

# PET PACKING TECHNOLOGY



**30 000**

bph



**14 000**

bph



**12 000**

bph



**7 000**

bph



**6 000**

bph



**3 000**

bph



**2 000**

bph



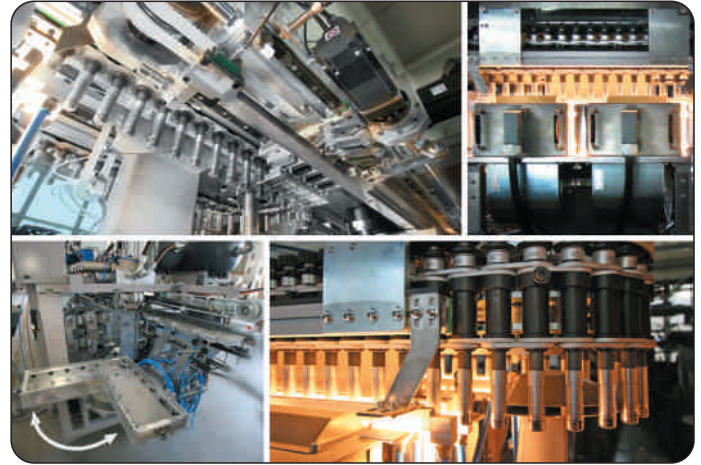
**smf**



# Optima family

**Optima Turbo** is a family of 4/8/16 cavities linear blow moulding machines which can produce bottles with continuous output of 7 000/14 000/28 000 BPH 500ml bottles. Special NT version of **Optima** allows matching the number of cavities to required speed and packaging size which makes **Optima** suitable for bottles 200ml up to 5L as well as wide mouth jars. **Optima Turbo** is fully electric blower where all vital units for bottles production process, such as closing unit, stretching rods, transmission of preforms between oven & moulds and oven itself are controlled and steered by servo drives for each section. **Optima Turbo** is designed for customers interested in high advanced and reliable blower for round, square, oval, asymmetric, trigger, flask or flat bottles – for water, CSD, beer, spirits, detergents, dairy drinks or edible oil.

- Compact size with maximal output – small footprint gives a possibility to fit a complete line in very limited space.
- Discharging ready bottles from Optima directly on air conveyor.
- Energy efficient heating process – NIR lamps instead of traditional IR radiation – electromagnetic radiation allows to reduce size of the heating units, total number of lamps, energy consumption and reaction time needed to start production after stop.
- Reduced air dead volume – low air consumption thanks to air collectors and special valves designed for linear.
- Continuous production of perfect bottles – 40 bar blowing pressure and system of clearance compensation on the closing unit and using servomotors.
- Useful equipment for easy operation: Central lubrication system and quick mould change system and Power Wizard based on pyrometers for self-adjustment process of heating.



