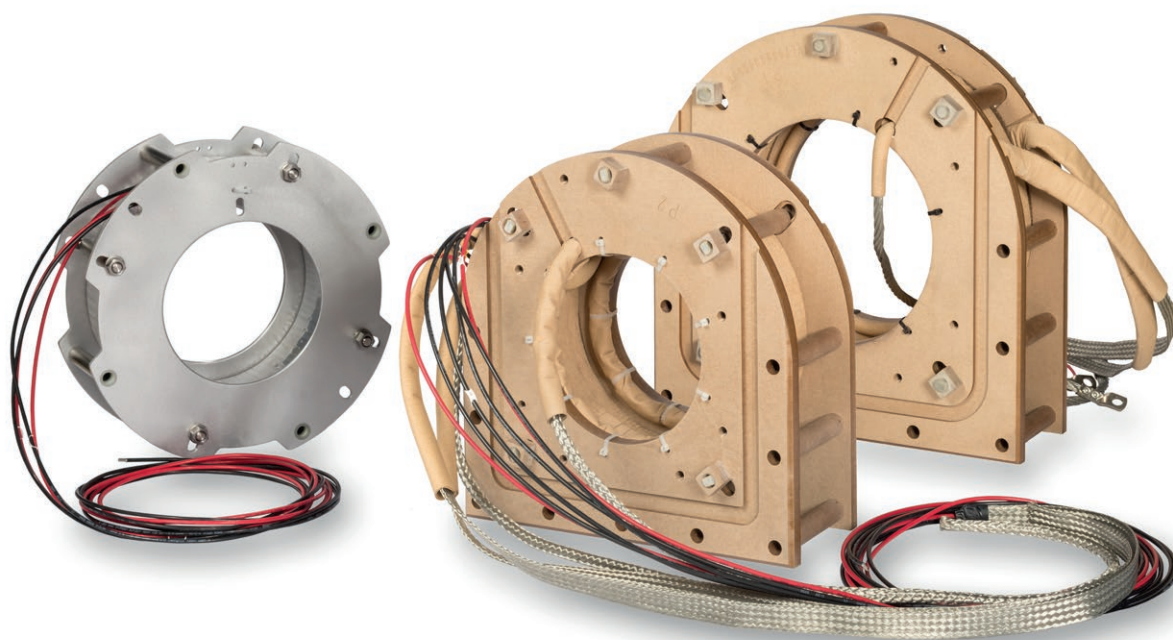


PRODUCTS FOR HIGH VOLTAGE APPLICATION

# **AT Current Instrument Transformer**

Instruction 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 outdoor operation. The instructions refer to current instrument transformers of the following types:

AT41 – up to 10 000 A; up to 1.2/6/- kV 40 kA(1s) and 100 kA

AT35 – up to 5 000 A; up to 1.2/6/- kV 100 kA(1s) and 120 kA

AT38 – up to 5 000 A; up to 1.2/6/- kV 100 kA(1s) and 120 kA

01 Example of rating plate

## 1. Service conditions

The transformers need to be installed in indoor conditions where the ambient air is not significantly polluted by dust, smoke, corrosive gases, vapor or salts.

The transformers are designed for standard ambient temperatures between -20°C and +105°C and altitudes below 1 000 m above sea level. The transformers can also be operated at higher or lower ambient air temperatures and higher installation altitudes if such are agreed with the manufacturer.

ABB CURRENT TRANSFORMER				
Type: AT41-1055/670 <sup>1</sup>				IEC 60044-1 <sup>2</sup>
1,2/6/- kV	Ith:30(1s) kA <sup>3</sup>	Idyn:75 kA <sup>4</sup>	50 Hz <sup>5</sup>	
1S1-1S2 <sup>6</sup>	3 000/1A <sup>7</sup>	ext.120% <sup>8</sup>	3 VA <sup>9</sup>	cl.TPY <sup>10</sup>
Rb=3 Ohm, Kssc=10, Tp=100 ms				
C-O-C-O t'-t' al-tfr-t''-t'' al=100-60-500-100-60 ms				
Rct=10 Ohm, Ts=1,00 s, Ktd=27,2				
2014 <sup>11</sup>				
Serial:1VLTS114000007 <sup>12</sup>				

01

## 2. Technical details

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

Dimensional drawing of AT transformer is shown in Appendix 1. Dimensions of the transformer may vary and depend on required parameters and the application they are intended for. This is why the customer is required to specify the highest or lowest dimensions, in line with the dimensional drawing in Appendix 1.

