

# SONY



## Digital Position Readout Systems Magnescale <sup>NEW</sup> GP Series

Digital Counter **LF-100**

Instruction Manual

### Features

The Digital Counter (LF-100 Type) is a highly accurate device that digitally displays the linear position and displacement as detected by the Scale Unit. Since the counter does not depend upon the skill of individual workers for accurate readout, it substantially enhances efficiency.

#### Greater Reliability and Extended Service Life

Circuits incorporating newly developed LSIs (Large Scale Integrated Circuits) and hybrid ICs assure greater reliability.

#### Switchable Resolution

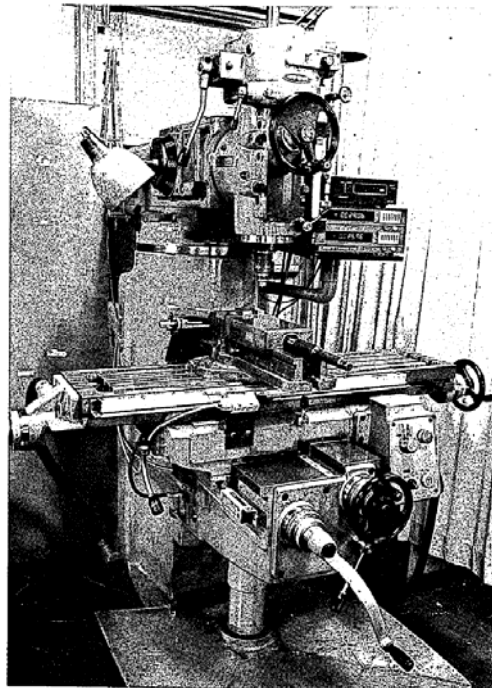
The 0.01 or the 0.005 mm resolution or diameter display (0.01 mm display in response to a 0.005 mm displacement on the scale) is selected by positioning the selector switch.

#### Factory Adjusted

Having been completely adjusted prior to shipment, the New GP Series Digital Position Readout System can be put into service immediately after installation.

#### Interchangeability

Any LF-100 Series Digital Counter may be used in combination with any New GP Series Scale Unit of any effective scale length. Please read this Instruction Manual thoroughly and also the manual for the Scale Unit (Scale and Cable Unit).

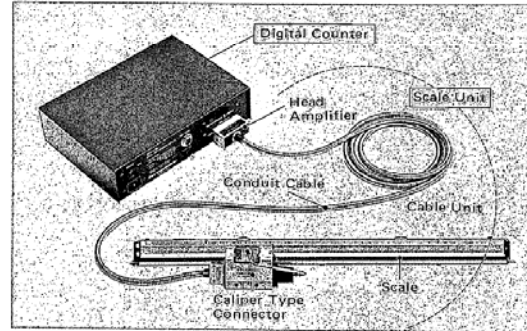


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# The New GP series

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- The New GP Series Digital Position Readout System consists of a Digital Counter and Scale Unit.
  - The Scale Unit consists of a Cable Unit and Scale.
  - The Cable Unit includes a head amplifier, signal cable, and a calliper-type connector.
- NOTE: Be sure not to confuse the names of the parts used in this Instruction Manual.
- The Scale and Cable Unit have been adjusted at the factory and have a combination number marked on the head amplifier of the Cable Unit. This number is identical to the serial number of the Scale.
  - Ensure that the power to the Digital Counter is OFF before connecting or disconnecting the Cable Unit to the Scale.



## Names of Parts of the 1-Axis Type Counter

LF 1-AXIS TYPE COUNTER



LED Display Unit

Reset Button  
(Press to reset the display to "0".)

Axis Badge  
(Label X, Y, or Z as required)



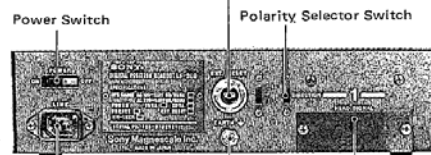
LF 1-AXIS TYPE COUNTER WITH PRESET SYSTEM

Reset Button

Preset Button  
(Press to display sign and digits set with thumbwheel switches.)

