COLORMETRY

CMU-124H

Maintenance & Troubleshooting

User's Manual

MIURA BOILER WEST, INC.

IN OUR CONTINUING EFFORT TO IMPROVE OUR PRODUCT, INFORMATION IN THIS MANUAL MAY BE CHANGED WITHOUT NOTICE.

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Introduction

We appreciate your purchase of the Colormetry system.

This user's manual covers instructions for the use of your Colormetry system. Please read through this manual and understand the contents before using the system.
We also recommend that the manual be kept nearby for reference when operating the Colormetry system.
Operate the system only in accordance with the instructions given in this manual.
We will under no circumstances whatsoever be liable for damages arising from the user's failure to follow the instructions given in this manual.

(Some details of the instructions contained in this manual may be different from the actual system purchased. The instructions are also subject to change without prior notice.)

⚠ CAUTION

The Colormetry system is a hardness-leakage monitoring system that monitor the harness of water and issues hardness-leakage alarm. It is not a system that remedies (effects recovery from) hardness leakage itself.

How this manual is organized

This manual consists of ten chapters listed below. We recommend that you familiarize yourself with the objectives and contents of each, and keep the manual handy for reference.

Organization

Chapter 1 Safety Warnings and Precautions
Explains the danger and precautionary signs and notes that apply to the handling, installation, wiring and maintenance of the Colormetry system.

.**Chapter 2 Maintenance**
Explains how to maintain the Colormetry system daily and how to replace the reagent cartridge, fiber filter cartridge and orifice.

Chapter 3 Troubleshooting
Explains what action should be taken on the occurrence of error, how to clear alarm and how to verify error records.

Chapter 4 About Displayed Messages
Explains the messages displayed in three modes

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Chapter 1 Safety Warning/Precautions

Explains the danger and precautionary signs and notes that apply to the handling, installation, wiring and maintenance of the Colormetry system.

WARNING

This sign indicates a situation in which incorrect handling might result in death or injury to the operator, or that may result in damage to property.

CAUTION

This sign indicates precautions for the prevention of damage to the equipment.

NOTE

Instructions for effective operation and information that may become useful are explained here.

Chapter 2 Maintenance

Explains how to maintain the Colormetry system daily and how to replace the reagent cartridge, fiber filter cartridge and orifice.

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(Routine care and replacement of supplies)

2-1 Routine care

(1) Daily inspection items

[1] Verifying the results of monitoring (weekly)
Use an ordinary hardness-indicator reagent to check for evaluation errors due to a possible system malfunction. Record the results.
An ordinary hardness-indicator reagent may be too low in sensitivity to compare the monitoring of minute hardness leakage against the Colormetry system. If the monitoring results of the two are obviously different, the system may have developed a problem.
Note: Use a low-range hardness indicator for this comparison (gpg range is not suitable).

[2] Verifying the results of automatic monitoring (weekly)
Check for proper automatic monitoring.
Where a remote signal is connected, but does not turn on due to a problem, the system will not enter the monitor status.

[3] Checking the state of feed water and drain pipes (as needed)
Check to see if the pipe is free of bends.
Bent pipe will prevent the adequate feeding of water. A bent drain tube will create back pressure, and in the worst case may cause water leakage.

[4] Replacing the reagent cartridge (every three to four months)
(Refer to Section 2-3, “Replacing reagent cartridges,” on page 7.)
Replace the cartridge when a “New Cartridge” message appears in the display.

[5] Replacing the fiber filter cartridge and orifice (as needed)
Refer to Section 2-4, “Replacing the fiber filter cartridge and orifice,” on page 11.)

(2) About verifying the amount of hardness leakage on the occurrence of hardness-leakage alarm (as needed)
The alarm trigger levels of hardness leakage are as low as 1 mg/L and 2 mg/L for the Colormetry system. These levels may be too low to be compared against the results of an ordinary hardness-indicator reagent evaluation method.
To verify the amount of hardness leakage, perform an analysis of water on Ca, Mg, Zn and Cu.
In comparison between the Colormetry system evaluation and water analysis, the results of the two may differ if the time and location of sample collection are different. For water analysis, obtain a sample from the Colormetry system's drain, as well, for comparison against the system evaluation result.

Recommended periodic maintenance schedule.

No.	Item	1 week	3 ~ 4 months	As Needed
[1]	Verifying the results of monitoring	●		
[2]	Verifying the automatic monitor operation	●		
[3]	Checking the state of feed-water and drain-pipes			●
[4]	Replacing the reagent cartridge		●	
[5]	Replacing the fiber filter cartridge and orifice			●
[6]	Verifying the level of hardness leakage on the occurrence of hardness-leakage alarm			●

(3) About the prevention of freezing

If there is a risk of freezing in an installation in a cold region, but no protection against freezing has been applied to it, close the main feed-water line valve to the Colormetry system and drain the water at the supply end. (Drain the filter casing also, and remove and store the fiber filter cartridge in a nonfreezing area. Freezing may damage the fiber.)

If possible, drain the water from the monitor cell. If it is too difficult to do so, pull the cartridge lever and remove the reagent cartridge from the main unit.

⚠ CAUTION

Freezing may crack the fiber filter cartridge, filter casing or monitor container inside the main unit.

2-2 General information

⚠ CAUTION

The maximum pressure of raw water to the Colormetry system is 70 psi. Pressure beyond that may cause water leakage due to deformations in the internal connections or gaskets. Be sure to use it under the specified pressure.
The drain end must open into the air. Back pressure at the drain end may cause an internal water leakage.
The main unit has a relief hole in the bottom to quickly drain away internally leaked water and prevent short circuits.
Do not place any object underneath the installed system that may get wet in the unlikely event of internal leakage.
Be sure to keep the feed-water and drain-water pipes free of kinks.

⚠ WARNING

(1) Do not remove the front cover from the main unit.
(2) Do not disassemble the Colormetry unit.

2-3 Replacing reagent cartridges

Replace the cartridges in accordance with the procedure given below so that the system will give a long service life.

2-3-1 Replacing reagent cartridges

(1) When to replace a cartridge

If a cartridge is used after a “Replace cartridge” [New Cartridge] message is displayed on a self-diagnostic error, the reagent would either run out or deteriorate to a point where monitoring is no longer possible. If no spare cartridge is available, obtain and reload one immediately.

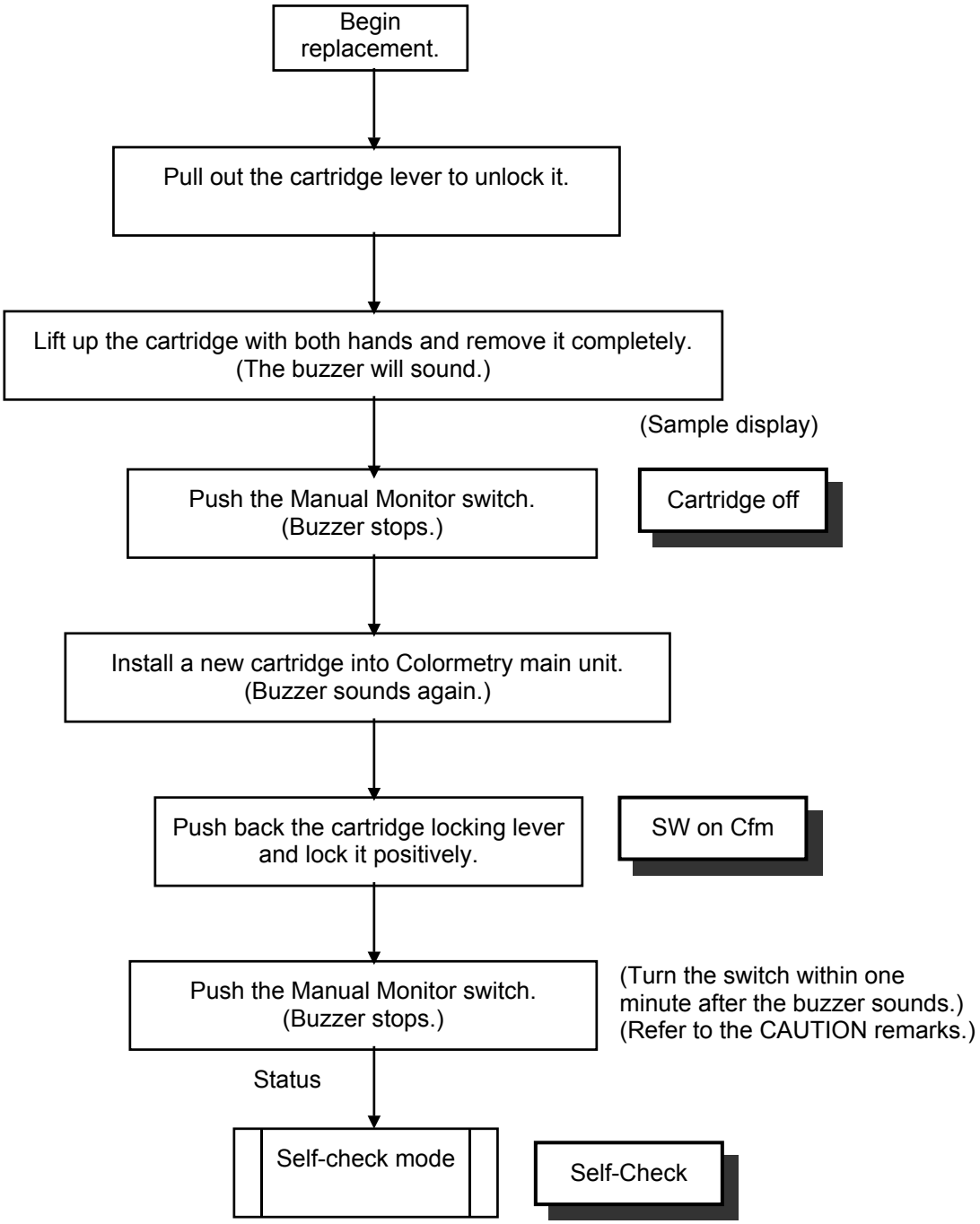
If a “Reagent injection confirmation error” [Injection Cfm F] or “Reagent injection error” [Injection F] is displayed, press the reagent bag with a finger through the hole in the back of the cartridge to check for the remaining reagent. If none is felt in the bag, replace the cartridge immediately.

(2) How to replace a cartridge

⚠ CAUTION

- Replace the cartridge with the power left on but only while the system is in monitor standby mode.
- Never remove the check tube attached to the nozzle of the reagent cartridge (refer to Section 2-2-2, “External appearance of reagent cartridge,” on page 7 in the Colormetry General Information Manual.) Keep the fingers off the check tube too, since doing so may affect the amount of injection.
- When installing a new cartridge, push it down slowly, being careful not to let the nozzle and check tube hit of the main unit.

