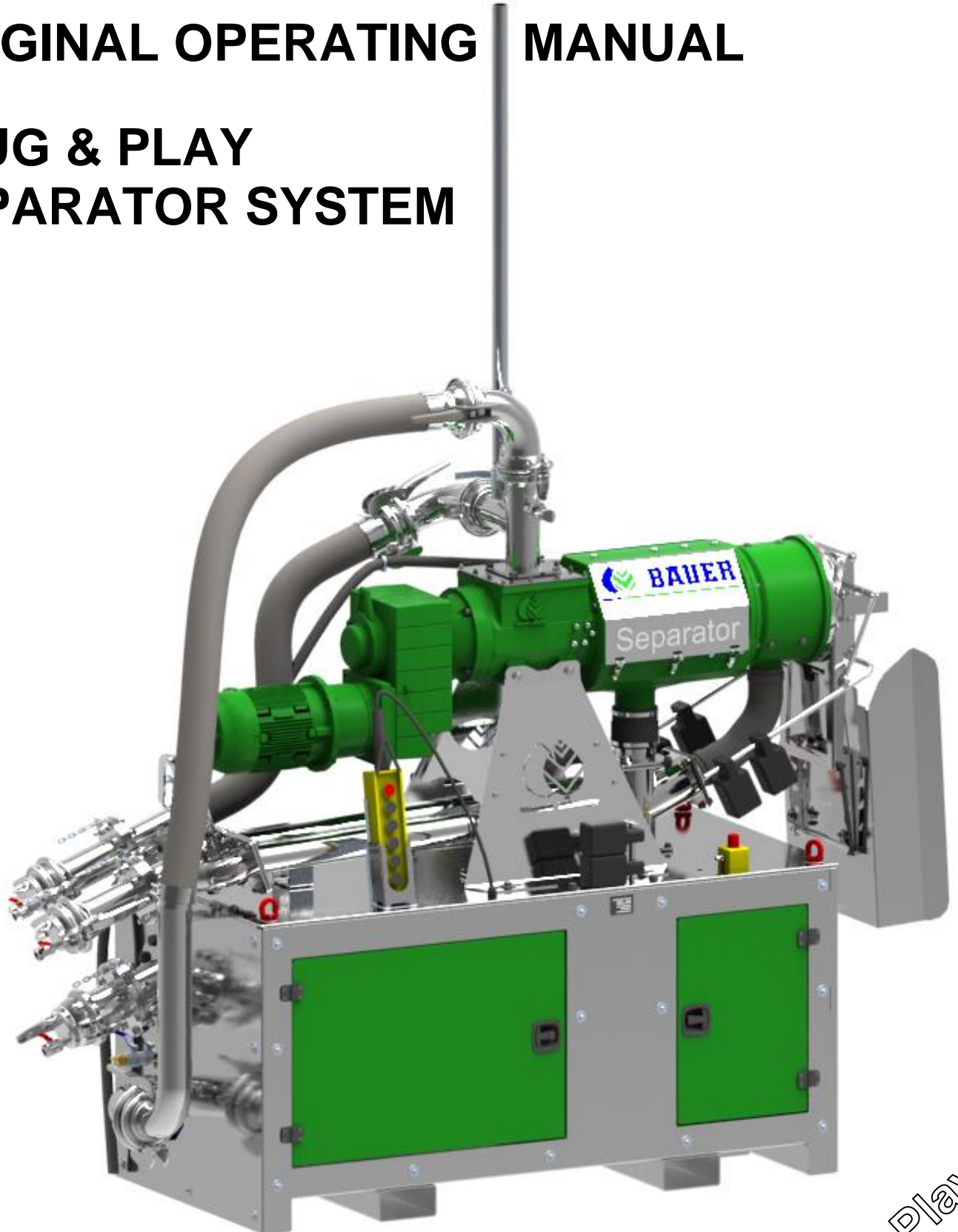




BAUER

FOR A GREEN WORLD

ORIGINAL OPERATING MANUAL FOR PLUG & PLAY SEPARATOR SYSTEM



Version: I- 2020

Plug & Play
E

Thank you for buying a **BAUER PLUG & PLAY Separator System!**

This **operating manual** is an important document that describes how to operate and maintain the **BAUER PLUG & PLAY Separator System**.

All information contained in this manual is based on the latest product details available at the time of printing. If you need still more information, please ask your dealer or contact the **BAUER** company directly.

Please note that the content of this manual neither constitutes part of nor alters in any way any previous or existing agreement, promise or legal relationship. **BAUER's** obligations are based solely on the respective purchase contract, which also contains the complete and only valid warranty agreement. Said contractual warranty is neither extended nor limited by the content of this manual.


The **BAUER Plug & Play Separator System** is designed for safe and reliable operation provided it is operated in accordance with this operating manual.


Therefore, please carefully read this operating manual and the manuals for the included components such as the **BAUER** separator, **BAUER** helix pump, discharge pump and the description of the control before starting up the **BAUER Plug & Play Separator System!** Strictly observe all instructions pertaining to system handling, operation and service!

On this condition, the **BAUER Plug & Play Separator System** will operate to your satisfaction for many years.

The content of this operating manual is the intellectual property of the company **BAUER GmbH** and/or its supplier companies. The available information may only be used in connection with the creation of specification-compliant documents in the course of an order from the **BAUER** Company. Without express written permission from the **BAUER** Company, no reproduction or sharing of this operating manual is permitted, even in excerpts. The **BAUER** Company reserves the right to make changes at any time without notice and without assuming any liability!

In the interests of a clearer presentation and due to the large number of possibilities, this operating manual does not contain all detailed information and, in particular, cannot address every conceivable operating and maintenance situation.

<p>WARNING</p> 	<p>Failure to follow this manual may cause personal injury or damage the equipment!</p>
---	--

<p>NOTE</p> 	<p>This manual is to be considered an integral part of BAUER Plug & Play Separator System. Suppliers of both new and used systems are advised to put down in writing that they delivered the manual together with the system.</p>
--	--

Please make this manual available to your staff. Please state the pump type and serial number of your **BAUER Plug & Play Separator System** and its components in all inquiries, correspondence, warranty claims or parts orders.

We wish you great success with your BAUER Plug & Play Separator System!



PRODUCT DETAILS

Type designation: Plug & Play Separator System

Serial number¹ Plug & Play: _____

Type and serial number Plug & Play Components:

Separator: S655 or S855 _____

Feed pump: Helix Drive 554 _____

Discharge pump: B70VBVGM C _____

Dealer: Name: _____

Address: _____

Tel. / fax: _____

Shipping date: _____

Producer of the machine: Röhren- und Pumpenwerk **BAUER** GmbH.
Kowaldstraße 2
A - 8570 Voitsberg
Tel.: +43 3142 200 - 0
Fax: +43 3142 200 -320 /-340
Email: sales@bauer-at.com
www.bauer-at.com

Owner or operator: Name: _____

Address: _____

Tel. / fax: _____

Note: Make a note of the type designations and serial numbers of your Plug & Play Separator System, its components and accessories! Include these numbers along with all contact with your dealer.

¹ It is very important to include with all guarantee claims and all correspondence related with this machine the entire serial number group, including all letters, both for the machine and for its relevant components. This point cannot be stressed enough.



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1 GENERAL SAFETY INSTRUCTIONS

This operating manual contains important information that must be observed during setup, operation and maintenance. For this reason, it must always be read and observed very carefully by the installation technician as well as the qualified personnel. It must always be available at the usage location of the machine.

If the installation and maintenance of the system are not carried out according to the operating manual, all claims with respect to defects become void.

The customer is responsible for the proper setup of all equipment. Read the instructions before assembling or installing the machine. Promised performance characteristics of the machine and the add-on components as well as the fulfillment of any warranty claims are dependent on compliance with these instructions.




The CE mark applied by the manufacturer documents the machine's conformity with the provisions of the Machinery Directive and with other pertinent EC directives.

1.1 Warnings and Symbols

The following notes and warnings are used in this operating manual for especially important instructions:

DANGER 	Information, requirements or prohibitions to protect against serious injury or property damage.
---	--

WARNING 	Special information on preventing minor injuries or requirements and prohibitions to prevent damage to the machine.
---	--

NOTE 	Special instructions to simplify working with the machine or to aid in efficient use of the machine.
--	---

To prevent malfunctions that could directly or indirectly result in serious injuries or property damage, it is equally important to comply with any other instructions concerning transport, assembly, operation and maintenance as well as reference data (in the operating manual, the product documentation or on the equipment itself).

1.2 Duty to Furnish Information

When passing the machine on to a new owner, the customer is obliged also to hand over the operating manual to the new owner. The recipient of the machine must be instructed with reference to the mentioned regulations.

Should you encounter difficulties in understanding this manual or other instruction, contact the respective dealer or the BAUER Company for any necessary clarifications.

1.3 Product Liability

According to the Product Liability Act, every farmer is an entrepreneur!

In accordance with Section 9 PHG (Product Liability Act), liability for damage to physical property caused by defective products is expressly excluded. This exclusion of liability also applies to parts not manufactured by BAUER itself but purchased from external suppliers.

