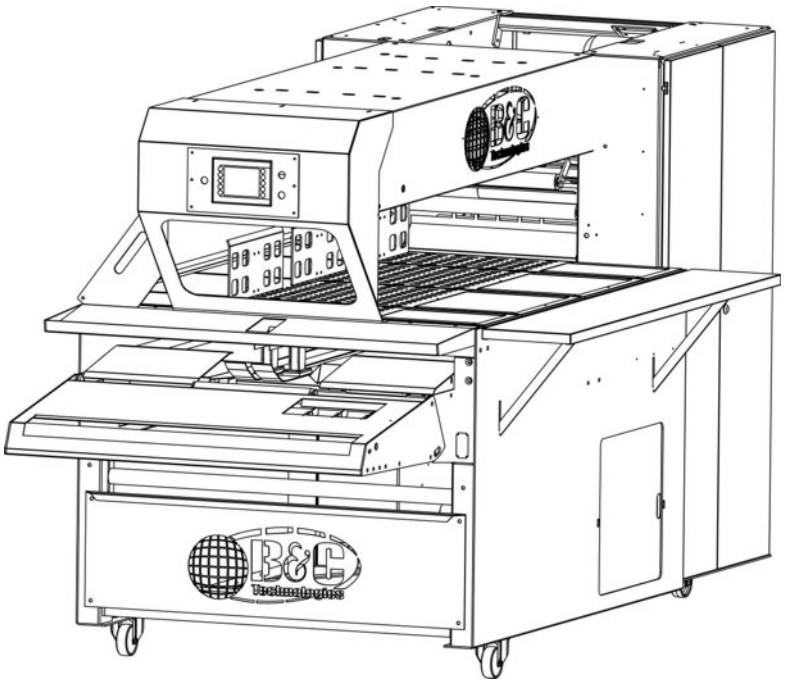
Small Piece Folder

PF Series Installation and Operation Manual

25-Aug-2015
Revision 1.2



Contents

Chapter 1

Model Identification

Information contained in this manual is for the following machines:

PF-1
PF-3

Refer to the PF Product Family chart on page 2 for details about the configuration and build of a particular machine. The Product Family Chart ″‘decodes″’ the model information as shown on the serial decal.

Family	- *Stacker*	- *Control*	*Voltage*
PF	1 – Single Stack	B – B&R PP65 PLC	2 - 200-240V, 50/60Hz, 3ph
	3 – Three Stack		4 - 380-415V, 50Hz, 3ph
			5 - 440-480V, 60Hz, 3ph

Crossfold	*Fold width*	*Double Left Fold*	*Conveyor*	*Prep*
A – Air Only	4 – 4 positions	N - None	0 - No	N - None
K – Knife Only	8 – 8 positions	D – Double	1 - Yes	E - EMI Filter and Shield
B – Air and Knife				

Approvals	*Packing*	*Design Rev.*
A - USA	B - Bag	A
E - Europe	C - Crate	
N - None		

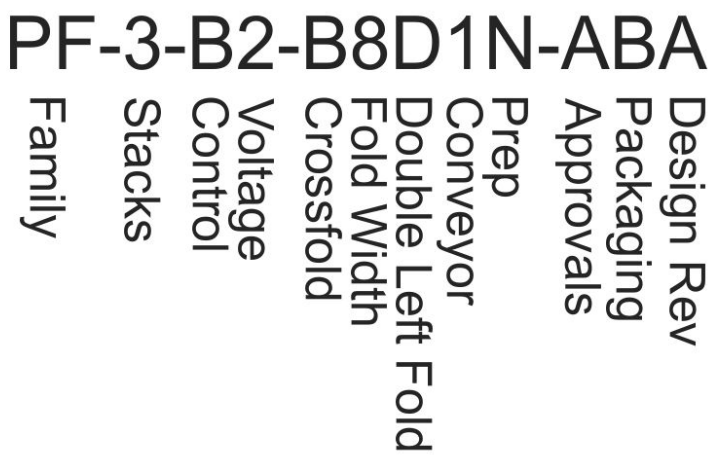


Figure 1.1: PF Product Family

Chapter 2

Important Instructions

2.1 Before Attempting Repairs

WARNING

Moving parts can cause serious injury or death. Before attempting repairs, follow proper shutdown procedures and remove power before commencement of service.

Safety is of primary concern with any maintenance or repair operation. If you are in any way unsure of how to proceed with a repair or adjustment, consult this manual, a qualified maintenance technician, your local distributor, or the B&C Technologies Technical Service Department at 850-249-2222.

Only trained and experienced personnel should attempt maintenance or repair work on this equipment. Follow all safety procedures including lock-out/tag-out procedures carefully. Ensure that any loose fitting clothing or jewelry is tucked in or not worn to avoid being pulled into the machine. Remember, the machine has no brain - you must use your own.

Before attempting repairs, follow proper shutdown procedures and remove power before commencement of service.

Never attempt to clean or service any area of the machine without removing power at the main disconnect.

Read, follow, and obey these safety rules! The B&C Technologies Technical Service Department

is available to answer any questions you may have about the operation and servicing of your machine. Please call with any questions or concerns about the operation of your machine.

2.2 Parts Ordering Information

If you require literature or spare parts, please contact your local distributor. If a local distributor is unavailable, you may contact B&C Technologies directly at (850) 249-2222 for the name of your nearest parts dealer.

For technical assistance in the United States, contact B&C Technologies:
(850) 249-2222 Phone
(850) 249-2226 FAX
parts@bandctech.com
www.bandctech.com

2.2.1 Nameplate Location

When contacting B&C Technologies about your equipment, please make note of the model and serial number, located on the nameplate as shown in figure 2.1.

2.3 Key Symbols

Anyone operating or servicing this machine must follow the safety rules in this manual. Particular attention must be paid to the DANGER, WARNING, and CAUTION blocks which appear throughout the manual and shown in figures 2.2 on page 6.

2.4 Safety Information

Installation Notice: For personal safety and for proper operation, the machine must be grounded in accordance with state and local codes and in the USA in accordance with the National Electric Code, article 250-96. Elsewhere, the equipment should be grounded in accordance with ANSI/NFPA 70, or the Canadian Electrical Code, CSA C22.1. The ground connection must be to a proven earth ground, not to conduit or water pipes.

Figure 2.1: Serial Decal

2.5 Installation and Operational Safety Instructions

1. Read all instructions prior to operating this equipment.
2. Ensure that the equipment is properly grounded before applying power and operation commences.
3. Do not allow children to play in or around or operate this equipment.
4. Check the operation of all safety interlocks at the start of every shift. If the interlocks do not stop the equipment immediately, the machine must be removed from service. Notify your immediate supervisor, and do not operate the machine.
5. Never attempt to service the machine while it is running. Never reach over, under, around, or behind any safety device, or into any area near moving parts or hot surfaces without shutting off power and allowing the machine to adequately cool.
6. Read, understand, and follow all safety instructions. Do not come close to moving parts and hot surfaces. Do not wear loose clothing, jewelry, neckties, or any other garment that could be come caught in the machine while operating or near the machine.
7. Only a qualified technician should attempt to service or repair the machine.
8. Do not install the machine in an area where it could be exposed to water or weather.
9. Do not alter or tamper with the control system.

Figure 2.2: Key Symbols

10. Keep the interior and exterior of the machine clean of lint, dirt, dust and debris.

11. Always disconnect the electrical service from the machine before performing service.

12. This machine must be installed according to the installation instructions. All utility connections must comply with state and local codes and must be made by a licensed installer where required.

Chapter 3

Introduction

The PF Series folders are suitable for folding a large variety of textiles. Cotton, terry, and other fabrics can be folded, sized up to 1.8m x 1.5m (72 x 60 inches).

The PF Series folders can make lateral and cross-folds. The machine is capable of 1 lateral and 2 cross-fold stations.

Lateral folding is done with a template, whose width can be adjusted gradually in order to perform 1/2, 1/3 or 1/4 folds. 1/2 folding is not recommended because the overlap is strongly influenced by the operator feeding the goods: The parts must be placed exactly at the center of the input belts.

In the crossfolding stations (folding crosswise to the running direction), textiles can also be folded 1/2, 1/3, 1/4, folded at a fixed size, or not folded at all (bypass). After folding, the textiles are transported to the stacker. The PF-3 allows stacking the pieces in 3 positions according to their length or type, while the PF-1 stacks all folded goods in a common stack.

The machine is equipped with a microprocessor control which is operated by means of a panel with a touch screen display. 100 different folding programms can be stored.

3.1 Customer Service

For technical assistance:
In the United States
Phone: (850)-249-2222
FAX: (850) 249-2226
e-mail: techsupport@bandctech.com
Web: www.bandctech.com

3.2 Replacement Parts

In the event that literature or replacement parts are required, contact the local distributor of the equipment, or contact B&C Technologies at the above phone numbers/internet addresses.

