VARIO
Modular I/O system

Highly modular I/O system

Digital and analog I/O modules in different modularities:2, 4, 6, 8, or 16 channels

Open for all interfaces:

Ethernet, Profibus DP, CANopen, DeviceNet

Required components are simply plugged together: the inter-connections are made automatically

Plug-in spring clamp connectors

Optimum convenience for terminal inscriptions

APPLICATIONS

- **Machine and systems engineering**
- **Automotive industry**
- **Process technology**
- **Energy generation**
- **Traffic control**
- **Building automation**

DESCRIPTION

The **vario** I/O modules offer maximum flexibility for decentralized installation of I/O circuits as well as high adaptability to the most varied applications.

The central component is an arbitrary bus coupler module, which also provides the supply voltage for the entire system.

Open bus standards permit the unproblematic connection of the **vario** system to various PLC or PC-based automation solutions.

Any number of digital and analog I/O modules, each with 2 to 16 channels, can be connected to the bus coupler, thus providing optimum modularity.

Apart from the standard **vario** I/O modules, other dedicated units are also available, such as the stand-alone multiloop controller units (see data sheet **KS vario**).

When putting a system together, the connections for bus and power supply are made automatically by means of contact pins as soon as a module is clipped to the mounting rail. Thus, no separate interconnections are necessary.

Moreover, the provision of segments with different voltage potentials is made possible by means of supply terminals.

All I/O modules are galvanically isolated on the bus side, and analog modules are also separated from each other (without additional supply terminals).

Electrical process connections are made using the 2, 3, or 4-wire technique. Screened connectors provide suitable EMC protection of sensitive analog signals.

All I/O wiring is done with plug-in spring clamp connector strips. In this way, tedious connection/disconnection of individual signal leads is omitted.

Diagnostic and status LEDs on each module provide an immediate indication of the system's operating condition.

Clip-on inscription strips and individual terminal numbering provide clear and unambiguous signal identification.

VARIO BK DP/V1

PROFIBUS-DP/V1 BUS COUPLER

- **Central coupler module with PROFIBUS-DP interface**
- **Baudrate up to 12 MBd, configurable**
- **DP/V1 for class 1 and class 2 masters**
- **Connectable up to 63 VARIO modules**
- **Integated 24V-DC-power supply for total VARIO-System**

APPLICATIONS

Head of the VARIO-system
Head of the modular closed-loop-control-system KS VARIO
For process automation, machinery automation, installations, factory automation

MAIN ATTRIBUTES

I/O module parameterization
Various diagnostic formats
Sub-D connector
Baudrates 9.6 ... 12000 kBd/s
Addresses 1... 127 via DIP switches
LED indicators: 5x status and diagnostics
Incoming 24V-DC supply for segment and main-circuit
Spring clamp-/plug-in terminals

Dimensions: 91 x 120 x 71,5 mm (W x H x D)
Power supply: 24V DC
Communication: PROFIBUS-DP/V1

VARIO BK ETH

ETHERNET BUS COUPLER

- **Central coupler module with Ethernet TCP/IP interface**
- **Baudrate up to 100 MBd, configurable**
- **10/100 BASE-T(X)**
- **Connectable up to 63 VARIO modules**
- **Integated 24V-DC-power supply for total VARIO-System**

APPLICATIONS

Head of the VARIO-system
Head of the modular closed-loop-control-system KS VARIO
For process automation, machinery automation, installations, factory automation

MAIN ATTRIBUTES

ETHERNET: Endgerät, conformable IEEE 802.3
Protocol: Modbus/TCP, TCP/UDP, SNMP, BootP
IP-parameter setting via BootP oder SNMP
RJ 45-connector
LED indicators: 9 x status and diagnostics
Incoming 24V-DC supply for segment and main-circuit
Spring clamp-/plug-in terminals

Dimensions: 90 x 116 x 72 mm (W x H x D)
Power supply: 24V DC
Communication: Ethernet TCP/IP

VARIO BK CAN

CANOPEN BUS COUPLER

- **Central coupler module with CANopen interface**
- **Baudrate up to 1 MBd, configurable**
- **Until 32 receive and 32 transmit-PDOs**
- **Connectable up to 63 VARIO modules**
- **Integated 24V-DC-power supply for total VARIO-System**

APPLICATIONS

Head of the VARIO-system
Head of the modular closed-loop-control-system KS VARIO
For process automation, machinery automation, installations, factory automation

MAIN ATTRIBUTES

Stored I/O-configuration
addresses 1... 127 via DIP switches
Up to 510 digital points, IN and OUT
Up to 244 analog inputs, IN and OUT
Trigger modes: event, timer, remote request
Baudrates 10 ... 1000 kBd/s
LED indicators: 9 x status and diagnostics
Incoming 24V-DC supply for segment and main-circuit
Spring clamp-/plug-in terminals
2 x 5-poliger TWIN-COMBICON-Bus-Stecker

Dimensions: 90 x 119,8 x 71,5 mm (W x H x D)
Power supply: 24V DC
Communication: CANopen

VARIO BK DN

DEVICENET BUS COUPLER

- **Central coupler module with DeviceNet interface**
- **Baudrate up to 500 KBd, configurable**
- **Cyclic messaging, polling, change of state, bit strobe**
- **Connectable up to 63 VARIO modules**
- **Integated 24V-DC-power supply for total VARIO-System**

APPLICATIONS

Head of the VARIO-system
Head of the modular closed-loop-control-system KS VARIO
For process automation, machinery automation, installations, factory automation

MAIN ATTRIBUTES

Stored I/O-configuration
Addresses 1... 127 via DIP switches
Trigger modes: event, timer, remote request
Baudrates 10 ... 1000 kBd/s
LED indicators: 5 x status and diagnostics
Incoming 24V-DC supply for segment and main-circuit
Spring clamp-/plug-in terminals
2 x 5-poliger TWIN-COMBICON-Bus-Stecker

Dimensions: 90 x 71,5 x 119,8 mm (W x H x D)
Power supply: 24V DC
Communication: CANopen

VARIO BK MOD

MODBUS BUS COUPLER

- **Central coupler module with Modbus interface**
- **For KS-VARIO Closed-Loop-Control-System**
- **Baudrate up to 38,4 kBd, configurable via KS-Vario**
- **Integated 24V-DC-power supply for total VARIO-System**

APPLICATIONS

Head of the modular closed-loop-control-system KS VARIO
For process automation, machinery automation, installations, factory automation

MAIN ATTRIBUTES

Modbus RTU-protocol
addresses 1... 127 via KS-VARIO selectable
2 LED indicators for status and diagnostics
Incoming 24V-DC supply for segment and main-circuit
Spring clamp-/plug-in terminals
2 x 9-poliger Sub-D connector for Modbus

