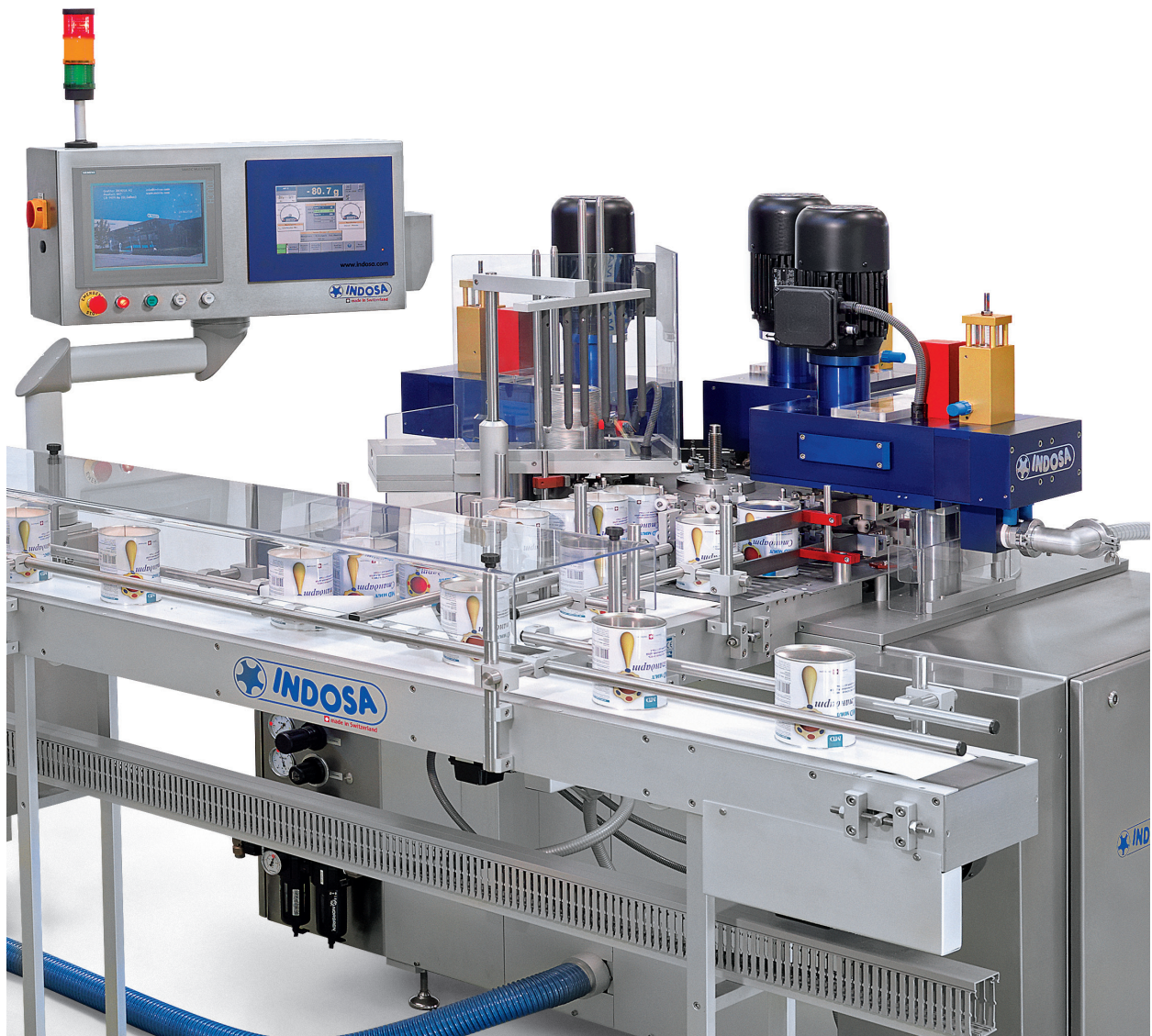




The World's No. 1 in Can Machinery

INDOSA Technology

Evacuating, gassing and seaming system proVac®



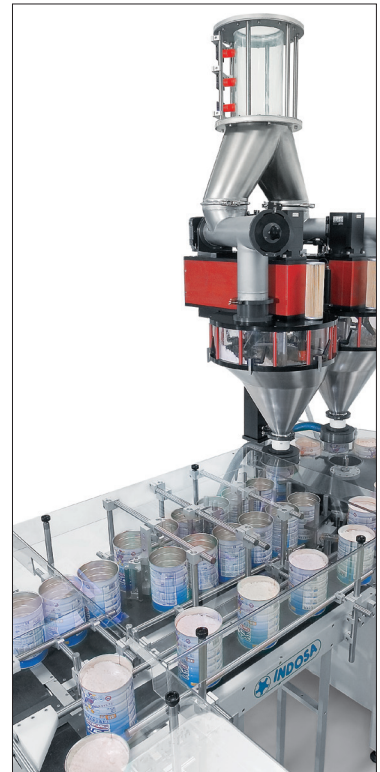
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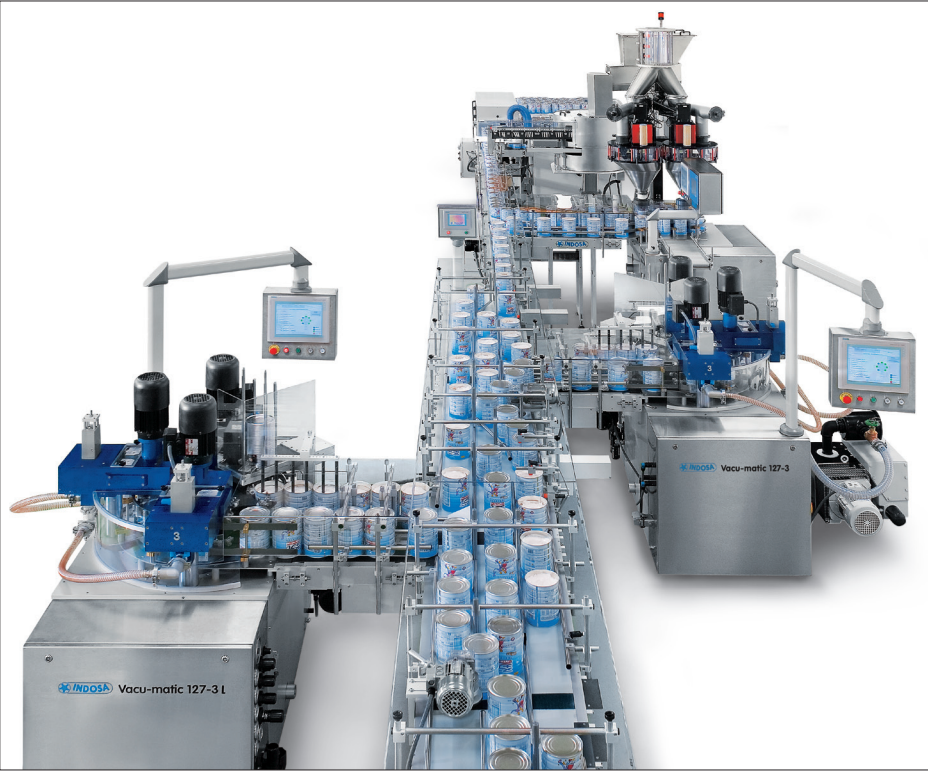


INDOSA proVac Milk

The World's No. 1 in Can Machinery



Powder Line with Single Can Security (SCS)



Why use evacuated / gassed cans for food?

A lot of manufacturers of high-quality products are gassing their cans. In gassed cans, pharmaceutical products or high-quality food products have a longer shelf-life and a significant improvement in quality.

By eliminating oxygen, the product can no longer oxidise or “perish”. The oxidable parts of the products, above all fats, proteins etc., retain their natural freshness when kept away from oxygen. The lower the oxygen levels in the product, the longer the can’s shelf-life. When gassing the cans, the oxygen is normally replaced by nitrogen. However, it is also possible to use a mixture of carbonic acids which have a certain conservation effect.

More and more countries make new regulations for the minimum of shelf-life and quality requirements for canned food products. The rules for a shelf-life guaranty in the EU countries are 2 years.

Which products are preferred for evacuation and gassing?

For decades now, gassing has been the standard method used for expensive, concentrated pharmaceutical products, such as vitamins. The gassing of cans is recommended for all types of food.

Here are a few canned products where gassing is the current quality standard:

- vitamins, pharmaceutical raw materials, medical or veterinary products
- soluble children’s food in powdered or granulated form, milk powder, diet products
- all forms of coffee, coffee substitute, instant products
- potato crisps, snack, pastries
- nuts, muesli, cereals
- meat products, cheese products

Evacuating, gassing – or both?

In principle, evacuation, i.e. the removal of the surrounding air, is sufficient to improve the shelf-life of products. This is the case for many fresh foods currently shrink-wrapped in film. But there is a problem when evacuating cans without gassing them: the cans can be completely destroyed. The can would collapse due to the internal vacuum and external pressure of the atmosphere. For this reason, the oxygen-laden air which is removed from the can must be replaced by an inert gas (nitrogen).

