

**FILTER VREĆASTI  
USISNI TIP FVU-P**

**FVU-P SUCTION  
BAG FILTER**

**Demos** d.o.o.

**Tvornica za projektiranje, proizvodnju, montažu i servisiranje,  
opreme za zaštitu okoliša**

## OPĆENITO

Tvornica "Ventilator" već od svog osnutka 1932. godine bavi se tehnikom pročišćavanja zraka u industriji. Svojim 75 godišnjim radom uspjeli smo razviti kvalitetne uređaje za oprrašivanje. Suradnjom sa inozemnim poduzećima kompletirali smo uređaje za oprrašivanje u svim zaprašanim industrijskim zonama, kao što su željezare, ljevaonice, cementare, kamenolomi, kemijska industrija, drvena industrija, itd. Otprašivanje vršimo: ciklonskim baterijama, mokrim odvajачima, vrećastim filterima i elektrofilterima, ovisno o postavljenom projektnom zadatku.

Vrećasti filter sa pneumatskim čišćenjem – otresanjem vreća (tip FVU-P) je potpuno automatski visoko učinski otprašivač. Područje primjene je u svim slučajevima gdje se upotrebljavaju vrećasti filteri. Otprašivač je jednokomorni, radi stalno tako da sve vreće sudjeluju u radu, pošto čišćenje – otresanje vreća traje kratko vrijeme. Izvedbe ovih filtera obuhvaćaju područje od 42 m<sup>2</sup> do 252 m<sup>2</sup> – jednorodna izvedba, odnosno do 500 m<sup>2</sup> dvoredna izvedba.

Osobine filtera sa pneumatskim čišćenjem su:

- male dimenzije i male težine za određeni učin,
- kvarovi na filteru gotovo su isključeni,
- jednostavan nadzor i održavanje,
- mogućnost reguliranja ciklusa otresanja vreća omogućuje prilagođavanje filtera različitim opterećenjima,
- opterećenje filterske površine (m<sup>3</sup>/m<sup>2</sup>h) kreće se od 130 do 270 (m<sup>3</sup>/m<sup>2</sup>h) ovisno o vrsti i količini prašine u 1 m<sup>3</sup> zraka, odnosno plina koji treba očistiti,
- nema mehanizama niti habajućih dijelova što ga čini jednostavnijim od filtera sa mehaničkim otresanjem,
- tipizacijom elemenata omogućena je jednostavna izrada i povećanje filterske površine od 42 m<sup>2</sup> sa skokom od 21 m<sup>2</sup> po odjelu.

## OPIS SASTAVNIH DIJELOVA FILTERSKOG UREĐAJA (SI. 1)

U prikazanoj shemi navedeni su svi bitni dijelovi filterskog uređaja:

1. Kompresorski agregat sa opremom za automatski rad unutar zadanog intervala pritiska 6,5 – 7,5 (8 atp). Agregat treba biti opremljen kvalitetnim odvajачima ulja i vode komprimiranog zraka.
2. Dodatni rezervoar komprimiranog zraka ugrađuje se u slučajevima kad se u pogonu primjeti preveliki pad pritiska.
3. Cjevovod komprimiranog zraka.
4. Membranski ventili – propuštaju i obustavljaju dovod zraka za otresanje vreća.
5. Magnetski ventili služe kao komandni elementi za upravljanje membranskim ventilima.
6. Manometar sa skalom 0 – 10 at. služi za kontrolu pritiska zraka pred filterom.
7. Elektronski programator upravlja sistemom za pneumatsko otresanje vreća. Priključuje se na napon 220 V / 50 Hz. Izlazni napon istosmjernih 24 V.
8. Vrećasti otprašivač – filter.
9. Transportni puž ø200 za sakupljanje i transport obojene prašine.
10. Čelijski zatvarač odstranjuje prašinu izdvojenu iz plina koji se čisti u otprašivaču.
11. Cjevovod neočišćenog zraka.
12. Cjevovod očišćenog zraka.
13. Ventilator za otklapanje zaprašene zraka.
14. Zasun za regulaciju protočne količine zraka (plina) u sistemu otprašivanja.

