CHEMPUMP
A DIVISION OF TEIKOKU USA INC.

Instruction Manual

for: Installation,Operation, & Maintenance

DYNAPUMP

Sealless Leakproof Canned Motor Pump

500 SERIES

700 SERIES

800 SERIES

J SERIES

5/04

Table of Contents

Page

SECTION 1.
General Information 1
1.1 General Design and Operation 1
1.2 Bearings 1

SECTION 2.
Installation 1
2.1 Receipt Inspection 1
2.2 Structural 1
2.3 Pump Location 1
2.4 Piping Data 1
2.5 Electrical 2
2.5.1 General 2
2.5.2 Starting Equipment 2
2.5.3 Thermal Cutout (Series J Dynapump) 3
2.5.4 Electrical Isolation 3
2.5.5 Jackets (Series J Dynapump only) 3

SECTION 3
Operation 3
3.1 Priming and Venting 3
3.2 Rotation Check 3
3.3 Starting Procedure 4
3.4 Shutdown Procedure 4

SECTION 4.
Maintenance 4
4.1 Bearing Inspection 4
4.2 Rotor Assembly Inspection 4
4.3 Stator Assembly Inspection 5
4.4 Disassembly and Reassembly Procedures 5
4.5 Thermal Cut Out Switch (Series J only) 6

FIGURES
2-1 Wiring diagram 460 Volt, 3 Phase 6
2-2 Wiring diagram voltages other than 460 Volt, 3 Phase 6
2-3 Motor electrical connection diagram, 500 & 700 Series 7
2-4 Motor electrical connection diagram, 800 Series, 1 Phase 7
2-5 Motor electrical connection diagram, 800 & J Series, 3 Phase 7

TABLES
2-1 Electrical Data, 500 & 700 Series 8
2-2 Electrical Data, 800 Series 8
2-3 Electrical Data, J Series 8
2-4 Critical Dimensions, All Models 8
2-5 Trouble Shooting 9

APPENDIX

Trouble Analysis Sheet A-1
Fluid Decontamination Form (Page 1) A-2
Fluid Decontamination Form (Page 2) A-3

PERFORMANCE CURVES

500 Series:

500	3450 RPM	(A-70162)
500	2880 RPM	(A-70218)

700 Series:

700	3450 RPM	(A-70163)
700	2880 RPM	(A-70219)

800 Series:

800	3450 RPM, 1 PHASE	(A-70007)
800	3450 RPM, 3 PHASE	(A-70006)
800	2880 RPM, 1 PHASE	(A-70014)
800	2880 RPM, 3 PHASE	(A-70013)

J Series:

JA	3450 RPM	(A-70045)
JB	3450 RPM	(J-70046)
JC	3450 RPM	(A-70047)
JA	1750 RPM	(A-70210)
JB	1750 RPM	(A-70213)
JC	1750 RPM	(A-70215)
JA	2880 RPM	(A-70201)
JB	2880 RPM	(A-70212)
JC	2880 RPM	(A-70216)
JA	1440 RPM	(A-70211)
JB	1440 RPM	(A-70214)
JC	1440 RPM	(A-70217)

DRAWINGS

500 Series:

500 Series	Cross Section	(C-65096)
500 Series	Outline	(C-60513)

700 Series:

700 Series	Cross Section	(C-65098)
700 Series	Outline	(C-60514)

800 Series:

800 Series	Cross Section	(C-65105)
800 Series	Outline	(C-60515)

J Series:

J Series	Cross Section	(C-65099)
JA Series	Outline	(C-60510)
JB Series	Outline	(C-60511)
JC Series	Outline	(C-60512)

CAUTION

Dynapumps are canned motor, sealless pumps which are normally used on fluids which may be hazardous. Care should be exercised upon installation, start up, removal and maintenance of the pumps. Recommended safety equipment should be used at all times.

Prior to returning any Dynapumps to the factory the following procedure must be followed:

1. Return Authorization must be obtained from the factory.

2. The pump must be decontaminated and cleaned.

3. The pump must be accompanied by a Decontamination Form, completely filled out and signed by a responsible individual at the customer's facility. (Refer to copy of Decontamination Form in rear of the Instruction Manual.)

It is recommend that, as a minimum, a set of bearings and gaskets be purchased for each Dynapump installed. When ordering spare parts, please reference the serial number and model designation indicated on pump nameplate. When ordering an impeller assembly, specify the diameter which can be measured across the blade tips.

Dynapumps purchase for a particular application should only be used for that service. Metallurgy, bearing materials and motor size may not be compatible if used on a different application. Consult your local, authorized Chempump representative of distributor on contact the factory for confirmation.

SECTION 1. General Information

1.1 General Design and Operation

The Dynapump sealless pump is a precision built unit that, with proper care, will give years of trouble-free, leakproof service. This manual containing basic instruction for installation, operation and maintenance of Dynapumps is designed to assist you in obtaining this service. It is important that the persons responsible for the installation, operation and maintenance of the pump read and understand the manual thoroughly.

Trouble-free Dynapump performance begins with proper pump selection and application. If the selected pump does not have the required performance characteristics or if the materials of construction are not properly specified for the fluid being handled, unsatisfactory operation may result.

Dynapump has only one moving part, a combined rotor-impeller assembly which is driven by the magnetic field of an induction motor. A small portion of the pumped fluid is allowed to recirculate through the rotor cavity to cool the motor and lubricate the bearings. The stator windings are protected from contact with the recirculating fluid by a corrosion-resistant non-magnetic alloy liner, which completely seals the stator windings.

1.2 Bearings

Dynapump bearings are molded carbon graphite (other materials are furnished depending on applications). Each bearing is manufactured to close tolerances for a high degree of concentricity.

SECTION 2. Installation

2.1 Receipt Inspection

1. Visually inspect the shipping container for evidence of damage during shipment.
2. Check unit to see that suction and discharge connections are sealed.
3. Inspect the suction and discharge to be certain that they are clean of foreign matter.

2.2 Structural

The pump design and construction eliminates the necessity of aligning the pump and motor. The pump can be supported from the piping or by its base if one is provided. It should be mounted in such a way as to have its weight properly supported. Suction and discharge piping must be properly supported and aligned so that no strain is placed on the pump casing.

2.3 Pump Location

Locate the pump as close as possible to the fluid supply with positive suction head. Installation with suction lift is not recommended.

Location of the pump and arrangement of the system should be such that sufficient NPSH (Net Positive Suction Head) is provided over vapor pressure of the fluid at the pump inlet. NPSH requirements at the design point are stated on the pump Performance Curve.

Depending on job conditions, available NPSH can sometimes be increased to suit that required by the pump for satisfactory operation. NPSH can be improved by changes in the piping, in liquid supply level, by pressurizing the suction vessel or other methods.

See Maintenance Trouble Shooting, Table 2-5.

2.4 Piping Data

Observe the standards of the Hydraulic Institute when sizing and making up suction and discharge piping. Follow these procedures:

1. Remove burrs and sharp edges when making up joints.
2. Use pipe hangers or supports at necessary intervals.
3. Provide for pipe expansion when required by fluid temperature.
4. When welding joints, avoid possibility of welding scatter entering the line and thereby entering the pump. Do not weld pipe while connected to pump.

5. When starting up a new system, place a temporary course mesh screen at or near the suction of the pump to catch weld shot, scale or other foreign matter. Screen should not remain in line longer than 24 hours after startup to avoid the possibility of a clogged screen starving the pump. The screen should have a net area of at least three times the area of the suction pipe.

6. Do not strain piping when making up any connections.

7. Make suction piping as straight as possible avoiding unnecessary elbows. Where necessary, use 45° or long-sweep 90° fittings.

8. Suction piping should be one or two sizes larger than pump suction port, depending on pipe length, and should go directly to the pump.

9. Insure that all joints in suction piping are airtight.

10. Install valves and other fittings in positions to avoid formation of air pockets.

11. Permanently mounted suction filters are not recommended.

It is extremely important to size and lay out the suction system to minimize friction losses and to be sure that the pump will not be "starved" for fluid during operation.

If suction pipe length is short, pipe diameter can be the same size as the pump suction port diameter. If suction piping is long, the size should be one or two sizes larger than pump suction port, depending on piping length. If elbows or tees must be used, locate them from 10 to 15 pipe diameters upstream from suction. When reducing to pump suction port diameter, use eccentric reducers with eccentric side down to avoid air pockets.

When operating under conditions where pump prime can be lost during off cycles, a foot valve should be provided in the suction line to avoid the necessity of priming each time the pump is started. This valve should be of the flapper type rather than the multiple spring type and of ample size to avoid undue friction in the suction line.

When necessary to connect two or more pumps to the same suction line, provide gate valves so that any pump can be isolated from the line. Install gate valves with stems horizontal to avoid air pockets. Globe valves should be avoided, particularly where NPSH is critical.

If discharge pipe length is normal, pipe diameter can be the same size as the pump discharge port diameter. If discharge piping is of considerable length, use larger diameter pipe (one or two sizes larger).

If the pump is to discharge into a closed system or an elevated tank, place a gate valve or check valve in the discharge line close to the pump. The pump can then be opened for inspection without fluid loss or damage to the immediate area.

RECOMMENDED

Install properly sized pressure gauges in suction and discharge lines near the pump ports so that operation of the pump and system can be easily observed. Should cavitation, vapor binding, or unstable operation occur, widely fluctuating discharge pressures will be observed.

Such gauges provide a positive means of determining actual system conditions and can be used to great advantage in evaluating system problems.

2.5 Electrical

2.5.1 General

All Dynapumps are started with full line voltage. Connections for high and low voltage are shown on the voltage connection portion of the nameplate. Phase sequence also is shown. (See Paragraph 3.2 for checking direction of rotation). Also see Figures 2-3, 2-4 and 2-5, depending on electrical source characteristics.

NOTE

The single phase models utilize a capacitor. The life of the capacitor is affected by high temperature.

2.5.2 Starting Equipment

Motor starters (normally not supplied with Dynapumps) should be sized to handle the load required. Start KVA, Full Load Hp and Full Load Amps Data are listed in Table 2-1, 2-2 and 2-3. Heaters in the starters should be sized for the amperage shown on the Chempump nameplate. DO NOT size heaters in excess of 10% of full load amp rating. In order to provide complete protection for Dynapump motors under all conditions, it is recommended that "quick trip" (Class 10) type heaters be used in the starters where available. Standard heaters

provide adequate protection for Chempump motors under starting or normal running conditions, but require a greater length of time than "quick trip" type heaters to cut out if the motor is subject to locked rotor or overload conditions. Also see Tables 2-1, 2-2, or 2-4, for electrical wiring data for the most common Dynapump motor sizes to assist in the electrical installation of the unit.

2.5.3 Thermal Cutout (Series J Dynapump)

Only the Series J Dynapumps are equipped with a thermal cutout. This is a heat-operated bimetallic switch mounted in intimate contact with the stator windings. It is to be wired in series with the holding coil in the starter box by removing a jumper, as shown in Case I and Case II of Wiring Diagram.

WARNING

Do not connect TCO in series with main power lead. Excessive heat buildup in the winding area opens the normally closed thermal switch, which in turn opens the holding coil circuit, shutting off power to the pump. Be sure to connect the thermal cutout as shown in the diagrams in Series J Wiring.

Thermal cutouts are set to open at 425°F in Class R insulated motors. If the motor cuts out because of TCO action, there will be a time delay before the motor can be restarted. The motor must be restarted manually. DO NOT RESTART UNTIL YOU DETERMINE THE SOURCE OF THE OVERHEATING.

WARNING

The thermal cutout switch does not provide protection against fast heat buildup resulting from locked rotor conditions, single phasing or extremely heavy overloads. This protection must be provided for by the thermal overload relays in the magnetic starter. The rating of the overload should be selected high enough to avoid nuisance cutouts under running loads but must not be oversized.

2.5.4 Electrical Isolation

To eliminate electrolytic corrosion when handling solutions during an electrolysis or plating operation, Dynapump should be electrically isolated. Insulated couplings or non-conductive plastic piping must be used in the primary suction and discharge lines. The Dynapump must be isolated electrically from the tank and separately grounded.

2.5.5 Jackets (Series J Dynapump only)

Since certain fluids must be handled at controlled temperatures, additional motor cooling sometimes must be provided. A removable steel jacket can be mounted to the stator band and provided with connections to plant water or cooling medium supply. This jacket is designed so that the heat is properly removed from the stator.

Where the pump model permits, low pressure steam jackets are occasionally used in installations where pumped fluid temperature must be maintained above certain limits.

SECTION 3. Operation

3.1 Priming and Venting

The pump must be primed before operating. Priming requires the filling of the pump casing and rotor chamber with system fluid. When there is a positive suction head on the pump, priming can be accomplished by opening the valves in the suction and discharge lines, allowing the pump casing and rotor chamber to fill. Air trapped in the unit will be displaced through the discharge piping. In a closed system, a vent should be provided in the system at the highest point.

3.2 Rotation Check

Centrifugal pump impellers must rotate in the proper direction to deliver rated head and capacity. The impeller must rotate in the same direction as the arrow cast in the pump casing. Jogging the pump before connecting suction piping allows visual observance of impeller rotation.

Wrong direction of rotation is indicated by a low discharge pressure. At shutoff, head is approximately 2/3 of the head produced by correct rotation. Continued operation in reverse can result in the impeller becoming loose or completely detached from the rotor shaft. If reverse rotation has occurred, it is wise to shut down and tighten the impeller nut before correct startup.

3.3 Starting Procedure

After priming and checking the direction of rotation, put the pump in operation as follows:

1. Close the valve in the discharge line, then crack open.
2. Open the valve in the suction line.
3. Start pump.
4. When the pump is running at full speed, slowly open the valve in the discharge line until the desired design point is obtained.

CAUTION

The pump should not be allowed to run for more than one minute with the discharge valve fully closed. Excessive heat and mechanical wear can occur if the pump is allowed to run longer.

In some cases, the fluid supply may contain an excessive amount of air or gas which will tend to separate from the fluid and remain in the passage of the pump. This results in the pump losing its prime and becoming air bound with a marked reduction in capacity. The discharge pressure gauge may also show large fluctuations.

If the pump appears air bound as a result of the unit not being properly primed, do not continue operation. Locate and correct the conditions that prevent proper priming before attempting to start the unit.

3.4 Shutdown Procedure

Shutdown as follows:

1. Close the valve in the discharge line.
2. Stop the pump. (De-energize the motor.)
3. Close suction valves if the pump is to be removed from service.

CAUTION

If the pump is to be shut down for a long period of time or if there is danger of freezing, stop pump, shut all suction and discharge valves, and drain the entire pump and connection piping.

SECTION 4. Maintenance

NOTE

To assist in determining remedies for various problems, see Table 2-5, Trouble Shooting.

4.1 Bearing Inspection

Initial inspection of the unit must be made about 1500 running hours or three months, whichever occurs first after initial startup. Subsequent inspection periods will be dependent on the wear rate experienced during the initial inspection, but in no case should any inspection period extend beyond three years.

If initial inspection indicates that bearings are not wearing or are wearing very slightly, the next inspection may be put off for an additional 1500 running hours, or three months of operation, whichever occurs first. If inspection still indicates only slight wear, then the interval may be lengthened. However, if bearings must be changed at the initial inspection, they will need to be changed again in the time period which necessitated a change at the initial inspection; i.e., 1500 running hours.

Bearings can be inspected and replaced without removing the pump casing from the line. No main piping connections need be broken.

Bearing inspection should include measurement of bearing inside diameter and of bearing length. Journal inspection should include measurement of the outside diameter of the shaft journals. If the difference in diameters between the journal O.D. and the bearing I.D. is more than .013", replace the bearings and/or rotor assembly. Reference Table 2-4, Critical Dimensions.

4.2 Rotor Assembly Inspection

The complete rotor assembly should be visually inspected for cracks, breaks, pitting, or corrosion which might destroy the effectiveness of the hermetically sealed rotor end covers and sleeve.

The rotor assembly shaft should be visually inspected at the bearing contact area for general appearance and uniform wear. Excessive undercutting, pitting, or scoring

is cause for rotor replacement. The hollow shaft on all Dynapump models should be inspected for possible material buildup of plugging. Refer to Table 2-4, Critical Dimensions, for allowable wear, bearing I.D. plus shaft O.D.

4.3 Stator Assembly Inspection

The complete stator assembly should be visually inspected for cracks, breaks, pitting or corrosion in the stator liner which might destroy the effectiveness of the barrier.

Inspect the wiring of the stator assembly by checking the visible portion of the connector leads for cracked, broken, or frayed insulation. Then, check the condition of the motor windings by taking readings with an ohmmeter and a meggar.

CAUTION

Between prolonged cycles of pumping fluids which may solidify, such as caustic soda, flush the system with steam, water, or the proper solvent to prevent the piping and internal passages of the pump from becoming plugged.

4.4 Disassembly and Reassembly Procedures

Disassembly of the unit should be made in the following manner: (Refer to the cross section drawing, located in this manual, for each series.)

SERIES 500/700/800 SERIES

Disassembly of the unit for bearing and journal inspection should be made in the following manner:
(Refer to cross-section drawings.)

1. Turn off power.
2. Disconnect the electrical supply.
3. Close the valves in the suction and discharge lines (if provided). Remove the drain plug at the bottom of the pump casing and drain the pump. If no drain plug is provided, caution must be taken in case of liquid being retained in the pump. Replace the drain plug after draining is completed.
4. Remove the bolts or "V" clamp holding the front end bell to the pump casing. Remove the complete motor end which will include the impeller and "O" ring.
5. Remove the impeller nut (left hand thread) or pin from the shaft. Slip off impeller.
6. ***Series 500 and 700:*** Remove the front retaining ring from the groove in the stator liner and remove the filter screen. Remove the front bearing retainer.

   Series 800: Remove the front bearing retainer from the motor section by removing the front bearing retaining screws.
7. Remove the filter screen
8. Then pull gently on the protruding shaft, and slip the front bearing and rotor assembly from the motor section.
9. To remove the rear bearing from inside the motor section, slip a "U" shaped wire, curled outward at both ends, inside the bearing shaft hold. Once the curled ends are engaged on the back end of the bearing, pull out the bearing.

NOTE

It is also possible to inspect and replace the motor windings on the Dynapumps if required. Proceed in the following manner (Ref. Fig. 6):

1. Merely slip off the stator band from the motor section.
2. Remove the four stator retaining screws holding the stator to the top hat/front end bell assembly.
3. Slip off the stator from the top hat/front end bell assembly.

SERIES "J"

1. Shut pump down. Do not forget to close discharge valve first and then the suction valve.
2. Drain pump.
3. Remove cooling inlet and drain connections, if used.
4. Remove V band clamp by loosening nut.
5. Remove motor section with impeller. If necessary, disconnect power cable from connector box. (Disconnecting power cable will allow the assembly to be taken to work bench.)
6. Remove impeller nut (nut turns off in the same direction as impeller turns . . . left hand thread) and remove impeller.
7. Remove rear bearing housing assembly.
8. Remove cotter pin, and remove bearing.
9. Test for bearing wear as discussed below.
10. Remove rotor assembly.
11. Remove front bearing housing. Pull out cotter pin and remove bearing.

REASSEMBLY

500/700/800 SERIES

To reassemble the unit, simple reverse the disassembly procedure, carefully noting the following:

1. When replacing the rear bearing (with stepped end toward you), make sure the bearing seats against the bottom end of the motor section and that one of the key slots in the back of the bearing seats over the bearing retaining pin or in line with dimples in stator liner. (The front and rear bearings are identical.)
2. The front bearing is replaced with the stepped end away from you.
3. After positioning the front bearing retainer, check end play of the unit (front to back movement of the shaft). Refer to critical dimensional chart, Table 2-4.

J SERIES

1. Reassemble pump by reversing disassembly procedure, replacing old gaskets with new ones. BE SURE TO TAKE UP EVENLY ON BOLTS SECURING REAR BEARING HOUSING. Otherwise, misalignment will cause rapid bearing wear.
2. Replace clamp, tighten nut to approx. 35 in. lbs.
3. Before connecting the motor, spin the rotor-impeller assembly by hand to ensure that it does not bind. Check end play. Refer to Table 2-4.
4. Complete reassembly.

4.5 Thermal Cut Out Switch (Series J only)

CASE I - 460 VOLT, 3-PHASE CHEMPUMP
See Figure 2-1.

Typical 3-phase across-the-line magnetic starter with start-stop push button station shown.

Thermoswitch (thermal cut-out inside Chempump motor) is wired in series with holding coil circuit by removing jumper between over load cut-outs as shown.

Be sure to size heaters properly. Rating should be as close as possible to current draw noted on pump nameplate.

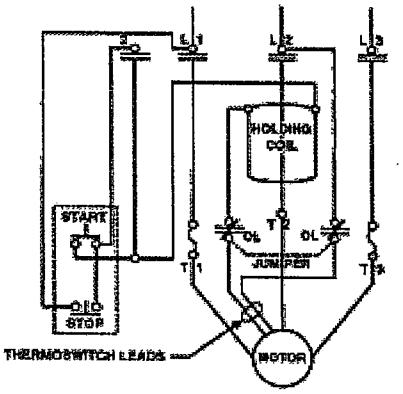


Figure 2-1. Wiring Diagram 460 Volt, 3 Phase

CASE II - All other voltages (not to exceed 600 volts), 3-PHASE CHEMPUMP. See Figure 2-2.