3.3 PF Sections

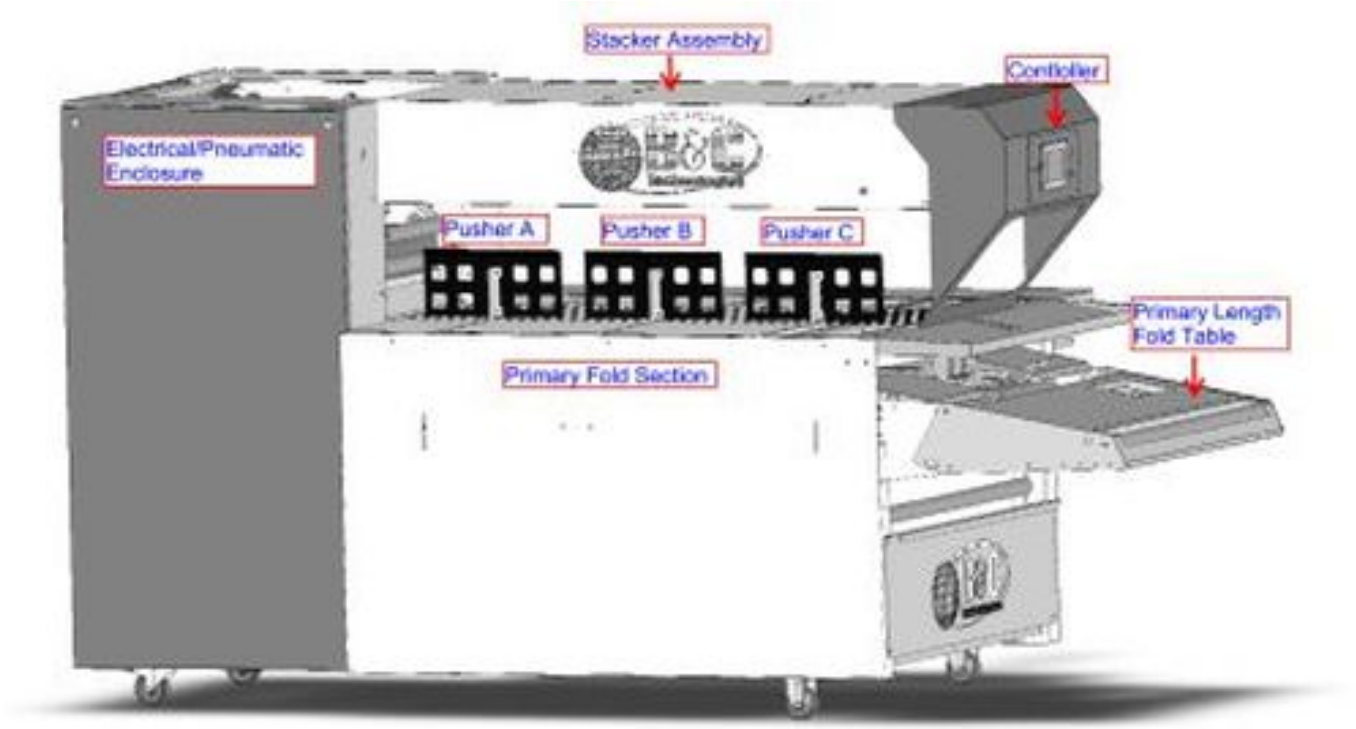


Figure 3.1: PF left side view and terminology

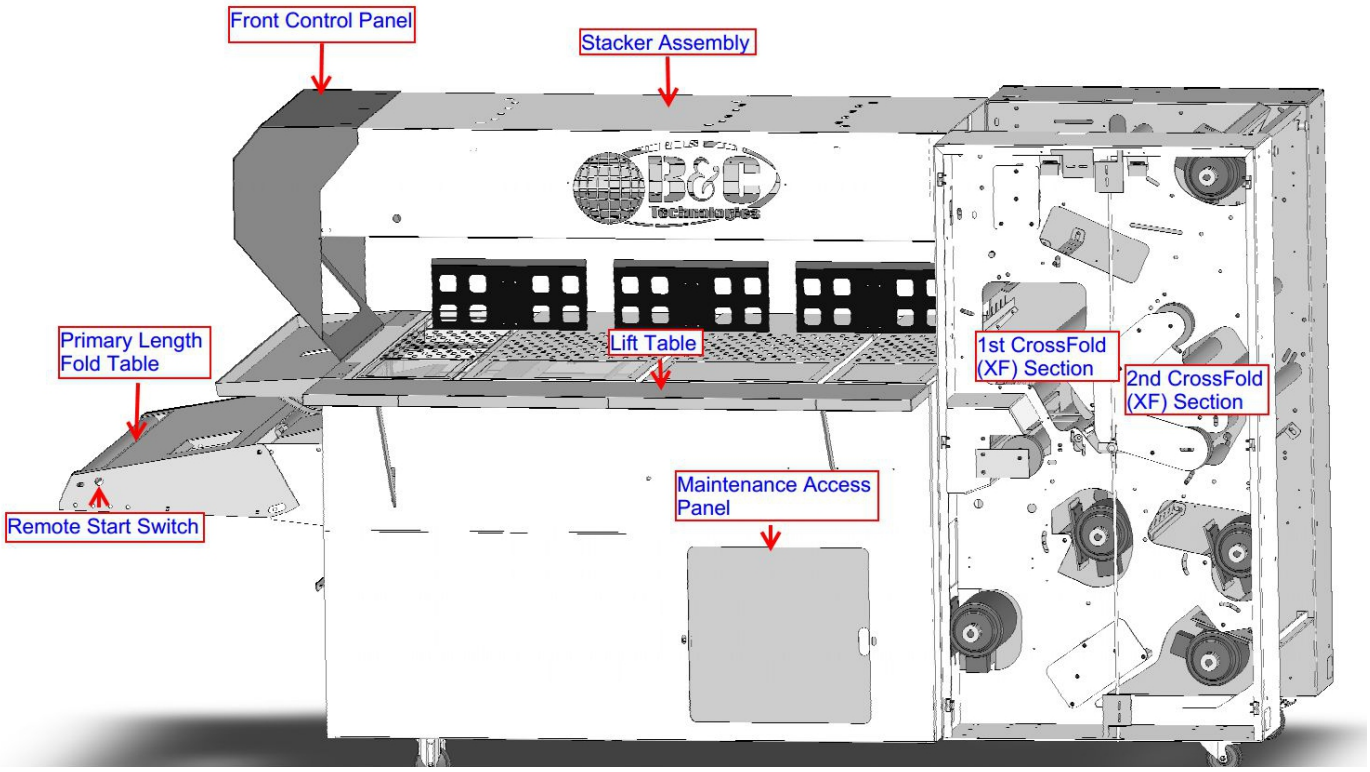
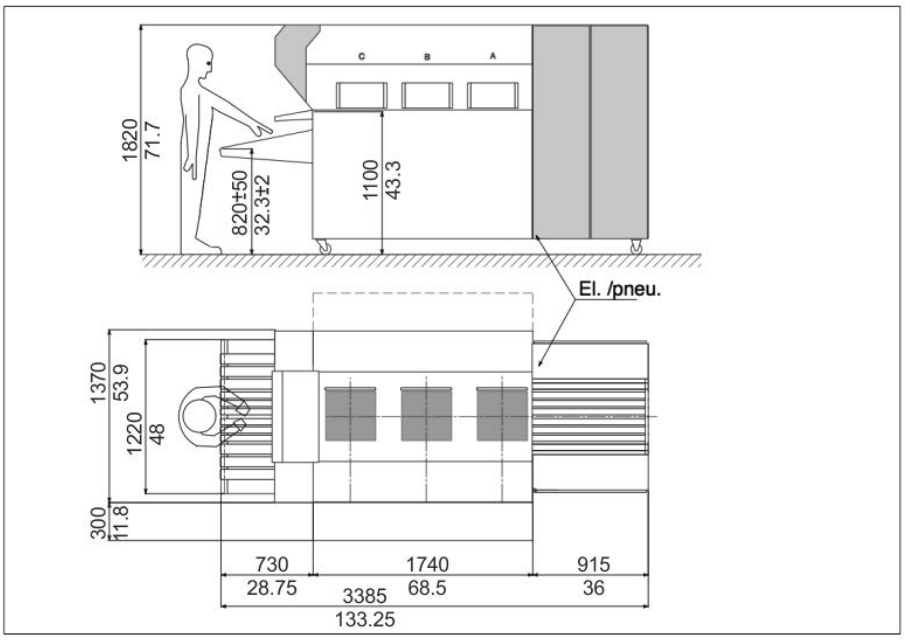


Figure 3.2: PF right side view and terminology

Chapter 4

General Specifications



Technical Specifications:

Electrical Connection:
230V, 3ph, 60Hz, 15A breaker
460V, 3ph, 60Hz, 15A breaker

Pneumatic Connection:
100 psi / 7 bar
1/2" / 13mm connection
4 CFM / 6 cubic meters/hr

Weight:
2800 lbs
1280 kg

Piece Size:	**Unfolded Length:**	13.75 to 72 inches 350 to 1800 mm	**Folded Length:**	7.75 to 23.5 inches 200 to 600 mm
	Unfolded Width:	18.75 to 60 inches 480 to 1500 mm	**Folded Width:**	6.25 to 13.75 inches 160 to 350 mm

Figure 4.1: PF Series General Specifications

Chapter 5

Installation

5.1 Receiving Inspection

Upon receipt of the equipment, visually inspect for shipping damage and note any damage with the carrier before signing the shipping receipt, or advise the carrier of the damage as soon as it is noted.

If damage is discovered, a written claim must be filed with the carrier as soon as possible.

Note: Warranty is VOID unless the equipment is installed according to instructions. The installation must comply with the minimum requirements listed in this manual. All national, state and local codes must be followed including but not limited to gas, electrical, plumbing and HVAC. Due to various requirements, statutory codes should be well understood before installation commences.

Important: The machine should be transported and handled in an upright position.

5.2 Safety Checklist

Before Initial start up of a B&C folder perform the following safety check:

1. Make sure all electrical and pneumatic connections have been made in accordance with applicable codes and regulations.
2. Make sure the machine is grounded electrically.

Before machine is placed in operation, the safety interlocks must be checked for proper operation as follows:

1. When the machine is energized electrically and in operation, the electrical panels and safety guards must be locked in the closed position. Verify this by attempting to open the panels

Before servicing any equipment, make certain it is disconnected from the electrical power source. Never allow operation of the machine when any safety device is malfunctioning. Never bypass safety devices.

Never insert hands or objects into moving belts. Doing so could result in serious injury.

and guards when the machine is operating. If necessary, check the panel safety interlocks for proper operation. Consult with a qualified service technician if necessary.

- To provide personal safety and keep the machine in proper working order, follow all maintenance and safety procedures presented in this manual. If questions regarding safety arise. Contact the factory immediately.
- Use factory authorized spare parts to avoid safety hazards.

5.2.1 Operator Safety

Do not bypass any safety devices in the machine.

5.2.2 Safe Operation Environment

Safe operation requires an appropriate operating environment for both the operator and the machine. If questions regarding safety arise, contact the factory.

5.2.3 Environmental Conditions

1. Ambient temperature. Temperatures above 120 F (50C) will result in more frequent motor overheating and, in some cases, malfunction or premature damage to solid state devices that are used in the machines. Special cooling devices may be necessary.
2. Humidity. Relative humidity above 90% may cause the machines electronics or motors to malfunction or may trip the ground fault interrupter. Corrosion problems may occur on some metal components. If the relative humidity is below 30% belts and hoses may eventually develop dry rot.
3. Ventilation. The need for make-up air openings for such laundry room accessories as dryers , ironers, water heaters, etc. must be evaluated periodically. Louvers, screens, or other separating devices may reduce the available air opening significantly.

Do not place volatile or flammable fluids in any machine. Do not clean the machine with volatile or flammable fluids such as acetone, lacquer thinners, enamel reducers, carbon tetrachloride, gasoline, benzene, naphtha, etc. Doing so could result in serious personal injury and/or damage to the machine.

