TOSHKENT IRRIGATSIYA VA QISHLOQ XO'JALIGINI MEXANIZATSIYALASH MUHANDISLARI INSTITUTI

FAN: NASOS VA NASOS STANSIYALARI

MAVZU **03**

NASOSNING SUV KO‘TARISH BALANDLIKLARI, TAMG‘ALANISHI

Suv energiyasi va nasos stansiyalaridan foydalanish kafedrasi dotsenti

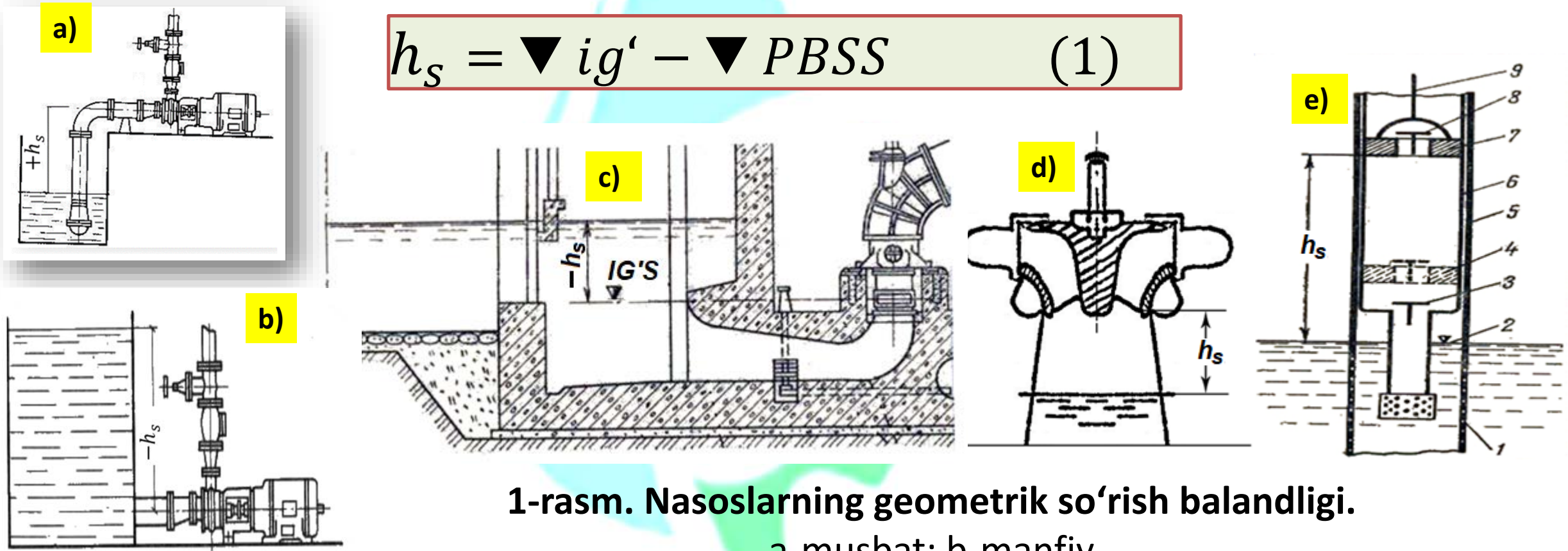
MA’RUZA REJASI:

- Nasosning so‘rish balandligi
- Nasosning haydash balandligi
- Nasosning umumiy suv ko‘tarish balandligi
- Nasoslarning tamgalanishi

Nasosning so‘rish balandligi

Geometrik so‘rish balandligi

$$h_s = \blacktriangledown ig‘ - \blacktriangledown PBSS \qquad (1)$$



1-rasm. Nasoslarning geometrik so‘rish balandligi.
a-musbat; b-manfiy

Nasosning so‘rish balandligi

Keltirilgan so‘rish balandligi

$$H_{k.s} = h_s + \Delta h_s \qquad (2)$$

2-rasm. Nasoslarning geometrik so‘rish balandligi.

