

PRODUCT FOR HIGH VOLTAGE APPLICATION

# **Current transformers for Gas-insulated switchgear type ELK**

Instructions for installation, use and maintenance



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# Scope of Contents

3	<b>1. Service conditions</b>
3	<b>2. Technical details</b>
4	<b>3. Instruction for installation</b>
4	General information
4	Safety instructions
5	Connection of transformer primary side
5	Connection of transformer secondary side
6	Mounting
7	<b>4. Instructions for use</b>
7	Routine test report
7	<b>5. Maintenance instructions before installation</b>
7	<b>6. Transport &amp; Storage</b>
8	<b>7. Disposal</b>
8	<b>8. Handling</b>
9	<b>9. Normative references</b>
9	<b>10. Dimensions</b>
9	<b>11. Lifetime</b>
10	<b>Appendix 1. Examples of electrical wiring</b>
11	<b>Appendix 2. Dimensional drawings</b>

# Instruction for installation, use and maintenance

These installation, use and maintenance instructions apply for current instrument transformers intended for indoor or outdoor operation. The instructions refer to: Current instrument transformers for indoor or outdoor use, of the following types: ELK - CN3–1080mm, ELK - CN3–720mm, ELK - CN14–840mm, ELK - CN14–560mm, CN14C

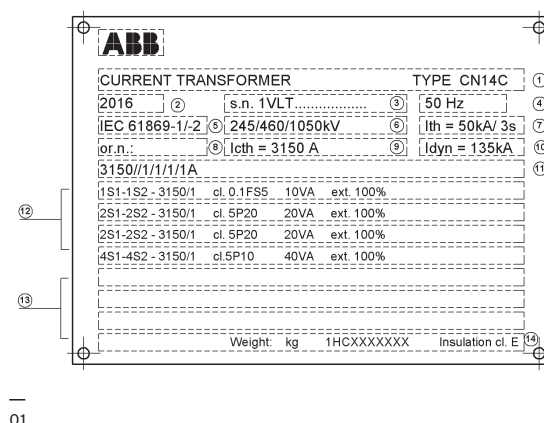
01 Example of current transformer rating plate

## 1. Service conditions

### Indoor and outdoor transformers

The transformers ELK - CN3, ELK - CN14 and CN14C without a primary conductor are designed for installation in gas-insulated switchgear for indoor and outdoor applications.

The transformers are designed for standard ambient temperatures between -25°C and +40°C and altitudes below 1000 m above sea level. Different ambient temperatures can also be agreed upon with the customer. The transformers are designed for protection class IP54.



## 2. Technical details

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

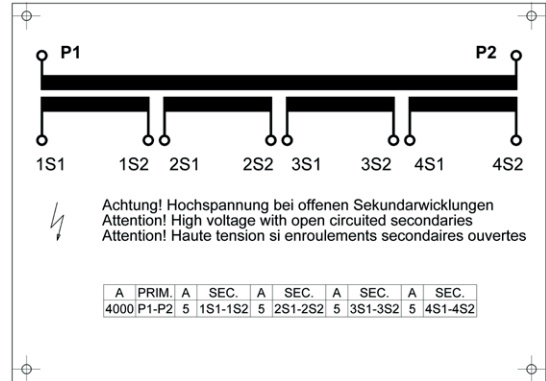
Dimensional drawings of transformers ELK - CN are shown in Appendix 2.

