Data Sheet
3KDE485000R1001

Power[IT]

# Power Transducer Series 50

PTA50, PTV50, without power supply;
PTM50, with power supply

- **Power transducers with excellent cost-performance ratio**

- **Advanced technology**
  - all inputs complying with overvoltage category III and degree of pollution 2
  - outputs separated from inputs through double insulation, meeting the requirements for extra-low voltage (PELV)
  - accuracy class 0.3

- **Dual measuring ranges**
  - for all current ranges and
  - for nearly all voltage ranges

- **Consistent design**
  - standard case for mounting on top-hat rails
  - 22.5 mm grid

- **Easy to install**
  - by snap-mounting


**Safe, reliable, compact and economical**

## Glossary of terms and definitions

**Aaron circuit**
In a 3-wire, 3-phase mains, the total of all wire currents is always zero. As a result, it is possible to use only two current converters and calculate the third current value. This kind of circuit using two current converters instead of three is called an Aaron circuit.

**Accuracy (class)**
The accuracy is the measure for equivalent transfer of an input signal to an output. The accuracy of a measuring transducer is specified by an accuracy class. The POWER 50 series transducers are in accordance with accuracy class 0.3. This means the deviation of the output signal equivalent to the input signal is max. 0.3 % referred to the rated input and output values.

**Active power**
Electrical power resulting from the multiplication of the instantaneous current and voltage values. This method also takes into account a possible phase shift (see apparent power).

**Aggregate quantities**
Aggregate quantities are derived quantities like
– Limit value max. or min.: a signal is output when the given value is exceeded or fallen below.
– Non-return pointer function max. or min.: The minimum or maximum value reached since the last return is saved and indicated.
– Totalizer: Counting and integrating of values, e.g. the integration of power, resulting in electrical energy.
– Average value: The average value is calculated for the values measured over a given time period and is then indicated. For load profile optimization this value is determined for a time period of 15 minutes. This 15-minute average value is determined and evaluated as a floating value.

**Alternating current**
A current which periodically changes its intensity and direction dependent on the time. The actual value is indicated by the RMS value. See also: Single phase mains, Connection methods.

**Alternating voltage**
A voltage which changes its value and direction dependent on the time. The actual value is indicated by the RMS value. See also: Single phase mains, Connection methods.

**Apparent power**
Apparent power (S) is the power resulting from the multiplication of current and voltage without taking into account any possible phase angle. Apparent power is composed of active power (P) where current and voltage are in phase, and reactive power (Q) where a 90° phase shift occurs between current and voltage.

From this results: $S \cdot \cos \varphi = P$ and $S \cdot \sin \varphi = Q$.

**Arithmetic mean**
The arithmetic mean is the calculated mean value, i.e. the weighted mean of the instantaneous values. For pure sinusoidal quantities this value is equal to 0. However, the procedure permits to filter direct current portions out of an alternating current quantity.

For a rectified pure sinusoidal signal the arithmetic mean is $2/\pi = 0.637$ of the peak value.

The root mean square (RMS) value for a sinusoidal signal is equal to $1/\sqrt{2} = 0.707$ of the peak value. As a result, a coefficient of correction (= form factor) of 0.707/0.637 = 1.11 is required for the arithmetic mean of the RMS value.

Note that this measuring procedure with a coefficient of correction of 1.11 is only suitable for pure sinusoidal signal. If harmonics are present, a maximum error of F[%] = harmonic wave [%] / ordinal number may occur.

**Basic insulation**
The basic insulation is the minimum required insulation (air gap or creeping distance) resulting from insulation coordination.

**Binary output:** see Output signal, Digital output signal

**Binary output signal:** see Output signal, Digital output signal

**Bus**
A data link to which several devices can be connected and which is used to transmit data to/from the devices.

**Calibration factor**
The calibration factor is relevant for power measurement and indicates the ratio of the measuring range to the rated input values, e.g. measured quantity 200 W in a single-phase mains, rated input values: current = 1 A; voltage = 230 V; calibration factor = 200 W/(1 A x 230 V) = 0.87. Typically, the calibration factor is a number between 0.5 and 1.5. Major deviations from this indicate dimensioning errors.

**Capacitive**
Capacitive stands for a phase shift between the current and voltage where the current leads the voltage.
For capacitive power the energy direction has to be considered as well. See also: 4-quadrant operation.

**Catalog number**
The catalog number is a number for unambiguous identification of the device type and version.

Example for Series 50 devices:

| | | | |
|---|---|---|---|
| Preferred type | **3KDE48514** | **0L** | 10210011 |
| Normal type | **3KDE48514** | **0V** | 10210011 |

| | |
|---|---|
| Type | **3KDE48514** |
| Preferred type | **0L** |
| Normal type | **0V** |
| Version details | 102100 |
| Hardware / software revision | 11 |

If items with special ordering features have been selected from the list, the respective numbers must be added as plain text to the catalog number.

When ordering a preferred type, the version details need not be added to the catalog number. When ordering the preferred type the device is delivered with the catalog number of the normal type. This is intended to simplify the type identification according to the ordering details. The hardware and software versions are reverse compatible. A higher revision number indicates a higher revision level. It is not necessary to indicate these numbers in the order. Please refer to the ordering information for details about the individual digits.

**CE**
The CE marking indicates that the device complies with the regulations and harmonized standards of the European Community. Devices which are put into circulation in the EC countries must be marked with this sign and comply with the respective regulations.

**Characteristic**
The characteristic is a graphical representation of the output signal as a function of the input signal. It is usually linear, e.g. an input signal of 0...1 A results in a 0...20 mA output signal. For some applications, a zoom effect is wanted for the initial or final value.

Example 1: The lower part of the current range is to be represented with an especially high resolution. The 0...2 A input signal shall be spread to a 0...16 mA output signal, whereas the remaining range of 2...5 A is to be represented as 16...20 mA. Hence: Input: 0...2...5 A; Output: 0...16...20 mA.

Example 2: The upper part of the voltage range is to be represented with an especially high resolution. The 0...80 V input signal is represented as a 0...4 mA output. The range of 80...120 V is represented with 4...20 mA. Hence: Input: 0...80...120 V; Output: 0...4...20 mA.

The point where the gradient of the curve changes is called its kink point.

**Connection methods**
Power transducers can be connected in different ways. A distinction is made between the following connection alternatives:

- Single-phase AC current;
  current and voltage measured in the same phase.
- Three-wire, three-phase current, balanced load with simulated phase;
  current and voltage measured in the same phase.
- Three-wire, three-phase current, balanced load;
  current measured in one phase, voltage measured between three phases.
- Three-wire, three-phase current, unbalanced load;
  current measured in two phases, voltage measured in between three phases.
- Four-wire, three-phase current balanced load;
  current and voltage measured in the same phase.
- Four-wire, three-phase current unbalanced load
  current measured in three phases, voltage measured between three phases.

**Crest factor**
The crest factor of a measuring signal is the ratio of the peak value to the RMS value (e.g. 1.41 for sinusoidal). For a transducer this is the overload range specified for the input transformers. A transducer with a crest factor 3 and a measuring range 0...5 A can still reliably measure a signal with a 15 A peak value. The same transducer can measure a 3 A signal with crest factor 5. However, it cannot be converted arbitrarily, but is limited for high frequencies and short-term high signals. The specified crest factor of a transducer always refers to the upper range value.

**Current (AC):** see Alternating current

**Current (DC):** see Direct current

**Curve shape:** see Characteristic

**Dead zero:** see Live zero/Dead zero

**Degree of pollution**
Classification according to the degree of expected pollution. A higher code number indicates a higher degree of pollution. Devices that are installed in cabinets or control rooms must meet the requirements of the Degree of pollution 2.

