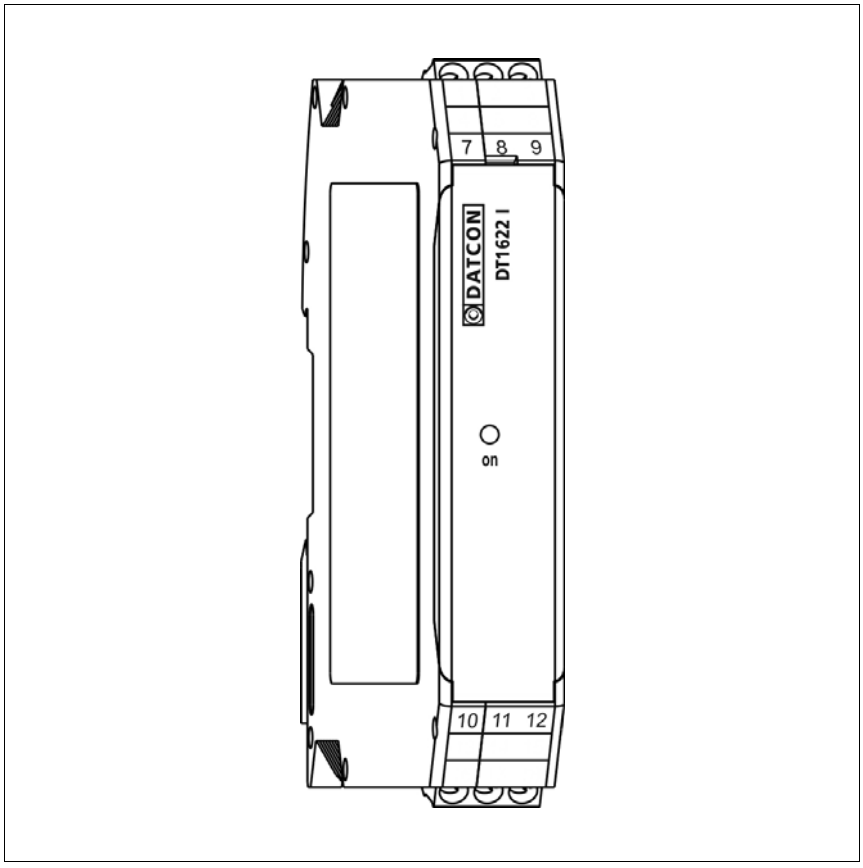
DATCON
INDUSTRIAL MEASUREMENT

DT1622 Ux

Loop powered AC Voltage Transmitters

Operating Instructions



CE

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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 Ux Loop powered AC Voltage 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 Ux Loop powered AC Voltage 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 Ux Loop powered AC Voltage 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 Ux Loop powered AC Voltage Transmitters is in conformity with the provisions of the following standards:
EN 61326:2014 (EMC)
EN 61010:2011

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 Ux
- documentation:
  this operating instructions manual
  certification
  warranty

3.2. Type designation

DT1622 □	RANGE		
	U125	**U250**	**U450**
INPUT	0-125 VAC	0-250 VAC	0-450 VAC

3.3. Principle of operation

Area of application

The DT1622 Ux Loop powered AC Voltage 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) voltage (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 voltage input to measured network. The isolated voltage input is a high bandwidth transformer.
The signal of voltage 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 in the current loop.