Sistem za otresanje vreća sastoji se od poz. 1 do 7. Prema tome, kao zamjena za mehanizam za otresanje vreća, kod ovog se filtera pojavljuju slijedeći dijelovi: kompresorski agregat, cjevovod komprimiranog zraka sa potrebnom armaturom, membranski elektromagnetski ventili, te elektronski programator.

Otresanje vreća se obavlja red po red.

Elektronski programator omogućuje kontinuiranu regulaciju trajanja otresanja vreća, kao i kontinuiranu regulaciju pauza između dva uzasopna otresanja istoga reda vreća.

Regulacija se može vršiti po slijedećem programu:

Trajanje otresanja: 0,2 – 5 (s).

## GENERAL

Since its foundation in 1932, the Ventilator factory deals with air purification systems in industrial plants. Through our 75 years of experience we succeeded in developing of high quality dust removing equipment. Through cooperation with foreign companies we completed and installed dust removing equipment in various industrial dust laden areas such as: iron-works, foundaries, cement mills, quarries, chemical plants, wood processing plants, etc. Dust removing is carried out by means of: cyclone systems, wet separators, bag filters, and electric filters depending on the project requirements.

Bag filter type FVU-P with pneumatic cleaning – shaking of bags its a completely automatic, heavy duty, dust removing unit. It can be applied in all fields where bag filters are generally used. It is a single chamber unit with continuous operation so that all bags are in operation, since cleaning – shaking of bags takes a short time. These filters are from 42 m<sup>2</sup> to 252 m<sup>2</sup> in single row workmanship and up to 500 m<sup>2</sup> in double row execution.

Characteristics of the filter with pneumatic cleaning are:

- small dimensions and light weight for desired output,
- minimum failures of filters
- easy control and maintenance
- possibility of adjustment of bag shaking cycles also enables also adjustment of filters to various loads
- load of the filter area (m<sup>3</sup>/m<sup>2</sup>h) is within 130 to 270 (m<sup>3</sup>/m<sup>2</sup>h) depending on the type and amount of dust or gas removed,
- there is no mechanism nor wearing parts which makes this filter more simple than the filter with mechanical shaking
- standardization of elements provides simple workmanship and increase of filter area for 42 m<sup>2</sup> in steps of 21 m<sup>2</sup> per section.

## DESCRIPTION OF FILTER COMPONENTS (Fig. 1)

Figure 1 shows all basic components of the filtering unit.

1. Compressed air unit provides automatic operation within pressure range from 6.5-7.5 (8 at). The compressor should be provided with efficient oil and water separators from compressed air.
2. An additional compressed air storage tank is provided for the case when the pressure drop is too high.
3. Compressed air piping.
4. Membrane valves – for opening and closing of air supply to the bag shaking.
5. Magnetic valves used as control elements for the membrane valves control.
6. Pressure gauge ranging from 0 – 10 at. used for air pressure control at the filter inlet.
7. Electronic programmer for pneumatic bag shaking control supply voltage 220 V/50 cps, outlet voltage 24 V DC.
8. Bag filter
9. Worm conveyer ø 200 for collection and transport of removed dust.
10. Airlock serves for removal of dust extracted from the filter gas.
11. Dirty air piping.
12. Clean air piping.
13. Fan for suction of dust laden air.
14. Valve for control of air (gas) flow in the filtering unit.

Bag shaking system consists of items 1 – 7. In substitution for the bag shaking mechanism, this filter has the following components: compressor, compressed air piping with necessary valves, membrane and electromagnetic valve and electronic programmer.

Bags are shaken row by row.

Electronic programmer provides continuous control of the period of bag shaking as well as permanent control of the time between two successive shaking of the same row of bags.

