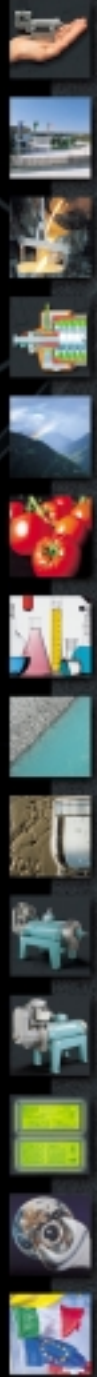


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 **Gennaretti**^{spa}
CENTRIFUGAL SYSTEMS

We are glad to introduce
to you our production of
Centrifugal Systems
GHT.





GENNARETTI S.p.A. has been in existence since the beginning of the 1980's. Its founders, experts in the mechanical and technical sector, had and still have a very ambitious aim: to build centrifugal systems which can provide innovative solutions to client's requirements by the choice of material employed, high technology and reliability. The founders also laid great importance on the aesthetic appearance of the machines. Their dedication and pride towards their work has led to the development of this product. Attention has been paid to every detail, from the technology to the functioning, from the materials used to the design. Consequently, over a short period of time GENNARETTI S.p.A. has become one of the most important national entities in the manufacture of solid/liquid separation systems. A technologically advanced and reliable product, commercial seriousness and a human touch are the main elements which make GENNARETTI S.p.A. the preferred choice in Italy, Europe, Asia and America. Being convinced that a good idea leads to a good product, at the beginning GENNARETTI S.p.A. spent a great deal of time and energy on the study and research of innovative solutions.

The new generation, the **Decanter line GHT (Gennaretti High Technology)** presents numberless technological innovations in terms of technical design and

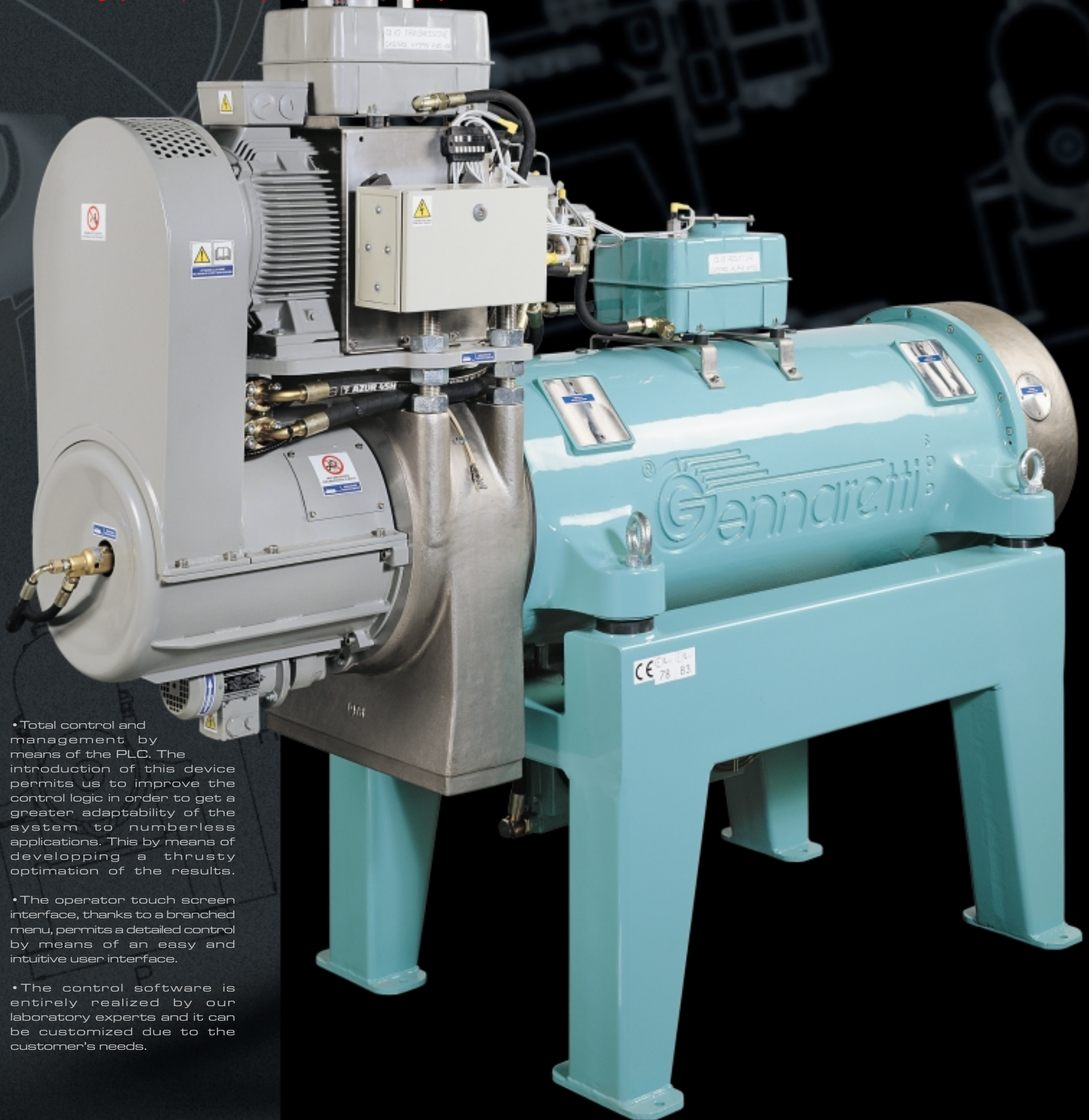
electronic control.