Dimensions: 90 x 119,8 x 71,5 mm (W x H x D)
Power supply: 24V DC
Communication: Modbus RTU

VARIO DI 2/24

DIGITAL INPUTS

- **2 digital inputs**
- **Connections for sensors in 2-, 3- and 4-wire technology**
- **Floating / non-floating contacts**

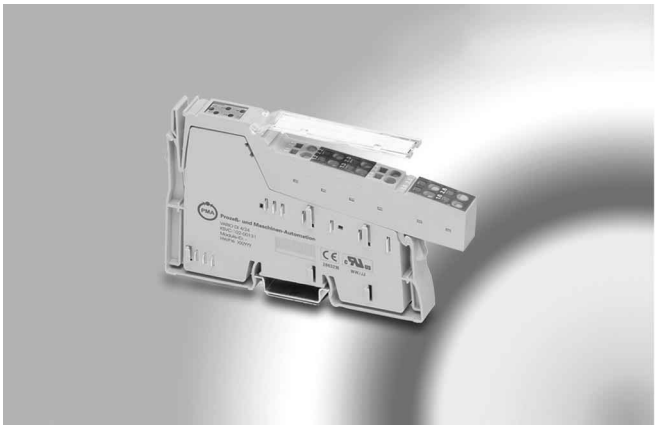
APPLICATIONS

I/O module of the VARIO-system
I/O-extension of the modular closed-loop-control-system KS VARIO
For process automation, machinery automation, installations, factory automation

MAIN ATTRIBUTES

Maximum load current per sensor: 250mA
LED indicators: 3x status and diagnostics
Inputs optically isolated

Dimensions: 12,2 x 120 x 71,5 mm (B x H x T)
Power supply: 24 V DC through potential routing
Inputs: 2 digital inputs
Nominal input current: 5 mA



VARIO DI 4/24

DIGITAL INPUTS

- **4 digital inputs**
- **Connections for sensors in 2- and 3-wire technology**
- **Floating / non-floating contacts**

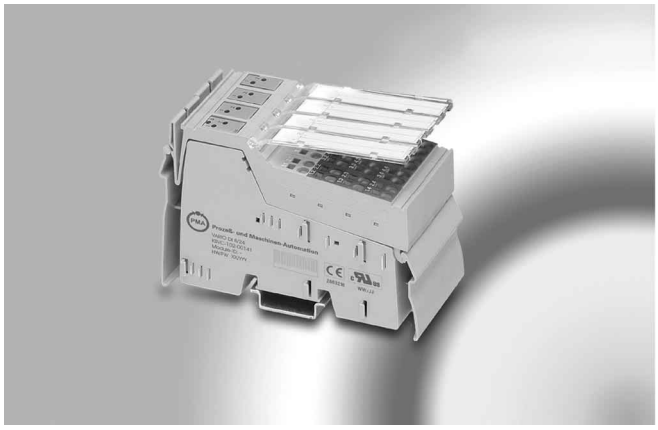
APPLICATIONS

I/O module of the VARIO-system
I/O-extension of the modular closed-loop-control-system KS VARIO
For process automation, machinery automation, installations, factory automation

MAIN ATTRIBUTES

Maximum load current per sensor: 250mA
LED indicators: 5x status and diagnostics
Inputs optically isolated

Dimensions: 12,2 x 120 x 71,5 mm (B x H x T)
Power supply: 24 V DC through potential routing
Inputs: 4 digital inputs
Nominal input current: 5 mA



VARIO DI 8/24

DIGITAL INPUTS

- **8 digital inputs**
- **Connections for sensors in 2-, 3- and 4-wire technology**
- **Floating / non-floating contacts**

APPLICATIONS

I/O module of the VARIO-system
I/O-extension of the modular closed-loop-control-system KS VARIO
For process automation, machinery automation, installations, factory automation

MAIN ATTRIBUTES

Maximum load current per sensor: 250mA
LED indicators: 9x status and diagnostics
Inputs optically isolated

Dimensions: 48,8 x 120 mm x 71,5 (B x H x T)
Power supply: 24 V DC through potential routing
Inputs: 8 digital inputs
Nominal input current: 5 mA

VARIO DI 16/24

DIGITAL INPUTS

- **16 digital inputs**
- **Connections for sensors in 2- and 3-wire technology**
- **Floating / non-floating contacts**

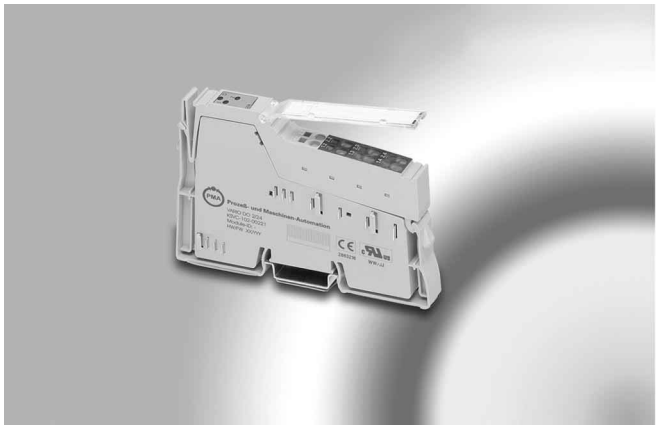
APPLICATIONS

I/O module of the VARIO-system
I/O-extension of the modular closed-loop-control-system KS VARIO
For process automation, machinery automation, installations, factory automation

MAIN ATTRIBUTES

Maximum load current per sensor: 250mA
LED indicators: 17 x status and diagnostics
Inputs optically isolated

Dimensions: 48,8 x 120 mm x 71,5 (B x H x T)
Power supply: 24 V DC through potential routing
Inputs: 16 digital inputs
Nominal input current: 5 mA



VARIO DO 2/24

DIGITAL OUTPUTS

- **2 digital outputs**
- **Connections of actuators in 2-, 3- and 4-wire technology**
- **Nominal current per output: 0,5 A**
- **Short ciruit and overload protected outputs**

