Industrial Systems, Inc.

May 13, 2003

SUBMITTAL

PROJECT: Henry A. Guerra Jr., Branch Public Library
7900 Block of Military Drive West

ENGINEER: Lizcano Consulting Engineers, Inc.

MECH. CONT.: Dynamic Air Service Co.
spm878rp

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IN-LINE PUMPS

Page: 15188, Para: 2.02

PACO Pump vertical closed coupled in-line Centrifugal circulating pump. The circulating pump shall have a cast iron housing, bronze impeller, sleeve, and fittings, corrosion-resistant stainless steel shaft, mechanical shaft seals with seal flush connections, and shall be statically and dynamically balanced. Pumps shall be suitable for 175 psi working pressure, 225° F maximum continuous operating temperature. Pump motors shall be 1750 RPM, EPACT efficiency, ODP motors.

HWP

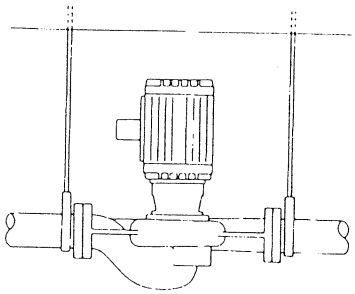
PACO Pump Model 16-2095-1, capable of 33 GPM @ 78' TDH, 1750 RPM, 3 hp, 460/3/60, ODP motor, size 2" x 2".

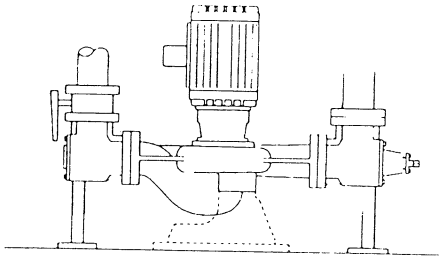
PACO® PUMPS

VERTICAL IN-LINE Centrifugal Pumps

A3-1a.05
7/99
Supercedes 10/89

TYPE VL VERTICAL IN-LINE PUMPS





Submittal Data

Job HENRY A. GUERRA PUBLIC LIBRARY
Engineer LIZCANO CONSULTING ENGINEERS
Contractor DYNAMIC AIR SERVICE CO.
Order No. _____ Date _____
Submitted By _____ Date _____
Approved By _____ Date _____

Operating Data

Pump Symbol HWP
Service Hot WATER
PACO Model No. 2095-1 Pump Size 2"X2"
Duty 33 GPM 78' TDH
Pump Eff. 30 IMP. Diameter 8.67
Suction Head: Maximum _____ Ft.,
Minimum _____ Ft.
Motor: 3 HP 1750 RPM 3 Phase
60 Hertz 460 ~~Vol~~ 208 ODP Enc. _____ Eff.

PACO Type VL Vertical In-Line Pumps are available in sizes through 10" discharge, capacities to 3600 GPM, heads to 400 feet and a wide selection of metallurgical and mechanical options to meet specific pumping requirements.

Suction and Discharge connections are the same size to simplify piping. The type VL design incorporates a short shaft with minimum overhang reducing shaft deflection. Back pull out design allows rotating assembly to be removed without disturbing the volute or piping for ease of maintenance and service 3" discharge and larger PACO In-Line Pumps feature an exclusive double volute design to reduce radial thrust and prolong bearing life.

PACO type VL Vertical In-Line Pumps eliminate costly installation steps. They require 1/3 the space of a conventional pump installation and drastically reduce the cost of layout foundation and piping. The versatility of the pump design allows for installation in-the-line like a valve (no floor space required) or floor mounted with optional cast iron stand or flange supports.

PACO type VL Vertical In-Line Pumps emphasize standardization of parts and maximum interchangeability permitting the customer a minimum of stock parts and flexibility for future modifications.

