

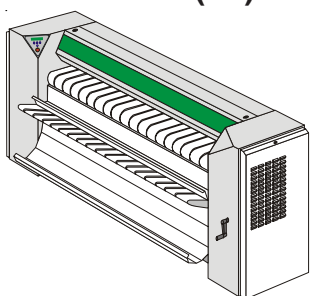
OPERATING HANDBOOK

FLATWORK IRONERS

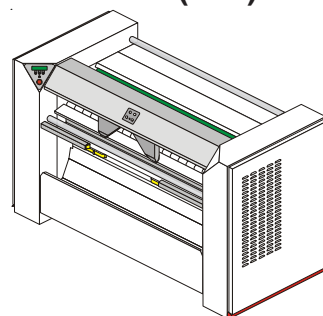
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LF/FLF/R/FR

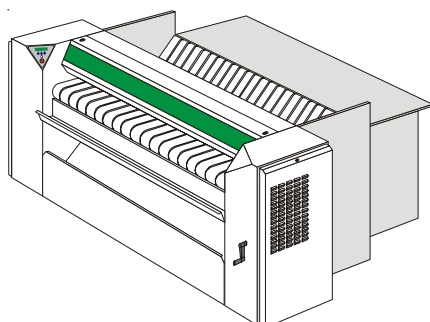
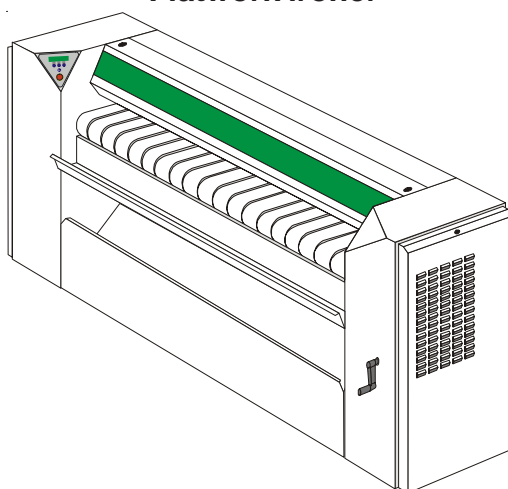
**Flatwork ironer
folder (LF)**



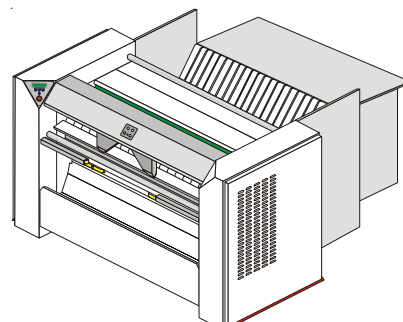
**Feeder flatwork ironer
folder (FLF)**



Flatwork ironer



**Flatwork ironer
with rear load removal (R)**



**Feeder flatwork ironer
with rear load removal (FR)**

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1. Precaution for use

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Precaution for use

- The machine should not be used by children.
- This ironer must be used exclusively for textiles appropriate for machine ironing, which have been previously and exclusively washed in water.
- Blankets should not be ironed.
- Be careful with synthetic linen and also with printed linen. They can melt and stick on the cylinder.
- Do not iron articles that contain plastic, foam, sponge rubber or similarly textured rubber-like materials.
- Do not iron linens coated with solvent, paint, wax, grease or any easily inflammable products.

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You should have found an instruction handbook and keys to open the machine casings, and a maintenance poster to display in your laundry, inside your machine.

Depending on its destination, the dryer ironer 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 maritime packing (wood crate).

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

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

Users must have learnt how the machine operates.

The identification plate is situated on the left side.

**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.**

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2. General

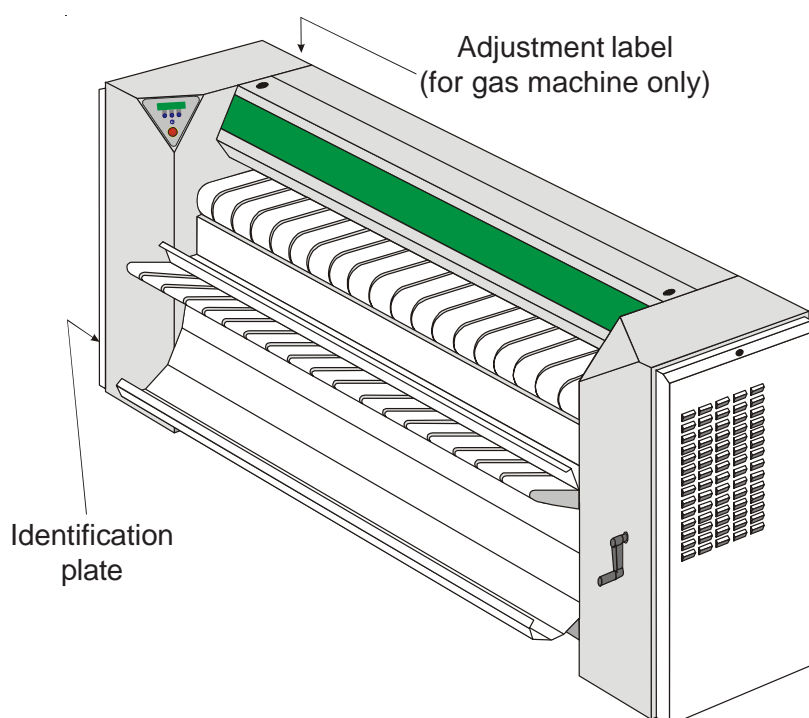
OPERATING HANDBOOK

The machines described in this handbook have a ironing capacity of 190, 210, 250, 280, 320 cm wide depending on the type. They are available with steam, electric, gas or thermal fluide heating.

A version of the machine with a fully automatic folding system enables one or two persons to dry, iron and fold sheets longitudinally.

Another version with a mechanical system allows the washing to come out at the back of the machine.

The ironing speed is adjustable as a function of the density (weight/m²) and humidity of the washing.



D1090

Identification plate

For safety reasons use only original spare parts.			
TYPE : _____ SERIAL N° : _____ QC N° : _____ PROD. N° : _____ CAPACITY : _____ l ; _____ kg P. MAX. : _____ W (M) _____ kW ISOL. CLAS : _____ _____ V ~ _____ Hz _____ A			
_____ IP 4		 Qn (HI) : _____ kW G : _____ mbar Mn/Vn : _____ / _____ Type : _____ G20 : _____ mbar G25 : _____ mbar G30 : _____ mbar G31 : _____ mbar η : _____ P. max. : _____ kPa	
		Date : ____/____/____ ELECTROLUX LAUNDRY SYSTEMS FRANCE 10430 Rosières-près-Troyes FRANCE Made in FRANCE	

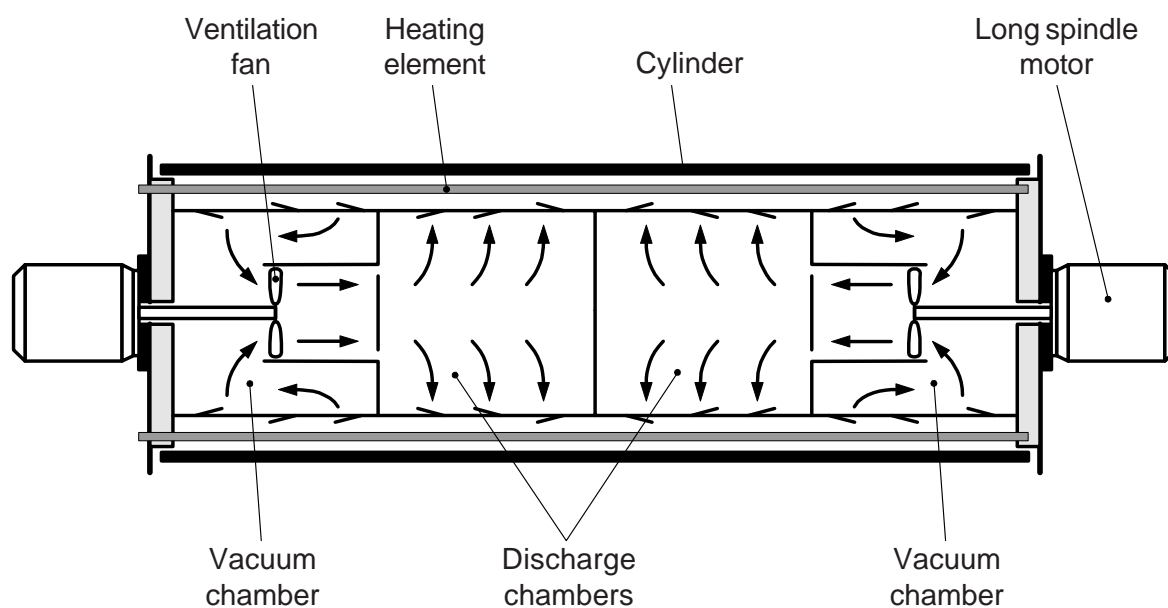
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The electrically heated dryers-ironers can be equipped with a temperature regulation system for the heating cylinder using circulating heat. Machines fitted with a Dubixium cylinder have a normal electric heating device.

This system provides an excellent tool to optimise the performance of the dryer-ironer for those clients who mainly carry out staggered ironing. It prevents suddenly heating cut-outs caused by partial use of the whole length of the machine (Patent No. 9608471).

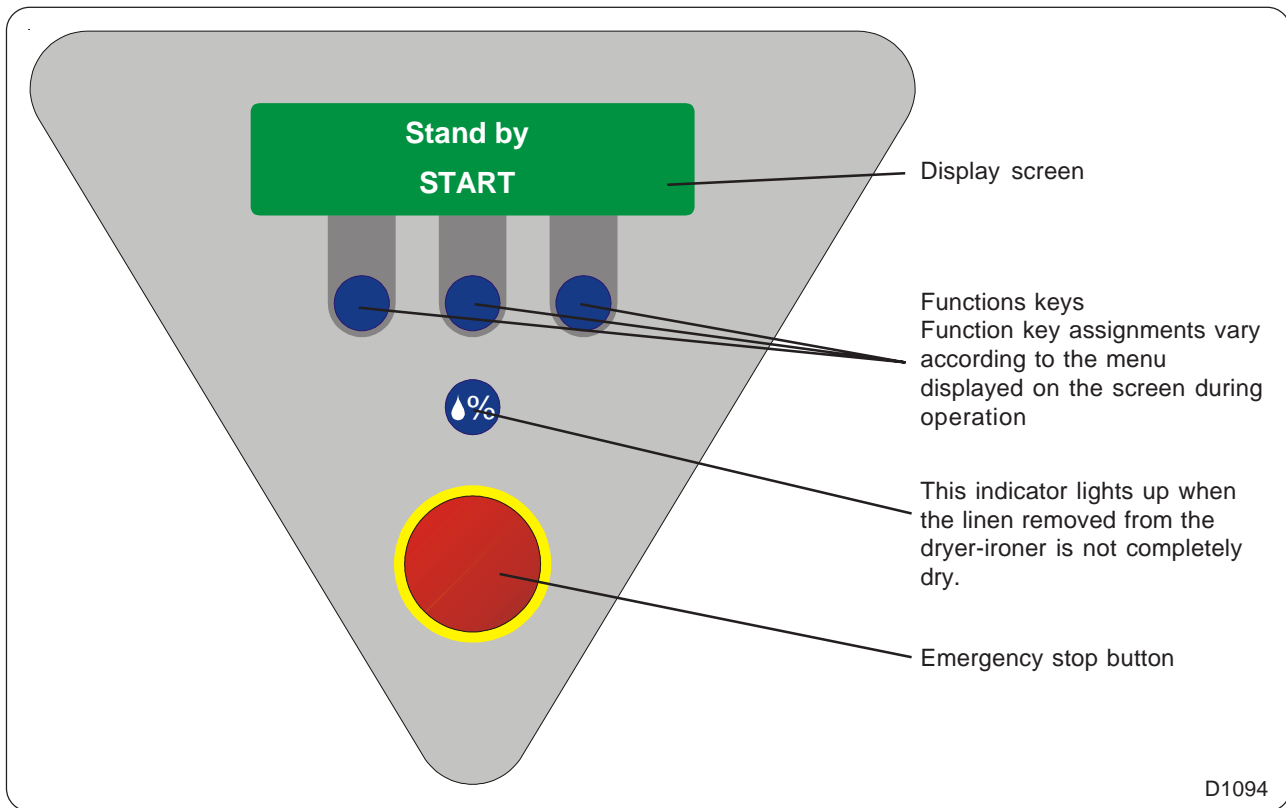
The unused calories on the sides of the cylinder are redistributed towards the centre, where the demand is greatest (please see the diagram below).

In this way, it is possible to limit the rise in temperature on the sides of the cylinder and the fall in temperature in the centre of the cylinder.