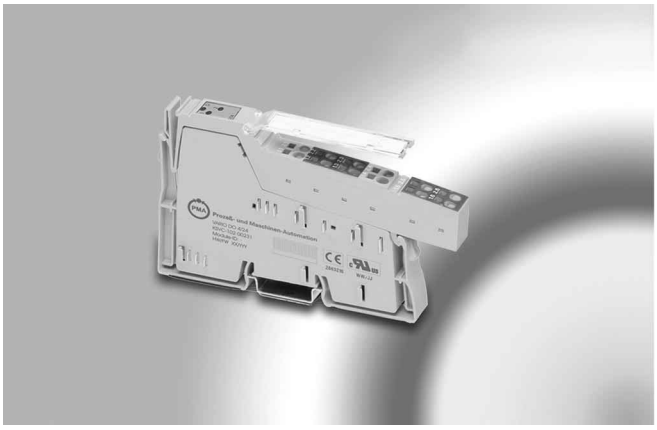
APPLICATIONS

I/O module of the VARIO-system
I/O-extension of the modular closed-loop-control-system KS VARIO
For process automation, machinery automation, installations, factory automation

MAIN ATTRIBUTES

Total current of the module: 1 A
LED indicators: 3x status and diagnostics
Outputs optically isolated

Dimensions: 12,2 x 120 x 71,5 mm (B x H x T)
Power supply: 24 V DC through potential routing
Outputs: 2 digital outputs,
each 0,5 A, 24 V DC



VARIO DO 4/24

DIGITAL OUTPUTS

- **4 digital outputs**
- **Connections of actuators in 2- and 3-wire technology**
- **Nominal current per output: 0,5 A**
- **Short ciruit and overload protected outputs**

APPLICATIONS

I/O module of the VARIO-system
I/O-extension of the modular closed-loop-control-system KS VARIO
For process automation, machinery automation, installations, factory automation

MAIN ATTRIBUTES

Total current of the module: 2 A
LED indicators: 5x status and diagnostics
Outputs optically isolated

Dimensions: 12,2 x 120 x 71,5 mm (B x H x T)
Power supply: 24 V DC through potential routing
Outputs: 4 digital outputs,
each 0,5 A, 24 V DC

VARIO DO 8/24

DIGITAL OUTPUTS

- **8 digital outputs**
- **Connections of actuators in 2-, 3- and 4-wire technology**
- **Nominal current per output: 0,5 A**
- **Short ciruit and overload protected outputs**

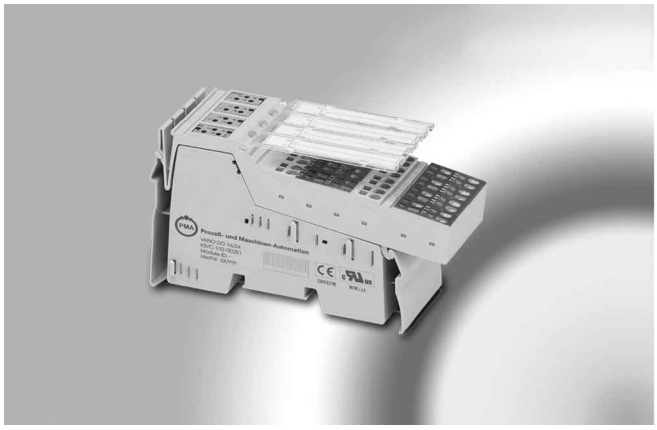
APPLICATIONS

I/O module of the VARIO-system
I/O-extension of the modular closed-loop-control-system KS VARIO
For process automation, machinery automation, installations, factory automation

MAIN ATTRIBUTES

Total current of the module: 4 A
LED indicators: 9x status and diagnostics
Outputs optically isolated

Dimensions: 48,8 x 120 x 71,5 mm (B x H x T)
Power supply: 24 V DC through potential routing
Outputs: 8 digital outputs,
each 0,5 A, 24 V DC



VARIO DO 16/24

DIGITAL OUTPUTS

- **16 digital outputs**
- **Connections of actuators in 2- and 3-wire technology**
- **Nominal current per output: 0,5 A**
- **Short ciruit and overload protected outputs**

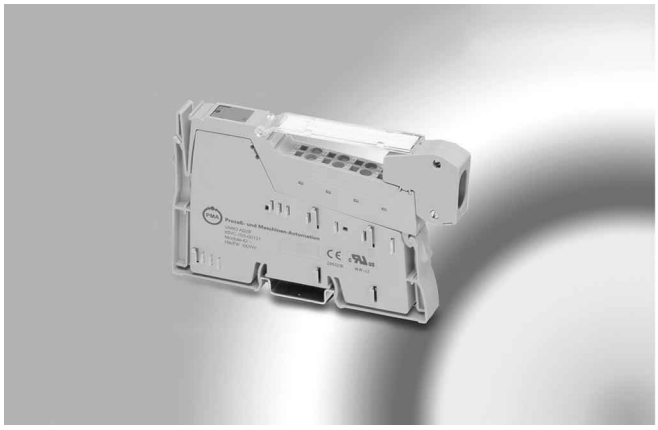
APPLICATIONS

I/O module of the VARIO-system
I/O-extension of the modular closed-loop-control-system KS VARIO
For process automation, machinery automation, installations, factory automation

MAIN ATTRIBUTES

Total current of the module: 8 A
LED indicators: 17 x status and diagnostics
Outputs optically isolated

Dimensions: 48,8 x 120 x 71,5 mm (B x H x T)
Power supply: 24 V DC through potential routing
Outputs: 16 digital outputs,
each 0,5 A, 24 V DC



VARIO AI 2/SF

ANALOG INPUTS STANDARD SIGNALS

- **2 analog inputs (single ended with shield)**
- **Connections for sensors in 2- and 3-wire technology**
- **16-Bit resulution**
- **Current ranges: 0/4..20mA, +/-20mA**
- **Voltage ranges: 10V, +/-10V**

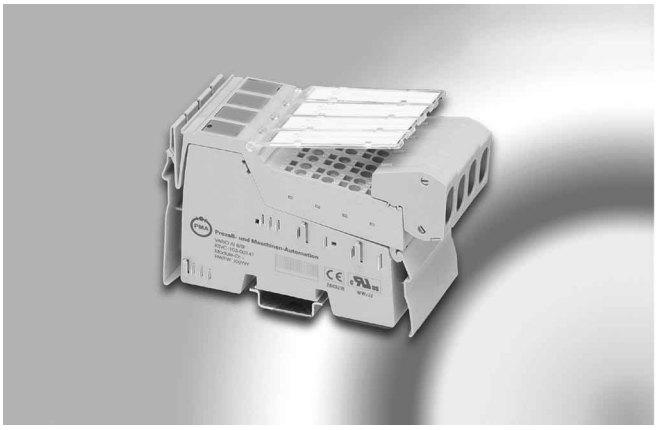
APPLICATIONS

I/O module of the VARIO-system
I/O-extension of the modular closed-loop-control-system KS VARIO
For process automation, machinery automation, installations, factory automation