We have paid particular attention to:

- The working out of the scroll shaft by one sole piece enables the achievement of a high clarification band by increasing the capacity.
- The axial motor positioning on the machine enables to keep clean the inferior parts and counterbalances the effort supported by the bearings due to the gravity force.
- Different types of belts, both trapezoidal and toothed ones, are employed for the machine drive and gives a substantial reliability for direct and instantaneous machine management.
- The positioning of the bearings has been chosen in order not to come in contact with any external element.
- A forced and continuous lubrication of the gear box is carried out to permit a long-life reliability and best working conditions also for hard situations.

The innovations of the electronic sector are:

- Inverter starting up that permits the continuous speed adjustment of the bowl, a soft and adjustable starting up, lack of absorption peaks, increasing reliability and a longer life in comparison to clutches.

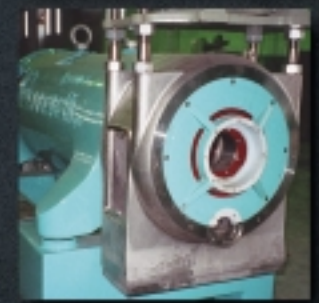


- Total control and management by means of the PLC. The introduction of this device permits us to improve the control logic in order to get a greater adaptability of the system to numberless applications. This by means of developing a thrifty optimization of the results.
- The operator touch screen interface, thanks to a branched menu, permits a detailed control by means of an easy and intuitive user interface.
- The control software is entirely realized by our laboratory experts and it can be customized due to the customer's needs.

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Since the beginning research into and the development of cutting edge technology has guided the companies decision making process. The principle objective of the research has always been the choice of materials, the treatments and the construction geometry. Today, the increased demand for high levels of performance makes it necessary to concentrate our attention on the whole "system", dedicating ourselves therefore even more to the realisation of control, protection and automation systems.

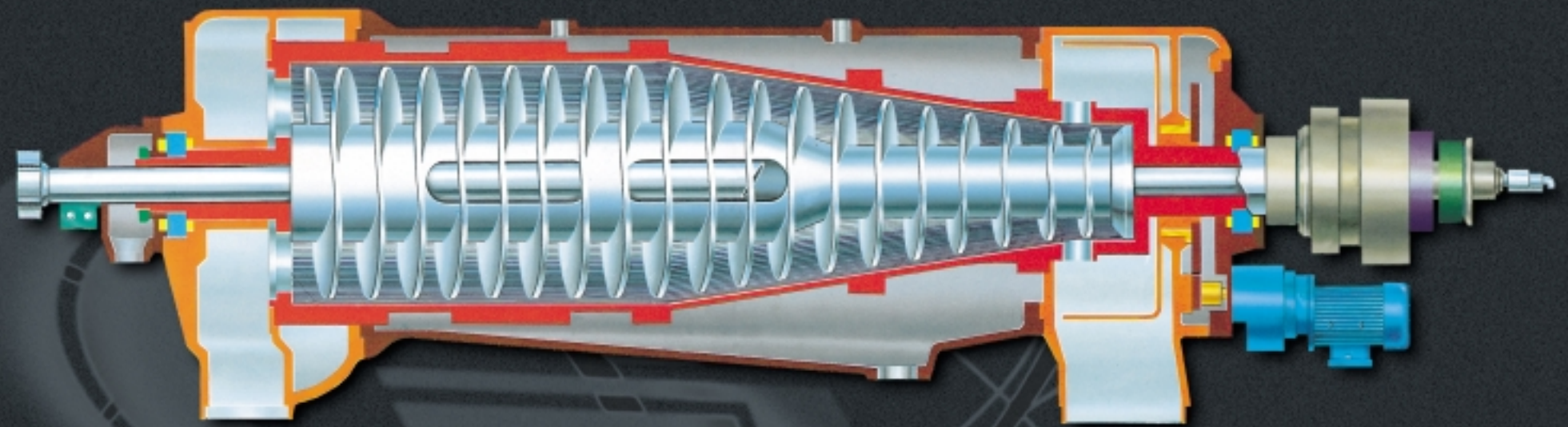


WORKING PRINCIPLE

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During the process of decanting, particles left in a solution for a period of time tend to deposit themselves on the tank floor due to the force of gravity. In some cases (biological fluids) the time taken for spontaneous sedimentation is too long and some particles take several years for sedimentation. If the same container is rotated in a circle, the solution is subject to an artificial force of gravity, with a proportional distance between the rotation centre and the square of rotation speed. By means of centrifugation, the force of gravity is higher than that of terrestrial gravity and therefore accelerates the sedimentation process. The principle behind the working of the of centrifuge is based on the specific weight difference between the substances to be separated. The separation takes place in the internal part of a cylindrical-conical container, which is called the drum and

which rotates at high speeds. It is driven by an electrical motor, in order to increase by infinite times the force of gravity. The product is supplied via the feeding tube and the drum rotation deposits the solid on to its internal walls, while the liquid forms a ring inside. The thickness is determined by the adjustment of the liquid outlet, from which the clarified liquid is released. The function of the scroll is to remove the solid product, which is then discharged by means of an evacuation system. In order to separate certain types of solid, it's necessary to use polymer to make the separation easier.