Reagent Cartridge



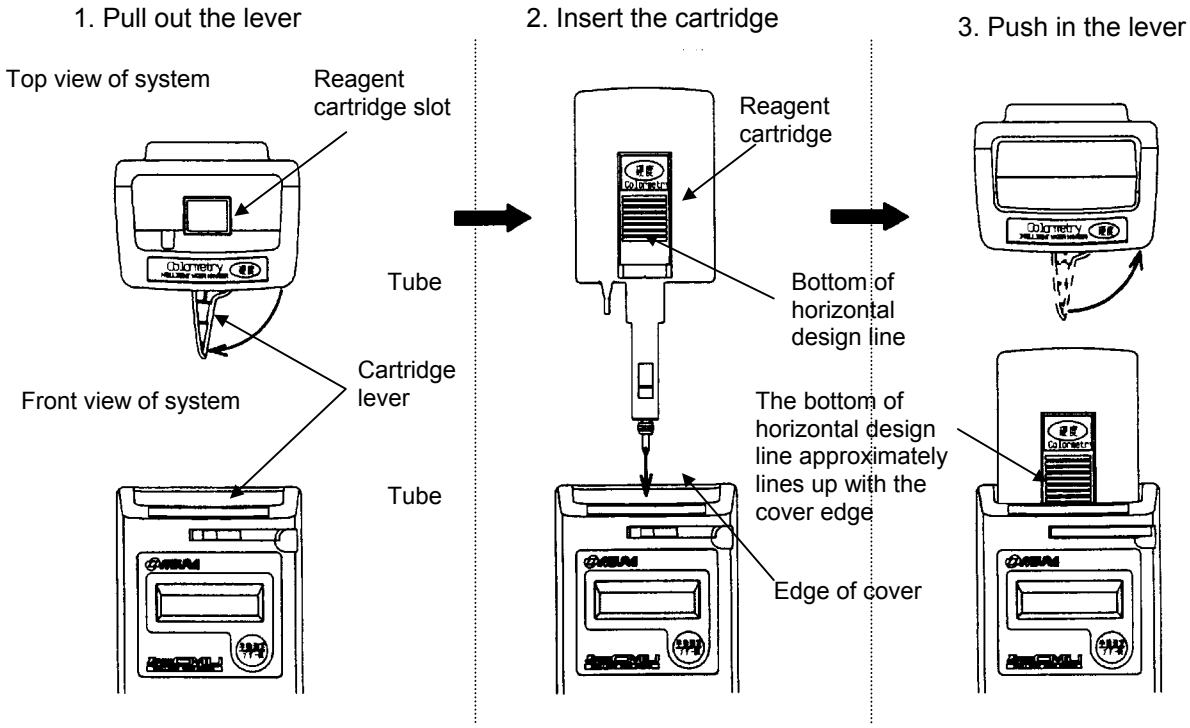


Fig. 15

⚠ CAUTION

If the reagent cartridge being used is temporarily removed for reinstallation later, do not press the Manual Monitor switch. The buzzer will stop automatically within one minute. Pressing the Manual Monitor switch will reset the timer for cartridge replacement, thereby rendering the automatically displayed replacement date meaningless.

⚠ CAUTION

About the reagent cartridge

[1] The reagent cartridge has a definite life. Finish a cartridge within one year of its date of manufacture, that is stated on the cartridge box. (A cartridge is used up in about four months.)

[2] Do not store cartridges for a long period of time. If they are to be stored, select a cool, dark place.

[3] Do not break the seal on the reagent cartridge bag until the moment of installation. Doing so will accelerate its deterioration.

[4] Do not touch the nozzle or tube of the reagent cartridge. Doing so will affect the injection level, and in the worst case may stop monitoring.

[5] Do not use the reagent cartridge for other than the Colormetry system.

[6] Never disassemble a reagent cartridge. Reagent may splatter onto the skin or in the eyes.

[7] Dispose of the reagent cartridge, assembled intact, as plastic waste.

[8] If the reagent gets on the skin or in the eyes, immediately rinse it off with water.

2-4 Replacing fiber filter cartridge and orifice

(1) When to replace

If the water flow is small even though the supply pressure is within the specified range, the fiber filter or orifice is clogged or has deteriorated. Specifically, when one of the following alarms is issued in the self-diagnostic error mode, the clogging or deterioration of the filter or valve should be suspected, if nothing else:

[1] "Wash error" [Wash F]
[2] "Reagent injection error" [Injection F]
[3] "Wash water flow insufficient" [Wash Flow F]

The lifespan of the fiber filter should be about a year on city water, but may be shorter depending on the water quality and supply pressure. Even if none of the above alarms is issued, it should be replaced after a year as a rule of thumb.

When replacing the fiber filter, also install the new orifice that comes with the replacement filter.

(2) How to replace

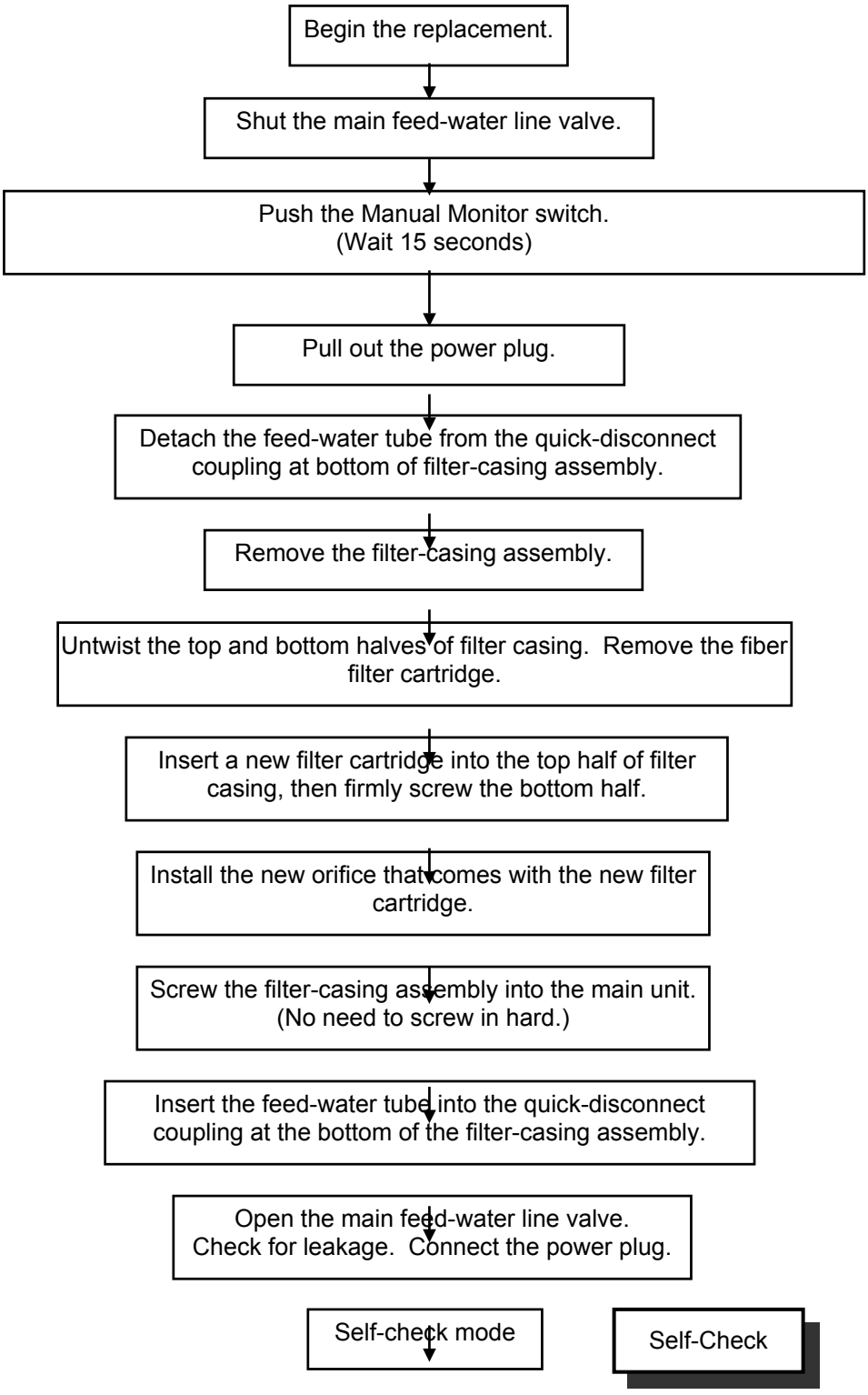
⚠ CAUTION

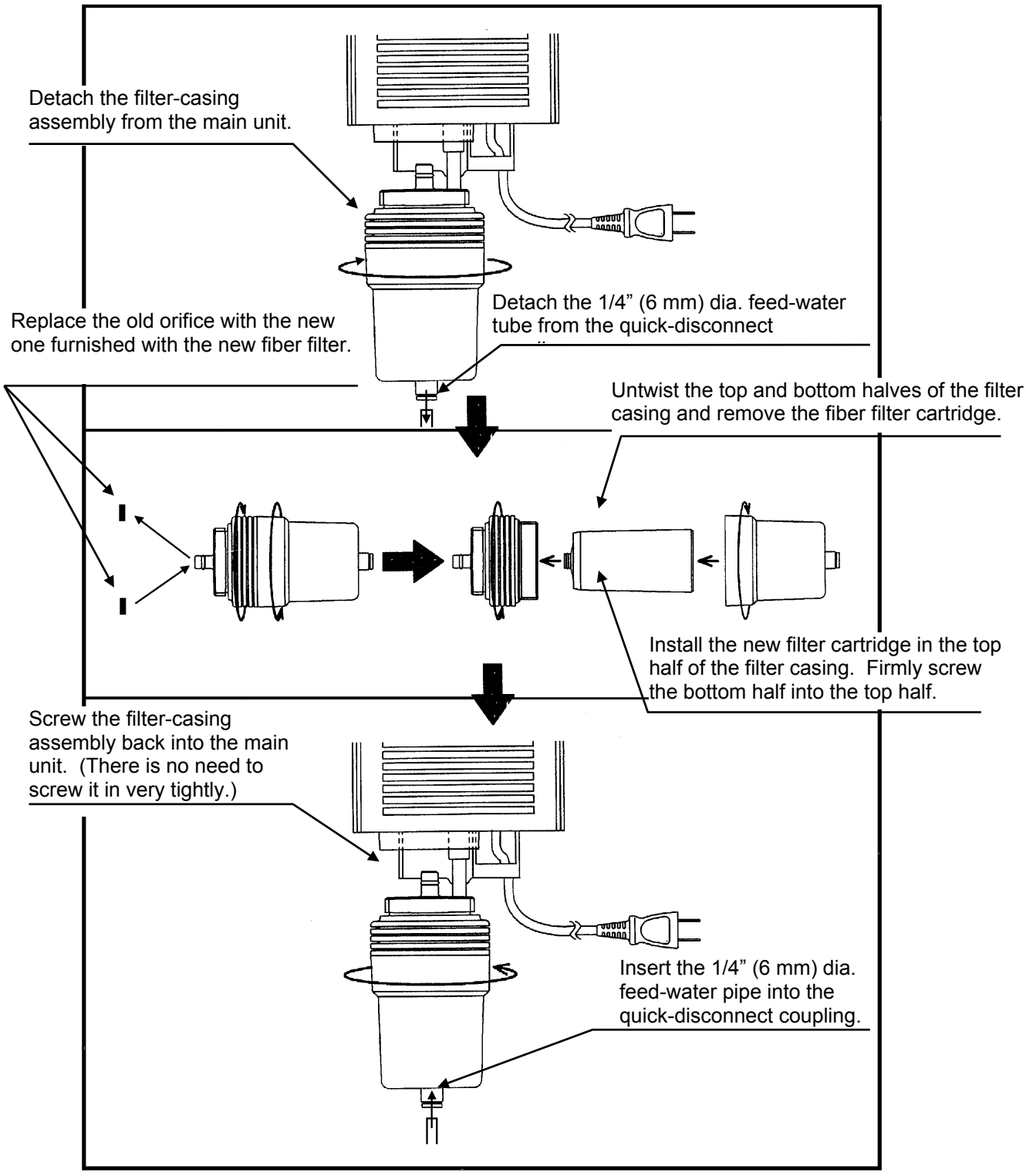
Water spills around the main unit when replacing the fiber filter. Do not leave things underneath the unit that should not get wet.

