

# Pumps and Compressors: 2002

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### SUMMARY OF FINDINGS

For 2002, the value of shipments for the types of pumps and compressors included in this report decreased by 4 percent, from \$8,271.3 million to \$7,969.5 million. Value of shipments for pumps (except vacuum pumps), including parts, fell from \$5,099.6 million in 2001 to \$4,817.3 million in 2002, a decrease of 6 percent. Vertical turbine

pumps (except drivers) decreased in value of shipments in 2002 by 4 percent, from \$263.0 million to \$253.7 million.

Domestic water systems, including drivers, fell by 3 percent in value of shipments for 2002, from \$474.9 million to \$460.3 million. Domestic sump pumps, including drivers, decreased in value of shipments by 3 percent in 2002, from \$144.0 million to \$140.2 million.

Oil well and oil field pumps decreased in value of shipments for 2002, from \$319.9 million to \$279.0 million, a decrease of 13 percent. The value of shipments of parts for pumps made by manufacturers of complete pumps decreased very slightly in 2002, from \$913.5 million to \$902.2 million.

Compressors, including vacuum pumps and parts, increased in value of shipments for 2002 by 1 percent, from \$2,712.0 million to \$2,727.7 million.

For general CIR information, explanation of general terms and historical note, see the appendix.

Address inquiries concerning these data to Investment Goods Industries Branch, Manufacturing and Construction Division (MCD), Washington, DC 20233-6900, or call Keeley Voor, 301-763-4746.

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# U S C E N S U S B U R E A U

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Table 1. Summary of Shipments of Pumps and Compressors: 2002 to 2001  
[Quantity in number of units. Value in thousands of dollars]

Product description	2002		2001	
	Quantity	Value	Quantity	Value
Total.....	(X)	7,969,479	(X)	8,271,325
Pumps (except vacuum pumps), including parts.....	(X)	4,817,273	(X)	5,099,575
Industrial pumps.....	12,401,917	2,687,538	10,937,258	2,891,188
Drivers, reported.....	(X)	424,544	(X)	458,212
Centrifugal pumps (except drivers).....	7,916,454	1,531,990	7,229,460	1,620,687
Submersible, reported.....	828,991	258,677	798,055	258,645
Other, reported.....	6,684,800	1,231,472	6,063,022	1,316,976
Estimated from pre-1995-basis reports.....	402,663	41,841	368,383	45,066
Vertical turbine pumps (except drivers).....	64,313	253,693	64,446	262,975
Reported.....	63,864	250,221	63,996	259,376
Estimated from pre-1995-basis reports.....	449	3,472	450	3,599
Reciprocating pumps (except drivers), reported.....	673,829	185,934	401,006	204,408
Diaphragm pumps (except drivers), reported.....	1,840,224	224,188	1,356,925	242,294
Rotary pumps (except drivers), reported.....	(D)	(D)	(D)	(D)
Other (except drivers), reported.....	859,811	156,811	834,751	163,484
Estimated from other sources (potentially including drivers).....	77,317	22,937	68,186	24,675
Domestic water systems, including drivers.....	2,380,776	460,877	2,543,574	474,910
Reported.....	2,376,655	460,133	2,539,453	474,183
Estimated from other sources.....	4,121	744	4,121	727
Domestic sump pumps, including drivers.....	2,183,419	140,194	2,279,572	143,983
Reported.....	2,178,115	139,871	2,274,034	143,651
Estimated from other sources.....	5,304	323	5,538	332
Oil well and oil field pumps.....	38,048	279,040	51,414	319,911
Drivers, reported.....	(X)	(D)	(X)	(D)
Subsurface pumps for oil-well pumping.....	(D)	(D)	40,001	111,807
Mud pumps, slush pumps.....	(D)	(D)	(D)	(D)
Other oil well and oil field pumps.....	5,449	26,222	(D)	(D)
Estimated from other sources.....	629	4,965	850	5,692
Other pumps.....	6,374,990	347,447	6,580,062	356,036
Reported.....	6,353,418	346,243	6,557,796	354,802
Estimated from other sources.....	21,572	1,204	22,266	1,234
Parts (reported; made by manufacturers of complete pumps).....	(X)	902,177	(X)	913,547
Compressors, including vacuum pumps and parts.....	(X)	2,727,662	(X)	2,712,020
Air and gas compressors (but not vacuum pumps).....	(X)	2,276,655	(X)	2,270,699
Drivers (except for one category of gas compressor), reported.....	(X)	194,435	(X)	209,472
Air compressors (except drivers), new, stationary, reported.....	1,306,086	827,450	1,271,331	826,156
Air compressors (except drivers), new, portable, reported.....	2,358,441	489,279	2,289,566	509,716
Gas compressors (usually except drivers), new, stationary, reported.....	2,457	644,747	4,242	613,896
Other compressors (except drivers), reported.....	39,709	79,057	35,228	69,881
Estimated from other sources.....	62,058	41,687	60,278	41,578
Laboratory vacuum pumps (potentially including drivers; reported).....	(D)	(D)	(D)	(D)
Vacuum pumps (except laboratory).....	(X)	135,572	(X)	171,152
Drivers, reported.....	(X)	26,890	(X)	29,067
Except drivers, reported.....	184,803	97,875	202,825	128,442
Estimated from other sources (potentially including drivers).....	12,693	10,807	13,931	13,643
Parts (reported; made by manufacturers of complete compressors).....	(X)	313,981	(X)	270,169

D Withheld to avoid disclosing data for individual companies. X Not applicable.

