Service Manual

EX6102c, EX6135c, EX6200c, EX6250c

438 9206-65/EN
06.37

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Safety

This machine can only be used with water.
Never use dry cleaning agents.

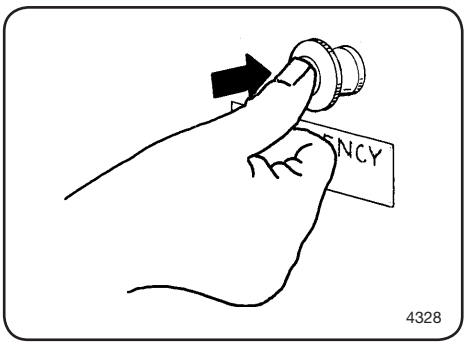
Do not allow children to operate the machine.

Do not hose down or spray the machine with water.

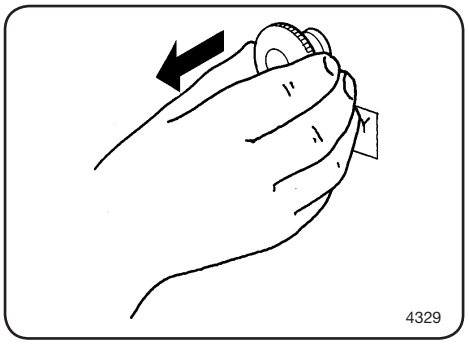
All mechanical and electrical installation must be carried out by qualified personnel.

Do not bypass the door locking device.

Should the machine malfunction, please report the fault to the technician responsible for the machine.



Emergency stop
If the machine for some reason has to be stopped – press emergency stop button



When necessary measures have been taken, the emergency button can be reset by pulling it out.

All external equipment which is connected to the machine must be CE/EMC-approved and connected using an approved shielded cable.

The manufacturer reserves the right to make changes to design and component specifications.

Technical data

	EX6102c	EX6135c
Innerdrum, volume ft³/litres	14.1/400	21.2/600
diameter inch/mm	36 1/4/920	38 9/16/980
Drum speed,		
wash rpm	37	36
extraction max rpm	825	800
Heating		
steam	x	x
hot water	x	x
G-factor	350	350
Weight, net lb/kg	2413-3196/1095-1450*	3042-3262/1380-1480*

* Precise weight depends on accessories fitted.

Connections

	EX6102c	EX6135c
Water valves		
connection DN	32	32
	1 1/4"	1 1/4"
recommended water psi	30-90	30-90
pressure, valve open kPa	200-600	200-600
Functioning limits psi	10-145	10-145
for water valve kPa	50-1000	50-1000
Capacity at gallon/min	37	37
300 kPa l/min	150	150
Drain valve outer Ø inch/mm	4 5/6/110	4 5/6/110
Draining capacity l/min	400	400
gallon/min	100	100
Steam valve		
connection DN	20	20
	3/4"	3/4"
rec. steam pressure kPa	300-600	300-600
psi	45-90	45-90
operating range		
of steam valve kPa	50-800	50-800
psi	8-120	8-120
Compressed air		
connection DN	6	6
	1/8"	1/8"
rec. air pressure kPa	500-700	500-700
psi	30-60	30-60
consumption l/h	20	20
gallon/h	5	5

Technical data

	EX6200c	EX6250c
Innerdrum, volume ft³/litres	30/850	39/1100
diameter inch/mm	48 1/16 / 1220	48 1/16 / 1220
Drum speed,		
wash rpm	42	42
extraction max rpm	720	663
Heating		
steam	x	x
hot water	x	x
G-factor	350	300
Weight, net lb/kg	4850-5070/2200-2300*	5070-5290/2300-2400*

* Precise weight depends on accessories fitted.

Connections

	EX6200c	EX6250c
Water valves		
connection DN	40	40
	1 1/2"	1 1/2"
recommended water psi	45-90	45-90
pressure, valve open kPa	300-600	300-600
Functioning limits psi	8-145	8-145
for water valve kPa	40-1000	40-1000
Capacity at gallon/min	87	87
300 kPa l/min	350	350
Drain valve outer Ø inch/mm	6 5/16 / 160	6 5/16 / 160
Draining capacity l/min	400	400
gallon/min	100	100
Steam valve		
connection DN	32	32
	1 1/4"	1 1/4"
rec. steam pressure kPa	300-600	300-600
psi	45-90	45-90
operating range		
of steam valve kPa	50-800	50-800
psi	8-120	8-120
Compressed air		
connection DN	6	6
	1/8"	1/8"
rec. air pressure kPa	200-400	200-400
psi	30-60	30-60
consumption l/h	20	20
gallon/h	5	5

Technical data

	EX6102c	EX6135c	EX6200c	EX6250c
Frequency of the dynamic force Hz	13.8	12.7	12.0	11.1
Max floor load lbs force at extraction kN	3865±181 16±0.75	3841±1546 15.9±6.4	5315 ± 1764 22 ± 7.3	5798 ± 1764 24 ± 7.3

Sound levels

Airborne sound level dB (A) re $2x10^{-5}$ Pa	75	76	85	85

Motor

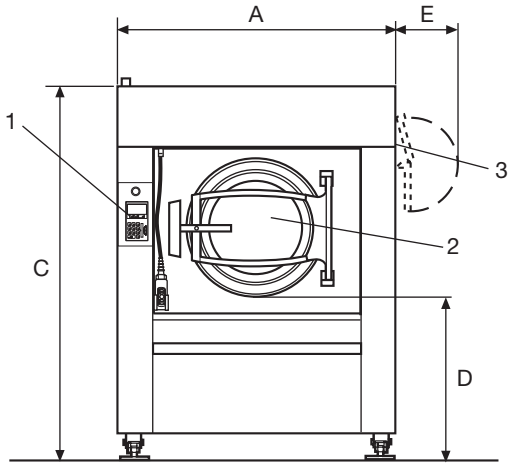
Power consumption hp/kW	7.6/5.5	8.3/6	25/18	25/18

Dimensions

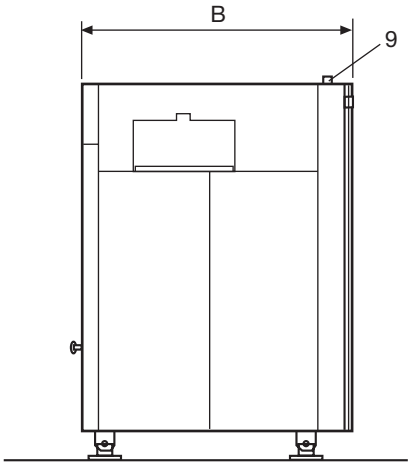
1	Control panel
2	Door opening ø 700 mm/29 9/16"
3	Soap supply injector, powder (optional)
4	Cold water connection
5	Hot water connection
6	Third water connection (optional)
7	Steam connection
8	Drain
9	Electrical connection
10	Compressed air
11	External liquid supply, 6 pcs ø 10, 1 pc ø 16 and 1 pc ø 20
12	Water connection, soap supply injector (optional)

in inch	A	B	C	D	E	F	G	H	I	K
EX6102c	52 3/16	57 1/16	79 5/16	35 13/16	11 13/16	73 7/16	52 3/16	32 5/16	16 9/16	17 1/8
EX6135c	54 3/4	63	79 5/16	38 3/16	11 13/16	72 13/16	52 3/16	35 5/16	20 11/16	16 3/4

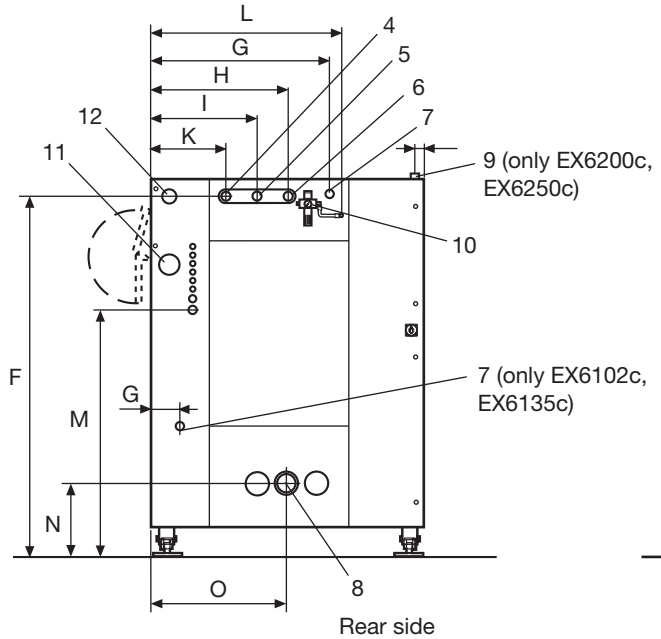
in inch	L	M	N	O	P	R	S	T	U	V
EX6102c	16 3/4	20 11/16	26	88	37 3/8	32 11/16	14 9/16	86 13/16	44 7/8	13 9/16
EX6135c	33 7/8	61 5/8	16 9/16	16 15/16	86 5/8	44 1/8	85 13/16	37 3/8	10 13/16	10 13/16



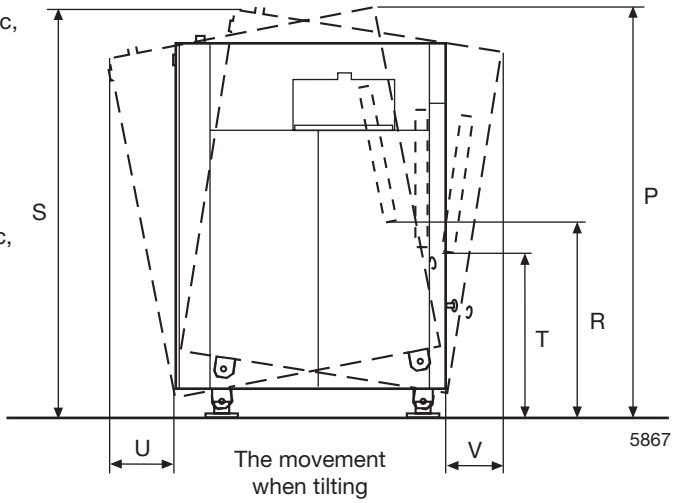
Front



Right side



Rear side



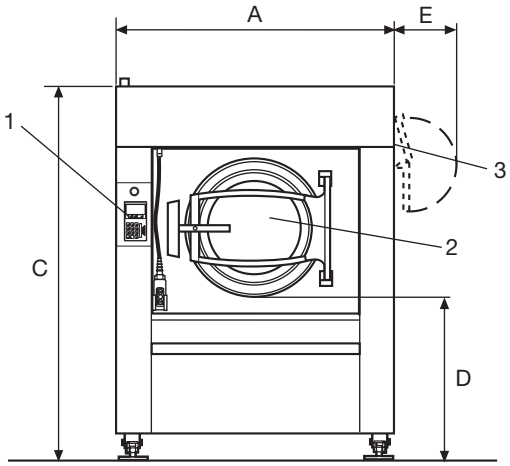
The movement when tilting

Dimensions

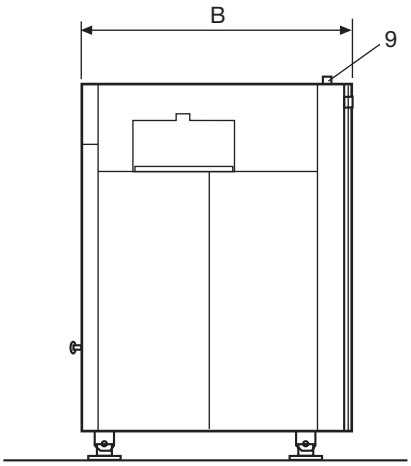
1	Control panel
2	Door opening ø 700 mm/29 9/16"
3	Soap supply injector, powder (optional)
4	Cold water connection
5	Hot water connection
6	Third water connection (optional)
7	Steam connection
8	Drain
9	Electrical connection
10	Compressed air
11	External liquid supply, 6 pcs ø 10, 1 pc ø 16 and 1 pc ø 20
12	Water connection, soap supply injector (optional)

in inch	A	B	C	D	E	F	G	H	I	K
EX6200c	64 9/16	64 3/16	87 13/16	38 3/16	14 15/16	84 1/16	42 1/8	32 1/2	25	17 1/2
EX6250c	64 9/16	72 5/8	87 13/16	38 3/16	14 15/16	84 1/16	42 1/8	32 1/2	25	17 1/2

in inch	L	M	N	O	P	R	S	T	U	V
EX6200c	44 7/8	63 3/4	17 3/8	32 3/8	95 1/8	48 1/2	95 3/4	39 3/4	10 7/16	15 3/4
EX6250c	44 7/8	63 3/4	17 3/8	32 3/8	95 1/8	48 1/2	95 3/4	39 3/4	9 7/16	13 3/16



Front



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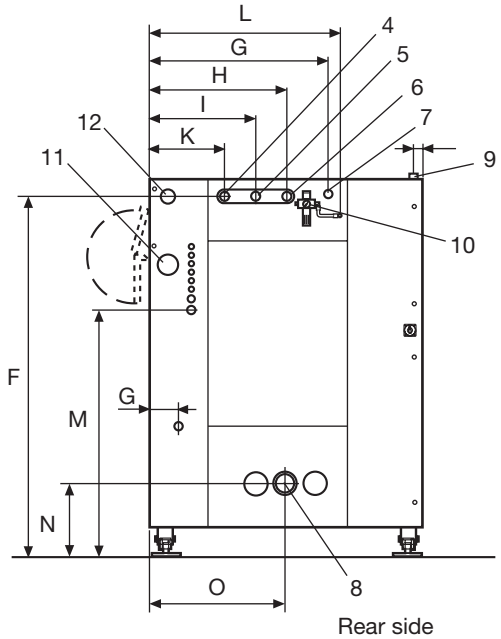
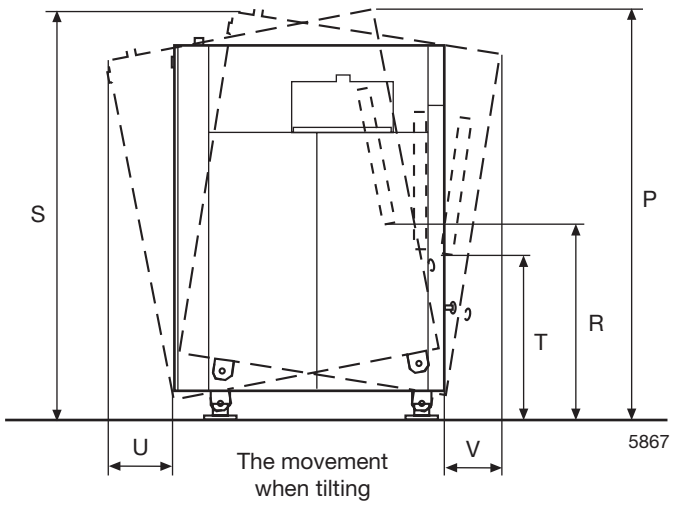


Rear side



The movement when tilting

EX6102c

Heating alternative	Voltage alternative	Total kW	Fuse A
No heating or Steam heating	200 V 3 AC	5,5	25
	208-240 V 3 AC	5,5	25
	230/400 V 3 AC	5,5	25/16
	240 V 3 AC	5,5	25
	346 V 3 AC	5,5	16
	380 V 3 AC	5,5	16
	400 V 3 AC	5,5	16
	415 V 3 AC	5,5	16
	440 V 3 AC	5,5	16
	480 V 3 AC	5,5	16
Electrical heated	230/400 V 3 AC	38	100/63
	240 V 3 AC	38	100
	346 V 3 AC	38	80
	380 V 3 AC	38	63
	400 V 3 AC	38	63
	415 V 3 AC	38	63
	440 V 3 AC	38	63
	480 V 3 AC	38	50

EX6135c

Heating alternative	Voltage alternative	Total kW	Fuse A
No heating	200 V 3 AC	4,0	20
or Steam	230 V 3 AC	4,0	16
heating	230 V 3 AC	4,0	16
	240 V 3 AC	4,0	16
	240 V 3 AC	4,0	16
	380 V 3 AC	4,0	16
	400 V 3 AC	4,0	16
	415 V 3 AC	4,0	16
	440 V 3 AC	4,0	16
	480 V 3 AC	4,0	16
Electrical heated	230 V 3 AC	38	100
	230 V 3 AC	56	160
	240 V 3 AC	38	100
	240 V 3 AC	56	160
	380 V 3 AC	38	63
	380 V 3 AC	56	100
	400 V 3 AC	38	63
	400 V 3 AC	56	100
	415 V 3 AC	38	63
	415 V 3 AC	56	100
	440 V 3 AC	38	63
	440 V 3 AC	56	80
	480 V 3 AC	56	80

EX6200c

Heating alternative	Voltage alternative	Total kW	Fuse A
No heating or Steam heating	200 V 3 AC	6,7	35
	230 V 3 AC	6,7	25
	240 V 3 AC	6,7	20
	380 V 3 AC	6,7	16
	400 V 3 AC	6,7	16
	415 V 3 AC	6,7	16
	440 V 3 AC	6,7	16
	480 V 3 AC	6,7	16

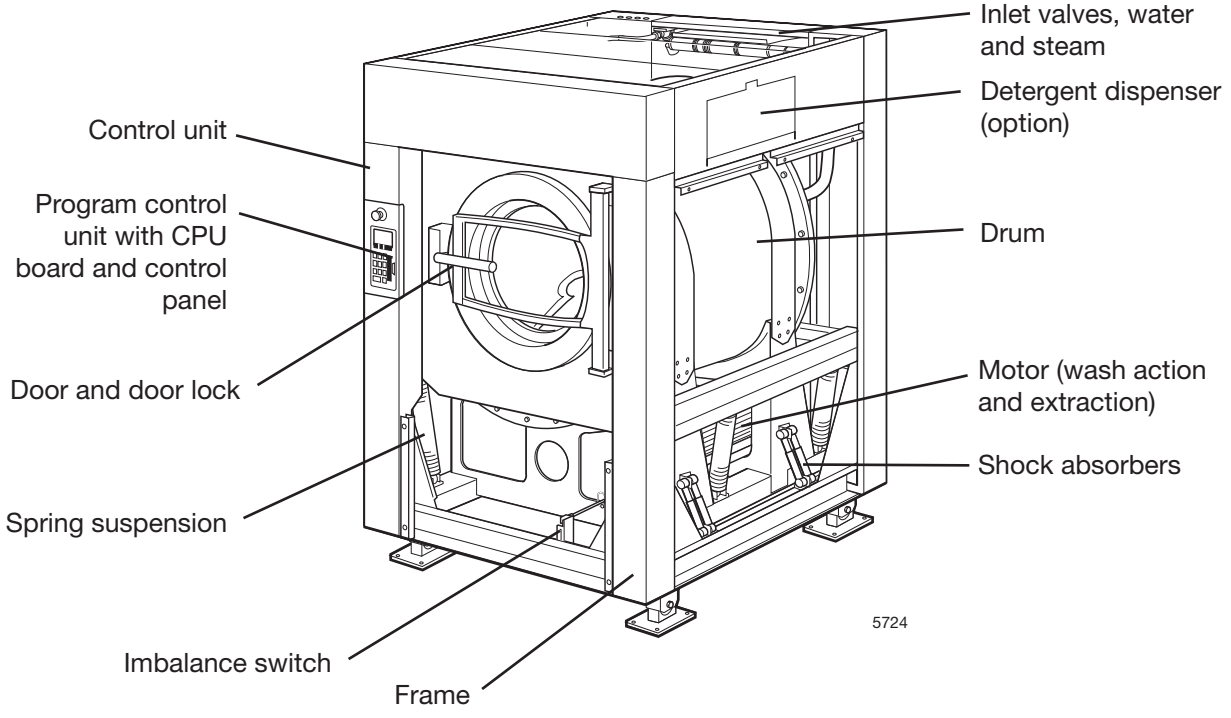
EX6250c

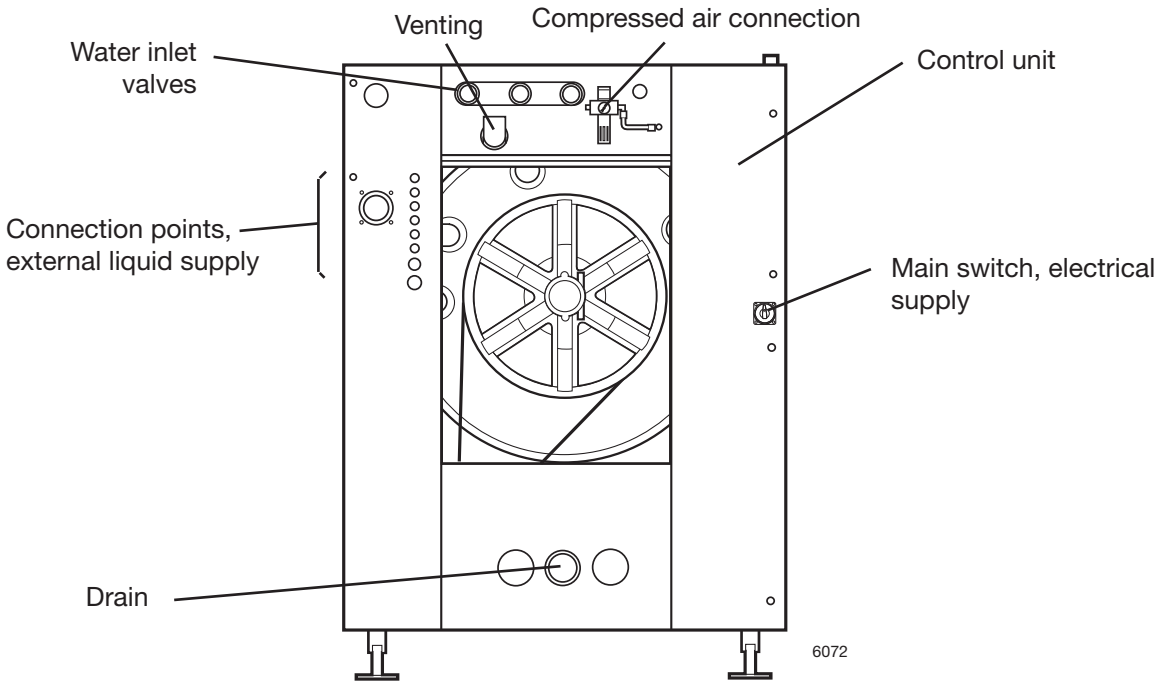
Heating alternative	Voltage alternative	Total kW	Fuse A
No heating or Steam heating	200 V 3 AC	5,3	35
	230 V 3 AC	5,3	25
	240 V 3 AC	5,3	20
	380 V 3 AC	5,3	16
	400 V 3 AC	5,3	16
	415 V 3 AC	5,3	16
	440 V 3 AC	5,3	16
	480 V 3 AC	5,3	16

Machine presentation

(1) The drum assembly on this model is of the suspended type, which means that the outer drum and its motor assembly are suspended in the machine chassis with strong coil springs in the middle and at each corner, inside the machine. By each spring there is a damper to minimise imbalance when the machine is operating. The union between the inner drum and the outer drum (at the back) has two heavy-duty bearings, and is sealed with three radial seals.

(1)





The inner drum is driven via four V-belts by a frequency-controlled motor, which is mounted on a motor mounting plate under the drum assembly. The motor mounting plate is adjustable, so that belt tension can be regulated. The motor has a microprocessor-controlled control unit which allows the motor speed, acceleration and deceleration to be controlled with high precision.

The drain valve is a diaphragm valve which is operated by compressed air.

The door is locked when the program starts.

The machine is supplied complete with a microprocessor-based control unit.

The electrical components are in the automatic control unit on the machine rear.

The machine exterior is made up of:

- Front panels of stainless steel.
- Back cover of hot-dip galvanised steel, painted white.
- Side panels and top cover of either stainless steel or of hot-dip galvanised steel.

Maintenance

The careful attention paid to all aspects of the design of this machine means that preventive maintenance has been reduced to a minimum. The measures listed below will, however, need to be followed at regular intervals, and their frequency should be adapted according to the actual level of machine use.

Daily

- Check that the door lock is working normally.
- Check that the door does not leak. Clean the door sealing disk of detergent residue.
- If the machine has an automatic dispenser: clean this (including scoops) of detergent residue.
- Check that the drain valve is not leaking and that it opens and closes normally.

(1)
- Check the compressed air regulator (A). If necessary empty separated water.

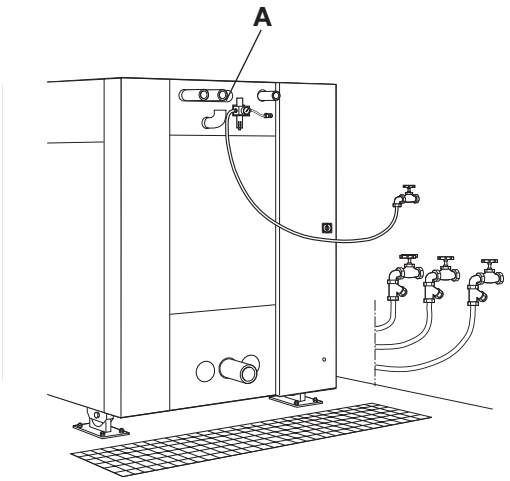
Every third month

- Ensure that the external switch is “OFF”.
- Remove rear and side panels.
- Check that hoses and connections are not leaking.

(2)
- Check that the drive belts are undamaged and properly tensioned. If necessary adjust the drive belts.

(3)
- Clean the filters at the steam and water connections.
- Refit the panels at the end of the check.

1



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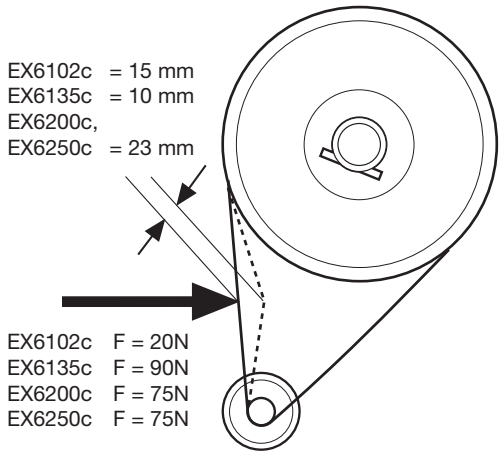

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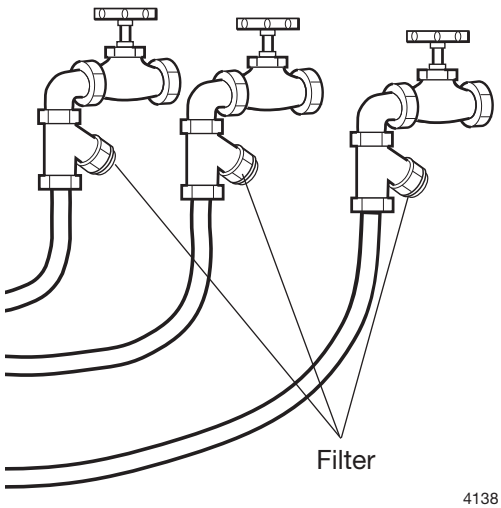

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General information about troubleshooting

The troubleshooting section is used to pinpoint a fault on the machine to a specific defective component or unit.

If the power supply is interrupted, the programme memory will keep the select programme in its memory for approx. 3-5 minutes.

Within this time period, the machine automatically restarts after the power interruption.

Precautions

Only authorized personnel is allowed to troubleshoot the machine.

Prior to commencing troubleshooting, pay close attention to the precautions in section 1.

If the power is on, be very careful when working on the the machine.

DANGER

Be very careful when measuring the motor controller since all components have a potential difference of about 300 V compared to Ground and Neutral.
When the green LED is lit, all components are powered with dangerous voltage.
When the power supply to the machine is interrupted and the motor has stopped, the motor controller will does lose power until after 10-30 seconds.

Measurements

For information about measurement points, components and voltages, please refer to the wiring diagrams for the machine.

Errors with no error codes

This section includes troubleshooting charts for errors for which no error code is generated.

Errors with error codes

Error indication

(1) Programme or machine errors are indicated by an alarm text in the display window.

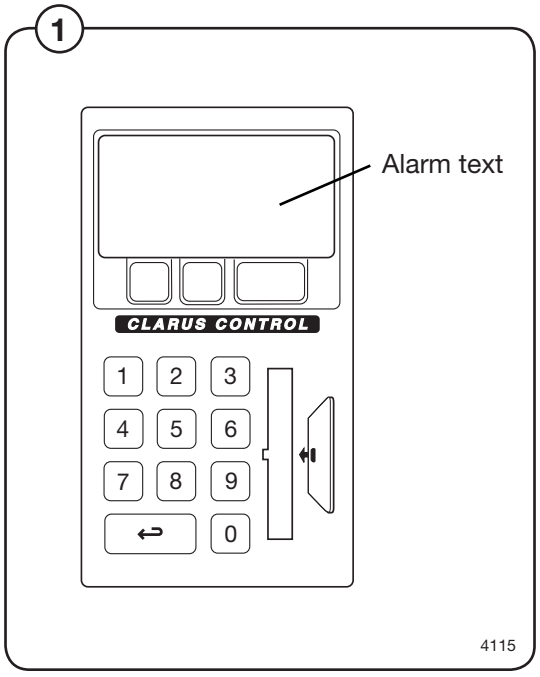
Resetting an error indication

Error indications can be reset in two different ways:

(1)
- By pressing START, the error may be temporarily reset. The machine then continuous the programme that was already started. If the error code remains, the error will come back at once.
- By pressing ⏎ the error is reset and the started programme is cancelled.

Error codes

A brief summary of all error codes and the possible cause for each error is presented below. Troubleshooting charts for all errors are presented on the following pages.



List of errors, functions monitored and relevant error messages displayed

Error/Function	Error message displayed
01 ERROR. NO WATER Water level has not reached set level within time set. After this error message appears and the machine is reset, the machine will try again.	NO WATER
02 ERROR. OPEN DOOR Signal from microswitch which checks door status absent during program. After this error message appears and the machine is reset, the machine will try again.	DOOR OPEN
03 ERROR. DOOR LOCK Signal from microswitch which detects when the door is locked absent during program.	DOOR UNLOCKED
04 ERROR. LOW TEMPERATURE The temperature is below the lowest value allowed (open circuit in temperature sensor).	NTC LOW TEMP
05 ERROR. HIGH TEMPERATURE The temperature is above the highest value allowed (short-circuit in temperature sensor).	NTC HIGH TEMP
06 ERROR. WATER IN MACHINE The water level is higher that the level EMPTY at the start of the program.	WATER IN DRUM
07 ERROR. OVER-FILLED The water level is higher than the ”LEVEL OVERFILL” (i.e. DRUM OVER-FILLED) level. If this function is switched off (=N), instead the drain valve will open for a short time and discharge some of the water. This is described under the function ”DRAIN TIME WHEN OVERFILL” (i.e. DRAIN TIME AFTER OVER-FILLING) earlier in this section.	MACHINE OVER-FILLED
08 ERROR. NO HEAT The temperature has not increased by the number of degrees specified in the function ”MIN. TEMPERATURE INCREASE” (see back in this section), over the period of time specified in the function MAXIMUM HEATING TIME (see ”SETTINGS 1”).	NO HEATING
10 ERROR. REMAINING WATER When the drain sequence has finished, the water level is still higher than the EMPTY level.	NOT DRAINED
11 ERROR. UNBALANCE SWITCH The unbalance switch is closed when the machine is starting on a drain sequence.	UNBALANCE SENSOR FAULT
13 ERROR. MOTOR COMMUNICATION Communication between PCU and motor control unit interrupted or disturbed.	NO MOTOR COMM
14 ERROR. LEVEL ADJUST Every machine has individual level calibration at the factory. If these calibration values are missing or fall outside the limit values, an error warning will be flagged at each program start-up. The program can still be started, however, by pressing START. It will then use standard (default) values, which means that the levels will not be as precise as intended.	LEVEL CALIBRATION

List of errors, functions monitored and relevant error messages displayed, cont.

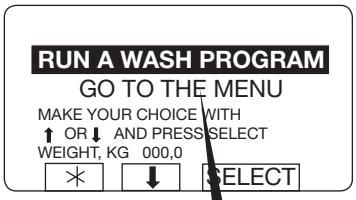
Error/Function	Error message displayed
15 ERROR. EMERGENCY STOP The emergency stop button has been pressed.	EMERGENCY STOP
16 ERROR. WEIGHT FROM SCALE Over-/Under-load of scale or weight above limit for maximum allowed weight at wash module start.	WEIGHT FROM SCALE
17 ERROR. DOOR LOCK SWITCH Even though the door lock microswitch indicates that the door is locked, the signal from the microswitch which is used to detect when the door is closed is absent.	DOOR LOCK
18 ERROR. START NOT ALLOWED Network does not allow programme start.	START NOT ALLOWED
19 ERROR. MIS COMMUNICATION Machine has lost contact with network.	MIS COMMUNICATION
20 ERROR. INTERLOCK Fault in MCU receiving circuitry for lock acknowledgement signal. The test of the MCU-interlock circuits proceeds in the following way: Before the locking of the door lock a speed command is sent from the timer to the MCU (=0 Hz). Then the timer checks that the value of the apparent current (ru 15) and output (ru 20) is below the value 5, which is a condition for locking the door. When the door is locked the timer again command running at 0 Hz and this time the apparent current and the output voltage shall have a value above 5.	INTERLOCK
21 ERROR. I/O COMMUNICATION Communication between the CPU board and one of the I/O boards interrupted or disturbed.	I/O COMMUNICATION
22 ERROR. LOW OIL LEVEL In machines with an oil lubrication system, indicates low level in the oil container.	LOW OIL LEVEL
23 ERROR. LOW OR HIGH VOLTAGE Incorrect input voltage to external equipment.	PHASE
24 ERROR. PRESSURE SENSORS, TILT Both pressure sensors are active at the same time.	PRESSURE SENSOR TILT
25 ERROR. PRESSURE SENSOR TIMEOUT No pressure at the relevant pressure sensor within the maximum time allowed for tilt backwards or forwards.	PRESSURE SENSOR TIMEOUT
26 ERROR. DOOR SWITCH, TILT Door closed (S3) is "on" at a time when the machine door is locked open (S25).)	DOOR SWITCH, TILT
27 ERROR. LEVEL OFFSET The pressure sensor for the water level signals a value that is so different from the empty machine state that the automatic level calibration cannot adjust the level system.	AUT. LEVEL CALIB.
28 ERROR. LEVEL NOT CALIBRATED Calibration of level system not done in service mode before use of machine.	

List of errors, functions monitored and relevant error messages displayed, cont.

Error/Function	Error message displayed
ERROR. ERROR CODES FROM MOTOR CONTROLLER This function includes a number of error warnings from the motor control system for frequency-controlled motors	
31 DC voltage too high Check the mains voltage.	OVER VOLTAGE
32 DC voltage too low Check the mains voltage.	UNDER VOLTAGE
33 DC level varying too much Check that all the fuses for the three fases are OK.	PHASE MISSING
34 Short-circuit between motor windings or to earth. Check the isolation to ground for motor cable and motor.	OVER CURRENT
36 Electronics too hot Check the ambient temp. Check if the drum is running smoothly.	OVERHEAT
38 Power module too hot Check the ambient temp. Check if the drum is running smoothly.	OVERHEAT PM
39 Motor thermal protection has tripped Check if the ventilation fan in the motor is working.	MOTOR OVERHEAT
46 Overload Check if the drum is running smoothly.	OVER LOAD
48 No communication between timer and motor control system Check the cables between timer and motor control.	WATCH DOG

Service programme

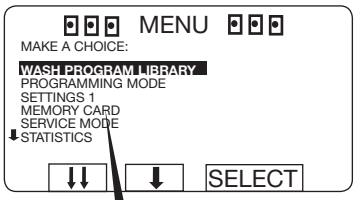
Opening the service programme



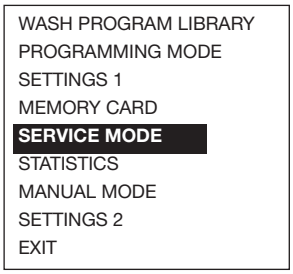
If this menu is not currently displayed:
Press ↩ repeatedly.

Press ↓ to highlight "GO TO THE MENU".

Press SELECT.



Press ↓ four times.



... to highlight "SERVICE PROGRAM".

Press SELECT.

The service program

The service program makes fault-finding on the machine easier, as it allows you to control the various machine functions individually:

- water filling
- detergent flushing
- motor rotation, clockwise and counterclockwise
- motor action, distribution and extraction
- drain
- door lock
- heating
- buzzer

You can also check which input signals to the PCU are activated:

- emergency stop
- remote start
- oil lubrication
- service
- repeat rinse
- phase check
- door locked
- door closed
- imbalance

The following values will also be displayed at all times:

- water level in machine
- water temperature
- motor speed
- whether drain is open or closed

PRESS BUTTON ON
CPU BOARD

✳ ✳ EXIT

Not for FOM71 CLS.

Press the button on the CPU circuit board.

SERVICE PROGRAM

MAKE A CHOICE:
SERVICE PROGRAM
CLEAR TRIP HOUR COUNTER
CLEAR SERVICE COUNTER
CLEAR WASH PROGRAM COUNTER IN CLS
CLEAR WASH PROGRAM COUNTER IN SMC
SCALE ADJUSTMENTS
CALIB. OF LEVEL SENSOR
EXIT

✳ ⬇ SELECT

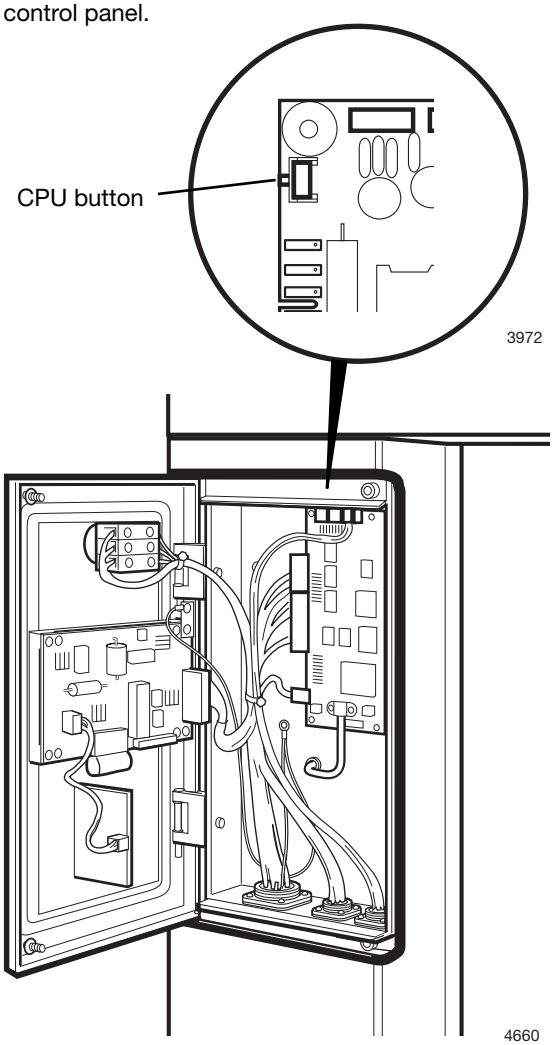
To access the service program:

SELECT

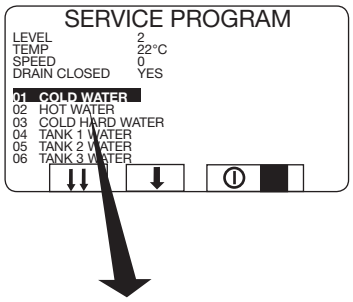
Press Select.

Prevention of unauthorised access

A button on the CPU circuit board has to be pressed to gain access to the service program, to prevent its unauthorised or inadvertent use. The CPU circuit board is located behind the control panel. Two screws have to be undone to open the control panel.



To control the machine functions



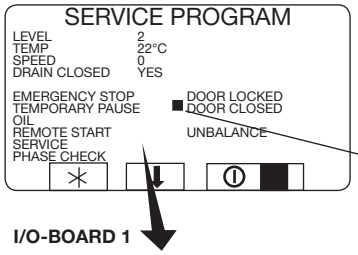
01 COLD WATER
02 HOT WATER
03 COLD HARD WATER
04 TANK 1 WATER
05 TANK 2 WATER
06 TANK 3 WATER
07 FLUSH
10 DETERGENT POWDER 1
11 DETERGENT POWDER 2
12 DETERGENT POWDER 3
13 DETERGENT POWDER 4
14 DETERGENT POWDER 5
17 LIQUID DETERGENT 1
18 LIQUID DETERGENT 2
19 LIQUID DETERGENT 3
20 LIQUID DETERGENT 4
21 LIQUID DETERGENT 5
22 LIQUID DETERGENT 6
23 LIQUID DETERGENT 7
24 LIQUID DETERGENT 8
25 LIQUID DETERGENT 9
26 LIQUID DETERGENT 10
27 LIQUID DETERGENT 11
28 LIQUID DETERGENT 12
29 LIQUID DETERGENT 13
33 MOTOR CLOCKWISE
34 MOTOR COUNTERCLOCKWISE
35 DISTRIBUTION
36 LOW EXTRACT
37 MEDIUM EXTRACT
38 HIGH EXTRACT
39 TURBO EXTRACT
40 NORMAL DRAIN
41 DRAIN BLOCKING
42 RECYCLE DRAIN A
43 RECYCLE DRAIN B
44 RECYCLE DRAIN C
45 RECYCLE DRAIN D
49 OIL (PULS)
51 DOOR LOCK
55 HEAT
56 HEAT 2 AS STANDARD
64 BUZZER
EXIT

To activate the various machine functions:

Use ↓ or ↑ to highlight the function.
Press ⏻ switch the function on and off.

I/O card inputs

1 **Press 1.**



Now you can check the various input signals from I/O board 1.

A black square in front of the name indicates that the input is active.

I/O-BOARD 1

EMERGENCY STOP
TEMPORARY PAUSE
OIL
REMOTE START
SERVICE
PHASE CHECK
DOOR LOCKED
DOOR CLOSED
UNBALANCE

Press any key to go back to the previous display.

When the programme unit has two I/O cards:

2 **Press 2.**

I/O-BOARD 2

CHANGE HEATING SYSTEM
REPEAT RINSE

It is now possible to verify the various input signals from I/O card 2.

Press any key to go back to the previous display.

To end the service programme

End the service programme by pressing ⮌.

Errors with no error codes

No indication in the display window (machine not responding or operates apart from this).

If the power is on, be very careful when working on the machine.

Verify that:

- the machine receives power.
- the machine has not been emergency stopped.
- (2) (3) the red LEDs on the programme unit card and the I/O card light steadily. (Verify through measurement that X3:1 - 2 at A11 is 16 V. If not, troubleshoot the voltage supply circuit.)
- verify that the green LEDs on the programme unit card and the I/O card blink quickly.
- (4) verify the fuses F11 and F12 (T 1.25 A) in the rear control unit. Replace burnt-out fuses.

1. Perform a communication test using the test box. Refer to the manual "Instructions for Clarus Communication Tests".

OK LED on test box

|

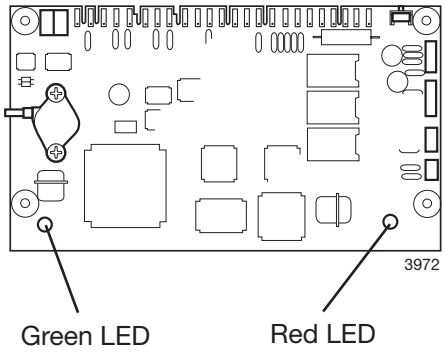
The display or display cable is probably defective.

Defective LEDs on test box

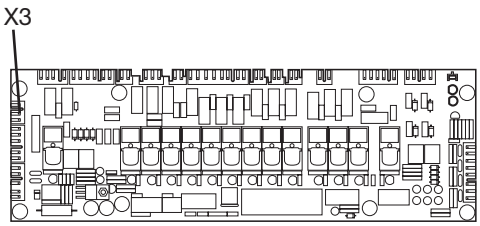
|

Troubleshoot according to the manual "Instructions for Clarus Communication Tests".

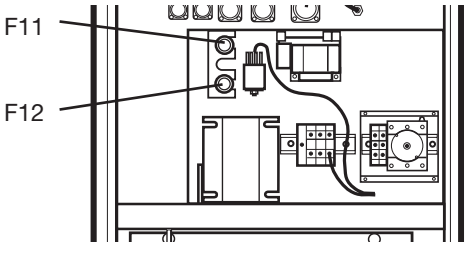
(2)



(3)



(4)



Errors with error codes

NO WATER

The water level has not reached the selected level within the given time. Following an alarm and subsequent, the machine will make a new attempt.

First verify that:

- the programme unit was not incorrectly programmed
- the inlet filter is not blocked
- all water faucets are open
- the drain is not leaking
- Reset the error code. Continue with troubleshooting if the error code appears again.

(5) **1. Enter the service programme and the activate water valves on the machine, one after the other.**

All valves fill up with water

One of the valves does not fill up with water

2. Activate the defective valve in the service programme and measure the voltage (230 V) at the water valve.

No voltage

Voltage OK

The valve is probably defective.
Verify and remedy

(5) **3. Depending on the valve, measure the supply voltage (230 V) of the water valve at switch X9 on I/O card 1, A11.The relay functions can also be verified using the LEDs on I/O card 1.**

No voltage

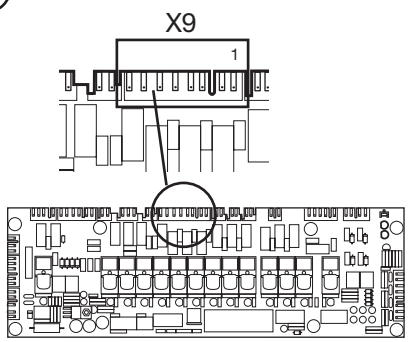
Voltage OK

Defective cables between the communication card A11 and the water valve, or defective programme unit card A1. Verify and remedy.

Probably defective control output from the programme unit card A1 or I/O card 1 A11.

Continued on next page

(5)



Valve		Switch	Relay
Y11	cold/warm compartment 1	X9:7	4 detergent dispenser
Y12	cold/warm compartment 2	X9:6	5 detergent dispenser
Y13	cold/warm compartment 3	X9:5	6 detergent dispenser
Y15	cold water	X9:4	7
Y22	warm compartment 2	X9:2	8 detergent dispenser
Y25	warm water	X9:1	9
Y14	cold/warm compartment 4	X9:3	10 detergent dispenser

Continued from previous page

5. Activate (close) the drain valve in the service programme. Activate another of the water valves and verify the drain valve function.

Drain valve OK

Drain valve defective

Troubleshoot the drain valve according to the instructions under error code **WATER IN DRUM** later in this troubleshooting section.

