

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 ETH

ETHERNET BUS COUPLER

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

APPLICATIONS

Head of the VARIO-system

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 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

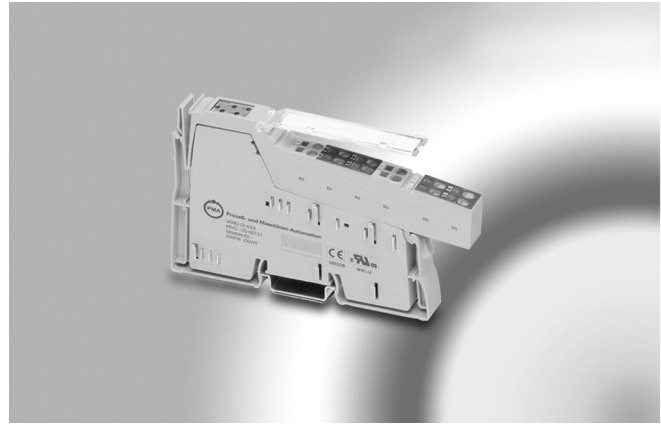
Inputs optically isolated

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

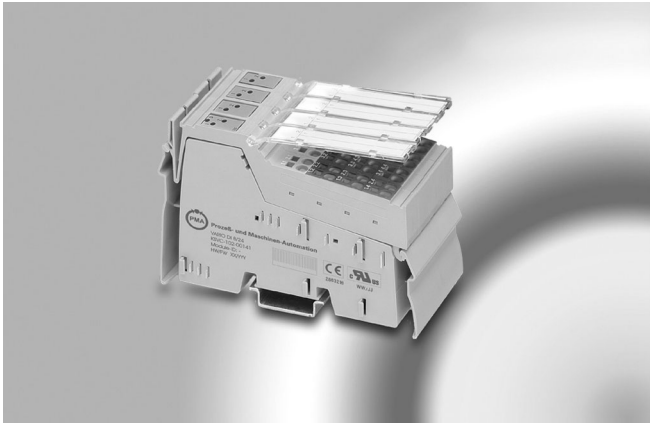
Inputs optically isolated

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

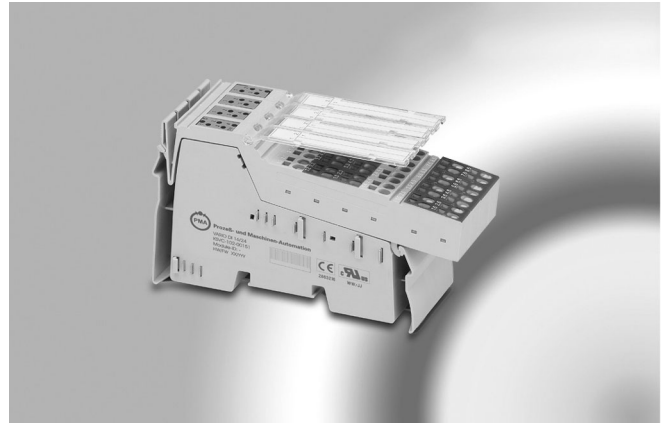
APPLICATIONS

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

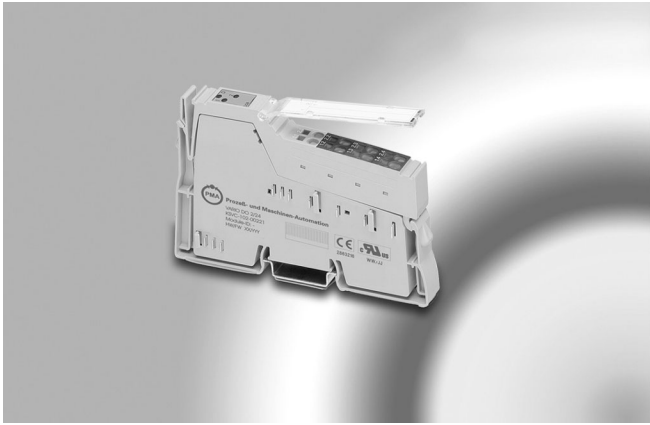
APPLICATIONS

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 circuit 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