Thumbwheel Switches  
(for presetting sign and digits)

Remote Reset Connector  
(Preset types only)



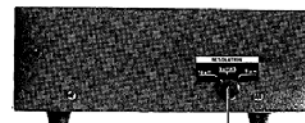
Power Switch

Polarity Selector Switch

Power Connector

Head-Amplifier Connector  
(Remove the blank plate to make the connection.)

Earth Terminal (Connect to the frame of the machine using the earth wire provided.)

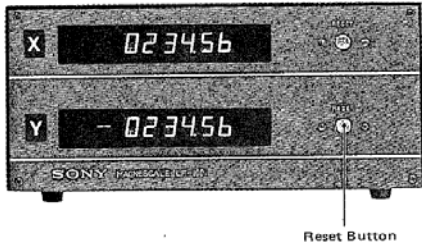


Resolution Selector Switch

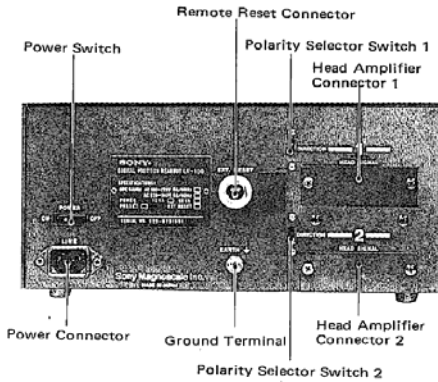
Each axis of a 2-axis Digital Display has its own Resolution Selector Switch and independently switchable.

# Names of Parts of the 2-Axis Type Counter

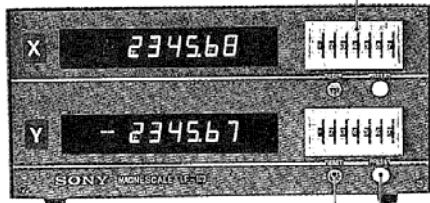
LF 2-AXIS  
TYPE COUNTER



Reset Button

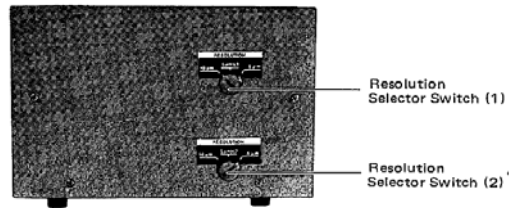


Thumbwheel Switches



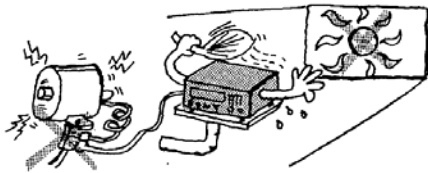
LF 2-AXIS TYPE  
COUNTER WITH PRESET  
SYSTEM

Reset Button  
Preset Button



## Unit Set-up

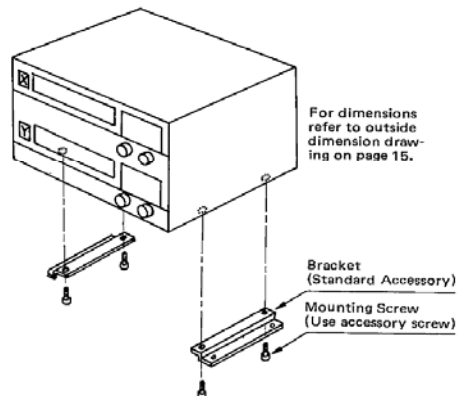
1. The Digital Counter should always be used in a well ventilated place with a temperature range of 0°~40°C. Do not use the unit in direct sunlight.



2. To avoid the possibility of danger, do not connect the counter to a noisy power source and only operate on the voltage specified.
3. Place the counter as far as possible from noise sources such as high voltage relays, high voltage and current switches. Do not route the signal cable and power cable adjacent to each other.

