

Shunt Resistors



Facts

Precise and long-term stable measurement of DC currents using shunt resistors

For currents up to 15 kA, up to 8 kA with standard devices

Low shunt voltage / small dimensions thanks to special shunt isolators

Shunt accuracy: Class 0.5 optionally Class 0.2

Shunt isolator/transmitter with 0.1% gain error

High overload capacity without remaining measurement error

Measurement principle prevents influences from adjacent lines

Galvanic isolation between power unit and control unit up to 3.6 kV working voltage / 15 kV test voltage

Conversion to standard signals ± 20 mA, ± 10 V, 4 ... 20 mA

MTBF of 96 years for the complete current measurement system

5-year warranty

Areas of Applications

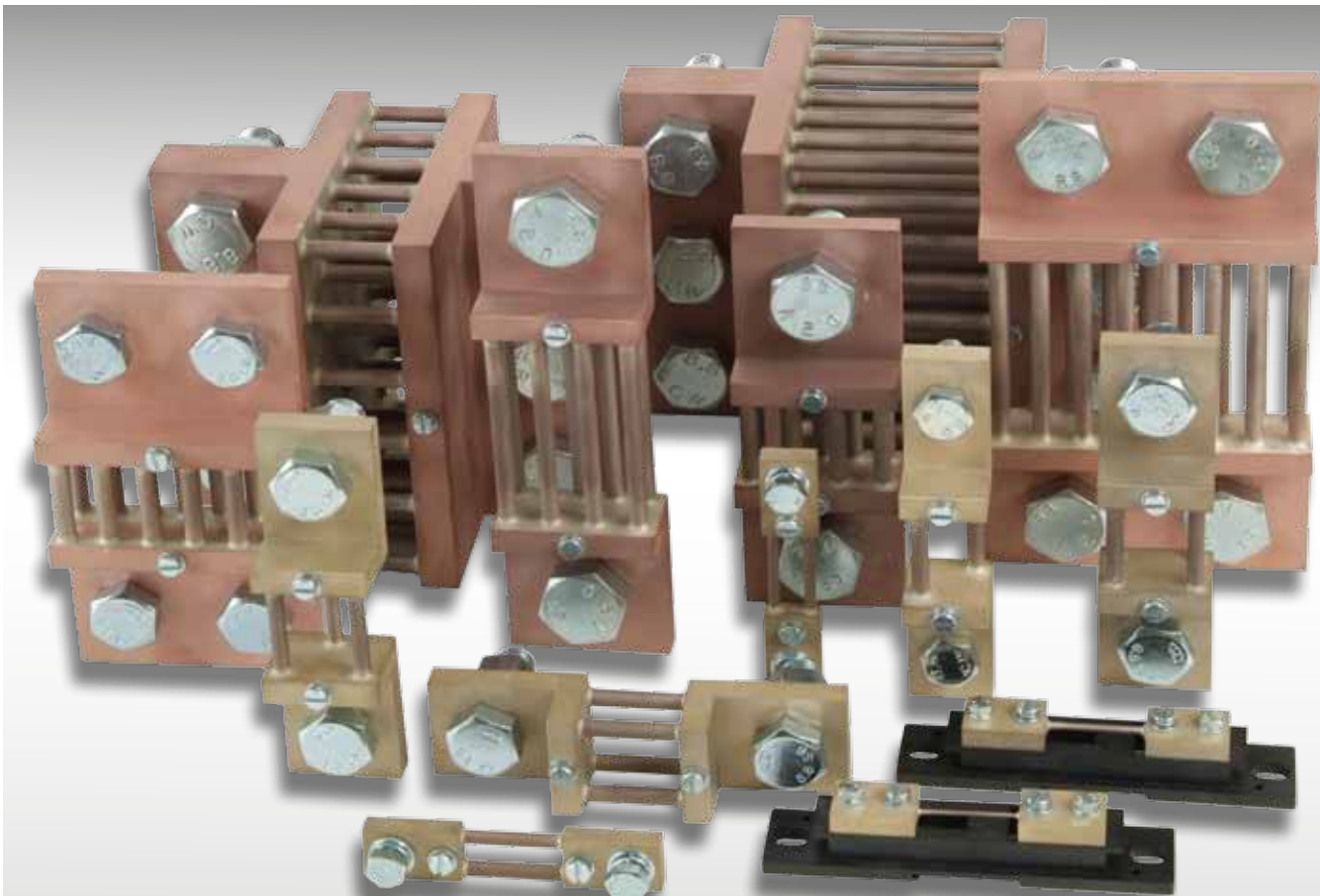
Photovoltaics

DC-supplied public transport systems

Control of motors and generators

Control of DC bus voltage / frequency inverters

Welding equipment

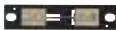





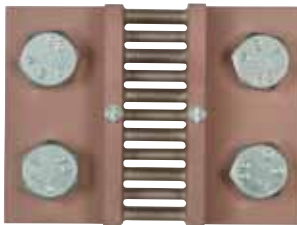
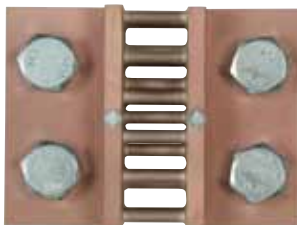
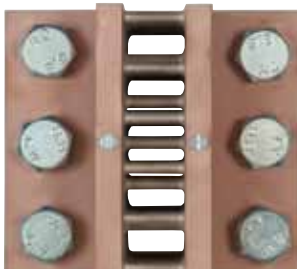


Selection Aid

	Current measurement $I < 100 \text{ mA}$	Current measurement $I < 5 \text{ A}$	Current measurement $I > 5 \text{ A}$	Voltage measurement
