# First-Class.

# VariTrans® A 21000

The first standard-signal isolation amplifier
with broad-range power supply in the 6-mm class.




Knick ›

Knick

# VariTrans® A 21000

**Knick is the first company in the world to present a standard-signal isolator in a 6-mm housing with broad-range power supply. Calibrated range selection and protective separation are both part of the compact devices' feature set.**

## ■ Ideal for high demands

VariTrans® A 21000 isolates, transmits and converts 0 to 20/4 to 20 mA and 0 to 10 V standard signals with a high level of accuracy. In spite of the modular housing only 6 mm wide, the new VariTrans® isolation amplifier provides maximum protection of personnel and equipment by protective separation up to an operating voltage of 300 V conforming to EN 61140. Test voltage is 2.5 kV AC.

Very small coupling capacitances ensure that high transient common-mode interferences can be reliably isolated and cannot lead to system malfunctions.

## ■ Worldwide application

Maximum flexibility is provided by the integrated broad-range power supply for 24 … 110 V DC/110 … 230 V AC. This ensures trouble-free operation with alternating or direct voltages everywhere in the world even in unstable power supply networks. Erroneous connection of mains supply is practically impossible and expensive standstill times and repair work during the commissioning are prevented.

## ■ Calibrated range selection

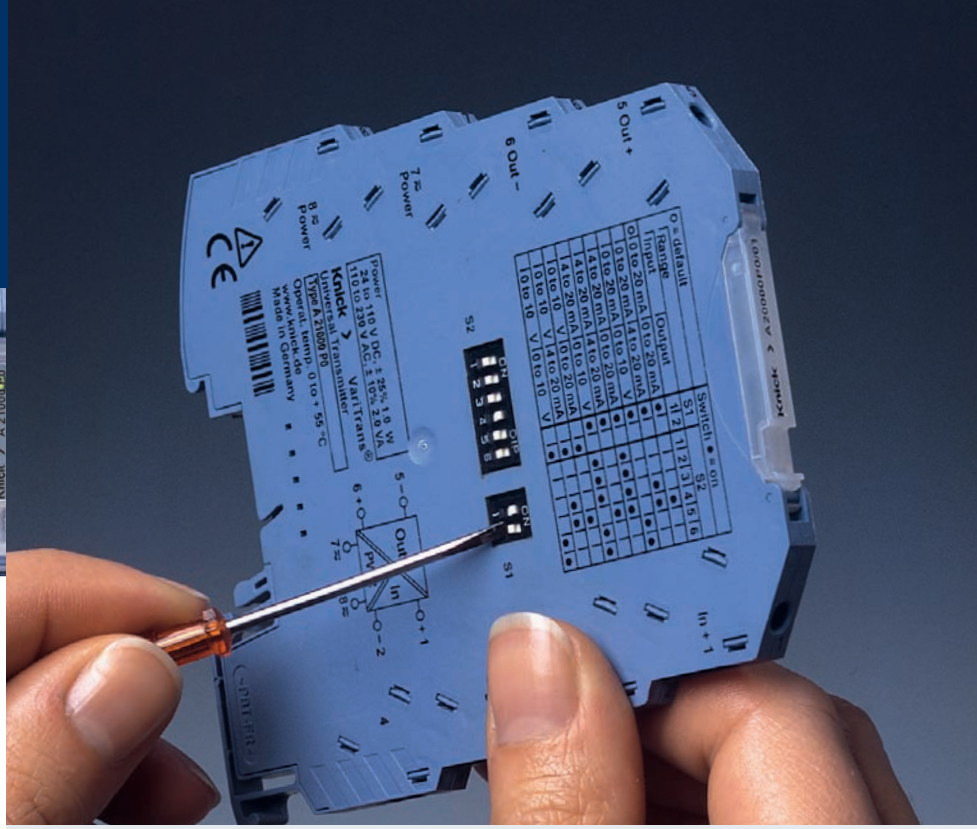
VariTrans® A 21000 sets the measuring ranges via DIP switches – comfortably and unmistakably.
Calibrated range selection ensures a gain accuracy of 0.2 (0.3) %. Tedious on site adjustment using a screwdriver, calibrator or multimeter is therefore no longer required – it couldn't be safer or easier!

## ■ Universal usability

The 3-port isolation offers diverse application possibilites. The input and output circuits can be applied to any potentials, taking account of the permitted working voltages. The distinction between input and output isolation amplifier is not required with the VariTrans® A 21000 because all three electric circuits are galvanically isolated from each other.

## ■ Ideal for SPC applications

In developing the VariTrans® A 21000 standard-signal isolation amplifier, the requirements of EN 61131-2 "Programmable Controllers" were consistently taken into account. Although isolation amplifiers are predominantly used for DC current signals, the correct transmission of fast signal changes cannot be dispensed with. 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 feature for further processing in the SPC.