MAIN ATTRIBUTES

Process data update: 1,5 ms
Diagnostic LED
Inputs optically isolated
Several representing formats
Measuring ranges and representing formats soft configurable

Dimensions: 12,2 x 120 x 71,5 mm (B x H x T)
Power supply: 24 V DC and 7,5 V DC through potential routing
Inputs: 2 analog inputs (single ended with shield)



VARIO AI 8/SF

ANALOG INPUTS STANDARD SIGNALS

- **2 analog inputs (single ended with shield)**
- **Connections for sensors in 2-wire technology**
- **16-Bit resulution**
- **Current ranges: 0/4..20mA, ±20mA, (±) 40mA**
- **Voltage ranges: 10V, ±10V, (±)5V, (±)25 V, (±)50V**

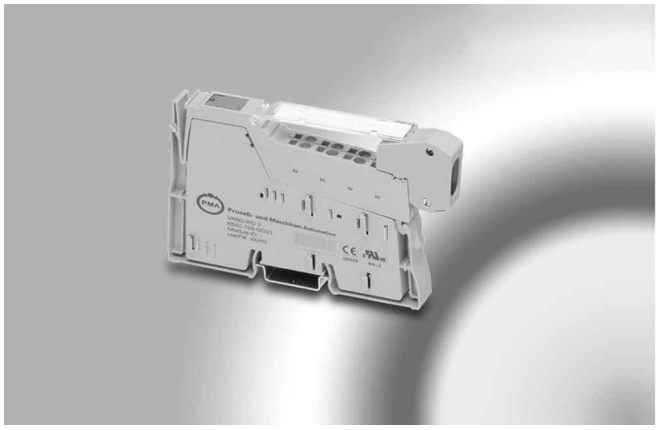
APPLICATIONS

I/O module of the VARIO-system
I/O-extension of the modular closed-loop-control-system KS VARIO
For process automation, machinery automation, installations, factory automation

MAIN ATTRIBUTES

Diagnostic LED
Inputs optically isolated
Several representing formats
Measuring ranges and representing formats soft configurable

Dimensions: 48,8 x 120 x 71,5 mm (B x H x T)
Power supply: 24 V DC and 7,5 V DC through potential routing
Inputs: 8 analog inputs (single ended with shield)



VARIO UTH 2

ANALOG INPUTS THERMOCOUPLE

- **2 analog inputs, differencial inputs with shield**
- **Internal or external detetion of cold junction temperature**
- **16-Bit resulution**
- **Types: B, C, E, J, K, L, N, R, S, T, U, W, HK**
- **Voltage range: -15..+85 mV**

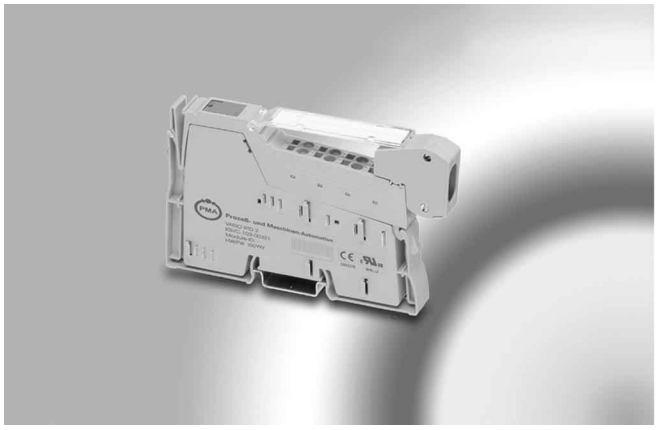
APPLICATIONS

I/O module of the VARIO-system
I/O-extension of the modular closed-loop-control-system KS VARIO
For process automation, machinery automation, installations, factory automation

MAIN ATTRIBUTES

Absolute or differencial temperature measurement
Process data update: max. 30 ms
Diagnostic LED
Inputs optically isolated
Several representing formats
Measuring ranges and representing formats soft configurable

Dimensions: 12,2 x 120 x 71,5 mm (B x H x T)
Power supply: 24 V DC and 7,5 V DC through potential routing
Inputs: 2 analog inputs, differencial inputs with shield



VARIO RTD 2

ANALOG INPUTS TEMPERATURE SHUNTS

- **2 analog inputs**
- **Connections for sensors in 2-, 3- and 4-wire technology**
- **16-Bit resulution**
- **Types: a.o. Pt DIN, PT SAMA, Ni DIN, CUxx, KTY**
- **Potentiometer, Linear R: 400, 4000 Ohm**

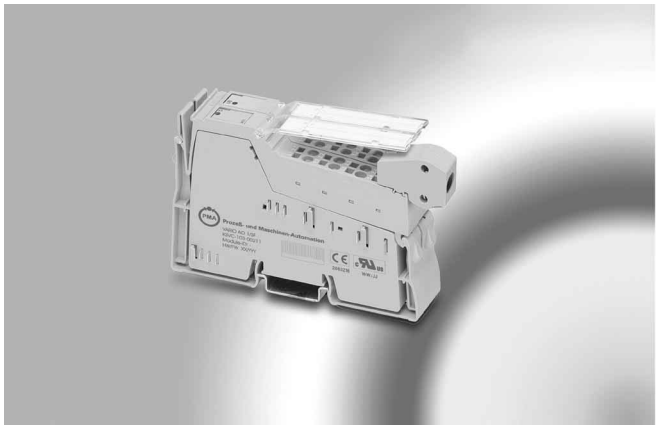
APPLICATIONS

I/O module of the VARIO-system
I/O-extension of the modular closed-loop-control-system KS VARIO
For process automation, machinery automation, installations, factory automation

MAIN ATTRIBUTES

Diagnostic LED
Process data update: max. 32 ms
Inputs optically isolated
Several representing formats
Measuring ranges and representing formats soft configurable

Dimensions: 12,2 x 120 x 71,5 mm (B x H x T)
Power supply: 24 V DC and 7,5 V DC through potential routing
Inputs: 2 analog inputs



VARIO AO 1/SF

ANALOG OUTPUT STANDARD SIGNALS

- **1 analog output**
- **2-wire technology with shield**
- **16-Bit resulution**
- **Current ranges: 0..20mA, 4..20mA**
- **Voltage range: 10V**

APPLICATIONS

I/O module of the VARIO-system
I/O-extension of the modular closed-loop-control-system KS VARIO
For process automation, machinery automation, installations, factory automation

MAIN ATTRIBUTES

Process data update: 1 ms
2 diagnostic LEDs
Output optically isolated
Several representing formats
Measuring ranges and representing formats soft configurable

Dimensions: 24,4 x 120 x 71,5 mm (B x H x T)
Power supply: 24 V DC and 7,5 V DC through potential routing
Inputs: 1 analog output

