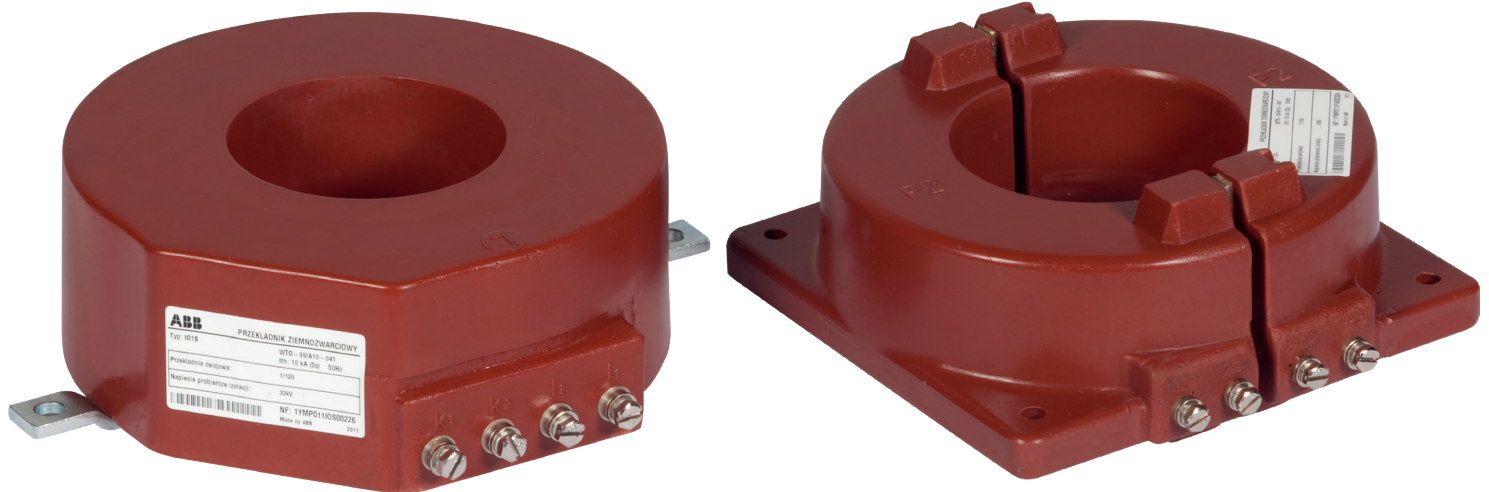


MEDIUM VOLTAGE PRODUCT

IO1s, IFW

Cable current transformers



Technical specification

Type	IO1s	IFW
Ratio (typical)	120/1	120/1
	100/1	100/1
Number of secondary winding (typical)	120 or 100	120 or 100
Test winding	5 or 10 turns	5 or 10 turns
Thermal short-circuit strength 5 s	10 kA	10 kA
Test voltage of the main insulation 50 Hz	33 kV	33 kV
Rated power-frequency withstand voltage at 50 Hz	2 kV	3 kV
Rated frequency	50 Hz	50 Hz
Weight	8.9 kg	9 kg

* Upon agreement with the manufacturer, on customer request, the transformer may be made with a different rated transmission or load resistance at particular earth fault primary current setting.

Description

Earth fault transformers, three-phase, with resin insulation type IO1s and IFW (split core type). They are mainly used for residual current metering together with earth-fault protection relay. Thanks to its construction the transformer can be installed without disconnecting the cable (IFW).

Range of rated earth fault primary currents:
0.1÷150 A.

Properties

- response to zero current (earth fault current) from very low values approx. 0.1 A
- compatible with earth fault protection relays of any type
- the mounting dimensions of the IFW transformer enable alternating with the earth fault transformer type IO1s
- a transformer with split core enables the installation on already installed, as well as already operated electrical energy cables with easy installation and removal

- equipped with special test winding for checking proper functionality of the set: transformer + protection

Operating conditions

An earth fault transformer is designed for operation in indoor equipment, under moderate climate conditions. Minimum transport and storage temperature is -30°C (243 K).

Design and operating principle

An earth fault transformer consists of a toroid magnetic core with two secondary windings. The protection winding is connected to terminals k1 – l1 (1S1-1S2) and designed to supply an earth fault protection relay, while the second winding, connected to terminals k2 – l2 (2S1-2S2), is a test winding, used to verify the transformer + protection assembly without the necessity of using current input on the primary side of the earth fault transformer (Note: during normal operation of the transformer the secondary winding k2 – l2 (2S1-2S2) should remain open).

