

Technical Data

General specification

Input glass size	min.	190 x 350		[mm]		
	max.	2700 x 4000		[mm]		
Glass thickness	min.	3		[mm]		
	max.	15		[mm]		
Vertical glass transport height		500 +/- 20		[mm]		
Weight of insulating glass units		max. 1000 kg resp. 250 kg/m				
Inclination of the production line		6 degrees				
Direction of travel		right to left				
Unit setting		metric				
Machine colours		Bystronic Design RAL 7035 RAL 5015				
Purchaser supplies	Power	Voltage	3 x 415 V / 50 Hz			
		Voltage variations	+6% to -10%			
		Grounding system (IEC 60364-1)	N + PE (TN-S)			
	Air pressure	Connection	G 1			
		Pressure	6.5	[bar]		
		Solids and max. oil content	Class 3			
		Water dew point	Class 2			
	Water	Raw water pressure	4.5	[bar]		
Ambient temperature	min.	15		[°C]		
	max.	35		[°C]		
Relative air humidity	max.	75		[%]		
Plant cabling	Cable		Cable ducts		Cable duct support	
	Delivery	Installation	Delivery	Installation	Delivery	Installation
	Supply line -> Cabinet	Customer	Customer	Customer	Customer	Customer
	Cabinet -> Machine	Bystronic	Bystronic	Bystronic	Bystronic	Bystronic
Machine -> Machine	Bystronic	Bystronic	Bystronic	Bystronic	Bystronic	
Requirements for processing glass plates						
Processable glass types	Float, toughened glass, laminated glass, patterns (only partially possible; depending on glass surface and position of the structure)					
Flatness tolerance of glass plates	Deviation from ideal plane of the entire glass plate may not exceed 2 mm. Greater deviations can lead to disturbances to the job routing and require a functional intervention from case to case through the operating personnel.					
Cutting tolerance of glass plates	+/- 0,5 mm A glass plate congruence of +/- 0,5 mm must be both with shapes and with rectangular formats guaranteed.					

Laminated glass	preferably rectangular sawn or ground, no overhanging foils
Glass edges	cut, without bevels
The production line is suitable for the manufacture of	<p>Double and triple insulated glass units (rectangular, congruent) according to Lenhardt's specification.</p> <p>One up to three sided stepped double insulating glass units according to Lenhardt's specification.</p> <p>Shaped i. g. units (congruent) according to Lenhardt's shape catalogue. except the sealing robot</p> <p>Automatic gas filling of double insulating glass units according to Lenhardt's specification.</p> <p>Automatic gas filling and sealing of triple and one up to three sided stepped double insulating glass units – possible with additional equipment – according to the following specification..</p>
Machine layout	plan no. 10080668.10
Conveyor speed	Two stage, V =48 m/min.
Detailed information about the individual machine please see in chapter "Scope of delivery"	

Documents / Language

Labeling on the machines	English	
Messages on the machinery displays	English	
Operation manuals	English	CD-ROM + Print out
Spare parts catalogue	German, English, French	CD-ROM (will be supplied approx. 3 weeks after acceptance)
All other documents	German/English	Print out

Insulating glass units with metallic spacer

Processable dimensions (h x l)	min.	190 x 350	[mm]
	max.	2700 x 4000	[mm]
Thickness of insulated glass units		12 to 60	[mm]
Glass thickness		3 to 15	[mm]
Spacer frame widths		6 to 24	[mm]
Distance from glass edge to spacer outside:	2 to 6 mm		
Processable spacer frame profiles	Standard Aluminium-, steel- or plastics profiles can be utilized, if the strength of these profiles is designed for a press-force of at least 50 Newton per cm.		
Shapes	In accordance with the Lenhardt shape catalogue LENEX TRIO 0707		

Special note for the glass plate washing machine

Processable dimensions (h x l)	min.	190 x 350	[mm]
	max.	2700 x 4000	[mm]
Glass plate thickness		3 to 15	[mm]
Transportation speed	4 to 12 m/min. variable; depending on glass plate thickness and properties of glass plates to be washed		

Special note for the tandem assembly-, gas fill and press robot; belt drive version

Processable dimensions (h x l)	min.	190 x 350	[mm]
tandem operation	max.	2250 x 2250	[mm]
single operation - one step pressing	max.	2700 x 4000	[mm]
Shaped units			
Max. Radius	150 mm on leading edge resp. on trailing edge		
Angle	min. 25° on leading edge resp. on trailing edge		
Overhang on edge	max. 150 mm on leading edge resp. on trailing edge		
Max. length of unit	With shaped formats the maximum processable length is 200 mm shorter than with rectangular		
Processable gases	Argon		
Gas filling rate	90 %, subject to the use of tight spacer		
Triple i. g. units	<u>Restrictions for metallic spacer:</u> <ul style="list-style-type: none"> • The total thickness of the intermediate glass plate is limited to 6 mm. • The total thickness of glass plate no. 1 and no. 2 must not exceed 15 mm. 		

Special note for the Speed sealing robot

Processable dimensions (h x l)	min.	190 x 350	[mm]
	max.	2700 x 4000	[mm]
Thickness of insulated glass units		12 to 60	[mm]
Glass thickness		3 to 15	[mm]
Spacer frame widths		6 to 24	[mm]
Distance from glass edge to spacer outside:	2 to 20 mm stepless adjustable		
Mixing System	Dynamic mixing system		
Sealant	Commercial 2-component sealant; proved quality for automatic sealing. For the processing of the sealant the minimum temperature of the material should be 15° C in consideration of the processing instructions given by the sealant manufacturer.		
Spacer frame profiles	Aluminium, plastic or steel profiles with flat profile back, height and form has to be uniform for all spacer widths, proved market quality suitable for the automatic sealing.		
Sealing speed	depending on the property of the used sealant and on production parameters		
Sealing depths/cross-section	2 mm up to 20 mm		
Edge displacement of glass plates of i. g. unit	+/- 1 mm		
Mixing ratio, adjustable by volume	from 100:6 till 100:14		
Sealing of stepped double i. g. units, rectangular and shapes (shapes acc. to Lenhardt's specification)	For automatic sealing of stepped double insulating glass units the front glass plate must be always the larger glass plate and the rear glass plate which shows to the support wall of the sealing robot must be always the smaller glass plate.		
Dimensions of drums to be used for sealing robot			
4x200 l drum A-component	Container with Cover – DIN 6644 D1.3 or 1.4		
1x20 l drum B-component	Container with Cover – DIN 6644 D3.1		
Possible sealing depths depending on spacer widths for sealing with 2-component sealants	Spacer width		Sealing depth
	6 mm	8 mm	max. 5 mm
	9 mm	10 mm	max. 10 mm
	10 mm	11 mm	max. 10 mm
	11 mm	12 mm	max. 12 mm
	12 mm	14 mm	max. 12 mm
	14 mm	16 mm	max. 15 mm
	16 mm		max. 15 mm
			max. 20 mm
These figures refer to standard 2 part sealants where we have respective experience.			