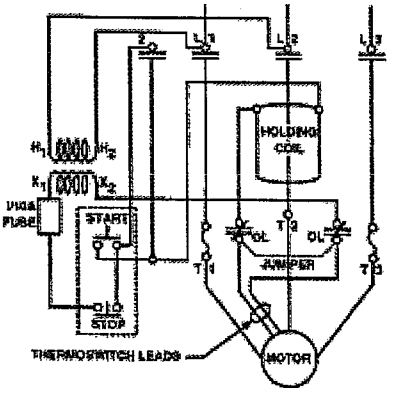


Figure 2-2. Wiring Diagram voltages other than 460 Volt, 3 phase

Use transformer with primary and 115 volt secondary. Use properly rated holding coil (115 volt). Wire Thermoswitch as for 460 volt systems described in Case 1.

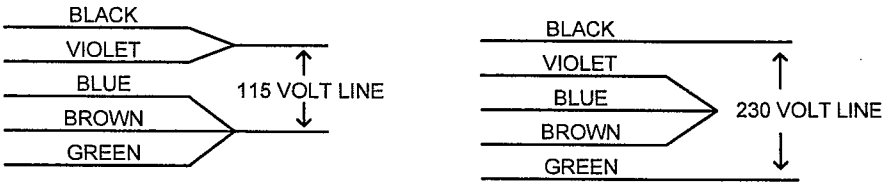


Figure 2-3
Motor Electrical Connection Diagrams
500 & 700 Series

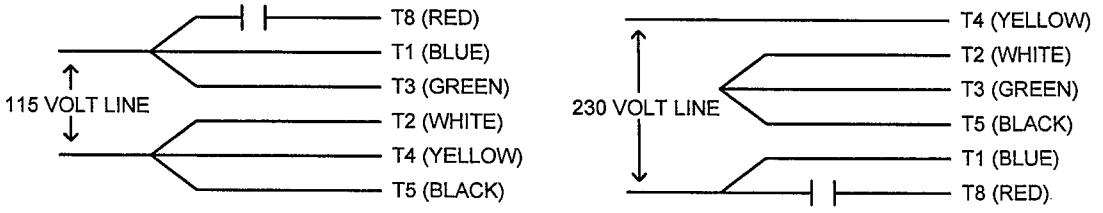


Figure 2-4
Motor Electrical Diagram
Series 800 Single Phase

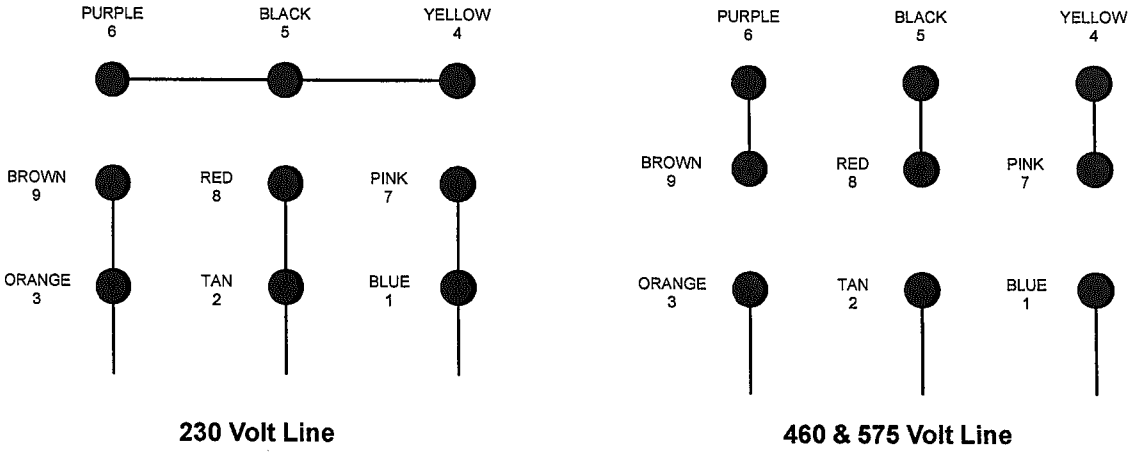


Figure 2-5
Motor Electrical Diagram
Series 800 and J Three Phase

TABLE 2-1
ELECTRICAL DATA
500 & 700 SERIES DYNAPUMPS

Model	Rated Fluid Temp °F	HP	PH	Volts	Hz	Motor Insulation	Full Load KW	Full Load Amps	RPM
581E and 781E	-40 to 225	1/2	1	230	60/50	F	0.70	3.6	3450
583E and 783E	-40 to 225	1/2	1	115	60/50	F	0.70	7.3	3450
584E and 784E	-40 to 225	1/2	3	230	60/50	F	0.40	3.3	3450

TABLE 2-2
ELECTRICAL DATA
800 SERIES DYNAPUMPS

Model	Rated Fluid Temp °F	HP	PH	Volts	Hz	Motor Insulation	Full Load KW	Full Load Amps	RPM
883E	-40 to 300	3/4	1	115/230	60	R	1.5	16.3/8.15	3450
884E	-40 to 300	3/4	3	230/460	60	R	1.6	5.35/2.67	3450
887E	-40 to 300	3/4	3	575	60	R	1.6	2.14	3450
888E	-40 to 300	3/4	3	190/380	50	R	1.38	5.6/2.8	3450

TABLE 2-3
ELECTRICAL DATA
J SERIES DYNAPUMP, 3400 RPM CLASS R INSULATION

Chempump Model	Rated Fluid Temp °F	Motor Size	Start KVA	Full Load Ratings				
				KVA	KW	Amperes		
						230 V	460 V	575 V
All	-40 to 300	1K	5.1	1.9	1.5	4.6	2.3	1.8
	-40 to 300	1.5K	10.4	3.1	2.5	7.7	3.83	3.1
	-40 to 300	3K	20.8	5.3	4.4	13.4	6.7	5.4
	-40 to 300	5K	28.4	7	5.9	17.6	8.80	7.0

TABLE 2-4
CRITICAL DIMENSIONS

Model	Bearing Inside Diameter (In.)	Bearing Length (In.)	Shaft Journal Diameter (In.)	End Play (In.)
500 & 700 Series	0.497/0.498	0.750	0.495/0.496	0.049/0.075
800 Series	0.832/0.833	1.211/1.215	0.829/0.8295	0.049/0.075
J Series	0.9175/0.9185	2.00	0.9143/0.9150	0.010/0.114

Table 2-5 Trouble Shooting

Trouble	Cause	Remedy
I. Failure to Deliver Required Capacity	a. Pump not primed. b. Air leaks in suction piping. c. Motor not energized. d. Motor windings burnt out or grounded. e. Low suction head. f. Discharge head too high. g. Discharge valve closed or partially opened. h. Impeller clogged. i. Wrong direction of rotation. j. Damaged impeller.	a. Reprime pump in accordance with Paragraph 3-2. b. Locate leaks and eliminate. c. Check motor wiring. See Paragraph 2-5. d. Check electrical continuity of windings and if negative response, stator assembly needs to be replaced. e. Correct suction side of system to insure availability of design NPSH. f. Correct discharge side of system to insure proper operating conditions. g. Open discharge valve until rated discharge pressure is obtained. h. Remove obstructions in the impeller. i. Reverse any two motor leads and check with phase sequence meter. See Paragraph 3-2. j. Impeller must be replaced.
II. Insufficient Pressure	a. Pump not primed. b. Air leaks in suction piping. c. Motor not energized. d. Motor windings burnt out or grounded. e. Low suction head. f. Discharge valve open too wide. g. Impeller clogged. h. Wrong direction of rotation. i. Damaged impeller.	a. Reprime pump in accordance with Paragraph 3-2. b. Locate leaks and eliminate. c. Check motor wiring. See Paragraph 2-5. d. Check electrical continuity of windings and if negative response, stator assembly needs to be replaced. e. Correct suction side of system to insure availability of design NPSH. f. Close down discharge valve until rated discharge pressure is obtained. g. Remove obstructions in the impeller. h. Reverse any two motor leads and check with phase sequence meter. See Paragraph 3-2. i. Impeller must be replaced.
III. Pump Loses Prime After Starting	a. Pump not properly primed at starting. b. Air leaks in suction piping. c. Air or gas in fluid. d. Low suction head.	a. Reprime pump in accordance with Paragraph 3-2. b. Locate leaks and eliminate. c. Locate source of gas or air entrainment and correct. d. Correct suction side of system to insure availability of design NPSH.
IV. Pump Takes Too Much Power	a. Shaft bent. b. Rotating element binds. c. Electrical short. d. Wrong direction of rotation.	a. Rotor assembly must be replaced. b. Replace bearings (See Paragraph 4-1) as a result of excessive wear, or check for presence of foreign material in rotor chamber. c. Check electrical continuity of all phases of the motor winding and replace stator assembly if necessary. d. Reverse any two motor leads and check with phase sequence meter. See Paragraph 3-2.
V. Pump Vibrates	a. Foundation not sufficiently rigid. b. Impeller partially clogged. c. Shaft bent. d. Worn bearings. e. Rotating element rubbing stator liner.	a. Tighten all bolts involved with the pump base and base supporting structure. b. Impeller partially clogged, causing unbalance. Remove obstructions in the impeller. c. Replace rotor assembly or straighten shaft if bend is not too great. d. Replace bearings (See Paragraph 4-1). e. Replace bearings (See Paragraph 4-1) as a result of excessive wear or check for presence of foreign material in rotor chamber.
VI. Motor Running Hot	a. If jacketed, no coolant flow circulating through jacket. b. Jacket clogged, preventing full circulation of coolant flow. c. Motor operating at overload condition. d. Plugged discharge filter (if pump is equipped with filter).	a. Turn on coolant flow. b. Shut down pump and flush jacket (If jacket is removable type, remove from stator and flush). c. Make sure pump is operating at design point and conditions specified when purchased. d. Remove pump from line and flush filter.

APPENDIX

CHEMPUMP
A DIVISION OF TEIKOKU USA INC.

TROUBLE ANALYSIS SHEET

CUSTOMER: _____ **DATE:** _____
ADDRESS: _____ **PHONE:** _____
_____ **FAX:** _____
CONTACT: _____ **S/N #:** _____
E-MAIL: _____

Proper analysis of the trouble you have been experiencing requires an accurate description of operating conditions and the system in which the pump is installed.

DATE INSTALLED:_____ DATE REMOVED:_____ HOURS USED: _____

1.) LIQUID OR SOLUTION HANDLED
(Include impurities or % if mixture): _____

IS DISSOLVED GAS PRESENT?_____

ARE SOLIDS IN SUSPENSION PRESENT?_____

IF SO, STATE NATURE:_____

2.) ACTUAL OPERATING CONDITIONS: TRANSFER CIRCULATION

FLOW: _____GPM SUCTION PRESSURE: _____PSIG
DISCHARGE PRESSURE: _____PSIG DIFFERENTIAL: _____PSI/FT.
PUMPING TEMPERATURE: _____F SP. GR. @ P.T.: _____

VISCOSITY AT: VAPOR PRESSURE AT:
PUMPING TEMPERATURE: _____CPS PUMPING TEMPERATURE:_____PSIA/MMHG
AMBIENT: _____CPS AMBIENT: _____PSIA/MMHG

3.) PLEASE SEND A SKETCH OF YOUR SYSTEM. GIVE A BRIEF DESCRIPTION, INCLUDING A ROUGH FLOW SHEET. INDICATE WHAT CHEMICAL OR PHYSICAL ACTION OCCURS BEFORE THE PUMP. SHOW COOLING OR HEATING SERVICES ON LINES DIRECTLY AFFECTING THE PUMP. SHOW WHAT CONTROLS ARE USED AND WHAT THEY OPERATE. IF MORE THAN ONE PUMP OPERATES ON A COMMON SUCTION, SHOW HOW THEY ARE BALANCED.

YOUR ATTENTION TO THIS REPORT IS GREATLY APPRECIATED.
UPON RECEIPT AT CHEMPUMP, WE WILL EVALUATE THE FACTS SHOWN AND RETURN OUR RECOMMENDATIONS TO YOU.

RETURN COMPLETED FORM TO:

CHEMPUMP FACTORY SERVICE CENTER
959 MEARNS ROAD, WARMINSTER, PA 18974
PHONE: (215) 343-6000 FAX: (267) 486-1037

CHEMPUMP
A DIVISION OF TEIKOKU USA INC.

DECONTAMINATION CERTIFICATION AND FLUSHING PROCEDURE

CUSTOMER _____ **DATE:** _____
ADDRESS: _____ **PHONE:** _____
_____ **FAX:** _____
CONTACT: _____ **RMA #:** _____

Please complete the items below. By providing this information, you will allow us to work as quickly and safely as possible.

PUMP MODEL: _____ **SERIAL NUMBER:** _____
PART NUMBER: _____ **DATE INSTALLED:** _____
DATE PURCHASED: _____ **INDOOR / OUTDOOR:** _____

REASON FOR RETURN: ☐ WARRANTY REQUEST ☐ FACTORY SERVICE

FAILURE INFORMATION:

☐ Failure To Deliver Required Capacity ☐ Vibration ☐ Motor Burnout
☐ Loses Prime After Starting ☐ Bearing Failure ☐ Other: _____
☐ Axial Wear Due To Thrust ☐ Insufficient Pressure

BRIEF DESCRIPTION OF PUMP FAILURE: _____
_____
_____

DECONTAMINATION INFORMATION

All pumps/parts must be completely decontaminated and all information in this section must be completed prior to shipment to our factory or service center. Shipments received without this documentation will not be accepted and will be returned to the point of shipment.

CHECK ONE OF THE FOLLOWING:

☐ The pump has been flushed by following steps A through A3 of the Chempump Flushing Procedure on page 2 of this form. No liner rupture is suspected.

☐ Both the complete pump and the stator assembly have been flushed by following steps A through B3 of the Chempump Flushing Procedure on page 2 of this form. The motor must be rewound.

FLUID PUMPED: _____ **FLUSHING FLUID:** _____

Attach completed material safety data sheets (MSDS) for these fluids. *If either fluid is proprietary, please attach a description of any characteristics that will assist Chempump in safe handling. Without detailed and complete information on the pumped fluid, we will not be able to process your order.*

PROTECTION EQUIPMENT RECOMMENDED FOR SAFE HANDLING OF THE PROCESS FLUID: _____
_____

DECONTAMINATION CERTIFIED BY: _____ **DATE:** _____

TITLE: _____ **PHONE:** _____

RETURN COMPLETED FORM AND PUMP/PART TO:

☐ CHEMPUMP FACTORY SERVICE CENTER
959 MEARNS ROAD, WARMINSTER, PA 18974
PHONE: (215) 343-6000 FAX: (267) 486-1037

☐ CHEMPUMP MIDWEST SERVICE CENTER
STATE ROUTE 2, BELMONT, WV 26134
PHONE: (304) 684-2459 FAX: (304) 684-7593

FLUSHING PROCEDURES FOR CHEMPUMP PRODUCTS

THE FOLLOWING FLUSHING PROCEDURES ARE REQUIRED TO ALLOW FOR MAXIMUM REMOVAL OF PROCESS FLUIDS.

PART "A" — COMPLETE PUMP

A) WITH THE SUCTION FLANGE DOWN, INTRODUCE AN APPROPRIATE NEUTRALIZING FLUID THROUGH THE DISCHARGE FLANGE. FLUSH THE PUMP IN THIS MANNER FOR A SUFFICIENT TIME TO ALLOW FOR THE REMOVAL OF ALL PROCESS FLUID.

A2) AGAIN, WITH THE SUCTION FLANGE DOWN, REMOVE THE CIRCULATION LINE (AND FITTING IF NECESSARY) AND INTRODUCE AN APPROPRIATE NEUTRALIZING FLUID TO THE REAR OF THE PUMP. FLUSH THE PUMP IN THIS MANNER FOR A SUFFICIENT TIME TO ALLOW FOR THE REMOVAL OF ALL PROCESS FLUID. ALSO FLUSH THE CIRCULATION LINE AND/OR HEAT EXCHANGER TUBING, AS REQUIRED.

A3) AFTER FLUSHING AS SPECIFIED ABOVE, REMOVE AS MUCH OF THE NEUTRALIZING FLUID AS POSSIBLE USING COMPRESSED AIR OR INERT GAS.

PART "B" — STATOR ASSEMBLY (if equipped with a relief valve)

IF A STATOR LINER RUPTURE IS SUSPECTED, FOLLOW THIS SECTION TO FLUSH THE STATOR CAVITY.
CAUTION: IF THIS STEP IS FOLLOWED, THE MOTOR MUST BE REWOUND.

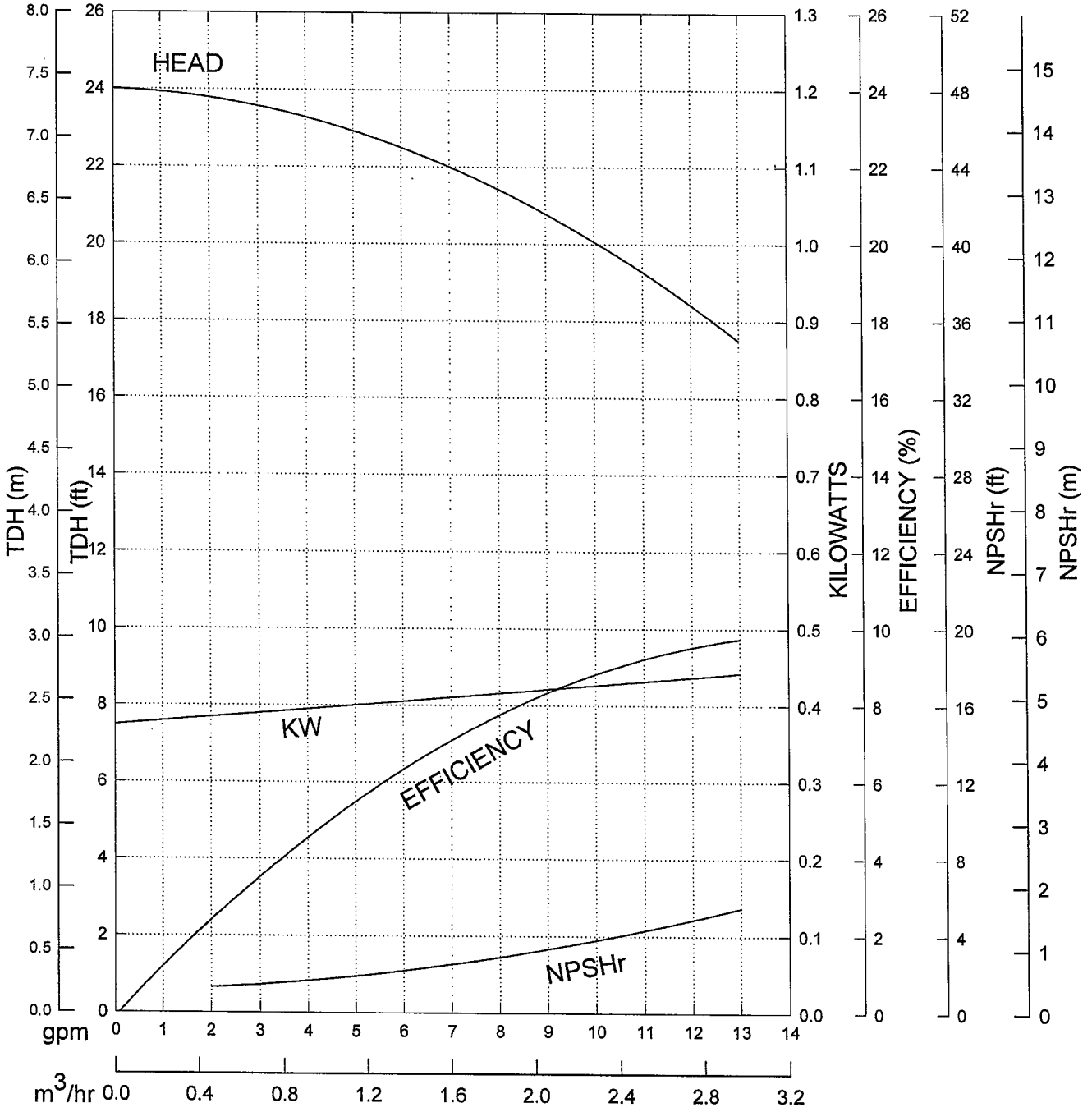
B1) REMOVE THE RELIEF VALVE. INSERT A SCREWDRIVER INTO THE RELIEF VALVE ADAPTER AND PRY THE LISK FILTER TO ONE SIDE. REMOVE THE CONNECTION BOX FROM THE LEAD NIPPLE AND CHIP AWAY THE POTTING COMPOUND FROM THE LEAD NIPPLE.

B2) POSITION THE STATOR ASSEMBLY WITH THE LEAD NIPPLE DOWN AND INTRODUCE AN APPROPRIATE NEUTRALIZING FLUID TO THE RELIEF VALVE ADAPTER. THE FLUID WILL EXIT THROUGH THE LEAD NIPPLE. FLUSH THE STATOR CAVITY IN THIS MANNER FOR A SUFFICIENT TIME TO ALLOW FOR THE REMOVAL OF ALL PROCESS FLUID AND STATOR OIL.

B3) REMOVE A MUCH OF THE NEUTRALIZING FLUID AS POSSIBLE BY PURGING THE STATOR CAVITY WITH COMPRESSED AIR OR INERT GAS FOR 3 - 5 MINUTES.

