

# Vakuové ventily

Dělení podle různých principů

Podle funkčnosti

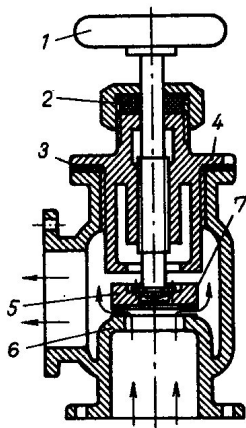
- oddělovací
- napouštěcí
- zavzdušňovací
- omezení čerpací rychlosti

Ovladání

- ruční
- pneumatický
- elektromagnetický

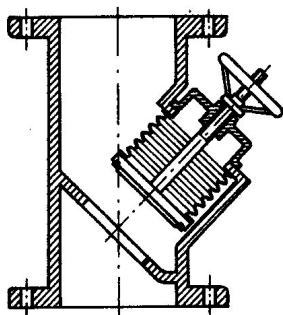
Oblast použití

- hrubé vakuum
- HV vakuum
- UHV, XHV vakuum

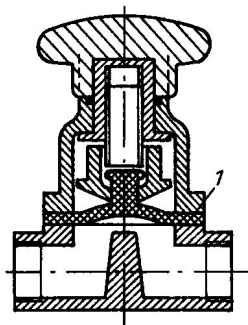


Obr. 6.27. Ventil s talířkem přitlačovaným šroubem

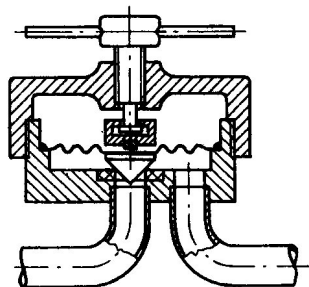
1 – rukojeť; 2 – těsnění; 3 – těsnící kroužek; 4 – horní příruba; 5 – talířek; 6 – dolní příruba; 7 – těsnění talířku



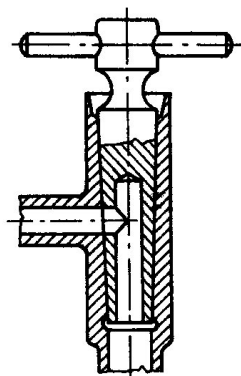
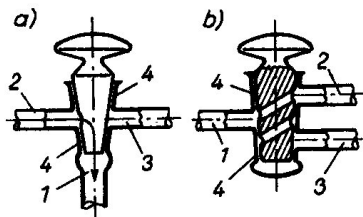
Obr. 6.28. Ventil těsněný vlnovcem

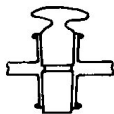


Obr. 6.32. Ventil pro nízké vakuum s membránovým těsněním (firma Leybold)

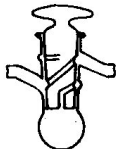


Obr. 6.33. Řez ventilu s kuželovým čepem a membránovým těsněním pro ultravysoké vakuum

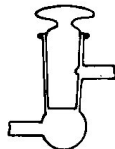




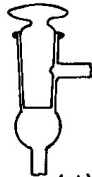
(a)



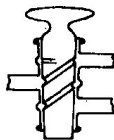
(b)



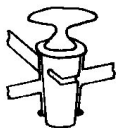
(c)



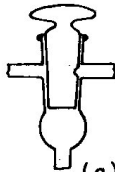
(d)



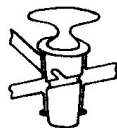
(e)



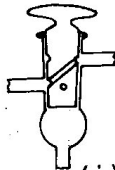
(f)



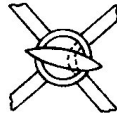
(g)