1.4 Qualified Operators

These are persons who on behalf of their training, experience and instruction as well as their knowledge of relevant standards, rules, precautions to be taken for accident prevention, and prevailing operating conditions, have been authorized by the person in charge of plant safety to perform the respective tasks required, and in doing so are able to recognize and avoid potential hazards. The statutory minimum age for the operating and maintenance personnel must be observed. Among other things, knowledge of first aid procedures is also required.

1.5 Intended Use

- The BAUER Plug & Play Separator System is intended exclusively for solid-liquid separation in agriculture, industry and biogas systems (intended use).
- Any use of the machine beyond this intended use is considered non-conforming. The manufacturer is not liable for damage resulting from such non-conforming use, the sole liability for damage from non-conforming use lies with the user.
- Intended use also includes compliance with manufacturer's operating, maintenance and service instructions.
- The BAUER Plug & Play Separator System may be used and operated only by persons who are familiar with the system and aware of the hazards involved.
- All relevant rules for accident prevention as well as any other generally accepted rules and regulations relating to safety, occupational medicine and traffic laws must be strictly observed.
- Unauthorized modifications to the machine release the manufacturer from liability for damage resulting from such modifications.

1.6 Unauthorized Modification and Manufacture of Replacement Parts

Modifications or alterations to the machine are only permitted after consultation with the manufacturer. Original replacement parts and authorized accessories from the manufacturer serve the interests of safety. The use of other parts voids the manufacturer's liability for any resulting damage.

The replacement parts used must correspond to the technical requirements established by the manufacturer of the system. The replacement and wearing parts delivered with the machine or via subsequent orders satisfy this condition.

1.7 Disposal

The machine must be disposed of according to the local disposal regulations.

The user must ensure safe and environmentally friendly disposal of operating materials and ancillary materials as well as replaced parts. Dispose of oil, grease, and filters in accordance with regulations!



2 GENERAL INSTRUCTIONS FOR SAFETY AND ACCIDENT PREVENTION

**WARNING****Check the operational safety of the machine before every startup!**

- All regulations of public authorities that apply to the operation and maintenance of the system must be strictly observed.
- In addition to the operating manual, all generally applicable statutory and otherwise mandatory regulations on accident prevention and environmental protection must be separately prescribed and observed.
Such obligations may concern, for instance, the handling of hazardous substances, the provision and wearing of personal protective gear or traffic and road safety regulations.
- The operating manual should be extended with the instructions for taking into account special operating conditions, such as with regard to the work organization, work processes and the active personnel. The supervisory and reporting obligations of the operator must also be clearly regulated.
- To ensure your safety and the safety of your employees, every person who is responsible for operating the system must also be familiar with these obligations. It is too late for this when the system is already running!
- The personnel assigned to operating the plant must have read the operating manual and in particular the section “General Instructions for Safety and Accident Prevention” before starting work.
- Every person must be aware of the safety measures that must be complied with during work on electro-mechanical components and machines.
- Only trained personnel may enter the hazard zone of the machine.
- Only trained personnel may be assigned to work with the machine. The respective competencies of the personnel for the operation, setup, maintenance and repair of the machine must be clearly defined. It must also be ensured that only appropriately authorized personnel work on the system.
- Personnel, who are being trained, taught, instructed or are participating in a general training program may only work on the system under the constant supervision of a person experienced in operation of the system.
- The safety- and risk-conscious work by the personnel in compliance with the operating manual must be checked at least at certain intervals.
- The personnel assigned to operate the machine may not have:
 - ⇒ Exposed long hair
 - ⇒ Loose clothing
 - ⇒ Jewelry, including rings and drop earringsSuch items could get stuck and/or drawn into the machine, resulting in possible injuries.
- The operating personnel of the system must be familiarized with the fire alarm and fire-fighting options.
- The wearing of personal protective gear such as hearing protection, safety glasses, safety shoes, etc. during operation of the system must be required by means of rules or regulations.
- All safety information and warnings present on the system must be pointed out, and these must be kept on the system in a clearly visible and legible condition.
- In event of safety-relevant changes to the system or its operating behavior, the system must be immediately shut down and the fault must be reported to the competent person or office.
- Replace pipelines and hoses in the specified or otherwise reasonable intervals, even if no operationally relevant defect is discernible.
- Intervals that are required or specified in the operating manual for regular daily, weekly and monthly inspections and tests must be complied with. Appropriate tools and equipment must be kept available for the performance of such work.
- Any potentially unsafe work on the machine must be avoided. The system may only be used in accordance with its intended use. All necessary measures must be taken to ensure that the system is only operated in a safe and fully functional condition.
- The system may only be started up if all protective and safety-related features are fully functional. This includes the fact that all removable protective features, **EMERGENCY OFF** buttons and covers must be present and functional.
- The system must be inspected for externally identifiable defects before it is started up each time. Any changes that occur, including changes to the operating behavior and functional disruptions, must be immediately reported to the competent party. The system must be immediately shut down and secured.

- If the following damage or malfunctions are discovered on the machine, operation of the machine must be stopped immediately.
 - ⇒ Defects, damage or cracks on the load-bearing parts, bearings, hydraulic components or safety equipment
 - ⇒ Damage to electrical cables
 - ⇒ Unusual noises
 - ⇒ Unusually fast or slow movements on the machine
 - ⇒ Errors in the operation or control of the machine
 - ⇒ Leaks on hoses, valves or the machine itself
- Procedures for switching the machine on and off as well as inspection of the control indicators must be carried out as described in the operating manual.
- Before switching on or starting up the machine, it must be ensured that no one will be endangered by the starting up of the machine.
- The correct functioning of the control must be checked before the start of work. Before startup, all tools and assembly aids must be stored safely to prevent accidents.
- The maintenance, configuration and inspection intervals specified in the operating manual must be complied with. The specified intervals are maximum deadlines and may not be exceeded. Such work as well as the replacement of components may only be performed by qualified personnel.
- During transport of the Plug & Play Separator System, measures must be taken to ensure sufficient securing of the transport area.
- The required switch-on and switch-off procedures according to the operating manual and the instructions for maintenance work must be observed during all work involving the operation, production adaptation, conversion or configuration of the system and its safety-related features as well as all work involving inspection, maintenance and repair.
- The operating personnel must be informed of special work, repair work or conversion work in a timely fashion prior to starting the work. A supervisor must always be appointed during the performance of such work.
- The work area must be blocked off and secured by a wide margin during such work, if necessary. Unauthorized persons must be prevented from entering.
- As a rule, maintenance and cleaning work as well as repairs of malfunctions may take place only with the drive switched off and the motor at rest (switch off and lock the main switch or disconnect the supply of electricity).
- Watch out for the unexpected starting of the system.
- It must be noted that a pressed EMERGENCY OFF button does not provide any protection against unauthorized starting of the machine.
- During disassembly and assembly, large individual parts and entire assemblies must be carefully fastened and secured to lifting equipment. Only suitable lifting equipment and load handling devices with sufficient carrying capacity and no technical operating defects may be used. Standing or working under suspended loads is not permitted. Grips, steps, railings, landings, platforms and ladders must be cleaned of oil, dirt, snow and ice before all activity on the system.
- Securing of personnel with suitable supporting elements is required during all maintenance work on an elevated system.
- During assembly work above head height, climbing aids and work platforms intended for such work or specially adapted for purposes of safety must be used. Never use system components as climbing aids. The system and, in particular, connections and bolt connections must be cleaned of oil, grease or care agents prior to the start of maintenance or repair work. No aggressive cleaning agents may be used. Only fiber-free cleaning cloths may be used.
- Before cleaning the system with water, steam, high-pressure cleaners or other cleaning aids, cover / tape over all openings into which no water, steam or cleaning agents may enter for safety and/or functional reasons. Electric motors and electronic switch cabinets are at particular risk. After cleaning, the applied covers / tape must be completely removed again.
- Wear appropriate protective gear to protect against flying particles while cleaning with compressed air or steam jets.