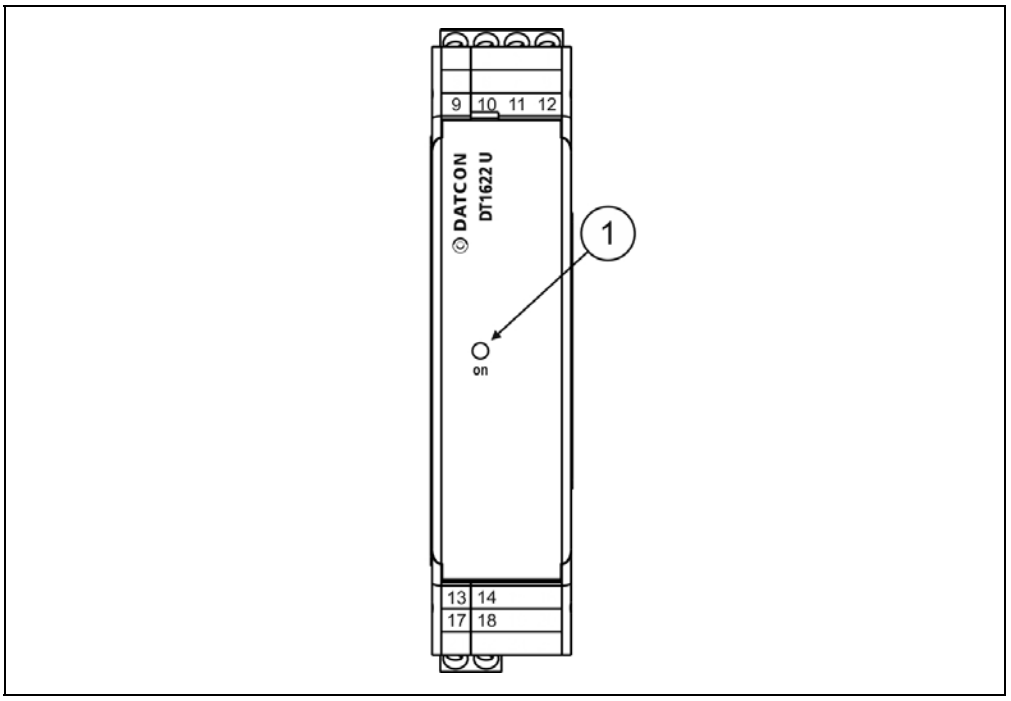
The devices is produced the energy supply and the reference voltage from 4-20 mA loop current.

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.

Errors 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 Ux 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 Ux 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