### Where:

- |                         |   |
|-------------------------|---|
| 1) CN14C                | type code of transformer (ELK CN3-720 / ELK CN3-1080 / ELK CN14-560 / ELK CN14-840 / CN14C) |
| 2) 2016                 | year of manufacture   |
| 3) 1VLT.....            | serial number   |
| 4) 50 / 60 Hz           | rated frequency   |
| 5) IEC 61869-1/-2       | corresponding standard (standards)  |
| 6) 245/460/1050kV       | voltage level   |
| 7) 50kA/ 3s             | rated short-time thermal current / duration   |
| 8) or.n.:               | order number  |
| 9) lcth = 3150A         | rated continuous thermal current  |
| 10) Idyn = 135kA        | rated dynamic current   |
| 11) 3150//1/1/1/1A      | rated transformer ratio   |
| 12) 1S1-1S2, 2S1-2S2... | parameters of all cores   |
| 13)                     | additional specifications if required   |
| 14)                     | weight, material number, insulation class   |

02 Example of current transformer connection schema nameplate

03 Example of a secondary terminal board of the ELK - CN type transformers



02

The connection schema nameplate is placed under the cover of the terminal box.

### 3. Instruction for installation

#### General information

The 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 such eligibility legislation is available the corresponding requirements can be found in the 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, unless you know for sure these are earthed.
2. Always ground 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 the transformer is interconnected, there should be only one grounded point to prevent accidental paralleling with the system grounding wire.
4. Always short-circuit the secondary of a 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.

#### Connection of transformer primary side

The ELK - CN transformers don't have their own primary conductor. If ELK - CN transformers will be used in other applications than ABB switchgear ELK-3, ELK-14 or ELK-14/245C please contact us for support.

**Attention:** a primary conductor must be centred in the application with tolerance  $\pm 1\text{cm}$ .

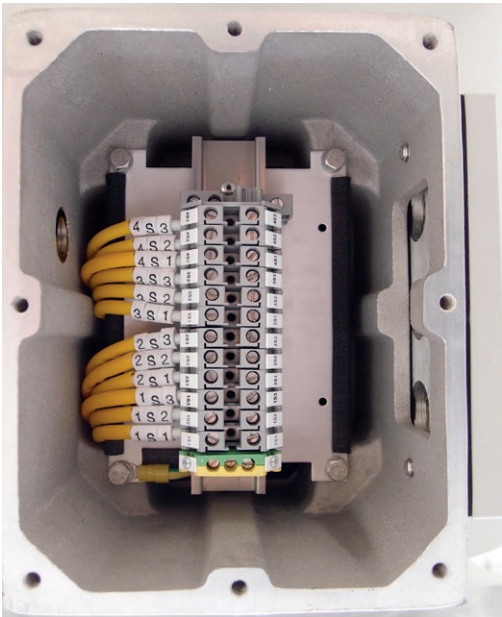
#### Connection of transformer secondary side

For all current transformers, the secondary cable connections must be led to a terminal box. The transformers ELK - CN contain an outlet cable which is connected to the terminal on the DIN rail. If not specified otherwise in the order, the cable cross-section may not exceed 6mm<sup>2</sup>.The terminals are equipped with M4 screws for connection of the secondary outlets. Maximum allowed torques for secondary screw connections:

Highest and lowest allowed torque values for secondary screw connections

Screw	Highest torque (Nm)	Lowest torque (Nm)
M4	1.8	1.5

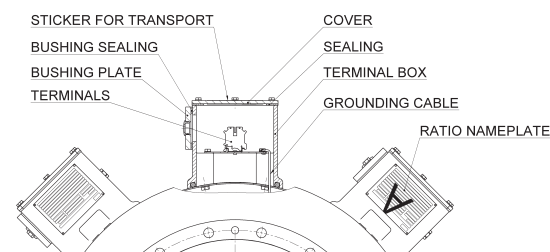
The end of the windings of all cores are correspondingly identified. Terminal arrangement according to the number of terminals and parameters of transformer. The type of terminals and terminal arrangement may be changed by the customer after agreement with the manufacturer.