Table 2. Quantity and Value of Shipments of Selected Pumps and Compressors: 2002 and 2001  
[Quantity in number of units. Value in thousands of dollars]

Product code	Product description	No. of cos.	2002		2001	
			Quantity	Value	Quantity	Value
3339111 pt.	Pumps and compressors 1/.....	(X)	(X)	7,969,479	(X)	8,271,325
	Industrial pumps (except hydraulic fluid power pumps).....	(X)	(X)	2,687,538	(X)	2,891,188
3339111401	Value of drivers 2/.....	100	(X) b/	424,544	(X) r/	458,212
	Centrifugal pumps:					
	Sewage type (nonsubmersible), vertical or horizontal					
	with nonlog impeller.....	(X)	6,742	47,281	8,369 r/	44,640
3339111411	12" and under.....	24 b/	6,449	40,677	8,128	38,462
3339111412	Over 12".....	7	293 b/	6,604	241	6,178
	Submersible effluent pumps (less than 1" solids					
	handling capacity).....	(X)	317,461	70,876	296,577	63,197
3339111424	Less than 1 hp.....	14	300,857	39,590	281,584	38,191
3339111425	1 hp and over.....	15	16,604 b/	31,286	14,993 r/	25,006
	Submersible solids handling pumps (solids 1" to 2"					
	inclusive).....	(X)	418,857	80,222	409,150	87,062
3339111428	1/2 hp and under.....	15	380,124	64,000	356,433	59,289
3339111429	Over 1/2 hp.....	20	38,733	16,222	52,717 r/	27,773
	Submersible nonclog pumps (greater than 2" solids					
	handling capacity).....	(X)	38,929	48,058	40,011 r/	51,628
333911142C	3" discharge and under.....	12	27,206	11,082	28,456	13,227
333911142E	Discharge more than 3" but less than 7".....	18	(D)	(D)	10,975	27,655
333911142G	7" and over discharge.....	8	(D)	(D) r/	580 r/	10,746
	Submersible grinder pumps (incorporating a hardened					
	stainless steel cutter mechanism to macerate the					
	solids into a fine slurry).....	(X)	53,744	59,521	52,317 r/	56,758
333911142K	2 hp and below.....	9	(D)	(D) r/	45,573 r/	46,370
333911142M	Over 2 hp.....	5	(D)	(D)	6,744	10,388
	Single and two stage, single and end suction, close					
	coupled with driver.....	(X)	1,150,804	189,156 r/	903,930 r/	213,375
3339111444	1" discharge and under.....	36	483,130 a/	53,671 r/	349,213 r/	51,876
3339111445	Discharge more than 1", up to 2".....	44	596,210	88,721	483,927 r/	109,706
3339111447	Over 2" discharge.....	38 a/	71,464	46,764	70,790	51,793
	Single and two stage, single suction, in-line, close					
	coupled with driver.....	(X)	856,214	20,667 r/	928,576 r/	23,440
3339111449	2" discharge and under.....	12	845,017	13,056 r/	917,108 r/	14,087
333911144A	Over 2" discharge.....	14	11,197	7,611	11,468 r/	9,353
	Single stage, single suction, vertical, in-line frame.....	(X)	381,278	62,216 r/	455,152 r/	67,356
333911144C	2" discharge and under.....	13 c/	371,786 c/	31,176 r/	445,289 r/	37,531
333911144D	Over 2" discharge.....	14	9,492	31,040 r/	9,863 r/	29,825
	Single stage, single suction, frame or foot mounted,					
	metallic pumps (built to National or International					
	Standards ANSI B73.1 or ISO 2858).....	(X)	54,041	120,261 r/	59,986 r/	122,713
333911144F	2" discharge and under.....	23	23,118	44,347 r/	26,269	50,943
333911144G	Over 2" discharge.....	22	30,923	75,914 r/	33,717 r/	71,770
	Single stage, single suction, frame or foot mounted,					
	nonmetallic pumps (built to National or International					
	Standards ANSI B73.1 or ISO 2858).....	(X)	18,395	14,177 r/	19,084 r/	15,989
333911144J	2" discharge and under.....	8	17,444	8,517 r/	17,862 r/	9,509
333911144K	Over 2" discharge.....	7	951	5,660 r/	1,222 r/	6,480
	Single stage, single suction, frame or foot mounted,					
	non-ANSI, non-ISO, with or without recessed impeller.....	(X)	75,852	78,005 r/	72,171 r/	73,734
333911144M	1" discharge and under.....	14	16,088	3,951 r/	16,557 r/	4,608
333911144N	Discharge more than 1", up to 2".....	20 b/	26,523 b/	16,550	25,829 r/	15,647
333911144R	Over 2" discharge.....	25 b/	33,241	57,504 r/	29,785 r/	53,479
	Single stage, single suction, replaceable elastomer					
	lined or hard metal, frame or foot mounted.....	(X)	4,975	40,308 r/	6,372 r/	53,186
3339111451	1" discharge and under.....	5	242	1,250 r/	305 r/	1,614
3339111452	Discharge more than 1", up to 2".....	6	3,032	17,057 r/	3,568 r/	16,975
3339111454	Over 2" discharge.....	5	1,701	22,001 r/	2,499 r/	34,597
	Single stage, single suction, centerline mounted.....	(X)	26,507	45,922	86,523	51,959
3339111456	2" discharge and under.....	9	24,100	20,110 r/	83,990 r/	26,114
3339111457	Over 2" discharge.....	9 b/	2,407 a/	25,812 r/	2,533 r/	25,845
	Single stage, axially split, double suction.....	(X)	10,427	80,921 r/	11,345 r/	73,329
3339111459	4" discharge and under.....	12 a/	2,834	10,277 r/	3,173 r/	11,014
333911145A	Discharge more than 4", up to 8".....	14 a/	5,711	27,989	6,223 r/	28,850
333911145C	Over 8" discharge.....	16	1,882 a/	42,655 r/	1,949 r/	33,465
	Single stage, radially split, double suction impeller					
	pumps, API-610 compliant.....	(X)	66	7,675 r/	68 r/	6,710
333911145E	4" discharge and under.....	3	6	656	(D)	(D)
333911145F	Discharge more than 4", up to 8".....	3	33	3,611	(D)	(D)
333911145H	Over 8" discharge.....	3	27	3,408	28	2,767