VARIO AO 2/SF

ANALOG OUTPUTS VOLTAGE

- **2 analog outputs**
- **2-wire technology with shield**
- **13-Bit resulution**
- **Voltage ranges: 10V, ±10V**

APPLICATIONS

I/O module of the VARIO-system
I/O-extension of the modular closed-loop-control-system KS VARIO
For process automation, machinery automation, installations, factory automation

MAIN ATTRIBUTES

Process data update: 1 ms
2 diagnostic LEDs
Outputs optically isolated
Several representing formats
Measuring ranges and representing formats soft configurable

Dimensions: 12,2 x 120 x 71,5 mm (B x H x T)
Power supply: 24 V DC and 7,5 V DC through potential routing
Inputs: 2 analog outputs

VARIO UTH 4-DO8

ANALOG / DIGITAL I/O-MODUL

- **4 analog thermocouple inputs**
- **differencial inputs with shield**
- **8 digital outputs, 24V DC**
- **1 heating current input**
- **14-Bit resulution**
- **Types:B, C, D, E, J, K, L, N, R, S, T, W**

APPLICATIONS

I/O module of the VARIO-system
I/O-extension of the modular closed-loop-control-system KS VARIO
For process automation, machinery automation, installations, factory automation

MAIN ATTRIBUTES

LED indicators: 3x status and diagnostics
Process data update: max. 125 ms
Inputs and outputs optically isolated
Measuring ranges and representing formats soft configurable
Voltage range: 0..70 mV

Dimensions: 48,8 x 120 x 71,5 mm (B x H x T)
Power supply: 24 V DC and 7,5 V DC through potential routing
Inputs: 4 analog inputs, differencial inputs with shield
1 heating current input (50 mA)
Outputs: 8 digital outputs,
each 70mA, 24 V DC

VARIO RTD 6-DO6

ANALOG / DIGITAL I/O-MODUL

- **6 analog inputs, differencial inputs with shield**
- **Connections of actuators in 2- and 3-wire technology**
- **8 digital outputs, 24V DC**
- **1 heating current input**
- **14-Bit resulution**
- **Types:B, C, D, E, J, K, L, N, R, S, T, W**

APPLICATIONS

I/O module of the VARIO-system
I/O-extension of the modular closed-loop-control-system KS VARIO
For process automation, machinery automation, installations, factory automation

MAIN ATTRIBUTES

LED indicators: 3x status and diagnostics
Process data update: max. 175 ms
Inputs and outputs optically isolated
Measuring ranges and representing formats soft configurable
Range for Linear R: 400, 4000 Ohm

Dimensions: 48,8 x 120 x 71,5 mm (B x H x T)
Power supply: 24 V DC and 7,5 V DC through potential routing
Inputs: 6 analog inputs (2-, 3- wire, shield)
1 heating current input (50 mA)
Outputs: 6 digital outputs,
each 70mA, 24 V DC

VARIO UTH 8-DO8

ANALOG / DIGITAL I/O-MODUL

- **8 analog thermocouple inputs**
- **differencial inputs with shield**
- **8 digital outputs, 24V DC**
- **1 heating current input**
- **14-Bit resulution**
- **Types:B, C, D, E, J, K, L, N, R, S, T, W**

APPLICATIONS

I/O module of the VARIO-system
I/O-extension of the modular closed-loop-control-system KS VARIO
For process automation, machinery automation, installations, factory automation

MAIN ATTRIBUTES

LED indicators: 3x status and diagnostics
Process data update: max. 225 ms
Inputs and outputs optically isolated
Measuring ranges and representing formats soft configurable
Voltage range: 0..70 mV

Dimensions: 48,8 x 120 x 71,5 mm (B x H x T)
Power supply: 24 V DC and 7,5 V DC through potential routing
Inputs: 8 analog inputs, differencial inputs with shield
1 heating current input (50 mA)
Outputs: 8 digital outputs,
each 70mA, 24 V DC

KS VARIO T4/RTD

MODULAR CONTROLLER SYSTEM

- **4 Channel Closed Loop Controller**
- **I/O extensible via VARIO-modules**
- **4 analog inputs for resistance thermometer**
- **6 digital outputs, 24V DC**
- **Heating current monitoring for all outputs**

APPLICATIONS

Intelligent closed loop controller module of the VARIO-system

For process automation, machinery automation, installations, factory automation

MAIN ATTRIBUTES

Latest control technology with complete functional range for the most varied applications

Free wiring of all inputs & outputs

Scanning rate adjustable per channel: from 100 ms

2 automatic self-tuning procedures

Heating current monitor with compensation of mains voltage variations

Separate RS232-interface for BlueControl Engineering Tool

Software update in Flash EPROM via the Engineering Tool

Dimensions: 48,8 x 120 x 71,5 mm (B x H x T)
Power supply: 24 V DC and 7,5 V DC through potential routing
Inputs: 4 analog inputs, 2- or 3-wire technology and additional srceen
1 heating current input (50 mA)
Outputs: 6 digital outputs,
each 70mA, 24 V DC
Communication: All fieldbusses via VARIO-buscoupler

KS VARIO T4/UTH

MODULAR CONTROLLER SYSTEM

- **4 Channel Closed Loop Controller**
- **I/O extensible via VARIO-modules**
- **4 analog thermocouple inputs (11 types, mV)**
- **8 digital outputs, 24V DC**
- **Heating current monitoring for all outputs**

APPLICATIONS

Intelligent closed loop controller module of the VARIO-system

For process automation, machinery automation, installations, factory automation

MAIN ATTRIBUTES

Latest control technology with complete functional range for the most varied applications

Free wiring of all inputs & outputs

Scanning rate adjustable per channel: from 100 ms

2 automatic self-tuning procedures

Heating current monitor with compensation of mains voltage variations

Separate RS232-interface for BlueControl Engineering Tool

Software update in Flash EPROM via the Engineering Tool

Dimensions: 48,8 x 120 x 71,5 mm (B x H x T)
Power supply: 24 V DC and 7,5 V DC through potential routing
Inputs: 4 analog inputs, differencial inputs with shield
1 heating current input (50 mA)
Outputs: 8 digital outputs,
each 70mA, 24 V DC
Communication: All fieldbusses via VARIO-buscoupler

KS VARIO T6/RTD

MODULAR CONTROLLER SYSTEM

- **6 Channel Closed Loop Controller**
- **Extensible via any VARIO-I/O-modul up to 30 control loops**
- **6 analog inputs for resistance thermometer**
- **6 digital outputs, 24V DC**
- **Heating current monitoring for all outputs**