Replace all panels that are removed to perform service and maintenance procedures. Do not operate the machine with missing guards or with broken or missing parts. Do not bypass any safety devices.

4. Radio Frequency Emissions. A filter is available for machines in installations where floor space is shared with equipment sensitive to radio frequency emissions. All machines that are shipped to CE countries are equipped with this filter and comply with the EMI regulations.
5. Water damage. Do not spray the machine with water. Short circuiting and serious damage may result.

5.2.4 Machine Location

1. Foundation. The floor must be of sufficient strength and thickness to handle the weight of the machine.
2. Service/ Maintenance Space. Provide sufficient space to allow comfortable performance of service procedures and routine maintenance. This is especially important in connection with machines equipped with AC inverter drives. Consult installation instructions for specific details.

5.2.5 Input and Output Services

1. Air Pressure. Best performance will be realized if air is provided at a pressure of 80-100psi (5.4-7 bar). PF Series machines will experience operational failure if compressed air service is interrupted. The machine is equipped with internal regulators and should be set to the values shown on the labels near each regulator. Dirty and/or wet air will cause operational problems. Air provided to the machine must be clean and dry for proper operation.
2. Power. For personal safety and for proper operation, the machine must be grounded in accordance with state and local codes. The ground connection must be to a proven earth ground, not to conduits or water pipes. An easy-access disconnect switch should be provided.

Ensure that a ground wire from a proven earth ground is connected to the ground lug in the electrical junction box on this machine. Without proper grounding personal injury from electrical shock could occur and machine malfunctions may be evident. Computer-controlled machines must have a proper ground to prevent computer malfunctions.

Always disconnect power and air supplies before a service technician performs any service procedure.

5.2.6 Inverter Drive

Machines equipped with AC drives require special attention with regard to the operating environment.

1. An especially dusty or linty environment will require more frequent cleaning of the AC drive cooling fan filter and of the AC drive itself.
2. Power line fluctuations from sources such as an uninterruptible power supplies (UPS) can adversely affect machines equipped with the AC drive. Proper suppression devices should be utilized on the incoming power to the machine to avoid problems.
3. A clean power supply free from voltage spikes and surges is absolutely essential for machines equipped with the AC drive. Nonlinear inconsistencies (peaks and valleys) in the power can cause the AC drive to generate nuisance errors. If voltage is above 230V for 200 V installations or above 460V for 400V installations, a buck/boost transformer is recommended. If voltage is above 240V or 480V, a buck/boost transformer is required unless the factory advises differently.
4. Sufficient space to perform service procedures and routine preventive maintenance is especially important for machines equipped with AC drives.

Chapter 6

Operation

6.1 Powering the Machine

After mains power is applied, wait until the control has fully booted (approximately 3 minutes). As soon as the start screen is visible, the machine can be started.

6.2 Emergency Stop

When the emergency stop is activated, power is removed from the outputs of the control.

The machine will not operate until the emergency stop button is released and the reset button on the touch screen is pressed.

The control signals 'Emergency Stop - Reset' symbol in middle of the screen. Refer to figure 6.1 on page 16.

6.3 Overload Relay

If a motor is shutdown due to a thermal overload the 'Check Thermo' screen appears. The circuit breaker must be checked. Refer to figure 6.2 on page 16.

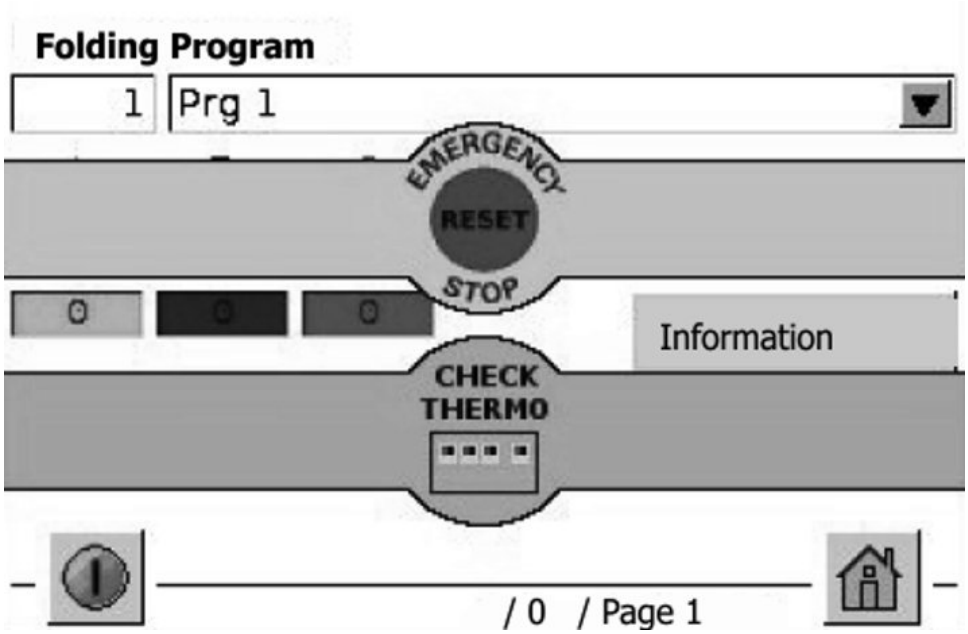


Figure 6.1: Touchscreen Emergency Stop Display

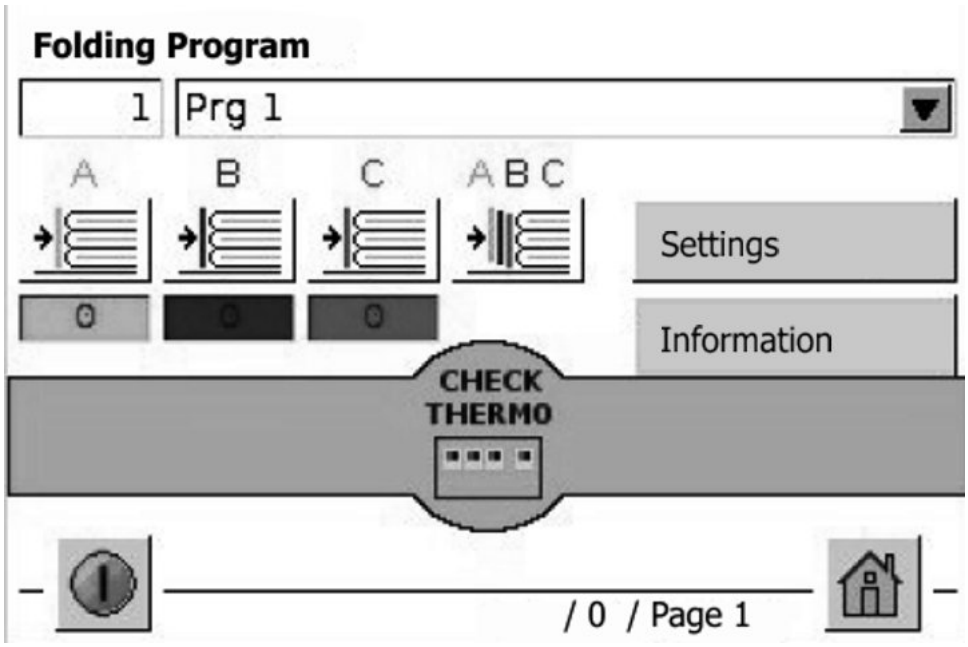


Figure 6.2: Touchscreen Overload Relay Display

6.4 Error Messages

Because error messages can cover the screen, they can be minimized. Touch anywhere on the alarm message and the error message will appear as an icon at the botton of the display. To display, touch the error icons at the bottom left of the display. When an error conditionn exists, a red border is displayed around the screen.

6.5 Daily Operation

6.5.1 Start the Machine


If there is no error message on the screen, the machine can be started with the green start button on the display.

6.5.2 Stop the Machine

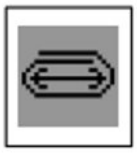

The machine can be stoped with the red stop button on the screen.

6.5.3 Feeding Method

There are two ways to feed textiles to the conveyor and into the machine. This feed type is set for a particular program.

1. While feeding big and/or complex pieces it is useful for the input conveyor to be stopped. As soon as the piece is ready, the machine is started by the remote pushbutton switch, located on the right side of the length fold table.
2. Smaller and simpler pieces can be fed on running belts. The transport stops during the first fold.

6.5.4 Miscellaneous Information


Set ski width manually: Either the width is entered directly (0-7), or the next width is selected by pressing the shown button.


Push out: For manually pushing stacked pieces out. Sort out: For sorting out a piece, press the sort out button beside the screen, immediately after the piece has been fed.

 If the machine is not running the belts can be manually started by pressing the shown button. The belts run as long as the shown button is pressed.

6.6 Control Dispaly

6.6.1 Pages

The main Home page is used to select the desired program. The PF stock programs start at program 30. Some display modes are built up with pages. These pages can be displayed in turn by pressing left and right arrow icons.

6.7 Settings

6.7.1 Password Protection

To prevent malfunctions, the parameter settings and manual switching of the control outputs are protected with a password.

The control has multiple password levels. If a button is greyed out and doesn't respond if pressed, this function is not available in the current password level. The password level is displayed in the footer on the panel The following is a listing of the various password levels:

1. User (level 0): During normal work no password is needed.
2. Operator (level 20): parameters of the control can be adjusted (Password 369).
3. Engineer (level 60): Full access to the control (**Use Caution!)** (Password: 7250).

6.7.2 Password input

To enter a password, navigate to the 'Settings' page via the left and right arrows. When the password page is displayed, touch in the password input field on the display. The keyboard will then be displayed, and the password can be entered. After the password is correctly entered, the password level will be displayed in the bottom center of the display. If the correct password is entered, the functions of the current password levels are available. These functions remain available until the password resets (see 'Password reset' in the next section).

6.7.3 Password reset

The password resets (times out) when:

1. If a user presses the button 'Reset Password on the page 'Settings'
2. If the emergency stop is pressed
3. The password times out after 60 minutes (after the password input is accepted) for the 'Operator' level. The level 'Engineer' does not time out - the control must be restarted.

If the password times out while in test mode, the activated test mode (see chapter 'Switching Outputs Manually') terminates. Refer to section 6.8 on page 20.

6.7.4 Machine Parameters

To change machine parameters, press the button 'Machine' on the page 'Settings'. The page 'Machine settings' appears. There are three possibilities to select a parameter:

1. Press the number of the selected parameter. Using the keypad which appears the number of the desired parameter can be entered.
2. The parameter number can be decreased or increased by the arrow buttons
3. Change the page of the parameter overview. By pressing on the parameter list, a bar with four buttons appears. With the arrow buttons you can select the desired parameter and activate it with the confirm button. If you press the cancel button the bar disappears.