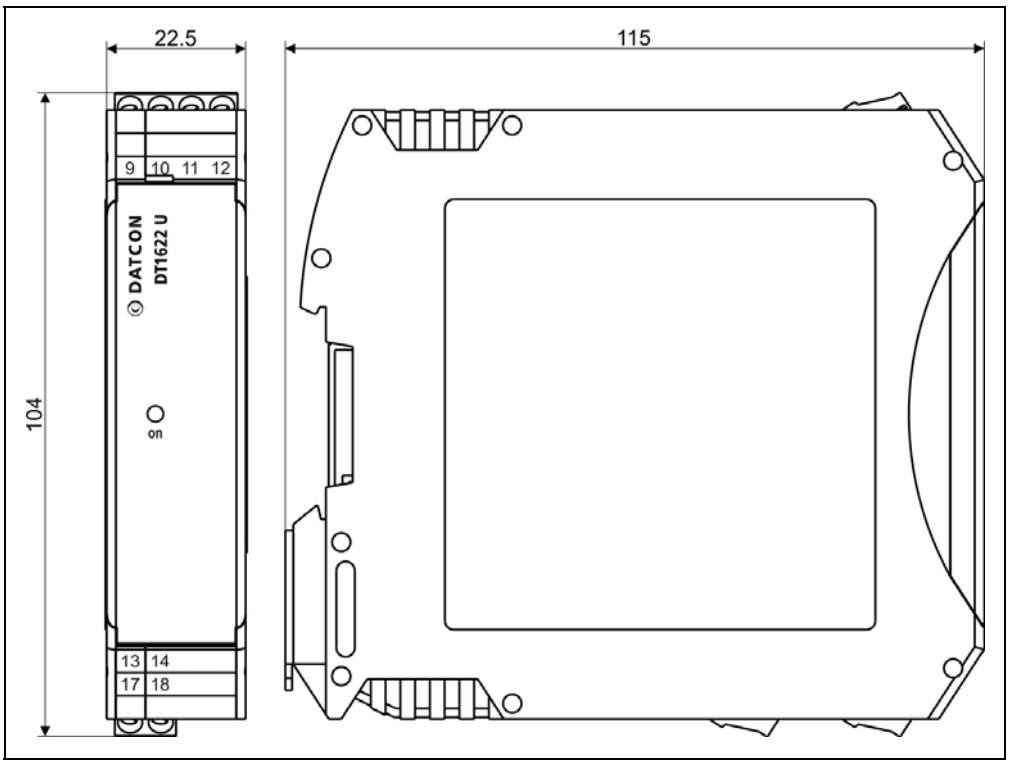
4.1. General instructions

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

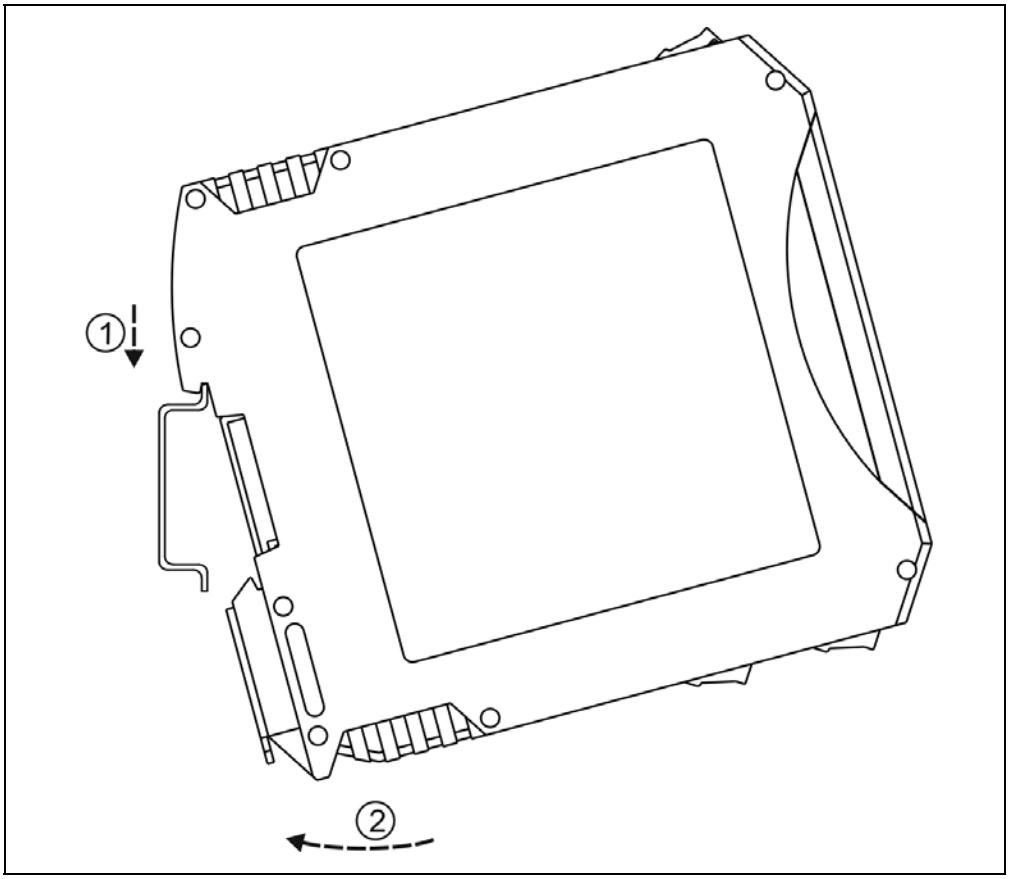
4.2. Main dimensions of the instrument



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

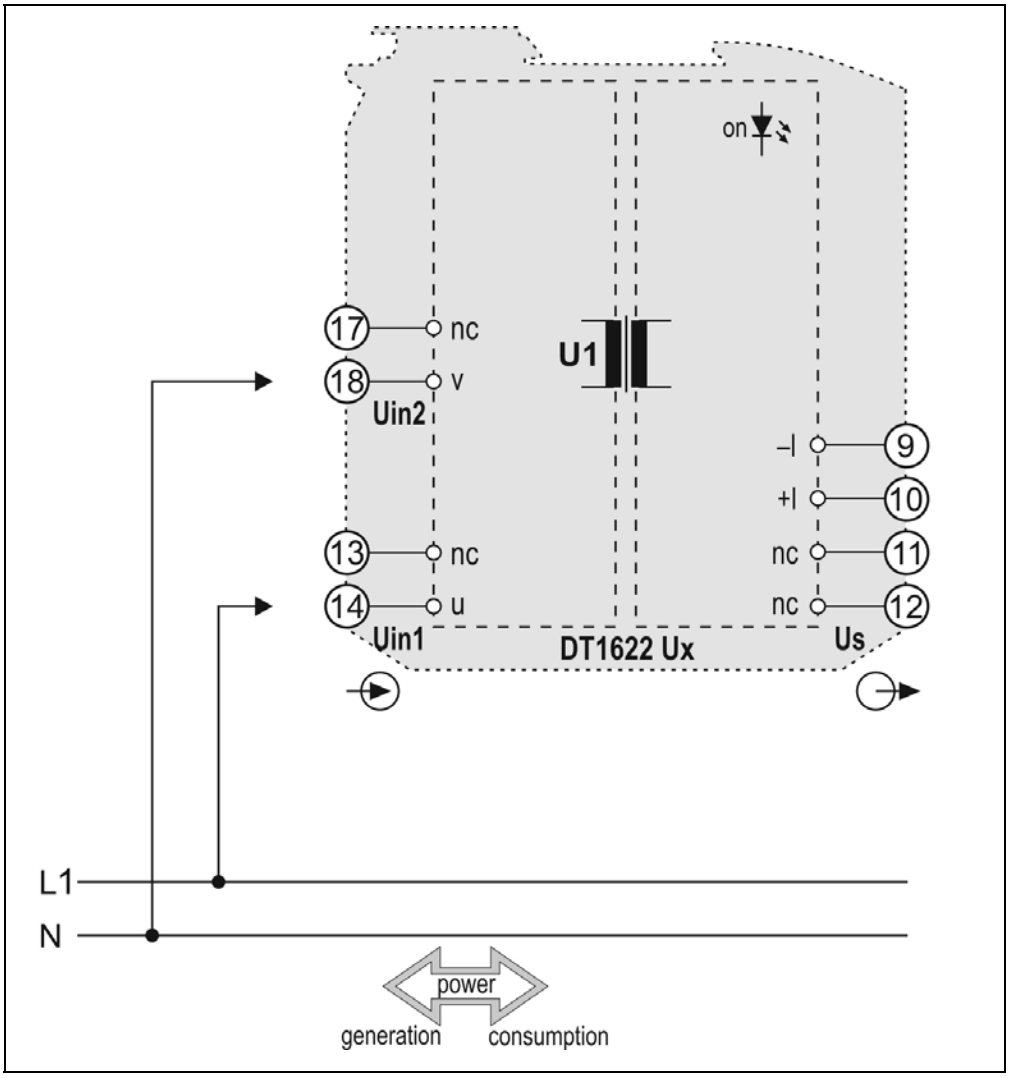
You may use either solid conductor or flexible conductor.
In case of using flexible conductor use crimped wire end.
Strip approx. 8 mm insulation.

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 single phase power network

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

Wiring plan, Connecting the voltage 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.