⚠ CAUTION

There is an orifice fit on the end of the filter casing. If the orifice is not found on the filter casing when it is removed from the main unit, the valve may have been left behind in the filter mount of the main unit. Remove the orifice without scratching the mount.

Filter Cartridge




Detach the filter-casing assembly from the main unit.
Detach the 1/4” (6 mm) dia. feed-water tube from the quick-disconnect
Replace the old orifice with the new one furnished with the new fiber filter.
Untwist the top and bottom halves of the filter casing and remove the fiber filter cartridge.
Install the new filter cartridge in the top half of the filter casing. Firmly screw the bottom half into the top half.
Screw the filter-casing assembly back into the main unit. (There is no need to screw it in very tightly.)
Insert the 1/4” (6 mm) dia. feed-water pipe into the quick-disconnect coupling.

Chapter 3 Troubleshooting

Explains what action should be taken on the occurrence of error, how to clear alarm and how to verify error records.

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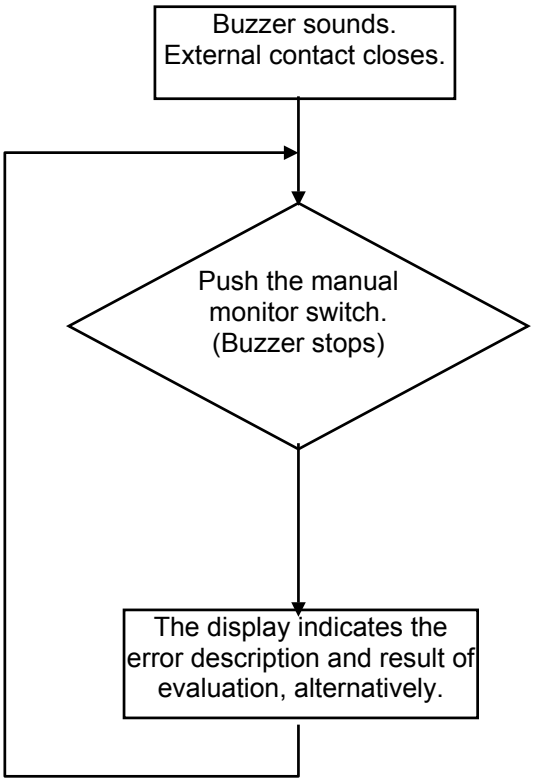
3-1 About error indications and how to clear alarms

On the occurrence of an error, a typical example of a possible cause of the error is indicated in the LCD display. Refer to the “Troubleshooting” flowchart for other causes.
If an error could not be recovered, contact your dealer immediately.

Error indications on an alarm (common to all errors in the self-check error mode)

When an error occurs, the system sounds a buzzer and the external alarm’s master output contact closes. The LCD display will alternately indicate the error description and most recent result of evaluation (or, “****:- - - -,“ if no evaluation is being made). (Note: Only the error description will be indicated in case of a DIP switch setting error.)



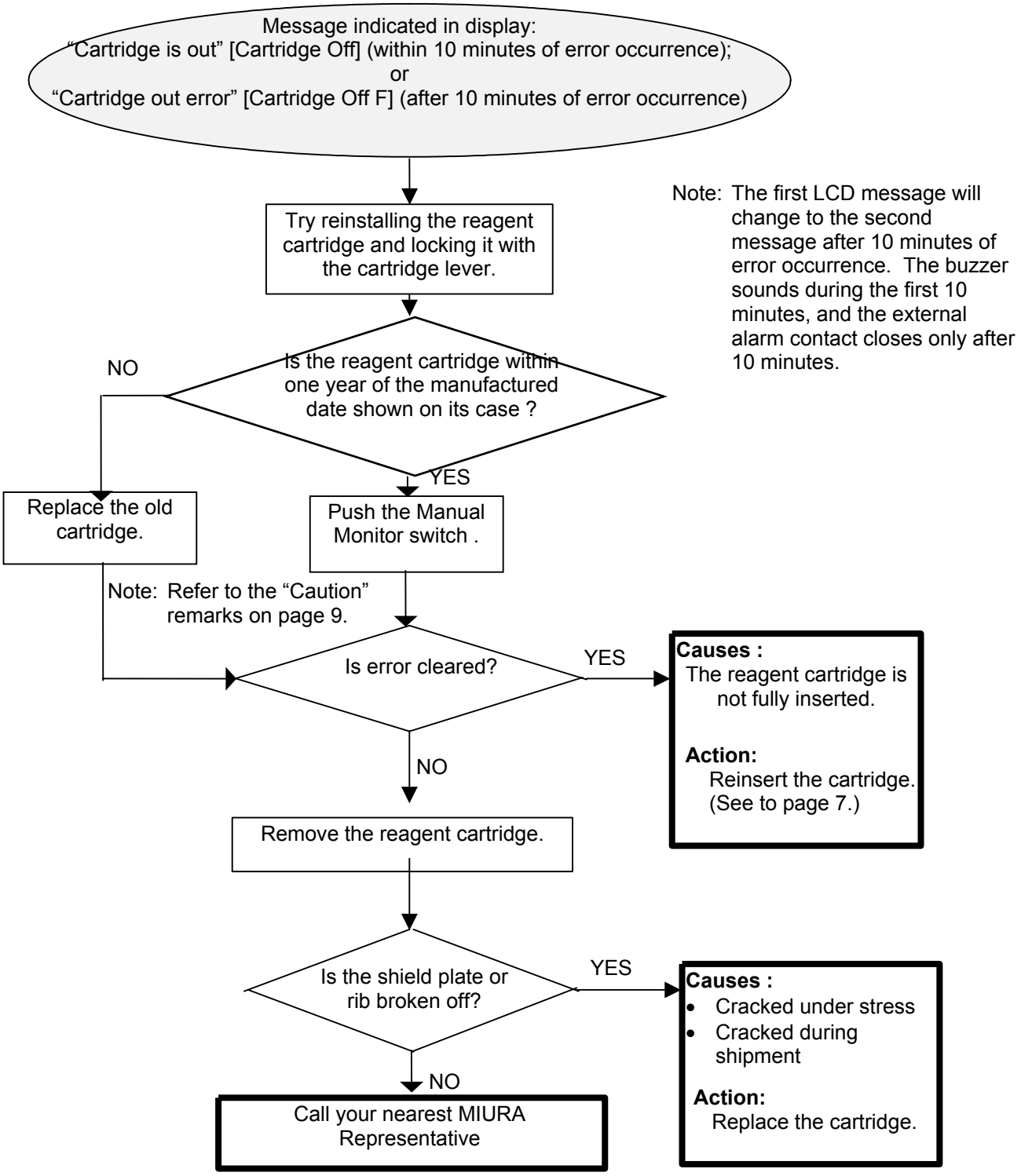
How to clear alarm

- With the buzzer sounding, press the Buzzer Reset (Manual Monitor) switch to stop it. Pressing the switch will not start the Manual-monitoring mode. Pressing the switch once again will start the Self-check or Monitor mode. The external alarm's master contact will not be reset until the condition is evaluated as normal again.
- If the conditions for monitoring are satisfied, monitoring will start even if an alarm is on. Alarm will automatically be cleared if the cause for system error has solved. However, if the error is due to unattachment of the cartridge, monitoring (self-check mode) will not start until attachment of the cartridge is confirmed. Monitoring will not start either on a DIP switch setting error, until the correct settings are made and system is restarted.

Note: The Buzzer Reset switch also functions as the Manual Monitor switch.

