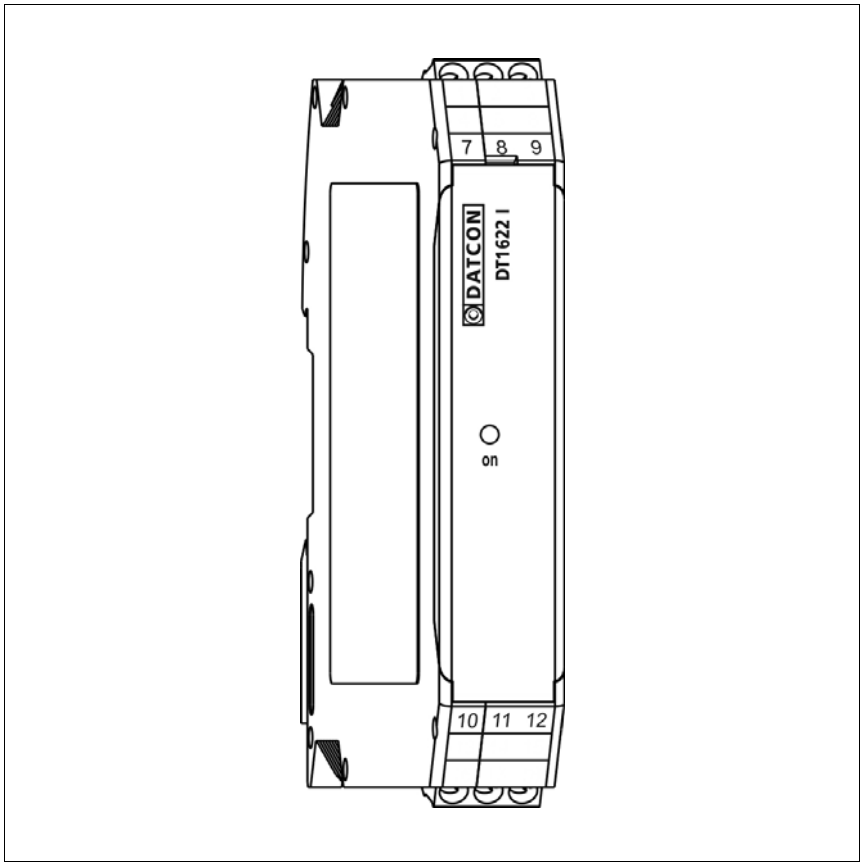
DATCON
INDUSTRIAL MEASUREMENT

# DT1622 Ix

Loop powered AC Current Transmitters

## Operating Instructions

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# 1. About this document

## 1.1. Function

This operating instructions manual has all the information you need for quick set-up and safe operation of
DT1622 Ix Loop powered AC Current Transmitters
Please read this manual before you start setup.

## 1.2. Target group

This operating instructions manual is directed to trained personnel. The contents of this manual should be made available to these personnel and put into practice by them

## 1.3. Symbolism used

**Information, tip, note**
This symbol indicates helpful additional information.

**Caution, warning, danger**
This symbol informs you of a dangerous situation that could occur. Ignoring this cautionary note can impair the person and/or the instrument

**List**

- The dot set in front indicates a list with no implied sequence.

**Action**

→ This arrow indicates a single action.

**Sequence**

1 Numbers set in front indicate successive steps in a procedure.

# 2. For your safety

## 2.1. Authorized personnel

All operations described in this operating instructions manual must be carried out only by trained and authorized specialist personnel. For safety and warranty reasons, any internal work on the instruments must be carried out only by DATCON personnel.

## 2.2. Appropriate use

The DT1622 Ix Loop powered AC Current Transmitters Detailed information on the application range is available in **Chapter 3. Product description**.

## 2.3. Warning about use

Inappropriate or incorrect use of the instrument can give rise to application-specific hazards, or damage to system components through incorrect mounting or adjustment.

## 2.4. General safety instructions

The DT1622 Ix Loop powered AC Current Transmitters is a high-tech instrument requiring the strict observance of standard regulations and guidelines. The user must take note of the safety instructions in this operating instructions manual, the country-specific installation standards as well as all prevailing safety regulations and accident prevention rules.

## 2.5. CE conformity

The DT1622 Ix Loop powered AC Current Transmitters is in conformity with the provisions of the following standards:
EN 61326 (EMC)
EN 61010

## 2.6. Environmental instructions

Protection of the environment is one of our most important duties. Please take note of the instructions written in the following chapters:

- Chapter **3.6. Store and transport**
- Chapter **7.2. Disposal**

# 3. Product description

## 3.1. Delivery configuration

**Delivered items**

The scope of delivery encompasses:

- DT1622 Ix
- documentation:
  this operating instructions manual
  certification
  warranty

## 3.2. Type designation

| DT1622 □ | RANGE | | | |
|---|---|---|---|---|
| | **I1** | **I5** | **I10** | **I15** |
| INPUT | 0–1 AAC | 0–5 AAC | 0–10 AAC | 0–15 AAC |

## 3.3. Principle of operation

**Area of application**

The DT1622 Ix Loop powered AC Current Transmitters, - depend the input (see the Chapter **3.2. Type designation**) - provide an output signal proportionally with the TRMS value of the input AC (50 Hz) current (CAT III).
The instruments are two wired loop powered transmitter, the energy taking from a 4-20 mA loop.