To change the value of the selected parameter, press the current value of the selected parameter. Using the keypad which appears the new value of the parameter can be entered.

6.7.5 Global Parameters

To change global parameters, press the 'Global' button on the 'Settings' page . The page 'Global settings' appears. Changing global parameters is the same as changing machine parameters.

6.7.6 Program Specific Parameters

To change program parameters, press the 'Program' button on the 'Settings' page . The page 'Program Parameters' appears. Changing program parameters is the same as changing machine parameters.

The difference between the machine and global parameters is that it matters which program is currently selected. The program you want to change can be selected with the keypad or with the arrow buttons.

If you change the parameters of the currently running program the new values are used immediately. This means that the new values are used from the next article fed into the machine after the change is made.

If you change the program number on the page 'Program Parameters', the currently running program is not changed. This must be done on the main page.

6.8 Switching Outputs Manually

The test mode is for testing the inputs and outputs (with the corresponding functions) of the machine. The test mode is password protected and can only be turned on if no error messages are displayed on the screen. If the currently entered password fulfils the requirements, the test mode can be activated. By looking at the button you see if this mode is activated or not (if the button is pressed the test mode is active. Additionally an icon appears in the footer).

As soon as the test mode is activated an output on the page 'Digital Outputs' can be selected and switched on or off by pressing it again.

By leaving the test mode the outputs are switched to their previous state.

If the password is reset, the test mode exits, and the outputs are switched to their previous state.

6.9 Setup Mode

The setup mode helps an engineer to adjust the pneumatic of the machine. The desired outputs can be selected. They are switched on and off according to the given times. This mode is password protected.

6.10 Miscellaneous

Calibrate touchscreen If you press 'Calibrate' on the page 'Settings', the touchscreen will go in a calibration mode. 4 crosses are displayed one after another, which have to be pressed.

A calibration must be made if the raster, which registers the pressure, does not correspond with the displayed drawing. This means everytime if you have to press any more besides a button to activate it.

Chapter 7

Machine Service

7.1 Daily

- Errors that appears on the display of the operation panel must be corrected immediately.
- Items stuck or jammed inside of the machinemust be removed first. Any item that interferes with the operation of the photocells must be removed.
- If the machine has not operated for a long duration (vacation or other extended idle time), run the machine 5 minutes using the endurance programm. This simulation programm ensures that the machine runs correctly.

7.2 Weekly

- Clean the photocells (if necessary often)
- Cleaning of the machine with vacuum cleaner - no harsh chemicals, sprays, or wet cleaners of any kind!
- Defective belts must replaced
- Confirm the oil level and fill if needed
- Check battery charge state (on the panel in the settings menu under Machine state)

7.3 Monthly

- Check the tension of the driving elements.

7.4 Yearly

- Replace the PLC battery. Contact B&C Technologies.

Chapter 8

Mechanical Components

8.1 Machine Drive

Refer to figure 8.1 on page 25 and table 8.1 on page 25 and 24.

8.2 Transportation Belts

Refer to figure 8.1 on page 25 and table 8.2 on page 25.

Lateral fold			
No	Qty	Description	Part.-No
30	1	Motor	220-100
20	1	Pulley	10-0056
13	1	Driving belt	280-197
21	1	Driving roll	603-256
23	2	Bearing roll	603-113
24	1	Bearing roll	603-101
26	2	Bearing roll	603-100
Crossfold			
No	Qty	Description	Part.-No
31	3	Motor	220-100
20	3	Pulley	10-0056
14	2	Driving belt	280-197
15	2	Driving belt	280-180
22	6	Driving roll	603-255
25	1	Bearing roll	603-102
27	15	Bearing roll	603-105
Stacker			
No	Qty	Description	Part.-No
30	1	Motor	220-100
20	1	Pulley	10-0056
14	1	Driving belt	280-197
22	1	Driving roll	603-255
27	1	Bearing roll	603-105

Table 8.1: Machine Drive Components

No	Qty	Description	Part.-No
1	6	Cotton belt 88mm L=5500mm	280-203
2	1	Cotton belt 50mm L=5500mm	280-204
3	2	Polyester belt 180mm perforated L=5505mm	280-205
4	2	Cotton belt 50mm L=900mm	280-206
4	2	Cotton belt 88mm L=900mm	280-207
5	2	Cotton belt 50mm L=1220mm	280-208
5	2	Cotton belt 88mm L=1220mm	280-209
6	2	Cotton belt 50mm L=1840mm	280-210
6	2	Cotton belt 88mm L=1840mm	280-211
7	2	Cotton belt 50mm L=1410mm	280-212
7	2	Cotton belt 88mm L=1410mm	280-213
8	2	Cotton belt 50mm L=1750mm	280-214
8	2	Cotton belt 88mm L=1750mm	280-215
9	2	Cotton belt 50mm L=2440mm	280-216
9	2	Cotton belt 88mm L=2440mm	280-217
10	7	Rounthane D1/4 L=1700mm order to length	391-059
11	2	Rounthane D1/4 L=1350mm order to length	391-059
12	1	Polyester / Polyester belt 180mm perforated L=3985mm	280-218

Table 8.2: Lateral fold, Crossfold and Stacker

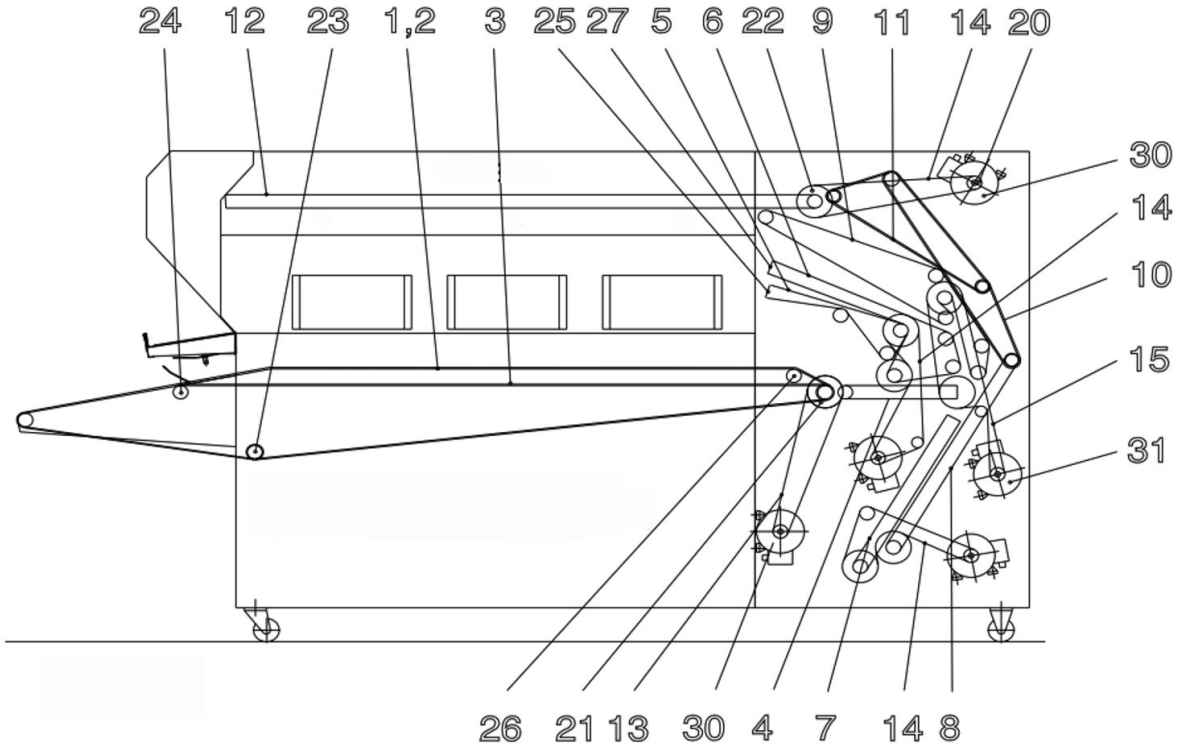


Figure 8.1: Machine Belt Detail

Chapter 9

PLC Adjustment

9.1 PLC Inputs

9.1.1 Input Module 01

Table 9.1: Input Module 1

Number	Description
DI0111	Emergency Stop
DI0121	Overload FC
DI0112	Button start A
DI0122	Button start B
DI0113	Button start C
DI0123	
DI0114	Button sort out
DI0124	Photocell XF 1
DI0115	Photocell inlet
DI0125	Photocell XF 2
DI0116	Photocell stacker
DI0126	Button push out

9.2 PLC Outputs

9.2.1 Output Module 01

Table 9.2: Output Module 1

Number	Description
DO0111	Motor inlet LF
DO0121	Motor Transport XF
DO0112	Motor XF 1 Bypass
DO0122	Motor XF 1 not Bypass
DO0113	Motor XF 2 Bypass
DO0123	Motor XF 2 not Bypass
DO0114	Motor stacker
DO0124	Flaps stacker
DO0115	Slider left fast
DO0125	Slider left slow
DO0116	Slider right
DO0126	Option vacuum input conveyor

9.2.2 Output Module 02

Table 9.3: Output Module 2

Number	Description
DO0211	Ski width A
DO0221	Ski width B
DO0212	Ski width C
DO0222	Push out pile A
DO0213	Push out pile B
DO0223	Push out pile C
DO0214	Finger XF 1
DO0224	Blowtube XF 1
DO0215	Sword XF 1
DO0225	Blowtube XF 2
DO0216	Sword XF 2
DO0226	LE Blowtube XF 2

9.2.3 Output Module 03

Table 9.4: Output Module 3

Number	Description
DO0311	
DO0321	
DO0312	
DO0322	
DO0313	
DO0323	
DO0314	Option lamp red
DO0324	
DO0315	Option belt conveyer forward
DO0325	Option belt conveyer backward
DO0316	Option up input conveyor
DO0326	Option down input conveyor

9.3 PLC Parameter

The following parameters are basic settings of the machine. These are geometric data or specify the basic functionalities of the machine. These parameters should not be changed after the implementing.