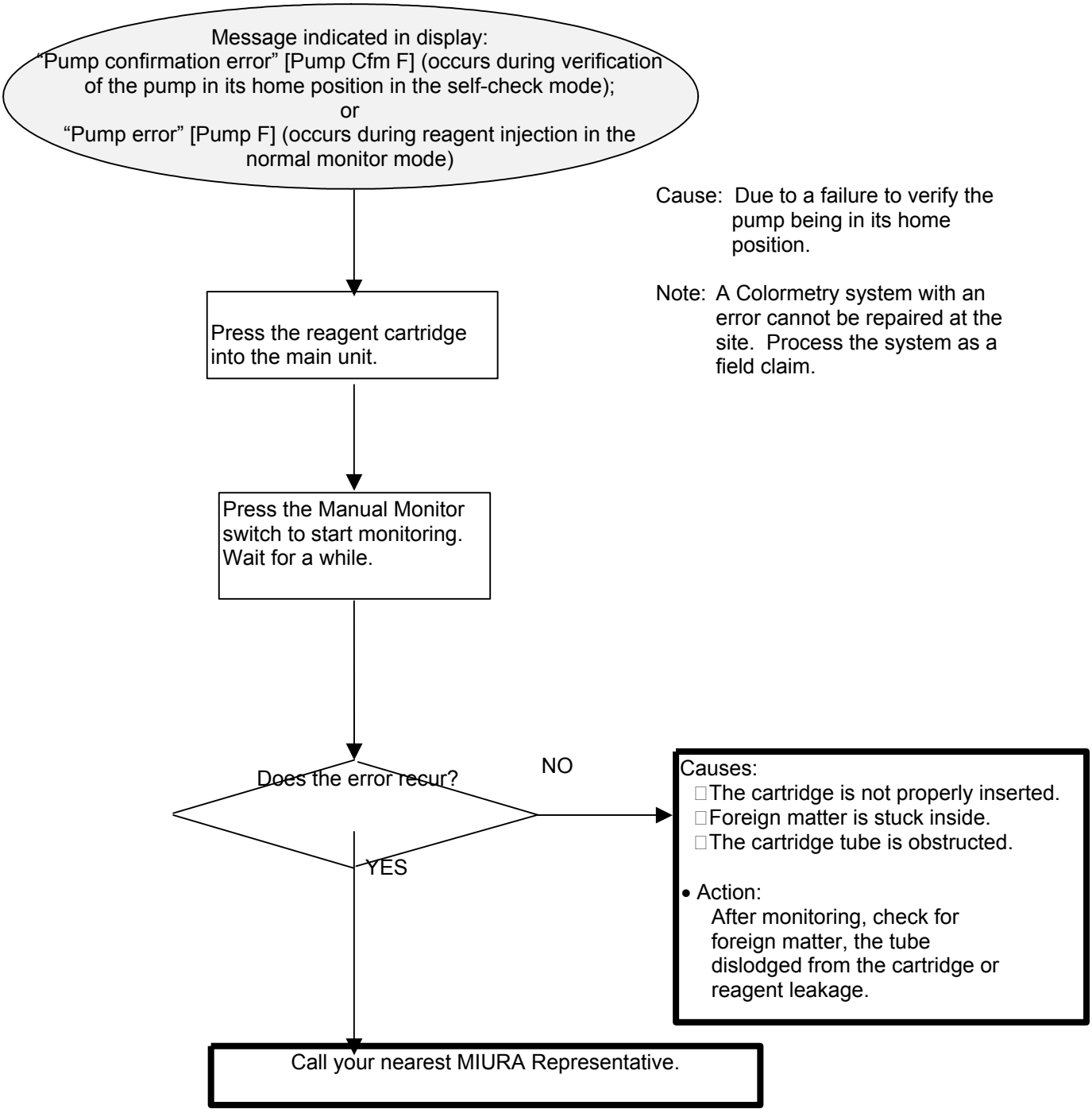
3-2 Troubleshooting

Cartridge Error

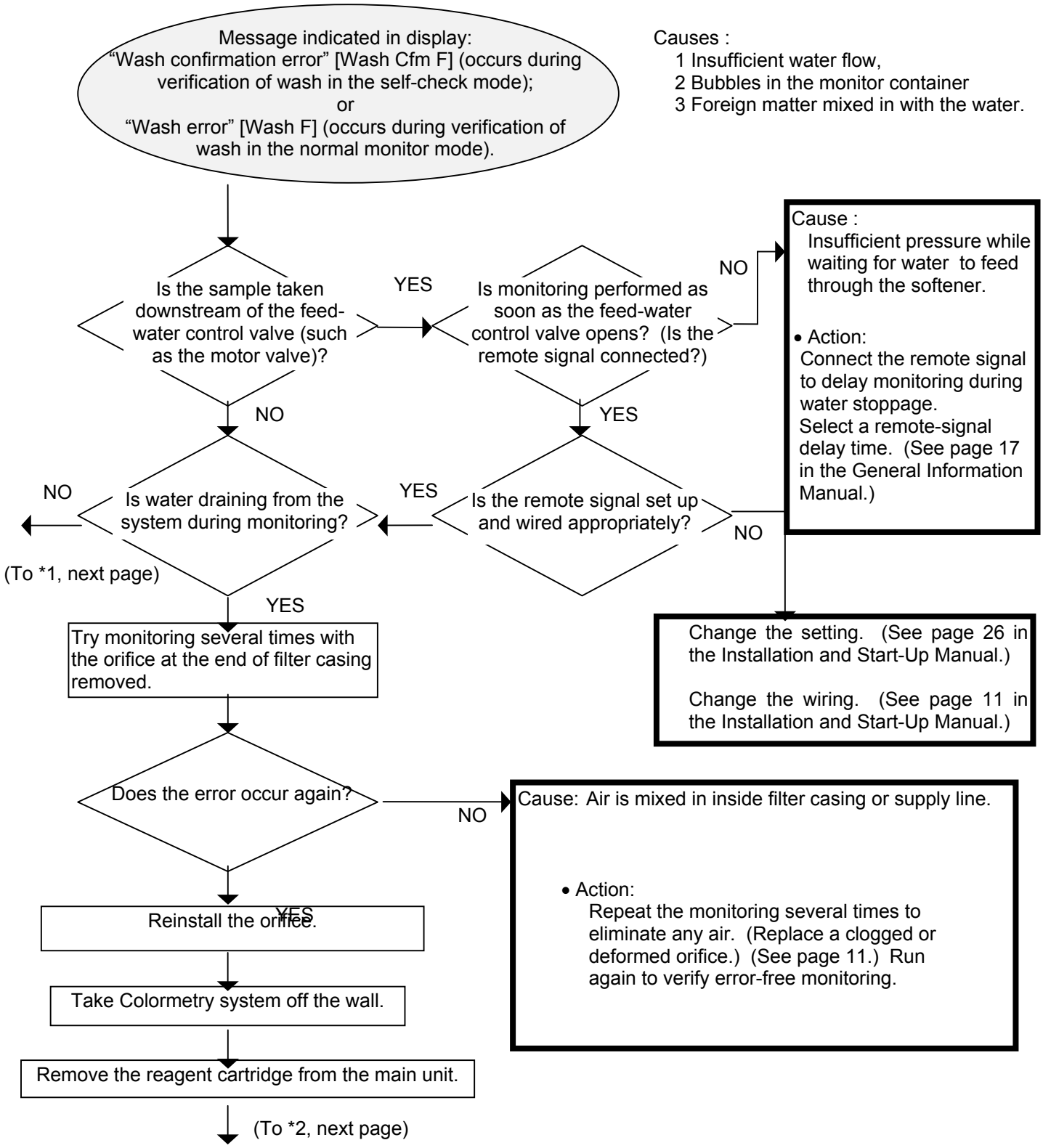


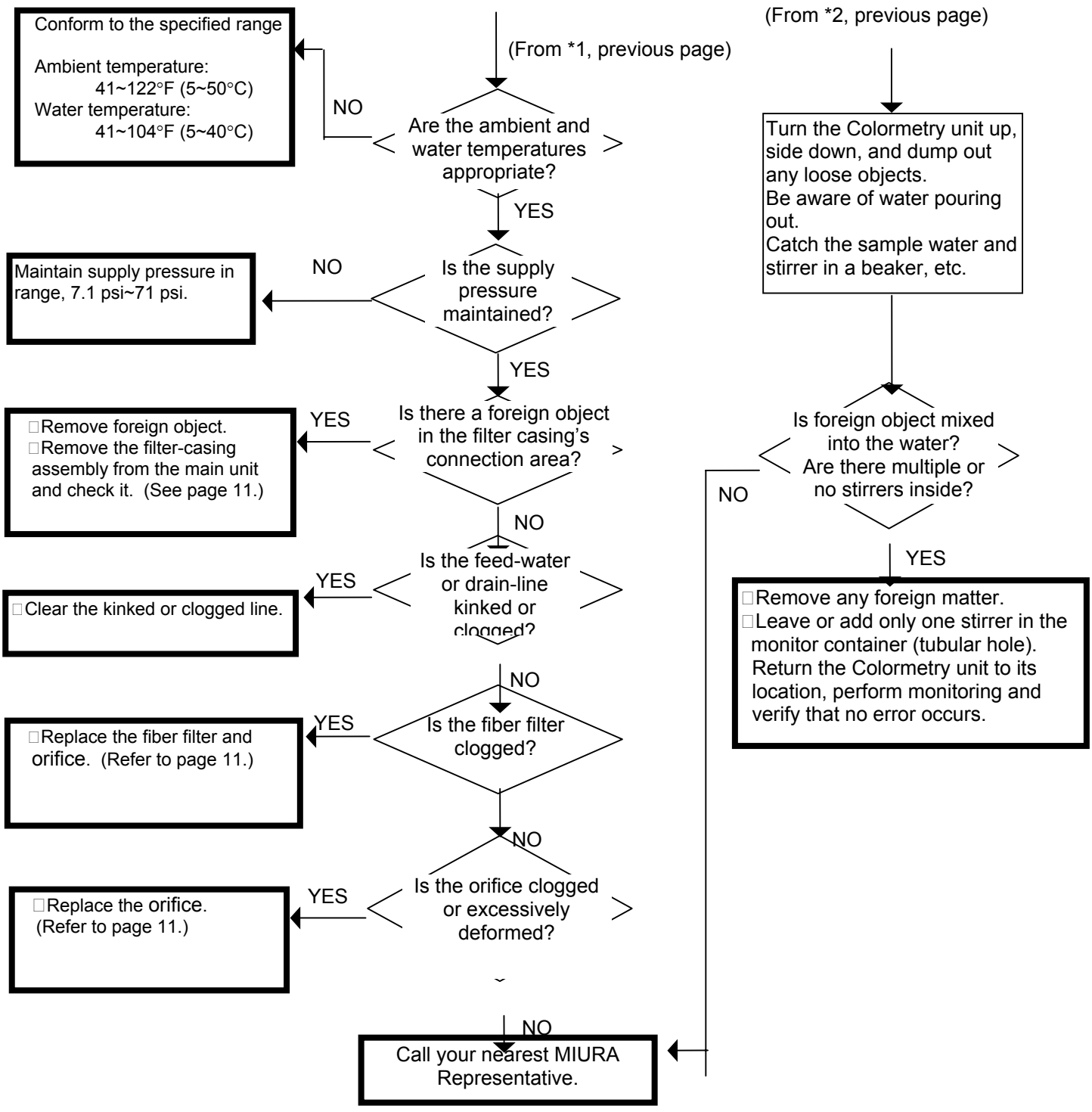
Note: The first LCD message will change to the second message after 10 minutes of error occurrence. The buzzer sounds during the first 10 minutes, and the external alarm contact closes only after 10 minutes.

