

OM

Operation Manual

Tetra Alcip[®] 10
TPOP MINI



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This document is valid for:

Series No/ Machine No

OM

Operation Manual

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Doc No. OM-1213424-0101

Issue 2002-01

Tetra Pak
Tetra Pak Dairy & Beverage Systems AB



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Introduction

This section contains basic information about this manual and the Tetra Pak equipment described.



WARNING!

To ensure maximum safety, always read the section **Safety precautions** before carrying out any work on the unit.

Equipment

Intended use of this Tetra Pak equipment

This unit is intended for use according to the specifications in **Technical data** (see **Technical Manual**) and related documents.

Tetra Pak will not be held responsible for injury or damage if the equipment is used for any other purpose.

Service

If problems are encountered when operating the unit, contact the nearest Tetra Pak service station.

Manufacturer

This Tetra Pak equipment was produced by:

Tetra Pak Dairy & Beverage Systems AB
Box 64
S-221 00 LUND
Sweden

Unit identification

All units carry a machine plate stating:

- unit identification
- data unique to the unit

Have this information available before contacting Tetra Pak concerning this particular unit.

The diagram shows a rectangular machine plate with rounded corners and two small circles at the top and bottom corners. At the top center is the Tetra Pak logo. Below the logo are five input fields for identification data:

- Machine Type:
- Drawing Spec.:
- Machine No.:
- Manufacturer:
- Year of manufacture: - -



Document

Operation Manual (OM)

The purpose of this Operation Manual is to provide the operator with information on how to operate the machine.

Tetra Pak recommend that you study it carefully, and - above all - ensure its availability to those who will be operating the unit.

Furthermore, it is important that you:

- keep the manual for the life of the equipment
- pass the manual on to any subsequent owner or user of the equipment.

Tetra Pak will not be held responsible for any breakdown of the equipment caused by the owner's failure to follow the instructions given in this manual.

Design modifications

The information given in this document is in accordance with the design and construction of the machine at the time it was delivered by the Tetra Pak machine production facility.

Further copies

Additional copies can be ordered from the nearest Tetra Pak service station.

When ordering technical publications, always quote the **document number** printed on the front cover of the document concerned.

Document producer

This document was produced by:

Tetra Pak Dairy & Beverage Systems AB
Box 64
S-221 00 LUND
Sweden

Number of pages

This document contains a total of 56 pages.

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Safety precautions

To ensure maximum safety for the operator, always read this section carefully before carrying out any work on the machine or making any adjustments.

Use of hazard information



DANGER!

Failure to observe this information results in immediate danger to life.



WARNING!

Failure to observe this information can result in major personal injury or loss of life

Caution!

Failure to observe this information can result in minor personal injury or damage to the equipment.



General

Only trained personnel are allowed to operate the machine. The machine may only be used in accordance with the instructions given in the manuals delivered with the equipment.

If the safety precautions are not followed, there is risk of personal injury.

This is an automated machine. It is controlled by a process controller and will change its mode of operation without operator intervention. All personnel must therefore:

- stay outside the safety area
- regard all electrical equipment as live
- regard all pipes as hot
- use hearing protection.

Before carrying out maintenance and repair:

- shut off main steam supply
- switch off power
- allow the machine to cool down and adjust to atmospheric pressure
- rinse out concentrated chemicals and cleaning solution with water from pipes and pumps
- inform the operator and other relevant personnel about the work you intend to do
- post warning signs in prominent places.

Pipes and other parts of this machine may be hot. Contact with hot equipment may result in severe burns. Avoid contact with hot equipment.

This machine operates under pressurized conditions. All personnel must therefore:

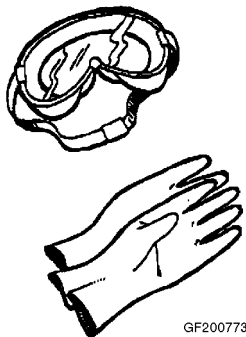
- watch out for leakage
- depressurize the equipment before attempting maintenance and repair work
- watch out for blasts of air/steam from safety valves.

Keep the doors of the control panel closed to protect it from water and steam.

Cleaning solution

Handling of cleaning solution

Cleaning solutions normally contain caustic soda (NaOH) or nitric acid (HNO₃). These chemicals may cause burning to skin and eyes. Follow the instructions given by the supplier.



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Whenever there is a risk of exposure to these chemicals, always wear:

- safety glasses
- protective gloves
- shoes made of PVC or PE plastic, or rubber
- apron.

In the case of an accident involving cleaning solution, the basic rule is to rinse the affected area as soon as possible with as much water as possible.

For this reason, always make sure that the showers work, that there are additional washing facilities, and that an eyewash device is available at or near each machine site.

Emergency precautions

If swallowed

If you happen to swallow cleaning solution:

- drink large amounts of lukewarm water (in order to dilute the cleaning solution); then seek medical attention immediately.

Contact with eyes

If cleaning solution is splashed into your eyes:

- wash the eyes thoroughly with lukewarm water for 15 minutes (keep eyelids widely apart); then seek medical attention immediately.

Contact with skin or clothes

If cleaning solution comes into contact with skin or clothes:

- rinse immediately with plenty of water
- thoroughly wash the clothes before they are worn again. If skin burns appear, seek medical advice immediately.

If inhaled

If you experience irritation or pain due to having inhaled vaporized cleaning solution:

- leave the affected area to get fresh air. If the symptoms become worse, seek medical advice.



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General description

Application

All food products demand a very strict standard of hygiene in the manufacturing process. The raw materials (e.g. milk, juice, beer) are in contact with a number of surfaces, all of which are potential sources of infection. Sterilization can reduce but not entirely eliminate the consequences of such an infection. The cleaning and disinfection equipment is therefore a most important aspect of the processing in a food plant.

Tetra Alcip 10 is a complete, frame mounted, Cleaning-in-place unit designed especially to meet the requirements of the food industry.

Control of the CIP is carried out by a process control system, once the program has been started, the cleaning sequence is fully automatic regarding times, temperatures, routing of liquids etc.

Requirements on personnel

Operator: basic knowledge of industrial processes.

Caution!

Unauthorized personnel

Operation by unauthorized personnel may endanger personnel and property.

Operator station

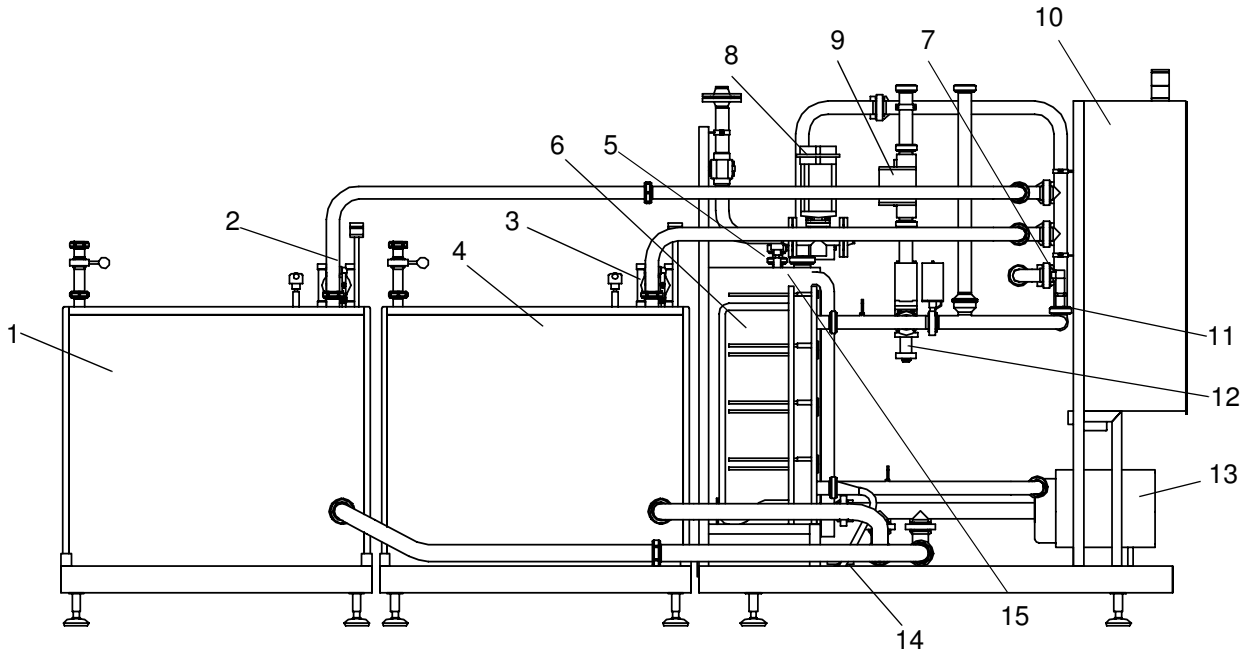
In front of the control panel.

Risk area

2 - 3 metres around the equipment due to:

- hot pipes and equipment
- jets of hot liquid

Denominations



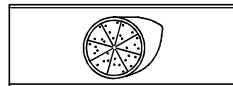
Symbol



Disinfectant metering pump



Lye metering pump



Acid metering pump

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- | | |
|-------------------------------|-----------------------------|
| 1 Acid buffert tank (option) | 9 Flow meter |
| 2 Acid metering pump (option) | 10 Control panel |
| 3 Lye metering pump (option) | 11 Conductivity transmitter |
| 4 Lye buffert tank (option) | 12 Flow regulating valve |
| 5 Level switch | 13 Pressure pump |
| 6 Plate heat exchanger | 14 Steam trap |
| 7 Flow switch | 15 Balance tank |
| 8 Steam regulating valve | |



Buffer tanks

The buffer tanks are used to:

- prepare cleaning solution
- contain cleaning solution to minimize cleaning solution losses

The tanks are equipped with low level switches indicating when the tanks are empty.

Control panel

Contains all equipment necessary for:

- indication of process status
- supervision of process performance
- control of automatic functions

Tetra Alcip automation is based on a process controller. This controller features:

- process sequence control
- timers
- control loops
- text display
- numeric and function keyboard
-

Plate heat exchanger (PHE)

PHE is used to heat the cleaning solution with use of steam. The plates are assembled in packs and clamped in a frame, each adjacent pair of plates forming a flow channel with the two media flowing in alternate channels. Two or more sections can be housed in the same frame.

