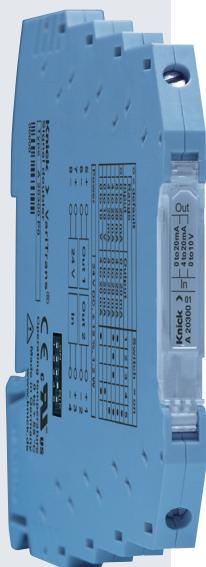


# Standard-Signal Doublers



## VariTrans A 20300

Signal doublers with two switchable calibrated outputs in a 6-mm housing, also for applications with high output loads.

### The Task

Isolation and transmission of 0(4) ... 20 mA and 0 ... 10 V standard signals in two 0(4) ... 20 mA output channels with galvanic isolation between input, outputs and power supply.

### The Problems

Measuring and control engineering frequently requires an analog standard signal to be processed at two points, i.e. by two devices, with both devices needing to receive the same signal.

To prevent falsified signals and in particular, in the event of errors, interaction or even damage, it makes sense to isolate signals and devices galvanically from one another.

### The Solution

The VariTrans A 20300 signal doubler is an extremely compact product which also provides a cost-effective solution to the problem. Its input, both outputs, and power supply are decoupled from one another (4-port isolation).

### The Housing

Measuring only 6 mm, the ultra-slim, closed 8-pin modular housing of the VariTrans A 20300 takes up only a little space on the top hat rail and, if necessary, can be installed at a later date.

### The Advantages

#### As a signal doubler:

In addition to "doubling" the analog signal, the VariTrans A 20300 can also convert signals if required. If, for example, the signal source only has a voltage output but current signals are used in the system, then the signal doubler converts the voltage signal (0 ... 10 V) proportionally into the required current signals (0 ... 20 mA or 4 ... 20 mA). Conversion from "Dead Zero" (0 ... 20 mA) to "Live Zero" (4 ... 20 mA) is also possible. The corresponding input and output signals are calibrated and can be selected using DIP switches, with the two outputs being switched over together.

### For load increase:

The VariTrans A 20300 can also be used when a particularly high output load is required. Standard signal sources can often drive a load of up to 500 ohms, i.e. supply 10 V at 20 mA. Sometimes certain devices – e.g. actuators – require a higher voltage; i.e. their input resistance is higher. The signal doubler can also solve this problem: Both output signals are not used separately in this case, but are connected in series to form one signal. This doubles the available voltage, making it possible to drive a higher load of up to 1000 ohms (20 V at 20 mA). Of course, the signal-defining 0/4 to 20 mA current is retained in the series configuration.

### The Technology

To implement the high level functionality of an A 20300 in the smallest of spaces – in a 6-mm wide modular housing with correspondingly small volume – a patent-pending circuit design is used. The energy balance (two active outputs) in particular must be optimized for all operating conditions. A patent application has been filed for the circuit principles of the VariTrans A 20300. As all products in the VariTrans A 20XXX series, the signal doubler also provides protective separation in accordance with EN 61140 to ensure high-level protection of persons and installations. This is achieved by means of increased insulation in compliance with EN 61010-1. In spite of being only 6 mm wide, the VariTrans A 20300 makes no compromises regarding its insulation properties.

For up-to-date information, please visit [www.knick.de](http://www.knick.de)