Internal Pump Error

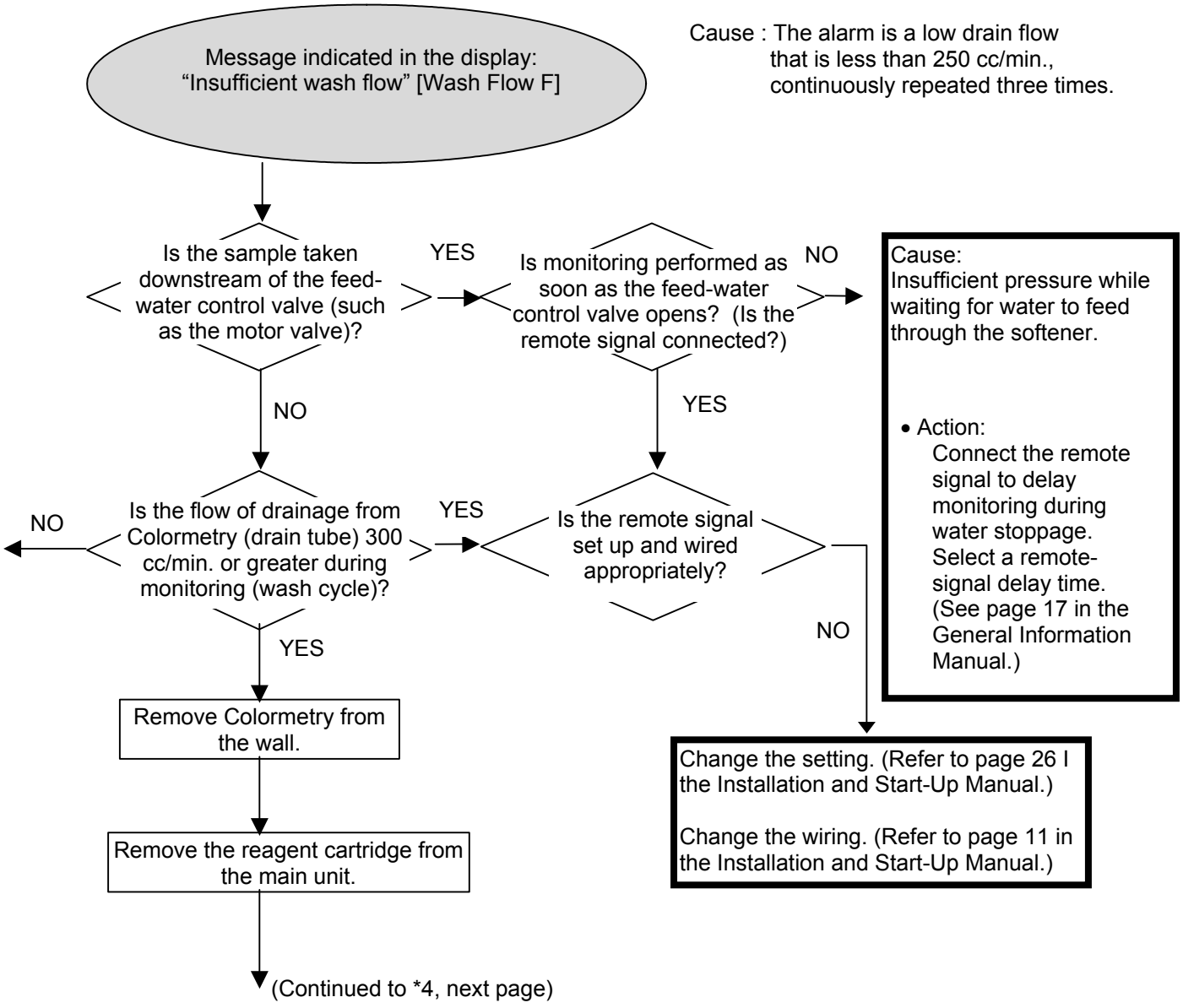


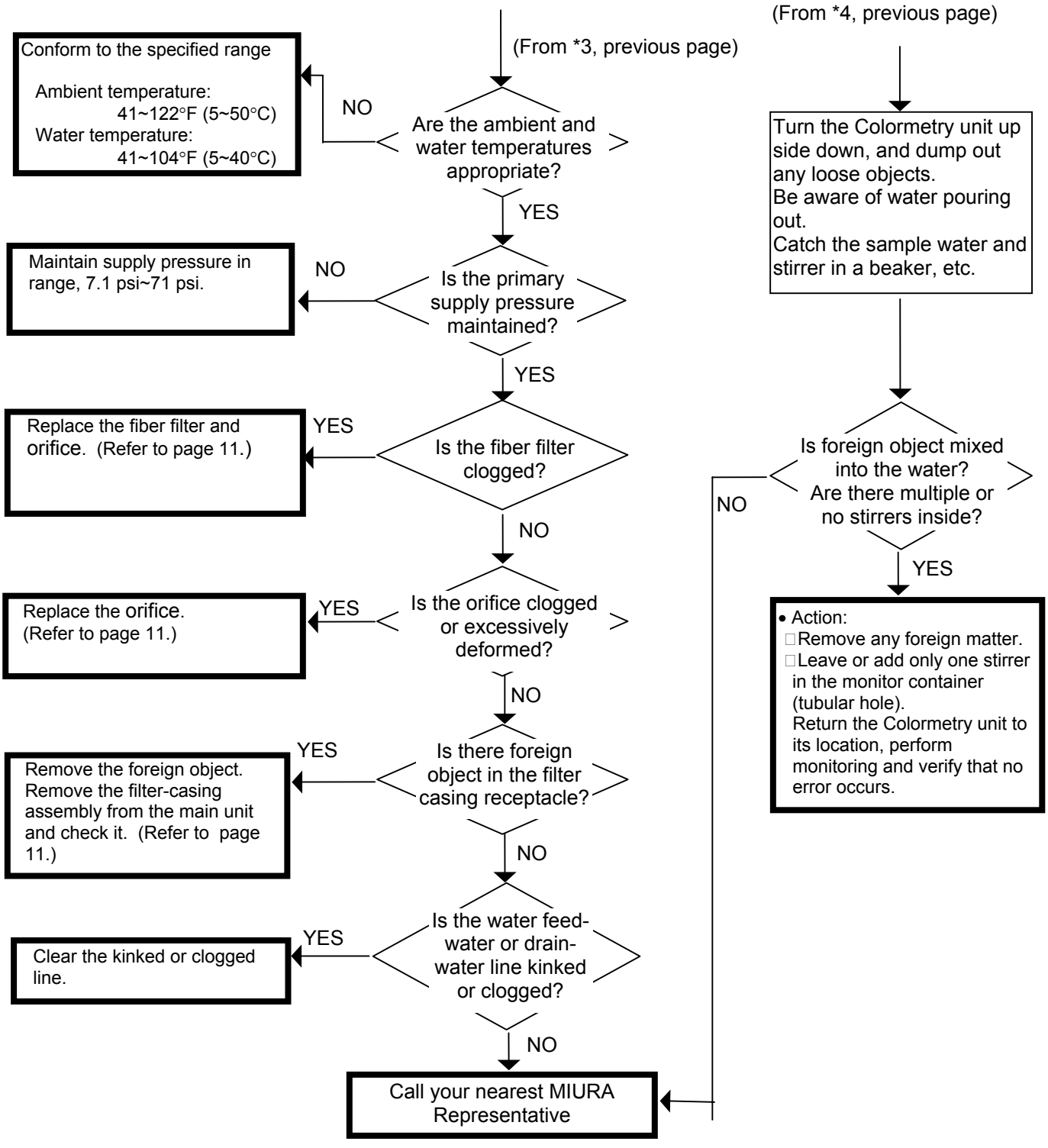
Wash Error


Message indicated in display:
"Wash confirmation error" [Wash Cfm F] (occurs during verification of wash in the self-check mode);
or
"Wash error" [Wash F] (occurs during verification of wash in the normal monitor mode).
Causes :
1 Insufficient water flow,
2 Bubbles in the monitor container
3 Foreign matter mixed in with the water.
Is the sample taken downstream of the feed-water control valve (such as the motor valve)?
YES
Is monitoring performed as soon as the feed-water control valve opens? (Is the remote signal connected?)
NO
Cause :
Insufficient pressure while waiting for water to feed through the softener.
• Action:
Connect the remote signal to delay monitoring during water stoppage.
Select a remote-signal delay time. (See page 17 in the General Information Manual.)
NO
YES
NO
Is water draining from the system during monitoring?
YES
Is the remote signal set up and wired appropriately?
NO
(To *1, next page)
YES
Try monitoring several times with the orifice at the end of filter casing removed.
Change the setting. (See page 26 in the Installation and Start-Up Manual.)
Change the wiring. (See page 11 in the Installation and Start-Up Manual.)
Does the error occur again?
NO
Cause: Air is mixed in inside filter casing or supply line.
• Action:
Repeat the monitoring several times to eliminate any air. (Replace a clogged or deformed orifice.) (See page 11.) Run again to verify error-free monitoring.
YES
Reinstall the orifice.
Take Colormetry system off the wall.
Remove the reagent cartridge from the main unit.
(To *2, next page)