**Direct current**
A current that flows in only one direction and has an essentially constant value, provided that the voltage and load remain the same.

**Direct voltage**
A voltage that does not change its value or direction provided that the source and load remain the same.

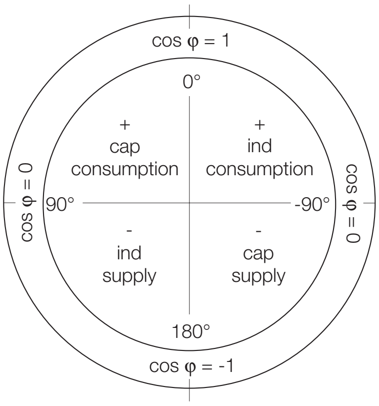
**Display**
The display is an accessory part for parameterizable transducers of the POWER 50 series. It is available as a panel instrument with a 96 mm x 96 mm front panel and a mounting depth of 70 mm (120 mm). It has a separate power supply and can be installed e.g. in a cabinet front, with the transducer itself accommodated inside the cabinet. A universal cable is used to link the parameterizable transducer and the display. The universal cable has a length of 5 m and jack plugs on each side. On the transducer side, the jack plug is plugged into the LCI socket on the front.

On the display side, the jack plug is plugged to the LCI 1 socket on the display rear. The LCI 2 socket is used to connect the parameterization cable, with a transducer-display link already existing.

A maximum of 4 values and a freely definable text line can be indicated on the display at the same time. The value, the relevant mnemonic description and the dimension (unit) can be indicated. Additionally, the aggregate values may be indicated, depending on the transducer type. Which data is to be displayed is set on the respective transducer.

**Electrical quantities, Phase Angle φ**
The phase angle φ is the shift between current and voltage zero crossing.

**Electrical quantities, cos φ**
The power factor is the ratio of the active power to the apparent power; cos φ = active power / apparent power. As can be seen in the illustration below, the power factor can only be measured in clockwise direction.




**Electrical quantities, Frequency**
Alternating current and voltage continuously reverse the direction and intensity, usually resulting in a sinusoidal wave. The change-over from a positive maximum value over a negative maximum value to the next positive maximum value is called a period = π. The number of periods per second is the frequency.

**Electrical quantities, Power factor/Active power factor:**
see Electrical quantities, cos φ

**Electrical quantities, Reactive power factor:**
see Electric quantities, sin φ

**Electrical quantities, sin φ**
The reactive power factor sin φ is the ratio of the reactive power to the apparent power
sin φ = reactive power/apparent power

**Functional extra low voltage**
An extra low voltage with safe separation from other current circuits through double insulation or double air gaps or creeping distances .
PELV = Protective extra low voltage.
Selv-e = Separated extra low voltage earthed.

**Fundamental wave**
The sinusoidal wave resulting from the frequency rating of an AC current / AC voltage.

**Harmonic**
In AC mains there is a fixed frequency, the fundamental sinusoidal wave, with, e.g. 50 Hz. External influences may cause distortions of this sinusoidal wave. These distortions can be considered as sinusoidal signals with a multiple frequency of the fundamental wave. Waves with a frequency that is a multiple of the fundamental wave are called harmonics (the 3rd./5th./7th. harmonic), or upper harmonic waves, or harmonic oscillation.

**Harmonic oscillation:** see Harmonic

**Harmonic waves:** see Harmonic

**Inductive**
Inductive stands for a phase shift between the current and the voltage where the current lags the voltage. For inductive power measurement the energy direction has to be considered as well. See also: 4-quadrant operation.

**Input limiting:** see Overload capability

**Input quantity:** see Measured quantity

**Insulation class II:** see Protective insulation

**Insulation coordination**
Rating of an insulation (air gaps and creeping distances) dependent on the voltage and environmental conditions (degree of pollution, transient noise voltages, air pressure, humidity).

**Kink point:** see Characteristic

**LCI**
The socket for the "Local Communication Interface" on the transducer or display. The LCI corresponds to an RS232 interface, but uses different signal levels.

**Live zero/dead zero**
If the output circuit of a transducer shall also be monitored, the characteristic curve is usually started with an input signal of 0 and with an active output signal. This means at this point there is a difference between a 0 input signal and an interruption of the output circuit.

Live zero: Input: 0...1 A; Output: 4...20 mA. Only possible for transducers with power supply, since an active output signal must be provided with a "0" input.

Dead zero: Input: 0...1 A; Output 0...20 mA. This is also possible for transducers without power supply.

**Load, Input circuit**
All connected devices, including transducers, act as a load. This must be taken into account, especially if they are to be connected to non-high-wattage circuits, e.g. the outputs of current or voltage converters. A higher load connected to a current or voltage converter would limit the load transfer ability in the same

dimension. Transmitters with additional power supply constitute a smaller load in the measuring circuits than 2-wire transmitters deriving their power from the measured signal.

**Load, Output circuit**
Analog output signals are usually current signals (max. rated value 20 mA), but in some cases also voltage signals (max. rated value 10 V).

The permissible load depends on the output current rating. For 20 mA it amounts to 15 V/20 mA ≤ 750 Ω; for 10 mA it amounts to 15 V/10 mA ≤ 1,500 Ω. The highest accuracy is reached with high output current ratings.

For analog voltage outputs the external resistance is in parallel with the internal resistance. The specified accuracy is only applicable for the given load value. With an open output circuit the output voltage for POWER 50 transducers is limited to 30 V.

**Mains type:** see Connection method

**Mains synchronization**
Measuring equipment for switching together 2 separate mains.

The following requirements must be met:

| | |
|---|---|
| – same frequency | (possibly little deviation) |
| – same phase | (possibly little deviation) |
| – same voltage level | (possibly little deviation) |

This is required to keep compensation currents that may occur at the switching moment as small as possible.

**Measured quantity**
Measured quantities are variables that are measured. Measured quantities of power transducers are current, voltage, or current and voltage. All other electrical quantities can be derived from these. In some cases it is also possible to select aggregate quantities. Power transducers of the POWER 50 series are designed for current and voltage and the rated frequency 50/60Hz. For non-parameterizable devices the rated value or measured quantity range must be specified in the order.

Parameterizable devices have adjustable ranges for the measured “Rated current” and “Rated voltage” and for other settable electrical quantities. Within these ranges, the rated value can be set, provided that the specified accuracy and overload limits are observed. For current and voltage settings above the given adjustment range lie in the overload range. To achieve a high accuracy, a measured value close to the rated value should be selected. The best accuracy is achieved with the upper range value.

**Measuring system or method**
The measuring system or method is the method including the circuitry or program selected for evaluating the input quantities.

**Nominal value:** see Rated value

**Output limiting**
Power transducers permit linear transmission of output signals up to 120 % of the rated input signal. For an input signal of 0 to 100 V and an output signal of 0 to 20 mA this means that 24 mA are provided at the output for a 120 V input signal. For higher input signals the output signal is no longer proportional to the input.

Output limiting is required for some subsequent devices. As a result, transducers of the POWER 50 series are limited to 1.8 x the rated output value or 1.25 x the rated output value. This value is settable for parameterizable devices.

**Output signal, Analog output signal**
The measured quantity of a transducer is converted to a proportional direct current or direct voltage signal.

**Output signal, Bipolar output signal**
If the analog output signal shall also indicate the direction of flow (this is not possible for AC current or voltage), a bipolar output signal is used.
Example: For active power (supply or consumption) the output signal is -20...0...+20 mA for a measured quantity of -5...0...+25 MW. Usually, the output signal sign is negative for power generation.

