



Standards for European Model Railroads  
**Pantograph with  
 Overhead Wire Operation**

**NEM  
 202**

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Binding Standard

Dimensions in mm

Edition 2017 (20181030)  
 (First English Edition)

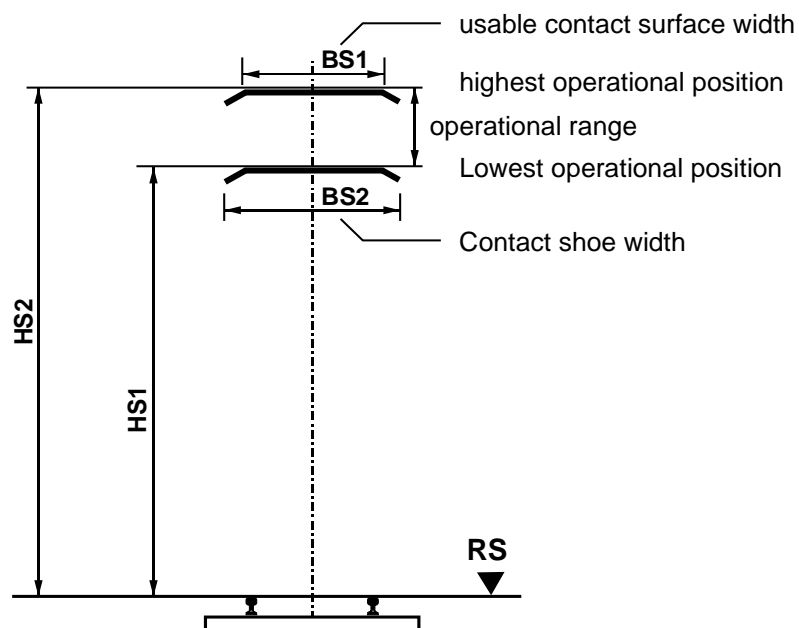
## 1. Purpose

This standard determines the usable contact surface width and the operational position of the pantograph pickup under overhead wire operations per NEM 201.

## 2. Introduction

In accordance with NEM 201 we differentiate the uses cases of **Wide** and **Narrow**.

## 3. Width Dimensions and Working Position



### Notes:

The curve between the contact strips and the pickup horns, as well as the tilt of the pickup horns and the entire contact shoe width, **BS2**, are determined by the prototypical pantographs. In no cases may a lowered pantograph (in rest position) have its width dimension **B<sub>2</sub>** or its height dimension **H<sub>4</sub>** exceed the limits of NEM 301.

### Dimension Table:

Gauge	BS1 Wide	BS1 Narrow	HS 1		HS 2	
			Nsp	Ssp	Nsp	Ssp
Z	7.5 +0.5	3.5 +0.5	25	23	31	29
N	10 +1	5 +1	34	29	41	39
TT	13.5 +1.5	7.5 +1.5	44	38	54	53
H0	18 +2	10 +2	60	50	75	72
S	25 +2	14 +2	80	69	101	96
0	34 +2	22 +2	112	98	142	136
I	48 +2	30 +2	155	134	198	185
II	69 +2	43 +2	220	190	282	266

Nsp: Normal and wide gauge      Ssp: Narrow gauge (m, e, i)

#### **4. Track Curve Radius**

In combining a deployed overhead wire (catenary) per NEM 201 and the corresponding tolerances one should consider that the pantographs are located in the vicinity of the vehicle guiding points (wheel truck pins or leading end axels). However, various prototypes require that suspensions in the models differ, so that the pantograph end up relatively farther away from the track guiding points such that they extend further out from the vehicle center.

Issues can be remediated via the following cited exemplary measures:

- with more closely spaced masts resulting from calculation of a smaller lateral deviation,
- deploying masts which pull the wire laterally outward in the curves,
- enlarging the deployed track curve radii or
- by installing wider (unattractive and out of scale) contact shoes.