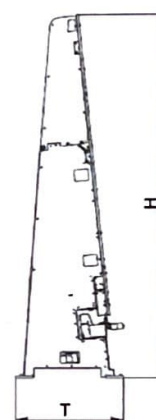
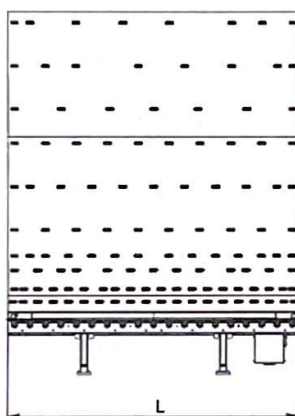
Special note for the one to three sided stepped double insulating glass units

- Only double insulating glass units (rectangular or shaped) are processable. Shaped units in accordance with the Lenhardt reference book **LENEX TRIO 0707**. Shape geometries deviating from this cannot be processed.
- No displacement on bottom edge.
- Displacement on leading and/or trailing and/or top edge 0 – 200 mm.
- The spacer frame has to be laid onto the smaller (rear) second glass plate. The larger glass plate has to be always the front one, otherwise automatic sealing is impossible.
- For the sealing of stepped double insulating glass units a suitable nozzle for stepped double units has to be utilized in the sealing robot.
- On principle, stepped double insulating glass units are processed in single mode at the run-out side of the tandem assembly-, gas fill- and press robot.
- Large and heavy insulating glass units have to be supported with suitable lifting devices when taking off.

Suitable lifting devices and transportation racks are not included in the supply volume. They have to be provided by the customer.
- The automatic gas filling of stepped double insulating glass units with the assembly, gas fill and press robot in standard design is only possible if no steps are on the leading edge. The automatic gas filling of stepped double insulating glass units with steps on leading edge requires additional equipment.

Scope of Delivery

Pos. 1 Conveyor station, vertical with roller support wall, type TB - BR - V - for gentle transport of glass plates and insulating glass units



- Modular system multi purposing, for integration in insulating glass production lines, easy adaptation to multiple functions by modular additions
- Basic design with one drive, prepared to add optional features
- Safe and reliable buffering of glass elements by separating in independent transport segments, occupancy monitoring by sensor system connected with production line control
- Backing rolls, easy interchangeable
- Smooth support wall surface without chafing points preventing accidents, easy to keep clean
- Drive of transport rollers by friction for gentle transport and less roller wearing
- Subsequent change of drive- /buffer segments and arrangement of drive units as well as drive direction is possible
- Transport level height: 500 mm +/- 20 mm

1091M0502 Conveyor station, vertical with roller support wall

1 piece

H=3200 mm L=3710 mm T=700 mm Tik=500 mm
Pel: 0,4 kW weight: approx. 690 kg

Type

TB	BR	2,70	3,70	V				
----	----	------	------	---	--	--	--	--

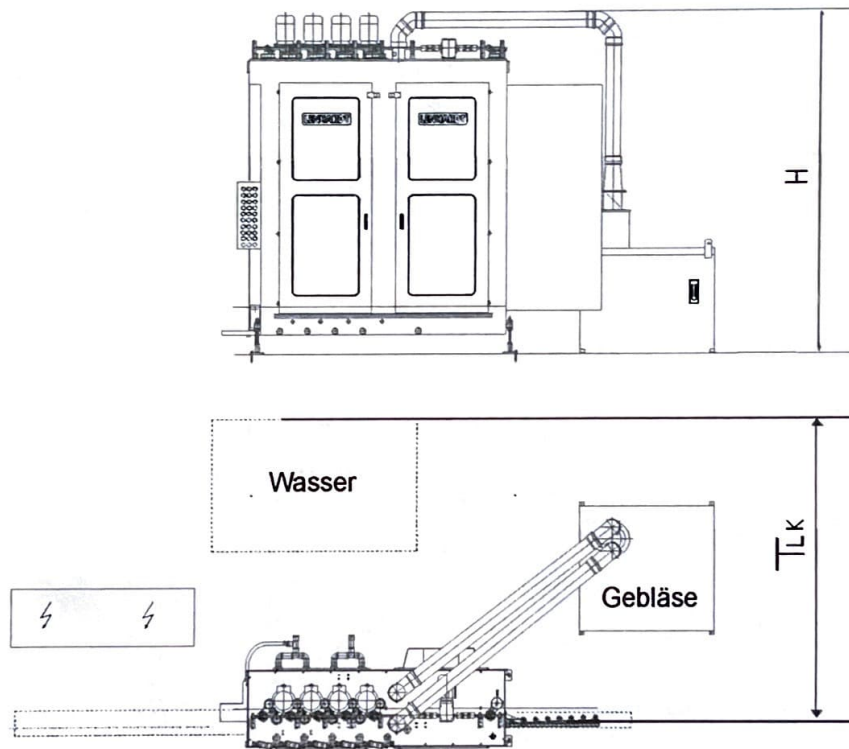
Pos. 1.1

931Z0502 All direction rollers girder for conveyor station, length = 3700 mm
1 piece

Pos. 1.2

921Z0503 Foot switch, transport start ↔ stop
1 piece

Pos. 2 Glass plate washing machine, standard universal, Type GW-SU
for continuous cleaning and drying of glass plates



- Universal high performance glass plate washing machine, can be modified for glass thickness up to 45 mm, option
- Easy accessible, chainless brush- and transport drives outside of the machine
- 4 separate brush drives
- Stepless adjustment of transport speed
- Alternating brush rotation directions for optimum cleaning results
- Gentle and slipfree glass plate transport, automatic opening and closing of parallel guided brush- and transport shafts
- **Maintenance-free, waterprotected bearings for a long lifetime**
- Synchronous drive of vertical transport shafts for slip- and distortion-free glass plate transport with minimal wear
- Constant brush contact depth if processing different glass thickness for the least possible brush wear
- Precise leading of glass lites allows the use of brushes with short bristles. Besides an optimal cleaning effect there are other advantages towards the use of brushes with long bristles (knotting of the bristles, inclusion of dirt and glass fragments etc.)
- Parallel adjustment of brush- and transport shafts

