



Mechanical Separation
Division

Westfalia Separator
Food Tec

Take the Best - Separate the Rest

HyDRY

HyDRY® GSC
Separators for beverage
application

Clarifiers with self-cleaning bowl
GSC 4/6/20/45/95/150

| absolute

separation |

focussed on your benefit

This clarifier incorporates the very latest developments in centrifuge construction.

The basic features of this new development are:

- New "hydrostop" system for controlled partial ejections. The amount of solids to be ejected can be pre-selected when the bowl is still rotating. The product feed is not interrupted.
- Low noise pollution with enclosed solids discharge system using a solids pump.
- The self-thinker and photoelectric control systems from Westfalia Separator select the ideal moment for ejection.
- Oxidation due to ambient air is prevented by means of a hermetic liquid seal.
- "Short spindle drive" for soft and vibration-free operation and low sensitivity to unbalance of bowl.
- Three-phase AC motor for slow acceleration starting.
- Easy to service by removing the complete drive spindle and the oil pan.
- A hydrohermetic feed can be supplied for shear-sensitive products depending on the capacity.

Bowl

The product enters the bowl via the inlet and is clarified in the disc stack. Centripetal pump then conveys the clarified liquid under pressure to outlet, where it is discharged without foam.

The separated solids collect in sediment holding space and are ejected periodically via ports.

Operating water is used only during the actual process of ejection.

Automatic solids ejection

Bowl ejections are controlled automatically by control unit.

The following operations are possible:

- partial ejections
- a combination of short and long partial ejections

Control systems

The following systems are available for controlling the automatic bowl ejections:

- Time-dependent control to suit the particular operation. Recommended for use with products in which the solids content remains constant.
- Photoelectric control using a photoelectric sensor to monitor the clarified liquid. If a pre-set turbidity level is exceeded, a signal is passed to the control unit which then initiates the solids ejection process. Recommended for use with translucent liquids in which the solids content is not constant or if the throughput capacity varies. This monitoring system can be installed on every standard centrifuge.
- Self thinker control by sensing the solids level in the bowl. A small amount of liquid is diverted via separating disc. It is clarified by discs and conveyed to the flow switch by means of sensing liquid pump. If it is then recycled back into the feed. If the sensing liquid inlet at the separating disc becomes blocked by an accumulation of solids in the sediment holding space, a proximity switch installed on the flow switch passes an impulse to the control unit which then initiates a solids ejection operation.

The "hydrostop" system for controlled partial solids ejections

When product is processed, only partial solids ejections are performed.

The solids ejection is initiated by the control unit.

In the case of partial solids ejection, the hydraulically operated sliding piston must be opened within as short a time as possible so as to ensure that the ejection ports are opened wide enough to allow unimpeded solids ejection.

The sliding piston is in closed position (left side of figure) when the closing chamber is full. The annular valve is hydraulically opened via valve (right side of fig.). The operating-water flows from the closing chamber into the storage chamber. When the storage chamber is full, the flow of liquid from the closing chamber will automatically stop, although the annular piston is still open ("hydrostop" system). The bowl then opens and the solids are discharged rapidly through the ejection ports.

The amount of solids ejected depends on the liquid level in the storage chamber (controlled partial solids ejection). The amount of solids to be ejected can be pre-selected by partially filling the storage chamber before the solids ejection is initiated. This is done by opening valve which releases water into the storage chamber through the nozzle.

After the ejection process, the closing chamber is topped up via valve. The annular valve then closes. The storage chamber empties through discharge nozzle. This new "hydrostop" system reduces the actual solids ejection time to less than 1/10 second. In the case of solids which are difficult to eject, a longer solids ejection cycle is initiated after several partial solids ejections, which has the effect of flushing out remaining solids while the product feed is still open.

Total solids ejection sequence during CIP

Total ejections are initiated during CIP manually or automatically on the control unit via an external CIP control.

