking	Upper : SV Lower : 0000
▲▼	Press UP or DOWN until the reading shows “5”	Upper : SV Lower : 0050
SEL	SV 2nd MSD blinking	Upper : SV Lower : 0050
SEL	SV MSD blinking	Upper : SV Lower : 0050
SEL	Run mode	Upper : PV value Lower : 0050

■ PARAMETER BLOCK 1

Hold down SEL key for 3 seconds to enter the programming mode for the block 1 parameters.

• Setting Lockout

[Example] 0 : Unlock → 1 : Lock

KEY	PROCEDURE / STATUS	DISPLAY
	Run mode	Upper : PV value Lower : SV value
SEL	Hold down for 3 sec. until the upper row shows LoC	Upper : LoC Lower : ----
SEL	Press once to show the current setting at the lower row	Upper : LoC Lower : 0
▲▼	Press UP or DOWN until the reading shows “1”	Upper : LoC Lower : 1
SEL	Press once to store the new setting	Upper : LoC Lower : ----
SEL	Hold down for 3 sec. until the displays return run mode	Upper : PV value Lower : SV value

• Lower Output Limit

[Example] -10% → 0%

KEY	PROCEDURE / STATUS	DISPLAY
	Run mode	Upper: PV value Lower: SV value
SEL	Hold down for 3 sec. until the upper row shows LoC	Upper : LoC Lower : ----
▲▼	Press UP or DOWN until the upper row shows PLC	Upper : PLC Lower : ----
SEL	Press once to show the current setting at the lower row	Upper : PLC Lower : -10
▲▼	Press UP or DOWN until the reading shows "0"	Upper : PLC Lower : 0
SEL	Press once to store the new setting	Upper : PLC Lower : ----
SEL	Hold down for 3 sec. until the displays return run mode	Upper: PV value Lower: SV value

• Upper Output Limit

[Example] 110% → 100%

KEY	PROCEDURE / STATUS	DISPLAY
	Run mode	Upper : PV value Lower : SV value
SEL	Hold down for 3 sec. until the upper row shows LoC	Upper : LoC Lower : ----
▲▼	Press UP or DOWN until the upper row shows PHC	Upper : PHC Lower : ----
SEL	Press once to show the current setting at the lower row	Upper : PHC Lower : 110
▲▼	Press UP or DOWN until the reading shows "100"	Upper : PHC Lower : 100
SEL	Press once to store the new setting	Upper : PHC Lower : ----
SEL	Hold down for 3 sec. until the displays return run mode	Upper : PV value Lower : SV value

■ PARAMETER BLOCK 2

Hold down SEL key for 6 seconds to enter the programming mode for the block 2 parameters.

• Input Type

[Example] 6 : 1 – 5V → A : 4 – 20mA

KEY	PROCEDURE / STATUS	DISPLAY
	Run mode	Upper : PV value Lower : SV value
SEL	Hold down for 6 sec. The upper row shows LoC in 3 sec., P-n2 in 6sec.	Upper : P-n2 Lower : ----
SEL	Press once to show the current setting at the lower row	Upper : P-n2 Lower : 6
▲▼	Press UP or DOWN until the reading shows "A"	Upper : P-n2 Lower : A
SEL	Press once to store the new setting	Upper : P-n2 Lower : ----
SEL	Hold down for 3 sec. until the displays return run mode	Upper : PV value Lower : SV value

• Output Type

[Example] 6 : 1 – 5V → A : 4 – 20mA

KEY	PROCEDURE / STATUS	DISPLAY
	Run mode	Upper : PV value Lower : SV value
SEL	Hold down for 6 sec. The upper row shows LoC in 3 sec., P-n2 in 6sec.	Upper : P-n2 Lower : ----
▲▼	Press UP or DOWN until the upper row shows P-Sv	Upper : P-Sv Lower : ----
SEL	Press once to show the current setting at the lower row	Upper : P-Sv Lower : 6
▲▼	Press UP or DOWN until the reading shows "A"	Upper : P-Sv Lower : A
SEL	Press once to store the new setting	Upper : P-Sv Lower : ----
SEL	Hold down for 3 sec. until the displays return run mode	Upper : PV value Lower : SV value

• PV Lower Scaling Value

[Example] 0 → 1000

KEY	PROCEDURE / STATUS	DISPLAY
	Run mode	Upper: PV value Lower: SV value
SEL	Hold down for 6 sec. The upper row shows LoC in 3 sec., P-n2 in 6 sec.	Upper : P-n2 Lower : ----
▲▼	Press UP or DOWN until the upper row shows P-SL	Upper : P-SL Lower : ----
SEL	Press once to show the current setting at the lower row	Upper : P-SL Lower : 0
▲▼	Press UP or DOWN until the reading shows "1000" Incrementing speed increases by holding down the key	Upper : P-SL Lower : 1000
SEL	Press once to store the new setting	Upper : P-SL Lower : ----
SEL	Hold down for 3 sec. until the displays return run mode	Upper: PV value Lower: SV value