The measuring ranges can you see on chapter **8.1. Technical specification**. Different measuring ranges are available.

The input and the output are galvanic isolated from each other.

**Operating principle**

The device connects with isolated current input to measured network. The isolated current input is a high bandwidth transformer.
The signal of current transformers goes trough the signal condition and protection circuit to high speed AD converter. The AD converter resolution is 16 bits.
The digitalized signal is processing by 16 bits RISC microcontroller. The microcontroller creates the True RMS value of measured signal. The microcontroller - Proportional of True RMS value - generating a pulsewidth modulated signal to analogue outputs circuit. The analogue outputs circuit makes 4-20 mA current it the current loop.

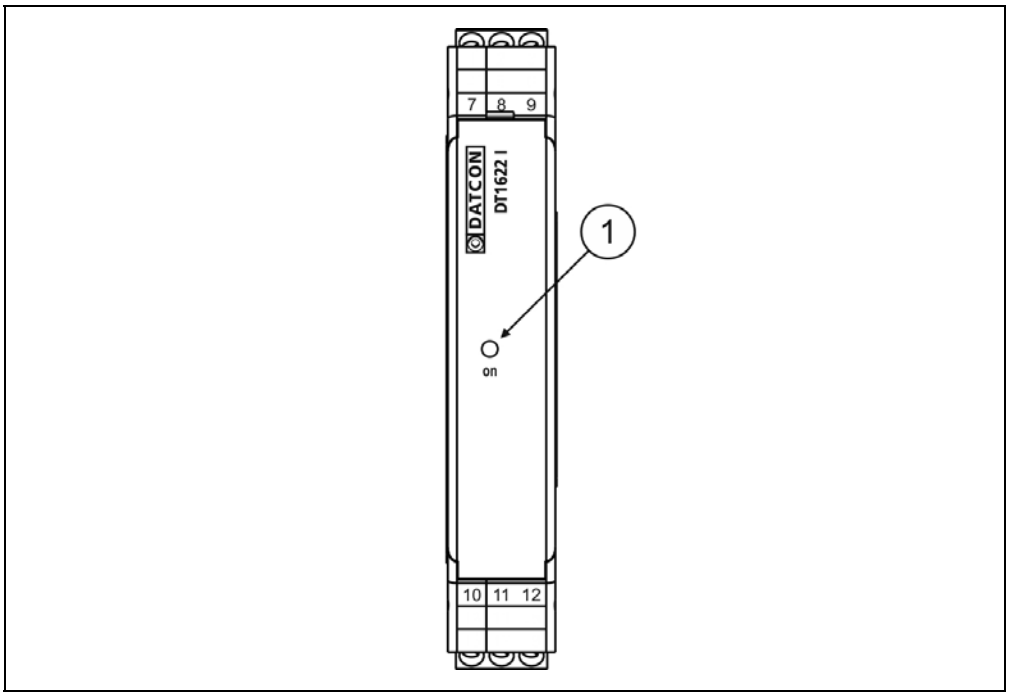
The devices is produced the energy supply and the reference voltage from 4-20 mA loop current.

**Power supply**

The power supply range is: 12-30 VDC max 25 mA.

### 3.4. Indicators

The following figure shows the frontpanel:




1. The green indicator light signal ”on” to be interpreted as follows:

**Normal state:**
The green LED light.

**Erros state:**
The green LED blinking. The numbers of flashes indicate the errors.
**1 flash:** serious error. The fault can only be rectified by Datcon.
**4 flashes:** The measured signal is outside of the measuring range.

### 3.5. Adjustment

The DT1622 Ix doesn’t need any adjustment. After connected to the power supply it is ready to work.

### 3.6. Store and transport

This instrument should be stored and transport in places whose climatic conditions are in accordance with chapter
**8.1. Technical specification** as described under the title: Environmental condition.

The packaging of DT1622 Ix consist of environment-friendly, recyclable cardboard is used to protect the instrument against the impacts of normal stresses occurring during transportation. The corrugated cardboard box is made from environment-friendly, recyclable paper. The inner protective material is nylon, which should be disposed of via specialized recycling companies.

