

# Modular Housings

**Knick** >

## VariTrans® A 20300



**Signal doublers with two switchable calibrated outputs in a 6 mm housing, also for applications with high-level 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, both of which are to recognize the signal. To prevent falsified signals and in particular, in the event of errors, interaction or even damage, it is vital to isolate signals and devices galvanically from one another.

### The Solution

The VariTrans® A 20300 signal doubler is an extremely compact product which also allows the task to be dealt with cost-efficiently. 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. For example, if the signal source has only one voltage output but the installation uses current signals, the signal doubler converts the voltage signal (0 ... 10 V) proportionally into the required current signals (0 ... 20 mA or 4 ... 20 mA). An adjustment 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, the two outputs being switched together.

#### For load increase:

The VariTrans® A 20300 may 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. Likewise in this case, the signal doubler can solve the problem: Both output signals are now not used separately but are connected in series to form one signal. The available voltage is then doubled allowing an increased load up to 1000 ohms (20 V at 20 mA). The 0/4 up to 20 mA current which determines the signal remains, of course.

### The Technology

In order to implement the high functionality of an A 20300 in the smallest of spaces – in a 6 mm wide modular housing with correspondingly small volume – a patented circuit technology is used. The energy balance (2 active outputs) in particular must be optimized for all operating conditions. An application for patent has been filed for the circuit principles of the VariTrans® A 20300. Like all products in the VariTrans® A 20XXX series, the signal doubler also provides Safe Isolation according to EN 61140 to ensure high-level protection of personnel and equipment. 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.

# Standard Signal Doublers

Isolation Amplifiers  
Transmitters

Indicators

Process Analytics

Portable Meters

Laboratory Meters

Sensors

Fittings



**Knick** >

Warranty  
**5 years!**

*Defects occurring within 5 years from delivery are remedied free of charge at our works (carriage and insurance paid by sender).*

## ■ 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**  
through Safe Isolation according to EN 61140

**Flexible use**  
with DIP switches accessible from the outside

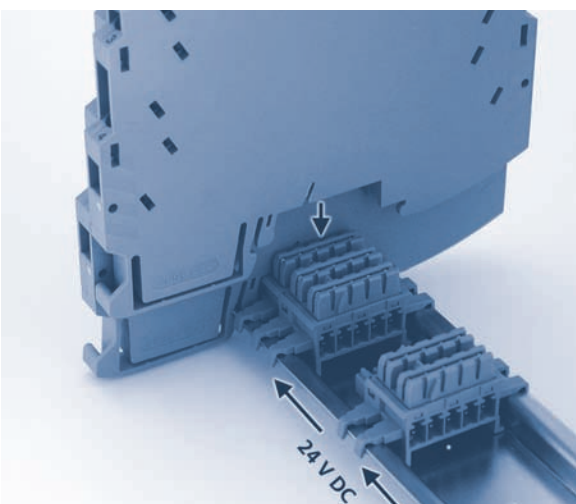
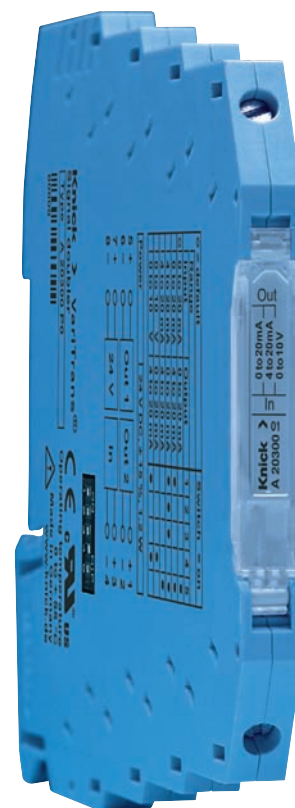
**Calibrated range selection**  
without complicated adjustments

**Low-cost solution**  
Only one compact, low-cost device is required instead of two conventional isolators

**International application**  
UL /CSA approvals

**5-year warranty**

**6mm CLASS**



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

Modular Housings

# Modular Housings

## VariTrans® A 20300

### ■ Product Line

Devices	Input	2 outputs	Order No.
VariTrans® A 20300 calibrated switchable (both outputs together)	0 ... 20 mA, 4 ... 20 mA, 0 ... 10 V	0 ... 20 mA, 10 V 4 ... 20 mA, 10 V	A 20300 P0

### Power supply

24 V DC

### Accessories

DIN rail bus connectors ZU 0628	Power supply bridging for 2 devices, A 20XXX P0 or P 32XXX P0	ZU 0628
IsoPower® A 20900	Power supply, 24 V DC, 1 A (see Page 212)	A 20900 H4
Power terminal block ZU 0677	Feeding the 20 ... 30 V DC supply voltage to the ZU 0628 DIN rail bus connector	ZU 0677

### ■ Specifications

#### Input data

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

#### Output data

Outputs 1 and 2	0 ... 20 mA, 4 ... 20 mA, switchable together (factory 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 ohms load)	
Cut-off frequency	$> 100$ Hz	

#### Transmission behavior

Gain error <sup>1)</sup>	$< 0.2$ % meas. val. with direct 1:1 current transmission $< 0.3$ % meas. val. with voltage input	
--------------------------	--	--

1) Additional error in live-zero operation 20  $\mu$ A

# Standard Signal Doublers

Isolation Amplifiers  
Transmitters

Indicators

Process Analytics

Portable Meters

Laboratory Meters

Sensors

Fittings

**Knick** 

## Specifications (continued)

### Response (continued)

Temperature coefficient<sup>2)</sup> < 0.01 %/K full scale (reference temperature 23 °C)

### Power supply

Power supply 24 V DC (± 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 among 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, you should ensure there is sufficient spacing or isolation from neighboring devices and protection against electric shocks.