For total solids ejection, the closing chamber is emptied via annular piston and nozzle by the addition of opening water. The sliding piston remains open until the whole contents of the bowl have been ejected. Subsequently, closing water is added, thus forcing the sliding piston to close.

Feed and discharge

The product is into the centrifuge by means of a closed system of pipes. The clarified liquid is discharged foam-free and under pressure via a centripetal pump. This machine is equipped with a feed and discharge housing. Connections conforming to DIN 11851. Valves and gauges are installed in a separate valve assembly.

Hermetic liquid seal

The 06 design can be additionally provided with a product seal from the atmosphere. In this design an immersion disk is fitted above the main centripetal pump which largely reduces O₂ intake.

„Self-thinker“ system by sensing the level of solids in the solids holding space
Guarantees the optimum moment for solids ejection

Double-walled hood
and solids collector
Coolable
Noise insulating

Feed,
product

Discharge, clarified phase
Closed discharge under pressure

Hydrohermetic seal on design
without „self-thinker“ system by
means of water seal
Minimal oxygen intake to assure high
product quality

Hydrohermetic feed
Gentle product feed guarantees
maximum clarification efficiency

Hood flushing
Cleaning of the product chamber
between bowl and hood

Discharge,
solids

Hydrostop system
Precisely pre-selectable
partial ejection volumes
Low product losses

Operating water feed
Hydraulic control of the
ejection process

Vibration monitoring
Maximum operating safety

Dumpening
Quiet an low-vibration running through
vibration dampers

Short-spindle drive
Intensive to bowl unbalance
Power transmission clutches
via flat belt to the bowl
spindle

The surplus sealing medium, e.g. water, is discharged without product contact.

In the -36-version, the product is sealed off by means of a sensing liquid pump situated above the main centripetal pump.

Cleaning-in-place (CIP)

Once the centrifugation process has been completed, the machine can be cleaned-in-place. The cleaning solution is circulated round the centrifuge and the connected system.

Frame and drive (GSC 4/6/20)

The cast-iron frame is equipped with brakes, a revolution indicator and an oil level sight glass.

The machine is driven by a three-phase AC motor. Power is transferred to the bowl spindle via a clutch and worm wheel gear. All bearings and the gear are splash-lubricated from a central oil bath.

Frame and drive (GSC 45/95/150)

The frame is made of cast iron. Vibrations are minimized by rubber cushions placed between the frame and foundation. The machine is driven by a three-phase AC motor designed for heavy load starting. Power is transferred directly to the bowl spindle by a flat belt, without the intermediary of a clutch. The drive is cushioned, thus reducing the load on bearings which might arise from imbalance of the bowl.

The oil pan is flanged beneath the spindle (see figure below).

The automatic lubrication system incorporates a suction pipe.

The short spindle drive contributes to a reduction in rotational mass, thus enabling high bowl speeds to be attained with minimum vibration.

The simple removal of the complete spindle assembly and the oil pan facilitates servicing of the drive. The solids are pumped away in an enclosed pipe system. A compensator is fitted between the solids cyclone pot and the pump.

Monitoring features

- Lube oil flow
- Operating-water pressure
- Motor*
- Speed*
- Bowl ejection*
- Vibration*
- Clear phase*
- Level in solids tank

*Additional equipment

Assembly and dismantling

The complete bowl can be detached from the spindle after removing the feed and discharge connections and the hood. Special tools are supplied with the machine.

Additional equipment (available at extra cost)

- Immersion disk for hydrohermetic (-06-version)
- Control unit for automatic program control
- Motor control
- Speed measuring device
- Ejection monitoring
- Vibration monitoring system

This system monitors the level of vibration.

If a certain pre-set level is exceeded, an alarm is given or an emergency-off program is initiated and the machine is shut off according to a pre-set program.

