

ITEM NO. SERIAL NO.

03-4-6010-540 1D378

03-4-6015-540 1D379



PURCHASERS ITEM NO. *	
SERIAL NO. *	
SIZE 6x8x11D	TYPE MSD
CAPACITY 1360	GPM
HEAD 3149	FT. RPM 3560
SP. GR. 0.9184	TEMP 304 °F
HYDRO TEST 2600	PSIG
CASE MAWP 1733	PSIG
THRUST BEARING JHS-5	
RADIAL BEARING 3.25	DIA. SLEEVE
P.O. NO.: 3457-115	
SULZER BINGHAM PUMPS INC PORTLAND, OR CAMBRIDGE, ONT - VANCOUVER, BC	

A19483

NAMEPLATE, STD API 610		A-1D378-C	
DR. MAR	APPD. -	DATE: 1/10/90	SCALE: 1,1
REF. 1104691	ECN. 3371-03	FIRST: 1D378/9	
UNLESS OTHERWISE SPECIFIED DIMENSIONS, INCHES LINEAR: .X = ±.12 .XX = ±.02 .XXX = ±.005 ANGULAR: X. = ±1° .X = ±.5° .XX = ±.25° DRK CORNERS .03 FIL .032R MAX FIN. 250 RMS/AAH			

NPSH- FEET

100

NPSH AT C.L. IMP.

EFF. %

90

HEAD

EFF. %

7

B. H. P.

1500

BHP AT 1010 G.P.M.

GALLONS PER MINUTE

CERTIFIED TEST PERFORMANCE
SULZER-BINGHAM PUMPS, INC.
PORTLAND, OREGON

RUST INTERNATIONAL
BOILER FEEDWATER PUMP
POM 20388-121
ITEM# 03-4-8010-540
PUMP# 10378

PUMP ENGINEERING DEPT.

**SULZER BINGHAM
PUMPS INC.**

IMPELLER MAX. DIA.	11.5"
MIN. DIA.	8"
DIA. EYE	17
SO. IN.	33'
N.P.S.H. REQUIRED	

6*8*11D MSD	7-STG	PUMP
DIA. IMPELLER	11.2"	3560 R.P.M.
REFERENCE		CURVE NO.
		15707

1/12/00

TM

TOTAL DYNAMIC HEAD IN FEET

HYDRAULIC TEST DATA SHEET

PAGE 1 OF 2

FORM NO. 930-4A

PUMP SIZE & TYPE										STGS.		CUSTOMER										PUMP TESTED			
6*8*11D MSD										7		RUST INTERNATIONAL										1D378			
PURCHASE ORDER NO: 29398-121										CUSTOMER ITEM NO: 03-4-6010-540															
CONDITION		R.P.M.	T.D. HEAD	G.P.M.	EFF.	S.P. GR.	EYE DIA.	EYE AREA	DISCH. PIPE I.D.	SUCT. PIPE I.D.	TESTED BY	DATE	START	STOP											
FIELD		3560	3149	1360	80.5	918	5.75	17	5.7610	7.9810	CS/TW	4/12/90	1:14 PM	1:45 PM											
TEST		REMARKS:																							
		TEST MOTOR: HM-27-3600 4160V																							
		IMP. MAX. DIA. 11.2"																							
		IMP. TEST DIA. 11.2"																							
		NPSH = H _s + H _{atm} + H _{v2/2G} +/- H _e - H _{vd}																							
		< NPSH FORMULA >																							
		NPSH = H _s + H _{atm} + H _{v2/2G} +/- H _e - H _{vd}																							
		NPSH = H _s + H _{atm} + H _{v2/2G} +/- H _e - H _{vd}																							
SPEED		CAPACITY		HY		GAGE TO		DISCHARGE		SUCTION		TOTAL		POWER		PUMP		CORRECTED TO		B.N.P.		VIBRATION		WATER	
R.P.M.		METER		FT. PER		ELEV.		"AA" DEADWT		Hg		DYNAMIC		C.T. 40:1		EFF %		OF		AT		SHAFT		TEMP.	
		A6-6" VENT		1000				R.S.I.		FEET OF		FEET OF		WATTS						G.P.M.		T.D.H.			
		IN. HG.		G.P.M.						WATER		WATER		HEAD						B.N.P.					
1		3591	0.00	0.0	0.0			1706	3940.9	28.7	3912.2	363	643.7	0.0	0.0	3844.9	627.2	575.7	0.918						
2		3589	1.20	410.8	0.3			1702	3931.6	30.2	3901.7	482	862.5	46.9	407.5	3838.9	841.8	772.8							
3		3585	5.85	907.0	1.4			1621	3744.5	26.2	3719.7	649	1169	72.9	900.7	3668.0	1145	1051							
4																									
5		3585	6.00	918.6	1.4			1584	3659.0	-16.9	3677.4	649		19.56		-16.90	34.39	0.54	3.60	2.06					
6		3580	13.25	1365.0	3.2			1436	3317.2	27.0	3293.4	782	1408	80.6	1357.4	3256.7	1384	1271							
7																									
8		3580	13.20	1362.4	3.2			1414	3266.3	-4.6	3274.1	781		32.63		-4.60	34.39	1.19	3.60	1.94					
9		3577	24.35	1850.5	5.9			1129	2608.0	28.2	2585.7	887	1593	75.8	1841.7	2561.1	1571	1442							
10																									
11		3577	24.20	1844.8	5.8			1128	2605.7	20.8	2590.7	883		59.14		20.80	34.39	2.18	3.60	1.83					
12																									
13																									
14																									
15																									
16																									
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23																									
24																									
25																									