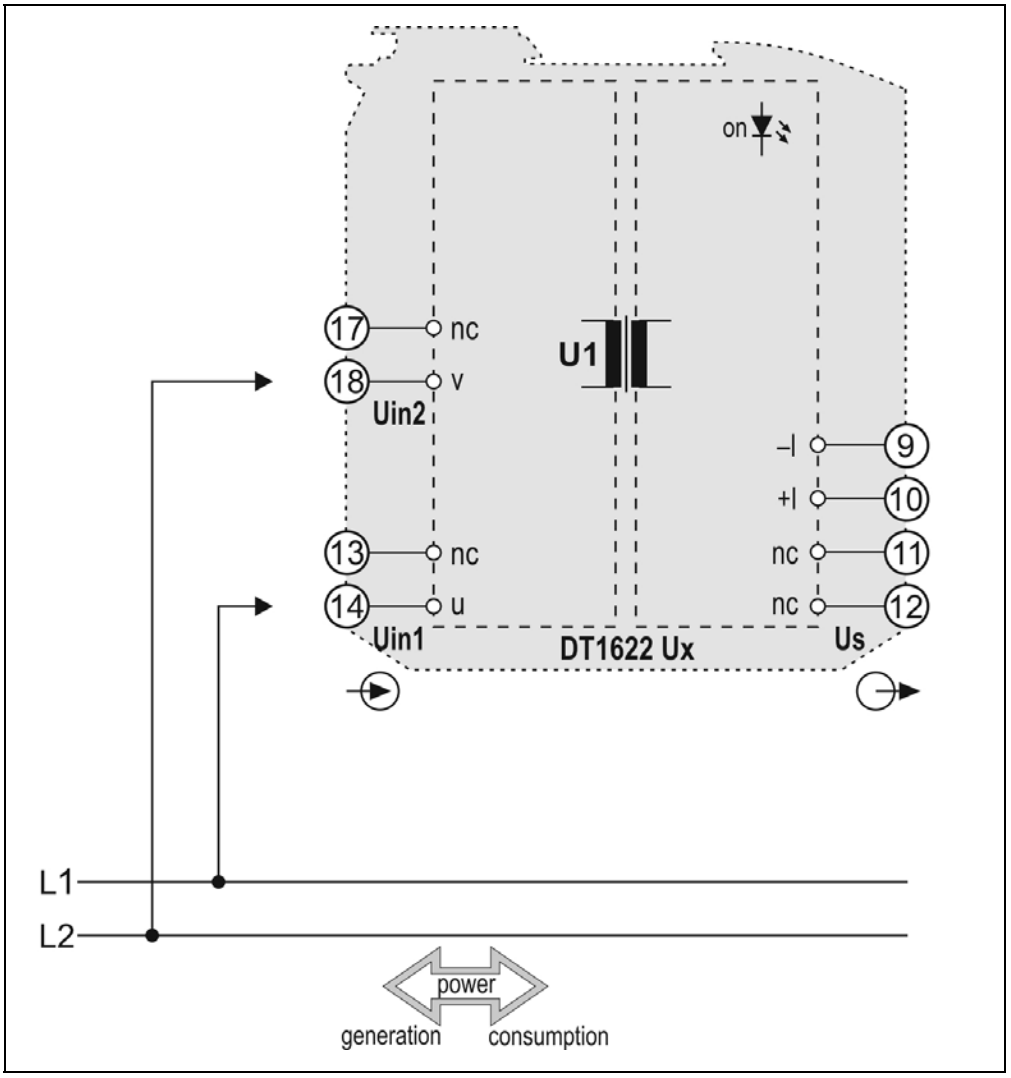
Checking the connections

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 low voltage three phase power network

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

Wiring plan, Connecting the voltage 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.