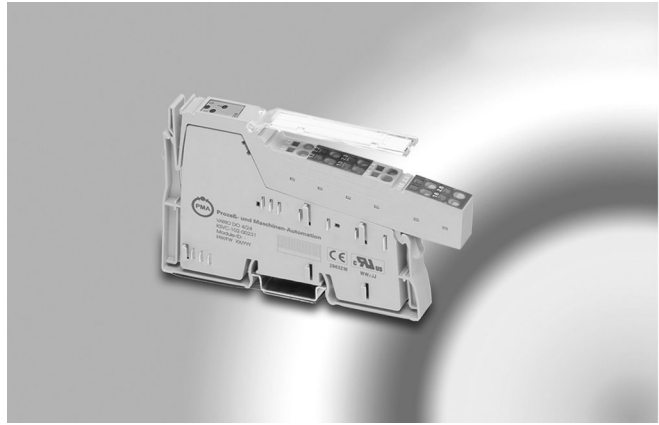
MAIN ATTRIBUTES

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 circuit 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 circuit 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

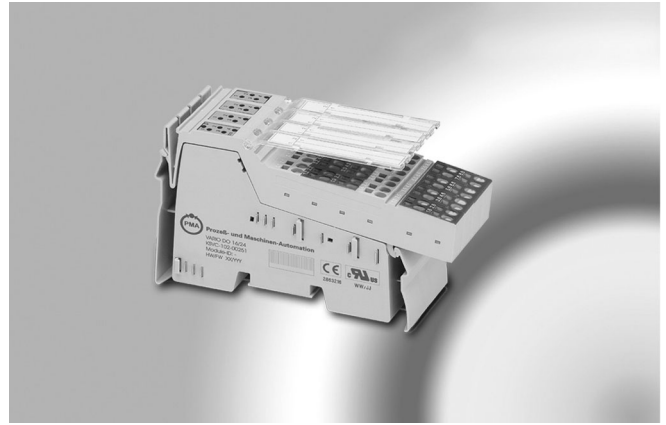
MAIN ATTRIBUTES

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 circuit 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

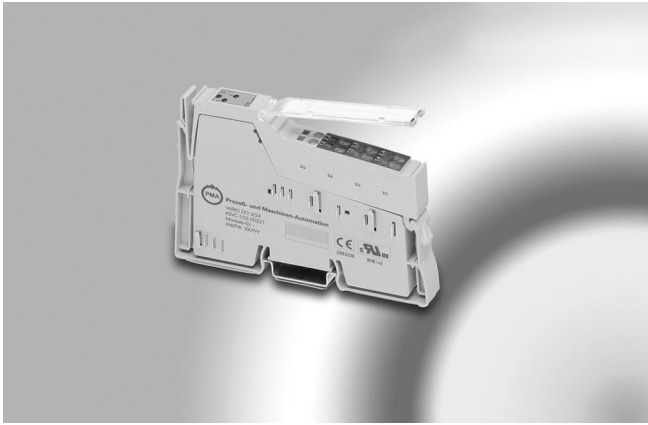
MAIN ATTRIBUTES

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 DO 1/230

RELAY OUTPUT

- 1 relay changeover contact (hard gold plated)
- Voltage: 5 - 253 V AC
- Max. current: 3 A

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: 2 x status and diagnostics
 Safe isolation according EN 50178

Dimensions: 12,2 x 120 x 71,5 mm (B x H x T)

Power supply: 24 V DC through potential routing

Outputs: 1 relay changeover contact
 5 - 253 V AC, 3 A



VARIO DO 4/230

RELAY OUTPUT

- 4 relay changeover contacts (hard gold plated)
- Voltage: 5 - 253 V AC
- Max. current: 3 A each relay

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

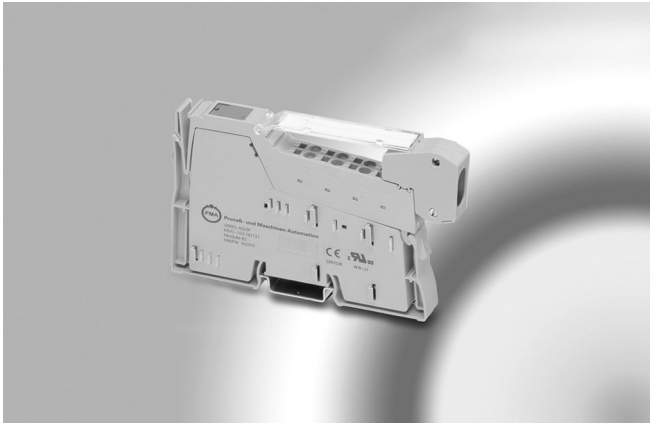
MAIN ATTRIBUTES

LED indicators: 5 x status and diagnostics
 Safe isolation according EN 50178

Dimensions: 48,8 x 120 x 71,5 mm (B x H x T)

