

RASTAVLJAČI SREDNJEG NAPONA ZA UNUTARNJU UGRADNJU

Serije Ru

1. OPĆENITO

Rastavljači su električni sklopni aparati koji služe za otvaranje strujnih krugova kada kroz njih ne teče struja. Oni mogu trajno voditi normalne pogonske struje, a određeno kratko vrijeme i struje kratkog spoja. Između kontakata rastavljača postoji u otvorenom položaju propisani razmak, tzv. rastavni razmak, koji je pouzdano vidljiv, jer o njemu ovisi sigurnost postrojenja i osoblja koje u njima radi. Rastavljači mogu prekidati i uklapati zanemarivo male struje (npr. struje naponskih transformatora ili kapacitivne struje kratkih neopterećenih kabela) ali i veće struje, ako kod njihovog uklapanja ne dolazi do znatnije promjene napona na stezaljkama (npr. u slučaju premoštenja zatvorenih kontakata prekidača).

Rastavljači za unutarnju ugradnju serije Ru dizajnirani su, proizvedeni i ispitani prema zahtjevima norme IEC 62271-102.

Standardne izvedbe grade se kao jednopolne i trolpolne jedinice, predviđene za ručno upravljanje pomoću stremenastog ili motornog pogona.

MEDIUM VOLTAGE DISCONNECTORS FOR INDOOR INSTALLATION

Series Ru

1. GENERAL INFORMATION

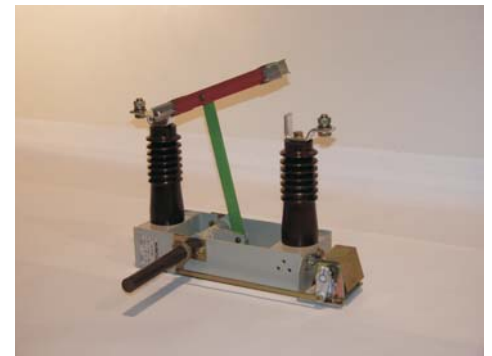
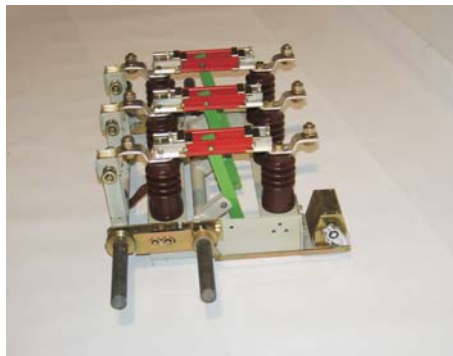
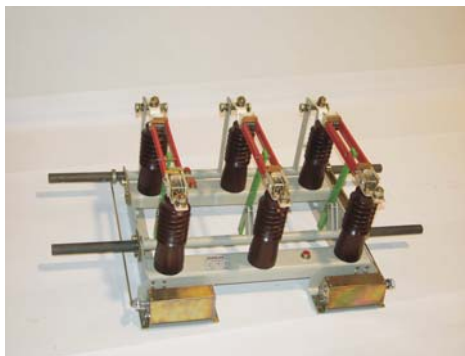
Disconnectors are mechanical switching devices, that for a safety reasons form isolating distance in opened position according to fixed requirements. They fulfill the demand for a visible isolating distance with a certain isolation capacity.

Under normal service conditions, disconnectors are capable of carrying normal currents as well as short circuit currents in determined short time.

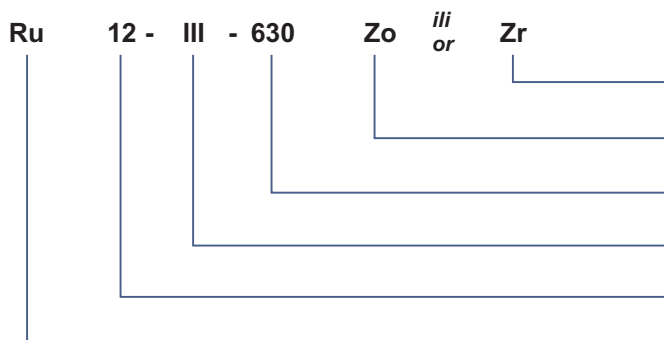
Disconnectors are also capable of breaking negligible currents, e.g. short unloaded cables or voltage transformers, as well as currents where no significant potential change at contacts occur, e.g. short circuit of closed circuit breaker contacts.

Medium voltage disconnectors series Ru for indoor installation have been designed, manufactured and tested in accordance with IEC 62271-102.

Standard versions of disconnectors series through are manufactured as three-pole and single-pole units. They can be operated by means of manual operating mechanism or motor drive.



