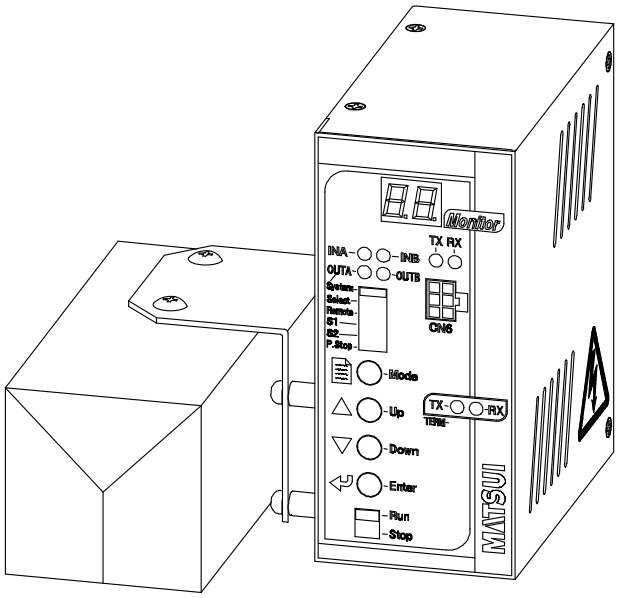
DIGI-PECA UNIT

DP-S (switch) DP-C2 (controller)

OPERATION MANUAL

⚠ WARNING

Thank you for choosing our product.
Before operating this equipment, please read this manual thoroughly.
Keep this manual in a location near the equipment so that it may be readily referred to whenever a question arises during equipment operation.



MATSUI

Issued October 2008

Introduction

Thank you for purchasing our DIGI-PECA UNIT. Please read this manual carefully for proper and safe operation. This instruction manual constitutes a warranty. So, please carefully store this manual after you have read it.

1. Warranty Period

If any defect is found in our equipment under normal operating conditions, and we determine it to be a defective, we will repair it or replace the parts free of charge within the following period and terms. In addition, please return the defective product to us.

1) This warranty shall remain valid for twelve (12) months from the date when the new products you purchased are delivered to you.
2) Only the following parts are subject to the warranty period of six (6) months after such delivery date.
   Electromagnetic contactors and mechanical seals
3) The warranty period for any parts replaced for repair shall be three (3) months from the date of repair.

2. Scope

This warranty shall be limited to repair of our equipment or replacement of its parts, and shall not cover any products manufactured by means of our equipment and defects in manufacturing such products.

3. Exceptions

This warranty shall not apply to the following defects:

1) Defects caused by remodeling or repair made by any party other than our company;
2) Defects resulting from natural disasters such as earthquakes, typhoons and floods, accidents and fires;
3) Defects resulting from use exceeding limitations in the specifications set forth in the instruction manuals or catalogs;
4) Defects resulting from non-performance of maintenance and inspection by not observing manual instructions.
5) Defects in the equipment caused by outside factors.
   (Peeling of coating caused by generated gas and malfunction due to electrical noise)
6) Defects resulting from non use of genuine parts (oil, medium, filters, etc.)
7) Consumables (hoses, filters, packing, O-rings, etc.).

4. In the case where the warranty period expires

We will make repairs for value, upon request, if the performance of our equipment can be maintained by such repairs.

5. Period during which parts can be supplied

As an approximate standard, service parts for our equipment can be supplied for eight (8) years after the equipment is discontinued. However, some parts may be supplied even after the period elapses. So, please make an inquiry at our service department about the availability of service parts.

Contents

⚠ The following marked chapters are very important. Please read them in advance and pay attention to them.

Chapter 1 For Safe Operation

This chapter contains instructions for operation, maintenance, and repair to operate this equipment properly and safely. Moreover this chapter explains the labels and meaning of each indication on the products.

⚠ WARNING

Indications for safety described in this manual should be observed when operating or inspecting this product.
We shall not be responsible for any injury or accidents caused by failure to observe these indications and we make no warranty against such injury or accidents.

1. Label and meaning of each indication

This instruction manual uses different indications depending on the extent of danger as follows:

Mark	Description
⚠ DANGER	This indication is used when failure to observe this may cause user death. Instructions with this indication explain how to prevent such an occurrence.
⚠ WARNING	This indication is used when failure to observe this may cause users to be seriously injured. Instructions with this indication explain how to prevent such an occurrence.
⚠ CAUTION	This indication is used when failure to observe this may cause users to be injured slightly or products to be damaged. Instructions with this indication explain how to prevent such an occurrence.
NOTE	This indication is used when special care must be taken in operation procedure or descriptions, and when the information should be emphasized.
⚠	This mark is used when special care must be taken in handling.
※	This mark is used when exceptional conditions or cautions are described in Tables and Figures.

2. Items to be observed for safety

To operate this product safely, general instructions which should be observed are described below.

1) Usage environment

- This equipment should be used indoors.
- This equipment should be used at ambient temperatures from 0°C to 45°C and an ambient humidity of 45-80%.

2) Prohibition against removing the main body cover

Operating the DIGI-PECA switch with the main body cover removed will cause an equipment failure.
Also, since foreign matter may be mixed in it, make sure to operate with the main body cover mounted.

3) Knowledge of electricity

Inspection or replacement by persons without sufficient knowledge of electricity may cause defects or danger. Therefore, inspection and replacement should be performed by Service Division or persons of your company who have sufficient knowledge about electricity.

4) Prohibition against remodeling

This equipment must not be remodeled or altered by users without obtaining our approval. We shall not be responsible for any accidents caused by remodeling or alteration.

5) Maintenance, inspection, and parts replacement

Before performing maintenance, inspection, and parts replacement, make sure to stop operation, and turn off your primary power.

6) Maintenance

Inspection and replacement of parts must be performed by persons who have sufficient knowledge about this product. Inspection and replacement by persons without sufficient knowledge about the product may cause defects or danger.
When maintenance or repair is necessary, contact Service Division at your nearest office (listed on the back page) location.

7) Damage prevention of the DIGI-PECA switch

Since a thin stainless plate and resin are used for the upper plate and lower plate of the DIGI-PECA switch, respectively, they will be damaged if strong external force is given. Handle carefully.

8) Disposal of the product and parts

When disposing of the product or parts, obey laws of the applicable use country after use of the product and parts.

⚠ CAUTION

9) Periodic inspection

Basically, the component devices and parts have their respective service lives. For those that need to be replaced, it is advisable to request inspection from Service Division in advance.

NOTE

10) Wiping

Do not wipe the equipment using petroleum solvent. Cleaning with benzene, thinner, and polishing powder will scratch the surface. When equipment is blemished badly, wipe it with a soft cloth soaked in water under 40°C and well wrung.

Chapter 2 Explanation of the DIGI-PECA Unit

1. Outline of the DIGI-PECA unit

This unit detects the suction pressure generated for conveyance and controls volumetric feeding of raw materials.

Here, a representative example of use is introduced in

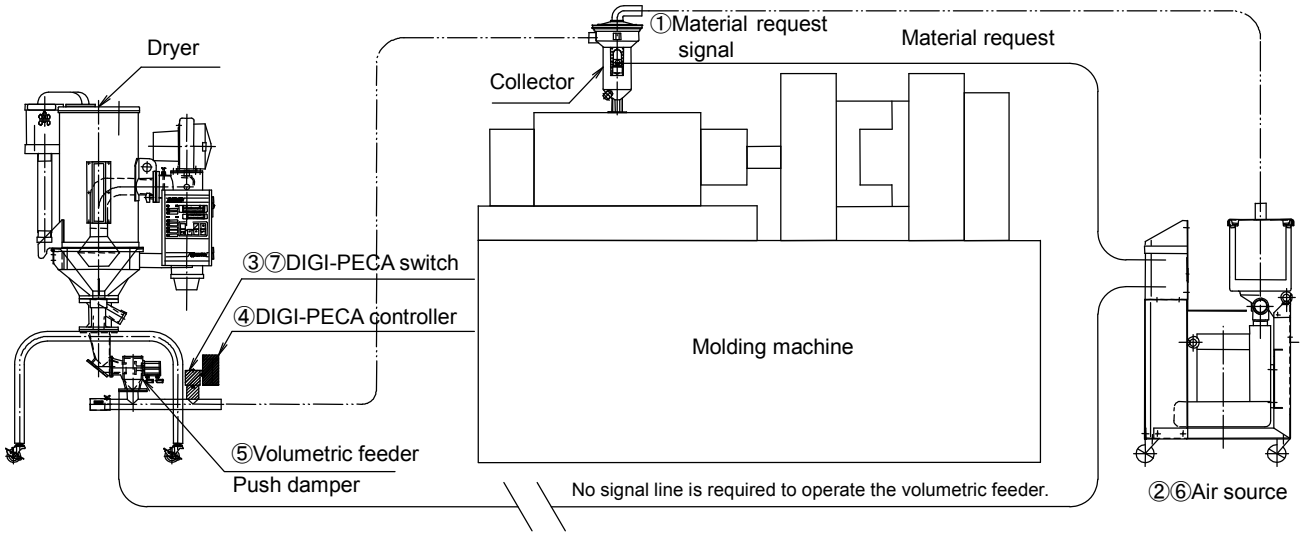
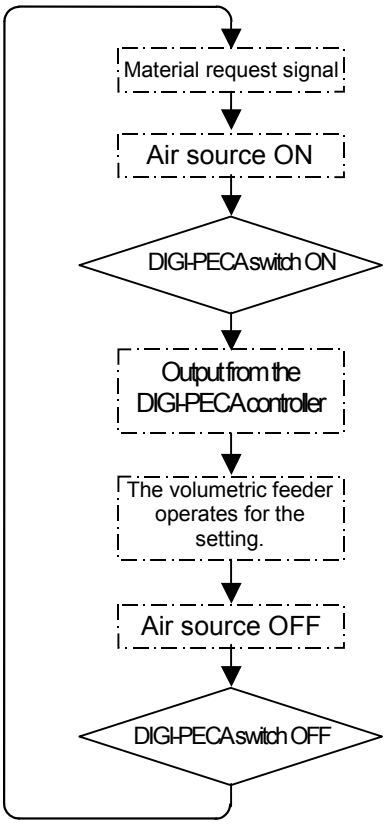


Fig. 2-1.