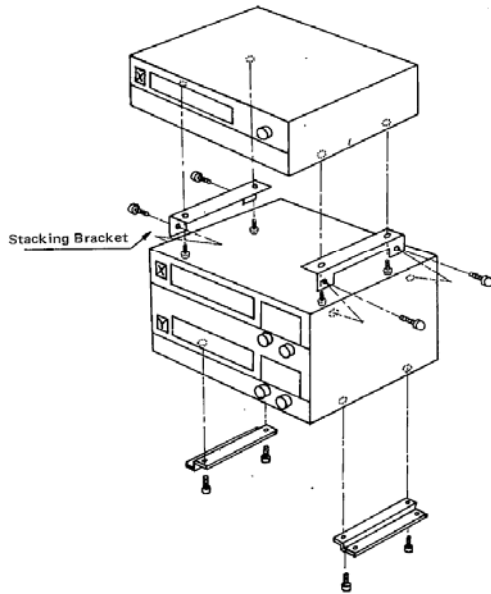
## Mouting

Mount the Digital Counter to the machine, etc., using the brackets and screws supplied with the counter. Use of screws other than those supplied may cause damage to the printed circuits.



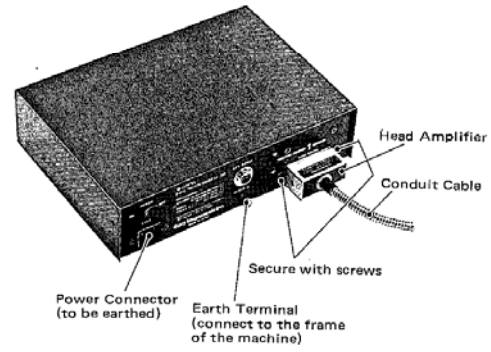
## Stacking

Use stacking brackets and screws to stack two or more Digital Counters. For information on stacking, consult your nearest dealer.



## Cable Hook-up

1. Connect the earth terminal of the Digital Counter to the frame of the machine using the earth wire provided. (The frame of the machine should also be earthed.)
2. Remove the blank plate over the head amplifier connector and securely attach the connector with screws. Attach the conduit cable to the machine at any appropriate place to ensure that it does not slacken.
3. Connect the counter to an AC outlet using the power supply cable provided. (Check the voltage of the power source to be used.) To avoid electrical shock, be sure to connect the earth wire for the power supply cable to earth.



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## Operation

1. Turn ON the Power Switch located on the rear panel of the Digital Counter.
2. Slide the scale to adjust the polarity of the counter to the direction of scale movement. If the polarity is incorrect, it can be changed easily by changing the position of the Polarity Selector Switch which is also located on the rear panel of the Digital Counter. For a 2-Axis Type Counter, the polarity for each axis may be changed independent of the other.



3. Bring the spindle or measurement stylus to zero point of the material to be machined or measured. Press the Reset Button for "0" display.
- NOTE: Since the polarity of the counter and the direction of scale movement invariably correspond with each other regardless of whether the power is ON or OFF, the procedure in 2 above is only required when the direction of scale movement is not correct. Push the Preset Button after each use of the Polarity Selector Switch.

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# Preset System (for LF-100-12 and LF-100-22)

For presetting, turn the thumbwheel switches to the desired sign, + or -, and to the proper digits. Depress the Preset Switch to set the selected sign and digits and to display them on the Digital Counter.

When the machining is of a long duration with interruptions, preset the value of the display just prior to the interruption. Or preset the value of the desired point using a minus sign; by doing this, the display on the counter will subtract the travel of the machine, and the machine operator has only to feed the table or the head of the machine until it comes to the point where the display reads "0". This enables the work to be accomplished with reduced operational errors and increased efficiency.

**NOTE:** When the resolution has been set to 0.005 mm, preset either "0" or "5" for the minimum display on the counter. If this is not done, incorrect readings may result. (Example: Set "2" and the display will count 2, 7, 2, 7.)