2. TIPNE OZNAKE



2. TYPE DESIGNATIONS

- Noževi za uzemljenje na strani razdvajanja kontakata
Earthing blades at opening side of the main contacts
- Noževi za uzemljenje na strani okretišta glavnog kontakata
Earthing blades at rotating side of the main contacts
- Nazivna struja (A)
Rated current (A)
- Broj polova
Number of poles
- Nazivni napon (kV)
Rated voltage (kV)
- Osnovna oznaka serije - rastavljač za unutarnju ugradnju
Basic series designation - disconnector for indoor installation

3. OPIS

Standardne izvedbe rastavljača serije Ru grade se za nazivne napone do 38 kV i nazivne struje do 2500 A, kao trolpolne jedinice predviđene za ručno upravljanje pomoću stremenastog pogona (v. poseban katalog stremenastih pogona i pribora) ili elektromotornog pogona EMP 25 (v. poseban prospekt). Na poseban zahtjev izrađujemo i rastavljače za veće nazivne struje, te manji broj faza. Tehničke podatke za takve izvedbe dajemo na upit.

Standardna izvedba trolpolnog rastavljača jedinstvena je cjelina koju čini čelični temeljni okvir, s tri mehanički povezana i istodobno upravljana pola. Svaki pol sastoji se od dva potporna izolatora izrađena od epoksidne zaljevne smjese, koji na sebi nose kontaktne noževe i nepomične kontakte.

Rastavljači mogu biti opremljeni noževima za uzemljenje na strani razdvajanja ili na strani okretišta glavnih noževa. Glavni noževi i noževi za uzemljenje međusobno su blokirani pouzdanom mehaničkom blokadom, tako da se istodobno jedni i drugi ne mogu nalaziti u zatvorenom položaju.

Ugradnjom rastavljača serije Ru postiže se korak ćelije:

- 700 mm na 12 kV
- 1000 mm na 24 kV
- 1500 mm na 38 kV

4. TEHNIČKI PODACI

		Oznaka / Designation	Jedinica / Unit	Tipna oznaka / Type designation								
				Ru12-III-630	Ru12-III-1250	Ru12-III-2500	Ru24-III-630	Ru24-III-1250	Ru24-III-2500	Ru38-III-630	Ru38-III-1250	Ru38-III-2500
Nazivni napon / Rated voltage		Un	kV	12			24			38		
Nazivna struja / Rated current		In	A	630	1250	2500	630	1250	2500	630	1250	2500
Dopuštena udarna struja kratkog spoja (ampl.) Permissible short-circuit current (ampl.)		Idyn	kA	63	80	125	50	63	125	40	63	125
Dopuštena kratkotrajna struja kroz 1 s (eff.) Permissible short time withstand current, 1sec. (eff. value)		Itherm	kA	25	31,5	50	20	25	50	16	25	50
Podnosivi napon 50Hz/1 min. Power frequency withstand voltage 50Hz/1 min.	Prema zemlji To earth		kV	28			50			80*		
	Na rastavnom putu Across insulating distance		kV	32			60			88*		
Podnosivi udarni napon oblika 1,2/50 μs Peak withstand voltage 1,2/50 μs	Prema zemlji To earth		kV	75			125			170		
	Na rastavnom putu Across insulating distance		kV	85			145			195		

* Deklarirano i ispitano prema IEC 62271-1:2016 (Draft) / Declared and type tested according to IEC 62271-1:2016 (Draft)

3. DESCRIPTION

Standard versions of disconnectors series through are manufactured as three-pole units. They can be operated by means of manual operating mechanism (see separate catalogue of toggle-joint operating mechanisms and levers) or electric motor drive type EMP 25 (see separate leaflet). Special versions of disconnectors for larger rated currents or less than three poles can be quoted and manufactured on customer's request.

Standard three-pole disconnector is a compact unit, which consists of steel base frame with three poles. The poles are mechanically interconnected and move simultaneously. Each pole has two epoxy resin post insulators which support fixed contacts and carry main blades (moving contacts).

The disconnectors can be equipped with earthing blades either at opening or rotating side of the main blades.

Main blades are interlocked with earthing blades by means of reliable interlock which prevents them to be in closed position at the same time.

Cell width:

- 700 mm at 12 kV
- 1000 mm at 24 kV
- 1500 mm at 38 kV

4. TECHNICAL DATA

5. POGONI

Za pogon standardnih izvedba rastavljača serije Ru, kao i njihovih noževa za uzemljenje mogu se primijeniti:

- stremenasti (ručni) pogoni tipa S-5 i S-15
- elektromotorni pogon tipa EMP-25

Na poseban zahtjev korisnika rastavljači mogu biti opremljeni i pneumatskim pogonima tipa Zp 8/9 ili Zp 10/13, koji se prigraduju na osovine noževa u tvornici. Mjerne skice rastavljača opremljenih pneumatskim pogonima dajemo na upit.

Radi prijenosa gibanja pogonskog polužja, kod upravljanja stremenastim ili elektromotornim pogonom, na glavnu osovinu ili osovinu noževa za uzemljenje montira se zakretna poluga Pz-30.

