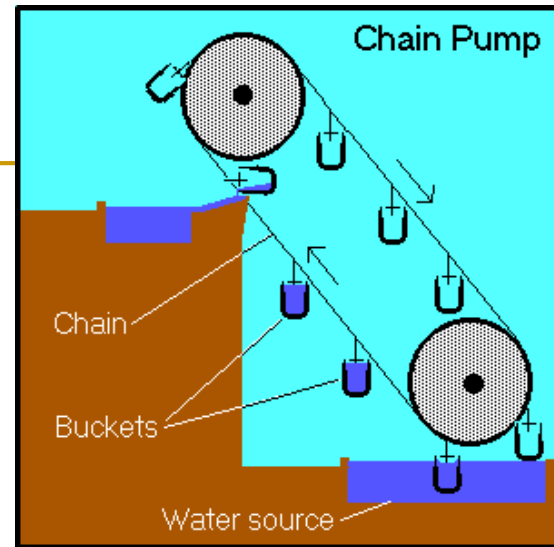


RADNI STROJEVI CRPKE, KOMPRESORI, VENTILATORI



CRPKE

■ **Namjena:**

Crpke su radni strojevi koji služe crpljenju i transportu tekućina s jednog mjesta na drugo, odnosno s nižeg na viši nivo.

Podjela crpki:

1. Prema načinu rada:

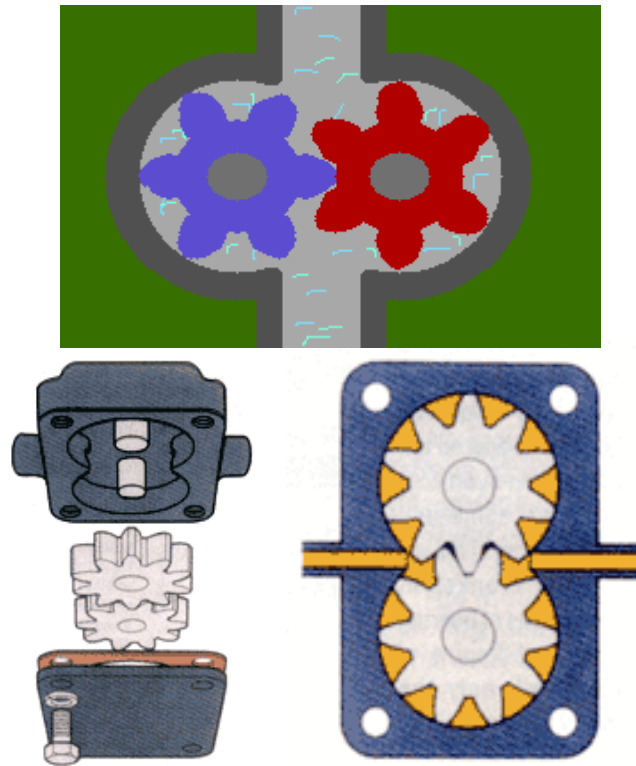
- crpke neprekinutog (kontinuiranog) djelovanja
- crpke prekidnog (diskontinuiranog) djelovanja

2. Prema konstrukciji

- centrifugalne
 - klipne i stapne
 - membranske
 - krilne
 - vijčane
 - zupčaste
 - ...itd.
-

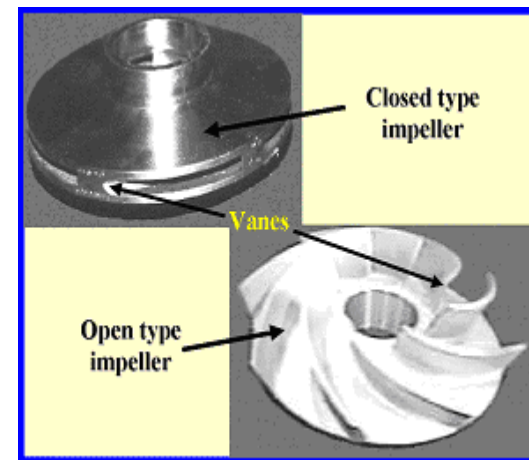
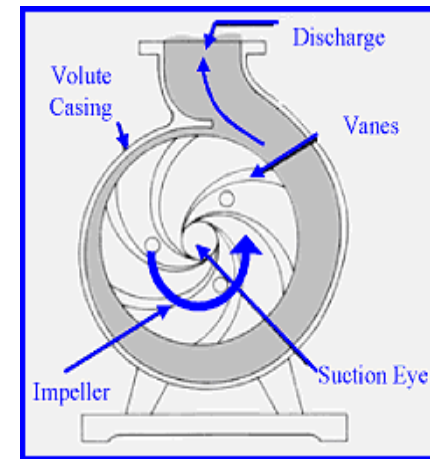
Zupčasta crpka