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Dryer-ironer control panel

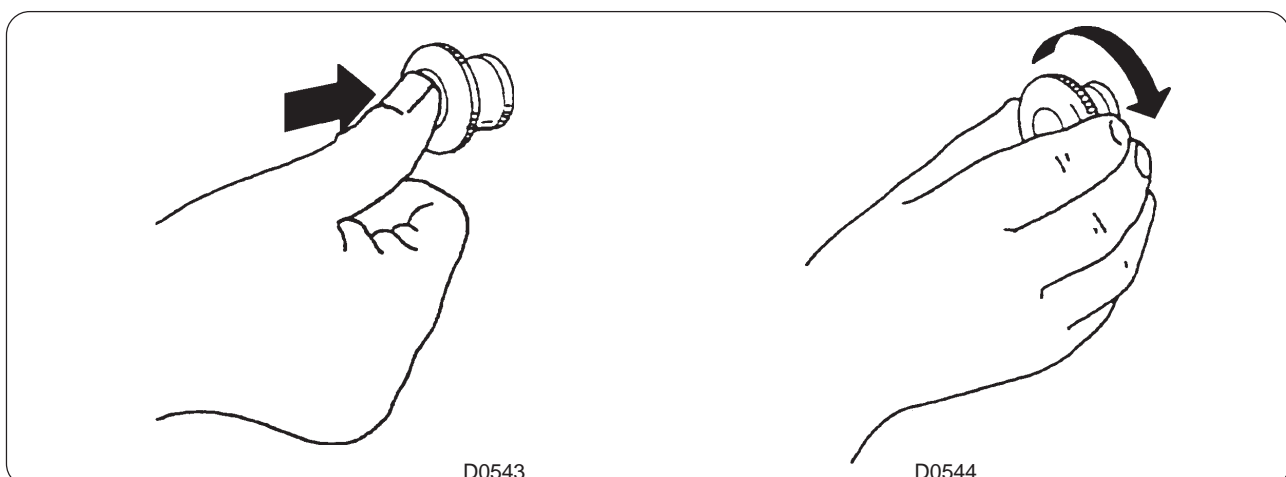


Emergency stop

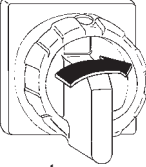
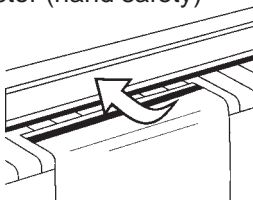
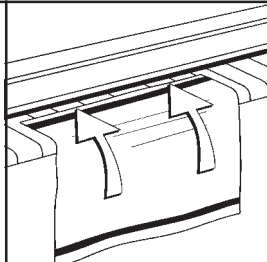
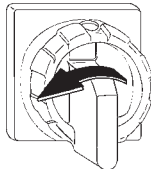
The emergency stop must be unblocked, if not the machine will not work (to unblock, turn the red button to the right).

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

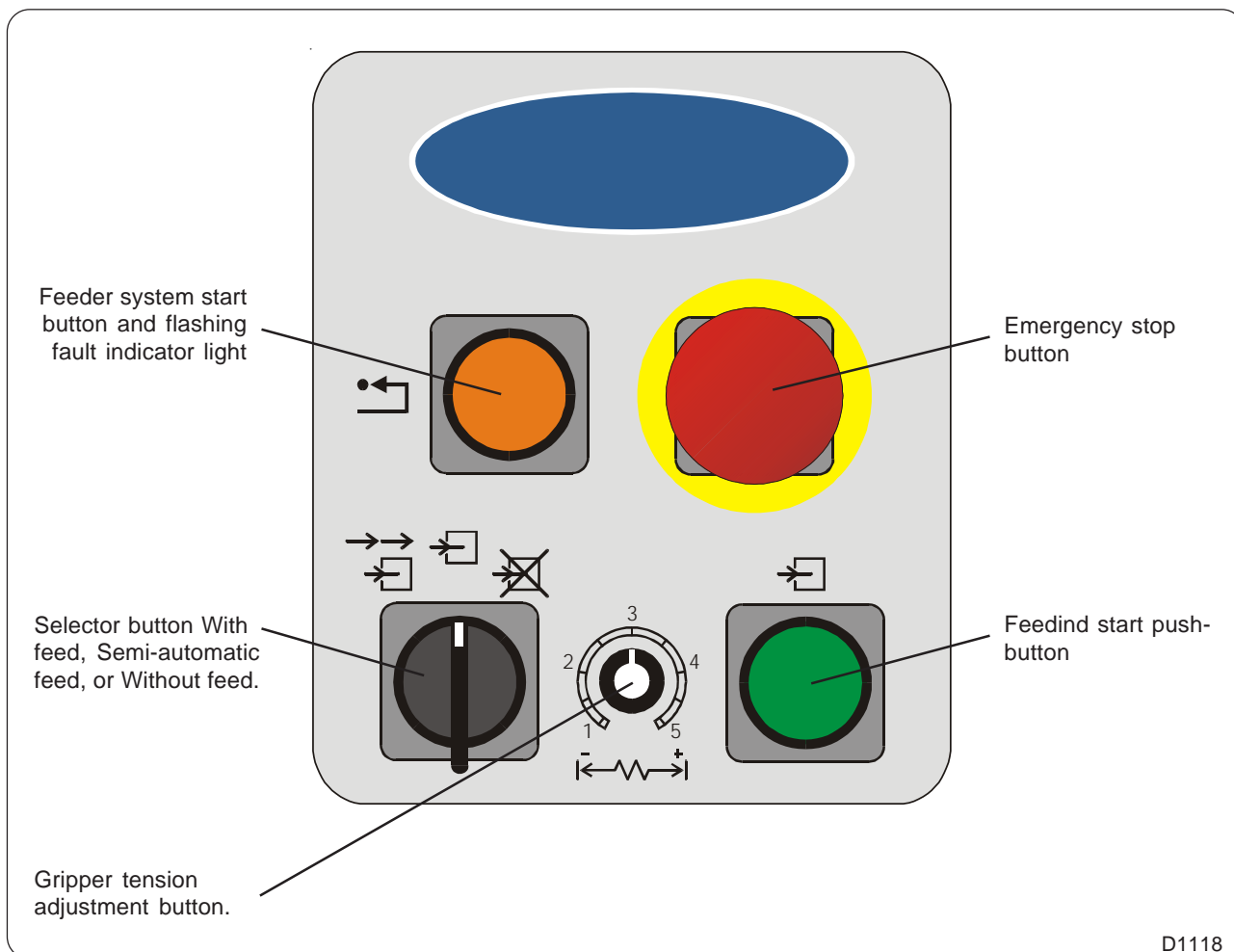
Release the emergency stop, by turning it clockwise only after checking what motivated this stop.



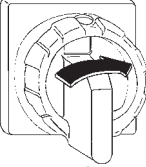
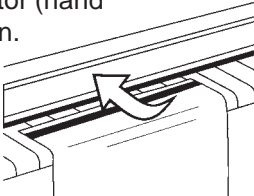
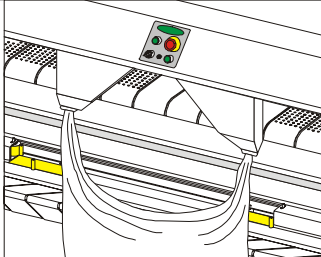
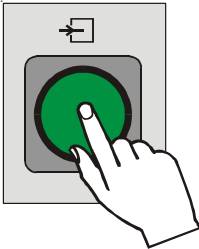
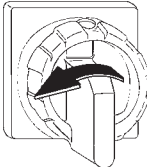
Simplified instructions for using the ironer

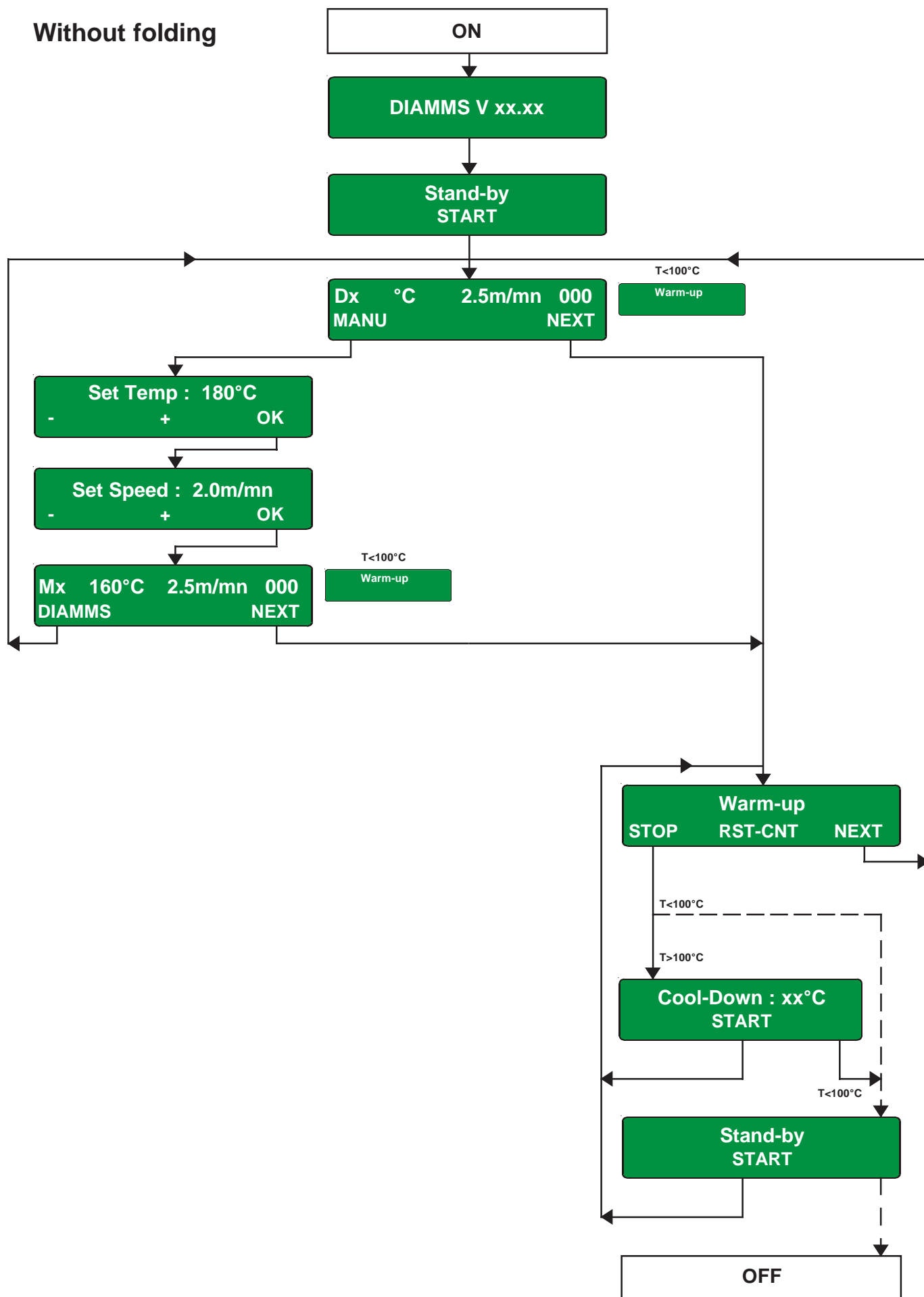
1	Switch on the main switch, open the gas stop valve or the steam valve. 	Wait for displaying of the following message and press the central key. <div>Stand by START</div>	When it begins operating, the machine is set to "automatic mode". You can now insert sheets. <div>Dx °C 2.5m/mn 000 MANU PLI NEXT</div>
2	Manual Mode : Adjust the order temperature on the wished value thanks to keys (-) or (+) and push on OK . <div>Set Temp : 180°C - + OK</div>	Manual Mode : Adjust the ironing speed on the wished value thanks to keys (-) and (+) and push on OK . <div>Set Speed : 2.0 m/mn - + OK</div>	
3	Folding : You should choose from the no folding, FIX folding (manual) or PLIVIT (automatic) modes and move the reception tank upwards. <div>Folding NO FIX PLIVIT</div>		
4	Safety : The machine must stop when the mobile safety protector (hand safety) is switched on. Check operation of this protection every day. 	Ironing : Place the washing to be ironed on the feeding table. <div>Error Gas Ignition</div>	
5	Ignition fault on gas heating machine : This message keeps on flashing over 30 seconds if a fault occurs when igniting the gas burner. 		
6	Stopping the machine : Push on any key to display "Select Running Mode" and push on STOP. Do not use the folding function during the cooling phase. Leave the machine cool down until the following message has disappeared. In an emergency, pressing the hand safety bar will stop the machine. <div>Cool-Down : xx°C START</div>	Switch the main switch off, close the gas stop valve or the steam valve. 	