- After cleaning, all gear oil and media lines as well as all electrical connections must be inspected for leaks, loosened connections, abrasions and damage. Identified defects must be corrected immediately.
- The bolt connections loosened during maintenance and repair work must be tightened again. Observe the required tightening torques.
- If it is necessary to remove safety features during maintenance, setup or repair, the safety equipment must be re-installed and inspected immediately after completion of the work.
- Do not start the machine unless all guards and safety devices are mounted completely and in proper working position!
- Protective caps and covers may not be removed.
- The stickers affixed to the device with safety and warning signs provide important instructions for safe operation; following these instructions is intended to keep you safe! These may not be removed.
- Check the proper seat of nuts and bolts regularly, and tighten them, if needed!
- When replacing operating elements with blades, use a suitable tool and wear gloves.
- The system is electrically operated. Take special care when performing work in the area of electrically operated system components.
- Maintain the minimum distances with respect to electrical lines. Otherwise, the electricity must be switched off or the work area restricted.
- Keep a sufficient distance to electrical cables; if this is not possible, the electricity supply must be interrupted or the work area restricted.
- Distance to 1,000 volt lines: at least 1 meter.
- Work on electrical and electronic components of the system may only be performed by a trained electrician or otherwise appropriately trained personnel under the guidance and supervision of a trained electrician in accordance with the applicable electrical and electronic regulations.
- With regard to an ATEX 95 zone 22 certification, see the special remarks.
- Never touch rotating or moving parts of the machines with hands or feet.
- Never reach with hands, tools or other parts into the inflow or hopper in the area of the screw while the machine is running.
- In handling slurry, always remember that the gases produced by the slurry are highly toxic and explosive in combination with oxygen. Open flame, light checks, spark creation and smoking are therefore prohibited!
- When using the retention or alternating retention method, special care must be taken in the area of the opened sliding gates to the pre-pool before the main tank or to cross channels due to the formation of gases. In addition, special care is required at stirring and withdrawal points while the stirring machines or pumps are active.
- Keep the machine clean to decrease the risk of fire.
- Always ensure sufficient ventilation when working with slurry.
- When working with biologically active materials in connection with the BAUER Plug & Play Separator System or connected components, the decomposition of these materials can lead to the production of life-threatening gases, especially in enclosed spaces. Always ensure sufficient supply and exhaust ventilation and/or appropriate protective clothing before entering such areas.

DANGER

In addition to the mechanical dangers of moving parts or parts under pressure, the operation of slurry handling machines also poses risks in connection with gases produced by liquid manure. These gases (carbon dioxide CO₂, ammonia NH₃, hydrogen sulfide H₂S, methane CH₄) can result in poisoning as well as explosions.

Especially when operating mixers, stirring machines, recirculation systems, pipe nozzles and slurry aeration systems, care must be taken that no gases can flow into the barn from exterior tanks or containers (install siphons or sliders).

Sufficient forced ventilation of the barn area must be ensured while handling slurry in the barn area.

3 FUNCTION DESCRIPTION

The BAUER Plug & Play Separator System is a compact mobile separation unit with all components installed within a minimal space in order that these can be transported quickly and easily to another location. It serves for separating pump able slurry (solid-liquid mixtures with relatively low solid matter content and no foreign bodies such as metal parts, stones, wood or rags) into solid and liquid (thin slurry, effluent) fractions. As a compact device, it contains the following components: separator, eccentric screw pump as feed pump, rotary discharge pump and electronic control mounted to a stable frame with forklift-compatible features. The individual components are optimally integrated into the design for guaranteed stability and a long lifespan. The BAUER Plug & Play Separator System is designed for sustained operation outdoors. It operates unimpaired in a temperature range of 0 to +40°C; in event of freezing temperatures, it must be ensured that the separator, feed pump and discharge pump as well as all pipelines are cleaned completely each time before being taken out of operation.

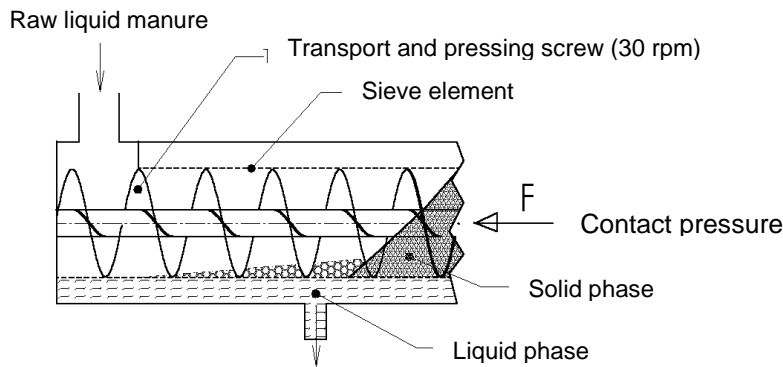


Figure 1 function description

The eccentric screw pump is controlled by a pressure sensor and feeds the slurry to the separator. In the inflow area of the separator, the mixture is drained of water via gravity inside the sieve. The interior screw transports the pre-drained material horizontally toward the solid outlet. Along the last section of the transport path, the screw presses out additional liquid, which escapes the separator through the sieve without pressure as thin slurry.

The required contact pressure is applied to the escaping solid by a system consisting of a cap loaded by a weighted lever. The liquid phase can be transported into a lagoon or elevated tank, for example, using the available clear flow pump.

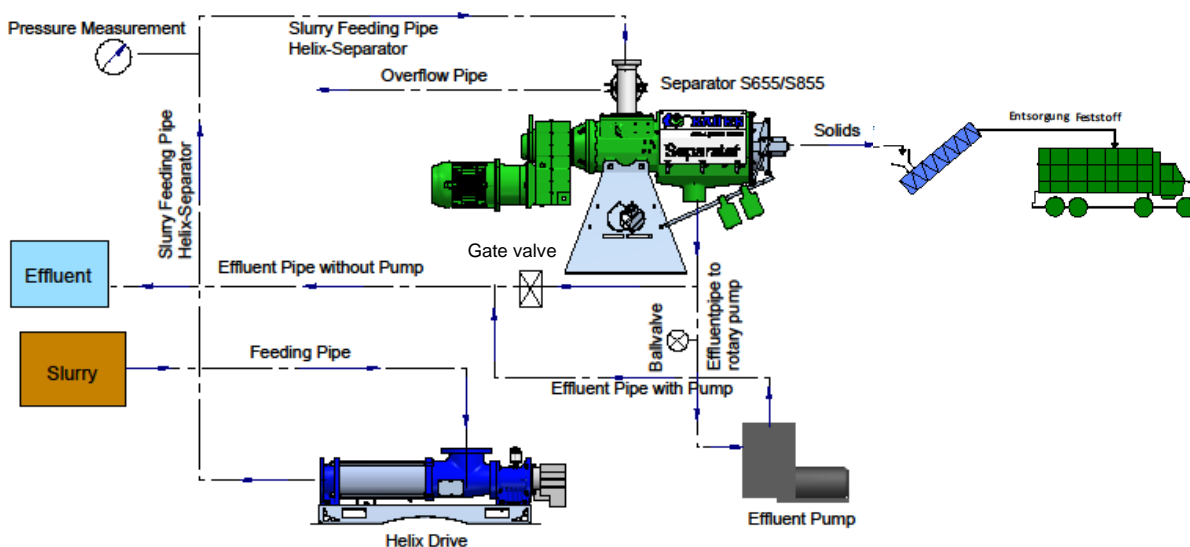


Figure 2 plug & play diagram



4 SETUP OF THE PLUG & PLAY SEPARATOR SYSTEM

4.1 Condition of the BAUER Plug & Play Separator System upon Delivery

The BAUER Plug & Play Separator System was developed by BAUER GmbH. It is delivered as a complete unit (separator, feed and discharge pumps, incl. pipelines and control).

You must connect the switch cabinet to the electrical supply. Connecting the system to the feed or clear flow line using the supplied hoses, if included, completes the installation of the Plug & Play Separator System.

DANGER

Work on electrical and electronic components of the system may only be performed by a trained electrician or otherwise appropriately trained personnel under the guidance and supervision of a trained electrician in accordance with the applicable electrical and electronic regulations.

4.2 Required Tools

Special tools are not required for setting up the Plug & Play Separator System. Standard assembly and electrical tools are required for assembly, setup and disassembly.

4.3 Transport

**WARNING**

Improper transport could cause the device to fall or tip. Severe injuries could result!

The customer must check based on the dimensions and weight of the Plug & Play Separator System whether the available lifting equipment (forklift or crane, with corresponding belts or chains) is sufficient for setting up the Plug & Play Separator System.

**WARNING**

The Plug & Play Separator System may only be lifted as follows:

- **By forklift: At the provided lifting points (2x) for forklift forks**

The following points must also be taken into account:

- The feed pump and discharge pump as well as all lines should be pumped empty.
- Move the slide plate to the transport position (vertical)
- The transporter must ensure that the BAUER Plug & Play System is tied down properly.