Example of basic operation



① With the material level drop switch ON, a material request signal is given.

② Upon receipt of the material request signal, operation results for the set timer.

・The air source is turned on to generate suction pressure in the piping.

③ With the suction pressure, the DIGI-PECA switch turns ON.

* For the suction pressure, see the specifications.

④ Upon receipt of the DIGI-PECA switch ON signal, output is made from the DIGI-PECA controller.

* For the settings and operational descriptions, see Chapter 3.

⑤ Upon receipt of the set output signal from the DIGI-PECA controller, the volumetric feeder operates.

⑥ After the timer is up, the air source is stopped.

・When the air source is stopped, the suction pressure goes out.

⑦ When the suction pressure is gone, the DIGI-PECA switch turns OFF.

2. Specifications of the DIGI-PECA unit

Specifications of the control section (DIGI-PECA controller DP-C2)

1)	Power source	100V AC - 220V AC±10%　50Hz／60Hz
2)	Power consumption	Max 3W
3)	Size	W53.2×H117×D97.6
4)	Number of inputs	1 (impedance 4.7kΩ)
5)	Number of outputs	1 (allowance 250V AC 1A)
6)	Ambient temperature	0°C - 45°C
7)	Ambient humidity	45% - 80%RH

Table 2-1

Specifications of the pressure detecting section (DIGI-PECA switch DP-S)

1)	ON pressure	-400Pa or less
2)	OFF pressure	-20Pa or more
3)	Size	W52×H102×D112
4)	Ambient temperature	-40°C - +90°C, 60%RH or less (non-freezing)
5)	Ambient humidity	95%RH or less (at +5 - +35°C)

Table 2-2

DIGI-PECA switch operating pressure areas

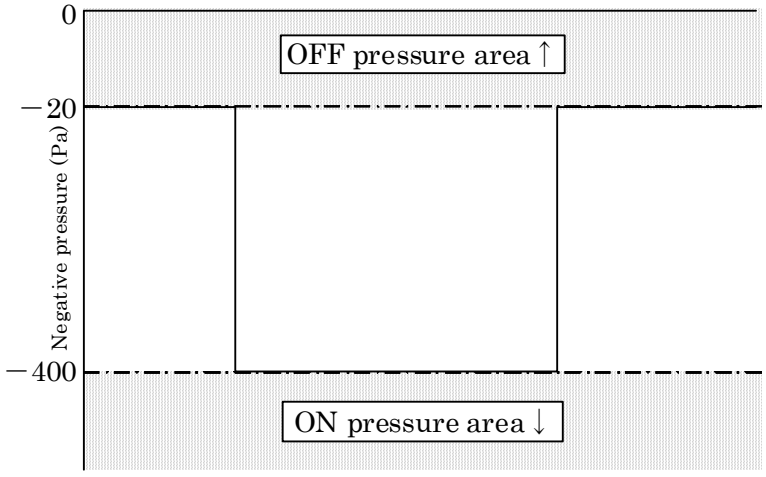


Fig. 2-2

3. Names of parts of the DIGI-PECA unit

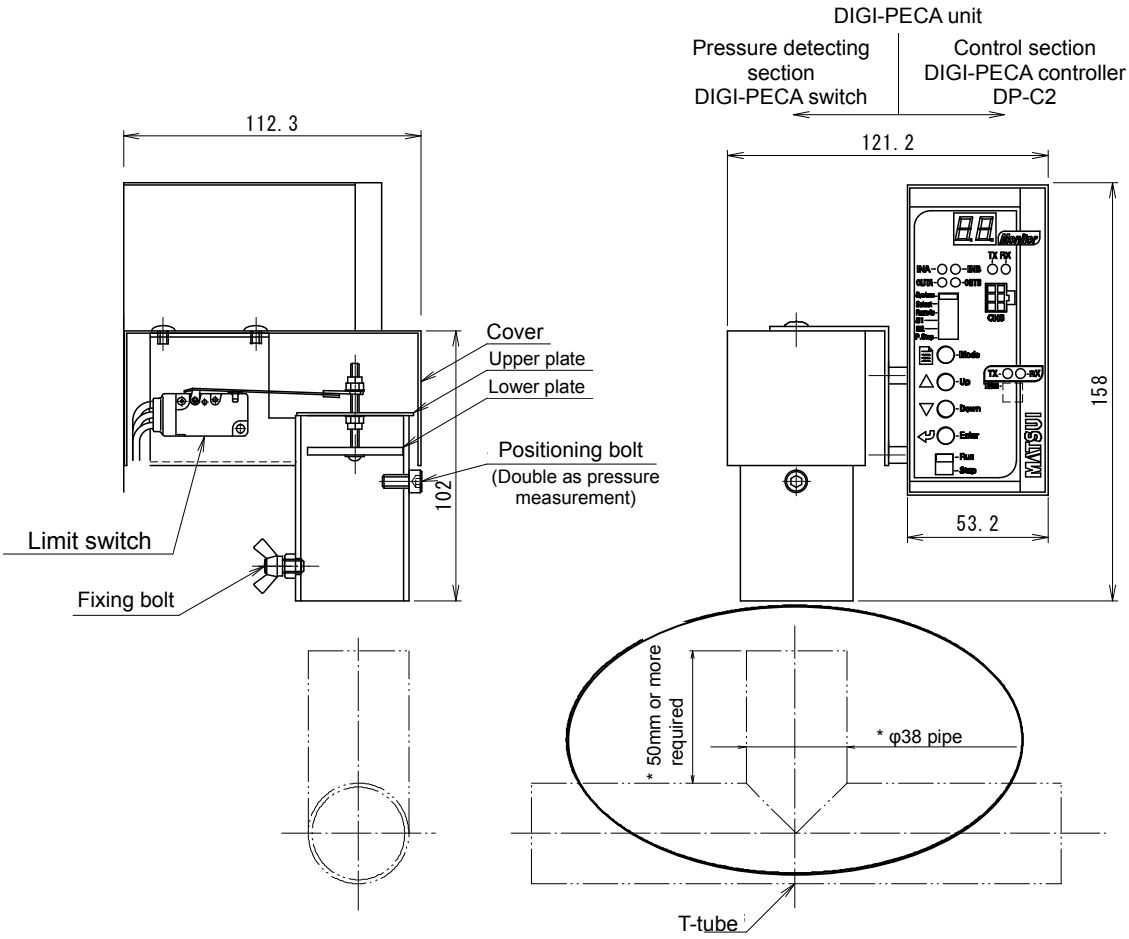


Fig. 2-3

4. Precautions to be followed when the DIGI-PECA unit is purchased separately

- Mount the DIGI-PECA unit horizontally by using a T-tube, and by keeping the dimensions marked with ⬭.
- No T-tube is attached.

[The outside dimensions of the straight tube section of the T-tube are undesignated.]

5. Names of parts of the DIGI-PECA controller setting section

7-segment LED display section

Displays the current status.
(For details, refer to Section 6.)

LED (INA)

Lights when DIGI-PECA is switched on.

LED (INB)

Flashes at a one second cycle in engineering setting mode.
Always flashes at a one second cycle in auto change mode setting.

LED (OUTA)

Lights when the volumetric feeder is ON.

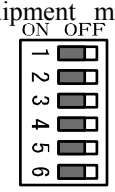
LED (OUTB)

* Option
Lights when the option output is ON.

DIP switch

Not used for this equipment.
* If the value on this switch is changed, the equipment may not operate.

Initial value→



Slide switch

Changes over Run/Stop.

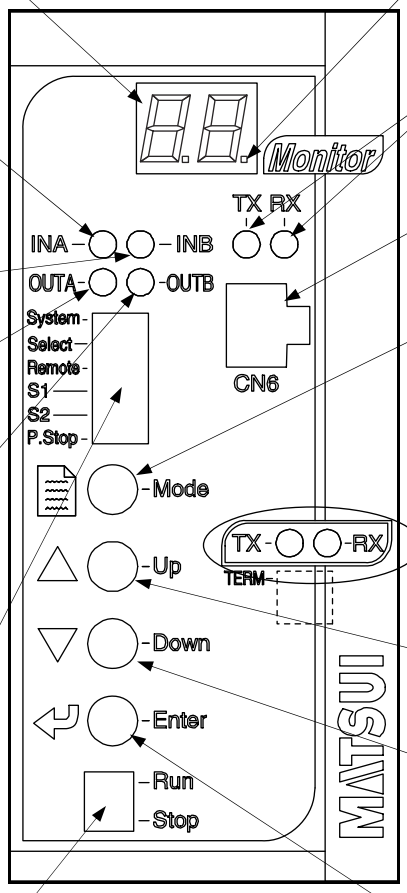


Fig. 2-4 Front view of control panel

Power indication

Power indication lights when power is turned on.

Tool port monitor LED

* Not used for this equipment.

Tool port

* Not used for this equipment.

Mode key

At Run: Displays the current SV value.
At Stop: Serves to move to or release set items.

Tool port monitor LED

* Not used for this equipment.

Up key

Changes items and the set value.

Down key

Changes items and the set value.

Enter key

* At setting change
Confirms selection of set item, and confirms changed set value.
* At manual operation
Starts manual operation.

6. Name of parts of 7-segment LED indication

Display of 7-segment LED and names corresponding to display are as follows.