# 4. Mounting

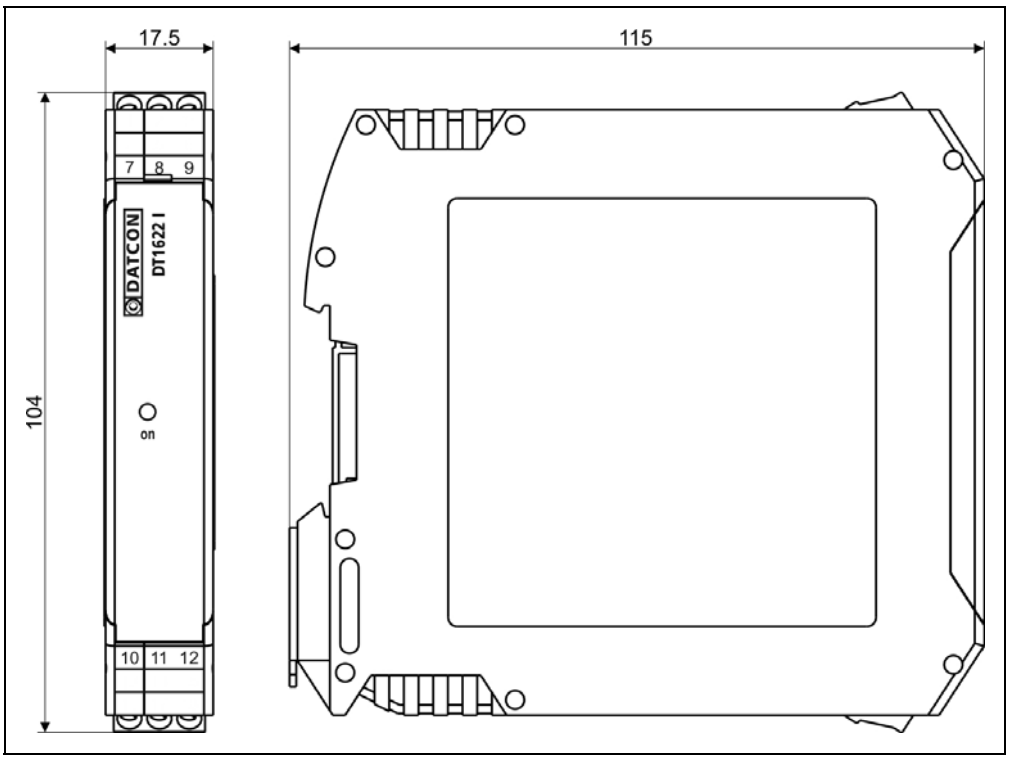
## 4.1. General instructions

The instrument should be installed in a cabinet with sufficient IP protection, where the operating conditions are in accordance with chapter **8.1. Technical specification**, as described under the title: Operating conditions.

**Mounting position**

The DT1622 Ix is built in a plastic housing, for mounting on TS-35 rail. The instrument should be mounted in vertical position (horizontal rail position).

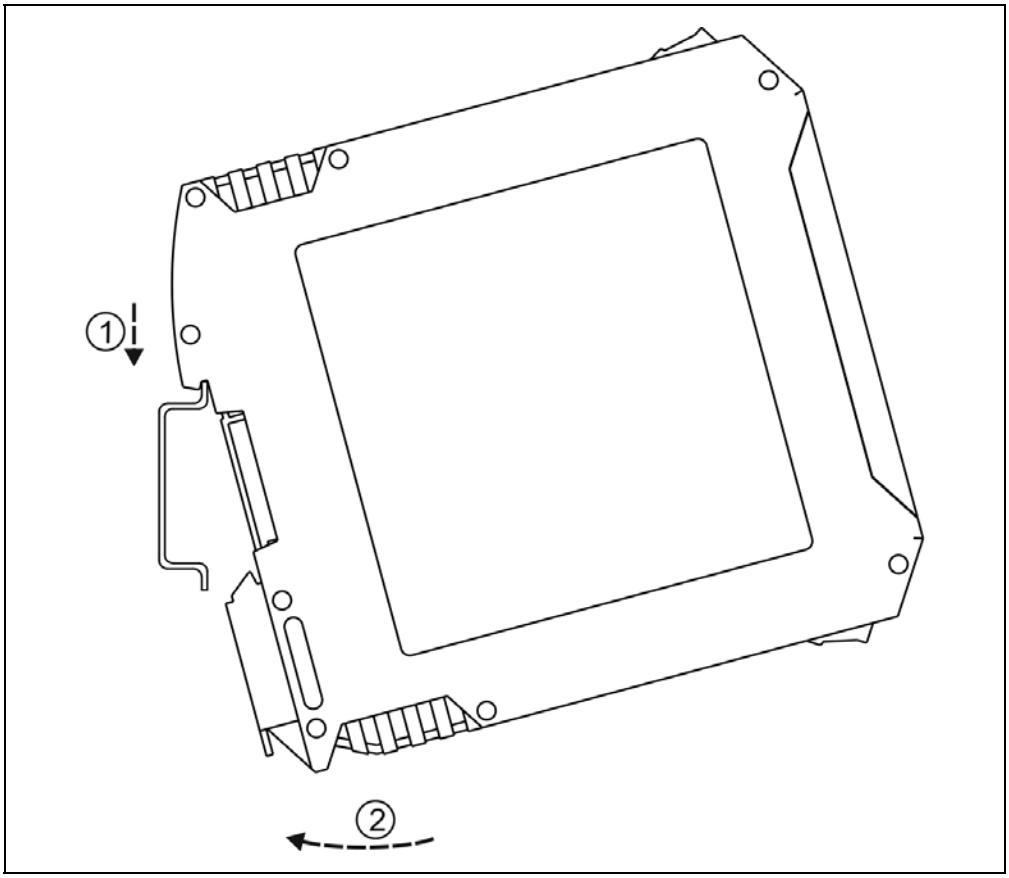
## 4.2. Main dimensions of the instrument