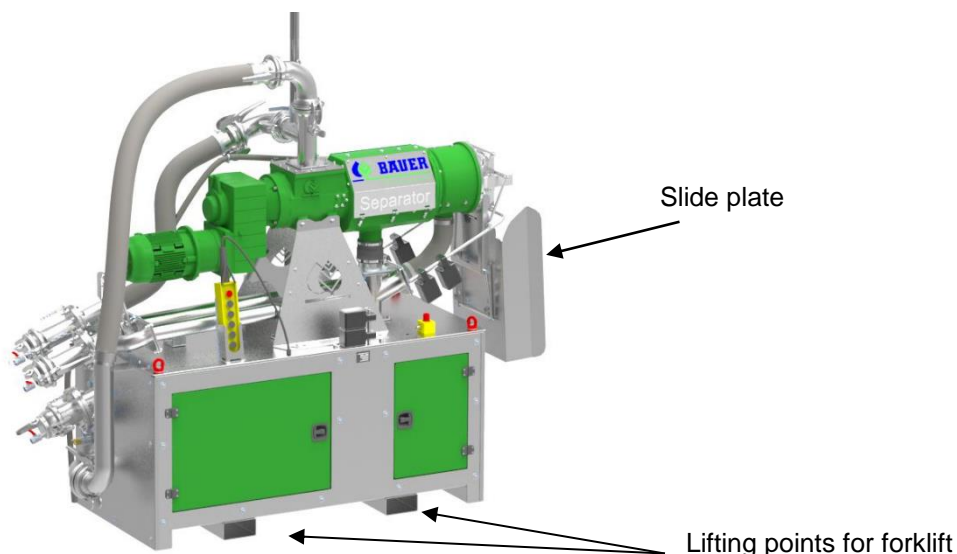
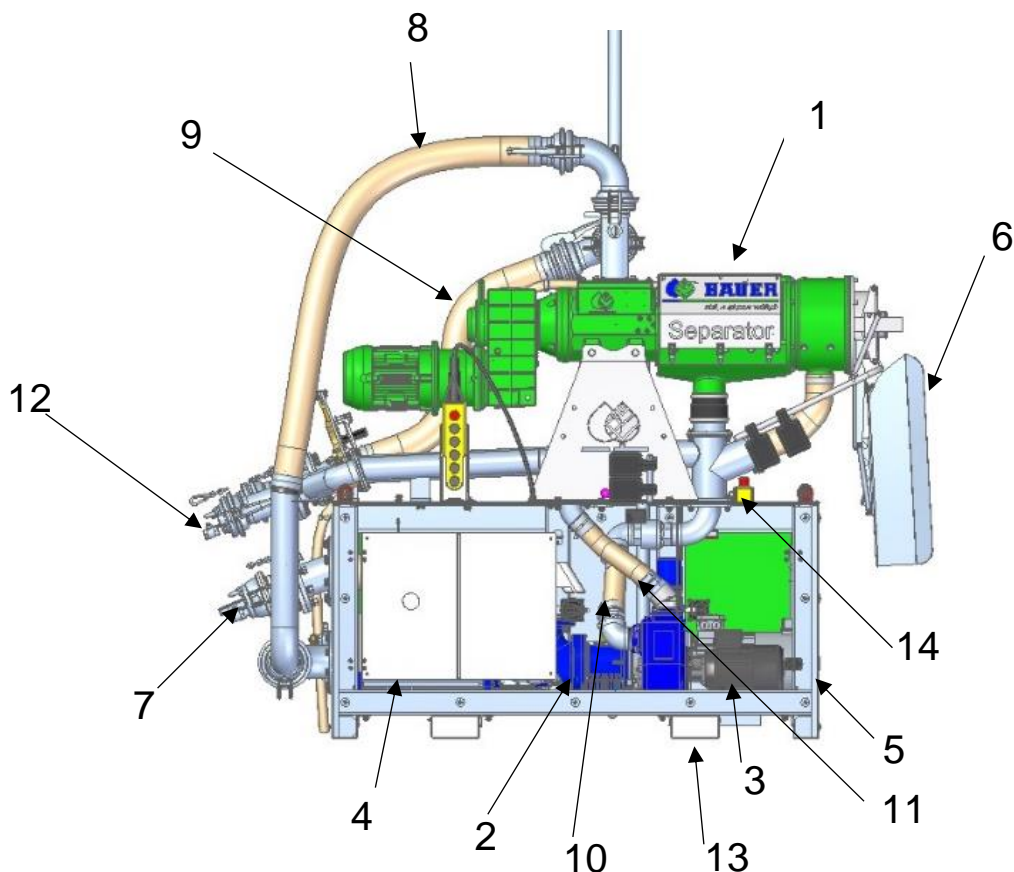


Figure 3 Transport aids

4.4 Features, Identification and Information

An overview of the components of the BAUER Plug & Play System is provided in Fig.4 Every BAUER Plug & Play System is adapted precisely to the customer requirements before assembly and configured accordingly. This means that every BAUER customer receives a P&P system that is perfectly adapted to his needs.



No.	Name
1	Separator
2	Helix Drive (eccentric screw pump)
3	Rotary discharge pump (clear flow pump)
4	Switch cabinet
5	Frame with doors
6	Slide plate
7	Helix suction line (eccentric screw pump)
8	Separator supply line (Helix pressurized line)
9	Separator overflow line
10	Clear flow line between separator and clear flow pump
11	Discharge line from clear flow pump
12	Clear flow line
13	Forklift lifting points
14	emergency stop

Figure 4 main components

The precise article numbers of the wearing parts and replacement sets as well as the exploded view of the main components can be found in the replacement parts list.



4.5 Type plates

When you contact your dealer or communicate directly with BAUER GmbH about wearing part or replacement part inquiries, you will be asked for your serial number and machine number in order to ensure faster assistance.

The type, year of manufacture and serial number of the Plug & Play Separator System are given on the type plate, which is located on the frame. Additional type plates are affixed to the individual components, such as separator, geared motor of the separator on the feed and discharge pumps.

Information on the Plug & Play Separator System Type Plate

The BAUER Plug & Play Separator System type plate contains the following information:

- Separator type: Plug&Play**S655/S655HD** or Plug &Play**S855/S855HD /S855GB**
- Serial number: e.g. **PP1807001** (PP means Plug&Play, 18 is the year, 07 the month, 001 is a three-digit incremental number)
- Required connected power: **17.2 kW** P&PS655/S655HD/S855;
19.2 kW P&PS855HD/S855GB
- Year of manufacture: e.g. 2018
- Weight: Depends on separator type

4.5.2 Information Signs

Information signs can be found on the individual main components, such as the Bauer separator, Bauer eccentric screw pump and rotary discharge pump and are explained in the individual operating manuals.

Any damaged signs must be replaced. These can be ordered from your dealer.

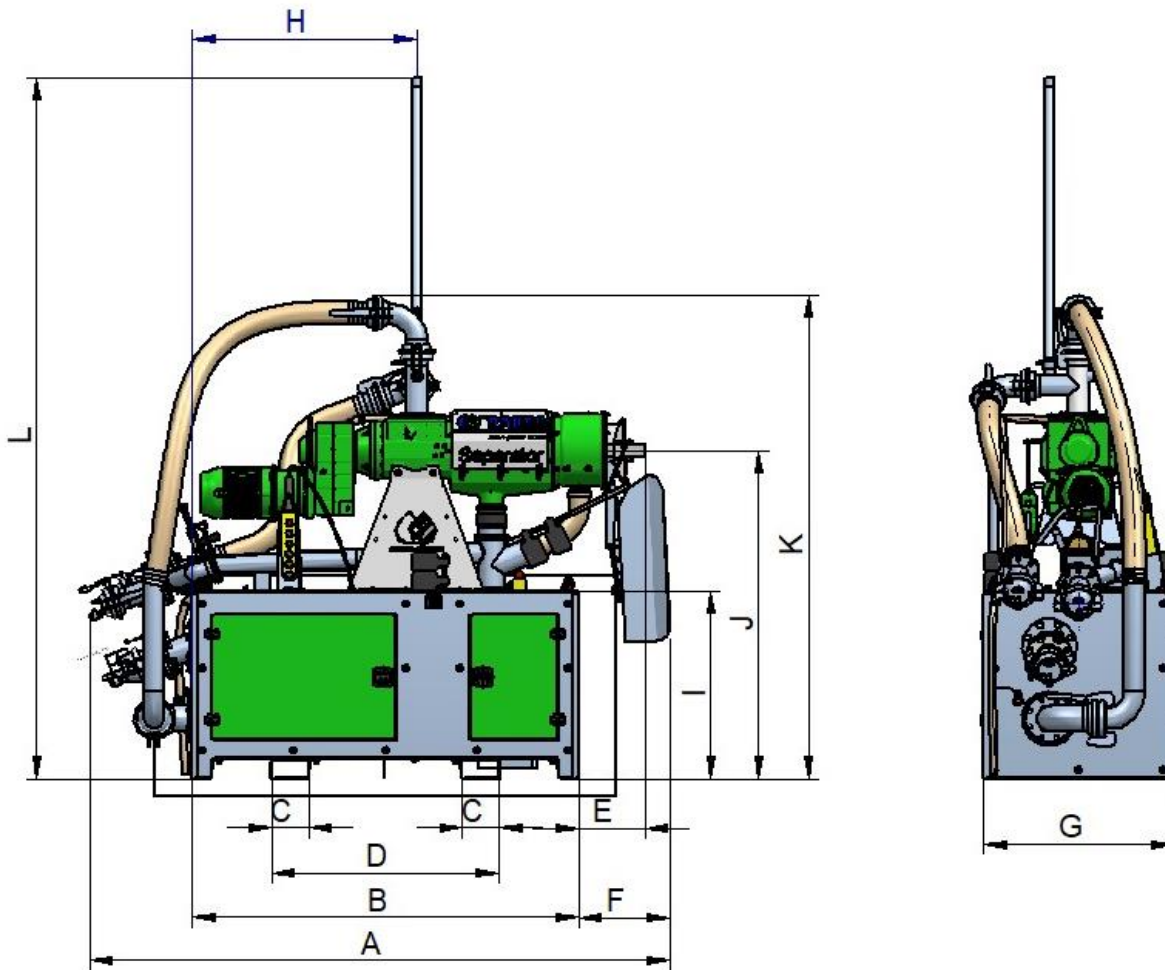
4.6 Technical Data of the Plug & Play Separator System

