# OPERATING & MAINTENANCE MANUAL

## EX 6100 C
## Clarus Control

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WARNING: ALL OPERATING AND MAINTENANCE PROCEDURES SHOWN ON THE NEXT PAGE OF THIS MANUAL MUST BE FOLLOWED DAILY FOR PROPER OPERATION OF YOUR WASCOMAT MACHINE.

PLEASE ENTER THE FOLLOWING INFORMATION AS IT APPEARS ON THE MACHINE(S) DATA PLATE(S).

| | |
|---|---|
| **MACHINE TYPE OR MODEL** | |
| **MACHINE SERIAL NUMBER(S)** | |
| **ELECTRICAL CHARACTERISTICS: _____ VOLTS, _____ PHASE, _____ HZ.** | |

MAKE CERTAIN TO KEEP THIS MANUAL IN A SECURE PLACE FOR FUTURE REFERENCE.

## NOTICE TO: OWNERS, OPERATORS AND DEALERS OF WASCOMAT MACHINES

IMPROPER INSTALLATION AND INADEQUATE MAINTENANCE, POOR HOUSEKEEPING AND WILLFUL NEGLECT OR BYPASSING OF SAFETY DEVICES MAY RESULT IN SERIOUS ACCIDENTS OR INJURY. TO ASSURE THE SAFETY OF CUSTOMERS AND/OR OPERATORS OF YOUR MACHINE, THE FOLLOWING MAINTENANCE CHECKS MUST BE PERFORMED ON A DAILY BASIS.

1. Prior to operation of the machine, check to make certain that all operating instructions and warning signs are affixed to the machine and legible. (See the following page of this manual for description and location of the signs.) Missing or illegible ones must be replaced immediately. Be sure you have spare signs and labels available at all times. These can be obtained from your dealer or Wascomat.

2. Check the door safety interlock, as follows:

   (a) OPEN THE DOOR of the machine and attempt to start in the normal manner:

   For CLARUS microprocessor models, choose a program and press the START button.

**THE MACHINE(S) SHOULD NOT START !**

   (b) CLOSE THE DOOR to start machine operation and, while it is operating, attempt to open the door without exerting extreme force on the door handle. The door should remain locked!

   If the machine can start with the door open, or can continue to operate with the door unlocked, the door interlock is no longer operating properly. The machine must be placed out of order and the interlock immediately replaced.
   (See the door interlock section of the manual.)

3. DO NOT UNDER ANY CIRCUMSTANCES ATTEMPT TO BYPASS OR REWIRE ANY OF THE MACHINE SAFETY DEVICES AS THIS CAN RESULT IN SERIOUS ACCIDENTS.

4. **Be sure to keep the machine(s) in proper working order**: Follow **all** maintenance and safety procedures. Further information regarding machine safety, service and parts can be obtained from your dealer or from Wascomat through its Teletech Service Telephone - 516/ 371-0700.

All requests for assistance must include the model, serial number and electrical characteristics as they appear on the machine identification plate. Insert this information in the space provided on the previous page of this manual.

5. **WARNING**: DO NOT OPERATE MACHINE(S) WITH SAFETY DEVICES BYPASSED, REWIRED OR INOPERATIVE! DO NOT OPEN MACHINE DOOR UNTIL DRUM HAS STOPPED ROTATING!

# SAFETY AND WARNINGS SIGNS

## Replace If Missing Or Illegible

**One or more of these signs must be affixed on each machine as indicated, when not included as part of the front instruction panel.**

## LOCATED ON THE OPERATING INSTRUCTION SIGN OF THE MACHINE:

**CAUTION**

1. Do not open washer door until cycle is completed, operating light is off, and wash cylinder has stopped rotating.
2. Do not tamper with the door safety switch or door lock.
3. Do not attempt to open door or place hands into washer to remove or add clothes during operation. This can cause serious injury.

**MACHINE SHOULD NOT BE USED BY CHILDREN**

**PRECAUCION**

1. No abra la puerta de la máquina lavadora sino hasta que la máquina haya terminado su ciclo, la luz operativa esté apaga da y el cilindro de lavado haya completamento terminado de girar.
2. No interferia o manipule el switch o la cerradura de la puerta.
3. No trate de abrir la puerta o meta las manos dentro de la máquina para meter o sacar ropa mientras la máquina está en operación, pues puede resultar seriamento herido.

**LAS MÁQUINAS NO DEBEN SER USADAS POR NIÑOS**

**LOCATED AT THE REAR OF THE MACHINE:**

# INSTALLATION AND MAINTENANCE WARNINGS

1. **This machine MUST be securely bolted according to the installation instruction to reduce the risk of fire and to prevent serious injury, or damage to the machine.**

   ***Pour reduire les risques d'incendie, fixer cet appareil sur un plancher beton sans revetement.***

2. **If installed on a floor of combustible material, the floor area below this machine must be covered by a metal sheet extending to the outer edges of the machine.**
3. **This machine MUST be connected to a dedicated electrical circuit to which no other lightning unit or general purpose receptacle is connected. Use copper conductor only.**

   ***Utiliser seulement des conducteurs en cuivre.***

4. **This machine MUST be serviced and operated in compliance with manufacturer's instructions. CHECK DOOR LOCKS EVERY DAY FOR PROPER OPERATION TO PREVENT INJURY OR DAMAGE. IF THE DOOR LOCK FAILS TO OPERATE PROPERLY, PLACE THE MACHINE OUT OF ORDER UNTIL THE PROBLEM IS CORRECTED.**
5. **Disconnect power prior to servicing of machine.**

   ***Deconnecter cet appareil del'alimentation avant de proceder a l'entretien.***

6. **To remove top panel, first remove screws at the rear. When remounting the top, reinstall them. To remove the top panel on models on which it is secured by one or two keylocks, use the keys originally shipped in the drum package. Be certain to relock after remounting the top panel.**

MANUFACTURED BY WASCATOR
DISTRIBUTED BY WASCOMAT INWOOD, NEW YORK, USA

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## LOCATED ON THE DOOR:

If you need to order more safety or warning signs, call Wascomat's parts department at 516-371-2000, or call your local dealer.

**WARNING !**

DO NOT ATTEMPT TO OPEN DOOR
UNTIL PROGRAM HAS FINISHED AND
DRUM HAS STOPPED ROTATING.

471 7651-17

# Washer extractor, drum volume 400 litres

## Contents

## Safety

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

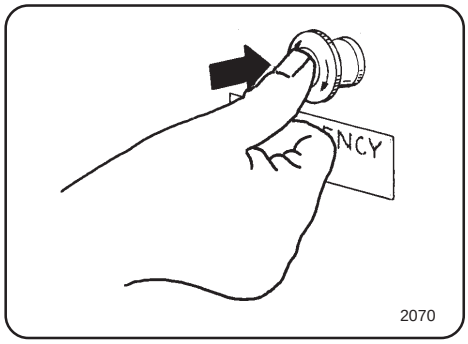
**Do not allow children to operate the machine.**

**Do not hose down or spray the machine with water.**

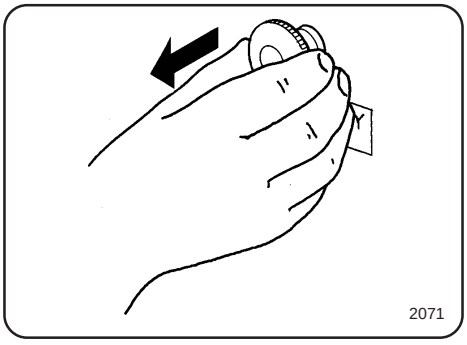
**All mechanical and electrical installation must be carried out by qualified personnel.**

**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.

# General description

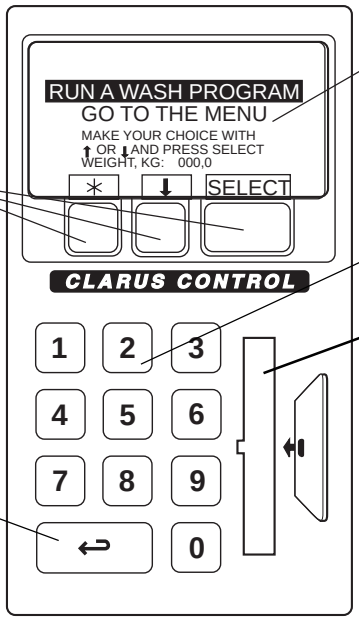
Fig. (1) This washer extractor is controlled by a microprocessor-based program control unit. There are many advantages to this equipment, including:

- timing, levels and temperatures are controlled with great precision and flexibility
- the large display screen means that detailed information on wash programs, machine status and operations, wash times and temperatures can be accessed in plain language
- it is possible for the user to create new wash programs, and to adapt programs with great precision, on the basis of experience and to suit various types of textile, degrees of soiling etc.
- a very high level of machine safety through continuous monitoring and built-in safety interlocks
- the program control unit has a reader for "smart cards". These are cards the size of a credit card which contain a memory chip. Smart cards allow the user to:
  - transfer wash programs between a PC and the washer extractor, or from one washer extractor to another
  - run programs straight from a card
- great flexibility during program operation:
  - rapid advance both forwards and backwards in the program
  - the user can change temperatures, program module lengths and extraction speeds directly, during program operation
  - change to running a different wash program, at any time during program operation of the washer extractor.

1

Function keys
The functions of these keys change, depending on which menu or part of a menu you are using. Their current functions at any time are shown on the display immediately above each key.

*During a wash:*
Pause key
*Before and after a wash, and during programming:*
"Move back" key
By pressing this key repeatedly you can move backwards through the menus you have navigated through. This will always bring you back to the menu shown on the display in this illustration.

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# Automatic operation

## Preparations

- Open the machine door and check that the drum is empty.
- Load the laundry items into the drum and close the door.
- Check that the emergency stop button has not been pressed inwards (see "Machine safety").

Fig. 2

- If the machine has a switch for selecting the heating type (electricity or steam), check that this switch is set as desired. This switch (where present) is inside the automatic control unit on the machine rear.

For machines with the tilt function and a loading hopper

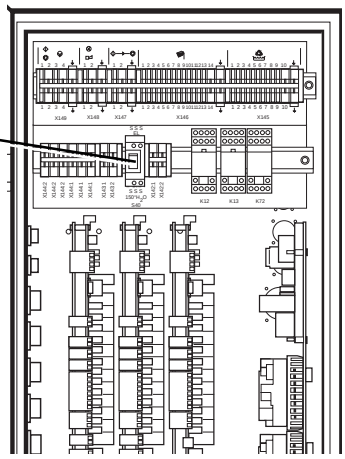
Fig. 3

- Open the door and lock it open by lowering the catch by the door hinge.

Fig. 4

- Release the catch for the loading hopper and lower it into position.

2

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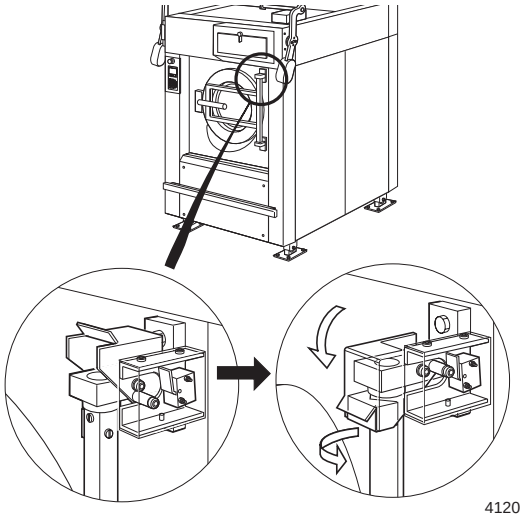

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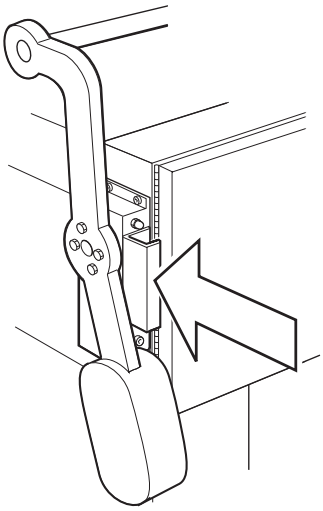

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Fig. 5
- Turn the uppermost switch on the tilt control unit anticlockwise. The machine will now tilt back.

Fig. 6
- Let the laundry items down into the loading hopper, and use the bottom switch on the tilt control unit to rotate the drum. This helps load the items into the drum.
- When the drum is full, lift the hopper back out of the way. It will be held by its catch automatically when it is pushed fully upwards.

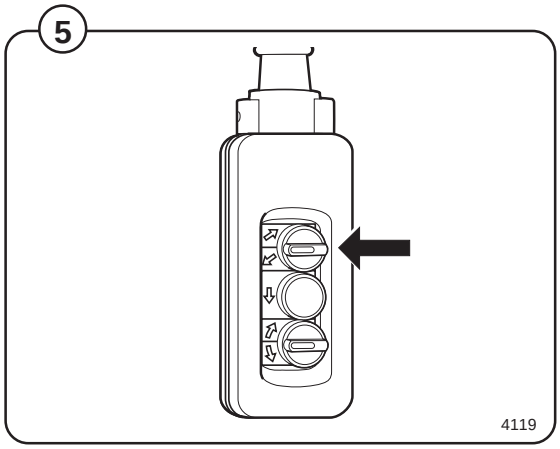
Fig. 7
- Press the middle switch on the tilt control unit. The machine will now return to its normal position.
- Close the machine door. The machine is now ready to begin washing.

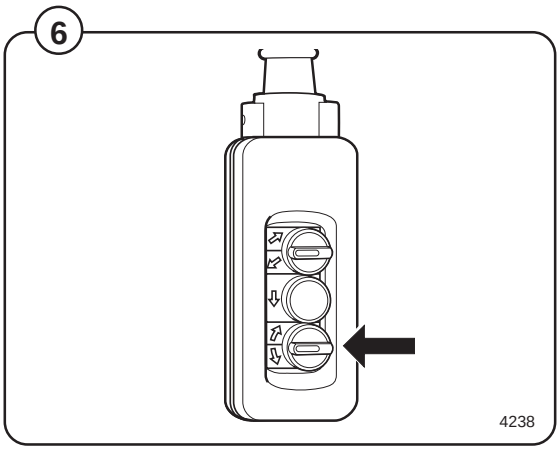
## Add detergent and other laundry products

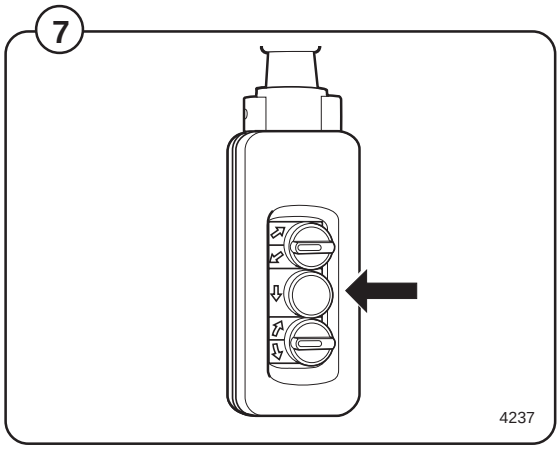
Fig. 8
If you are using the machine's built-in detergent dispensers, add the required detergent and other laundry products, according to the indicator lights.

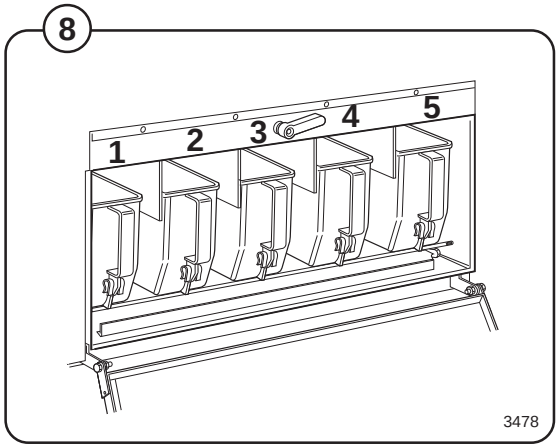
**Warning!**

**Take care when adding laundry products. Powder or liquids left in the compartments (scoops) may be corrosive.**



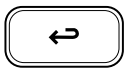



# To run a wash program

## Preparations

- Sort the load, paying attention to the textile care labels on the items. Empty all pockets and do up zip fasteners.
- Open the machine door, check that the drum is empty, load the items into the machine and close the door.
- Check that the emergency stop button has not been pressed inwards (see ”Machine safety”).

## The ”Move back” key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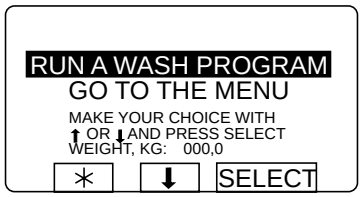
If you find you are in the wrong place, or if you want to undo earlier key presses:

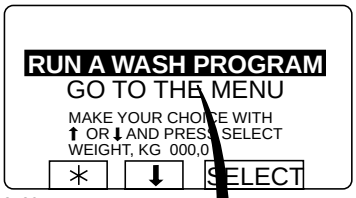
**Press the ”Move back” key one or more times.**

***The "Move back" function***

Each press of the ”Move back” key moves you back one menu, in reverse order. By pressing this key repeatedly you can return to this menu at any time:




## To start the wash program



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If this menu is not currently displayed:

**Press ⮌ repeatedly.**


If ”GO TO THE MENU” is highlighted:

**Press ⬆.**


When ”RUN A WASH PROGRAM” is highlighted:


**Press SELECT.**

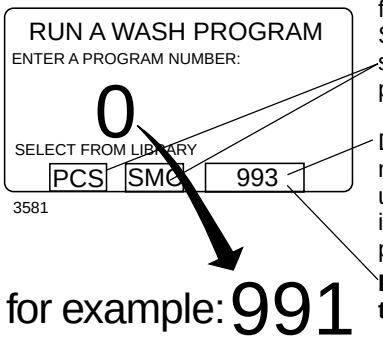
***Two ways of starting a program***

**By entering the actual program number**

Enter the actual program number if you know it, then press **SELECT**.

**By starting from the program library (see section "To start a wash program from the program library)**

If you are unsure about the programs available, you can select a program from the program library, where the programs are listed with their descriptions.




for example: **991**

Here you can select programs from the program libraries. See the section entitled ”To start a wash program from the program library”.

Displayed here will be the number of the most frequently used program. S993 would indicate the number of a program on a memory card.

**Press this key if you want to select this program.**

SELECT

**Use the numeric keys to enter the program number**

**Press SELECT.**

***If you have entered the wrong number***

Enter the correct number to overstrike the earlier one.

**Note:** you must always enter three digits, even when the number is really only a one or two-digit number.

Examples:

The program number required is **9**. Enter **009** to overstrike all digits in the wrong number.

The program number required is **19**. Enter **019** to overstrike all digits in the wrong number.

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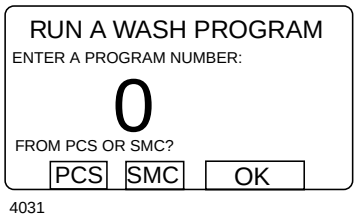



If you have a memory card in the program control unit, and the program you selected is both on the memory card and in the PCU, you will be asked ”FROM PCS OR SMC?”.

PCS

**Press PCS if you want to take the program from the PCU.**

SMC

**Press SMC if you want to take the program from the memory card.**

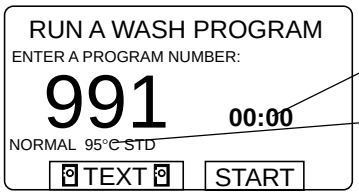
In some of the text shown on the display, Clarus Control is referred to as PCS and the memory card is referred to as SMC.

***Memory cards***

A memory card is a plastic card, the size of a credit card, with an electronic memory chip inside it. This card is capable of storing 10 to 15 wash programs of normal size. If the programs are mostly small ones, more of them can be stored, whereas larger programs will reduce the number which can be held by the card. Memory cards of this type can be used to:

- transfer wash programs from one washer extractor to another
- run wash programs straight from the card
- transfer wash programs from a PC to a memory card and from a memory card to a PC (these procedures, and how to write a wash program on a PC, are described elsewhere).

Memory cards are described in detail in the section entitled ”The Memory card”.

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Delayed start time (hrs:mins)

Program name

**If you want to see the description of the program:**

TEXT

**Press TEXT.**

***Pressing "Text" displays more information***

The text displayed is a description of the wash program selected. This text description is inserted when a new wash program is created. This procedure is described fully in the programming manual.

**Choose 1 or 2:**

① START

1 To start the program now:

**Press START.**

② 1 2 3 4 5 6 7 8 9 0

**2** Delayed start

**Use the numeric keys to enter a time (max. 24 hrs). This parameter appears on the right of the display.**

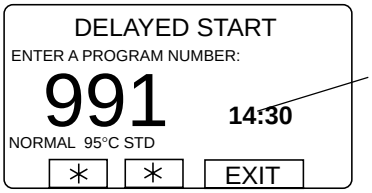
START

**Press START.**

***Delayed start***

Delayed start means that the machine will not start the wash program until the time entered has elapsed.

This function allows you, for example, to load the machine in the evening, but delay the start of the wash until early the next morning, to end in time for the next shift.




Time left before the machine is to start

If you want to cancel the delayed start:
**Press EXIT**

EXIT

↩

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During a wash program:

**Press ↩ to make the machine pause during the wash program.**

***Two ways of pausing during a wash program***

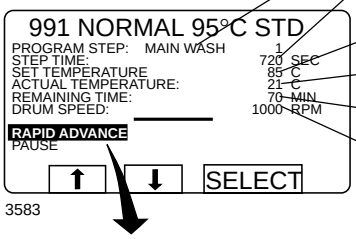
There are two ways of pausing during a wash program:

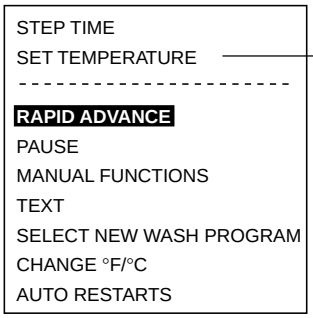
1 By pressing ↩.

2 As an additional function. This is described in **section "Pause"**.

The following information is displayed during the wash program:

- Current program step
- Time left for this program step
- Set temperature
- Actual temperature
- Remaining program time
- Drum speed




If required:

**Select a function using the cursor keys.**

**Press SELECT.**

### *To terminate a program before it has finished*

- Select RAPID ADVANCE and press SELECT. Advance to ”END OF PROGRAM” and press SELECT.
- Wait until ”THE DOOR IS OPEN” appears on the display.
- Now the door can be opened.

### *To change parameters in the current program step*

**See section "To change parameters in the current program step".**

Certain program step parameters can be altered during the course of the program. In the example (left), the length of the program step and the heating temperature can be altered.

### *Additional functions during the program*

**Rapid advance (see section ”To change parameters in the current program step”)**
Rapid advance through the program to the program step required. Rapid advance can be used to move both forwards and backwards through the program.

**Display weight (see section ”Display weight”)**
The actual load weight is shown in large digits on the display (weight display mode). (On machines with weighing equipment only.)

**No water level reduction (see section ”No water level reduction”)**
Machines with weighing equipment installed adjust the water level automatically according to the load weight. This function lets you switch off water level reduction during the current program.

**Pause (see section ”Pause”)**
The machine stops. The drain valve remains closed. Another way to pause the program: Press ↩.

**Manual functions (see section ”Manual operation during a program”)**
The following functions can be controlled manually during the course of the program:

- all water valves, drain and pumps (where applicable).
- limit highest extraction speed.
- motor on/off after end of wash program.
- flush detergent.

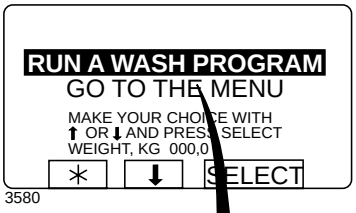
**Text (see section ”Text”)**
Display description of wash program (if available).

**Select a different wash program (see section ”To change the wash program after program operation has commenced”)**
You can switch to using a different wash program at any stage during the wash. Once this function has been selected, the current step (for example, rinse) of the earlier program will be allowed to finish and then the new program will start (from the beginning).

**Change temperature scale °C or °F (see section ”To change temperature scale °C/°F”)**

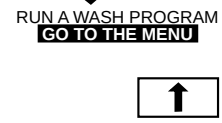
**Auto restart (see section ”Auto restart”)**
Here you enter the number of times you wish the wash program to restart automatically.

## To start a wash program from the program library




If this menu is not currently displayed:

**Press ⮌ repeatedly.**




If ”GO TO THE MENU” is highlighted:



**Press ⬆.**


When ”RUN A WASH PROGRAM” is highlighted:


**Press SELECT.**

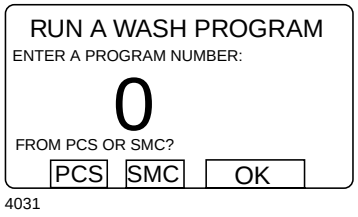
***What is the program library?***

The program library lists all wash programs, both user and standard programs, showing their program numbers and a description, for example:

| | |
|---|---|
| 1 | MY OWN 40 °C |
| 2 | MY OWN 60 °C |
| 3 | MY OWN 90 °C |
| 991 | NORMAL 95°C STD |
| 992 | NORMAL 60°C STD |
| 993 | NORMAL 40°C STD |
| 994 | INTENSIVE 95°C |
| 995 | INTENSIVE 60°C |
| 996 | PERM. PRESS 60°C |
| 997 | PERM. PRESS 40°C |
| 998 | LOW EXTRACT 1 MIN |
| 999 | HIGH EXTRACT 5 MIN |

Each time a new program is stored in the machine program memory, its number and description will be inserted automatically into the program library.

The program library may be used for starting a wash program, but is also used in programming, when a wash program needs to be modified or if a new program is to be created on the basis of an existing one.

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To select a program from the PCU program library:

**Press PCS.**

PCS

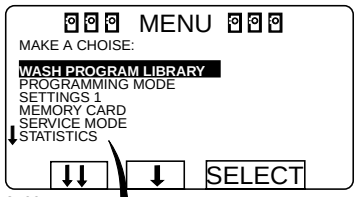
If there is a memory card in the PCU and you wish to select a program on that:

**Press SMC.**

SMC

***Select library via menu***

You can also select the program library via the option ”GO TO THE MENU”. Then select ”WASH PROGRAM LIBRARY”.

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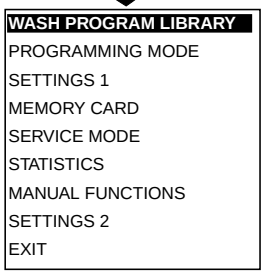
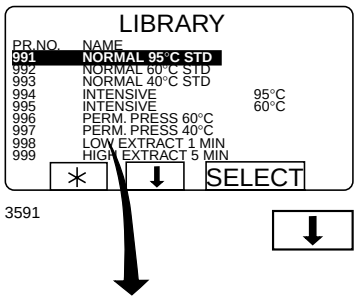
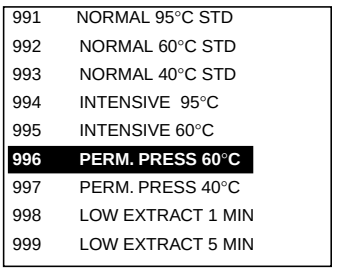



3591

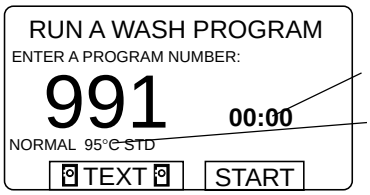



**Press ⬇ the required number of times...**

**...to highlight the wash program required.**

SELECT

**Press SELECT.**




3582

Delayed start time (hrs:mins)

Program name

If you want to see the description of the program:

**Press** TEXT

***Pressing "Text" displays more information***

The text displayed is a description of the wash program selected. This text description is inserted when a new wash program is created. This procedure is described fully in the programming manual.

**Choose 1 or 2:**

① START

**1** To start the program now:

**Press START.**

② 1 2 3 4 5 6 7 8 9 0

**2** Delayed start

**Use the numeric keys to enter a time (max. 27 hrs). This parameter appears on the right of the display.**

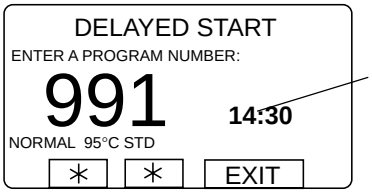
START

**Press START.**

**Delayed start**

Delayed start means that the machine will not start the wash program until the time entered has elapsed.

This function allows you, for example, to load the machine in the evening, but delay the start of the wash until early the next morning, to end in time for the next shift.



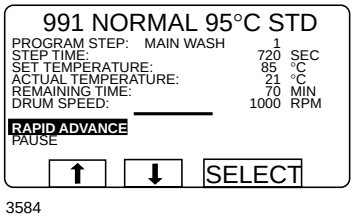

Time (in hours and minutes) left before the machine is to start.

OIf you want to cancel the delayed start:
**Press EXIT.**

EXIT

The functions which are available during program operation are described in sections "To change parameters in the current program step - Auto restart".

## To change parameters in the current program step




3584

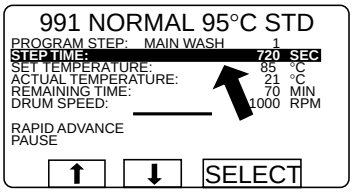
During program operation the display will look like this (see section "To start the wash program").

***You can alter the following program steps:***

**Prewash, Main wash, Rinse, Drain, Soak**
Length of program step (max. 9998 seconds), heating temperature (max. 97°C).

**Extraction**
Length of program step (max. 3600 seconds), extraction speed.

**Press ⬆ one or more times...**




**...to highlight the line required.**

***If you have entered the wrong parameter***

Continue pressing numeric keys to overstrike the incorrect parameter.

**Note:** always use the same number of digits as used on the display to overstrike the incorrect parameter.

Example:

To change the time for the program step to **30** seconds, enter **030** to overstrike the earlier parameter.

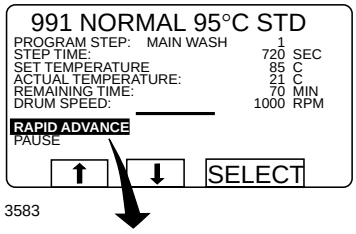
SELECT **Press SELECT.**

1 2 3
4 5 6
7 8 9
0

**Use the numeric keys to enter the new parameter.**

SELECT **Press SELECT.**

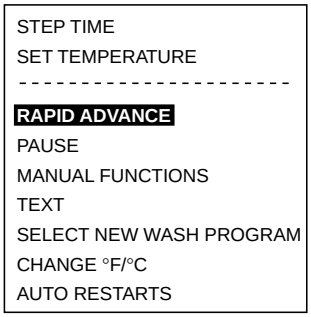
## Rapid advance




3583

During program operation the display will look like this (see section "To start the wash program").

**Check that ”RAPID ADVANCE” is highlighted.**



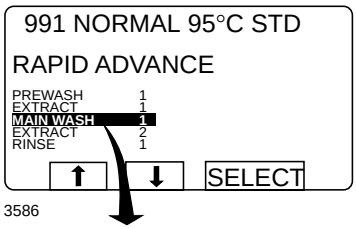

If it is not highlighted:

**Press ⬆ or ⬇ one or more times to highlight ”RAPID ADVANCE”.**


**Press SELECT.**

***To terminate a program before it has finished***

- Select RAPID ADVANCE and press SELECT. Advance to ”END OF PROGRAM” and press SELECT.
- Wait until ”THE DOOR IS UNLOCKED” appears on the display.
- Now the door can be opened.




3586

| | |
|---|---|
| PREWASH | 1 |
| EXTRACT | 1 |
| **MAIN WASH** | **1** |
| EXTRACT | 2 |
| RINSE | 1 |
| EXTRACT | 3 |
| RINSE | 2 |
| EXTRACT | 4 |
| RINSE | 3 |
| EXTRACT | 5 |
| END OF PROGRAM | |

**Press ⬇ or ⬆ one or more times to highlight the program step you wish to advance to.**

SELECT **Press SELECT.**

***Rapid advance works in both directions***

Rapid advance works in both directions, using ⬇ and ⬆.

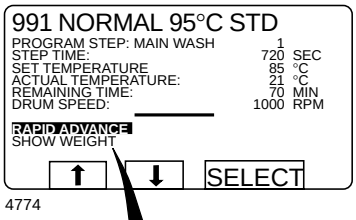
Using rapid advance to move forwards allows you to skip one or more program steps. Using rapid advance backwards allows you to repeat one or more program steps.

***Automatic return to normal display***

Once you have selected any of the functions below, you must make any changes required within 20 seconds. If no further keys are pressed within 20 seconds, the display will revert automatically to its normal appearance during a wash program.

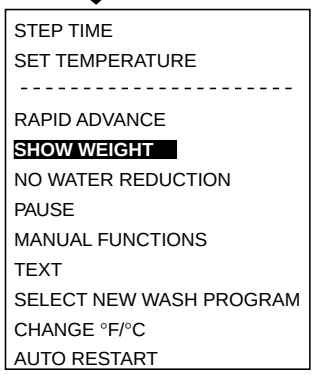
**For machines with weighing equipment installed only!**

## Show weight




4774

During program operation the display will look like this (see section ”To start the wash program”).



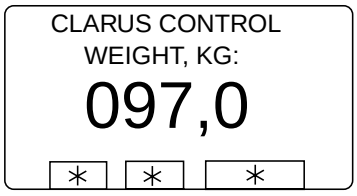

**Press ⬆ or ⬇ one or more times to highlight ”SHOW WEIGHT”.**

**Press SELECT.**

***Show weight***

The actual weight is shown in large digits on the display (weight display mode).

If the weighing equipment is not connected, the error message “FUNCTION NOT ALLOWED” will appear. See the section “Fault-finding, weighing equipment” in the machine manual.




4775

Weight display mode:

The actual net weight is shown in large digits on the display.

***Return to normal display***

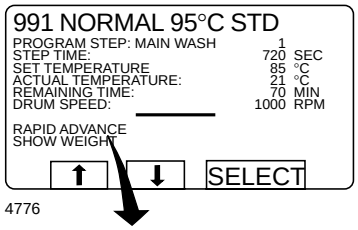
The display will return to normal at the end of the ”time for weight display” set as a parameter in Settings 1. The manufacturer’s default parameter is 20 seconds.

***To end weight display sooner***

Press ↩ or use the numeric keys to enter a new program number.

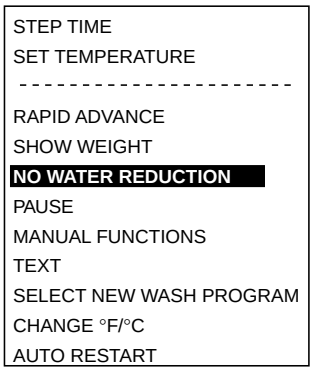
**For machines with weighing equipment installed only!**

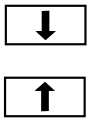
## No water reduction




4776

During program operation the display will look like this (see section ”To start the wash program”).



**Press ⬆ or ⬇ one or more times to highlight ”NO WATER REDUCTION”.**

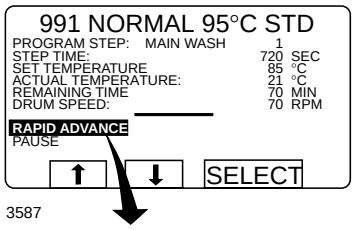

**Press SELECT.**

***No water reduction***

The wash load is weighed during the program and the water level is adjusted automatically according to its weight. If the load is not a full one, the water level will be reduced according to a water level reduction table. You can switch off water level reduction at any stage of a program.

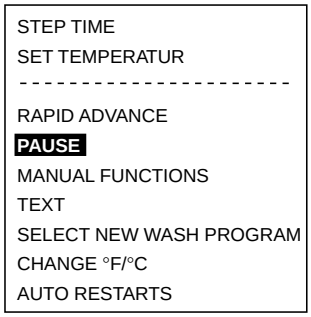
Note that if you select ”NO WATER REDUCTION”, this applies only to the program currently running. The next time a program is started, water level reduction will occur automatically again.

## Pause



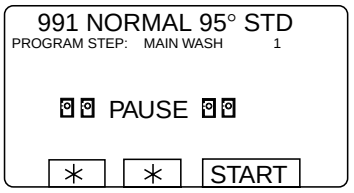

3587

During program operation the display will look like this (see section "To start the wash program").