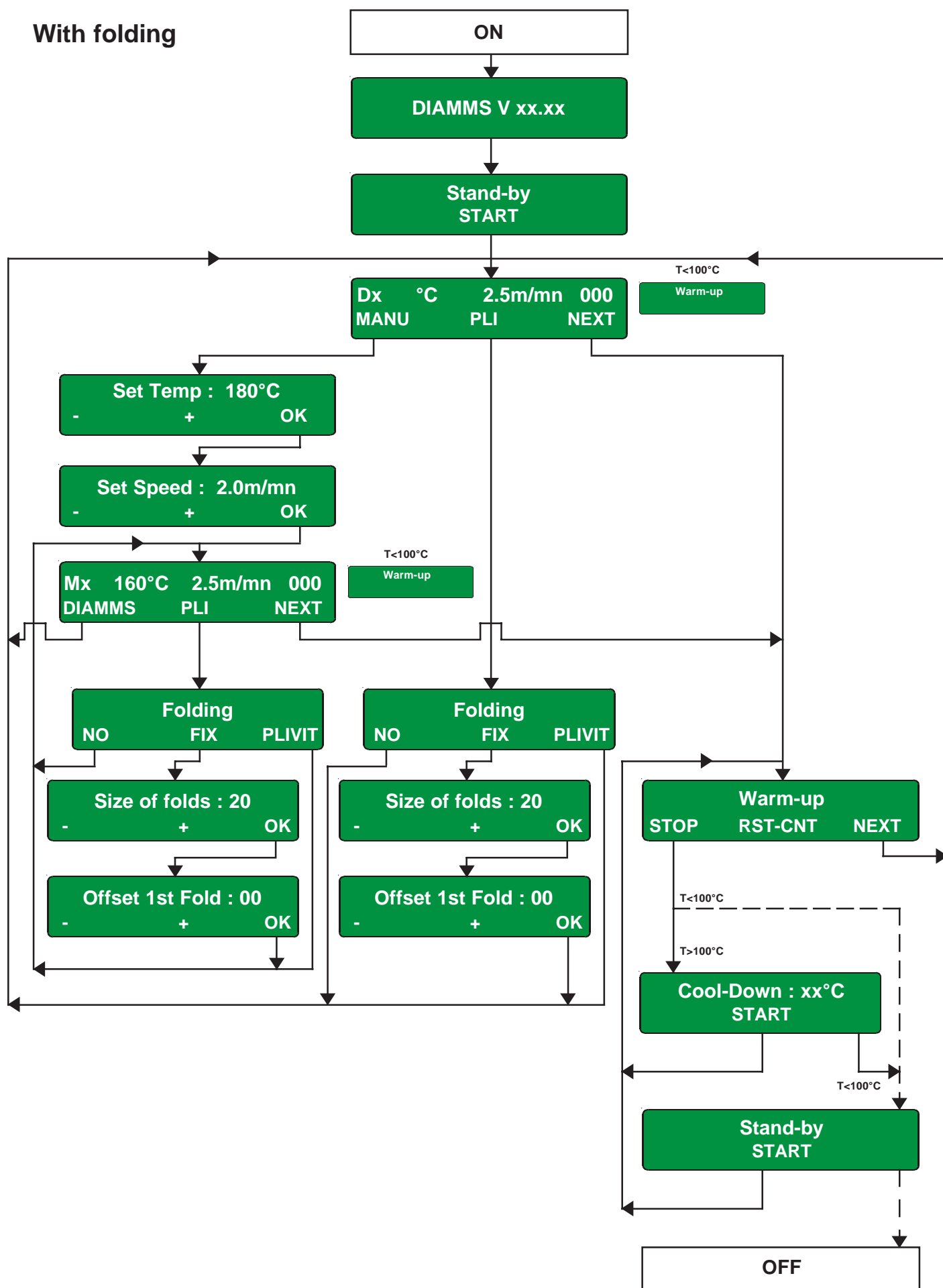
Feeder system control panel



Simplified instructions for using the ironer

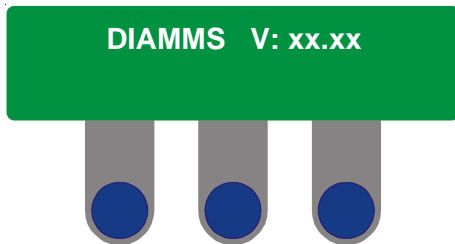
1	Switch on the main switch, open the gas stop valve or the steam valve. 	Wait for displaying of the following message and press the central key. <div>Stand by START</div>	When it begins operating, the machine is set to "automatic mode". You can now insert sheets. <div>Dx °C 2.5m/mn 000 MANU PLI NEXT</div>
2	Manual Mode : Adjust the order temperature on the wished value thanks to keys (-) or (+) and push on OK . <div>Set Temp : 180°C - + OK</div>	Manual Mode : Adjust the ironing speed on the wished value thanks to keys (-) and (+) and push on OK . <div>Set Speed : 2.0 m/mn - + OK</div>	
3	Folding : You should choose from the NO folding, FIX folding (manual) or PLIVIT (automatic) modes and move the reception tank upwards. <div>Folding NO FIX PLIVIT</div>		
4	Safety : The machine must stop when the mobile safety protector (hand safety) is switched on. Check operation of this protection every day. 	Ignition fault on gas heating machine : This message keeps on flashing over 30 seconds if a fault occurs when igniting the gas burner. <div>Error Gas Ignition</div>	
5	In Automatic mode : - First select the mode With feeding. - Pinch both edges of a sheet length in the clips.		Feeding: Push on the button Start Feeding. 
6	Stopping the machine : Push on any key to display "Select Running Mode" and push on STOP. Do not use the folding function during the cooling phase. Leave the machine cool down until the following message has disappeared. In an emergency, pressing the hand safety bar will stop the machine.	<div>Cool-Down : xx°C START</div>	Switch the main switch off, close the gas stop valve or the steam valve. 





Client mode

Starting the machine



Start-up screen

Turn on the power to the machine using the machine's main switch. The software version will appear on the screen for 4 seconds.



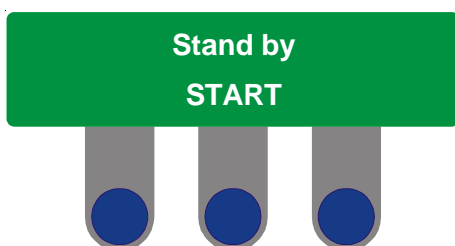
"Emergency stop" warning message

If the screen displays this message, check whether the emergency stop button has been operated.



Reset the emergency stop button and confirm by pressing the central key.

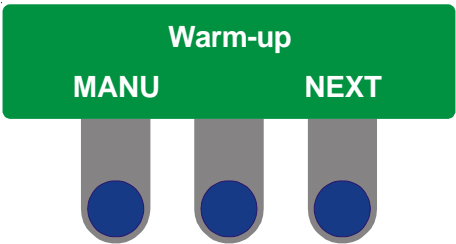
In all cases, you will return to the previous menu.



Accessing the start-up menu

The machine now asks you to press the central key to exit standby mode so as to display the pull-down menus and select the machine's operating modes.

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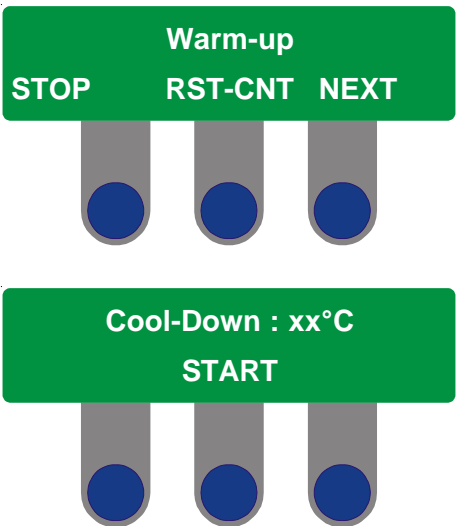
Warm-up

As soon as the machine is turned on, the "Start heating" command is given. The cylinder temperature begins to rise.

By default, the machine is set for automatic mode.

The service screen appears as soon as the sheets have been inserted or when the required temperature is reached.

Cooling mode

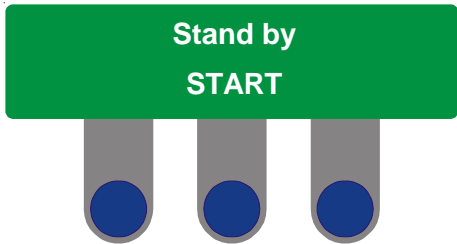


Cooling mode

When the **STOP** function is requested during operation, the machine will switch to standby and the heating system will be switched off.

The screen will remain in this mode as long as the temperature of the cylinder remains above 100°C (212°F).

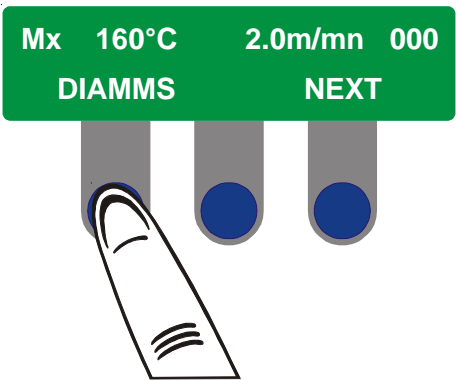
The screen then displays the following message.



You can now switch off the machine.

RST-CNT resets the sheet counter.

Automatic mode



Selection of the automatic mode

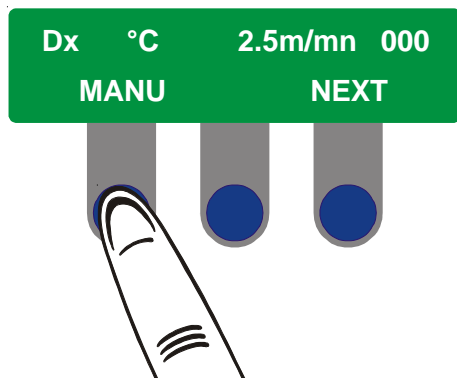
When it starts up, the machine is set for automatic mode by default. However, you can switch over to manual mode at any time.

The "M" in the upper left-hand corner shows that you are in manual mode. To return to automatic mode, all you need to do is to press once on the "DIAMMS" button.

The "X" behind the letter "M" can take several forms:

- "F" if you have chosen the "FIX" folding mode.
- "P", if you have chosen the "PLIVIT" folding mode.
- If nothing is shown, this means that folding is deactivated.

Manual mode



Selection of Manual mode

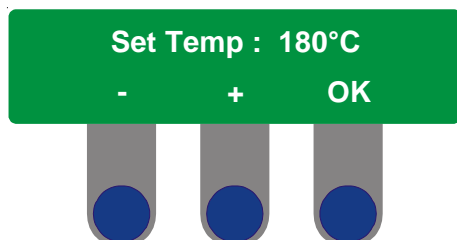
If you press **MANU**, you will switch to manual mode.

In this mode you use the following menus to select the temperature and the ironing speed you wish to apply to the machine.

The "X" behind the letter "D" can take several forms:

- "F", if you have chosen the "FIX" folding mode.
- "P", if you have chosen the "PLIVIT" folding mode.
- If nothing is shown, this means that folding is deactivated.

Each changeover from manual mode to automatic mode automatically resets the sheet counter.



Temperature setting

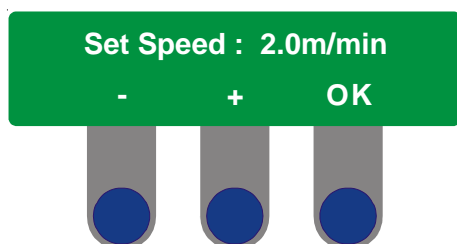
This screen does not appear on machines equipped with a steam heating mode.

The screen will now ask you to set the ironing temperature.

The ironing temperature can be adjusted in increments of 5 degrees Celsius (or 9 degrees Fahrenheit) by pressing.

Press **OK** to confirm the temperature.

Note: if you request a temperature lower than 120°C (248°F), the screen will display a (-) sign to indicate that the heating has been switched off and allow the machine to operate without heating.



Ironing speed

The screen now asks you to select the ironing speed.

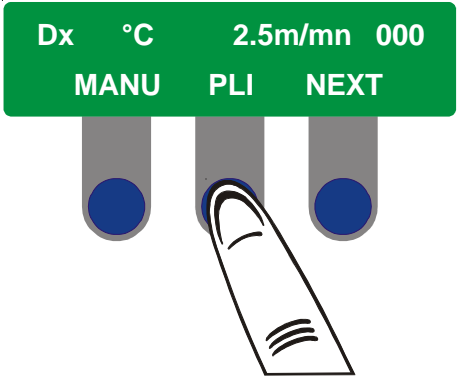
The ironing speed can be set between and minimum and a maximum value specified in the Settings menu. The value can be adjusted in increments of 1/10 of a metre (or 3/10 of an inch) by pressing.

Press **OK** to confirm the ironing speed.

It should be noted that the minimum and maximum ironing values depend on the converter adjustment settings.

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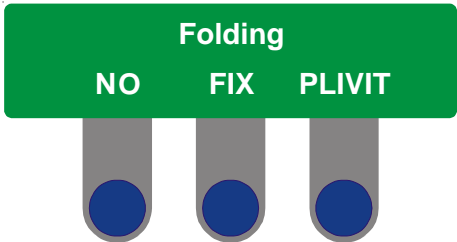
With folding or without folding mode



Selection of With folding or Without folding mode

This screen will only appear if you have replied YES when setting the machine's starting parameters.

The screen now asks you to select the with folding or without folding mode.



If you do not want to fold, press "NO".

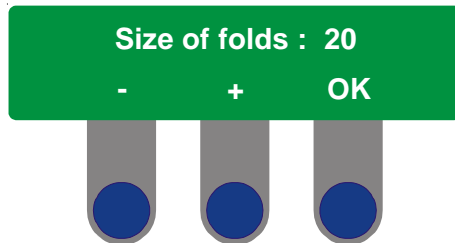
If you wish to use the manual folding function, (in other words by adjusting the length of the desired folds), press on "FIX".

In the opposite case, press on "PLIVIT" in order to have the machine carry out automatic folding.

It should be noted that by returning to this screen and reselecting one of the two options, you can reinitialise the folding system in the event of incorrect operation.

Following screens are displayed only if your machine includes the folding option and the manual fold adjusting.

Select the length of folds



Length of fold

This screen enables to manually select the fold length while folding.

Before feeding in a sheet, choose the desired fold length according to the length of the sheet.

To calculate the length of the folds, you should measure the length of the sheet and then estimate a fold length, bearing in mind that you should always divide by an even number of folds (minimum four).

As an example :

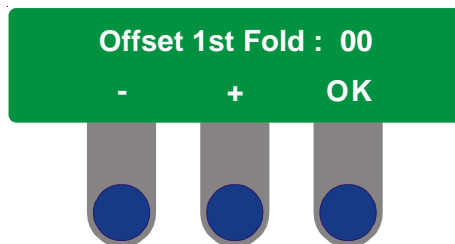
- Sample values : for a sheet of 240 cm, we obtain 6 folds of 40 cm or 8 folds of 30 cm. On the other hand, it is not possible to have 4 folds of 60 cm.

After an initial trial, you should then fine-tune the folding function by increasing or reducing the fold length: for example by increasing an initial fold value of 40 cm to 41 cm or reducing it to 39 cm.

The fold length can be adjusted from 20 to 48 cm per steps of 1 by pressing the two left keys.

Valid by pressing the key **OK**.

Select the offset of the first fold



Length of the first fold

This screen makes it possible to manually select the length of the first folds during the folding process in order to adjust the length of the sheet tail with the other folds.

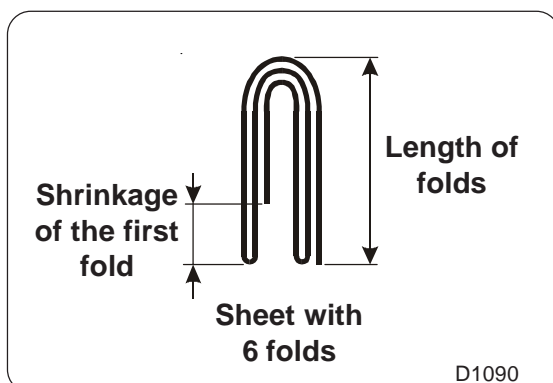
- Sample values: with a sheet of 265 cm and 8 x 35 cm folds, you can set the first fold at 20 cm (with an edge margin of 15 cm) followed by 6 folds of 35 cm.
- Sample values: with a sheet of 265 cm and 6 x 45 cm folds, you can set the first fold at 40 cm (with an edge margin of 5 cm), followed by 4 folds of 45 cm.