03

#### 04 Mounting of terminal box

05 Example of transformer ELK CN3 – 1080 mm with six terminal boxes

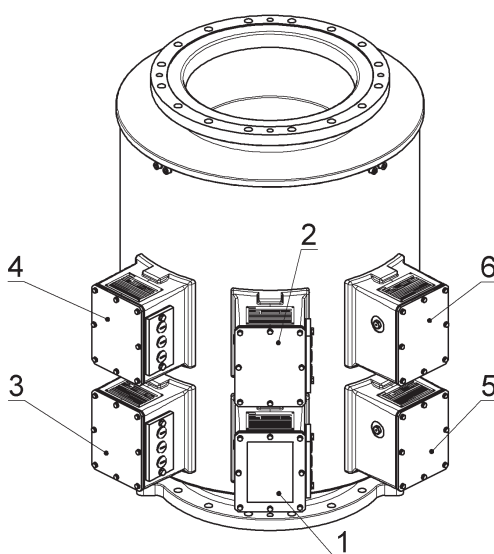


04

After connection of the terminal, the terminal box is closed by a cover and bushing plate with corresponding sealing compound against penetration of splash water.

The number of terminal boxes may be changed after agreement between the customer and manufacturer and according to the type of transformer. Max. number of terminal boxes is shown in the table below.

Type	Max.Number of terminal boxes	Position
ELK CN3 - 1080mm	6	1, 2, 3, 4,5,6
ELK CN3 - 720mm	2	1, 2
ELK CN14 - 840mm	4	1, 2, 3, 4
ELK CN14 - 560mm	2	1, 2
CN14C	1	1



05

#### Mounting

The transformers ELK - CN are designed as low-voltage current transformers 0.72/3kV, without a built in primary conductor. For use in higher voltages it is therefore necessary to combine them with the primary conductor with self-isolation. A primary conductor is not included in the supply.

Mounting and placement of the ELK - CN transformers is proposed by the customer depending on application and using of the primary conductor and its insulation. The transformer has a flange with holes used to attach the transformer screws. Before installation of the primary conductor and whole transformer, clean the sealing surface and inside surface of the transformer from dust, grease and another impurities, see 5. Maintenance instructions. For each type of ELK - CN transformer use the corresponding fasteners, primary conductor and insulator. Use only a primary conductor designed by ABB.

#### 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 the 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 a current transformer for a 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 information can be provided free of charge:

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

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06 Transformer surface

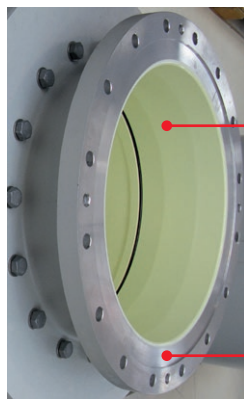
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07 Example of sticker

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; 0.2 S; 0.5; 0.5 S)

## 5. Maintenance instructions before installation

Excessive dust sediments or any other type of contamination are to be removed from the transformer using a soft brush and alcohol, in such a way as not to damage the coating and sealing surface. Protect the sealing surface from both sides of ELK - CN during manipulation with a transformer. The spray painted surface inside CT must be smooth without sharp edges and coarse defects.



Spray painted surface

Sealing surface

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06

## 6. Transport & Storage

The permitted temperature for transport and storage ranges from -55°C to +80°C. During transport and storage the transformers have to be protected from direct impact of solar radiation. The transformers are delivered according to delivery instruction HASV600377.

## 7. Disposal

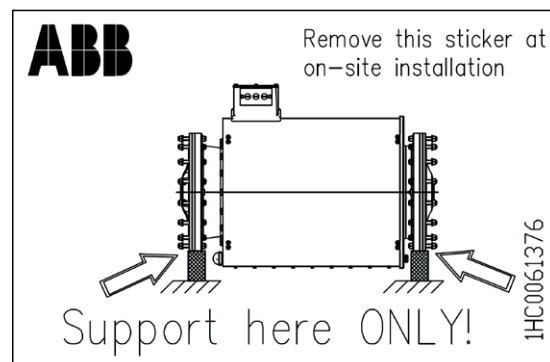
Materials used in instrument transformers are considered as materials without environmental impact and the materials are not toxic. Instrument transformers have to be disposed of in accordance with national legislation relevant to domestic waste disposal.