# Knick >

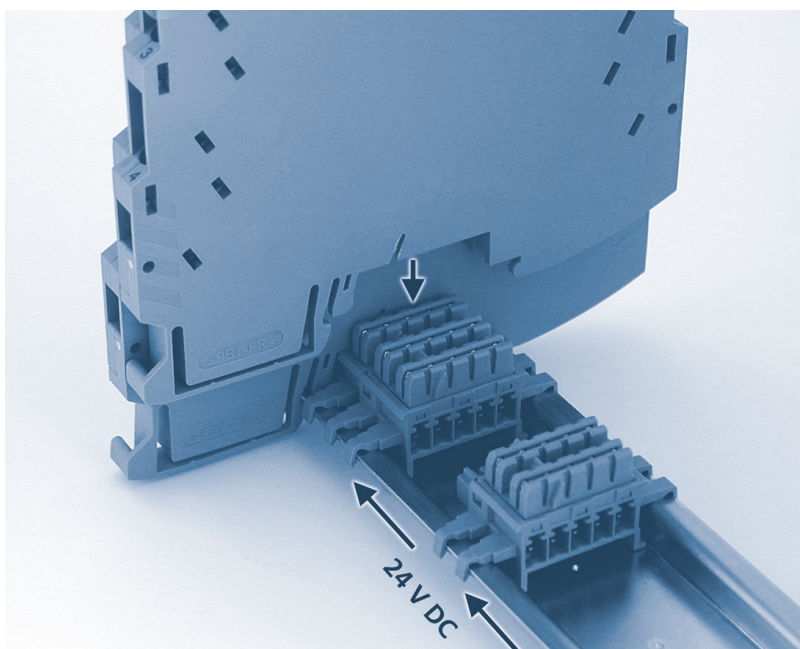
## The Facts

- **Safety in the smallest of spaces**  
4-port isolation in a 6-mm housing
- **Signal doubling**  
combined with signal conversion
- **Load increase**  
up to 1000 ohms possible for inputs  
with high input impedances
- **Personal protection conforming to standards**  
through protective separation  
according to EN 61140
- **Flexible use**  
with DIP switches accessible from  
the outside
- **Calibrated range selection**  
no cumbersome calibrating required
- **Low-cost solution**  
instead of two conventional isola-  
tors, only one compact and competi-  
tively priced device is required
- **International use**  
UL/CSA approvals
- **5-year warranty**



## Warranty 5 years!

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



The power supply can be routed  
from one device to another via  
DIN rail bus connectors.

# Standard-Signal Doublers

## VariTrans A 20300

### Product Line

Device	Input	Output	Order No.
VariTrans A 20300	0 ... 20 mA	0 ... 20 mA, 10 V	<b>A 20300 P0</b>
calibrated switching	4 ... 20 mA	4 ... 20 mA, 10 V	
(both outputs together)	0 ... 10 V		

### Power supply

24 V DC

### Accessories

		Order No.
ZU 0628 DIN-rail bus connector	Power supply bridging for 2 isolators, A 20XXX P0 or P 32XXX P0	<b>ZU 0628</b>
IsoPower A 20900	Power supply, 24 V DC, 1 A (see page 212)	<b>A 20900 H4</b>
ZU 0677 power terminal block	For connecting the 20 ... 30 V DC supply voltage to the ZU 0628 DIN rail bus connector	<b>ZU 0677</b>
DIN rail bus connector	for tapping of supply voltage (2 units required if on right side of IsoPower A 20900)	<b>ZU 0678</b>

### Specifications

#### Input data

Input	0 ... 20 mA, 4 ... 20 mA, 0 ... 10 V switchable (default setting 0 ... 20 mA)	
Input resistance	Current input:	Voltage drop $\leq 0.1$ V at 20 mA (with power failure approx. 350 mV)
	Voltage input:	Approx. 100 kohms
Overload capacity	Current input:	Self-resetting overcurrent protection (PTC characteristic)
	Voltage input:	Voltage limited to 30 V by suppressor diode, max. permitted continuous current: 3 mA

#### Output data

Outputs 1 and 2	0 ... 20 mA, 4 ... 20 mA jointly switchable (default setting 0 ... 20 mA)	
Load	$\leq 10$ V ( $\leq 500$ ohms at 20 mA), $\leq 20$ V (both outputs in series)	
Offset	$< 30$ $\mu$ A	
Residual ripple	$< 10$ mV <sub>rms</sub> (at 500 ohm load)	
Cutoff frequency	$> 100$ Hz	

#### Transmission behavior

Gain error <sup>1)</sup>	$< 0.2$ % meas. val. with direct current transmission 1:1 $< 0.3$ % meas. val. with voltage input	
Temperature coefficient <sup>2)</sup>	$< 0.01$ %/K full scale (reference temp. 23 °C)	

**Specifications** (continued)

**Power supply**

Power supply

24 V DC ( $\pm 15\%$ ), approx. 1.2 W

The power supply can be routed from one device to another via DIN rail bus connectors.

**Isolation**

Galvanic isolation

4-port isolation between input, outputs and power supply

Test voltage

1.5 kV AC, 50 Hz: power supply against input

2.5 kV AC, 50 Hz: outputs against each other and against input/power supply

Working voltage (basic insulation)

Up to 300 V AC/DC across all circuits with overvoltage category II and pollution degree 2.

For applications with high working voltages, ensure there is sufficient spacing or isolation from neighboring devices and protection against electric shocks.

Protection against electric shock

Protective separation according to EN 61140 by reinforced insulation according to EN 61010-1.

Working voltage up to 300 V AC/DC with overvoltage category II and pollution degree 2 between each output and all other circuits.

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<sup>3)</sup>

Product family standard: EN 61326

Emitted interference: Class B

Immunity to interference: Industry

Approval

cURus, File No. E 220033, Standards: UL 508 and CAN/CSA 22.2 No. 14-95

**Other data**

MTBF<sup>4)</sup>

Approx. 243 years

Ambient temperature

during operation: 0 ... +55 °C when mounted in row

during storage: -25 ... +85 °C

Design

Modular housing with screw terminals, 6.2 mm wide

See dimension drawings for further measurements

Ingress protection

IP 20

Mounting

For 35-mm top-hat rail (EN 60715)

Weight

Approx. 50 g

<sup>1)</sup> Additional error for live-zero operation 20  $\mu$ A

<sup>2)</sup> Average TC in the specified operating temperature range 0 °C ... +55 °C