Feed problems or problems concerning the shape of the sheets (which can sometimes be irregular), may lead to the last fold "overshooting".

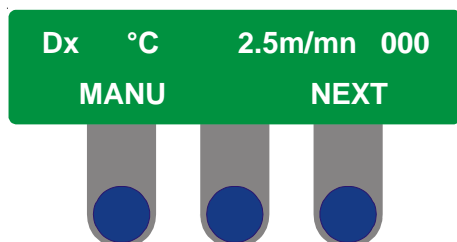
- Sample values: if you have selected folds of 45 cm and if after having modified the edge margin setting, the final folds exceed 10 cm, you should increase the fold length to 47 cm :
 $[45 \text{ cm} + (10 \text{ cm} / \text{no. of folds})] = [45 + (10 / 5)]$
in order to adjust the tail of the sheet.

By pressing the two buttons on the left, the value for the first fold can be adjusted from 0 up to half of the "fold length" value previously set (with the value increasing by 1 each time you press the button).

Valid by pressing the key **OK**.



Service screen in Automatic mode



Service screen in automatic mode

The values for the current use of the machine are shown on the first line of the screen.

- The "D" shows that you are in automatic mode (DIAMMS).

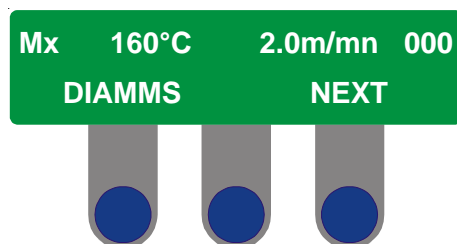
The two following values show:

- The ironing speed
- The sheet counter information

In automatic mode (**DIAMMS**), the cylinder temperature will not be displayed. This is managed by the machine itself. Only the flashing "°C" indicator is shown.

The second line displays the commands accessible from the buttons on the panel.

Service screen in Manual mode



Service screen in Manual mode

The first line of the screen displays the values for the current use of the machine.

- The "M" shows that you are in manual mode.

The following three values show:

- The current cylinder temperature
- The ironing speed
- The sheet counter information.

Various indications regarding the temperature of the ironing cylinder are displayed:

- If the temperature indicator blinks, this means the machine is preheating.
- A (-) sign indicates that the temperature of the cylinder is below 100°C (212°F).
- The current temperature is displayed when the temperature of the cylinder is between 101°C and 245°C (213°F and 470°F).
Note: values 101-245°C are minimum and maximum temperature that the electronic programmer can display. The maximum ironing temperature cannot reach 245°C (470°F), a safety thermostat automatically cuts off heating before reaching this value.
- A (+) sign indicates that the temperature of the cylinder is above 245°C (470°F).

At this point, press one of the three keys to return to the manual/automatic mode selection display. Use this function to change the set temperature or ironing speed.

The second-line displays the commands accessible from the buttons on the panel.

Complementary instructions for starting up a machine with gas heating.

The ignition of the burner is delayed by 30 seconds following the start command in order to allow for the pre-ventilation of the combustion chamber.

The machine will be ready to be used after the following message disappears :
"Error Gas Ignition".

NOTE: the noise at the inter-ignition is not an explosion. It is a normal phenomenon.

Complementary instructions for starting up a machine with electrical heating.

The typical ironing temperature is 150 to 180 °C (300 °F to 356 °F). You just have to set the electronic thermostat to the required temperature.

In automatic mode, the ironing temperature is defined and managed by the machine.

Complementary instructions for starting up a machine with steam heating.

Note that the temperature is directly related to the steam pressure (see table bellow).

The typical ironing temperature is 150 to 180 °C (302 °F to 356 °F).

On the contrary of a gas or electric heated machine, for a steam heated machine, you just have to adjust the ironing speed regarding the linen and its water retention.

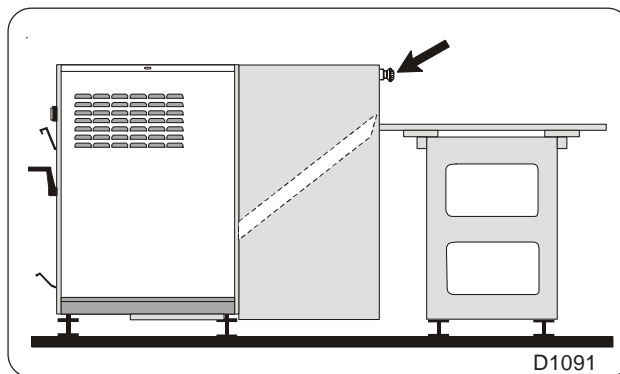
Correspondence between Steam pressure / Temperature								
Manometric pressure in bars	300 (3)	400 (4)	500 (5)	600 (6)	700 (7)	800 (8)	900 (9)	1000 (10)
Temperature in °C	143	151	158	164	169	174	179	183

Additional instructions for using an ironer with rear delivery

Two emergency push buttons are located at the rear of the machine in order to ensure the safety of the employees.

To underline that a sudden stop of the ironing cylinder with temperature above 120 °C (248 °F) can damage the ironing belts.

After an action on the emergency push button, re-starting the ironer is only possible after pushing the ON key and then the heating ON key.

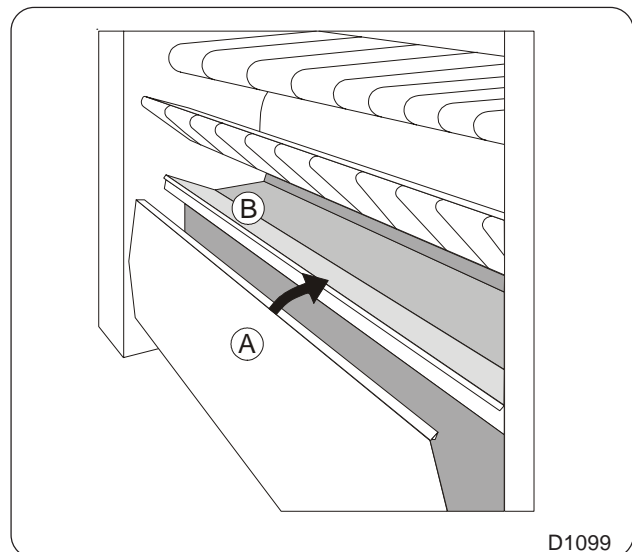


Additional instructions for using a machine with automatic folding

Even if your ironer is equipped with the automatic folding function, a "With folding/Without folding" mode makes it possible for you to use your ironer without the automatic folding function. In this case, you simply need to move the reception tank upwards in order to enable the linen to leave the machine unfolded, and then select the "Without folding" function on the command panel.

Ironing of small items of linen, without using the feeding system or the automatic folding system.

- Close the flap (A) so as to be able to stand as close as possible to the machine.
- Leave the linen collector (B) in the horizontal position to receive the small items of linen as they are ironed.

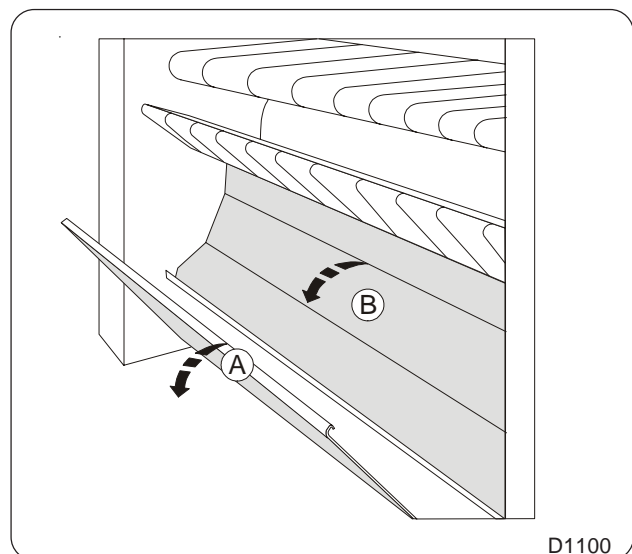


If the tank is in the wrong position to receive unfolded linen, an electronic device prevents you from using the ironer in the folding mode, even if you have selected the folding mode via the command panel. The message "Warning: tank position error" is then displayed on the command panel.

To return to the automatic folding mode, you should select the "with folding" mode and then lower the reception tank. The linen will then be released directly on to the reception table.

Ironing with the automatic feeding system and the automatic folding system

- Open the flap (A) to allow the linen to hang correctly during smoothing.
- Swing the linen collector (B) into the vertical position to form a box with the flap.



NOTE: to ensure easy handling of the reception tank, it is recommended that you operate this manually from its centre (between the two arrows inlaid on the front edge of the tank).

Folding characteristics (machine with folding function only)

- Dimension of sheets compatible with folding:
Min. length : 90 cm (35")
Max. length : 355 cm (140")
- Fold dimensions :
Min. length: 20 cm (8")
Max. length : 50 cm (24")
- Number of folds :
4 folds min.
10 folds max.
- Minimum feeding separation distance between two sheets : 10 cm (4")
- Dimension of the first fold before the complete sheet measurement (advance folding) :
25 cm (10")
- Dimension of the second fold before the complete sheet measurement (advance folding) :
35 cm (14")
- When a sheet is too long, folding starts before the complete sheet measurement, this is advance folding. The machine then automatically adjusts the folds as a function of the measurement made.

Automatic feed characteristics (machine with feed function only).

- Gripper movement speed
- The sheet size must be between 85% and 100% of the usable width of the dryer-ironer.

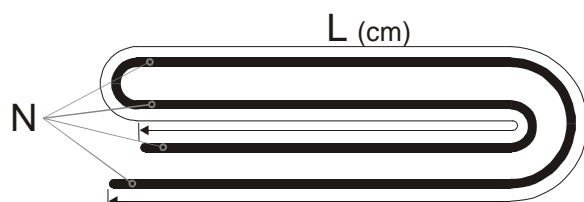
Table for adjustment of folding values

Note : Only the following values guarantee a correct folding.

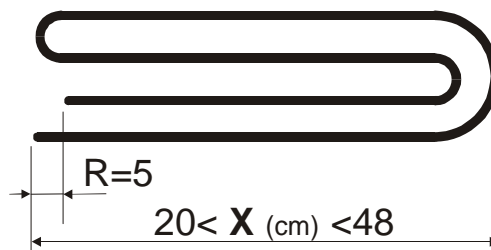
L cm \ N	4	6	8
90	X=25	-	-
95	26	-	-
100	28	-	-
105	29	-	-
110	30	-	-
115	31	21	-
120	33	22	-
125	34	23	-
130	35	23	-
135	36	24	-
140	38	25	-
145	39	26	-
150	40	27	-
155	41	28	21
160	43	28	21
165	44	29	22
170	45	30	23
175	46	31	23
180	48	32	24

L cm \ N	6	8	10	12
185	X=33	24	-	-
190	33	25	-	-
195	34	26	21	-
200	35	26	21	-
205	36	27	22	-
210	37	28	22	-
215	38	28	23	-
220	38	29	23	-
225	39	29	24	-
230	40	30	24	-
235	41	31	25	20
240	42	31	25	21
245	43	32	26	21
250	43	33	26	22
255	44	33	27	22
260	45	34	27	23
265	46	34	28	23
270	47	35	28	23
275	48	36	29	24

L cm \ N	8	10	12
280	X=36	29	24
285	37	30	25
290	38	30	25
295	38	31	25
300	39	31	26
305	39	32	26
310	40	32	27
315	41	33	27
320	41	33	28
325	42	34	28
330	43	34	28
335	43	35	29
340	44	35	29
345	44	36	30
350	45	36	30



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Instructions for using the feeding system

The feed device includes a command panel with five buttons or indicators.

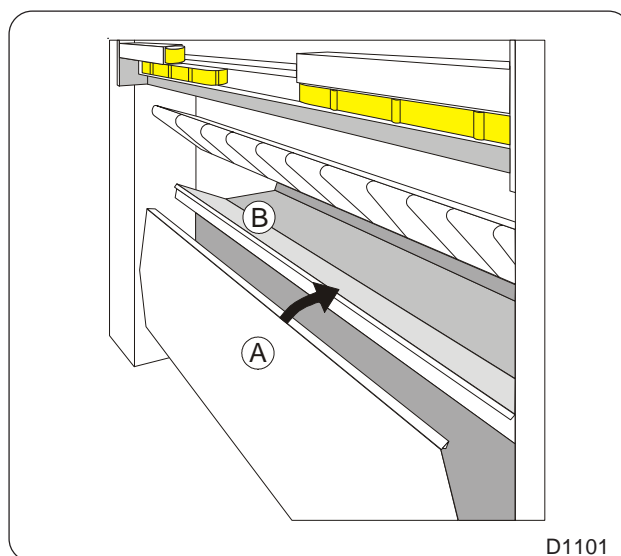
The feeder operates independently of the automatic folding system.

The ironer can be used in a variety of ways:

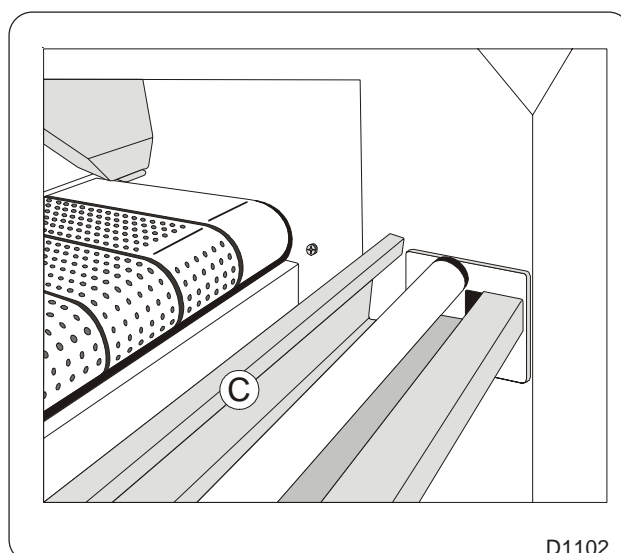
- ironer on its own for small items of linen,
- the ironer together with the feeding system,
- the ironer together with the automatic folding system,
- ironer together with the feeding system and the automatic folding system.