**Press ⬆ or ⬇ one or more times to highlight "PAUSE".**

**Press SELECT.**




3588

**Press START to restart the wash program.**

***Two ways of pausing during a wash program***

Note that you must be in normal wash mode to be able to pause in this way. If, for example, you are using "Manual Functions", you will have to exit that first before you can use Pause.

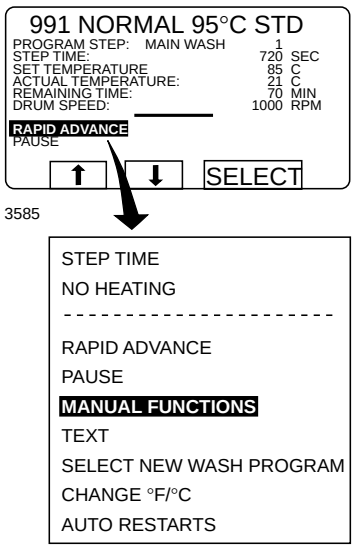
There are two ways of pausing during a wash program:

1 As an additional function. This is described in this section.
2 By pressing ⮌.

***When the machine pauses:***

- Program operation is halted.
- Filling is halted (where applicable).
- Heating is halted (where applicable).
- The motor stops.
- The drain valve remains closed.
- The door cannot be opened.

## Manual operation during a program




During program operation the display will look like this (see section **"To start the wash program").**

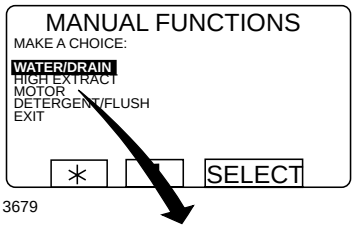
**Press ⬆ or ⬇ one or more times to highlight ”MANUAL FUNCTIONS”.**


**Press SELECT.**

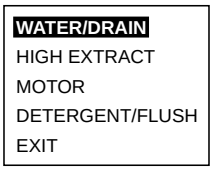
***Two types of manual operation***

There are two types of manual operation, which should not be confused:

- **Manual operation during a program**
  These functions are described in this section.
- **Manual operation when no program is running**
  These functions are described in **section "Manual operation"**.




3679




**Use the cursor keys to select the function.**

SELECT **Press SELECT.**

***Automatic return to normal display***

Once you have selected any of the functions below, you must make any changes required within 20 seconds. If no further keys are pressed within 20 seconds, the display will revert automatically to its normal appearance during a wash program.

***Manual functions during a wash program***

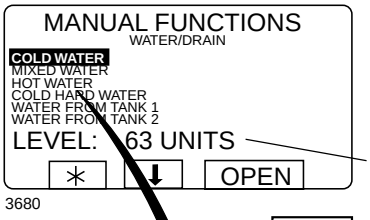
**Water/drain (see section "Water/drain")**
Allows manual operation of all water valves and the drain valve.

**Highest extraction speed (see section "Maximum extraction speed")**
Here you can limit the maximum extraction speed for the current program.

**Motor (see section "Motor on after wash")**
Motor on/off after program has ended.

**Detergent valves (see section "Detergent signals and water flushing")**
Allows you to control all valves in the detergent compartment or in external detergent supply system.

## Water/drain

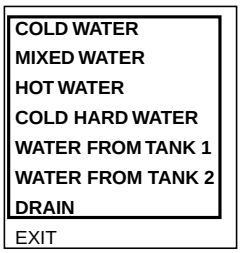



3680

To access this function, see instructions in section "Manual operation".

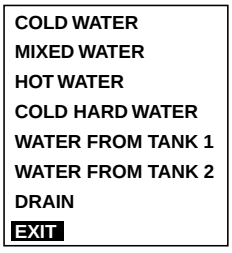
Water level in drum

**Use ⬇ and ⬆ to select the water/drain option you require.**




OPEN

Press OPEN.
The function will be activated for as long as you press and hold this key. The function ceases as soon as you release the key.



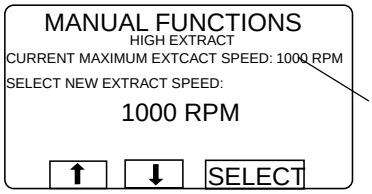

When you have finished:

**Press ⬇ repeatedly to highlight "EXIT".**

SELECT

**Press SELECT.**

## Maximum extraction speed



3681

To access this function, see instructions in section "Manual operation".

Maximum extraction speed in current program.

1 2 3
4 5 6
7 8 9
0

**Enter the maximum extraction speed you require for this program.**

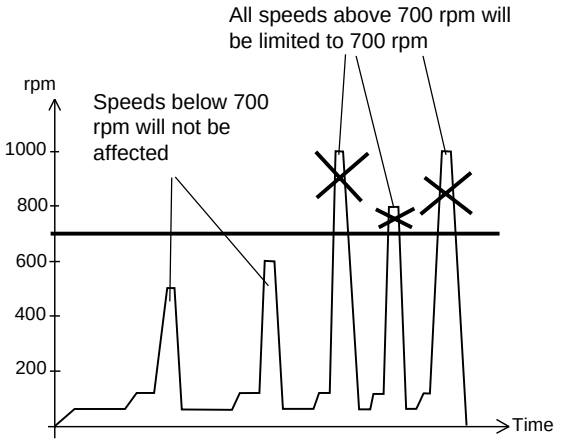
SELECT **Press SELECT.**

***To limit the program's highest extraction speed***

This function allows you to modify the highest extraction speed allowed during the program.

Example:

Assume that the highest speed in the program is 1000 rpm and that you have set 700 rpm as the highest speed allowed.

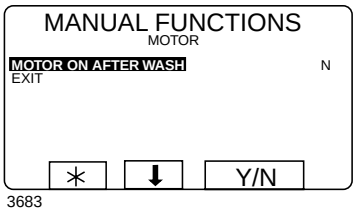


3682

This change will affect the current program only. No change will be implemented if extraction is taking place at the time of the (attempted) change.The next time that this program is used, the original maximum speed will apply.

This function does not allow you to set a **higher** speed than the usual maximum speed for the program.

## Motor on after wash



3683

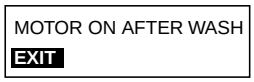
To access this function, see instructions in section "Manual mode".

Y/N

A toggle function:
**Use Y/N to toggle the function from ON (Yes) to OFF (No).**

⬇

When you have finished:
**Press ⬇ to highlight "EXIT".**




SELECT

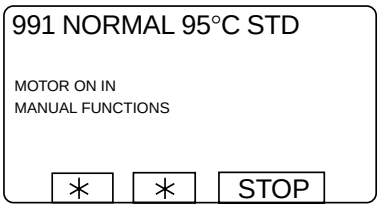
**Press SELECT.**

***Motor to rotate after program has ended***

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

The motor will continue to rotate in alternative directions after the program has ended. This prevents creasing of the load.

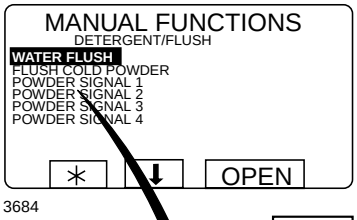
When the program has ended, the display will look like this:



4111

**Press STOP to stop the motor.**

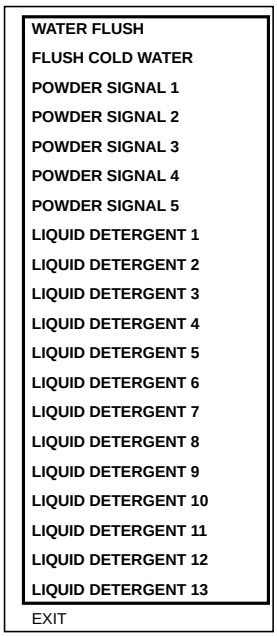
## Detergent signals and water flushing




3684

To access this function, see instructions in section "Manual mode".

**Use ⬇ and ⬆ to select the function you require.**



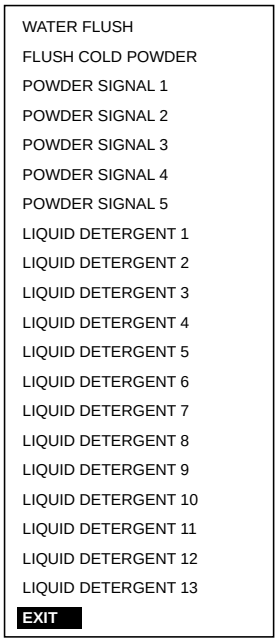

***Detergent signals and water flushing***

**FLUSH WATER:**
This function uses water to clear detergent from the supply tubes of the detergent dispensing system.

**POWDER SIGNAL:**
This function will either: a) use water to dispense detergent from machine compartments, or: b) dispense detergent from an external system. The number of valves present will vary according to the machine type.

OPEN

**Press OPEN.**
The function will be activated for as long as you press and hold this key. The function ceases as soon as you release the key.

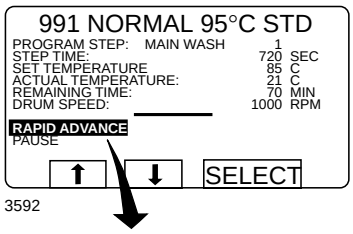



When you have finished:
**Press ⬇ repeatedly to highlight "EXIT".**

SELECT

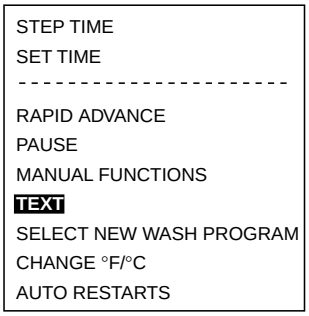
**Press SELECT.**

## Text




3592

During program operation the display will look like this (see section "To start the wash program".




**Press ⬆ or ⬇ one or more times to highlight "TEXT".**

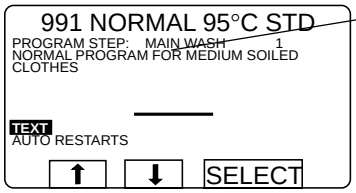
⬇

⬆

SELECT

**Press SELECT.**

---




3630

Description of wash program

SELECT

To return to the normal display:
**Press SELECT** again.

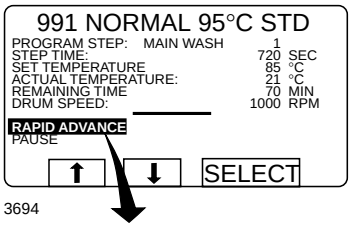
***Pressing "Text" displays more information***

The text displayed is a description of the wash program selected. This text description is inserted when a new wash program is created. This procedure is described fully in the programming manual.

***Automatic return to normal display***

If you do not press SELECT within 20 seconds, the display will revert automatically.

## To change the wash program after program operation has commenced




3694

During program operation the display will look like this (see section "To start the wash program".

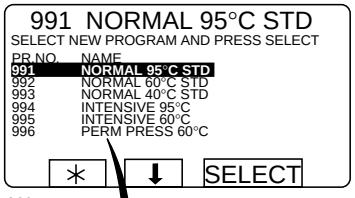

**Press ⬆ or ⬇ one or more times to highlight "SELECT NEW WASH PROGRAM".**


**Press SELECT.**

***To change the wash program after program operation has commenced***

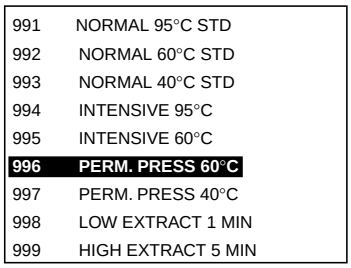
You can change to a different wash program at any time during program operation. When you do, the current function (for example, rinse) will be interrupted. The new program will start immediately after that (from the beginning).

This function is useful, for example, if you discover that you have started the wrong program.



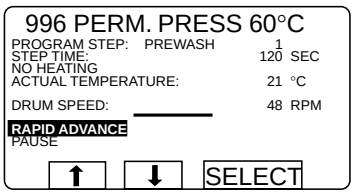

3695

**Press ⬇ one or more times as required...**




**...to highlight the new wash program.**


**Press SELECT.**

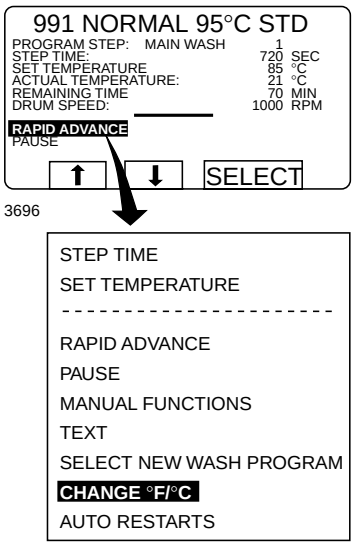



The existing wash program will now be interrupted and the new one will begin.

***Automatic return to normal display***

If no key is pressed within 20 seconds, the display will revert automatically.

## To change temperature scale °C/°F




During program operation the display will look like this (see section "To start the wash program".

**Press ⬆ or ⬇ one or more times to highlight "CHANGE °C/°F".**

**Press SELECT.**

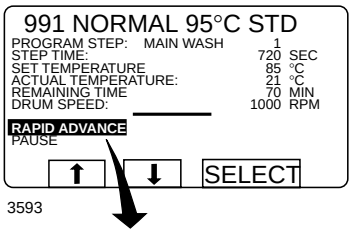
***To change temperature scale °C/°F***

This function changes the temperature scale used for all temperatures displayed during the wash program.

Please note that this scale change applies only to the current program. The default temperature scale will apply next time you run a program.

To change the default temperature scale for all programs, use the function "SETTINGS", which is described in the Service Manual.

## Auto restart




3593


**Press ⬇ one or more times to highlight "AUTO RESTART".**

⬇

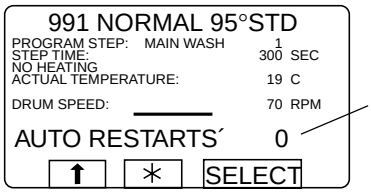
⬆

SELECT **Press SELECT.**

***What is Auto restart?***

Auto restart means that the same program will be repeated one or more times, according to the number set. The program will restart immediately, and the door will remain locked. If you have set auto restart, the display will show the number of restarts left.

This function is used primarily for testing.




3594

Shows the number of times the program will restart.

1 2 3
4 5 6
7 8 9
0

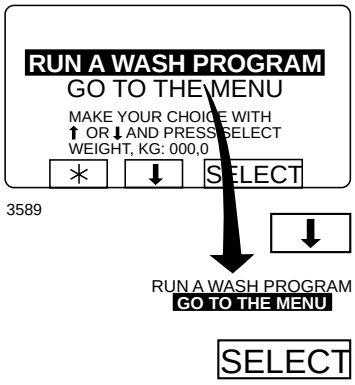
If required:
**Use the numeric keys to change the required number of restarts.**

SELECT

**Press SELECT.**

# Manual operation

## To select manual operation



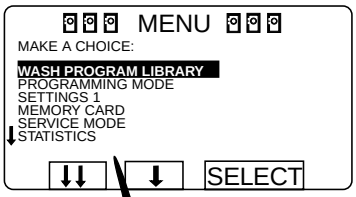

If this menu is not currently displayed:
**Press ⮌ repeatedly.**



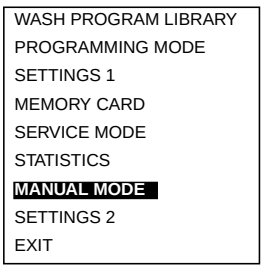

**Press ⬇ to highlight "GO TO THE MENU".**




**Press SELECT.**




**Press ⬇ six times...**




**....to highlight "MANUAL MODE".**


**Press SELECT.**

***Two types of manual operation***

There are two types of manual operation, which should not be confused:

- **Manual operation when no program is running**
  These functions are described in this section.
- **Manual operation during a program**
  These functions are described in **section "Manual operation"**.

***Always lock the door first!***

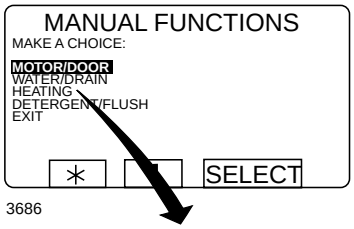
You must always close and lock the door first before you can operate the machine manually.

To lock the door, use the submenu MOTOR/DOOR, **see section "Motor/door"**.

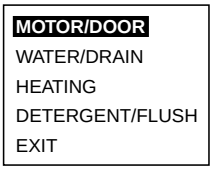
***All manual settings are cancelled when you exit manual operation***

All manual settings (such as door, motor, temperature, and drain) will be cancelled when you exit manual operation.

The door is unlocked, the motor stops, the drain opens, heating is halted, and the temperature is reset to zero.




3686




**Select the function required using the cursor keys.**

**Press SELECT.**

***Manual operation when no program is running***

**Motor/door (see section "Motor/door")**
Lock/unlock door. Switch motor on/off (normal drum action).

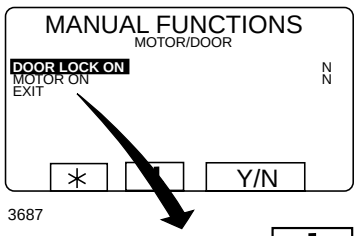
**Water and drain valves (see section "Water/drain")**
Operation of drain valve and all water valves.

**Heating (see section "Heating")**
Heat water to any temperature required.

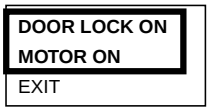
**Detergent valves (see section "Detergent signals and water flushing")**
Allows manual operation of all valves in detergent compartment or external detergent supply system.

**Exit**
Returns you to the MENU display.

## Motor/door




3687



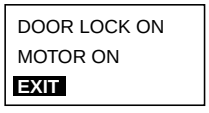

**Press ⬇ as required to select a function.**

A toggle function:

**Use Y/N to toggle the function from ON (Yes) to OFF (No).**

When you have finished:

**Press ⬇ to highlight "EXIT".**




**Press SELECT.**

***Lock the door and start the motor***

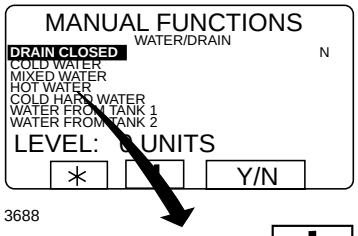
**DOOR LOCK ON**
If you answer **Yes (Y):**

The door will be locked. Note that you must always lock the door before you can operate the machine manually.

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

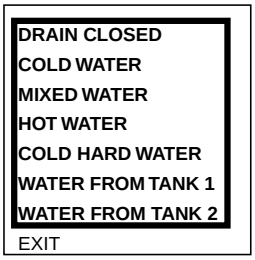
The motor will start and operate, using normal action.

## Water/drain




To access this function, see instructions in section "To select manual operation".

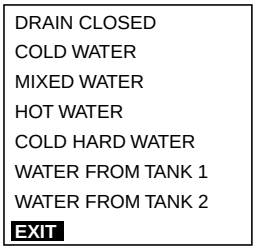
**Use ⬇ or ⬆ to select Drain or one of the six Water filling alternatives.**




Drain (a toggle function) :
**Press Y/N to toggle the function from Yes (Y) and No (N).**


Water filling:
**Press OPEN.**
The function will be activated for as long as you press and hold this key. The function ceases as soon as you release the key.

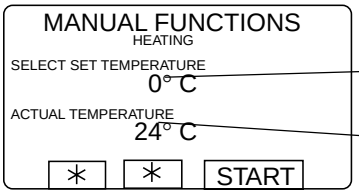

When you have finished:
**Press ⬇ to highlight ”EXIT”.**





**Press SELECT.**

## Heating

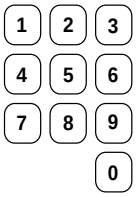



3689

To access this function, see instructions in section "To select manual operation".

Temperature selected

Actual temperature




**Use the numeric keys to enter the temperature the water is to be heated to.**

START

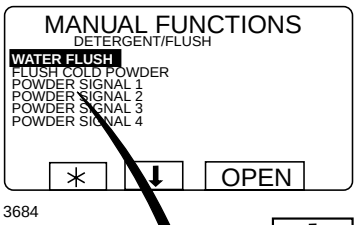
**Press START.**
Heating will now begin.

STOP

If you wish, you can cancel heating before the set temperature is reached:

**Access this function again and press STOP.**

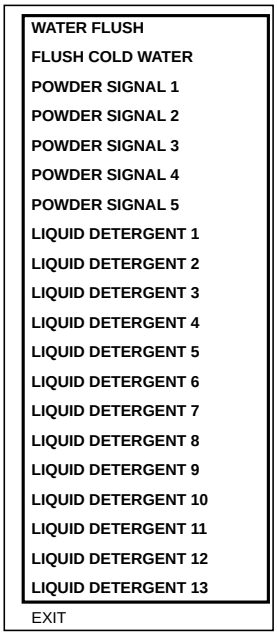
## Detergent signals and water flushing




3684

To access this function, see instructions in section "To select manual operation".

**Use ⬇ and ⬆ to select the function you require.**




***Detergent signals and water flushing***

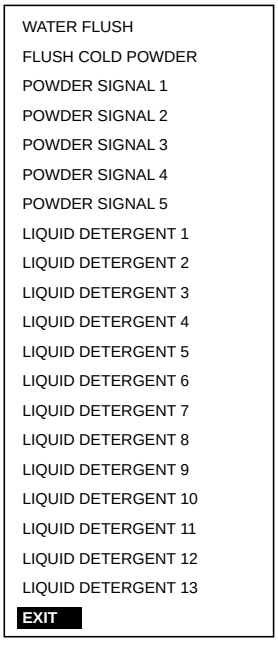
**FLUSH WATER:**
This function uses water to clear detergent from the supply tubes of the detergent dispensing system.

**POWDER SIGNAL:**
This function will either: a) use water to dispense detergent from machine compartments, or: b) dispense detergent from an external system. The number of valves present will vary according to the machine type.

**Press OPEN.**

OPEN

The function will be activated for as long as you press and hold this key. The function ceases as soon as you release the key.




When you have finished:

**Press ⬇ repeatedly to highlight "EXIT".**

SELECT

**Press SELECT.**

## At the end of the wash

Machines without tilt function:

Open the machine door and remove the washed load.

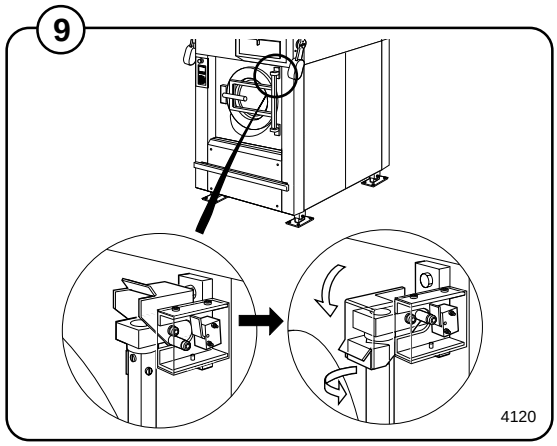
Machines with tilt function:

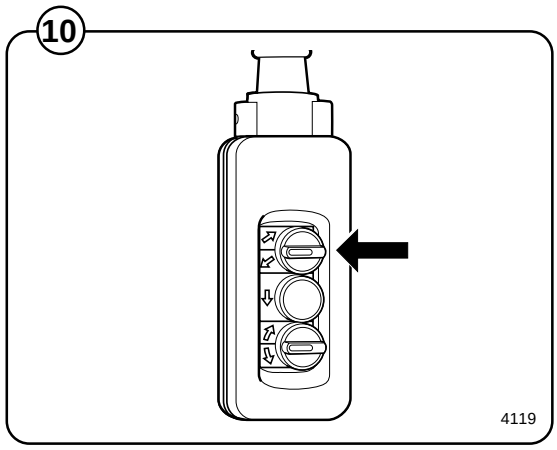
Fig. 9
- Open the door and lock it open by lowering the catch by the door hinge.

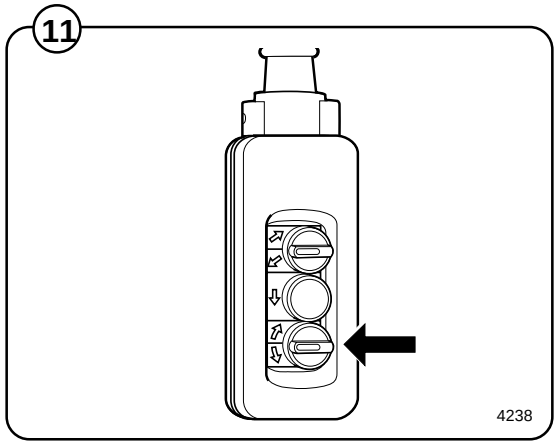
Fig. 10
- Turn the uppermost switch on the tilt control unit clockwise. The machine will now tilt forward.

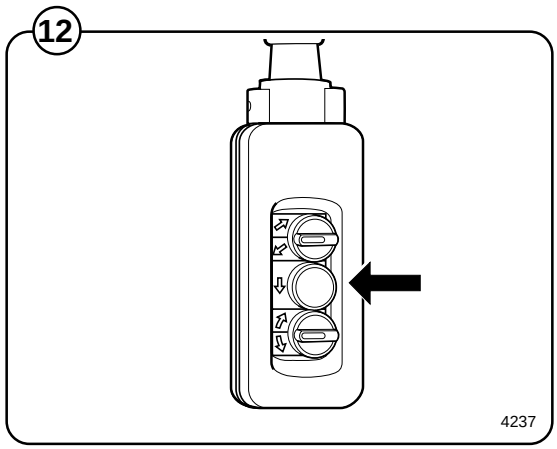
Fig. 11
- Use the bottom switch on the tilt control unit to rotate the drum, either to the right or the left. This makes it easier to empty the drum.

Fig. 12
- Press the middle switch on the tilt control unit. The machine will now return to its normal position.



# Statistics

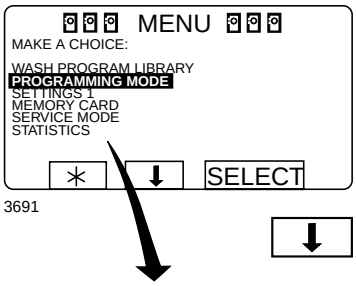
## To select Statistics


If this menu is not currently displayed:

**Press ⮌ repeatedly.**

**Press ⬇ to highlight ”GO TO THE MENU”.**

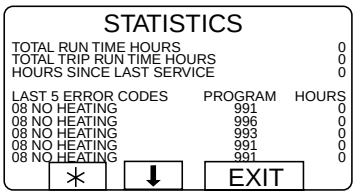
**Press SELECT.**




**Press ⬇ five times...**

**...to highlight ”STATISTICS”.**

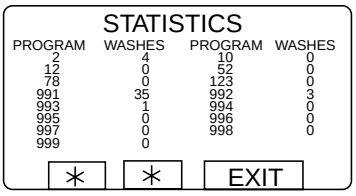
**Press SELECT.**




3690

To display the next page of statistics:

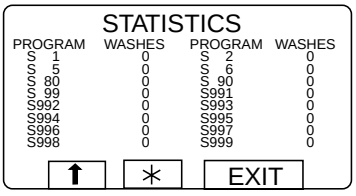
**Press ⬇.**




3958

To display the next page of statistics:

**Press ⬇.**




4040

If a memory card is in place in the PCU, the memory card program statistics will be displayed. An ”S” before the program number shows that it is a memory card program.


When you want to cancel the display of statistics:

**Press EXIT.**

***The Statistics function***

The Statistics function gives you access to the following information:

**TOTAL RUN TIME HOURS:**

Shows the total operating time for the machine since it was installed.

**TOTAL TRIP RUN TIME HOURS:**

This register records the total number of operating hours since it was last reset. It can, for example, be used to keep track of operating time since the last machine service. The procedure for resetting it is described in **section "To reset "Total trip run time hours" to zero"**.

**HOURS SINCE LAST SERVICE**

This register shows the time elapsed since the last service. The register can also be used to generate a signal on the display to show when service is needed (see the section ”Settings 1” in the service manual).

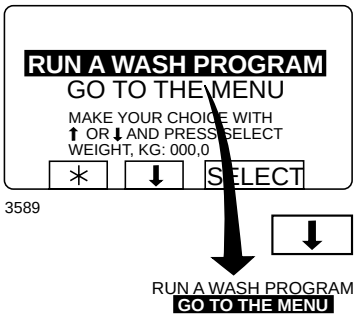
**LAST 5 ERROR CODES:**

This displays the most recent error codes, and tells which program was operating at the time and during which hour (according to the ”total run time” record) the error code was flagged.

**NO. OF TIMES EACH PROGRAM USED:**

Displays statistics for PCU programs and for programs on any memory card currently in place in the PCU.

## Resetting statistic registers




If this menu is not currently displayed:

**Press ↩ repeatedly.**

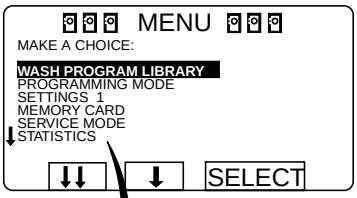
**Press ↓ to highlight "GO TO THE MENU".**

**Press SELECT.**

***Statistics registers which can be reset to zero***

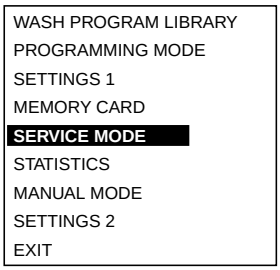
The following registers in the statistics function can be cleared (reset to zero):

- Total trip run time hours.
- Hours since last service.
- No. of times each program used (PCU programs).
- No. of times each program used (programs on any memory card currently in the PCU).




3693

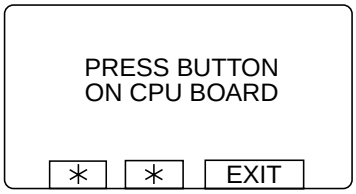
**Press ⬇ ..four times....**




**... to highlight "SERVICE PROGRAM".**

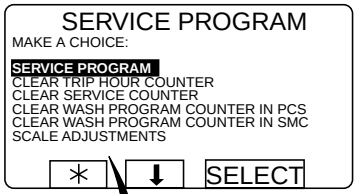
SELECT

**Press SELECT**




4209

**Press the button on the CPU circuit board.**




4042

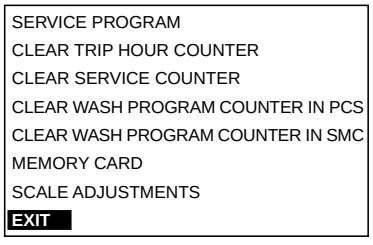
Now you can choose either to clear/reset a register or to adjust the weighing equipment.

**Press ⬇ to highlight the option you want, then press SELECT.**

SELECT

If you want to exit:

**Press ⬇ repeatedly until EXIT is highlighted.**



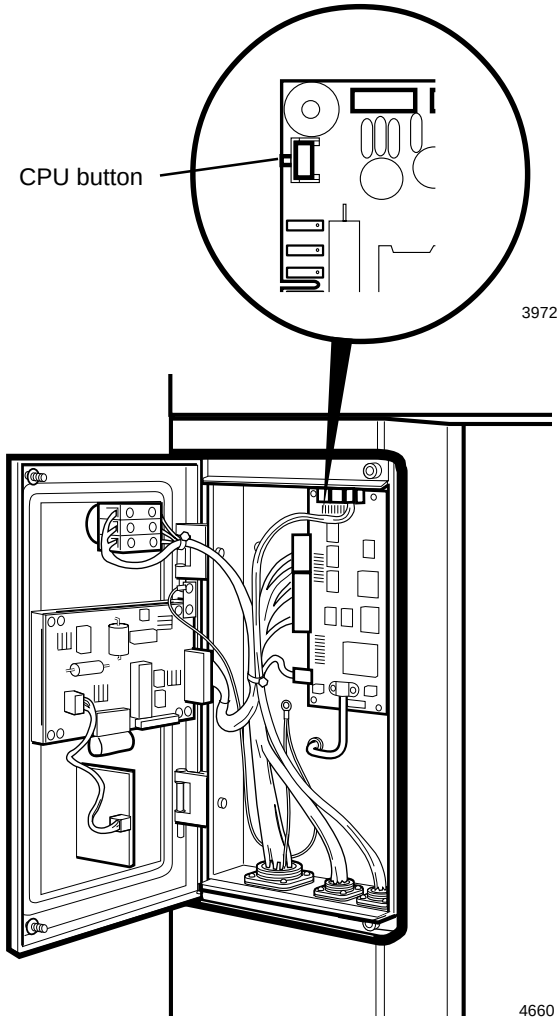

SELECT

**Press SELECT.**

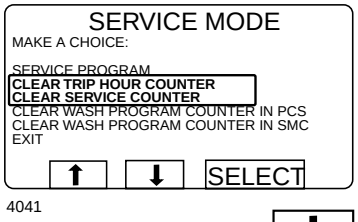
**The service program may only be used by authorised personnel, because all safety interlocks are disabled when it is in use.**

***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.



## Time counter, hours after last service

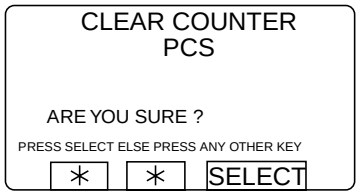



4041

Both counters can be reset in the same way.

**Press ⬇ so that CLEAR TRIP HOUR COUNTER OR CLEAR SERVICE COUNTER will be marked.**

**Press SELECT.**




4043

First you have a chance to change your mind.

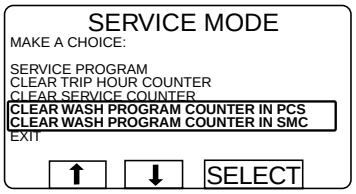
If you **do not want to reset** the register:

**Press any key <u>other than</u> SELECT.**

If you want to reset the register:

**Press SELECT.**

## Number of washes for program in timer or memory card

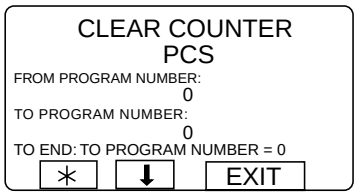



4044

You can reset program in both timer and the memory card (if inserted).

**Press ⬇ so that CLEAR WASH PROGRAM COUNTER IN PCS or CLEAR WASH PROGRAM COUNTER IN SMC will be marked.**

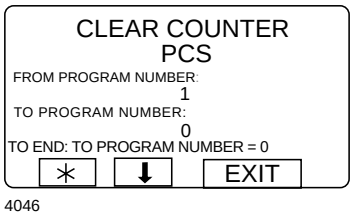
**Press SELECT.**




4045

Write from which program number you want to clear wash programs.

**Press ⬇.**



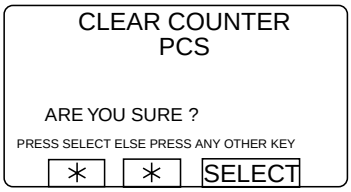

4046

1 2 3
4 5 6
7 8 9
0

Enter digits corresponding to the program number (inclusive) up to which you wish to clear the total counter.

ERASE

**Press ERASE.**




4043

First you have the chance to change your mind.

If you **do not want to** reset the register:

**Press any key other than SELECT.**

If you do want to reset the register:

SELECT

**Press SELECT.**

Now the totals of the program numbers you have specified will be cleared.

If you wish to change any numbers you have entered:

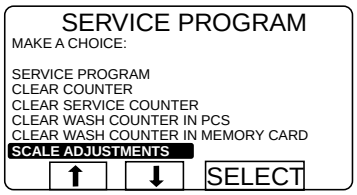
**Press ⬆ if you want to change the first number entered. Enter the new number.**

If you change your mind:

**Press ↩.**

**For machines with weighing equipment installed only!**

## Scale adjustments

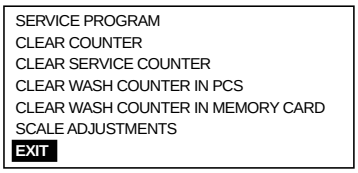



4777

**Press ⬇ repeatedly until SCALE ADJUSTMENTS is highlighted.**


**Press SELECT.**

**When you have finished: Press ⬇ repeatedly until EXIT is highlighted.**





**Press SELECT.**

***Scale adjustments***

The following functions are accessed via the SCALE ADJUSTMENTS menu:

**Reset scale to zero (see section ”Reset scale to zero”)**
Used to make the weighing equipment display 0 when the machine has no load in it.

**Reset tare to zero (see section ”Reset tare to zero”)**
Used to clear a stored tare parameter.

**Tare scale (see section ”Tare scale”)**
Used to reset the weighing equipment so that a weight such as a container will not be included when calculating net weight.

**Set tare to a certain value (see section ”Set tare to a certain value”)**
Used to enter a value for the tare parameter, a weight in hectograms.