Display	Name	Status
	Equipment name indication	Indicated when power is turned on.
	Stop indication	Indicated in stop status.
	Operation indication	Indicated in operation status.
	Set value change-over indication	Indicates currently set value with change item of set value and Enter key.
	Function setting indication	Indicates function setting menu with function setting item and Enter key.
	Manual operation indication	Indicates manual operation menu with manual operation item and Enter key.
	Operation selection indication	Indicates operation with operation selection item and Enter key.
	Operation mode setting indication	Indicates operation mode with operation selection item and Enter key.
	Counter setting indication	Indicated when operation is counter selection.
	Timer setting indication	Indicated when operation is timer selection.
	Manual change mode setting indication	Indicated when manual change mode is selected in operation mode setting.
	Auto change mode setting indication	Indicated when auto change mode is selected in operation mode setting.
	Measuring check indication	Indicated when measuring check is selected in manual operation menu.
	Output 1 operation indication	Indicated when output 1 operation is selected in manual operation menu.
	Output 2 operation indication	Indicated when output 2 operation is selected in manual operation menu.
	Output 3 operation indication	Indicated when output 3 operation is selected in manual operation menu.
	Output 4 operation indication	Indicated when output 4 operation is selected in manual operation menu.
	Input 1 monitor indication	Indicated when status of input 1 is checked in manual operation menu.
	Input 2 monitor indication	Indicated when status of input 2 is checked in manual operation menu.
	Input 3 monitor indication	Indicated when status of input 3 is checked in manual operation menu.
	Input 4 monitor indication	Indicated when status of input 4 is checked in manual operation menu.
	Volumetric feeder ON time indication	Indicated when this is selected in engineering setting menu.
	Volumetric feeder OFF time indication	Indicated when this is selected in engineering setting menu.
	Volumetric feeder start delay indication	Indicated when this is selected in engineering setting menu.
	Volumetric feeder stop delay indication	Indicated when this is selected in engineering setting menu.
	Set value lock setting indication	Indicated when this is selected in engineering setting menu.

Table 2-3

Chapter 3 Operational Description

1. Operational Description

This equipment allows the following operations.

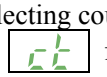
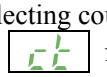
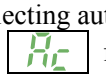
Operation			Operation/Setting
Auto operation	Counter operation (see page 10)	Auto change mode (see page 11)	1. For selecting counter operation. Select  from Chapter 4, section 3 [Selection of operation]. 2. For selecting auto change mode Select  from Chapter 4, section 5 [Selection of operation].
		Manual change mode (see page 11)	1. For selecting counter operation. Select  from Chapter 4, section 3 [Selection of operation]. 2. For selecting manual change mode Select  from Chapter 4, section 5 [Selection of operation].
	Timer operation (see page 10)	Auto change mode (see page 11)	1. For selecting timer operation. Select  from Chapter 4, section 3 [Selection of operation]. 2. For selecting auto change mode Select  from Chapter 4, section 5 [Selection of operation].
		Manual change mode (see page 11)	1. For selecting timer operation. Select  from Chapter 4, section 3 [Selection of operation]. 2. For selecting manual change mode Select  from Chapter 4, section 5 [Selection of operation].
Manual operation (For details, see page 20.)			Select  from Chapter 4, section 2 [Selection of operation].

Table 3-1

2. Operation

2-1 Counter operation

Counter operation turns ON and OFF the volumetric feeder for the count set by the DIGI-PECA switch.

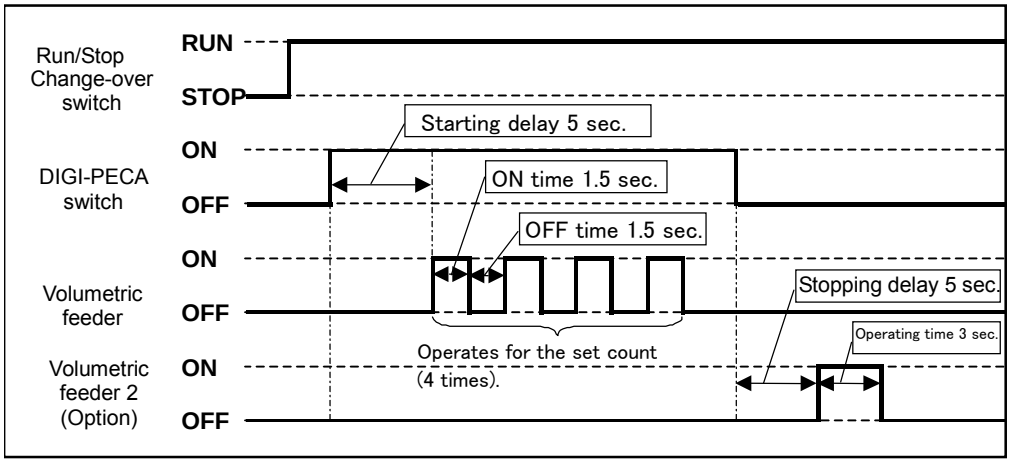


Fig. 3-1 Timing chart of counter operation

Flow of operation

I. When the equipment is running, if the DIGI-PECA switch is kept ON for 5 seconds, the volumetric feeder starts to operate.
II. After ON and OFF operations for the set count, the volumetric feeder turns OFF.
III. If the DIGI-PECA switch is kept OFF for 5 seconds, the volumetric feeder 2 (option) turns OFF for 3 seconds only.

2-2 Timer operation

Timer operation turns on the volumetric feeder for the time set by the DIGI-PECA switch.

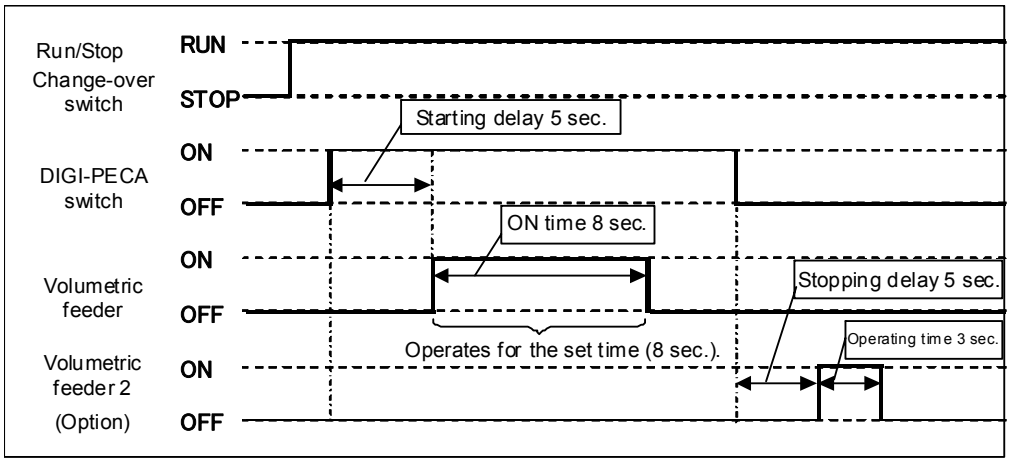


Fig. 3-2 Timing chart of counter operation

Flow of operation

I. When the equipment is running, if the DIGI-PECA switch is kept ON for 5 seconds, the volumetric feeder turns on.
II. After a lapse of the set time, the volumetric feeder turns OFF.
III. If the DIGI-PECA switch is kept OFF for 5 seconds, the volumetric feeder 2 (option) turns OFF for 3 seconds only.

3. Operation mode

3-1 Auto change mode

Auto change mode operates the volumetric feeder according to the operating time of the blower (input time of the DIGI-PECA switch). This mode is established by setting  from Chapter 4, Section 5 [Selection of operation mode].

① At power-on, 1 time of counter operation and 2 seconds of timer operation are set for the volumetric feeder.

② When the blower operates, and then the DIGI-PECA switch turns ON, and the starting delay time elapses, the volumetric feeder starts both counter operation and timer operation at the above set values. At this time, measurement of the DIGI-PECA switch ON time also starts.

③ When the blower stops operation, and then the DIGI-PECA switch turns OFF, and stopping delay time elapses, measurement of the time ends, and respective set values of operation of the volumetric feeder are reset by using this time for timer operation and counter operation according to Table 3-2 to wait for the next DIGI-PECA switch ON. (Example: When the measured time is 40 seconds, the set values of output 1 of the volumetric feeder are changed to 8 seconds in the case of timer operation and 2 times in the case of counter operation according to Table 3-2.)

Note 1: When the power is turned OFF, or Run changes to Stop, the initial values are set.

Counter operation One operation is counted with <opening for 1.5 sec. and closing for 1.5 sec.>		Timer operation	
DIGI-PECA switch ON time	Output count of the volumetric feeder	DIGI-PECA switch ON time	Output count of the volumetric feeder
First operation, setting change, and 35 sec. or less	1 time	First operation, setting change, and 29 sec. or less	2 sec.
36 sec. – 40 sec.	2 times	30 sec. – 49 sec.	8 sec.
41 sec. – 45 sec.	3 times	50 sec. – 69 sec.	15 sec.
46 sec. – 50 sec.	4 times	70 sec. or more	25 sec.
51 sec. – 55 sec.	5 times		
56 sec. – 60 sec.	6 times		
61 sec. – 65 sec.	7 times		
66 sec. or more	8 times		

Table 3-2 Operation change-over table of auto change mode

3-2 Manual change mode

Manual change mode operates the output of the volumetric feeder uniformly irrespective of the operating time of the blower. This mode is established by setting  from Chapter 4, Section 5 [Selection of operation mode].

3-3 Operational flow chart of auto change mode

Operational flow of auto change mode is shown below.

