

Current transformers ELK-CT0

Instructions for installation, use and maintenance

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Instructions for installation, use and maintenance for current instrument transformers

These installation, use and maintenance instructions apply for current instrument transformers intended for indoor operations.

The instructions refer to current instrument transformers of the following types:

ELK-CT0 145 LG	up to 145 kV, 40 kA/3s and 3150 A
ELK-CT0 145 F	up to 145 kV, 40 kA/3s and 3150 A
ELK-CT0 170 L	up to 145 kV, 63 kA/3s and 4000 A
	up to 170 kV, 63 kA/3s and 3150 A
ELK-CT0 735 FG	up to 170 kV, 63 kA/3s and 3150 A
ELK-CT0 170 F/735 F	up to 170 kV, 63 kA/3s and 4000 A
ELK-CT0 520 LK	up to 145 kV, 40 kA/3s and 2500 A
ELK-CT0 520 LG	up to 145 kV, 40 kA/3s and 3150 A
ELK-CT0 735 L	up to 145 kV, 63 kA/3s and 4000 A
	up to 170 kV, 63 kA/3s and 3150 A
ELK-CT0 520 F	up to 145 kV, 40 kA/3s and 2500 A

1. Service conditions

Indoor transformers

The transformers are installed in compartment with SF₆ insulation gas. Before the installation transformer has to be kept in dry and indoor conditions where the air is not significantly polluted by dust, smoke, corrosive gases, vapors or salts. The transformers are designed for standard ambient temperatures between -30°C and +40°C and altitudes below 1000 m above sea level. Different ambient temperatures can also be agreed upon with the customer.

2. Technical details

Technical details and specifications of each of the transformers are shown on a rating plate. It is not allowed to operate the transformer at values exceeding the name plate data.

Dimensional drawings of transformers ELK-CT0 are shown in Appendix 2.

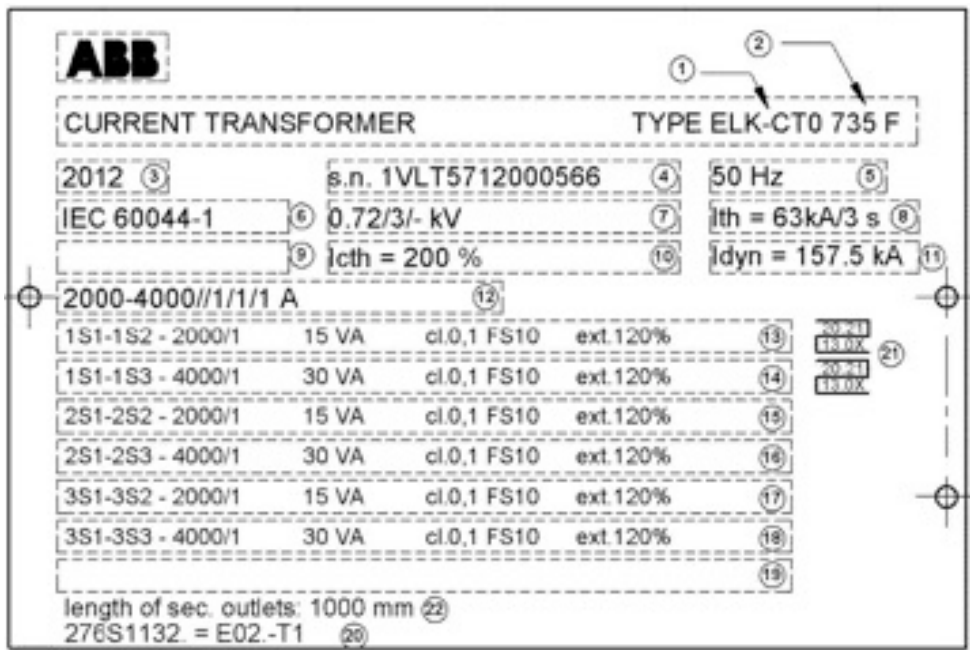


Fig. 1. Example of current transformer rating plate

Where:

- 1) type code of transformer
- 2) configuration
- 3) year of manufacture
- 4) serial number
- 5) operating frequency
- 6) corresponding standard (standards)
- 7) insulation levels
- 8) rated short-time thermal current (duration)
- 9) additional standard
- 10) rated continuous thermal current
- 11) rated dynamic current

- 12) ratio
- 13) parameters of 1st core (terminal marking, transformer ratio, rated output (burden), accuracy class, extension)
- 14) parameters of 1st core
- 15) parameters of 2nd core
- 16) parameters of 2nd core
- 17) parameters of 3rd core
- 18) parameters of 3rd core
- 19) additional specification if required
- 20) order number
- 21) PTB marking (if required)
- 22) length of sec. outlets (if required)

3. Instructions for installation

General informations

Instrument transformer is electrical equipment and the electrical installation of the instrument transformer can be done by skilled personnel only. The level of experience, age and eligibility criteria for persons working with, on or near electric installations is governed by national legislation. If no asuch eligibility legislation is available the corresponding requirements can be found in EN 50110-1 standard.

