

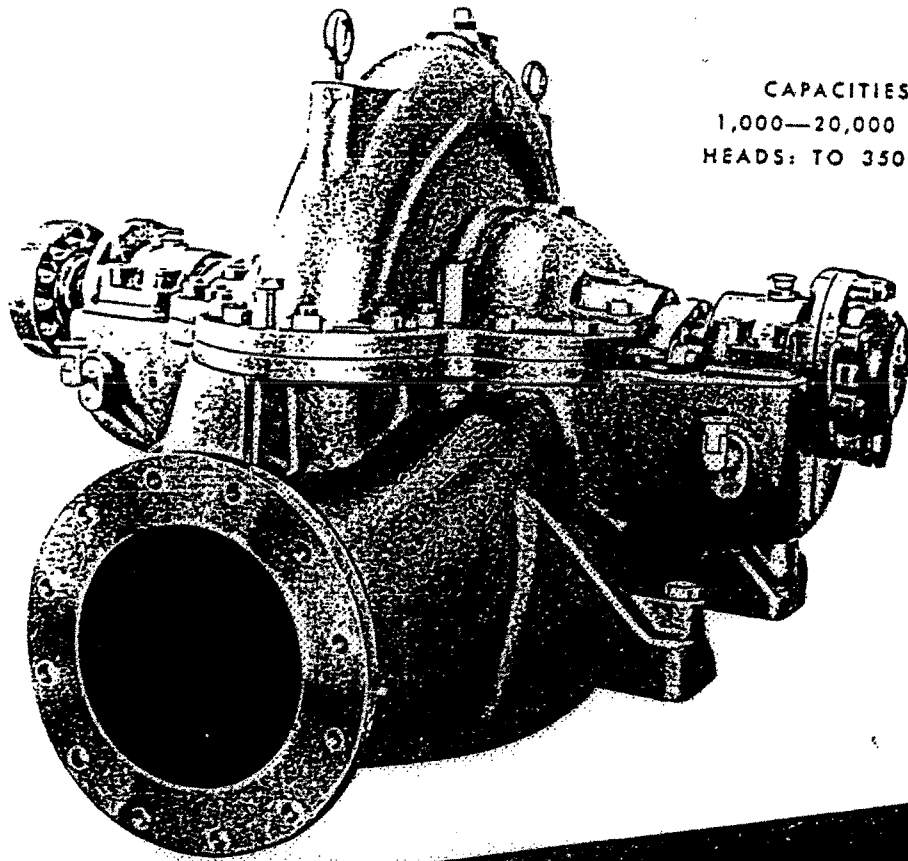
# **Appendix B**

## **MacLean Pump Construction Data**

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BULLETIN 1004

**DE LAVAL**  
SINGLE STAGE DOUBLE SUCTION  
**Types L, M and P**  
CENTRIFUGAL PUMPS



CAPACITIES:  
1,000—20,000 GPM  
HEADS: TO 350 FEET

DE LAVAL STEAM TURBINE COMPANY • TRENTON 2, NEW JERSEY

PUMP SIZE AND TYPE

De Laval 18/16" Horizontal, Single Stage Split Casing, Bottom Suction, Side Discharge Double Volute Centrifugal Pump with Fabricated Steel Bedplate for Pump and Driver.

MATERIALS

PUMP CASING	Cast Iron ASTM A48 Class 30
IMPELLER	Bronze ASTM B143 Class 1A
IMPELLER RINGS	Bronze ASTM B147-49-(8A)
CASE RINGS	Bronze ASTM B143 Class 1A
SHAFT	Open Hearth Machinery Steel ASTM A107 Grade 1045 or ASTM A306 Grade 75
SHAFT SLEEVES	Chrome Plated Bronze
BEARINGS	Steel Shell Babbitt Lined

DIMENSIONS

1. Bearings Couplings	3-1/2 x 5" 700 HP, 1180 RPM
2. Wearing Rings	Double Labyrinth Type
3. Stuffing Boxes 6 - Rings	4" I.D. 5-1/2" O.D. 3/4" square packing
4. Shaft Diameter at Impeller	4"
5. Bearing Load	23 lbs. per square inch projected area
6. Shaft Size at Bearing Bearing Center Distance	3-1/2" 48-1/2"
7. Weight Shaft and Impeller Assembly	800 lbs.
Weight - Complete Pump	7,000 lbs.