**Read tare value (see section ”Read tare value”)**
Used to check the value currently stored as the tare parameter.

**Calibrate the scale (see section ”Calibrate the scale”)**
This function is used only on installation of a new scale unit.

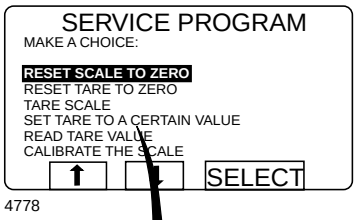
**Zero calibration (see section ”Zero calibration”)**
Used to increase the accuracy of the weighing equipment.

**Read version number (see section ”Read version number”)**
This is where you find the version number of the weighing equipment.

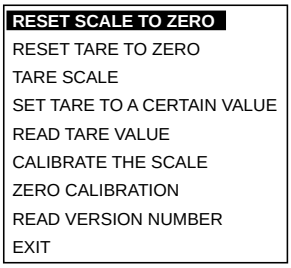
If the weighing equipment is not connected, the error message “WEIGHING EQUIPMENT NOT CONNECTED” will be displayed. Connect the weighing equipment and try again. If necessary, see the section “Fault-finding, weighing equipment” in the machine manual.

**For machines with weighing equipment installed only!**

*Reset scale to zero*




4778

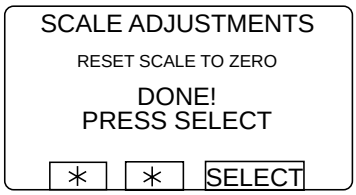



**Check that ”RESET SCALE TO ZERO” is highlighted.**

If it isn't...

**Press ⬆ or ⬇ as required to highlight ”RESET SCALE TO ZERO”.**

**Press SELECT.**




4779

This screen shows that the weighing equipment has been reset to zero.

**Press SELECT.**

***Reset scale to zero***

”Reset weighing equipment” is used to make the weighing equipment display 0 when the machine has no load in it.

If your attempt to reset the weighing equipment fails at this point, you will see an error message equivalent to: “FAILED. PRESS SELECT” on the display. For troubleshooting, see the section “Fault-finding, weighing equipment” in the machine manual.

***Please note:***

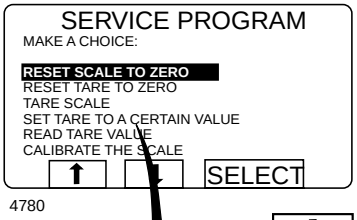
The machine must be unladen when you use this function, i.e. no water or wash load in the drum.

***Please note:***

After a power-cut, the weighing equipment will always display 0, no matter what the actual load in the drum. In this event you will have to use the “Reset scale to zero" function.

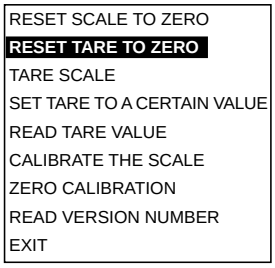
**For machines with weighing equipment installed only!**

*Reset tare to zero*

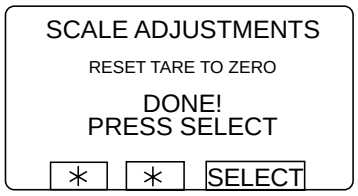



4780

**Press ⬇ once to highlight "RESET TARE TO ZERO".**




SELECT **Press SELECT.**




4781

This screen shows that the stored tare parameter has been cleared.

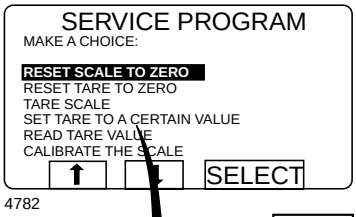
SELECT **Press SELECT.**

***Reset tare to zero***

If your attempt to clear the tare parameter fails at this point, you will see an error message equivalent to: "FAILED. PRESS SELECT" on the display. For troubleshooting, see the section "Fault-finding, weighing equipment" in the machine manual.

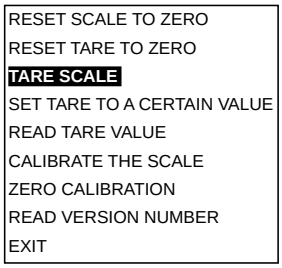
**For machines with weighing equipment installed only!**

*Tare scale*

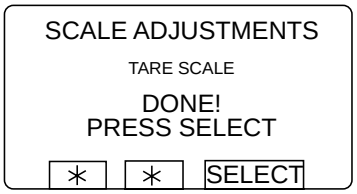



4782

**Press ⬇ twice to highlight ”TARE SCALE”.**




SELECT **Press SELECT.**




4783

This screen shows that the weighing equipment has been tared successfully.

SELECT **Press SELECT.**

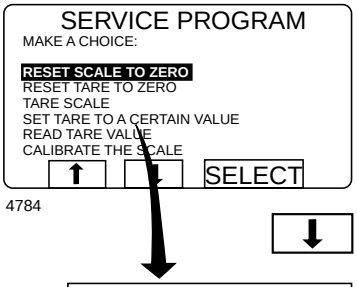
***Tare scale***

This function involves first loading the drum with, for example, a container, then taring (resetting) the weighing equipment so that the weight of the container will not be included when calculating net weight.

If your attempt to tare the weighing equipment fails at this point, you will see an error message equivalent to: “FAILED. PRESS SELECT” on the display. For troubleshooting, see the section “Fault-finding, weighing equipment” in the machine manual.

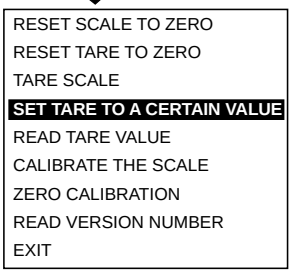
**For machines with weighing equipment installed only!**

*Set tare to a certain value*

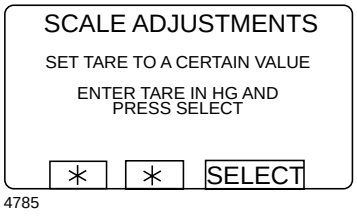



4784

**Press ⬇ three times to highlight "SET TARE TO A CERTAIN VALUE"**




SELECT **Press SELECT.**

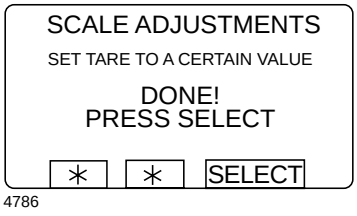



4785

1 2 3
4 5 6
7 8 9
0

**Use the numeric keys to enter the tare you require, unit: hectograms; 1 hectogram = 100 grams).**

SELECT **Press SELECT.**




4786

This screen shows that the parameter has been entered successfully.

SELECT **Press SELECT.**

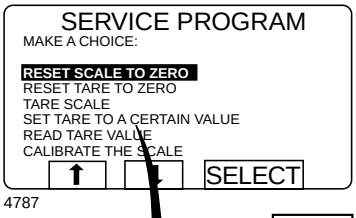
***Set tare to a certain value***

This function lets you enter a value for the tare parameter, i.e. a weight value which the weighing equipment will disregard when showing a net weight on the display. The function will automatically clear any earlier tare value when you enter a new one.

If your value is not entered successfully at this point, you will see an error message equivalent to: "FAILED. PRESS SELECT" on the display. For troubleshooting, see the section "Fault-finding, weighing equipment" in the machine manual.

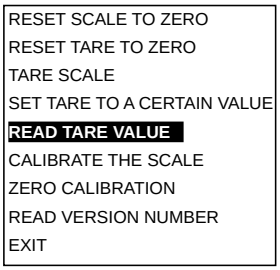
**For machines with weighing equipment installed only!**

*Read tare value*

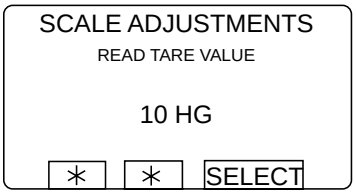



4787

**Press ⬇ four times to highlight ”READ TARE VALUE”.**




SELECT **Press SELECT.**




4788

This screen shows the stored tare parameter (unit: hectograms (1 hectogram = 100 grams).

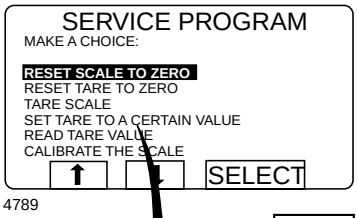
SELECT **Press SELECT.**

***Read tare value***

This function lets you check the value currently stored as the tare parameter.

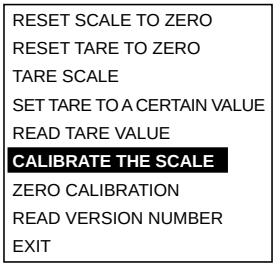
**For machines with weighing equipment installed only!**

*Calibrate the scale*

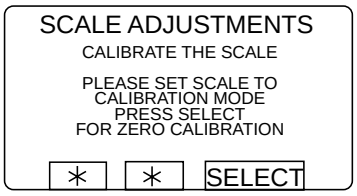



4789

**Press ⬇ five times to highlight ”CALIBRATE THE SCALE”.**



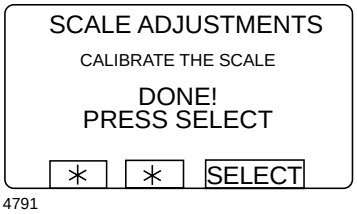

SELECT **Press SELECT.**




4790

**Set the calibration switch to calibration mode.**

SELECT **Press SELECT.**




4791

SELECT **Press SELECT.**

***Please note:***

This function is used only on installation of a new scale unit.

***Calibrate the scale***

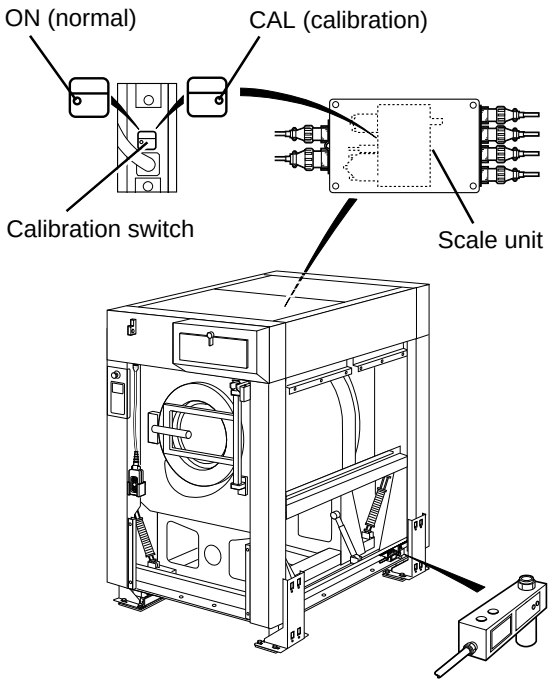
If this calibration has not succeeded you will see an error message equivalent to: “FAILED. PRESS SELECT” on the display. For troubleshooting, see the section “Fault-finding, weighing equipment” in the machine manual.

***Please note:***

The machine must be unladen at the start of calibration, i.e. no water or wash load in the drum.

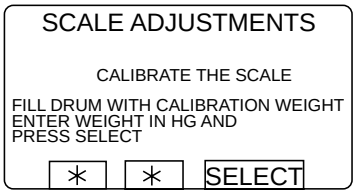
***Calibration mode/normal mode***

To gain access to the calibration switch in the scale unit, the left-hand rear side panel has to be taken off. Remove the four screws on the scale unit cover. Then the calibration switch can be switched between normal mode ”ON” and calibration mode ”CAL”.




4758

**For machines with weighing equipment installed only!**



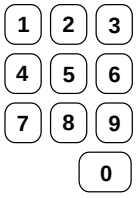

4792

**Put the calibration weight in the drum.**

***Calibration weight***

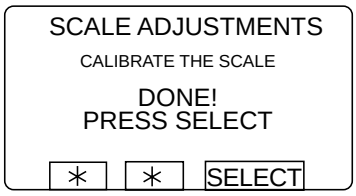
A weight of between 40 kg and 400 kg should be used as a calibration weight.

The higher the weight (within these limits), the better the weighing accuracy of the machine.



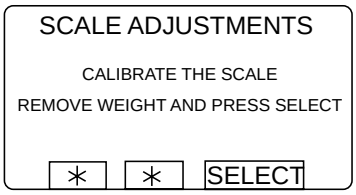

**Use the numeric keys to enter the calibration weight in hg (1 hg = 100 grams).**

SELECT **Press SELECT.**




4791

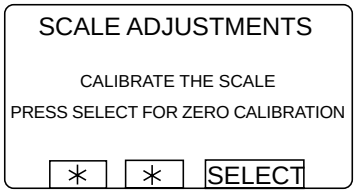
SELECT **Press SELECT.**




4793

**Remove the calibration weight.**

SELECT **Press SELECT.**




4794

If you want to use the ”Calibrate zero” function now:

SELECT **Press SELECT.**

**For machines with weighing equipment installed only!**

SCALE ADJUSTMENTS

CALIBRATE THE SCALE

DONE!
PRESS SELECT

[*] [*] SELECT

4791

SELECT **Press SELECT.**

SCALE ADJUSTMENTS

CALIBRATE THE SCALE

RESET SCALE FROM CALIBRATION MODE AND PRESS SELECT

[*] [*] SELECT

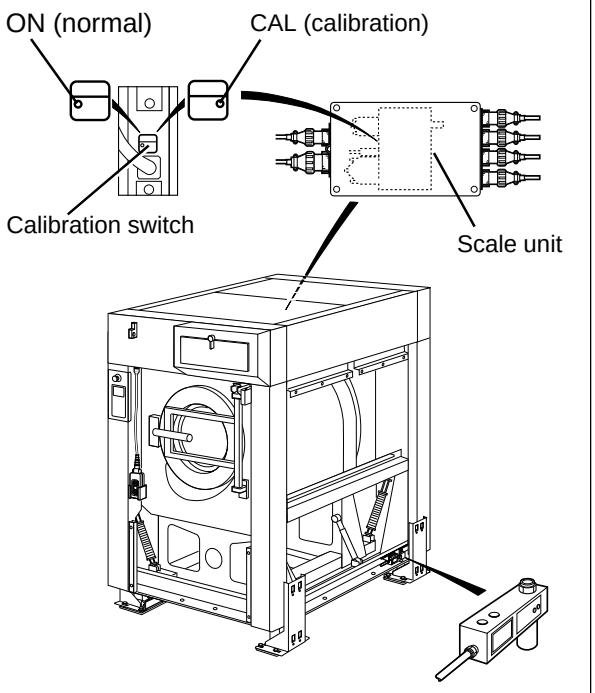
4795

**Restore the calibration switch to normal mode.**

SELECT **Press SELECT.**

***Calibration mode/normal mode***

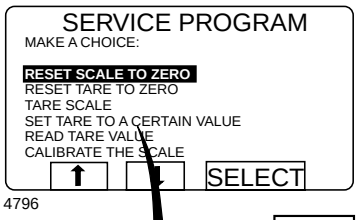
To gain access to the calibration switch in the scale unit the left-hand rear side panel has to be taken off. Remove the four screws on the scale unit cover. Then the calibration switch can be switched between normal mode ”ON” and calibration mode ”CAL”.




4758

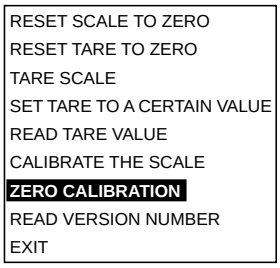
**For machines with weighing equipment installed only!**

*Zero calibration*

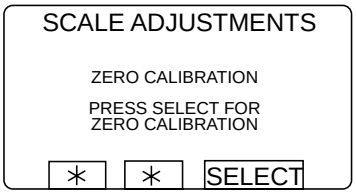



4796

**Press ⬇ six times to highlight "ZERO CALIBRATION".**



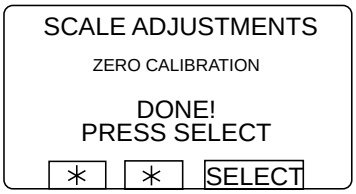

SELECT **Press SELECT.**




4797

If you wish to calibrate zero for the weighing equipment:

SELECT **Press SELECT.**




4798

This screen shows you have calibrated zero.

SELECT **Press SELECT.**

***Zero calibration***

The "Zero calibration" function is used to increase the accuracy of the weighing equipment. This should be done once a month.

If this calibration has not succeeded you will see an error message equivalent to: "FAILED. PRESS SELECT" on the display.

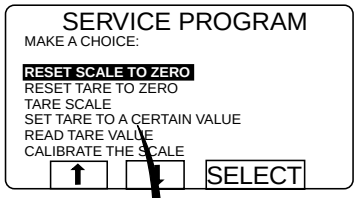
For troubleshooting, see the section "Fault-finding, weighing equipment" in the machine manual.

***Please note:***

The machine must be unladen during this calibration, i.e. no water or wash load in the drum.

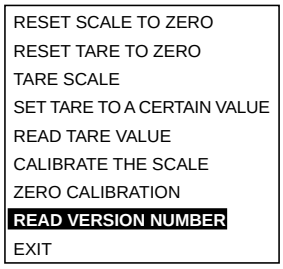
**For machines with weighing equipment installed only!**

*Read version number*

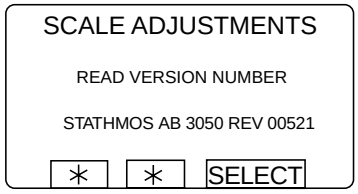



4799

**Press ⬇ seven times to highlight ”READ VERSION NUMBER”.**




SELECT **Press SELECT.**




4800

The screen shows the version number.

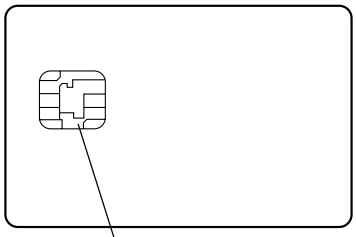
SELECT **Press SELECT.**

***Read version number***

In the event of a fault in the weighing equipment (which cannot be put right with the aid of the section “Fault-finding, weighing equipment” in the machine manual), make a note of the version number accessed via this function before you contact the supplier’s service department.

# Memory card

## General introduction



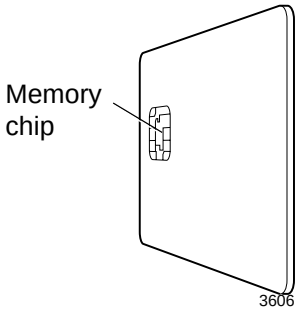

A memory card is a plastic card, the size of a credit card, with an electronic memory chip inside it. This memory card is capable of storing 10 to 15 wash programs of normal size. If the programs are mostly small ones, more of them can be stored, whereas larger programs will reduce the number which can be held by the memory card. Memory cards of this type can be used to:

- transfer wash programs from one machine to another
- run wash programs straight from the memory card
- transfer wash programs from a PC to a memory card and from a memory card to a PC (these procedures, and how to write a wash program on a PC, are described elsewhere)

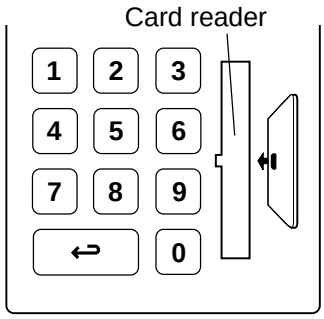
A program stored on a memory card may be given restricted-use status. This means that:

- The program cannot be deleted or copied to the program control unit of a washer extractor.
- You cannot alter the program or inspect the way it is written.
- To run the program you have to have the memory card and to insert it into the program control unit when the program is to be started.

## To select the ”Memory card” function

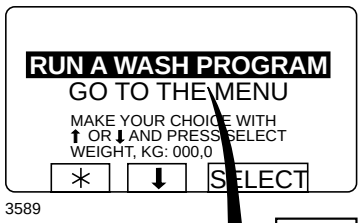



**Turn the memory card so its memory chip is at the far end, and on the left of the card...**




**...then insert the memory card into the program control unit.**

---



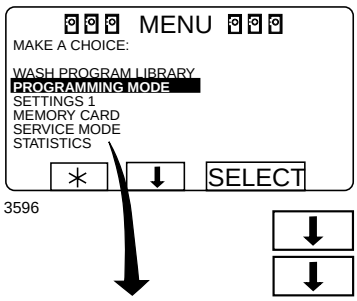

If this menu is not currently displayed:

**Press ⮌ repeatedly.**

**Press ⬇ to highlight ”GO TO THE MENU”.**

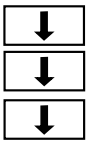


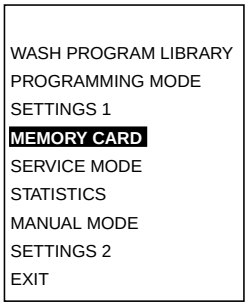
**Press SELECT.**




3596

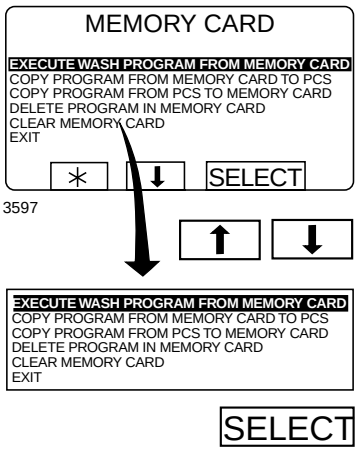
**Press ⬇ three times...**






**...to highlight ”MEMORY CARD”.**

SELECT **Press SELECT.**




**Select the function required using the cursor keys.**




SELECT **Press SELECT.**

***"The "Memory card" functions***

**Run wash program straight from memory card (see section "To run a wash program straight from a memory card")**

A wash program can be run from the memory card, without first being copied to the washer extractor. The memory card may be removed from the card reader after the program has started.

Programs on memory cards may have "restricted-use" status, which means that they can only be run straight from the memory card, not copied or modified.

**Copy program from memory card to PCS (see section "To copy a program from a memory card to the machine´s program control unit")**

One or more wash programs can be copied from the memory card to the memory chip in the machine's program control unit. Note that programs on the memory card with "restricted-use" status cannot be copied to the machine memory chip.

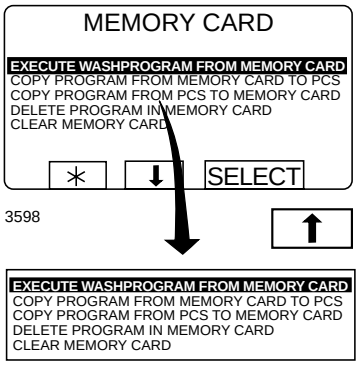
**Copy program from PCS to memory card (see section "To copy a program from the program control unit to a memory card")**

One or more wash programs can be copied from the memory chip in the machine's program control unit to the memory card. The memory card can hold 10 to 15 wash programs of normal size.

**Delete program on memory card (see section "To delete a program on a memory card")**

**Clear memory card (see section "To delete all programs on a memory card")**

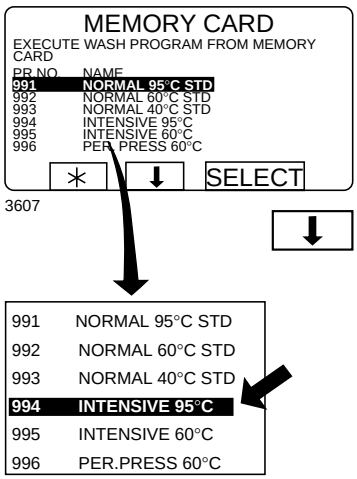
## To run a wash program straight from a memory card




To access this menu, follow the instructions in section "To select the "Memory card" function".

**Highlight ”EXECUTE WASH PROGRAM FROM MEMORY CARD” (press ⬆ if necessary).**

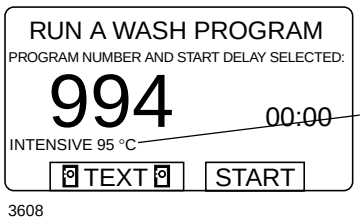
SELECT **Press SELECT.**




⬇ **If necessary, use ⬇ to...**

**... highlight the wash program required.**

SELECT **Press SELECT.**




Program name

If you want to see the description of the program (where available):

TEXT **Press TEXT.**

START To start the program:

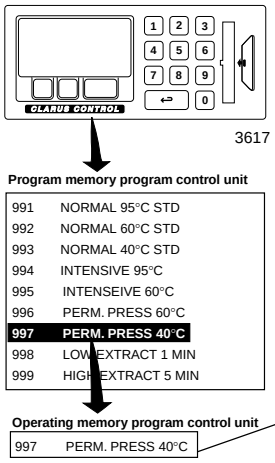
**Press START.**

Once the program has started, the memory card may be removed from the card reader.

### *To run a program from the memory card*

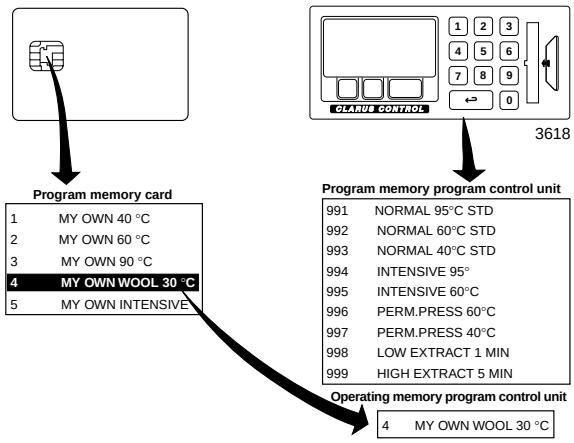
In broad terms, the program control unit has two different memories. One is a ”**program memory**” where all its wash programs are stored, the other is an ”**operating memory**”, which is used to hold the program currently in use. The program control unit takes the instructions it needs to run the program from the operating memory.

When a wash program is started, the correct program is retrieved from the program memory and copied into the operating memory.




Program currently being used

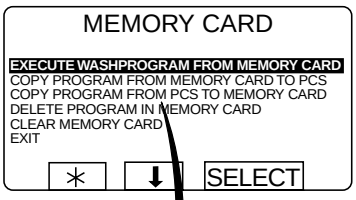
A parallel process takes place when a program is started from a memory card. In other words, the program is copied from the memory card into the operating memory, and the machine runs the program entirely from the set of instructions in the operating memory.




That is why you may remove the memory card from the card reader once the program has started.

Once the program has ended it is erased from the operating memory.

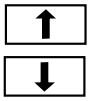
## To copy a program from a memory card to the machine's program control unit



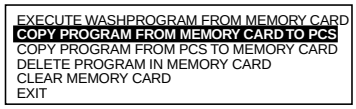

3609

To access this menu, follow the instructions in section "To select the "Memory card" function".

**Note that** restricted-use programs on a memory card cannot be copied.

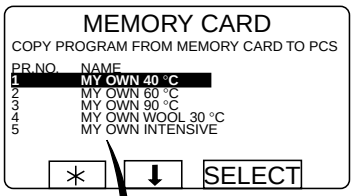


**Highlight "COPY PROGRAM FROM MEMORY CARD TO PCS" (press ⬇ or ⬆ if necessary).**



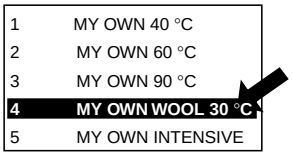

SELECT **Press SELECT.**

---




3610

**If necessary, use ⬇ to...**




**... highlight the wash program required.**

SELECT **Press SELECT.**

---

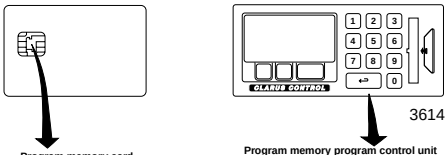
### *What is a restricted-use program?*

A wash program which has been created on a PC can be made a "restricted-use" program. This means that:

- The program cannot be deleted or copied to the program memory of a washer extractor.
- You cannot modify the program or examine its structure.
- To run the program you must have access to the memory card, and insert it into the card reader when the program is to be started.

### *What happens when a program is copied?*

Both the memory card and the program control unit have memory chips capable of storing wash programs. The chip on the card can hold about 10 to 15 programs of normal size, while the chip in the program control unit has a capacity of several hundred programs.



3614

**Program memory card**

| | |
|---|---|
| 1 | MY OWN 40 °C |
| 2 | MY OWN 60 °C |
| 3 | MY OWN 90 °C |
| 4 | MY OWN WOOL 30 °C |
| 5 | MY OWN INTENSIVE |

**Program memory program control unit**

| | |
|---|---|
| 991 | NORMAL 95°C STD |
| 992 | NORMAL 60°C STD |
| 993 | NORMAL 40°C STD |
| 994 | INTENSIVE 95° |
| 995 | INTENSIVE 60°C |
| 996 | PERM.PRESS 60°C |
| 997 | PERM.PRESS 40°C |
| 998 | LOW EXTRACT 1 MIN |
| 999 | HIGH EXTRACT 5 MIN |

When a program is copied from a memory card to the machine's program control unit, it is copied, not moved (not deleted from the card). A copy is transferred from the chip on the memory card to the storage chip of the machine program control unit.

**Program memory card**

| | |
|---|---|
| 1 | MY OWN 40 °C |
| 2 | MY OWN 60 °C |
| 3 | MY OWN 90 °C |
| 4 | MY OWN WOOL 30 °C |
| 5 | MY OWN INTENSIVE |

**Program memory program control unit**

| | |
|---|---|
| 4 | MY OWN WOOL 30 °C |
| 991 | NORMAL 95°C STD |
| 992 | NORMAL 60°C STD |
| 993 | NORMAL 40°C STD |
| 994 | INTENSIVE 95° |
| 995 | INTENSIVE 60°C |
| 996 | PERM.PRESS 60°C |
| 997 | PERM.PRESS 40°C |
| 998 | LOW EXTRACT 1 MIN |
| 999 | HIGH EXTRACT 5 MIN |

3615

The program remains on the memory card, but another copy of it has now been stored in the program control unit.

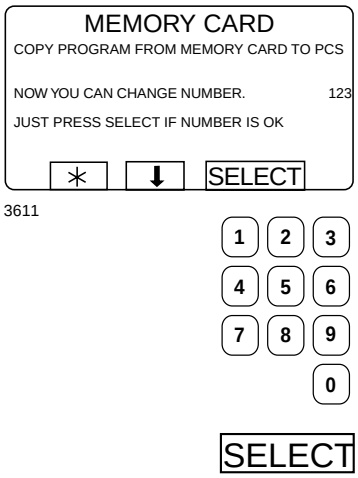
**Program memory card**

| | |
|---|---|
| 1 | MY OWN 40 °C |
| 2 | MY OWN 60 °C |
| 3 | MY OWN 90 °C |
| 4 | MY OWN WOOL 30 °C |
| 5 | MY OWN INTENSIVE |

**Program memory program control unit**

| | |
|---|---|
| 4 | MY OWN WOOL 30 °C |
| 991 | NORMAL 95°C STD |
| 992 | NORMAL 60°C STD |
| 993 | NORMAL 40°C STD |
| 994 | INTENSIVE 95° |
| 995 | INTENSIVE 60°C |
| 996 | PERM.PRESS 60°C |
| 997 | PERM.PRESS 40°C |
| 998 | LOW EXTRACT 1 MIN |
| 999 | HIGH EXTRACT 5 MIN |

3616




3611



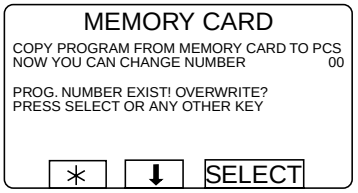

**Choose 1 or 2:**

**1** If you want to give the program a different program number (from the one it had on the memory card):

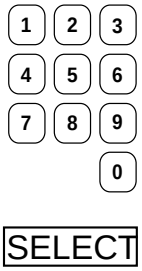
**Use the numeric keys to enter the new program number, then press SELECT.**

**2** If the existing number is suitable:

**Press SELECT.**




4114



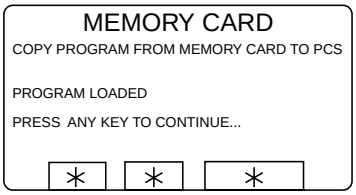

If the number you have choosen is already used:

1 Select another number.

**Enter the new number and press SELECT.**

2 Erase the old program number.

**Press SELECT.**

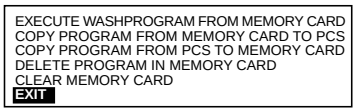



3612

After the program has been copied (it takes only a few seconds) the menu will look like this:

If you want to copy more programs:

**Press any key to continue.**



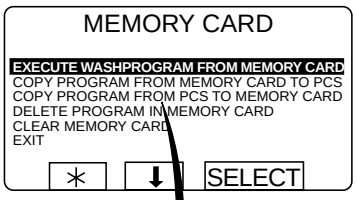

4210

When you have finished:

**Press ⬇ repeatedly tohighlight "EXIT".**


**Press SELECT.**

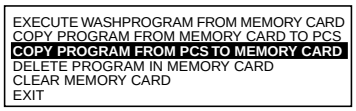
## To copy a program from the program control unit to a memory card




3619

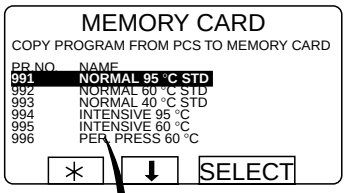
To access this menu, follow the instructions in section "To select the "Memory card" function.

**Highlight "COPY PROGRAM FROM PCS TO MEMORY CARD" (press ⬇ or ⬆ if necessary).**




SELECT **Press SELECT.**

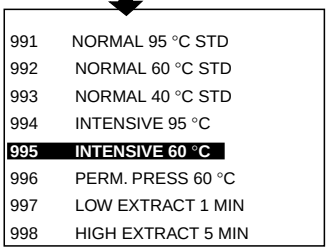
---




3620

**If necessary, use ⬇ to...**

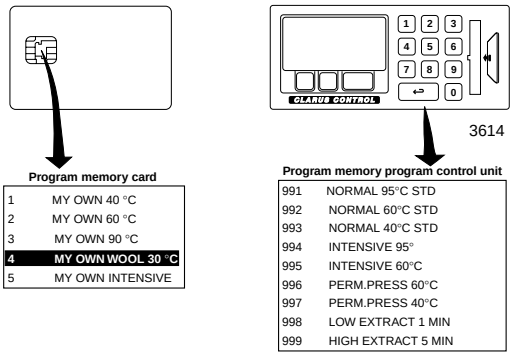
**... highlight the wash program required.**




SELECT **Press SELECT.**

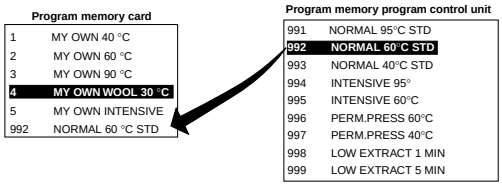
### *What happens when a program is copied?*

Both the memory card and the program control unit have memory chips capable of storing wash programs. The chip on the memory card can hold about 10 to 15 programs of normal size, while the chip in the program control unit has a capacity of several hundred programs.



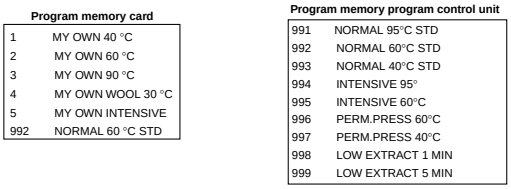

3614

When a program is copied from the machine's program control unit to a memory card, it is copied, not moved (not deleted from the machine). A copy is transferred from the storage chip of the machine program control unit to the chip on the card.

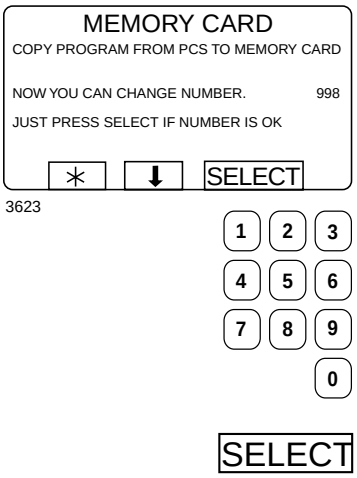



3621

The program remains in the program control unit, but another copy of it has now been stored on the card.