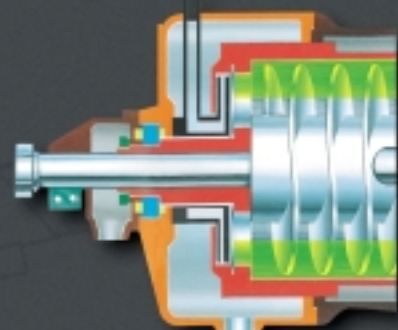


Centripetal pump.

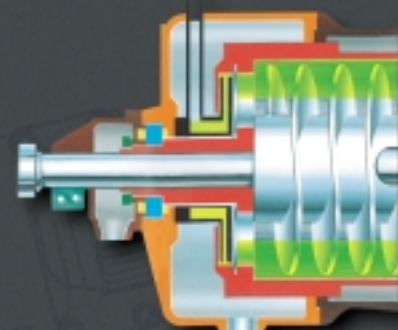
In order to avoid oxigenation and oxidation of the liquid outlet phase it is undispensable for some processing lines the use of centripetal pumps. They form a counter-pressure

in the outlet to get a pressure product that can be stocked. There are different control systems for the centripetal pumps.

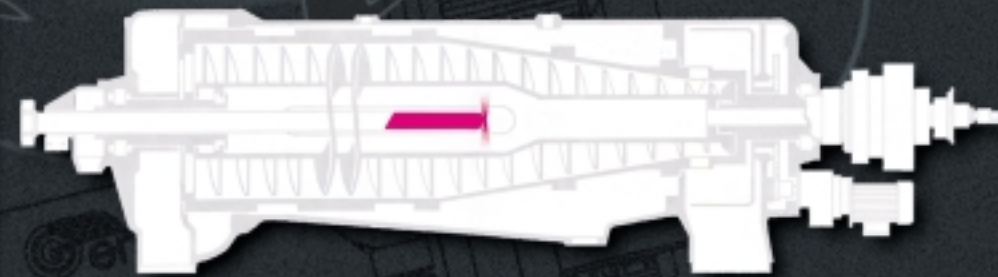
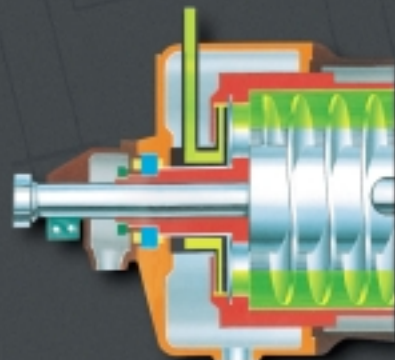
Liquid phase in the internal part of the bowl



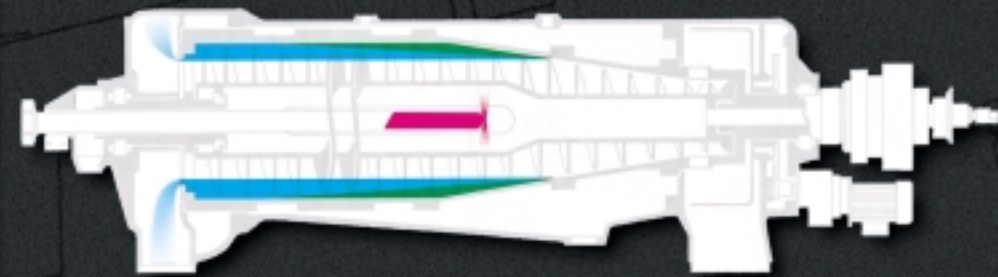
Input of the liquid phase in the centripetal pump



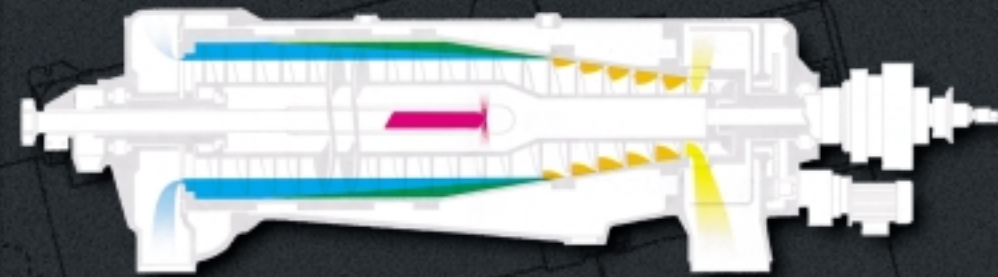
Pressure output of the liquid phase



Product inlet by means of the feeding device in machine's inner part



Solid-liquid separation phase in bowl's inner part



Liquid and solid product output

ECOLOGY

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For this particularly important sector, the company constructs high efficiency, polyvalent machines which are used in purification plants, in water treatments plants, in sludge dehydration and in sludge pre-thickening. On the operator panel you can switch from one mode to another, due to the advanced control software of the machine.