Continued

Table 2. Quantity and Value of Shipments of Selected Pumps and Compressors: 2002 and 2001  
[Quantity in number of units. Value in thousands of dollars]

Product code	Product description	No. of cos.	2002 Quantity	2002 Value	2001 Quantity	2001 Value
	Single stage, radially split, double suction impeller pumps, non-API compliant.....	(X)	(D)	(D)	(D)	(D)
333911145K	4" discharge and under.....	3	1,640	1,857	(D)	(D)
333911145L	Discharge more than 4", up to 8".....	3	(D)	(D)	191	1,305
333911145N	Over 8" discharge.....	1	(D)	(D)	(D)	(D)
	Multistage, single or double suction, diffuser design, radially split case.....	(X)	47,264	43,155 r/	37,389 r/	39,448
3339111461	4" discharge and under.....	14	46,922	22,432	(D)	(D)
3339111464	Discharge more than 4", up to 8".....	9 c/	323 b/	19,582 r/	345 r/	14,318
3339111467	Over 8" discharge.....	3	19	1,141	(D)	(D)
	Multistage, single or double suction, volute or diffuser design, axially split case.....	(X)	5,765	77,673	6,289 r/	84,952
333911146C	4" discharge and under.....	9 c/	5,212	23,594	5,651 r/	27,767
333911146E	Discharge more than 4", up to 8".....	8	513	48,076	(D)	(D)
333911146H	Over 8" discharge.....	5	40	6,003	(D)	(D)
	Sealless centrifugal pumps, magnetic drive.....	(X)	207,677	35,945 r/	124,855 r/	50,272
3339111471	1" discharge and under.....	13	202,392	24,095 r/	105,992 r/	18,137
3339111474	Discharge more than 1", up to 2".....	8	(D)	(D)	(D)	(D)
3339111477	Over 2" discharge.....	5	(D)	(D)	(D)	(D)
	Sealless centrifugal pumps, canned motor.....	(X)	(D)	(D)	(D)	(D)
333911147C	1" discharge and under.....	6 c/	5,259	6,611 r/	4,694 r/	5,532
333911147E	Discharge more than 1", up to 2".....	4 c/	7,273 c/	7,153	7,986	7,973
333911147H	Over 2" discharge.....	2	(D)	(D)	(D)	(D)
	Propeller and mixed flow, horizontal and vertical including vertical turbine over 36".....	(X)	2,702	39,214 r/	2,240 r/	42,421
3339111481	36" and under.....	16 a/	2,433 b/	28,240 r/	2,020 r/	30,631
3339111484	Over 36".....	9 c/	269 c/	10,974 r/	220 r/	11,790
	All other centrifugal pumps.....	(X)	3,821,406	312,346 r/	3,340,673 r/	353,452
333911148K	6" discharge and under.....	42	3,820,241	245,137 r/	3,338,986 r/	268,567
333911148M	Over 6" discharge.....	18 b/	1,165 a/	67,209 r/	1,687 r/	84,885
	Centrifugal pumps, n.s.k. ....	(X)	402,663	41,841 r/	368,383	45,066
	Vertical turbine pumps not exceeding 36" discharge, including deep-well:					
	Pump with submersible motor.....	(X)	28,358	55,137 r/	30,352 r/	58,970
3339111493	Bowl diameter 6" and under.....	19	16,378 a/	24,454 r/	18,332	29,844
3339111498	Bowl diameter over 6".....	17 b/	11,980 b/	30,683 r/	12,020 r/	29,126
333911149F	Pump and bowl assemblies through 36" (all column and shaft lengths, including FM or UL approved vertical turbine fire pumps; deep well and short coupled pumps, except can and pot type).....	16 b/	33,592 b/	169,479 r/	31,639 r/	166,035
333911149N	Can and pot type (pump and bowl assemblies, suction can and pot type).....	9 b/	1,914	25,605	2,005 r/	34,371
	Vertical turbine pumps, n.s.k. ....	(X)	449	3,472	450 r/	3,599
	Reciprocating pumps:					
33391114C3	Direct-acting steam-driven.....	(X)	(X)	(X)	(X)	(X)
33391114C7	Driven by electric motor, engine, or steam turbine: Reciprocating piston, plunger or diaphragm (not air operated) pumps.....	33	673,829 a/	185,934	401,006	204,408
33391114D5	Diaphragm pumps (air operated).....	19	1,840,224	224,188	1,356,925 r/	242,294
	Rotary pumps:					
	100-PSI and under designed pressure.....	(X)	725,853	206,840 r/	712,618 r/	234,676
33391114R1	10 GPM and under, designed capacity.....	33	568,914 b/	101,540 r/	549,028 r/	101,099
33391114R3	11 to 99 GPM, designed capacity.....	24 b/	147,440 b/	51,810 r/	148,455	76,646
33391114R5	100 to 299 GPM, designed capacity.....	15	(D)	(D)	(D)	(D)
33391114R7	300 GPM and over, designed capacity.....	10	(D)	(D)	(D)	(D)
	101 to 249 PSI, designed pressure.....	(X)	109,599	60,479 r/	165,941 r/	75,774
33391114RA	10 GPM and under, designed capacity.....	12	74,463	17,458 r/	120,142 r/	21,599
33391114RC	11 to 99 GPM, designed capacity.....	11	24,196	23,867 r/	32,512	27,258
33391114RE	100 GPM, and over, designed capacity.....	9	10,940	19,154	13,287 r/	26,917
	250 to 500 PSI, designed pressure.....	(X)	132,485	22,157 r/	85,487 r/	18,977
33391114RJ	10 GPM and under, designed capacity.....	10	125,035	14,862 r/	79,660 r/	9,154
33391114RM	11 GPM, and over, designed capacity.....	9	7,450	7,295 r/	5,827 r/	9,823
33391114RR	Over 500 PSI, designed pressure.....	6	(D)	(D)	(D)	(D)
33391114T5	Other industrial pumps, n.e.c. ....	26 a/	859,811 c/	156,811 r/	834,751 r/	163,484
	Industrial pumps, n.s.k. 3/.....	(X)	77,317	22,937	68,186	24,675
	Domestic water systems, including drivers.....	(X)	2,380,776	460,877	2,543,574	474,910
3339111167	Nonsubmersible pump systems (jet and nonjet, including drivers).....	15	1,107,693	191,911	1,107,567 r/	187,457

