2.1 General process description

The **FSW 500 C** Folio-Size-Wrapper is a system specially designed to wrap large-sized reams which are either picked up from the pallets or exiting from the cutter, depending on the machine lay-out. The wrapping paper used is drawn from reels. The reams, once wrapped, are palletized on pallets.
Designed and manufactured with the latest technology for automatic machines, the **F.S.W.** is provided with an automatic system to control size change-over and adjustment operations. The operator is able to use an interface with a touch-screen monitor connected to the PLC in order to control production and machine operations.

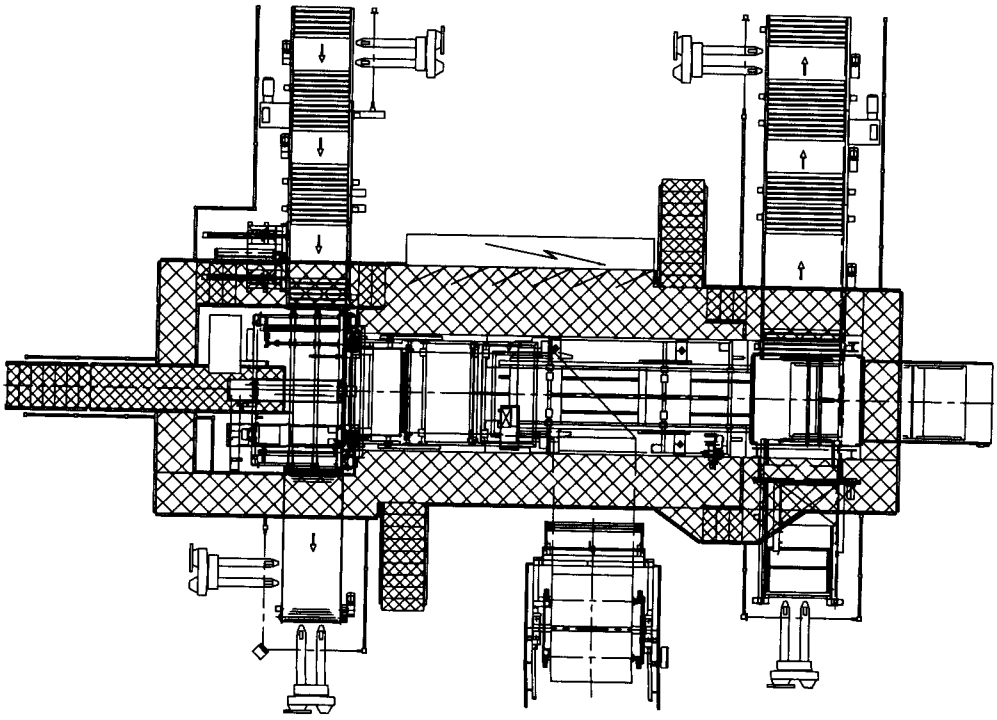
2.1.1 Main features

The distinctive features which make the **F.S.W.** a particularly efficient and competitive machine compared to others of its type are the following:

- It is an automatic machine for wrapping large size reams of paper (the operating characteristics can be seen from the machine specifications).
- Automatic feed and lifting of the pallets holding the reams to be wrapped, according to the skill of the operator in charge.
- Fully automatic packaging sheet cutting , wrapping , glue application and wrap sealing.
- The wrapped reams can be placed on several palletizers so as not to interrupt the production process, even when full pallets are being unloaded.
- Fully automatic size change-over operations with control of production and optimum use of wrapping materials even when size is changed over frequently

2.1.2 Optional equipment

The machine may be equipped with a series of optional units which alter its production and wrapping features.
A description of these optional units is given in this manual even if they are not actually part of your machine.