Safety instructions

1. Always consider the transformer as a part of electric circuit which it is connected to. Don't touch incoming connectors and terminals, or any other parts of the transformer, except you know for sure these are earthed.
2. Ground always the metallic base of the instrument transformer.
3. Always connect one terminal of each secondary winding of the transformer to the earth. When the secondary of transformer is interconnected, there should be only one grounded point to prevent accidental paralleling with system grounding wire.
4. Always short-circuit the secondary of the current transformer that is not currently in use, to prevent secondary voltages, which may be hazardous to personnel or damaging to the transformer's secondary. The secondary like this must be additionally grounded.

Mounting

Transformers ELK-CT0 are designed as low-voltage current transformers 0.72/3kV, without built in primary conductor. Primary conductor is not included in supply.

Transformers ELK-CT0 are designed for mounting in gas-insulated switchgears type ELK-04. Depending on the protection concept they can be arranged in front or behind of the circuit breaker's interrupting unit. The primary sided insulation is provided by SF₆-gas. Up to a rated nominal current of 3 150 A current transformers are usually integrated into the flanges of the circuit breaker enclosure. Note, in case of a rated nominal

current of 4 000 A a separate current transformer is required. All current transformers are casted on a support which is required to fix the current transformer in the enclosure. By that, the distance to the high voltage loaded conductors is guaranteed even in the case of a short circuit (and consequently high magnetic forces). The terminals of the secondary windings are interfaced to the substation via a terminal box consisting of a multiple bushing disk and terminal blocks. Before installation of transformer into enclosure all surfaces have to be cleaned from dust, grease and other impurities, see 5. maintenance instructions.

Connection of transformer primary side

The ELK-CT0 transformers don't have their own primary conductor. If ELK-CT0 transformers will be used in other applications than ABB ELK-04 Gas-Insulated Switchgear please contact us for support.

Connection of transformer secondary side

The transformers ELK-CT0 contains outlet cable with defined length for each type. Outlet cables are ended with cable lugs M6. If not specified otherwise in the order, the cable cross-section may not exceed 6 mm². The interface of the current transformer to the terminal box is handled with stranded wire connected to gas-to-air bushings with 60 pins (M6x12/15) to the outer environment. Depending on the number of wires either one or two gas-to-air bushings are available. The ends of the windings of all cores are correspondingly identified. This identification may be changed by customer after agreement with manufacturer.

Outlets designation

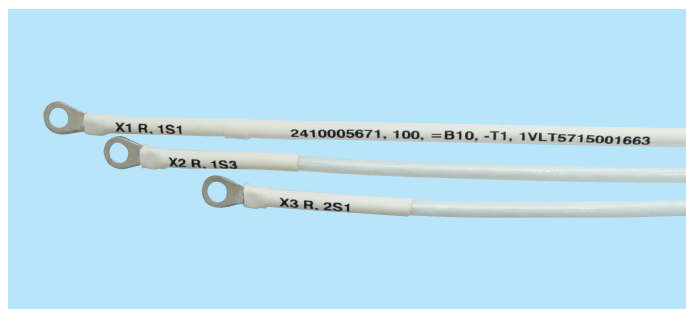


Fig. 1. Example of outlets designation

	Text example	Remark
Project number	2410005671	1 x / Phase on the first
Position	100	outlet wire only (1S1)
Bay	B10	2410005671, 100, 10,
Transformer designation	T1	T1, 1VLT5715001663
Serial number	1VLT5715001663	
Pin designation	X1	each outlet wire X1R.,
Phase designation	R	1S1
Standard designation	1S1	

The parameter about the project number / position / bay and transformer designation according to order documents. The parameter about the pin designation / phase of designation and standard designation according to switching documents (wiring diagram).

4. Instructions for use

Current instrument transformers are used:

- to convert currents in the primary circuit to an appropriate level for secondary circuit equipment (relays and meters)
- to insulate primary and secondary circuit from each other to protect the secondary equipment from the harmful effects of current appearing during the operation (short circuits)

The use of current transformer for purpose other than described above is forbidden if not agreed with the producer.

Routine test report

The routine test report of a current instrument transformer includes:

- verification of terminal markings
- inter-turn overvoltage test
- determination of errors
- power-frequency test

Upon the customer's request the following informations can be provided free of charge:

- theoretical current/voltage error and phase displacement values
- theoretical excitation (magnetization) curves

Additional reports for supplementary charge, made available on request:

- test report on accuracy
- excitation (magnetization) curves
- additional nameplates (if more than 1 is required)
- verification tests for measuring cores (classes 0.2; 0.2S; 0.5; 0.5S)

5. Maintenance instructions before installation

The current transformers are delivered packed in foil unit, protected from dust and ambient humidity. The foil unit keeps transformer clean for installation into SF₆ compartment. Any dust sediments or any other type of contamination has to be removed from the transformer using a soft brush and alcohol, in a way not to damage the insulation or cables taken out from the transformer. Protect surface inside of tube during manipulation with a transformer. Surface inside of tube of flange must be smooth without sharp edges and coarse defects.

6. Transport & Storage

The permitted temperature for transport and storage ranges from -30°C to +60°C. During transport and storage the transformers have to be protected from direct impact of solar radiation. The transformers are delivered fixed on transport pallets in wooden crates.

7. Disposal

Materials used in instrument transformers are considered as materials without environmental impact and the materials are not toxic. Instrument transformers have to be disposed in accordance with national legislation relevant to domestic waste disposal.

