

Fan Folder

Instruction Manual



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Thank you for purchasing a Fan Folder high performance system. The Fan Folder provides the Technology you need produce at high speeds. With this system, your company will increase throughput and quality.

The Fan Folder is one of many high-quality, innovative systems available from Matti Technology AG, Switzerland. If you would like information on our other systems or require technical assistance or spare part replacement, please contact one of our field service or customer service specialists at:

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Again, thank you and welcome to the growing family of Matti Technology AG customers. We appreciate your current and continued business.

Sincerely,

Dr. Dieter Woschitz
President

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Vice President Operating

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2 Forward

The purpose of this manual is to provide the necessary information to enable experienced personnel to safely install, operate and maintain the Fan Folder.

It is assumed that all necessary tools, precision measuring devices and equipment for safely moving and installing this system will be available. Information and data is based on the latest product information available at the time of writing.

The right is reserved to make changes at any time, in materials, specifications, models and discontinue models.

Note: In order to clearly show details of this system some covers, shields, door or guards have either been removed or shown in an open position. All such protective devices must be installed in position before operating the system.

2.1 Important

Carefully read the instructions and safety precautions given in this manual. Do not attempt to install this system until you have thoroughly read and understood the data contained in this manual.

At the time of writing, this manual was completely up-to-date. However, due to contained herein may vary to a slight extent from the system delivered to you. This merely implies that the system has improved to better fulfill your requirements. If there are any questions, you are encouraged to contact our field service personnel for assistance at:

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2.2 Compliance statements

2.2.1 FCC Compliance statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

2.2.2 European EMI Compliance statement

This equipment generates, uses, and can radiate radio frequency energy. When this equipment is not installed in accordance with instructions in the installation chapter and is not used in accordance with the instructions in the operator safety information, the radio frequency energy may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user, at the user's own expense, will be required to take whatever measures may be required to correct the interference.

2.3 Inspection of Shipped Parts

Please inspect all packed materials carefully so that small parts are not inadvertently thrown away. Report any shortage or damage to Matti Technology AG and the carrier.

All equipment is shipped on one or two pallets and should contain the following parts:

- FanFolder
- Tilt table (optional)
- Mobile Document Trolley (optional)

3 Specification sheet

3.1 General

Name / Type	Fan Folder
Maximum form length	17" (432mm)
Minimum form length	7" (175mm)
Maximum paper width	20" (510mm)
Minimum paper width	6" (150mm)
Maximum speed	500ft/min (150m/min)
Length *	93" (2360 mm)
Width	44¼" (1125 mm)
Height	51" (1300 mm)
Power supply	240V 1ph 50/60Hz; 8A.
Noise level	78dB (A)

* Length of standard machine with 1.5m long delivery table and without buffer table

3.2 Standard options

1.0m Delivery Table
Command interface to process machine.
Buffer tables @ 1.5m or 2m long.
Adaptation for Mobile Document Trolley.
Vertical Stacker
High Pile Stacker Turner
Additional Spiral Gearboxes
Leveling Feet

4 Safety information

4.1 General

The Fan Folder is designed for safe operation. Nevertheless, installation, maintenance and operation of the system can be dangerous for a careless operator or maintenance person. For your safety and the safety of others, please read the instructions of this INSTRUCTION MANUAL and follow these safety practices, which will help to prevent accident or injury.

4.2 Safety information for the owner

The owner of the system has to assure that the system is only used under good operating condition which adheres to the safety regulations.

Only trained and qualified personnel should operate the system which is totally familiar with all the safety and mechanical instructions and devices.

Supervisors have to assure that they are familiar with all the chapters or operating and safety of the equipment.

Furthermore he should be familiar with the general requirements of accident prevention and preservation of the environment.

4.3 Safety information for the operator

Operator of the equipment must read and understand the operating instructions, specially the paragraphs regarding safety. This is especially important for shift personal that might not be involved with this equipment on regular basis.

Operator must also be familiar with the safety and accident prevention information and should avoid any functions on the machine that is doubtful and any violation of the operating procedure of the Fan Folder.

4.4 Specific security advices

Prior to any kind of repairing, the MAIN SWITCH has to be turned off. The location of the main switch is to be secured with a padlock, see existing openings on the main switch, to prevent accidental switch on. Only original part used in correcting / repairing the machine will secure correct functioning and protect warranties.

4.5 Guarding

Main Switch:

The main switch for the transport system is located on control cabinet, drive side of the unwind unit. This switches turns the systems on and off.

External Emergency Stop:

The external emergency switch shuts down the system in case of emergency.

