

easyRelay Controls Water Treatment with easyConnect SmartWire



Nowadays, special glass processing machines with diamond fitted tools carry out the full or semiautomatic grinding, sawing, drilling or cutting of glass. A large volume of water is required during the processing for rinsing and cooling. Depending on the size of the machine, up to 3000 l/min is required at a water pressure of 6 bar. Glastechnik Holger Kramp uses easyRelay with easyConnect SmartWire for its clean water systems. Following the “easy way to connect” principles of Moeller’s Darwin technology, SmartWire provides the finishing touch in glass processing.



With Darwin technology Moeller is heralding a fundamental change in the conventional switching cabinet. Darwin technology represents a bridge between

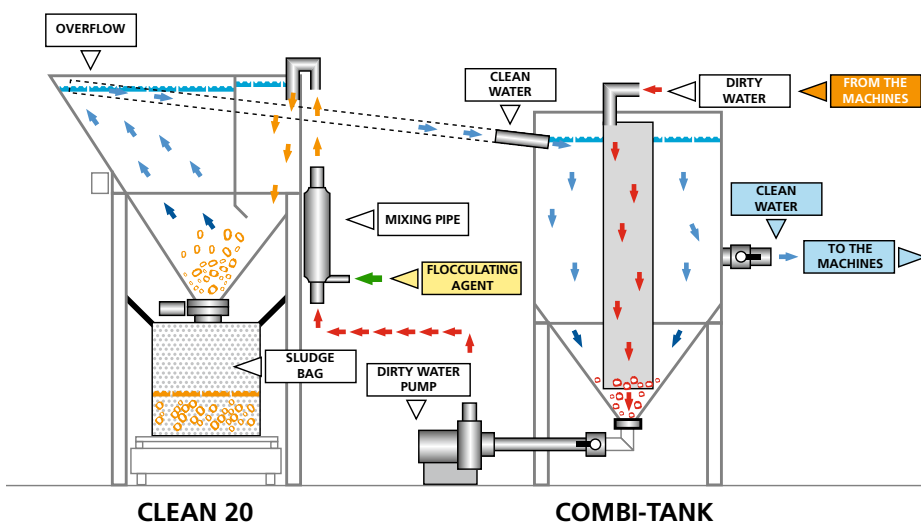
the automation world and the world of switching devices: switching devices and automation components are growing together; the conventional control wiring between the I/O modules and the switching devices is being replaced by a new simple connection technology.

The Darwin project covers the entire Moeller product portfolio for the switching cabinet in single evolutionary stages, and involves the areas controlling, switching, protecting, HMI functionality and drives. The step in this new direction is called easyConnect SmartWire or "plug & work" for motor starters. SmartWire enables conventional xStart motor starters to be connected to a PLC without any complex control wiring required. SmartWire is an addition to the well-established range of Moeller switching devices and is designed as an accessory for the standard devices. This ensures that the flexibility of the switching devices is fully maintained, and allows the proven system accessories to be used without any restrictions.



easyConnect SmartWire ensures a "tidy" control cabinet. After all, the control current power supply can be completely replaced with SmartWire.

FLOW DIAGRAM OF CLEAN 20 COMBI



However, not only in glass processing is water essential. Several factories produce contaminated waste water that can only be introduced to the sewage system with a legal water permit, and partly only pre-treated. Furthermore, approval requirements have become more rigorous since January 1, 2007. Supply and waste volumes now have to be documented and the materials contained in the water must be declared. The volume of waste water introduced into the sewage system is now also limited: of the 100 percent water volume taken from the drinking water supply, no more than 20 percent can be fed back to the sewage system as waste water. Since the water requirement of a glass processing plant is up to 300 m³ per week, depending on the machine size, taking the water requirement exclusively from the drinking water supply is uneconomical. Moreover, the water polluted by the glass processing contains around 200 grams of sludge per litre, of which 80 percent consists of quartz. For this problem Glastechnik Holger Kramp offers patented clean water systems that clean the contaminated process water at a 100% volume flow and feed it back to the process continuously.