Continued

Table 2. Quantity and Value of Shipments of Selected Pumps and Compressors: 2002 and 2001  
[Quantity in number of units. Value in thousands of dollars]

Product code	Product description	No. of cos.	2002		2001	
			Quantity	Value	Quantity	Value
	Submersible pump systems, 5 hp and under, including drivers.....	(X)	1,260,316	267,009	1,423,297	285,591
3339111172	Up to 1 hp.....	15 a/	936,889 a/	192,300 r/	1,081,365 r/	207,369
3339111175	Over 1 hp to 3 hp.....	12 b/	225,856 b/	57,585 r/	236,791 r/	59,074
3339111178	Over 3 hp to 5 hp.....	12 c/	97,571 a/	17,124 r/	105,141 r/	19,148
3339111190	Domestic hand and windmill pumps, pump jacks, and cylinders (sold separately, including drivers).....	3	8,646	1,213 r/	8,589 r/	1,135
	Domestic water systems and related pumps, n.s.k. ....	(X)	4,121	744	4,121 r/	727
3339111 pt.	Domestic sump pumps, 1 hp and under, including drivers.....	(X)	2,183,419	140,194 r/	2,279,572 r/	143,983
3339111235	Pedestal, including drivers.....	17	219,722	11,388 r/	222,047 r/	11,975
	Submersible, including drivers.....	(X)	1,958,393	128,483 r/	2,051,987 r/	131,676
3339111238	1/3 hp and under.....	15	1,540,711	96,563 r/	1,592,409 r/	99,283
3339111239	Over 1/3 hp.....	10	417,682	31,920 r/	459,578 r/	32,393
	Domestic sump pumps, n.s.k. 3/.....	(X)	5,304	323 r/	5,538 r/	332
3339111330	Oil well and oilfield pumps (except boiler feed).....	(X)	38,048	279,040	51,414 r/	319,911
3339111335	Value of drivers 2/.....	7	(X)	(D)	(X)	(D)
3339111341	Subsurface pumps for oil-well pumping.....	7	(D)	(D)	40,001 r/	111,807
3339111352	Mud pumps (slush pumps).....	3	(D)	(D)	(D)	(D)
3339111363	Other oil well and oil field pumps 4/.....	7	5,449	26,222	(D)	(D)
	Oil well and oil field pumps, n.s.k. 3/.....	(X)	629	4,965 r/	850 r/	5,692
	Other pumps, n.e.c., including drivers.....	(X)	6,374,990	347,447	6,580,062	356,036
	Other pumps (except vacuum pumps, automotive pumps, measuring and dispensing or service station pumps, hand pumps, and hydraulic fluid power pumps), including oil burner and appliance pumps, fire engine pumps, laboratory pumps, packaged pump units, hot water heating circulator pumps, etc.:					
3339111580	Reported (or estimated from prior year reports).....	28	6,353,418	346,243	6,557,796	354,802
	Estimated from other sources 3/.....	(X)	21,572	1,204	22,266	1,234
	Parts and attachments for pumps and pumping equipment whose product codes begin with 333911; made by manufacturers of complete units only.....	(X)	(X)	902,177	(X) r/	913,547
3339115144	Aftermarket (spare) parts for centrifugal pumps.....	60	(X)	509,539	(X) r/	481,015
3339115155	Aftermarket (spare) parts for vertical turbine pumps.....	14	(X) a/	41,936	(X) r/	65,587
3339115166	Aftermarket (spare) parts for reciprocating pumps.....	31	(X)	117,198	(X)	113,269
3339115199	Other.....	37	(X)	233,504	(X) r/	253,676
3339121 pt.	Air and gas compressors.....	(X)	(X)	2,276,655	(X) r/	2,270,699
3339121115	Value of drivers 2/.....	33	(X) b/	194,435	(X) r/	209,472
	Air compressors, new:					
	Stationary, reciprocating, single acting.....	(X)	1,205,402	428,257 r/	1,168,130 r/	405,211
3339121121	1-1/2 hp and under.....	17	(D)	(D)	(D)	(D)
3339121124	Over 1-1/2 hp to 5 hp.....	23	578,032	185,586 r/	626,930 r/	190,565
3339121127	6 hp to 25 hp.....	28 b/	434,987 a/	185,718 r/	350,030 r/	155,283
333912112A	26 hp and over.....	11	(D)	(D)	(D)	(D)
3339121133	Stationary, reciprocating, double acting.....	6 c/	11,162	7,942 r/	11,291 r/	11,999
	Stationary, rotary positive:					
3339121144	Discharge pressure 50 PSIG and under, all hp sizes.....	7	57,991 c/	28,849 r/	58,437 r/	29,356
	Discharge pressure of 51 PSIG and over.....	(X)	14,397	225,784 r/	15,961 r/	244,561
3339121151	40 hp and under.....	12	6,526	55,153 r/	7,790 r/	62,801
3339121154	41-150 hp.....	13	6,244	100,977 r/	6,333 r/	101,011
3339121157	151-300 hp.....	9	972	34,071 r/	1,142 r/	41,626
333912115A	301 hp and over.....	6	655	35,583 r/	696 r/	39,123
3339121166	Stationary, centrifugal and axial.....	10	17,134	136,618 r/	17,512 r/	135,029
	Portable.....	(X)	2,358,441	489,279	2,289,566 r/	509,716
3339121171	Under 11 CFM.....	8	2,335,545	323,408	2,265,537 r/	320,310
3339121174	11 to 74 CFM.....	6 c/	11,521 c/	12,954 r/	10,337 r/	12,268
3339121177	75 to 124 CFM.....	6 c/	349	2,330 r/	379 r/	2,802
333912117A	125 to 249 CFM.....	6 c/	7,882	66,476 r/	9,759 r/	81,349
333912117E	250 to 599 CFM.....	5 c/	1,687	21,184	(D)	(D)
333912117H	600 CFM and over.....	5 c/	1,457	62,927	(D)	(D)