## Long-term reliability

Knick has achieved a significant increase in reliability and service life through the development of isolation amplifiers with extremely low power consumption. The resulting minimum self-heating of the devices together with their only 6-mm-wide modular housing allows high component density in the enclosure. The benefit for reliability is reflected in an MTBF (mean time between failures) of 280 years.

**Warranty: 5 years**
Defects occurring within 5 years from delivery date shall be remedied free of charge at our plant (carriage and insurance paid by sender).

## Facts

- Integrated broad-range power supply 24 to 110 V DC / 110 to 230 V AC
- 3-port isolation; prevention of incorrect measurements caused by potential differences
- Protective separation up to 300 V AC/DC according to EN 61140
- High isolation – 2.5 kV AC test voltage
- Long service life; extremely low failure rate due to reduced self-heating
- Cost savings with smaller control cabinets; closely packed mounting of the compact housings allows more channels per meter DIN rail
- High accuracy and temperature stability: gain error 0.2 % and temperature coefficient 0.01 %/K
- Calibrated range selection without complicated adjustments
- Simple configuration by DIL switches; accessible from outside
- UL approval for North America
- Adjustable or fixed-range models
- Best value for money
- 5-year warranty

# VariTrans® A 21000

## Product Line

| Devices | Input | Output | Order No. |
|---|---|---|---|
| VariTrans® A 21000 with calibrated switching of input and output | 0 ... 20 mA,<br>4 ... 20 mA,<br>0 ... 10 V | 0 ... 20 mA,<br>4 ... 20 mA,<br>0 ... 10 V | A 21000 P0 |
| VariTrans® A 21000 with fixed settings | 0 ... 20 mA<br>0 ... 20 mA<br>0 ... 20 mA<br>4 ... 20 mA<br>4 ... 20 mA<br>4 ... 20 mA<br>0 ... 10 V<br>0 ... 10 V<br>0 ... 10 V | 0 ... 20 mA<br>4 ... 20 mA<br>0 ... 10 V<br>0 ... 20 mA<br>4 ... 20 mA<br>0 ... 10 V<br>0 ... 20 mA<br>4 ... 20 mA<br>0 ... 10 V | A 21016 P0<br>A 21017 P0<br>A 21018 P0<br>A 21026 P0<br>A 21016 P0<br>A 21028 P0<br>A 21036 P0<br>A 21037 P0<br>A 21038 P0 |

## Specifications

### Input data

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

### Output data

| | | |
|---|---|---|
| Outputs | 0 ... 20 mA<br>4 ... 20 mA<br>0 ... 10 V | <br><br>switchable (factory setting 0 ... 20 mA) |
| Load | With output current:<br>With output voltage: | ≤ 10 V (≤ 500 ohms at 20 mA)<br>≤1 mA (≥ 10 kohms at 10 V) |
| Offset | < 20 µA or < 10 mV | |
| Residual ripple | < 10 $mV_{rms}$ | |

### Transmission behavior

| | |
|---|---|
| Gain error | < 0.2 % meas.val. with direct 1:1 current transmission<br>< 0.3 % meas.val. with voltage input and/or voltage output<br>Additional error in live-zero operation 20 µA or 10 mV |

Knick

## Specifications

### Transmission behavior *(continued)*

| | |
|---|---|
| Temp influence | < 0.01 %/K full scale (reference temp. 23 °C)<br>Average TC in specified operating temperature range 0 ... +55 °C |
| Cutoff frequency | >100 Hz, –3 dB |

### Power supply

| | |
|---|---|
| Power supply | 24 V … 110 V DC (±25 %), approx. 1.0 W<br>110 V … 230 V AC (±10 %), approx. 2.0 VA |

### Isolation

| | |
|---|---|
| Test voltage | 2.5 kV AC, 50 Hz |
| Working voltage (basic insulation) | bUp to 300 V AC/DC across input and output/power supply, for overvoltage category II and pollution degree 2.Up to 100 V AC/DC across output and power supply for overvoltage category II and pollution degree 2 acc. to EN 61010-1 |
| Protection against electric shock | Protective separation up to 300 V across input and output/power supply according to EN 61140 by reinforced insulation according to EN 61010-1 with overvoltage category II and pollution degree 2.<br>For applications with high working voltages, ensure there is sufficient spacing or isolation from neighboring devices and protection against electric shocks. |

