IZOELEKTRO

05/2022

SN prenapetostni odvodniki
MV surge arresters

Korak pred časom
Ahead of it's time

SN prenapetostni odvodniki *MV surge arresters*

Proizvodi
SNO in 2SS15N so tipi srednje napetostnih kovinsko oksidnih odvodnikov prenapetosti s silikonskim plaščem. Namenjeni so za vgradnjo v SN omrežje do 52 kV kot zaščita pred direktnim udarom strele.

Lastnosti
Vrhunsko kvaliteto jim zagotavlja:
- zmogljiv varistorski blok,
- varistorski blok neposredno zalit s silikonom,
- toga konstrukcija,
- plašč odporen na UV sevanje in kemične vplive,
- vgrajen material, obstojen na vremenske vplive in staranje.

Vgradnja
Mesto montaže odvodnikov prenapetosti SNO in 2SS15N, določajo pravilniki in tehnični predpisi.
Odvodnike prenapetosti SNO in 2SS15N vgrajujemo:
- zunaj in znotraj,
- pri zaščiti elektroenergetskih naprav,
- za zaščito kompenzacijskih naprav,
- na železnicah, rudnikih...

Splošni podatki
- temperaturno območje okolja **T = -60 °C ... +85 °C**
- plašč: **silikonska guma**
- barva silikona: **siva**
- priključni navoj: **M12x20 mm**

Product
SNO and 2SS15N are medium voltage metal oxide surge arresters with silicone coating. They are designed to be installed in MV power networks up to 52 kV as protection against direct lighting strikes.

Characteristics
Their top quality is ensured by:
- *top quality varistor block,*
- *varistors are directly enclosed in silicone,*
- *rigid construction,*
- *resistance to UV radiation and chemical influences,*
- *built-in material is resistant to weathering and ageing.*

Installation
The position for installing SNO and 2SS15N surge arresters is decided by directives and technical regulations.
Surge arresters SNO and 2SS15N are used for:
- *indoor and outdoor installation,*
- *protection of electric devices,*
- *protection of compensation devices,*
- *in railways, mines...*

General data
- *ambient temperature range **T = -60 °C ... +85 °C***
- *coat: **silicone rubber***
- *silicone colour: **grey***
- *connection thread: **M12x20 mm***

Tip	SNO	2SS15N
Standard	IEC 60099-4:2014 in IEC 60099-5	IEC 60099-4:2004 in IEC 60099-5
IEC razred	DH	1

Type	*SNO*	*2SS15N*
Standard	*IEC 60099-4:2014 and IEC 60099-5*	*IEC 60099-4:2004 and IEC 60099-5*
IEC class	*DH*	*1*

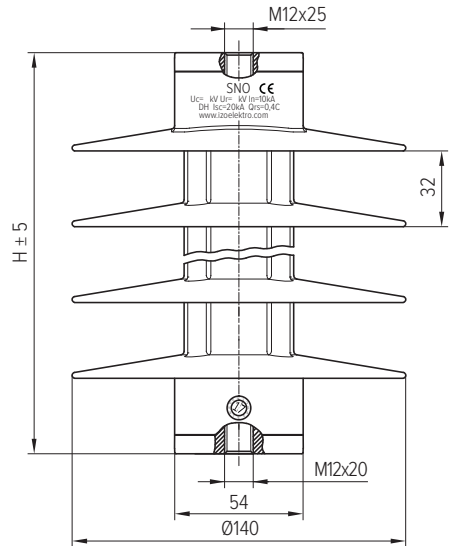
Prednosti pred konkurenco
SNO in 2SS15N odvodniki prenapetosti za zunanjo in notranjo montažo imajo:
- certifikat akreditiranega laboratorija,
- varistorje neposredno zalite s silikonom,
- togo konstrukcijo ohišja,
- nizko preostalo napetost,
- visoko energetsko absorpcijo,
- odlične mehanske lastnosti,
- 100% končno kontrolo v lastnem laboratoriju,
- predvidena vgradnja indikatorja stanja.

Na zahtevo kupca izdelamo in dobavimo odvodnike prenapetosti SNO in 2SS15N:
- kot tovarniški komplet po izbiri kupca,
- s trajno obratovalno napetostjo Uc do 1 do 44 kV,
- z neizbrisljivo številko meritve na vsakem odvodniku.