**Output signal, Digital output signal**
Usually, aggregate values like limit values (as static signal) or counter values (as pulse signal) are output via digital outputs. The transducers of the POWER 50 series use (open collector) transistor outputs as digital outputs.

A special type of digital output is the serial bus interface. The bus connector is optionally available for parameterizable devices. Information and data can be transmitted to and from the device via the bus connector (see also: Interface).

**Output signal, Unipolar output signal**
The analog output signal is unipolar for AC current or AC voltage measurement. Example: For a measured quantity of 0...1 A an analog output signal of 0...20 mA is output.

**Overload capability**
Power transducers may be overloaded to a specific degree. This means that a current higher than the input current rating may be applied to the input for a short time or permanently. Refer to the Technical data section for the respective overload specifications. Always observe the maximum permissible voltage values of the input variables.

**Overvoltage category**
Classification into categories according to the height of the expected transient overvoltages. A higher code number means a higher transient voltage. The measuring circuits of devices that are usually connected to standard mains or secondary circuits of current or voltage converters have to meet the requirements of Overvoltage category III.

**Parameterizable transducers**
Parameterizable transducers are provided with a communication interface. A PC with a special parameterization software is used to change the parameter settings of the measured values and to select the quantities for the analog outputs.

**Parameterization, Parameter definitions**
Parameterizable devices must be set up (parameterized) for a certain application. The advantage of these devices is that the customer can make these settings and can flexibly adapt the devices according to his needs. A parameterization software and a PC link cable are needed for device parameterization. These items are available as accessories for the respective devices.

**Parameterization, Parameterization cable**
Special link cable with level converter for connecting parameterizable POWER 50 transducers to a PC.

**Parameterization, Parameterization software**
A special parameterization software is available. It is called “R&C Process Data Management" and has the following components:
– Device Configuration
– Process Data Visualization
– MODBUS OPC Server
– Data Archiving

**Parameterization, Custom Parameterization**
The customer can parameterize the devices according to his needs by using the parameterization program, and can take full advantage of the parameterization feature.

**Parameterization, Customized Parameterization in factory**
The customer can order a pre-parameterized device for a special application, with pre-defined parameters (extra charge). The parameterization form must be filled-in and added to the order in this case.

**Peak value**
A peak value is a periodically recurring positive and negative maximum value. You can calculate the RMS value for a rectified sinusoidal value by using the formula RMS value = peak value / $\sqrt{2}$ (see also: RMS value)

Peak value measurement is not useful for RMS value measurement. However, the peak value is quite important for the crest factor.

**PELV:** see Functional extra low voltage

**Phase voltage**
Voltage between two wires of a single-phase mains, or between a phase and the neutral point in a three-phase mains. The voltage between two phases of a three-phase mains is called a line-to-line voltage or delta voltage.

**Phase angle:** see Electrical quantities, Angle φ

**Power**
Power is the product of current and voltage. A distinction is made between active power, reactive power and apparent power.

**Power consumption/Motor operation**
If not otherwise specified in the order, active power transducers are calibrated for power consumption in factory. In case of a bidirectional energy flow (consumption and generation), power consumption produces an output signal with a positive sign.

**Power generation/Generator operation**
If not otherwise specified in the order, active power transducers are calibrated for power consumption in the factory. In case of a bidirectional energy flow (consumption and generation), power supply produces an output signal with negative sign.

**Protective insulation**
Devices with protective insulation meet the requirements of Insulation class II. They must be fully surrounded by non-conducting (i.e. insulating) materials and must be provided with a double insulation or double air gaps or creeping distances in accordance with the insulation coordination.

**PTA50**
POWER 50 series AC power transducer for current, without additional power supply.

**PTM50-AN**
POWER 50 series AC power transducer for current, with additional power supply and true RMS value measurement.

**PTM50-AS**
POWER 50 series AC power transducer for current, with additional power supply.

**PTM50-FN**
POWER 50 series AC power transducer for frequency, with additional power supply.

**PTM50-VN**
POWER 50 series AC power transducer for voltage, with additional power supply and true RMS value measurement.

**PTM50-VS**
POWER 50 series AC power transducer for voltage with additional power supply.

**PTV50**
POWER 50 series AC power transducer for voltage without additional power supply.

**Rated current:** see Rated value

**Rated frequency:** see Rated value

**Rated power:** see Rated value

**Rated value**
The rated value or nominal value corresponds to the set point of a quantity. For ranges, e.g. a measuring range (from 0...rated value), the rated value is the high limit. Values above the rated value are overload values. Measured quantities can also be specified as ranges (e.g. 20... 40 V; 45...50 Hz; -50...+50 MW).

**Rated voltage:** see Rated value
The line-to-line voltage or delta voltage in a 3-phase mains.

**R&C Process Data Management:** see Parameterization, Parameterization software

**Reactive power**
Inductive or capacitive elements in a current circuit produce reactive power. As a result, a phase shift between current and voltage occurs (i.e. the zero crossings do no longer occur at the same time). Reactive power cannot be used for mechanical work and, thus, should be minimized as far as possible by taking the appropriate compensation measures.

Seen from the mathematical point of view, reactive power is the product of current, voltage and sin φ.

**Response time**
The response time is the time period after which the digital output (switching output) responds after a step function on the input.

**RMS value**
The root means square (RMS) value is the energy content of a signal with an arbitrary curve shape. It produces on an ohmic load the same temperature rise as a direct current of the same (current) intensity. Seen from the mathematical point of view, the pure RMS value is given by the following formula:

$$\text{RMS value} = \sqrt{\frac{1}{T} \times \int_0^T \text{value}^2 dt}$$

For the pure sinusoidal signal, squaring results in a sinusoidal signal of double frequency, with the minimum value on the zero line. The square of the RMS value is half the peak-peak value of this squared quantity, i.e. the RMS value is the peak value /√2 of the single quantity.

RMS value = peak value/√2
(Example: RMS value = 230 V; peak value = 325 V).

For digital devices the integral value is achieved by summing instantaneous values on a time scale. If these values are first squared, then averaged over the time, and finally submitted to square root extraction, the real RMS value is achieved.

**Root mean square value** see RMS value

**RS232** is a serial interface for a point-to-point connection with standardized signals**.**

**RS485** is a serial interface for a bus link with standardized signals.

**Selv-e:** see Functional extra low voltage

**Settling time**
The settling time is the time which the output needs after a step function on the input to reach the (99%) right signal.

**Simulated phase**
Determination of the power for a 3-wire, 3-phase current by measuring an equivalent 1-phase current with the same load, where an additional phase of the voltage is simulated in the device through a 30° phase shift.

**Sinusoidal quantity**
A sinusoidal quantity is a pure AC fundamental wave without harmonics.

**Single-phase mains:** see Connection methods

**Star voltage (Y-voltage):** see Phase voltage

**Three-phase current:** see Three-phase mains, Connection methods

**Three-phase mains:** see Connection methods

**Transducers**
Transducers convert physical quantities like pressure, temperature or current into a standard output signal. For a physical input signal an equivalent output signal can be derived as a standard signal (usually in mA, e.g. 0...20 mA; also in V, e.g. 0...10 V).

**Transducers, AC power transducers**
Transducers for AC power quantities. The measured quantity is indicated through the rated value or nominal value
(e.g. $I_{rated} = I_{nom}$ or $U_{rated} = U_{nom}$).

**Transducers, AC power transducers for current**
AC current is the input quantity. An equivalent analog output (mA/V) signal is derived from the AC input current.

**Transducers, AC power transducer for current and voltage**
AC current and AC voltage are the input quantities. An equivalent analog output signal (mA/V) can be derived from these input signals. Advanced digital transducers also provide output signals equivalent to frequency as well as all quantities that can be derived from current and voltage like phase angle φ, cos φ, sin φ, apparent power, active power, reactive power.