APPLICATIONS

Intelligent closed loop controller module of the VARIO-system

For process automation, machinery automation, installations, factory automation

MAIN ATTRIBUTES

Latest control technology with complete functional range for the most varied applications

Free wiring of all inputs & outputs

Scanning rate adjustable per channel: from 100 ms

2 automatic self-tuning procedures

Heating current monitor with compensation of mains voltage variations

Separate RS232-interface for BlueControl Engineering Tool

Software update in Flash EPROM via the Engineering Tool

Dimensions: 48,8 x 120 x 71,5 mm (B x H x T)
Power supply: 24 V DC and 7,5 V DC through potential routing
Inputs: 6 analog inputs, 2- or 3-wire technology and additional srceen
1 heating current input (50 mA)
Outputs: 6 digital outputs,
each 70mA, 24 V DC
Communication: All fieldbusses via VARIO-buscoupler

KS VARIO T8/UTH

MODULAR CONTROLLER SYSTEM

- **8 Channel Closed Loop Controller**
- **Extensible via any VARIO-I/O-modul up to 30 control loops**
- **8 analog thermocouple inputs (11 different types, mV)**
- **8 digital outputs, 24V DC**
- **Heating current monitoring for all outputs**

APPLICATIONS

Intelligent closed loop controller module of the VARIO-system

For process automation, machinery automation, installations, factory automation

MAIN ATTRIBUTES

Latest control technology with complete functional range for the most varied applications

Free wiring of all inputs & outputs

Scanning rate adjustable per channel: from 100 ms

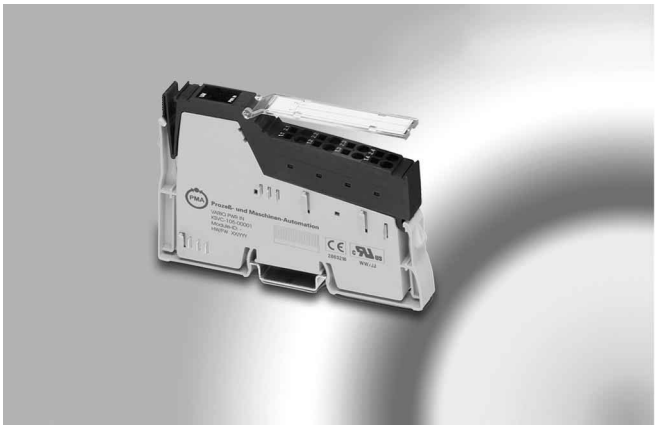
2 automatic self-tuning procedures

Heating current monitor with compensation of mains voltage variations

Separate RS232-interface for BlueControl Engineering Tool

Software update in Flash EPROM via the Engineering Tool

Dimensions: 48,8 x 120 x 71,5 mm (B x H x T)
Power supply: 24 V DC and 7,5 V DC through potential routing
Inputs: 8 analog inputs, differencial inputs with shield
1 heating current input (50 mA)
Outputs: 8 digital outputs,
each 70mA, 24 V DC
Communication: All fieldbusses via VARIO-buscoupler



VARIO PWR IN/24

VARIO POWER TERMINAL

- **Supply of the main power 24 V DC**
- **Supply of the segment power 24 V DC**

APPLICATIONS

Supply of 24 V DC for VARIO-systems with a high number of modules

For process automation, machinery automation, installations, factory automation

MAIN ATTRIBUTES

Diagnostic LED

Dimensions: 12,2 x 120 x 71,5 mm (B x H x T)
Power supply: 24 V DC

TECHNICAL SYSTEM-DATA

GENERAL

Number of devices in an vario-station 63, maximum
Maximum current carrying capacity of the voltage jumpers:

- 8 A for 24 V DC Main- and segment circuit
- 0,5 A for power supply of analog circuits

AMBIENT CONDITIONS

Regulations

Developed according to ***VDE 0160, UL 508***

Permissible Temperatures

Ambient temperature (operation):	-25...55 °C
Ambient temperature (storage/transport):	-25...85 °C
Maximum permissible temperature inside the terminal during operation:	85 °C

Humidity

Humidity (operation):
75 % on average; 85 % occasionally; no condensation
Humidity (storage/transport)
75%, on average; 85%, occasionally; no condensation

Air pressure

Air pressure (operation):
80 kPa to 106 kPa (up to 2000 m [6562 ft.] above sea level)
Air pressure (storage/transport):
70 kPa to 106 kPa (up to 3000 m [9843 ft.] above sea level)

Protection modes

Degree of protection according to DIN 40050, IEC 60529
IP 20

Protection class

Degree of protection according to DIN 57106-1 Class 3

Air and creepage distances

Air and creepage distances According to IEC 60644/IEC 60664A/
DIN VDE 0110: 1989-01 and
DIN VDE 0160: 1988-05

Housing material

Plastic, PVC-free, PA6.6, self-extinguishing (V0)

Degree of pollution

according to EN 50178 2; condensation not permissible in operation

Environmental compatibility

Not resistant to chloroform
Gases that may endanger functions according to
DIN 40046-36, DIN 40046-37

Sulfur dioxide (SO2)

Concentration 10 ± 0.3 ppm
Ambient conditions

- Temperature: 25°C (77°F) (± 2°C)
- Humidity 75% (± 5%)
- Test duration: 10 days

Hydrogen sulfide (H2S)

Concentration 1 ± 0.3 ppm
Ambient conditions

- Temperature: 25°C (77°F) (± 2°C)
- Humidity 75% (± 5%)
- Test duration: 4 days

Resistance of the housing

material to termites resistant
material to fungi resistant

MECHANICAL DEMANDS

Vibration test

sinusoidal vibrations according to
IEC 60068-2-6; EN 60068-2-6
5g load, 2 hours for each space direction

Shock test

according to IEC 60068-2-27; EN 60068-2-27
25g load for 11 ms, half sinusoidal wave,
three shocks in each space direction and
orientation

Broadband noise

according to IEC 60068-2-64; EN 60068-2-64
0.78g load, 2.5 hours for each space direction

CONFORMANCE WITH EMC DIRECTIVE 89/336/EEC

This table provides standard data. For different values, please refer to the terminal-specific data sheets.