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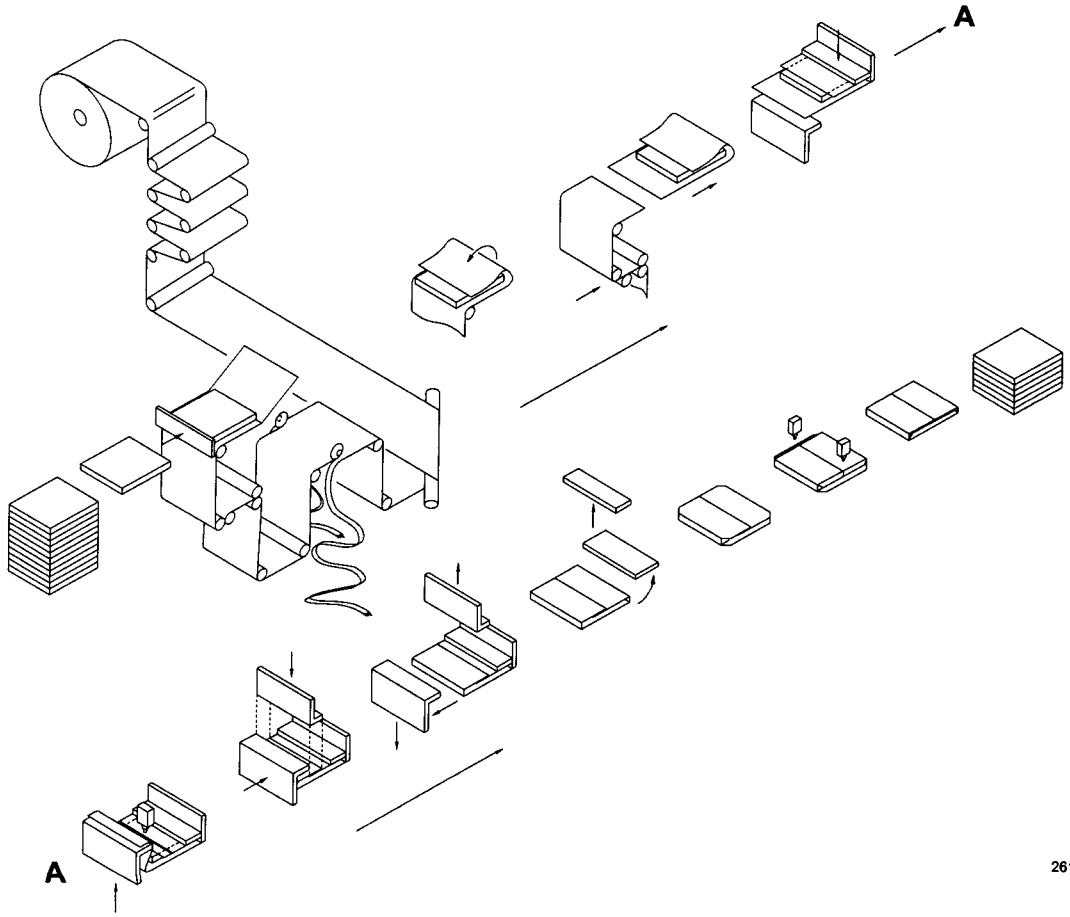
2.2 Work-cycle