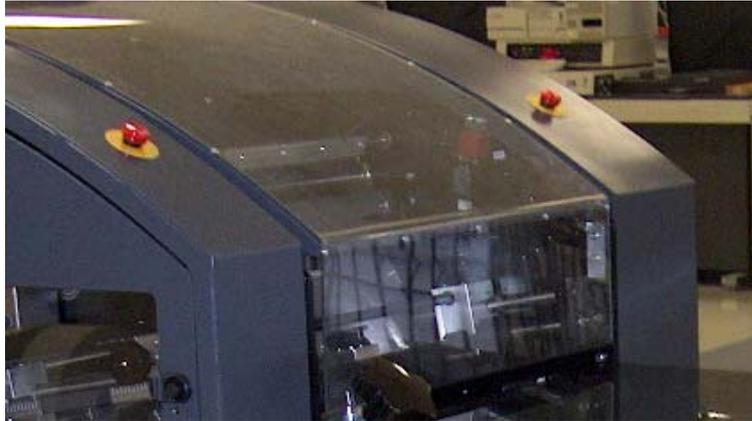


Illustration 1: Emergency Stop button

4.6 Mechanical Safety

Wear safety shoes and safety glasses at all times.

Remove or secure items that could be caught or tangled in the mechanisms, including jewellery, loose clothing, and long hair.

Keep all equipment covers closed when operating the printer.

After a fast or emergency stop, be certain all error conditions are corrected before trying to restart the FanFolder.

In the event of leaks or breaks at pressure relief valves, automatic pressure regulators, limit sensors, and other automatic safety features, turn off all compressed air to the system.

The air expandable shafts require the same action if a leak or break occurs.

Watch your feet when loading, unloading and handling the paper roll.

Do not touch any moving parts.

Do not remove any cover of the unit.

If any unsafe situation is possible or recognized stop the machine immediately and switch it off. Do not run the machine again until the situation is safe.

Do not touch any moving parts.

Do not remove any cover of the unit.

If any unsafe situation is possible or recognized stop the machine immediately and switch it off. Do not run the machine again until the situation is safe.

4.7 Electrical Safety

There is danger of electrical shock when servicing the transport, dryer or control cabinet.

Even when the circuit breaker of the control cabinet is in the OFF position, there is live HIGH VOLTAGE (up to 240V) present at the power entry of the circuit breaker.

WARNING!

**ALWAYS disconnect the external power
prior to servicing the system.**

**NEVER operate the system with open doors
of control cabinet or transport.**

5 Labels

The following chapters explain the different labels used on the transport system.

5.1 Safety Labels

5.1.1 Dangerous voltage



Illustration 2: Dangerous voltage

Dangerous voltage. Contact may cause electric shock or burn.

DANGER! Power terminals remain live up to 3 minutes after mains disconnection.

5.1.2 Burn hazard



Illustration 3: Burn hazard

Burn hazard, hot surface. Do not touch the surface of this component during equipment operation. Allow to cool down before servicing.

5.1.3 Danger of cuts from moving paper



Illustration 4: Danger from cut of moving paper

Danger of cuts from moving paper. Keep body away from edge of moving paper.

5.1.4 Danger of crushing



Illustration 5: Danger of crushing

Danger of crushing from moving paper roll. Stand back from the lift arms and paper roll during operation.

5.1.5 Pinch point rollers



Illustration 6: Pinch point rollers

Pinch point danger from rollers. Keep hands and clothing away from rotating rollers.

5.1.6 Pinch point from moving parts



Illustration 7: Danger from moving parts

Danger from moving parts. Moving parts can crush and cut. Do not operate with guard removed. Follow lockout procedure before servicing. Disconnect main power before servicing.

5.1.7 Danger of entanglement from belt drive



Illustration 8: Danger of entanglement from belt drive

Danger of entanglement from belt drive. Shear hazard. Moving part can crush and cut. Keep hand clear. Do not operate with guard removed. Follow lockout procedure before servicing.

5.1.8 Danger of entanglement from rotating gear



Illustration 9: Danger of rotating gear

Danger of rotating gear. Keep hands and clothing away from rotating gear. Danger of entanglement from gear. Moving part can crush and cut. Keep hand clear. Do not operate with guard removed. Follow lockout procedure before servicing.

5.1.9 Danger of cutting blade



Illustration 10: Danger of cutting blade

Danger of cutting blade. Shear hazard. Moving part can crush and cut. Keep hand clear. Do not operate with guard removed. Follow lockout procedure before servicing.

5.1.10 Danger of cutting of fingers or hand



Illustration 11: Danger of cutting of fingers or hand / angled blade

Danger of cutting of fingers or hand. Moving parts can crush and cut. Do not operate with guard removed. Follow lockout procedure before servicing.