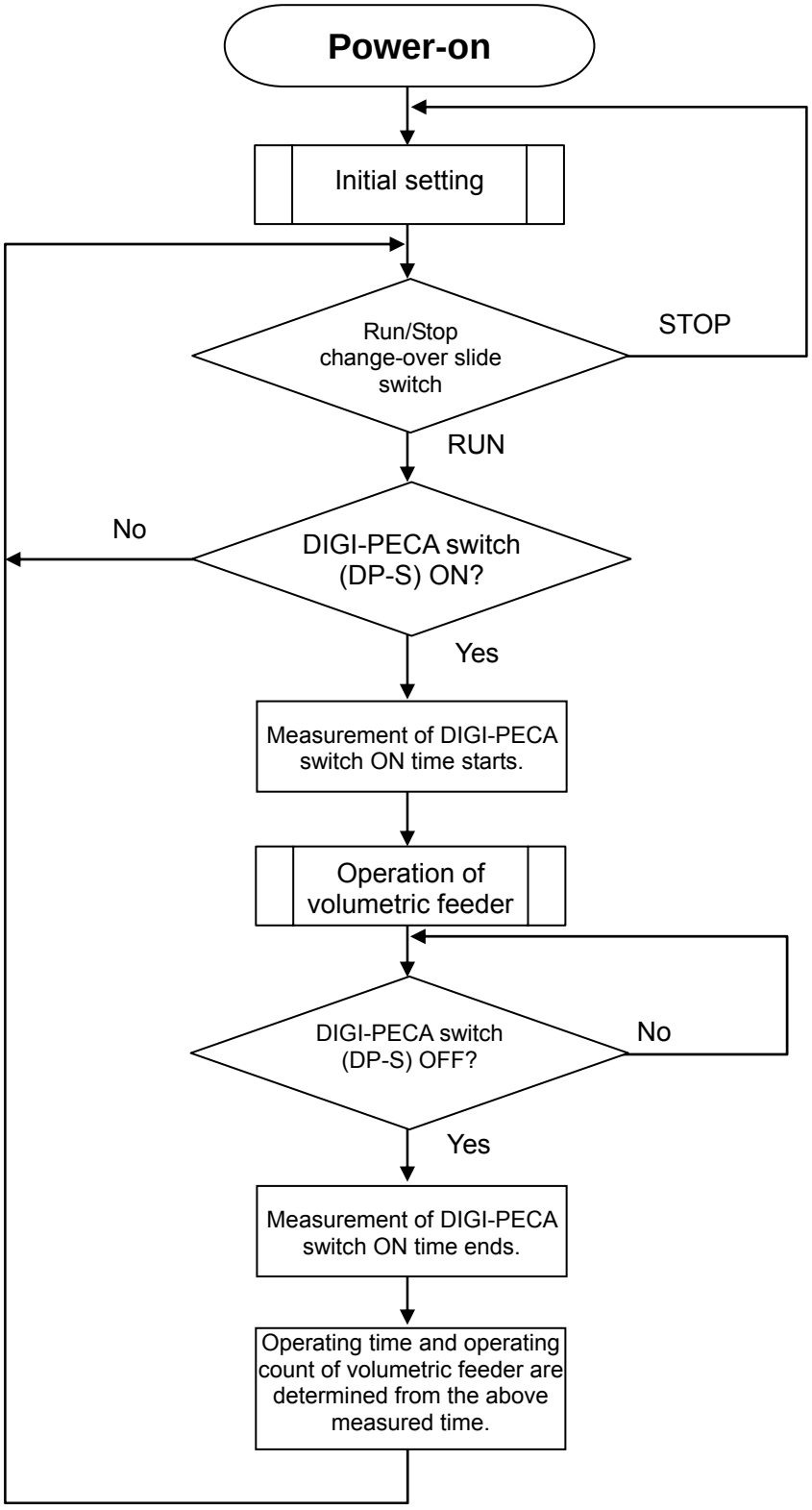


Fig. 3-3

Chapter 4 Setting

1. Status transition

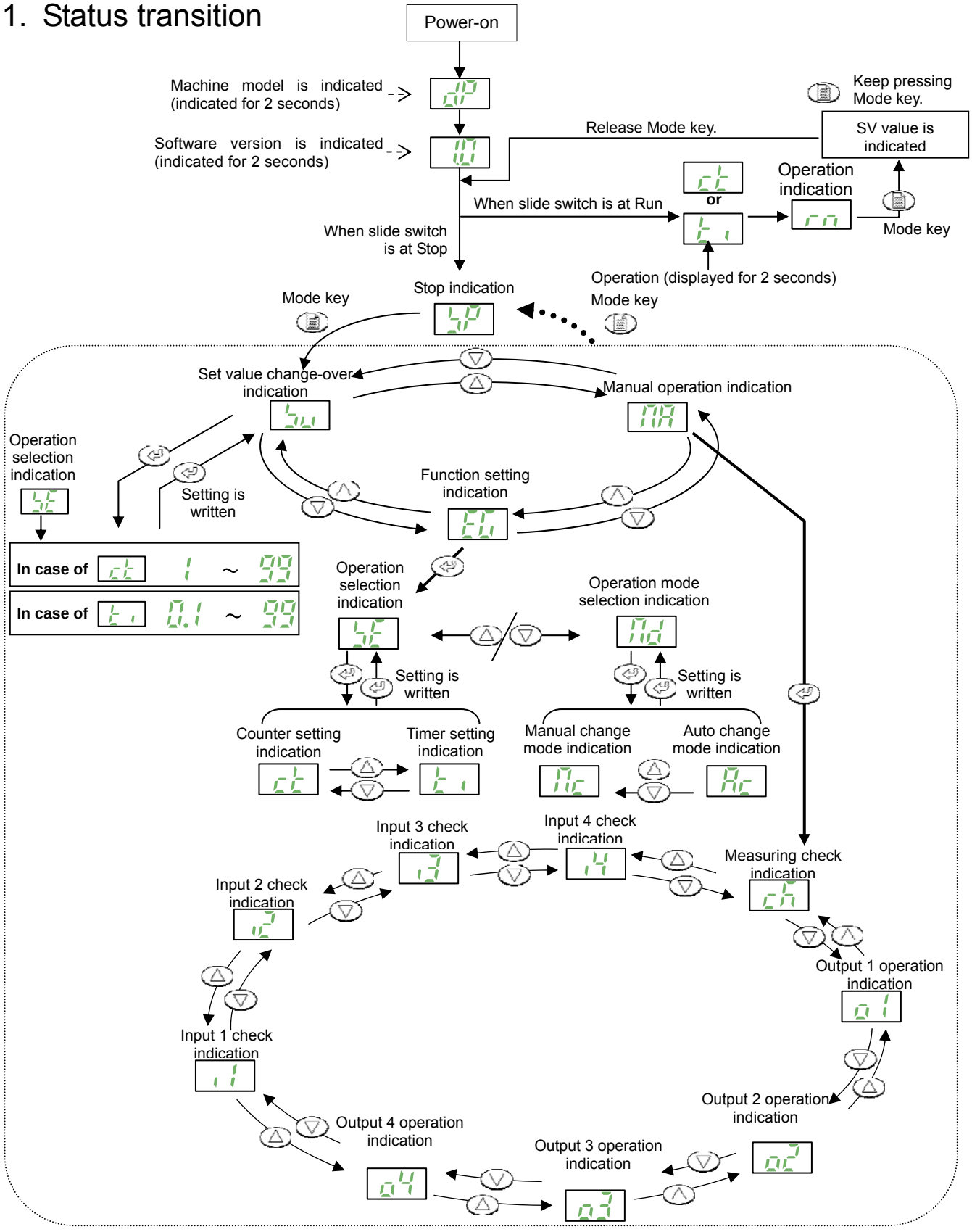


Fig.4-1 Overall status transition

2. Moving to setting

Turn on the power for this equipment while the slide switch [Run/Stop] is at [Stop].

When the power is turned on, [dP] is indicated on the 7-segment LED display part (hereinafter, referred to as 7-segment display part) for 2 seconds, and the current software version is indicated for 2 seconds, and then [SP] is indicated. (If the power has been already turned on, change over the slide switch to [Stop].)

When [SP] is indicated on the 7-segment display part, press [Mode key] one time, and move to setting.

At this time, [SU] is indicated on the 7-segment display part and flashes at a one second cycle.

Press [Up key] and [Down key] to select item you want to operate while [SU] is indicated.

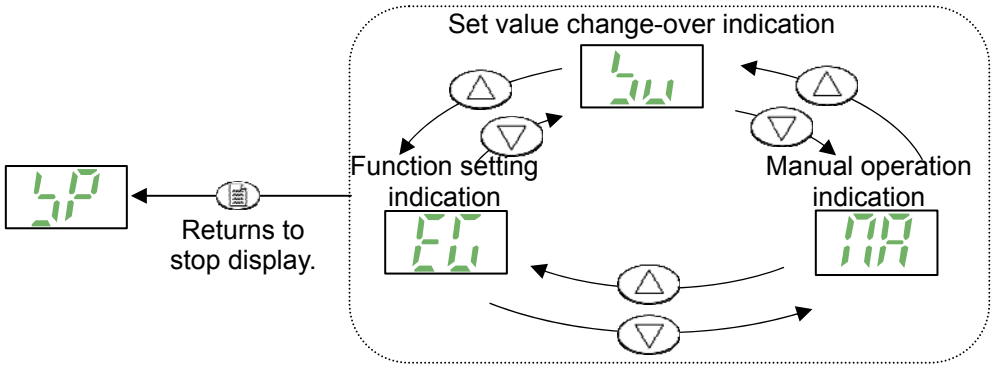


Fig. 4-1 Item transitional chart

3. Selection of operation

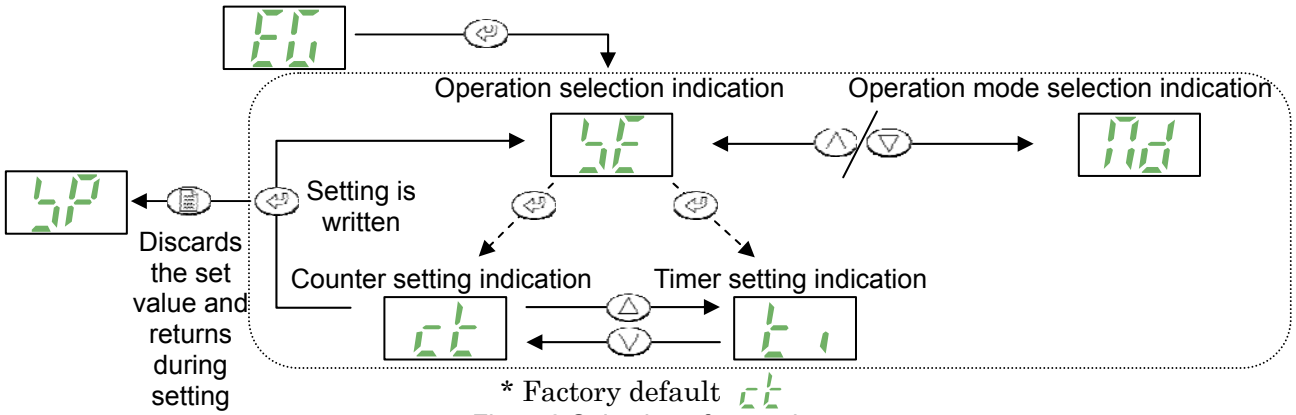
Display [FU] on the 7-segment display part in Section 2 [Moving to setting].