### 4.3. Mounting procedure

The following figure shows the mounting procedures (fixing on the rail):

**Mounting on the rail**




The mounting doesn't need any tools.
1. Tilt the instrument according to the figure; put the instrument's mounting hole onto the upper edge of the rail (figure step 1.).
2. Push the instrument's bottom onto the bottom edge of the rail (figure step 2.), you will hear the fixing assembly closing.
3. Check the hold of the fixing by moving the instrument firmly.

# 5. Connecting

## 5.1. Preparing the connection

Always observe the following safety instructions:

- The connection must be carried out by trained and authorized personnel only
- Connect only in the complete absence of supply voltage
- Take note the data concerning on the overcurrent protection in installation
- Use only a screwdriver with appropriate head

**Select connection cable**

Take note the suitability of the connecting cable
(Wire cross-section, insulation, etc.).
The cross-section of the connecting wires specified in the following table

| Connector | Wire cross-section |
|---|---|
| Current measurement input | 2.5-4.5 $mm^2$ |
| Analogue output | > 0.25 $mm^2$ |

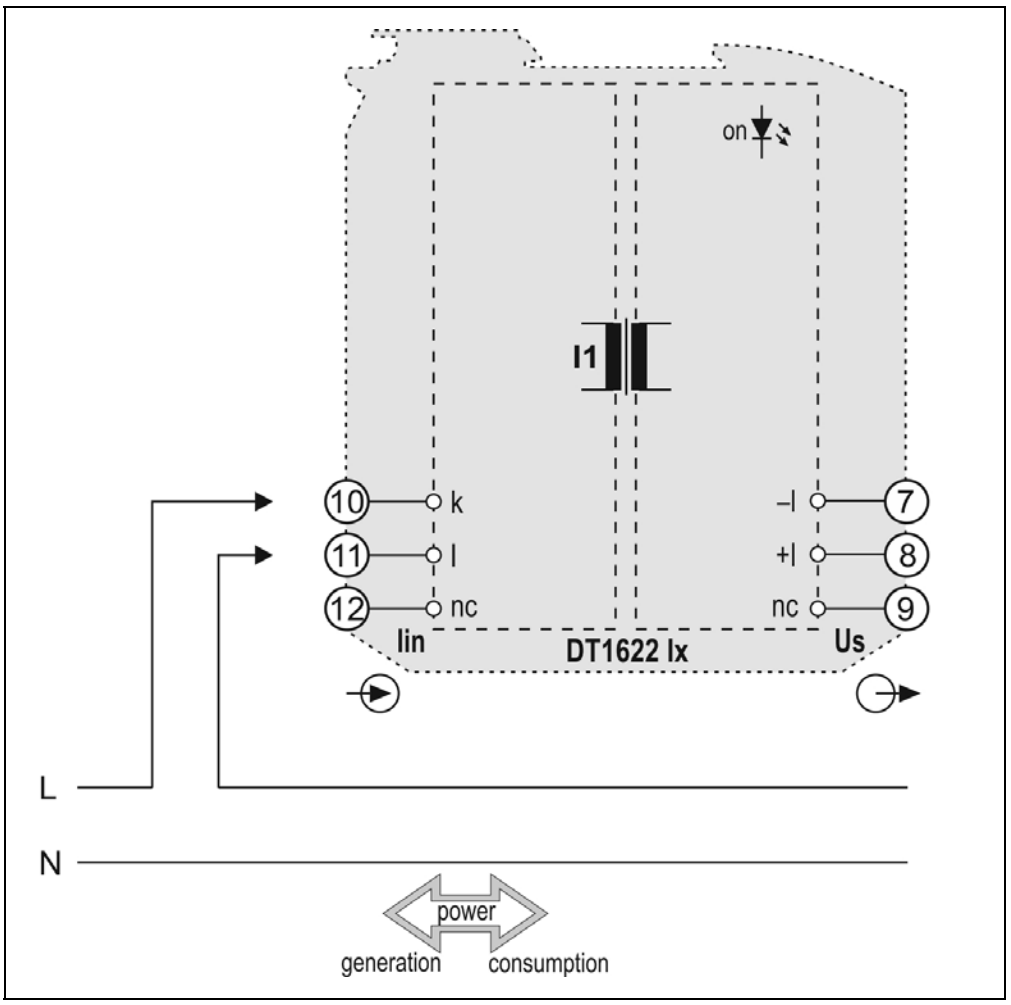
You may use either solid conductor or flexible conductor.
In case of using flexible conductor use crimped wire end.
Strip approx. 8 mm insulation.