5.2 Text warning Labels

5.2.1 Running with different voltages and frequencies

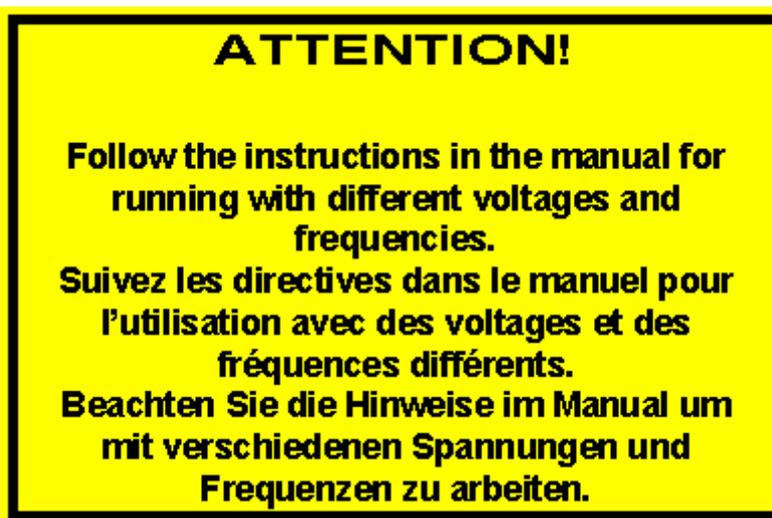


Illustration 12: Running with different voltages and frequencies

5.2.2 Disconnect main switch before servicing



Illustration 13: Disconnect main switch before servicing

5.2.3 This switch does not disconnect all power of this machine



Illustration 14: This switch does not disconnect all power of this machine

5.2.4 Inside the dryer it is maybe very hot

Illustration 15: Inside the dryer it is maybe very hot

5.2.5 Compressor installed under the cover

Illustration 16: Compressor installed under the cover

6 Site preparation / Installation instruction

6.1 Electrical

Voltage	220V – 240V; 1ph
Frequency	50 / 60 Hz
Fusing	250V / 8 A
	short circuit capacity of Breaker/Fuses 10 kA

6.2 Mechanical / Physical

Maximum speed	500ft/min (150m/min)
Length *	93" (2360 mm)
Width	52" (1340 mm)
Height	56" (1425 mm)
Delivery table	1.5m

* Length of standard machine with 1.5m long delivery table and without buffer table

7 Introduction

The FanFolder is a well-proven spiral folder with a tensionless infeed system to enable the folder to be used in conjunction with a variety of other equipment.

The FanFolder can be used in-line with the output from a pack or roll printer or similar equipment, providing a high volume continuous operation.

The FanFolder is equipped with automatic stop/start which is controlled by web demand and is compatible with all types of laser printers.

The web is fed into the FanFolder via a sensor controlled loop arrangement and onto a pinwheel drive system which feeds the web direct into the folder mechanism. The folded web exits the FanFolder in a continuous stream by a 2-stage conveyor system, where the packs can be either packed or transported onto a mobile trolley for further operations.

Standard size changes for form length and width are adjusted easily to enable set up times to be achieved in reasonable time. The delivery belts on the output conveyor are variable speed and easily adjusted whilst running to enable uniform packs to be produced.

The folder is fitted with forward and rear spirals to allow edge trim stock to be processed, and to produce a positive folded output from a pack or roll fed process machine.

The FanFolder is wheel-mounted to make it a mobile unit which can be moved to link up with other equipment as required.

A 1.5 meter long delivery table is fitted as standard.

The FanFolder is available in left-hand or right-hand versions.

Several options can be incorporated into the FanFolder to suit various folding requirements.

7.1 Power Control Cabinets

The power distribution cabinets contain the main circuit breaker for incoming power and the circuit breaker for each power device. They also contain the process control units for the dryer and the transport system.

The Fan Folder connects to a 240V, single phases, 50/60Hz.

WARNING!

Switch OFF the Main switches before opening the control cabinets.

8 Mechanical Installation

For the mechanical installation follow this sequence:

- FanFolder

8.1 Tools Required

- Knife
- Machinist level
- Open end wrenches 6 – 24 (mm scale)
- Allen set 1 – 12 (mm scale)
- Fork lift; minimum load capacity 1200kg (2650 pound)
- Pallet truck; minimum load capacity 1200kg (2650 pound)

8.2 Install FanFolder

8.2.1 Selection of Site

Careful sitting will have a very substantial effect on the productivity and ease of use of the machine. The following factors should be taken into consideration:

- 1) Sufficient space for storage and manipulation of packs at input end of machine.
- 2) Proximity to pack storage.
- 3) Sufficient space for handling packs, delivery of machine.
- 4) Work flow to subsequent operations.
- 5) Adequate space for operator around the machine.

8.2.2 Preparation

- 1) Remove all protective covers (sheeting etc) and clean down machine. To remove protective wax from metal parts use a suitable solvent such as white spirit, pay special attention to the following:
 - a) Path rollers and brush plate must be absolutely clean - wax tends to trap dirt and may cause the paper to pick the dirt up.
 - b) Check pinwheels and gripper wheels are completely clean with no wax drips.
- 2) Remove all guards, check that no foreign matter is in the gears or drive belts etc.
- 3) Check that all screws are tight - tighten as required.
- 4) Check that all gears are still properly lubricated. If not, brush on Molybdenum based grease (we recommend Molyslip OGL).
- 5) All bare metal shafts such as beater shafts and lays shafts should now be lightly oiled with a good quality anti-corrosive light oil. This is most easily achieved by wiping with an oiled cloth.