- Continuous cleaning of different thicknesses of glass plates as the setting of the thickness for each pair of brushes and transport shafts is done individually
- Symmetric design of brush shafts, bilateral suitable
- Brush drives, waterpumps and air blower are automatically switched-off, if production is interrupted
- Air knife design blower-nozzles for optimum glass plate drying
- Machine housing completely made of stainless steel, drying zone with sound protection
- Environmentally beneficial, energy saving water-circuit system by separated washing areas
- Basic design for 2-circuit water system
- Inspection lites in front doors

433M0301 Glass plate washing machine, 2,7m

1 piece

*Glass plate thickness: 3-15mm
 processing dimensions: 170x350 mm up to 2700 mm operating width
 H=3965 mm L=2785 mm Tlk=2600 mm
 Pel:app.25 kW (without heater) pneu: 6bar, R¼
 weight:3520 kg (with blower and control cabinet)*

Type

GW	SU	2,70	V	4B15		
-----------	-----------	-------------	----------	-------------	--	--

Pos. 2.1

445Z0301 Electronic frequency control, stepless

1 piece

for four brush pairs

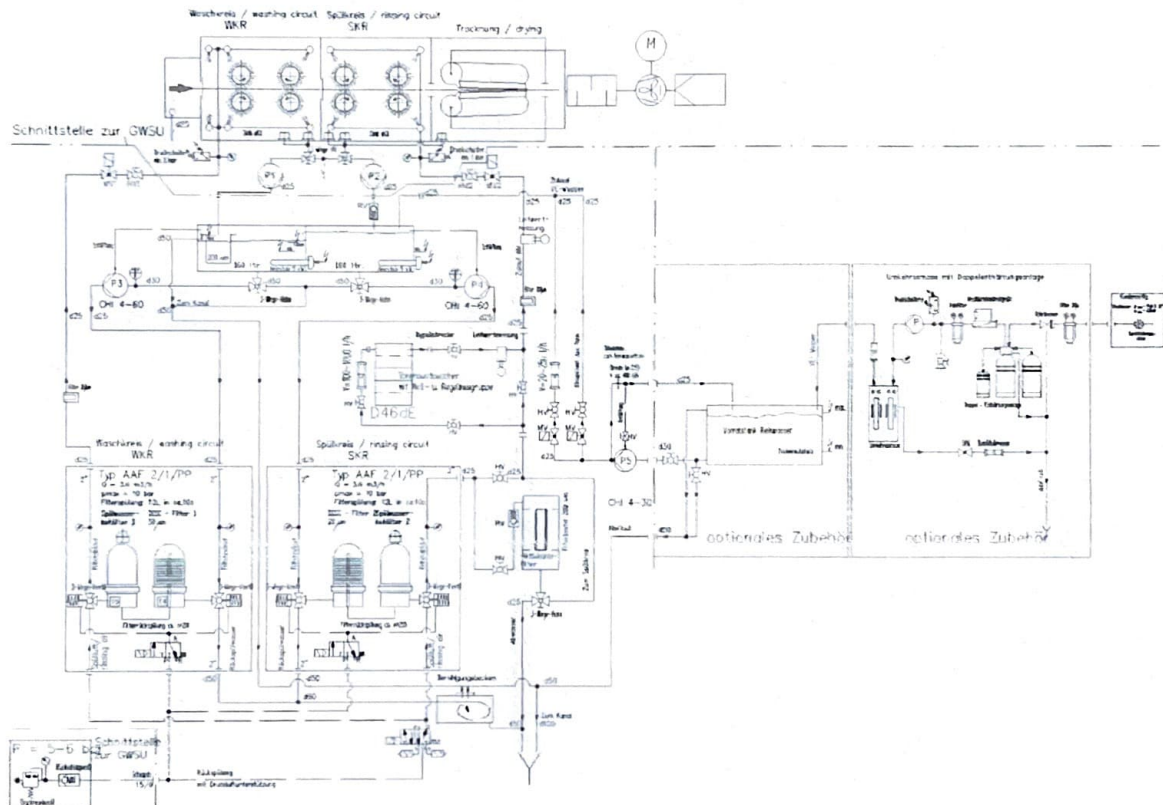
Pos. 2.2**476Z0302 Monitoring device for coated glass plates with conductivity testing of the coated side prior to it going to the washing machine**
1 piece

The coated glass plate is stopped automatically in the area of the monitoring device before reaching the washing machine. Conductivity testing carries out the subsequent checking of the coated glass plate, which registers exclusively metallic conducting coatings.

The monitoring device is linked via software to the control of the washing machine. Thus the right sequence is monitored during feeding of the coated glass plates to the washing machine. If an incorrect feed occurs an error message appears and the production process is interrupted.

Pos. 2.3**448Z0301 Platform for blower, 2,20 m high**
1 piece

Pos. 2.4 2-circuit pure water filtration system, fully automatic, applicable to glass plate washing Type GW-SU



932Z04
1 piece

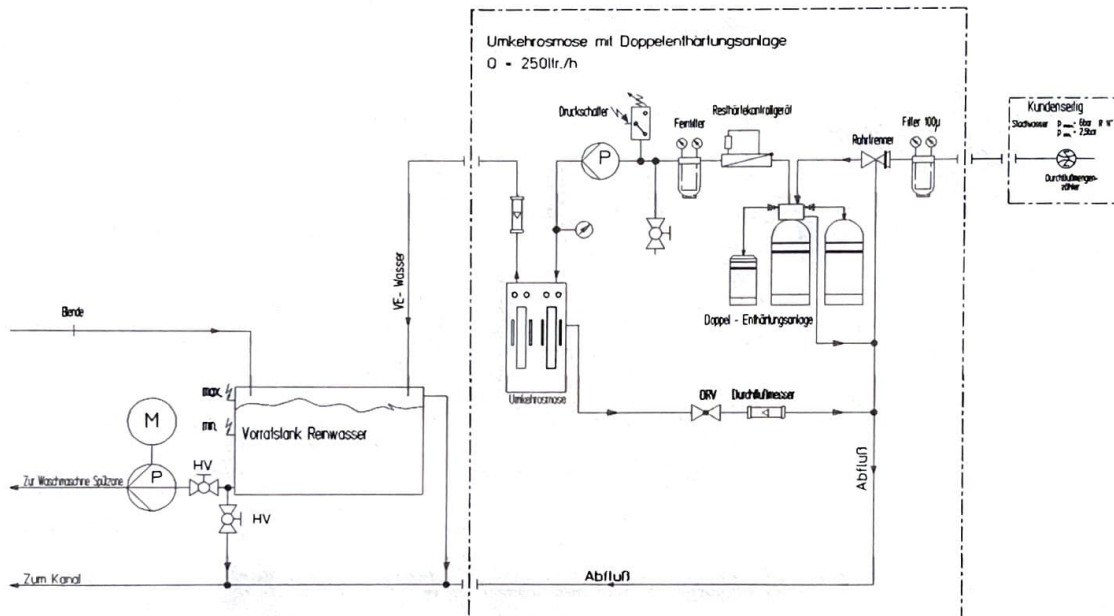
2- circuit pure water filtration system for glass plate washing machine Type GW-SU for fully automatic control, filtration and flushing back of the pure water