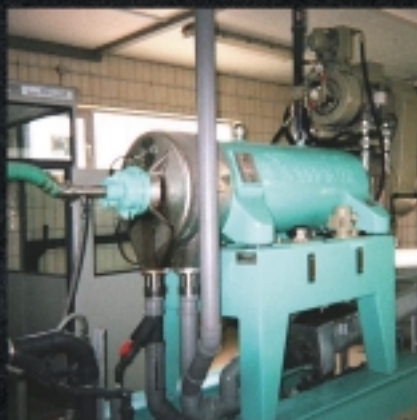
The use of the centrifuge as a pre-thickener (reduction of the liquid inlet volume) renders the use of equalisation tanks unnecessary.



View of the purification plant



Biologic sludge collecting



Sludge separation processing plant



FOOD & JUICES

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In this sector the decanters are utilized for the processing of agricultural products such as tomatoes, lemons, orange, kiwi and mangos. These machines are used when the separation of the pulp from the juice is needed, or in fruit juice preparation, when a better clarification of the juice is required.



Lemon working processing



Tomatoe working processing



Carot working processing



CHEMICAL

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In the chemical sector the decanters are primarily used in the salt separation process and in the crystals separation process. In this sector often the substances to be treated are particularly harsh and so the machine parts (solid and liquid discharge, drum, scroll) in contact with the substance need to be treated with particularly resistant material. We apply Duplex or Super-Duplex.



Complete view of the plant



View of the separation processing on a treatment plant of timber



View of the salt separation plant



MINING

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The wide experience gained through the development of centrifugal decanters enabled us to apply those systems to the treatment of quarry sludges. This application field requires in particular an efficient method of an automatic separation process. The Gennaretti spa manufactures high technological centrifuges (GHT) for sludge dewatering through the solid/liquid separation process, or more specifically, through the specific weight difference. The

construction quality is given by the machine structure made of cast iron, the discharge chutes of inox castings and the careful choice of components, giving long-life reliability to the machine that is submitted to hard and stressful working conditions. After a long period of studies and research, we are able to offer now a long and unique working experience of several years. This experience was gained on the plants where our centrifuges are used with satisfaction and it enables us

further to propose centrifuges with excellent results and extreme less wear than other systems which are normally used for the treatment of quarry sludges. All in all, our plants are able to realize the best performance results with minimum overall dimensions with no need of personnel for adjustment and/or control. The high technology level allows the application of our centrifuges in different types of plants with static or dynamic clarifiers or alternatively, without it.



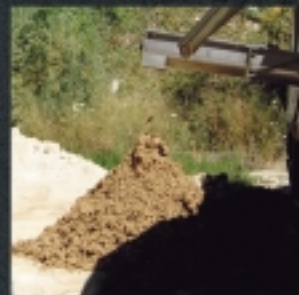
Washing plant of inerts



Collecting of washing water



View of the plant's solid output



GLOBAL

The solid liquid separation processing is applied on all the sectors where the specific weight difference permits the process of separation.

We list some of the application sectors in which it's possible to use centrifugal decanters for the separation processing:

- Paper industry
- Polystyrene
- Nickel hydroxid
- Magnesium hydroxid
- Caolin
- Color industry
- Bauxite
- Sorosio
- Gelatine
- Copper