Continuous cleaning process

The contaminated process water produced by the glass processing is pumped by the processing machines from above downward into a tapered combination tank. The so-called combi tank contains a cylinder inside, through which the process water is fed. The water that is already cleaned is collected in the combi tank outside of the cylinder. The process water then reaches the reaction tank via the dirty water pump. A

flocculating agent is added to the process water for binding the sediment and is then pumped at a high flow speed to the downward tapered dirty water reaction tank. This produces a rapidly increasing flow speed inside the tank. Thanks to the increasing flow, the dirt particles are drawn "out of the water". Gravity finally ensures the accumulation of the sludge at the bottom of the reaction tank. The sludge emptied here is disposed of as building rubble. The "lighter" process water that has been cleaned of dirt particles flows through the lamelling system that is open at the top in the reactor tank and reaches the combi tank via an overflow, where it is temporarily stored until a pump feeds it back into the glass processing machine. The water circuit then starts from the beginning.

The conductivity and pH values of the water are monitored continuously during the entire cleaning process, and stabiliser is added if required, or the water drained and fresh water added.

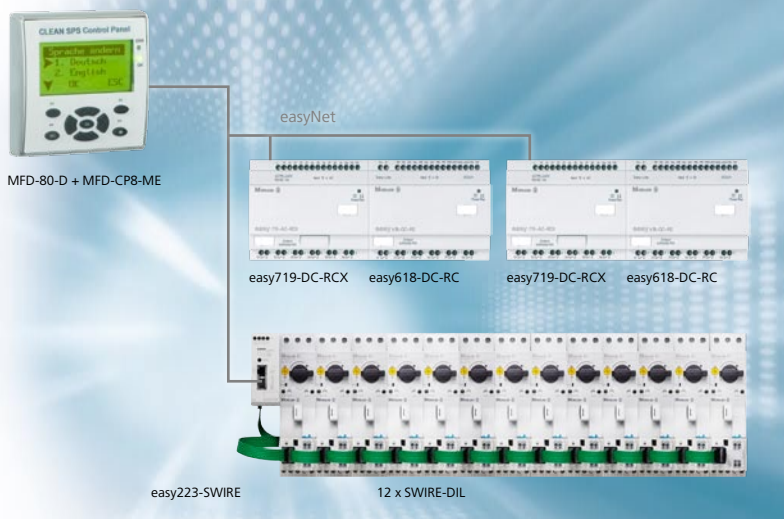
Automation simply easy

Glastechnik Holger Kramp uses different controller systems depending on the size of the clean water system. For example, the smallest system - CLEAN 10 DOSI (water throughput of 60 l/min) - is controlled with MFD-Titan the IP65 protected multi-function display from Moeller's easyHMI series. The compact backlit graphic display with 132 x 64 pixels contains nine operating buttons that can be provided with customised inscriptions. The visualisation is designed with the easySoft-Pro software. A power supply unit with CPU and an I/O module

are added to the rear of the display: The plug & work technology enables users to fit all the modules together simply as required. Thanks to the processing capacity of the easy800 over 300 I/O points can be processed. Four analog inputs, four high-speed counter inputs as well as networking via easyNet with up to eight stations allow this device series to also be used for larger clean water systems.

Glastechnik Holger Kramp designs its larger systems with redundancy to thus ensure an extremely high level of availability: Apart from the rugged easy800 controller, all the modules such as motor starters or any frequency inverters are installed redundantly - such as on the CLEAN 40 SPS glass processing machine (around 400 l/min). However, in order to nevertheless offer an outstanding price/performance ratio, these systems are fitted out with Moeller's easyConnect SmartWire: plug & work technology for motor starters. easyConnect SmartWire replaces the cumbersome control wiring between motor starters and the I/O level with pluggable, pre-assembled connecting cables. The I/O level is now therefore located directly at the motor starter. In order to make a motor starter SmartWire-compatible, the user simply plugs an additional SmartWire module onto the contactor. The primary main current connection is implemented cost-efficiently using three-phase commoning links or busbar systems.