	Optima 2		Optima turbo NT4	Optima 2 MAX	Optima turbo 8	Optima turbo NT10	Optima 8 Bigger	Optima 4 MAX	Optima 16
	OP 2		OP4 NT	OP2 MAX	OP 8 NT	OP 10 NT	OP 8B	OP 4 MAX	OP 16
<b>cav</b>	<b>2</b>	<b>1</b>	<b>4</b>	<b>2</b>	<b>8</b>	<b>10</b>	<b>8</b>	<b>4</b>	<b>16</b>
<b>blowing pressure</b>	up to 40 bars								
<b>bottle size</b>	0,5-5 L	0,5-7 L	0,2-2,5 L	2-5 L	0,2-2,0 L	0,2-0,6 L	0,2-2,5 L	2-6 L	0,2-2,0 L
<b>output</b>	ca. 3600 of 0,5-1 L	1600 of 5L	ca. 7000 of 0,5-1 L	ca. 3000 of 5 L	ca. 14000 of 0,5-1 L	17000 of 500 ml	ca. 14000 of 0,5-1 L	ca. 6500 of 5 L	ca. 28000 of 0,5-1 L
	ca. 3200 of 1,5 L		ca. 6000 of 1,5 L		ca. 12000 of 1,5 L		ca. 12000 of 1,5 L		ca. 24000 of 1,5 L
	ca.1000 of 5L		ca. 5000 of 2 L		ca. 10000 of 2 L		ca. 10000 of 2 L		ca. 20000 of 2 L
<b>max diameter of the bottle</b>	140 mm	170 mm	105 mm	170 mm	90 mm	75 mm	105 mm	180 mm	90 mm
<b>max height of the bottle</b>	340 mm	340 mm	340 mm	340 mm	340 mm	340 mm	340 mm	360 mm	340 mm
<b>max neck diameter</b>	42 mm	42 mm	42 mm	42 mm	42 mm	42 mm	42 mm	42 mm	42 mm
<b>max power installed</b>	63 kW	63 kW	110 kW	110 kW	160 kW	160 kW	160 kW	210 kW	320 kW
<b>effective power for 1L</b>	15 kW	23,3 kW	34 kW	34 kW	65 kW	65 kW	65 kW	94 kW	130 kW
<b>working air qty (10bars)</b>	0 bar <small>(with recuperation)</small>	0 bar <small>(with recuperation)</small>	0 bar <small>(with recuperation)</small>	0 bar <small>(with recuperation)</small>	0 bar <small>(with recuperation)</small>	0 bar <small>(with recuperation)</small>	0 bar <small>(with recuperation)</small>	0 bar <small>(with recuperation)</small>	0 bar <small>(with recuperation)</small>
<b>working air qty (40bars)</b>	3,08 m <sup>3</sup> /min	4,92 m <sup>3</sup> /min	6,63 m <sup>3</sup> /min	5,73 m <sup>3</sup> /min	12,2 m <sup>3</sup> /min	7,37 m <sup>3</sup> /min	12,2 m <sup>3</sup> /min	20,0 m <sup>3</sup> /min	24,4 m <sup>3</sup> /min



**Optima Turbo NT**  
2 – 4 – 8 – 10 – 20 cavities  
speed up to 35 000 bph (500ml)



**Optima Jar**  
2 – 4 cavities  
speed up to 4 500 jars per hour



**Optima MAX**  
1 – 2 – 4 cavities  
speed up to 4 500 bph



# Jumbo family

## JUMBO-5

Blowing pressure	25 bar – stable ± 2 bar
Working pressure	10 bar – stable ± 5%
Bottle size	<b>0.25 ÷ 6.0L</b>
Bottle dimensions	D <sub>max</sub> – 170mm H <sub>max</sub> – 350mm
Output *	5.0L – up to 600 BPH
Power installed	55 kW (nominal), max. 97kW
Quantity of cavities	2
Moulds material	FORTAL
Pneumatics	FESTO + NORGREN
Controller	PLC Mitsubishi
Control panel	HMI Mitsubishi

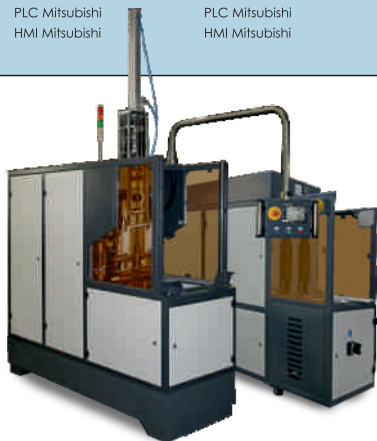
## JUMBO-20

Blowing pressure	25 bar – stable ± 2 bar
Working pressure	10 bar – stable ± 5%
Bottle size	<b>10.0 ÷ 20.0L</b>
Bottle dimensions	D <sub>max</sub> – 250mm H <sub>max</sub> – 555mm
Output *	20.0L – up to 50 BPH
Power installed	55 kW (nominal), max. 97kW
Quantity of cavities	1
Moulds material	FORTAL
Pneumatics	FESTO + NORGREN
Controller	PLC Mitsubishi
Control panel	HMI Mitsubishi