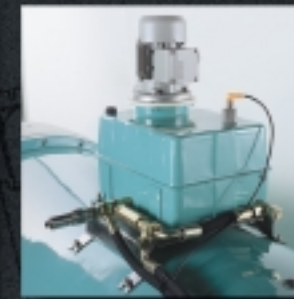
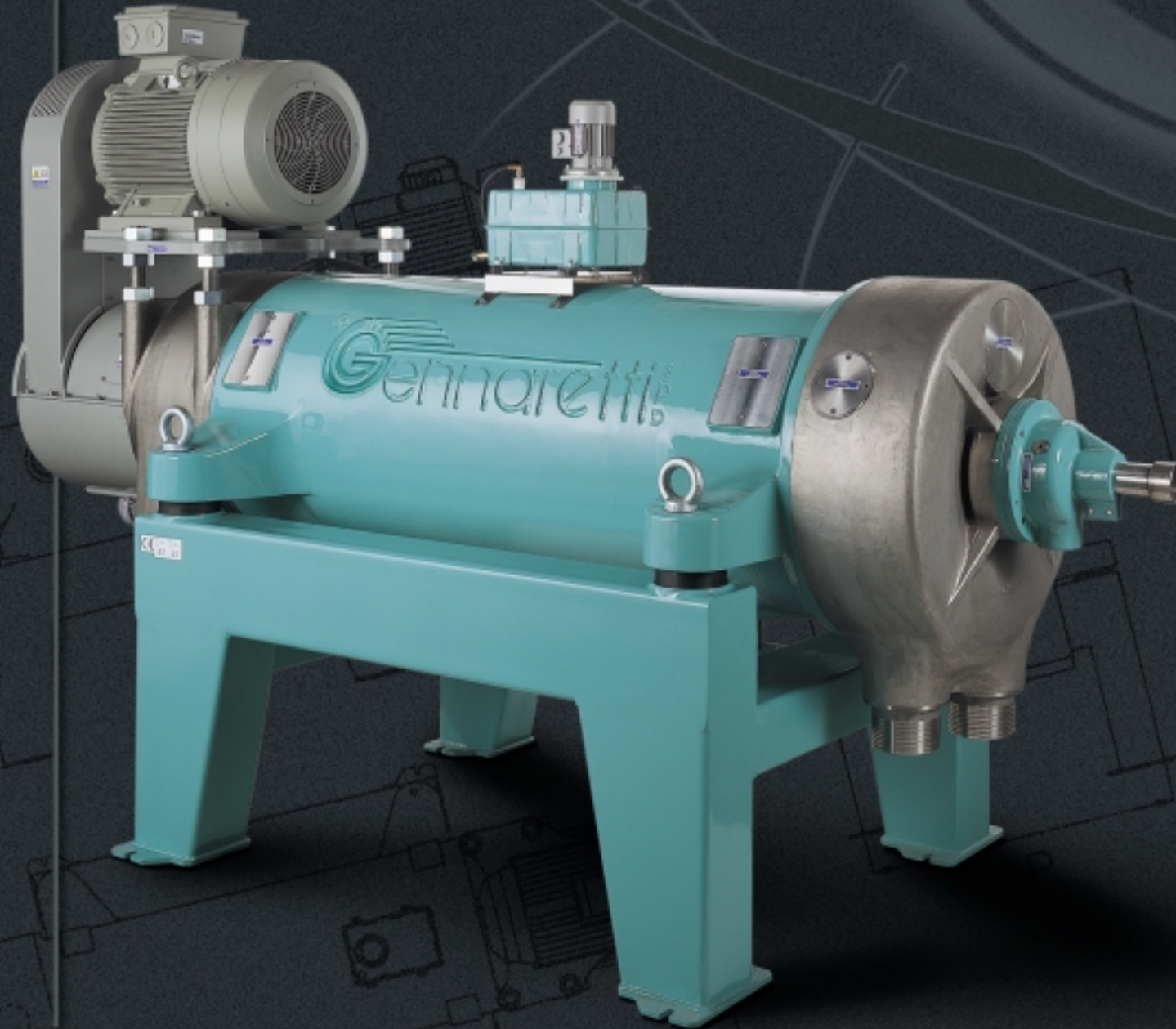
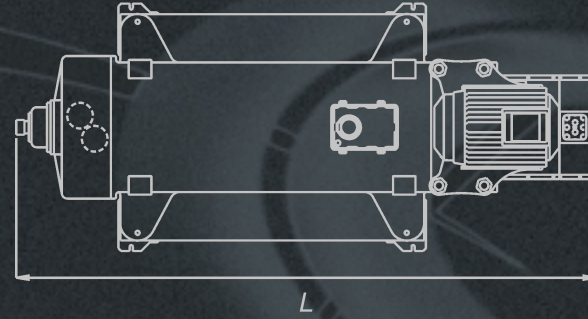
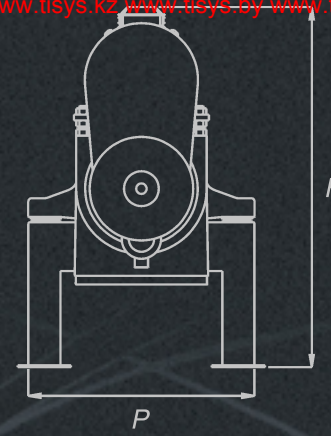
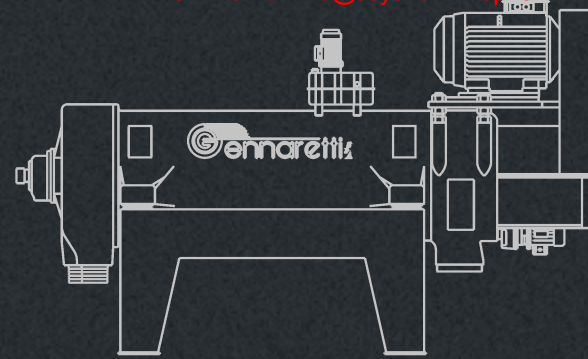
The GHT machines have a wide adjustment range for the variable types of centrifuges. This enables them to adapt themselves in all the above mentioned application sectors. The experience gained and the great effort we have employed permit us to develop every day new application possibilities.

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P TYPE

These are identified by an even decanter denomination (GHT 10, GHT 22, GHT 34, and so on). In these machines the scroll and the drum are driven by only one electric motor, which is started up by an inverter. This enables the proportional speed difference variation of the scroll and the direct drum variation from RPM 0 to RPM MAX. This model is suitable in a situation where the material going in is characterised by a constant dry solid composition and the material to be discharged is to be of a fix dry solid composition.