Elementi za prijenos gibanja naručuju se odvojeno (v. zaseban katalog - identifikacija). Svi podaci o pogonima i elementima za prijenos gibanja nalaze se u zasebnom katalogu.

Odabir pogona za pojedine tipove rastavljača naveden je u ovoj tablici:

5. OPERATING MECHANISMS AND DRIVES

The following kinds of operating mechanisms and drives can be used to operate disconnectors series Ru:

- manual (toggle-joint) operating mechanism, types S-5 and S-15
- electric motor drive, type EMP-25

The disconnectors can be equipped with pneumatic (air blast) drives type Zp 8/9 or Zp 10/13, which are assembled to the main shafts in the factory. These drives can be delivered on customer's special request only. (Dimensional drawing also on request.)

To enable motion transmission, the rotating lever PZ-30 is to be mounted to the main shaft of earthing shaft.

The motion transmitting parts (levers, rods, handles) are to be ordered separately - see separate catalogue.

The choice of drives & operating mechanism is presented in the following table:

Pogoni za trole polne rastavljače serije Ru Recommended drives for three-pole disconnectors series Ru			POGONI DRIVES & OPERATING MECHANISMS					
			Stremenasti pogoni Toggle joint operating mechanisms			Elektromotorni pogon/ Electric motor drive EMP-25	Pneumatski pogoni* Compressed air drive*	
			S-5		S-15		Zp 8/9	Zp 10/13
			R=250mm	R=400mm				
Rastavljači Disconnectors	12 kV	630 A	x			x	x	
		1250 A		x		x	x	
		2500 A			x	x	xx	xx
	24 kV	630 A	x			x	x	
		1250 A		x		x		x
		2500 A			x	x	xx	xx
	38 kV	630 A		x		x	x	
		1250 A			x	x		x
		2500 A			x	x	xx	xx
Noževi za uzemljenje Earthing blades	12 kV		x			x	x	
	24 kV		x			x	x	
	38 kV		x			x	x	

* Samo na poseban zahtjev, u dogovoru s proizvođačem

* On special request only; to be agreed between customer and manufacturer

6. SIGNALIZACIJA

Za signalizaciju položaja glavnih noževa i noževa za uzemljenje prigraduju se na rastavljače signalne sklopke serije SNL, i to XIII, IX i VI-polne izvedbe. Signalne sklopke na rastavljače prigradujemo na zahtjev naručitelja (v. podatke za narudžbu).

Uobičajena mjesta za prigradnje signalnih sklopki vidljiva su na mjernim skicama. Općenito su sa navedenim sklopkama moguća slijedeća standardna rješenja prigradnje:

Za rastavljač bez noževa za uzemljenje 12, 24 i 38 kV sve veličine signalne sklopke mogu se prigraditi gore, dolje, lijevo ili desno.

Isključivo na poseban zahtjev, radi smanjenja visine rastavljača, moguća je i lijeva ili desna bočna prigradnja signalne sklopke (kod rastavljača 12 kV samo VI-polna, a kod rastavljača 24 i 38 kV može se na taj način prigraditi VI-, IX- i XIII-polna signalna sklopka).

Za rastavljač opremljen noževima za uzemljenje na strani razdvajanja kontakata, signalne sklopke se mogu prigraditi samo dolje ili bočno, lijevo ili desno, a za rastavljač s noževima za uzemljenje na strani okretišta glavnih noževa, samo gore ili bočno, lijevo ili desno.

Signalne sklopke tipa SNL predviđene su za napon do 500 V, te struju do 10 A. Sastoje se od niza segmenata u koje je ugrađen kontaktni mehanizam, te okretnog valjka sastavljenog od elemenata koji se mogu podešavati neovisno jedan o drugom. Podešavanjem elemenata na valjku mogu se dobiti različiti uklopni položaji (točnost 4°).

Standardne sheme signalnih sklopki prikazane su u nastavku na slici 1.

6. AUXILIARY DEVICES

If customer requests, the disconnecter can be equipped with auxiliary device (see Ordering data).

Auxiliary device indicates the position of main blades or earthing blades of the disconnecter. Auxiliary switches series SNL (versions SNL VI jN, SNL IX eN and SNL XIII fN).