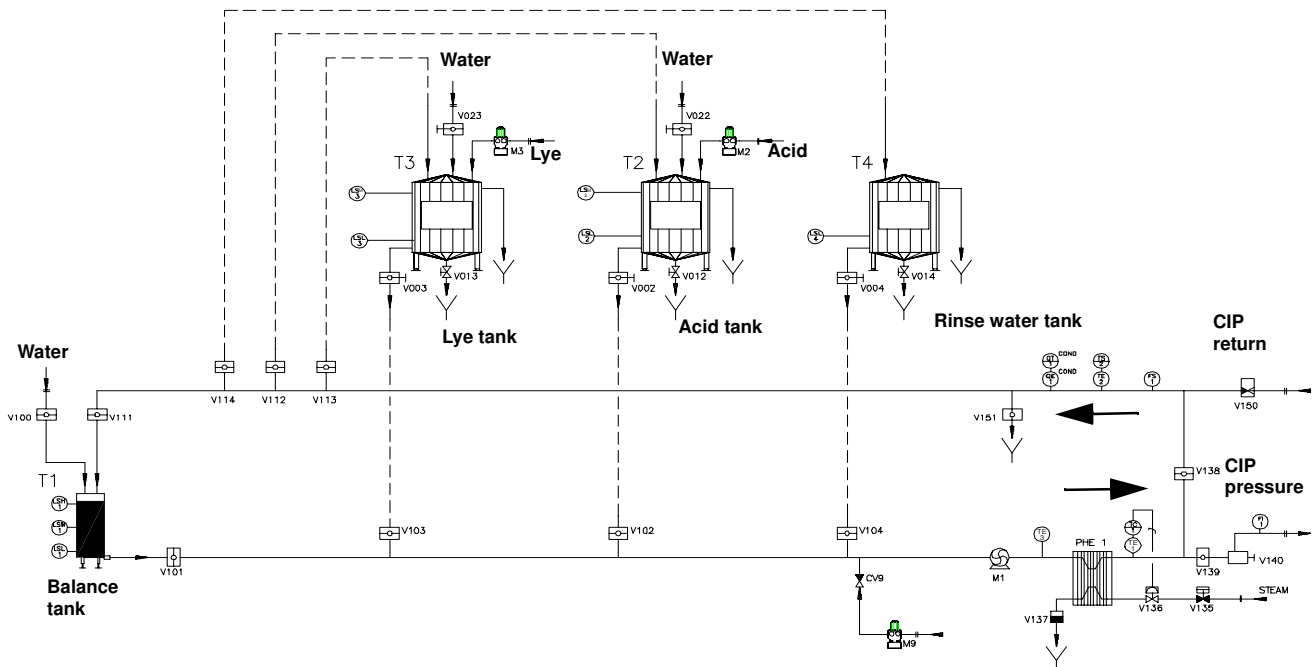


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Process description

Presented here is a flow chart simplified to enhance the understanding of the process. Please see complete flowchart in Technical Manual for details.



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Flow during circulation

Cleaning liquid is pumped by pump M1 out to the process lines/CIP circuits. Returning cleaning liquid flows back to the Tetra Alcip via CIP return pipes

Cleaning liquid flows:

- **during lye circulation:** through V103, M1, cleaning object, V113, and the CIP-solution tank,
- **during acid circulation:** through V102, M1, cleaning object, V112 and the CIP-solution tank.

Flow to drain

Returning flow is routed to drain via V151.

Flow during disinfection (Option)

Disinfectant is pumped into the CIP circuit via the metering pump M9 and the disinfection solution is circulated over the balance tank.



Flow during rinse

Water flows via V100, V101 and pump M1 out to the process lines. Remaining (in the pipes) cleaning liquid flows back to the Tetra Alcip via CIP return pipes. The mixture of cleaning liquid/water, and finally pure water, is routed to drain via V151.

Flow during recovery

Returning cleaning solution is routed to appropriate CIP-solution tank, or rinse water tank.

Flow during hot water circulation

Water is circulated through the cleaning circuit, by-passing the balance tank.

Cleaning of Active Cleaning Objects (ACO)

The cleaning sequence is controlled by the ACO; the Tetra Alcip merely executes the commands received.

The ACO can command the Tetra Alcip to:

- stand-by for cleaning of ACO,
- deliver liquid,
- collect liquid,
- heat the liquid being delivered.

The liquids available depends on the Tetra Alcip configuration (lye, acid, rinse water).

The conductivity instrument sorts the returned liquid to a tank or to drain.

Cleaning sequence step programmes

Tetra Alcip supports 11 types of programmes and a total of 16 cleaning circuits.

Preparation & emptying programs

31. Lye preparation
32. Acid preparation
41. Lye emptying
42. Acid emptying
52. Rinse water emptying

Cleaning programmes

1. Lye
2. Acid
3. Lye and acid
4. Disinfection
5. Hot water
6. Flush



Programme sequence steps

No	Description	Note
1	Water to object Water is flushed through the cleaning circuit for a preset time. Heating is started.	Water from balance tank if rinse water does not exist
21	Lye to object Water in the circuit is purged to drain by lye solution until lye reaches concerned circuit.	In-line system: water from circulation tank
22	Empty object Pump and heating stops during a preset time to allow the tank to be completely drained.	The step is jumped by unless "Tank" is configured in "Object type selection".
23	Lye to CIP unit Heating restarts and water in the circuit is purged to drain by lye solution until the conductivity transmitter in the return pipe detects the lye solution. This step is supervised by a min. and a max. time.	In line system: water from circulation tank, maximum filling time is used as step condition.
24	In-line dosing Lye solution is dosed while water is circulated for a preset time.	The step is jumped by if In-line system is not configured
25	Lye circulation Hot lye is circulated during a preset time. If temperature drops below a preset value the time counting will stop. Time counting restarts when correct temperature is achieved.	
30	Empty balance tank balance tank is completely emptied.	The step is jumped by if In-line system is not configured
31	Water to object Lye in the circuit is purged to lye tank by water until water reaches concerned circuit.	In-line system: return to drain.
32	Empty object Pump and heating stops during a preset time to allow the tank to be completely drained.	The step is jumped by unless "Tank" is configured in "Object type selection".
33	Lye recovery Water purges the lye in the circuit to the CIP solution tank. Purge continues until the conductivity transmitter in the return pipe detects water. This step is supervised by a minimum and a maximum time.	
41	Acid to object Water in the circuit is purged to drain by acid solution until acid reaches concerned circuit.	
42	Empty object Pump and heating stops during a preset time to allow the tank to be completely drained.	The step is jumped by unless "Tank" is configured in "Object type selection".

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No	Description	Note
43	Acid to CIP unit Heating restarts and water in the circuit is purged by acid solution until the conductivity transmitter in the return pipe detects the acid solution. This step is supervised by a min. and a max. time.	In-line system: water from balance tank, maximum filling time is used as step condition.
44	In-line dosing Acid solution is dosed while water is circulated for a preset time.	The step is jumped by if In-line system is not configured
45	Acid circulation Hot acid is circulated during a preset time. If temperature drops below a preset value the time counting will stop. Time counting restarts when correct temperature is achieved.	
50	Empty balance tank Balance tank is completely drained.	The step is jumped by if In-line system is not configured
51	Water to object Acid in the circuit is purged to acid tank by water until water reaches concerned circuit.	In-line system: return to drain.
52	Empty object Pump and heating stops during a preset time to allow the tank to be completely empty.	The step is jumped by unless "Tank" is configured in "Object type selection".
53	Acid recovery Water purges the acid in the circuit to the CIP solution tank. Purge continues until the conductivity transmitter in the return pipe detects water. This step is supervised by a minimum and a maximum time.	
61	Hot water circulation Water is circulated for a preset time. If the temperature drops below a preset value the time counting will stop. Time counting restarts when correct temperature is achieved.	
62	Final hot water rinse Water flows through the circuit to drain for a preset time.	The step is executed only if temperature set-point is > 0 °C.
71	Water to object Water is sent to the circuit for a preset time.	
72	Empty object Pump and heating stops during a preset time to allow the tank to be completely drained.	The step is jumped by unless "Tank" is configured in "Object type selection".
73	Water to CIP unit Heating restarts and water in the circuit is flushed to drain for a preset time.	
74	In-line dosing Disinfection is dosed while water is circulated for a preset time.	

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No	Description	Note
75	Disinfection circulation Water and disinfection is circulated during a preset time. If temperature drops below a preset value the time counting will stop. Time counting restarts when correct temperature is achieved.	
76	Empty balance tank Balance tank is completely emptied.	
77	Final disinfection rinse Water flows through the circuit to drain for a preset time.	
81	Water to object Water is flushed through the circuit to drain for a preset time.	Return to rinse water tank if program no. 6 is not operating.
91	Empty object Pump and heating stops during a preset time to allow the tank to be completely drained.	Return to rinse water tank if program no. 6 is not operating. (The step is jumped by unless Tank is configured in Object selection)



Indications during cleaning of ACO

A step sequence is not used in Tetra Alcip during cleaning of ACO.

The function/command in progress is indicated on the operators panel (TPOP as a three digit value.

1:st digit	= "8"	Cleaning of ACO
	= "9"	Cleaning of ACO ^a
2:nd digit	request command function	
3:rd digit	return command function	

a. with the conductivity transmitter activating the return valve defined by the return function

The following values are used for the 2:nd and 3:rd digit.

Function	2:nd digit request	3:rd digit request
None	0	0
Lye	6	6
Acid	5	5
Water	4	4 ^a
Rinse water	3	3
Closed return	-	1

a. When return to balance tank during "Hot water circulation".



Cleaning programmes

The following steps are utilised in the different programmes:

Step	1. Lye	Step	2. Acid	Step	3. Lye and acid
1	Water to object.	1	Water to object.	1	Water to object.
21	Lye to object.	41	Acid to object.	21	Lye to object.
22	Empty object.	42	Empty object.	22	Empty object.
23	Lye to CIP unit.	43	Acid to CIP unit.	23	Lye to CIP unit.
24	In-line dosing.	44	In-line dosing.	24	In-line dosing.
25	Lye circulation	45	Acid circulation.	25	Lye circulation
30	Empty balance tank	50	Empty balance tank.	30	Empty balance tank
31	Water to object.	51	Water to object.	31	Water to object.
32	Empty object.	52	Empty object.	32	Empty object.
33	Lye recovery.	53	Acid recovery.	33	Lye recovery.
81	Water to object.	81	Water to object.	81	Acid to object.
91	Empty object.	91	Empty object.	91	Empty object.
-	-	-	-	41	Acid to CIP unit.
-	-	-	-	42	In-line dosing.
-	-	-	-	43	Acid circulation.
-	-	-	-	44	Empty balance tank.
-	-	-	-	45	Water to object.
-	-	-	-	50	Empty object.
-	-	-	-	51	Acid recovery.
-	-	-	-	52	Water to object.
-	-	-	-	53	Empty object.
-	-	-	-	81	Acid to object.
-	-	-	-	91	Empty object.
Step	4. Disinfection	Step	5. Hot water	Step	6. Flush
71	Water to object.	61	Hot water	81	Water to object.
72	Empty object.	62	Final hot water rinse	91	Empty object.
73	Water to CIP unit.	91	Empty object.	-	-
74	In -line dosing.	-	-	-	-
75	Disinfection circulation.	-	-	-	-
76	Empty balance tank.	-	-	-	-
77	Final disinfection rinse.	-	-	-	-
91	Empty object.	-	-	-	-

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Preparation and emptying programmes

The following steps are utilised in the different programmes:

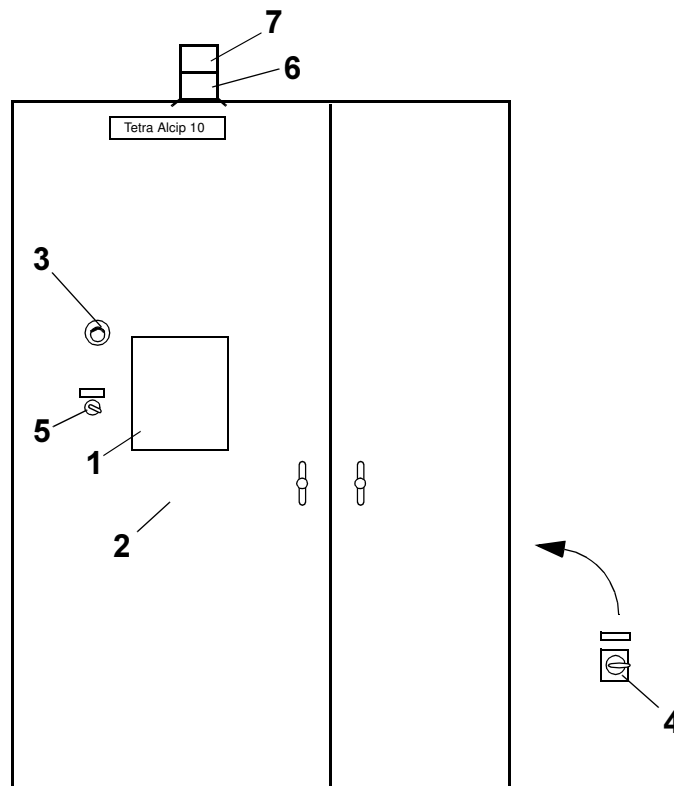
Step	31. Lye preparation (no by-pass)	Step	31. Lye preparation (option by-pass)
113	Lye dosing	105	Fill detergent tank
		106	Circulation before concentration check
		107	Intermediate circulation between concentration checks
		108	Lye concentration check
		109	Add lye to detergent tank
		110	Lye tank heating and temperature check
		111	Water flush and collection of diluted lye
		135	Final flush, pause
		136	Final flush
Step	32. Lye emptying		
125	Lye emptying		
135	Final flush, pause		
136	Final flush		
Step	41. Acid preparation (no by-pass)	Step	41. Acid preparation (option by-pass)
123	Acid dosing	115	Fill detergent tank
		116	Circulation before concentration check
		117	Intermediate circulation between concentration checks
		118	Acid concentration check
		119	Add acid to detergent tank
		120	Acid tank heating and temperature check
		121	Water flush and collection of diluted acid
		135	Final flush, pause
		136	Final flush
Step	42. Acid emptying	Step	52. Rinse water emptying
127	Acid emptying	129	Rinse water emptying
136	Final flush	136	Final flush

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Control panel

Denomination

- | | |
|---|--|
| 1 Operator's panel | 6 Cleaning indication lamp (green)
steady light; CIP sequence running
flashing light; CIP sequence held |
| 2 Conductivity instrument | 7 Alarm indication lamp (yellow):
steady light; acknowledged alarm
flashing light; unacknowledged
alarm |
| 3 Emergency stop button | |
| 4 Mains switch | |
| 5 Selector switch, remote control
1 = Tetra Alcip is operated from a
remote system
0 = Tetra Alcip is operated from the
TPOP on the control panel | |



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General rules for indication

Local/Remote control

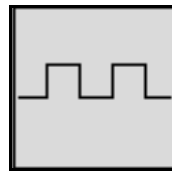
Local/Remote is selected by means of a key switch on the front of the control panel.

Local control means that the plant is operated from the TPOP. It is still possible to change pictures and view the application from the remote control unit, but it is not possible to operate the module

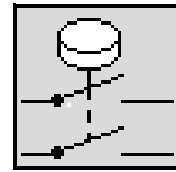
If the key is in remote position the module can be operated from the TPOP, a remote control system or remote I/O (ACO CIP).



Local control



Remote control

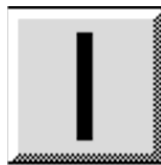


Remote I/O control

Function symbols

Functions available in the plant are indicated with a symbol. When the symbol is possible to select it appears as a “Push-button”.

A recessed symbol indicates the function has been selected.



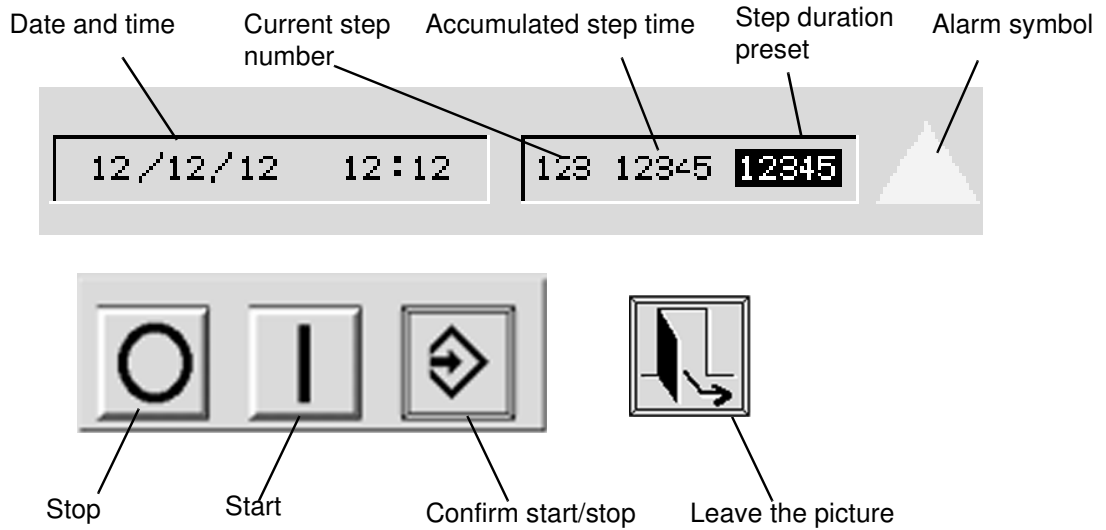
Selectable function



Selected function

Common function symbols and indications

These function symbols indications are represented on several of the pictures



Restricted functions

The access code push-button is available in the Overview picture. To get access to the restricted functions push the access code push-button and enter the correct access code with the numerical keys.

Following functions need access code:

- Manual step
- Regulator picture
- Editing parameters

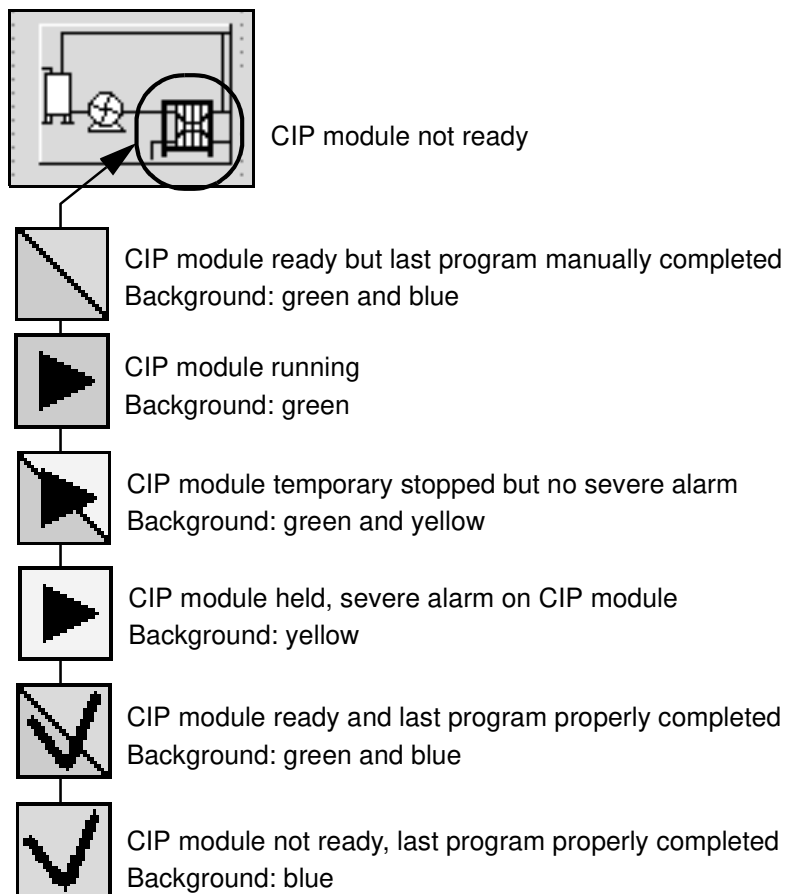


When entering correct code: green light
If incorrect code is entered: blue light with a cross

The correct code is valid until a incorrect code is entered or maximum 20 minutes

CIP module status

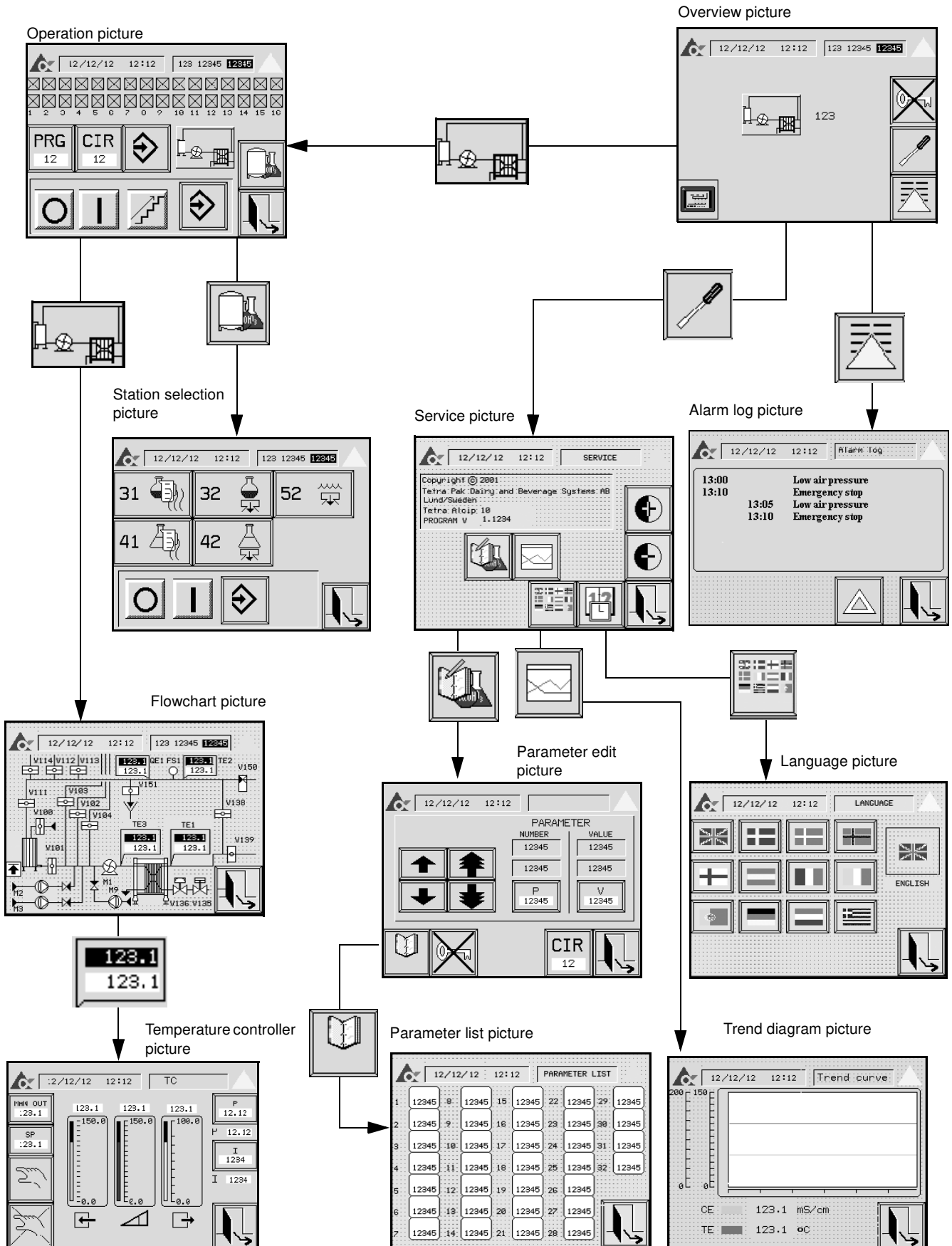
These function symbols are represented on Overview and Operating picture