This control can be done through the following programme:

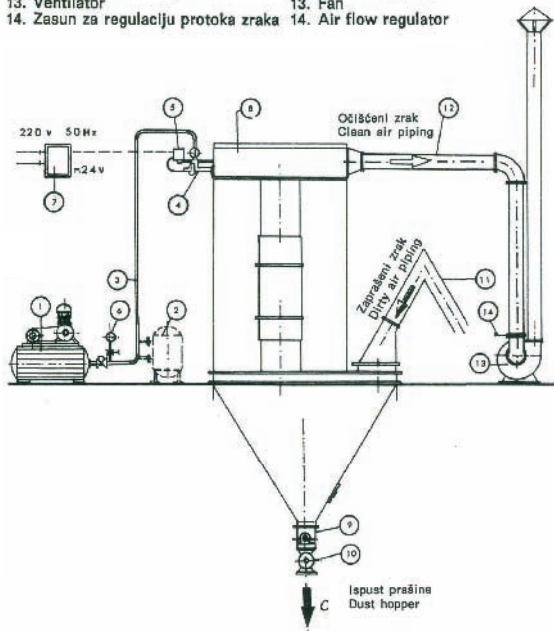
Time of shaking: 0.2 – 5 sec.

## Shema filterskog uređaja Filter operation principle

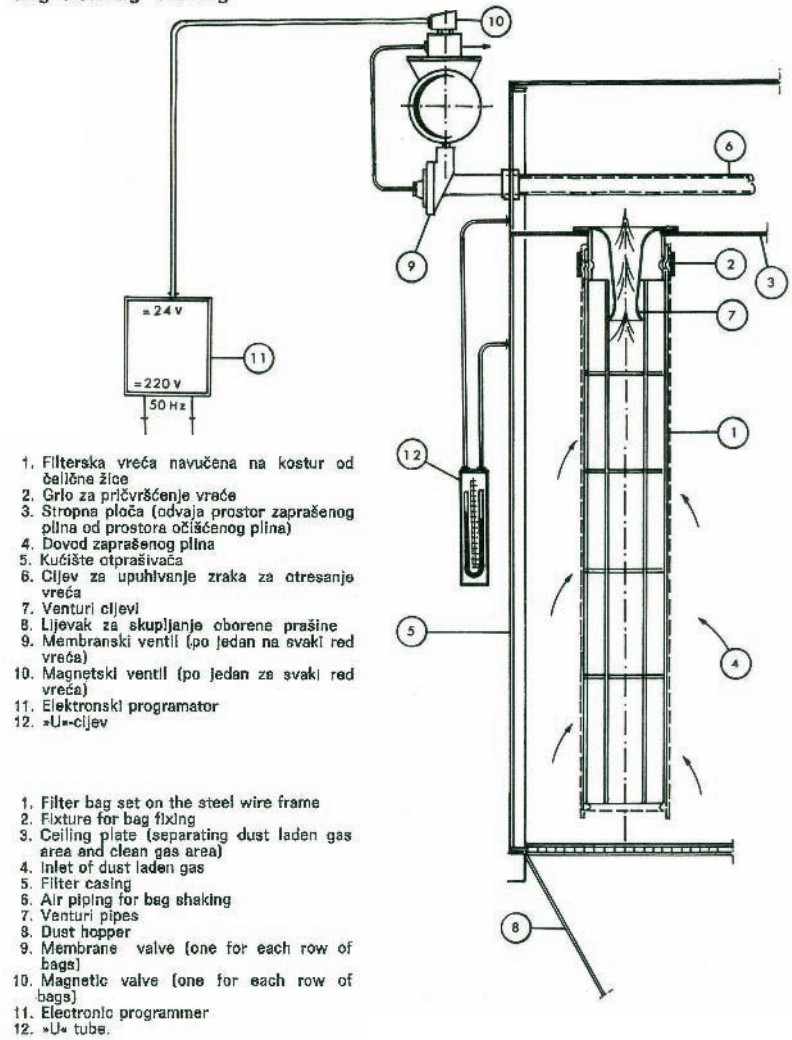
- A — Ulaz zapašenog zraka      A — Inlet of dust laden air  
B — Izlaz očišćenog zraka      B — Clean air outlet  
C — Ispust oborene prašine      C — Dust hopper

