AD-8118B

UNIVERSAL PRINTER

INSTRUCTION MANUAL

UNIVERSAL PRINTER

A&D Company, Limited

1366-1B-IE.1998.03.19

INTRODUCTION

Thank you for purchasing an AD-8118D Universal Printer. Before using your printer, please read this manual to gain an understanding of its functions and correct use.
After reading this manual, please store it in a safe place.

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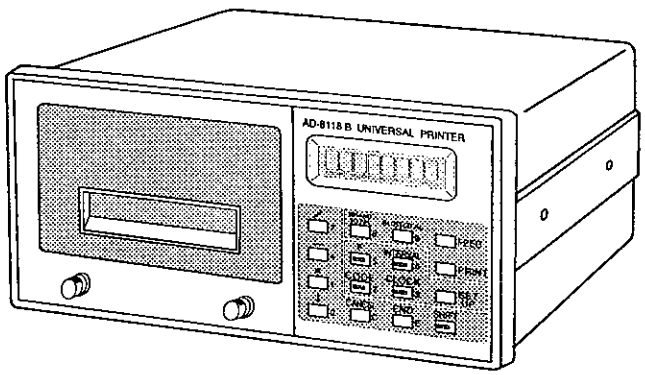
Compliance with FCC Rules

Please note that this equipment generates, uses and can radiate radio frequency energy. This equipment has been tested and has been found to comply with the limits of a Class A computing device pursuant to Subpart J of Part 15 of FCC rules. These rules are designed to provide reasonable protection against interference when equipment is operated in a commercial environment. If this unit is operated in a residential area it might cause some interference and under these circumstances the user would be required to take, at his own expense, whatever measures are necessary to eliminate the interference.

(FCC = Federal Communications Commission in the U.S.A.)

Section A

This section describes the features, specifications, composition, precautions and printer paper replacement procedure for the AD-8118B Universal Printer.



Welcome!

Thank you for your A&D purchase !

This is an Instruction Manual for the AD-8118B Universal printer. The AD-8118B is a product of years of design, development, and in-fieid testing. It is designed to withstand harsh environmental conditions - and each printer is subjected to several levels of quality control before it leaves the factory. Every care has been taken during the manufacturing process of this printer to ensure that it will perform accurately and reliably for many years.

The AD-8118B Universal Printer is mainly for use with A&D's industrial scales and electronic balances. A highly reliable printer mechanism is perfect for 8118B is built solid to protect against noise influence. Easy to operate, the Universal Printer provides fast dependable printing.

Features

The AD-8118B Universal Printer is designed primarily for use with A&D industrial scales and electronic balances and has the following features:

- ❑ Highly reliable printer mechanism for industrial use
- ❑ Error-free operation(internal self-check function)
- ❑ High noise immunity.
- ❑ Dot impact mechanism allows long-term storage of printed contents.
- ❑ 24 columns/line printing for high printing density.
- ❑ Panel mountable small DIN size. Installation in an instrument panel, etc. is easy.
- ❑ Cumulative total function by code and grand total calculation function.
- ❑ Calendar/clock function. Date and time may be printed.
- ❑ Lithium battery provides cumulative total memory and calendar/clock back-up without AC power for approximately 6 years (with power off)
- ❑ 60mm paper used for large printing capability.
- ❑ Serial input allows simple connection with only one cable. Current loop input allows connection to remote devices also (about 100m) .
- ❑ Interval function performs printing at set times.
- ❑ Programmable printing format.
- ❑ Inputs can be expanded up to 4 channels by adding options so that the data of four scales can be printed with one printer.

Specifications

Printer Unit Specifications

Printer

1)	Printing system	Dot matrix impact printer
2)	Printing width	24 columns/line for 5 × 7 dot character (standard character) 12 columns/line for 10 × 7 dot character (enlarged character)
3)	Printing speed	Approximately 1.7 lines/second (internal processing time excluded)
4)	Character dimensions	1.7 (W) × 2.6 (H)mm (standard character) 3.4 (W) × 2.6 (H)mm (enlarged character)
5)	Reliability	Approximately 1,000,000 lines

Display and Keys

1)	Display element	Liquid crystal 8 digits (character display)
2)	Character height	6.95mm
3)	Keys	Ten keypad and function keys (16)

Ink Ribbon

1)	Character color	Purple
2)	Life	Approximately 250,000 characters (varies depending on the environment)

Printer Paper

1)	External dimensions	57.5 (W) × 60 (D) mm
2)	Length	Approximately 30m (an ending mark appears approximately 1m from the end)
3)	Number of printing lines	Approximately 8000 lines

Input Specifications

Method	EIA RS-232C or current loop
Baud rate	2400/600bps
Data bits	7/8bits
Parity bit	1 (EVEN)/ No
Stop bit	1
Codes used	ASCII

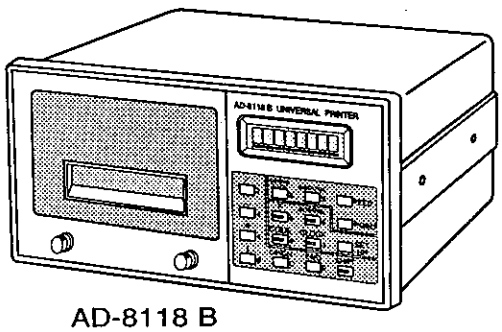
General Specifications

1)	Power requirement	100, 117, 220, 240 V AC +10%/-15%, 50/60Hz Approximately 20VA (printing)
2)	Weight	Approximately 3kg
3)	Operating temperature range	0 to 40°C (32°F to 104°F)
4)	Operating humidity	80% RH (non-condensating)
5)	Physical dimensions	192 (W) 185 (D) X 96 (H)mm
6)	Panel cutout dimensions	$186 \pm {}^{1.0}_{0}$ x $92 \pm {}^{0.8}_{0}$ mm

- Specifications and appearance are subject to change without prior notice.

Product and Accessories

Universal Printer

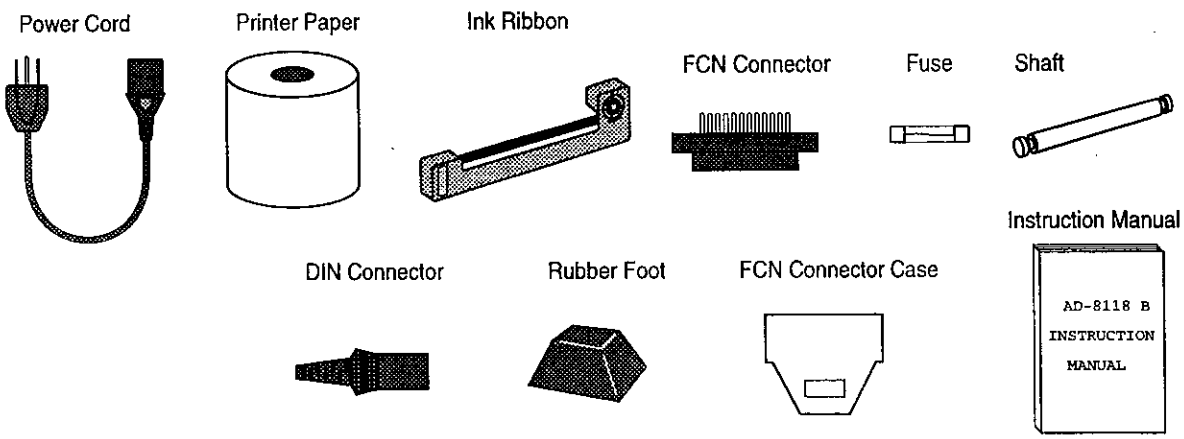


AD-8118 B

Accessory Check List

Accessories

- AC power cord 1
- Fuse 1
- Printer paper 1
- Ink ribbon 1
- Shaft 1
- I/O connector 1
- DIN connector 1(With OP-01 installed, 3 mini DIN connectors are included.)
- Rubber feet 4
- Instruction manual 1



Precautions

This printer is a precision electronic device. Handle it carefully.

Installation

1) The operating temperature range is 0°C to 40°C (32°F to 104°F) . Do not install the printer in direct sunshine.
2) As the printer is not sealed, do not use the printer where dust is prevalent. If conductive substances inside the printer, trouble may occur.
3) Do not subject to strong vibrations.
4) Be careful not to expose the printer to excessive noise or static electricity, they may cause the printer to malfunction.

Connection of Power Supply/Ground

1) Ground the AD-8118B via the power cable to the rear terminal of your scale or balance. Don't plug it in directly to any other equipment. Do not use it commonly with power devices.
2) If the local AC electricity supply fluctuates by more than ±10% an AC regulator must be used to stabilize the power supply. Do not use a common source for the power lines.

⚠ NOTE: Do not turn ON the power at this time. Connect the power plug after all other connections have been made.

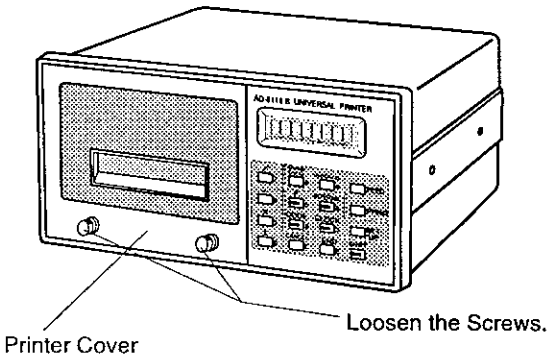
Power-up Procedure

When this printer is connected to other devices, turn on the power of the other devices first, then turn on the power of this printer.
If the power is turned on at the same time, start-up of the CPU of the connected devices may be delayed and when the printer is set to the automatic print or dump print mode, the first data may not be processed normally.
For manual printing, there will be no problem if the data is input several times after the power is turned on.

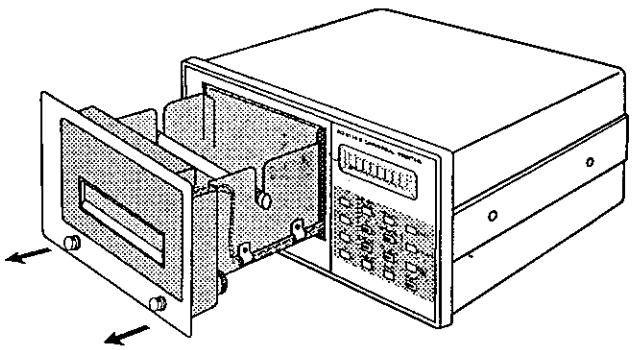
Replacing the Printer Paper and Ink Ribbon

Replacing the Printer Paper

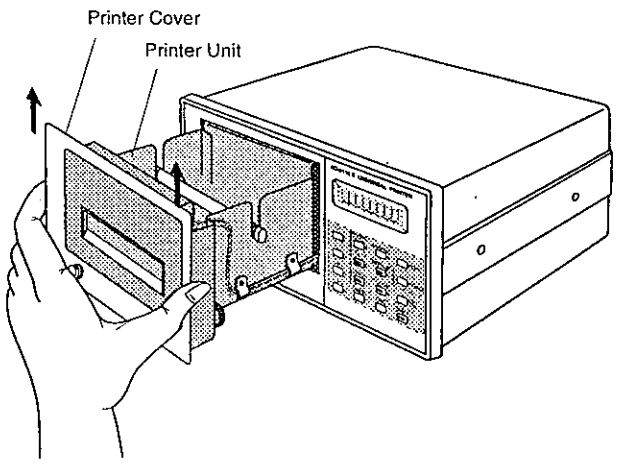
- First, turn the power OFF.
- Loosen the screws on the printer cover.



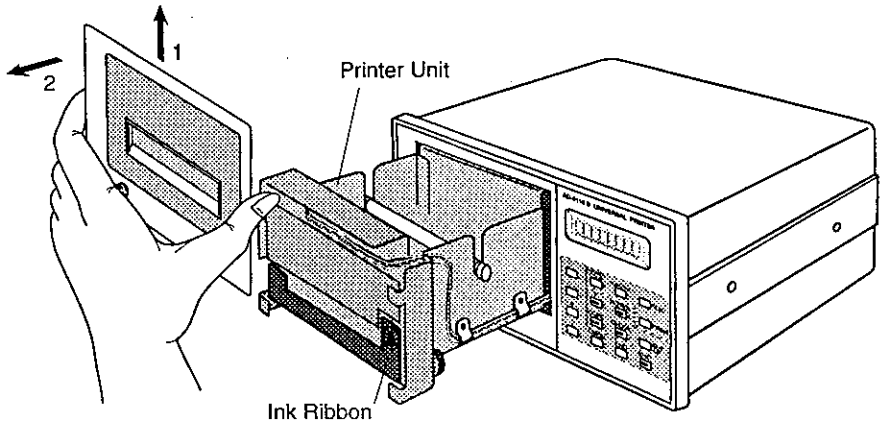
- Pull out the printer cover and printer unit together.



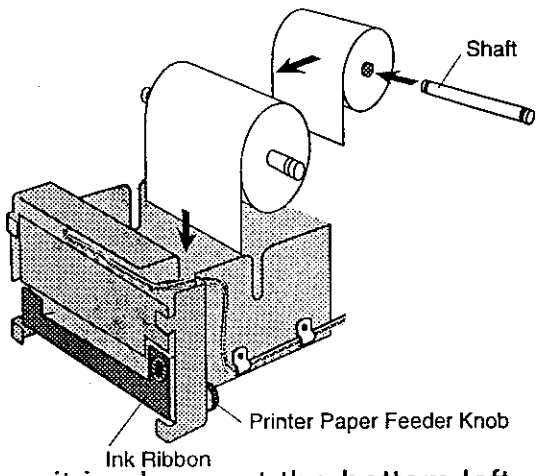
- Next, remove the printer cover by lifting it gently as shown below.



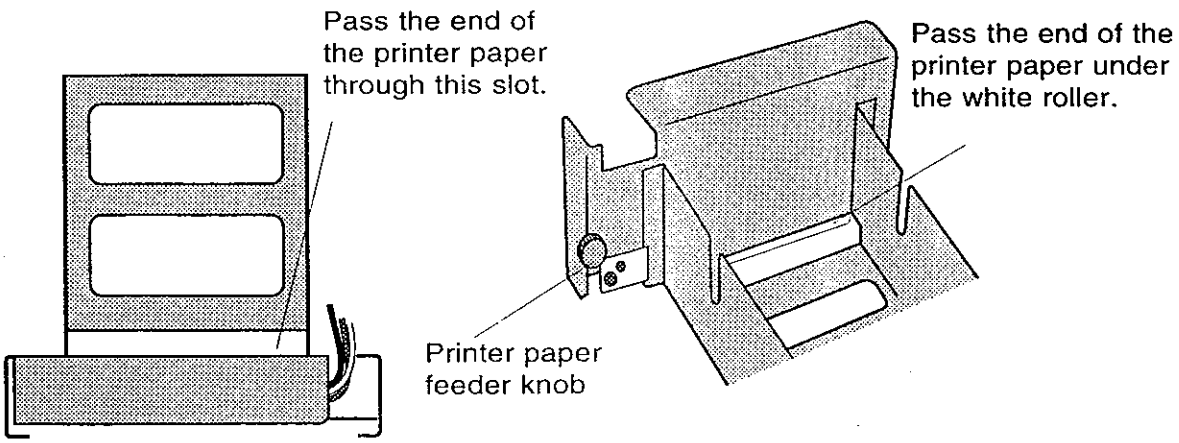
- The ink ribbon () at the front of the printer unit can be accessed by removing the printer cover from the printer unit.



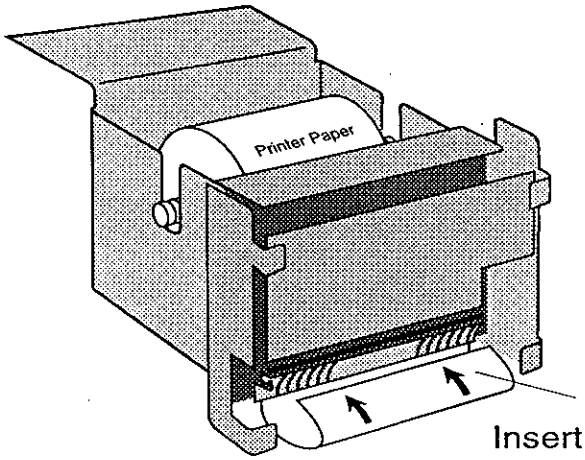
- Peel off the adhesive tape on the printer paper completely, insert the shaft supplied as an accessory into the printer paper and set the paper on top of the printer unit.



A top view of the printer unit is shown at the bottom left.
First, pass the end of the printer paper through the slot and pass it under the roller.

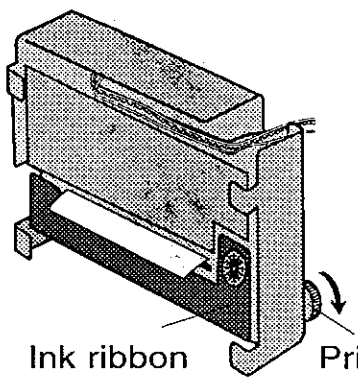


- Set the paper and shaft in place, pull out the paper downward and pass it through the bottom roller and insert it into the printer slot.



Insert paper into slot.

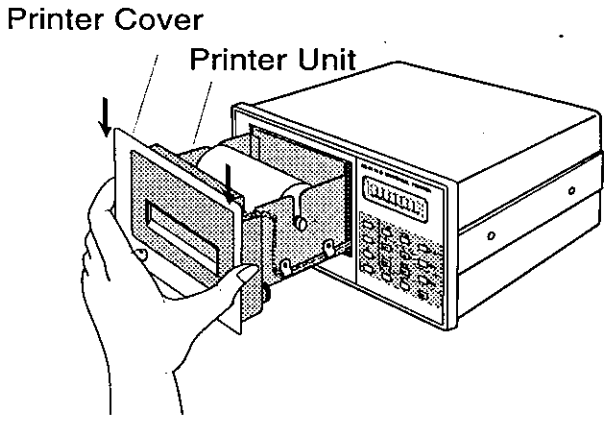
- After installing the paper, turn the printer paper feeder knob as shown in the figure. The paper should come out the front.



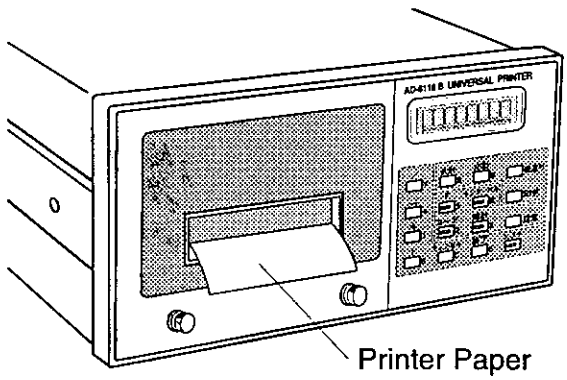
Ink ribbon

Printer paper feeder knob

- Next, reinstall the printer cover on the printer unit as shown below.



- Insert the printer unit into the printer chassis and tighten the printer cover screws.
- Feed a small amount of printer paper from the printer.



Note 1. Do not apply excessive force to the printer unit. If normal, it can be pulled out easily. If it is hard to take out, re-insert it once and pull it out again.

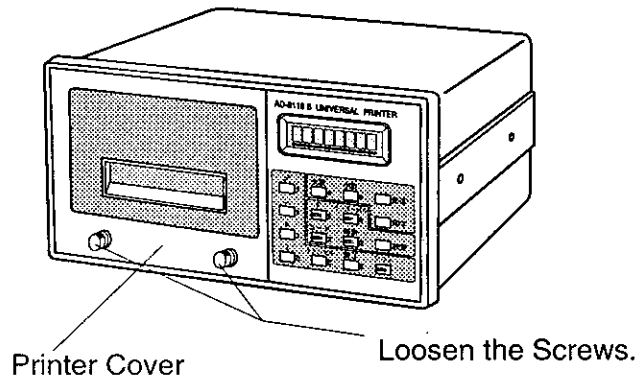
Note 2. The printer is made of electric circuits and other precision components and could be damaged if metallic powder, water or other foreign substances get inside it. Also be careful of static electricity when the printer unit is pulled out.

If dust or other foreign substances get inside the printer, blow it out with clean air. If the printer is used in a dusty environment, consider using a dust cover or air purge when the printer is not in use.

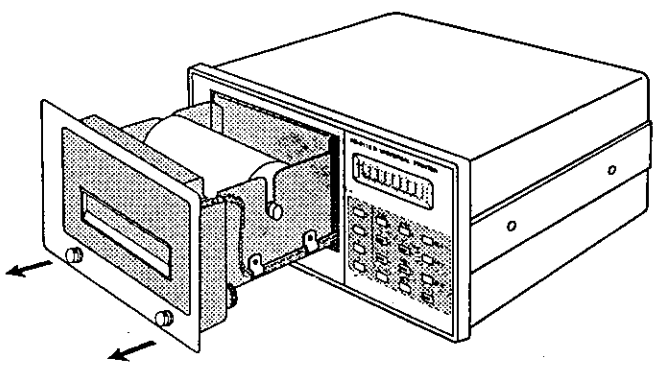
Note 3. A red mark will be printed approximately 1m before the end of the roll of paper; replace the paper when you see this mark. Printing without any paper in the printer may shorten the life of the printer.

Replacing the Ink Ribbon

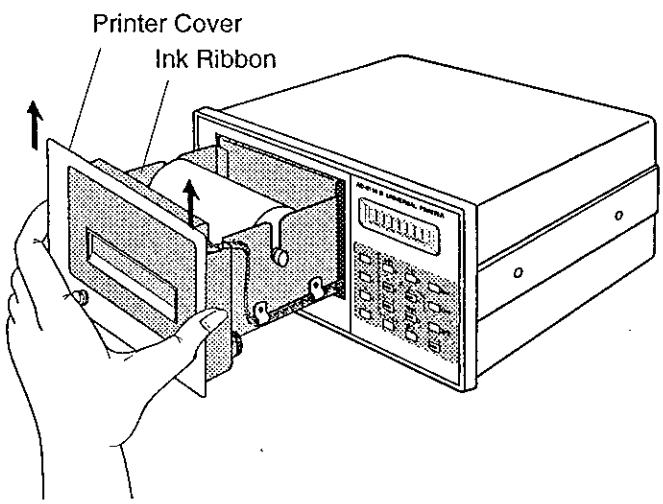
- First, turn the power OFF.
- Loosen the screws on the printer cover.