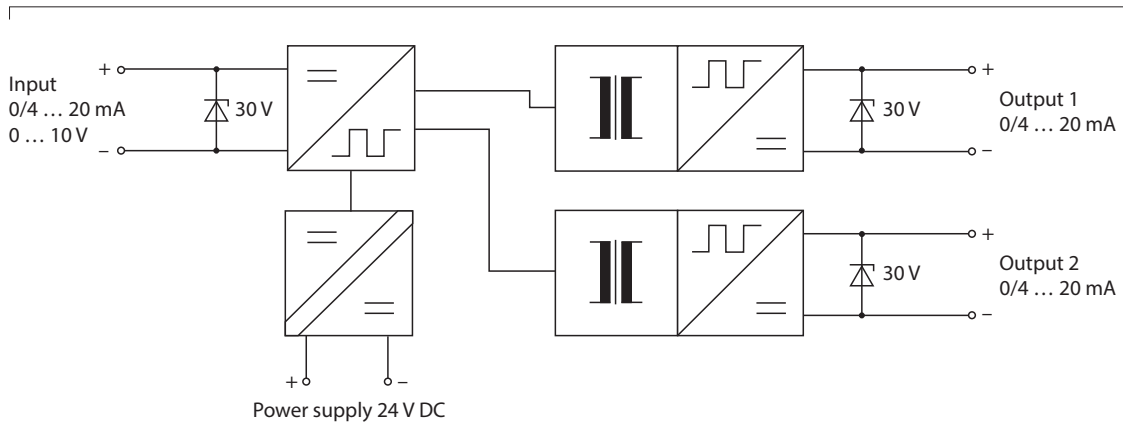
<sup>3)</sup> Slight deviations are possible while there is interference

<sup>4)</sup> Mean Time Between Failures – MTBF – according to EN 61709 (SN 29500). Conditions: stationary operation in well-kept rooms, average ambient temperature 40 °C, no ventilation, continuous operation

# Standard-Signal Doublers

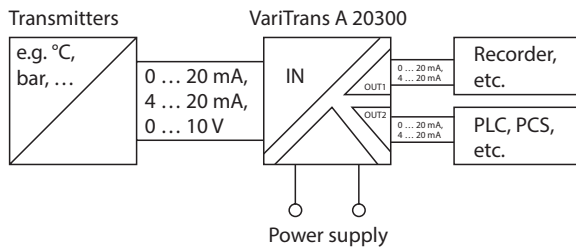
## VariTrans A 20300

### Block Diagram

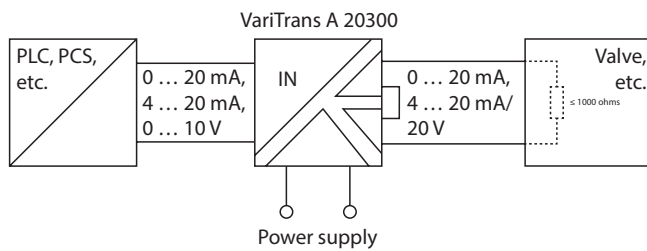


### Typical Applications

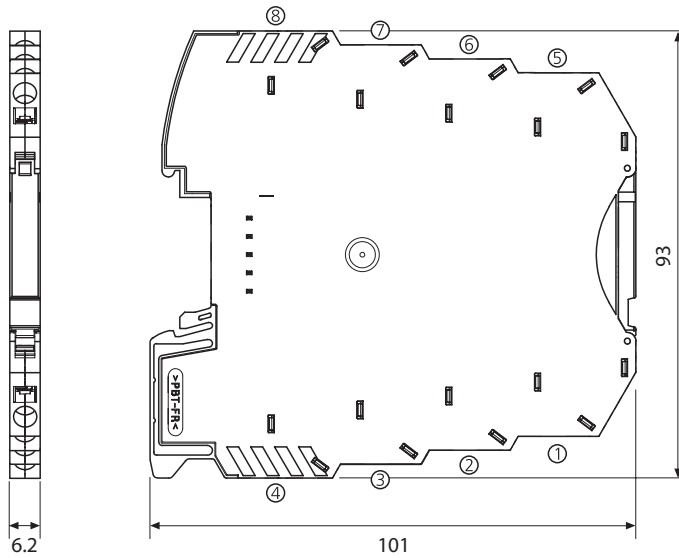
#### Signal doubling



#### Load increase



## Dimension Drawings and Terminal Assignments



### Terminal assignments

- 1 Output 2 +
- 2 Output 2 -
- 3 Input +
- 4 Input -
- 5 Output 1 +
- 6 Output 1 -
- 7 Power supply +
- 8 Power supply -

### Conductor cross-sections:

- single wire 0.2 ... 2.5 mm<sup>2</sup>
- stranded wire 0.2 ... 2.5 mm<sup>2</sup>
- 24-14 AWG

All dimensions in mm