### Ispust prašine

- |                                       |                                   |
|---------------------------------------|-----------------------------------|
| 1. Kompresorski agregat               | 1. Compressed air unit            |
| 2. Dodatni rezervoar za komp. zrak    | 2. Compressed air additional tank |
| 3. Cjevovod komprimiranog zraka       | 3. Compressed air piping          |
| 4. Membranski ventil                  | 4. Membrane valve                 |
| 5. Magnetski ventil                   | 5. Magnetic valve                 |
| 6. Manometar                          | 6. Pressure gauge                 |
| 7. Elektronski programator            | 7. Electronic programmer          |
| 8. Filter                             | 8. Filter                         |
| 9. Transportni puž                    | 9. Worm conveyer                  |
| 10. Čeljusti zapornik                 | 10. Airlock                       |
| 11. Cjevovod nečistog zraka           | 11. Dirty air piping              |
| 12. Cjevovod očišćenog zraka          | 12. Clean air piping              |
| 13. Ventilator                        | 13. Fan                           |
| 14. Zasun za regulaciju protoka zraka | 14. Air flow regulator            |



## Shema uređaja za čišćenje — otresanje vreća Bag cleaning - shaking



1. Filterska vreća navučena na kostur od čelične žice
2. Grič za pričvršćenje vreća
3. Stropna ploča (odvaja prostor zapašenog plina od prostora očišćenog plina)
4. Dovod zapašenog plina
5. Kućište otprašivača
6. Cijev za upuhivanje zraka za otresanje vreća
7. Venturi cijevi
8. Lijevak za skupljanje oborene prašine
9. Membranski ventil (po jedan na svaki red vreća)
10. Magnetski ventil (po jedan za svaki red vreća)
11. Elektronski programator
12. »U«-cijev

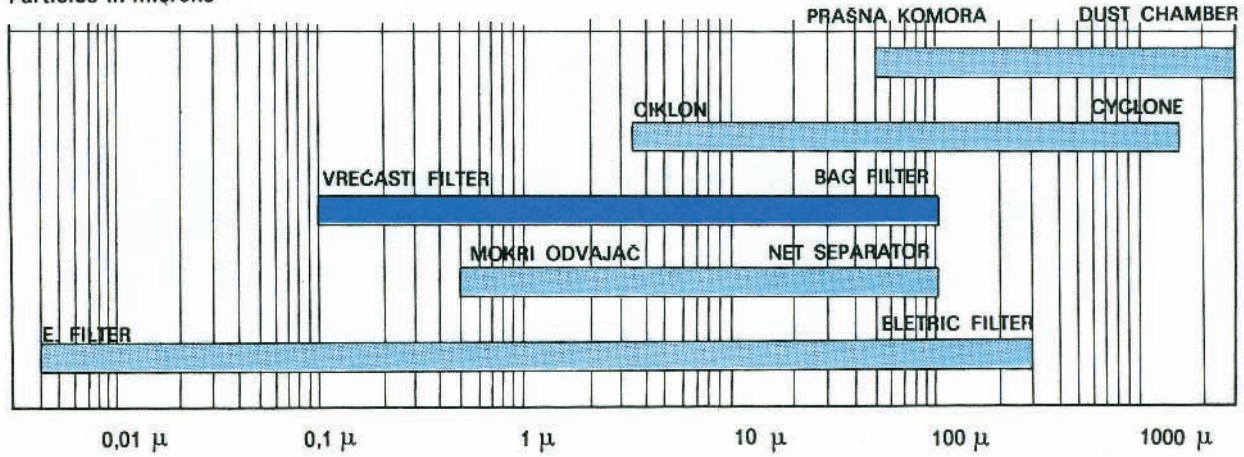
1. Filter bag set on the steel wire frame
2. Fixture for bag fixing
3. Ceiling plate (separating dust laden gas area and clean gas area)
4. Inlet of dust laden gas
5. Filter casing
6. Air piping for bag shaking
7. Venturi pipes
8. Dust hopper
9. Membrane valve (one for each row of bags)
10. Magnetic valve (one for each row of bags)
11. Electronic programmer
12. »U« tube.