Separator	BAUER Separator S655 / S655HD
	BAUER Separator S855 / S855HD / S855GB
Feed pump	BAUER Helix Drive
Clear flow pump	Rotary pump
Plug & Play frame	Steel, galvanized
Helix suction line	Existing connection BAUER cup HK133 – steel, galvanized
Clear flow line	Existing connection BAUER ball HK108 – steel, galvanized
Separator overflow line	Existing connection BAUER ball HK108 – steel, galvanized
Control	Required connection power: 17.2 kW for PP655/PP655HD/PP855 19.2 kW for PP855HD/PP855GB



4.7 Setup and Assembly

The basic dimensions of the BAUER Plug & Play Separator System for determining the dimensions of the setup location are shown in Fig. 5



	PP655	PP855
A <i>in transportposition</i>	2940	3010
B	2005	2005
C <i>support inside</i>	190	190
D	1180	1180
E	80	340
F	400	470
G	990	990
H	1165	1165
I	980	980
J	1705	1705
K	2515	2515
L	3640	3640

Figure 5 dimensions Plug & Play Separator System - all dimensions in [mm]



5 ELECTRICAL CONNECTION

DANGER

Work on electrical and electronic components of the system may only be performed by a trained electrician or otherwise appropriately trained personnel under the guidance and supervision of a trained electrician in accordance with the applicable electrical and electronic regulations.

WARNING

Fuses do not protect the motor from overloads; they only protect the electrical supply lines or switching systems from damage in event of a short-circuit.

WARNING

Set the motor protection circuit breaker to the value specified on the motor type plate ($I_{Rated}/I_N/I\Delta$)

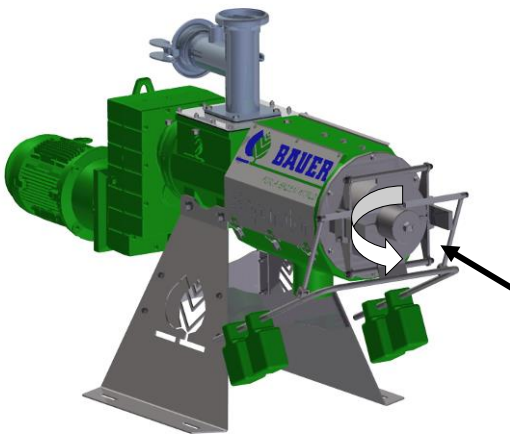


Figure 6 rotation direction of the screw

In forward motion, the screw shaft turns counterclockwise.
(As viewed from the discharge regulator toward the geared motor)

Viewing direction

This can be checked with the phase monitoring relay “1F2” in the switch cabinet:

Direction of rotation correct: Indicator light is on (steady)

Direction of rotation incorrect: Indicator light is off

If the direction of rotation is incorrect, two of the current-carrying conductors “L1” and “L2” in the switch cabinet are swapped.

6 PREPARATION FOR INITIAL STARTUP

WARNING



It must be ensured that no large foreign bodies such as metal parts, stones, wood pieces or rags enter into the separator; such objects would otherwise overload the sieve and the screw in particular. It should also be noted that abrasive media (e.g. high sand content) will reduce the service life of the screw shaft, sieve and stator of the eccentric screw pump.

Before beginning the startup process, check the following measures:

1. Place the Plug & Play Separator System on a flat, hard surface.
2. Check: Whether the machine is horizontal (level)
3. Check: Supply line between slurry pit, eccentric screw pump and separator connected and sealed
4. Check: Overflow line (if necessary) connected and sealed
5. Check: Line for discharge of the separated slurry connected and sealed
6. Check: Slider and ball valve position of the clear flow line:
 - Operation **with** clear flow pump: gate valve closed – ball valve open
 - Operation **without** clear flow pump: gate valve open – ball valve closed
7. Fill the feed pump / eccentric screw pump (suction line) completely with liquid to prevent damage to the rotor and stator of the pump.
8. Make sure that the press head and the functioning of the separator can be seen clearly from the switch cabinet [it must be possible to watch the solid cake and its discharge speed].
9. Supply with sealing medium: When using grease as the sealing medium, 3 to 5 cm³ of grease must be introduced via the lubricating nipple to fill the labyrinth seal before initial startup. (See also the Separator operating manual, section 13.1.1)
10. Check the oil level in the separator gearbox and top up, if necessary; properly dispose of old oil.
11. Remove the weights (minimum closing force)
12. Check: Whether all power cables are in perfect condition before connecting the machine to the power network.
13. Connect the Plug & Play Separator System to the power network
14. Set the motor protection circuit breaker to the required rated current.
15. After switching on, check the correct direction of rotation (see section 5); note the arrow on the press head, switch motor off again.



7 INITIAL STARTUP

NOTE



Before starting up the system, please read the operating manual of the separator, eccentric screw pump and control (see attachment)

NOTE



The reaction time before each setting change takes several minutes, meaning that the effect of any change can only be determined after this time.

For this reason, always allow enough time after making a change and only make changes in small steps!

NOTE



Before the initial startup and after prolonged downtime, the separator should be flooded before switching it on by starting the pump briefly in order to prevent possible damage from dry running.

NOTE



In order to achieve good separating results, it is necessary to mix the pumped medium well before separating.

7.1 Motor circuit breakers:

All motor protection switches (5F1, 5F2, 5F3, 6F1, 6F2, 7F1) check on the proper nominal current of the respective electric motors or set and then activate

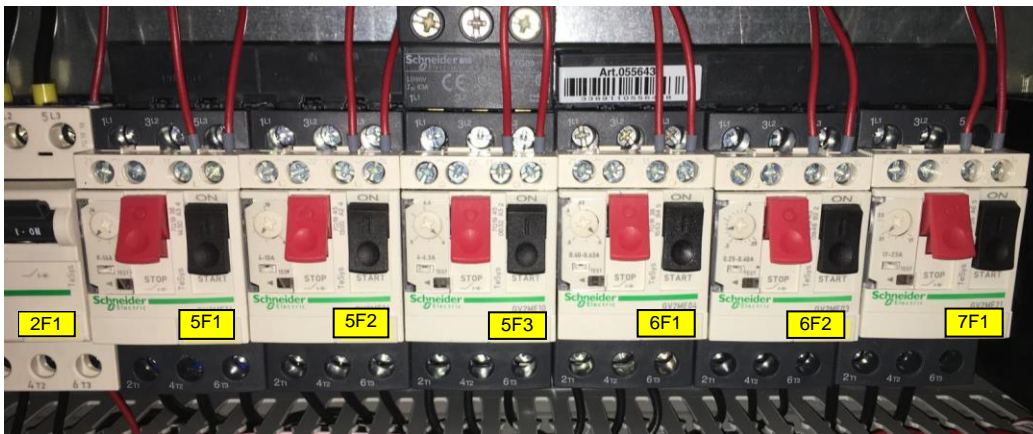


Figure 7 motor circuit breakers



7.2 Main switch of the electrical switch cabinet

Set main switch on the electrical cabinet to position "ON/1" = vertical

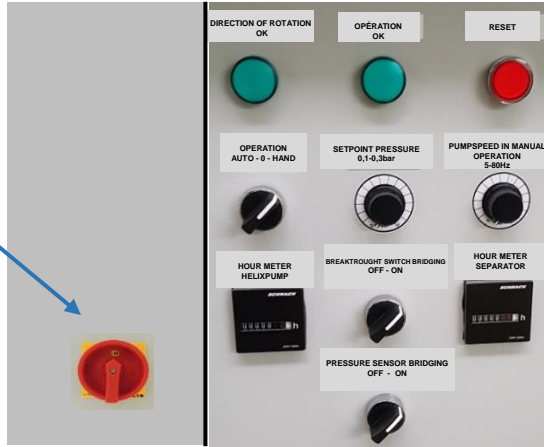
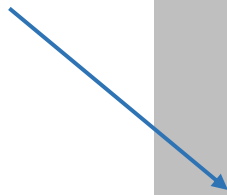


Figure 8 electrical cabinet main switch

7.3 Check direction of rotation:

Figure 9 electrical cabinet

Check the direction of rotation of the separator screw using the phase monitoring relay "1F2" in the switch cabinet. The screw must run counterclockwise as seen from the press head.

- Direction of rotation correct: Indicator light is on (steady) see figure 10
- Direction of rotation incorrect: Indicator light not lit → Swap lines L1 and L2
→ Press reset button 2x (please refer figure 13)

Indicator light

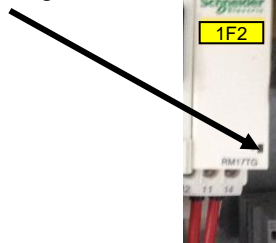


Figure 10 phase monitoring relay

7.4 Bridging switch for break-through-control

For starting the unit, the break-through-control can be bridged manually (Switch Position „ON“). After the plug has been built and the flaps are in working position, the bridging can be ended (Switch Position „OFF), after that, the break-through-control is active.