Working voltage < 1000 V	VariTrans P 27000 universal transmitter 	VariTrans P 29001 Maconic shunt resistor + shunt isolator 	VariTrans P 29001 Maconic shunt resistor + shunt isolator 	VariTrans P 29000 high-voltage isolation amplifier 
Working voltage > 1000 V	VariTrans P 43000 current transmitter 	VariTrans P 43000 current transmitter 	VariTrans P 41000 Maconic shunt resistor + shunt isolator 	VariTrans P 42000 high-voltage isolation amplifier 
Working voltage > 2200 V	VariTrans P 43100 current transmitter 	VariTrans P 43100 current transmitter 	VariTrans P 41100 Maconic shunt resistor + shunt isolator 	VariTrans P 42100 high-voltage isolation amplifier 



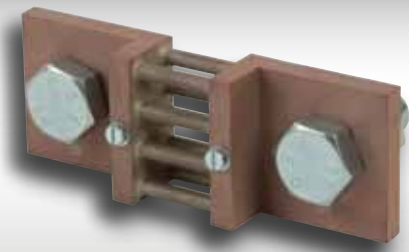
Product Line

Rated current	Rated voltage drop	Accuracy class	Order no.	Picture (example)
10 A 25 A	60 mV 60 mV	0.5 0.5	Maconic M10S Maconic M25S	
40 A 100 A 150 A	60 mV 60 mV 60 mV	0.5 0.5 0.5	Maconic M40S Maconic M100S Maconic M150S	
250 A 300 A	60 mV 60 mV	0.5 0.5	Maconic M250S Maconic M300S	
400 A 500 A 600 A 800 A	60 mV 60 mV 60 mV 60 mV	0.5 0.5 0.5 0.5	Maconic M400S Maconic M500S Maconic M600S Maconic M800S	
1000 A 1200 A	60 mV 60 mV	0.5 0.5	Maconic M1000S Maconic M1200S	
1500 A 2000 A	60 mV 60 mV	0.5 0.5	Maconic M1500S Maconic M2000S	
2500 A 3000 A	60 mV 60 mV	0.5 0.5	Maconic M2500S Maconic M3000S	
4000 A 5000 A	60 mV 60 mV	0.5 0.5	Maconic M4000S Maconic M5000S	
6000 A 8000 A	60 mV 60 mV	0.5 0.5	Maconic M6000S Maconic M8000S	

