

KLARI-PROBES 1000V



HV-LI - PROBE



HV-I - PROBE



HV-U - PROBE



Thermocouple type K

- Features**
- **KLARI-PROBES_{1000V}** are the matching measuring adapters for high-voltage modules of Co.Klaric.
 - With an isolation of 1 kV these PROBES can be applied for measurements in hybrid- and electric vehicles when using appropriate isolated measuring modules.
 - For current measurements the PROBES are equipped with low resistive accuracy resistors, for voltage measurements with voltage dividers. Temperature measurements are executed with thermocouples or in special case with PT100 sensors.
 - All **KLARI-PROBES** have a memory device with communication cable to the module. Therefore the configuration data (type, adjustment values, serial number etc.) are read out of the PROBE and transmitted to the module.
 - The adjustment values are considered for the measurement result calculation. This implicates a very high degree of accuracy.
 - Because the shunts only have marginal temperature drift, temperature compensation is not needed.
 - **On request we offer a factory or a DaKKs calibration.**

- Versions**
- **HV-LI-PROBES:** These PROBES are used to measure current in range of 0,25 μ A...150 A (peak current). The user has to take care of protecting the measuring circuit
 - **HV-I-PROBES:** Depending on the selected PROBE current measurements may be performed in ranges of 2,5 mA...+7.200/-3.000 A (peak current when using a 100 μ Ω -Shunt). The user has to take care of protecting the measuring circuit.
 - **HV-U-PROBES:** With these PROBES voltage measurements are available in ranges of 1,25 mV...+/- 1000 V.
 - **HV-LI/U-PROBES:** These PROBES consist of a voltage **and** a current PROBE with same potential. It allows current measuring in range of μ A...150 A (peak current) and also voltage measuring in range of mV...+/- 1000 V. The user has to take care of protecting the measuring circuit.
 - **HV-I/U-PROBES:** These PROBES consist of a voltage and a current PROBE with same potential. It allows current measuring in range of μ A...1.500 A (peak current) and also voltage measuring in range of mV...+/- 1000 V. The user has to take care of protecting the measuring circuit.
 - **HV-T-PROBES:** For temperature measurement thermocouples type K are used. With this PROBE-type the user is able to measure temperatures in range of -200...+1.200 $^{\circ}$ C on high potentials up to 1000 V.

KLARI-PROBES 1000V

HV-LI - PROBES

Measuring adapter with cable lead-out for looping-in the PROBE into the measuring circuit. The protection of the measuring circuit has to be provided by the user. The shunt is integrated in a grouted casing.

PROBE-construction:

- grouted casing with integrated shunt
- memory device, used for PROBE-identification and calibration data (placed in connector)
- cable lead-out = L1 (1 m), (heat resistant and very flexible) with loose cable ends
- data cable = L2 (1...5 m) with 8-pin Redel connector

Caution: The maximum continuous current is lower than the measuring range.

Please refer to the user manual.

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HV-LI - PROBES

Resistor [mOhm]	Measuring range [A]	Resolution/Bit* [µA]	Maximum permanent current** [A]
1000	-0,3...+0,72	0,25	0,72
500	-0,6...+1,44	0,5	1,44
100	-3...+7,2	2,5	6,5
50	-6...+14,4	5	9,5
25	-12...+28,8	10	12
10	-30...+72	25	21
5	-60...+144	50	25
2	-150...+360	125	40

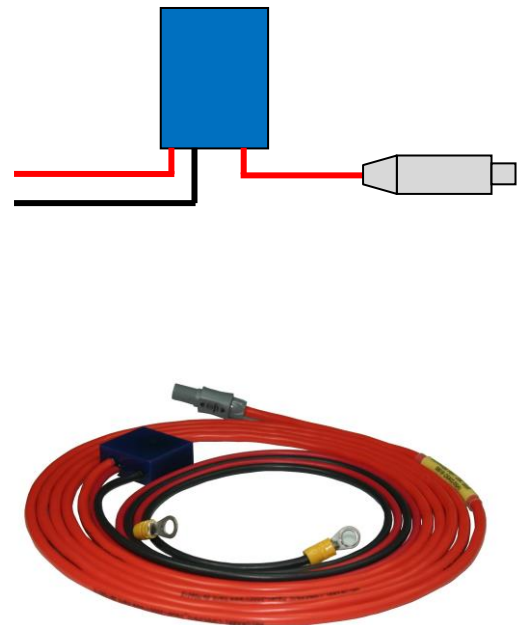
* indicated for the lowest measuring range

