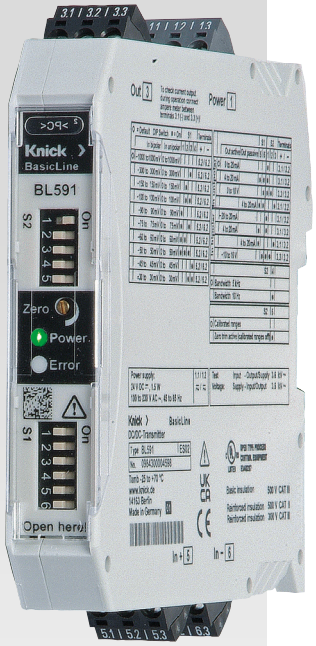
Universal Transducers



BasicLine BL590/591

Designed to measure currents and voltages with up to 500 V

The Transducers BL590 and BL591 are part of Knick's BasicLine product series. They are designed to measure currents and voltages in applications with up to 500 V.

Short circuit recognition, monitoring and control of motors, recognition of DC-link voltage or battery current/voltage are some use case examples.

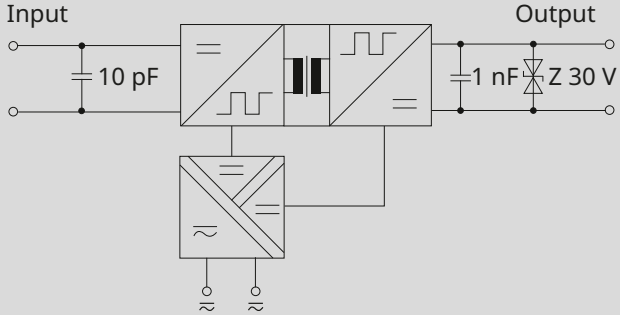
The input is galvanically isolated from output and auxiliary power. The housing can be quickly snapped on a DIN-Rail.

The products come with 10 selectable input ranges and unipolar as well as bipolar output signals. The device automatically calibrates itself after switching input or output ranges.

Facts

- Calibrated range selection
- 10 selectable input ranges and unipolar as well as bipolar output signals
- Universal power supply for 24 V DC supply or 100 ... 230 V AC mains supply
- Only 17.5 mm wide modular housing with comprehensive functionality
- Passive output for direct connection to a supplying PLC
- Monitor output for non-disruptive measurement of the output current by connecting a multimeter or permanently connecting an isolated display unit
- Galvanic 3-port isolation for undistorted transmission of the measuring signals or damages
- Highest reliability
- Optimum price/perfomance ratio
- 3 year warranty

Block Diagram



Power supply 24 V DC (±15 %), 100 ... 230 V AC (±10 %)

BasicLine BL590/591

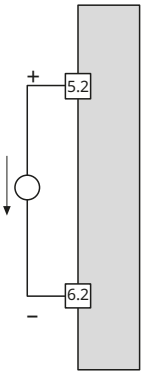
Product Range

Product	Input	Output	Order No.
BasicLine BL590 Input and output adjustable	10 switchable input ranges 50 ... 500 V DC	0 ... 20 mA, 4 ... 20 mA 0 ... 10 V, 0 ... ±10 V 0 ... ±20 mA	**BL590**
BasicLine BL591 Input and output adjustable	10 switchable input ranges 30 ... 1000 mV DC	0 ... 20 mA, 4 ... 20 mA 0 ... 10 V, 0 ... ±10 V 0 ... ±20 mA	**BL591**

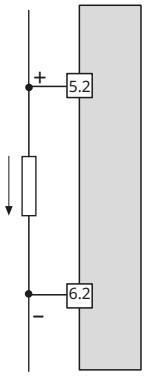
Wiring Examples

Input Wiring

BasicLine BL590:
0 ... 500 V

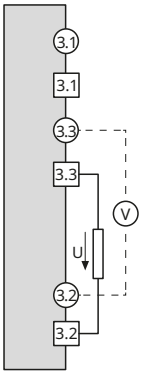


BasicLine BL591:
0 ... 1000 mV

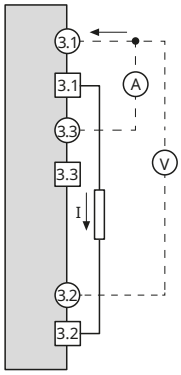


Output Wiring

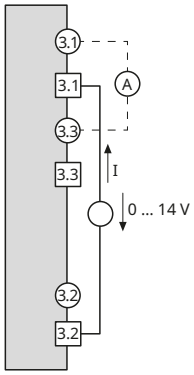
Voltage output with optional measurement