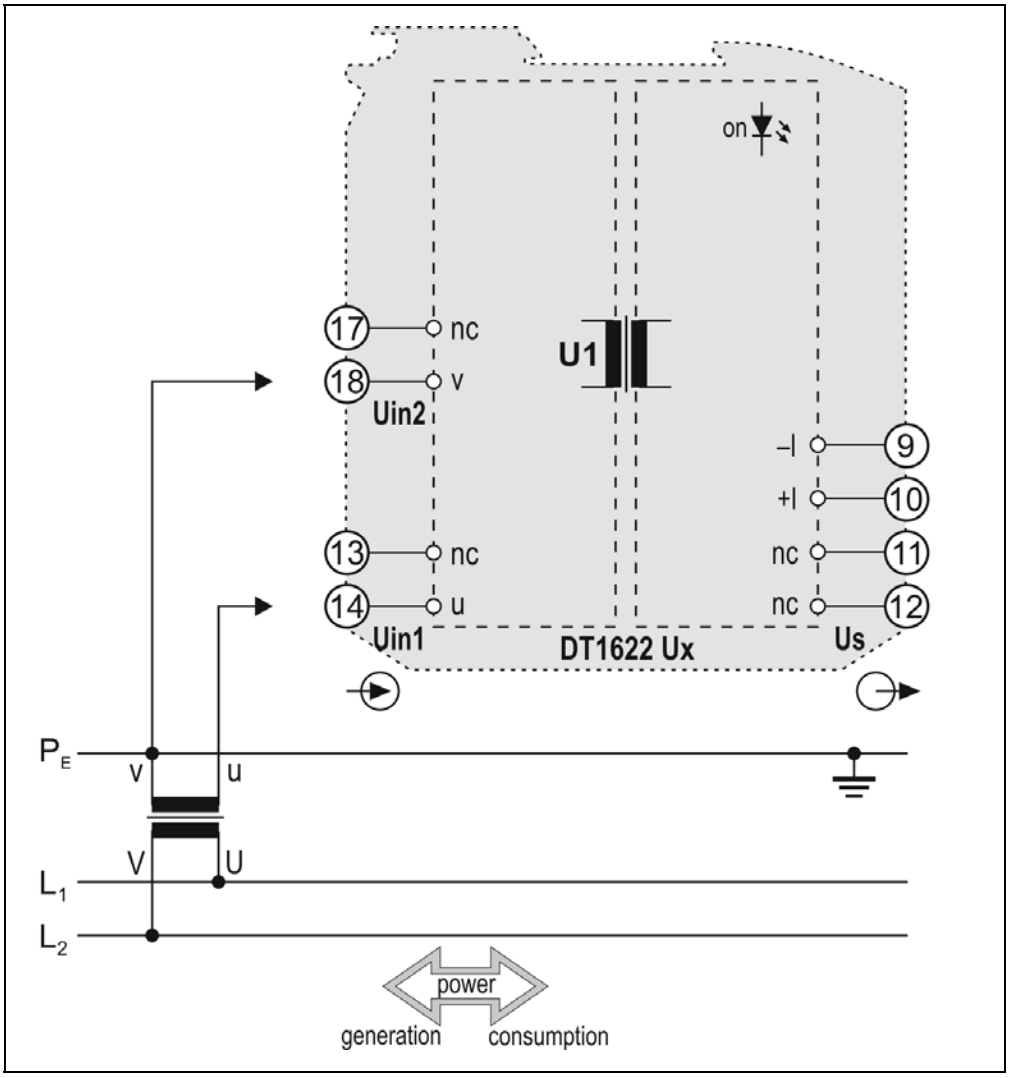
Checking the connections

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).

5.4. Connecting the measuring inputs to three phase power network trough VT

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

Wiring plan, Connecting the voltage inputs to power network.



The terminal “v” of VT 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

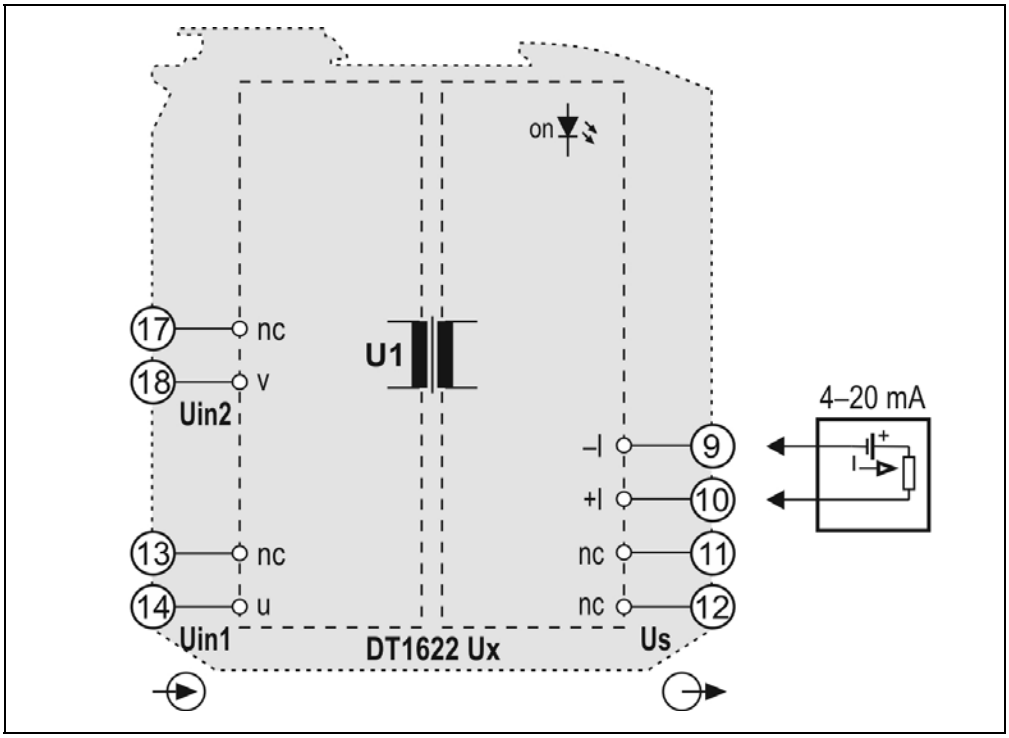
Check if the cables are connected properly (have you connected all the cables, have you connected to the right place, do not the cable-ends touch each other).