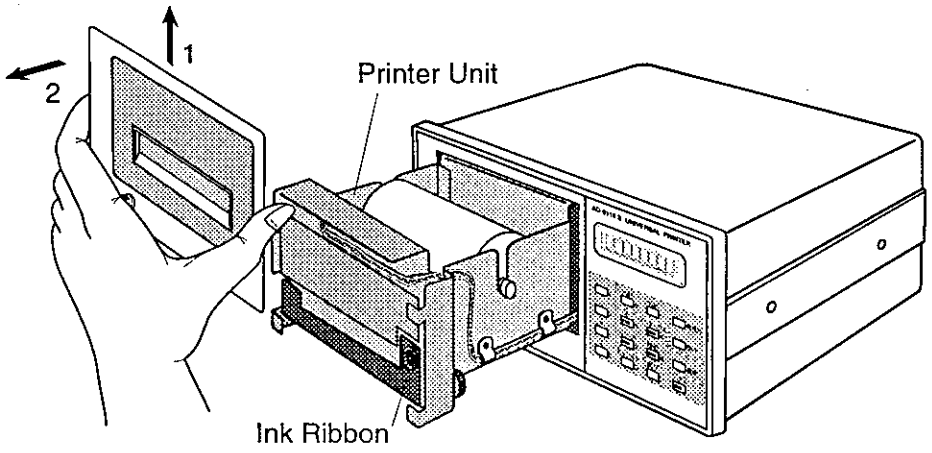
- Pull out the printer cover and printer unit together.



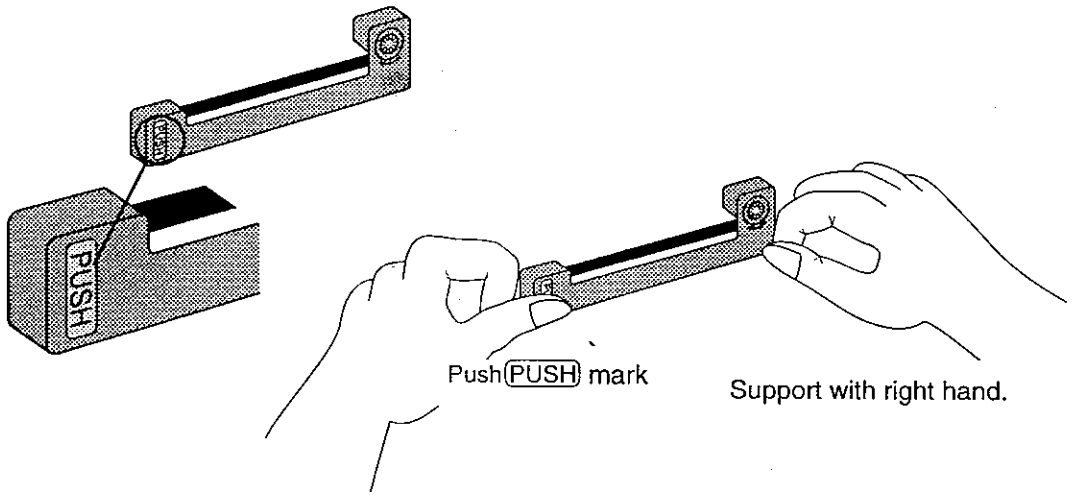
- Next, remove the printer cover by lifting it off gently as shown below.



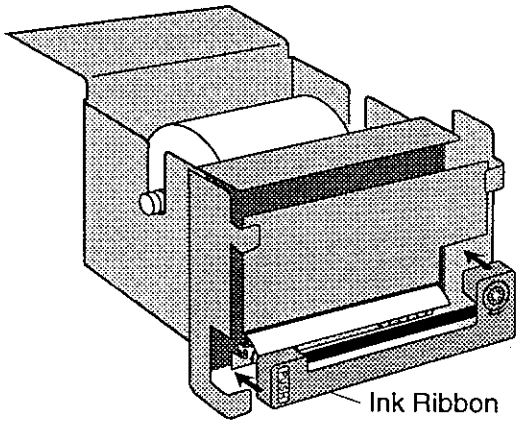
- The ink ribbon () at the front of the printer unit can be accessed by pulling up the printer cover and removing it from the printer unit.



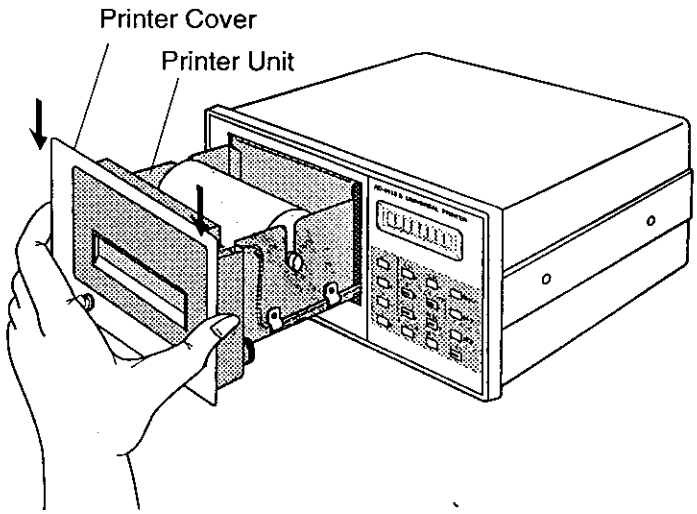
Push the PUSH mark at the front left of the ink ribbon while supporting the ink ribbon with your right hand as shown in the figure. Remove the ink ribbon forward.



- Install the new ink ribbon by pushing it gently in the arrow direction as shown in the figure.



- Next, install the printer cover to the printer unit as shown below.

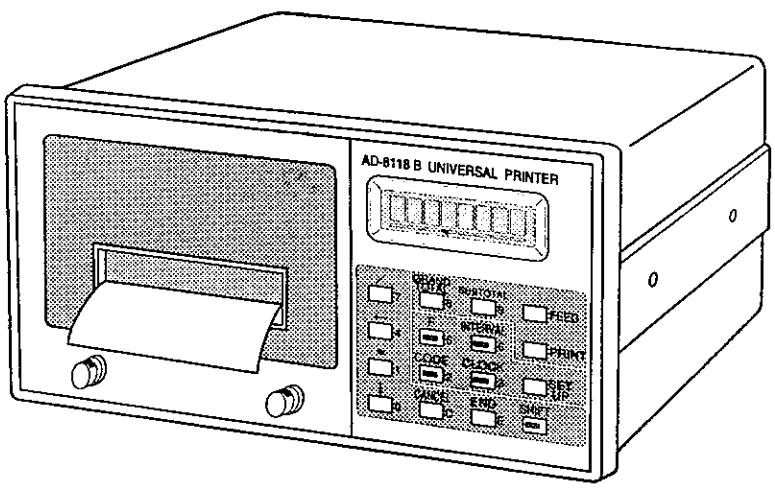


- Insert the printer unit into the printer proper and tighten the printer cover screws.

Note 1. Do not apply excessive force to the printer unit. If normal, it can be pulled out easily. If it is hard to take out, re-insert it once and pull it out again.

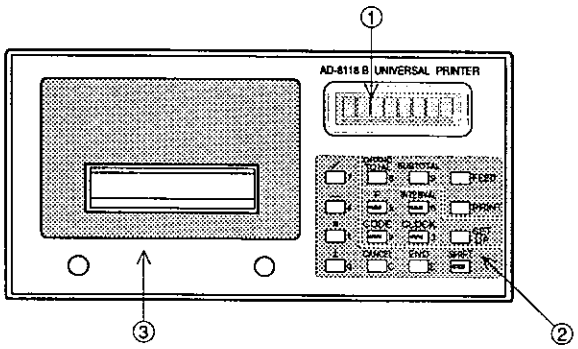
Section B

This section describes the AD-8118B panels, operation keys, the method of processing input data from an indicator, etc. and the error display contents.



Description of Panels

Front Panel



① 8-digit liquid crystal display

Displays the data, time, and other internal information.

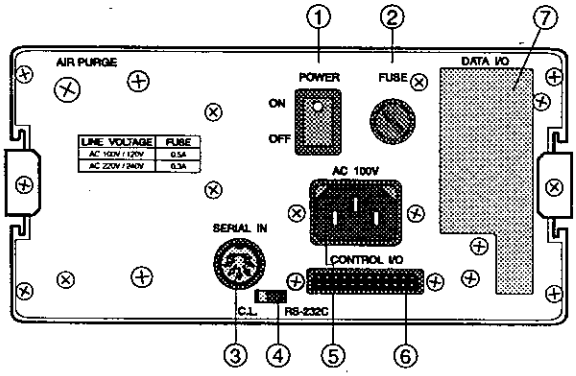
② Operation keys

For a description of the operation of these keys, see "Operation of Key Switches".

③ Printer cover

When replacing the printer paper, ink ribbon, etc. loosen the screws on this cover and pull out the printer unit. See "Replacing the Printer Paper and Ink Ribbon".

Rear Panel



① POWER switch

This switch turns the printer power on and off.
Set it to OFF when not using the printer.

② FUSE

When this fuse blows, replace it after ascertaining the cause.

③ SERIAL IN connector

This is the RS-232C or current loop input connector. The CH (channel) number is 1.
See "Serial Input Connection".

④ Input selector switch

This control switches the serial input between RS-232C and current loop.
See "Serial Input Connection".

⑤ AC power cord connector

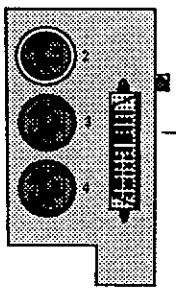
The end of the AC power cord connects to this connector.

⑥ CONTROL I/O connector

This is the I/O connector for controlling the printer from externaly.
See "Control I/O Connection".

⑦ Expansion input option (OP-01)

The Serial input can be expanded by 3 channels. The CH numbers from the top, are CH2, CH3, and CH4.



Option control I/O connector

AD-8118B Quick Operation Example

When desiring to use this printer immediately, first connect its serial input connector to the serial I/O connector of the other device with a cable. The internal settings of this printer are made at the factory as shown in Table 1.

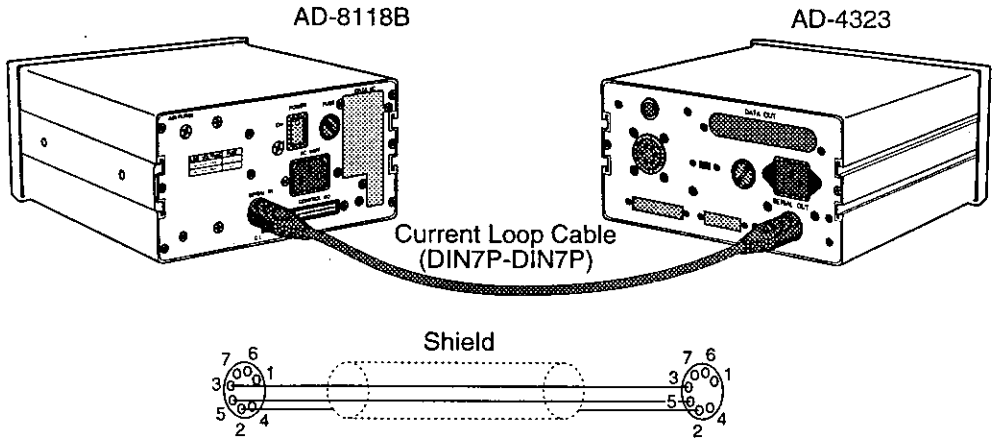
Table 1

Signal specifications	Baud rate Data bits	2400bps 7bit
Printing specifications	Printing mode Printing characters/size	Normal printing Standard character size (24 columns/line)
Printing method	Output format	Standard output format
Code number	Input method	Key input (2 digits)
Print timing	Timing	Manual addition printing (When a print command is input from the PRINT key or control I/O, the input data is internally added and printed.)
Input mode	Input data	Gross weight, net weight, or tare can be input. Input data calculation is also possible.
Serial signal input port number	CH number	1CH

The internal setting of Table 1 above are the settings which print the weight data sent from the connected device and add it internally when the PRINT key of this printer is pressed (or print command by control I/O is input).

Example of connection to AD-4322/23/25

The connection diagram for connection to the AD-4323 is shown here.



The AD-4323 rear panel SERIAL OUT connector is connected to the AD-8118B SERIAL IN connector.

1) Printing when AD-8118B PRINT key pressed (or print command input from control I/O)(Manual printing)

* Set the AD-4323 as shown in Table 2.

Table 2

F21	2	(2400bps)
F22	1	* F22 does not necessarily have to be set to 1. Select the data you want to print.
F23	1	(Stream)
F24	1	(Send data even when it overflows or is unstable.)

Data Formatting Mode

You con select from the following date formats:

American style: 6 / 22 / 92
European style: 22 / 6 / 92
Japanese style: 92 /6 / 22

To change date format:

Step 1. Turn off the power switch on the rear panel.

Step 2. Press and hold the [/ 7] key and the [FEED] key, and turn on the power switch.

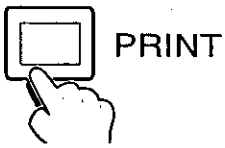
Step 3. Press the [CLOCK 3] key to rotate through the three styles. The style selected will be displayed as the [CLOCK 3] key is pressed.

American style: U.S.A.
European style: EUROPE
Japanese style: JAPAN

Step 4. Turn off the power switch.

D-8118B Key Operation

(1) Printing and addition

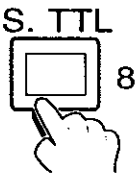


- Press the PRINT key at the desired print timing. The first data input within 3 seconds after the PRINT key was pressed is printed and added to the internal memory.

(2) Paper feed

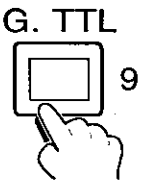
- The paper is fed while the FEED key is being pressed.

(3) Subtotal



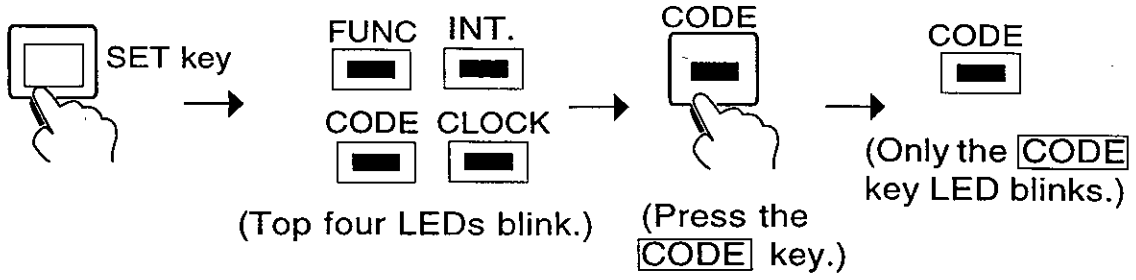
- When this key is pressed, the sub total value is printed in the format selected by function data. However, after printing, the sub total value is automatically cleared. For the function data (F-17, F-18, F-19, F-31), see page C-19.

(4) Grand total

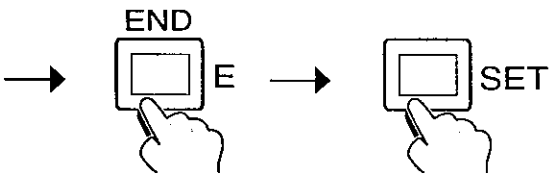


- When this key is pressed, the grand total value is printed in the format selected by function data. The grand total value data is cleared when the G.TTL key is pressed while pressing the C (cancel) key. For the function data (F-20, F-21, F-22, F-32), see page C-21.

(5) Code number registration



→ CH1** is displayed. When the END key is pressed, CH number is incremented. Therefore, select CH number and input the desired code number (2 digits).



CH : Serial signal input port number.
Standard port is CH1 and option inputs are, from the top, CH2, CH3, and CH4.

2) When print timing determined by AD-4323/25 (automatic printing)

For example, the internal settings when weight data is automatically output one time after the AD-4323/25 is used in the sequential mode and weighing is complete are shown in Table 3.

Table 3

AD-4323/25 internal setting	AD-8118B internal setting points
F21 2 (2400bps) F22 1 F23 2 (auto print) F24 1 (Send data even when it overflows or is unstable.) F15 3 (Sequential on) **NOTE:** The F15 setting above is for sequential on. For sequential off, F15→ 4.	*To switch the print timing from manual addition printing to automatic addition printing, set the contents of F10 to 6.

Note: Also set the AD-8118B as shown in Table 3 when the print command is input from the AD-4323/25 control I/O. However, at AD-4323/25 setting, set F23 to 3 (manual print).

The AD-8118B paper feed, subtotal, grand total, and code number operation contents are the same as those given on the preceding page.

3) When desiring to set the code number at the AD-4325 and output it together with the weight data.

During AD-4325 internal setting, set F25 to 1. The code number and weight are output from the serial data output .
Also set the AD-8118B internal setting F14 to 2. This enables the code number output by the AD-4325. (Refer to the function data settings.)

Error Printing

This printer identifies and prints the following errors:

Error printing	Contents
T ERROR	Input data was not input within 3 seconds after operation at manual printing.
U ERROR*1	Units are not the same as the last data in the cumulative total mode.
S ERROR*2	Cumulative total weight is overweight.
O ERROR	Data is overweight.
F ERROR	Data format does not match.
I ERROR	Data outside the set limit (-, unstable data) is input.
B ERROR	Print buffer overflows.
R ERROR*3	Other than 00 to 99 is input as code input.

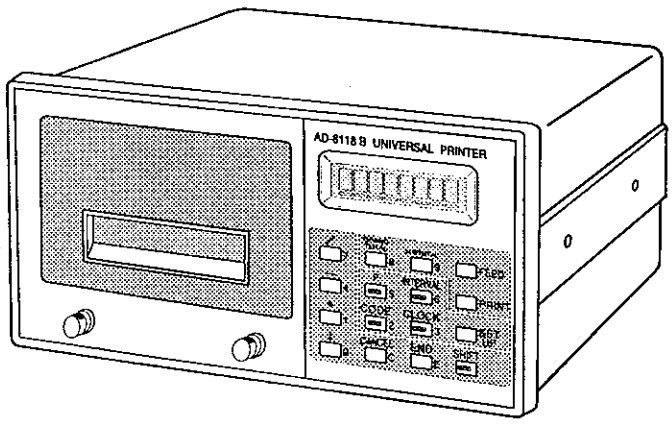
*1 This message prints the weight value and also adds the data to the cumulative total.

*2 This message prints the weight value, but does not add the data to the cumulative total.

*3 This message prints the weight value and adds it to the code No. 00 cumulative total.

Section C

This section describes the AD-8118B internal setting contents and weight value cumulative total. This description is also combined with printout examples.



Key Operation and Internal Setting

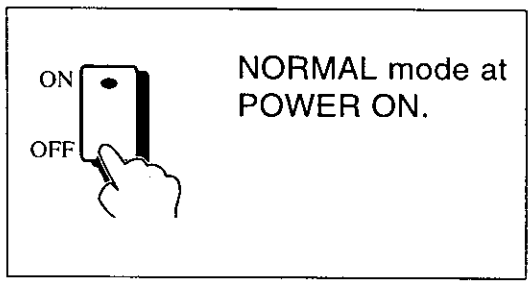
The AD-8118B has three operation modes: NORMAL mode, SET mode, and PROGRAM mode.

(1) NORMAL mode

When the power is turned ON, the AD-8118B enters this mode. Normal printing operation is performed in this mode. The key operations that are performed in this mode are paper feed, print, subtotal, and grand total.

Table 4

Operable keys in NORMAL mode	
FEED	GRAND
SUBTOTAL	PRINT
INTERVAL	CLOCK
CODE (batch mode)	

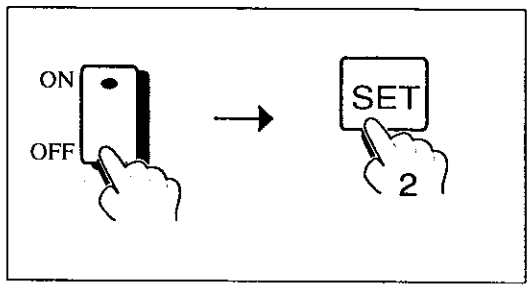


(2) SET mode

To enter this mode, press the SET key in the NORMAL mode. The internal settings shown in Table 5 can be performed in this mode.

Table 5

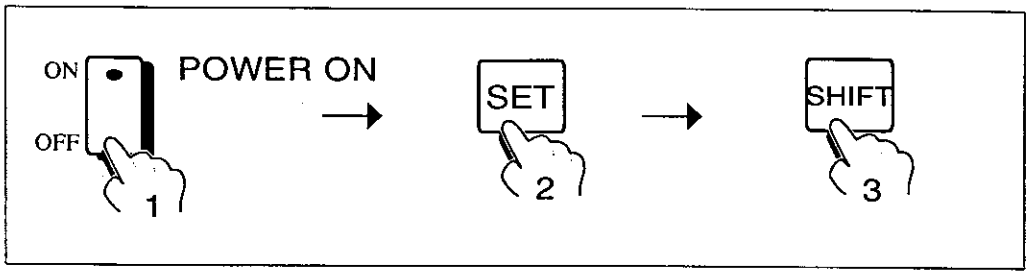
Internal settings which can be performed in SET mode	
Clock	Interval time
Code number	Function data



* Code number setting is effective when function number 14 is set for key input.