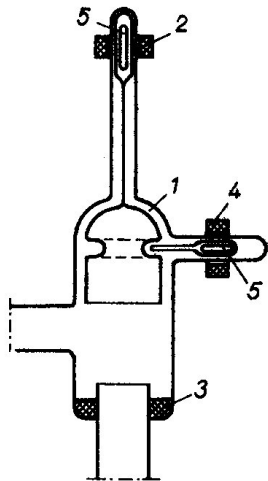
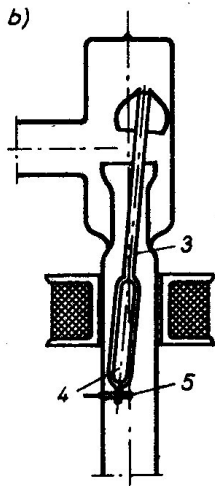
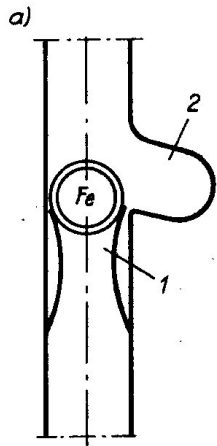
(h)

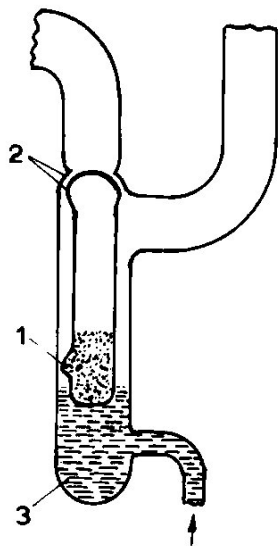


(i)

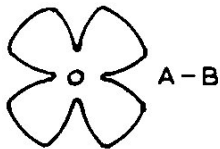
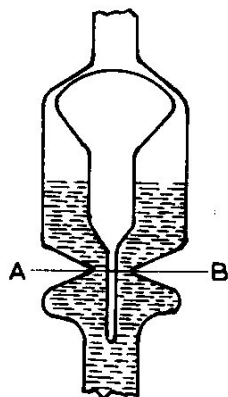


(j)





(a)



(b)

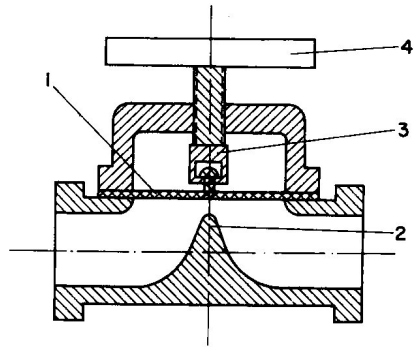
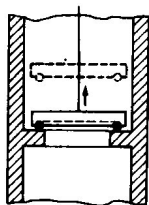
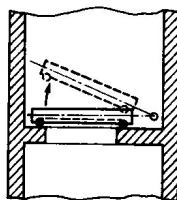


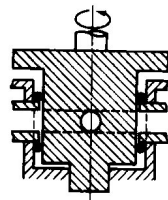
Fig. 7.61 Diaphragm valve.



(a)

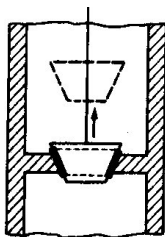


(b)

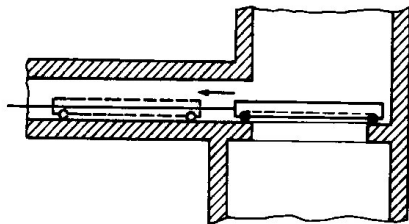


(c)

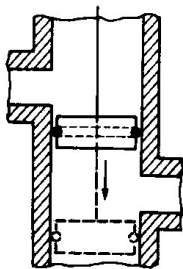




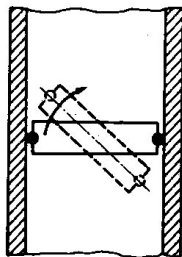
(d)



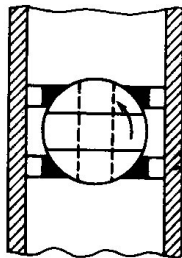
(e)