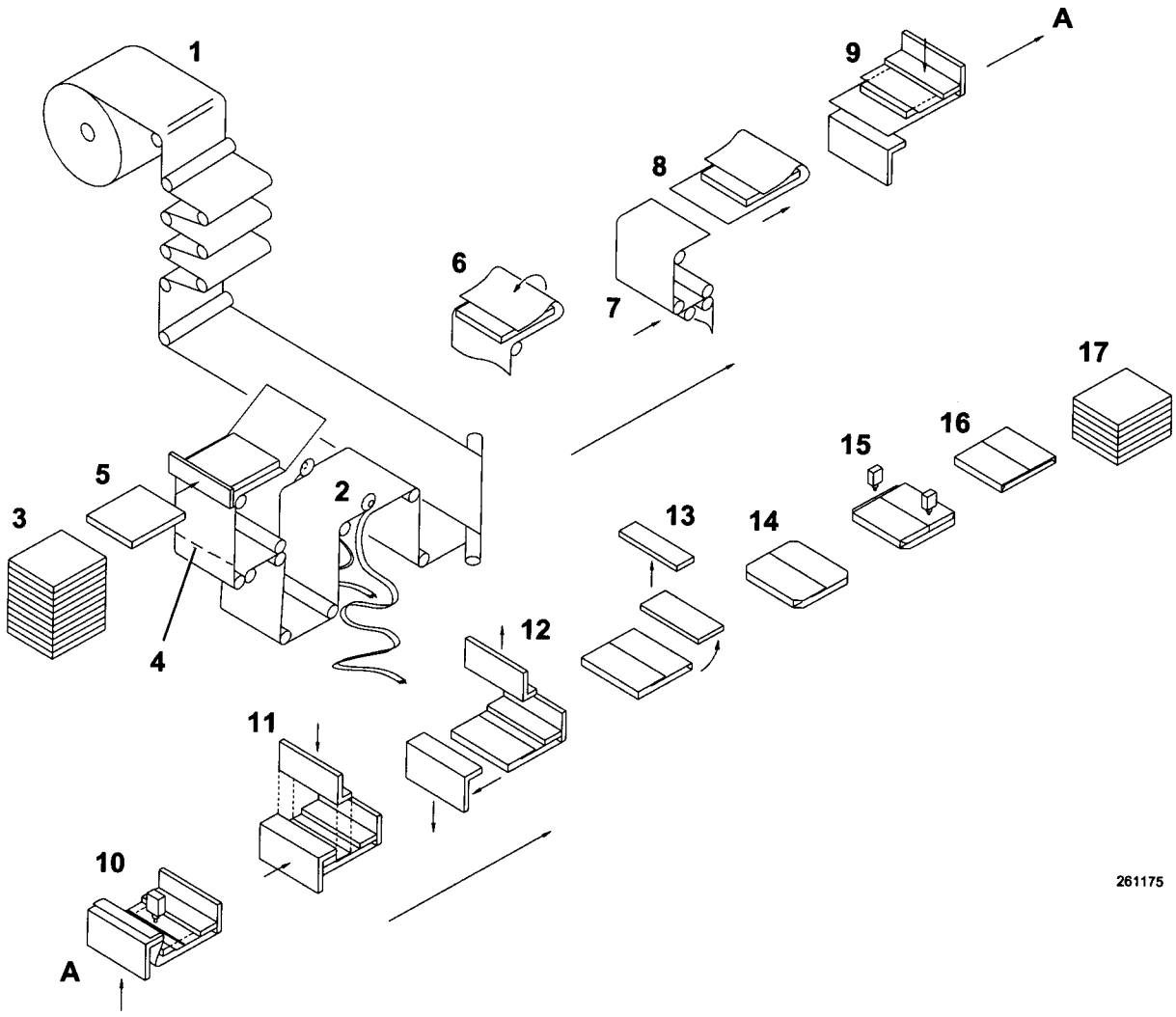
The reams to be packaged (stacked) placed on a pallet, are deposited in the depalletization station. From this point, they are brought to the loading position in front of the operator. By using the gun that blows air under the reams, the operator feeds the reams to the machine(*1) until the two fixed back-plates are reached. These back-plates trigger pincer operation by activating two sensors. The function of the pincers is to hold the reams in place. During this stage, the height of the reams is measured and recorded by the pincers by means of an encoder. The packaging process has now started: the pincers, holding the reams in place, start to carry out their stroke bringing the reams to the center of the machine in front of the pusher. The pusher then moves the reams against a front counter-plate fitted with two sensors. Tube formation starts once the sensors have been activated.
The reams are then clamped by two belts (one on top and one the bottom) and carried to the wrapping paper which has already been unwound vertically. During the next stage the reams are picked up by two different belts that carry them to a front stop. The pre-cut wrapping paper is torn while the reams are being conveyed.
While the reams are against the front stop, the front corner is marked by a hold-down, the glue is applied cross-wise and the back is folded by a folder which moves vertically and horizontally. Tube formation is completed by applying pressure on the glue. While the reams are being carried on the exit conveyor belt, they come to the head folders which make the first head folds. Once this has been done, two movable side folders bend the back part of the head fold, thereby forming the top and bottom flaps.
The top flaps are folded by a number of devices so that the guns can apply glue on the bottom flaps. These will then be folded on top of the previous ones by propeller shaped folders.
The cycle ends by bringing the reams to the palletizing unit. Here, the reams are stacked on a pallet and discharged from the machine by a conveyor belt.

(*1) When the machine is provided with a sheet inserter device, the operator pushes the reams onto an air-cushioned belt conveyor which leads to the zone where the cardboard sheets are inserted (i.e. one at the top and one at the bottom). A pusher and a conveyor chain fitted with teeth carry the reams up to two fixed end-plates. The latter operate the pincer to pick up the reams, allowing the packaging operations to be continued.