(6) **6. Verify that the level hose is not damaged, bent, blocked and has not come lose from the T-joint, drum, programme unit card A1 or level guard B2.**

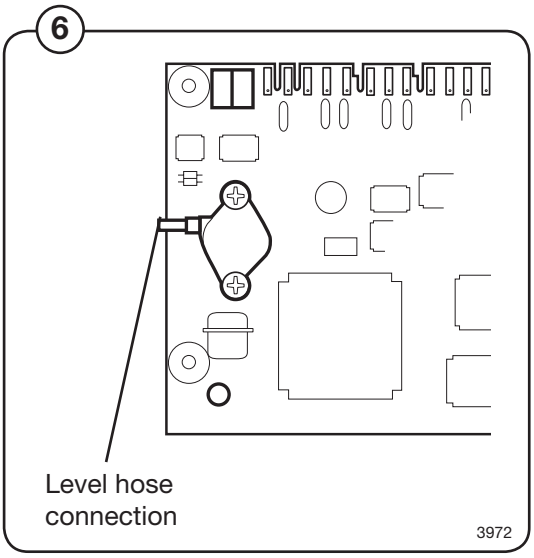
Level hose OK

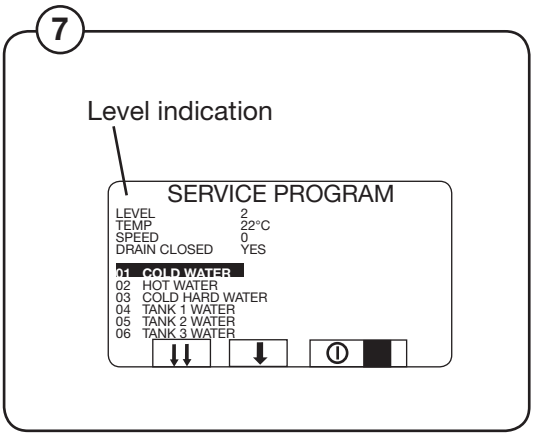
Defective level hose

Fit the hose correctly or replace it.

(7) Level detector on programme unit card A1 probably defective.

- Enter the service programme and verify that the level indication is stable.
- Blow into the level hose and check the level indication increases.
- Check the level system for leakage.





DOOR OPEN

No signal from the ”Door closed” during programme operation. If the input signal for ”Door closed” is lost during programme operation, the OPEN DOOR error code is immediately generated.

If the power is on, be very careful when working on the machine.

1. Try to restart the machine (i.e. reset the error code) by pressing START.

Error message returns

No error message

Temporary error (probably defective contact)

(8) **2. Exit the programme using ⏎. Enter the service programme (unlock the door if it is locked). Verify voltage supply is present between X5:4 - 5 when the door is closed.**

(9) No voltage

Voltage present but black square does not light

I/O card 1 A11 probably defective.

3. Verify voltage is present between X5:3 - 5.

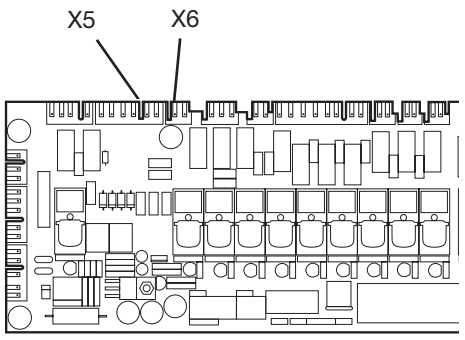
Voltage present

No voltage

Troubleshoot the cabling for the voltage supply (between the main power switch Q1 and X6).

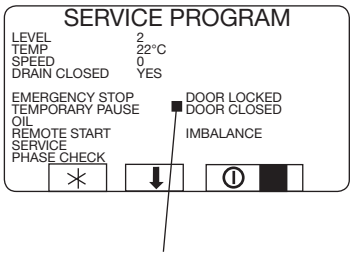
Continued on next page

8



3973

9



Indication **Door locked**

5390

Continued from previous page

(10) **4. Disassemble the door lock and verify the function of S3 using an ohm meter.**

Correct function

Incorrect function

Replace S3.

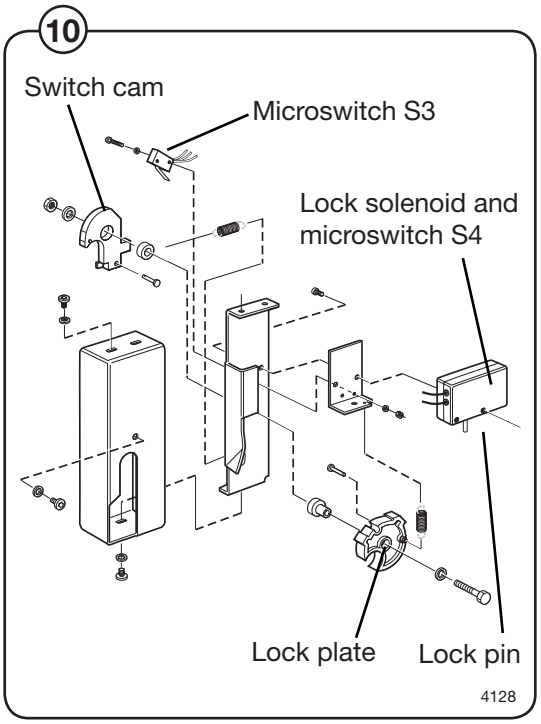
5. Inspect the cabling between X5 and S3 using an ohm meter.

Cabling OK

Incorrect cabling

Remedy or replace the cables.

Inspect the mechanical function of the door lock. Replace any defective components or replace the door lock.



DOOR UNLOCKED

No signal from the ”Door locked” during programme operation.

If the input signal for the "Door locked" is lost during programme operation, the "DOOR UNLOCKED" error code is immediately genrerated.

At programme start, this error code is suppressed for a few seconds.

If the power is on, be very careful when working on the machine.

1. Try to restart the machine (i.e. reset the error code) by pressing START.

Error message returns

No error message

Temporary error in the door lock or programme unit

(11) **2. Exit the programme using ⏎. Enter the service programme and verify that there is voltage between X5:2 - 6 when the door lock is engaged.**

(12) No voltage

Voltage present but black square does not light

I/O card 1 A11 probably defective

3. Verify that there is voltage supply between X5:1 - 5 when the door lock is switched on.

Voltage present

No voltage

Troubleshoot the cabling for the voltage supply (between the main power switch Q1 and X6).

(13) **4. Is the lock command present? Measure X:92 on the door lock controller.**

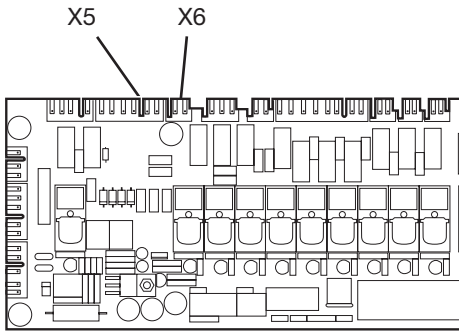
Yes

No

Troubleshoot according to the error codes in section 29.

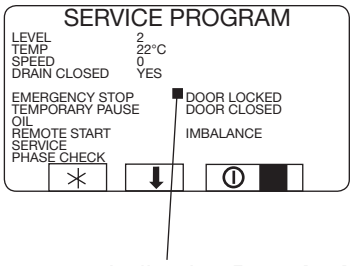
Troubleshoot cabling between X5 and the actuator. The actuator could be defective.

(11)



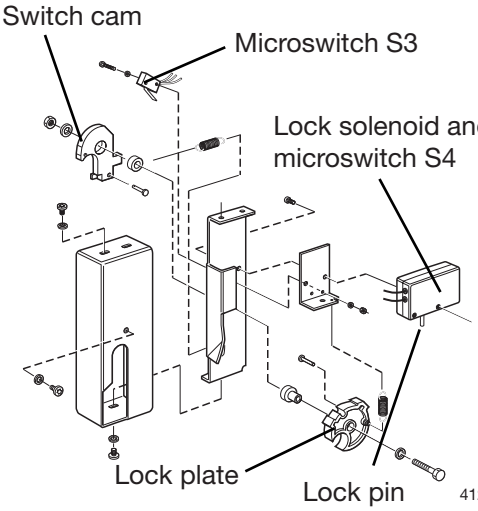
3973

(12)



Indication **Door locked**

(13)



4128

NTC LOW TEMP

The programme unit indicates an interruption with the temperature sensor or the temperature is below -5 °C.

Try to restart the machine (i.e. reset the error code) by pressing START.

(14) **1. Undo the temperature sensor connections and measure the resistance of the sensor. The resistance should be as in the table below:**

Approximate values for a fully functional temperature sensor

T (°C)	R (ohm)
19	6109
20	5844
21	5592
22	5353
23	5124

Resistance OK

Incorrect resistance

The temperature sensor is probably defective.

(15) **2. Exit the programme using ⏎. Enter the service programme and read the temperature (the display window shows 0°C). Short-circuit inputs 1 and 2 on**

(16) **card switch X1. Verify that the display window shows 100°C.**

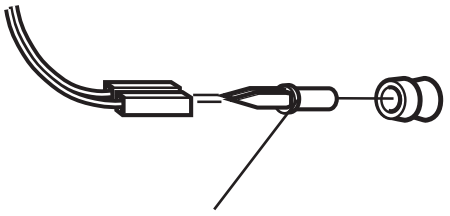
Yes

No

Incorrect temperature sensing on the programme unit card. Replace the card.

Incorrect cabling to the . Verify and replace if necessary.

(14)

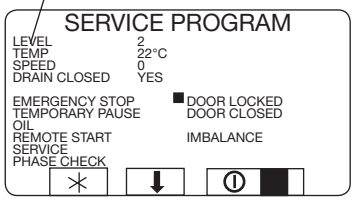


Temperature sensor

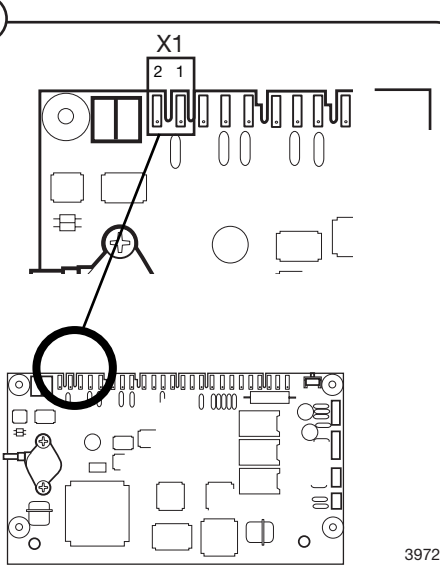
5204

(15)

Temperature indication



(16)



3972

NTC HIGH TEMP

The programme unit indicates a short-circuit with the temperature sensor or the temperature exceeds 98°C.

Try to restart the machine (i.e. reset the error code) by pressing START.

(17) **1. Undo the temperature sensor connections and measure the resistance of the sensor. The resistance should be as in the table below:**

Approximate values for a fully functional temperature sensor

T (°C)	R (ohm)
19	6109
20	5844
21	5592
22	5353
23	5124

Resistance OK

Incorrect resistance

The temperature sensor is probably defective.

(18) **2. Reset the connection on the sensor and exit the programme using ⮌. Enter the service programme and read the temperature. Disconnect one of the inputs 1 and 2 on card switch X1. Verify that the display window shows 0°C.**

(19)

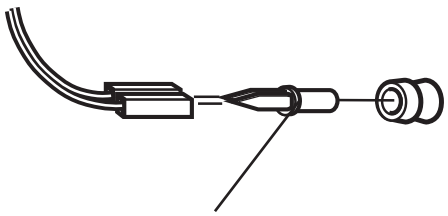
Yes

No

Incorrect temperature sensing on the programme unit card.

Incorrect cabling to the temperature sensor. Verify and replace if necessary.

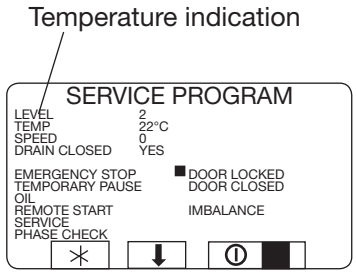
(17)



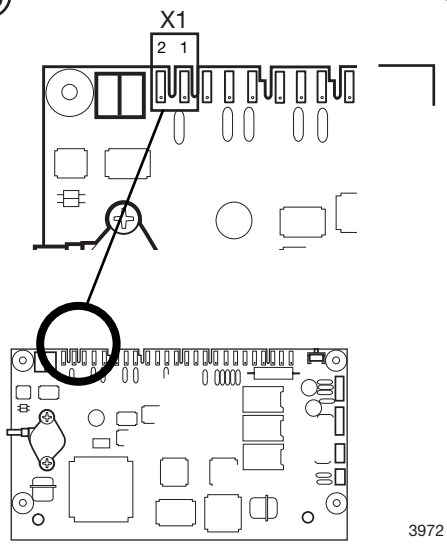
Temperature sensor

5204

(18)



(19)



3972

WATER IN DRUM

The water level is higher than EMPTY at programme start.

First verify whether:

- the same error appears again following resetting of the error code
- the drain is blocked by fluff or foam
- the level hose and air box are blocked (blow into the level hose)
- For machines with a drain pump, verify correction operation.

Pay attention to temperature extremes in the surrounding which may affect the level system, generating this error code.

1. Verify whether there is any water in the drum.

Water in drum

No water in drum

(20) (21)

2. Enter the service program and record the actual level value. Disconnect the level hose from the programme unit card A1.

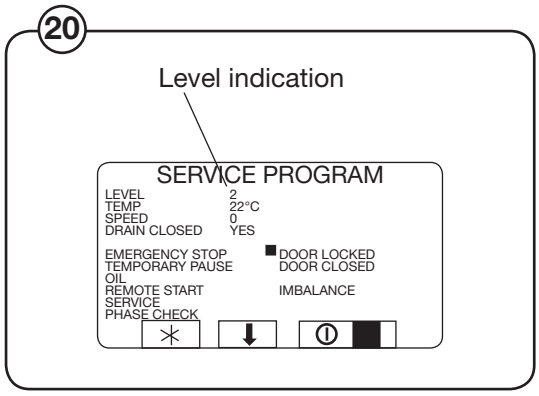
Level value does not change

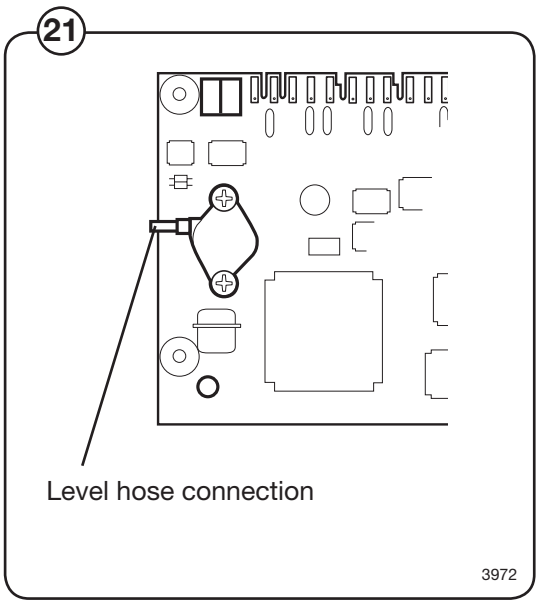
Level value falls

The level hose is probably blocked by fluff or due to incorrect installation. Verify and clean, or replace the hose.

Level detector on programme unit card A1 is defective.

Verify the operation of the drain valve using the service programme. Remedy or replace the defective drain valve if necessary.





MACHINE OVERFILLED

The water level is above the level for OVER-FILLED MACHINE. If this function is switched off (=N) the drain valve will open instead for a short while to drain some of the water.

If the power is on, be very careful when working on the machine.

Try to restart the machine (i.e. reset the error code) by pressing START.
If the error returns, first make sure that:

- the level hose and air box are not blocked (blow into the level hose)
- that none of the water valves has locked (i.e. poured in continuously).

1. Visually inspect. Is there too much water in the machine?

No

Yes

Exit the programme and drain the machine.

(22) **2. Exit the programme using ⏎. Enter the service programme and record the actual level value. Undo the level hose from the programme unit and verify whether the level falls.**

(23)

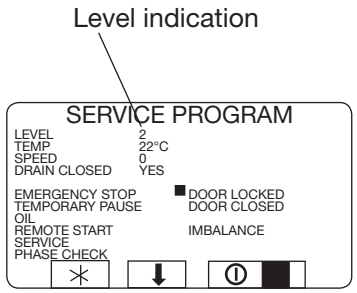
No

Yes

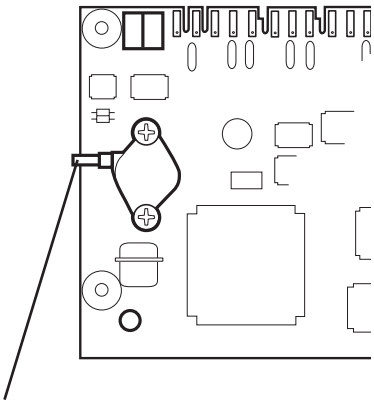
Inspect the level system (hoses, nipples and air box).

3. Inspect whether the level input on the programme unit is blocked. If this is not the case, the the programme unit is probably defective.

22



23



NO HEATING

The temperature has not increased the number of degrees specified in the function MIN ALLOWABLE TEMPERATURE INCREASE (see settings 2) during the time that is programmed in the function MAXIMUM HEATING TIME (Configuration 1).


If the power is on, be very careful when working on the machine.

Try to restart the machine (i.e. reset the error code) by pressing START.
If the error returns, first make sure that:

- the programme module is not incorrectly programmed
- the heat supply is intact, the steam boiler is operating
- the drain does not leak.

1. Exit the programme using ⮌. Enter the service programme and fill up water to above the safety level (5-10 cm above the lower edge of the inner drum). Switch on the heating. Does the steam valve open?

NOT DRAINED

The water level exceeds EMPTY at wash program start.

Try to restart the machine (i.e. reset the error code) by pressing START. If the error returns, first verify these items:

- Is the drain is blocked by fluff or foam?
- Are the the level hose and air box blocked (blow into the level hose)?
- Verify the operation of the drain using the service programme.
- Is the drain in the room capable of receiving the water from the machine?

UNBALANCE SENSOR FAULT

The imbalance switch is closed during program start.


If the power is on, be very careful when working on the machine.

Try to restart the machine (i.e. reset the error code) by pressing START. If the error returns, troubleshoot as follows:

Verify:

- the mechanical function of the imbalance switch
- the resistance between the imbalance switch and the cabling.

If the error remains, there is probably an internal error in the motor controller.

NO MOTOR COMM.

Communication between the programme unit and the motor controller has been interrupted or interfered.


If the power is on, be very careful when working on the machine.

Try to restart the machine (i.e. reset the error code) by pressing START. If the error returns.

LEVEL CALIBRATION

The water level system has not been correctly calibrated.

Each machine has been individually level adjusted at the factory. If the calibration values are missing or outside the limits, an error is generator at programme start. The programme can, however, be started by pressing START once more. In this case the standard values are used and the level swill not be as exact.

Carry out programming anew and make sure the calibration values are within the allowed limits.

WEIGHT FROM SCALE

The scale is all the time sending the actual weight to the timer. If the scale is over- or under-loaded all the time the error will be indicated.

The same error will also be indicated if the weight transfered from the scale to the timer at the beginning of a water filling periode, is above a certain limit set in the configuration system of the machine. To correct the problem, try to first zerocalibrate the scale and then reset the scale in the service-mode. If the error remains, please contact service.

EMERGENCY STOP

The emergency stop button was pressed.


If the power is on, be very careful when working on the machine.

Find out the reason for the emergency stop button having been pressed.

Take the necessary measures.

Reset the emergency stop button by turning it counter-clockwise.

Restart the machine by pressing START or ⏎.

DOOR LOCK

The signal from the ”Door locked ” switch is present although there is no signal from the ”Door closed” switch.

This error code can only be generated prior to programme start.

If the power is on, be very careful when working on the machine.

Try to restart the machine (i.e. reset the error code) by pressing START.
If the error returns, troubleshoot as follows:

(24) **1. Undo the card connection X5 on I/O card 1, A11**

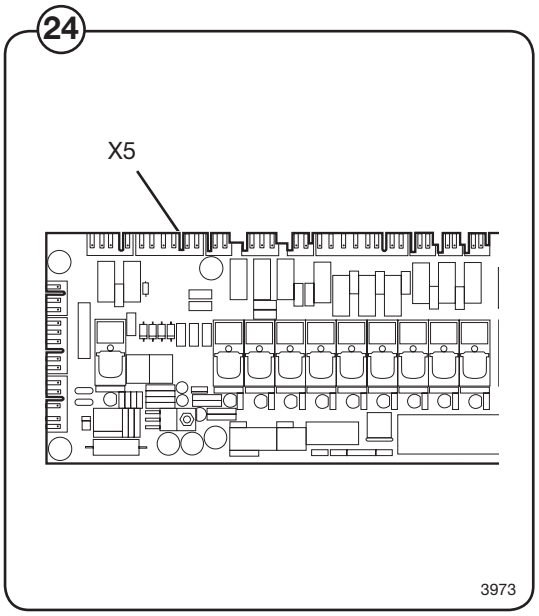
Error message returns

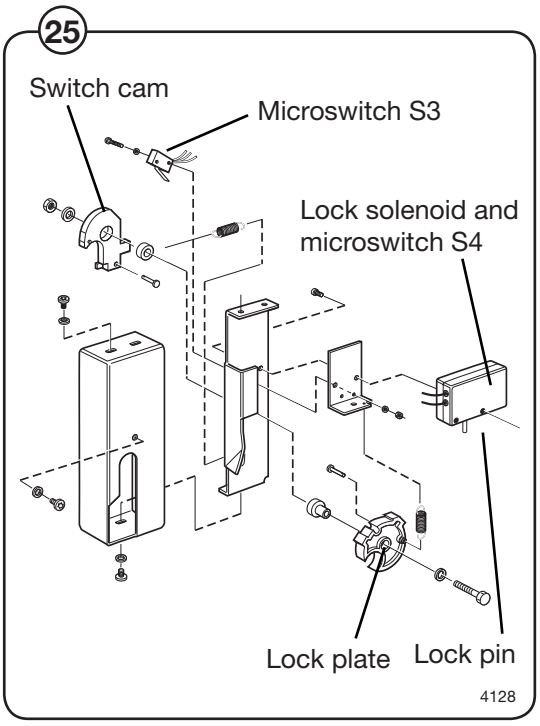
(25)

I/O card A11 probably defective.

No error message

Troubleshoot the door lock actuator and the cabling for electric or mechanical short-circuit.





START NOT ALLOWED

The network does not allow start of the washing programme.

Try to reset the error code.

If the error remains, contact the responsible person for the network and have the error fixed.

MIS COMMUNICATION

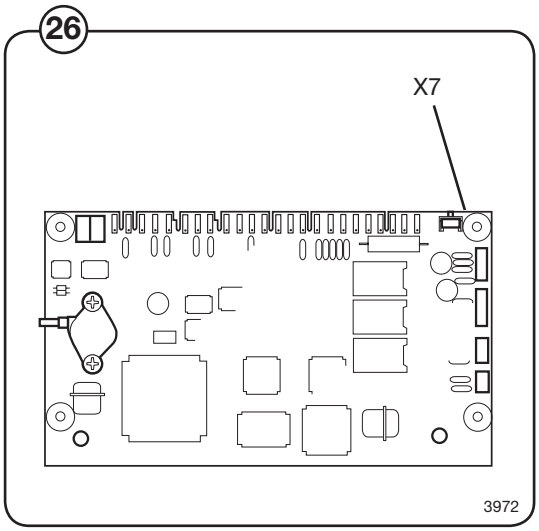
Communication between the programme unit card A1 and the network has been interrupted.

If the power is on, be very careful when working on the machine.

Try to restart the machine (i.e. reset the error code) by pressing START.
If the error returns, troubleshoot as follows:

(26) Verify that the cable between the network and X7 on programme unit card A1 is connected.
If the cable is properly connected, contact the person responsible for the network.

Note!
This error code will disappear by itself after several programme starts. In case communication has been interrupted intentionally, the machine can be operated with no further intervention required.



INTERLOCK STATUS

The motor controller does not receiving an interlock signal during programme operation.

If the power is on, be very careful when working on the machine.

Switch off the machine for at least 30 seconds to ensure the motor controller has been completely reset. Then try to start the machine again. If the error returns, troubleshoot as follows:

(27) **1. Measure the interlock signal on the motor controller XA2:16 interlock (+24V) and XA2:22 GND.**

No signal

Signal OK

Troubleshoot the motor controller.

(28) **2. Measure the signal on the I/O card 1 interlock bus A11:X10.**

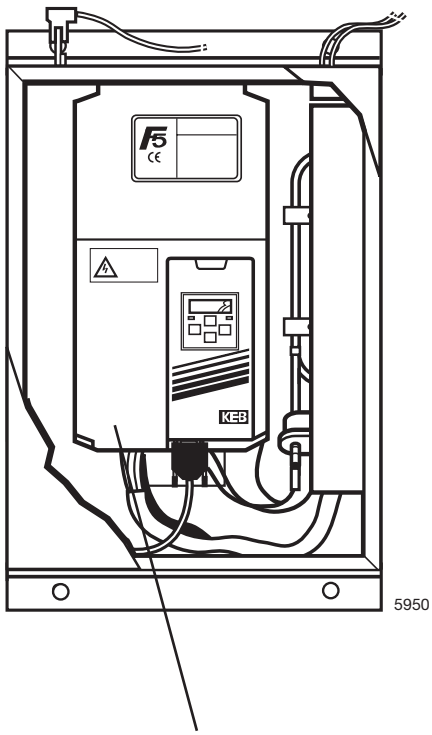
No signal

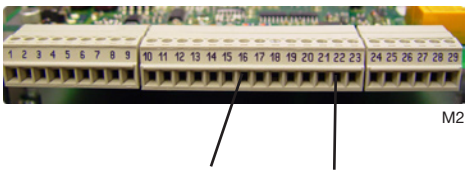
Signal OK

Troubleshoot the cabling between the motor controller and programme unit. Inspect the cabling and replace if necessary.

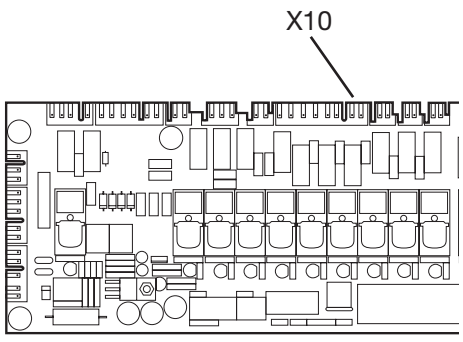
Troubleshoot the interlock circuits.

(27)





(28)



IO COMMUNICATION

Communication between programme unit A1 and one of the I/O cards has been interfered with or interrupted, or incorrect configuration of the I/O cards.


If the power is on, be very careful when working on the machine.

Try to restart the machine (i.e. reset the error code) by pressing START. If the error returns, troubleshoot as follows:

1. Perform a communication test using the test box. Refer to the manual ”Instructions for Clarus Communication Tests”.

OK LED on test box

Defective LEDs on test box

Troubleshoot according to the manual ”Instructions for Clarus Communication Tests”.

The motor controller or cabling for the motor controller is probably defective.

LOW OIL LEVEL

Low oil level in the oil container. Applies only to machines with oil lubrication.

Fill up with oil and restart the machine.

Verify for any leaks.

PHASE

Alarm from the mains monitoring equipment.

An input on I/O card 1 (X16:7-8) can be connected to external equipment that monitors received mains signals in terms of voltage levels, loss of phase, etc. If this input goes high, the error message is displayed.

Find out the reason for the error indication by inspecting the mains monitoring equipment.

For more on this troubleshooting, refer to the manual supplied with the mains monitoring equipment in use.

AUT. LEVEL CALIB.

The pressure sensor for the water level signals a value that is so incorrect when the machine is empty that automatic level calibration of the level system is not possible.

If the power is on, be very careful when working on the machine.

Try to restart the machine (i.e. reset the error code) by pressing START.
If the error returns, troubleshoot as follows:

(29) **1. Verify the level indication in the service programme when the drum is empty. Does the level indication exceed the set limit value?**

Yes

No

2. Try to restart a washing programme again.

No error code

Error remains

The level hose is probably blocked.
Replace or clean the level hose.

Temporary error.

(30) **3. Undo the level hose from the programme unit card A1. Does the level indication still exceed the set limit value?**

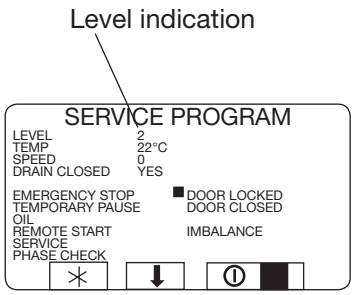
Yes

No

The level hose is probably blocked.
Replace or clean the level hose.

The programme unit card A1 is probably defective.

29



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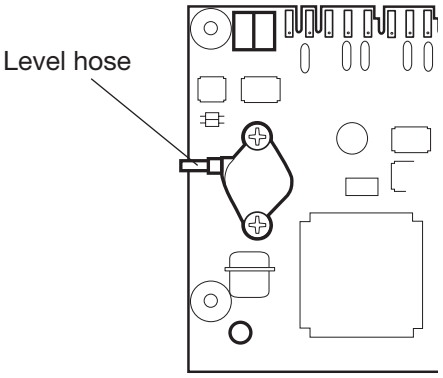


LEVEL NOT CALIBRATED

Before the machine is used filling water controlled by the pressure sensor system, the pressure sensor system must be calibrated. The pressure sensor system for water filling can be calibrated in the service mode.

It is possible to use the machine in weight mode, filling water on weight, without calibrating the water pressure sensor system.

NO SCALE CONNECTED

Communication between the timer and the scale is not working. Check the wire between the timer and the scale. If still not working, please contact service.

OVER HEAT PM

The motor controller indicates too high a temperature at the heat sink.

This error code appears if the external temperature has been very high. It his has been the case, lower the temperature by e.g., ventilation the room.


If the power is on, be very careful when working on the machine.

First verify that:

- the machine is not overloaded
- the machine is not covered
- any fan for the motor controller operates correctly
- the motor controller heat sink is not blocked by dust
- the motor controller display do not indicate and error.

Switch off the machine for at least 30 seconds to ensure the motor controller has been completely reset. Then try to start the machine again. If the error returns, troubleshoot as follows:

1. Verify that the drum and motor operate smoothly.

Drum/motor OK

Heavy operation of the drum/motor

Defective bearings in drum or motor, or there is an object between the outer and inner drum. Inspect and remedy.

2. Enter the service programme. Run the motor at different washing revolutions, clockwise and counter-clockwise. Verify that no noise can be heard from the drum/motor.

Drum/motor OK

Noise from drum/motor

Defective bearings in drum or motor, or there is an object between the outer and inner drum. Inspect and remedy.

The motor controller is probably defective.

MOTOR OVER HEAT

The motor controller indicates the thermal protector of the motor has triggered.

If the power is on, be very careful when working on the machine.

First verify that:

- the machine is not overloaded
- the motor fan is working
- the external temperature is very high
- the motor is not abnormally warm (more than 130°C)

Switch off the machine for at least 30 seconds to ensure the motor controller has been completely reset. Then try to start the machine again. If the error returns, troubleshoot as follows:

1. Switch off the machine and verify that the drum and motor operate smoothly.

Drum/motor OK

Heavy operation of the drum/motor

Defective bearings in drum or motor, or there is an object between the outer and inner drum. Inspect and remedy.

2. Wait for at least 10 minutes to allow the motor to cool down. Then switch on the machine again. Enter the service programme and run the motor at low washing revolutions. Verify whether the error indication immediately returns.

No error indication

Immediate error indication

(31)

3. Switch off the machine. Undo the contactor at X3 on the motor. Use an ohmmeter to measure the resistance in the between the contactor and the motor between X3:7 - 9.

Contact

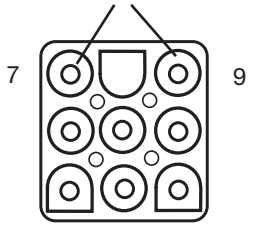
Interruption

Thermal protector of motor interrupted. Replace the motor.

Continued on next page

(31)

Measure the resistance between pins 7 and 9



Contactor X3, female towards motor

3402 A

Continued from previous

(32)

4. Replace X3. Remove the contactor X312 and measure the resistance of the contactor with the motor cabling between X312:T1-T2.

Contact

Interruption

Defective cabling between motor controller and motor. Inspect the cabling and replace if necessary.

Internal error in the thermal sensor of the motor controller detector.

(33)

5. Switch of the wall-mounted power switch. Undo the contactor at X3 on the motor. Use an ohmmeter to measure the resistance towards the motor. Measure between 1-2, 1-3, and 2-3. Correct resistance should be:

	W4400H	W3600H	W3850H, W31100H
cold motor	0,84 ohm	0,68 ohm	0,48 ohm
hot motor	1,13 ohm	0,9 ohm	0,6 ohm

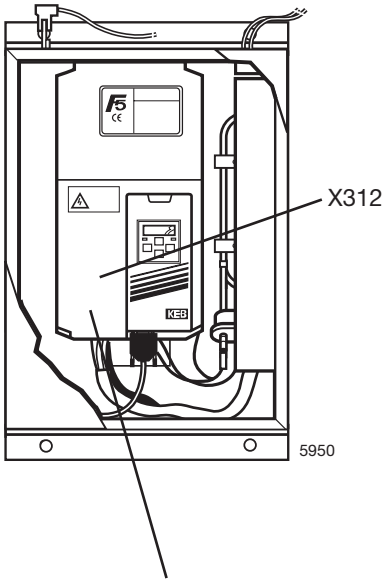
Correct resistance

One of the resistance values is incorrect

The motor is probably defective.

Troubleshoot the cabling between the motor and motor controller.

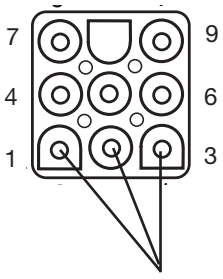
(32)



X312

(33)

Contactor X3, female towards motor



Measure resistance between pins 1, 2, 3, 4, 5 and 6.

3402 A

OVER CURRENT

The motor controller indicates a short-circuit in the motor windings, cabling or internally in the motor controller.

If the power is on, be very careful when working on the the machine.

Switch off the machine for at least 30 seconds to ensure the motor controller has been completely reset. Then try to start the machine again. If the error returns, troubleshoot as follows:

(34) **1. Switch off the machine. Undo the contactor at X3 on the motor. Use an ohmmeter to measure the resistance towards the motor. Measure between 1-2, 1-3, and 2-3. Correct resistance should be:**

	W4400H	W3600H	W3850H, W31100H
cold motor	0,84 ohm	0,68 ohm	0,48 ohm
hot motor	1,13 ohm	0,9 ohm	0,6 ohm

Correct resistance

One of the resistance values is incorrect

The motor is probably defective.

(35) **2. Inspect the cabling from X312 on the motor controller to X3 on the motor. Use an ohmmeter and measure the five leads as follows:**

X312: U V W T1 T2

X3: 1 2 3 7 9 (X3:4 - 6, 8 not used)

Also measure the five leads to be sure there is no short-circuit between any two leads.

Cabling OK

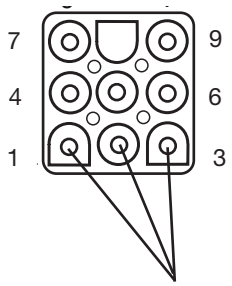
Incorrect cabling

Inspect the cabling and replace if necessary.

The motor controller output is defective.

(34)

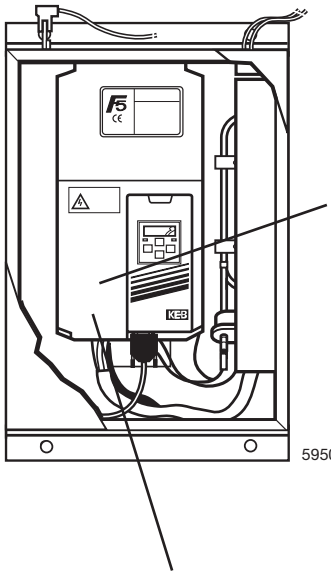
Contactor X3, female towards motor



Measure resistance between pins 1, 2, 3, 4, 5 and 6.

3402 A

(35)



X312

INTERLOCK

The motor controller indicates an error in the interlock receiving circuit.


If the power is on, be very careful when working on the machine.

Switch off the machine for at least 30 seconds to ensure the motor controller has been completely reset. Then try to start the machine again.

Fault in MCU receiving circuitry for lock acknowledgement signal.
The test of the MCU-interlock circuits proceeds in the following way: Before the locking of the door lock a speed command is sent from the timer to the MCU (=0 Hz). Then the timer checks that the value of the apparent current (ru 15) and output (ru 20) is below the value 5, which is a condition for locking the door. When the door is locked the timer again command running at 0 Hz and this time the apparent current and the output voltage shall have a value above 5.

UNDER VOLTAGE

The motor controller indicates the DC level is too low.

If the power is on, be very careful when working on the machine.

Switch off the machine for at least 30 seconds to ensure the motor controller has been completely reset. Then try to start the machine again. If the error returns, troubleshoot as follows:

(36)

1. Verify the voltage supply (230/400 V) to the motor controller at the contactor X311.

Voltage too low

Voltage OK

The motor controller is probably defective.

2. Inspect the power supply (230/400 V) at the main power switch Q1 on the machine.

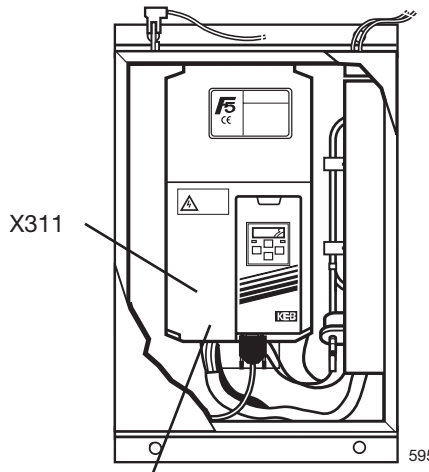
Voltage too low

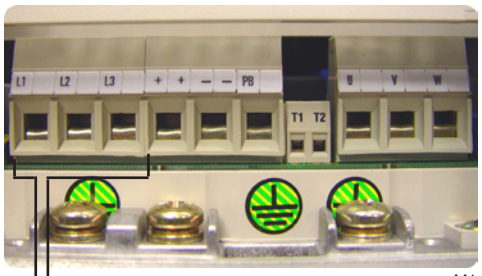
Troubleshoot the mains.

Voltage OK

Defective cabling.

(36)





OVER VOLTAGE

The motor controller indicates the DC level is too high.

If the power is on, be very careful when working on the machine.

Switch off the machine for at least 30 seconds to ensure the motor controller has been completely reset. Then try to start the machine again. If the error returns, troubleshoot as follows:

(37)

1. Verify the voltage supply (230/400 V) to the motor controller at the contactor X311.

Voltage too high

Voltage OK

The motor controller is probably defective.

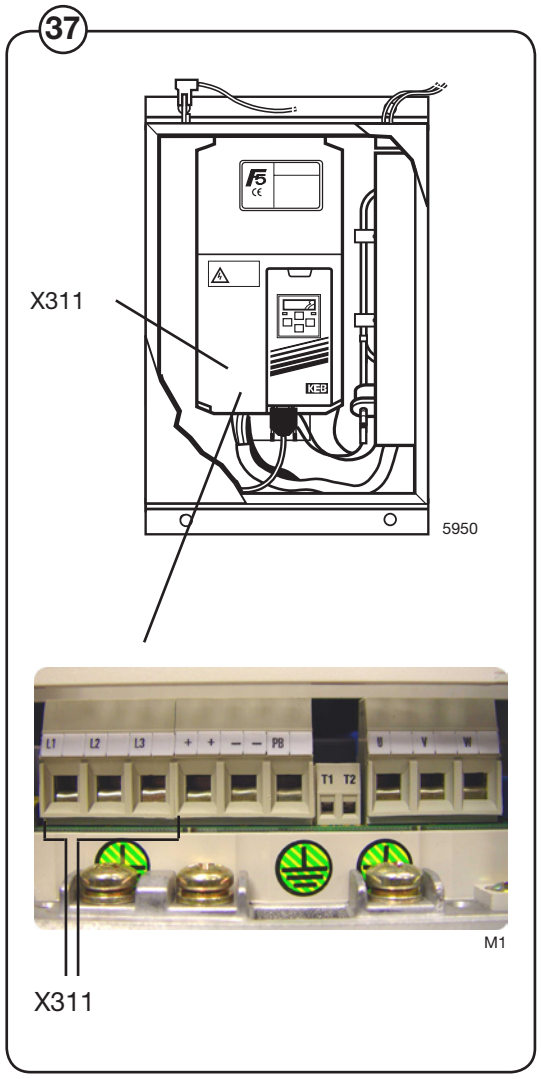
2. Inspect the power supply (230/400 V) at the main power switch Q1 on the machine.

Voltage too high

Voltage OK

Defective cabling.

Troubleshoot the mains.



PHASE MISSING

The DC voltage level fluctuates too much.

If the power is on, be very careful when working on the machine.

Switch off the machine for at least 30 seconds to ensure the motor controller has been completely reset. Then try to start the machine again. If the error returns, troubleshoot as follows:

(38)

1. Verify the voltage supply (400 V) to the motor controller at the contactor X311.

Large voltage fluctuations

Voltage OK

The motor controller is probably defective.

2. Inspect the power supply (230/400 V) at the main power switch Q1 on the machine.

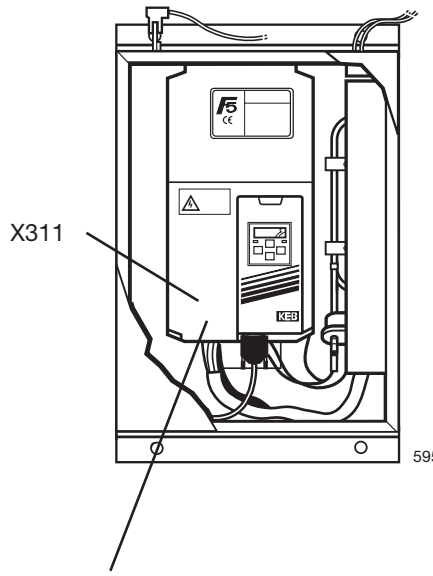
Large voltage fluctuations

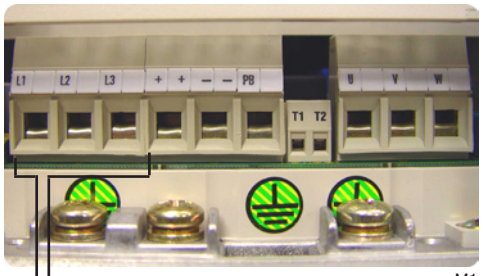
Voltage OK

Defective cabling.

Troubleshoot the mains.

(38)





X311

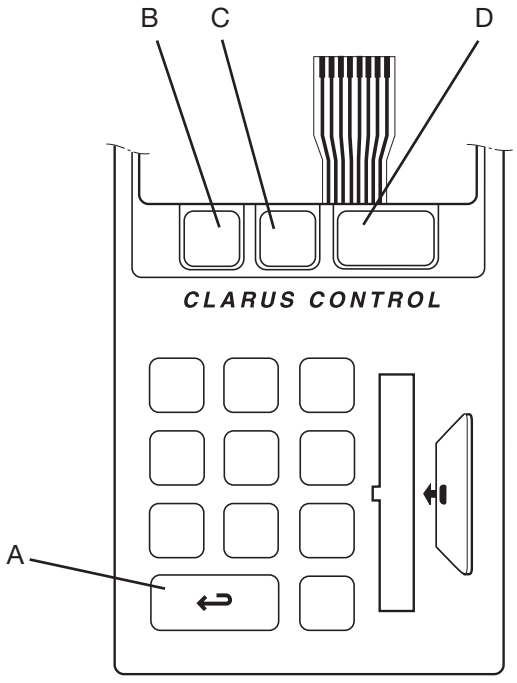
Troubleshooting the keypad in the display unit

When a key is pressed on the keypad of the programme unit, two of the outputs on the keypad close. By disconnected the flat cable from the display card, pressing a key and the measuring the resistance between the outputs that should close, it is possible to determine correct operation of any one key.