8. Handling

The transformers ELK-CT0 are too heavy and it is necessary to use hanging belts attached on holes for screws on three places; for handling use belts and crane with sufficient load capacity. Always make sure that the belts are secured safely on the crane and on the transformer. For single phase units is used special tool which takes unit from the coils bottom.



Fig. 2. Manipulation on crane with belts attached on 3 places



Fig. 3. Manipulation of single phase unit

ATTENTION: During the manipulation with transformer it is necessary to follow safety work instructions. Never stay under the freight. Always make sure that the freight is safely locked on the crane and make sure that there is no risk of unexpected release or turnover of the freight.

9. Normative references

IEC 61869-1, 2	Current instrument transformers
IEC 60529	Degrees of protection provided by enclosures
ISO 12100	Machine safety – basic concepts, general principles of design
EN 50110-1	Operation of electrical installations

Current instrument transformers are designed, tested and manufactured in accordance with international or national standards, the customer's requirements, based on an agreement between the customer and the manufacturer. The specific standard is always mentioned on the transformer ratio nameplate.

As an example the following standards can be mentioned: IEC 60044-1; IEC 60044-6; IEC 61869-1; IEC 61869-2; AS 60044-1; ČSN EN 60044-1; ČSN EN 60044-6; IEEE Std C57.13.6-2005; ANSI C57.13-1978; CSA Std CAN3-C13-M83; BS EN 60044-1; GOST 7746-2001.

When agreed, transformers made in accordance with other standards can also be supplied, or in accordance with other release version of the above standards.

10. Dimensions

Dimensions of the current transformers acc. Appendix 2.

11. Lifetime

The product's lifetime is more than 40 years.

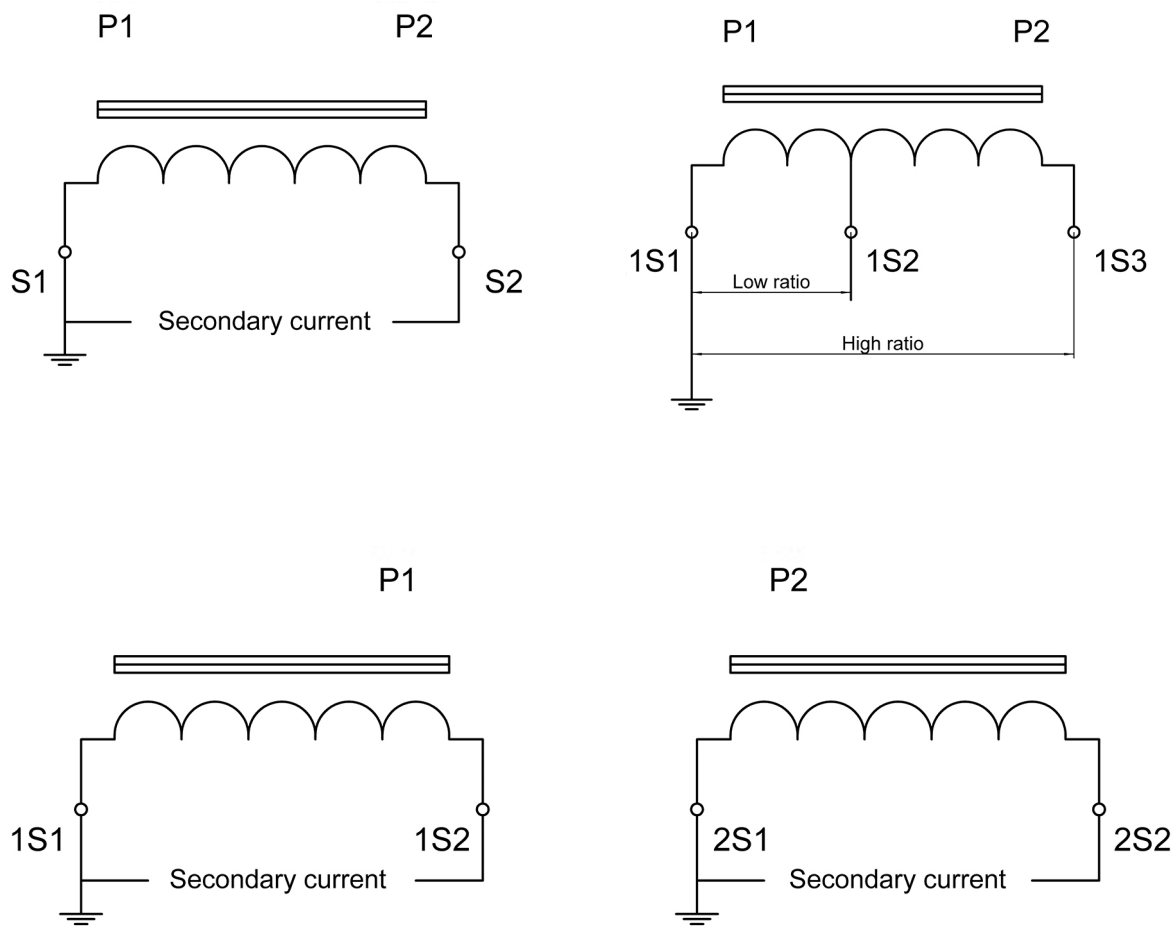
12. Repair

Transformers are not repairable on customer's side. When a repair is needed, contact manufacturer of transformer.