- Photoelectric sensor or turbidity meter for monitoring in clear phase
- Solids pump for enclosed solids discharge
- Solids pump control
- Valve assembly (depending on throughput)

Included are:

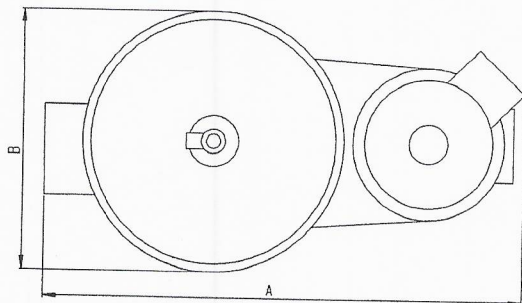
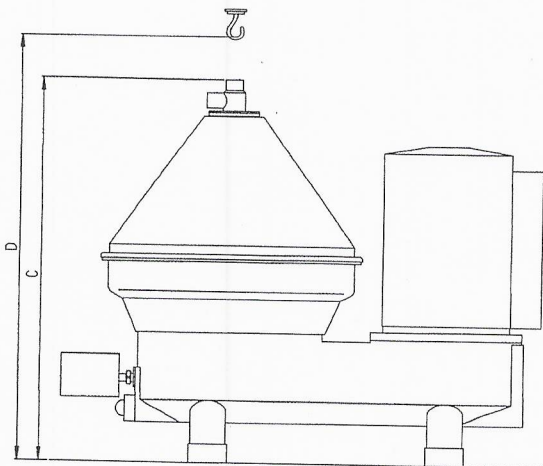
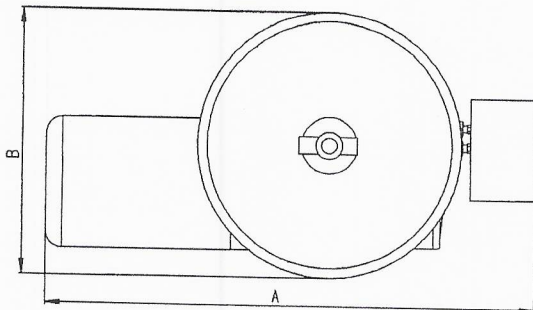
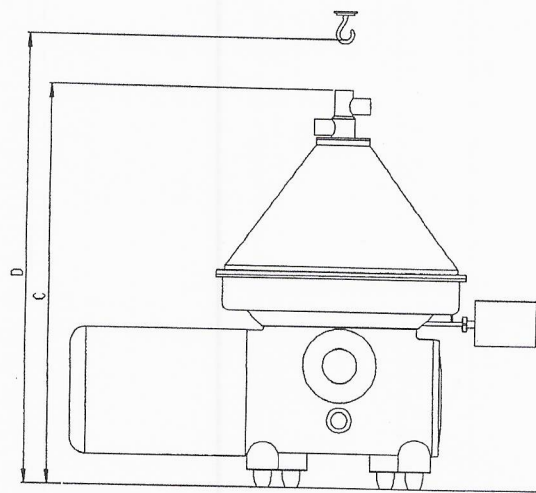
- automatic valves,
- sight glasses in feed and discharge,
- flowmeter in discharge,
- magnetic and inductive flowmeters,
- pressure gauge for discharge,
- constant-pressure valve in discharge,
- valve cabinet.

This cabinet contains solenoid valves, pressure reducer, pressure gauge, pneumatic remote control, compressed-air control unit.

- Erosion protection for sliding piston and bowl bottom
- Operating water connection with solenoid valves and pressure reducer of stainless steel

Materials

All parts coming into contact with the product, the discharging solids and the operating water are made of austenitic Cr-Ni-Mo steel or, for bowl parts subjected to high mechanical stress, of soft martensitic Cr-Ni-Mo steel or duplex alloys.



