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D

Decay time; Fall time (of an impulse)

Time interval between the time at which the momentary value of an impulse again achieves a given upper value and then a given lower value.

Note: If not differently defined, the upper and the lower values are respectively fixed on 90% and/or 10% of the amplitude of impulse.

Directional factor

See Vibration sensor, directional factor

Damping

Loss of energy in a vibrating system over time or distance.
Degradation of signals when transferring over a transmitting medium (signal level decreases). It is thus the opposite of amplification (signal amplification). The D. usually increases with rising frequency and cable length. It is measured as a level in decibels (dB).

Damping, critical

Minimum damping, which permits a deflected system to return to its starting situation without vibration.

Damping, negative

Negative damping corresponds to an amplification.

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Damping, viscous

Damping which arises, if a small part in a vibrating system is braked by a force whose amount is proportional to the amount of the particle speed and whose direction is opposite the direction of the particle motion.

Damping ratio

Ratio of the actual damping to the critical damping.

Data security

Measures and mechanisms, which bring about or maintain data security.

dB

Abbr. for Decibel

DC measurement

General name for the measurement of DC voltage or DC current.
With measurements for the evaluation of the machine condition, the operating parameters are thereby meant by which the operating condition (or as the case may be the operating regime) of the machine is characterized.

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DC Signal

A signal (of equal value), whose instantaneous value $x(t)$ is temporally constant. Examples are direct current, DC voltage and the mean DC values during non-contacting shaft vibration measurement (GAP voltage). With varying signals the instantaneous value $x(t)$ changes temporally, but maintains the same polarity.

Default

Designated always the initial state or the fixed pre-setting of certain parameters of a computer and/or a measuring system or program.

Default value

The predefined value of a variable which should be valid as long as no other value is specified.

Decrement, logarithmic

Natural logarithm of the relationship of distant arbitrary sequential maxima of the same polarity in the decay curve of a natural frequency vibration.

Note: Also described as damping factor D.

Demodulation

Procedure for the recovery of the original modulating signal from a modulated signal.
Reversal of the modulation, i.e. reconverting the signal modulated on a high frequency carrier oscillation to the original (low-frequency) signal by a demodulator.

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With amplitude modulation the D. essentially exists in rectification by means of a fast peak value rectifier. With the frequency modulation the frequency variations are converted by a frequency discriminator into amplitude oscillations and finally converted in parallel or directly afterwards to the low frequency.

Decibel

1) Measure for the sound volume of noise and machinery
2) Measure of the relationship between two electrical signals $P1$ and $P2$.

- Amplitude relationship in dB $= 20Ig\ (P1/P2)$
- Power relationship in dB $= 10Ig\ (P1/P2)$

e.g. 60 dB amounts to the amplitude ratio of voltages from 1 V and 1 mV.

DFT

Abbr. for **D**iscrete **F**ourier **T**ransformation

Diagnostic system

D. are today the broadest form of expert systems. Abstractly they are characterized by the fact that from a small (finite) quantity of alternatives they make the correct selection and thus the correct classification.

Differential test masses

Two weights, each of which constitutes a different unbalance, which are attached in the same plane in diametrically opposed positions (opposite one another). The effective unbalance consists of the difference between the two unbalances.

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D

Difference unbalance

The unbalance difference between two different test weights.

Digital-Analogue-Converter;

A functional unit which converts a digital signal (input signal) into an analogue signal (see also DIN 19226). Since a digital input signal possesses only a discrete range of values, the output signal of an ideal DAC has points of discontinuity, when new values are handed over. Since this causes a disturbance with different applications, a suitable filter and/or interpolation procedures is used for the smoothing.

The converse is an Analogue-Digital-Converter.

Digital filter

One, or several, algorithms and/or arithmetic operations for evaluation (filtering) of signal values, which are scanned at discrete times.

Digitize

Transformation of the analogue representation of the value of a physical dimension into a digital representation. The digital representation consists of a finite number of sequences, which come from a given supply of consequences.

