

WMS VT – standard version

The machine with conveyor on turntable

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Standard version	– bold face
option	– thin face, grey background

1. Basic parameters

			Standard	Profi	Automatic
control			programmable system		
	count of programs		6	20	10
turntable	performance		with conveyor		Automatic
	maximum load	kg	1500, 2000		
	regulation *)		frequency converter		
mast		m	2300, 3000		
	height of goods check **)		optical		
prestretch device	performance		electromagnetic brake, 1motor, 1motor Light, 2motor		1motor, 2motor
foil ending	tearing ***)		no, eligible with 1motor, 2motor		no
	ending ****)		no		yes
top platen			no, electric		

*) control of turntable speed

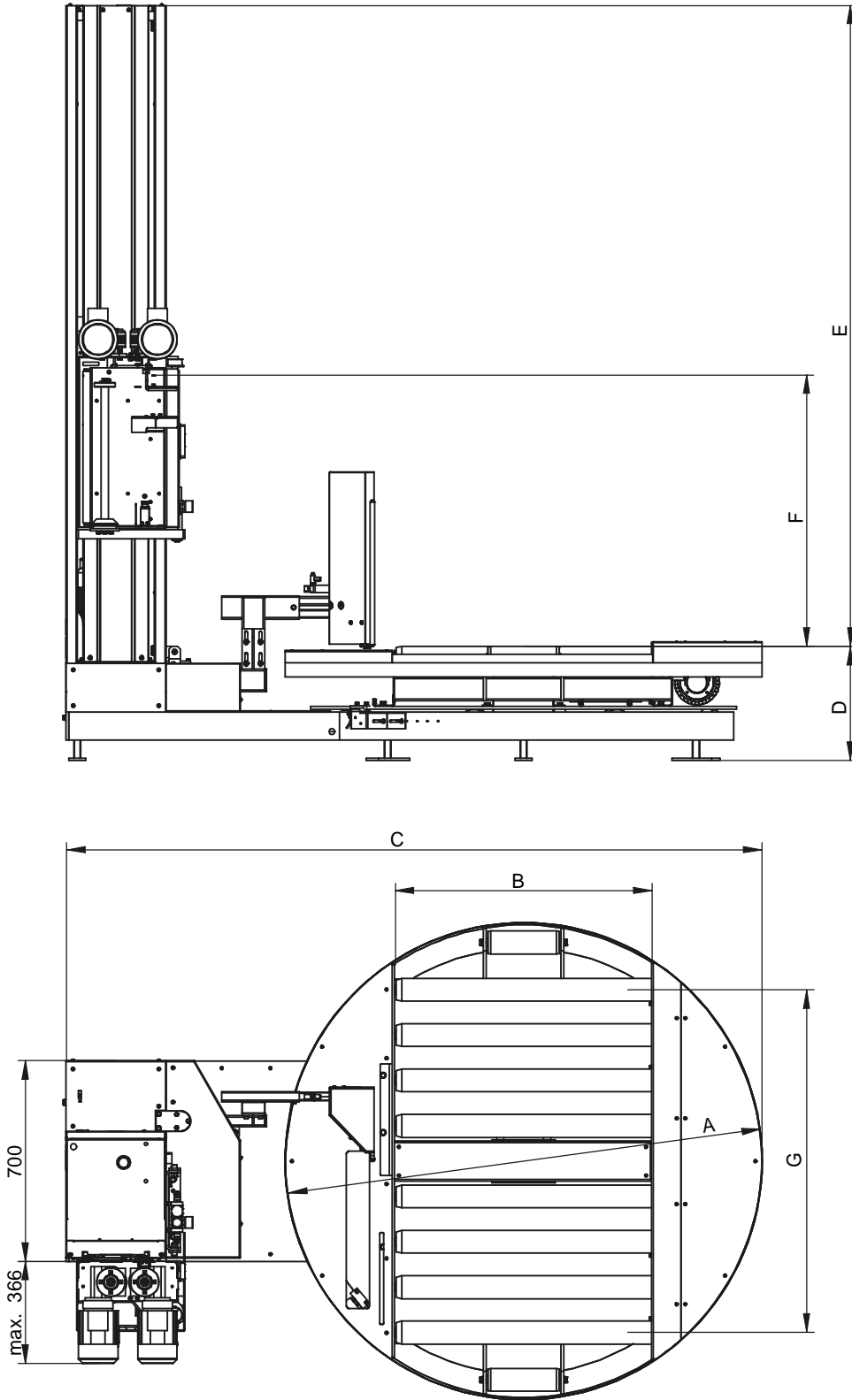
**) goods height check during the wrapping; the pallet is wrapped all over the height