Table 9.5: Machine Parameters

Number	Description	Units	Standard value	Set value
2	Speed of belts	mm/min	52000	
3	Ski length	mm	1700	
4	Distance PhC inlet -¿ PhC XF 1 + LE-window	mm	2500	
5	Distance Photocell XF 1 -¿ XF 1	mm	135	
6	Distance XF 1 -¿ XF 2	mm	450	
7	Distance XF 1 -¿ Photocell XF 2	mm	570	
8	Without Photocell XF 2	0/1	0	
10	Distance Photocell stacker -¿ stacker	mm	180	
11	Position pile A	mm	750	
12	Position pile B	mm	1350	
13	Position pile C	mm	2000	
14	Distance PhC XF 12 -¿ XF 2	mm	0	
15	Position sort out	mm	3500	
16	Distance PhC XF 12 -¿ PhC XF 2	mm	0	
17	Width of a stacker length	mm	450	
18	Bypass-Distance XF 1 -¿ XF 2	mm	0	
19	Correction Bypass-Distance PhC XF 2	mm	0	
20	Distance XF 2 -¿ start stacker	mm	500	
21	Distance stop stacker without a piece	mm	1500	
22	Correction transport out	mm	0	
25	Distance PhC XF1 -¿ PhC stacker + LE-window	mm	2500	
30	Stop position in LF	mm	1150	
32	PhC inlet: time until active	ms	16	
33	PhC inlet: time until inactive	ms	16	
41	Shift blow LE XF 2	mm	-100	
50	Shift fingers XF 1	mm	-100	
60	Shift reversing XF 1	mm	-100	
61	Shift reversing XF 2	mm	-100	
70	Correction reversing XF 1	mm	100	
71	Correction reversing XF 2	mm	100	
76	Time until under-worked	ms	5000	
80	Shift knife XF 1	mm	0	
81	Shift knife XF 2	mm	0	
90	Vertically adjustable input conveyor	0/1	0	
96	Enable separate input conveyor	0/1	0	
98	Activate PhC Top XF 1	0/1	0	

9.4 Global Parameters

The following parameters apply globally for the machine. They are always used no matter which program is currently chosen.

Table 9.6: Global Parameters

Number	Description	Units	Standard value	Set value
1	Preselected program number		100	
2	Empty piles on program change	0/1	1	
3	Reset counter when changing program	0/1	0	
4	Total counter on start page	0/1	0	
5	Correction piece length after TE stop	mm	-50	
6	Adjust ski width not until LE PhC XF 1	0/1	0	
7	Correct piece length Photo A	0-2	0	
8	Minimal piece length	mm	200	
10	Duration stop stacker before flaps open	ms	350	
11	Duration stacker flaps open	ms	250	
12	Duration delay stacker flaps	ms	0	
15	Delay push out pile	ms	500	
16	Duration push out pile	ms	1000	
17	Delay belt after push out	ms	0	
20	Duration until jam Photocell dark	ms	3000	
22	Interval pulse blowing	ms	80	
23	Pulse duration	ms	40	
25	Number of pieces until jam LF		3	
26	Number of pieces until jam XF		4	
70	Delay deploy cylinders	ms	300	
80	Persist interval statistics	s	600	
81	Persist interval time statistics	s	600	
85	Piece length endurance run	mm	1000	
86	Cycle time endurance run	ms	3500	
90	Language	0-5	0	
95	Duration until automatic switch-off	s	300	
98	Duration until pasknife reset	s	3600	
99	Current program number	0-99	0	

9.5 Program Specific Parameters

The following parameters can be adjusted differently per program.

Table 9.7: Program Specific Parameters

Number	Description	units	Standard value	Set value
1	Ski width LF	0-7	2	
2	Delay left slider	ms	0	
3	Duration slider left	ms	325	
4	Slider left fast	ms	800	
5	Delay right slider	ms	200	
6	Duration slider right	ms	325	
7	Delay transport out of LF	ms	300	
8	Duration stop separate input conveyor	ms	0	
9	Duration finger XF 1	ms	300	
10	Fold parameter XF 1		666	
11	Fold parameter XF 2		500	
13	Duration blowtube XF 1	ms	0	
14	Duration blowtube XF 2	ms	140	
16	Duration knife XF 1	ms	100	
17	Duration knife XF 2	ms	0	
18	Delay pulse blowing XF 2	ms	0	
19	Duration pulse blowing XF 2	ms	0	
20	Duration blowtube leading edge XF 2	ms	200	
25	Without stop in lateral fold	0/1	0	
30	Trailing edge stop	0-2	0	
31	Start with time/button	0/1	0	
32	Stop position LE in LF	mm	500	
33	Duration intermediate stop	ms	1000	
35	Couple stacker A and B	0/1	0	
36	Couple stacker B and C	0/1	0	
37	Stack on trailing edge	0/1	0	
40	Number of pieces pile A		5	
41	Number of pieces pile B		5	
42	Number of pieces pile C		5	
49	Start with button, photocell or robot	0-3	0	
50	Automatic program selection	0-6	0	
51	Boundary length 1 to 2	mm	0	
52	Boundary length 2 to 3	mm	0	
53	Boundary length 3 to 4	mm	0	
54	Boundary length 4 to 5	mm	0	
55	Boundary length 5 to 6	mm	0	
56	Program number length 1 / Button A	0-99	0	
57	Program number length 2 / Button B	0-99	0	
58	Program number length 3 / Button C	0-99	0	
59	Program number length 4 / Button D	0-99	0	
60	Program number length 5 / Button E	0-99	0	
61	Program number length 6 / Button F	0-99	0	
65	Stacker selection by button	0/1	0	
70	Overlength detection	0/1	1	
75	Discharge conveyor	0/1/2	0	
80	Disable automatic switch-off	0/1	0	
85	Endurance run	0/1	0	
90	Piece counter program total		0	
91	Piece counter program		0	
92	Piece counter sort out		0	
93	Piece counter today		0	
94	Program duration today		0	
95	Piece counter yesterday		0	
96	Program duration yesterday		0	
97	Piece counter stacker A today		0	
98	Piece counter stacker B today		0	
99	Piece counter stacker C today		0	

Chapter 10

Machine Functions

10.1 Sensors and Outputs

The exact position and description of all sensors and outputs are explained in the electric schematics, included with the machine. Refer to the 'Switching Outputs Manually' section on page 20, showing how all outputs can be tested in their function.

10.2 Feeding of Textiles

As described in the input mode section on page 17, there are two ways to feed the machine:

1. Feeding with conveyor stopped
2. Feeding with the conveyor running

The requested mode is saved in program parameter 49. When working using mode 1 above, the buttons under the belts are used for starting the conveyor. These start-buttons choose a defined fold program (parameter 51 - 53) or a stacker (parameter 65): Inside = A ; Middle = B; Outside = C;

10.3 Automatic Folding

The machine can distinguish between the pieces by their lengths and split them into six groups. Each group can be handled by a given sub-program. The selected programm (main program) determines which sub-program will be used. Length piece 1

Limit 1 / 2

Length piece 2

Limit 2 / 3

Length piece 3

Prg		LF		XF	
42	42	A	1/3	C	1/2
	43	B	1/3	B	1/3
	44	C	1/3	A	1/4

Figure 10.1: Sub-program detail

The main program determines the following:

Parameter No 50: Number of pieces to distinguish

Parameter No 51: Limit piece length 1 to 2

Parameter No 52: Limit piece length 2 to 3

Parameter No 53: Limit piece length 3 to 4

Parameter No 54: Limit piece length 4 to 5

Parameter No 55: Limit piece length 5 to 6

Parameter No 56: Program No length 1

Parameter No 57: Program No length 2

Parameter No 58: Program No length 3

Parameter No 59: Program No length 4

Parameter No 60: Program No length 5

Parameter No 61: Program No length 6

The sub-program determines the lateral folding (ski width and kind of folding), the crossfolding (bypass:1/2, 1/3, 1/4, ...) and the stacker. Every sub-program can be a main program too.

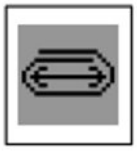
The main program is the program that you select for folding. A sub-program is the program which is actually used for folding the particular piece fed into the machine.

10.4 Slider Adjustment

The slider can be independently adjusted in their movements with timers. Usually the left slider is activated shortly after the stop in the lateral fold, whereas the right pusher is extended time-delayed. For the 1/4-fold the left pusher is extended longer and taken back together with the right slider. 1/2- folds can be done with only one slider. Parameter 7 determines when the piece is transported out of the lateral fold after the fold is done.

10.5 Ski Width

The ski width can be adjusted in 8 steps (0-7) of 30 mm each. This width is adjusted in parameter 1. At each new start or change of program, the ski width is set according to this adjustment.



With the corresponding button, the ski width can be changed temporarily.

Table 10.1: Ski Width Adjustment

Template width	Value
200 mm	0
230 mm	1
260 mm	2
290 mm	3
320 mm	4
350 mm	5
380 mm	6
410 mm	7

10.6 Folding with Air and Knife

There is a blowtube and a knife built in each cross fold. The parameters 13, 14, 16 and 17 define the duration of these functions can be determined. With the Value 0 that means function is disabled.

10.7 Crossfold Values

The fold parameters determine the folding patterns of the crossfold. For permil-folding a value between 0 and 1000 has to be entered (500 is bisection, 333 is one third from leading edge, ...).

These values can be changed minimally to adjust the overlapping and the folding for different fabric qualities. If a certain folding length is required, an exact end length can be acquired with fixed length: For a fold with fixed length leading edge the value in millimetres has to be entered plus 10000, from trailing edge plus 20000.

10.8 Endurance Run

The endurance run is needed to set up the machine. The machine simulates all movement without any pices running through (pices cannot be folded during this test run.) This function has been activated in programm number 48 (parameter 85).

Chapter 11

Programming Example

The following is a brief example outlining the creation or modification of your own folding programs.

First consider how the goods will be fed into the machine and how each fold should be made.

Procedure:

1. On the main page choose 'Settings', enter a password (if needed) and choose 'Program'. Select the desired program number.
2. Longitudinal fold: Measure the width of the textile (0.9 m in the example). The required template width is 1/3, which means 300 mm. Select Parameter 1 and enter value 4 (see chapter 'Program specific parameters').
3. 1. Crossfold: Select parameter 10 and enter 666 (2/3 of 1000).
4. 2. Crossfold: Select parameter 11 and enter 500 (1/2 of 1000).
5. Set pile height: Adjust the values of parameters 40 - 42 (for stacker A - C).
6. Test folding: You have entered the most important values, (the folding parameters) and you can continue with the fine adjustment.
7. Fine adjustment of the longitudinal (French) fold: Duration and delay of the skis. From the drawing you see which parameters are appropriate for which movements. (Circles mean delay, arrows movement respective durations. All times are set in milliseconds).