Bridging switch for Break-through control
OFF - ON



Figure 11 Bridging switch for break through control



7.5 Fault bridging pressure sensor

ATTENTION



As a result of a maloperation in the manual (hand) mode (activation of the pump in a closed overflow) or when there is foreign matter in the medium, the pressure sensor might be damaged.

If there is a damage to the pressure sensor, the machine will stop automatically (the frequency converter LFF3 receives a signal and will stop the machine). This malfunction will be displayed in the automatic as well as in the manual mode.

If you want the machine to continue in the manual mode until the pressure sensor is exchanged, you can continue despite the malfunction under the condition that you proceed as follows:

1. Turn off the **MAIN SWITCH** at the front of the control box (position “**OFF**”) see position „**A**“

ELECTRICAL CABINET MAIN SWITCH



2. **OPERATION** choice: Turn off the switch (position „**0**“) see position „**B**“

OPERATION AUTO 0 HAND



3. **PRESSURE SENSOR BRIDGING**: turn it on (position “**ON**”) see position „**C**“

PRESSURE SENSOR BRIDGING OFF - ON



4. Turn on the **MAIN SWITCH** - (position „**ON**“) see position „**D**“



ELECTRICAL CABINET MAIN SWITCH

5. Press **RESET** see position „**E**“

RESET/ fault lamp



6. Turn **OPERATION** choice switch to hand mode (position „**HAND**“) siehe Pos „**F**“

OPERATION AUTO 0 HAND

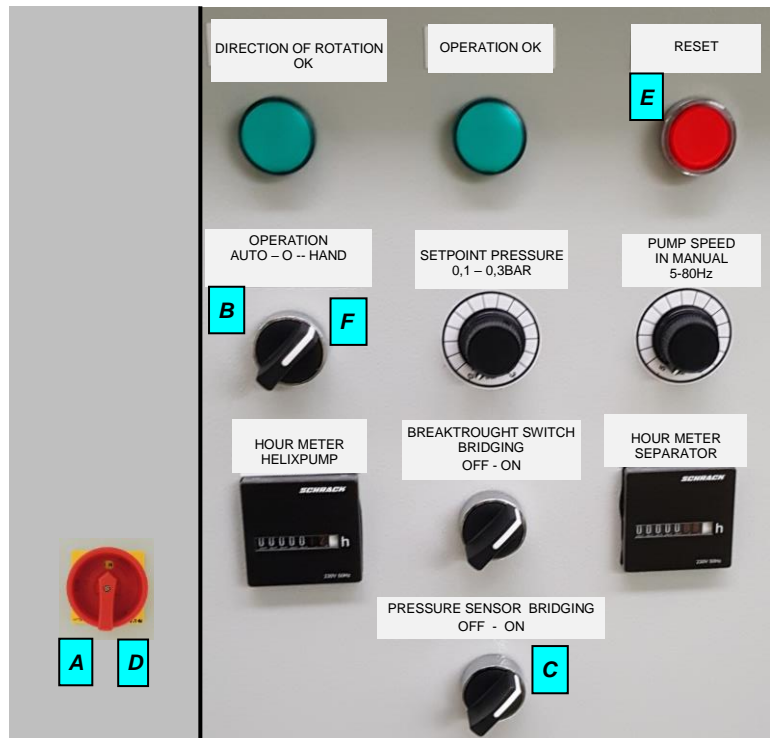


Figure 12 fault bridging pressure sensor

ATTENTION



The faulty pressure sensor must be exchanged as soon as possible. The mode of operation as described above is only an emergency operation mode.

After installing a new pressure sensor, the switch “**PRESSURE SENSOR BRIDGING**” must be turned to “**OFF**” for the machine to function correctly.

7.6 Clear the stored faults

Press the RESET button on the front side of the switch cabinet to clear the stored faults → Fault light goes out. (please refer fig 13)

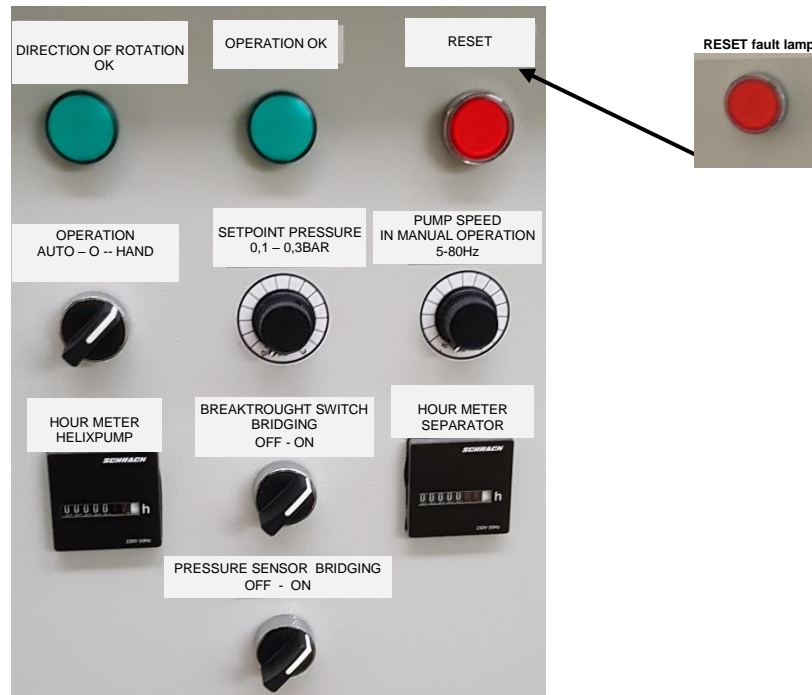


Figure 13 reset button / fault lamp

7.7 Check function of each component

- ⇒ Set the **OPERATION** choice switch on the front of the switch cabinet to “**HAND**” (please refer fig.14)



Figure 14 OPERATION SWITCH

- ⇒ Press the switches of the respective components (separator, feed pump; clear effluent pump; conveyor belt (if available), on the remote control (please refer fig.15) to check the function:



Figure 15 remote control



7.8 Separator - Forming the starter cake:

During commissioning and after servicing, if the separator screw was completely un-emptied, it is necessary first of all, to build a plug in the separator press head. For this purpose please proceed as described below using the "plug-forming aid".

1. Insert the plug forming aid in the press head, that inside-screw and outside-sieve is sealed. (plug forming aid in the basic frame stowed)
2. Set the Operation choice switch on switch cabinet to "HAND" (please refer fig.16)

Operation choice (on switch cabinet)
AUTO OFF HAND



Figure 16 OPERATION SWITCH

3. Set the feed-pump switch on the remote control on position- "FORWARD" to operate the feed pump manually, until the separator inflow housing is completely filled

Switch on remote control
FEED PUMP
REVERSE OFF FORWARD



Figure 17 switch feed pump

4. Switch on separator
5. During separator-operation must be ensured that sufficient liquid is present in the inlet housing, this is realized by temporarily on and off switching of the feed pump. This process is repeated until the plug in the separator press head moves continuously forward.

7.9 Pressure set point

7.9.1 Automatic operation

For the automatic operation it is necessary to set a pressure set point. The pressure set point is a control variable, which specifies the speed of the eccentric screw pump, so that a constant pressure prevails in the screen housing of the separator.

The pressure set point regulates the inlet pressure and the feed flow, this way the separator is supplied with only as much material as is needed. Due to the precisely controlled feed rate no overflow and no ventilation for the overflow is needed.

The optimal system pressure varies depending on the medium and can be individually adjusted with the potentiometer for the automatic operation (min. 0, 1 bar, - max.0, 3 bar).

7.9.2 Adjusting the pressure set point

The adjustment of the pressure set point is done by a potentiometer on the front of the control panel.

Classification of the scale:

potentiometer on position 0 = 0,1 bar

potentiometer on position 10 = 0,3 bar



Figure 18 switch pressure set point

7.9.3 Shutdown of the plant at excess pressure

On the one hand the built-in disconnection with overpressure serves for the protection of the pressure sensor and the system and on the other hand the overpressure disconnection prevents the separator from a "breakthrough". The „disconnection with overpressure“ is only active during automatic operation. In manual operation the operator must make sure that the overflow can run off freely, the air pipe is screwed on and that the 1 ½" ball valve in inlet T- piece is opened to prevent an increase of pressure in the inlet. If the pressure in the inlet rises too high, it can cause damage to the system. The shut-down pressure which is preset in the sensor is set in the factory and cannot be changed. The maximum pressure in the sensor is set higher than the maximum working pressure(0,3bar). The sensor is adjusted in order to switch the system off in case the maximum pressure is exceeded and the fault lamp on the electrical cabinet and on the pressure sensor lights up. In order to start the system again, the pressure must be released from the inlet pipes (red light on the pressure sensor goes out).



7.10 Operating modes

The BAUER Plug & Play separation system can be operated in two main operating modes:

1. Automatic operation with pressure control
 - Automatic operation with clear effluent pump (see chapter 7.10.3)
 - Automatic operation without clear effluent pump (see chapter 7.10.4)
2. Manual operation
 - Manual operation with clear effluent pump (see chapter 7.10.5)
 - Manual operation without clear effluent pump (see chapter 7.10.6)

The different operating modes are described further below (see chapter 7.10.3 to chapter 7.10.6).

