

Description

The digital power measuring transducer AD-LU 620 GVF measures all quantities of the three-phase network (current, voltage, energy, harmonics, phase angle, active power, reactive power, apparent power) and converts these measuring values onto two freely scalable analogue outputs. With the integral relay and transistor output, the switching of limiting values or the output of energy pulses is possible. The unit is therefore optimal suitable for integration in energy management systems. For measuring of high voltages or high currents, external transformers can be connected in series at any time. All measuring ranges and outputs can be freely parameterized. This can be carried out via the optional operating modul AD-VarioControl or via the programming software AD-Studio. The LEDs at the front signals the operating condition and the relay-status. The compact type of construction and the high performance ability with simultaneous low energy consumption allows usage in almost any application.

Application

Typical usage in plant, machines or energy management systems for balancing and determination of energy distribution.



Specific characteristics

- Connection of 3 phases with neutral, any load
- Measuring quantities: effective power, reactive power, apparent power, currents and voltages, frequency, power factor, harmonics, energy metering
- current and voltage output
- relay or transistor output
- Counters for active power (consumption and infeed), reactive power (inductive and capacitive) and apparent power
- 33 mm narrow housing with detachable terminal clamp
- Operating module AD-VarioControl as an accessory

Business data

Order number

AD-LU 620 GVF

Accessory (optional)

Operating module [AD-VarioControl](#)
 USB programming adapter [AD-VarioPass](#)
 Configuration software [AD-Studio](#)

Technical specifications

Current-inputs (I1...I3)

Measuring ranges 0 ... 1 A AC; 0 ... 5 A AC
 Max. measurable harmonic 40

Voltage-inputs (L1...L3)

Measuring range 10 ... 253 V AC
 Input resistance > 1 MOhm

Output current

Output range 0/4 ... 20 mA
 Max. load 400 Ohm
 Resolution 11 Bit
 Residual ripple 25 µAss

Output voltage

Output range 0/2 ... 10 V
 Min. load 10 kOhm
 Resolution 11 Bit
 Residual ripple 20 mVss

Semiconductor output

Maximum switching load DC 30 V, 50 mA
 Pulse length min ... max 50 ms ... 10000 ms

Relay output

Maximum switching load AC 250 V, 2 A
 Maximum switching load DC 50 V, 2 A
 Contact construction potential-free changeover
 Switching operations mechanical
 At 230V/2A AC, cos(phi)=1 $6 \cdot 10^5$
 At 230V/2A AC, cos(phi)=0,4 $2 \cdot 10^5$
 At 24V/2A DC $2 \cdot 10^5$
 Pulse length min ... max 500 ms ... 10000 ms

Supply

Voltage range AC 50 ... 253 V AC, 50/60 Hz
 Nominal voltage AC / DC 230 V AC / 24 V DC
 Voltage range DC 20 ... 253 V DC
 Power consumption AC / DC 4,6 VA / 2,4 W
 Power consumption with operating module AC / DC 4,8 VA / 2,6 W

Transmission behaviour

Basic accuracy < 0,5 % (class 0.5)
 Temperature influence 80 ppm/K
 Response time < 0,5 s

Technical specifications

Housing

| | |
|-------------------------------|--|
| Dimensions (WxHxD) | 33x110x134mm |
| With operating module (bxhxt) | 33x110x138 mm |
| Type of protection | IP 20 |
| Connection method | detachable terminal clamp |
| Terminals, wire cross section | 2,5 mm ² flex wire / 4 mm ² one wire |
| Bolting torque terminals | 0,5 Nm |
| Skinning length | 6 mm |
| Weight | ~ 190 g |
| Manner of fastening | 35 mm DIN rail 35mm |

Environmental conditions

| | |
|-----------------------|---------------------------------|
| Ambient temperature | -10 ... 50 °C |
| Storage and transport | -10 ... 70 °C (no condensation) |

EMC

| | |
|-------------------------|--------------------------------|
| Product family standard | EN 61326-1 ¹⁾ |
| Emitted interference | EN 55011, CISPR11 Cl. B, Gr. 1 |

¹⁾ During checking, slight signal deviations are possible.