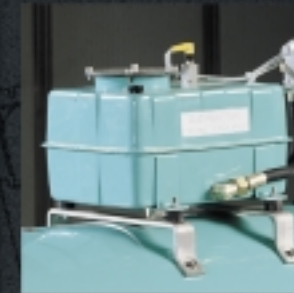
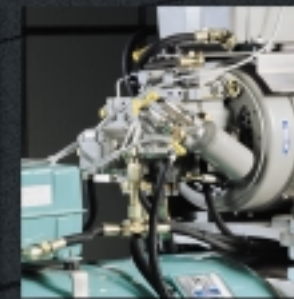
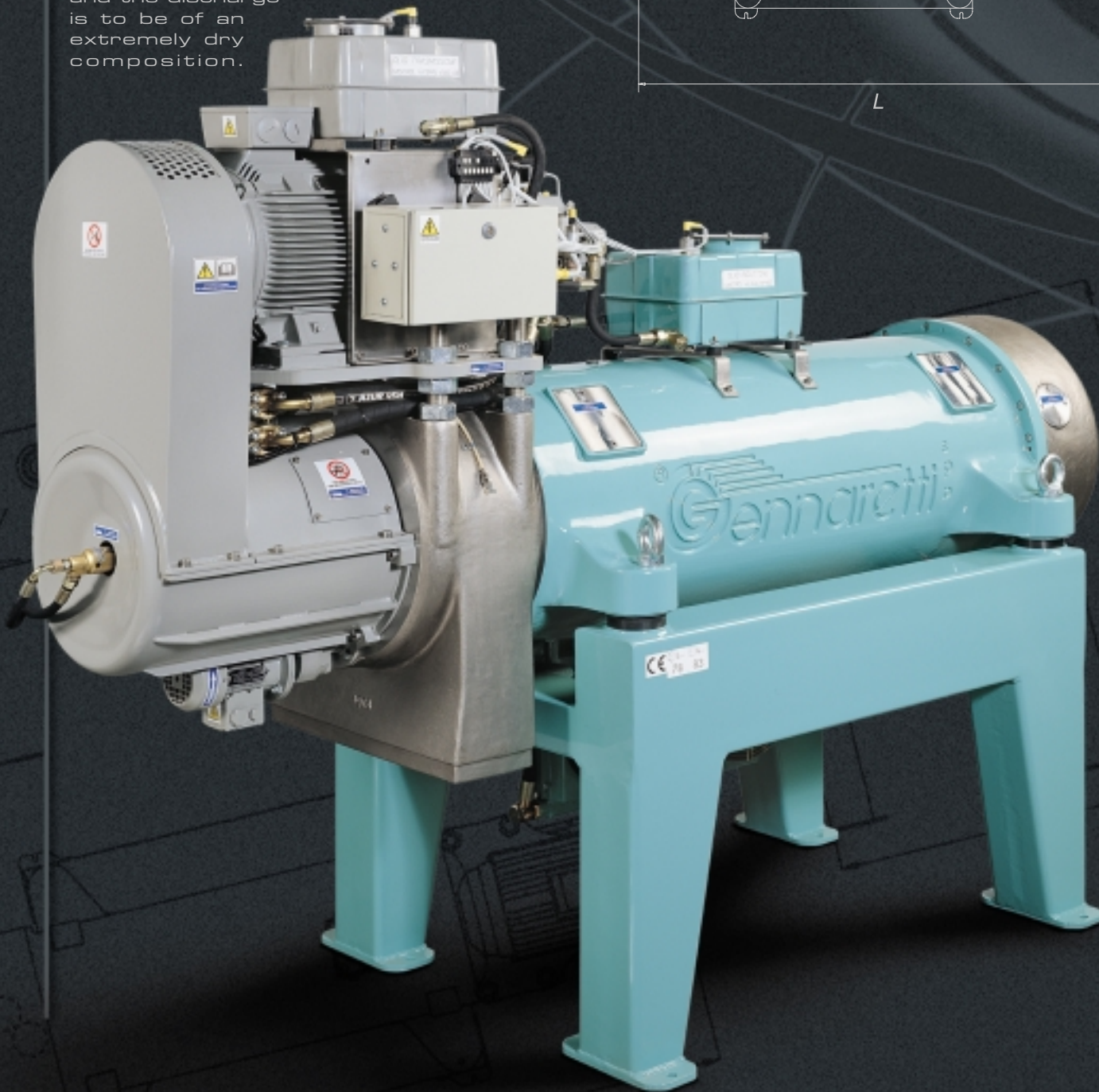
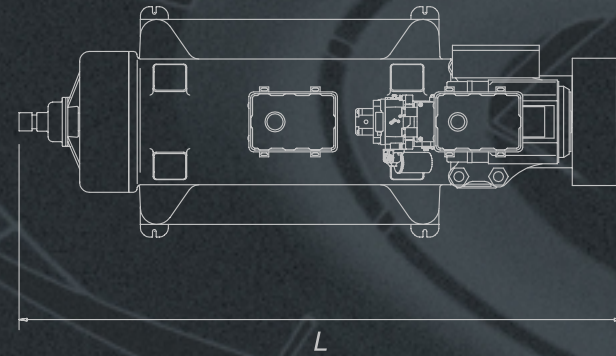
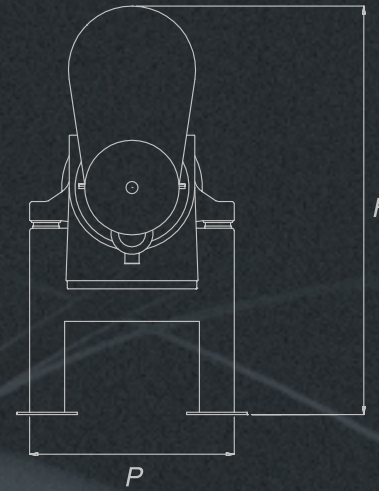
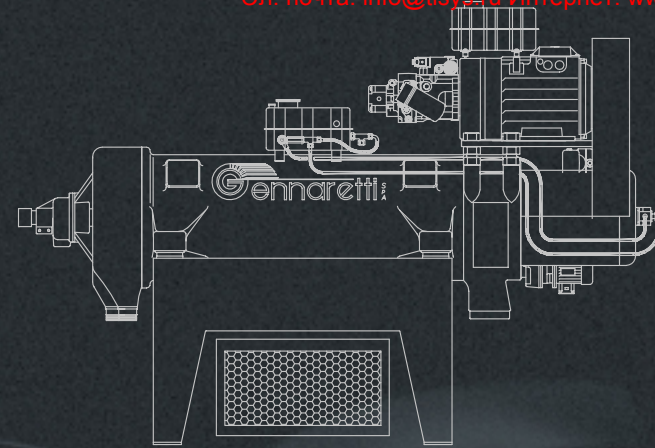
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Item	Decanter GHT Proportional Type
Application field	Various
General Data	
Type	Dehydration sludges Pre-thickening
Working principle	Counter-current
Hydraulic capacity [mc/h]	from 6 to 200
Effective capacity [mc/h]	Depends on products
Max temperature	80° Standard - 150° Optional
Machine Casing	
Machine frame	Cast iron casting
Solid product outlet	AISI casting
Liquid product outlet	AISI casting
Vibration dumpers	Integrated to the casing near baricentre
Painting	Plain furnace
Color	Casing and support in green motor and protection cover in RAL 7030
Weight [kg]	from 550 to 15100
Rotating Parts	
Bowl	High resistant AISI
Internal diameter [mm]	
Internal length [mm]	
Slimming rate [l/d]	
Max bowl rotation [rpm]	
Scroll	High resistant AISI
Max diameter [mm]	
Internal length [mm]	
Differential speed [rpm]	
Facing ledges	Inox steel AISI 316 L
Scraper	Inox steel with gear drive
Reduction gear	Epicycloidal Lubrication in continuous
Bowl drive	Trapezoidal belt with electronic rotation control
Scroll drive	Trapezoidal belt with electronic rotation control
Machine will be supplied with two drive systems, one installed and one in stock	
Operating	
Main motor [kw]	from 7,5 to 132 inverter starting-up
Scraper motor [kw]	from 0,18 to 0,75
Lubrication reducer pump [kw]	from 0,18 to 0,37
Technology	
Clarification	Wide band
Energy	Low energy consumption due to recovery of mechanical force conversion
Conditioning of outlet flow speed by means of weir plates	
Anti-wearing facing	
Solid product outlet through sintered bushings, easily positioning and substitution through maintenance ports.	
Scroll metallizing anti-wear sinterizzate	
Components Applied	
Electric motor	Siemens IP55 - Tropicalized Multitension - Class F
Belts	Gates, Dayco, Texrope
Bearings	FAG, SKF
Epicycloidal reducer	Cyclo - Lubricated with oil in continuous (GHT 1XP with grease)