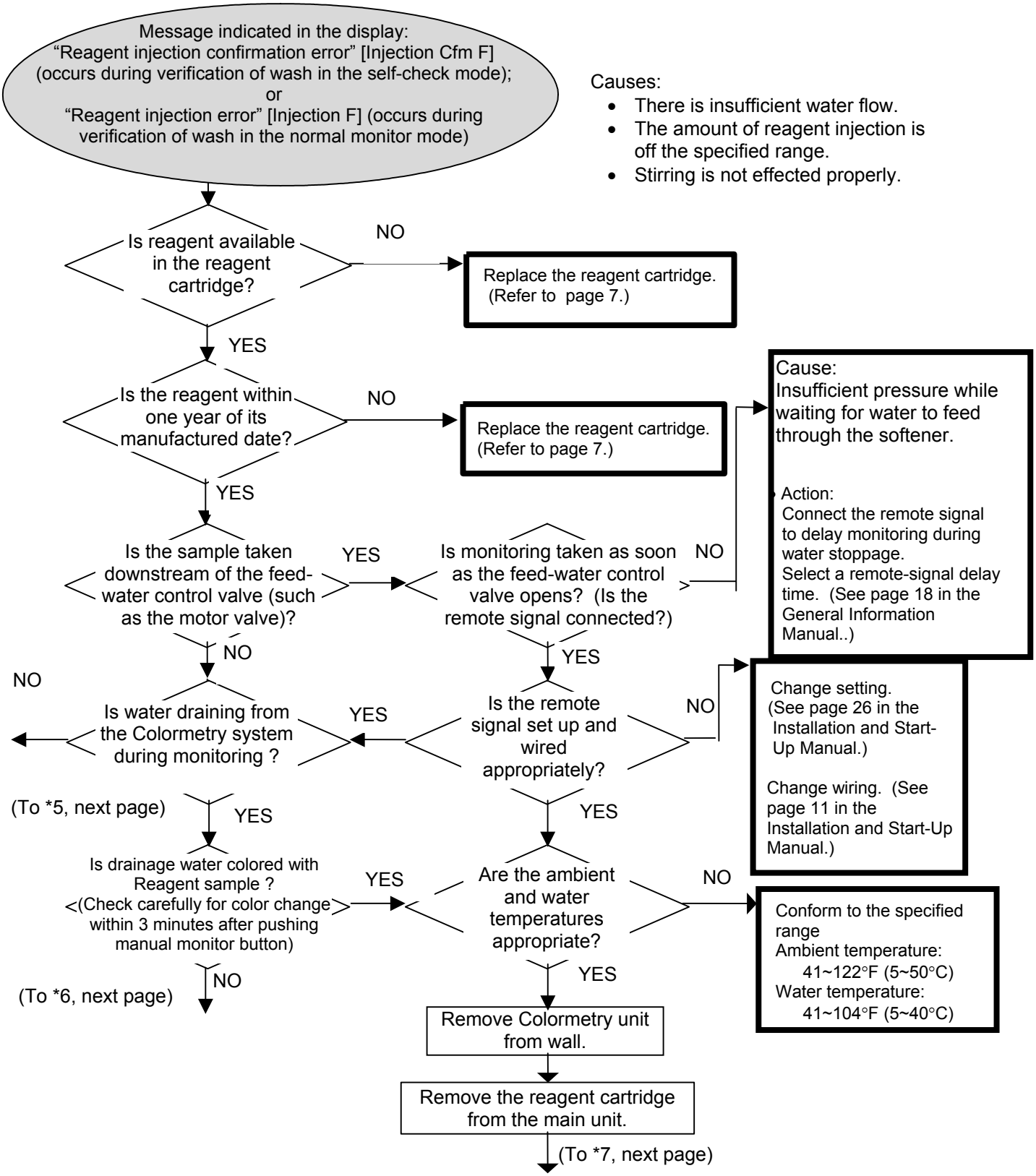

(From *1, previous page)
Are the ambient and water temperatures appropriate?
NO
Conform to the specified range
Ambient temperature:
41~122°F (5~50°C)
Water temperature:
41~104°F (5~40°C)
YES
Is the supply pressure maintained?
NO
Maintain supply pressure in range, 7.1 psi~71 psi.
YES
Is there a foreign object in the filter casing's connection area?
YES
Remove foreign object.
Remove the filter-casing assembly from the main unit and check it. (See page 11.)
NO
Is the feed-water or drain-line kinked or clogged?
YES
Clear the kinked or clogged line.
NO
Is the fiber filter clogged?
YES
Replace the fiber filter and orifice. (Refer to page 11.)
NO
Is the orifice clogged or excessively deformed?
YES
Replace the orifice. (Refer to page 11.)
NO
Call your nearest MIURA Representative.
(From *2, previous page)
Turn the Colormetry unit up, side down, and dump out any loose objects.
Be aware of water pouring out.
Catch the sample water and stirrer in a beaker, etc.
Is foreign object mixed into the water? Are there multiple or no stirrers inside?
NO
YES
Remove any foreign matter.
Leave or add only one stirrer in the monitor container (tubular hole).
Return the Colormetry unit to its location, perform monitoring and verify that no error occurs.

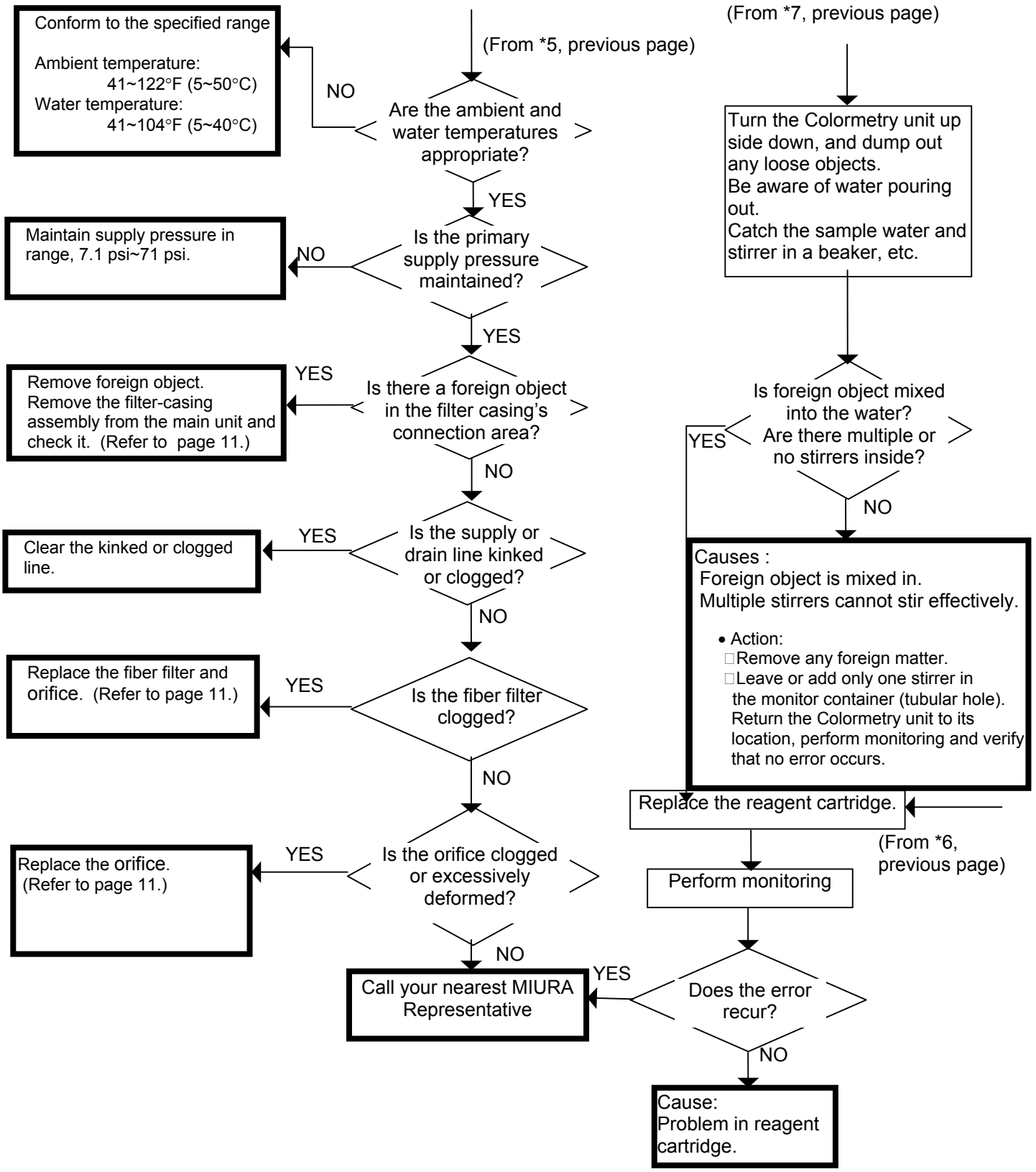
Insufficient Wash Flow Error



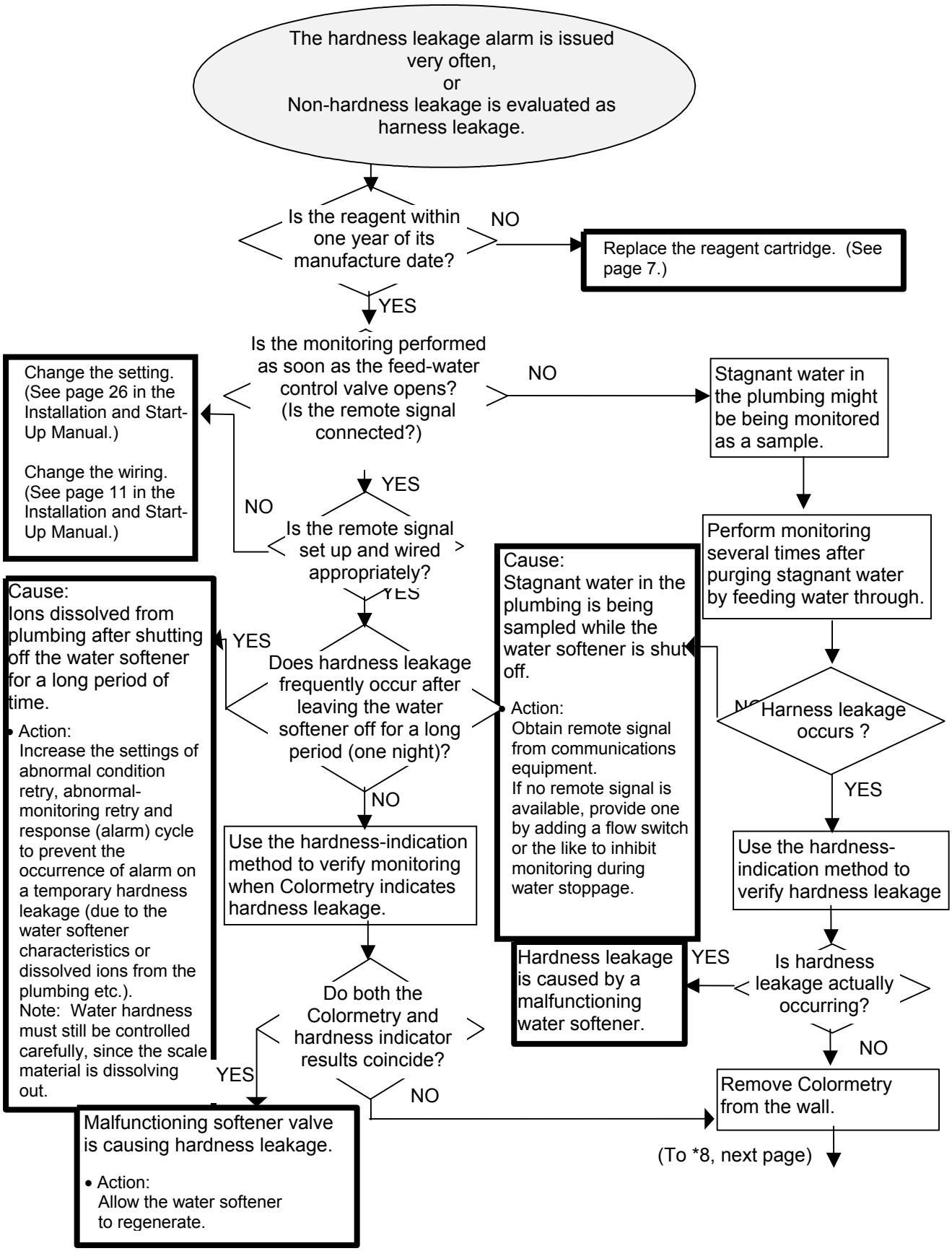

(From *3, previous page)
Are the ambient and water temperatures appropriate?
NO
Conform to the specified range
Ambient temperature:
41~122°F (5~50°C)
Water temperature:
41~104°F (5~40°C)
YES
Is the primary supply pressure maintained?
NO
Maintain supply pressure in range, 7.1 psi~71 psi.
YES
Is the fiber filter clogged?
YES
Replace the fiber filter and orifice. (Refer to page 11.)
NO
Is the orifice clogged or excessively deformed?
YES
Replace the orifice. (Refer to page 11.)
NO
Is there foreign object in the filter casing receptacle?
YES
Remove the foreign object. Remove the filter-casing assembly from the main unit and check it. (Refer to page 11.)
NO
Is the water feed-water or drain-water line kinked or clogged?
YES
Clear the kinked or clogged line.
NO
Call your nearest MIURA Representative
(From *4, previous page)
Turn the Colormetry unit up side down, and dump out any loose objects.
Be aware of water pouring out.
Catch the sample water and stirrer in a beaker, etc.
Is foreign object mixed into the water? Are there multiple or no stirrers inside?
NO
YES
• Action:
Remove any foreign matter.
Leave or add only one stirrer in the monitor container (tubular hole).
Return the Colormetry unit to its location, perform monitoring and verify that no error occurs.