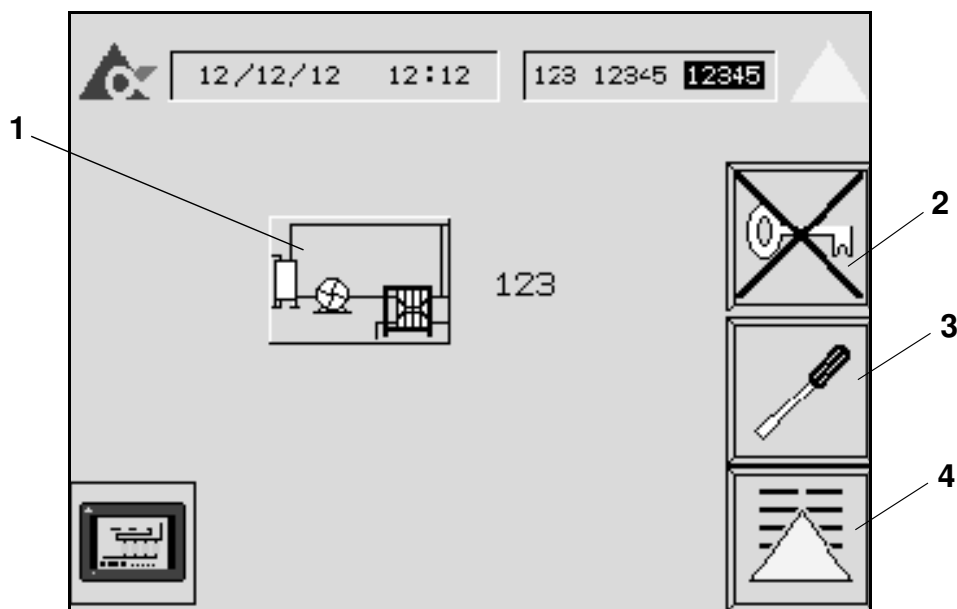
Control system menu tree

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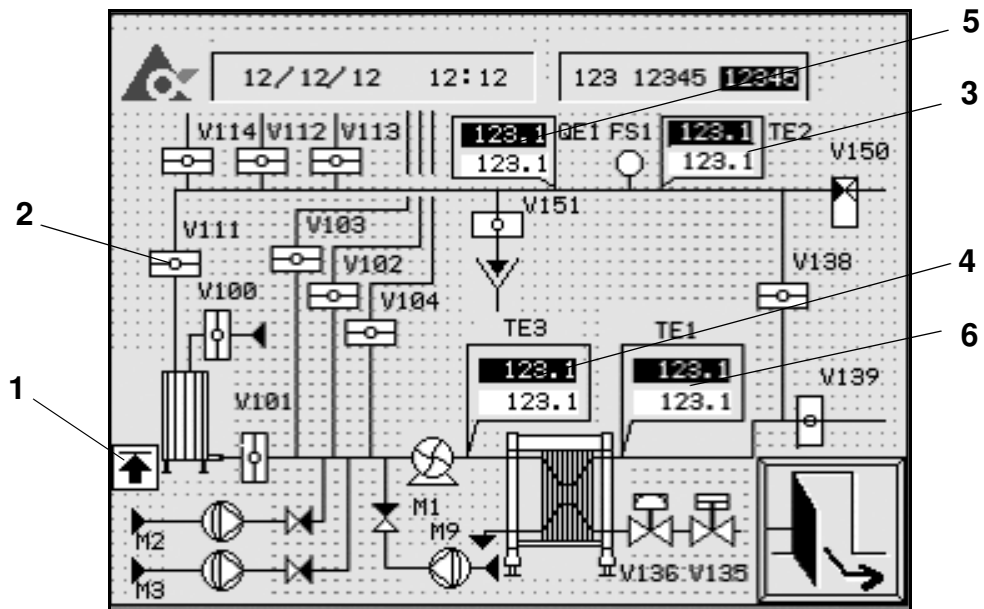
Overview picture



- 1 Bring up the **OPERATION PICTURE** see page [26](#)
- 2 Bring up the **NUMERICAL KEY PICTURE** for entering acces code, see page [36](#)
- 3 Bring up the **SERVICE PICTURE** see page [33](#)
- 4 Bring up the **ALARM LOG PICTURE** see page [30](#)

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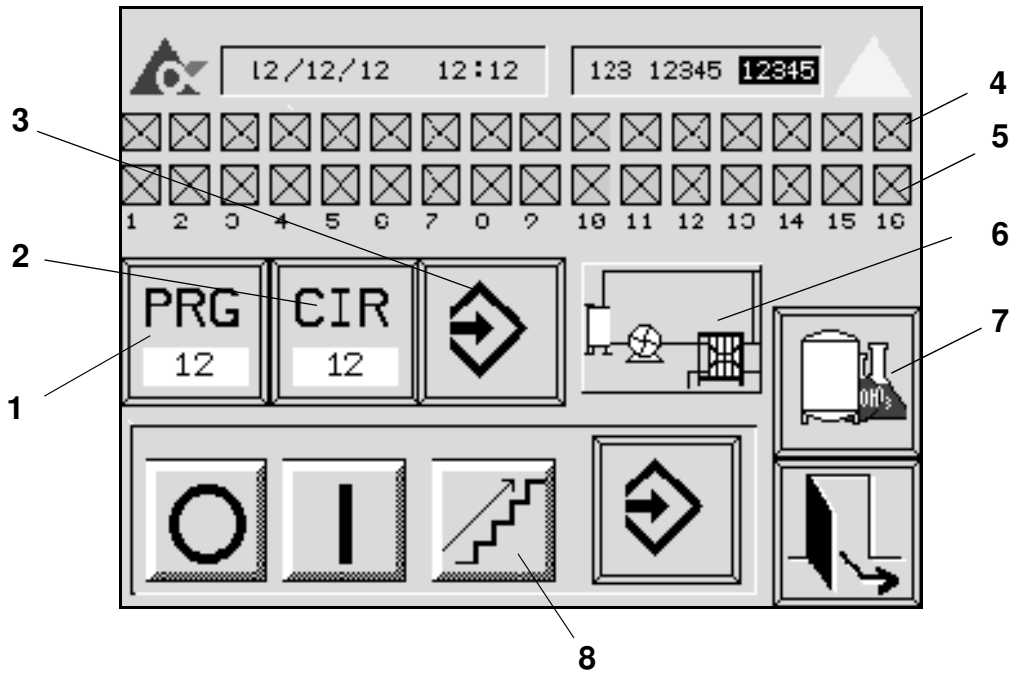
Flowchart picture



- 1 Level indication symbol; low level in tank.
- 2 Valve symbol, green when active.
- 3 Displays temperature on return side; setpoint black field, measured value white field.
- 4 Displays temperature in the detergent tank; setpoint black field, measured value white field.
- 5 Displays conductivity on return side; setpoint black field, measured value white field.
- 6 Bring up the **TEMPERATURE CONTROLLER PICTURE** see page [27](#). Displays temperature on pressure side; setpoint black field, measured value white field.



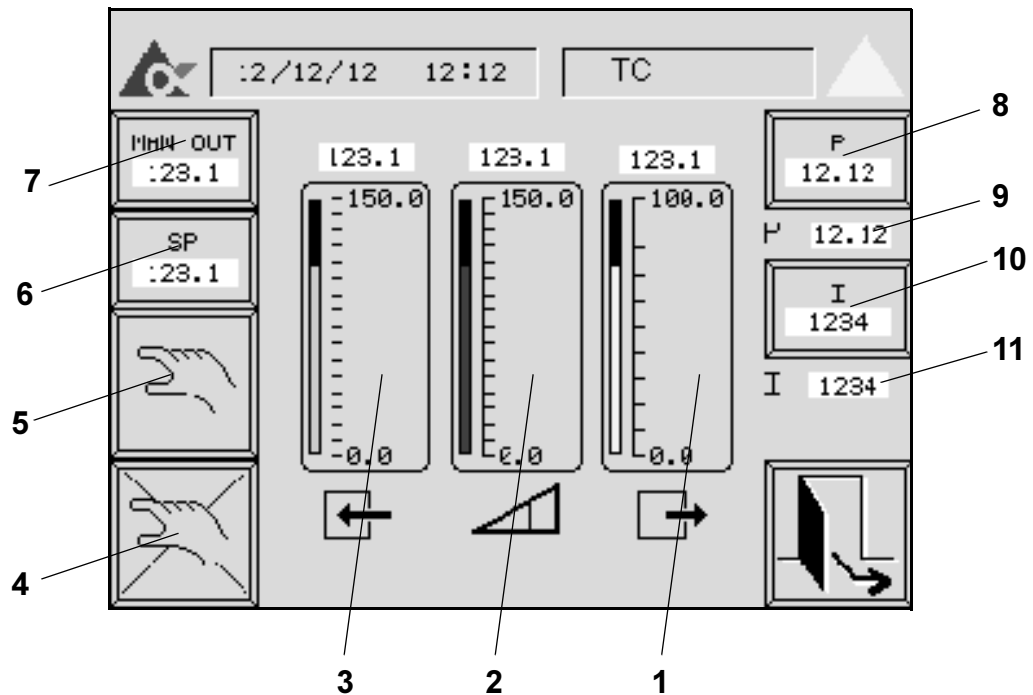
Operation picture



- 1 Bring up the **THE NUMERICAL KEY PICTURE** see page [36](#) Display shows current CIP programme.
- 2 Bring up the **NUMERICAL KEY PICTURE** , see page [36](#). Display shows current CIP circuit.
- 3 Confirm chosen CIP circuit
- 4 Indicate CIP circuits ready for cleaning.
- 5 Indicate CIP circuits selected or running.
- 6 Bring up the **CIP MODULE FLOWCHART PICTURE** see page [22](#). See also CIP module status
- 7 Bring up the **STATION SELECTION PICTURE**, see page [34](#).
- 8 Manual step, used for forcing the cleaning cycle to step forward.