Competitive advantages
SNO and 2SS15N surge arresters for indoor and outdoor installation have:
- *a certificate from an accredited laboratory,*
- *varistors directly encased by silicone,*
- *a rigid housing construction,*
- *low residual voltage,*
- *high energy absorption,*
- *excellent mechanical properties,*
- *100% final inspection in our own laboratory,*
- *planned installation for condition indicators.*

At the customer's request we produce and deliver surge arresters SNO and 2SS15N:
- *as a factory set by buyer's choice,*
- *with continuous operating voltage Uc from 1 to 44kV.*
- *with an indelible measurement number on each arrester.*

Razred DH *Class DH*



Scan Me

SNO - RP 24 kV

Parametri za tip SNO - razred DH

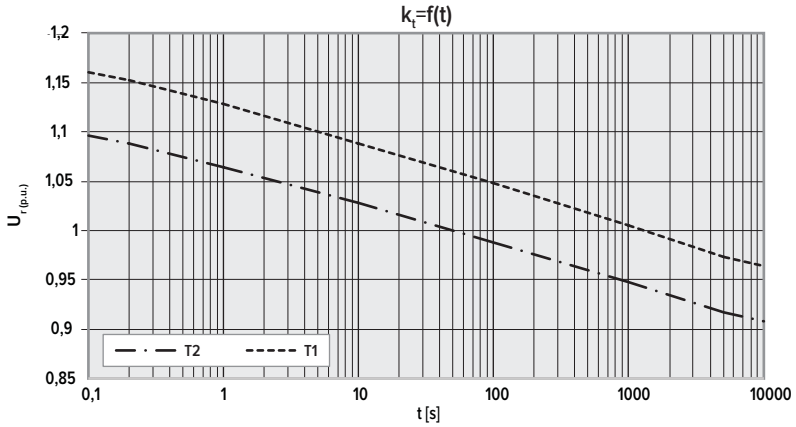
Razred odvodnika	DH
Tip prenapetostnega odvodnika	SNO
Komercialna oznaka oblike	RP
Trajna obratovalna napetost U_c	3 – 44 kV
Nazivna napetost U_r	4 – 55 kV
Nazivni odvodni tok I_n (8/20µs)	10 kA
Visok impulzni tok (4/10µs)	100 kA
Zdržni kratkostični tok (I_{sc})	20 kA
Sposobnost prenosa termičnega naboja (Q_{th})	1,1 C
Sposobnost prenosa ponavljajočega naboja (Q_{rs})	0,4 C
Upogibni moment pri U_r= 45 kV (M_u)	250 Nm
Vertikalna sila (F_v)	800 N
Torzijski moment pri Ur= 55 kV (M_t)	50 Nm

Parameters for type SNO - class DH

Arrester class	*DH*
Arrester type	*SNO*
Commercial designation	*RP*
Continious operating voltage U_c	*3 – 44 kV*
Rated voltage U_r	*4 – 55 kV*
Nominal discharge current I_n (8/20µs)	*10 kA*
High impulse current (4/10µs)	*100 kA*
Short circuit current (I_{sc})	*20 kA*
Thermal charge transfer rating (Q_{th})	*1,1 C*
Repetitive charge transfer rating (Q_{rs})	*0,4 C*
Cantilever strenght at Ur=45 kV (M_u)	*250 Nm*
Vertical load (F_v)	*800 N*
Terminal torque at Ur= 55 kV (M_t)	*50 Nm*