When [Enter key] is pressed while [FU] is indicated, function setting menu appears and [SE] is indicated.

Press the [Enter key] again while [SE] is indicated.

The currently set operation is displayed and the 7-segment display part flashes at a 0.6 second cycle.

Select an operation with [Up key] or [Down key] and confirm with the [Enter key]. To interrupt setting and discard the changed content, press [Mode key].



* Factory default [ct]

Fig. 4-2 Selection of operation

NOTE

If no operation is performed for 15 seconds, change schedule content is discarded, setting is automatically omitted and the indication changes to [SP] indication.

4. Setting of volumetric feed count and time

Indicate [SW] on the 7-segment display part in Section 3 [Moving to setting].

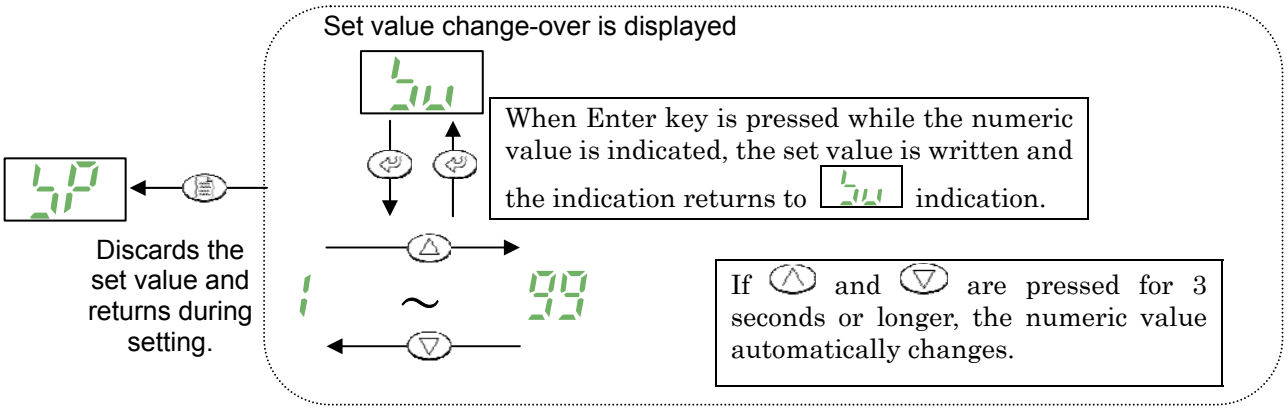
The set value of operation set with [SE] (factory default is [ct]) can be changed.

When the [Enter key <⏎>] is pressed while [SW] is indicated, the currently set value is displayed and the 7-segment display part flashes at a 0.6 second cycle.

Select a numeric value with [Up key <△>] or [Down key <▽>] and confirm with the [Enter key <⏎>].

To interrupt setting and discard the changed content, press [Mode key <▤>].

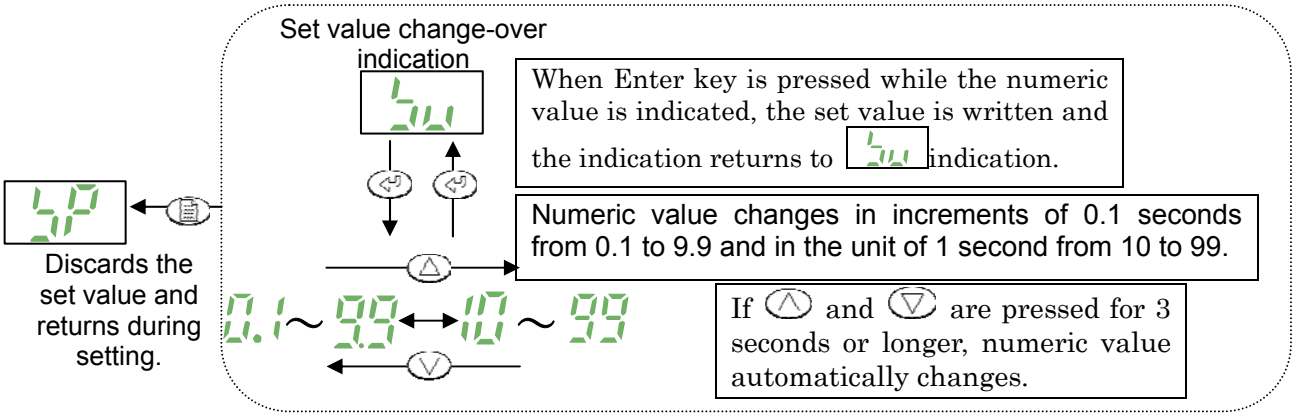
4-1 Setting of count for counter operation (when selecting [ct] with [SE] setting)



* Factory default Counts 1

Fig. 4-3 Setting range (Counter operation)

4-2 Setting of time for timer operation (when selecting [t.] with [SE] setting)



* Factory default 2 seconds

Fig. 4-4 Setting range (Timer operation)

NOTE

1. The counter operation and timer operation have individual set values, however, their set values cannot be simultaneously changed. Change the set value after changing the operation in the operation selection.
2. If no operation is performed for 15 seconds, change schedule content is discarded, setting is automatically omitted and the indication changes to [SP] indication.

5. Selection of operation mode

Indicate [FG] on the 7-segment display part in Section 2 [Moving to setting].

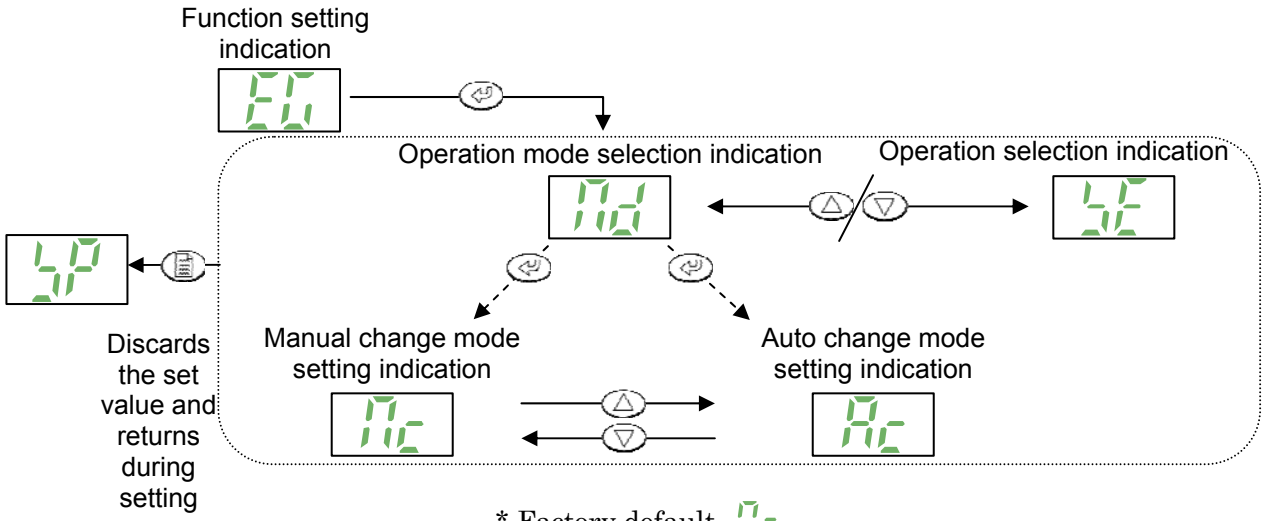
When [Enter key] is pressed while [FG] is indicated, function setting menu appears and [SE] is displayed.

Indicate [Md] with [Up key] or [Down key].

Press the [Enter key] again while [Md] is indicated.

The currently set operation is displayed and the 7-segment display part flashes at a 0.6 second cycle.

Select an operation with [Up key] or [Down key] and confirm with the [Enter key]. To interrupt setting and discard the changed content, press [Mode key].



* Factory default [Ac]

Fig. 4-5 Selection of operation mode

NOTE

If no operation is performed for 15 seconds, change schedule content is discarded, setting is automatically omitted and the indication changes to [SP] indication.

Chapter 5 Engineering setting

1. Engineering setting

Engineering setting can set volumetric feeder ON time (F1) (enabled only in counter operation), volumetric feeder OFF time (F2) (effective only in counter operation), volumetric feed stopping delay time (F3), volumetric feed completion delay time (F4) and set value lock setting (nE).