***) automatic foil tearing at the moment of end of wrapping

****) automatic foil ending at the moment of end of wrapping (cutting and welding the foil)

2. Basic diameters

2.1. Machine VT with roll conveyor



Marking of **standard** and **optional** equipment

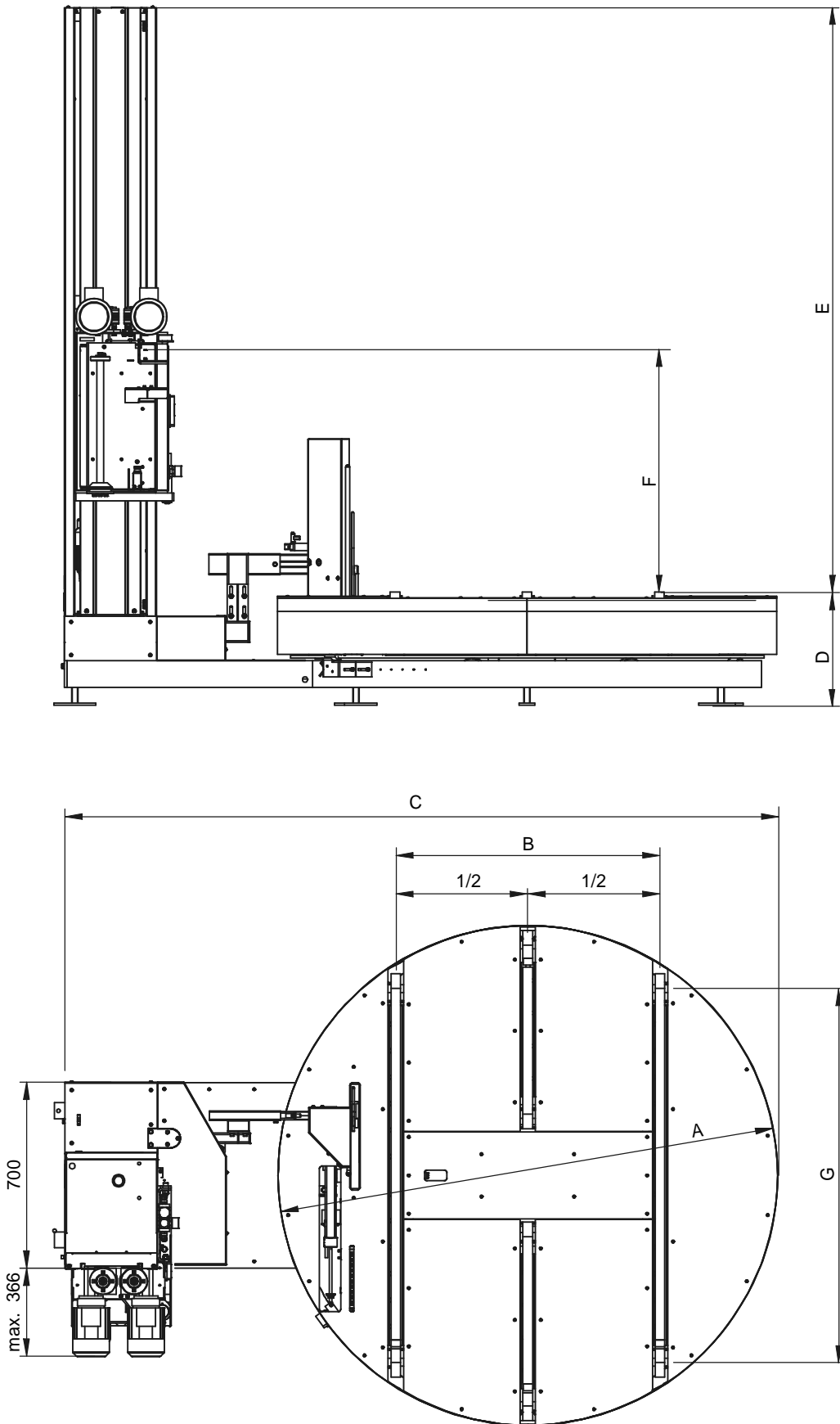
nominal size		900	1100	1200	1300	
max. dimension of pallet	mm	850x1200	1050x1200	1150x1200	1250x1200	
load capacity	kg	1200	1200	1200	1200	
weight	kg	max. 800	max. 820	max.1020	max.1030	
A – outside diameter	mm	1665	1795	1964	1965	
B – roller width	mm	900	1100	1200	1300	
C – total turntable length	mm	2422	2487	2732	2732	
transport length for mast 2300/3000/3500	mm	2650/3350/3850	2650/3350/3850	2732/3350/3850	2732/3350/3850	
transport length for mast 2300/3000/3500 + top-plate	mm	2830/3530/4030	2830/3530/4030	2830/3530/4030	2830/3530/4030	
D – standard	mm	500 ± 30				
D – to order	mm	360 to 800	360 to 800	360 to 800	360 to 800	
E – mast 2300/3000/3500	mm	2240/2940/3440				
E – transport height	mm	600				
F – min. wrap height *)	mm	500				
F – max. wrap height *)	mm	2370/3070/3570 for mast 2300/3000/3500				
G – outside roller spacing	mm	1198	1430	1518	1498	
roller diameter	mm	80	80	80	89	
roller drive	W	550	550	550	550	
turntable drive	W	750	750	750	750	
accuracy of turntable stop		±1°				
conveyor speed	m/min	12				
turntable speed	1/min	10				