## TEHNIČKI PODACI O TKANINAMA ZA FILTRIRANJE TECHNICAL DATA OF FILTERING CLOTHES

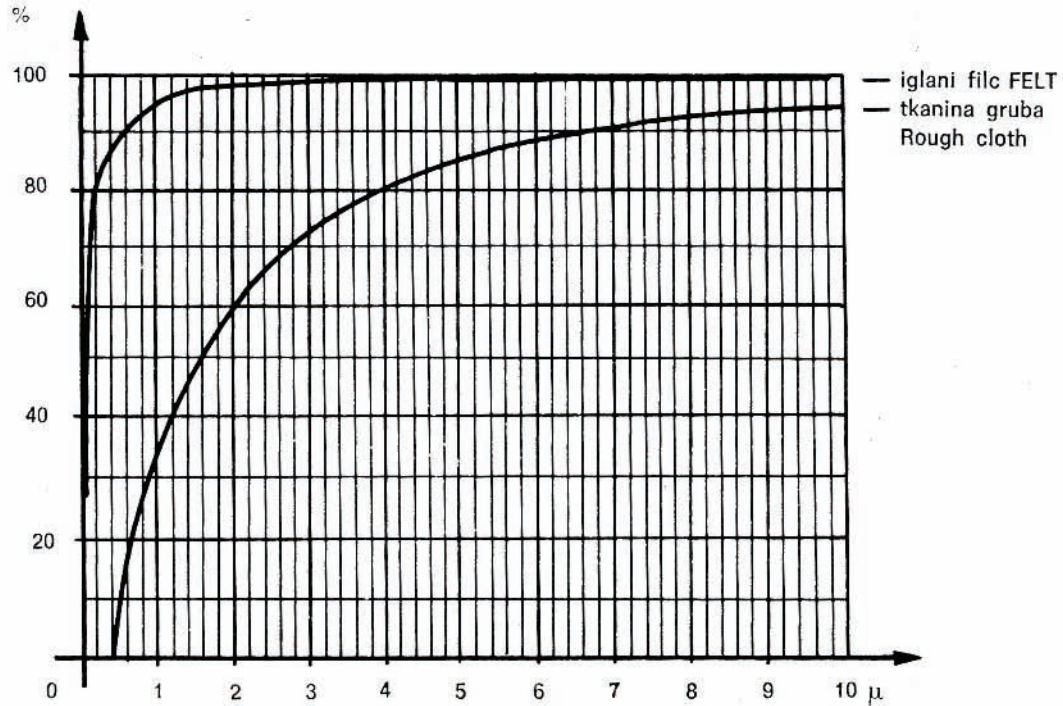
Vlakna Fibres	Naziv vlakna Fibre designation	Oznaka Symbols	Trajna otpornost na temp. °C Constant resistance at °C temp.	Kratkotrajna otpornost na temp. °C Short resistance at °C temp.	Težina gr/m <sup>2</sup> Weight	Ocjena postojanosti prema: (vidi legendu) Resistance: (see legend)					
						Kiselinama Acid	Lužinama Lyes	Oksidacionim sred. Oxidation agents	Organskim sredstvima za topljenje Organic solvents	Truljenju i bakterijama Rotting and bacteria	
1	2	3	4	5	6	7	8	9	10	11	
Prirodna Natural	Vuna Wool	V	95	120	400-720	3	1	3	5	1	
	Pamuk Cotton	B	85	110	180-620	1	3	2	4	2	
Sintetska Synthetic	Perlon	PA 6	100	110	200-600	1	5	3	4	5	
	poliamidi Nylon	PA 66	120	130	200-600	1	5	3	3	5	
		Nomex	N	210	230	240-450	3	4	5	4	4
	poliest. Vestan	PE	150	200	300-620	2	3	4	5	5	
		Trevira	PE	150	200	300-620	2	3	4	5	5
	poli-prepileni Meraklon	PP	100	130	200-600	5	5	3	3	4	
Sintetska Synthetic	poliakril- Malon	PAN	130	160	300-600	5	2	2	5	3	
	nitrili Dralon	PAN	140	160	300-600	5	2	2	5	3	
		Orlon	PAN	130	160	300-600	5	2	2	5	3
	polivinil Rovil	PVC	60	70	200-600	5	4	4	4	5	
	kloridi Termovil	PVC	90	100	200-600	5	4	4	4	5	
Politetra- fluoretani Teflon	T	260	275	240-450	5	5	5	5	5		
Mineral Staklena Mineralvuna Fiber glass			300	600	400-720	5	3	5	3	3	

