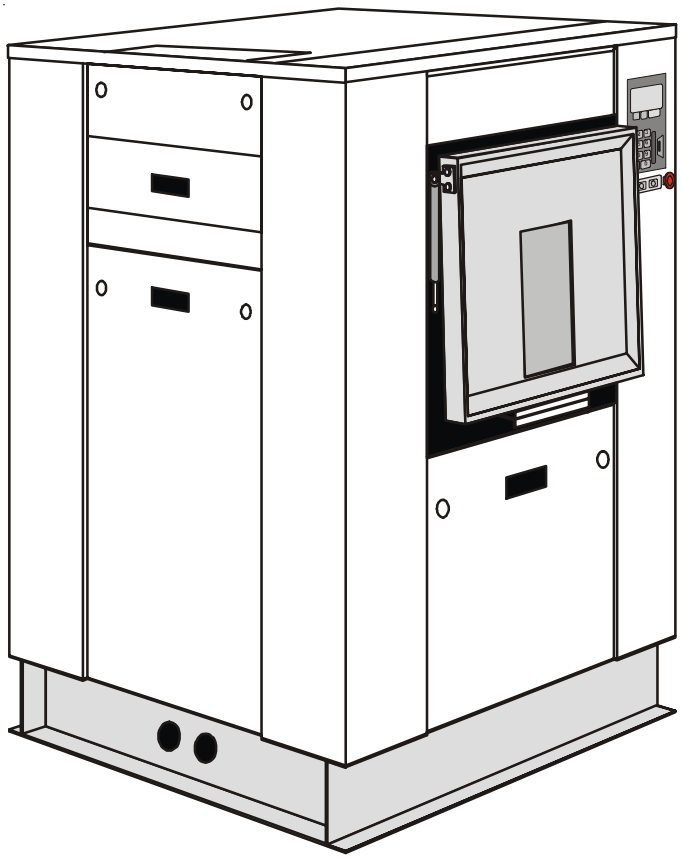
INSTRUCTION HANDBOOK

WASHER-EXTRACTORS

WS3/WSB3 230-340-470-670 H



Electrolux

01201055GB
2008-01

General instructions

The machines described in this handbook have a washing capacity of 229, 338, 467 or 668 litres according to their type.

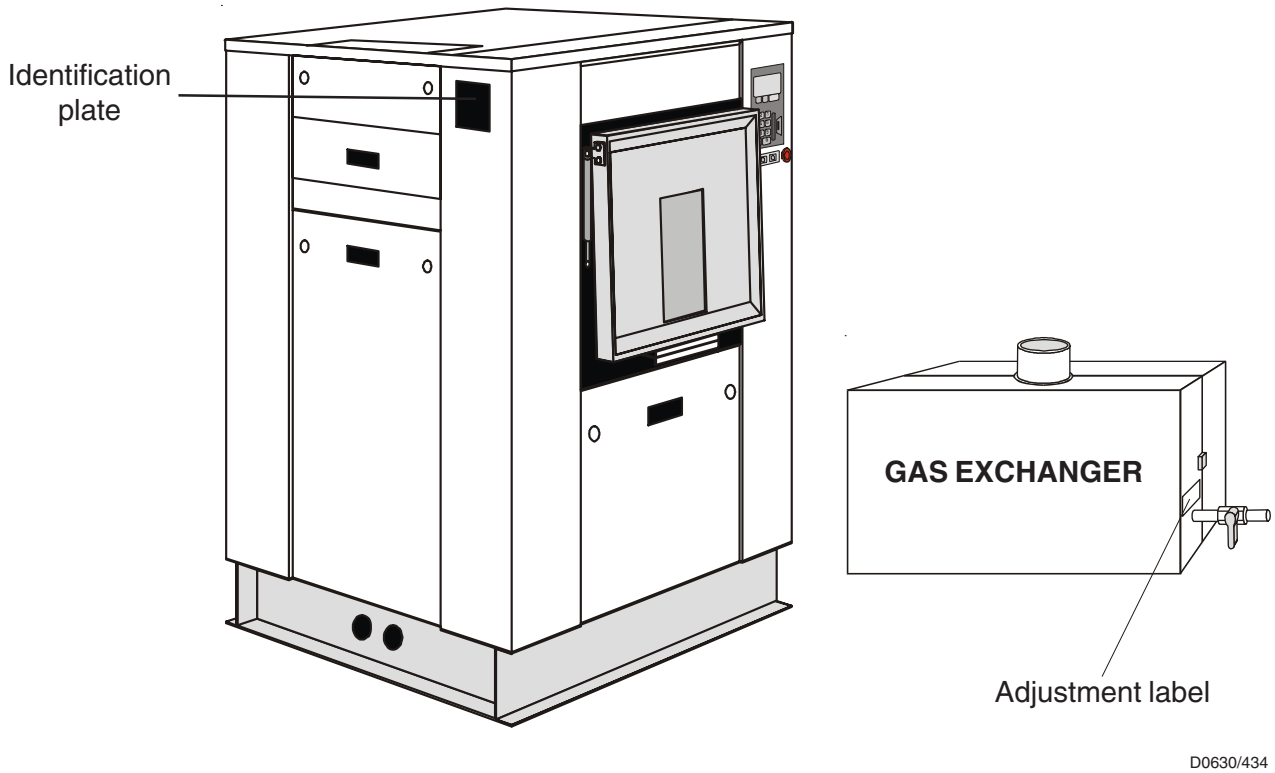
They are washer-extractors designed to meet the most severe requirements.

They are designed to be installed in hotels, laundries, hospitals or collectivities.

The suspension device mounted with springs and shock absorbers limits to the maximum ground vibrations.

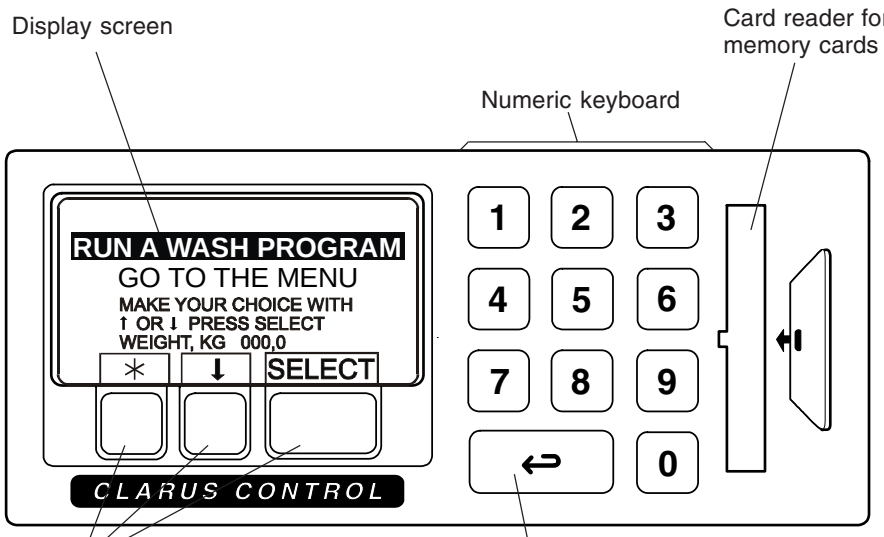
A important G factor guarantees the highest extraction quality for your linen.

These machines also exist in barrier version allowing the respect of linen's hygiene rules.



This washer extractor is controlled by a microprocessor-based program control unit placed on the loading side. 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.



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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A very high working safety level of the machine is achieved thanks to a continuous monitoring and built-in safety devices.

Even the compound textile fabrics can be washed at a high temperature with no crumpling risk thanks to a special cooling process before the rinsing cycle.

In order to avoid an excessive mechanical fatigue during the hydro-extraction process, the machine is equipped with an unbalance detector. If the latter detects the least unbalance of the load, the hydro-extraction cycle is interrupted and the machine fills with water to make a new distribution of the linen possible.

The machine then resumes the distribution speed and another hydro-extraction cycle begins.

The machine can also be controlled sequence by sequence and is equipped with a keyboard for the manual control of certain functions.

Note about the A.C. power

- According to the EN 60204-1:1997 standard, the machine is provided for AC supplies corresponding to the extracted caracteristics below :

  4.3.2 AC supplies

  Voltage :
  Steady state voltage : 0,9…1,1 of nominal voltage.

  Frequency :
  0,99…1,01 of nominal frequency continuously.
  0,98…1,02 short time.

  Harmonics :
  Harmonic distorsion not to exceed 10% of the total r.m.s. voltage between live conductors for the sum of the second through to the fifth harmonic. An additional 2% of the total r.m.s. voltage between live conductors for the sum of the sixth through to the 30th harmonic is permissible.

  Voltage unbalance :
  Neither the voltage of the negative sequence component nor the voltage of the zero sequence component in three-phase supplies shall exceed 2% of the positive sequence component.

  Voltage interruption :
  Supply interrupted or at zero voltage for not more than 3ms at any random time in the supply cycle. There shall be more than 1s between successive interruptions.

  Voltage dips :
  Voltage dips shall not exceed 20% of the peak voltage of the supply for more than one cycle. There shall be more than 1s between successive dips.

Precautions for use

- ☞ The machine should not be used by children.
- ☞ The machine is designed for "water washing" of textile only.
- ☞ This machine is for professional use and must be used exclusively by qualified personnel.
- ☞ It is forbidden to wash textiles soaked with solvents.
- ☞ In case of a gas heated machine, do not assemble the machine on premises containing a dry cleaning machines or other similar machines.
- ☞ Make sure note to over load the machine.
- ☞ Please wash only items offering appropriate distribution inside the drum. Do not wash items such as mattresses or shoes.
  Call our technical departments before washing non-standard items. Non compliance with these instructions may void the manufacturer's guarantee in case of abuse of the washer-extractor.

Environmental information

Concerned by providing the end user with useful and necessary environmental information, we wish to precise :

- ☞ Data about energetic consumptions, wastes (atmospheric and liquid) and sound level are indicated in the paragraph **"Technical characteristics"**.
- ☞ The running of this machine requires the use of detergents which draining in the nature can have a significant environmental impact. So, we do recommend to only use, with agreement of the manufacturers, the quantities of detergents strictly necessary.
- ☞ Forseeing its recycling, this machine is fully dismantle.
- ☞ This machine is free from any asbestos.
- ☞ Our machine packing complies with the provisions of rule 98-639 dated July 20th 1998 regarding environmental demands.

For additional information, do not hesitate to consult our environmental department.

Preliminary instructions

Before any use, it is compulsory to read the instruction handbook.

Users must have learnt how the machine operates.

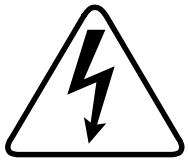
The identification plate is placed on the left hand side of the machine.

In order to prevent any risk of fire or explosion, flammable products should never be used to clean the machine.

Any repair or maintenance intervention should be carried out by qualified personnel only.

Detergents used in laundry are particularly agressive. No stainless steel is able to resist their corrosive actions. Detergent dispenser must consequently be considered as wearing parts likely to be replaced.

Explanation of graphic symbols



A flash of lightning with an arrow at its end displayed inside an equilateral triangle, warns the user about the presence of uninsulated "dangerous current" sufficient in intensity to cause electrocution.

An exclamation mark inside an equilateral triangle offers the user important advice about usage, servicing and hazardous conditions.

This symbol warns the user that there are mechanisms inside the machine which can be dangerous. The protective housing must be in place during use.

This symbol warns the user of the presence of high temperatures which could cause severe burns. Some surfaces can reach close to 200 °C (392 °F).

SAFETY

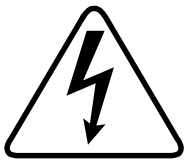
This machine should be installed in conformance to the health and safety regulations, and only used in a sufficiently aerated area.

Check the instructions before installing or using the machine.

SAFETY

The mechanical and electrical installation of the machine should only be done by qualified personnel.

CAUTION

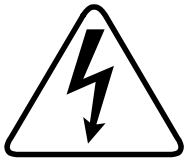


Do not use the machine unless it is plugged into a correctly earthed power socket complying with standards in force.

CAUTION

For your personal safety, never use the machine without the protective housings.

CAUTION



Disconnect the machine electrical power supply before doing any repair or servicing work.

Disconnect all the sources of energy before any intervention on the machine.

Never try to open the drum door before the complete stop of the cage.

The safety devices of the drum door(s) should in no case be made inoperative.

The machines comply with the European Directive EMC (Electromagnetic Compatibility). They have been tested in laboratory and approved as such. It is so prohibited to add wires or non shielded electric cables in the cabinets, strands or cables' troughs.

Considering that the volume of the cage is superior to 150 liters, the standard kept for the electric part is the IN 60204.

Ensure that the machine is not loaded beyond its nominal capacity (see "Specific load" in the instruction booklet's technical characteristics).

An excessive load has consequences for the lifetime of the machine's organs, as follows:

- **Rapid destruction of the suspension elements (springs, shock absorbers);**
- **Excessive fatigue of motorisation elements (engine, belt);**
- **Rapid reduction of lifetime of drum bearings (rolling bearings);**
- **Opening and destruction of drum doors and tank doors during oil dehydration.**

This is particularly important for your safety and that of others.

The consequence is an immediate cancellation of the warranty.

The use and handling of chemical products such as detergent, chlorine, acids, antiliming agents etc... may create hazards for health and environment ; the following precautions should be taken.

- Do not breathe the dusts or steam.

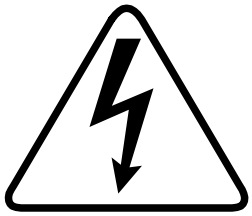
- Avoid contact with skin or eyes (may cause burns).

- In case of important spillage, wear a protecting mask, gloves, and eye protectors.

- Handle with care.

- Consult the use and first aid advice on the packings.

- Do not dispose pure products in the environment.



The machine can work without the protective casing when the electric supply is not cut off.

Interlock the main isolating switch with a padlock.

Close the steam or gas inlet valves.

Distributor Letter

Chemical System Responsibility

Disclaimer

The following policy should be considered and understood as a warranty/disclaimer to customers operating textile care installations where liquid supply (chemical) systems use or may use peristaltic pumps to inject supplies into equipment.

To Whom it May Concern :

We, the undersigned, accept no responsibility for loss or damage when, during periods of non-use, concentrated chemicals leak, spray or "dribble" onto any part of our machines or their contents.

It is well known that many pumped liquid chemical systems tend to permit concentrated chemicals to dribble out of the injection tubes when the system has not been used for relatively long periods of time – as after working hours and during weekends. This puts highly concentrated corrosive chemicals in direct contact with dry stainless steel surfaces and often directly on any textiles left in the machine. Chemical deterioration (rusting) of the stainless steel and damage to the textiles is the inevitable result.

It is absolutely useless to flush the affected sites after each injection because the *harmful dribble always occurs later* – after the machine is no longer in use. One seemingly foolproof solution for "dribbling chemicals" (which we highly recommend but obviously cannot guarantee) is to locate the chemical tanks and pumps well below the injection point on the machine (so the contents of the injection tube(s) cannot siphon into the machine) and to completely purge the just-used chemical injection tube(s), or manifold, with *fresh water after every injection* so that only fresh water (which cannot cause a problem) can dribble out. Naturally, this – or any other solution – is the sole responsibility of the pump and/or chemical supplier (not the machine manufacturer).

Additionally, external chemical leakage is dangerous to personal health and safety, and will also cause severe damage to machines and/or their surroundings. The installer and/or user of the chemical injection system must make sure there are no external chemical leaks and that excessive pressure can never build up in any chemical delivery tube, *because excessive pressure can burst the tube, or disconnect it from the machine, and spray dangerous concentrated chemicals about the premises.*

The machinery manufacturer is not, and cannot be, responsible for compliance with the above.

Locking and tagging procedure

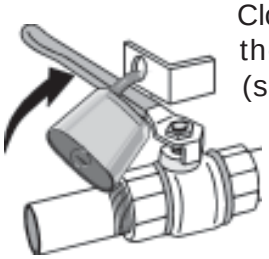
A red insert at the beginning of this instruction handbook schematically shows the locking and tagging procedure described below. If you wish, you can detach this insert and display it close to the machine to remind maintenance personnel of the safety instructions.

1

Always respect items 2, 3 and 4 carefully before doing any repair or maintenance work on the machine.

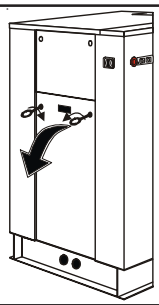
2

Put the main switch to Off and lock the handle with a padlock in one of the three holes provided for this purpose.



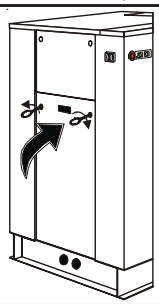
Close the stop valves for the other supplies (steam, gas, thermal fluid, compressed air) to stop and lock their handle with a padlock.

3



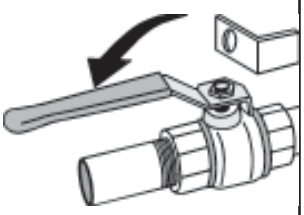
Open the fixed protectors (casings, doors) with the key provided or a special tool.

Do the maintenance.



Close and carefully lock the fixed protectors.

4

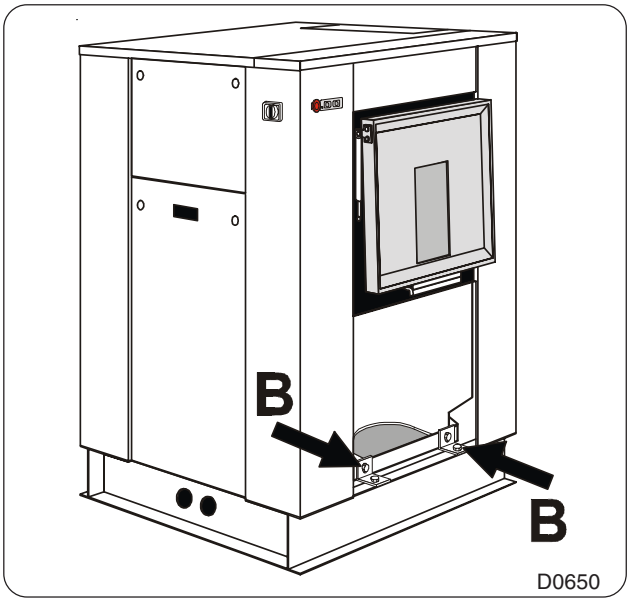


Unlock the stop valves and the main switch.

Handling

Before any handling, check that the four transport locks fitted are still in place and well-tightened.

To do so, remove the front and rear casings and check presence of four locks (B).



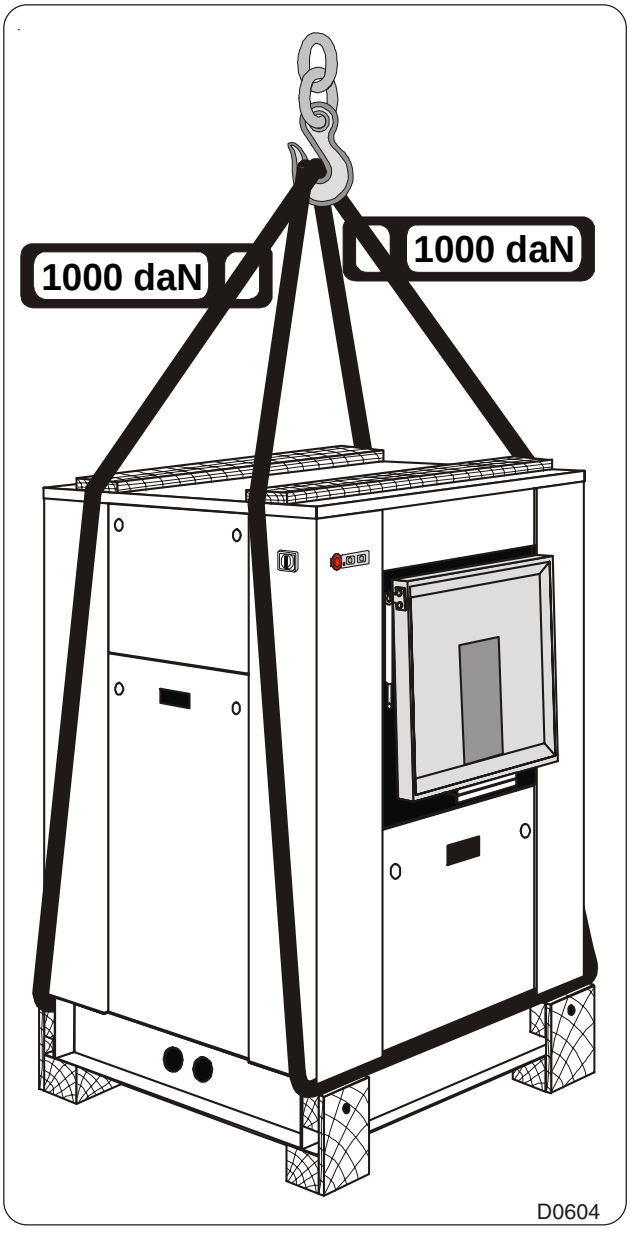
SAFETY

It is obligatory that all these operations are undertaken by handling specialists.

1/ Lifting with handling straps

Lifting in that case can only be done with handling straps (minimum capacity 1000 daN) which bear weight of the machine.

Nota : in order to avoid bending of the machine's casings, make sure to place the lifting straps at each end of the wooden planks.



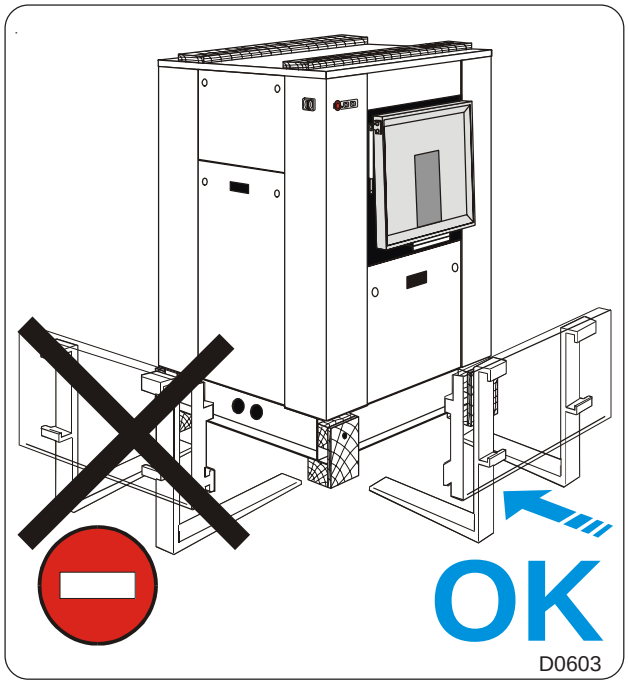
CAUTION

You should never handle the machine in its longitudinal side (any other than shown on the drawing below) with a fork-lift truck.

Important risk of parts deterioration for those fixed under the machine.

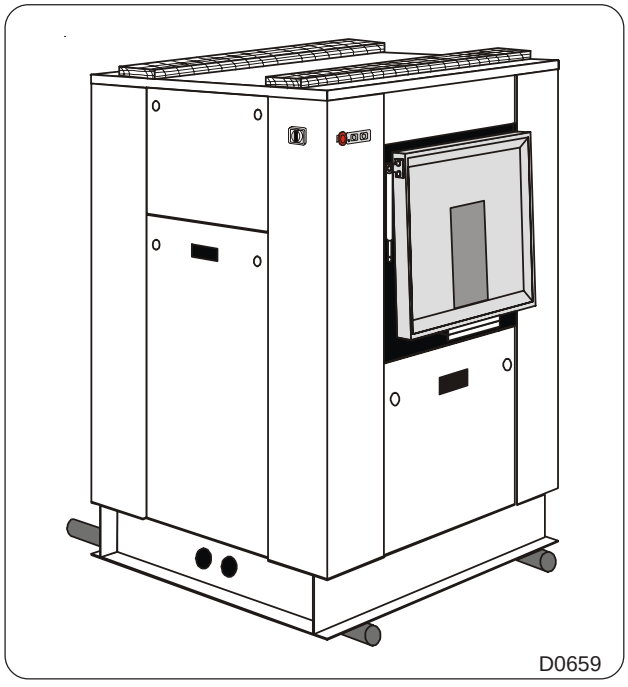
2/ Lifting with a fork-lift truck

This can be carried out from the front or back, at the centre of the machine.



3/ Ground moving

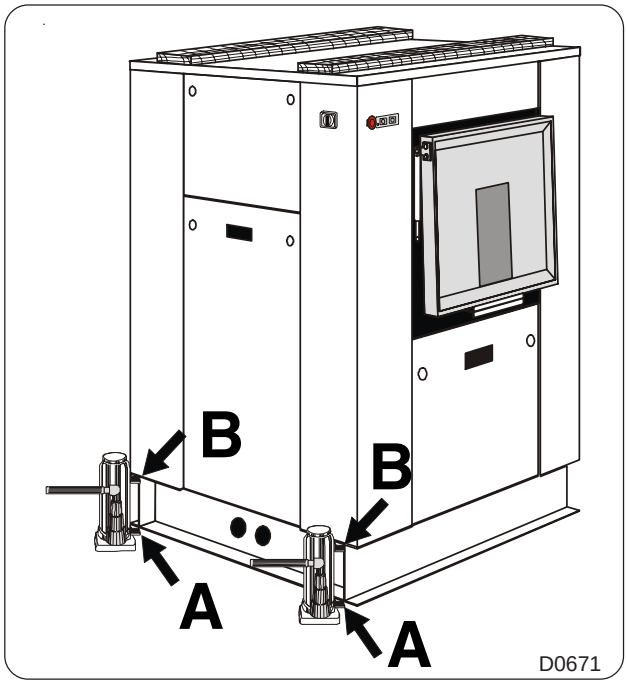
The machine frame is made up of two parallel parts, making ground moving possible by means of rollers.



4/ Lifting with a jack

Lifting in this case can only be done with a jack (minimum capacity 500 daN) which can bear the machine's weight.

Nota : in order to avoid the bending of the sole, make sure to place the lifting jack at each corner of the machine at point A or B.



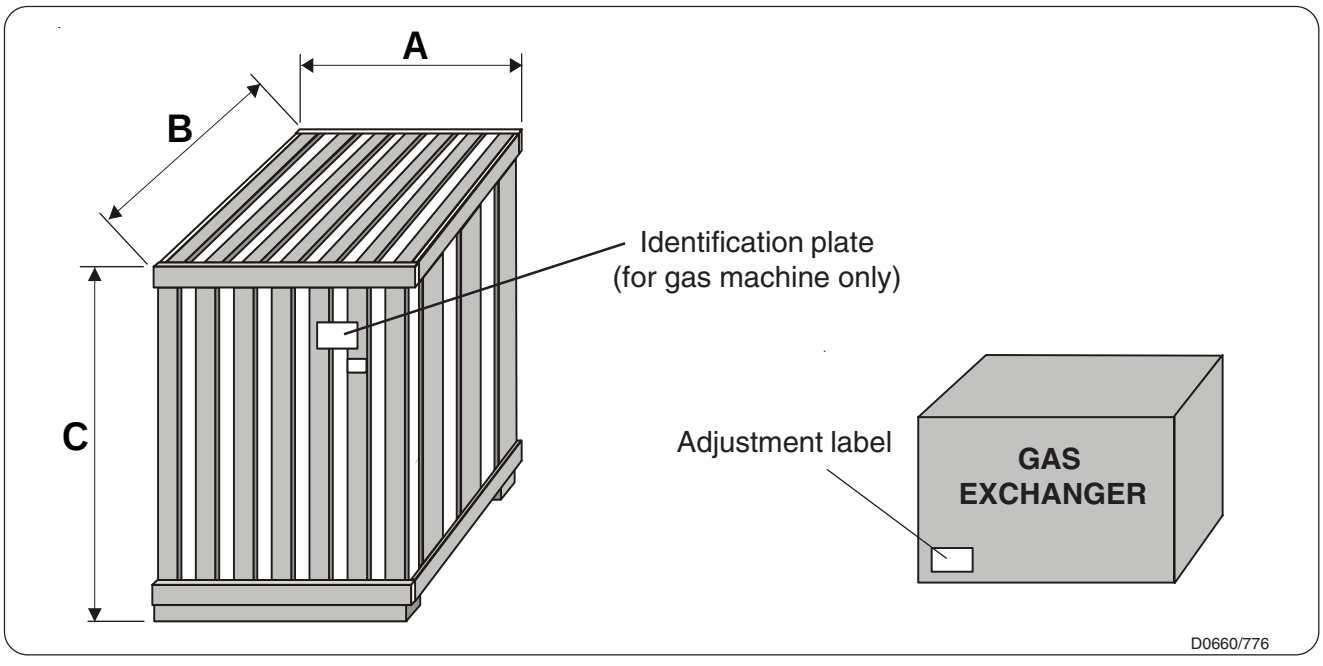
CAUTION
In order to avoid any bending of casings, you should never climb and stand on top of the machine.

Packing

Packing dimensions in mm/inch	Size A	Size B	Size C
Washer extractor Type 230 standard	1180/46.5	1230/48.4	1840/72.4
Washer extractor Type 230 barrier	1180/46.4	1230/48.4	1840/72.4
Washer extractor Type 340 standard	1180/46.4	1450/57	1840/72.4
Washer extractor Type 340 barrier	1180/46.4	1450/57	1840/72.4
Washer extractor Type 470 standard	1180/46.4	1760/69.3	1840/72.4
Washer extractor Type 470 barrier	1180/46.4	1760/69.3	1840/72.4
Washer extractor Type 670 standard	1180/46.4	2180/85.8	1840/72.4
Washer extractor Type 670 barrier	1180/46.4	2180/85.8	1840/72.4

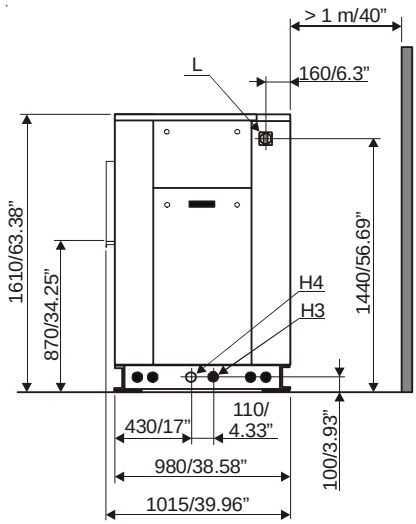
Weight

Weight in kg/lb (machine + crate)	Gas	Electric	Steam/T.F
Washer extractor Type 230 standard	775/1709	775/1709	775/1709
Washer extractor Type 230 barrier	775/1709	775/1709	775/1709
Washer extractor Type 340 standard	890/1963	890/1963	890/1963
Washer extractor Type 340 barrier	890/1963	890/1963	890/1963
Washer extractor Type 470 standard	1090/2404	1090/2404	1090/2404
Washer extractor Type 470 barrier	1090/2404	1090/2404	1090/2404
Washer extractor Type 670 standard	1195/2636	1195/2636	1195/2636
Washer extractor Type 670 barrier	1195/2636	1195/2636	1195/2636

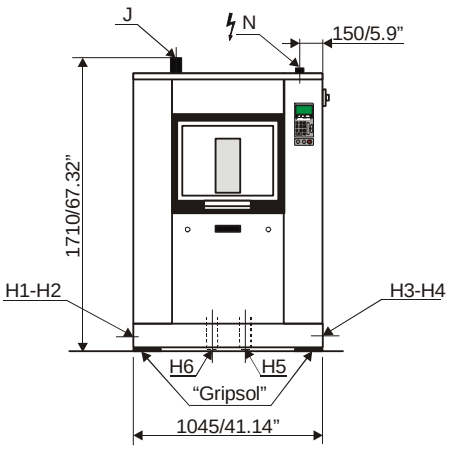


Washer extractor type 230 standard

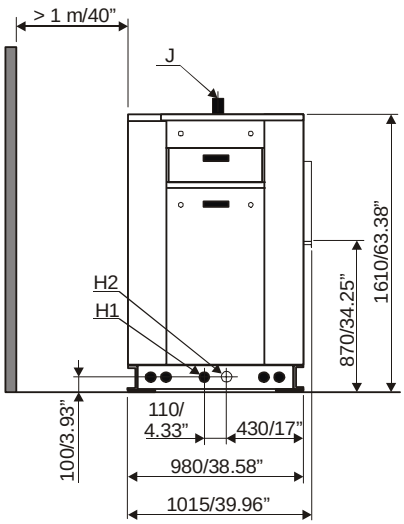
Right view

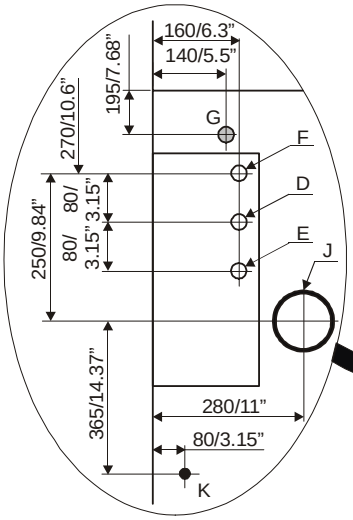


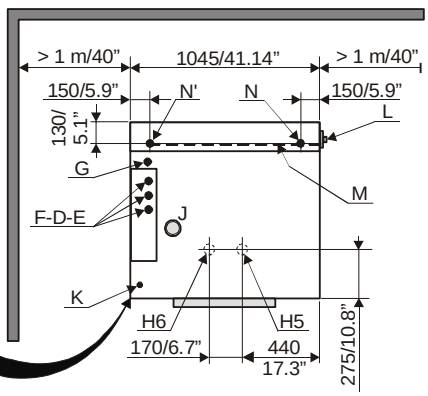
Front view



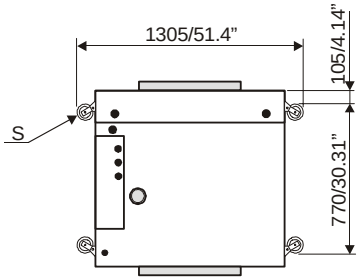
Left view

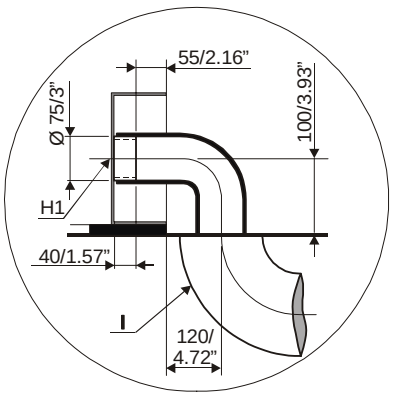






Top view





Example of drain connection

07100081

Washer extractor type 230 standard

Diagram no. 07100081

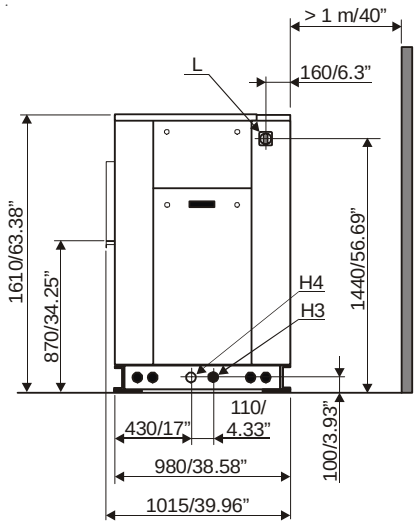
		Gas	Electric	Steam	Thermic fluid
Characteristics	Ø cage	770 mm (30.31")			
	Cage length	520 mm (20.47")			
	Cage volume	229 dm³ (229 l)			
	Specific load 1/10 (dry linen, ISO 9398-4)	22.9 kg (50.5 lb)			
	Opening cage doors (L x H)	450 x 400 mm (17.71x15.74")			
	Opening drum door (L x H)	466 x 525 mm (18.34x20.67")			
Floor area		1 m² (10.76 sq. ft)			
Net weight		670 daN (1478 lb)			
Weight loaded (high level)		834 daN (1840 lb)			
Water volume, washing, low level		65 l	65 l	65 l	65 l
Water volume, washing, high level		130 l	130 l	130 l	130 l
Max dynamic load		F = 101 daN (222 lb)			
Max transmitted floor load		935 daN (2062 lb)			
Max pressure transmitted to floor		191 kPa			
Spin efficiency		350 G			
Max. unbalance		3.6 kg (7.94 lb)			
(L) Main switch to connect main cable					
(M) Electric cable (section)		4x2.5 mm²	4x6 mm²	4x2.5 mm²	4x2.5 mm²
(N) or (N') Stuffing box for main cable					
Supply voltage		380 / 415 V 3+E ~ 50/60 Hz			
Installed electric power		3.7 kW	21.7 kW	3.7 kW	3.7 kW
Installed heating power		40 kW	18 kW	-	-
Electric consumption for a normal cycle*		0.8 kWh/h	6 kWh/h	0.6 kWh/h	0.6 kWh/h
Heat loss		3 % of installed heating power			
(G) Steam inlet				DN 20 (3/4" BSP)	
	- Maximum supply pressure			600 kPa (87 psi)	
	- Steam intantaneous flow rate at 600 kPa			72 kg/h	
	- Seam consumption for a normal cycle*			12 kg/h at 600 kPa (87 psi)	
(D) Hot water connection / flow		DN 20 (3/4" BSP) - 70 l/min at 250 kPA (36 psi)			
(E) Cold hard water connection / flow		DN 20 (3/4" BSP) - 70 l/min at 250 kPA (36 psi)			
(F) Cold soft water connection / flow (option)		DN 20 (3/4" BSP) - 70 l/min at 250 kPA (36 psi)			
Water supply minimum pressure		50 kPa (7.25 psi)			
Water supply maximum pressure		300 kPa (43.5 psi)			
Water consumption for a normal cycle*		360 l	340 l	340 l	340 l
Water consumption for an ECO cycle**		282 l	260 l	260 l	260 l
(K) Liquid detergents inlet		DN 20 (3/4" BSP)			
(H1 or H3 or H5) Drain connection		Ø 75 mm (3")			
(H2 or H4 or H6) Double drain connection		Ø 75 mm (3")			
Maximum flow rate		240 l/min			
(I) Waste water collector (3 cm/m (3%) minimum slope)		DN 150 mm (6" BSP)			
(J) Air vent hole		Ø 60 mm (2.36 ")			
(N') Thermic fluid inlet					DN 15 (1/2" BSP)
(G) Thermic fluid return					DN 15 (1/2" BSP)
	- Maximum supply pressure				600 kPa
	- Installed calorific power				34400 kcal
	- Average calorific consumption				11500 kcal/h
	- Inner volume thermic fluid exchanger				2,62 l
Gas inlet		DN 20 (3/4" BSP)			
Combustion products evacuation		Ø 125 mm (5")			
(S) Weighing equipment (optional)					
Compressed air inlet		Ø 4/6 mm			
	- Min./max. compress air pressure	5,5/7 bar			
	- Consumption	10 l/h			

* normal cycle : prewash 3 min at 35 °C, drain. 2 min, main wash 4 min at 65 °C, drain 2 min, rinse 2 min, extract. 2 min, rinse 2 min, extract 2 min, rinse 2 min, extrac. 10 min (cold water supply at 15 °C).

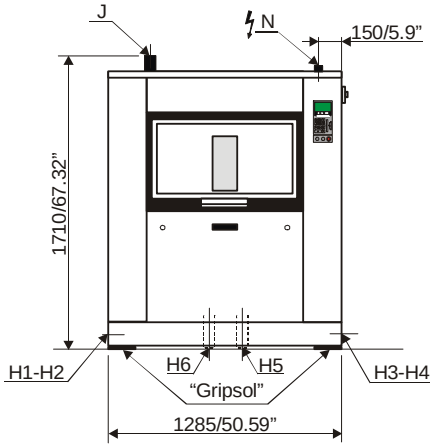
** ECO cycle : normal cycle with rinse 5 l/kg instead of 6 l/kg dry linen.

Washer extractor type 340 standard

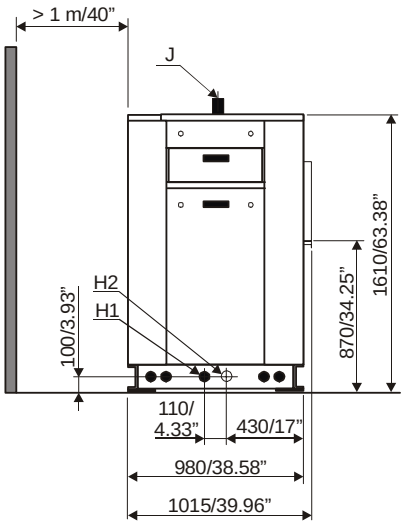
Right view

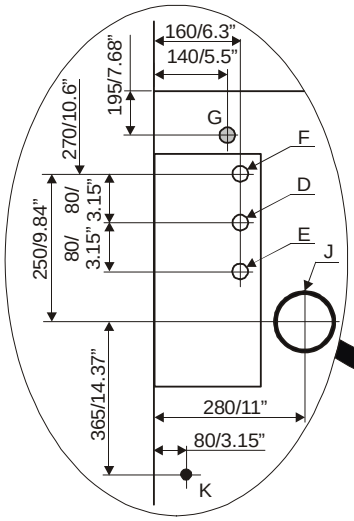


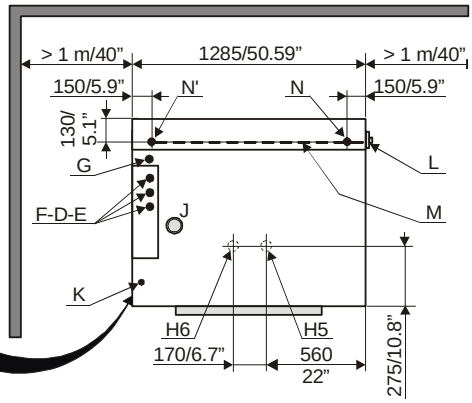
Front view

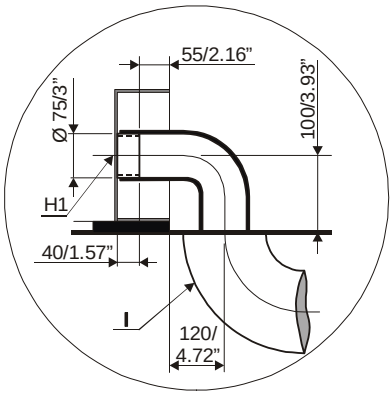


Left view



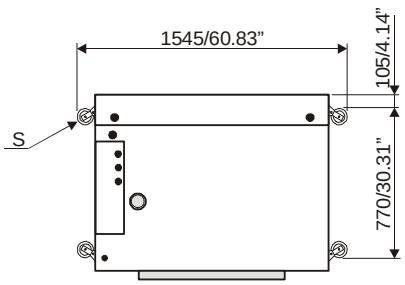






Example of drain connection

Top view



07100083

Washer extractor type 340 standard

Diagram n°. 07100083

Heating	Gas	Electric	Steam	Thermic fluid
Characteristics Ø cage	---------- 770 mm (30.31") ----------			
Cage length	---------- 760 mm (30") ----------			
Cage voume	---------- 338 dm³ (338 l) ----------			
Specific load 1/10 (dry linen, ISO 9398-4)	---------- 33.8 kg (74.55 lb) ----------			
Opening cage doors (L x H)	---------- 600 x 400 mm (23.62x15.74") ----------			
Opening drum door (L x H)	---------- 616 x 525 mm (24.25x20.67") ----------			
Floor area	---------- 1.25 m² (13.45 sq. ft) ----------			
Net weight	---------- 760 daN (1676 lb) ----------			
Weight loaded (high level)	---------- 1008 daN (2223 lb) ----------			
Water, washing, low level	93 l	93 l	93 l	93 l
Water, washing, high level	186 l	186 l	186 l	186 l
Max dynamic load	---------- F = 155 daN (342 lb) ----------			
Max transmitted floor load	---------- 1163 daN (2565 lb) ----------			
Max pressure transmitted to floor	---------- 237 kPa ----------			
Spin efficiency	---------- 350 G ----------			
Max. unbalance	---------- 4.8 kg (10.58 lb) ----------			
(L) Main switch to connect main cable				
(M) Electric cable (section)	4x2.5 mm²	4x16 mm²	4x2.5 mm²	4x2.5 mm²
(N) or (N') Stuffing box for main cable				
Supply voltage	----------380 / 415 V 3+E ~ 50/60 Hz----------			
Installed electric power	4.8 kW	32 kW	4.8 kW	4.8 kW
Installed heating power	40 kW	27 kW	-	-
Electrical consumption for a normal cycle*	1.2 kWh/h	9.2 kWh/h	1 kWh/h	1 kWh/h
Heat loss	----------3 % of installed heating power----------			

(G) Steam inlet	DN 20 (3/4" BSP)
- Maximum supply pressure	600 kPa (87 psi)
- Steam instantaneous flow rate at 600 kPa	108 kg/h
- Steam consumption for a normal cycle*	18 kg/h at 600 kPa (87 psi)

(D) Hot water connection / flow	DN 20 (3/4" BSP) - 70 l/min at 250 kPA (36 psi)			
(E) Cold hard water connection / flow	DN 20 (3/4" BSP) - 70 l/min at 250 kPA (36 psi)			
(F) Cold soft water connection / flow (option)	DN 20 (3/4" BSP) - 70 l/min at 250 kPA (36 psi)			
Water supply minimum pressure	---------- 50 kPa (7.25 psi) ----------			
Water supply maximum pressure	---------- 300 kPa (43.5 psi) ----------			
Water consumption for a normal cycle*	495 l	470 l	470 l	470 l
Water consumption for a ECO cycle**	415 l	395 l	395 l	395 l
(K) Liquid detergents inlet	DN 20 (3/4" BSP)			
(H1 or H3 or H5) Drain connection	---------- Ø 75 mm (3") ----------			
(H2 or H4 or H6) Double drain connection	---------- Ø 75 mm (3") ----------			
Maximum drain flow rate	240 l/min	240 l/min	240 l/min	240 l/min
(I) Waste water collector (3 cm/m (3 %) minimum slope)	---------- DN 150 mm (6" BSP) ----------			
(J) Air vent hole	---------- Ø 60 mm (2.36 ") ----------			
(N') Thermic fluid inlet				DN 15 (1/2" BSP)
(G) Thermic fluid return				DN 15 (1/2" BSP)
- Maximum supply pressure.				600 kPa
- Installed calorific power				34400 kcal
- Average calorific consumption				12500 kcal/h
- Inner volume thermic fluid				2,62 l

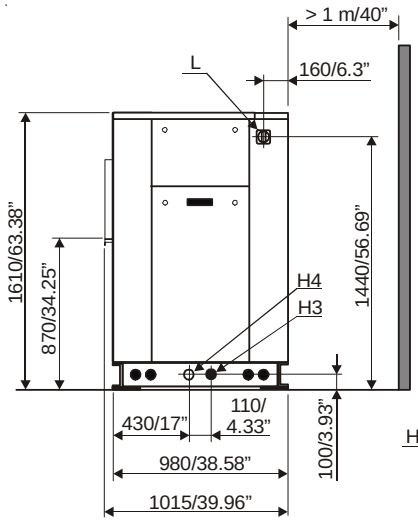
Gas inlet	DN 20 (3/4" BSP)
Combustion products evacuation	Ø 125 mm (5")
(S) Weighing equipment (optional)	
Compressed air inlet	----------Ø 4/6 mm----------
- Min./max. compress air pressure	----------5,5/7 bar----------
- Consumption	----------10 l/h----------

* normal cycle : prewash 3 min at 35 °C, drain. 2 min, main wash 4 min at 65 °C, drain 2 min, rinse 2 min, extract. 2 min, rinse 2 min, extract 2 min, rinse 2 min, extrac. 10 min (cold water supply at 15 °C).

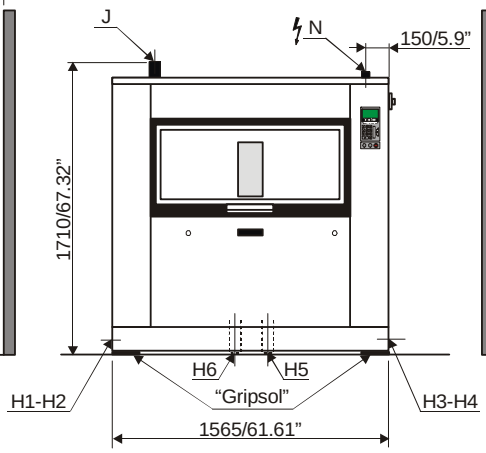
** ECO cycle : normal cycle with rinse 5 l/kg instead of 6 l/kg dry linen.