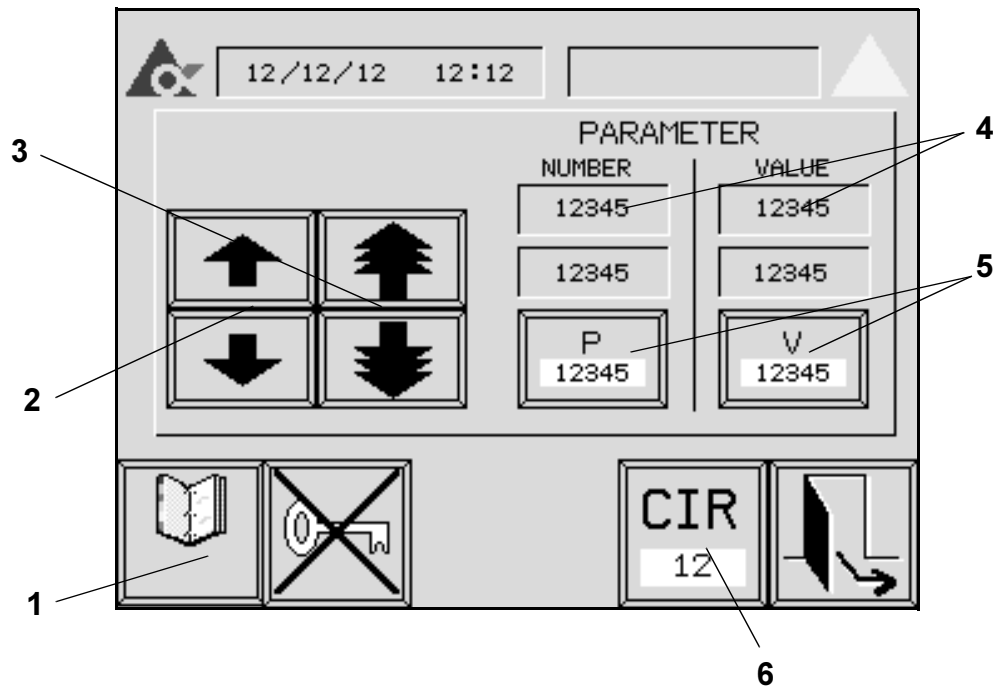
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Temperature controller picture



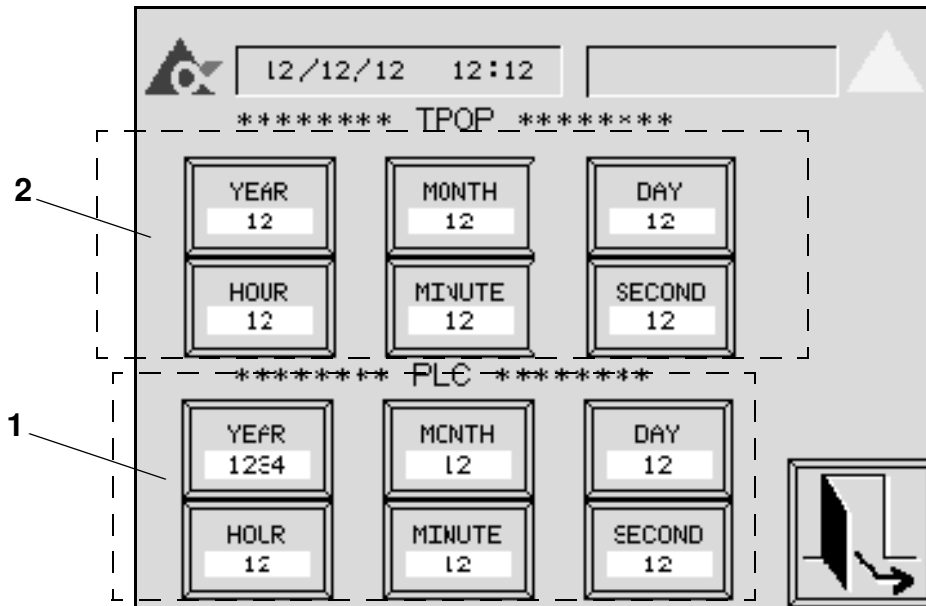
- 1 Bar graph and numeric display of the input signal to the regulator.
- 2 Bar graph and numeric display of the setpoint for the regulator.
- 3 Bar graph and numeric display of the output signal of the regulator.
- 4 Auto mode
- 5 Manual mode
- 6 Bring up the **NUMERICAL KEY PICTURE** for change of setpoint setting see page [36](#).
- 7 Bring up the **NUMERICAL KEY PICTURE** for change of manual output see page [36](#).
- 8 Bring up the **NUMERICAL KEY PICTURE** for change of gain setting see page [36](#).
- 9 Gain setting for the utilized sequence step.
- 10 Bring up the **NUMERICAL KEY PICTURE** for change of integration time see page [36](#).
- 11 Integration time for the utilized sequence step.

Parameter edit picture



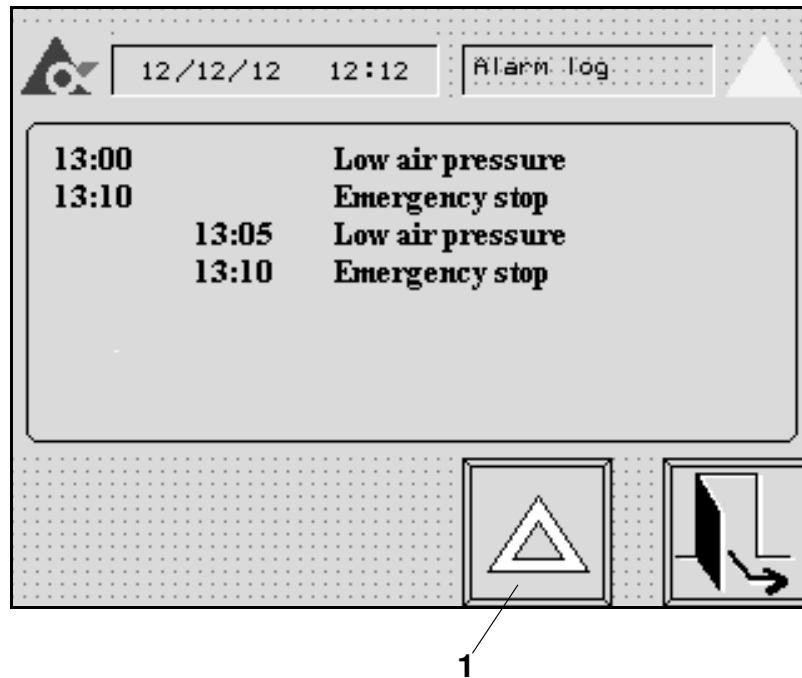
- 1 Bring up the **PARAMETER LIST PICTURE** see page [32](#).
- 2 Toggles up/down available circuits parameters.
- 3 Toggles up/down (3 step toggle) available circuits parameters.
- 4 Displays shows next parameter number/parameter value up/down.
- 5 Bring up the **NUMERICAL KEY PICTURE** see page [36](#). The displays shows parameter number/ parameter value.
- 6 Bring up the **NUMERICAL KEY PICTURE** see page [36](#). Display shows current CIP circuit number

Date and time picture



- 1 Selected pushbutton brings up the the **NUMERICAL KEY PICTURE** for setting of date and time for the PLC, see page [36](#).
- 2 Selected pushbutton brings up the the **NUMERICAL KEY PICTURE** for setting of date and time for the TPOP see page [36](#).

Alarm log picture



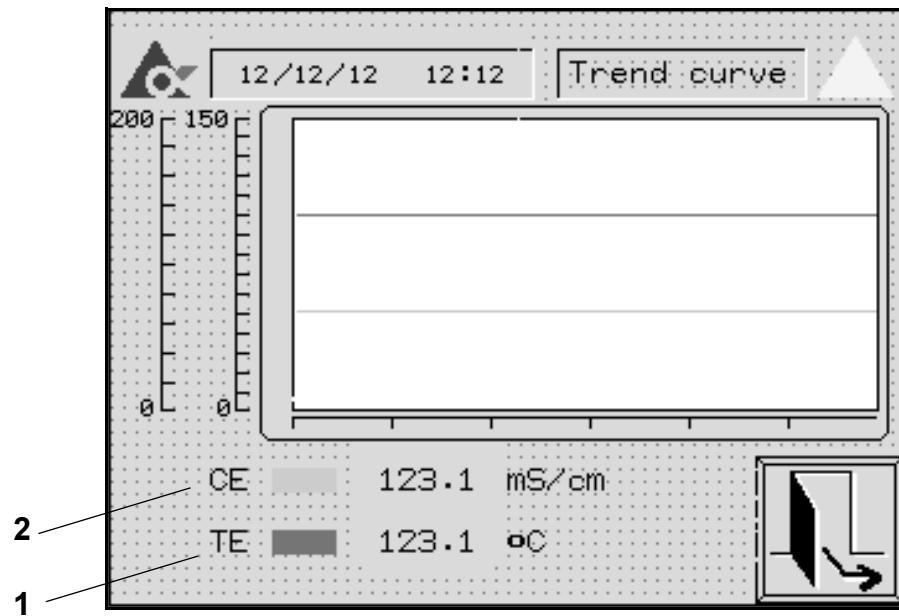
An active alarm is indicated by black text on yellow background together with a time stamp in the first column.

When the alarm is cleared, the text appears on white background with a time stamp in the second column.

When the alarm list is full the logged data is cleared according to the principle first-in-first-out.