## 8. Handling

The transformers ELK - CN are too heavy and is necessary to use hanging belts attached on holes for screws on three places or to use one or more hanging belts attached around the flange of the transformer. For handling use belts and a crane with sufficient load capacity. Always make sure that the belts are secured safely on the crane and on the transformer.

**ATTENTION:** During the manipulation with the 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.

Follow the Label Instructions:



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07

## 9. Normative reference

IEC 60044-1	Current instrument transformers
IEC 61869-1/-2	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.

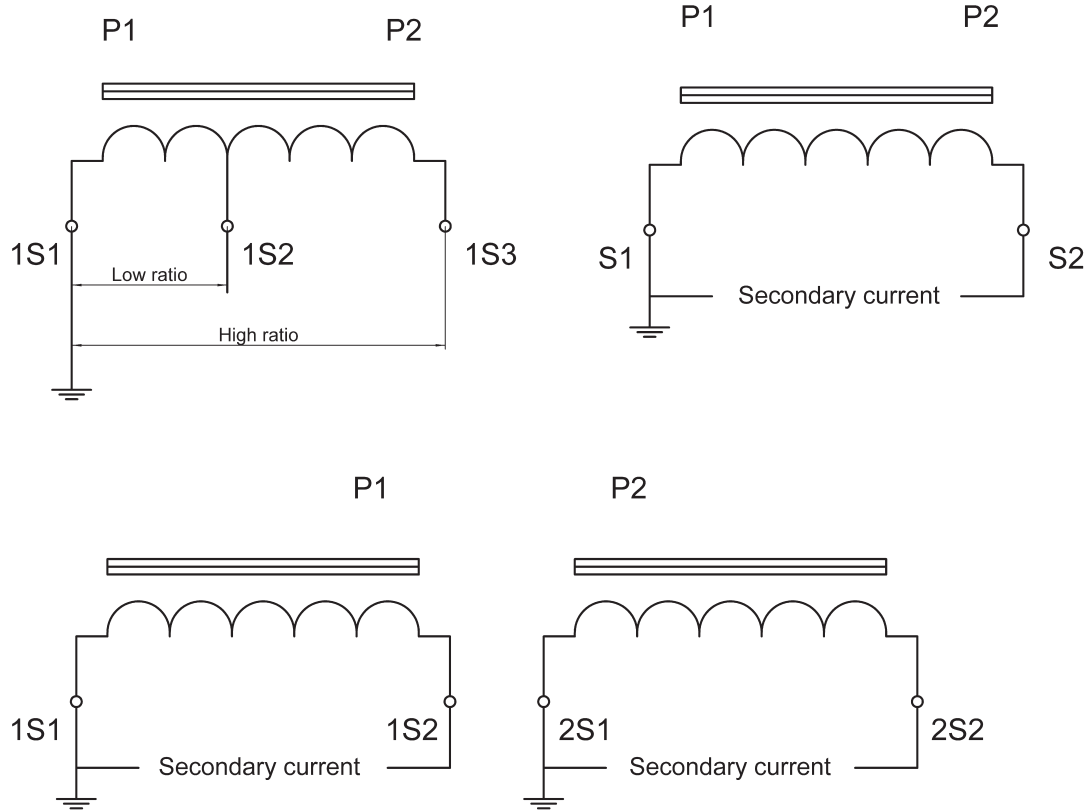
## 10. Dimensions

Dimensions of the current transformers acc. appendix 2.

## 11. Lifetime

The product's lifetime is more than 40 years.