CONSTRUCTION SPECIFICATIONS

PART	STANDARD FITTED	BRONZE FITTED	OTHER
Volute	Gray Iron	Gray Iron	
Impeller	Gray Iron	Bronze	
Wear Ring	Bronze	Bronze	
Back Plate	Gray Iron	Gray Iron	
Motor Shaft 5/8"	Stainless 416	Stainless 416	
Motor Shaft 1-1/4" & Larger	Steel	Steel	
Shaft Sleeve 1-1/4" & Larger	Bronze	Bronze	
Mechanical Seal*			
Standard Single	1	1	
Double Mechanical Standard	1	1	
Ni-Resist-Viton	6	6	
Tungsten Carbide	2	2	
Teflon Type 9	9	9	

***MECHANICAL SEAL PARTS**

REF. NO.	STAT. SEAT	WASHER	ELAS-TOMER	METAL PARTS	SPRING
1	Ceramic	Carbon	Buna	St. Steel	St. Steel
2	Tung. Carbide	Carbon	Viton®	St. Steel	St. Steel
5	Ceramic	Carbon	Teflon	Plated Steel	St. Steel
6	Ni-Resist	Carbon	Viton®	St. Steel	St. Steel
7	Ni-Resist	Carbon	Buna	St. Steel	St. Steel

METALS LEGEND

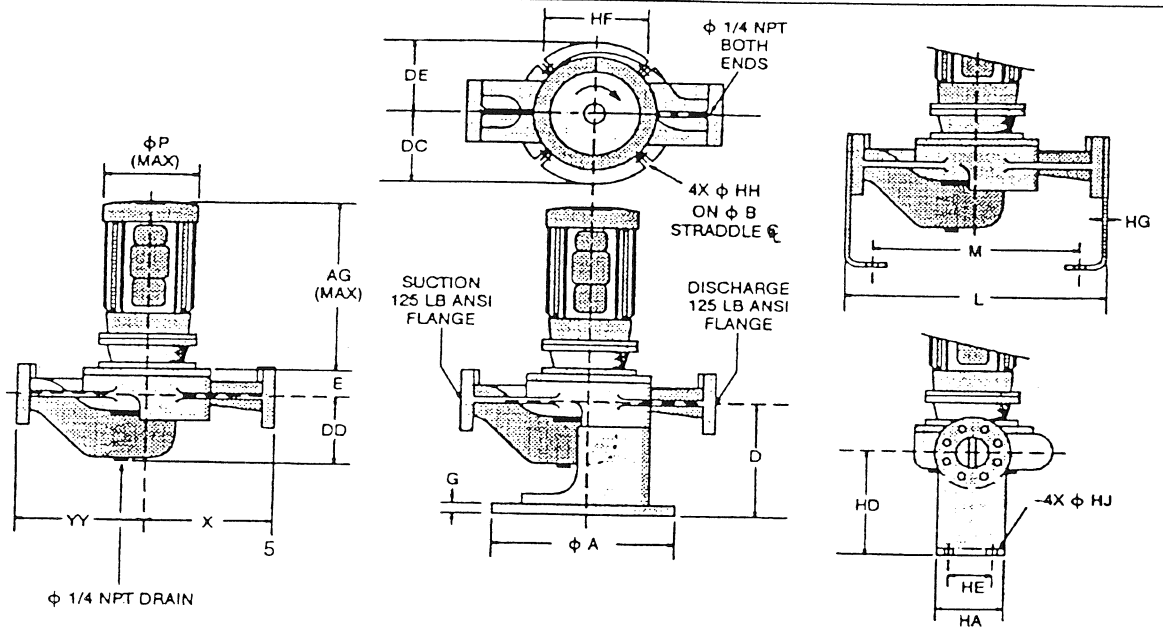
Gray Iron – ASTM A48 C1.30
Bronze – 1836, C89833
Bronze 660 – SAE 660
Stainless 416 – AISI 416
Stainless 303 – AISI 303