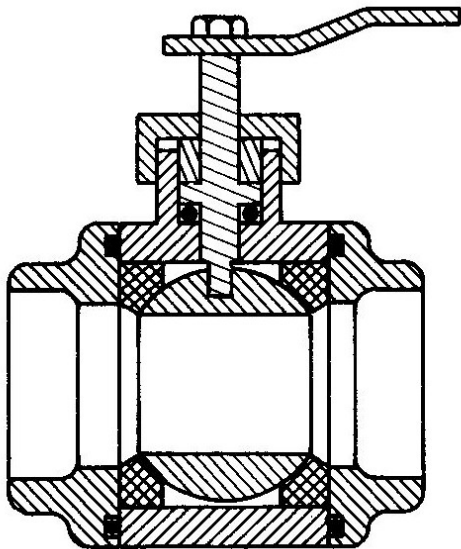
(f)



(g)



(h)



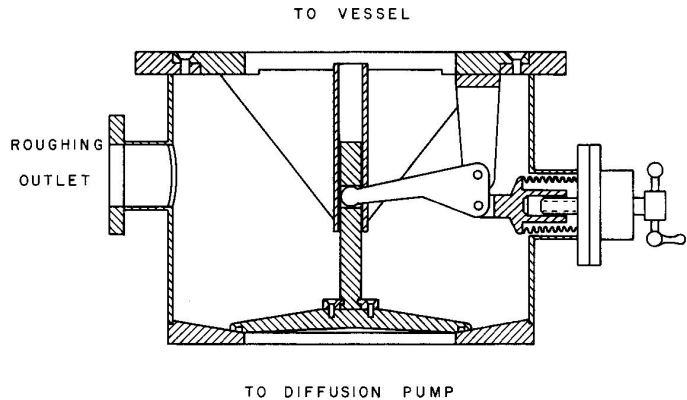


Fig. 2.29. Poppet valve.

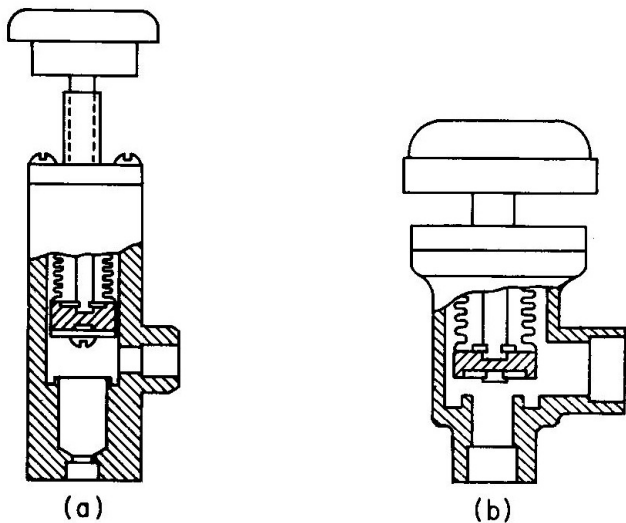


Fig. 2.28. Angle valves. (a) Machined from bar stock. (b) Cast.