Table 2. Quantity and Value of Shipments of Selected Pumps and Compressors: 2002 and 2001  
[Quantity in number of units. Value in thousands of dollars]

Product code	Product description	No. of cos.	2002		2001	
			Quantity	Value	Quantity	Value
	Gas compressors, new:					
	Stationary, centrifugal and axial.....	(X)	580	277,123 r/	665 r/	205,070
3339121183	Natural gas.....	6	112 a/	108,140 r/	89 r/	80,024
3339121188	All other gases.....	9	468	168,983 r/	576 r/	125,046
	Stationary reciprocating:					
	Integral engine, including drivers.....	2	(D)	(D)	(D)	(D)
	Other than integral engine:					
33391211A1	1,000 hp and under.....	14 a/	624 c/	54,954 r/	1,447	65,832
33391211A9	1,001 hp and over.....	7	907	275,112 r/	1,424 r/	281,745
33391211CC	Stationary rotary positive.....	7 b/	233 b/	31,716 r/	349	50,717
33391211FF	Other compressors (except for refrigeration, air-conditioning, and ice-making), including rebuilt compressors, compressor packages, and packaged compressor units assembled from purchased compressors.....	10 c/	39,709 c/	79,057 r/	35,228 r/	69,881
	Air and gas compressors, n.s.k. 3/.....	(X)	62,058	41,687 r/	60,278 r/	41,578
	Laboratory vacuum pumps.....	(X)	(D)	(D)	(D)	(D)
3391110123	Laboratory vacuum pumps, including drivers and replacement parts.....	3	(D)	(D)	(D)	(D)
3339121 pt.	Vacuum pumps, excluding laboratory.....	(X)	(X)	135,572	(X) r/	171,152
3339121225	Value of drivers 2/.....	14	(X)	26,890	(X) r/	29,067
	Low vacuum, 29.5" mercury vacuum and lower:					
3339121261	Under 5 hp.....	16	168,668	35,811 r/	182,394 r/	38,203
3339121265	5 hp and over.....	14 a/	2,353 a/	17,604 r/	3,070 r/	26,975
	High vacuum, 29.6" mercury vacuum and over:					
3339121273	Under 5 hp.....	11	9,578	15,670 r/	12,759 r/	25,825
3339121277	5 hp and over.....	7 a/	4,204 b/	28,790 r/	4,602 r/	37,439
	Vacuum pumps, n.s.k. 3/.....	(X)	12,693	10,807 r/	13,931 r/	13,643
	Parts and attachments for air and gas compressors and vacuum pumps whose product codes begin with 333912; made by manufacturers of complete units only.....	(X)	(X)	313,981	(X) r/	270,169
3339125111	Parts and attachments for air and gas compressors and vacuum pumps.....	39	(X)	313,981	(X) r/	270,169

D Withheld to avoid disclosing data of individual companies. n.e.c. Not elsewhere classified. n.s.k. Not specified by kind.  
pt. Part. r/Revised by 5 percent or more from previously published data. X Not applicable.

1/Value includes parts but quantity does not.

2/The value of drivers (electric motors, internal combustion engines, hydrostatic transmissions, steam turbines, etc.) is not included for most product categories but rather placed in one of four separate "driver" categories within the product class. Drivers may be included in values for products in product classes without separate driver categories.

3/Not specified by kind, or "n.s.k.": Values and quantities for a number of manufacturing establishments (either delinquent or too small to be included in the survey) were estimated from other surveys and records. Estimates were made only to the product class level. Drivers may be included in some cases.

4/Power pumps for water flooding are reported in product code 3339111363.

Note: Percent of estimation of each item is indicated as follows: a/16 to 25 percent of this item is estimated. b/26 to 50 percent of this item is estimated. c/Over 50 percent of this item is estimated.