Karakteristike za tip SNO

Factory characteristics for type SNO



Legenda:
Krivulja T1:
brez predhodne energije

Krivulja T2:
2 x 34 kA, 8/20 µs predhodna energija

Legend:
Curve T1:
without prior energy

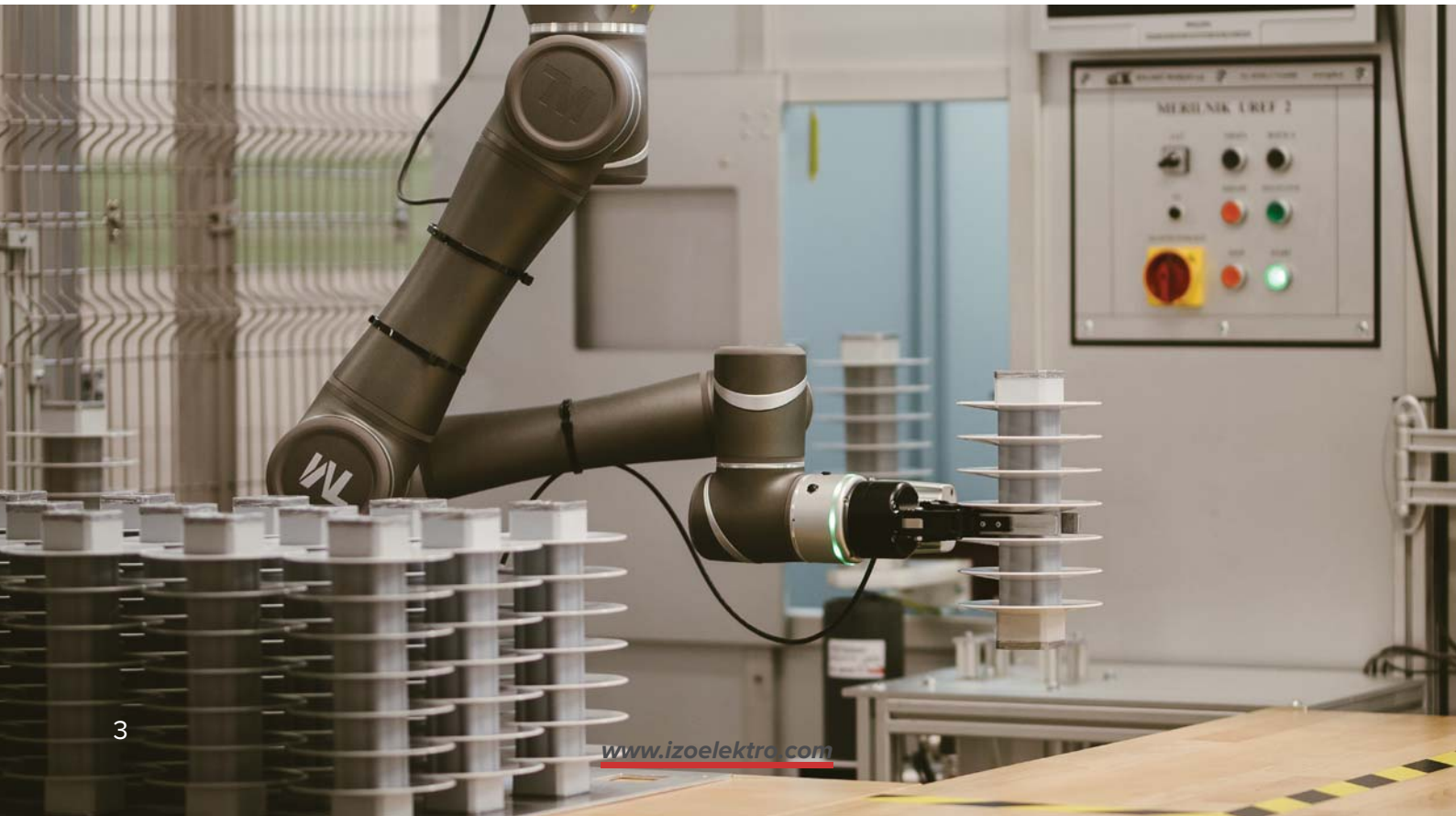
Curve T2:
2 x 34 kA, 8/20 prior energy

Rezred DH *Class DH*

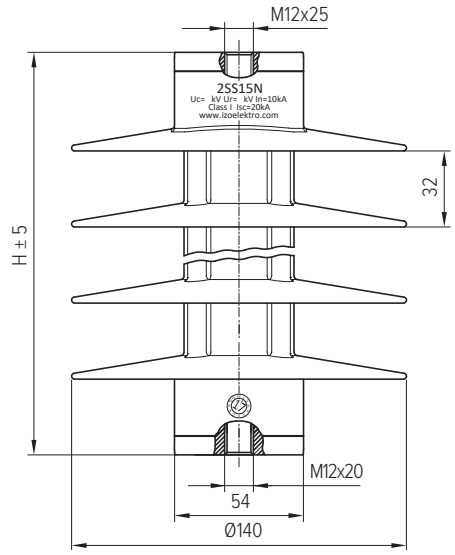
ELEKTRIČNE KARAKTERISTIKE / *ELECTRICAL CHARACTERISTICS*							MEHANSKE KARAKTERISTIKE / *MEHANICAL CHARACTERISTICS*							
U_c	U_r	U_{res}			U_{peak}	U_{rms}	SSL	SLL	AD	CD	A	B	H	N
		8/20µs 5kA	8/20µs 10kA	8/20µs 20kA	1,2/50µs	50 Hz, 1 min								
[kV]	[kV]	[kV]	[kV]	[kV]	[kV]	[kV]	[N]	[N]	[mm]	[mm]	[mm]	[mm	[mm]	
3,2	4,0	9,12	9,84	10,78							80	100		
6,4	8,0	18,24	19,68	21,56	90	35	1800	1437	154	343	100	120	136	3
7,6	9,5	21,67	23,38	25,60							120	140		
10,8	13,5	30,79	33,22	36,38	105	40	1454	1163	186	453	140	160	168	4
12,0	15,0	34,22	36,93	40,42							160	180		
14,0	17,5	39,91	43,04	47,12	120	45	1220	975	218	563	180	200	200	5
16,0	20,0	43,34	46,76	51,20	130	50	1052	841	250	674	200	220	232	6
20,4	25,5	55,89	60,30	66,02							240	260		
22,0	27,5	62,75	67,70	74,10	140	65	929	742	282	784	240	260	263	7
24,0	30,0	68,44	73,86	80,84							300	320		
26,0	32,5	74,13	79,98	87,57	150	75	828	662	314	894	320	340	295	8