INDOSA PRODUCT-INFO**Vacuum Cans II****Which system?**

The criteria for deciding which system and plant to use depend on various parameters and requirements:

- available budget
- total capacity of the plant in cans/hr and kg/hr
- layout and position in the factory
- can formats and can sizes
- products and product behaviour
- weights and charges of fillings
- filling weight of the products
- required residual oxygen content
- degree of automation and accuracy
- safety requirements and logging
- additional machines for additional operations

Methods and systems for evacuating and gassing cans**1. Gassing tunnel** (easy way, but not enough efficient)

Gassing filled cans in a gassing tunnel (without evacuation) by flooding gas over the cans before sealing them. Residual Oxygen Content in Can $O_2 = 6-8 \%$

2. Vacuum and gassing chambers (old fashion, very complex, insecure method)

After pre-clinching the vacuum lids onto the cans, a large number of cans are evacuated and gassed in a sealed vacuum chamber; then the gassed cans are seamed tight in the atmosphere. Residual Oxygen Content in Can $O_2 = 2-3 \%$

3. Sealing stations with vacuum chambers (high vacuum only in strong tin cans)

Evacuation of filled cans in sealing stations with chambers with evacuating process in seaming chamber up to 50 % Vacuum. Residual Oxygen Content in Can $O_2 = < 11 \%$

4. Machines with rotary seaming heads (restricted possibilities, inefficient by mechanical angle control, complex for format change)

Evacuation and gassing of filled cans in mechanical rotary seaming stations with mechanically controlled processes by angle sectors. Residual Oxygen Content in Can $O_2 = < 2 \%$

5. Evacuation using the flow process (INDOSA proGas)

and the gassing of filled cans in many sequential chambers with measurement and control of the processes. $O_2 = 1-2 \%$

6. Process-machines with stationary multi head process stations (INDOSA proVac)

Evacuation, gassing and seaming of filled cans in stationary process stations with controlled processes in independent chambers. Defined under pressure in finished can. Automated chamber cleaning after each stroke. Unique 100% safe memorised process.

SCS-System (Single Can Process Security) Residual Oxygen Content in Can $O_2 = < 0.5 \%$

Systems for the various methods are supplied by INDOSA.

All sizes and types of can (tin and composite cans) can be processed by INDOSA machines.

INDOSA Systems for vacuum cans are available in all ranges of capacity and degree of automation.



INDOSA Vacu-matic 127-3 proVAC Vacuum Seamer

- Perfect system to produce evacuated, gasified and seamed cans with highest security standards for the best protection of your high-quality products
- **Worldwide unique SCS (Single Can Security) technology**
 - all process sequences are independently controlled and checked
 - Only successfully terminated sequences allows the next process step to be triggered

Maximal capacity:

20-30 cans/min.

Output depends heavily on:
product, residual oxygen content and vacuum pump

Can range:

Ø 73 mm - Ø 127 mm, height: 50 mm - 190 mm

Can type:

Tin cans, aluminium cans or gas tight composite cans

Lids:

Tin and aluminium lids (also ring-pull, easy-open, etc.),
with or without (!) evacuating cams

Low residual oxygen content:

Residual oxygen adjustable <0.5% by setting the vacuum point
gassing with N2 or CO2
Low residual oxygen setting reduces process speed (logarithmic!)

Grabher INDOSA AG - The World's No. 1 in Can Machinery

since 1936

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Vacuum seamer with proVac technology

Technical benefits with the proVac system

- Each can will be tightly seamed, gasyfied with low-pressure and evacuated in a tight and closed vacuum chamber
- SCS (Single Can Security) absolute process security through clearly defined and controlled process chain
- Controlled vacuum valves evacuating speed will be adjusted with various vacuum valves, to achieve optimum speed according to the used product (without extraction of the product)
- Installation stops on errors and reports notification

Persistent INDOSA system technology

- Possibility to have a bigger output by integration of multiple machines of the modular INDOSA system
- Ingenious can distributing system for all active machines, saves room and optimizes speed self-actuating
- Installation speed results on all integrated machines and will be adjusted automatically
- Detailed overview of all connected machines and working modules available



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New concept by new method

Due to decades of experience and consequent development in terms of filling, evacuating and gassing of cans, the Swiss company Grabher INDOSA-Maschinenbau AG succeeded in offering an entirely new concept for the manufacture of gassed milk powder cans.

New method "proVAC"

By essential shortening of process times in the single vacuum stations with the procedure proVAC, it is nowadays possible to construct lines for milk powder in a technology as they were formerly only applied in the pharmaceutical industry for very expensive products like vitamins. This technique not only guarantees perfect safety for every single can, but also a cost-performance ratio standing up to every comparison with "old" methods. This not only in the lower, but also in the medium up to the higher capacity range.

New concept: modular structure of a line for every capacity range

By use of several structurally identical but autonomously working vacuum seaming machines that run parallelly, every requested capacity can be "arranged". This way an adapted performance and therefore a good cost-performance ratio is individually achieved for the customer and the specific product.

By this simple method, also later capacity extensions can be carried out at the vacuum machines or filling machines as well by simply adding a "vacuum element" or putting in a "filling element".

INDOSA filling line

The cans are filled by an ultra-modern dosing system INDOSA TR2. The speed and accuracy can be adapted according to the filling product. In case of need, depending on the product or prescription, a very accurate check weigher is integrated. For higher performance, also several filling chucks can be utilized. An extension to greater capacity with additional construction groups is possible at any time.

INDOSA vacuum seaming machines

The filled cans are carried directly into the vacuum can seaming machines. Depending on the capacity requirement, one or several autonomous vacuum seaming machines can be used parallelly.

Each single vacuum seaming machine has an autonomous station with own vacuum pump, own vacuum control valve and own process control.

INDOSA vacuum seaming machines with proVAC system

INDOSA seaming machines are modern one-chucked automatic seaming machines that externally hardly differ from a "normal" INDOSA automatic seaming machine. These machines can be used as simple can seaming machines, as can seaming machines with evacuating of the cans ONLY or as can seaming machines with evacuating and gassing of the cans. The requested programme can be retrieved simply. The programme is controlled by modern micro processors and saved, filed and recalled for every can format and product. All programme steps are checked and can only continue if all conditions are fulfilled.

Operation sequence

Cans filled before run into an indexing turret via a conveyor. This indexing turret places each can into the work station individually. Now a transparent tube (vacuum bell) from below runs over the can and closes the chamber tightly. In this vacuum chamber now all processes of a preset programme run automatically.

First of all the can is evacuated on the programmed vacuum data in millibar. The evacuating speed is controlled by a special progressive valve. Certain procedures prevent the escaping of product from the can. When the adjusted data are achieved, the chamber with the can is gassed. The gassing is carried out with a slight underpressure (or overpressure) in order to distinguish the can for later checking purposes from the normal pressure of the atmosphere. After finishing of the process, the can is closed in the chamber by a double seam. The vacuum bell opens again and is automatically cleaned from possible product residues.

The indexing turret pushes the can out of the work station and a new one in. Now the process can start anew.

Advantages

- highest quality standard, most modern design, latest technology
- very little space requirement, no congestion areas necessary
- automatic adaptation of the speed to forerunner machine
- world wide unique SCS (Single Can Security) technology
- each can is processed and examined individually
- residual oxygen content of less than 0,5% possible
- total safety by monitoring every single operation
- underpressure in each can for checking of the process and the tightness
- very low gas consumption
- simple and safe format change
- simple programming of the working process
- modular structure of the line for simple extension to greater capacity.