Noise Immunity Test according to EN 50082-2

Electrostatic discharge (ESD) according EN 61000-4-2 / IEC 61000-4-2

- Criterion B
- 6 kV contact discharge
- 8 kV air discharge

Electromagnetic fields according EN 61000-4-3, IEC 61000-4-3

- Criterion A
- Field strength: 10 V/m

Fast transients (burst) according EN 61000-4-4 / IEC 61000-4-4

- Criterion B
- Remote bus: 2 kV
- Voltage supply 2 kV
- I/O cables: 2 kV
- Criterion A
- All interfaces: 1 kV

Surge voltage according EN 61000-4-5/ IEC 61000-4-5

- Criterion B
- AC supply lines: 2.0 kV/4.0 kV (symmetrical/asymmetrical)
- DC supply lines: 0.5 kV/0.5 kV (symmetrical/asymmetrical)
- Signal lines: 1.0 kV/2.0 kV (symmetrical/asymmetrical)

Conducted interference according EN 61000-4-6, IEC 61000-4-6

- Criterion A
- Test voltage 10 V

Noise Emission Test According to EN 50081-2

Noise emission of housing: EN 55011 Class A

POWER SUPPLY

24 V Supply of the Bus Terminal

Nominal voltage: 24 V DC
Ripple: ± 5 %
Permissible voltage range:
19,2 V DC to 30,0 V DC, ripple included
Connection Spring-clamp terminals

7.5 V Bus Logic Supply (UL)

Nominal voltage: 7,5 V
ripple: ± 5 %
Load current: 2 A, maximum
Connection Voltage jumpers on the sides

Remark:

Voltage is produced in the bus terminal by a DC/DC converter from the 24 V supply voltage.
UL is not electrically isolated from the 24 V bus terminal voltage.
UL is not electrically isolated from the I/O
voltages UM and US.
Communications power UL is electronically
short-circuit protected.

Supply of Terminals for Analog Signals (UANA)

Nominal voltage: 24 V DC
Tolerance : - 15 % / + 20 %
Ripple: ± 5 %
Permissible voltage range:
19,2 V DC to 30,0 V DC, ripple included
Load current: 500 mA, maximum
Connection Voltage jumpers on the sides

Remark:

Isolation of the 24 V input voltage by means of a diode. Smoothing through Π—filter;
corner frequency: 9.8 kHz and attenuation of 40 dB/decade.
UANA is not electrically isolated from the 24 V bus terminal supply and the 7.5 V communications power.

Supply of Terminals for Digital Signals (UM, US) in the 24 V Area

Nominal voltage: 24 V DC
Tolerance : - 15 % / + 20 %
Ripple: ± 5 %
Permissible voltage range:
19,2 V DC to 30,0 V DC, ripple included
Load current: 8 A, maximum
Connection Voltage jumpers on the sides

Remark

Segment circuit US All digital outputs and initiator supplies without individual short-circuit protection are connected to the segment circuit US.
Main circuit UM Initiator supplies with individual short-circuit protection are connected to the main circuit UM.

Voltage Dips and Interruptions to the I/O Supply

Intensity PS1: Interruption time < 1 ms
Time interval between voltage dips < 1 s
Behavior:
Evaluation criterion 1. A < 1 ms supply voltage dip is not registered by the bus.

Intensity PS2: Interruption time < 10 ms
Time interval between voltage dips < 1 s
Behavior:
Evaluation criterion 3. Bus disconnection; all outputs of the system are reset..

AIR AND CREEPAGE DISTANCES (ACCORDING TO EN 50178, VDE 0109, VDE 0110)

Isolating Distance:

– Incoming bus / bus logic
– Outgoing bus / bus logic
– Incoming bus / outgoing bus
– Bus logic / I/O

Air distance: 0,3 mm
Creepage distance: 0,3 mm
Impulse Voltage Withstand Level: 0,5 kV

TEST VOLTAGES

The following isolating distances are tested by *500 V AC test voltage, 50 Hz, 1 min*

5 V supply incoming remote bus /
5 V supply of outgoing remote bus

5 V supply incoming remote bus/
7.5 V communications power, 24 V bus terminal supply

5 V supply incoming remote bus/
24 V main supply, 24 V segment supply

5 V supply incoming remote bus/
functional earth ground

5 V supply outgoing remote bus/
7.5 V communications power, 24 V bus terminal supply

5 V supply outgoing remote bus/
24 V main supply, 24 V segment supply

5 V supply outgoing remote bus/
functional earth ground

7.5 V communications power, 24 V bus terminal supply/
functional earth ground
7.5 V communications power, 24 V bus terminal supply/
24 V main supply, 24 V segment supply