## Preset for Addition

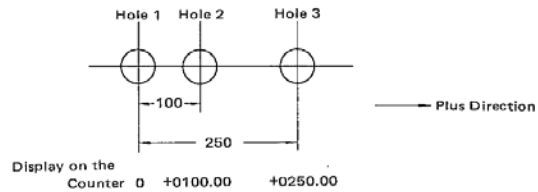
Suppose holes as shown in the figure below are to be drilled by a drilling machine.

Without PRESET, bring the drill center to the center of hole 1, zero the counter and drill the hole. Next, bring the drill center to the center of hole 2 where the counter displays +0100.00 and drill hole 2. Now, bring the drill center to the center of hole 3 where the counter displays +0250.00 and drill hole 3.

The machine operator may, on occasion, be interrupted. After drilling hole 2 for example. This interruption does not affect the position of the drill or that of the work. They will remain as they are.

The digits displayed on the counter will be erased when the counter power switch is turned OFF. When machining is begun again, and the power switch is turned ON, the counter is reset to zero.

Preset the counter to +0100.00, bring the drill center to the center of hole 3 where the counter displays +0250.00 and drill hole 3.



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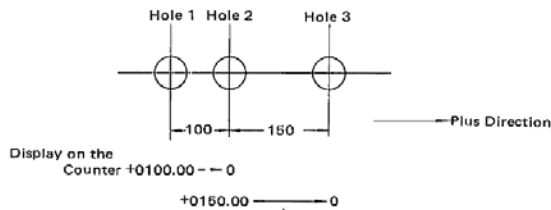
## Preset for Subtraction

Suppose the holes are to be drilled as shown in the figure.

Set the Direction Selector Switch located on the rear panel of the counter in such a way that the display on the counter subtracts as the drill is moved from hole 1 to hole 2 or 3.

Next bring the drill center to the center of hole 1 and drill it. Then, preset the counter to +0100.00, bring the drill center to the center of hole 2 where the counter displays zero and drill hole 2. Now preset the counter to +0150.00, bring the drill center to the center of hole 3 where the counter displays zero and drill hole 3.

With "Preset for Subtraction", the machine operator can work more efficiently without mistakes since he only has to feed the table or the head of the machine until it comes to the point where the display on the counter reaches zero. He is released from the char of remembering a complicated number to the next stop point.



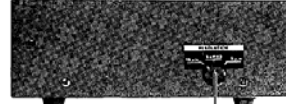
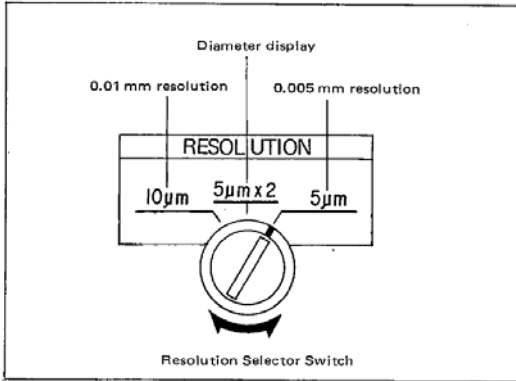
## Selection of 0.01mm or 0.005mm Resolution or Diameter

0.01 mm or 0.005 mm resolution or diameter display can be selected with the Resolution Selector Switch located on the left side of the digital counter.

Use a coin or a screw driver and set the switch to the desired position.

- 10  $\mu\text{m}$  . . . . . 0.01 mm resolution
- 5  $\mu\text{m}$  . . . . . 0.005 mm resolution
- 5  $\mu\text{m} \times 2$  . . . . . Diameter display (displays 0.01 mm in response to a 0.005 mm displacement). Diameter display is convenient for reading cross feed on a lathe.

