

Centrifugal Pump Piping Connections

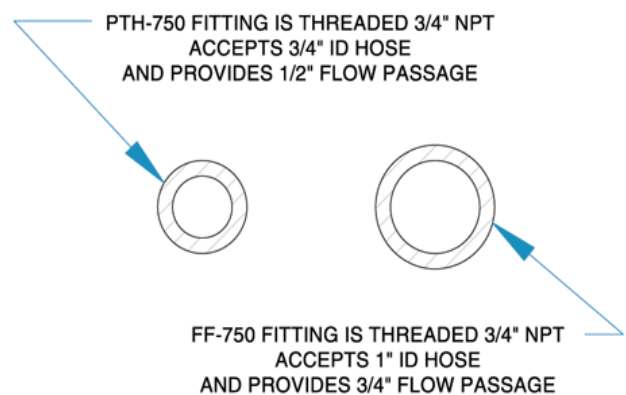
One of the most common problems that we see with the installation of both chillwater and seawater pumps is the restriction of water flow due to the use of incorrectly sized components. This reduction of flow in and out of the pump reduces the capacity of the system and prevents it from performing up to specifications. Chillers freezing up due to low chillwater flow or chillers tripping on head pressure faults because of low seawater flow are all symptoms of this problem.



Standard
Fitting

One of the biggest problems in many systems is the standard male pipe x hose barb adapter (shown at left). They are restrictive because the hose barb size is the same as the male pipe connection. For example, on a 2" fitting, the male pipe size is 2" and the hose barb is designed to slip *inside* of a 2" ID hose. While the male pipe size and hose size are correct, the hose barb section of the fitting is restrictive. To allow for a 2" OD size on the hose barb the actual ID size of the hose barb is somewhat closer to 1-5/8", a 19% decrease in cross sectional area.

If you want to use male pipe x hose barb fittings you need to use one that is either 1) a "full flow" design or 2) an oversized fitting. There is only one company that I am aware of that makes a "full flow" design and that company is Groco Marine Products (www.groco.net, phone 410-712-4242). They offer these fittings in sizes from 1/2" to 3". A comparison between a standard flow fitting and a full flow fitting is shown to the right.