Appendix 1

Examples of electrical wiring

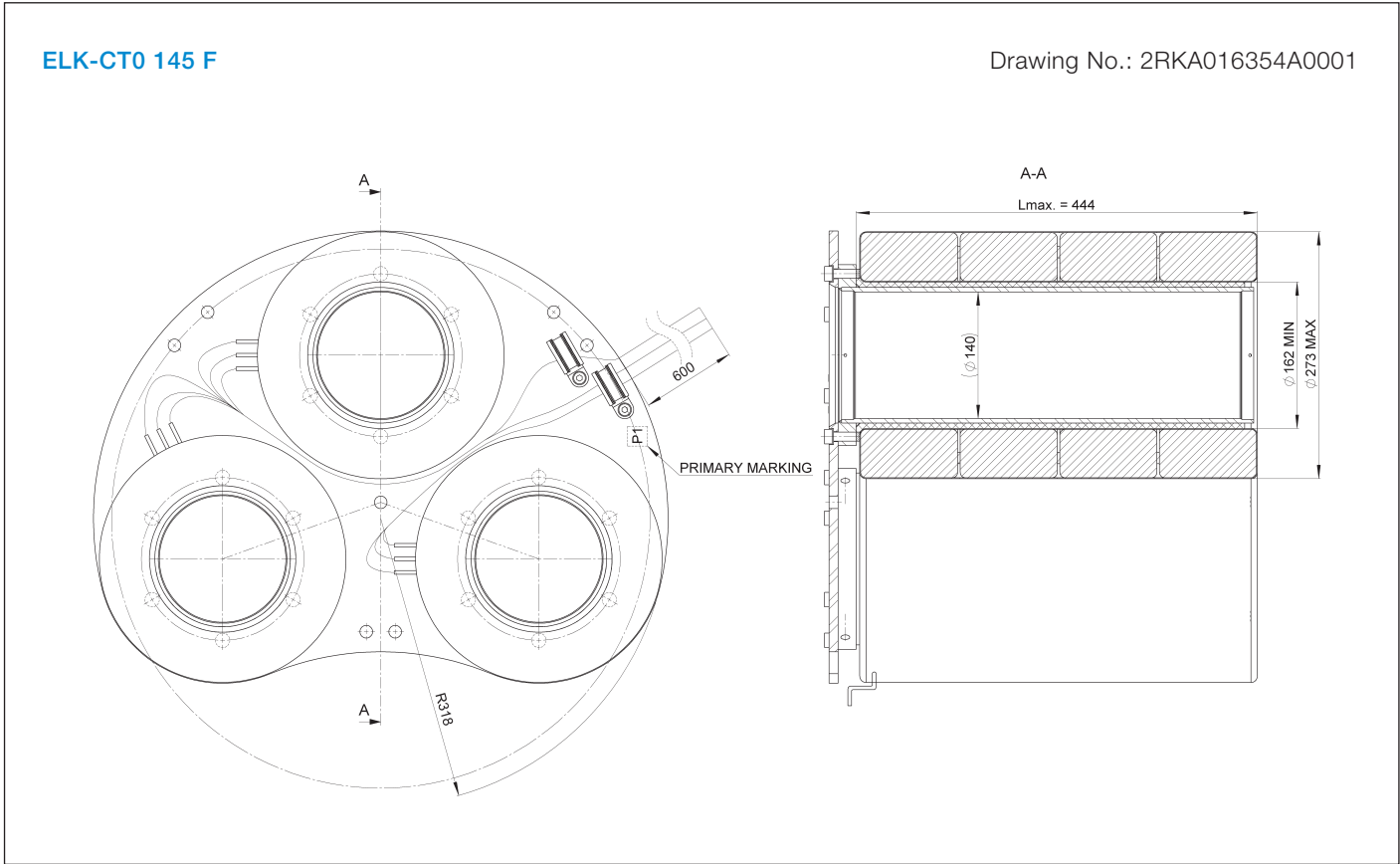
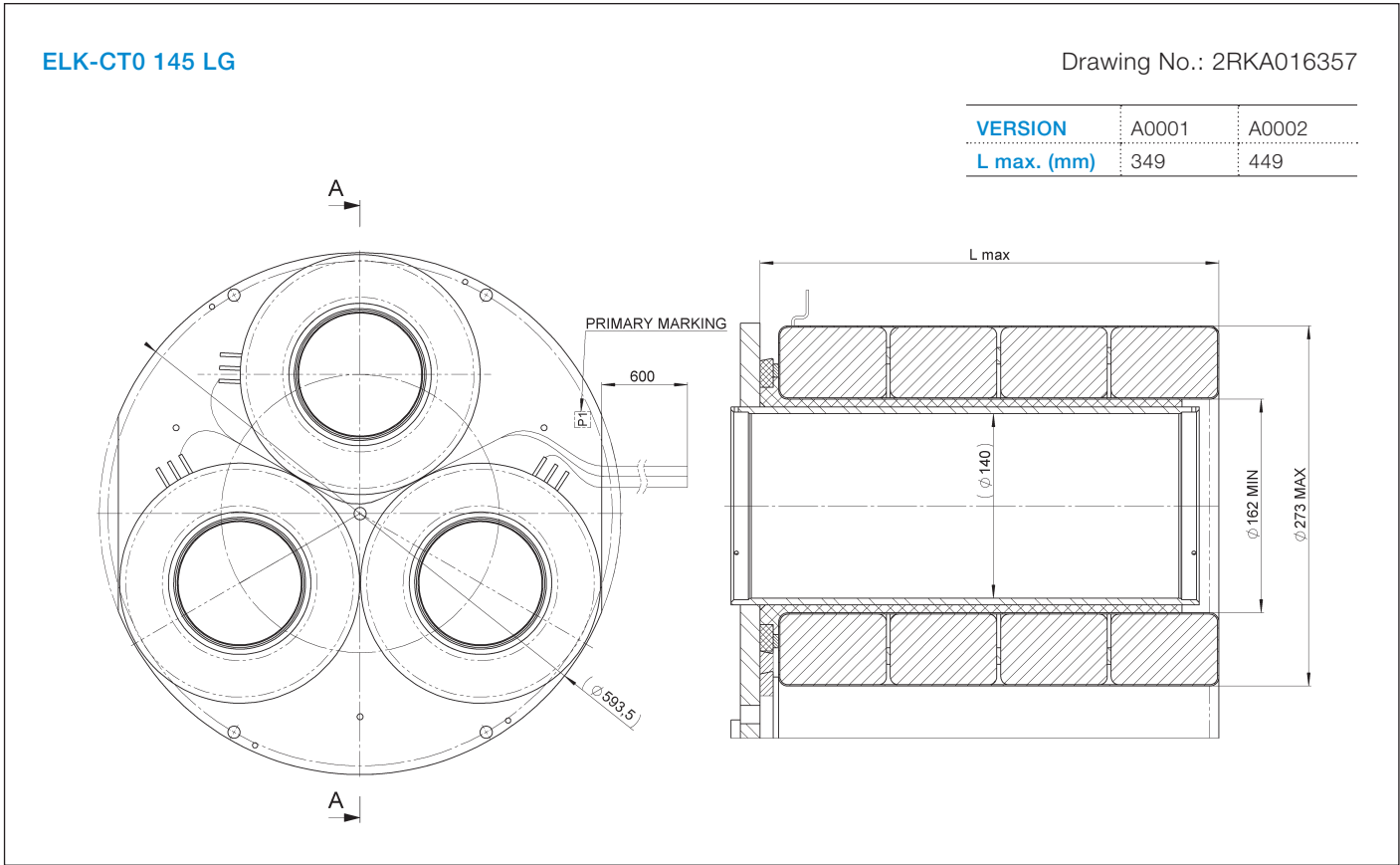
Current instrument transformers:



Appendix 2

Dimensional drawings

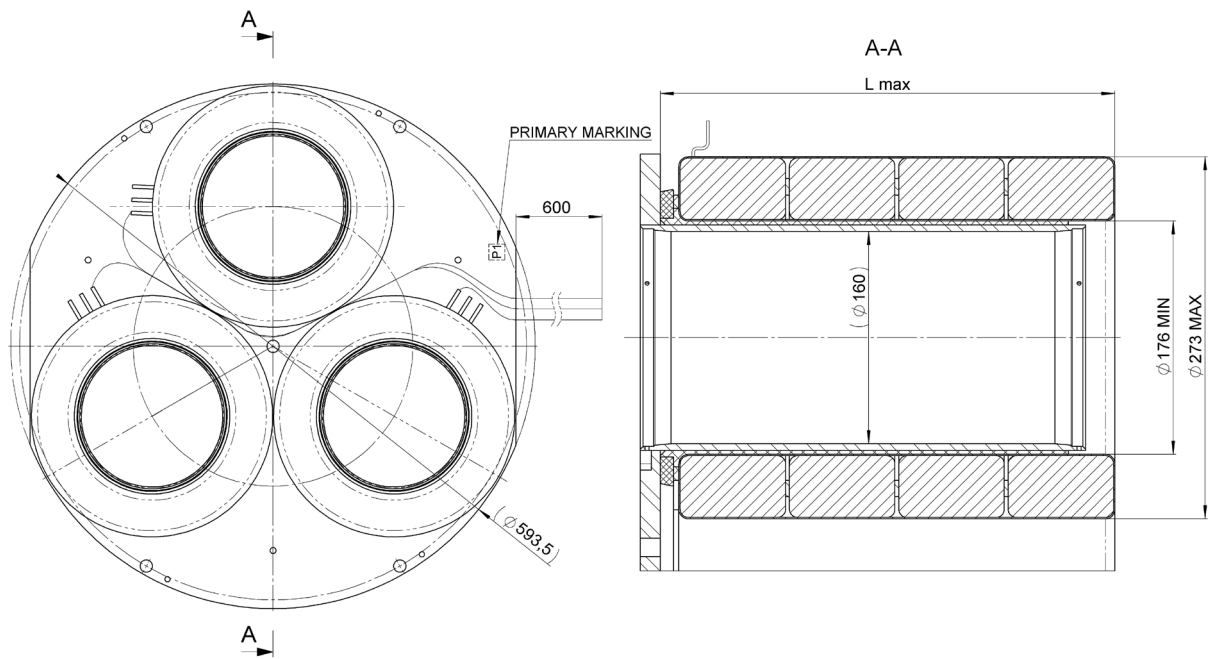
Weight of the transformers depends on number of cores and their parameters.