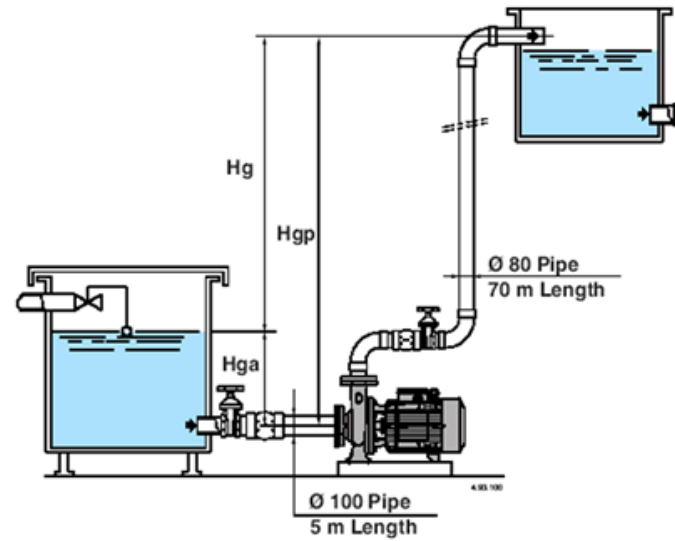
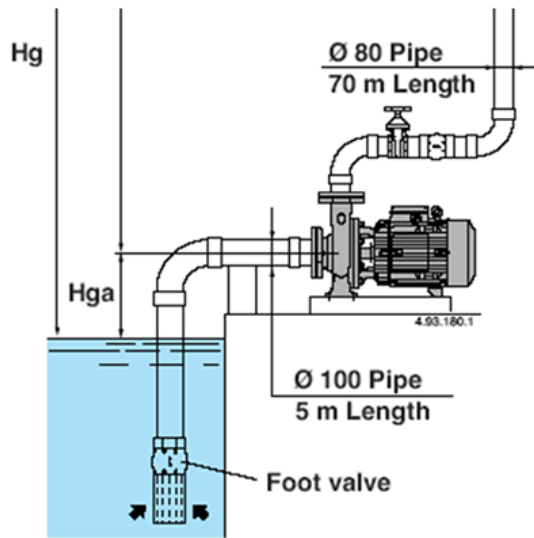
- Crpka kontinuiranog djelovanja.
- Primjena u motorima SUI – crpka za ulje uređaja za podmazivanje, kod traktora – crpka hidraulika itd.



CENTRIFUGALNA CRPKA

- Crpka kontinuiranog djelovanja
- Služi za opskrbu vodom na farmama, za hlađenje motora SUI rashladnom tekućinom itd.

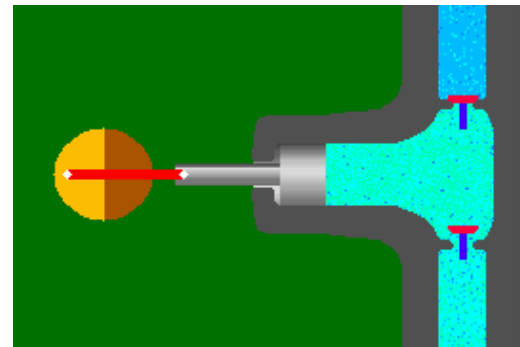




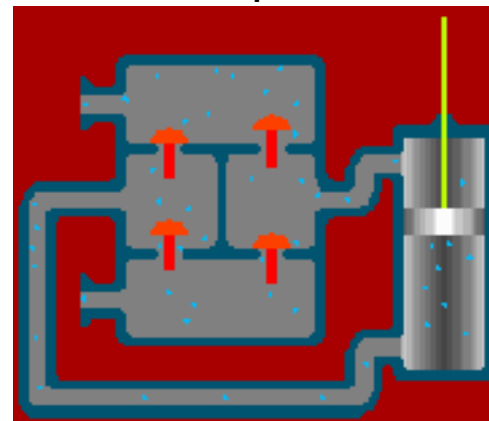
KLIPNA CRPKA

- Crpka prekidnog (diskontinuiranog) djelovanja
- Služi za snabdijevanje gorivom motora SUI, za rad prskalice itd.

