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### Glossary

**This glossary** was originally prepared by the President as a footnote to his article on converter locomotives. At the editor's request, he had added the German equivalents of the English terms, this we trust will help members translate articles in *Eisenbahn Amateur* and other German language texts.

#### Adhesion: Haftreibunskraft

Friction force with whichg a locomotive adheres to the rails.

#### Adhesion coefficient: Reibwert

Tractive effort/weight ratio obtained by dividing the tractive effort in kg by the adhesion in kg. With modern locomotives this coefficient is in the range 0.35-0.38.

#### Amplitude : Amplitude

The highest value of the variable size of an electric wave.

#### Ampere: Stromstärke

Unit of measurement of the strength of an electric current.

#### Asynchronous motor: Asynchronmotor

Electric motor for rotary current. The latter produces revolving magnetic fields in the excited field windings. The short circuited windings of the rotor follow this rotating magnetic field. The 3 phases of the supply are displaced by 120°.

#### Brake: Bremse

A device for (hopefully) stopping a train at the desired place, and for holding it there.

#### Brushes: Kollektorbürsten

Motor components made of carbon or metal, used to feed current to the commutator.

#### Collector: Kolleckor

Also commutator, reverses current in motors.

#### Commutator: Kommutator

See collector.

#### Conventional locomotive:

#### bisherige Lokomotive

Term used for locomotives using single phase AC at  $16^2/_3$  cycles per second; the conventional Swiss (and German + Austrian) approach.

#### Converter locomotive:

#### Umrichter-Lokomotive

Electric locomotive where the supply current is converted once or twice (ie to DC or 3-phase AC).

#### Cycles per second (CPS):

#### Frequenz pro Sekunde

Describes one period in which AC flows first in one and then in the opposite direcvtion.  $16^2/_3$  CPS means a current flowing  $16^2/_3$  times per second forth and back again.

#### Direct motor locomotive:

#### Direktmotor-Locomotive

Term used for a locomotive where the current is not converted, but consumed directly, in the case of Swiss  $16^2/_3$  cycle supply, with transformer reduced voltage.

#### Energy balance: Energiebilanz

The energy consumed in a given time with a given load on a given railway line. The lower the consumption of idle power and enewrgy for auxiliary equipment and the higher the recuperation of energy, the better the energy balance.

#### Four quadrant regulator:

#### Vierquadrantensteller

Supply side converter with GTO-thyristors for regulating the intermediate circuit's voltages and shaping the supply side alternating current in a sinusoidal form to obtain any desired temporal displacement between the voltage and the phase (control of true and idle power).

#### Frequency: Frequenz

The number of cycles per second.

#### Gate turn off thyristor:

#### Beliebig ein- und abschaltbarer Thyristor

Special semiconductor which is turned on and off at any required moment of the half wave. Modern thyristors switch with a frequency of over 200 cycles per second.

#### Harmonic waves: Oberwellen-Verzerrungen

Waves with frequencies of multiples of the basic frequency. These often interfere with the frequewncies of signal and communication circuits.

#### HP: PS (Pferdestärke)

Unit of work equalling 75 mks, ie, the power needed to lift 75 kg 1 metre in one second. Repoaced since 1 January 1978 by the Watt. 1 HP = 735.5 W, or 1 KW = 1.36 HP.

#### Idle power: Blindleitsung

Share of power which is not being consumed by an electric appliance operating on AC.

#### Intermediate circuit: Zwischenkreis

This stabilised the direct current voltage by smoothing out the  $33^{1}/_{3}$  frequency, serves as an accumulator for the com-ensation of currents between the input and output converters in both directions.

#### kW: Kilowatt

1 kW = 1000 Watt, the measuring unit for electric power. 1 W = 1 V x 1 A. The power of an electric locomotive can be calculated by the formula:

kN x Speed (km/h) / 3.6

For example:

 $300 \times 84 = 22500 / 3.6 = 7000 \text{ kW (BLS converter locomotive)}.$ 

#### kN: Kilonewton

Kilo Newton or 1000 Newtons, the measuring unit for force. 1 N produces an acceleration of 1  $\text{m/s}^2$  on a body on 1 kg. Used also to indicate the tractive effort of a locomotive, 300 kN = 30000 kg. The exact value is 29700 but a factor of 10 is acceptable according to UIC.