## JUMBO-J (JARS)

Blowing pressure	25 bar – stable ± 2 bar
Working pressure	10 bar – stable ± 5%
Bottle size	<b>0.25L - 6.0L (63 - 120mm)</b>
Bottle dimensions	D <sub>max</sub> – 170mm H <sub>max</sub> – 350mm
Output *	5.0L – up to 150 JPH
Power installed	30 kW(nominal), max. 65 kW
Quantity of cavities	2
Moulds material	FORTAL
Pneumatics	FESTO + NORGREN
Controller	PLC Mitsubishi
Control panel	HMI Mitsubishi

\*depends on bottle shape



## SEMI-AUTOMATIC BLOW MOULDING MACHINES

JUMBO is a series of semi-automatic machines designed for industrial production of medium size and large PET packages. 0.25 and 6.0 liters bottles can be blown as well as ONE-WAY USE or MULTIPLE-WAY USE 5 GALLON BOTTLES. JUMBO machine can also manufacture WIDE-MOUTH JARS with the neck diameter up to 120mm. The machines are easy to operate and service. Robust construction of closing unit, easy regulation and efficient nozzle clamping system ensures production of bottles at highest technological level. Machines are manufactured with the usage of top brands components supplied by companies, which guarantee service around the world: TOSHIBA, MITSUBISHI, FESTO, NORGREN. JUMBO machines fulfill all the European standards



# hs & combi family

HS and Combi are series of linear blowing machines suitable for production of PET bottles 200 ml – 3 000 ml. Thanks to reliable construction, easy operation and maintenance HS and Combi machines working all around the world.

## COMBI 200

Blowing pressure	25BAR
Bottle size	0.25L - 2.5L
Output*	<b>up to 1700 BP</b>
Number of cavities	2
Power installed	32.5 kW
Working air quantity (10BAR)	1.0m <sup>3</sup> /min
Blowing air quantity (25BAR)	1.73m <sup>3</sup> /min
Steering voltage	24V /DC
Mould material	FORTAL

## COMBI 400

Blowing pressure	25BAR
Bottle size	0.25L - 2.5L
Output*	<b>up to 3400 BPH</b>
Number of cavities	4
Power installed	65.0 kW
Working air quantity (10BAR)	2.0m <sup>3</sup> /min
Blowing air quantity (25BAR)	3.46m <sup>3</sup> /h
Steering voltage	24V /DC
Mould material	FORTAL

## MAIN PARAMETERS

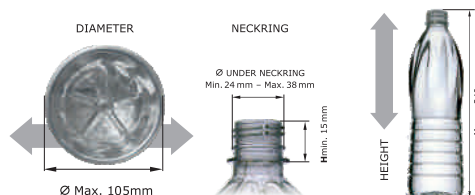
### HS3000

Blowing pressure	25BAR
Bottle size	<b>0.25L - 3.0L</b>
Output*	<b>upto 2500 BPH - 1.0L upto 2400 BPH - 1.5L</b>
Power installed	36 kW
Working air quantity (10BAR)	1.3 m <sup>3</sup> /min
Blowing air quantity (25BAR)	2.2 m <sup>3</sup> /min
Number of cavities	2
Steering voltage	24V /DC
Mould material	FORTAL
Pneumatics	FESTO

### HS6000

Blowing pressure	25BAR
Bottle size	<b>0.25L - 3.0L</b>
Output*	<b>upto 5000 BPH - 1.0L upto 4800 BPH - 1.5L</b>
Power installed	72 kW
Working air quantity (10BAR)	2.6 m <sup>3</sup> /min
Blowing air quantity (25BAR)	4.4 m <sup>3</sup> /min
Number of cavities	4
Steering voltage	24V /DC
Mould material	FORTAL
Pneumatics	FESTO

- Compact size and durability of the equipment.
- Flexible and efficient – heating system with heating modules – each of them consisted of 7 heating zones (adjusted from machine's touchscreen) ensures proper heating up even long preforms – full control of materials distribution during blowing process.
- Easy & flexible in operation – easy mould change-over system and possibility to work with many types of neck rings.
- Advanced PLC with build-in memory to keep blowing parameters for many types of bottles.
- Stable production with high performance per cavity – short decompression time.
- Reliable machines ensuring cost-saving production
- Modular construction – modules can be combined together with one frame – each module can work integrated to get maximal machine's efficiency or can be switched off to adjust.