CASE WORKING PRESSURE	
	Standard 175 PSI

PACO®
PUMPS

A3-1c.1
DIMENSIONS
IN-LINE CENTRIFUGAL PUMPS
TYPE VL

IN-LINE WITH SUPPORT STAND & WITH FLANGE SUPPORTS — MODELS 1270-7 THRU 2570-7



PUMP DIMENSIONS

Pump Model	Suct. Disch.	A	B	D	E	G	L	M	DC (1)	DD (1)	DE (1)
1270-7	1-1/4	12	11	8	1-5/8	3/4	14-1/2	11-1/2	4-3/8	4-1/8	4-5/8
1570-9	1-1/2	12	11	8	1-1/2		14-1/2	11-1/2	4-5/8	4-3/8	5-1/8
2070-5	2	12	11	7-7/8	1-5/8		16-3/4	13-3/4	4-3/4	5-1/2	5-1/4
2095-1,-5,-9	2	16	13-1/2	8-5/8	1-5/8		18-3/4	15-3/4	6	4-7/8	5-3/8
2570-7	2-1/2	12	11	7-7/8	1-5/8		17-3/4	13-3/4	4-3/4	6	5-5/8

(cont.)

Pump Model	HA	HD	HE	HF	HG	HH (2)	HJ	X	YY
1270-7	4-1/2	6	3	7-13/16	1/4	3/4	5/8	.7	7
1570-9	4-1/2	6	3	7-13/16	1/4		5/8	.7	7
2070-5	5-1/2	6-1/2	4	7-13/16	3/8		3/4	8	8
2095-1,-5,-9	5-1/2	6-1/2	4	9-9/16	3/8		3/4	9	9
2570-7	6	8	4	7-13/16	3/8		3/4	8-1/2	8-1/2

MOTOR DIMENSIONS
THREE PHASE MOTORS

	X0 CONST.	X3 CONST.				X4/XA CONST.		
	56J	143TC/ 145JM	182TC/ 184JM	213TC/ 215JM	254 TC/JM	213TC/ 215JM	254TC/ 256JM	284TC/ 286JM
P(max)	8	8	10	12	14	12	14	15
AG(max) (3)	18	18	20	22	24	22	24	26

SINGLE PHASE MOTORS

	X0 CONST.	X3 CONST.					
	56J	143JM	145JM	182JM	184JM	213JM	215JM
P(max)	8	8	8	10	10	12	12
AG(max)	18	15	15	17	17	22	22

(1) Dimensions of cast surfaces vary ± 1/4.
(2) 'HH' Dimension is slot.
(3) If head space requirement is critical, contact Factory.

In the interest of Product Improvement, dimensions are subject to change without notice.
ALL DIMENSIONS ARE IN INCHES.

Customer_____ P.O. No._____ Job No._____

Project_____ Item No._____ Certified By_____ Date_____

HP_____, RPM_____, HZ_____, V_____, ENCL_____, FR_____, Total Wgt._____

INDUSTRIAL SYSTEMS INC.
MORGAN HARPER

PACO Select ver: 6.042
05/12/03

PUMP DATA SHEET

PACO Pump Company

Selection file: (untitled)

Catalog: WTR_PMP.MPC v 5.51

Curve: RC-2521

Design Point: Flow: 33 US gpm
Head: 78 ft

Pump: **VERT_IN_LINE - 1800** **Size: 2095-1**
Speed: 1750 rpm Dia: 8.67 in

Limits: Temperature: 210 °F Sphere size: --- in
Pressure: 175 psi_g Power: --- bhp

Specific Speed: Ns: --- Nss: ---

Dimensions: Suction: 2 in Discharge: 2 in

Motor: 3 hp Speed: 1800 Frame: 182T
NEMA Standard TEFC Enclosure
sized for Max Power on Design Curve

Fluid: Water Temperature: 60 °F
SG: 1
Viscosity: 1.122 cP
Vapor pressure: 0.2568 psi_a
Atm pressure: 14.7 psi_a