(39) The table below shows the outputs that need to be closed for each key:

Key	Outputs that should close
1	2 + 7
2	2 + 6
3	2 + 5
4	3 + 7
5	3 + 6
6	3 + 5
7	4 + 7
8	4 + 6
9	4 + 5
0	5 + 8
A	6 + 8
B	1 + 2
C	1 + 3
D	7 + 8

(39)



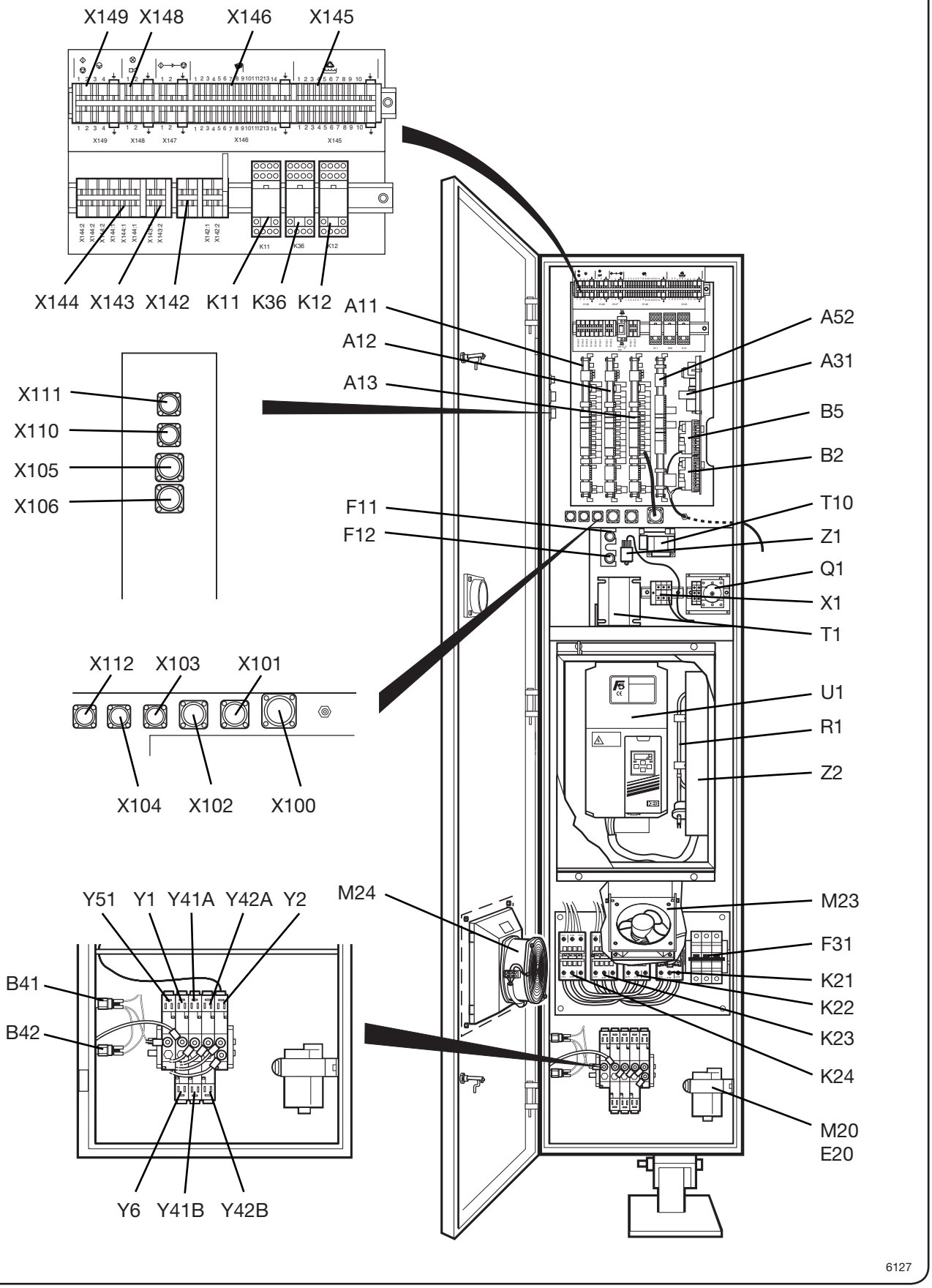
4231

Control unit

(1)	A11-13	I/O-board
	A31	Control unit, door lock
	A52	Card for tilting functions (option)
	B2	Level control, safety monitoring for control unit, door lock
	B41, 42	Pressure guard for tilting
	B5	Level control, overfilling
	E20, M20	Oil lubrication
	F11, F12	Fuses, 1.25 AT, protection of 230 V power supply to I/O board, CPU board, display unit and control unit, door lock
	K11	Motor interlock
	K12	Motor fan relay
	K21-24	Heating relay
	K36	Relay, oil lubrication
	M23	Fan, motor controller
	M24	Fan, door
	Q1	Main switch, isolating switch
	R1	Brake resistance
	T1	Transformer, for adaptation of feed voltage for control unit and control equipment
	T10	Transformer, power supply I/O board, CPU board, and display unit
	U1	Motor control unit
	X1	Distribution terminals for input voltage
	Z1	Filter, control voltage
	Z2	Filter, motor control

Control unit

1



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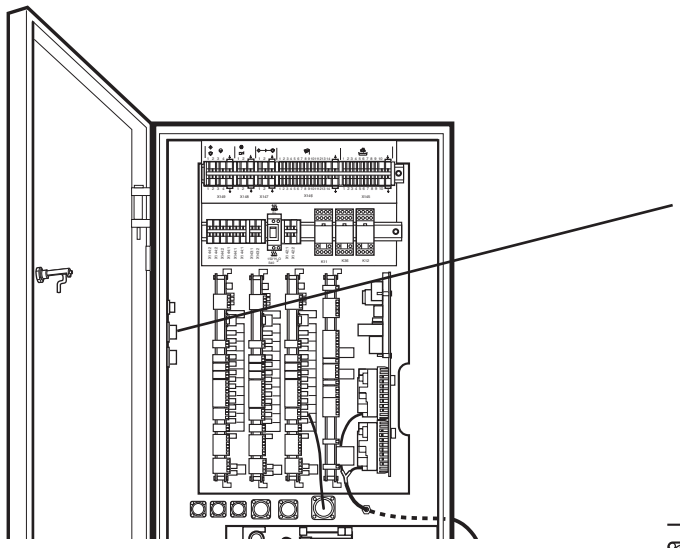
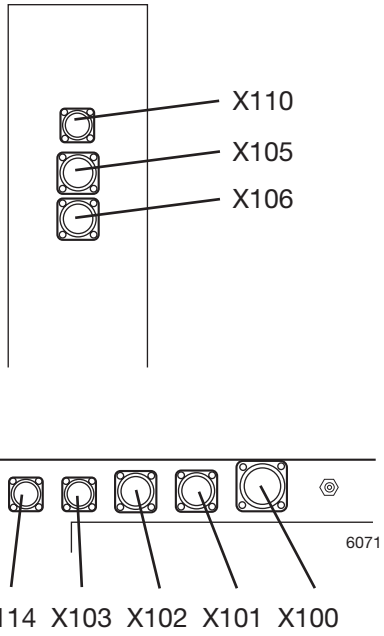
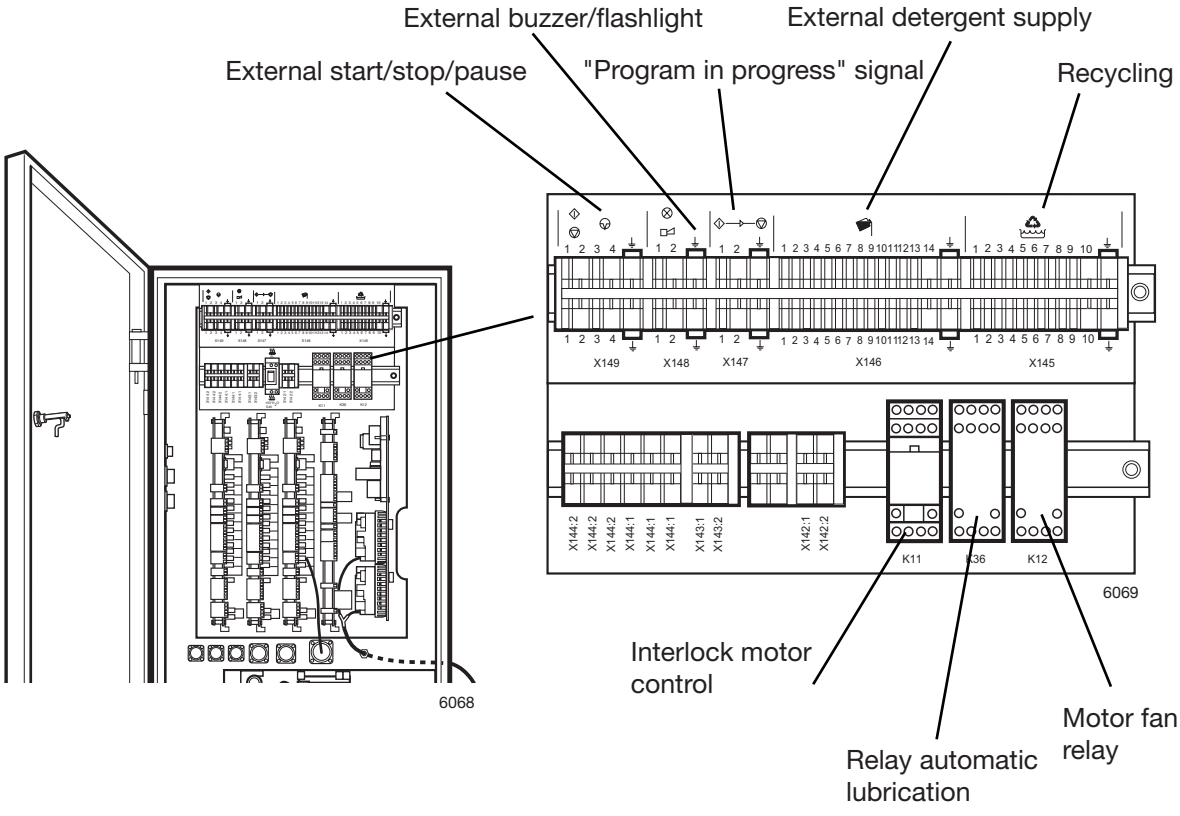

6068


X110
X105
X106
6071
X112 X114 X103 X102 X101 X100


External buzzer/flashlight
External detergent supply
External start/stop/pause
"Program in progress" signal
Recycling
X149
X148
X147
X146
X145
K11
K36
K12
6069
6068
Interlock motor control
Relay automatic lubrication
Motor fan relay

(2)

Connectors

X100 Connector, 37 pole, CPU board

X101 Connector, 14 pole, door lock

X102 Connector, 14 pole, control unit and sensor(s) for tilt function (optional equipment)

X103 Connector, 4 pole, speed sensor on motor

X104 Connector, 4 pole, unbalance

X105 Connector, 14 pole, water supply

X106 Connector, 14 pole, detergent supply, powder (optional equipment)

X110 Connector, 4 pole, water valve, cold, hard water (optional equipment)

X112 Connector, 4 pole, motor fan

External start/stop/pause (inputs)

X149: 1 start/stop, phase (mains voltage)
2 start/stop, neutral
3 pause, phase (mains voltage)
4 pause, neutral

External buzzer/flashlight (output)

X148: 1 phase (mains voltage)
2 neutral

"Program in progress" signal (output)

X147: 1 phase (mains voltage)
2 neutral

External detergent connections (outputs)

X146

total of 13 outputs

The terminal numbering corresponds to the numbering used in the liquid detergent function in programming.

X146:14 common neutral

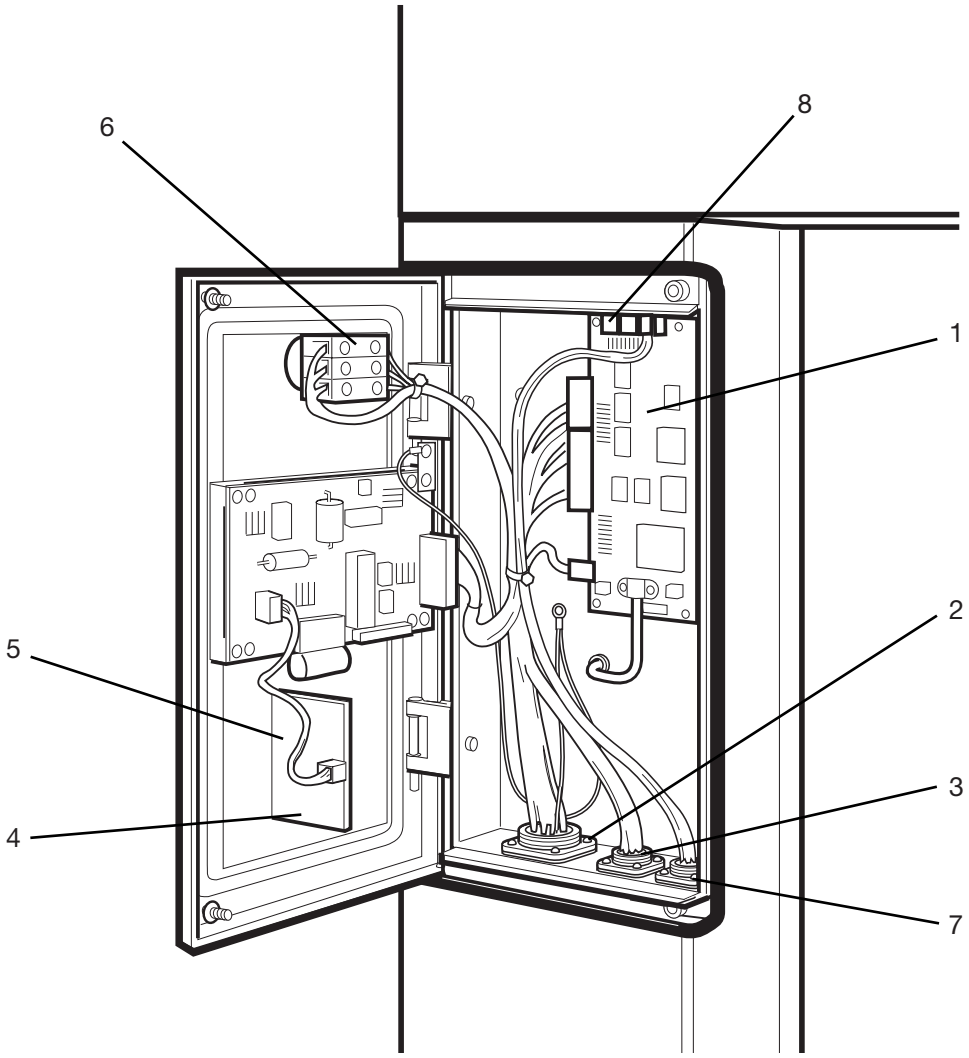
Water recycling (outputs)

X145: 1 Drain 1 (Y1)
2 Pump 1
3 Stop drain (Y1b)
4 Drain 2 (Y2) (normally open)
5 Drain 2 (Y2) (normally closed)
6 Drain 3
7 Drain 4
8 Tank 1 water valve (Y44)
9 Tank 2 water valve (Y54)
10 Common neutral

Clarus control unit

(3)	1	A200-1	CPU circuit board
	2	X200	Connector, 37 pole, operator unit
	3	X201	Connector, 4 pole, sensor(s) thermostat
	4	A200-3	Card reader
	5	A200-2	Display circuit board
	6	S2	Connection terminals
	7	X202	Connector, 4 pole, weighing equipment
	8	X7	DMIS/CMIS (optional equipment)

(3)



4660

Program control unit

This chapter describes the components which are specific to this washer extractor. For a general description of the CPU board, display board and I/O board(s), consult the service manual for the Clarus Program Control Unit.

System structure

CPU board

(4) The machine's wash programs are stored in the CPU board memory. The CPU board controls the various washer extractor functions with the aid of the program data and signals from the control panel buttons.

The CPU board communicates with the display board, motor control unit and the three I/O boards via serial interfaces.

The CPU board has its own level switch and inputs from temperature sensors.

I/O boards

The I/O boards receive information from the CPU board concerning the outputs which are to be controlled. The I/O boards can control the following functions:

I/O board 1:

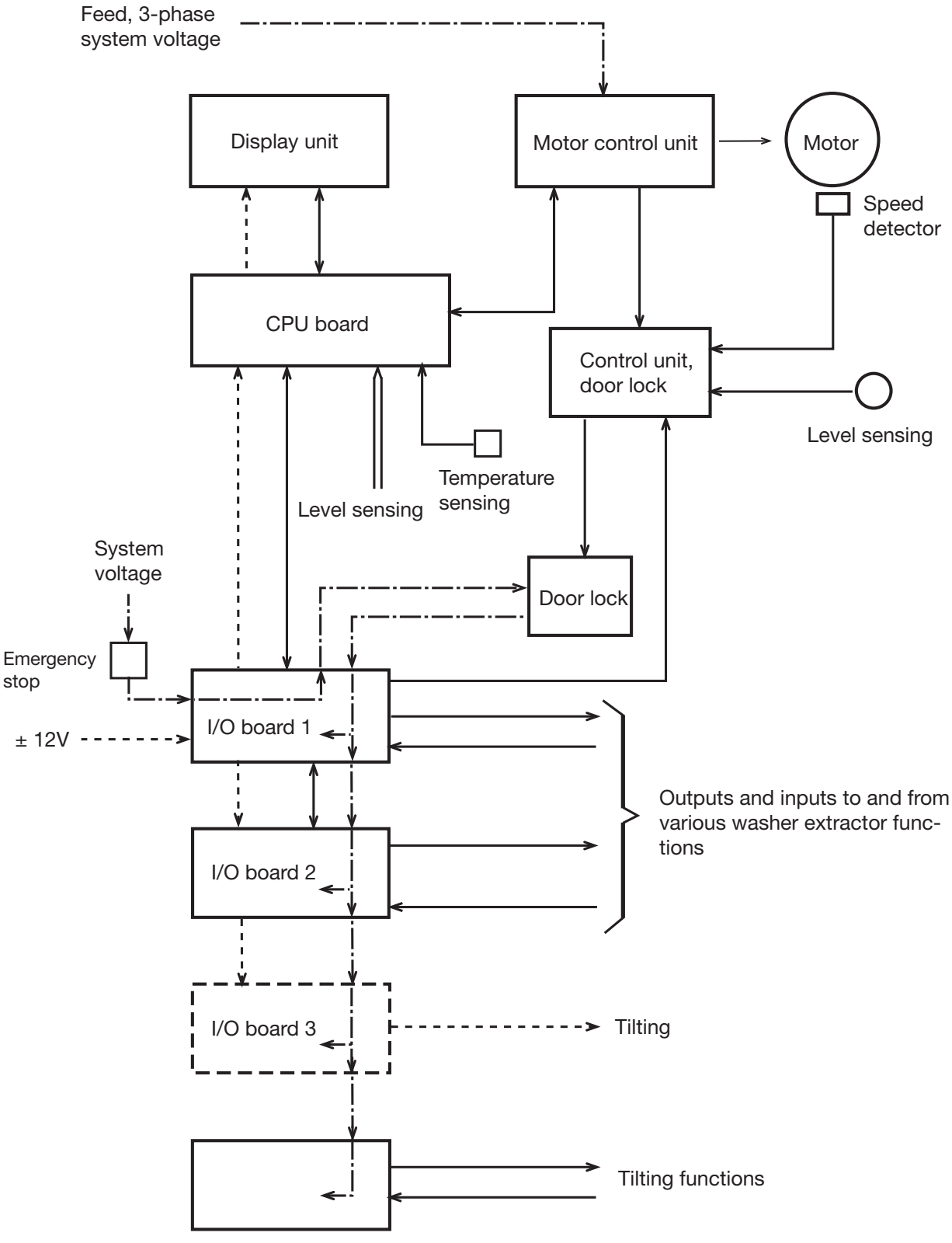
door lock, water valves - cold and hot water, flush 1, drain 1, detergent dispensing 1-4, external detergent dispensing 1-4 and heating relay 1.

I/O board 2:

water valves - cold, hard water and tank 1, drain 2, detergent dispensing 5, external detergent dispensing 5-11, heating relay 2 and stop valve drain 1.

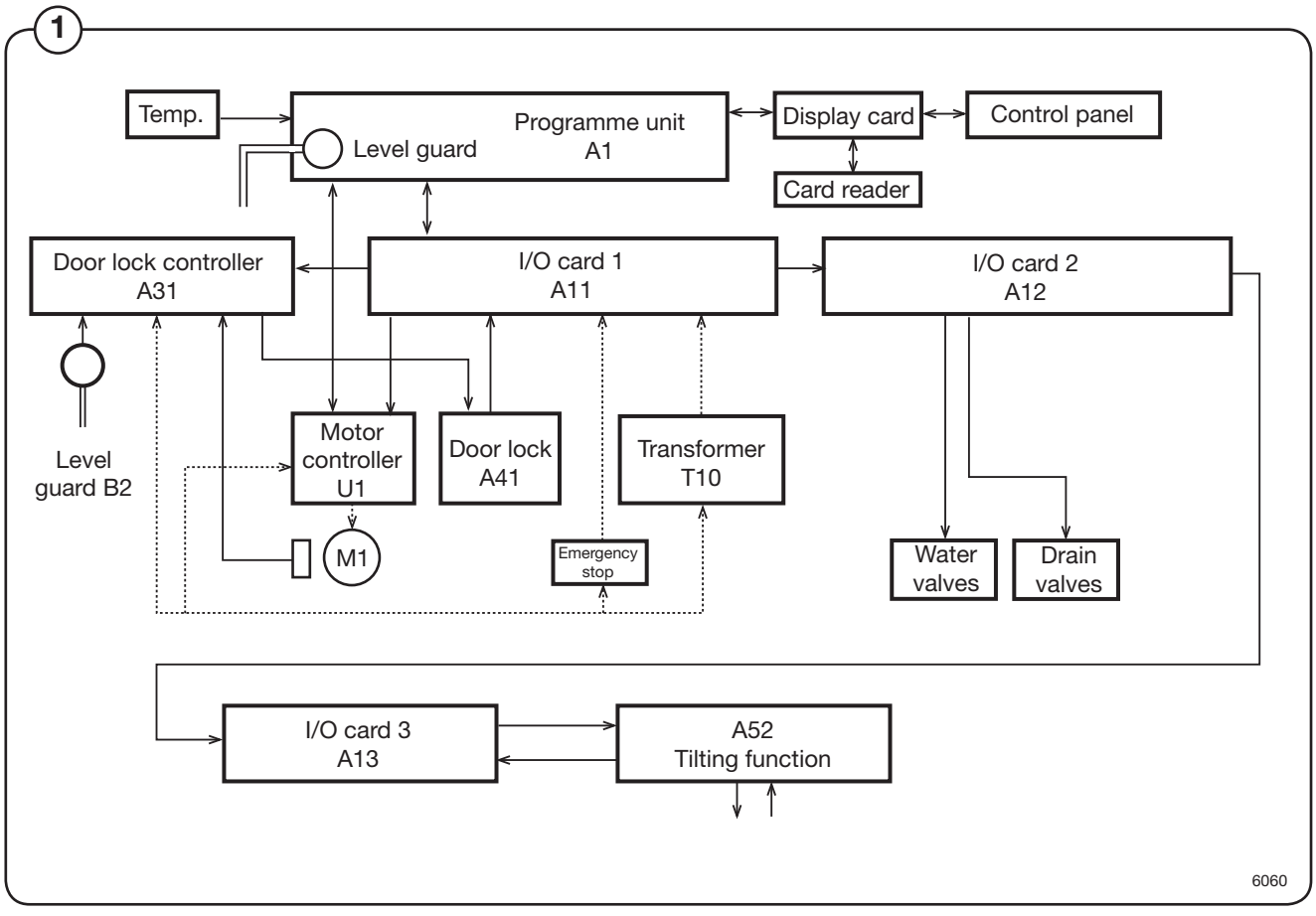
From the I/O boards' inputs, the CPU board receives information om the door lock switch, door status switch, (where applicable) external start/stop and pause signals, low oil level and signals from tilt sensors and the tilt control unit.

4


Feed, 3-phase system voltage
Display unit
Motor control unit
Motor
Speed detector
CPU board
Control unit, door lock
Level sensing
Temperature sensing
Level sensing
System voltage
Door lock
Emergency stop
± 12V
I/O board 1
I/O board 2
I/O board 3
Tilting
Outputs and inputs to and from various washer extractor functions
Tilting functions
6061

- **I/O cards A11 and A12**
  The I/O cards are controlled by the CPU card via a serial interface. The I/O cards feature outputs, which, via the communication cards in the rear electric box, control various machine functions, such as the water valves, heater connection and drain valve. On the input connection blocks, it is possible to connect signals for control of e.g. the detergent supply.

  The cards also have inputs for emergency stop and door lock ACK.



Function

CPU card A1

(2) The CPU card controls all functions of the washing machine using various control programmes in the CPU card memory. The CPU card communicates with the I/O card, display card and motor controller using a serial interface.

The following functions are controlled:

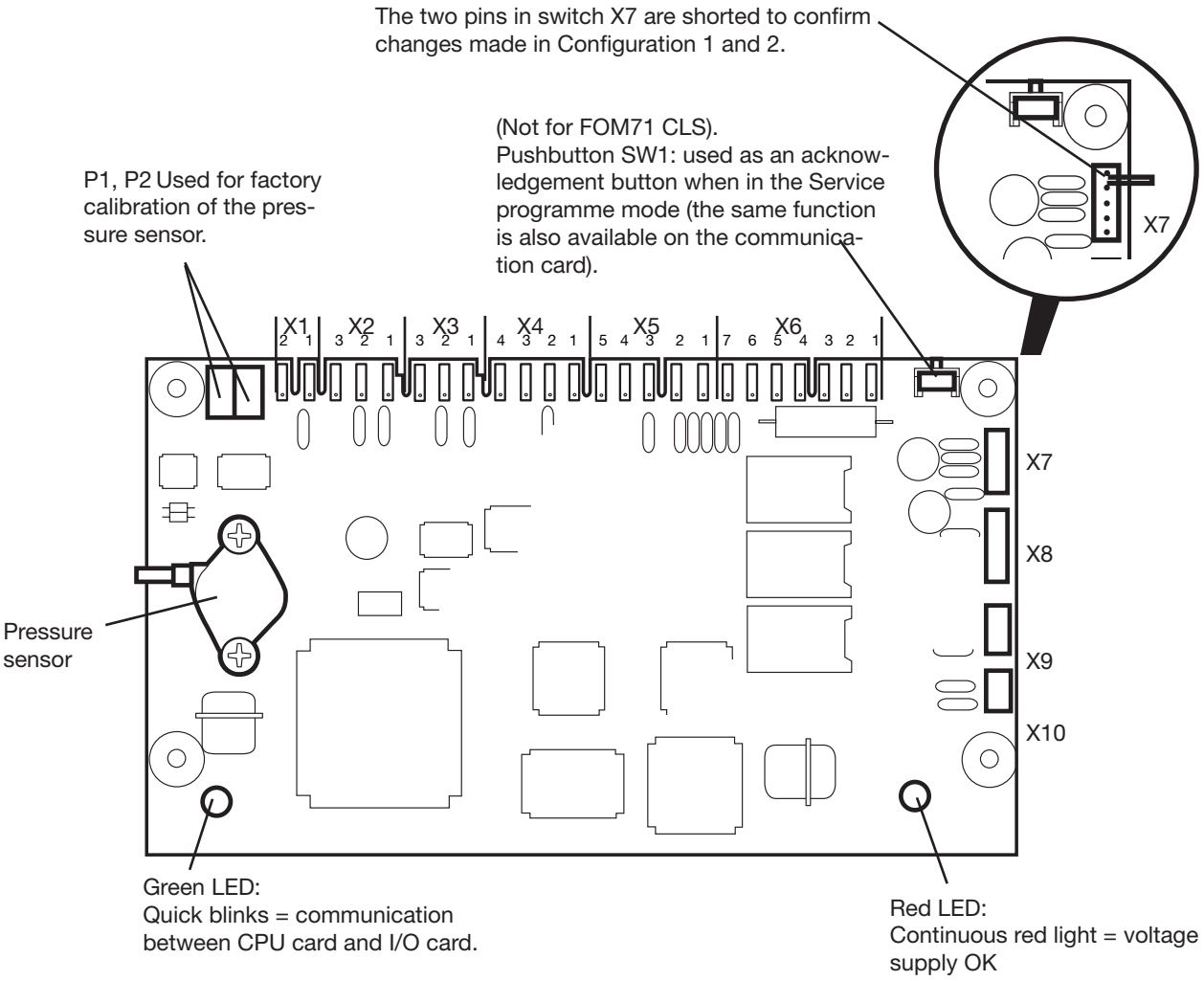
- The CPU card controls the water valves, detergent supply, drain and heating using one or two I/O cards. Depending on the number of functions to be controlled, the number of I/O cards varies between different machines.
- The CPU card controls the alphanumeric display window on the display card.
- The CPU card controls the motor via a motor controller.

To obtain information about the various operations of the washing machine, the following inputs are used:

- The CPU card has inputs for e.g., temperature sensors.
- The CPU card receives information from the I/O card inputs about door locking state and any external switches (e.g., Start/Stop and Pause).
- The CPU card has a pressure sensor to which a hose for measuring the water level in the drum can be connected.
- The CPU card receives information from the display card about which buttons were pressed.

Note that the CPU card does not contain any removable memory chips. If the CPU card needs replacement, the correct software for the machine needs to be programmed in the new card using a laptop with special software. See the section “Replacing the CPU card”. Personalised washing programmes can be transferred using a Smart card.

2



Card Switch	Function
X1	Input from water temperature sensor
X2	not used
X3	not used
X4	Output to motor controller
X5: 1-3	Serial communication with I/O card 1
X5: 4-5	Voltage supply from I/O card 1
X6: 1-5	Serial communication with display card
X6: 6-7	Voltage supply to display card
X7	PC communication
X8	Motor communication (reserved)
X9	Scale communication
X10	Internal communication (not used)

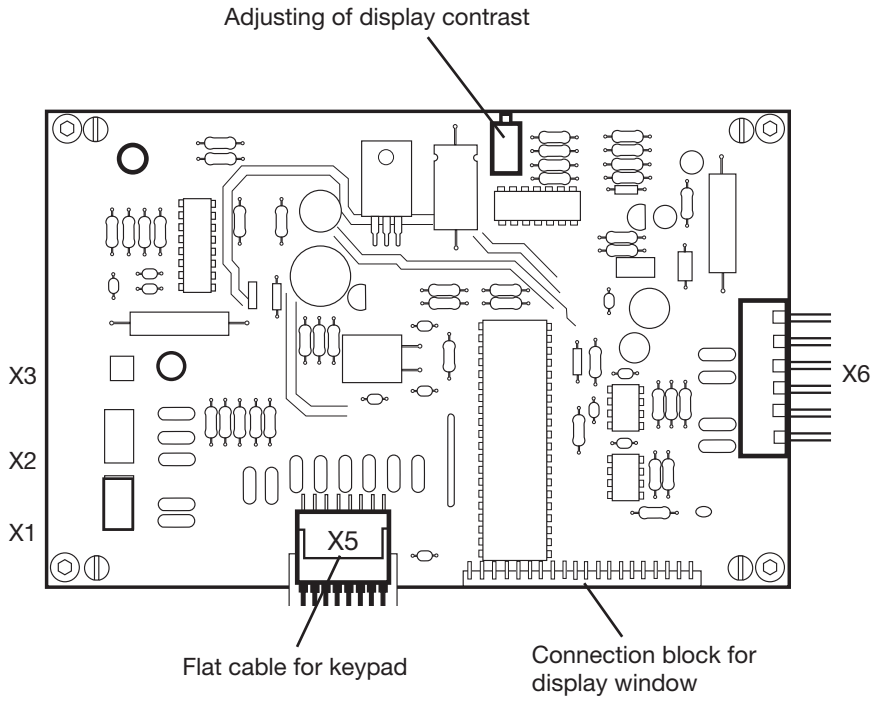
3972

Display card A2

(3) The display card communicates with the CPU card through a serial interface. The CPU card informs what should be displayed in the display window and the display card converts these messages to information that controls the alphanumeric display window.

The display card also detects which buttons are pressed on the control panel and sends these signals to the CPU card.

(3)



Card switch	Function
X1	Not used
X2	Communication with card reader for memory cards
X3	Not used
X4	Not used
X5	Connection from front key board
X6: 1-2	Voltage supply from CPU card
X6: 3-7	Serial communication with CPU card

4233

I/O cards

(4) The I/O cards are controlled by the CPU card and communicate via a serial interface. Depending on the need for inputs and outputs, one programme unit may have one or two I/O cards.

All inputs and outputs are switched from the I/O card to the various functions via the communication cards in the rear electric module. Each I/O card is connected to a separate communication card: I/O card A11 uses communication card A21 and I/O card A12 uses communication card A22.

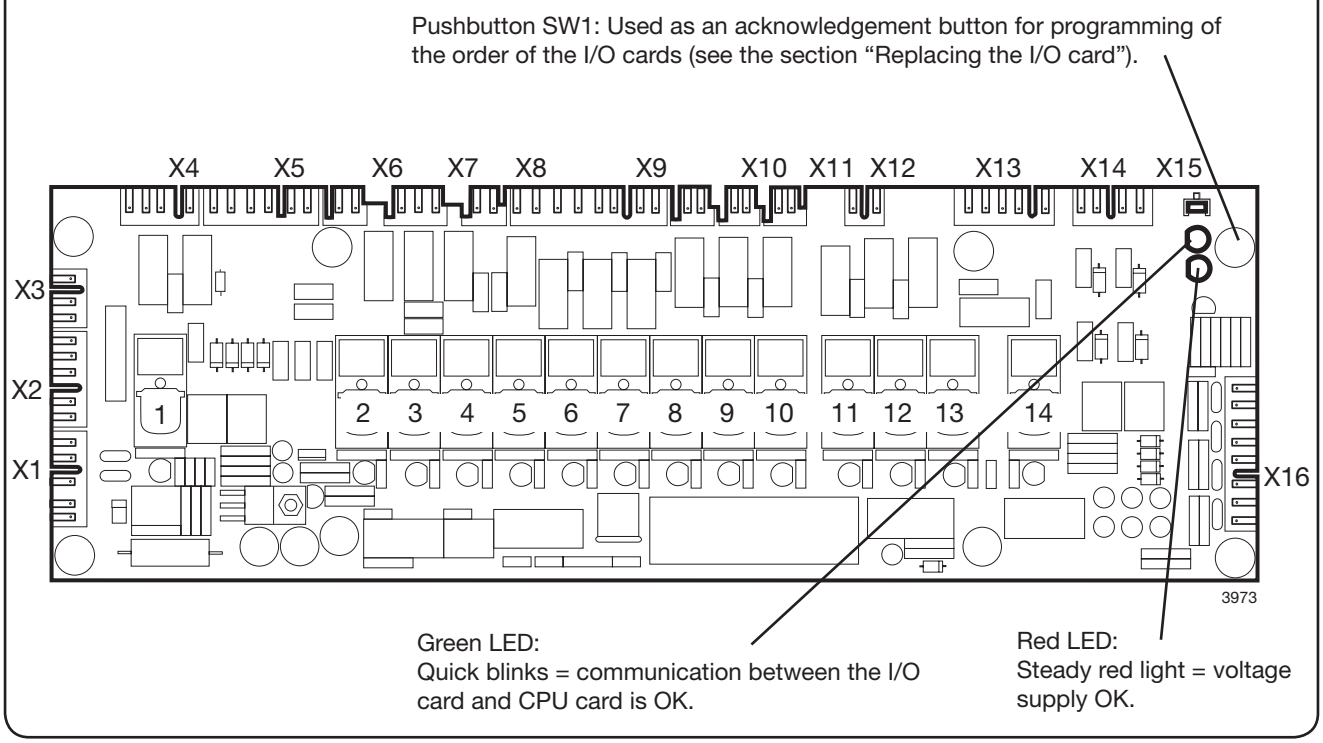
There are inputs for door lock and external switches (e.g. Start/Stop and Pause). Signals on these inputs are passed on to the CPU card.

The outputs control water valves, detergent supply, drain and heating.

The voltage supply to the CPU and I/O cards takes place via I/O card 1 A11, which feeds voltage to both the CPU card A1 and a possible I/O card 2 A12.

Note that if the programme unit uses two cards and one needs to be replaced, special programming is required. It is necessary to programme the new card with the correct I/O card number (1 or 2) using a laptop and special software. See the section “Replacing the I/O card”.

(4)



Input and outputs on I/O cards 1 and 2

Card switch	I/O-card 1 A11	I/O-card 2 A12
Serial interface and voltage supply		
X1: 1-3	Serial interface to card 2	-
4	16 V+ supply to card 2	-
5	0 V– supply to card 2	-
X2: 1	0 V– supply to CPU	12 V- from card 1
2	16 V+ supply to CPU	12 V+ supply from card 1
3-5	Serial interface to CPU	Serial interface to card 1
X3: 1	16 V+ supply from T10	-
2	0V- supply from T10	-
X6: 1	230 V supply from emergency stop, phase	230 V direct supply, phase
2	230 V supply from emergency stop, neutral	230 V direct supply, neutral
X10:1	Interlock signal to motor controller, phase	Supply to relays from I/O 1, phase
2	Interlock signal to motor controller, neutral	Supply to relays from I/O 1, neutral
X11:1	Supply to relays from I/O 2, phase	-
2	Supply to relays from I/O 2, neutral	-
X12:1	To X13: supply to relays 11-14, phase	To X13: supply to relays 11-14, phase
2	To X13: supply to relays 11-14, neutral	To X13: supply to relays 11-14, neutral
X13:1	Supply to relays 11-14, neutral	Supply to relays 11-14, neutral
2	Supply to relays 11-14, phase	Supply to relays 11-14, phase

Card switch	I/O-card 3 A13
Serial interface and voltage supply	
X2: 1	12V- from card 2
2	12V+ supply from card 2
3-5	Serial interface to card 2
X6: 1	Phase
2	Common

Outputs on I/O cards

I/O-card Connection block No.	Switch No.	I/O-card 1 A11 Function
Outputs		
X4: 1		Neutral
2	1	Door lock relay, phase (normally open)
3		Neutral
4	1	Door lock relay, phase (normally open)
X7: 1	2	Drain 1 (Y1), phase (normally open)
2		Common neutral
3	2	Drain 1 (D1), phase (normally closed)
X8: 1	3	Heater relay (K21)
2		Neutral
X9: 1	9	Hot water inlet (Y25)
2	8	Powder 5 (Y22)
3	10	Powder 4 (Y14/24)
4	7	Cold water inlet (Y15)
5	6	Powder 3 (Y13)
6	5	Powder 2 (Y12)
7	4	Powder 1 (Y11)
8		N (common neutral)
X14:1	14	Signal 4, external detergent pump
2	12	Signal 3, external detergent pump
3	13	Signal 2, external detergent pump
4	11	Signal 1, external detergent pump
5		N (common neutral)

		I/O-card 3 A13 Function
Outputs		
X9: 1		Phase K42 NC to Y41A
2		Phase K41 NC to Y42A
3		Phase K41B and Y42B
4		Phase X972:3 to K43
5		Phase control unit for tilting
8		N (common)

Outputs on I/O card 1 and 2

I/O-card Connection block No.	Switch No.	I/O-card 2 A12 Function
Outputs		
X4: 1		-
2	1	Flashlight, phase
3		-
4	1	
X7: 1	2	Cold, hard water (Y35)/Flushing detergent dispenser
2		N (neutral)
3	2	-
X8: 1	3	
2		Neutral
X9: 1	9	Inlet C (Y65)
2	8	Inlet B (Y55)
3	10	Inlet A (Y45)
4	7	Drain C (Y4)
5	6	Drain B (Y3)
6	5	Drain A (Y2)
8		N (common neutral)
X14:1	14	Signal 8, external detergent pump
2	12	Signal 7, external detergent pump
3	13	Signal 6, external detergent pump
4	11	Signal 5, external detergent pump

I/O-card Connection block No.	Opto-coupler	I/O-card 1 A11 Function
Inputs		
X5: 1		Door lock micro-switch S4/N, Com
2		Door lock micro-switch S4/N, No
3-4	1	Door lock position micro-switch S3/N
5-6	2	Door lock micro-switch S4/Phase
X15:1	4	External start/stop signal, phase
2	4	External start/stop signal, neutral
3	3	External pause signal, phase
4	3	External pause signal, neutral
X16:1-2		Emergency stop (S2)
3-4		External service switch
5-6		Oil level
7-8		-

I/O-card Connection block No.	Opto-coupler	I/O-card 2 A12 Function
Inputs		
X5: 1		-
2		-
3-4	1	-
5-6	2	-
X15:1	4	-
2	4	-
3	3	
4	3	
X16:1-2		-
3-4		-
5-6		-
7-8		-

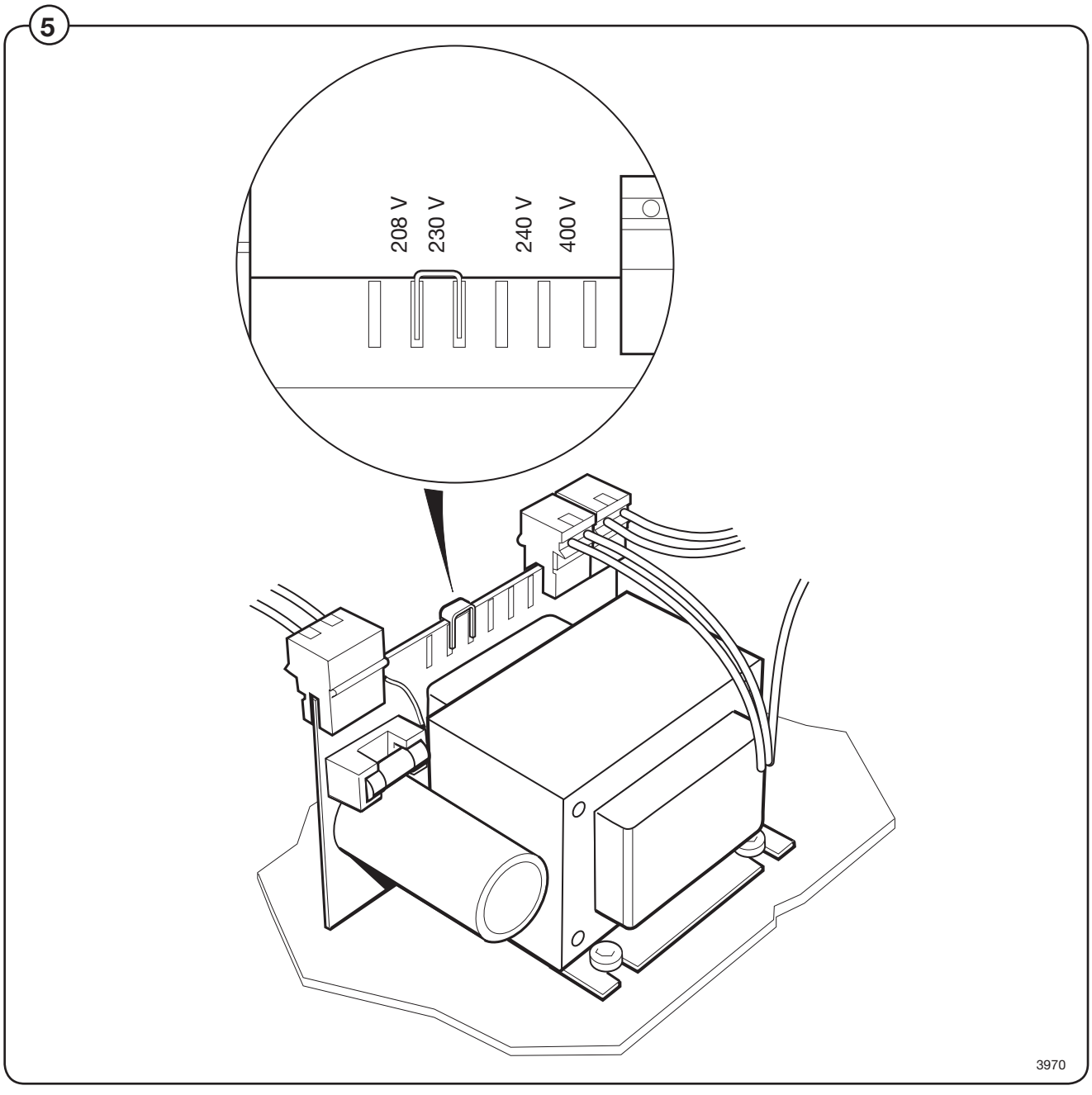
I/O-card Connection block No.	Opto-coupler	I/O-card 3 A13 Function
Inputs		
X5: 1	-	Neutral S44A No
2	-	Neutral S44A COM
3	-	Neutral S44A COM
4	1-2	Neutral (COM)
5	1	Phase
6	2	Phase S44B/COM
X15: 1	4	Neutral
2	4	Phase K41 COM
3	3	Neutral
4	3	Phase K42 COM
X16: 1-2		K46
3-4		K47
5-6		K44
7-8		K45

Control system transformer T10

(5) The control system transformer is used to provide the voltage feed for the CPU board, I/O boards and display board.

The transformer supplies 12 V on its secondary side, and can be adapted to suit any of four different primary voltages by moving a bridge.

The transformer should normally be connected for a primary voltage of 230 V. Adaptation for different power supply voltages takes place at transformer T1.



The service program

The service programme facilitates troubleshooting on the machine by enabling control of **all machine functions**. **Input signals to the various I/O cards** that are active are also indicated.

The following functions can be controlled:

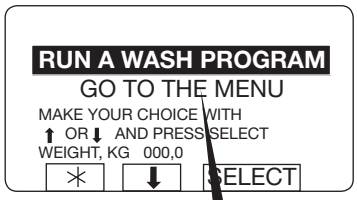
01	COLD WATER	36	LOW EXTRACT
02	HOT WATER	37	MEDIUM EXTRACT
03	COLD HARD WATER	38	HIGH EXTRACT
04	TANK 1 WATER	39	TURBO EXTRACT
05	TANK 2 WATER	40	NORMAL DRAIN
06	TANK 3 WATER	41	DRAIN BLOCKING
07	FLUSH	42	RECYCLE DRAIN A
10	DETERGENT POWDER 1	43	RECYCLE DRAIN B
11	DETERGENT POWDER 2	44	RECYCLE DRAIN C
12	DETERGENT POWDER 3	45	RECYCLE DRAIN D
13	DETERGENT POWDER 4	46	FLASHING LIGHT
14	DETERGENT POWDER 5	51	DOOR LOCK
17	LIQUID DETERGENT 1	55	HEAT 1
18	LIQUID DETERGENT 2	56	HEAT 2
19	LIQUID DETERGENT 3	64	BUZZER
20	LIQUID DETERGENT 4		
21	LIQUID DETERGENT 5		
22	LIQUID DETERGENT 6		
23	LIQUID DETERGENT 7		
24	LIQUID DETERGENT 8		
33	MOTOR CLOCKWISE		
34	MOTOR COUNTERCLOCKWISE		
35	DISTRIBUTION		

These signals can be read:

I/O-BOARD 1:
EMERGENCY STOP
TEMPORARY PAUSE
OIL
REMOTE START
SERVICE
PHASE CHECK
DOOR LOCKED
DOOR CLOSED

I/O-BOARD 2:
CHANGE HEATING SYSTEM
REPEAT RINSE

To select the ”Service Program” function

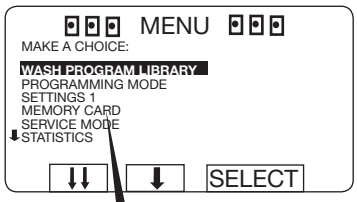


If this menu is not currently displayed:
Press ↩ repeatedly.

Press ↓ to highlight ”GO TO THE MENU”.

RUN A WASH PROGRAM
GO TO THE MENU

SELECT **Press SELECT.**



Press ↓ four times.

WASH PROGRAM LIBRARY
PROGRAMMING MODE
SETTINGS 1
MEMORY CARD
SERVICE MODE
STATISTICS
MANUAL MODE
SETTINGS 2
EXIT

... to highlight ”SERVICE MODE”.

SELECT **Press SELECT.**

The service program

The service program makes fault-finding on the machine easier, as it allows you to control the various machine functions individually:

- water filling
- detergent flushing
- motor rotation, clockwise and counterclockwise
- motor action, distribution and extraction
- drain
- door lock
- heating
- buzzer

You can also check which input signals to the CPU are activated:

- emergency stop
- remote start
- oil lubrication
- service
- repeat rinse
- phase check
- door locked
- door closed
- unbalance

The following values will also be displayed at all times:

- water level in machine
- water temperature
- motor speed
- whether drain is open or closed

PRESS BUTTON ON
CPU BOARD

✳ ✳ EXIT

Not for FOM71 CLS.