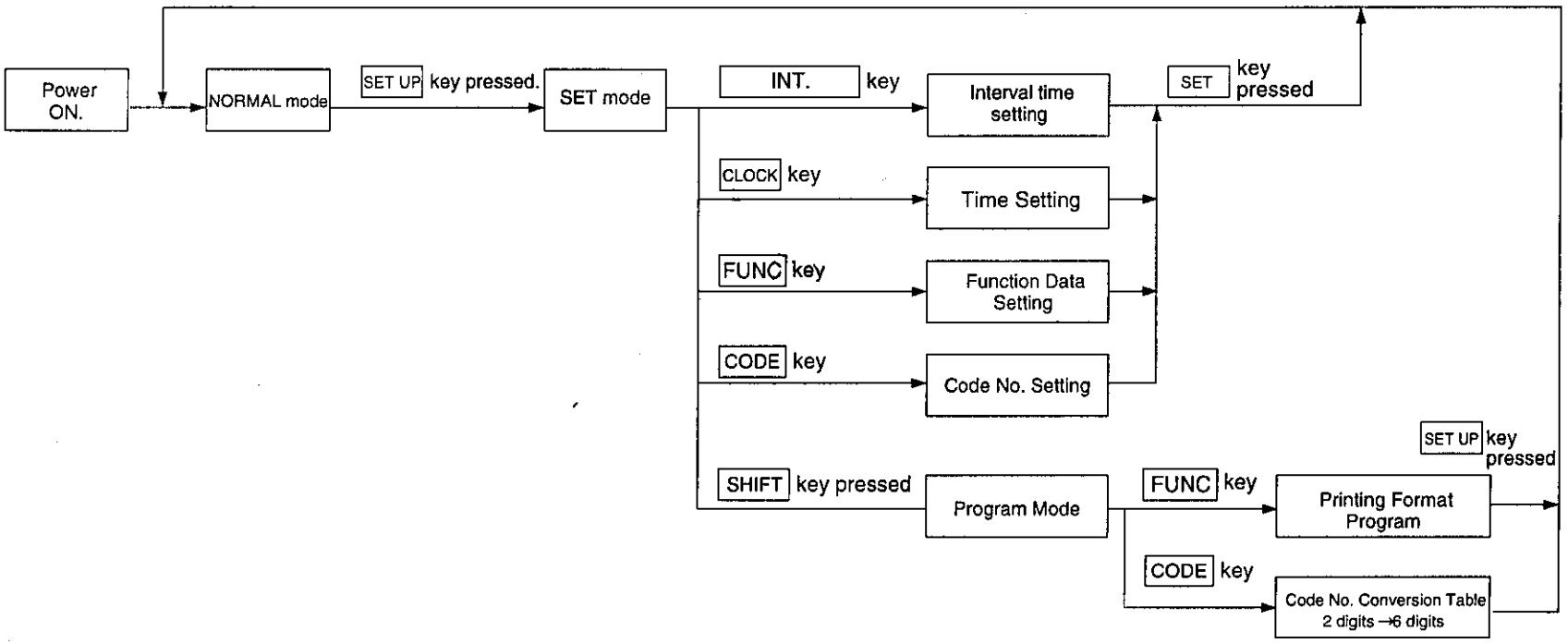
(3) PROGRAM mode

To enter this mode, press the SHIFT key in the SET mode. In this mode, 2-digit code numbers can be converted to 6 digits. The printing format can also be programmed.

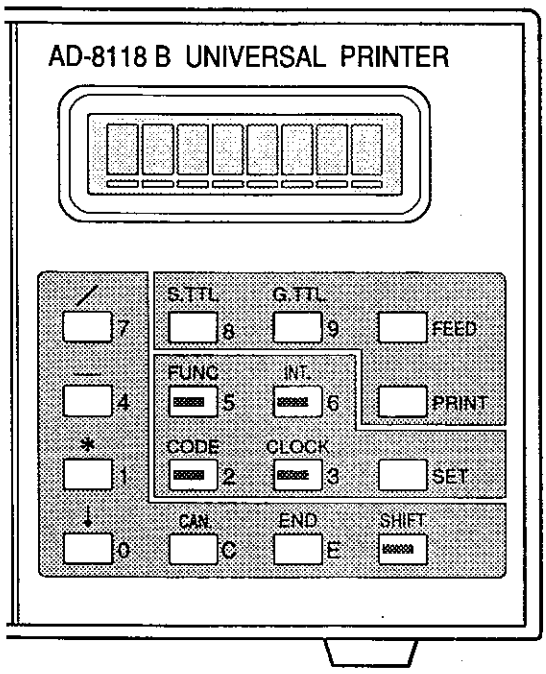


Check the relationship between each mode and the contents of each mode with the figure on the following page. The contents of key operations related to each mode are described beginning on page C-5.

Relationship Between and Contents of NORMAL, SET, and PROGRAM Modes



Key Operation in NORMAL Mode



1) FEED key
When this key is pressed one time, the printer paper is fed one line. When this key is held down, the paper is fed continuously.

2) PRINT key
When this key is pressed, the first data input within 3 seconds after the key was pressed is printed.
*When the multiple channels (CH) option is installed, when the PRINT key is pressed, "CH No." is displayed on the printer display. Enter the channel number that you want to print.

Note: When data is to be printed by PRINT key, function F-10 must be set to manual printing during internal setting.

F-10 setting	
Manual printing	1
Manual addition printing	3

3) S.TTL key

When this key is pressed, the subtotal value is printed in accordance with the contents set at functions F-17, F-18, F-19, and F-31. After printing, the subtotal value is automatically cleared.

F-17 setting	
Print total by code number.	1
Do not print total by code number.	2

F-18 setting (printings of statistics by channel)	
Do not calculate statistics by channel.	1
Calculate statistics by channel (Sample standard deviation).	2
Calculate statistics by channel (Population standard deviation).	3

F-19 setting (cumulative total statistics calculation and printing)	
Do not calculate statistics.	1
Calculate statistics (sample standard deviation).	2
Do not calculate statistics (Population standard deviation).	3

F-31 setting (printing of each channel)	
Calculate statistics and print. Print each channel.	1
Calculate statistics and print. Do not print each channel.	2

4) [G. TTL] key

When this key is pressed, the grand total value is printed in accordance with the contents set at functions F-20, F-21, F-22, and F-32. After printing, the grand total value is not automatically cleared.
When you want to clear the grand total, press the [G. TTL] key while pressing the [C] key.

⚠ If the grand total is cleared while there is some data in the buffer in batch printing, the calculated value of the buffer is also cleared at the same time.

F-20 setting contents	
Print grand total by code number.	1
Do not print grand total by code No.	2

F-21 setting contents (Statistics calculation and printing by channel)	
Do not calculate statistics.	1
Calculate statistics (sample standard deviation).	2
Calculate statistics (Population standard deviation).	3

F-22 setting contents (cumulative total statistics calculation and printing)	
Do not calculate statistics.	1
Calculate statistics (sample deviation).	2
Calculate statistics (standard deviation).	3

F-32 setting contents	
Calculate statistics and print. Print each CH.	1
Calculate statistics and print. Do not print each CH.	2

5) [INT.] key

When this key is pressed, the LED for the key lights and interval printing is enabled. See page C-9 "Interval timer setting".

6) [SET] key

When this key is pressed, if the printer is in the NORMAL mode, it shifts to the SET mode.

7) [CLOCK] key

When this key is pressed, the date and time are printed on one line.

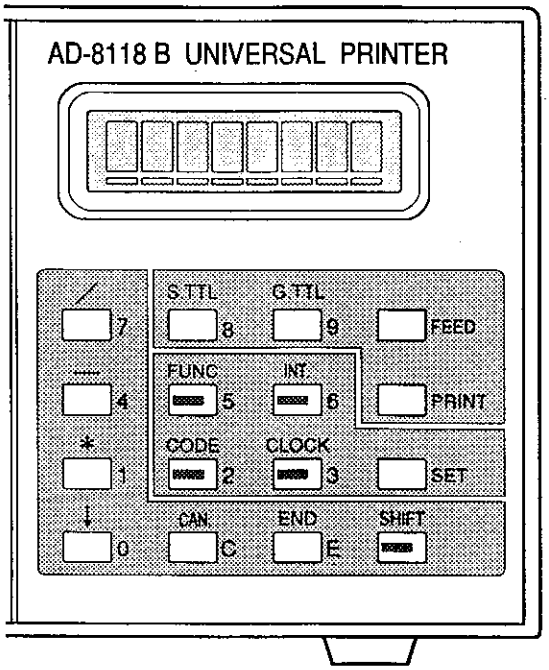
Note: In the normal mode, an arbitrary 8-digit number can be printed separately from the code No. only when the printer is set to the batch printing mode (F-9=2).

When the [CODE] key is pressed and an 8-digit number is input and the [END] key pressed and the batch print command or lot print command is input, that number is printed.

In random printing (G-9=1) , if the [PRINT] key is pressed with the [C] key held down, "* CANCEL" is printed and the data item added last to memory is cleared.

In batch printing (F9=2), if the [PRINT] key is pressed with the [C] key held down, "* CANCEL" is printed and the batch printing buffer is cleared. (At this time, the data in the buffer has already been added internally and is not cleared.)

Key Operation in SET Mode

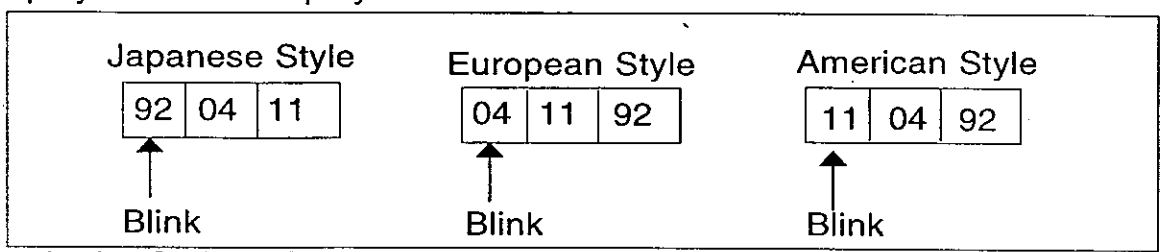


When the SET key is pressed in the NORMAL mode, the printer enters the SET mode. SET MODE is displayed on the display.
At the same time, the INT. key, CLOCK key, CODE key, and FUNC key LEDs blink.

- Of the four keys with blinking LED, press the one you want to set. The LED of only the pressed key blinks and setting is enabled.

1) Clock setting

When the CLOCK key is pressed, only its LED blinks and the following is displayed on the display:

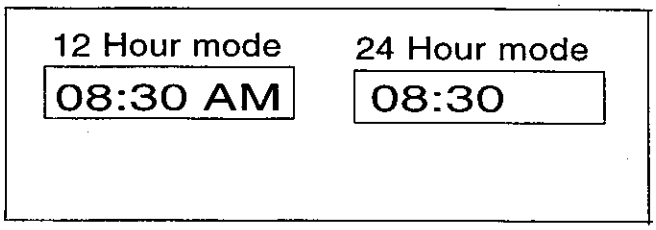


- In the CLOCK SET mode, hour, minute, AM, PM, and blank are set, in addition to the date.

- Since the blinking cursor moves from left to right, input thedate, hour, and minute one figure at a time.

- At the end of date input, press the END key. Operation shifts to hour, minute, AM, and PM input.

- The hour, minute, AM, and PM input screen is displayed as shown below and input is enabled.



- When the [ ] 0 (zero) key is pressed, AM, PM, and a blank display are switched alternately. For AM/PM, the time data is read as AM or PM. When not displayed, the time data is displayed as a 24-hour clock.

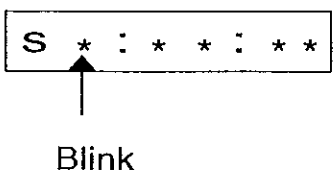
- At the end of hour, minute, AM, and PM input, press the [END] key. The screen returns to the date display. When you want to return to the NORMAL mode, press the [SET] key. The printer returns to the NORMAL mode after the time is set.

- If setting is incorrect, when the [END] key is pressed, [C Error] is displayed for about 2 seconds.

⚠ When the month, day, hour, or minute is actually one digit, for example, for April, input 04. Similarly, for 5 hours 5 minutes, input 05, 05.

2) [INTERVAL TIMER] setting

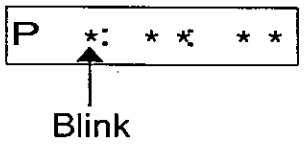
This function prints at a set interval. It is convenient when printing data at a fixed interval or when trying to conserve printer paper. In the SET mode,the no-print and print times can be set.
When the [INT.] key of the four keys with blinking LED is pressed after the printer enters the SET mode, first the following is displayed on the display screen:



- S shows that no-print time setting has been performed .
- The digit at the left end represents the hour.
- The 2 digits at the center represent the minute.
- The 2 digits at the right end represent the second.

- Set the numbers in accordance with movement of the cursor from left to right. For example, when you want to print the data every hour, input, [1] : [0] [0] : [0] [0] from left to right, and press the [END] key.

•When the [END] key is pressed, the display screen changes to the following:



•"P" shows that print time setting has been performed.

- Input the desired numbers in accordance with movement of the blinking cursor.

- At the end of input, press the [END] key. The display screen returns to the no-print time screen. When you want to return to the NORMAL mode, press the [SET] key. The printer returns to the NORMAL mode after the time is set.

⚠ 1) When the print time is set to 0, the first data sent after the no-print time elapsed is printed one time.

2) The [INTERVAL TIMER] setting contents are common to CH1 to CH4.

3) When batch printing (F-9=2) is set during function setting of this printer, the interval timer does not operate.

4) The interval timer does not operate for connected devices whose print timing is set to manual (F-10=1-3) during function setting of this printer.
When a print command (manual print) is input from the control I/O, printing is performed even within the no-print time.

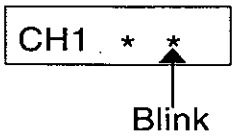
3) [CODE number] setting

"Code number" is the number which is paired with the weight data. The weight data can be totaled for each code number. This printer has a 2-digit and a 6-digit code number input function.

- When code number input is 2 digits
  - The code number can be input for each channel (maximum 4 channels) connected to this printer.
  - The data can be totaled for each input code number.
  - Example, the code number can be input for each material and product name and the total of each can be printed.
  - This 2-digit code number can be input by key input, RS-232C, or control I/O.
  - When 2-digit control number is insufficient, it can be converted from 2 digits to 6 digits. The code number is automatically converted to a 6-digit number and totaled and printed.

- Two-digit code number setting method (F13=1, F14=3)

In the SET mode, press the [CODE] key of the four keys with blinking LED. Only the [CODE] key blinks and the display screen changes to the following:



- CH1 represents the connected device.
- The 2 digits at the right represent the code number.
- The blinking cursor does not move at number input. Since the numbers move to the left in input order, when you want to input 1, for example, input 1.

- At the end of code number input for CH1, press the [END] key.

The display changes in [CH1→CH2→CH3→CH4] order.

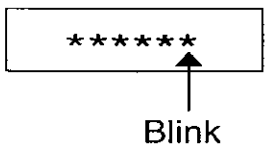
- At the end of code number input for the connected devices, press the [SET] key. The printer leaves the SET mode and returns to the NORMAL mode.

- When code number input is 6 digits

- The code number cannot be registered for each device connected to this printer.
- Totaling cannot be performed for each 6-digit code number either.
- Six-digit code numbers can be serialized by function data setting.
- This is convenient when separating print data by lot and when referencing each print data from the end.

- Six-digit code number setting (input) method (F13=2, F14=3)

In the SET mode, press the [CODE] key of the four keys with the blinking LED. Only the [CODE] key blinks and the display screen changes to the following:



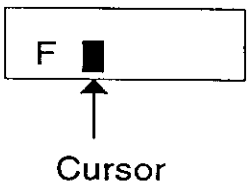
- Input the 6-digit code number sequentially from the most significant digit.
* When the [CAN.] key is pressed, the input data is canceled and the data returns to the original data.
- At the end of 6-digit code number input, press the [END] key. The displayed code number is read into the printer.
- When the [SET] key is pressed, the printer leaves the SET mode and returns to the NORMAL mode.

4) FUNCTION DATA setting

The function data is a function which determines the basic operation of this printer. It can be set for each function number.

* Function data setting

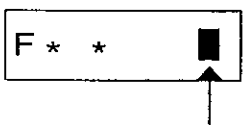
When the FUNC key of the four keys with blinking LED is pressed, only the FUNC key blinks and the display screen changes to the following:



(F signifies function number)

Cursor

- Input the desired function number.
- At the end of function number input, press the END key.
- The display screen changes to the following:



Cursor

- This screen shows the data of the set contents stored in the input function number memory.
- Input the values corresponding to the desired data.
- At the end of input, press the END key.
- The next function number is displayed and the display screen returns to the F * * display.

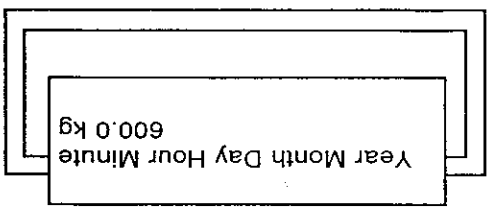
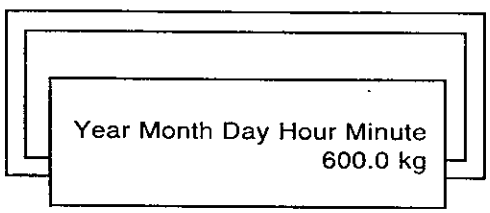
- To end the FUNCTION mode, press the SET key. The printer returns to the NORMAL mode.
  When the PRINT key is pressed in the FUNCTION mode, a function list is printed.

- Function number and corresponding set value contents

(" * " represents the factory setting)

Function number	Function data value	Function data contents	
F1 Baud rate setting	1	600 bps	• Serial input data speed setting. • For 2400bps, the data speed is fast(if the data cable is long (about 100 m)data may be lost due to noise), set the data speed to 600bps. • Always set to match the data transmitting device baud rate.
	* 2	2400bps	
F2 Data bits	* 1	7 bit	• The number of data bits can be selected to be 7 bits or 8 bits for CH1 only. • For CH2 to CH4, the number of data bits is fixed at 7 bits even parity. • For 7 bits, the parity is 1 even parity (EP) and for 8 bits, there is no parity bit (NP) • This is the number of data bits for the transfer of one character.
	2	8 bit	
F3 CH1 input signal mode	* 1	Standard format mode	• In the standard format mode, only data that was input in accordance with A&D industrial indicators (AD-4323, AD-4324, AD-4325, etc.) and electronic balances output data format is accepted. • Weight data totaling, format, etc. are processed internally and printed. • CH2 to CH4 will accept standard format only.
	2	Dump print mode	• Not available for CH2 to CH4 • In the dump print mode, the totaling, statistics calculation, and printing format program functions of this printer annot be used. • The dump print mode prints the data as received in its original format. • Printing starts when CR or CR, LF is received, or when the number or characters exceeds 26 characters.

⚠ The dump print mode (F3=2) is valid only for CH1. CH2 to CH4 must be A&D standard format.

Function number	Function data value	Function data contents	
F4 Printing mode	1	Normal characters	• During printing, normal characters are output in the reverse direction, but are printed in the forward direction.
	* 2	Inverted characters	• During printing, inverted characters are output in the forward direction, but are printed in the reverse direction.
	Normal characters 		Inverted characters 
	⚠ Since even inverted characters with fixed total and other formats are printed from the end, they are not printed in the reverse direction.		

F5 Input Conditions	* 1	Yes (receive)	• Sets whether (yes) or not (no) negative and unstable data is printed.
	2	No (do not receive)	

F6 Character size	* 1	Standard character (5x7 dots)	• Switches between printing standard character size or enlarged character size.
	2	Enlarged character (10x7 dots)	• The number of columns/line is 24 columns for standard size and 12 columns for enlarged size.

F7 Key input	* 1	Enable	• Enables front panel key input or disables key inputs other than the SET key in the NORMAL mode.
	2	Disable	

F8 Number of paper feed lines	0 to 9 Factory setting: "2"	• Sets the number of paper feed lines after each time printing and cumulative total printing by a number from 0 to 9.

F9 Printing mode	* 1	Random printing	• The random printing mode prints the input data in the order in which it is input • In the batch printing mode, the input data is temporarily stored in a buffer and the data in the buffer is printed for each CH when a batch print command is input. • An 80-data item buffer is provided for each CH. The printing format is fixed. • When the print timing is set to addition only, printing is not performed. (When F10 is set to 2 or 5.)
	2	Batch printing	

F10 Print timing (Set for each CH)	1	Manual printing	Printing is performed only at print command input.
	2	Manual addition	Only addition is performed at print command input.
	* 3	Manual addition printing	Printing and addition are performed at print command input.
	4	Automatic printing	Only printing is performed at data input.
	5	Automatic addition	Only addition is performed at data input.
	6	Automatic addition printing	Printing and addition are performed at data input.

- Manual printing processes the first data that is input within 3 seconds after the print command is input from the PRINT key or the control I/O. Set the data output of the connected device to the STREAM mode.
- Automatic printing processes all the input data. Set the data output of the connected device to the auto print or the manual print mode (mode which outputs data only one time when print or addision are desired). The print timing is controlled by the connected device.

⚠ Each channel may be set to print, print and add, or add only in manual or automatic mode.

⚠ When the print timing is set to manual, the interval function is not performed.

- Settings for each CH connected to this printer

CH CH CH CH
4 3 2 1

F10	*	*	*	*

- The channels are displayed in CH4, CH3, CH2, CH1 order, from left to right.
- The input prder to each CH is sequential in decending order.
- Example, when you want to set CH1 to 1, CH2 to 2, CH3 to 3, and CH 4 to 4, input the values [4], [3], [2], [1] and press the [END] key.
- Unused channels (CH) are automatically ignored.

⚠ If a channel requires a change, all channels must be re-entered. Example, to change CH3 to 1, input [4] →, [1] →, [2] →, [1] →, [END].

⚠ The functions F11, F12, F14, F18 and F21 set using the same method as F10.

F11 Input data selection (Selected for each CH)	* 1	All enable
	2	Gross weight
	3	Net weight
	4	Tare

- This function setting is used when connecting an indicator and multiple peripheral devices. Example, to display the gross weight on an external display and print the net weight on this printer, set the indicator to output the gross, net, and tare weight and select net weight at F11 for this printer.

F12 Calculation data (Selected for each CH)	* 1	Total all
	2	Total gross weight only
	3	Total net weight only
	4	Total tare only

- This function is set when the data to be totaled is selected by F11.
- If F11 (input data selection) was set to "1" (all enable) and each time printing program was set to print two or more weight values, which data is to be totaled is selected by this function.
- In other cases, set F12 to "1" (total all input data) or select the F12 setting matched to the output data setting of the connected device (indicator).

⚠ If F11 and F12 are set incorrectly, printing and totaling will not be performed.
Example, when the connected device (indicator) is set to "gross weight" and F11 of this printer is set to "3" (net weight), printing is not performed. When F12 and connected device settings are not the same, totaling is not performed.