PUMP CASING	B-03579	SIZE	3/4 x 1/2	MODEL	500 Series Dynapump
IMPELLER	B-03595	IMP. DIA.	2.5	RPM	3450
SERIAL #					

Curves are based on shop test while handling clean water at 20°C and at sea level. Performance guarantees apply at rating point only. Efficiencies shown are overall wire to water. Numbers beneath model designations indicate full load kilowatt ratings for the referenced motor load lines. When pumping fluids with specific gravities other than 1.0, select pump model (see load line) to handle load equivalent in feet of water. e.g, 40 feet of fluid of Sp. Gr.=1.5 is load equivalent of 60 feet (1.5x40) of water. Please note that this is merely a short cut method to estimate the model required. For proper model selection, especially when handling a fluid with a Sp. Gr. greater than 1.7, consult your Chempump representative or the factory.

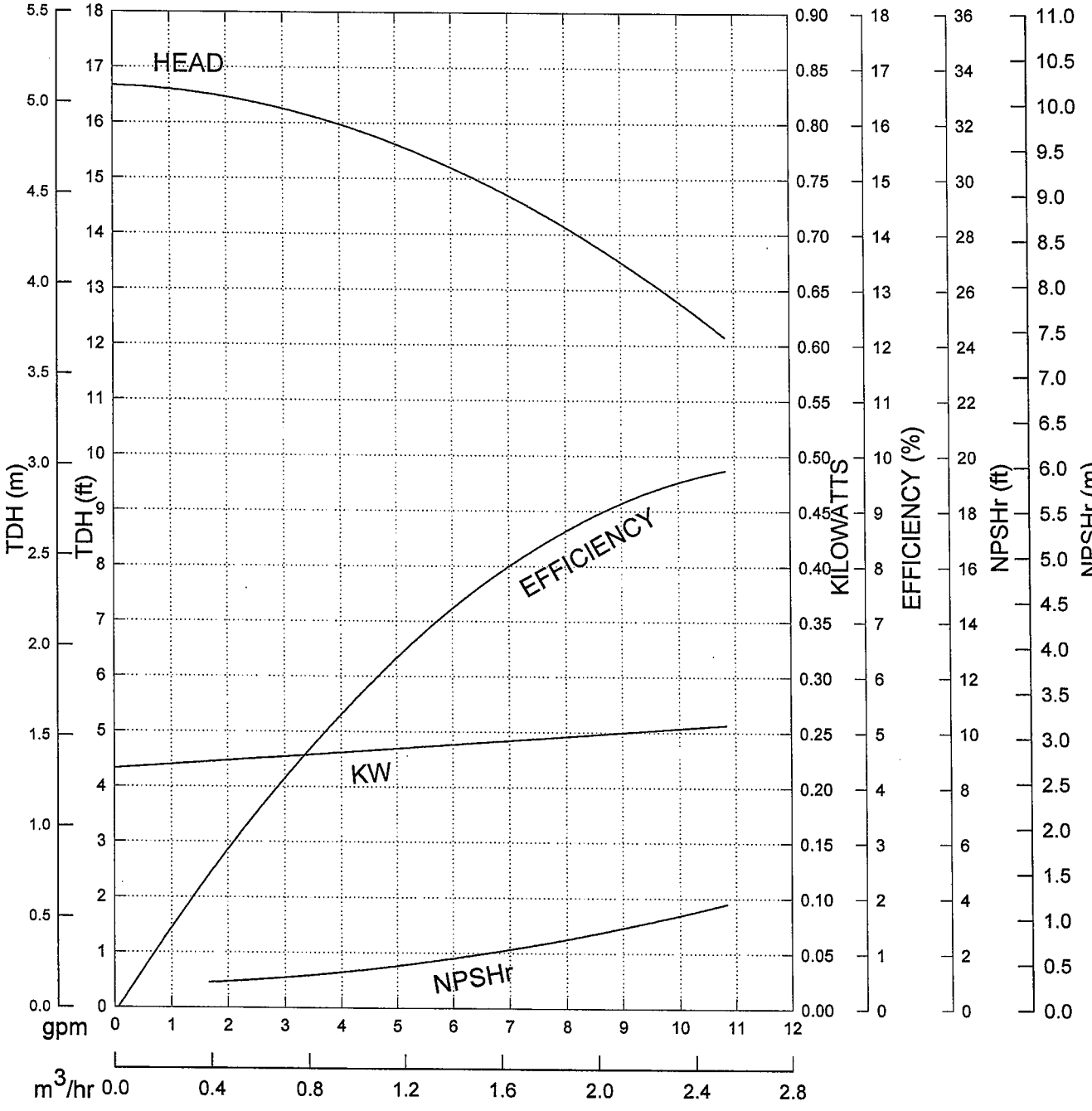


Rev 1: Resized & added metric axis. SAJ 8/00

CHEMPUMP A DIVISION OF TEIKOKU USA INC. www.chempump.com www.teikoku-usa.com	DRAWN	DATE	CURVE	REV.
	CLB	11-4-96	A-70162	1

PUMP CASING	B-03579	SIZE	3/4 x 1/2	MODEL	500 Series Dynapump
IMPELLER	B-03595	IMP. DIA.	2.5	RPM	2880
SERIAL #					

Curves are based on shop test while handling clean water at 20°C and at sea level. Performance guarantees apply at rating point only. Efficiencies shown are overall wire to water. Numbers beneath model designations indicate full load kilowatt ratings for the referenced motor load lines. When pumping fluids with specific gravities other than 1.0, select pump model (see load line) to handle load equivalent in feet of water. e.g, 40 feet of fluid of Sp. Gr.=1.5 is load equivalent of 60 feet (1.5x40) of water. Please note that this is merely a short cut method to estimate the model required. For proper model selection, especially when handling a fluid with a Sp. Gr. greater than 1.7, consult your Chempump representative or the factory.

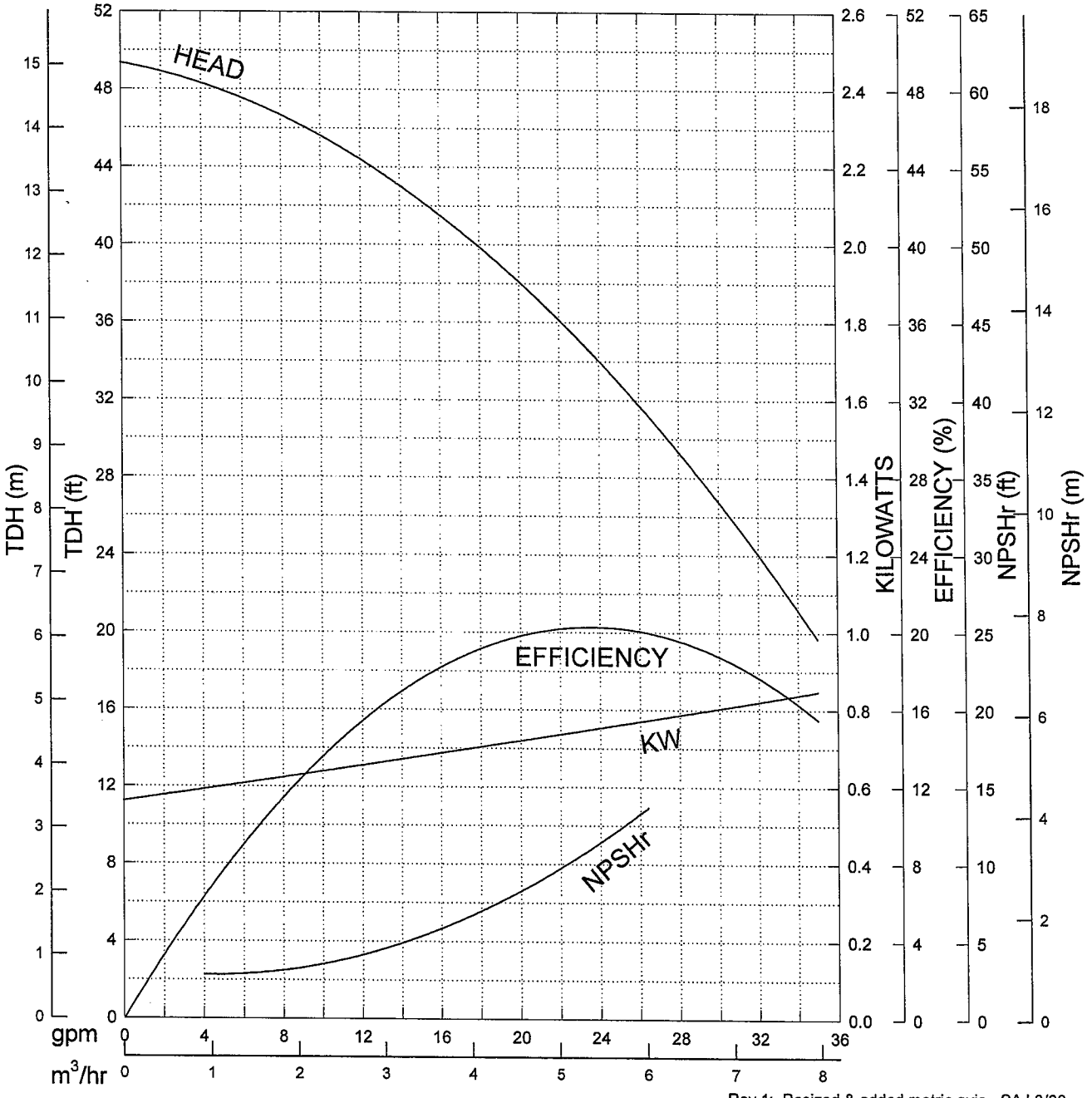


Rev 1: Resized & added metric axis. SAJ 8/00

CHEMPUMP A DIVISION OF TEIKOKU USA INC. www.chempump.com www.teikoku-usa.com	DRAWN	DATE	CURVE	REV.
	SAJ	08-29-00	A-70218	

PUMP CASING	B-03577	SIZE	1 x 1/2	MODEL	700 Series Dynapump
IMPELLER	B-03571	IMP. DIA.	3.5	RPM	3450
SERIAL #					

Curves are based on shop test while handling clean water at 20°C and at sea level. Performance guarantees apply at rating point only. Efficiencies shown are overall wire to water. Numbers beneath model designations indicate full load kilowatt ratings for the referenced motor load lines. When pumping fluids with specific gravities other than 1.0, select pump model (see load line) to handle load equivalent in feet of water. e.g, 40 feet of fluid of Sp. Gr.=1.5 is load equivalent of 60 feet (1.5x40) of water. Please note that this is merely a short cut method to estimate the model required. For proper model selection, especially when handling a fluid with a Sp. Gr. greater than 1.7, consult your Chempump representative or the factory.

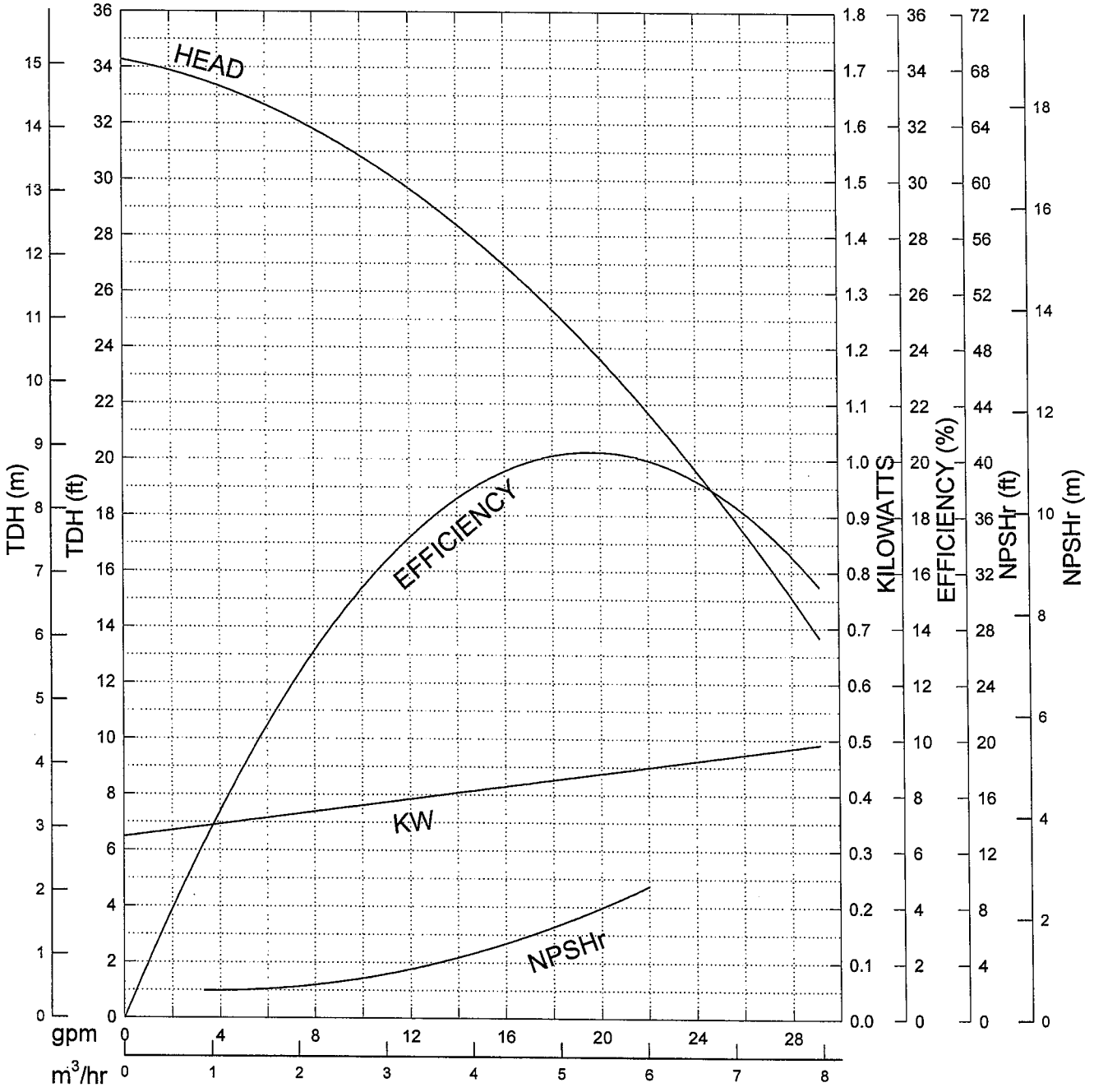


Rev 1: Resized & added metric axis. SAJ 8/00

CHEMPUMP A DIVISION OF TEIKOKU USA INC. www.chempump.com www.teikoku-usa.com	DRAWN	DATE	CURVE	REV.
	CLB	11-8-96	A-70163	1

PUMP CASING	B-03577	SIZE	1 x 1/2	MODEL	700 Series Dynapump
IMPELLER	B-03571	IMP. DIA.	3.5	RPM	2880
SERIAL #					

Curves are based on shop test while handling clean water at 20°C and at sea level. Performance guarantees apply at rating point only. Efficiencies shown are overall wire to water. Numbers beneath model designations indicate full load kilowatt ratings for the referenced motor load lines. When pumping fluids with specific gravities other than 1.0, select pump model (see load line) to handle load equivalent in feet of water. e.g, 40 feet of fluid of Sp. Gr.=1.5 is load equivalent of 60 feet (1.5x40) of water. Please note that this is merely a short cut method to estimate the model required. For proper model selection, especially when handling a fluid with a Sp. Gr. greater than 1.7, consult your Chempump representative or the factory.

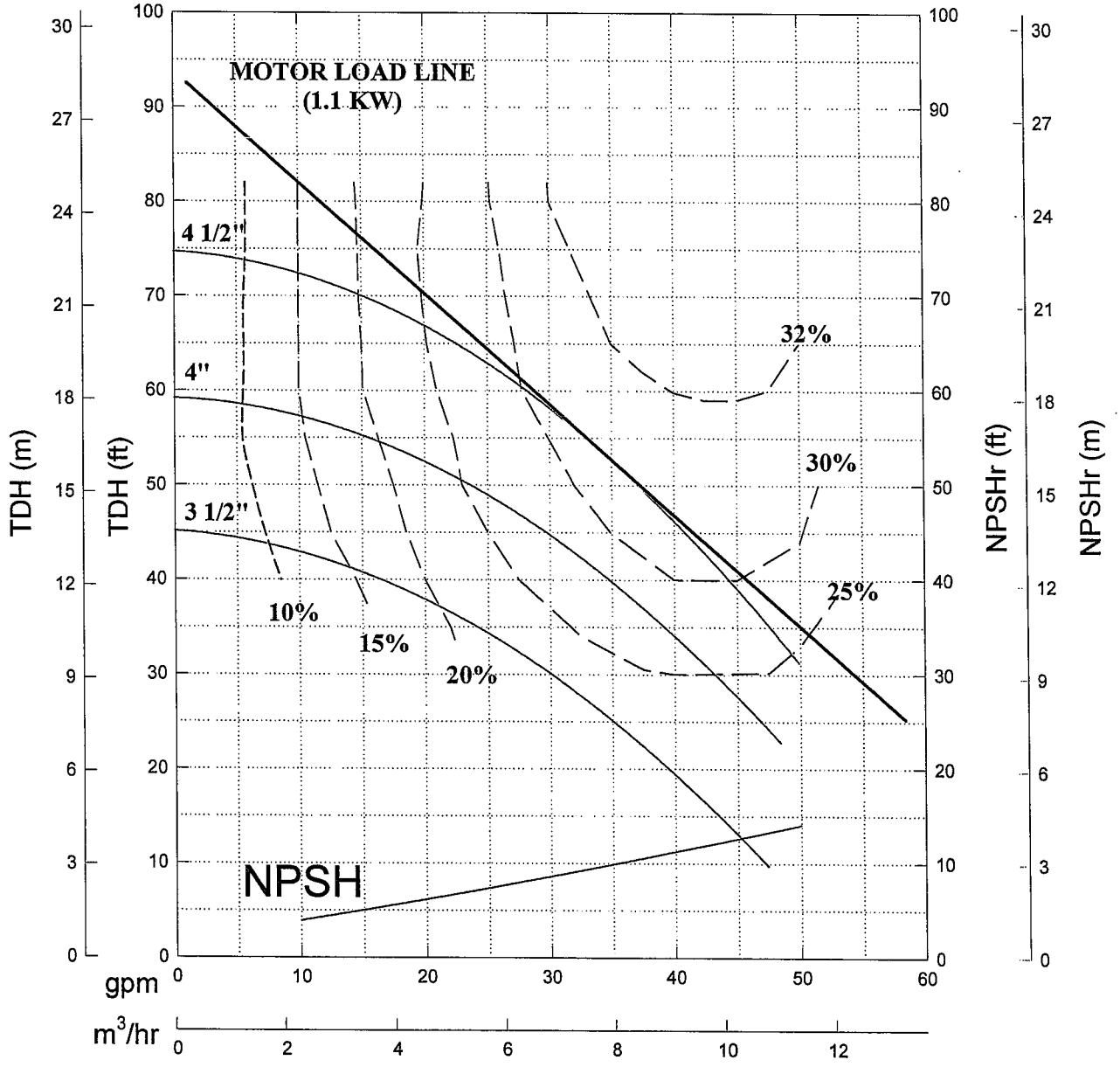


Rev 1: Resized & added metric axis. SAJ 8/00

CHEMPUMP A DIVISION OF TEIKOKU USA INC. www.chempump.com www.teikoku-usa.com	DRAWN	DATE	CURVE	REV.
	SAJ	08-31-00	A-70219	

PUMP CASING C-3974	SIZE 1 x 3/4	MODEL 800 1 PHASE	
IMPELLER C-3973	IMP. DIA.	RPM 3450	
SERIAL #	REVISION DATED 9/00, COMPUTER GENERATED		

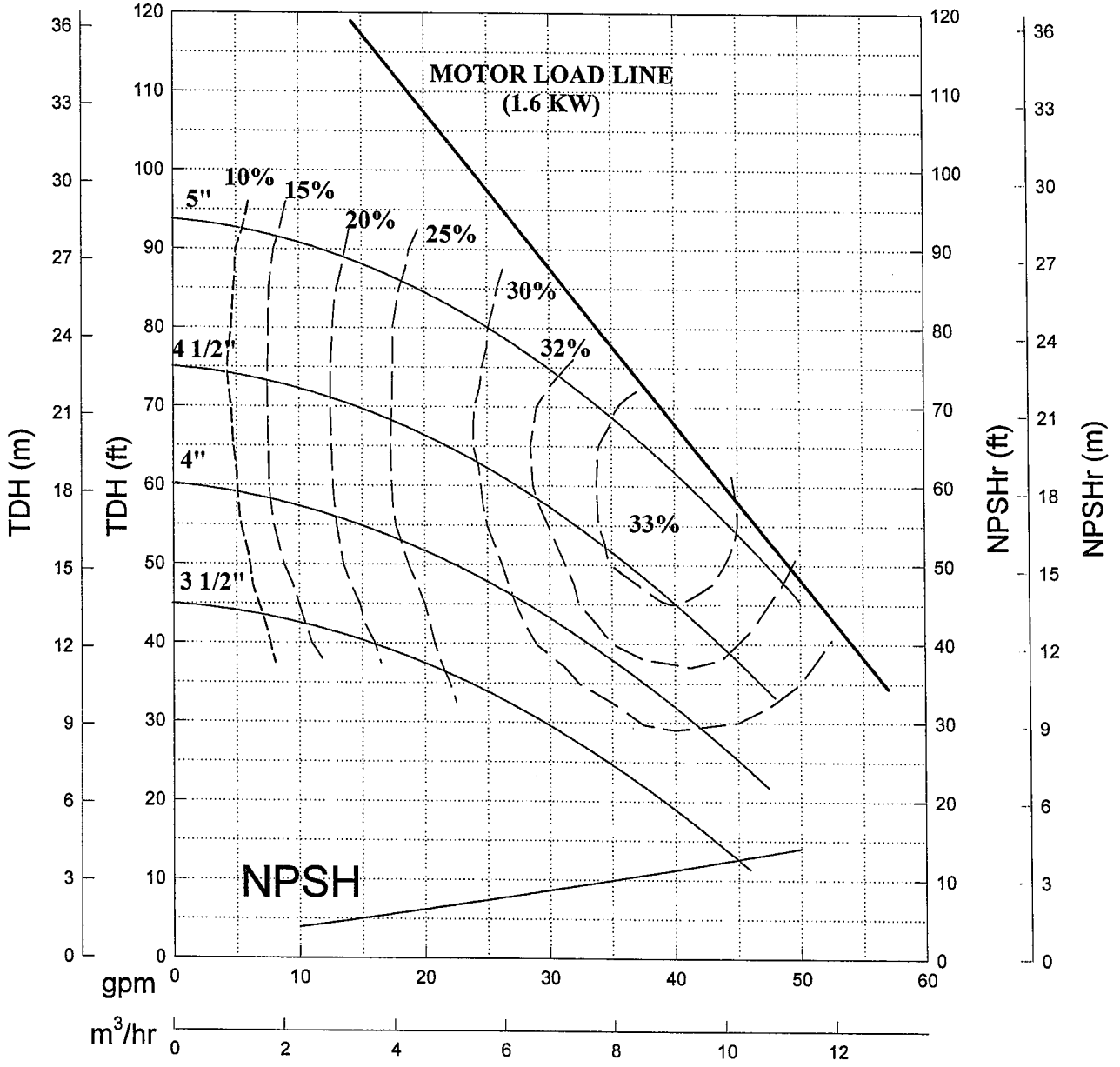
Curves are based on shop test while handling clean water at 20°C and at sea level. Performance guarantees apply at rating point only. Efficiencies shown are overall wire to water. Numbers beneath model designations indicate full load kilowatt ratings for the referenced motor load lines. When pumping fluids with specific gravities other than 1.0, select pump model (see load line) to handle load equivalent in feet of water. e.g, 40 feet of fluid of Sp. Gr.=1.5 is load equivalent of 60 feet (1.5x40) of water. Please note that this is merely a short cut method to estimate the model required. For proper model selection, especially when handling a fluid with a Sp. Gr. greater than 1.7, consult your Chempump representative or the factory.