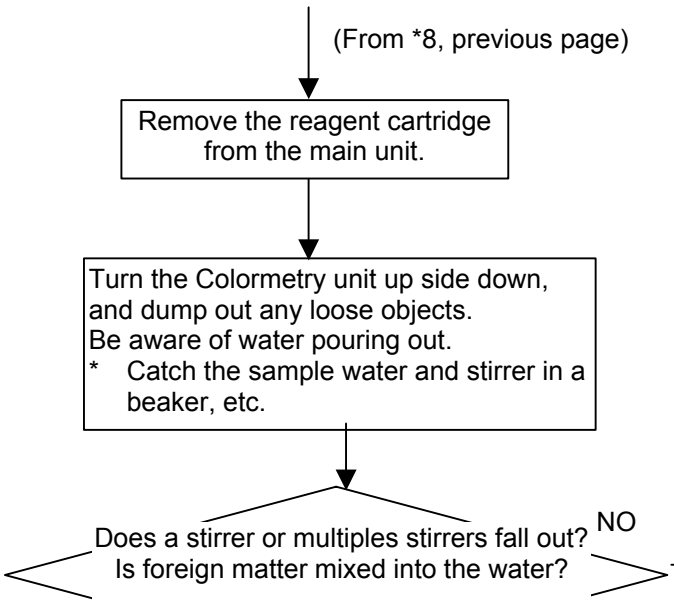
Reagent Injection Error




(From *5, previous page)
Are the ambient and water temperatures appropriate?
NO
Conform to the specified range
Ambient temperature:
41~122°F (5~50°C)
Water temperature:
41~104°F (5~40°C)
YES
Is the primary supply pressure maintained?
NO
Maintain supply pressure in range, 7.1 psi~71 psi.
YES
Is there a foreign object in the filter casing's connection area?
YES
Remove foreign object.
Remove the filter-casing assembly from the main unit and check it. (Refer to page 11.)
NO
Is the supply or drain line kinked or clogged?
YES
Clear the kinked or clogged line.
NO
Is the fiber filter clogged?
YES
Replace the fiber filter and orifice. (Refer to page 11.)
NO
Is the orifice clogged or excessively deformed?
YES
Replace the orifice. (Refer to page 11.)
NO
Call your nearest MIURA Representative
(From *7, previous page)
Turn the Colormetry unit up side down, and dump out any loose objects.
Be aware of water pouring out.
Catch the sample water and stirrer in a beaker, etc.
Is foreign object mixed into the water?
Are there multiple or no stirrers inside?
YES
NO
Causes :
Foreign object is mixed in.
Multiple stirrers cannot stir effectively.
• Action:
Remove any foreign matter.
Leave or add only one stirrer in the monitor container (tubular hole). Return the Colormetry unit to its location, perform monitoring and verify that no error occurs.
Replace the reagent cartridge.
(From *6, previous page)
Perform monitoring
Does the error recur?
YES
NO
Cause:
Problem in reagent cartridge.

Constant Hardness Alarms





Causes :

- Trace hardness leakage due to water-softener problems.
- Excessive amount of metal ion dissolution from the plumbing and elsewhere.

• Action:
Allow the water softener to regenerate.
Check out the plumbing for corrosion.
Avoid the use of material that is prone to dissolution of metallic ions (such as white gas plumbing).

Note: Metal ions, Zn, Cu, etc., react the same way as the hardness indication method.

- Results of evaluation of zinc ions by Colormetry

Unit: mg/L

	Zn concentration		
	0.5	1.0	2.0
Total hardness 0	1	1.5	3
Total hardness 1	2	2.5	5

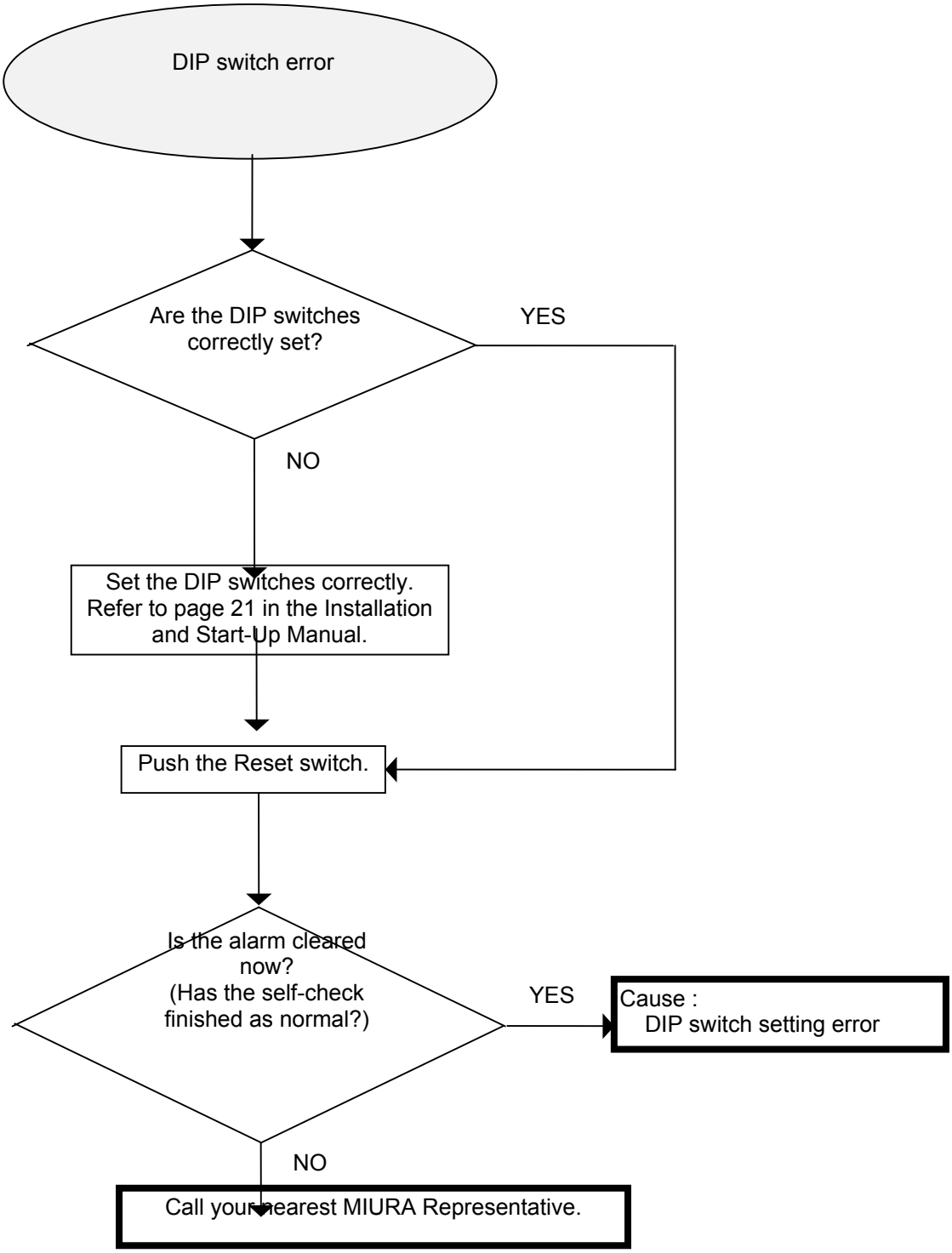
- Results of evaluation of copper ions by Colormetry

Unit: mg/L

	Cu concentration		
	0.5	1.0	2.0
Total hardness 0	0.75	1.8	5
Total hardness 1	2	3.3	5

- Results of evaluation of iron-ion concentration by Colormetry
Colormetry monitoring is not especially affected by iron.

DIP Switch Error

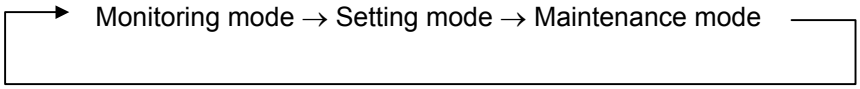


3-3 Verifying error records (How to use Maintenance mode)

Historical records of hardness leakage and system errors may be checked in Maintenance mode. Additionally, input and output status and other abnormalities may also be displayed in Maintenance mode, but they are not required during on-site repairs.
Normally useful items in the records are listed below.

Starting and exiting from Maintenance mode

Each depression of the display indicator switch changes modes as follows:



- Starting Maintenance mode: Press the display indicator switch as required to start Maintenance mode.
- Exiting from Maintenance mode: Press the indicator to exit from Maintenance mode.

If no switch is operated for 10 minutes, however, the mode changes to Monitoring mode automatically.

Items displayed in Maintenance mode

In the table shown below, the items under category 1 are selected by the Item switch, and those under category 2 by the Up switch.