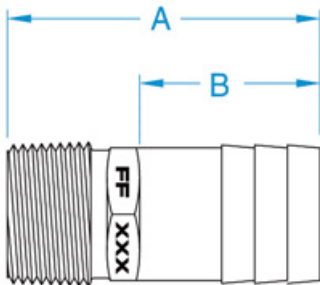


Standard Hose Barb



Full Flow Hose Barb

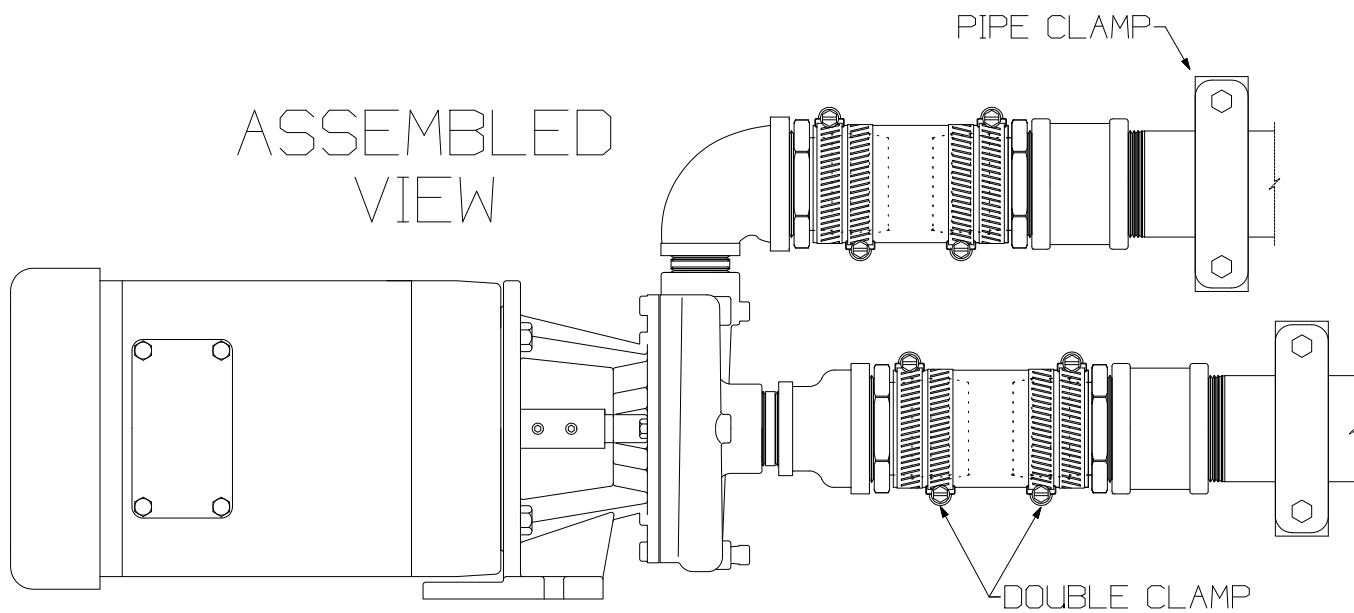
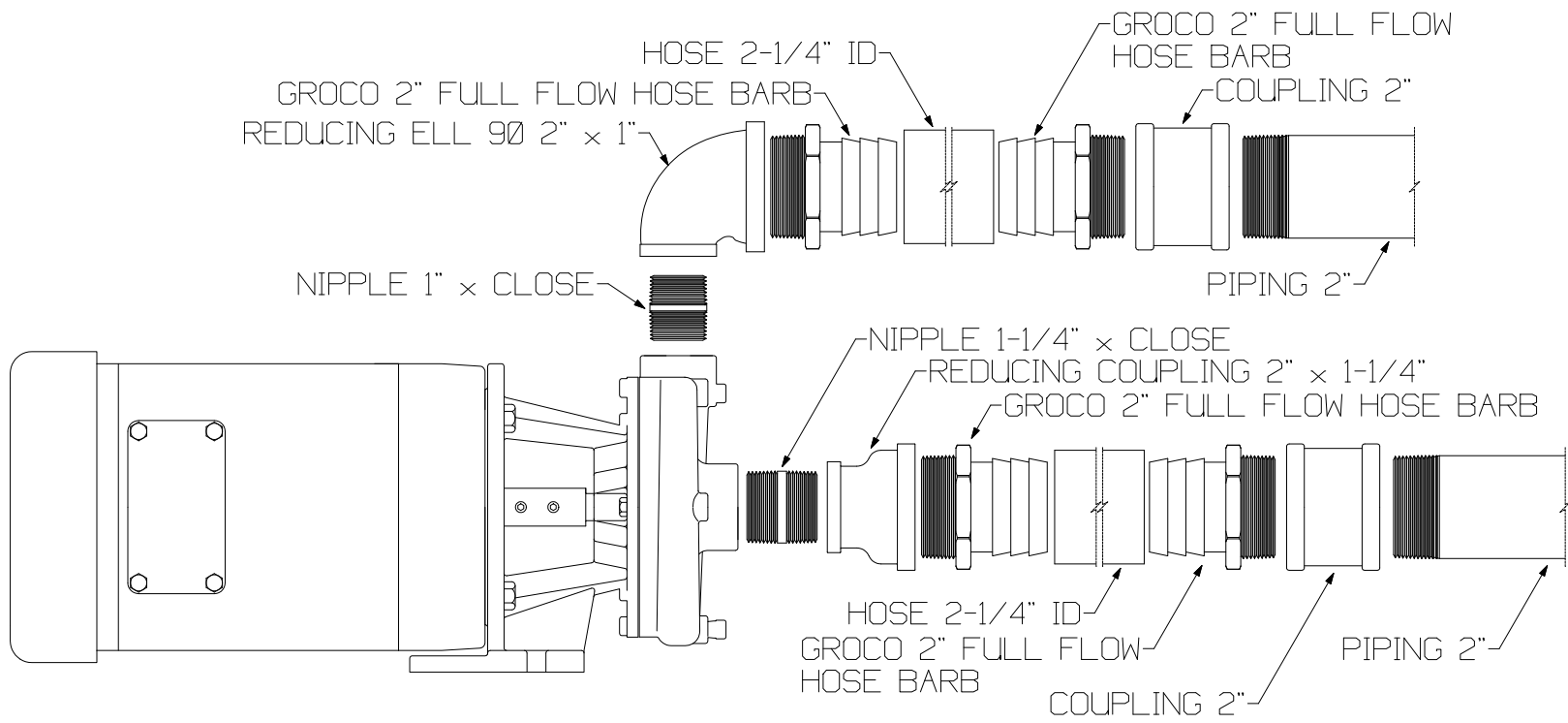
As you can see from the pictures above the difference in open internal area is considerable. The hose size will be larger for each size, i.e. a 2-1/4" hose for a 2" fitting but at least you will not restrict the flow to and from the pump. Dimensions for the full flow hose barbs are shown below.