## Where:

1)	type code of transformer
2)	corresponding standard
3)	rated short-time thermal current
4)	rated dynamic current
5)	rated frequency
6)	terminal marking for tap of transformer
7)	rated transformer ratio
8)	extended current
9)	rated output (burden)
10)	accuracy classes
11)	year of manufacture
12)	serial number

Label abbreviation definitions

## 3. Instruction for installation

### General information

Instrument transformer is an 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 EN 50110-1 standard.

### Safety instructions

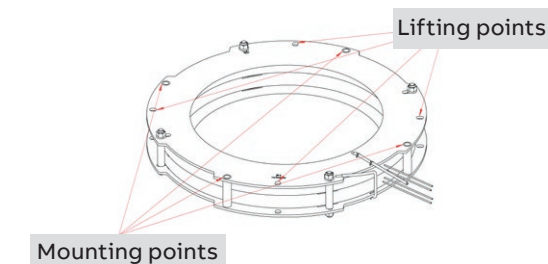
1. Always consider the transformer as a part of electric circuit which it is connected to.  
Don't touch incoming connectors and terminals, or any other parts of the transformer, except you know for sure these are earthed.

—  
02 AT35/41 mouting  
points  
—  
03 AT38 mounting  
points

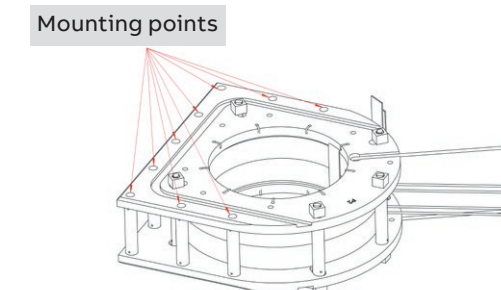
2. Ground always the metallic base of the instrument transformer.
3. Connect always one terminal of each secondary winding of the transformer to the earth. When the secondary of transformer is interconnected, there should be only one grounded point to prevent accidental paralleling with system grounding wire.
4. Always short-circuit the secondary of the current transformer, which 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

Mounting points are showed on picture below



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The AT transformer is mounted in different ways-using rings to fix the transformer directly to the bushing, using flanges, or other ways of fixation. The mounting is not a part of transformer delivery and the customer is fully responsible for installation in the right way.

### Tightening torques

AT35 (M12)	30 Nm
AT38 (M16)	30 Nm
AT41 (M16)	50 Nm

**The producer has not any liability for incorrect mounted form or possible consequences of it. Nuts and threaded rods are delivered on customer request.**

### Connection of transformer primary side

The AT transformers don't have its own primary conductor. The primary conductor is designed as a bushing with its own insulation, or insulated cable.

### Connection of the transformer secondary side

Secondary outlets are marked by color. Which color is assigned to which wire you can see in table below.

### Outlets marking

test wire (measure side)	black marked with M
test wire (earth side)	black mark with Ground
screen earth	black mark with Ground
secondary wire xS1 (X1, Y1, Z1, U1, V1, W1)	black and marked with core/terminal no.
secondary wire xS2 (X2, Y2, Z2, U2, V2, W2)	red and marked with core/terminal no.
secondary wire xS3 (X3, Y3, Z3, U3, V3, W3)	yellow and marked with core/terminal no.
secondary wire xS4 (X4, Y4, Z4, U4, V4, W4)	blue and marked with core/terminal no.
secondary wire xS5 (X5, Y5, Z5, U5, V5, W5)	grey and marked with core/terminal no.
secondary wire xS6 (X6, Y6, Z6, U6, V6, W6)	brown and marked with core/terminal no.

## 4. Instructions for use

Current instrument transformers are used:

- to convert large 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 large current appearing during the operation (short circuits).

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

#### **Routine test report**

The routine test report of a current instrument transformer includes:

- a) verification of terminal markings;
- b) inter-turn overvoltage test;
- c) determination of errors.

There are two rating plates available for the transformer (one glued on the transformer body, the other in the by-pack kit).

On customer request the following information 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 2 are required);
- verification tests for measuring cores (classes 0.2; 0.2 S; 0.5; 0.5 S).