Category 1	Category 2	LCD display (an example)	Range of indicated values
M Result hardness		MHardness 2.0 mg/L	(Note 1)
M CPU version		MCPUver DE111012	***…CPU version
M Date(m/d/y) & time		M06/23/98 15:28	
Type of monitoring		Mhardness Mon	
M Input-output mode		MIN-OUT Mode *	(Note 2)
	M Output1	MOUT1 1111 1111	0000 0000-1111 1111
	M Output2	MOUT2 1111 1111	0000 0000-1111 1111
	M Input1	MIN1 1111 1111	0000 0000-1111 1111
	M Input1	MIN2 1111 1111	0000 0000-1111 1111
	M AD FF FF FF	MAD FF FF FF	00 00 00-FF FF FF
	M AD Thermista: FF	MAD (Thmsta): FF	00-FF
	M AD(R): FF FF	MAD(R): FF FF	00 00-FF FF
	M AD(-): 00 00	MAD(O): 00 00	
	M AD(G): FF FF	MAD(G): FF FF	00 00-FF FF
	M Pre Wash period 9.99 second	MWash Pd 9.99S	
	M Set M-alkalinity	MMAlkal<60mg/L	Under 60/300 and up
	M select from LED wavelength table	MWL:L	S/L
	M Operation status	MOp Stus: FF	00-FF
M Alarm description		MAlarm Content *	
	M Error table 1	MError1: 11111111	00000000-11111111
	M Error table 2	MError2: 11111111	00000000-11111111
M Cartridge data (Note 3)		MCartridge Dta *	
	M Cartridge replacement date(m/d/y)	MC Exc 06/23/98	
	M Cartridge used hours since replacement	MC Hrs 999999	00000-999999 (hours)
	M Reagent injection frequency since cartridge replacement	MRgt Inj Fqc 9999	0000-9999 (times)

Category 1	Category 2	LCD display (an example)	Range of indicated values
M Hardness leakage record 1 (Note 4)		MLeakage Log 1	
	M Date of Hardness leakage(m/d/y)	MDate 06/23/98	
	M Time of Hardness leakage	MTime 15:28	
	M Evaluation standard at concentration	MEvl Std Conc: 2	0-2
	M AD(R): FF FF	MAD(R): FF FF	00 00-FF FF
	M AD(□): 00 00	MAD(-): 00 00	
	M AD(G): FF FF	M AD(G): FF FF	00 00-FF FF
	M Total leakage minute	MLeakage Min9999	0000-9999 (minutes)
	M Date of reset(m/d/y)	MRset 06/23/98	
	M Time of reset	MRset Time 15:28	
M Hardness leakage record 2	(Same as “M Hardness leakage record 1”)		
M Hardness leakage record 3	(Same as “M Hardness leakage record 1”)		
M System error record 1 (Note 5)		MStm Fault Log 2	
	M Date of System error(m/d/y)	MDate 06/23/98	
	M Time of System error	MTime 15:28	
	M Error table 1	MError1: 11111111	00000000-11111111
	M Error table 2	MError2: 11111111	00000000-11111111
	M Date of reset(m/d/y)	MRset 06/23/98	
	M Time of reset	MRset Time 15:28	
M System error record 2	(Same as M system error record 1)		
M System error record 3	(Same as M system error record 1)		
M black out record 1 (Note 6)		MBlk Out Log 1 *	
	M Date of black out(m/d/y)	MDate 06/23/98	
	M Time of black out	MTime 15:28	
	M Date of reset(m/d/y)	MRset 06/23/98	
	M Time of reset	MRset Time 15:28	
M black out record 2	(Same as “M System error record 1”)		
M black out record 3	(Same as “M System error record 1”)		

Note 1: If the results of monitoring are in the 0—1mg/L, 1—2 mg/L , 2—5 mg/L, and 5 mg/L and up, the indicated values will be 0.0 mg/L, 1.0 mg/L, and 2.0 mg/L, and 5.0 mg/L, respectively. If the result is abnormal, the indicated value will be 9.9 mg/L.

Note 2: If a “>” symbol is indicated in the LCD display, it means there is an item to be selected by Up switch. Normally, the procedure is not utilized except in case of “M Set M-alkalinity.”

Note 3: The category indicates the date of cartridge installation, cumulative hours used and number of times used (number of times the injection pump has operated) since the date of installation.
When the number of hours or times used has reached 3,500 hours or times, a message to replace the reagent cartridge is displayed.

Note 4: The historical data for up to three most recent occurrences of hardness leakage is stored.
The cumulative operating time of hardness leakage, [M Total leakage minutes], counts time only if the remote signal function is set for “Monitoring in remote signal-on state.”

Note 5: The historical data for up to three most recent system errors is stored in this category.
The error table for the category describes previously occurred system errors.
The LCD indications of the error table in this category also corresponds to the table referred to in Note 5.
The LCD display will indicate [1] for the description of an error, as is the case with Note 6.

<Error table>

	B7	B6	B5	B4	B3	B2	B1	B0
Error code (1)	Replace reagent	Reagent-injection error	Reagent injection-pump error	Light-receptor error	Wash error	Reagent-injection error (K)	Wash error (K)	Reagent injection-pump error (K)
Error code (2)	Abnormal concentration	***	***	***	***	Decreased sample flow	DIP switch setting error	Cartridge out

Note: The notation (K) shows an error that has occurred in the self-check mode only.

Note 6: The historical data will be stored on up to three most recent power outage.

The error code describes an error currently occurring in the system. An error and a normal state are indicated by a [1] and [0], respectively.
[Example] In case of a reagent-injection error
Displays: M Table 1 = 0100 0000

3-4 How to reset

Ordinarily, no resetting action is required.

(1) Normal reset

All setting data and historical data are preserved when a reset is executed.

[1] How to execute a reset

Detach the front cover from the front side of the main unit, then press the Reset switch.

[2] How system operates when the Reset switch is pressed

Refer to Section 3-2-1, "(1) If the data-memory backup battery has been charged by the time the power is turned on . . . , or when reinitialized from a reset," on page 23 of the Installation and Start-Up Manual.

(2) All reset

When an all reset is executed, all setting data and historical record data will be initialized.

[1] How to execute an All Reset

a. Detach the front cover on the front of the main unit, and turn DIP switch DSW-8 to "On."
b. With DSW-8 turned to "On," press the Reset switch.
c. Check the display to verify that an "All clear" message is indicated following a "CPU version" message. When the "All clear" message disappears, return the DSW-8 to "Off."

[2] About the system after reset is executed

Refer to Section 3-2-1, "(2) If the data-memory backup battery has not been charged when the power is turned on, or when reinitialized after executing an All Reset, on page 23 of the Installation and Start-Up Manual.

Chapter 4 Digital display description

Explains the messages displayed in three modes.

4-1 Monitoring Mode 33
4-2 Set Mode..... 34
4-3 Maintenance Mode 34

4-1 Monitoring Mode

	Display	Description
1	CPUverDE111012	CPU version
2	Hardness Monitor	Hardness monitor
3	Pump Start Cfm	During verification of the pump in its home position
4	Self Check	Self check
5	Self Check Retry	Self check retry
6	Std-by: ----	Waiting foe monitoring stage
7	Std-by: 0-1mg/L	Monitor stand-by: 1mg/L or less
8	Std-by: 1-2mg/L	Monitor stand-by: Between 1mg/L and 2mg/L
9	Std-by: >2mg/L	Monitor stand-by: 2mg/L or more
10	Monitor On	Monitoring ionic concentration(hardness)
11	Monitor On Retry	Monitor on retry
12	Result: 0-1mg/L	Result: 1mg/L or less
	Std-by: 0-1mg/L	Monitor stand-by: 1mg/L or less
13	Result: 1-2mg/L	Result: Between 1mg/L and 2mg/L
	Std-by: 1-2mg/L	Monitor stand-by: Between 1mg/L and 2mg/L
14	Result: >2mg/L	Result: 2mg/L or more
	Std-by: >2mg/L	Monitor stand-by: 2mg/L or more
15	Warning: >1mg/L	Hardness leakage detected: 1mg/L or more
16	Warning: >2mg/L	Hardness leakage detected: 2mg/L or more
17	Cartridge OFF	Cartridge disconnected
18	Cartridge OFF F	Cartridge disconnected fault
19	Pump Cfm F	Pump confirmation error
20	Pump F	Reagent injection pump fault
21	Wash F	Insufficient pre-wash
22	Wash Cfm F	Faulty confirmation on pre-wash
23	Injection Cfm F	Faulty confirmation on reagent injection
24	Injection F	Incomplete reagent injection
25	Wash Flow F	Insufficient water flow for wash
26	Photo Rpt F	Photoreceptor fault
27	SW ON Cfm	Switch ON confirmed after cartridge replacement
28	Dip SW Err	Dip switch error
29	New Cartridge	Need cartridge replacement

4-2 Set Mode

	Display	Description
1	SDate 06/23/98	S Date (m/d/y) 06/23/98
2	STime 15:28	S Time 15:28
3	SIntvl 060min	S Monitor interval 60 min
4	SStart 08:30	S Start time 08:30
5	SStop 20:30	S Finish time 20:30
6	SRet Sgl Off	S Monitor by remote signal off
7	SRet Sgl On	S Monitor by remote signal on
8	SRet Sgl Dl 10s	S Remote signal time delay
9	SAlarm Set2.0mg/L	S Alarm set at 2mg/L
10	SAlarm Inc No:2	S 2 consecutive incidents set alarm off
	SAlarm Inc No:3	S 3 consecutive incidents set alarm off
11	SAlarm Det No:3	S 2nd leakage detection set alarm off
12	SC Rpl 06/23/98	S Cartridge replacement date(m/d/y)

S: Indicate Set Mode

4-3 Maintenance Mode

	Display	Description
1	MHardness 2.0mg/L	M Result hardness 2.0mg/L
2	MCPUver DE111012	M CPU version
3	M06/23/98 15:28	M Date(m/d/y) & time
4	MHardness Mon	M Hardness monitor
5	MIN-OUT Mode *	M Input-output mode
6	MOUT1 1111 1111	M Output1 1111 1111
7	MOUT2 1111 1111	M Output2 1111 1111
8	MIN1 1111 1111	M Input1 1111 1111
9	MIN2 1111 1111	M Input2 1111 1111
10	MAD FF FF FF	M AD FF FF FF
11	MAD (Thmsta): FF	M AD Thermista: FF FF
12	MAD(R): FF FF	M AD(R): FF FF
13	MAD(-): 00 00	M AD(-): 00 00

14	MAD(G): FF FF	M AD(G): FF FF
15	MWash Pd 9.99S	M Pre Wash period 9.99 secoud
16	MMAlkal < 60mg/L	M Set M-alkalinity at 60mg/L or less
	MMAlkal < 120mg/L	M Set M-alkalinity at 60mg/L to 120mg/L
	MMAlkal < 300mg/L	M Set M-alkalinity at 120mg/L to 300mg/L
	MMAlkal <500mg/L	M Set M-alkalinity at 300mg/L to 500mg/L
17	MWL: L	M select from LED wavelength table: L
	MWL: S	M select from LED wavelength table: S
18	MOp Stus: FF	M Operation status: FF
19	MAlarm Content *	M Alarm description
20	MError1: 11111111	M Error table 1: 11111111
21	Merror2: 11111111	M Error table 2: 11111111
22	MCartridge Dta *	M Cartridge data
23	MC Exc 06/23/98	M Cartridge replacement data(m/d/y)
24	MC Hrs 999999	M Cartridge used hours since replacement: 999999
25	MRgt Inj Fqc9999	M Reagent injection frequency since cartridge replacement: 9999
26	MLeakage Log1 *	M Hardness leakage record 1
27	MDate 06/23/98	M Date of Hardness leakage(m/d/y) 06/23/98
28	MTime 15:28	M Time of Hardness leakage 15:28
29	MEvl Stg Conc: 2	M Evaluation standard at concentration of 2
30	MLeakage Min9999	M Total leakage minute: 9999min.
31	MRset 06/23/98	M Date of reset (m/d/y): 06/23/98
32	MRset Time 15:28	M Time of reset: 15:28
33	MStm Fault Log1*	M System error record 1
34	MBlk Out Log1 *	M black out record 1

M: Indicate Maintenance Mode

Maintenance Mode display can be changed by pressing the “Items” switch.
In the event an * mark appears, mode/display can be changed by pressing the “UP” switch.