Table 3. Shipments, Exports, and Imports of Pumps and Compressors: 2002 and 2001  
[Quantity in number of units. Value in thousands of dollars]

Product description	Manufacturers' shipments 1/		Export shipments 2/		Import shipments 4/	
	Quantity	Value f.o.b. plant	Quantity	Value 3/	Quantity	Value 5/
2002						
Pumps 6/.....	23,379,151	3,915,096	2,315,484	980,429	65,229,026	788,342
Centrifugal pumps, submersible.....	828,991	258,677	324,672	80,885	1,543,572	73,478
Centrifugal pumps, other 7/.....	7,087,463	1,273,313	145,441	311,023	11,765,332	317,172
Turbine pumps, vertical.....	64,313	253,693	45,721	36,612	30,034	7,942
Reciprocating pumps.....	673,829	185,934	57,761	64,725	511,976	101,006
Diaphragm pumps.....	1,840,224	224,188	269,449	53,884	980,957	22,116
Rotary pumps.....	(D)	(D)	98,846	115,535	1,064,348	70,566
Oil well and oil field pumps (except boiler feed).....	38,048	279,040	9,058	92,683	28,526	12,578
Domestic water systems, including windmill and hand pumps.....	2,380,776	460,877	564,211	34,747	32,613,193	42,492
Other pumps, including sump pumps, hot water circulator pumps, etc. ....	9,418,220	644,452	800,325	190,335	16,691,088	140,992
Compressors 6/.....	3,706,693	2,040,533	2,348,917	211,068	4,858,673	81,661
Stationary air compressors:						
Reciprocating, single and double acting 8/.....	1,216,564	436,199	(NA)	(NA)	-	-
Rotary positive, centrifugal, and axial 8/.....	89,522	391,251	(NA)	(NA)	-	-
Portable air compressors 8/.....	2,358,441	489,279	4,533	57,944	51,041	16,199
Other air and gas compressors, including gas compressors, and compressor packages.....	42,166	723,804	2,344,384	153,124	4,807,632	65,461
Vacuum pumps.....	197,496	135,572	706,606	128,767	4,265,299	337,601
2001						
Pumps 6/.....	22,391,880	5,099,575	1,869,272	1,011,327	71,548,787	717,874
Centrifugal pumps, submersible.....	798,055	258,645	307,788	88,628	1,087,589	53,901
Centrifugal pumps, other 7/.....	6,431,405	1,362,042	130,575	292,888	9,379,263	267,707
Turbine pumps, vertical.....	64,446	262,975	24,125	35,607	5,792	12,506
Reciprocating pumps.....	401,006	204,408	51,706	60,987	325,389	90,088
Diaphragm pumps.....	1,356,925	242,294	155,684	56,125	939,263	20,511
Rotary pumps.....	(D)	(D)	57,308	117,262	497,041	66,843
Oil well and oil field pumps (except boiler feed).....	51,414	319,911	10,687	119,399	23,679	30,833
Domestic water systems, including windmill and hand pumps.....	2,543,574	474,910	552,012	32,604	45,368,197	36,557
Other pumps, including sump pumps, hot water circulator pumps, etc. ....	9,688,847	663,171	579,387	207,827	13,922,574	138,928
Compressors 6/.....	3,511,625	2,097,635	2,588,977	197,403	11,994,397	410,048
Stationary air compressors:						
Reciprocating, single and double acting 8/.....	1,179,421	417,210	(NA)	(NA)	306,764	65,351
Rotary positive, centrifugal, and axial 8/.....	91,910	408,946	(NA)	(NA)	501,920	113,957
Portable air compressors 8/.....	2,201,181	598,234	3,911	53,988	6,975,983	154,650
Other air and gas compressors, including gas compressors, and compressor packages.....	39,113	673,245	2,585,066	143,415	4,209,730	76,090
Vacuum pumps.....	216,756	171,152	421,672	125,484	4,994,300	376,563

- Represents zero. D Withheld to avoid disclosing data for individual companies. NA Not available.

1/Manufacturers' shipments generally exclude values of drivers.

2/Source: Census Bureau report EM 545, U.S. Exports.

3/Excludes the value of drivers.

4/Sources: Census Bureau report IM 145, General Imports, and IM 146, U.S. Imports for Consumption.

5/Value represents the c.i.f. (cost, insurance, and freight) value at the first port of entry in the United States plus import duties.

6/Manufacturers' shipments detail does not necessarily sum to total because of such factors as drivers, parts, and "n.s.k."; see Table 2.

7/Manufacturers' shipments include n.s.k. (see Table 1) which is believed not to include submersible pumps.

8/Export data for three categories of compressors are combined because one harmonized code in the third category may be used interchangeably with any of several codes in the first two categories.

Note: For comparison of North American Industry Classification System (NAICS)-based codes with Schedule B export codes and HTSUSA import codes, see contact at the beginning of this report.

Table 4. Comparison of North American Industry Classification System (NAICS)-Based Product Codes with Schedule B Export Codes and HTSUSA Import Codes: 2002

