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Series WKO-2C-B

Double core technology closed-loop current transformers for railway engineering



Unique Selling Point

- Fullfils the required railway engineering safety standards: EN 50178, EN 50155:2007 and IEC 61373:2010
- Shock- and vibration tested according to IEC 61373:2010
- High current measurement accuracy of 0.3%
- Modular mounting plates providing universal mounting options
- Lower sensitivity to external magnetic fields
- Bidirectional and isolated current measurement up to ±750A current output
- Modular mounting plates
- REO double core technology
- All materials manufactured using UL listed materials

Description

The current transducer WKO-2C-B with hall effect elements and double-core technology has an extended frequency response up to 150 kHz and an accurate phase response. The WKO-2C-B guarantees an increased current measurement accuracy better than 0.3% in the whole frequency range: DC to 150 kHz.

A completely redesigned electronics ensures that the new C/L current transducer has better drift compensation and an extended temperature range from -40°C to 85°C.

Modular design

The current transformer has a modular design which allows a variety of mounting options. The cost-effective basic model consists of a housing with screw terminals, bushing for cable and holes for fixing. Optionally, the transducers are available with mounting kit for busbars, molex connectors and feets for horizontal or vertical mounting.

According to:

- EN 50178:1997
- UL 94-V0
- EN 50178
- EN 50155:2007
- IEC 61373:2010

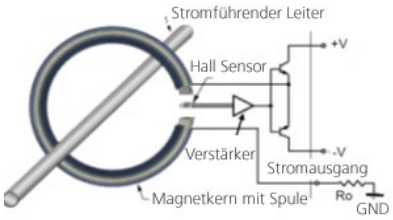
Typical applications

- Railway engineering

Technical Data

- Primary rated current : 500 - 2000 A
- Measurement range : 0...3000 A
- Frequency range : 120000 Hz

Mode of operation



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Technical data

Type	Primary RMS Nominal-current IPN [A]	Measurement range IP [A]	Feed-in UC [V]	Measurement accuracy XG@Ipn [-20...70°C] von IPN [%]	ratio KN	Secondary RMS Nominalcurrent m ISN [mA]	Secondary-winding Resistor Rs@85°C [Ω]	No-load current [mA]
WKO-2C-300	300	0 ... ±2000	±11,4...25,2	< ±0,3	2000	150	13	26+IS
WKO-2C-500	500	0 ... ±1000	±11,4...25,2	< ±0,3	5000	100	76	26+IS
WKO-2C-1000	1000	0 ... ±2700	±14,25...25,2	< ±0,3	5000	200	42	26+IS
WKO-2C-2000	2000	0 ... ±4000	±14,25...25,2	< ±0,3	5000	400	26	26+IS

Accuracy and dynamic data

Type	Linearity-mistake e [%]	Offset-mistake@25° IO [mA]	Offset Drift -25°C ...+70°C IOT [mA]	Reaction time tra[µs]	Response time 10%-90% ta[µs]	dI/dt [A/µs]	Band with -1dB [kHz]
WKO-2C-300	< ±0,1	< 0,5	< 25	200	400	400	120/150
WKO-2C-500	< ±0,1	< 0,5	< 25	200	400	400	120/150
WKO-2C-1000	< ±0,1	< 0,5	< 25	200	400	400	120/150
WKO-2C-2000	< ±0,1	< 0,5	< 25	200	1000	1000	150

Isolation data

Type	Creepage distance dCp [mm]	Clearance dCi [mm]	Creep resistance [CTI]	AC-Isolation test 50/60Hz 1min Ud [kV]	Impulse voltage test 1,2/50µs Ui[kV]	Weight [kg]
WKO-2C-300	14	13	600	6	12,5	0,340
WKO-2C-500	14	13	600	6	12,5	0,260
WKO-2C-1000	20	18	600	6	12,5	0,700
WKO-2C-2000	35	30	600	6	12,5	1,600