Ironing of small items of linen, without using the feeding system or the automatic folding system.

- Close the flap (A) so as to be able to stand as close as possible to the machine.
- Leave the linen collector (B) in the horizontal position to receive the small items of linen as they are ironed.

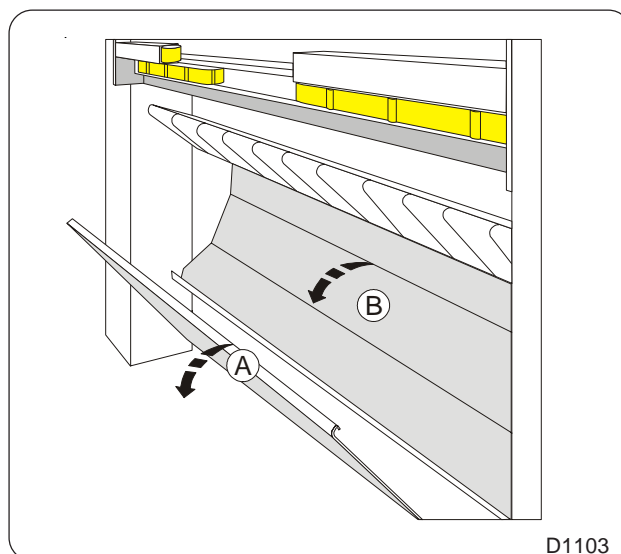


- Leave the shelf (C) in a vertical position to allow access to the container of the feeding table in order to store the linen in it.

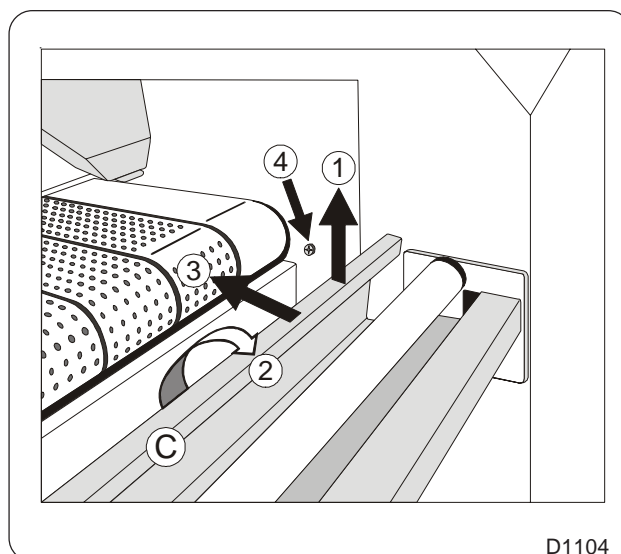


Ironing with the automatic feeding system and the automatic folding system

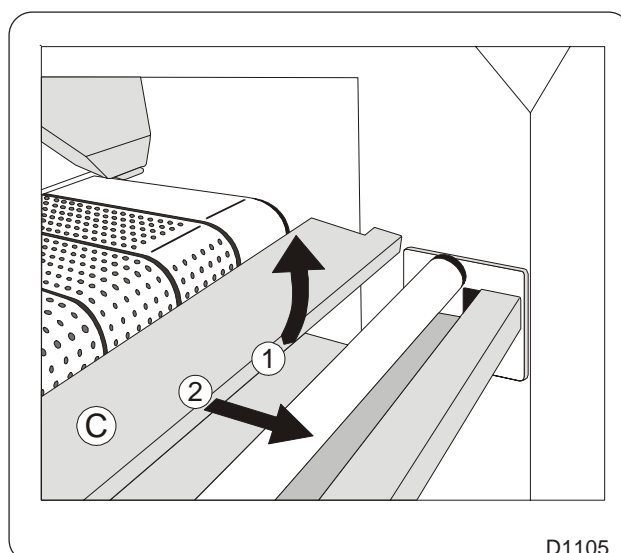
- Open the flap (A) to allow the linen to hang correctly during smoothing.
- Swing the linen collector (B) into the vertical position to form a box with the flap.



- Raise the shelf (C) as shown in the diagram opposite to cover the container of the feeding table so that it rests on the stop (4).



- If you wish to lower the shelf (C), proceed as shown in the diagram opposite.



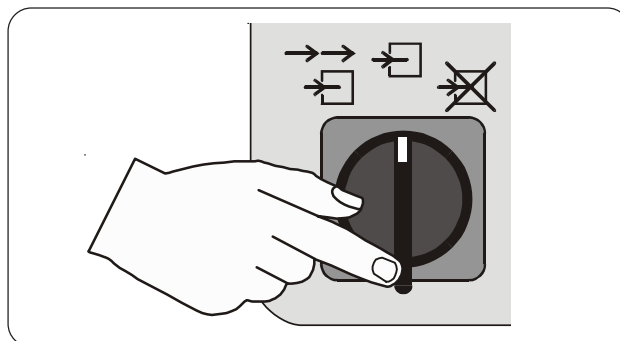
- Turn the selection button to select the mode :



- Automatic feed

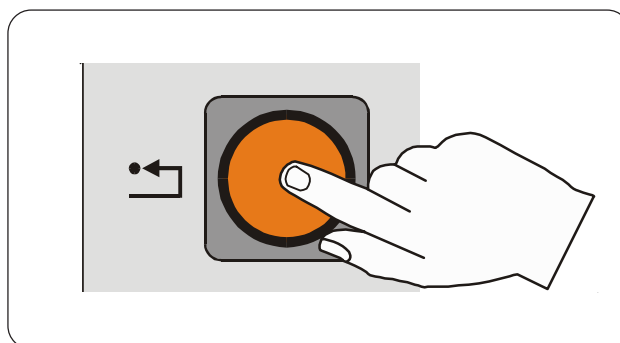


- Semi-automatic feed

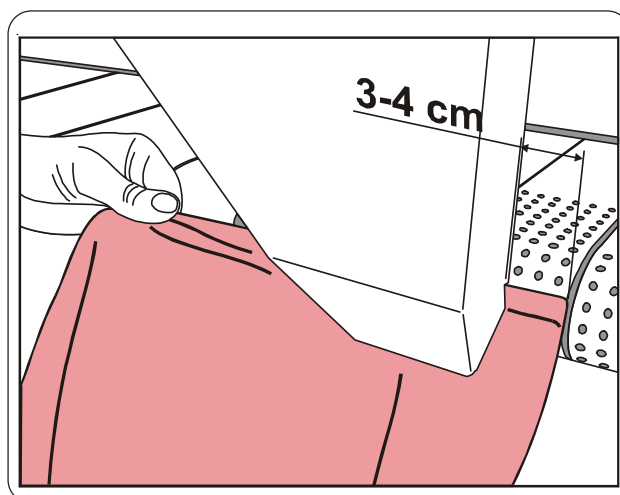


- Press the initialisation button to position the clamps in operating mode (clamps in the centre of the machine).

Note: in the event of blockage or stoppage of the machine, of restarting, power failure or if this indicator begins flashing, you must press this same button again to reinitialise the feeder.

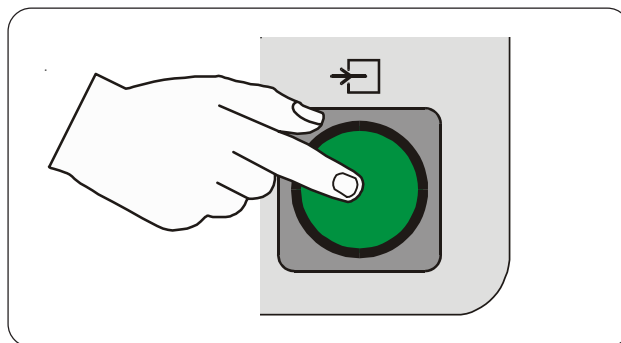


- Take a large edge of the sheet in your hands and place one corner in one clamp and the other corner in the other clamp. Do not leave over 3 to 4 cm outside the clamp.

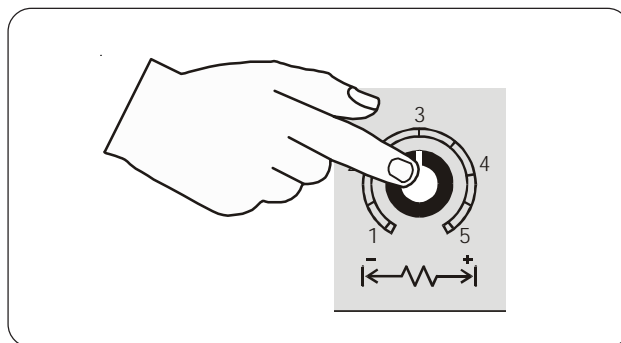


- Press the feeder start button.

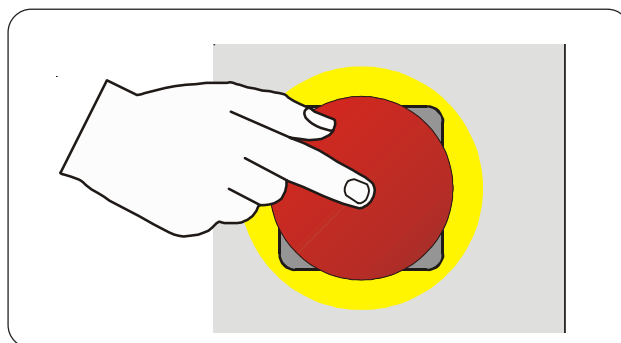
Note : If the machine is set on the semiautomatic feeding mode, you must push this start button to move the clamps in front position.



- Turn this button to adjust the sheet tension using the grippers before it is released on to the feeder table.



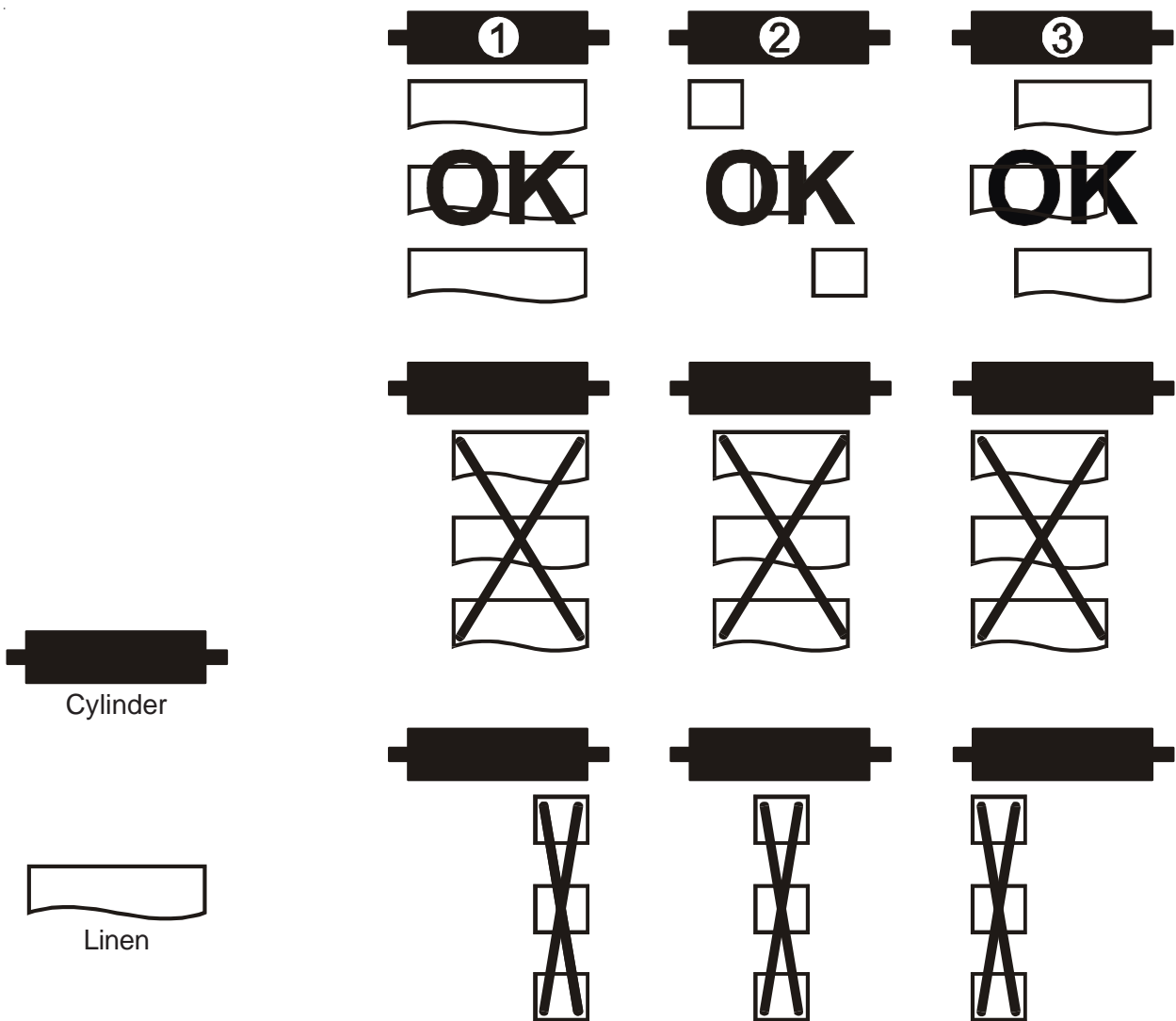
- In the event of a problem, press the emergency stop button.