Dimensions

Type	A	B	C	D
GSC 4	1000	750	900	1500
GSC 6	1000	750	900	1500
GSC 20	1560	1130	1500	2400

in mm

Dimensions

Type	A	B	C	D
GSC 45	1420	1155	1350	2400
GSC 95	2200	1570	1900	2400
GSC 150	2910	1700	2070	3000

in mm

V
X

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		GSC 4 -06-076 -36-076	GSC 6 -06-076 -36-076	GSC 20 -06-076 -36-076	GSC 45 -06-177 -36-177	GSC 95 -06-777 -36-777	GSC 150 -06-777 -36-777
Weights and shipping data							
Weights							
Separator complete	net	230 kg	230 kg	780 kg	950 kg	2600 kg	4145 kg
Separator without motor and bowl	net	180 kg	180 kg	585 kg	600 kg	1430 kg	2050 kg
	gross	–	–	940 kg	1200 kg	1600 kg	2350 kg
Bowl	net	50 kg	50 kg	195 kg	250 kg	710 kg	1145 kg
	gross	–	–	–	350 kg	760 kg	1232 kg
Motor	net	–	–	–	–	460 kg	950 kg
	gross	–	–	–	–	–	1050 kg
Case dimensions (L x W x H)							
Frame and tools	mm	1300x850x1100	1300x850x1100	1560x1060x1120	1800x1350x1420	2000x1500x1750	2200x1500x1750
Bowl	mm	–	–	–	550x550x600	700x700x850	870x870x1020
Motor	mm	–	–	–	–	–	1700x800x950
Shipping volume	m³	1,2	1,2	1,9	3,7	7	7,84
Technical data							
Solids space	l	0,7	0,7	4	7,5 - 9,5	14,5	25
Max. discharge pressure	bar	5	5	5	6	6	6
Motor*	kW	4,8	5,5	11	18,5-22	37-45	55-75
* depending on feed capacity.							
Capacity							
rated capacity*	l/h	3000	3000	11000	22000	50000	90000
* The rated capacity indicates the max. throughput capacity of the bowl. The effective capacity is generally lower.							

GEA Westfalia Separator
Food Tec

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A company of mg technologies group

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The information contained in this brochure merely serves as a non-binding description of our products and is without guarantee.
Binding information, in particular relating to capacity data and suitability for specific applications, can only be provided within the framework of concrete inquiries.

9997-1005-000 / 0804 EN

Subject to modification

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Printed on chlorine-free bleached paper

