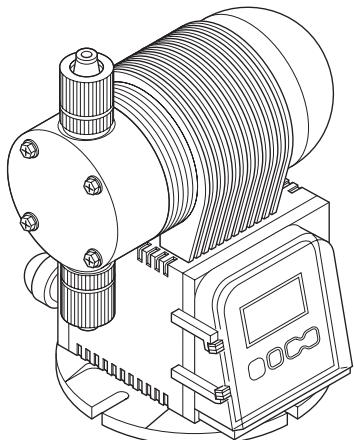


Solenoid-driven Diaphragm Metering Pump**PZi Series****Instructions and Key Operation Manual
for Special Functions**

**Please read this Instructions and Key Operation Manual carefully before use.
Operating the pump incorrectly in disregard of these instructions may lead to
death, injury and/or cause property damage.**

**Applicable Models**

PZi4-300/500

PZi8-300/500

This illustration is for the PZi4-300.

- Thank you for purchasing this TACMINA product. Please read this Instructions and Key Operation Manual carefully in order to ensure that you will use the product safely and correctly.
- Be sure to keep this Instructions and Key Operation Manual in a place where it will be easily available for reference.
- If the product you purchased conforms to special specifications not described in this Instructions and Key Operation Manual, handle the product according to details of separate meetings, drawings and approved documents.

- TACMINA accepts no liability whatsoever for any damage caused by malfunction of this product and other damage caused by use of this product.
- Additional information on this product and manuals in other languages may be found on our website.

Contents

— Outline —

1	Outline	1
2	External Dimensions	1
2-1	Overview	1
2-2	Layout of Operation/Display Panel	1
3	Model Selection Guide	2
4	Features	2
4-1	Common Terms	2
4-2	PZi8 (input/output control model)	2
4-3	Special Function Model	2
5	Installation	3
6	Preparing for Operation	3

— Setting Modes —

7	Mode Functions	3
7-1	Manual mode	3
7-2	Analog mode	4
7-3	Frequency-division mode	4
7-4	Multiplication mode	5
7-5	Count mode	5
7-6	Interval mode	6
8	Setting Up Operation	7
8-1	Changing the Operation Mode	7
8-2	Basic Operation Flow	7
8-3	How to Change the Operation Mode	8
8-4	Setting Manual Mode (changing the number of strokes)	9
8-5	Setting the Analog Mode	9
8-6	Setting the Frequency-Division Mode	10
8-7	Setting the Multiplication Mode	10
8-8	Setting the Count Mode	11
8-9	Setting the Interval Mode	11

— Setting Parameters —

9	Setting Up Parameters	12
9-1	Parameter Setup Flow	12
9-2	Setting the Parameters	12
10	Setup Examples	13
10-1	Control by 2-point Level Switch	13
10-2	Pulse Signal Noise Countermeasures	13
10-3	Flowrate Display	13
10-4	Control of Multiple Pumps by a Single Signal	13
11	Input/Output Port Assignments Change	14
11-1	Input/Output Signals (Port Assignments)	14

— Specifications —

12	Specifications	15
12-1	Functions	15
12-2	Display	15
12-3	Alarm Display, External Alarm Output	15
12-4	I/O Signal Specifications (number of ports)	15
12-5	Terminal Block Connections	15

— Data —

13	Data	16
13-1	List of Parameters	16
13-2	Table 1: Input Signal Assignments	17
13-3	Table 2: Output Signal Assignments	17
13-4	Alarm	17
13-5	Display Details in Different Statuses in Each Mode	18

Contents - Quick Search

Connecting Signal Leads

Signal Specifications	page 15
Signal Wiring and Terminal Block Diagram	page 15
Input/Output Port Assignments Change	page 14
Input/Output Signal Assignments	page 17

Trial Operation

Changing the Mode	page 8
Setting Manual Mode	page 9

Setting Up Operation

Basic Operation Flow	page 7
Changing the Mode	page 7
Setting Individual Modes	page 9

Setting Up Parameters

Parameter Setup Flow	page 12
Setting the Parameters	page 12
List of Parameters	page 16

System Design

Functions in Each Mode	page 3
Basic Operation Flow	page 7
Setup Examples	page 13

Data

Specifications	page 15
List of Parameters	page 16
Error Codes	page 17
Display Details	page 18

Checking out the product

After unpacking the pump, check the following.

- Is the pump the one that was ordered?
- Do the details on the pump's nameplate match what was ordered?
- Is all the accessories supplied?
 - * Check the supplied accessories against the "Accessories list" below.
- Has the pump sustained any damage from vibration or impact during transit?
- Have any of the screws come loose or fallen out?

Every care is taken by TACMINA in the shipment of its pumps, but if you come across anything untoward, please contact your vender or a TACMINA representative.

A signal cable is attached to chemical injection system "PTS series" which either PZi is installed.

Accessory

* When "NON" is selected for power plug, the power cable (2m) is not provided.

Item	PZi4/PZi8					
	VTCE	VTCF	FTCT	STCT		
Hose/Tube (3m)	PVC braided hose (12x18) PE tube (9x12 or 3/8x1/2)		PTFE tube (12x15)	PTFE tube (12x15)		
Anti-siphon check valve	1 set (R1/2 or R3/8)		1 set (R1/2)			
Foot valve	1 set					
Ceramic weight	1 set		—			
Pump mounting nuts/bolts	2 sets (M5x30)					
Operation manual	1 set					

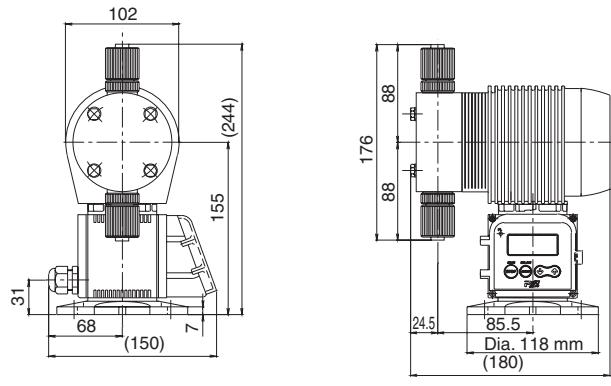
1 Outline

The PZi4/8-300/500 models has a high-grade chemical injection amount control function and an LCD display integrated into its compact body. It allows easy and reliable setup by key operation, control of injection amount by external input signals, and operation by level switch inputs, for example.

The PZi8 is provided with an interval function and other additional modes.

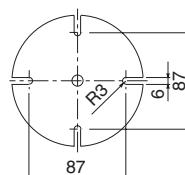
2 External Dimensions

2-1 Overview



Pump head view

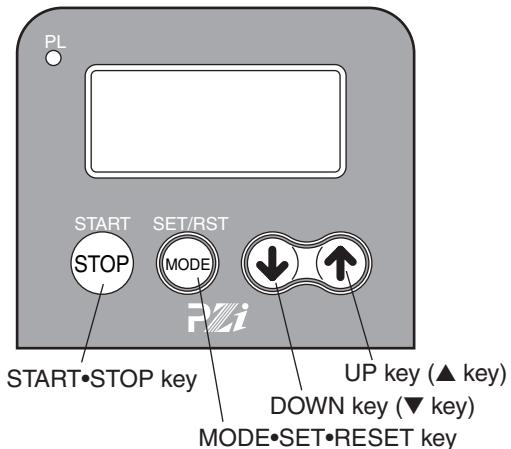
Side view



Bottom view

Note: The pump can be mounted within a mounting pitch of 87 to 110 mm.