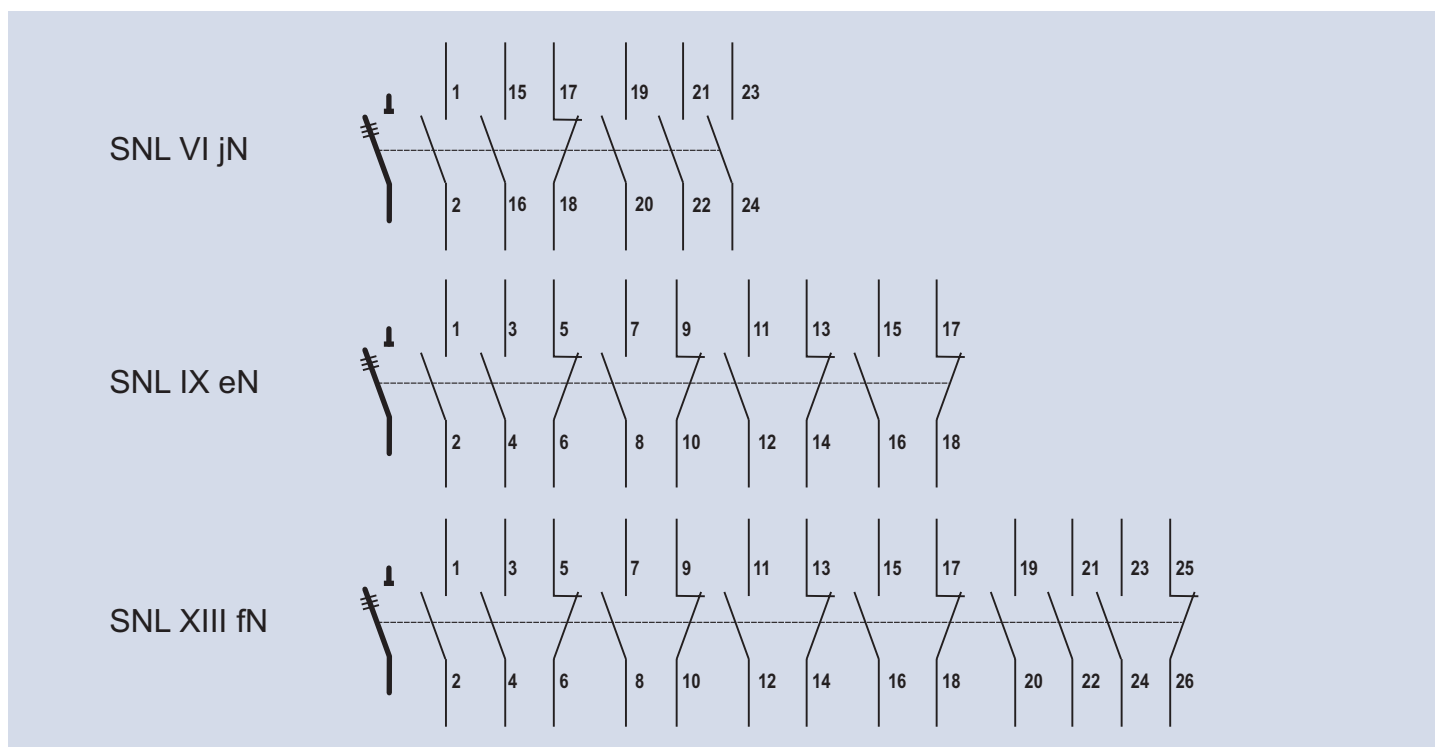
The following standard solutions are possible:

For disconnecters without earthing blades, all sizes of auxiliary switches can be mounted to any position (up, down, left, right). On special request only, if the height of disconnecter must be reduced, the auxiliary switch can be mounted laterally: at disconnecters for 12 kV rated voltage only VI-pole auxiliary switch can be mounted laterally, at the disconnecters for 24 and 38 kV rated voltage, all sizes of auxiliary switches can be mounted that way.

If the disconnecter is equipped with earthing blades at opening side of the main contacts, auxiliary switches can be mounted only at lower side (down), left or right. If the disconnecter is equipped with earthing blades at the rotating side of the main blades, auxiliary switch can be mounted only at upper side, left or right.

Auxiliary switches series SNL are built for rated voltage up to 500 V and rated current up to 10A. They consist of a line of segments with contact mechanism, and a rotating cylinder composed of independent adjustable elements. The adjustable elements provide various positions, with accuracy of approx. 4°.

Standard diagrams of the auxiliary switches are presented at Fig. 1.:



Slika 1. Kontakti signalne sklopke tipa SNL

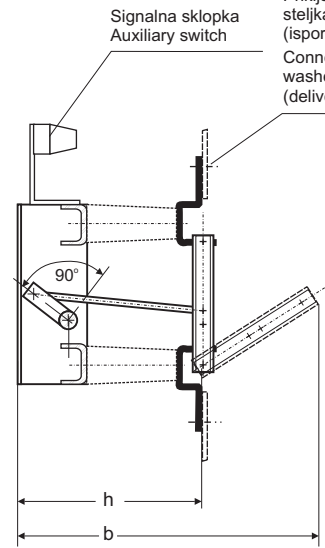
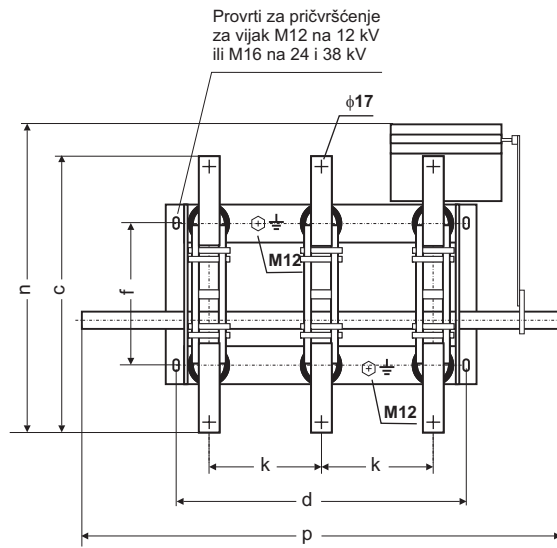
Fig. 1. Auxiliary switch type SNL - contacts

7. MJERNE SKICE

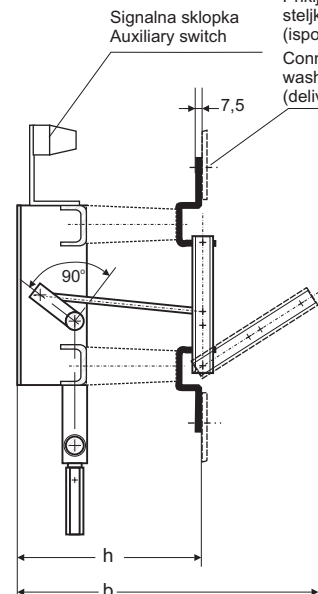
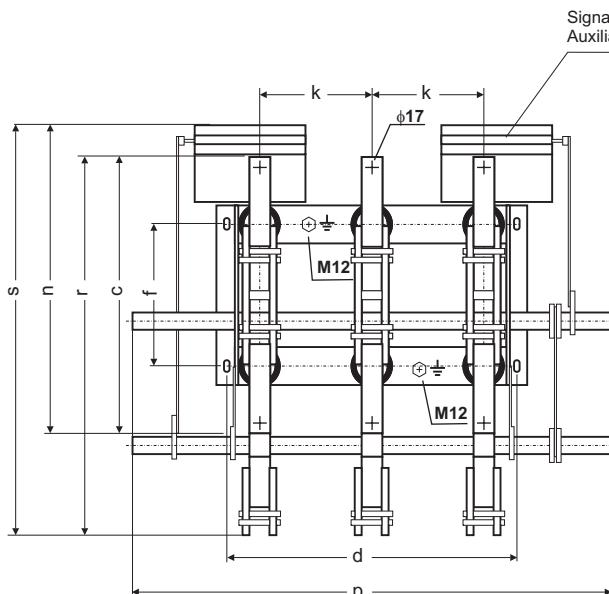
7.1. Rastavljači za nazivnu struju 630 A

7. DIMENSIONAL DRAWINGS

7.1. Disconnectors for 630 A rated current



Tip /Type	Vanjske mjere Overall dimensions						Mjere za ugradnju Fixing dimensions	
	b	c	k	h	n	p	d	f
Ru 12-III-630	450	385	180	258	454	854	400	230
Ru 24-III-630	645	495	260	365	54	1120	600	340
Ru 38-III-630	855	605	360	453	674	1480	810	450



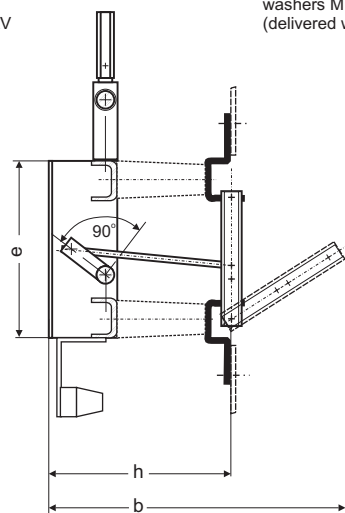
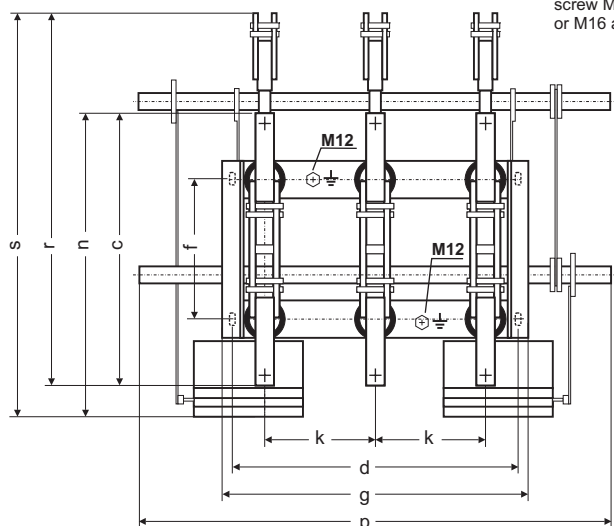
Tip /Type	Vanjske mjere Overall dimensions									Mjere za ugradnju Fixing dimensions	
	b	c	k	h	n	p	r	s	d	f	
Ru 12-III-630 zo	450	385	180	258	454	854	587	655	400	230	
Ru 24-III-630 zo	645	495	260	365	54	1120	790	858	600	340	
Ru 38-III-630 zo	855	605	360	453	674	1480	981	1049	810	450	