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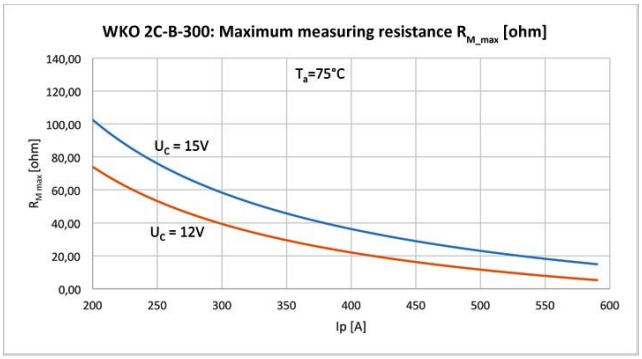
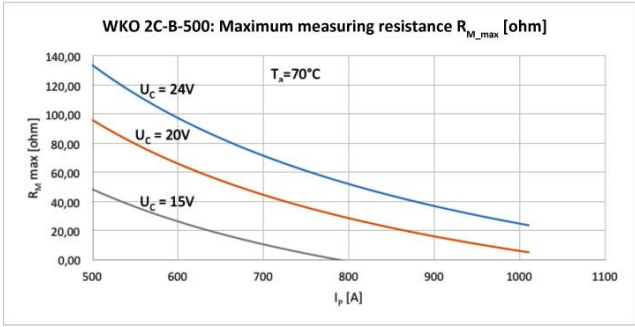
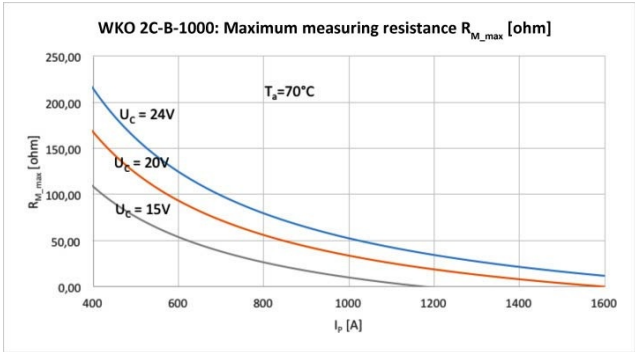
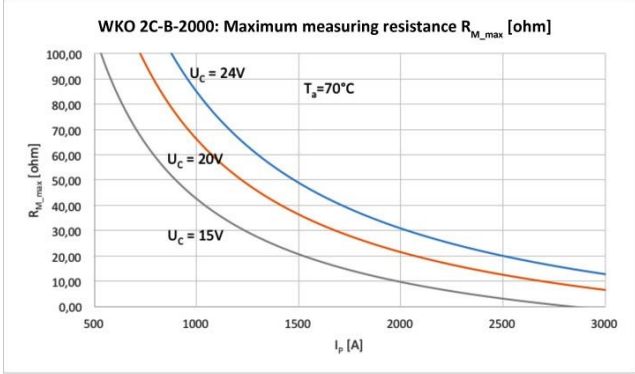
Maximum measuring resistance









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Series WKO-2C-B

Double core technology closed-loop current transformers for railway engineering



WKO-2C-B
Basic model with Faston plugs and bolts and front cover



WKO-2C-B-F
Basic model with Faston plugs, front cover and mounting feet frontal



WKO-2C-B-L
Basic model with Faston plugs, front cover and mounting feet lateral



WKO-2C-B-M-F
Basic model with Faston plugs, front cover and mounting kit for busbar and mounting feet frontal

Type - Fig.1	WKO-2C-B Basic model with Faston plugs and bolts / Article No.
WKO-2C-B-500	30642 0 2 501 1 00 00
WKO-2C-B-1000	30642 0 2 102 1 00 00
WKO-2C-B-2000	30642 0 2 202 1 00 00