** at room temperature (23°C)

size (l/w/h): 50x40x16 mm

Ordering:

<name> - <resistance value> - <L1> - <L2> - <L3>
HV-LI - 1000 / ... / 2 - 1 - 1...5 - 0



KLARI-PROBES 1000V

HV-I - PROBES (without measuring circuit protection)

These PROBES are set to place the shunt directly into the measuring circuit.

The protection of the measuring circuit has to be provided by the user.

PROBE-construction:

- shunt (type BF1 or BF2) with mounting straps (temperature range -40...+130°C)
- memory device, used for PROBE-identification and calibration data (placed in connector)
- data cable = L2 (1...5 m) with 8-pin Redel connector.

Caution: The maximum continuous current is lower than the measuring range.

Please refer to the user manual.

HIGH-CURRENT - PROBES

BF-1

Resistor [mΩ]	Measuring range [A]	Resolution/Bit* [mA]	Maximum permanent current** [A]
2	-150...360	0,125	60
1	-300...+720	0,25	80
0,5	-600...+1440	0,5	120
0,2	-1500...+3600	1,25	150

size (l/w/h): 42x16x15 mm

the shunts are linked with a copper bar 20x3x200 mm

* indicated for the lowest measuring range

** at room temperature (23°C)

BF-2

Resistor [mΩ]	Measuring range [A]	Resolution/Bit* [mA]	Maximum permanent current** [A]
2	-150...360	0,125	80
1	-300...+720	0,25	120
0,5	-600...+1440	0,5	130
0,2	-1500...+3600	1,25	180
0,1	-3000...+7200	2,5	310

size (l/w/h): 68x27x15 mm

the shunts are linked with a copper bar 20x3,5x200 mm

* indicated for the lowest measuring range

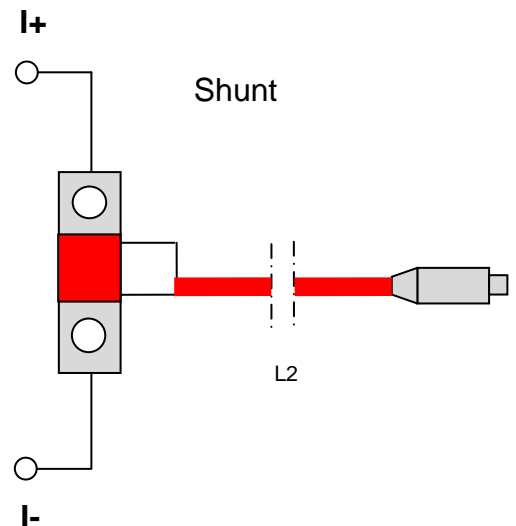
** at room temperature (23°C)

Ordering:

< name> - <resistance value> - <L1> - <L2> - <L3>

HV-BF1 - 2 / ... / 0,2 - 0 - 1...5 - 0

HV-I-BF2 - 2 / ... / 0,1 - 0 - 1...5 - 0



KLARI-PROBES 1000V

HV-U - PROBES

HV-U - PROBES possess a voltage divider. The input voltage is reduced on an allowed voltage level for the modules.

PROBE-construction:

- grouted integrated voltage divider
- memory device, used for PROBE-identification and calibration data (placed in connector)
- cable lead-out = L1 (1 / 3 m) (heat resistant) with loose cable ends
- data cable = L2 (1 m) with 8-pin Redel connector

The measuring ranges and resolutions are listed below:

VOLTAGE - PROBES

type 200 V

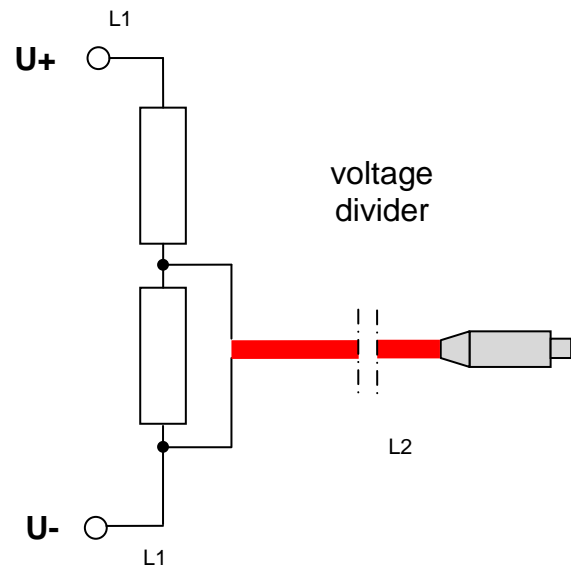
Gain	Measuring range [V DC]	Resolution/Bit [mV/Bit]
100	0...+/- 5	0,170
50	0...+/- 10	0,340
24	0...+/- 20	0,680
6	0...+/- 80	2,720
1	0...+/- 200	16,320

Ordering: <name> - <L1> - <L2> - <L3>
 HV-U-200V - 1 / 3 - 1 - 0

type 1000 V

Gain	Measuring range [V DC]	Resolution/Bit [mV/Bit]
100	0...+/- 37,5	1,25
50	0...+/- 75	2,5
24	0...+/- 150	5
6	0...+/- 600	20
1	0...+/- 1000	120

Ordering: <name> - <L1> - <L2> - <L3>
 HV-U-1000V - 1 / 3 - 1 - 0



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KLARI-PROBES 1000V

COMBI-PROBES - HV-LI-U – PROBES

HV-LI-U – PROBES consist of a voltage- **and** a current-PROBE.

Current measurement:

- The measuring shunt is placed in a grouted casing with cable lead-out for looping-in the PROBE into the measuring circuit.

- The protection of the measuring circuit has to be provided by the user.

Voltage measurement:

- The voltage is measured via a voltage divider.

- The input voltage is reduced to an allowed voltage level for the modules.

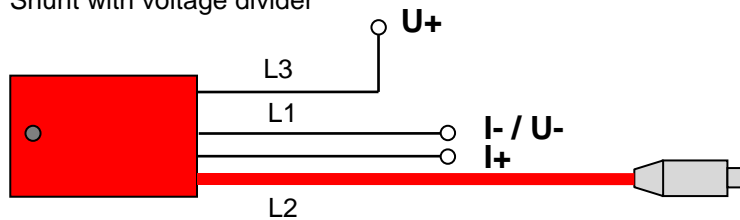
PROBE-construction:

- grouted casing with integrated shunt (type PBV) and voltage divider.
- memory device, used for PROBE-identification and calibration data (placed in connector)
- I-PROBE, cable lead-out = L1 (1 m), (heat resistant and high flexible) with loose cable ends
- U-PROBE, connection-cable = L3 (0,5 m), (heat resistant and high flexible) with loose cable ends
- data cable = L2 (1 / 3 / 5 m) with 8-pin Redel connector

Caution: The maximum continuous current is lower than the measuring range.

Please refer to the user manual.

Shunt with voltage divider



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VOLTAGE-COMBI-PROBES

CURRENT-PROBES type PBV

Resistor [mΩ]	Measuring range [A]	Resolution/Bit* [mA]	Maximum permanent current** [A]
1000	-0,3...+0,72	0,25	0,72
500	-0,6...+1,44	0,5	1,44
100	-3...+7,2	2,5	6,5
50	-6...+14,4	5	9,5
25	-12...+28,8	10	12
10	-30...+72	25	21
5	-60...+144	50	25
2	-150...+360	125	40

VOLTAGE-PROBES type 1000 V

Gain	Measuring range [V DC]	Resolution/Bit [mV/Bit]
100	0...+/- 37,5	1,25
50	0...+/- 75	2,5
24	0...+/- 150	5
6	0...+/- 600	20
1	0...+/- 1000	120

* indicated for the lowest measuring range
** at room temperature (23°C)

size (l/w/h):50x40x16 mm

Ordering:

<name> - <resistance value> - <L1> - <L2> - <L3>
HV-LI/U - 1000 / ... / 2 - 1 - 1 / 3 / 5 - 0,5



KLARI-PROBES 1000V

COMBI - PROBES - HV-I/U-BF1 - PROBES

HV-I/U – PROBES consist of a voltage- **and** a current-PROBE.