Washer extractor type 470 standard

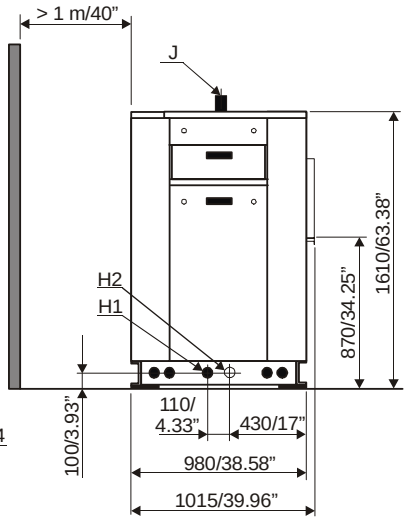
Right view

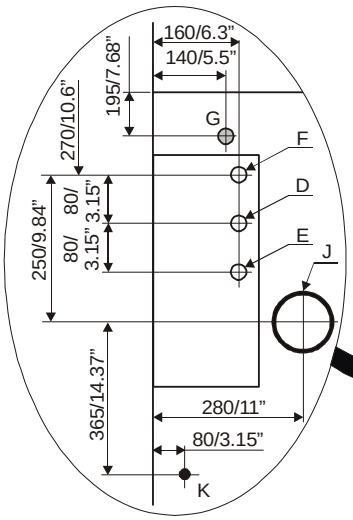


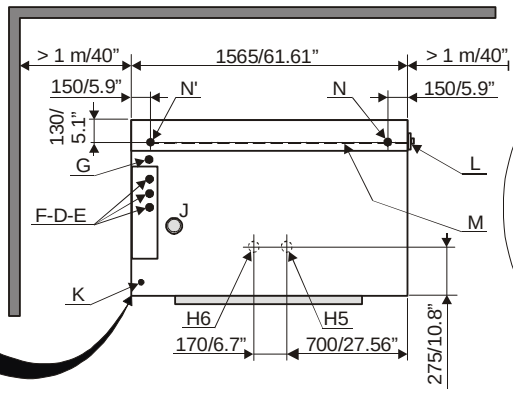
Front view



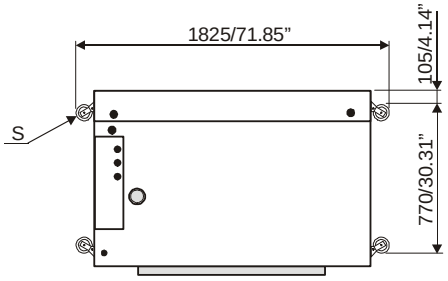
Left view

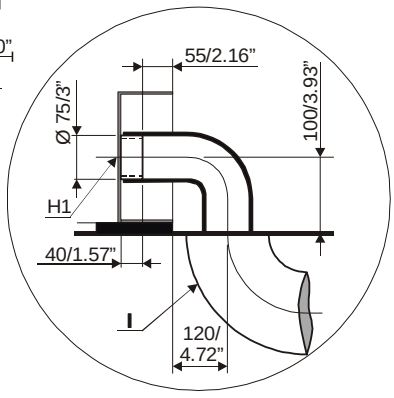






Top view





Example of drain connection

07100085

Washer extractor type 470 standard

Diagram no. 07100085

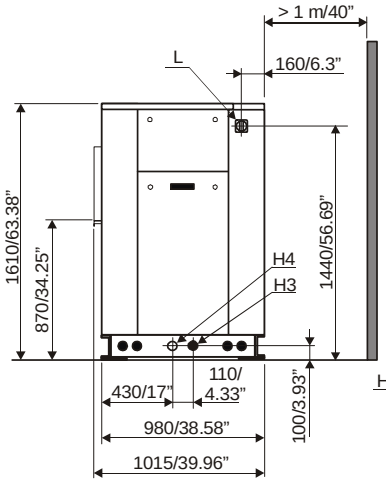
		Gas	Electric	Steam	Thermic fluid
Heating					
Characteristics	Ø cage	---------- 770 mm (30.31") ----------			
	Cage length	---------- 1040 mm (41") ----------			
	Cage volume	---------- 467 dm³ (467 l) ----------			
	Specific load 1/10 (dry linen, ISO 9398-4)	---------- 46.7 kg (103 lb) ----------			
	Opening cage doors (L x H)	---------- 2x450 x 400 mm (17.71x15.74") ----------			
	Opening drum door (L x H)	---------- 935 x 527 mm (36.81x20.74") ----------			
Floor area		---------- 1.52 m² (16.36 sq. ft) ----------			
Net weight		---------- 870 daN (1919 lb) ----------			
Weight loaded (high level)		---------- 1272 daN (2805 lb) ----------			
Water, washing, low level		127 l	127 l	127 l	127 l
Water, washing, high level		255 l	255 l	255 l	255 l
Max dynamic load		---------- F = 275 daN (606 lb) ----------			
Max transmitted floor load		---------- 1547 daN (3412 lb) ----------			
Max pressure transmitted to floor		---------- 316 kPa ----------			
Spin efficiency		---------- 350 G ----------			
Max. unbalance		---------- 5.5 kg (12.13 lb) ----------			
(L) Main switch to connect main cable					
(M) Electric cable (section)		4x2.5 mm²	4x25 mm²	4x2.5 mm²	4x2.5 mm²
(N) or (N') Stuffing box for main cable					
Supply voltage		---------- 380 / 415 V 3+E ~ 50/60 Hz ----------			
Installed electric power		5.8 kW	42 kW	5.8 kW	5.8 kW
Installed heating power		40 kW	36 kW	-	-
Electrical consumption for a normal cycle*		1.5 kWh/h	11 kWh/h	1.2 kWh/h	1.2 kWh/h
Heat loss		---------- 3 % of installed heating power ----------			
(G) Steam inlet				DN 20 (3/4" BSP)	
	- Maximum supply pressure			600 kPa (87 psi)	
	- Steam instantaneous flow rate at 600 kPa			144 kg/h	
	- Steam consumption for a normal cycle*			24.5 kg/h at 600 kPa (87 psi)	
(D) Hot water connection / flow		DN 20 (3/4" BSP) - 70 l/min at 250 kPA (36 psi)			
(E) Cold hard water connection / flow		DN 20 (3/4" BSP) - 70 l/min at 250 kPA (36 psi)			
(F) Cold soft water connection / flow (option)		DN 20 (3/4" BSP) - 70 l/min at 250 kPA (36 psi)			
Water supply minimum pressure		---------- 50 kPa (7.25 psi) ----------			
Water supply maximum pressure		---------- 300 kPa (43.5 psi) ----------			
Water consumption for a normal cycle*		638 l	610 l	610 l	610 l
Water consumption for an ECO cycle**		558 l	530 l	530 l	530 l
(K) Liquid detergents inlet		DN 20 (3/4" BSP)			
(H1 or H3 or H5) Drain connection		---------- Ø 75 mm (3") ----------			
(H2 or H4 or H6) Double drain connection		---------- Ø 75 mm (3") ----------			
Maximum drain flow rate		240 l/min	240 l/min	240 l/min	240 l/min
(I) Waste water collector (3 cm/m (3 %) minimum slope)		---------- DN 150 mm (6" BSP) ----------			
(J) Air vent hole		---------- Ø 60 mm (2.36 ") ----------			
(N') Thermic fluid inlet					DN 15 (1/2" BSP)
(G) Thermic fluid return					DN 15 (1/2" BSP)
	- Maximum supply pressure				600 kPa
	- Installed calorific power				47300 kcal
	- Average calorific consumption				13800 kcal/h
	- Inner volume thermic fluid				5,33 l
Gas inlet		DN 20 (3/4" BSP)			
Combustion products evacuation		Ø 125 mm (5")			
(S) Weighing equipment (optional)					
Compressed air inlet		---------- Ø 4/6 mm ----------			
	- Min./max. compress air pressure	---------- 5,5/7 bar ----------			
	- Consumption	---------- 10 l/h ----------			

* normal cycle : prewash 3 min at 35 °C, drain. 2 min, main wash 4 min at 65 °C, drain 2 min, rinse 2 min, extract. 2 min, rinse 2 min, extract 2 min, rinse 2 min, extrac. 10 min (cold water supply at 15 °C).

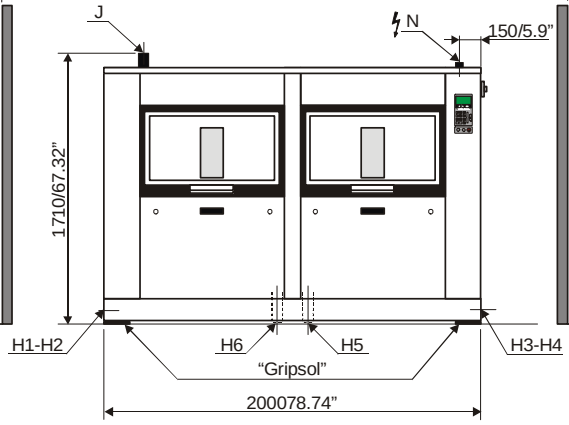
** ECO cycle : normal cycle with rinse 5 l/kg instead of 6 l/kg dry linen.

Washer extractor type 670 standard

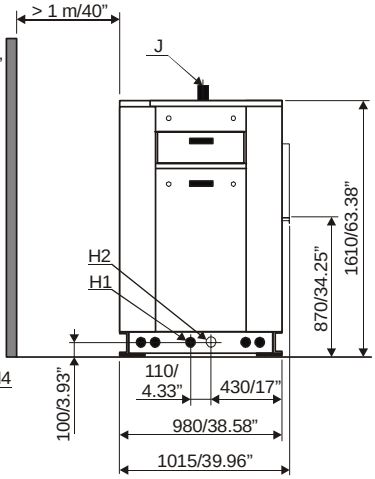
Right view

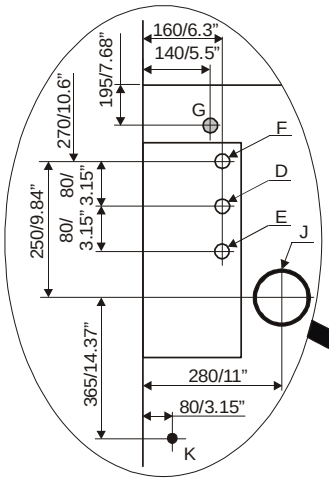


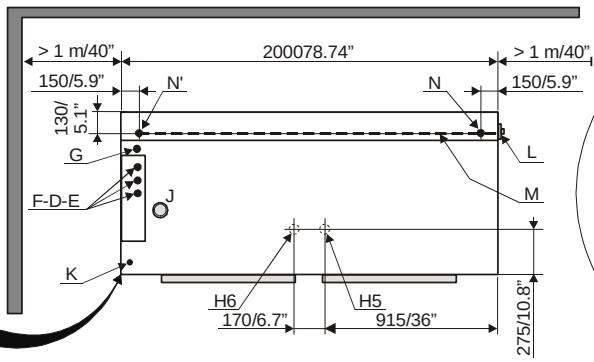
Front view



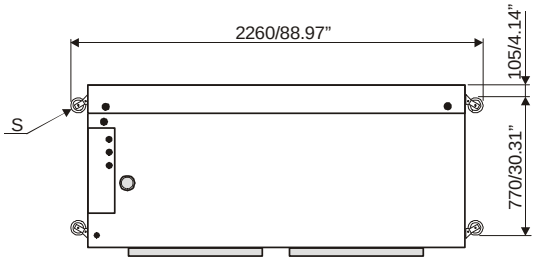
Left view

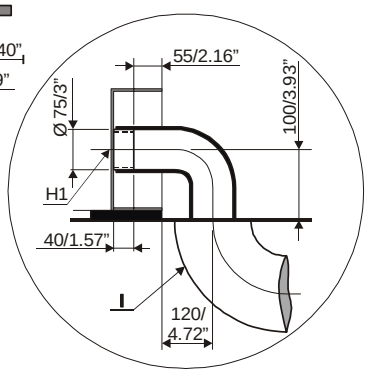






Top view





Example of drain connection

07100087

Washer extractor type 670 standard

Diagram no. 07100087

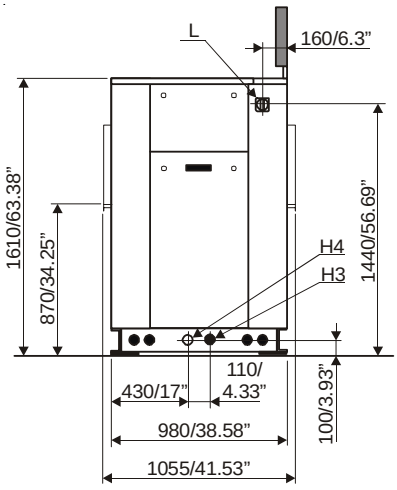
		Gas	Electric	Steam	Thermic fluid
Heating					
Characteristics	Ø cage	770 mm (30.31")			
	Cage length	1500 mm (59")			
	Cage volume	668 dm³ (668 l)			
	Specific load 1/10 (dry linen, ISO 9398-4)	66.8 kg (147.33 lb)			
	Opening cage doors (L x H)	2x600 x 400 mm (23.62x15.74")			
	Opening drum door (L x H)	2x616 x 525 mm (24.25x20.66")			
Floor area		2 m² (21.53 sq. ft)			
Net weight		940 daN (2073 lb)			
Weight loaded (high level)		1589 daN (3504 lb)			
Water, washing, low level		182 l	182 l	182 l	182 l
Water, washing, high level		365 l	365 l	365 l	365 l
Max dynamic load		F = 466 daN (1028 lb)			
Max transmitted floor load		2055 daN (4533 lb)			
Max pressure transmitted to floor		419 kPa			
Spin efficiency		350 G			
Max. unbalance		8 kg (17.65 lb)			
(L) Main switch to connect main cable					
(M) Electric cable (section)		4x2.5 mm²	4x35 mm²	4x2.5 mm²	4x2.5 mm²
(N) or (N') Stuffing box for main cable					
Supply voltage		380 / 415 V 3+E ~ 50/60 Hz			
Installed electric power		7.8 kW	61.5 kW	7.8 kW	7.8 kW
Installed heating power		40 kW	54 kW	-	-
Electrical consumption for a normal cycle*		2 kWh/h	23 kWh/h	2 kWh/h	2 kWh/h
Heat loss		3 % of installed heating power			
(G) Steam inlet				DN 20 (3/4" BSP)	
	- Maximum supply pressure			600 kPa (87 psi)	
	- Steam instantaneous flow rate at 600 kPa			216 kg/h	
	- Steam consumption for a normal cycle*			24.5 kg/h at 600 kPa (87 psi)	
(D) Hot water connection / flow		DN 20 (3/4" BSP) - 70 l/min at 250 kPA (36 psi)			
(E) Cold hard water connection / flow		DN 20 (3/4" BSP) - 70 l/min at 250 kPA (36 psi)			
(F) Cold soft water connection / flow (option)		DN 20 (3/4" BSP) - 70 l/min at 250 kPA (36 psi)			
Water supply minimum pressure		50 kPa (7.25 psi)			
Water supply maximum pressure		300 kPa (43.5 psi)			
Water consumption for a normal cycle*		977 l	977 l	977 l	977 l
Water consumption for an ECO cycle**		782 l	782 l	782 l	782 l
(K) Liquid detergents inlet		DN 20 (3/4" BSP)			
(H1 or H3 or H5) Drain connection		Ø 75 mm (3")			
(H2 or H4 or H6) Double drain connection		Ø 75 mm (3")			
Maximum drain flow rate		240 l/min	240 l/min	240 l/min	240 l/min
(I) Waste water collector (3 cm/m (3 %) minimum slope)		DN 150 mm (6" BSP)			
(J) Air vent hole		Ø 60 mm (2.36 ")			
(N') Thermic fluid inlet					DN 15 (1/2" BSP)
(G) Thermic fluid return					DN 15 (1/2" BSP)
	- Maximum supply pressure				600 kPa
	- Installed calorific power				47300 kcal
	- Average calorific consumption				15800 kcal/h
	- Inner volume thermic fluid				5,33 l
Gas inlet		DN 20 (3/4" BSP)			
Combustion products evacuation		Ø 125 mm (5")			
(S) Weighing equipment (optional)					
Compressed air inlet		Ø 4/6 mm			
	- Min./max. compress air pressure	5,5/7 bar			
	- Consumption	10 l/h			

* normal cycle : prewash 3 min at 35 °C, drain. 2 min, main wash 4 min at 65 °C, drain 2 min, rinse 2 min, extract. 2 min, rinse 2 min, extract 2 min, rinse 2 min, extrac. 10 min (cold water supply at 15 °C).

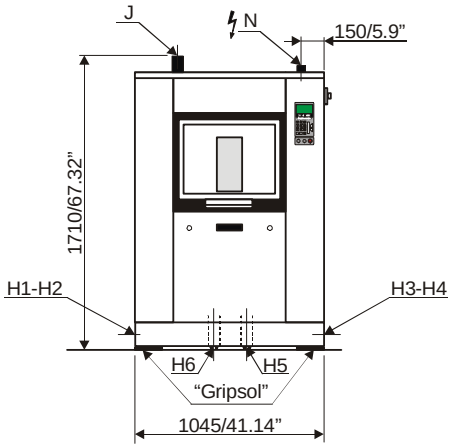
** ECO cycle : normal cycle with rinse 5 l/kg instead of 6 l/kg dry linen.

Washer extractor type 230 barrier

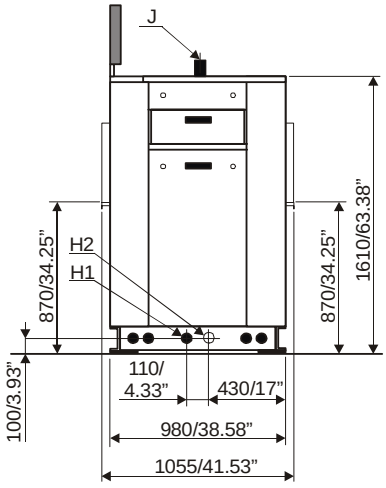
Right view

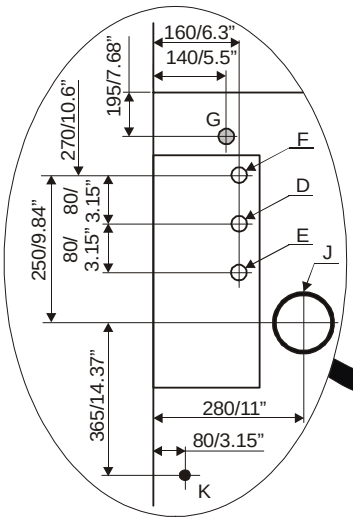


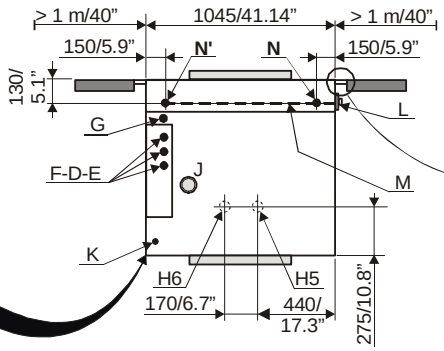
Front view

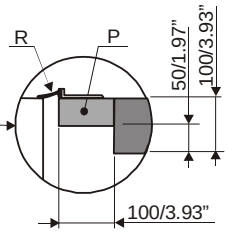


Left view

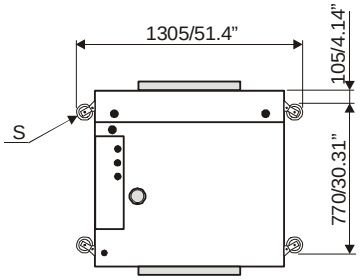


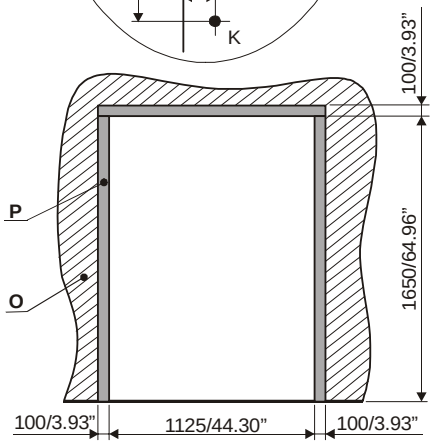


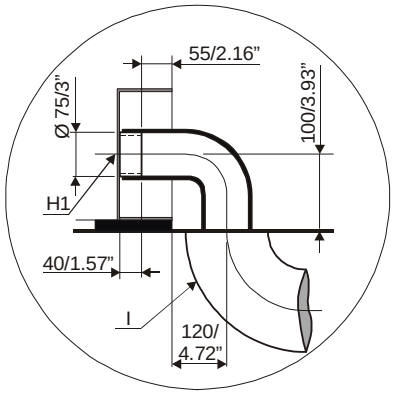




Top view







Example of drain connection

07100082

Washer extractor type 230 barrier

Diagram no. 07100082

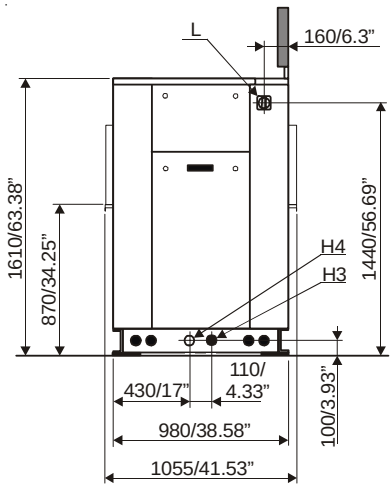
Heating	Gas	Electric	Steam	Thermic fluid
Characteristics Ø cage	---------- 770 mm (30.31") ----------			
Cage length	---------- 520 mm (20.47") ----------			
Cage volume	---------- 229 dm³ (229 l) ----------			
Specific load 1/10 (dry linen, ISO 9398-4)	---------- 22.9 kg (50.5 lb) ----------			
Opening cage doors (L x H)	---------- 450 x 400 mm (17.71x15.74") ----------			
Opening drum door (L x H)	---------- 466 x 525 mm (18.34x20.67") ----------			
Floor area	---------- 1 m² (10.76 sq. ft) ----------			
Net weight	---------- 670 daN (1478 lb) ----------			
Weight loaded (high level)	---------- 834 daN (1840 lb) ----------			
Water, washing, low level	65 l	65 l	65 l	65 l
Water, washing, high level	130 l	130 l	130 l	130 l
Max dynamic load	---------- F = 101 daN (222 lb) ----------			
Max transmitted floor load	---------- 935 daN (2062 lb) ----------			
Max pressure transmitted to floor	---------- 191 kPa ----------			
Spin efficiency	---------- 350 G ----------			
Max. unbalance	---------- 3.6 kg (7.94 lb) ----------			
(L) Main switch to connect main cable				
(M) Electric cable (section)	4x2.5 mm²	4x6 mm²	4x2.5 mm²	4x2.5 mm²
(N) or (N') Stuffing box for main cable				
Supply voltage	----------380 / 415 V 3+E ~ 50/60 Hz----------			
Installed electric power	3.7 kW	21.70 kW	3.7 kW	3.7 kW
Installed heating power	40 kW	18 kW	-	-
Electrical consumption for a normal cycle*	0.8 kWh/h	5.3 kWh/h	0.6 kWh/h	0.6 kWh/h
Heat loss	----------3 % of installed heating power----------			
(G) Steam inlet			DN 20 (3/4" BSP) (87 psi)	
- Maximum supply pressure			600 kPa	
- Steam instantaneous flow rate at 600 kPa			72 kg/h	
- Steam consumption for a a normal cycle*			12 kg/h at 600 kPa (87 psi)	
(D) Hot water connection / flow	DN 20 (3/4" BSP) - 70 l/min at 250 kPA (36 psi)			
(E) Cold hard water connection / flow	DN 20 (3/4" BSP) - 70 l/min at 250 kPA (36 psi)			
(F) Cold soft water connection / flow (option)	DN 20 (3/4" BSP) - 70 l/min at 250 kPA (36 psi)			
Water supply minimum pressure	---------- 50 kPa (7.25 psi) ----------			
Water supply maximum pressure	---------- 300 kPa (43.5 psi) ----------			
Water consumption for a normal cycle*	360 l	340 l	340 l	340 l
Water consumption for an ECO cycle**	282 l	260 l	260 l	260 l
(K) Liquid detergents inlet	DN 20 (3/4" BSP)			
(H1 or H3 or H5) Drain connection	---------- Ø 75 mm (3") ----------			
(H2 or H4 or H6) Double drain connection	---------- Ø 75 mm (3") ----------			
Maximum drain flow rate	240 l/min	240 l/min	240 l/min	240 l/min
(I) Waste water collector	---------- DN 150 mm (6" BSP) ----------			
(3 cm/m (3 %) minimum slope)				
(J) Air vent hole	---------- Ø 60 mm (2.36") ----------			
(N') Thermic fluid inlet				DN 15 (1/2" BSP)
(G) Thermic fluid return				DN 15 (1/2" BSP)
- Maximum supply pressure				600 kPa
- Installed calorific power				34400 kcal
- Average calorific consumption				11500 kcal/h
- Inner volume thermic fluid				2,62 l
Gas inlet	DN 20 (3/4" BSP)			
Combustion products evacuation Ø 125 mm (5")				
(O) Barrier partition (provided by customer)				
(P) Frame 60x100 mm maxi (provided by customer)				
(R) Aseptis seal				
(S) Weighing equipment (optional)				
Compressed air inlet	----------Ø 4/6 mm----------			
- Min./max. compress air pressure	----------5,5/7 bar----------			
- Consumption	----------10 l/h----------			

* normal cycle : prewash 3 min at 35 °C, drain. 2 min, main wash 4 min at 65 °C, drain 2 min, rinse 2 min, extract. 2 min, rinse 2 min, extract 2 min, rinse 2 min, extrac. 10 min (cold water supply at 15 °C).

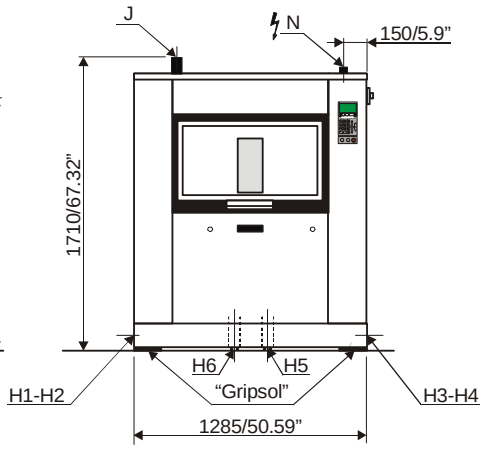
** ECO cycle : normal cycle with rinse 5 l/kg instead of 6 l/kg dry linen.

Washer extractor type 340 barrier

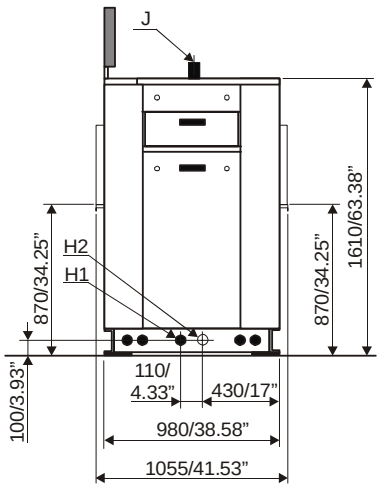
Right view

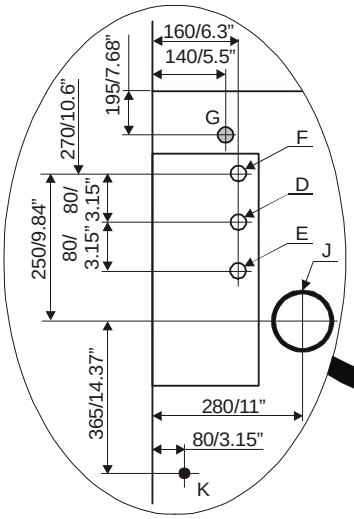


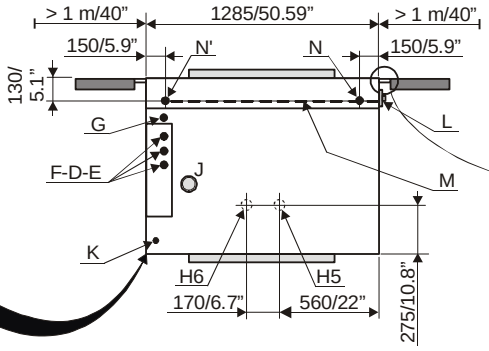
Front view

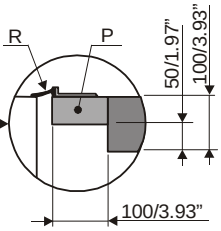


Left view

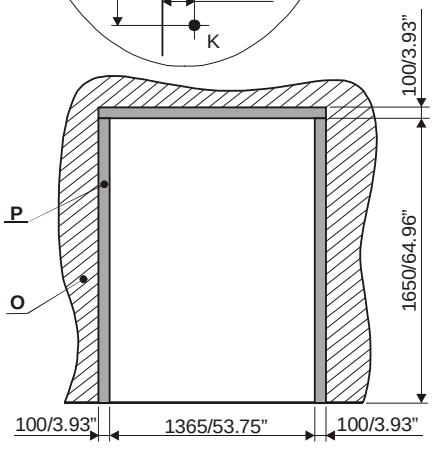


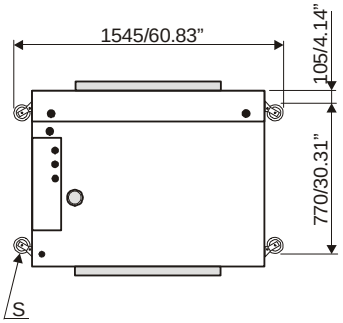


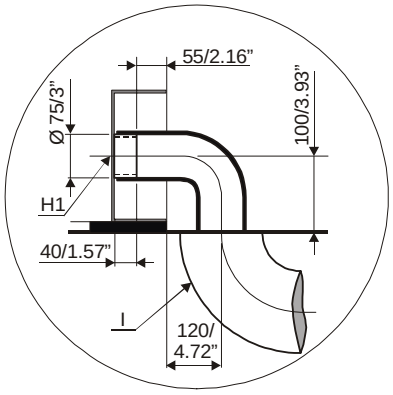




Top view







Example of drain connection

07100084

Washer extractor type 340 barrier

Diagram no. 07100084

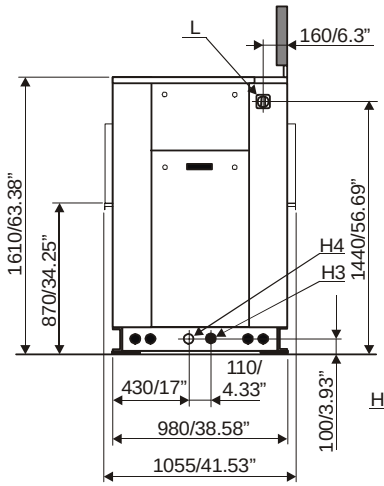
Heating		Gas	Electric	Steam	Thermic fluid
Characteristics	Ø cage	---------- 770 mm (30.31") ----------			
	Cage lenght	---------- 760 mm (30") ----------			
	Cage volume	---------- 338 dm³ (338 l) ----------			
	Specific load 1/10 (dry linen, ISO 9398-4)	---------- 33.8 kg (74.55 lb) ----------			
	Opening cage doors (L x H)	---------- 600 x 400 mm (23.62x15.74") ----------			
	Opening drum door (L x H)	---------- 616 x 525 mm (24.25x20.67") ----------			
Floor area		---------- 1.25 m² (13.45 sq. ft) ----------			
Net weight		---------- 760 daN (1676 lb) ----------			
Weight loaded (high level)		---------- 1008 daN (2223 lb) ----------			
Water, washing, low level		93 l	93 l	93 l	93 l
Water, washing, high level		186 l	186 l	186 l	186 l
Max dynamic load		---------- F = 155 daN (342 lb) ----------			
Max transmitted floor load		---------- 1163 daN (2565 lb) ----------			
Max pressure transmitted to floor		---------- 237 kPa ----------			
Spin efficiency		---------- 350 G ----------			
Max. unbalance		---------- 4.8 kg (10.58 lb) ----------			
(L) Main switch to connect main cable					
(M) Electric cable (section)		4x2.5 mm²	4x16 mm²	4x2.5 mm²	4x2.5 mm²
(N) or (N') Stuffing box for main cable					
Supply voltage		---------- 380 / 415 V 3+E ~ 50/60 Hz ----------			
Installed electric power		4.8 kW	32 kW	4.8 kW	4.8 kW
Installed heating power		40 kW	27 kW	-	-
Electrical consumption for a normal cycle*		1.2 kWh/h	9.2 kWh/h	1 kWh/h	1 kWh/h
Heat loss		---------- 3 % of installed heating power ----------			
(G) Steam inlet				DN 20 (3/4" BSP) (87 psi)	
	- Maximum supply pressure			600 kPa	
	- Steam instantaneous flow rate at 600 kPa			108 kg/h	
	- Steam consumption for a normal cycle*			18 kg/h at 600 kPa (87 psi)	
(D) Hot water connection / flow		DN 20 (3/4" BSP) - 70 l/min at 250 kPA (36 psi)			
(E) Cold hard water connection / flow		DN 20 (3/4" BSP) - 70 l/min at 250 kPA (36 psi)			
(F) Cold soft water connection / flow (option)		DN 20 (3/4" BSP) - 70 l/min at 250 kPA (36 psi)			
Water supply minimum pressure		---------- 50 kPa (7.25 psi) ----------			
Water supply maximum pressure		---------- 300 kPa (43.5 psi) ----------			
Water consumption for a normal cycle*		495 l	470 l	470 l	470 l
Water consumption for an ECO cycle**		315 l	395 l	395 l	395 l
(K) Liquid detergents inlet		DN 20 (3/4" BSP)			
(H1 or H3 or H5) Drain connection		---------- Ø 75 mm (3") ----------			
(H2 or H4 or H6) Double drain connection		---------- Ø 75 mm (3") ----------			
Maximum drain flow rate		240 l/min	240 l/min	240 l/min	240 l/min
(I) Waste water collector (3 cm/m (3 %) minimum slope)		---------- DN 150 mm (6" BSP) ----------			
(J) Air vent hole		---------- Ø 60 mm (2.36") ----------			
(N') Thermic fluid inlet					DN 15 (1/2" BSP)
(G) Thermic fluid return					DN 15 (1/2" BSP)
	- Maximum supply pressure				600 kPa
	- Installed calorific power				34400 kcal
	- Average calorific consumption				12500 kcal/h
	- Inner volume thermic fluid				2,62 l
Gas inlet		DN 20 (3/4" BSP)			
Combustion products evacuation Ø 125 mm (5")					
(O) Barrier partition (provided by customer)					
(P) Frame 60x100 mm maxi (provided by customer)					
(R) Aseptis seal					
(S) Weighing equipment (optional)					
Compressed air inlet		---------- Ø 4/6 mm ----------			
	- Min./max. compress air pressure	---------- 5,5/7 bar ----------			
	- Consumption	---------- 10 l/h ----------			

* normal cycle : prewash 3 min at 35 °C, drain. 2 min, main wash 4 min at 65 °C, drain 2 min, rinse 2 min, extract. 2 min, rinse 2 min, extract 2 min, rinse 2 min, extrac. 10 min (cold water supply at 15 °C).

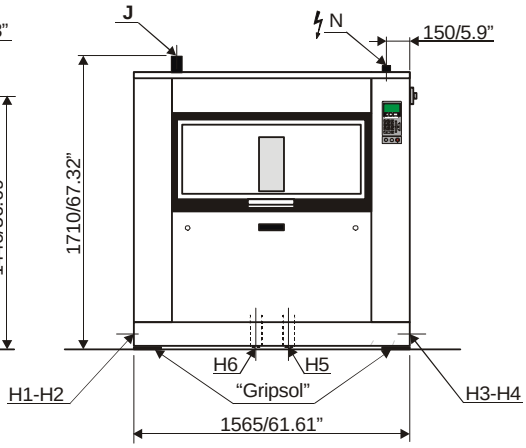
** ECO cycle : normal cycle with rinse 5 l/kg instead of 6 l/kg dry linen.

Washer extractor type 470 barrier

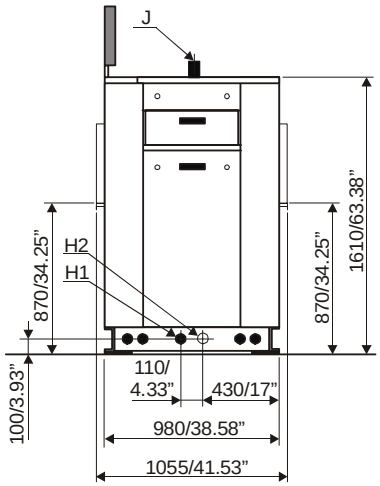
Right view

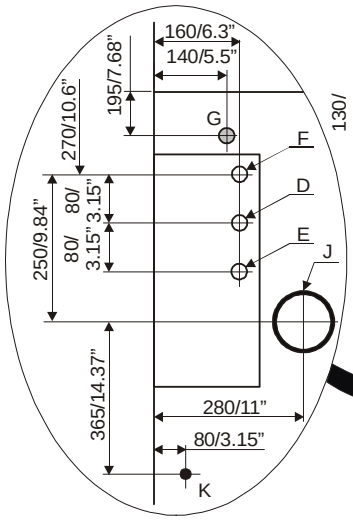


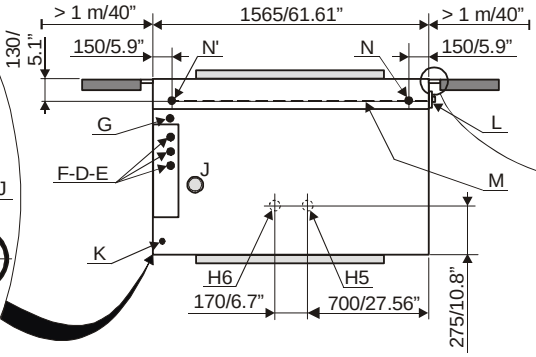
Front view

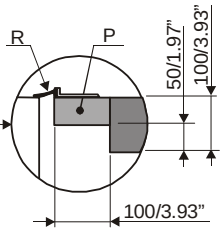


Left view

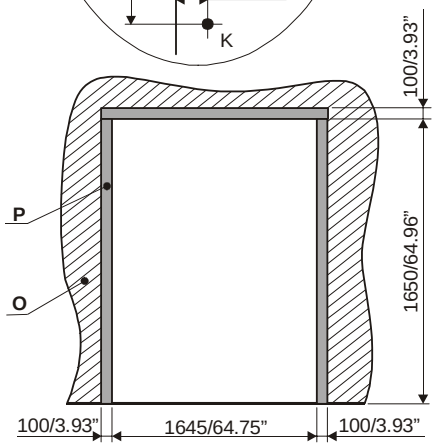


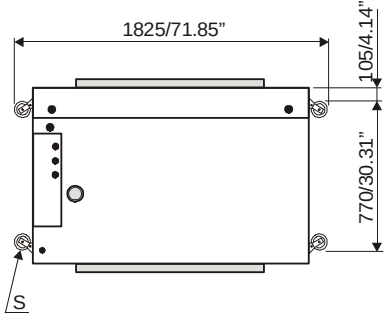


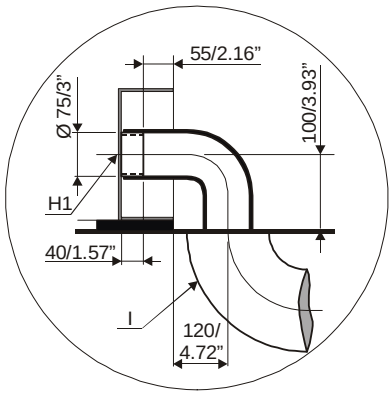




Top view







Example of drain connection

07100086

Washer extractor type 470 barrier

Diagram no. 07100086

Heating	Gas	Electric	Steam	Thermic fluid
Characteristics Ø cage	---------- 770 mm (30.31") ----------			
Cage length	---------- 1040 mm (41") ----------			
Cage volume	---------- 467 dm³ (467 l) ----------			
Specific load 1/10 (dry linen, ISO 9398-4)	---------- 46.7 kg (103 lb) ----------			
Opening cage doors (L x H)	---------- 2x450 x 400 mm (17.71x15.74") ----------			
Opening drum door (L x H)	---------- 935 x 527 mm (36.81x20.74") ----------			
Floor area	---------- 1.52 m² (16.36 sq. ft) ----------			
Net weight	---------- 870 daN (1919 lb) ----------			
Weight loaded (high level)	---------- 1272 daN (2805 lb) ----------			
Water, washing, low level	127 l	127 l	127 l	127 l
Water, washing, high level	255 l	255 l	255 l	255 l
Max dynamic load	---------- F = 275 daN (606 lb) ----------			
Max transmitted floor load	---------- 1547 daN (2805 lb) ----------			
Max pressure transmitted to floor	---------- 316 kPa ----------			
Spin efficiency	---------- 350 G ----------			
Max. unbalance	---------- 5.5 kg (12.13 lb) ----------			
(L) Main switch to connect main cable				
(M) Electric cable (section)	4x2.5 mm²	4x25 mm²	4x2.5 mm²	4x2.5 mm²
(N) or (N') Stuffing box for main cable				
Supply voltage	----------380 / 415 V 3+E ~ 50/60 Hz----------			
Installed electric power	5.8 kW	42 kW	5.8 kW	5.8 kW
Installed heating power	40 kW	36 kW	-	-
Electrical consumption for a normal cycle*	1.5 kWh/h	11 kWh/h	1.2 kWh/h	1.2 kWh/h
Heat loss	----------3 % of installed heating power----------			

(G) Steam inlet	DN 20 (3/4" BSP)
- Maximum supply pressure	600 kPa (87 psi)
- Steam instantaneous flow rate at 600 kPa	144 kg/h
- Steam consumption for a normal cycle*	24.5 kg/h at 600 kPa (87 psi)

(D) Hot water connection / flow	DN 20 (3/4" BSP) - 70 l/min at 250 kPA (36 psi)			
(E) Cold hard water connection / flow	DN 20 (3/4" BSP) - 70 l/min at 250 kPA (36 psi)			
(F) Cold soft water connection / flow (option)	DN 20 (3/4" BSP) - 70 l/min at 250 kPA (36 psi)			
Water supply minimum pressure	---------- 50 kPa (7.25 psi) ----------			
Water supply maximum pressure	---------- 300 kPa (43.5 psi) ----------			
Water consumption for a normal cycle*	638 l	610 l	610 l	610 l
Water consumption for an ECO cycle**	558 l	530 l	530 l	530 l

(K) Liquid detergents inlet	DN 20 (3/4" BSP)			
(H1 or H3 or H5) Drain connection	---------- Ø 75 mm (3") ----------			
(H2 or H4 or H6) Double drain connection	---------- Ø 75 mm (3") ----------			
Maximum drain flow rate	240 l/min	240 l/min	240 l/min	240 l/min
(I) Waste water collector	---------- DN 150 mm (6" BSP) ----------			
(3 cm/m (3 %) minimum slope)				
(J) Air vent hole	---------- Ø 60 mm (2.36") ----------			
(N') Thermic fluid inlet				DN 15 (1/2" BSP)
(G) Thermic fluid return				DN 15 (1/2" BSP)
- Maximum supply pressure				600 kPa
- Installed calorific power				47300 kcal
- Average calorific consumption				13800 kcal/h
- Inner volume thermic fluid				5,33 l

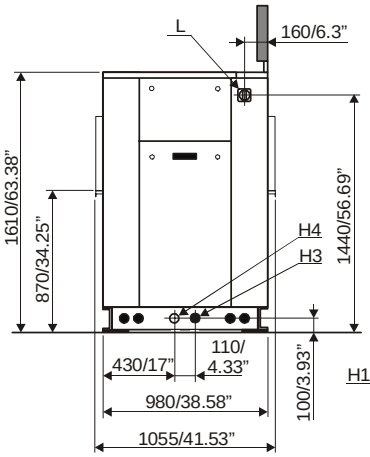
Gas inlet DN 20 (3/4" BSP)
Combustion products evacuation Ø 125 mm (5")
(O) Barrier partition (provided by customer)
(P) Frame 60x100 mm maxi (provided by customer)
(R) Aseptis seal
(S) Weighing equipment (optional)

Compressed air inlet	----------Ø 4/6 mm----------
- Min./max. compress air pressure	----------5,5/7 bar----------
- Consumption	----------10 l/h----------

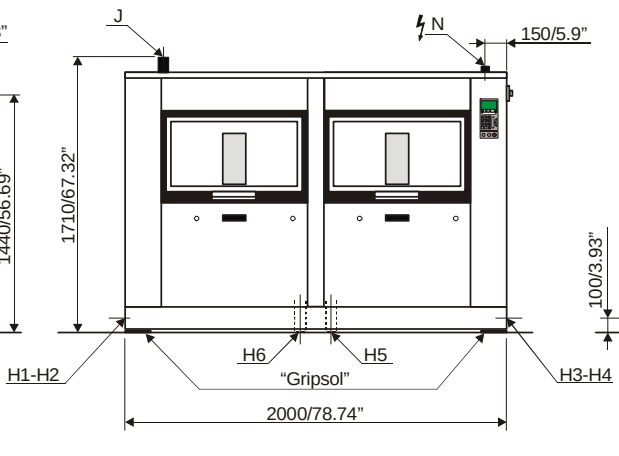
* normal cycle : prewash 3 min at 35 °C, drain. 2 min, main wash 4 min at 65 °C, drain 2 min, rinse 2 min, extract. 2 min, rinse 2 min, extract 2 min, rinse 2 min, extrac. 10 min (cold water supply at 15 °C).
** ECO cycle : normal cycle with rinse 5 l/kg instead of 6 l/kg dry linen.

Washer extractor type 670 barrier

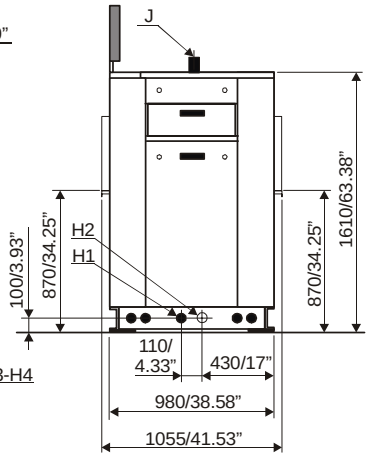
Right view

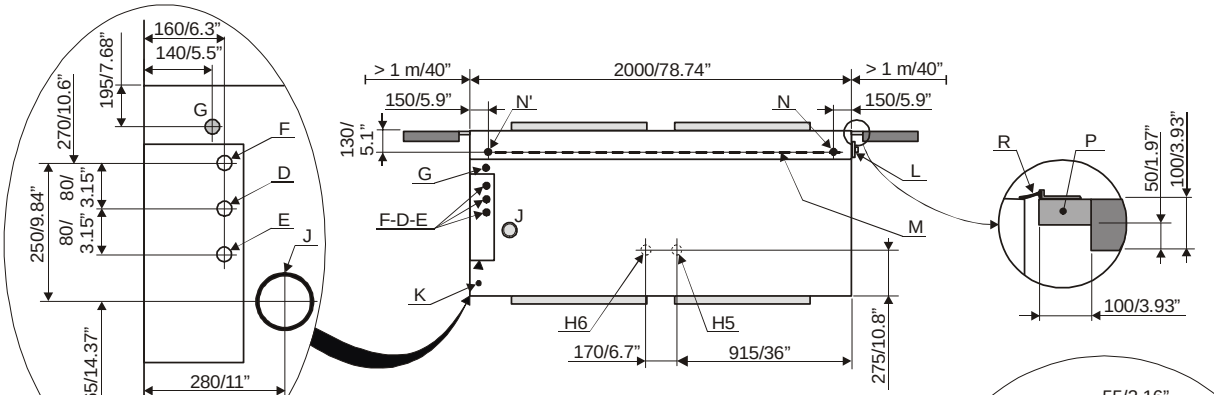


Front view

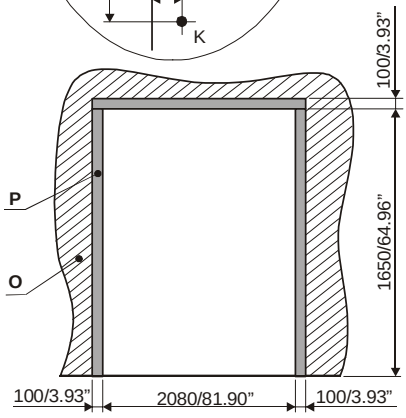


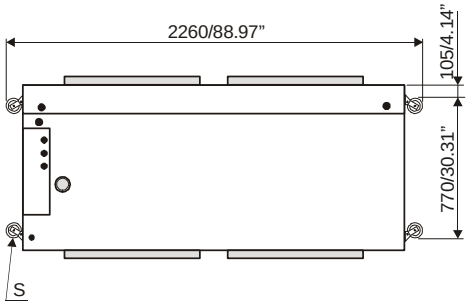
Left view

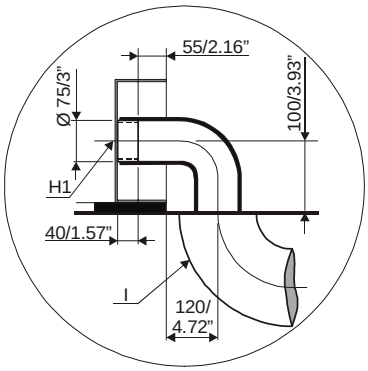




Top view







Example of drain connection

07100088

Washer extractor type 670 barrier

Diagram no. 07100088

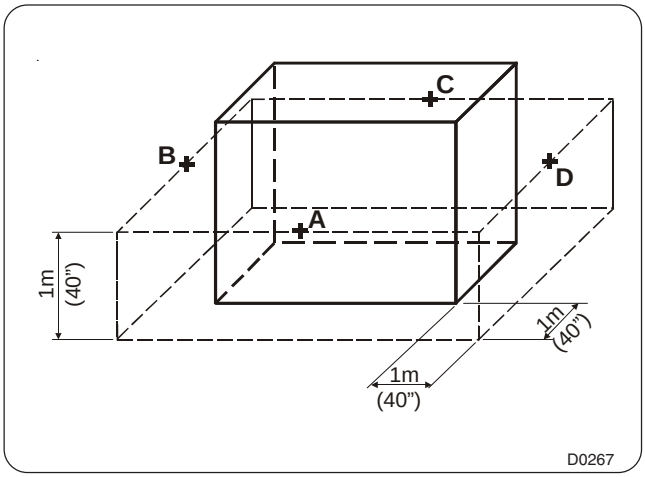
Heating	Gas	Electric	Steam	Thermic fluid
Characteristics Ø cage	---------- 770 mm (30.31") ----------			
Cage length	---------- 1550 mm (59") ----------			
Cage volume	---------- 668 dm³ (668 l) ----------			
Specific load 1/10 (dry linen, ISO 9398-4)	---------- 66.8 kg (147.33 lb) ----------			
Opening cage doors (L x H)	---------- 2x600 x 400 mm (23.62x15.74") ----------			
Opening drum door (L x H)	---------- 2x616 x 525 mm (24.25x20.66") ----------			
Floor area	---------- 2 m² (21.53 sq. ft) ----------			
Net weight	---------- 940 daN (2073 lb) ----------			
Weight loaded (high level)	---------- 1589 daN (3504 lb) ----------			
Water, washing, low level	182 l	182 l	182 l	182 l
Water, washing, high level	365 l	365 l	365 l	365 l
Max dynamic load	---------- F = 466 daN (1028 lb) ----------			
Max transmitted floor load	---------- 2055 daN (4533 lb) ----------			
Max pressure transmitted to floor	---------- 419 kPa ----------			
Spin efficiency	---------- 350 G ----------			
Max. unbalance	---------- 8 kg (17.65 lb) ----------			
(L) Main switch to connect main cable				
(M) Electric cable (section)	4x2.5 mm²	4x35 mm²	4x2.5 mm²	4x2.5 mm²
(N) or (N') Stuffing box for main cable				
Supply voltage	----------380 / 415 V 3+E ~ 50/60 Hz----------			
Installed electric power	7.8 kW	61.5 kW	7.8 kW	7.8 kW
Installed heating power	40 kW	54 kW	-	-
Electrical consumption for a normal cycle*	2 kWh/h	23 kWh/h	2 kWh/h	2 kWh/h
Heat loss	----------3 % of installed heating power----------			
(G) Steam inlet			DN 20 (3/4" BSP)	
- Maximum supply pressure			600 kPa (87 psi)	
- Steam instantaneous flow rate at 600 kPa			216 kg/h	
- Steam consumption for a normal cycle*			24.5 kg/h at 600 kPa (87 psi)	
(D) Hot water connection / flow	DN 20 (3/4" BSP) - 70 l/min at 250 kPA (36 psi)			
(E) Cold hard water connection / flow	DN 20 (3/4" BSP) - 70 l/min at 250 kPA (36 psi)			
(F) Cold soft water connection / flow (option)	DN 20 (3/4" BSP) - 70 l/min at 250 kPA (36 psi)			
Water supply minimum pressure	---------- 50 kPa (7.25 psi) ----------			
Water supply maximum pressure	---------- 300 kPa (43.5 psi) ----------			
Water consumption for a normal cycle*	977 l	977 l	977 l	977 l
Water consumption for an ECO cycle**	782 l	782 l	782 l	782 l
(K) Liquid detergents inlet	DN 20 (3/4" BSP)			
(H1 or H3 or H5) Drain connection	---------- Ø 75 mm (3") ----------			
(H2 or H4 or H6) Double drain connection	---------- Ø 75 mm (3") ----------			
Maximum drain flow rate	240 l/min	240 l/min	240 l/min	240 l/min
(I) Waste water collector (3 cm/m (3 %) minimum slope)	---------- DN 150 mm (6" BSP) ----------			
(J) Air vent hole	---------- Ø 60 mm (2.36") ----------			
(N') Thermic fluid inlet				DN 15 (1/2" BSP)
(G) Thermic fluid return				DN 15 (1/2" BSP)
- Maximum supply pressure				600 kPa
- Installed calorific power				47300 kcal
- Average calorific consumption				15800 kcal/h
- Inner volume thermic fluid				5,33 l
Gas inlet	DN 20 (3/4" BSP)			
Combustion products evacuation Ø 125 mm (5")				
(O) Barrier partition (provided by customer)				
(P) Frame 60x100 mm maxi (provided by customer)				
(R) Aseptis seal				
(S) Weighing equipment (optional)				
Compressed air inlet	----------Ø 4/6 mm----------			
- Min./max. compress air pressure	----------5,5/7 bar----------			
- Consumption	----------10 l/h----------			

* normal cycle : prewash 3 min at 35 °C, drain. 2 min, main wash 4 min at 65 °C, drain 2 min, rinse 2 min, extract. 2 min, rinse 2 min, extract 2 min, rinse 2 min, extrac. 10 min (cold water supply at 15 °C).