Printed in Germany



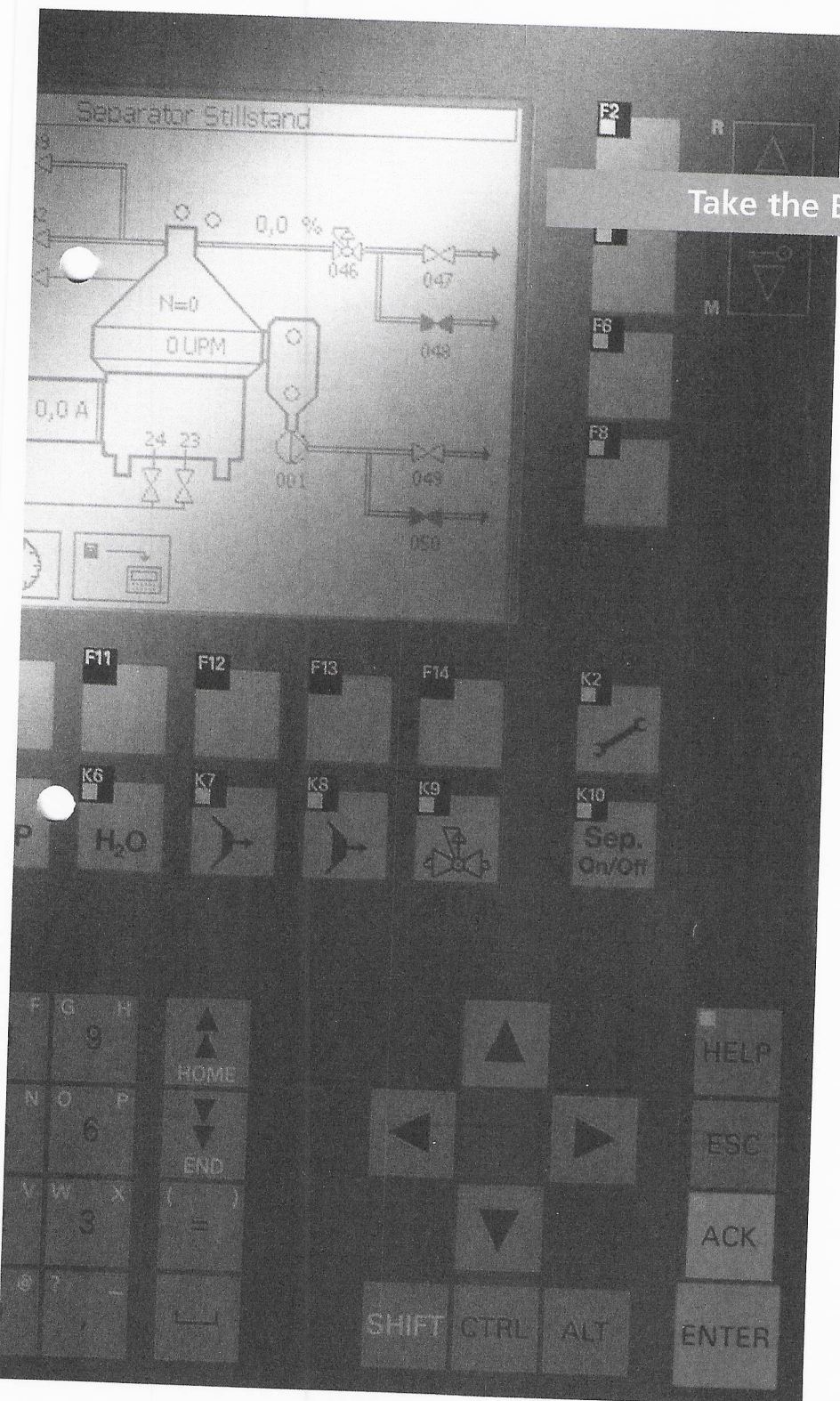
Mechanical Separation
Division

Westfalia Separator
Engineering

Take the Best - Separate the Rest

We automate - you separate

Separator Control
System with
TVE 7



Separator control system with TVE 7

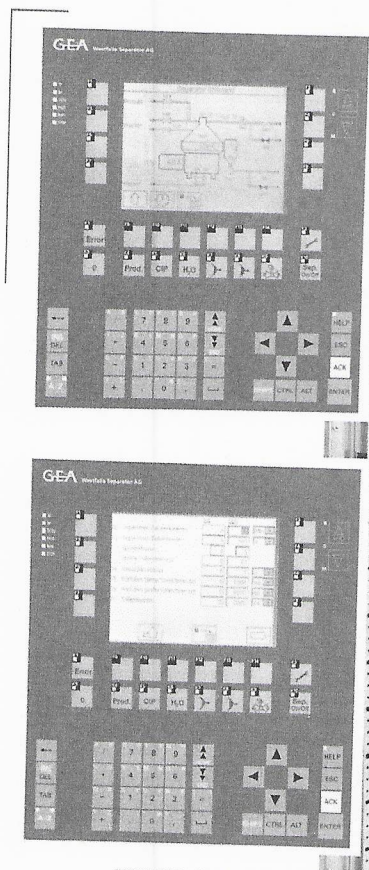
The separator control system assures automatic programme control and supervision of centrifugal separators. It is configured depending on product and customer-related requirements, tried-and-tested, and ready for operation. The integrated control unit TVE 7 controls and supervises the separator as well as its entire periphery, including automatic valves, pumps, and measurement transducers.