**Transducers, AC power transducers for frequency**
Either AC current or AC voltage is the input quantity. An output signal for the frequency is derived from this input quantity. The accuracy of frequency measurement depends on the input quantity. Therefore, the input signal should be as close to the rated value as possible. Since the voltage is usually constant, whereas the current in most cases is not, normally voltage is used as the input quantity for frequency measurement. In order to provide a reference between the output signal and the measuring range, the frequency range to be measured (e.g. 45...55 Hz = 0...20 mA) must be specified in addition to the input rating.

**Transducer, AC power transducers for power**
AC current and AC voltage are the input quantities. An analog output signal (mA/V) equivalent to the power is generated for these input quantities. Usually, advanced digital transducers can provide these equivalent signals not only for current, voltage and power, but also for all derivable quantities

**Transducers, AC power transducers for voltage**
AC voltage is the input quantity. An equivalent analog output signal (mA/V) can be derived from the AC input voltage.

**Transducers, analog**
Analog transducers analogously process the physical input signal. These devices are designed for exactly one task.

**Transducers, digital**
Digital transducers provide signal conditioning of an analog input signal by means of a microprocessor. Parameterizable transducers allow the user to set the input quantity within a given range, to select functions from a given range, and to set the output signal quantity as an equivalent to the selected input quantity or a quantity derived from it.

**Transducers without power supply**
Transducers without power supply derive the energy for the output circuits from the input quantities. As a result, the input circuit load is correspondingly high. The output signal can only be an active signal when an input signal is available. As a result, the output signal can only range from 0... (dead zero).

**Transducers with power supply**
The output circuits of transducers with power supply are powered separately and, therefore, only have a minor input circuit load.

The output signal may also be active when no input signal is available yet (live zero).

**Transducers, 2-wire**
Transducers without power supply or transducers deriving their power form the (externally supplied) output circuit.

**Transducers, 4-wire**
Transducers with separate power supply.

**Transformers**
Current or voltage transformers are required for power transducers when input currents or voltages exeed the range limits. When ordering analog devices or parameterizing digital devices, specify the transmission ratio of the current and voltage transformers to ensure that the measured values refer to the primary variables.

**Transformers, Current transformers**
Power transducers can only handle currents up to a specific intensity. Higher currents have to be transformed into a lower intensity – usually 1 A or 5 A – by using a current transformer. Example: 2.400 A/1 A. This specification is called the transmission ratio of the transformer.

**Transformers, Voltage transformers**
Power transducers can only handle voltages up to a specific height. Higher voltages have to be transformed into a lower voltage value – usually 100 V – by using a voltage converter. Example: 110.000 V/100 V. This specification is called the transmission ratio of the transformer.

**Transmission ratio:** see Transformers, Current transformers, Voltage transformers

**Voltage, Max. permissible values**
The maximum permissible voltage values (between the terminals and against ground) of the input quantities must be observed, independent of the transducer's overload capabilities. Refer to the Technical data section for details.

**Voltage (AC):** see Alternating voltage

**Energy**
Energy is the electrical power integrated over the time, measured in Wh (or kWh, MWh).

**4-quadrant operation**
The current, voltage or power can be illustrated in a vector diagram (see also: Electrical quantities, cos φ). You can consider, e.g., the energy consumption axis (pure active power) over the energy consumption area (active power and inductive reactive power portion) up to the energy consumption (pure inductive reactive power)/energy supply (pure capacitive reactive power) inflection point and continue over the energy supply (active power and capacitive reactive power portion) up to the energy supply axis (pure active power).

From here, you can achieve the full circle by heading over the inductive energy supply up to the energy supply (inductive reactive power)/energy consumption (capacitive reactive power) inflection point and from there over the capacitive energy consumption to the energy consumption (active power) axis.

## Standards and regulations

The following standards and regulations were considered when designing, manufacturing and testing POWER 50 power transducers.

DIN EN 60 688 (April 2002)
Messumformer für die Umwandlung von Wechselstromgrößen in analoge oder digitale Signale
IEC 60688: 2001
Electrical measuring transducers for converting a.c. electrical quantities to analogue or digital signals
DIN EN 60529 (Sept. 2000); VDE 0470 Teil 1 (Sept. 2000)
Schutzarten durch Gehäuse (IP-Code)
IEC 60529: 1989 + A1: 2000
Degrees of protection provided by enclosures (IP Code)
DIN VDE 0100-410 (Jan. 1997) (PELV)
Errichten von Starkstromanlagen mit Nennspannungen bis 1000 V
Teil 4: Schutzmaßnahmen
Kapitel 41: Schutz gegen elektrischen Schlag
IEC 60364-4-41: 2001-08
Electrical installations of buildings
Part 4-41: Protection for safety –
Chapter 41: Protection against electric shock
DIN EN 61140 (Aug. 2001); VDE 0140 Teil 1 (Aug. 2001)
Schutz gegen elektrischen Schlag
Gemeinsame Anforderungen für Anlagen und Betriebsmittel
IEC 61140: 1997
Protection against electric shock
Common aspects for installation and equipment
DIN EN 60947-1 (Dez. 1999) + /A1 (Aug. 2001)
Niederspannungsschaltgeräte
Teil 1: Allgemeine Festlegungen
IEC 60947-1: 1999 (mod) + Corrigendum 1999 + /A1 (2000)
Low-voltage switchgear and controlgear
Part 1: General rules
DIN EN 60721-3-3 (Sept. 1995) + /A2 (Juli 1997)
Klassifizierung von Umweltbedingungen
Klasse 3 Klassen von Umwelteinflußgrößen und deren Grenzwerte
Hauptabschnitt 3: Ortsfester Einsatz, wettergeschützt
IEC 60721-3-3: 1994 + /A2 (1996)
Classification of environmenttal conditions –
Part 3: Classification of groups of environmental parameters and their severities –
Section 3: Stationary use at weatherprotected locations
DIN VDE 0110-1 (April 1997) + Beiblatt 1 (März 2000) + Beiblatt 2 (Aug. 1998)
Isolationskoordination für elektrische Betriebsmittel in Niederspannungsanlagen
Teil 1: Grundsätze, Anforderungen und Prüfungen
IEC 60664-1: 2000-04
Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests
DIN EN 61 010 Teil 1 (März 2001)
Sicherheitsbestimmungen für elektrische Mess-, Steuer-, Regel- und Laborgeräte
Teil 1: Allgemeine Anforderungen
IEC 61010-1: 2001
Safety requirements for electrical equipment for measurement, control and laboraty use;
Part 1: General requirements
DIN EN 61558-1 (Juli 1998) + /A1 ( Nov. 1998)
Sicherheit von Transformatoren, Netzgeräten und dergleichen
Teil 1: Allgemeine Anforderungen und Prüfungen
IEC 61558-1: 1998-07
Safety of power transformers, power supply units and similar – Part 1 General requirements and tests
DIN EN 50178 (April 1998)
Ausrüstung von Starkstromanlagen mit elektronischen Betriebsmitteln
DIN EN 61326 (März 2002)
Elektrische Betriebsmittel für Messtechnik, Leittechnik und Laboreinsatz
EMV-Anforderungen
IEC 61326/A2: 2000
Electrical Equipment for measurement, control and laboratory use – EMC requirements
Part 1: General requirements
73/73/EEC (14.04.2000)
Low-voltage directive
89/336/EEC (14.12.2000)
EMC directive

**NAMUR Recommendations:**

| | |
|---|---|
| NE06 (01.07.97) | Standardized electrical signals and questions related to instrumentation |
| NE43 (18.01.94) | Standardization of the signal level for the breakdown information of digital transmitters |
| NE53 (18.12.95) | Software of field devices and signal processing devices with digital electronics |
| NE21 (01.08.91) | Electromagnetic compatibility (EMC) of industrial process and laboratory control equipment. |