** ECO cycle : normal cycle with rinse 5 l/kg instead of 6 l/kg dry linen.

Sound level

Airborne noise emitted by the machine (values established from measurements made on machine at points A, B, C, and D).



Weighted sound pressure level (A) in dB(A).

	Washer 230		Washer 340		Washer 470		Washer 670	
	washing / spinning		washing / spinning		washing / spinning		washing / spinning	
A	61,5	73,5	60	71.5	61	72	61	72
B	62,5	76	60	75.5	62	74	60	75
C	61,5	73,5	61	75.5	61	72	61	73
D	62,5	76	61.5	72.5	62	74	62	74

Label of energetic performance (gas heating only)

The global output *hg* of the gas heated washer-extractor is determinated according to a standardised method and shall not be lower than 50 %.

This output minimal level is indicated on the machine's marking by the symbol ★.

Beyond the output minimal level hereabove specified, a label of energetic performance is given to the machine according to its global output *hg* and according to the hereunder chart.

Symbolisation of the label	Value of the output *hg*
★ ★	50 % <= *hg* < 65 %
★ ★ ★	65 % <= *hg* < 80 %
★ ★ ★ ★	*hg* >= 80 %

The indication of the energetic performance of this washer-extractor is of ★★★★ .

You should have found an instruction handbook and keys to open the machine casings, in the machine.

Depending on its destination, the washer extractor is delivered bare or may be placed on a transport pallet and/or packed with plastic film.
In some cases, it may be delivered in a crate, or in maritime packing (wood box).

Please refer to the handling chapter in this instruction handbook for a description of handling operations.

Unpacking

Take off the plastic film or remove the four wood socles with an spanner.

Check that no damage has been caused during transport.

Installation

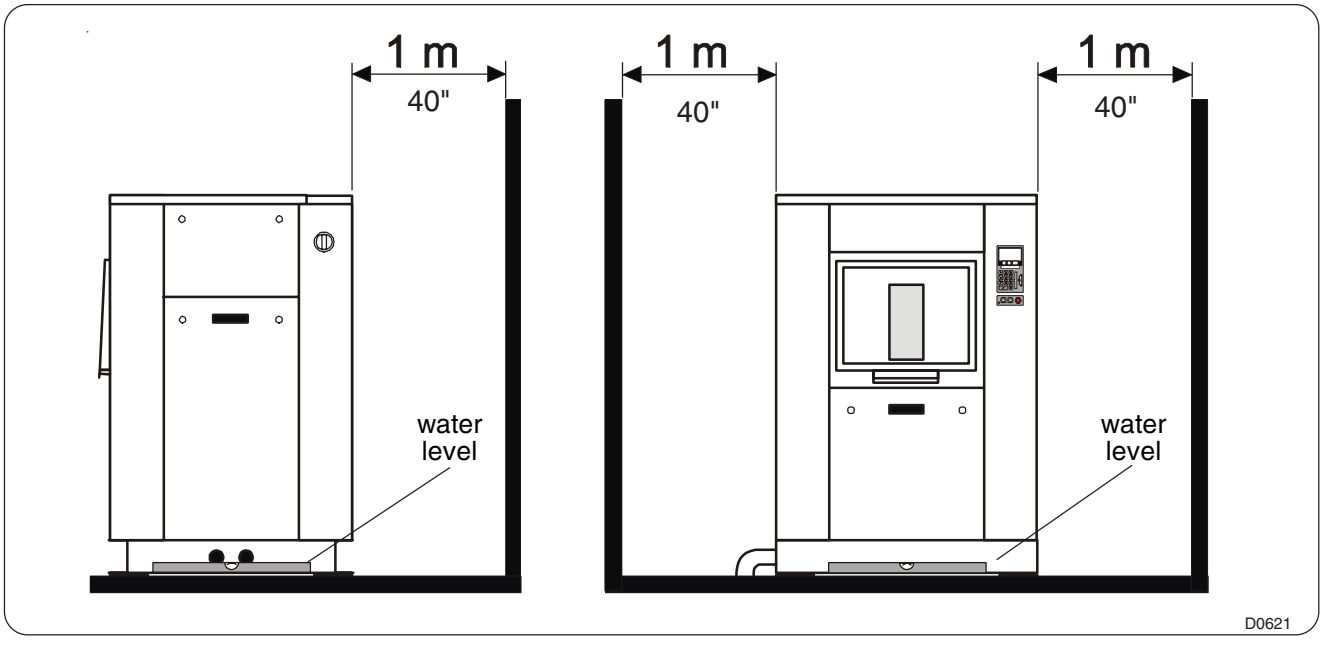
The installation must be done by competent technicians in accordance with local codes and regulations. When there are not local codes and regulations, the installation **must be comply** with European standards applicable.

The machine must be installed on a perfectly even surface, strong and horizontal, capable resisting to the efforts shown in the technical characteristics.
Adjustment of the machine by addition of level plate should be avoided.

☞ Control the horizontal level using a water level placed on the machine's sole.

☞ Place the washer extractor so that it is easy for the user and the service technician to do their work.

☞ Leave at leasy 1 m (40") **(according to the recommendation in standard EN 60204)** between the machine, a wall or any other machine at the sides.



Working place lighting

The lighting should be designed so as to avoid eye strain for the operator ; it should be uniform without any glare, and should be sufficient to detect any hazards.

The average lighting value on the working place recommended by the clothing industry for inspecting linen is **500** lux.

Whenever possible, the working place should be illuminated by daylight.

Supplies

Take the box placed underneath the drum.

List of accessories provided with each machine :

- 1 instruction handbook + Clarus Control memory card + converter handbook
- 3 keys for frames
- 1 opening drum lever
- 2 or 3 stainless steel flexible pipes DN20 + 4 or 6 fiber seals
- 2 or 3 waters filters + 2 or 3 nipples
- 1 elbowed durit Ø 60 + 1 collar
- 1 elbowed durit Ø 75 mm + 1 collar for drain
- 2 fixing dowells
- 2 fitted safety locks
- 4 **"Gripsol"** bolsters (see explanation for the setting)

Extra accessories for steam heating machine :

- 1 steam electrovalve (available in the soap box)
- 1 steam flexible

Extra accessories for gas heating machine :

- 4 meters blue flexible pipes
- 2 pipes Ø 125 mm (5") , length 500 mm (20") to be connect at the chimney
- 1 T-square pipe Ø 125 mm (5") and a anti-bursting chimney regulator to be connected over the gas exchanger
- 1 draught accelerator to extract the exhaust of burn gas, to be connected at the chimney (in 3 parts)
- 4 collars Ø 40 x 60

Extra accessories for barrier machine :

- 1 rubber seal + the aluminium extruded sections
- 2 filling angles + 4 screws + 4 nuts Ø 6

Mechanical installation

Setting of the "Gripsol" bolsters

Preparation of the ground and machine :

- Degrease carefully the ground and the soles of the machine.

Preparation of the "Gripsol" bolsters :

- Soak the bolsters in hot water during 5 minutes, then let them in open air for 3 to 4 minutes.
- Then unstick the protective film on the two adhesive sides.

Setting the "Gripsol" bolsters :

- Place each bolster (G) at its respective location (see drawing). Check that the bolster projects inside the soles and heave successively each bearing of the machine.

Putting the machine into service

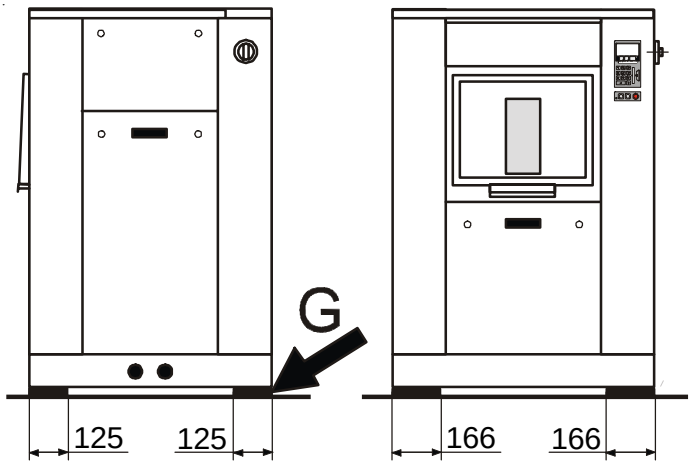
- Waiting time : Before putting the machine into service, it is necessary that each bearing is well fixed by crushing of the upper layer of **"Gripsol"** and that the lower layer has penetrated in the porosity of the ground.

For an ambient temperature of 18 °C (65 °F), the crushing time is two hours.

Electrical safety device :

- As **"Gripsol"** is a very good electric insulating material, the earthing of the machine is compulsory.

To displace the machines sealed with **"Gripsol"** bolsters, you just have to heave the machine and pull off the **"Gripsol"** bolsters.



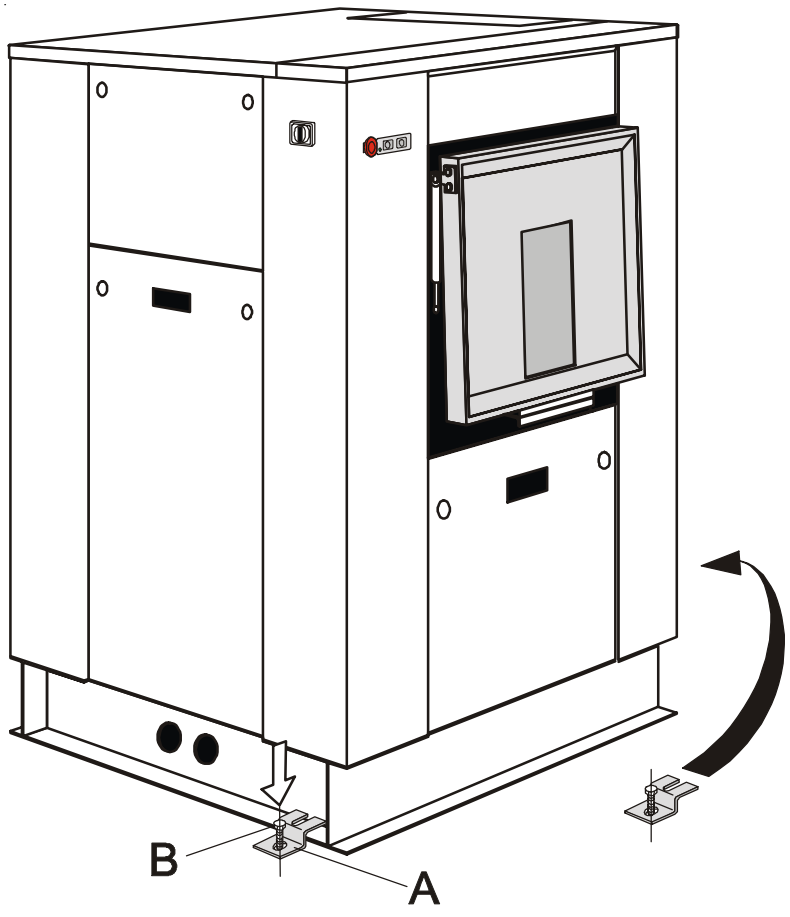
D0622

Instructions to fit the safety flanges

Position the safety flanges (A) crosswise (one in the front and the other at the back of the sole).

Mark the place of the drilling hole for the fixing pin (B) and drill the holes for fixing of flanges (holes diam. 12 mm (1/2"), depth 60 mm (3")).

Put the pins in the flanges, position the flanges and screw.

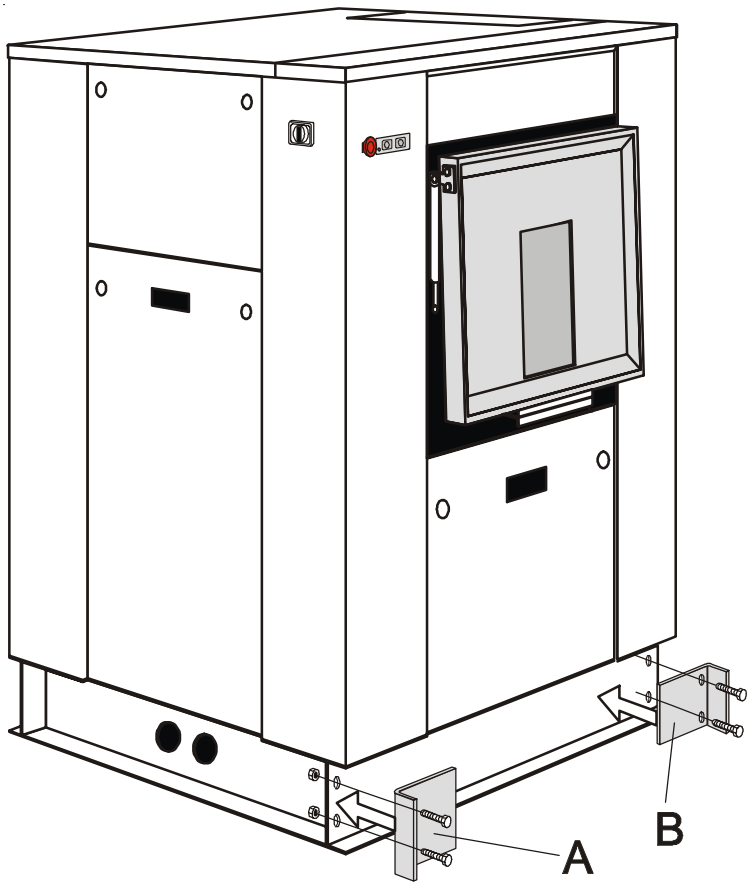


D0697

Instructions to fit the filling angles (barrier machines only)

Two angles (A and B) allow to fill the the soles ends.

Assemble each filling angle with screws and nuts to the sole ends which are next to the partition wall, in the clean area.



D0696

Instructions for installation of the washer with barrier partition

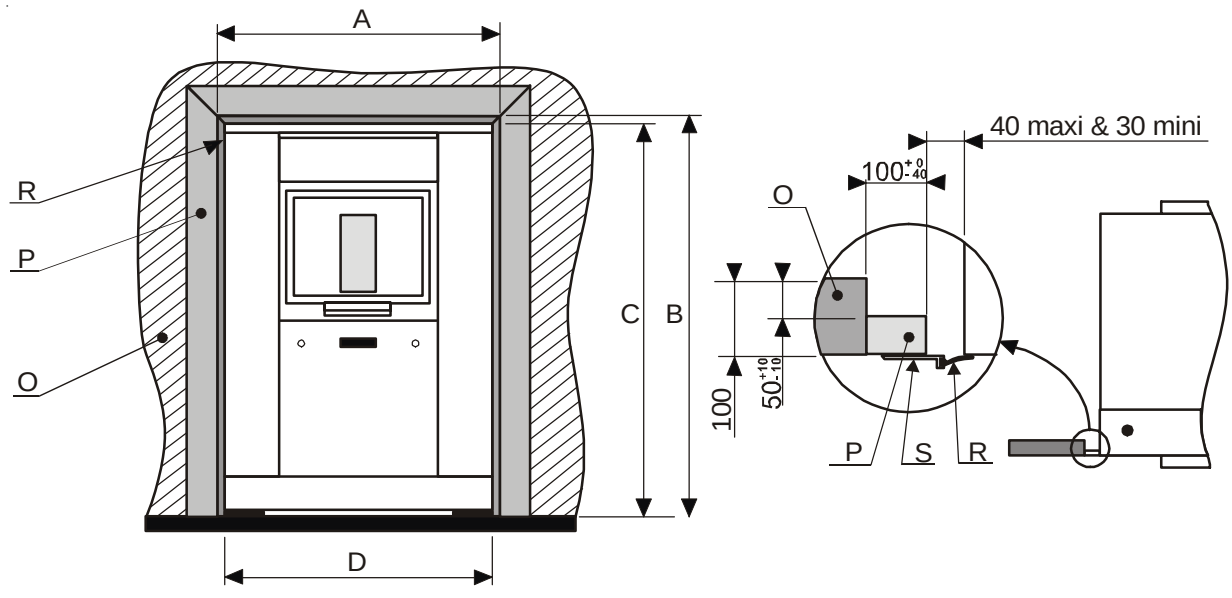
The barrier partition (O) (provided by customer) should be assembled before the installation of the machine.

Centre and align the washer-extractor with the frame (P) 60 x 100 mm maxi (provided by customer).

Place the rubber seal (R) inside the aluminium extruded section (S).

Srew the aluminium extruded section (S) on the frame or on the optional plates (P).

Machine type	230	340	470	670
Size A	1125/44.29	1365/53.74	1645/64.76	2080/81.89
Size B	1650/64.96	1650/64.96	1650/64.96	1650/64.96
Size C	1610/63.38	1610/63.38	1610/63.38	1610/63.38
Size D	1045/41.14	1285/50.39	1565/61.61	2000/78.74



Waters connections

Washer extractors are assembled in standard execution with two waters inlet.
One hot water and one hard water. On option, a third water inlet (soft) is possible.

The hereunder example sketch shows the connection of the machine to the different inlets.

U Manual stop valve DN 20 (¾" BSP) (provided by customer)

X Nipple (male) ¾" (provided)

Y Flexible pipe DN 20 (¾" BSP) (provided)

D Hot water inlet DN 20 (¾" BSP)

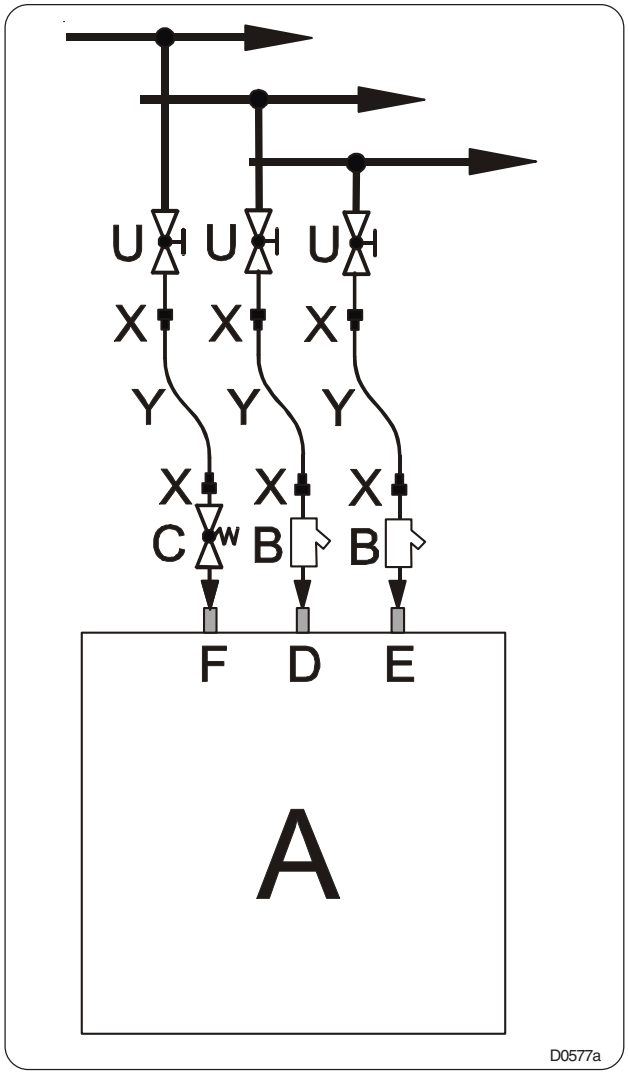
E Hard water inlet DN 20 (¾" BSP)

F Cold soft water inlet (option) DN 20 (¾" BSP)

C Steam electrovalve DN20 (¾" BSP) (provided)

B Water filter (provided)

A Washer-extractor



Water supply pressure, **50 kPa (7.25 psi) mini.**

Water supply pressure , **300 kPa (43.5 psi) maxi.**

Steam connection

For transport reasons, the steam electrovalve is dismantled and placed in the cardboard box supplies.

The inlet pipe to the machine has to be fit with a manual stopping valve to ease installation and maintenance.

Connect the steam electrovalve on its pipe union.

Assemble the set **(P.G.F.V.U)** between the machine and steam piping.

Hereunder values apply to the steam pressure :

Recommended pressure : 300 at 600 kPa (3 at 6 kg/cm²) (43.5 at 87 psi)

Limiting of values :
mini. 100 kPa (1 kg/cm²) (14.5 psi)
maxi. 600 kPa (6 kg/cm²) (87psi)

Connection size : DN 20 (¾" BSP).

Connect the steam installation on the top of the machine (see example sketch).

A Washer-extractor

S Steam inlet

Y Manual stop wheel valve
DN 20 (¾" BSP)
(provided by customer)

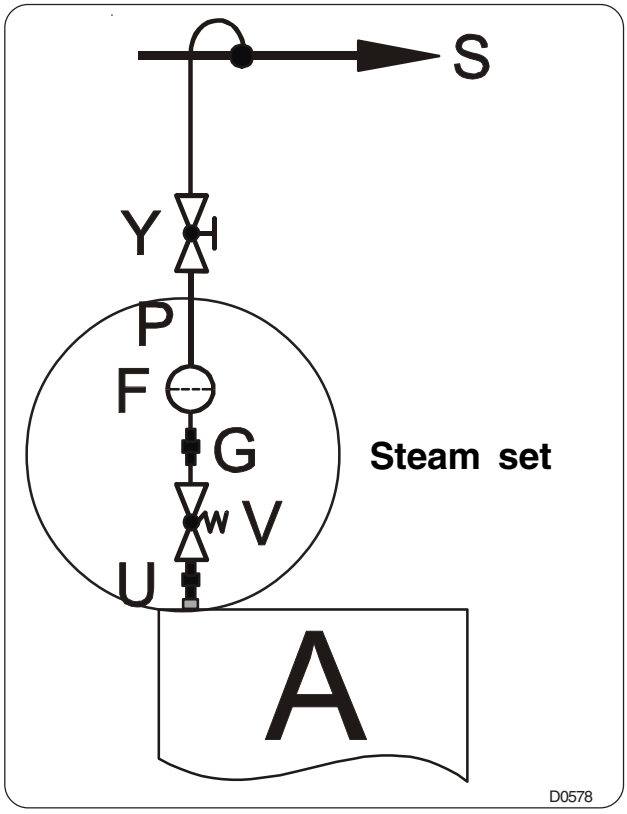
P Steam special flexible pipe
DN 20 (¾" BSP)(provided)

G Nipple DN 20 (¾" BSP) (provided by customer)

F Steam filter
DN 20 (¾" BSP) (provided)

V Steam electrovalve
DN 20 (¾" BSP) (provided)

U Pipe union
DN 20 (¾" BSP) (provided)



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Drain connection

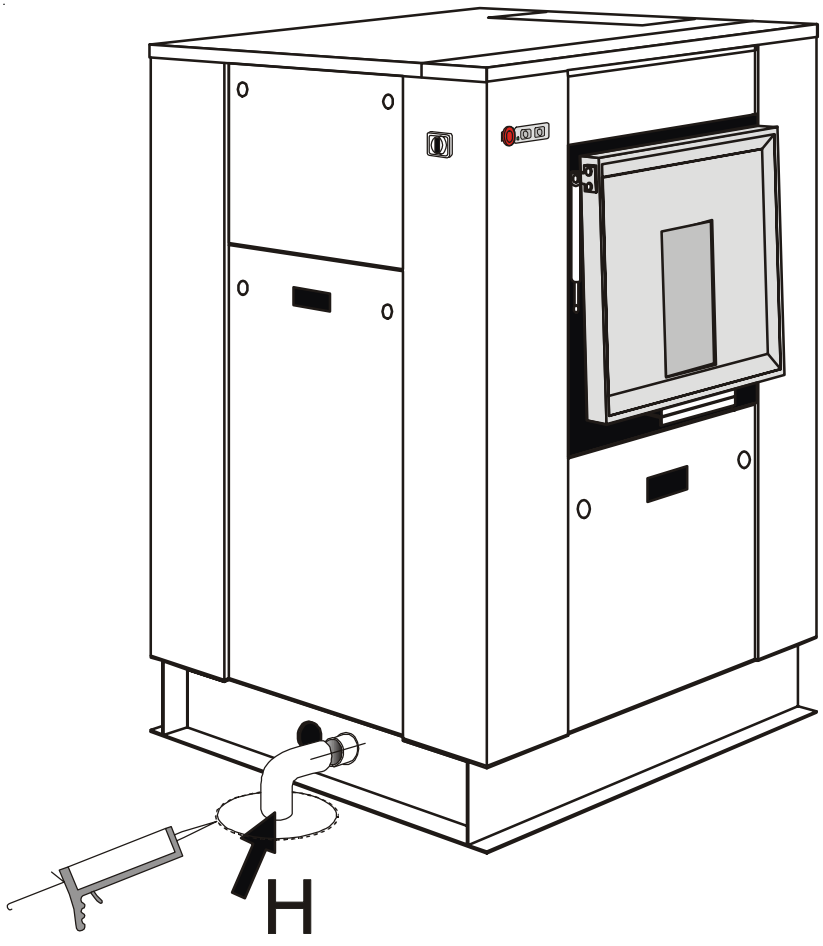
The machine's exhaust sleeve outside diameter is of 75 mm (3"). Depending of your installation, it might be fit on the left or right side of the machine.

Adapt and connect the rubber bend (H) to the machine's exhaust sleeve and to the wasted waters collector (rubber bend supplied with one collar in the machine).

Avoid acute bends or folds which might prevent water from flowing out.

The end of the pipe has to open in the air, at minimum 25 mm (1") on top of a ground siphon, drain pipe or another similar dispositive.

The waste water collector diameter 150 mm (6") (manufactured by customer) should have a 3 cm/m (3 %) slope and resist to a temperature of 90 °C (194 °F). It should be connected to the waste water general network in accordance with local codes and regulations.



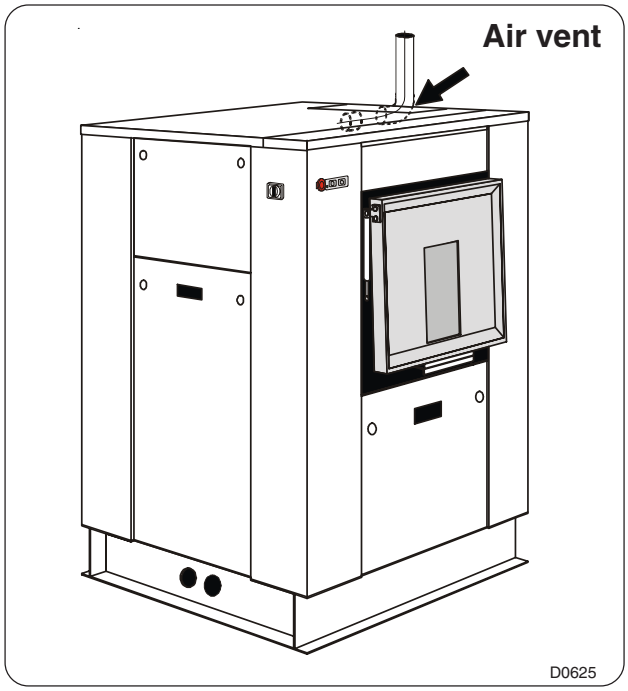
D1158

Air vent connection

The air vent of the drum opens on the top of the machine. Remove the upper casing protecting the water inlets to reach the air intake sleeve, then connect the bent hose to this opening.

Connect the air vent, to the outside of the laundry in accordance with tte legislation.

The air vent should resist to 100 °C (212 °F) temperature and allow the condenses to return to the machine.



Installation of the gas exchanger

The gas exchanger can be installed indifferently on the left or on the right of the machine according to the available place. Holes are provided on the sole of the machine on the two sides.

CAUTION

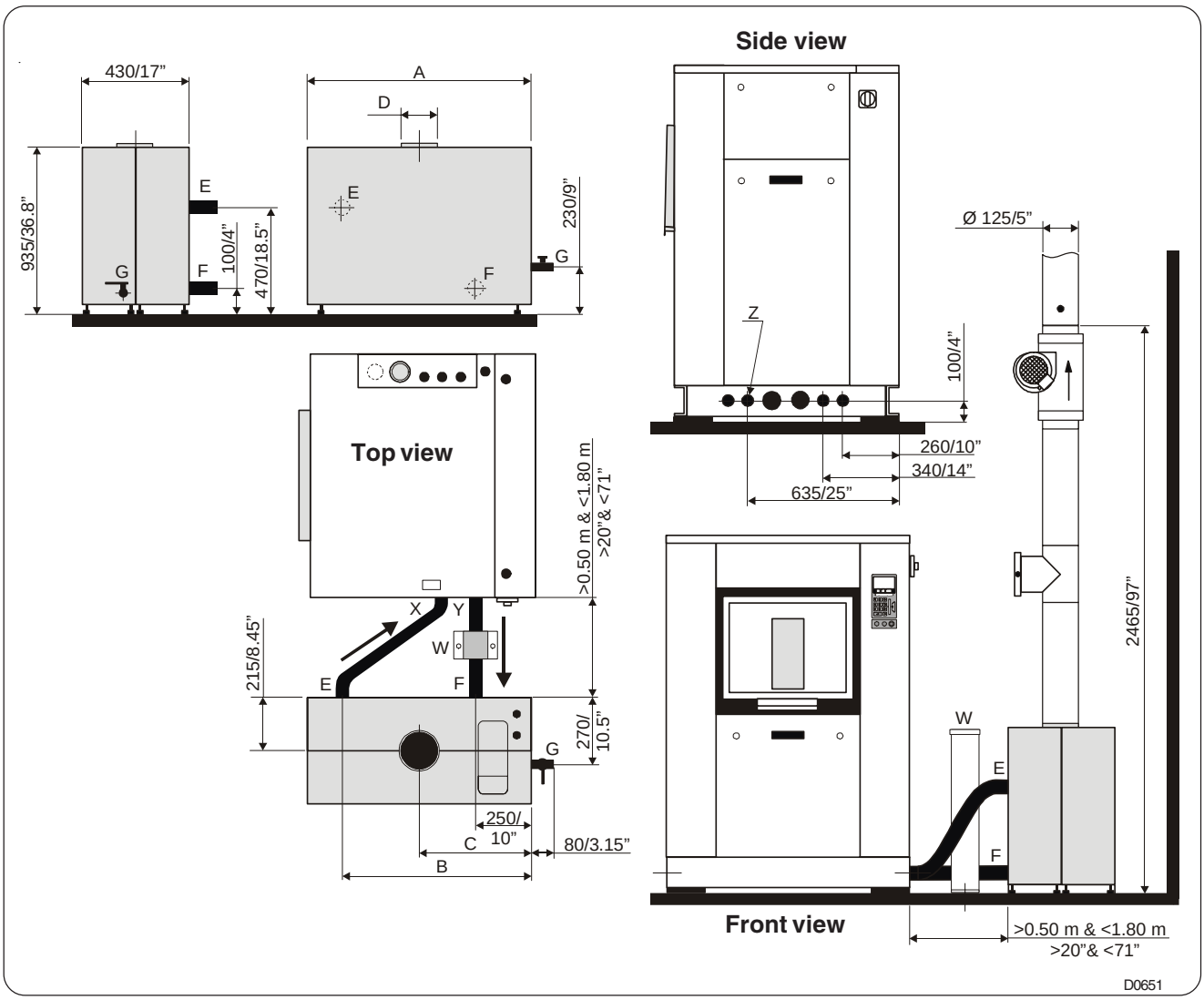
The machine should be installed in conformity with the regulations and standards enforced and situated in a correctly ventilated room.

SAFETY

Any repairing or maintenance operation should be carried out by a specialist.

Machine type		Units	
A	Length of exchanger	mm/inch	1110/43.7"
B	Dimension of output exchanger	mm/inch	1040/41"
C	Dimension of evacuation pipe	mm/inch	645/25.39"
D	Evacuation of burn gas	mm/inch	Ø 125/5"
E	Exchanger bottom output	mm/inch	Ø 36/40 (1"1/2)
F	Exchanger bottom input	mm/inch	Ø 36/40 (1"1/2)
G	Gas connection	mm/inch	DN 20 (3/4" BSP)
W	Filter		
X	Input machine/exchanger (higher plug on the tank)		
Y	Output machine/exchanger (lower plug on the tank)		
Z	Hole for electric cable to gas exchanger		

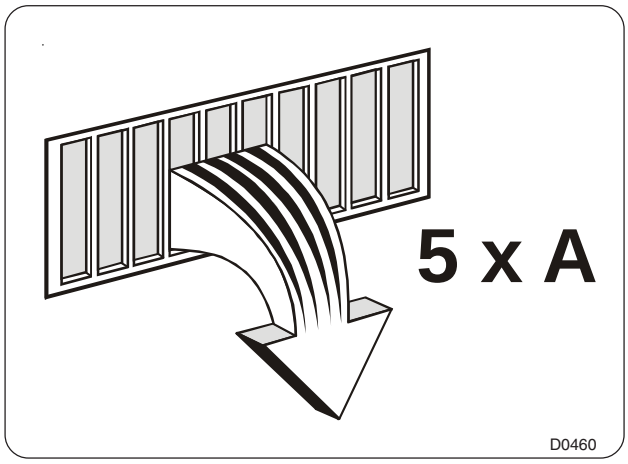
The gas exchanger pump must always be connected to the lower plug on the tank.



Connection of the evacuation pipe of the gas exchanger.

Fresh air inlet

To allow the gas exchanger to work at ist best, it is important that the laundry air inlet passes throught an opening from the outside.



The fresh air arrival must be equivalent to the volume of evacuated air.

In order to prevent drafts in the room, the best solution is to place the air inlet behind the machine.

It is essential that the rooms should be ventilated.

The free section of the air inlet must be five times greater than the section of the evacuation pipe.

Do not forget to allow for the fact that grills often occupy half the total area of the free air opening.

Evacuation duct

It is recommended that a separate smoothwalled evacuation duct should be connected to each machine, providing the least possible resistance to air.

Check that the shaft flow is at least twice the capacity of the gas exchanger draught accelerator.

- Draught accelerator maximum flow rate with no pressure : 260 m³/h (152 cfm).
- Maximum pressure available with no flow : 27 mm H_2O (1" H_2O).
- Maximum admissible head loss on evacuation : 15 mm H_2O (0.6 " H_2O) at point (**P**).
- Average temperature of exhaust coming out of the gas exchanger : 140°C (284°F).

Provided an upper **ventilation of 7 dm² (1.1 sq. ft)** and a **lower one of 14 dm² (1.5 sq. ft)** in your laundry.

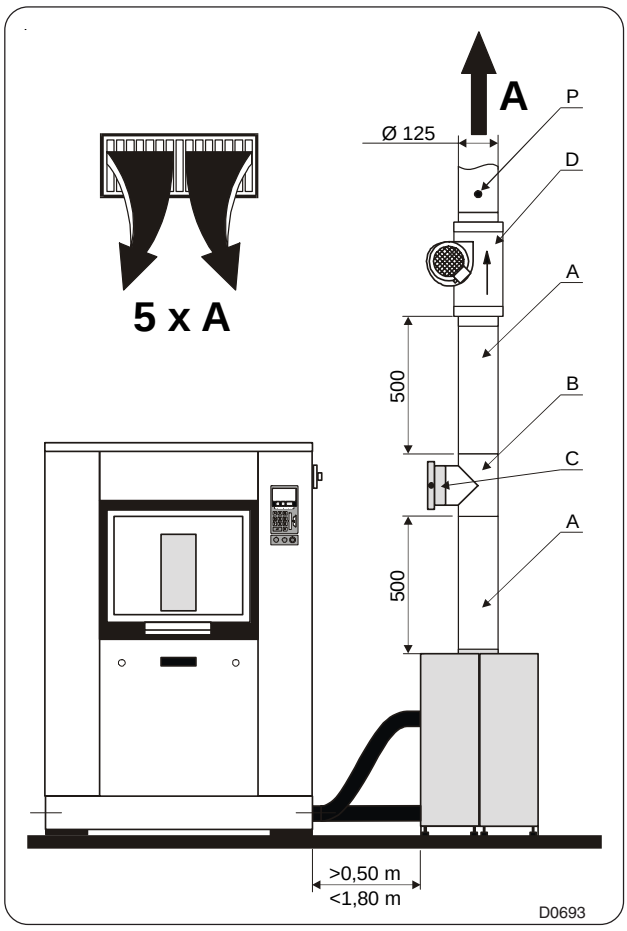
These conditions are absolutely essential for the correct working of the machine.

For gas heating, the required combustion fresh air supply should be not less than 2 m³/h (1.17 cfm) per kW, either 80 m³/h (47 cfm) minimum.

NOTE : if the flow is insufficient due to an excessive pressure loss, a safety pressure switch will automatically switch the heating off.

Installation of the exhaust of burn gas

- Connect the whole set of pipes on your cheminey pipe, that is to say :
- 1 aluminium pipe (A) lenght 500 mm (20") on the exchanger.
-1 T-square (B) pipe + 1 regulator (C).
-1 aluminium pipe (A) length 500 mm (20") .
-1 draught accelerator (D).



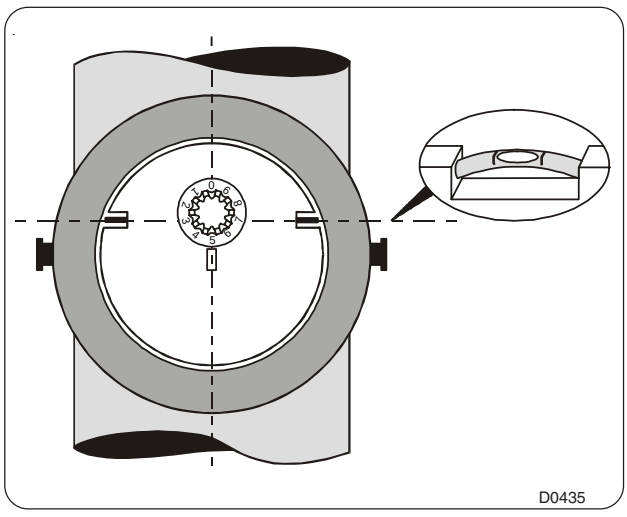
It is necessary to install the gas exchanger at the ground level.

Evacuation of burn gas from a machine with gas heating must never be connected to the evacuation used for a dry cleaning machine or other machine of the same type.

Installation of the chemney regulator

For a correct running of the installation, this chimney regulator must always have its axle of rotation of his flap perfectly horizontal.

The adjustment toothed wheel has to be positioned on the mark no 7.



Gas connection

CAUTION

The installation, connection and gas arrival adjustments for the machine must be done by qualified personnel only.

The customer must install a filter and a manual stop valve on the supply side of the machine if NATURAL GAS is used.
For BUTANE 28-30 mbar or PROPANE 37 or 50 mbar, the customer must install a filter, a manual closing valve and a pressure reducer.

Check that the diameter of injectors is adequate for the king of gas of your installation (see table). The machine is delivered with extra injectors in a plastic envelope. There is also a sheet metal plate with a cork joint or an adjusting head to feed the machine with another gas.

Connect the installation at the exchanger : DN 20 (3/4" BSP).

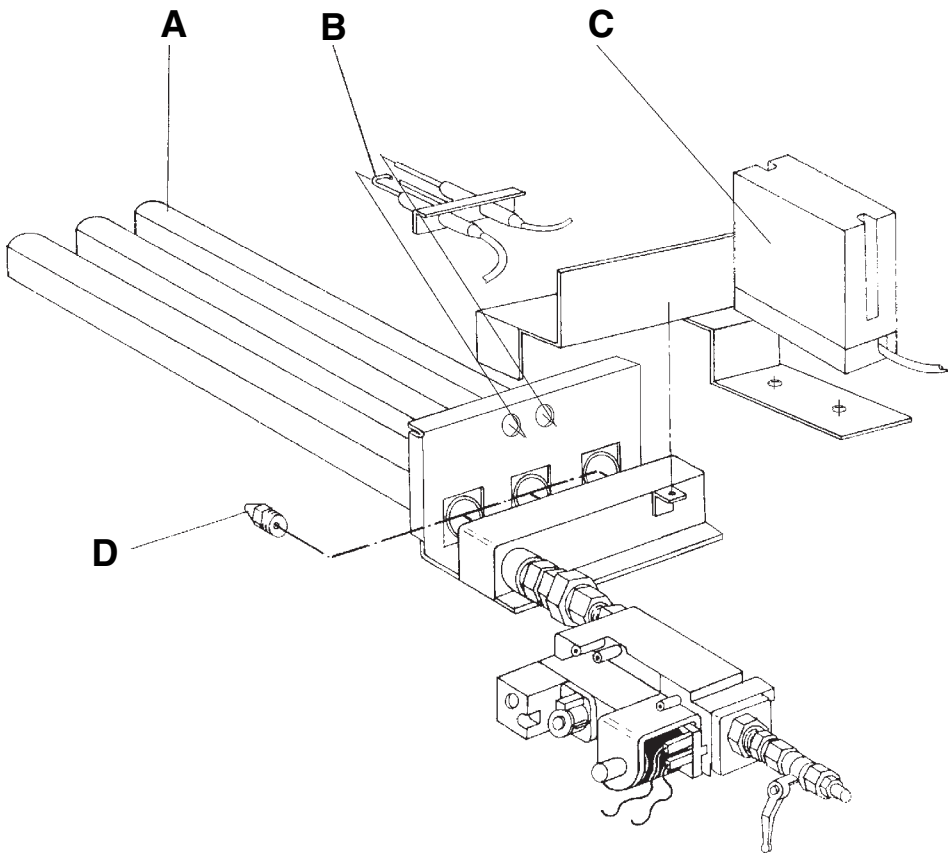
A : gas burner

B : ignition and control electrodes

C : ignitor

D : injectors

E : gas admission



D0410

The gas exchanger is adjusted at the plant to be suitable for the kind of gas specified on the order. If you have to supply your machine with gas in a family different from the gas for which your machine was adjusted, proceed as follows.

Testing pressures

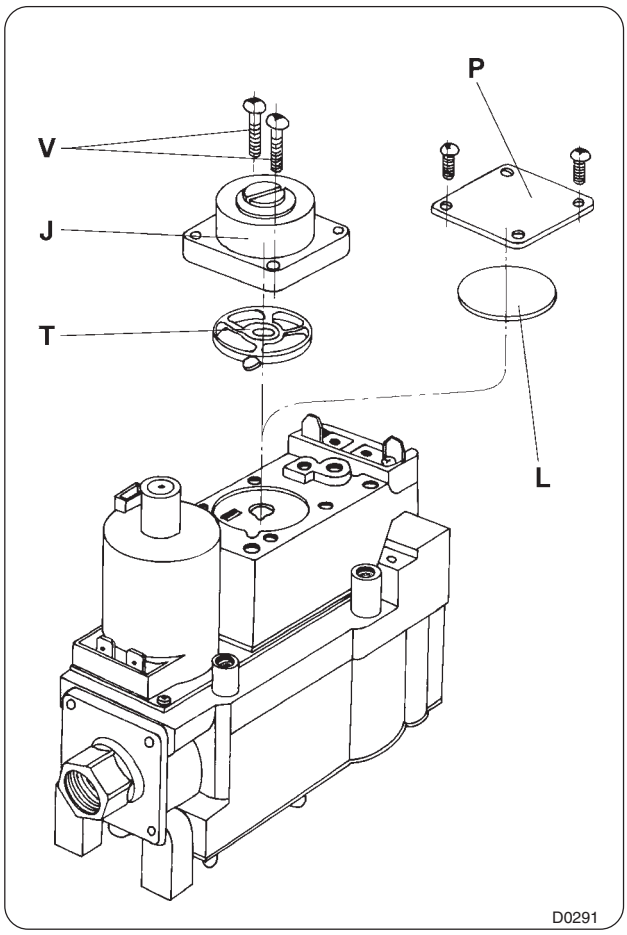
According to the EN 437 standard, the values of the testing pressures mentioned in our various documents are values for static pressure taken at the gas inlet connection of the machine ; the heating of the machine being on.

Changing to a gas in the same family (type H or L)

- Change the 3 injectors with joints (see tables of correspondences).

Changing to a gas in a different family (from type H or L to butane or propane)

- Change the 3 injectors with joints (see tables of correspondences)
- Unscrews the fixing screws (V) and remove the adjusting head (J) as well as its cork (T), keep these parts in case a change would by necessary.
- Replace it by the cork (L) and the plate (P).
- Screw the two screws and block.



Changing a gas from one family to another (from butane or propane to type H or L)

- Change the 3 injectors with joints (see tables of correspondences)
- Unscrews the fixing screws (V) and remove the plate (P) as well as the cork (L), keep these parts in case a change would by necessary.
- Set the cork (T) and the adjustment head (J).
- Screw the two screws and block.

IMPORTANT

Adjustments should be made by qualified personnel only.

Adjustement and chesking of the outlet pressure

The gas outlet pressure of the electrovalve is adjusted at the factory. If you have to make another adjustment, proced as follows.

A Inlet

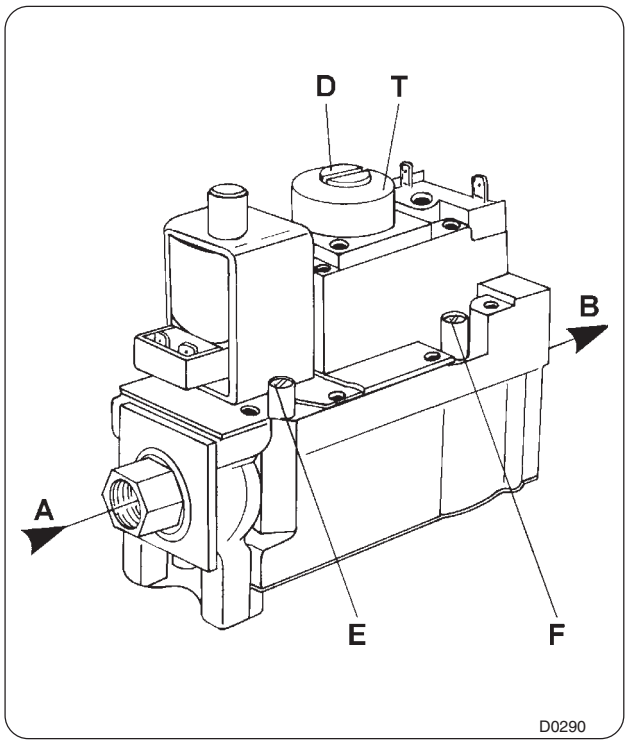
B Outlet

D Outlet pressure regulator adjustment screw plug.

E Inlet pressure tapping

F Outlet pressure tapping

T Head regulation



1- Close the gas inlet and remove the binding screw from the pressure tapping (F) and connect the manometer tube.

2- The electricity supply must be energized otherwise gas will not be supplied to the burner.

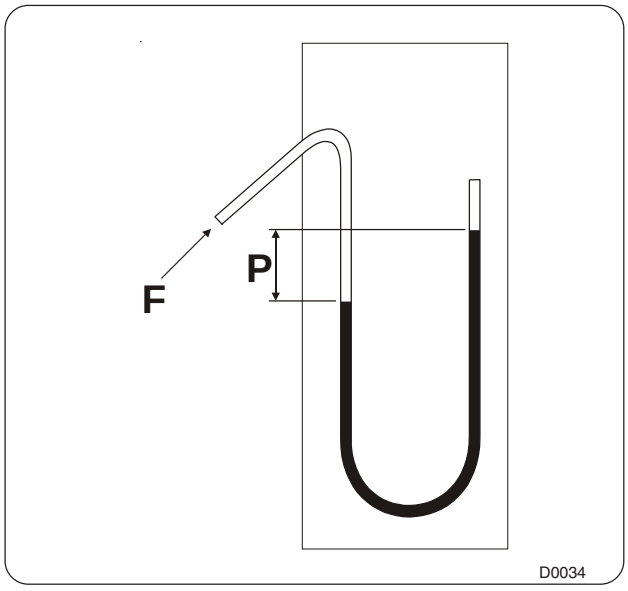
3- Open and check the gas inlet main burner using the manometer on the pressure tapping (F).

4- Remove the pressure regulator cap (D).

5- Using a screwdriver, slowly turn the adjustment screw until the required pressure (P) is indicated on manometer (see tables on the following pages).

Turn the adjustment screw clockwise to increase and counter-clockwise to decrease gas pressure.

6- Reset the pressure regulator cap, close off the gas inlet, remove the manometer tube and put the binding screw back in (F).

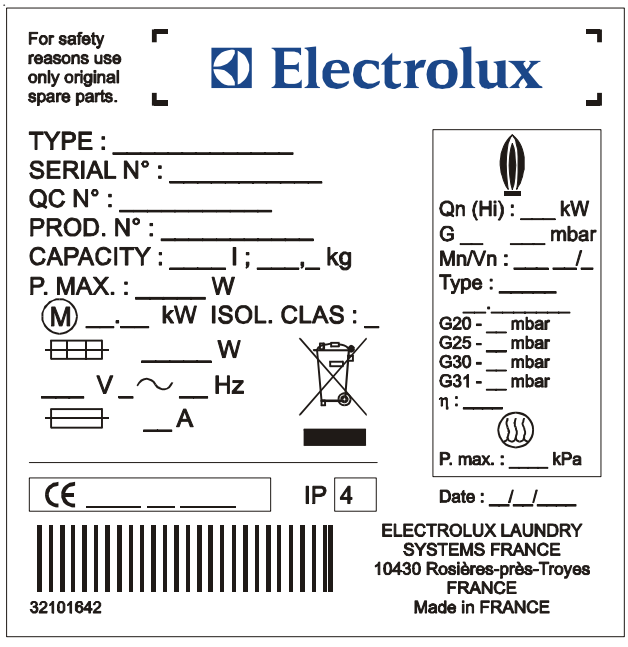


Legend of symbols used

I: machine working with only one gas family
II: machine working with two gas families
1: 1st family : caol gas or town gas (for information : not used here)
2: 2nd family : natural gas
3 : 3th family : liquefied petroleum gas (LPG)
H : natural gas with high calorific value (type G20)
L : natural gas with low calorific value (type G25)
E : natural gas with high and low calorific value (type G20)
LL : natural gas with low calorific value (type G25)
Esi : natural gas with high and low calorific value with adjustment (type G20)
B : butane gas (type G30)
P : propane gas (type G31)
B/P : butane and propane gas (type G30 and G31)
3+ : butane/propane gas with couple of pressure 30/37 (type G30 and G31)

Qn (Hi) : nominal heat emission express in relation to the net calorific value
Mn : nominal mass (for butane/propane gas)
Vn : nominal volume (for naturel gas)

AT : Austria
BE : Belgium
CH : Switzerland
DK : Denmark
DE : Germany
ES : Spain
FI : Finland
FR : France
GB : Great Britain
GR : Greece
IE : Irland
IT : Italy
LU : Luxemburg
NL : Netherlands
NO : Norway
PT : Portugal
SE : Sweden



Country	Category	Gas	Pressure (mbar)
AT	I2H	G20	20
DE	I2E I3P	G20 G31	20 50
BE	I2E(S)B I3P	G20/G25 G31	20/25 37
DA-FI-SE-IT	I2H	G20	20
FR	II2ESI3P	G20/G25 G31	20/25 37/50
ES-GR-IE PT-CH-GB	II2H3P	G20 G31	20 37
ES-CH	II2H3P	G20 G31	20 50
NL	II2L3P	G25 G31	25 50
LU	I2E	G20	20

TABLE OF CORRESPONDENCES - Washer-Extractor 230

Category index	Type of gas	Working supply pressure in mbar	Hi	Ø of injectors in mm	Pressure at injectors in mm H_2O	Heat emission Qn in kW (Hi)	Consumption Mn in kg/h (Hi)**	Consumption Vn in m^3/h**
*2E, 2H, 2ESI	G 20	20	34.02 MJ/m^3	2.90	153	40	-	0.90
2L, 2ESI	G25	25	29.25 MJ/m^3	3.20	154	40	-	1.05
3 P	G31	37	46.34 MJ/kg	1.85	regulator out of operation	40	0.66	-
3 P	G31	50	46.34 MJ/kg	1.70	regulator out of operation	40	0.66	-
* For Belgium, no work is allowed between G20 and G25.								