2-2 Layout of Operation/Display Panel



Important:

In text descriptions, individual operations on dual-function keys are referred to by the required function.

(Example)

To start pump operation

START key (START•STOP key)

To determine setting values

SET key (MODE•SET•RESET key)

To change the mode

MODE key (MODE•SET•RESET key)

3 Model Selection Guide

* Not all model combinations are possible.
When selecting the pump model, first check "Specification" and "Liquid-end Material".

PZi8 - 300 - VTCE - 12 x 18PVC - W - S - JPL

(1) (2) (3) (4) (5) (6) (7)

(1) Series name

<For injection of general chemicals>

PZi4: Analog/digital-input

PZi8: Analog/digital-input & digital-out

(2) Model (discharge volume standard)

300: 300mL/min

500: 500mL/min

(3) Liquid-end material

Type	Pump head	Diaphragm	Check ball	O-ring
VTCE: PVC	PTFE	Ceramic	EPDM	
VTCE: PVC	PTFE	Ceramic	Fluoro-rubber	
FTCT: PVDF	PTFE	Ceramic	PTFE	
STCT: SUS304	PTFE	Ceramic	PTFE	

(4) Hose/tube standard (size (I.D x O.D)/material)

12 x 18 PVC

9 x 12 PE

3/8 x 1/2 PE

12 x 15 PTFE

(5) Joint specification

W: Standard

(6) Applicable standard

S : Standard

CE: CE marking-compatible

(7) Power plug

EUP: Euro plug

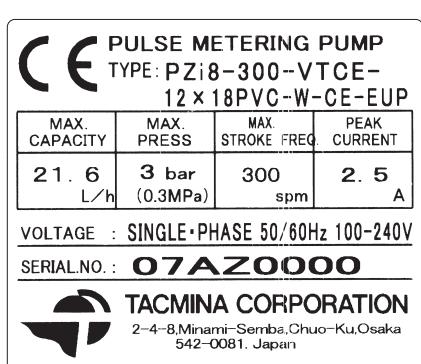
ULP : UL plug

AUP: Australia plug

UKP : UK plug

JPL : Japan lead wire

NON: No cable



4 Features

4-1 Common Terms

- Power supply can be used in a wide range of 100 to 240 VAC. (Wide range voltage supply) The pump is free from the power voltage fluctuation.
- Operation keys and LCD display offer high-precision setup and a variety of control modes.
- Injection amount can be controlled and pump operation/stop can be controlled by input signals. Analog signals of 4-20 mA DC (0-20 mA DC is available in the case of PZi8 model), pulse signals (flow meter signal, open collector, etc.), or open collector signal can be used for controlling the injection amount.
- Contact signals such as a level switch can be input directly as the operation/stop signal.

4-2 PZi8 (input/output control model)

Provided with a control signal output function in addition to the input control functions of PZi4. Signal during operation, operation synchronous pulse signals, and alarm signals can be output.

- An input port is provided for extensive control.
- Counter and interval functions are provided as the self control function as standard.
- Parameter settings are open to users to enable detailed setup.
- Input/output port assignment is possible to provide many selections for functions.

4-3 Special Function Model

PZiP: pH control can be achieved by combination with a pH meter without the need to use a controller.

PZiR: Residual chlorine control can be achieved by combination with a residual chlorine meter without the need to use a controller.

PZiN: Provided with an internal non-linearizer function to achieve non-linear control.

5 Installation

Refer to the "PZD Series Operation Manual."

6 Preparing for Operation

Check the installation state of the PZi, hoses on the discharge and suction sides, and power supply and signal lead connections. If there are no problems for installation, turn the power ON.

7 Mode Functions

PZi4 PZi8 Special Function Model

- Manual operation:

The number of strokes (spm) can be set directly on the operation panel.

(Set within the range 1 to 300 spm digitally in single-step increments.)

- Automatic operation:

Control is performed by changing the number of strokes per minute by external signals (analog signal, pulse signal).

- Timer operation

The interval function is automatically turned ON/OFF according to an internal timer.

(The PZi4 is not provided with this function.)

- Stop input signal control:

Pump operation is controlled by non-voltage contact signals from a level switch or other device. (External stops and control by alarms can be set.) (PZi4/8)

When setting modes, the applicable model is indicated as PZi4, PZi8 or Special Function Model.

If none of these is indicated, the mode itself is not provided on any model.

7-1 Manual mode

1. Basic operation

(1) The number of strokes can be set digitally in single-step increments within the range 1 to 300 spm by the UP, DOWN key on the operation panel.

(2) With the PZi8 and special function models, the display unit (spm) can be switched to % or mL/min.

2. Purpose of use

- Test operation after pump installation
- Temporary operation, for example, when an error occurs during automatic operation (e.g. signals are not output)
- The stroke speed during automatic operation (multiplication, count, interval) can be changed.

3. LCD display

During a pump stoppage



During pump operation



During setting



* 138 indicates blinking display.

4. Operation control signal

Basically, there is no need to supply signals from the outside in the manual mode. However, operation can be paused by a stop input (continuous signal) from the outside.

7-2 Analog mode

(PZi4)

(PZi8)

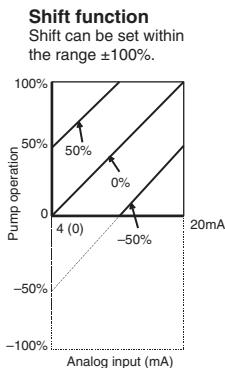
(Special Function Model)

1. Basic operation

(1) Analog input signals from the outside are received, and automatic operation is performed within the range 0 to 300 spm according to the setting value (proportional band and shift amount).

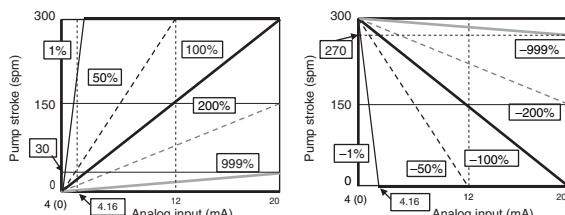
(2) The ramp for the number of strokes in response to analog input can be set by proportional band (1 to 999% for increments and -1 to -999% for decrements). This proportional curve can be shifted in parallel towards the vertical axis by a shift amount ($\pm 100\%$).

(3) The number of strokes changes linearly in response to the analog input signal from the outside.



Proportional band function

The proportional band can be set within wide range $\pm 1\%$ to $\pm 999\%$. The increment/decrement polarity can also be easily changed.



2. Purpose of use

Flowrate proportional injection, etc.

3. LCD display

During a pump stoppage



During pump operation



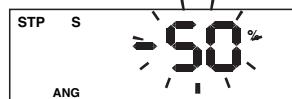
Pressing the UP key



During setting a proportional band



During setting a shift



4. Operation control signal

4 to 20 mA DC

0 to 20 mA DC (PZi8 and special function models only)

7-3 Frequency-division mode

(PZi4)

(PZi8)

(Special Function Model)

1. Basic operation

(1) Pulse signals from the outside are received, and automatic operation is performed according to the frequency-dividing ratio setting value.