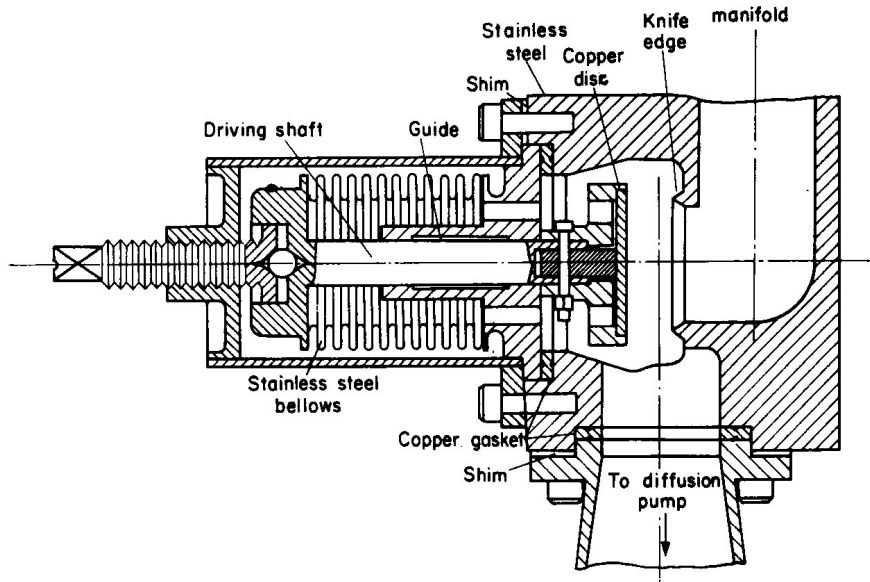


Fig. 7.65 Ultra-high vacuum valve. After Baker (1962).

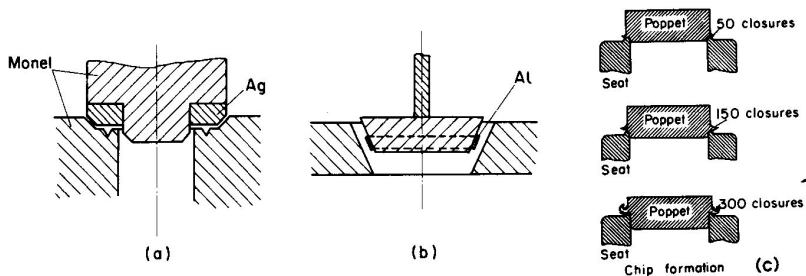
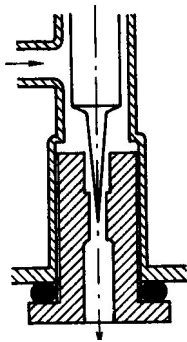
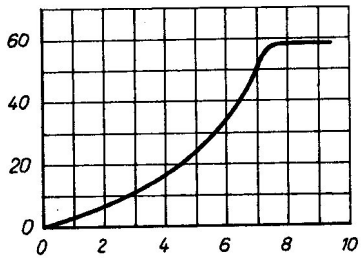


Fig. 7.63 Closing systems of all-metal valves; (a) with flat silver ring (Bills and Allen, 1955); (b) with aluminum conical ring (Kienel and Lorenz, 1960); (c) with copper poppet (Parker and Mark, 1961).



$I_N (\text{cm}^3(\text{NTP})\text{s}^{-1})$



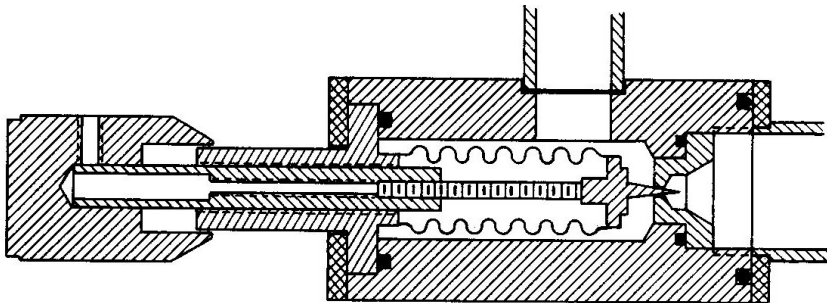


Fig. 2.31. Needle valve.

