



THE COOLING EFFICIENCY IS INFLUENCED BY THE FOLLOWING BOUNDARY CONDITIONS:

- The water absorption capacity of the air depends on temperature
- The sand to castings ratio
- The shape and the movement of castings in the drum
- Temperature distribution in the mould block can vary extremely



It should be kept in mind that over-wetting of the sand can cause sticking and blocking of the sieves and result in increased lump formation, hampering separation of castings and sand. In case of insufficient moisturising the desired exit temperature of castings and sand is not reached, which is of disadvantage for the subsequent production process. For efficient instrumentation sensors are used for:

- Measurement of fresh air into the drum
- Measurement of mould box temperature when dropped into drum
- Measurement of exhaust air leaving the drum
- Measurement of used sand temperature on the belt behind the drum
- Measurement of residual sand moisture on the belt behind the drum
- Determination of sand height on the belt behind the drum by means of a level switch or by installation of a belt scale



THE FOLLOWING INPUT PARAMETERS ARE STORED:

- Weight of moulding box or mould block
- Sand / casting coefficient of block
- Desired used sand moisture at drum exit



FOLLOWING SIGNALS, RELEASED BY DRUM CONTROL, ARE PROCESSED:

- Drum ready for operation
- Pulse for each mould fed into drum



Based on this information the required water quantity is calculated and sprayed in. For this, water piping is installed in the drum with spraying nozzles, controlled by valve units.

By measuring the temperature of the moulds when fed into the drum, empty moulds are

detected and taken into account in the water requirement.

If a further increase of used sand moisture is required, it is possible to install an additional moisturising line on the belts behind the drum.

TRUST IN INNOVATION



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INNOVATIVE PLANT CONCEPT DESIGNS

AUTOMATIC WATER DOSING

FOR SHAKE OUT DRUMS / COOLING DRUMS

FRS-T

- Moisture measurement
- Temperature measurement
- Material flow
- Water flow



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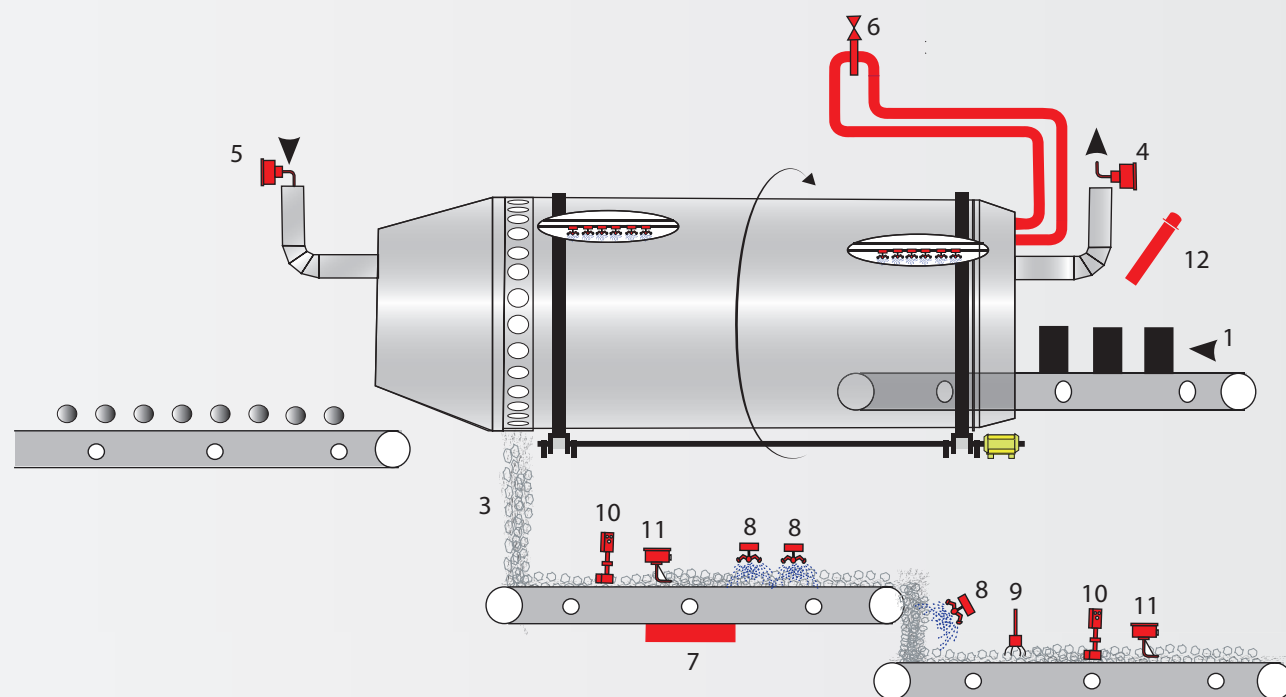


WATER DOSING FOR SHAKE OUT / COOLING DRUMS **FRS-T**



The task of shake out and cooling drums is to separate sand and castings and to cool simultaneously. Mould blocks are fed into the drum and are disintegrated by means of vibrations or rotation. The sand drops through openings onto a used sand conveyor belt, while the castings are leaving at the drum end and are transferred to the fettling shop.

The movement inside the drum effects a heat exchange and the water in the sand evaporates partly, contributing to lowering the sand temperature. For improving the cooling effect on castings and sand, a demand-oriented, dosed water addition is of advantage. In this context the physical principle of evaporation cooling is used. The hot used sand containing heat-energy spends this energy by making the water to evaporate. The water vapour is exhausted with the air. The result is additional cooling of castings and used sand.



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|---|--|--|
| 1. Mould block entry | 6. Water spray system | 10. Moisture measurement |
| 2. Castings exit | 7. Belt scale for quantity determination | 11. Temperature measurement |
| 3. Sand exit | 8. Additional water spray unit | 12. Measurement of mould block temperature |
| 4. Temperature / air moisture exhaust air | 9. Mixing device | |
| 5. Temperature / air moisture fresh air | | |

Example: Water dosing system at a shake out / cooling drum



HARDWARE

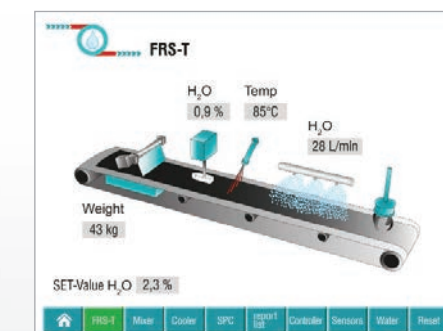
As a module for connection to the FRS-Central or as a single version with its own HMI in a control cabinet.

A Siemens S7 PLC is used. It is also possible to adapt to existing older PLC versions.



SOFTWARE

- Multi-touch menus
- Presentation of the process data
- Intuitive user interface
- Measuring watchdog function



DATA BASE

All process-relevant data are filed in a data base and presented graphically for evaluation. In addition to the control parameters the following data can be stored in the data base:

- Moisture measurement
- Temperature measurement
- Material flow
- Water flow

Special customer-specific features can be integrated.



CROSS LINKING

- Data security
- Mobile HMIs / User interfaces
- Remote maintenance / diagnostic