Protection against electric shock Safe Isolation according to EN 61140 by reinforced insulation according to EN 61010-1. Working voltages up to 300 V AC/DC across each output and all other circuits with overvoltage category II and pollution degree 2. For applications with high working voltages, you should ensure there is sufficient spacing or isolation from neighboring devices and protection against electric shocks.

### Standards and approvals

EMC<sup>3)</sup> Product 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. 240 years

Ambient temperature During operation: 0 ... +55 °C when mounted in row  
During storage: -25 ... +85 °C

Design Modular housing with screw terminals, width 6.2 mm, see dimension drawings for further measurements

Ingress protection IP 20

Mounting For 35 mm top hat rail to EN 60715

Weight Approx. 50 g

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

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

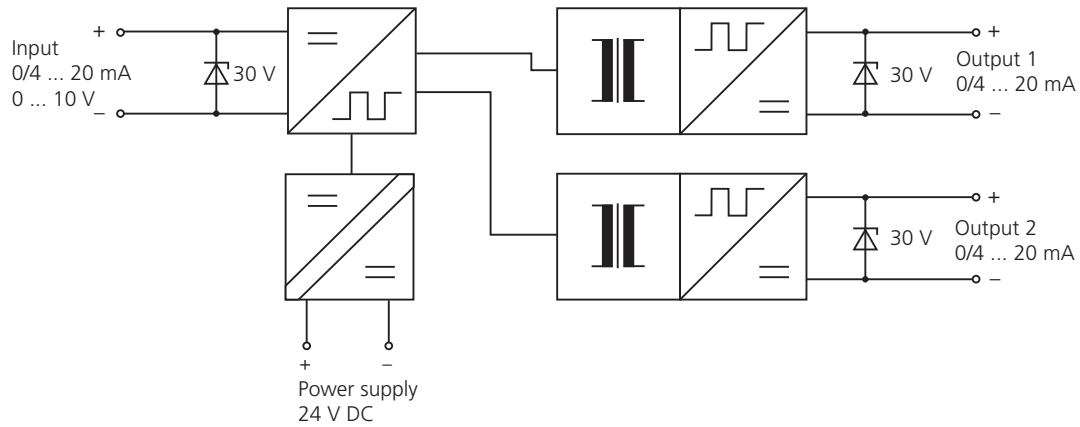
<sup>4)</sup> Mean Time Between Failures – MTBF – according to EN 61709 (SN 29500).

Conditions: stationary operation in well-kept rooms, average ambient temperature 40 °C, no ventilation, continuous operation

# Modular Housings

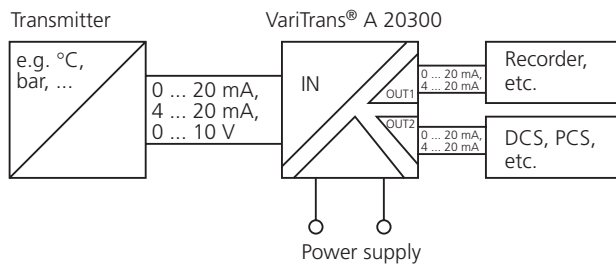
## VariTrans® A 20300

### ■ Block Diagram

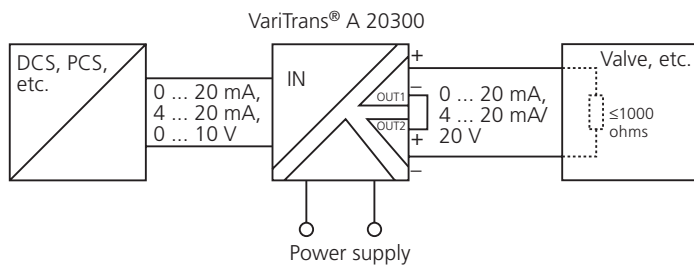


### ■ Application Examples

#### Signal doubling



#### Load increase



# Standard Signal Doublers

Isolation Amplifiers  
Transmitters

Indicators

Process Analytics

Portable Meters

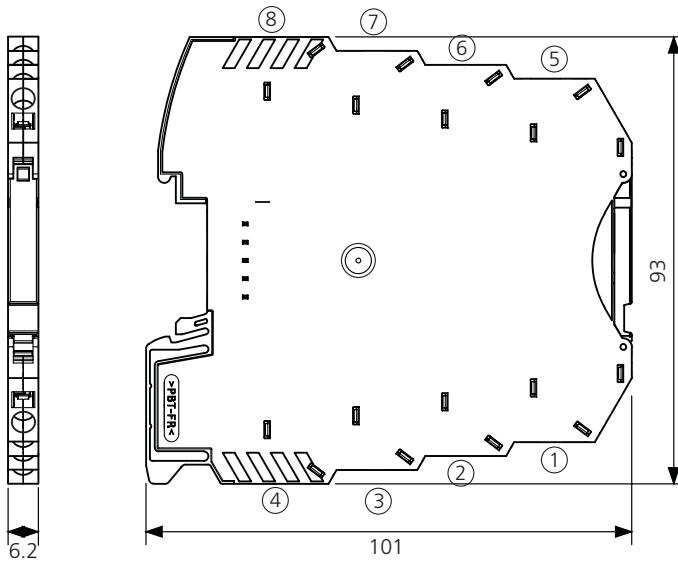
Laboratory Meters

Sensors

Fittings

## Knick

### ■ Dimension Drawings and 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>  
– Fine-wire: 0.2 ... 2.5 mm<sup>2</sup>  
– 24-14 AWG

All dimensions in mm!

Modular Housings