3622



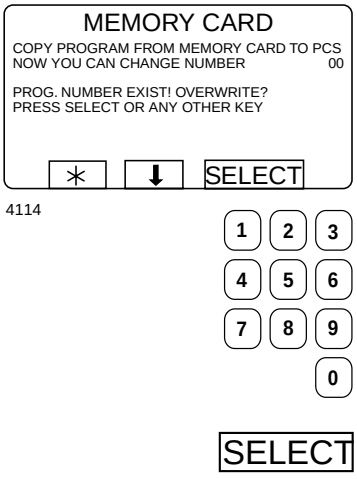

**Choose 1 or 2:**

**1** If you want to give the program a different program number (from the one it had on the machine):

**Use the numeric keys to enter the new program number, then press SELECT.**

**2** If the existing number is suitable:

**Press SELECT.**



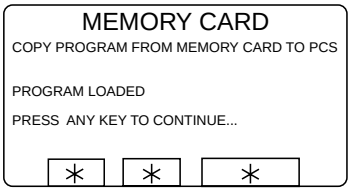

If the number you have choosen is already used:

1 Select another number.

**Enter the new number and press SELECT.**

2 Erase the old program number.

**Press SELECT.**

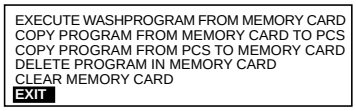



3612

After the program has been copied (it takes only a few seconds) the menu will look like this:

If you want to copy more programs:

**Press any key to continue.**




4210

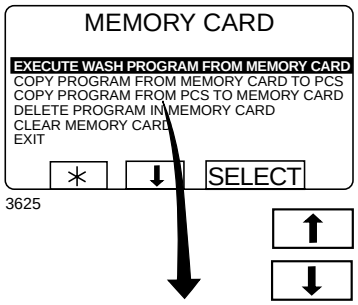
When you have finished:

**Press ⬇ repeatedly to highlight "EXIT".**

SELECT

**Press SELECT.**

## To delete a program on a memory card




3625

To access this menu, follow the instructions in section "To select the "Memory card" function

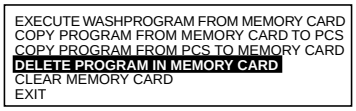
**Note that** restricted-use programs on a memory card cannot be deleted.

***What is a restricted-use program?***

A wash program which has been created on a PC can be made a ”restricted-use” program. This means that:

- The program cannot be deleted or copied to the program memory of a washer extractor.
- You cannot modify the program or examine its structure.
- To run the program you must have access to the memory card, and insert it into the card reader when the program is to be started.

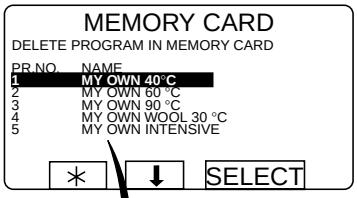
**Highlight ”DELETE PROGRAM IN MEMORY CARD” (press ⬆ or ⬇ if necessary).**




**Press SELECT.**

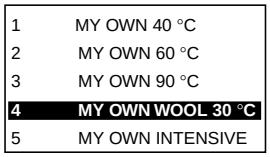
SELECT

---




3626

**If necessary, use ⬇ to...**



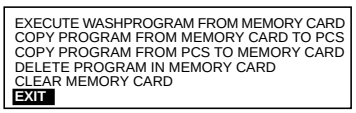

**.... highlight the wash program required.**

SELECT **Press SELECT.**

The program will now be deleted from the memory card. This takes between 5 and 15 seconds.

If you want to delete more programs:

**Continue in the same way as described above.**



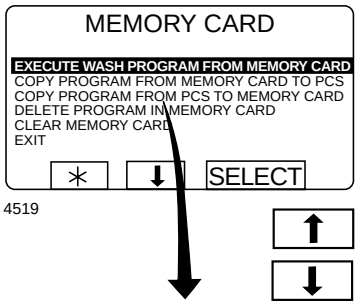

4210

When you have finished:

**Press ⬇ repeatedly to highlight "EXIT".**

SELECT **Press SELECT.**

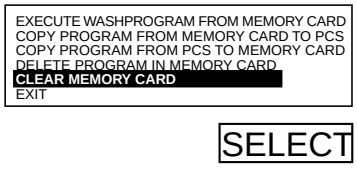
## To delete all programs on a memory card




To access this menu, follow the instructions in section "To select the "Memory card" function

**Note that** restricted-use programs on a memory card cannot be copied or deleted.

**Highlight ”CLEAR MEMORY CARD” (press ⬇ or ⬆ if necessary).**




**Press SELECT.**

SELECT

***What is a restricted-use program?***

A wash program which has been created on a PC can be made a ”restricted-use” program. This means that:

- The program cannot be deleted or copied to the program memory of a washer extractor.
- You cannot modify the program or examine its structure.
- To run the program you must have access to the memory card, and insert it into the card reader when the program is to be started.

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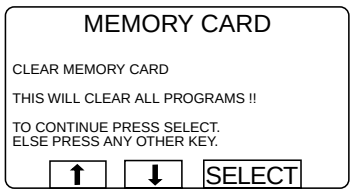



If you change your mind and do not want to delete the entire memory card:

**Press any key <u>other than</u> SELECT.**

If you want to delete all programs on the memory card (with the exception of any restricted-use programs):

**Press SELECT.**

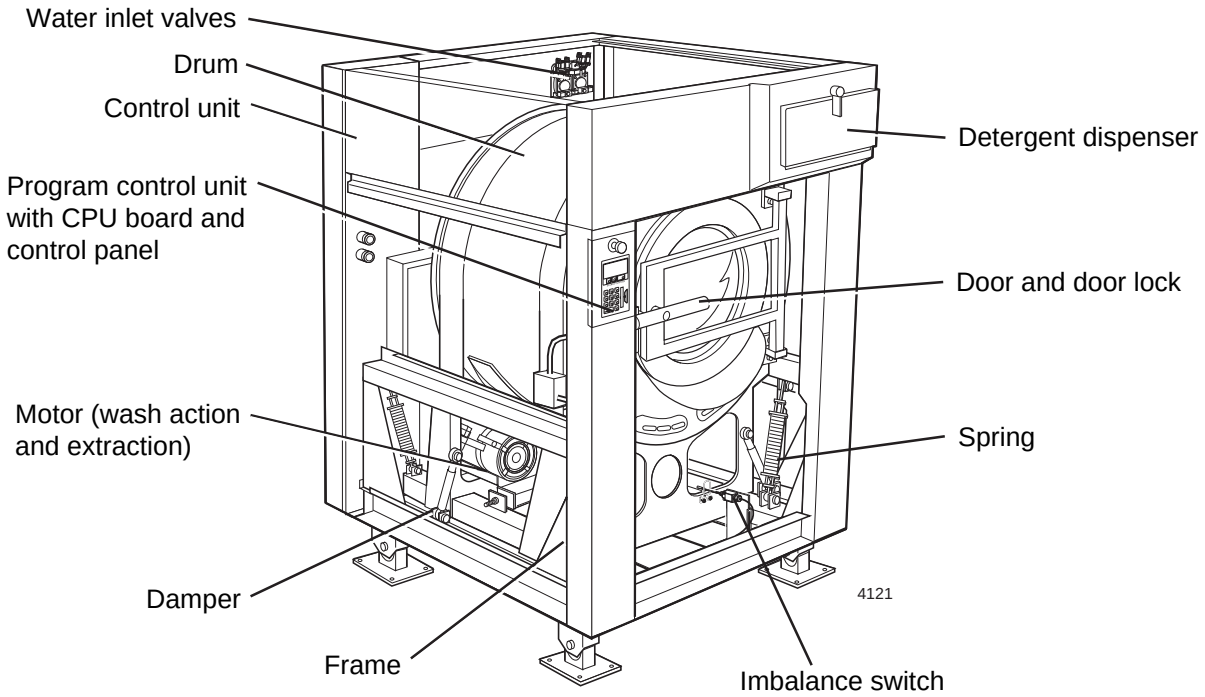
SELECT

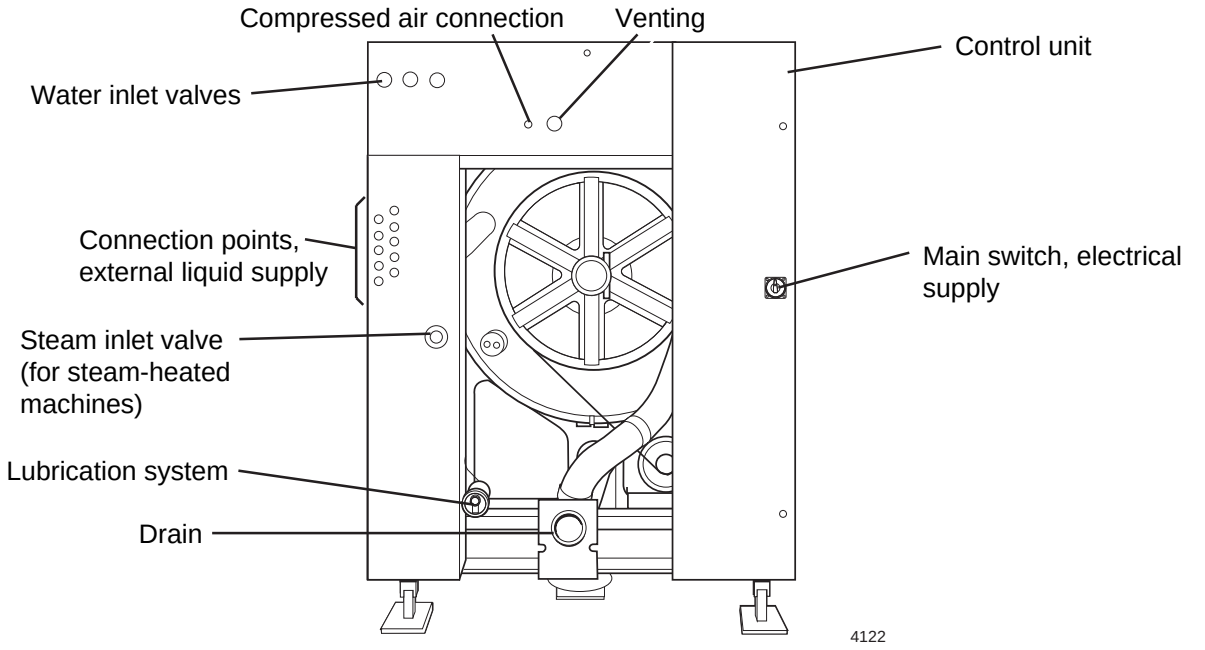
# Description of main units

Fig. 13

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 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.

13



The inner drum is driven via three 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:

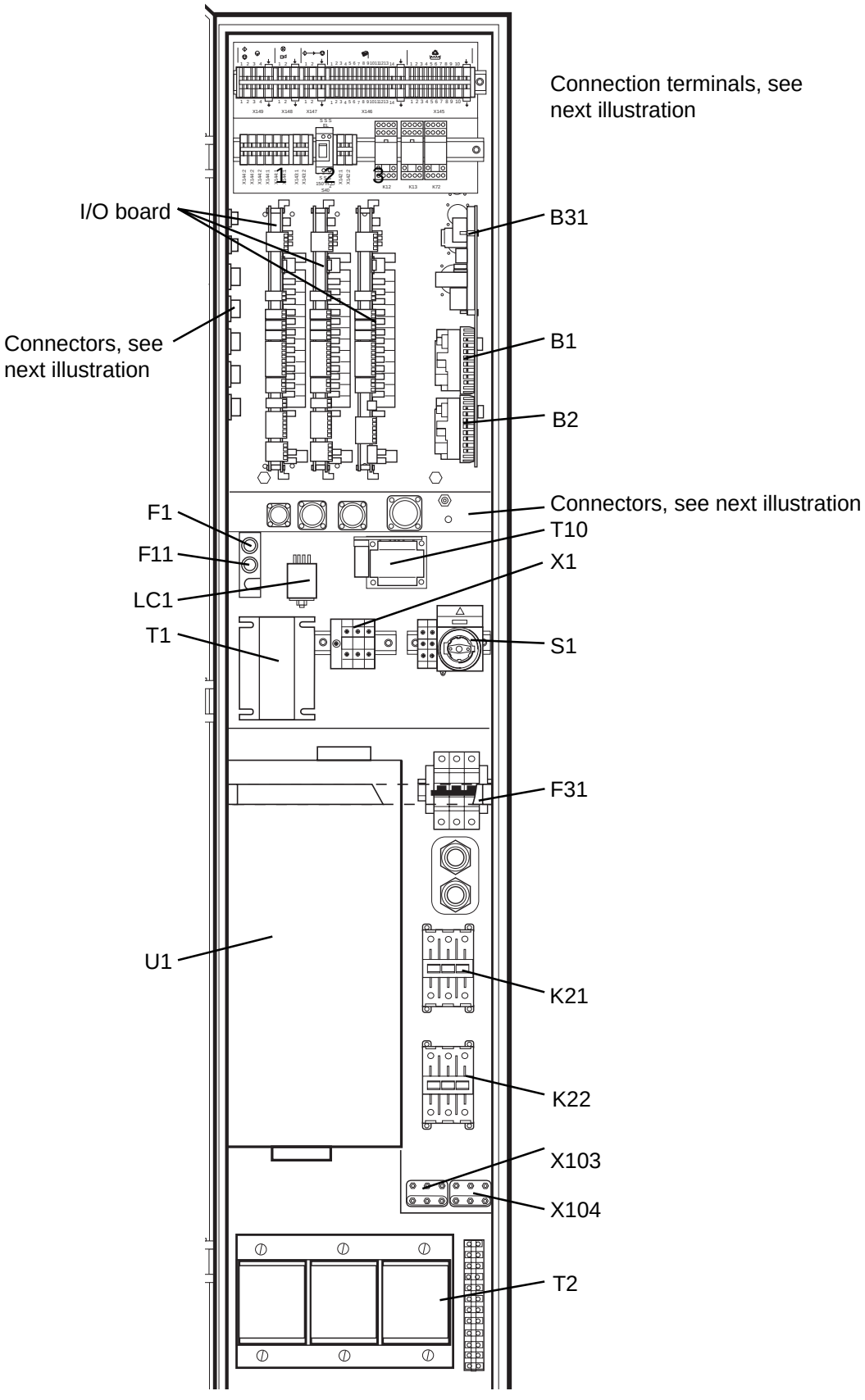
- Front panels of stainless steel.
- Back cover of hot-dip galvanised steel, painted white.
- Side panels and top cover of either stainless steel or of hot-dip galvanised steel, painted white.

# Control unit

Fig. 14

| | |
|---|---|
| LC1 | Suppressor |
| T1 | Transformer, for adaptation of feed voltage for control unit and control equipment |
| T2 | Transformer, for adaptation of feed voltage for motor control unit |
| T10 | Transformer, power supply I/O board, CPU board, and display unit |
| B1 | Level control, overfilling |
| B2 | Level control, safety monitoring for control unit, door lock |
| B31 | Control unit, door lock |
| S1 | Main switch, isolating switch |
| K21 | Relay for electric heating, circuit 1 |
| K22 | Relay for electric heating, circuit 2 |
| F1, F11 | Fuses, 1.25 AT, protection of 230 V power supply to I/O board, CPU board, display unit and control unit, door lock |
| F31 | Circuit breaker (only on machines with electric heating) |
| U1 | Motor control unit |
| X1 | Distribution terminals for input voltage |
| X103, X104 | Terminals for adapting the feed to the elements for electric heating with various voltage alternatives (optional equipment) |

14


Connection terminals, see next illustration
I/O board
B31
Connectors, see next illustration
B1
B2
Connectors, see next illustration
F1
T10
F11
X1
LC1
T1
S1
F31
U1
K21
K22
X103
X104
T2

4482

Fig. 15

**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 |
| X105 | Connector, 14 pole, drain valve/drain valves |
| X106 | Connector, 14 pole, detergent supply, powder (optional equipment) |
| X107 | Connector, 14 pole, oil lubrication |
| X108 | Connector, 14 pole, compressed air valves and compressed air switches, tilt function (optional equipment) |
| X109 | Connector, 14 pole, valves for water recycling (optional equipment) |
| X110 | Connector, 4 pole, water valve, cold, hard water (optional equipment) |
| X111 | Connector, 4 pole, steam valve for heating |

**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

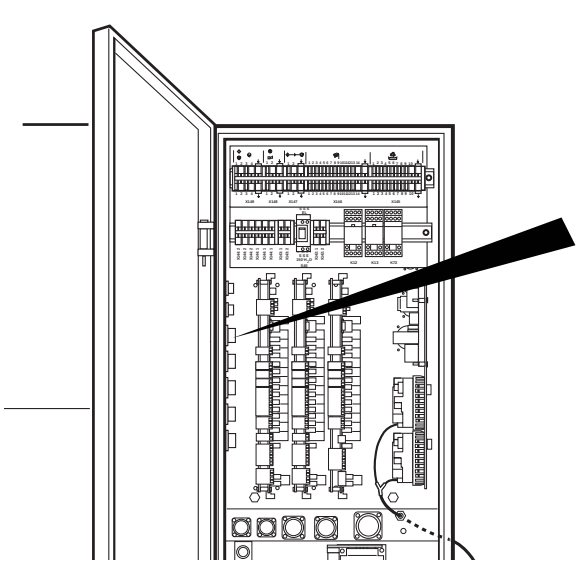
The terminal numbering corresponds to the numbering used in the liquid detergent function in programming.

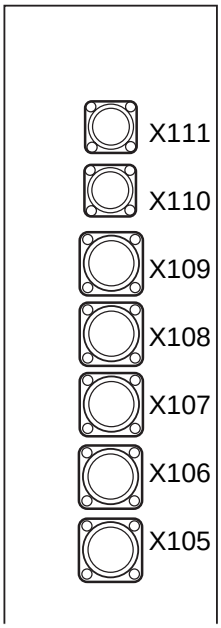
X146:14 common neutral

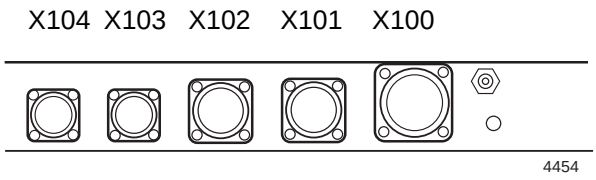
**Water recycling (outputs)**

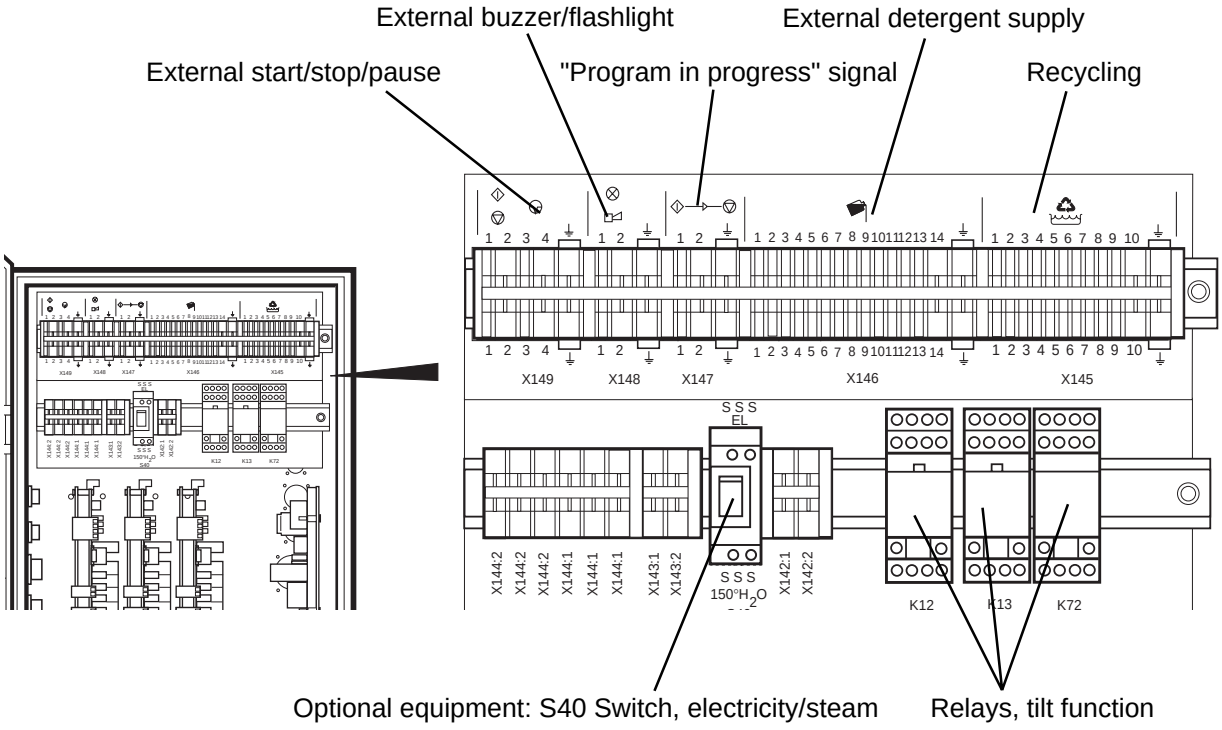
| | | |
|---|---|---|
| X145: | 1 | Drain 1 (Y1) |
| | 2 | Pump 1 |
| | 3 | Stop drain (Y1b) |
| | 4 | Drain 2 (Y2) (normally open) |
| | 5 | Drain 2 (Y2) (normally closed) |
| | 6 | Drain 3 |
| | 7 | Drain 4 |
| | 8 | Tank 1 water valve (Y44) |
| | 9 | Tank 2 water valve (Y54) |
| | 10 | Common neutral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

15


4482


X111
X110
X109
X108
X107
X106
X105


X104 X103 X102 X101 X100
4454

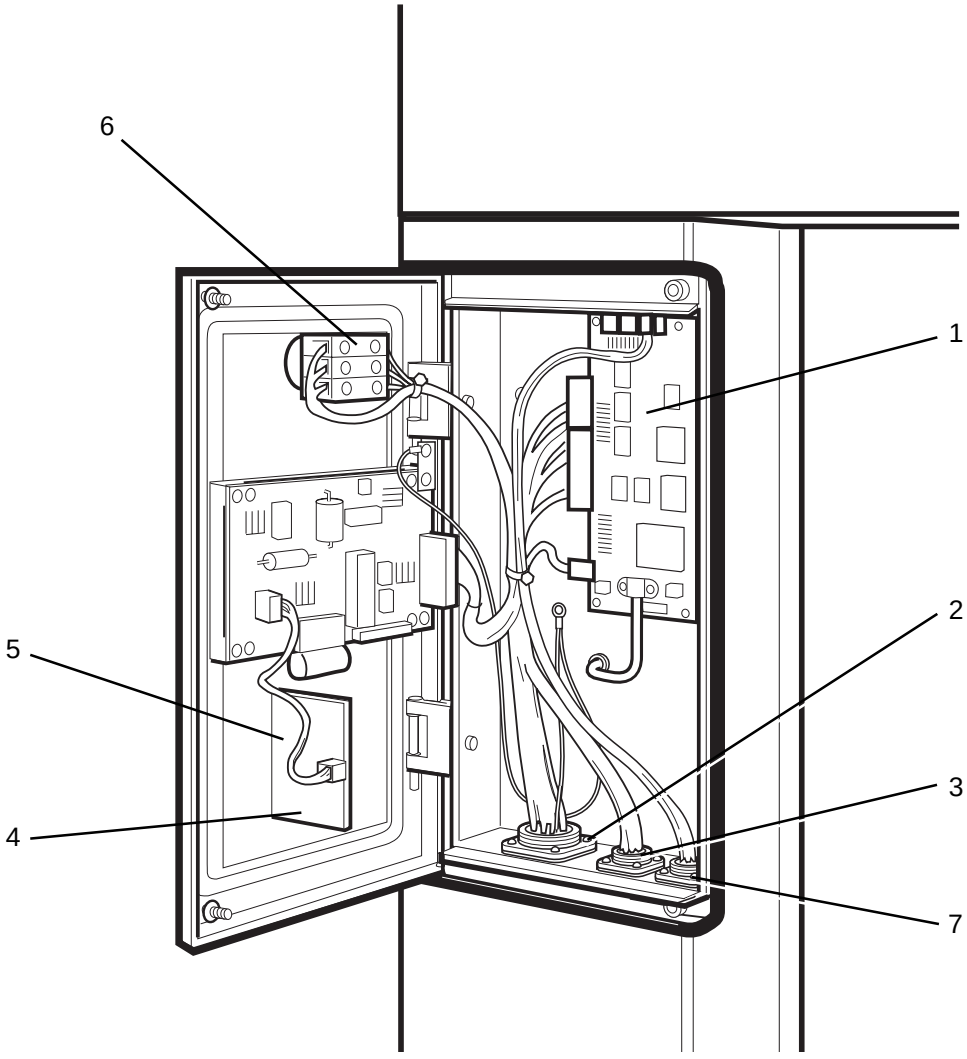

External buzzer/flashlight
External detergent supply
External start/stop/pause
"Program in progress" signal
Recycling
X149
X148
X147
X146
X145
S S S
EL
S S S
150°H2O
K12
K13
K72
Optional equipment: S40 Switch, electricity/steam
Relays, tilt function

4235 4236

# Clarus control unit

| Fig. 16 | | | |
|---|---|---|---|
| | 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 |

16




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

**Fig. 17**

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.

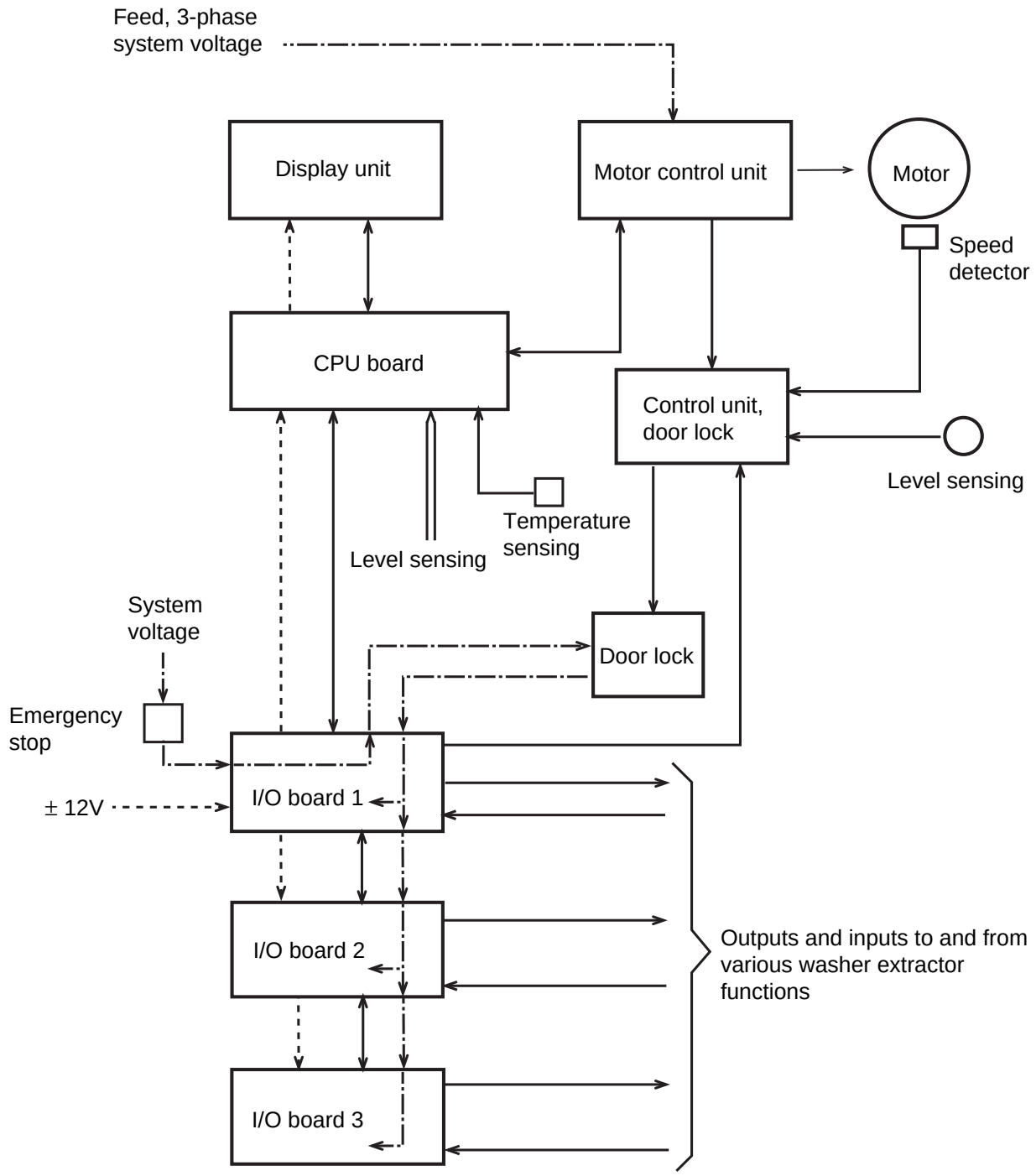
I/O board 3:

water valve - tank 2, drain 3 and 4, detergent dispensing 6-7, external detergent dispensing 12-13, flush powder, oil lubrication and (where applicable) tilt.

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.

# Program control unit

17



## Door lock control unit

Fig. 18

The sole function of this control unit is to oversee the correct functioning of the door lock. The CPU board receives information from the motor control unit on the motor rotation, and has its own level monitoring device. The control unit also detects water level and motor speed through separate level measurement devices and the rotation guard (speed detector). By means of this doubling of monitoring means, a very high level of reliability of the safety function can be achieved.

When the CPU board commands door locking, the control unit checks that there is no water in the drum and that the drum is not rotating. Only after that is a signal given to the door lock. Level and rotation are checked in the same way before the door is allowed to open.

The voltage feed to the I/O boards' outputs goes via both the emergency stop and the door lock switch, which means that no functions can proceed unless the emergency stop is in its normal position (not actuated) and the door is locked.

*PCB connector: Function*

Fig. 18

**X90: Inward voltage feed 200 - 240 V AC**

**X91: Spare connector for outward power supply**

Fig. 19

Spare input/output which can be used to provide power supply to another circuit board.

**X92: Input from PCU: Lock door**

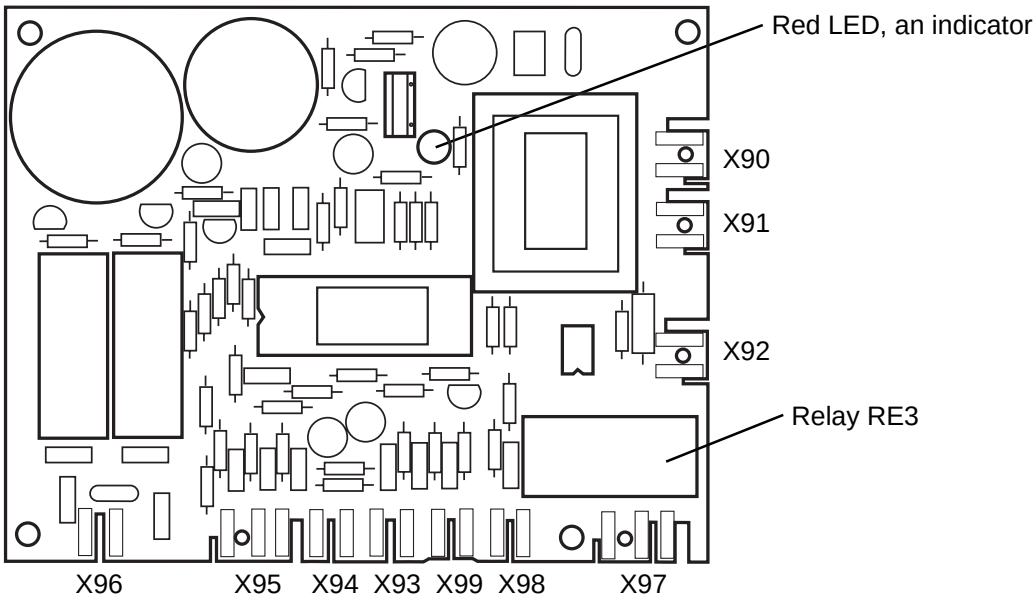
230 V DC: Command from PCU for door locking

0 V: Command from PCU to open door

Before the control unit locks the door (output X96), a check is made that there is no water in the drum and that the motor is at a standstill.

18

Control unit, door lock



**X93: Input from level switch**

5 V DC: Water in drum (level contact open)

0 V: Empty drum (level contact closed)

If the input voltage is 5 V DC when the door is not locked, door locking will be prevented. The LED on the control unit will then flash (specific pattern of flashes) to reveal an error code (see the section ”Error indication patterns”).

**X94: Input from:**
**auxiliary relay on motor contactor (machines without frequency control) motor control unit (machines with frequency control)**

5 V DC: Motor operating (contact open)

0 V: Motor not operating (contact closed)

If the input voltage is 5 V DC when the door is not locked, door locking will be prevented. The LED on the control unit will then flash (specific pattern of flashes) to reveal an error code (see the section ”Error indication patterns”).

The input signal from X94 is also compared with the signal from the rotation sensor on the motor shaft (input X95) to check that both sensors are working normally.

**X95: Input from rotation sensor on motor shaft**

> 0,4 Hz: drum rotating

< 0,4 Hz: drum at standstill

Input voltage: 4-10 V DC

**X96: Output to door lock**

Output voltage: 17 - 31 V

Locks the door lock if the following conditions have been fulfilled:

- 230 V DC at input X92 (command from PCU for door locking)
- 0 V DC at input X93 (no water in drum)
- 0 V DC at input X94 (motor not operating)
- < 0.4 Hz at input X95 (drum at standstill)

Unlocks the door lock if the following conditions have been fulfilled:

- 0 V DC at input X92 (command from PCU for door opening)
- 0 V DC at input X93 (no water in drum)
- 0 V DC at input X94 (motor not operating)
- < 0.4 Hz at input X95 (drum at standstill)

**X97, X98, X99: Rotation-monitoring device/Excess-speed-monitoring device**

X97: Output

X98: Input 0 = 0 V

1 = 5 V

X99: Input: 0 = closure between terminals 1 and 2 = Excess-speed monitoring device

1 = open input = Rotation-monitoring device

Excess-speed-monitoring device

X99 = 0

RE3 is deactivated if the drum speed exceeds 45 rpm. RE3 is reactivated when the drum speed falls below 20 rpm.

Rotation-monitoring device

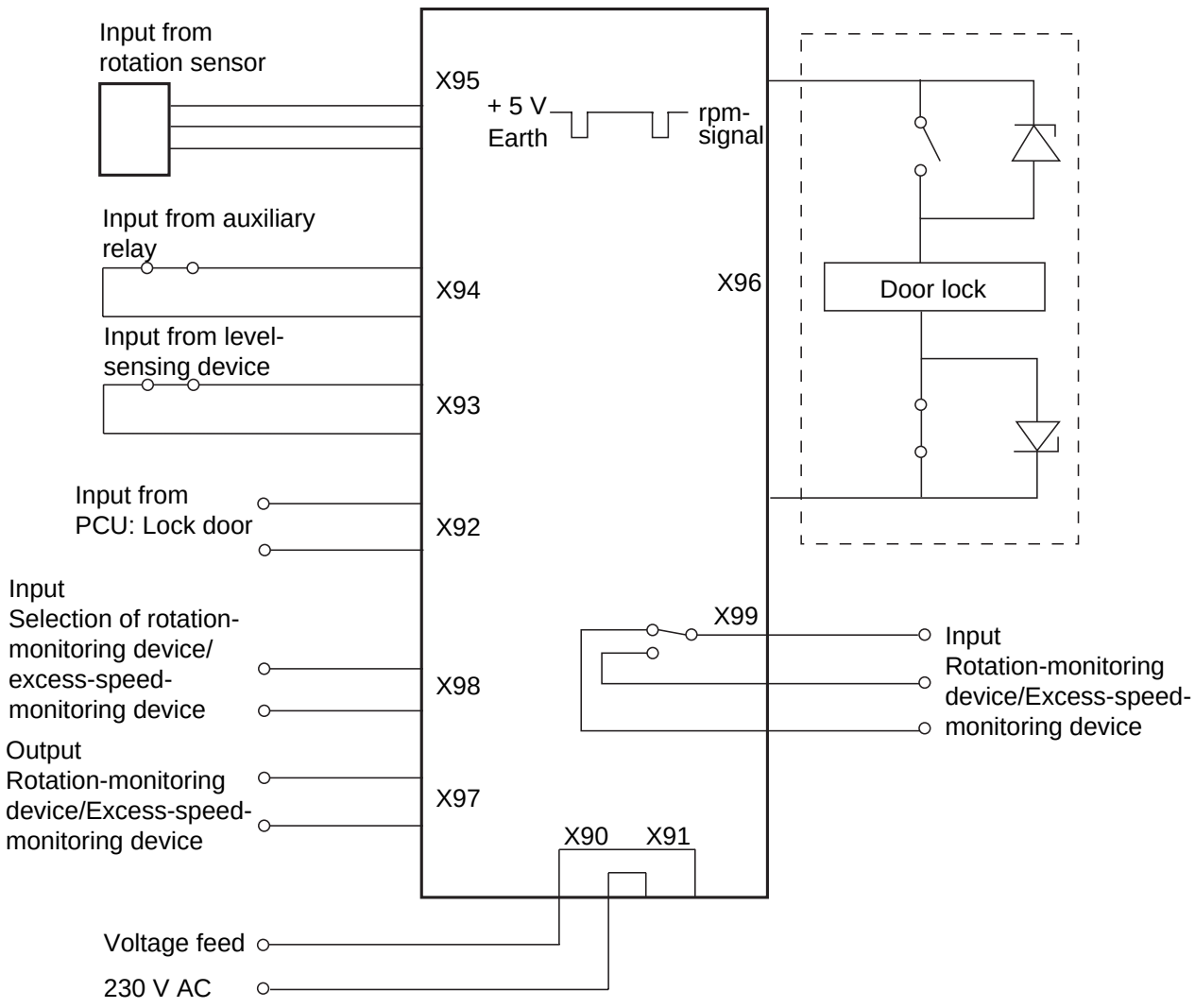
X99 = 1  X98 = 1

RE3 is activated when the drum is at a standstill and deactivated when the drum is moving.