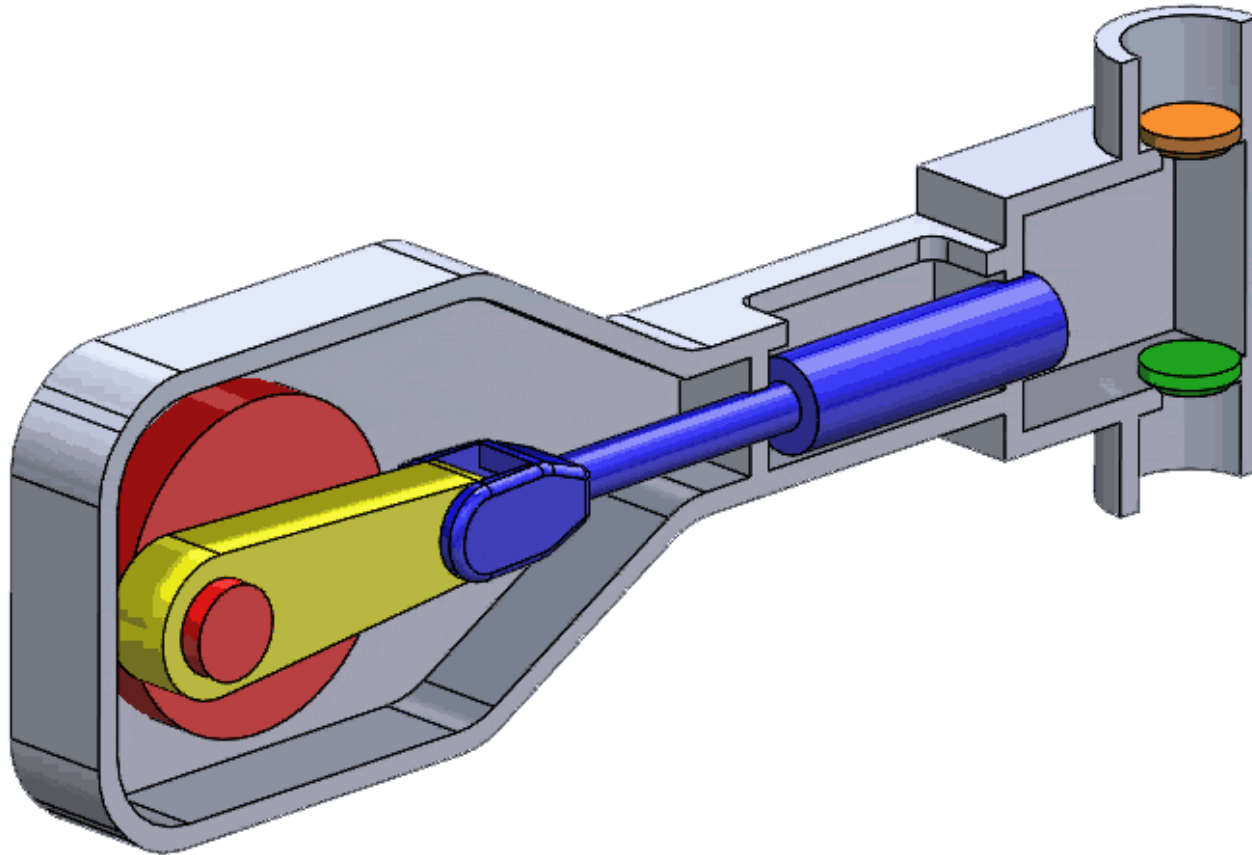
1-radna crpka



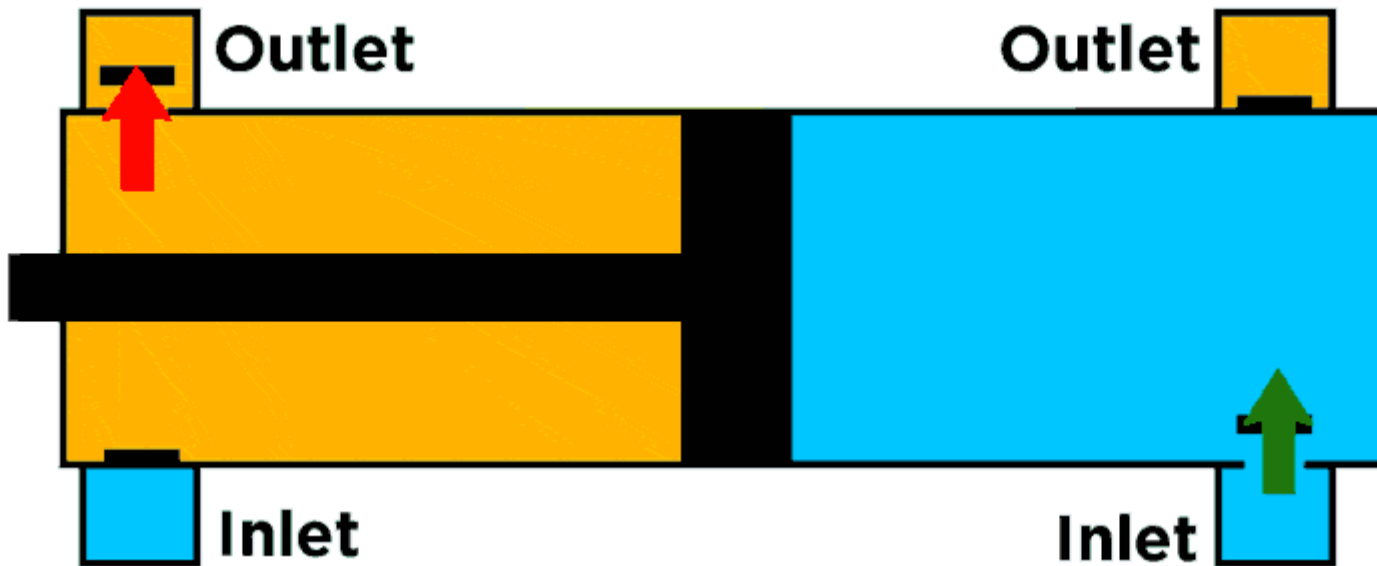
2-radna crpka



1-radna klipna crpka

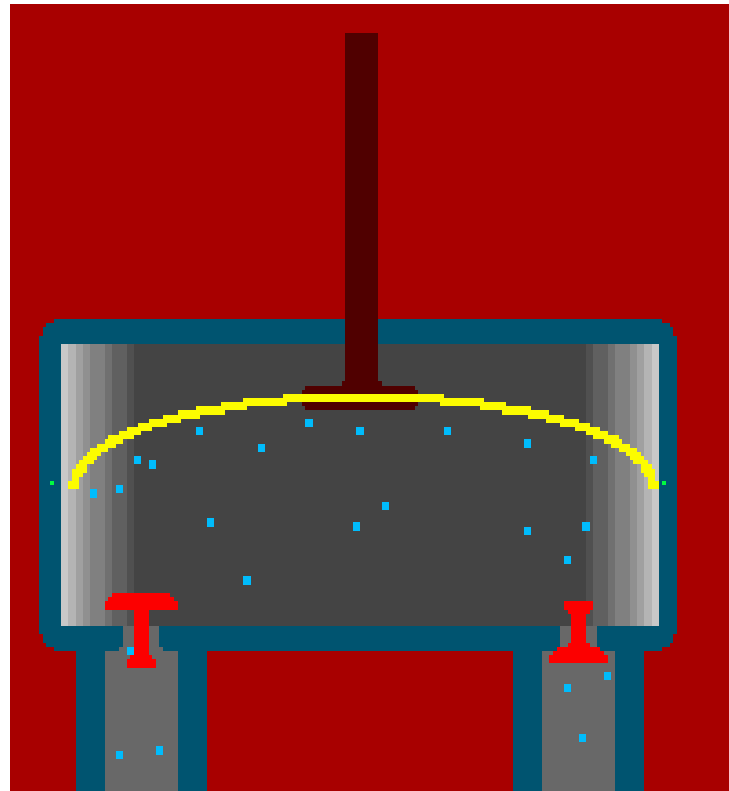


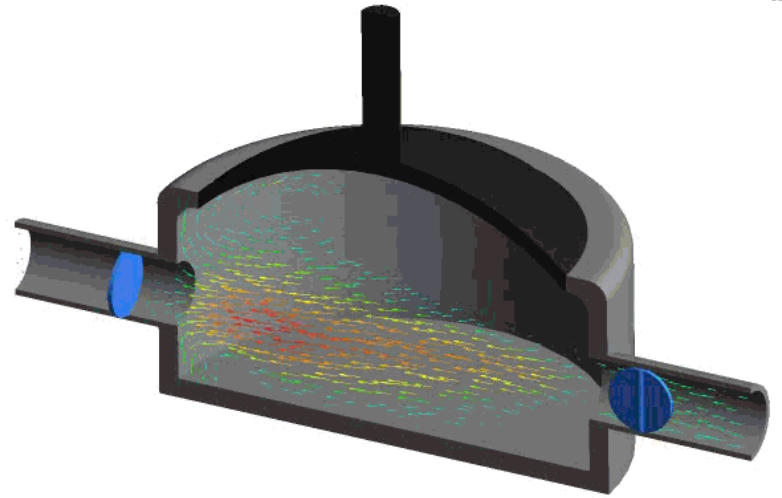