24 V main supply, 24 V segment supply/
functional earth ground

MODUL OVERVIEW: I/O-System vario

Notation	*Order-no.*	*Function*
Fieldbus Coupler		
VARIO BK DP/V1	KSVC-101-00011	Vario-Profibus-bus-terminal-module, Standard-Profibus-DP and extension DP/V1, 24 V DC, spring-clamp connection, labeling field
VARIO BK CAN	KSVC-101-00021	Vario-CANopen-bus-terminal-module, 24 V DC, spring-clamp connection, labeling field
VARIO BK ETH	KSVC-101-00031	Vario-ETHERNET-bus-terminal-module, 24 V DC, spring-clamp connection, labeling field
VARIO BK DN	KSVC-101-00041	Vario-DeviceNet-bus-terminal-module, 24 V DC, spring-clamp connection, labeling field
VARIO BK MOD	KSVC-101-00051	Vario-Modbus-terminal-module, 24 V DC, spring-clamp connection, labeling field
Digital Inputs		
VARIO DI 2/24	KSVC-102-00121	Vario digital input module, input terminal block, spring-clamp connection, labeling field, 2 inputs, 24 V DC, 4-wire connection
VARIO DI 4/24	KSVC-102-00131	Vario digital input module, input terminal block, spring-clamp connection, labeling field, 3 inputs, 24 V DC, 3-wire connection
VARIO DI 8/24	KSVC-102-00141	Vario digital input module, input terminal block, spring-clamp connection, labeling field, 8 inputs, 24 V DC, 4-wire connection
VARIO DI 16/24	KSVC-102-00151	Vario digital input module, input terminal block, spring-clamp connection, labeling field, 16 inputs, 24 V DC, 4-wire connection
Digital Outputs		
VARIO DO 2/24	KSVC-102-00221	Vario digital output module, input terminal block, spring-clamp connection, labeling field, 2 outputs, 24 V DC, 500 mA, 4-wire connection
VARIO DO 4/24	KSVC-102-00231	Vario digital output module, input terminal block, spring-clamp connection, labeling field, 4 outputs, 24 V DC, 500 mA, 3-wire connection
VARIO DO 8/24	KSVC-102-00241	Vario digital output module, input terminal block, spring-clamp connection, labeling field, 8 outputs, 24 V DC, 500 mA, 4-wire connection
VARIO DO 16/24	KSVC-102-00251	Vario digital output module, input terminal block, spring-clamp connection, labeling field, 16 outputs, 24 V DC, 500 mA, 3-wire connection
Analog Inputs		
VARIO AI 2/SF	KSVC-103-00121	Vario analog input module, input terminal block, spring-clamp connection, labeling field, 2 inputs, 0-20 mA, 4-20 mA, ±20 mA, 0-10 V, ±10 V, 2-wire connection
VARIO AI 8/SF	KSVC-103-00141	Vario analog input module, input terminal block, spring-clamp connection, labeling field, 8 inputs, 0-20 mA, 4-20 mA, ±20 mA, 0-10 V, ±10 V, (additional 0-40 mA, ±40 mA, 0-5 V, ±5 V, 0-25 V, ±25 V, 0-50 V), 2-wire connection
VARIO RTD 2	KSVC-103-00321	Vario analog input module, input terminal block, spring-clamp connection, labeling field, 2 inputs, RTD (resistance element), 2-, 3-, 4-wire connection
VARIO UTH 2	KSVC-103-00421	Vario analog input module, input terminal block, spring-clamp connection, labeling field, 2 inputs, TC (thermocouples), 2-wire connection
Analog Outputs		
VARIO AO 1/SF	KSVC-103-00211	Vario-analog output module, output terminal block, spring-clamp connection, labeling field, 1 output 0-20 mA, 4-20 mA, 0-10 V, 2-wire connection
VARIO AO 2/U/BP	KSVC-103-00221	Vario-analog output module, output terminal block, spring-clamp connection, labeling field, 2 outputs 0-10 V, ±10 V, 2-wire connection
Analog/digital I/O-Modules		
VARIO UTH 4-DO8	KSVC-103-00441	Vario-I/O-module, spring-clamp connection, labeling field, 4 inputs, TC (thermocouples), 2 wire connection + shield, 8 outputs 24 V DC, 1 heating current input
VARIO RTD 6-DO6	KSVC-103-00341	Vario-I/O-module, spring-clamp connection, labeling field, 6 inputs, RTD (resistance element), 3 wire connection + shield, 6 outputs 24 V DC, 1 heating current input
VARIO UTH 8-DO8	KSVC-103-00441	Vario-I/O-module, spring-clamp connection, labeling field, 8 inputs, TC (thermocouples), 2 wire connection + shield, 8 outputs 24 V DC, 1 heating current input
Common Feed Terminal Blocks		
VARIO PWR IN/24	KSVC-105-00001	Vario bus terminal module, common feed terminal block, spring-clamp connection, labeling field, 24V DC, without fuse
Closed Loop Controller		
KS VARIO T4/RTD	KSVC-104-00331	Vario-temperatur-controller, 4-channel, spring-clamp connection, labeling field, 4 inputs, RTD (resistance element), 3 wire connection + shield, 6 outputs 24 V DC, 1 heating current input, I/O extensible
KS VARIO T4/UTH	KSVC-104-00431	Vario-temperatur-controller, 4-channel, spring-clamp connection, labeling field, 4 inputs, TC (thermocouples), 2 wire connection + shield, 8 outputs 24 V DC, 1 heating current input, I/O extensible
KS VARIO T6/RTD	KSVC-104-00341	Vario-temperatur-controller, until 30-channel, spring-clamp connection, labeling field, 6 inputs, RTD (resistance element), 3 wire connection + shield, 6 outputs 24 V DC, 1 heating current input, I/O extensible until 30 channels
KS VARIO T8/UTH	KSVC-104-00441	Vario-temperatur-controller, until 30-channel, spring-clamp connection, labeling field, 8 inputs, TC (thermocouples), 2 wire connection + shield, 8 outputs 24 V DC, 1 heating current input, I/O extensible until 30 channels

ORDERING DATA FOR ACCESSORIES

General VARIO-accessories

End clamp	KSVC 109 00011
Universal ground terminal block	KSVC 109 00021
Coding profil (100 pcs. / package)	KSVC 109 00031
Zack markers for labeling modules	KSVC 109 00041
Screw driver according DIN 5264 (for spring-clamp terminals)	KSVC 109 00051
Labeling field, snap in, breadth: 2	KSVC 109 00061
Labeling field, snap in, breadth: 8	KSVC 109 00071
Labeling sheets for labeling field, breadth: 2	KSVC 109 00081
Labeling sheets for labeling field, breadth: 8	KSVC 109 00091

Documentation / operation manuals

VARIO BK DP/V1	German	9499-040-69118
	English	9499-040-69111
VARIO BK CAN	German	9499-040-69218
	English	9499-040-69211
VARIO BK ETH	German	9499-040-69318
	English	9499-040-69311
VARIO BK DN	German	9499-040-69418
	English	9499-040-69411
VARIO BK MOD	German	9499-040-70218
	English	9499-040-70211
KS VARIO T4/RTD	German	9499-040-69518
	English	9499-040-69511
KS VARIO T4/UTH	German	9499-040-69518
	English	9499-040-69511
KS VARIO T6/RTD	German	9499-040-69518
	English	9499-040-69511
KS VARIO T8/UTH	German	9499-040-69518
	English	9499-040-69511
VARIO DI 2/24	German	9499-040-68018
	English	9499-040-68011
VARIO DI 4/24	German	9499-040-68118
	English	9499-040-68111
VARIO DI 8/24	German	9499-040-68218
	English	9499-040-68211
VARIO DI 16/24	German	9499-040-68318
	English	9499-040-68311
VARIO DO 2/24	German	9499-040-67818
	English	9499-040-67811
VARIO DO 4/24	German	9499-040-68418
	English	9499-040-68411
VARIO DO 8/24	German	9499-040-68518
	English	9499-040-68511
VARIO DO 16/24	German	9499-040-68618
	English	9499-040-68611
VARIO AI 2/SF	German	9499-040-68718
	English	9499-040-68711
VARIO AI 8/SF	German	9499-040-67918
	English	9499-040-67911
VARIO RTD 2	German	9499-040-68918
	English	9499-040-68911
VARIO UTH 2	German	9499-040-68818
	English	9499-040-68811
VARIO AO 1/SF	German	9499-040-67618
	English	9499-040-67611
VARIO AO 2/U/BP	German	9499-040-69018
	English	9499-040-69011
VARIO UTH 4-DO8	German	9499-040-70318
	English	9499-040-70311
VARIO RTD 6-DO6	German	9499-040-70318
	English	9499-040-70311
VARIO UTH 8-DO8	German	9499-040-70318
	English	9499-040-70311
VARIO PWR IN/24	German	9499-040-67718
	English	9499-040-67711
Data sheet Closed Loop Controller KS VARIO	German	9498-737-47133
	English	9498-737-47113

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