a-musbat; b-manfiy

Nasosning so‘rish balandligi

Vakuummetrik so‘rish balandligi

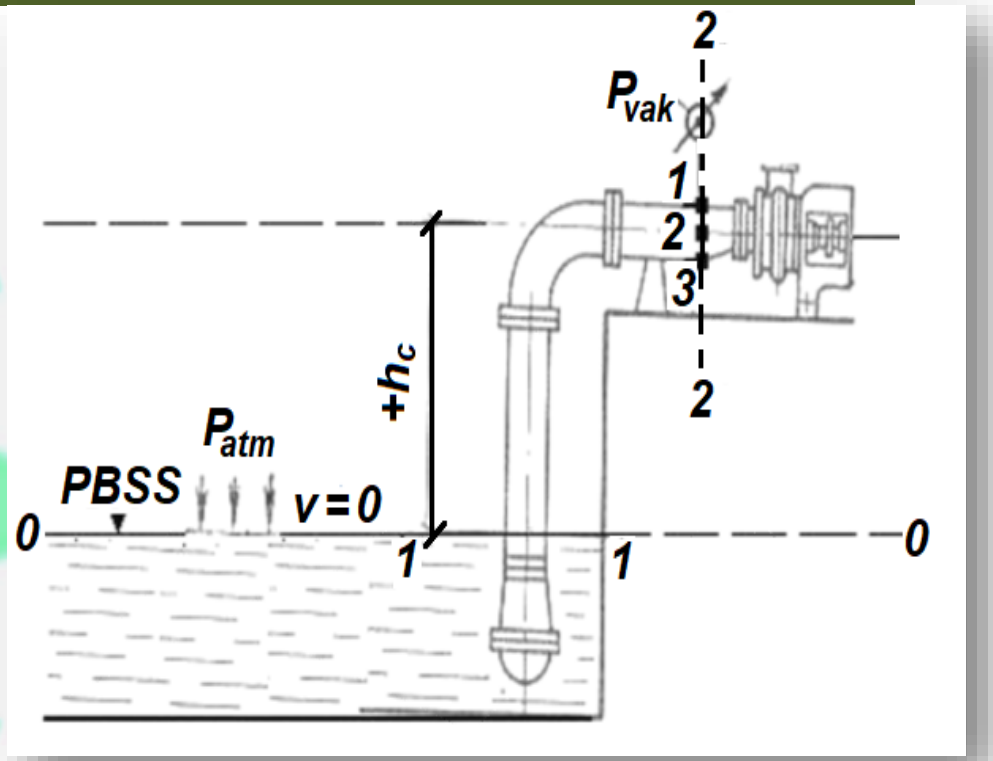
$$0 + \frac{P_{atm}}{\gamma} + 0 = h_s + \frac{P_{vak}}{\gamma} + \frac{v_{kir}^2}{2g} + \Delta h_s \quad (4)$$

$$\frac{P_{atm}}{\gamma} - \frac{P_{vak}}{\gamma} = h_s + \frac{v_{kir}^2}{2g} + \Delta h_s \quad (5)$$

$$\frac{P_{atm}}{\gamma} - \frac{P_{vak}}{\gamma} = H_{vak} \quad (6)$$

$$H_{vak} = H_{k.s} + \frac{v_{kir}^2}{2g} \quad (7)$$

$$H_{vak} = H_{k.s} + \frac{v_{kir}^2}{2g} \pm y \quad (8)$$



3-rasm. Vakuummetrni o‘rnatish sxemasi:
1, 2, 3 – vakuummetrni o‘rnatish nuqtalari.

Nasosning so‘rish balandligi

Mumкin bo‘lgan so‘rish balandligi

$$H_{vak}^{m.b} = H_a - \Delta h_s - \Delta h_{kav} - h_{s.b} \quad (9)$$

$$H_a = 10{,}33 - \frac{\nabla PBSS}{900} \quad (10)$$

Suv harorati t = 20^{0}C bo‘lgandagi barometrik bosimning qiymatlari

Nasos o’rnatilgan joyning dengiz sathidan balandligi (m)	0	100	200	300	400	600	800	2000
Barometrik bosim H_a (m)	10,3	10,2	10,1	10,0	9,8	9,6	9,4	8,4