5.5. Connecting to signal processing unit and to power supply

The following figure shows the wiring plan, connecting the DT1622 Ux 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.

5.6. 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 Ux Loop powered AC Voltage Transmitters is defective call the manufacturer service department.

6.2. Repairing

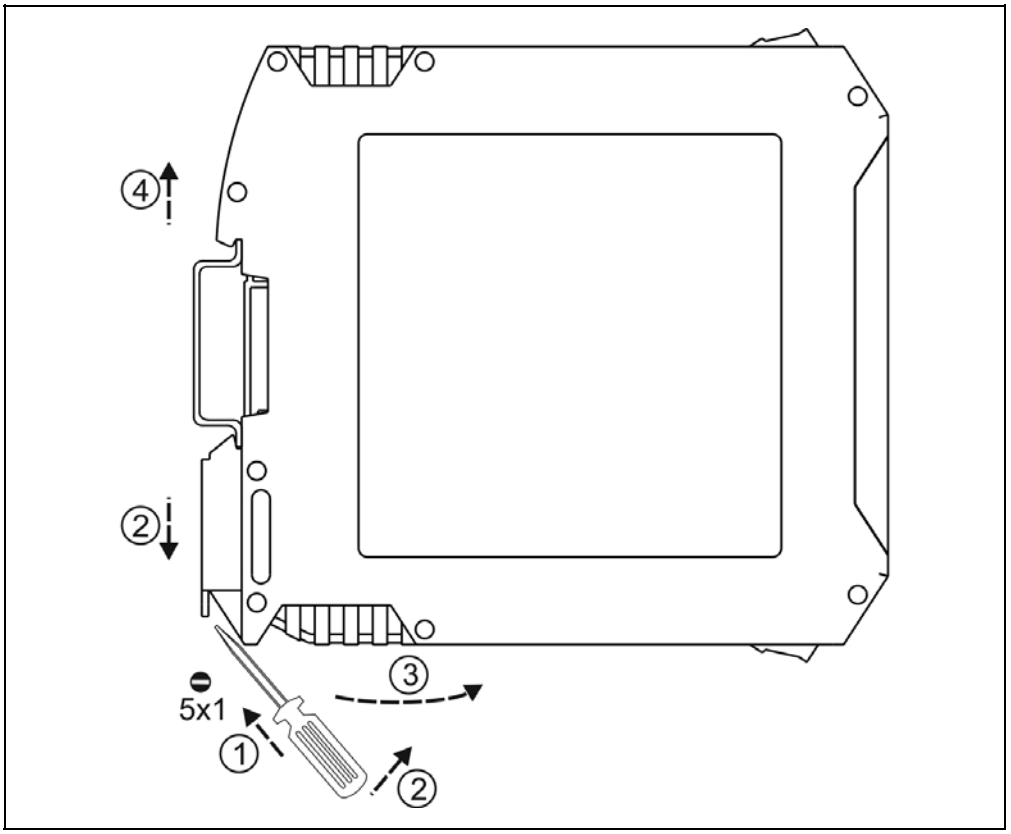
There is no user repairable part inside the instrument.
In accordance with Point **2.1.: For safety and warranty reasons, any internal work on the instrument must be carried out by DATCON personnel.**

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 61010-1:2011, taking into consideration the following:

Pollution level:	2
Measurement category:	CAT III

Input parameters:

Input signal:	Alternating voltage
Input current range:	See chapter **3.2. Type designation**
Short-term overdrive rating (1 sec):	

Type	I max [A]
U125	250 VAC
U250	300 VAC
U450	500 VAC

Long-term overdrive rating (continuous):	500 AVC @ 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 61326-1:2014

Emission: in accordance with the standard EN 61326-1:2014

Conducted:	EN 55011:2010 Limits for Class „A" equipments	
Radiated:	EN 55011:2010 Limits for Class „A" equipments	