*) Wrap height – max. height between conveyors and upper edge of foil on reel in prestretch device

nominal size		1100x1500				
max. dimension of pallet	mm	1050x1500				
load capacity	kg	1200				
weight	kg	max. 930				
A – outside diameter	mm	2032				
B – roller width	mm	1100				
C – total turntable length	mm	2766				
transport length for mast 2300/3000/3500	mm	2650/3350/3850				
transport length for mast 2300/3000/3500 + top-plate	mm	2830/3530/4030				
D – standard	mm	500 ± 30				
D – to order	mm	360 to 800				
E – mast 2300/3000/3500	mm	2240/2940/3440				
E – transport height	mm	600				
F – min. wrap height *)	mm	500				
F – max. wrap height *)	mm	2370/3070/3570 for mast 2300/3000/3500				
G – outside roller spacing	mm	1511				
roller diameter	mm	80				
roller drive	W	550				
turntable drive	W	750				
accuracy of turntable stop		±1°				
conveyor speed	m/min	12				
turntable speed		10				

*) Wrap height – max. height between conveyors and upper edge of foil on reel in prestretch device

2.2. Machine RT with chain conveyor



Marking of **standard** and **optional** equipment

nominal size		700	800	1000		
max. dimension of pallet		800 x 1200 lengthwise	1000 x 1200 longitudinal	1200 x 1200 across		
load capacity	kg	1200	1200	1200		
weight	kg	max. 890	max. 915	max. 930		
A – outside diameter	mm	1588	1888	1888		
B – chain row spacing	mm	700	800	1000		
C – total turntable length	mm	2394	2694	2694		
transport length for mast 2300/3000/3500	mm	2650/3350/3850	2694/3350/3850	2732/3350/3850		
transport length for mast 2300/3000/3500 + top-plate	mm	2830/3530/4030	2830/3530/4030	2830/3530/4030		
D – standard	mm	505 ± 30				
D – to order	mm	360 to 800				
E – mast 2300/3000/3500	mm	2240/2940/3440				
E – transport height	mm	600				
F – min. wrap height *)	mm	500				
F – max. wrap height *)	mm	2370/3070/3570 for mast 2300/3000/3500				
G – chain wheel spacing	mm	1252	1542	1412		
chain		16B	16B	16B		
count of chain rows	mm	3	3	3		
conveyor drive	W	550	750	750		
turntable drive	W	750	750	750		
accuracy of turntable stop		±1°				
conveyor speed	m/min	12				
turntable speed	1/min	10				

*) Wrap height – max. height between conveyors and upper edge of foil on reel in prestretch device

3. Basic components parameters

3.1. Turntable, conveyor on turntable

see chap. 2

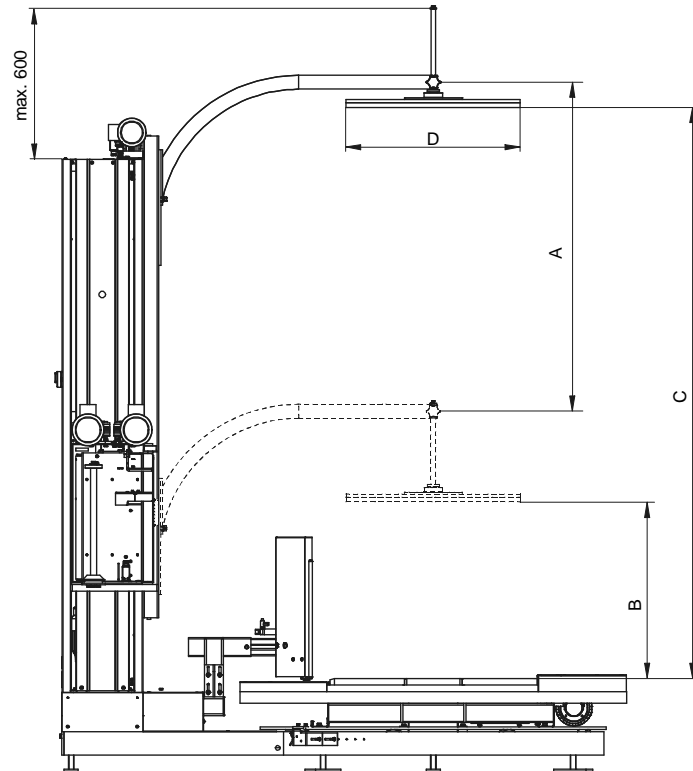
3.2. Mast

model		2300	3000	3500
height	mm	2300	3000	3500
width	mm	350		
depth	mm	435	435	435
profile	mm	-		
film carriage drive		180W 3x400V 50Hz		
chain of the film carriage		086		