## Technical data

| Type | | PTA50 | PTV50 | |
|---|---|---|---|---|
| **Catalog number** | | **3KDE48510** | **3KDE48511** | |
| **Input** | | | | |
| Current | Standard value | 1 A/5 A | | |
| | Available | 0.1/0.5...2.4/12 A | | |
| | Internal power consumption per phase | ≤ 1.6 VA | | |
| | Overload rating, permanent | 2 x $I_{nom}$ [2)] | | |
| | Overload rating,1 second | 30 x $I_{nom}$; max. 200 A [2)] | | |
| | Number of phases | 1 | | |
| Voltage | Standard value | | 100/120 V | |
| | Available | | 10/12...250/300...600 V | |
| | Internal power consumption per phase | | ≤ 2.1 VA | |
| | Overload rating, permanent | | 1.5 x $U_{nom}$ [2)] | |
| | Overload rating,1 second [1)] | | 4 x $U_{nom}$ [2)] | |
| | Number of phases [1)] | | 1 | |
| | [1)] Observe max. voltage | | Terminal: 300/600 V | |
| | | | Against ground: 600 V | |
| Frequency | Nominal frequency | 50/60 Hz ± 10 % | 50/60 Hz ± 10 % | |
| | Adjustable range | | | |
| | Minimum span | | | |
| Characteristic | | sinusoidal | sinusoidal | |
| **Power supply** | | without | without | |
| | 80...265 V (45...65 Hz)/80...300 V DC | | | |
| | 19...72 V (45...65 Hz)/19...100 V DC | | | |
| **Transient response** | | | | |
| Error limits | | 0.3 % | 0.3 % | |
| | for frequency and angle measurement | | | |
| | for frequency and angle measurement | | | |
| Response time | | 0.2 s | 0.2 s | |
| Residual ripple | | ≤ 0.7 % (peak-peak) | ≤ 0.7 % (peak-peak) | |
| Reference conditions, ambient temperature | | 23 °C ± 1 % | 23 °C ± 1 % | |
| | Frequency | $f_{nom}$ ± 2 % | $f_{nom}$ ± 2 % | |
| | Curve shape | sinusoidal | sinusoidal | |
| | Output load, current | 375 Ω ± 1 % | 375 Ω ± 1 % | |
| | Output load, voltage | 200 kΩ | 200 kΩ | |
| Influences, ambient temperature | | ≤ 0.5 %/10 K | ≤ 0.5 %/10 K | |
| | Overranging | 1.2-fold: ≤ 0.4 % | 1.2-fold: ≤ 0.4 % | |
| | Curve shape | F[%] = harmonic wave [%]/ | F[%] = harmonic wave [%]/ | |
| | | ordinal number | ordinal number | |
| | External magnetic field | ≤ 1 % up to 400 A/m | ≤ 1 % up to 400 A/m | |
| | Power supply | not applicable | not applicable | |
| **Output** | | | | |
| Function of input quantities | | I (current) | U (voltage) | |
| Analog outputs | | 1 | 1 | |
| Current | Standard value | 0...20 mA | 0...20 mA | |
| | Available | 0...max. 20 mA | 0...max. 20 mA | |
| | Current limiting | max. 1.8 x $I_{nom}$ | max. 1.8 x $I_{nom}$ | |
| | Load | ≤ 15 V/$I_{nom}$ | ≤ 15 V/$I_{nom}$ | |
| | | (≤ 750 Ω with 20 mA) | (≤ 750 Ω with 20 mA) | |
| Voltage | Available | 0...max. 10 V | 0...max. 10 V | |
| | Voltage limiting | 30 V with R = ∞ | 30 V with R = ∞ | |
| | Load | R ≥ 100 kΩ | R ≥ 100 kΩ | |
| Characteristic | | linear | linear | |

[2)] under reference conditions

| **PTM50-AS** | **PTM50-VS** | **PTM50-AN** | **PTM50-VN** | **PTM50-FN** |
|---|---|---|---|---|
| **3KDE48512** | **3KDE48513** | **3KDE48514** | **3KDE48515** | **3KDE48516** |
| | | | | |
| 1 A/5 A | | 1 A/5 A | | |
| | | 0.1/0.5...2.4/12 A | | |
| ≤ 0.15 VA | | ≤ 0.15 VA | | |
| 2 x $I_{nom}$ | | 2 x $I_{nom}$ | | |
| 30 x $I_{nom}$; max. 200 A$^{2)}$ | | 30 x $I_{nom}$; max. 200 A$^{2)}$ | | |
| 1 | | 1 | | |
| | 100/120 V | | 100/120 V | 100/120 V |
| | | | 10/12...250/300...600 V | 10/12...250/300...600 V |
| | ≤ 1 mA x $U_{nom}$ | | ≤ 1 mA x $U_{nom}$ | ≤ 1 mA x $U_{nom}$ |
| | 1.5 x $U_{nom}$ | | 1.5 x $U_{nom}$ | 1.5 x $U_{nom}$ |
| | 4 x $U_{nom}{}^{2)}$ | | 4 x $U_{nom}{}^{2)}$ | 4 x $U_{nom}{}^{2)}$ |
| | Terminal: 300/600 V | | Terminal: 300/600 V | Terminal: 300/600 V |
| | Against ground: 570 V | | Against ground: 570 V | Against ground: 570 V |
| | 1 | | 1 | 1 |
| 50/60 Hz ± 10 % | 50/60 Hz ± 10 % | 50/60 Hz ± 10 % | 50/60 Hz ± 10 % | 50/60 Hz ± 10 % |
| | | | | 30...80 Hz |
| | | | | 2 Hz |
| sinusoidal | sinusoidal | any | any | any |
| | | | | |
| yes < 2.0 VA | yes < 2.0 VA | yes < 2.0 VA | yes < 2.0 VA | yes < 2.0 VA |
| no | no | yes < 2.0 VA | yes < 2.0 VA | yes < 2.0 VA |
| | | | | |
| 0.3 % | 0.3 % | 0.3 % | 0.3 % | 0.3 % |
| | | | | ≥ 0.8 x $U_{rated}$: 0.3 % |
| | | | | ≥ 0.6 x $U_{rated}$: 0.5 % |
| 0.2 s | 0.2 s | 0.4 s | 0.4 s | 0.4 s |
| ≤ 0.7 % (peak-peak) | ≤ 0.7 % (peak-peak) | ≤ 0.7 % (peak-peak) | ≤ 0.7 % (peak-peak) | ≤ 0.7 % (peak-peak) |
| 23 °C ± 1 % | 23 °C ± 1 % | 23 °C ± 1 % | 23 °C ± 1 % | 23 °C ± 1 % |
| $f_{nom}$ ± 2 % | $f_{nom}$ ± 2 % | $f_{nom}$ ± 2 % | $f_{nom}$ ± 2 % | $f_{nom}$ ± 2 % |
| sinusoidal | sinusoidal | sinusoidal | sinusoidal | sinusoidal |
| 375 Ω ± 1 % | 375 Ω ± 1 % | 375 Ω ± 1 % | 375 Ω ± 1 % | 375 Ω ± 1 % |
| 200 kΩ | 200 kΩ | 200 kΩ | 200 kΩ | 200 kΩ |
| ≤ 0.5 %/10 K | ≤ 0.5 %/10 K | ≤ 0.5 %/10 K | ≤ 0.5 %/10 K | ≤ 0.5 %/10 K |
| 1.2-fold: ≤ 0.4 % | 1.2-fold: ≤ 0.4 % | 1.2-fold: ≤ 0.4 % | 1.2-fold: ≤ 0.4 % | 1.2-fold: ≤ 0.4 % |
| F[%] = harmonic wave [%]/ | F[%] = harmonic wave [%]/ | up to crest factor 3.6 | up to crest factor 3.6 | up to crest factor 3.6 |
| ordinal number | ordinal number | ≤ 0.05 % | ≤ 0.05 % | ≤ 0.05 % |
| ≤ 1 % up to 400 A/m | ≤ 1 % up to 400 A/m | ≤ 1 % up to 400 A/m | ≤ 1 % up to 400 A/m | ≤ 1 % up to 400 A/m |
| ≤ 0.05 % | ≤ 0.05 % | ≤ 0.05 % | ≤ 0.05 % | ≤ 0.05 % |
| | | | | |
| I (current) | U (voltage) | I (current) | U (voltage) | f (frequency) |
| 1 | 1 | 1 | 1 | 1 |
| 4...20 mA | 4...20 mA | 4...20 mA | 4...20 mA | 4...20 mA |
| | | 0...max. 20 mA | 0...max. 20 mA | 0...max. 20 mA |
| max. 1.8 x $I_{nom}$ | max. 1.8 x $I_{nom}$ | max. 1.25 x $I_{nom}$ | max. 1.25 x $I_{nom}$ | max. 1.25 x $I_{nom}$ |
| ≤ 15 V/$I_{nom}$ | ≤ 15 V/$I_{nom}$ | ≤ 15 V/$I_{nom}$ | ≤ 15 V/$I_{nom}$ | ≤ 15 V/$I_{nom}$ |
| (≤ 750 Ω with 20 mA) | (≤ 750 Ω with 20 mA) | (≤ 750 Ω with 20 mA) | (≤ 750 Ω with 20 mA) | (≤ 750 Ω with 20 mA) |
| | | 0...max. 10 V | 0...max. 10 V | 0...max. 10 V |
| | | 30 V with R = ∞ | 30 V with R = ∞ | 30 V with R = ∞ |
| | | R ≥ 100 kΩ | R ≥ 100 kΩ | R ≥ 100 kΩ |
| linear | linear | linear | linear | linear |