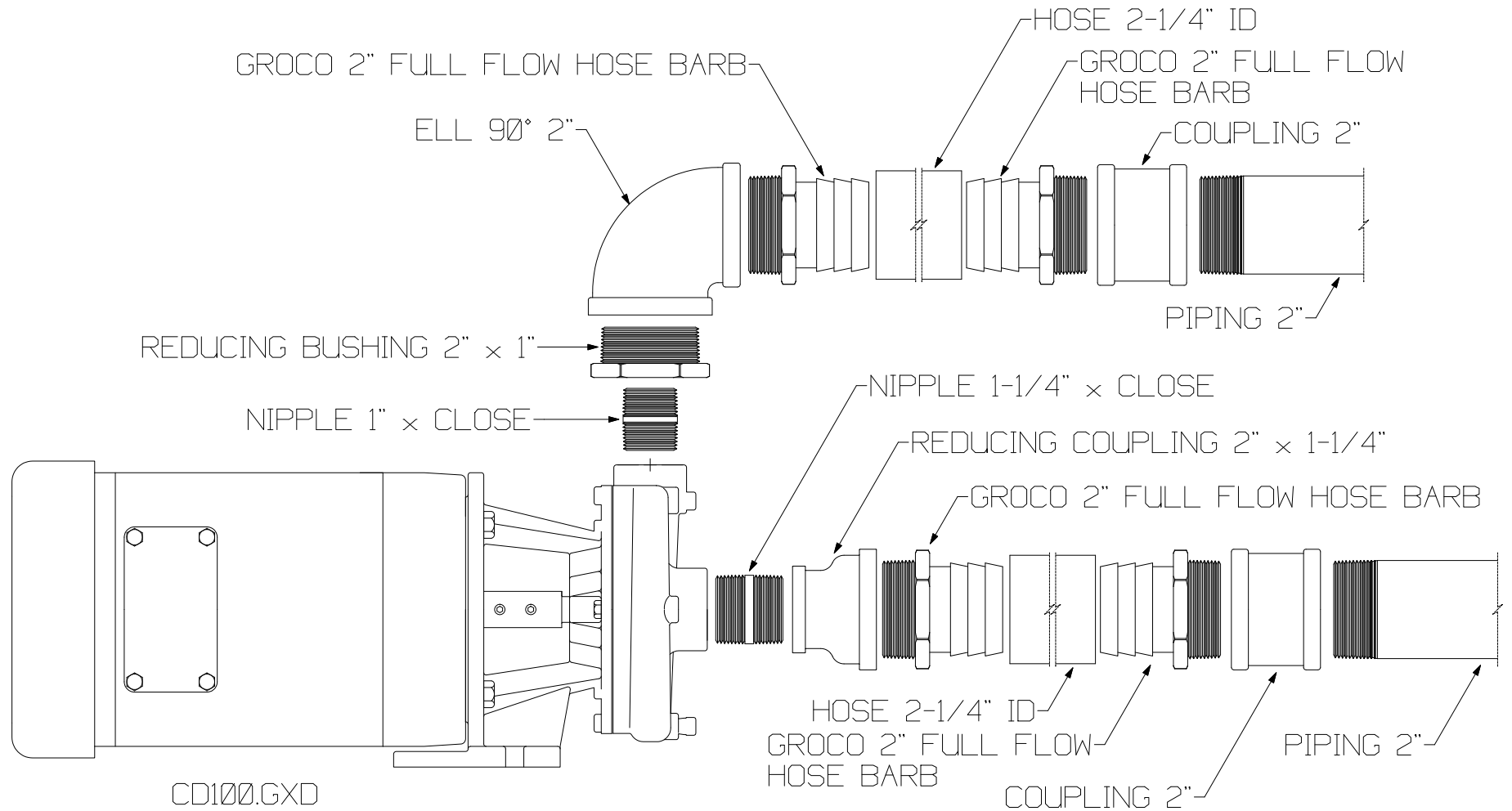
MODEL NO.	NPT PIPE	HOSE ID	DIMENSIONS IN INCHES		WEIGHT (LBS.)	PKG
			A	B		
FF-500	1/2"	3/4"	2.28	1.38	.20	10
FF-750	3/4"	1"	2.39	1.38	.25	10
FF-1000	1"	1-1/4"	2.48	1.38	.32	10
FF-1125	1"	1-1/8"	2.48	1.38	.34	10
FF-1250	1-1/4"	1-1/2"	2.65	1.55	.64	10
FF-1500	1-1/2"	1-3/4"	3.00	1.90	.70	10
FF-2000	2"	2-1/4"	2.89	1.75	.96	10
FF-2500	2-1/2"	2-3/4"	3.47	2.00	1.45	1
FF-3000	3"	3-1/2"	3.61	2.00	2.60	1

If you are unable to use the full flow hose barbs the only other solution is to increase the size of the fittings by one size. If the piping schematic requires a 2" line size, use a 2-1/2" fitting. This will prevent any restrictions to flow.