3.3. Prestretch device

			el.mag. brake	1motor	1motor LIGHT	2motor
height	mm		717	836	787	820
width	mm		396	390	396	390
depth	mm		295	360	295	360
regulation of pre-stretch			el. mag. brake	motor + transmiss.	motor + transmiss.	2 motors
primary pre-stretch standard	%		-	180	180	-
primary pre-stretch optional	%		-	80, 130, 180, 230, 280	80, 130, 180	50 to 500
secondary pre-stretch	%		0 to 100 % (braking force)	70 to 400	70 to 400	70 to 400
power consumption of el. mg. brake	W		12	-	-	-
motor (3x400V 50Hz)	W		-	370	370	driving 370 driven 250
tearing of film			no	optional	no	optional

3.4. Top-platen



3.4.1. Electric top-platen

for mast	mm	2300	3000	3500
pressing force	N	cca. 500, set up fixed		-
A – stroke	mm	1300	2000	-
B – min. height *)	mm	850		-
C – max. height *)	mm	2450	3150	-
motor		120W 3x400/230V 50Hz		-
chain		086		-
plate		round, not oriented, foam rubber coating		-
D – diameter of plate	mm	Ø 750		-
diameter of plate	kg	max. 55	max. 65	-

*) min./max. height of the top platen over turntable (after displacement of platen axe, without spare for handling with pallet and without view for the possibility or impossibility of the top of goods wrapping on pallet)

3.5. Ending

ending method		welding by resistance hot-band against the support plate
mechanism	turntable	<ul style="list-style-type: none"> extension support plate arbor
	skeleton	<ul style="list-style-type: none"> rotary arm with foil cutting and welding
foil cutting		resistance (wire \varnothing 0.8 mm)
foil welding		resistance (band 3 x 0.1 mm)
weld width		300 mm
mechanism drive		pneumatic

Marking of **standard** and **optional** equipment

4. Parameters of additional accessories

4.1. Driven conveyor

width	mm	900	1100	1200	1300	1400
nominal length		1350	1500	1500		
		1500	2000			
		2000	2500			
		2500				
		3000				
height - standard	mm	440 - 540				
height – to order	mm	(360 to 800)				
roller spacing	mm	166.5				
motor 3x400V 50Hz	W	550, 750	550			
load capacity	kg	1200	1200	1200		
speed	m/min	12				

4.2. Fencing

total height	mm	min. 2000
space floor	mm	max. 160
width of door	mm	920
execution of door		right, left
width of door opening	mm	min. 800
size of wire cloth	mm	40x40
diameter of cloth wire	mm	3.1

5. Additional information

5.1. Environment

environment	according HD60364-5-51:2009	normal, AA5+AB5
	according EN 60721-3-3	3K3/3B1/3C1/3S1/3M1
	workplace	indoor, covered
	degree of corrosion aggressiveness of the environment according to ISO 12944	C2
	temperature	+5°C to +40°C
	rate of temperature change	max. 0.5°C/min.
	relative humidity	5% to 85% without condensation
	altitude	up to 2000 m
	explosive environment	no (prohibited)
	emission of noise	63.9 dB
	floor	horizontal, concrete, flatness max. ±3 mm/2m
	workplace lighting	EN 12464-1
	area around machine	EN 547-1
	interference elimination	ČSN EN 61000-6-3
	interference resistance	ČSN EN 61000-6-1
operating staff	age	18 and more
	burden	17 kg (reel with film during loading)
	aquaint with user manual	obligatory
revision	initial revision from manufacturer	EN 60204-1
	revision before operating	according to national regulations
CE certification		yes
service life		50 000 hours

5.2. Connection of the machine

			Standard	Profi	Automatic
compressed air	input	MPa	-		
	working	MPa	-		
air consumption	ending		-		
compressed air quality			ISO 8573-1 (7:4:4)		
el. installation	power supply		TNC-S 3+PE+N 3x400/230V, 50Hz ČSN EN 50160 (EN 50160)		
	power requirement	kVA	4.3 *)	4.3 *)	4.3 *)
	protection	A	16 *)	16 *)	16 *)
	voltage of control circuit	V	24=		
IP-code	motors		IP55		
	switch boards		IP54		
	sensors		IP65		
	ending		-		
					IP00

*) Power, protection – see name plate (depend on configuration and connection)

5.3. Expendable material

foil wrapper	material		PE stretch foil
	roll diameter	mm	max. 250
	foil width	mm	500
	tube diameter	mm	74 to 86
	weight of full roll	kg	cca. 17
	foil thickness	µm	20 to 40