## 5. Maintenance instructions

Excessive dust sediments or any other type of contamination is to be removed from the transformer using a soft brush, in a way not to damage the insulation or cables taken out from the transformer.

## 6. Transport & Storage

Permitted temperature for transport and storage ranges from -40°C to +105°C. During transport and storage the transformers have to be protected from direct impact of solar radiation. The transformers are delivered in wooden crates or fixed on transport pallets.

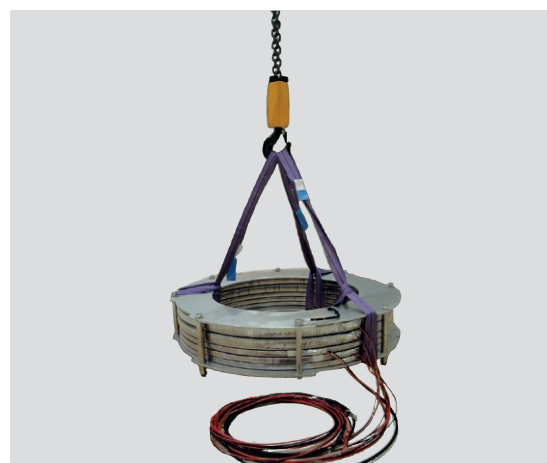
Transported transformers must be protected to avoid any damages. Right option of transport must be wisely chosen.

## 7. Disposal

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

## 8. Handling

All the manipulation has to be performed with great effort to prevent any damage risks. During manipulation with the hanging strips make sure that it was used equipment for minimalizing of forces applied to active parts (transformer coils) - cushioned hanging strips, tying direction according picture. If necessary place between the strips and coil/flanges, suitable foam distances to prevent of dangerous pressure to coil. Always check whether the last insulation layer of the coils is undamaged after manipulation. For flanges as well.



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## 9. Normative references

IEC 61869-2 Current instrument transformers

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 in-

ternational or national standards, the customer requirements, based on an agreement between the customer and the manufacturer. The specific standard is always mentioned on the transformer rating plate (AS, BS, GOST, IEEE, etc).

As an example the following standards can be mentioned:

IEC 60044-1; IEC 60044-6; 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

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.

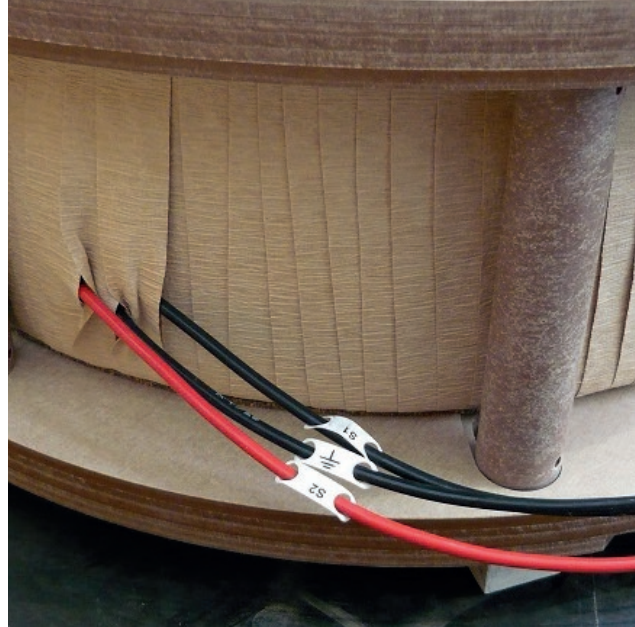
## 12. Service

After end of lifetime, device must be changed for new one. There is no service interventions allowed after life time.