#### Macroskid range: Makroschlupf-Bereich

The range of wheel revolutions or peripheral speed just before sl;ipping. This depends on the rail conditions, type of motor, axle load distribution and anti-skid counter measures.

#### Microprocessor control:

#### Mikroprozessor-Steuerung

Integrated circuits acting as central pro-

cessing units (CPU) of small computers. In Class 460, used for all locomotive functions.

#### Motor power: Motorleistung

Power measured in kW at the motor shaft; this is higher than the engine power measured at wheel rims, due to losses in the drive unit.

#### Phase angle control: Anschnittsteurung

The thyristors of rectifier locomotives produce a wave shaped direct currentr (also called mixed current), which can be 'cut' by the turn-on electrode at any moment and angle of the half wave. The higher the sector covered by the angle, the higher the power.

#### Pulsing torque: pulsierendes Drehmoment

Due to the pulsations of AC, the torque is pulsing at double the supply frequency. The torque is the power turning the body, for example, if you touch a turning shaft, the torque tries to turn your hand. which is why this is not a very good idea.

Torque equals the turning force times the vertical distance from the turning axis (T=radius x force).

#### Rectifier locomotive:

#### Gleichrichter-Lokomotive

Locomotive in which the AC supply is converted and rectified to DC (direct current).

#### Recuperative brake: Rekuperationsbremse

An electric brake in which the motors act as generators. Converter locomotives have the same brake force as the starting tractive force.

## Self steering, shifting action drive bogie : selbselenkendes Drehgestell mit Schiebelagerantrieb

A bogie with low unsprung mass and transversely decoupled axles, trapeziodally arranged links between the motor and a central girder to provide radial adjustment of the wheels.

#### Series wound commutator motor:

#### in Serie gechalteter Kollektor-motor

A motor consisting of a fixed field, rotor, comutator and brushes, wound in series to obtain a high starting torque.

#### Single phase alternating current (AC) : Einphasen-Wechselstrom

Produced by special generators in power plants for railway traction.  $16^2/_3$  cycles AC was chosen by the SBB at the beginning of the century because the arcing problems with commutators are easer to control than with the industrial 50 cycles supply.

#### Tap changer: Stufenschalter

Connects the transformer tappings on the secondary windings with the terminal motor feeders. It serves to regulate voltages and therefore power and speed.

#### Thyristor: Thyristor, Halbleiter

A semiconductor that works as a contactless switch, it conducts electricity only when an impulse is applied to an electrode.

Tractive effort : Zugkraft

The force which a locomotive produces when hauling a train. It is given in N or kN and measured at the wheel rims.

#### Three phase alternating current:

#### Dreiphasen-Wechselstrom

This is generated at the industrial frequency of 50 cps in Europe, when applied interlinked in three phases displaced at 120° equals rotary current.

#### True power: Wirkstrom

Product of the current, voltage and power factor; the share of power available for conversion to mechanical work.

#### Voltage, volt : Spannung

Small

Unit of measurement for the electromotive force (EMF) with which the current is flowing. 1 Volt = 1 Amp x 1 Ohm.

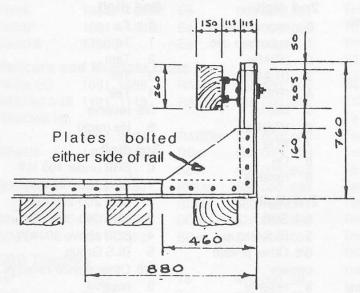
Wood block bol-

ted to cross rails

spacer

plate welded bet-

ween rail heads



Side Elevation

# Disentis Station Buffer stops to carriage siding

adjacent to FO carriage shed
Drawing by David Yule
not to scale

Front Elevation