Marking of **standard** and **optional** equipment

5.4. Manufacturers

		WMS Standard VT	WMS Profi VT	WMS Automatic
pneumatic component				FESTO
PLC		PMA		Siemens
control panel		PMA		Siemens
cells and sensors	optical	Schneider		SUNX
	inductive	Schneider		
contactors		Schneider		
circuit breakers		Schneider		
auxiliary relays		Schneider		
distribution frames		WAGO		
controllers		Schneider		
motors:	turntable	Bonfiglioli		
	foil carriage	Bonfiglioli		
	top-platen	Bonfiglioli		
	prestretch device	Bonfiglioli		
	conveyors	Bonfiglioli		

Different components may be used, but do not affect the operation of the device

5.5. Standard colors

mast, turntable frame	RAL 9006	grey	possible to change according to customers wish
moving parts	RAL 3020	red	not possible to change
safety parts	RAL 1018	yellow	not possible to change
others	RAL 9005 -	black galvanized parts without colouring	possible to change according to customers wish not possible to change

5.6. Documentation

Customer`s country	CZ, SK	DE, A	PL	RU, post soviet states	ostatní
count of impression *)	1	1	1	1	1
User`s guide	CZ	DE	PL	RU	GB
Wiring diagram	CZ	DE	GB	GB	GB
Manuals of components (sensors, converters)	CZ (GB) **)	DE (GB) **)	DE (GB) **)	DE (GB) **)	DE (GB) **)
Spare parts catalogue	for demand CZ	for demand DE	for demand PL	for demand RU	for demand GB
CE certification	CZ	DE	GB	GB	GB
Certificate of warranty	CZ	DE	GB	GB	GB
Overtake protocol	CZ	DE	GB	GB	GB
Documentation on CD ROM	for demand (languages consistent with standard documentation)				

Another languages: must be specified

*) Count of impression for one machine.

***) Delivered documentation (original or copy) delivered by producer of component

Marking of **standard** and **optional** equipment

5.7. Weights

All weights are rounded to 5 kg.

turntable		15	18
		230 kg	255 kg

mast		plastic cover	sheet cover
	2300	115 kg	120 kg
	3000	-	125 kg
	3500	-	125 kg

prestretch device	mechanical	el. mag. brake	1motor	1motor LIGHT	2motor
without tearing	40 kg	30 kg	65 kg	50 kg	70 kg
with tearing	-	-	65 kg	-	70 kg

Electric top-platen	for mast	2300		3000	
	for turntable	15	18	15	18
		55 kg	55 kg	65 kg	65 kg

roller conveyor	900 vp	1100 vp	1200 vp	1300 vp	1100/1500 vp	
	315 kg	340 kg	520 kg	530 kg	435 kg	

chain conveyor	700 rp	800 rp	1000 rp	1000/15 rp		
	385 kg	495 kg	495 kg	400 kg		

ending	welding		
	45 kg		

5.7.1. Weights of additional parts

holder of top sheet application	width of the foil	1200	1400	
		30 kg	30 kg	

driven conveyor	width	900	1100	1200	1300	1400
	length 1330	125 kg	-	-	-	-
	length 1500	135 kg	165 kg	175 kg	-	-
	length 2000	190 kg	210 kg	-	-	-
	length 2500	225 kg	255 kg			
	length 3000	265 kg	-	-	-	-

6. Communication with surround

6.1. WMS Standard, Profi (standard)

Wrapping machines range WMS STANDARD and PROFI are adapt for building in to roll conveyor line. Standard version of the machine is with roll conveyor powered and control by PLC system of the line.

INPUT SIGNALS from conveyor to wrapper

1. **Possible to wrap** (external stop) – if the signal is inactive, all motions of the machine are blocked, running program is interrupted, interrupted program is terminated by the next declining edge of **Possible to wrap** signal.
1 switching contact 24V DC 200mA – in conveyor switch board
2. **Motor of conveyor** - 3x400V 550W – on turntable terminal
3. **Emergency stop** – disconnect, if neighbourhood is in emergency stopping
2 switching contacts 24V DC 5A - on switch board terminal

OUTPUT SIGNALS from wrapper to conveyor

1. **Conveyor free** = turntable does not turn, conveyor is in straight direction, the machine is in automatic mode, there is no program running and no collision with top platen.
(Upon switch off of the machine has volume **0**).
1 switching contact 24V DC 200mA – in conveyor switch board
2. **Feeding out of the pallet** = button on control pallet
1 switching contact 24V DC 200mA – in conveyor switch board
3. **Sensor of the pallet on conveyor** (turning with turntable)
(powered from PLC system of the conveyor line)
optical PNP/NPN 10-40V DC 200mA (switch over light/dark) – on turntable terminal
4. **Emergency stop** – disconnect, when wrapper is in emergency stopping
2 switching contacts 24V DC 5A on switch board terminal

FUNCTION OF THE MACHINE

1. If it is **Conveyor free** system can send the pallet on turntable.
2. If it is **Possible to wrap** operator push the button **Wrapping Start** or perform manual wrapping.
3. Operator push the button **Pallet send out** after wrapping.