## Appendix 1

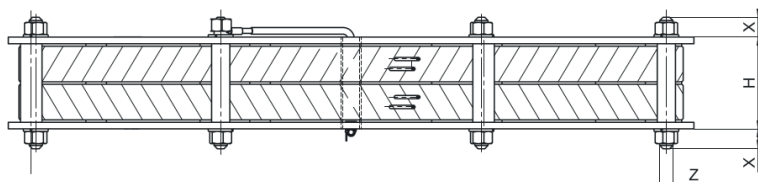
### Examples of outlets



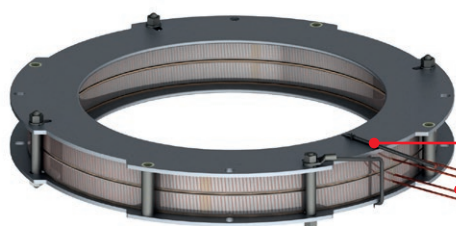
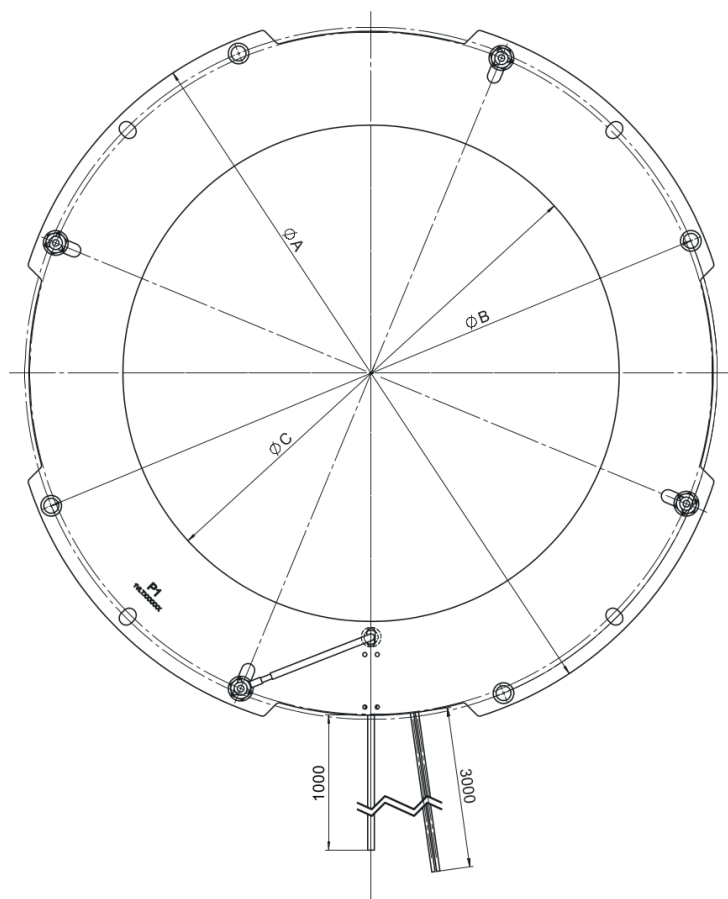
## Appendix 2

### Dimensional Drawings

#### AT35 and AT41



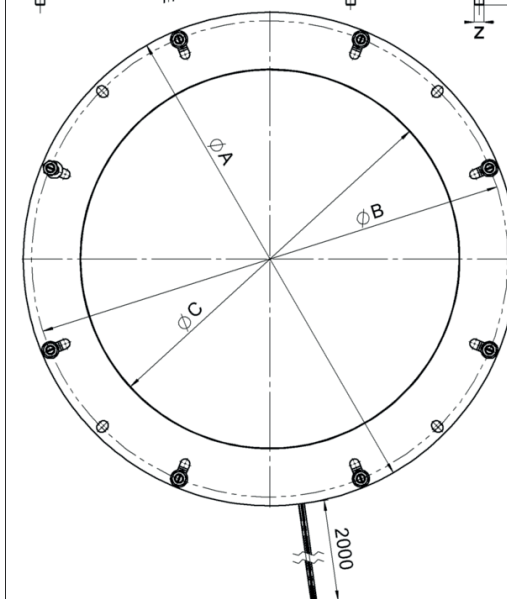
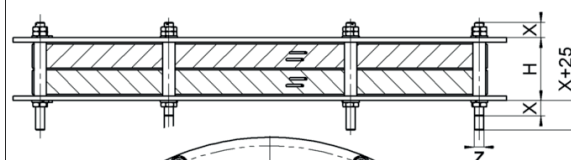
SIGN	VALUE	
	AT35	AT41
A [mm]	300 - 550	650 - 1055
B [mm]	269 - 520	619 - 1025
C [mm]	ACC. REQUIREMENTS	
X [mm]	17	24
H [mm]	ACC. REQUIREMENTS	
Z	M12	M16



