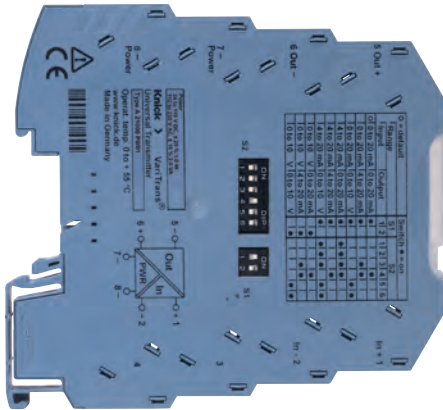


VariTrans A 21000

The first signal conditioners with protective separation and broad-range power supply in the 6-mm class.



The Task

Isolation and conversion of 0 ... 20 mA, 4 ... 20 mA and 0 ... 10 V standard signals with high measurement accuracy requirements. At the same time, best possible protection of personnel and equipment must be guaranteed.

The Problem

The standards governing the erection of installations demand protective separation according to EN 61140. The tightly dimensioned installation space on the mounting rail must be optimally used. Procurement logistics and stockkeeping demand a universal product which covers all common signal combinations and which can be used around the world with the broad-range power supply.

The Solution

In spite of the just 6 mm wide modular housing, VariTrans A 21000 meets the requirements of EN 61140 regarding protective separation up to an operating voltage of 300 V. The test voltage is 2.5 kV AC.

Very small leakage capacitances also ensure that high transient common-mode interferences can be isolated reliably and don't lead to system malfunctions. Standardization and flexible signal conversion are optimally implemented by the calibrated range selection – on-site calibration becomes superfluous.

The Housing

The just 6 mm wide modular housing allows high component density in the enclosure. In order to reduce the wiring requirements, power can be provided via the mounting rail bus connector from a central power supply.

The Advantages

Knick achieves a significant increase in reliability and lifetime by developing signal conditioners with extremely low power consumption and self-heating. This leads to a significant increase in the reliability and service life of the electronic components – for example, the MTBF (mean time between failures) of the new VariTrans A 21000 signal conditioners is 280 years.

Thanks to the VariPower power supply for all common supply voltages from 24 to 110 V DC ($\pm 25\%$) and 110 to 230 V AC ($\pm 10\%$), the devices can be used internationally with virtually all supply voltages.

Although signal conditioners are mostly used for DC signals, the perfect transmission of rapid signal changes is still essential. Excellent large-signal characteristics guarantee a correct run into the overrange limit. Dead times, hysteresis, signal reversal or latch-up effects are prevented – an indispensable features for further processing in the PLC.

VariTrans A 21000

Facts and Features

- **Broad-range power supply**
24 to 110 V DC (+/-25 %) and
110 to 230 V AC (+/-10 %)
- **Standards-compliant personal and plant protection**
Protective separation according to EN 61140
- **3-port isolation**
Prevention of incorrect measurements caused by potential differences
- **Ideal value for money**
High accuracy and isolation – 2.5 kV AC test voltage
- **Easy installation**
DIN rail bus connectors allow for easy and extremely cost efficient connection of the power supply to several VariTrans A 21000 or other Knick products in 6 mm housings.
- **Cost reduction with smaller enclosures**
More channels per meter DIN rail thanks to space-saving 6 mm housing and closely packed mounting
- **Long service life**
Extremely low failure rate (MTBF of 280 years) due to reduced self-heating
- **High accuracy and temperature stability**
Gain error 0.2 % and temperature coefficient 0.01 %/K
- **Calibrated range selection**
without complicated readjustments
- **Easy configuration**
DIP switch accessible from outside
- **Adjustable or fixed-range models**
- **International use**
UL approvals for US and Canada
- **5-year warranty**