Press the button on the CPU circuit board.

SERVICE PROGRAM
MAKE A CHOICE:
SERVICE PROGRAM
CLEAR TRIP HOUR COUNTER
CLEAR SERVICE COUNTER
CLEAR WASH PROGRAM COUNTER IN CLS
CLEAR WASH PROGRAM COUNTER IN SMC
SCALE ADJUSTMENTS
CALIB. OF LEVEL SENSOR
EXIT

✳ ⬇ SELECT

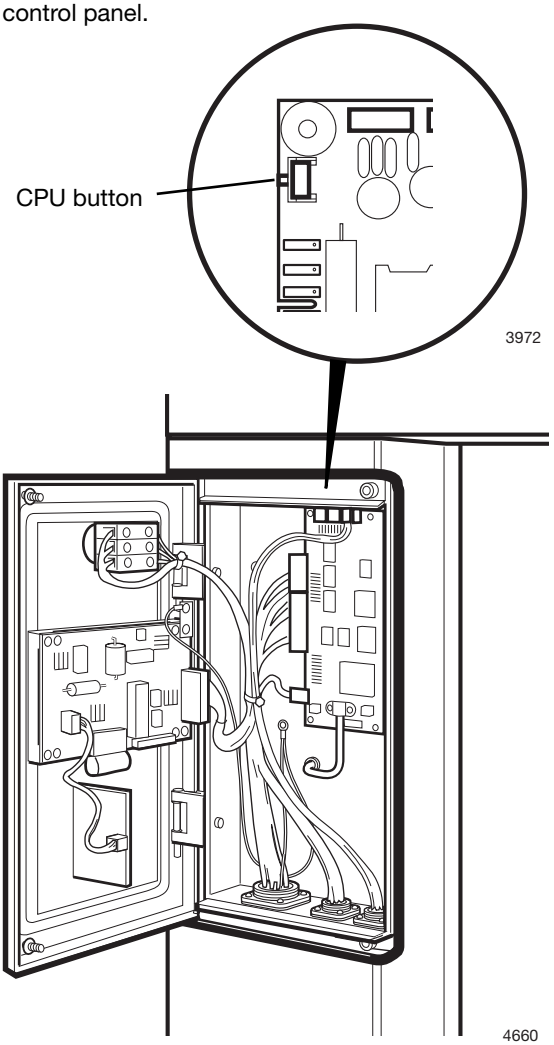
To access the service program:

SELECT

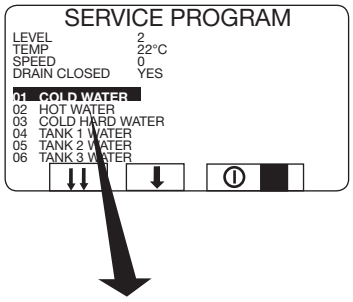
Press Select.

Prevention of unauthorised access

A button on the CPU circuit board has to be pressed to gain access to the service program, to prevent its unauthorised or inadvertent use. The CPU circuit board is located behind the control panel. Two screws have to be undone to open the control panel.



To control the machine functions



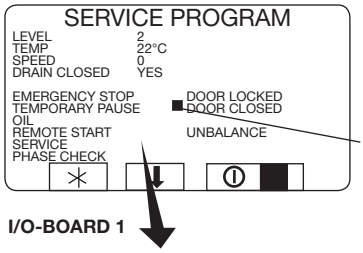
- 01 COLD WATER
- 02 HOT WATER
- 03 COLD HARD WATER
- 04 TANK 1 WATER
- 05 TANK 2 WATER
- 06 TANK 3 WATER
- 07 FLUSH
- 10 DETERGENT POWDER 1
- 11 DETERGENT POWDER 2
- 12 DETERGENT POWDER 3
- 13 DETERGENT POWDER 4
- 14 DETERGENT POWDER 5
- 17 LIQUID DETERGENT 1
- 18 LIQUID DETERGENT 2
- 19 LIQUID DETERGENT 3
- 20 LIQUID DETERGENT 4
- 21 LIQUID DETERGENT 5
- 22 LIQUID DETERGENT 6
- 23 LIQUID DETERGENT 7
- 24 LIQUID DETERGENT 8
- 25 LIQUID DETERGENT 9
- 26 LIQUID DETERGENT 10
- 27 LIQUID DETERGENT 11
- 28 LIQUID DETERGENT 12
- 29 LIQUID DETERGENT 13
- 33 MOTOR CLOCKWISE
- 34 MOTOR COUNTERCLOCKWISE
- 35 DISTRIBUTION
- 36 LOW EXTRACT
- 37 MEDIUM EXTRACT
- 38 HIGH EXTRACT
- 39 TURBO EXTRACT
- 40 NORMAL DRAIN
- 41 DRAIN BLOCKING
- 42 RECYCLE DRAIN A
- 43 RECYCLE DRAIN B
- 44 RECYCLE DRAIN C
- 45 RECYCLE DRAIN D
- 46 FLASHING LIGHT
- 51 DOOR LOCK
- 55 HEAT
- 56 HEAT 2 AS STANDARD
- 64 BUZZER
- EXIT

To activate the various machine functions:

Use ↓ or ↑ to highlight the function.
Press ⏻ to switch the function on and off.

I/O card inputs

1 **Press 1.**



Now you can check the various input signals from I/O board 1.

A black square in front of the name indicates that the input is active.

I/O-BOARD 1

EMERGENCY STOP
TEMPORARY PAUSE
OIL
REMOTE START
SERVICE
PHASE CHECK
DOOR LOCKED
DOOR CLOSED
UNBALANCE

Press any key to go back to the previous display.

When the programme unit has two I/O cards:

2 **Press 2.**

I/O-BOARD 2

CHANGE HEATING SYSTEM
REPEAT RINSE

It is now possible to verify the various input signals from I/O card 2.

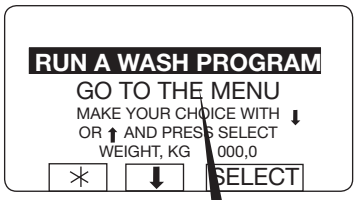
Press any key to go back to the previous display.

Settings 1

In the Configuration 1 mode, the variables can be changed without requesting a special password from the supplier:

ADJUST TIME ALLOWED	LEVEL HIGH
ADJUST TEMPERATURE ALLOWED	MIDDEL TEMPERATURE COOL-DOWN
RAPID ADVANCE ALLOWED	DEFAULT MOTOR ON TIME
SHOW WEIGHT ALLOWED	DEFAULT MOTOR OFF TIME
WATER REDUCTION NOT ALLOWED	FLUSH DELAY TIME
MANUAL FUNCTIONS ALLOWED	FLUSH ON TIME
PAUSE ALLOWED	BUZZER ON BUTTON
FREE TEXT ALLOWED	MAX FILLING TIME
CHANGE WASH PROGRAM ALLOWED	MAX HEATING TIME
AUTO RESTART ALLOWED	SHOW WEIGHT TIMEOUT
ADJUST SPIN SPEED ALLOWED	PC5 BLOCKING OF HEATING
DISPLAY REMAINING TIME	PC5 BLOCKING OF SPINNING
DISPLAY ACTUAL TEMPERATURE	HEAT 2 AS STANDARD
DISPLAY ACTUAL SPEED	SERVICE ALARM HOURS
MACHINE NOT HEATED	BUZZER TIMEOUT AT END
TEMPERATURE CONTROL OF WATER	BUZZER TIMEOUT AT PAUS
TEMPERATURE IN °C	ERROR, OVERFILLED
REPEAT PROGR. MODE QUESTION	PASSWORD ACTIVE
LOCKED STANDARD WASH PROGRAMS	CMIS ADDRESS
LEVEL QUICK COOL-DOWN	LEVEL IN MM ACTIVE
LEVEL UNBALANCE	START SLOW FILLING, HG
LEVEL LOW	OFFSET LEVEL, HG
LEVEL MEDIUM	READY

To select the ”SETTINGS 1” function

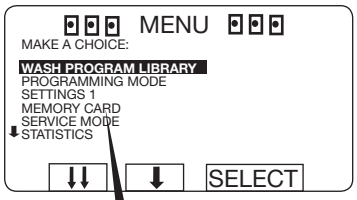


If this menu is not currently displayed:
Press ↩ repeatedly.

Press ↓ to highlight ”GO TO THE MENU”.

RUN A WASH PROGRAM
GO TO THE MENU

SELECT **Press SELECT.**



Press ↓ twice...

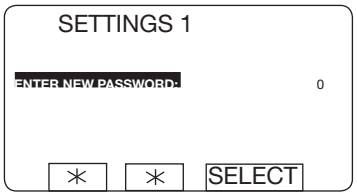
WASH PROGRAM LIBRARY
PROGRAMMING MODE
SETTINGS 1
MEMORY CARD
SERVICE MODE
STATISTICS
MANUAL MODE
SETTINGS 2
EXIT

... to highlight ”SETTINGS 1”.

SELECT **Press SELECT.**

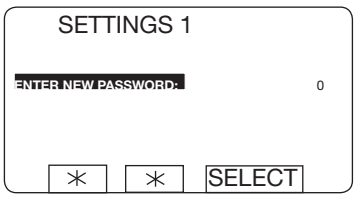
Password

To open the function without a password



SELECT **Press SELECT.**

To enter a password the first time

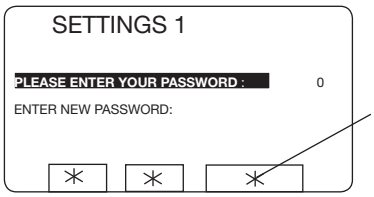


1 2 3
4 5 6
7 8 9
0

Enter a password consisting of any four digits.

SELECT **Press SELECT.**

To open the function using a password



If the function has already been password-protected, you will see an asterisk here instead of the word SELECT.

1 2 3
4 5 6
7 8 9
0

Use the numeric keys to enter your four-digit password.

Once the correct password has been entered, the display will show ⬇ and **SELECT**.

SELECT **Press SELECT.**

Password protection or not?

It is for you to decide whether or not the functions SETTINGS 1 and PROGRAMMING will be password-protected. Please note that if you do decide to implement password protection for either of them, then access to **both** these functions will be by means of the same password.

The password consists of any four digits, chosen by you.

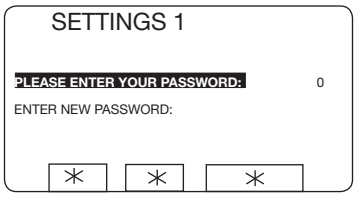
At any time you can change this password, or remove password protection from these functions.

Password set or not set

In Configuration 1, it is possible to select whether or not to use a password.

If the password is not used, the password explanations can be disregarded.

To change the password



1 2 3
4 5 6
7 8 9
0

Enter your four-digit password.

Once the correct password has been entered, the display will show ⬇ and **SELECT**.

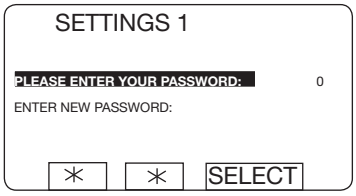
⬇ **Press ⬇.**

1 2 3
4 5 6
7 8 9
0

Enter the new four-digit password.

SELECT **Press SELECT.**

To remove the password protection



1 2 3
4 5 6
7 8 9
0

Enter your four-digit password.

Once the correct password has been entered, the display will show ⬇ and **SELECT**.

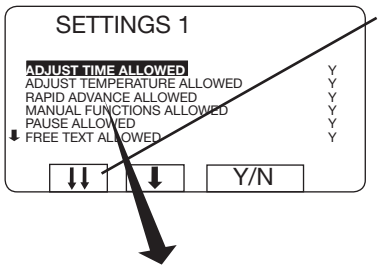
⬇ **Press ⬇.**

1 2 3
4 5 6
7 8 9
0

Enter four noughts (0000).

SELECT **Press SELECT.**

Variables under ”SETTINGS 1”



When the top line of a menu is highlighted you have the option of scrolling down through the menu faster by pressing ⇊. When you do, the next portion of the menu is displayed, with its last line highlighted.

ADJUST TIME ALLOWED	Y
ADJUST TEMPERATURE ALLOWED	Y
RAPID ADVANCE ALLOWED	Y
SHOW WEIGHT ALLOWED	Y
WATER REDUCTION NOT ALLOWED	Y
MANUAL FUNCTIONS ALLOWED	Y
PAUSE ALLOWED	Y
FREE TEXT ALLOWED	Y
CHANGE WASH PROGRAM ALLOWED	Y
AUTO RESTART ALLOWED	Y
ADJUST SPIN SPEED ALLOWED.	Y
DISPLAY REMAINING TIME	Y
DISPLAY ACTUAL TEMPERATURE	Y
DISPLAY ACTUAL SPEED	Y
MACHINE NOT HEATED	N
TEMPERATURE CONTROL OF WATER	Y
TEMPERATURE IN °C	Y
REPEAT PROGR. MODE QUESTION	N
LOCKED STANDARD WASH PROGRAMS	N
LEVEL QUICK COOL-DOWN	175
LEVEL UNBALANCE	0
LEVEL LOW	135
LEVEL MEDIUM	150
LEVEL HIGH	175
MIDDEL TEMPERATURE COOL-DOWN	70° C
DEFAULT MOTOR ON TIME	0:12
DEFAULT MOTOR OFF TIME	0:03
FLUSH DELAY TIME	0:06
FLUSH ON TIME	0:10
BUZZER ON BUTTON	Y
MAX FILLING TIME	10:00
MAX HEATING TIME	10:00
SHOW WEIGHT TIMEOUT	0:20
PC5 BLOCKING OF HEATING	N
PC5 BLOCKING OF SPINNING	Y
HEAT 2 AS STANDARD	Y
SERVICE ALARM HOURS	Y
BUZZER TIMEOUT AT END	Y
BUZZER TIMEOUT AT PAUS	Y
ERROR, OVERFILLED	Y
PASSWORD ACTIVE	Y
CMIS ADDRESS	Y
LEVEL IN MM ACTIVE	Y
START SLOW FILLING, HG	Y
OFFSET LEVEL, HG	Y
READY	

Answer the questions using the function key or the numeric keys.

Y/N Yes/No question

1 2 3 4 5 6 7 8 9 Times, temperatures, levels.

Press ⇓ to move on to the next question.

0 **You can go back and change a question you have answered already by pressing ⇑ repeatedly. Then simply change the value in the normal way.**

⇓

⇑

Different types of question

The questions in the various modules are of two different types, each of which needs to be answered in a different way:

Yes/No questions
The function key display shows **Y/N** , which is a toggle function (the letter to the right of the highlighted question toggles between **N** and **Y** each time it is pressed).

Times, temperatures, water levels
To answer these questions, use the numeric keys. The number of digits required will vary. If you make a mistake while entering digits, delete it by pressing **ERASE** one or more times.

No confirmation of value entered
Once you have entered the right value, you simply move on to the next by pressing ⇓ . There is no enter or return key to press to confirm each value.

To alter the value for a question you have already answered
Press ⇑ to highlight the question you want, then simply change the value.

Your changes can affect program operation

If you have answered any of the first 11 variables in the menu with N (No), and later during program operation you attempt to activate one of these, a message equivalent to "FUNCTION NOT ALLOWED" will appear on the display. You can then press any key to return to normal program operation.

Confirm changes before you exit Settings 1

If you have changed any of the variables, this change must be confirmed when you exit Settings 1. To do this you have to use a strap to short-circuit two terminals on the CPU board, see section headed "To conclude making changes in variables under SETTINGS 1".

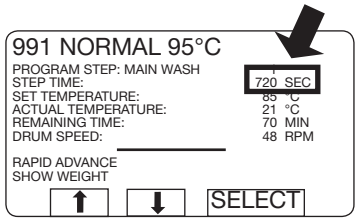
ADJUST TIME ALLOWED	**Y**
ADJUST TEMPERATURE ALLOWED	Y
RAPID ADVANCE ALLOWED	Y
SHOW WEIGHT ALLOWED	Y
WATER REDUCTION NOT ALLOWED	Y
MANUAL FUNCTIONS ALLOWED	Y
PAUSE ALLOWED	Y
FREE TEXT ALLOWED	Y
CHANGE WASH PROGRAM ALLOWED	Y
AUTO RESTART ALLOWED	Y
ADJUST SPIN SPEED ALLOWED.	Y
DISPLAY REMAINING TIME	Y
DISPLAY ACTUAL TEMPERATURE	Y
DISPLAY ACTUAL SPEED	Y
MACHINE NOT HEATED	N

Y/N **Answer Yes (Y) or No (N).**

↓ **Press ↓.**

Altering ”step time” allowed

Here you determine if manual adjustment of the remaining ”step time” (by using ↑ to move to the line for ”STEP TIME” then entering a new time) will be allowed.



If you answer **Yes (Y)**:

Changing the ”step time” during program operation will be allowed.

If you answer **No (N)**:

Changing the ”step time” during a wash program will not be allowed.

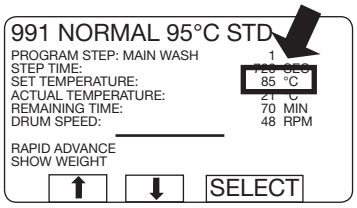
ADJUST TIME ALLOWED	Y
ADJUST TEMPERATURE ALLOWED	**Y**
RAPID ADVANCE ALLOWED	Y
SHOW WEIGHT ALLOWED	Y
WATER REDUCTION NOT ALLOWED	Y
MANUAL FUNCTIONS ALLOWED	Y
PAUSE ALLOWED	Y
FREE TEXT ALLOWED	Y
CHANGE WASH PROGRAM ALLOWED	Y
AUTO RESTART ALLOWED	Y
ADJUST SPIN SPEED ALLOWED.	Y
DISPLAY REMAINING TIME	Y
DISPLAY ACTUAL TEMPERATURE	Y
DISPLAY ACTUAL SPEED	Y
MACHINE NOT HEATED	N

Y/N **Answer Yes (Y) or No (N).**

↓ **Press ↓.**

Altering temperature allowed

Here you determine if manual adjustment of the wash temperature (by using ↑ to move to the line for ”SET TEMPERATURE” then entering a new wash temperature) will be allowed.



The following functions determine how the temperature may be altered:

ADJUST TEMPERATURE ALLOWED

If you answer **Yes (Y)**:

Altering the temperature will be allowed.

If you answer **No (N)**:

Altering this temperature parameter will not be allowed.

The following two functions are under ”SETTINGS 2”:

TEMPERATURE INCREASE ALLOWED

which determines whether it is allowed to alter the temperature parameter to higher than the original temperature in the wash program or not.

MAX ADJUST TEMPERATURE

which determines the upper temperature limit for manual temperature adjustment.

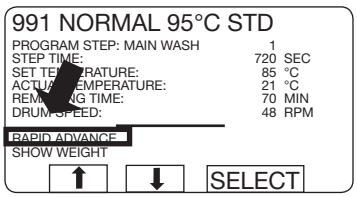
ADJUST TIME ALLOWED	Y
ADJUST TEMPERATURE ALLOWED	Y
RAPID ADVANCE ALLOWED	**Y**
SHOW WEIGHT ALLOWED	Y
WATER REDUCTION NOT ALLOWED	Y
MANUAL FUNCTIONS ALLOWED	Y
PAUSE ALLOWED	Y
FREE TEXT ALLOWED	Y
CHANGE WASH PROGRAM ALLOWED	Y
AUTO RESTART ALLOWED	Y
ADJUST SPIN SPEED ALLOWED.	Y
DISPLAY REMAINING TIME	Y
DISPLAY ACTUAL TEMPERATURE	Y
DISPLAY ACTUAL SPEED	Y
MACHINE NOT HEATED	N

Y/N **Answer Yes (Y) or No (N).**

↓ Press ↓.

Rapid advance allowed

Here you determine whether it is allowed to use rapid advance forwards or backwards through the wash program during program operation.



If you answer **Yes (Y)**:

Rapid advance is allowed.

If you answer **No (N)**:

Rapid advance is not allowed. If you have answered N (No), and subsequently during program operation you wish to terminate a program before it has ended, press the emergency stop button.

For machines with weight measurement installed only!

ADJUST TIME ALLOWED	Y
ADJUST TEMPERATURE ALLOWED	Y
RAPID ADVANCE ALLOWED	Y
SHOW WEIGHT ALLOWED	
WATER REDUCTION NOT ALLOWED	Y
MANUAL FUNCTIONS ALLOWED	Y
PAUSE ALLOWED	Y
FREE TEXT ALLOWED	Y
CHANGE WASH PROGRAM ALLOWED	Y
AUTO RESTART ALLOWED	Y
ADJUST SPIN SPEED ALLOWED.	Y
DISPLAY REMAINING TIME	Y
DISPLAY ACTUAL TEMPERATURE	Y
DISPLAY ACTUAL SPEED	Y
MACHINE NOT HEATED	N

Y/N **Answer Yes (Y) or No (N).**

↓ Press ↓.

Show weight allowed

Here you determine whether the menu line showing actual weight will be displayed or not.

Menu line showing actual weight

If you answer **Yes (Y)**:

Menu line showing current weight will be displayed.

If you answer **No (N)**:

Menu line showing current weight will not be displayed.

For machines with weight measurement installed only!

ADJUST TIME ALLOWED	Y
ADJUST TEMPERATURE ALLOWED	Y
RAPID ADVANCE ALLOWED	Y
SHOW WEIGHT ALLOWED	Y
WATER REDUCTION NOT ALLOWED	
MANUAL FUNCTIONS ALLOWED	Y
PAUSE ALLOWED	Y
FREE TEXT ALLOWED	Y
CHANGE WASH PROGRAM ALLOWED	Y
AUTO RESTART ALLOWED	Y
ADJUST SPIN SPEED ALLOWED.	Y
DISPLAY REMAINING TIME	Y
DISPLAY ACTUAL TEMPERATURE	Y
DISPLAY ACTUAL SPEED	Y
MACHINE NOT HEATED	N

Water reduction not allowed

If the weight measurement function is installed, the water level will be reduced automatically if the machine does not have a full load.

Here you determine whether it will be possible to switch off the water level reduction during a wash program, using the function "WATER REDUCTION NOT ALLOWED".

If you answer **Yes (Y)**:
The function "WATER REDUCTION NOT ALLOWED" can be used.

If you answer **No (N)**:
The function "WATER REDUCTION NOT ALLOWED" **cannot** be used.

Y/N **Answer Yes (Y) or No (N).**

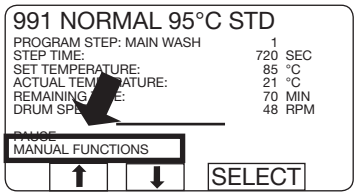
↓ Press ↓.

ADJUST TIME ALLOWED	Y
ADJUST TEMPERATURE ALLOWED	Y
RAPID ADVANCE ALLOWED	Y
SHOW WEIGHT ALLOWED	Y
WATER REDUCTION NOT ALLOWED	Y
MANUAL FUNCTIONS ALLOWED	
PAUSE ALLOWED	Y
FREE TEXT ALLOWED	Y
CHANGE WASH PROGRAM ALLOWED	Y
AUTO RESTART ALLOWED	Y
ADJUST SPIN SPEED ALLOWED.	Y
DISPLAY REMAINING TIME	Y
DISPLAY ACTUAL TEMPERATURE	Y
DISPLAY ACTUAL SPEED	Y
MACHINE NOT HEATED	N

Manual functions allowed

Here you determine whether it will be possible to use certain functions manually during the wash program:

- Control water valves and drain valve
- Determine the highest extraction speed allowed
- Motor action after program end
- Control detergent valves



If you answer **Yes (Y)**:
These manual functions will be allowed.

If you answer **No (N)**:
These manual functions will not be allowed.

Y/N **Answer Yes (Y) or No (N).**

↓ **Press ↓.**

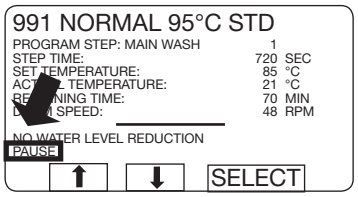
ADJUST TIME ALLOWED	Y
ADJUST TEMPERATURE ALLOWED	Y
RAPID ADVANCE ALLOWED	Y
SHOW WEIGHT ALLOWED	Y
WATER REDUCTION NOT ALLOWED	Y
MANUAL FUNCTIONS ALLOWED	Y
PAUSE ALLOWED	**Y**
FREE TEXT ALLOWED	Y
CHANGE WASH PROGRAM ALLOWED	Y
AUTO RESTART ALLOWED	Y
ADJUST SPIN SPEED ALLOWED.	Y
DISPLAY REMAINING TIME	Y
DISPLAY ACTUAL TEMPERATURE	Y
DISPLAY ACTUAL SPEED	Y
MACHINE NOT HEATED	N

Y/N **Answer Yes (Y) or No (N).**

↓ **Press ↓.**

Pause allowed

Here you determine whether it is allowed to use the pause function during the wash program. This function will not work until the second time the program is run. Before that the line will be blank even if you have inserted Y (Yes) here.



If you answer **Yes (Y)**:

The use of the pause function during the wash program will be allowed. Pause is selected either through the PAUSE function or by pressing ↵.

If you answer **No (N)**:

The use of the pause function during the wash program will not be allowed. It is still possible, however, to pause using the ↵ key.

ADJUST TIME ALLOWED	Y
ADJUST TEMPERATURE ALLOWED	Y
RAPID ADVANCE ALLOWED	Y
SHOW WEIGHT ALLOWED	Y
WATER REDUCTION NOT ALLOWED	Y
MANUAL FUNCTIONS ALLOWED	Y
PAUSE ALLOWED	Y
FREE TEXT ALLOWED	**Y**
CHANGE WASH PROGRAM ALLOWED	Y
AUTO RESTART ALLOWED	Y
ADJUST SPIN SPEED ALLOWED.	Y
DISPLAY REMAINING TIME	Y
DISPLAY ACTUAL TEMPERATURE	Y
DISPLAY ACTUAL SPEED	Y
MACHINE NOT HEATED	N

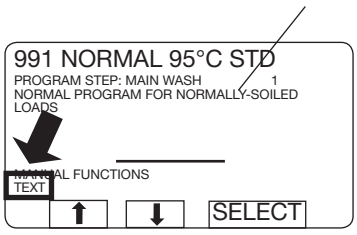
Y/N **Answer Yes (Y) or No (N).**

↓ **Press ↓.**

Display of free text about program allowed

Here you determine whether the display of free text about the wash program will be allowed.

Example of ”free text”, entered when the program is created.



If you answer **Yes (Y)**:

Display of free text will be allowed.

If you answer **No (N)**:

Display of free text will <u>not</u> be allowed.

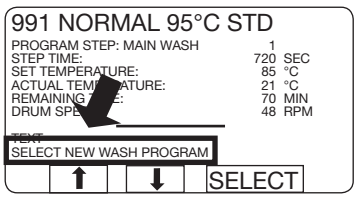
ADJUST TIME ALLOWED	Y
ADJUST TEMPERATURE ALLOWED	Y
RAPID ADVANCE ALLOWED	Y
SHOW WEIGHT ALLOWED	Y
WATER REDUCTION NOT ALLOWED	Y
MANUAL FUNCTIONS ALLOWED	Y
PAUSE ALLOWED	Y
FREE TEXT ALLOWED	Y
CHANGE WASH PROGRAM ALLOWED	**Y**
AUTO RESTART ALLOWED	Y
ADJUST SPIN SPEED ALLOWED.	Y
DISPLAY REMAINING TIME	Y
DISPLAY ACTUAL TEMPERATURE	Y
DISPLAY ACTUAL SPEED	Y
MACHINE NOT HEATED	N

Y/N **Answer Yes (Y) or No (N).**

↓ **Press ↓ .**

Changing wash program allowed

Here you determine whether it is allowed to change to a different wash program during program operation.



If you answer **Yes (Y)**:

Changing to a different wash program allowed.

If you answer **No (N)**:

Changing to a different wash program not allowed.

ADJUST TEMPERATURE ALLOWED	Y
RAPID ADVANCE ALLOWED	Y
SHOW WEIGHT ALLOWED	Y
WATER REDUCTION NOT ALLOWED	Y
MANUAL FUNCTIONS ALLOWED	Y
PAUSE ALLOWED	Y
FREE TEXT ALLOWED	Y
CHANGE WASH PROGRAM ALLOWED	Y
AUTO RESTART ALLOWED	**Y**
ADJUST SPIN SPEED ALLOWED.	Y
DISPLAY REMAINING TIME	Y
DISPLAY ACTUAL TEMPERATURE	Y
DISPLAY ACTUAL SPEED	Y
MACHINE NOT HEATED	N
TEMPERATURE CONTROL OF WATER	Y

Y/N **Answer Yes (Y) or No (N).**

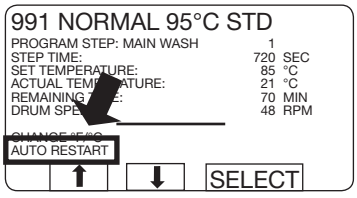
↓ **Press ↓ .**

Automatic restart allowed

Here you determine whether automatic restart of a wash program is allowed.

Automatic restart means that the same program will be repeated the number of times entered. The program will restart immediately, and it will not be possible to open the door in between. If automatic restart has been programmed, the display will show the number of restarts left.

The function is mostly used for testing.



If you answer **Yes (Y)**:

Automatic restart will be allowed.

If you answer **No (N)**:

Automatic restart will not be allowed.

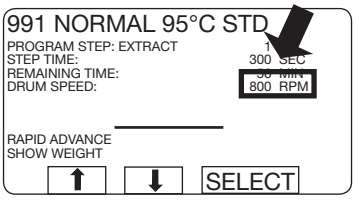
RAPID ADVANCE ALLOWED	Y
SHOW WEIGHT ALLOWED	Y
WATER REDUCTION NOT ALLOWED	Y
MANUAL FUNCTIONS ALLOWED	Y
PAUSE ALLOWED	Y
FREE TEXT ALLOWED	Y
CHANGE WASH PROGRAM ALLOWED	Y
AUTO RESTART ALLOWED	Y
ADJUST SPIN SPEED ALLOWED.	**Y**
DISPLAY REMAINING TIME	Y
DISPLAY ACTUAL TEMPERATURE	Y
DISPLAY ACTUAL SPEED	Y
MACHINE NOT HEATED	N
TEMPERATURE CONTROL OF WATER	Y

Y/N **Answer Yes (Y) or No (N)..**

⬇ **Press ⬇.**

Altering extraction speed allowed

Here you determine whether it is allowed to alter the extraction speed during the current extraction sequence by using ⬆ to move to the DRUM SPEED line and entering a new value.



If you answer **Yes (Y)**:

Altering extraction speed will be allowed.

If you answer **No (N)**:

Altering extraction speed will not be allowed.

MANUAL FUNCTIONS ALLOWED	Y
PAUSE ALLOWED	Y
FREE TEXT ALLOWED	Y
CHANGE WASH PROGRAM ALLOWED	Y
AUTO RESTART ALLOWED	Y
ADJUST SPIN SPEED ALLOWED.	Y
DISPLAY REMAINING TIME	**Y**
DISPLAY ACTUAL TEMPERATURE	Y
DISPLAY ACTUAL SPEED	Y
MACHINE NOT HEATED	N
TEMPERATURE CONTROL OF WATER	Y
TEMPERATURE IN °C	Y
REPEAT PROGR. MODE QUESTION	N
LOCKED STANDARD WASH PROGRAMS	N
LEVEL QUICK COOL-DOWN	175

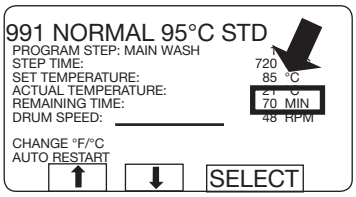
Y/N **Answer Yes (Y) or No (N)..**

⬇ **Press ⬇.**

Display time left

Here you determine whether the time the program has left to run will be displayed during the program. This function will not work until the second time the program is run. Before that the line will be blank even if you have inserted Y (Yes) here.

The time displayed will be based on the average of the last five times the program was used.



If you answer **Yes (Y)**:

The time the program has left to run will be displayed.

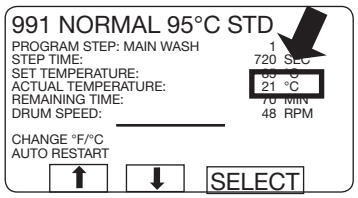
If you answer **No (N)**:

The time the program has left to run will not be displayed.

MANUAL FUNCTIONS ALLOWED	Y
FREE TEXT ALLOWED	Y
CHANGE WASH PROGRAM ALLOWED	Y
AUTO RESTART ALLOWED	Y
ADJUST SPIN SPEED ALLOWED.	Y
DISPLAY REMAINING TIME	Y
DISPLAY ACTUAL TEMPERATURE	**Y**
DISPLAY ACTUAL SPEED	Y
MACHINE NOT HEATED	N
TEMPERATURE CONTROL OF WATER	Y
TEMPERATURE IN °C	Y
REPEAT PROGR. MODE QUESTION	N
LOCKED STANDARD WASH PROGRAMS	N
LEVEL QUICK COOL-DOWN	175
LEVEL UNBALANCE	0

Display actual temperature

Here you determine whether the actual water temperature will be displayed during the program.



If you answer **Yes (Y)**:

Actual water temperature will be displayed.

If you answer **No (N)**:

Actual water temperature will not be displayed.

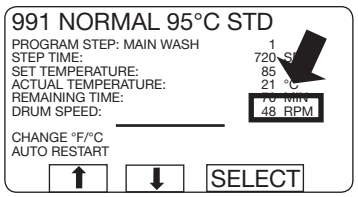
Y/N **Answer Yes (Y) or No (N).**

Press ⬇.

FREE TEXT ALLOWED	Y
CHANGE WASH PROGRAM ALLOWED	Y
AUTO RESTART ALLOWED	Y
ADJUST SPIN SPEED ALLOWED.	Y
DISPLAY REMAINING TIME	Y
DISPLAY ACTUAL TEMPERATURE	Y
DISPLAY ACTUAL SPEED	**Y**
MACHINE NOT HEATED	N
TEMPERATURE CONTROL OF WATER	Y
TEMPERATURE IN °C	Y
REPEAT PROGR. MODE QUESTION	N
LOCKED STANDARD WASH PROGRAMS	N
LEVEL QUICK COOL-DOWN	175
LEVEL UNBALANCE	0
LEVEL LOW	135

Display actual speed

Here you determine whether the actual drum speed will be displayed during the program.



If you answer **Yes (Y)**:

Actual drum speed will be displayed.

If you answer **No (N)**:

Actual drum speed will not be displayed.

Y/N **Answer Yes (Y) or No (N).**

Press ⬇.

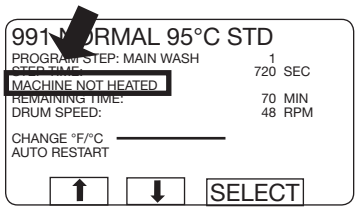
CHANGE WASH PROGRAM ALLOWED	Y
AUTO RESTART ALLOWED	Y
ADJUST SPIN SPEED ALLOWED.	Y
DISPLAY REMAINING TIME	Y
DISPLAY ACTUAL TEMPERATURE	Y
DISPLAY ACTUAL SPEED	Y
MACHINE NOT HEATED	**N**
TEMPERATURE CONTROL OF WATER	Y
TEMPERATURE IN °C	Y
REPEAT PROGR. MODE QUESTION	N
LOCKED STANDARD WASH PROGRAMS	N
LEVEL QUICK COOL-DOWN	175
LEVEL UNBALANCE	0
LEVEL LOW	135
LEVEL MEDIUM	150

Y/N **Answer Yes (Y) or No (N)..**

Press ↓ **.**

Machine not heated

Here you determine if the machine is to heat the water to the required temperature before the time the wash sequence starts, or if the wash time of the sequence is to begin directly after water filling.



If you answer **Yes (Y)**:

The machine will not wait for the water to heat, but will begin to count down the time of on the wash sequence immediately.

The temperature of the water will, however, still be monitored and adjusted during filling if the answer Yes has been inserted for the question ”TEMPERATURE CONTROL OF WATER” (see next question).

If the answer ”Yes” is in place (Yes is the default) for the question ”HEATING RELAY ON WHEN NOT HEATED” (see "Settings 2") the heating relay (if machine is equipped with one) will switch on. This means you can heat the water while wash action is in progress. If you do not want the heating relay to switch on, you must insert the answer ”No” for the question ”HEATING RELAY ON WHEN NOT HEATED”.

If you answer **No (N)**:

The machine will heat the water to the set temperature before the count down of the wash sequence begins. The temperature values will be shown on the display (if you have ”allowed” their display).

AUTO RESTART ALLOWED	Y
ADJUST SPIN SPEED ALLOWED.	Y
DISPLAY REMAINING TIME	Y
DISPLAY ACTUAL TEMPERATURE	Y
DISPLAY ACTUAL SPEED	Y
MACHINE NOT HEATED	N
TEMPERATURE CONTROL OF WATER	**Y**
TEMPERATURE IN °C	Y
REPEAT PROGR. MODE QUESTION	N
LOCKED STANDARD WASH PROGRAMS	N
LEVEL QUICK COOL-DOWN	175
LEVEL UNBALANCE	0
LEVEL LOW	135
LEVEL MEDIUM	150
LEVEL HIGH	175

Y/N **Answer Yes (Y) or No (N).**

Press ↓ **.**

Temperature control of water

Here you determine whether the machine will monitor and adjust the water temperature during filling, by opening and closing the cold and hot water valves.

If you answer **Yes (Y)**:

This function will be activated.

If you answer **No (N)**:

Temperature control not activated. Both the hot and the cold water valves will be opened until the machine has filled to the correct level.

ADJUST SPIN SPEED ALLOWED.	Y
DISPLAY REMAINING TIME	Y
DISPLAY ACTUAL TEMPERATURE	Y
DISPLAY ACTUAL SPEED	Y
MACHINE NOT HEATED	N
TEMPERATURE CONTROL OF WATER	Y
TEMPERATURE IN °C	**Y**
REPEAT PROGR. MODE QUESTION	N
LOCKED STANDARD WASH PROGRAMS	N
LEVEL QUICK COOL-DOWN	175
LEVEL UNBALANCE	0
LEVEL LOW	135
LEVEL MEDIUM	150
LEVEL HIGH	175
MIDDLE TEMPERATURE COOL -DOWN	70 °C

Temperature in °C

Here you determine if all temperatures are to be shown in °C or °F.

If you answer **Yes (Y)**:

All temperatures will be shown in °C.

If you answer **No (N)**:

All temperatures will be shown in °F.

Y/N **Answer Yes (Y) or No (N).**

Press ↓ **.**

DISPLAY REMAINING TIME	Y
DISPLAY ACTUAL TEMPERATURE	Y
DISPLAY ACTUAL SPEED	Y
MACHINE NOT HEATED	N
TEMPERATURE CONTROL OF WATER	Y
TEMPERATURE IN °C	Y
REPEAT PROGR. MODE QUESTION	**N**
LOCKED STANDARD WASH PROGRAMS	N
LEVEL QUICK COOL-DOWN	175
LEVEL UNBALANCE	0
LEVEL LOW	135
LEVEL MEDIUM	150
LEVEL HIGH	175
MIDDLE TEMPERATURE COOL-DOWN	70 °C
DEFAULT MOTOR ON TIME	0:12

Repeat program mode question

Here you determine whether you (or the user) will be given the chance to select either Standard or Advanced mode for each new program module you are programming, if you start programming in Standard mode.

If you answer **Yes (Y)**:

You can select either Standard or Advanced mode for each new program module you program.

If you answer **No (N)**:

All modules must be programmed using either Standard mode or Advanced mode consistently, whichever is selected when you begin programming.

Y/N **Answer Yes (Y) or No (N).**

Press ↓ **.**

DISPLAY ACTUAL TEMPERATURE	Y
DISPLAY ACTUAL SPEED	Y
MACHINE NOT HEATED	N
TEMPERATURE CONTROL OF WATER	Y
TEMPERATURE IN °C	Y
REPEAT PROGR. MODE QUESTION	N
LOCKED STANDARD WASH PROGRAMS	**N**
LEVEL QUICK COOL-DOWN	175
LEVEL UNBALANCE	0
LEVEL LOW	135
LEVEL MEDIUM	150
LEVEL HIGH	175
MIDDLE TEMPERATURE COOL-DOWN	70 °C
DEFAULT MOTOR ON TIME	0:12
DEFAULT MOTOR OFF TIME	0:03

No access to standard programs

Here you determine whether the user will have access to the machine's standard programs (numbered 991-999) or not.

If you answer **Yes (Y)**:

The user will not have access to the standard programs.

If you answer **No (N)**:

The user will have access to the standard programs.

Y/N **Answer Yes (Y) or No (N).**

Press ⬇.

DISPLAY ACTUAL SPEED	Y
MACHINE NOT HEATED	N
TEMPERATURE CONTROL OF WATER	Y
TEMPERATURE IN °C	Y
REPEAT PROGR. MODE QUESTION	N
LOCKED STANDARD WASH PROGRAMS	N
LEVEL QUICK COOL- DOWN	**175**
LEVEL UNBALANCE	0
LEVEL LOW	135
LEVEL MEDIUM	150
LEVEL HIGH	175
MIDDLE TEMPERATURE COOL-DOWN	70 °C
DEFAULT MOTOR ON TIME	0:12
DEFAULT MOTOR OFF TIME	0:03
FLUSH DELAY TIME	0:06

Use the numeric keys to enter the value.

1 2 3
4 5 6
7 8 9
0

If you make a mistake while entering digits:

Press ERASE.

⬇

When you have finished:

Press ⬇.

Water level for quick cool-down

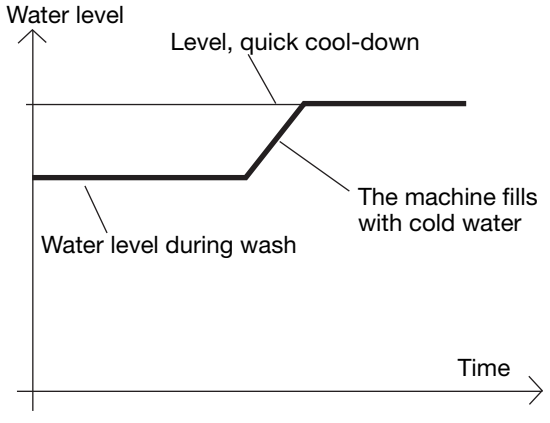
Here you determine the level to which the machine fills with cold water for quick cool-down.

When you are creating a wash program, in the module "COOL-DOWN" there is an option for programming "QUICK COOL-DOWN".

Quick cool-down means that the machine will fill with cold water to a higher level.

This function is used mainly for reducing the temperature of the water before it is discharged.

For information on the levels used for the various machines, see the manual "Programming, PCS Program Control Unit".



MACHINE NOT HEATED	N
TEMPERATURE CONTROL OF WATER	Y
TEMPERATURE IN °C	Y
REPEAT PROGR. MODE QUESTION	N
LOCKED STANDARD WASH PROGRAMS	N
LEVEL QUICK COOL-DOWN	175
LEVEL UNBALANCE	**0**
LEVEL LOW	135
LEVEL MEDIUM	150
LEVEL HIGH	175
MIDDLE TEMPERATURE COOL-DOWN	70 °C
DEFAULT MOTOR ON TIME	0:12
DEFAULT MOTOR OFF TIME	0:03
FLUSH DELAY TIME	0:06
FLUSH ON TIME	0:10

Use the numeric keys to enter the value.

If you make a mistake while entering digits:

Press ERASE.

When you have finished:

Press ⬇ .

Water level after unbalance halt

Here you determine the water level to which the machine fills after a halt in extraction due to unbalance.

If the machine's unbalance-sensing equipment is activated when extraction begins, that extraction will halt and a new attempt will begin. If you want the drum to be filled with water to a certain level before the drain valve opens and the machine makes a fresh attempt at extraction, you can set that level here. Level 0 means that the drum will not fill.

For information on the levels used for the various machines, see the manual "Programming, PCS Program Control Unit".

TEMPERATURE IN °C	Y
REPEAT PROGR. MODE QUESTION	N
LOCKED STANDARD WASH PROGRAMS	N
LEVEL QUICK COOL-DOWN	175
LEVEL UNBALANCE	0
LEVEL LOW	**135**
LEVEL MEDIUM	**150**
LEVEL HIGH	**175**
MIDDLE TEMPERATURE COOL-DOWN	70 °C
DEFAULT MOTOR ON TIME	0:12
DEFAULT MOTOR OFF TIME	0:03
FLUSH DELAY TIME	0:06
FLUSH ON TIME	0:10
BUZZER ON BUTTON	Y
MAX FILLING TIME	10:00

Use the numeric keys to enter the value.

If you make a mistake while entering digits:

Press ERASE.

When you have finished:

Press ⬇ .

Low / Medium / High levels

Here you determine the water levels which are to correspond to L (low), M (medium) and H (high). These levels are used when you are programming in Standard mode.

For information on the levels used for the various machines, see the manual "Programming, PCS Program Control Unit".

LEVEL QUICK COOL-DOWN	175
LEVEL UNBALANCE	0
LEVEL LOW	135
LEVEL MEDIUM	150
LEVEL HIGH	175
MIDDLE TEMPERATURE COOL-DOWN	**70**
DEFAULT MOTOR ON TIME	0:12
DEFAULT MOTOR OFF TIME	0:03
FLUSH DELAY TIME	0:06
FLUSH ON TIME	0:10
BUZZER ON BUTTON	Y
MAX FILLING TIME	10:00
MAX HEATING TIME	10:00
SHOW WEIGHT TIMEOUT	0:20
PC5 BLOCKING OF HEATING	N
PC5 BLOCKING OF SPINNING	Y
HEAT 2 AS STANDARD	Y
SERVICE ALARM HOURS	Y

1 2 3
4 5 6
7 8 9
0

Use the numeric keys to enter the value.

If you make a mistake while entering digits:

Press ERASE.

When you have finished:

Press ⬇ .

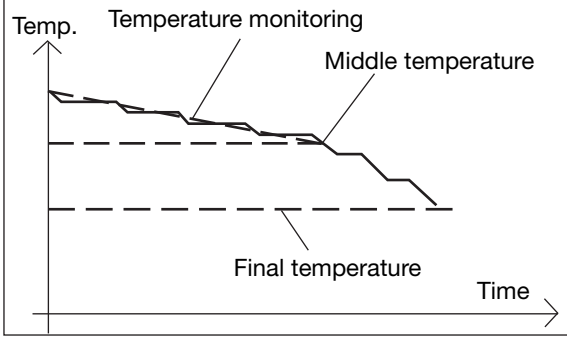
Middle temperature cool-down

Here you determine the middle temperature for cool-down.