(2) The frequency-dividing ratio can be set within the range 1/1 to 1/9999.

Frequency-dividing ratio (1/1 to 1/9999)

(Example) 1/5 dividing ratio



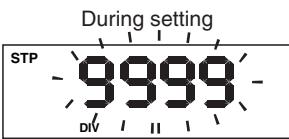
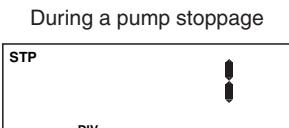
2. Purpose of use

• This mode is used for flowrate proportional injection, etc. The pump operates proportionally to the number of input pulses from the outside.

• Used when there is a large number of pulses from a flow meter or other instrument, and the chemical injection amount is too great. (setting in direction for reducing injection amount)

- Fine-adjustment of discharge volume is performed by the stroke adjustment dial. (See 10. Setup Examples.)

3. LCD display



4. Operation control signal

No-voltage contact or open collector signal input

7-4 Multiplication mode

(PZi4) (PZi8) (Special Function Model)

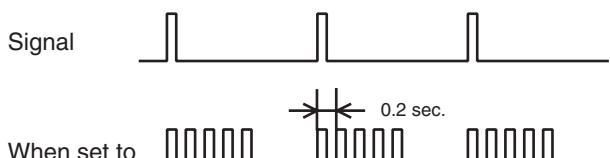
1. Basic operation

- (1) Pulse signals from the outside are received, and automatic operation is performed by the number of strokes corresponding to the multiplication.
- (2) The multiplication can be set within the range 1 to 9999. At this time, the pump operates at the number of operation strokes (spm) set in the manual mode.

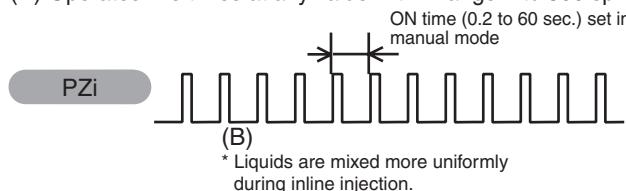
Multiplication (can be set within range 1 to 9999)

As the default setting, external signals are canceled when an external pulse input signal is input again during pump operation. External pulse input signals can also be held and stored to memory by setting in this mode. (PZi8 type special function model only)

(A) Operates five times at 300 spm (fixed)



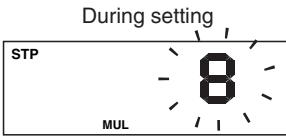
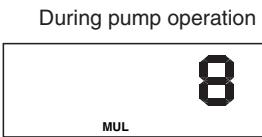
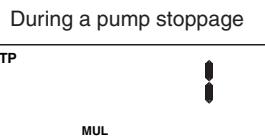
(B) Operates five times at any value within range 1 to 300 spm



2. Purpose of use

- This mode is used for flowrate proportional injection, etc. The pump operates proportionally to the number of input pulses from the outside.
- Used when there are a few number of pulses from a flow meter or other instrument, and the chemical injection amount is too small. (setting in direction for increasing injection amount)
- Fine-adjustment of discharge volume is performed by the stroke adjustment dial. (See 10. Setup Examples.)

3. LCD display



4. Operation control signal

No-voltage contact or open collector signal input

7-5 Count mode

(PZi8) (Special Function Model)

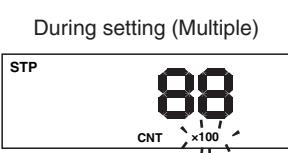
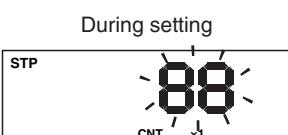
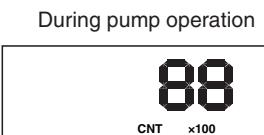
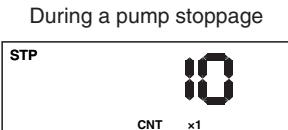
1. Basic operation

- (1) The start signal is received and the pump operates for the number of preset times. (batch processing)
- (2) The setting value can be set by a combination of 1 to 9999 times and $\times 1$, $\times 10$, $\times 100$, $\times 1000$ multiplication. (1 to 9999, 10 to 99990, 100 to 999900, 1000 to 9999000)
- (3) Start signal can be selected from an external input and START•STOP key.
- (4) The end signal (100 msec one-shot signal) can be output when operation for the preset count ends.

2. Purpose of use

This mode is used in sites where fixed amounts are repeatedly injected. Operation can be easily instructed or confirmed from the outside by the start and end signals, for example, during batch injection to a container on a conveyor belt.

3. LCD display



4. Operation control signal

[Start signal]

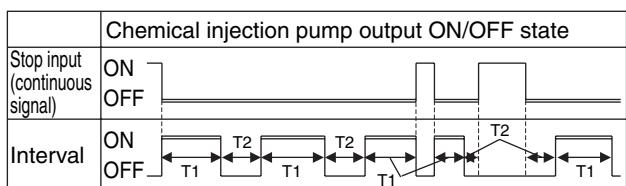
No-voltage contact or open collector signal input
START•STOP key

7-6 Interval mode

(PZi8) (Special Function Model)

1. Basic operation

- (1) Intermittent operation by the preset ON and OFF times is repeated.
* The ON/OFF state during a start can be changed by parameters.
- (2) The setting values of each of the ON and OFF times is set from 1 to 9999 minutes (in 1-minute increments).
- (3) Operation can be paused by input of an external stop signal.



Operation Time Chart

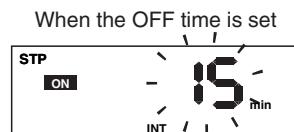
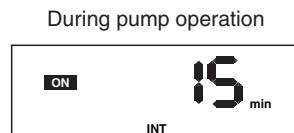
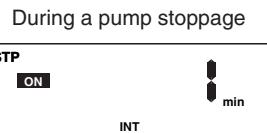
- 1) T1 = ON time setting (1 to 9999 min)
T2 = OFF time setting (1 to 9999 min)
- 2) When the stop signal turns ON, counting of both T1 and T2 is discontinued.
* When an external stop is applied, timers in the interval mode also are paused.

2. Purpose of use

This mode can be used in sites where control is performed by alternate ON/OFF operation.

- Can be used for skipped operation at sites, for example, small amounts of chemicals are injected for air conditioning.
- Small amounts can be injected by operation control by combining intermittent operation and stop input.