ELK-CT0 170 L

Drawing No.: 2RKA016361

VERSION	A0001	A0002	A0003	A0004
L max. (mm)	343	353	443	493

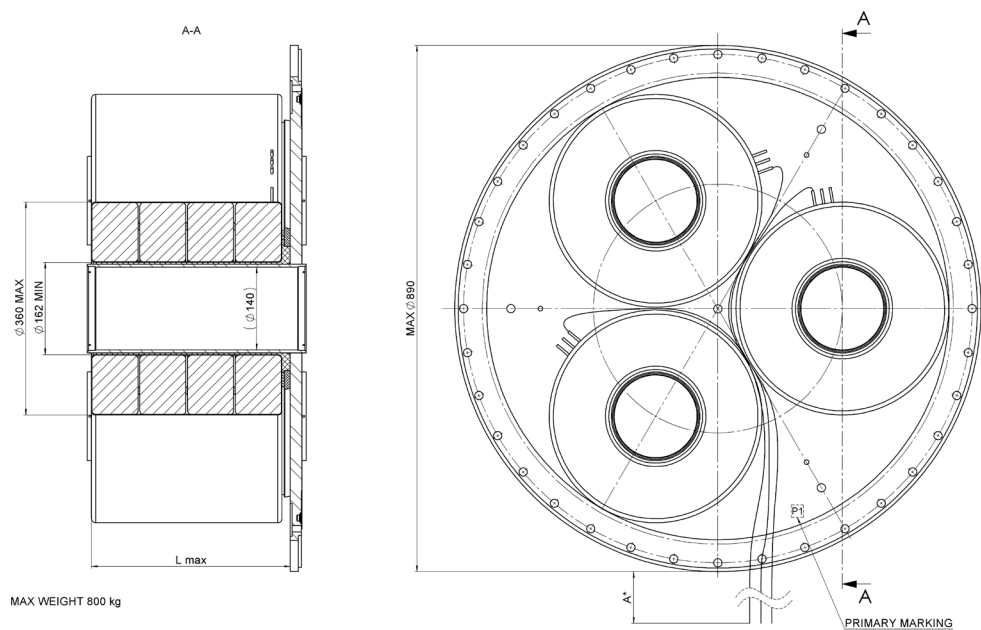


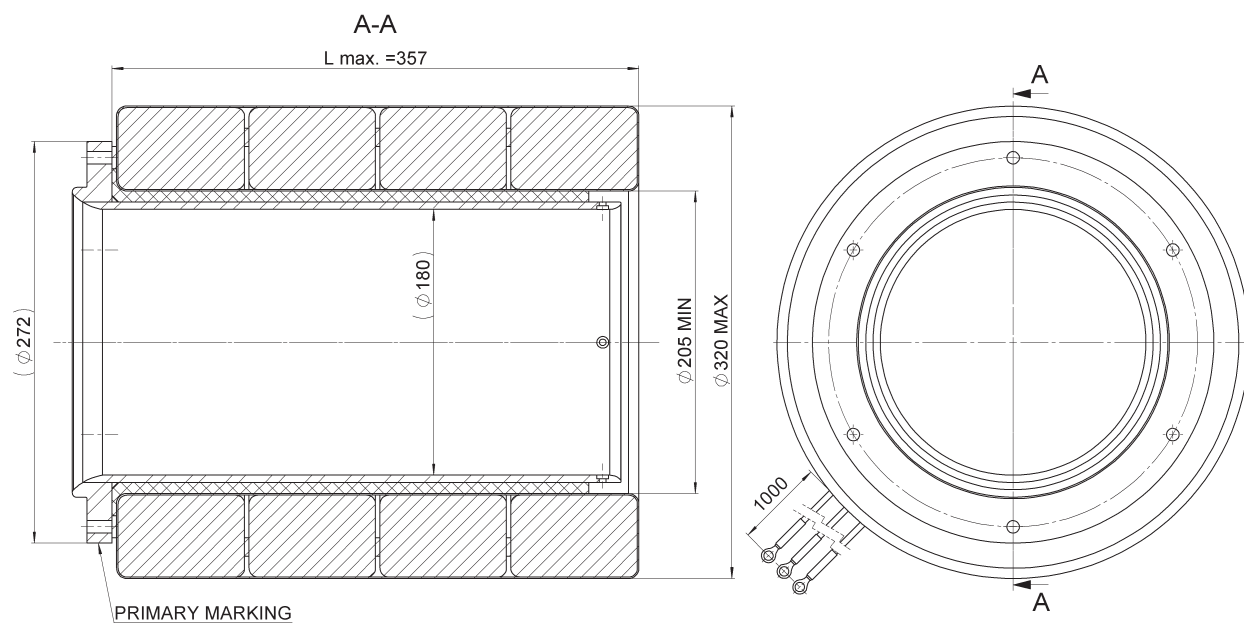
ELK-CT0 735FG

Drawing No.: 2RKA016368

* Up to 60 outlets A=750mm, for more than 60 outlets A=850mm (only for A0003 and A0004).

