Reference Data

Customer/company ordering	[redacted]
Machine designation	bottelpack® Typ 430
Year of construction	2016
Machine number	430001

Machine Specifications

Dimensions and Weights	
Length	approx. 4.000 mm
Width	approx. 2.800, plus punching press extern
Height	approx. 4.000 mm
Weight	approx. 9 t

Power generation and distribution

Supply **Derivation**

Electrical			
Voltage / Frequency Allowable voltage change paragraph	3/N/PE AC400V 60Hz VDE-AR-N 4105:2011-08 paragraph 5.3 and 5.4	**2**	Produced containers Heat radiation Noise
Electrical connection	approx. 75 kVA (approx. 60 kW)		
Electrical consumption (on average)	approx. 40 kWh		
Main fuse	125 A		
Nom current	120 A		
Minimum cable cross section up to 100 m length. Local regulations have to be observed.	L1, L2, L3, = 70mm^2 N = 70mm^2 PE = 35mm^2		
Protection type	IP 54		
Control voltage	DC 24V		
Grounding resistance	< 0,8 Ω		
UPS (control system, operator panel, LFR-fan)	approx. 4,2 kVA (approx. 3,4 kW) 3/N/PE AC400V 60Hz Current: 6 A Fuse: 25 A		

Connection by customer on bottelpack®:
☞ bottelpack® - drawing *Appendix II-99, No.943000-001-0160

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Electrical USV				
Voltage / Frequency - Allowable voltage change	3/N/PE AC400V 60Hz VDE-AR-N 4105:2011-08 paragraph 5.3 and 5.4	**55**		Produced container Heat radiation Noise
Electrical connection	ca. 2 kVA (ca. 2 kW)			
Main fuse	20 A by customer! 16 A Switch cabinet			
Current (max.)	3 A			
Minimum cable cross section up to 100 m length. Local regulations have to be observed.	L1, L2, L3, = 4mm^2 N = 4mm^2 PE = 4mm^2			
Protection type	IP 54			
Control voltage	DC 24V			
Grounding resistance	< 0,8 Ω			

Pneumatic				
Compressed air	min. 8 bar, max. 10 bar, oilfree	**4**	**22**	Exhaust air collection
Consumption - bottelpack® - external punch	 approx. 100 NL/min approx. 300 NL/min			
Particle size Class 1 according to ISO 8573-1 (2010) Remainder oil rate Class 2 according to ISO 8573-1 (2010) Water in class 4 in accordance with ISO 8573-1 (2010) **Note regarding water:** the pressure dew point must be at least 15°C below the ambient and medium temperature and should be a maximum of 3°C.				

Cooling water				
with re-cooling	approx. 2 m^3/h; 10 - 12°C Δ T 8°C; Δ P approx. 2 bar; 4-5 bar; < 55 µm / 12 °dH	**9**	**10**	in circuit impact pressure max. 2 bar
Fresh water for vacuum pump	approx. 0,06 m^3/h; max. 20°C; < 55 µm / 12 °dH	**7**	**8**	Drain water

Connection by customer on bottelpack®: ☞ bottelpack® - drawing *Appendix II-99, No. 943000-001-0000

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Steam „saturated clean steam DIN 58950-7“				
Pressure	min. 1,6 bar - max. 2,5 bar adjustable; purity < 1 µm	**13**		
Consumption for sterilisation	approx. 40 kg/h		**8**	Heat radiation approx. 26 kW drain water approx. 40 Ltr./h
Consumption for production	approx. 15 kg/h		**8**	Heat radiation approx. 7 kW drain water approx. 12 Ltr./h
Cleaning				
Product line	0,5 - 1,5 m^3/h with 2,5 bar; approx. 15 min	**1**	**(16)**	Cleaning return (without impact pressure)
Air volume requirement				
Apparatus cabinet	approx. 5 m^3/min	**21**	**22**	approx. 5 m^3/min Δ T approx. 20°C
Granulate feeding				
Granulate connection	approx. 20 m^3/h	**19**		
Suction line			**18**	Vacuum from MFG 5.2, 8.2 approx. 20 m^3/h
Vacuum				
Exhaust air			**23**	Humid air, approx. 50 m^3/h
Emissions				
Noise				max. 84 dB(A)
Heat radiation	Electric energy /steam - White side - dark side			approx. 13 kW (at sterilization) approx. 3W (at production) approx. 22 kW (at sterilization) approx. 13 kW (at production)

Technical data for information

Re-cooling device (by customer!)	
Output	approx. 23,5 kW
Electrical connection	approx. 12 kW