# Stratos family

STRATOS 10E and 20E electric machines are fully automatic blowers for 3.0L – 20.0L bottle productions.

	STRATOS-10E	STRATOS-20E
Blowing pressure	25-35 BAR	25-40 BAR
Bottle size	3.0 ÷ 12.0 L	5.0 ÷ 20.0L
Max. container diameter	220 mm	320 mm
Max. container height	435 mm	550 mm
Max. neck diameter	48mm	55 mm
Output*	2000 BPH (3-5 L) 1300 BPH (10L)	500 BPH (5 US gal) 700 BPH (5.0L)
Working air quantity	8 m <sup>3</sup> /h (10bar)	7m <sup>3</sup> /h (10bar)
Blowing air quantity	478 m <sup>3</sup> /h (35bar)5l 591 m <sup>3</sup> /h(35bar)10l	691 m <sup>3</sup> /h (40bar)
Number of cavities	2	1
Power installed	105 kW	155 kW
Power supply	400V +/- 5%	400V +/- 5%
	3P, 50-60Hz	3P, 50-60Hz
Mould material	Aluminium 7075	Aluminium 7075
Pneumatics	FESTO	FESTO
Servomotors	mitsubishi	mitsubishi

\*depends on bottle design



- Reliable & easy in operation – mould change-over system with rollers, central lubrication system, air recuperation – lower air consumption,
- Discharging ready bottles from Stratos directly on conveyor.
- Precise & high quality productions – stretching bars with servomotors provides fluent regulation of blowing process.
- Compact size & user-friendly PLC control system with option to connect with internet and on-line support.
- Powerful heating unit with precise controller.

# HL & CL family

HL3000	
Blowing pressure	25 bar
Bottle size	0.25 up to 1.5 L
Output 1.5 L	up to 1900 bph
Number of cavities	2
Power installed	36.0 kW
Steering voltage	24V/DC
Mould material	FORTAL

HL 3000 and CL 200 / 400 are fully automatic linear PET blowing machines suitable for production of bottles 200 ml – 2000 ml.

Machines have very compact footprint and can be easily fit in very limited space. Ready bottles are discharged in upright position and can be easily connected with air conveyor. Low air and energy consumption makes HL and CL suitable for cost effective production of various shapes of PET bottles.

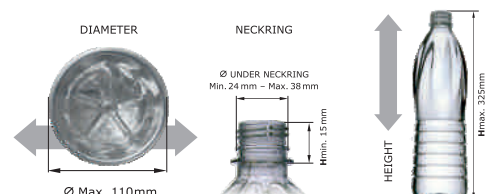
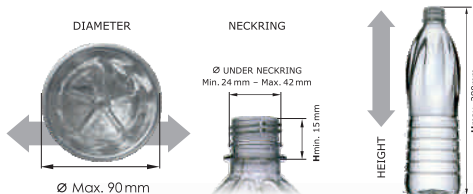
CL machines are equipped with classic heating system (as combi series) and one pneumatic cylinder responsible for work of the closing unit.

HL closing unit is moved by servomotor and equipped with compensation system. Central lubrication system installed in HL machines allows easy, fast and precise application of lubricant. Preform transport system based on specially designed pins (as in HS series) allows stable work of machine with oil and chemical preforms.

## KEY BENEFITS

- Bottles discharged in upright position – no devices for bottle orientation needed.
- Compact size – space saving solution.
- Simple construction, easy operation and maintenance.
- Easy change-over of bottle size and types of neckrings.
- High bottle quality with air blowing pressure only 25 bars – energy saving solution.