Kavitasiya hodisasi yuz bermasligi uchun vakuummetrik so’rish balandligi mumкin bo’lgan so’rish balandligidan katta bo’lmasligi kerak

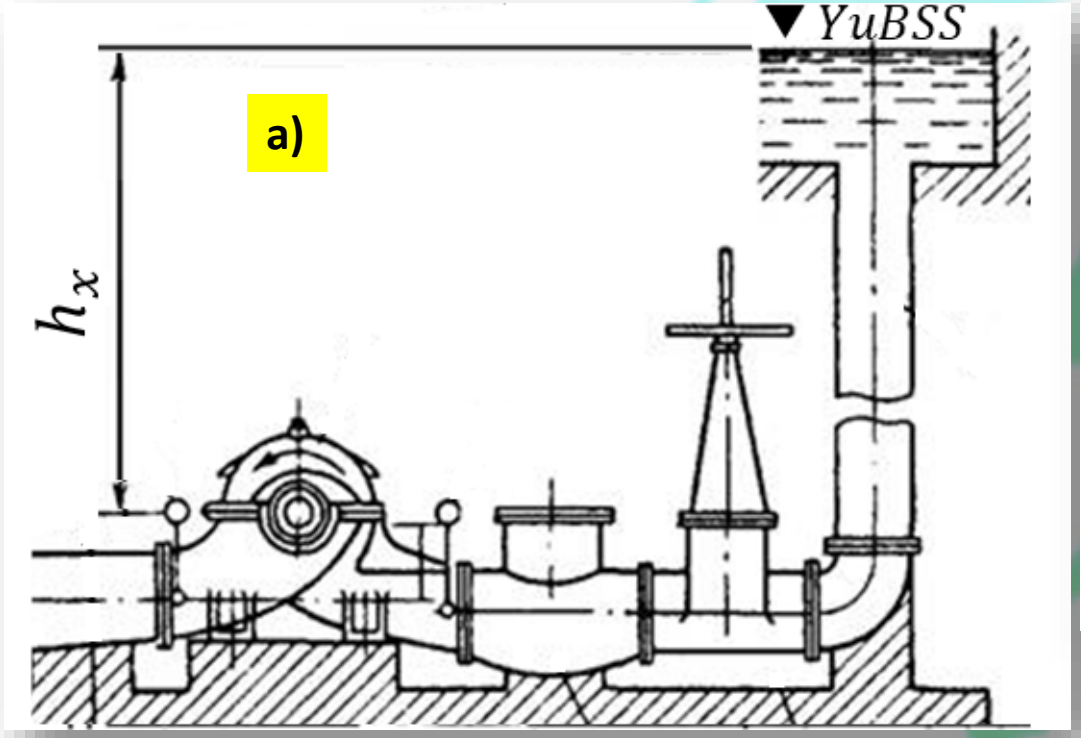
$$H_{vak} \leq H_{vak}^{m.b} \quad (11)$$