28,0	35,0	79,82	86,12	94,32							340	360		
32,8	41,0	92,45	100,32	109,56	160	80	747	597	345	1004	380	400	327	9
34,0	42,5	96,97	104,62	114,51							400	420		
36,0	45,0	102,68	110,78	121,52	170	85	680	544	377	1114	420	440	359	10
38,0	47,5	108,38	116,93	127,99							440	460		
40,4	50,5	115,23	124,32	136,07	180	90	625	500	409	1234	450	470	391	11
44,0	55,0	125,50	135,40	148,20							470	490		

U_c	Trajna obratovalna napetost
U_r	Nazivna napetost
U_{res}	Preostala napetost pri različnih tokovnih impulzih
U_{peak}	Atmosferska udarna napetost 1,2/50µs v suhem
U_{rms}	Izmenična vzdržna napetost 50 Hz v mokrem, 1min
SSL	Specifična kratkotrajna obremenitev
SLL	Specifična dolgotrajna obremenitev
AD	Preskočna razdalja
CD	Plazilna pot
A	Minimalna razdalja do stene
B	Minimalna razdalja med fazami
H	Višina odvodnika prenapetosti ±5 mm
N	Število reber

U_c	*Continious operating voltage*
U_r	*Rated voltage*
U_{res}	*Residual voltages at different impulse currents*
U_{peak}	*Lightning impulse withstand voltage 1,2/50µs in dry*
U_{rms}	*Power frequency withstand voltage 1 min. 50Hz, wet*
SSL	*Specific short-term load*
SLL	*Specific long-term load*
AD	*Arcing distance*
CD	*Creepage distance*
A	*Minimum distance to wall*
B	*Minimum distance between phases*
H	*Surge arrester height ±5 mm*
N	*Number of sheds*