Current measurement:

- The measuring shunt is placed via mounting straps directly into the measuring circuit
- The protection of the measuring circuit has to be provided by the user

Voltage measurement:

- The voltage is measured via a voltage divider
- The input voltage is reduced to an allowed voltage level for the modules

PROBE-construction:

- shunt (type BF1) with mounting straps (temperature range -40...+130°C) and voltage divider
- memory device, used for PROBE-identification and calibration data (placed in connector)
- U-connection-cable = L3 (0,5 m) (heat resistant and high flexible) with loose cable ends
- data cable = L2 (1 / 3 / 5 m) with 8-pin Redel connector

Caution: The maximum continuous current is lower than the measuring range.
Please refer to the user manual.

VOLTAGE-COMBI-PROBES

CURRENT-PROBES type BF1

Resistor [mΩ]	Measuring range [A]	Resolution/Bit* [mA]	Maximum permanent current** [A]
2	-150...360	0,125	60
1	-300...+720	0,25	80
0,5	-600...+1440	0,5	120
0,2	-1500...+3600	1,25	150

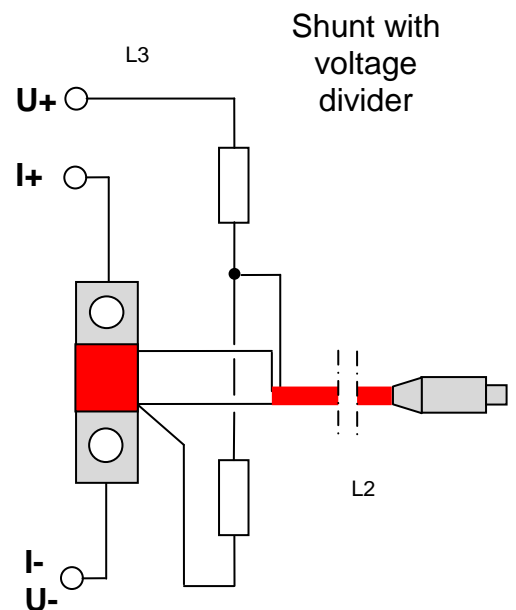
* indicated for the lowest measuring range

VOLTAGE-PROBES type 1000 V

Gain	Measuring range [V DC]	Resolution/Bit [mV/Bit]
100	0...+/- 37,5	1,25
50	0...+/- 75	2,5
24	0...+/- 150	5
6	0...+/- 600	20
1	0...+/- 1000	120

Ordering:

<name> - <resistance value> - <L1> - <L2> - <L3>
 HV-I/U-BF1 - 2 / ... / 0,2 - 0 - 1 / 3 / 5 - 0,5



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KLARI-PROBES 1000V

COMBI - PROBES - HV-I/U-BF2 - PROBES

HV-I/U – PROBES consist of a voltage- and a current-PROBE.

- Current measurement:
- The measuring shunt is placed via mounting straps directly into the measuring circuit
 - The protection of the measuring circuit has to be provided by the user
- Voltage measurement:
- The voltage is measured via a voltage divider
 - The input voltage is reduced to an allowed voltage level for the modules

PROBE-construction:

- shunt (type BF2) with mounting straps (temperature range -40...+130°C) and voltage divider
- memory device, used for PROBE-identification and calibration data (placed in connector)
- U-connection-cable = L3 (0,5 m) (heat resistant and high flexible) with loose cable ends
- data cable = L2 (1 / 3 / 5 m) with 8-pin Redel connector

Caution: The maximum continuous current is lower than the measuring range.
Please refer to the user manual.

