



## 1 Purpose

This standard establishes the position of the contact wire for overhead line operation of models of European normal- and broad-gauge railways and is in accordance with NEM 202.

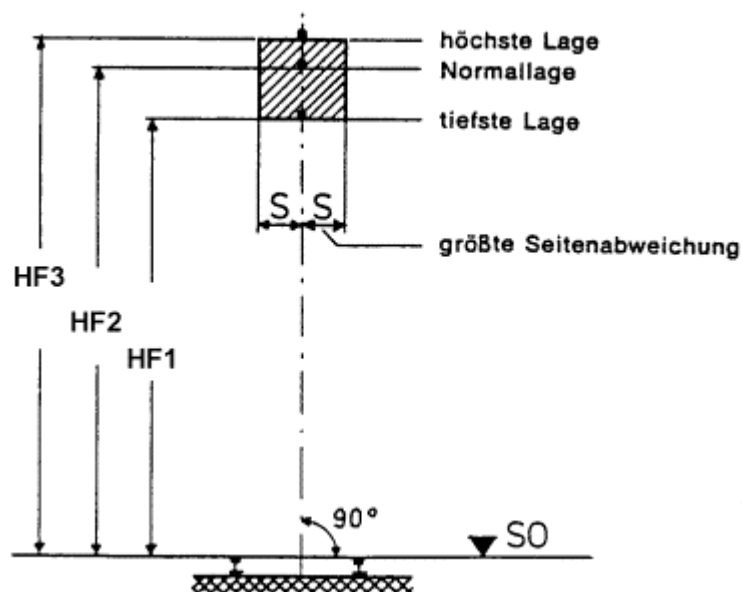
## 2 Preface

Among European railways there exist different measurements for the usable pantograph contact width and overall pantograph shoe width, and to a lesser extent, for the contact wire height. Given the reduced curve radii employed in model railway construction, the usable pantograph contact width will determine the required distance between the supporting masts (e.g. mast spacing).

Therefore, two contact wire applications are allowed:

- Wide System : For operation with wide-shoe pantographs (e.g., modeling the DB, ÖBB, and others that employ 300-400 mm of lateral deviation (zig-zag),
- Narrow System : For operation with narrow-shoe pantographs (e.g., modeling the SBB, FS, SNCF, and others that employ 200-300 mm of lateral deviation in the overhead line).

## 3 Contact wire position (Normallage = Nominal (Normal) Height)



**Dimension Table:**

Scale	Wide	Narrow	HF 1	HF 2	HF 3
Z	2	1	25	28	30
N	3,5	1,5	34	38	40
TT	4,5	2	44	50	52
HO	6,5	3	60	69	73
S	8,5	4	80	93	98
O	11	6	110	130	139
I	17	8	150	180	194

**Notes:**

1) The lateral distance (S) is the maximum allowed. It is appropriate to employ the full measurement only in curves. On tangent (straight) track, a zig-zag in the wire is recommended, but should be limited to approximately 2/3 of the maximum.

2) The dimension HF2 is the Normal wire height mandated for unobstructed locations and should be followed as strictly as possible. Height may be increased in stations and decreased in tunnels and other locations where the terrain requires, but in all cases, the position of the contact wire must remain between the Maximum and Minimum heights (HF3 and HF1).

3) Mast Spacing

The distance between masts (L max) on curved track with radius R, is a function of the lateral distance (S) and can be calculated with the following formula:

$$L \text{ max.} = 4 * \sqrt{R * S}$$

In multiple track arrangements with standard spacing (centerline to centerline), compute the distance between masts using the largest track radius. In other situations, calculation for several radii is recommended. To maintain reasonable (and visually pleasing) mast spacing, use the minimum radii recommended in NEM 111.