F13 (Key input code No.) Selects whether the code No. is handled as 2 digits or 6 digits.	* 1	Use 2-digit code number.
	2	Use 6-digit code number and increment.
	3	Use 6-digit code number and do not increment.
	• When the code number is set to 6 digits, all input is from keys. (F14 and F15 settings are ignored.) • When the code number is set to 6 digits and increment, the code number is printed serially at each printing.	

When a code number is converted to six digits by the selection of the internal setting of F13 and F15, the initial setting is automatically changed as follows:

Printing format prior to conversion to six digits

```
08 / 11 / 92 / 10:30 : AM
#        1CD 12 G          200.0kg
```

Printing format when code unmber is converted to six digits

```
08 / 11 / 92 / 10:30 : AM
#        1CD 123456
                 G         200.0kg
```

F14 Code No. input method (Set for each CH)	1	Input form control I/O
	2	Input serially together with weight data
	* 3	Key input
	• If the connected device cannot output the code number serially with the weight data , the code number is input from the control I/O or keys. • When an AD-4325 or other indicator that can output the code number serially is connected, when "2" is selected, the code number input with the weight data will be used.	

F15 Converts code No. from 2 digits to 6 digits.	* 1	Do not convert to 6 digits	• When converting a 2-digit code number to 6 digits, select "2" and in the PROGRAM mode, select the 2 digit to 6 digit code number conversion.
	2	Convert to 6 digits	

F16 (–, G, N, T printing setting)	* 1	Print –, G, N, and T	• Sets whether or not the polarity (–) and symbols G (gross weight), N (net weight), and T (tare) sent by the connected device are printed.
	2	Do not print –, G, N, and T	

F23 Time Display	1	Display time	Display switching in the normal mode
	2	Display nothing	

F24 Grand Total Function	1	Use	If F 24 is set to "2", When SUB total printing is performed, the GRAND total is cleared.
	2	Do not use	

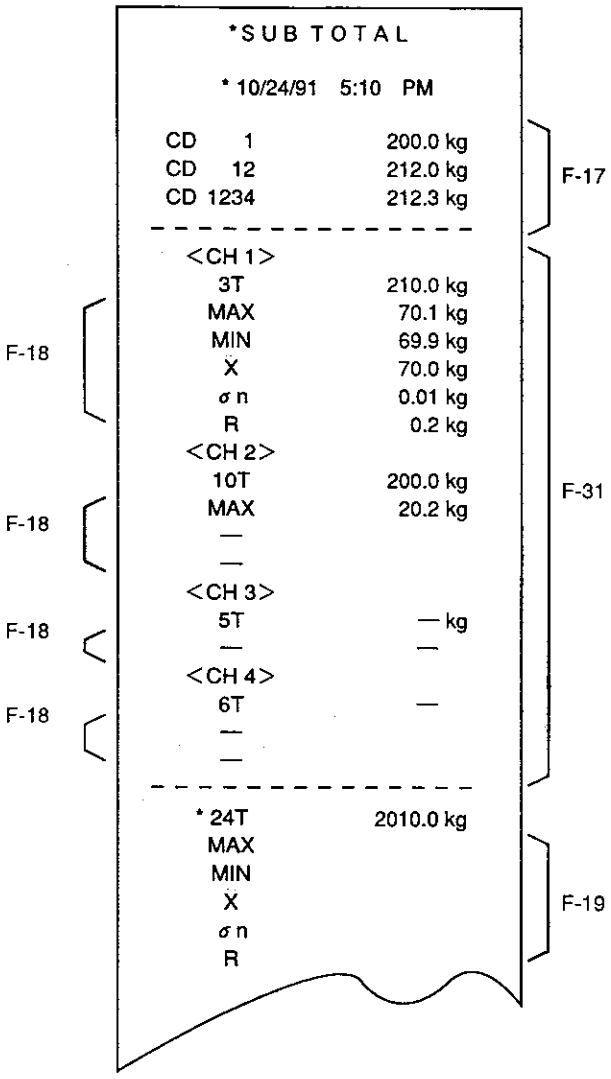
OP-01 setting

F30	Input the number of connected devices (number of channels) used by a number from 1 to 4. ⚠ The control I/O signal contents vary depending on this setting. (Factory setting: "1")

Subtotal Printing Format Setting and Printing Example

Subtotal is printed in the format shown below. However, printing can be disabled for each item.

⚠ Subtotal printing is available only for the RANDOM printing mode and cannot be used in the BATCH mode.



("*" represents the factory setting)

F17	*1	Total and print by code number.
	2	Do not total and print by code number.
	• Selects whether or not total and printing are performed by code number at subtotal printing.	

F18 (Statistics calculation and printing)	*1	Do not calculate statistics.
	2	Calculate sample standard deviation (n-1)
	3	Calculate population standard deviation (n)
	• Selects whether or not statistics calculation is performed for a connected device (CH) and switches if statistics calculation is used or population standard deviation is used for each CH.	

F19 (Cumulative total statistics calculation and printing)	*1	Do not calculate cumulative total statistics
	2	Calculate cumulative total statistics by sample standard deviation (n-1)
	3	Calculate cumulative total statistics by population standard deviation (n)

F31 (Subtotal printing by CH)	*1	Print subtotal
	2	Do not print subtotal

Formula:

Sample standard deviation $\sigma n-1=\sqrt{\frac{N\Sigma Xi^2-(\Sigma Xi)^2}{N(N-1)}}$

Population standard deviation $\sigma n=\sqrt{\frac{N\Sigma Xi^2-(\Sigma Xi)^2}{N^2}}$

N : Number of times
Xi : Weight data

- When statistics calculation and printing are performed, the following data is printed:

  Maximum weight value (MAX)

  Minimum weight value (MIN)

  Average weight value ($\overline{X}$)

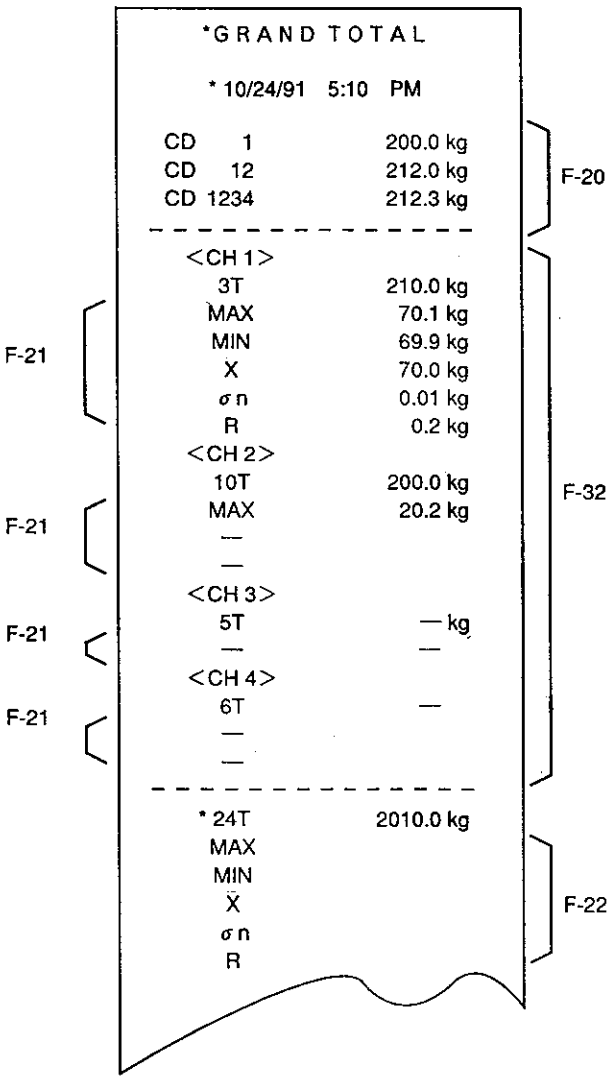
  Maximum weight value minus minimum weight value (R)

  Sample standard deviation ($\sigma n-1$)

  Population standard deviation (σn)

Grand Total Printing Format Setting and Printing Example

The grand total printing format is the same as the subtotal format previously described. Printing of each item can be disabled.



Parts indicated by the * are always printed even when disabled by all functions.

F20	*1	Total and print by code number.
	2	Do not total and print by code number.
	• Selects whether or not total and printing are performed by code number at subtotal printing.	

F21 (Statistics calculation and printing)	*1	Do not calculate statistics.
	2	Calculate sample standard deviation (n-1)
	3	Calculate population standard deviation (n)
	• Selects whether or not statistics calculation is performed for a connected device (CH) and switches if statistics calculation is used or population standard deviation is used for each CH.	

F22 (Cumulative total statistics calculation and printing)	*1	Do not calculate cumulative total statistics
	2	Calculate cumulative total statistics by sample standard deviation (n-1)
	3	Calculate cumulative total statistics by population standard deviation (n)

F32 (Total printing by CH)	*1	Print total
	2	Do not print total

Formula:

Sample standard deviation $\sigma n\text{-}1=\sqrt{\frac{N\Sigma Xi^2-(\Sigma Xi)^2}{N(N-1)}}$

Population standard deviation $\sigma n=\sqrt{\frac{N\Sigma Xi^2-(\Sigma Xi)^2}{N^2}}$

N : Number of times
Xi : Weight data

- When statistics calculation and printing are performed, the following data is printed:

  Maximum weight value (MAX)

  Minimum weight value (MIN)

  Average weight value ($\overline{X}$)

  Maximum weight value minus minimum weight value (R)

  Sample standard deviation ($\sigma n\text{-}1$)

  Population standard deviation (σn)

Summary of Various Printing Samples

Sample of the Random printing mode

Printed every time

```
August 11, 1998, 8:04 AM
CH1 CD123456
#   1        G    200.0 kg
```

Changing the print item order or disabling printing of unnecessary items is possible.

Subtotal printing

```
SUBTOTAL
August 11, 1998, 8:04 AM
CD     1          200.0 kg
CD   123          150.0 kg
CD 12345          320.3 kg
CD123456          170.0 kg
----------------------------
<CH 1>
   1T             200.0 kg
<CH 2>
   1T             150.0 kg
<CH 3>
   1T             320.0 kg
<CH 4>
   1T             170.0 kg
----------------------------
   4T             840.0 kg
MAX               320.0 kg
MIN               150.0 kg
X                 210.0 kg
σn                65.95 kg
R                 170.0 kg
```

Printing by code

Printing by channel

CH2 to CH4 printing is possible by option 01.

Number of times, subtotal

Maximum

Minimum

Average

Standard deviation

Range

Sample of the Batch printing mode

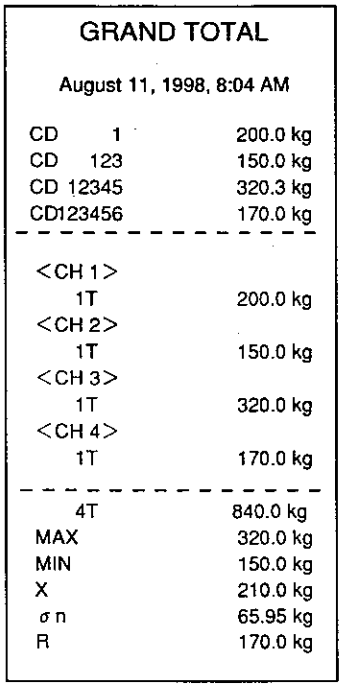
Batch printing

```
August 11, 1998, 8:01 AM
No. 12345678              1T
<CH 1>
CD     1          200.0 kg
<CH 2>
CD   123          150.0 kg
<CH 3>
CD 12345          320.0 kg
<CH 4>
CD123456          170.0 kg
----------------------------
                  840.0 kg
```

Batch count

Lot printing

```
LOT TOTAL
August 11, 1998, 8:02 AM
No. 12345678              2T
<CH 1>
CD     1          400.0 kg
<CH 2>
CD   123          300.0 kg
<CH 3>
CD 12345          640.0 kg
<CH 4>
CD123456          340.0 kg
----------------------------
                 1680.0 kg
```



Refer to the table below which summarizes the difference in function of the batch printing and random printing.

Function	Random printing mode	Batch printing mode
Printed every time (program)	√	×
Subtotal printing	√	×
Grand total printing	√	√
Batch printing	×	√
Lot printing	×	√

√ = Available
× = Not available

Usage of Batch Printing

Batch printing temporarily stores the input data in a buffer, collects and prints the data in the buffer by channel (CH). It is mainly suitable for formula weight printing. The total of batch printing by channel (CH) is called lot printing.

① Do not use the connected device in the stream mode as automatic addition is performed internally. (The F-10 setting is ignored). Use the connected device in the auto print or manual print mode. (Cumulative total print can also be used for the AD4325.)

Example 1) When the connected device is set to auto print (AD4325, etc.)

AD4323/25 setting

Function No.	Set value	Contents
F-23	2	Auto print

Example 2) When the connected device is set to manual print

AD4323/25 setting

Function No.	Set value	Contents
F-23	3	Manual print
F-9	1 or 2	

In the above setting, connect the control I/O input pin 6 to input COM.

Example 3) When the connected device is used in the cumulative total print mode.

AD4325 setting

Function No.	Set value	Contents
F-23	4	Cumulative total print
F-9	2	Performs cumulative total

In the above setting, connect the control I/O input pin 5 to input COM.

② An 80-line buffer is provided for each channel.

③ The data in the buffer is retained even when the power is turned off. (If the power is turned off while there is some data in the buffer, the remaining data is printed when the power is turned on again.) In order to delete the data in the buffer, press the [PRINT] key while holding down the [C] key. "* CANCEL" is printed and the batch printing buffer is cleared. (At this time, the data in the buffer has already been added internally and the calculated value is not cleared.)

④ The batch printing is the block total from the previous batch printing. The lot printing is the total value after several batch operations. The memory is cleared after printing.

⑤ The subtotal printing is not available in the batch printing mode.

⑥ The grand total printing for a daily report or monthly report is possible. The grand total is not automatically cleared after printing. Pressing the [G.TTL] key while holding down the [C] key clears the grand total. (If the grand total is cleared while there is some data in the buffer, the calculated value in the buffer is also cleared at the same time. However, the weight data in the buffer is not cleared and is printed at the time of batch printing. Be sure to clear the grand total when there is no data in the buffer.)

⑦ Addition is performed in the grand total memory even when the grand total printing function is not used . The grand total should be cleared periodically. (If the grand total memory overflows, no addition operation is performed thereafter.)

☆ Inputting Lot Number

The lot number is a number printed in 8 digits as "No. ********" at the time of batch printing/lot printing. (See printing sample.)

① Press the [CODE] key.

② The [CODE] key LED lights up and the current set value and cursor are displayed.

③ Input an 8-digit code number. The code number is read internally. (No zero-suppression is performed. If "00012345" is input as a lot number, "No.00012345" is printed. To print "No. 12345", input "12345".

④ When changing the number, press the [C] Key. The display is cleared. Input a new code number.

⑤ Pressing the [END] key returns to the normal mode.

Batch Printing Printing Example

Batch printing (printed by batch print command)(When F9=2)

```
        12/27/91  10:08
No. 12345678              1T
<CH 1>
CD      1              200.0 kg
<CH 2>
CD    123              150.0 kg
<CH 3>
CD  12345              320.0 kg
<CH 4>
CD123456               170.0 kg
- - - - - - - - - - - - - - -
                       840.0 kg
```

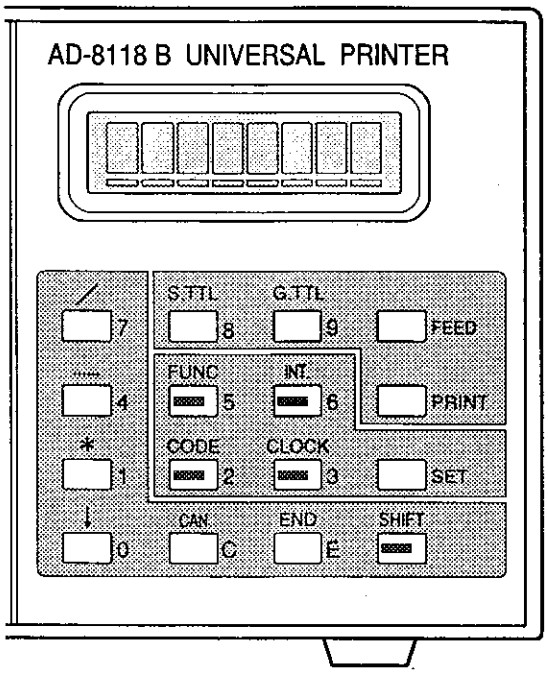
←Batch number
Incremented for each batch and serves as a serial number.
No. 12345678 is an 8-bit lot number and is input from the keys.

Lot printing (Printed by lot print command)

```
          LOT TOTAL
        12/27/91  10:08
No. 12345678              2T
<CH 1>
CD      1              400.0 kg
<CH 2>
CD    123              300.0 kg
<CH 3>
CD  12345              640.0 kg
<CH 4>
CD123456               340.0 kg
- - - - - - - - - - - - - - -
                      1680.0 kg
```

This is an example of lot printing after the batch printing above was performed two times.

Key Operation in the PROGRAM Mode



1) FEED key — When this key is pressed once, the printer paper is fed one line. When the key is held down, the paper is fed continuously.

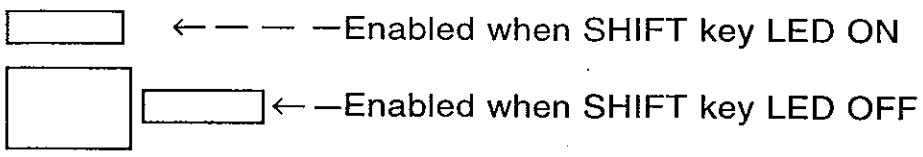
2) PRINT key — Prints a list of the 6-digit code numbers registered at the 2-digit code numbers in the mode in which 2-digit code numbers are converted to 6-digit code numbers.

PROGRAM mode printing format

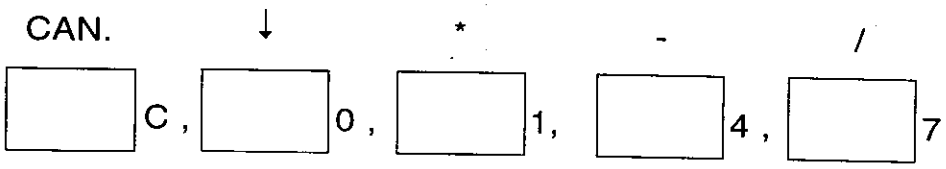
SHIFT key LED OFF
Programmed format is printed.

SHIFT key LED ON
List of programmable items is printed.

3) SHIFT key — The function of this key varies depending on whether the LED of the key is on or off. When the LED is ON, the function of the characters above the key is enabled. When the LED is OFF, the function written at the side of the key is enabled.

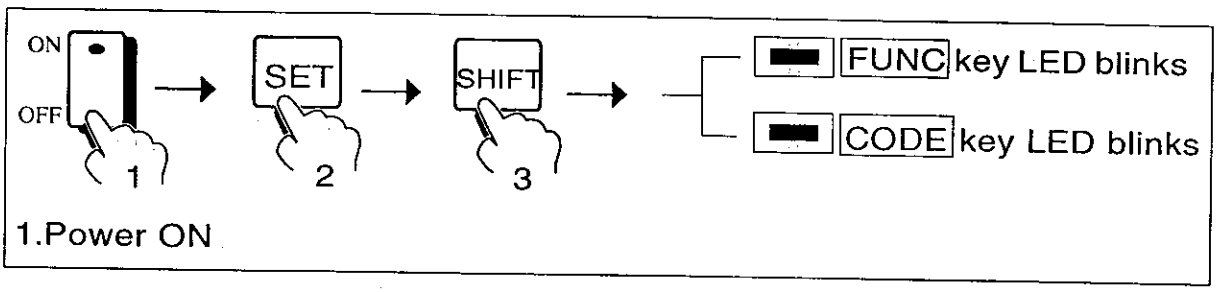


4) Keys whose functions are changed by the SHIFT key
(Mainly used in the PROGRAM mode.)



The function of the keys above change.
The other keys are used as numeric keys.

Press the SHIFT key in the SET mode. The SHIFT key LED lights and at the same time the FUNC key and CODE key LEDs blink.

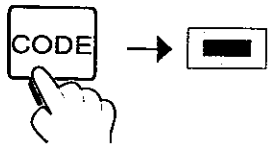


The following is displayed.

PROG MD

- 2 digits to 6 digits conversion table
  - This table converts 2-digit code number to 6-digit code number. When 6-digit code numbers are registered at this table, and a 2-digit code number is input, it is automatically converted to a 6-digit code number. However, set F13 to "1" and F15 to "2".

- Converting 2-digit code number to 6-digit code number.



Code key LED blinks.

- Display screen changes to

CODE2 **

- First, input the desired 2-digit code number. For example, to key in code number 12, input [1] [2] and press the [END] key.

- The display screen changes to [* * * * * *]

- Next, input the desired 6-digit code number. For example, to register 120120, input [1] [2] [0] [1] [2] [0] and press the [END] key.

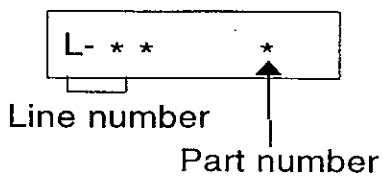
- The 2-digit code number and 6-digit code number are registered here.

- To leave the PROGRAM mode, press the [SET] key. The printer returns to the NORMAL mode.

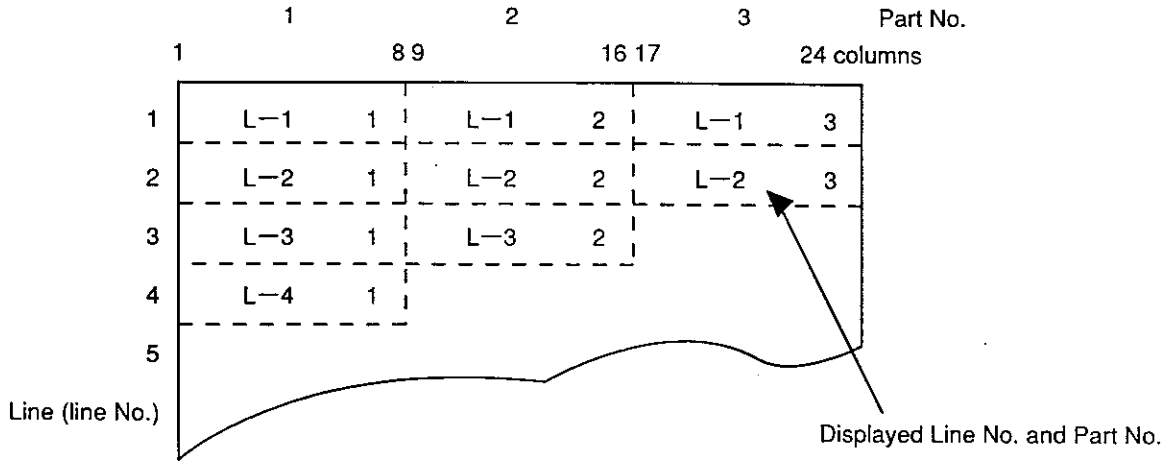
Note: When the [PRINT] key is pressed at the code number 2 digits - 6 digits conversion table, the set contents can be printed as a list.