Type - Fig.2	WKO-2C-B-F Basic model with Faston plugs, front cover and mounting feet frontal / Article No.
WKO-2C-B-F-500	30642 0 2 501 1 01 00
WKO-2C-B-F-1000	30642 0 2 102 1 01 00
WKO-2C-B-F-2000	30642 0 2 202 1 01 00

Type - Fig.3	WKO-2C-B-L Basic model with Faston plugs, front cover and mounting feet lateral / Article No.
WKO-2C-B-L -500	30642 0 2 501 1 04 00
WKO-2C-B-L -1000	30642 0 2 102 1 04 00
WKO-2C-B-L -2000	30642 0 2 202 1 04 00

Type - Fig. 4	WKO-2C-B-M-F Basic model with Faston plugs and bolts, mounting kit for busbar and mounting feet frontal / Article No.
WKO-2C-B-M-F-500	30642 0 2 501 1 11 00
WKO-2C-B-M-F-1000	30642 0 2 102 1 11 00
WKO-2C-B-M-F-2000	30642 0 2 202 1 11 00

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Series WKO-2C-B

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WKO-2C-B-M-FR
Basic model with Faston plugs, front cover and mounting kit for busbar and mounting feet frontal, fitted on the right



WKO-2C-B-M-L
Basic model with Faston plugs, front cover and mounting kit for busbar and mounting feet lateral



WKO-2C-B-M-F-C
Basic model with Faston plugs, front cover and mounting kit for busbar and mounting feet frontal and busbar

Type - Fig.5	WKO-2C-B-M-FR Basic model with Faston plugs, front cover and mounting kit for busbar and mounting feet frontal, fitted on the right / Article No.
WKO-2C-B-M-FR-500	30642 0 2 501 1 07 00
WKO-2C-B-M-FR-1000	30642 0 2 102 1 07 00
WKO-2C-B-M-FR-2000	30642 0 2 202 1 07 00

Type - Fig. 6	WKO-2C-B-M-L Basic model with Faston plugs, front cover and mounting kit for busbar and mounting feet lateral / Article No.
WKO-2C-B-M-L-500	30642 0 2 501 1 09 00
WKO-2C-B-M-L-1000	30642 0 2 102 1 09 00
WKO-2C-B-M-L-2000	30642 0 2 202 1 09 00

Type - Fig. 7	WKO-2C-B-M-F-C Basic model with Faston plugs, front cover and mounting kit for busbar and mounting feet frontal and busbar / Article No.
WKO-2C-B-M-F-C-500	30642 0 2 501 1 16 00
WKO-2C-B-M-F-C-1000	30642 0 2 102 1 16 00
WKO-2C-B-M-F-C-2000	30642 0 2 202 1 16 00

Type - not illustrated	WKO-2C-B-M-L-C Basic model with Faston plugs and bolts, mounting kit for busbar, mounting feet lateral and busbar / Article No.
WKO-2C-B-M-L-C-500	30642 0 2 501 1 19 00
WKO-2C-B-M-L-C-1000	30642 0 2 102 1 19 00
WKO-2C-B-M-L-C-2000	30642 0 2 202 1 19 00

Type - not illustrated	WKO-2C-B-M-FG Basic model with Faston plugs and bolts, mounting kit for busbar and mounting feet frontal fitted on the left / Article No.
WKO-2C-B-M-FG-500	30642 0 2 501 1 08 00
WKO-2C-B-M-FG-1000	30642 0 2 102 1 08 00
WKO-2C-B-M-FG-2000	30642 0 2 202 1 08 00