3. LCD display



4. Operation control signal

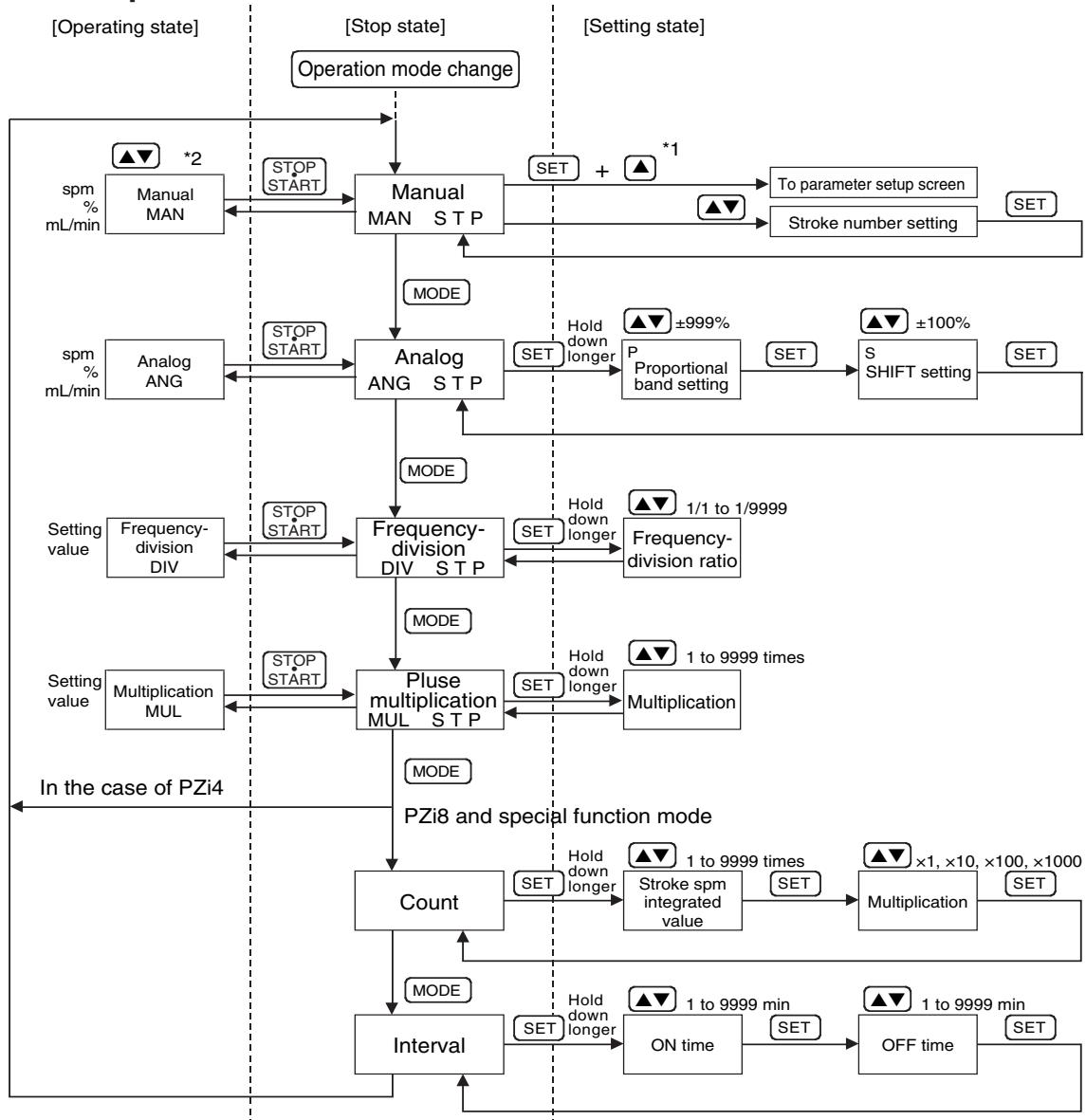
Stop input: Operation is paused by input of an external stop signal.

8 Setting Up Operation

8-1 Changing the Operation Mode

For PZi, the manual and automatic (pulse, analog, etc.) control methods can be switched by changing the operation mode. To change the operation mode, hold down the MODE key for at least 0.5 seconds with the pump stopped. This sets the pump to the setup mode. If the MODE key is held down longer, the screen enters setup screen for each mode. Do not hold the MODE key down longer when changing the operation mode.

8-2 Basic Operation Flow



Remarks:

- If the key is not pressed for five seconds at [Setting state], the newly set value is canceled, and the STP state is returned to.
- In the [Setting state], the setting value blinks, and lights by pressing the **▲▼** keys. The value is scanned.
- For PZi4, only the stroke speed (spm) is set.

8-3 How to Change the Operation Mode

PZi4

PZi8

Special Function Model

Mode	Display	Operation	Explanation
Manual		Power ON	The display shows the default state. (manual mode) When the power is next turned ON, the previous operation is stored to memory. (If the power is turned OFF and then back ON again during operation, the pump starts up in the run mode.) "MAN" is displayed at the bottom of the screen.
Analog		SET/RST MODE	To change the mode, press the MODE key. (The manual mode changes to the analog mode.)
Pulse Frequency-division		SET/RST MODE	This is the display screen for the analog mode. "ANG" is displayed at the bottom of the screen. The current input mode (4-20mA) is displayed.
Pulse multiplication		SET/RST MODE	Pressing the MODE key changes the mode as follows: Manual → Analog → Frequency-division → Multiplication.
Count	 PZi4 PZi8 and special function model	SET/RST MODE	This is the display screen for the frequency-division mode. "DIV" is displayed at the bottom of the screen.
Interval		SET/RST MODE	This is the display screen for the multiplication mode. "MUL" is displayed at the bottom of the screen.
		SET/RST MODE	Pressing the MODE key while the pulse multiplication mode is stopped returns the PZi4 to the manual mode. On the PZi8 and special function model, the mode changes to the count mode.
		SET/RST MODE	This is the display screen for the count mode. "CNT" is displayed at the bottom of the screen.
		SET/RST MODE	This is the display screen for the interval mode. "INT" is displayed at the bottom of the screen.
		SET/RST MODE	The ON time is displayed.
		SET/RST MODE	Pressing the MODE key while the interval mode is stopped returns to the manual mode.

Note 1: The mode can be changed only when pump operation has stopped.

Note 2: The currently set mode is displayed abbreviated as MAN, ANG, etc. at the bottom of the screen.

Note 3: When changing the operation mode, do not hold the MODE key down for 0.5 seconds or longer.

8-4 Setting Manual Mode (changing the number of strokes)

PZi4

PZi8

Special Function Model

Display	Operation	Explanation
STP 300 spm MAN		Default is 300 spm. "MAN" is displayed at the bottom of the screen.
STP 138 spm MAN		Press the UP, DOWN key to set the number of pulses within the range 0 to 300 spm. (in single step increments)
STP 138 spm MAN		The number of strokes (spm) blinks.
STP 138 spm MAN		Press the SET key to determine the setting value. (To cancel the setting value, do not operate the key for five seconds.) The number stops blinking and lights. This completes changing of the setting value.
STP 138 spm MAN		Press the START key to start pump operation.
STP 110 spm MAN		The pump enters the run mode, and STP goes out.
STP 110 spm MAN		The number of strokes can also be changed during operation. Change the number of strokes by the UP, DOWN keys, and determine the setting value by the SET key.

* The number of strokes (spm) set here is reflected in the multiplication, count and interval modes.