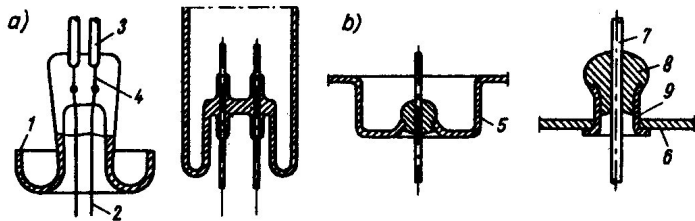


- deskové ventily - při otevírání dif.tlak menší než  $\sim 30$  mbar
- ventily s kovovým těsněním - omezený počet cyklů
- jehlové ventily - nedotahovat silou
- zábrusové ventily - dobře namazat

# *Elektrické průchodky*

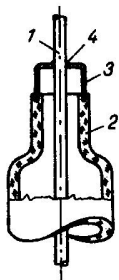
Vakuum v rozsahu tlaků 1-5000 Pa je velmi špatný elektrický izolant.  
Průchodky vybíráme podle:

- napětí
- proudu
- frekvence

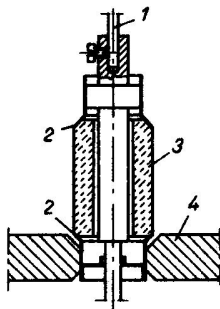


Obr. 6.47. Elektrické průchodky pro slabé proudy

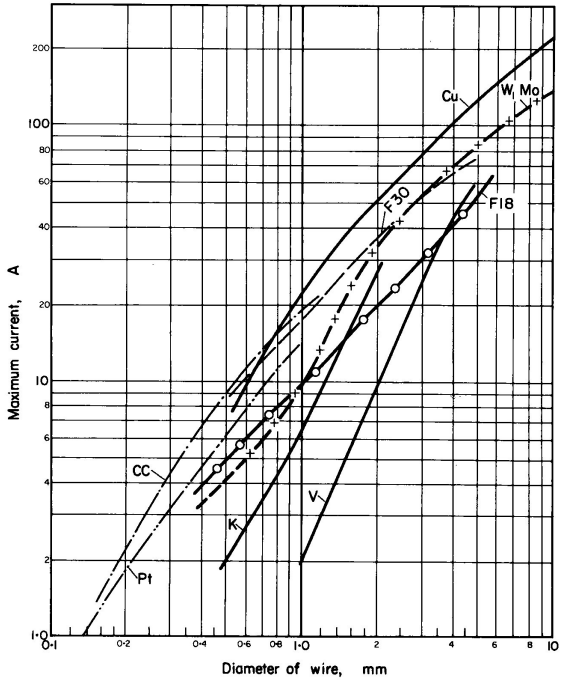
a) vodič z plášťového nebo platinovaného drátku zataveného ve skle, b) prûtav skleněnou perličkou zatavenou do otvoru v kovové stěně



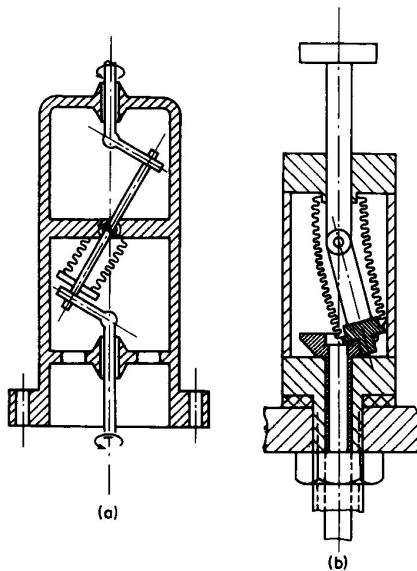
Obr. 6.48. Silnoproudá průchodka skleněnou trubicí  
 1 – průtav; 2 – sklo; 3 – kovarová čepička; 4 – pájka