Testing primary

Secondary outlets

#### Variant C



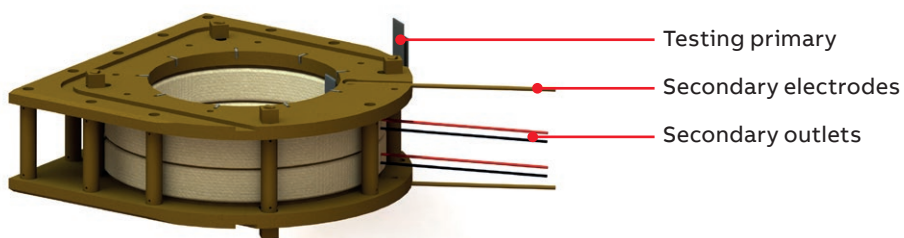
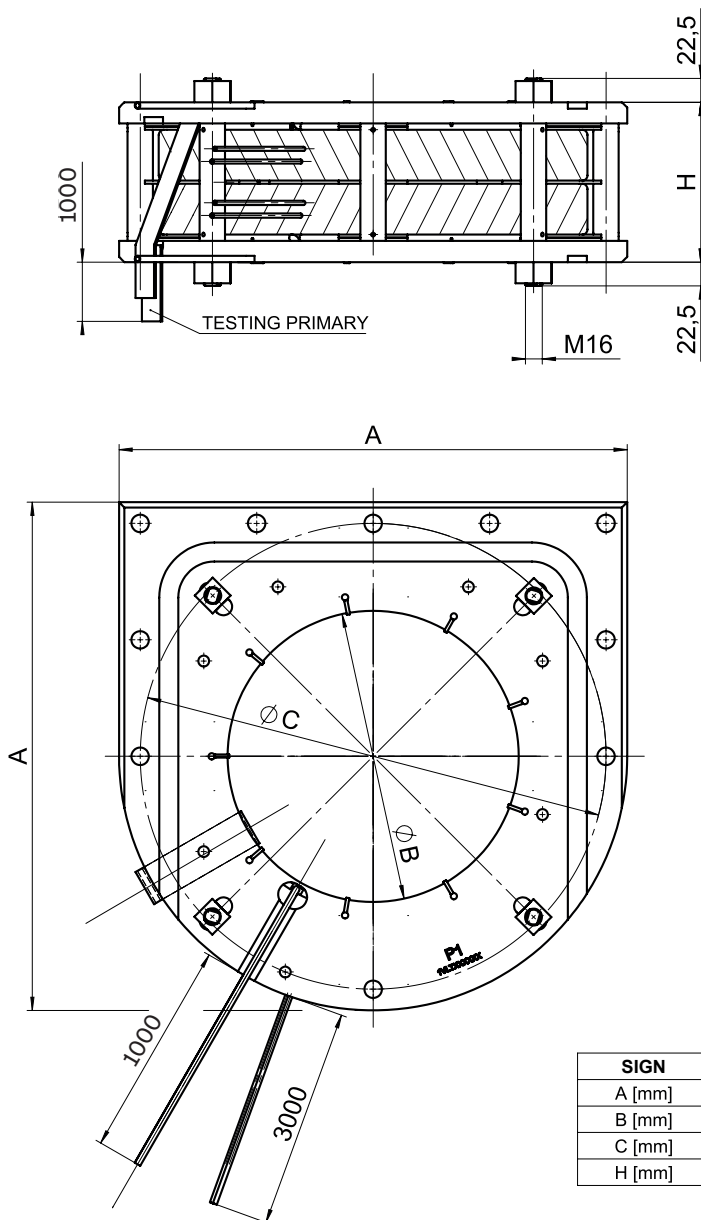
SIGN	VALUE	
	AT35-C	AT41-C
A [mm]	300 - 550	600 - 1000
B [mm]	270 - 520	570-970
C [mm]	ACC. ORDER	ACC. ORDER
X [mm]	27	27
H [mm]	ACC. ORDER	ACC. ORDER
Z	M12	M16

NOTE: Variant C with optional testing primary (see catalogue) and optional length of secondary outlets depending on customer request. The fixing part are a part of delivery, mounting parts can be ordered separately as and attachment.

**NOTE:** The Length of an outlets (testing primary, secondary outlets) is optional and depends on customer request. The fixing parts are a part of a delivery, mounting parts can be ordered separately as an attachment.



## AT38



**NOTE:** The Length of an outlets (testing primary, secondary outlets, screening electrodes) is optional and depends on customer request. The fixing parts are a part of a delivery, mounting parts can be ordered separately as an attachment.

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