- Printing format program (random printing)
  In the PROGRAM mode, the printing format that is printed each time can be programmed. (However, the user cannot program the grand total, subtotal, and batch printing printing formats.)

  - There are 8 columns of display space.
  - [L- * * *] is displayed . "L- * * " represents the line number and the * at the right side represents the part number (3 parts).



- The figure below shows the printer paper when it is divided by line number and part number.



⚠ To change the input program, delete the data of one line or cancel the entire program and reinput the data from the beginning of that line. When input is possible, the cursor will blink. The program cannot be overwritten.

⚠ The items which can be programmed are limited to the 13 items shown on the next page. Each item is given an item number. When that number is input, the number of columns of the pertinent item is secured.

⚠ The number of lines that can be programmed is 20.

- Thirteen items that can be programmed

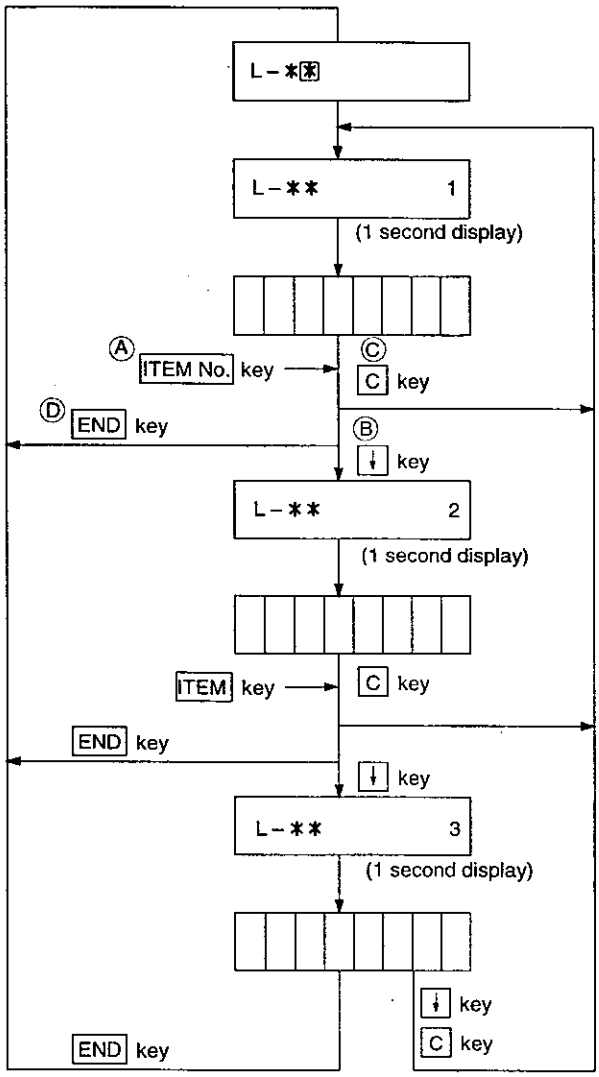
Item No.	Item	Displayed data example	Area (number of columns)
0:	Year month day	00/00/00	9 columns
1:	Hour minute	11:11:AM	8 columns (12-hour system)
		11:11:	6 columns (24-hour system)
2:	Channel No.	CH2	3 columns
3:	Code No.	CD333333	8 columns
		CD33	4 columns
4:	Number of times	#44444	6 columns
5:	Gross weight	G␣␣5555555 kg	12 columns
6:	Net weight	N␣␣6666666 kg	12 columns
7:	Tare	T␣␣7777777 kg	12 columns
8:	Weight value	␣8888888888 kg	12 columns
9:	Space		1 column

Item	Displayed data example	Area (number of columns)
Asterisk	*	1 column
Hyphen	-	1 column
Slash	/	1 column

⚠ The " weight value" of item No. 8 is used when a program which prints the weight value without regard to gross weight (G), net weight (N), and tare (T) is executed.

The printing format programming procedure flowchart and specific setting method are shown on the following pages.

Progamming Procedure



Input the desired line number and press the END key.

The line number and part number 1 are displayed for 1 second.

If an item has already been input, the programmed data is displayed.
If an item has not been input, the cursor blinks.

The line number and part number 2 are displayed for 1 second.

If the item has already been input, the programmed data is displayed.
If an item has not been input, the cursor blinks.

The line number. and part number 3 are displayed for 1 second.

If an item has already been input, the programmed data is displayed.
If an item has not been input, the cursor blinks.

Ⓐ When keys 0-9, *, -,* and / are used, the cursor moves the number of columns of that key. Where number of columns is large, the cursor moves to the next part.

Ⓑ When the ↓ key is pressed, the display shifts to the next part.

Ⓒ When the C key is pressed, the program of one line is canceled and operation returns to the beginning.

Ⓓ When you want to shift to the next line at the end of programming of one line, press the END key. Operation shifts to the next line.

⚠ When the SHIFT key is pressed (SHIFT key LED ON) and the CAN. key is pressed, the entire program is canceled and operation returns to the beginning.

Program Setting Method

⚠ The printing format shown below is programmed at the factory.

```
00/00/00/11:11:AM
#44444 CD33   8888888888 g
```

To change this program, press the SHIFT key and clear all the program data with the CAN. key.

The display screen changes to L - ■ . .

Cursor

FUNC CODE

When the ▬ key and ▬ key LEDs start to blink. press the FUNC key. Only the FUNC key LED blinks and the display screen changes to

L - ■

↓

Next, input line number1 and press the END key.

The display screen changes to L - 1 1 and the line number and part number are displayed.

L - 1 1 is displayed for 1 second, then the display screen changes to ■

Cursor

The program can be input from the column indicated by the blinking cursor by means of this.

⚠ When the previous program is displayed at this time, press the SHIFT key, then press the CAN. key. The old program data will be cleared.

↓

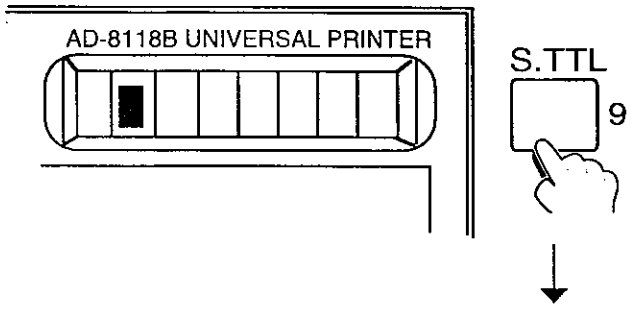
The procedure to print in the following format is described below as a sample program. This sample program shows American style date stamp and 12 hour time format.

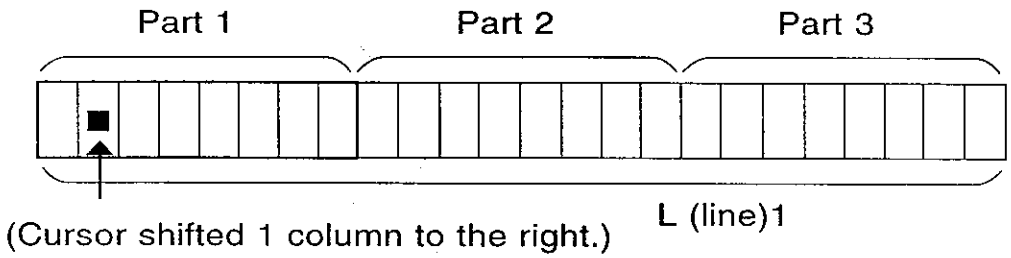
Sample program

␣ 12/10/92/␣␣10:25:AM

␣ CH1␣#00001␣N␣␣0010000 kg

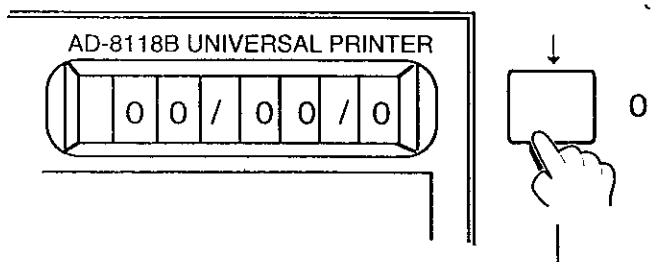
① Input a space, use key S.TTL/9.

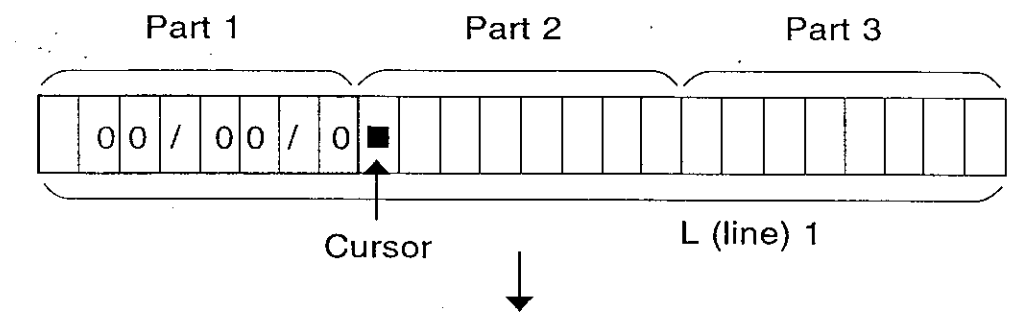


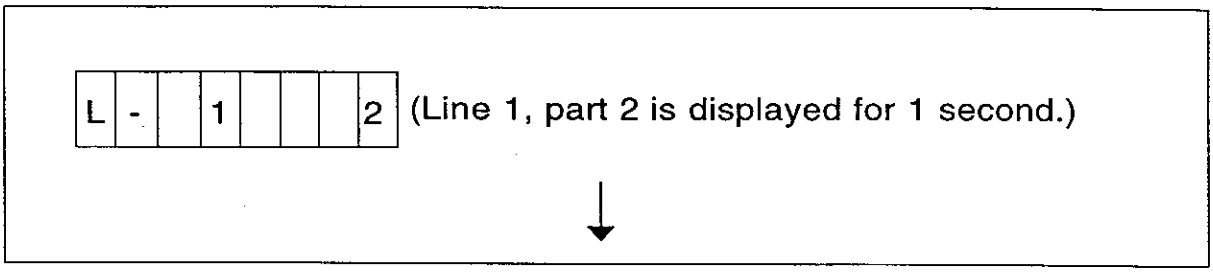


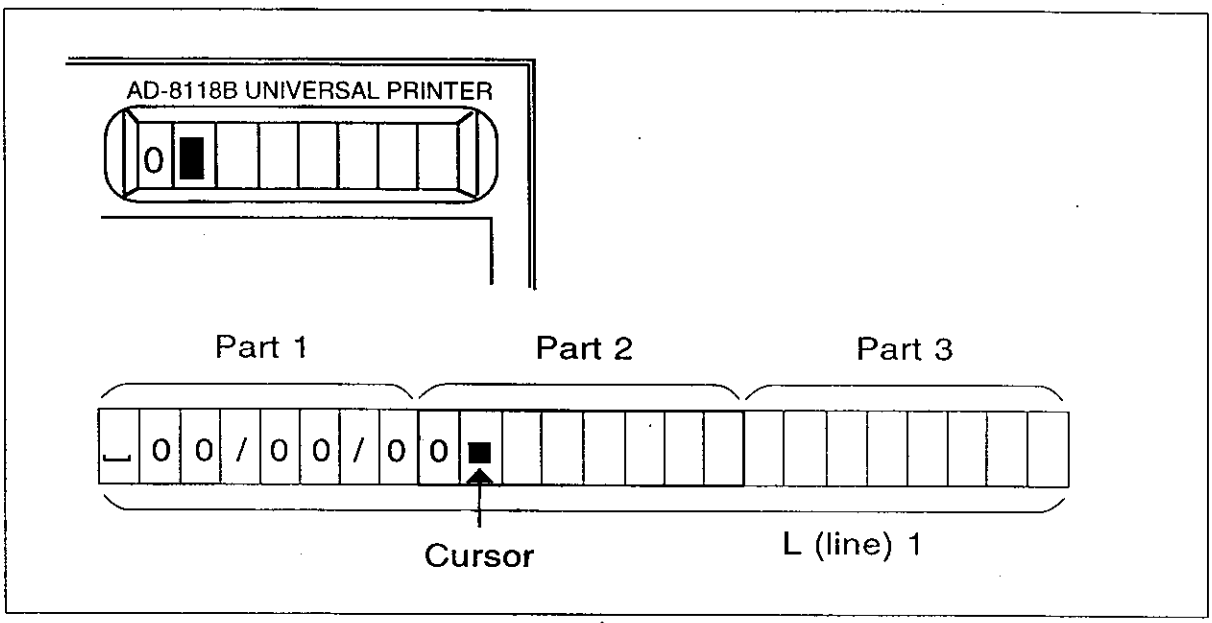
(Cursor shifted 1 column to the right.)

② Input the month day year, use key ↓/0.

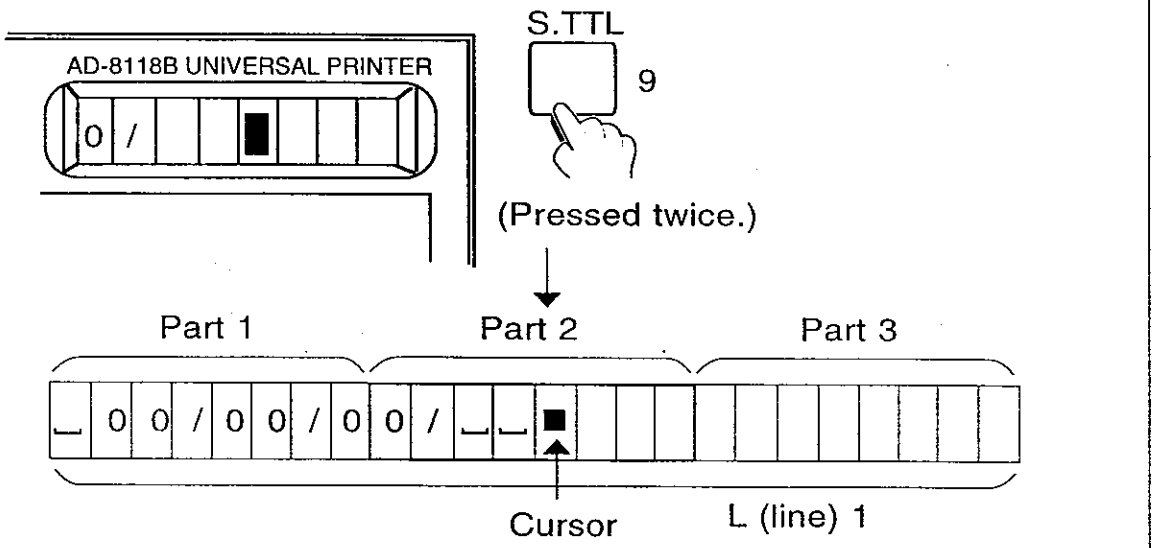




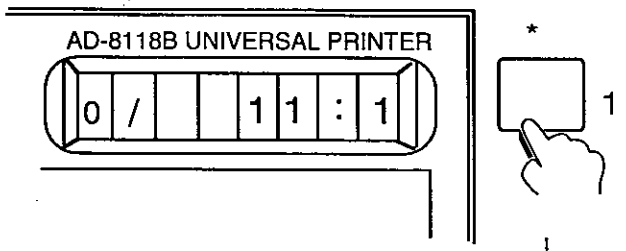


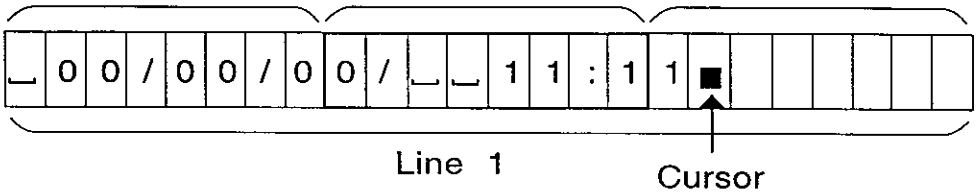


③ Next, input a space, use key S.TTL/9 twice to set the format which prints ␣ ␣ 10:25:AM.

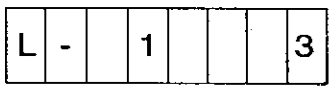


④ Next, program the time display format. Input hour and minute, use key * /1 .

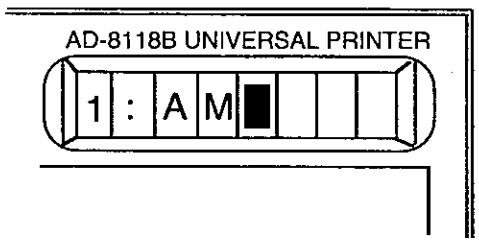


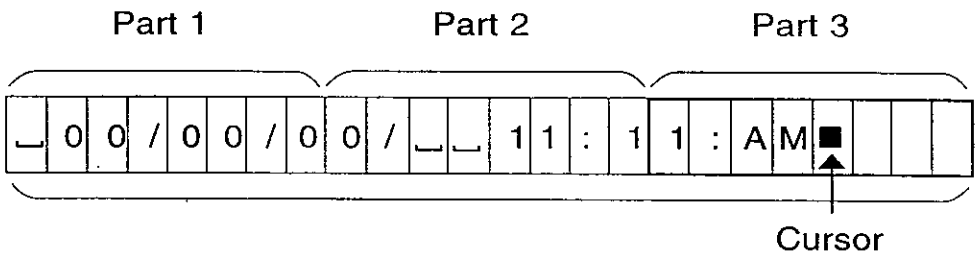


Line 1 Cursor



(Line No. 1, part 3 is displayed for about 1 second.)

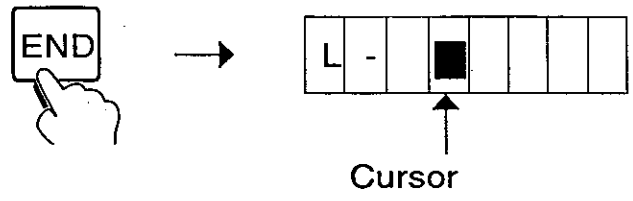




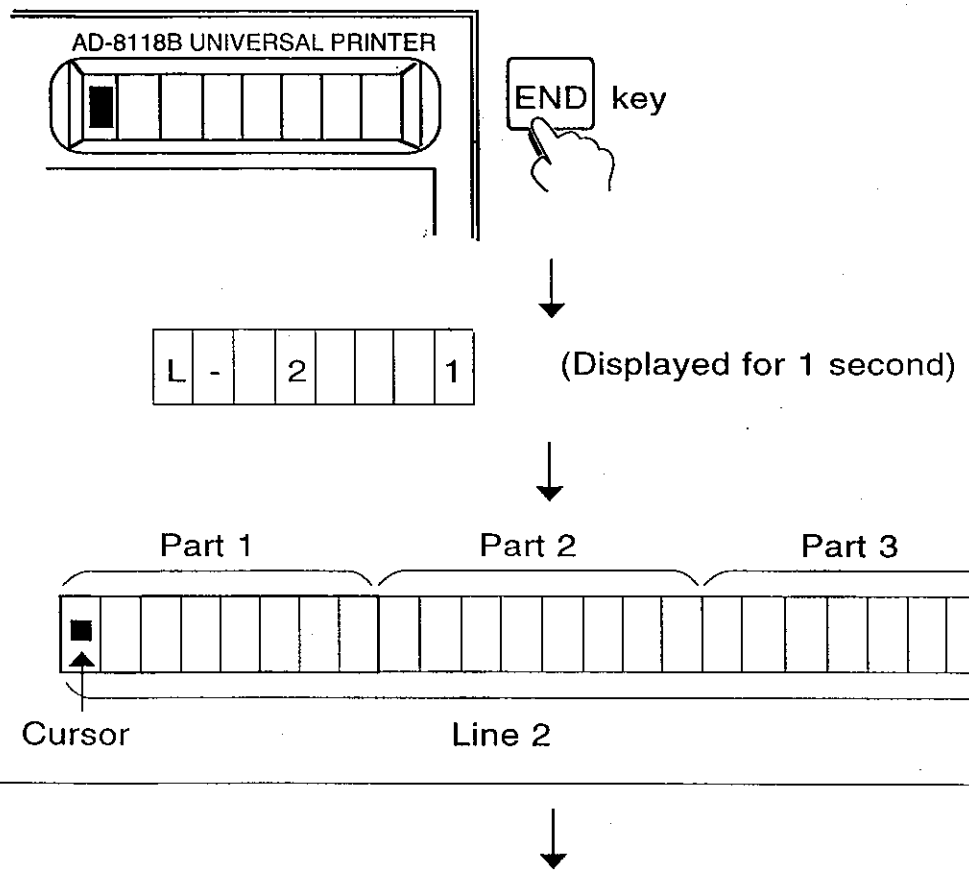
Cursor

This procedure completes the program which prints the date and time. When you want to check the program input at line 1 here, press the SHIFT key to turn on the SHIFT key LED, then press the ↓ 0 key one time. The display returns to the line 1, part 1 program display and the part 1 program can be checked. Similarly, when the ↓ 0 key is pressed again, the part 2 program can be checked. Part 3 is also checked in the same way.