Electrical safety requirements

| | |
|-------------------------|----------------|
| Product family standard | EN 61010-1 |
| Overvoltage category | II |
| Pollution degree | 2 |
| Safety measurement | EN 61010-2-030 |
| Measurement category | CAT III |

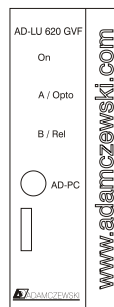
Galvanic isolation, test voltages

| | |
|---------------------------------|----------------------|
| Input to outputs / power-supply | 4 kV, 50 Hz (1 min.) |
| Power-supply to outputs | 3 kV, 50 Hz (1 min.) |
| Relay contacts to outputs | 3 kV, 50 Hz (1 min.) |

Protection circuits

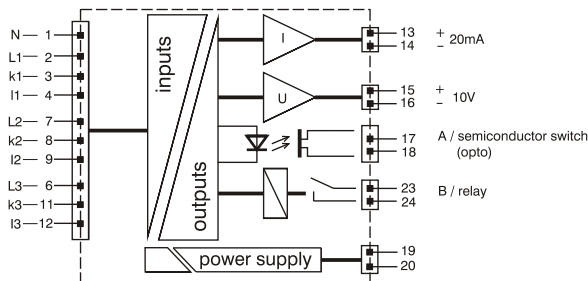
| | |
|----------------|--|
| Input | electrical surge protection |
| Power supply | protection against over-temperature, over-voltage and over-current |
| Analog outputs | electrical surge protection |

Display and operating elements

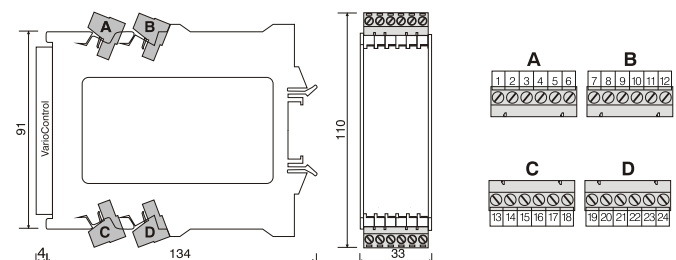


On: LED for operating display in green
 on - normal operation
 flashing - Signal failure, signal outside range limits
A / Opto: LED for semiconductor switch
 on - activated
B / rel: LED for relays
 on - activated
AD-PC: Communication interface for configuration by a PC
 Communication interface for VarioControl