Power supply: 24 V DC through potential routing

Outputs: 4 relay changeover contacts
 5 - 253 V AC, 3 A



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 resolution
- 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

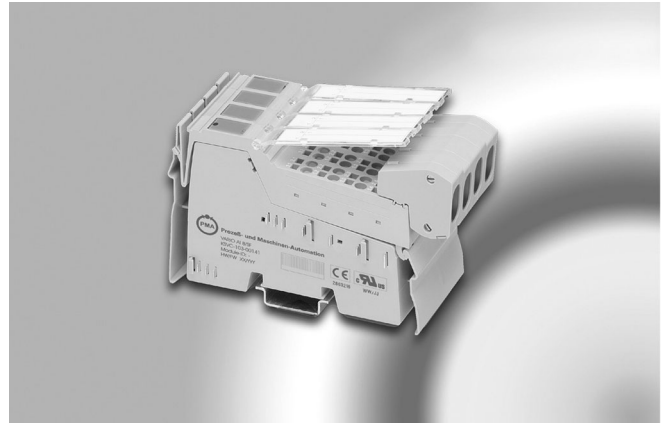
MAIN ATTRIBUTES

Process data update: 1,5 ms
 Diagnostic LED
 Inputs optically isolated
 Several input 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

- 8 analog inputs (single ended with shield)
- Connections for sensors in 2-wire technology
- 16-Bit resolution
- 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

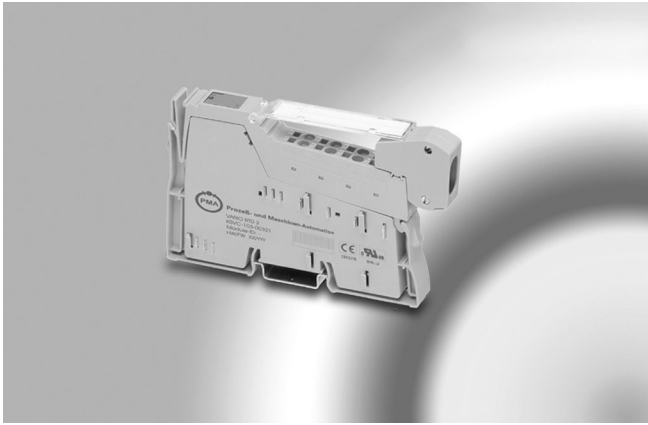
MAIN ATTRIBUTES

Diagnostic LED
 Inputs optically isolated
 Several input 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, differential inputs with shield
- Internal or external detection of cold junction temperature
- 16-Bit resolution
- 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

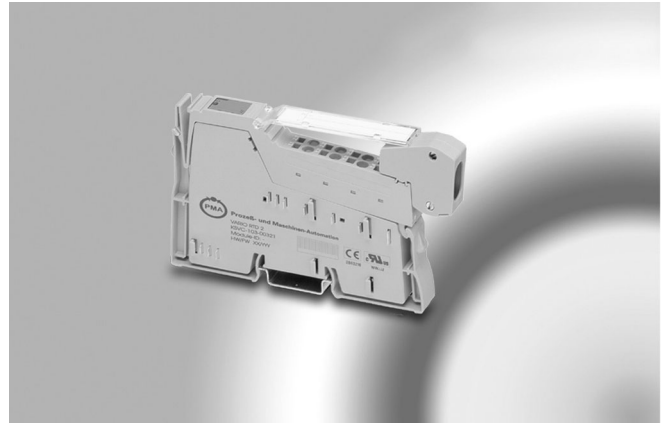
MAIN ATTRIBUTES

Absolute or differential temperature measurement
 Process data update: max. 30 ms
 Diagnostic LED
 Inputs optically isolated
 Several input 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, differential 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 resolution
- 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