CHEMPUMP A DIVISION OF TEIKOKU USA INC. www.chempump.com www.teikoku-usa.com	DRAWN	DATE	CURVE	REV.
	SAJ	09/05/00	A-70007	4

PUMP CASING	C-3974	SIZE	1 x 3/4	MODEL	800 3 PHASE
IMPELLER	C-3973	IMP. DIA.		RPM	3450
SERIAL #		REVISION DATED 9/00, COMPUTER GENERATED			

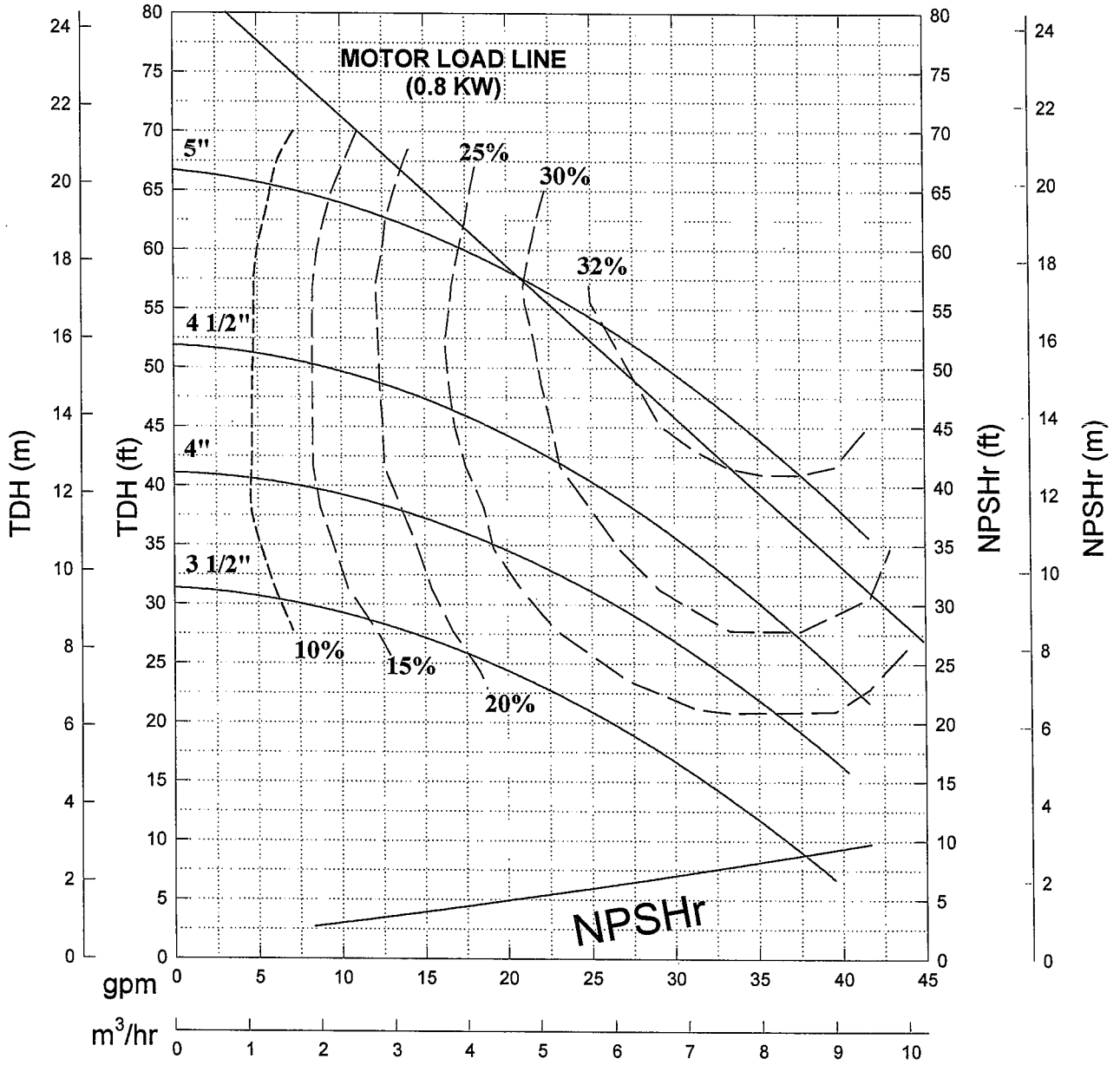
Curves are based on shop test while handling clean water at 20°C and at sea level. Performance guarantees apply at rating point only. Efficiencies shown are overall wire to water. Numbers beneath model designations indicate full load kilowatt ratings for the referenced motor load lines. When pumping fluids with specific gravities other than 1.0, select pump model (see load line) to handle load equivalent in feet of water. e.g, 40 feet of fluid of Sp. Gr.=1.5 is load equivalent of 60 feet (1.5x40) of water. Please note that this is merely a short cut method to estimate the model required. For proper model selection, especially when handling a fluid with a Sp. Gr. greater than 1.7, consult your Chempump representative or the factory.



CHEMPUMP A DIVISION OF TEIKOKU USA INC. www.chempump.com www.teikoku-usa.com	DRAWN	DATE	CURVE	REV.
	SAJ	09/06/00	A-70006	4

PUMP CASING	C-3974	SIZE	1 x 3/4	MODEL	800 1 PHASE
IMPELLER	C-3973	IMP. DIA.		RPM	2880
SERIAL #		REVISION DATED 9/00, COMPUTER GENERATED			

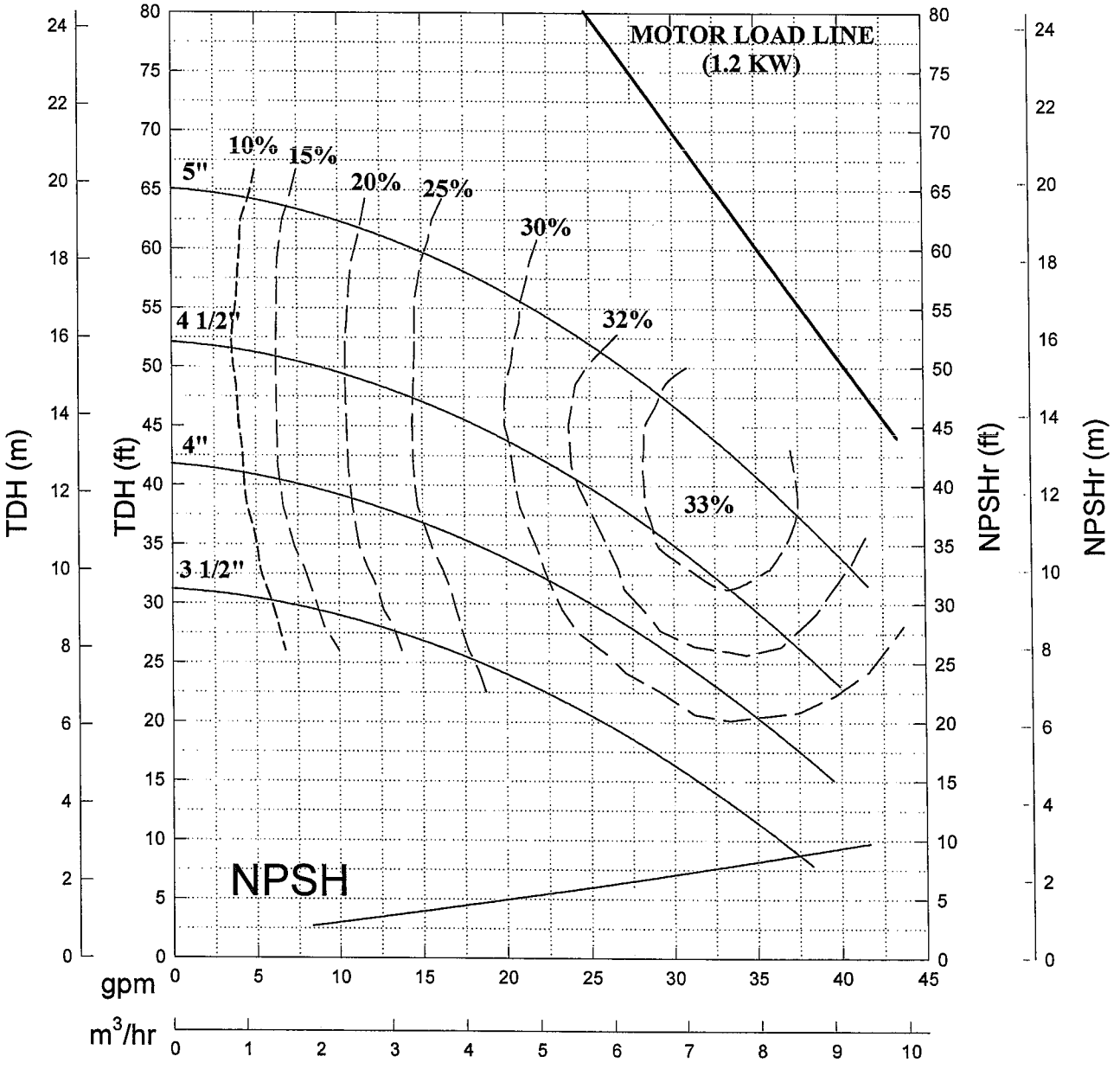
Curves are based on shop test while handling clean water at 20°C and at sea level. Performance guarantees apply at rating point only. Efficiencies shown are overall wire to water. Numbers beneath model designations indicate full load kilowatt ratings for the referenced motor load lines. When pumping fluids with specific gravities other than 1.0, select pump model (see load line) to handle load equivalent in feet of water. e.g, 40 feet of fluid of Sp. Gr.=1.5 is load equivalent of 60 feet (1.5x40) of water. Please note that this is merely a short cut method to estimate the model required. For proper model selection, especially when handling a fluid with a Sp. Gr. greater than 1.7, consult your Chempump representative or the factory.



CHEMPUMP A DIVISION OF TEIKOKU USA INC. www.chempump.com www.teikoku-usa.com	DRAWN SAJ	DATE 09/07/00	CURVE A-70014	REV. 3

PUMP CASING	C-3974	SIZE	1 x 3/4	MODEL	800 3 PHASE
IMPELLER	C-3973	IMP. DIA.		RPM	2880
SERIAL #		REVISION DATED 9/00, COMPUTER GENERATED			

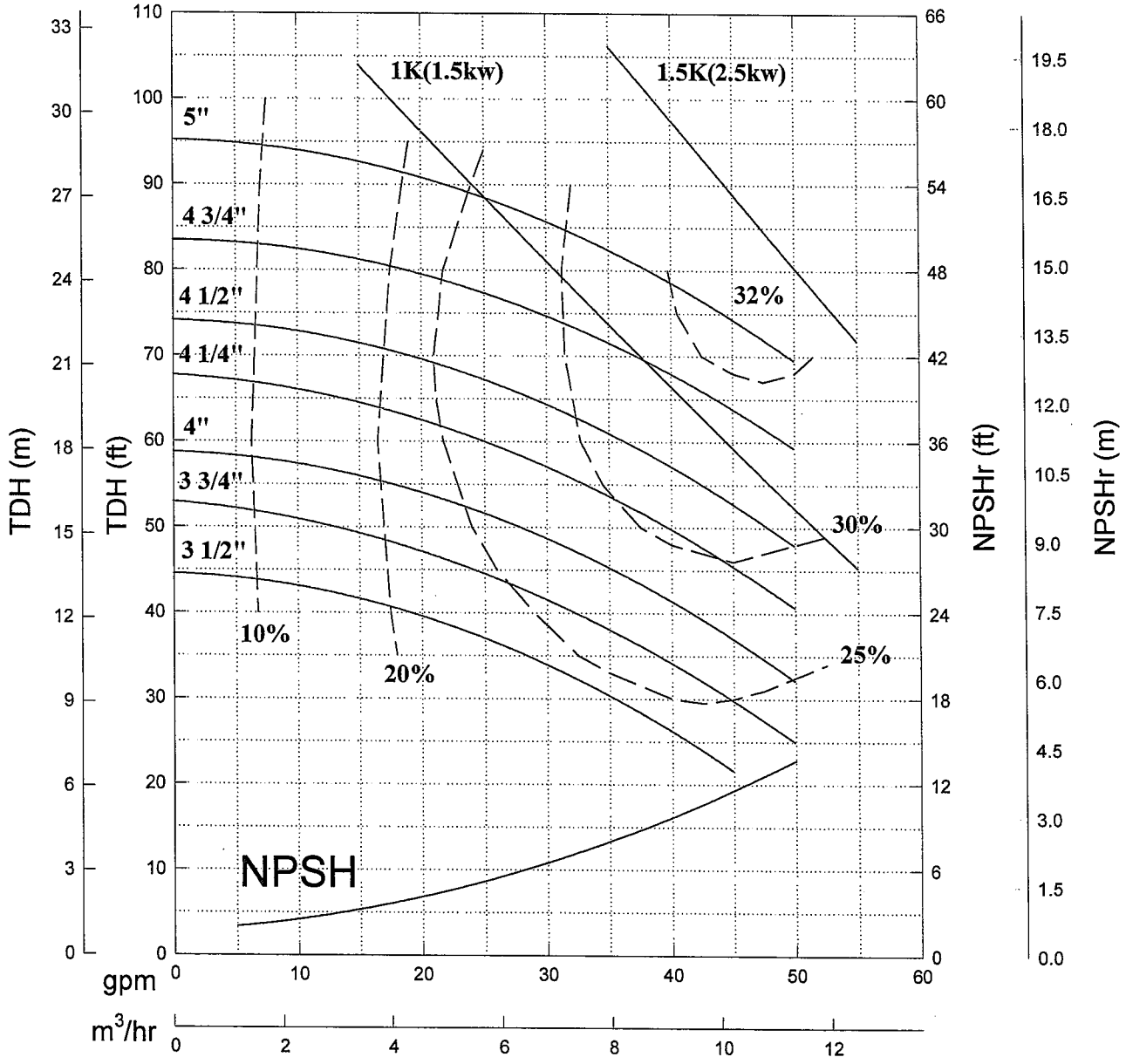
Curves are based on shop test while handling clean water at 20°C and at sea level. Performance guarantees apply at rating point only. Efficiencies shown are overall wire to water. Numbers beneath model designations indicate full load kilowatt ratings for the referenced motor load lines. When pumping fluids with specific gravities other than 1.0, select pump model (see load line) to handle load equivalent in feet of water. e.g, 40 feet of fluid of Sp. Gr.=1.5 is load equivalent of 60 feet (1.5x40) of water. Please note that this is merely a short cut method to estimate the model required. For proper model selection, especially when handling a fluid with a Sp. Gr. greater than 1.7, consult your Chempump representative or the factory.



CHEMPUMP A DIVISION OF TEIKOKU USA INC. www.chempump.com www.teikoku-usa.com	DRAWN	DATE	CURVE	REV.
	SAJ	09/06/00	A-70013	4

PUMP CASING C-38354	SIZE 1 x 3/4 x 5	MODEL JA	
IMPELLER C-38345	IMP. DIA.	RPM 3450	
SERIAL #	REVISION DATED 2/93, COMPUTER GENERATED		

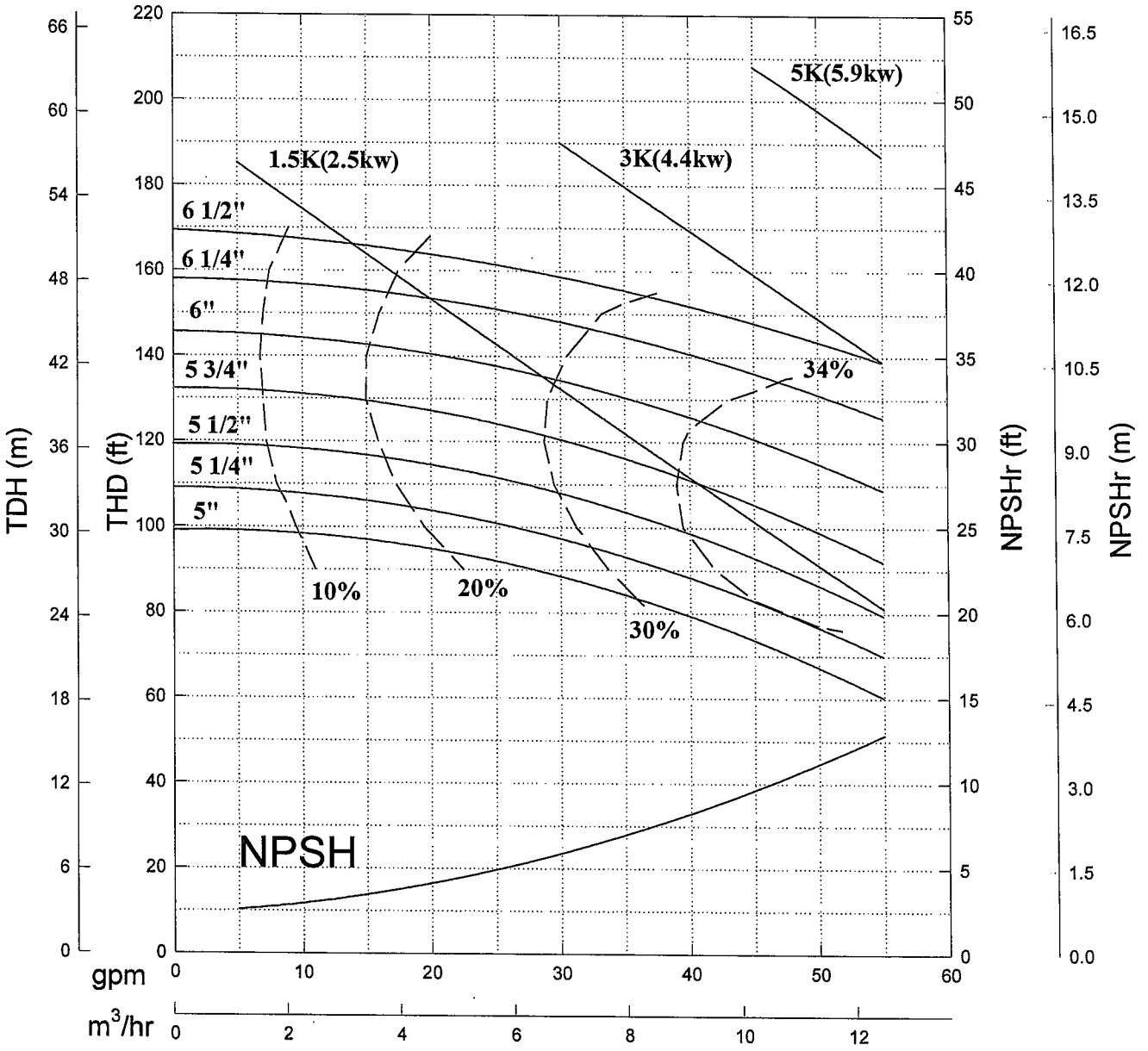
Curves are based on shop test while handling clean water at 20°C and at sea level. Performance guarantees apply at rating point only. Efficiencies shown are overall wire to water. Numbers beneath model designations indicate full load kilowatt ratings for the referenced motor load lines. When pumping fluids with specific gravities other than 1.0, select pump model (see load line) to handle load equivalent in feet of water. e.g, 40 feet of fluid of Sp. Gr.=1.5 is load equivalent of 60 feet (1.5x40) of water. Please note that this is merely a short cut method to estimate the model required. For proper model selection, especially when handling a fluid with a Sp. Gr. greater than 1.7, consult your Chempump representative or the factory.