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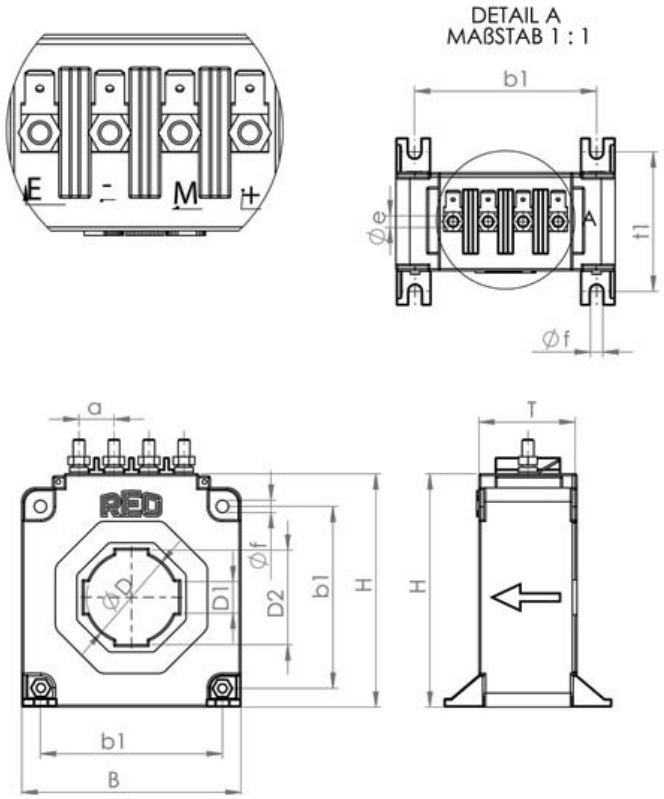
Dimension drawing



Dimensions

Type	B [mm]	H [mm]	T [mm]	b1 [mm]	D [mm]	D1xD2 [mm]	f [mm]	e [mm]
WKO-2C-B-500	70	76	38	57	30,2	30,5x10,5	4,3	M5
WKO-2C-B-1000	94	100	42	78	38,5	40,5x13,5	5,3	M5
WKO-2C-B-2000	135	141	52	102	57,5	60,5x20,5	6,5	M5

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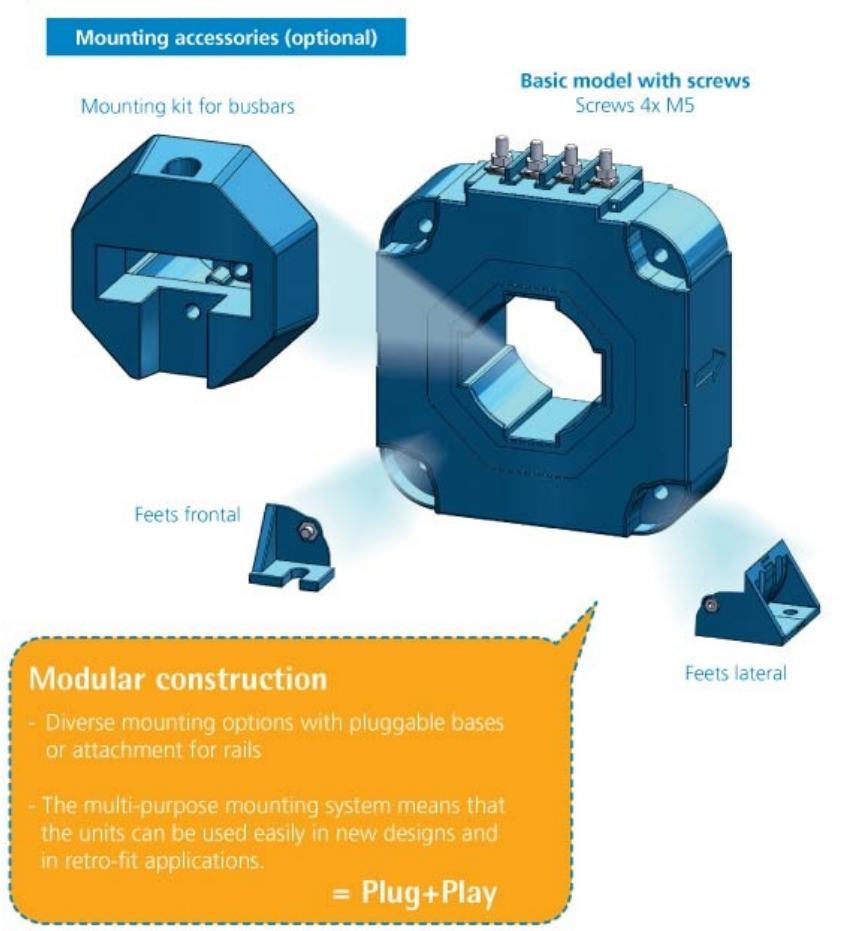
Accessories