Disc filter system for reliable filtration of suspended particles and alga up to approx. 50 µm in the washing circuit resp. 20 µm in the rinsing circuit.

The fully automatic flushing back – supported by compressed air – is effected within 20 to 25 sec. by using approx. 14 ltr. pure water.

Additional integration of an activated charcoal filter in the water circuit for retaining smallest organic particles, further an ion-exchanger for lowering the conductivity figure is included.

Pos. 2.5 Reverse osmosis plant



Reverse osmosis plant HP 250 KR for washing machine Type GW

1303Z04 Reverse osmosis plant HP 250 KR for washing machine Type GW 1 piece

Layout 333230, configuration:

- reverse osmosis system HP 250 KR
 - nominal permeate output 250 l/h
 - diaphragm material PA-PS
 - desalting rate 97 - 99.5%
 - max. yield 75%
- double water softening device
- control unit for residual hardness
- pipe separator
- prefilter 100 µm
- finefilter 10", mesh width 5 µm
- control system
- stainless rack

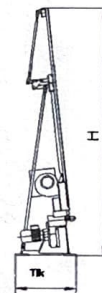
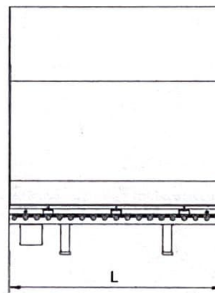
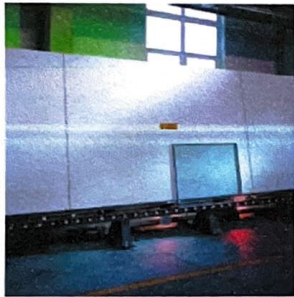
LxBxH approx.=800 x 710 x1700 mm

Pel. approx. 0.55 kW weight approx. 160 kg

Pos. 2.5.1

- 840Z04** **Reservoir 2000 ltr. for storage of full demineralized pure water**
1 piece **with level control device**
 material: PE, impervious to light, inspection hole: \varnothing 350 mm
 dimensions: 2070 x 1690 (+ 150 mm fittings) x 720 mm

Pos. 3 **Conveyor station, vertical, airfloat design Type TB - LK - V - .** for transport of glass plates and insulating glass units without areal touching the support wall



- Modular system multi purposing, for integration in insulating production lines, easy adaptation to multiple functions by modular additions
- Basic design with one drive, prepared to add optional features
- Safe and reliable buffering of glass elements by separating in independent transport segments, occupancy monitoring by sensor system connected with production line control
- Non-contact transport by air-cushion support, no roller prints
- Effective air cushion, slot-shaped, air nozzle arranged at the bottom edge of support wall avoids draught
- Air cushion is created with filtered air by blower
- Smooth support wall surface without chafing points preventing accidents, easy to keep clean
- Drive of transport rollers by friction for gentle transport and less roller wearing
- Subsequent change of drive- /buffer segments and arrangement of drive units as well as drive direction is possible
- Transport level height: 500mm +/- 20 mm

1084M0501 Conveyor- and buffering station, vertical, airfloat design

1 piece H=3200 mm L=3710 mm T=700 mm Tlk=500 mm
 Pel: 1,4 kW weight.: approx. 700 kg

Type	TB	LK	2,70	3,70	V				
------	----	----	------	------	---	--	--	--	--

Pos. 3.1

851Z0503 Conveyor subdivision for additional buffer zone,
2 piece price per additional segment incl. drive

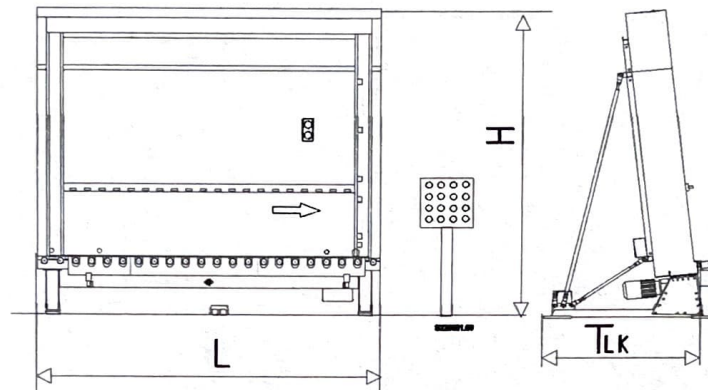
Pos. 3.2

852Z0503 Frequency converter for stepless adjustment of transport speed,
2 piece Pmax. = 1 kW

Pos. 3.3

849Z0503 Horizontal frame positioning girder with quick adjustment of
1 piece frame setback 0-25 mm

Pos. 4 Inspection and manual frame positioning station, Type VR...
for visual inspection of glass plates and for manual positioning of butyl coated metal spacers, with integrated indirect lighting in vertical movable pedestal roller girder.