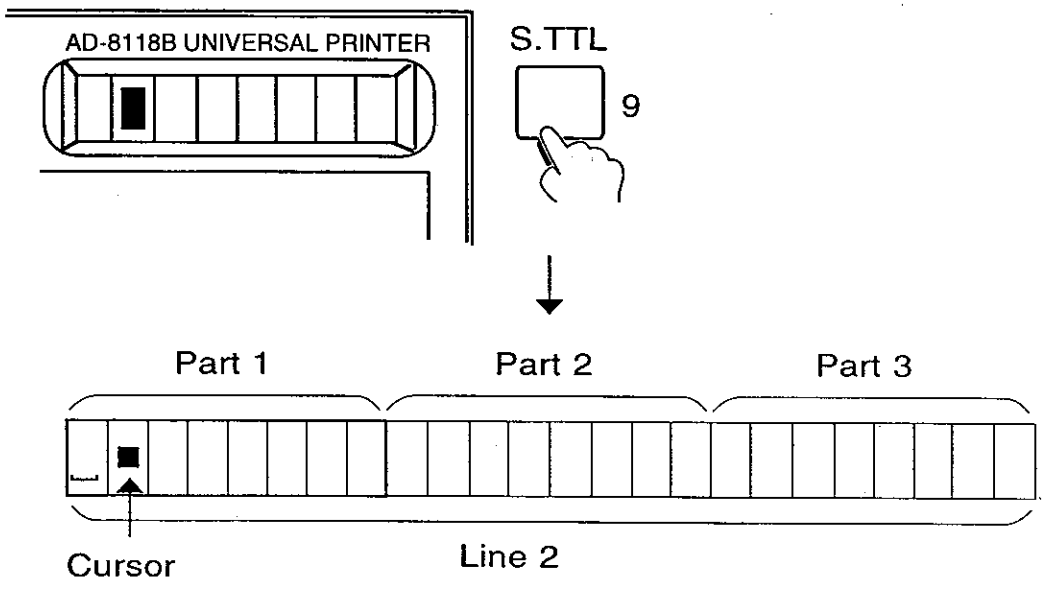
⑤ Finally, when the END key is pressed, line number 1 ends and line number 2 blinks.



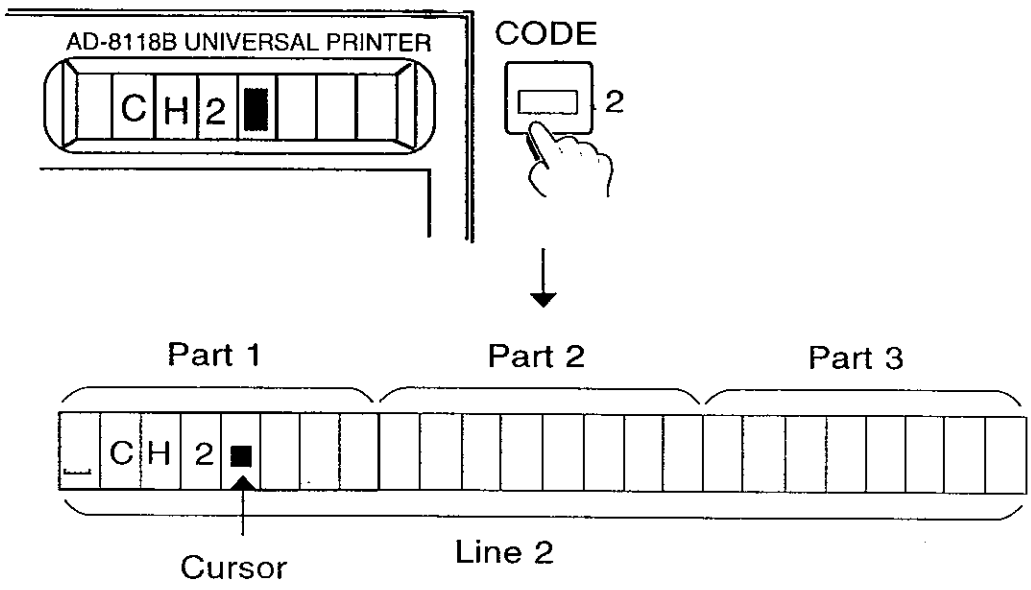
⑥ Next, press the END key.
Line 2, part 1 is displayed and the line 2, part 1 program can be input.



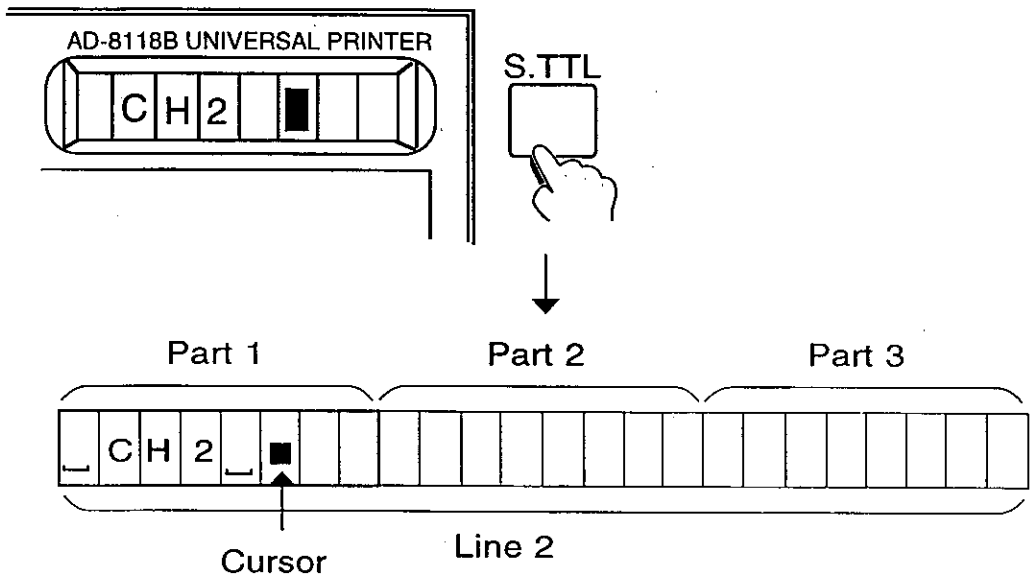
⑦ To program the format ␣ CH1␣ #00001␣ N␣␣0010000kg at line 2 (2nd line), first input a space, use key S.TTL/9 once.



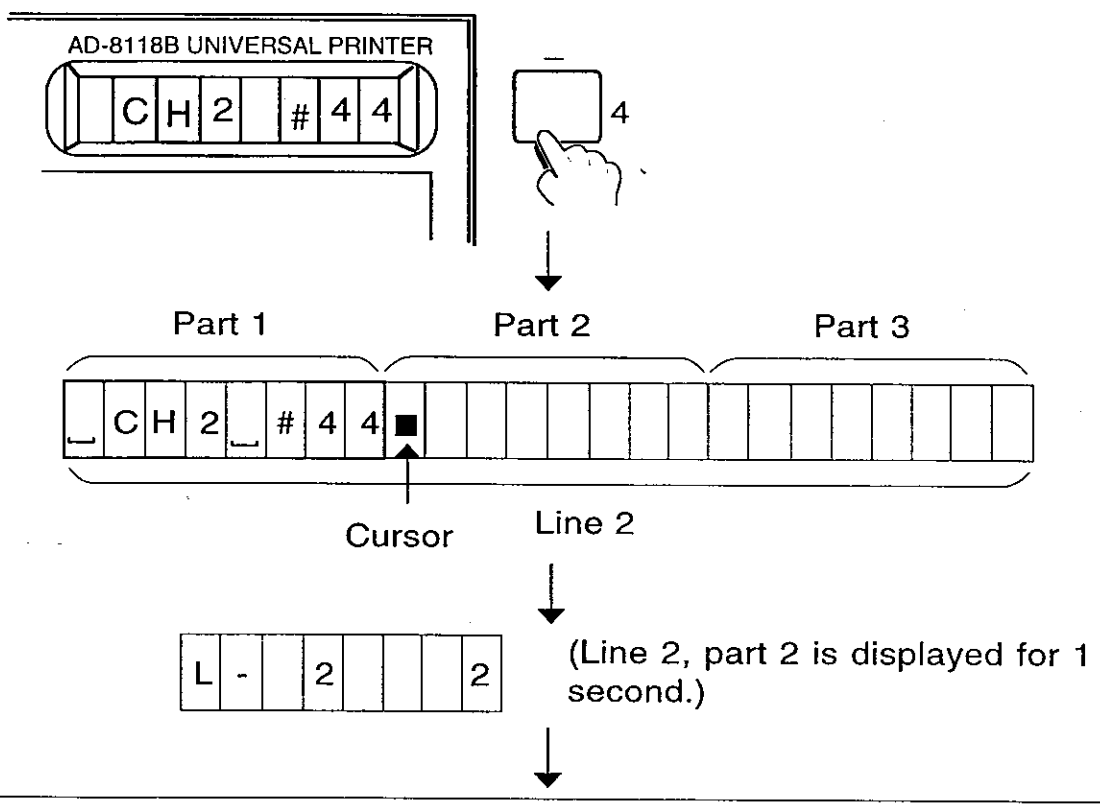
⑧ Next, input CH (Channel number) printing, use key CODE/2.

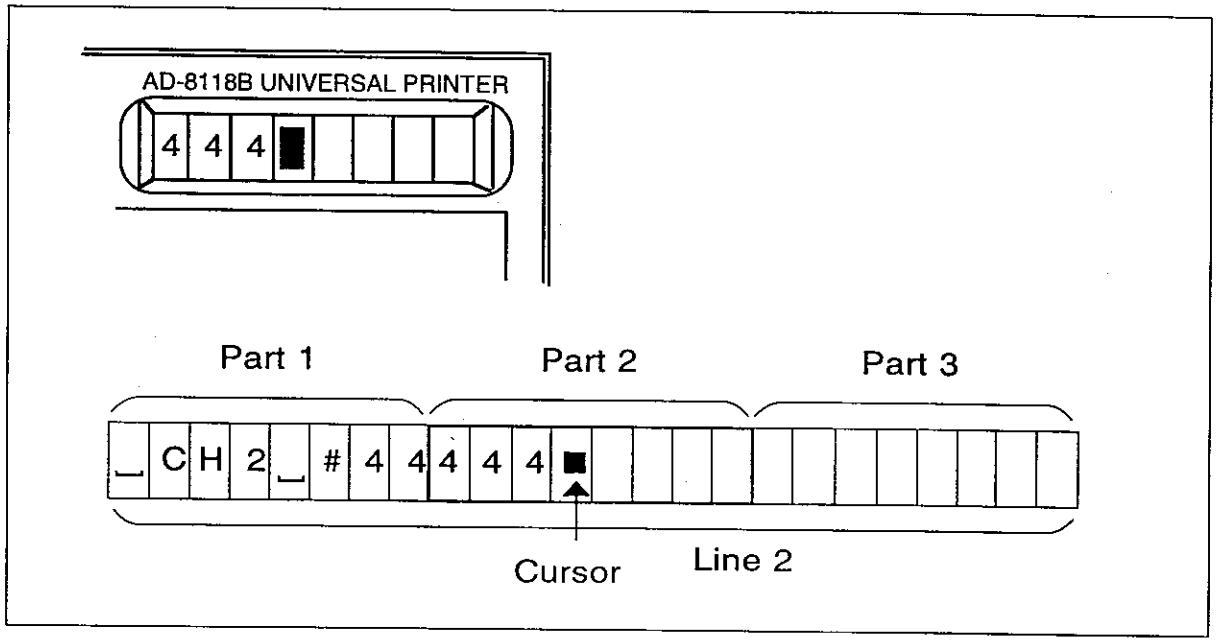


⑨ Next, input a space, use key S.TTL/9.

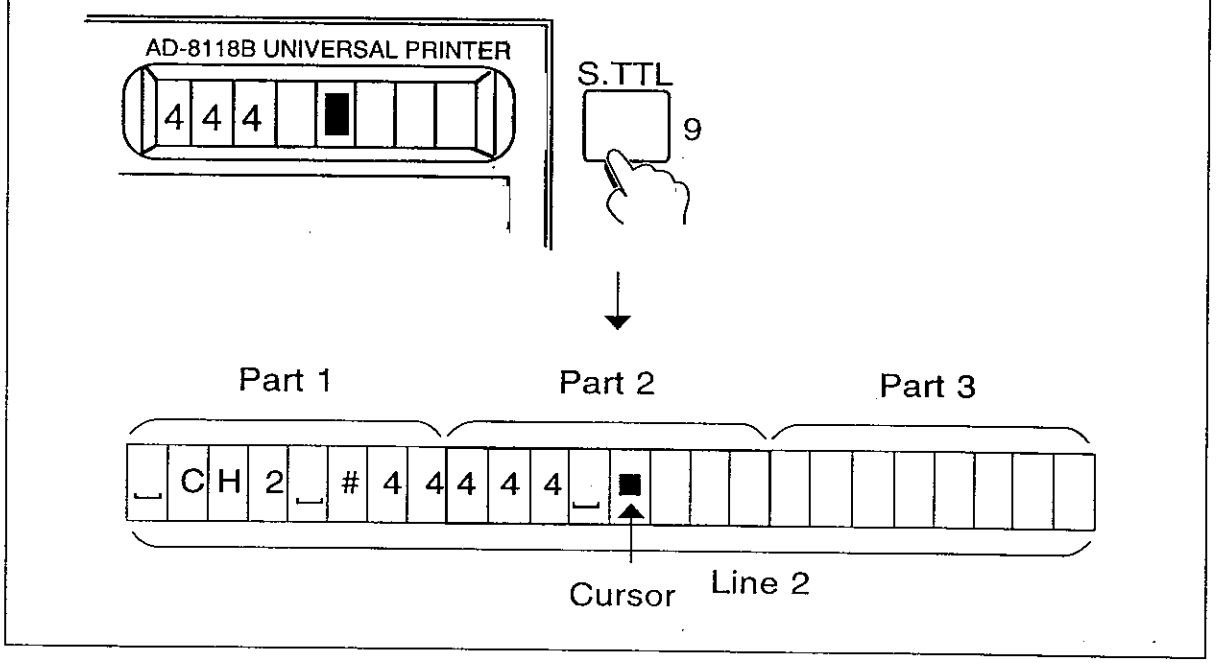


... Next, input number of times, use key ¯/4 .

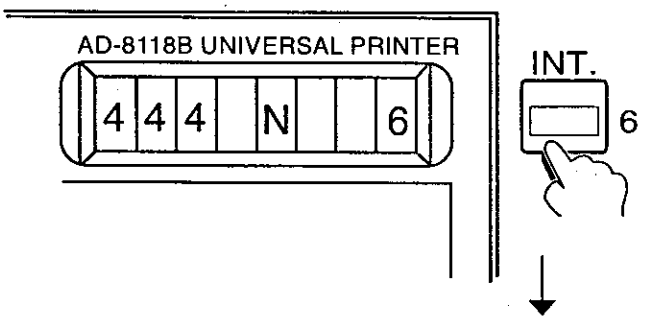


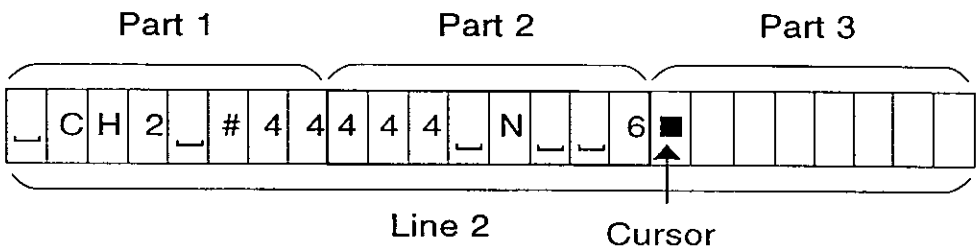


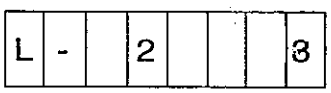
⑪ Next, input a space, use key S.TTL/9.



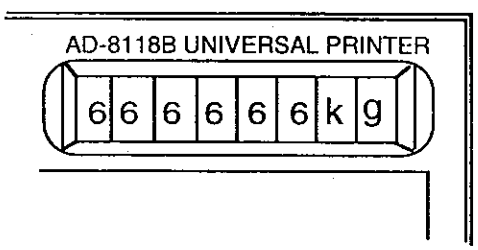
⑫ Finally, program the format which prints the net weight value. Input net weight to print, use key INT./6.

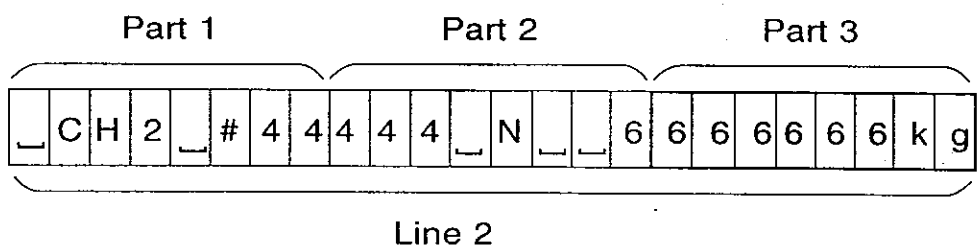






(Line 2, part 3 is displayed for 1 second.)





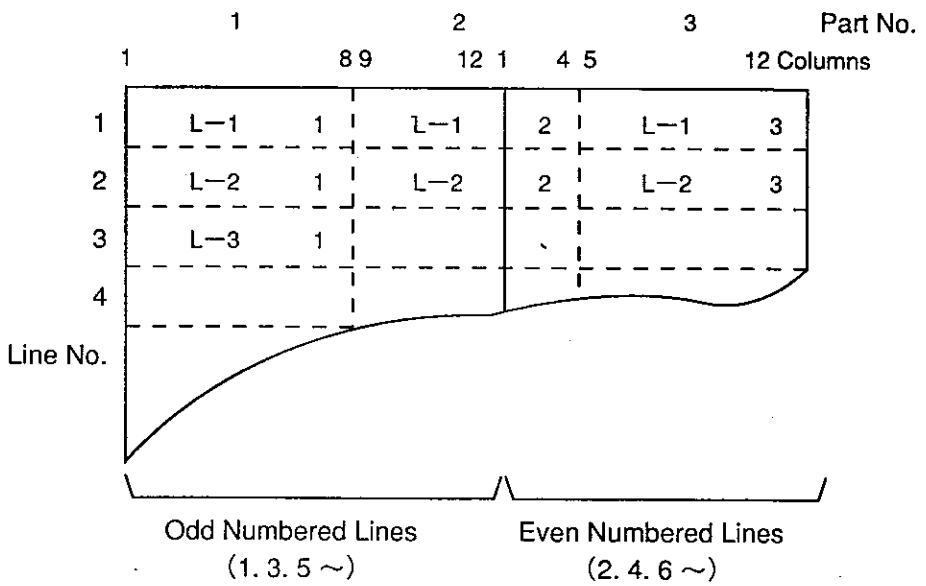
As this completes the program, press the END key, then press the SET key. The program is stored and the printer returns to the NORMAL mode.
Execute the desired format program based on an understanding of the program operation procedure described above.

- When the PRINT key is pressed in the program mode, the program contents are printed.

Enlarged characters program

Because enlarged characters are double the size of standard characters, the printing format programmed on one line is actually printed on two lines.

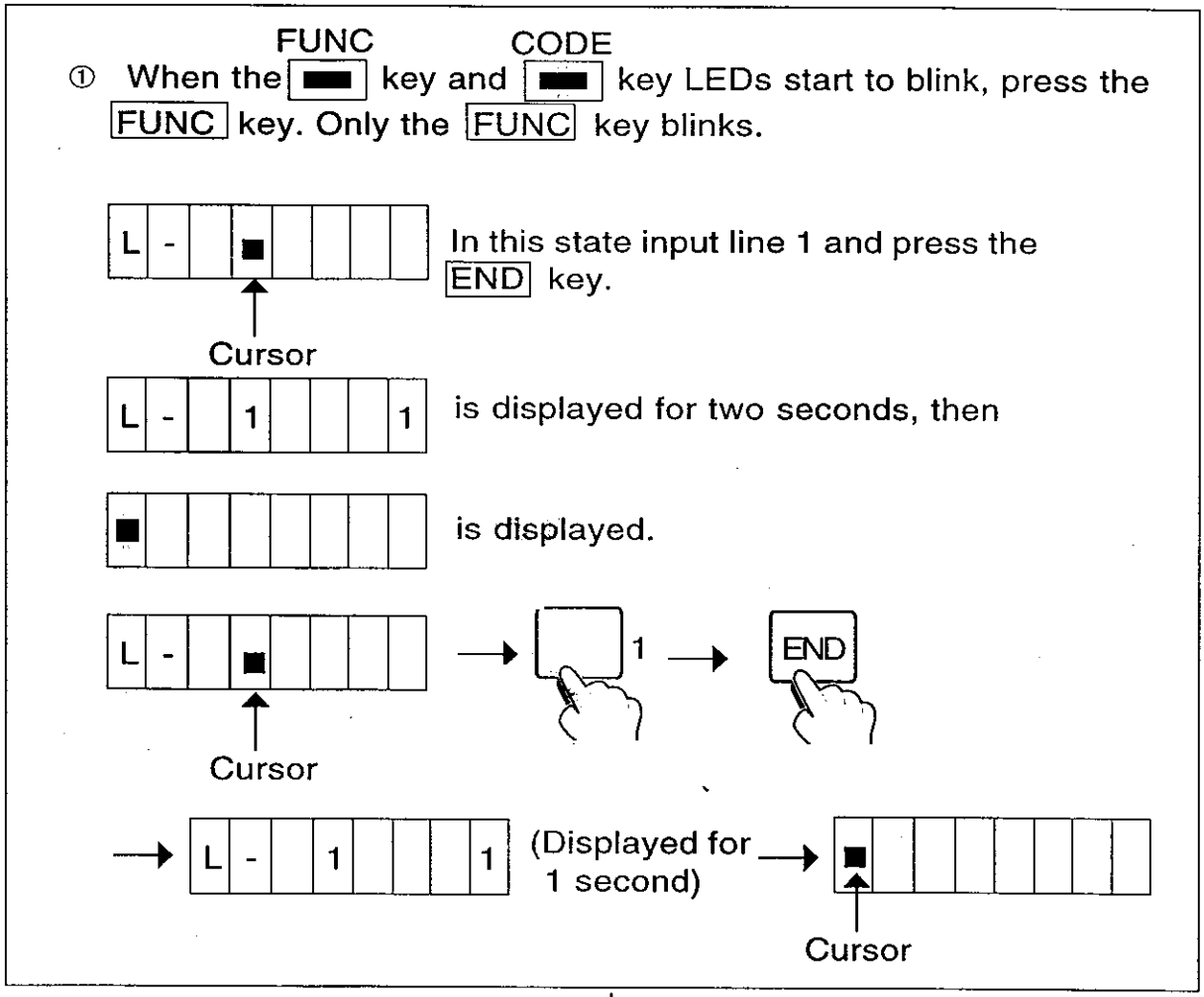
⚠ The line number and part number are displayed as if normal characters are input, but program the actual printing format so that up to one-half of part number 2 of each line is printed as one line. The number of lines that can be programmed is 40.
The printer paper divided by line number and part number is shown below.