INDOSA matic 153 FC

Automatic Can Filling Machine with INDOSA TR2 Auger Filler

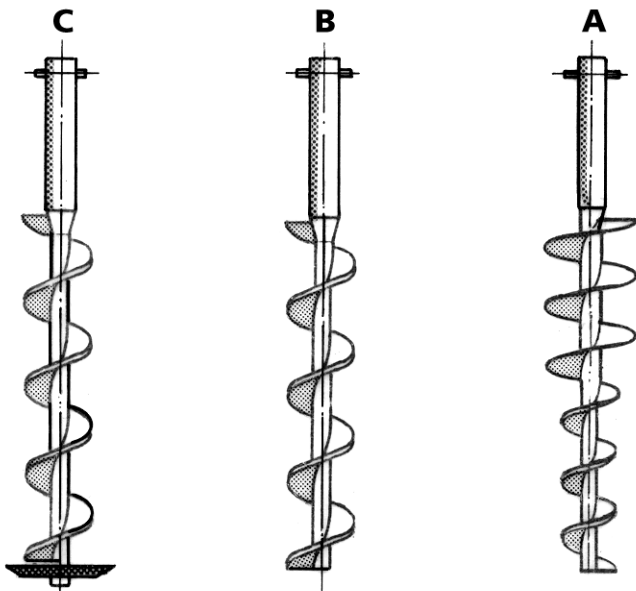
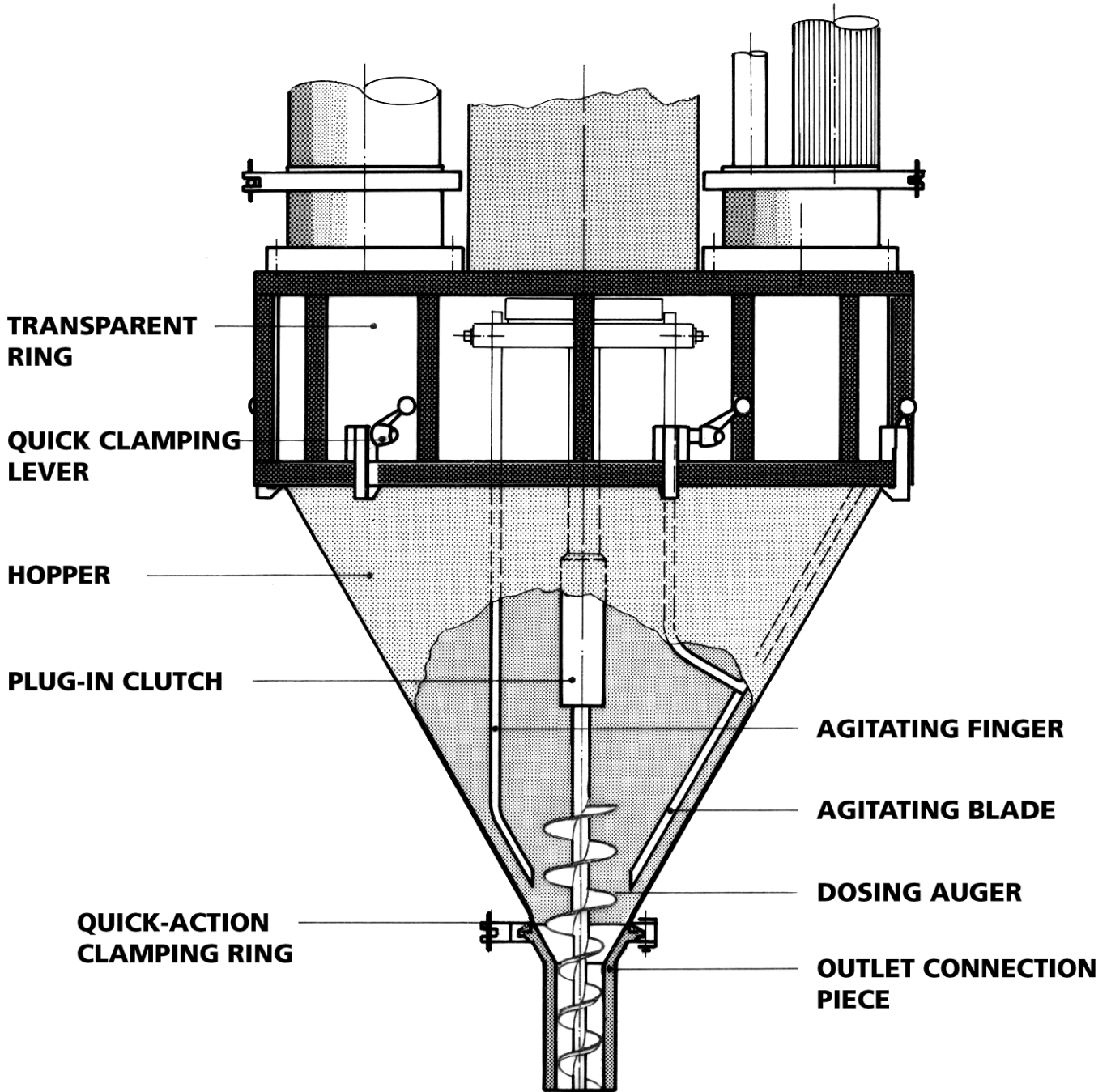


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- A COMPRESSION AUGER**
- B CYLINDRICAL AUGER**
- C AUGER WITH SPINNER DISK**



- Fully automatic filling machine
- Integrated check-weighing system with feedback control
- Automatic height adjustment
- Touch screen GUI (graphical user interface)
- For powder and granulates

Capacity	Up to 80 cans/min
Can diameter	Up to 127mm
Can height	Up to 340mm
Cans	Tin, composite or plastic cans

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Difficult filling product

Dried milk powder is a rather difficult filling product. It can - depending on formula, fat content, drying method, granulation and density rate - show very different filling properties. Even the same product can - according to manufacturing conditions - possibly show variable properties. Great experience is necessary to construct lines that are able to fill milk powder clean, accurate and efficient.

INDOSA TR2 filling system

INDOSA TR2 filling machines have been specially developed for the different properties of milk powder. Behind this filling system is all technology in order to fill the various kinds of milk powder very accurate, dust-free and quickly.

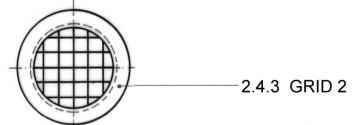
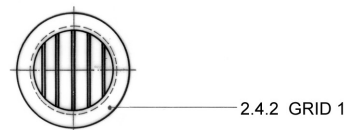
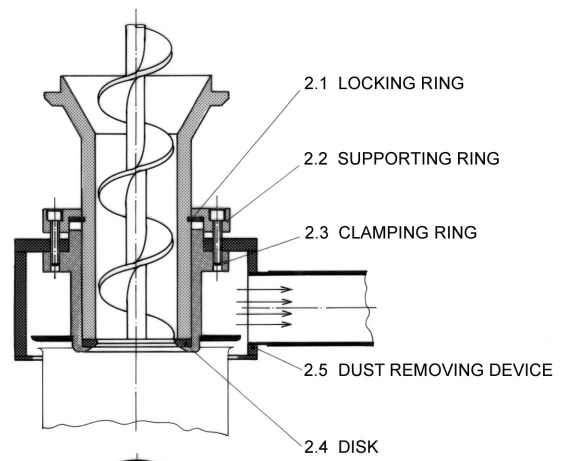
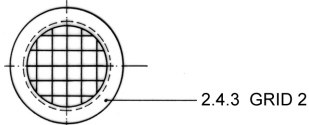
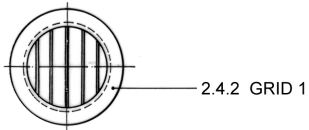
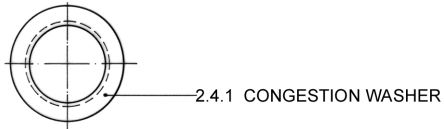
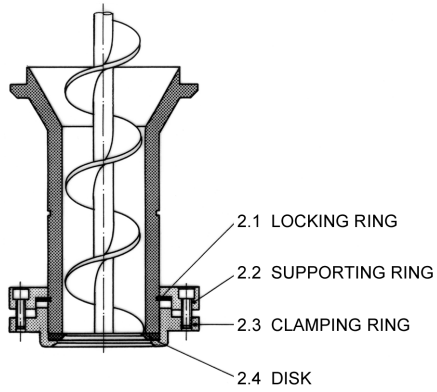
Simple operation and high performance

After a unique basic adjustment of the requested parameters to the various filling products, the requested filling as per product, weight, tolerance, etc. can be retrieved at any time via a video display. The machine then calculates the respective adjustments itself from the parameters and permanently automatically optimizes during the current fillings. Changes of the conditions as differences in bulk material (piled weight, flow rate) or in the environment (temperature, air humidity) are recognized automatically and corrected accordingly. INDOSA TR2 filling machines do have integrated unique automatic optimizing processes in order to adjust to the permanently changing filling conditions, and this not only for accuracy and tolerances, but also for the capacity.

Cleanliness and security

For the subsequent evacuating for milk powder cans, the filling product can be vibrated into the can with the INDOSA TR2 system in order to attain the right free space (between product and lid) for the subsequent evacuation. To prevent dust developments, dust collection is effectively carried out at the right positions.

The filled can is weighed again, checked and registered. A print-out verifies the accuracy and the weighed quantities. A can that for any reasons does not fulfil the parameters, is automatically eliminated before seaming.

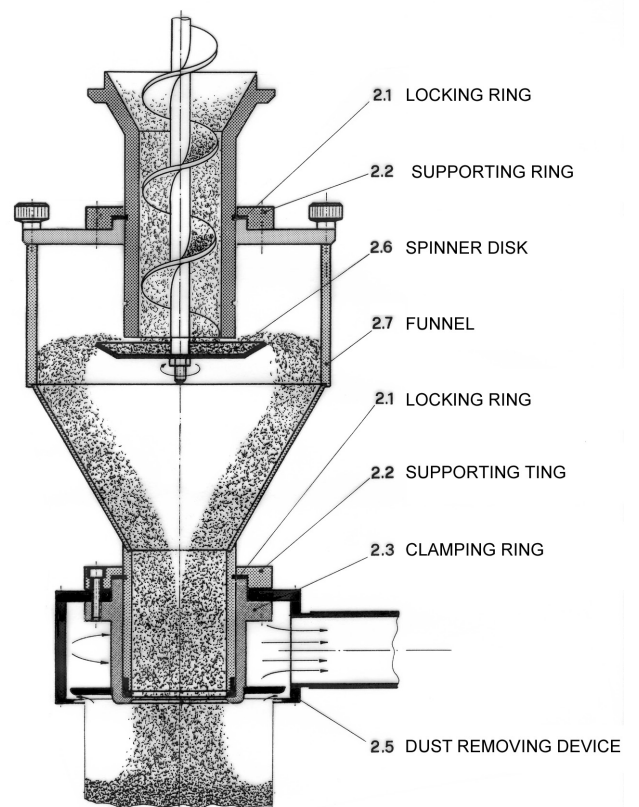
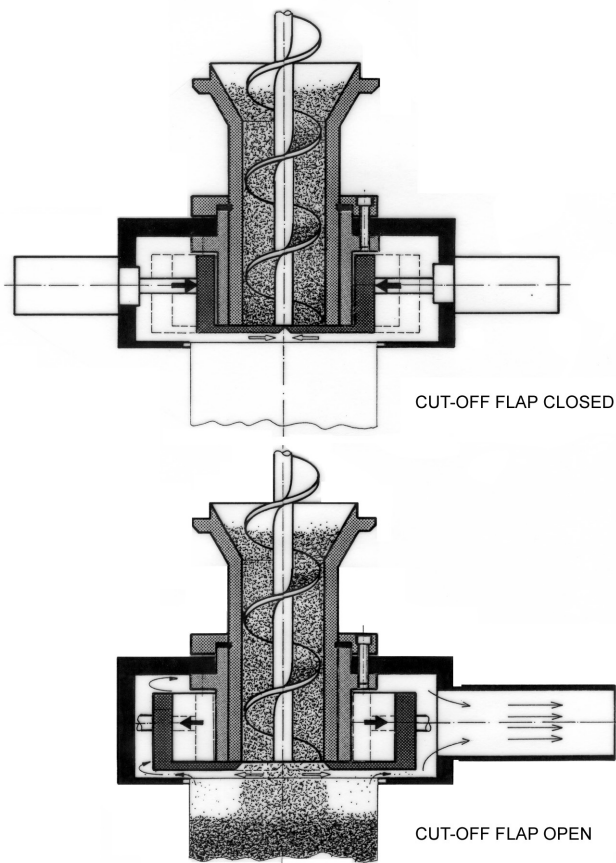