LEGENDA: 1 — Loša      2 — Zadovoljava      3 — Dobra      4 — Vrlo dobra      5 — Odlična  
LEGEND:      Bad      Satisfactory      Good      Very good      Excellent

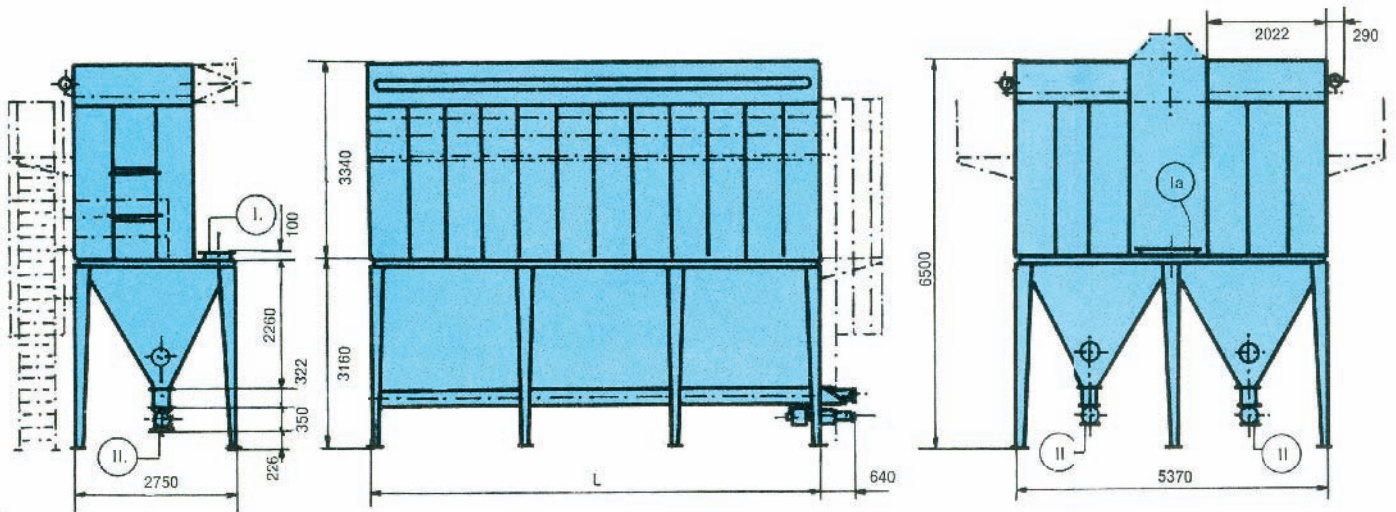
Veličina čestica u mikronima  
Particles in microns