Features of the TVE 7

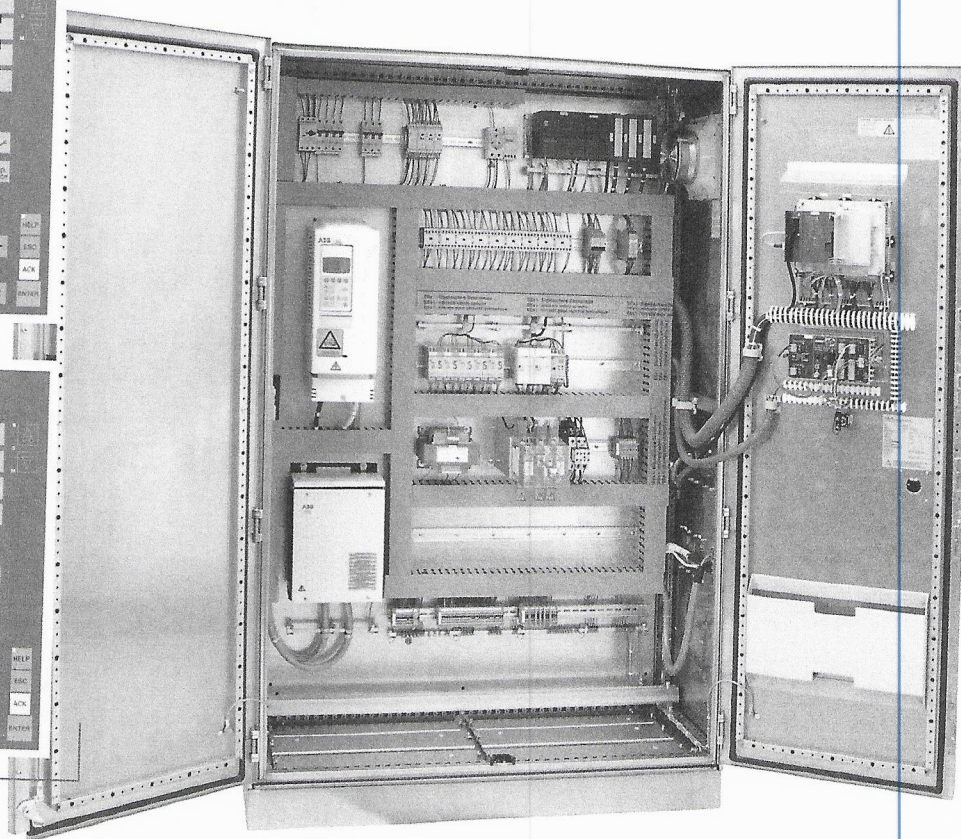
- Unit consisting of programmable logic control and operator panel
- Fully graphic 6" blue-mode display
- Membrane keyboard with function keys
- Profibus interface DP
- Data storage on Micro Memory Card (MMC) and Compact Flash Card (CFC)

Separator control system

- Visualisation of the separator plant (including process diagram of separator, status of valves and pumps, measuring values and alarms)
- Menu-driven user guidance
- Possibility of checking all separator-related data (analogue values, timers, limit values, automatic valves, connected pumps, etc.)
- External signals for controlling the production and cleaning cycles



*TVE 7-I with display figures:
Main functions of the separator
(see upper figure) and timers
(see lower figure)*



*Example of a compact control
cabinet with TVE 7. Stainless-
steel design, with frequency con-
verter, output filter, and for
separators in explosion-proof
areas*

Unit of separator and control system

Planning and production of the complete functional unit, comprising the separator and a complete control system from Westfalia Separator, offers all the benefits of the Westfalia Separator quality standard in accordance with ISO 9001:2000 (worldwide!) for our customers. Our control systems are designed according to the EN 60204 standard and comply with the requirements of the official European Machine Directive. This is to ensure that the separator and the control system are completely tested and that the unit comprising the machine and the control system fulfills the European CE rules and regulations. In addition, the safety requirements for the centrifuge according to EN 12547 standard as well as the safety rules under the European User and Operator Directive (89/655/EG) and specified by the employer's liability insurance association are fully met. Our customers can not only take profit from the benefits in terms of safety but also from our process-technological know how gathered over decades.

