

A state-of-the-art gas cabinet solution using the Siemens PLC

Safety first

Specialty gas supply systems are fundamental pieces of equipment for the semiconductor industry. Safety and reliability are crucial issues in the design of these systems – and this is why Messer Nippon Sanso relies on Simatic technology to automate their specialty gas supply solutions.

Messer Nippon Sanso specialty gas systems have a fundamental design philosophy that strives for intrinsic safety along with a range of secondary safety subsystems. Recognizing that many safety incidents are the direct result of human error a considerable amount of effort has been invested into eliminating this with the careful thought on how the systems should be operated.

Employing fully automatic systems can often eliminate human errors but for specialty gas systems this is unrealistic. Physical activities such as exchanging empty cylinders or performing routine maintenance operations must be performed by operators and maintenance technicians.

Safety by application

Messer Nippon Sanso specialty gas systems offer a combination of automatic and semi-automatic operating modes. Every possible operation has been fully automated to entirely eliminate human errors. The systems check each operator intervention to determine if it has been completed safely. Its built-in intelligence records operator errors and produces a fail-safe response to the errors.

The physical implementation of these automatic and semi-automatic routines are handled by a Simatic S7-300 controller and a Simatic MP 370 touch panel interfaced to all of sensors and actuators.

The software design was based on analysis of operator actions and determining ways in which these can be guided and checked. The safety features embodied in the control system are supplemented by a range of physical characteristics such as safety enclosure, monitored exhaust sys-

tem, intrinsically safe electrical devices, safety shields and gas monitoring.

Modularity at its best

Recognizing that each country, and each individual fab, have differing ideas on processing and approaching safety has driven Messer Nippon Sanso to structure its products with a modular architecture. This enables quick and cost effective solutions to customer specific requirements and extends to the control software which can be easily configured to provide safe and tested versions for all possible hardware configurations.

Messer Nippon Sanso has also adopted the same philosophy for modular design of hardware and control software to the specialty gas distribution systems. Valve manifold boxes share the same family of Simatic controllers – in this case the S7-200 series and touch screen TP 170A panel.

Integrated monitoring and control

Additionally, in today's sophisticated fabs it is essential that the performance of the vast variety of production equipment are monitored for efficiency and signs of potential problems. Messer Nippon Sanso has a range of solutions for interconnectivity of specialty gas systems that can be interfaced to monitoring systems using cost effective, modular and robust solutions based on Simatic controllers. ■

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Valve manifold box with S7-200 CPU TP 170A panel



Specialty gas system from Messer Nippon Sanso uses Simatic S7-300 CPU and MP 370 touch panel

Pictures: Messer Nippon Sanso