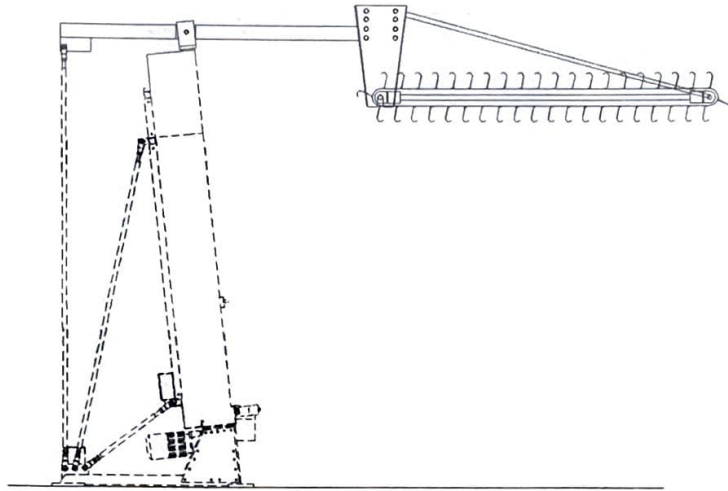
- Total visual surface monitoring of glass plate, supported on upper and lower edge only
- Contrastive lighting of inspection area for effective and quick glass plate control
- Automatic adjustment of vertical movable roller girder
- Non-soiling glass plate transport
- Program controlled vertical- and horizontal frame positioning girder for quick and exactly application of butyl-coated metal frames
- Automatic adjustment of frame positioning girder according to present glass thickness
- Quick adjustment for frame setback
- Operation-programs for double- and triple-insulating units
- Manual adjustment of movable roller girder for shaped glass plates
- Start/stop control of transport by foot switch
- User guiding by coloured signal-lights
- Additional non glaring lamp

513M0701 Inspection and manual frame positioning station, 2,7m, vertical
1 piece glass plate thickness: 3 up to 45 mm
 processing dimensions.: 170x350 mm up to working height of 2700 mm
 including foot switch

H=3700 mm L=2910 mm Tlk=1140 mm
 Pel:0,75 kW pneu: 6,5 bar weight app. 720 kg

Type	VR	2,70	2,90	V				
------	----	------	------	---	--	--	--	--

Pos. 4.1 Overhead conveyor, type RQF
for uncoated and coated spacer frames



Picture shows overhead conveyor mounted on inspection and frame positioning station

- Overhead conveyor for manual or automatic transport of spacer frames
- Possibilities of mounting: on ceiling, on inspection station, free installation on stand
- Transport of coated spacer frames without touching the coating
- Light barrier switch for stopping frame transport on the end of take off side
- For transport of coated frames the hooks are provided with anti-adhesive layer
- Possibility to transport several spacer frames in one hook row
- Subsequent installation in existing production line possible

1133M0704 Overhead conveyor, 18 usable hook rows, 5 hook chains

1 piece

for mounting on inspection and frame positioning station.
For safety requirements an additional fastening on ceiling is necessary!

H=1260 mm L=2260 mm T=2250 mm

Type

RQF	VR	2,0	2,6					
-----	----	-----	-----	--	--	--	--	--

Pos. 5**1082M0501 Conveyor- and buffering station, vertical, airfloat design**

1 piece H=3200 mm L=2510 mm T=700 mm Tlk=500 mm
 Pel: 1,4 kW weight.: approx. 540 kg

Type

TB	LK	2,70	2,50	V				
----	----	------	------	---	--	--	--	--

Pos. 6**1082M0501 Conveyor- and buffering station, vertical, airfloat design**

1 piece H=3200 mm L=2510 mm T=700 mm Tlk=500 mm
 Pel: 1,4 kW weight.: approx. 540 kg

Type

TB	LK	2,70	2,50	V				
----	----	------	------	---	--	--	--	--

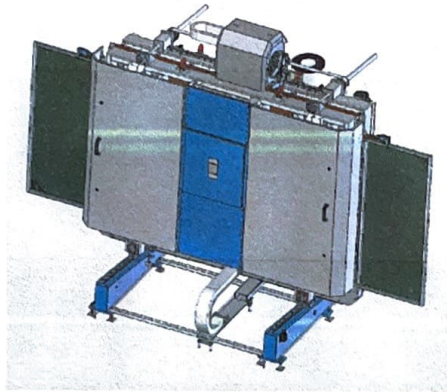
Pos. 7**1082M0501 Conveyor- and buffering station, vertical, airfloat design**

1 piece H=3200 mm L=2510 mm T=700 mm Tlk=500 mm
 Pel: 1,4 kW weight.: approx. 540 kg

Type

TB	LK	2,70	2,50	V				
----	----	------	------	---	--	--	--	--

Pos. 8 Tandem assembly-, gas fill- and press robot, belt drive design; Type ZPG-RTG
Separated press plates for simultaneous assembling, gas filling and pressing of two insulating glass units with any glass plate / spacer frame arrangement and formats



- Simultaneous assembling and pressing of two glass insulating units with any formats and glass/frame arrangement by tandem operation
- Efficient by tandem operation for mostly required dimensions, bigger formats are processed in single operation
- Press plates synchronized for single operation
- Formats: rectangular as well as nearly all kind of shapes
- Standard filling gas is Argon
- Prepared for using **optional** gases like SF6, Krypton and Xenon as well as mixtures of Argon and aforementioned gases
- 2-step pressing of oversized insulating glass units with metallic spacers
- Program controlled optimisation of filling parameters
- No holes in spacer frame necessary
- Processing different glass thickness and spacer width in any sequence
- Electronic pressing power control for i.g.-unit with metallic spacer
- Constant pressing with plane-parallel guided and deformation free press-plates
- Adjustable precise press plate guiding
- Fault indicator by diagnosis-program
- Press plates can be wide opened for convenient maintenance
- Combined measuring and sequence monitoring device

1485M1002 Tandem assembly-, gas fill- and press robot, belt drive design
1 piece seperated press plates for simultaneous assembling, gas filling and pressing of two insulating glass units with any glass/frame arrangement and formats. sizes in tandem operating: max. 2,25 m length

thickness of unit: max. 60 mm, glass plate thickness: max. 15 mm
processing dimensions: 170x350 mm up to 2700x5000 mm
using two step pressing up to 6000 mm (without gas filling)
H= 3900 mm L= 5220 mm T= 2200 mm
P el: kW pneu: bar weight: kg

Type	ZPG	RTG		2,70	5,00	V			
------	-----	-----	--	------	------	---	--	--	--

Pos. 8.1

1489Z1001 Adjustment device for 1-3 sided stepped insulating glass units (no step on lower edge)
1 piece

Glass plate displacement on leading edge adjustable from 0 up to 200 mm. Step adjustment of specified position on display is initiated by keyboard and driven by motor.