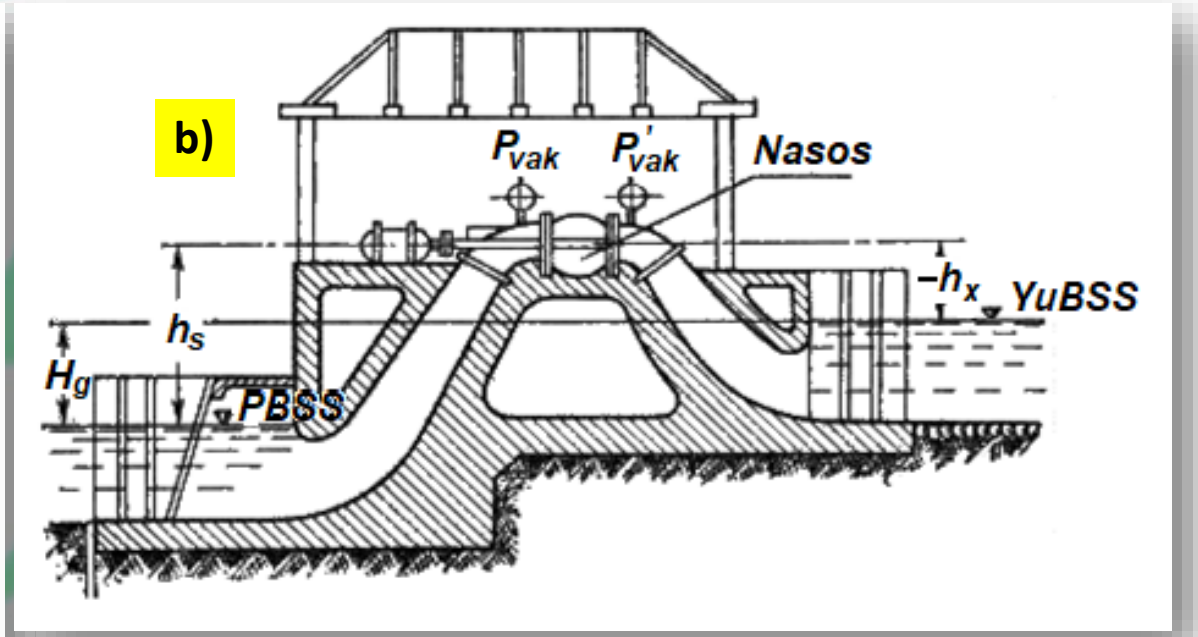
Nasosning haydash balandligi

Keltirilgan xaydash balandligi

$$h_x = \blacktriangledown YuBSS - \blacktriangledown ig' \quad (6)$$

$$H_{k.x} = h_x + \Delta h_n \quad (7)$$





4-rasm. Nasoslarning haydash balandligi.