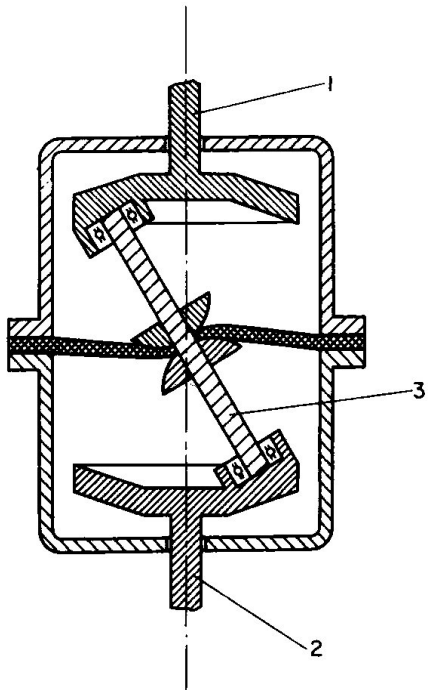


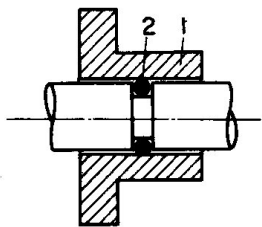
Obr. 6.49. Silnoproudá průchodka kovovou stěnou s keramickým izolátorem  
 1 – přívod; 2 – spoj kovu s keramikou; 3 – keramika; 4 – stěna vakuového systému



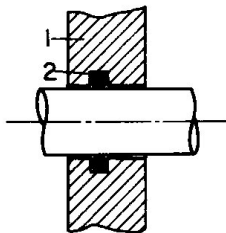
## *Přenos rotace do vakua*



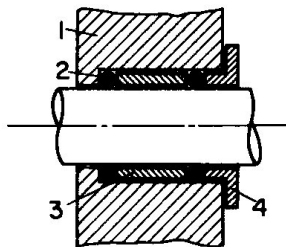
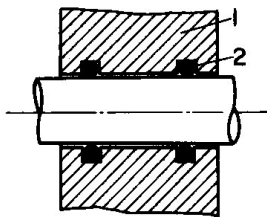




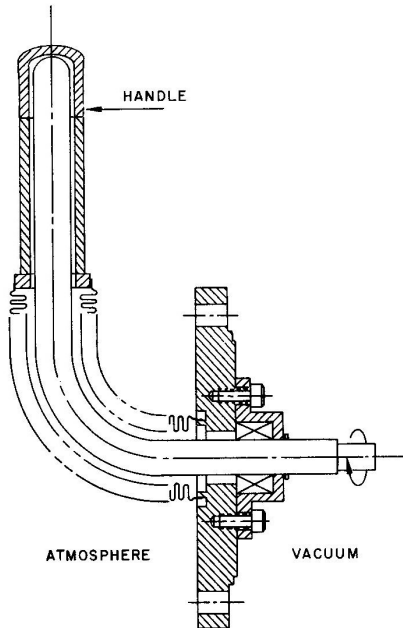
(a)

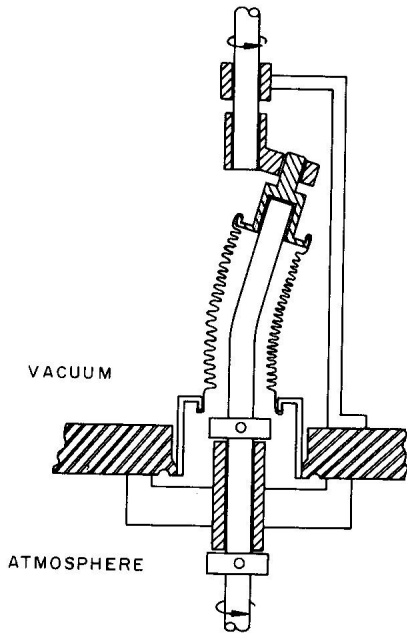


(b)











# *Ohebné spoje*

- připojení primárních vývěv
  - kovové vlnovce
    - bellows - změna délky při změně tlaku
    - flexible metal hose
  - tlustostěnné hadice
  - hadice s kovovou spirálou