Additional instructions to optimise a dryer-ironer.

When ironing small sheets or small washing, pass abreast the washing of the heating cylinder to provide correct regulation of the cylinder temperature.

As a general rule, the whole of the cylinder should be used (1). Either iron the linen from the front (2) or iron alternately (3), which makes maximum use of the heat units available over the surface of the cylinder. It also overcomes difficulties arising from random control values caused by partial use of the cylinder.



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3. Method of use

OPERATING HANDBOOK

Precautions for use

Please respect the following usage recommendations to get the best out of your ironer:

In manual mode

- Avoid when running, too low or badadjusted temperatures as consequence of :
 - a too high ironing speed with high moisture content in sheets : bad sliding on metallic sparts.
 - a partial use of the ironing lenght of the cylinder : creating overheating (be carreful especially, to the risk for the polycotton sheets to loose their shape, generally stabilised at 200 °C (392 °F).
- You should begin ironing when the "**Warming up**" message disappears.
- Check that the washing can be ironed and check the temperature at which it is to be ironed.

The productivity and quality of ironing / folding depend on the washing quality ; make sure that all these conditions are satisfied.

- We recommend as far as possible, that you should feed pieces of flat washing (towels, sheets, etc.) by their hem, with the seam facing top, to obtain maximum ironing quality.
- Carefully engage the washing to be ironed, because it is impossible to disengage a badly engaged washing.
- Allow 10 cm between washing to be ironed when using a machine with an automatic folding system
- Do not iron washing folded in four, because it will be too thick to achieve the drying/ ironing/folding quality that you are entitled to expect from your machine.
- If possible, use the entire ironing width of the dryer ironer.

Practices to avoid

- Make sure that the width of the washing does not exceed the useful width of the machine.
- Linen units under 0,90 m (machine with the automatic folding or/and feeding option).
- Sizes not fitting the cylinder working length, partial use of the cylinder.
- Draw-sheets or any other double-layer sheet or sheet pulled into the machine side by side.

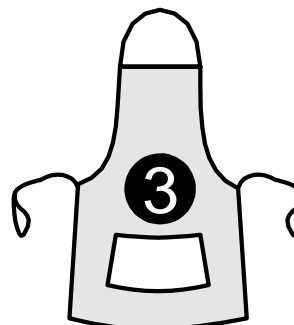
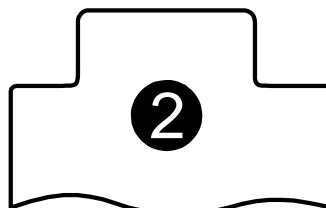
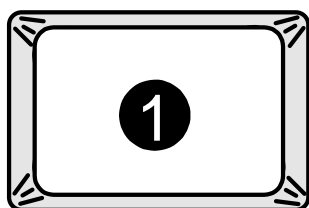
Practices not recommended

- Folding of tableclothes (of poor quality).
- Folding of tableclothes (of poor quality).
- Worn polycotton sheets (cotton worn away) : uneven finish look when folded, high static electricity.
- Large cotton or flax-made sheets > 200 g/m².

Cautions

- Prepare the large sheets before feeding : ironing and longitudinal folding defects.
- Avoid the torn, worn or holed sheets, that may hook and alter the measurements and the longitudinal folding.
- Comply with the mini-maxi sizes of sheets (machine with automatic feeding).

In all cases, you should ensure that the folding characteristics are respected.



① Fitted-sheet

② Comforter cases with flap

③ Butcher's apron

D0411

	Draw-sheets	Fitted-sheets	Comforter cases	Butcher's apron	Linen < 200 g/m ²	Linen > 200 g/m ²
Flatwork ironer	✓	✓	✓	○	✓	○
Flatwork ironer + Folder	✓	○	✓	✗	✓	○
Flatwork ironer featuring rear load removal	✓	○	✓	✗	✓	○
Flatwork ironer with feeding + Folder	✓	○	✓	✗	✓	○
Flatwork ironer with feed device featuring rear load removal	✓	○	✓	✗	✓	○

✓ Yes

○ Cautions

✗ Practices to avoid

- Fitted-sheet (1) : might cause folding problems, measurements altered.
- Comforter cases with flap (2) (folding problems).
- Linen other than flatwork (butcher's apron (3) : watch that the cords do not slide between the feeding strips).
- Linen < or = 80 g/m² : gravitational pull difficult at lengthwise folding.

Stopping the machine

To avoid potentially serious damage to the ironing belts and other components, follow these instructions when shutting down the machine :

- On steam heated machines, turn off the steam supply to stop the heating and slowly open the trap-bypass valve to bleed.
- Use the **STOP** function on control panel to begin the shut-down cooling process.
- When the screen displays "**Stand by/Start**", switch the main switch to the "OFF" position.
- On gas heated machines, close the gas supply valve.

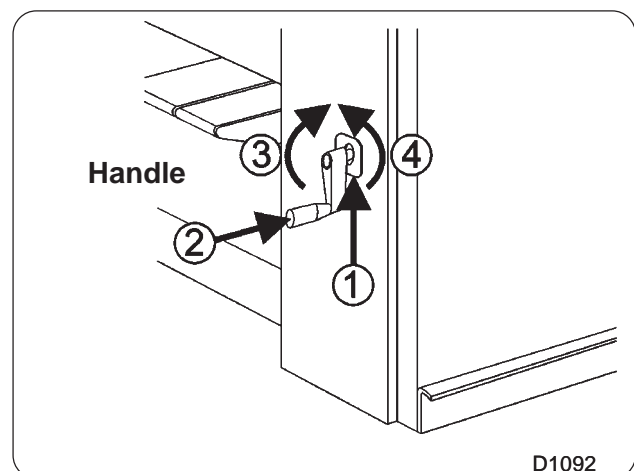
You can switch the machine off at any time by pressing on the machine stop switch; but note that if the ironing cylinder is too hot (above 120 °C (248 °F), it can damage the bands.

Using the handle

The dryer ironer is fitted with a handle.

This is very useful to take out the washing if there is a power failure while you are ironing; or you can use it to feed a piece of wet washing to protect the ironing bands when the ironing temperature is too high.

Lift • the safety plate (1) then push (2), and turn the handle in the clockwise direction (3) (machine with folding option) and in the anti-clockwise direction (4) (machine without folding) to rotate the cylinder and take out the washing.



RABC option (Risks Analysis Biocontamination Control)

RABC (Risks analysis and bio contamination control) is a method used for checking hygiene in laundry shops. It records vital data to ensure processing is performed according to procedures.

Traceability for quality control :

All of the dryer-ironers are compatible with the traceability systems corresponding to the RABC method.

- CMIS software



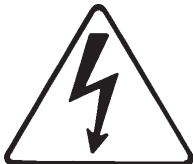
- RABC printer

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CAUTION

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



CAUTION

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



WARNING

The presence of dangerous mechanisms inside the machine can cause serious injuries. Respect all safety instructions before doing any work on the machine. Replace protective casings after doing any work.



CAUTION

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



CAUTION

The temperature of the ironing cylinder after use can reach 200 °C (392 °F) and can cause serious burns if you touch it. Allow the machine to cool down before doing any repair or servicing work.



SAFETY

Never iron if the mobile safety protector (hand protection bar) is not operating.



CAUTION

Never open the Dubixium cylinder's filling cap. This may void the guarantee.



IMPORTANT

To ensure optimal operation of the machine (gas heating, electronic boards, etc.), ensure that the ambient temperature does not fall below 15°C.

All repair and servicing work must be undertaken by a competent person.

Never wear full clothes during work (wide sleeves, ties, scarves, etc.).

Disconnect all energy sources and let the ironing cylinder cool down before doing any work on the machine.



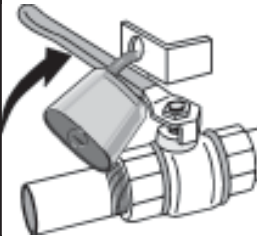
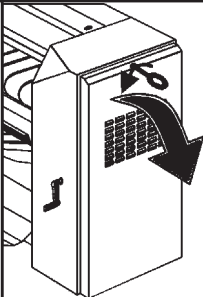
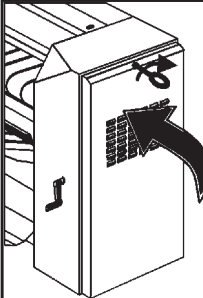

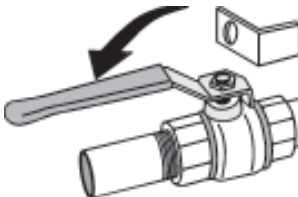
In order to avoid any danger of fire or explosion, never use inflammable products to clean the machine.

If you smell gas, turn off the gas supply, open the windows, do not touch any switches and inform the maintenance service.

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

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.
		Close and carefully lock the fixed protectors.
		Do the maintenance.
4		Unlock the stop valves and the main switch.

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4. Safety

OPERATING HANDBOOK

Safety devices

Feed safety device

The space between the feed safety flap and the drive bands is too small for you to enter your fingers. The machine stops automatically as soon as the flap is pushed in.

Protection of motors

The motors have overload protection :

- by thermomagnetic circuit breakers and
- by the electrical selector (for movement).

Restarting the machine

You will not be able to restart the machine after it has stopped (power failure, emergency stop, action on the feed safety device), until you have pressed one of the keys on the control panel.

Gas heating

The gas burner is ignited and the flame is controlled by an electronic box that provides integral safety, for example if the flue draft is poor or if the gas supply is cut off.

An message on the control panel shows that the system has been put in a safe condition.

A pressure switch connected to the combustion products outlet turns off the machine's heating function should extraction problems arise.

Accessibility

All casings can be disassembled using a special tool.

Heating safety device

The control panel applies an initial safety level at the time the machine starts up. If the temperature is not reached after a given time, the heating command is deactivated.

The operation of the heating function is linked to the rotation of the cylinder. If the cylinder should stop rotating for any reason, the machine stops heating.

A safety thermostat, which is independent of all electronic systems, limits the heating temperature of the ironing cylinder in all circumstances, (except in the case of a steam heating machine).

Power supply failure

If there is a mains power supply failure, use the handle to remove any washing engaged in the machine. If the temperature is too high, use the handle to feed some wet washing and protect the ironing bands.



SAFETY

Make sure that the protection casings are in position before use.

Complementary instructions for operation

Check daily that the hand safety bar is working correctly, the machine must stop when you press it. The screen on control panel displays "Emergency Stop/ Reset Push Button". Press any key to resume ironing.

Ironing Temperature Display

The control enclosure includes an electronic thermostat panel which shows in real time the temperature of the ironing cylinder.

A running temperature over the selected temperature is normal. This happening is not a failure of measuring devices but it is due to heating inertia.

In automatic mode, temperature and speed management are handled by the machine itself.

The use of steam heating machines.

Steam heating machines are designed to operate only using dry saturated steam at a maximum pressure of 1000 kPa (10 bar). You should take care not to exceed this limit in order to avoid premature damage to pressurised components.

Each time the machine cools down, water vapour is inevitably created. The use of dry saturated steam reduces the risk of erosion and corrosion of the tubes and pressurised components.

There is a risk of deformation, cracking and bursting if pressure levels are used which exceed the recommended 1000 kPa (10 bar). Check that the safety valve operates correctly in order to avoid the risks of excess pressure building up.

Fire-related risks.

Should a fire breakout inside the machine, it is recommended that you use a CO2 extinguisher.

Note : in the case of a machine using gas heating, it is **strictly forbidden** to attempt to put out the fire before having first turned off the gas inlet valve.

The client must ensure conformity with the Labour Code and his supplier of fire-fighting equipment who issues the Q4 certificate to him.

Repair and maintenance work on the machine.

All work on the machine must be carried out by qualified personnel, able to carry out the work required.

Ensure that the applicable safety conditions for the destination country are fully observed.

Encountered problem	Cause of problem	Solution
The washing remains stuck to the cylinder	<p>Your washing is not rinsed correctly</p> <p>if the washing is insufficiently rinsed.</p> <p>Check that ironer separating ribbons are intact.</p> <p>Check the cylinder temperature.</p> <p>The washing is not sufficiently spun.</p> <p>Your linen is starched</p>	<p>Check rinsing with a 1 % phenolphthalein solution diluted in alcohol. If this colorless liquid turns to pink on the washing as it comes out of the washing machine, and it still contains detergents.</p> <p>Increase the number of rinsings if necessary or reduce product doses.</p> <p>There is a risk of starch deposits forming on the cylinder</p>
When the linen comes off the dryer-ironer it is not dry	<p>Your washer-spin dryer has a spin rating of below 300G.</p> <p>Check the drying quality of your washing machine.</p> <p>The ironing speed is too high.</p> <p>The ironing temperature is too low.</p> <p>The linen that you are trying to iron is too thick.</p> <p>Check operation of the heating.</p> <p>Check operation and cleanliness of the vacuum intake system.</p> <p>Check the condition of ironing bands (fibers containing scale).</p> <p>Check the pressure of the ironing roller on the ironing cylinder.</p>	<p>You should plan on a short pre-drying session in a dryer (5 – 10 mins).</p> <p>The residual moisture content of the washing should be about 50 %.</p> <p>Reduce the ironing speed.</p>
The folding system works without stopping	<p>Check that the photoelectric cell is opposite its reflector.</p> <p>The cell is correctly positioned opposite its reflector.</p>	<p>Check that these are clean and clean them if required.</p>

Encountered problem	Cause of problem	Solution
The heating does not work, or works badly	<p>Check the temperature preselection.</p> <p>Check the safety thermostat.</p> <p>Check to see if the panel is showing overheating or a high temperature.</p> <p>Check the cylinder's rotation detection system.</p> <p>Gas heating Check the gas inlet.</p> <p>Clean pressure reducer filters.</p> <p>Check electronic ignition.</p> <p>Check the position of the ignition electrodes and flame control.</p> <p>Check operation of the gas solenoid valve.</p> <p>The flame is yellow</p> <p>Electrical heating Check heating contacts KM6, KM7 and KM8.</p> <p>Check heating resistances.</p> <p>Check resistance connections.</p> <p>Check phases.</p> <p>Steam heating Check the steam inlet and the boiler pressure.</p> <p>Check the steam quality.</p> <p>Check the non-return valve and the steam purge.</p>	<p>Check the panel's sensors.</p> <p>Check that the vapour intake fan is working and is turning in the right direction.</p> <p>Check that air inlets are not blocked.</p> <p>Check the combustion products exhaust flue.</p> <p>Check injector calibration.</p> <p>Clean machine air inlet filters.</p>

Encountered problem	Cause of problem	Solution
The folding system is defective	<p>Check that the photoelectric cell and its reflector are clean.</p> <p>Check the folding arm limit switch.</p> <p>Condensation given off by the linen when still damp has affected the operation of the photoelectric cell.</p>	<p>Check that the linen is perfectly dry after being ironed.</p>
The machine temperature drops	<p>Check the sensor in the thermostat regulation system.</p> <p>Check the thermostat by measuring the cylinder temperature with a thermometer.</p> <p>Check that the regulation shoe is in contact with the cylinder.</p>	
The machine stops suddenly	<p>Check the electric power supply.</p> <p>Check the hand safety flap switches S5 and S6.</p> <p>Check the movement and ventilation fans.</p> <p>Check circuit breakers.</p>	

Static electricity makes the folding difficult to achieve (machine with the folding system only)

- Synthetic textiles are used increasingly in laundry. The low rate of relative moisture on output from drying allows high ironing speeds, which leads to production of harmful static electricity when the linen is ironed in the machine.
- Use of softening and anti-static products attenuates this phenomenon.
- So, static electricity might cause important difficulties at folding, especially when ironing polyester/cotton. It is advised to add a rinsing anti-static liquid at the end of washing cycle in order to reduce the formation of static electricity when ironing.