Pos. 8.2

1490Z1001 Automatic gas filling of 1-3 sided stepped double insulating glass units (no step at lower edge)
1 piece

Glass plate displacement at the leading edge up to 200 mm.

For automatic gas filling of insulating glass units with 1 to 3 steps (no step at lower edge) and subsequent automatic sealing, the larger glass plate must always be at the front side.

The automatic assembly and gas filling of insulating glass units with 1 up to 3 steps (no step at lower edge) can only be effected in the run off part of the tandem press.

Pos. 8.3

1469Z1001 Insulating glass units with georgian bars - additional equipment for automatic gas filling
1 piece
(the voids of the georgian bars can cause a reduction in the degree of gas filling)

Pos. 8.4

1486Z1001 Additional equipment for gas filling of triple insulating glass units; for both sides
1 piece

For gas filling of triple units the thickness of the middle glass plate is limited to 6 mm. The total thickness of glass plate 1 and 2 must not exceed 15 mm.

Pos. 9**1082M0501 Conveyor- and buffering station, vertical, airfloat design**

1 piece H=3200 mm L=2510 mm T=700 mm Tik=500 mm
 Pel: 1,4 kW weight.: approx. 540 kg

Type	TB	LK	2,70	2,50	V				
------	----	----	------	------	---	--	--	--	--

Pos. 10**944M1201 Electronic control system for production line consisting of:****1 piece**

- manual spacer frame application
- tandem assembly- and press robot
- sealing robot

Pos. 11 Sealing robot Speed Sealer, single head design, shapes, Type VAS 1K V MOD,
for shaped and rectangular formats, 2-component-sealant, single nozzle system



- Single nozzle system for automatic sealing of shapes and rectangular formats in any sequence, with constant high quality
- All around and clean sealing due to fast reacting and volume controlled dosing system even when frame set back is not steady
- Processing of double- and triple insulating glass units
- Data input for shapes according to stored shape catalogue
 - manual by keyboard
 - by USB interface
 - on line -option-
- Processing of rectangulars automatically by sensor system, without data input
- Perfect mixing quality for all field proven 2-component sealants for insulating glass by dynamic mixer
- Mixing ratio electronically adjustable
- Electronic registration of air-space width, centre of air-space and total thickness of insulating glass unit for optimum adjustment of volume flow and transport system
- Auto centering of nozzle to air-space centre
- Homogeneously sealed corners ensured by sealant injection with nozzle/spatula system

- Stepless and independent rotation of nozzle head and spatula
- Sealing of wide spacer width range without changing nozzle when processing double units
- Sealing of triple insulating glass units in two cycles with standard nozzle (option)
- Safe sealing of narrow air-space with highest mixing quality
- Short dynamic mixer system
- Automatic rinsing program for cleaning of the mixing unit with A-component
- Rinsing cabinet for cleaning of nozzles
- Quick-action lock system for fast nozzle change
- Basic equipment with one multirange swivel nozzle for double IG units, joint width 8-20 mm
- Additional program for alternate sealing of insulating glass units with different spacer frame systems
- Material supply by Lenhardt drum pumps, basic design: A-component 200 litres, B component 20 litres
- V-shaped run out conveyor system for sealed units
 - no soil of lower glass edge
 - smooth transport, no glass breakage
 - safe and convenient take-off of insulating glass unit
 - self cleaning
 - long service life
- Air cushion support wall assists take-off of insulating glass unit by suction lifting device
- Free access to operation side
- Fault indicator by diagnosis-program
- Easy user guide by touch screen

**1634M3002 Sealing robot Speed sealer, single head design, shapes, 2,7 m,
1 piece**

Basic design:
 run-out conveyor: 4000 mm long
 processing dimensions: 190x350 mm up to 2700x4000 mm
 joint width: 6-24 mm insulating glass thickness: 12-60 mm
 glass plate thickness max.: 15 mm
 l x w x h: approx. 8450 x 2470 x 3800 mm
 depths from glass transportation line approx. 2740 mm
 Pel: 22 kW pneu: 6 bar, R½ weight.: approx. 5760kg

Type

VAS	1K	2,70		V	MOD			
-----	----	------	--	---	-----	--	--	--

1180M1101 Sealing robot / Mixing and dosing system

1 piece

executed for the processing of two-component polysulphide

Pos. 11.1

1642Z3008 Sealing robot, with extended run-off conveyor, for insulating glass units up to
1 piece 5,0 m length
working height 2,70 m
with **V-shaped run out conveyor station**, 3 sections, 5,00 m long
subdivided in two drive segments
with possibility to apply fork lift system for take-off of large and heavy
insulating glass units

Pos. 11.2

1658Z3013 **Fully Automatic Quick Change System for operation with two different**
1 piece **sealants**

with separate drum pump system for second sealant with 200 l A- and 20 l B-
drum pump.

The entire dosing and mixing system is changed fully automatically after
selection at the control panel.

No manual intervention on the sealing tower required.

All electronic and pneumatic supplies are automatically changed via
connectors together with the dosing unit. Therefore access to the security
area behind the machine is not required. The change-over can easily be
carried out by one operator, working from the control panel.

If the equipment for alternate operation with two different sealants is used, the
distance from glass transportation edge to the wall behind the line must be at
least 3.800 mm.

Pos. 11.3

1665Z3014 Additional equipment for the sealing of stepped double e.g. units,
1 piece for rectangular formats with maximum 3 steps on front-, upper- and back
edge (not lower edge).

Maximum size of a step: 250 mm

The required data for step size on leading, upper and trailing edge, as well as glass plate thickness, air space widths, length and height of the smaller glass plate are typed in manually at the operation panel. Data input may equally be effected via USB stick or online (option). Automatic data transmission requires a corresponding network link.

In the event of available data transfer within the production line the production data for stepped I.G. units is transmitted automatically.

During sealing of stepped insulating glass units the "stepped units" nozzle kit needs to be used; respectively the standard kit needs to be changed.