CHEMPUMP A DIVISION OF TEIKOKU USA INC. www.chempump.com www.teikoku-usa.com	DRAWN	DATE	CURVE	REV.
	JFK	10-30-73	A-70045	

PUMP CASING	C-38382	SIZE	1 x 3/4 x 5	MODEL	JB
IMPELLER	C-38381	IMP. DIA.		RPM	3450
SERIAL #		REVISION DATED 2/93, COMPUTER GENERATED			

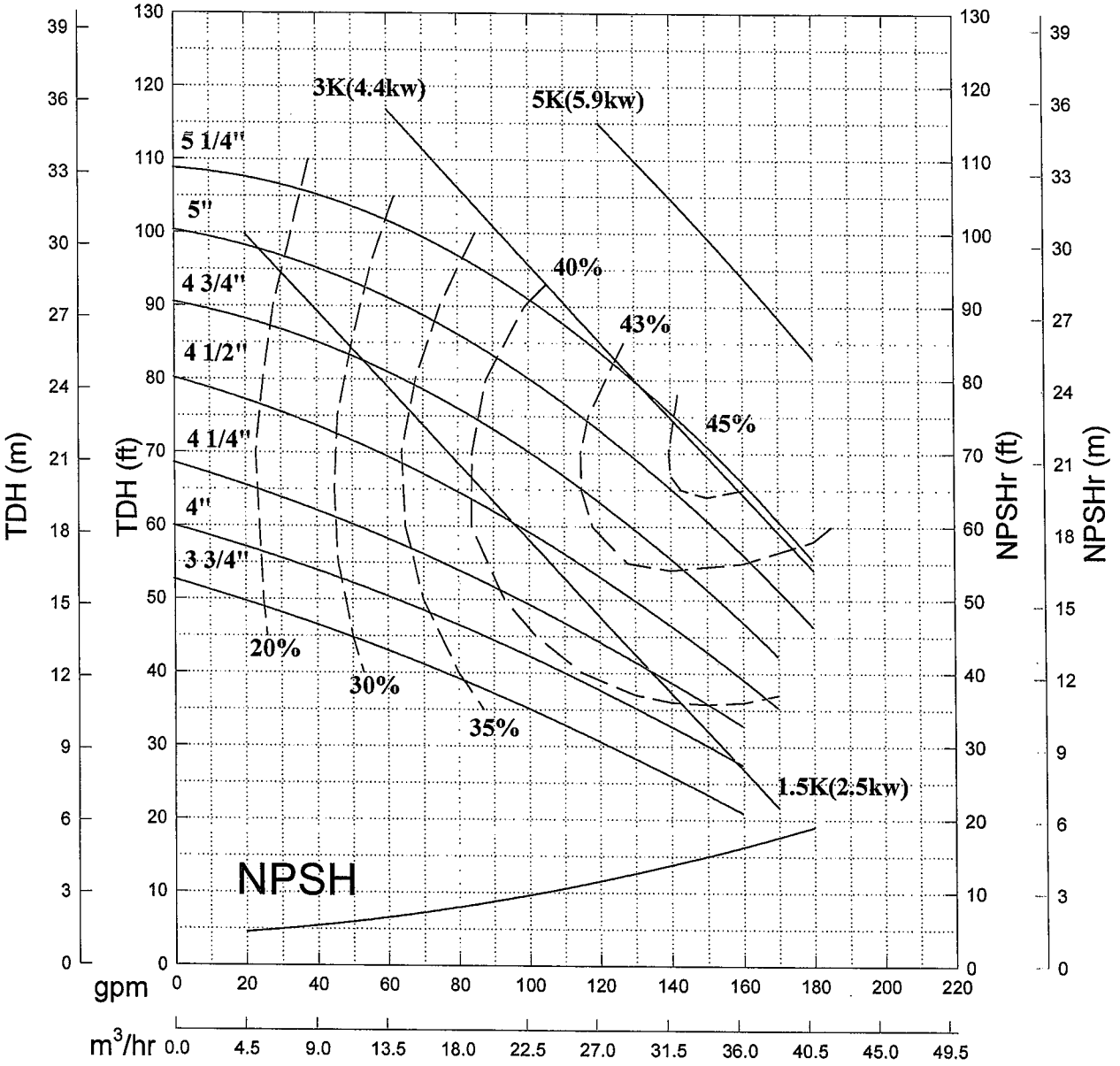
Curves are based on shop test while handling clean water at 20°C and at sea level. Performance guarantees apply at rating point only. Efficiencies shown are overall wire to water. Numbers beneath model designations indicate full load kilowatt ratings for the referenced motor load lines. When pumping fluids with specific gravities other than 1.0, select pump model (see load line) to handle load equivalent in feet of water. e.g, 40 feet of fluid of Sp. Gr.=1.5 is load equivalent of 60 feet (1.5x40) of water. Please note that this is merely a short cut method to estimate the model required. For proper model selection, especially when handling a fluid with a Sp. Gr. greater than 1.7, consult your Chempump representative or the factory.



CHEMPUMP A DIVISION OF TEIKOKU USA INC. www.chempump.com www.teikoku-usa.com	DRAWN	DATE	CURVE	REV.
	JFK	01-02-74	A-70046	

PUMP CASING C-38353	SIZE 2 x 1 1/2 x 5 1/4	MODEL JC
IMPELLER C-38349	IMP. DIA.	RPM 3450
SERIAL #	REVISION DATED 2/93, COMPUTER GENERATED	

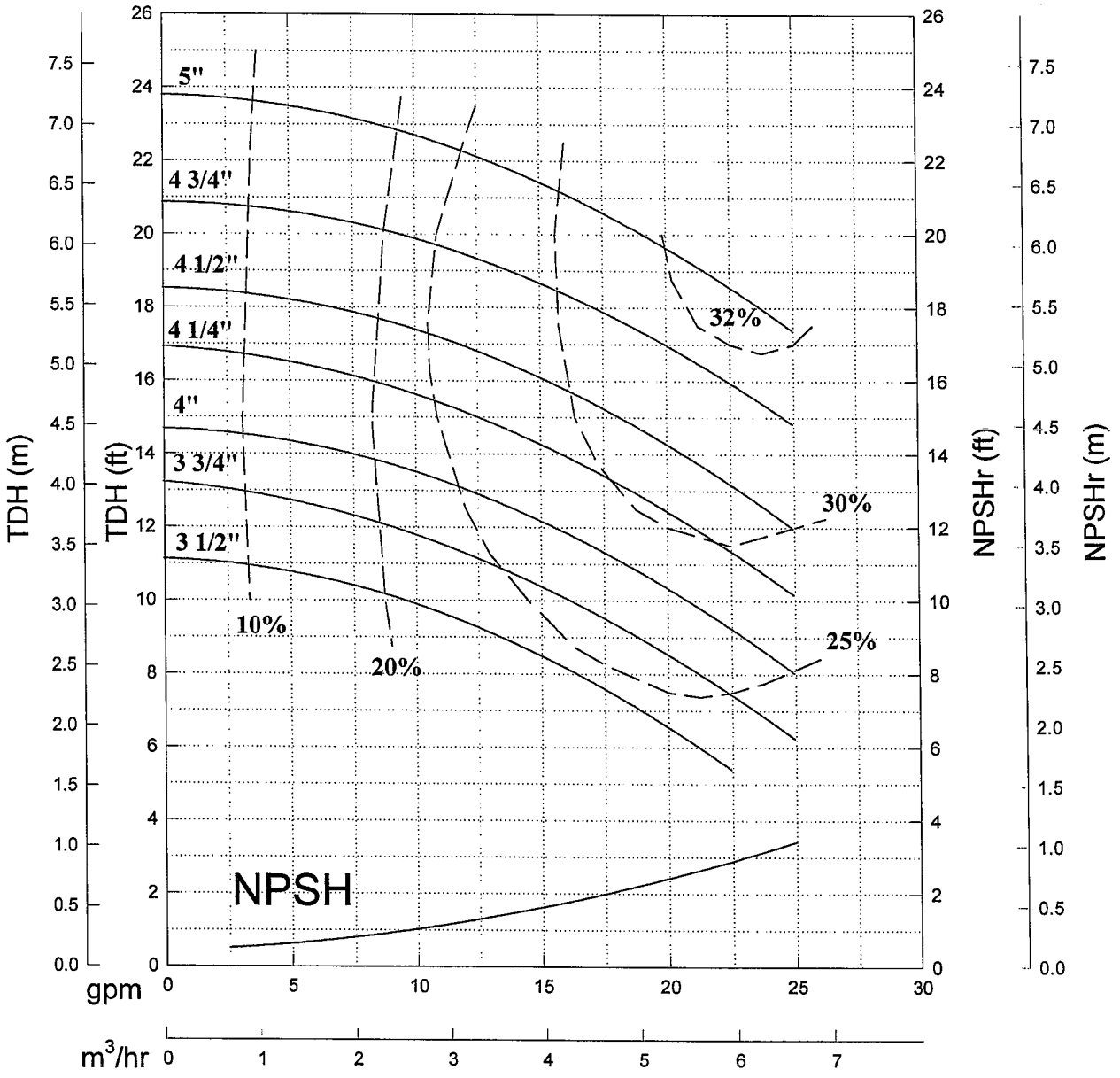
Curves are based on shop test while handling clean water at 20°C and at sea level. Performance guarantees apply at rating point only. Efficiencies shown are overall wire to water. Numbers beneath model designations indicate full load kilowatt ratings for the referenced motor load lines. When pumping fluids with specific gravities other than 1.0, select pump model (see load line) to handle load equivalent in feet of water. e.g, 40 feet of fluid of Sp. Gr.=1.5 is load equivalent of 60 feet (1.5x40) of water. Please note that this is merely a short cut method to estimate the model required. For proper model selection, especially when handling a fluid with a Sp. Gr. greater than 1.7, consult your Chempump representative or the factory.



	DRAWN	DATE	CURVE	REV.
CHEMPUMP A DIVISION OF TEIKOKU USA INC. www.chempump.com www.teikoku-usa.com	JFK	10-31-73	A-70047	

PUMP CASING	C-38354	SIZE	1 x 3/4 x 5	MODEL	JA
IMPELLER	C-38345	IMP. D.A.		RPM	1725
SERIAL #					

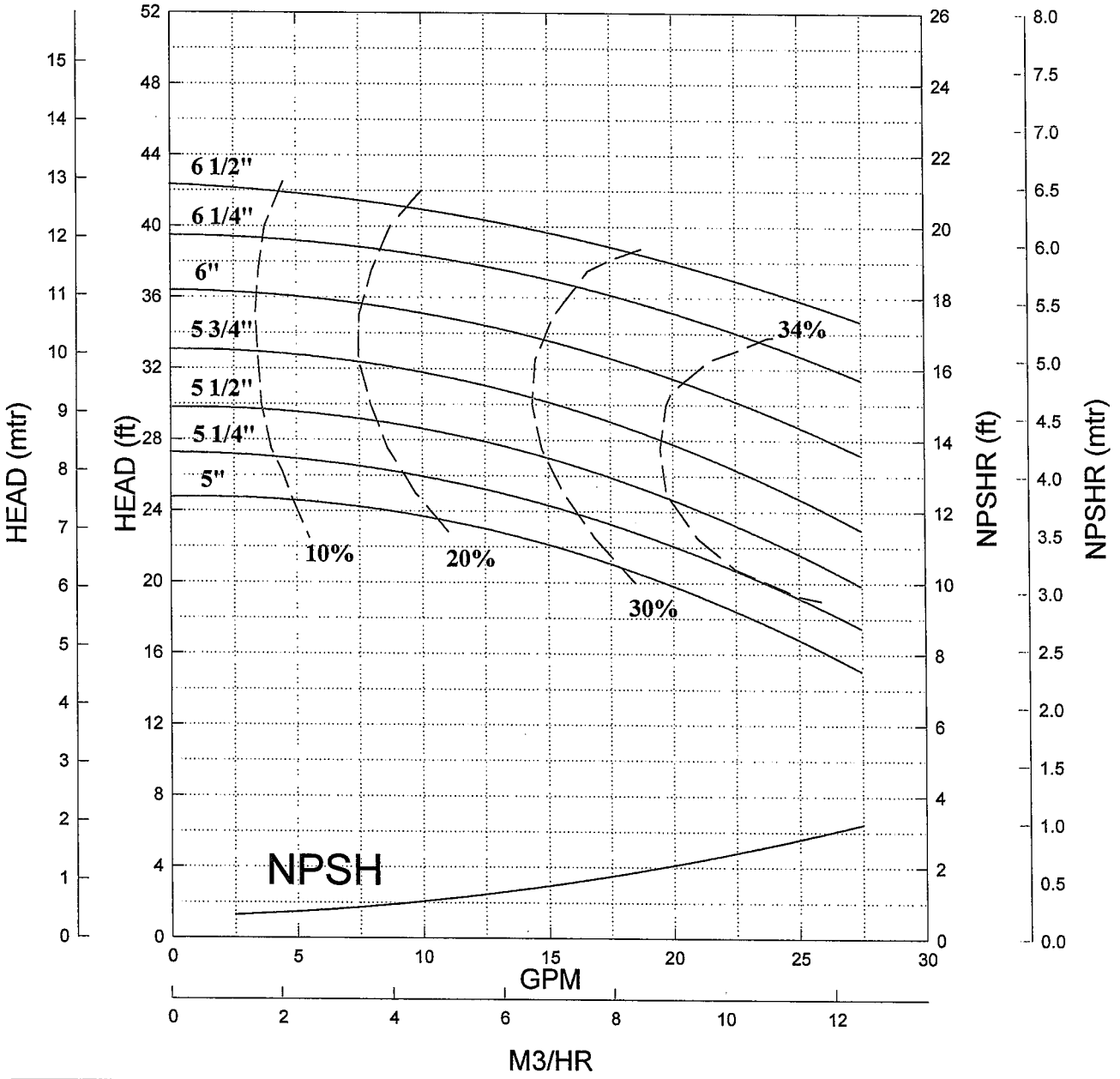
Curves are based on shop test while handling clean water at 20°C and at sea level. Performance guarantees apply at rating point only. Efficiencies shown are overall wire to water. Numbers beneath model designations indicate full load kilowatt ratings for the referenced motor load lines. When pumping fluids with specific gravities other than 1.0, select pump model (see load line) to handle load equivalent in feet of water. e.g, 40 feet of fluid of Sp. Gr.=1.5 is load equivalent of 60 feet (1.5x40) of water. Please note that this is merely a short cut method to estimate the model required. For proper model selection, especially when handling a fluid with a Sp. Gr. greater than 1.7, consult your Chempump representative or the factory.



CHEMPUMP A DIVISION OF TEIKOKU USA INC. www.chempump.com www.teikoku-usa.com	DRAWN	DATE	CURVE	REV.
	SAJ	08-11-00	A-70210	

PUMP CASING	C-38382	SIZE	1 x 3/4 x 5	MODEL	JB
IMPELLER	C-38381	IMP. DIA.		RPM	1750
SERIAL #					

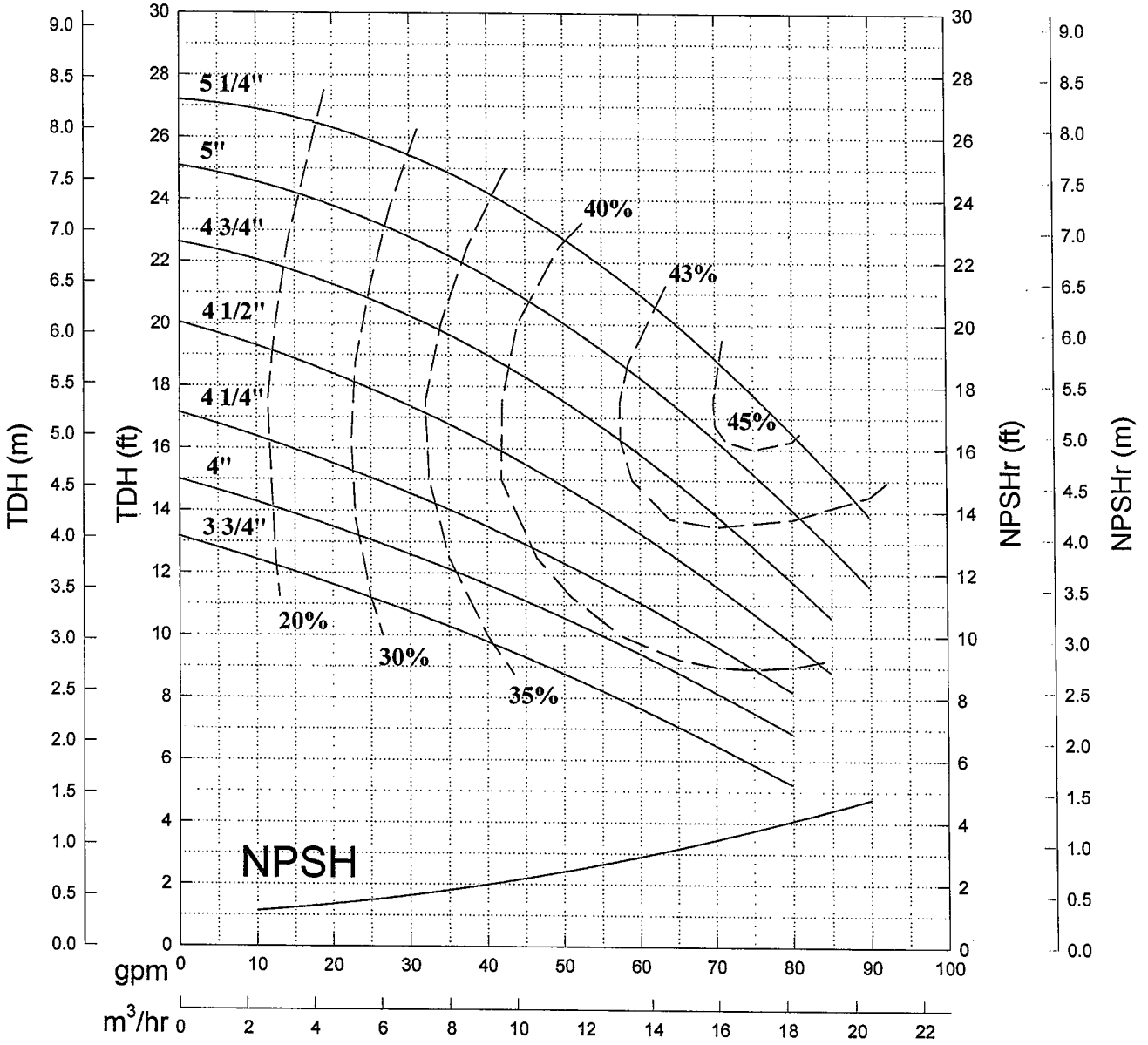
Curves are based on shop test while handling clean water at 20°C and at sea level. Performance guarantees apply at rating point only. Efficiencies shown are overall wire to water. Numbers beneath model designations indicate full load kilowatt ratings for the referenced motor load lines. When pumping fluids with specific gravities other than 1.0, select pump model (see load line) to handle load equivalent in feet of water. e.g, 40 feet of fluid of Sp. Gr.=1.5 is load equivalent of 60 feet (1.5x40) of water. Please note that this is merely a short cut method to estimate the model required. For proper model selection, especially when handling a fluid with a Sp. Gr. greater than 1.7, consult your Chempump representative or the factory.