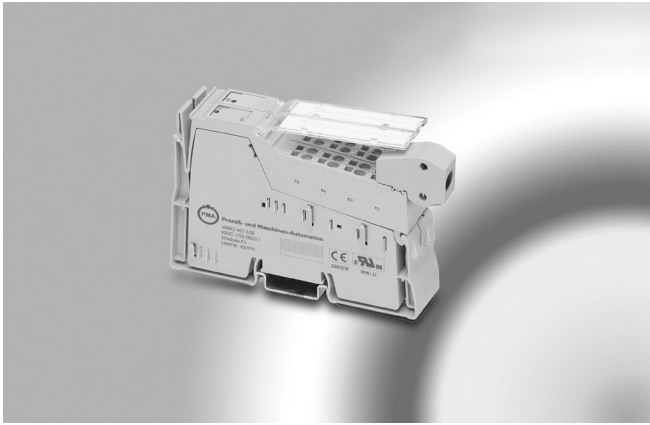
MAIN ATTRIBUTES

Diagnostic LED
 Process data update: max. 32 ms
 Inputs optically isolated
 Several input 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 resolution
- 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

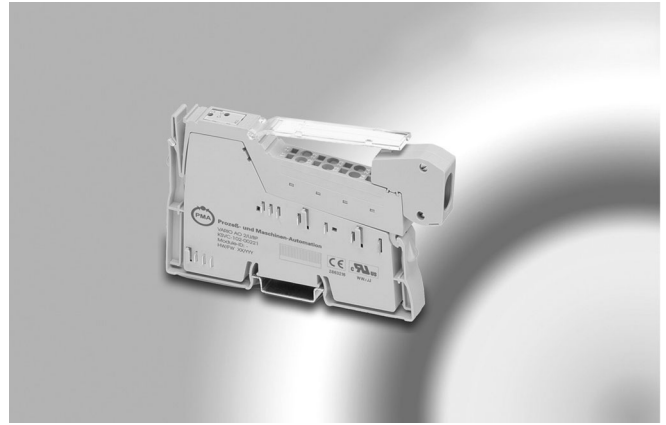
MAIN ATTRIBUTES

Process data update: 1 ms
 2 diagnostic LEDs
 Output optically isolated
 Several output 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/U/BP

ANALOG OUTPUTS VOLTAGE

- 2 analog outputs
- 2-wire technology with shield
- 13-Bit resolution
- 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

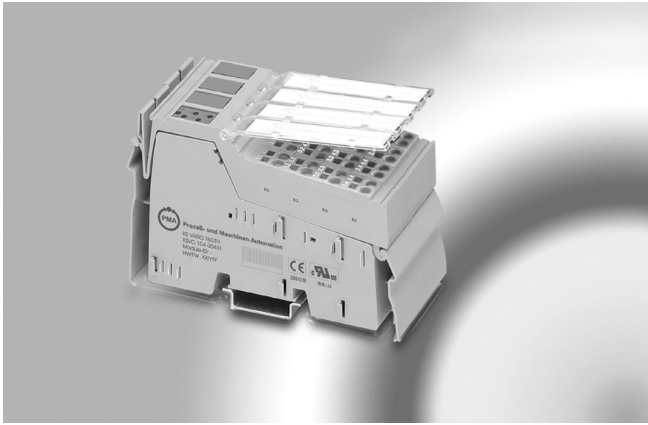
MAIN ATTRIBUTES

Process data update: 1 ms
 2 diagnostic LEDs
 Outputs optically isolated
 Several output 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
- differential inputs with shield
- 8 digital outputs, 24V DC
- 1 heating current input
- 14-Bit resolution
- Types: B, C, D, E, J, K, L, N, R, S, T, W