Razred I — *Class I*



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2SS15N-RP 12 kV

Parametri za tip 2SS15N - razred 1

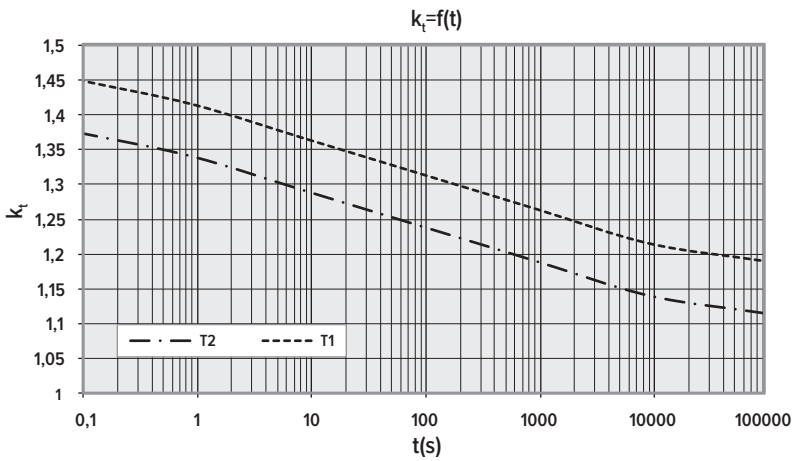
Razred odvodnika	1
Tip prenapetostnega odvodnika	2SS15N
Komercialne oznake oblike	R, RP, RO, NO
Trajna obratovalna napetost U_c	3 – 44 kV
Nazivna napetost U_r	3,7 – 55 kV
Nazivni odvodni tok I_n (8/20µs)	10 kA
Visok impulzni tok (4/10µs)	100 kA
Zdržni kratkostični tok (I_{sc})	20 kA
Tok dolgega vala (I_{2ms})	250 A
Sposobnost energijske absorpcije (dolgi val) (W_{2ms})	2,8 kJ/kVU_c
Sposobnost energijske absorpcije (impulzni tok) ($W_{4/10}$)	4,8 kJ/kVU_c
Upogibni moment 24 kV (M_u)	300 Nm
Upogibni moment 36 kV (M_u)	250 Nm
Vertikalna sila (F_v)	625 N
Torzijski moment pri Ur= 45 kV (M_t)	80 Nm

Parameters for type 2SS15N - class 1

Arrester class	*1*
Arrester type	*2SS15N*
Commercial designation	*R, RP, RO, NO*
Continious operating voltage U_c	*3 – 44 kV*
Rated voltage U_r	*3,7 – 55 kV*
Nominal discharge current I_n (8/20µs)	*10 kA*
High impulse current (4/10µs)	*100 kA*
Short circuit current (I_{sc})	*20 kA*
Long-duration current (I_{2ms})	*250 A*
Energy absorption capability (long duration) (W_{2ms})	*2,8 kJ/kVU_c*
Energy absorption capability (impulse current) ($W_{4/10}$)	*4,8 kJ/kVU_c*
Cantilever strenght 24 kV (M_u)	*300 Nm*
Cantilever strenght 36 kV (M_u)	*250 Nm*
Vertical load (F_v)	*625 N*
Terminal torque at Ur= 45 kV (M_t)	*80 Nm*