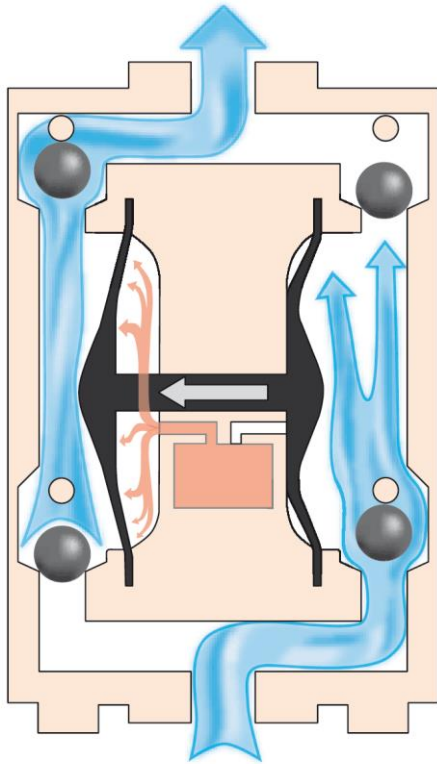
2-radna klipna crpka



MEMBRANSKA CRPKA

- Crpka prekidnog (diskontinuiranog) djelovanja
- Služi kao crpka za gorivo motora SUI, za rad prskalice itd.