8.2.3 Positioning of Folder

The FanFolder Spiral Folder is mounted on wheels to enable the unit to be rolled into its working position. The folder is fitted with 4 swivel castors, the two rear castors are fitted with brakes. With the folder parked in the required position, apply the brakes on the rear castors.

Care must be taken to ensure that the FanFolder is aligned correctly to the equipment feeding the web to the folder. This should be carried out using a stick micrometer or equivalent, measuring between the first path roller of the FanFolder and the output roller of the feed unit.

If the folder is not required to be moved, leveling feet can be provided as an option if required. To level the folder, remove the drive side guard to reveal the access opening in the base of the folder. The leveling screws are mounted on the lower cross bars in the base. The leveling screws are adjusted by using a 16mm A/F spanner on the base of the screw. When the folder is level the 24mm A/F locknut should then be tightened.

Using a good quality engineer level placed on the path rollers and/or tie bars, adjust the leveling bolts until the folder is level and tighten the locking nuts. Re-check the level and re-adjust if necessary.

Fixing holes for floor bolts are provided if it is required to bolt the folder to the floor in a permanent position.

9 Electrical Connections

The electrical connections are situated on the interface panel at the rear of the folder.

A power lead (240/220V 1ph 50/60Hz) is supplied ready to plug in to the supply.

Further interface connections should be made to link up if required other equipment being used in conjunction with the FanFolder. Multi-pin connectors and leads will be supplied as requested for this purpose.



Illustration 17: Main switch and Interface connector

10 Operation

10.1 Main Control Cabinet

The main electrical control equipment is housed in the cabinet beneath the control console.

Before switching the isolator ON ensure all the other equipment being used in conjunction with the FanFolder is connected into the interface panel.

10.2 Interlocks

All four access doors into various parts of the folder are interlocked for safety. These switches **MUST NOT** be tampered with.

The folder will run only with all four access doors closed.

The folder will only inch (crawl) with the change gear and chute swing adjuster access doors closed. The folder access door and the top lid can be open whilst inching the folder.

11 Mechanical Controls & Adjustments

11.1 Pinwheels

The pinwheels can be adjusted to suit various widths of paper. Each pinwheel has a locking thumbscrew which can be released to allow the pinwheels to be pushed along it's drive shaft to the required position. After moving the pinwheels to the required position it is important to tighten the lock screws before running or inching the machine.

Form widths from 6" to 39" (150mm to 510mm) are capable of being run on the FanFolder. Removable split support rings are also supplied and should be used in conjunction with the pinwheel to support the web. (See Illustration 18: Pin Wheel and web support). These rings must be removed or added as necessary depending upon the web width being run.

The support rings are fitted with spring loaded lock screws to enable the rings to be pushed along the drive shaft as required without having to adjust the lock screws.

It is important to support the web at this point with as many support discs as space will allow. One of the pinwheels is usually set as a DATUM position, and can be kept in position once the folder is set up.

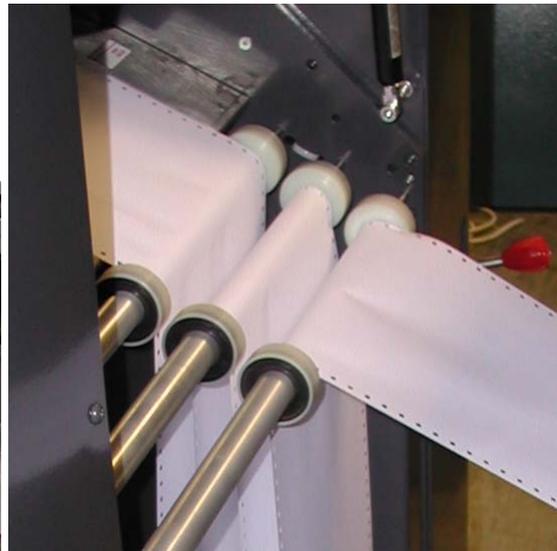
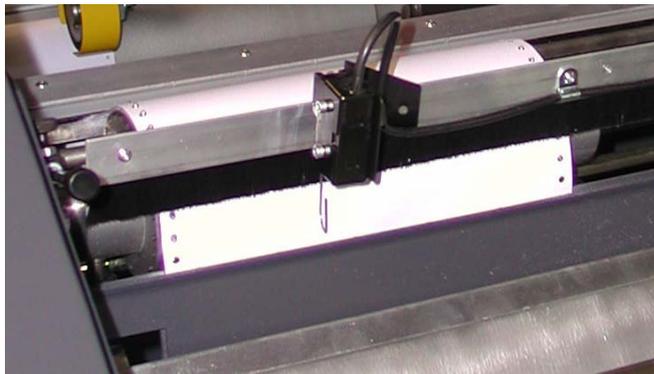


Illustration 18: Pin Wheel and web support

11.1.1 Pinwheel Tension Brush

The tension brush fitted adjacent to the pinwheels is provided to ensure the paper passing over the pinwheels remains engaged on the pins until the web passes vertically into the folder chute.