- 1 Acknowledge alarm

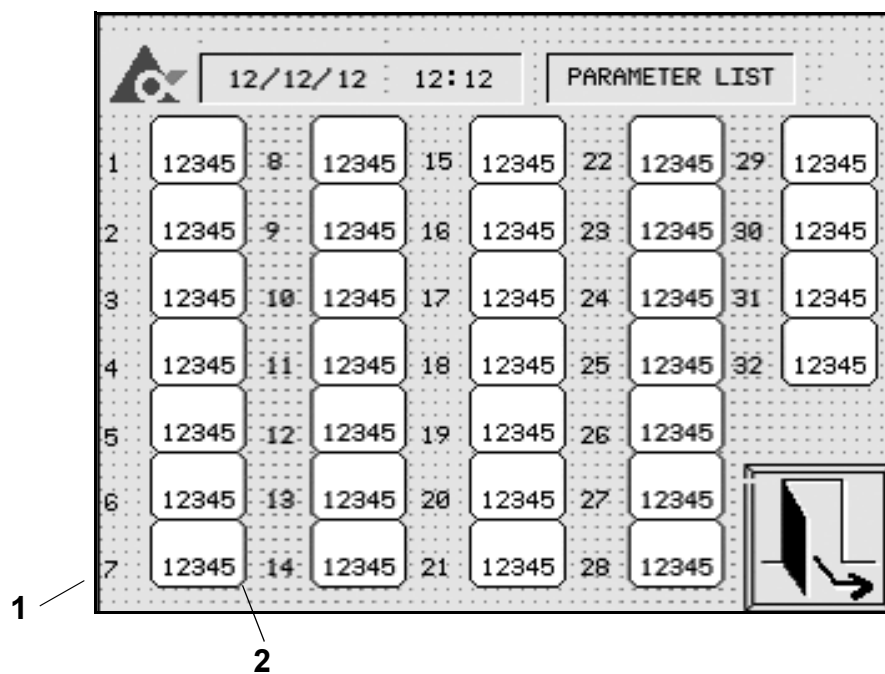
Trend diagram picture



- 1 Trend curve for temperature (TE)
- 2 Trend curve for concentrate (QE)

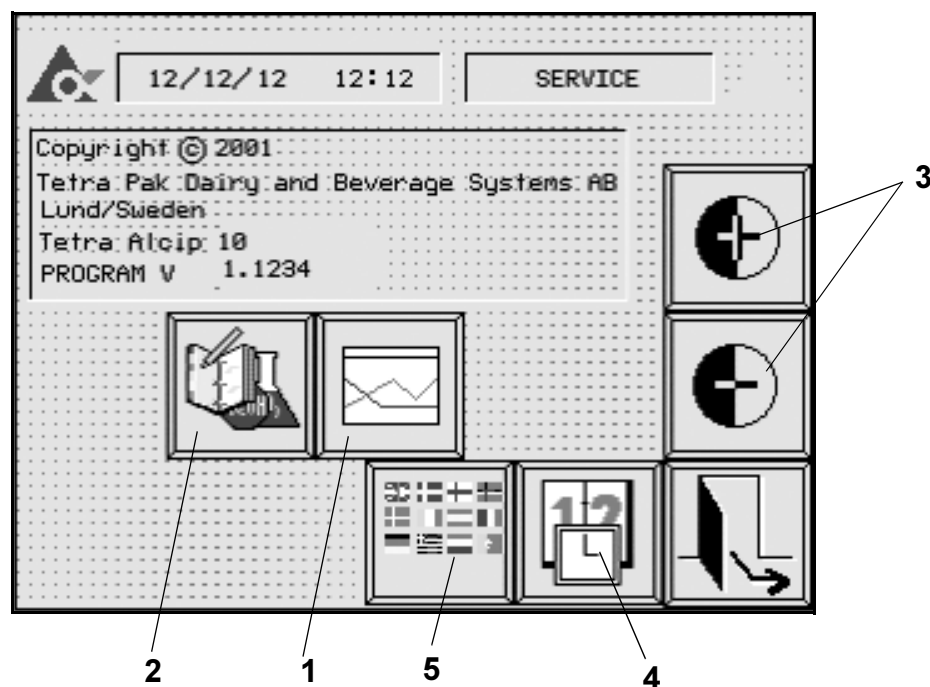


Parameter list picture



- 1 Parameter number
- 2 Parameter value

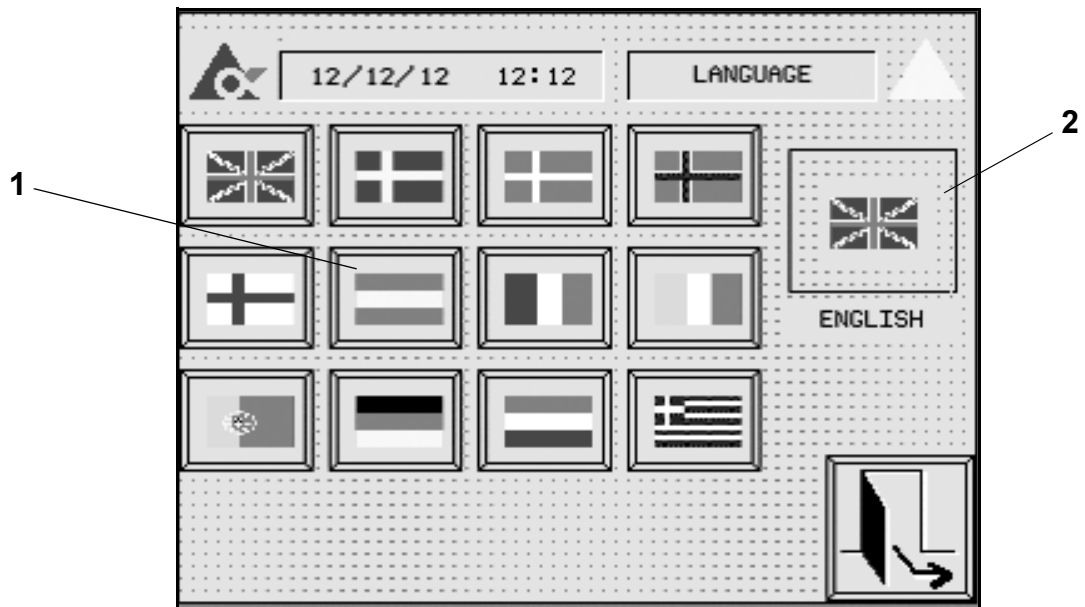
Service picture



- 1 Bring up the **PARAMETER EDIT PICTURE** see page [28](#).
- 2 Bring up the **TREND DIAGRAM PICTURE** ee page [31](#).
- 3 Change brightness in picture
- 4 Bring up the **DATE AND TIME PICTURE** ee page [29](#).
- 5 Bring up the **LANGUAGE PICTURE** ee page [34](#).

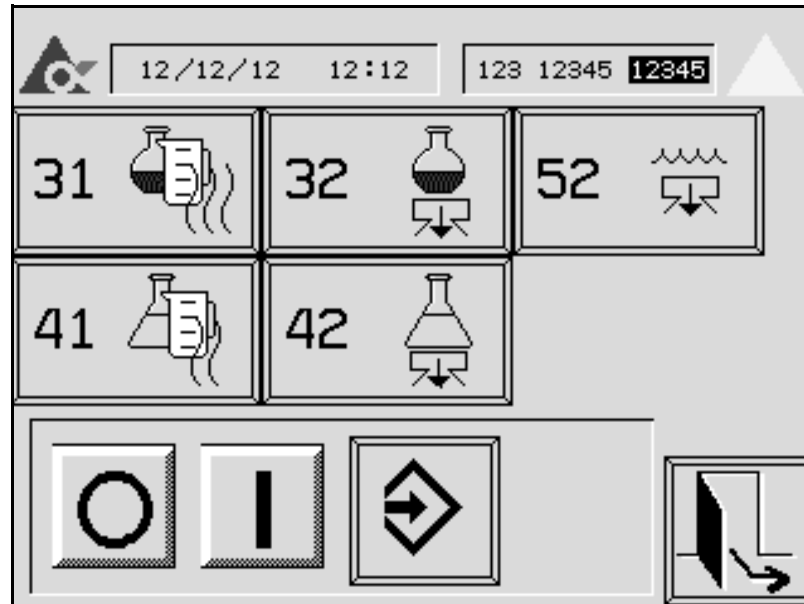


Language picture



- 1 Selectable languages
- 2 Selected language

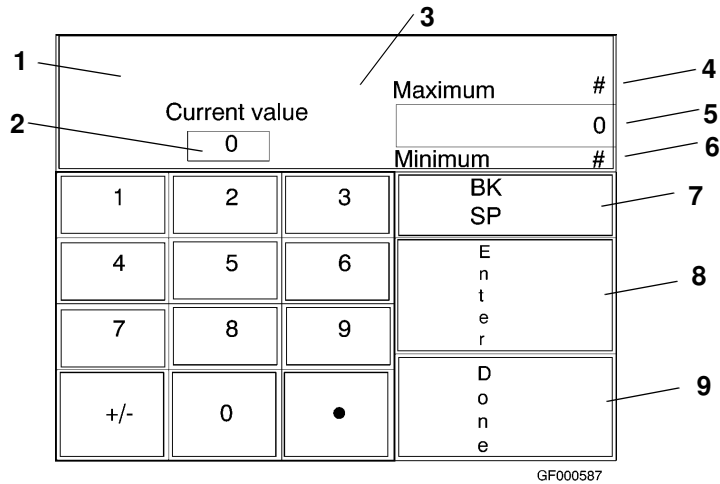
Station selection picture



- 31 Lye preparation
- 32 Lye emptying
- 41 Acid preparation
- 42 Acid emptying
- 52 Rinse water emptying



Numerical key picture



GF000587

1	Selected parameter to be changed
2	Current value of selected parameter
3	If an entered value exceeds the min-max limits, there will be a flashing Indication: Max (Min) value exceeded.
4	Maximum permitted value of selected parameter
5	Entered value of selected parameter
6	Minimum permitted value of selected parameter
7	Back space
8	Enter new value
9	Leave the picture

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List of alarms

Caution! Fault indication
Always investigate the cause of a fault indication. Otherwise you may endanger the equipment.

Alarms are divided into two categories as follows:

- A** Faults that will cause an alarm only. They are not critical but the operator should investigate the cause.
- B** Faults that will cause a temporary stop. Rectify the fault. See section "Maintenance" in the technical manual (**TeM**) for trouble shooting chart.

Type	Text in alarm menu	Fault
A	Temp fault return pipe	Temperature fault return pipe
A	Low conc. return pipe	Low concentration return pipe
A	High level circ. tank	High level balance tank
A	Too high conc.return pipe	Too high concentration return pipe (only ACO)
B	Motor fault M1	Feedback fault on pressure pump
B	Motor fault M9	Feedback fault on disinfection metering pump
B	No flow in return pipe	No flow in return pipe
B	Low level in circ. tank	Low level in balance tank
B	Low level in lye tank	Low level in lye tank
B	Low level in acid tank	Low level in acid tank
B	Low airpressure	Low pressure on air supply
B	Emergency stop activated	Emergency stop activated
B	Temp. fault pressure side	Temperature fault pressure side
B	Host communication fault	Communication fault with host computer
B	Detergent tank not available	Detergent tank not available (only ACO)
		Detergent tank interlocked (only if several pressure lines)
B	Circuit x not ready	Circuit x not ready
B	AFM x feedback fault	Valve or boosterpump feedback fault

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Preparations



WARNING!

Chemical hazard

Cleaning solutions normally contain caustic soda or acid. These chemical may cause burning to skin and eyes. Before proceeding read the **Safety precautions**.

Manual preparation

- a) Check that required utilities are available:
 - Water (pressure), **OPEN MANUAL SHUT OFF VALVE**
 - Steam (pressure), **OPEN MANUAL SHUT OFF VALVE**
 - Air (pressure), **OPEN MANUAL SHUT OFF VALVE**
 - Electricity
- b) Calculate the amount of concentrated lye and acid necessary to achieve the correct concentration of cleaning solutions.

$$L = \frac{V}{\left(\frac{DC}{C}\right)^{-1}}$$

where

V is water volume in buffer tank

C is required concentration of detergent solution in weight %

DC is concentrated detergent concentration in weight %

L is concentrated detergent needed, litres

Example:

$$\frac{1000}{\left(\frac{0.45}{0.012}\right)^{-1}} = 27.4 \text{ litres}$$



Preparation of lye

- a) Check that the **MANUAL DRAIN VALVE V013** for the buffer tank is **CLOSED**.
- b) **OPEN MANUAL WATER VALVE V023** to 50% to fill water into the lye buffer tank.
- c) When the water level reaches the water inlet pipe: **ADD** gently the concentrated lye into the buffer tank via the man hole.
- d) When the buffer tank is filled to required level (water + lye): **CLOSE MANUAL WATER VALVE V023**.