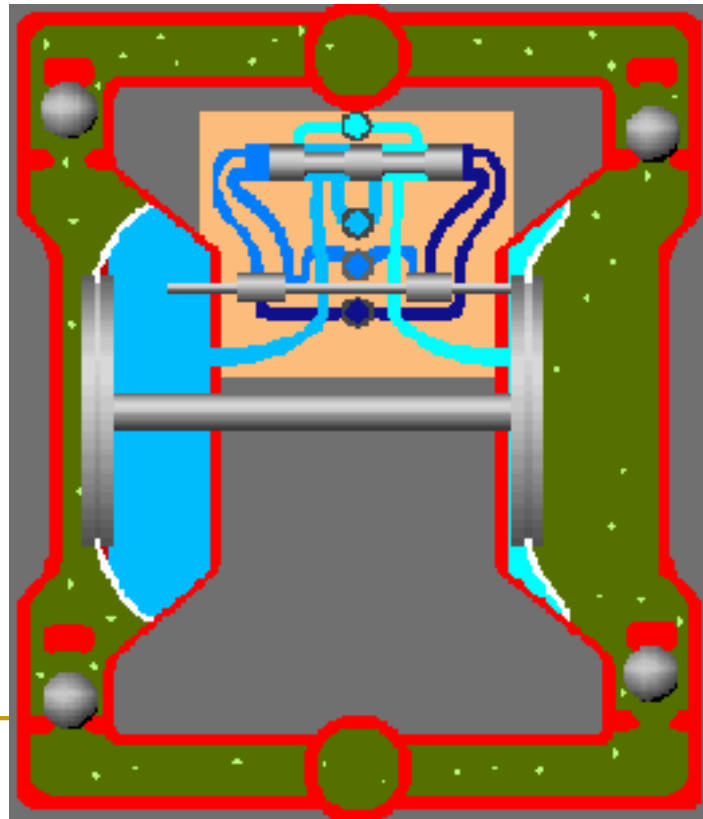




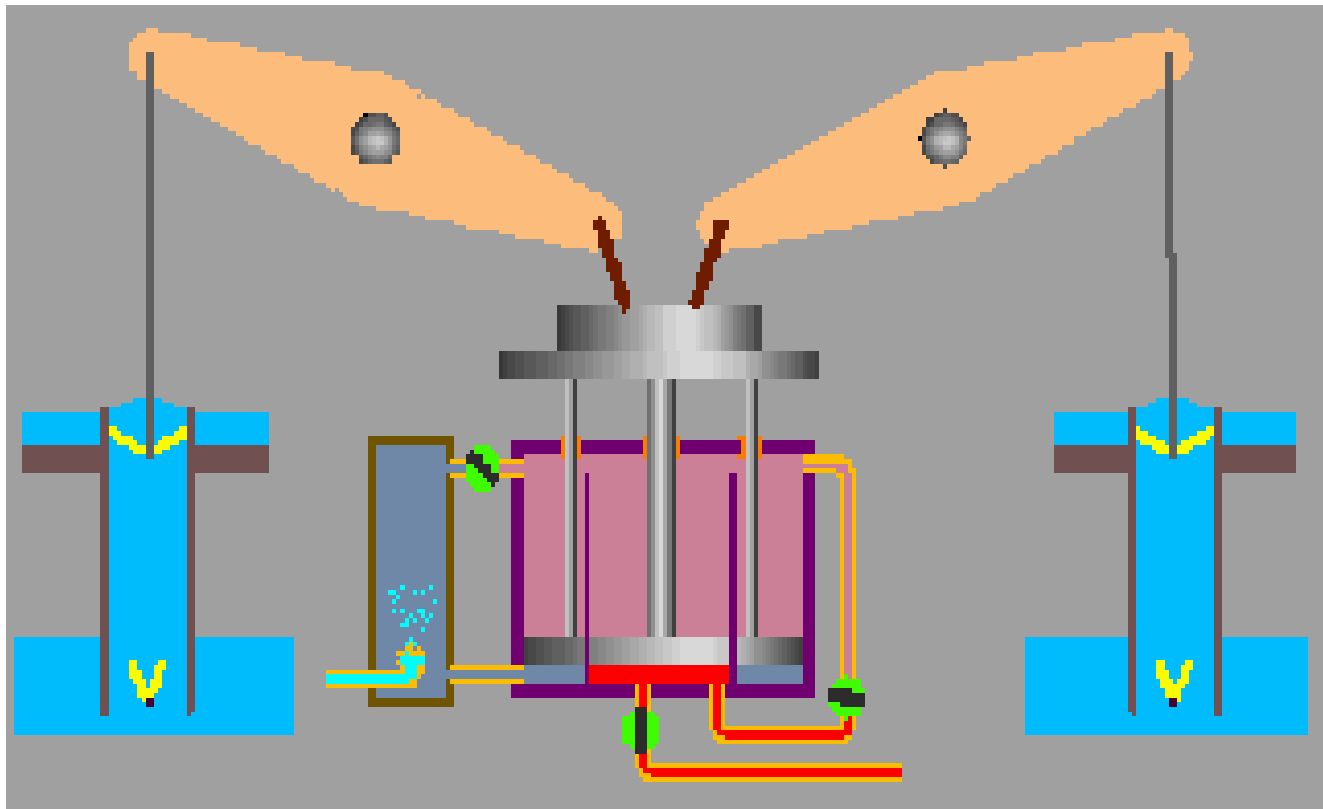
ANSYS
v18.1

KLIPNO-MEMBRANSKA CRPKA

- Služi za rad prskalice



CRPNA STANICA (19. STOLJEĆE)



Karakteristike crpke

■ Snaga

$$P = \frac{\gamma \times Q \times H_{man}}{\eta \times 102} [kW]$$

γ = specifična težina tekućine (kg/l)
 Q = kapacitet crpke (l/s)
 H_{man} = manometarska visina (m V.S.)
 η = stupanj korisnog djelovanja crpke

Kapacitet 1-radne stepne crpke

$$Q = V \cdot n \cdot \eta = \frac{D^2 \cdot \pi}{4} \cdot s \cdot n \cdot \eta [l/s]$$

V = volumen cilindra crpke (l)

D = promjer cilindra (dm)

s = stapaj (dm)

n = broj okretaja pogonskog vratila (s-1)