Product code	Product description	Export code 1/	Import code 2/
3339111424, 425, 428, 429, 42C, 42E, 42G, 42K, 42M	Centrifugal pumps, submersible .....	8413.70.2004	8413.70.2004
3339111411, 412, 444, 445, 447, 449, 44A, 44C, 44D, 44F, 44G, 44J, 44K, 44M, 44N, 44R, 451, 452, 454, 456, 457, 459, 45A, 45C, 45E, 45F, 45H, 45K, 45L, 45N, 461, 464, 467, 46C, 46E, 46H, 471, 474, 477, 47C, 47E, 47H, 481, 484, 48K, 48M	Centrifugal pumps, other.....	8413.70.1000	8413.70.1000
		8413.70.2005	8413.70.2005
		8413.70.2015	8413.70.2015
		8413.70.2022	8413.70.2022
		8413.70.2025	8413.70.2025
		8413.70.2030	8413.70.2030
		8413.70.2040	8413.70.2040
		8413.70.2090	8413.70.2090
3339111493, 498, 49F, 49N	Turbine pumps, vertical.....	8413.81.0020	8413.81.0020
33391114C3, 4C7	Reciprocating pumps.....	8413.50.0090	8413.50.0090
33391114D5	Diaphragm pumps.....	8413.50.0050	8413.50.0050
33391114R1, 4R3, 4R5, 4R7, 4RA, 4RC, 4RE, 4RJ, 4RM, 4RR	Rotary pumps.....	8413.60.0070	8413.60.0070
		8413.60.0090	8413.60.0090
3339111335, 341, 352, 363	Oil well and oil field pumps (except boiler feed).....	8413.50.0010	8413.50.0010
		8413.60.0050	8413.60.0050
3339111167, 172, 175, 178, 190	Domestic water systems, including windmill and hand pumps.....	8413.20.0000	8413.20.0000
		8413.81.0030	8413.81.0030
33391114T5, 235, 238, 239, 580	Other pumps.....	8413.81.0040	8413.81.0040
3339121121, 124, 127, 12A, 133	Stationary air compressors, reciprocating, single and double acting.....	8414.80.1018	8414.80.1505
		8414.80.1042	8414.80.1515
		8414.80.1055	8414.80.1525
			8414.80.1535
			8414.80.1540
3339121144, 151, 154, 157, 15A, 166	Stationary air compressors, rotary positive, centrifugal, and axial.....		8414.80.1545
			8414.80.1555
		8414.80.1060	8414.80.1560
		8414.80.1067	8414.80.1565
		8414.80.1075	8414.80.1570
3339121171, 174, 177, 17A, 17E, 17H	Portable air compressors.....	8414.80.1080	8414.80.1575
			8414.80.1580
		8414.40.0000	8414.40.0000
		8414.80.1095	8414.80.1585
			8414.80.1590
3339121183, 188, 199, 1A1, 1A9, 1CC, 1FF	Other compressors.....	8414.80.2010	8414.80.2010
		8414.80.2050	8414.80.2050
		8414.80.2060	8414.80.2060
		8414.80.2070	8414.80.2070
		8414.80.9000	8414.80.9000
3391110123, 3339121225, 261, 265, 273, 277	Vacuum pumps.....	8414.10.0000	8414.10.0000

1/Source: 2002 edition, Harmonized System-based Schedule B, Statistical Classification of Domestic and Foreign Commodities Exported from the United States.

2/Source: Harmonized Tariff Schedule of the United States, Annotated (2002).



# Appendix.

## General CIR Survey Information, Explanation of General Terms and Historical Note

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### GENERAL

The CIR program has been providing monthly, quarterly, and annual measures of industrial activity for many years. Since 1904, with its cotton and fats and oils surveys, the CIR program has formed an essential part of an integrated statistical system involving the quinquennial economic census, manufacturing sector, and the annual survey of manufactures. The CIR surveys, however, provide current statistics at a more detailed product level than either of the other two statistical programs.

The primary objective of the CIR program is to produce timely, accurate data on production and shipments of selected products. The data are used to satisfy economic policy needs and for market analysis, forecasting, and decision making in the private sector. The product-level data generated by these surveys are used extensively by individual firms, trade associations, and market analysts in planning or recommending marketing and legislative strategies, particularly if their industry is significantly affected by foreign trade. Although production and shipments information are the two most common data items collected, the CIR program collects other measures also such as inventories, orders, and consumption. These surveys measure manufacturing activity in important commodity areas such as textiles and apparel, chemicals, primary metals, computer and electronic components, industrial equipment, aerospace equipment, and consumer goods.

The CIR program uses a unified data collection, processing, and publication system. The U.S. Census Bureau updates the survey panels for most reports annually and reconciles the estimates to the results of the broader-based annual survey of manufactures and the economic census, manufacturing sector. The manufacturing sector provides a complete list of all producers of the products covered by the CIR program and serves as the primary source for CIR sampling. Where a small number of producers exist, CIR surveys cover all known producers of a product. However, when the number of producers is too large, cutoff and random sampling techniques are used. Surveys are continually reviewed and modified to provide the most up-to-date information on products produced. The CIR program includes a group of mandatory and voluntary surveys. Typically the monthly and quarterly surveys are conducted on a voluntary basis. Those companies that choose not to respond to the voluntary surveys are required to submit a mandatory annual counterpart corresponding to the more frequent survey.

### NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS), 1997

The adoption of the North American Industry Classification System (NAICS) in the 1997 Economic Census has had a major impact on the comparability of current and historic data. Approximately half of the industries in the manufacturing sector of NAICS do not have comparable industries in the Standard Industrial Classification (SIC) system that was used in the past.

While most of the change affecting the manufacturing sector was change within the sector, some industries left manufacturing and others came into manufacturing. Prominent among those that left manufacturing are logging and portions of publishing. Prominent among the industries that came into the manufacturing sector are bakeries, candy stores where candy is made on the premises, custom tailors, makers of custom draperies, and tire retreading. The net effect of the classification changes are such that if the 1997 value of shipments data for all manufacturers were tabulated on an SIC basis, it would be approximately 3 percent higher.