# DE LAVAL SINGLE STAGE DOUBLE SUCTION CENTRIFUGAL PUMPS

## TYPES

### L, M and P

*offer sustained efficiencies over long years of service*

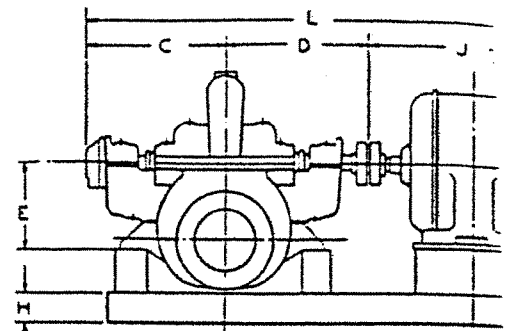
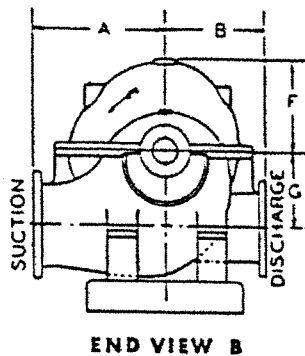
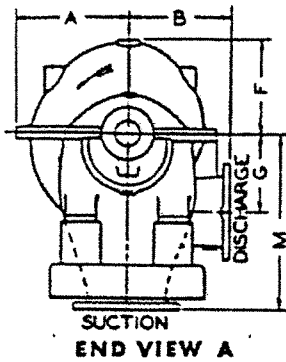
De Laval Types L, M and P horizontally split case centrifugal pumps are built to stay on the job. Their high efficiencies are a result of more than a half century of experience in pump manufacture and continuous research. Initial efficiencies are maintained over long periods of operation with a minimum of maintenance by De Laval's widely accepted double-labyrinth casing and impeller wearing rings. Other features described in the chart at the right also contribute to long dependable life.

De Laval L, M and P pumps are rugged in construction. They are easily disassembled. All parts can be inspected without disturbing the suction and discharge pipe connections. The materials used are selected to resist corrosion and wear. Renewal parts can be quickly installed because all parts are produced to limit gages for complete interchangeability.

FEATURE	CONSTRUCTION
Pump Casing	Divided on the horizontal centerline, discharge nozzles, as well as support cast integral with the lower half casing, own foundry of Meehanite metal.
Impeller	Vanes and shrouds forming the enclosure of the double suction one-piece type in smooth finished inside and out.  Impeller is accurately balanced.
Double Labyrinth Type Wearing Rings	Casing rings are securely held in place by a tongue and groove joint in the pump casing. Impeller rings threaded opposite to rotation, screwed to the outside diameter of the casing.  Intermeshing grooves of the double labyrinth and number of abrupt turns reduce internal leakage.
Shaft	Ampley proportioned, of high tensile alloy steel. Accurately machined for interchangeability of both shaft and parts upon it.
Shaft Sleeve	Threaded type, screwed to shaft and abutting impeller hub, completely covers shaft and provides a bearing surface for the packing.
Bearings	Radial bearings are ring-oiled, split-shell type. Liberal size shells are steel-backed babcock bearing on the outboard end locates the shaft.

# D I M E N S I O N S

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All dimensions are in inches. Motor dimensions w depending on make and frame.