2) under reference conditions

## Technical data (continued)

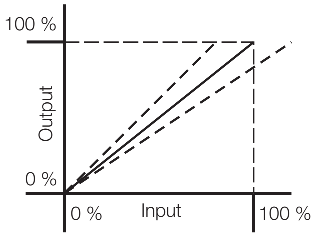
| **Type** | | | **PTA50** | **PTV50** | |
|---|---|---|---|---|---|
| **Catalog number** | | | **3KDE48510** | **3KDE48511** | |
| **Housing** | | | | | |
| Made of plastic, hardly flammable, halogen-free | | | yes, to VL94-V2 | yes, to VL94-V2 | |
| **Connections** | | | | | |
| Current (solid/flexible) | | | 6.0/4.0 $mm^2$ | | |
| Others (solid/flexible) | | | 2.5/2.5 $mm^2$ | 2.5/2.5 $mm^2$ | |
| **Type of protection** | | | | | |
| Housing | | | IP 40 | IP 40 | |
| Terminals | | | IP 20 | IP 20 | |
| **Weight** | | | approx. 235 g | approx. 235 g | |
| **Standards and regulations** | | | | | |
| Basic standard for power transducers | | | DIN EN 60688/IEC 60688 | DIN EN 60688/IEC 60688 | |
| Safety information to DIN EN 61010-1/IEC 61010-1 | | | | | |
| | Test voltage input against output | | 5.55 kV, 50/60 Hz | 5.55 kV, 50/60 Hz | |
| | Voltage across input terminals | | ≤ 300/600 V | ≤ 300/600 V | |
| | Voltage against ground | | ≤ 600 V, double insulation | ≤ 600 V, double insulation | |
| | Overvoltage category | Inputs | III | III | |
| | | Outputs | II | II | |
| | Degree of pollution | | 2 | 2 | |
| | Output circuits are functional extra-low | | | | |
| | voltage circuits to DIN VDE 0100-410 | | | | |
| | (PELV) for input voltages | | ≤ 600 V | ≤ 600 V | |
| | The safe isolation of theses circuits meets the | | | | |
| | requirements to DIN EN 61140/IEC 61140 | | | | |
| | EMC and radio suppression: | | | | |
| | DIN EN 61326/IEC 61326 | | | | |
| | Class A | | yes | yes | |
| Climatic category to DIN IEC 721 or DIN EN 60721-3-3 | | | | | |
| | Ambient temperature | | 3K5 -20...+60 °C | 3K5 -20...+60 °C | |
| | Storage temperature | | 2K4 -40...+80 °C | 2K4 -40...+80 °C | |
| Mechanical capability to DIN IEC 68-2-27 | | | | | |
| and 68-2-6 | | | | | |
| | Shock | | 30 g, 11 ms | 30 g, 11 ms | |
| | Vibration | | 2 g, 5...150 Hz | 2 g, 5...150 Hz | |

| **Accessories** | **Catalog number** |
|---|---|
| Top hat rail, 2 m long, for mounting (35 x 7.5 x 2000 mm) DIN EN 60715 | V86299A-1100000 |

| **PTM50-AS**<br>**3KDE48512** | **PTM50-VS**<br>**3KDE48513** | **PTM50-AN**<br>**3KDE48514** | **PTM50-VN**<br>**3KDE48515** | **PTM50-FN**<br>**3KDE48516** |
|---|---|---|---|---|
| | | | | |
| yes, to VL94-V2 | yes, to VL94-V2 | yes, to VL94-V2 | yes, to VL94-V2 | yes, to VL94-V2 |
| | | | | |
| 6.0/4.0 $mm^2$ | | 6.0/4.0 $mm^2$ | | |
| 2.5/2.5 $mm^2$ | 2.5/2.5 $mm^2$ | 2.5/2.5 $mm^2$ | 2.5/2.5 $mm^2$ | 2.5/2.5 $mm^2$ |
| | | | | |
| IP 40 | IP 40 | IP 40 | IP 40 | IP 40 |
| IP 20 | IP 20 | IP 20 | IP 20 | IP 20 |
| approx. 135 g | approx. 145 g | approx. 135 g | approx. 145 g | approx. 145 g |
| | | | | |
| DIN EN 60688/IEC 60688 | DIN EN 60688/IEC 60688 | DIN EN 60688/IEC 60688 | DIN EN 60688/IEC 60688 | DIN EN 60688/IEC 60688 |
| | | | | |
| 5.55 kV, 50/60 Hz | 5.55 kV, 50/60 Hz | 5.55 kV, 50/60 Hz | 5.55 kV, 50/60 Hz | 5.55 kV, 50/60 Hz |
| ≤ 300/600 V | ≤ 300/600 V | ≤ 300/600 V | ≤ 300/600 V | ≤ 300/600 V |
| ≤ 570 V, double insulation | ≤ 570 V, double insulation | ≤ 570 V, double insulation | ≤ 570 V, double insulation | ≤ 570 V, double insulation |
| III | III | III | III | III |
| II | II | II | II | II |
| 2 | 2 | 2 | 2 | 2 |
| | | | | |
| | | | | |
| ≤ 570 V | ≤ 570 V | ≤ 570 V | ≤ 570 V | ≤ 570 V |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| yes | yes | yes | yes | yes |
| | | | | |
| 3K5 -20...+60 °C | 3K5 | 3K5 -20...+60 °C | 3K5 -20...+60 °C | 3K5 -20...+60 °C |
| 2K4 -40...+80 °C | 2K4 | 2K4 -40...+80 °C | 2K4 -40...+80 °C | 2K4 -40...+80 °C |
| | | | | |
| | | | | |
| 30 g, 11 ms | 30 g, 11 ms | 30 g, 11 ms | 30 g, 11 ms | 30 g, 11 ms |
| 2 g, 5...150 Hz | 2 g, 5...150 Hz | 2 g, 5...150 Hz | 2 g, 5...150 Hz | 2 g, 5...150 Hz |