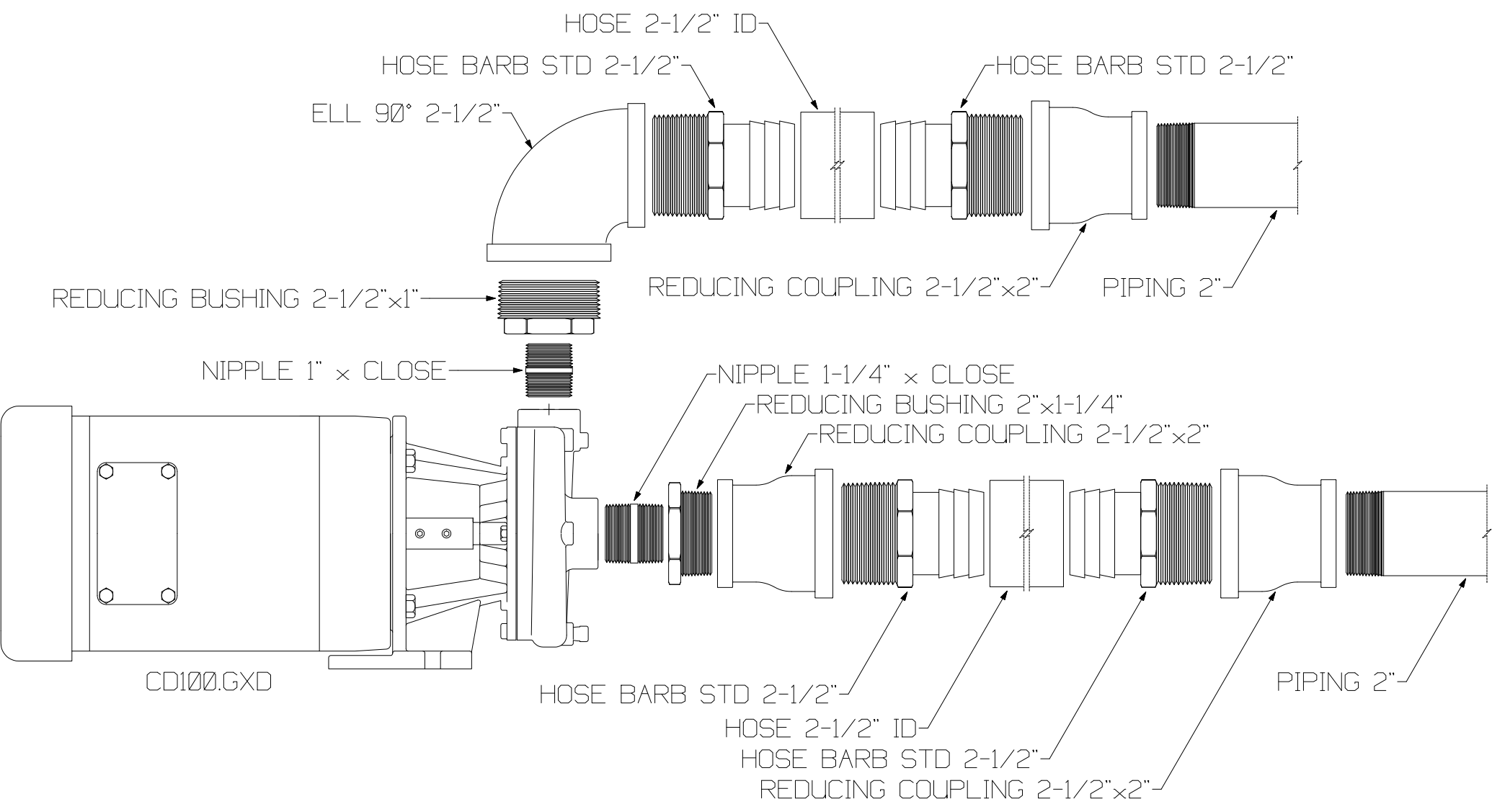
On the following pages are drawings showing the correct piping connections to a CD100 series pump using full flow hose barbs and standard hose barbs.. Please notice the *immediate* transition from the pump suction and discharge fitting sizes to the piping size that is required by the main piping network. In all of the following examples the piping network is 2" nominal (ID or Inside Dimension).



CD100 SERIES PUMP INSTALLED IN A 2" PIPING NETWORK USING GROCO FULL FLOW MALE ADAPTER HOSE BARB FITTINGS OPTION 1 USING A REDUCING ELL ON DISCHARGE OF PUMP



CD100 SERIES PUMP INSTALLED IN A 2" PIPING NETWORK USING GROCO FULL FLOW MALE ADAPTER HOSE BARB FITTINGS
 OPTION 1
 USING A REDUCING BUSHING AND STANDARD ELL ON THE DISCHARGE OF THE PUMP



CD100 SERIES PUMP INSTALLED IN A 2" PIPING NETWORK
 USING STANDARD MALE ADAPTER HOSE BARB FITTINGS
 OPTION 2