**PODRUČJE PRIMJENE VREĆASTIH FILTERA  
BAG FILTER APPLICATION AREA**



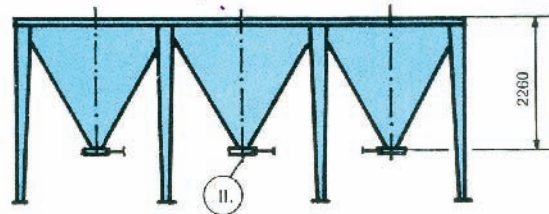
**STUPANJ OTPRAŠIVANJA  
DEDUSTING DEGREE**



JEDNOREDNA SINGLE ROW

IZVEDBA: A TYPE A

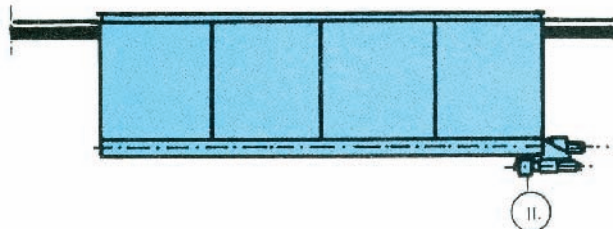
IZVEDBA: B TYPE B



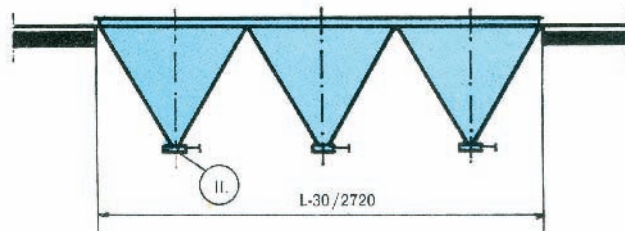
DVOREDNA DOUBLE ROW

IZVEDBA: A TYPE A

IZVEDBA: C TYPE C



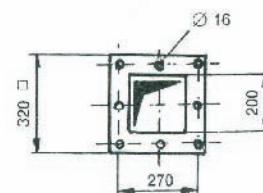
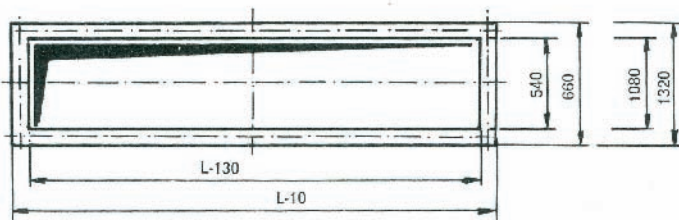
IZVEDBA: D TYPE D



PRIRUBNICA: FLANGE I.

la.

PRIRUBNICA FLANGE II.



Tip filtera Filter type	Površina filtera u m <sup>2</sup> Filter area in m <sup>2</sup>	Broj odjela No. of sections	Broj vreća i venturi cijevi No. of bags and venturi tubes	Ventil kom. Valves pes.	Elektro- program Electric program- me	L mm Length	Orijentacio- na tež. filtera u kg* Approx. weight of filter in kg*
FVU-P-42/2	42	2	48	6	1	1400	3000
FVU-P-63/3	63	3	72	9	1	2030	3600
FVU-P-84/4	84	4	96	12	1	2660	4200
FVU-P-105/5	105	5	120	15	1	3290	4800
FVU-P-126/6	126	6	144	18	1	3920	5400
FVU-P-147/7	147	7	168	21	1	4550	6000
FVU-P-168/8	168	8	192	24	1	5180	6600
FVU-P-189/9	189	9	216	27	1	5810	7200
FVU-P-210/10	210	10	240	30	1	6440	7800
FVU-P-231/11	231	11	264	33	2	7070	8400
FVU-P-252/12	252	12	288	36	2	7700	9100
2 FVU-P-147/7	294	14	336	42	2	4550	12100
2 FVU-P-168/8	336	16	384	48	2	5180	13300
2 FVU-P-189/9	378	18	432	54	2	5810	14500
2 FVU-P-210/10	420	20	480	60	2	6440	15700
2 FVU-P-231/11	464	22	528	66	4	7070	16900
2 FVU-P-252/12	504	24	576	72	4	7700	18100

\* NAPOMENA: U težinu filtera uračunata je težina postolja, podesta i ograda.

*Filter weight includes also weight of support, platform and handrail suction bag filter.*



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