Dosing and Filling System INDOSA TR2

Auger filler ⇒ Outlet connection piece

Dosing and Filling System INDOSA TR2

Auger filler ⇒ Outlet connection piece, removing device

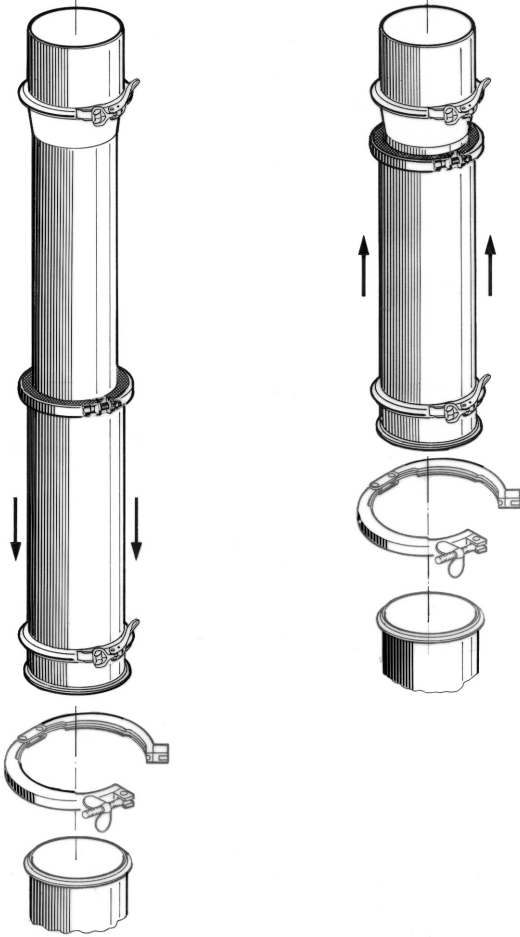


Dosing and Filling System INDOSA TR2

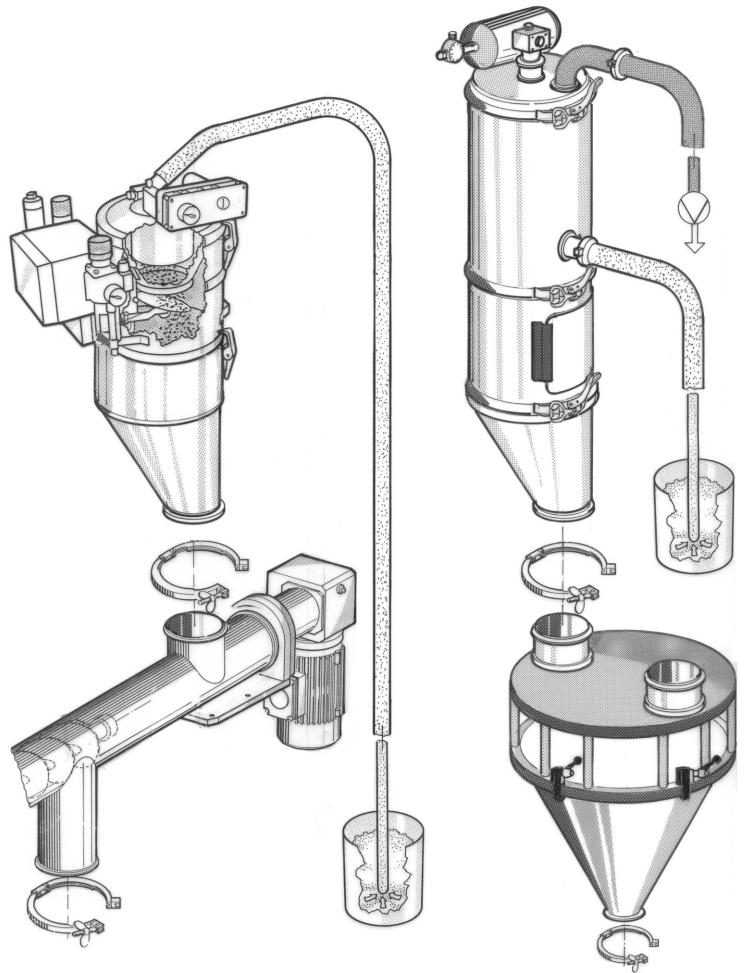
Auger filler ⇒ Outlet connection piece, dust removing device, cut-off flaps

Dosing and Filling System INDOSA TR2

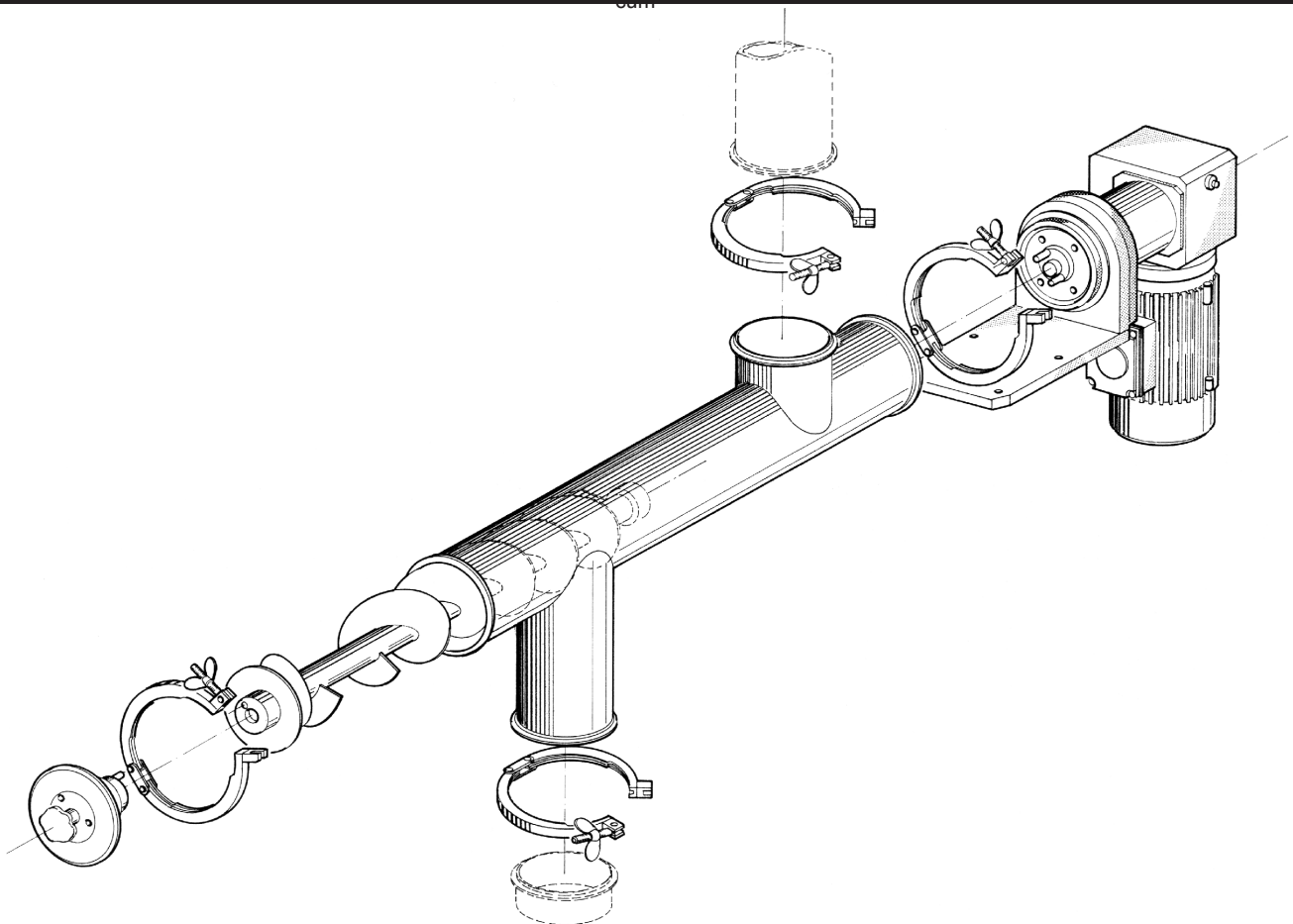
Auger filler ⇒ auger with spinner disk



Dosing and Filling System INDOSA TR2
 Product feeding ⇒ Inlet tube movable by telescope



Dosing and Filling System INDOSA TR2
 Product feeding ⇒ Product transport device with air transport and vacuum



Dosing and Filling System INDOSA TR2
 Product feeding ⇒ horizontal feeding auger



INDOSA as partner for the manufacture of gassed milk powder cans

INDOSA is the only company in the world manufacturing filling machines for milk powder, transportation systems for cans, seaming machines for cans as well as classical and also most modern evacuating and gassing systems.

INDOSA can deliver everything out of one hand and give extensive consultancy and explanation of all systems. With INDOSA you can verify your arguments most accurately.