The digitization of a value is accomplished with an Analogue-Digital-Converter.

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DIN

Abbr. for German Institute for Standardization – registered association committee for the definition of technical standards in Germany.

Discriminator

Frequency modulator

Display, alpha-numeric

An indicator arrangement, which exists e.g. of a point grid (e.g. $5x7, 8x8, 7x9$) of light points and can be represented by the letters of the alphabet (large and small), the 10 numerals 0 to 9 and further formula, separation and punctuation marks (e.g. $+, -; =/!?$).

Dongle

Software copy protection plug

Drift

Unwanted slow changes of the output values of a measuring instrument and/or a measurement chain with constant input.

Causes e.g. are: temperature influences, aging of the construction units, the materials of sensors. For drift suppression often complex measures are necessary in construction and manufacturing.

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Drop-out

An inadvertent brief amplitude loss of a signal.

Duplex

Description for the direction of data transmission. Over the transmission circuit the transmission can be carried out in three ways:

- Simplex: Transmission occurs in only one direction.
- Half-duplex: Transmission occurs in only one direction.
- Full-duplex: Transmission occurs simultaneouisly in both directions.

Dynamic

Name for the relationship between maximum and minimum transferable, or resolvable, signal level in the measuring technique. This is given in decibels (dB).

Dynamic range

The D. is a criterion for the amplitude resolution of signal analysers. It describes the property of being able to investigate small signals in the simultaneous presence of large signals.
The dynamic range is defined as the ratio between largest and the smallest simultaneously existing signal amplitudes than can be analysed.

Dynamic range (of a signal)

The difference between maximum and minimum signal level over a given time period, expressed in decibels.

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D

Digital Filter

Digital filter

Damped natural frequency

Natural frequency, damped

Driver; of an instrument

The D. is described as the part of an operating system which is responsible for the control of the input/output channels. In small computers this can be the direct input/outputs ports and in medium and large computers the input/output processors. A D. represents the lowest level of the operating system and serves for making available an interface for the next higher level of a largely device-independent peripheral device.

DC voltage

D. is described as an electrical voltage which does not change in magnitude over time.

DC voltage amplifier

An amplifier for small DC voltages. Because D. are often employed in connection with measurement equipment, one also speaks of measurement amplifiers.

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D

DC voltage converter; Transverter

A switching configuration, for the shaping of DC voltages. With the D. by means of switching transistors alternating voltages with proportional amplitude are formed out of DC voltages. These are converted by means of a transformer to a larger or smaller voltage level and transformed afterwards by a rectifier switch again into DC voltages. A D. produces functional disturbances and must therefore be shielded.

DC current

D. is that electrical current which does not change in magnitude over time (e.g. current from a battery).

DC current part

The arithmetic mean value of a time-variable voltage, or a time-variable current. .

Degrees

1) Unit character °, a legal unit of the even angle, in former times also called old degree, defined as the 90th part of a right angle.
2) Unit character ‚deg', non-legal unit of the differences of Celsius temperatures and concomitantly in thermodynamic temperatures; $1\,deg. = 1\,K$.

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Distortion factor

The D. is the relationship of the rms of the harmonics to the total rms of a vibration signal.

A measure for the non-linear distortions occurring within the controlling limits in a four-pole network (e.g. amplifier, converter). The D. is mainly given as the distortion factor d in percent. One distinguishes the distortion factor for the individual harmonics $d_2 = U_2/U_1 \; k_3 = U_3/U_1$ etc. (U_1 voltage of the fundamental, U_2 voltage of the 2nd harmonic, etc.) about the total distortion factor

$$d_{tot} = \frac{\sqrt{U_2^2 + U_3^2 + U_4^2 + \cdots}}{\sqrt{U_1^2 + U_2^2 + U_3^2 + \cdots}}$$

as the ratio of the rms value of the harmonic voltage to the rms value of the total voltage of the signal mix.