It's an important rule that the power cables and signal cables should lead on a separate way.

### 5.2. Connecting the measuring inputs to power network

The following figure shows the wiring plan, connecting the instrument to power network.

**Wiring plan, Connecting the current inputs to power network.**




1. Loosen terminal screws.
2. Insert the wire ends into the open terminals according to the wiring plan.
3. Screw the terminal in.
4. Check the hold of the wires in terminals by pulling on them firmly.

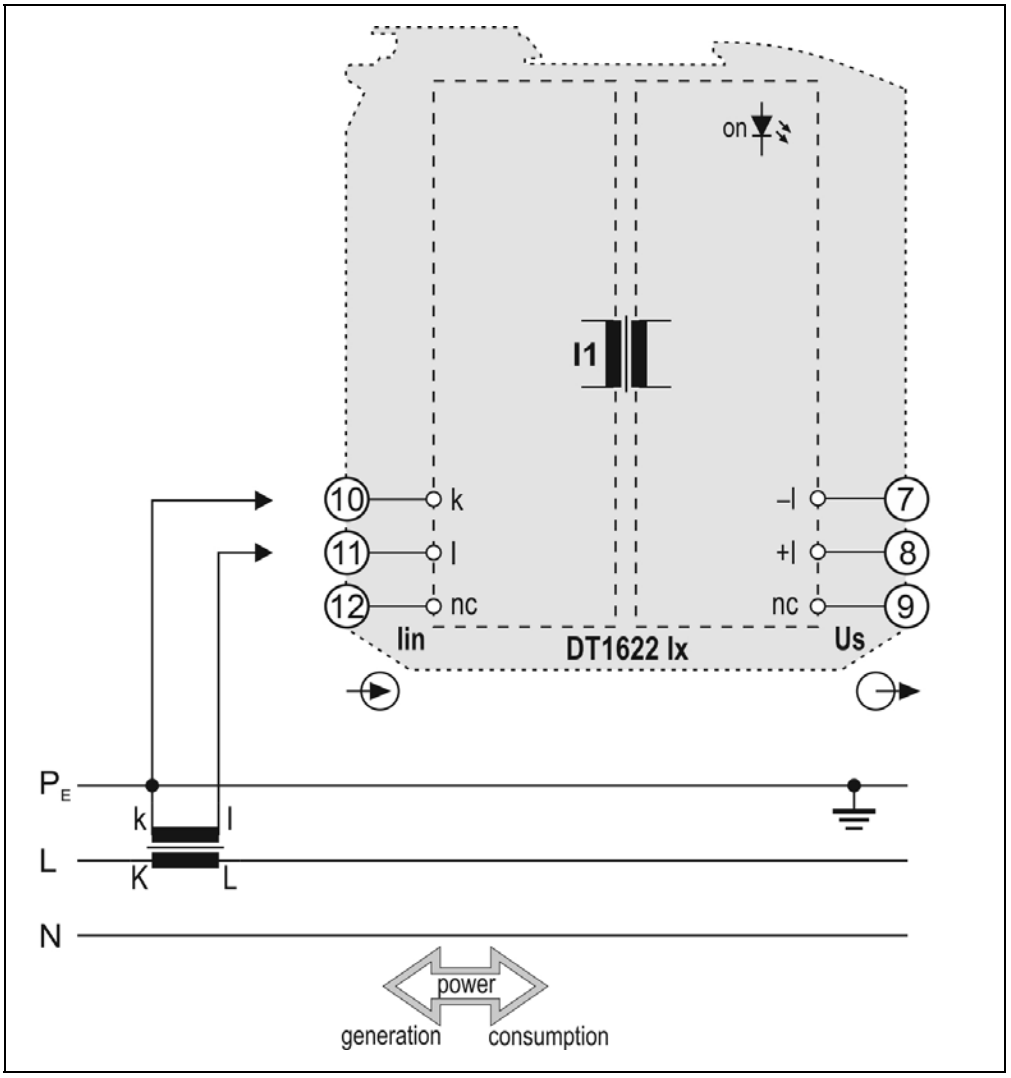
**Checking the connections**

Check if the cables are connected properly (have you connected all the cables, have you connected to the right place, do not the cable-ends touch each other).

### 5.3. Connecting the measuring inputs to power network trough CT

The following figure shows the wiring plan, connecting the instrument to power network.

**Wiring plan, Connecting the current inputs to power network.**




**The terminal “k” of CT you have to connecting to earth!**

1. Loosen terminal screws.
2. Insert the wire ends into the open terminals according to the wiring plan.
3. Screw the terminal in.
4. Check the hold of the wires in terminals by pulling on them firmly.