X99 = 1  X98 = 0

X97 is locked in the position it was in when X98 = 1, no matter what the current activity of the washer extractor.

19

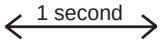


*Error indication patterns*

**Fig.** (20) If the door lock is working correctly, this is indicated by the red LED, by a pattern of flashes which indicates ”OK”. The error indication patterns revealed by the LED flash at various frequencies for the various errors or faults. All error indication patterns have a frequency cycle of 50%, i.e. the LED will be on half the time, off half the time.

20

LED pattern of flashes during normal functioning






Pattern of flashes indicating ”OK”, drum at standstill



Pattern of flashes indicating ”OK”, drum rotating, 5 Hz

| Error indication pattern | Meaning/Cause |
|---|---|
|  | Level-sensing device indicates water in drum when door lock is open. 2,19 Hz |
|  | Auxiliary relay for motor indicates that the motor contactor is activated when the door lock is open (this error indication pattern does not occur when the excess-speed-monitoring device is selected). 1,46 Hz |
|  | Signals from rotation sensor and auxiliary relay do not correspond. 1,56 Hz |
|  | The control unit sensor circuits indicate fault/error in drive circuits for door lock including its wiring. 0,85 Hz |
|  | Armament circuits for RE1/RE2 activated (capacitor C8 charged when it should be discharged). 0,37 Hz |

4686

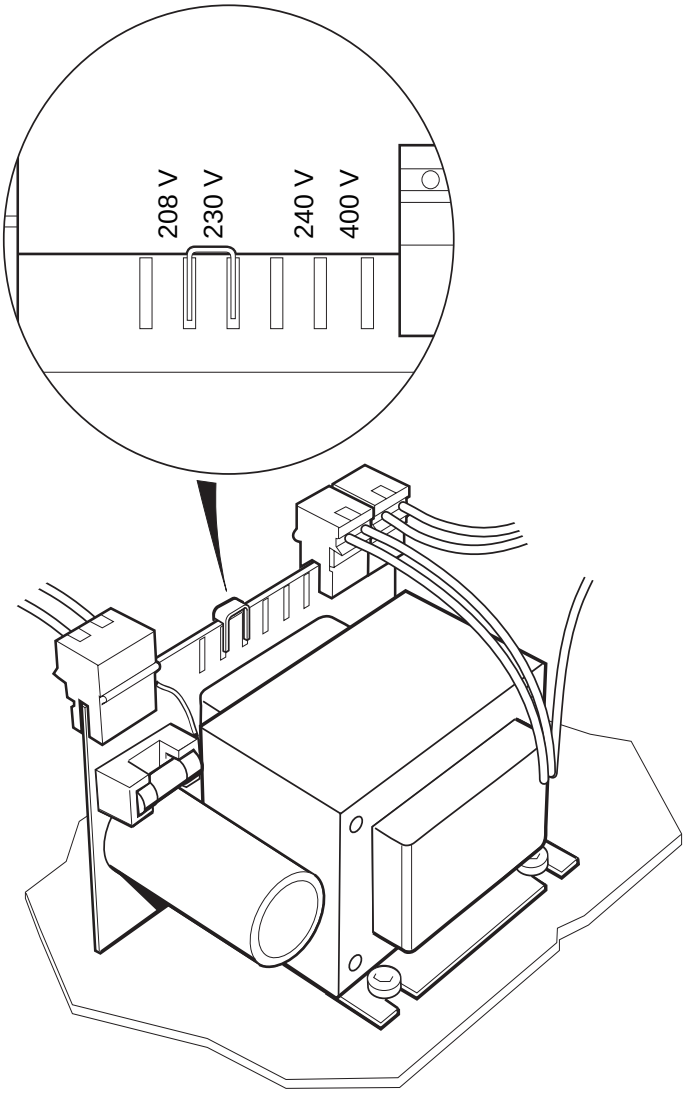
## Control system transformer T10

Fig. 21 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.

21




3970

# Imbalance switch

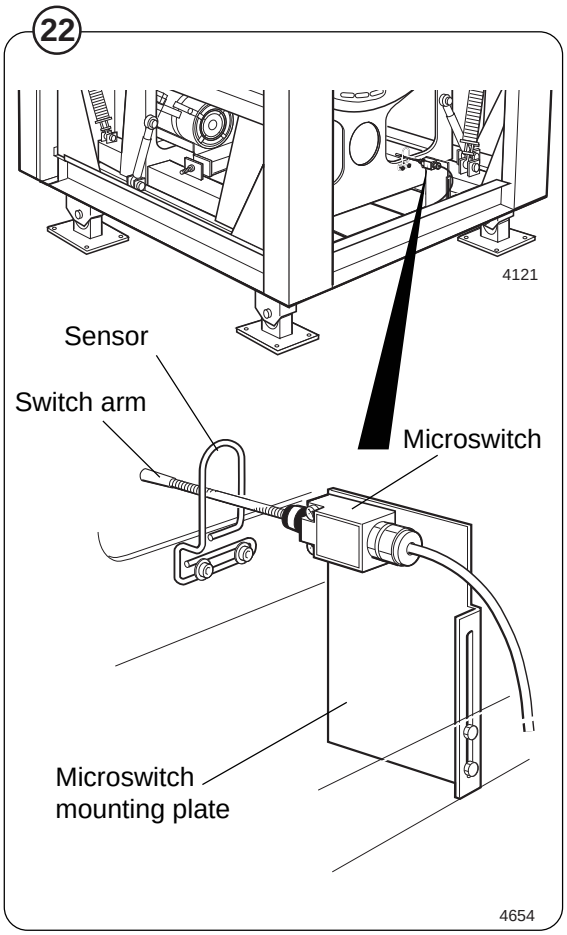
## Description

Fig. 22

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

# Motor

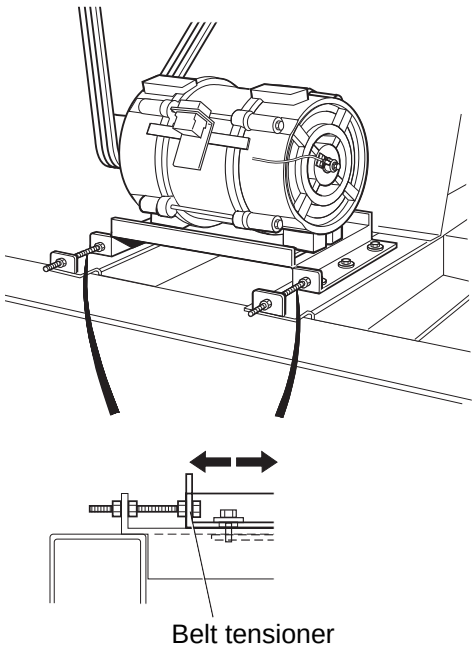
Fig. 23 The motor is located on a motor mounting plate beneath the outer drum. It drives the inner drum via three drive belts. There are two belt tensioners on the motor mounting plate.

Fig. 24 The motor has an electrical quick-connector.

This is a frequency-controlled motor, and its speeds for normal action, distribution and extraction are controlled by U1, which is a microprocessor-based motor control unit in the rear lower control unit.

The motor windings have overload protection in the form of a thermal cut-out.

23

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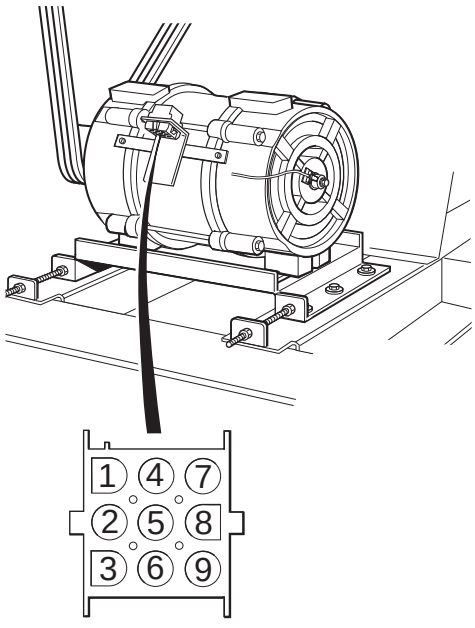
24




4127

## Motor control unit

Fig. 26

**The low voltages +5 V and +15 V used internally in the motor control unit have a potential difference of approx. 300 V relative to the earth of the mains power supply. For this reason you must take great care when making any measurements on the motor control unit board and CPU board (the CPU board is supplied with the same voltages as listed above). Do not use oscilloscopes and other metering instruments which are earthed.**

Fig. 25

**Once the power supply has been switched off, wait for <u>at least one minute</u> before you touch the motor control unit or any of its components.**

The motor control unit, which has a microprocessor, supplies a three-phase voltage to power the washer extractor drive motor. The motor has frequency control. The motor control unit allows precision control of wash and extraction speeds, acceleration and deceleration.

The motor control unit also monitors the torque of the motor at constant speed and during acceleration and deceleration. It uses this torque data to detect any unbalance occurring during extraction.

25

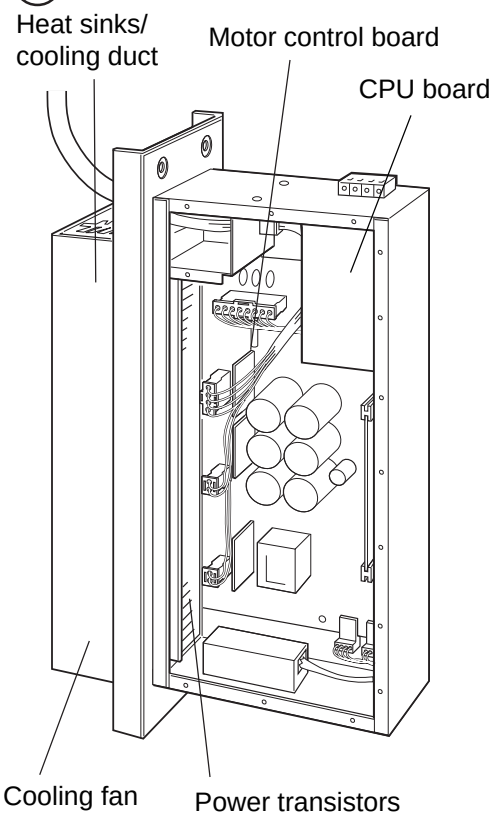
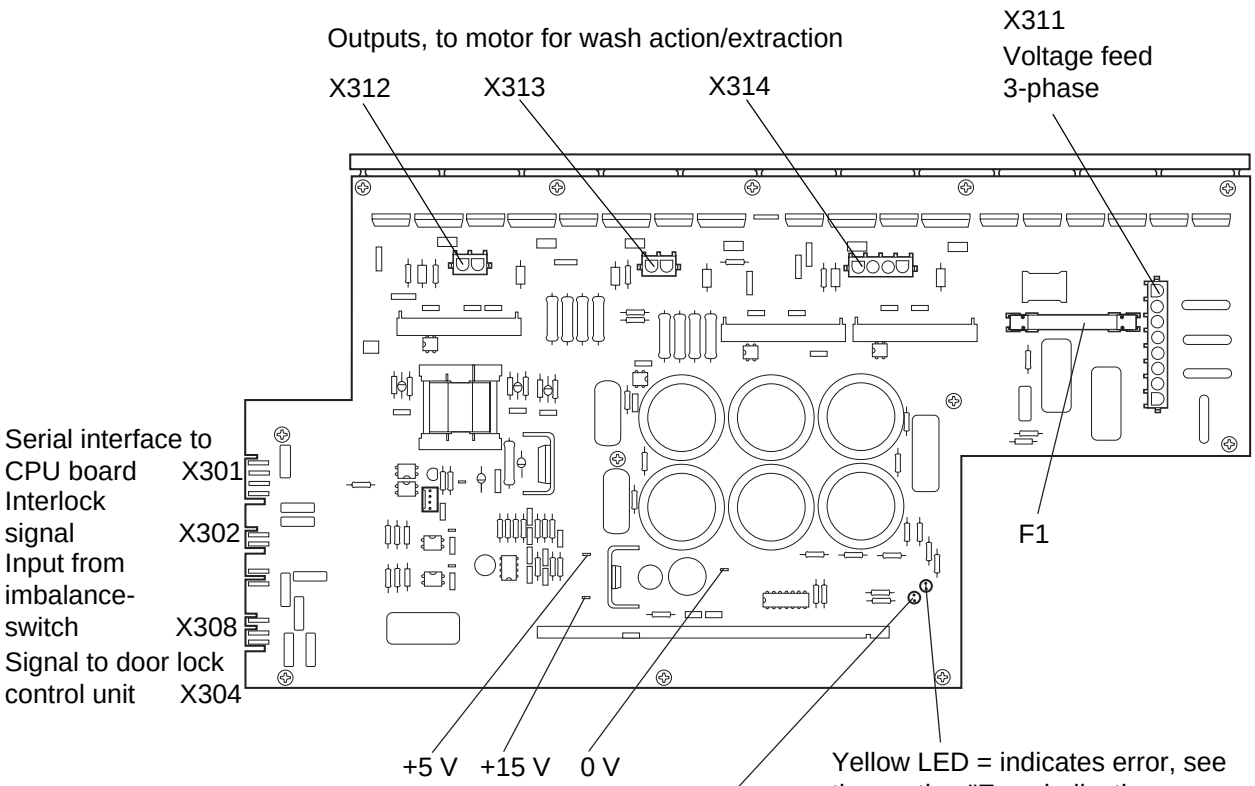


**Fig. 26** Communication between the CPU board and the motor control unit is via a serial interface (X301). The CPU board can command the motor to operate at any speed, and also determine the acceleration rate at which the motor is to increase speed up to its final speed. The motor control unit informs the CPU board if it has discovered imbalance or if a fault has arisen in the motor control unit or motor. The motor control unit also notifies if the interlock signal disappears during operation of the motor.

At input X302 the motor control unit receives a signal to notify that the door lock is locked. At output X304 the motor control unit provides a signal to the SKAK board which indicates whether the motor is operating or at a standstill. At input X308 the motor control unit receives a signal from the imbalance switch to notify that the machine is vibrating too much during extraction.

**26**

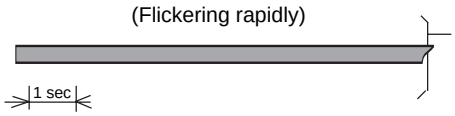



**Dangerous voltages**
The voltages above have a potential difference of approx. 300 V relative to the earth of the mains power supply.

4760

## Error indication patterns

**Fig. 27** If a fault or error occurs in the motor or motor control unit, this will be indicated by a yellow LED on the motor control unit board. The pattern of flashing by this LED identifies the fault/error, as follows:

| LED pattern of flashes | Cause |
|---|---|
|  | Output current to motor too high, motor control unit current-limiting function activated. |
|  | Short-circuit in motor windings. Caused by fault in motor control unit, in motor or wiring. |
|  | Short-circuit in motor windings several times. The motor control unit interrupts power supply to motor. |
|  | Lock acknowledgement signal absent during program operation. Caused by door being not locked or not closed, faulty door lock or faulty wiring. |
|  | Fault in receiving circuitry for lock acknowledgement signal. Replace motor control unit. |
|  | Communications error, motor control – program control unit. Caused by faulty program control unit, motor control unit or wiring. |
|  | Heat sink temperature too high. Caused by clogged vanes on heat sinks or faulty cooling fan. An extremely high ambient temperature can also cause this fault. |
|  | Thermal protection for motor has cut out. Faulty motor, motor control unit or wiring. An extremely high ambient temperature can also cause this fault. |
|  | Loss of phase in voltage feed to motor control unit. |
|  | Input voltage to motor control unit too low or too high (<180 V between two phases). |
|  | Fault in receiving circuitry for motor overheating. |

### Extraction

The extraction speed is controlled to the speed required from the CPU board, with the aid of instructions via the serial interface.

### Imbalance measurement

Each time the program control unit sends a command for distribution speed or extraction, the motor control unit carries out imbalance detection. The motor control unit senses the torque of the motor for a set time and, on the basis of variations in the torque data, is able to determine whether the imbalance is above the threshold value.

There are two threshold values:

- **high imbalance**, used during extraction
- **extreme imbalance**, used during distribution

If the motor control unit detects imbalance, it notifies the CPU board, which then halts distribution/extraction. The motor receives the command to run at wash speed, then a fresh attempt at distribution/extraction is made. The program control unit will make up to four attempts at distribution/extraction. If the fourth attempt fails too, the machine will move on to the next sequence in the program (program module).

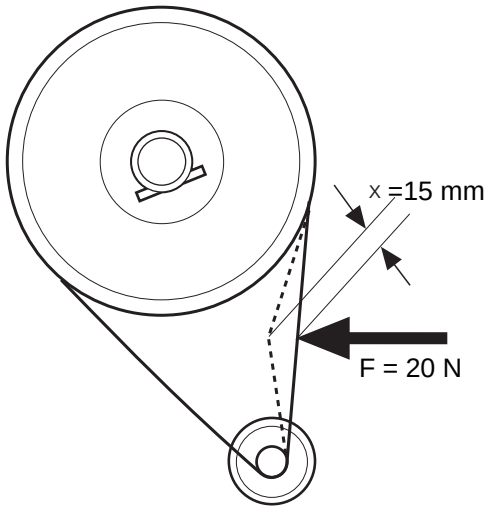
## Belt tension

Fig. 28 The belt tension of new machines is preset at the factory.

Fig. 29 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.**

28

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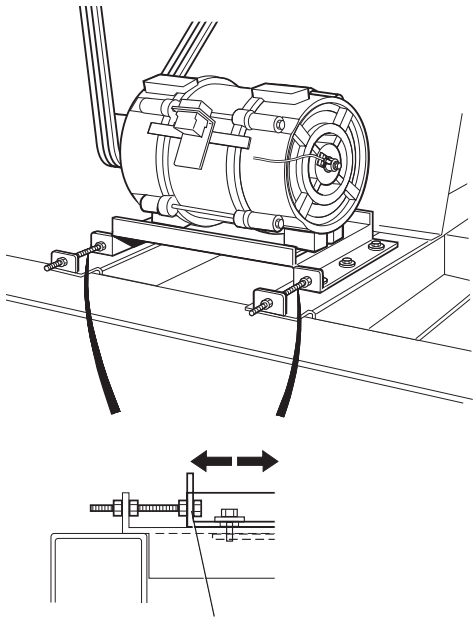
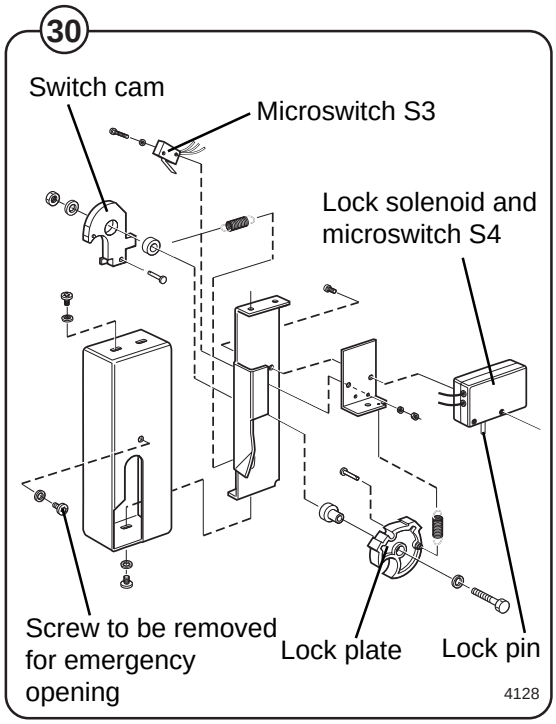



4126

# Door lock

Fig. 30 The machine door lock, working in conjunction with the CPU board and the door lock control unit, is a safety system designed to prevent injury by ensuring:

- that it is not possible to start the machine until the door has been closed
- that the door will be locked automatically when the machine starts
- that will not be possible to open the door until the program has ended, the water has been discharged and the drum is at a standstill




## Instructions for opening machine door if door lock is faulty

**This emergency procedure for opening the door lock may only be carried out by authorised personnel, and only if the door lock has failed.**

Fig. 30 The cover on the door lock cannot be removed if the door is locked. If the door lock should fail when the door is locked, for example because of a fault in the door lock solenoid or because the lock pin is binding, the emergency procedure for opening the door will have to be followed before the lock can be replaced.

Remove the screw on the door lock cover. Use a tool such as a small screwdriver (max. diameter 3 mm) to lift the lock pin upwards out of the slot in the lock plate, while at the same time turning the door handle.

# Door lock

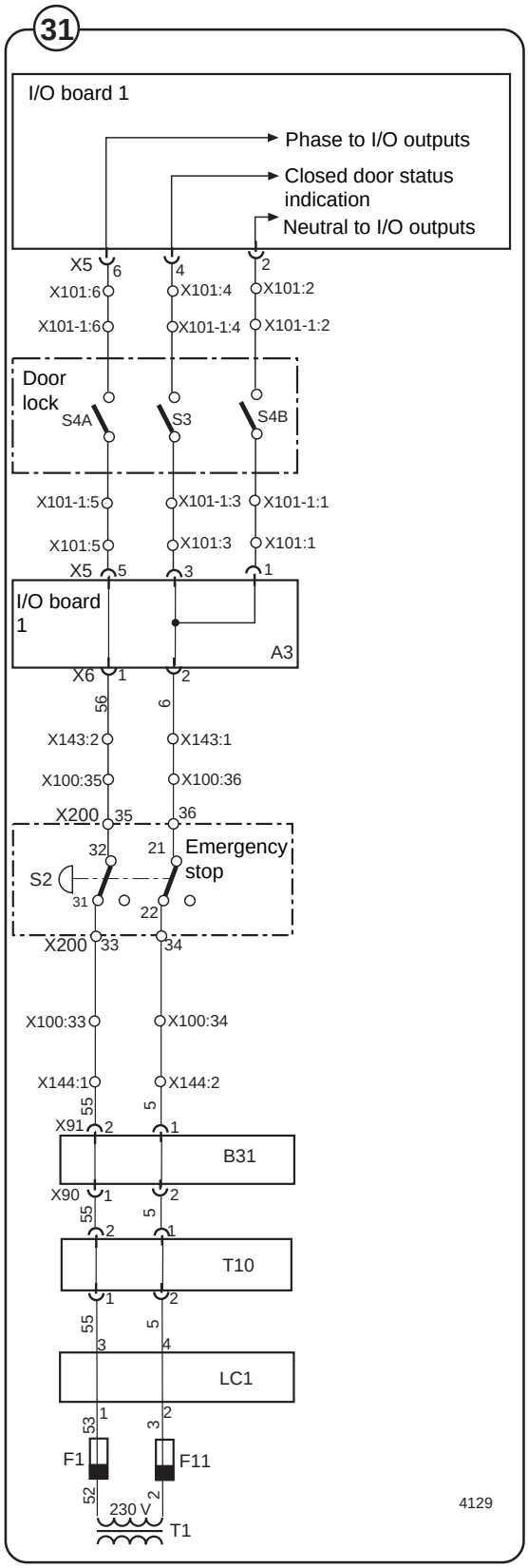
Fig. 31

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.



# Drain valve

## Description

Fig. 32 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

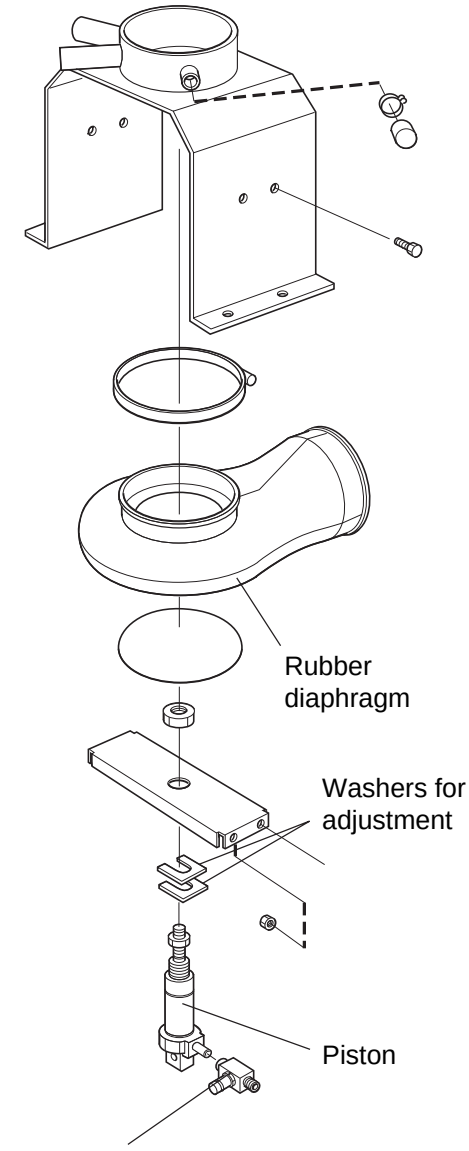
Check that:

- 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.

32



# Detergent dispenser

Fig. 33 The detergent dispenser has five compartments. Each compartment is connected to a water valve. The water supply to individual compartments is as follows:

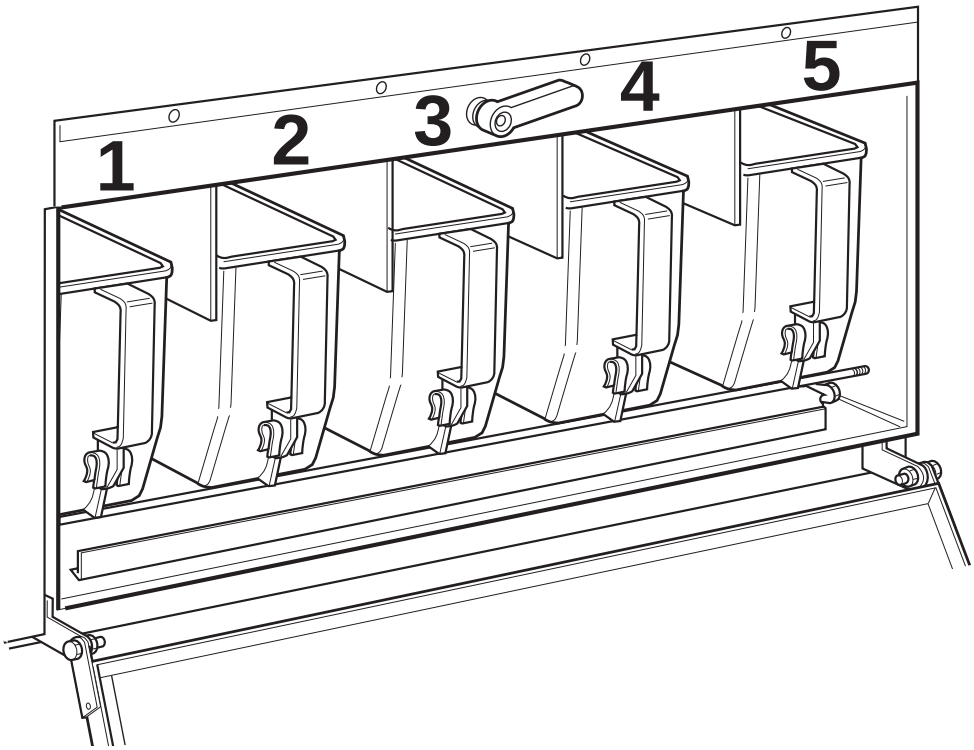
| Comp. | Valve | Water |
|---|---|---|
| 1 | Y25 | warm |
| 2 | Y26 | warm |
| 3 | Y27 | warm |
| 4 | Y28 | warm |
| 5 | Y18 | cold |

There is also a separate cleaning (water flushing) function for all compartments in the detergent dispenser, connected to valve Y16, 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.**

33




3478

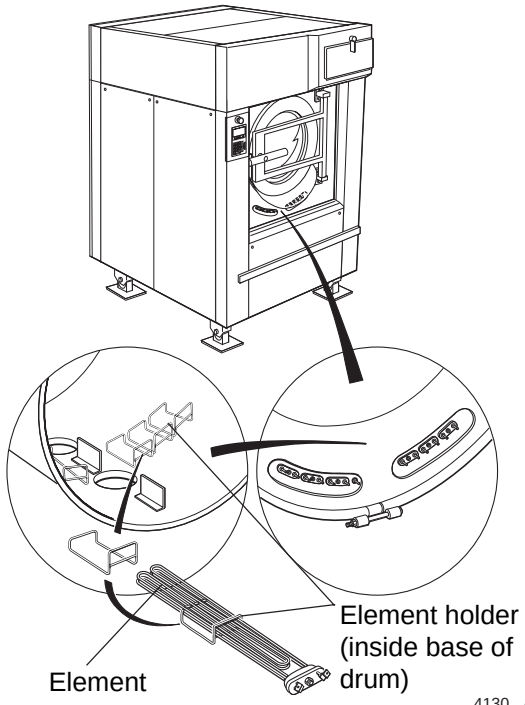
# Heating

Fig. 34 The six heating elements are located on the lower edge of the outer drum, accessible from the front of the machine. They are switched by two heating relays (K21 and K22) which are controlled by the program control unit. K21 is switched in as soon as the program control unit gives the command for heating, whilst K22 is switched in after a certain delay. The length of this delay can be programmed in "Settings 2".

Fig. 35 Some machines are equipped with terminal sets X103 and X104, so that the elements can have either star or delta connection.

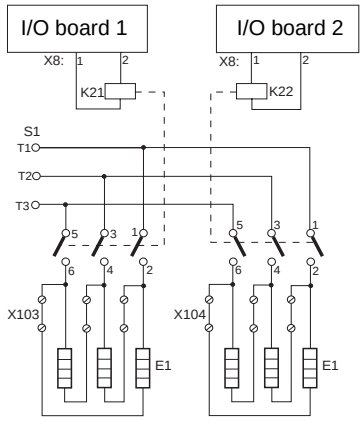
The program control unit prevents the elements from being switched in if there is no water in the drum. In the event of a fault which allowed the elements to be energised with no water in the drum, their built-in thermal cut-outs would fuse.

34

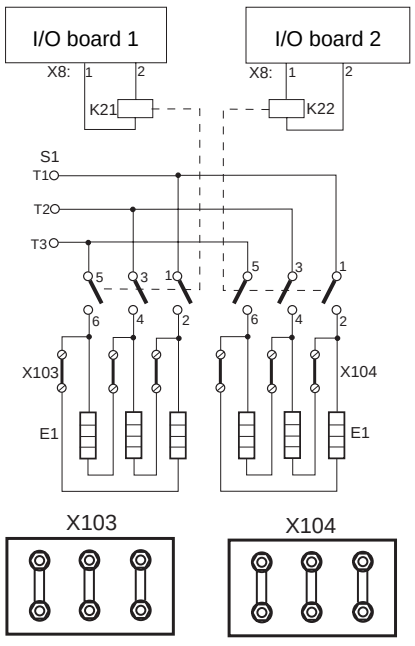



35

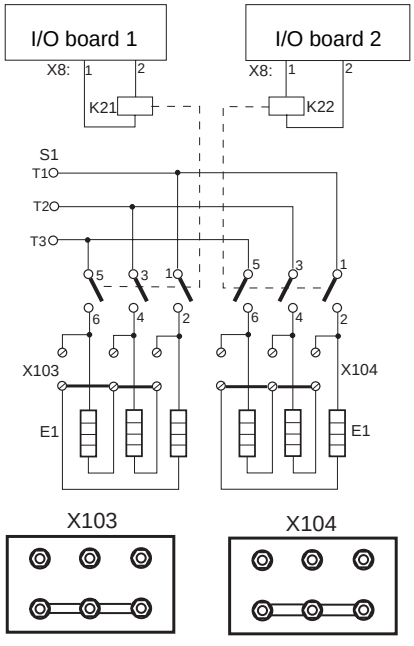
Machine without terminal sets X103 and X104.




Machine with terminal sets X103 and X104 for various voltage alternatives.




**200 - 277 V**




**346 - 480 V**

## Fault-finding

**May only be carried out by authorized personnel.**

If the heating time is abnormally long

- Switch off the power supply to the machine at the main switch/wall switch and check that the machine is isolated from the power supply. Remove the covers in front of the elements.
- Use a multimeter to determine if one of the elements is burnt out. For access to the elements, remove the machine’s front panel.
- Build-up of limescale can reduce the efficiency of the elements. If necessary, descale them. Follow the descalant manufacturer’s instructions concerning quantity of descalant to use.

To replace an element

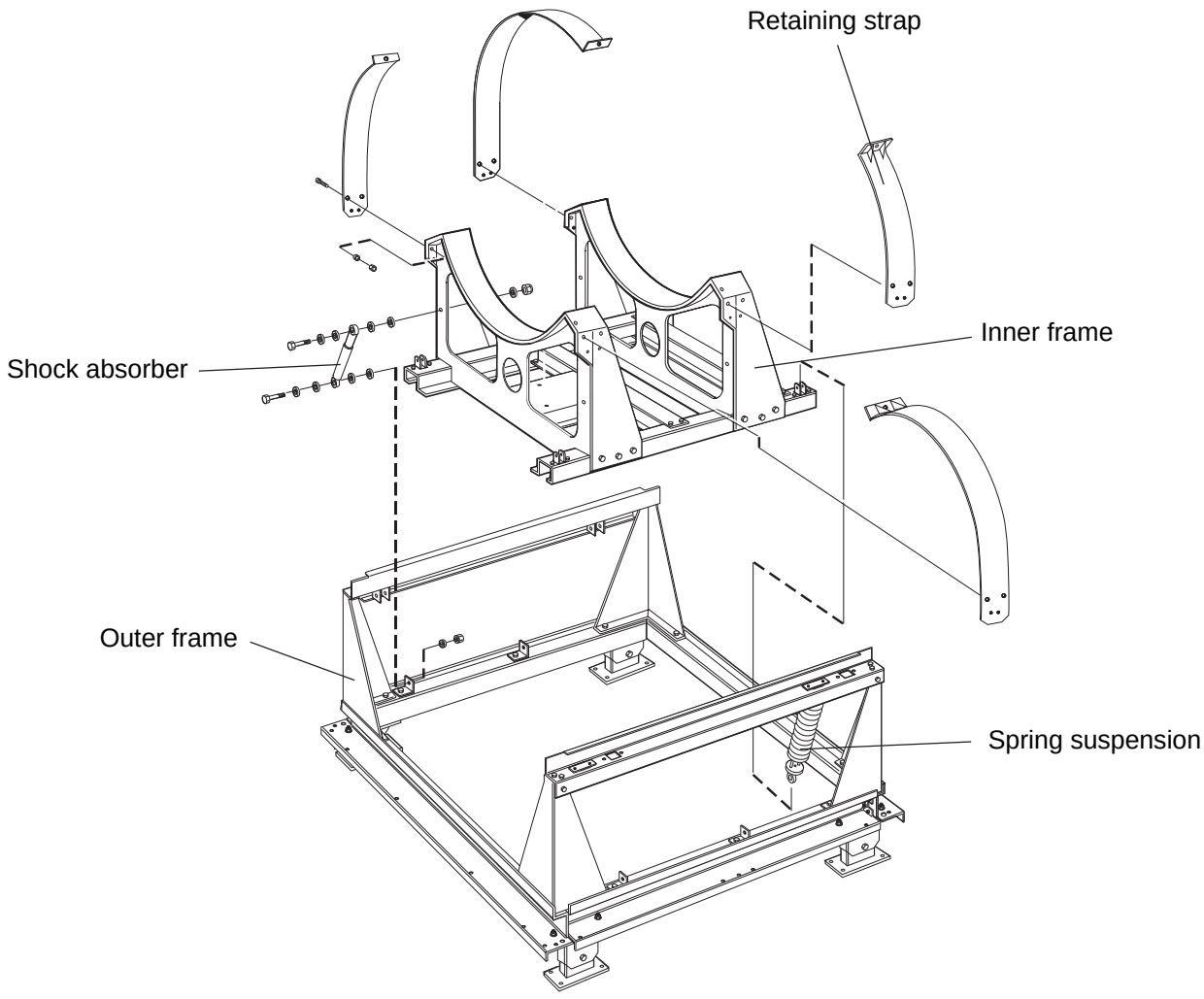
- Switch off the power supply to the machine at the main switch/wall switch and check that the machine is isolated from the power supply. Remove the covers in front of the elements.
- Note how the element is connected, then disconnect it.
- Undo the nut between the element connections and pull the element out.
- Guide the new element into its element holder at the rear of the drum and tighten the nut.
- Connect up the element.
- Fill the machine and check that there are no leaks from the element seal.