## Appendix 1. Examples of electrical wiring

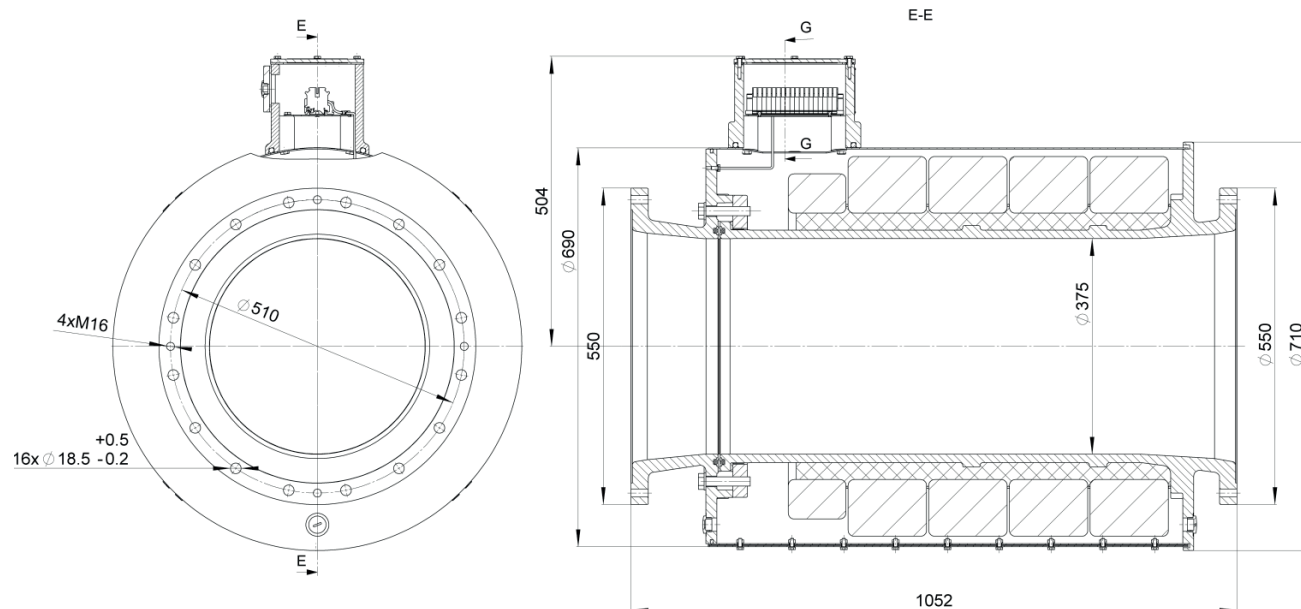
**Current instrument transformers:**



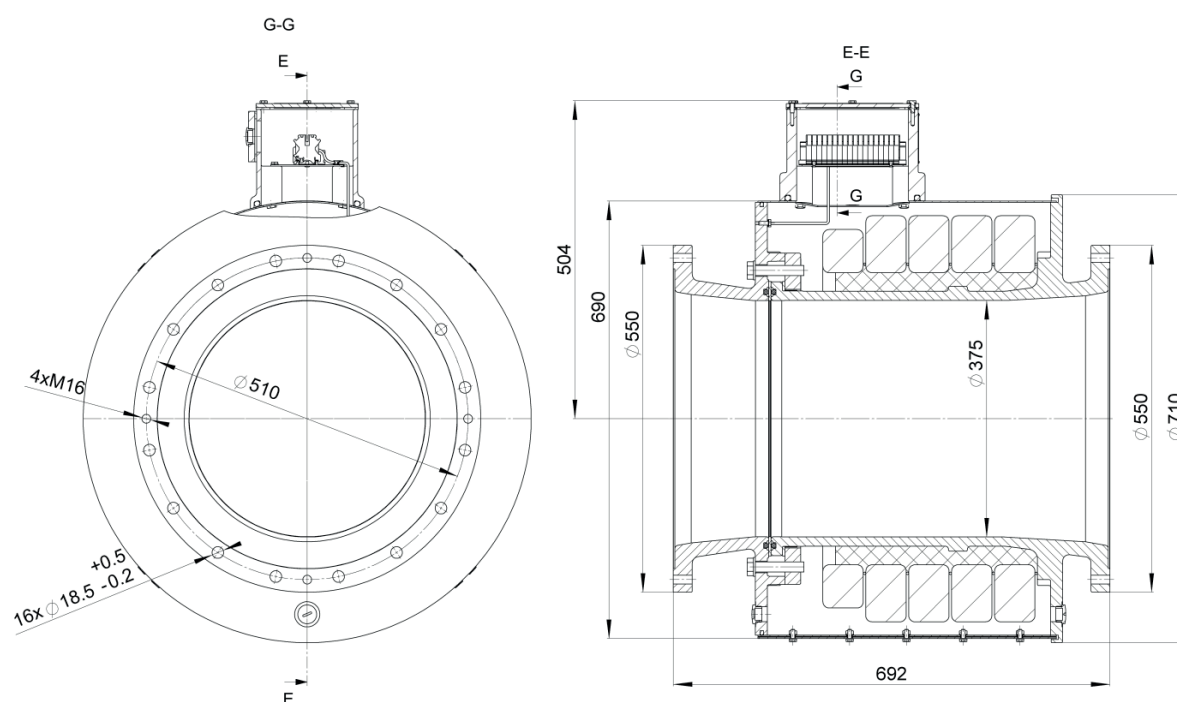