Pos. 11.4

1667Z3014 Nozzle for stepped double insulating glass units.
3 pieces Possible spacer widths 12-14 - 14-17 - 17-20

Pos. 11.5

1660Z3013 Use of a 200 litres drum pump instead of the standard 20 litres drum pump for
1 piece B-hardener component
additional price

Pos. 11.6

1662Z3013 **Equipment for uninterrupted operation during drum change of the basic component**
1 piece For uninterrupted operation during drum change of the basic component a second 200 l drum pump is installed. During drum change one can switch over manually to a second ready drum pump. A break in operation occurs during drum change of the B-component

Pos. 11.7

1664Z3013 **Heating of the material pipes for A- and B-component**
1 piece for system 1

Pos. 11.8**1672Z3016 Hard and software for interface matching between sealing robot and customer's PPS system**
1 piece**Supply volume:**

- Online connection for automatic data transmission from the PPS system to the sealing robot
- Provision of a router
- Data input via
 - a) USB storage mediums (USB stick, portable USB hard disk,...)
 - b) CD ROM
 - c) Online
 - d) manually at control panel
- Driver software for online connection (installed on PC of the control panel)

Supply volume of the customer:

- Data cable incl. connection of the online link from the server to the control cabinet of the sealing robot
- A static IP address within the customer's network
- Installation of the necessary paths and log-in mechanisms on customer's server
- Access to customer's network has to be guaranteed
- Data transmission according to Lenhardt interface; according to current production data description

Network specification:

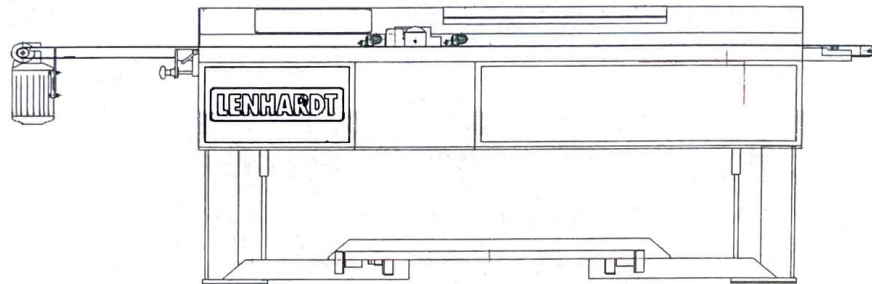
Connection to server:	MICROSOFT NETWORK or compatible
Network-Type:	10/100/1000 Mbps Ethernet Network
Transport protocol:	TCP/IP
Data supply cables:	10 BASE-T, twisted pair, CAT 5 or better
Connections:	RJ 45

Pos. 11.9**1655Z3012 Hard- und Software-Equipment for sealing twice on a triple unit with standard nozzle**
1 piece

The conveyor belts of the infeed conveyor are split into two parallel conveying elements and horizontally movable, in order to support all three glass plates during second sealing process. (Maximum unit length ≤ 4 m).

Pos. 12 Butyl-Extruder, type BEZ

for double sided coating of spacer frames with thermoplastic sealant (Butyl, Hotmelt...), height adjustable



- PLC control system for automatic and speed dependent adjustment of hold down rollers and nozzle open/close
- Suitable for coating of straight, bent, circular and polygonal spacer frames (shaped frames) as well as for spacer frames with muntin bars
- Specially hold down roller for radius shaped-spacers
- Infinitely height adjustment for optimal ergonomic working conditions
- Measuring device for automatic adjustment of nozzle head distance according to measured spacer width
- Processing of different spacer heights by adjustable nozzle height
- Infinitely adjustment for temperature, pressure and coating speed
- Convenient and fast refilling of sealant in vertical tiltable material cylinder with quick change attachment
- Automatic bleeding system and low level indicator
- Timer for preheating the sealant material, with weekly program sequence
- Short heat up-cycle by optimized heating circuits
- Low energy consumption in standard operation, low-noise operation
- Optimized coating quality
- Easy operation, low maintenance design

577M28
1 piece

Butyl-Extruder BEZ

volume of butyl approx. 7,5 l
height adjustment: approx. 650 - 950 mm (25.6"-37.4")
transport speed: approx. 5 - 50 m /min (16.4-164.0 feet/min)
spacer width: automatical measuring 4 - 24 mm (0.157"-0.944"), manual up to 35 mm (1.38"), spacer height: 5 - 12 mm (0.197"- 0.472")
l x w x h: approx. 2870 x 750 x 1100 mm
el. power: approx. 5 kW (only in warm up period)
air: 6,5 bar weight: approx. 960 kg

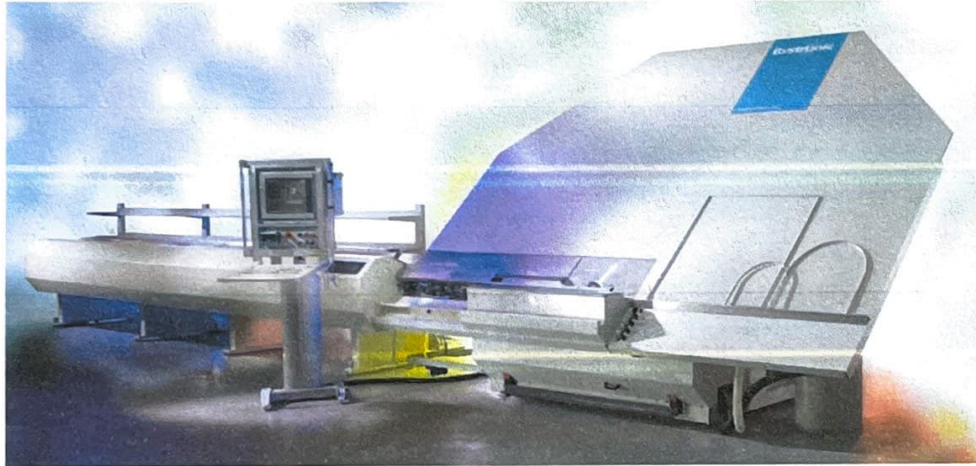
Type

BEZ	7,5							
------------	------------	--	--	--	--	--	--	--

Pos. 13 Spacer bender, Type RB NTB, AL-EST

for production of aluminium and stainless steel spacer frames for insulating glass units;

Picture shows: Spacer bender, type RB NTB



- Efficient and robust bending system for spacer frames
- Basic design for rectangular formats
- Shaped spacer frames according to stored shape catalogue - **option** -
- Executions:
 - for processing of aluminium box profiles of bendable alloy and
 - for processing of bendable stainless steel profiles
- 4 bent corners
- Correction cut if connector appears to come into bending section
- No change of bending tool required for aluminium box profiles
- Quick changing of bending tool for stainless steel profiles and aluminium frames with a radius
- Rotating spacer bar magazine for 8 different profile widths, consisting of:
 - Rotating spacer bar magazine with 8 storage cassettes, each for maximum 21 spacer bars
 - transport system for automatically feeding of spacers into bending tool, spacer bars are automatically separated from storage cassettes with recovery of residual spacer bar
 - automatically monitoring and searching of specified storage cassette
- Profile intake with integrated length measuring system
- Assembling tool for last frame joint
- Profile length: 6 m (shorter profiles are possible as well)
- 2-head-spacer saw for aluminium and stainless steel