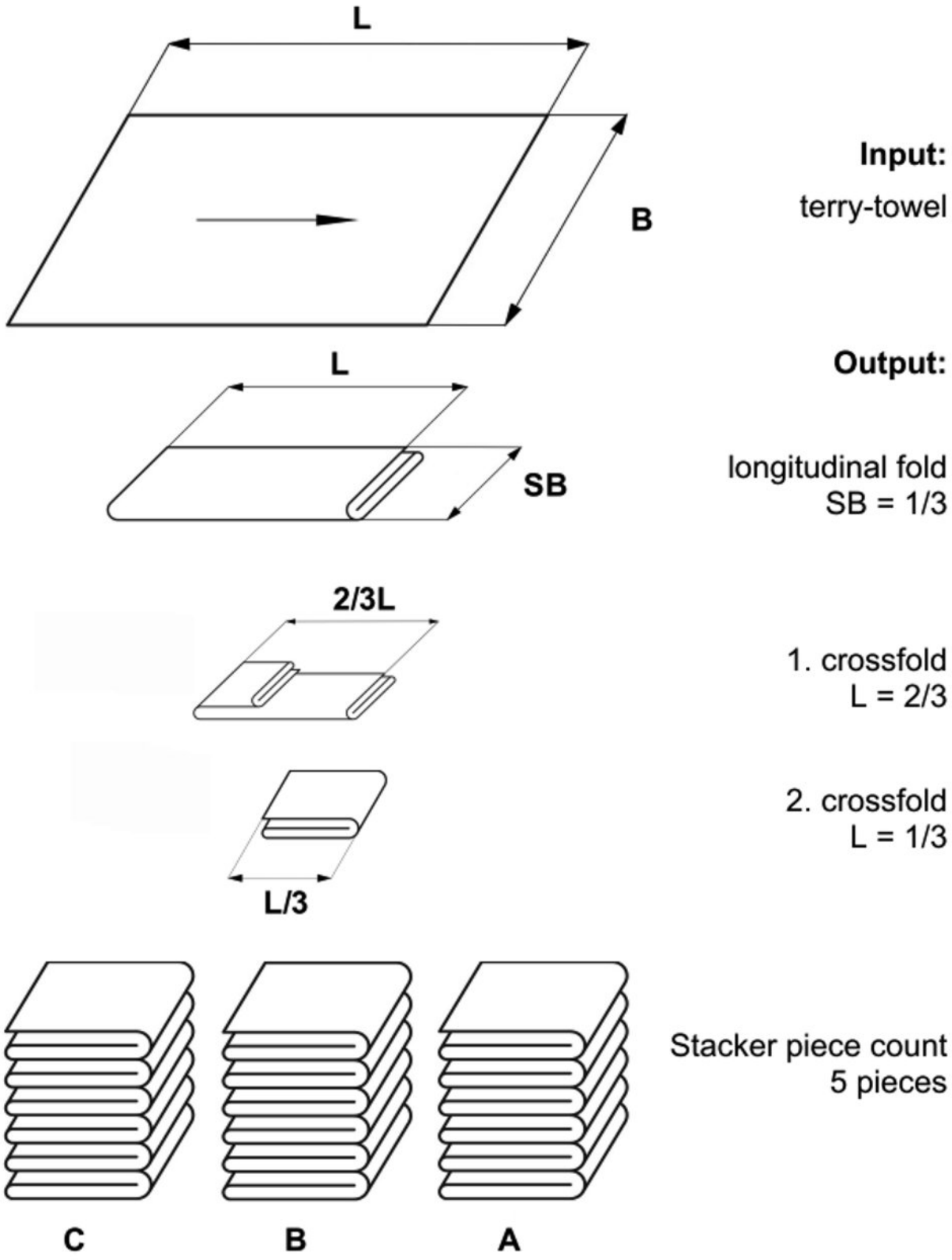


Figure 11.1: Example Adjustment Procedure

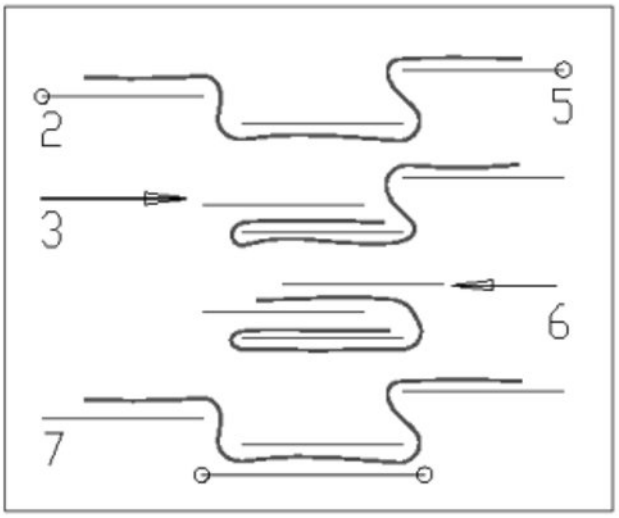


Figure 11.2: Ski programming

8. Fine adjustements of the first crossfold: In this crossfold is built-in a blowtube and a knife. The duration of the blowtube (parameter 13) and of the knife (parameter 16) can be set (in milliseconds). Value 0 means that this function is disabled.

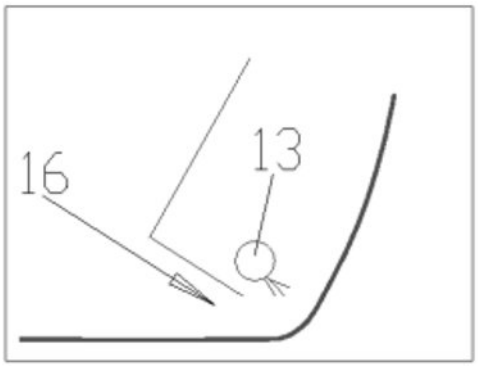


Figure 11.3: First Crossfold Adjustment

9. Fine adjustements of the second crossfold: In this crossfold is built-in a blowtube and a knife. The duration of the blowtube (parameter 14) and of the knife (parameter 17) can be set (in milliseconds). Additionaly the duration of the leading edge blowtube can be set (parameter 20). Value 0 means the respective function is disabled.

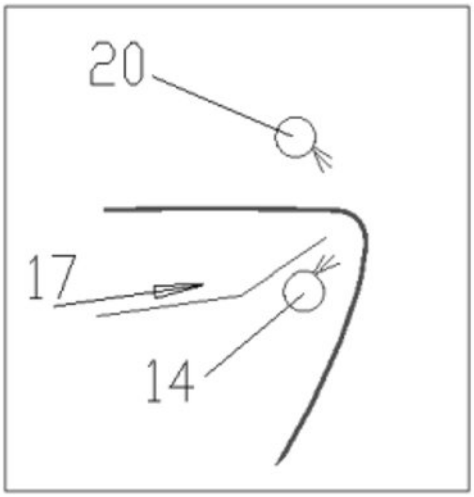


Figure 11.4: Second Crossfold Adjustment

Prg	LF	XF	Prg	LF	XF	Prg	LF	XF	ST	Textil / Textile
0			16	1/3	1/2	32				
1	1/4	1/4	17	1/3	1/2	33				
2	1/4	1/4	18	1/3	1/2	34				
3	1/4	1/4	19	1/4	1/2	35				
4	1/4	1/4	20	1/3	1/2	36				
5	1/4	1/4	21	1/3	1/2	37				
6	1/4	1/4	22	1/4	1/2	38				
7	1/3	1/4	23	1/3	1/2	39	1/3	Bypass	C 5	Frottée
8	1/3	1/3	24	1/3	1/2	40	1/2	1/2	B 10	Frottée
9	1/3	1/3	25	1/3	Bypass	41	1/3	1/4	A 10	Frottée
10	1/4	1/3	26	1/3	Bypass	42	1/3	1/2	C	Frottée
11	1/3	1/3	27	1/4	1/3	43	1/3	1/3	B	Frottée
12	1/3	1/3	28	1/4	1/4	44	1/3	1/4	A	Frottée
13	1/4	1/3	29	1/4	1/2	45	1/4	1/2	C	Jacket
14	1/3	1/3	30			46	1/4	1/3	B	Kittel
15	1/3	1/3	31			47	1/4	1/4	A	Overall

Figure 11.5: Default Programs

Prg	LF	XF	Prg	LF	XF	Prg	LF	XF	Prg	LF	XF
48			64			80			97		
49			65			81			98		
50			66			82			99		
51			67			83					
52			68			84					
53			69			85					
54			70			86					
55			71			87					
56			72			88					
57			73			90					
58			74			91					
59			75			92					
60			76			93					
61			77			94					
62			78			95					
63			79			96					

Figure 11.6: Program Worksheet

Chapter 12

Service & Parts

12.1 Service

Service must be performed by a qualified trained technician, service agency, or gas supplier. If service is required, contact the distributor from whom the equipment was purchased. If the distributor cannot be contacted or is unknown, contact B&C Technologies for a distributor in your area.

For technical assistance in the United States, contact B&C Technologies:

(850) 249-2222 Phone
(850) 249-2226 FAX
parts@bandctech.com
www.bandctech.com

NOTE: When contacting B&C Technologies be sure to supply the correct model number and serial number so that your inquiry is handled in an expeditious manner.