** normal cycle : prewash 3 min at 35 °C, drain. 2 min, main wash 4 min at 65 °C, drain 2 min, rinse 2 min, extract. 2 min, rinse 2 min, extract 2 min, rinse 2 min, extrac. 10 min (cold water supply at 15 °C).

TABLE OF CORRESPONDENCES - Washer-Extractor 340

Category index	Type of gas	Working supply pressure in mbar	Hi	Ø of injectors in mm	Pressure at injectors in mm H_2O	Heat emission Qn in kW (Hi)	Consumption Mn in kg/h (Hi)**	Consumption Vn in m^3/h**
*2E, 2H, 2ESI	G 20	20	34.02 MJ/m^3	2.90	153	40	-	1.30
2L, 2ESI	G25	25	29.25 MJ/m^3	3.20	154	40	-	1.50
3 P	G31	37	46.34 MJ/kg	1.85	regulator out of operation	40	0.95	-
3 P	G31	50	46.34 MJ/kg	1.70	regulator out of operation	40	0.95	-
* For Belgium, no work is allowed between G20 and G25.								

** normal cycle : prewash 3 min at 35 °C, drain. 2 min, main wash 4 min at 65 °C, drain 2 min, rinse 2 min, extract. 2 min, rinse 2 min, extract 2 min, rinse 2 min, extrac. 10 min (cold water supply at 15 °C).

Note : G20 (H) = natural gas, Lacq type (20 mbar)
G25 (L) = natural gas, Groningue type (20 or 25 mbar)
G31 = propane gas (28/30, 37, 50 mbar)

20 mbar = 0.29 psi
25 mbar = 0.36 psi
28 mbar = 0.41 psi
30 mbar = 0.43 psi
50 mbar = 0.72 psi

TABLE OF CORRESPONDENCES - Washer-Extractor 470

Category index	Type of gas	Working supply pressure in mbar	Hi	Ø of injectors in mm	Pressure at injectors in mm H_2O	Heat emission Qn in kW (Hi)	Consumption Mn in kg/h (Hi)**	Consumption Vn in m³/h**
*2E, 2H, 2ESI	G 20	20	34.02 MJ/m³	2.90	153	40	-	1.90
2L, 2ESI	G25	25	29.25 MJ/m³	3.20	154	40	-	2.10
3 P	G31	37	46.34 MJ/kg	1.85	regulator out of operation	40	1.40	-
3 P	G31	50	46.34 MJ/kg	1.70	regulator out of operation	40	1.40	-
* For Belgium, no work is allowed between G20 and G25.								

** normal cycle : prewash 3 min at 35 °C, drain. 2 min, main wash 4 min at 65 °C, drain 2 min, rinse 2 min, extract. 2 min, rinse 2 min, extract 2 min, rinse 2 min, extrac. 10 min (cold water supply at 15 °C).

TABLE OF CORRESPONDENCES - Washer-Extractor 670

Category index	Type of gas	Working supply pressure in mbar	Hi	Ø of injectors in mm	Pressure at injectors in mm H_2O	Heat emission Qn in kW (Hi)	Consumption Mn in kg/h (Hi)**	Consumption Vn in m³/h**
*2E, 2H, 2ESI	G 20	20	34.02 MJ/m³	2.90	153	40	-	2.80
2L, 2ESI	G25	25	29.25 MJ/m³	3.20	154	40	-	3.30
3 P	G31	37	46.34 MJ/kg	1.85	regulator out of operation	40	2.05	-
3 P	G31	50	46.34 MJ/kg	1.70	regulator out of operation	40	2.05	-
* For Belgium, no work is allowed between G20 and G25.								

** normal cycle : prewash 3 min at 35 °C, drain. 2 min, main wash 4 min at 65 °C, drain 2 min, rinse 2 min, extract. 2 min, rinse 2 min, extract 2 min, rinse 2 min, extrac. 10 min (cold water supply at 15 °C).

Note : G20 (H) = natural gas, Lacq type (20 mbar)
G25 (L) = natural gas, Groningue type (20 or 25 mbar)
G31 = propane gas (28/30, 37, 50 mbar)

20 mbar = 0.29 psi
25 mbar = 0.36 psi
28 mbar = 0.41 psi
30 mbar = 0.43 psi
50 mbar = 0.72 psi

IMPORTANT

Tightness test after installation
The gas leak test is performed as follows :

1/ Paint pipe joints, pilot gas tubing connections and inspect outlets with rich soap and water solution ; do not use an aggressive soap.
2/ Put the machine into service. Bubbles indicate a gas leak.
3/ Eliminate this leak.

NOTE : After all intervention, re-seal (red varnish) the following adjustment organs :
- regulator of pressure
In case of changing of gas, the stick for the adjustment has to be modified.

Check-out

Before leaving, put the appliance into operation and allow to run a complete cycle. Watch to ensure that all burner system components function correctly.

Liquid detergents connection

CAUTION

Liquid detergents are particularly aggressive. We advise you to use only products with pH lower than 9 in order to avoid the machine's rubbers from being attacked.
Dilute imperatively all of your detergents before letting them flow into the machine.

ADVISE IF USING LIQUID DETERGENTS

After use, there is always chemical remaining in the liquid detergents' dosing pipes.
When the machine is not running, this detergent may slowly drip and so, quickly corrode the parts in contact with.
In order to avoid (ex. corrosion of the drum or by bleach), we advise you to forecast a device to drain every night the distribution pipes of the liquid detergents.

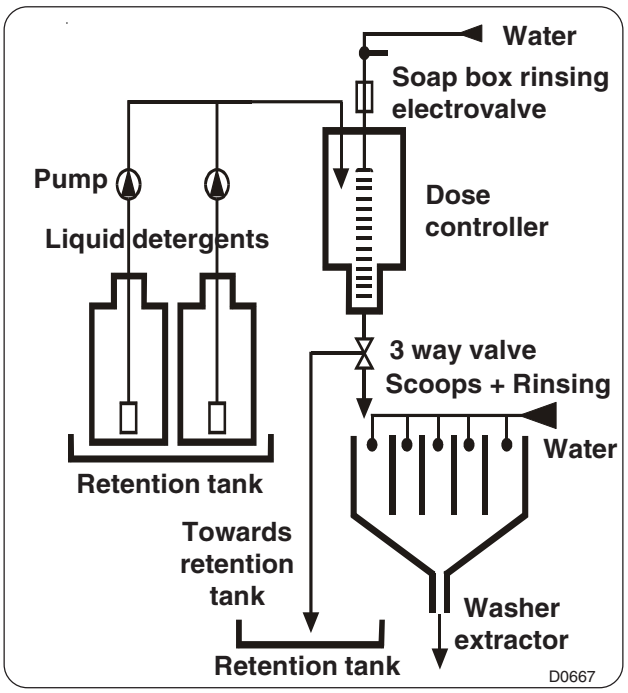
CAUTION

The running of detergents must be independent from the running of the machine.
The control information of detergents must imperatively be relayed.

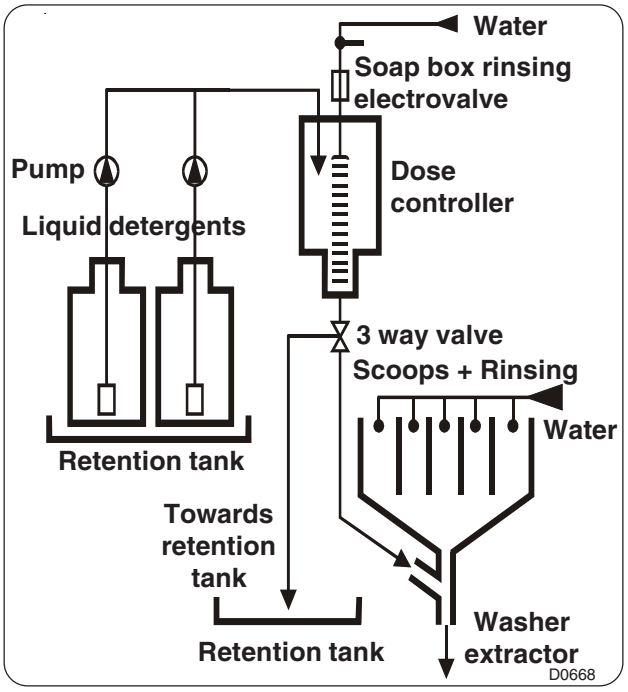
Connection scheme of liquid detergents

We advise you to use one of the two systems shown hereby to connect your liquid detergents.

Single inlet dose controller with a compulsory rinsing device.



Multi inlet dose controller with a compulsory rinsing device.



Electrical liquid detergents' connection

If your machine have 1 I/O card, you have to use signal of detergent box.

Connectors card I/O no 1

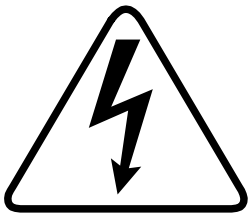
Powder	1	IO1-X9-4
Powder	2	IO1-X9-5
Liquid	1	IO1-X14-1
Liquid	2	IO1-X14-2
Liquid	3	IO1-X14-3
Common		IO1-X9-8

If your machine have 2 I/O cards, use signal 4 to 13.

Connectors card I/O no 2

Liquid	4	IO2-X9-3
Liquid	5	IO2-X9-4
Liquid	6	IO2-X9-5
Liquid	7	IO2-X9-6
Liquid	8	IO2-X9-7
Common		IO2-X9-8
Liquid	9	IO2-X14-1
Liquid	10	IO2-X14-2
Liquid	11	IO2-X14-3
Liquid	12	IO2-X14-4
Common		IO2-X14-5
Liquid	13	IO2-X8-1
Common		IO2-X8-2

Washer-extractor electricity power supply



CAUTION

Prior to use, the washer-extractor should be plugged into a correctly earthed power socket complying with the standards in force.

SAFETY

The electrical installation of the machine must be undertaken by qualified personnel.

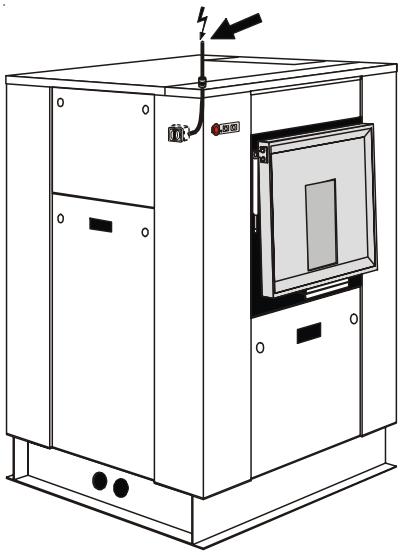
CAUTION

Ensure that the electrical voltage is correct and that the power of your supply is sufficient, before connecting the machine.

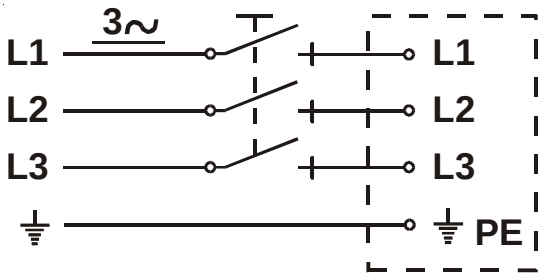
The use of power electronics (variator or filter for example) may lead to unexperted release of breakers with 30 mA differential current device.

This type of breaker should thus be avoided, or a value of **300 mA** maximum should be observed according to standard NFC 15100 paragraph 532.2.6.

Pass the power supply cable of the machine through the stuffing box on the top of the machine.



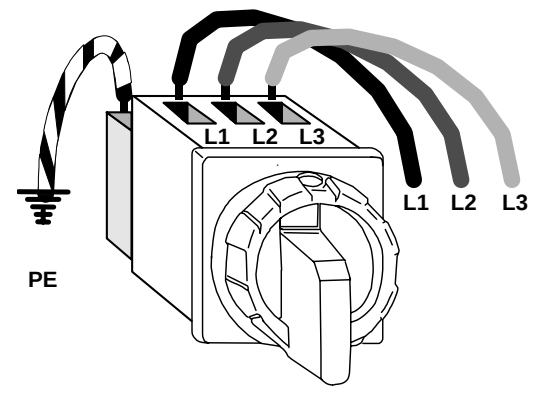
For each machine, install a fixed multipole circuit breaker (or fuses protector) in the laundry main cabinet.



Connect the power supply cable on the machine main switch.

Connect the 3 phases on the main switch (see marks L1, L2, L3) and connect the earth wire on the earth terminal (PE) of this main switch.

(check operation, see chapter no. 10).

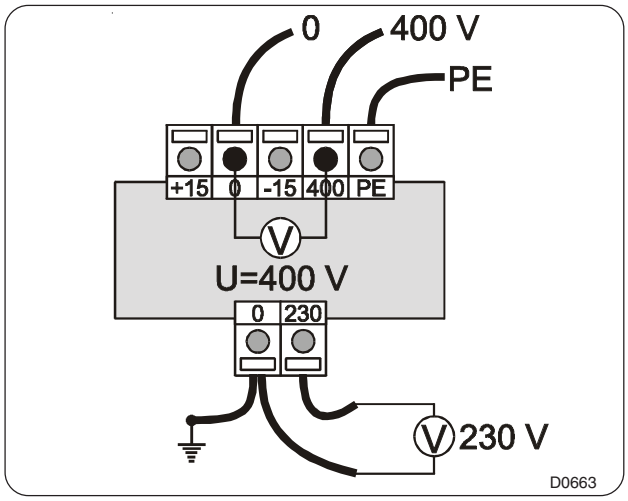


Connection diagrams for the control circuit power supply transformer (T1) as a function of the various customer power supply voltages.

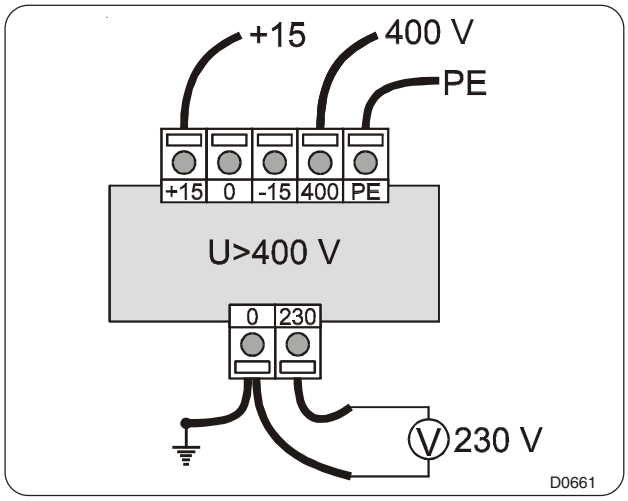
The tension of the control circuit delivered by the transformer must be 230 volts, single-phase. The supply tension for your machine is normally of 400 volts between 2 phases, this tension can however be different. The following schemes show how to adjust the tension at the secondary of the transformer.

Measure the power supply voltage at the transformer primary with a voltmeter between the transformer 0 and 400 volts terminals.

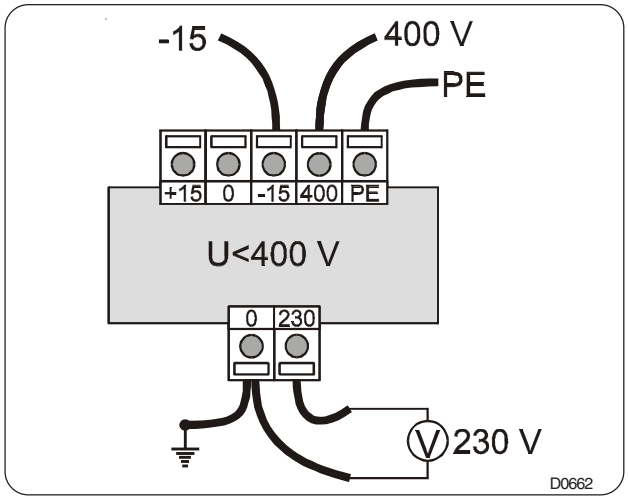
- If the voltage is equal to 400 volts, do not touch the transformer connection which must be as shown in the adjacent figure.



- If the voltage is > 400 volts (for example : 420 or 430 volts), connect the wires to the transformer as shown in the adjacent figure.



- If the voltage is significantly < 400 volts (for example : 370 or 380 volts), connect the wires to the transformer as shown in the adjacent figure.



The feeder cable sections mentioned in our literature are given **only as a guide.**

To obtain a value perfectly suited to your own application and which takes account of the different correction factors in respect of your plant, refer to the tables below.

Table 1 (in accordance with EN Standard 60204-1)

Values given for :
- Cable with copper conductors
- Cable with PVC insulation (for other insulants see Table 3)
- Ambient temperature 40 °C max. (for others see Table 2)
- Three-phase cable under load without including starting currents
- BT / C/ E cable layout.

Maximum Admissible Current

Cable section	Seated in Cable Duct or Cable Trough	Wall Fixing	Cable Tray
	B2	C	E
3 x 1.5 mm²	12.2 A	15.2 A	16.1 A
3 x 2.5 mm²	16.5 A	21 A	22 A
3 x 4 mm²	23 A	28 A	30 A
3 x 6 mm²	29 A	36 A	37 A
3 x 10 mm²	40 A	50 A	52 A
3 x 16 mm²	53 A	66 A	70 A
3 x 25 m²	67 A	84 A	88 A
3 x 35 mm²	83 A	104 A	114 A
3 x 50 mm²	-	123 A	123 A
3 x 70 mm²	-	155 A	155 A

Table 2

(correction factors for different ambient temperatures)

Ambient Temperature	Correction Factor
30°C (86°F)	1.15
35°C (95°F)	1.08
40°C (104°F)	1.00
45°C (113°F)	0.91
50°C (122°F)	0.82
55°C (131°F)	0.71
60°C (140°F)	0.58

Table 3

(correction factors for different cable insulating materials)

Insulating material	Max. Working Temperature range	Correction factor
PVC	70°C (158°F)	1.00
Natural or Synthetic Rubber	60°C (140°F)	0.92
Silicone Rubber	120°C (248°F)	1.60

Table 4

(B2, C and E correction factors for cable grouping)

Number of cables	B2 Seated in Cable Duct	C Wall Fixing or Cable Trough	E Cable Tray
1	1.00	1.00	1.00
2	0.80	0.85	0.87
4	0.65	0.75	0.78
6	0.57	0.72	0.75
9	0.50	0.70	0.73

The total current included for using Table 1 should be the maximum rated current for the machine divided by the product of the different correction factors. Other correction factors may also be applied ; consult the cable manufacturers.

Calculation : Example
- The machine has a rated current of 60 A.
- The ambient temperature is 45 °C ; Table 2 gives a correction factor of 0.91.
- Rubber cable insulant : Table 3 gives a correction factor of 0.92.
- The cable is fixed directly to the wall (Column C), with 2 cables side by side. Table 4 gives a correction factor of 0.85.

$$\text{Total current : } \frac{\textbf{60 A}}{\textbf{0.91 x 0.92 x 0.85}} = \textbf{84 A}$$

Taking Column C in Table 1 (wall fixing), we obtain a minimum cable section of : **3 x 25 mm².**

Machine type	Heating	Supply Voltage	Installed Power	Rated Intensity	Main Switch	Connection Cable Section	Fuse
230	Gas/steam/T.F	380/415 V 3+E ~ 50/60 Hz	3.7 kW	8.5 A	3 x 16 A	4 x 2.5 mm²	3 x 16 A
230	Electric	380/415 V 3+E ~ 50/60 Hz	21.7 kW	33.5 A	3 x 40 A	4 x 6 mm²	3 x 40 A
340	Gas/Steam/T.F	380/415 V 3+E ~ 50/60 Hz	4.8 kW	11 A	3 x 16 A	4 x 2.5 mm²	3 x 16 A
340	Electric	380/415 V 3+E ~ 50/60 Hz	32 kW	50 A	3 x 63 A	4 x 16 mm²	3 x 63 A
470	Gas/Steam/T.F	380/415 V 3+E ~ 50/60 Hz	5.8 kW	12.5 A	3 x 16 A	4 x 2.5 mm²	3 x 16 A
470	Electric	380/415 V 3+E ~ 50/60 Hz	42 kW	64.5 A	3 x 80 A	4 x 25 mm²	3 x 80 A
670	Gas/Steam/T.F	380/415 V 3+E ~ 50/60 Hz	7.8 kW	16 A	3 x 20 A	4 x 2.5 mm²	3 x 20 A
670	Electric	380/415 V 3+E ~ 50/60 Hz	61.5 kW	94 A	3 x 100 A	4 x 35 mm²	3 x 100 A

Remove of the transport locks fitted

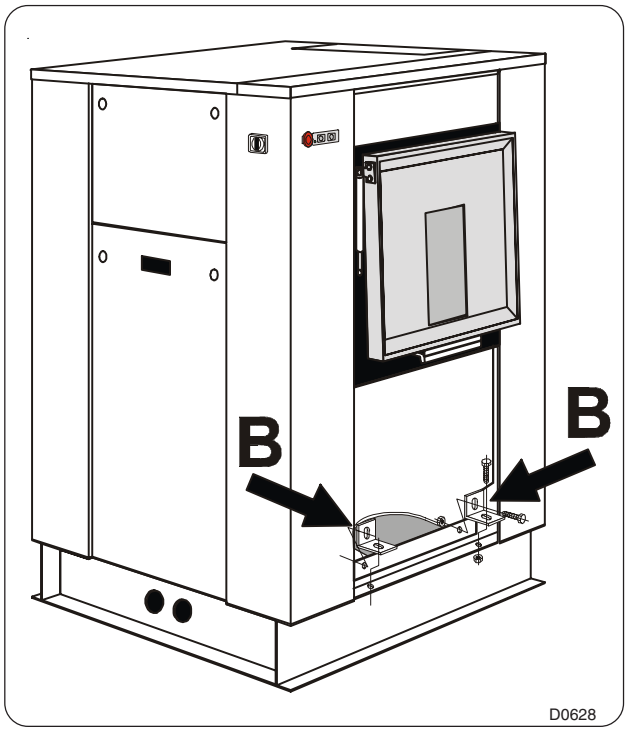
CAUTION

Before putting the machine into service, it is compulsory to remove the 4 transport locks fitted.

To do so, remove the front and rear casings, then the fixing screws of the transportation bridles (B).

Keep the transport locks fitted with their screws and bolts to be able to assemble them again in case you would need to lift the machine.

Nota : Never handling the machine without the transportation bridles.



Compressed air connection

The customer should arrange the installation of filter/lubricator device, as well as a pressure regulator (manometer) on the machine's compressed air supply.

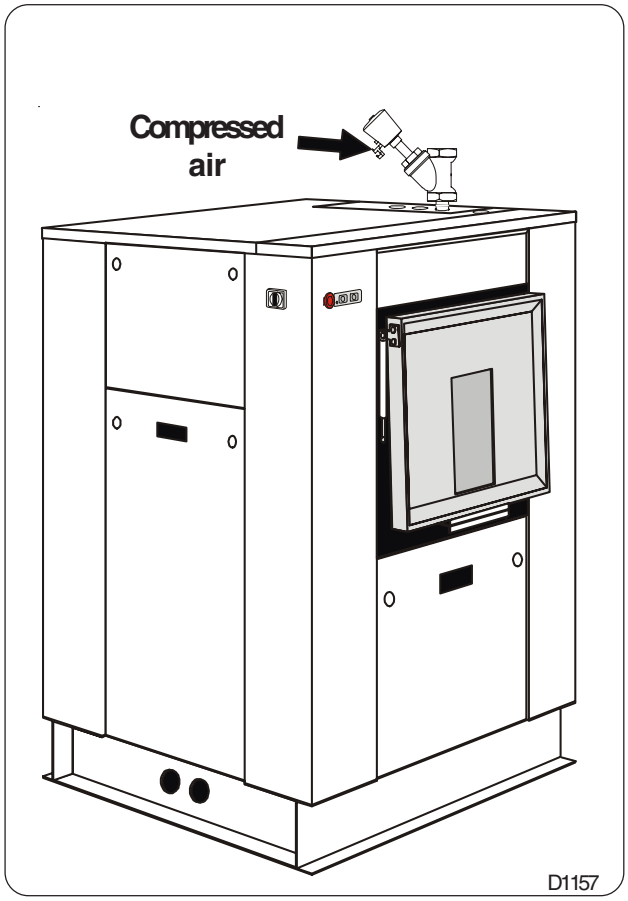
The manual stopping valve lockable in closed position (provided by customer) should be installed on the machine's compressed air supply.

The supply pipe should accept a pressure of at least 1 Mpa (10 bar) (145 psi).

- Connection diameter : rapid action hose coupling DN 4 for hose Ø 4/6 mm.

Nota : to avoid too big head losses, the compressed air supply pipe should be bigger in diameter than the coupling diameter (DN 6 for example) ; in this case, put a 4/6-6/8 adapter.

- Advised pressure : 550-700 kPa (5.5-7 bar) (80-102 psi)
- Minimum pressure : 550 kPa (5.5 bar) (80 psi)
- Maximum pressure : 700 kPa (7 bar) (102 psi)
- Consumption 10 l/h



Operating inspection

Before putting the machine into service, carry out the working tests.

The operating inspection must be done by an approved technician.

Manual operation

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

- Switch on the machine's main switch and check the voltage on the three phases (3 x 400 volts).
- Check the direction of rotation of the motion motor fan (see arrow stuck on the fan). Switch off the current and shift two phases on the main switch of the machine if the fan rotates in the wrong direction.
- Check the direction of rotation of the circulating pump and of the draught accelerator gas heating.

Note : The exchangers of the gas heated machines have a water circulating pump.

Before the first start of the machine, you must check if this pump is priming well.

Therefore, it is necessary to fill the machine with water and to run only the circulating pump, without heating, by pushing, with an isolated screwdriver, on the manual control of the exchanger's KM3 contactor.

To be sure that the pump is well primed (10 to 15 secondes), you must pay attention to a change in the running noise when the water goes through the circuit.

- Check that the cage is empty.
- Open the manual valves controlling the water and steam supplies (for steam heating machines).
- 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 machine on wash action, and check that the motor is revolving alternately in the both ways, as normal for wash action.
- Start heating by programming a final temperature. Check that the steam valve opens or the heating element relay reacts, as appropriate.
- Check that the detergents container is working as they should.
- 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.

Automatic operation

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

Final checking

If all function checks have been satisfactory, reassemble all protection casings.

Auxiliary controls

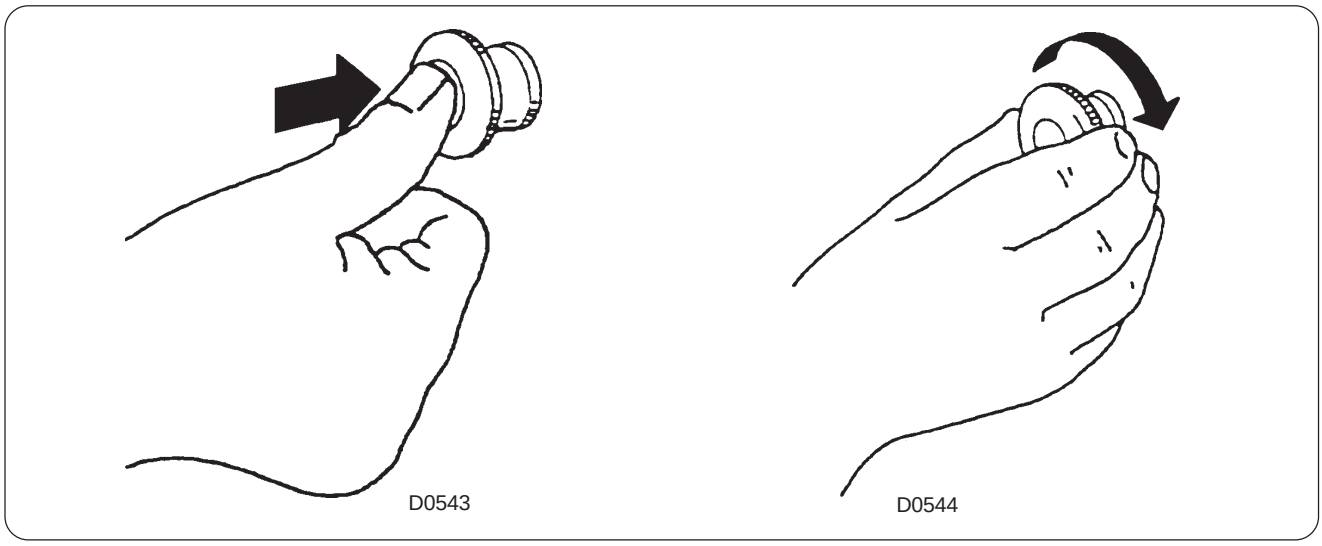
Emergency stop

The emergency stop must be unblocked, if not the machine will not work (to unblock, turn the red button to the right).

If the machine for some reason has to be stopped, abnormal or dangerous running, press emergency stop button.

Nota : it is necessary to wait for 30 seconds before resetting after any action on the emergency stop.

Release the emergency stop, by turning it clockwise only after checking what motivated this stop.

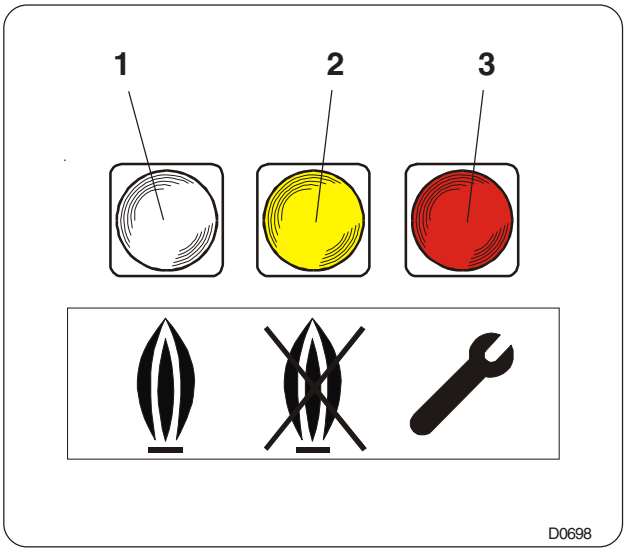


Gas exchanger

Three indicators are situated on the top of the gas exchanger.

- White indicator (1) light = **"gas heating On"**.
- Yellow indicator (2) light = **"ignition gas burner fault indicator"**.
- Red indicator (3) light = **"water fault in gas exchanger".**

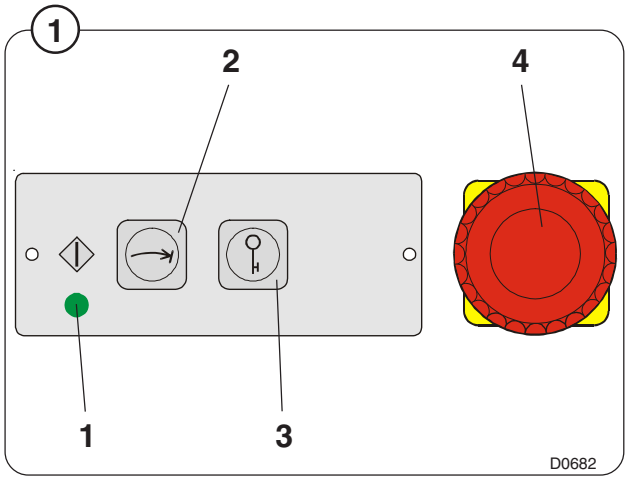
The yellow and the red indicator remains on if a fault occurs when the gas burner ignites or if no water is detected inside the gas exchanger, the gas heating does off and the machine stops functioning. Verify the working of the gas exchanger. If the fault remains, consult your after-sales service.



The control board on the loading side includes the following :

Fig. 1

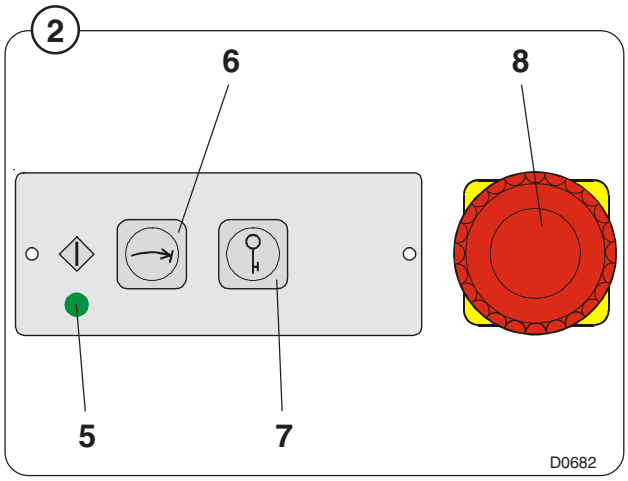
- Indicator (1) light = **"power On"**.
- Key (2) **"Cage positioning"**.
- Key (3) **"Door unblocking"**.
- Emergency stop (4).



The control board on the unloading side includes the following :

Fig. 2

- Indicator (5) light = **"Drum door opening"**.
- Key (6) **"Cage positioning"**.
- Key (7) **"Door unblocking"**.
- Emergency stop (8).



Automatic operation

Preparation

Sort the linen according to the instructions mentioned on the care labels.

Empty the pockets and clasp the slide fasteners.

Fig. 3

- Position the cage doors in front of the drum door thanks to the key **"Cage positioning"**.

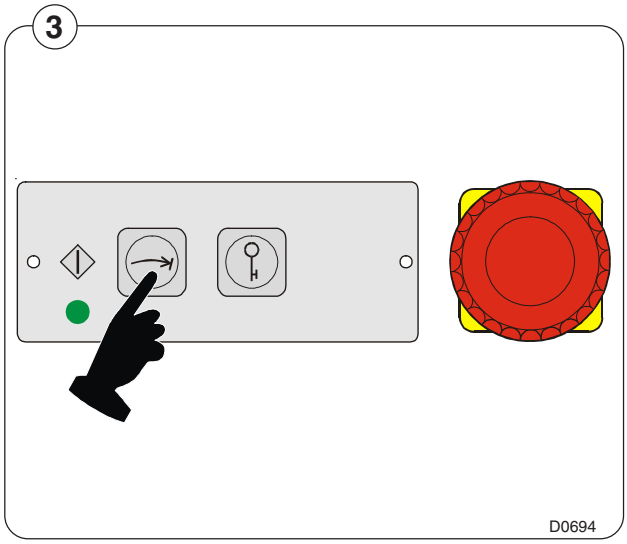


Fig. 4

- Press key loading **"Door unblocking"**.
- Open the loading door with the handle.

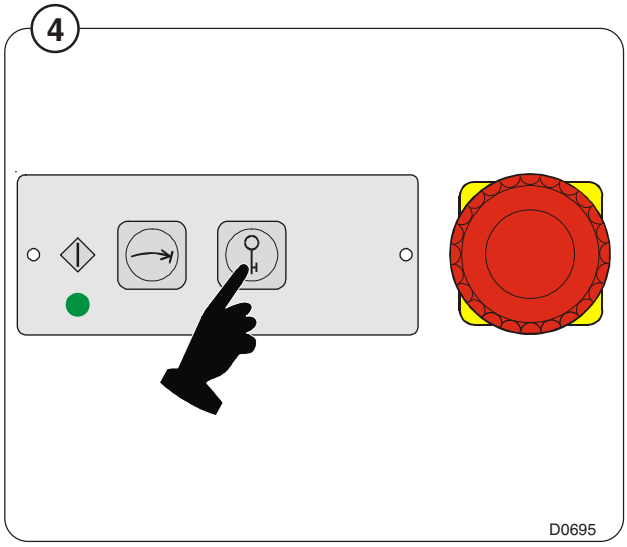


Fig. 5

- Open the inner drum doors.
- Press the safety latch (B) and at the same time on the upper and lower doors with both hands.
- Caution, maintain the doors until they are widely open.

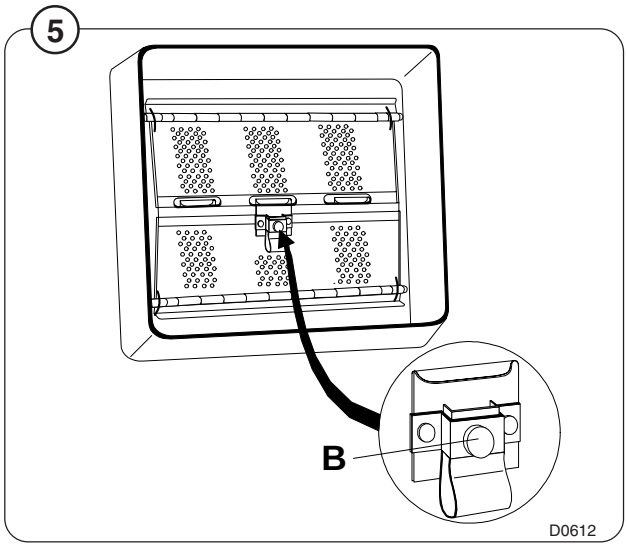
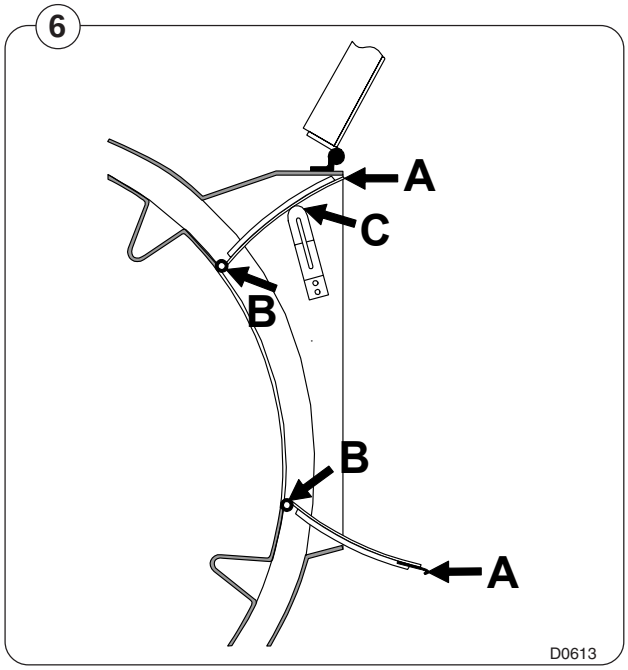


Fig. 6

- Block the cage (B) by rotating it manually to the front and rear so that the upper door stops on the blocking straps (C).



WARNING

In case of important unbalance inside the drum, an unexpected rotation of the latter can pinch and arm hands of the operator.

- Never press the doors in (A) to rotate the cage.
- Load the linen in the cage. Be careful to distribute it correctly

Nota : The washing machines with a two part cage must not be loaded by evenly sharing the load in both compartments. Completely load one compartment, and put the rest in the second one.

As strange as it might seem, it is better to run the machine with a full compartment and an empty one. This way you will avoid many unbalance stops as well as important vibrations and therefore the early breakout of the shock absorbers.

It is the same for washing in rets. Respect the same principle as described above, making sure you don't over load each compartment.

However, you must note, for the same reasons, that it is better to use several nets, three or four in the same compartment rather than one or two.
More over, you should finish your load using loose linen if necessary.

- Close the cage doors (press them to check the good working of the mechanical safety device).
- Close the drum door and lock it with the handle. The machine is now ready to start the washing cycle.

Add detergent and other laundry products.

If you are using the machine's built-in detergent dispensers, add the required detergent and other laundry products in the compartments.

WARNING !

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

ATTENTION

Do not open the cover when the water valves are flushing water through the detergent dispenser. Take care when adding laundry products.

Detergent dispenser

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

Compartment	Valve	Water
P1	Y9	warm
P2	Y13	warm
L1	Y11	cold
L2	Y10	cold
L3	Y12	cold

There is also a separate cleaning (water flushing) function for all compartments in the detergent dispenser, connected to valve Y27, 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.

Dosage of the detergents

Fig. (7) Pour the detergents in the containers according to the program.

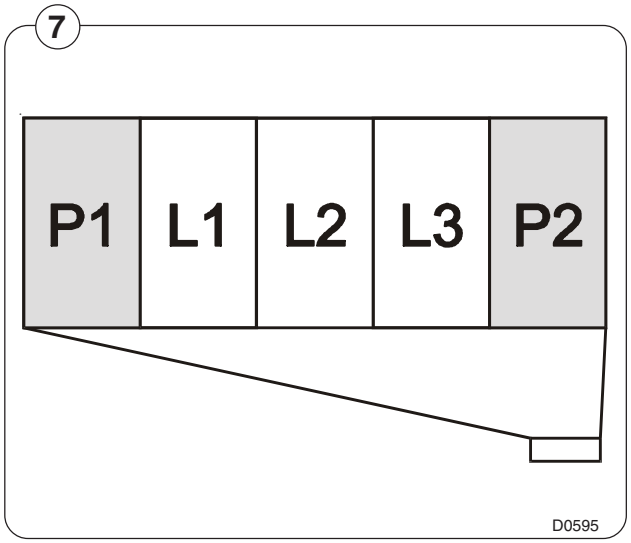
P1 : powder product (prewash)

P2 : powder product (wash)

L1 : liquid product (ex : chlorine)

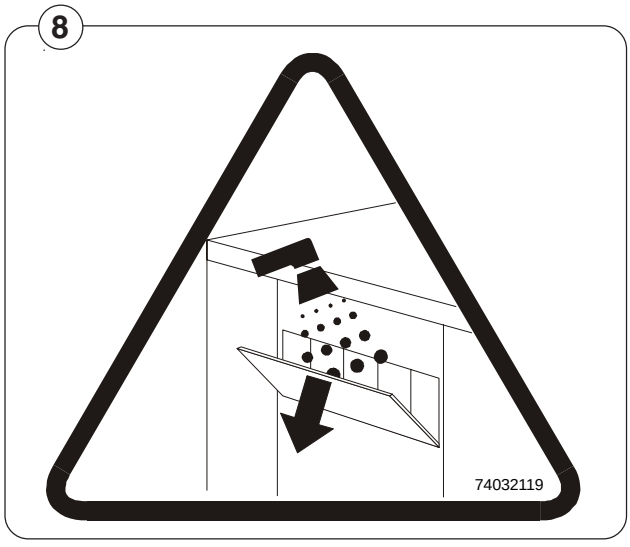
L2 : liquid product (ex : neutralizer)

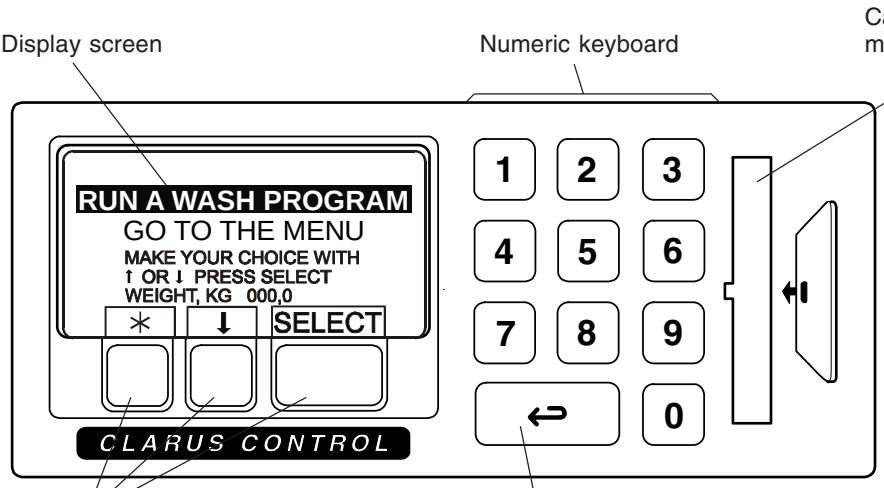
L3 : liquid product (ex: softener)



Rinsing of the soap box

Fig. (8) Rinse the inside, every days with water, the detergents container.





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.

4221 3651

To run a wash program

The « Move back » key

3627

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 :

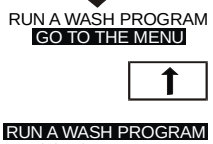
3651

To start the wash program

3580

If the menu is not currently displayed :

Press ↩ repeatedly.



If « GO TO THE MENU » is highlighted :

Press ⇧.

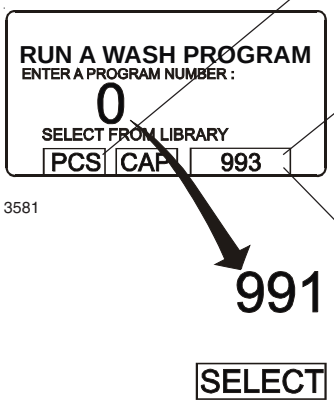
When « RUN A WASH PROGRAM » is highlighted :

Press SELECT.

Two way 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.



3581

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 program.

Use the numeric key to enter the program number.

Press SELECT.

If you have entered a wrong number…

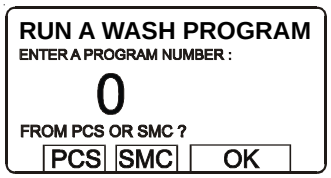
Enter the correct number to overstrike the earlier one.

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



4031

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.

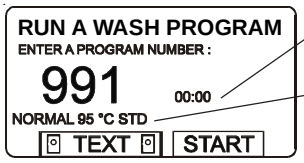
In some of the text shown on the display, Clarus Control is referred to as PCS and the memory card is referred to as SMC.

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".



3582

Delayed start time (hrs:mins)

Nom du programme

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

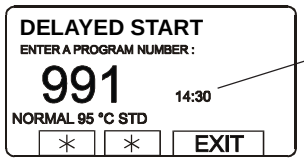
2 Delayed start

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 :

EXIT **Press EXIT.**

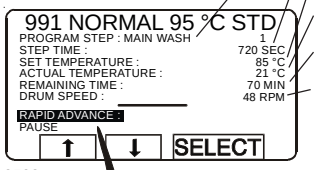
During a wash program :

3627

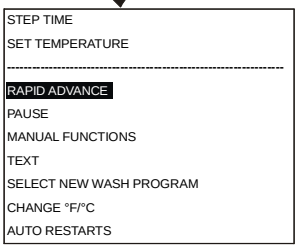
Press ⏎ to make the machine pause during the wash program.

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



3583



If required :

Select a function using the cursor keys.

↓ ↑

SELECT **Press SELECT.**

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 ».**

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 « Rapid advance »)
Rapid advance through the program to the program step required. Rapid advance can be used to move both forwards and backwards through the program.

Pause (see section « Pause »)
The machine stops. The drain valve remains closed. Alternative method for pausing during program :
Press ⏎.

Manual functions (see section « Manual operation during program operation »)
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 temperatures scale °C or °F (see section « To change temperatures 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 terminate a program before it has finished

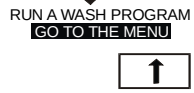
- Select RAPID ADVANCE and press SELECT. Advance to « END OF PROGRAM » and press SELECT.
- Wait until « THE DOOR IS OPEN » appears on the display.
- Now the door can be opened.

To start a wash program from the program library

3580

If this menu is not currently display :

Press ↩ reapetedly.



If « GO TO THE MENU » is highlighted :

Press ⇧.

When « RUN A WASH PROGRAM » is highlighted :

Press SELECT.

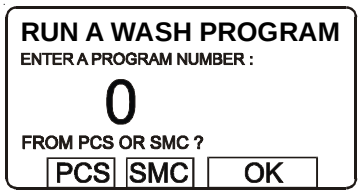
Waht is the program library ?

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 (104°F)
2	MY OWN 60°C (140°F)
3	MY OWN 90°C (194°F)
991	NORMAL 95°C (203°F) STD
992	NORMAL 60°C (140°F) STD
993	NORMAL 40°C (104°F) STD
994	INTENSIVE 95°C (203°F)
995	INTENSIVE 60°C (104°F)
996	PERM. PRESS 60°C (140°F)
997	PERM. PRESS 40°C (104°F)
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.



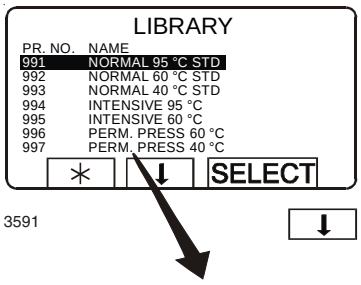
4031

To select a program from the PCU program labrary :

PCS **Press PCS.**

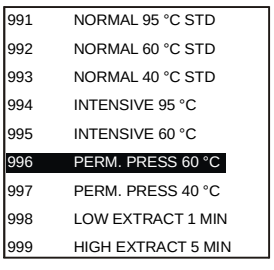
If there is a memory card in the PCU and you wish to select a program on that :

SMC **Press SMC.**



3591

Press ⇩ the required number of times...

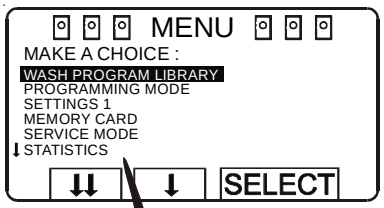


... to highlight the wash program required.

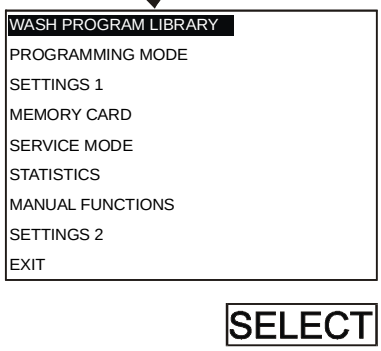
SELECT **Press SELECT.**

Select library via menu

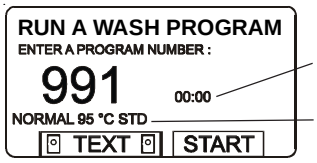
You can also select the program library via the option "GO TO THE MENU". Then select "WASH PROGRAM LIBRARY".



3590



SELECT



3582

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.

Choice 1 or 2 :

1 to start the program now :

① START **Press START.**

2 Delayed start

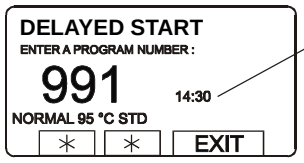
② 1 2 3 / 4 5 6 / 7 8 9 / 0 **Use the numeric keys to enter a time (max. 24 hrs). This parameter appears on the right of the display.**

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.

START **Press START.**



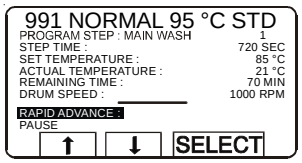
Time (in hours and minutes) left before the machine is to start.

If you want to cancel the delayed start :

EXIT **Press EXIT.**

The functions wich are available during program operation are described in section « To change parameters in the current program step » and « Auto restart ».