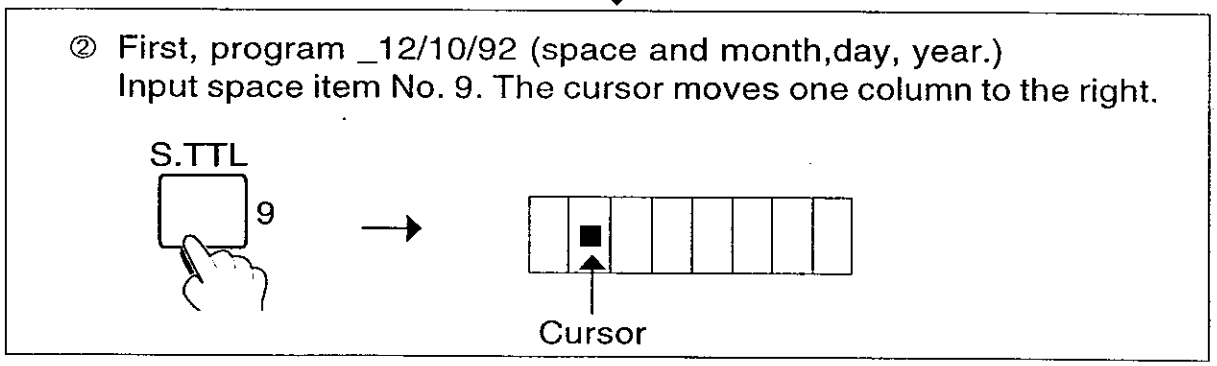


For example, when month, day, year, hour, and minute␣ 12/10/92/␣ ␣ 10:30:AM are printed in enlarged characters, the printing format is considered to span two lines as shown below.

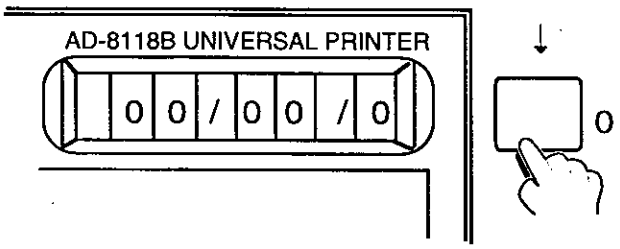
Sample program

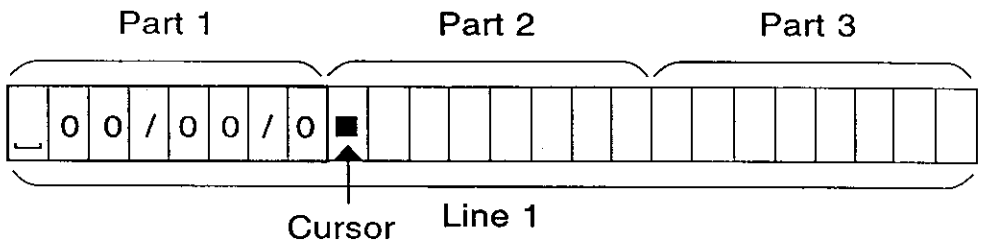
␣ 12/10/92
10:30:AM

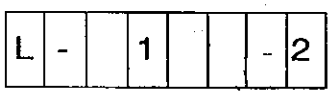




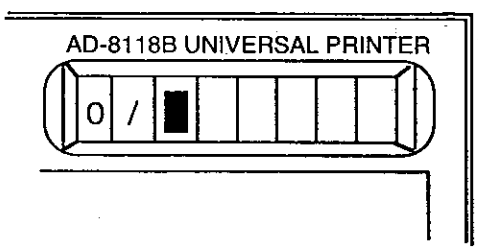
③ Next, program the month, day and year.
Input the month, dayand year, use key ↓/0 .

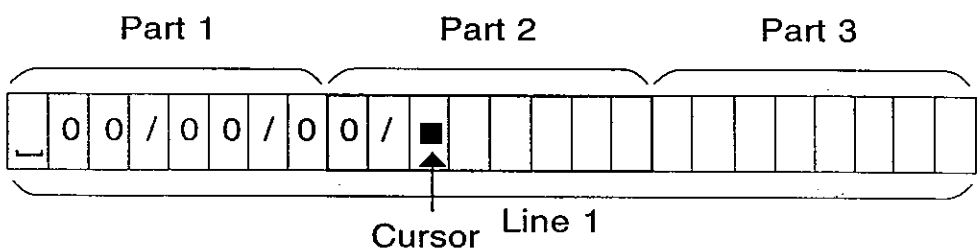






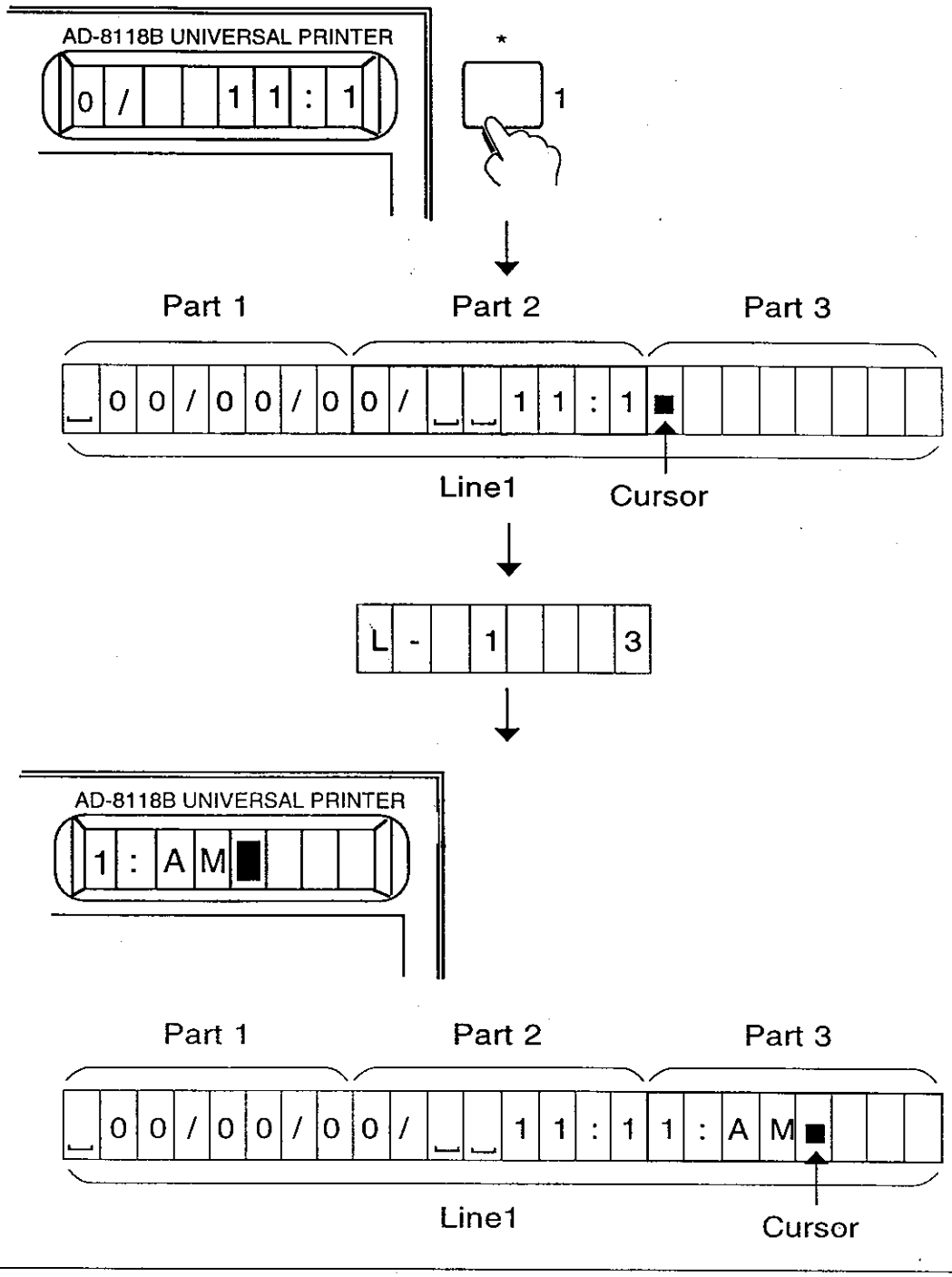
(Displayed for 1 second)





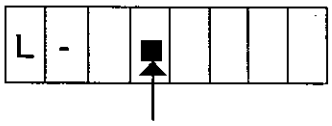
Since the number of columns of the data string displayed by the time program must be 9, the first line (line1) is considered to be ended, key in two spaces. Press S.TTL/ 9.
Up to 4 columns of line 1, part 2 are printed on the first line of the printer paper.

√ Next, input the time, use key */1.



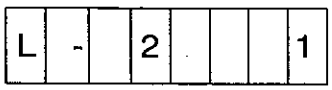
If there are other items to be programmed, press the END key here.

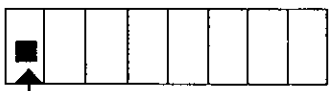
Line 1 (1st line) program ends and the display changes to



Input line No. 2 and press the END key.

Cursor



is displayed for 1 second, then the display changes to  .

Cursor

⑤ If program items other than the month, day, year, hour minute printing format program are unnecessary, press the END key, then press the SET key.
The printer returns to the NORMAL mode.

- When the PRINT key is pressed in the program mode, the program contents are printed.

Function and Printing Format Program Standard Setting

There are several function setting and programming methods to print or add data with the AD-8118B.

Set the AD-8118B in accordance with the standard settings described below.

Printing One Data Set Each Time (Data and Addition Data are the Same)

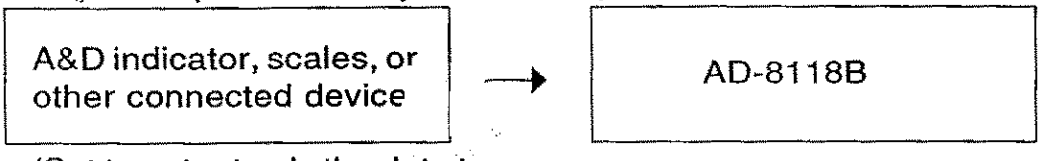
(1) For the printing format program, program the data to be printed by item number 8 (weight value).

NOTE: Sent data is printed without regard to gross, net, or tare weight.

(2) Set F12 (calculation data) to 1 (total all data).

(3) There are the following two methods of setting F11 (input data selection):

① Set F11=1 (all) and set the connected device (A&D indicator, scales, etc.) to output the data you want to print.



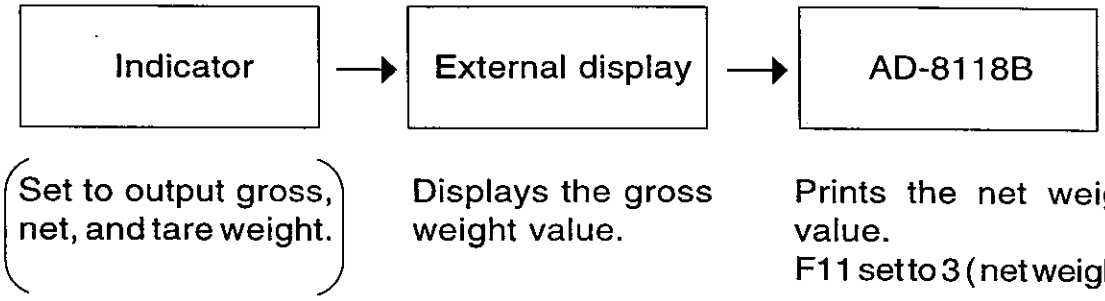
(Set to output only the data to be printed)

F11=1
F12=1
Program=Item No. 8 (weight value)

} The sent data is printed and totaled.

In particular, when setting the indicator output data the same as the display, proceed as shown above:

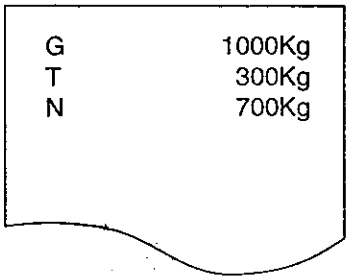
② Select the data you want to print with F11 (input data selection).



When an indicator, external display, and AD-8118B are connected and each of them processes different data, select the data you want to print with F11.

When Multiple Data Printed Each Time

(1) At the printing format program, for example, program the gross weight (G), tare weight (T), and net weight (N) as follows:



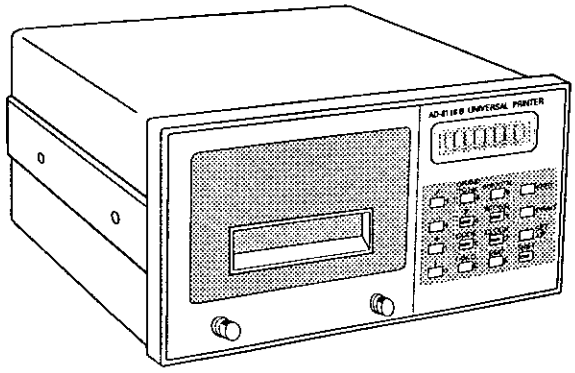
(2) Set F11 (input data selection) to 1 (all enabled).
(3) Select the data you want to calculate with F12 (calculation data).
(4) Set the indicator so that gross, net, and tare weight are output.

Setting for Other Printing

The sent data may not be printed depending on the setting of F5 (receive/ do not receive minus (-) and unstable data).
When you want to print only when the weight data is stable, set the stable condition of the indicator to send all data and set F5 of the AD-8118B to 2.
When you want to print the data even if it is unstable, set F5 to 1 and set the indicator so that the data is output even if it is unstable. In particular, when F10 (print timing) is set to automatic, printing may not be performed if F5 is not set to receive unstable data.

Section D

This section describes the serial input and serial input connection, control I/O connection and operation, connection to an indicator and scales, electronic balance, and external display.



Serial Input (CH 1 Only)

The serial input can be switched between RS-232C and current loop by a rear panel slide switch.Select either one depending on the product being connected.
For A&D products, the power for the current loop is supplied by the receiving side. When connecting a general device, use RS-232C. The following cables are also available:

1. CH1 connection cable

- Current loop use (DIN7P-DIN7P) Note 1
  KO: 359-200
  KO: 359-400
  KO: 359-600
  KO: 359-800
  KO: 359-1000
  KO: 359-1200
  KO: 359-1400
- RS-232C use (DIN7P-DSUB25P)
  KO: 360-200

For example, KO:359-200 is a 200cm current loop cable. The xxx or xxxx indicates length in cm.

Note 1 When connecting OP-03 (RS-232C option) from an FV or FW, use a current loop cable.
Set the connected device to stream, auto print or manual print mode.
The command mode is not supported. In addition, when this printer is set to the standard format input, inputs may not be accepted. In this case, set this printer to dump print.

Serial Input Connection

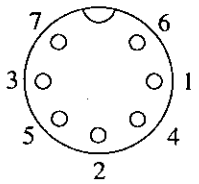
For the AD-4322, 23, 24, 25, etc., 1-to-1 connection to the standard serial output (current loop) is possible. For the FX, FY, FR, FV, FW, AD-4316, AD-4321, etc. connect the serial input by using the RS-232C option. (However, when a current loop output is optional, it can also be used.)
An external display, etc. can also be connected. (CH1 only.)

CH1

Connection table

18-4-1

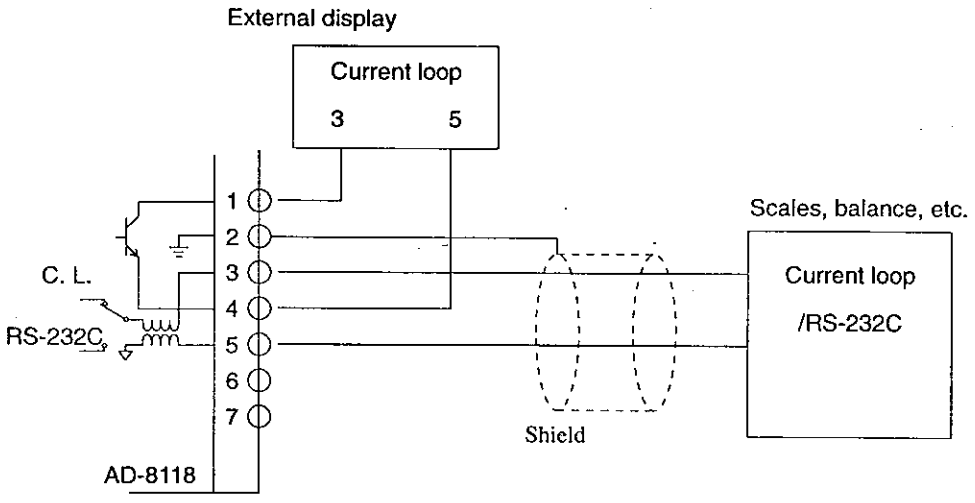
Pin No.	Symbol	Contents
1	C.L.OUT	Current loop output
2	F.G.	Frame ground
3	Ser.IN+	Serial input + (TxD)
4	GND	Signal ground
5	Ser.IN-	Serial input (SG)
6	I.C.	Connected internally
7	I.C.	Connected internally



View from rear panel

- Serial input uses both RS-232C and current loop. For RS-232C, pin 5 is signal ground. Connect the shield to pin 2.
- Shielded twisted pair cable is recommended as the signal line.

18-4-2

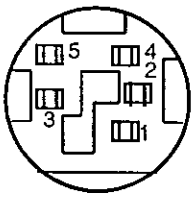


- Serial input connection (OP-01)

Option serial input is switched between RS-232C and current loop as shown below.

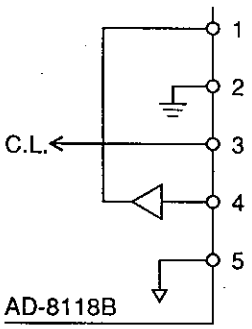
Connection table

Pin No.	Symbol	Contents
1	CONV.OUT	RS-232C conversion output
2	F.G.	Frame ground
3	C.L. IN	Current loop input
4	RS IN	RS-232C input
5	S.G.	Signal ground

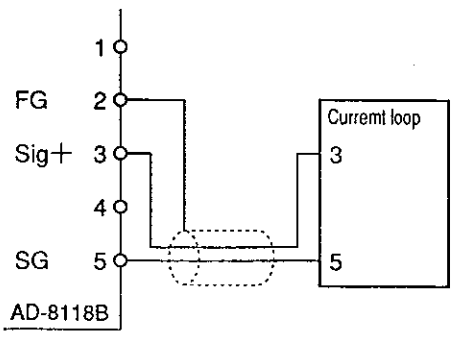


View from rear panel

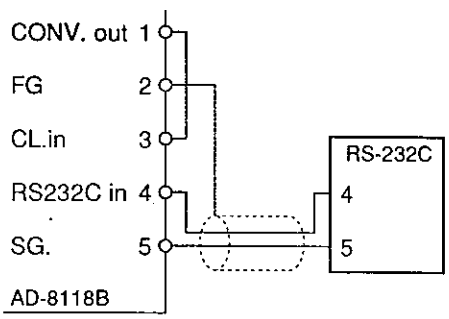
Interface circuit (common to all CHs)



Current loop connection

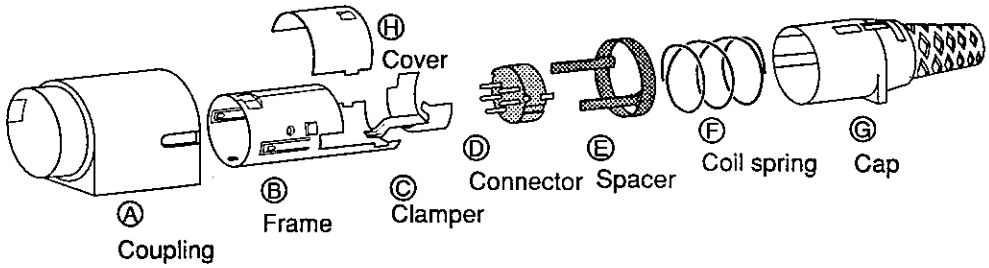


RS-232C connection



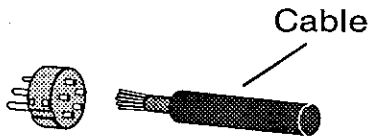
Mini DIN Connector Assembly Procedure

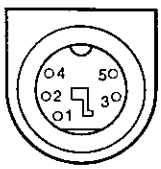
1.



2. Insert the parts onto the cable in Ⓖ , Ⓕ , Ⓔ order.

3. Solder the connector Ⓓ to the cable.

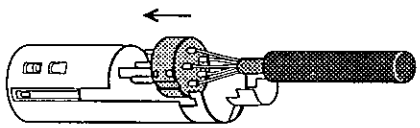




Front of connector Ⓓ

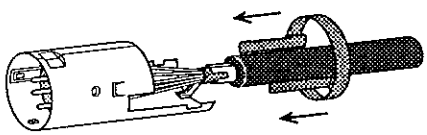
⚠ Check the wiring at the time it is wired to the connector Ⓓ.
Once, assembled, the connector cannot be disassembled.

4. Insert the connector with cable connected into frame Ⓑ .

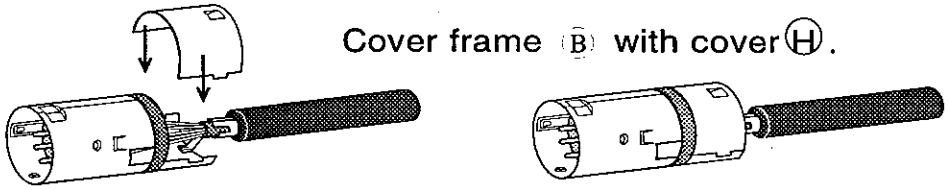


When the connector reaches the prescribed position, it is locked. The cable shield is held by the clamper Ⓒ .