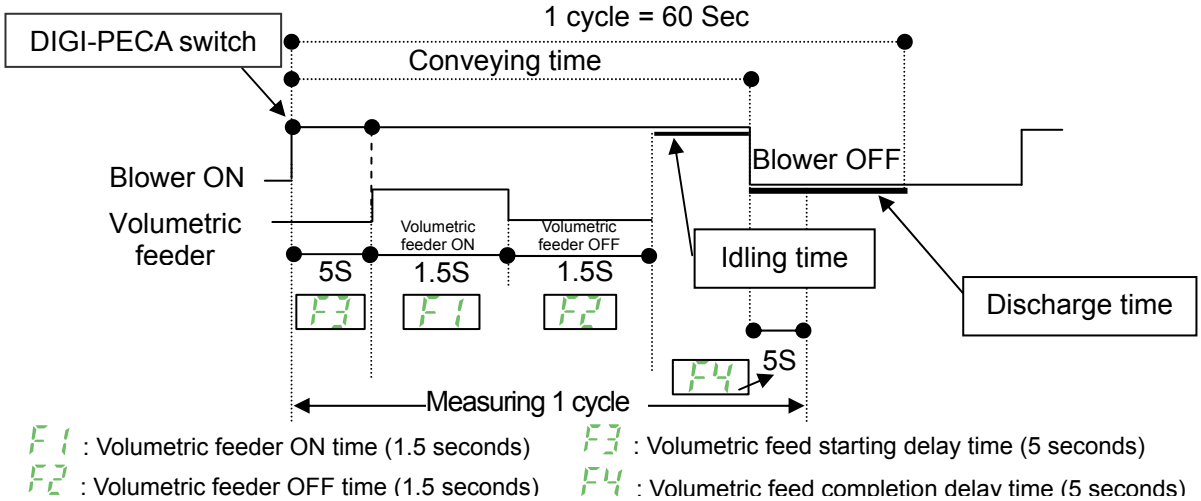


Fig. 5-1 Timing chart of counter operation

1-1 Setting of volumetric feeder ON/OFF time, and volumetric feed starting / stopping delay

1. When the slide switch [Run/Stop] is at [Stop] and SP is indicated on the 7-segment display part, keep pressing the Mode key for 5 seconds or longer. F1 is indicated on the 7-segment display part and flashes at a one second cycle. At this time, LED (INB) also flashes at a one second cycle.
2. While the LED (INB) is flashing, press the Up key and Down key to select setting items of F1 through nE. When the Enter key is pressed after the setting items are determined, the currently set value is displayed and the 7-segment display part flashes at a 0.6 second cycle.
3. Change the numeric value with the Up key and Down key.
4. To enable the changed content, press the Enter key, and to interrupt setting and discard the changed content, press the Mode key. The set value change-over indication is ended and returns to stop indication.

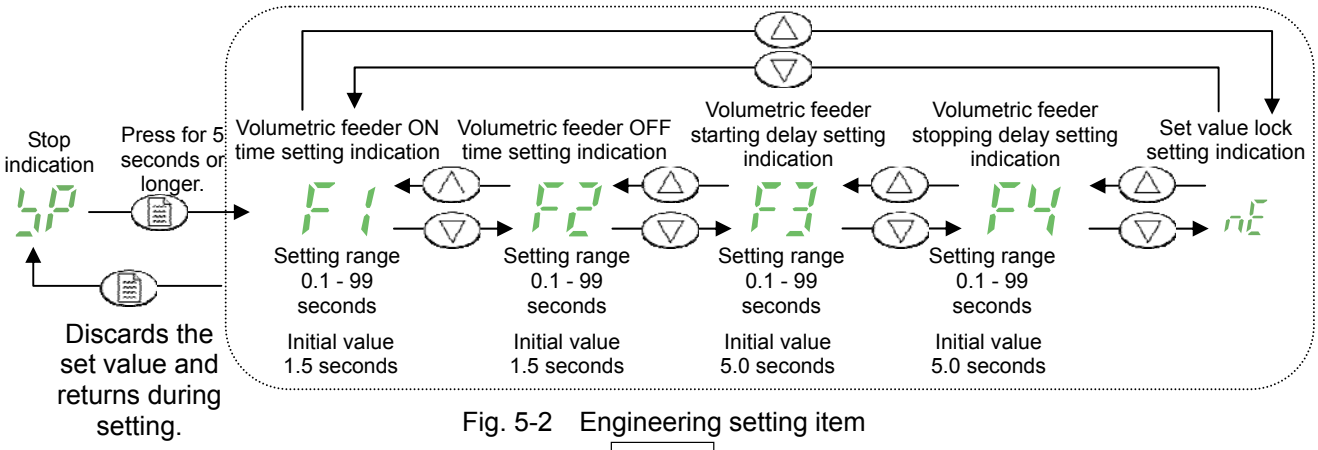


Fig. 5-2 Engineering setting item

NOTE

If no operation is performed for 10 seconds, change schedule content is discarded, setting is automatically omitted and the indication changes to SP indication.

1-2 Set value lock

This sets so that all set values of this equipment cannot be changed.

When set value lock setting is set to ON, setting item can be selected for respective setting by normal operation, however, setting cannot be completely changed. The 7-segment display part does not flash at a 0.6 second cycle, but flashes at a 2 second cycle.

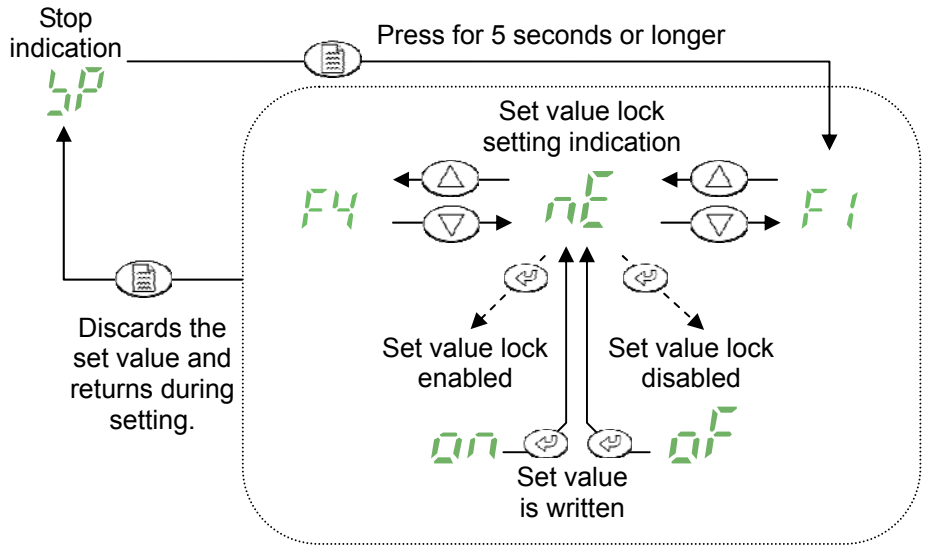
1-2-1 How to set the set value lock

1. When the slide switch [Run/Stop] is at [Stop] and SP is indicated on the 7-segment display part, keep pressing the Mode key for 5 seconds or longer. F1 is indicated on the 7-segment display part and the LED (INB) flashes at a one second cycle.

2. While the LED (INB) is flashing, press the Up key and Down key to select setting items of nE. When the Enter key is pressed after the setting items are determined, the currently set value is displayed and the 7-segment display part flashes at a 0.6 second cycle.

3. Change the setting with the Up key and Down key.

4. To enable the changed content, press the Enter key, and to interrupt setting and discard the changed content, press the Mode key. The set value change-over indication is ended and returns to stop indication.



* Factory default oF

Fig. 5-3 Engineering setting (setting lock)

NOTE

If no operation is performed for 10 seconds, change schedule content is discarded, setting is automatically omitted and the indication changes to SP indication.

Chapter 6 Run operation

1. Run operation

Procedure	Operation	Operation / Setting
1	Power-on	Turn "ON" the power. After  is indicated for 2 seconds, the software version is indicated for 2 seconds.
2	Auto run operation start	①When the slide switch [Run/Stop] on the control panel is set to [Run] side,  is indicated for 2 seconds in case of counter operation, and  is indicated for 2 seconds in case of timer operation, then  is indicated. ② Operate the conveying equipment. When the conveying equipment starts and the DIGI-PECA switch detects conveyance, the LED (INA) lights up and after 5 seconds, measuring operation starts. When measuring operation starts, residual count is indicated on the 7-segment display part for counter operation, and residual time is indicated on the 7-segment display part for timer operation. After this, measuring is performed at every conveyance. * The LED (INA) lights up even during stop if the DIGI-PECA switch is turned ON. **⚠ CAUTION** The measuring section operates in synchronization with operation of the conveying equipment without prior notice during auto run operation. Keep hands and head away from the measuring section for safety.
3	Auto run operation stop	Set the slide switch [Run/Stop] on the control panel to [Stop] side. The indication changes to  indication. If measurement is being performed when the slide switch is changed over to [Stop], the 7-segment display part flashes at a one second cycle, and the cycle stops. The indication changes to  indication after cycle stop is completed. If stopping the equipment for long time, turn [OFF] the power.

NOTE

If the DIGI-PECA switch is turned OFF and the stopping delay time (5 seconds) elapses even during auto run operation, operation of the volumetric feeder is forcibly stopped and measurement is interrupted. However, volumetric feeder 2 (option) is output for 3 seconds after the stopping delay time elapsed. (see the chart below.)

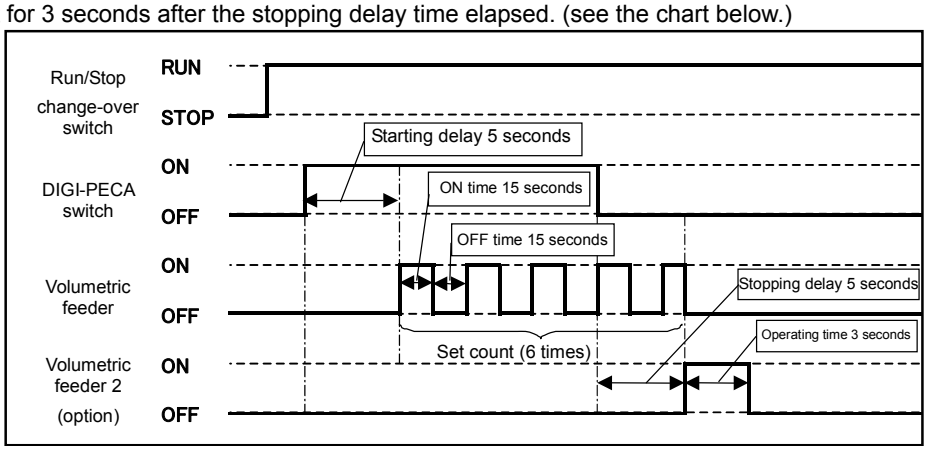


Fig. 6-1 Auto run operation stop timing chart

2. Manual run operation

Indicate [MA] on the 7-segment display part and press the [Enter key <↵>].

