

# Worthington; Moving more kinds of fluids, more ways, for more industries.



Worthington offers the broadest choice of pumps in North America (or the world) and moves more kinds of fluids more ways for more industries than any other pump company in the world. Your advantage is that regardless of your pumping needs, you are more than likely to find we can offer an uncompromised solution to your problem.

Within our extremely broad selection of pumps — standard end suction centrifugals, vertical in-line, horizontally split single or multi-stage centrifugals, positive displacement rotary, reciprocating, vertical turbine, and more — there is a pump to match your job needs precisely.

And, Worthington maintains an extensive network of direct sales offices and franchised pump distributors in every major trading area in North America to assure that a qualified pump representative is nearby when you need him.

At nearly 100 distributor locations, specialists in pumping equipment can offer expert assistance on pump application, selection, installation, operation and maintenance. With an inventory in new units and parts of more than \$10 million, they are geared for immediate reaction to your needs. In addition, many distributors have the capability to assemble and package pumps to special configurations to meet unique requirements. Worthington's own sales engineers are full-time specialists in the selection and application of pumps. They are trained to solve your liquid-handling problems and, if necessary can draw on the full technical capability of our seven North American manufacturing centers.

# TABLE OF CONTENTS

Page

**1** Technical Data



Technical Data Section Table of Contents .....	2
Basic Terms and Formulas .....	3
Centrifugal Pump Fundamentals .....	7
Viscosity .....	22
Corrosion and Materials .....	30
Friction Loss .....	34
Dimensions (Flange and Pipe Data) .....	49
Tables (Conversion, Properties of Water, Specific Gravity) .....	56
Motor Data .....	63
Sealing and Mechanical Seals .....	67

**Pump Type**

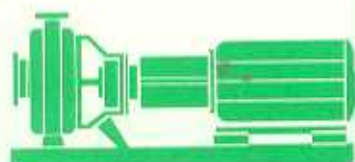
**Model**

**Description**

**Coverage**

**Page**



**2** Chemical Process




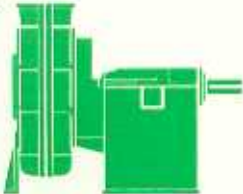

ANSI D-1010	Horizontal frame mounted End suction, single stage Overhung closed or open impellers Corrosion resistant	Capacities to 5,000 gpm Heads to 600 ft. Sizes to 8 in.	79
ANSI D-1160	Vertical in-line, frame mounted Single stage Closed impeller Corrosion resistant	Capacities to 800 gpm Heads to 600 ft. Sizes to 4 in.	79
D-1130	Vertical in-line, close coupled Single stage Closed impeller Corrosion resistant	Capacities to 800 gpm Heads to 600 ft. Sizes to 4 in.	111
DP-900 (Non-Metallic)	Horizontal, frame mounted End suction, single stage Overhung, open impeller Reinforced epoxy resin material Corrosion resistant	Capacities to 400 gpm Heads to 450 ft. Sizes to 2 in.	119
CNG	Horizontal, frame mounted End suction, single stage Overhung, semi-open impeller Corrosion resistant	Capacities to 5,000 gpm Heads to 475 ft. Sizes to 8 in.	131






## TABLE OF CONTENTS

Pump Type	Model	Description	Coverage	Page
<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> <span style="border: 1px solid black; border-radius: 50%; padding: 2px 5px; font-weight: bold;">3</span> </div> <div> <p>General</p>  </div> </div>	D-500	Horizontal frame mounted (D-511/D-512) Horizontal close coupled (D-520) End suction, single stage Overhung, closed impeller Corrosion Resistant	Capacities to 175 gpm Heads to 110 ft. Sizes to 1½ in.	147
	D-800	Horizontal frame mounted (D-814) Horizontal close coupled (D-824) Vertical in-line close coupled (D-834) Single stage, closed impeller	Capacities to 1,500 gpm Heads to 400 ft. Sizes to 4 in.	153
	D-1020	Horizontal close coupled End suction, single stage Overhung, closed impeller Corrosion resistant	Capacities to 1,200 gpm Heads to 650 ft. Sizes to 4 in.	169
<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> <span style="border: 1px solid black; border-radius: 50%; padding: 2px 5px; font-weight: bold;">4</span> </div> <div> <p>API Process</p>  </div> </div>	HQ	API 610 Horizontal Single stage, end suction Closed impellers Centerline support	Capacities to 6,000 gpm Heads to 700 ft.	177
	HNN	API 610 Horizontal Single stage, end or top suction Closed impellers Centerline support	Capacities to 4,200 gpm Heads to 5,000 ft.	187
	HN	API 610 Horizontal End or top suction Closed impellers Centerline support	Capacities to 13,000 Heads to 800 ft.	193