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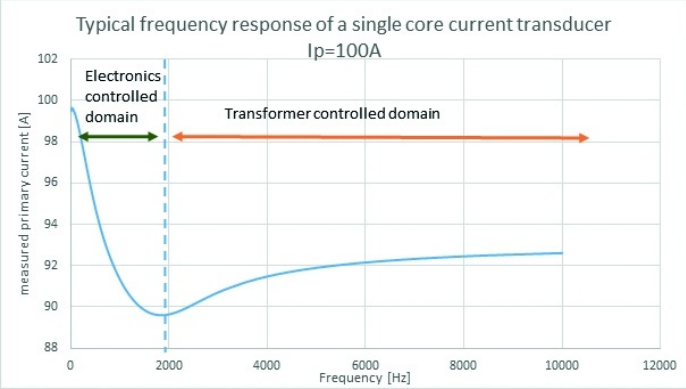
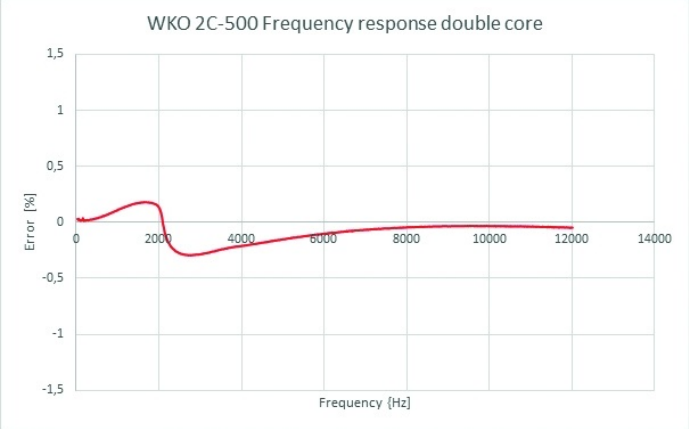
REO - Double Core Technology

In most applications, C/L current transducers deal with measurements in the range from DC to mains frequencies 150kHz. For this purpose standard single core technology hall effect sensor mounted in the air gap is a good solution.

In this design, the hall effect sensor located in the air gap, is used with a bipolar power stage to create an equal and opposite magnetic field in the core. This means that the current output signal is directly proportional to the measureable element on the conductor.

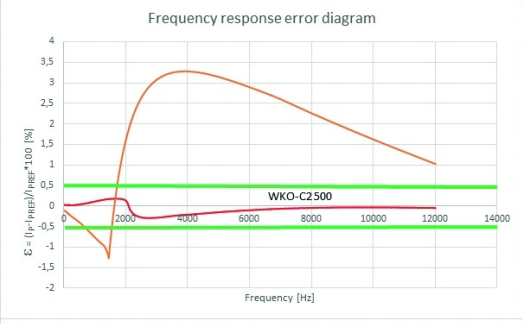
This principle works well for lower frequencies, but as frequencies increase the core inductivity becomes a larger factor and the compensating electronics are not able to function adequately. At this point, the unit acts like a conventional current transformer with poor linearity. This effect is demonstrated in Figure "Electronic and transformer phases are out of tune". This effect and subsequent lack of measurement accuracy is where the REO WKO 2C with double core technology is so important.





REO´s double core frequency response in Figure 4 shows the smooth path between electric and transformer domains.

We have tested other current transducer products and we can safely say that only a few of them have acceptable smooth frequency transition performance as shown in Figure "Comparison WKO-2C 500 and competitors products" below.



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