For a complex line, it is important that all technologies and components are perfectly adapted to each other, so that a smooth production performance without annoyance and problems can be guaranteed.

INDOSA can, however, also complement by inclusion of existing lines. When arranging different single systems, it is doubly important to hand the responsibility for a total concept over to a company with extensive experience and expert knowledge.

Experience of decades with different vacuum systems

INDOSA has an experience of decades both in classical pre-clinching machines, vacuum chambers and seaming machines and also in one- or more-chucked vacuum seaming machines. INDOSA can still nowadays also supply the classical technologies for certain applications. For new investments in certain capacity ranges, it is today, however, almost unavoidable to utilize the latest technologies and the INDOSA future-promising technique.

New procedure for capacity increase

With the **proVAC** system INDOSA has developed a completely new procedure to enlarge the evacuation speed without having the product sucked out of the can. This procedure - for which INDOSA applied for a patent - is world-wide unique, and there are hardly no comparable alternatives.

INDOSA vacuum seaming machines are the latest result of a development of decades as far as vacuum technique is concerned.

Decisive advantages with INDOSA systems

Safety and overview of the process

Filled cans run directly into one or several vacuum seaming machines via a conveyor. **Each single can** is evacuated, gassed and seamed in a machine in the closed vacuum chamber in a **separate process**. The vacuum chamber of each seaming machine only opens again when the programmed data for vacuum and gas pressure are achieved and the can is closed tightly. Thus it is secured that errors in the process are excluded and thereby the requested rest oxygen content in each can is attained.

Cleanliness by automatic cleaning

The vacuum chambers of the seaming machines are automatically cleaned of possible milk powder residues and sucked out after each process. This way nothing can happen even then when small quantities of milk powder dust come out of the can during evacuating.

Examination of the finished, gassed cans: SCS (Single Can Security)

With **INDOSA proVAC system** it is possible to gas each can in the chamber with a defined pressure (e.g. 850 mbar) and to seam afterwards. With the generated defined pressure (e.g. relative underpressure to the surrounding atmosphere) in the final-seamed can, it can later be found out at any time whether the can has been correctly evacuated and gassed and is still gastight. The checking can be used directly after the seaming and also at any time later, as the internal pressure of the can differs from the normal external pressure of the atmosphere. The examination can be carried out very simply for single cans or in series with high speed without destruction of the can (different height levels of the sound during knocking of the can due to varying own frequency). This examination is not possible for cans that have been evacuated and gassed with the traditional chamber system.

Great savings with inert gas by minimal gas consumption

Each can is gassed in the own vacuum chamber. Thereby it is possible to adapt the vacuum bells exactly to the cans. The vacuum bells are only a few millimetres bigger than the cans resulting in a very economic gas consumption. The savings in gas costs are enormous, as many times less gas is needed than with other systems.

Simple switch over to other can sizes

INDOSA vacuum seaming machines are easy to adapt to other can sizes. Other can heights are only adjusted at a crank. Other can diameters can be adjusted by simple exchange of a few, specially coloured and clearly marked parts. This is essential in order to grant the safety of the process, and that after switching over to other can formats, also the first can already is again perfectly processed.

Maintenance-free

Further great advantages are unique with INDOSA: The whole line is completely maintenance-free, very easy to operate and requires no special maintenance measures. Thus the service life is designed for decades.

Future-oriented, flexible total concept

Also for the future, this line is designed correctly, as it can easily, simply and inexpensively be adapted to coming developments and requirements. Both the filling capacity and also the capacity of the vacuum and seaming machines can be increased separately by additional components.

Usable as "normal automatic seaming machine" with high performance

After respective switching over at a key-operated switch, the vacuum seaming machine can be used as normal quick can seaming machine (without vacuum). The machine then corresponds with a "normal can seaming machine" and is neither as far as outlook capacity is concerned, nor in terms of tool set costs to distinguish from a usual automatic INDOSA can seaming machine.



The World's No. 1 in Can Machinery

Fully automatic with the proven proVac

1.0 Can Cleaning & Sanitizing

- 1.1 Can Turning Device for internal can cleaning of the empty cans with ionized and treated air
- 1.2 UV-tunnel for can sanitising
- 1.3 central dust collection system

3.0 Filling Machine for Milk Powder

- 3.1 dosing system with vertical auger feeder and agitator
- 3.2 double filling station with lifting tables and vibrators
- 3.3 dust collection system with dust separator

2.0 Spoon Dispenser

- 2.1 automatic feeding over feeding channel

5.0 Check Weighing System for filled cans

- 5.1 Feedback control for the auger filler
- 5.2 Output device for failed weighted cans
- 5.3 Statistic program with interface

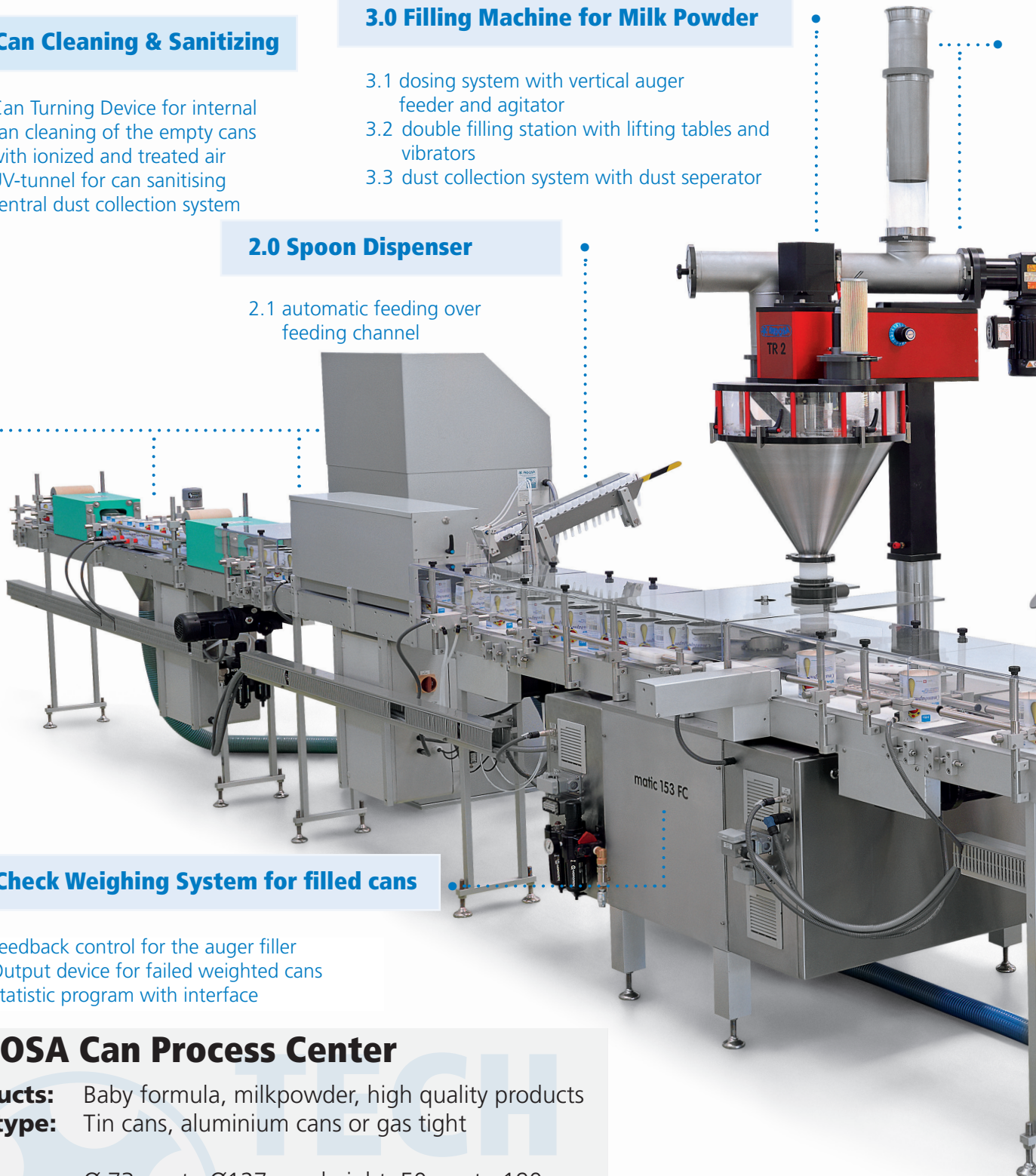
INDOSA Can Process Center

Products: Baby formula, milkpowder, high quality products
Can type: Tin cans, aluminium cans or gas tight

Can range: Ø 73mm to Ø127mm, height: 50mm to 190mm

Technology: Evacuating of the cans with less than 1% residual oxygen
 Gassing with N2 or CO2 to a underpressure level of 850mbar (other values adjustable)

Capacity: 20-25 cans/min (depending on product)



can filling and seaming process line system for milkpowder and baby formula

4.0 Product Feeding System

- 4.1 product inlet from hopper or conveyor
- 4.2 horizontal auger feeder for outlet hopper
- 4.3 proportional levelling control

6.0 HMI-Interface

- 6.1 touchpanel with USB-Connectivity and advanced statistics

7.0 Can process center with 3 seaming heads

- 7.1 programming for each seaming head for evacuating and gassing
- 7.2 under- or overpressure gassing
- 7.3 Single Can Security (SCS) for each can
- 7.4 conveyor splitting and merging

8.0 process optimization

- 8.1 „Yellow Valve“ vacuum control
- 8.2 „Red Box“ vacuum chamber measurement system