Listed below are the NAICS sectors:

- 21 Mining
- 22 Utilities
- 23 Construction
- 31-33 Manufacturing
- 42 Wholesale Trade
- 44-45 Retail Trade
- 48-49 Transportation and Warehousing
- 51 Information
- 52 Finance and Insurance
- 53 Real Estate and Rental and Leasing
- 54 Professional, Scientific, and Technical Services
- 55 Management of Companies and Enterprises
- 56 Administrative and Support and Waste Management and Remediation Services
- 61 Educational Services
- 62 Health Care and Social Assistance
- 71 Arts, Entertainment, and Recreation
- 72 Accommodation and Food Services
- 81 Other Services (except Public Administration)

(Not listed above are the Agriculture, Forestry, Fishing, and Hunting sector (NAICS 11), partially covered by the census of agriculture conducted by the U.S. Department of Agriculture, and the Public Administration sector (NAICS 92), covered by the census of governments conducted by the Census Bureau.)

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The 20 NAICS sectors are subdivided into 96 subsectors (three-digit codes), 313 industry groups (four-digit codes), and, as implemented in the United States, 1170 industries (five- and six-digit codes).

## FUNDING

The Census Bureau funds most of the surveys. However, a number of surveys are paid for either fully or partially by other Federal Government agencies or private trade associations. A few surveys are mandated, but all are authorized by Title 13 of the United States Code.

## RELIABILITY OF DATA

Survey error may result from several sources including the inability to obtain information about all cases in the survey, response errors, definitional difficulties, differences in the interpretation of questions, mistakes in recording or coding the reported data, and other errors of collection, response, coverage, and estimation. These nonsampling errors also occur in complete censuses. Although no direct measurement of the biases due to these nonsampling errors has been obtained, precautionary steps were taken in all phases of the collection, processing, and tabulation of the data in an effort to minimize their influence.

A major source of bias in the published estimates is the imputing of data for nonrespondents, for late reporters, and for data that fail logic edits. Missing figures are imputed based on period-to-period movements shown by reporting firms. A figure is considered to be an impute if the value was not directly reported on the questionnaire, directly derived from other reported items, directly available from supplemental sources, or obtained from the respondent during the analytical review phase. Imputation generally is limited to a maximum of 10 percent for any one data cell. Figures with imputation rates greater than 10 percent are suppressed or footnoted. The imputation rate is not an explicit indicator of the potential error in published figures due to nonresponse, because the actual yearly movements for nonrespondents may or may not closely agree with the imputed movements. The range of difference between the actual and imputed figures is assumed to be small. The degree of uncertainty regarding the accuracy of the published data increases as the percentage of imputation increases. Figures with imputation rates above 10 percent should be used with caution.

## DATA REVISIONS

Statistics for previous years may be revised as the result of corrected figures from respondents, late reports for which imputations were originally made, or other corrections. Data that have been revised by more than 5 percent from previously published data are indicated by footnotes.

## DISCLOSURE

The Census Bureau collects the CIR data under the authority of Title 13, United States Code, which specifies that the information can only be used for statistical purposes and cannot be published or released in any manner that would identify a person, household, or establishment. "D" indicates that data in the cell have been suppressed to avoid disclosure of information pertaining to individual companies.

## EXPLANATION OF GENERAL TERMS

**Capacity.** The maximum quantity of a product that can be produced in a plant in 1 day if operating for 24 hours. Includes the capacity of idle plants until the plant is reported to be destroyed, dismantled, or abandoned.

**Consumption.** Materials used in producing or processing a product or otherwise removing the product from the inventory.

**Exports.** Includes all types of products shipped to foreign countries, or to agents or exporters for reshipment to foreign countries.

**Gross shipments.** The quantity or value of physical shipments from domestic establishments of all products sold, transferred to other establishments of the same company, or shipped on consignment, whether for domestic or export sale or use. Shipments of products purchased for resale are omitted. Shipments of products made under toll arrangements are included.

**Interplant transfers.** Shipments to other domestic plants within a company for further assembly, fabrication, or manufacture.

**Inventories.** The quantity or value of finished goods, work in progress, and materials on hand.

**Machinery in place.** The number of machines of a particular type in place as of a particular date whether the machinery was used for production, prototype, or sampling, or was idle. Machinery in place includes all machinery set up in operating positions.

**Net receipts.** Derived by subtracting the materials held at the end of the previous month from the sum of materials used during the current month.

**Production.** The total volume of products produced, including: products sold; products transferred or added to inventory after adjustments for breakage, shrinkage, and obsolescence, plus any other inventory adjustment; and products that undergo further manufacture at the same establishment.

**Quantities produced and consumed.** Quantities of each type of product produced by a company for internal consumption within that same company.

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**Quantity and value of new orders.** The sales value of orders received during the current reporting period for products and services to be delivered immediately or at some future date. Also represents the net sales value of contract change documents that increase or decrease the sales value of the orders to which they are related, when the parties concerned are in substantial agreement as to the amount involved. Included as orders are only those that are supported by binding legal documents such as signed contracts or letter contracts.

**Quantity and value of shipments.** The figures on quantity and value of shipments represent physical shipments of all products sold, transferred to other establishments of the same company, or shipped on consignment, whether for domestic or export sale. The value represents the net sales price, f.o.b. plant, to the customer or branch to which the products are shipped, net of discounts, allowances, freight charges, and returns. Shipments to a company's own branches are assigned the same value as comparable appropriate

allocation of company overhead and profit. Products bought and resold without further manufacture are excluded.

**Stocks.** Total quantity of ending finished inventory.

**Unfilled orders (backlog).** Calculated by adding net new orders and subtracting net sales from the backlog at the end of the preceding year.

#### **HISTORICAL NOTE**

Data on pumps and compressors have been collected by the Census Bureau since 1960. Data on hydraulic fluid power pumps and motors formerly collected on this survey are now included in the Current Industrial Report, MA333N, Fluid Power Products. Historical data may be obtained from Current Industrial Reports available at your local Federal Depository Library.