VOLTAGE-COMBI-PROBES

CURRENT-PROBES type BF2

Resistor [mΩ]	Measuring range [A]	Resolution/Bit* [mA]	Maximum permanent current** [A]
2	-150...360	0,125	80
1	-300...+720	0,25	120
0,5	-600...+1440	0,5	130
0,2	-1500...+3600	1,25	180
0,1	-3000...+7200	2,5	310

the shunts are linked with a copper bar 20x3,5x200 mm

* indicated for the lowest measuring range

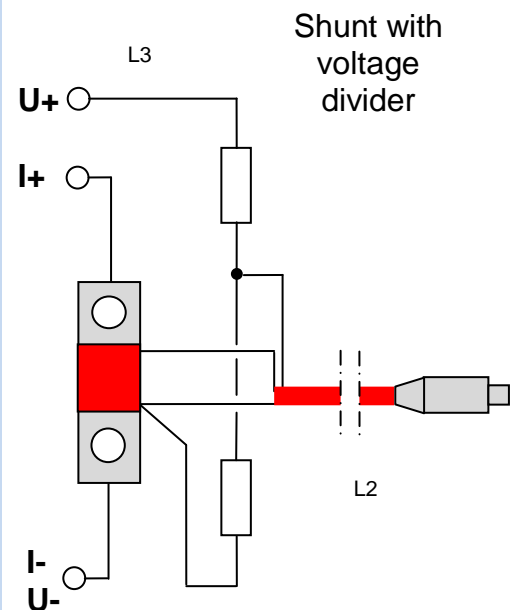
** at room temperature (23°C)

VOLTAGE-PROBES type 1000 V

Gain	Measuring range [V DC]	Resolution/Bit [mV/Bit]
100	0...+/- 37,5	1,25
50	0...+/- 75	2,5
24	0...+/- 150	5
6	0...+/- 600	20
1	0...+/- 1000	120

Ordering:

<name> - <resistance value> - <L1> - <L2> - <L3>
 HV-I/U-BF2 - 2 / ... / 0,1 - 0 - 1 / 3 / 5 - 0,5



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TEMPERATURE - PROBES - HV-T - PROBES

As standard we use thermocouples type K. The measuring range includes temperatures in the range of -200...+1200 °C.

PROBE-construction:

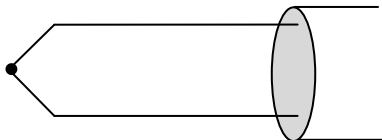
- temperature compensation placed in connector
- memory device, used for PROBE-identification and calibration data (placed in connector)
- thermo-cable, isolation $\leq 2000V$ DC with 8-pin Redel-connector
- cable lengths 1 m and 3 m
- also as 4 -pair type (4 x thermocouple) available

PT100-sensors can be used in special cases. The temperature range is between -40...+250°C.

PROBE-construction:

- memory device, used for PROBE-identification and calibration data (placed in connector)
- cable lengths 1 m and 3 m
- PT100-sensors have to be isolated by the user
- acid-resistant

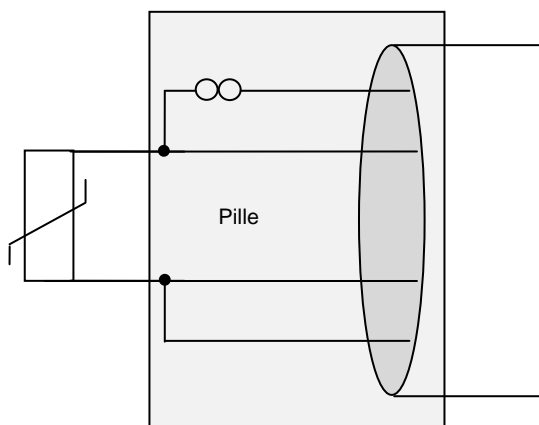
Thermocouple



4 -pair type

Ordering: <name> - <L1> - <L2> - <L3>
 HV-T_K / - 1/3 - 0 - 0
 HV-4T_K

PT100



Ordering: <name> - <L1> - <L2> - <L3>
 HV-T_PT100 - 1/3 - 0 - 0

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KLARI-PROBES 1000V

SPECIAL MEASUREMENT-ADAPTERS FOR CURRENT AND VOLTAGE

- Measurement-adapters with original automobile plug connectors. They are placed directly into the measuring circuit.
- Application of battery-interruptor for current measurement via "Service Plug".

We are pleased to quote individual solutions.



Ordering: <Name> - <L1> - <L2> - <L3>
HV-SPECIAL - - -

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