Active current output with optional measurement via test terminals

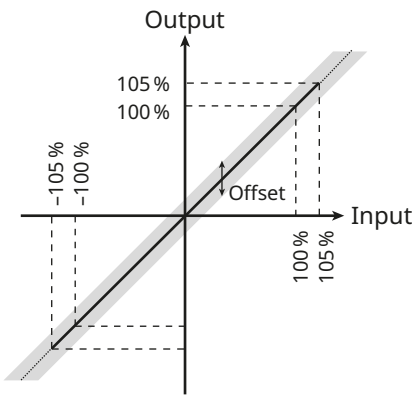


Passive current output with optional measurement via test terminals



Characteristic Curves

Transmission curve with display of the adjustable offset. The device functions linearly with 100 % precision up to 105 % input signal.



Universal Transducers

Technical Data

Input data

Input Measurement Range	BL590		BL591	
	Bipolar Input	Unipolar Input	Bipolar Input	Unipolar Input
	±500 V	0...500 V	±1000 mV	0...1000 mV
	±450 V	0...450 V	±300 mV	0...300 mV
	±400 V	0...400 V	±150 mV	0...150 mV
	±350 V	0...350 V	±100 mV	0...100 mV
	±300 V	0...300 V	±90 mV	0...90 mV
	±250 V	0...250 V	±75 mV	0...75 mV
	±200 V	0...200 V	±60 mV	0...60 mV
	±150 V	0...150 V	±50 mV	0...50 mV
	±100 V	0...100 V	±45 mV	0...45 mV
	±50 V	0...50 V	±30 mV	0...30 mV
	Input resistance	BL590: approx. 2 MΩ	BL591: approx. 10 kΩ	
	Overload capacity	BL590: max. ±600 V	BL591: max. ±30 V	

Output data	Active output	±20 mA	0 ... 20 mA	4 ... 20 mA
		±10 V	0 ... 10 V	
	Passive output	4 ... 20 mA		
	Load	Current output	≤ 600 Ω	Passive: 12 ... 26 V
		Voltage output	≥ 1000 Ω	
	Offset adjustment	± 5 %		
	Residual Ripple	< 10 mV_{eff}		

Transmission behavior	Gain error	Active output	< 0.3 % of end of scale
		Passive output	< 0.5 % of end of scale
	Temperature influence[1)]	BL590	80 ppm/K of end of scale (reference temperature 23 °C)
		BL591	50 ppm/K of end of scale (reference temperature 23 °C)
	Cutoff frequency	5 kHz or 10 Hz (selectable via DIP switch)	
	Response time t_{99}	≤ 200 µs for 5 kHz cutoff frequency	
		≤ 200 ms for 10 Hz cutoff frequency	
	Common Mode Rejection Ratio[2)]	CMRR:	approx. 150 dB (DC/AC 50 Hz)
		T-CMRR:	approx. 100 dB (1000 V, tr = 1 µs)

BasicLine BL590/591

Technische Daten

Power supply	24 V DC ±15 %, 100 ... 230 V AC ±10%, 45 Hz to 65 Hz		
Galvanic isolation	Galvanic isolation	3-port isolation between input, output and power supply	
	Type test voltage	3.6 kV AC	Input against output / power supply
		3.6 kV AC	Power supply against input / output
	Reinforced isolation according to EN 61010-1 / UL 61010-1 for protection against electric shock	Working Voltage	500 V AC/DC
		Overvoltage category	OV 2
		Pollution degree	PD 2
Standards and Certifications	Electrical safety	UL listing according to UL 61010-1	
	EMC	Industry applications	EN 61326-1
	RoHS conformity	According to directive 2011/65/EU	
Further Data	Ambient temperature	Operation	
		Active output	–25 ... +70 °C
		Passive output	–25 ... +60 °C
		Transport and storage	–50 ... +85 °C
Ambient Conditions	Stationary use, indoor use		
	Relative humidity	5 ... 95 %, no condensation	
	Max. altitude	2000m (air pressure: 790 ... 1060 hPa)	
	Mounting	Vertical or horizontal snap-on mounting, DIN-Rails acc. to EN 60715	
	Connection	Screw terminals, conductor cross section max. 2.5 mm²	
	Tightning torque	0.6 Nm	
	Weight	Approx. 119 g	
	Dimensions	17.5 x 99 x 114.5 mm	

1) Average TC in the specified operating temperature range –20 °C ... +70 °C

2) Common mode rejection ratio = differential voltage gain / common-mode gain
Transient common mode rejection ratio = differential DC gain / common-mode transient peak value gain