The World's No. 1 in Can Machinery

INDOSA proVac-System

Line for Filling, Evacuating, Gasifying and Seaming of Cans with Milk Powder

3.0 Spoon Dispenser

- 3.1 Vibrator pot for the position-specific feeding and sorting of the spoons
- 3.2 Storage hopper for the spoons

4.0 Product Feeding System

- 4.1 Product inlet from hopper or conveyor
- 4.2 Horizontal auger feeder for outlet hopper
- 4.3 Proportional levelling control

7.0 Vacuum Can Seaming System with 9 Heads

- 7.1 Programming for each seaming head for evacuating and gassing
- 7.2 Under- or overpressure gassing
- 7.3 Single Can Security (SCS) for each can
- 7.4 Conveyor splitting and merging

1.0 Depalletiser for empty cans

- 1.1 Transference plate with lift and built-on roller conveyor
- 1.2 Infeed conveyor with rotary table and outlet conveyor

2.0 Can cleaning & sanitising

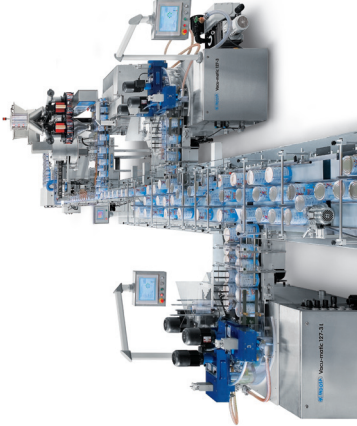
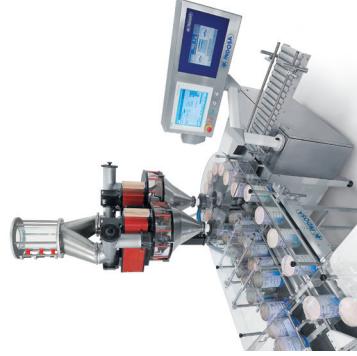
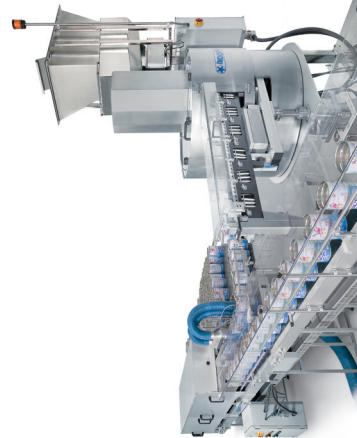
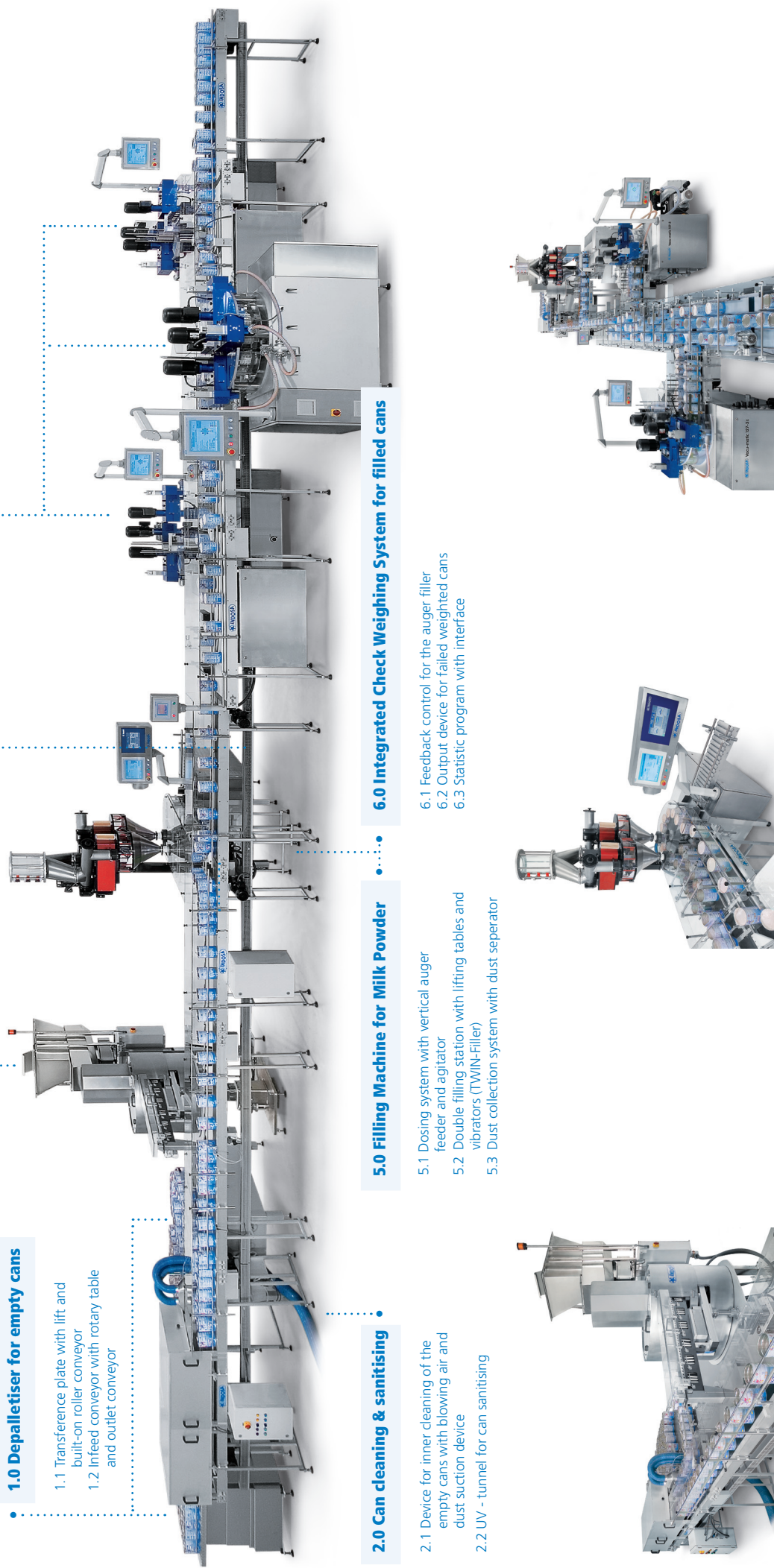
- 2.1 Device for inner cleaning of the empty cans with blowing air and dust suction device
- 2.2 UV - tunnel for can sanitising

5.0 Filling Machine for Milk Powder

- 5.1 Dosing system with vertical auger feeder and agitator
- 5.2 Double filling station with lifting tables and vibrators (TWIN-Filler)
- 5.3 Dust collection system with dust separator

6.0 Integrated Check Weighing System for filled cans

- 6.1 Feedback control for the auger filler
- 6.2 Output device for failed weighted cans
- 6.3 Statistic program with interface





Line for Filling, Evacuating, Gasifying and Seaming of Cans with Milk Powder / Baby-Formula ($\varnothing < 200\text{mm}$)

CanFeeding System

- Accumulation and buffering table for empty cans
- Rotary table feeder for separating empty cans in one lane

Product Feeding System

- Product inlet connection from hopper or conveyor
- Inlet tube moveable by telescope
- Horizontal auger feeder for outlet funnel
- Level control into outlet funnel

Spoon Spending Device

- Device for dropping a spoon in each can before filling
- Vibrator channel for the position specific feeding of spoons
- Hopper and sorting funnel for spoon orienting and feeding
- Storage hopper for spoons

Dust Collection System

- Product dust collector with distributor
- Dust separator for cleaning system
- Dust separator for auger filler
- Dust separator for vacuum machine

Can Cleaning System

- Device for inner cleaning of cans with blowing air and exhausted device
- UV-tunnel for can sterilizing

