Systematic multiloop control

Flexible & modular: the KS vario multiloop controller system

now with ProfiNet
The modular KS vario multiloop controller system has been developed specifically for temperature treatment processes, whereby the basic version consists of a controller module and a field bus coupler. These two components already provide a fully operable control unit with 4 or 8 loops. Simply by adding the required number of individual I/O modules, the system is expandable up to 30 control loops with minimum extra costs. The individual modules of a KS vario system are simply plugged together without the need for tools – all interconnections are made automatically, and power is supplied via the bus coupler. The field bus coupler with integral power supply represents the heart of the system, and links the multiloop controller to all established field bus systems. Apart from Profibus and innovative Ethernet topologies, the coupler also supports classical field buses such as ProfiNet and innovative Ethernet topologies, the coupler also supports classical field buses such as Profibus-DP, CANopen, DeviceNet, and Modbus.

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### Application areas
- Converter automation
- Instrumentation
- Mold heating
- Tissue machines
- Packaging machines
- Semiconductor production
- Fans
- Doors
- Chronic climbers
- Heat treatment
- Burner & boiler control
- Medical technology
- Seedling

### KS vario: The system components

#### COUPLERS

- **KS VARIO BK FIN**
  - Profibus bus coupler
  - 2rd Ethernet port
  - ProfiNet real-time

- **KS VARIO BK IFP**
  - Ethernet/IP bus coupler
  - 10/100 Base T
  - IP protocol/Rockwell

- **KS VARIO BK ETH**
  - Ethernet TCP/IP bus coupler
  - 10/100 Base T
  - Modbus TCP/IP bus coupler

- **KS VARIO BK VN**
  - Profibus-DP/Versa coupler
  - Up to 12 Mbits/s
  - DVI/V Linc and D2

- **KS VARIO BK CIAN**
  - DeviceNet bus coupler
  - Up to 115 Mbits/s
  - Up to 12 Mbits/s

- **KS VARIO BK DIN**
  - DeviceNet bus coupler
  - Up to 100 kbits/s
  - Failing, change of status

- **KS VARIO BK MOD**
  - Modbus bus coupler
  - Modbus RTU

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| **VARIO DO 1/U/BP** | Relay output module | 1 output: 0...20 mA, 5...253 VAC, 3 A | **VARIO CO 2/U** | Supply module for sensors |
| **VARIO DO 2/U/BP** | Relay output module | 2 outputs: 0...20 mA, 5...253 VAC, 3 A | **VARIO RM BK** | Coupler module for remote I/Os |
| **VARIO DO 4/U/BP** | Relay output module | 4 outputs: 24 VDC, 500 mA | **VARIO RM B** | Branch module for remote bus |
| **VARIO DO 8/U/BP** | Relay output module | 8 outputs: 24 VDC, 70 mA | **VARIO CO 2/U** | Supply module for sensors |

#### INPUT MODULES

- **VARIO DI 2/24**
  - Digital input module
  - 2 inputs: 24 VDC

- **VARIO DI 4/24**
  - Digital input module
  - 4 inputs: 24 VDC

- **VARIO DI 8/24**
  - Digital input module
  - 8 inputs: 24 VDC

- **VARIO DI 16/24**
  - Digital input module
  - 16 inputs: 24 VDC

| **VARIO AO 1/SF** | Analog output module | 1 output: 0...20 mA, 4...20 mA, ± 5 V, 0...10 V, ± 10 V, 0...25 V, ± 25 V, 0...50 V | **VARIO RM B** | Branch module for remote bus |
| **VARIO AO 2/U/BP** | Analog output module | 2 outputs: 0...20 mA, 4...20 mA, ± 20 mA, 4...40 mA, ± 40 mA, 0...5 V, ± 5 V, 0...10 V, ± 10 V, 0...25 V, ± 25 V, 0...50 V | **VARIO CO 2/U** | Supply module for sensors |
| **VARIO AO 4/U/BP** | Analog output module | 4 outputs: 24 VDC, 500 mA | **VARIO RM BK** | Coupler module for remote I/Os |
| **VARIO AO 8/U/BP** | Analog output module | 8 outputs: 24 VDC, 500 mA | **VARIO RM B** | Branch module for remote bus |

#### OUTPUT MODULES

- **VARIO DO 1/U/BP**
  - Relay output module
  - 1 output: 0...20 mA, 4...20 mA, ± 5 V, 0...10 V, ± 10 V

- **VARIO DO 2/U/BP**
  - Relay output module
  - 2 outputs: 0...20 mA, 4...20 mA, ± 5 V, 0...10 V

- **VARIO DO 4/U/BP**
  - Relay output module
  - 4 outputs: 24 VDC, 500 mA

- **VARIO DO 8/U/BP**
  - Relay output module
  - 8 outputs: 24 VDC, 500 mA
The system at a glance

Control functions
All conventional control modes including master/slave and valve motor control are selectable per channel. Two self-tuning options are available for determining the best control parameters: during start-up or at setpoint. Individual sampling rates starting at 100 ms are adjustable for each channel.

Controller modules
• 4, 6 or 8 analog inputs
• Thermocouples or resistive sensors
• Up to 8 outputs, 24 VDC, 70 mA
• Integrated heating current monitor
• Expandable up to 30 control zones

Additional functions
Several special functions such as controlled start-up for plastics processing machines are standard features of the basic version. Comprehensive heating current monitoring functions with correction for mains voltage variations (per phase), and the direct connection of strain gauge pressure sensors are just two of many other features.

BlueControl® Engineering Tool
BlueControl® is a powerful engineering tool for controller and system configuration. It combines clear operating functions with visualization and monitoring. Moreover, the tool provides a simulation of the entire control loop with selectable process responses.

Performance features in detail

Comprehensive communication options
Bus couplers connect the I/O systems to all established fieldbus systems: Profinet, Ethernet IP, Modbus, DeviceNet, CANopen.

Demand-oriented expansion
Simply by plugging additional I/O modules into the system, a finely graduated expansion up to 30 control loops is possible.

Galvanic isolation
Each segment is energized by means of special isolated power supply terminals, which automatically isolates them from the adjacent segments.

Clear identification
KS vario modules can be fitted with „Zack“ numbering markers to identify every terminal. It is also possible to label each channel in plain text.