8-5 Setting the Analog Mode

PZi4

PZi8

Special Function Model

Display	Operation	Explanation
STP 4-20 ANG		Default is 4-20 mA DC. (On the PZi8, the default can be changed to 0-20 mA in parameters.) "ANG" is displayed at the bottom of the screen.
STP P 100 % ANG		Holding down SET key for at least 0.5 seconds with pump stopped enters the proportional band setup screen. (default: 100%)
STP P 80 % ANG		This is the proportional band setup screen. The present value is blinking, and "P" is displayed at the top left.
STP S 0 % ANG		Press the UP, DOWN key to set the proportional band within the range -999 to +999%.
STP S -50 % ANG		The setting value is displayed but not yet determined.
STP 4-20 ANG		Press the SET key to determine the setting value. (To cancel the setting value, do not operate the key for five seconds.) After determining the setting value, the shift amount setup screen is entered. (default: 0%)
STP S 0 % ANG		When the proportional band setting value is determined, the "P" at the top left disappears, and an "S" is displayed in its place. This indicates the shift amount setup screen.
STP S -50 % ANG		Press the UP,DOWN key to set the shift amount within the range -100 to +100%.
STP 4-20 ANG		The setting value is displayed but not yet determined.
STP 264 spm ANG		Press the SET key to determine the setting value. (To cancel the setting value, do not operate the key for five seconds.) The stop state in the analog mode is returned.
STP 264 spm ANG		Press the START key to start pump operation.
STP 264 spm ANG		The current number of strokes is displayed. (On the PZi8, % and mL can be displayed instead of spm by changing the parameter setting.)

* Settings cannot be changed during operation. To change a setting, first stop pump operations.

* The current analog input value is displayed by pressing the  or  key during a pump stoppage.

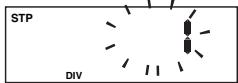
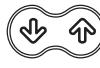
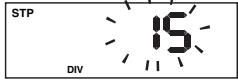
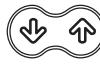
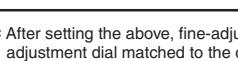
* Set a minus (-) value to set a decrease in the proportional band setting.

8-6 Setting the Frequency-Division Mode

PZi4

PZi8

Special Function Model

Display	Operation	Explanation
		Default is "1" (When the display indicates 1, the set dividing ratio is 1/1.) "DIV" is displayed at the bottom of the screen. Holding down SET key for at least 0.5 seconds with pump stopped enters the dividing ratio setup screen.
		The current value starts blinking.
		Press the UP, DOWN key to set the dividing ratio within the range 1/1 to 1/9999. (In this setup, set the denominator of dividing ratio.)
		The setting value is displayed but not yet determined. (The example in this screen is 1/15.)
		Press the SET key to determine the setting value. (To cancel the setting value, do not operate the key for five seconds.) The stop state in the frequency-division mode is returned to.
		This completes the setting, and the display stops blinking and stays lit.
		Press the START key to start pump operation.
		STP goes out and pump operation starts. The pump starts to operate according to external signals.

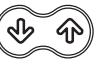
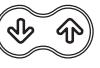
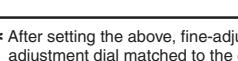
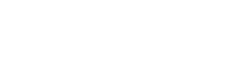
* After setting the above, fine-adjust the discharge volume using the stroke adjustment dial matched to the calculated dividing ratio value.

8-7 Setting the Multiplication Mode

PZi4

PZi8

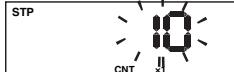
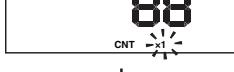
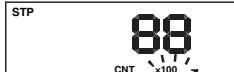
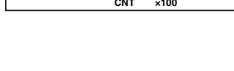
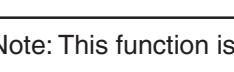
Special Function Model

Display	Operation	Explanation
		Default is "1". "MUL" is displayed at the bottom of the screen.
		Holding down SET key for at least 0.5 seconds with pump stopped enters the multiplication setup screen.
		The present value starts to blink.
		Press the UP, DOWN key to set the multiplication within the range 1 to 9999.
		The setting value is displayed but not yet determined.
		Press the SET key to determine the setting value. (To cancel the setting value, do not operate the key for five seconds.) After the setting value is determined, the multiplication stop mode is returned.
		The setting is completed, and the display stops blinking and stays lit.
		Press the START key to start pump operation.
		STP goes out, and the pump enters the run mode. The pump starts to operate according to external signals.

* After setting the above, fine-adjust the discharge volume using the stroke adjustment dial matched to the calculated multiplication value.

8-8 Setting the Count Mode

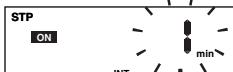
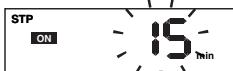
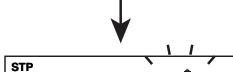
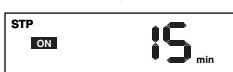
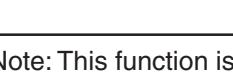
(PZi8) Special Function Model

Display	Operation	Explanation
		"CNT" and the multiplication factor ($\times 1, \times 10, \times 100, \times 1000$) are displayed at the bottom of the screen. Holding down SET key for at least 0.5 seconds with pump stopped enters the strokes setup screen.
		The present value starts to blink.
		Press the UP, DOWN key to set the number of strokes within the range 1 to 9999.
		The setting value is displayed but not yet determined.
		Press the SET key to determine the setting value. (To cancel the setting value, do not operate the key for five seconds.) The setting value is determined, and the multiplication factor setup screen is entered.
		The number of strokes lights, and multiplication starts to blink.
		Press the UP, DOWN key to change the multiplication in four stages: $\times 1, \times 10, \times 100$ or $\times 1000$.
		The multiplication factor setting value is displayed but not yet determined.
		Press the SET key to determine the setting value. (To cancel the setting value, do not operate the key for five seconds.) The setting value is determined, and stop state in the count mode is entered.
		The number of strokes and multiplication factor light to indicate that the settings are determined. Press the START key to start pump operation. In this state, the pump starts to operate by the start signal from the outside. (The pump startup mode can be changed in parameter P-31.)

Note: This function is not provided on the PZi4.

8-9 Setting the Interval Mode

(PZi8) Special Function Model

Display	Operation	Explanation
		"INT" is displayed at the bottom of the screen. ON or OFF is displayed at the left. If the start operation state is ON, ON is displayed. (This can be changed in parameter P-30.)
		Holding down SET key for at least 0.5 seconds with pump stopped enters the ON time setup screen.
		ON is displayed at the left of the screen, and the present value of the ON time blinks.
		Press the UP, DOWN key to set the ON time within the range 1 to 9999 minutes.
		The setting value is displayed but not yet determined.
		Press the SET key to determine the setting value. (To cancel the setting value, do not operate the key for five seconds.) After the setting value is determined, the display moves to the OFF time setup screen.
		The ON display goes out, and OFF is displayed. Also, the present value of the OFF time blinks.
		Press the UP, DOWN key to set the OFF time within the range 1 to 9999 minutes.
		The setting value is displayed but not yet determined.
		Press the SET key to determine the setting value. (To cancel the setting value, do not operate the key for five seconds.) The setting value is determined, and the interval stop state is returned to.
		ON is displayed at the left, and the setting value of the ON time is displayed.
		Press the START key to start pump operation.
		Counting starts and the display is decremented from the setting value.

Note: This function is not provided on the PZi4.