When creating a new wash program you can, to prevent creasing of the load, use the COOL-DOWN module to achieve controlled cool-down of the water in the drum. The cool-down sequence is divided into two stages:

1 **wash temperature to middle temperature**
Throughout this stage the machine will monitor the cool-down rate, to ensure it does not exceed the cool-down rate set (4°C per minute when the machine leaves the factory). If the rate set is exceeded, no water will be added until the mean value is acceptable again.

2 **middle temperature to final temperature**
The rate of cool-down is not monitored during this stage. The valve opens and shuts as you have programmed it to do.



LEVEL UNBALANCE	0
LEVEL LOW	135
LEVEL MEDIUM	150
LEVEL HIGH	175
MIDDLE TEMPERATURE COOL-DOWN	70 °C
DEFAULT MOTOR ON TIME	**0:12**
DEFAULT MOTOR OFF TIME	**0:03**
FLUSH DELAY TIME	0:06
FLUSH ON TIME	0:10
BUZZER ON BUTTON	Y
MAX FILLING TIME	10:00
MAX HEATING TIME	10:00
SHOW WEIGHT TIMEOUT	0:20
PC5 BLOCKING OF HEATING	N
PC5 BLOCKING OF SPINNING	Y
HEAT 2 AS STANDARD	Y
SERVICE ALARM HOURS	Y

1 2 3
4 5 6
7 8 9
0

Use the numeric keys to enter the value.

If you make a mistake while entering digits:

Press ERASE.

When you have finished:

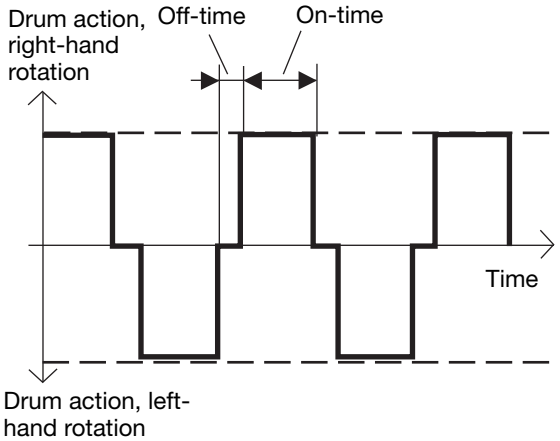
Press ⬇ .

Default motor on-time / off-time

Here you determine the machine default times for motor rotation, both ”on-time” and ”off-time”.

Under certain circumstances during a wash program, e.g when the machine starts up again after a halt in extraction due to imbalance, the machine cannot find the ”on-time” and ”off-time” values for its motor action in the current wash program. That is when it needs to be able to find and use the default ”on-time” and ”off-time” values stored here.

The values shown are those recommended by the supplier.



LEVEL UNBALANCE	0
LEVEL LOW	135
LEVEL MEDIUM	150
LEVEL HIGH	175
MIDDLE TEMPERATURE COOL-DOWN	70 °C
DEFAULT MOTOR ON TIME	0:12
DEFAULT MOTOR OFF TIME	0:03
FLUSH DELAY TIME	**0:06**
FLUSH ON TIME	**0:10**
BUZZER ON BUTTON	Y
MAX FILLING TIME	10:00
MAX HEATING TIME	10:00
SHOW WEIGHT TIMEOUT	0:20
PC5 BLOCKING OF HEATING	N
PC5 BLOCKING OF SPINNING	Y
HEAT 2 AS STANDARD	Y
SERVICE ALARM HOURS	Y

Flush times

Here you determine times relating to flushing clean the supply lines of an external system for liquid detergent: the delay time and the length of time ”on”.

1 2 3
4 5 6
7 8 9
0

Use the numeric keys to enter the value.

If you make a mistake while entering digits:

Press ERASE.

⬇

When you have finished:

Press ⬇ .

LEVEL UNBALANCE	0
LEVEL LOW	135
LEVEL MEDIUM	150
LEVEL HIGH	175
MIDDLE TEMPERATURE COOL-DOWN	70 °C
DEFAULT MOTOR ON TIME	0:12
DEFAULT MOTOR OFF TIME	0:03
FLUSH DELAY TIME	0:06
FLUSH ON TIME	0:10
BUZZER ON BUTTON	**Y**
MAX FILLING TIME	10:00
MAX HEATING TIME	10:00
SHOW WEIGHT TIMEOUT	0:20
PC5 BLOCKING OF HEATING	N
PC5 BLOCKING OF SPINNING	Y
HEAT 2 AS STANDARD	Y
SERVICE ALARM HOURS	Y

Key click on

Here you determine whether or not there will be an audible click (or beep) each time a key on the PCU control panel is pressed.

If you answer **Yes (Y)**:

Click (beep) for each key press.

If you answer **No (N)**:

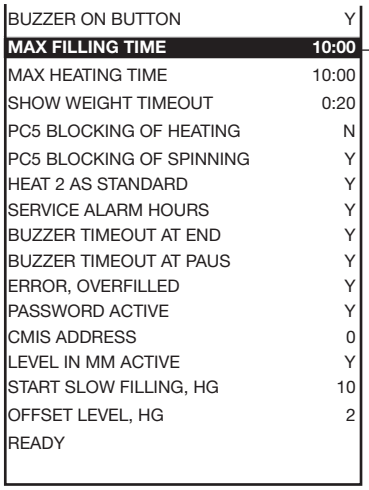
No click or beep audible when keys pressed.

Y/N

Answer Yes (Y) or No (N).

⬇

Press ⬇ .



Maximum filling time

Here you determine the maximum time to be allowed for filling the machine with water to the level set.

If the correct level has not been reached within this time, the error message ”NO WATER” will appear on the display.

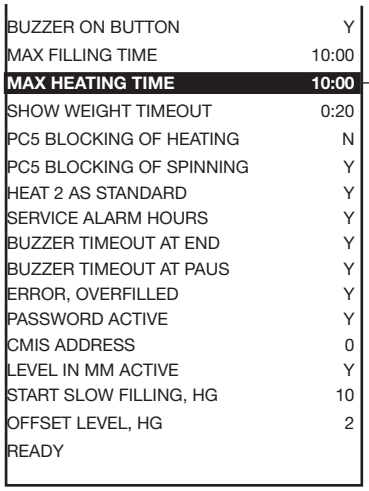
Use the numeric keys to enter the value.

If you make a mistake while entering digits:

Press ERASE.

When you have finished:

Press ⬇ .



Maximum heating time

Here you determine the maximum time to be allowed to heat the water a certain number of degrees (the number of degrees can be set as a parameter via the function ”MINIMUM TEMPERATURE INCREASE” under ”SETTINGS 2”).

If the water has not been heated within this time, the error message ”NO HEATING” will appear on the display.

Use the numeric keys to enter the value.

If you make a mistake while entering digits:

Press ERASE.

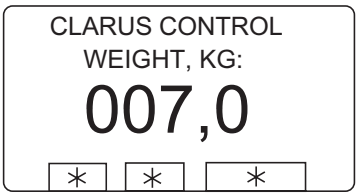
When you have finished:

Press ⬇ .

BUZZER ON BUTTON	Y
MAX FILLING TIME	10:00
MAX HEATING TIME	10:00
SHOW WEIGHT TIMEOUT	**0:20**
PC5 BLOCKING OF HEATING	N
PC5 BLOCKING OF SPINNING	Y
HEAT 2 AS STANDARD	Y
SERVICE ALARM HOURS	Y
BUZZER TIMEOUT AT END	Y
BUZZER TIMEOUT AT PAUS	Y
ERROR, OVERFILLED	Y
PASSWORD ACTIVE	Y
CMIS ADDRESS	0
LEVEL IN MM ACTIVE	Y
START SLOW FILLING, HG	10
OFFSET LEVEL, HG	2
READY	

Show weight timeout

Here you determine the length of time the weight will be displayed, before the normal display is restored.



Weight display mode

[1] [2] [3] [4] [5] [6] [7] [8] [9] [0] **Use the numeric keys to enter the value.**

If you make a mistake while entering digits:

Press ERASE.

[⬇] When you have finished:

Press [⬇] .

BUZZER ON BUTTON	Y
MAX FILLING TIME	10:00
MAX HEATING TIME	10:00
SHOW WEIGHT TIMEOUT	0:20
PC5 BLOCKING OF HEATING	**N**
PC5 BLOCKING OF SPINNING	**Y**
HEAT 2 AS STANDARD	Y
SERVICE ALARM HOURS	Y
BUZZER TIMEOUT AT END	Y
BUZZER TIMEOUT AT PAUS	Y
ERROR, OVERFILLED	Y
PASSWORD ACTIVE	Y
CMIS ADDRESS	0
LEVEL IN MM ACTIVE	Y
START SLOW FILLING, HG	10
OFFSET LEVEL, HG	2
READY	

PC5, Power Control

Here you determine whether input X15 on I/O PCB 1 (external pause signal) will have the ”external pause signal” function (for this, the letter ”N” (No) should be inserted on both option lines), or the Power Control (PC5) function. For detailed instructions on PC5 connection and settings, see relevant manual section.

[Y/N] **Answer Yes (Y) or No (N).**

[⬇] **Press [⬇] .**

BUZZER ON BUTTON	Y
MAX FILLING TIME	10:00
MAX HEATING TIME	10:00
SHOW WEIGHT TIMEOUT	0:20
PC5 BLOCKING OF HEATING	N
PC5 BLOCKING OF SPINNING	Y
HEAT 2 AS STANDARD	**Y**
SERVICE ALARM HOURS	Y
BUZZER TIMEOUT AT END	Y
BUZZER TIMEOUT AT PAUS	Y
ERROR, OVERFILLED	Y
PASSWORD ACTIVE	Y
CMIS ADDRESS	0
LEVEL IN MM ACTIVE	Y
START SLOW FILLING, HG	10
OFFSET LEVEL, HG	2
READY	

Relay for steam as standard

Here you decide if the machine should heat with steam or el. Yes (Y) the machine will heat with steam (standard) and No (N) the machine will heat with el.

Y/N **Answer Yes (Y) or No (N).**

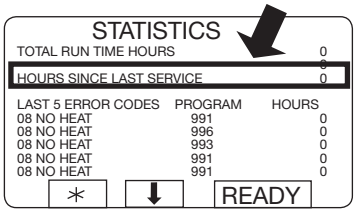
Press ⬇ .

SERVICE ALARM HOURS	**0**

Service interval

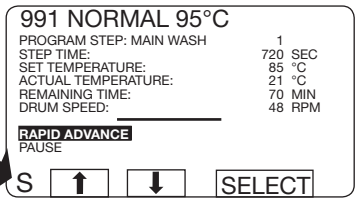
Here you determine the interval between service interventions on the machine.

The statistics function of the programme unit contains a counter that can be reset to show the number of hours of effective washing on the machine since the last service intervention.



When the service technician has serviced the machine, this counter is reset.

When the time on the counter exceeds the programmed interval, “S” is displayed in the lower, left corner of the display indicating the need for Service.



1 2 3 4 5 6 7 8 9 0 **Use the numeric keys to enter the value.**

If you make a mistake while entering digits:

Press ERASE.

When you have finished:

Press ⬇ .

Buzzer length at programme end

Here you determine for how long the buzzer should sound at the end of the programme unless it is not turned off manually.

When programming the main data for a washing programme, it is possible to select whether or not to sound the buzzer at the programme end. The buzzer is switched off by pressing a function button on the control panel.

1 2 3
4 5 6
7 8 9
0

Use the numeric keys to enter the value.

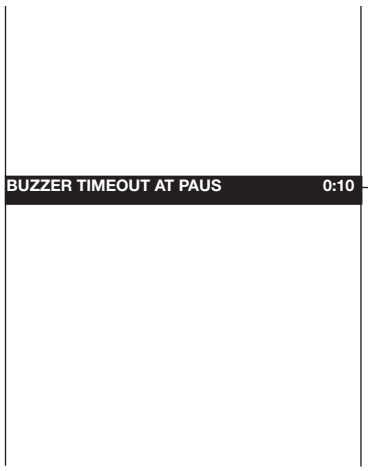
If you make a mistake while entering digits:

Press ERASE.

⬇

When you have finished:

Press ⬇ .



Buzzer length at pause

Here you determine for how long the buzzer should sound at a programmed pause unless it is not turned off manually.

When programming a washing programme, it is possible to select whether or not to pause and sound the buzzer for each washing module before that module starts. The buzzer is switched off by pressing a function button on the control panel.

1 2 3
4 5 6
7 8 9
0

Use the numeric keys to enter the value.

If you make a mistake while entering digits:

Press ERASE.

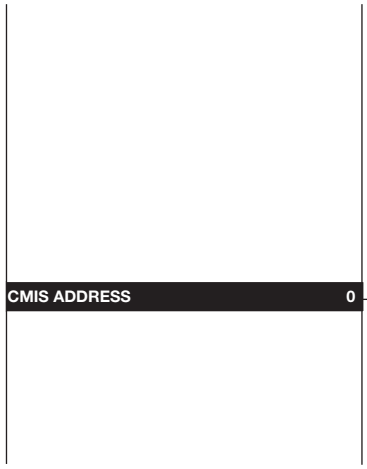
⬇

When you have finished:

Press ⬇ .

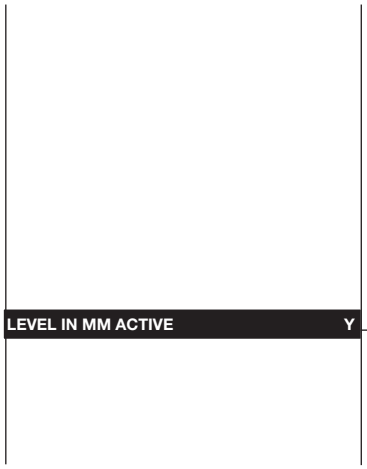
Password active

Here you determine whether or not to set a password according to the explanations.



CMIS address

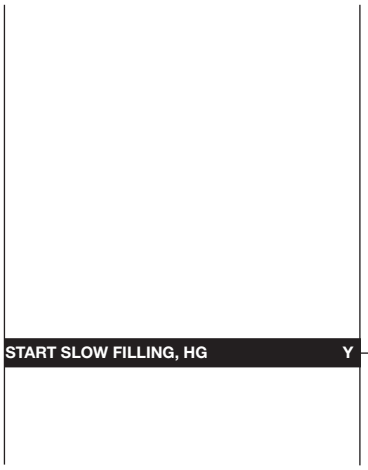
Here you can give the machine a unique address when connected to the CMIS system. 0 = inactive
Allowed values = 1-127.



Level in mm active

Y(es) = Pressure sensor system for water filling active.

N(o) = Water filling will be made on weight.



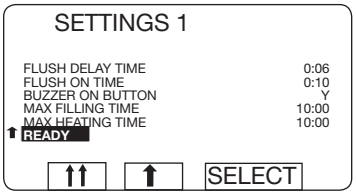
Start slow filling, hg

When filling on weight, detergent valve 3 will be used to finalize the washer filling. Detergent valve 3 will be opened given value before the final level is reached.

Offset level, hg

Gives value will be subtracted from programing water level before water filling starts. Only when filling on weight.

To conclude making changes in variables under ”SETTINGS 1”



Press ↓ to highlight READY.

Insert a suitable strap to short-circuit terminals X7:1-2 on the CPU circuit board.

SELECT **Press SELECT.**

The display illustrated left will appear if you fail to insert the strap to short-circuit terminals X7:1-2.

Check that the strap between X7:1-2 is intact and in place.

Press SELECT and try again.

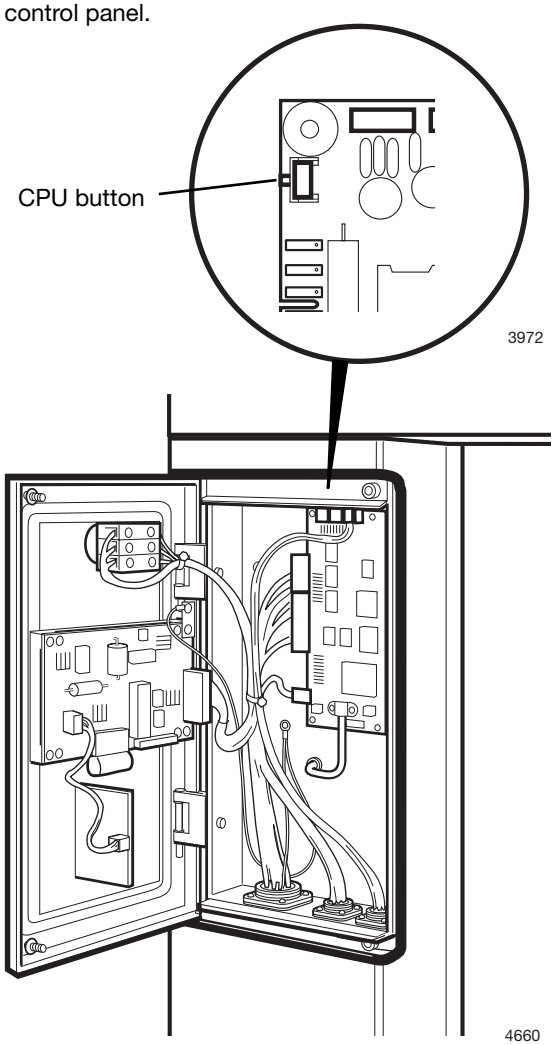
The variables will now have been stored in the PCU.

Remove the strap between terminals X7:1-2 on the CPU circuit board.

SELECT **Press SELECT.**

Prevention of unauthorised access

A button on the CPU circuit board has to be pressed to gain access to the service program, to prevent its unauthorised or inadvertent use. The CPU circuit board is located behind the control panel. Two screws have to be undone to open the control panel.



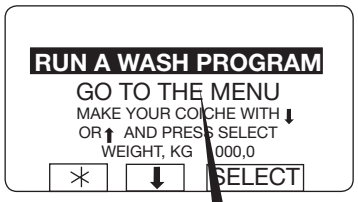
Settings 2

In Configuration 2, there are variables that, in case of carelessness or lack of knowledge, may affect the safety systems or operating safety of the machine. Because of this, these variables are protected by a code system. Each time a variable needs to be changed, it is necessary to obtain a new code from the manufacturer.

The following variables are available in **Configuration 2**:

HEATING RELAY ON IF NOT HEATED
TEMPERATURE INCREASE ALLOWED
LEVEL EMPTY
LEVEL OVERFILL
PAUSE TEST LEVEL
PAUSE TEST TEMPERATURE
DEFAULT TEMPERATURE HYSTERIS
TEMPERATURE STEP IN COOL-DOWN
DEFAULT LOW EXTRACT TIME
DEFAULT MEDIUM EXTRACT TIME
DEFAULT HIGH EXTRACT TIME
DEFAULT DRAIN TIME
DEFAULT DISTR. TIME
DO UNBALANCE MEASUREMENT
DRAIN OPEN DELAY
START EXTRACT TIME
ROLLOUT TIME
PAY PER WASH ALARM
LOCK TEST DELAY
DRAIN TIME WHEN OVERFILL
OIL LUBRICATION HOURS
PULSE TIME OIL LUBR. SEC
AMOUNT OF I/O MODULES (1-3)
DELAY CLEAR DOOR TEXT
TIMEOUT DRAIN AT PROGRAM START
TIMEOUT DURING PAUSE
MINIMUM TEMPERATURE INCREASE
DOOR OPEN DELAY FOR MOTOR LOST
ERROR, NO WATER
ERROR, OPEN DOOR
ERROR, DOOR LOCK
ERROR, LOW TEMPERATURE
ERROR, HIGH TEMPERATURE
ERROR, WATER IN MACHINE
ERROR, NO HEAT
ERROR, REMAINING WATER
ERROR, UNBALANCE SWITCH
ERROR, MOTOR COMMUNICATION
ERROR, LEVEL ADJUST
ERROR, EMERGENCY STOP
ERROR, WEIGHT FROM SCALE
ERROR, DOOR LOCK SWITCH
ERROR, START NOT ALLOWED
ERROR, MIS COMMUNICATION
ERROR, EWD INTERLOCK
ERROR, I/O COMMUNICATION
ERROR, LOW OIL LEVEL
ERROR, LOW OR HIGH VOLTAGE
ERROR, ERROR CODES FROM MOTOR
ERROR, PRESS. SENSOR TILT
ERROR, PRESSURE SENSOR TIMEOUT
ERROR, DOOR SWITCH TILT
ERROR, LEVEL OFFSET
ERROR, LEVEL SYSTEM NOT CALIB.
TIME DELAY BEFORE DOOR OPENING
UPPER TEMPERATURE FOR ERROR
LOWER TEMPERATURE FOR ERROR
MAX ADJUST TEMPERATURE
MAXIMUM EXTRACT SPEED
DEFAULT WASH SPEED
DISTRIBUTION SPEED 1
DISTRIBUTION SPEED 2
DEFAULT LOW EXTRACT SPEED
DEFAULT MEDIUM EXTRACT SPEED
DEFAULT HIGH EXTRACT SPEED
START EXTRACT SPEED
DEFAULT WASH ACCELERATION
DISTRIBUTION ACCELERATION
RETARDATION ACCELERATION
EXTRACT ACCELERATION
START EXTRACT ACCELERATION
EXTRACT RETARDATION
MAX SPEED DURING FILLING
MAX LEVEL OFFS. FOR AUT. CALIB.
TIME AT DISTRIBUTION SPEED 2
NUMBER OF REDIST LOW 1 UNB.
NUMBER OF REDIST LOW 2 UNB.
NUMBER OF REDIST MEDIUM UNB.
NUMBER OF REDIST HIGH UNB.
NUMBER OF REDIST EXTREME UNB.
DRAIN TIME AT PROGR. START
DRAIN TIME AT PROGR. END
READY

To select the ”SETTINGS 2” function



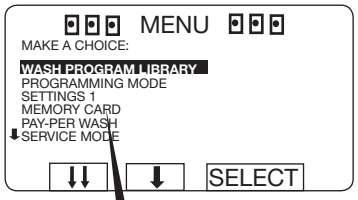
If this menu is not currently displayed:

Press ↩ repeatedly.

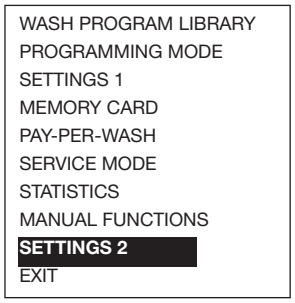
Press ↓ to highlight ”GO TO THE MENU”.

RUN A WASH PROGRAM
GO TO THE MENU

SELECT **Press SELECT.**

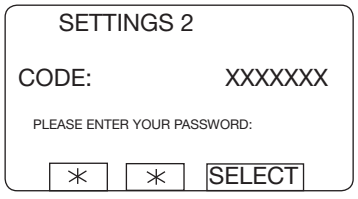


Press ↓ several times...



... to highlight ”SETTINGS 2”.

SELECT **Press SELECT.**



Enter the four-digit code supplied by the supplier.

SELECT **Press SELECT.**

Changes in ”SETTINGS 2” must be approved by the supplier

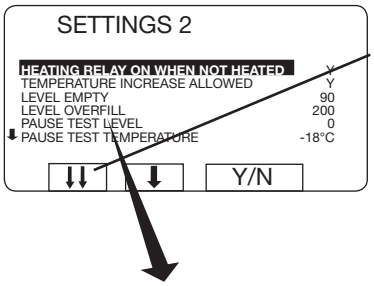
The variables which you can change via ”SETTINGS 2” belong to a category which, if they are changed carelessly or incorrectly, could jeopardise the machine’s safety system(s) or its reliability.

For this reason SETTINGS 2 is protected by a code/password system. Every time you access SETTINGS 2 you have to obtain a new password from the supplier.

The system works like this:

- When you open SETTINGS 2, you will see an eight-digit code. This code will be different each time you open SETTINGS 2.
- You need to tell the supplier, Sweden exactly what this code was. Using a special computer program, they will then ascertain the four-digit password which unlocks this code, and give it to you. This password will work only with the eight-digit code you have noted this time.
- Once you have entered the password, you have access to SETTINGS 2, and can change functions as required.

Variables under "SETTINGS 2"



When the top line of a menu is highlighted you have the option of scrolling down through the menu faster by pressing ⇓⇓ . When you do, the next portion of the menu is displayed, with its last line highlighted.

HEATING RELAY ON IF NOT HEATED	Y
TEMPERATURE INCREASE ALLOWED	Y
LEVEL EMPTY	90
LEVEL OVERFILL	200
PAUSE TEST LEVEL	0
PAUSE TEST TEMPERATURE	-18 °C
DEFAULT TEMPERATURE HYSTERIS	4 °C
TEMPERATURE STEP IN COOL-DOWN	4 °C
DEFAULT LOW EXTRACT TIME	00:00
DEFAULT MEDIUM EXTRACT TIME	00:00
DEFAULT HIGH EXTRACT TIME	00:00
DEFAULT DRAIN TIME	00:00
DEFAULT DISTR. TIME	00:00
DO UNBALANCE MEASUREMENT	N
DRAIN OPEN DELAY	0:13
START EXTRACT TIME	00:30
ROLLOUT TIME	00:01
PAY PER WASH ALARM	0
LOCK TEST DELAY	0:10
DRAIN TIME WHEN OVERFILL	0:05
OIL LUBRICATION HOURS	100
PULSE TIME OIL LUBR. SEC	0:01
AMOUNT OF I/O MODULES (1-3)	1
DELAY CLEAR DOOR TEXT	04:00
TIMEOUT DRAIN AT PROGRAM START	4:00
TIMEOUT DURING PAUSE	0:00
MINIMUM TEMPERATURE INCREASE	5 °C
DOOR OPEN DELAY FOR MOTOR LOST	1:00
ERROR, NO WATER	Y
ERROR, OPEN DOOR	Y
ERROR, DOOR LOCK	Y
ERROR, LOW TEMPERATURE	Y
ERROR HIGH TEMPERATURE	Y
ERROR, WATER IN MACHINE	Y
ERROR, NO HEAT	Y
ERROR, REMAINING WATER	Y
ERROR, UNBALANCE SWITCH	Y
ERROR, MOTOR COMMUNICATION	Y
ERROR, LEVEL ADJUST	Y
ERROR, EMERGENCY STOP	Y
ERROR, WEIGHT FROM SCALE	Y
ERROR, DOOR LOCK SWITCH	Y
ERROR, START NOT ALLOWED	Y
ERROR, MIS COMMUNICATION	Y
ERROR, EWD INTERLOCK	Y
ERROR, I/O COMMUNICATION	Y
ERROR, LOW OIL LEVEL	Y
ERROR, LOW OR HIGH VOLTAGE	Y
ERROR, ERROR CODES FROM MOTOR	Y
ERROR, PRESS. SENSOR TILT	Y
ERROR, PRESSURE SENSOR TIMEOUT	Y
ERROR, DOOR SWITCH TILT	Y
ERROR, LEVEL OFFSET	Y
ERROR, LEVEL SYSTEM NOT CALIB	Y
TIME DELAY BEFORE DOOR OPENING	0:30
UPPER TEMPERATURE FOR ERROR	98°C
LOWER TEMPERATURE FOR ERROR	-9 °C
MAX ADJUST TEMPERATURE	97 °C
MAXIMUM EXTRACT SPEED	1200
DEFAULT WASH SPEED	48
DISTRIBUTION SPEED	90
DEFAULT LOW EXTRACT RPM	550
DEFAULT MEDIUM EXTRACT RPM	700
DEFAULT HIGH EXTRACT RPM	900
START EXTRACT SPEED	1000
DEFAULT WASH ACCELERATION	20
DISTRIBUTION ACCELERATION	9
EXTRACT ACCELERATION	40
START EXTRACT ACCELERATION	40
EXTRACT RETARDATION	50
MAX SPEED DURING FILLING	100
MAX LEVEL OFFS. FOR AUT. CALIB.	
TIME AT DISTRIBUTION SPEED 2	
NUMBER OF REDIST LOW 1 UNB.	
NUMBER OF REDIST LOW 2 UNB.	
NUMBER OF REDIST MEDIUM UNB.	
NUMBER OF REDIST HIGH UNB.	
NUMBER OF REDIST EXTREME UNB.	
DRAIN TIME AT PROG. START	
DRAIN TIME AT PROG. END	
READY	

Answer the questions using the function key or the numeric keys.

Press ⇓ to move on to the next question.

You can go back and change a question you have answered already by pressing ⇑ repeatedly.

Different types of question

The questions in the various modules are of two different types, each of which needs to be answered in a different way:

Yes/No questions

The function key display shows **Y/N** , which is a toggle function (the letter to the right of the highlighted question toggles between **N** and **Y** each time it is pressed).

Times, temperatures, water levels

To answer these questions, use the numeric keys. The number of digits required will vary. If you make a mistake while entering digits, delete it by pressing **ERASE** one or more times.

No confirmation of value entered

Once you have entered the right value, you simply move on to the next by pressing ⇓. There is no enter or return key to press to confirm each value.

To alter the value for a question you have already answered

Press ⇑ to highlight the question you want, then simply change the value.

Confirm changes before you exit Settings 2

If you have changed any of the variables, this change must be confirmed when you exit Settings 2. To do this you have to use a strap to short-circuit two terminals on the CPU board, see section headed "To conclude making changes in variables under SETTINGS 2".

HEATING RELAY ON IF NOT HEATED	Y
TEMPERATURE INCREASE ALLOWED	Y
LEVEL EMPTY	90
LEVEL OVERFILL	200
PAUSE TEST LEVEL	0
PAUSE TEST TEMPERATURE	-18 °C
DEFAULT TEMPERATURE HYSTERIS	4 °C
TEMPERATURE STEP IN COOL-DOWN	4 °C
DEFAULT LOW EXTRACT TIME	00:00
DEFAULT MEDIUM EXTRACT TIME	00:00
DEFAULT HIGH EXTRACT TIME	00:00
DEFAULT DRAIN TIME	00:00
DEFAULT DISTR. TIME	00:00
DO UNBALANCE MEASUREMENT	N
DRAIN OPEN DELAY	0:13
START EXTRACT TIME	00:30

Y/N **Answer Yes (Y) or No (N).**

↓ **Press ↓.**

Heating relay on

Here you determine whether the heating relay will switch on when heating begins.

Note that the heating relay switches on even if the answer ”Yes” is in place for the function ”MACHINE NOT HEATED” (see ”SETTINGS 1”).

If you answer **Yes (Y)**:

The heating relay will switch on when heating begins. This is the normal sequence in machi nes with heating.

If you answer **No (N)**:

The heating relay will not switch on. Used for machines without heating (not using heating), which are equipped with a heating relay.

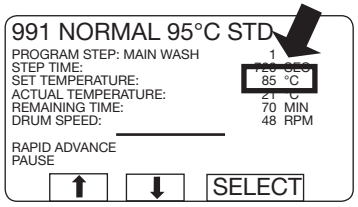
HEATING RELAY ON IF NOT HEATED	Y
TEMPERATURE INCREASE ALLOWED	Y
LEVEL EMPTY	90
LEVEL OVERFILL	200
PAUSE TEST LEVEL	0
PAUSE TEST TEMPERATURE	-18 °C
DEFAULT TEMPERATURE HYSTERIS	4 °C
TEMPERATURE STEP IN COOL-DOWN	4 °C
DEFAULT LOW EXTRACT TIME	00:00
DEFAULT MEDIUM EXTRACT TIME	00:00
DEFAULT HIGH EXTRACT TIME	00:00
DEFAULT DRAIN TIME	00:00
DEFAULT DISTR. TIME	00:00
DO UNBALANCE MEASUREMENT	N
DRAIN OPEN DELAY	0:13
START EXTRACT TIME	00:30

Y/N **Answer Yes (Y) or No (N).**

↓ **Press ↓ .**

Temperature increase allowed

Here you determine whether or not it will be possible for the user, during a wash program, to adjust the wash temperature to a level **higher than the temperature set** (this would be done by highlighting the line ”SET TEMPERATURE” and entering a different wash temperature).



The following functions determine how temperatures may be changed:

TEMPERATURE INCREASE ALLOWED

If you answer **Yes (Y)**:

This allows the temperature to be changed to a value which is either **higher or lower** than the original ”set temperature” of the wash program.

If you answer **No (N)**:

The only type of change allowed will be to a value which is **lower** than the original ”set temperature”.

Under ”SETTINGS 1” there is the function:

ADJUST TEMPERATURE ALLOWED

which determines whether or not altering the temperature is allowed at all.

Under ”SETTINGS 2” (i.e. later in this section) there is the function:

MAX ADJUST TEMPERATURE

which determines the upper temperature limit for manual temperature adjustment.

HEATING RELAY ON IF NOT HEATED	Y
TEMPERATURE INCREASE ALLOWED	Y
LEVEL EMPTY	**90**
LEVEL OVERFILL	200
PAUSE TEST LEVEL	0
PAUSE TEST TEMPERATURE	-18 °C
DEFAULT TEMPERATURE HYSTERIS	4 °C
TEMPERATURE STEP IN COOL-DOWN	4 °C
DEFAULT LOW EXTRACT TIME	00:00
DEFAULT MEDIUM EXTRACT TIME	00:00
DEFAULT HIGH EXTRACT TIME	00:00
DEFAULT DRAIN TIME	00:00
DEFAULT DISTR. TIME	00:00
DO UNBALANCE MEASUREMENT	N
DRAIN OPEN DELAY	0:13
START EXTRACT TIME	00:30

Level empty

Here you determine the water level at which the drum will be regarded as empty.

It is advisable to set this level so that the inner drum will have emptied, but so that some water remains in the outer drum.

If the water has not fallen to this level before the drain time has ended, the message ”NOT DRAINED” will appear on the display.

For information on the levels used for the various machines, see the manual ”Programming, PCS Program Control Unit”.

Use the numeric keys to enter the value.

If you make a mistake while entering digits:

Press ERASE.

When you have finished:

Press ⬇ .

HEATING RELAY ON IF NOT HEATED	Y
TEMPERATURE INCREASE ALLOWED	Y
LEVEL EMPTY	90
LEVEL OVERFILL	**200**
PAUSE TEST LEVEL	0
PAUSE TEST TEMPERATURE	-18 °C
DEFAULT TEMPERATURE HYSTERIS	4 °C
TEMPERATURE STEP IN COOL-DOWN	4 °C
DEFAULT LOW EXTRACT TIME	00:00
DEFAULT MEDIUM EXTRACT TIME	00:00
DEFAULT HIGH EXTRACT TIME	00:00
DEFAULT DRAIN TIME	00:00
DEFAULT DISTR. TIME	00:00
DO UNBALANCE MEASUREMENT	N
DRAIN OPEN DELAY	0:13
START EXTRACT TIME	00:30

Level for over-filled drum

Here you determine the water level at which the drum will be regarded as over-filled.

Over-filling can occur if a water valve is faulty, or if you have over-filled the machine manually.

For information on the levels used for the various machines, see the manual ”Programming, PCS Program Control Unit”.

Under ”SETTINGS 2” (i.e. later in this section) there are two functions which influence the way the machine reacts to over-filling:

”DRAIN TIME WHEN OVERFILL”

(i.e. DRAIN TIME AFTER OVER-FILLING)

If you have the answer N (No) inserted for the function ”ERROR OVER-FILLED” (described below, this page), the drain valve will open and discharge water for the time inserted as a parameter under ””DRAIN TIME WHEN OVERFILL”. The level will be checked after that, and the same sequence will be repeated until the level is back to normal.

ERROR OVER-FILLED

If you answer Y (Yes): if the drum becomes over-filled, the machine will stop and the error message ”MACHINE OVER-FILLED” will be displayed.

If you answer N (No): the drain valve will open as described above.

Use the numeric keys to enter the value.

If you make a mistake while entering digits:

Press ERASE.

When you have finished:

Press ⬇ .

HEATING RELAY ON IF NOT HEATED	Y
TEMPERATURE INCREASE ALLOWED	Y
LEVEL EMPTY	90
LEVEL OVERFILL	200
PAUSE TEST LEVEL	**0**
PAUSE TEST TEMPERATURE	**-18 °C**
DEFAULT TEMPERATURE HYSTERIS	4 °C
TEMPERATURE STEP IN COOL-DOWN	4 °C
DEFAULT LOW EXTRACT TIME	00:00
DEFAULT MEDIUM EXTRACT TIME	00:00
DEFAULT HIGH EXTRACT TIME	00:00
DEFAULT DRAIN TIME	00:00
DEFAULT DISTR. TIME	00:00
DO UNBALANCE MEASUREMENT	N
DRAIN OPEN DELAY	0:13
START EXTRACT TIME	00:30

Use the numeric keys to enter the values.

If you make a mistake while entering digits:

Press ERASE.

When you have finished:

Press ⬇ .

Test values for pause

Here you determine whether, and if relevant, the conditions under which it will be allowed for the user to open the door during a wash program, for example to take samples of the water.

The following conditions must be fulfilled before it will be possible to open the door:

- The user must have pressed Pause.
- The water level must not exceed the level parameter you have programmed as PAUSE TEST LEVEL.
- The temperature must not exceed the temperature you have programmed as PAUSE TEST TEMPERATURE.

If one or both of the parameters above is set at 0, this function will be disabled and it will not be possible to open the door during the wash program.

HEATING RELAY ON IF NOT HEATED	Y
TEMPERATURE INCREASE ALLOWED	Y
LEVEL EMPTY	90
LEVEL OVERFILL	200
PAUSE TEST LEVEL	0
PAUSE TEST TEMPERATURE	-18 °C
DEFAULT TEMPERATURE HYSTERIS	**4 °C**
TEMPERATURE STEP IN COOL-DOWN	4 °C
DEFAULT LOW EXTRACT TIME	00:00
DEFAULT MEDIUM EXTRACT TIME	00:00
DEFAULT HIGH EXTRACT TIME	00:00
DEFAULT DRAIN TIME	00:00
DEFAULT DISTR. TIME	00:00
DO UNBALANCE MEASUREMENT	N
DRAIN OPEN DELAY	0:13
START EXTRACT TIME	00:30

Use the numeric keys to enter the value.

If you make a mistake while entering digits:

Press ERASE.

When you have finished:

Press ⬇ .

Temperature hysteresis

Here you determine a default value for the machine's temperature hysteresis.

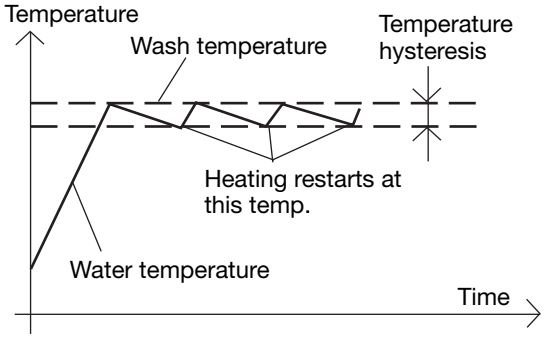
The temperature hysteresis can be programmed individually for each wash program. However, under certain circumstances, e.g. when the user has set the temperature manually, the PCU may not be able to find the temperature hysteresis values in the current wash program. That is when it needs to use the default value stored here.

What is temperature hysteresis?

Once the drum has filled with water to the right level, it is heated to the wash temperature you have programmed. During the wash the water will cool down somewhat.

When the water temperature has reached a lower limit, heating restarts and the water temperature is brought back up to the correct level.

Temperature hysteresis is the number of degrees between the wash temperature and the temperature at which heating needs to restart.



HEATING RELAY ON IF NOT HEATED	Y
TEMPERATURE INCREASE ALLOWED	Y
LEVEL EMPTY	90
LEVEL OVERFILL	200
PAUSE TEST LEVEL	0
PAUSE TEST TEMPERATURE	-18 °C
DEFAULT TEMPERATURE HYSTERIS	4 °C
TEMPERATURE STEP IN COOL-DOWN	**4 °C**
DEFAULT LOW EXTRACT TIME	00:00
DEFAULT MEDIUM EXTRACT TIME	00:00
DEFAULT HIGH EXTRACT TIME	00:00
DEFAULT DRAIN TIME	00:00
DEFAULT DISTR. TIME	00:00
DO UNBALANCE MEASUREMENT	N
DRAIN OPEN DELAY	0:13
START EXTRACT TIME	00:30

Use the numeric keys to enter the value.

1 2 3
4 5 6
7 8 9
0

If you make a mistake while entering digits:
Press ERASE.

When you have finished:
Press ⬇ **.**

Temperature step in cool-down

Here you determine the maximum reduction in temperature per minute during the first stage of cool-down.

How does cool-down work?

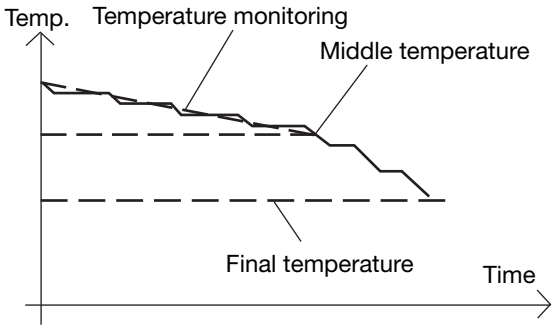
When creating a new wash program you can, to prevent creasing of the load, use the COOL-DOWN module to achieve controlled cool-down of the water in the drum. The cool-down sequence is divided into two stages:

1 wash temperature to middle temperature

Throughout this stage the machine will monitor the cool-down rate, to ensure it does not exceed the limit value you are determining here. If the rate set is exceeded, no water will be added until the mean value is acceptable again.

2 middle temperature to final temperature

The rate of cool-down is not monitored during this stage. The valve opens and shuts as you have programmed it to do.



HEATING RELAY ON IF NOT HEATED	Y
TEMPERATURE INCREASE ALLOWED	Y
LEVEL EMPTY	90
LEVEL OVERFILL	200
PAUSE TEST LEVEL	0
PAUSE TEST TEMPERATURE	-18 °C
DEFAULT TEMPERATURE HYSTERIS	4 °C
TEMPERATURE STEP IN COOL-DOWN	4 °C
DEFAULT LOW EXTRACT TIME	**00:00**
DEFAULT MEDIUM EXTRACT TIME	**00:00**
DEFAULT HIGH EXTRACT TIME	**00:00**
DEFAULT DRAIN TIME	00:00
DEFAULT DISTR. TIME	00:00
DO UNBALANCE MEASUREMENT	N
DRAIN OPEN DELAY	0:13
START EXTRACT TIME	00:30

Applies only to machines with frequency-controlled motor.

Use the numeric keys to enter the value.

1 2 3
4 5 6
7 8 9
0

If you make a mistake while entering digits:
Press ERASE.

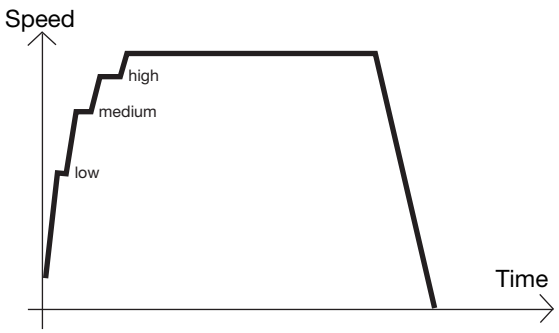
When you have finished:
Press ⬇ **.**

Default values, extraction time

Here you determine how long the machine will extract at the speeds low, medium and high. Later in this section you will find the instructions for programming the actual speeds to be used for low, medium, high and ”turbo” extraction.

How an extraction sequence works:

In order to extract some of the water from the load at lower speeds, the drum does not accelerate to its highest speed immediately. Instead it accelerates in several steps. This means that the drum first accelerates to a low speed level, remains at that for a certain time, then accelerates to a higher level, extracts at that speed for a certain time, and so on until it reaches its final (maximum) extraction speed. If you program a low extraction speed, the number of steps at the beginning of the extraction sequence may be reduced.



PAUSE TEST LEVEL	0
PAUSE TEST TEMPERATURE	-18 °C
DEFAULT TEMPERATURE HYSTERIS	4 °C
TEMPERATURE STEP IN COOL-DOWN	4 °C
DEFAULT LOW EXTRACT TIME	00:00
DEFAULT MEDIUM EXTRACT TIME	00:00
DEFAULT HIGH EXTRACT TIME	00:00
DEFAULT DRAIN TIME	**00:00**
DEFAULT DISTR. TIME	**00:00**
DO UNBALANCE MEASUREMENT	N
DRAIN OPEN DELAY	0:13
START EXTRACT TIME	00:30
ROLLOUT TIME	00:01
PAY PER WASH ALARM	0

Default values for re-start after unbalance

Here you determine the drain time and distribution time the machine will use if it cannot find the time parameters it requires, e.g. during manual operation of the drain in a washer extractor with a suspended drum.

Use the numeric keys to enter the value.

If you make a mistake while entering digits:

Press ERASE.

When you have finished:

Press ⬇.

DEFAULT TEMPERATURE HYSTERIS	4°C
TEMPERATURE STEP IN COOL-DOWN	4 °C
DEFAULT LOW EXTRACT TIME	00:00
DEFAULT MEDIUM EXTRACT TIME	00:00
DEFAULT HIGH EXTRACT TIME	00:00
DEFAULT DRAIN TIME	00:00
DEFAULT DISTR. TIME	00:00
DO UNBALANCE MEASUREMENT	**N**
DRAIN OPEN DELAY	0:13
START EXTRACT TIME	00:30
ROLLOUT TIME	00:01
PAY PER WASH ALARM	0
LOCK TEST DELAY	0:10
DRAIN TIME WHEN OVERFILL	0:05

Unbalance measurement

Here you determine whether the machine will calculate unbalance before it accelerates to extraction speed. Drum unbalance can only be calculated in washer extractors with suspended drums. It uses torque data from the motor control unit to determine whether the imbalance is too high.

For washer extractors with suspended drums without frequence control and which have a separate unbalance switch, the answer to this question should be No.

If you answer Yes (Y):

The machine will calculate unbalance before every extraction sequence.

If you answer No (N):

The machine will not calculate unbalance.

Answer Yes (Y) or No (N).

Press ⬇.

TEMPERATURE STEP IN COOL-DOWN	4 °C
DEFAULT LOW EXTRACT TIME	00:10
DEFAULT MEDIUM EXTRACT TIME	00:15
DEFAULT HIGH EXTRACT TIME	00:20
DEFAULT DRAIN TIME	00:40
DEFAULT DISTR. TIME	00:30
DO UNBALANCE MEASUREMENT	Y
DRAIN OPEN DELAY	**0:13**
START EXTRACT TIME	00:30
ROLLOUT TIME	00:01
PAY PER WASH ALARM	0
LOCK TEST DELAY	0:10
DRAIN TIME WHEN OVERFILL	0:05
OIL LUBRICATION HOURS	100

Use the numeric keys to enter the value.