V TYPE

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These are identified by an odd decanter denomination (GHT 11, GHT 23, GHT 45, and so on). Here the drum is driven by an electric motor while the scroll is operated by a hydraulic system. The speed variation of the scroll is continuous and automatic and can carry out two procedures, at constant rotations (the drive torque changes in relation to the dry solid), or at constant torque (the rotations vary in relation to the dry solid). This model is particularly suitable in a situation where the material to be treated is characterised by a variable composition and the discharge is to be of an extremely dry composition.



Item	Decanter GHT Variable Type
Application field	Various
General Data	
Type	Dehydration sludges Pre-thickening
Working principle	Counter-current
Hydraulic capacity [mc/h]	from 6 to 200
Effective capacity [mc/h]	Depends on products
Max temperature	80° Standard - 150° Optional
Machine Casing	
Machine frame	Cast iron casting
Solid product outlet	AISI casting
Liquid product outlet	AISI casting
Vibration dampers	Integrated to the casing near baricentre
Painting	Plain furnace
Color	Casing and support in green motor and protection cover in RAL 7030
Weight [kg]	from 550 to 15100
Rotating Parts	
Bowl	High resistant AISI
Internal diameter [mm]	
Internal length [mm]	
Slimming rate [l/d]	
Max bowl rotation [rpm]	
Scroll	High resistant AISI
Max diameter [mm]	
Internal length [mm]	
Differential speed [rpm]	
Facing ledges	Inox steel AISI 316 L
Scraper	Inox steel with gear drive
Reduction gear	Epicycloidal Lubrication in continuous
Bowl drive	Trapezoidal belt with electronic rotation control
Scroll drive	Trapezoidal belt with electronic rotation control
Machine will be supplied with two drive systems, one installed and one in stock	
Operating	
Main motor [kw]	from 7,5 to 132 inverter starting-up
Scraper motor [kw]	from 0,18 to 0,75
Lubrication reducer pump [kw]	from 0,18 to 0,37
Hydraulic pump	55 cc and 75 cc - drive PWM
Hydraulic motor	30 cc and 40 cc
Technology	
Clarification	Wide band
Energy	Low energy consumption due to recovery of mechanical force conversion
Conditioning of outlet flow speed by means of weir plates	
Anti-wearing facing	
Solid product outlet through sintered bushings, easily positioning and substitution through maintenance ports.	
Scroll metallizing anti-wear sinterizzate	
Components Applied	
Electric motor	Siemens IP55 - Tropicalized Multitension - Class F
Belts	Gates, Dayco, Texrope
Bearings	FAG, SKF
Epicycloidal reducer	Cyclo - Lubricated with oil in continuous (GHT 1XV with grease)
Hydraulic pump	Linde
Hydraulic motor	Parker