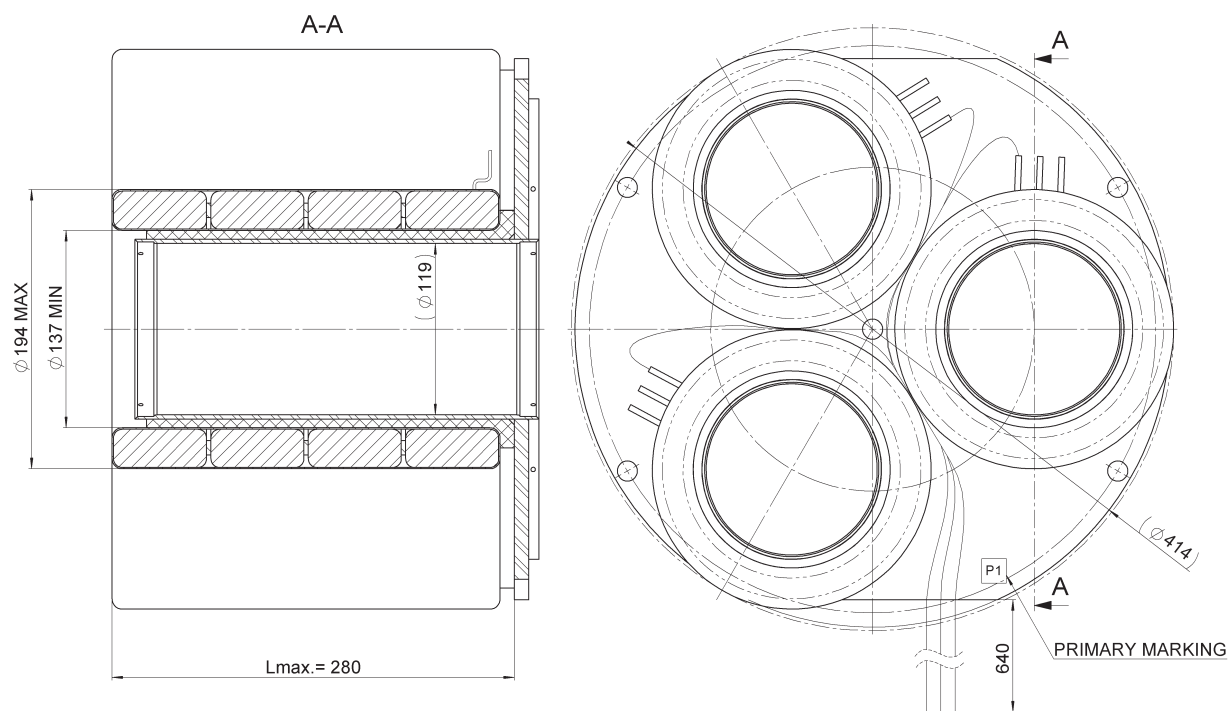
VERSION	A0001	A0002	A0003	A0004
L max. (mm)	336	386	500	466