• PV Upper Scaling Value

[Example] 2000 → 3000

KEY	PROCEDURE / STATUS	DISPLAY
	Run mode	Upper: PV value Lower: SV value
SEL	Hold down for 6 sec. The upper row shows LoC in 3 sec., P-n2 in 6 sec.	Upper : P-n2 Lower : ----
▲▼	Press UP or DOWN until the upper row shows P-SU	Upper : P-SU Lower : ----
SEL	Press once to show the current setting at the lower row	Upper : P-SU Lower : 2000
▲▼	Press UP or DOWN until the reading shows "3000" Incrementing speed increases by holding down the key	Upper : P-SU Lower : 3000
SEL	Press once to store the new setting	Upper : P-SU Lower : ----
SEL	Hold down for 3 sec. until the displays return run mode	Upper: PV value Lower: SV value

• PV Decimal Point Position

[Example] 0 (_ _ _ _) → 2 (_ _ _ _)

KEY	PROCEDURE / STATUS	DISPLAY
	Run mode	Upper: PV value Lower: SV value
SEL	Hold down for 6 sec. The upper row shows LoC in 3 sec., P-n2 in 6 sec.	Upper : P-n2 Lower : ----
▲▼	Press UP or DOWN until the upper row shows P-dP	Upper : P-dP Lower : ----
SEL	Press once to show the current setting at the lower row	Upper : P-dP Lower : 0
▲▼	Press UP or DOWN until the reading shows "2"	Upper : P-dP Lower : 2
SEL	Press once to store the new setting	Upper : P-dP Lower : ----
SEL	Hold down for 3 sec. until the displays return run mode	Upper: PV value Lower: SV value

■ PARAMETER BLOCK 3

Hold down SEL key for 9 seconds to enter the programming mode for the block 3 parameters.

• Input Filter Time Constant

[Example] 0.0 second → 2.0 seconds

KEY	PROCEDURE / STATUS	DISPLAY
	Run mode	Upper: PV value Lower: SV value
SEL	Hold down for 9 sec. The upper row shows LoC in 3 sec., P-n2 in 6 sec., P-dF in 9 sec.	Upper : P-dF Lower : ----
SEL	Press once to show the current setting at the lower row	Upper : P-dF Lower : 0.0
▲▼	Press UP or DOWN until the reading shows "2.0"	Upper : P-dF Lower : 2.0
SEL	Press once to store the new setting	Upper : P-dF Lower : ----
SEL	Hold down for 3 sec. until the displays return run mode	Upper: PV value Lower: SV value

• Moving Average

[Example] 2 → 8

KEY	PROCEDURE / STATUS	DISPLAY
	Run mode	Upper: PV value Lower: SV value
SEL	Hold down for 9 sec. The upper row shows LoC in 3 sec., P-n2 in 6 sec., P-dF in 9 sec.	Upper : P-dF Lower : ----
▲▼	Press UP or DOWN until the upper row shows P-Av	Upper : P-Av Lower : ----
SEL	Press once to show the current setting at the lower row	Upper : P-Av Lower : A 2
▲▼	Press UP or DOWN until the reading shows "A 8"	Upper : P-Av Lower : A 8
SEL	Press once to store the new setting	Upper : P-Av Lower : ----
SEL	Hold down for 3 sec. until the displays return run mode	Upper: PV value Lower: SV value

• SV Zero Adjustment

[Example] 0% → 2%

KEY	PROCEDURE / STATUS	DISPLAY
	Run mode	Upper: PV value Lower: SV value
SEL	Hold down for 9 sec. The upper row shows LoC in 3 sec., P-n2 in 6 sec., P-dF in 9 sec.	Upper : P-dF Lower : ----
▲▼	Press UP or DOWN until the upper row shows SAJ0	Upper : SAJ0 Lower : ----
SEL	Press once to show the current setting at the lower row	Upper : SAJ0 Lower : 0
▲▼	Press UP or DOWN until the reading shows "2"	Upper : SAJ0 Lower : 2
SEL	Press once to store the new setting	Upper : SAJ0 Lower : ----
SEL	Hold down for 3 sec. until the displays return run mode	Upper: PV value Lower: SV value

• SV Span Adjustment

[Example] 100% → 95%

KEY	PROCEDURE / STATUS	DISPLAY
	Run mode	Upper: PV value Lower: SV value
SEL	Hold down for 9 sec. The upper row shows LoC in 3 sec., P-n2 in 6 sec., P-dF in 9 sec.	Upper : P-dF Lower : ----
▲▼	Press UP or DOWN until the upper row shows SAJS	Upper : SAJS Lower : ----
SEL	Press once to show the current setting at the lower row	Upper : SAJS Lower : 0
▲▼	Press UP or DOWN until the reading shows "-5"	Upper : SAJS Lower : -5
SEL	Press once to store the new setting	Upper : SAJS Lower : ----
SEL	Hold down for 3 sec. until the displays return run mode	Upper: PV value Lower: SV value