OPERATOR PANELS

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Operator panel T 100

Main characteristics

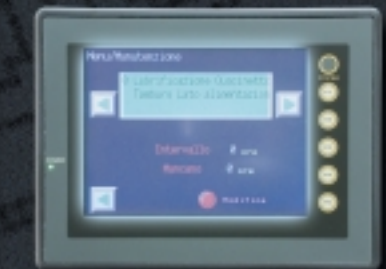
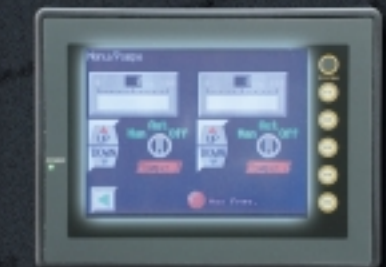
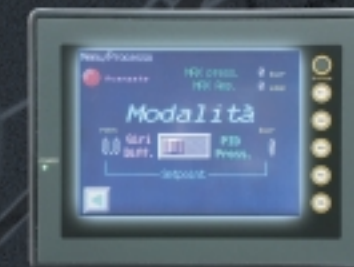
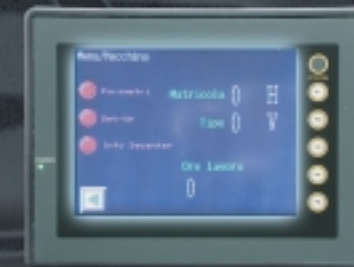
- Control logic is integrated on PLC;
- Possibility to be SLAVE of the net Profibus or Ethernet for the remote control and comand of the centrifuge;
- Inverter management (main motor and eventually some pumps) with analogue signals;
- Operator interface monochromatic touch-screen with 3 colours back-lighting and 160x64 resolution pixel;
- Possibility of periodic report prints;
- MODEM connection for telematic control and assistance;



Operator panel TS 6

Main characteristics

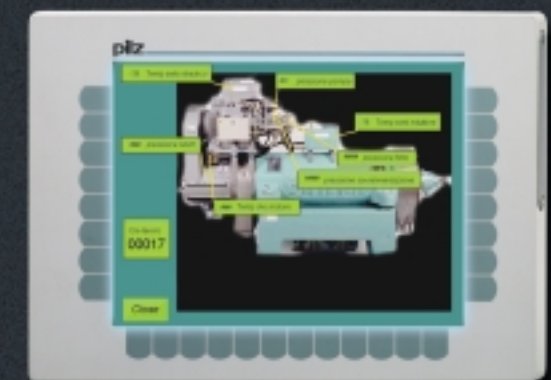
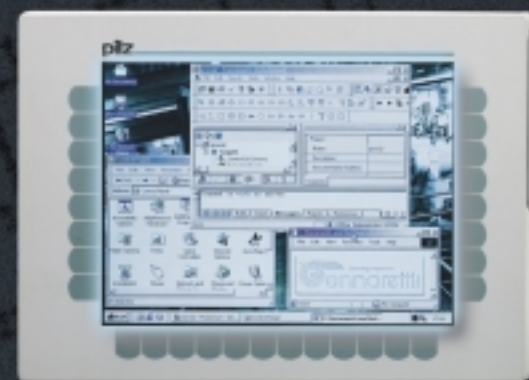
- Control logic is integrated on PLC
- Possibility to be SLAVE of the net Profibus or Ethernet for the remote control and comand of the centrifuge
- Inverter management (main motor and eventually some pumps) via Profibus ;
- Data acquisition of the machine via Profibus (to simplify at most the wiring between the machine and the electric control panel);
- Extensive connection possibility of the plant accessories (e.g. flow meter or level meter, temperature etc.) both directly on the PLC control and as Profibus nodes;
- Operator interface touch-screen 16 colours , 6 inches and 320x240 resolution pixel;
- Possibility of periodic report print;
- MODEM connection for telematic control and assistance;



Operator Panel TS 14

Main characteristics

- Control logic with SOFT-PLC technology integrated on an industrial PC Touch-screen, 14 inches with 800x600 resolution pixel , and the operative system WINDOWS 2000 or WINDOWS NT;
- Multioperator interface with SCADA supervision;
- Possibilità di essere SLAVE di reti Profibus o Ethernet per il controllo ed il comando in remoto della centrifuga;
- Possibilità di connettere il PC ad una rete Ethernet TCP-IP già presente nell'impianto/azienda e di controllare e comandare la macchina tramite un Browser Internet comune;
- Gestione degli Inverters (motore principale più eventuali pompe) via Profibus ;
- Acquisizione dei segnali macchina via Profibus (per semplificare al massimo il cablaggio tra macchina e quadro di controllo);
- Ampla possibilità di collegamento dei vari accessori di impianto (es. misuratori di portata o livello, temperature ecc..) sia direttamente sul PLC di controllo sia come Nodi Profibus ;
- Possibilità di files di logging delle variabili impianto personalizzati, di condivisione delle tabelle dati e interfacciamento tra supervisione e applicativi Microsoft Office;
- Stampa di report periodici personalizzabili su stampante locale o remota in rete;
- Aggiornamenti software e assistenza via Modem o via Internet;



INSTALLATIONS

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Some of our worldwide installations



EXIBITIONS

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TAU Expo
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