Central Control Box

- Central box for controlling the power and air of the complete line

Filling System for Milk Powder

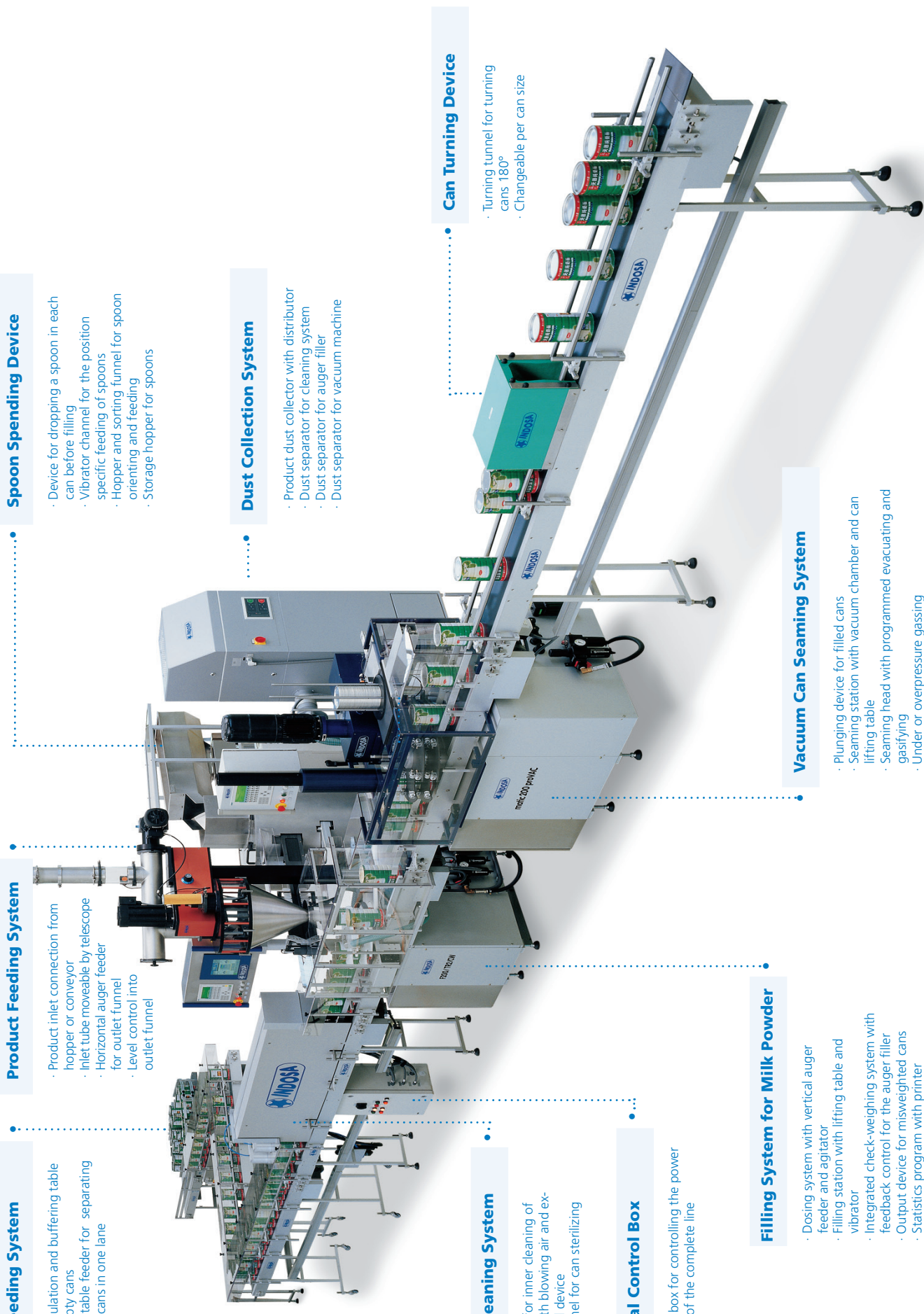
- Dosing system with vertical auger feeder and agitator
- Filling station with lifting table and vibrator
- Integrated check-weighing system with feedback control for the auger filler
- Output device for misweighted cans
- Statistics program with printer

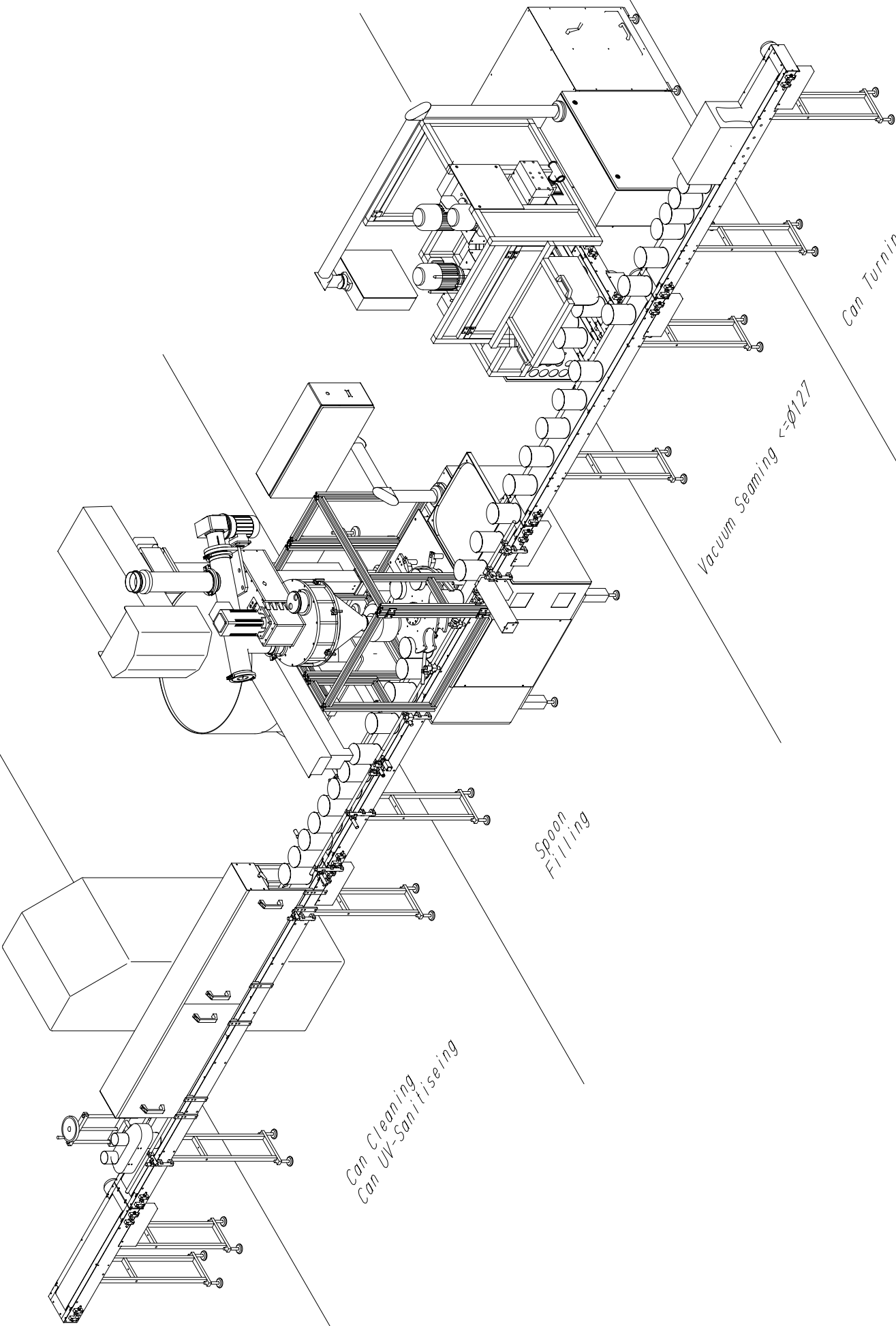
Vacuum Can Seaming System

- Plunging device for filled cans
- Seaming station with vacuum chamber and can lifting table
- Seaming head with programmed evacuating and gasifying
- Under or overpressure gassing

Can Turning Device

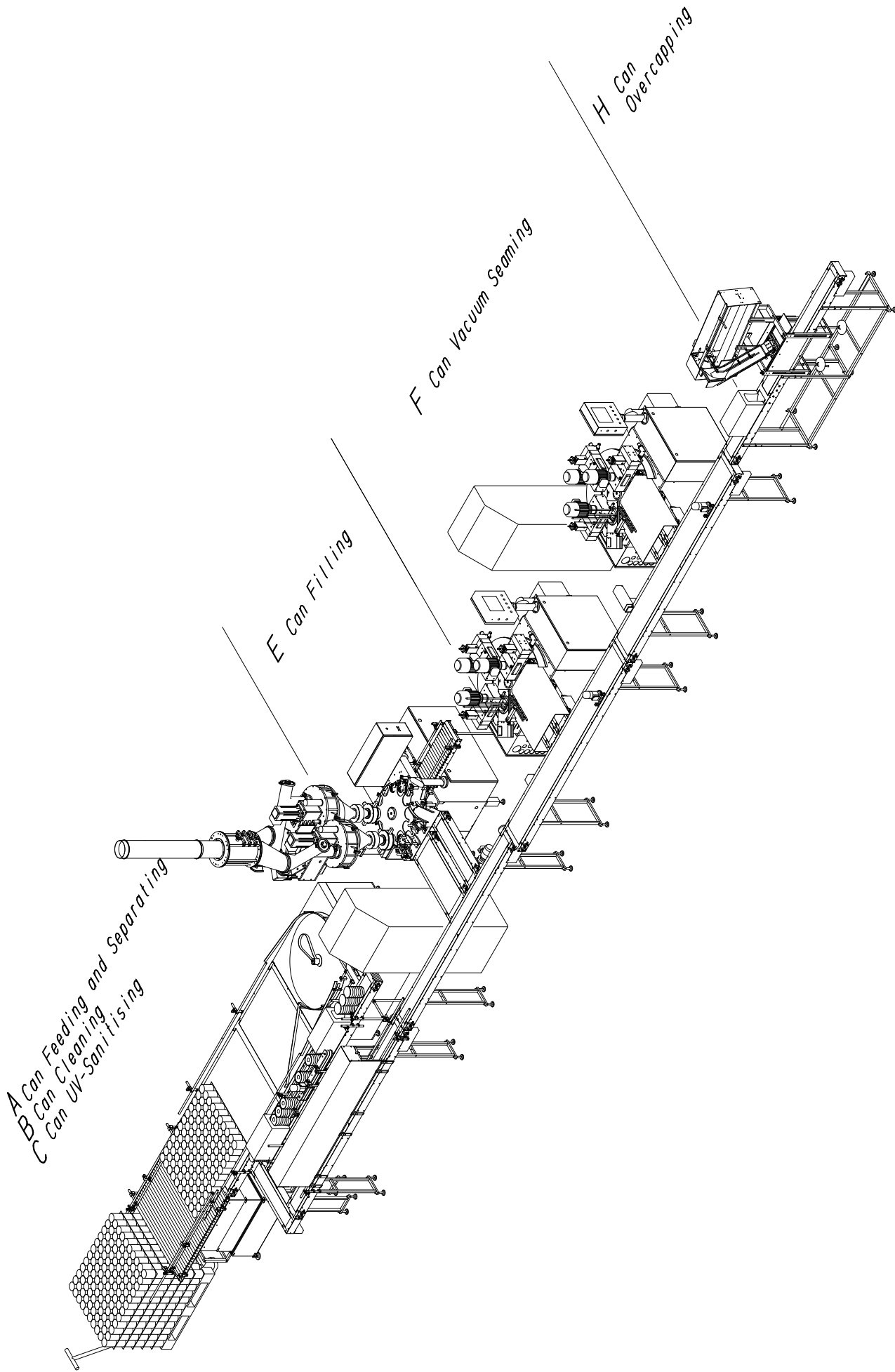
- Turning tunnel for turning cans 180°
- Changeable per can size