Preparation of acid

- a) Check that the **MANUAL DRAIN VALVE V013** for the buffer tank is **CLOSED**.
- b) **OPEN MANUAL WATER VALVE (V022)** to 50% to fill water into the acid buffer tank.
- c) When the water level reaches the water inlet pipe: **ADD** gently the concentrated acid into the buffer tank via the man hole.
- d) When the buffer tank is filled to required level (water + acid): **CLOSE THE MANUAL WATER VALVE (V022)**.

Preparation with metering pump

$$\frac{L}{CS} = S$$

where

L is concentrated detergent needed, litres

CS is capacity of metering pump, litres/second

S is required metering pump run time, seconds to make a complete preparation

Example:

$$\frac{27,4}{0,055} = 498 \quad \text{seconds}$$

- Check the capacity of the metering pumps
- Calculate required dosing times
- Update parameter (see section Commissioning in Technical Manual)
 - **1 FOR LYE**
 - **13 FOR ACID**
- Check the level for concentrated lye and acid. Adjust if necessary.

Preparation of lye (no by-pass valve)

- Check that the **MANUAL DRAIN VALVE V013** for the buffer tank is **CLOSED**.
- OPEN MANUAL WATER VALVE V023** to 50% to fill water into the lye buffer tank.
- Display the **STATION PROGRAM** picture. see page [47](#) and start the desired station program

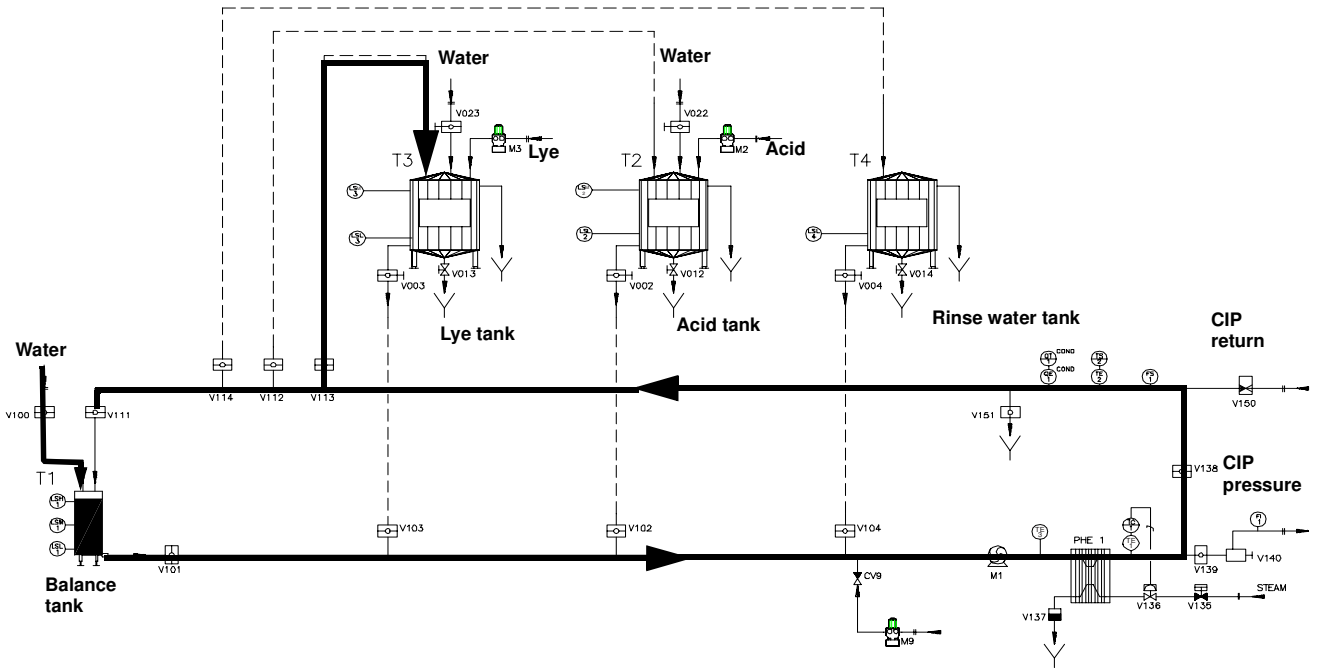
Preparation of acid (no by-pass valve)

- Check that the **MANUAL DRAIN VALVE V013** for the buffer tank is **CLOSED**.
- Open **MANUAL WATER VALVE V022** to 50% to fill water into the acid buffer tank.
- Display the **STATION PROGRAM** picture. see page [47](#) and start the desired station program.
- When the buffer tank is filled to required level, **CLOSE MANUAL WATER VALVE**
 - **V023** (If lye preparation)
 - **V022** (If acid preparation)



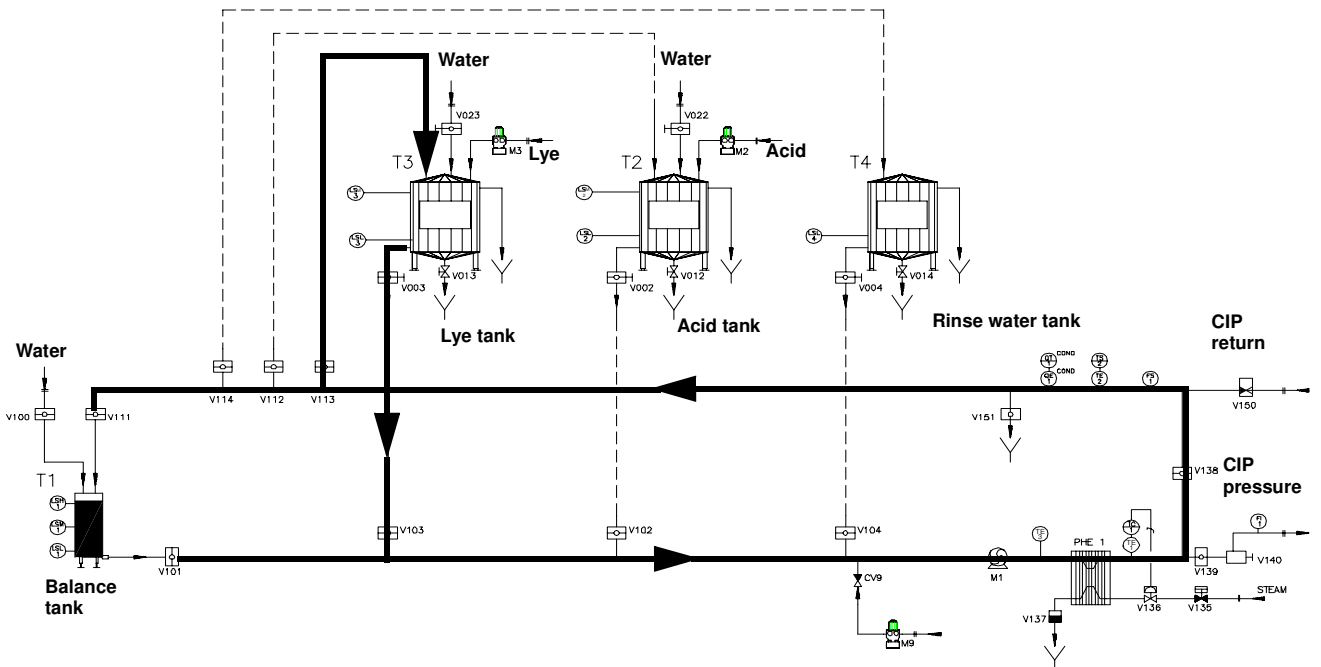
Preparation using the by-pass

- a) Display the **STATION PROGRAM** picture. see page [47](#) and start the desired station program.
- b) The detergent tank is filled to LSH with water , fresh water is taken from the circulation tank. The steam valve is activated and the steam starts to heat up the cleaning solution.
- c) Detergent tank level reach LSH.
- d) Circulation of detergent tank starts and continues for a preset time (parameter).
- e) Intermediate circulation of detergent tank starts and continues for a preset time (parameter).
- f) Check of concentration starts.
 - If concentration is below setpoint (parameter) the program continues on step [g](#)).
 - If concentration is correct the program continues on step [h](#)).
- g) Filling of remaining concentrated detergent starts.
 - Metering pump for concentrated detergent is activated for a (by the program) calculated time.
 - When the time has elapsed the program continues on step [e](#)).
- h) Check of temperature starts.
 - When the temperature reaches setpoint (parameter), the steam valve closes.
- i) Water is flushed into the system to sort out and collect the cleaning solution in the pipes to the detergent tank.
- j) Water is flushed to drain for a preset time (parameter).



Flow during preparation, filling of lye tank

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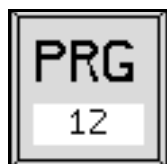
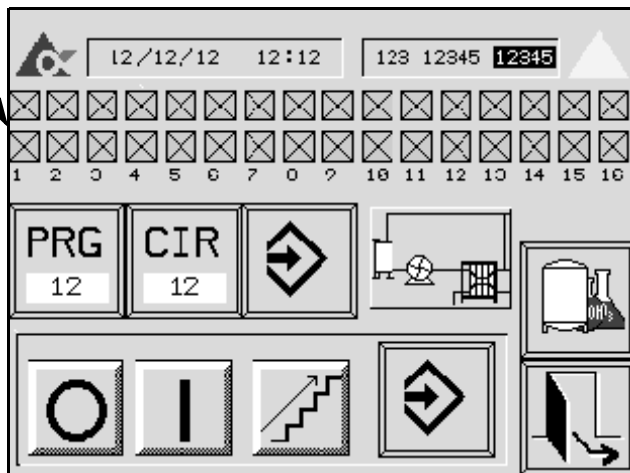
Flow during preparation, lye circulation



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Circuit display



Initial start of cleaning 1

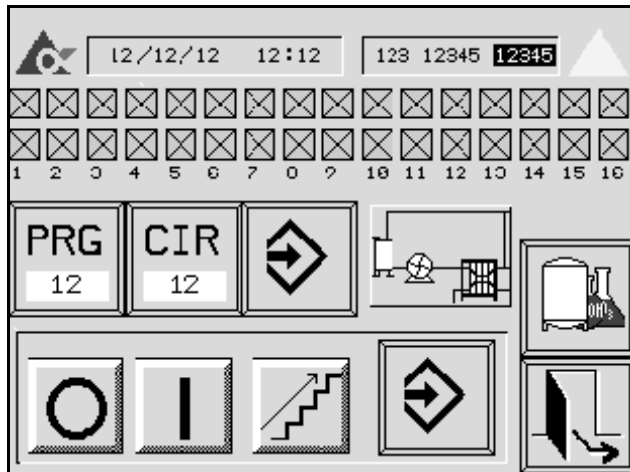
a) Display the **OPERATION PICTURE**.