# Frame

Fig. 36 This machine has the suspended type of drum assembly, i.e. an inner frame carrying the drum assembly and motor, which is suspended (and movable) within an outer frame.

The inner frame (the upper part of which is shaped like a cradle to hold the outer drum) is mounted on the outer frame on four springs. For each spring there is also a shock absorber, to take up excessive vibration or a degree of unbalance. In addition the machine has electronic unbalance sensing, which halts load distribution or extraction if the unbalance is excessive.

36



# Weighing equipment

## Description

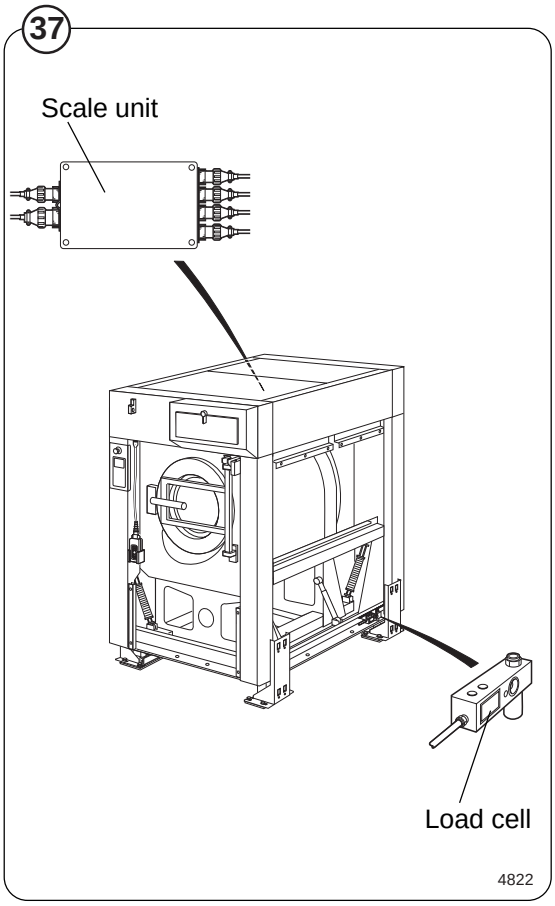
Fig. 37

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 power is restored after a power-cut, the weight displayed will always be 0, no matter whether there is a load in the drum or not. If this happens, it is important that you use the "Reset weighing equipment" function via the Clarus software. Follow the instructions under "Reset weighing equipment" in the "Machine operation" section of the manual.

**After a power-cut, the weighing equipment will always display 0, no matter what the actual load in the drum. In this event you will have to use the "Reset weighing equipment" function.**

## 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 is, however, never allowed to be any lower than the safety level plus the hysteresis.

## Actual weight display

Fig. 38 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).

Fig. 39 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”.

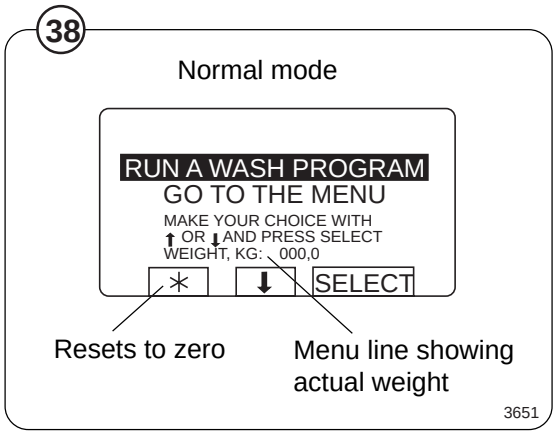
While a wash program is running, you can switch to weight display mode by selecting ”Show weight”, see the section ”Show weight” under ”Machine operation”.

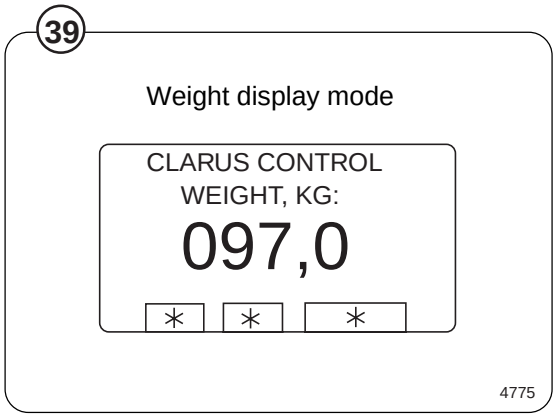
The weight shown on the display will always be the net weight (achieved because the weighing equipment has been ”tared”). A slight delay is built in to prevent the display from flickering.

## Resetting the weighing equipment

Fig. 38 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

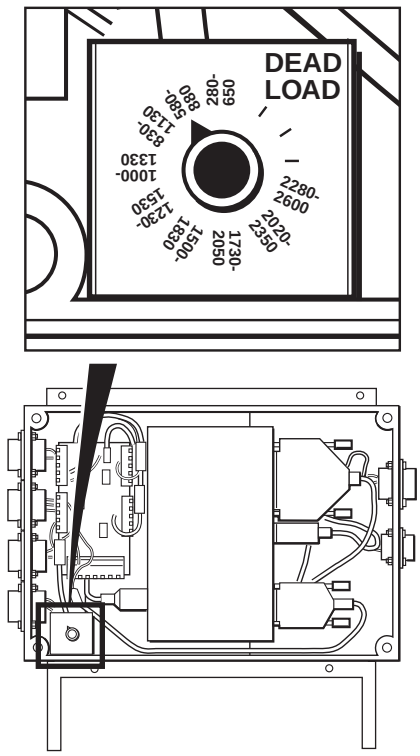
Fig. 40

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 **1000-1330 kg.**

If calibration of the weighing equipment should fail, one possible cause can be that this selector is incorrectly set.

40

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## To replace a load cell

Fig. 41

- 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.
- Remove the three screws (C).
- Disconnect the load cell cable at the scale unit and remove the strap.
- Remove nuts and bolts (D).
- Remove the faulty load cell and fit the new, assembly is reverse of disassembly.

**Install the new load cell as indicated by arrow on side of load cell!**

41

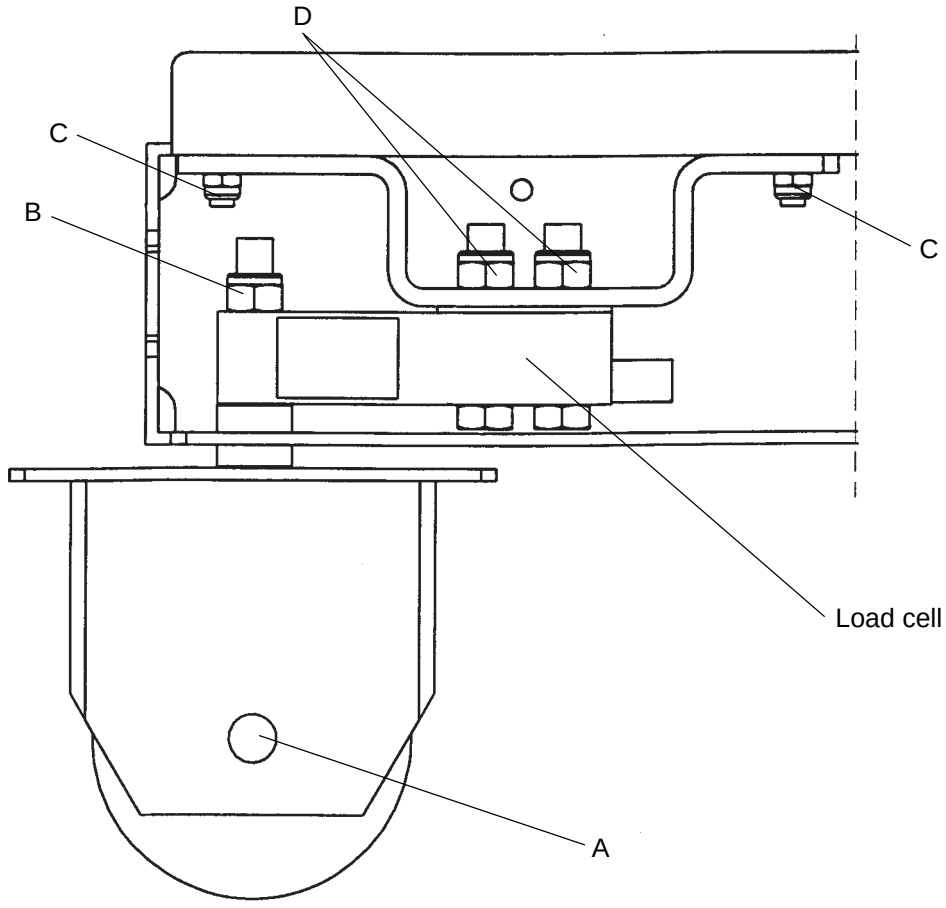


Illustration shows a machine with the tilt function.

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## To replace the scale unit

Fig. 42

- 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 **1000-1330 kg.**
- Calibrate the weighing equipment, see "Calibrate the scale" under "Machine operation".

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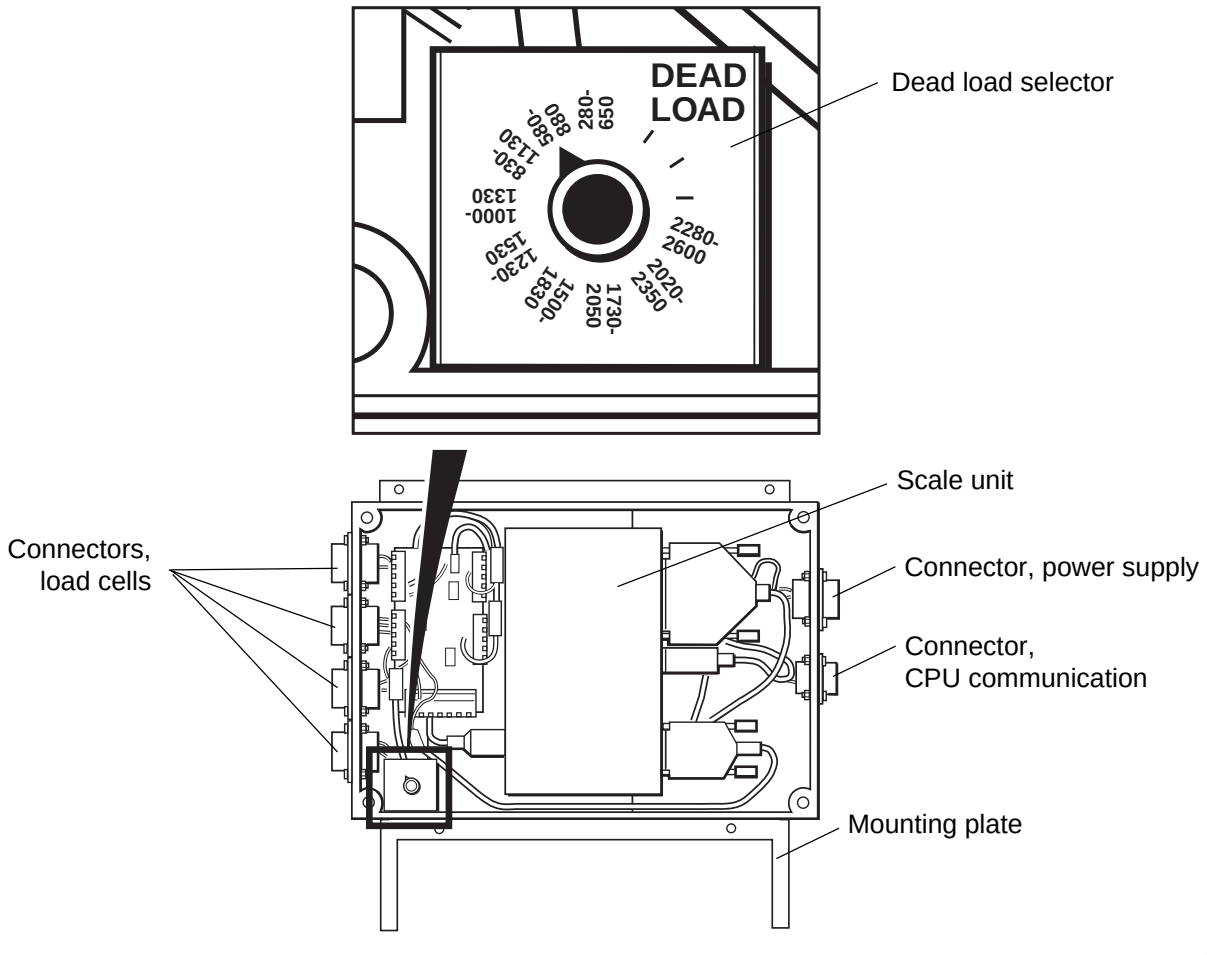


## Component locations

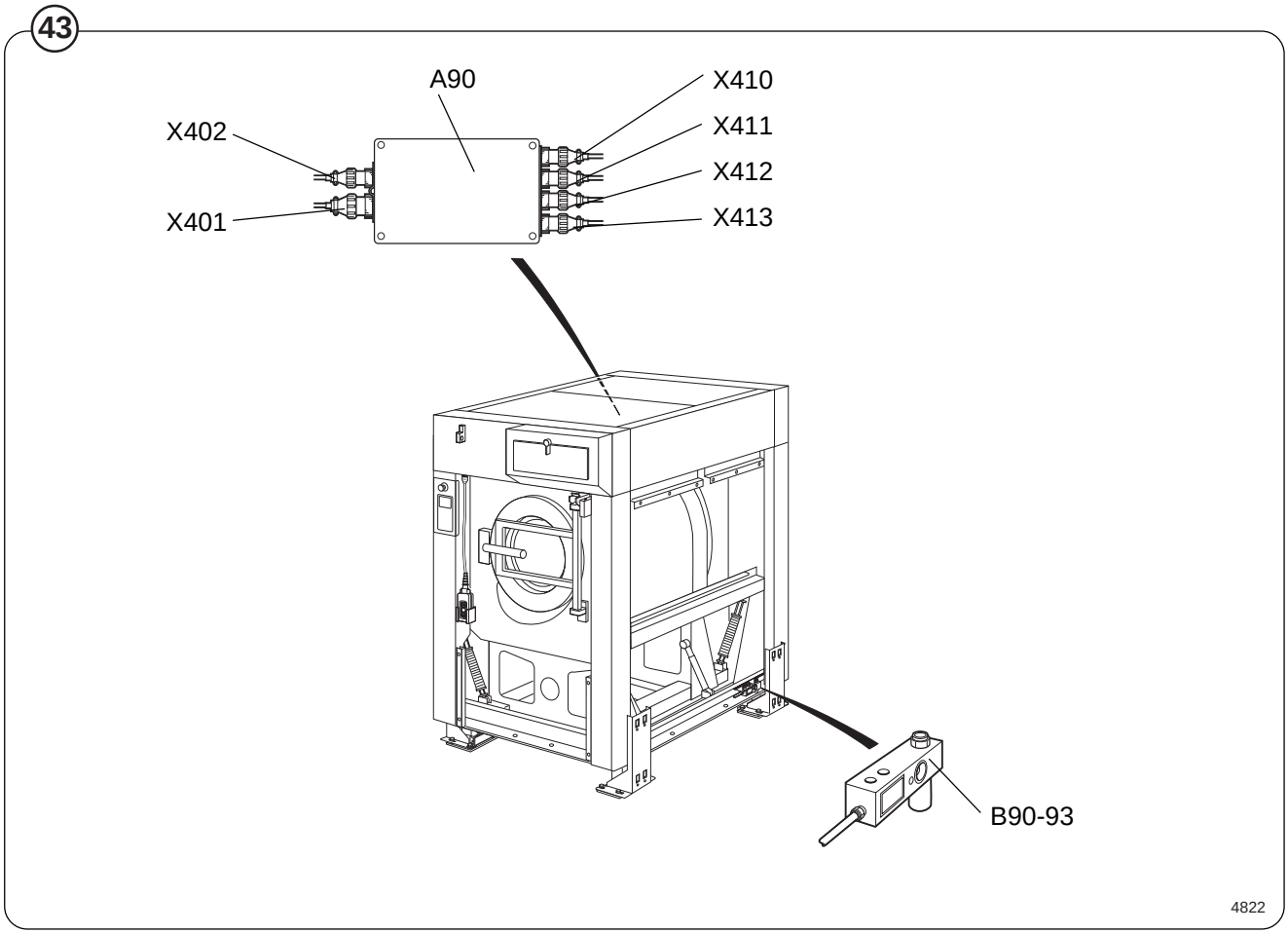



**Fig. 43**

| | |
|---|---|
| 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 eller -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.

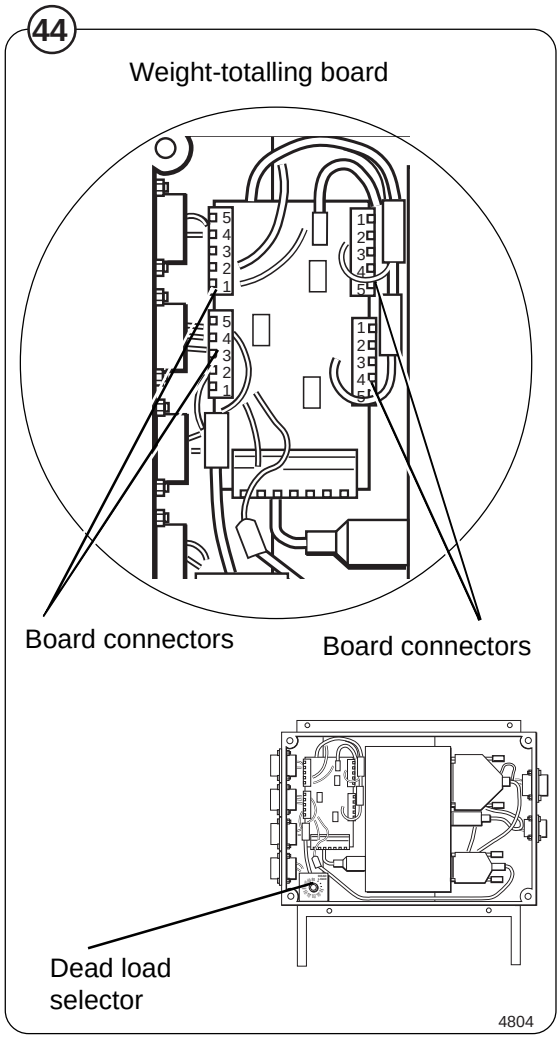
*Fault-finding procedure:*

**Fig. 44**

- Remove the left-hand rear side panel. Check that the dead load selector is set to **1000-1330 kg**. If it is not, set it correctly and calibrate the weighing equipment according to “Calibrate the scale” under “Machine operation”.
- Remove the side panels and check that the load cells are unobstructed. Remove any mechanical obstructions.

**Fig. 44**

- 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.
- 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.
  - Take the scale unit off its mounting plate.
  - 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”.



*Error message on display (fault symptom):*

| |
|---|
| 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”.

*Suspected fault:*

| |
|---|
| If you suspect that the weighing equipment is not displaying accurate weight values. |

*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:*

**Fig. 45**

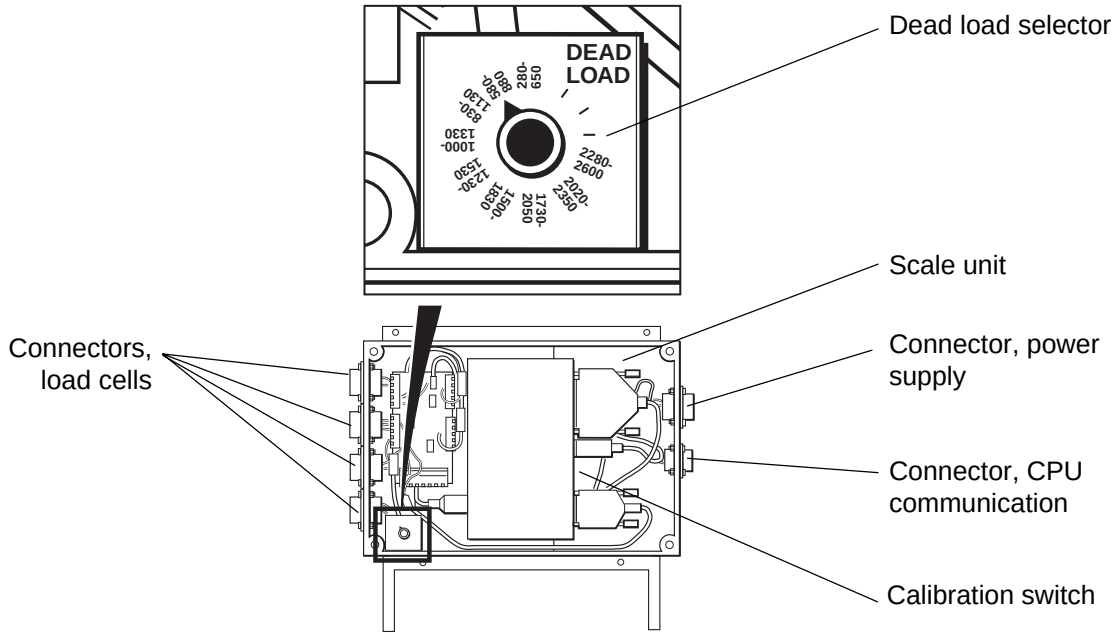
- Check that the dead load selector is set correctly. It should be set to 1000-1330 kg.
- If you are or have recently been calibrating the weighing equipment, the calibration switch may be incorrectly set, or an incorrect calibration weight may have been used for calibration.

  Check that the calibration switch is set correctly. It should normally be set to ON. 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.

**45**



*Error message on 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.

*Error message on 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.

# Technical data

| | | |
|---|---|---|
| Innerdrum, volume | litres | 400 |
| diameter | mm | 920 |
| depth | mm | 610 |
| Drum speed, | | |
| wash | rpm | 37 |
| extraction | rpm | selectable |
| Heating, | | |
| electricity | kW | 36 |
| steam | | x |
| hot water | | x |
| G-factor | | 350 |
| Weight, net | kg | 1095-1450* |

* Precise weight depends on accessories fitted.

### Connections

| | | |
|---|---|---|
| Water valves | connection | DN32 |
| | BSP | 1 1/4" |
| recommended water pressure, valve open | kPa | 150-400 |
| Functioning limits for water valve | kPa | 50-1000 |
| Capacity at 300 kPa | l/min | 400 |
| Drain valve | outer Ø mm | 110 |
| Draining capacity | l/min | 400 |
| Steam valve | connection | DN20 |
| | BSP | 3/4" |
| recommended steam pressure | kPa | 300-600 |
| operating range (limits) of steam valve | kPa | 50-800 |
| Compressed air | connection | DN6 |
| BSP, internal thread | | 1/8" |
| BSP,external thread | | 1/4" |
| recommended air pressure | kPa | 400-600 |
| consumption | l/tim | 20 |

| | | |
|---|---|---|
| Frequency of the dynamic force | Hz | 13,8 |
| Max floor load at extraction | kN | 16±0,75 |

## Sound levels

| | | |
|---|---|---|
| Solid sound level in re $10^{-9}$ mm/sec | dB (A) | |
| Airborne sound level dB (A) re $2x10^{-5}$ Pa | | 65/62* |
| Vibration level | $mm/sec^2$ | |
| Vibration speed | mm/sec | |

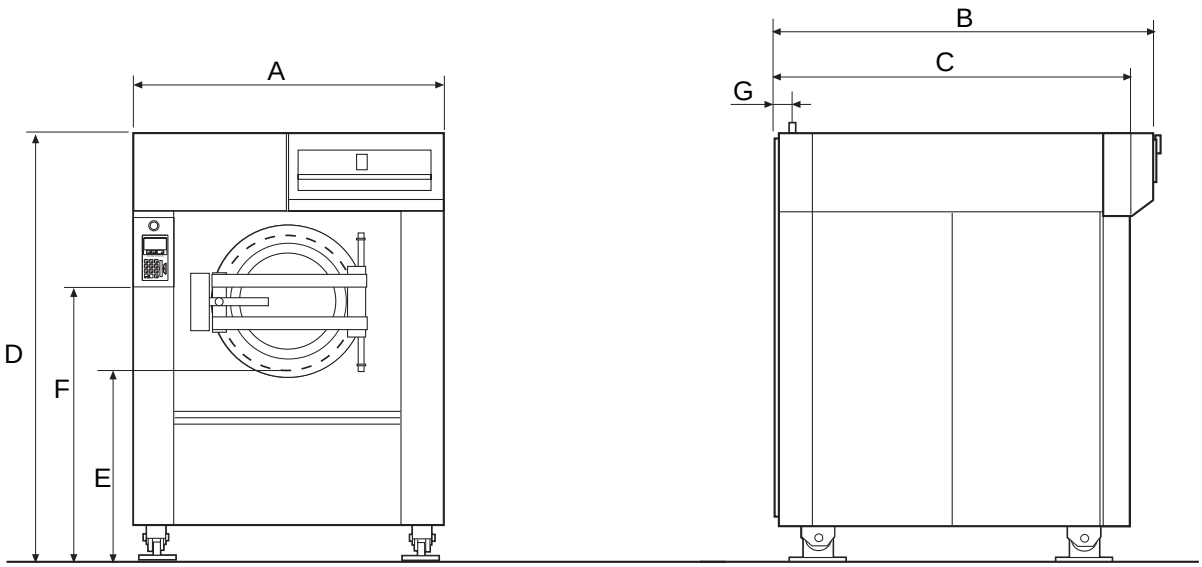
* With insulation

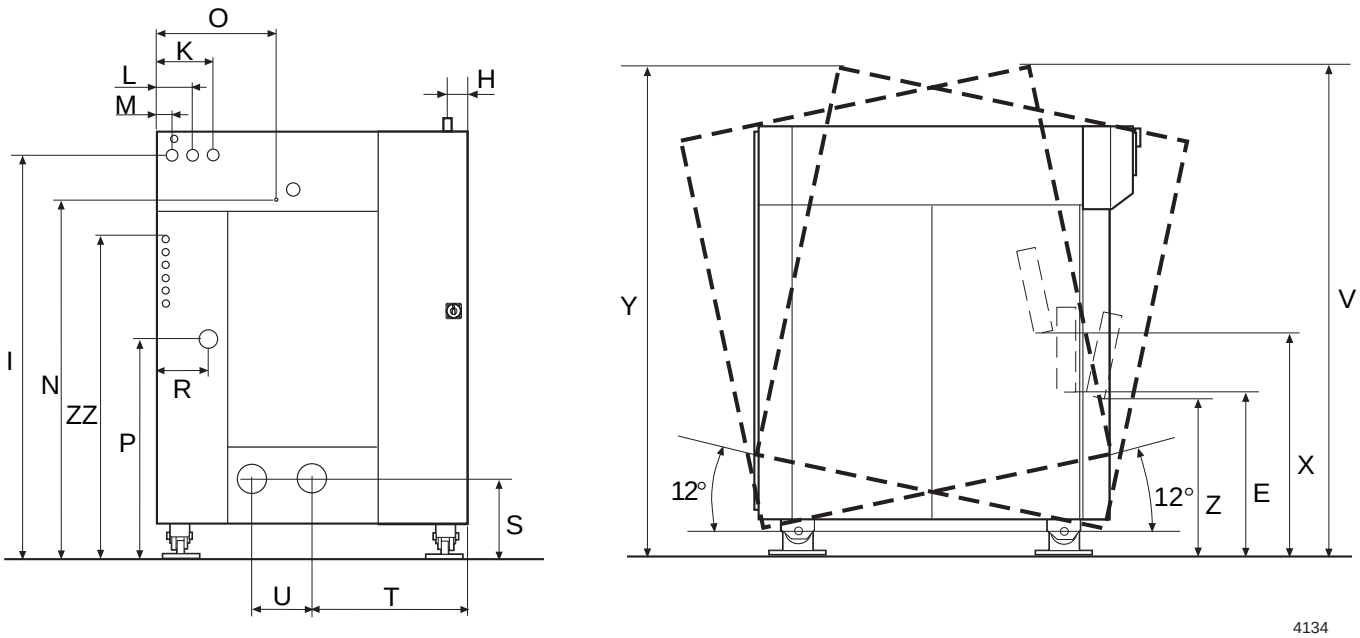
## Motor

| | | |
|---|---|---|
| Power consumption | kW | 5,5 |

## Dimensions

| A | B | C | D | E | F | G | H | I | K | L | M | N |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1330 | 1465 | 1360 | 1890 | 880 | 1165 | 75 | 40 | 1775 | 240 | 150 | 60 | 1580 |
| O | P | R | S | T | U | V | X | Y | Z | ZZ | | |
| 510 | 975 | 220 | 360 | 660 | 260 | 2195 | 1165 | 2200 | 745 | 1325 | | |

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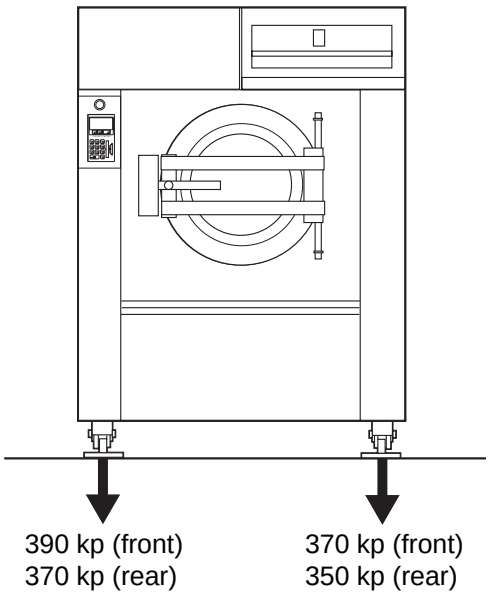
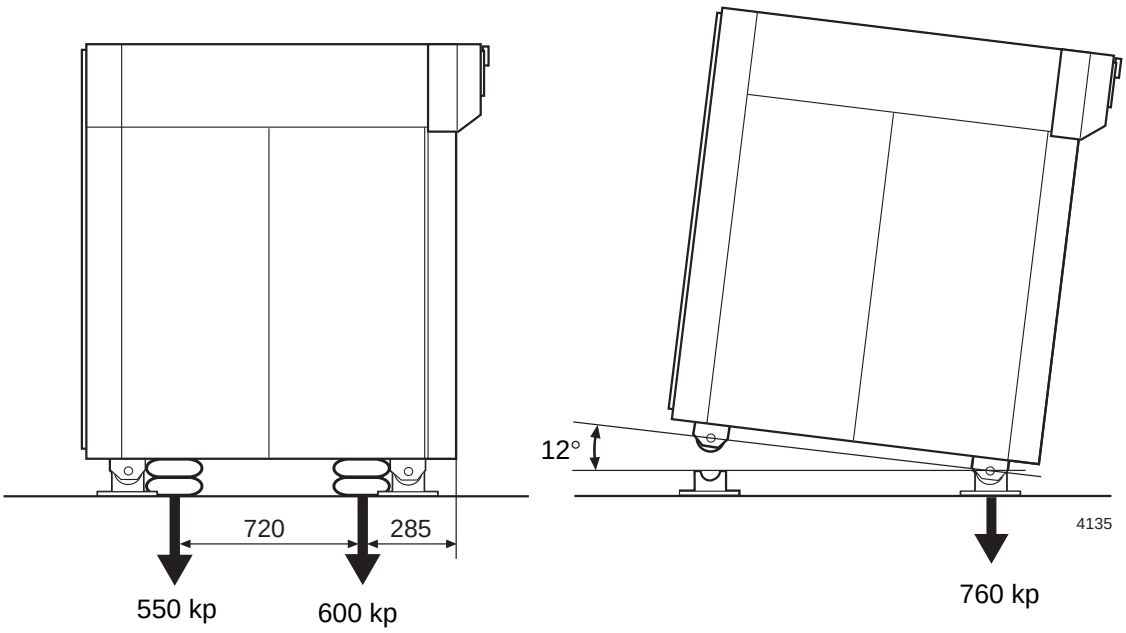
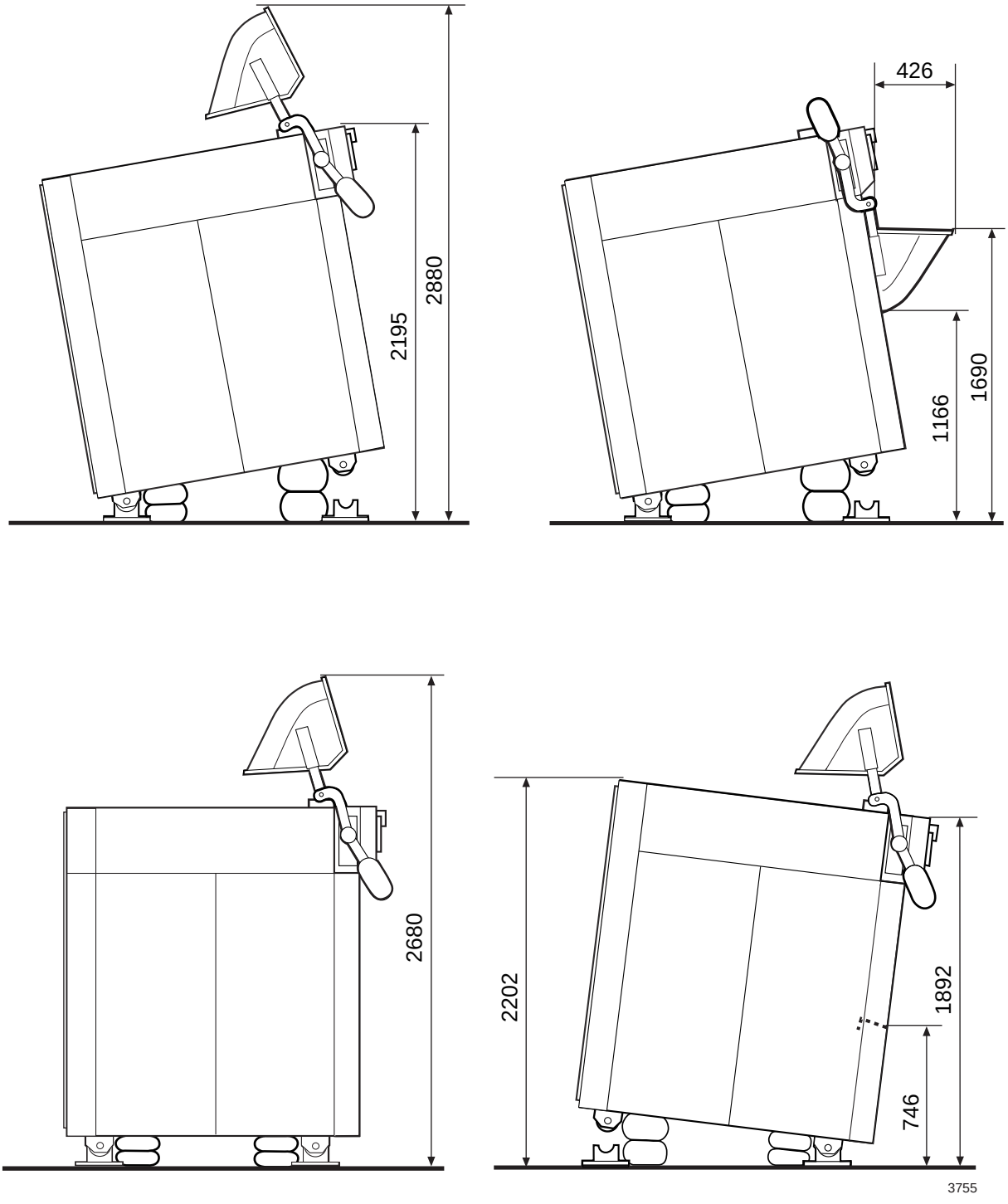
## Floor loading data



## Dimensions, machine with tilt function



# Installation

**For the installation of machines with optional equipment (such as the tilt function), see also the section ”Optional equipment” at the end of this manual.**

The washer extractor is supplied bolted in place on a pallet and packaged in a delivery crate. In some cases the machine may be supplied in waterproof/dustproof packaging. The direction from which the machine must be lifted and the machine centre of gravity are shown on the packaging.