## Appendix 2. Dimensional drawings

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

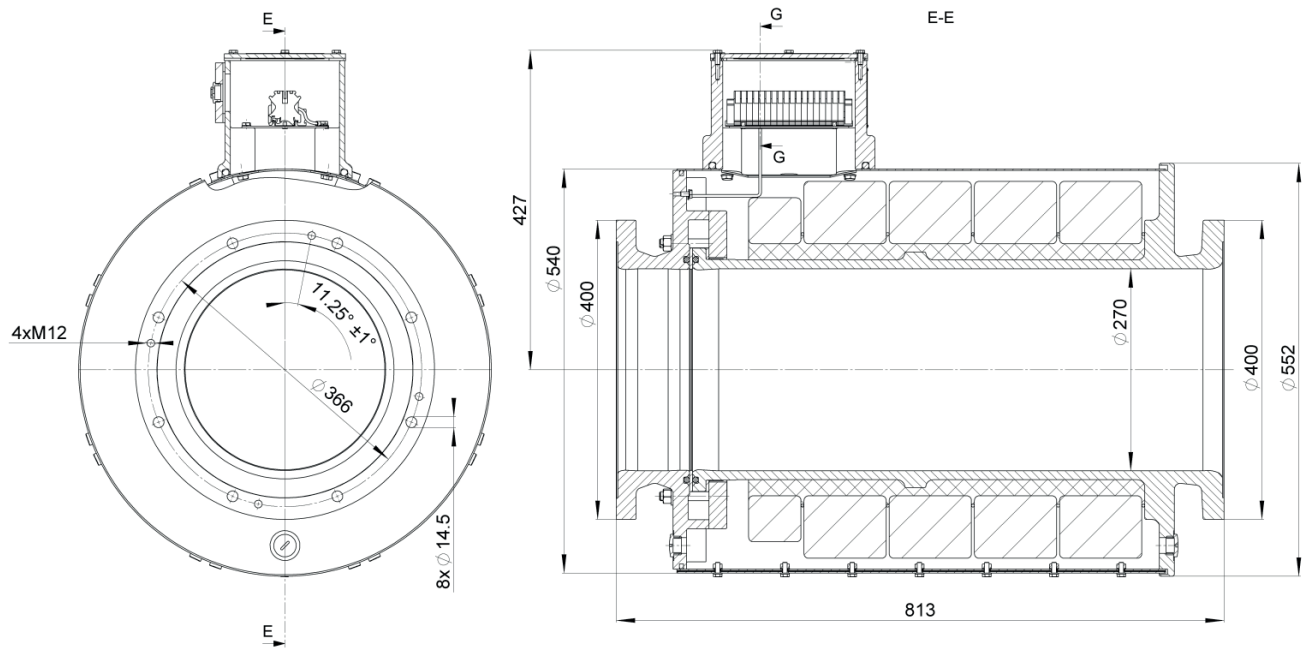
### ELK - CN3-1080mm



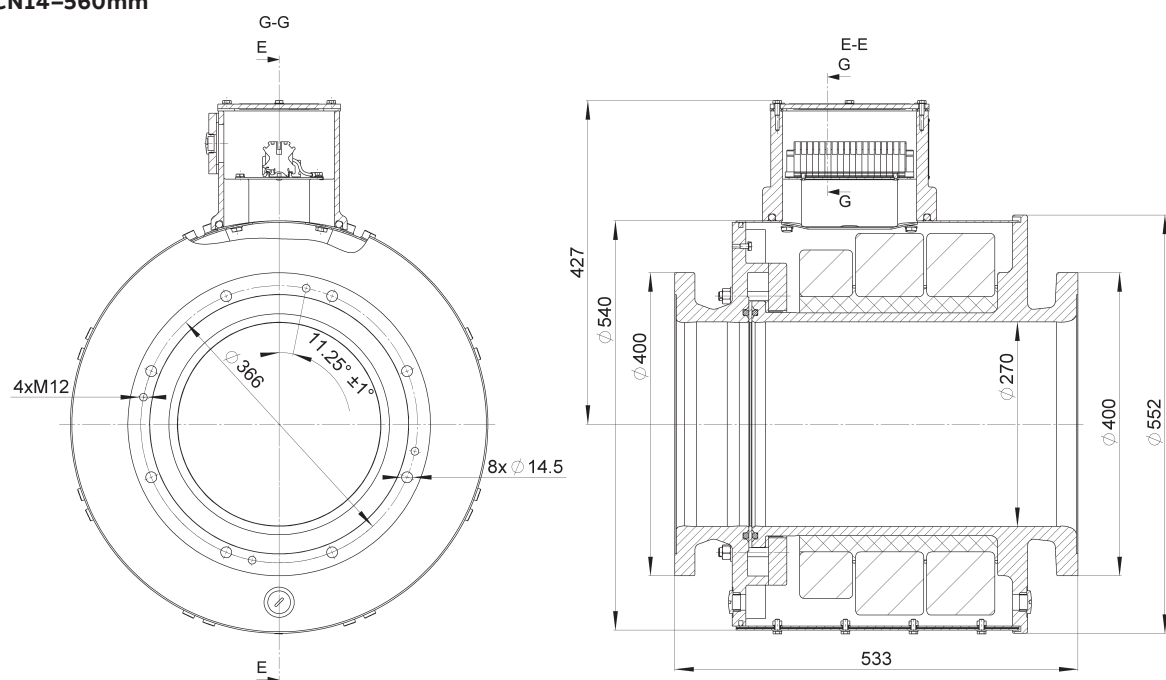
