

Modification: A

SYSTEM OF ELECTRIFICATION

	Specification	Value	Measuring unit	Permitted deviation	
				Class I	Class II
1.	Voltage of electrical overhead wire				
1.1	Voltage of electrical overhead wire***	25 000	V	+10% -24%	+10% -24%
1.2	Nominal voltage of electrical overhead wire***	25 000	V		
1.3	Minimum continuous voltage (Umin1) ***	19000	V		
1.4	Minimum non-continuous voltage (Umin2)***	17500	V		
1.5	Maximum continuous voltage (Umax1)***	27500	V		
1.6	Maximum non-continuous voltage (Umax2)***	29000	V		
2.	Frequency of electrical overhead wire				
2.1	The frequency of input power of current supply ***	50	Hz	±2	±2
2.2	Frequency of the electric traction system in 99,5% of a year period ***	50	Hz	±1	±1
2.3	Frequency of the electric traction system in 100% of a year period ***	50	Hz	+4/-6 %	+4/-6 %
3.	Minimum height dimension of electrical overhead wire above rail level: above level crossings: 6000 mm	5050**	mm	+20 -0	+20 -0
4.	Minimum height dimension of electrical overhead wire above level crossings	6000	mm	+20 -0	+20 -0
4.2	Minimum height dimension of electric overhead wire above level crossings in case of an electric overhead wire system built, in case of derogation made by railway authority****	5700	mm	+20 -0	+20 -0
5.	Maximum height dimension of electrical overhead wire above rail level	6150	mm	+0 -20	+0 -20
6.	Staggering of electrical overhead wire: ±300 mm	±300	mm	±10	±30
7.	Staggering of electrical overhead wire built before 1992 (tolerated value)	±400	mm	±10	±30
8.	Maximum permissible height lift of overhead wire during the passage of pantograph	120	mm		
9.	Pre-sag of wire	0	mm		
10.	Pantograph (static) contact force	75	N	±5	±5
11.	Section insulator - Permitted height difference of overhead wire connection		mm	±5	±15

* In compliance with National Railway Regulation, Volume I (on the basis of Decree 103/2003 (XII. 27.) GKM)

**National Railway Regulation Volume I (on the basis of Decree 103/2003 (XII. 27.) GKM for overhead wire networks not having a derogation for overhead wire height in level crossings given by the railway authority.

***In compliance with MSZ EN 50163 Standard for railway lines that are under the scope of EU Regulation 1301/2014/EU

****In compliance with MSZ EN 50119 Standard in case of electric overhead wire systems having a derogation for overhead wire height in level crossings given by the railway authority

***** Exceptions:

The height of the overhead wire

- a) in the Budapest Déli pu. tunnel in sections 14-17 at Kis-Gellért-hegy object above left track is 4800 mm
- b) in the Budapest Déli pu. tunnel in sections 14+00 - 17+00 at Kis-Gellért-hegy object above right track 4850 mm
- c) on the tracks of Budapest Déli at road overpass at Márvány utca some tracks under the bridge at Márvány utca in sections 6+00 - 7+00 4980 mm
- d) On line between Budapest-Nyugati - Városliget elágazás in sections 19+75 - 20+25 at _100/1_19+70/SZ1 Signal bridge new object, under the Signal bridge (Western section) above left track 4970 mm
- e) on line between Budapest-Nyugati - Városliget elágazás in sections 19+75 - 20+25 at _100/1_19+70/SZ1 Signal bridge new object, under the Signal bridge (Western section) above right track 5010 mm
- f) on the Debrecen - Apafa line in sections 2230+41 - 2230+42 at Db. Vágóhíd utca road overpass, under Road overpass (Diószegi bridge) above right track 4970 mm
- g) on Kelenföld - Háros line in sections 36+24 - 36+12 at road overpass by Bpest Kitérő út, under road bridge above left track 4960 mm
- h) on Kelenföld - Háros line in sections 36+24 - 36+12 at road overpass by Bpest Kitérő út, under road bridge above right track 5010 mm
- i) on Kelenföld - Háros line in sections 36+06 - 36+12 at Kitérő út villamos felüljáró 1 object, under BKV bridge above left track 4980 mm
- j) on Kelenföld - Háros line in sections 36+06 - 36+12 at Kitérő út villamos felüljáró 1 object, under BKV bridge above right track 5040 mm
- k) Mende - Süllyáp line in section 237+100 and 237+50 Mende Péceli úti kfj. at object under road overpass above right track 5040 mm
- l) Novajidrány - Hidasnémeti section 557+62 and 558+20 Hidasnémeti Perényi u. kfj under the Road Bridge on single track 5030 mm
- m) in Rákospuszta in sections 29+00 - 30+00 at road overpass by Kacsóh Pongrácz út road crossing (Rákospuszta - Városliget) 5030 mm
- n) in Sárospatak in sections 906+00 - 907+00 at road overpass 84150 main road, under road bridge 4960 mm
- o) on Székesfehérvár - Szabadbattyán line in sections 684+98 - 685+98 at road overpass Vásártér út, under Homokos overpass above right track 5034 mm
- p) on Szentendre - Csurgó line in sections 877+80 és 878+80 at main road 6801, Csurgó road overpass object, under road bridge single track 5040 mm
- q) in Tüskevár in sections 999+00 - 1000+00 at main road 8., Tüskevár road overpass object, under road bridge 5020 mm.

All the electrified lines on the railway network of MÁV Infrastructure Co. Ltd. are rated as Class I.

Voltage of the electrical overhead wire in electrified border crossings**MÁV Infrastructure Co. Ltd.**

	Name of the border crossing	Infrastructure Managers	Voltage/frequency of the overhead wire	
			MÁV Infrastructure Co. Ltd.	Next IM
1.	Hegyeshalom - Nickelsdorf	MÁV Infrastructure Co. Ltd./ÖBB	25 kV/50 Hz	15 kV/16 2/3 Hz
2.	Gyékényes - Koprivnica	MÁV Infrastructure Co. Ltd./HŽ	25 kV/50 Hz	25 kV/50 Hz
3.	Kelebia - Subotica	MÁV Infrastructure Co. Ltd./ŽS	25 kV/50 Hz	25 kV/50 Hz
4.	Lőkösháza - Curtici	MÁV Infrastructure Co. Ltd./CFR	25 kV/50 Hz	25 kV/50 Hz
5.	Hidasnémeti - Cana	MÁV Infrastructure Co. Ltd./ŽSR	25 kV/50 Hz	3 kV DC
6.	Szob - Sturovo	MÁV Infrastructure Co. Ltd./ŽSR	25 kV/50 Hz	25 kV/50 Hz
7.	Komárom - Komarno	MÁV Infrastructure Co. Ltd./ŽSR	25 kV/50 Hz	25 kV/50 Hz
8.	Óriszentpéter - Hodoš	MÁV Infrastructure Co. Ltd./SŽ	25 kV/50 Hz	25 kV/50 Hz

GYSEV Zrt.

	Name of the border crossing	Infrastructure Managers	Voltage/frequency of the overhead wire	
			GYSEV Zrt.	Next IM
1.	Sopron - Baumgarten	GYSEV	25 kV/50 Hz	25 kV/50 Hz
2.	Harka - Deutschkreutz	GYSEV/ÖBB	25 kV/50 Hz	25 kV/50 Hz
3.	Fertőszentmiklós - Pamhagen	GYSEV	25 kV/50 Hz	25 kV/50 Hz
4.	Rajka - Rusovce	GYSEV/ŽSR	25 kV/50 Hz	25 kV/50 Hz