




TYPE

CLOSE COUPLED PUMPS**CCS/CGS/CKS**

**photo
coming
soon**

Flows to 300 gpm, Heads to 260 feet, 1/4 thru 30 hp, 3450 & 1750 rpm, 1" thru 2" discharge, with 2' npsh suction inducer.

HIGHLIGHTS

-  2 ft. npsh pumps
-  Pumping Fluids Close to Boiling Point
-  Axial Flow Suction Inducer Impeller

NET POSITIVE SUCTION HEAD (NPSH)

Npsh is the force which causes a liquid to flow into the suction eye of a centrifugal pump impeller.

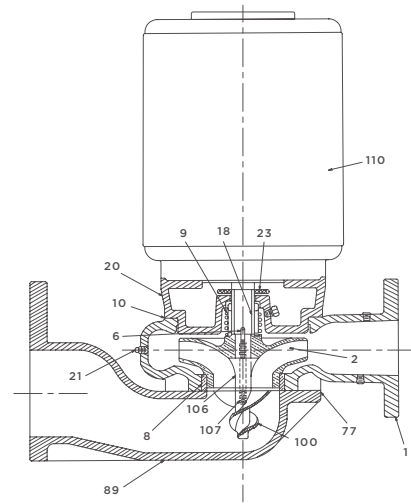
There are two npsh values which must be considered. First is the **npsh required** by the pump, which is a function of the pump design. Second is the **npsh available** to the pump, which is a function of the system design.

The **npsh available** must be greater than or equal to the **npsh required**, or cavitation (bubble formation) may occur in the impeller eye, causing the pump to malfunction.

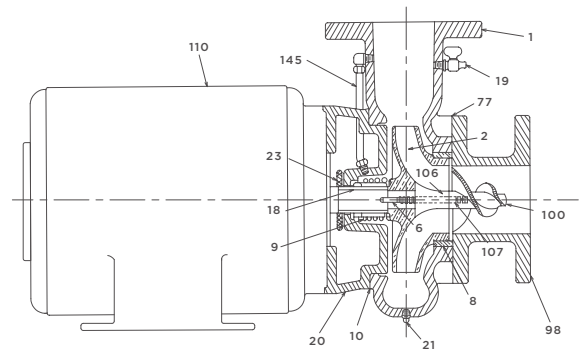
The **npsh required** is read from pump performance curve. The **npsh available** is the static head (height of the suction source above the pump centerline) plus the temperature head available from the water (see table below).

WATER TEMPERATURE IN FARENHEIGHT	TEMP. HEAD AVAILABLE IN FEET (SEA LEVEL)	WATER TEMPERATURE IN FARENHEIGHT	TEMP. HEAD AVAILABLE IN FEET (SEA LEVEL)
50	34	160	23
60	33	170	20
70	33	180	17
80	33	190	12
90	32	200	7
100	32	210	1
110	31	212*	0
120	30	220	-6
130	29	230	-14
140	27	240	-24
150	25	250	-35

*Boiling point of water under atmospheric pressure at sea level.



Vertical Close-Coupled Flange Mounted



Horizontal Close-Coupled Base Mounted

2-FT. NPSH PUMPS

There are many applications where the water to be pumped is close to its boiling point (212 degrees F) and where it is not practical to raise the suction source sufficiently high above the pump center-line.

For such applications, Federal has developed its **2-ft. npsh pumps**. These pumps have a centrifugal main impeller plus an axial flow suction inducer impeller, so that they are capable of operating with 2-ft. of NPSH available to the pump.

These are available in the following types:

CCS, CGS and CKS -horizontal close-coupled for base mounting.

CCSF, CGSF and CKSF -vertical close-coupled for flange mounting on the side of the tank.

CCSB, CGSB, CKSB -horizontal flexible coupled for base mounting.

These **2-ft. npsh pumps** can be substituted for the standard pumps, if preferred, on CCV and CCH condensation return units and BFV and BFC boiler feed units.

MODEL DESIGNATIONS

CCS, CGS, CKS = Horizontal Close-Coupled base mounted

CCSF, CGSF, CKSF = Vertical Close-Coupled flange mounted

CCSB, CGSB, CKSB = Horizontal Flexible coupled Base Mounted

CC = Pumps with small diameter impellers

CG = Pumps with medium diameter impellers

CK = Pumps with large diameter impellers

S = Pumps with suction inducer

F = Flange mounted pumps

B = Bearing bracket mounted pumps (flexible coupled)

Parts List

NO.	NAME	REQD.	MATERIAL
1	CASING	1	CAST IRON
2	IMPELLER	1	BRONZE
3	IMPELLER LOCK SCREW	1*	STEEL
4	IMPELLER WASHER	1*	ST. ST.
6	IMPELLER KEY	1*	STEEL
8	CASING WEARING RING (A)	1*	BRONZE
9	MECHANICAL SHAFT SEAL	1*	VARIOUS
10	CASING GASKET	1*	VELUMOID
18	SHAFT SLEEVE	1*	BRONZE
19	VENT COCK	1	BRASS
20	PUMP BRACKET	1	CAST IRON
21	PLUG	1	STEEL
22	CAP SCREW (B)	-	STEEL
23	FLINGER	1*	RUBBER
77	SUCTION GASKET	1	RUBBER
89	SUCTION BRACKET	1	CAST IRON
98	INDUCER HOUSING	1	CAST IRON
100	SUCTION INDUCER ©	1	BRONZE
106	INDUCER SLEEVE	1	BRONZE
107	INDUCER ROD	1	ST. ST.
110	MOTOR	1	VARIOUS

(A) Optional.

(B) Not shown.

(C) Inducer shown applies to CGS and CKS models.

Inducer for CCS models is of slightly different construction.



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