Immunity: in accordance with the standard EN 61326-1:2014

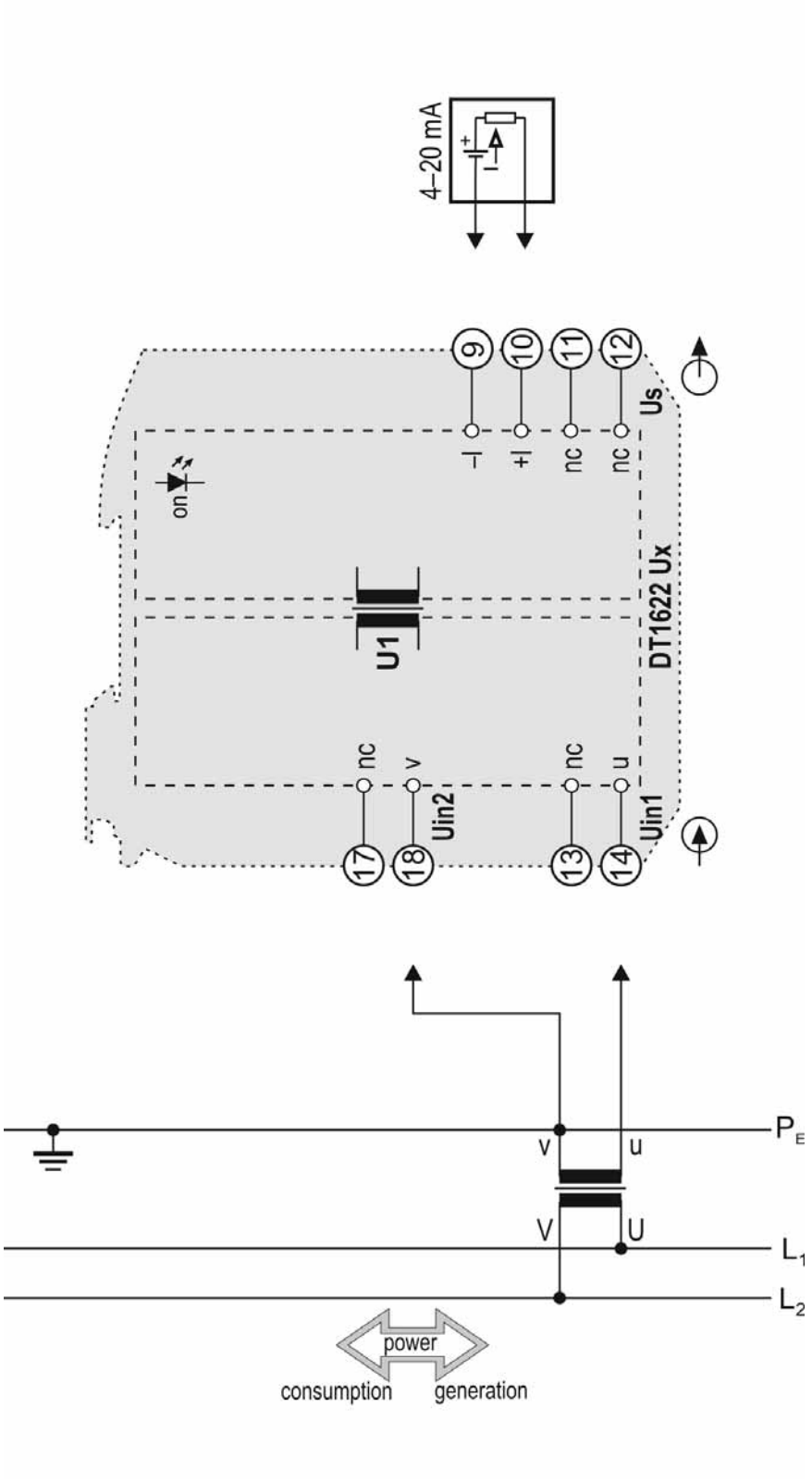
ESD:	4 kV / 8 kV contact / air	-A- criteria
BURST:		
- Power measure input	2 kV (5/50 ns, 5 kHz)	-A- criteria
- Analogue output	1 kV (5/50 ns, 5 kHz)	-A- criteria
SURGE:		
- Power measure input	4 kV (CATIII, 250 V)	-B- criteria
- Analogue output	1 kV (line to ground)	-B- criteria
Conducted RF immunity:	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 material: polyamide PA6.6
Connection:	Screw-terminal
Dimension:	22.5 x 104 x 115 mm (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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