## TABLE OF CONTENTS

Pump Type	Model	Description	Coverage	Page
<b>4</b> API Process (cont.)	HNI	API 610 Overhung, closed impellers End suction Centerline support	Capacities to 11,000 gpm Heads to 1,500 ft.	199
	HNI-DS	API 610 Top suction Between bearings impeller Centerline support	Capacities to 11,000 gpm Heads to 1,500 ft.	201
	HDS	API 610 Horizontal, radially split Centerline support Single stage, double suction Between bearings impeller	Capacities to 14,000 gpm Heads to 1,700 ft.	203
<b>5</b> Paper Stock Process  	FRBH	Overhung, single stage Semi-open impeller with pump out vanes	Capacities to 22,000 gpm Heads to 325 ft.	207
<b>6</b> Slurry Process  	R/M	Overhung, closed impeller single stage Overhead motor mount	Capacities to 20,000 gpm Heads to 300 ft.	223
<b>7</b> Horizontal Split Case  	LR	Horizontal split Single stage, double suction	Capacities to 20,000 gpm Heads to 800 ft. Sizes to 16 in.	239
	LLR	Horizontal split Two stage, single suction	Capacities to 350 gpm Heads to 800 ft. Sizes to 2 in.	239
	LN	Horizontal split Single Stage, double suction	Capacities to 200,000 gpm Heads to 750 ft.	261



## TABLE OF CONTENTS

Pump Type	Model	Description	Coverage	Page
<b>8</b> Reciprocating  	Plunger Pumps	Vertical, pressure lubricated Outboard packed Three, five and seven, plungers	Capacities to 3,000 gpm Pressures to 40,000 psi	281
	Steam Pumps VA/VC	Horizontal duplex pumps	Capacities to 470 gpm Pressures to 300 psi	283
	ARL/ARLH	Horizontal simplex, side pot pumps	Capacities to 620 gpm Pressures to 750 psi	285
	PRL/PRLH	Horizontal duplex, side pot pumps	Capacities to 1,240 gpm Pressures to 750 psi	285
<b>9</b> Vertical  	Vertical Turbine Pumps VTP	Deep well and short coupled types Closed impellers	Capacities to 40,000 gpm Heads to 2,300 ft. Diameters to 40 in.	289
	Submersible	Short coupled Completely sealed submersible motor	Capacities to 2,000 gpm Heads to 990 ft. Sizes to 12 in.	303
	Can	Multistage vertical turbine pump inside integral can	Capacities to 25,000 gpm Heads to 1,500 ft.	305
	KL/KM	Wet pit propeller and impeller pumps	Capacities to 100,000 gpm Heads to 60 ft.	311
<b>10</b> Wet Pit  	QL	Vertical, wet pit Between bearings impeller Double suction, double volute centrifugal pump Line shaft enclosed	Capacities to 80,000 gpm Heads to 700 ft.	319
	FRBHJ/RJ MJ	Vertical sump pumps End suction, single stage enclosed or semi-open impellers	Capacities to 5,000 gpm Heads to 200 ft.	333

# TABLE OF CONTENTS

Pump Type	Model	Description	Coverage	Page
<b>11</b> Solids Handling  	MF	Overhung, Single stage Mixed flow, closed impeller Horizontal or vertical models	Capacities to 7,000 gpm Heads to 225 ft.	<b>337</b>
	MN	Overhung, single stage Mixed flow, closed impeller Horizontal or vertical models	Capacities to 200,000 gpm Heads to 225 ft.	<b>345</b>
<b>12</b> Positive Displacement  	GA	Herringbone external gears Internal bearings	Capacities to 120 gpm Pressures to 150 psi Sizes to 7 in.	<b>351</b>
	GR	Herringbone external gears Internal bearings Heavy duty	Capacities to 5,000 gpm Pressures to 500 psi Sizes to 6 in.	<b>359</b>
	Gearex	Herringbone gear type rotary Internal or external bearings	Capacities to 650 gpm Pressures to 350 psi	<b>369</b>
	Sier-Bath Screw	Horizontal, positive displacement Two screws Timing gears	Capacities to 10,000 gpm Pressures to 350 psi	<b>375</b>

## TABLE OF CONTENTS

Pump Type	Model	Description	Coverage	Page
<b>13</b> Multi-Stage 	WD	Modular interstage between bearings High head, low flow	Capacities to 400 gpm Heads to 1,500 ft.	381
	WRL/WRM	Moderator interstage between bearings High head, low flow	Capacities to 2500 gpm Heads to 2500 ft.	391
	WT	Multistage diffuser Horizontally split High pressure	Capacities to 600 gpm Heads to 3,000 ft.	399
	UNB/UNQ	Between bearings, two or four stage Closed opposed impellers Axially split	Capacities to 2,000 gpm Heads to 2,200 ft.	403
	UZD	API 610 Between bearings, external crossover Double volute Horizontally split multistage Centrifugal pump	Capacities to 8,000 gpm Heads to 1,850 ft.	412
	UXH	API-610 Multistage, between bearings Axially split, centerline support Heavy duty process	Capacities to 4,200 gpm Heads to 5,000 ft.	413
	WC/WNC	Barrel type, horizontal Multistage centrifugal Double radially split barrel casing	Capacities to 14,000 gpm Pressures to 6,000 psi	417
<b>14</b> Hydroturbines	Hydroturbines	Horizontal, vertical, single stage, multi-stage	Capacities to 1,500 KW	421
<b>15</b> Ejectors 	Steam Jet Ejectors	One to six stages Condensing or noncondensing	Capacities unlimited Pressures 75 MM to 100 microns	427