	DRAWN	DATE	CURVE	REV.
CHEMPUMP A DIVISION OF TEIKOKU USA INC. www.chempump.com www.teikoku-usa.com	SAJ	08-18-00	A-70213	

PUMP CASING	C-38353	SIZE	2 x 1 1/2 x 5 1/4	MODEL	JC
IMPELLER	C-38349	IMP. DIA.		RPM	1750
SERIAL #					

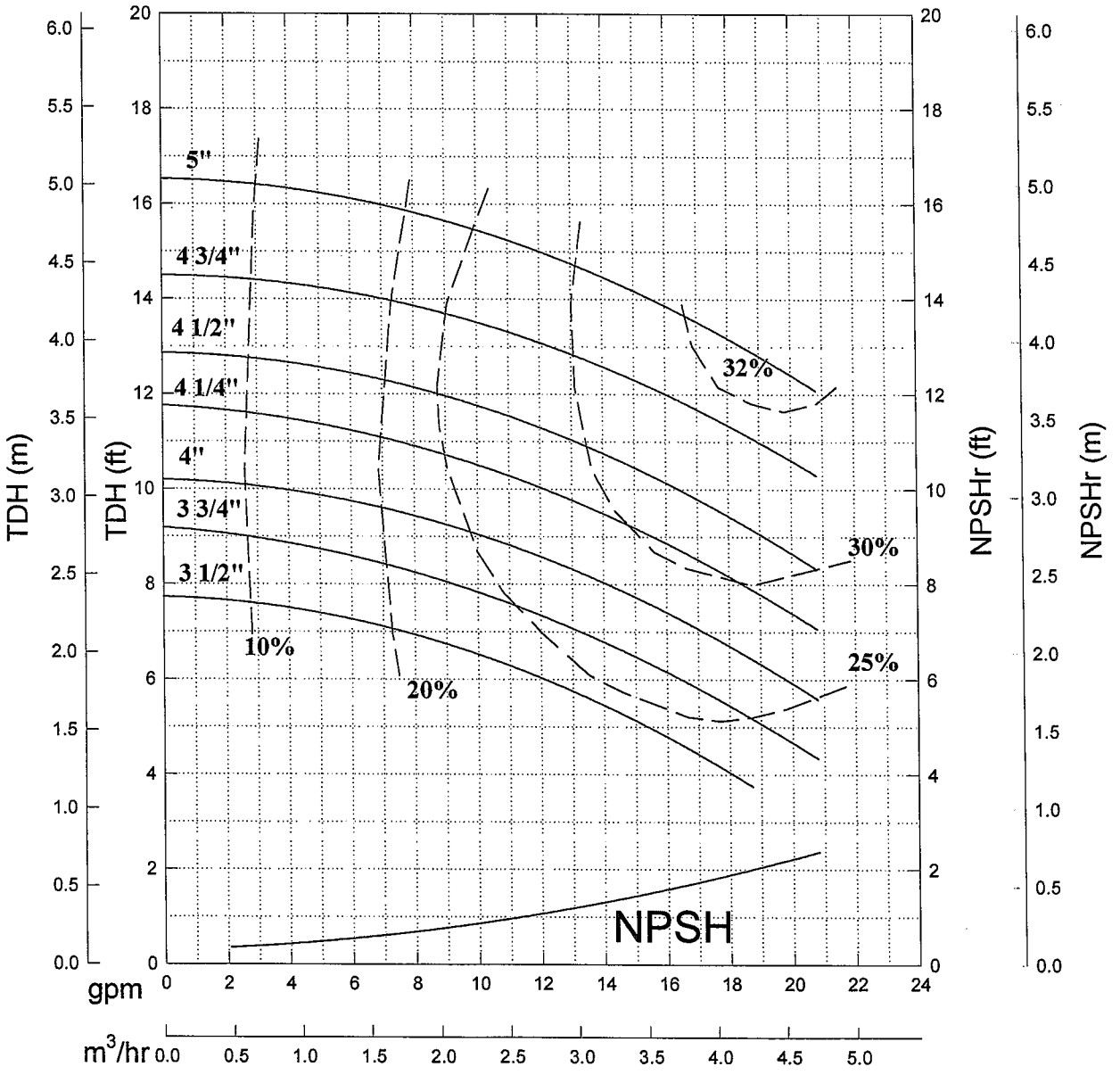
Curves are based on shop test while handling clean water at 20°C and at sea level. Performance guarantees apply at rating point only. Efficiencies shown are overall wire to water. Numbers beneath model designations indicate full load kilowatt ratings for the referenced motor load lines. When pumping fluids with specific gravities other than 1.0, select pump model (see load line) to handle load equivalent in feet of water. e.g, 40 feet of fluid of Sp. Gr.=1.5 is load equivalent of 60 feet (1.5x40) of water. Please note that this is merely a short cut method to estimate the model required. For proper model selection, especially when handling a fluid with a Sp. Gr. greater than 1.7, consult your Chempump representative or the factory.



CHEMPUMP A DIVISION OF TEIKOKU USA INC. www.chempump.com www.teikoku-usa.com	DRAWN SAJ	DATE 08-25-00	CURVE A-70215	REV.

PUMP CASING	C-38354	SIZE	1 x 3/4 x 5	MODEL	JA
IMPELLER	C-38345	IMP. DIA.		RPM	1440
SERIAL #					

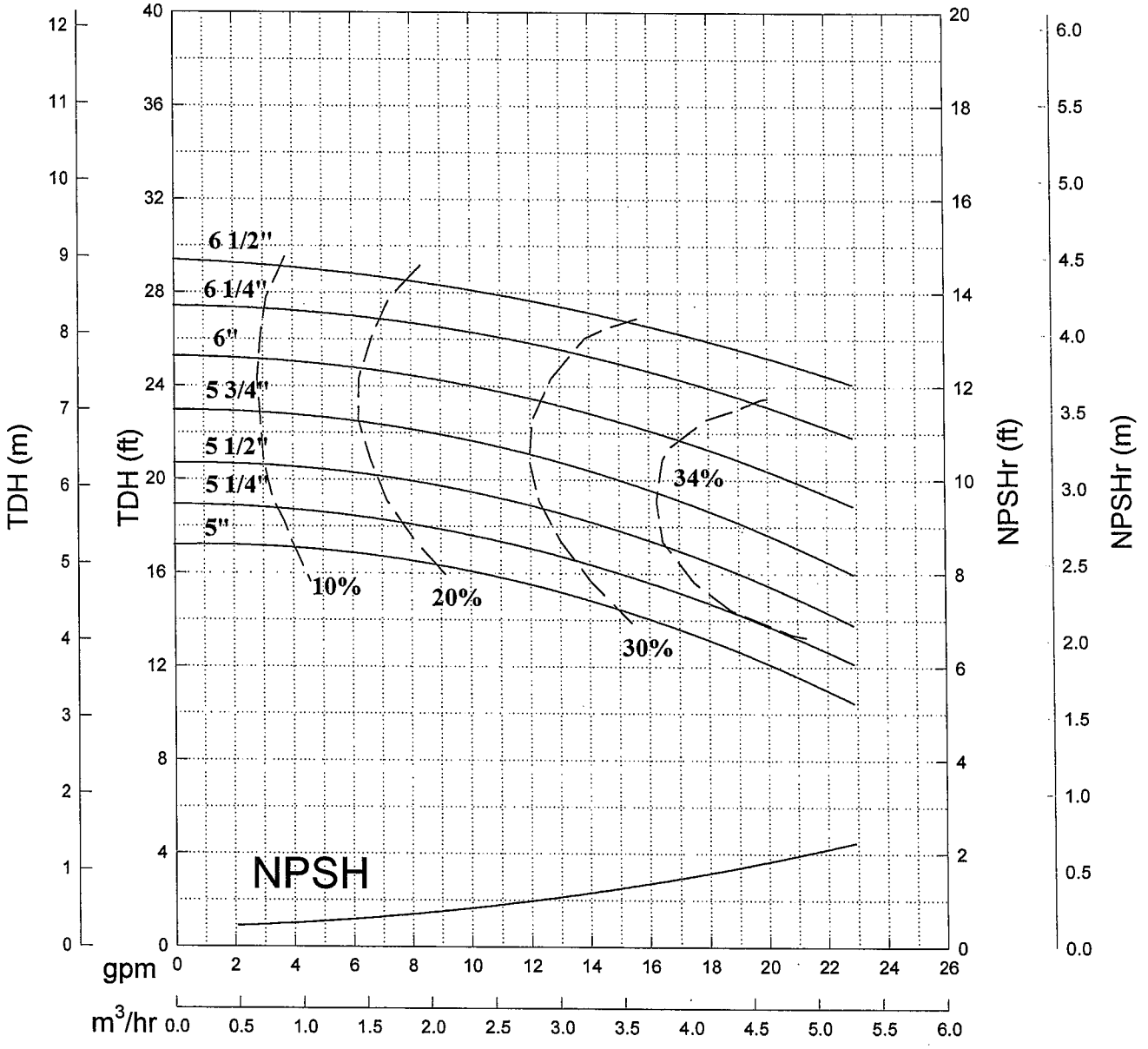
Curves are based on shop test while handling clean water at 20°C and at sea level. Performance guarantees apply at rating point only. Efficiencies shown are overall wire to water. Numbers beneath model designations indicate full load kilowatt ratings for the referenced motor load lines. When pumping fluids with specific gravities other than 1.0, select pump model (see load line) to handle load equivalent in feet of water. e.g, 40 feet of fluid of Sp. Gr.=1.5 is load equivalent of 60 feet (1.5x40) of water. Please note that this is merely a short cut method to estimate the model required. For proper model selection, especially when handling a fluid with a Sp. Gr. greater than 1.7, consult your Chempump representative or the factory.



	DRAWN	DATE	CURVE	REV.
CHEMPUMP A DIVISION OF TEIKOKU USA INC. www.chempump.com www.teikoku-usa.com	SAJ	08-15-00	A-70211	

PUMP CASING	C-38382	SIZE	1 x 3/4 x 5	MODEL	JB
IMPELLER	C-38381	IMP. DIA.		RPM	1440
SERIAL #					

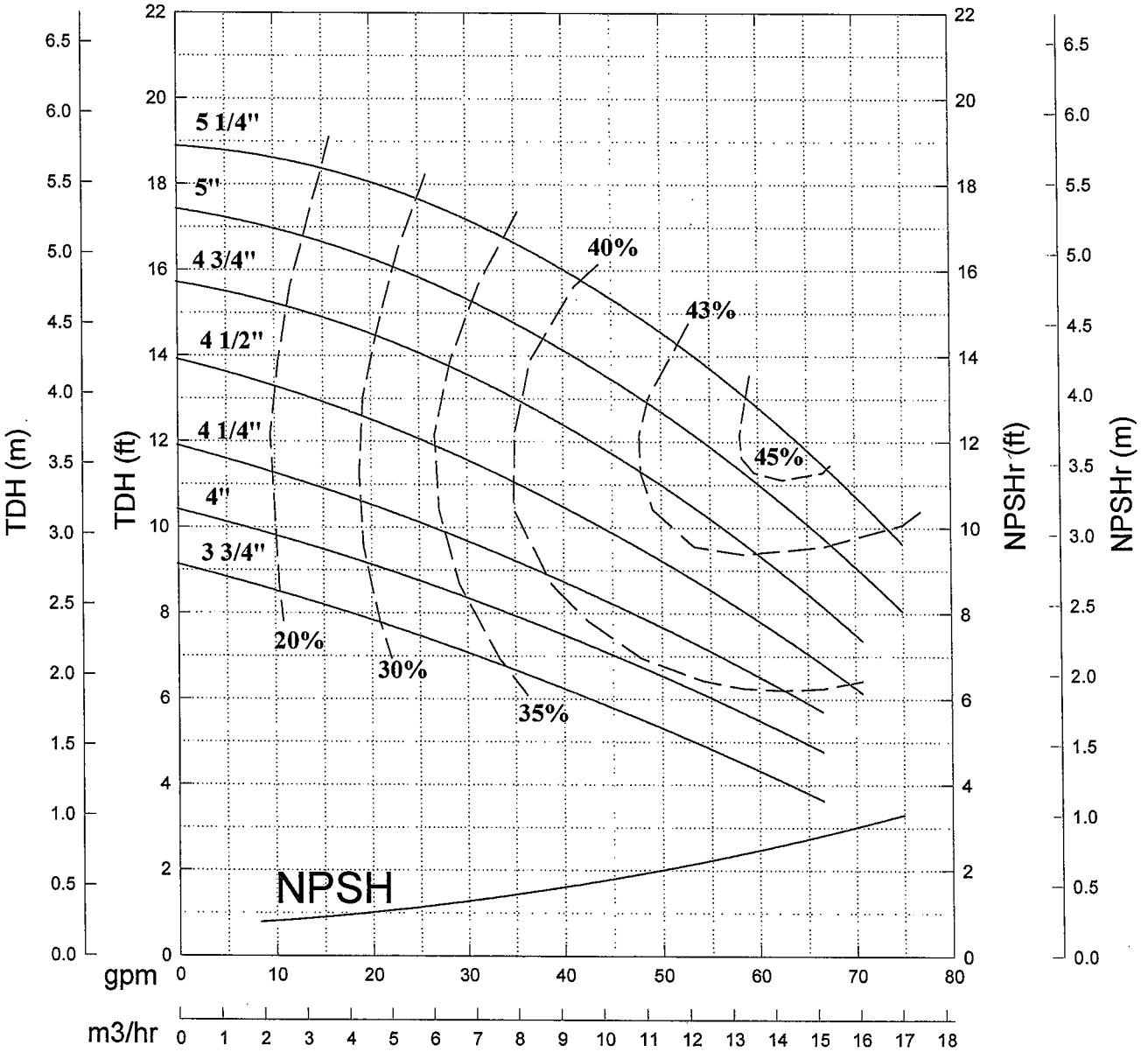
Curves are based on shop test while handling clean water at 20°C and at sea level. Performance guarantees apply at rating point only. Efficiencies shown are overall wire to water. Numbers beneath model designations indicate full load kilowatt ratings for the referenced motor load lines. When pumping fluids with specific gravities other than 1.0, select pump model (see load line) to handle load equivalent in feet of water. e.g, 40 feet of fluid of Sp. Gr.=1.5 is load equivalent of 60 feet (1.5x40) of water. Please note that this is merely a short cut method to estimate the model required. For proper model selection, especially when handling a fluid with a Sp. Gr. greater than 1.7, consult your Chempump representative or the factory.



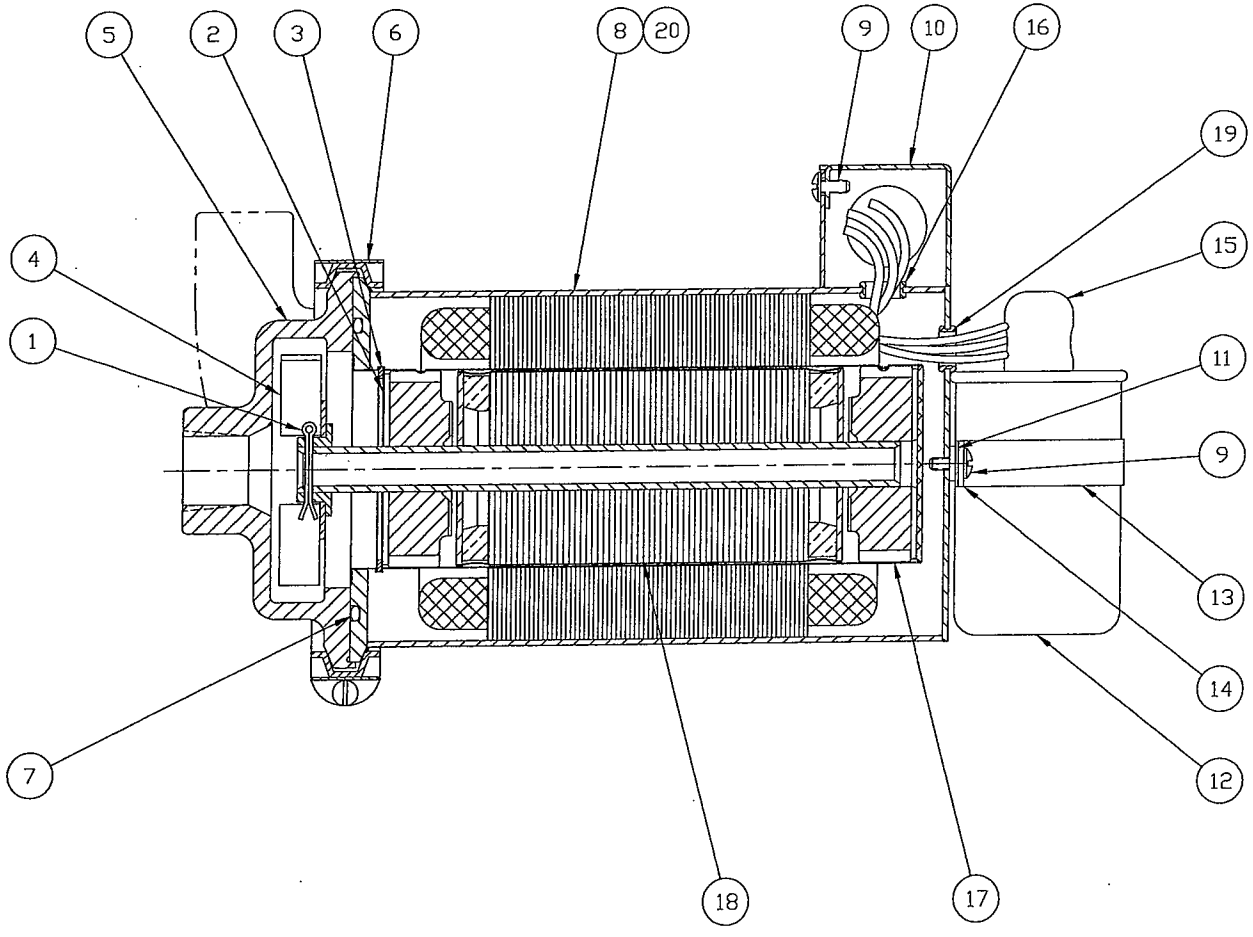
	DRAWN	DATE	CURVE	REV.
CHEMPUMP A DIVISION OF TEIKOKU USA INC. www.chempump.com www.teikoku-usa.com	SAJ	08-18-00	A-70214	

PUMP CASING	C-38353	SIZE 2 x 1 1/2 x 5 1/4	MODEL JC
IMPELLER	C-38349	IMP. DIA.	RPM 1440
SERIAL #			

Curves are based on shop test while handling clean water at 20°C and at sea level. Performance guarantees apply at rating point only. Efficiencies shown are overall wire to water. Numbers beneath model designations indicate full load kilowatt ratings for the referenced motor load lines. When pumping fluids with specific gravities other than 1.0, select pump model (see load line) to handle load equivalent in feet of water. e.g, 40 feet of fluid of Sp. Gr.=1.5 is load equivalent of 60 feet (1.5x40) of water. Please note that this is merely a short cut method to estimate the model required. For proper model selection, especially when handling a fluid with a Sp. Gr. greater than 1.7, consult your Chempump representative or the factory.



CHEMPUMP A DIVISION OF TEIKOKU USA INC. www.chempump.com www.teikoku-usa.com	DRAWN	DATE	CURVE	REV.
	SAJ	08-28-00	A-70217	



PARTS LIST		
ITEM	QTY.	DESCRIPTION
1	1	COTTER PIN, 5/64 DIA. X 3/4 LG.
2	1	SUCTION SCREEN
3	1	RETAINING RING
4	1	IMPELLER ASS'Y
5	1	PUMP CASING
6	1	"V" BAND CLAMP
7	1	O-RING 3 I.D. X 3 1/4 O.D. X 1/8 C.S.
8	1	STATOR ASS'Y.
9	A/R	SCREW,#8-18 UNC X 5/16 LG.,TYPE B
10	1	CONNECTION BOX COVER
11	A/R	NYLON PLUG
* 12	1	CAPACITOR
* 13	1	STRAP
* 14	2	WASHER, 3 16 X 1/2 X 1/16
* 15	1	CAPACITOR BOOT
16	1	GROMMET
17	2	BEARING, FRONT & REAR
18	1	ROTOR ASS'Y
19	1	GROMMET
20	1	NAMEPLATE WITH SERIAL NO.

* 1 PHASE MOTORS ONLY

REF. SERIAL NO. WHEN ORDERING PARTS.

SEE WORK DATA SHEET FOR APPROVAL SIGNATURE

CHEMPUMP
A DIVISION OF TEIKOKU USA,INC.
MEARNS PARK, WARMINSTER, PA.

UNLESS OTHERWISE STATED,
-ALL UNITS IN INCHES
-DIMS. IN BRACKETS ARE IN mm
-DIMS. MARKED * ARE ±1/16 [±2]
-ALL OTHER DIMS. ARE ±1/4 [±6]
-ANGLE DIMS. ARE ±5
NOTE: ROUNDING TO NEAREST INCH/mm PRECLUDES INCH/mm CONVERSION.