Static electricity

- Any friction generates static electricity. Remember the plastic ruler people rub over their pullover to attract little bits of paper. With the same causes producing the same effects, the linen being subjected to friction in the course of ironing, the rubbing of the linen against the cylinder generates static electricity. If too much static electricity builds up, friction has to be reduced, which can be done by removing the driving chain of the press-cylinder to reduce the generation of static electricity.

Linen colouring

- The brown coloring is due to detergent residues, and will disappear at the next washing.
- Colouring caused by the temperature being too high is permanent. Reduce the ironing temperature or increase the ironing speed.
- The washing should be correctly rinsed so that it does not turn yellow and does not make the cylinder dirty.
 - Check the quality of the washing water (TH/TAC).
 - Check the washing and rinsing cycles (see "phenolphthalein" operating incidents).
 - Check incrustation of the washing (ash content).

The feed bands are not turning

- This type of incident is normal when it only affects a few bands.
When washing will not engage any more, adjust the tension of all the bands by changing the setting of the feed table bearings.
Do not overtighten the bands.
The band must stop turning when you press on it with your finger. It must start again when you remove your finger.

Complementary instructions for starting up a machine with gas heating.

The message "**Error Gas Ignition**" is flashing on display screen during 30 seconds to show that the gas burner is being ignited. If this message is still displayed after 6 seconds, there may be an ignition fault, a failure in gas valve opening or a lack of gas.
Switch the machine off and call your local repairman if this occurs regularly.

About 10 minutes is necessary to warm up.

Note :

Do not forget to open the stop valve on the gas supply line before starting to use the machine, and then close it again after use.

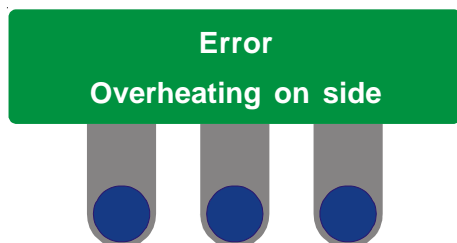
The noise at the inter-ignition is not an explosion. It is a normal phenomenon.

Complementary instructions for starting up a machine with steam heating.

Note : do not forget to open the by-pass or the condensate return valve for about a minute to purge the pipes so that the cylinders can warm up more quickly; do this before starting to switch on the machine. Close it afterwards.

Slowly open the steam inlet valve and check the temperature on the control display panel.

Overheating of cylinder sides



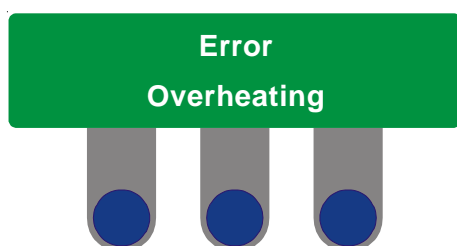
Overheating of cylinder sides (when feeding is carried out on the centre of the cylinder too often)

In the event that one of the two sides of the cylinder overheats due to it being partially used, a flashing message will be displayed on the screen, alternately with the service screen.

The heating system of the machine will remain shut down while this flashing message is displayed.

To continue ironing, allow the cylinder to cool until the flashing display disappears.

Overheating of centre of cylinder



Overheating of centre of cylinder (when small linen units are too often fed on the centre of the cylinder)

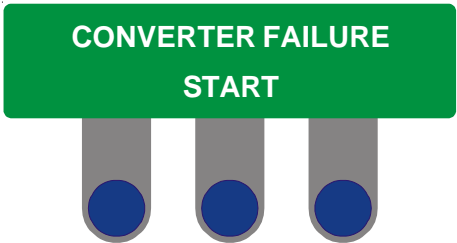
In the event that the centre of the cylinder overheats due to it being used laterally, a flashing message will be displayed on the screen alternately with the operating screen.

The heating system of the machine will remain shut down while this message continues to be displayed.

To continue ironing, allow the cylinder to cool until the flashing display disappears.

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Converter fault



"Converter failure" message

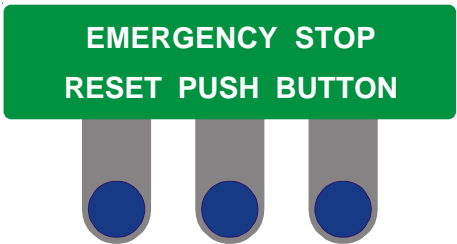
If this message appears on the screen, the converter has developed a fault. Please refer to the converter manual for information repairing the fault.

The machine will only be able to be restarted once the fault has been repaired.

To reinitialise the machine, press the central key.

If the fault remains, switch off then switch back on the power supply using the main switch.

Fault Emergency stop



Message: "Emergency stop-check button"

If the screen displays this message, one of the emergency stop buttons has been triggered. The machine enters safety mode, the heating is turned off and the cylinder stops.

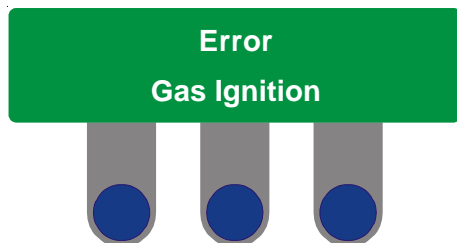
Check why the button was pressed and then reset it. The screen should now display this message :



You can now press on the central button on the panel to return to the machine operation mode.

If resetting the button does not solve the problem, you should then check the others.

Gas burner ignition fault (only for machines using gas heating)



"Gas ignition fault" message (only on gas-heated machines).

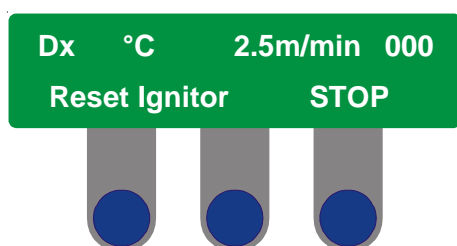
The screen will alternately display this flashing message and the service screen. This means that the lighting of the gas burners has been requested.

If this message has been displayed over 30 seconds, the gas burner is not ignited. The heating system falls into safety state and heating is cut off. Try again and follow the starting procedure.

Press any key to display the following menu.

After an additional failure, please check the gas heating running. If the fault remains, consult your after-sales service.

Reset the igniter (only for machines using gas heating)



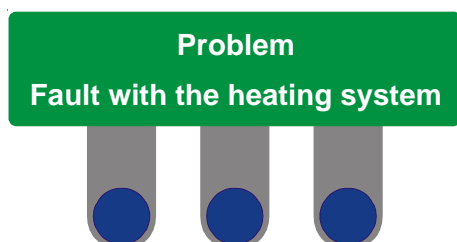
Message: "Reset igniter"

The message on the screen will then ask you if you wish to reset the igniter.

Press on one of the two buttons on the left to restart the gas igniter.

Press the **"STOP"** button to stop the machine.

Fault with the heating system



Message: "Problem - fault with the heating system".

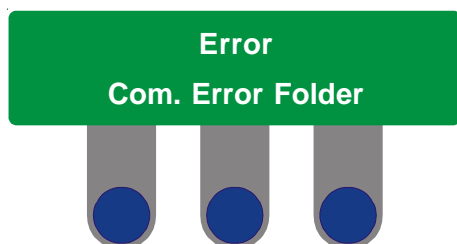
The screen appears if, after a certain time (approximately 20 minutes) the cylinder temperature remains below 100°C.

Try to restart the machine.

If the problem continues, please consult your after-sales service department.

The following three screens will only appear if you have a machine with a folding option and manual fold adjustment.

Error of communication with the folding option



"Com. Error Folder" message

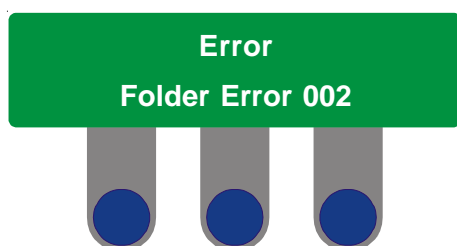
The screen will alternately display this flashing message and the service screen.

This message means that there is a communication failure between the control panel and the folding programmable logic controller.

- Check the link between the control panel and the programmable logic controller.
- Check the setting of the programmable logic controller.
- In the **Set 2** menu of the service program check the configuration for the control panel. The **MANU** parameter should be selected.

If the fault remains, consult your after-sales service.

Error of the folder running



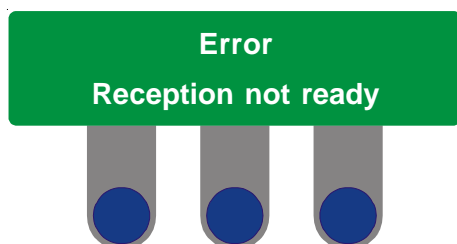
"Folder Error 002" message

The screen will alternately display this flashing message and the service screen.

This message followed by a number means a failure in the folder running.

Switch off then switch back on the power supply using the main switch. If the fault remains, consult your after-sales service.

Positioning fault with the reception tank



Message: "Problem - tank positioning error".

The screen displays the following flashing message, alternating with the service screen.

This message shows that the reception tank on the machine is not in the correct position for the folding option that you have chosen:

- Raised to use the machine without folding (folding mode: **WITHOUT**).
- Lowered to use the machine with folding (folding mode: **FIX** or **PLIVIT**).

Preventive maintenance of the ironer

Daily (8 h.) (at the beginning of each working day)

1. Check that the machine stops when you press the mobile safety protector (hand safety device).
2. Check that the "emergency stop button" works correctly.

Weekly (40 h.)

3. Clean motor ventilation grills.
4. Clean the separators.
5. Clean the detection cell and its reflector (on models with the folding function only).
6. Check and clean the plush filter. Clean the cover filter with suction device
- 6'. Clean the cover filter with suction device.

Monthly (170 h.)

7. Remove dust from outside the machine.
8. Ensure that the thermostatic regulation and overheat safety shoes are always clean and in contact with the cylinder.
9. Lubricate the steam heater bearings (see lubrication chart in next pages).

Every six months (1000 h.)