Product Line

Devices	Input	Output	Order no.	
VariTrans A 21000 P0 with calibrated switching of input and output	0 ... 20 mA	0 ... 20 mA	A 21000 P0/	<input type="checkbox"/>
	4 ... 20 mA	4 ... 20 mA		<input type="checkbox"/>
	0 ... 10 V	0 ... 10 V		<input type="checkbox"/>
VariTrans A 21000 P0 with fixed settings	0 ... 20 mA	0 ... 20 mA	A 21016 P0/	<input type="checkbox"/>
	0 ... 20 mA	4 ... 20 mA	A 21017 P0/	<input type="checkbox"/>
	0 ... 20 mA	0 ... 10 V	A 21018 P0/	<input type="checkbox"/>
	4 ... 20 mA	0 ... 20 mA	A 21026 P0/	<input type="checkbox"/>
	4 ... 20 mA	4 ... 20 mA	A 21016 P0/	<input type="checkbox"/>
	4 ... 20 mA	0 ... 10 V	A 21028 P0/	<input type="checkbox"/>
	0 ... 10 V	0 ... 20 mA	A 21036 P0/	<input type="checkbox"/>
	0 ... 10 V	4 ... 20 mA	A 21037 P0/	<input type="checkbox"/>
	0 ... 10 V	0 ... 10 V	A 21038 P0/	<input type="checkbox"/>
Power supply	24 V DC via screw terminals or DIN rail bus connector			00
	Broad-range power supply 24 V ... 110 V DC, 110 ... 230 V AC via screw terminals only			01
Accessories			Order no.	
ZU 0628 DIN rail bus connector	Power supply bridging for two isolators, resp., A 21000 P0		ZU 0628	
IsoPower A 20900	Power supply 24 V DC, 1 A A20900 H4 power supply		A 20900 H4	
ZU 0678 DIN rail bus connector	Tapping of supply voltage, routing to DIN rail bus connector ZU 0628		ZU 0678	
ZU 0677 power terminal block	For connecting the supply voltage to the ZU 0628 DIN rail bus connector		ZU 0677	

VariTrans A 21000

Specifications

Input data

Inputs	0 ... 20 mA 4 ... 20 mA 0 ... 10 V switchable (default setting 0 ... 20 mA)
Input resistance	Current input: voltage drop < 0.1 V at 20 mA Voltage input: approx. 100 kohms
Overload capacity	Current input: < 100 mA Voltage input: voltage limited to 30 V by suppressor diode, max. permitted continuous current: 3 mA

Output data

Outputs	0 ... 20 mA 4 ... 20 mA 0 ... 10 V switchable (default setting 0 ... 20 mA)
Load	With output current: $\leq 10 \text{ V}$ ($\leq 500 \text{ ohms}$ at 20 mA) With output voltage: $\leq 1 \text{ mA}$ ($\geq 10 \text{ kohms}$ at 10 V)
Offset	< 20 μA or < 10 mV
Residual ripple	< 10 mV _{rms}

Transmission behavior

Transmission error	< 0.2 % of the measured value for direct current transmission 1:1 < 0.3 % of the measured value for voltage input and/or voltage output Additional error with live-zero operation 20 μA or 10 mV
Temperature coefficient	$\geq 0.01 \text{ %/K}$ full scale (reference temp. 23 °C) Average TC in specified operating temperature range 0 ... +55 °C
Response time T_{90}	< 5 ms
Cutoff frequency	$\geq 100 \text{ Hz}$, -3 dB

Power supply

Power supply	A 210XX P0/01: 24 V ... 110 V DC ($\pm 25 \text{ %}$), approx. 1.0 W 110 V ... 230 V AC ($\pm 10 \text{ %}$), approx. 2.0 VA A 210XX P0/00: 24 V DC ($\pm 25 \text{ %}$), approx. 0.65 W The power supply can be routed from one device to another via DIN rail bus connectors. Broad-range power supply, 24 ... 110 V DC, 110 ... 230 V AC, without DIN rail bus connector Power supply 24 V DC, screw terminals or DIN rail bus connector
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Specifications *(continued)*

Isolation

Galvanic isolation	3-port isolation between input, output, and power supply
Test voltage	2.5 kV AC, 50 Hz
Working voltage (basic insulation)	up to 300 V AC/DC across input and output/power with overvoltage category II and pollution degree 2
Protection against electric shock	Protective separation according to EN 61140 through reinforced insulation according to EN 61010-1, up to 300 V across input and output/power with overvoltage category II and pollution degree 2. For applications with high working voltages, take measures to prevent accidental contact and make sure that there is sufficient distance or insulation between adjacent devices.