Otvori za pričvršćenje
za vijak M12 na 12 kV
ili M16 na 24 i 38 kV

Fixing openings -
screw M12 at 12kV
or M16 at 24 and 38kV

Priključni vijci sa pripadnim
steljkama M16x35
(isporučuju se uz rastavljač)

Connecting bolts and
washers M16x35
(delivered with disconnecter)



Tip /Type	Vanjske mjere Overall dimensions										Mjere za ugradnju Fixing dimensions		
	b	c	e	g	h	k	l	n	p	r	s	d	f
Ru 12-III-630 zr	450	385	310	444	258	180	75	454	854	587	655	400	230
Ru 24-III-630 zr	645	495	420	650	356	260	75	54	1120	790	858	600	340
Ru 38-III-630 zr	855	605	530	870	453	360	100	674	1480	981	1049	810	450

7.2. Rastavljači za nazivnu struju 1250 A

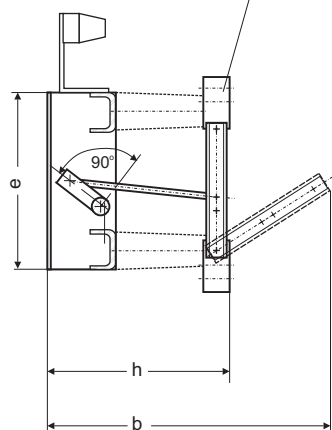
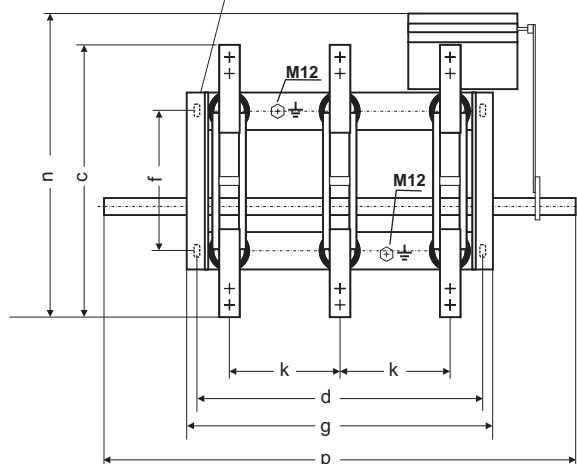
7.2. Disconnecters for 1250 A rated current

Otvori za pričvršćenje
za vijak M12 na 12 kV
ili M16 na 24 i 38 kV

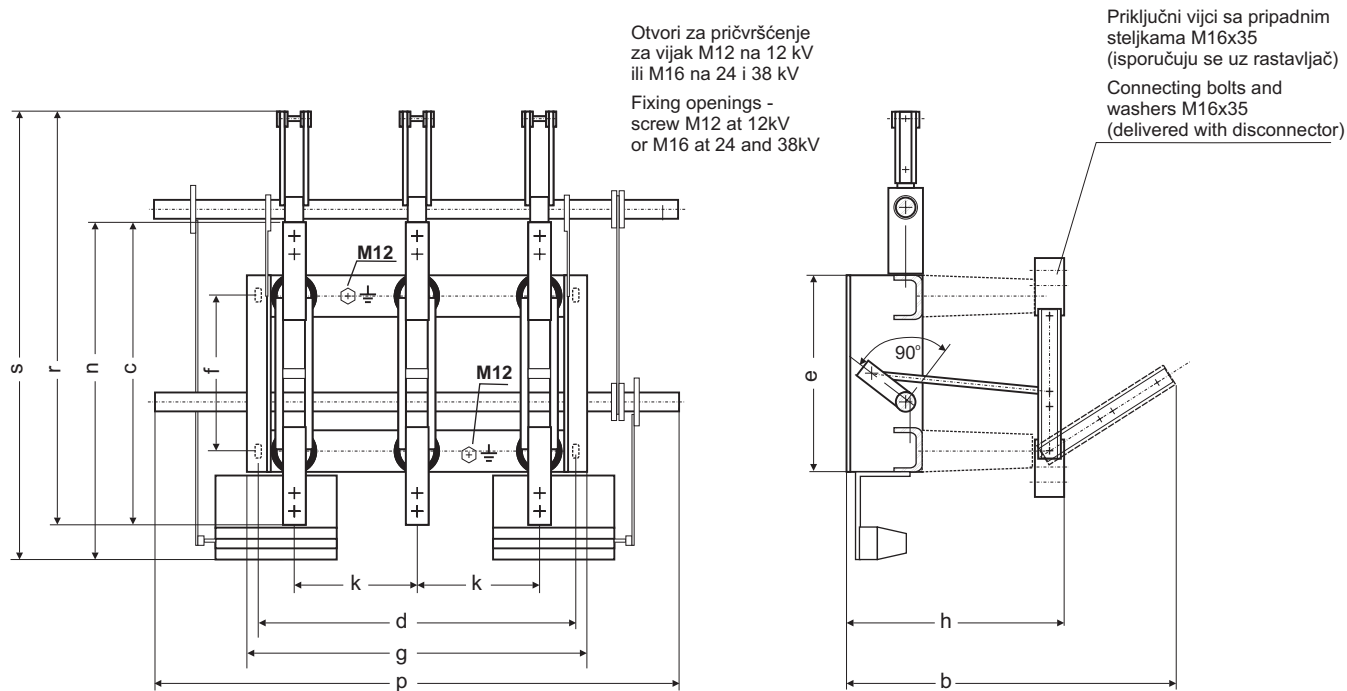
Fixing openings -
screw M12 at 12kV
or M16 at 24 and 38kV

