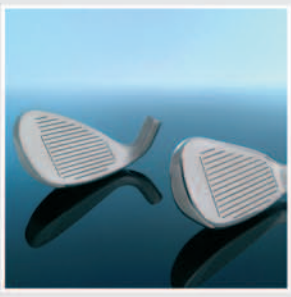
Mass Finishing Technology: Control and Operation with MFD-Titan and easy800

In collaboration with Walther Trowal GmbH, Moeller developed the new control and operating concept for the universal mass finishing machines. The Moeller easy control relay can now replace the classical hardwired control system that requires several switching devices. The machines are operated seamlessly via the MFD-Titan multi-function display - another device in the easy series.



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THE COMPANY

Walther Trowal GmbH & Co. KG was founded in 1931 and has been a pioneer in innovative mass finishing technology over several decades. The first mass finishing vibrator was built in 1956. Offering an output 10 times greater than conventional machines, it brought about the end of the hexagonal barrel de-burring and polishing technique that had previously been widely used. This was followed by the geometrically shaped grinding chip, the development of circular vibrators with an integrated screening system, the introduction of centrifugal grinding and the manufacture and sale of state-of-the-art drag finishing machines. The latest innovation is the M-TMD, a drag finishing system which is used for high-quality and delicate work pieces consisting of extremely hard, difficult to machine materials.

The universal mass finishing machines of the CB circular vibrator series enable a wide range of work pieces and machining objects to be used. They can be used in applications ranging from aggressive grinding to surface smoothing and the high gloss polishing of delicate parts, i.e. from coarse pre-grinding to the preparation of surfaces for galvanizing. They are also suitable as inexpensive stand-alone machines and for automatic production sequences that are fully interlinked. This series machine uses the MFD-Titan multi-function display, each networked with an easy800 and a local expansion.

Retentive data storage

The operating principle of the mass finishing technology is based on the process of nature in which coarse stones are turned into smooth and perfectly rounded pebbles by the continuous grinding of sand and water. This process depends on one essential factor - time: In the circular vibrators, a defined process time is required for high quality and delicate work pieces. If finishing is interrupted, due, for example, to the switching off of the machine, process data has to be stored retentively so that the machine can continue the finishing process seamlessly at the restart. The easy800 control relay and MFD-Titan provide for this purpose a freely definable 200 byte non-volatile memory for retentively storing the relevant marker bytes, data function blocks, counters and timers.

Reducing the number of switching devices and saving wiring costs

For Walther Trowal there was another decisive reason in choosing these Moeller products: easy and MFD-Titan enable the company to considerably reduce the number of switching devices such as timing relays, operating hours counters, contactor relays and control circuit devices required. In the universal mass finishing machine, the number of individual components was reduced by over 70 percent. The footprint of the control cabinet could be reduced to forty percent compared to the area required by conventional control solutions. This consequently also reduced the costs for wiring considerably.

Clearly structured machine operation

This company, based in Haan, uses the MFD-Titan multi-function display as a complete machine control system. Only a start and emergency-stop button are otherwise required. All other functions are controlled by the MFD-Titan, which also provides a clearly structured visualization interface. For example, the two freely programmable LEDs are assigned to three functions. The red LED indicates a fault, the green LED indicates Automatic mode and a flashing green LED indicates an interruption in Automatic mode. The operating buttons of the MFD-Titan are also assigned with customised functions, such as the switching from Manual to Automatic mode. The display unit was provided with customised laser inscriptions for the application so that the functions of buttons and LEDs are clearly legible. Setpoints such as times or speeds of the vibration motor can be entered, and the corresponding actual values and faults can be shown on the display.

Decentralised control structure

At Walther Trowal, the MFD-Titan is fitted in the control cabinet door and is used for operating the machine and displaying the production process. The control tasks are handled by an easy822 control relay with an easy620 local expansion device. The components are fitted on a mounting plate and are connected to the display via easy.NET. To create a decentralised system, it is only necessary to address the appropriate stations. For example, the speed setpoint is set on the MFD-Titan multi-function display and transferred to the control relay via easy.NET. The analog output of the control relay transfers this value to the analog input of the frequency inverter. The analog output of the inverter then returns the speed actual value back to the control relay. The value then reaches MFD-Titan via easy.NET and is displayed there as the actual value in rpm.

CONCLUSION

Georg Wystrach, electrical design engineer at Walther Trowal had this to say: "The conventional contactor control circuit required considerably more components than the control system with easy and MFD-Titan. Previously, we required a large number of time switches, pushbuttons and selector switches that consequently also required the use of several relays and contactors. We wanted to make use of innovative technology to replace as many time switches as possible with one device and also simplify operation. The easy822-DC-TCX control relay, the easy620-DC-TE expansion device and the MFD-CP8-NT enabled us to achieve these goals. We were able to provide the operator interface with clearly structured menus and plain text displays. We are already planning the next application program for easy and MFD. This involves the integration of easy and MFD-Titan in the ZA series water treatment plant."

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