**Checking the connections**

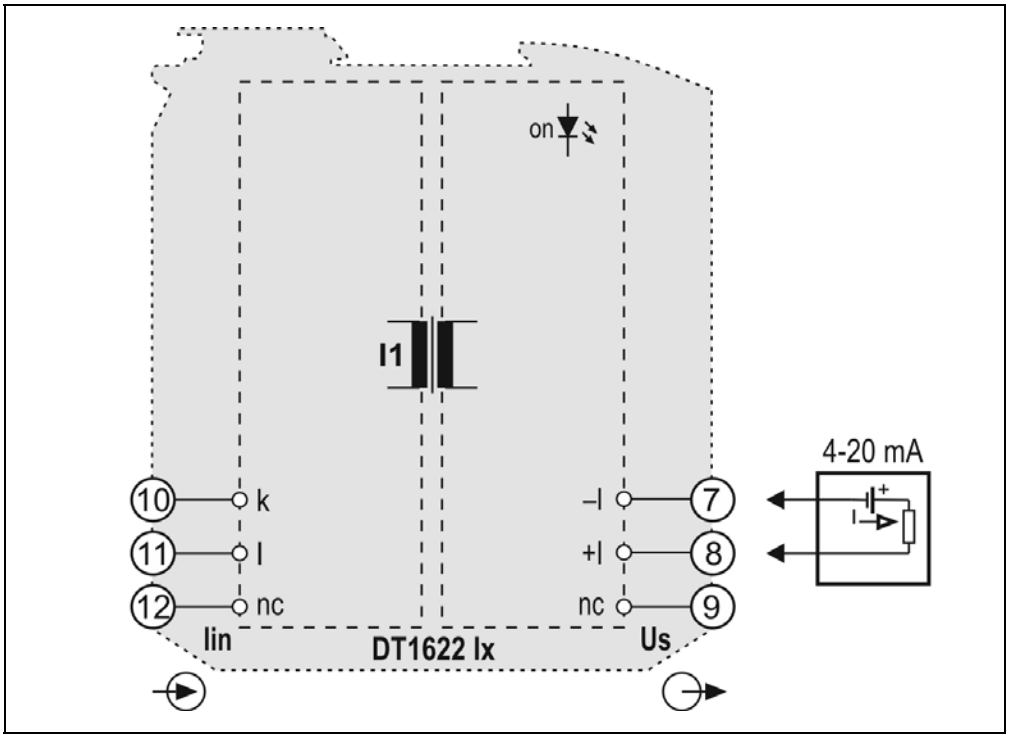
Check if the cables are connected properly (have you connected all the cables, have you connected to the right place, do not the cable-ends touch each other).

### 5.4. Connecting to signal processing unit and to power supply

The following figure shows the wiring plan, connecting the DT1622 Ix to signal processing unit and to power supply.

**Wiring plan, connecting to power supply.**

Ensure to correct polarity!




1. Loosen terminal screws.
2. Insert the wire ends into the open terminals according to the wiring plan.
3. Screw the terminal in.
4. Check the hold of the wires in terminals by pulling on them firmly.

**Checking the connections**

Check if the cables are connected properly (have you connected all the cables, have you connected to the right place, do not the cable-ends touch each other

### 5.5. Connecting to power supply

**Put the instrument under supply voltage**

After you have completed all the connections, put the instrument under supply voltage. If the connections are correct the green indicator gives light and you can detect an output signal according to the measured value by the instrument.

# 6. Fault rectification

## 6.1. Fault finding

The fault finding must be carried out by trained and authorized personnel only!

- The green indicator is dark → check the power supply.
If the supply voltage is OK: the instrument is defective.

- No output current→ check the power supply.
If the supply voltage is OK: the instrument is defective.
- The output current < 3.8 mA → check the minimal value of loop voltage. If the loop voltage is minimum 12 VDC and the output current lower 3.8 mA: the instrument is defective.

When the result of fault finding is that the DT1622 Ix Loop powered AC Current Transmitters is defective call the manufacturer service department.

## 6.2. Repairing

There is no user repairable part inside the instrument.