### ELK - CN3-20mm



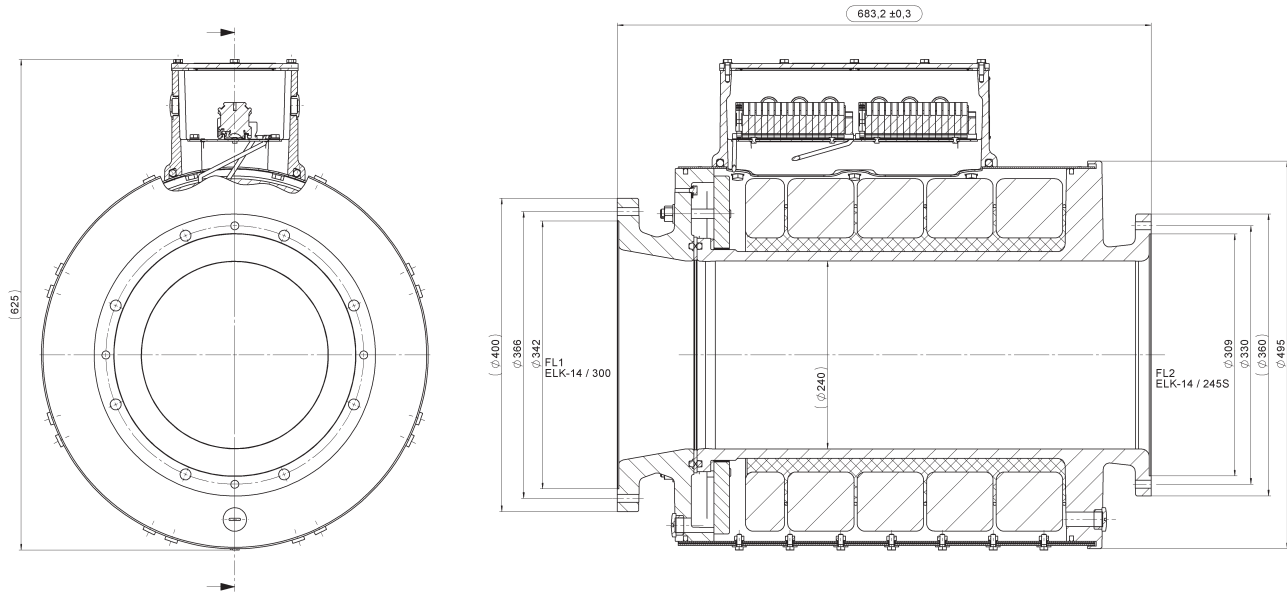
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**ELK-CN 14-840mm**


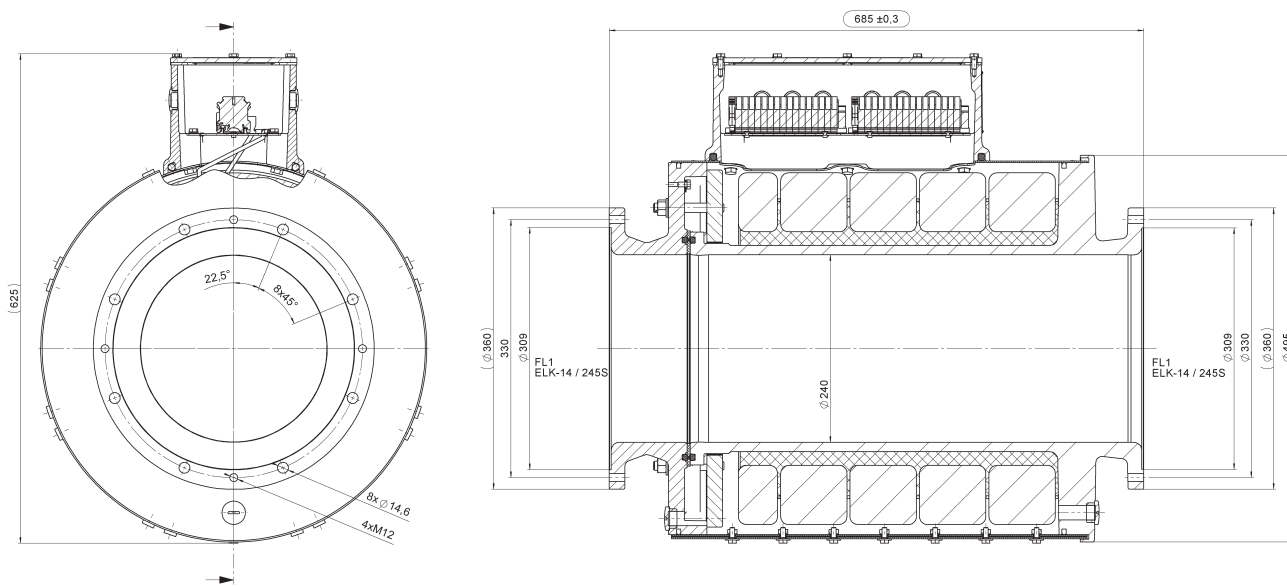

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**ELK-CN14-560mm**


CN14C  
Configuration A0001



CN14C  
Configuration A0002



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