Block and wiring diagram

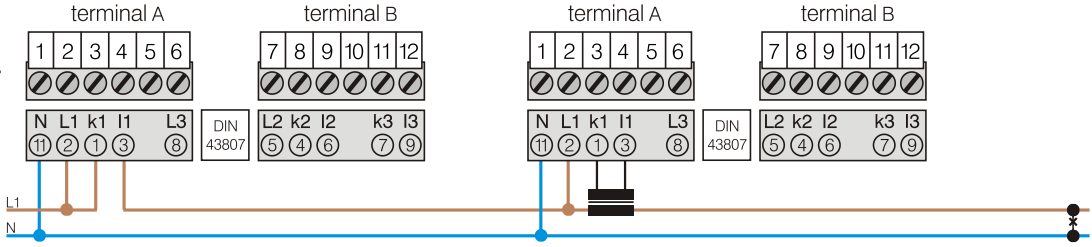


Dimensions

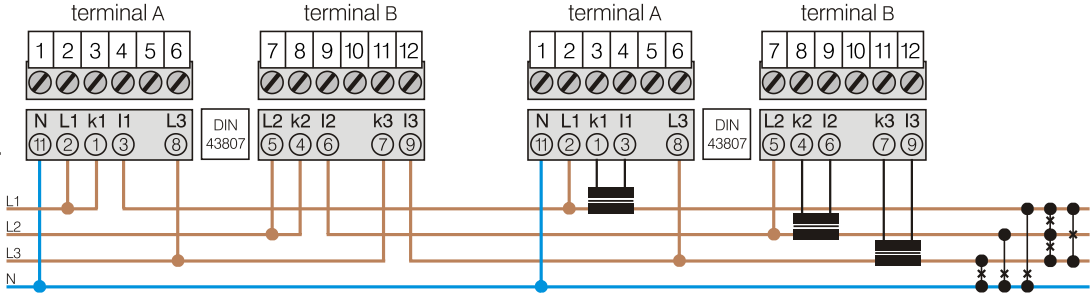


Circuit examples

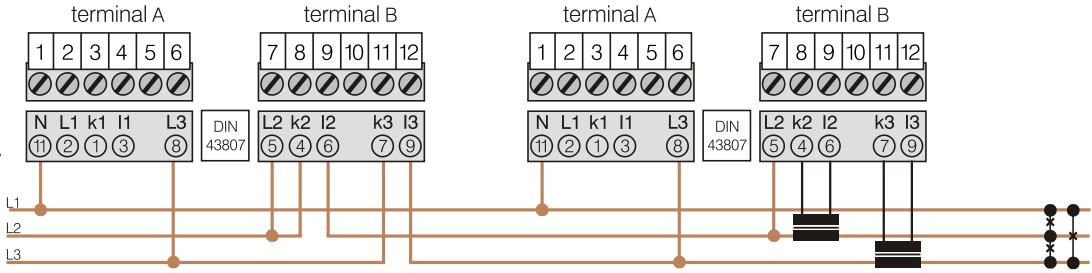
connection for
1 current transformer
(1 phase)



connection for
3 current transformer
in 4-wire system
(unsymmetric load)



connection for
2 current transformer
in 3-wire system
(unsymmetric load)
*Aron-circuit *1)*



*1) Attention: When using the Aron circuit, please observe the measured value list.
Only "bold"-written measured values can be used.

Modbus Communication

The optional AD-VarioConnect operating module has an RS-485 interface. The data is transferred via the Modbus RTU protocol, the AD-VarioConnect operating module represents a Modbus slave. Communication takes place according to the master-slave procedure and starts with a request from the master, e.g. from a PLC or a PC. Each bus participant must have a unique address. If a slave detects that its address has been addressed by the master, the slave always sends an answer. The slaves never communicate with each other. They are also not able to start a communication with the master.

The Modbus master can read out the individual registers of the AD-LU 620 GVF via the addresses.

The default standard data format is 19200,e,8,1 with slave address 1. These settings can be changed via the AD-VarioConnect operating module.