## Location and surface

The machine must not be sited over an open floor drain. Check that the floor has an even surface and is level. The floor must be capable of withstanding the following:

- max. floor loading during extraction: 16±0.75 kN
- frequency, dynamic load: 13.8 Hz

The following clearances are recommended:

Fig. 46

- at least 1 metre between the machine and any wall behind it.
- at least 0.5 metres at each side, between the side of the machine and a wall, or between machines where these are side by side.

## Mechanical installation

Fig. 47

- Remove the packaging material. Remove the machine’s rear cover, side panels and lower front panel.

Fig. 48

- Remove the four bolts securing the machine’s outer frame onto the pallet.

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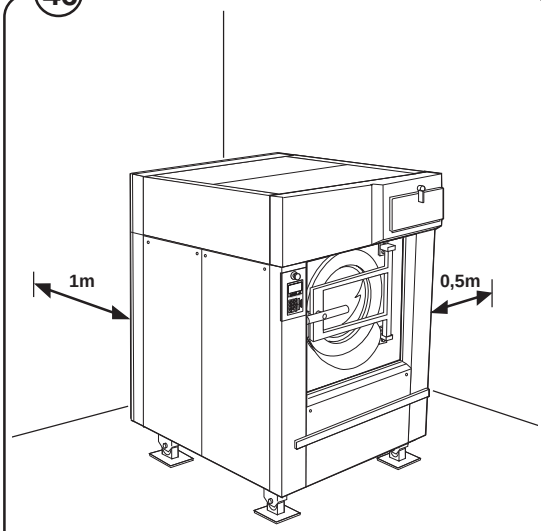


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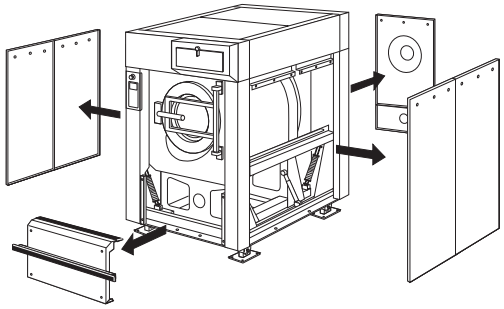

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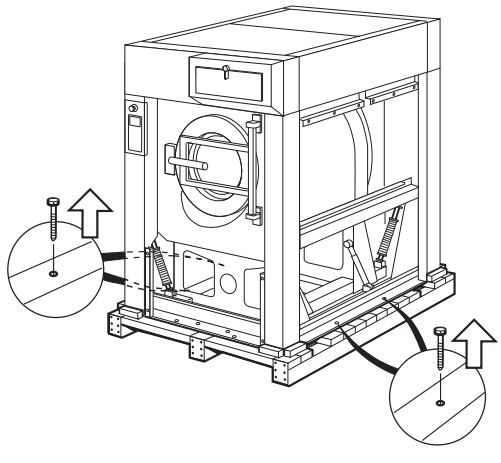

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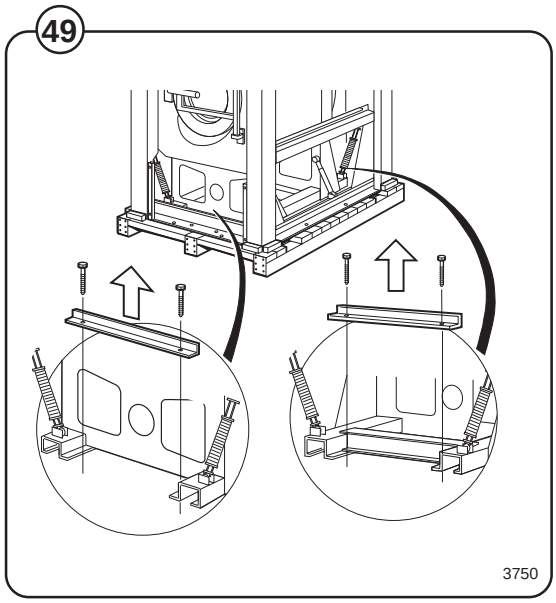
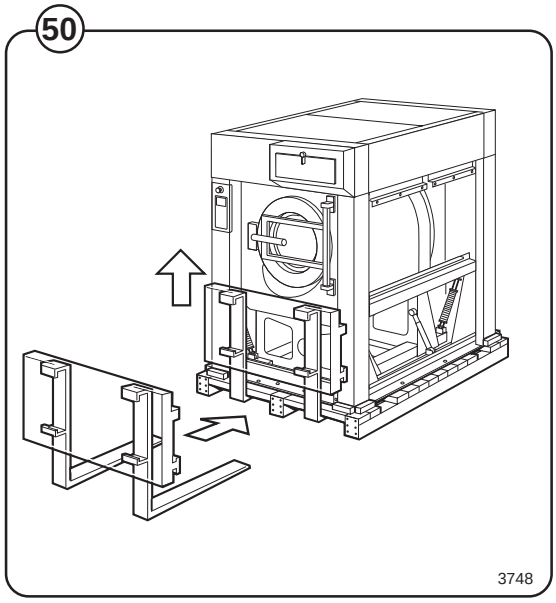
Fig. 49
- Remove the two transport locking devices (bars) used to secure the machine's inner frame in transit.

Fig. 50
- Use a fork-lift truck to lift the machine. The machine weighs between 1095 and 1450 kg.

Fig. 51
- Position the four blocks of wood supplied, one beneath each machine foot (on the outer frame), within the recesses in the pallet.



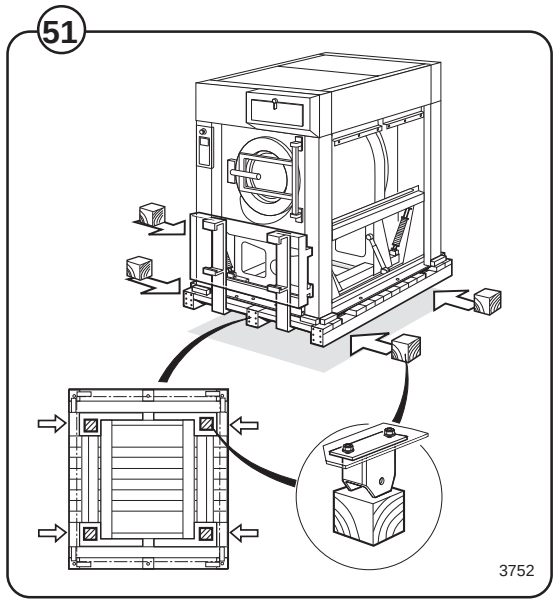



Fig. 52

- Lower the machine (A) and withdraw the truck forks (B). The machine should now be standing on the four blocks, and the pallet will be on the floor, clear of the machine. The next step is to insert the truck forks very carefully between machine and pallet (C).

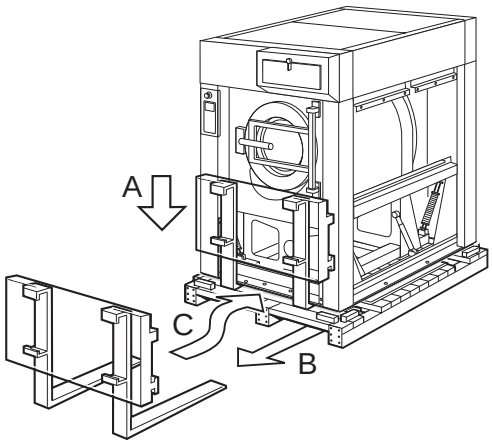
Fig. 53

- Lift the machine and remove pallet and blocks.

Fig. 54

- Screw on the machine feet. These may be either of two types: fixed feet, or pivoting feet if the machine is to have the tilt function.
- If the machine is to have the tilt function, this is a suitable time to install the corner posts which hold the protective plates, and also, where applicable, the position sensors (see the section ”Tilt function (optional equipment)”).

52

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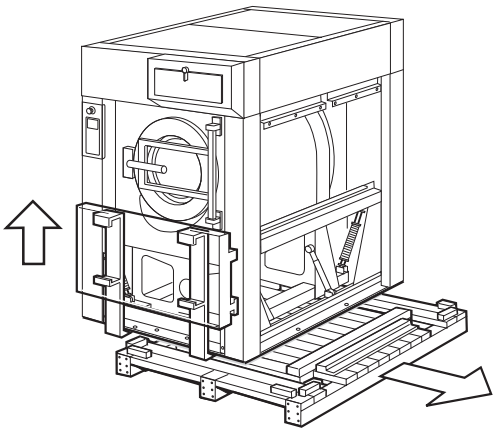

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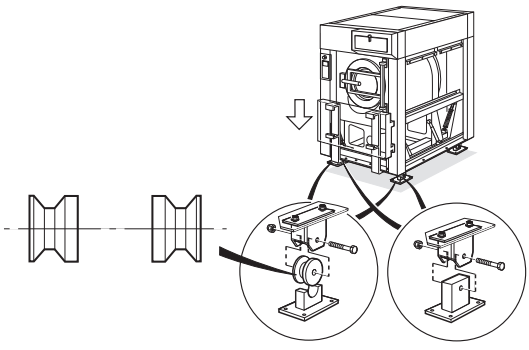


4761

Fig. 55

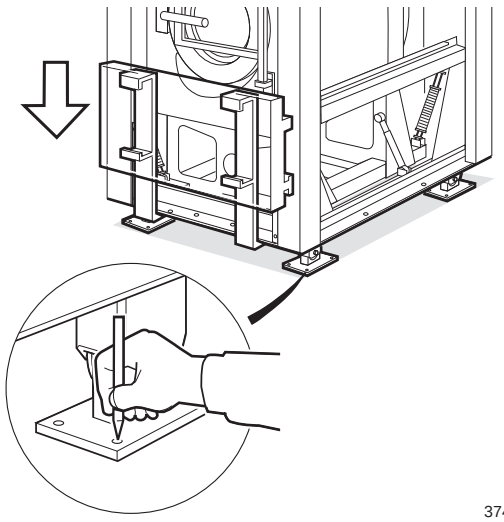
- Put the machine in place. Mark out and drill the holes for fixing the feet. Hole diameter: 15 mm.

Fig. 56

Fig. 57

**Use a spirit level and, where necessary, the ”washers” (or rectangular metal plates) supplied, to ensure that the floor mountings are level.**

55



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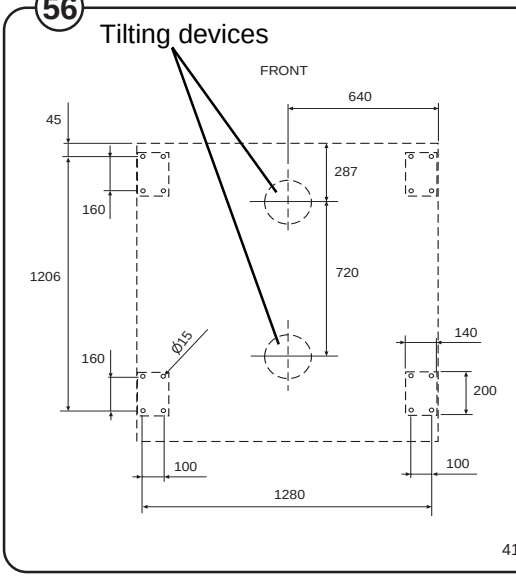


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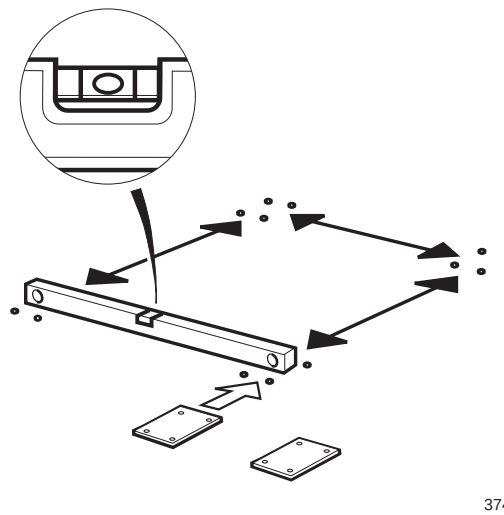


3742

Fig. 58
- Put the machine in place. Use a spirit level on suitable surfaces of the outer frame to check that the machine is level. Check too that the machine is resting firmly on all four feet.

Fig. 59
- Bolt the machine feet to the floor. Then check again that the machine is resting firmly (without movement) and is level.

## Connecting the water supply

Fig. 60 The supply pipes to the machine should be fitted with manual shut-off valves to facilitate installation and service. Refer to local utilities regulations when fitting non-return valves.

The hoses should be rated for high pressure and for 2.5 MPa (25 kp/cm$^2$).

The following values apply to water pressure:

- recommended: 150-400 kPa
  (valve fully open) (1,5-4 kp/cm$^2$)

- limiting values, min: 50 kPa (0,4 kp/cm$^2$)
  max: 1 MPa (10 kp/cm$^2$)

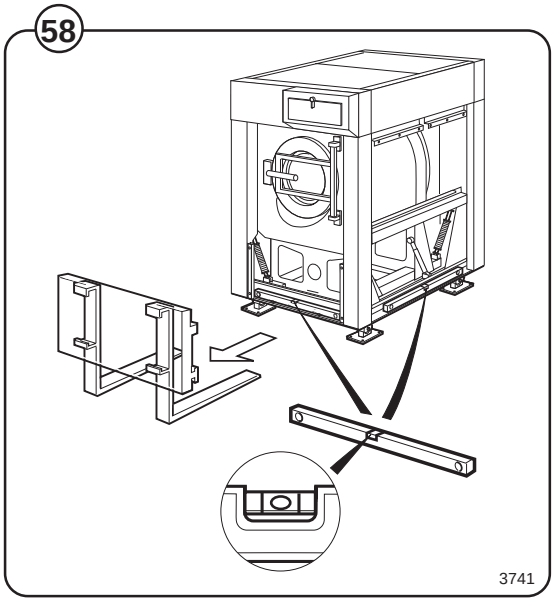
The hoses should be flushed through before being connected to the machine.

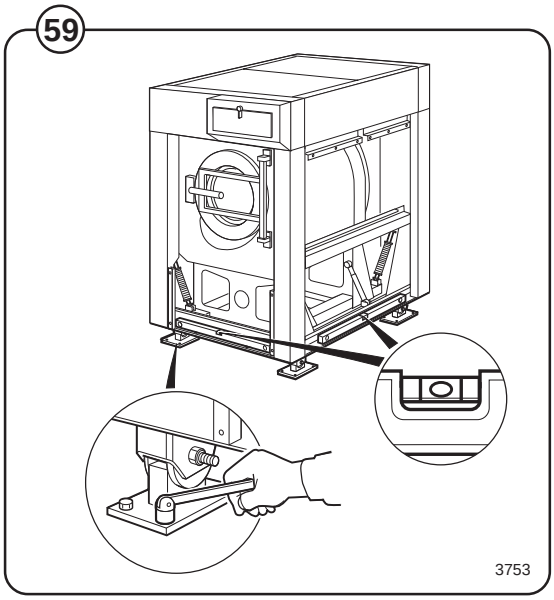
The hoses should hang in gradual arcs. This is particularly important if the machine is fitted with a tilting function.

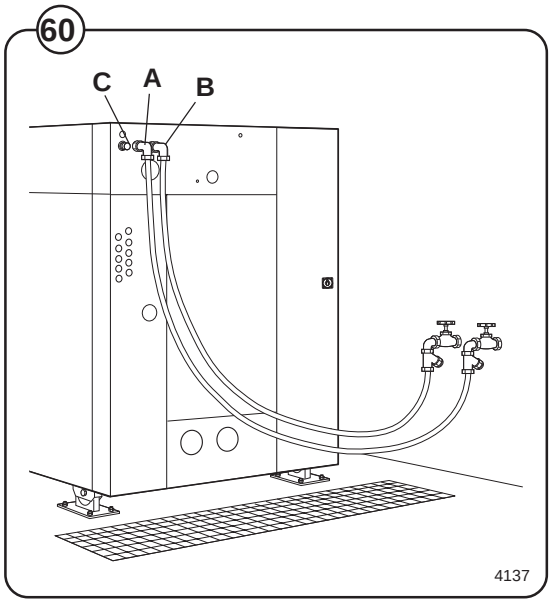
Connect the hoses as follows:

- cold water to (A)
- hot water to (B)
- (if using a third water supply:) the third water hose to (C).

  Sizes of A, B and C: DN 32 (1 1/4" BSP).



## Steam supply

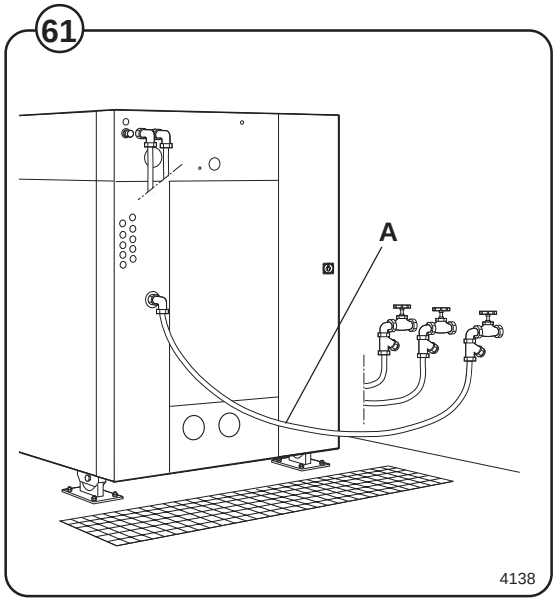
Fig. 61 The supply hose (A) must have a manual shut-off valve to make installation and servicing easier.

Connect an approved hose between filter and machine. The following values apply to steam pressure:

- recommended: 300-600 kPa (3-6 kp/cm$^2$)
- limiting values, min: 50 kPa (0,5 cm$^2$)
  max: 800 kPa (8 kp/cm$^2$)

The hose should hang in a gradual arc. This is particularly important if the machine is fitted with a tilting function.

Connection size: DN 20 (3/4" BSP).



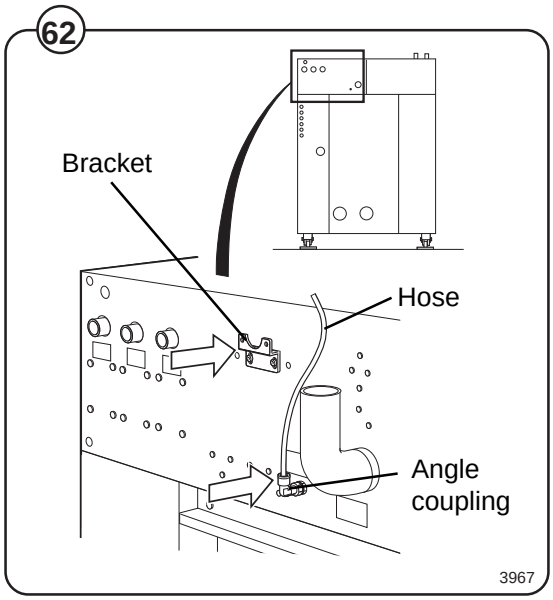
## Compressed air connection

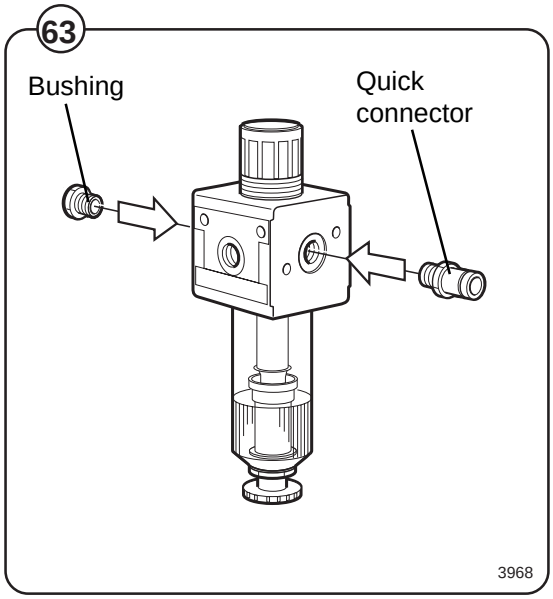
Fig. 62 — Applies only to machines with tilt function

A pressure regulator complete with water separation device is to be installed on the machine. When the machine is supplied, the angled coupling, hose and bracket for the pressure regulator will already be installed.

Fig. 63 — Install the quick-connector for the hose and a bushing (for the hose from the compressed air supply) on the pressure regulator.

Fig. 64 — Install the regulator on the bracket using two screws. Connect the compressed air hose using the quick-connector. Screw on the pressure gauge.



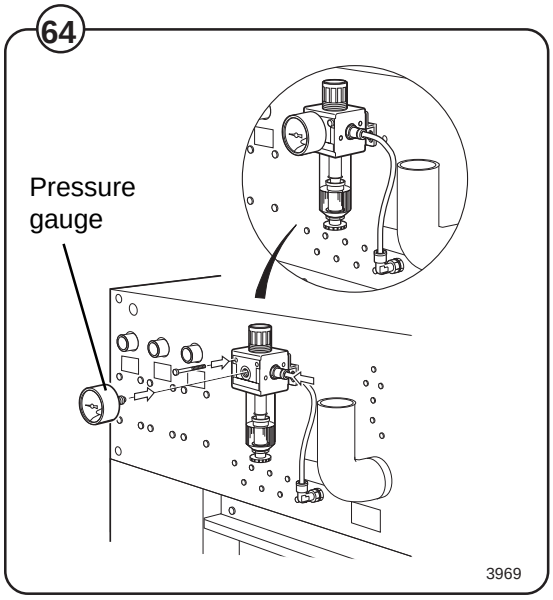
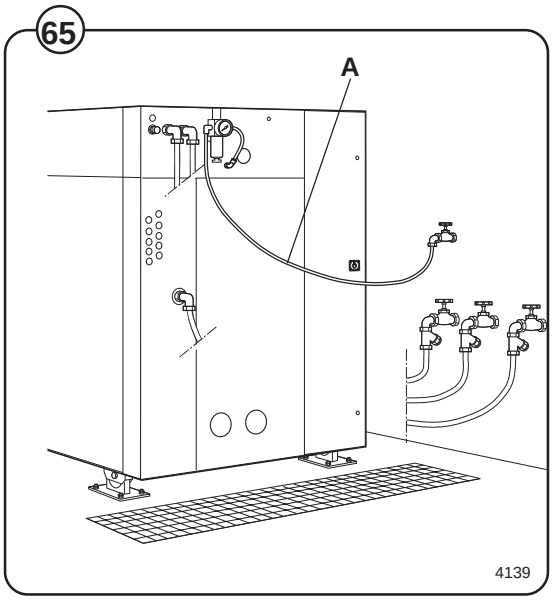



Fig. 65 Connect the hose from the compressed air supply to the bushing on the pressure regulator. Connect the hose so it hangs in a gentle arc. This is particularly important if the machine has the tilt function.

The connecting hose must be rated for a pressure of at least 1 MPa (10 kp/cm$^2$).

The following values apply to the compressed air supply:

- Recommended pressure: 450-600 kPa (4.5-6 kp/cm$^2$)
- Min. pressure 450 kPa (4.5 kp/cm$^2$)
- Max. pressure 800 kPa (8 kp/cm$^2$)

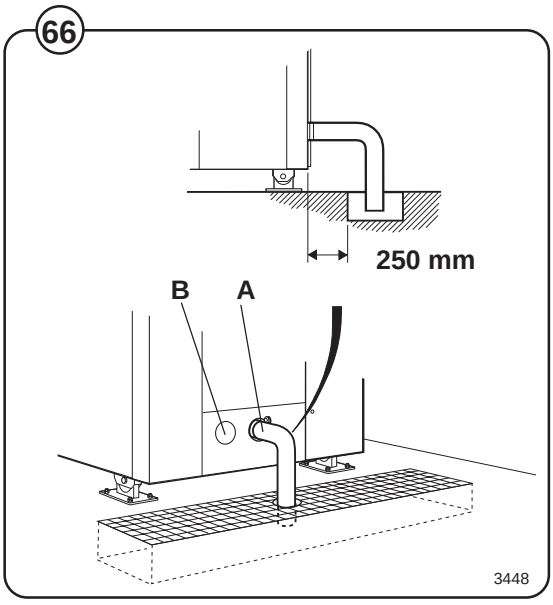



## Drain

Fig. 66 The connector for the machine discharge (A) has an external diameter of 110 mm. The distance between the machine and the floor gully or drainage channel should be at least 250 mm.

Connect a hose or a pipe to the drain connection. Avoid acute angles or kinks which could impede the flow. The hose or pipe should open into a floor gully, drainage channel or similar waste outlet. Make sure that the hose's function is unaffected by the tilting function if the machine has this feature.

If the machine has a second discharge, (B) must also be connected to the floor drain.



## Detergent dispenser, non-liquid detergents

If only non-liquid detergents are to be used in the detergent dispenser, the following adaptation is recommended:

Fig. 67 Drill two 5 mm holes in the bottom of each scoop to allow any water left to drain off.

## Installation of equipment for external liquid supply.

**Electrical installation may only be carried out by competent, authorised personnel.**

**All external equipment which is connected to the machine must be CE/EMC-approved.**

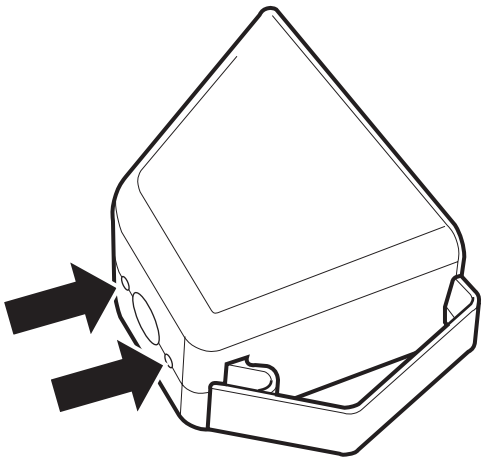
Fig. 68 As standard equipment the machine has five pipe connectors of 1/2" diameter, for connecting an external liquid supply system (A).

Fig. 69 External supply equipment is connected to X146 on the top row of terminals in the automatic control unit. There is a total of 13 outputs for detergent dosage.

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

Common neutral for all outputs is on terminal X146:14.

67



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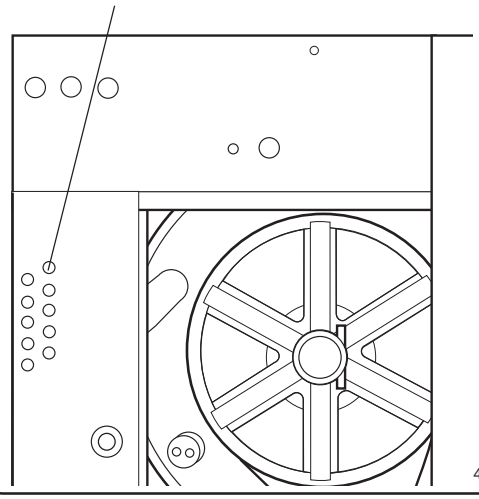
System A



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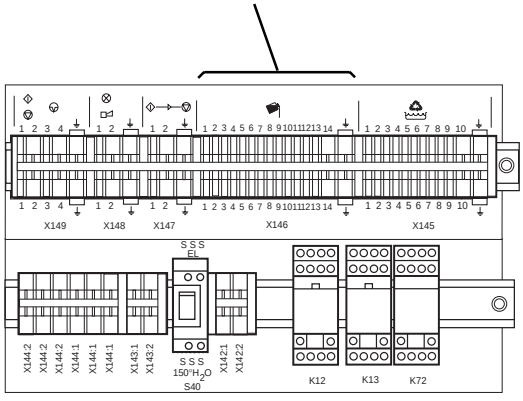
External liquid supply equipment

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## Electrical installation

**Electrical installation may only be carried out by competent, authorised personnel. Check that the earth conductor is correctly connected.**

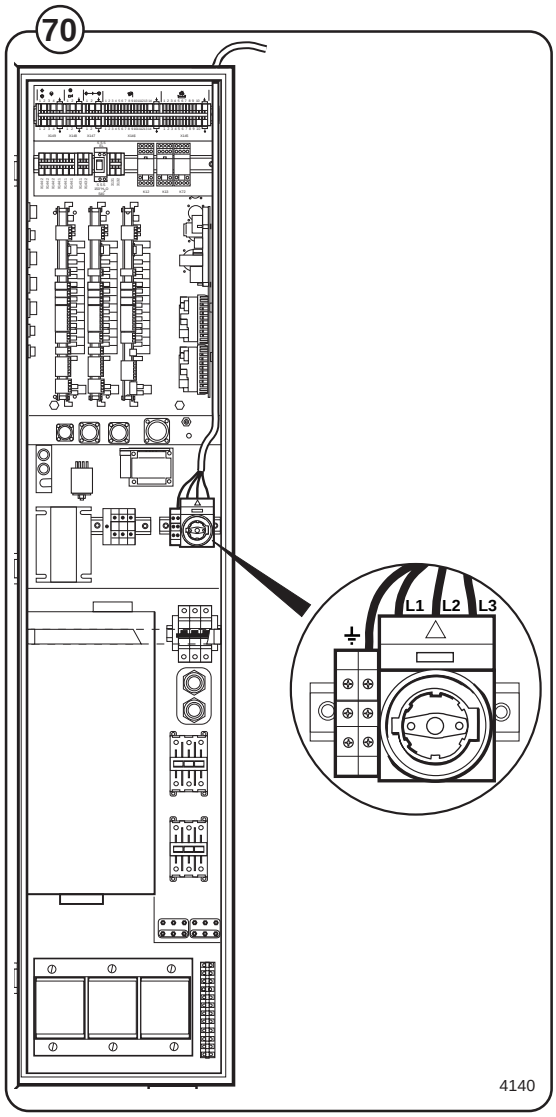
The electrical cable for the machine's power supply should hang in a gentle arc. This is particularly important if the machine is equipped with the tilt function.

Fig. 70 Connect the machine to a separate mains circuit with its own circuit breaker(s). The various ratings required for circuit breakers are shown in the table on the next page.

Fig. 71 Connect the cable to the main switch inside the compartment on the machine rear, see illustration.

Fig. 70 The electrical cable used must be of a suitable size/rating. For the correct size/rating for this cable, check the relevant local or national regulations.

If an earth leakage circuit breaker (or RCD - residual current device) is used, it must be installed to protect the washer extractor only.



71

No heating or steam heating
Total wattage: 5,5 kW

| Voltage alternative | Fuse A |
|---|---|
| 200 V 3 AC 50 Hz | 25 |
| 200 V 3 AC 60 Hz | 25 |
| 208-240 V 3 AC 60 Hz | 25 |
| 230 V 3 AC 50 Hz | 25 |
| 230/400 V 3 AC 50 Hz | 25/16 |
| 240 V 3 AC 50 Hz | 25 |
| 346 V 3 AC 50 Hz | 16 |
| 380 V 3 AC 50 Hz | 16 |
| 380 V 3 AC 60 Hz | 16 |
| 400 V 3 AC 50 Hz | 16 |
| 415 V 3 AC 50 Hz | 16 |
| 440 V 3 AC 60 Hz | 16 |
| 480 V 3 AC 60 Hz | 16 |

With electrical heating
Total effekt: 38 kW

| Voltage alternative | Fuse A |
|---|---|
| 230/400 V 3 AC 50 Hz | 100/63 |
| 240 V 3 AC 50 Hz | 100 |
| 346 V 3 AC 50 Hz | 80 |
| 380 V 3 AC 50 Hz | 63 |
| 380 V 3 AC 60 Hz | 63 |
| 400 V 3 AC 50 Hz | 63 |
| 415 V 3 AC 50 Hz | 63 |
| 440 V 3 AC 60 Hz | 63 |
| 480 V 3 AC 60 Hz | 50 |

### Instructions for change of power supply from 230 V 3 AC 50 Hz to 400 V 3 AC 50 Hz

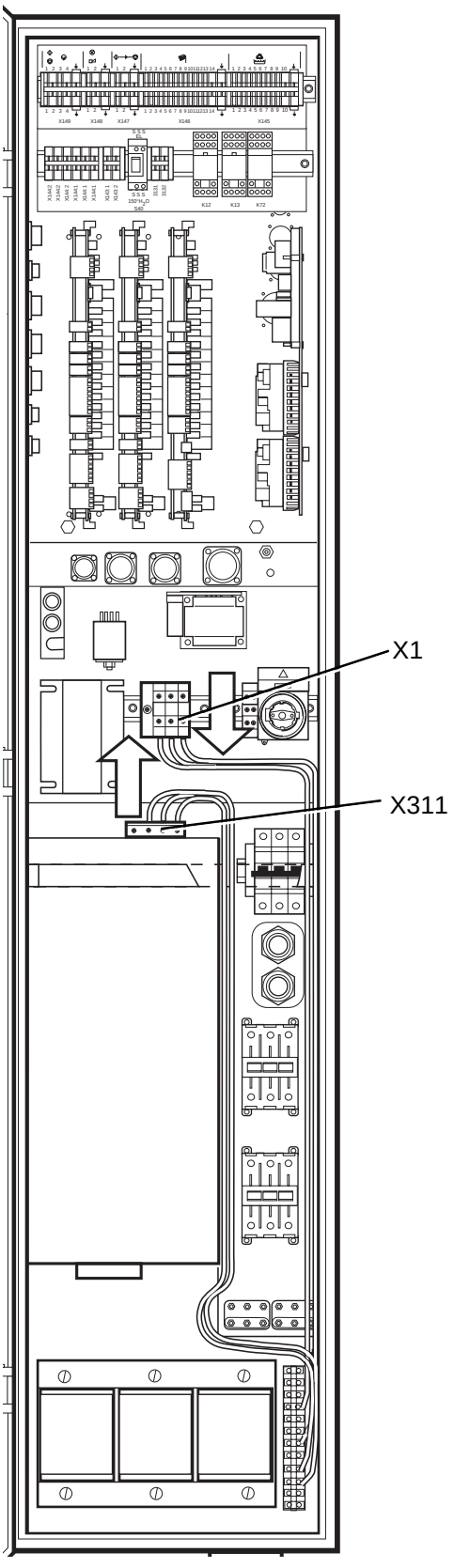
Procedure:

- Transformer T2 has to be disconnected, as follows:
  - Check that the machine is safely isolated from the electrical supply.
  - Disconnect the wiring between T2 and terminal set X1.
  - Disconnect the wiring between T2 and terminal set X311 on the motor control unit.
  - Connect terminal set X1 to terminal set X311 as shown in the illustration.