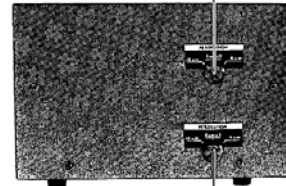
\* After changing positions of the Resolution Selector Switch, always depress the Reset Button. You cannot change from one resolution to another (e.g. from 0.01 mm to 0.005 mm) continuously while measuring one length.



Resolution Selector Switch

Each axis of a 2-axis counter has its own Resolution Selector Switch and independently switchable.

Resolution Selector Switch (1)



Resolution Selector Switch (2)

## Remote Reset System

Reset may be effected without depressing the Reset Button on the front panel by providing an appropriate switch or relay at any external position in relation to the Remote Reset Connector.

For the 2-axis type counter, each axis can be externally set independently of the other.

Use a two-core shielded cable for a 1-axis type counter and a three-core shielded cable for a 2-axis type counter to make the connection to the Remote Reset Connector.



1- Axis Type

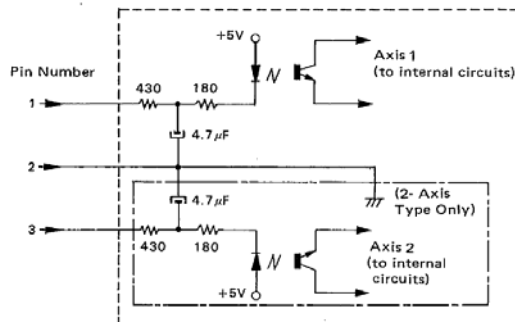
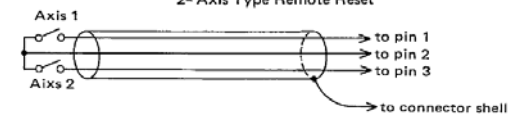