ELK-CT0 520 LK

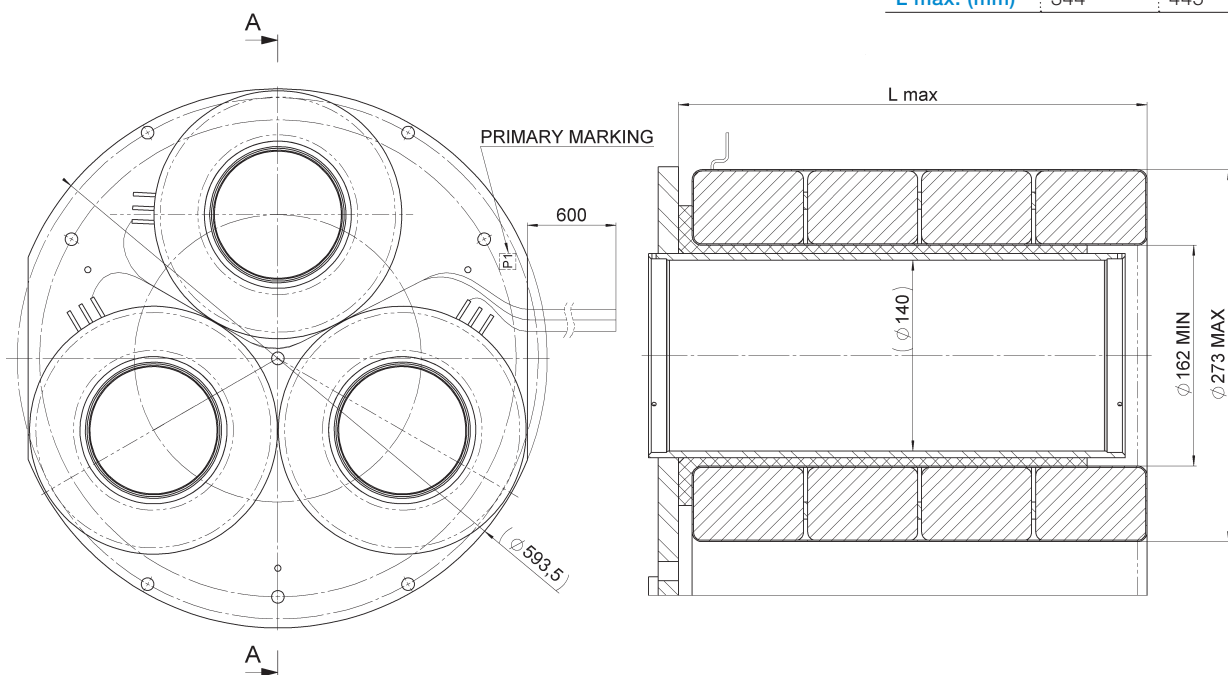
Drawing No.: 2RKA014879A0001



ELK-CT0 520 LG

Drawing No.: 2RKA014872

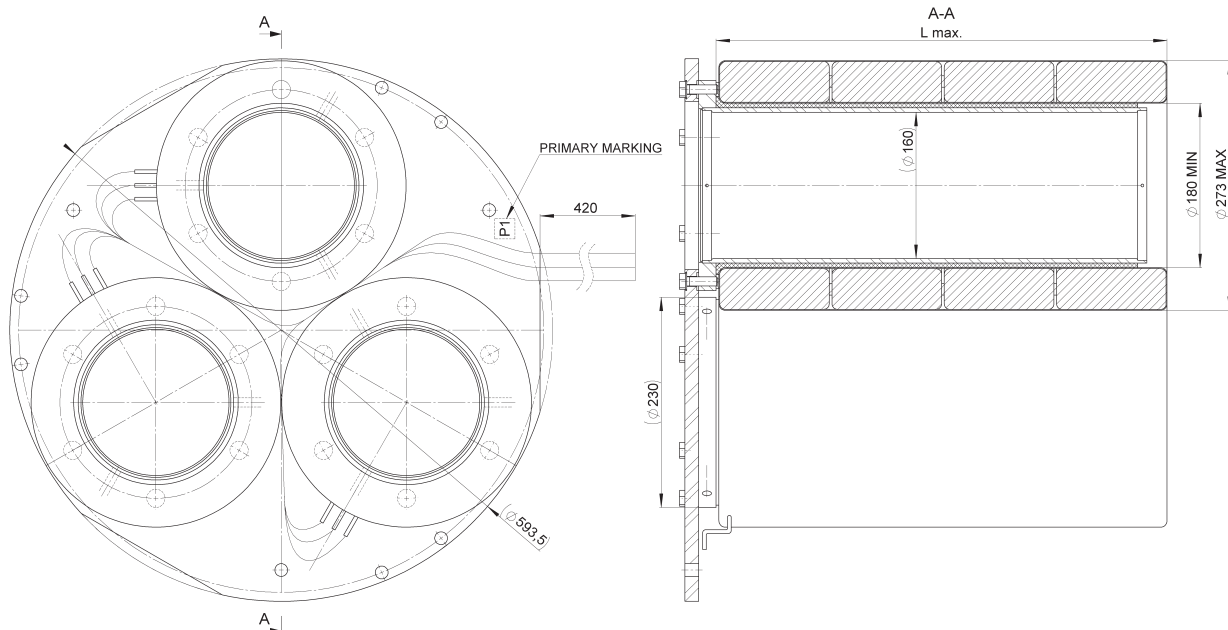
VERSION	A0002	A0004
L max. (mm)	344	445



ELK-CT0 735 L

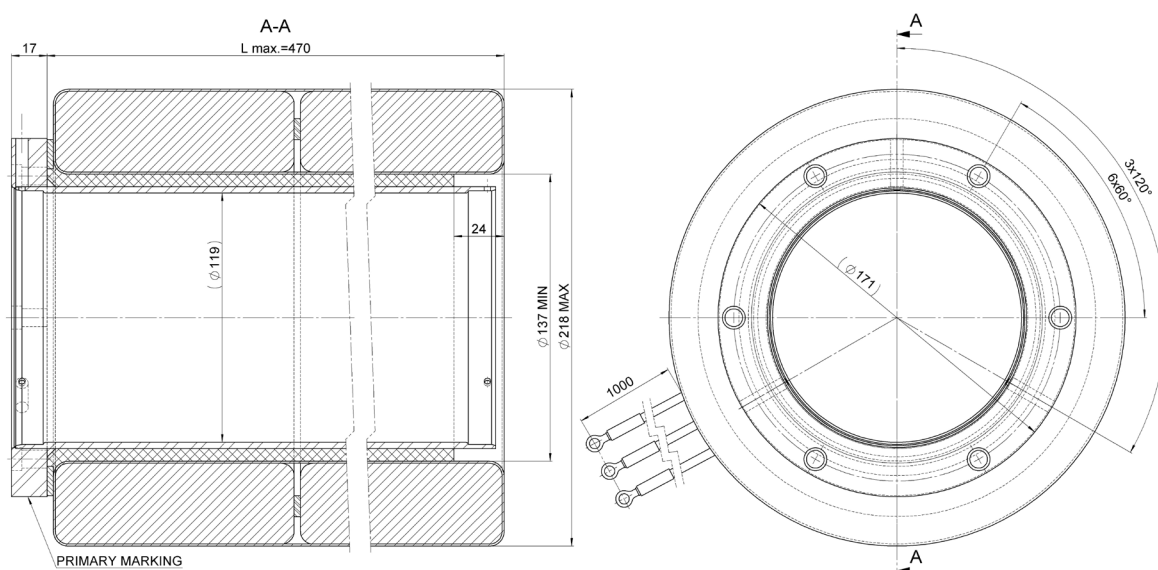
Drawing No.: 2RKA014876

VERSION	A0001	A0002	A0003	A0004	A0008	A0009
L max. (mm)	193	493	353	343	443	153



ELK-CT0 520 F

Drawing No.: 2RKA014881A0003



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