| Start address | Number of registers | Name | Unit | Data type | read | write |
|-------------------------|---------------------|--------------------------------|-------|-----------|------|-------|
| Measured values: | | | | | | |
| 40202 | 1 | digital output A | | 3 | 1 | 1 |
| 40203 | 1 | digital output B | | 3 | 1 | 1 |
| 40204 | 1 | digital output A LED | | 3 | 1 | 1 |
| 40205 | 1 | digital output B LED | | 3 | 1 | 1 |
| 40501 | 2 | active power total | kW | 7 | 1 | 0 |
| 40503 | 2 | active power total L1 | kW | 7 | 1 | 0 |
| 40505 | 2 | active power total L2 | kW | 7 | 1 | 0 |
| 40507 | 2 | active power total L3 | kW | 7 | 1 | 0 |
| 40509 | 2 | total reactive power | kvar | 7 | 1 | 0 |
| 40511 | 2 | reactive power L1 | kvar | 7 | 1 | 0 |
| 40513 | 2 | reactive power L2 | kvar | 7 | 1 | 0 |
| 40515 | 2 | reactive power L3 | kvar | 7 | 1 | 0 |
| 40517 | 2 | total apparent power | kVA | 7 | 1 | 0 |
| 40519 | 2 | apparent power L1 | kVA | 7 | 1 | 0 |
| 40521 | 2 | apparent power L2 | kVA | 7 | 1 | 0 |
| 40523 | 2 | apparent power L3 | kVA | 7 | 1 | 0 |
| 40525 | 2 | total power factor | | 7 | 1 | 0 |
| 40527 | 2 | power factor in L1 | | 7 | 1 | 0 |
| 40529 | 2 | power factor in L2 | | 7 | 1 | 0 |
| 40531 | 2 | power factor in L3 | | 7 | 1 | 0 |
| 40533 | 2 | total active fundamental power | kW | 7 | 1 | 0 |
| 40535 | 2 | active fundamental power L1 | kW | 7 | 1 | 0 |
| 40537 | 2 | active fundamental power L2 | kW | 7 | 1 | 0 |
| 40539 | 2 | active fundamental power L3 | kW | 7 | 1 | 0 |
| 40541 | 2 | total active harmonic power | kW | 7 | 1 | 0 |
| 40543 | 2 | active harmonic power L1 | kW | 7 | 1 | 0 |
| 40545 | 2 | active harmonic power L2 | kW | 7 | 1 | 0 |
| 40547 | 2 | active harmonic power L3 | kW | 7 | 1 | 0 |
| 40549 | 2 | voltage L1 | V | 7 | 1 | 0 |
| 40551 | 2 | voltage L2 | V | 7 | 1 | 0 |
| 40553 | 2 | voltage L3 | V | 7 | 1 | 0 |
| 40555 | 2 | current N line (calculated) | A | 7 | 1 | 0 |
| 40557 | 2 | current in L1 | A | 7 | 1 | 0 |
| 40559 | 2 | current in L2 | A | 7 | 1 | 0 |
| 40561 | 2 | current in L3 | A | 7 | 1 | 0 |
| 40563 | 2 | voltage peak L1 | V | 7 | 1 | 0 |
| 40565 | 2 | voltage peak L2 | V | 7 | 1 | 0 |
| 40567 | 2 | voltage peak L3 | V | 7 | 1 | 0 |
| 40569 | 2 | current peak L1 | A | 7 | 1 | 0 |
| 40571 | 2 | current peak L2 | A | 7 | 1 | 0 |
| 40573 | 2 | current peak L3 | A | 7 | 1 | 0 |
| 40575 | 2 | frequency | Hz | 7 | 1 | 0 |
| 40577 | 2 | phase angle Phi L1 | ° | 7 | 1 | 0 |
| 40579 | 2 | phase angle Phi L2 | ° | 7 | 1 | 0 |
| 40581 | 2 | phase angle Phi L3 | ° | 7 | 1 | 0 |
| 40583 | 2 | temperature | °C | 7 | 1 | 0 |
| 40585 | 2 | phase angle Psi L1 | ° | 7 | 1 | 0 |
| 40587 | 2 | phase angle Psi L2 | ° | 7 | 1 | 0 |
| 40589 | 2 | phase angle Psi L3 | ° | 7 | 1 | 0 |
| 40801 | 2 | output current | mA | 7 | 1 | 0 |
| 40803 | 2 | output voltage | V | 7 | 1 | 0 |
| Counter: | | | | | | |
| 44003 | 2 | counter kWh - consumption | kWh | 5 | 1 | 1 |
| 44005 | 2 | counter kWh - infeed | kWh | 5 | 1 | 1 |
| 44007 | 2 | counter kVarh - inductiv | kVarh | 5 | 1 | 1 |
| 44009 | 2 | counter kVarh - capacitiv | kVarh | 5 | 1 | 1 |
| 44011 | 2 | counter kVAh - apparent energy | kVAh | 5 | 1 | 1 |

Legend of the datatypes:

| | | | | | | |
|--------|--------|--------|--------|--------|--------|----------|
| U08: 1 | S08: 2 | U16: 3 | S16: 4 | U32: 5 | S32: 6 | float: 7 |
|--------|--------|--------|--------|--------|--------|----------|