6.2. WMS Standard, Profi – version with turning for 90°(for ordering)

Wrapping machines range WMS STANDARD and PROFI are adapt for building in to roll conveyor line. Standard version of the machine is with roll conveyor powered and control by PLC system of the line.

INPUT SIGNALS from wrapper to conveyor

1. **Possible to wrap** (external stop) – if the signal is inactive, all motions of the machine are blocked, running program is interrupted, interrupted program is terminated by the next declining edge of **Possible to wrap** signal.
1 switching contact 24V DC 200mA – in conveyor switch board
2. **Turntable forwards** – turning of turntable on direction of the clock hands (minimal speed)
1 switching contact 24V DC 200mA – in conveyor switch board
3. **Turntable astern** - turning of turntable against direction of the clock hands (minimal speed)
1 switching contact 24V DC 200mA – in conveyor switch board
4. **Motor of conveyor** - 3x400V 550W – on turntable terminal
5. **Emergency stop** – disconnect, neighbourhood is in emergency stopping
2 switching contacts 24V DC 5A - on switch board terminal

OUTPUT SIGNALS from conveyor to wrapper

1. **Conveyor free** = turntable does not turn, conveyor is in straight direction, the machine is in automatic mode, there is no program running and no collision with top platen.

1 switching contact 24V DC 200mA – on conveyor switch board terminal
2. **Sending out of the pallet** = button on control pallet
1 switching contact 24V DC 200mA – on conveyor switch board terminal
3. **Sensor of the pallet on conveyor** = pallet is at the end of conveyor on turntable (turning with turntable, powered from PLC system of the conveyor line)
optical PNP/NPN 10-40V DC 200mA (switch over light/dark) – on turntable terminal
4. **Turntable 0°** = turntable is in position for feeding in of the pallet
(Upon switch off the machine has volume 0).
1 switching contact 24V DC 200mA – on conveyor switch board terminal
5. **Turntable 90°** = turntable is in position for feeding out of the pallet
(powered from PLC system of the conveyor line).
Induction PNP 24V DC 200mA – on turntable terminal
6. **Able to turn** = is is possible to run the turntable (it is not possible to wrap and there is no collision with top platen, top sheet applicator or foil ending mechanism)
1 switching contact 24V DC 200mA – on conveyor switch board terminal
7. **Emergency stop** – disconnect, when wrapper is in emergency stopping
2 switching contacts 24V DC 5A on switch board terminal

FUNCTION OF THE MACHINE

1. If it is possible to run the turntable, turntable is in correct direction and conveyor is turned in to correct direction, control system of the conveyor line can send pallet on turntable (eventually before this to turn turntable for 90°)
2. Conveyor line control system stop **Motor of conveyor** for command of sensor **Pallet on turntable**.
3. If it is **Possible to wrap**, operator push the button **Wrapping start** or perform manual wrapping
4. Operator push the button **Pallet send off** after wrapping
5. Conveyor line control system send off the pallet (eventually turns turntable for 90° before sending)

Note: Conveyor on turntable is powered from conveyor line control system.
Conveyor line control system turns turntable always with min. speed and turntable must move just in angle 90° between sensors **Turntable 0°** and **Turntable 90°**. Otherwise is not insured precise stop.
When wrapper is switch off, conveyor stay in function, but it is not possible to turn turntable.

6.3. WMS Automatic – without control of the line (standard)

INPUT SIGNALS from conveyor to the wrapper

1. **Start of wrapping**
2. **Possible to wrap** (external stop)
3. **Assortment 1**
4. **Assortment 2**
5. **Assortment 3**
6. **Emergency stop** – disconnect, if neighbourhood is in emergency stopping
2 switching contacts 24V DC 5A – on terminal of switch board
7. **Motor of the line** - 3x400V 550W – on terminal of turntable
8. **Door** - breaks, if the fence door opens
Safety contacts don't have to switch on after fencing door closing without reset from operator.
2 switching contacts 24V DC 5A (from safety module) - on terminal of switch board

Note:

Signals **Assortment 1**, **Assortment 2**, and **Assortment 3** are optional, using combinations of these signals is possible to choose one of 8 preset wrapping programs (if this function is not used program nr. 0 will be started).

If **Possible to wrap** signal is inactive, all movements of machine are blocked, running program is interrupted, interrupted program is terminated by following descending edge of **Possible to wrap** signal.

OUTPUT SIGNALS from wrapper to conveyor

1. **Conveyor free** = the conveyor is in straight direction, turntable does not run, machine is in automatic mode, there is no running program and there is no collision with top platen, top sheet application or ending mechanism.
2. **End of wrapping**
3. **Error** - switch off in case of wrapper fault (e.g. consumption of the film, open covers)
4. **Sensor of the pallet on conveyor** = pallet is at the end of conveyor on turntable (it is turned with turntable, it is powered by PLC system of the line)
optical PNP/NPN 10-40V DC 200mA (switch over light/dark) – on turntable terminal
5. **Emergency stop** – disconnect, if wrapper is in emergency stopping
2 switching contacts 24V DC 5A on terminal of switch board

Note:

Upon switch off of the machine, signals have logic volume **0**.