Compliance with standards

WTO-99/A10-041

Marking

IFW variants:

IFW-120; IFW-120s; IFW-100; IFW-100s; IFW-100e; IFW-100es

s – with metal sheet

e – short variant

IO1s variants:

150, 120, 100, 90, 75, 60 or 50 – number of secondary winding coils

For an earth fault transformer IO1s and IFW in secondary winding k1 – l1 (1S1-1S2), loaded with the resistance of $R = 3.5 \Omega$, the secondary current value I_{sn} depending on the primary current I_{pn} (earth fault current) and corresponds to the values in following table:

I_{pn} [A]	1.0	3.0	5.0	8.0
I_{sn} [mA] for 150/1	5 ÷ 6	15 ÷ 18	26 ÷ 32	42 ÷ 50
I_{sn} [mA] for 120/1	6.1 ÷ 8	22 ÷ 26	37 ÷ 43	59 ÷ 68
I_{sn} [mA] for 100/1	6.1 ÷ 9	26 ÷ 30	44 ÷ 51	72 ÷ 82
I_{sn} [mA] for 75/1	9.3 ÷ 12	34.7 ÷ 40	58.7 ÷ 68	96 ÷ 109
I_{sn} [mA] for 60/1	11.7 ÷ 15	43.3 ÷ 50	73.3 ÷ 85	120 ÷ 136.7
I_{sn} [mA] for 50/1	14 ÷ 18	52 ÷ 60	88 ÷ 102	144 ÷ 164

For earth fault transformers type IFW value of secondary voltage U_{sn} depending on the primary current I_{pn} at the winding load with the resistance of $R_{obc} = 0.05 \Omega$ should meet the values in the next table:

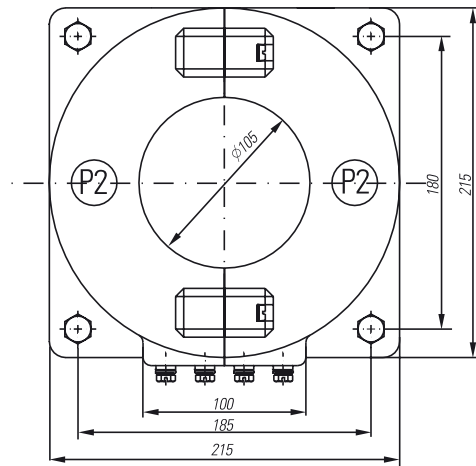
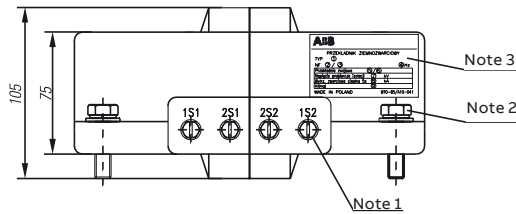
I_{pn} [A]	50	75	100	120
U_{sn} [V] for IFW 120e	0.019 ÷ 0.023	0.029 ÷ 0.033	0.040 ÷ 0.044	0.047 ÷ 0.054
U_{sn} [V] for IFW 100e	0.023 ÷ 0.026	0.036 ÷ 0.040	0.047 ÷ 0.043	0.057 ÷ 0.063
U_{sn} [V] for IFW 90e	0.025 ÷ 0.029	0.040 ÷ 0.045	0.052 ÷ 0.059	0.063 ÷ 0.070
U_{sn} [V] for IFW 75e	0.031 ÷ 0.035	0.048 ÷ 0.053	0.063 ÷ 0.071	0.076 ÷ 0.084
U_{sn} [V] for IFW 50e	0.038 ÷ 0.043	0.060 ÷ 0.067	0.078 ÷ 0.088	0.095 ÷ 0.105

The value of electromotive force E in testing winding k2 – l2 (2S1-2S2) at the secondary winding k1 – l1 (1S1-1S2) load with the resistance of 3.5Ω and primary current of $I_{pn}=3$ A, should be: 3.2 mV ÷ 4.0 mV. Transformers marked with 120 and 120s have 5 turns of test winding, while other transformers have 10 turns of test winding.

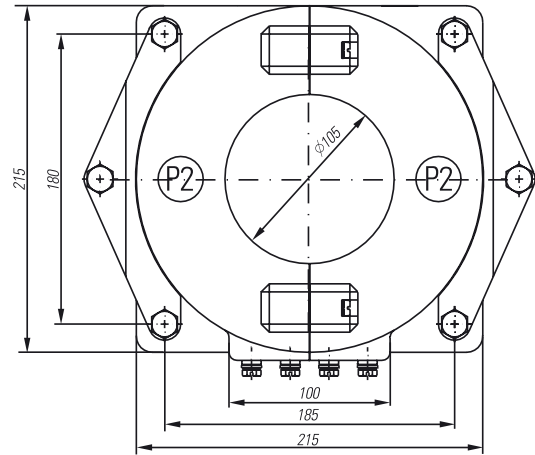
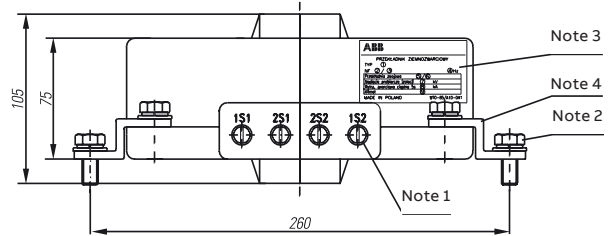
Dimensional Drawings