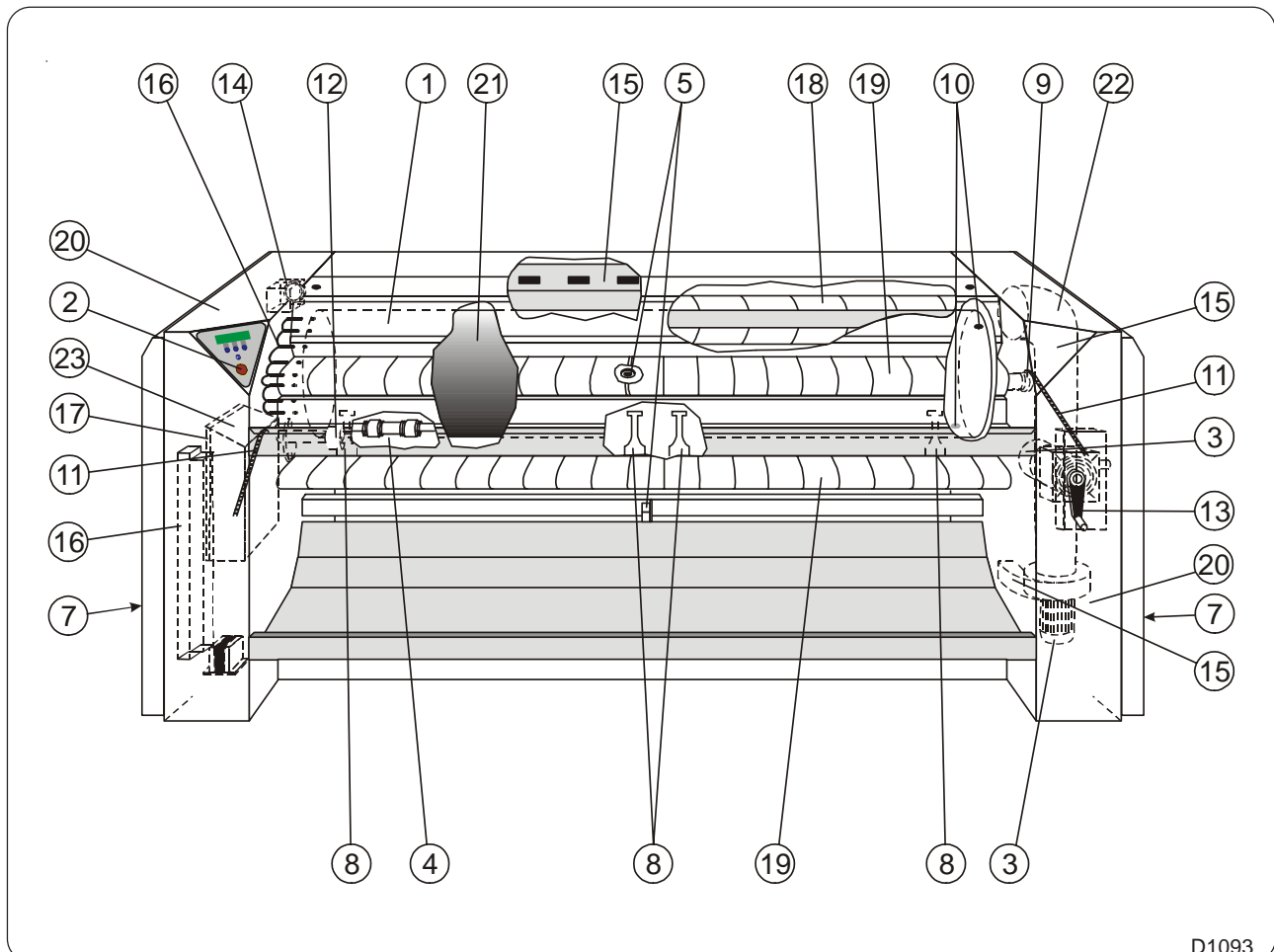
10. Check for any possible oil seepage, particularly at the filler plug (only on Dubixium cylinders).
11. Grease chains (see lubrication table on the following pages).
12. Clean and check cylinder support rollers (except on machine with steam heating).
13. Check operation of the handle.
14. Inspect tightness of electrical connections on the power supply terminal block and electrical earthing connections.
15. Clean the entire intake system.
16. Inspect heating elements, cables and electrical connections (on electrical heating only).
17. Clean gas filters (on gas heating only).
18. Check the condition of ironing bands and their staples.
19. Check the feed bands and their drive and ejection bands (on models with the folding function only).
20. Remove dust from inside the machine.

Every year (2000 h.)

- 21. Check if the cylinder is dirty and clean it if necessary.
- 22. Inspect and clean external pipes.
- 23. Check that the burner works correctly (gas machines only).
- 23. Clean the fluff filter with suction device.
- 23. Clean the cover filter with suction device.
- 23. Clean the inner gas burner with suction device.
- 23. Check the sight of the ceramic plates joints and change them if necessary.

Every three year (6000 h.)

- 23. Clean the fluff filter with suction device.
- 23. Clean the cover filter with suction device.
- 23. Clean the ceramic plates with suction device.
- 23. Change the high temperature joints made of mineral wool.
- 23. Check the tightness of the venturis.



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6. Preventive maintenance

OPERATING HANDBOOK



SAFETY

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



CAUTION

For an optimal service of your machine, execute this instructions at regular intervals and according to the frequency of use.

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Preventive maintenance of the ironer

Daily (8 h.) (at the beginning of each working day)

1. Check that the "emergency stop button work correctly.

Weekly (40 h.)

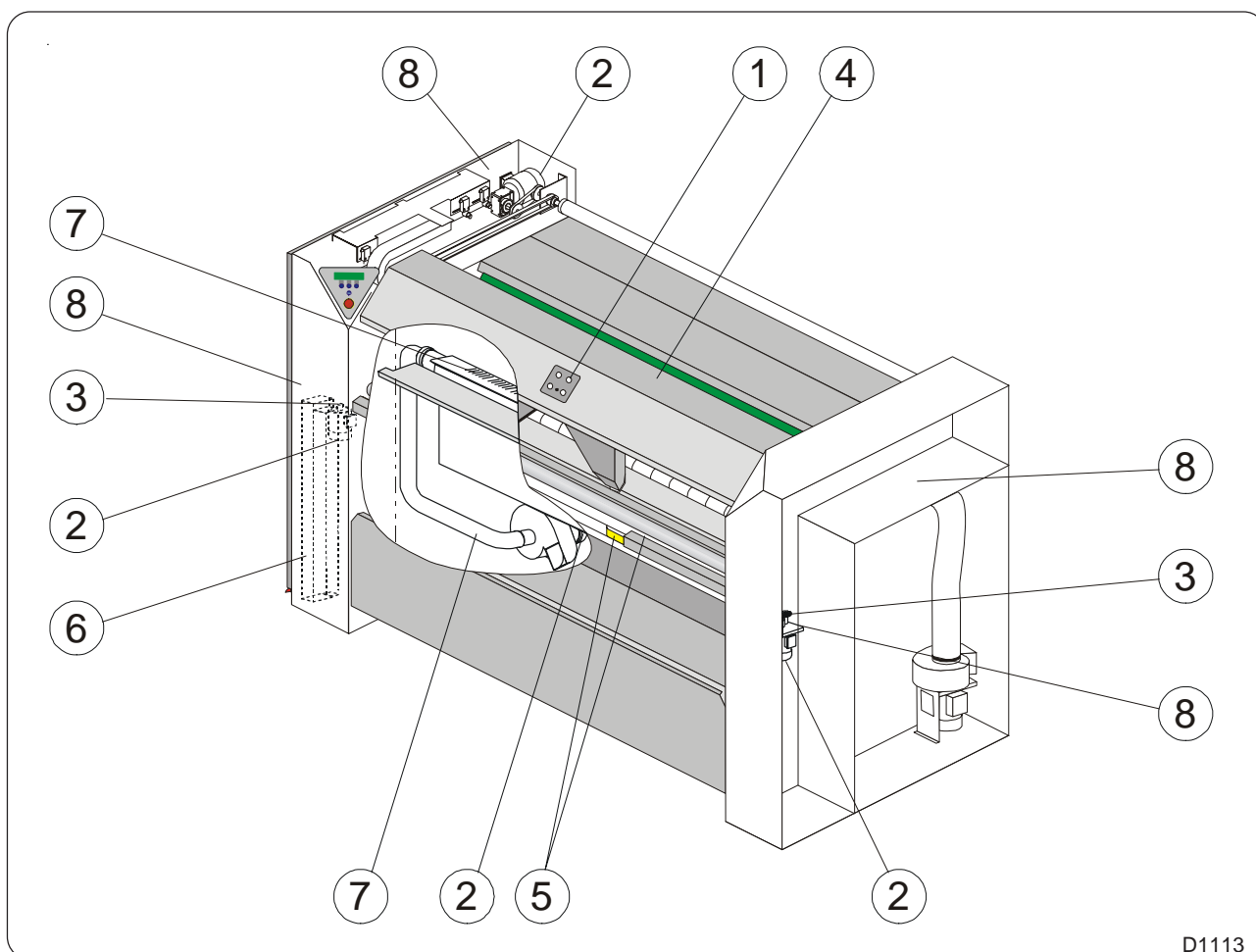
2. Clean motor ventilation grills.
3. Clean the drive system of the dewrinkling strips.

Monthly (170 h.)

4. Remove dust from outside the machine.
5. Check the condition of the separating ribbons on the press roller, and replace them if necessary.

Every six months (1000 h.)

6. Inspect tightness of electrical connections on the power supply terminal block and electrical earthing connections.
7. Clean the entire intake system.
8. Remove dust from inside the machine.



D1113



WARNING

Carry out these instructions at regular intervals, depending on the frequency of use, to keep your machine in optimum working condition.

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Motors

- The fan motor is life lubricated.
- The movement reduction gear is life lubricated.

Bearings

- The bearings are greased for life and do not need to be re-greased. However, you may regrease them using a grease which features the same characteristics as that originally used (grease high temperature "EMALUBE M").
- Only the two bearings on the steam cylinder should be regreased periodically (please see "Preventive maintenance") using a grease which is resistant to high temperatures.

Cylinder

- The cylinder must be maintained very carefully so that ironing is easy and good quality.
- Detergent or scale deposits must be removed as soon as they reduce ironing quality (jamming, creases on the washing, etc.).

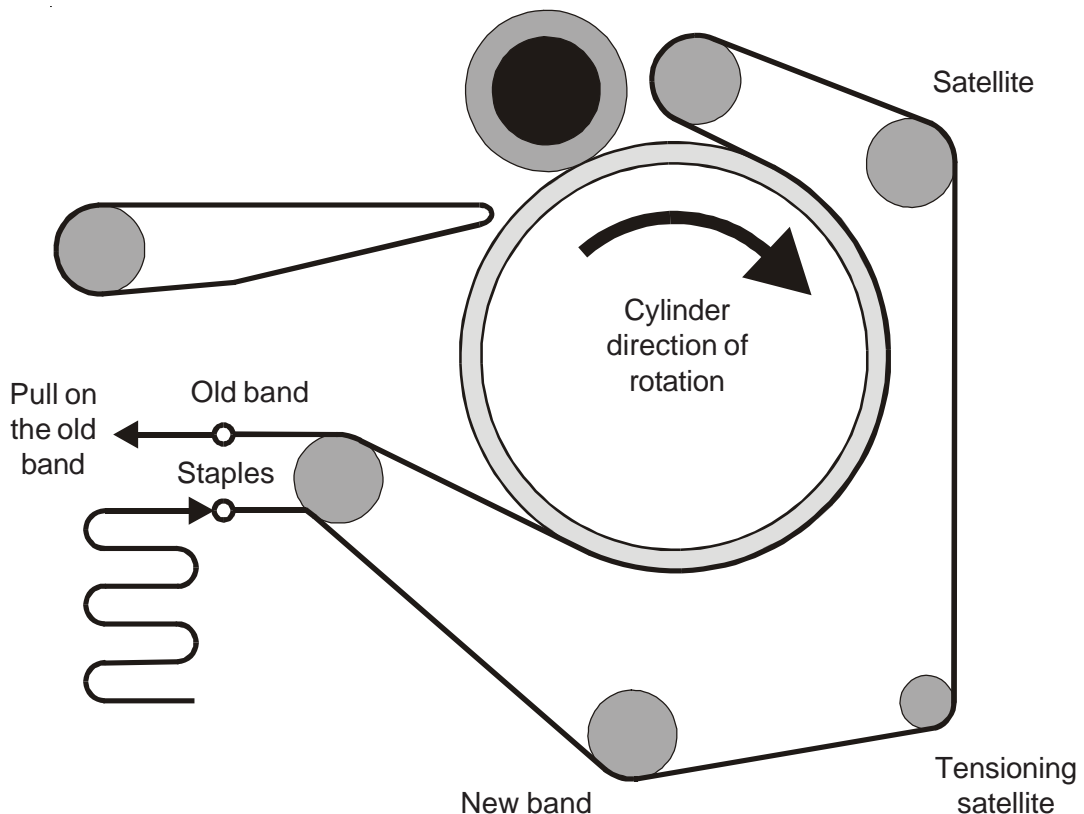
Replacing ironing bands

- Remove the feed tray to obtain easy access to the ironing bands.
- Remove staples from the two ends of the bands to be replaced and staple the end of the old band with the end of the new band.
- Rotate the cylinder using the handle.
- Unstaple the ends of the old and the new band, and staple the two ends of the new band together.
- Do the same for the other bands.
- Replace the feed tray.

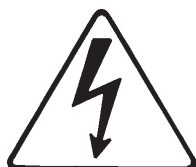
CAUTION



The tension of the ironing bands was adjusted in the factory with the machine hot.
Never retension the bands.
 Their tension must be as low as possible (just enough to drive them) since excessive tension will cause fast wear of these bands.
 Remember these comments if you need to make an adjustment or a replacement.



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).

Washing symbols

(ISO 3758:2005 standard)

Washing

The tub symbolizes washing.

	Max. washing temperature in °C	Mechanical action
D1232	95	normal
D1233	95	mild
D1234	70	normal
D1235	60	normal
D1236	60	mild
D1237	50	normal
D1238	50	mild
D1239	40	normal
D1240	40	mild
D1241	40	very mild
D1242	30	normal
D1243	30	mild
D1244	30	very mild
D1245	40	Wash by hand
D1246		Do not wash

Bleaching

The triangle symbolizes bleaching.

D1247	Bleaching allowed (chlorine or oxygen).
D1248	Bleaching allowed (only oxygen).
D1249	Do not bleach.

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

Dry or water cleaning

The circle symbolizes dry or water cleaning.

D1253	Normal dry cleaning with perchloroethyl, solvent of hydrocarb.
D1254	Mild dry cleaning with perchloroethyl, solvent of hydrocarb.
D1255	Normal dry cleaning with solvent of hydrocarbon.
D1256	Mild dry cleaning with solvent of hydrocarbon.
D1257	Do not dry clean.
D1258	Normal water cleaning.
D1259	Mild water cleaning.
D1260	Very mild water cleaning.

Drying

The circle in a square symbolizes tumble drying.

D1261	Can be put in a tumble dryer. Normal temperature.
D1262	Can be put in a tumble dryer. Lower temperature.
D1263	Do not put in a tumble dryer.

Ironing

The iron symbolizes the domestic ironing and pressing process.

D1264	Max. temperature 200 °C.
D1265	Max. temperature 150 °C.
D1266	Max. temp. 110 °C. The steam can cause irreversible damages.
D1267	Do not iron.

Conversion of measurement units

The 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 H₂O
 1 bar = 14.504 psi

british 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

kilogramme per square centimeter :
 1 kg/cm² = 98 066.5 Pa

1 kg/cm² = 0.980 665 bar
 1 kg/cm² = 10 000 mm H₂O
 1 kg/cm² = 735.557 6 mm Hg

pound : 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 H₂O
 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 = 10⁶ cal
 1 th = 4.185 5 x 10⁶ 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

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
C O R R E S P O N D E N C E	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						



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