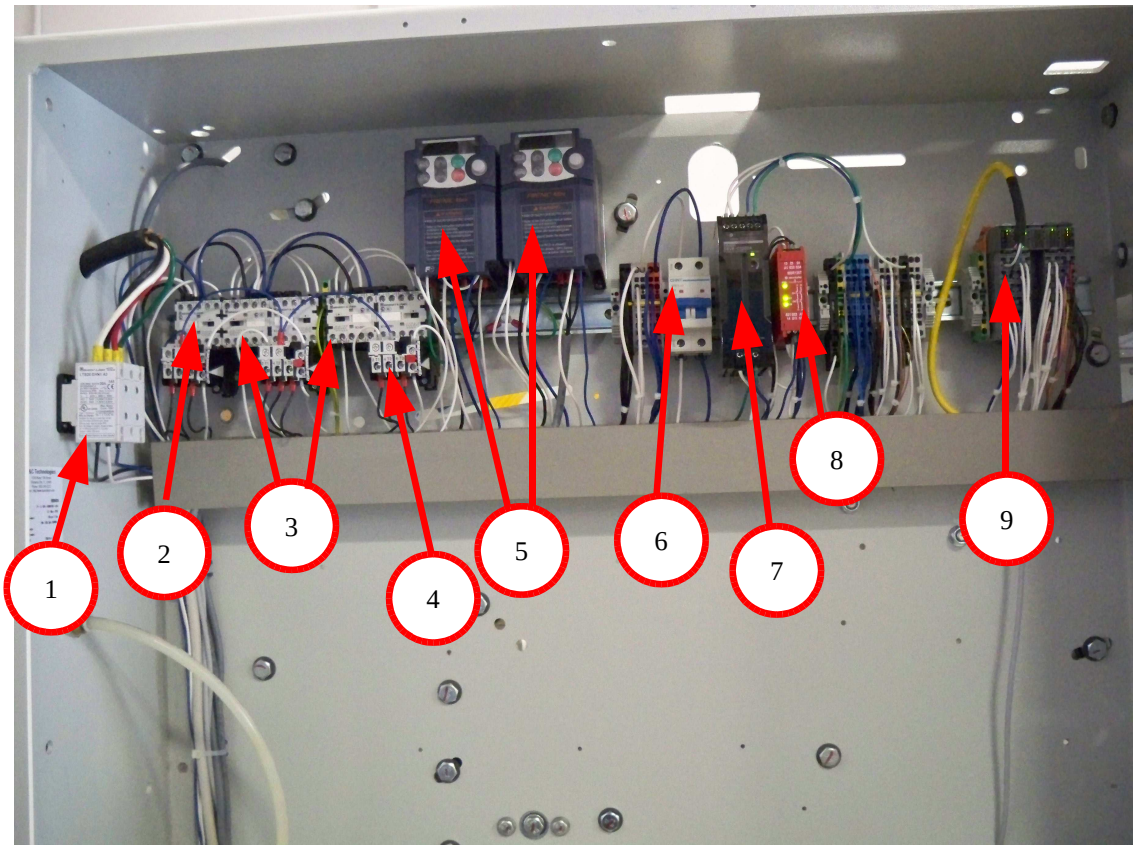
12.2 Parts

Replacement parts should be purchased from the distributor from whom the equipment was purchased. If the distributor cannot be contacted or is unknown, contact B&C Technologies for a distributor in your area. Parts may also be purchased directly from the factory

NOTE: When ordering replacement parts from a dealer or B&C Technologies, be sure to supply the correct model number and serial number so that your parts order can be processed in an expeditious manner.

PF SERIES PARTS MAUAL

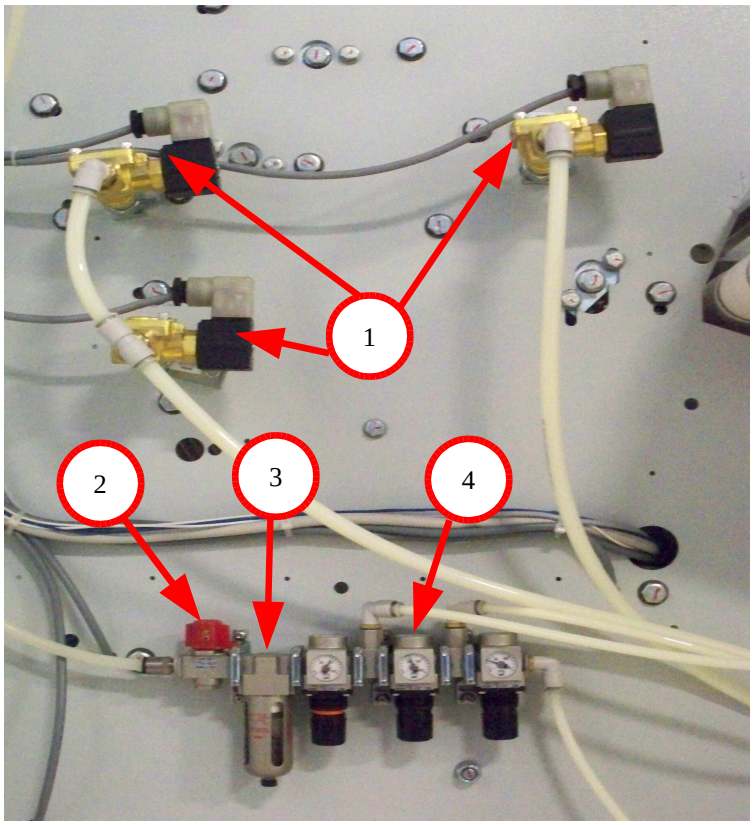
Electrical Left Enclosure



Item NO.	QTY	DESCRIPTION	PART NUMBER
1	1	Main Power Switch	330-258
2	1	Contactor	330-100
3	2	Reversing Contactor	330-101
4	3	Thermal Overload	330-102(480VAC) 330-103(240VAC)
5	2	Inverter	370-068
6	1	Circuit Breaker 3A	340-017
7	1	DC Power Supply	391-023
8	1	Safety Relay	391-035
9	1	PLC	392-001

PF SERIES PARTS MAUAL

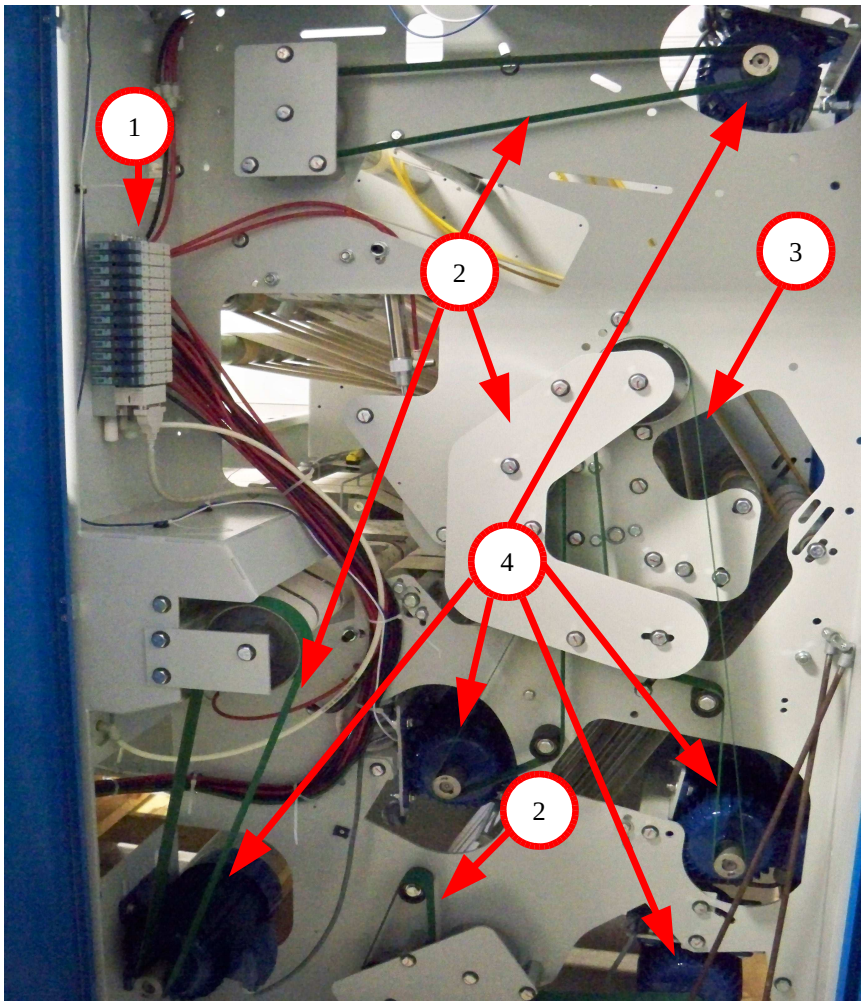
Pneumatics Left Enclosure



Item NO.	QTY	DESCRIPTION	PART NUMBER
1	3	Air Solenoid Blowtube	903680
2	1	Air-supply Cutoff Valve	391-006
3	1	Air Filter Assembly	391-007
4	3	Air Regulator	391-008

PF SERIES PARTS MAUAL

Drive Motors Right Enclosure

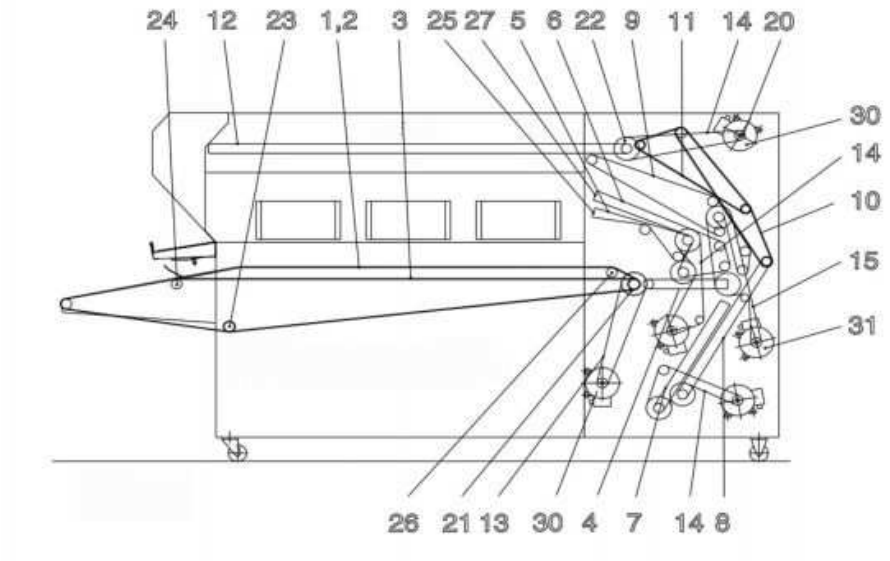


Item NO.	QTY	DESCRIPTION	PART NUMBER
1	12	AIR SELINOID	391-002
2	4	DRIVE BELT 40mmX1350mm	280-197
3	1	DRIVE BELT 40mmX1730mm	280-180
4		DRIVE MOTOR	220-100

Lateral fold			
No	Qty	Description	Part.-No
30	1	Motor	220-100
20	1	Pulley	10-0056
13	1	Driving belt	280-197
21	1	Driving roll	603-256
23	2	Bearing roll	603-113
24	1	Bearing roll	603-101
26	2	Bearing roll	603-100
Crossfold			
No	Qty	Description	Part.-No
31	3	Motor	220-100
20	3	Pulley	10-0056
14	2	Driving belt	280-197
15	2	Driving belt	280-180
22	6	Driving roll	603-255
25	1	Bearing roll	603-102
27	15	Bearing roll	603-105
Stacker			
No	Qty	Description	Part.-No
30	1	Motor	220-100
20	1	Pulley	10-0056
14	1	Driving belt	280-197
22	1	Driving roll	603-255
27	1	Bearing roll	603-105