Priključni vijci sa pripadnim
steljkama M16x35
(isporučuju se uz rastavljač)

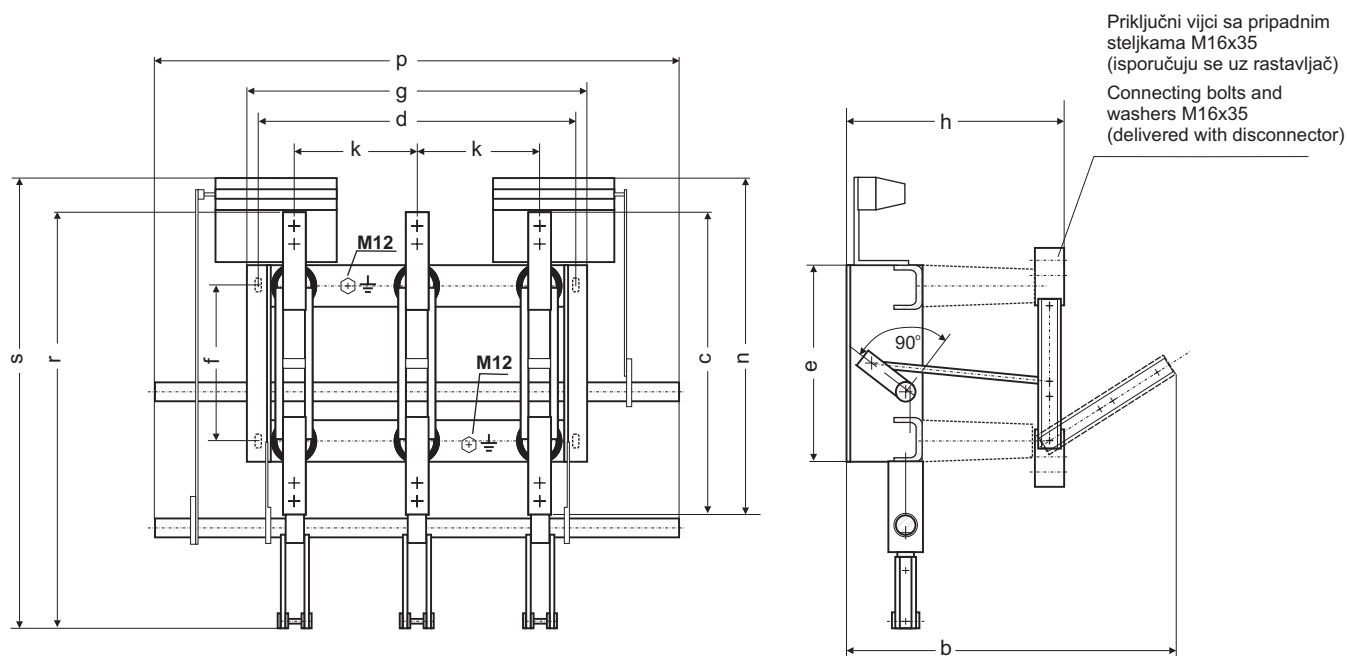
Connecting bolts and
washers M16x35
(delivered with disconnecter)



Tip /Type	Vanjske mjere Overall dimensions							Mjere za ugradnju Fixing dimensions	
	b	c	g	k	h	n	p	d	f
Ru 12-III-1250	463	423	550	180	262	481	950	510	247
Ru 24-III-1250	645	538	730	270	367	596	1180	690	362
Ru 38-III-1250	854	667	930	370	452	725	1540	890	491