- Automatic adjustable support girder avoiding enlargement of the last corner when using profiles instable frames
- Product marking by inkjet printer - **option** -
- Control: Efficient multi-axis control for exact coordination of transport, bending and operating functions
- Easy operation by touch screen surface
- Integrated fault diagnostic system
- The production data file can be processed forward and reverse
- Data entry:
 - manual by the use of keyboard and touch screen
 - by USB-Stick / CD-ROM
 - "on line"-connection - option -

1094Z1403 Spacer bender, for production of **aluminium and stainless steel** spacer frames for insulating glass units; with subsequent desiccant filling

1 piece

Basic design for rectangular formats

Spacer bender consists of:

- Rotating spacer bar magazine for 8 different profile widths, with recovery of residual spacer bar;

profile widths: SZR 6 - 27 (5.5 – 26.5 mm)

profile heights: 6.5 – 7 mm

H=2750 mm L= 11810 mm D= 2185 / 2750 mm

Frame min. 110 x 250 mm / Frame max. 2000 x 2000 mm (1 part)

Frame max. 2200 x 4000 mm (in two parts)

P el: approx. 5.0 KW pneu: 6 bar

Type

RB	NTB	6-27				AL	EST	
----	-----	------	--	--	--	----	-----	--

Pos. 13.1

170Z1405 Ink jet printer, for product marking
1 piece touch-free marking with fast drying **black ink** (Ink-Jet process); marking of date, air space, order number und production number;
2 possible operation modes:
- Product marking information derived from production data file
- Manual selection of text to be printed from a predefined text catalogue
Interface: RS 232
Company logo possible – **Additional price** depending on software costs

1448Z1403 Bending tool adapter for frame spacer width SZR 6
1 piece

Pos. 13.2

1430Z1402 Shaped frames according to shape catalogue
1 piece *Bending angle: min. 35° for aluminium
min. 40° for stainless steel*
*Radius: min. 80 mm for air space < 8; 100 mm for air space > 8 for alu.
min. 300 mm for stainless steel depending of frame spacer
width and type of profile*

Pos. 13.3**618Z1405 Hard- and software for interface matching between spacer bender and customer's PPS system**
1 piece**Supply volume:**

- Online connection for automatic data transmission from the PPS system to the spacer bender
- Provision of a router
- Data input via
 - a) USB storage mediums (USB stick, portable USB hard disk,..)
 - b) CD ROM
 - c) Online
 - d) manually at control panel
- Driver software for online connection (installed on PC of the control panel)

Supply volume of the customer:

- Data cable incl. connection of the online link from the server to the control cabinet of the spacer bender
- A static IP address within the customer's network
- Installation of the necessary paths and log-in mechanisms on customer's server
- Access to customer's network has to be guaranteed
- Data transmission according to Lenhardt interface; according to current production data description

Network specification:

Connection to server:	MICROSOFT NETWORK or compatible
Network-Type:	10/100/1000 Mbps Ethernet Network
Transport protocol:	TCP/IP
Data supply cables:	10 BASE-T, twisted pair; CAT 5 or better
Connections:	RJ 45

Pos. 13.4**174Z1405 Bending tool for radius for aluminium-spacer frames (per air space)**
5 pieces

Pos. 13.5

1100Z1405 Bending tool for radius (upper and lower roll) for **stainless steel-spacer**
5 piece frames (per air space)

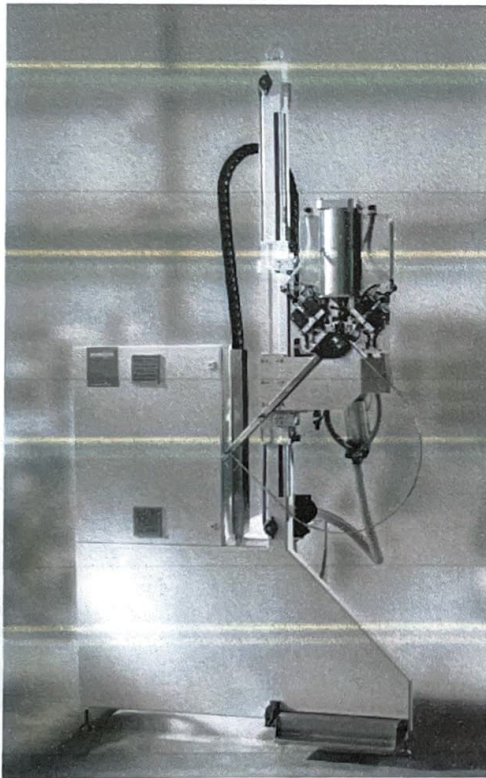
Pos. 13.6

1508Z1402 Additional bending sequence for the production of frames from Thermix
1 piece A production mode can be chosen to bent Thermix profiles. It has to be mentioned that a support by hand is necessary above a frame leg length of approx. 1,2 m. In addition also an exchange of the saw blade is necessary. The data, whether to bent Thermix or aluminium profiles can be stored in the production data file. This presupposes an appropriate user adjustment of the PPS system.

Pos. 13.7

1509Z1406 Bending tool for THERMIX-spacer frames (profile widths: 8 - 24 mm)
1 piece

Pos. 14 Desiccant filling station Type FST



- Drilling and filling of 2 sides of the frame
- Automatic control of the filling process
- Desiccant feeding by 200 l drum
- Removal of excessive desiccant grains by suction
- Desiccant grains, spheric \varnothing 0.5 up to 0,8 mm
- Automatic sealing of the filling holes with butyl
- Height of the filling device step less adjustable by motor drive

168Z1405 Desiccant filling station for desiccant filling of the frame spacer
1 piece

Processable frame dimensions:
 min.: 170 x 260 mm
 max.: 2.000 x 2.000 mm in one piece
 max.: 3.600 x 3.700 mm in two pieces

Processable profile heights: SZR 6 – 27 (5.5 – 26.5 mm)
 H=3550 mm L= 2830 mm D=1550 mm
 P approx: ca. 1,5 KW pneu: 6 bar

Type

FST									
------------	--	--	--	--	--	--	--	--	--