Control functions

All the functions of the separator can be controlled and monitored.

- Startup and shut-down of the separator
- Motor current
- Bowl speed
- Ejection monitoring
- Turbidity measurement
- Ejection sequences
- Control of the valves for the hydraulic system of the bowl
- Control of the feed and discharge valves
- Level control for the solids pump
- Control of the valve cabinet
- Throughput and pressure control and adjustment



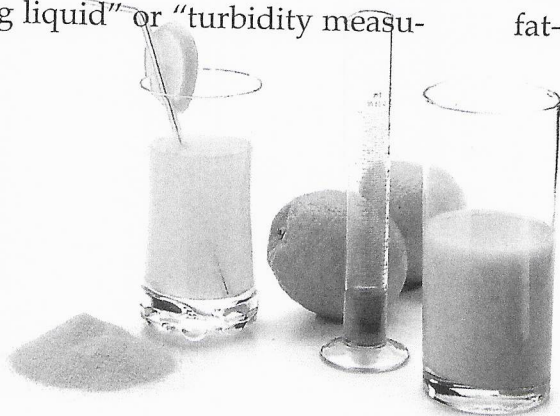
Possible configurations

The four control-system variants available (TVE 7-I, TVE 7-MI, TVE 7-MO and TVE 7-R) are supplied with basic functions / equipment, modified according to the relevant project application. Thus, the general functionality of the various control systems can be further extended by special features.

TVE 7-I

For separator types
SA/SB/SC/ES/HS/GS/CS/HF

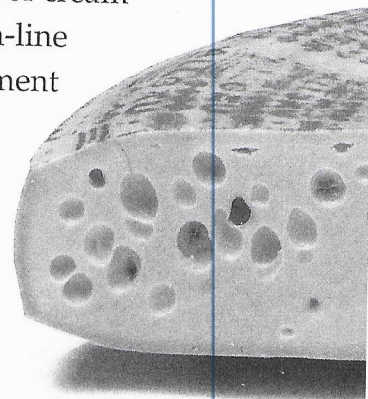
- Possibility of combined partial and total ejection programs
- Control of the product and solids valves/pumps
- Optionally for internal control systems using "sensing liquid" or "turbidity measurement"



TVE 7-MO

For separator types
MS/CN/CS

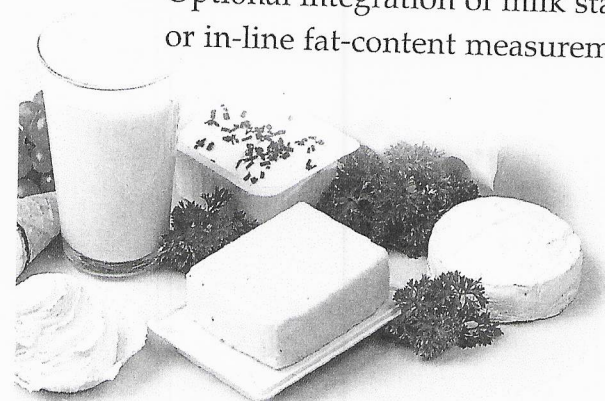
- Combined partial and total ejection programs
- Product displacement prior to a total ejection
- Optional integration of cream standardization or in-line fat-content measurement