7.10.1 Automatic Operation

The automatic mode is the preferred mode of operation for the BAUER Plug & Play separation system. In the automatic mode the system is regulated via a pressure sensor and a frequency converter. The pressure sensor measures the pressure in the separator inlet. The desired pressure must be set in advance by using the potentiometer at the front of the control panel. (see chapter 7.9). If the pressure in the inlet deviates too strongly from the set value, the frequency converter regulates the pump speed up or down, until the preset target pressure is reached again. Moreover, in the automatic mode a shut-off for over pressure (chapter 7.9.3) and a wire break monitoring of the pressure sensor cable are active. If the pressure in the inlet rises or the cable of the pressure sensor is damaged, the system automatically switches off.

7.10.2 Manual Operation

The manual operation is designed for building up a starter cake (described in chapter 7.8) / for the cleaning or "empty run" and for the case that the pressure sensor is damaged. In the manual operation the pressure in the inlet is measured, this, however, has no influence on the pump speed. In the manual operation the pump speed should be adjusted in a way that there is some raw liquid manure in the overflow. This way it is made sure that enough liquid raw manure is supplied to the separator. In order to get a suitable rotation speed for the pump for each application, the frequency for the pump motor must be adjusted by the second potentiometer at the front of the control panel. The adjustment range of the potentiometer is following:

0 = 5Hz
10 = 80Hz

The adjustment of the speed can vary according to the type of manure or the screen width and ranges between under 50 hertz or more than 50 hertz.

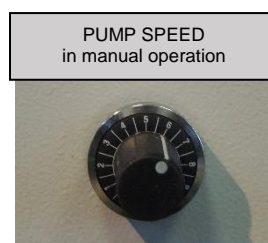


Figure 19 switch pump-speed

7.10.3 Automatic operation with clear effluent pump:

In automatic mode the system is regulated via a pressure sensor and a frequency converter. The pressure sensor measures the pressure in the separator inlet. The pressure must be set with the potentiometer in advance. (see chapter 7.9). If the pressure in the inlet deviates too strongly from the set value, a frequency converter regulates the pump speed up or down, until the preset value is reached again. In the automatic mode with clear effluent pump, a centrifugal pump, pumps off the effluent. In order that the effluent can be pumped off, the gate valve 4" of the effluent pipe must be closed and the 3" ball valve in the base be opened (see chapter 7.10.3.1.)The automatic operation can only be started after a starter cake is formed(starter cake formation must done manually and is described in chapter 7.8). After the starter cake is formed, the Operation choice switch on the electrical cabinet must be switched to AUTO. Moreover, in the automatic mode the 1 1/2" ball valve in the inlet T pipe and the overflow must be closed.

7.10.3.1 Automatic operation with clear effluent pump switch and lever position:

- Gate valve for effluent closed, limit switch active: "closed"
- Ball valve 3" open (is located on the base frame): "open"
- Operation choice switch (on electrical cabinet): „AUTO“
- Feed pump switch(remote control): "OFF"
- Separator switch (remote control): „OFF“
- Overflow closed "closed"



Figure 20 lever and switch position in Automatic operation with clear effluent pump



7.10.4 Automatic operation without clear effluent pump:

In the automatic mode the system is regulated via a pressure sensor and a frequency converter. The pressure sensor measures the pressure in the separator inlet. The pressure must be set with the potentiometer in advance (see chapter 7.9). If the pressure in the inlet deviates too strongly from the set value, a frequency converter regulates the pump speed up or down, until the preset value is reached again. In the automatic mode, without the clear effluent pump, the effluent is not pumped off, that means that the effluent pipe must be moved in such a way that the effluent can flow back in a reservoir (liquid manure pit). In order that the effluent can run off, the gate valve 4" of the effluent pipe must be opened and the 3" ball valve in the base must be closed (see chapter 7.10.4.1) The automatic operation can only start after a starter cake has built up (starter cake formation must be done manually and is described in chapter 7.8). After the starter cake has built up, the operation choice switch on electrical cabinet must be switched to AUTO. Moreover, in the automatic mode the 1 1/2" ball valve in the inlet T pipe and the overflow must be closed.

7.10.4.1 Automatic operation without clear effluent pump switch and lever position:

- Gate valve for effluent open, limit switch inactiv: "open"
- Ball valve 3" closed (is located on the base frame): „closed“
- Operation choice switch (on electrical cabinet): „AUTO“
- Feed pump switch(remote control): "OFF"
- Separator switch (remote control): „OFF“
- Overflow closed "closed"



Figure 21 lever and switch position in Automatic operation without clear effluent pump

7.10.5 Manual operation with clear effluent pump:

The operation mode „manual operation with clear effluent pump“ requires that all components of the system must be switched on by hand. In the manual operation the overflow must be opened, so that the excessive liquid manure can run off and the pressure in the inlet does not rise. If the pressure in the inlet is too high, the pressure sensor can be damaged. In manual operation the air pipe has to be mounted and the 1 ½” ball valve in the inlet t piece must be opened. In the operation mode „manual operation with effluent centrifugal pump“ a centrifugal pump pumps off the effluent. In order that the effluent can be pumped off, the gate valve 4” of the effluent pipe must be closed and the 3” ball valve in the stand must be opened (see chapter 7.10.5.1). The system can be started after a starter cake has built up (starter cake built up chapter 7.8).

7.10.5.1 Manual operation with clear effluent pump switch and lever position:

- Gate valve for effluent closed, limit switch active: “closed”
- Ball valve 3” open (is located on the base frame): “open”
- Operation choice switch (on electrical cabinet): „HAND“
- Feed pump switch(remote control): “FORWARD”
- Separator switch (remote control): „FORWARD“
- Overflow open “open”



Figure 22 lever and switch position in manual operation with clear effluent pump



7.10.6 Manual operation without clear effluent pump:

In the operation mode „manual operation without clear effluent pump“ all required components must be switched on by hand. In manual operation the overflow must be opened, so that the excessive liquid manure can run off and the pressure in the inlet does not rise. If the pressure in the inlet is too high the pressure sensor or the gearbox sealing can be damaged. In manual operation the air pipe has to be mounted and the 1 ½” ball valve in the inlet t piece has to be opened. With the operation mode „manual operation without clear effluent pump“ the effluent is not pumped off, that means that the effluent pipe must be moved in such a way that the effluent can flow back to the reservoir (liquid manure pit). In order that the effluent can run off, the gate valve 4” of the effluent pipe must be opened and the 3” ball valve in the base must be closed (see chapter 7.10.6.1). The system can only be started after a starter cake has built up (starter cake built up chapter 7.8).

7.10.6.1 Manual operation without clear effluent pump switch and lever position:

- Gate valve for effluent open, limit switch inactive: “open”
- Ball valve 3 “closed”:
- Operation choice switch (on electrical cabinet): „HAND“
- Feed pump switch(remote control): “FORWARD”
- Separator switch (remote control): „FORWARD”
- Overflow open “open”

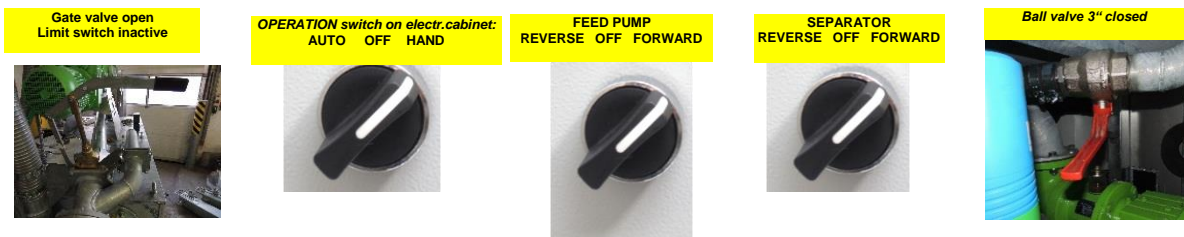




Figure 23 lever and switch position in manual operation without clear effluent pump

8 PROBLEMS – TROUBLESHOOTING

NOTE 	For troubleshooting the individual components of the Plug & Play Separator System, such as the separator, feed pump, discharge pump and control; please see the enclosed operating manuals of the respective components.
WARNING 	Troubleshooting should only be performed by appropriately qualified personnel.

8.1 Geared motor switches off - Motor protection tripped:

Motor protection separator =	5F1
Motor protection clear effluent pump =	5F2
Motor protection conveyor belt =	5F3
Motor protection oscillator =	6F1
Motor protection external fan Helix	6F2
Motor protection frequency inverter / Helix =	7F1

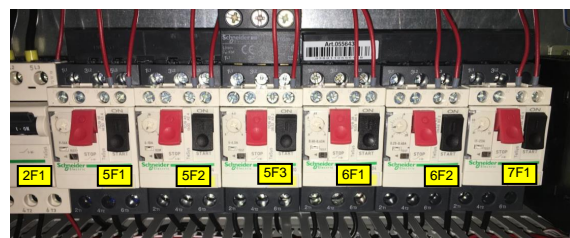


Figure 24 motor protection switches

The motor switches off when the permissible power consumption of the respective motor has been exceeded.