Standard communication:

- Signals are realized using the Ethernet S7 Connection protocol.
- separation of technological networks using the Mikrotik RB951Ui-2HnD router

Possible non-standard communications - additional charge:

- separation of technological networks using PN / PN coupler
- electrically isolated outputs on the PLC terminal placed in electric cabinet of wrapper.
- potential-free relay contacts on the terminal board in the electric cabinet of wrapper.

FUNCTION OF THE MACHINE

1. If **Conveyor is free** system can send the pallet on conveyor
2. Conveyor control system stops the pallet in the middle of the wrapping space
3. Conveyor control system send 1s pulse **Start of wrapping cycle**.
4. If signal **Possible to wrap** is active machine will accomplish programmed cycle.
5. Wrapping machine announce **End of wrapping cycle** (pulse 1s)
6. If **Conveyor is free**, conveyor control system can sends off the pallet.
7. Conveyor line control system sends off the pallet.

6.4. WMS Automatic – without control of the conveyor line with turning for 90° (for ordering)

INPUT SIGNALS from conveyor to the wrapper

1. **Start of wrapping**
2. **Possible to wrap** (external stop)
3. **Assortment 1**
4. **Assortment 2**
5. **Assortment 3**
6. **Emergency stop** – disconnect, if neighbourhood is in emergency stopping
2 switching contacts 24V DC 5A – on terminal block of switch board
7. **Motor of the line** - 3x400V 550W – on terminal of turntable
8. **Turntable forwards** - turning of the turntable in direction of clock hands (min. speed)
9. **Turntable back** - turning of the turntable against direction of clock hands (min. speed)
10. **Door** – disconnects if fencing door open. Safety contacts may not be switched (connected) back with only closing the door without subsequent reset of machine by operator. 2 switching contacts 24V DC 5A (of safety module) - on switchboard terminal (Valid if safety fencing door is not a part of machine supply)

Note:

Signals **Assortment 1**, **Assortment 2**, and **Assortment 3** are optional, using combinations of these signals is possible to choose one of 8 preset wrapping programs (if this function is not used program nr. 0 will be started).

If **Possible to wrap** signal is inactive, all movements of machine are blocked, running program is interrupted, interrupted program is terminated by following descending edge of **Possible to wrap** signal.

OUTPUT signals from wrapper to conveyor

1. **Conveyor free** = conveyor is in straight direction, turntable does not run, machine does not run program and there is no collision with top platen, top sheet application or ending and it is in automatic mode
2. **End of wrapping**
3. **Error** - switch off in case of wrapper fault (e.g. consumption of the film, open covers)
4. **Sensor of the pallet on conveyor** = pallet is at the end of conveyor on turntable (it is turned with turntable, it is powered by PLC system of the machine)
optical PNP/NPN 10-40V DC 200mA (switch over light/dark) – on turntable terminal
5. **Emergency stop** – disconnect, if wrapper is in emergency stopping
2 switching contacts 24V DC 5A on switch board terminal
6. **Turntable 0°** = turntable is in position for feed in pallet
7. **Turntable 90°** = turntable is in position feed out pallet
8. **Able to turn** = it is possible to run the turntable (it is not possible to wrap and there is no collision with top platen, top sheet applicator or ending device).

Note:

Upon switch off of the machine, signals have logic volume **0**.

Standard communication:

- Signals are realized using the Ethernet S7 Connection protocol.
- separation of technological networks using the Mikrotik RB951Ui-2HnD router

Possible non-standard communications - additional charge:

- separation of technological networks using PN / PN coupler
- electrically isolated outputs on the PLC terminal placed in electric cabinet of wrapper.
- potential-free relay contacts on the terminal board in the electric cabinet of wrapper.

FUNCTION OF THE MACHINE

1. If **Able to turn**, turntable does not turn and conveyor is turned in to correct direction, control system of the conveyor line can send pallet on turntable (eventually before this to turn turntable for 90°)
2. Conveyor line control system set command **Wrapping Start** (1s pulls is enough)
3. If **Possible to wrap**, wrapping machine provide programmed wrapping cycle
4. Wrapping machine report **End of wrapping** (1s pulls)
5. If **Conveyor is free**, conveyor control system can take off the pallet
6. Conveyor line control system send off the pallet.

Note:

Conveyor on turntable is powered from conveyor line control system.

Conveyor line control system turns turntable always by min. speed and turntable must move just in angle 90° between sensors **Turntable 0°** and **Turntable 90°**. Otherwise is not insured precise stop.