	CL 200	CL 400
Blowing pressure	25 bar	25 bar
Bottle size	0.25 L – 2.5 L	0.25 L – 2.5 L
Output* 1.5 L	up to 1700 bph	up to 3400 bph
Number of cavities	2	4
Power installed	35.0 kW	70.0 kW
Working air quantity (10 bar)	1.0 m <sup>3</sup> /min	2.0 m <sup>3</sup> /min
Blowing air quantity (25 bar)	1.73 m <sup>3</sup> /min	3.46 m <sup>3</sup> /min
Steering voltage	24V/DC	24V/DC
Mould material	FORTAL	FORTAL



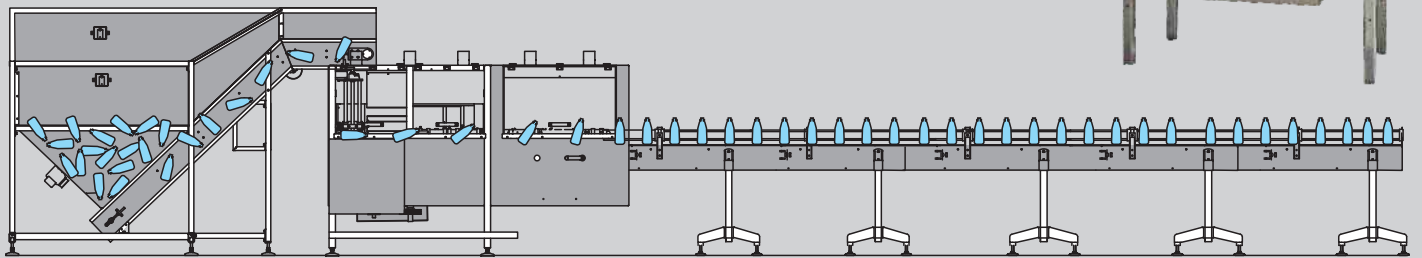
# SB unscramblers

**SB bottle unscrambler** is used to provide bottles in upright position to transfer them directly to filling line. Disordered bottles are loaded into bottle hopper and unscrambler puts them into vertical position and moves them on the vacuum/ plate or air conveyor. SMF offers liner "belt type" unscramblers (**SB6** and **SB10**) as well as "pocket type" rotary unscrambler **SB20** most suitable for very light bottles.

	<b>SB-6</b>	<b>SB-10</b>	<b>SB-20</b>
Power installed	1.5KW	2.5KW	~6.5 kW
Air requirement	0.5 m <sup>3</sup> /h	0.5 m <sup>3</sup> /h	~54 m <sup>3</sup> /h
Max. working pressure	0.1 – 0.4MPa	0.1 – 0.4MPa	6 BAR
Power supply	400V – 3 PH 50/60 Hz	400V – 3 PH 50/60 Hz	400V – 3 PH 50/60 Hz
Steering voltage	Mitsubishi (24 V/DC)	Mitsubishi (24 V/DC)	Mitsubishi (24 V/DC)
Dimensions SB (L×W×H)mm	1680 × 2390 × 1530	2100 × 2970 × 1530	2475 × 2130 × 2090
<b>Output</b> (depends on a bottle design)			
Bottles 0.25 – 0.5L	<b>12 000 BPH</b>	<b>14 000 BPH</b>	<b>12 000 BPH</b>
Bottles 1.0 L	<b>9 000 BPH</b>	<b>10 000 BPH</b>	<b>8 000 BPH</b>
Bottles 2.0L	—	<b>6 000 BPH</b>	<b>8 000 BPH</b>

## KEY ADVANTAGES OF SB SERIES:

- Suitable for PET bottles or other type of plastics
- Versatility in running many bottle formats and sizes on same machine – suitable for cylinders, jars, ovals, squares, rectangles, trigger sprays and other oddly shaped bottles
- Cost-saving solution – automation of production process,
- Hygienic process – bottles do not have contact with operators, all bottle contact part made in stainless steel and plastic
- Operational simplicity – no specialized personnel needed & fast and easy format change