Standards and approvals

EMC	Product family standard: EN 61326 Emitted interference: Class B Immunity to interference: Industry Slight deviations are possible during interference.
RoHS conformity	According to directive 2011/65/EU

Further data

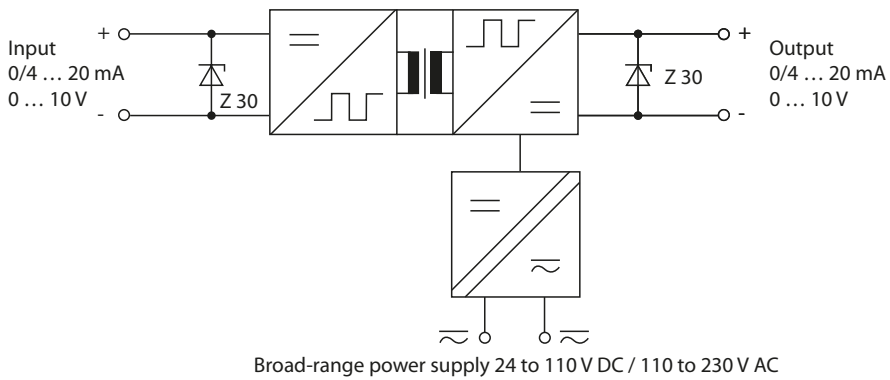
MTBF	Approx. 280 years Mean time between failures – MTBF – according to EN 61709 (SN 29500) Requirements: stationary operation in well-kept rooms, average ambient temperature 40 °C, no ventilation, continuous operation
Ambient temperature	During operation: 0 ... +55 °C In storage: -40 ... +85 °C
Ambient conditions	Indoor use ¹⁾ ; relative humidity 5 ... 95 %, no condensation; max. altitude 2000 m (air pressure: 790 ... 1060 hPa) ²⁾
Design	Modular housing with screw terminals, width 6.2 mm
Ingress protection	IP 20
Conductor cross sections	Single wire 0.2... 2.5 mm ² Stranded wire 0.2... 2.5 mm ² 24-14 AWG
Tightening torque	0.6 Nm
Mounting	For 35-mm DIN rail according to EN 60715
Weight	Approx. 50 g

¹⁾ Closed, weather-protected operating areas (stationary operation), water or wind-driven precipitation (rain, snow, hail, etc.) excluded

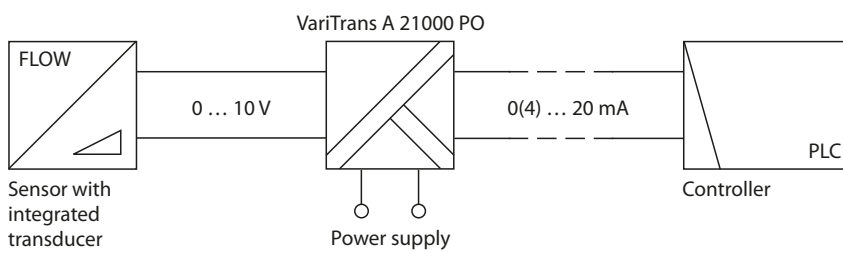
²⁾ Lower air pressure reduces the allowable working voltages.

VariTrans A 21000

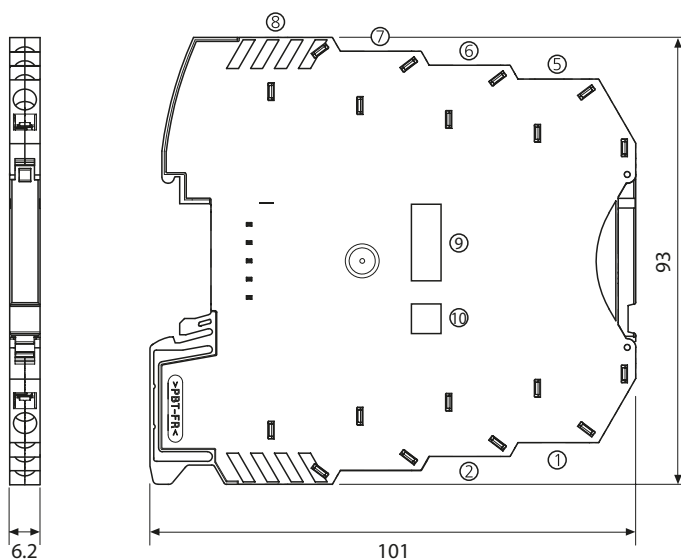
Block Diagram



Typical Application



Dimension Drawing and Terminal Assignments



Terminal assignments

- 1 Input +
- 2 Input -
- 5 Output +
- 6 Output -
- 7 Power supply ~
- 8 Power supply ~
- 9 DIP switch S2
- 10 DIP switch S1

All dimensions in mm