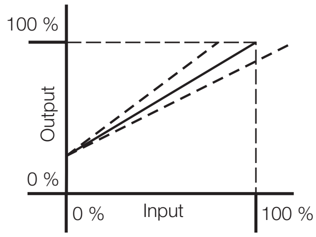
**Catalog number**
V86299A-1100000

## Characteristic




Linear

PTA50, PTV50, PTM50-..
PTK50-1, PTK50-3, PTSU50-3




Linear
Live-zero
PTM50-..
PTK50-1, PTK50-3,PTSU50-4

## Connection diagrams (device)


**Power supply**
13 L + / ~
14 N - / ~

**Current**
1.1 L1, current, input 1
1.2 L1, current, input 2
3 L1, current, output

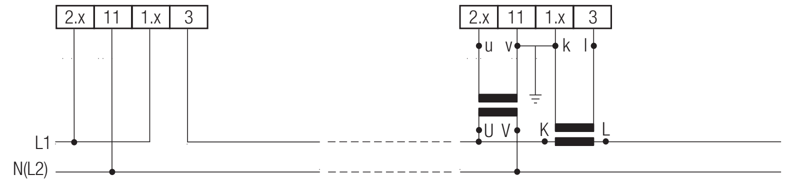
**Voltage**
2.1 L1, voltage, input 1
2.2 L1, voltage, input 2
11 Neutral point, voltage

**Analog outputs**
111 Analog output 1
112 Analog output 1 +

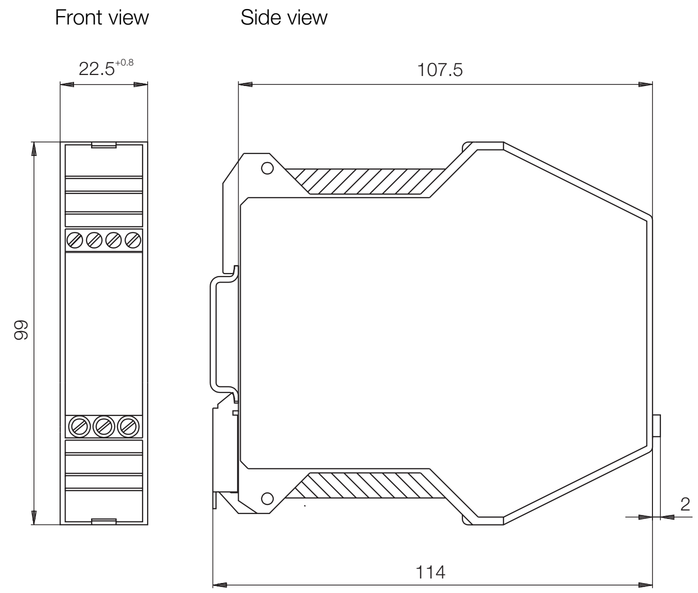
**Caution**
Terminals 101 and 102 of PTM50-.N transducers are used for changing over the analog output from 0...20 mA (with bridge) to 4...20 mA (without bridge). Bridging of these terminals must be realized on the shortest possible way. No other terminal assignment is permitted.

## Connection diagram (system)

Single-phase AC current (~) [PTA50, PTV50; PTM50-..]




## Dimensional drawings




PTA50
PTV50
PTM50-AS
PTM50-AN
PTM50-VN
PTM50-FN

## Bestellinformationen

| | Catalog No. | | | | | | | | | Code | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | |
| **Preferred types for sinusoidal variables** | | | | | | | | | | | | | |
| **Power transducer PTA50** (for current) | **3KDE485100L** | 1 | 0 | 0 | 2 | 0 | 0 | | | | | | |
| **Power transducer PTV50** (for voltage) | **3KDE485110L** | 0 | 1 | 0 | 2 | 0 | 0 | | | | | | |
| | | | | | | | | | | | | | |
| **Variants for sinusoidal variables** | | | | | | | | | | | | | |
| **Power transducer PTA50** (for current) | **3KDE485100V** | | **0** | **0** | | **0** | **0** | | | | | | |
| **Power transducer PTV50** (for voltage) | **3KDE485110V** | **0** | | **0** | | **0** | **0** | | | | | | |
| **Rated current**[3] | | | | | | | | | | | | | |
| **$I_{rated}$ = 1 A / 5 A** | | **1** | **0** | | | | | | | | | | |
| $I_{rated}$ = 1.2 A / 6 A | | 2 | 0 | | | | | | | | | | |
| $I_{rated}$ = 2 A / 10 A | | 3 | 0 | | | | | | | | | | |
| $I_{rated}$ = 2,4 A / 12 A | | 4 | 0 | | | | | | | | | | |
| $I_{rated}$ = xA/5 · xA $I_{rated}1$ = 0.1...2.4 A (x.xx A)[4] ($I_{rated}2$=5 × $I_{rated}1$) clear text | | 9 | 0 | | | | | | | | | | |
| $I_{rated}2$ = 0.5...12.0 A (xx.xx A)[4] clear text | | | | | | | | | | | | | |
| **Rated voltage**[3] | | | | | | | | | | | | | |
| **$U_{rated}$ = 100 V / 120 V** | | **0** | **1** | | | | | | | | | | |
| $U_{rated}$ = 110 V / 133 V | | 0 | 2 | | | | | | | | | | |
| $U_{rated}$ = 130 V / 250 V | | 0 | 3 | | | | | | | | | | |
| $U_{rated}$ = 400 V | | 0 | 4 | | | | | | | | | | |
| $U_{rated}$ = 500 V | | 0 | 5 | | | | | | | | | | |
| $U_{rated}$ = 600 V | | 0 | 6 | | | | | | | | | | |
| $U_{rat.}$ = xV/1.2 · xV $U_{rated}1$ = 10...250 V (xxx.x V)4) clear text | | 0 | 9 | | | | | | | | | | |
| $U_{rated}2$ = 12...300 V (xxx.x V)[4] ($U_{rated}2$=1.2 × $U_{rated}1$) clear text | | | | | | | | | | | | | |
| > 300...600 V (xxx.x V) (only $U_{rated}2$) clear text | | | | | | | | | | | | | |
| **Power supply** | | | | | | | | | | | | | |
| without | | | | **0** | | | | | | | | | |
| **Output signal** | | | | | | | | | | | | | |
| **0...20 mA** | | | | | **2** | | | | | | | | |
| 0...10 mA | | | | | 3 | | | | | | | | |
| 0...1 mA | | | | | 4 | | | | | | | | |
| 0....xx.x mA to xx.x > 0 to 20 mA[4] clear text | | | | | 6 | | | | | | | | |
| 0...1 V | | | | | 7 | | | | | | | | |
| 0...10 V | | | | | 8 | | | | | | | | |
| 0...xx.x V to xx.x > 0 to 10 V[4] clear text | | | | | 9 | | | | | | | | |
| **Communication** | | | | | | | | | | | | | |
| without | | | | | | **0** | | | | | | | |
| **Options** | | | | | | | | | | | | | |
| without | | | | | | | **0** | | | | | | |
| **Hardware/Software version** | | | | | | | | | | | | | |
| will be specified by ABB | | | | | | | | * | * | | | | |
| **Certificates** | | | | | | | | | | | | | |
| Certificate of conformity (to DIN EN 10204-2.1) clear text | | | | | | | | | | | | | |
| Inspection certificate B (to DIN EN 10204-3.1B) or manufacturer's certificate M (to DIN 55350-18-4.2.2)[1)2)] | | | | | | | | | | 499 | | | |
| Inspection certificate C (to DIN EN 10204-3.1C) or inspection certificate O/M (to DIN 55350-18-4.3.1/3) clear text | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| **Accessories** | | | | | | | | | | | | | |
| Top hat rail to DIN EN 60715 (35 × 7.5 mm, 2000 mm long) | V86299A-1100000 | | | | | | | | | | | | |

1) Can be ordered prior to manufacturing, only.
2) This code No. does not appear on the rating plate of the device or on the device packing.
3) Max. permissible voltages: 300/600 V across the terminals; 600 V against ground.
4) The selected special value must be added to the catalog number as plain text.