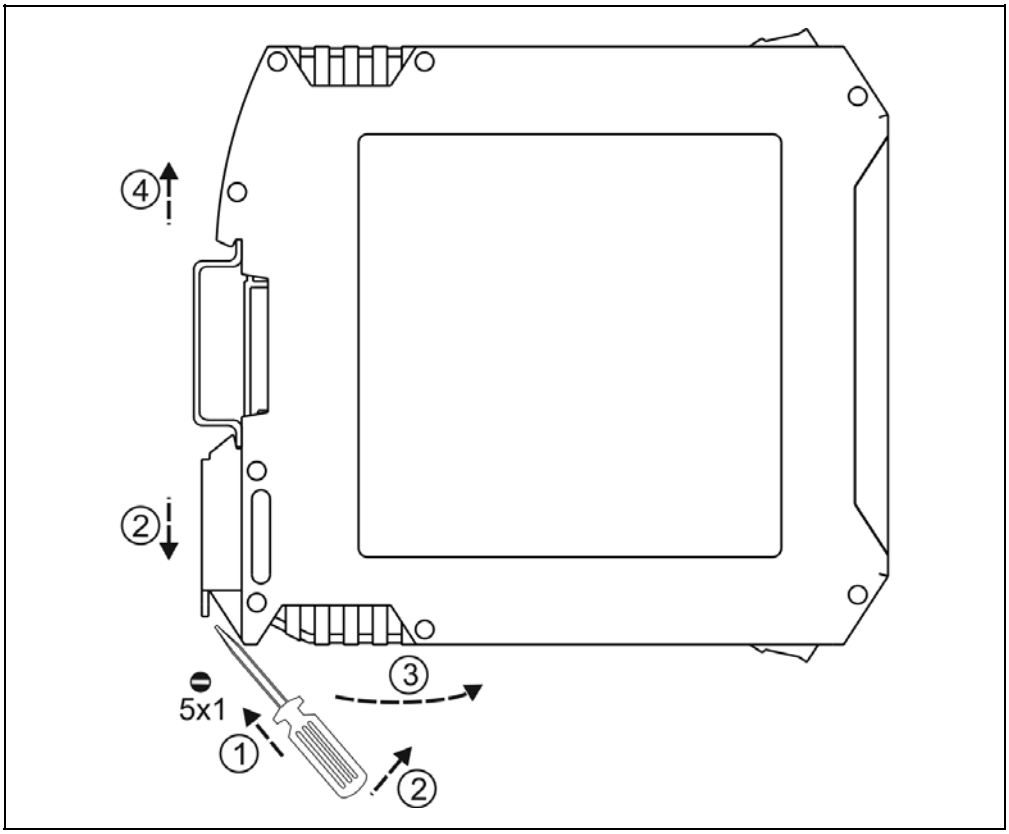
In accordance with Point **2.1.: For safety and warranty reasons, any internal work on the instrument must be carried out by DATCON personnel.**

# 7. Dismounting

## 7.1. Dismounting procedure

The following figure shows the dismounting procedures:

**Dismounting from the rail**




The dismounting procedure needs a screwdriver for slotted screws.
1. Before dismounting disconnect all wires.
2. Put the screwdriver end into the fixing assembly's hole (figure step 1.).
3. Lift the screwdriver handle until it possible to open the fixing assembly (figure step 2.).
4. Keeping the screwdriver in this position lift the instrument bottom from the bottom edge of the rail (figure step 3.).
Lift the whole instrument (you may put out the screwdriver) (figure step 4), the instrument will be free.

## 7.2. Disposal

According with the concerning EU directive, the manufacturer undertakes the disposal of the instrument that are manufactured by it and intended to be destroyed. Please deliver it in contamination-free condition to the site of the Manufacturer or to a specialized recycling company.

# 8. Appendix

## 8.1. Technical specification

**Safety data:**

The connection terminals of the inputs, the outputs and the supply voltages are galvanic isolated from each other. The isolation of the measuring inputs and the power supply input are in accordance with the standard EN 61010-1, taking into consideration the following:

| | |
|---|---|
| Pollution level: | 2 |
| Measurement category: | CAT III |

**Input parameters:**

| | |
|---|---|
| Input signal: | Alternating current |
| Input current range: | See chapter **3.2. Type designation** |
| Long-term overdrive rating (continuous): | |

| Type | I max [A] |
|---|---|
| I1 | 2 AAC |
| I5 | 10 AAC |
| I10 | 20 AAC |
| I15 | 20 AAC |

| | |
|---|---|
| Short-term overdrive rating (1 sec): | 100 AAC @ 1 sec |
| Consumption of the input: | maximum 0.25 VA |

**Loop powered analogue output**

| | |
|---|---|
| Output type: | Galvanic isolated loop current output |
| Ranges: | direct current, 4-20 mA |
| Characteristic: | linear |
| Accuracy (end of range): | 0.2% |
| Temperature coefficient: | 85 ppm / ˚C (0-60 °C) |
| Supply voltage: | 4-20 mA loop (U = 12-30 VDC) |
| Current limit: | 25 mA |
| Output overvoltage protection: | 35 V (limited) |
| Maximum value of serial resistor: | $R_{max}$ = (U - 4 V) / 0.02 A [Ohm] |
| Isolation test voltage: | 4 kV |

**Ambient conditions:**

| | |
|---|---|
| Operating temperature range (Ta): | 0-60 °C (-20 - +60 °C to order) |
| Storage temperature range: | -20 - +70 °C |
| Relative humidity: | 90% (max., no condensing) |
| Place of installation: | cabinet |

**Electromagnetic compatibility (EMC): in accordance with the standard EN 61326-1**

**Emission:** in accordance with the standard EN 61326-1

| | | |
|---|---|---|
| Conducted: | EN 55011<br>Limits for Class „A" equipments | |
| Radiated: | EN 55011<br>Limits for Class „A" equipments | |