The SmartWire connection cable provides the contactor actuation and indicates the switch position of the contactor and the motor-protective circuit-breaker. Up to 16 SmartWire-enabled DOL or reversing starters up to 15 kW can be interconnected and connected to a gateway on which the control voltage is also fed.



For systems with more than 16 starters users can simply combine several gateways. The easyNet/CANopen gateway handles the communication with easy800 control relays. Alternatively, an easyConnect SmartWire gateway is available for connecting to Profibus. After the SmartWire installation is completed, all that is needed to address the motor starters is to press a button on the gateway so that the addresses are assigned automatically. The dirty water pumps for larger systems with 1200 l/min require up to 56kW of power. An I/O module with four inputs and two relay outputs is available for connecting these types of switching devices to easyConnect. easyConnect SmartWire is clearly more cost-efficient than all previous networking solutions known to date: It offers savings potentials in all project phases, ranging from design, wiring, commissioning to later expansions or flexible modifications.

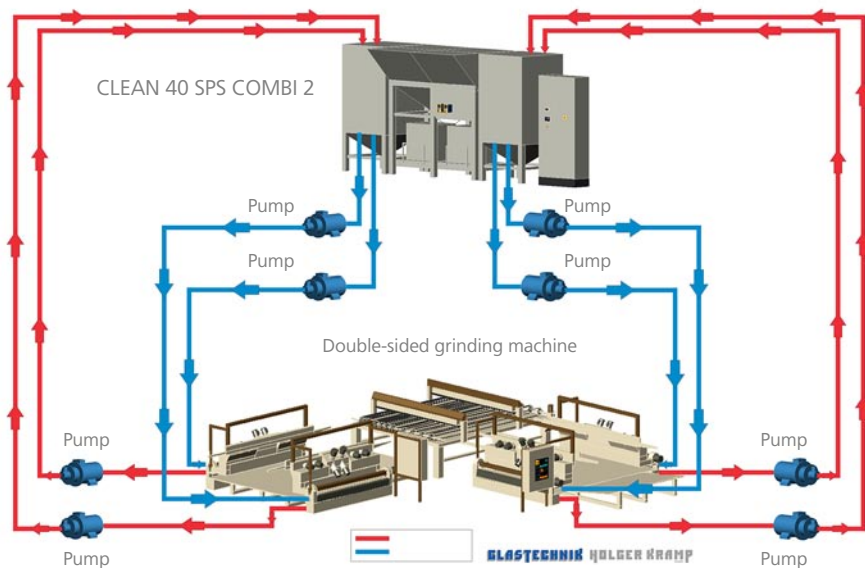
THE COMPANY

Glastechnik Holger Kramp GmbH was founded in 1987 with headquarters in Stockelsdorf /Lübeck and supplies machines for flat glass processing. Four years ago the company expanded into the water treatment sector with its proprietary CLEAN-SPS product series that was developed in-house. The company has operations worldwide with 20 employees and over 380 systems in operation worldwide. A project is currently being implemented in Australia. www.glastechnik.com/ www.clean20.net

CONCLUSION

"Whilst all clean water systems currently available on the market operate with a bypass system, our CLEAN SPS systems clean 3000 l/min at 6 bar to 100 percent in full flow," explained authorised company representative Michael Kramp. "Our high quality standard depends on the use of innovative, high-end control technology as offered by the easy device series. With easyConnect SmartWire we considerably reduce wiring costs and reduce the test and commissioning phase since wiring faults are not possible with easyConnect SmartWire. Teleservice functionality allows us to perform diagnostics on any failed stations without any problems. In this way, service operations in the field are often unnecessary, so that our customers' systems can be restored to service very quickly."

CLEAN 40 SPS COMBI 2 For double-sided grinding machine



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