If you make a mistake while entering digits:

Press ERASE.

When you have finished:

Press ⬇ .

Drain open delay

Here you determine whether you want a delay before the drain valve opens, for example if you want the drum to have time to gather speed first, before the valve opens.

The drain module

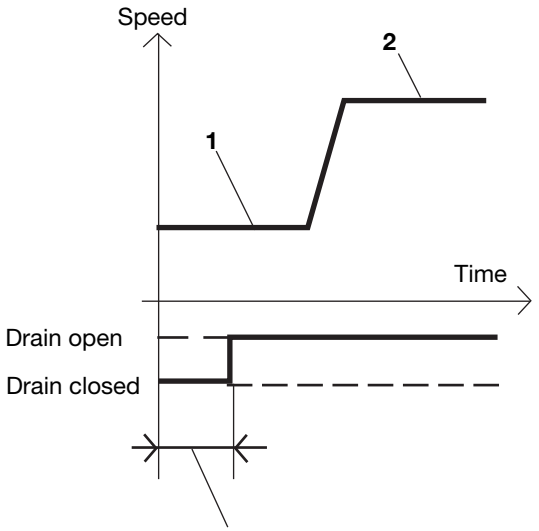
may be structured according to point 1 (here) only, according to point 2 only, or a combination of 1 and 2, according to the way you program.

1 Drain time

The drain will be open. The motor may be at a standstill, on gentle action or normal action.

2 Distribution time

The drain will be open. The motor runs at distribution speed. During this time the wash load will be distributed evenly around the walls of the inner drum.



You can program this time here

DEFAULT LOW EXTRACT TIME	00:10
DEFAULT MEDIUM EXTRACT TIME	00:15
DEFAULT HIGH EXTRACT TIME	00:20
DEFAULT DRAIN TIME	00:40
DEFAULT DISTR. TIME	00:30
DO UNBALANCE MEASUREMENT	Y
DRAIN OPEN DELAY	0:13
START EXTRACT TIME	**00:30**
ROLLOUT TIME	00:01
PAY PER WASH ALARM	0
LOCK TEST DELAY	0:10
DRAIN TIME WHEN OVERFILL	0:05
OIL LUBRICATION HOURS	100
PULSE TIME OIL LUBR. SEC	0:01

Use the numeric keys to enter the value.

If you make a mistake while entering digits:

Press ERASE.

When you have finished:

Press ⬇ .

Start extract time (i.e. Initial extraction time)

Here you determine the length of time for initial extraction (if used).

When you are programming the ”main data” for a wash program you can determine whether the program is to begin with initial extraction. Initial extraction is used to spin the load outwards against the drum walls, which makes it absorb water more readily on first filling. As a result of this the machine will not require so much extra filling (repeated topping up) later (to maintain its required water level).

There are two other functions affecting initial extraction which can be programmed under SETTINGS 2:

- START EXTRACT SPEED
- START EXTRACT ACCELERATION

DEFAULT MEDIUM EXTRACT TIME	00:15
DEFAULT HIGH EXTRACT TIME	00:20
DEFAULT DRAIN TIME	00:40
DEFAULT DISTR. TIME	00:30
DO UNBALANCE MEASUREMENT	Y
DRAIN OPEN DELAY	0:13
START EXTRACT TIME	00:30
ROLLOUT TIME	**00:01**
PAY PER WASH ALARM	0
LOCK TEST DELAY	0:10
DRAIN TIME WHEN OVERFILL	0:05
OIL LUBRICATION HOURS	100
PULSE TIME OIL LUBR. SEC	0:01
AMOUNT OF I/O MODULES (1-3)	3

1 2 3
4 5 6
7 8 9
0

Use the numeric keys to enter the value.

If you make a mistake while entering digits:

Press ERASE.

When you have finished:

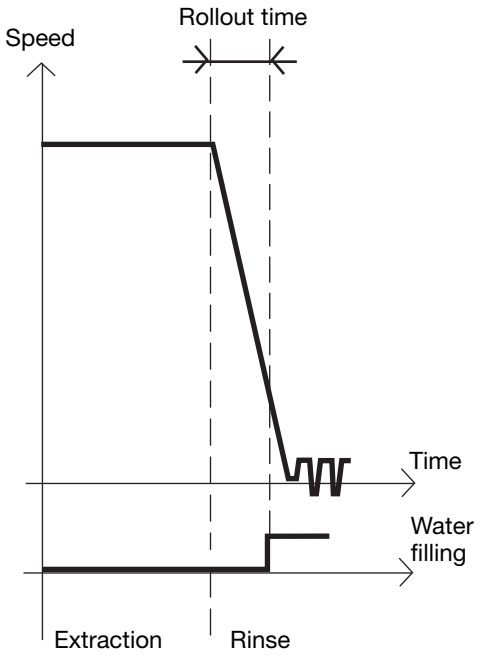
Press ⬇ .

Rollout time

Here you determine whether you want a time delay after each extraction before the machine starts to fill with water, to give the motor time to slow down. This function is useful if the motor is not a frequency-controlled one.

Another function, intended primarily for frequency-controlled motors (which continuously report motor speed to the PCU), is called ”MAX. SPEED DURING FILLING” (SETTINGS 2, described later in this section). This function allows you to specify a speed which the motor must drop below before water filling can begin.

If these functions are combined, you must ensure that the ”rollout time” will have ended before water filling is allowed to begin, regardless of whether the drum speed has, prior to that, dropped below the speed specified in ”MAX. SPEED DURING FILLING”.



DEFAULT HIGH EXTRACT TIME	00:20
DEFAULT DRAIN TIME	00:40
DEFAULT DISTR. TIME	00:30
DO UNBALANCE MEASUREMENT	Y
DRAIN OPEN DELAY	0:13
START EXTRACT TIME	00:30
ROLLOUT TIME	00:01
PAY PER WASH ALARM	**0**
LOCK TEST DELAY	0:10
DRAIN TIME WHEN OVERFILL	0:05
OIL LUBRICATION HOURS	100
PULSE TIME OIL LUBR. SEC	0:01
AMOUNT OF I/O MODULES (1-3)	3

Pay per wash

This question is for special installations with pay systems. How to use it is described in the documentation supplied with these systems.

Press ⬇ **.**

DO UNBALANCE MEASUREMENT	Y
DRAIN OPEN DELAY	0:13
START EXTRACT TIME	00:30
ROLLOUT TIME	00:01
PAY PER WASH ALARM	0
LOCK TEST DELAY	**0:10**
DRAIN TIME WHEN OVERFILL	0:05
OIL LUBRICATION HOURS	100
PULSE TIME OIL LUBR. SEC	0:01
AMOUNT OF I/O MODULES (1-3)	3
DELAY CLEAR DOOR TEXT	04:00
MAX DRAIN TIME	4:00

Lock test delay

Here you determine the length of time between when the door is locked and when the check should be made of the lock's microswitch.

When the machine commands that the door be locked, the door lock is activated. The lock actuates a microswitch which signals whether or not the door is really locked.

Note that the machine always begins its wash sequence immediately after the door has been locked, and that the time you program here will not affect that. If, when this check is made, the microswitch should signal that the door is not locked, the machine will stop and the error message DOOR UNLOCKED will be displayed.

1 2 3
4 5 6
7 8 9
0

Use the numeric keys to enter the value.

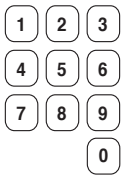
If you make a mistake while entering digits:

Press ERASE.

When you have finished:

Press ↓ .

DRAIN OPEN DELAY	0:13
START EXTRACT TIME	00:30
ROLLOUT TIME	00:01
PAY PER WASH ALARM	0
LOCK TEST DELAY	0:10
DRAIN TIME WHEN OVERFILL	**0:05**
OIL LUBRICATION HOURS	100
PULSE TIME OIL LUBR. SEC	0:01
AMOUNT OF I/O MODULES (1-3)	3
DELAY CLEAR DOOR TEXT	04:00
MAX DRAIN TIME	4:00
TIMEOUT DURING PAUSE	1:00



Use the numeric keys to enter the value.

If you make a mistake while entering digits:

Press ERASE.

When you have finished:

Press ⬇ .

Time drain to open after over-filling

Here you determine how long the drain valve should open for if the machine has over-filled, provided you ensure that the parameter (response) stored for the function ERROR OVER-FILLED is N (No) (see below). The drain valve will open for the time programmed and the level will then be checked. If the level is still too high, the drain valve will open again, and so on.

Over-filling can occur if a water valve is faulty, or if you have over-filled the machine manually.

Also under ”SETTINGS 2” there are two functions which influence the way the machine reacts to over-filling:

ERROR OVER-FILLED

If you answer Y (Yes): if the drum becomes over-filled, the machine will stop and the error message ”MACHINE OVER-FILLED” will be displayed.

If you answer N (No): the drain valve will open as described above.

LEVEL OVERFILL (i.e. DRUM OVER-FILLED)

Here you specify the level at which the drum is considered to be ”over-filled”.

PAY PER WASH ALARM	0
LOCK TEST DELAY	0:10
DRAIN TIME WHEN OVERFILL	0:05
OIL LUBRICATION HOURS	**100**
PULSE TIME OIL LUBR. SEC	**0:01**
AMOUNT OF I/O MODULES (1-3)	3
DELAY CLEAR DOOR TEXT	04:00
MAX DRAIN TIME	4:00
TIMEOUT DURING PAUSE	1:00
MINIMUM TEMPERATURE INCREASE	5°C
DOOR OPEN DELAY FOR MOTOR LOST	1:00
ERROR, NO WATER	Y

Oil lubrication

Here you determine the lubrication interval and pulse time for the oil lubrication systems used on larger washer extractors.

Use the numeric keys to enter the value.

If you make a mistake while entering digits:

Press ERASE.

When you have finished:

Press ⬇.

PAY PER WASH ALARM	0
LOCK TEST DELAY	0:10
DRAIN TIME WHEN OVERFILL	0:05
OIL LUBRICATION HOURS	100
PULSE TIME OIL LUBR. SEC	0:01
AMOUNT OF I/O MODULES (1-3)	**3**
DELAY CLEAR DOOR TEXT	04:00
MAX DRAIN TIME	4:00
TIMEOUT DURING PAUSE	1:00
MINIMUM TEMPERATURE INCREASE	5°C
DOOR OPEN DELAY FOR MOTOR LOST	1:00
ERROR, NO WATER	Y

Number of I/O circuit boards

Here you specify how many I/O circuit boards the PCU has.

Different types of washer extractor may be equipped with one, two or three I/O boards, according to how many inputs and outputs the particular machine needs (e.g. for external liquid supply, tilt function and extra water valves).

Use the numeric keys to enter the value.

If you make a mistake while entering digits:

Press ERASE.

When you have finished:

Press ⬇.

DRAIN TIME WHEN OVERFILL	0:05
OIL LUBRICATION HOURS	100
PULSE TIME OIL LUBR. SEC	0:01
AMOUNT OF I/O MODULES (1-3)	3
DELAY CLEAR DOOR TEXT	**04:00**
MAX DRAIN TIME	4:00
TIMEOUT DURING PAUSE	1:00
MINIMUM TEMPERATURE INCREASE	5°C
DOOR OPEN DELAY FOR MOTOR LOST	1:00
ERROR, NO WATER	Y
ERROR, OPEN DOOR	Y
ERROR, DOOR LOCK	Y
ERROR, LOW TEMPERATURE	Y
ERROR, HIGH TEMPERATURE	Y

Delay clear door text

Here you determine how long the text ”WAITING FOR DOOR TO UNLOCK” will remain visible if, for some reason, the door is not unlocked at the right time.

When a wash program has ended, the text above will be displayed until the door is unlocked. The door is normally unlocked within one minute on most machines.

If the door is not unlocked within a reasonable time, the most common cause is probably jamming in the lock mechanism. In these cases, the text above may mislead the user, causing him to think that the normal unlocking sequence is not yet finished.

1 2 3
4 5 6
7 8 9
0

Use the numeric keys to enter the value.

If you make a mistake while entering digits:

Press ERASE.

⬇

When you have finished:

Press ⬇ .

OIL LUBRICATION HOURS	100
PULSE TIME OIL LUBR. SEC	0:01
AMOUNT OF I/O MODULES (1-3)	3
DELAY CLEAR DOOR TEXT	04:00
TIMEOUT DRAIN AT PROGRAM START	**4:00**
TIMEOUT DURING PAUSE	1:00
MINIMUM TEMPERATURE INCREASE	5°C
DOOR OPEN DELAY FOR MOTOR LOST	1:00
ERROR, NO WATER	Y
ERROR, OPEN DOOR	Y
ERROR, DOOR LOCK	Y
ERROR, LOW TEMPERATURE	Y
ERROR, HIGH TEMPERATURE	Y
ERROR, WATER IN MACHINE	Y

Timeout drain at program start

If water in machine at wash program start, and level not lower than emty level within given value, an error will be indicated.

1 2 3
4 5 6
7 8 9
0

Use the numeric keys to enter the value.

If you make a mistake while entering digits:

Press ERASE.

⬇

When you have finished:

Press ⬇ .

OIL LUBRICATION HOURS	100
PULSE TIME OIL LUBR. SEC	0:01
AMOUNT OF I/O MODULES (1-3)	3
DELAY CLEAR DOOR TEXT	04:00
MAX DRAIN TIME	4:00
TIMEOUT DURING PAUSE	**1:00**
MINIMUM TEMPERATURE INCREASE	5°C
DOOR OPEN DELAY FOR MOTOR LOST	1:00
ERROR, NO WATER	Y
ERROR, OPEN DOOR	Y
ERROR, DOOR LOCK	Y
ERROR, LOW TEMPERATURE	Y
ERROR, HIGH TEMPERATURE	Y
ERROR, WATER IN MACHINE	Y

Use the numeric keys to enter the value.

If you make a mistake while entering digits:

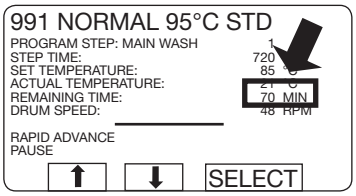
Press ERASE.

When you have finished:

Press ⬇ .

Timeout during pause

Here you determine the maximum time for a pause in the program, if it is to be available for use in calculating the average length of the program.



The time shown on the display alongside ”REMAINING TIME” is based on the average of the last five times this program was used. This time also includes pauses in the program. If the pause time in the program exceeds the time parameter you have programmed, it will not be used for average-time calculation derived from the current program operation.

PULSE TIME OIL LUBR. SEC	0:01
AMOUNT OF I/O MODULES (1-3)	3
DELAY CLEAR DOOR TEXT	04:00
MAX DRAIN TIME	4:00
TIMEOUT DURING PAUSE	1:00
MINIMUM TEMPERATURE INCREASE	**5°C**
DOOR OPEN DELAY FOR MOTOR LOST	1:00
ERROR, NO WATER	Y
ERROR, OPEN DOOR	Y
ERROR, DOOR LOCK	Y
ERROR, LOW TEMPERATURE	Y
ERROR, HIGH TEMPERATURE	Y
ERROR, WATER IN MACHINE	Y

Use the numeric keys to enter the value.

If you make a mistake while entering digits:

Press ERASE.

When you have finished:

Press ⬇ .

Minimum temperature increase

Here you determine the smallest temperature increase allowed during the time specified in MAXIMUM HEATING TIME (see below).

These three functions are linked:

The following two functions also affect the way in which the machine is controlled during heating:

MAXIMUM HEATING TIME (SETTINGS 1)

Here you determine the maximum time it may take to heat the water the number of degrees you have specified above.

The function ERROR, NO HEAT (SETTINGS 2)

If you answer **Y (Yes)**:

If the temperature has not increased by the number of degrees you program here over the time which is specified in MAXIMUM HEATING TIME, the error message NO HEATING will appear on the display.

If you answer **N (No)**:

Monitoring of heating will be switched off, and no error message will be displayed.

AMOUNT OF I/O MODULES (1-3)	3
DELAY CLEAR DOOR TEXT	04:00
MAX DRAIN TIME	4:00
TIMEOUT DURING PAUSE	1:00
MINIMUM TEMPERATURE INCREASE	5°C
DOOR OPEN DELAY FOR MOTOR LOST	**1:00**
ERROR, NO WATER	Y
ERROR, OPEN DOOR	Y
ERROR, DOOR LOCK	Y
ERROR, LOW TEMPERATURE	Y
ERROR, HIGH TEMPERATURE	Y
ERROR, WATER IN MACHINE	Y
ERROR, NO HEAT	Y

Door open delay for ”motor lost”

Here you determine the length of time during which the door will be prevented from opening if, (in machines with frequency control) the MCU loses control of braking at the end of extraction.

In machines with frequency-controlled motors it is the MCU which ensures that the motor and drum are braked smoothly after extraction speed.

If anything should go wrong at this stage so that the MCU loses control of the braking process (colloquially referred to as ”motor lost”) the MCU will inform the PCU. If the program has reached the final extraction sequence, the PCU will ensure that the door cannot be opened until the time you program here has elapsed.

1 2 3
4 5 6
7 8 9
0

Use the numeric keys to enter the value.

If you make a mistake while entering digits:

Press ERASE.

When you have finished:

Press ⬇ .

ERROR, NO WATER	**Y**
ERROR, OPEN DOOR	**Y**
ERROR, DOOR LOCK	**Y**
ERROR, LOW TEMPERATURE	**Y**
ERROR, HIGH TEMPERATURE	**Y**
ERROR, WATER IN MACHINE	**Y**
ERROR, NO HEAT	**Y**
ERROR, REMAINING WATER	**Y**
ERROR, UNBALANCE SWITCH	**Y**
ERROR, MOTOR COMMUNICATION	**Y**
ERROR, LEVEL ADJUST	**Y**
ERROR, EMERGENCY STOP	**Y**
ERROR, WEIGHT FROM SCALE	**Y**
ERROR, DOOR LOCK SWITCH	**Y**
ERROR, START NOT ALLOWED	**Y**
ERROR, MIS COMMUNICATION	**Y**
ERROR, EWD INTERLOCK	**Y**
ERROR, I/O COMMUNICATION	**Y**
ERROR, LOW OIL LEVEL	**Y**
ERROR, LOW OR HIGH VOLTAGE	**Y**
ERROR, ERROR CODES FROM MOTOR	**Y**
ERROR, PRESS SENSOR TILT	**Y**
ERROR, PRESSURE SENSOR TIMEOUT	**Y**
ERROR, DOOR SWITCH TILT	**Y**
ERROR, LEVEL OFFSET	**Y**
ERROR, LEVEL SYSTEM NOT CALIB.	**Y**

Switch on/off monitoring of machine functions/error message display

All of these options (involving monitoring of machine functions and display of the related error message if flagged) can be switched on or off here.

If you answer **Yes (Y)**:

This enables function monitoring/error message display for this particular line.

If you answer **No (N)**:

This disables function monitoring/error message display for this particular line.

On the next two pages is a summary of all the options accessible here, the errors monitored and the error message which will be displayed for each.

1 2 3
4 5 6
7 8 9
0

Use the numeric keys to enter the value.

If you make a mistake while entering digits:

Press ERASE.

When you have finished:

Press ⬇ .

List of errors, functions monitored and relevant error messages displayed, cont.

Error/Function	Error message displayed
ERROR. ERROR CODES FROM MOTOR This function includes a number of error warnings from the motor control system for frequency-controlled motors (EWD)	
31 Temperature of MCU control circuits too high	HEAT SINK TOO HOT
32 Motor thermal protection has tripped	MOTOR TOO HOT
33 The motor has received a start command from the PCU without receiving an interlock signal from the door lock. The MCU receiving circuitry for the interlock signal is not faulty	NO INTERLOCK
35 Short-circuit between motor windings or to earth.	MOTOR SHORTNING
36 Fault in MCU receiving circuitry for lock acknowledgement signal.	INTERLOCK HARDWARE
37 DC voltage too low	LOW DC VOLTAGE
38 DC voltage too high	HIGH DC VOLTAGE
39 DC level varying too much	RIPPEL ON DC BUS
40 One phase missing for/at motor control unit	LINE INTERRUPT
41 Hardware fault, temperature monitoring, motor	KLIXON CIRCUITS

ERROR, EWD INTERLOCK	Y
ERROR, I/O COMMUNICATION	Y
ERROR, LOW OIL LEVEL	Y
ERROR, LOW OR HIGH VOLTAGE	Y
ERROR, ERROR CODES FROM MOTOR	Y
ERROR, PRESS SENSOR TILT	Y
ERROR, PRESSURE SENSOR TIMEOUT	Y
ERROR, DOOR SWITCH TILT	Y
ERROR, LEVEL OFFSET	Y
ERROR, LEVEL SYSTEM NOT CALIB.	Y
TIME DELAY BEFORE DOOR OPENING	**0:30**
UPPER TEMPERATURE FOR ERROR	98°C
LOWER TEMPERATURE FOR ERROR	-9°C
MAX ADJUST TEMPERATURE	97°C
MAXIMUM EXTRACT SPEED	825
DEFAULT WASH SPEED	37

Time delay before door opening

Here you determine the length of time during which the door will be prevented from opening if the machine has detected a fault-error and is displaying an error message. This must give enough time for the water to empty and drum speed to be reduced.

Please note that the water will not be emptied as a result of all types of error. In the case of the HIGH TEMPERATURE error, for example, the door will remain locked even though the time you have programmed has elapsed. One reason for this is to prevent the risk of a fire if the electrical heating equipment is still switched on and heating.

Use the numeric keys to enter the value.

If you make a mistake while entering digits:

Press ERASE.

When you have finished:

Press ⬇ .

ERROR, I/O COMMUNICATION	Y
ERROR, LOW OIL LEVEL	Y
ERROR, LOW OR HIGH VOLTAGE	Y
ERROR, ERROR CODES FROM MOTOR	Y
ERROR, PRESS SENSOR TILT	Y
ERROR, PRESSURE SENSOR TIMEOUT	Y
ERROR, DOOR SWITCH TILT	Y
ERROR, LEVEL OFFSET	Y
ERROR, LEVEL SYSTEM NOT CALIB.	Y
TIME DELAY BEFORE DOOR OPENING	0:30
UPPER TEMPERATURE FOR ERROR	**98°C**
LOWER TEMPERATURE FOR ERROR	**-9°C**
MAX ADJUST TEMPERATURE	97°C
MAXIMUM EXTRACT SPEED	825
DEFAULT WASH SPEED	37
DISTRIBUTION SPEED	63

Upper and lower temperature limits for errors

Here you determine the temperature limits for the errors HIGH TEMPERATURE and LOW TEMPERATURE respectively.

If the HIGH TEMPERATURE error is flagged, this usually indicates an short circuit in the sensor or wiring. LOW TEMPERATURE usually indicates a open circuit in sensor or wiring. That is why the default value for the low temperature limit is -9 C. If the sensor cools to this temperature, the resistance from the sensor will be 0 ohms, which corresponds to a short-circuit.

Use the numeric keys to enter the value.

If you make a mistake while entering digits:

Press ERASE.

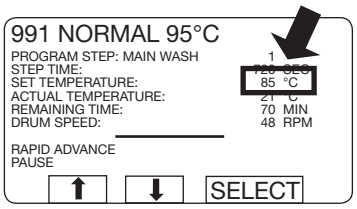
When you have finished:

Press ⬇ .

ERROR, I/O COMMUNICATION	Y
ERROR, LOW OIL LEVEL	Y
ERROR, LOW OR HIGH VOLTAGE	Y
ERROR, ERROR CODES FROM MOTOR	Y
ERROR, PRESS SENSOR TILT	Y
ERROR, PRESSURE SENSOR TIMEOUT	Y
ERROR, DOOR SWITCH TILT	Y
ERROR, LEVEL OFFSET	Y
ERROR, LEVEL SYSTEM NOT CALIB.	Y
TIME DELAY BEFORE DOOR OPENING	0:30
UPPER TEMPERATURE FOR ERROR	98°C
LOWER TEMPERATURE FOR ERROR	-9°C
MAX ADJUST TEMPERATURE	**97°C**
MAXIMUM EXTRACT SPEED	1200
DEFAULT WASH SPEED	48
DISTRIBUTION SPEED	90

Upper limit for manual temperature adjustment ("Max adjust temperature")

Here you determine the highest temperature the user may alter the wash temperature to manually (by using ⬆ to move to the line for "SET TEMPERATURE" then entering a new wash temperature).



The function above will be available only if the answer Y (Yes) is in place for these two functions:

- ADJUST TEMPERATURE (SETTINGS 1) which determines whether or not it will be allowed to alter the temperature during a program.
- TEMPERATURE INCREASE ALLOWED (SETTINGS 2) which determines whether or not it will be allowed to alter the temperature parameter to higher than the original temperature in the wash program or not.

1 2 3 4 5 6 7 8 9 0

Use the numeric keys to enter the value.

If you make a mistake while entering digits:

Press ERASE.

⬇

When you have finished:

Press ⬇.

ERROR, I/O COMMUNICATION	Y
ERROR, LOW OIL LEVEL	Y
ERROR, LOW OR HIGH VOLTAGE	Y
ERROR, ERROR CODES FROM MOTOR	Y
ERROR, PRESS SENSOR TILT	Y
ERROR, PRESSURE SENSOR TIMEOUT	Y
ERROR, DOOR SWITCH TILT	Y
ERROR, LEVEL OFFSET	Y
ERROR, LEVEL SYSTEM NOT CALIB.	Y
TIME DELAY BEFORE DOOR OPENING	0:30
UPPER TEMPERATURE FOR ERROR	98°C
LOWER TEMPERATURE FOR ERROR	-9°C
MAX ADJUST TEMPERATURE	97°C
MAXIMUM EXTRACT SPEED	**1200**
DEFAULT WASH SPEED	48
DISTRIBUTION SPEED	90

Maximum extract speed

Here you determine the machine's maximum extraction speed.

This speed cannot be exceeded, neither by programming parameters in wash programs nor by manual adjustment.

1 2 3 4 5 6 7 8 9 0

Use the numeric keys to enter the value.

If you make a mistake while entering digits:

Press ERASE.

⬇

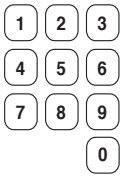
When you have finished:

Press ⬇.

ERROR, PRESS SENSOR TILT	Y
ERROR, PRESSURE SENSOR TIMEOUT	Y
ERROR, DOOR SWITCH TILT	Y
ERROR, LEVEL OFFSET	Y
ERROR, LEVEL SYSTEM NOT CALIB.	Y
TIME DELAY BEFORE DOOR OPENING	0:30
UPPER TEMPERATURE FOR ERROR	98°C
LOWER TEMPERATURE FOR ERROR	-9°C
MAX ADJUST TEMPERATURE	97°C
MAXIMUM EXTRACT SPEED	825
DEFAULT WASH SPEED	**48**
DISTRIBUTION SPEED	90
DEFAULT LOW EXTRACT RPM	550
DEFAULT MEDIUM EXTRACT RPM	700
DEFAULT HIGH EXTRACT RPM	900
START EXTRACT SPEED	1000
DEFAULT WASH ACCELERATION	20

Default wash speed

Here you determine the wash speed the machine will use at any time when it cannot find instructions for the correct wash speed, e.g. in the event of manual operation.



Use the numeric keys to enter the value.

If you make a mistake while entering digits:

Press ERASE.

When you have finished:

Press ⬇ **.**

ERROR, PRESS. SENSOR TILT	Y
ERROR, PRESSURE SENSOR TIMEOUT	Y
ERROR, DOOR SWITCH TILT	Y
ERROR, LEVEL OFFSET	Y
ERROR, LEVEL SYSTEM NOT CALIB.	Y
TIME DELAY BEFORE DOOR OPENING	0:30
UPPER TEMPERATURE FOR ERROR	98°C
LOWER TEMPERATURE FOR ERROR	-9°C
MAX ADJUST TEMPERATURE	97°C
MAXIMUM EXTRACT SPEED	825
DEFAULT WASH SPEED	48
DISTRIBUTION SPEED 1	**90**
DISTRIBUTION SPEED 2	
DEFAULT LOW EXTRACT RPM	550
DEFAULT MEDIUM EXTRACT RPM	700
DEFAULT HIGH EXTRACT RPM	900
START EXTRACT SPEED	1000
DEFAULT WASH ACCELERATION	20

Distribution speed

Here you determine the machine's distribution speed. The distribution speed is not programmable when you create a wash program. Instead the machine always uses the value you set here.

Use the numeric keys to enter the value.

If you make a mistake while entering digits:

Press ERASE.

When you have finished:

Press ⬇ **.**

TIME DELAY BEFORE DOOR OPENING	0:30
UPPER TEMPERATURE FOR ERROR	98°C
LOWER TEMPERATURE FOR ERROR	-9°C
MAX ADJUST TEMPERATURE	97°C
MAXIMUM EXTRACT SPEED	1200
DEFAULT WASH SPEED	48
DISTRIBUTION SPEED	90
DEFAULT LOW EXTRACT RPM	**550**
DEFAULT MEDIUM EXTRACT RPM	**700**
DEFAULT HIGH EXTRACT RPM	**900**
START EXTRACT SPEED	1000
DEFAULT WASH ACCELERATION	20
DISTRIBUTION ACCELERATION	9
RETARDATION ACCELERATION	
EXTRACT ACCELERATION	40
START EXTRACT ACCELERATION	40
EXTRACT RETARDATION	50

Use the numeric keys to enter the value.

If you make a mistake while entering digits:

Press ERASE.

When you have finished**:**

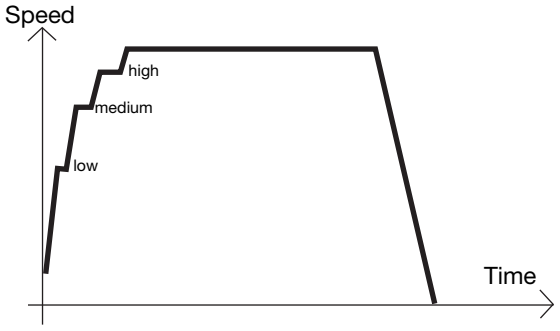
Press ⬇ .

Default value, extraction time

Here you determine the various speeds (low, medium and high) for extraction. The instructions for determining the length of extraction times are to be found earlier in SETTINGS 2.

How an extraction sequence works:

In order to extract some of the water from the load at lower speeds, the drum does not accelerate to its highest speed immediately. Instead it accelerates in several steps. This means that the drum first accelerates to a low speed level, remains at that for a certain time, then accelerates to a higher level, extracts at that speed for a certain time, and so on until it reaches its final (maximum) extraction speed. If you program a low extraction speed, the number of steps at the beginning of the extraction sequence may be reduced.



START EXTRACT SPEED	**1000**
DEFAULT WASH ACCELERATION	20
DISTRIBUTION ACCELERATION	9
RETARDATION ACCELERATION	
EXTRACT ACCELERATION	40
START EXTRACT ACCELERATION	40
EXTRACT RETARDATION	50
MAX SPEED DURING FILLING	100
MAX LEVEL OFFS FOR AUT. CALIB.	
TIME AT DISTRIBUTION SPEED 2	
NUMBER OF REDIST LOW 1 UNB.	
NUMBER OF REDIST LOW 2 UNB.	
NUMBER OF REDIST MEDIUM UNB.	
NUMBER OF REDIST HIGH UNB.	
NUMBER OF REDIST EXTREME UNB.	
DRAIN TIME AT PROGR. START	
DRAIN TIME AT PROGR. END	
READY	

Use the numeric keys to enter the value.

If you make a mistake while entering digits:

Press ERASE.

When you have finished:

Press ⬇ .

Start extract speed (i.e. Initial extraction speed)

Here you determine the speed of initial extraction.

When you are creating a wash program you can determine (under ”Main data”) whether it is to begin with initial extraction. Initial extraction is used to spin the load outwards against the drum walls, which makes it absorb water more readily on first filling. As a result of this the machine will not require so much extra filling later.

There are two other functions affecting initial extraction which can be programmed under SETTINGS 2:

- START EXTRACT TIME
- START EXTRACT ACCELERATION

START EXTRACT SPEED	1000
DEFAULT WASH ACCELERATION	**20**
DISTRIBUTION ACCELERATION	9
RETARDATION ACCELERATION	
EXTRACT ACCELERATION	40
START EXTRACT ACCELERATION	40
EXTRACT RETARDATION	50
MAX SPEED DURING FILLING	100
MAX LEVEL OFFS FOR AUT. CALIB.	
TIME AT DISTRIBUTION SPEED 2	
NUMBER OF REDIST LOW 1 UNB.	
NUMBER OF REDIST LOW 2 UNB.	
NUMBER OF REDIST MEDIUM UNB.	
NUMBER OF REDIST HIGH UNB.	
NUMBER OF REDIST EXTREME UNB.	
DRAIN TIME AT PROGR. START	
DRAIN TIME AT PROGR. END	
READY	

Default wash acceleration

Here you determine the acceleration rate (rpm/second) which the machine can use to reach wash speed when it cannot find this value elsewhere, e.g. in the event of manual operation of the drain sequence in machines with suspended drum.

1 2 3 4 5 6 7 8 9 0 **Use the numeric keys to enter the value.**

If you make a mistake while entering digits:

Press ERASE.

⬇ When you have finished:

Press ⬇ .

START EXTRACT SPEED	1000
DEFAULT WASH ACCELERATION	20
DISTRIBUTION ACCELERATION	**9**
RETARDATION ACCELERATION	
EXTRACT ACCELERATION	40
START EXTRACT ACCELERATION	40
EXTRACT RETARDATION	50
MAX SPEED DURING FILLING	100
MAX LEVEL OFFS FOR AUT. CALIB.	
TIME AT DISTRIBUTION SPEED 2	
NUMBER OF REDIST LOW 1 UNB.	
NUMBER OF REDIST LOW 2 UNB.	
NUMBER OF REDIST MEDIUM UNB.	
NUMBER OF REDIST HIGH UNB.	
NUMBER OF REDIST EXTREME UNB.	
DRAIN TIME AT PROGR. START	
DRAIN TIME AT PROGR. END	
READY	

Distribution acceleration

Here you determine the acceleration rate (rpm/second) the machine will use to reach distribution speed and to decelerate after distribution speed, respectively. This value is not programmable when you create a wash program. Instead the machine always uses the value you set here.

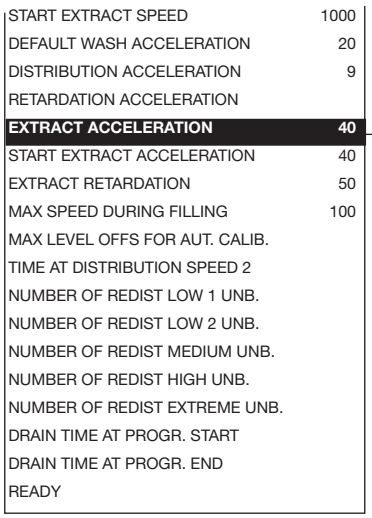
1 2 3 4 5 6 7 8 9 0 **Use the numeric keys to enter the value.**

If you make a mistake while entering digits:

Press ERASE.

⬇ **When you have finished:**

Press ⬇ .



Extraction acceleration

Here you determine the acceleration rate (rpm/second) the machine will use to reach extraction speed. This value is not programmable when you create a wash program. Instead the machine always uses the value you set here.

1 2 3
4 5 6
7 8 9
0

Use the numeric keys to enter the value.

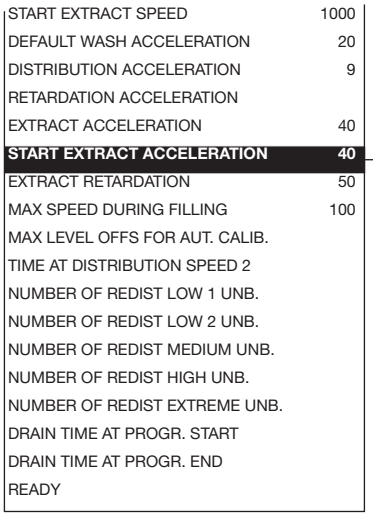
If you make a mistake while entering digits:

Press ERASE.

↓

When you have finished:

Press ↓ .



Start extract acceleration (i.e. Acceleration rate for initial extraction)

Here you determine the acceleration rate (rpm/second) which the machine will use to reach its initial extraction speed. This value is not programmable when you create a wash program. Instead the machine always uses the value you set here.

There are two other functions affecting initial extraction which can be programmed under SETTINGS 2:

- START EXTRACT TIME
- START EXTRACT SPEED

1 2 3
4 5 6
7 8 9
0

Use the numeric keys to enter the value.

If you make a mistake while entering digits:

Press ERASE.

↓

When you have finished:

Press ↓ .

START EXTRACT SPEED	1000
DEFAULT WASH ACCELERATION	20
DISTRIBUTION ACCELERATION	9
RETARDATION ACCELERATION	
EXTRACT ACCELERATION	40
START EXTRACT ACCELERATION	40
EXTRACT RETARDATION	**50**
MAX SPEED DURING FILLING	100
MAX LEVEL OFFS FOR AUT. CALIB.	
TIME AT DISTRIBUTION SPEED 2	
NUMBER OF REDIST LOW 1 UNB.	
NUMBER OF REDIST LOW 2 UNB.	
NUMBER OF REDIST MEDIUM UNB.	
NUMBER OF REDIST HIGH UNB.	
NUMBER OF REDIST EXTREME UNB.	
DRAIN TIME AT PROGR. START	
DRAIN TIME AT PROGR. END	
READY	

Extract retardation (i.e. Deceleration rate after extraction)

Here you determine the deceleration rate (rpm/second) at which the drum will slow down after extraction speed. This value is not programmable when you create a wash program. Instead the machine always uses the value you set here.

1 2 3
4 5 6
7 8 9
0

Use the numeric keys to enter the value.

If you make a mistake while entering digits:

Press ERASE.

⬇

When you have finished:

Press ⬇ .

START EXTRACT SPEED	1000
DEFAULT WASH ACCELERATION	20
DISTRIBUTION ACCELERATION	9
RETARDATION ACCELERATION	
EXTRACT ACCELERATION	40
START EXTRACT ACCELERATION	40
EXTRACT RETARDATION	50
MAX SPEED DURING FILLING	**100**
MAX LEVEL OFFS FOR AUT. CALIB.	
TIME AT DISTRIBUTION SPEED 2	
NUMBER OF REDIST LOW 1 UNB.	
NUMBER OF REDIST LOW 2 UNB.	
NUMBER OF REDIST MEDIUM UNB.	
NUMBER OF REDIST HIGH UNB.	
NUMBER OF REDIST EXTREME UNB.	
DRAIN TIME AT PROGR. START	
DRAIN TIME AT PROGR. END	
READY	

1 2 3
4 5 6
7 8 9
0

Use the numeric keys to enter the value.

If you make a mistake while entering digits:

Press ERASE.

⬇

When you have finished:

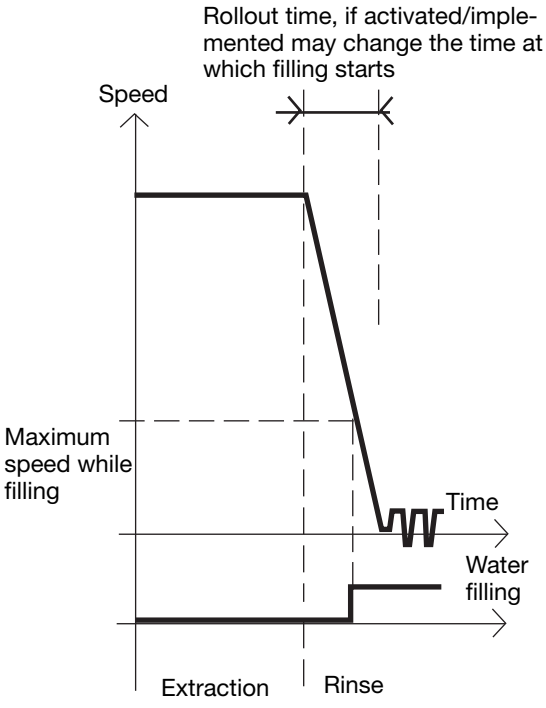
Press ⬇ .

Max. speed during filling

Here you specify a speed which the motor must drop below when it is being braked after extraction. Water filling will not take place until the motor has slowed to this speed. This function is useful for frequency-controlled motors.

Another function, intended primarily for motors without frequency control, is called ”ROLLOUT TIME” (accessed via SETTINGS 2, described earlier in this section). ROLLOUT TIME allows you to specify a time period which must elapse before water filling starts.

If these functions are combined, you must ensure that the ”rollout time” will have ended before water filling is allowed to begin, regardless of whether the drum speed has, prior to that, dropped below the speed specified in ”MAX. SPEED DURING FILLING”.



START EXTRACT SPEED	1000
DEFAULT WASH ACCELERATION	20
DISTRIBUTION ACCELERATION	9
RETERDATION ACCELERATION	
EXTRACT ACCELERATION	40
START EXTRACT ACCELERATION	40
EXTRACT RETARDATION	50
MAX SPEED DURING FILLING	100
MAX LEVEL OFFS. FOR AUT. CALIB.	
TIME AT DISTRIBUTION SPEED 2	
NUMBER OF REDIST LOW 1 UNB.	
NUMBER OF REDIST LOW 2 UNB.	
NUMBER OF REDIST MEDIUM UNB.	
NUMBER OF REDIST HIGH UNB.	
NUMBER OF REDIST EXTREME UNB.	
DRAIN TIME AT PROGR. START	
DRAIN TIME AT PROGR. END	
READY	

Max level offs. for aut. calib.

Maximum level in SKD for automatic calibration.

1 2 3
4 5 6
7 8 9
0

Use the numeric keys to enter the value.

If you make a mistake while entering digits:

Press ERASE.

⬇

When you have finished:

Press ⬇ .

START EXTRACT SPEED	1000
DEFAULT WASH ACCELERATION	20
DISTRIBUTION ACCELERATION	9
RETARDATION ACCEL	
EXTRACT ACCELERATION	40
START EXTRACT ACCELERATION	40
EXTRACT RETARDATION	50
MAX SPEED DURING FILLING	100
MAX LEVEL OFFS. FOR AUT. CALIB.	
TIME AT DISTRIBUTION SPEED 2	
NUMBER OF REDIST LOW 1 UNB.	
NUMBER OF REDIST LOW 2 UNB.	
NUMBER OF REDIST MEDIUM UNB.	
NUMBER OF REDIST HIGH UNB.	
NUMBER OF REDIST EXTREME UNB.	
DRAIN TIME AT PROGR. START	
DRAIN TIME AT PROGR. END	
READY	

Drain time at progr. start

Drain time at program start after that the level is below level empty.

1 2 3
4 5 6
7 8 9
0

Use the numeric keys to enter the value.

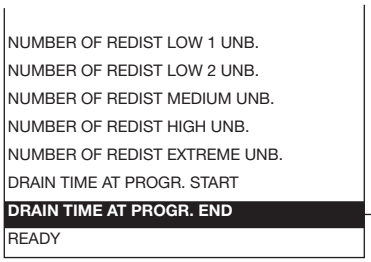
If you make a mistake while entering digits:

Press ERASE.

⬇

When you have finished:

Press ⬇ .



Drain time at progr. end

Drain time at program end after that the level is below level empty.

1 2 3
4 5 6
7 8 9
0

Use the numeric keys to enter the value.

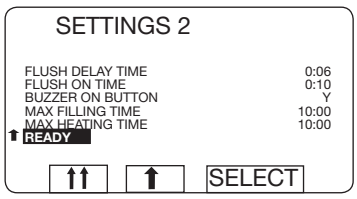
If you make a mistake while entering digits:

Press ERASE.

When you have finished:

Press ⬇ .

To conclude making changes in variables under ”SETTINGS 2”



Press ↓ to highlight READY.

Insert a suitable strap to short-circuit terminals X7:1-2 on the CPU circuit board.

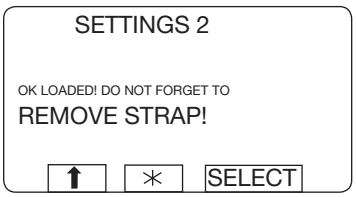
SELECT

Press SELECT.

The display illustrated left will appear if you fail to insert the strap to short-circuit terminals X7:1-2.

Check that the strap between X7:1-2 is intact and in place.

Press SELECT and try again.



The variables will now have been stored in the PCU.

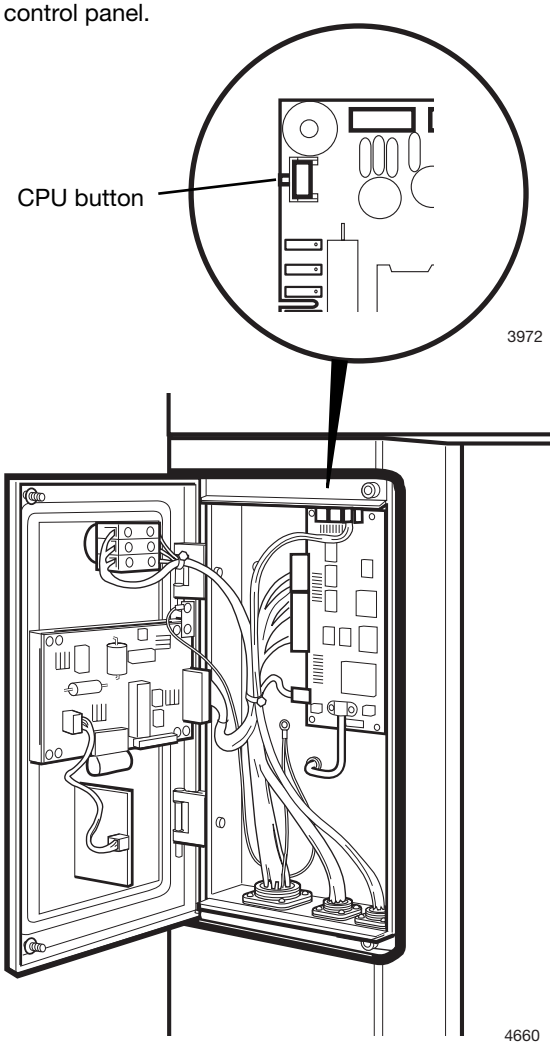
Remove the strap between terminals X7:1-2 on the CPU circuit board.

SELECT

Press SELECT.

Prevention of unauthorised access

A button on the CPU circuit board has to be pressed to gain access to the service program, to prevent its unauthorised or inadvertent use. The CPU circuit board is located behind the control panel. Two screws have to be undone to open the control panel.



To replace the CPU board

If the CPU board is faulty and has to be replaced, the correct software for the particular washer extractor will have to be downloaded onto the new CPU board.