(* Refer to Chapter 4 Section 2 [Moving to setting])

Manual menu appears and [ch] is indicated.

2-1 Measuring check operation

When the [Enter key <↵>] is pressed for 1 second or longer with [ch] being indicated, the equipment operates for the set count or for the set time.

PV value is indicated on the 7-segment display part during operation of the volumetric feeder.

Operation can be immediately stopped by pressing the [Mode key <▤>] during manual run operation.

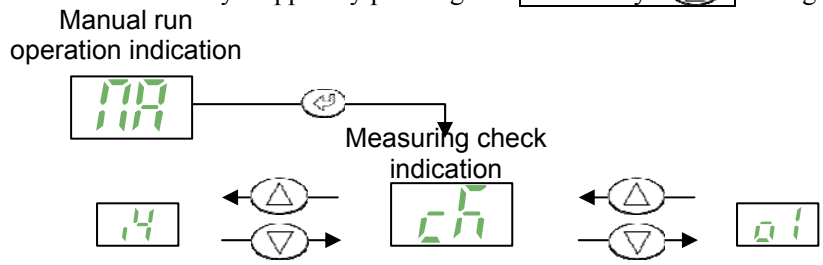


Fig. 6-2 Measuring check screen

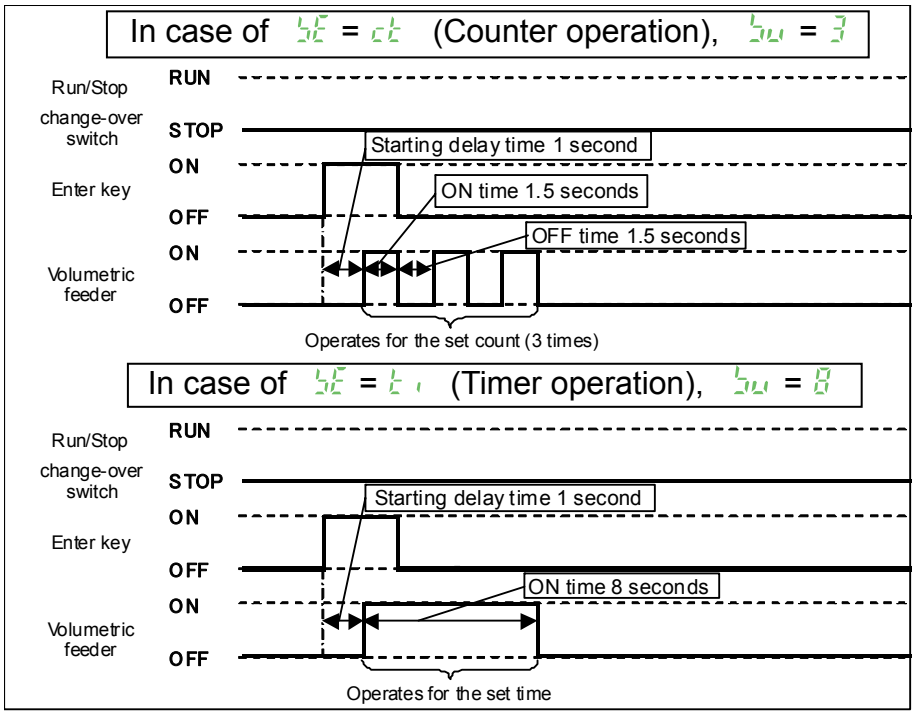


Fig. 6-3 Timing chart at measuring check

NOTE

1. While manual operation menu is indicated, setting is not automatically omitted even if time elapsed.
2. Operations other than [Mode key <▤>] are not completely accepted by manual operation during operation of the volumetric feeder.

2-2 Manual output operation

When the Enter key <↵> is pressed while o1, o2, o3 and o4 are indicated, respectively corresponding external outputs can be turned ON/OFF. When output is performed, the LED (OUTA) lights up.

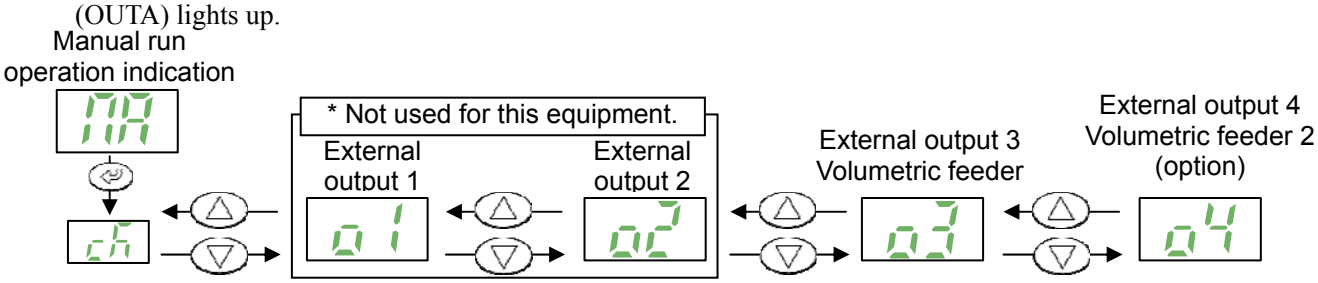


Fig. 6-4 Manual output operation screen

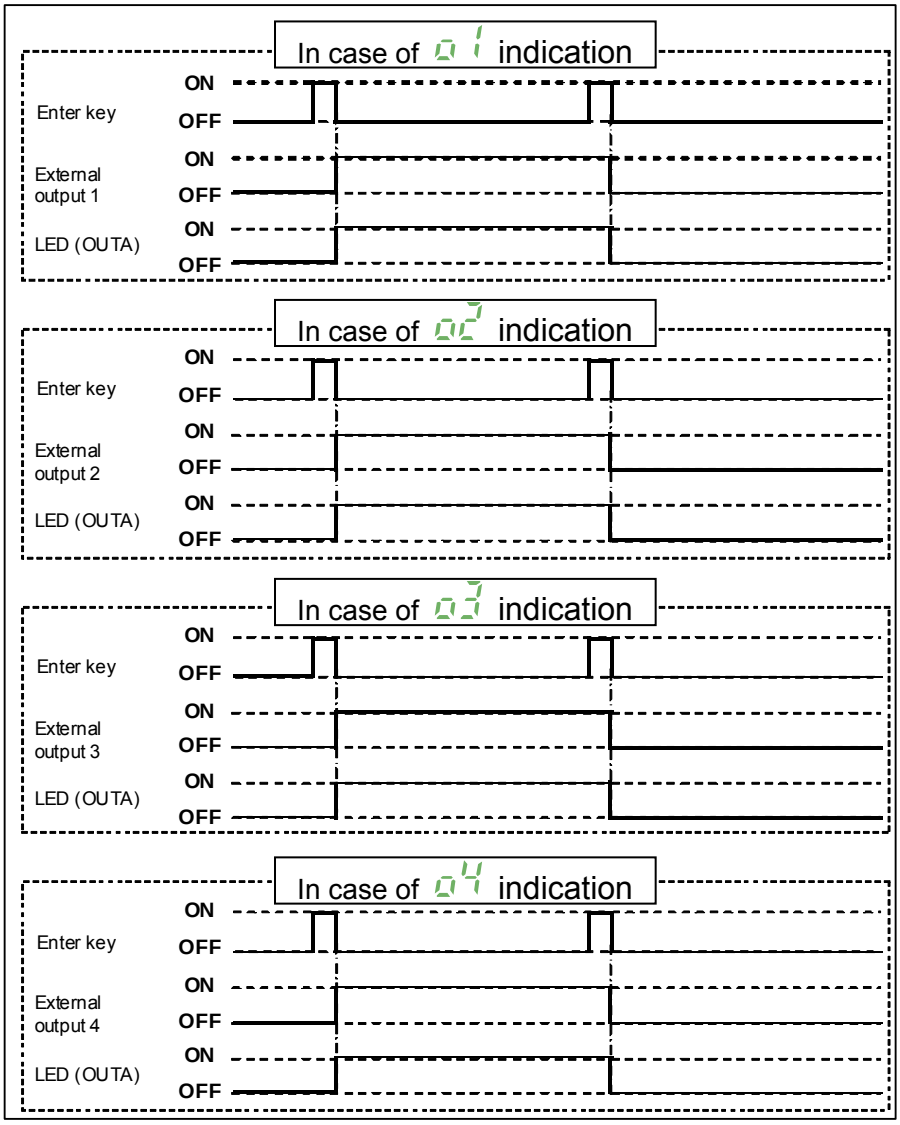


Fig. 6-5 Timing chart of manual output operation

NOTE

1. Other operations are not completely accepted during manual operation output. Perform operation after turning OFF the output.
2. Some outputs cannot be simultaneously made.

2-3 Input check indication

While i1, i2, i3 and i4 are indicated, the LED (INA) lights up when external input signal corresponding to each indication is turned ON, then input status can be checked.