This brush is spring loaded to enable it to be held open when threading the paper into the chute.

The tension on this brush can be adjusted to suit the type of paper being processed by means of the small adjusting screw situated below the actuating lever, inside the operator side plate. (See Illustration 18: Pin Wheel and web support).

A web crash detector switch is fitted to the tension brush. The whisker of the switch should be set so that if an excessive amount of paper 'bubbles' at the top of the chute, the switch will activate and stop the folder.

11.2 Carriage Adjustments

The carriages (front and rear sections) can be moved backward and forward independently of each other to various positions to set the form depth. (See Illustration 19:). The adjuster hand wheel on the operator side can be unlocked and the carriage moved to the setting required. Scales are fitted to the folder frame and the indicator arrows fitted to the carriage to ensure that the carriages can be positioned quickly.

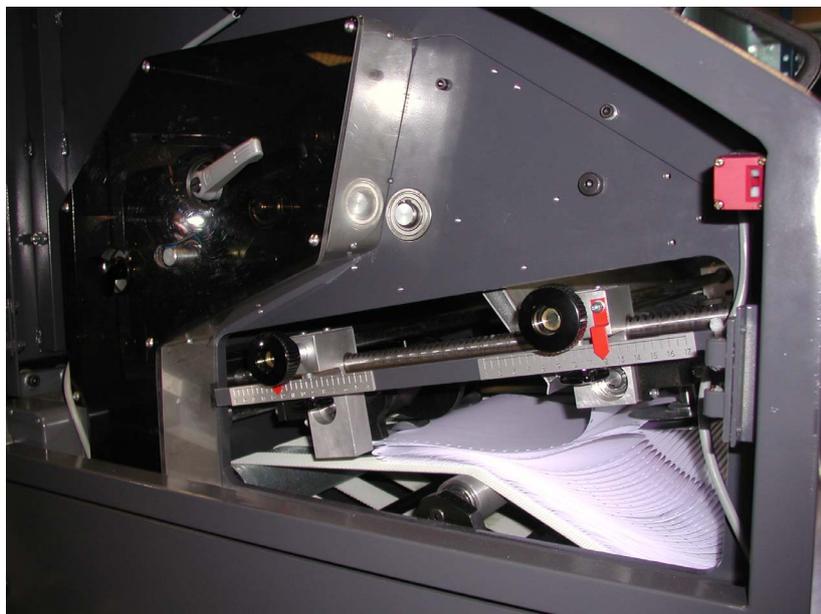


Illustration 19: Carriage adjustment

When the carriage is positioned to the size required, re-tighten the lock screws.

Note: the scales provided are a guide to setting up for standard jobs only. The position of the carriage may need to be adjusted further to suit more difficult jobs, i.e. Multi-part sets and / or various types of paper.

The standard FanFolder is fitted with four spiral gearboxes, 2 front and 2 rear, together with sets of beaters. Access to the rear of the carriage can be gained through the internal hinged web support plate, provided underneath the web path.

The spiral gearboxes and beaters can be adjusted to suit various paper widths. The gearboxes have a locking screw which locks onto the rear cross bars and the beaters are provided with small locking screws which lock them into the beater drive shafts.

The larger size beaters can be added or removed depending upon the width of job as required. However, the smaller beaters should always remain in the same relative position to the spirals.

Additional spiral gearboxes are optional and may be fitted depending upon customer's requirements. This option incorporates 4 gearboxes front and 4 gearboxes rear. The advantage of the additional gearboxes, is to enable the folder to be set up so that no width adjustment need to be made, only form length adjustments.

Note : With this option, the spirals are of a smaller size than the standard machine, and that an additional amount of beaters are also supplied.

11.3 Conveyor Speed Control

The speed of the conveyor is driven via a variable speed drive unit. The adjustment lever is on the side of the operator guard and can be raised or lowered to adjust the exit speed of the conveyor to enable the web to be delivered at a uniform rate.

Before adjusting the speed the lever must be unlocked by turning the knob anti-clockwise and when the desired speed is achieved it must be re-locked to avoid the lever "creeping" whilst running.

A scale is provided so that the operator can note the speed setting for any particular job being run, and the folder can be quickly set to the same speed setting again.

The speed setting of the output conveyor is set relative to the speed of the folding, thus if the folding speed is increased or decreased the conveyor output speed will increase or decrease proportionally.

11.3.1 Conveyor Profile Adjustment

The geometry of the first stage of the conveyor is adjustable to facilitate the varying parameters required when delivering different form lengths. The conveyor belts are supported at mid length by a movable roller which traverses through an arc. This movement is adjusted by means of the large handwheel at the front of the folder and can be locked in position by the locking screw provided. A pack wedge is provided with the folder to enable the initial folding onto the conveyor belts to be started off by giving added support to the first part of the folded pack.

11.3.2 Outfeed Conveyor

The outfeed conveyor can be used as a short run conveyor or can have a buffer table and/or a mobile trolley attached for long production runs.