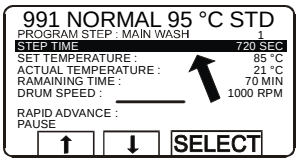
To change parameters in the current program step



3584

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

↑ **Press ⇧ one or more times …**



… to highlight the time required.

SELECT **Press SELECT.**

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

SELECT **Press SELECT.**

You can alter the following parameters :

Prewash, Main wash, Rinse, Drain, Soak, Rinse repeat
Length of program step (max. 9998 seconds), heating temperature (max. 97°C (205°F)).

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

ATTENTION
Never program a temperature above to 90°C (195°F).

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 :

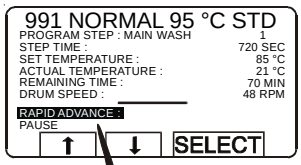
To change the time for the program step to **30** seconds, enter **030** to overstrike the earlier parameter.

WARNING

If you happen to make your own program, you must not input cold water in the cage while this later has a washing bath at 85°C (185°F), with the cage stopped. It is compulsory that the cage turns while letting in cold water.

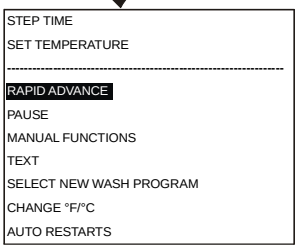
A bad programming can, in this particular case, be the cause of the breakage of the doors' windows.

Rapid advance



3583

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

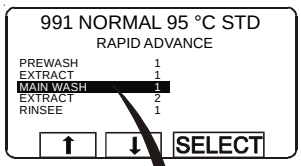


Check that « RAPID ADVANCE » is highlighted.

If it is not highlighted :

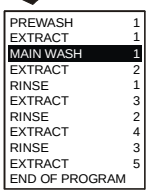
Press ⇩ or ⇧ one or more times to highlight « RAPID ADVANCE ».

Press SELECT.



3586

Press ⇧ or ⇩ one or more times to highlight the program step you wish to advance to.



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.

Rapid advance works in both directions

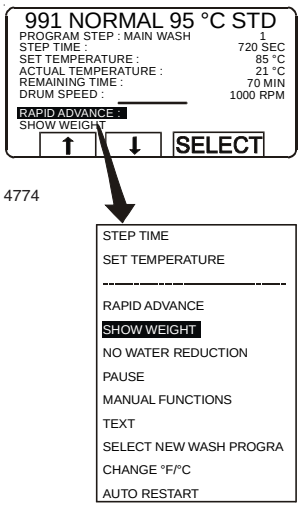
Rapid advance works in both directions, using (⇩) and (⇧).

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.

Show weight (for machines with weighing equipment installed only)



4774

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

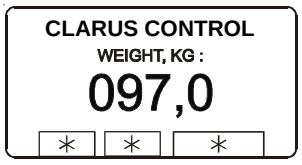
Show weight

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.

Press ⇧ or ⇩ one or more times to highlight « SHOW WEIGHT ».

Press SELECT.



4775

Weight display mode :

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

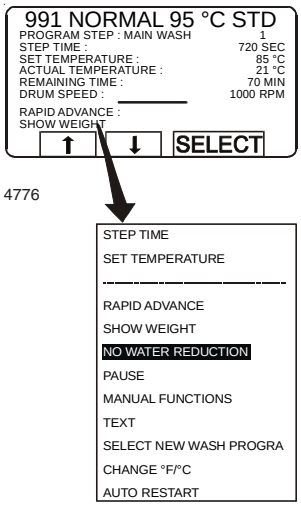
Return to normal display

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.

No water reduction (for machines with weighing equipment installed only)



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 ».

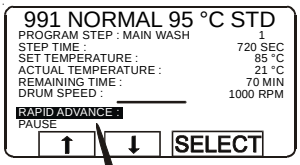
Press SELECT.

No water reduction

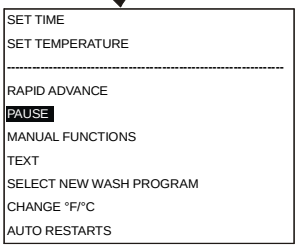
The wash load is weighed during the program and the water level is adjusted automatically according to its weight. If the load is not a full one, the water level will be reduced according to a water level reduction table. You can switch off water level reduction at any stage of a program.

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 this (see section « To start the wash program »).

↓ **Press ⇧ or ⇩ one or more times to highlight « PAUSE ».**

↑

SELECT **Press SELECT.**

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.

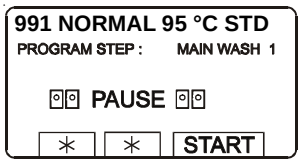
There are two ways of pausing during a wash program :

1 As an additional function. This is described in this section.

2 By pressing ↩.

When the machine pauses :

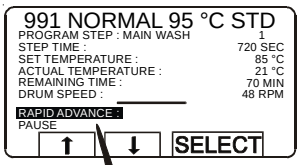
- Program operation is halted.
- Filling is halted (where applicable).
- Heating is halted (where applicable).
- The motor stops.
- The drain valve remains closed.
- The door cannot be opened.



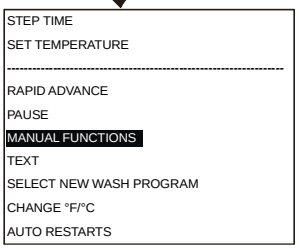
3588

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

Manual operation during a program



3585



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

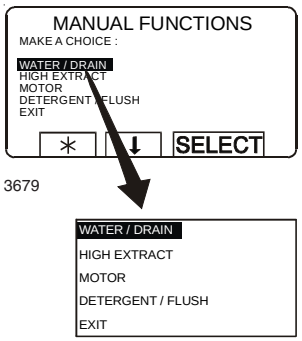
⇩ ⇧ **Press ⇧ or ⇩ one or more times to highlight « MANUAL FUNCTIONS ».**

SELECT **Press SELECT.**

Two types of manual operation

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

- M**anual 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 key 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

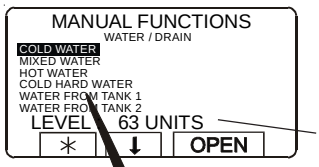
Water/drain (see section "Water/drain")
Allows manual operation of all water valves and the drain valve.

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

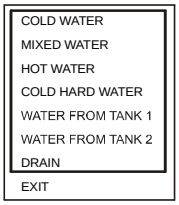
To access this function, see instructions in section « Manual operation ».

Water level in drum.

⇩

⇧

Use ⇩ and ⇧ to select the water/drain option you require.

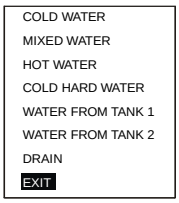


Press OPEN.

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.

⇩



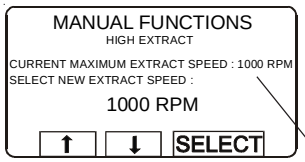
When you have finished :

Press ⇩ repeatedly to highlight « EXIT ».

SELECT

Press SELECT.

Maximum extraction speed



3681

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

Maximum extraction speed in current program.

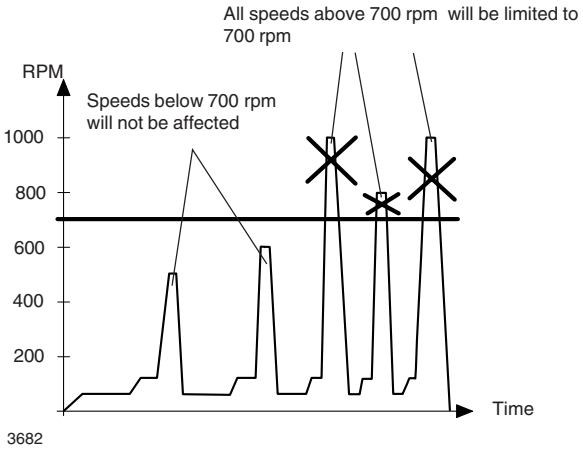
1 2 3
4 5 6
7 8 9
0

Enter the maximum extraction sped 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.

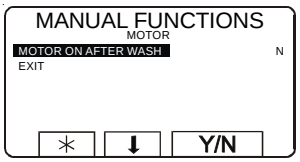


3682

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



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

3683

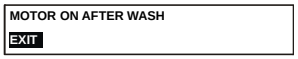
Y/N

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

⇩

When you have finished :

Press ⇩ to highlight « EXIT ».



SELECT

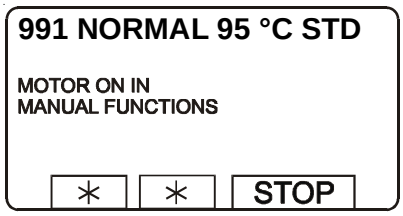
Press SELECT.

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.

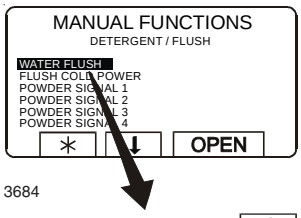
When the program has ended, the display will look like this :



4111

Press STOP to stop the motor.

Detergent signals and water flushing

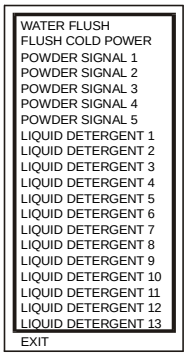


3684

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

⇩ ⇧

Use ⇩ and ⇧ to select the function you require.

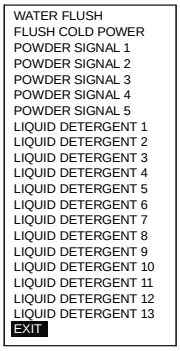


Press OPEN.

OPEN

⇩

The function will be actived 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 ⇩ repeatdly to highlight « EXIT ».

Press EXIT.

SELECT

Detergent signals and water flushing

FLUSH WATER :

This function uses water to clear detergent from the supply tubes of the detergent dispensing system.

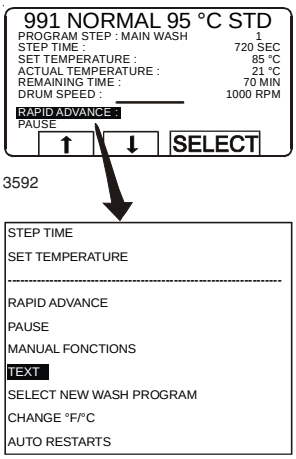
POWDER SIGNAL :

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.

Text



3592

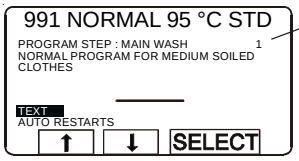
During program operation the display will look this (see section « To start the wash program »).

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.

Press ⇩ or ⇧ one or more times to highlight « TEXT ».

Press SELECT.



3630

Description of wash program.

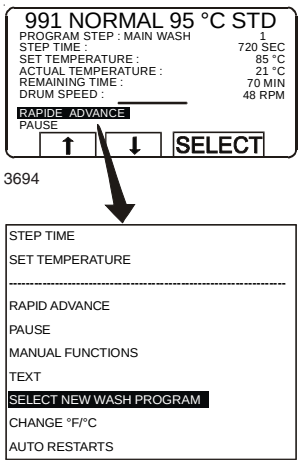
To return to the normal display :

Press SELECT again.

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 this (see section « To start the wash program »).

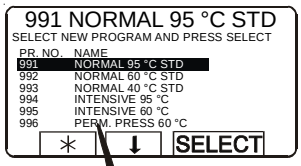
Press ⇩ or ⇧ one or more times to highlight « SELECT NEW WASH PROGRAM ».

Press SELECT.

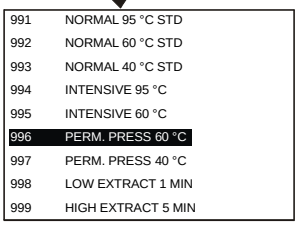
To change the wash program after program operation has commenced

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.



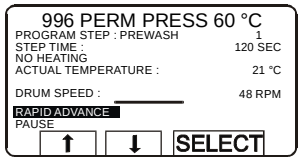
3695



Press ⇩ one or more times as required...

... to highlight the new wash program.

Press SELECT.

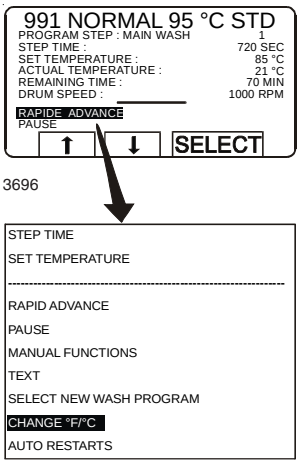


The existing wash program will not be interrupted and the new one will begin.

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 this (see section « To start the wash program »).

Press ⇩ or ⇧ one or more times to highlight « CHANGE °C/°F ».

Press SELECT.

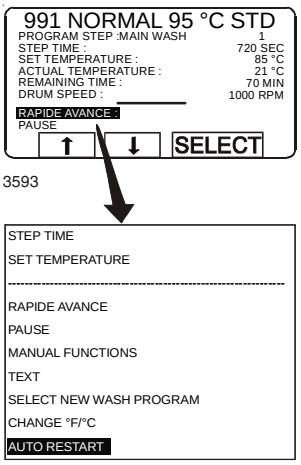
To change temperature scale °C/°F

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

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

What is Auto restart ?

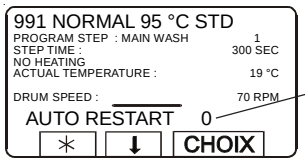
Auto restart means that the same program will be repeated one or more times, according to the number set. The program will restart immediately, and the door will remain locked. If you have set auto restart, the display will show the number of restarts left.

This function is used primarily for testing.

↓ **Press ⇩ one or more times to highlight « AUTO RESTART ».**

↑

SELECT **Press SELECT.**



3594

Shows the number of time the program will restart.

1 2 3
4 5 6
7 8 9
0

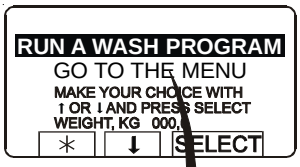
If required :

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 ».

SELECT **Press SELECT.**

Two types of manual operation

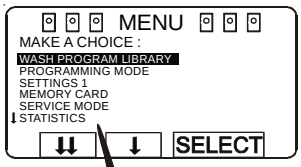
There are two types of manual operation, which should not be confused :

- **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"**.

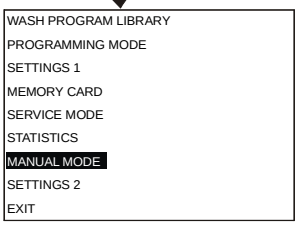
Always lock the door first !

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"**.



Press ⇩ six times...



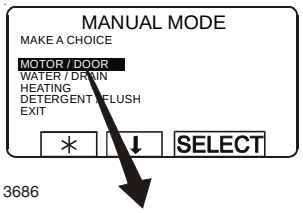
... to highlight "MANUAL MODE".

SELECT **Press SELECT.**

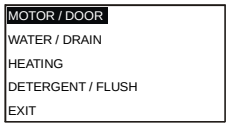
All manual settings are cancelled when you exit manual operation

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**

SELECT **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).

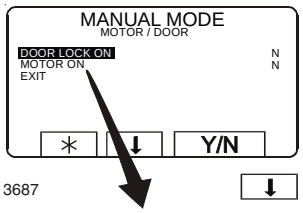
Water and drain valves (see section "Water/ drain")
Operation of drain valve and all water valves.

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 diplay.

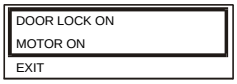
Motor/door



3687

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

↓ **Press ⇩ as required to select a function.**



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

↓ When you have finnished :
Press ⇩ to highlight "EXIT".

SELECT **Press SELECT.**

Lock the door and start the motor

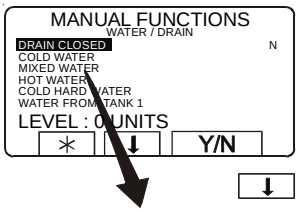
DOOR LOCK ON

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

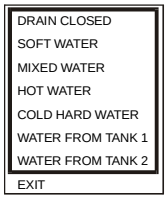


To access this function, see instructions in section « To select manual operation ».

↓

↑

3688



Use ⇧ or ⇩ to select Drain or one of the six Water filling alternative.

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

Y/N

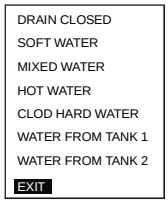
Water filling :
Press OPEN.

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 finnished :
Press ⇩ to highlight « EXIT ».

↓

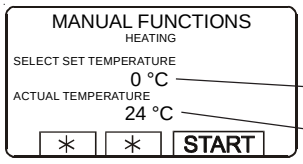


SELECT

Press SELECT.

Heating

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



Temperature selected

Actual temperature

3689

1 2 3
4 5 6
7 8 9
0

Use the numeric key to enter the temperature the water is to be heated do.

ATTENTION
Never program a temperature above to 90°C (194°F).

START

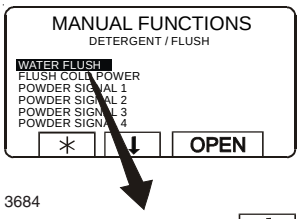
Press START.
Heating will now begin.

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

STOP

Access this function again and press STOP.

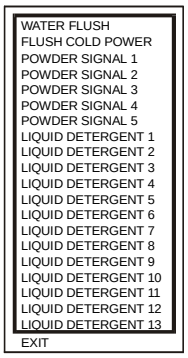
Detegent signals and water flushing



3684

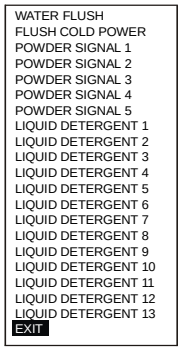
To access this function, see instructions in section « To select manual operation ».

Use ⇩ and ⇧ to select the function you require.



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 finnished :
Press ⇩ repeatedly to highlight « EXIT ».



Press SELECT.

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.

At the end of the wash

For your safety, the door can only be open after 40 seconds.

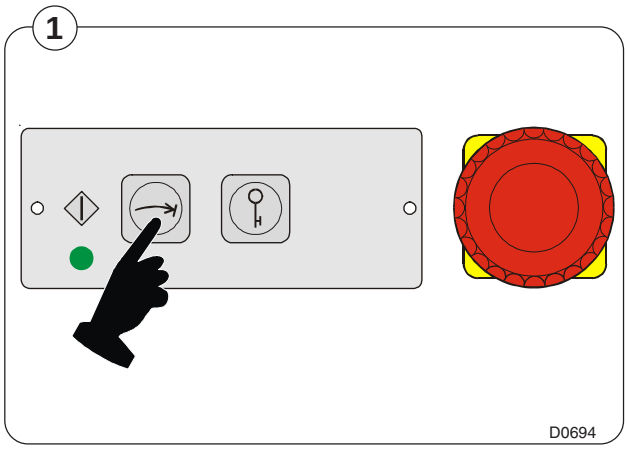
Standard machines

Fig. 1

- Position the cage doors in front of the drum door with key **"Cage positioning".**

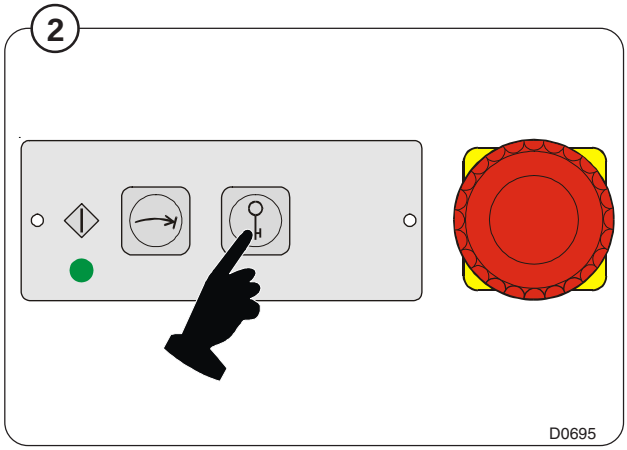
Fig. 2

- Press the **"Door unblocking"** key.
- Open the unloading door with the handle.
- Rotate the door manually to complete the positioning of the doors in front of the opening of the drum.



WARNING

In case of important unbalance inside the drum, an unexpected rotation of the latter can pinch and arm hands of the operator.



- Open the cage doors.
- Unloading the linen and close the doors.

You can start a new washing cycle.

Barrier machines (unloading side)

Fig. 3

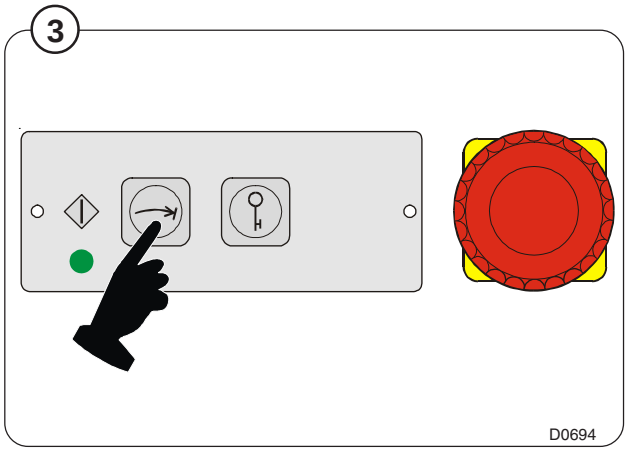
- Position the cage doors in front of the drum door with key **" Cage positioning"**.

Fig. 4

- Press the **"Door unblocking"** key.

The linen unloading indicator remains lit as long as the door is unlocked.

- Open the unloading door with the handle.



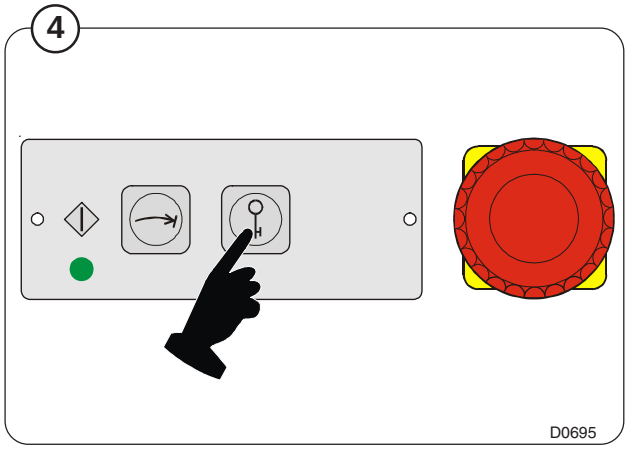
- Rotate the door manually to complete the positioning of the doors in front of the opening of the drum.

WARNING

In case of important unbalance inside the drum, an unexpected rotation of the latter can pinch and arm hands of the operator.

- Open the cage doors.
- Unloading the linen and close the doors.

You can start a new washing cycle.



Clean room barrier machines (unloading side)

Fig. 5

- The green light is on to indicate the end of the washing cycle.
- Press the **" Cage positioning"** key (the light stays off), keep up pressing the key until the light is on again.
  The cage doors are in unloading position now.

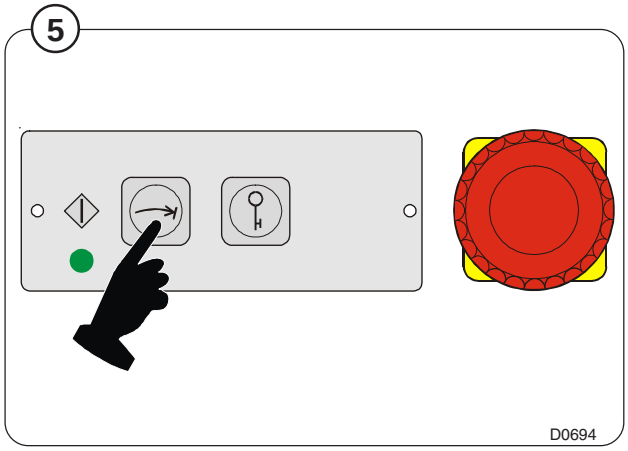


Fig. 6

- Press the **"Door unblocking"** key.

The linen unloading indicator remains lit as long as the door is unlocked.

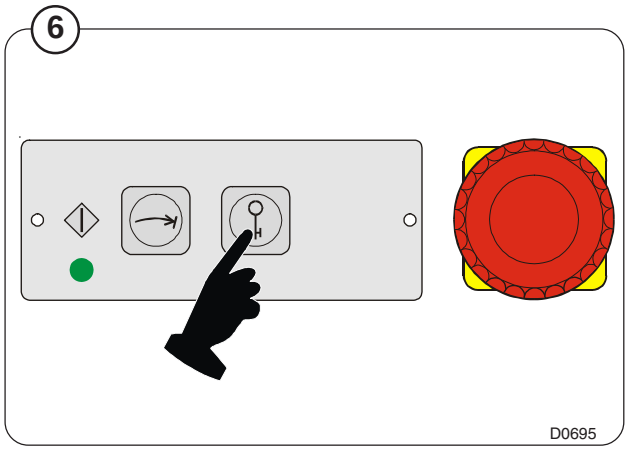
- Open the unloading door with the handle.
- Rotate the door manually to complete the positioning of the doors in front of the opening of the drum.

WARNING

In case of important unbalance inside the drum, an unexpected rotation of the latter can pinch and arm hands of the operator.

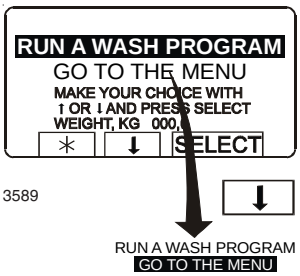
- Open the cage doors.
- Unloading the linen and close the doors.

You can start a new washing cycle.



Statistics

To select "Statistics"



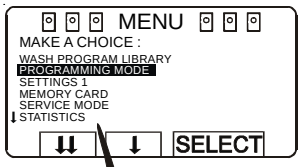
If this menu is not currently diplayed :

Press ↩ repeatedly.

3589

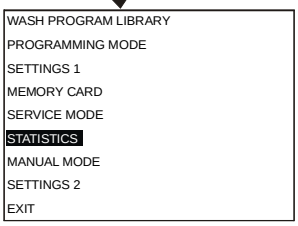
Press ⇩ to highlight « GO TO THE MENU ».

Press SELECT.



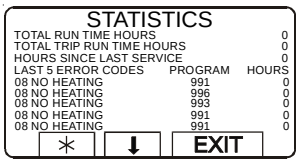
3691

Press ⇩ five times…



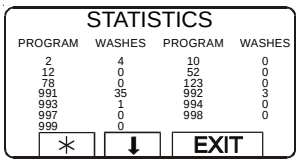
… to highlight « STATISTICS ».

Press SELECT.



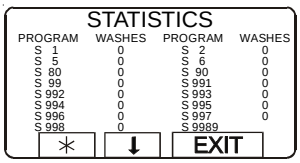
3690

To display the next page of "statistics" :
Press ⇩.



3958

To display the next page of "statistics" :
Press ⇩.



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.

4040

When you want to cancel to 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 statistics registers

If the menu is not currently displayed :

Press ↩ repeatedly.

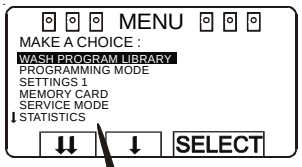
Press ⇩ to highlight « GO TO THE MENU ».

Press SELECT.

Statistics registers which can be reset to zero

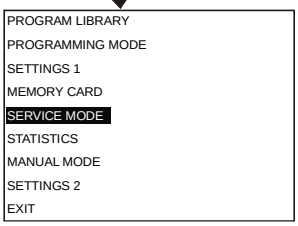
The following registers in the statistics function can be cleared (reset to zero) :

- 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).



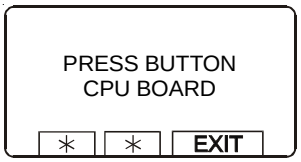
3693

Press ⇩ four times...



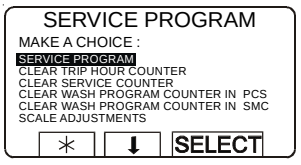
... to highlight « SERVICE MODE ».

SELECT **Press SELECT.**



4209

Press the button on the PCU circuit board.



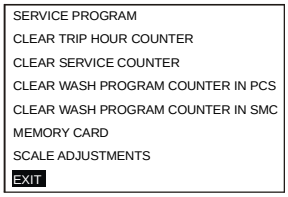
Now you can choose either to clear/reset a register or to adjust the weighing equipment.

4042

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

SELECT

If you want to exit :



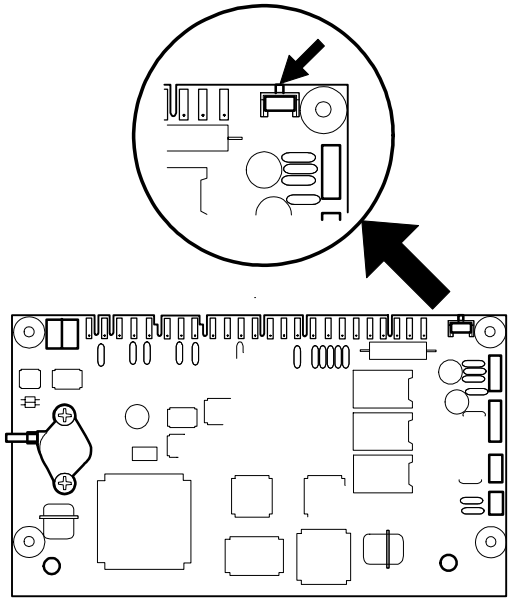
Press ⇩ repeatedly until EXIT is highlighted.

SELECT **Press SELECT.**

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

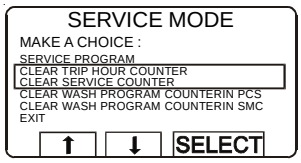
To prevent unauthorised or accidental use

To access this function, you must first press the button on the CPU circuit board. This is to prevent unauthorised or accidental use of the service program.



3972

Time counter « service time » and « last service »

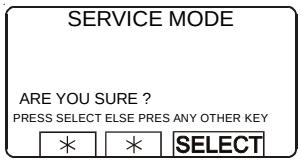


4041

Both counters can be reset in the same way.

Press ⇩ so that « CLEAR TRIP HOUR COUNTER » or « CLEAR SERVICE COUNTER ».

SELECT **Press SELECT.**



4043

First you have a chance to change your mind.

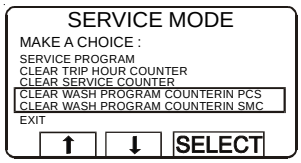
If you **do not want to reset** the register :

Press any key *other than* SELECT.

If you want to reset the register :

SELECT **Press SELECT.**

Number of washes for program in timer or memory card



4044

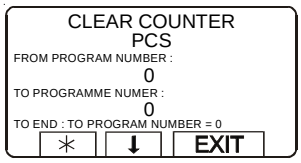
You can reset program in both timer and the memory card (if inserted) :

⇩

Press ⇩ so that "CLEAR WASH PROGRAM COUNTER IN PCS" or "CLEAR WASH PROGRAM COUNTER IN SMC".

SELECT

Press SELECT.



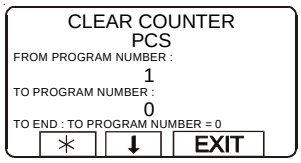
4045

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

1 2 3
4 5 6
7 8 9
0

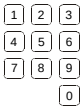
⇩

Press ⇩.

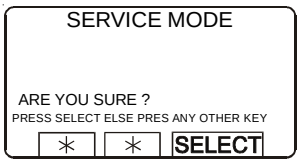


Write up to which program number you want to clear wash programs.

4046



Press ERASE.



Do you want to change your mind ?

If you do not want to reset the register :

Press on any button except SELECT.

4043

If you want to reset the register :

Press SELECT.

Now the numbers of washes toy haves marked are erased.

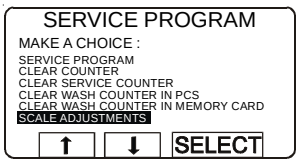
If you want to change any number you have written:

Press ⇧ if you want to change the first written number. Write the new number.

If you regret something :

Press ↩.

Scale adjustments (for machines with weighing equipment installed only)

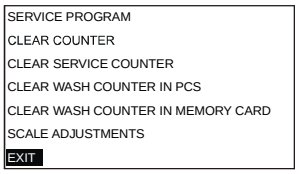


Press ⇩ repeatedly until SCALE ADJUSTMENTS is highlighted.

4777 ↓

SELECT **Press SELECT.**

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



SELECT **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.

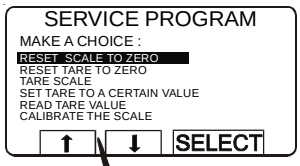
Calibrate the scale (see section "Calibrate the scale")
This function is used only on installation of a new scale unit.

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

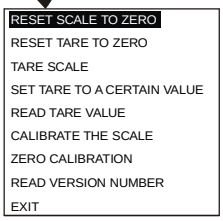
Read version number (see section "Read version number")
This is where you find the version number of the weighing equipment.

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.

Reset scale to zero (for machines with weighing equipment installed only)



4778

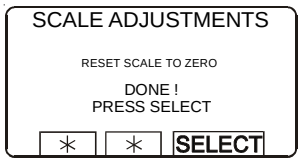


Check that "RESET SCALE TO ZERO" is highlighted.

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 :

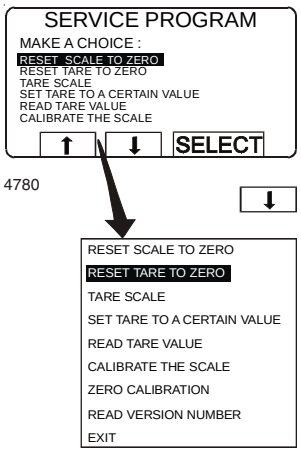
The machine must be unladen when you use this function, i.e. no water or wash load in the drum.

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.

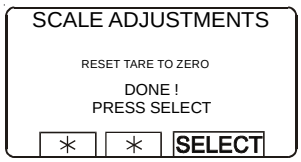
Reste tare to zero (for machines with weighing equipment installed only)



4780

Press ⇩ once to highlight "RESET TARE TO ZERO".

SELECT **Press SELECT.**



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

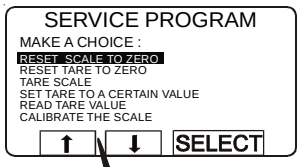
4781

SELECT **Press SELECT.**

Reset tare to zero

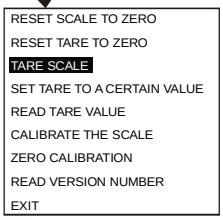
If your attempt to clear the tare parameter fails at this point, you will see an error message equivalent to : "FAILED. PRESS SELECT" on the display. For troubleshooting, see the section "Fault-finding, weighing equipment" in the machine manual.

Tare scale (for machines with weighing equipment installed only)

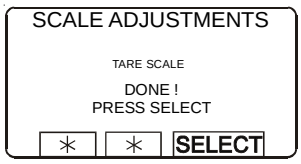


4782

Press ⇩ twice to highlight "TARE SCALE".



SELECT **Press SELECT.**



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

4783

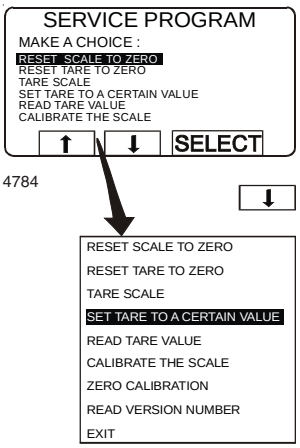
SELECT **Press SELECT.**

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.

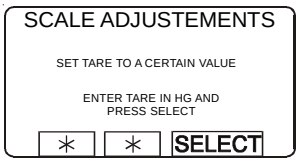
Set tare to a certain value (for machines with weighing equipment installed only)



4784

Press ⇩ three times to highlight "SET TARE TO A CERTAIN VALUE".

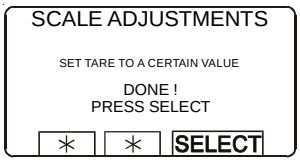
Press SELECT.



4785

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

Press SELECT.



This screen shows that the parameter has been entered successfully.

4786

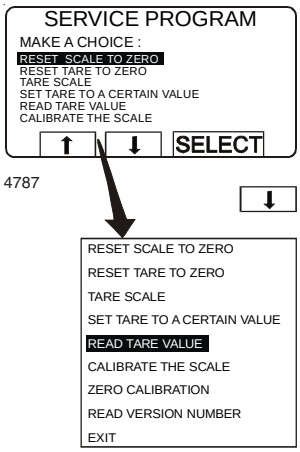
Press SELECT.

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.

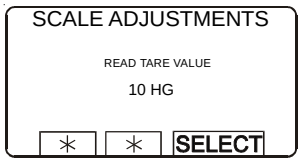
Read tare value (for machines with weighing equipment installed only)



4787

Press ⇩ four times to highlight "READ TARE VALUE".

Press SELECT.



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

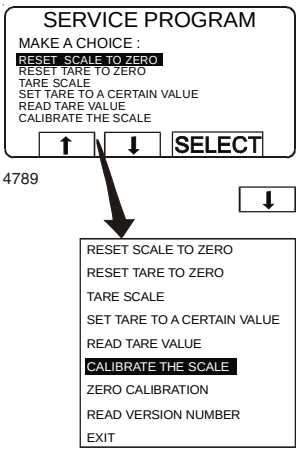
4788

Press SELECT.

Read tare value

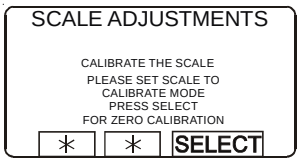
This function lets you check the value currently stored as the tare parameter.

Calibrate the scale (for machines with weighing equipment installed only)



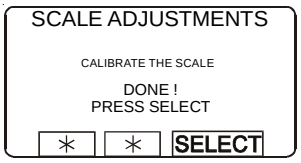
Press ⇩ three times to highlight "SET TARE TO A CERTAIN VALUE".

SELECT **Press SELECT.**



Set the calibration switch to calibartion mode.

SELECT **Press SELECT.**



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 :

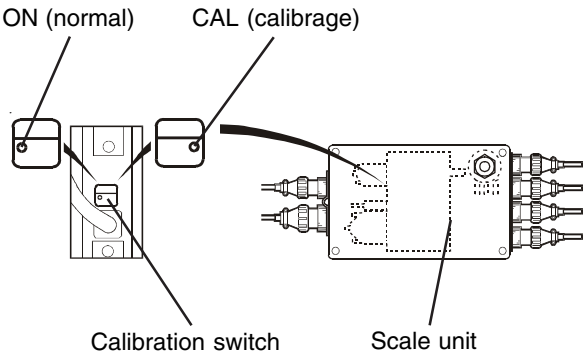
The machine must be unladen at the start of calibartion ; i.e. no water or wash load in the drum.

Calibration mode/normal mode

To gain access to the calibration switch in the scale unit, the lower front 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".



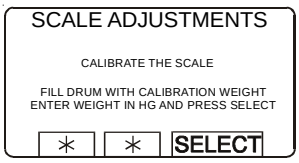
(for machines with weighing equipment installed only)

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.

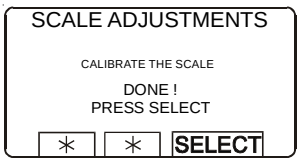
The higher the weight (within these limits), the better the weighing accuracy of the machine.



4792

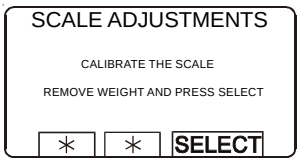
Use the numeric key to enter the calibration weight in hg (1 kg = 10 hg).

SELECT **Press SELECT.**



4791

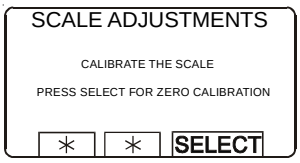
SELECT **Appuyez sur CHOIX.**



Remove the calibration weight.

4793

SELECT **Press SELECT.**

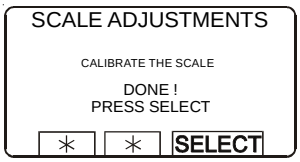


If you want to use the "Calibration zero" function now :

4794

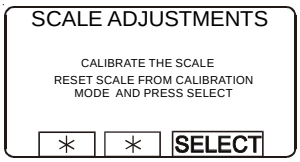
SELECT **Press SELECT.**

(for machines with weighing equipment installed only)



4791

SELECT **Press SELECT.**



Restore the calibration switch to normal mode.

4795

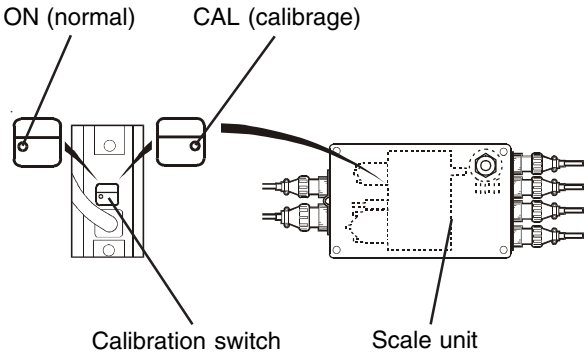
SELECT **Press SELECT.**

Calibration mode/normal mode

To gain access to the calibration switch in the scale unit, the lower front panel has to be taken off.

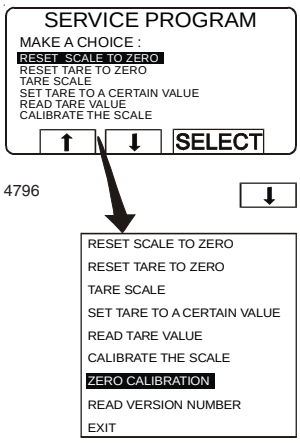
Remove the four screws on the scale unit cover.

Then the calibration switch can be switched between normal mode "ON" and calibration mode "CAL".



4758

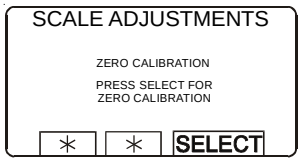
Zero calibration (for machines with weighing equipment installed only)



4796

Press ⇩ six times to highlight "ZERO CALIBRATIONN".

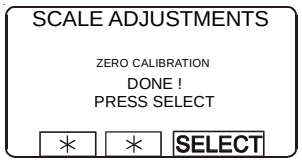
SELECT **Press SELECT.**



If you wish to calibrate zero for the weighing equipment :

4797

SELECT **Press SELECT.**



This screen shows you have calibrated zero.

4798

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.

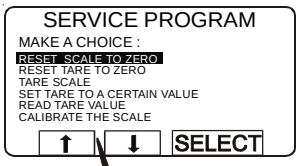
If this calibration has not succeeded you will see an error message equivalent to: "FAILED. PRESS SELECT" on the display.

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

Please note :

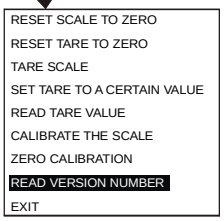
The machine must be unladen during this calibration, i.e. no water or wash load in the drum.

Read version number (for machines with weighing equipment installed only)

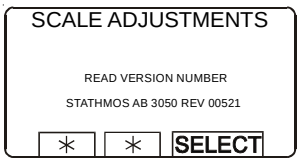


4799

Press ⇩ seven times to highlight "READ VERSION NUMBER".



SELECT **Press SELECT.**



The screen shows the version number.

4800

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.

Functions "ON/OFF" and "Servo-control pause" by exterior signals

Description

During a programme, an on/off function and a servo-control pause can be used to vary the heating or the starting of a machine in comparison to another by using an exterior signal (electric signal).

Functioning

The on/off function is made by feeding X15-1 and X15-2 with 230 V (just one impulse is enough) having previously chosen the washing programme and pushed the button “SELECT” in order to be in START position.

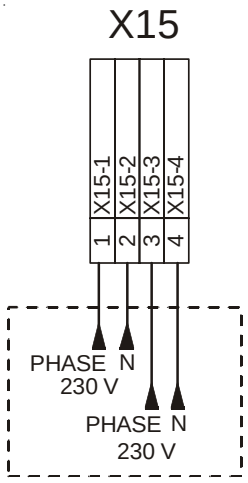
The function “servo-control pause” is made by feeding X15-3 and X15-4 with 230 V. The heating is cut off, the signal “servo-control pause” blocks the time deduction and the other units (rinse, emptying, spin, etc…) of the machine is still working.

When the electric signal disappears, the heating is back on.

Connector X15 on I/O CARTE no 1 of CLARUS

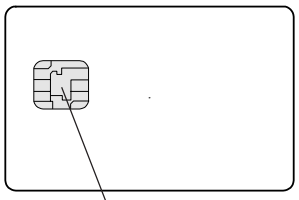
Exterior signal in 230 V :

- X15-1 and X15-2 putting into service by servo-control
- X15-3 and X15-4 heating is halted



Memory card

General introduction



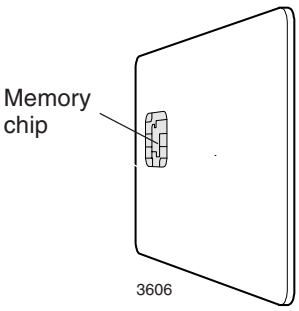
A memory card is a plastic card, the size of a credit card, with an electronic memory chip inside it. This memory card is capable of storing 10 to 15 wash programs of normal size. If the programs are mostly small ones, more of them can be stored, whereas larger programs will reduce the number which can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

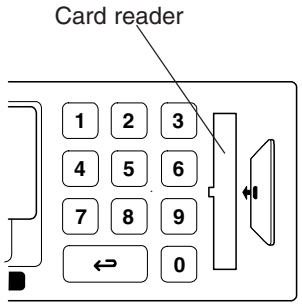
A program stored on a memory card may be given restricted-use status. This means that :

- 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.

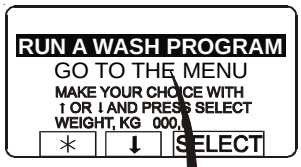
To select the « Memory card » function



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.

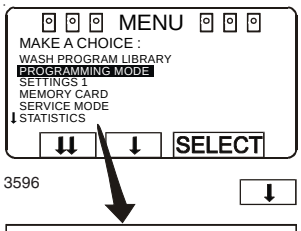


If this menu is not currently displayed :

Press ↩ repeatedly.

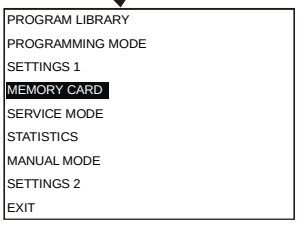
Press ⇩ to highlight « GO TO THE MENU ».

Press SELECT.



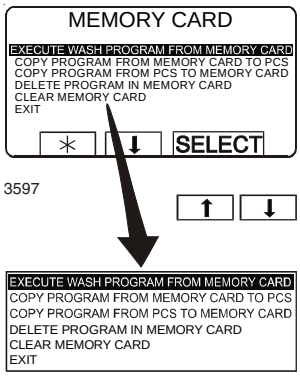
3596

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.

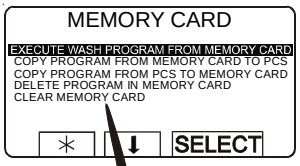
Copy program from PCS to memory card (see section "To copy a program from the program control unit to a memory card")

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")

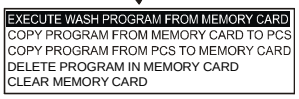
Clear memory card (see section "To delete all programs on a memory card")

To run a wash program straight from a memory card



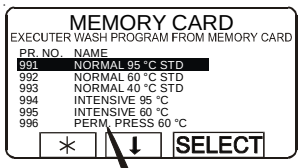
To access this menu, follow the instructions in section « To select the "Memory card" function ».

3598



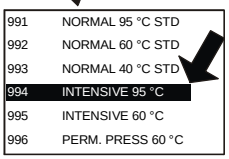
Highlight « EXECUTE WASH PROGRAM FROM MEMORY CARD » (press ⇧ if necessary).

Press SELECT.



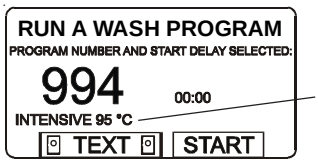
3607

If necessary, use ⇩ to…



… highligh the wash program required.

Press SELECT.



3608

Program name

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

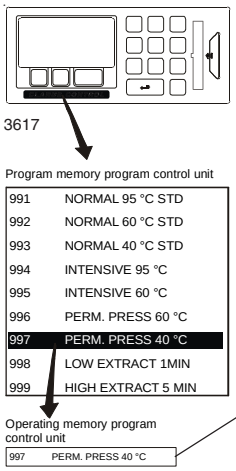
To start program.
Press START (see also section « To start the wash program »).

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

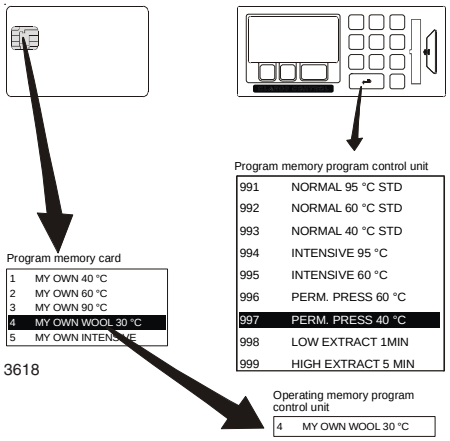
To run a program from the memory card

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.

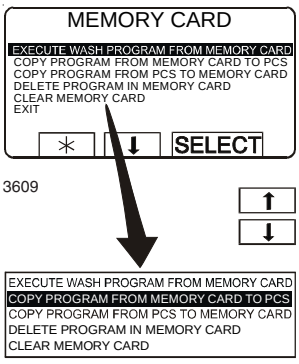


A parallel process takes place when a program is started from a memory card. In other words, the program is copied from the memory card into the operating memory, and the machine runs the program entirely from the set of instructions in the operating memory.



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 memory card to the machine's program control unit

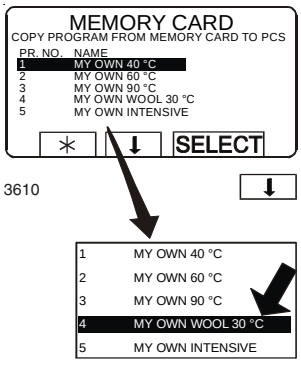


To access this menu, follow the instructions in section « To select the "Memory card" function ».

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.**



⇩ **If necessary, use ⇩ to…**

...highlight the wash program required.

SELECT **Press SELECT.**

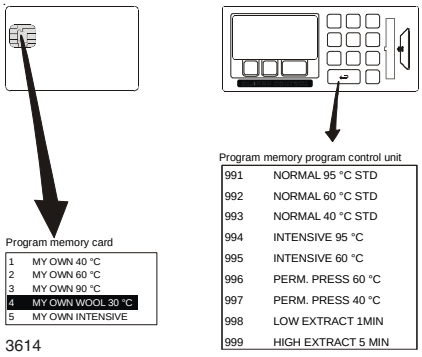
What is a restricted-use program ?

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

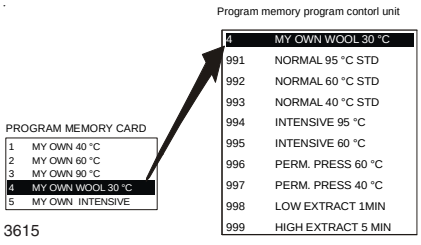
- The program cannot be deleted or copied to the program memory of a washer extractor.
- You cannot modify the program or examine its structure.
- To run the program you must have access to the memory card, and insert it into the card reader when the program is to be started.

What happens when a program is copied ?