Note: Unless explicitly stated, all dimensions and tolerances are valid with generally defined tolerance 0,6 %. Tolerance applies to the all geometric characteristics including form variation of the products. All dimensional references representing a diameter or radius of a circles are defined as the minimal value of a real dimension.

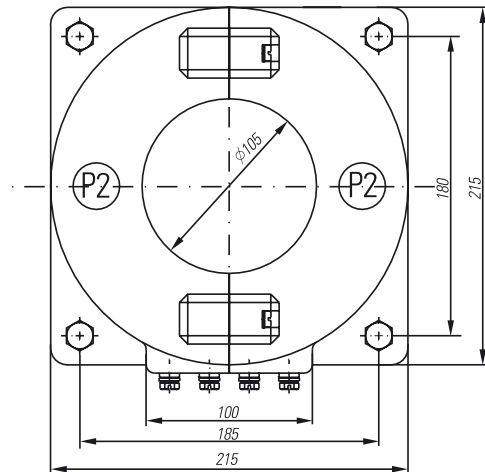
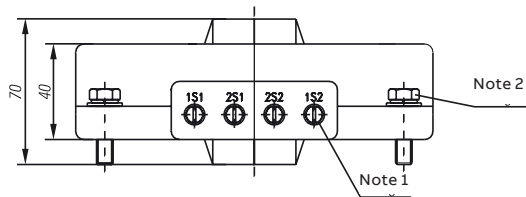
IFW 120 and IFW 100



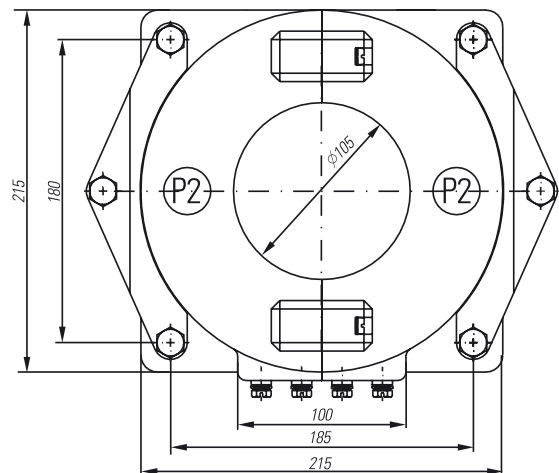
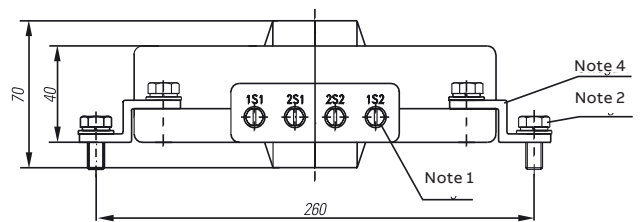
IFW 120s and IFW 100s

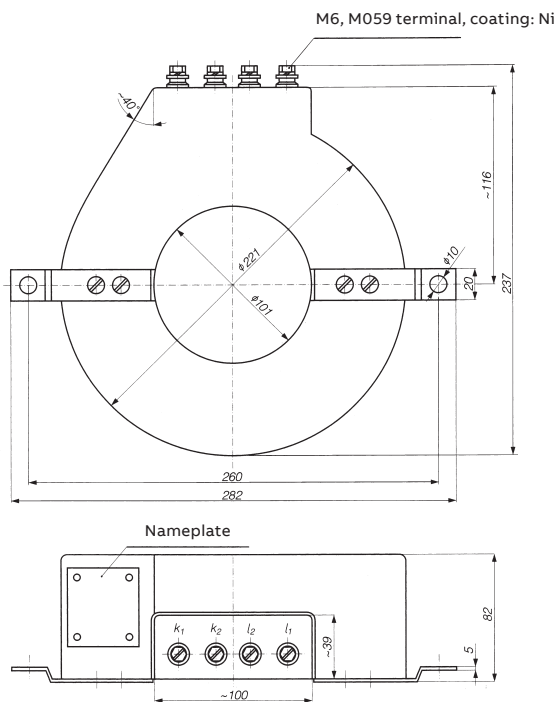


IFW 100e



IFW 100es



IO1s


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