Tovarniške karakteristike za tip 2SS15N

Factory characteristics for type 2SS15N



Legenda:
Krivulja T1:
brez predhodne energije

Krivulja T2:
100 k_A, 4/10 µs predhodna energija

Legend:
Curve T1:
without prior energy

Curve T2:
100 kA, 4/10 µs prior energy

Razred I — *Class I*

ELEKTRIČNE KARAKTERISTIKE / *ELECTRICAL CHARACTERISTICS*											MEHANSKE KARAKTERISTIKE / *MEHANICAL CHARACTERISTICS*					
U_c	U_r	U_{res}							U_{peak}	U_{rms}	AD	CD	A	B	H	N
		1/20µs 5 kA	1/20µs 10kA	8/20µs 5kA	8/20µs 10kA	8/20µs 20kA	30/60µs 125 A	30/60µs 500 A	1,2/50µs	50 Hz, 1 min						
[kV]	[kV]	[kV]	[kV]	[kV]	[kV]	[kV]	[kV]	[kV]	[kV]	[kV]	[mm]	[mm]	[mm]	[mm	[mm]	
3	3,75	8,55	9,65	7,18	8,78	9,60	7,35	7,85	90	35	154	343	60	90	136	3
4	5,00	12,80	14,20	11,25	12,92	14,15	9,63	10,16					80	100		
6	7,50	21,35	23,85	17,95	21,70	23,75	16,98	18,01					100	120		
8	10,00	25,60	28,40	26,12	25,84	28,30	19,26	20,32					120	140		
10	12,50	34,15	38,05	29,00	34,62	37,90	26,61	28,17	105	40	186	453	140	160	168	4
12	15,00	38,40	42,60	33,15	38,76	42,45	28,89	30,48					160	180		
14	17,50	46,95	52,25	39,98	47,54	52,05	36,24	38,33	120	45	218	563	180	200	200	5
16	20,00	51,20	56,80	44,10	51,68	56,60	38,52	40,64					200	220		
18	22,50	59,75	66,45	51,26	60,46	66,20	45,87	48,49	130	50	250	674	220	240	232	6
20	25,00	64,00	71,00	55,45	64,60	70,75	48,15	50,80					240	260		
21	26,25	67,55	77,10	58,93	67,95	76,25	52,15	54,55	140	65	282	784	260	280	263	7
22	27,50	72,55	80,65	63,00	73,38	80,35	55,50	58,65					270	300		
24	30,00	76,80	85,20	66,15	75,98	84,90	57,78	60,96					300	320		
26	32,50	85,35	94,85	74,39	84,76	94,50	65,13	68,81	150	75	314	894	320	340	295	8
28	35,00	89,60	99,40	77,20	88,21	99,05	67,41	71,12					340	360		
30	37,50	98,15	109,05	84,90	96,99	108,65	74,46	78,97	160	80	345	1004	360	380	327	9
32	40,00	102,40	113,60	88,00	101,15	113,20	77,04	81,28					380	400		
34	42,50	110,95	123,25	96,05	109,93	122,80	84,39	89,13	170	85	377	1114	400	420	359	10
36	45,00	115,20	127,80	99,10	114,10	127,35	86,67	91,44					420	440		
38	47,50	120,35	130,33	106,25	123,66	136,50	90,85	95,65	180	90	409	1234	440	460	391	11
40	50,00	124,87	135,63	114,33	129,78	145,73	95,50	100,75					450	470		
42	52,50	130,50	138,75	120,63	137,85	154,78	100,43	105,47					460	480		
44	55,00	136,75	143,25	127,55	142,68	162,35	103,58	108,35					470	490		

U_c Trajna obratovalna napetost
U_r Nazivna napetost
U_{res} Preostala napetost pri različnih tokovnih impulzih
U_{peak} Atmosferska udarna napetost 1,2/50µs v suhem
U_{rms} Izmenična vzdržna napetost 50 Hz v mokrem, 1min
AD Preskočna razdalja
CD Plazilna pot
A Minimalna razdalja do stene
B Minimalna razdalja med fazami
H Višina odvodnika prenapetosti ±5 mm
N Število reber

U_c *Continious operating voltage*
U_r *Rated voltage*
U_{res} *Residual voltages at different impulse currents*
U_{peak} *Lightning impulse withstand voltage 1,2/50µs in dry*
U_{rms} *Power frequency withstand voltage 1 min. 50Hz, wet*
AD *Arcing distance*
CD *Creepage distance*
A *Minimum distance to wall*
B *Minimum distance between phases*
H *Surge arrester height ±5 mm*
N *Number of sheds*

SN priključki — *MV connectors*

Za podrobnejše informacije o priključkih pošljite zahtevo.

Please send a request for more detailed information.

priključek A
connector A

priključek B
connector B

priključek C
connector C

priključek E
connector E

SN priključki

MV connectors

priključek F
connector F

priključek G
connector G

silikonska zaščita DH-Z
silicone cover DH-Z

odklopna naprava ON
disconnecting device ON

nosilec R - izolacijski
bracket R - insulated

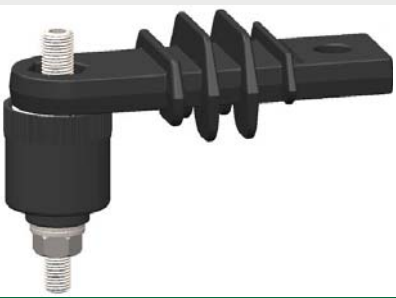
nosilec T - jeklen
bracket T - steel

priključek M
connectorM

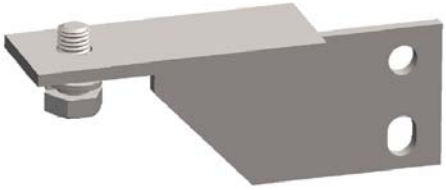
priključek O
connector O

priključek N
connectorN

nosilec S - jeklen
bracket S - steel



priključek L
connector L



priključek P
connector P

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IZOELEKTRO

ISO 9001
Q-262

ISO 14001
E-238