Select CIP circuit program

- b) Select **PRG PUSH-BUTTON** to display the numerical key picture
- c) Use the numerical key to enter the desired CIP circuit program, see chapter “Control panel”.

Select circuit number

- d) Select **CIR PUSH-BUTTON** to display the numerical key picture
- e) Use the numerical key to enter the desired CIP circuit, see chapter “Control panel”.
- f) Select push-button to **CONFIRM**.
- If the confirmation is valid the selected circuit will be marked with X in the “Circuit display”



2

- g) **START AND CONFIRM** the program with the “Common function symbols”

Cleaning of package machine (optional)

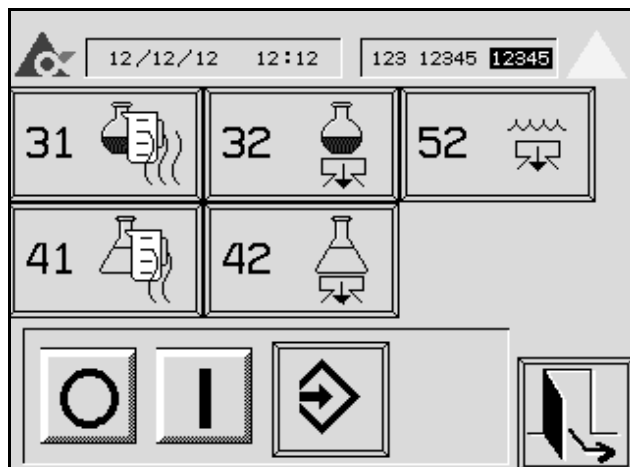
1

If cleaning of packaging machines it is possible to select more than one CIP circuit.

To reset a selection, select the circuit again

- Communication: 4 packaging machines; circuit numbers 9-14

Confirm the circuit selection, select cleaning program and start the cleaning as described above.



Initial start of stations programs

1

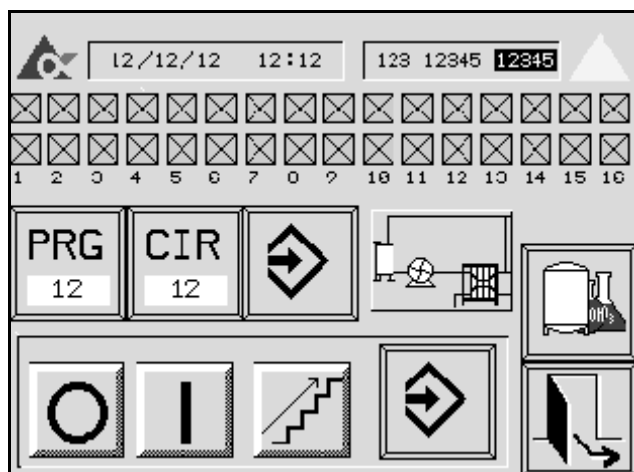
- a) Display the **STATION PROGRAM** picture.

Note!

The initial start of station programs must be done from the station program picture. When this is done it is possible to stop and restart the station program from other menus.

- b) Select the **PUSH-BUTTON** that represent the desired station program and the display turns yellow.
- c) **START AND CONFIRM** the program with the “Common function symbols”

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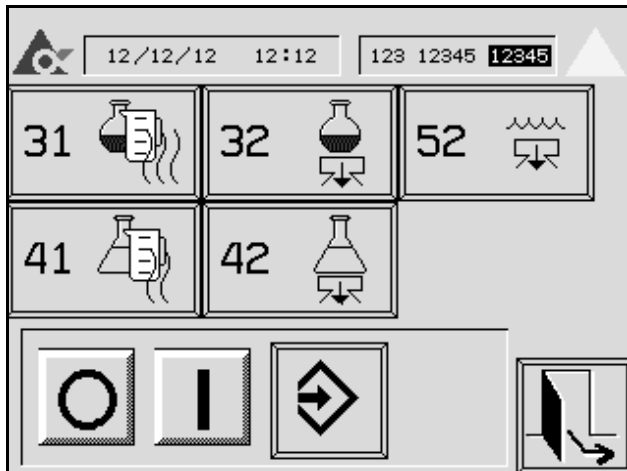
Stepping of cleaning cycle

1

- Select the **MANUAL STEP** followed by **CONFIRM** to step the cleaning cycle forward

Note!

Manual stepping can be done only when CIP is running and if valid access code is entered.



Drain of tank

Drain of a tank can be done as long as there is no cleaning started.

If the module is not equipped with by-pass valve; connect the circuit to a neutralizing unit, drain etc.

Note!

The initial start of station programs must be done from the station program picture. When this is done it is possible to stop and restart the station program from other menus.

- a) Select the **PUSH-BUTTON** for the desired station program.
 - The button will change color.
- b) Select **START** push-button.
- c) Select **CONFIRM START/STOP** push-button.



Cleaning

To achieve the best possible performance of the equipment it is essential to keep it clean and tidy.

Clean the **buffer tanks** when changing cleaning solution:

Do as follows:

- a) Perform a **Drain of the tank**, see section **Operation**.
- b) Fill a small amount of water. Use a rubber hose.
- c) Scrub the tank inside with a broom.
- d) Open the manual drain valves (V013 for lye and V012 for acid) to drain the tank.
- e) Flush the tank with water. Use a rubber hose, continue until no residues remains.
- f) Close the manual drain valves (V013 and V012).
 - Clean the **panel** once a week with a cloth.
 - Clean **remaining equipment** at regular intervals.



WARNING!

Chemical hazard

Cleaning solution contains caustic soda (NaOH) or nitric acid (HNO₃).

This chemical may cause severe burning to skin and eyes. Use protective clothes, goggles and gloves during handling.

If exposed - wash with water for at least 15 minutes. Seek medical assistance. Follow the instructions given by the supplier.

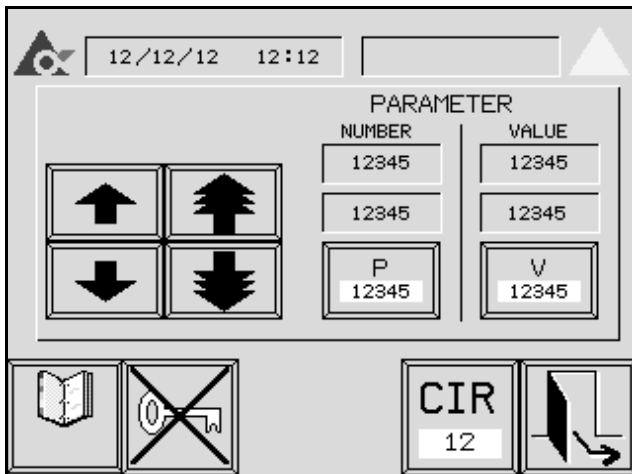


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Settings



Inspection/change of parameter values

1

- Display the **PARAMETER EDIT PICTURE** for the appropriate module.

CAUTION!

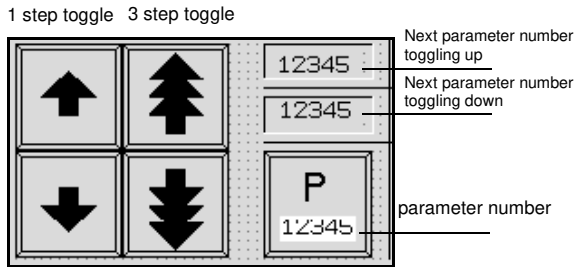
Change of values

A change of value will change the machines way of working. This operation needs access code

Note!

For parameter list, see section “Commissioning” in Technical Manual (TeM).

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Change parameter number

2

- Toggle the **ARROWS** until the right parameter number to inspect/change is displayed or select the **P PUSH-BUTTON** to display the numerical keys picture and enter the desired parameter number
- To change value continue according to Change parameter value

3

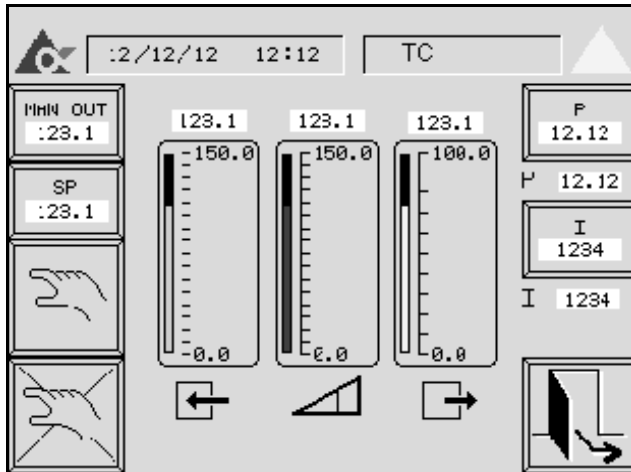
Change parameter value

- Select **V PUSH-BUTTON** to display the numerical keys picture
- Use the numerical key to enter the new parameter value see chapter “Control panel”.

Note!

If no value is given the old value is kept unchanged.





Inspection/change of controllers

4

- a) Display the **CONTROLLER PICTURE**.

Note!

In the controller menu change of settings for test purpose is possible. When leaving the controller menu the settings are reset to values used when entering the menu.

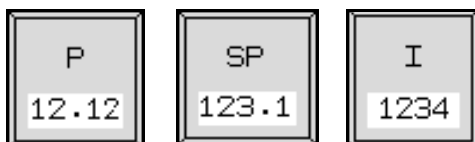
Final setting is selected in a parameter, see section “Commissioning” in Technical manual (TeM).

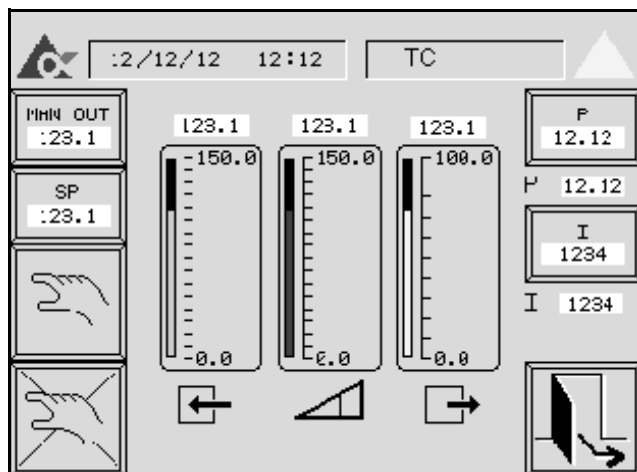
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5

Change of gain, TI and setpoint

- a) Select the **PUSH-BUTTON** symbolizing desired controller
- b) Use the numerical key to enter new value see chapter “Control panel”.





6

Change of output

- a) Select **MANUAL MODE PUSHBUTTON** for turning the controller manually off
- b) Select **MAN OUT PUSH-BUTTON** to display the numerical keys picture
- c) Use the numerical key to enter the new output see chapter “Control panel”.
- a) Select **AUTO MODE PUSHBUTTON** for turning the controller manually on.