η = stupanj korisnog djelovanja crpke

Kapacitet 2-radne stapne crpke

$$Q = \frac{D^2 \cdot \pi}{4} \cdot 2s \cdot n \cdot \eta [l/s]$$

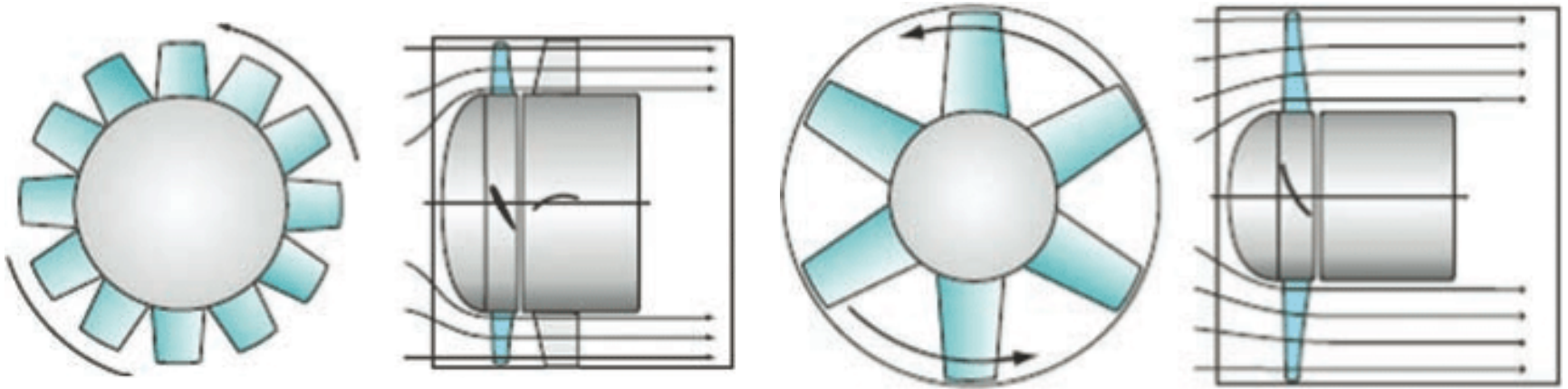
VENTILATORI

- **Radni strojevi** namijenjeni dobavi **velikih** količina zraka pod **malim** pritiskom (izmjeni zraka u prostorijama, hlađenju, grijanju i sl.).
- Ventilatori mogu biti:
 - aksijalni (p = **do 30 mm V.S.**) za veće količine dobave zraka
 - radijalni (p = **do 500 mm V.S.**) za manje količine dobave zraka

AKSIJALNI VENTILATORI



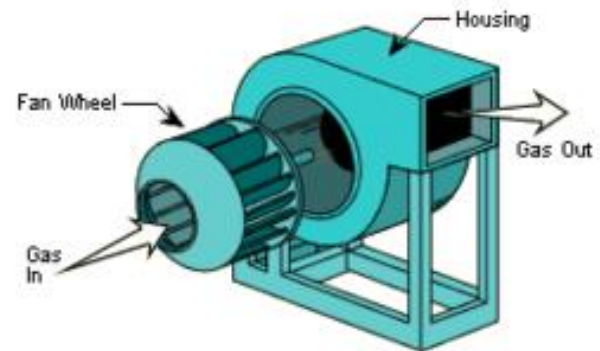
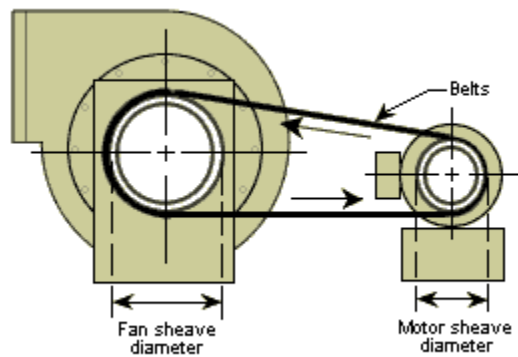
AKSIJALNI VENTILATOR