Rated current	Rated voltage drop	Accuracy class	Order no.
500 A	60 mV	0.2	Maconic M500HS
1000 A	60 mV	0.2	Maconic M1000HS
2000 A	60 mV	0.2	Maconic M2000HS
2500 A	60 mV	0.2	Maconic M2500HS
4000 A	60 mV	0.2	Maconic M4000HS

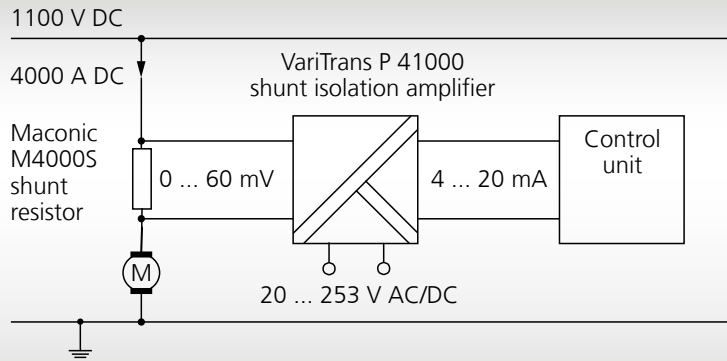
Other current up to 20kA or voltage values, e.g. 50 mV versions, are available upon request

Cap for type A shunt resistors up to 150 A, 60 mV (use with insulating base only)	ZU 0901
Insulating base for type A shunt resistors, 30 to 150 A, 60 mV (up to 25 A included in package contents of shunt resistor)	ZU 0910

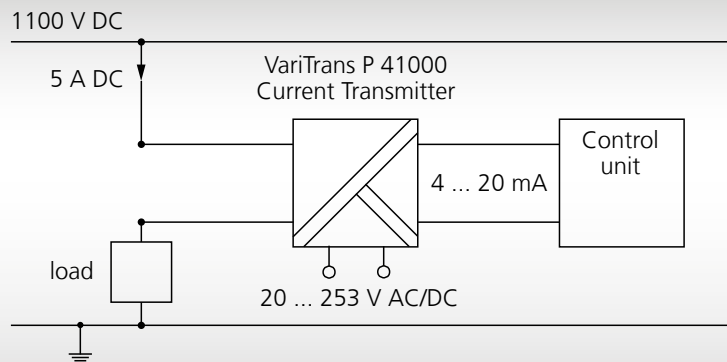


Typical Applications

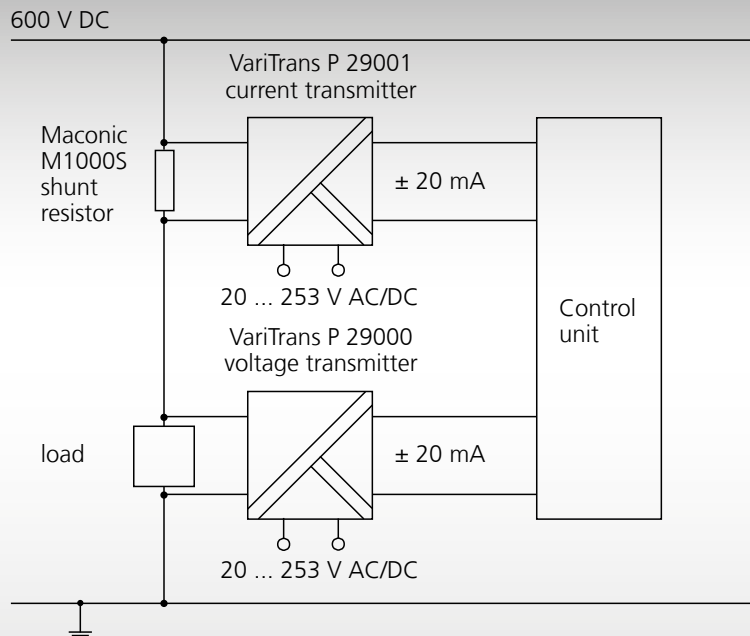
Current measurement using shunt resistor