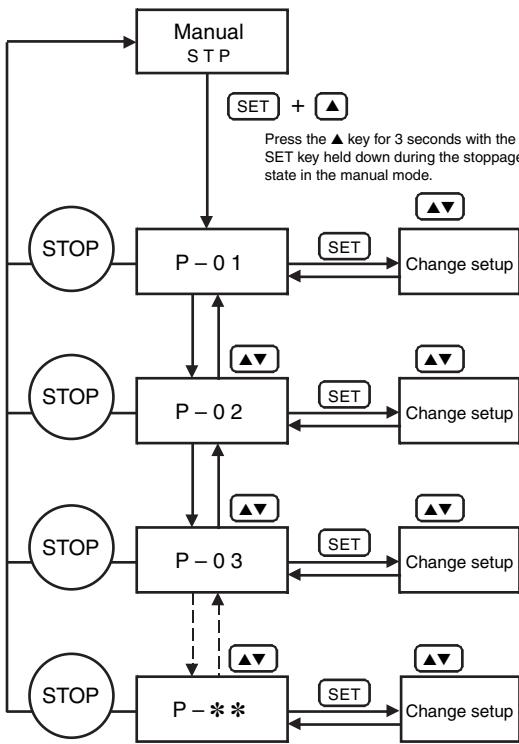
9 Setting Up Parameters

9-1 Parameter Setup Flow

(PZi8) (Special Function Model)

Remarks:

For meanings of parameters, refer to "13-1 List of Parameters".



- * The parameter-setting screen can be activated only from the manual mode (pump stoppage state).
- * Pressing the SET key in the setting change screen determines the newly set parameter setting.

Note: On the PZi4, the parameter setups cannot be changed.

Important:

- Do not change the parameters that are not explained in the parameter list. They are used for internal processing.

Remarks:

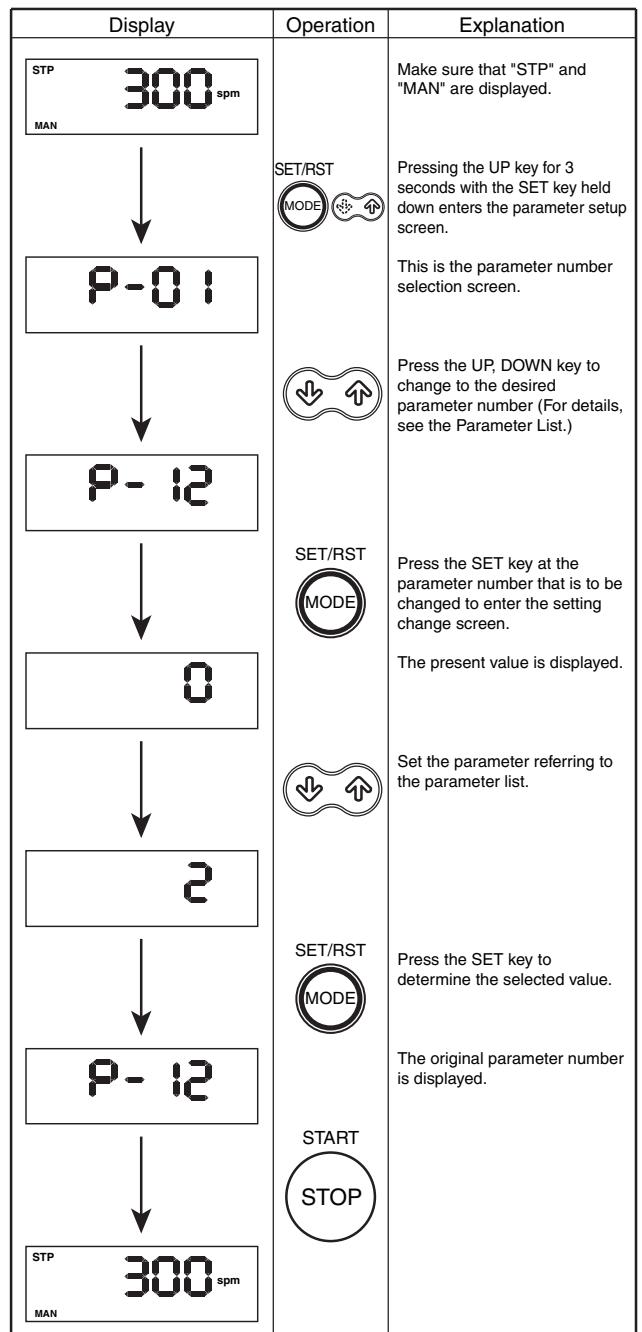
- To return the parameters to the values at the factory shipment time, select 1 in P-80 and then press the SET key.



9-2 Setting the Parameters

(PZi8)

(Special Function Model)



Note: Parameters can be continuously changed until the STOP key is pressed.

10 Setup Examples

10-1 Control by 2-point Level Switch

(PZi8) Special Function Model

(1) Change the parameters.

Change P-06 (IN3) to "6: Level switch input".

Set P-12 to "0" (operation is continued when an alarm occurs).

Set P-08 to "5" (level error alarm is output).

(2) Connect the signals.

- Connect the lower limit signal (IN3) across pins 7 (IN3) and 8 (COM1) on the 8-pin connector.
- Connect the lower/lower limit signal (IN2) across pins 6 (IN2) and 8 (COM1).
- Connect the alarm output signal (OUT1) across pins 9 (OUT1) and 11 (COM2).

10-2 Pulse Signal Noise Countermeasures

If the influence of power supply frequency causes the pump to malfunction during pulse input, this noise influence can be reduced by switching to the low-speed port. (In the case of the signal less than 600 pulse/sec.)

* See "12-4 I/O Signal Specifications."

(1) Change the parameters.

Change P-04 (IN1) to "0: Unused".

Change P-04 (IN2) to "1: Pulse input signal".

(2) Connect the signal.

Connect the pulse signal (IN2) across pins 7 (IN2) and 8 (COM1) on the 8-pin connector.

10-3 Flowrate Display

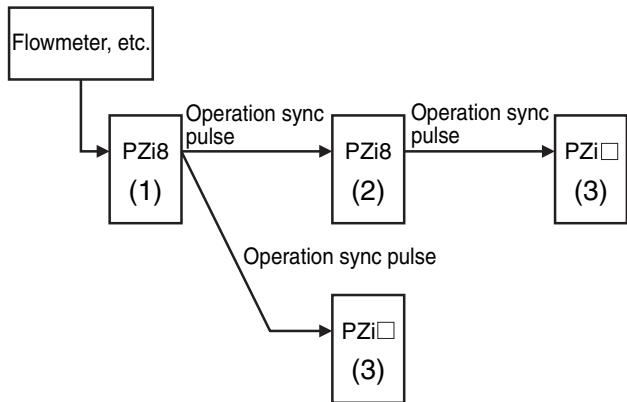
The indication (setting) in each mode can be set to mL/min by setting the maximum discharge volume (at 300 spm) of the pump in parameters.

(1) Set the parameters.

- Set P-10 to 0.1 to 600 (mL/min).
* Set according to the pump specifications or actual measured value.
- Set P-11 to "2: mL/min"
* Changing the stroke adjustment dial causes the indicated value to deviate.
The indicated value is the value calculated from the number of strokes (spm).

10-4 Control of Multiple Pumps by a Single Signal

In the following kind of application, a pulse divider is generally used. This, however, is not required on the PZi8.