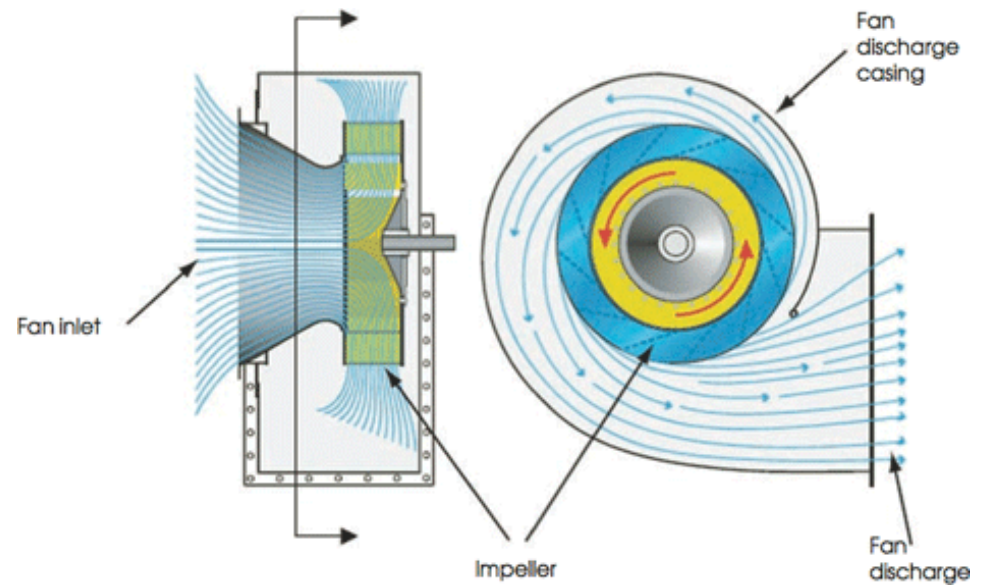
Aksijalni ventilator



Radijalni (centrifugalni) ventilator

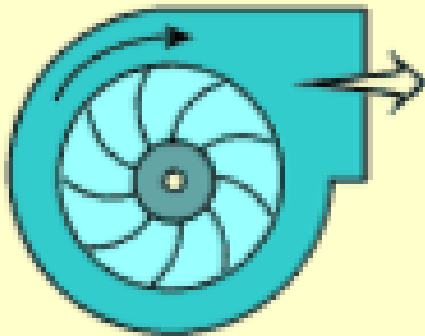


CENTRIFUGALNI VENTILATOR

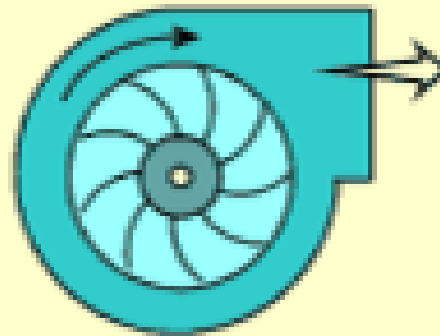


Centrifugalni ventilator

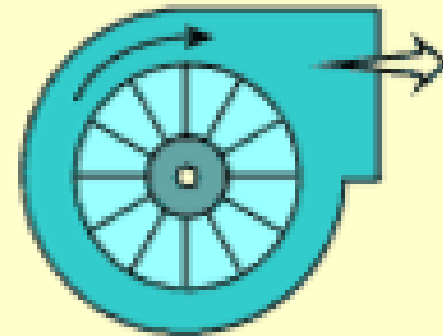
Izvedbe lopatica



(a) Forward Curved



(b) Backward Curved



(c) Radial

RADIJALNI VENTILATORI

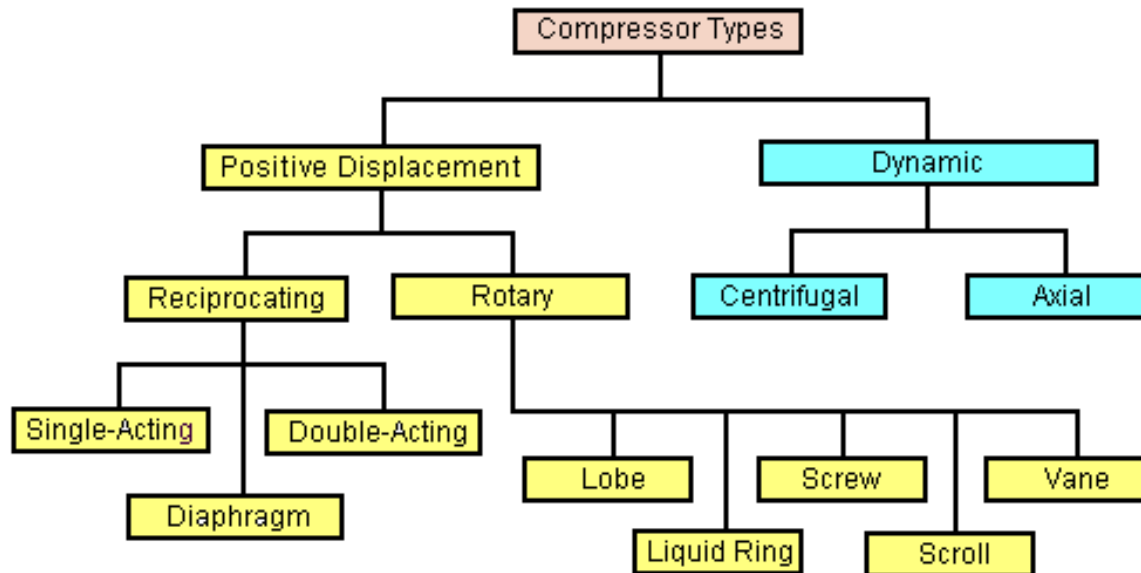


Radijalni (centrifugalni) ventilator

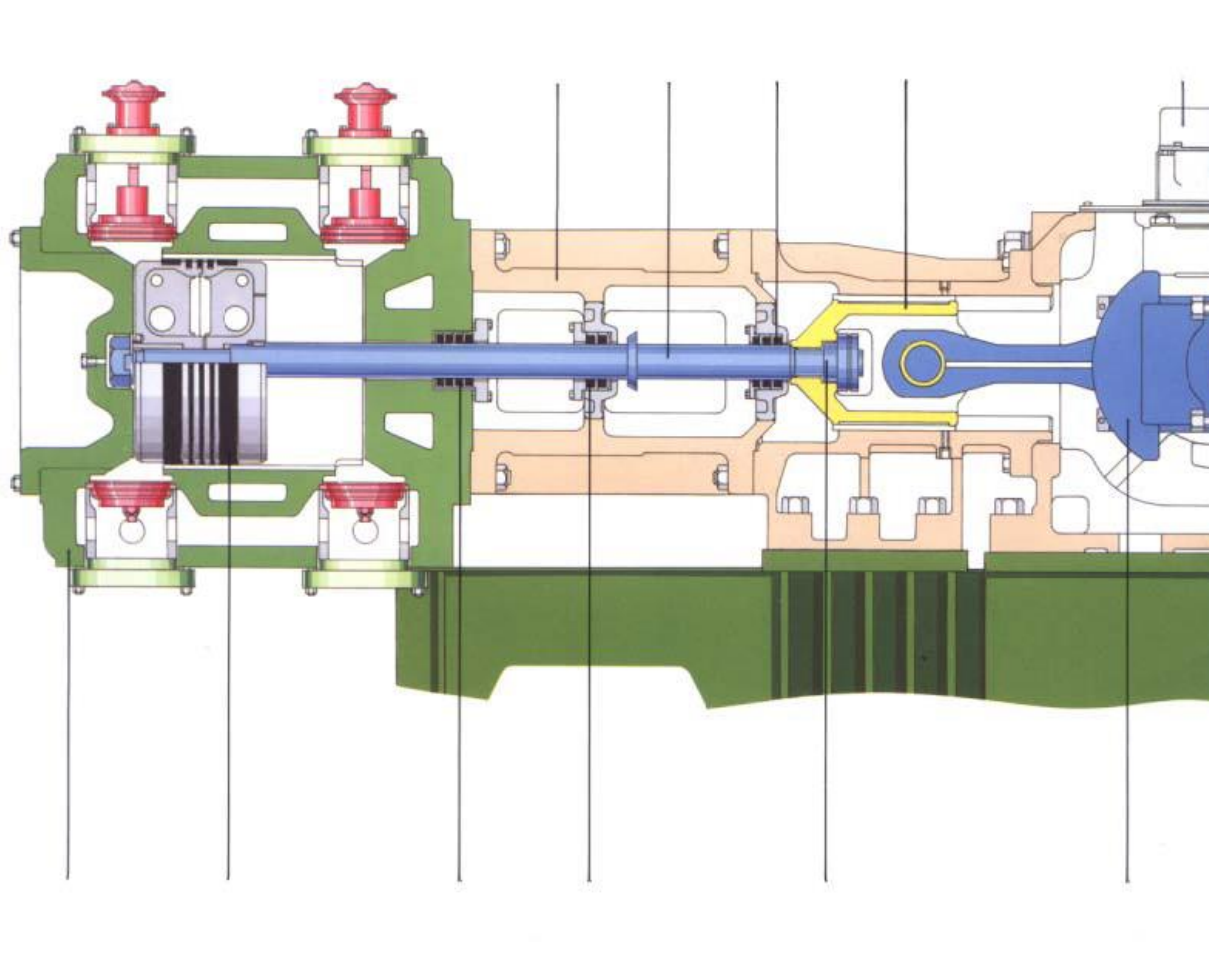


KOMPRESORI

- Radni strojevi namijenjeni komprimiranju plinova.