## Bottom Suction—Side Discharge (End View A)

TYPE	SIZE	SUCT.	DISCH.	A	B	C	D	E	F	G	H	J	K	L
L	16/14	16	14	19½	20	26¾	28¾	20	15¼	14	5	50¾	31	106¼
	18/16	18	16	22½	20	26¾	28¾	20	18	14	5	56¾	32½	112¼
M	12/10	12	10	20¾	19	27¾	30	17	16¾	14	5	50¾	28½	107¾
	14/12	14	12	22½	20	27¾	30	17	17¾	15	5	56¾	31	113¾
	16/14	16	14	23½	21	27¾	30	17	18¾	16	5	56¾	33	113¾
P	12/10	12	10	20½	24	33½	37	20	17	11	6	54¾	27	124¾
	12/10 D	12	10	30	26	30¾	36¾	19	22½	19	6	57¾	34½	125¾
	14/12	14	12	22	25	30¾	36¾	22	18	14	6	59¾	31	126¾
	16/14 D	16	14	31	28	30¾	36¾	22	22	21	6	63¾	39	130¾
	18/16	18	16	25¾	30	33½	37	24	20¾	19	6	63¾	39	133½
	18/16 D	18	16	34½	30	30¾	36¾	24	25	24	6	72¾	43¾	139¾
	20/18	20	18	25	24	30¾	36¾	20	20	16	6	56¾	36	123¾
24/20	24	20	27	24	30¾	36¾	22	21	19	6	59¾	42¾	126¾	

## Side Suction—Side Discharge (End View B)

TYPE	SIZE	SUCT.	DISCH.	A	B	C	D	E	F	G	H	J	K	L
L	10/8 D	10	8	23	18	24¾	26¾	21½	16	12½	5	50¾	28	100
	12/10	12	10	20	17	24¾	26¾	21½	13½	9¾	5	53¾	28	100
	14/12	14	12	22	20	24¾	26¾	21½	14¾	10¾	5	56¾	28	100
	16/14	16	14	24	20	26¾	28¾	30	15¼	14	5	50¾	36½	100
	18/16	18	16	30	20	26¾	28¾	30	18	15	5	56¾	36½	111
M	12/10	12	10	25	19	27¾	30	17	16¾	14	5	50¾	30	107
	12/10 D	12	10	30	26	27¾	30	17	18¾	17½	5	57¾	33	114
	14/12	14	12	26	20	27¾	30	17	17¾	15	5	56¾	32	113
	16/14	16	14	27	21	27¾	30	17	18¾	16	5	56¾	34	113
P	12/10	12	10	27	23	33½	37	25¼	17½	15½	6	54¾	32	124
	12/10 D	12	10	30	26	30¾	36¾	19	22½	19	6	57¾	36	125
	14/12	14	12	29	24	30¾	36¾	25	18½	16	6	59¾	33	126
	16/14	16	14	32	28	33½	37	28	19¾	16	6	63¾	35	133½
	16/14 D	16	14	34	28	30¾	36¾	22	21¾	21	6	63¾	39	130¾
	18/16	18	16	35	30	30¾	36¾	21½	20½	19	6	72¾	39½	139¾
	20/18	20	18	32	24	30¾	36¾	20	19¾	16	6	56¾	38	123½
24/20	24	20	33	24	30¾	36¾	22	20¾	19	8	59¾	45½	126½	