For this you need:

1. A new CPU circuit board.
2. A portable PC with Windows 98, NT, ME or 2000.
3. The correct cable for connecting the PC to the CPU board.
4. Software which is correct for the model of washer extractor the CPU board is to be installed in, to be downloaded onto that CPU board. These program files can be ordered from the supplier.
5. A special program called CMM G3000 (Certus Maintenance Manager), used for converting and dowloading the files onto the new CPU board. This program can also be ordered from the supplier.

Instructions:

1. Order the right software for your CPU board from the supplier. You must state the type and serial number of the machine to obtain the correct version of the program. If you do not have it already, you should order the program CMM G3000 (Certus Maintenance Manager) at the same time. The programs can be supplied on diskette or via E-mail.
2. Install and open the CMM G3000.
3. In main menu click "Downloading software".
4. Click on "Browse" and select your file. Mark the file, then "open".
5. "Ready to download", click "proceed".

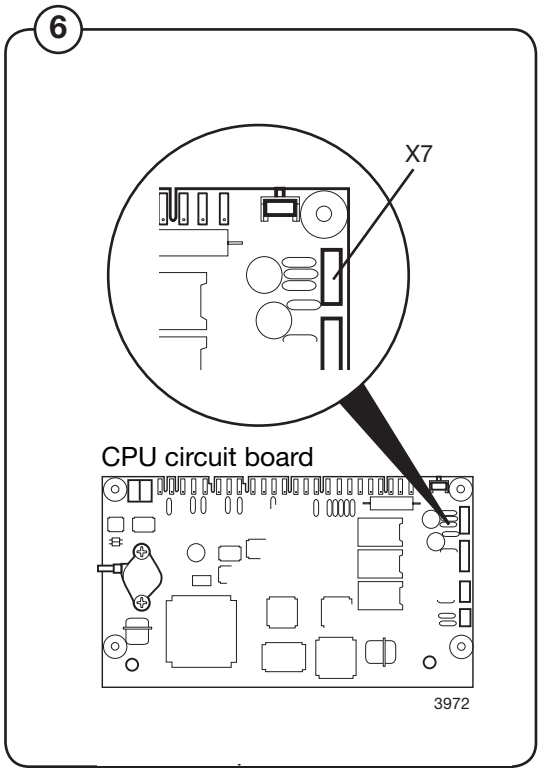
(6) 6. Switch off the machine's main power switch. Install the new CPU board and connect all the PCB connectors. Connect the correct cable between the computer (COM1 port) and the interface connector X7 on the CPU board. Switch the machine's main power switch back on.

7. Click OK. The downloading is started. An indication that downloading is working OK is that the two LED's at the lower left corner Red Tx and Yellow Rx are flashing within one minute.

   The computer will now process and adapt the five files for downloading onto the CPU board. This will take a minute or so.

8. When downloading is finished, the PC screen will tell you that the software is OK.

9. Switch off the machine's main power switch. Remove the cable linking PC and CPU board. Switch the machine's main power switch back on. The PCU will now start up with the new software.



To replace an I/O board

The procedure described here is for machines with more than one I/O board. On machines with only one I/O board, that board can be replaced without any need for this procedure.

If there is more than one I/O circuit board, the processor must know whether the new circuit board is I/O board 1, I/O board 2 or I/O board 3. For this programming you need:

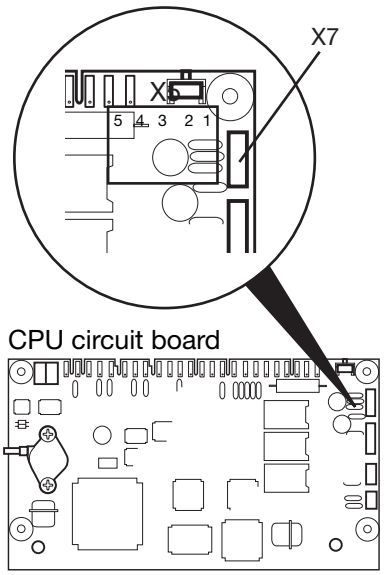
1. A portable PC with Windows 98, NT, ME or 2000.
2. The correct cable for connecting the PC to the CPU board.
3. A service program for the PCU which you can run on a PC. The program is called ”CMM G3000” and can be used for numbering the I/O boards correctly, amongst other things. This program can be ordered from the supplier.

Instructions:

1. Order a copy of the program ”CMM G3000” if you do not have it already. Programs can be supplied on diskette or via E-mail.
2. If you have not already installed it, install the program ”CMM G3000” on your computer.
3. Switch off the machine’s main power switch. Install the new I/O board and connect all the PCB connectors.
4. (7) Switch the machine’s main power switch back on. Connect the correct cable between the computer (COM1 port) and the interface connector X7 on the CPU board.

It is important to ensure that the PCU is energised and running <u>before</u> you connect the cable to interface connector X7.

(7)

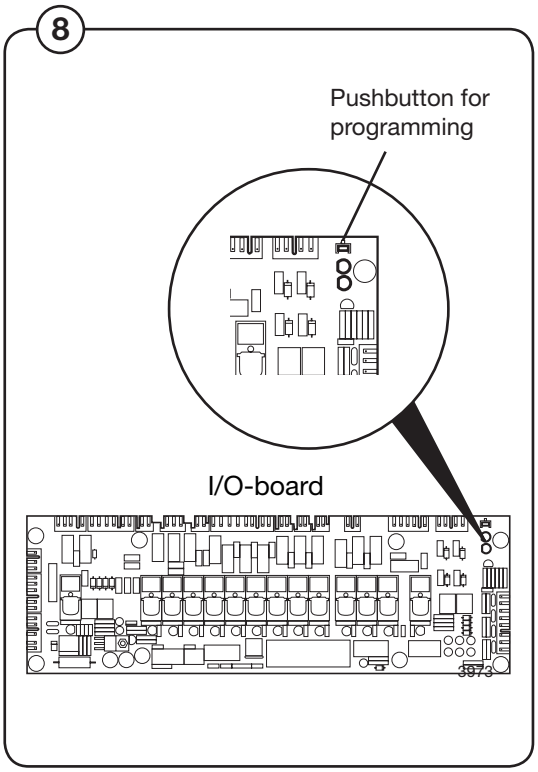


5. Start “CMM G3000”.
6. A menu where various service interventions can be made is displayed.
7. Click "Service".
8. "Service menu" is shown.
9. Click I/O-board address.
10. Click I/O-board to be configured.

(8) Press the button on I/O board 1.

A confirmation will be shown on the PC-screen.

11. Continue in this fashion for other new and unprogrammed I/O boards (if present).
12. When ready, disconnect the cable between the PC and the CPU board.



Imbalance switch (emergency switch)

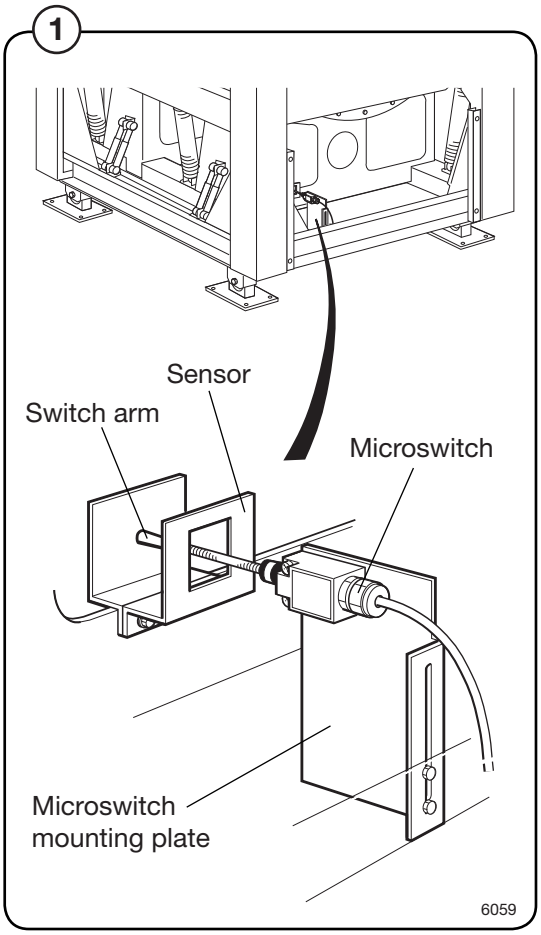
Note! Imbalance detection is primarily done in the motor control.

Description

(1) The imbalance switch is a safety feature which protects the machine from damage during extraction caused by uneven distribution of the wash load.

The imbalance switch consists of a microswitch and a switch arm mounted on the outer frame, plus a sensor mounted on the inner frame. The sensor is U-shaped and is secured by two screws.

If the inner frame, and therefore the sensor, moves beyond a certain limit, the sensor will actuate the microswitch via the switch arm. When this happens the extraction relay is switched out. The PCU switches over to wash speed and water filling takes place. After that the PCU switches to distribution speed, before another attempt at extraction.



Instructions for repair

Checking imbalance switch adjustment

- Check, when the machine is empty, that the switch arm for the microswitch is located in the centre of the sensor.

  If necessary adjust as follows:

  - release the screws securing the sensor and move the sensor sideways.
  - release the screws holding the microswitch mounting plate and move the mounting plate up or down.

If the imbalance switch is being triggered repeatedly:

- Unsuitable wash loads
- The imbalance switch is wrongly adjusted, refer to section above
- The dampers are in poor condition, see under heading ”Frame”
- High water level not programmed for extraction

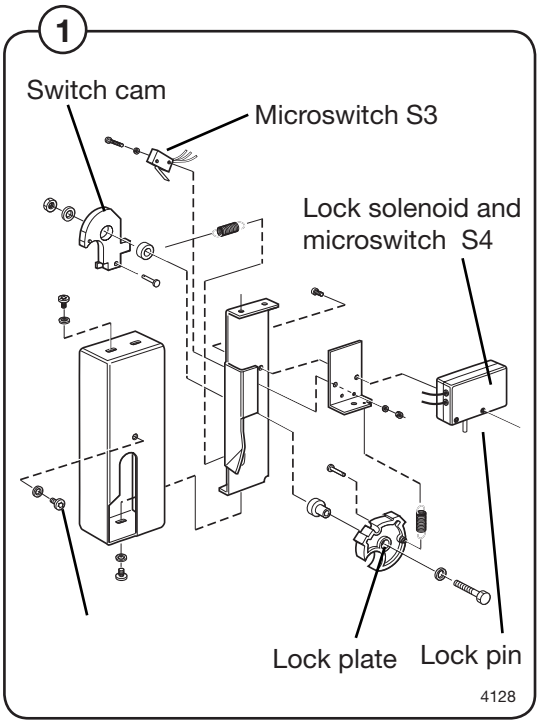
Description

General

The door lock part consists of the following:

(1)

- **Door lock A41** that contains
  - an **actuator** that locks the door lock and which also has two built-in micro switches, S4a and S4b. The actuator is bi-stable, i.e., it has two stable positions: locked door and unlocked door. The actuator must receive a pulse to lock and unlock the door lock. S4a and S4b are both closed when the door is locked.
  - **micro switch** S3 that is closed when the door is closed.
  - an **emergency opening arm** that can be used to open the door lock in an emergency.
- **Door lock control A31** that is situated in the front control unit of the machine. This card controls the door lock function and whether the drum is empty and not rotating. It locks and unlocks the door lock when the programme unit requests door locking or unlocking.



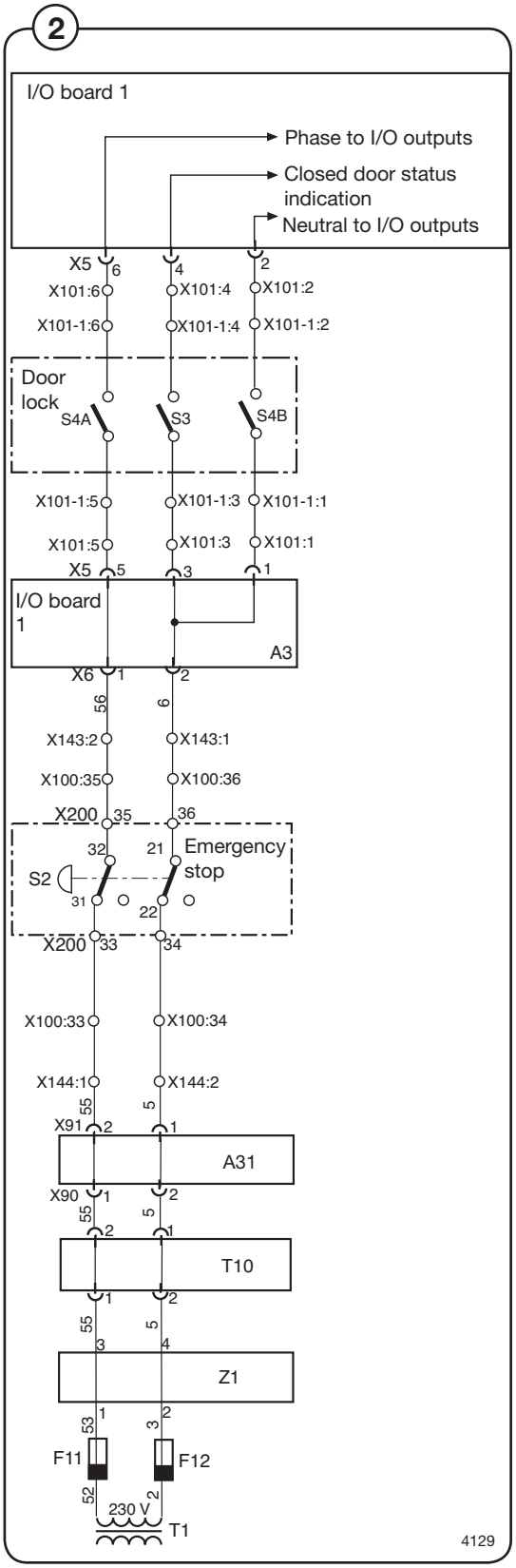
Door lock function

(2) The door is locked by means of an electromechanical, bistable locking device. The lock has two stable states; one when the lock pin which locks the door handle is **extended** (the door lock is locked), the other when the lock pin is **retracted** (the lock is unlocked). This means that, in the event of a loss of power to the machine, the lock will remain in the same state as before the loss of power.

When the locking arm has closed the door, the switch cam is actuated and it closes microswitch S3. The program control unit monitors the status of S3, and when S3 closes, the program control unit can give the command for door closing.

The door lock control unit checks that there is no water in the drum and that the drum is at a standstill. After that the door lock control unit locks the door lock by activating the solenoid, to make the lock pin enter a slot in the lock plate. When the lock pin is fully home in this slot, switches S4A and S4B both close. Only now, when S3, S4A and S4B are all closed, will the outputs on the I/O boards which control the machine's functions be energised, and the wash program can begin.

When the program control unit requests that the door be unlocked, the door lock control unit checks that there is no water in the drum and that the drum is not rotating. After that the solenoid is activated, now with polarity reversed, to make the lock pin disengage and to allow the door to be opened.



The door lock locks the door

(3) When the door is closed (closed door lock switch S3), the programme unit may request door locking by applying a voltage of 200-240 V on door lock controller A31 input X92.

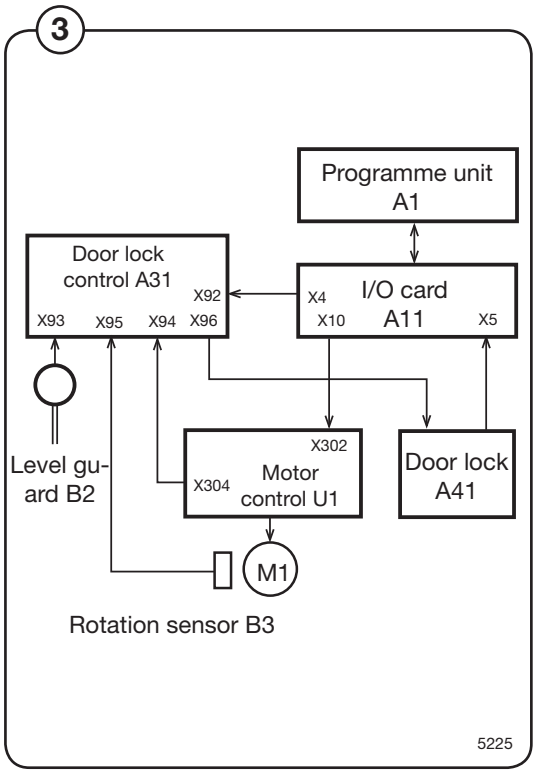
The following check is made by the A31 card prior to locking of the door:

- **No water in drum** - input X93 from level guard B2 is closed = 0 V
- **Motor not engaged** - input X94 from motor control U1 open = 5 V
- **Drum not rotating** - pulse frequency on input X95 from rotation sensor B3 less than 0.4 Hz.

When the above conditions are met, the card A31 outputs a positive pulse on output X96 to the door lock actuator, which then locks the door. The micro switches S4a and S4b in the actuator are closed when the door is locked. These micro switches feed voltage to:

- **The output relays** on I/O card 1. The relays govern the machine's drain and water valves as well as heater switch-on.
- **Interlock signal** for motor control (input X302 via I/O card 1) that releases the motor start prevention state.

Programme operation is now possible.



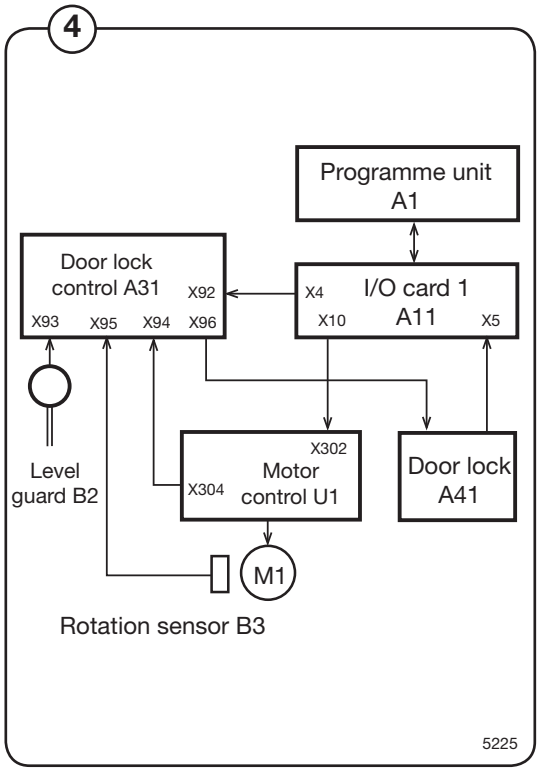
The door lock unlocks the door

(4) The programme unit requests door unlocking by applying 0 V on input X92 of the door lock controller.

The following check is made prior to unlocking of the door:

- **No water in drum** - input X93 from level guard B2 is closed = 0 V
- **Motor not engaged** - input X94 from motor controller U1 open = 5 V
- **Drum not rotating** - pulse frequency on input X95 from rotation sensor B3 less than 0.4 Hz.

When the above conditions are met, the door lock controller outputs an negative pulse on output 96 to the door lock actuator, which then unlocks the door. Micro switches S4a and S4b now interrupt the actuator and the I/O card 1 relays lose all voltage to prevent the motor from starting (no interlock signal on motor controller input X302). The drain and water valves of the machine are now disabled and the heater and motor cannot be switched on.



Error codes

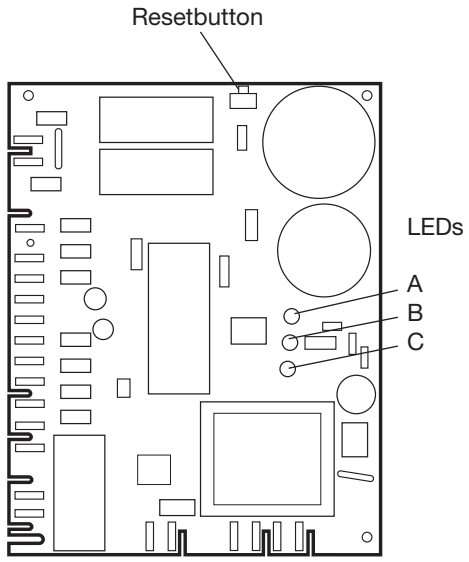
(5) The door lock control has three LEDs that show whether the door lock operates normally or whether an error has been detected. During normal operation, the LEDs blink when the drum is not turning and are off when the drum rotates. In case of an error, the three LEDs will show the error condition according to the table below. Any error codes are automatically cleared 5 minutes after the error has been remedied. In case the error occurred at the end of the programme, the door also unlocks after 5 minutes.

LEDs A	LEDs B	LEDs C	Normal operation
●	●	●	No error. The drum is not rotating (LEDs blinking) No error. The door is locked and there is water in the machine (LED's blinking double-time).
❍	❍	❍	No error. The drum is rotating

LEDs A	LEDs B	LEDs C	Error state
●	●	❍	Level guard B2 indicates water in drum when the door lock is open (input X93 not closed).
❍	●	●	Motor control indicates that motor is operating when door lock is open (input X94 closed).
●	❍	❍	No signal from rotation sensor B3 (frequency input X95 < 0.4 Hz) in spite of the motor control indicating motor operation.
❍	●	❍	No signal from motor control (input X94 open) in spite of rotation sensor B3 indicating motor operation (frequency input X95 > 0.4 Hz).
●	❍	●	Error in drive circuits for door lock (output X96) or error in door lock/cable harness for the door lock.
❍	❍	●	Internal error in the door lock control.

❍ = no lit, ● = lit

(5)



Reset button

(5) The door lock control features a reset button used to reset the programme routines stored in the computer. When pressed, any error codes are erased;

Door lock control inputs/outputs

(6) **X90: AC 200-240 V feed**

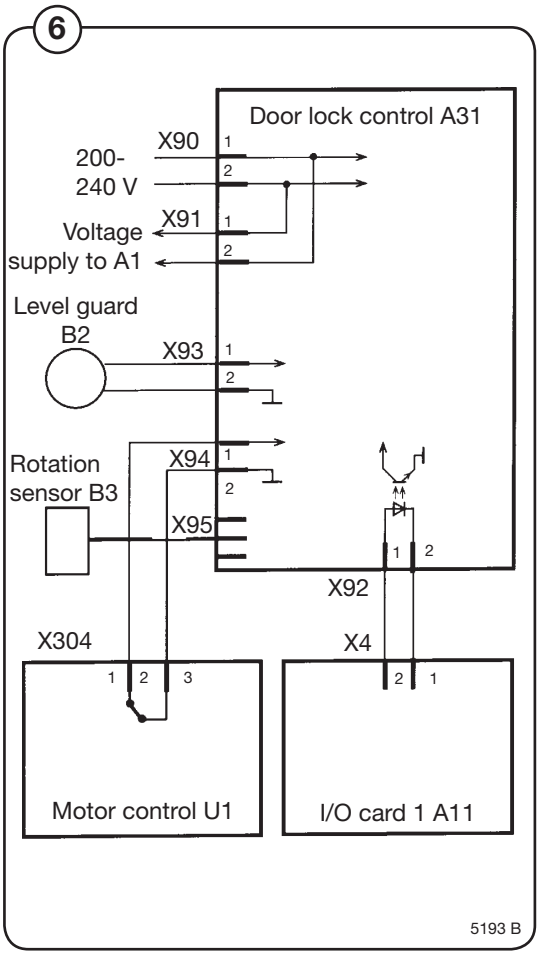
X91: Transfer of voltage supply

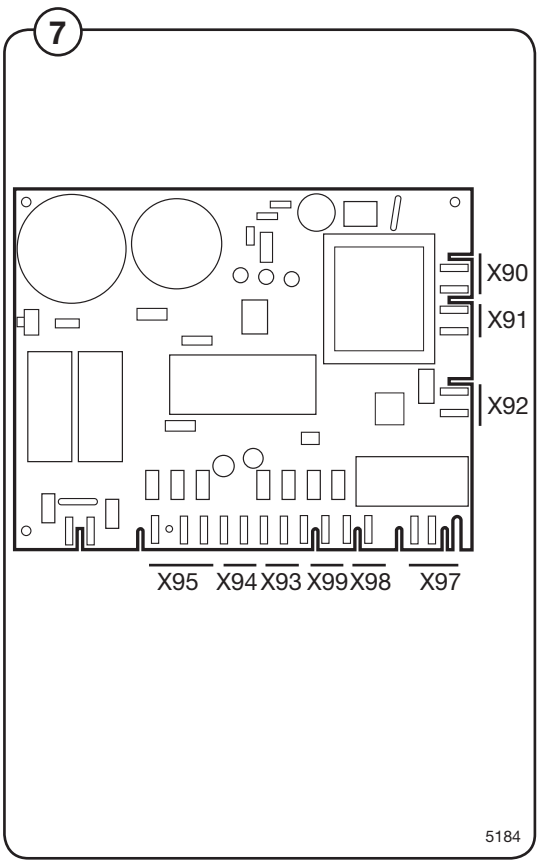
(7) Feeds the voltage to programme unit A1.

X92: Input from programme unit (via I/O card 1): Lock door

Prior to the door lock controller locking the door (output X96), a check is made of any water left in the drum (input X96 closed) and whether the drum is not rotating (input X94 open).

Input voltage	Function
200-240 V DC:	Programme unit requests door locking
0 V:	Programme unit requests door opening





(8) **X93: Input from level guard**

(9) If the input indicates “Water in drum” when the door is not locked, the door cannot be locked. The LEDs then show the error code ● ● ❍.

Input voltage	Function
5 V DC:	Water in drum (level guard open)
0 V:	Drum empty (level guard closed)

X94: Input from motor control

Only when door is open

If the input indicates “Motor operating”, the door cannot be locked. The LEDs then show the error code ❍ ● ●.

Only when door is locked

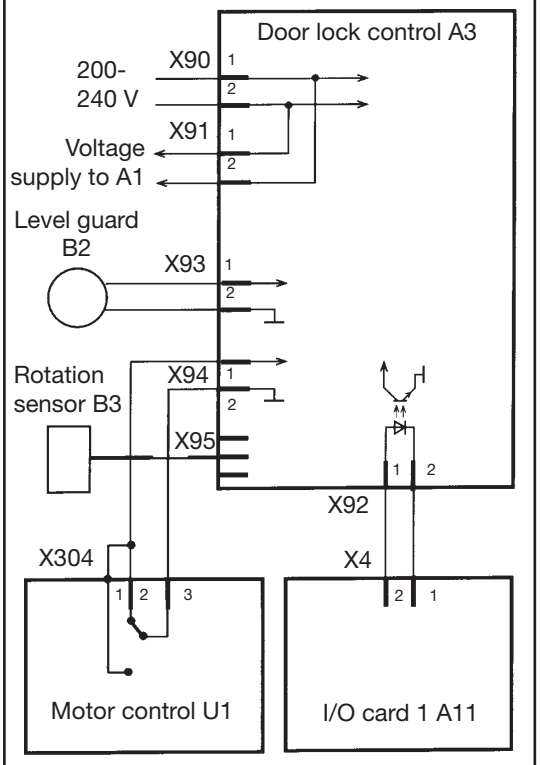
The input signal from X94 is compared with the signal from the rotation sensor B3 (input X95).

If the motor is operating, but the rotation sensor does not provide a signal, error code ● ❍ ❍ is shown.

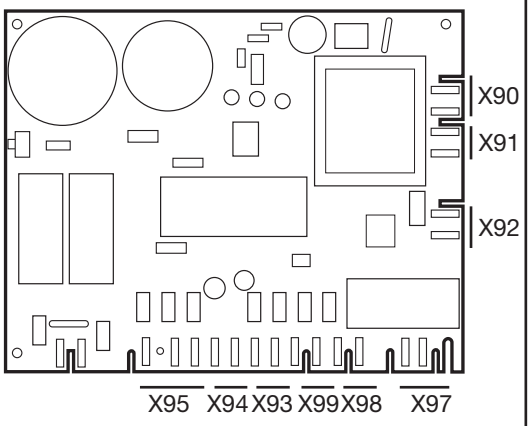
If the rotation sensor indicates motor operation when the motor is not operating, error code ❍ ● ❍ is shown.

Input voltage	Function
5 V DC:	Motor not operating (input open)
0 V:	Motor operating (input closed)

8



9



(10) (11)

X95: Input from rotation sensor on motor shaft

When the motor is operating, a pulse train is applied on the input.

Input	Function
Pin 1:	DC 4-10 V feed
Pin 2:	0V
Pin 3:	DC 4-10 V pulse input Frequency > 0.4 Hz: drum is rotating Frequency < 0.4 Hz: drum is not rotating

X96: Output to door lock

Locks the door lock when the following conditions are met:

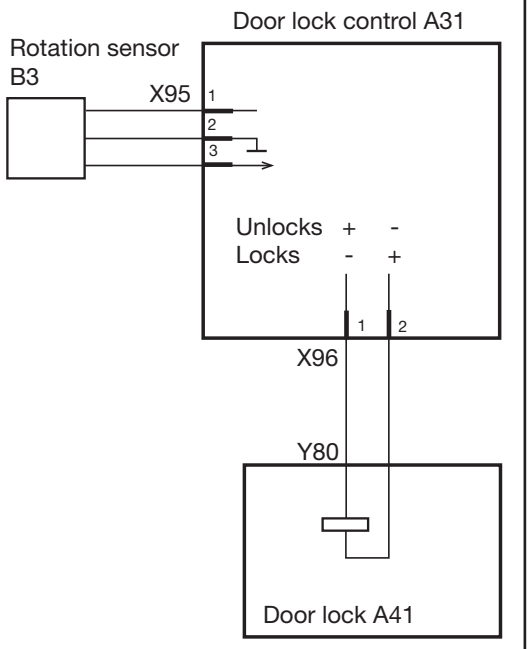
- DC 200-240 V on input X92 (programme unit request door locking)
- DC 0 V on input X93 (no water in drum)
- DC +5 V on input X94 (motor not activated)
- <0.4 Hz on input X95 (drum not rotating)
- No error code present

Unlocks the door lock when the following conditions are met:

- DC 0 V on input X92 (programme unit request door opening)
- DC 0 V on input X93 (no water in drum)
- DC +5 V on input X94 (motor not activated)
- <0.4 Hz on input X95 (drum not rotating)
- No error code present

Voltage	Function
DC 17-31 V, + on pin 1, - on pin 2	Unlock the door
DC 17-31 V, - on pin 1, + on pin 2	Locks the door

(10)



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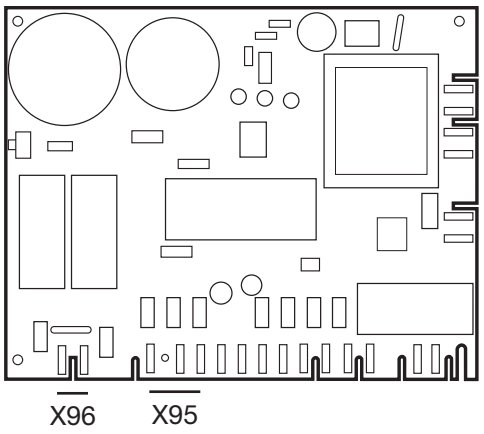
(11)



5184

Warnings

DANGER

Be careful when measuring the electric components in the motor control. All components have a potential difference of approx. 300 V in relation to protective earth and neutral. When the red LED on the motor control card is lit, the components carry dangerous voltages. The motor control lose all voltage about 10-30 seconds after the voltage has been disconnected and the motor has stopped.

Description

Motor

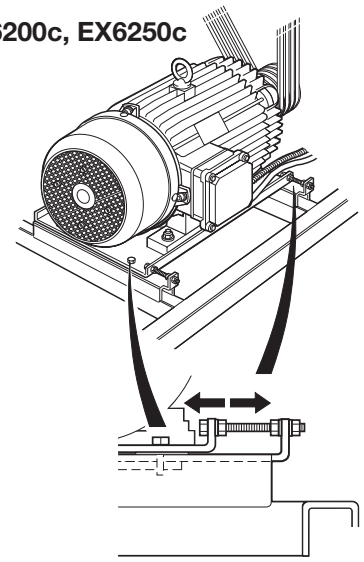
(1) The motor is fitted in a bridge carrier under the outer drum. It drives the washing drum with four belts.

The motor is frequency-controlled and is controlled by microcomputer control. The various speeds for normal operation, distribution speeds and extraction as well as acceleration/ retardation can be controlled with a high degree of precision.

The motor winding is protected against overloads using a thermal overheating protector that is automatically reset.

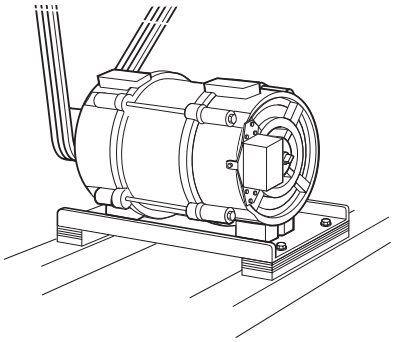
(1)

EX6200c, EX6250c



6058

EX6102c, EX6135c



102358 OP

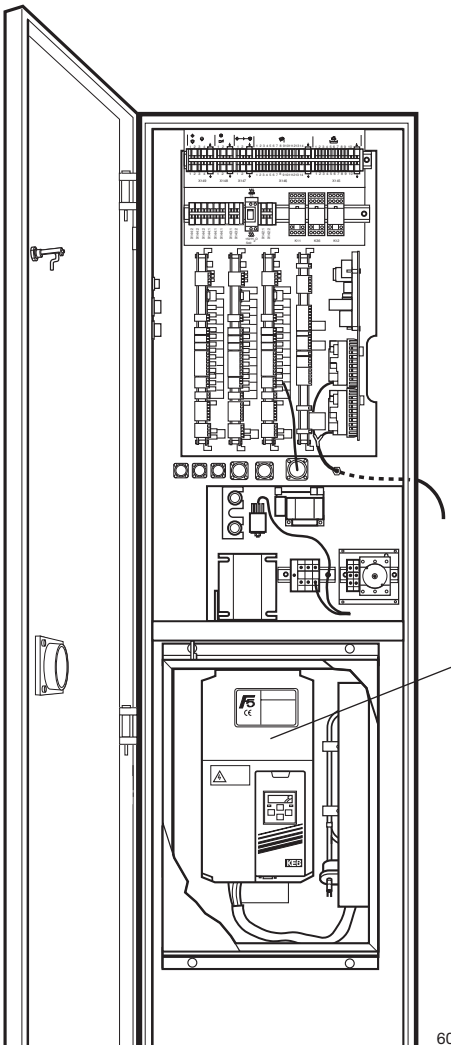
Motor control

(2) The motor control unit is microcomputer controlled and is places in the rear control unit.

The cable harness is directly connected to the motor control, voltage supply input and the voltage supply to the motor using connectors.

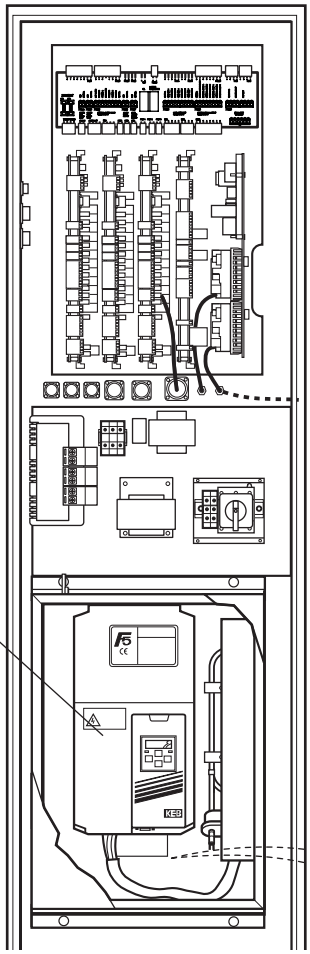
(2)

EX6135c, EX6200c, EX6250c



6068 A

EX6102c



6588 A

Motor control

6068 A

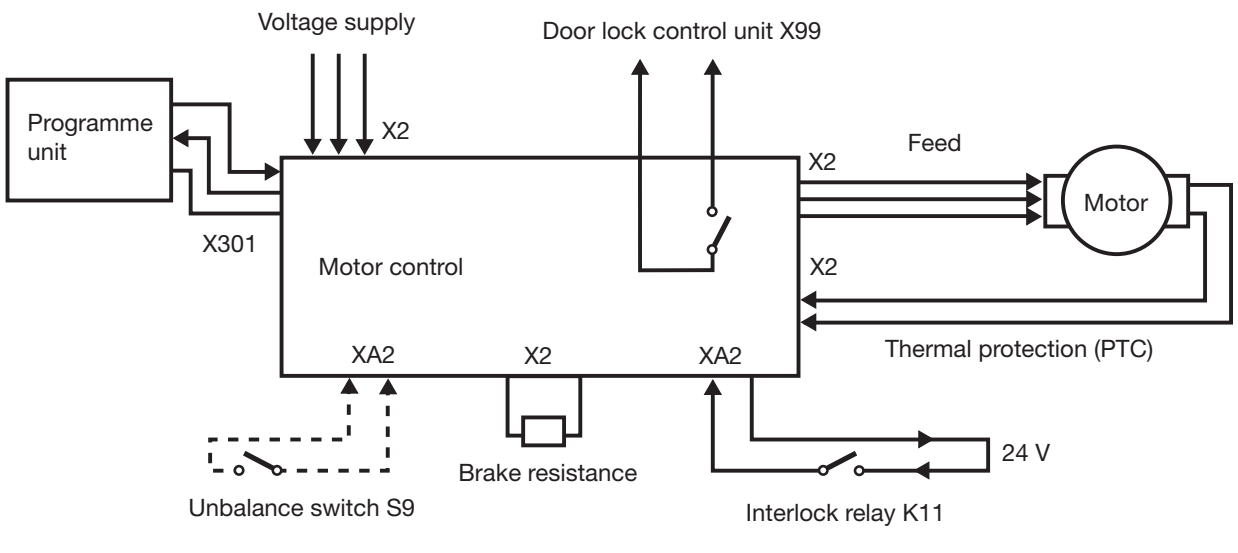
Function

DANGER

Be careful when measuring the electric components in the motor control. All components have a potential difference of approx. 300 V in relation to protective earth and neutral.
When the green LED on the motor control card is lit, the components carry dangerous voltages.
The motor control lose all voltage about 10-30 seconds after the voltage has been disconnected and the motor has stopped.

(3) The motor control communicates with the programme unit via a serial two-way interface. With the help of the motor control, the programme unit can control not only the instantaneous motor rpm, but also with high precision the acceleration and retardation of the motor in order to reach the target rpm. The motor control continuously replies with information to the programme unit PCB regarding the current operating state and sends reports if an error occurs.

(3)



The motor control is also able to deliver various instantaneous and output values during constant speed, acceleration and retardation. These values are used to calculate the weight of the loaded laundry and to detect any load imbalances. A separate imbalance breaker can also be connected to the motor control.

The safety system of the machine includes double detection of the door lock. Both the programme unit and motor control use different switches to detect proper door locking. The motor cannot start unless both switches verify the door is locked.

Belt tension

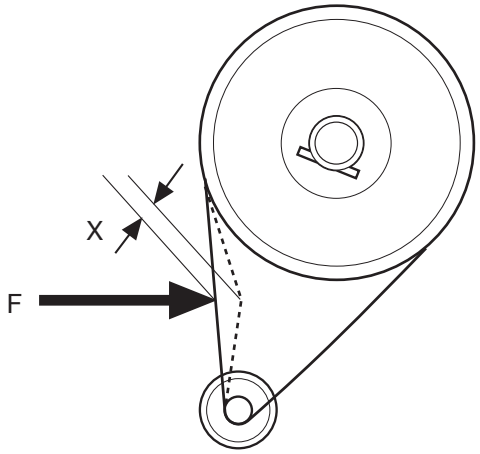
(4) The belt tension of new machines is preset at the factory.

	EX6102c	EX6135c	EX6200c	EX6250c
X	15 mm	10 mm	23 mm	23 mm
F	20N	90N	75N	75N

(5) To check the belt tension, or to reset it after replacing components which affect the tension, follow the instructions in the illustrations.

Checking the belt tension is important, and should always be included in regular maintenance and servicing routines.

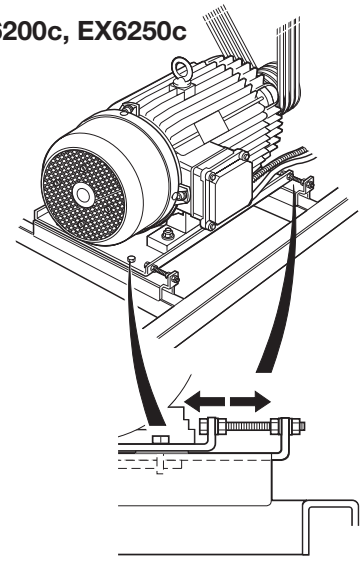
(4)



5588

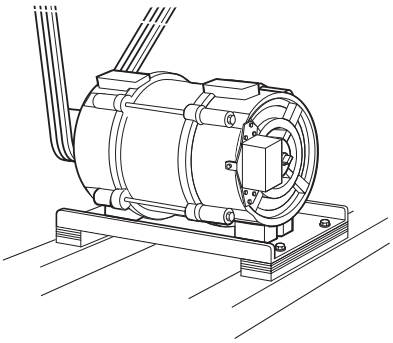
(5)

EX6200c, EX6250c



6058

EX6102c, EX6135c



102358 OP

Drain valve

Description

(1) The drain valve uses compressed air to close. A control valve opens and supplies pressure to a piston located beneath the rubber diaphragm of the drain valve.

Fault-finding

May only be carried out by authorized personnel.

The drain valve will not close

Check that:

- The control valve is energised.
- Hoses and the control valve are not blocked. Check by undoing the supply line at the drain valve and then activating the control valve.
- The rubber diaphragm is in good condition.
- The piston is operating correctly.

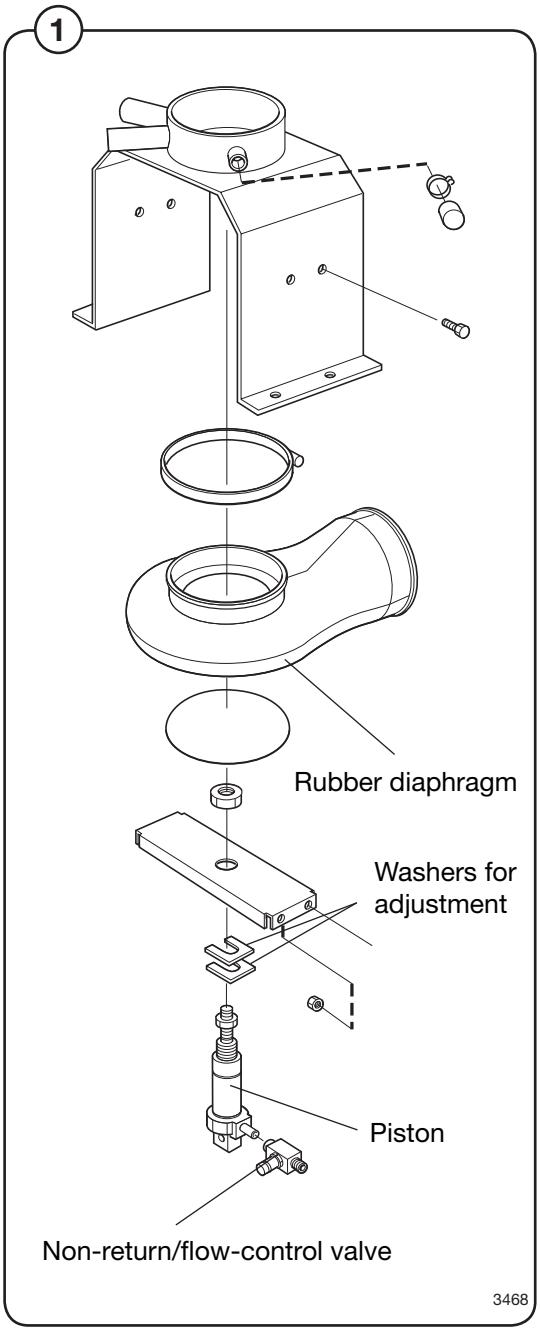
The drain valve will not open

Check that:

- The piston is operating correctly.
- The non-return/flow-control valve is open. At low air pressures the flow-control valve opens more.

The drain valve is leaking (water).

- Remove one of the washers for adjustment.



Detergent dispenser

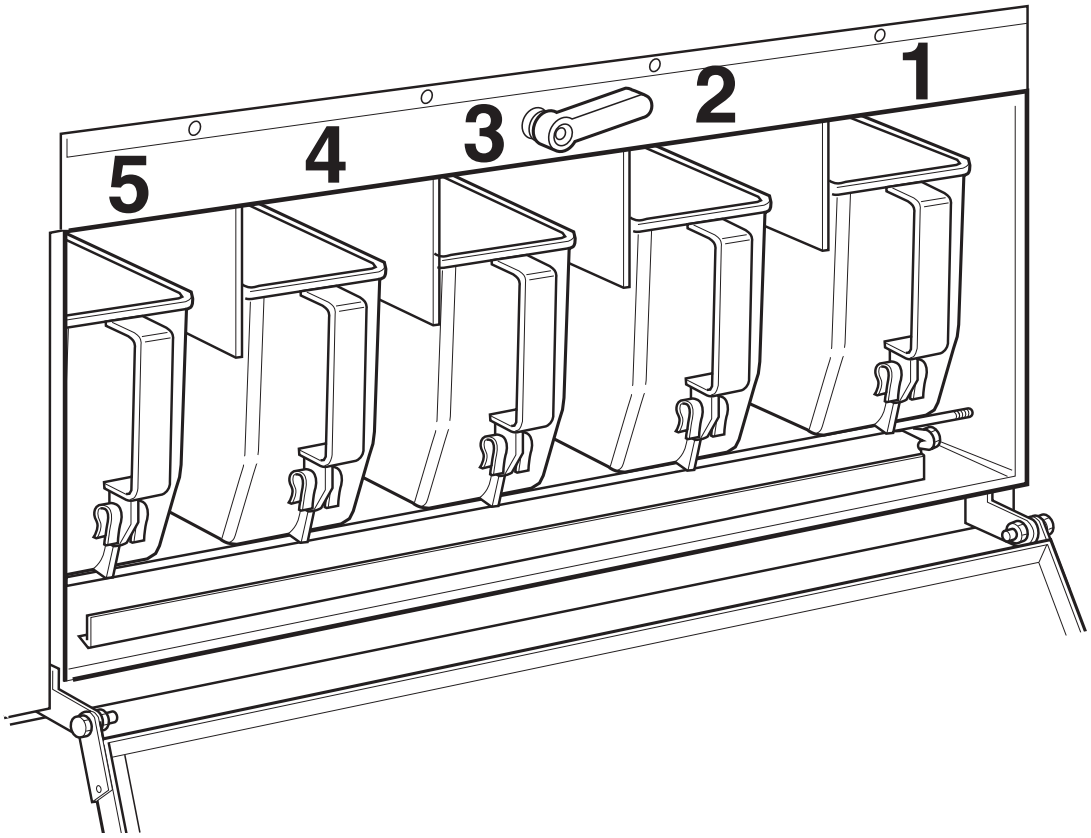
(1) The detergent dispenser has five compartments. Each compartment is connected to a water valve and can be flushed with hot or cold water.