a-musbat; b-manfiy

Nasosning umumiy suv ko‘tarish balandligi

$$H_g = h_{g.s} + h_{g.x} \quad (8)$$

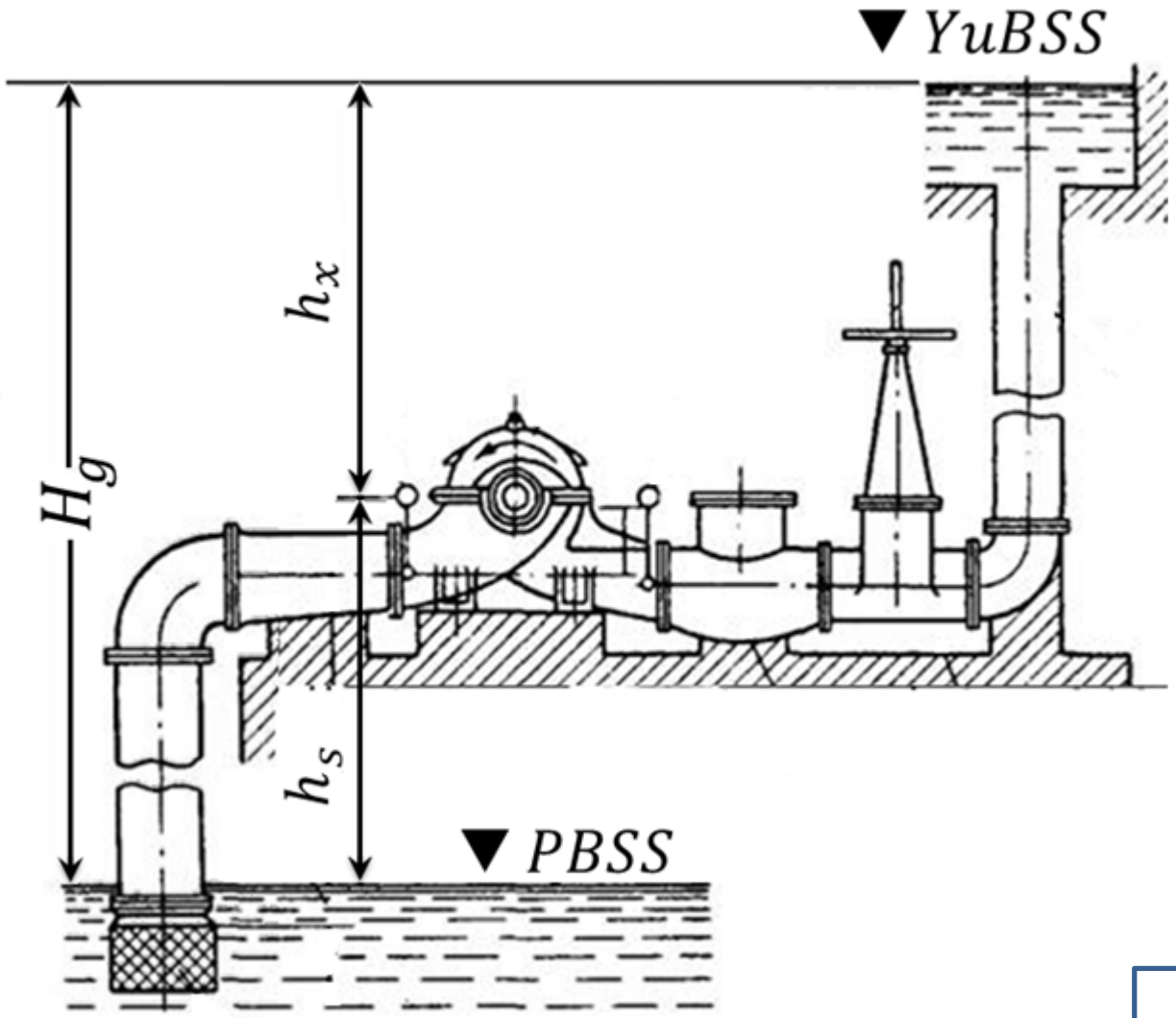
yoki

$$H_g = \blacktriangledown YuBSS - \blacktriangledown PBSS \quad (9)$$

$$H = H_{k.s} + H_{k.x} \quad (10)$$

yoki

$$H = H_g + \Delta h \quad (11)$$



Nasoslarning tamg‘alanishi

Nasoslarning turlari, kirish patrubkalarining o‘lchamlari, bosimi, suv sarfi va boshqa ko‘rsatkichlarini qisqacha belgilash, nasoslarni tamg‘alash – shartli qisqacha nomlashdir

Nasoslarning tamg‘alanishi

Konsol nasoslar

1973 y.	1982 y.	1990 y.
1,5K-6	K8/18	K50-32-125
2K-6	K20-30	K65-50-160
3K-9	K45/30	K80-65-160
3K-6	K45/55	K80-50-200
4K-12	K90/35	K100-80-160
4K-8	K90/55	K100-65-200
4K-6	K90/85	K100-65-250
6K-12	K160/20	K150-125-250
6K-8	K160/30	K150-125-315
8K-12	K290/30	K200-150-315

1973 yil. **2K-6**

- kirish patrubkasining 25 marta kamaytirilgan diametri, mm
- konsol
- 10 marta kamaytirilgan tez yurish koэffitsienti

1982 yil. **K90/35**

- konsol
- sarf, m3/soat
- napor, m

1990 yil. **K100-80-160**

- konsol
- kirish patrubkasi diametri, mm
- chiqish patrubkasi diametri, mm
- Ishchi g‘ildirak nominal diametri, mm

Nasoslarning tamg‘alanishi

Monoblokli konsol nasoslar

1973 y.	1982 y.	1990 y.
1,5KM-6	KM8/18	1KM50-32-125
2KM-6	KM20-30	1KM65-50-160
3KM-9	KM45/30	1KM80-65-160
3KM-6	KM45/55	1KM80-50-200
4KM-12	KM90/35	1KM100-80-160a(б,в)
4KM-8	KM90/55	KM100-65-200
4KM-6	KM90/85	KM100-65-250
6KM-12	KM160/20	KM150-125-250
6KM-8	KM160/30	KM150-125-315

1973 yil **2KM-6**

- kirish patrubkasining 25 marta kamaytirilgan diametri, mm
- monoblok-konsol
- 10 marta kamaytirilgan tez yurish koэffitsienti