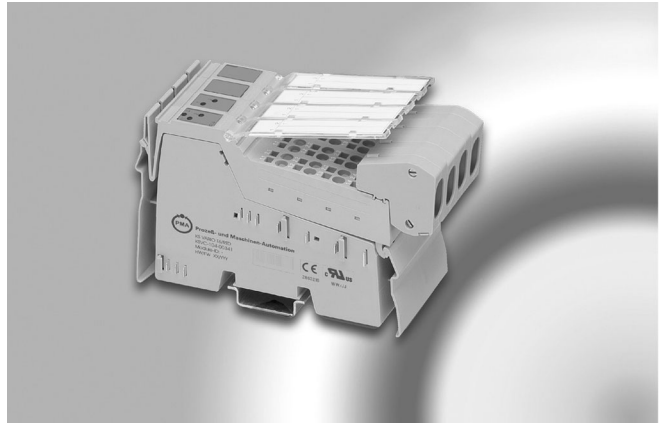
APPLICATIONS

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

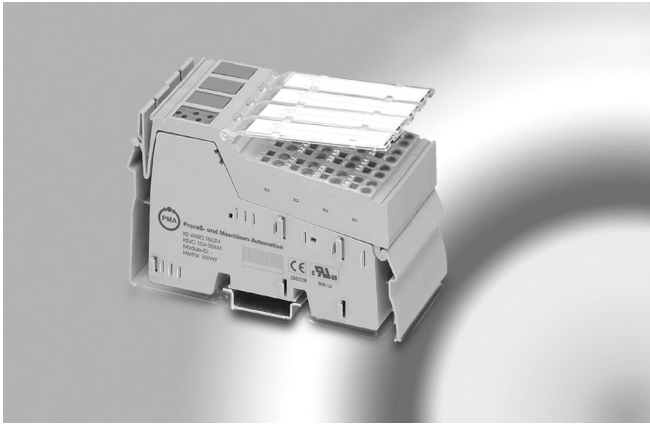
APPLICATIONS

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: 450 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
- differential inputs with shield
- 8 digital outputs, 24V DC
- 1 heating current input
- 14-Bit resolution
- 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

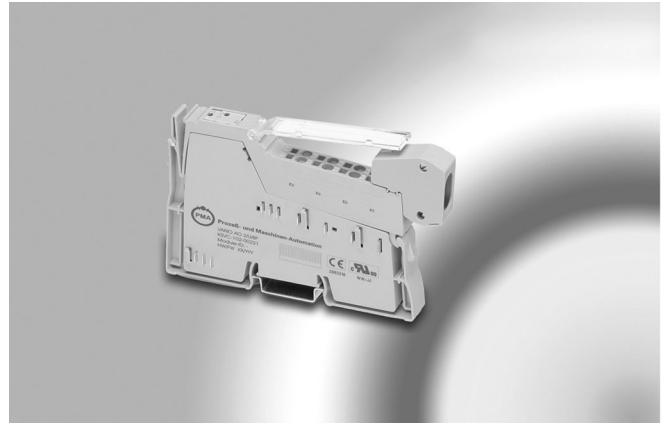
LED indicators: 3x status and diagnostics
 Process data update: max. 225 ms
 Inputs and outputs optically isolated
 Measuring ranges and input formats soft configurable
 Voltage range: 0..70 mV

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, differential inputs with shield
 1 heating current input (50 mA)

Outputs: 8 digital outputs,
 each 70mA, 24 V DC



VARIO CO 2/U

POWER SUPPLY FOR SENSORS

- 2 analog outputs
- 2-wire technology with shield
- 10 V DC, constant voltage

APPLICATIONS

I/O module of the VARIO-system
 I/O-extension of the modular closed-loop-control-system KS VARIO
 For process automation, extrusion
 Supply for melt pressure sensors

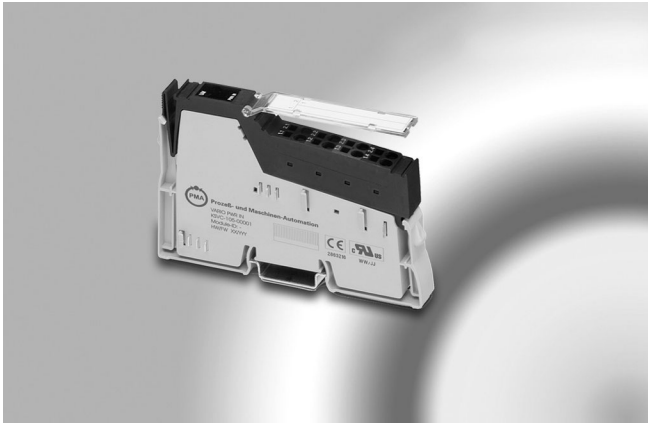
MAIN ATTRIBUTES

1 diagnostic LED
 Outputs optically isolated
 10V DC, max. 2 x 30 mA or 1 x 60 mA
 Accuracy: 0,3% drift typ.
 Short circuit proofed