**Immunity:** in accordance with the standard EN 61326-1

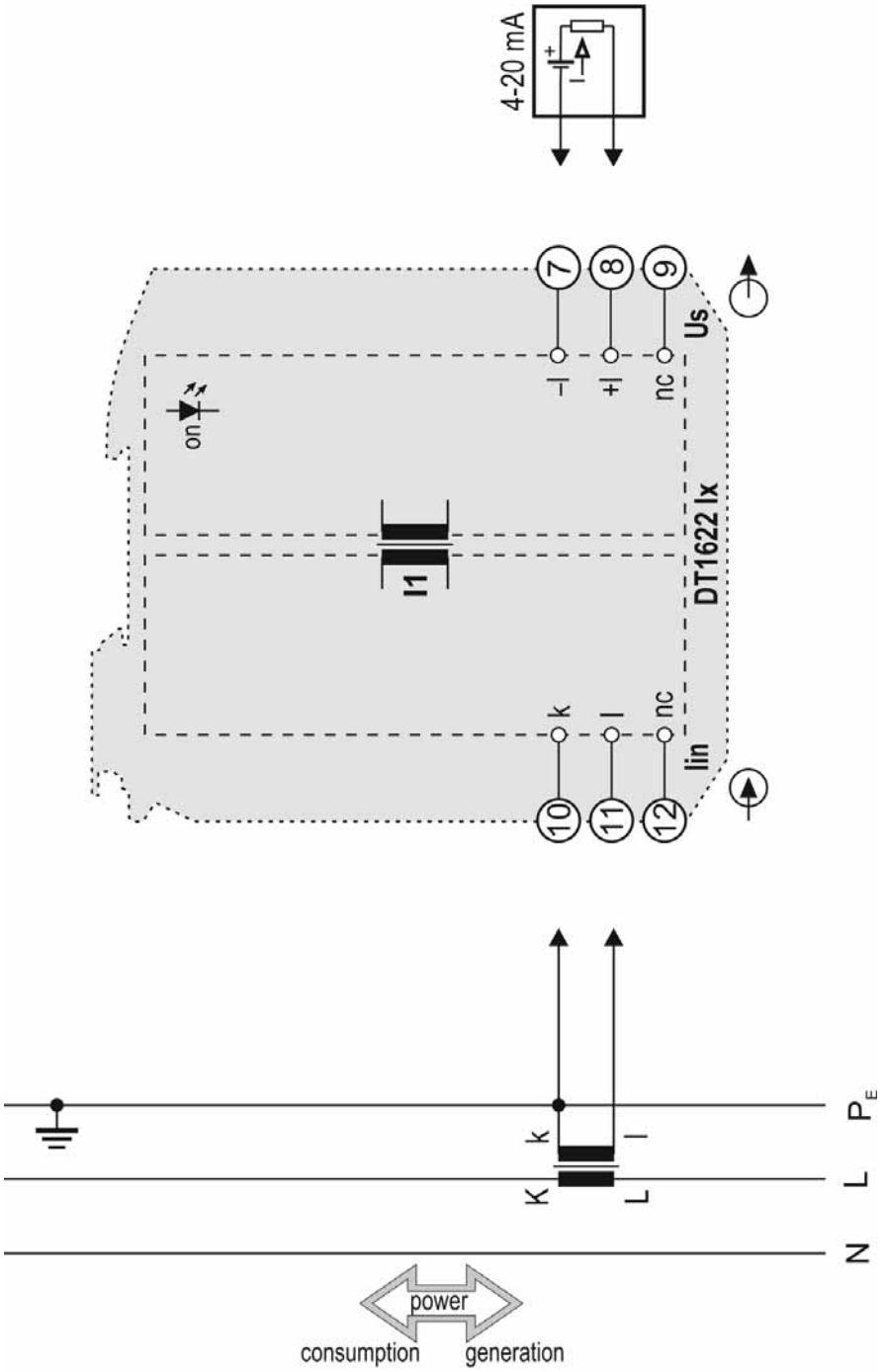
| | | |
|---|---|---|
| ESD: | 4 kV / 8 kV contact / air | -A- criteria |
| BURST: | | |
| - Power measure input | 2 kV (5/50 ns, 5 kHz) | -A- criteria |
| - Analogue output | 1 kV (5/50 ns, 5 kHz) | -A- criteria |
| SURGE: | | |
| - Power measure input | 4 kV (CATIII, 250 V) | -B- criteria |
| - Analogue output | 1 kV (line to ground) | -B- criteria |
| Conducted RF immunity: | 3 Veff | -A- criteria |
| Conducted RF emission | 1 group, Class B | |
| Radiated RF immunity | E =10 V/m | -A- criteria |
| Radiated RF emission | 1 group, Class B | |

**General data**

| | |
|---|---|
| Housing: | TS-35 rail mounting housing<br>material: polyamide PA6.6 |
| Connection: | Screw-terminal |
| Dimension: | 17.5 x 104 x 115 mm<br>(width x height x depth) |
| Weight: | 0.1 kg |
| Protection: | IP 20 |
| Connection cable: | |
| Measuring input : | max. 4 $mm^2$ |
| Analogue output: | 0.25-1.5 $mm^2$ |

The Manufacturer maintains the right to change technical data.

### 8.2. Application example



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