There is also a separate cleaning (water flushing) function for all compartments in the detergent dispenser, connected to cold water.

If the water pressure is low (<1 bar) the cleaning effect may be less satisfactory. For this reason, where the pressure is low the water flushing times should be increased for best results.

Do not open the cover when the water valves are flushing water through the detergent dispenser. Take care when adding laundry products. Powder or liquids left in the compartments (scoops) may be corrosive.

(1)

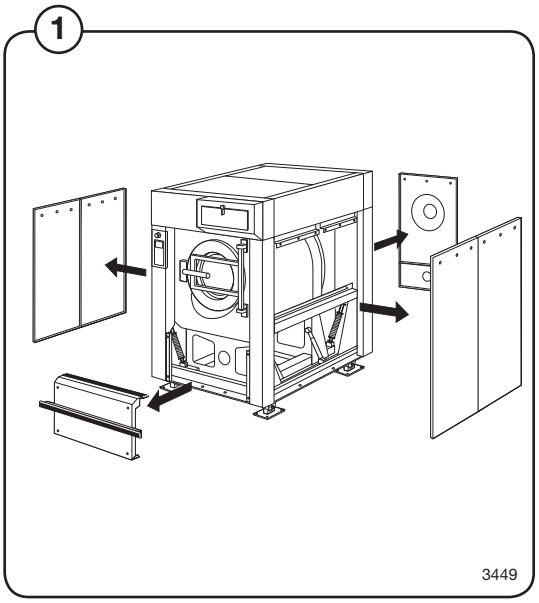


3478 A

Tilt function

Installation

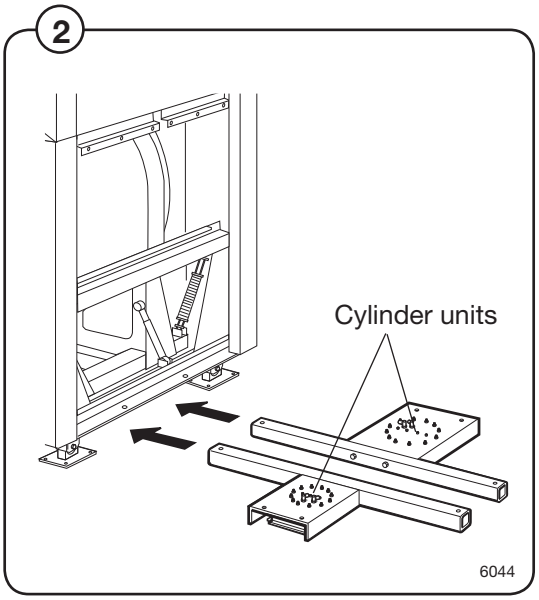
(1) Remove the machine's side panels, lower front panel and rear covers.



(2) <u>For machines with tilt both forwards and backwards</u>:

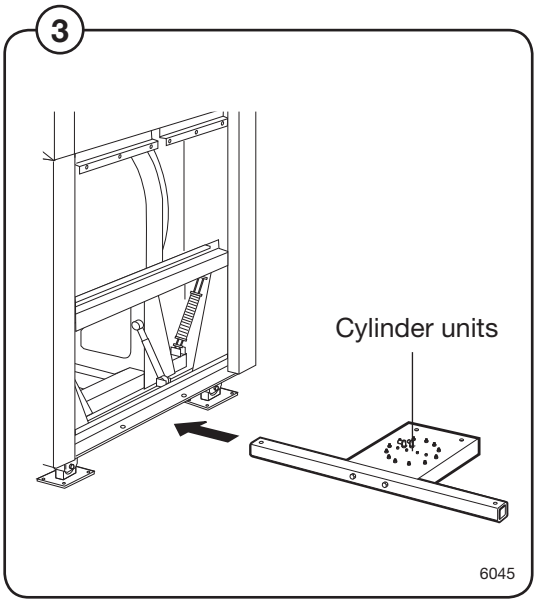
Insert the two cylinder units from the side of the machine underneath the machine frame.

If there is vinyl floor-covering on the floor:
To protect the floor from wear, a sheet of stainless steel should be laid beneath each cylinder unit.



(3) <u>For machines with forward tilt only</u>:

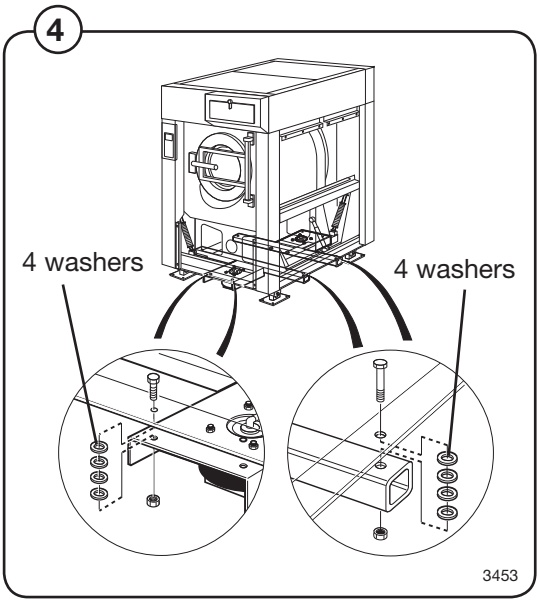
Insert the cylinder unit from the side of the machine underneath the rear section of the machine frame.



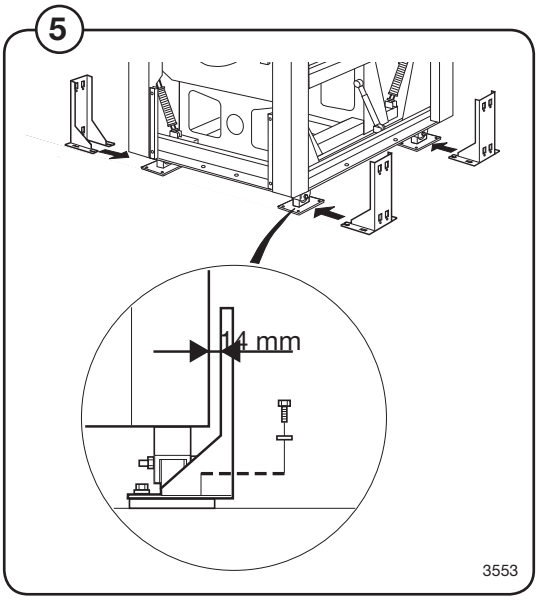
Tilt function (Optional equipment)

(4) Secure the cylinder units using four bolts and nuts.

It is important to fit four washers (each 5 mm thick) between each cylinder unit and the machine frame (see illustration).

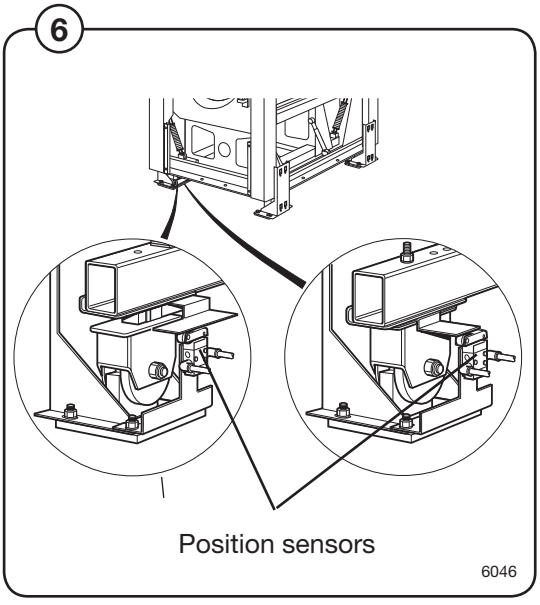


(5) Fit the four corner posts, one for each corner of the machine, using the bolts which secure the machine feet to the floor. Adjust the clearance between the upper part of each corner post and the machine so it is 14 mm.



(6) <u>For machines with tilt both forwards and backwards</u>:

Fit two pneumatic position sensors on two of the machine feet: at left-hand front and right-hand rear, diagonally opposed. The position sensors are to be fitted using the inner two fastening bolts of the feet, mounted on the corner posts just installed.



For machines with tilt both forwards and backwards:

The compressed air lines which are to be connected to the air bellows and position sensors are supplied bundled on the machine rear.

Connect the lines to the air bellows and pressure sensors according to the table below. These lines do not need to be fastened to the frame, but can be laid on the floor underneath the machine.

The air lines are marked as follows:

(7)

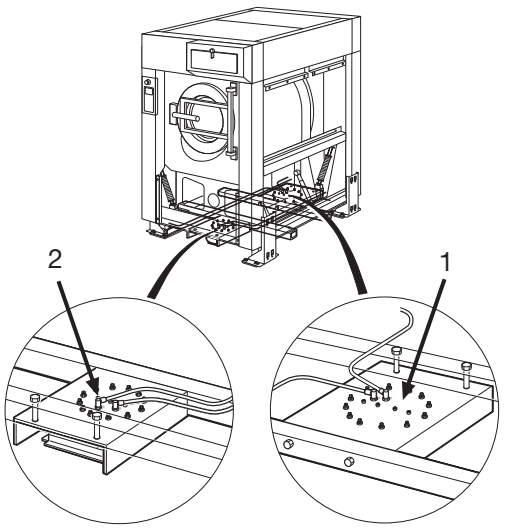
ID marking	Connect to
1	Rear air bellows
2	Front air bellows
3	Rear pressure sensor, connection 1
4	Rear pressure sensor, connection 2
5	Front pressure sensor, connection 1
6	Front pressure sensor, connection 2

(8) Note that the tubes for the pressure sensors must be connected correctly, see Fig. 7.

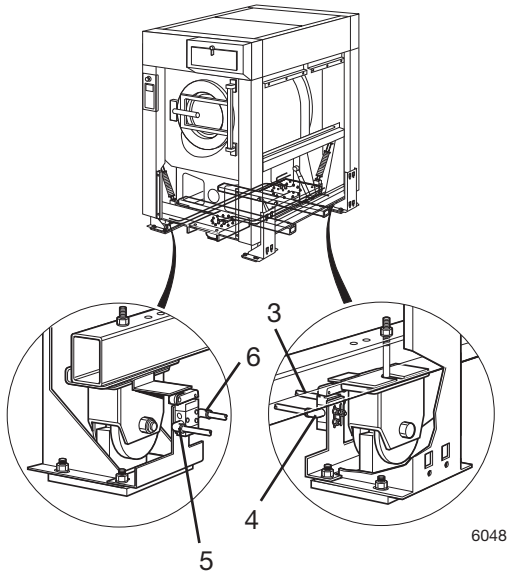
– Connection 1 – same side as data plate.

– Connection 2 – same side as the inset white plate.

(7)



6047



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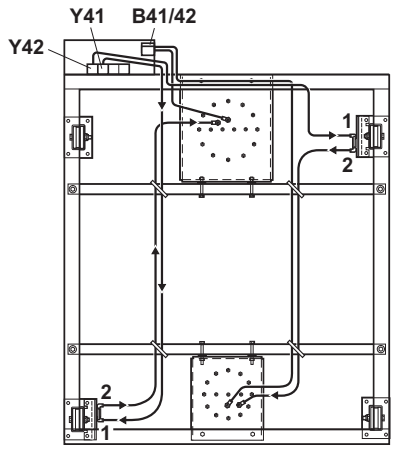
(8)

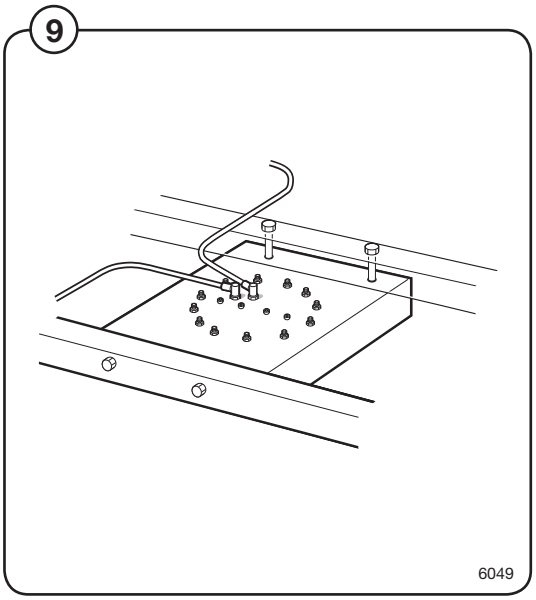


6026

Tilt function (Optional equipment)

(9) <u>For machines with forward tilt only:</u>

The compressed air line to be connected to the air bellows is supplied bundled on the machine rear. Connect this line to the connection nipple on the top of the bellows.



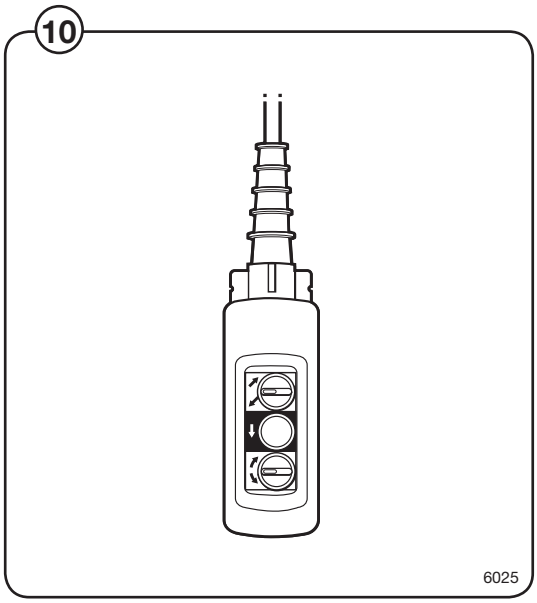
(10) Test the tilt function:

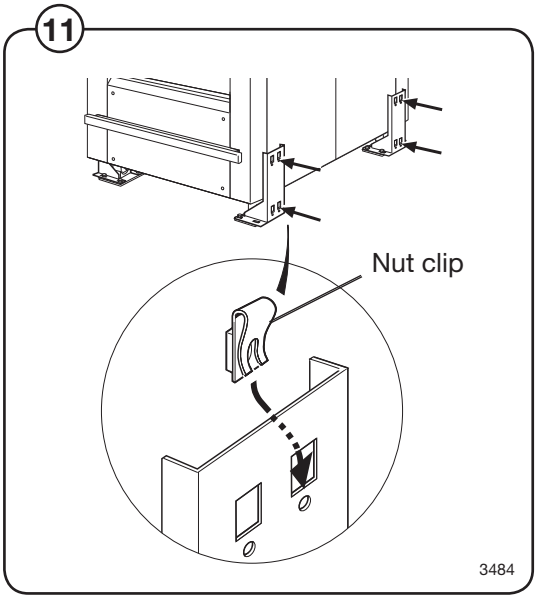
- Switch on the machine electrical switch(es) and turn on the compressed air supply.
- Open the door and lock it open.
- The uppermost switch on the tilt control unit tilts the machine either backwards (turn switch anticlockwise) or forwards (turn switch clockwise). The middle switch returns the machine to its normal (upright) position. These switches must be kept actuated throughout the entire tilt movement. If the switch is released, the tilt movement will halt and the machine will stop in its position.
- The bottom switch on the control unit rotates the drum either clockwise or anticlockwise.
- Check that the machine cannot tilt in the opposite direction until it has returned to its normal position after an earlier tilt.
- Check for any possible leaks from compressed air lines or from bellows and sensors.

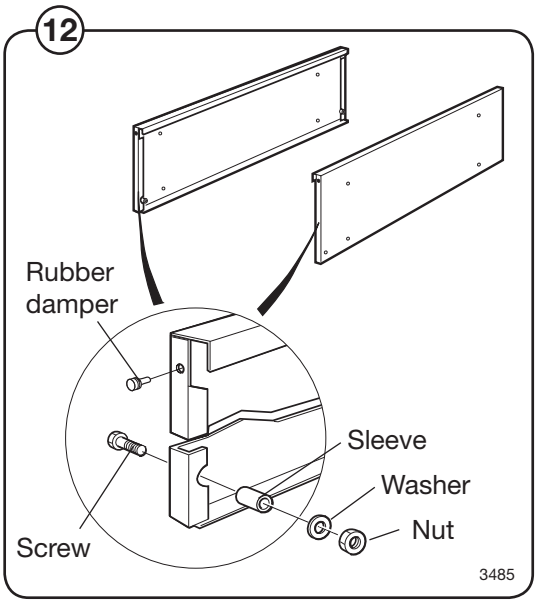
Refit the machine panels/covers.

(11) Fit two nut clips to each corner post. The nut clips slot into the rear grooves on the posts.

(12) Fit the rubber dampers and sleeves to the front end of each side panel strip.

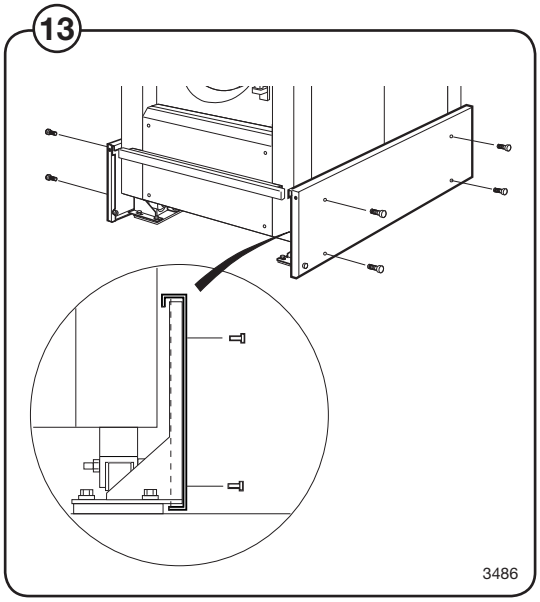




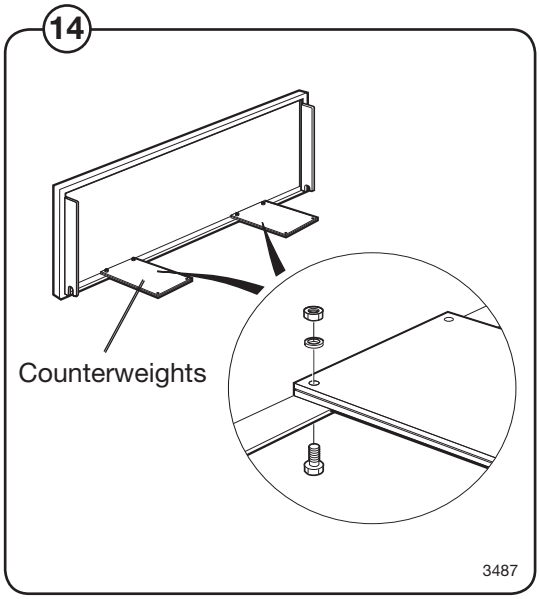


Tilt function (Optional equipment)

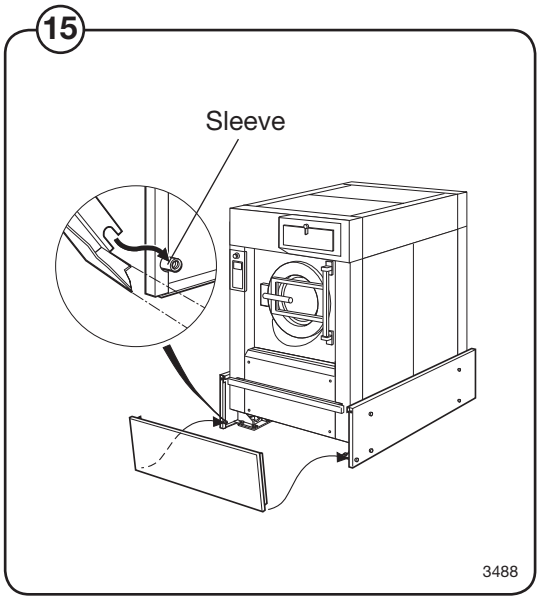
(13) Position and fasten the side panel strips.



(14) Fit the two counterweights to the front panel strip. The bolt heads should be at the bottom.



(15) Hang the front panel strip on the two sleeves you fitted to the side strips. Protective plates are mounted on the front and rear.



Weighing equipment

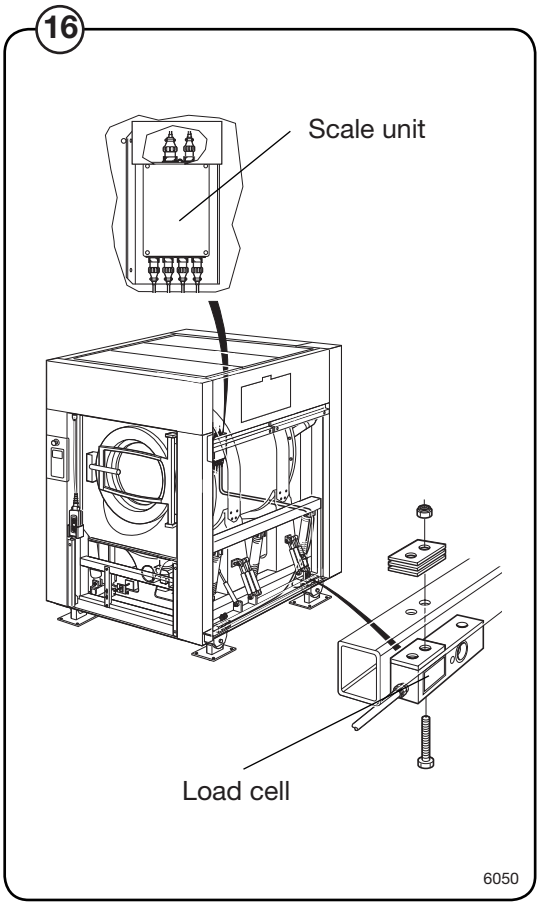
Description

(16) The weighing equipment comprises the following units:

- A scale unit located inside the machine's left-hand rear side panel
- Four load cells, one in each corner of the frame
- Wiring

The weight of the wash load is registered by the four load cells, which send analogue signals to the scale unit. In the scale unit the signals are processed and converted to a weight value in an analogue-digital converter. The weight value is transmitted via a serial interface to the CPU board. The weight is then shown on the display.

Weighing the load allows the water level to be adjusted automatically according to the actual weight of the load, i.e. the water level is reduced during washing if the machine does not have a full load. The consumption of water and energy can thus be reduced.



Safety rules

The weighing equipment is a precision measuring device and must be treated as such.

- Never spray water directly onto the load cells and scale unit.
- The load cells are vulnerable to impact.
- The load cells are potentially vulnerable if welding is carried out. If welding has to be done on the washer extractor, attach the earth cable clamp as close as possible to the welding site.

After a power-cut

When the supply is restored after a power-cut, the weight display will show "0" if the load inside the drum is less than 6.25 kg. If the load weighs more than 6.25 kg, the true weight of the load will be shown.

Water level reduction

To achieve optimum load volumes, the weight of the load can be seen on the display while the machine is being loaded. If the machine does not have a full load, the water level will be reduced according to a water-level reduction table. The water level can never be any lower than the safety level plus the hysteresis.

Actual weight display

(17) The Clarus control unit automatically detects if weighing equipment is connected, and the actual (current) weight is shown on the display, on one line of the menu (normal display mode).

(18) When the machine starts to be loaded, the display switches to showing the actual weight in large numerals (weight display mode).

Normal display mode is resumed:

- If a new program number is entered using the numeric keys.
- If ↵ is pressed.
- Automatically after the time set via ”Settings 1” under ”Time for weight display”.

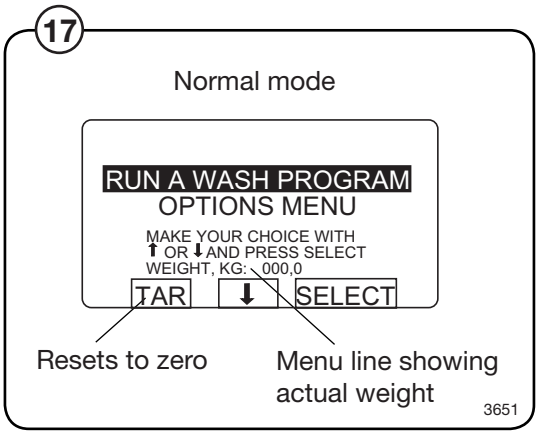
While a wash program is running, you can switch to weight display mode by selecting ”Show weight”, see the section ”Show weight” under ”Machine operation”.

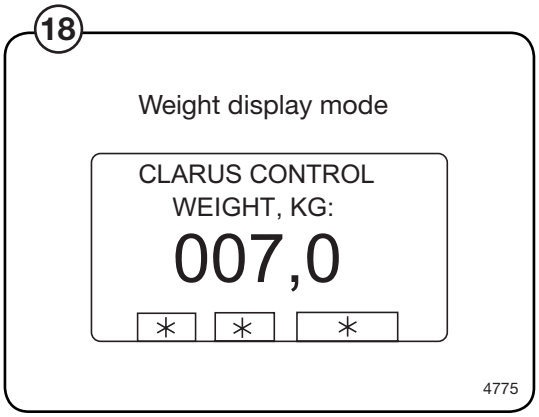
The weight shown on the display will always be the net weight (achieved because the weighing equipment has been ”tared”). A slight delay is built in to prevent the display from flickering.

Resetting the weighing equipment

(17) If the display does not show the weight (in an empty machine) as zero after a program, the weighing equipment can be reset to zero using the TAR key.

For a description of the functions used to set and check the tare value, see the section headed ”Scale adjustments” under ”Machine operation”.





Calibrating the weighing equipment

The “Zero calibration” function is used to increase the accuracy of the weighing equipment. This should be done once a month. See the section headed “Zero calibration” under “Machine operation”.

If a new scale unit is installed, it must be calibrated as described in the section ”Calibrate the scale” under ”Machine operation”.

Checking accuracy of weighing equipment display

Twice a year you need to check that the weighing equipment is displaying the accurate weight, with the aid of an object of known weight. If the weighing equipment does not show the real weight of this object, you will need to follow the “Zero calibration” procedure, a function in the Clarus software. Follow the instructions under “Zero calibration” in the “Machine operation” section of the manual. If this is unsuccessful, the weighing equipment will have to be recalibrated using the “Calibrate the scale” function, as described under “Machine operation”.

If the weighing equipment has a fault

Follow the troubleshooting procedure under the heading “Fault-finding, weighing equipment”.

If you cannot rectify the problem with the help of that section, make a note of the weighing equipment version number before you contact the service department.

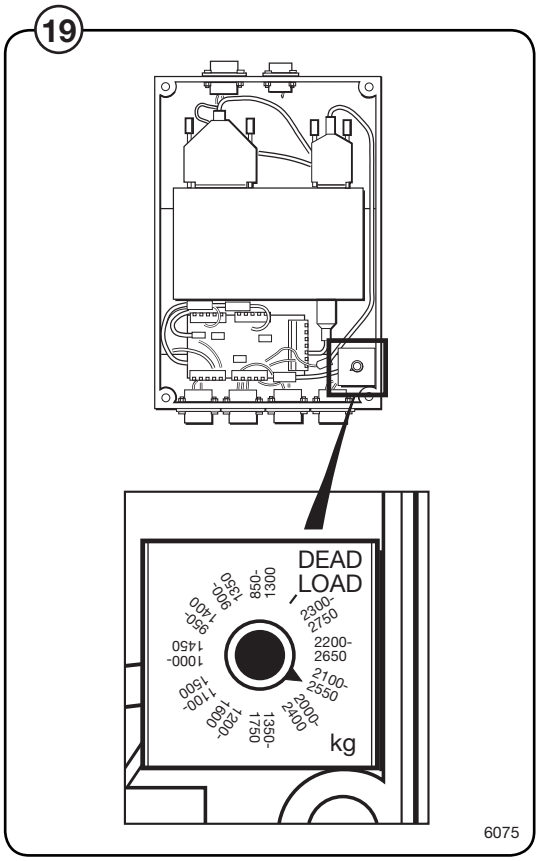
To find the weighing equipment version number, access the service program, select “Scale adjustments”, then “Read version number”.

The dead load selector

(19) The dead load selector, located in the scale unit, is used for setting the machine's "dead load".

The dead load is the load (weight) to which the load cells are subjected before any load is placed in the wash drum. The dead load selector is set before the machine leaves the factory, and its setting should not normally be changed. For this machine the selector should be set to **1000-1400 kg** for EX6102c, **2100-2550 kg** for EX6200c, EX6250c and **1200-1600 kg** for EX6135c.

If calibration of the weighing equipment should fail, one possible cause can be that this selector is incorrectly set.



To replace a load cell

(20)

- Machines without tilt function: Remove nut + bolt (A).
- Use a suitable jack to lift under the frame at the corner where the load cell is to be replaced.
- Insert a suitable object as a chock beneath the frame, to remove risk of injury and machine damage.
- Machines with tilt function: Remove nut + bolt (A) and remove the wheel.
- Remove nut (B). Use a socket wrench to remove the bolt.
- Disconnect the load cell cable at the scale unit and remove the strap.
- Remove nuts and bolts (C).
- Remove the faulty load cell and fit the new, assembly is reverse of disassembly.

(20) **Install the new load cell as indicated by arrow on side of load cell!**

(20)

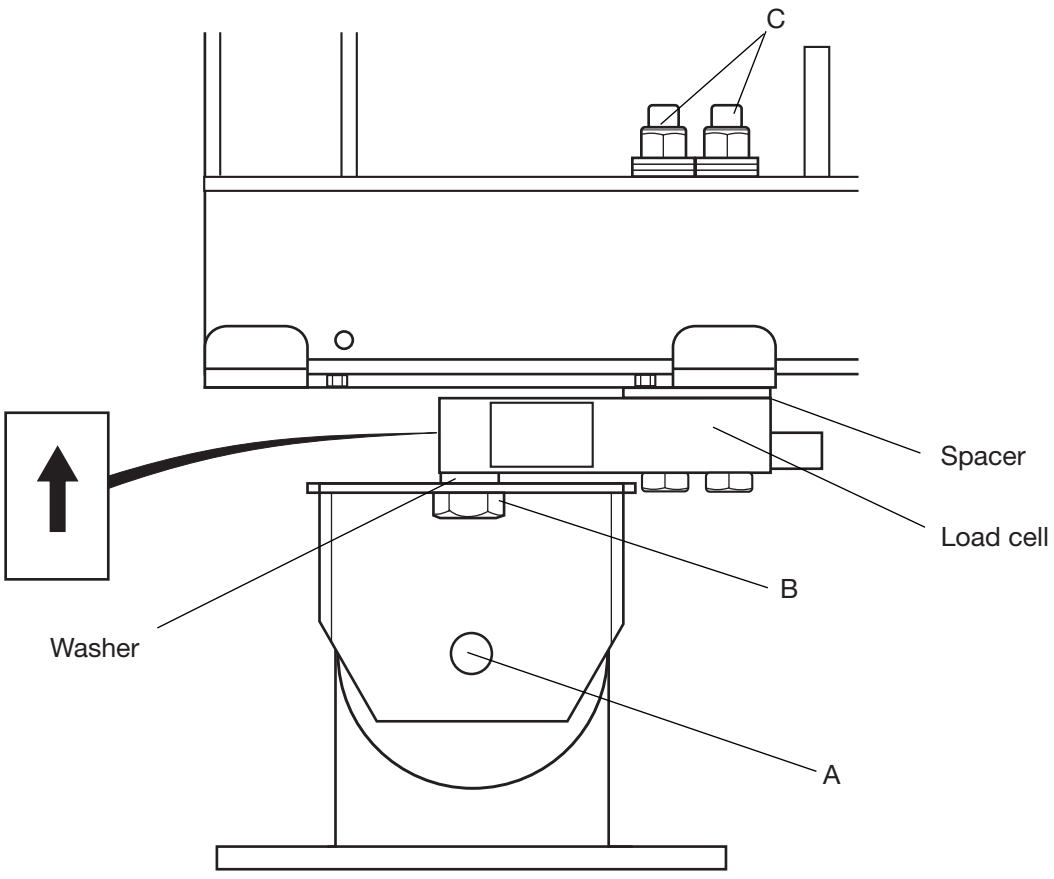


Illustration shows a machine with the tilt function.

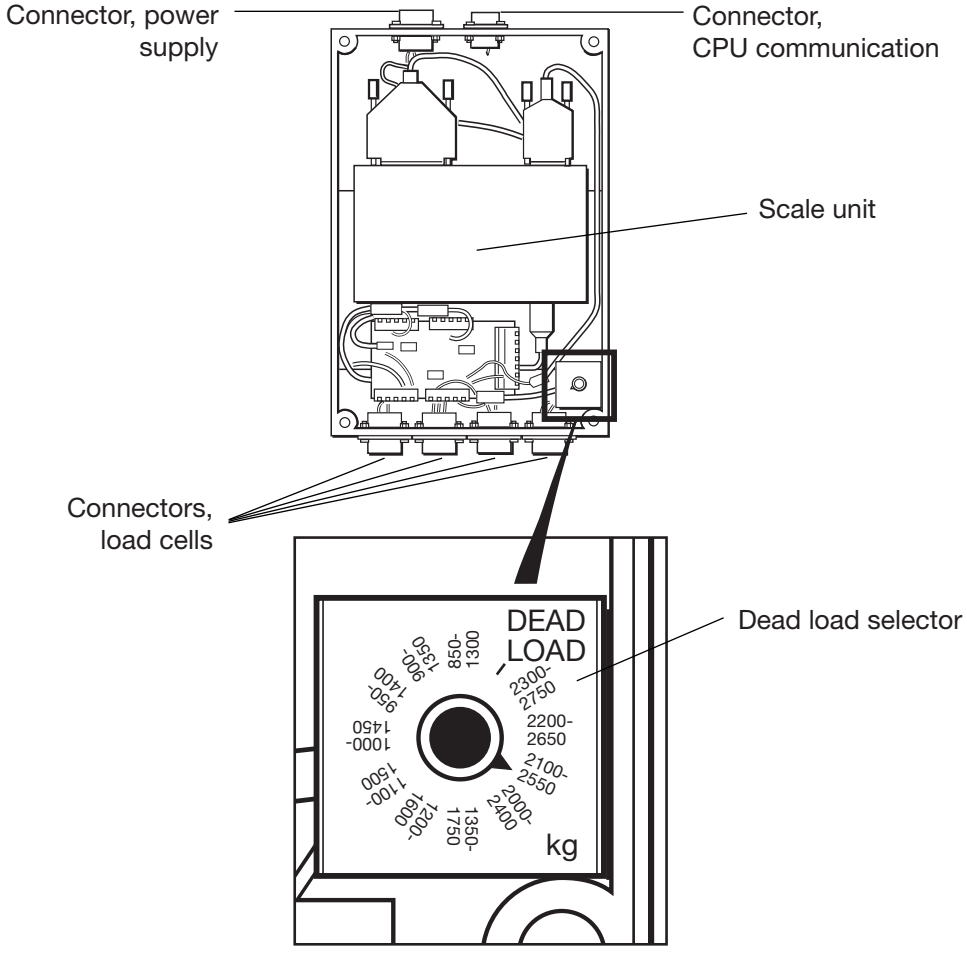
5032

To replace the scale unit

(21)

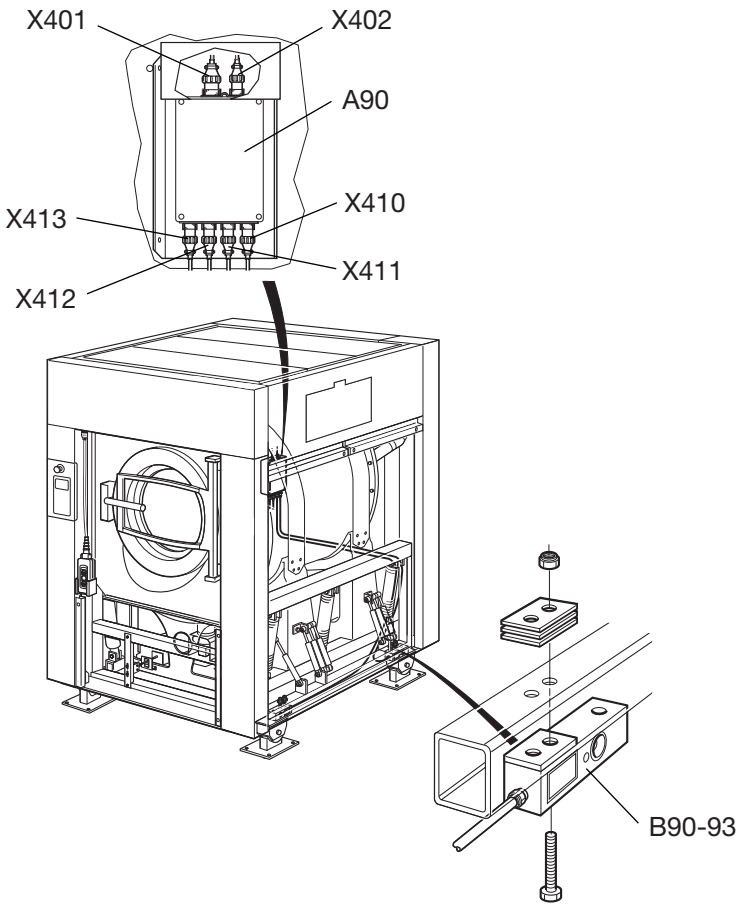
- Remove the machine's left-hand rear side panel.
- Disconnect the six connectors to the scale unit.
- Take the scale unit off its mounting plate.
- Install the new scale unit, assembly in reverse order of disassembly.
- Check that the dead load selector is set to **1000-1400 kg** for EX6102c, **2100-2550 kg** for EX6200c, EX6250c and **1200-1600 kg** for EX6135c.
- Calibrate the weighing equipment, see "Calibrate the scale" under "Machine operation".

(21)



Component locations

22



22	A90	Scale unit
	B90-93	Load cells
	Connectors	
	X401	Voltage feed
	X402	Communication with CPU board
	X410-413	Load cells

Fault-finding, weighing equipment

Error message on display:

Weight, kg:	**999,9 or -999,9**

Probable cause:

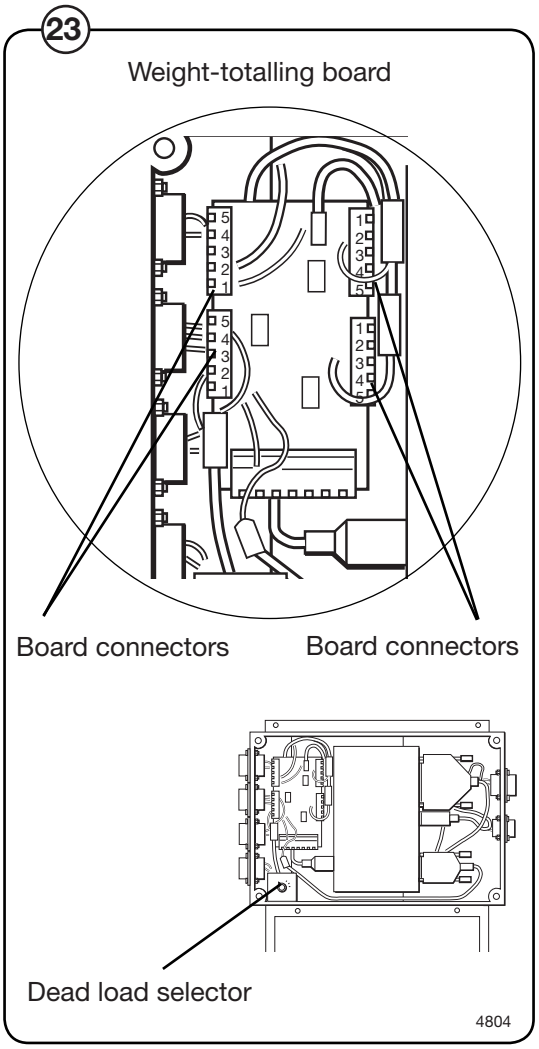
The weighing equipment is overloaded/ ”underloaded”, i.e. the load cells are sending a signal which is too high/low to the scale unit. Probable cause is one or more load cells faulty. The dead load selector may be on the wrong setting. The machine may be incorrectly installed.

Fault-finding procedure:

(23)
- Check that all connections to the machine are flexible.
- Remove the left-hand rear side panel. Check that the dead load selector is set to **1000-1400 kg** for EX6102c, **2100-2550 kg** for EX6200c, EX6250c and **1200-1600 kg** for EX6135c. If it is not, set it correctly and calibrate the weighing equipment according to “Calibrate the scale” under “Machine operation”.
- If the weight displayed is -999.9, try following the "Zero calibration" procedure (described under "Zero calibration" in the "Machine operation" chapter).
- Remove the side panels and check that the load cells are unobstructed. Remove any mechanical obstructions.

(23)
- Taking the load cell cables one at a time, disconnect the cable connecting each load cell to the scale unit. Continue one by one until a stable weight parameter is displayed (but not 999.9). When this stable parameter is displayed you will know which of the load cells must be faulty.

(23)



- If more than one load cell is faulty, the faulty cells can be identified using a multimeter on the scale unit weight-totalling board to check each cell in turn, as follows:
  - Remove the four screws on the scale unit cover.
  - Check that the four load cell cables are connected to the scale unit.
  - Measure the voltage at the connectors on the weight-totalling board, between terminal 2 and 3 for each load cell. The normal value for an unladen machine is approx. 3-5 mV (DC). A value different from this indicates that the load cell is faulty.
  - Replace the faulty load cell(s) as described under “To replace a load cell”.

Menu line which should show actual weight not displayed.

Possible causes:

The option “DISPLAY WEIGHT ALLOWED” may be switched off (have the answer “No” alongside) in “Settings 1”. Possible fault in communication with CPU board or display. The fault can also be in the scale unit.

Fault-finding procedure:

- Check in “Settings 1” that the option “DISPLAY WEIGHT ALLOWED” has “Yes” alongside.
- Check that the cables/wiring for CPU communication and power supply are connected to the scale unit and in good condition.
- If the washer extractor appears to be working normally apart from the absence of weight parameter display, try replacing the scale unit as described under “To replace the scale unit”.

If you suspect that the weighing equipment is not displaying accurate weight value.

Probable cause:

Probably a faulty load cell.

Fault-finding procedure:

- Place an object of known weight at one corner on top of the washer extractor. Check the weight shown on the display. Move the weight to each of the other corners of the machine in turn, checking the display each time. If one corner is different from the others, this will reveal which load cell is faulty.
- Check that the load cell in question is mechanically unobstructed, free of anything which could affect its normal functioning.
- Replace the load cell as described under “To replace a load cell”.

Error message on display:

Failed. Press SELECT.

Possible causes:

Dead load selector or calibration switch incorrectly set. An incorrect calibration weight has been used for calibration.

Fault-finding procedure:

(24)

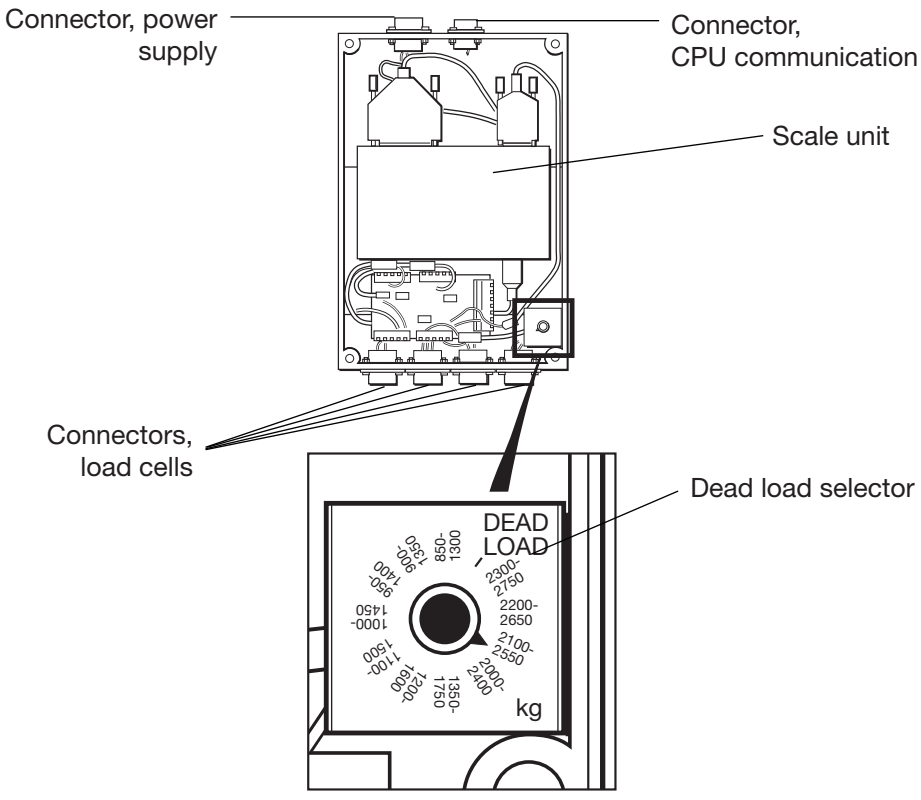
- Check that the dead load selector is set correctly. It should be set to **1000-1400 kg** for EX6102c, **2100-2550 kg** for EX6200c, EX6250c and **1200-1600 kg** for EX6135c.
- If you are or have recently been calibrating the weighing equipment, the calibration switch may be incorrectly set, or an incorrect calibration weight may have been used for calibration.

  Check that the calibration switch is set correctly. It should normally be set to NORM. During calibration the switch should be set to CAL.

  The calibration weight should be between 40 and 400 kg.

  If relevant/necessary, calibrate the weighing equipment, or follow the “Calibrate the scale” procedure under “Machine operation”.
- Check that all cables/wiring to the scale unit are sound and correctly connected.

(24)



Information in display:

Function not allowed.

Probable cause:

A function has been selected in the program which cannot be carried out.

Fault-finding procedure:

- Check that the function in question is switched on under “Settings”.
- Check that the cables for CPU communication, power supply and load cells are connected.
- Check that these cables are all in good condition.
- If any cable is faulty, replace it.

Information in display in service program:

Weighing equipment not connected.

Probable cause:

CPU board not communicating with scale unit.

Fault-finding procedure:

- Check that the connectors for CPU communication, power supply and load cells are connected on the scale unit.
- Check that their cables are all in good condition.
- If any cable is faulty, replace it.