NPSHa: --- ft

Piping: System: ---
Suction: --- in
Discharge: --- in

---- Data Point ----

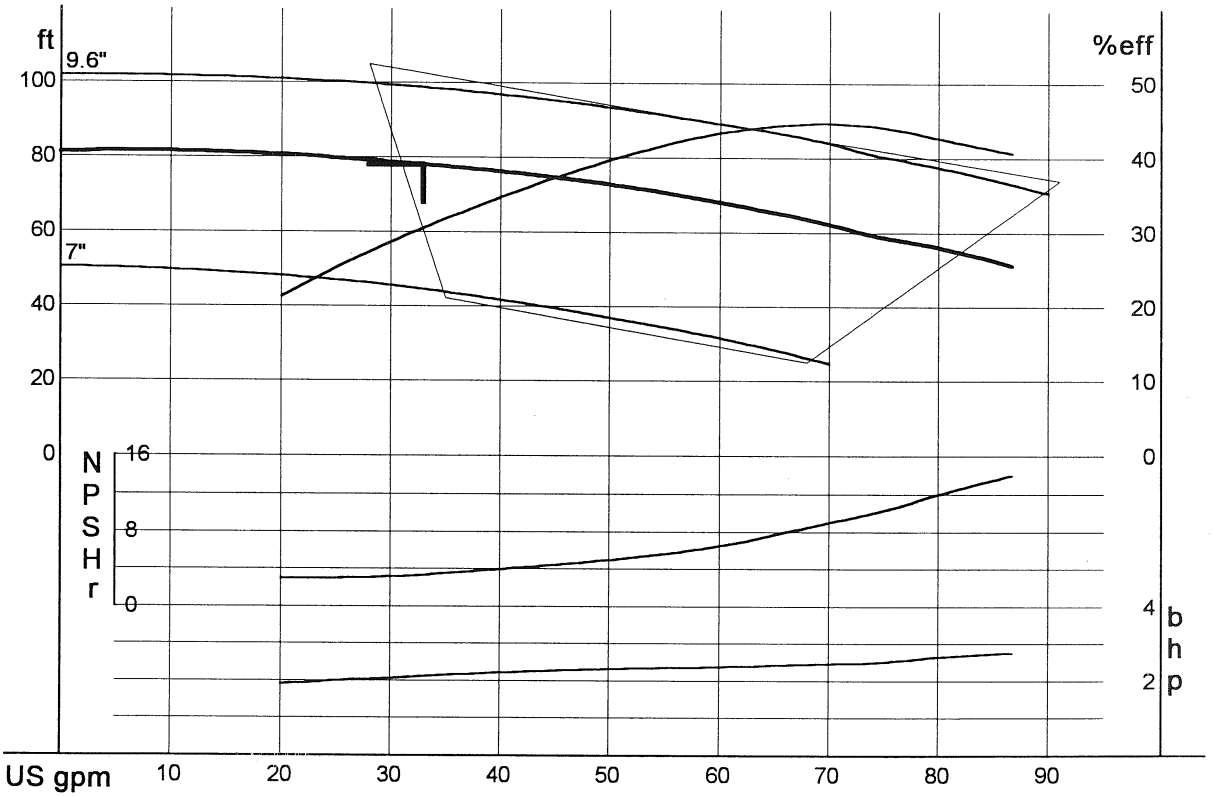
Flow: 33 US gpm
Head: 78 ft
Eff: 30%
Power: 2.12 bhp
NPSHr: 3.44 ft

-- Design Curve --

Shutoff Head: 81.3 ft
Shutoff dP: 35.2 psi
Min Flow: - US gpm
BEP: 45% eff
@ 69.7 US gpm
NOL Pwr: 2.76 bhp
@ 86.7 US gpm

-- Max Curve --

Max Pwr: 3.57 bhp
@ 90 US gpm



--- PERFORMANCE EVALUATION ---

Flow US gpm	Speed rpm	Head ft	Pump %eff	Power bhp	NPSHr ft	Motor %eff	Motor kW	Hrs/yr	Cost /kWh
39.6	1750	76.4	34	2.22	3.97				
33	1750	78	30	2.12	3.44				
26.4	1750	79.4	26	2.02	3.13				
19.8	Flow Rate is Out of Range for this Pump								
13.2	Flow Rate is Out of Range for this Pump								