If using as a short run conveyor the four transfer plates at the end of the conveyor can be left in the vertical position to stop the pack falling off the end of the conveyor.

The standard conveyor is 1.5m long, but a 1m length table can be provided as an option.

A vertical stacker unit can also be added to the end of the conveyor to enable the packs to form a vertical stack onto removable trolleys.

For instructions on the buffer tables, document trolleys and vertical stacking unit, see the relevant sections in this manual.

11.4 Change Gear Adjustments

The folder uses a change gear principle to alter the parameters of the fold mechanism. This requires a different gear to be fitted depending on the size of form to be folded.

Storage of additional change gears is provided inside the drive side cover.

The table below indicates number of teeth on folder gear for different form depths.

11.4.1 Change Gear Table

FORM DEPTH	GEAR SIZE	PART NO.	FORM DEPTH	GEAR SIZE	PART NO.
7"	42T	300594	11 2/3"	70T	300603
7 1/3"	44T	300595	12"	72T	300604
7 1/2"	45T	300596	13"	78T	300605
8"	48T	300597	14"	84T	300606
8 1/2"	51T	300598	14 2/3"	88T	300607
9"	54T	300599	15"	90T	300608
10"	60T	300600	16"	96T	300609
11"	66T	300601	16 1/2"	99T	300610
			17"	102T	300611

To change the change gear, open the access door on the operator side of the machine and undo the gear locking screw and remove the screw.

Release the quadrant locking lever and swing the quadrant gear clear of the change gear.

Remove change gear and replace with size of change gear required. Re-fit the gear locking screw and re-tighten. Align the timing mark on the change gear with the vertical marker below the gear.

Re-engage quadrant and re-tighten quadrant locking lever. See Illustration 19: Carriage adjustment.

11.5 Chute Adjustments

The fan fold chute arrangement is adjustable to enable the amount of swing to be varied according to the form size being folded.

This adjustment is on the drive side of the machine directly behind the access door.

To ensure the adjusted arm is in a horizontal position before opening the access door, inch the folder so that the chute is fully forward or back on its maximum swing.

To adjust the amount of swing, slacken the locking screw in the centre of the chute control arm and slide the marker boss along to the appropriate size on the scale marked on the hub and re-tighten the locking screw.

The chute swing hub can also be adjusted to centralise the chute with relationship to the beaters. See section on Folder Factory Settings.

The chute supplied is standard, however a split chute can be fitted with an adjustable lower section to enable very short forms to be folded. i.e. less the 7" fold length

11.6 Brush Tension Arrangement

The FanFolder is fitted with a brush strip device to add a small amount of tension to the web prior to the pinwheels. The purpose of this device is to ensure the web mounts the pinwheels correctly without riding up over the pins.

This brush is positioned onto a 'dead bar' after the loop sensors, and is spring loaded to enable it to be opened to enable the paper to be threaded through easily.

The amount of brush tension can be altered by means of the small adjuster screw situated on the inside of the framework.

12 Operating Procedure

12.1 Folder Set-up – Standard Form Sizes

Set pinwheels to width of form required. One of the pinwheels can be left in position as a datum. This is usually the operator side pinwheel and can remain in position with the drive side pinwheel being adjusted to suit the paper width.

Ensure enough web support collars are fitted to the pinwheel shaft and that they are evenly spaced between the pinwheels.

Set the front and rear carriages to the form size required by turning the adjusting handles until the marker arrows are aligned with the selected size on the scales.

Set spirals and beaters to width of form being processed.

With the change gear quadrant swung back, fit the correct change gear for the size of form. Do not swing the quadrant back at this stage.

Set the chute swing adjuster to the form length required.

Feed the paper into the folder as shown in the webbing up diagram until the paper has entered the chute.

Inch the paper until a perf line is in line with the datum marks on the support plate prior to the pinwheels.

With the perf line parked on the datum line. Rotate the change gear manually until the timing mark on the change gear is in line with the red marker plate. When this is in line swing the quadrant plate into position to engage the gears and tighten the quadrant locking screw.

Inch the paper through and guide the paper into the spirals to achieve the first fold. Continue inching until several folds have been made and the start of a pack has been obtained. A pack wedge can be used if the paper proves to be difficult to start. When the folder has been set using the timing marks please ensure the beaters are between $\frac{1}{2}$ to 1 inch behind the fold perforation as the fold perforation enters the spiral.

Ensure the support roller under the conveyor belts is adjusted to support the web whilst folding. When the folder is under normal operation, the belt height roller must be lowered so that the paper directly under the spirals forms a 'gently valley'.

Close all guards and press run button.

Adjust the delivery belt speed so that the folder documents exit with an open shingle, i.e., slight air space between documents. Do not run a tightly shingled delivery as the documents can back up into the folder causing an excessive increase in overall weight of documents thus requiring operator to make further adjustments.

Some types of paper may need side guidance to maintain a neat uniform pack when exiting the folder. A pair of side guides are supplied with the folder and can be fitted to the rectangular cross bar on the front carriage.