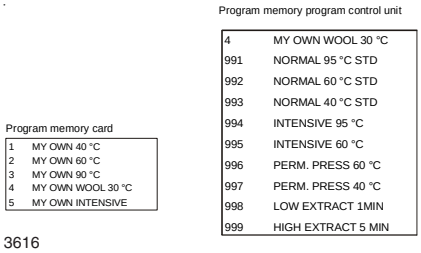
Both the memory card and the program control unit have memory chips capable of storing wash programs. The chip on the card can hold about 10 to 15 programs of normal size, while the chip in the program control unit has a capacity of several hundred programs.



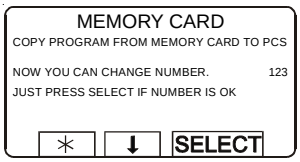
When a program is copied from a memory card to the machine's program control unit, it is copied, not moved (not deleted from the card). A copy is transferred from the chip on the memory card to the storage chip of the machine program control unit.



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



Change program number when you copied a program from memory card to program control unit



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 :

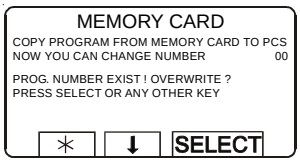
Use the numeric keys to enter the new program number, the press SELECT.

1 2 3
4 5 6
7 8 9
0

2 If the existing number is suitable :

SELECT

Press SELECT.



4114

If the number yoy have choosen is already used :

1 Select another number.

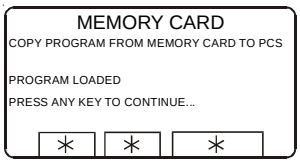
Enter the new number and press SELECT.

1 2 3
4 5 6
7 8 9
0

2 Erase the old program number.

SELECT

Press SELECT.

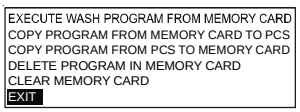


3612

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.



4115

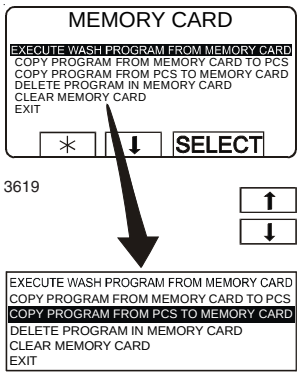
When you have finished :

Press ⇩ repeatedly to highlight « EXIT ».

SELECT

Press SELECT .

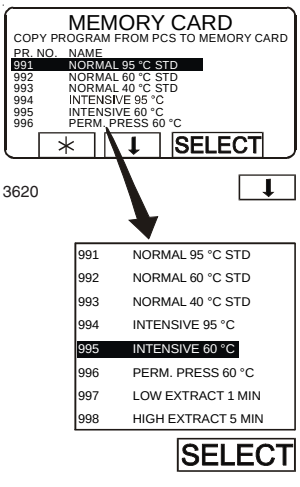
To copy a program from the program control unit to a memory card



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.**



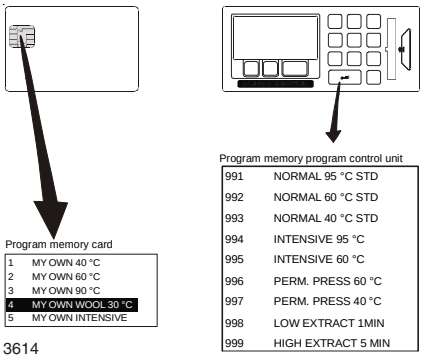
⇩ **If necessary, use ⇩ to…**

… highlight the wash program required.

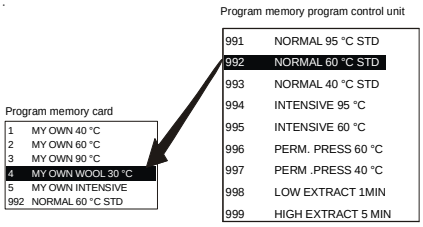
SELECT **Press SELECT.**

What happens when a program is copied ?

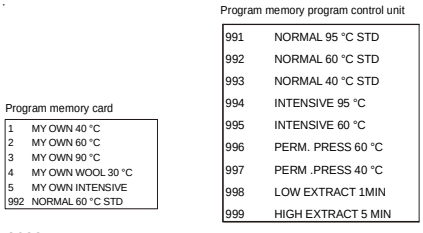
Both the memory card and the program control unit have memory chips capable of storing wash programs. The chip on the memory card can hold about 10 to 15 programs of normal size, while the chip in the program control unit has a capacity of several hundred programs.



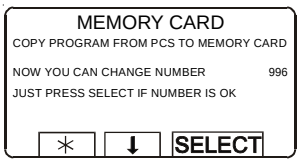
When a program is copied from the machine's program control unit to a memory card, it is copied, not moved (not deleted from the machine). A copy is transferred from the storage chip of the machine program control unit to the chip on the card.



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



Change program number when you copied a program from program control unit to memory card



3623

Choose 1 or 2 :

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

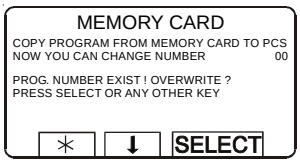
Use the numeric keys to enter the new program number, then press SELECT.

1 2 3
4 5 6
7 8 9
0

2 If the existing number is suitable :

SELECT

Press SELECT.



4114

If the number you have choosen is already used :

1 Select another number.

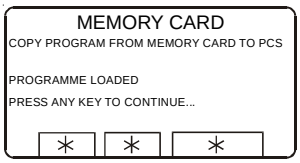
Enter the new number and press SELECT.

1 2 3
4 5 6
7 8 9
0

2 Erase the old program number.

SELECT

Press SELECT.

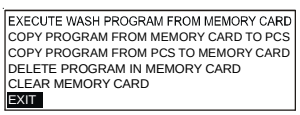


3624

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.



4115

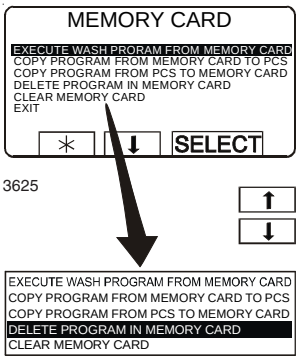
When you have finished :

Press ⇩ repeatedly to highlight « EXIT ».

SELECT

Press SELECT.

To delete a program on a memory card

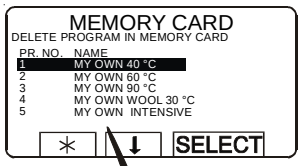


To access this menu, follow the instructions in section « To select the "Memory card" function ».

3625

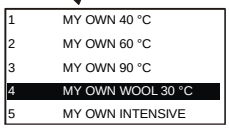
Highlight « DELETE PROGRAM FROM IN MEMORY CARD » (press ⇧ or ⇩ if necessary).

SELECT **Press SELECT.**



3626

If necessary, use ⇩ to…



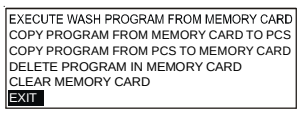
… highlight the wash program required.

SELECT **Press SELECT.**

The program will now be deleted from the memory card. This takes between 5 and 51 seconds.

If you want to delete more programs:

Continue in the same way as described above.



When you have finished :

Press ⇩ repeatedly to highlight « EXIT ».

4115

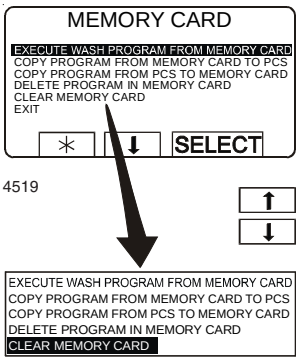
SELECT **Press SELECT.**

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.

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.

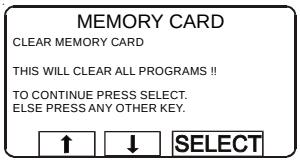
Highlight « CLEAR MEMORY CARD » (press ⇧ or ⇩ if necessary).

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.



If you change yor 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) :
SELECT **Press SELECT.**

Weighing equipment (optional equipment)

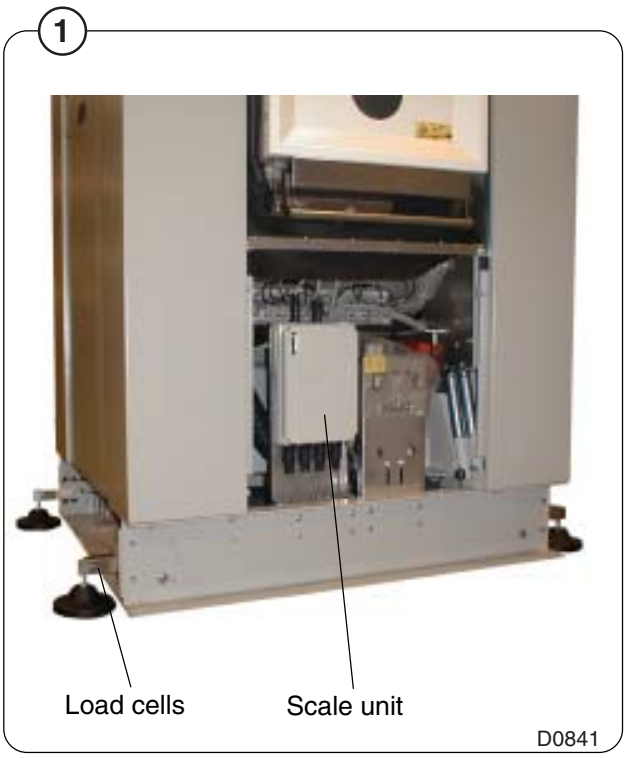
Description

Fig. 1

The weighing equipment comprises the following units :

- A scale unit located
- 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.



Safety rules

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

- Never spray water directly onto the load cells and scale unit.
- The load cells are vulnerable to impact.
- The load cells are potentially vulnerable if welding is carried out. If welding has to be done on the washer extractor, attach the earth cable clamp as close as possible to the welding site.

After a power-cut

When the supply is restored after a power-cut, the weight display will show "0" if the load inside the drum is less than 6.25 kg. If the load weighs more than 6.25 kg, the true weight of the load will be shown.

Water level reduction

To achieve optimum load volumes, the weight of the load can be seen on the display while the machine is being loaded. If the machine does not have a full load, the water level will be reduced according to a water-level reduction table. The water level can never be any lower than the safety level plus the hysteresis.

Actual weight display

Fig. (2) 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).

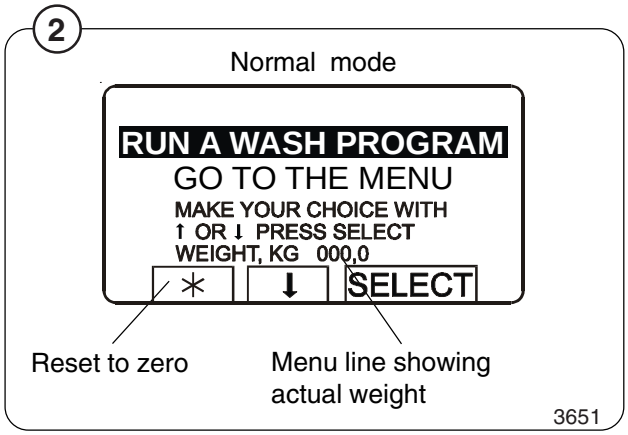
Fig. (3) When the machine starts to be loaded, the display switches to showing the actual weight in large numerals (weight display mode).

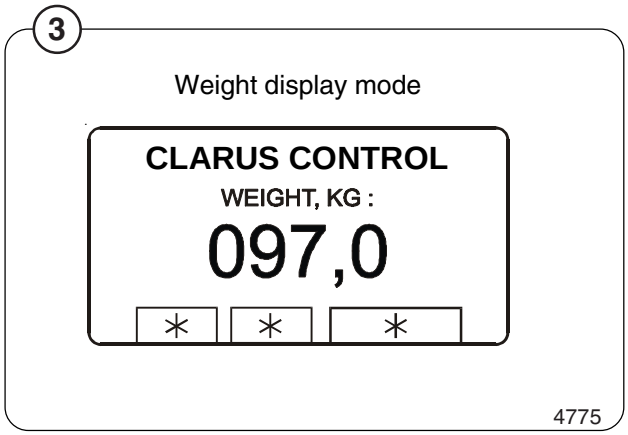
Normal display mode is resumed :

- 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

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".

Calibration 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".

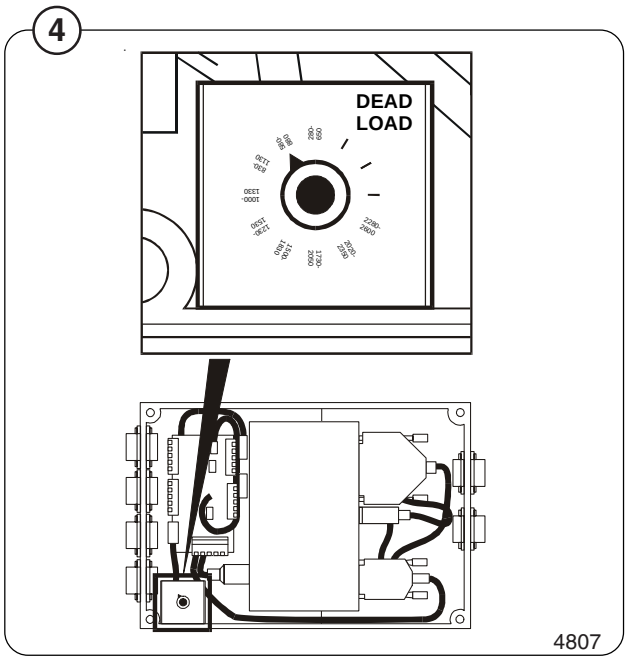
The dead load selector

Fig. 4

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. The selector should be set to **580-880 kg** (machines 230-340-470) or **830-1130 kg** (machine 670).

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

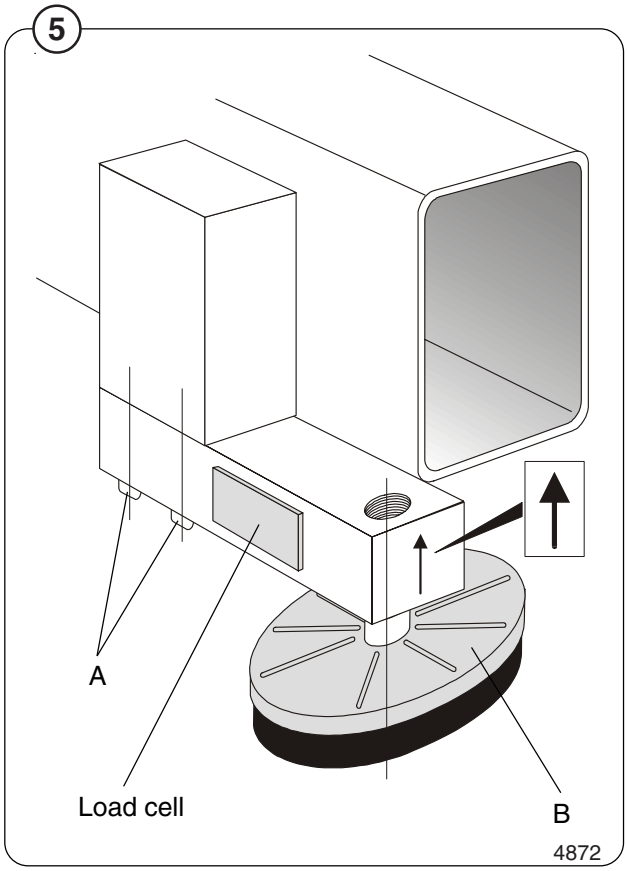


To replace a load cell

Fig. 5

- 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.
- Disconnect the load cell cable at the scale unit.
- Remove the screws (A).
- Remove (B).
- Remove the faulty load cell and fit the new, assembly is reverse of disassembly.

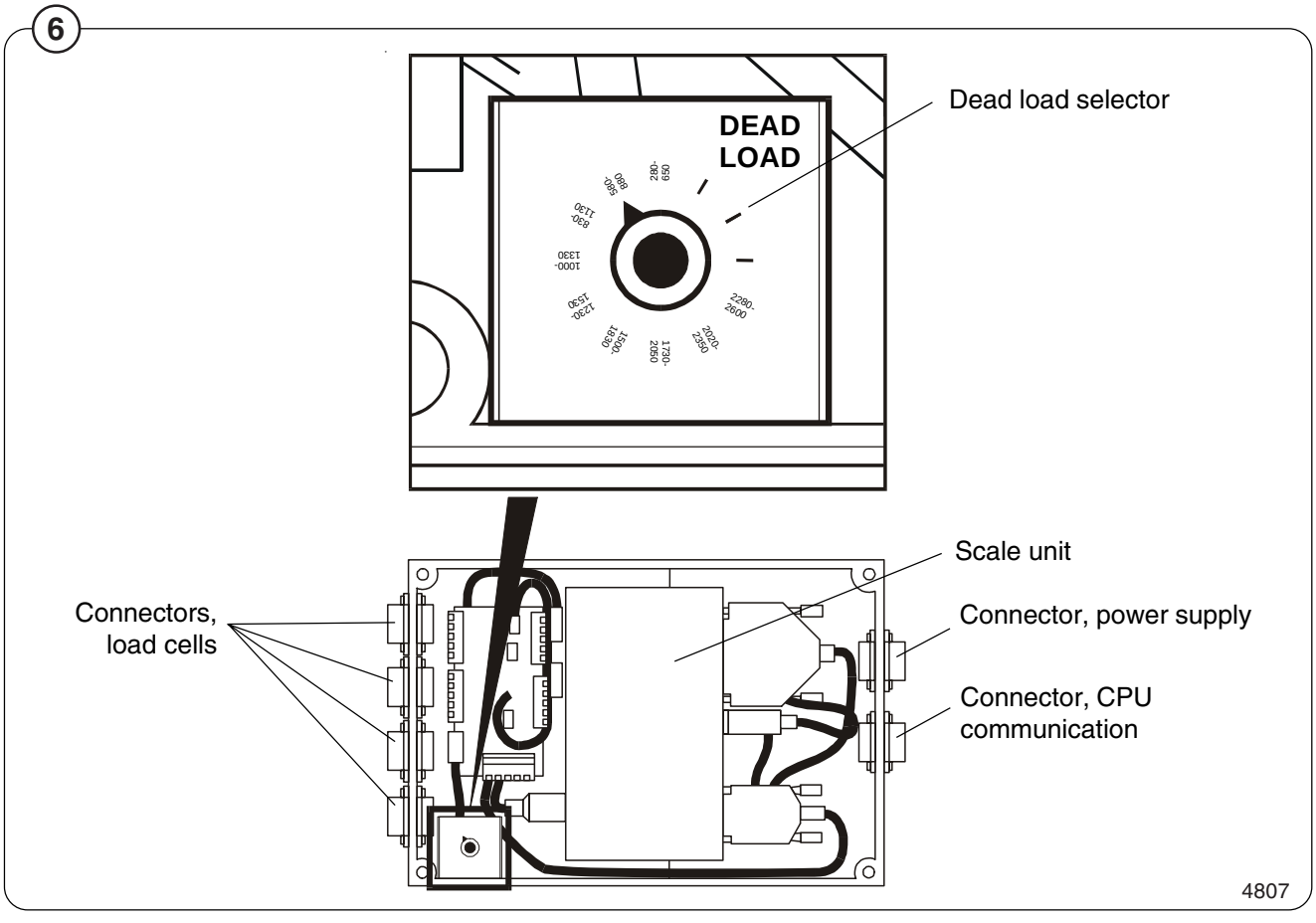
Install the new load cell as indicated by arrow on side of load cell !



To replace the scale unit

Fig. 6

- Remove the machine's side panel.
- Disconnect the six connectors to the scale unit.
- Remove the scale unit.
- Install the new scale unit, assembly in reverse order of disassembly.
- Check that the dead load selector is set to **580-880 kg** (machines 230-340-470) or **830-1130 kg** (machine 670).
- Calibrate the weighing equipment, see "Calibrate the scale" under "Machine operation".



Component locations

7

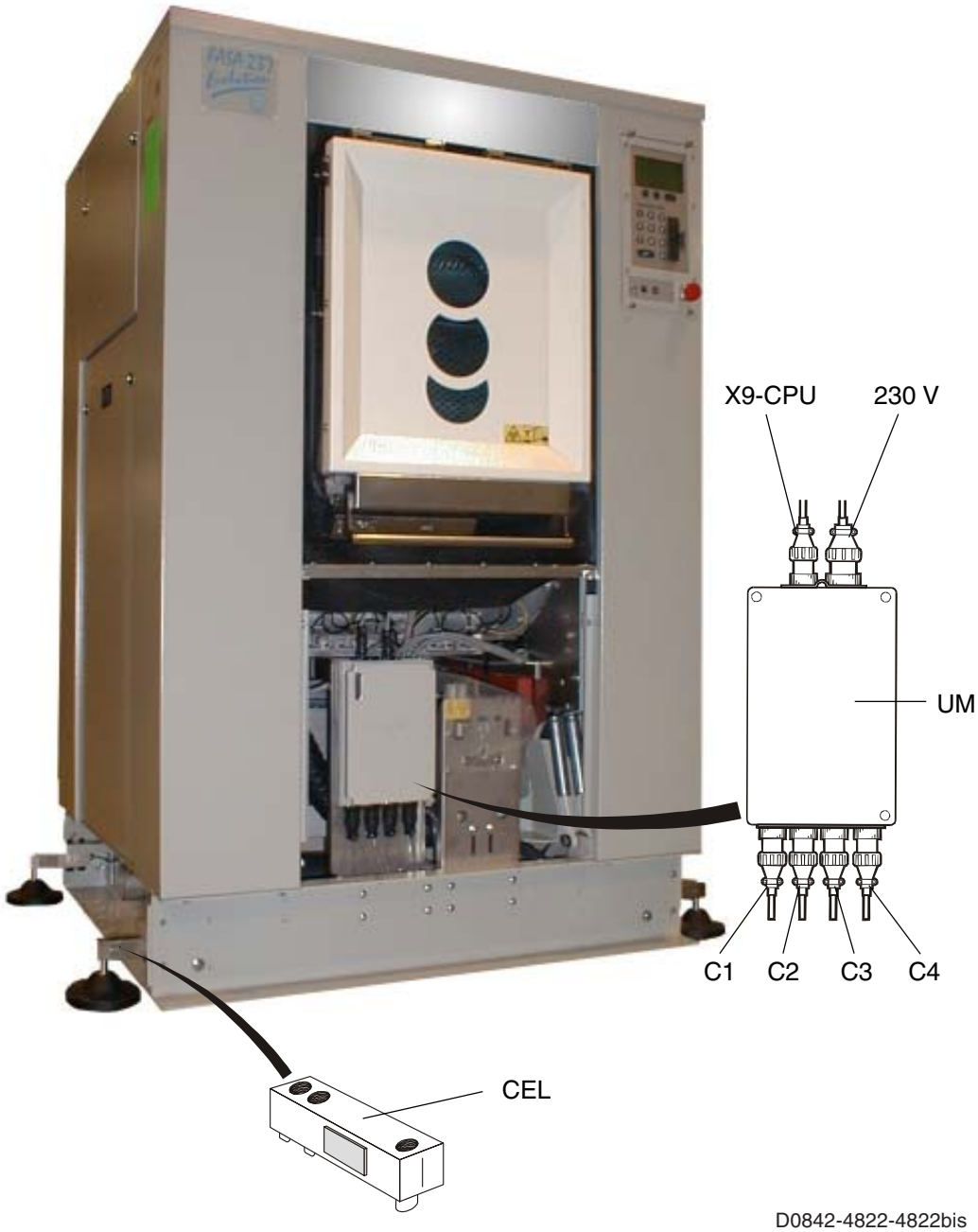


Fig. 7

UM	Scale unit
CEL	Load cells
Connectors	
230 V	Voltage feed
X9-CPU	Communication with CPU board
C1-C4	Load cells

Fault-finding, weighing equipment

Error message on display :

Weight, in kg : 999,0 or -999,9

Probable cause :

The weighing equipment is overloaded/ "underloaded", i.e. the load cells are sending a signal which is too high/low to the scale unit. Probable cause is one or more load cells faulty. The dead load selector may be on the wrong setting. The machine may be incorrectly installed.

Fault-finding procedure :

- Check that all connections to the machine are flexible.

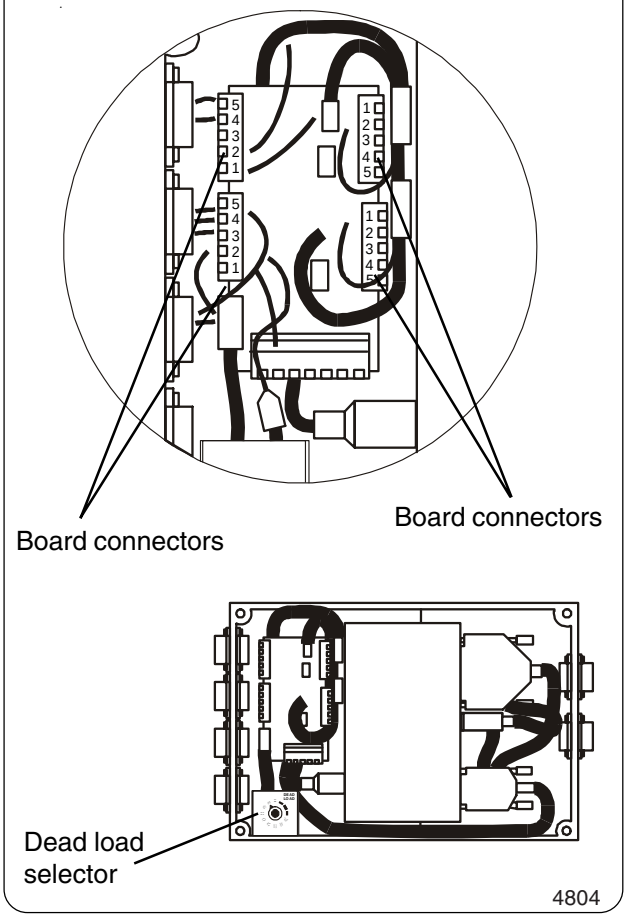
Fig. 8

- Remove the side panel. Check that the dead load selector is set to **580-880 kg** (machines 230-340-470) or **830-1130 kg** (machine 670). If it is not, set it correctly and calibrate the weighing equipment according to "Calibrate the scale" under "Machine operation".
- If the weight displayed is -999.9, try following the "Zero calibration" procedure (described under "Zero calibration" in the "Machine operation" chapter).
- Remove the side panels and check that the load cells are unobstructed. Remove any mechanical obstructions.

Fig. 8

- 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.

8



- If more than one load cell is faulty, the faulty cells can be identified using a multimeter on the scale unit weight-totalling board to check each cell in turn, as follows :

- Remove the four screws on the scale unit cover.
- Check that the four load cell cables are connected to the scale unit.
- Measure the voltage at the connectors on the weight-totalling board, between terminal 2 and 3 for each load cell. The normal value for an unladen machine is approx. 3-5 mV (DC). A value different from this indicates that the load cell is faulty.
- Replace the faulty load cell(s) as described under "To replace a load cell".

Menu line which should show actual weight not displayed.

Possible causes :

The option “DISPLAY WEIGHT ALLOWED” may be switched off (have the answer “No” alongside) in “Settings 1”. Possible fault in communication with CPU board or display. The fault can also be in the scale unit.

Fault-finding procedure :

- Check in "Settings 1" that the option "DISPLAY WEIGHT ALLOWED" has "Yes" alongside.
- Check that the cables/wiring for CPU communication and power supply are connected to the scale unit and in good condition.
- If the washer extractor appears to be working normally apart from the absence of weight parameter display, try replacing the scale unit as described under "To replace the scale unit".

If you suspect that the weighing equipment is not displaying accurate weight value.

Probable cause :

Probably a faulty load cell.

Fault-finding procedure :

- Place an object of known weight at one corner on top of the washer extractor. Check the weight shown on the display. Move the weight to each of the other corners of the machine in turn, checking the display each time. If one corner is different from the others, this will reveal which load cell is faulty.
- Check that the load cell in question is mechanically unobstructed, free of anything which could affect its normal functioning.
- Replace the load cell as described under "To replace a load cell".

Error message on display :

Failed. Press SELECT.

Possible causes :

Dead load selector or calibration switch incorrectly set. An incorrect calibration weight has been used for calibration.

Fault-finding procedure :

Fig. 9

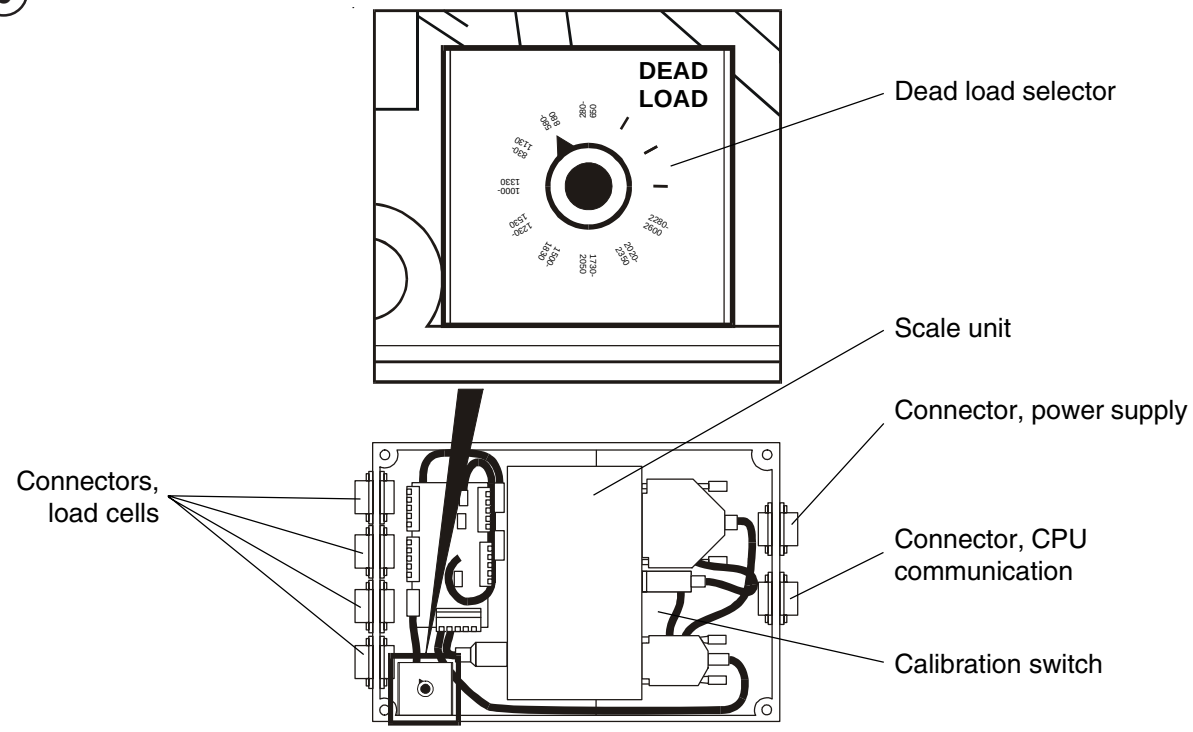
- Check that the dead load selector is set correctly. It should be set to **580-880 kg** (machines 230-340-470) or **830-1130 kg** (machine 670).
- If you are or have recently been calibrating the weighing equipment, the calibration switch may be incorrectly set, or an incorrect calibration weight may have been used for calibration.

  Check that the calibration switch is set correctly. It should normally be set to NORM (normal). During calibration the switch should be set to CAL (calibrage).

  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.

9



Information in display :

Function no allowed.

Probable cause :

A function has been selected in the program which cannot be carried out.

Fault-finding procedure :

- Check that the function in question is switched on under "Settings".
- Check that the cables for CPU communication, power supply and load cells are connected.
- Check that these cables are all in good condition.
- If any cable is faulty, replace it.

Information in display 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.

HACCP option (Hazards Analysis Critical Control Points)

Traceability for quality control :

As a quality control option, all washer-extractors can be equipped for traceability to comply with HACCP method.

HACCP (Hazards Analysis Critical Control Points) is a very well known quality control method used in catering industry. It allows the recording of vital statistics to ensure the exactness of an achieved process in regards to its program.

The machine is equipped with :

1 - Watermeters on water inlets
2 - Temperature recorder
3 - 1/4 turn valve for bath analyses
4 - Automatic weighing system

Watermeters :

Water meter allowing to record the water consumption for each cycle. Recording water consumption must be manually made.

Temperature recorder :

Disk type temperature recorder allowing to draw the temperature curve of the wash cycle. (A pack of about 100 disks is provided with the recorder).

1/4 turn valve for bath analyses :

1/4 turn valve on machine's outer drum allowing to manually withhold a sample of bath for analyses.

Automatic weighing system :

Internal load cells located in the feet of the machine weigh the content of the drum as it is being loaded.

The actual weight of the wash load is displayed on the Clarus Control panel. It eliminates time and efforts of weighing each load on scale.

Replacement of the disk

The recorder disk must be changed after three or four using days (following the use).

To achieve its replacement, please follow the instructions.

A- Open the transparent cover with the key

B- Delicately raise the needle (1)

C- Unscrew the central nut (2)

D- Remove the old disk (3)

E- Put the new disk and center it carefully on the shouldered axis

F- Slide the edge of the disk under the three peripheral pin (4)

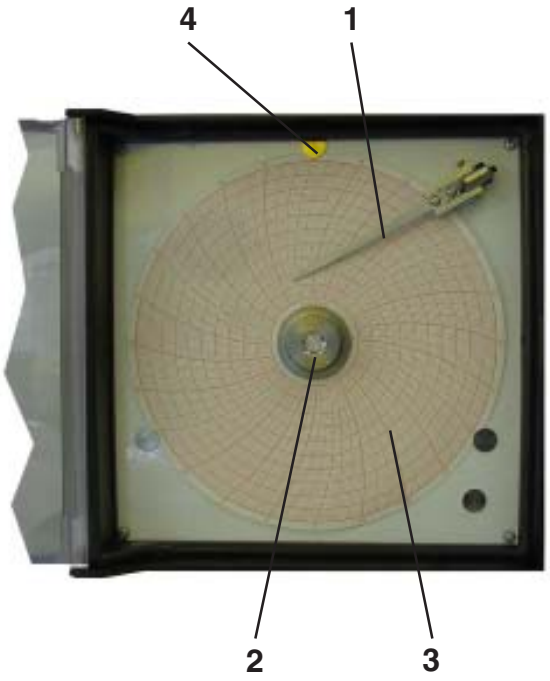
G- Lower the needle

H- Screw the central nut but not completely

I- Turn manually the disk to place the number for "0" (zero) under the superior pin

J- Block the central nut

K- Close and lock the cover



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Safety

Restarting the machine

After any stoppage of the machine, either due to power failure, emergency stop, motor safety, the machine can only be restarted after having pressed key "ON".

Outer doors

All of the different parts of the machine stop working automatically as soon as one of the doors is opened. The doors can only be opened if the cage is at a complete standstill and the programmer on end of cycle.

The drum door is kept opened by gas jacks.

On barrier machines, the loading and unloading doors cannot be opened at the same time.

For barrier machines, the unloading door opening is possible only if the wash program has been completely achieved. This guarantee the barrier process for a decontamination wash program in particular (time, temperature, water levels and detergents' inputs have been respected).

Motor protection

The motors driving our machines are of asynchronous rotor type with short circuit. They are protected by a frequency converter. A circuit breaker protect the frequency converter.

Level

Our machines are equipped with a pressure switch which controls the level of water in the machine according to the different programmes, prevents heating from taking place in the absence of water (minimum water level authorized : 10 units), and prevents from opening the door if the water level is higher than low level.

Washing-extraction

A safety device ensured by a electronic temporized relay adjusted at 40 seconds prevents the drum doors from being opened after its complete stop. This safety device is doubled by a rotation detector checking the total stop of the cage.

Unbalance safety device

A safety device stops the machine if the load is unbalanced (uneven distribution of linen at start of extraction).

Cage doors

If the drum doors are opened, the revolving drum is blocked mechanically.

Drum doors

Drum doors are equipped with "securit" type small windows, make of 2 tempered glasses separated by a plastic film, avoiding glass projection in case of thermic or physical shock.

Emergency stop

An emergency stop button is provided on the loading and unloading sides of the barrier machines.

Drain

A 'hold to run" switch allows the manual opening of the drain to empty the machine if needed (open the loading side casing to get to it).

Accessibility

All of the casings can be dismantled by means of a specially designed tool.

Safety

Gas heating

The gas burners are ignited and the flamme controlled by an electronic conrol box which ensures perfect security in the case of bad draught, disruption of gas flow, power cuts, etc...

Operating incidents

In order to limit the risk of failure in the electronic controls of the programming unit of the machine, the machine should be earthed. Should interferences happen, the first thing to be checked is the earthing of the machine.

The programming unit permanently checks the machine, regarding both safety and working aspects. To make the fault finding easier, the display window indicates in clear text the origin of the failure, or the reason why the particular function cannot be used. The table below gives for each problem detected the message of the machine and the solutions to be brought.

Error/Function	Cause	Action
NO WATER **Error 1** Water level has not reacher set level within set time.	- Electrovalve's filters are blocked.	- Clean electrovalve's filters.
	- No water in main supply.	- Check water in main supply.
	- Manual water valves (taps) are close.	- Open taps.
	- Electrovalves are faulty.	- Check function of electrovalves.
	- Drain valve is open.	- Check function of drain valve.
	- Level tube is faulty or not come loose from mother board.	- Check that level tube is sound and his raccordement.
	- Level detection function on CPU PCB faulty.	- Replace PCB.
DOOR OPEN **Error 2** **DOOR UNLOCKED** **Error 3** Signal from microswitch which detects when the door is locked absent at program start.	- Door not locked.	- Test whether door really locked.
	- Fault in door lock switch or in wiring faulty.	- Open the door and switch off power to machine. Wait a minute or so, switch on power supply ,close door again and try restarting. - Check wiring or replace door lock as appropriate.
	- The PCB is faulty.	- Replace PCB.
NTC LOW TEMP. **Error 4** Temperature sensor indicating a temperature below lowest allowable value.	- This suggests open circuit (continuity fault) in sensor or wiring.	- Check the wiring temperature sensor and replace as appropriate.
	- Temperature sensor faulty.	- Replace temperature sensor.
	- Fault in temperature sensing device on CPU PCB.	- Replace PCB.

Error/Function	Cause	Action
NTC HIGH TEMP. **Error 5**		
Temperature sensor indicating a temperature above highest allowable value.	- This suggests short-circuit in sensor or wiring.	- Check the wiring temperature sensor and replace as appropriate.
	- Temperature sensor faulty.	- Replace temperature sensor.
	- Temperature detection function on CPU PCB faulty.	- Replace PCB.
WATER IN DRUM **Error 6**		
The water level is higher than the EMPTY level at start of program.	- Waste water collector might be blocked.	Clean waste water collector.
	- Drain valve or wiring faulty.	- Check drain valve functioning.
	- Level tube probably blocked.	- Clean or replace level tube. Clean connection of the water level control device.
	- Level detection function on CPU PCB faulty.	- Replace PCB.
	- Air vent blocked.	- Clean air vent.
MACHINE OVERFILLED **Error 7**		
The water level is above the set safety level during program operation or manual operation.	- Transient fault or water has been added manually.	- Drain machine then restart a program or change the level in the manual program.
	- Electrovalves are faulty.	- Check function of electrovalves.
	- Level detection function on CPU PCB faulty.	- Replace PCB.
NO HEATING **Error 8**		
Rate of temperature incease in water slower than minimum value allowed.	- Bad water seal of the drain valve.	- Check water seal of the drain valve.
	- Elements faulty.	- Switch off power supply at wall switch. Measure resistance of elements to see if any element is faulty (open circuit).
		- Replace faulty element.
	- Leak at water supply.	- Check seals of water electrovalves.
	- Fault in wiring between contactor and element(s) or heating contactor faulty.	- Check wiring and replace the heating contactor.
	- Temperature detection function on CPU PCB faulty.	- Replace PCB.
NOT DRAINED **Error 10**		
The water level is higher than the EMPTY level after drain sequence.	- Programmed drain time too short.	- Increase drain time.
	- Level tube probably blocked.	- Clean or replace level tube. Clean connection of the water level control device.
	- Drain valve or wiring faulty.	- Check drain valve functioning.
	- Level detection function on CPU PCB faulty.	- Replace PCB

Error/Function	Cause	Action
UNBAL SENSOR FAULT **Error 11**		
The unbalance safety device has been activated before spinning.	- The unbalance safety contact has been activated for at least 5 seconds during washing before a distribution. - The unbalance safety contact fautly or a suspension spring is broken. - Bad loading of machine.	- Turn the machine's wall switch off and check unbalance safety contact. - Check suspension. - Correctly load the drum or put linen in several nets.
NO INVERTER COMM. **Error 13**		
Communication between PCU and frequency converter interrupted or disturbed.	- Transient fault. No action required. - Frequency converter faulty.	- Turn the machine's wall switch off and on again. Start a program. - Check the frequency converter.
LEVEL CALIBRATION **Error 14**		
The water level system has not been correctly calibrated.	- If the level system has not been calibrated at thefactory the error message will appear for five seconds immediately after every program start-up. The machine can be operated, but the levels will be slightly wrong, mostly too low.	- Carry out programming anew and make sure the calibration values are within the allowed limits.
EMERGENCY STOP **Error 15**		
The emergency stop button has been pressed.	- Abnormal or dangerous running of the machine.	- After the problem which caused the emergency stop has been put right, reset the emergency stop button by turning it until it pops back out. - Check wiring.
DOOR LOCK **Error 17**		
signal absent from door status switch, although door is locked.	- Transient fault. No action required. - Fault in door lock switch or in wiring faulty. - The PCB is faulty.	- Check if the door is locked. - Open the door and switch off power to machine. Wait a minute or so, switch on power supply, close door again and try restarting. - Check wiring or replace door lock as appropriate. - Replace PCB.
START NOT ALLOWED **Error 18**		
The network does not allow start of washing programme.	.	- Try to reset the error code. If the error remains, contact the responsible person for the network and have the error fixed.

Operating incidents	Cause	Action
CMIS COMMUNICATION **Error 19**		
Machine has lost contact with network.	- Communication between the programme unit card A1 and the network has been interrupted.	- Verify that the cable between the network and X7 on programme unit card A1 is connected. If the cable is properly connected, contact the person responsible for the network.
TACHO **Error 20**		
The motor controller does not receiving an interlock signal during programme operation.	- Fault in MCU receiving circuitry for lock acknowled-gement signal. The test of the MCU-interlock circuits proceeds in the following way: Before the locking of the door lock a speed command is sent from the ti-mer to the MCU (=0 Hz). Then the timer checks that the value of the apparent current (ru 15) and output (ru 20) is below the value 5, which is a condition for locking the door. When the door is locked the timer again command running at 0 Hz and this time the apparent current and the output voltage shall have a value above 5.	- Switch off the machine for at leas 30 seconds to ensure the motor controller has been completely reset. Then try to start the machine again.
I/O COMM ERROR **Error 21**		
Communication between the CPU board and one of the I/O boards disturbed or lost.	- Transient fault. No action required. - The PCB is faulty.	- Turn the machine's wall switch off and on again. Start a program. - Replace PCB.
PHASE **Error 23**		
Incorrect input voltage to external equipment.	- An input on I/O card 1 (X16:7-8) can be connected to external equipment that monitors received mains signals in terms of voltage levels, loss of phase, etc. If this input goes high, the error message is displayed.	- Find out the reason for the error indication by inspecting the mains monitoring equipment
LEVEL OFFSET **Error 27**		
The pressure sensor for the water level signals a value that is so different from the empty machine state that the automatic level calibration cannot adjust the level system.	.	- Try to restart the machine (i.e. reset the error code) by pressing START.
MOTOR TOO HOT **Error 40**		
The frequency converter has detected a high temperature of the motor.	- The motor's fan does not cool down anymore. - Internal fault in motor causing high temperature.	- Check the direction of rotation of the fan. - Clean the grid of the fan. - Replasse the fan. - Replace the motor.

Operating incidents	Cause	Action
TANGLING OF THE LINEN		
The mechanical action during washing can lead to the tangling of large pieces such as bed sheets or table cloths.	- Bad programming options can be responsible of this matter : - too long washing cycle - washing without detergents - exagerated time of programming - too many rinses - heating time at low level too long - rotation with no water (levels control too long) - washing at reduced speed or too long rotation cadence - textil embedded with limestone or detergent	- Avoid mechanical action with no water. - Avoid fillings and drain at no rotation. - Use a softener at last rinse. - Optimize programming. - Verify incrustation rate of linen.

Error	Meaning	Possible cause
Displayed advertisement : **KEB ERROR 31 EOP** Error overvoltage.	- Voltage in the DC-link circuit too high.	- Poor controller adjustment (overshooting), input voltage too high, interference voltages at the input, deceleration ramp too short, braking resistor defective or too small.
Displayed advertisement : **KEB ERROR 32 EUP** Error underpotential.	- Occurs, if DC-link voltage falls below the permissible value.	- Input voltage too low or instable, inverter rating too small, voltage losses through wrong cabling, the supply voltage through generator/transformer breaks down at very short ramps, E.UP is also displayed if no com-munication takes place between power circuit and control card, jump factor (Pn.56) too small, if a digital input was programmed as external error input with error message E.UP (Pn.65)
Displayed advertisement : **KEB ERROR 33 EUPH** Error phase failure.	- One phase of the input voltage is missing (ripple-detection).	.
Displayed advertisement : **KEB ERROR 34 EOC** Error overcurrent.	- Occurs, if the specified peak current is exceeded	- Acceleration ramps too short, the load is too big at turned off acceleration stop and turned off constant current limit, short-circuit at the output, ground fault, deceleration ramp too short, motor cable too long, EMC, DC brake at high ratings active.
Displayed advertisement : **KEB ERROR 36 EOHI** Error overheat internal.	- Overheating in the interior : error can only be reset at E.nOHI, if the interior temperature has dropped by at least 3°C.	.
Displayed advertisement : **KEB ERROR 37 ENOHI** No Error overheat internal.	- No longer overheating in the interior E.OHI, interior temperature has fallen by at least 3°C.	.
Displayed advertisement : **KEB ERROR 38 EOH** Error overheat pow. mod.	- Overtemperature of power module. Error can only be reset at E.nOH.	- Insufficient air flow at the heat sink (soiled), ambient temperature too high, ventilator clogged.
Displayed advertisement : **KEB ERROR 39 EDOH** Error drive overheat.	- Overtemperature of motor PTC. Error can only be reset at E.ndOH, if PTC is again low-resistance.	- Resistance at the terminals T1/T2>1650 Ohm, motor overloaded, line breakage to the temperature sensor.

Error	Meaning	Possible cause
Displayed advertisement : **KEB ERREUR 41 ENDOH** No Error drive overheat.	- Motor temperature switch or PTC at the terminals T1/T2 is again in the normal operating range. The error can be reset now.	.
Displayed advertisement : **KEB ERREUR 42 EPU** Error power unit.	- Software version for power circuit and control card are different. Error cannot be reset.	.
Displayed advertisement : **KEB ERROR 44 EPUIN** Error power unit invalid.	- Les softwares de la carte de puissance et de commande sont incompatibles. L'erreur ne peut pas être remise à zéro.	.
Displayed advertisement : **KEB ERROR 45 ELSF** Error load shunt fault.	- Load-shunt relay has not picked up, occurs for a short time during the switch-on phase, but must automatically be reset immediately.	- Load-shunt defective, input voltage wrong or too low, high losses in the supply cable, braking resistor wrongly connected or damaged, braking module defective.
Displayed advertisement : **KEB ERROR 46 EOL** Error overload.	- Overload error can only be reset at E.nOL, if OL-counter reaches 0% again. Occurs, if an excessive load is applied longer than for the permissible time.	- Poor control adjustment (overshooting), mechanical fault or overload in the application, inverter not correctly dimensioned, motor wrongly wired, encoder damaged
Displayed advertisement : **KEB ERROR 47 ENOL** No Error overload.	- No more overload, OL-counter has reached 0%. After the error E.OL, a cooling phase must elapse. This message appears upon completion of the cooling phase. The error can be reset. The inverter must remain switched on during the cooling phase.	.
Displayed advertisement : **KEB ERROR 48 EBUS** Error bus.	- Ajusted monitoring time (watchdog) of communication between operator and PC/ operator and inverter has been exceeded.	
Displayed advertisement : **KEB ERROR 49 EOL2** Error overload 2.	- Occurs if the standstill constant current is exceeded. The error can only be reset if the cooling time has elapsed and E.nOL2 is displayed.	.
Displayed advertisement : **KEB ERROR 50 ENOL2** No Error overload 2.	- The cooling time has elapsed. The error can be reset.	

Error	Meaning	Possible cause
Displayed advertisement : **KEB ERROR 51 EEEP** Error EEPROM defective.	- After reset the operation is again possible (without storage in the EEPROM).	
Displayed advertisement : **KEB ERROR 52 EPUCO** Error power unit commun.	- Parameter value could not be written to the power circuit. Acknowledgement from PC<>OK.	.
Displayed advertisement : **KEB ERROR 53 SBUS** Error bus synchron.	- Synchronization over sercos-bus not possible. Programmed response : «Error, restart after reset».	.
Displayed advertisement : **KEB ERROR 60 EOH2** Error motor protection.	- Electronic motor protective relay has tripped.	
Displayed advertisement : **KEB ERROR 61 EEF** Error external fault.	- External error. Is triggered, if a digital input is being programmed as external error input and trips.	.
Displayed advertisement : **KEB ERROR 62 ENC** Error encoder.	- Cable breakage of encoder at encoder interface.	- Encoder temperature is too high, speed is too high, encoder signals are out of specification, encoder has an internal error.
Displayed advertisement : **KEB ERROR 63 EPFC** Error power factor control.	- Error in the power factor control.	. .
Displayed advertisement : **KEB ERROR 66 ENOH** No Error over heat pow. mod.	- Temperature of the heat sink is again in the permissible operating range. The error can be reset now.	
Displayed advertisement : **KEB ERROR 69 ESET** Error set.	- It has been attempted to select a locked parameter set. Programmed response : «Error, restart after reset».	.
Displayed advertisement : **KEB ERROR 76 EPRF** Error prot. rot. for.	- The drive has driven onto the right limit switch. Programmed response : «Error, restart after reset».	