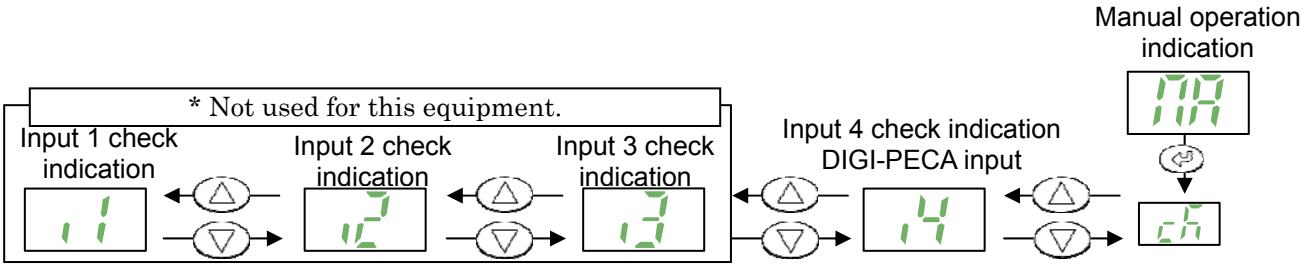
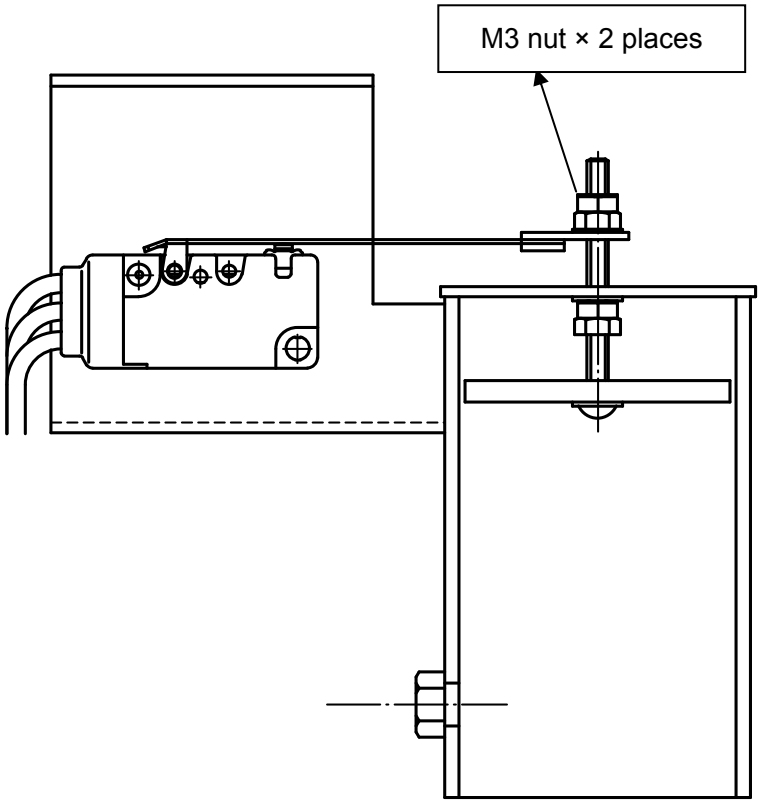


Fig. 6-6 Input monitor screen

Chapter 7 Maintenance and Inspection

This chapter describes maintenance and inspection of the equipment.

1. Maintenance and inspection to be performed every 3 months

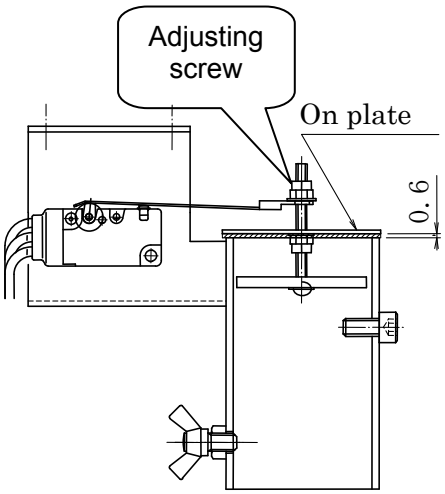
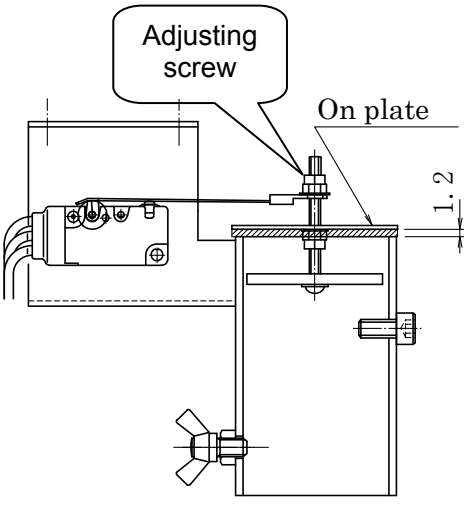
Maintenance and inspection item	Descriptions
Looseness of M3 nuts	Remove the cover of the DIGI-PECA switch, and check the M3 nuts fixing the parts at the end of the limit switch for looseness by vibration. ⚠ Before inspection, make sure that the conveyance (air source) is stopped.  Fig. 7-1

Chapter 8 Troubleshooting

This chapter describes troubleshooting of the equipment. Check before requesting repair.

⚠ WARNING	Make sure to stop operation before inspection.

No conveyance		
Location to be checked	Action	Precaution
Check to see if 7-segment LED display of the controller is lit.	If not, turn on the input power.	
Check to see if 7-segment LED display of the controller is lit when the input power is on.	If not, replace the controller.	For replacement of the controller, contact Service Division.
Check the Run/Stop change-over slide switch of the controller for being set at Stop.	Set the Run/Stop change-over slide switch to RUN.	No operation results if switching is done for RUN with the DIGI-PECA switch ON. Operation starts with the next ON after the DIGI-PECA switch turns OFF completely.
Check to see if the air source is in normal operation.	Take action referring to the instruction manual of the air source.	
Check the filter of the air source for clogging.	Clean or replace the filter.	

Poor operation of the limit switch (INA does not turn ON.)		
Location to be checked	Action	Precaution
Remove the cover of the DIGI-PECA switch, and check by pushing the upper plate by hand to see if the INA lamp of the controller lights when the clearance between the upper plate and pipe is approx. 0.6mm or more (Fig. 8-1), and when the clearance is approx. 1.2mm or less (Fig. 8-2). It is factory-adjusted so that the INA lamp lights when the clearance between the upper plate and pipe is 0.6mm or more, and 1.2mm or less. Check the lever of the limit switch for deformation, and M3 nuts for looseness by vibration, etc.	If the INA lamp does not light normally or does not go out, there may be an abnormality the limit switch or controller. Contact Service Division. Adjust by pushing the upper plate by hand so that the INA lamp of the controller lights when the clearance between the upper plate and pipe is approx. 0.6mm or more (Fig. 8-1), and when the clearance is approx. 1.2mm or less (Fig. 8-2).  Fig. 8-1  Fig. 8-2	Work after switching the controller setting from Run to STOP. Securely tighten the M3 nuts by using two spanners having an opposite side distance of 5.5mm. If the tightening is insufficient, the nuts will become loose, and the DIGI-PECA switch may malfunction. Adjust with great care. For replacement of the limit switch and controller, contact Service Division. (Life of the limit switch: 1,000,000 times)

<table>
<tr><th colspan="3">1) Poor operation of the limit switch (INA remains ON, and does not turn OFF.)</th></tr>
<tr><th>Location to be checked</th><th>Action</th><th>Precaution</th></tr>
<tr>
<td>Remove the cover of the DIGI-PECA switch, and check by pushing the upper plate by hand to see if the INA lamp of the controller lights when the clearance between the upper plate and pipe is approx. 0.6mm or more (Fig. 8-3), and when the clearance is approx. 1.2mm or less (Fig. 8-4).

It is factory-adjusted so that the INA lamp when the clearance between the upper plate and pipe is 0.6mm or more, and 1.2mm or less.
Check the lever of the limit switch for deformation, and M3 nuts for looseness by vibration, etc</td>
<td>If the INA lamp does not light normally or does not go out, there may be an abnormality with the limit switch or controller.
Contact Service Division.

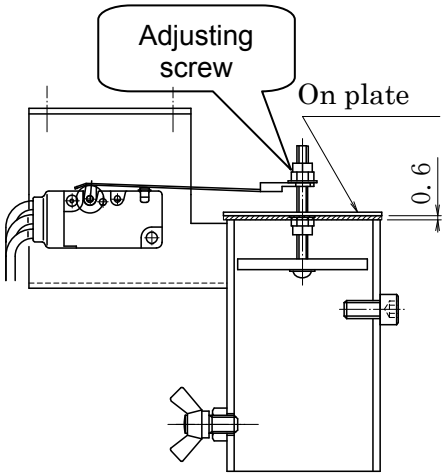
Adjust by pushing the upper plate by hand so that the INA lamp of the controller lights when the clearance between the upper plate and pipe is approx. 0.6mm or more (Fig. 8-3), and when the clearance is approx. 1.2mm or less (Fig. 8-4).
 

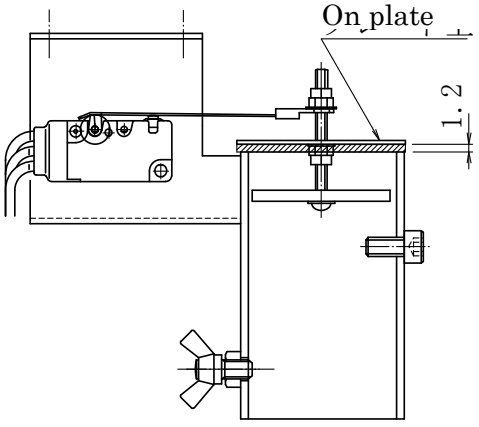
Fig. 8-3
 

Fig. 8-4</td>
<td>Work after switching the controller setting from Run to Stop

Securely tighten the M3 nuts by using two spanners having an opposite side distance of 5.5mm. If the tightening is insufficient, the nuts will become loose, and the DIGI-PECA switch may malfunction. Adjust with great care.

For replacement of the limit switch and controller, contact Service Division.
(Life of the limit switch: 1,000,000 times)</td>
</tr>
</table>

2) Poor operation of the limit switch (INA remains ON, and does not turn OFF.)		
Location to be checked	Action	Precaution
Remove the cover of the DIGI-PECA switch, and check the inner surface of the pipe and its end, and plates for accumulation of dust. If dust has accumulated, the frictional force of the lower plate will increase with the result that the operation of the limit switch may deteriorate.	Clean dust off the inner surface of the pipe and its end, and plates with alcohol.	Never use thinner as a solvent. The resin used for the lower plate dissolves in thinner. Work after switching the controller setting from Run to Stop