12.1.1 Size Changes

Size changes can be undertaken quickly as follows:

Changing from 7" to 17" with the same form width for example, requires a minimum of changes.

- a) Reset the carriages to new fold sizes.
- b) Release change gear quadrant
- c) Remove change gear.
- d) Fit new change gear.
- e) Reset chute swing adjuster to new fold size.
- f) Feed in new size web and line perf up to the datum line.
- g) Re-engage gear quadrant, with timing mark correctly positioned.

If the width also requires altering, the extra time is required to reposition pinwheels, support rings, beaters and spirals as required, unless fitted with additional spirals.

When setting for different widths of web, ensure that a sufficient quantity of beaters is used to enable a clean fold.

12.2 Folder Factory Settings

The position of the beaters are fixed with the rear beaters 180° out of phase in relation to the front beaters. If this setting is not correct it can be adjusted by slackening the grub screws on the coupling which drives the front beaters. The beater shaft can then be rotated to its correct position and the grub screw should then be re-tightened. The coupling is located on the drive side of the folder on the front beater shaft. The positions of the beaters and coupling are factory set and should not need adjusting.

With the beaters the chute can then be centralised. Open guard on drive side of machine in the top left hand corner. Behind the chute swing adjuster there are two 5mm allen headed bolts in a flange, slacken these bolts and rotate outer section of flange until chute is in its central position, when in correct position lock-up bolts in the flange.

To position spirals as, slacken the 3/16 AF headed allen screws in the centre of each spiral on the underside then rotate spiral to its correct position. When spirals are in position re-tighten retaining screws.

Note: Make sure spirals are rotating in the direction indicated; if spirals are ever removed make sure they are replaced in their correct order. Some folders are also fitted with a small locking screw in the side of the spiral boss.

13 Maintenance

Regular maintenance of the equipment is essential for efficient operation. The time you invest in maintenance and inspection will result in less downtime.

Maintenance is performed by operators and service technicians. The operator's procedures in this chapter do not require you to open any locked doors or to come in contact with electrical circuits. A service technician is required to inspect and clean inside the components.

13.1 General

Treating your folder with care and respect will reduce the amount of major maintenance work. However there are certain items which do need attention periodically which are listed in this section. There are also a few basic rules which should also be adhered to.

- 1) Always keep the folder as clean as possible.
- 2) Always look out for loose or worn parts and report them to a supervisor.
- 3) Never abuse or misuse the folder.
- 4) Ensure parts that require lubrication do not run dry.

13.2 Monthly

- 1) Spray folder gears with a fluid grease lubricant such as Molyslip OGL.
- 2) Grease bevel gears inside the folder which drive the beaters shafts.
- 3) Lightly oil beater shafts.
- 4) Clean lenses of loop sensors

13.3 Every Three Months

- 1) Spray folder gears with a fluid grease.
- 2) Grease bevel gears.
- 3) Lightly oil beaters shafts.
- 4) Remove guards and lubricate drive chains.
- 5) Using a grease gun lubricate spiral gearboxes. There is a grease nipple on the top of each box. Care must be taken not to use too much grease, as it will escape along the beater shafts.

13.4 Annually

- 1) Clean gears with a spirit based cleaner and re-grease as previously described.
- 2) Clean bevel gears if possible with spirit based cleaner and re-grease.
- 3) Clean beater shafts and lightly oil.
- 4) Using a grease gun lubricate spiral gearboxes.
- 5) Remove guards and lubricate chain drives.
- 6) Check all timing belts for any wear and adjust tension as required. Do not over tension.
- 7) Check all chain drives and adjust tension as required. Do not over tension.
- 8) Change oil in zero maximum drive using motor oil SAE40 or equivalent.

13.5 Procedure for checking and replacement of the Zero-max gearbox oil

The Zero-max gearbox is normally a trouble free unit as long as the zero-max mechanism is running in oil. Periodically (once a year) the gearbox needs to be inspected and if necessary extra oil added.

13.5.1 Inspection

Annually inspect the gearbox for leaks paying particular attention to the output shafts, handle and the cork gasket. If there is any leaking or if it is known that the gearbox has been running hot (40°C over ambient). Then the gearbox will need to be stripped from the machine to gauge the oil level and if necessary, the oil replenished.

13.5.2 Gearbox removal

1. Unscrew the speed adjustment handle from the gearbox.



Illustration 20: Gearbox removal

2. Undo the main guard mounting screws and move the guard out from the machine by 300mm to allow room to remove the gearbox from the side frame.
3. Slacken of the chains to the gearbox by losing the tensioning sprockets
4. Remove the drive sprockets from the gearbox by undoing the fixing grub screws.
5. Remove the 4 gearbox mounting bolts and remove the gearbox from the machine.
6. Stand the gearbox on a level surface with the level plug in the up most position, as shown in the illustration.