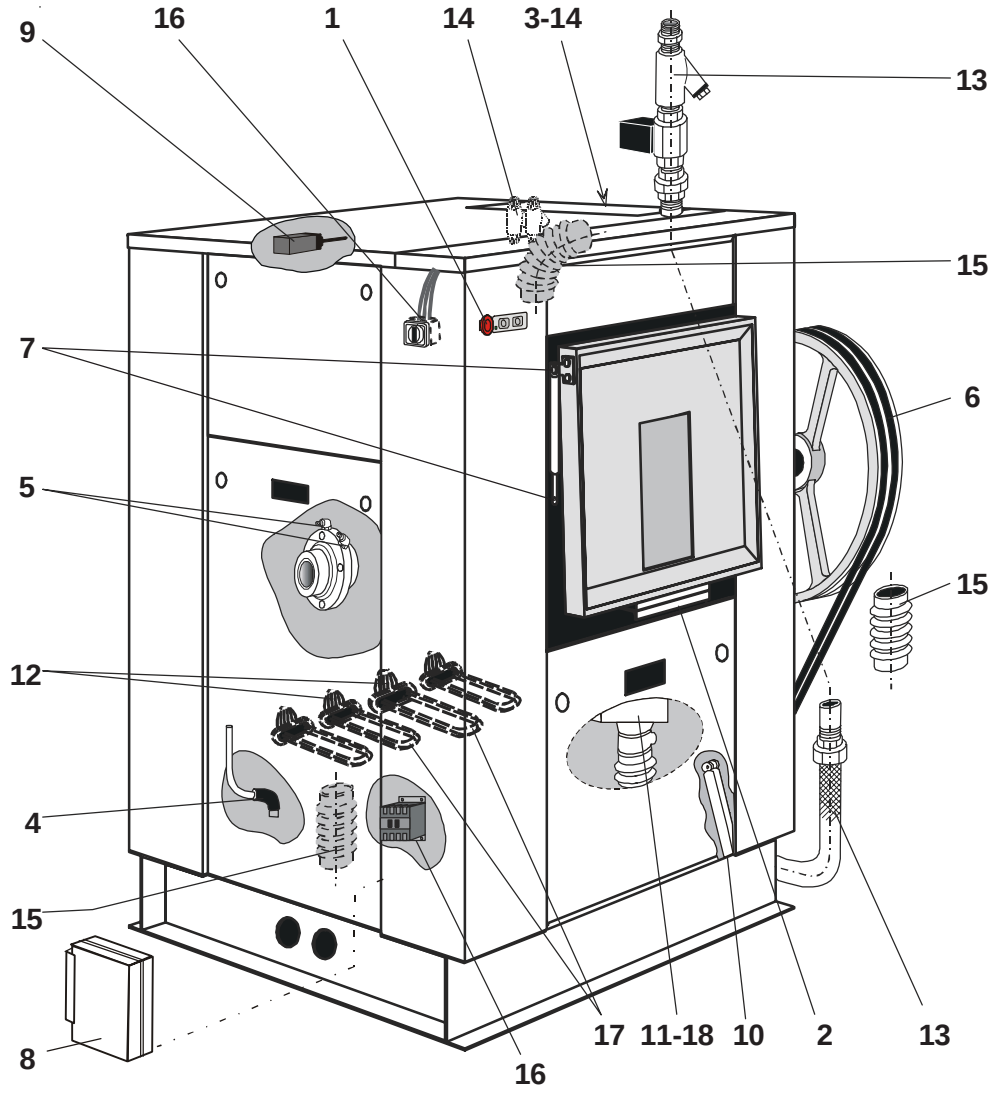
Error	Meaning	Possible cause
Displayed advertisement : **KEB ERROR 77 EPRR** Error prot. rot. rev.	- The drive has driven onto the left limit switch. Programmed response : «Error, restart after reset».	.
Displayed advertisement : **KEB ERROR 79 EPUCI** Error pow. unit code inv.	- During the initialization the power circuit could not be recognized or was identified as invalid.	.
Displayed advertisement : **KEB ERROR 80 EPUCH** Error power unit changed.	- Power circuit identification was changed. With a valid power circuit this error can be reset by writing to SY.3. If the value displayed in SY.3 is written, only the power-circuit dependent parameters are reinitialized. If any other value is written, then the default set is loaded. On some systems after writing SY.3 a Power-On-Reset is necessary.	.
Displayed advertisement : **KEB ERROR 81 EDRI** Error driver relay.	- Relay for driver voltage on power circuit has not picked up even though control release was given.	
Displayed advertisement : **KEB ERROR 82 EHYB** Error hybrid.	- Invalid encoder interface identifier	
Displayed advertisement : **KEB ERROR 83 EIED** Error input error detect.	- Error at PNP/NPN switching or input failure.	
Displayed advertisement : **KEB ERROR 84 EC01** Error counter overrun 1.	- Counter overflow encoder channel 1.	
Displayed advertisement : **KEB ERROR 85 ECO2** Error counter overrun 2.	- Counter overflow encoder channel 2.	
Displayed advertisement : **KEB ERROR 86 EBR** Error brake.	- This error can occur in the case of switched on brake control.	- The load is below the minimum load level (Pn.43) at start up or the absence of an engine phase was detected. - The load is too high and the hardware current limit is reached.

Error	Meaning	Possible cause
Displayed advertisement : **KEB ERROR 87 EINI** Error initialisation MFC.	- MFC not booted.	
Displayed advertisement : **KEB ERROR 88 EOS** Error over speed.	- Real speed is bigger than the max. output speed.	
Displayed advertisement : **KEB ERROR 89 EHYBC** Error hybrid changed.	- Encoder interface identifier has changed, it must be confirmed over ec.0 or ec.10.	
Displayed advertisement : **KEB ERROR 90 ECDD** Error calc. drive data.	- During the automatic motor stator resistance measurement.	

CAUTION

Complete the washing cycle, unload the machine and shut off the power supplies (water, gas, electricity, steam) before any maintenance or repair intervention is carried out.

Maintenance



Daily (8 H.)

1 Check that the "emergency stop button" works properly.

2 Check that the opening safety devices of the drum doors and of the outer doors are working correctly.

3 Clean the soap box (operate the rinse electrovalve of soap box).

Monthly (170 H.)

4 Clean the water level and connections on the drain valve (do not blow in the pipe towards the CPU).

5 Grease the drum bearings (two greasing points on per bearing). Use an appropriate pump and grease, avoid brutal injections. Use lithium soap grease, drop point 190°C (374°F) and penetration 250/300 (see lubrication table in the following pages).

6 Check that the belts are clean and tightened. Clean the drum pulley.

7 Lubricate gas suspension door hinges with aerosol spray-on grease.

8 Clean the converter air vent with suction device. Increase the cleaning times frequency to the dirtying.

Every three months (500 H.)

9 Check that the unbalance switch works correctly: the machine should stop when the switch is manually driven.

10 Visually check the shock absorbers.

11 Remove and clean the drain.

Every six months (1000 H.)

12 Check the connections of the heating elements (for electric heating).

13 Check the steam heating pipes: aspect and connecting points. Clean the filter (for steam heating).

14 Check the water inlet pipes: aspect and connecting points. Clean the valve filters.

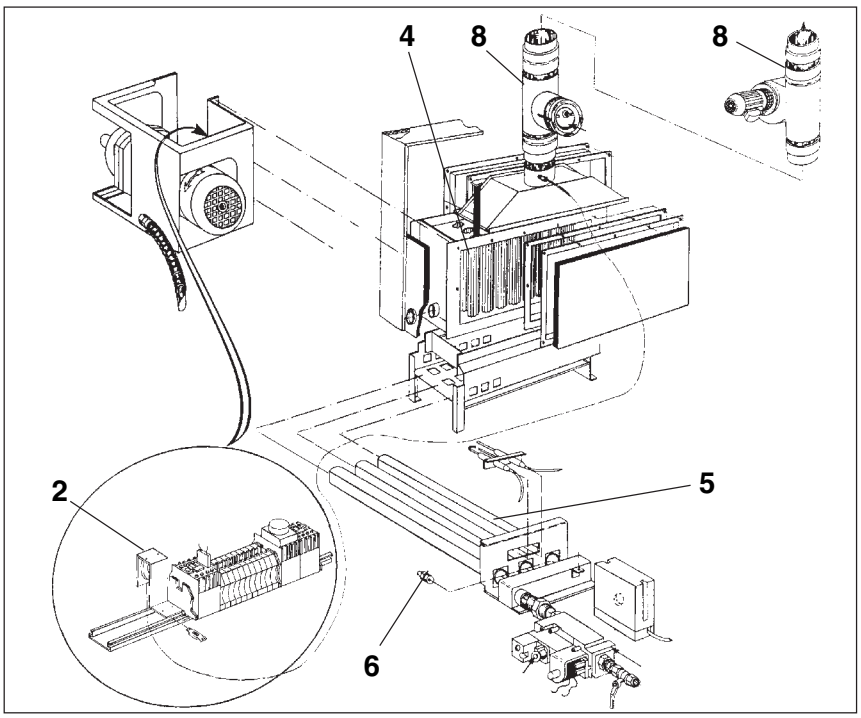
15 Check the bellows: aspects and choke collar.

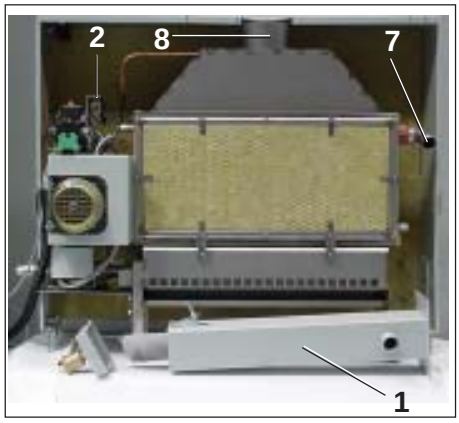
16 Check that the electrical connection are correctly tightened as well on the main switch than on the electric elements contactor.

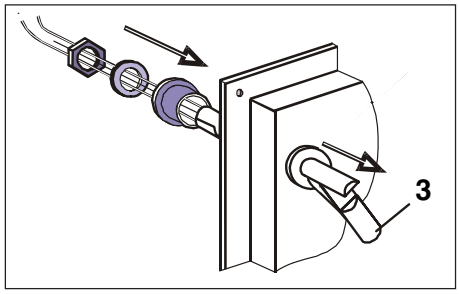
17 Remove the scale of the heating elements using the right chemical. Adapt this operation according to your need (water hardness).

18 Grease the thread of the thrust cone on the drain and the return spring.

Gas exchanger







Daily (8 H.)

1 Clean the pump filter of the heating box on the gas exchanger.

Weekly (40 H.)

1 Clean the fluff filter with suction device.
1 Clean the cover filter with suction device.

Monthly (170 H.)

2 Check the pressure switch.
3 Check that the water level detector properly operates.
4 Check the pipes of the heating rack. Clean if necessary. The frequency of your visits should depend on the degree of deposits.

Nota : the gas exchanger never completely drains from its water ; because the position of the machine's connections are higher than the exchanger's.
Every month, it is then necessary to run a special scaling program (antiliming) with a rinse making sure that the circulation pump runs, i.e. : with a scheduled temperature.

Maintenance of the gas exchanger

a) Carry out a scaling cycle : the dosage will depend on product used.
Example : Horolith C
- dose : 5 % per litre of water
- cycle length : 5-10 min at washing speed at 60°C (140°F)

b) Carry out 2 cold rinses for 5 minutes at high level.

Every six months (1000 H.)

5 Clean the pipe burners.
6 Check the gas pressure on injectors.
7 Check the condition of the pipes between the gas exchanger and the washer.

Every year (2000 H.)

8 Sweep the smoke tubes of the heating box and the exhaust pipes of burnt gas.

CAUTION

To ensure that your machine gives the very best service, please take care that maintenance is carried strict accordance with the instructions above mentioned.

Frictional electricity

Some textiles may generate frictional electricity causing damages when calendering. In most cases, this can be avoided by using at the last rinse a softener with an antistatic agent.

Example :
Colgate Palmolive : Soupline Absolue, Program Pro Soft, Program Pro DNA
Ecolab : gamme BOSIT, gamme ELPA, gamme SOFTENIT, turbo neutrasoft (CEE)
Johnson Diversey: CLAX soft, CLAX kombi citric, CLAX Bactisoft, Delingyl, DIVERTEX 6AL1
JONPRO Soft, JONPRO Soft hygiène
Cajoline

Chlorine

Chlorine introduced in a rinsing bath at a temperature of more than 40°C (104°F) affects stainless steel.
The chlorometric degree should be between 47° and 50°.
(1° chlorometric degree corresponds to 3.17 g (0.11 oz) of active chlorine).
The chlorine concentration should not exceed the ratio indicated, or the stainless steel may be affected. Check the concentration ratio of your products.
The javellization should be of 10 to 15 cm^3 / kg (0.28 to 0.42 cu in/lb) of linen.

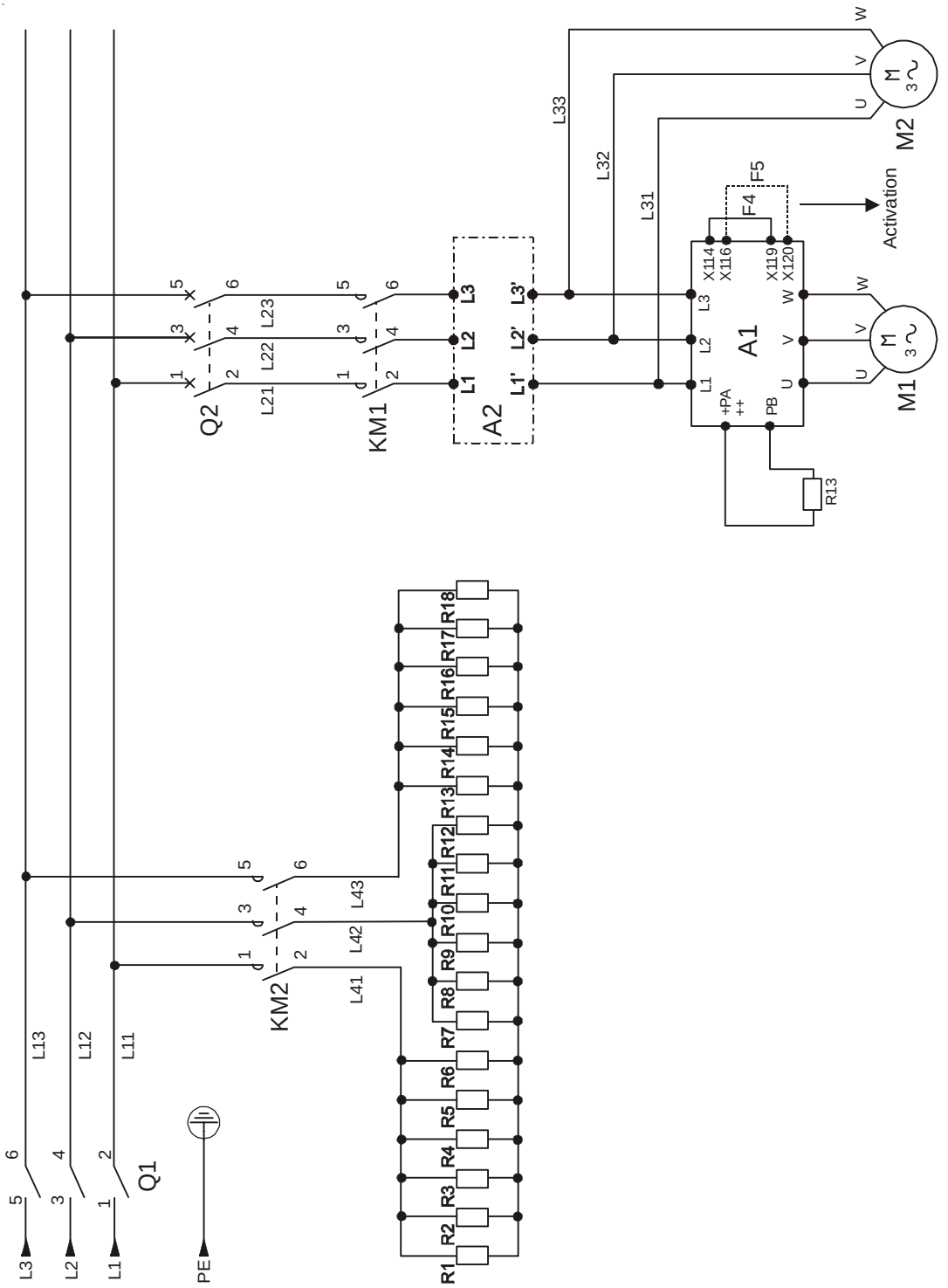
Colorants

Do not input colorant in the machine with very hot water. Very hot water react with the colorant, which creates a very corrosive solution. The colorants must be input with cold water or warm water which temperature doesn't exceed 50°C (122°F).

LUBRIFICATION TABLE

	USES	Rolling bearings Bearings	Rolling bearings Bearings hight temperature	Assembly paste (fretting corrosion)	Bare gears Chains shafts Thread Slides	Flange joints Union pipes Steam circuits	Reducers with wheels and screws	Reducers with gears	Circuits and pneumatic devices
	TYPES OF LUBRICANTS AND STANDAR-DIZATION	Lithium soap grease	Lithium soap grease + silicone oil	Lithium soap paste + mineral oil + mineral solid greases	Lithium soap grease with MOS2 additive	Graphite grease mini 60% graphite, special leakproof	Extreme hight pressure oil	Extreme hight pressure oil	Inhibited oil SAE5
		Grade ISO NLGI2	Grade ISO NLGI3	Grade ISO NLGI1	Grade ISO NLGI2	Grade ISO NLGI2	Grade ISO VG150	Grade ISO VG220	Grade ISO VG22
	TEMPERATURE LIMIT RANGE	-20°C + 140°C	-40°C + 200°C	-20°C + 150°C	-20°C + 135°C	-30°C + 700°C	0°C + 100°C	0°C + 120°C	+10°C + 65°C
	RECOMMENDED	ALVANIA R2	**NTN SH44 M**	ALTEMP Q NB 50	MI-SETRAL 43N	GRACO AF 309	**REDUCTELF SP150**	**REDUCTELF SP200**	LUBRAK ATL SAE 5W
	CODE PRODUCT	96 011 008	-	96 011 014	96 011 000	96 011 004	96 010 001	96 010 004	96 010 030
CORRESPONDENCE	ANTAR	ROLEXA 2			EPOXA MO 2		EPONA Z 150	EPONA Z 220	MISOLA AH
	BP	LS EP 2					ENERGOL CRXP 150	ENERGOL CRXP 220	SHF 22
	CASTROL	SPEEROL EP2					ALPHA SP 150	ALPHA SP 220	
	ELF	EP2			STATERMA MO10		REDUCTELF SP150	REDUCTELF SP220	SPINEF 22
	ESSO	BEACON EP2			MULTI PURPOSE GREASE MOLY		SPARTAN EP150	SPARTAN EP220	SPINESSO 22
	FINA	MARSON EP2					GIRAN SR150	GIRAN SR220	
	GBSA					BELLEVILLE N			
	GRAFOIL					GRACO AF 309			
	KLUBER	CENTOPLEX 2	UNISILKON L50Z	ALTEMP Q.NB50	UNIMOLY GL82	WOLFRACOAT C	LAMORA 150	LAMORA 220	CRUCOLAN 22
	MOBIL	MOBILUX					MOBILGEAR 629	MOBILGEAR 630	DTE 24
	KERNITE	LUBRA K LC			LUBRA K MP		TOP BLENB ISO 80W90	TOP BLENB ISO 220	LUBRA K ATL SAE5W
	SETRAL				MISETRAL 43N				
	SHELL	**ALVANIA R2**			RETINA AM		OMALA 150	OMALA 220	TELLUS 22
	TOTAL	MULTISS EP2					CARTER EP150	CARTER EP220	EQUIVIS 22
	MOLYKOTE		MOLYCOTE 44	PATE DX					
	OPAL	GEVAIR SP			SUPER MOS 2		GEAROPAL GM 65 ISO 150	GEAROPAL GM 75 ISO 220	HYDROPAL HO 110 HM++22
	ITECMA	GRL-ULTRA	VULCAIN	SILUB-P	GMO	LHT-C	DURAGEAR BL	DURAGEAR BL	AEROSYN
	DOW CORNING		SH 44 N						

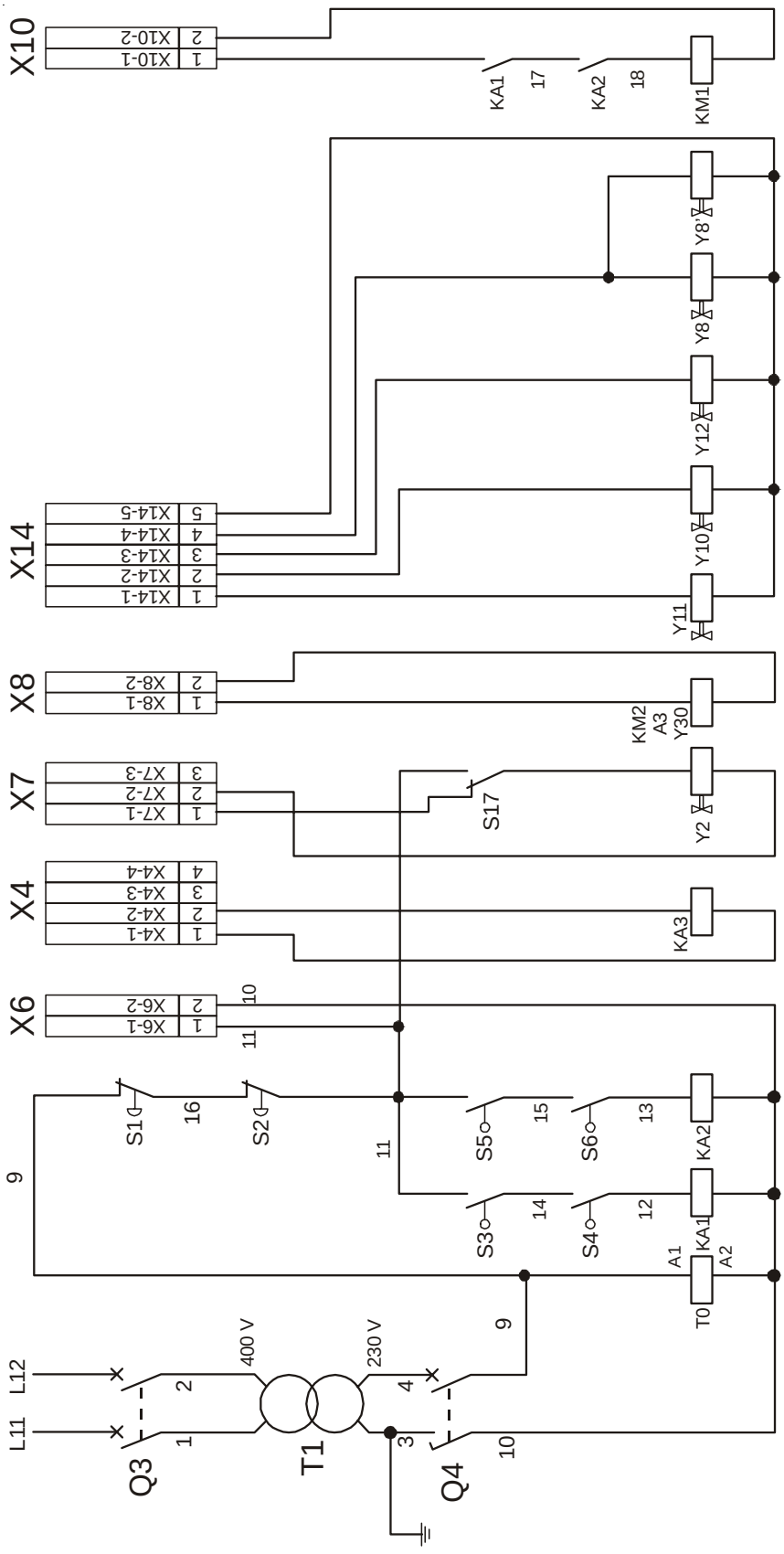
15. Electric diagrams



31100331

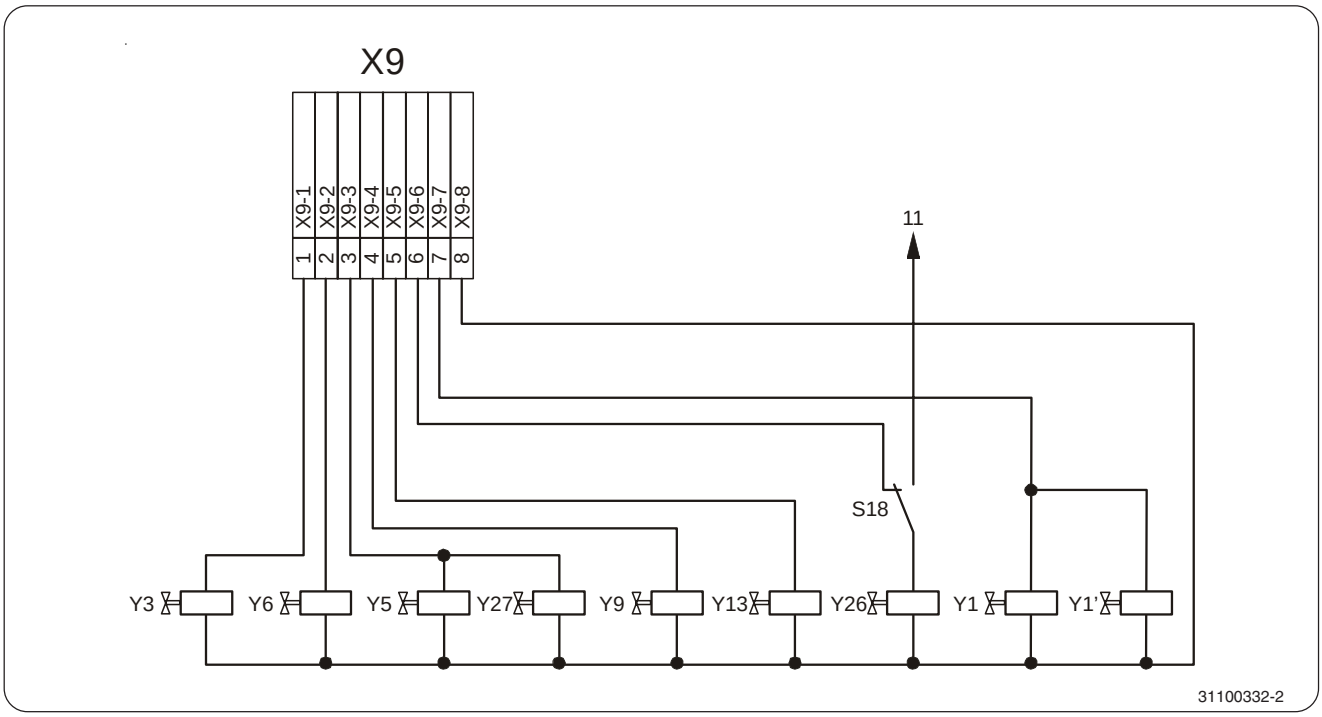
POWER CIRCUIT
All washer-extractor
Diagram no. 31100331

A1	Frequency converter
A2	Interference filter
Q1	Main switch
Q2	Motor breaker
KM1	Motion contactor
KM2	Heating contactor
R1-R2-R7-R8-R13-R14	Heating element (230)
R3-R9-R15	Heating element (340)
R4-R10-R16	Heating element (470)
R5-R6-R11-R12-R17-R18	Heating element (670)
R13	Braking resistor
M1	Motion motor
M2	Fan motor


X10
X10-2
X10-1
KA1
17
KA2
18
KM1
X14
X14-5
X14-4
X14-3
X14-2
X14-1
Y8'
Y8
Y12
Y10
Y11
X8
X8-2
X8-1
KM2
A3
Y30
X7
X7-3
X7-2
X7-1
S17
Y2
X4
X4-4
X4-3
X4-2
X4-1
KA3
X6
X6-2
X6-1
10
11
S1
16
S2
S5
15
S6
13
KA2
9
11
S3
14
S4
12
KA1
A1
A2
T0
L12
L11
400 V
230 V
9
2
1
4
3
10
Q3
T1
Q4
31100332-1

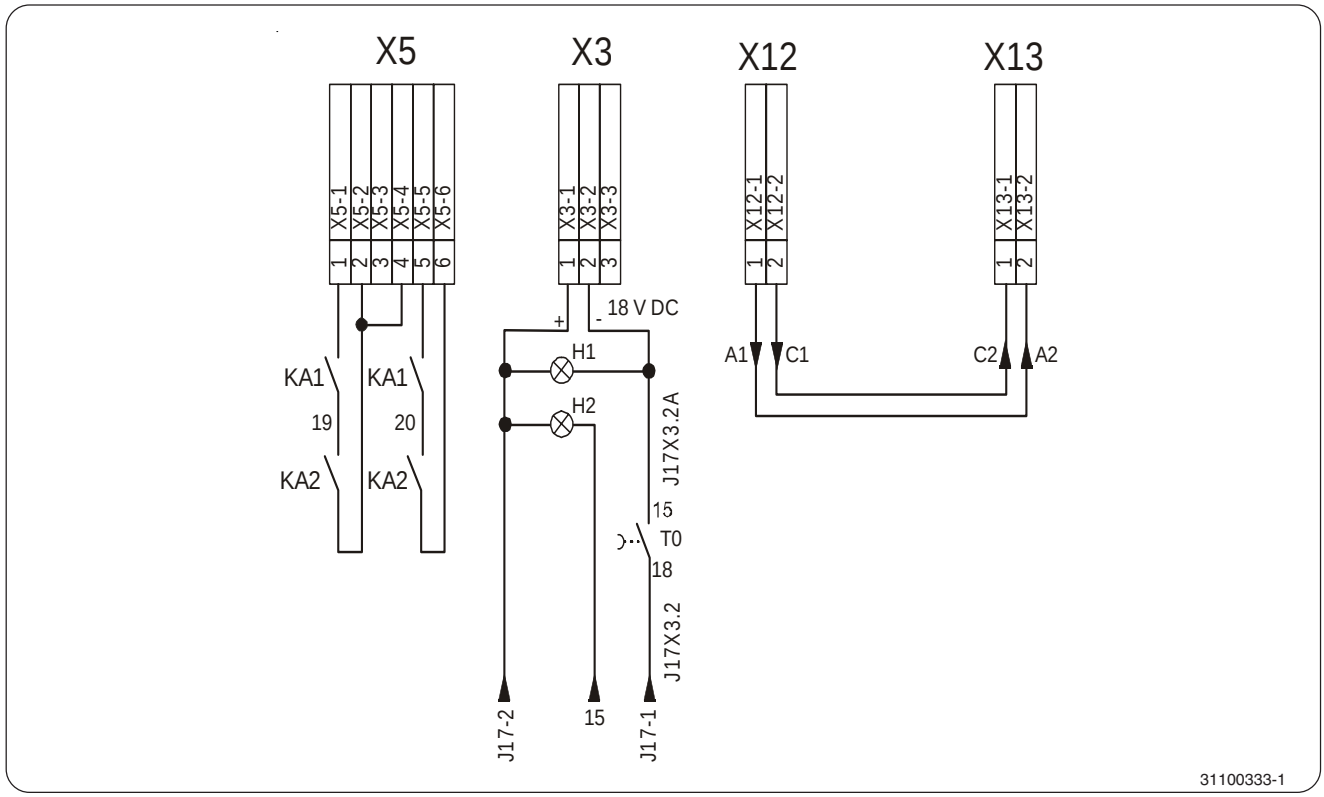
POWER CIRCUIT - PROGRAMMER OUTPUTS
All washer-extractor barrier types
Diagram no. 31100332-1

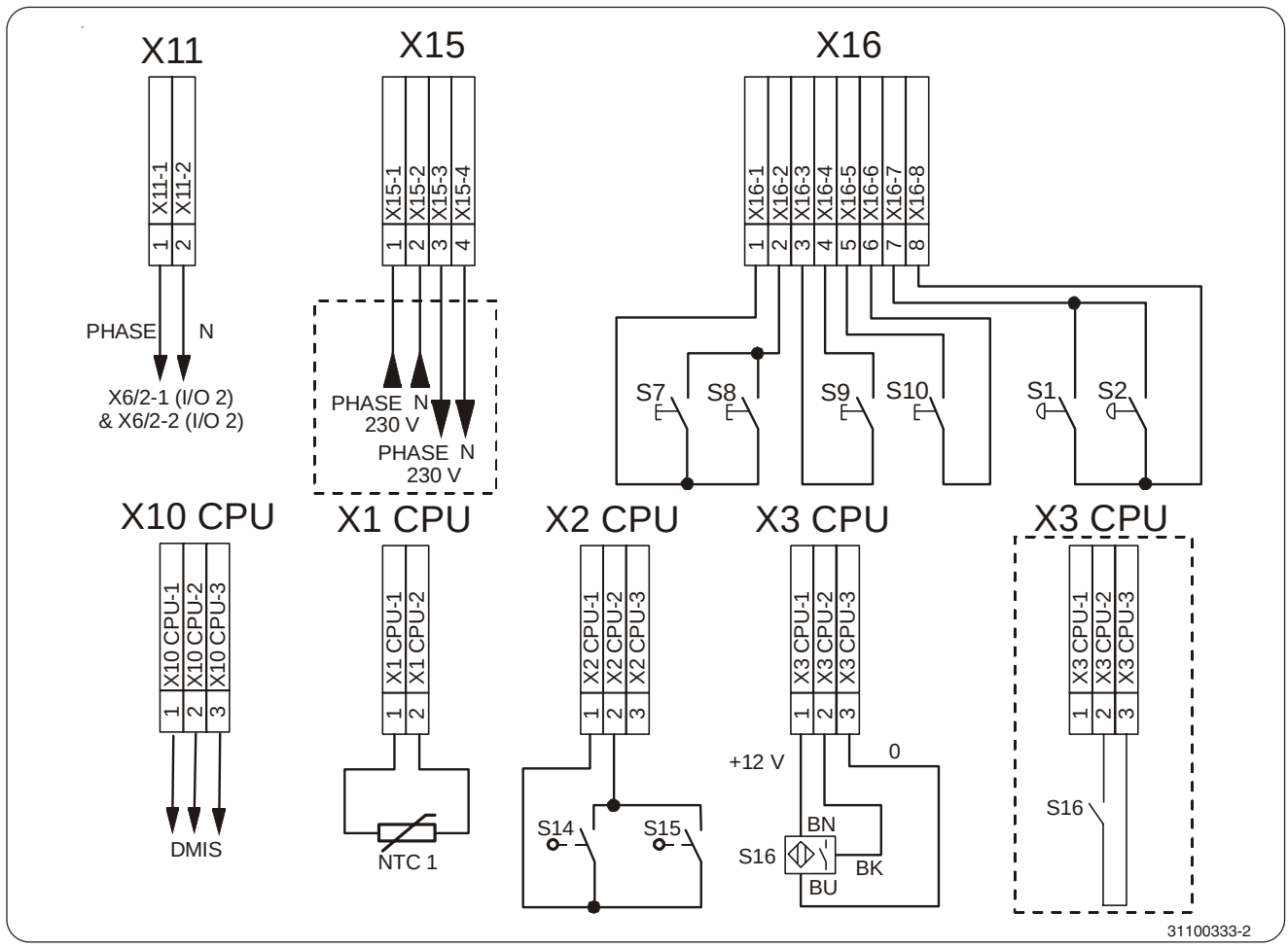
A3	Ignitor of gas exchanger
KA1	Unloading door lock relay
KA2	Loading door lock relay
KA3	Unloading indicator relay
KM1	Motion contactor
KM2	Heating contactor
Q3	Primary breaker
Q4	Secondary breaker
S1	Loading side emergency stop pushbutton
S2	Unloading side emergency stop pushbutton
S3	Loading side door switch
S4	Loading side door switch (670)
S5	Unloading side door switch
S6	Unloading side door switch (670)
S17	Manual drain pushbutton control
T1	Control circuit transformer
X4	End of cycle connector
X6	230 V supply connector
X7	Drain connector
X8	Heating connector
X10	Motion connector
X14	Products connector
X14	Loading door lock connector
Y2	Drain electrovalve
Y8	Loading door lock
Y8'	Loading door lock (670)
Y10	Liquid product no. 2 electrovalve
Y11	Liquid product no. 1 electrovalve
Y12	Liquid product no. 3 electrovalve
Y30	Steam electrovalve


X9
X9-1
X9-2
X9-3
X9-4
X9-5
X9-6
X9-7
X9-8
1
2
3
4
5
6
7
8
11
S18
Y3
Y6
Y5
Y27
Y9
Y13
Y26
Y1
Y1'
31100332-2

CONTROL CIRCUIT - PROGRAMMER OUTPUTS
All washer-extractor barrier types
Diagram no. 31100332-2

S18	Manual drain switch control (optional)
X9	Waters connector
X9	Unloading door lock connector
X9	Products connector
X9	Drain connector
Y1	Unloading door lock
Y1'	Unloading door lock (670)
Y26	Recycling water drain electrovalve (optional)
Y27	Detergents container rinsing electrovalve
Y3	Soft cold water electrovalve (optional)
Y5	Hard cold water electrovalve
Y6	Hot water electrovalve
Y9	Powder product no. 1 electrovalve
Y13	Powder product no. 2 electrovalve


X5
X3
X12
X13
X5-1
X5-2
X5-3
X5-4
X5-5
X5-6
X3-1
X3-2
X3-3
X12-1
X12-2
X13-1
X13-2
18 V DC
+
-
H1
H2
KA1
KA1
19
20
KA2
KA2
J17X3.2A
15
T0
18
J17X3.2
A1
C1
C2
A2
J17-2
15
J17-1
31100333-1

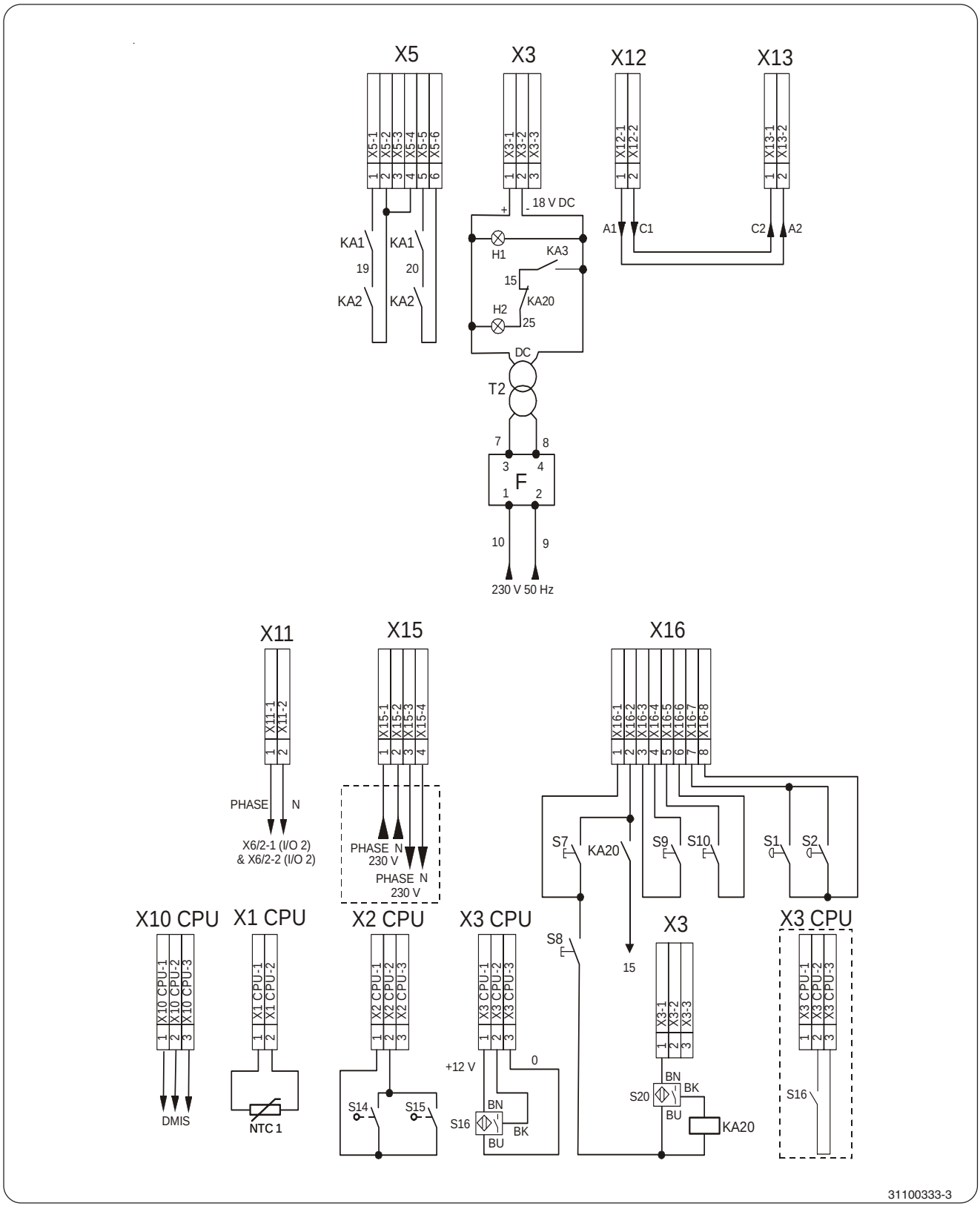

X11
X15
X16
X11-1
X11-2
X15-1
X15-2
X15-3
X15-4
X16-1
X16-2
X16-3
X16-4
X16-5
X16-6
X16-7
X16-8
PHASE
N
X6/2-1 (I/O 2)
& X6/2-2 (I/O 2)
PHASE N
230 V
PHASE N
230 V
S7
S8
S9
S10
S1
S2
X10 CPU
X1 CPU
X2 CPU
X3 CPU
X3 CPU
X10 CPU-1
X10 CPU-2
X10 CPU-3
X1 CPU-1
X1 CPU-2
X2 CPU-1
X2 CPU-2
X2 CPU-3
X3 CPU-1
X3 CPU-2
X3 CPU-3
X3 CPU-1
X3 CPU-2
X3 CPU-3
DMIS
NTC 1
S14
S15
+12 V
0
BN
S16
BK
BU
S16
31100333-2

CONTROL CIRCUIT - PROGRAMMER INPUTS/OUTPUTS
All washer-extractor barrier types

Diagram no. 31100333-1 & 2

F	Frequency converter interference filter
H1	Voltage indicator
H2	Possible unloading indicator
KA1	Loading door lock relay
KA2	Unloading door lock relay
KA3	Unloading indicator relay
NTC 1	Temperature probe
S1	Loading side emergency stop pushbutton
S2	Unloading side emergency stop pushbutton
S7	Loading side cage positioning puschbutton
S8	Unloading side cage positioning puschbutton
S9	Loading door opening pushbutton
S10	Unloading door opening pushbutton
S14	Left side unbalance switch
S15	Right side unbalance switch
S16	Cage stop control proximity detector
T2	Low-voltage transformer (fuse = 1,25 A-T)
X3	240 V supply connector
X5	Door connector
X11	Optional card no. 2 connector
X12	Shunt connector
X13	Shunt connector
X15	Connector to putting into service and pause by exterior signals (optional) X15-1 and X15-2 putting into service by servo-control X15-3 and X15-4 heating is halted
X16	Inputs connector : opening door pushbutton
X16	Inputs connector : cage positioning pushbutton
X16	Inputs connector : emergency stop pushbutton
X1 CPU	Inputs connector : temperature probe
X2 CPU	Inputs connector : unbalance
X3 CPU	Inputs connector : cage turn control
X10 CPU	Input connector : (DMIS) detergent proportioning system

15. Electric diagrams



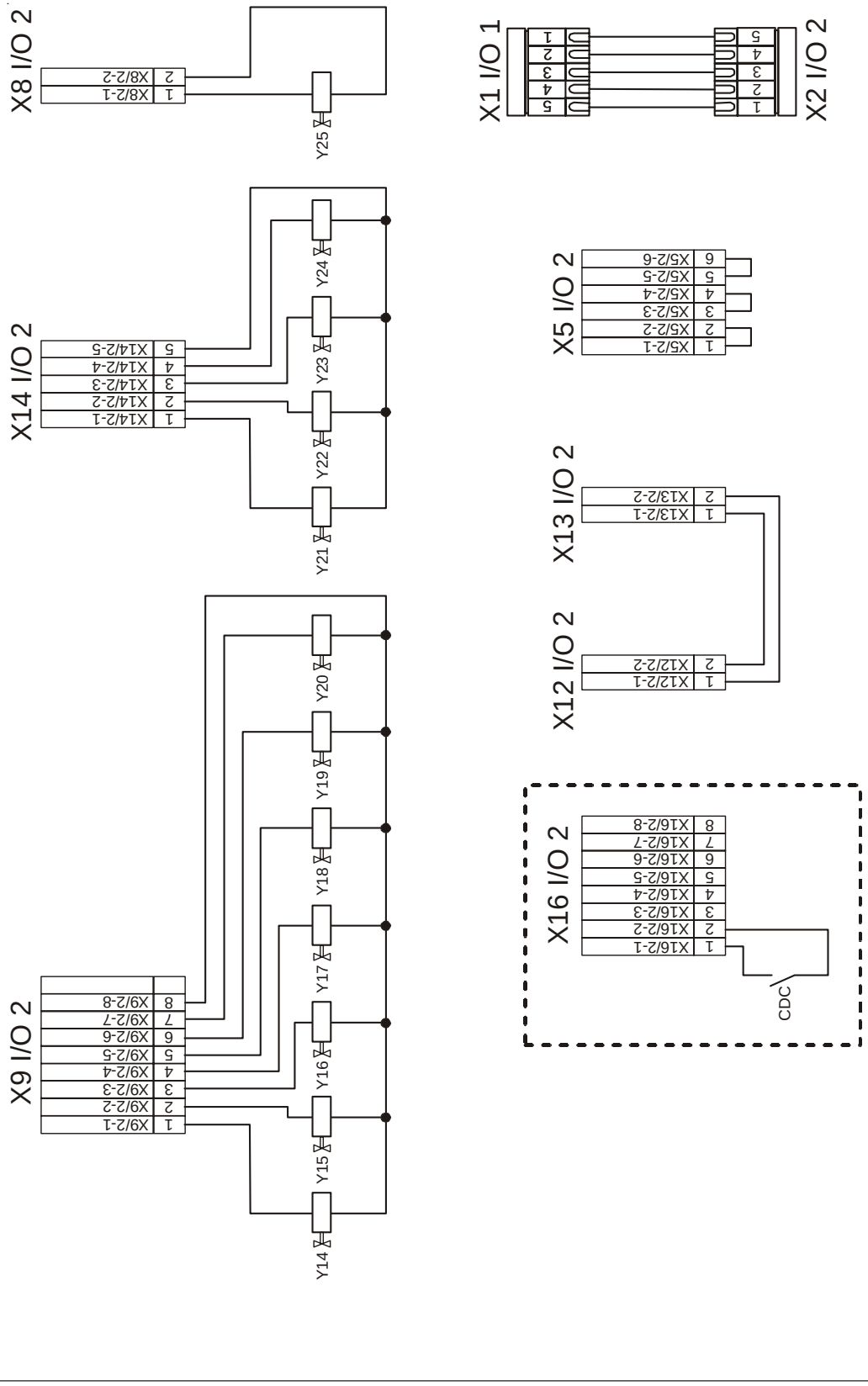
31100333-3

CONTROL CIRCUIT - PROGRAMMER INPUTS/OUTPUTS
All washer-extractor barrier types (clean room)

Diagram no. 31100333-3

F	Frequency converter interference filter
H1	Voltage indicator
H2	Possible unloading indicator
KA1	Loading door lock relay
KA2	Unloading door lock relay
KA3	Unloading indicator relay
KA20	Unloading side cage positioning relay
NTC 1	Temperature probe
S1	Loading side emergency stop pushbutton
S2	Unloading side emergency stop pushbutton
S7	Loading side cage positioning puschbutton
S8	Unloading side cage positioning puschbutton
S9	Loading door opening pushbutton
S10	Unloading door opening pushbutton
S14	Left side unbalance switch
S15	Right side unbalance switch
S16	Cage stop control proximity detector
S20	Unloading side cage positioning proximity detector
T2	Low-voltage transformer (fuse = 1,25 A-T)
X3	240 V supply connector
X5	Door connector
X11	Optional card no. 2 connector
X12	Shunt connector
X13	Shunt connector
X15	Connector to putting into service and pause by exterior signals (optional) X15-1 and X15-2 putting into service by servo-control X15-3 and X15-4 heating is halted
X16	Input connector : opening door pushbutton
X16	Input connector : cage positioning pushbutton
X16	Input connector : emergency stop pushbutton
X1 CPU	Input connector : temperature probe
X2 CPU	Input connector : unbalance
X3 CPU	Input connector : cage turn control
X10 CPU	Input connector : (DMIS) detergent proportioning system