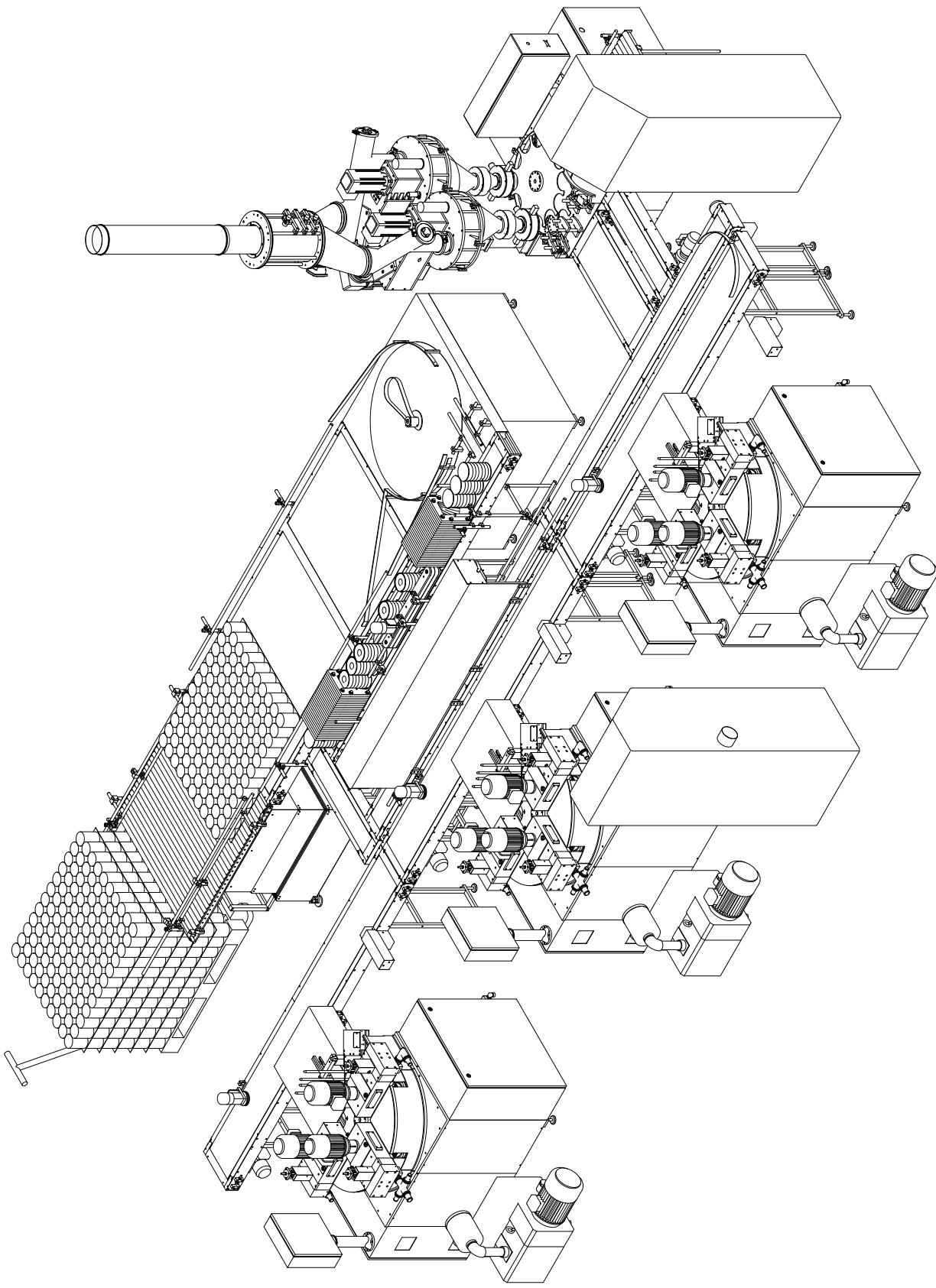


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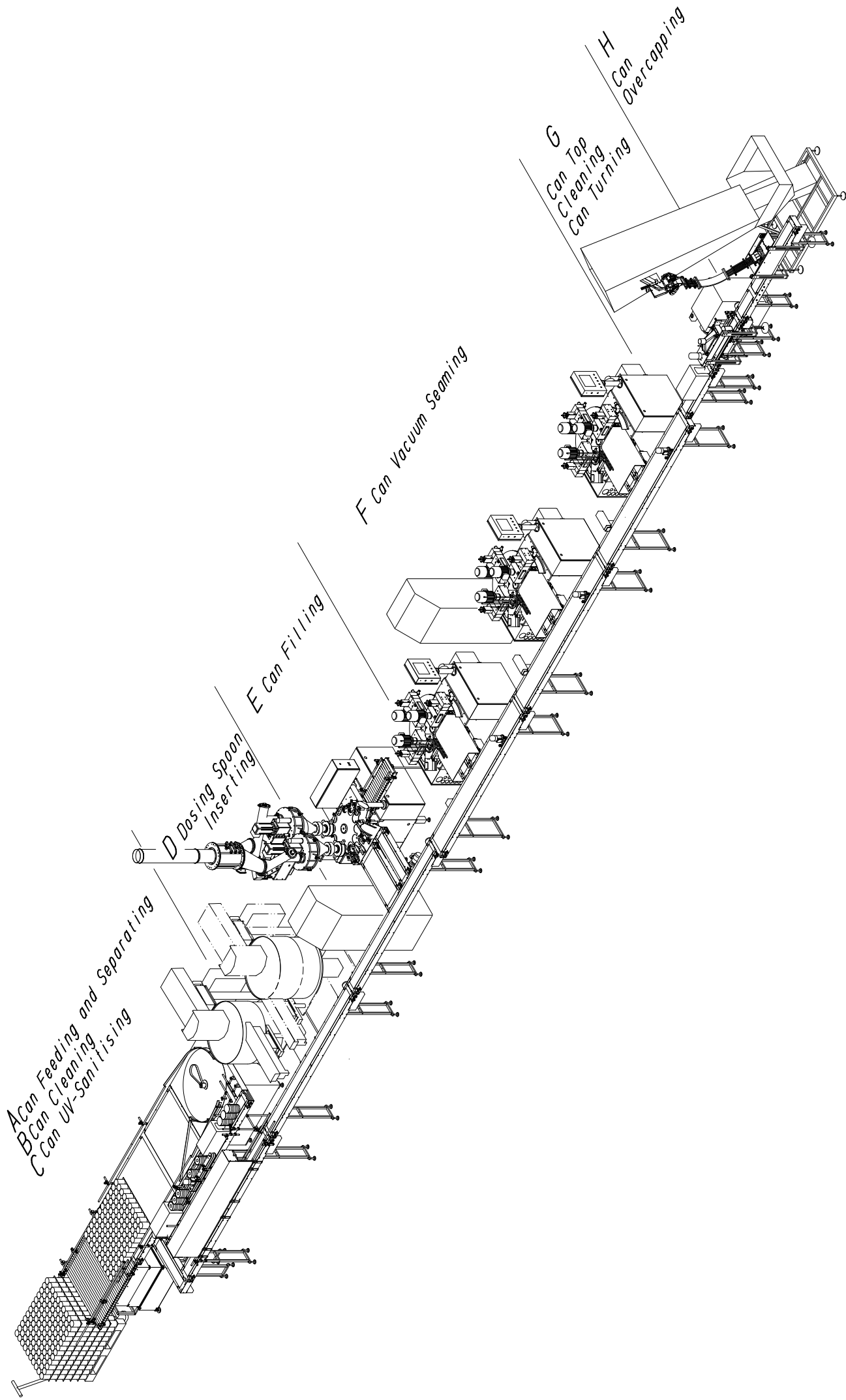



INDOSA pro/vac 127	A-Nr.	Gezeichnet	26.03.2007	ml
Milk powder can line 55-60 cpm	U-Nr.	Geprüft		
NAL ZT DIR UV mF127Twin 2pV127-3 MRA153	Kunde			
 Grabher INDOSA-Maschinenbau AG CH-9134 Au (S), Gaierten, Switzerland		461 002 241		



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A-Nr.	Gezeichnet	
	U-Nr.	
	Kunde	
MAL ZT DIR UV mF127Twin		
 Grabher INDOSA-Maschinenbau AG CH-9034 Au (St. Gallen), Switzerland		461 002 193



INDOSA pro/vac 127		A-Nr.	Gezeichnet	27.03.2007	m
Milk powder can line 60-80 cpm		U-Nr.	Geprüft		
MAL, ZT, DFR, UV, mF127Twin, 3pV127-3, CTC, SF18L		Kunde			
 Grabher INDOSA-Maschinenbau AG CH-9434 Au (S), Gaierten, Switzerland		461 002 231			