## Bestellinformationen

| | Catalog No. | | | | | | | | | Code | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | |
| **Preferred types for sinusoidal variables** | | | | | | | | | | | | | |
| **Power transducer PTM50-AS** (for current) | **3KDE485120L** | 1 | 0 | 2 | 1 | 0 | 0 | | | | | | |
| **Power transducer PTM50-VS** (for voltage) | **3KDE485130L** | 0 | 1 | 2 | 1 | 0 | 0 | | | | | | |
| **Preferred types for RMS value measurement** | | | | | | | | | | | | | |
| **Power transducer PTM50-AN (for current)** | **3KDE485140L** | 1 | 0 | 2 | 1 | 0 | 0 | | | | | | |
| **Power transducer PTM50-VN (for voltage)** | **3KDE485150L** | 0 | 1 | 2 | 1 | 0 | 0 | | | | | | |
| **Power transducer PTM50-FN (for frequency)**<br>Measuring range 47.5...52.5 Hz | **3KDE485160L** | 0 | 1 | 2 | 1 | 0 | 9 | | | | | | |
| | | | | | | | | | | | | | |
| **Variants for sinusoidal variables** | | | | | | | | | | | | | |
| **Power transducer PTM50-AS (for current)** | **3KDE485120V** | **1** | **0** | **2** | **1** | **0** | **0** | | | | | | |
| **Power transducer PTM50-VS (for voltage)** | **3KDE485130V** | **0** | **1** | **2** | **1** | **0** | **0** | | | | | | |
| **Variants for RMS value measurement** | | | | | | | | | | | | | |
| **Power transducer PTM50-AN (for current)** | **3KDE485140V** | | **0** | | | **0** | **0** | | | | | | |
| **Power transducer PTM50-VN (for voltage)** | **3KDE485150V** | **0** | | | | **0** | **0** | | | | | | |
| **Power transducer PTM50-FN (for frequency)** | **3KDE485160V** | **0** | | | | **0** | **9** | | | | | | |
| **Rated current**[3] | | | | | | | | | | | | | |
| **$I_{rated}$ = 1 A / 5 A** | | **1** | **0** | | | | | | | | | | |
| $I_{rated}$ = 1.2 A / 6 A | | 2 | 0 | | | | | | | | | | |
| $I_{rated}$ = 2 A / 10 A | | 3 | 0 | | | | | | | | | | |
| $I_{rated}$ = 2.4 A / 12 A | | 4 | 0 | | | | | | | | | | |
| $I_{rat.}$ = xA/5 • xA — $I_{rated}1$ = 0.1...2.4 A (x.xx A)[4] ($I_{rated}2$ = 5 × I | clear text | 9 | 0 | | | | | | | | | | |
| $I_{rated}2$ = 0.5...12.0 A (xx.xx A)[4] | clear text | | | | | | | | | | | | |
| **Rated voltage**[3] | | | | | | | | | | | | | |
| **$U_{rated}$ = 100 V / 120 V** | | **0** | **1** | | | | | | | | | | |
| $U_{rated}$ = 110 V / 133 V | | 0 | 2 | | | | | | | | | | |
| $U_{rated}$ = 130 V / 250 V | | 0 | 3 | | | | | | | | | | |
| $U_{rated}$ = 400 V | | 0 | 4 | | | | | | | | | | |
| $U_{rated}$ = 500 V | | 0 | 5 | | | | | | | | | | |
| $U_{rated}$ = 600 V | | 0 | 6 | | | | | | | | | | |
| $U_{rat.}$ = xV/1.2 • xV — $U_{rated}1$ = 10...250 V (xxx.x V)[4] | clear text | 0 | 9 | | | | | | | | | | |
| $U_{rated}2$ = 12...300 V (xxx.x V)[4] ($U_{rated}2$ = 1.2 | clear text | | | | | | | | | | | | |
| > 300...600 V (xxx.x V) only $U_{rated}2$) | clear text | | | | | | | | | | | | |
| **Power supply** | | | | | | | | | | | | | |
| $U_H$ = 19...72 V, 50/60 Hz, 19...100 V DC | | | | 1 | | | | | | | | | |
| **$U_H$ = 80...265 V, 50/60 Hz, 80...300 V DC** | | | | **2** | | | | | | | | | |
| **Output signal** | | | | | | | | | | | | | |
| **4...20 mA** | | | | | **1** | | | | | | | | |
| 0...20 mA | | | | | 2 | | | | | | | | |
| 0...10 mA | | | | | 3 | | | | | | | | |
| 0...1 mA | | | | | 4 | | | | | | | | |
| 0...20 mA / 4...20 mA | | | | | 5 | | | | | | | | |
| xx.x...xx.x mA — from xx.x = 0 to ... mA[4] | clear text | | | | 6 | | | | | | | | |
| to xx.x = ... to 20 mA[4] | clear text | | | | | | | | | | | | |
| 0...1 V | | | | | 7 | | | | | | | | |
| 0...10 V | | | | | 8 | | | | | | | | |
| xx.x...xx.x V — from xx.x = 0 to ... V[4] | clear text | | | | 9 | | | | | | | | |
| to xx.x = ... to 10 V[4] | clear text | | | | | | | | | | | | |
| **Communication** | | | | | | | | | | | | | |
| without | | | | | | **0** | | | | | | | |
| **Measuring range for frequency transmitters** | | | | | | | | | | | | | |
| xx.x...xx.x Hz — from xx.x = 30 to ... Hz[4] | | | | | | | 9 | | | | | | |
| to xx.x = ... to 80 Hz[4] Difference ≥ | clear text | | | | | | | | | | | | |
| **Hardware/Software version** | | | | | | | | | | | | | |
| will be specified by ABB | | | | | | | | * | * | | | | |

continued on the next page

[4] The selected special value must be added to the catalog number as plain text.

## Ordering information (continued)

| | | Code | | | |
|---|---|---|---|---|---|
| | | | | | |
| **Certificates** | | | | | |
| Certificate of conformity (to DIN EN 10204-2.1) | clear text | | | | |
| Inspection certificate B (to DIN EN 10204-3.1B) or manufacturer's certificate M (to DIN 55350-18-4.2.2)[1)2)] | | 499 | | | |
| Inspection certificate C (to DIN EN 10204-3.1C) or inspection certificate O/M (to DIN 55350-18-4.3.1/3) | clear text | | | | |
| | | | | | |
| **Accessories** | | | | | |
| Top hat rail to DIN EN 60715 (35 × 7.5 mm, 2000 mm long) | V86299A-1100000 | | | | |

[1)] Can be ordered prior to manufacturing, only.
[2)] This code No. does not appear on the rating plate of the device or on the device packing.
[3)] Max. permissible voltages: 300/600 V across the terminals; 570 V against ground

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Printed in the Fed. Rep. of Germany (03.03)



3KDE485000R1001

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