* On the PZi8 and special function model, two signals can be output.

* After receiving the operation sync pulse, the PZi can also perform frequency-division and multiplication on that signal.

* When the dividing ratios differ, connection is performed using the lower of the two dividing ratios (larger number of pump operations).

(1) Set the parameters.

Set P-8 and P-9 of the PZi8 (1) pump to "2: Operation sync pulse output".

* The operation sync pulse output is set for both OUT1 and OUT2.

* Pumps (2) and (3) are used in the frequency-division (multiplication) mode.

11 Input/Output Port Assignments Change

11-1 Input/Output Signals (Port Assignments)

(PZi8) (Special Function Model)

The PZi8 and special function model has three pulse input ports and two pulse output ports. However, these functions are not assigned in the standard specification. In this case, the ports can be switched to make effective use of the limited number of I/O ports.

Note, however, that functions other than "0: Unusable" cannot be assigned in duplicate on input ports.

* See "13-2 Table 1: Input Signal Assignments" and "13-3 Table 2: Output Signal Assignments."

(1) Setting of input signals (The following functions can be assigned to inputs 1 to 3.)

0. Unused

Disables use of the input signal port.
(This function is used, for example, when changing ports to avoid duplicate assignments.)

1. Pulse input signal

Performs pulse input for frequency-division and multiplication.

2. Stop input

Pump operation can be paused by inputting this signal during operation.

(Pump operation is stopped by shorting across terminals, and pump operation is started by leaving terminals open.)

When this signal is input, only the STOP key is enabled and pump operation is stopped. The function of other keys is not accepted.

3. Present value reset input

Resets and restarts the current value of the count mode and interval modes.

4. Alarm reset input

Cancels alarm output that is output when an alarm occurs, or pump stoppage according to the setting when an alarm occurs. If the alarm reoccurs even after performing a reset, the alarm cannot be cancelled unless the alarm-reset signal is entered once more.

5. Unused (setting prohibited)

6. Level switch signal input

Alarms are displayed and output when the signal input is ON.

The pump operating state when an alarm occurs can be set by parameter P-12. (default: pump pause)

(2) Setting of output signals (The following functions can be assigned to outputs 1 and 2.)

0. Unused

Disables use of the output signal port.

1. Package alarms

The signal is output when an alarm signal is input. This signal is canceled when the alarm is reset by the alarm reset signal or RESET key.

2. Operation sync pulse output

A single pulse signal (pulse width 40 msec) is output per stroke synchronized with solenoid drive.

3. Operation signal output

This signal is output continuously during operation.

Output is also stopped during a stop performed on the operation panel and a pause from the outside.

4. End signal output

When the count preset in the count mode is exceeded, the end signal (100 msec width) is output.

5. to 8. Individual alarm outputs

Alarms are output individually. See "13-3 Table 2: Output Signal Assignments."

(3) How to assign ports

Set the respective function No. to parameters P-04 to P-06 and P-08 to P-09.

(4) Cautions when Assigning Ports

1. Pulse input port

- The input port cannot be assigned in duplicate except for assignment of "Unused."
First, set the duplicate assigned port to "0: Unused" and then set the function No. to the desired port.

- Input control functions on the PZi4 are fixed and cannot be changed.

1) High-speed port

Pulse transmitting flow meter signals can be used only on the high-speed port.

2) Low-speed port

Malfunction caused by noise can be prevented by using the low-speed port if malfunction occurs by pulse input.

2. Output ports

- All assignments for output ports can be assigned twice or more.

- Two output ports provided.

12 Specifications

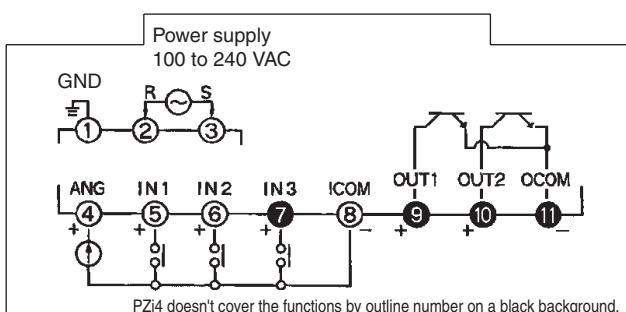
Specifications	PZi4	PZi8	Special Function Model
12-1 Functions			
Manual operation (0 to 300 spm setting)	Key Operation	Key Operation	Key Operation
Automatic operation (Analog signal input) Proportional band setting, shift setting	○	○	○
Automatic operation (Pulse signal input) Frequency-dividing ratio 1/1 to 1/9999 Multiplication 1 to 9999	○	○	○
Special Function Model ^{*1}	—	—	○
12-2 Display			
spm display	spm	spm, %, mL/min	spm, %, mL/min
Mode state display (current mode, unit)	○	○	○
Setup screen, parameters, and error display	○	○	○
12-3 Alarm Display, External Alarm Output			
External stop input	Display	Display, output	Display, output
Input analog signal Out-of-range error ^{*2}	Display	Display, output	Display, output
Input pulse signal Memory over ^{*2}	Display	Display, output	Display, output
12-4 I/O Signal Specifications (number of ports)			
1) Digital input (high-speed port) No-voltage pulse or open collector Input resistance Approx. 2kΩ Max. number of pulses 7500 pulse/min Min. width of pulses 4 msec (when ON time)	1 port (IN1)	1 port (IN1)	1 port (IN1)
2) Digital input (low-speed port) No-voltage pulse or open collector Input resistance Approx. 2kΩ Max. number of pulses 600 pulse/min Min. width of pulses 50 msec (when ON time)	1 port (IN2)	2 port (IN2, 3)	2 port (IN2, 3)
3) Analog input Input resistance Approx. 110 Ω	1 port 4 to 20 mA DC	1 port 4 to 20 mA DC 0 to 20 mA DC	1 port 4 to 20 mA DC 0 to 20 mA DC
4) Digital output 3 mA DC, 25 V or less	None	2 ports (OUT1, 2)	2 ports (OUT1, 2)

*1 See "4-3 Special Function Model"

*2 Automatic operation during the signal input

Digital signals use sync logic (NPN). Please use a converter when connecting to a source logic (PNP) device.
(Example of recommended equipment: DEK-TR/INV-2964319 manufactured by Phoenix Contact GmbH & Co. KG)

12-5 Terminal Block Connections



Use multi-core round cabtyre cable as the signal line.

Select a power supply wire that has:

- a size of at least 0.75 mm² and
- an outside diameter of 5 to 10 mm.