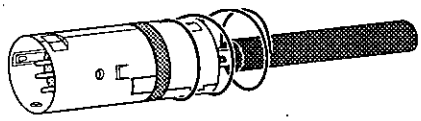
5. Insert the spacer Ⓔ .



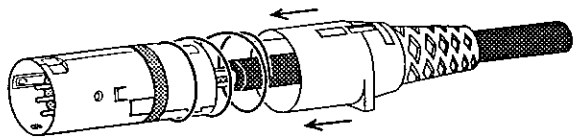
6. Cover frame (B) with cover (H).



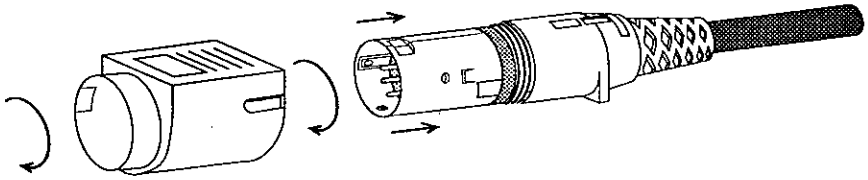
7.



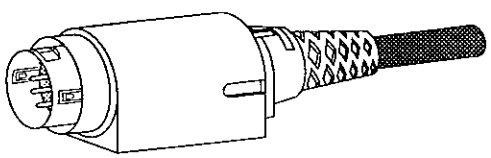
Insert the cap (G) onto frame (B) through coil spring (F) and lock the cap.



8. Finally, hold coupling (A) in the position shown in the figure and insert it forcefully onto the connector while grasping the spacer (E) and turning the coupling clockwise.



When coupling (A) is inserted up to the prescribed position, the entire connector is locked.



A&D Product Group Compatibility

Standard format input is possible with the following A&D industrial scales:

- AD-4316+OP-04*1
- AD-4321+OP-04
- AD-4322(OP-04)*2
- AD-4323(OP-04)
- AD-4324(OP-04)
- AD-4325(OP-04)
- FV SERIES+OP-03
- FW SERIES+OP-03
- FT SERIES(OP-04)
- AD-4601
- AD-4942 SERIES(OP-04)
- AD-4943 SERIES(OP-04)
- AD-4326+OP-04/OP-05
- AD-4327+OP-03/OP-04/OP-05
- AD-4328(OP-04)
- AD-4401(OP-04)
- FG SERIES+OP-03
- HV SERIES+OP-03
- HW SERIES+OP-03

- Set the baud rate to match the specifications of this printer.
- When connecting the AD-4325, set the output format to output the code number with the data. The cumulative total processing is performed by AD-4325 code.
- The AD-4601 is equipped with RS-232C as standard. When the RS-232C function is set to the printer mode, standard format input is possible. (However, flow value cannot be input. In this case, set this printer to dump print.)

*1 Products designated +OP-XX must have that option installed.
*2 Products designated (OP-XX) can be connected to standard serial output. Otherwise, they are connectable even if OP-XX is installed.

Connection to Electronic Balance

Standard format input is possible with the following A&D electronic balances:

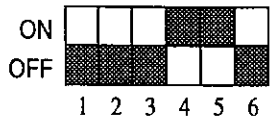
- EP SERIES+OP-03
- ER SERIES+OP-03
- ET SERIES+OP-03
- FX SERIES+OP-03
- FY SERIES+OP-03
- FC SERIES+OP-03
- EK SERIES+OP-03
- FR SERIES+OP-03
- FA SERIES+OP-03
- FY SERIES+OP-03
- HX SERIES(OP-05)
- HA SERIES+OP-03
- HM SERIES+OP-03/OP-05
- HR SERIES+OP-03/OP-05
- HF SERIES+OP-03/OP-05
- HP SERIES+OP-03/OP-05

- However, match the baud rate to the specifications of this printer.

The contents settings related to data output of the devices above are given on the following page.

18-4-5

AD-4321



FT, AD-4322A, AD-4323, AD-4325A/V

F21	2
F22	1
F23	1
F24	1

FC

F6-1	0,1,2,3
F6-2	0100
	0010
F6-3	0
F6-4	0,2

AD-4324, AD-4942, AD-4943

F20	2
F21	1

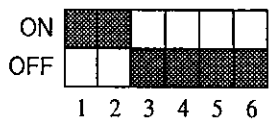
FR

C2 Print	0-4
C2 PAUSE	1
C3 bPS	0 or 2
C3 PAr	0
C3 bit	0
C3 StoP	0
C3 Cr-LF	0 or 1
C3 tYPE	0 or 1

HA

C5 Print	0~4
C5 PAUSE	1
C6 bPS	0 or 2
C6 PAr	0
C6 bit	0
C6 StoP	0
C6 Cr-LF	0 or 1
C6 tYPE	0 or 1
C6 tES	0

ER



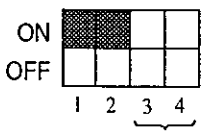
AD-4601

SS3	OFF
F45	2
F46	0

FX/FY, FA/FB

C3	4
C4	2
C5	0

AD-4316

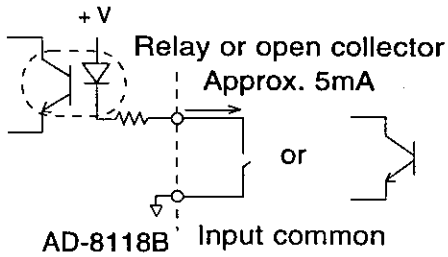


EP

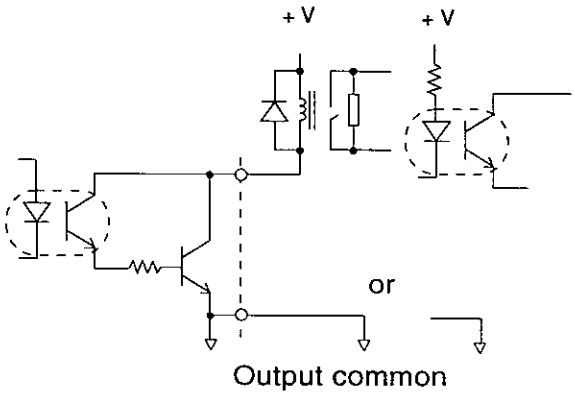
Print mode	6-04000
Baud rate	6-00000
Parity	6-0000
Data length Stop bit	6-00000

Control I/O Connection

Input circuit



Output circuit



The input and output circuits are shown above. Be careful of the minimum applicable load when connecting the input. Receive the output by auxiliary relay, solid-state relay (SSR), etc. Use a relay with a coil voltage of DC12 to 24V and a current of 50mA or less. (Omron MY Series DC24, etc.)
When the environment is noisy connect the cable shield to frame ground.

Standard I/O Connector

The signal contents are different when less than three and three or more indicators are connected to this printer. (The number of units connected is set by F30.)

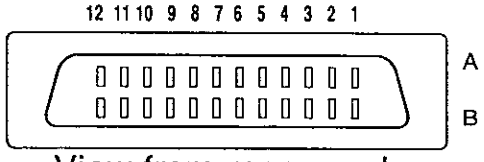
Less than 3			3 or more	
Pin No.	Contents		Contents	
A1	1		1	
2	2		2	
3	4		4	CH1 code input
4	8	CH1 code input	8	
5	10		10	
6	20		CH4	print command input
7	40		CH3	print command input
8	80		CH2	print command input
9	CH1 print command input			
10	Paper feed command input			
11	Subtotal print command input			
12	Grand total print command input			
B1	Cumulative total clear command input			
2	Interval print ON			
3	Batch print command input			
4	Lot print command input		Common	
5	Busy output			
6	Print announcement output			
7	NC			
8	Output COM			
9	NC			
10	Input COM			
11	Input COM			
12	F.G.			

Option I/O Connector

Less than 3 units			3 or more units	
Pin No.	Contents		Contents	
A1	1		1	
2	2		2	
3	4		4	CH2 code input
4	8	CH2 code input	8	
5	10		10	
6	20		1	
7	40		2	
8	80		4	CH3 code input
9	CH2 print command		8	
10	(*)		10	
11	(*)		1	
12	(*)		2	
B1	(*)		4	CH4 code input
2	(*)		8	
3	(*)		10	
4	(*)			
5	CH2 busy	output		
6	CH3 busy	output		
7	CH4 busy	output		
8	Output	COM		
9	N.C			
10	Input	COM		
11	Input	COM		
12	F.G.			

(*) Not to be connected.

Unless otherwise specified, the input is operated by shorting to input COM and when the output is operated, the output transistor is turned ON. Inputs other than code input are pulse inputs. Input a pulse width of at least 200msec. Code input is negative logic.



View from rear panel

Control I/O Operation

Input

- •Code input ——————— When F14 is set to 1, the code No. input from the control I/O becomes effective. When two or less channels are connected, the code No. can be input in two digits, but when three or more channels are connected, the code numbers that can be used are 0 to 19.
- •Print command ———— When this input is turned on, the first data that enters within the next three seconds is printed or added. However, this applies only when the F10 print timing is set to manual.
- •Paper feed command —— Feeds the paper one line.
- •Subtotal print command— Prints the subtotal up to that point. After printing, the subtotal value is not stored, but is cleared. This command cannot be used in the batch printing mode.
- •Grand total print ———— Prints the grand total up to that command point. After printing, the cumulative total values (subtotal, grand total) are not cleared.
- •Cumulative total clear —— Clears the cumulative total value command up to that point. "*CLEAR" is printed. When there is no cumulative total value, nothing is performed.

⚠ Print command will not operate in the automatic print mode.

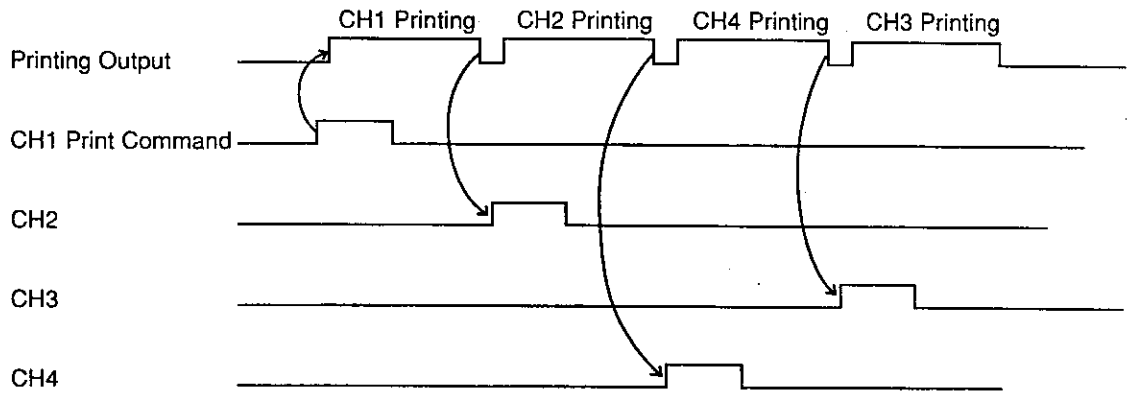
⚠ In dump print mode, only the paper feed command will operate.

Output

- •Interval print command — When this input is turned on, interval printing is performed. I/O has priority over key input.
- •Batch print command —— With F9 set to 2 (batch printing), when this signal is turned on, batch printing is performed.
- •Lot printing command —— With F9 set to 2 (batch printing), when this signal is turned on, lot printing (batch printing total) is performed.
- •Busy ——————————— When the data buffer exceeds 75 lines, this output is turned on.

•Print announcement — — When the printing operation is performed, this signal is turned on. At this time, control inputs are not received. Therefore, input control commands when this output is OFF.

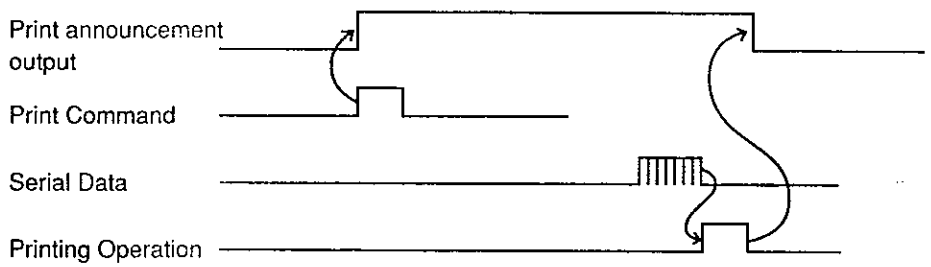
Timing Chart



Always input the control signals when the printing announcement output is OFF or set this printer to the automatic printing mode (F10= 4 or 6) and input the print command from an indicator set to the manual printing mode.

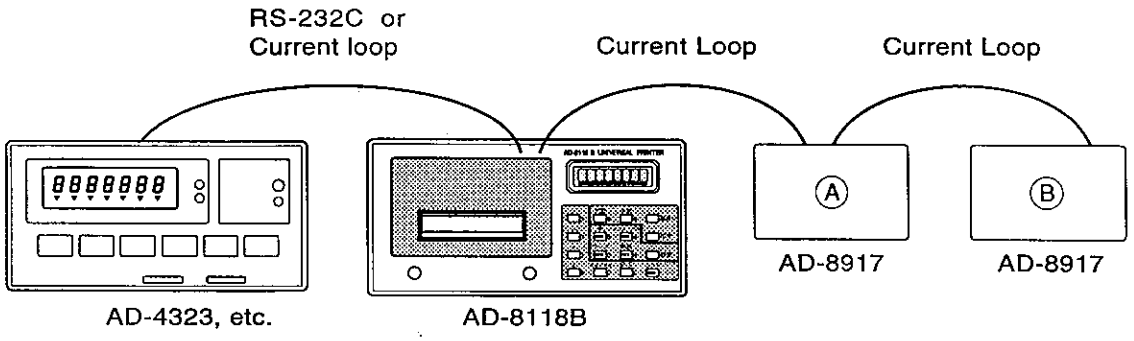
- Each command input is leading edge active and is operated only once when it is turned on.
- When an input is turned on (shorted to input COM) for more than 200ms, it is accepted.
- The print announcement output may be turned on at times other than a printing operation.
  At manual printing, if serial data is not input within three seconds after the print command is input, print announcement output is turned on for three seconds after print command input.

Timing Chart



Connection to Peripheral Devices

Standard serial input CH1 of this printer has a function which outputs the serial input directly by current loop. The AD-8916, 17, 18, 19, etc. can be connected by means of this.
Example, when set so that the gross, net, and tare weight of the AD-4322, AD-4323, and AD-4325 Series serial outputs are output simultaneously and two AD-8917 are connected, the following application is possible:



In the example above, the gross weight is displayed at AD-8917 Ⓐ and the tareweight is displayed at AD-8917 Ⓑ. However, only one AD-8118B can be used.

Note) Option serial inputs CH2 to CH4 do not have a function which outputs serial inputs directly by current loop.

Set the baud rate to 600bps when the current output is used.

Connection to Other Devices

Connection to a personal computer, sequencer, etc. is described here.
Basically, set this printer to RS-232C and dump print and set the baud rate, etc. to the 2400bps or 600bps setting range of this printer.
For the characters which can be printed, see the "Character Code Table" in the appendix.
This printer only receives signals, it cannot output control signals, messages, etc.
Note that data buffer overflow is valid for control I/O only.
Of the character codes 00H to 1FH, the following have meaning as control signals:

0DH	Prints the characters up to here and moves the character point to the beginning of the next line and resets the enlarged character specification.
0EH	Enlarged characters are printed from the character after this code. This code is reset by 0DH or 14H character input.
14H	If this code is input in the enlarged character mode, the printer returns to the normal character mode. This command is ignored in the normal character mode.
1BH	This code is used in combination with the following two characters as an auxiliary code: 1BH+44H Prints the date. 1BH+54H Prints the time.

Data Buffer

This printer has a data buffer for 80 data items so that data can be input even while the printer is printing.
When data temporarily overlaps and the printing speed is exceeded, the data is stored in this buffer. When printed, that data is cleared.
When this buffer exceeds 75 lines, the I/O output busy signal is turned on and when it exceeds 80 lines, "B ERROR" is printed one time.
When the buffer drops to 75 lines or less during printing,the I/O output busy signal is turned off, when it exceeds 80 lines again, "B ERROR" is printed again.
Since the printing speed is approximately 1.7 lines/second (the printing speed of one data item by time printing and number of feed lines becomes that number of lines), do not input data at a speed exceeding this.

Test Mode (Faulty operation check)

The AD-8118B has been provided with a TEST MODE as standard and can check for faulty operation.

To enter the TEST MODE procede as follows:

Press and hold the [/ 7] key, the [G.TTL 8] key, and turn on the power.

[CHECK MD] will be displayed for abour two seconds. At this time, the printer will print "8118.BK1 JAPAN","BK1" is the version number of the ROM used in this printer.
When the keys are released and you press the keys described below respectively, the TEST MODE operation will be performed.

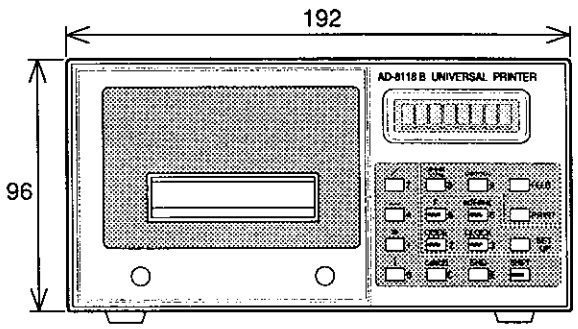
[G.TTL 8]	Prints the all characters, figures, units, and symbols which are used by this printer.
[G.TTL 8]	You can enter the key check mode after [KEY CHEK] has been displayed. In this mode, if each key illustrted below is pressed. The number of the pressed key will be displayed. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 When the [SHIFT] key (number 16) is pressed, [SW 16] will be displyed for abour two seconds, then the AD-8118B will exit the key check mode.
[ ] FEED	Feeds the paper

[ ] 4	When this key is pressed, the I/O check will be performed. [I/O CHEK] is displayed. Each time an input is received, its data is printed on one line. When the [SHIFT] key is pressed, the AD-8118B exits the I/O check mode.
F [ ] 5	When this key is pressed, the option control I/O check will be performed. [OPTION] will be displayed. Each time an input received, its data will be printed on one line. **NOTE:** **If there is no option installed, undefined data will be printed continuosly.** When the [SHIFT] key is presssed, AD-8118B wil exit the option control I/O check mode.
[ ] PRINT	When the [PRINT] key is pressed, the printer enters the mode in whech all of the serial input data is printed. [ALL PRINT] is displayed for about one second, then [CH No. ?] is displayed. When a key corresponding to the channels shown below is pressed, all the serial data of that channel (CH) is printed. CH1 → * [ ] 1 CH2 → CODE [ ] 2 CH3 → CLOCK [ ] 3 CH4 → [ ] SET

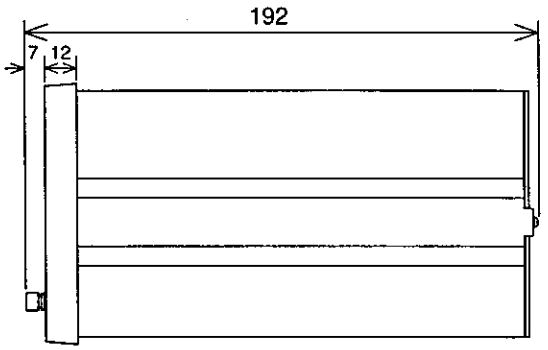
[ ] PRINT	For standard serial input, when the input is not connected to a curent loop (C.L.) source, "NL NL NL..." is printed. When the [SHIFT] key is pressed, the AD-8118B exits the all print mode.
SHIFT [ ]	When the [SHIFT] key is pressed, the serial input, control I/O, optional control I/O, and key check modes are terminated and the printer returns to the TEST MODE.

Section E

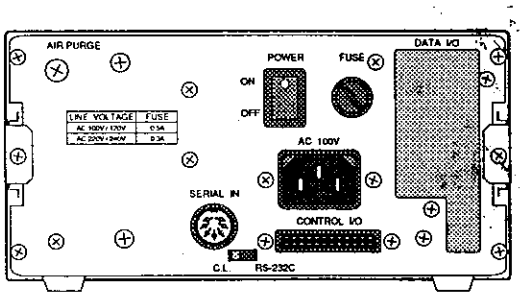
Appearance and Panel Cutout Dimensions



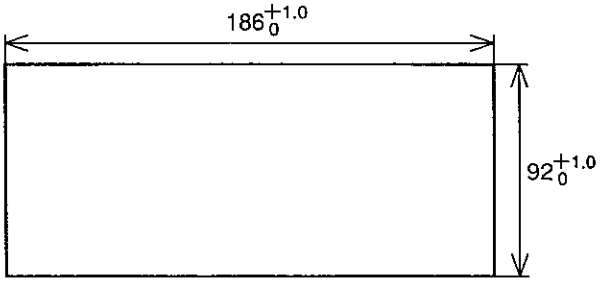
FRONT VIEW



SIDE VIEW



REAR VIEW



PANEL CUT DIMENSIONS

Character Code Table

81-B

HEX. NO	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL		(sp)	0	@	P	¯	p	μ	⊥						
1			!	1	A	Q	a	q	—	⊤						
2			"	2	B	R	b	r	—	⊣						
3			#	3	C	S	c	s	—	⊢						
4			$	4	D	T	d	t	▬	¯						
5			%	5	E	U	e	u	▬	–						
6			&	6	F	V	f	v	▬	|						
7			'	7	G	W	g	w	■	|						
8			(	8	H	X	h	x	|	⌈						
9			)	9	I	Y	i	y	|	¬						
A	LF		*	:	J	Z	j	z	▮	⌙						
B		ESC	+	;	K	[	k	{	▮	⌋						
C			,	<	L	¥	l	|	▮	⌜						
D	CR		–	=	M	]	m	}	▮	⌝						
E			.	>	N	^	n	~	■	⌞						
F			/	?	O	–	o	Σ	+	⌟						