

2005.x: Drive and Safety Panel

Drive and Safety Panel

- Ferrum centrifuges are built according to the latest standards and guidelines to ensure a safe and reliable work environment. Risk analyses help finding critical elements in the design and manufacturing process for centrifuges. Together with our vast experience a complete safety solution is created.
- The drive and safety package guarantees a safe and optimized operation of the centrifuge. The panel is designed and built according to the latest guidelines and requirements such as:
 - EN 12547 Centrifuges - Common safety requirements
 - EN 954-1 Safety of machinery - Safety related Parts of Control Systems
 - EN 60204 Safety of machinery - Electrical equipment of machines
 - IEC 61508 Functional safety of electrical/electronic/programmable electronic safety related systems
- The drive and safety panel is assembled on a mounting plate (for installation in a cabinet, see Pos. 2006)



Safety Design

Hazardous area	Centrifuges are often located in hazardous areas where explosion danger is eminent. We generally design equipment for: <ul style="list-style-type: none"> Non hazardous installations Hazardous installation according to NEMA (Class Division system) Hazardous installation according to EN (Zone system)
ATEX	ATEX is the standard valid in Europe for installations in hazardous areas.
EN 12547	This document applies to centrifuges aiming at separation of liquid/solid/solid or at least two of these substances. It gives requirements for minimizing the risk of mechanical, ergonomical and electrical hazards. Excluded are for example hazards from microbiological, flammable and explosive substances. The document also covers requirements for noise measurement.
SIL	Safety instrumented systems (SIS) are used to provide safe control functions for processes, e.g. emergency shutdown (ESD). Electric and electronic devices can be certified for use in SIL applications of a given SIL level according to IEC 61508, thus providing the market with some degree of confidence in their safety performance and with a means of determining if they can be used in a given application.

Interface

The main component is a state of the art VFD (Variable Frequency Drive) to adjust the speed of the basket. The panel is equipped with a standardized customer interface allowing easy set-up and trouble free commissioning. The panel is pre-wired with calibrated and pre-programmed monitoring devices. The entire unit is tested as part of the centrifuge FAT in our facilities.

Integrated Features

Hardwired interlocks are provided for critical parts of the system. The integrated VFD is equipped with SIL2 approved safety functions Safe Stop 1 (SS1) and Safely Limited Speed (SLS) as defined by IEC 61508. The SS1-feature prevents the drive from starting unintentionally while the SLS-function reduces the speed to a safe level in case of excessive vibrations. Additionally installed are monitoring components necessary to operate a centrifuge, control centres for auxiliary motors and drives, circuit breakers and fuse boxes as required.

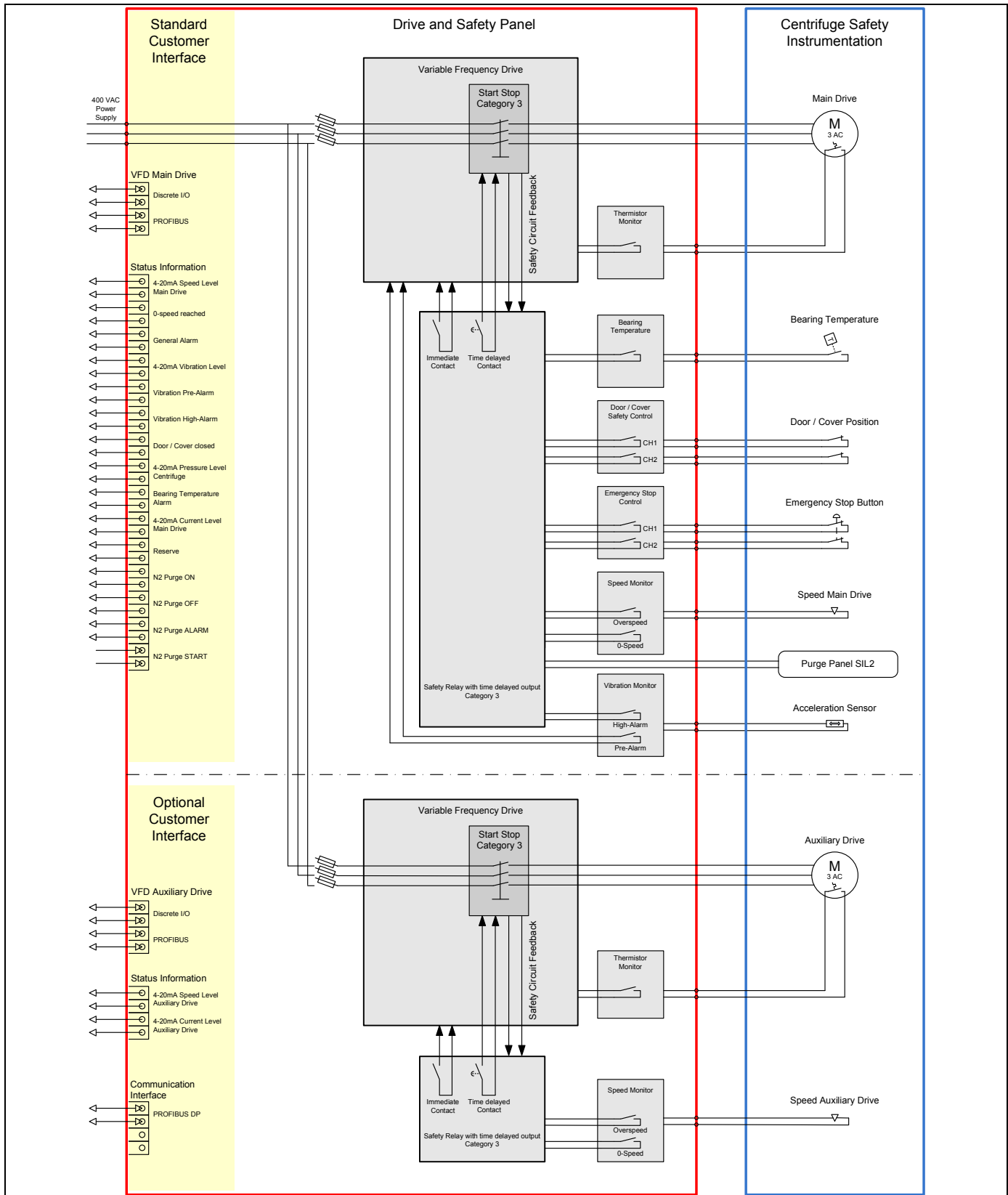
Modules and Interfaces included

Safety Modules	Standard Modules	Interfaces
<ul style="list-style-type: none"> Frequency converter Motor temperature Motor speed Bearing temperature Vibration (Unbalance) Door / Cover monitor Emergency Stop 	<ul style="list-style-type: none"> Power supply for hydraulic unit Fuse box & Line breaker 24 V DC power supply Intrinsically safe barriers Signal transmitters Terminal blocks 	<ul style="list-style-type: none"> Analog 4-20 mA Digital In dry contact Digital Out dry contact PROFIBUS DP (optional)

For further details see Block Diagram on next page.

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Block Diagram



Note

- Main Drive:** Basket (for all types of centrifuges)
- Auxiliary Drive:** Optional inclined feed and wash disc for vertical centrifuges (VBC)
Optional electrically actuated scraper unit for horizontal centrifuges (HPZ)