Fig. 72

Fig. 73

72

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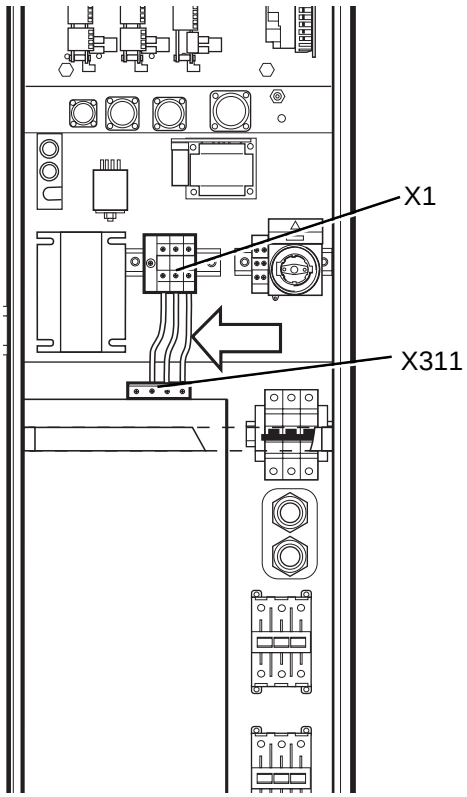


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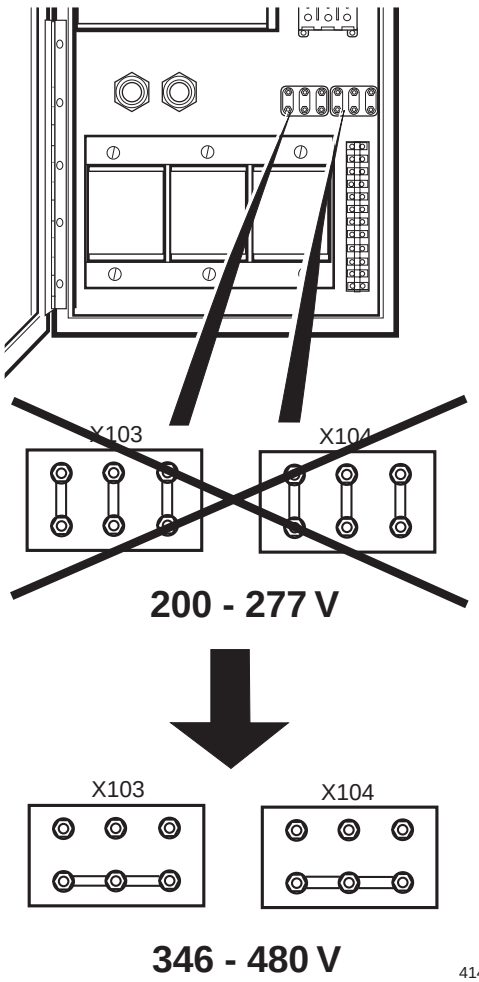
Fig. 74

- Change the way the heating elements are connected on terminal sets X103 and X104, from the connection method for 208-277 V to the connection method for 346-480 V, as illustrated.

Fig. 75

- On transformer T1, disconnect the wire connected to terminal 9 and connect it to terminal 5. The wire connected to terminal 1 should remain unchanged.
- Change the voltage rating plate on the rear of the machine to show the correct voltage.

74

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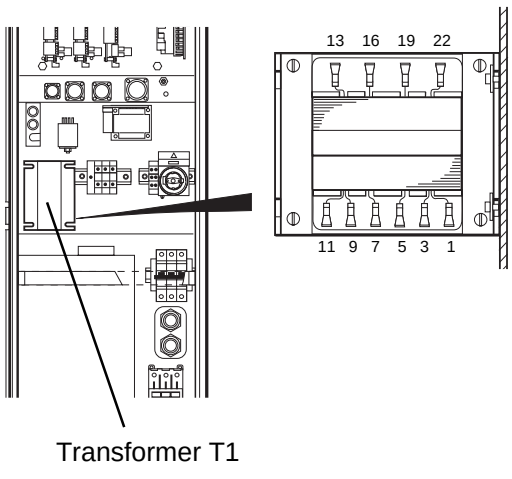


# Function checks

### Manual operation

- Switch on the machine's main switch.
- Open the manual valves for water and compressed air, also for steam if the machine has steam heating.

The procedure for operating the various machine functions manually is described in the chapter "Machine Operation" under the heading "Manual Functions".

- Check that the drum is empty and close the door.
- Close the drain valve.
- Operate the machine manually to fill with cold water, then hot water. Check that these water supplies are connected as they should be.
- Start the motor on wash action, and check that the motor is revolving clockwise and anticlockwise alternately, as normal for wash action.
- Start heating by entering a final temperature and then pressing **START**. Check that the steam valve opens or the heating element relay reacts, as appropriate.
- Check that all sources of detergent supply are working as they should, including the built-in detergent supply compartments, where present.
- Check the water and steam connections and the drain valve for signs of any leakages.
- Empty the water from the machine and open its door.

For machines with tilt function

- Operate the tilt control unit to tilt the machine forwards and backwards. Please note that if you switch the direction of tilt from one direction straight to the other, the cylinder will not start to fill until the pressure in the active cylinder has reduced to below 20 kPa.
- Check that the machine will **not** move from tilt position to normal position when the emergency stop is pressed in, but that it remains in the position it was in already.

### Automatic operation

- Check that the external switch or switches are switched on and that the manual valves for water, compressed air and steam (if the machine has steam heating) are open.
- Run one of the machine's built-in (standard) programs with heating to 60 C.
- Check that the program proceeds normally, and that water filling, detergent filling, heating and motor action are all working in accordance with the program display on the display screen.

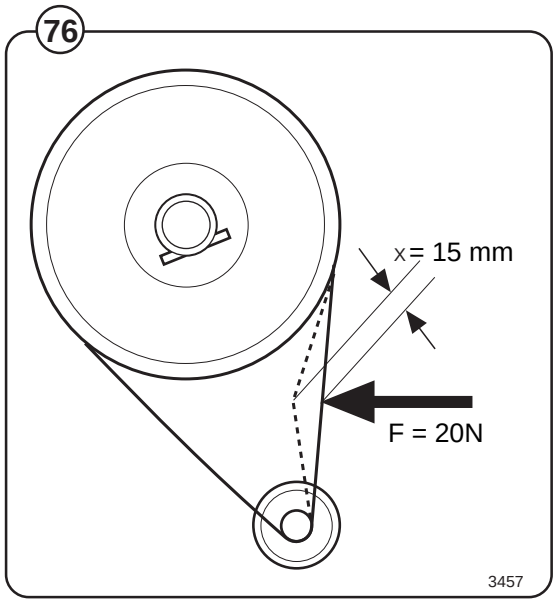
## To conclude this set of function checks

If all function checks have been satisfactory, refit the side panels, rear and front covers and any other panels which were taken off during installation.

## Checking and adjusting drive belt tension

Fig. 76

- Make sure that the external switch or switches are all off before you remove any covers from the machine.
- When the new machine has been in use for a few hours, check the belt tension, and adjust it if necessary using the belt tensioning devices. When correctly tensioned, the belts should move inwards by 15 mm when a force of 20 N is applied to them.



# 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 functioning normally and that the door is not leaking. Clean any residues of detergent off the door seal.
- If the machine has a detergent dispenser, clean it (and the compartments/scoops), removing all residues.
- Check that the drain valve is not leaking and that it opens and closes normally.

Fig. 77
- Check the compressed air regulator (A). If necessary empty water from the water separator.

## Every three months

- Make sure that the external electrical switch is switched ”OFF”.
- Remove the rear and side panels.
- Check the hoses and connectors for leakages.

Fig. 78
- Check that the drive belts are undamaged and properly tensioned. If necessary, adjust the drive belts.

Fig. 79
- Clean the filters at the steam and water intake connections.
- Refit the panels at the end of the check.

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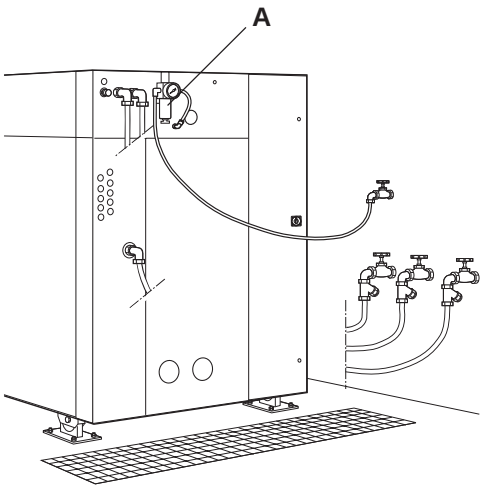


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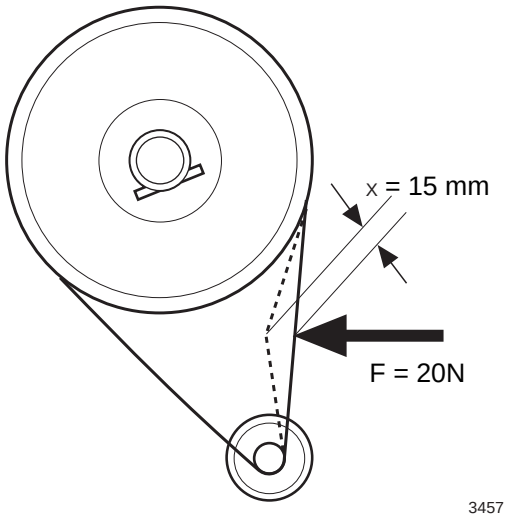


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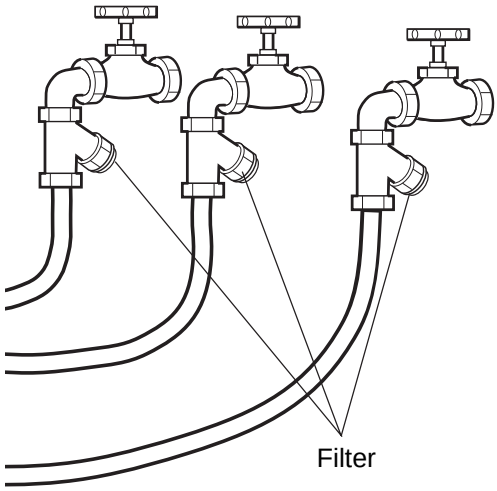


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# Tilt function

## Installation

Fig. 80 Remove the machine's side panels, lower front panel and rear covers.

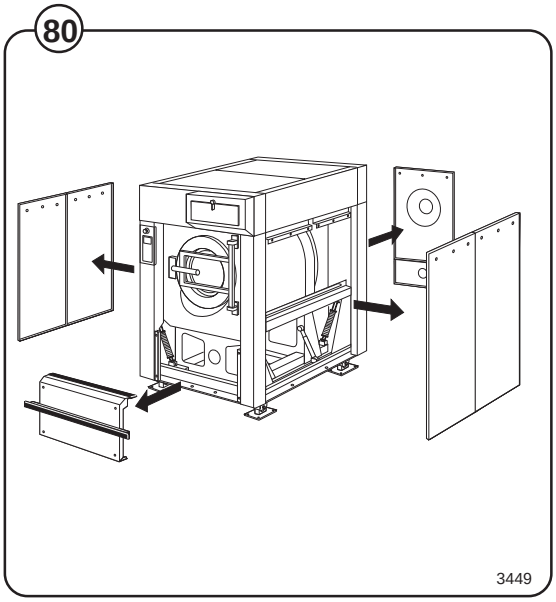



Fig. 81 <u>For machines with tilt both forwards and backwards</u>:

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.

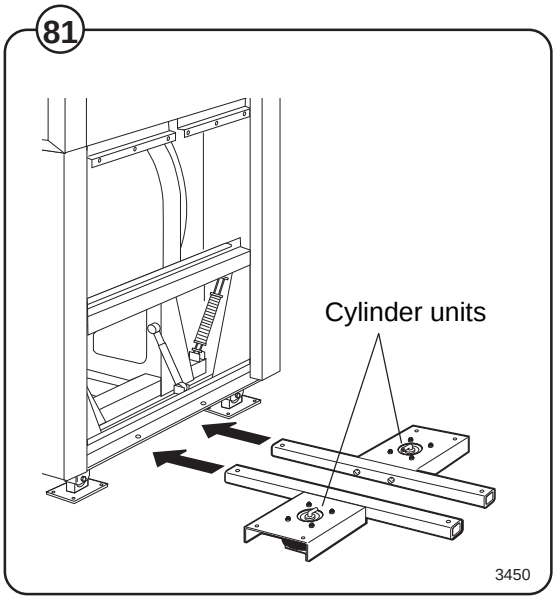
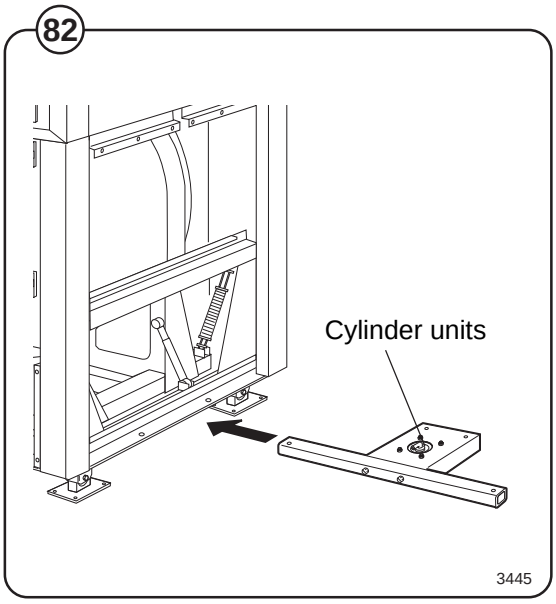



Fig. 82 <u>For machines with forward tilt only</u>:

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



# Tilt function (optional equipment)

**Fig. 83** 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).

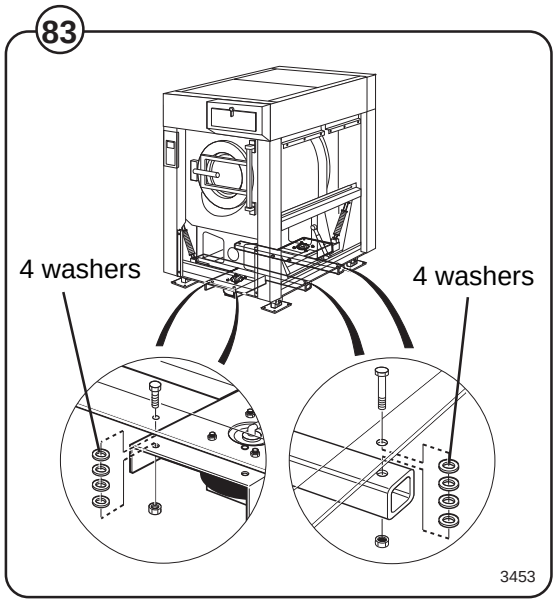



**Fig. 84** Fit the four corner posts, one for each corner of the machine, using the bolts which secure the machine feet to the floor. Adjust the clearance between the upper part of each corner post and the machine so it is 14 mm.

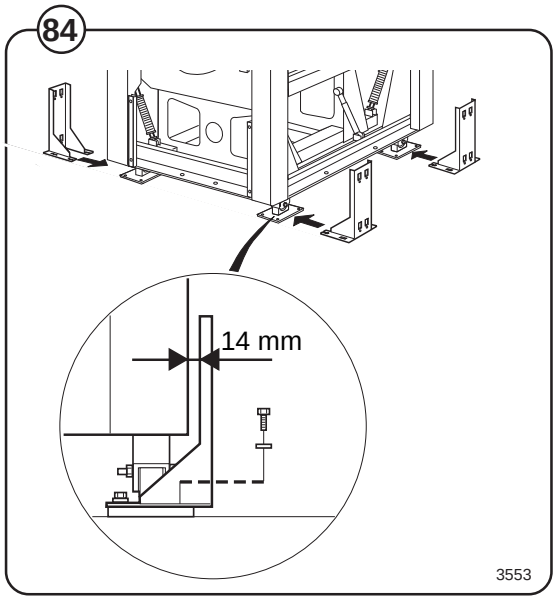
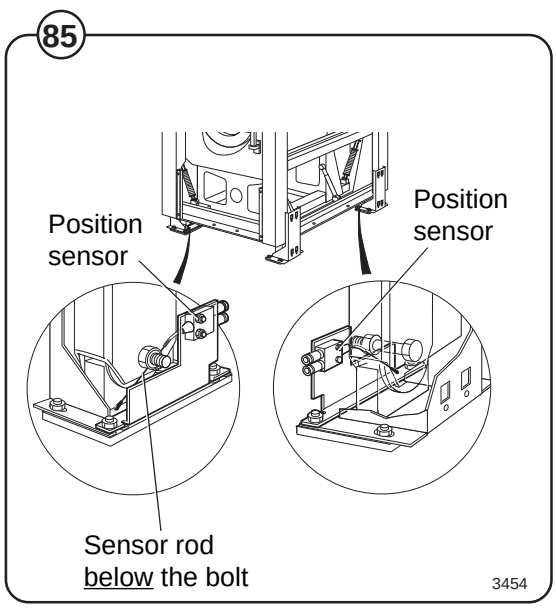



**Fig. 85** <u>For machines with tilt both forwards and backwards</u>:

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.

Please note that the sensor rod must be placed <u>below</u> the bolt for the wheel.



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.

Fig. 88 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:

Fig. 86

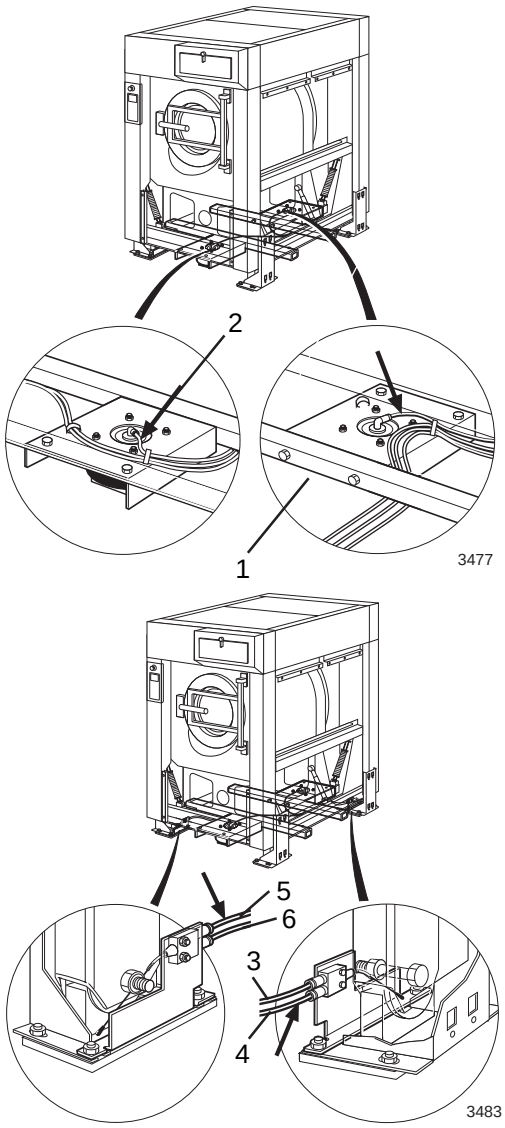
| ID marking | Connect to |
|---|---|
| 1 | Rear air bellows |
| 2 | Front air bellows |
| 3 | Rear pressure sensor, connection 1 |
| 4 | Rear pressure sensor, connection 2 |
| 5 | Front pressure sensor, connection 1 |
| 6 | Front pressure sensor, connection 2 |

Fig. 87 Note that the tubes for the pressure sensors must be connected correctly, see Fig. 7.

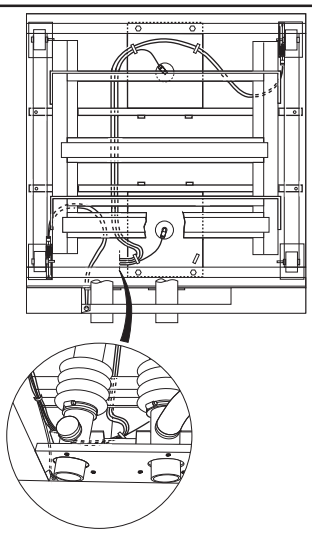
– Connection 1 – same side as data plate.

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

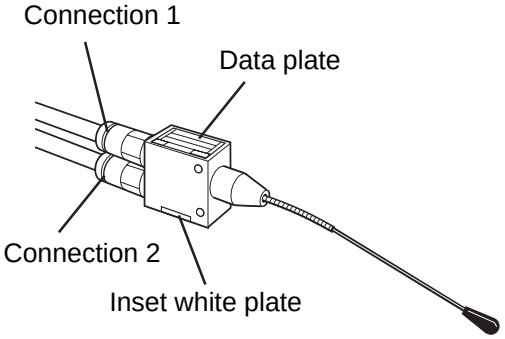
86




88




87



# Tilt function (optional equipment)

Fig. 89

For machines with forward tilt only:

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.

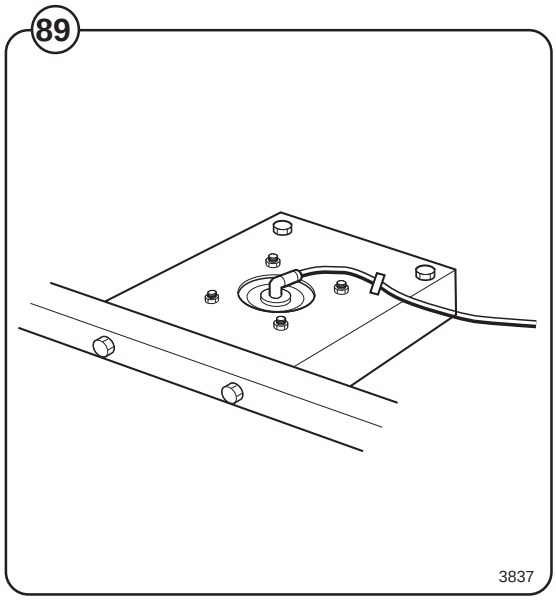


Fig. 90 Test the tilt function:

- 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.

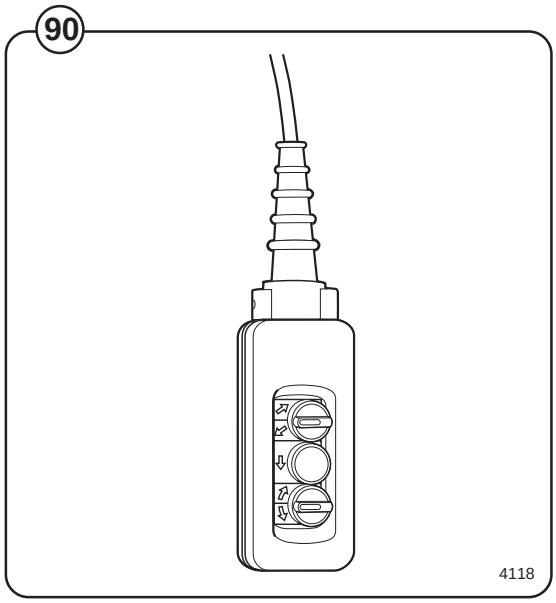



Fig. 91 Fit two nut clips to each corner post. The nut clips slot into the rear grooves on the posts.

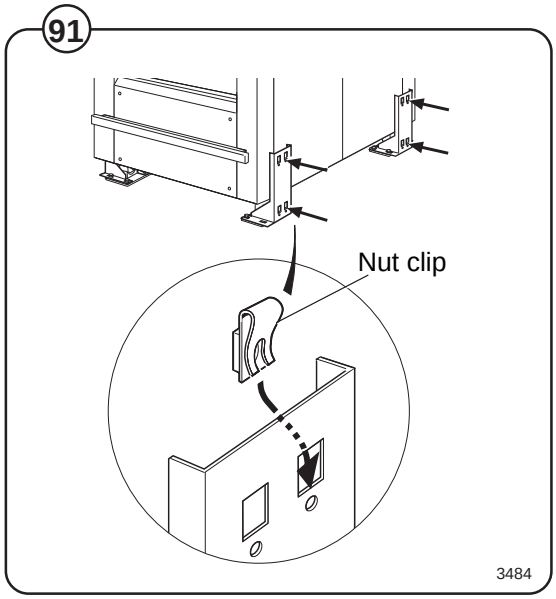
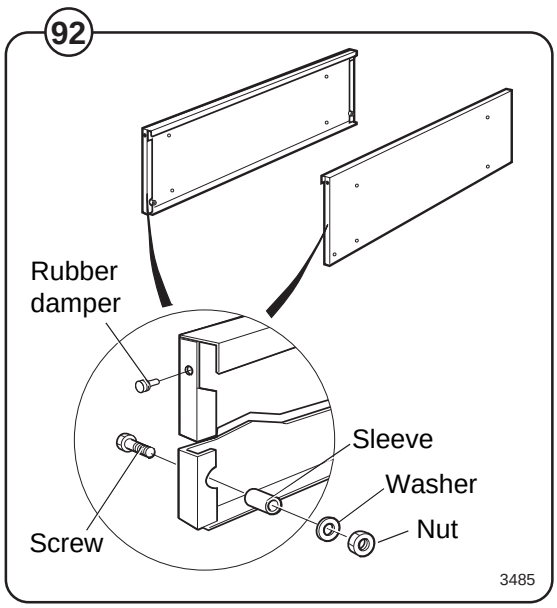



Fig. 92 Fit the rubber dampers and sleeves to the front end of each side panel strip.



# Tilt function (optional equipment)

**Fig. 93** Position and fasten the side panel strips.

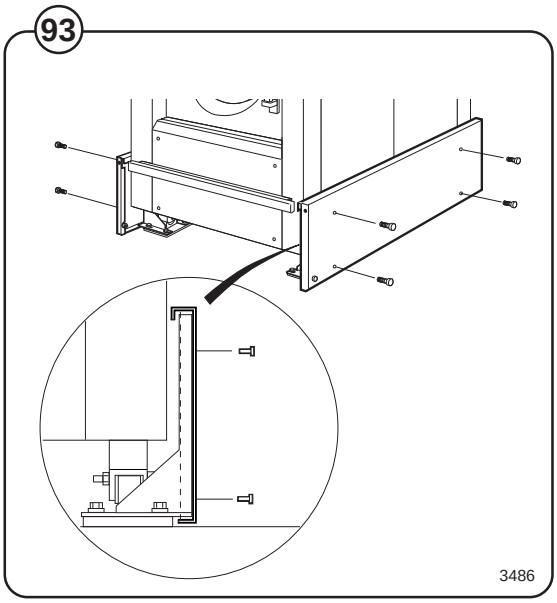



**Fig. 94** Fit the two counterweights to the front panel strip. The bolt heads should be at the bottom.

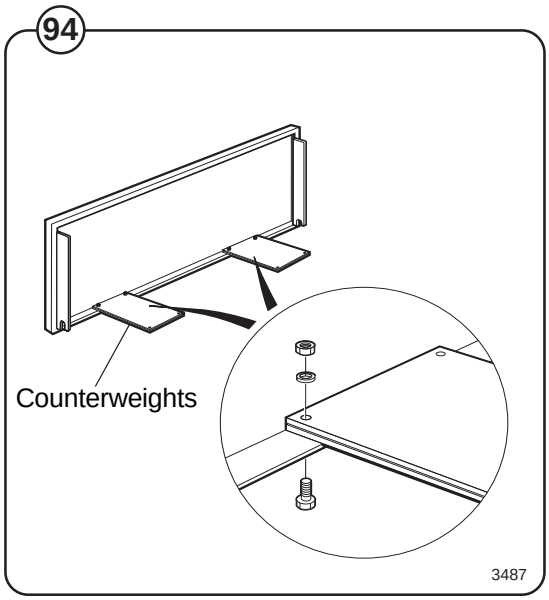
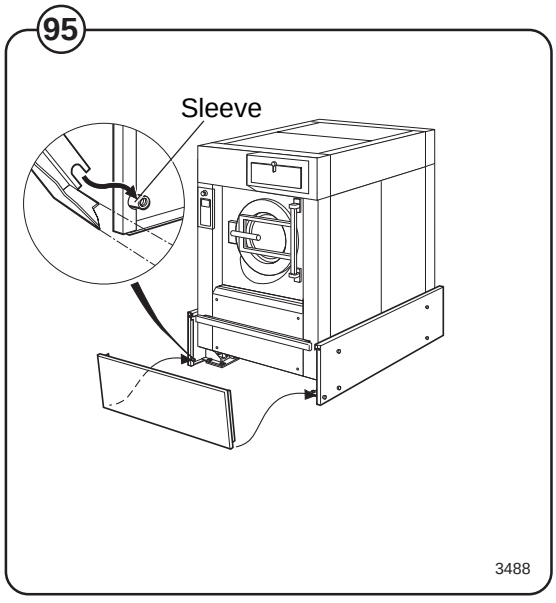



**Fig. 95** Hang the front panel strip on the two sleeves you fitted to the side strips.



# Loading hopper

## Installation

**Fig. 96** Install the left-hand counterweight arm on the pivot mount using two bolts and washers.

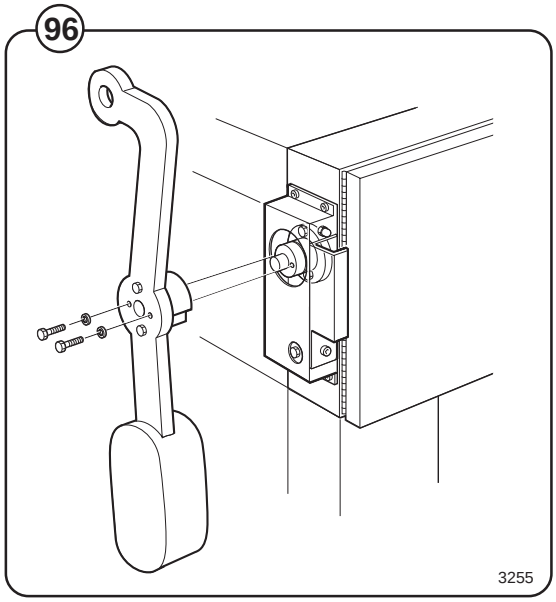



**Fig. 97** Install the right-hand counterweight arm on the other pivot mount using two bolts and washers.

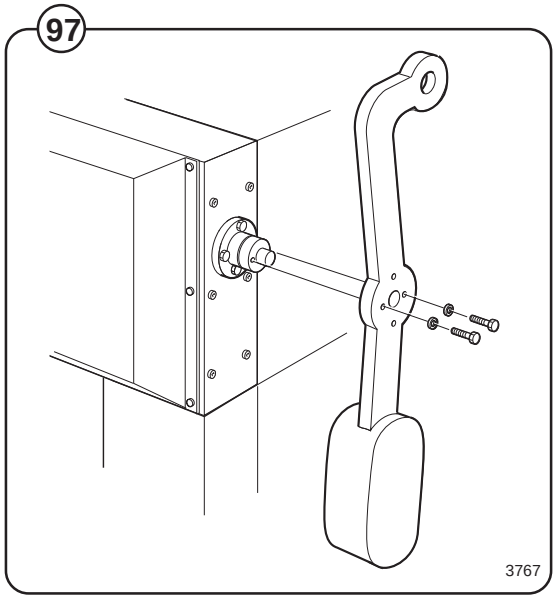
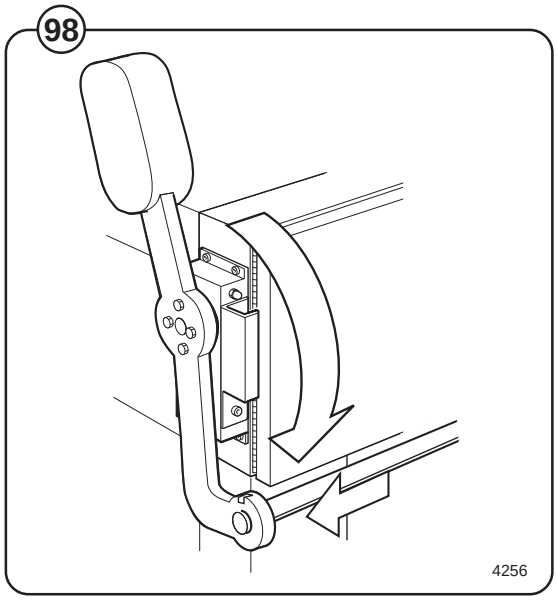



**Fig. 98** Release the catch and pull the left-hand counterweight downwards. Slide the loading hopper shaft into place, so it projects about 30 mm.



# Loading hopper (optional equipment)

**Fig. 99** Pull the right-hand counterweight downwards and insert the shaft into place.

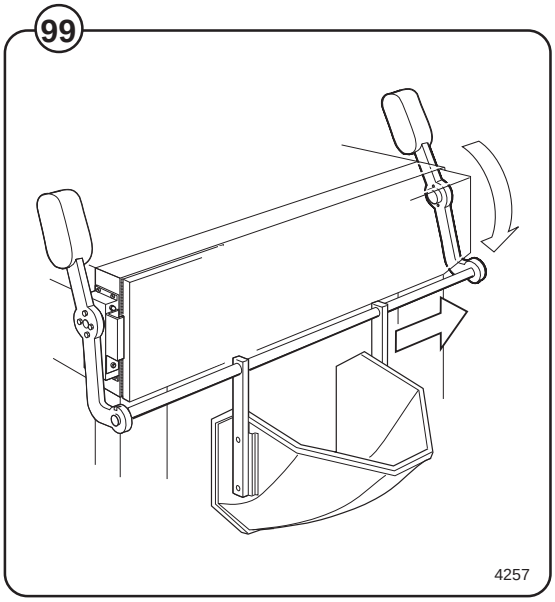



**Fig. 100** Secure the shaft using the four screws, two on each shaft mount.

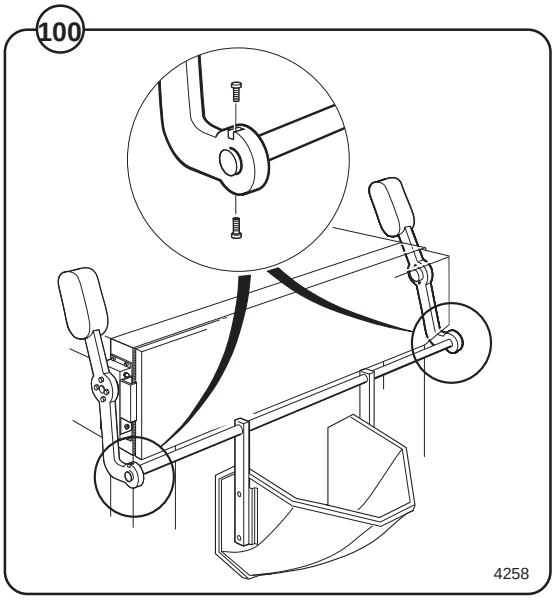



**Fig. 101** Check that the hopper, when lowered, is positioned correctly in relation to the door. The two rubber sections on the hopper should be in contact with the outer drum. The hopper should be centred and about 10 mm above the door opening on the outer drum.

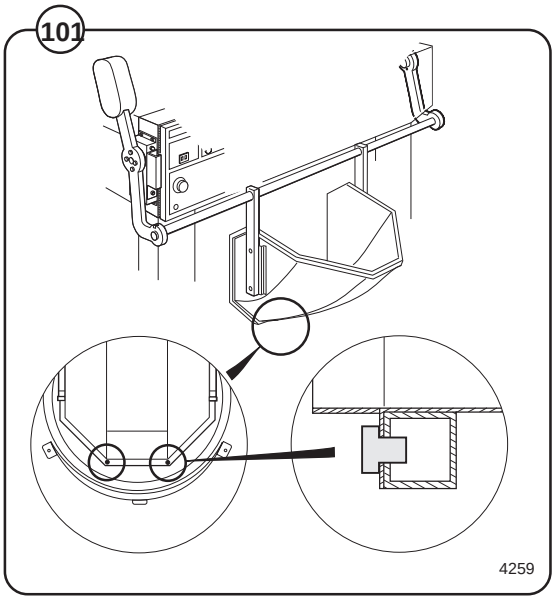


**Fig. 102** Adjust the screws on both sides of the hopper.

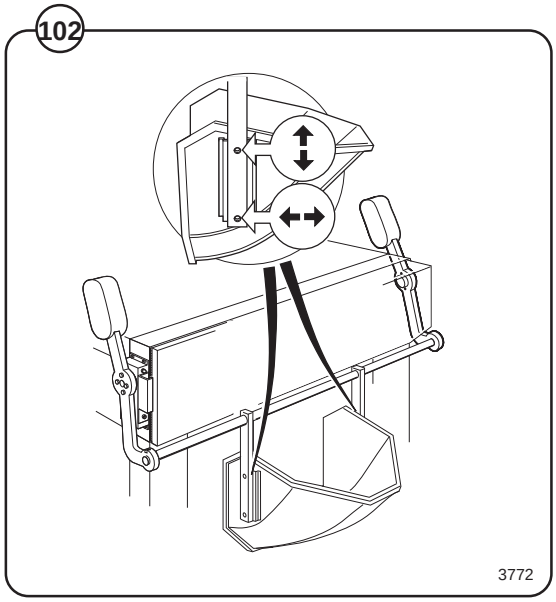



**Fig. 103** Install the metal box on top of the machine. This box functions as a stop when the hopper is raised.