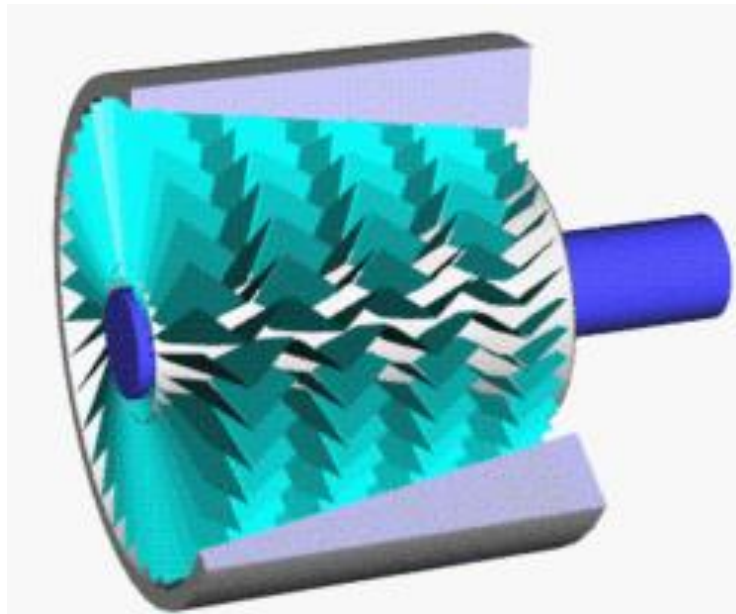
KLIPNI KOMPRESOR



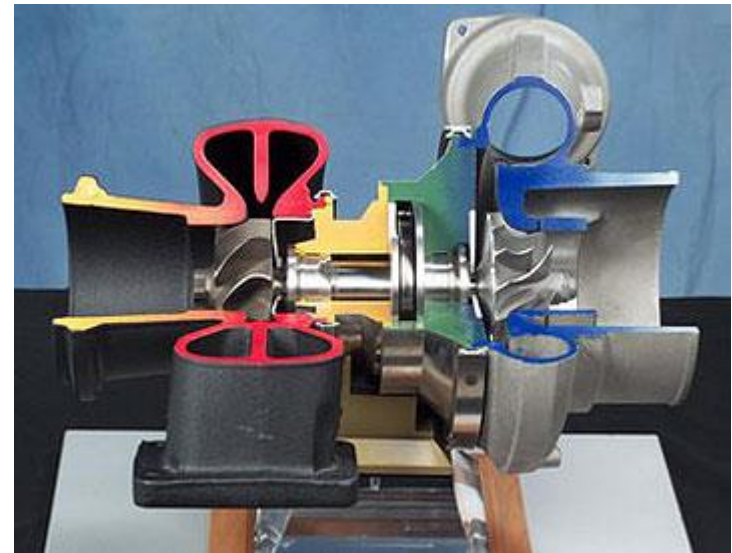
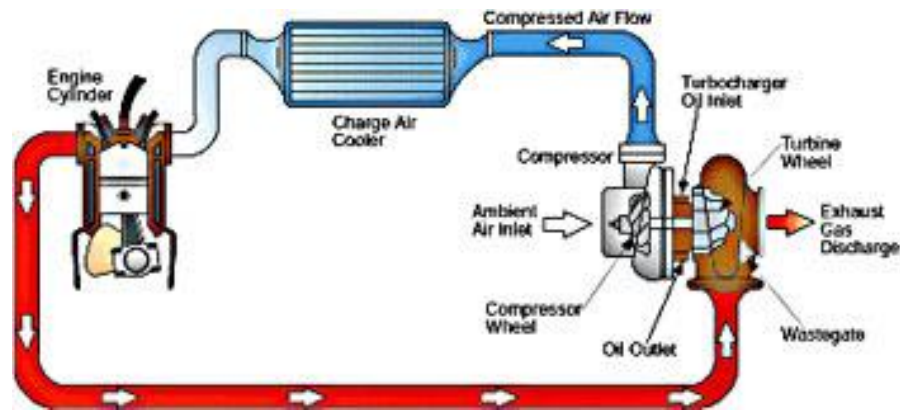
SPIRALNI (VIJČANI) KOMPRESOR



Aksijalni kompresor



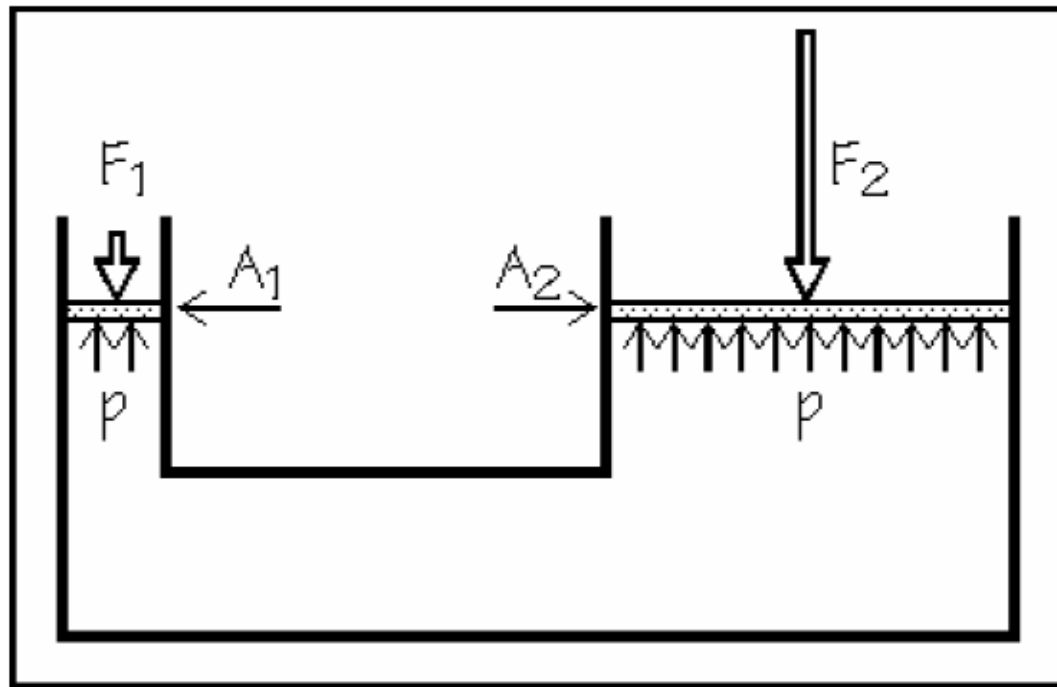
Turbo kompresor za prednabijanje zraka motora SUI



Hidraulična dizalica

- Pascalov zakon – pritisak fluida u posudi prenosi se jednako na sve stijenke (hidrostatski pritisak)

$$F_2 = F_1 \frac{A_2}{A_1}$$



Hidrostatski pritisak

- $p = \rho gh$
- (ρ) – gustoća fluida
- g – gravitacija
- h – visina stupca fluida



Princip spojenih posuda

$$\rho_1 g h_1 + p_0 = \rho_2 g h_2 + p_0$$

$$\frac{h_1}{h_2} = \frac{\rho_2}{\rho_1}$$