Direct current measurement



Current measurement and voltage measurement



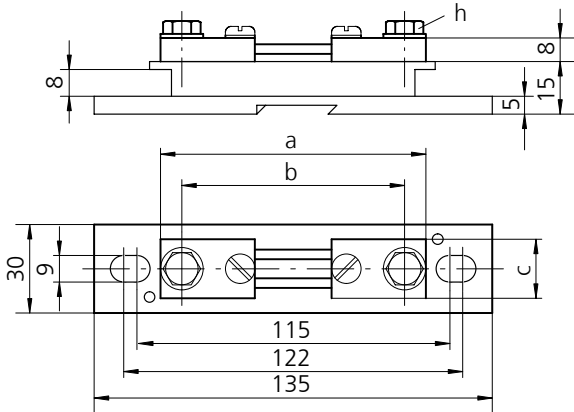
Specifications

Accuracy under rated conditions	Class 0.5 or Class 0.2		
Overload capacity	Permanent	120% full scale	
	Max 5 s	Rated < 2000 A Rated > 2000 A	500% full scale 200% full scale
Rated conditions	23 °C ± 1 K		
Ambient conditions	Climate suitability	Climatic class 3 according to VDE/VDI 3540	
	Ambient temperature	Operation	-10 ... +55 °C
		Transport and storage	-25 ... +65 °C
Relative humidity	Annual average < 75%, no condensation		
Mounting	Type A with insulating base	Up to 150 A	Snap-on mounting for 35-mm top-hat rail according to EN 60715 or wall mounting, screws max. M8
	Type B	Up to 3000 A	L profiles
	Type C	Up to 8000 A	T profiles
Material	Resistor bars	Manganin	
	Connecting pieces	Type A	Brass
		Type B	Brass/copper
		Type C	Copper
Base material	Type A	Lexan, black, self-extinguishing to UL 94 V-0	
Connections	Current	For threaded screws, see table	
	Voltage	M5 x 8	
Ingress protection	IP 00		
Dimensions	See dimension drawings and product line		
Weight	See dimension drawings and product line		