2.2.1 Flow chart

1 Paper unwinding
2 Wrapping paper trimming
3 Ream infeed
4 Pre-cutting
5 Reams conveyed to "tube" formation station
6 Bending of front flap of "tube"
7 Paper unwinding stop
8 Pre-cut paper (tube) torn
9 Ream stop and final fold of front flap of "tube"
10 Ream stop and glue application on front flap of "tube" and raising of back flap
11 Ream stop, final fold and pressure applied to close back fold of "tube"
12 Ream stop, rear folder backs up and moves down and pressing unit for closing the back flap moves up
13 Pressing unit for front flap of "tube" moves up and ream stop-plate moves up
14 Back and front side flaps folded
15 Top side flaps folded and glue applied on bottom side flaps
16 Bottom side flaps closed
17 Reams discharged onto palletizer



2.3 Specifications

2.3.1 Technical details

Model	**F.S.W. 500 C (Folio Size Wrapper)**	
Type of machine	Ream wrapper	
Ream feed	Manual/semiautomatic (optional)	
Operation	Electric-mechanical - pneumatic	
Controller	Electronic	
Operators	1 (supervisor) + 1 (ream feeder)	
Max. production rate	strokes/min.	16,5
Average size change-over time	minutes	6 (approx.)
Time taken to change paper roll	minutes	3 (approx.)
Machine weight	See chapter 3	
Noise level	dB (A)	80
Dimensions	See overall dimensions	

2.3.2 Electrical system

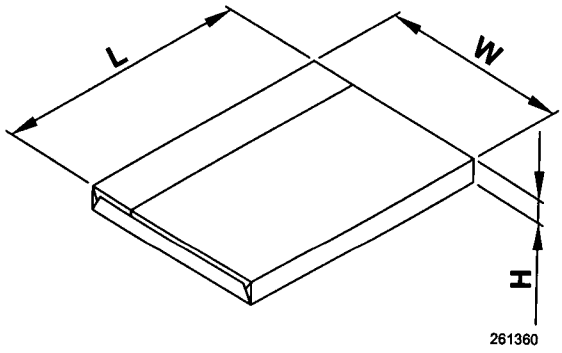
Power requirements		kVA	53
Phases		n°	3 + earth
Neutral wire		(not provided)	
Voltage		V	480
Frequency		Hz	60
Allowable voltage fluctuation		+8% / - 5%	
Service voltage:	power outlets	VAC	220
	lighting	VAC	220
PLC I/O voltage:	inputs & outputs	VDC	24
	solenoid valve outputs	VDC	24
Electrical wiring		complies with EC standards	
Programmable logic controller (PLC)		Allen Bradley	

2.3.3 Air supply

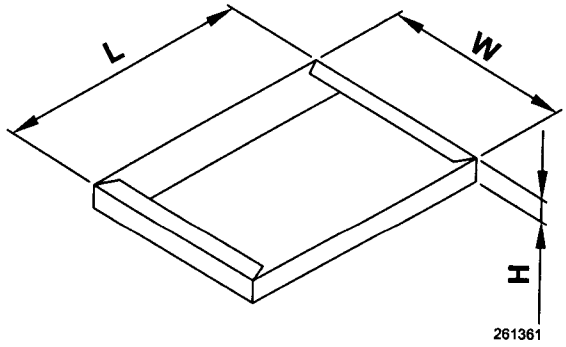
Air pressure	bar	6
Air requirements	Nl/min	700

2.3.4 Package sizes

REAMS WITH END-FOLDS



REAMS WITH OVERLAPPING FOLDS



Ream size		**W** min	mm	420	inches	16" 1/2
		W max	mm	1000	inches	39" 3/8
		L min	mm	420*1	inches	16" 1/2
			mm	530	inches	20" 3/4
		L max	mm	1400	inches	55" 1/8
		H min	mm	15	inches	5/8"
		H max	mm	80	inches	3" 5/32
	on depalletizer in pairs	**W** max	mm	700	inches	27" 9/16
	on depalletizer in threes	**W** max	mm	500	inches	19" 11/16
	on palletizer in pairs*1	**W** max	mm	700	inches	27" 9/16
	on palletizer in threes*1	**W** max	mm	430	inches	17"
	on palletizer in threes*1	**L** max	mm	1040	inches	41"
	on palletizer in fours*1	**W** max	mm	550	inches	21" 5/8
	on palletizer in fours*1	**L** max	mm	600	inches	23" 5/8
Ream weight		min	kg	4		
		max	kg	50		
Type of folds: overlapping		min	mm	15	inches	5/8"
		max	mm	80	inches	3" 5/32
Type of folds: end-folds		min	mm	25	inches	1"
		max	mm	80	inches	3" 5/32
Basic paper weight (minimum)			g/m²	45		

*1 optional