Extruder	
Extruder ø	55 mm (24 D)
Extruder motor	approx. 25 kW
Plastics granulate used	PE
Plasticizing capacity plastics granulate	approx. 40 kg/h

General installation instructions for the machine

The following must always be provided:

- dry installation area with a temperature between 18°C (minimum) and 25°C (maximum)
- 40 - 60% relative humidity
- firm anchoring of the installation on a vibration-free surface

Pos. 1 Product

The product must have a temperature of 20 to 25 °C. The maximum viscosity is 100 mPa*s. The pressure of the product should be 1.2 +/-0.2 bar. When the machine is being cleaned, the pressure on the **bottelpack**® should be approx. 2.5 bar. Steam can also be added to the **bottelpack**® during the Sterilisation program via the product line (the pressure is the same as in Pos. 13). Sterile air must be added to the **bottelpack**® if the program is switched to "Filter drying". Depending on the customer's requirements, the sterilisation process can also run backwards to the customer's line. In this case, the air used for drying would flow from the **bottelpack**® to the steam trap at the customer's site.

Pos. 2 Electrical system

a) Voltage

The **bottelpack**® must be operated using a control voltage of 3 x 400 V +N +PE.

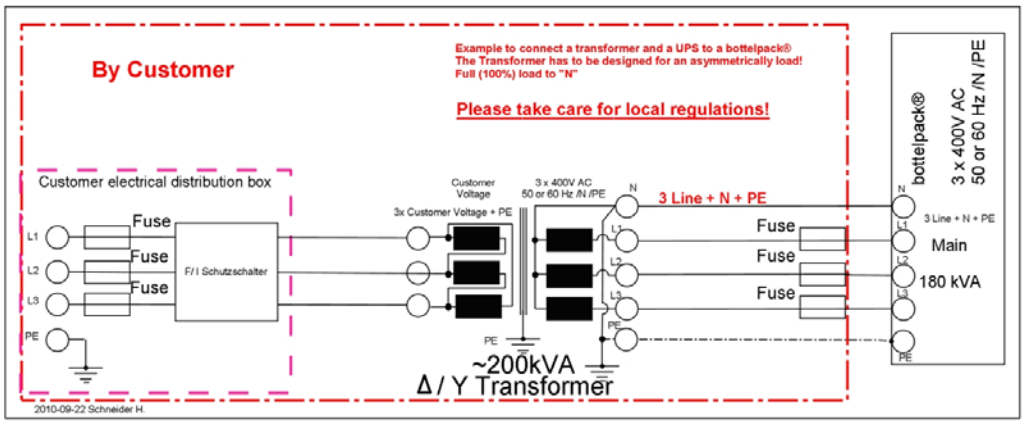
The general voltage fluctuations must be in accordance with VDE-AR-N 4105: 2011-08 a maximum of +/- 3 %.

A tolerance of +/- 10 % is permissible for rapid voltage spikes that must last under 60 seconds within 10 minutes.

b) Servo drives

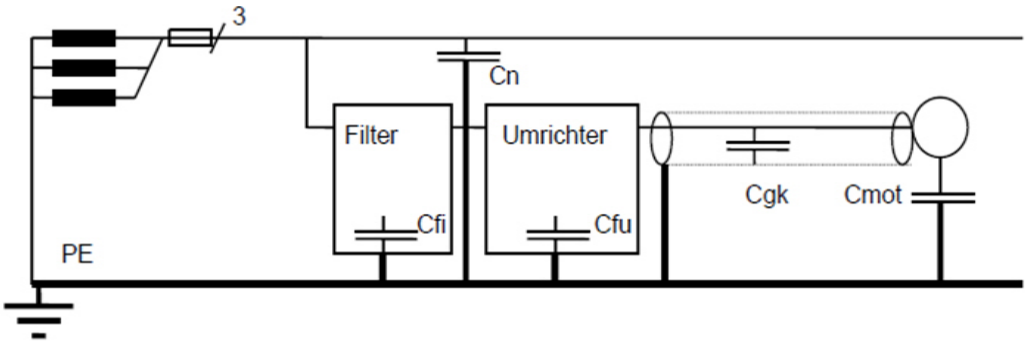
In some countries, the electricity utility companies require an earth leakage circuit breaker. This is not possible with **bottelpack**® machines that have an electric servo drive. A transformer must be installed if necessary.

Example:



Explanatory note:

Owing to the construction and mode of operation of the servo amplifiers, there are leakage capacitances at different points that lead to high capacitive leakage currents. On the one hand it concerns explicitly integrated leakage capacitances in the line filter and servo amplifier (Cfi, Cfu) that are needed for the function, and on the other hand parasitic leakage capacitances in the motor cables and the motor itself (Cgk, Cmot).