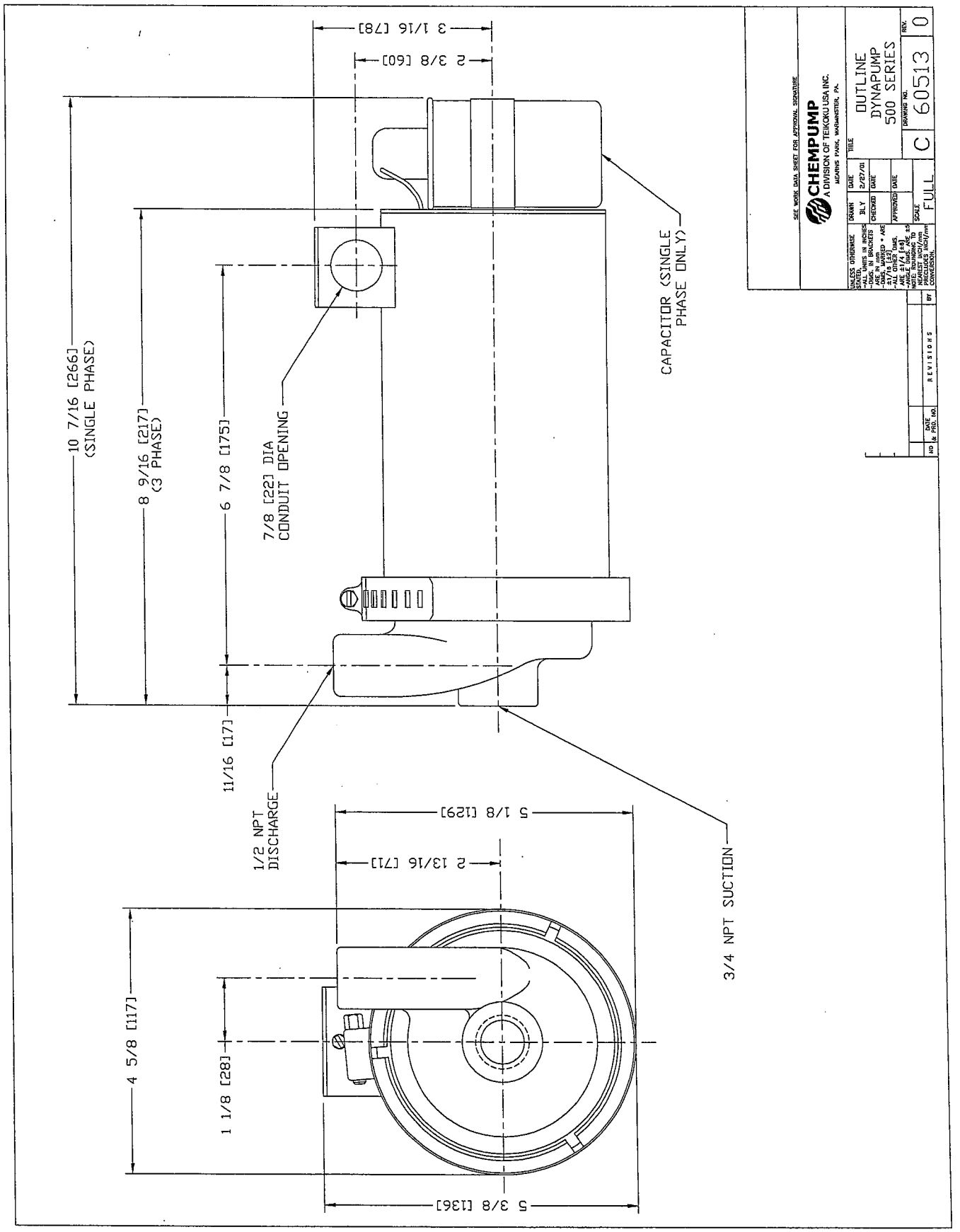
	DRAWN	DATE
	RH	9-30-71
	CHECKED	DATE
	WE	9-30-71
	APPROVED	DATE
	JFK	9-30-71
	SCALE	FULL

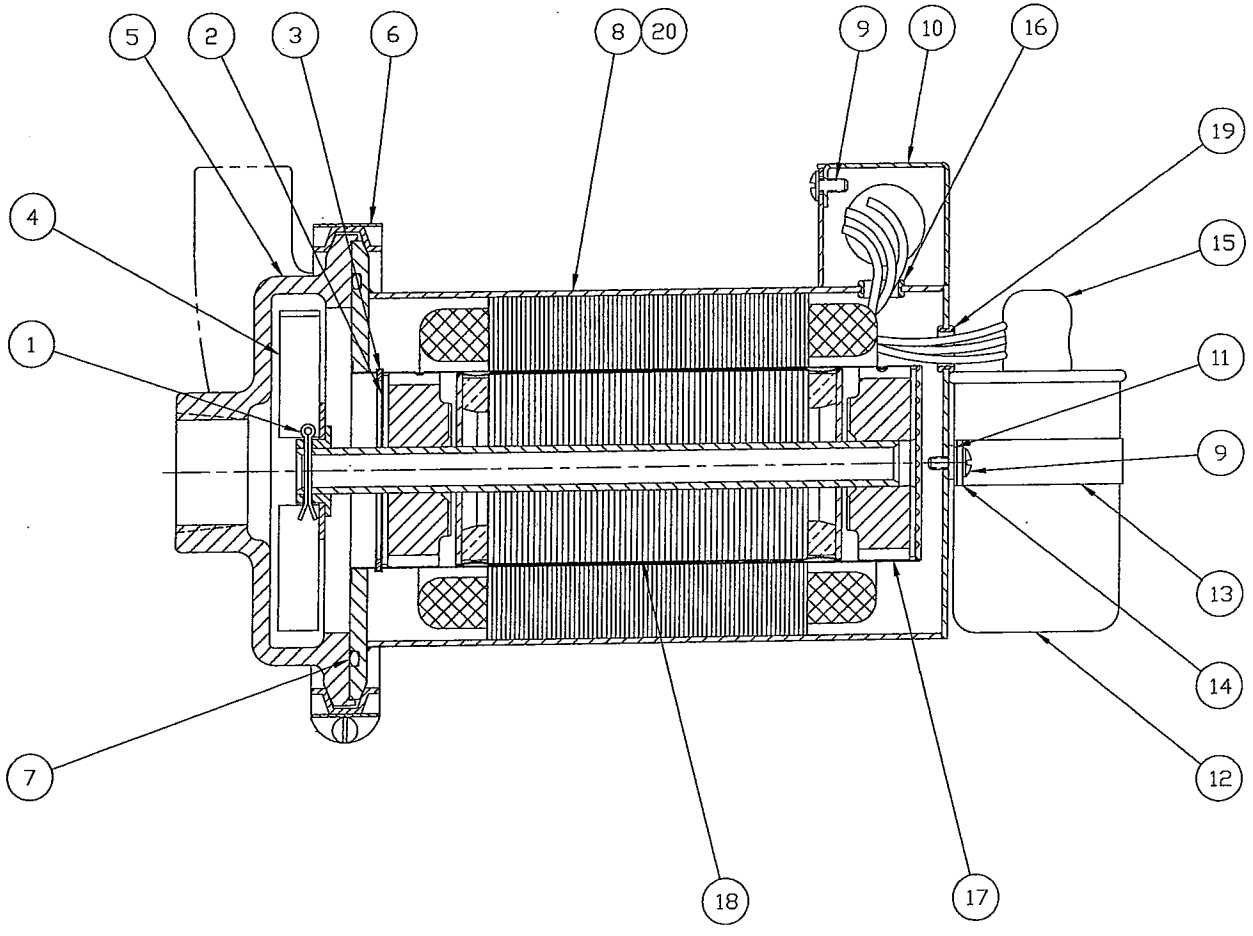
TITLE: CROSS SECTION 500 SERIES DYNAPUMP

DRAWING NO. C 65096 REV. 4

NO	DATE & PRO. NO.	REVISIONS	BY
4	5-24-04	REDRAWN ON CAD	BLY

A-21


3 1/16 [78]
2 3/8 [60]
10 7/16 [266]
(SINGLE PHASE)
8 9/16 [217]
(3 PHASE)
6 7/8 [175]
7/8 [22] DIA
CONDUIT OPENING
CAPACITOR (SINGLE
PHASE ONLY)
11/16 [17]
1/2 NPT
DISCHARGE
3/4 NPT SUCTION
5 1/8 [129]
2 13/16 [71]
4 5/8 [117]
1 1/8 [28]
5 3/8 [136]
SEE WORK DATA SHEET FOR APPROVAL SIGNATURE
CHEMPUMP
A DIVISION OF TEIKOKU USA INC.
ADAMS PARK, WARMINSTER, PA.
DRAWN BLY
DATE 2/27/01
CHECKED
DATE
APPROVED
DATE
SCALE FULL
TITLE
OUTLINE
DYNAPUMP
500 SERIES
DRAWING NO. C 60513
REV. 0
REVISIONS
NO
DATE
PROJ. NO.
BY



PARTS LIST			
	ITEM	QTY.	DESCRIPTION
	1	1	COTTER PIN, 5/64 DIA. .X 3/4 LG.
	2	1	SUCTION SCREEN
	3	1	RETAINING RING
	4	1	IMPELLER ASS'Y
	5	1	PUMP CASING
	6	1	"V" BAND CLAMP
	7	1	O-RING 4 I.D.X4 1/4 O.D. X 1/8 C.S.
	8	1	STATOR ASS'Y.
	9	A/R	SCREW,#8-18 UNC X 5/16 LG.,TYPE B
	10	1	CONNECTION BOX COVER
	11	A/R	NYLON PLUG
*	12	1	CAPACITOR
*	13	1	STRAP
*	14	2	WASHER, 3/16 X 1/2 X 1/16
*	15	1	CAPACITOR BOOT
	16	1	GROMMET
	17	2	BEARING, FRONT & REAR
	18	1	ROTOR ASS'Y.
	19	1	GROMMET
	20	1	NAMEPLATE WITH SERIAL NO.

* 1 PHASE MOTORS ONLY

REF. SERIAL NO. WHEN ORDERING PARTS.

NO	DATE & PRO. NO.	REVISIONS	BY
4	5-25-04	REDRAWN ON CAD	BLY

SEE WORK DATA SHEET FOR APPROVAL SIGNATURE

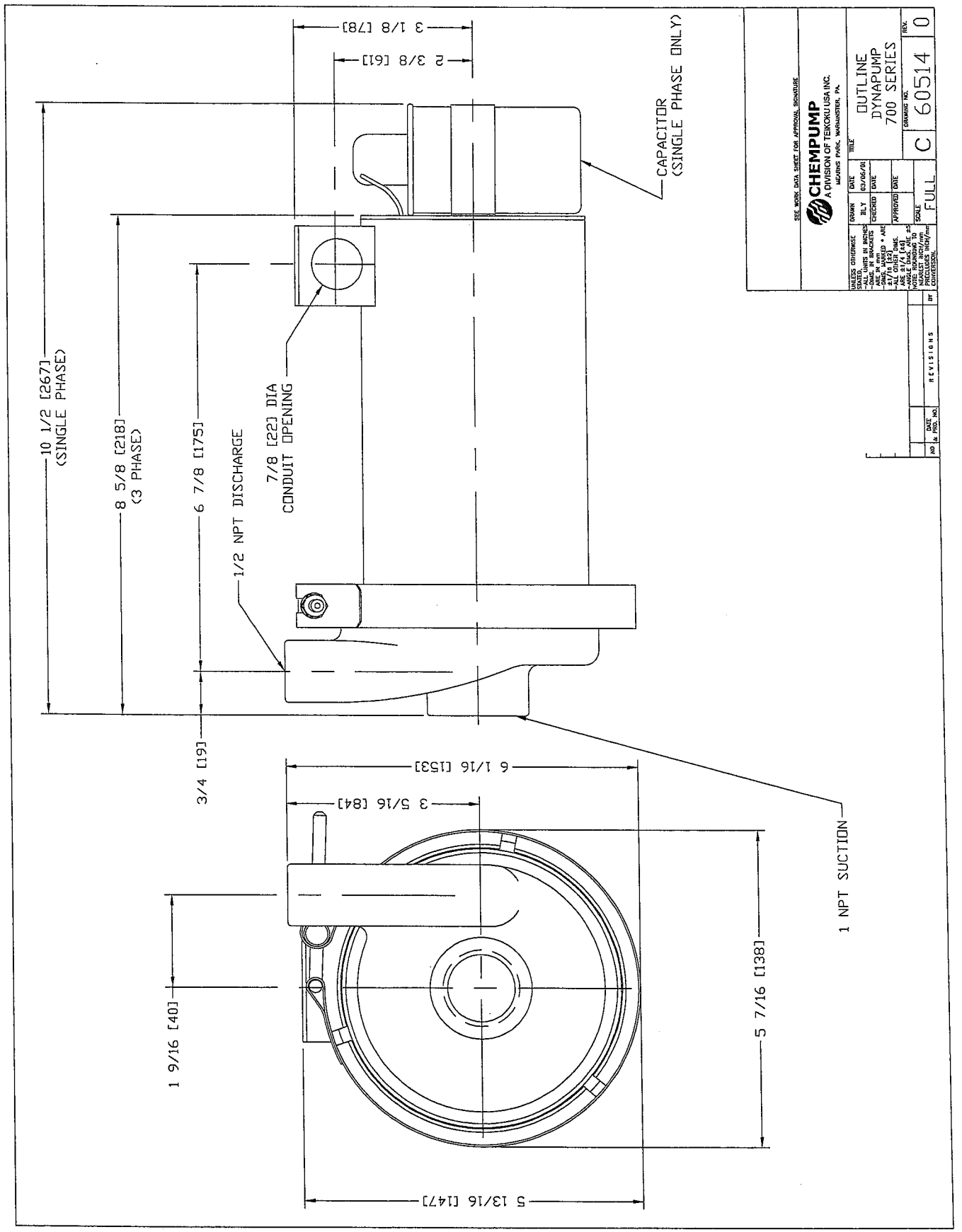
CHEMPUMP
A DIVISION OF TEIKOKU USA INC.
MEARNS PARK, WARMINSTER, PA.

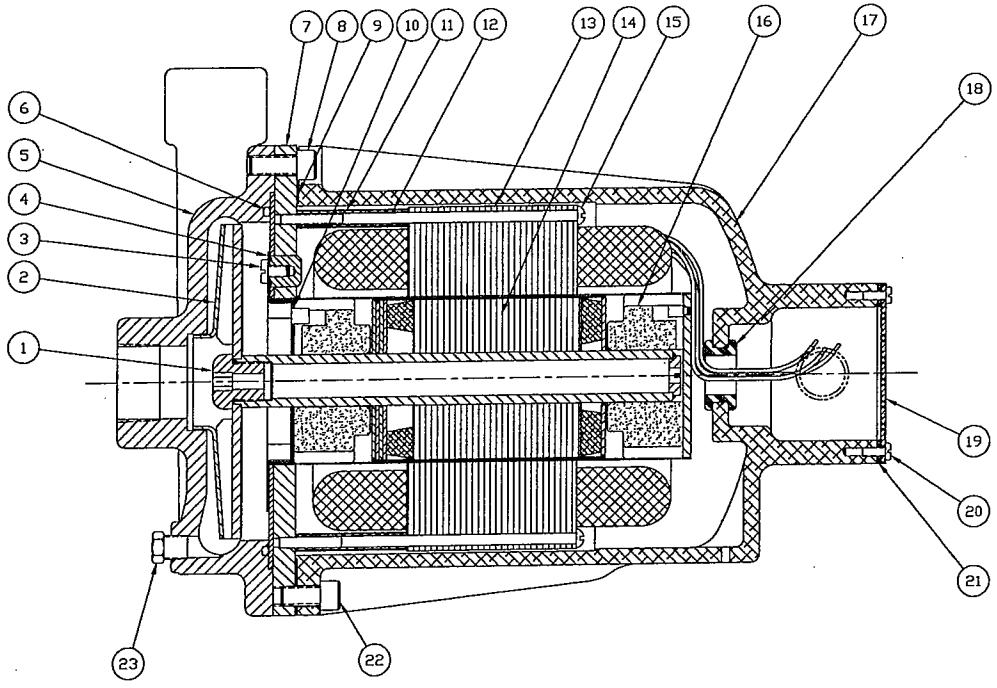
UNLESS OTHERWISE STATED,
-ALL UNITS IN INCHES
-DIMS. IN BRACKETS ARE IN mm
-DIMS. MARKED * ARE ±1/16 [±2]
-ALL OTHER DIMS. ARE ±1/64 [±.6]
-ANGLE DIMS. ARE ±5°
NOTE: ROUNDING TO NEAREST INCH/mm PRECLUDES INCH/mm CONVERSION.

DRAWN	RH	DATE 7-16-71
CHECKED	EMD	DATE 8-18-72
APPROVED	JFK	DATE 8-19-72
SCALE	FULL	

TITLE: CROSS SECTION 700 SERIES DYNAPUMP

DRAWING NO.	REV.
C 65098	4


3 1/8 [78]
2 3/8 [61]
CAPACITOR
(SINGLE PHASE ONLY)
10 1/2 [267]
(SINGLE PHASE)
8 5/8 [218]
(3 PHASE)
6 7/8 [175]
7/8 [22] DIA
CONDUIT OPENING
1/2 NPT DISCHARGE
3/4 [19]
6 1/16 [153]
3 5/16 [84]
1 NPT SUCTION
1 9/16 [40]
5 7/16 [138]
5 13/16 [147]
SEE WORK DATA SHEET FOR APPROVAL SIGNATURE
CHEMPUMP
A DIVISION OF TEIKOKU USA INC.
WARMINSTER, PA.
UNLESS OTHERWISE STATED: UNITS IN INCHES [MM] IN BRACKETS ARE IN MM DIMS. MARKED * ARE ±1/16 [±2] ALL OTHER DIMS. ARE ±1/4 [±6] ANGLES ±1°
NOTE: ROUNDING TO NEAREST INCH/MM PREFERRED USES INCH/mm CONVERSION
DRAWN JLY 03/06/01
CHECKED
APPROVED
SCALE FULL
TITLE
OUTLINE
DYNAPUMP
700 SERIES
DRAWING NO. C 60514
REV. 0
NO. DATE & PROJ. NO. REVISIONS BY



PARTS LIST		
ITEM	QTY.	DESCRIPTION
1	1	LOCKING SCREW, IMPELLER
2	1	IMPELLER
3	2	SCREW,PAN HD.,10-32 UNF X 5/16 LG.
4	1	FRONT BEARING RETAINER
5	1	PUMP CASING
6	1	O-RING, PUMP CASING
7	1	STATOR ASSEMBLY
8	6	SCREW, SHC, 5/16-18 UNC X 3/4 LG.
9	1	GASKET, STATOR BAND
10	1	FILTER SCREEN
11	4	STATOR SPACER
12	4	INSULATION SLEEVE
13	1	STATOR
14	1	ROTOR ASSEMBLY
15	4	SCREW, RDHD, 8-32 UNC X 4 3/4 LG.
16	2	BEARING
17	1	STATOR BAND
18	1	GROMMET
19	1	CONNECTION BOX COVER/NAMEPLATE
20	6	SCREW, PAN HD, 6-32 UNC X 3/8 LG.
21	1	GASKET, CONNECTION BOX
22	6	SCREW, SHC, 5/16-18 UNC X 5/8 LG.
23	1	PLUG, HEX, 1/8 NPT

REF. SERIAL NO. WHEN ORDERING PARTS

NO	DATE & PRN. NO.	REVISIONS	BY
3	5/21/84	REDRAWN	

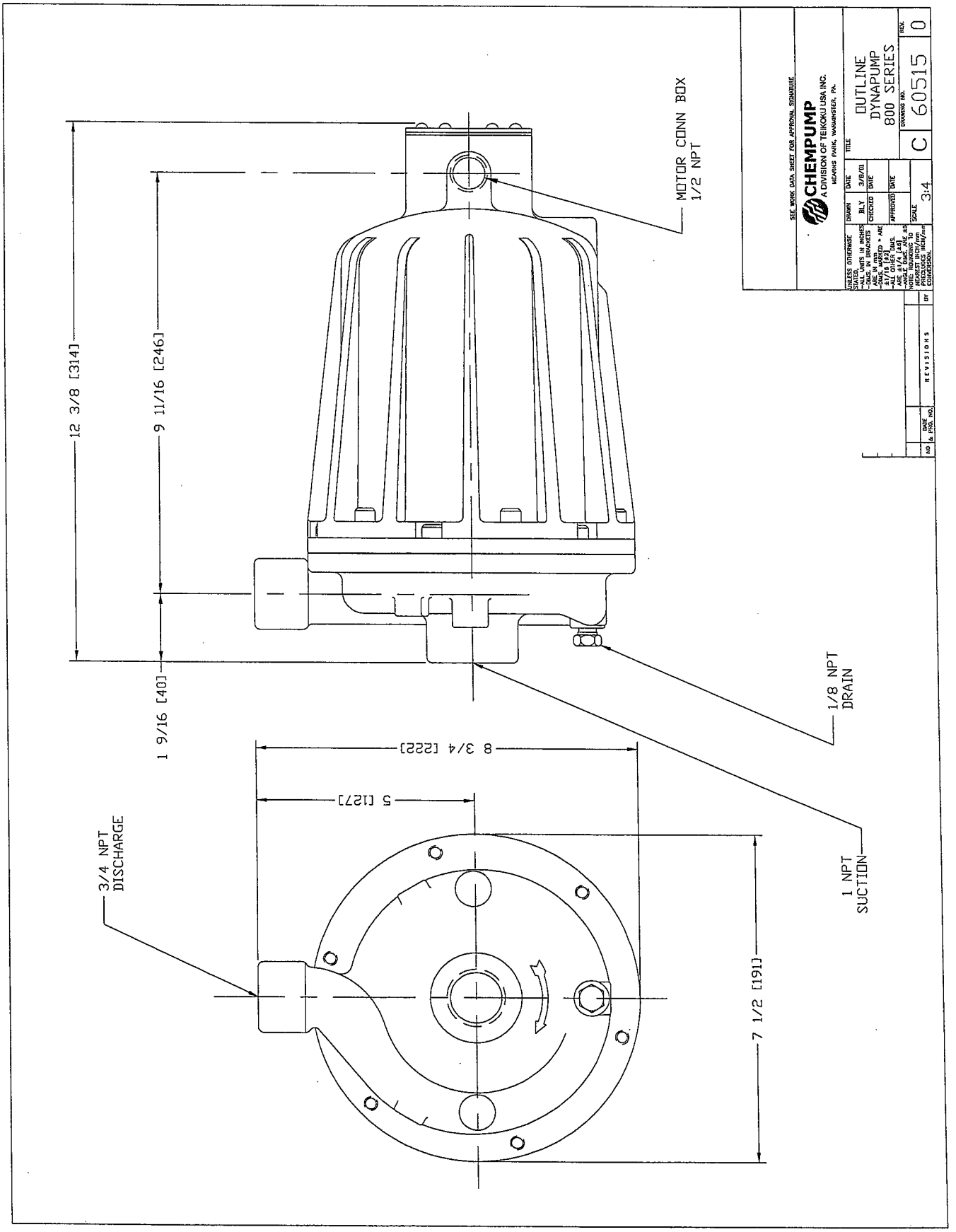
SEE WORK DATA SHEET FOR APPROVAL SIGNATURE

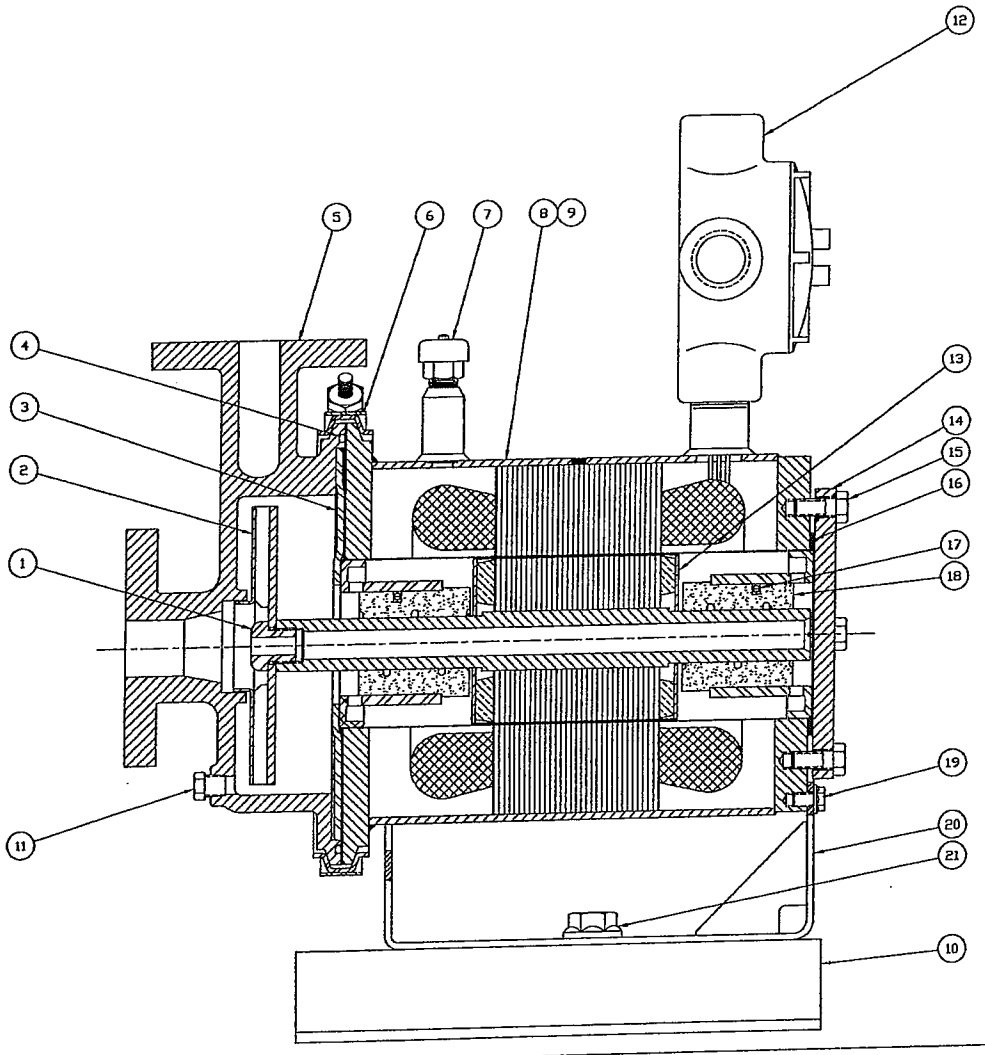
CHEMPUMP
A DIVISION OF TEIKOKU USA INC.
WARMINGTON, PA.