15. Electric diagrams

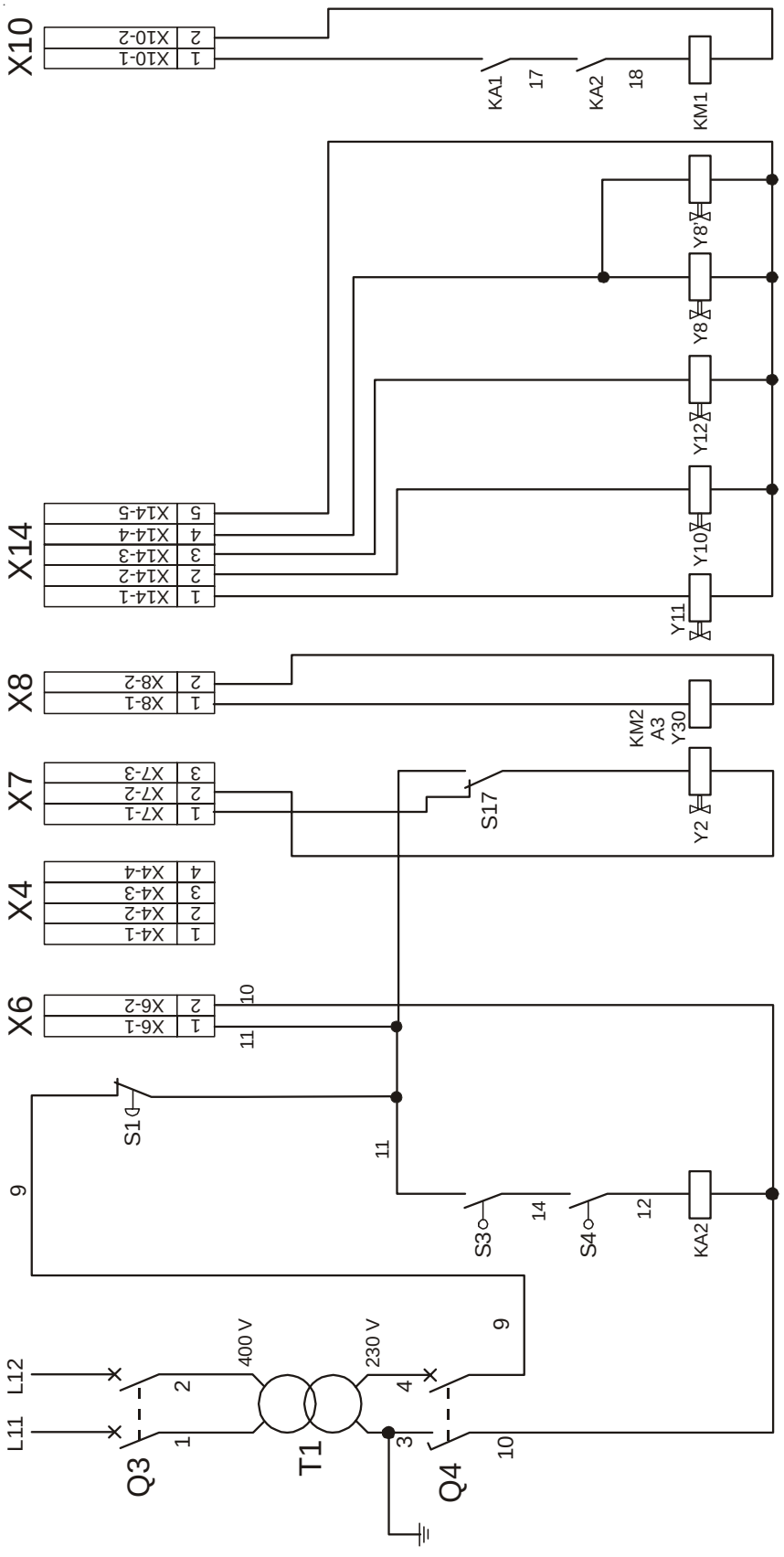


31100341

INPUTS / OUTPUTS CARD No. 2 (OPTIONAL)
All washer-extractor

Diagram no. 31100341

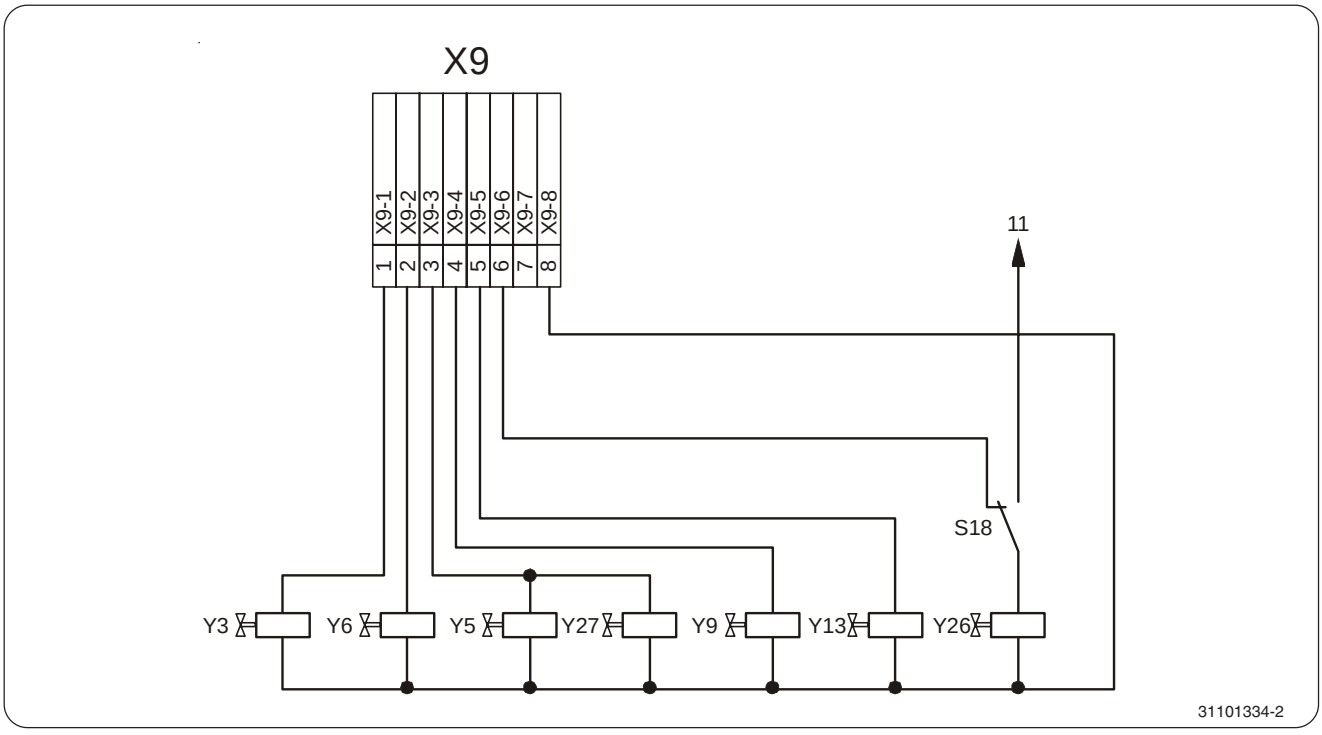
CDC	Frequency converter failure safty contact (if necessary)
X1 I/O 1 - X2 I/O 2	Card 1 & 2 connector
X5 I/O 2	Shunt connector
X8 I/O 2	Liquid products no. 13 electrovalve connector
X9 I/O 2	Liquid products no. 4 to 8 electrovalve connector and recycling water
X12 I/O 2	Shunt connector
X13 I/O 2	Shunt connector
X14 I/O 2	Liquid products no. 9 to 12 electrovalve connector
X16 I/O 2	Frequency converter failure safty contact connector (if necessary)
Y14	Recycling water no. 1 electrovalve
Y15	Recycling water no. 2 electrovalve
Y16	Liquid product no. 4 electrovalve
Y17	Liquid product no. 5 electrovalve
Y18	Liquid product no. 6 electrovalve
Y19	Liquid product no. 7 electrovalve
Y20	Liquid product no. 8 electrovalve
Y21	Liquid product no. 9 electrovalve
Y22	Liquid product no. 10 electrovalve
Y23	Liquid product no. 11 electrovalve
Y24	Liquid product no. 12 electrovalve
Y25	Liquid product no. 13 electrovalve


X10
X10-1
X10-2
KA1
17
KA2
18
KM1
X14
X14-1
X14-2
X14-3
X14-4
X14-5
Y8'
Y8
Y12
Y10
Y11
X8
X8-1
X8-2
KM2
A3
Y30
X7
X7-1
X7-2
X7-3
S17
Y2
X4
X4-1
X4-2
X4-3
X4-4
X6
X6-1
X6-2
10
11
S1
9
11
S3
14
S4
12
KA2
L12
L11
400 V
230 V
9
2
1
4
3
10
Q3
T1
Q4

31101334-1

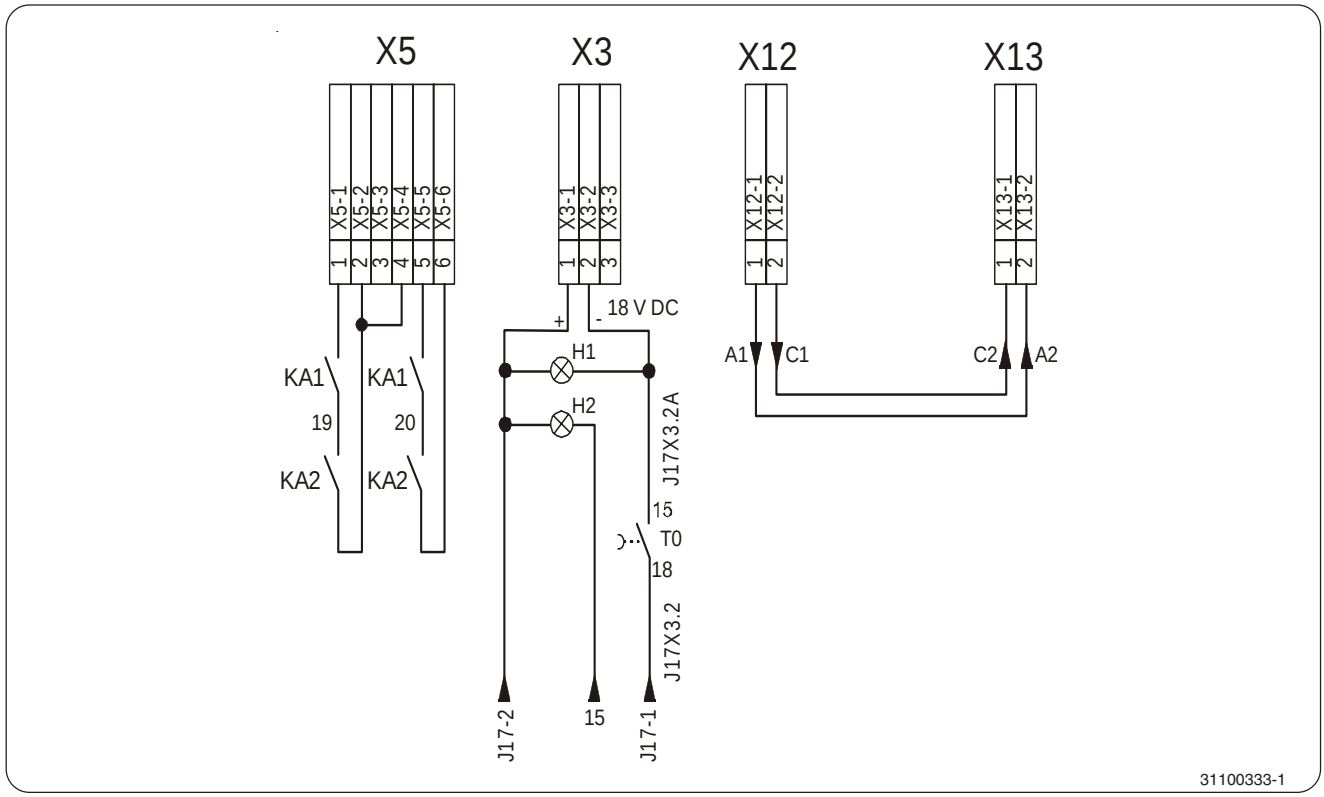
POWER CIRCUIT - PROGRAMMER OUTPUTS
All washer-extractor standard types
Diagram no. 31101334-1

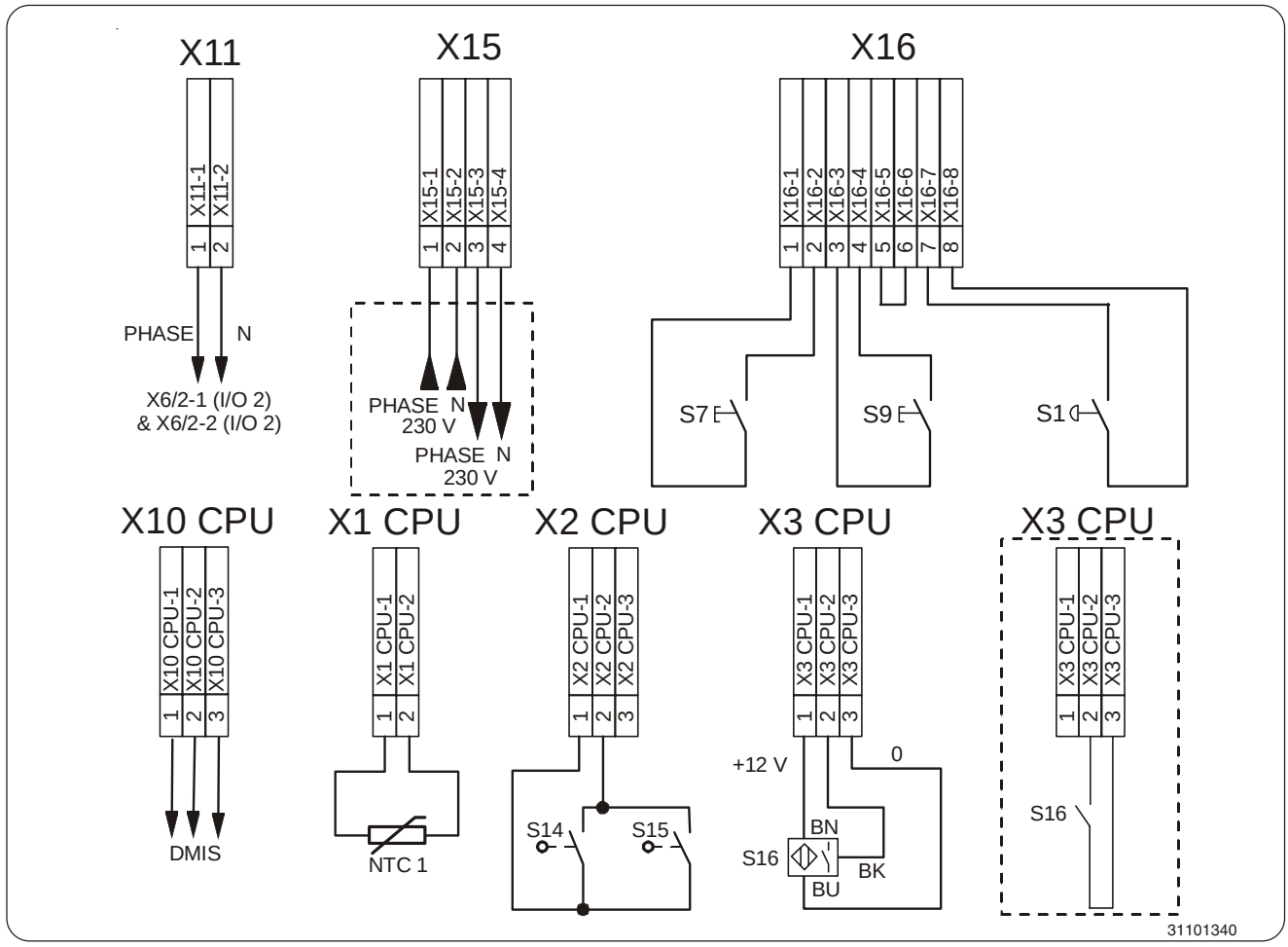
A3	Ignitor of gas exchanger
KA1	Unloading door lock relay
KA2	Loading door lock relay
KM1	Motion contactor
KM2	Haeting contactor
Q3	Primary breaker
Q4	Secondary breaker
S1	Loading side emergency stop pushbutton
S3	Loading side door switch
S4	Loading side door switch (670)
S17	Manual drain pushbutton control
T1	Control circuit transformer
X4	End of cycle connector
X6	230 V supply connector
X7	Drain connector
X8	Heating connector
X10	Motion connector
X14	Products connector
X14	Loading door lock connector
Y2	Drain electrovalve
Y8	Loading door lock
Y8'	Loading door lock (670)
Y10	Liquid product no. 2 electrovalve
Y11	Liquid product no. 1 electrovalve
Y12	Liquid product no. 3 electrovalve
Y30	Steam electrovalve


X9
X9-1
X9-2
X9-3
X9-4
X9-5
X9-6
X9-7
X9-8
1
2
3
4
5
6
7
8
11
S18
Y3
Y6
Y5
Y27
Y9
Y13
Y26
31101334-2

CONTROL CIRCUIT - PROGRAMMER OUTPUTS
All washer-extractor standard types
Diagram no. 31101334-2

S18	Manual drain switch control (optional)
X9	Waters connector
X9	Unloading door lock connector
X9	Products connector
X9	Drain connector
Y26	Recycling water drain electrovalve (optional)
Y27	Detergents container rinsing electrovalve
Y3	Soft cold water electrovalve (optional)
Y5	Hard cold water electrovalve
Y6	Hot water electrovalve
Y9	Powder product no. 1 electrovalve
Y13	Powder product no. 2 electrovalve

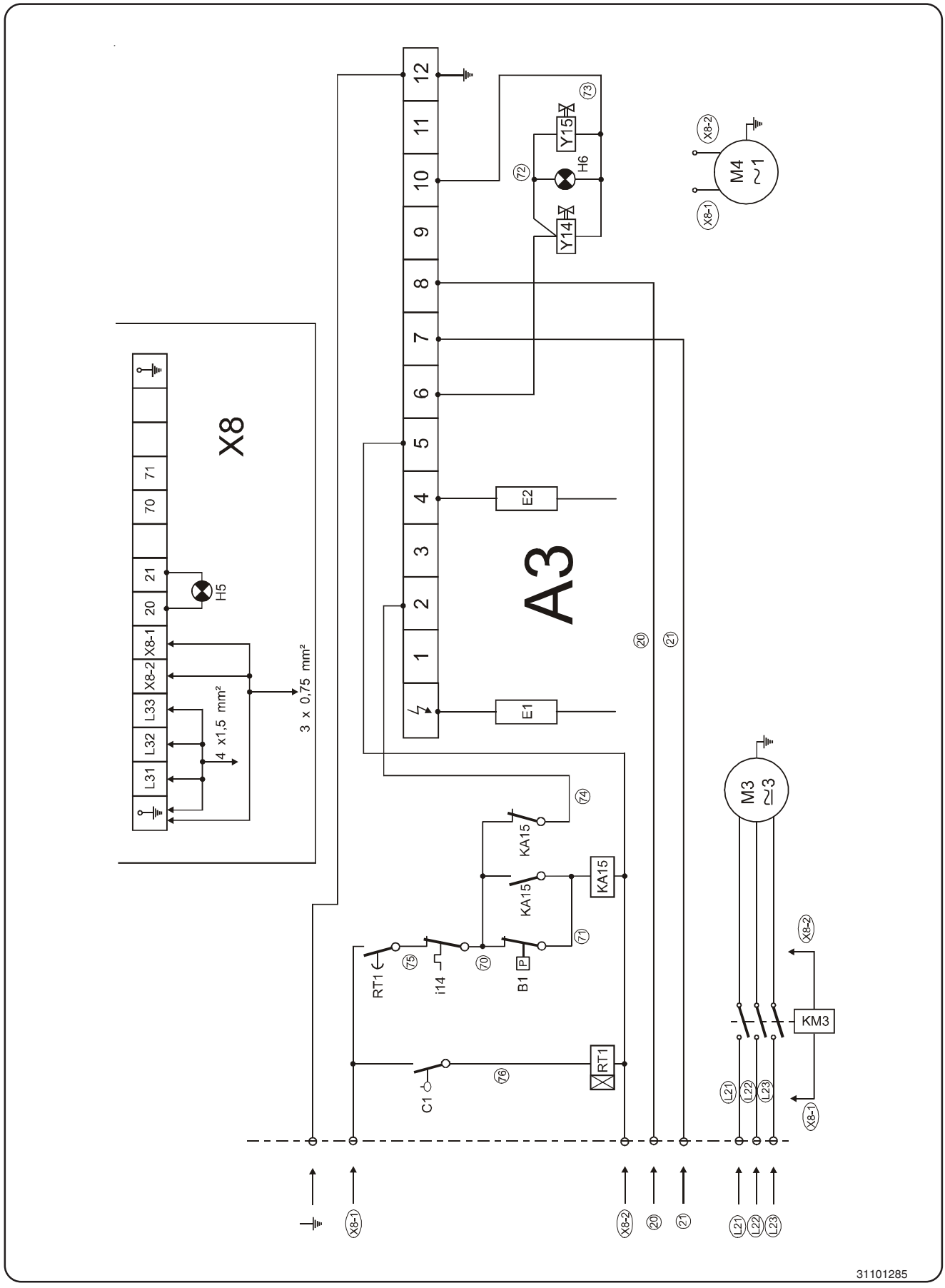

X5
X3
X12
X13
X5-1
X5-2
X5-3
X5-4
X5-5
X5-6
X3-1
X3-2
X3-3
X12-1
X12-2
X13-1
X13-2
18 V DC
H1
H2
KA1
KA2
19
20
A1
C1
C2
A2
J17X3.2A
J17X3.2
T0
15
18
J17-2
J17-1
31100333-1


X11
X15
X16
X11-1
X11-2
X15-1
X15-2
X15-3
X15-4
X16-1
X16-2
X16-3
X16-4
X16-5
X16-6
X16-7
X16-8
PHASE
N
X6/2-1 (I/O 2)
& X6/2-2 (I/O 2)
PHASE N
230 V
PHASE N
230 V
S7
S9
S1
X10 CPU
X1 CPU
X2 CPU
X3 CPU
X3 CPU
X10 CPU-1
X10 CPU-2
X10 CPU-3
X1 CPU-1
X1 CPU-2
X2 CPU-1
X2 CPU-2
X2 CPU-3
X3 CPU-1
X3 CPU-2
X3 CPU-3
DMIS
NTC 1
S14
S15
+12 V
0
BN
S16
BK
BU
31101340

CONTROL CIRCUIT - PROGRAMMER INPUTS/OUTPUTS
All washer-extractor standard types

Diagram no. 31100333-1 & no. 31101340

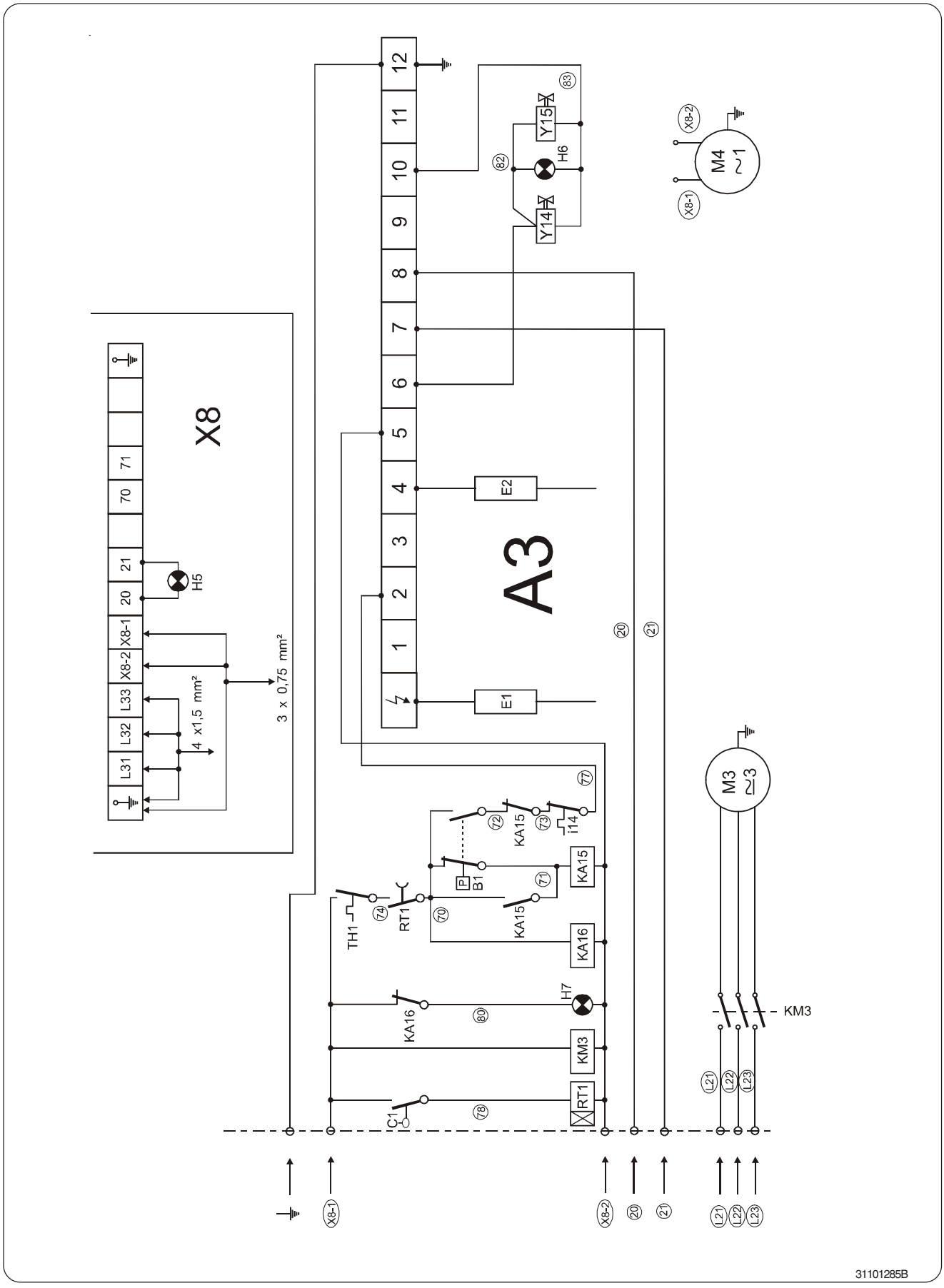
F	Frequency converter interference filter
H1	Voltage indicator
H2	Possible unloading indicator (barrier machine only)
KA1	Loading door lock relay
KA2	Unloading door lock relay
KA3	Unloading indicator relay (barrier machine only)
NTC 1	Temperature probe
S1	Loading side emergency stop pushbutton
S7	Loading side cage positioning puschbutton
S9	Loading door opening pushbutton
S14	Left side unbalance switch
S15	Right side unbalance switch
S16	Cage stop control proximity detector
T2	Low-voltage transformer (fuse = 1,25 A-T)
X3	240 V supply connector
X5	Door connector
X11	Optional card no. 2 connector
X12	Shunt connector
X13	Shunt connector
X15	Connector to putting into service and pause by exterior signals (optional) X15-1 and X15-2 putting into service by servo-control X15-3 and X15-4 heating is halted
X16	Inputs connector : opening door pushbutton
X16	Inputs connector : cage positioning pushbutton
X16	Inputs connector : emergency stop pushbutton
X1 CPU	Inputs connector : temperature probe
X2 CPU	Inputs connector : unbalance
X3 CPU	Inputs connector : cage turn control
X10 CPU	Input connector : (DMIS) detergent proportioning system


X8
L31
L32
L33
X8-2
X8-1
20
21
70
71
H5
4 x1,5 mm²
3 x 0,75 mm²
A3
12
11
10
9
8
7
6
5
4
3
2
1
E1
E2
Y14
Y15
H6
M4
M3
KA15
KA15
KA15
RT1
i14
B1
C1
RT1
KM3
X8-1
X8-2
20
21
L21
L22
L23
31101285

GAS HEATING - CONNECTING DIAGRAM
All washer-extractor

Diagram no. 31101285

A3	Ignitor and checking box
B1	Products of combustion pressure switch (do not change the adjustments)
C1	Water level detector
E1	Ignitor electrode
E2	Checking electrode
H5	Safety heating gas burner indicator
H6	Heating indicator On
i14	Circulating pump ipso
KA15	Depression safety relay
KM3	Circulating pump contactor
M3	Circulating pump motor
M4	Draught accelerator motor
RT1	Time relais 5 sec.
X8	Gas exchanger terminal
Y14	Gas electrovalve
Y15	Gas electrovalve


X8
A3
12
11
10
9
8
7
6
5
4
3
2
1
70
71
21
20
X8-1
X8-2
L33
L32
L31
H5
4 x1,5 mm²
3 x 0,75 mm²
E2
E1
Y15
Y14
H6
M4
M3
KA15
KA16
KM3
RT1
TH1
B1
H7
C1
i14
KM3
L21
L22
L23

31101285B

GAS HEATING - CONNECTING DIAGRAM
All washer-extractor

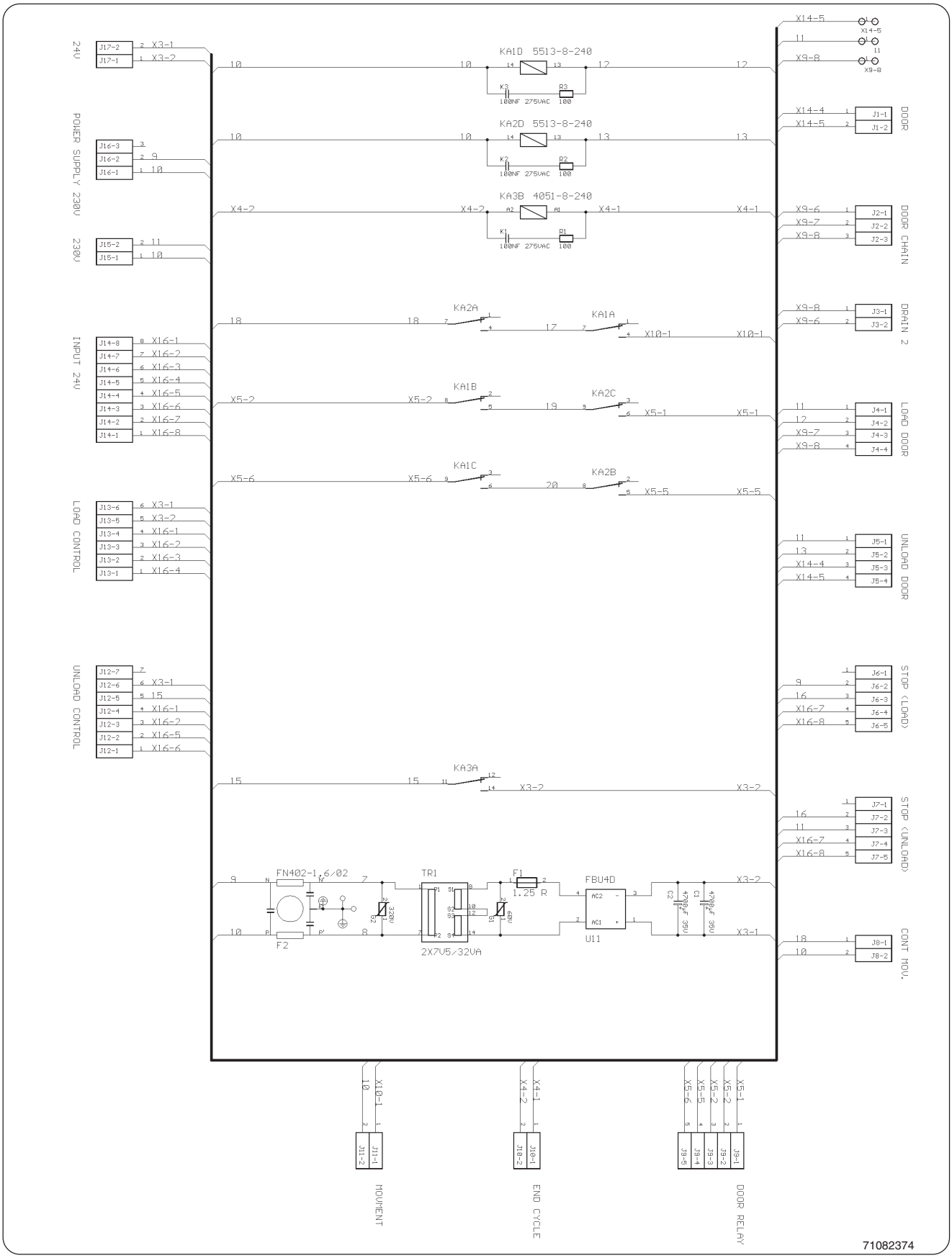
Diagram no. 31101285B

A3	Ignitor and checking box
B1	Products of combustion pressure switch (do not change the adjustments)
C1	Water level detector
E1	Ignitor electrode
E2	Checking electrode
H5	Safety heating gas burner indicator
H6	Heating indicator On
H7	Water default indicator
i14	Circulating pump ipso
KA15	Depression safety relay
KA16	Positive security thermostat relay
KM3	Circulating pump contactor
M3	Circulating pump motor
M4	Draught accelerator motor
RT1	Time relais 5 sec.
TH1	Positive security thermostat
X8	Gas exchanger terminal
Y14	Gas electrovalve
Y15	Gas electrovalve

INTERFACE BOARD "ALCOPO"

All washer-extractor

Diagram no. 71082374



Configuration of variator KEB type 5

list of CP parameters

Code	Function
CP. 0	Password input
CP. 1	Inverter status display
CP. 2	Utilization
CP. 3	Actual frequency display
CP. 4	Peak of load
CP. 5	Variator temperature
CP. 6	Apparent current
CP. 7	Active set
CP. 8	Transmission speed
CP. 9	Last error
CP.10	Overcurrent
CP.11	Overload
CP.12	Overvoltage
CP.13	Overtemperature
CP.14	Max. constant current set 0
CP.15	Max. ramp current set 0
CP.16	Boost stop set 0
CP.17	Max. constant current wash set 1
CP.18	Max. ramp current wash set 1
CP.19	Regulator of proportional speed wash set 1
CP.20	Regulator of integral speed wash set 1
CP.21	Boost wash set 1
CP.22	Autoboost wash set 1
CP.23	Max. constant current distribution set 2
CP.24	Max. ramp current distribution set 2
CP.25	Regulator of proportional speed distribution set 2
CP.26	Regulator of integral speed distribution set 2
CP.27	Boost distribution set 2
CP.28	Autoboost distribution set 2
CP.29	Max. constant current extraction set 3
CP.30	Max. ramp current extraction set 3
CP.31	Overmodulation extraction set 3
CP.32	Max. constant current positionning set 4
CP.33	Max. ramp current positionning set 4
CP.34	Boost positionning set 4
CP.35	Autoboost positionning set 4

NOTA :

After parameterizing it is compulsory to barr the unit against access. Enter the value 100 in CP.0 after loading the programme in the inverter.
In after sales you can enable the access to CP parameters by entering the value 200 in CP.O

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Conversion of measurement units

To following is a list of correspondences of the main frequently used units, to avoid the need to use measurement unit conversion tables.

bar : 1 bar = 100 000 Pa
1 bar = 1.019 7 kg/cm²
1 bar = 750.06 mm Hg
1 bar = 10 197 mm H_2O
1 bar = 14.504 psi

Bitish Thermal Unit : 1 Btu = 1 055.06 J
1 Btu = 0.252 1 kcal

calorie : 1 cal = 4.185 5 J
1 cal = 10^{-6} th
1 kcal = 3.967 Btu
1 cal/h = 0.001 163 W
1 kcal/h = 1.163 W

continental horse-power : 1 ch = 0.735 5 kW
1 ch = 0.987 0 HP

cubic foot : 1 cu ft = 28.316 8 dm³
1 cu ft = 1 728 cu in

cubic inch : 1 cu in = 16.387 1 dm³

foot : 1 ft = 304.8 mm
1 ft = 12 in

gallon (U.K.) : 1 gal = 4.545 96 dm³ or l
1 gal = 277.41 cu in

gallon (U.S.A.) : 1 gal = 3.785 33 dm³ or l
1 gal = 231 cu in

Horsepower : 1 HP = 0.745 7 kW
1 HP = 1.013 9 ch

inch : 1 in = 25.4 mm

joule : 1 J = 0.000 277 8 Wh
1 J = 0.238 92 cal

kilogramme : 1 kg = 2.205 62 lb

kilogram per square centimeter :
1 kg/cm² = 98 066.5 Pa
1 kg/cm² = 0.980 665 bars
1 kg/cm² = 10 000 mm H_2O
1 kg/cm² = 735.557 6 mm Hg

livre : 1 lb = 453.592 37 g

meter : 1 m = 1.093 61 yd
1 m = 3.280 83 ft
1 m = 39.37 in

cubic meter : 1 m³ = 1 000 dm³
1 m³ = 35.314 7 cu ft
1 dm³ = 61.024 cu in
1 dm³ = 0.035 3 cu ft

pascal : 1 Pa = 1 N/m²
1 Pa = 0.007 500 6 mm Hg
1 Pa = 0.101 97 mm H_2O
1 Pa = 0.010 197 g/cm²
1 Pa = 0.000 145 psi
1 MPa = 10 bar

psi : 1 psi = 0.068 947 6 bar

thermie : 1 th = 1 000 kcal
1 th = 10^6 cal
1 th = 4.185 5 x 10^6 J
1 th = 1.162 6 kWh
1 th = 3 967 Btu

watt : 1 W = 1 J/s
1 W = 0.860 11 kcal/h

watt-hour : 1 Wh = 3600 J
1 kWh = 860 kcal

yard : 1 yd = 0.914 4 m
1 yd = 3 ft
1 yd = 36 in

temperature degrees :
0° K = -273.16 °C
0° C = 273.16 °K
t° C = 5/9 (t° F-32)
t° F = 1.8 t° C + 32

Washing symbols

(ISO 3758:2005 standard)

To overcome language barriers, the following are symbols used internationally to give you guidance and recommendations when washing different textiles.

Washing *The tub symbolizes washing.*

	Max. washing temperature in °C	Mechanical action
	95	normal
	95	mild
	70	normal
	60	normal
	60	mild
	50	normal
	50	mild
	40	normal
	40	mild
	40	very mild
	30	normal
	30	mild
	30	very mild
	40	Wash by hand
		Do not wash

Bleaching *The triangle symbolizes bleaching.*


Bleaching allowed (chlorine or oxygen).


Bleaching allowed (only oxygen).


Do not bleach.

Dry or water cleaning *The circle symbolizes dry or water cleaning.*


Normal dry cleaning with perchloroethyl, solvent of hydrocarb.


Mild dry cleaning with perchloroethyl, solvent of hydrocarb.


Normal dry cleaning with solvent of hydrocarbon.


Mild dry cleaning with solvent of hydrocarbon.


Do not dry clean.


Normal water cleaning.


Mild water cleaning.


Very mild water cleaning.

Drying *The circle in a square symbolizes tumble drying.*


Can be put in a tumble dryer. Normal temperature.


Can be put in a tumble dryer. Lower temperature.


Do not put in a tumble dryer.

Ironing *The iron sybolizes the domestic ironing and pressing process.*


Max. temperature 200 °C.

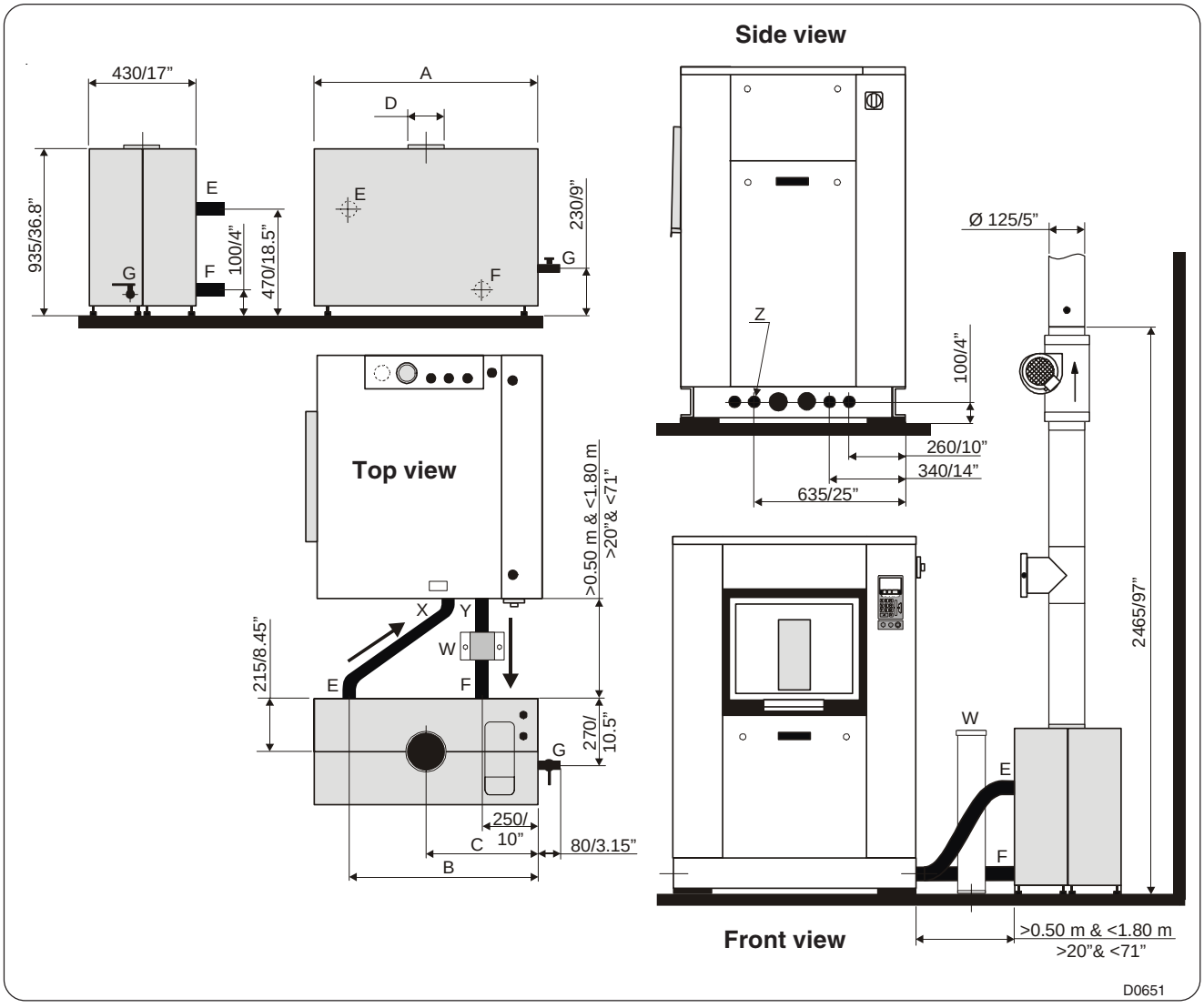

Max. temperature 150 °C.


Max. temp. 110 °C. The steam can cause irreversible damages.


Do not iron.

Gas exchanger old version of 25 kW

Machine type		Units	230/340
A	Length of exchanger	mm	910
B	Dimension of output exchanger	mm	840
C	Dimension of evacuation pipe	mm	545
D	Evacuation of burn gas	mm	Ø 125
E	Exchanger bottom output	mm	Ø 36/40
F	Exchanger bottom input	mm	Ø 36/40
G	Gas connection	mm	DN 20 (3/4" BSP)
X	Output machine/exchanger		
Y	Input machine/exchanger		
Z	Hole for electric cable to gas exchanger		



Evacuation duct

It is recommended that a separate smoothwalled evacuation duct should be connected to each machine, providing the least possible resistance to air.

Check that the shaft flow is at least twice the capacity of the gas exchanger draught accelerator.

- Draught accelerator maximum flow rate with no pressure : 180 m^3/h.
- Maximum pressure available with no flow : 23 mm H_2O.
- Maximum admissible head loss on evacuation : 15 mm H_2O at point (**P**).
- Average temperature of exhaust coming out of the gas exchanger : 140 °C.

Provided an upper **ventilation of 7 dm^2** and a **lower one of 14 dm^2** in your laundry.

These conditions are absolutely essential for the correct working of the machine.

For gas heating, the required combustion fresh air supply should be not less than 2 m^3/h per kW, either 50 m^3/h minimum for 230 or 340 machine.

Installation of the chemney regulator

For a correct running of the installation, this chimney regulator must always have its axle of rotation of his flap perfectly horizontal.

The adjustment toothed wheel has to be positioned on the maximum, mark no 10, (the less sensitive flap).

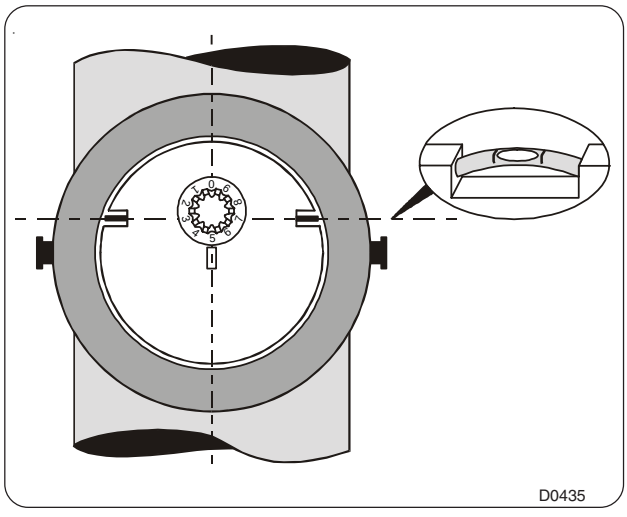


TABLE OF CORRESPONDENCES - Washer-Extractor 230

Category index	Type of gas	Working supply pressure in mbar	Hi in MJ/m³	Ø of injectors in mm	Ventilation plate position	Pressure at injectors in mm H_2O	Heat emission Qn in kW (Hi)	Consumption Mn in kg/h	Consumption Vn in m³/h
*2E, 2H, 2ESI	G 20	20	34.02	2.60	maxi	142	24.5	-	0.90
2L, 2ESI	G25	25	29.25	2.60	maxi	204	24.5	-	1.05
2LL	G25	20	29.25	2.60	maxi	183	24.5	-	1.05
3 +	G30 G31	28-30/37 28-30/37	45.65 46.34	1.45 1.45	5 mm 5 mm	regulator out of operation	24.5 24.5	0.66 0.66	- -
3 B / P	G30 G31	50 50	45.65 46.34	1.30 1.30	5 mm 5 mm	regulator out of operation	24.5 24.5	0.66 0.66	- -
3 B / P	G30 G31	30 30	45.65 46.34	1.45 1.45	5 mm 5 mm	regulator out of operation	24.5 24.5	0.66 0.66	- -
3 P	G31	50	46.34	1.45	5 mm	regulator out of operation	24.5	0.66	-

* For Belgium, no work is allowed between G20 and G25.

TABLE OF CORRESPONDENCES - Washer-Extractor 340

Category index	Type of gas	Working supply pressure in mbar	Hi in MJ/m³	Ø of injectors in mm	Ventilation plate position	Pressure at injectors in mm H_2O	Heat emission Qn in kW (Hi)	Consumption Mn in kg/h	Consumption Vn in m³/h
*2E, 2H, 2ESI	G 20	20	34.02	2.60	maxi	142	24.5	-	1.30
2L, 2ESI	G25	25	29.25	2.60	maxi	204	24.5	-	1.50
2LL	G25	20	29.25	2.60	maxi	183	24.5	-	1.50
3 +	G30 G31	28-30/37 28-30/37	45.65 46.34	1.45 1.45	5 mm 5 mm	regulator out of operation	24.5 24.5	0.95 0.95	- -
3 B / P	G30 G31	50 50	45.65 46.34	1.30 1.30	5 mm 5 mm	regulator out of operation	24.5 24.5	0.95 0.95	- -
3 B / P	G30 G31	30 30	45.65 46.34	1.45 1.45	5 mm 5 mm	regulator out of operation	24.5 24.5	0.95 0.95	- -
3 P	G31	50	46.34	1.45	5 mm	regulator out of operation	24.5	0.95	-

* For Belgium, no work is allowed between G20 and G25.

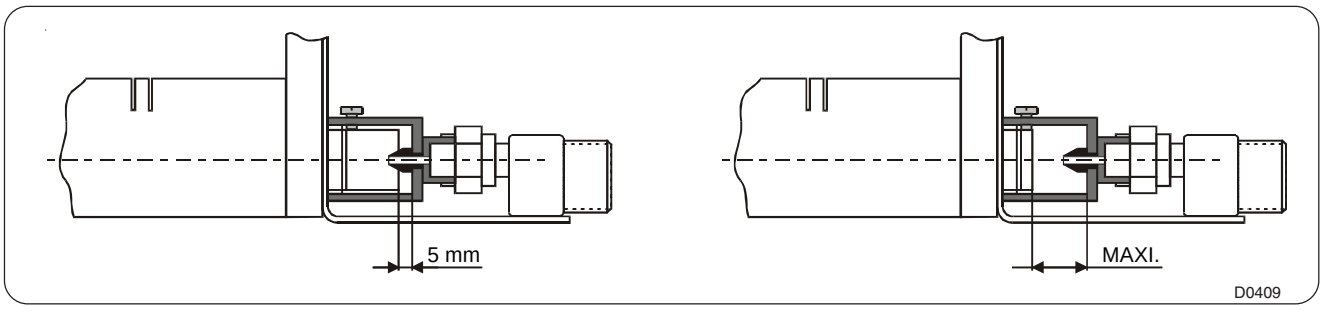


TABLE OF CORRESPONDENCES - Washer-Extractor 470

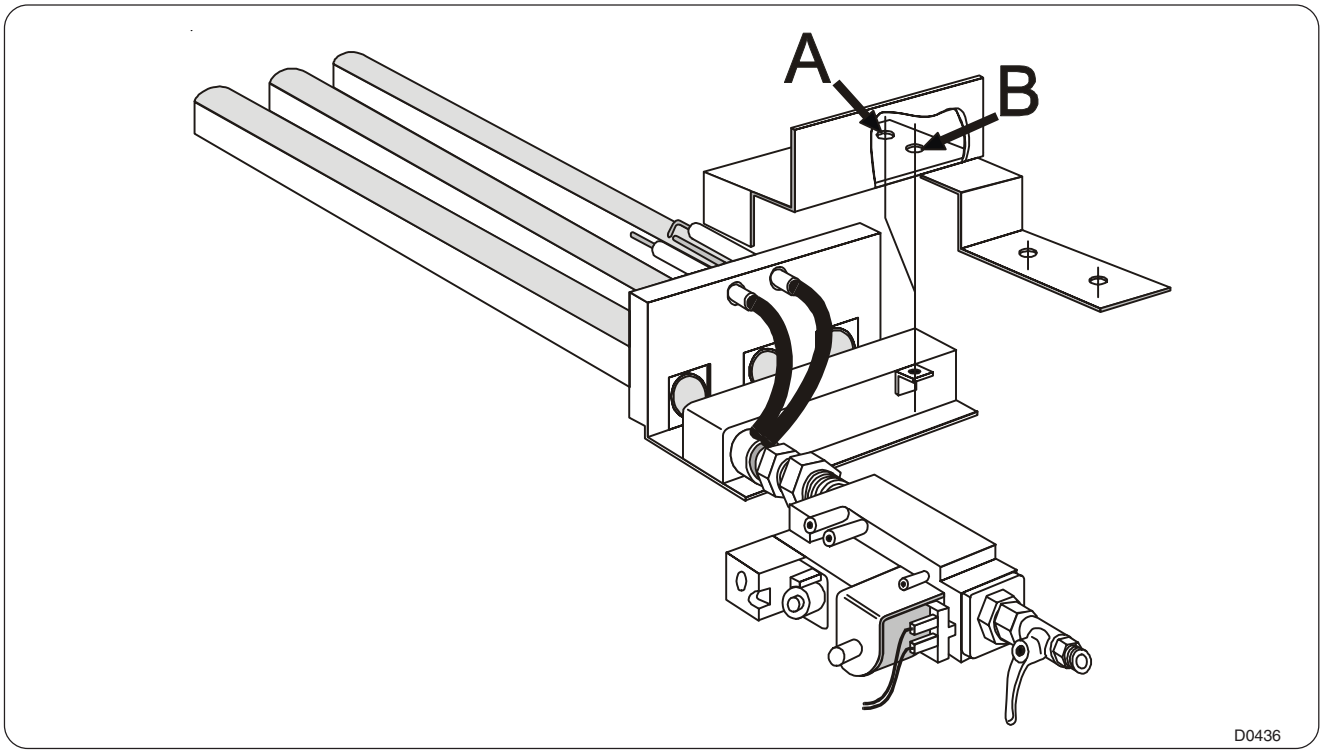
Category index	Type of gas	Working supply pressure in mbar	Hi in MJ/m³	Ø of injectors in mm	Ventilation plate position	Pressure at injectors in mm H_2O	Heat emission Qn in kW (Hi)	Consumption Mn in kg/h	Consumption Vn in m³/h
*2E, 2H, 2ESI	G 20	20	34.02	2.90	A	153	40	-	-
2L, 2ESI	G25	25	29.25	3.20	A	154	40	-	-
2LL	G25	25	29.25	3.20	B	153	40	-	
3 B / P	G30 G31	50 50	45.65 46.34	1.60 1.60	B B	regulator out of operation	40 40	- -	- -
3 P	G31	30	46.34	1.95	A	regulator out of operation	40	-	-
3 P	G31	37	46.34	1.90	A	regulator out of operation	40	-	-
3 P	G31	50	46.34	1.70	B	regulator out of operation	40	-	-

* For Belgium, no work is allowed between G20 and G25.

TABLE OF CORRESPONDENCES - Washer-Extractor 670

Category index	Type of gas	Working supply pressure in mbar	Hi in MJ/m³	Ø of injectors in mm	Ventilation plate position	Pressure at injectors in mm H_2O	Heat emission Qn in kW (Hi)	Consumption Mn in kg/h	Consumption Vn in m³/h
*2E, 2H, 2ESI	G 20	20	34.02	2.90	A	153	40	-	-
2L, 2ESI	G25	25	29.25	3.20	A	154	40	-	-
2LL	G25	25	29.25	3.20	B	153	40	-	
3 B / P	G30 G31	50 50	45.65 46.34	1.60 1.60	B B	regulator out of operation	40 40	- -	- -
3 P	G31	30	46.34	1.95	A	regulator out of operation	40	-	-
3 P	G31	37	46.34	1.90	A	regulator out of operation	40	-	-
3 P	G31	50	46.34	1.70	B	regulator out of operation	40	-	-

* For Belgium, no work is allowed between G20 and G25.



Note : G20 (H) = natural gas, Lacq type (20 mbar)
G25 (L) = natural gas, Groningue type (20 or 25 mbar)
G30 = butane gas (28/30, 37, 50 mbar)
G31 = propane gas (28/30, 37, 50 mbar)

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