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 PWR IN/24

VARIO POWER TERMINAL

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

APPLICATIONS

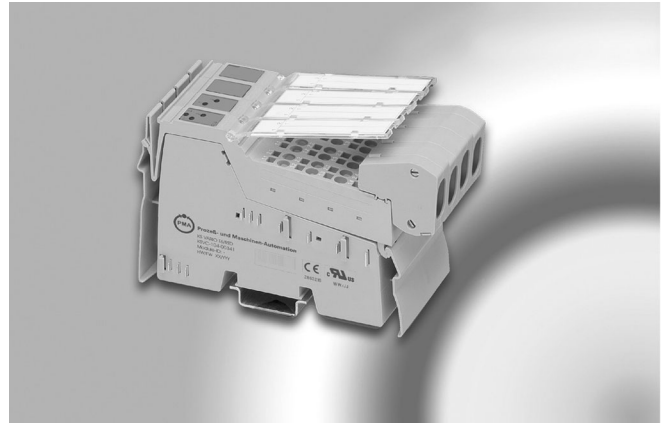
Supply of 24 V DC for VARIO-systems with a high number of modules
For process automation, machinery automation, installations, factory automation

MAIN ATTRIBUTES

Diagnostic LED

Dimensions: 12,2 x 120 x 71,5 mm (B x H x T)

Power supply: 24 V DC



KS VARIO T4/RTD

MODULAR CONTROLLER SYSTEM

- 4 Channel Closed Loop Controller
- I/O extensible via VARIO-modules
- 4 analog inputs for resistance thermometer and R linear
- 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 screen
1 heating current input (50 mA)

Outputs: 6 digital outputs,
each 70mA, 24 V DC

Communication: All fieldbusses via VARIO-buscoupler

TECHN. 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 to EN 61000-4-2 / IEC 61000-4-2

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

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

- Criterion A
- Field strength: 10 V/m

Fast transients (burst) according to 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 to 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 to 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 II—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

MODULE OVERVIEW: I/O-System vario

Notation	Order-no.	Function
Fieldbus Coupler for vario I/O systems		
VARIO BK ETH	KSVC-101-00031	Vario-ETHERNET-bus-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, 4 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
Relay Outputs		
VARIO DO 1/230	KSVC-102-01211	Vario digital output module, output terminal block, spring-clamp connection, labeling field, 1 relay changeover contact (hard gold plated), 5 - 253 V AC, 3 A
VARIO DO 4/230	KSVC-102-01231	Vario digital output module, output terminal block, spring-clamp connection, labeling field, 4 relay changeover contacts (hard gold plated), 5 - 253 V AC, 3 A

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-D08	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-D06	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-D08	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
Power supply module for sensors		
VARIO CO 2/U	KSVC-103-02221	Vario-analog output module, output terminal block, spring-clamp connection, labeling field, 2 outputs, 10V constant, 2 x 30mA (or 1 x 60mA)
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

ORDERING DATA FOR ACCESSORIES

General VARIO-accessories

End clamp (1 per unit)	KSVC-109-00011
Universal ground terminal block (1 per unit)	KSVC-109-00021
Coding profil (100 per unit)	KSVC-109-00031
Zack markers for labeling modules (10 per unit)	KSVC-109-00041
Screw driver according DIN 5264 (for spring-clamp terminals)	KSVC-109-00051
Labeling field, snap in, breadth: 2 (10 per unit)	KSVC-109-00061
Labeling field, snap in, breadth: 8 (10 per unit)	KSVC-109-00071
Labeling sheets for labeling field, breadth: 2 (72 per unit)	KSVC-109-00081
Labeling sheets for labeling field, breadth: 8 (5 x 15 per unit)	KSVC-109-00091
Spring-clamp terminals, grey (10 per unit)	KSVC-109-00201
Spring-clamp terminals, grey, with shield connection (5 per unit)	KSVC-109-00111

Documentation / operation manuals

All documents are available at our homepage : <http://www.pma-online.de>



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