1982 yil **KM90/35**

- monoblok-konsol
- sarf, m3/soat
- napor, m

1990 yil **1 KM100-80-160a(б,в)**

- modernizatsiya
- monoblok-konsol
- kirish patrubkasi diametri, mm
- chiqish patrubkasi diametri, mm
- Ishchi g‘ildirak nominal diametri, mm
- Ishchi g‘ildirak yo‘nilganligi haqida belgi

Nasoslarning tamg‘alanishi

Suyuqlik ikki tomonlama kiruvchi (двухсторонный) nasoslar

1973 yil	1982 yil	1990 yil
4НДв	Д200-36	Д200-36
5НДв	Д200-95	1Д200-90
6НДс	Д320-50	1Д315-50
6НДв	Д320-70	1Д315-71
10Д-6	Д500-65	1Д500-63
8НДв	Д630-90	1Д630-90
12Д-9	Д800-57	1Д800-56
12НДс	Д1250-65	1Д1250-63
14Д-6	Д1250-125	1Д1250-125а(б,в)
14НДс	Д1600-90	1Д1600-90

1973 yil. **4НДВ**

kirish patrubkasining 25 marta kamaytirilgan diametri, mm

nasos

двухсторонный

Yuqori naporli (высоконаорный)

1990 yil **1 D 1250-125а(б,в)**

modernizatsiya

ikki tomonlama kiruvchi

sarf, m3/soat

napor, m

Ishchi g‘ildirak yo‘nilganligi haqida belgi

Nasoslarning tamg‘alanishi

О 5 – 55	О – (осевой) –o’qiy; 5 – ish g’ildiragi namunasining tartib soni; 55 – ish g’ildiragining dimetri, *sm*
ОГ 6 – 25	О – (осевой) – o’qiy; Г – gorizontal xolatda o’rnatiladigan; 6 – ish g’ildiragi namunasining tartib soni; 25 – ish g’ildiragining diametri, *sm*
ОПВ2–145	ОПВ – (осевой с поворотными лопастями) – parrаklari buriladigan o’qiy nasos; 2 – Ish g’ildiragi namunasining tartib soni; 145 – ish g’ildiragi diametri, *sm*

Nasoslarning tamg‘alanishi

А50ГО–0,5/10	**А –agregat;** **50 – ish g’ildiragi diametri, *sm*;** **ГО – (горизонтально-осевой) gorizontal-o’qiy;** **0,5 – nasosning suv sarfi, m^3/s;** **10 – nasosning bosimi, *m***
ЭЦВ12-255-30	**Э – elektronasos;** **Ц – (центробежный) markazdan qochma;** **В – (водяной) suvga mo’ljallangan;** **12 – quduqning 25 marta kichraytirilgan diametri *(mm);*** **255 – nasosning suv sarfi, $m^3/soat$;** **30 – nasosning bosimi, *m***

Nasoslarning tamg‘alanishi

А40ГЦ–0,55/21	А – agregat; 40 –ish g’ildiragi diametri, sm; ГЦ – (горизонтально-центробежный) gorizontal-markazdan qochma; 0,55 – nasosning suv sarfi, m3/s; 21 – nasosning bosimi, m.
СНП500/10	С – stansiya; Н – nasos; П – (передвижной) ko’chma; 500 – nasosning suv sarfi, l/s; 10 – nasosning bosimi, m

Nasoslarning tamg‘alanishi

ЦНС 38-110	Ц – (центробежный) markazdan qochma; Н – nasos; С – seкsiyali; 38 – nasosning suv sarfi, m3/soat; 110 – nasosning bosimi, m
ЦТВ10-100-80	Ц – (центробежный) markazdan qochma; Т –transmission valli; В – (водяной) suvga mo’ljallangan; 10 – quduqning 25 marta кichraytirilgan diametri, mm; 100 – nasosning suv sarfi, m3/soat; 80 – nasosning bosimi, m
АТН8-1-22	А – artezianli; Т– transmission valli; Н – nasos; 8 – quduqning 25 marta кichraytirilgan diametri, mm; 1 –ish g’il-diragining turi (yopiq turdagi); 22 –ish g’ildiraкlari soni

Adabiyotlar:

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