2- Axis Type

### 1- Axis Type Remote Reset



### 2- Axis Type Remote Reset

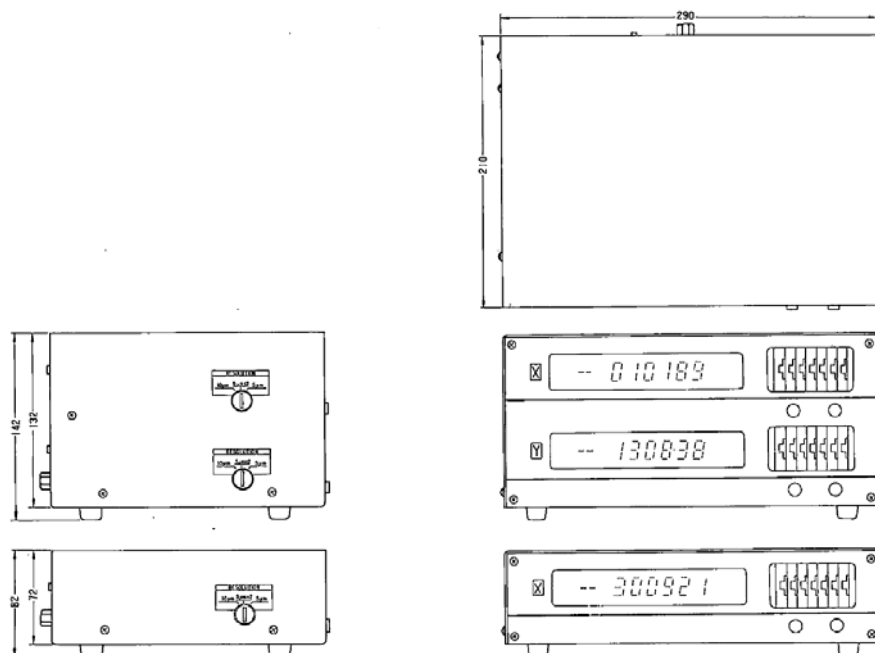


# Specifications

	1-Axis Counter	2-Axis Counter	1-Axis Counter With Preset	2-Axis Counter With Preset
Model Name	LF-100-11	LF-100-21	LF-100-12	LF-100-22
Number of Display Axes	1	2	1	2
Number of Digits	6 Digits plus $\pm$ Signs			
Resolution	0.005 mm, 0.01 mm, or diameter display selectable by an selector switch.			
Maximum Display Range	0 $\sim$ $\pm$ 999.995 mm or 0 $\sim$ $\pm$ 9999.99 mm			
Maximum Response Speed	50 m/min.			
Quantization Error	$\pm$ 1 count, max.			
Scale System	Magnescale SR-1711			
Connecting Cable	HK-3 (3 m), HK-5 (5 m) or HK-10 (10 m)			
Reset System	One touch resetting by a push button at any point on the scale.		a. One touch resetting by a push button at any point on the scale. b. One touch resetting by an external switch or an external electrical signal.	
Preset System	c. Turn the thumbwheel switches to the desired sign, + or -, and the appropriate digits. Then depress the Preset Switch for simultaneous presetting of all sign and digits.			
Power Supply	AC 100/110, 220/240V $\pm$ 10% 50/60Hz			
Power Consumption	10VA	20VA	10VA	20VA
Operating Temperature	0° C $\sim$ +40° C			
Storage Temperature	-10° C $\sim$ +50° C			
Outside Dimensions	290(W)x210(D)x82(H)	290(W)x210(D)x142(H)	290(W)x210(D)x82(H)	290(W)x210(D)x142(H)
Weight	3.2 kg	4.8 kg	3.2 kg	4.8 kg
Standard Accessories	1. Power Supply Cable 2. Earth Wire 3. Spare Fuse 4. Axis Indication Badge (X, Y, & Z) 5. Brackets 6. Screw (+) M3 x 5	1 5 m 1 1 2 6	1. Power Supply Cable 2. Earth Wire 3. Spare Fuse 4. Axis Indication Badge (X, Y, & Z) 5. Brackets 6. Screw (+) M3 x 5 7. Connector	1 5 m 1 1 2 6 1

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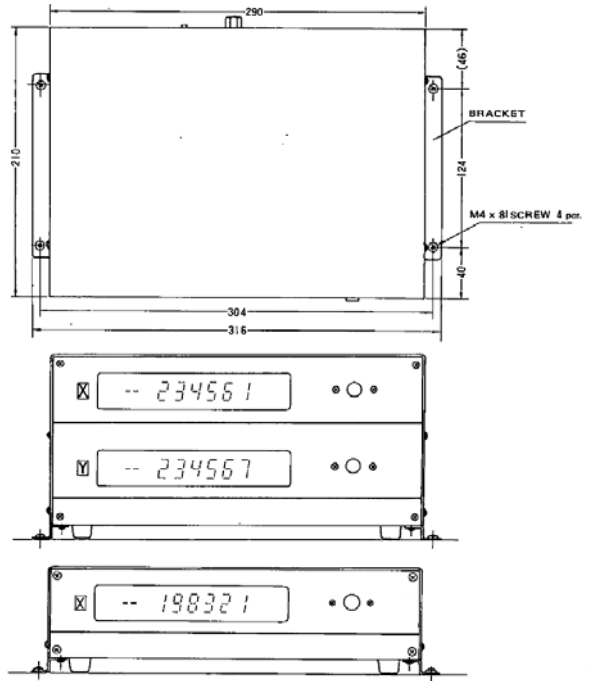
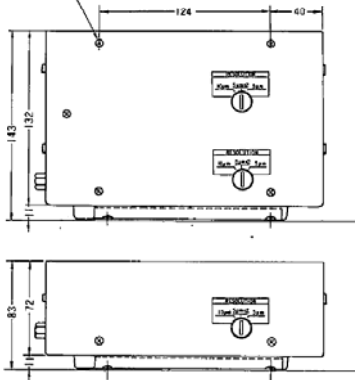
# Outline Drawing



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DIMENSIONS WITH BRACKETS MOUNTED

(FOR STACKING)  
4 - M3 TAPPED



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