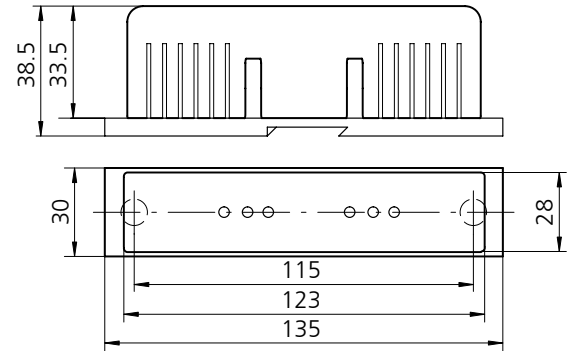


Dimension Drawings

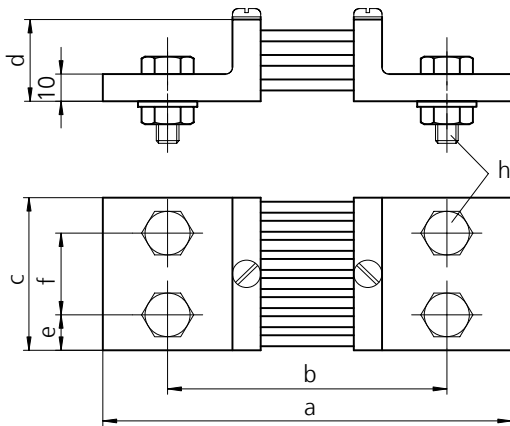
Type A
with insulating base



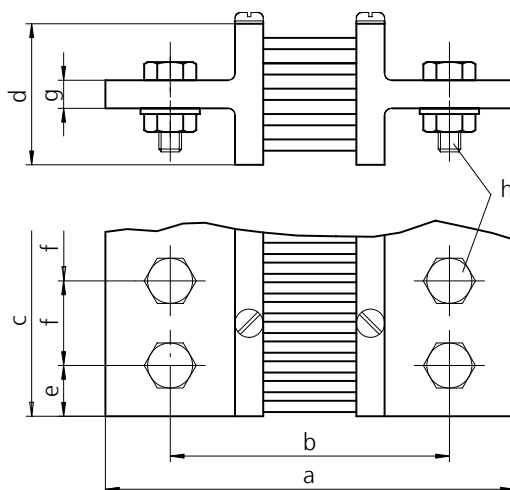
with insulating base and cap



Type B



Type C



All dimensions in mm

Rated current	Rated voltage drop	Type	Weight (kg)	Dimensions (mm)							Current connections on each side	Accuracy class	Order no.	
				a	b	c	d	e	f	g				h
10 A	60 mV	A	0.13	90	78	20					1	M5x12	0.5	Maconic M10S
25 A	60 mV	A	0.13	90	78	20					1	M5x12	0.5	Maconic M25S
40 A	60 mV	A	0.13	100	80	20					1	M8x16	0.5	Maconic M40S
100 A	60 mV	A	0.13	100	80	20					1	M8x16	0.5	Maconic M100S
150 A	60 mV	A	0.13	100	80	20					1	M8x16	0.5	Maconic M150S
250 A	60 mV	B	0.61	145	105	30	30	15			1	M12x40	0.5	Maconic M250S
300 A	60 mV	B	0.61	145	105	40	30	20			1	M16x45	0.5	Maconic M300S
400 A	60 mV	B	0.83	145	105	40	30	20			1	M16x45	0.5	Maconic M400S
500 A	60 mV	B	0.83	145	105	40	30	20			1	M16x45	0.5	Maconic M500S
600 A	60 mV	B	0.85	145	105	40	30	20			1	M16x45	0.5	Maconic M600S
800 A	60 mV	B	0.90	145	105	40	30	20			1	M16x45	0.5	Maconic M800S
1000 A	60 mV	B	1.45	165	115	60	30	30			1	M20x50	0.5	Maconic M1000S
1200 A	60 mV	B	1.45	165	115	90	30	21	48		2	M16x45	0.5	Maconic M1200S
1500 A	60 mV	B	1.96	165	115	90	30	21	48		2	M16x45	0.5	Maconic M1500S
2000 A	60 mV	B	2.30	165	115	90	30	21	48		2	M16x45	0.5	Maconic M2000S
2500 A	60 mV	B	2.90	165	115	120	30	21	48		2	M16x45	0.5	Maconic M2500S
3000 A	60 mV	B	3.00	165	115	120	30	21	48		2	M16x45	0.5	Maconic M3000S
4000 A	60 mV	C	4.25	165	115	120	60	30	60	15	2	M20x50	0.5	Maconic M4000S
5000 A	60 mV	C	4.30	165	115	120	60	30	60	15	2	M20x50	0.5	Maconic M5000S
6000 A	60 mV	C	10.5	175	125	154	130	25	52	25	3	M20x75	0.5	Maconic M6000S
8000 A	60 mV	C	12.0	175	125	154	130	25	52	25	3	M20x75	0.5	Maconic M8000S
500 A	60 mV	B		210	160	60	30	30	-	-	1	M20x50	0.2	Maconic M500HS
1000 A	60 mV	B		210	160	120	30	30	60	-	2	M20x50	0.2	Maconic M1000HS
2000 A	60 mV	C		210	160	120	60	30	60	15	2	M20x60	0.2	Maconic M2000HS
2500 A	60 mV	C		220	170	120	130	30	60	25	2	M20x60	0.2	Maconic M2500HS
4000 A	60 mV	C		220	170	154	130	25	52	25	3	M20x75	0.2	Maconic M4000HS

Other current up to 20kA or voltage values, e.g. 50 mV versions, are available upon request