DRAWN	WF	DATE 3/13/78
CHECKED	EH	DATE 4/27/78
APPROVED	JFK	DATE 4/27/78
SCALE	FULL	

TITLE: CROSS SECTION SERIES 800 DYNAPUMP

DRAWING NO. D 65105 REV. 3


MOTOR CONN BOX
1/2 NPT
12 3/8 [314]
9 11/16 [246]
1 9/16 [40]
1/8 NPT
DRAIN
8 3/4 [222]
5 [127]
3/4 NPT
DISCHARGE
1 NPT
SUCTION
7 1/2 [191]
SEE WORK DATA SHEET FOR APPROVAL SIGNATURE
CHEMPUMP
A DIVISION OF TEIKOKU USA INC.
WEARNS PARK, WARMINSTER, PA.
DRAWN
JLY
3/8/01
CHECKED
APPROVED
SCALE
3:4
TITLE
OUTLINE
DYNAPUMP
800 SERIES
DRAWING NO.
C
60515
REV.
0
REVISIONS



PARTS LIST		
ITEM	QTY.	DESCRIPTION
1	1	IMPELLER LOCK SCREW
2	1	IMPELLER ASSEMBLY
3	1	FRONT BEARING HOUSING ASSEMBLY
4	1	PUMP CASING O-RING
5	1	PUMP CASING
6	1	FLANGE CLAMP
7	1	RELIEF VALVE
8	1	STATOR ASSEMBLY
9	1	NAMEPLATE WITH SERIAL NO.
10	1	BASE PLATE
11	1	HEX PLUG, 1/8 NPT
12	1	CONNECTION BOX ASSEMBLY
13	1	ROTOR ASSEMBLY
14	1	REAR BEARING HOUSING ASSEMBLY
15	6	SCREW, HHC, 5/16-18 UNC X 3/4 LG.
16	1	MOTOR GASKET
17	2	BEARING PIN
18	2	BEARING
19	1	SCR.,1/4-20 UNC X 3/8 LG. WHIZLOCK
20	1	BASE CRADLE
21	1	SCR.,1/2-13 UNC X 1 LG. WHIZLOCK

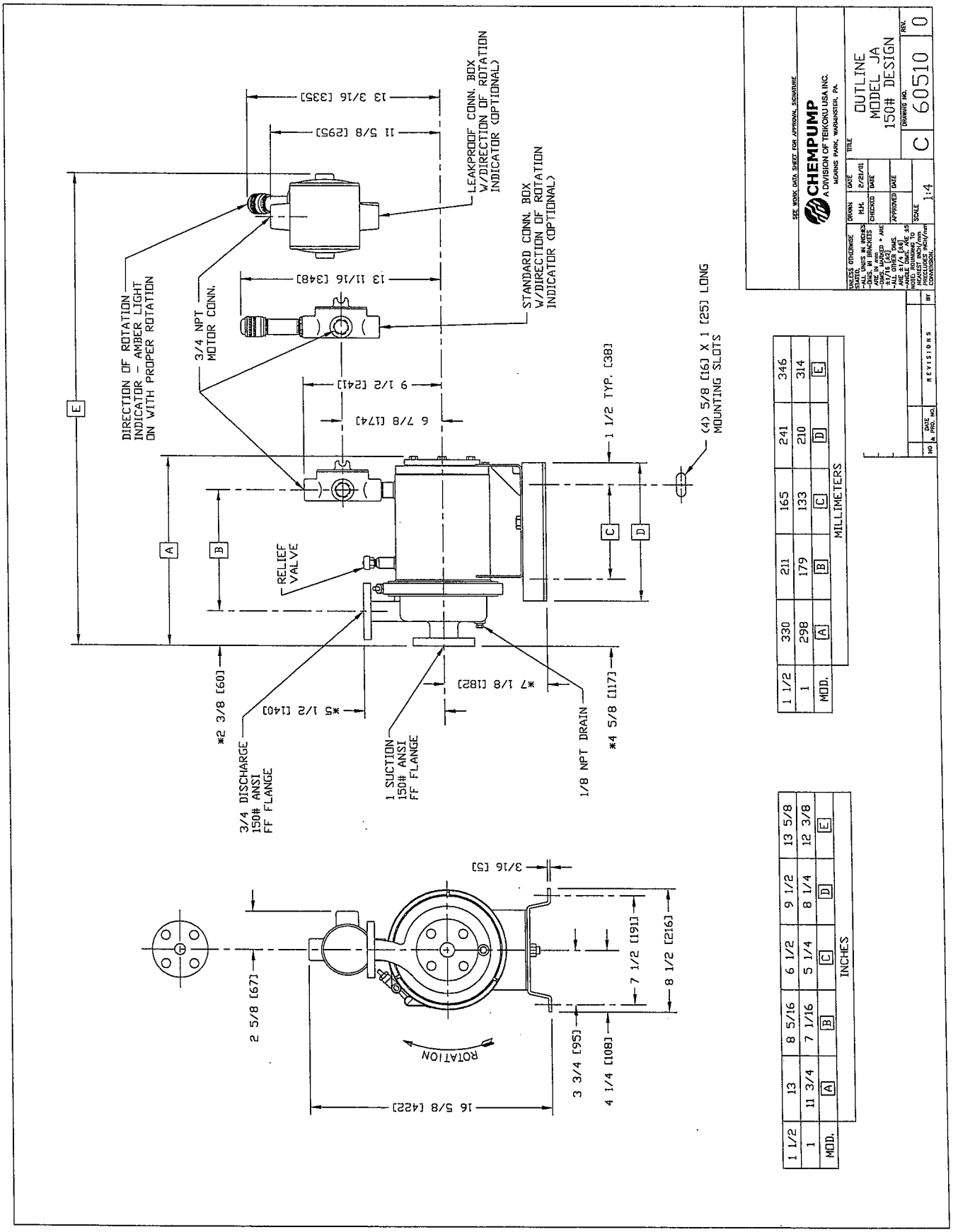
REF. SERIAL NO. WHEN ORDERING PARTS

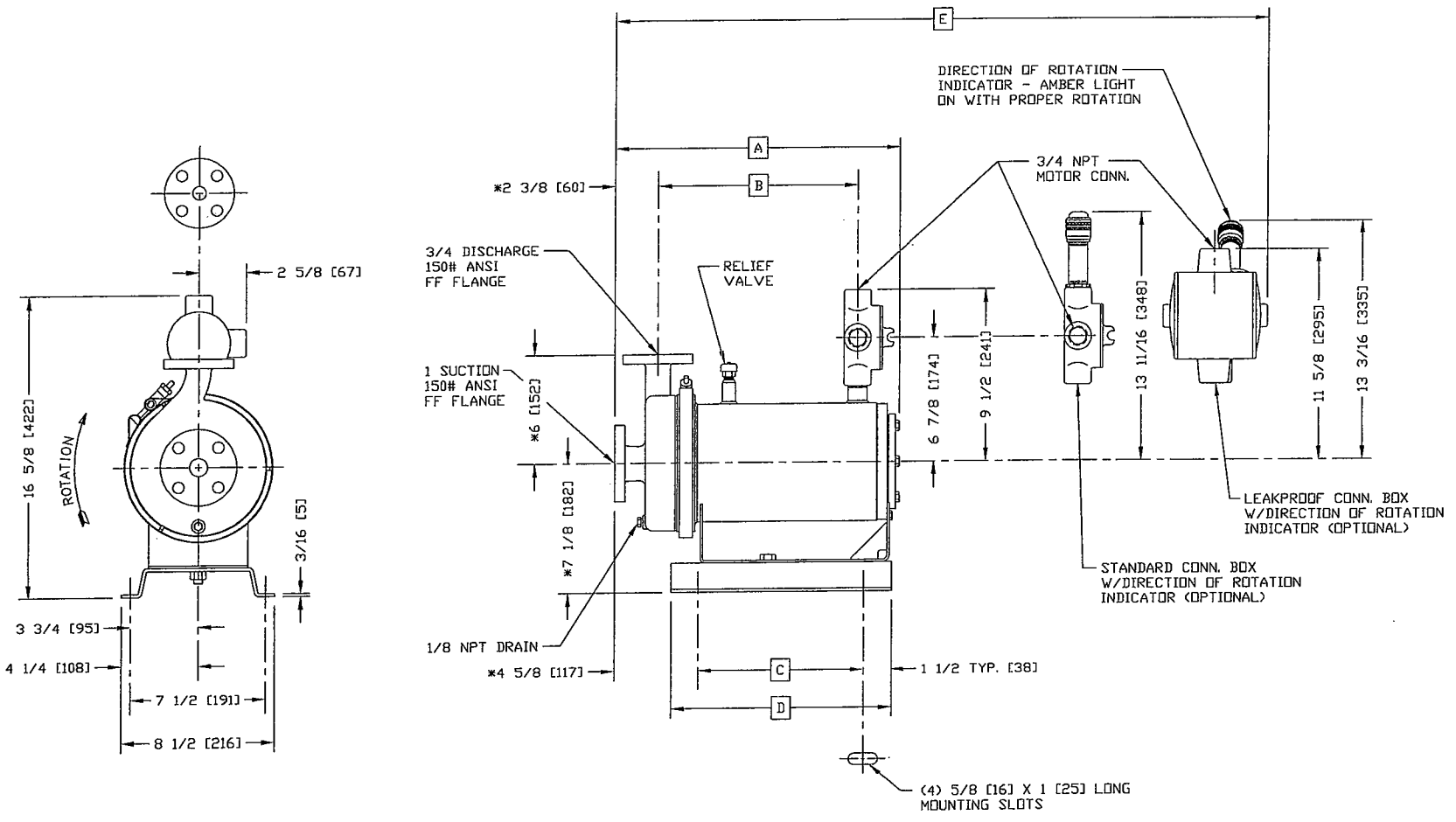
CHEMPUMP
A DIVISION OF TEIKOKU USA INC.

CROSS SECTION
MODEL JA

D | 65099 | 4

FULL


13 3/16 [335]
11 5/8 [295]
LEAKPROOF CONN. BOX W/DIRECTION OF ROTATION INDICATOR (OPTIONAL)
13 11/16 [348]
STANDARD CONN. BOX W/DIRECTION OF ROTATION INDICATOR (OPTIONAL)
DIRECTION OF ROTATION INDICATOR - AMBER LIGHT ON WITH PROPER ROTATION
3/4 NPT MOTOR CONN.
9 1/2 [241]
6 7/8 [174]
1 1/2 TYP. [38]
(4) 5/8 [16] X 1 [25] LONG MOUNTING SLOTS
RELIEF VALVE
*2 3/8 [60]
*5 1/2 [140]
*7 1/8 [182]
*4 5/8 [117]
3/4 DISCHARGE 150# ANSI FF FLANGE
1 SUCTION 150# ANSI FF FLANGE
1/8 NPT DRAIN
3/16 [5]
2 5/8 [67]
7 1/2 [191]
8 1/2 [216]
3 3/4 [95]
4 1/4 [108]
16 5/8 [422]
ROTATION
SEE WORK DATA SHEET FOR APPROVAL SIGNATURE
CHEMPUMP
A DIVISION OF TEIKOKU USA INC.
WEARNS PARK, WARMINSTER, PA.
OUTLINE
MODEL JA
150# DESIGN
DRAWING NO. C 60510
REV. 0
SCALE 1:4
DRAWN H.M. DATE 2/21/01
CHECKED DATE
APPROVED DATE
UNLESS OTHERWISE SPECIFIED:
-ALL UNITS IN INCHES
-DIMS. IN BRACKETS ARE IN MILLIMETERS
-DIMS. MARKED * ARE ±1/16 [1.6]
-ALL OTHER DIMS. ARE ±1/4 [6.0]
-ANGULAR DIMS. ARE ±5
NOTE: ROUNDING TO NEAREST INCH/mm PREFERRED PRACTICE CONVERSION.
NO. DATE PROD. NO. REVISIONS BY
1 1/2 330 211 165 241 346
1 298 179 133 210 314
MOD. A B C D E
MILLIMETERS
1 1/2 13 8 5/16 6 1/2 9 1/2 13 5/8
1 11 3/4 7 1/16 5 1/4 8 1/4 12 3/8
MOD. A B C D E
INCHES



MOD.	A	B	C	D	E
1 1/2	13 1/16	8 5/16	6 1/2	9 1/2	13 5/8
3	14 9/16	9 13/16	8	11	15 1/8
5	15 13/16	11 1/16	9 1/4	12 1/4	16 3/8

INCHES

MOD.	A	B	C	D	E
1 1/2	331	212	165	241	346
3	369	250	203	279	384
5	401	281	235	311	416

MILLIMETERS

SEE WORK DATA SHEET FOR APPROVAL SIGNATURE

CHEMPUMP
A DIVISION OF TEIKOKU USA INC.
WEARNS PARK, WARMINSTER, PA.

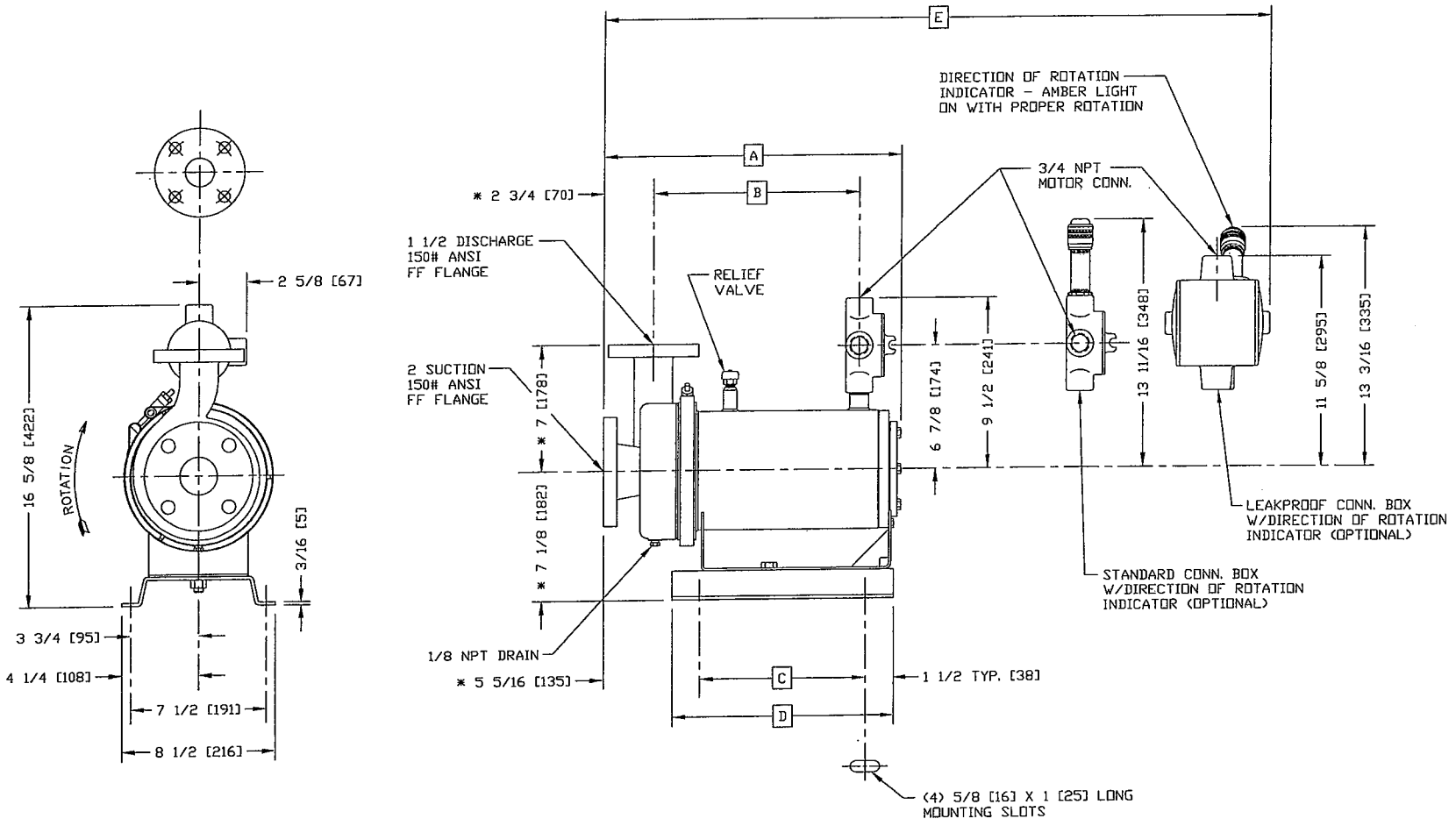
UNLESS OTHERWISE STATED:
-ALL UNITS IN INCHES
-DIMS. IN BRACKETS ARE IN mm
-DIMS. MARKED * ARE ±1/16 [±2]
-ALL OTHER DIMS. ARE ±1/4 [±6]
-ANGLE DIMS. ARE ±5
NOTE: ROUNDING TO NEAREST INCH/mm PRECLUDES INCH/mm CONVERSION.

	DRAWN	DATE
	M.M.	2/21/01
	CHECKED	DATE
	APPROVED	DATE
	SCALE	1:4

TITLE: OUTLINE MODEL JB 150# DESIGN

DRAWING NO. C 60511 REV. 0

NO	DATE & PRO. NO.	REVISIONS	BY



MOD.	A	B	C	D	E
5	16 1/2	11 7/16	9 1/4	12 1/4	17 1/8
3	15 1/4	10 3/16	8	11	15 7/8
1 1/2	13 3/4	8 11/16	6 1/2	9 1/2	14 3/8

INCHES

MOD.	A	B	C	D	E
5	419	290	235	311	435
3	387	259	203	279	403
1 1/2	349	220	165	241	365

MILLIMETERS

SEE WORK DATA SHEET FOR APPROVAL SIGNATURE

CHEMPUMP
A DIVISION OF TEIKOKU USA INC.
WEARNS PARK, WARMINSTER, PA.

UNLESS OTHERWISE STATED,
- ALL UNITS IN INCHES
- DIMS. IN BRACKETS ARE IN mm
- DIMS. MARKED * ARE ±1/16 [±2]
- ALL OTHER DIMS. ARE ±1/4 [±6]
- ANGLE DIMS. ARE ±5
NOTE: ROUNDING TO NEAREST INCH/mm PRECLUDES INCH/mm CONVERSION.

DRAWN	DATE
M.M.	2-22-01
CHECKED	DATE
APPROVED	DATE

SCALE 1:4

TITLE: OUTLINE MODEL JC 150# DESIGN

NO	DATE & PRO. NO.	REVISIONS	BY

DRAWING NO. C 60512 REV. 0

CHEMPUMP
A DIVISION OF TEIKOKU USA INC.
959 Mearns Road, Warminster, PA 18974 Phone: (215) 343-6000 Fax: (267) 486-1037 Website: www.chempump.com E-mail: chempump@chempump.com