• PV Zero Adjustment

[Example] 0.0% → 0.5%

KEY	PROCEDURE / STATUS	DISPLAY
	Run mode	Upper: PV value Lower: SV value
SEL	Hold down for 9 sec. The upper row shows LoC in 3 sec., P-n2 in 6 sec., P-dF in 9 sec.	Upper : P-dF Lower : ----
▲▼	Press UP or DOWN until the upper row shows PAJ0	Upper : PAJ0 Lower : ----
SEL	Press once to show the current setting at the lower row	Upper : PAJ0 Lower : 0.0
▲▼	Press UP or DOWN until the reading shows "0.5"	Upper : PAJ0 Lower : 0.5
SEL	Press once to store the new setting	Upper : PAJ0 Lower : ----
SEL	Hold down for 3 sec. until the displays return run mode	Upper: PV value Lower: SV value

• PV Span Adjustment

[Example] 100% → 98.5%

KEY	PROCEDURE / STATUS	DISPLAY
	Run mode	Upper: PV value Lower: SV value
SEL	Hold down for 9 sec. The upper row shows LoC in 3 sec., P-n2 in 6 sec., P-dF in 9 sec.	Upper : P-dF Lower : ----
▲▼	Press UP or DOWN until the upper row shows PAJS	Upper : PAJS Lower : ----
SEL	Press once to show the current setting at the lower row	Upper : PAJS Lower : 0.0
▲▼	Press UP or DOWN until the reading shows “-1.5”	Upper : PAJS Lower : -1.5
SEL	Press once to store the new setting	Upper : PAJS Lower : ----
SEL	Hold down for 3 sec. until the displays return run mode	Upper: PV value Lower: SV value

• Power ON Delay Time

[Example] 0 second → 5 seconds

KEY	PROCEDURE / STATUS	DISPLAY
	Run mode	Upper: PV value Lower: SV value
SEL	Hold down for 9 sec. The upper row shows LoC in 3 sec., P-n2 in 6 sec., P-dF in 9 sec.	Upper : P-dF Lower : ----
▲▼	Press UP or DOWN until the upper row shows P-d0	Upper : P-d0 Lower : ----
SEL	Press once to show the current setting at the lower row	Upper : P-d0 Lower : 0
▲▼	Press UP or DOWN until the reading shows “5”	Upper : P-d0 Lower : 5
SEL	Press once to store the new setting	Upper : P-d0 Lower : ----
SEL	Hold down for 3 sec. until the displays return run mode	Upper: PV value Lower: SV value

• Initialize Settings

[Example] Parameter block 0-3 settings to factory default

KEY	PROCEDURE / STATUS	DISPLAY
	Run mode	Upper: PV value Lower: SV value
SEL	Hold down for 9 sec. The upper row shows LoC in 3 sec., P-n2 in 6 sec., P-dF in 9 sec.	Upper : P-dF Lower : ----
▲▼	Press UP or DOWN until the upper row shows rSt	Upper : rSt Lower : ----
SEL	Press once to show the current setting at the lower row	Upper : rSt Lower : roFF
▲▼	Press UP or DOWN until the reading shows “r on”	Upper : rSt Lower : r on
SEL	Press once to initialize the parameters and return to run mode	Upper: PV value Lower: SV value

• Version Display

[Example] Confirming version display of the unit

KEY	PROCEDURE / STATUS	DISPLAY
	Run mode	Upper: PV value Lower: SV value
SEL	Hold down for 9 sec. The upper row shows LoC in 3 sec., P-n2 in 6 sec., P-dF in 9 sec.	Upper : P-dF Lower : ----
▼	Press DOWN once (Version is displayed)	Upper : Version display Lower : Version display
SEL	Hold down for 3 sec. until the displays return run mode	Upper: PV value Lower: SV value

■ HOW TO CONFIRM PV & SV

Both values are on the displays in the run mode.

■ CAUTION IN SETTING

- A new setting value on the display is automatically stored in the memory if the keys are untouched for 3 seconds. It is also stored when pressing SEL key.
- The display automatically returns to the run mode if the keys are untouched for 30 seconds.

STARTING UP, SETTING UP

When the power supply to the ABS3 is turned on, all displays turn on for approximately 2 seconds, then the model No. appears on the PV display for 2 seconds. The ABS3 starts operating in a few seconds after that.

The ABS3 must be set up to meet its operating conditions. It is recommended to wait for 10 minutes for warming up.

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: Check that the input signal is within -10 – +110% of the full-scale.
- 4) Output: Check that the load resistance meets the described specifications.

CHARACTER SET

-	1	0	1	2	3	4	5	6	7	8	9	-	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
-	1	0	1	2	3	4	5	6	7	8	9	-	A	b	C	d	E	F	G	H	,	U	P	L	ñ	n	o	P	q	r	S	t	U	u	y	ü	Y	≡