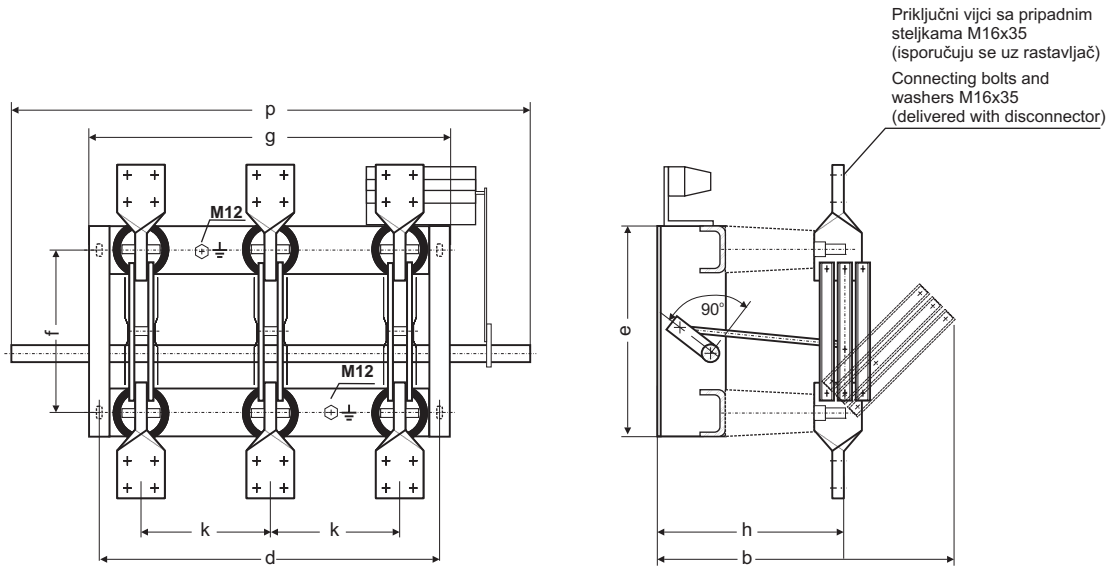
Tip /Type	Vanjske mjere Overall dimensions								Mjere za ugradnju Fixing dimensions	
	b	c	k	h	n	p	r	s	d	f
Ru 12-III-1250 zr	463	423	180	262	481	950	570	628	510	247
Ru 24-III-1250 zr	645	538	270	367	596	1180	780	838	690	362
Ru 38-III-1250 zr	854	667	370	452	725	1540	984	1042	890	491



Tip /Type	Vanjske mjere Overall dimensions								Mjere za ugradnju Fixing dimensions	
	b	c	k	h	n	p	r	s	d	f
Ru 12-III-1250 zo	463	423	180	262	481	950	570	628	510	247
Ru 24-III-1250 zo	645	538	270	367	596	1180	780	838	690	362
Ru 38-III-1250 zo	854	667	370	452	725	1540	984	1042	890	491

7.3. Rastavljači za nazivnu struju 2500 A

7.3. Disconnectors for 2500 A rated current



Tip /Type	Vanjske mjere Overall dimensions							Mjere za ugradnju Fixing dimensions		
	b	c	e	g	h	k	p	r	d	f
Ru 12-III-2500	610	698	480	630	330	230	1090	200	400	230
Ru 24-III-2500	800	808	590	830	400	315	1330	220	600	340
Ru 38-III-2500	970	928	710	970	490	380	1596	1596	810	450

8. PODACI ZA NARUDŽBU

U upitu ili narudžbi za ovaj proizvod potrebno je navesti:

Punu tipnu oznaku (koja sadrži podatke o naponu, struji, broju polova, te noževima za uzemljenje i s koje strane se oni nalaze).

Ako je potrebna signalna sklopka, navesti da li se prigraduje samo na glavne noževe ili i na noževe za uzemljenje, te broj polova za svaku. Detaljne informacije o signalnim sklopkama navedene su u poglavlju 5.

Navesti sve posebne zahtjeve (npr. pneumatski pogon), za što je potreban dogovor s proizvođačem.

NAPOMENA:

Svi podaci navedeni u ovom katalogu informacijskog su karaktera.
Proizvođač pridržava pravo izmjene.
Obvezujuće podatke i mjerne skice dajemo na zahtjev.

8. ORDERING DATA

In inquiry or order the following data should be specified:

Full type designation (with rated voltage, rated current, number of poles and eventually earthing blades).

If auxiliary switches are required, the number of contacts (see Chapter 5.) should be specified for each auxiliary device (for main blades and earthing blades, if required).

Any special request (e. g. if compressed air drive is required) should be specified. These cases are to be agreed between customer and manufacturer.

NOTICE:

Technical characteristics, dimensional drawings and other relevant data are subject to change.

Obligatory data only on request.