8.2 System pressure set point was adjusted incorrectly:

When starting the system in automatic mode the feed pump does not start → no system pressure adjusted

The feed pump switches off after a few minutes → target pressure set too low

The feed pump conveys too much material (Separator breaks through) → target pressure set too high

Adjusting the pressure set point see chapter 7.9 pressure adjustments

8.3 Main switch on electrical switch cabinet is switched off

Main switch of the electrical switch cabinet vertical

Turn to "ON"/1 (please refer fig.25)

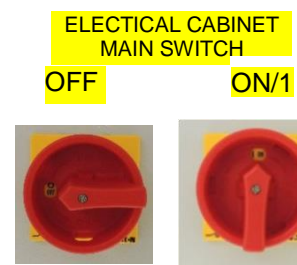


Figure 25 electrical cabinet main switch

8.4 Power network connection does not work:

The cabinet is electroless

- „Reset“-lamp does not light up
- „Operation OK“ lamp does not light up
- Frequency inverter does not start up

Check the supply line for correct connection and proper condition



8.5 Troubleshooting

Fault	Cause	Remedy
Geared motor of a component switches off The motor switches off when the permissible power consumption of the motor has been exceeded. The setting for the maximum power consumption applies to operation under load	<ol style="list-style-type: none">1. Motor protection Separator switches off (5 F1)2. Motor protection clear Effluent pump switches off (5F2)3. Motor protection Belt conveyor switches off (5F3)4. Motor protection Oscillator switches off (6F1)5. Motor protection external fan Helix switches off (6F2)6. Motor protection Feeding pump Helix switches off (7F1)7. Overload8. The setting for the maximum power consumption is not adjusted correctly or the control unit has been damaged.9. Foreign bodies are blocking a component	<ol style="list-style-type: none">1. up to 7. Check motor protection for correct setting.8. The switch-off limit should be adjusted again by a qualified electrician according to the instructions (see attached circuit diagram and documentation)9. Check Separator, Helix pump, Clear effluent pump, Belt conveyor and remove foreign bodies „important“: remove foreign bodies only when cabinet is disconnected
Feeding pump does not start when starting the system	<ol style="list-style-type: none">1. Check motor protection2. Feeding pump switches off after a few minutes of operation3. Feeding pump is delivering too much material, Separator breaks through	<ol style="list-style-type: none">1. See troubleshooting: geared motor switches off2. Target pressure set too low.3. Target pressure set too high.
Electrical cabinet currentless	<ol style="list-style-type: none">1. Reset-lamp does not light up2. „Operation OK“ lamp does not light up3. Frequency converter does not start	<ol style="list-style-type: none">1. Check power supply line for correct connection and proper condition.

Fault	Cause	Remedy
Reset button cannot be acknowledged	<ol style="list-style-type: none"> 1. Emergency stop switch is pressed 2. PT100 Sensor from HELIX pump triggered 3. Phase line from power connection reversed 4. Level switch triggered (Option) 5. Break through protection triggered (option) 	<ol style="list-style-type: none"> 1. Check emergency stop switches 2. Check PT 100 Sensor possibly change setting (see operation manual PT 100 Sensor and JUMO Device) 3. Change phase line of power connection (rotation control device does not light up, see chapter 7.3) 4. If installed: check connection of level switch and correct function, check connection cable 5. If installed: check connection of break through protection and connection cable of break through protection
System is shuts down in automatic mode	<ol style="list-style-type: none"> 1. Pressure in the inlet pipe too high (Status LED on pressure switch lights up red) 2. Break through protection triggered 3. Level switch triggered 4. PT 100 Sensor from Helix pump triggered 	<ol style="list-style-type: none"> 1. not the correct screen for this application installed (use screens with larger or smaller slots) 2. Check break through protection switch, possibly build up a new starter cake see chapter 7.8. in case of repeating check, wash or change screens, check cable 3. Check level switch, slurry pit empty, Level switch cable faulty 4. Check PT 100 Sensor, Helix pump is running dry, check suction line and slurry level in pit
Fault of an respective component		<ol style="list-style-type: none"> 1. See operation manual of respective system component
Problems that cannot be corrected A problem as described above cannot be corrected despite optimal configuration according to the instructions given above.	Document any errors, faults and the taken measures to correct the problem.	Contact your dealer or BAUER company for further information. Please always have the serial number ready.





9 WINTER OPERATION – TAKING OUT OF OPERATION

If temperatures are below freezing and the Plug & Play Separator System is not operated continuously or will be stopped for several days, take the following measures:

- When switching off the system, ensure that the separator, the feed pump and discharge pump as well as all lines and hoses have been completely emptied to prevent freezing of the liquid.
- Note the applicable steps specified in the operating manuals of the individual components under winter operation, taking out of operation or prolonged shut-down.

10 MAINTENANCE AND INSPECTION

NOTE 	For maintenance intervals and inspection activities for the individual components of the Plug & Play Separator System, such as the separator, feed pump, discharge pump and control, please see the enclosed operating manuals of these components.
--	--

DANGER! 	Before doing maintenance work or inspecting electrical cabinet, the machine must be disconnected from power supply on all sides and all poles and secured against reactivation! Always keep the switch cabinet closed!
---	---

 WARNING	Check the operational safety of the machine before every startup!
--	--

- Before every startup, carefully check the machine and the setup for externally visible defects, damage and changes
- Check screw connections, hose connections and parts of the hydraulic system for damage and oil leaks
- Check whether bolts and screw connections are firm
- Check load-bearing parts for any cracks or damage

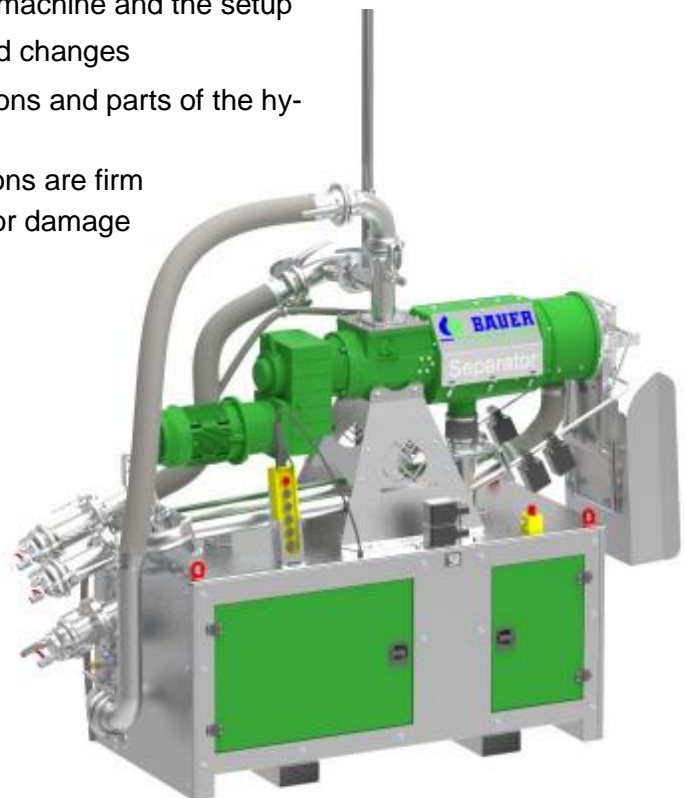


Figure 26 Plug & Play Separator System

11 NOTES:



12 CONFORMITY DECLARATION

EC Conformity Declaration according to EC Directive 2006/42/EC

The manufacturer

Röhren- und Pumpenwerk BAUER Gesellschaft m.b.H.
Kowaldstraße 2, 8570 Voitsberg, Austria
Tel: +43 3142 200-0; Fax: +43 3142 200-320/-340

declares that the machine named below

Designation of the machine	Plug & Play Separator System
Machine type / base device	PP655/PP655HD, PP855/PP855HD/PP855GB
Description	Mobile separation unit for solid-liquid separation

correspondingly applies to the relevant provisions of the following directives.

Machinery Directive	2006/42/EC
Electromagnetic Compatibility Directive	2014/30/EU
Low Voltage Directive	2014/35/EU

The following standards in the current versions were applied correspondingly:

EN ISO 12100:2011/03	Safety of machinery -General principles for design risk assessment and risk reduction
EN ISO 13849-1:2016/06	Safety of machinery – Safety-related parts of control systems – Part 1: General principles for design
EN ISO 13849-2:2013/02	Safety of machinery – Safety-related parts of control systems – Part 2: Validation
EN ISO 13857:2008/08	Safety of machinery – Safety distances to prevent hazard zones being reached by upper and lower limbs
EN 349:2008/09	Safety of machinery - Minimum gaps to avoid crushing of parts of the human body
EN 60204-1:2009/12	Safety of machinery – Electrical equipment of machines Part1 - General requirements

This declaration is invalidated by any modification of the machine not approved by Bauer GmbH.

Party responsible for documentation: Thomas Theissl, Kowaldstraße 2, 8570 Voitsberg, Austria,