When wrapper is switch off, conveyor stay in function, but it is not possible to turn turntable.

6.5. WMS Automatic - with control of conveyors (for ordering)

Wrapper controls its conveyor.

Conveyors before and behind of wrapper controls neighbouring line (thereinafter neighbouring).

Turning by 90° is possible (pallet input does not have to be in the same direction as pallet output)

SIGNALS from neighbourhood to wrapper

1. **Palette on entrance** (permanent signal) – on the conveyor before wrapper is palette ready for sending on wrapper conveyor
2. **Free on exit** (permanent signal) - conveyor behind wrapper is free
3. **Palette received on exit** (pulse 1s) – palette reach sensor on conveyor behind wrapper
4. **Assortment 1**
5. **Assortment 2**
6. **Assortment 3**
7. **Emergency stop** - disconnect, if neighbourhood is in emergency stopping
2 switching contacts 24V DC 5A – on terminal block of switchbox cabinet

Note:

Signals **Assortment 1**, **Assortment 2**, and **Assortment 3** are optional, by their combinations is possible remotely choose one of 8 preset wrapping programs (if they are not used, program No. 0 will be started). Wrapper scans signal status of assortment at the moment of start of wrapping cycle.

SIGNALS from wrapper to neighbourhood

1. **Free on entrance** (permanent signal) – wrapper conveyor is free
2. **Palette received on entrance** (impulse 1s) - palette reach sensor on wrapper conveyor
3. **Palette on exit** (permanent signal) – on wrapper conveyor is palette ready for sending on conveyor behind wrapper
4. **(Emergency stop)** - disconnect, if neighbourhood is in emergency stopping
2 switching contacts 24V DC 5A – on terminal block of switchbox cabinet
5. **Free on entrance 2-** (permanent signal)-for pallet input from 2. direction

Note:

Signals have logical value **0** in manual mode and when the machine is switched off

Standard communication:

- Signals are realized using the Ethernet S7 Connection protocol.
- separation of technological networks using the Mikrotik RB951Ui-2HnD router

Possible non-standard communications - additional charge:

- separation of technological networks using PN / PN coupler
- electrically isolated outputs on the PLC terminal placed in electric cabinet of wrapper.
- potential-free relay contacts on the terminal board in the electric cabinet of wrapper.

FUNCTIONS OF THE LINE

1. Feeding in of palette is possible if **Palette is on entrance** and **is Free on entrance** (it does not matter, which command occurs earlier).
2. Neighbourhood starts conveyor before wrapper, wrapper start conveyor of wrapper – palette is feeding in on wrapper conveyor.
3. If during feeding in one of the signal **Palette on entrance** or **Free on entrance** falls down, moving of pallets is stopped. After restoring of the signal is possible to continue.
4. Pallet is stopped on pallet sensor on wrapper conveyor, wrapping machine answers **Pallet received on entrance** (signal 1s), feeding in is finished by this way.
5. Feed out of the pallet is possible if the **Palette is on exit** and if **is Free on exit** (does not matter, which command occurs earlier).
6. Wrapper starts wrapper conveyor, neighbourhood starts conveyor behind wrapper – pallet is feeding out on conveyor behind wrapper.
7. If during feeding out of the pallet falls down one of the signal **Palette on exit** or **Free on exit**, moving of pallets is stopped. After restoring of the signal is possible to continue.
8. Pallet stops on sensor of the pallet on conveyor behind wrapper, neighbourhood answers **Palette received on exit** (signal 1s), feeding out is finished by this way.

Note: If wrapper controls more conveyors:

- for feeding in: wrapper conveyor = first conveyor controlled by wrapper
- for feeding out: wrapper conveyor = last conveyor controlled by wrapper
- Pallets are moved in sequence from previous conveyor to the next conveyor (if it is free).

If pallets are taken off from conveyor controlled by wrapper:

- description of the function for exit and signals are not valid
- feeding out conveyor is considered as busy 20s yet (it is possible to adjust) after pallet is taken off- replace sensor of the fork lift.

INITIALISATION OF THE LINE

Initialisation runs after each start of wrapper and each switchover in to automatic mode – wrapper trays to find loss pallets (in between conveyors or between sensors).

Initialisation is unable to solve all failure states, due to this operator attendance is necessary.

1. Operator check state of wrapper, switchover wrapper in to manual mode, sets wrapper in to initial position (if it is necessary) and switchover back in to automatic mode.
2. Conveyors, which does not have screened sensor, are set in to motion for 10s.
3. Pallet stops on the nearest sensor, if the pallet was between sensors.
4. If pallet was on boundary line of conveyors, next conveyor is started and trays to pull over the pallet.
5. Operator has to check position of the pallets after finishing of initialisation, eventually adjust their position in manual mode.
6. If there is a busy conveyor in wrapping space, operator must decide if to wrap pallet or to send away.
7. Wrapper gives communication signals in to neighbourhood after finishing of initialisation.