Roller Chart

No	Qty	Description	Part.-No
1	6	Cotton belt 88mm L=5500mm	280-203
2	1	Cotton belt 50mm L=5500mm	280-204
3	2	Polyester belt 180mm perforated L=5505mm	280-205
4	2	Cotton belt 50mm L=900mm	280-206
4	2	Cotton belt 88mm L=900mm	280-207
5	2	Cotton belt 50mm L=1220mm	280-208
5	2	Cotton belt 88mm L=1220mm	280-209
6	2	Cotton belt 50mm L=1840mm	280-210
6	2	Cotton belt 88mm L=1840mm	280-211
7	2	Cotton belt 50mm L=1410mm	280-212
7	2	Cotton belt 88mm L=1410mm	280-213
8	2	Cotton belt 50mm L=1750mm	280-214
8	2	Cotton belt 88mm L=1750mm	280-215
9	2	Cotton belt 50mm L=2440mm	280-216
9	2	Cotton belt 88mm L=2440mm	280-217
10	7	Rounthane D1/4 L=1700mm order to length	391-059
11	2	Rounthane D1/4 L=1350mm order to length	391-059
12	1	Polyester / Polyester belt 180mm perforated L=3985mm	280-218



Chapter 13

Decommisioning

In the event that the machine must be decommissioned, follow these steps:

1. Clean interior of machine, both basket and shell.
2. Disconnect electrical power.
   (a) Shut of main power supply at the breaker box or main control panel.
   (b) Do not attempt to disconnect power supply wires from power supply. Have a qualified electrician disconnect power to machine at its source.
3. Disconnect gas/steam supply.
4. Disconnect exhaust system.
5. Remove the machine from its foundation pad.
   (a) Keep all panels in place to provide stability when moving the machine.
   (b) Verify that door is closed and secure
   (c) Place the machine on skid and bolt the frame to the skid. This will facilitate the removal of the machine on to a truck.
6. Recycle.

The manufacturer uses the highest quality material in their products so that those material may be recycled at the end of the product's service life.

Chapter 14

Appendix I: Quick Start Guide

PF BASIC START UP PROCEDURES

Purpose

The purpose of this manual is to establish the start-up of a new PF series folder and to eliminate any simple issues after installation. The manual will familiarize the user with the built in diagnostic aids of the controller.

Electrical

1. Main Power Electrical. The main power connected in the left enclosure to the Main Power Switch. The Voltage requirements are 208-240VAC or 415-480VAC. As required by machine serial decal. (Fig. 1)

Figure

2. Turn Main Power On. Allow the controller to completely boot. (This may take 2-3 minutes) (Fig. 2)

Figure

Figure

3. Clear All Emergency Stops by pressing the Reset button. (Fig.3)(Schematic)

About the controller:

The controller is an LED touchscreen device that displays current program on the home screen. It has 3 main menus (Settings, Piece Info, and Statistics.) The settings menu has 5 pages of sub-menus (Parameter, IN- / Outputs, Set-up, Service, Factory Settings) which allow the operator to enter machine/program parameters, diagnose inputs/outputs, and setup other functions.

Test Digital Inputs

1. Touch Settings button on control. Enter password by touching the "asterisk box."(Fig.4) The password is 7250. Click the checkmark after entering the password. The management button will turn bold when password has been entered correctly. (Fig. 5) Then using the arrows scroll to the In- / Outputs page.(Fig. 6) Select the Digital Inputs button. (*The machine should be powered on and belts **NOT** turning)*

Figure

Figure 5

Useful Tip

Do not leave the password with the operators.

Figure 6

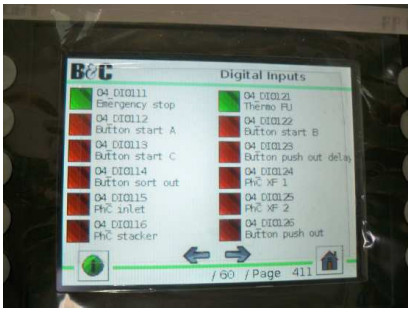


Figure 7

Useful Tip

The top two icons, Emergency stop and Therm PU should be green. If not then check the E-Stops and Thermal Overloads *(Fig. 7)*

2. Thermal Overloads are located on the 3 main contactors and on the 30A and 30C on the two inverters. (Inverter overload circuit cannot be tested and is tested at the factory)(Fig. 8 & 9)(See Schematic)

Useful Tip

Sometimes a wrong button will be pressed. In order to find the correct screen the best option is to press the home button and start the step over. The figures have the screens seen during start up.

Figure 8

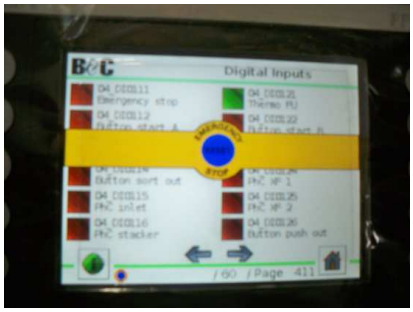


Figure 9

3. Place an item such as a towel under each of the 4 Photocells (PC) (*See drawing*.) Each PC are green and yellow when open. They turn green when closed. Each of the corresponding icons on the control should turn green. See drawings for locations. (Fig. 10)

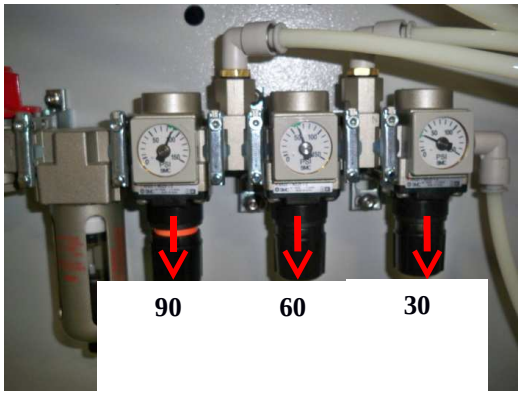
Figure 10

WARNING: ONCE CHECKED REMOVE ALL ITEMS PLACED IN THE MACHINE.

4. At this time the remote start button and the reject button can also be tested. (See Schematic)

Pneumatic Setup

1. The main air supply is in the left panel should be set to 100psi-120psi. The 3 air regulators **MUST** be set at 90psi, 60psi, 30psi respectively. (Fig. 11) *(This is set at the factory and is not adjustable on machines shipped after 8-1-2015)*



2. Inspect airlines for leaks.

Test Digital Outputs

1. Check the phasing of the line Voltage by following the steps.

WARNING: INSURE THE MACHINE IS CLEAR OF ANY PERSONNEL AND FOREIGN ITEMS.

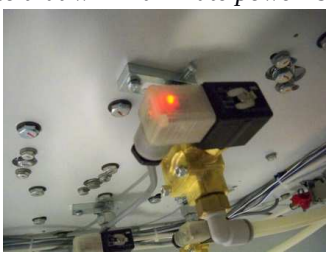
Step 1. Press the home button screen and press settings, scroll over to the In- / Outputs screen, select Digital Outputs. Then press the Test mode button. At this point the Test Mode button should change to orange. (Fig. 12)

Figure 12

Step 2. Select Motor Inlet LF and Motor Transport XF by pressing the red icons next to the name. Both should be on at the same time. The icons should turn green. Both the Lengthfold belts and the Crossfold Transport belts should be turning in the same direction. If not disconnect main power then switch L1 and L2 of the main power switch of the folder.

WARNING: VERIFY THE MACHINE IS DISCONNECTED BEFORE SWITCHING THE PHASE

2. After the phase has been checked, all other outputs can be checked by pressing the associated icon to the desired output under test. Not all outputs are used (*see schematic.)* Press the Test mode button when finished to exit testing the outputs. Hit the home button to return to the home screen. *Each air solenoid has red LED lights to that will illuminate power is applied.* *(Fig. 13 & 14)*



Useful Tip

The digital Input and Output screens are very useful troubleshooting tools. The inputs and outputs can be monitored when the machine is static or in operation. These diagnostic aids are a good place for initial troubleshooting.

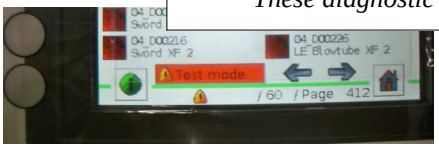
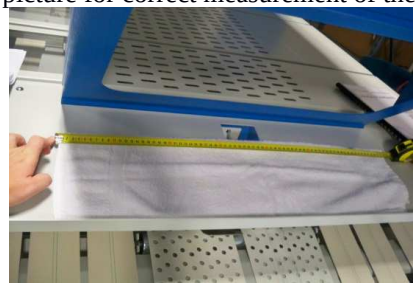


Figure 13 Figure 14 Figure 15

Belt Speed Setup

1. Carefully measure the piece to be folded using a metric device and record the measurement in mm. See picture for correct measurement of the piece. Folded in half and measured down the middle. (Fig. 16)



Useful Tip

The belt speed cannot be physically changed. This portion of the setup is to correctly enter the proper time distance formula to determine correct length of items to be folded. The variables are belt speed (mm/min) and Time PC is on (ms).

2. Select Piece info on the home screen display on the controller. Press the green start button and run the piece through the machine and record the length measurement (in mm) on the screen. (Fig. 17)

Figure 17

Useful Tip

*Make sure the control is out of **Test mode**. If it still is in test mode there will be a yellow symbol next to the green start button. This will not allow the operator to run the machine and it must be taken out of test mode before being able to run. To exit test mode go to settings from the home screen. Scroll to digital outputs and select digital outputs. Press the orange test mode button. This exits the test mode and the button should turn yellow*

3. Compare the two recorded values. They should be within 10 mm of each other. If not, go to step 4.

4. Go to the home screen and touch the settings button. Scroll to the parameter page and hit the Machine button. Using the up and down arrow keys select parameter 2 (Speed of Belts).

(This does not change the actual speed of the belts)

5. If the recorded value from the piece info is shorter than the hand measured value, increase parameter 2. If the recorded value from the piece info is larger than the hand measured value, decrease parameter 2. *The machine standard is approximately 51000mm/min.*

6. Return to the home screen by pressing the home button.