High capacitive leakage currents flow in the leakage capacitances in the filter and servo amplifier (Cfi, Cfu) when the machine is switched on (= brief operation of 1 and/or 2 phases by contact bouncing) as well as with asymmetric line voltages and those prone to harmonics. Since the voltage waveforms at the output of the servo amplifiers are not sinusoidal, but form a rectangular PWM instead, this results in very broad-band, high frequency capacitive leakage currents through the leakage capacitances in the motor cables and the motors itself (Cgk, Cmot).

The earth leakage circuit breakers or RCD for short (RCD - residual-current operated protective devices) detect these capacitive leakage currents and are incorrectly triggered without there having been any earth faults. Capacitive leakage currents can arise in particular in the range of just a few amps when there are large and/or numerous servo amplifiers in one machine. The complicating factor is that the ACOPOS and ACOPOSmulti servo amplifiers have a power rectifier, as do all converters on the market. There may be a smooth error direct current in the event of body contact, which prevents the triggering of an AC sensitive or pulse sensitive RCD of type A and/or AC and thus removes the protective function for all the connected consumers. So it is mandatory that only an RCD type B (DC sensitive, according to IEC 60755) may be used for connecting the ACOPOS and ACOPOSmulti to the mains. This kind of RCD is only available on the market with a rated current of up to 250A and with a maximum fault current of 1A.
In the case of large and/or numerous servo amplifiers in one machine, it is only possible to separate them from the mains with an isolation transformer and to apply the classic zeroing as a protective measure. This means that RCDs with purposefully selected capacitive leakage currents can be used again without any difficulty upstream of the machine as well as standard RCDs type A and AC, in particular.

Pos. 7 Cooling water – in feed (vacuum)

The customer must install a manual shut-off valve upstream of the **bottelpack**®. It must be possible to operate the valve from the **bottelpack**® room.

Pos. 8 Waste water

The draining process must always be depressurised, especially in the cleaning program. It is best to provide a pipe system without a siphon with a NW of 100. The waste water can be warm, up to 80°C, when cleaning with hot WFI and during sterilisation.

Pos. 9 Cooling water - infeed

The temperature should be between approx. 10°C to max. 12°C. However, it must remain constant within a deviation of +/- 1°C during production.

A suitable corrosion protection must be provided by the operator, such as: "STARTOL UNIVERSAL KÜHLERSCHUTZ BS".

The customer must install a manual shut-off valve upstream of the **bottelpack**®. It must be possible to operate the valve from the **bottelpack**® room.

We recommend a separate cooling circuit for each **bottelpack**®.

Pos. 13 Steam

The steam pressure must be max. 2.5 bar. A pressure regulator must be provided in order to adjust the pressure between approx. 1.6 and 2.4 bar.

The customer must install a manual shut-off valve upstream of the **bottelpack®**. It must be possible to operate the valve from the **bottelpack®** room.

Pos. 22 Exhaust air - apparatus cabinet

This exhaust air connection also discharges exhaust air from the pneumatic system. We therefore recommend this connection to be positioned on the outside.

Pos. 23 Exhaust air - vacuum pump

When the vacuum pump is turned on, a surge of water is thrust up into the exhaust air line. This water can flow back again and is then disposed of in the **bottelpack®**'s internal drainage system. Humid air always flows out during a regular operation. We therefore recommend that this line runs a few metres straight up and exits over the roof.

Information for 460 systems with room dividers

We achieve a total permeability of approximately 100 x 100 mm between white side and dark side. The customer can reduce this figure further by applying sealant. However, this only applies to the **bottelpack®**.

In order to feed the ampoule band to the punch, and depending on the design of the clean room wall, the total width of the ampoule belt and the position of the conveyor belt after the **bottelpack®**, an opening of 25 - 50 mm height and 300 - 380 mm width is necessary. The position of the opening is specified by the customer.

Notice for all connections:

All the information regarding the nominal widths, pressures, volumes, etc., relate to the connection point on the **bottelpack®**.

The customer must lay out his lines in such a way that the resistors and pressure drop can be correspondingly balanced.

Notice for cable conduits:

The customer must lay out cable conduits in the ceiling. If nothing else is known, we will assume a ceiling height of 4500 mm.

Granulate supply:

see diagram 909400-001-0060

If possible install stainless steel pipes with a NW of 35-40. The advantage of using steel pipes is that they prevent the static charge of the granulate. Provide for a large radius of approx. 500 mm in the cams. Do not install any U-shaped pipes that are curved downwards, because this is where the risk of clogging is at its highest.