# conveyors

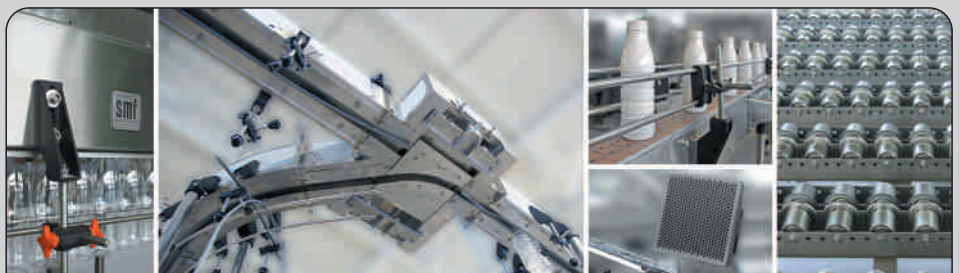
**SMF conveyors** are designed to transfer bottles, jars, cans, boxes and many other products. Depending on customers' requirements conveyors are available in straight parts or curve parts and may work in horizontal line or with different inclination angle.

For each project SMF prepares unique layout of conveyors to make it suitable for capacity of the line, technical conditions and available space to ensure stable production.



























Types of conveyors produced by the SMF:






- AIR conveyors system
- Combiners/ Adders
- Plate conveyors system
- VACCUM Conveyors
- ROLL Conveyors
- BELT Conveyors



# smf PET BLOWERS

BOTTLE SIZE	MACHINE SPEED (bottles/hour)	MAX BOTTLE VOLUME	MACHINE TYPE	
0,25 – 2,5 Liters 	<b>2000</b> 0,5 L bottles/h	<b>2,5 L</b>	<b>COMBI</b> <i>200</i>	
0,25 – 2,0 Liters 	<b>4000</b> 0,5 L bottles/h	<b>2,5 L</b>	<b>COMBI</b> <i>400</i>	
0,25 – 3,0 Liters 	<b>3000</b> 0,5 L bottles/h	<b>3,0 L</b>	<b>HS3000</b>	
0,25 – 3,0 Liters 	<b>6000</b> 0,5 L bottles/h	<b>3,0 L</b>	<b>HS6000</b>	
0,25 – 2,5 Liters 	<b>7000</b> 0,5 L bottles/h	<b>2,5 L</b>	optima 4 turbo	
0,25 – 1,5 Liters 	<b>14 000</b> 0,5 L bottles/h	<b>1,5 L</b>	optima 8 turbo	
0,25 – 1,5 Liters 	<b>28 000</b> 0,5 L bottles/h	<b>1,5 L</b>	optima 16 turbo NT	
2,00 – 6,00 Liters 	<b>6500</b> 5 L bottles/h	<b>5 L</b>	optima 4 max	
0,25 – 6,0 Liters 	<b>500</b> 5 L bottles/h	<b>5 L</b>	<b>JUMBO 5</b>	
10,0 – 20,0 Liters 	<b>50</b> 20 L bottles/h	<b>20 L</b>	<b>JUMBO 20</b>	
3,0 – 12,0 Liters 	<b>2000</b> 5 L bottles/h	<b>12 L</b>	<b>STRATOS</b> 10E	
5,0 – 20,0 Liters 	<b>500</b> 5 L bottles/h	<b>20 L</b>	<b>STRATOS</b> 20T	

# smf BOTTLE UNSCRAMBLERS

BOTTLE SIZE	MACHINE SPEED (bottles/hour)	MAX BOTTLE VOLUME	MACHINE TYPE	
0,25 – 2,0 Liters 	<b>7000</b> 0,5 L bottles/h	<b>2 L</b>	<b>SB</b> <sub>6</sub>	
0,25 – 2,0 Liters 	<b>12000</b> 0,5 L bottles/h	<b>2 L</b>	<b>SB</b> <sub>10</sub>	
0,25 – 2,0 Liters 	<b>12000</b> 0,5 L bottles/h	<b>2 L</b>	<b>SB</b> <sub>20</sub>	