TVE 7-MI

For separator types MS/CN/CS

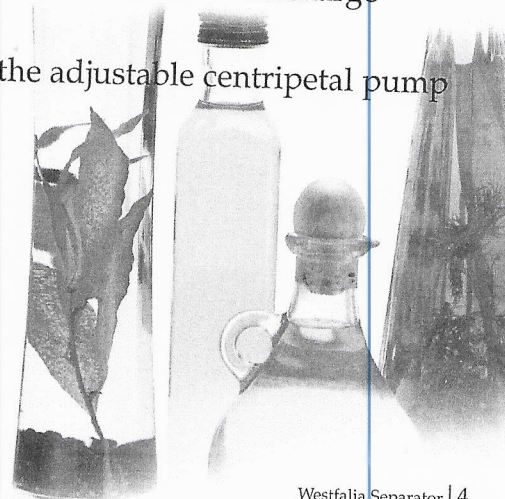
- Partial ejections only
- Control of the product and solids valves/pumps
- Optional integration of milk standardization or in-line fat-content measurement



TVE 7-R

For separator types RS/ES/OS

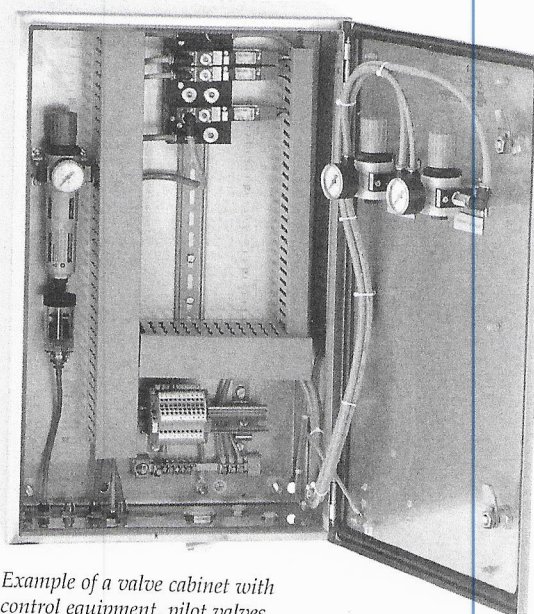
- Partial ejections only
- Filling of the bowl with water
- Supervision of the clean-oil discharge pressure
- Control of the adjustable centripetal pump



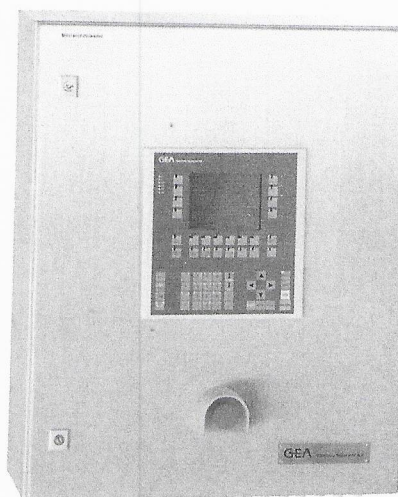
Optional equipment

On customer's request, each separator control system can be provided with the following additional equipment.

- Control cabinet in stainless-steel design
- EEX control panel for explosion-proof areas
- Bus connection (e.g. Profibus DP)
- Valve cabinet with pressure reducers and pilot valves 24 VDC, for pneumatic control of constant pressure valve, metering piston and/or automatic valves in the separator feed and discharge lines
- TVE 7 and motor starter are included in the compact control cabinet as standard equipment (see figure on page 2). For on-site operation, control unit and motor starter can be designed as separate units (see adjacent figure)



Example of a valve cabinet with control equipment, pilot valves, and two pressure reducers



TVE 7 in the on-site cabinet, stainless-steel design, with control unit and motor starter being provided as separate units

Additional services

Westfalia Separator Engineering

- | | |
|---|---|
| • Installation of plant equipment: | Installation of individual machines, assembly of plants, supervision of assembly |
| • Installation of automatic equipment: | Commissioning /support in commissioning, supervision of installation, troubleshooting |
| • Plant construction, package units, CIP units | |
| • Replacement of older control systems against new ones | |
| • Technical advice, service | |
| • Training, technical support | |