Illustration 21: Gearbox removal

7. Remove the plug and the oil level should be at the bottom of this hole. Top up with oil (SAE 40) until this level is reached.
8. Reassemble the machine in the reverse order.
9. Inspect the gearbox after a week, if the gearbox continues to leak then a replacement gearbox needs to be ordered and fitted as soon as practicable.

14 General Faults

14.1 Machine Running Problems

Problem	Possible Causes	Remedy
Machine will not run	Access doors or guards not shut properly	Ensure doors/guards are shut
	Crash detector jammed	Clear jam and ensure detector is free from obstructions
	Emergency stop button not released	check stop buttons and release button
	Paper loop at uppermost position. No web storage	Allow more paper to be fed into loop control

14.2 Paper Processing Problems

Problem	Possible Causes	Remedy
Stock will not fold	Wrong perf in paper	Change to correct perforation paper
	Weak perforation in stock	Change paper
	Wrong change gear fitted	Fit correct folder change gear
	Chute setting not set correctly	Re-set stroke on crank arm
	Spirals and beaters too close or too far apart	Re-set to correct position on scale

If the reason for the fault cannot be traced to equipment etc external to the drive unit, the best course of action is to repeat the set-up procedure until you reach a step where the fault manifests itself. This should highlight which particular part of the system seems to be malfunctioning. If electronic expertise is on hand then reference to the circuit diagrams included in this manual may solve the problem.

15 Options

15.1 FanFolder Vertical Pile Stacker

The vertical pile stacker, which is fitted to the end of the outfeed conveyor enables packs of paper to be delivered into vertical piles upon removable mobile platforms.

The mobile dolly is located onto the two arms protruding from the front of the stacker, ensuring the dolly is flush against the back face of the unit.

The dolly should now be raised to its fully up position by using the table UP/DOWN switch on the control panel. To operate this switch, the MANUAL / AUTO switch must be set to MANUAL.

When the dolly has been raised to its fully up position, the upper limit indicator will light and the MANUAL / AUTO switch should be switched to AUTO.

The folded pack travels along the conveyor belts and will fall onto the dolly and form itself into a vertical pack. A sensor in the control panel will sense when the pack has built up to a consistent feed rate and as the pack builds up, the table will automatically lower in pre-determined steps until the dolly with its pack, has been lowered completely.

As the dolly reaches the floor, a limit switch will activate the lower limit indicator on the control panel. At this point the folded pack should be cut at a suitable point and the pack on the conveyor pushed backwards to enable enough time for the full dolly to be removed and an empty dolly to be raised into position.

The sensor position can be adjusted to suit various paper stocks. An adjusting knob located beside the sensor enables the sensor to be raised or lowered to the height required to allow the pack to transfer onto the dolly in a continuous motion.

Note: On some machines, the sensor is located opposite the control box.

16 Mobile Document Trolley

16.1 FanFolder

The mobile document trolley is a self-contained unit for moving large volumes of stationary to other process machinery. The top of the trolley is rigidified stainless steel to allow the stationary to compress whilst being pushed on by the FanFolder conveyor and to slide along to the end with minimum resistance. The stainless steel top should be kept clean.

16.1.1 Specification

Length	1550 mm
Height	710 mm
Width	650 mm
Max. Paper Width	510 mm (20")

16.1.2 Operation

The mobile trolley is easily attached to the FanFolder by aligning the driven end of the trolley with the outfaced conveyor of the FanFolder.

Pushing the trolley forward, the two locating spigots will guide the trolley into position. When the trolley is hard up against the conveyor operate the locking latch mounted on the FanFolder conveyor to secure the trolley into position.

Connect the flying lead connector on the FanFolder into the connector on the trolley.

Finally flip down the transfer plates which are mounted on the end of the FanFolder to enable the pack to transfer across to the trolley.

The trolley is fitted with a trolley full sensor. When the sensor is covered by the pack a buzzer will activate together with error indicator 3 which will flash for a pre-set period of time.

16.2 FanFolder Buffer Table

The buffer table is an additional conveyor system which is added to the FanFolder to extend the outfeed conveyor, to enable longer runs of stationary to be handled.

16.2.1 Specification

Length*	2000 mm
Height	710 mm
Width	759 mm
Max. paper width	510 mm (20")

*Length can be supplied to suit customers requirements.

16.2.2 Operation

The buffer table is fitted with its own conveyor belts but is driven via a chain drive from the FanFolder.

The table is attached to the outfeed conveyor of the FanFolder by two clamping plates.

When fitted the pack exiting the FanFolder will just continue onto the buffer table which will be running at the same speed as the outfeed conveyor.

Note : The bridging plates at the end of the outfeed conveyor must be fitted and set in the horizontal position.

A separate drive motor is fitted to the buffer table to enable the processed packs to be 'fast forwarded' onto the document trolley if required.

The table is fitted with a table full sensor. When the sensor is covered by the pack a buffer will activate with error indicator 3 mounted on the FanFolder control panel.

If the document trolley is fitted the table sensor is over-ridden by the trolley full sensor.