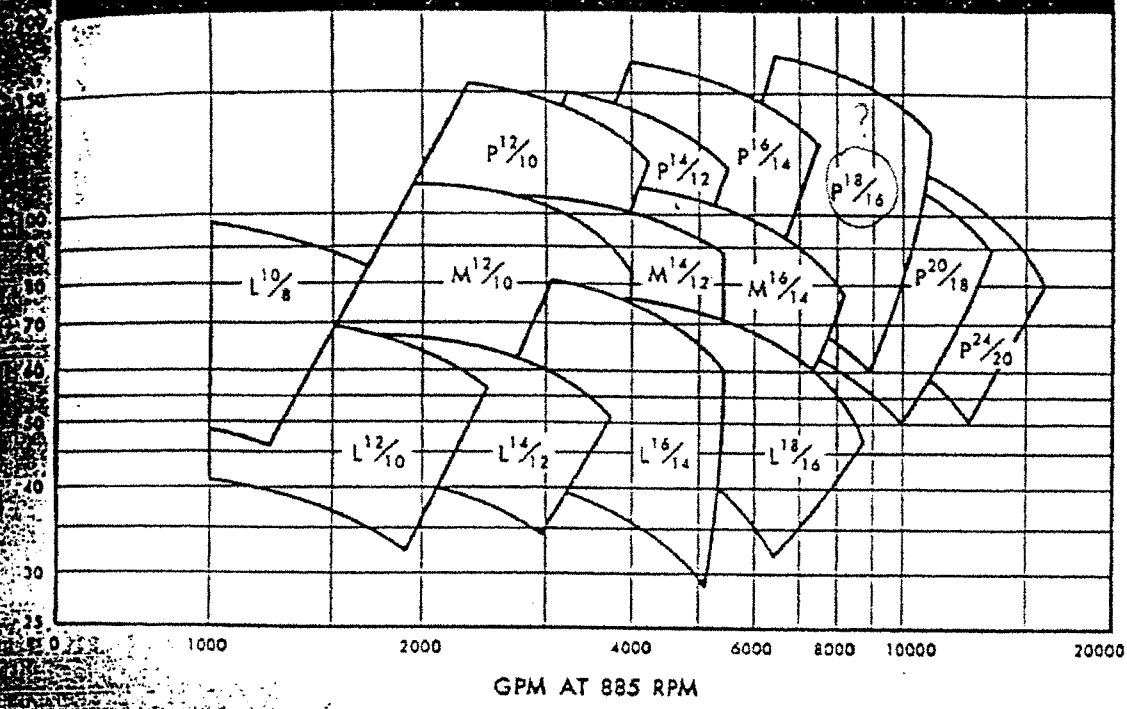
**DE LAVAL** Steam Turbine Company

Trenton 2, New Jersey

District offices and representatives in principal cities of the United States, Canada and abroad

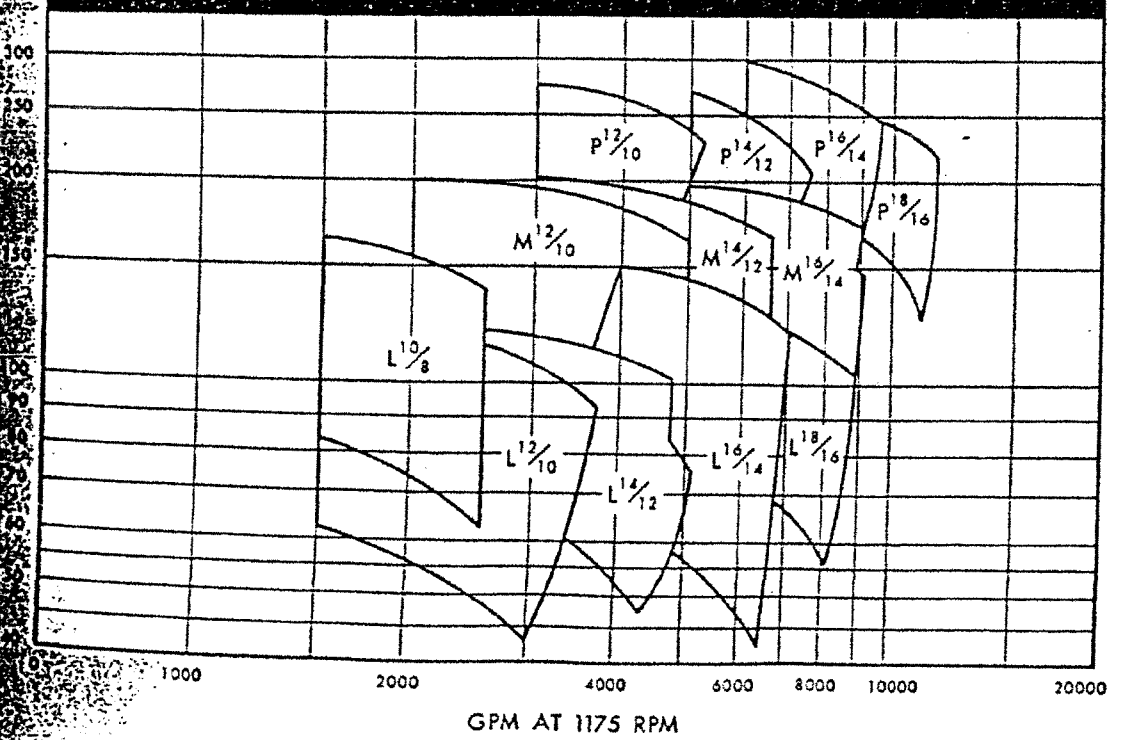
# PERFORMANCE DATA

## CAPACITY AND HEAD RANGE



GPM AT 885 RPM

## CAPACITY AND HEAD RANGE



GPM AT 1175 RPM