13 Data

13-1 List of Parameters

No.	Item	Description	Parameter	Default	Explanation
P-01	Analog mode	Type of input signals	0: 4-20 1: 0-20	0	4 to 20 mA or 0 to 20 mA analog signals supported
P-02	Frequency-division/ multiplication mode	Count of surplus pulse signal	1 to 9999 buffer size	1	Number of pulses to hold.
P-03		Remained pulses when stopped by the external stop signal	0: Save 1: Clear	1	Makes remaining pulses to store/clear at an external signal stop
P-04	Input 1 (high-speed)	Function	See Table 1	1	Any value can be selected from Table 1. Only selected function is enabled (Port and function are assigned simultaneously.)
P-05	Input 2 (low-speed)		See Table 1	2	Two or more assignments other than "0: Unused" cannot be set at the same time.
P-06	Input 3 (low-speed)		See Table 1	3	
P-07	Used for internal processing	—			
P-08	Output 1 (O.C.)	Function	See Table 2	1	Can be freely selected from Table 2. Only the selected functions are effective.
P-09	Output 2 (O.C.)		See Table 2	2	(Port assignment and function assignment are performed simultaneously.)
P-10	Display	Max. displayed discharge volume value	0.1 to 600	360.0	Max. value (reference value) to be displayed when mL/min is selected on P-11.
P-11		Display unit	0: spm 1: % 2: mL/min	0	Unit is displayed as spm or %, mL/min.
P-12	Alarms	Level	0: Operation continued 1: Pause 2: Pump stopped	1	Selects operation when an alarm occurs. The pause function temporarily stops operation when an alarm occurs, and operation is automatically resumed when the alarm is canceled.
P-13		Injection monitor		0	
P-14		Analog error	0: Operation continued 1: Pause (temporary stop)	1	Select the operation when an analog error occurs.
P-15	Mode screen display	ANG: Analog mode	0: Disabled 1: Enabled	1	When "Disabled" is selected, the mode will be hidden.
P-16		DIV: Frequencydivision mode	0: Disabled 1: Enabled	1	
P-17		MUL: Multiplication mode	0: Disabled 1: Enabled	1	
P-18		CNT: Count mode	0: Disabled 1: Enabled	0	
P-19		INT: Interval mode	0: Disabled 1: Enabled	0	
P-20 to P-29	Used for internal processing	—			
P-30	Interval mode	Operation at starting time	0: ON 1: OFF	0	Default operation at starting
P-31	Counter mode	Start trigger	0: Start key 1: External input	1	Sets the start reset method
P-80	Reset	Reset to the setting at the factory shipment	0: Disabled 1: Effective	0	When 1 is selected and press SET key, all values will be initialized to become the condition at the shipment. The value of P-80 returns to 0.

Note: Parameters cannot be changed on the PZi4 model.

13-2 Table 1: Input Signal Assignments

Code No.	Description	Application
0	Unused	—
1	Pulse input signal	Used in frequency-division/multiplication mode
2	Stop input	When this signal is input, pump operation stops temporarily and the pump standsby.
3	Present value reset input	Resets the present value to the setting value.
4	Alarm reset input	This input resets the alarm flag.
5	Unused (setting prohibited)	
6	Level switch signal input	Alarm is displayed and output when this input is present.

13-3 Table 2: Output Signal Assignments

Code No.	Description	Application	Specifications
0	Unused	—	—
1	Package alarms	This signal is output when any alarm occurs.	Continuous
2	Operation sync pulse output	Pulse signal synchronized with solenoid drive	40 msec pulse
3	Operation signal output	This signal is output during pump operation.	Continuous
4	End signal output	End signal when counting of the setting value ends in the countmeasuring mode.	100 msec pulse
5	Abnormal level error	Selected to output alarm outputs individually.	Continuous
6	Input pulse buffer overflow		
7	Analog input error		
8	Unused (setting prohibited)		

Remarks:

For details on signal specifications, see "12-4 I/O Signal Specifications".

13-4 Alarm

(PZi8) (Special Function Model)

13-4-1 Explanation of alarm codes

The following codes appears on the display when an alarm occurs.

Alarm Code No.	Type	State When Alarm Occurs	Remarks
E-01	ROM write error	Pump error	Operation is stopped.
E-02	Abnormal level alarm	When "Level input" is set for the input port, and that port is ON (shorted)	Selects the processing method on P-12.
E-03*	Input pulse buffer overflow	When the number of input pulses increases momentarily during frequency-division/multiplication mode, and the preset buffer size is exceeded	Operation is continued even if an alarm is output.
E-04*	Analog input error alarm (min to max)	When the input signal deviates from the stipulated range during pump operation in the analog input mode	Selects the processing method on P-14.

* Alarms are only displayed on the PZi4.

When the error is remedied, the alarm is automatically canceled, and the regular display returns.

13-4-2 Mode when an alarm occurs (occurs only during operation)

Alarm Code No.	MAN	ANG	DIV•MUL	CNT•INT
1	●	●	●	●
2	●	●	●	●
3	—	—	●	—
4	—	●	—	—

●: Alarm occurring

13-4-3 How to remedy alarms

<<No.1>>

- Try turning the power OFF and then back ON again. If this does not remedy the alarm, a probable cause is a circuit error.

<<No.2 to 4>>

- Press the RESET key to remedy.
- Remedy by resetting the alarm externally.
- Stop pump operation by the STOP key.

13-5 Display Details in Different Statuses in Each Mode

Status Mode	Operation			External stop			Internal stop			Setting 1			Setting 2		
	Code	Numerical value	Unit	Code	Numerical value	Unit	Code	Numerical value	Unit	Code	Numerical value	Unit	Code	Numerical value	Unit
Manual	MAN	Setting value	*1	MAN STP	Setting value	*1	MAN STP	Setting value	*1						
Analog	ANG	Output value	*1	ANG STP	0	*1	ANG STP	*2		ANG STP P	Proportional band setting value	%	ANG STP P	SHIFT setting value	%
Frequency-division	DIV	Frequency-dividing ratio	Disabled	DIV STP	Frequency-dividing ratio	Disabled	ANG STP	Frequency-dividing ratio	Disabled	DIV STP	Frequency-dividing ratio	Disabled			
Multiplication	MUL	Multiplication	Disabled	MUL STP	Multiplication	Disabled	ANG STP	Multiplication	Disabled	MUL STP	Multiplication	Disabled			
Count *9	CNT *8	*3	Disabled	CNT *8 STP	*4	Disabled	CNT STP *8	Setting value	Disabled	CNT STP *8	Setting value	Disabled	CNT STP *8	Setting value	Disabled
Interval *9	INT *7	*7	min	INT STP *5	*4	min	INT STP *6	*Setting value corresponding to 6	min	INT STP ON	Setting value	min	INT STP OFF	Setting value	min

*1: spm or % or mL/min (See P-10 and P-11.) The unit is fixed to spm on the PZi4 model.

*2: 4-20 or 0-20 (See P-01.) PZi8 model and special function model only

*3: Countdown display from setting value. Pump operation stops when count reaches 0 at the end of countdown.

*4: Countdown is paused, and standby state is entered. (pause function)

*5: ON/OFF display is switched and lit according to the set time.

*6: State at start of timer operation is displayed. Either of ON or OFF (see P-30)

*7: Countdown display from setting value. ON/OFF is switched at end of countdown.

*8: Digit setting or setting value of X1000, X100, X10, X1

*9: This mode and function are not provided on the PZi4 model.

Product designs and specifications are subject to change without notice for product improvement.

TACMINA CORPORATION

Head Office:
2-2-14 Awajimachi, Chuo-ku, Osaka 541-0047 Japan
Tel.+81(0)6-6208-3974 Fax.+81(0)6-6208-3978
URL www.tacmina.com
E-mail trade@tacmina.com

EM-116(7)-
2024/4/III

Z0588