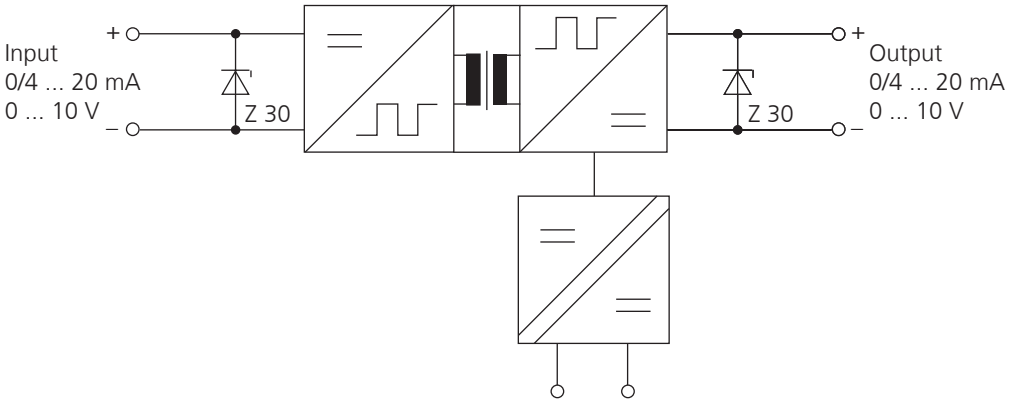
### Standards and approvals

| | |
|---|---|
| EMC | Product standard: EN 61326<br>Emitted interference: Class B<br>Immunity to interference: Industry<br>Slight deviations are possible during interference |
| Approval (pending) | cULus Listed,<br>Standard: UL 61010-1 and CSA C22.2 No. 61010-1 |

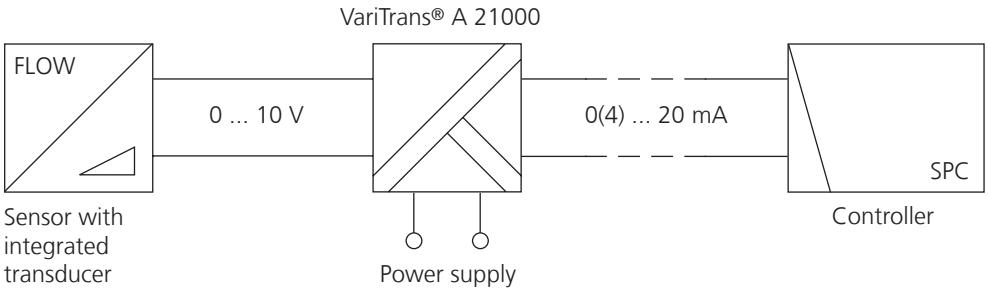
### Other data

| | |
|---|---|
| MTBF | 280 years<br>Mean Time Between Failures (MTBF) according to EN 61709 (SN 29500).<br>Conditions: stationary operation in well-kept rooms,<br>average ambient temperature 40 °C, no ventilation, continuous operation |
| Ambient temperature | during operation: 0 ... +55 °C when mounted in row<br>during storage: –40 ... +85 °C |
| Design | Modular housing with screw terminals, power supply also possible via cross-connections, width 6.1 mm; see dimension drawing for further dimensions |
| Ingress protection | IP 20 |
| Mounting | For 35-mm top-hat rail (EN 60715) |
| Weight | Approx. 50 g |

## Block Diagram

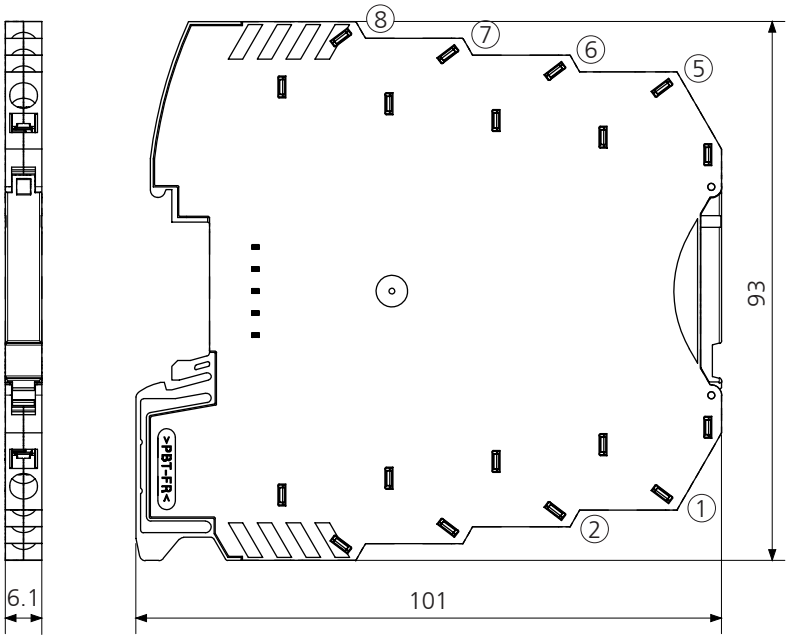



## Typical Application



Knick

## Dimension Drawings and Terminal Assignments




VariTrans® A 21000

① Input +
② Input –
⑤ Output +
⑥ Output –
⑦ Power supply
⑧ Power supply

Isolation Amplifiers
Transmitters

Indicators

Process Analytics

Portable Meters

Laboratory Meters

Sensors

Fittings

Knick

**Knick Elektronische Messgeräte GmbH & Co. KG**
Beuckestraße 22, 14163 Berlin, Germany
Phone: +49 (0)30 - 801 91 - 0
Fax: +49 (0)30 - 801 91 - 200
knick@knick.de · www.knick.de

TP-252.300.E1110 5000