CERTIFIED TEST PERFORMANCE
SULZER-BINGHAM PUMPS, INC.
PORTLAND, OREGON
DATED: 4/12/90
SEE CURVE 46792

CERTIFIED BY: *Th W*

COMMENTS

VIBRATION MEASURED ON BEARING HOUSINGS.

CUSTOMER RUST INTERNATIONALSERIAL NO. 1D378CUST. IT.# 03-4-6010-540CUST. P.O.# 2939B-121SIZE & TYPE 6 X 8 X 11D MSDDATE 4/12/90 BY CSSTART 1:14 PM STOP 1:45 PMTEST SPEED 3600 RPMINSTRUMENT IRD-350

		DISPLACEMENT -- MILS				VELOCITY IN/SEC				REMARKS
FREQ. CPM		ALL	3600			ALL				
GPM	LOC.	PASS				PASS				
411	DRIVE END	H	1.5	1.3						
		V	1.6	0.4						
		A								
	THRUST END	H	1.2	1.0						
		V	0.9	0.2						
		A	0.9	0.3						
907	D.E.	H	1.6	1.4						
		V	1.4	0.4						
		A								
	T.E.	H	1.4	1.2						
		V	0.7	0.3						
		A	0.3	0.1						
1365	D.E.	H	1.6	1.4						
		V	0.4	0.3						
		A								
	T.E.	H	1.4	1.2						
		V	0.5	0.2						
		A	0.5	0.15						
1851	D.E.	H	1.6	1.5						
		V	0.4	0.3						
		A								
	T.E.	H	1.3	1.1						
		V	0.4	0.2						
		A	0.5	0.1						

NPSH- FEET

-100

-50

-0

NPSH AT C.L. IMP.

EFFX

HEAD

4000-

3500-

3000-

2500-

2000-

1500-

TOTAL DYNAMIC HEAD IN FEET

B.H.P.

-1500

-1000

-500

-0

BHP AT .910 SP. GR.

2000

1600

1200

800

400

0

GALLONS PER MINUTE

CERTIFIED TEST PERFORMANCE
SULZER-BINGHAM PUMPS, INC.
PORTLAND, OREGON



RUST INTERNATIONAL BOILER FEEDWATER PUMP PO# 29398-121 ITEM# 63-4-6815-548 PUMP# 1D379	PUMP ENGINEERING DEPT.		6*8*11D MSD 7-STC PUMP	
	SULZER BINGHAM PUMPS INC.		DIA. IMPELLER 11.2"	
	4/20/90		DIA. IMPELLER 11.2"	
	T/M		DIA. IMPELLER 11.2"	
		SO. 17	N.P.S.H. REQUIRED 33'	REFERENCE
		3560 R.P.M.		CURVE NO.
		AC700		

HYDRAULIC TEST DATA SHEET

PAGE 1 OF 2

FORM NO. 930-4A

PUMP SIZE & TYPE										STGS.		CUSTOMER		PUMP TESTED	
6*8*11D MSD										7		RUST INTERNATIONAL		1D379	
PURCHASE ORDER NO: 2939B-121										CUSTOMER ITEM NO: 03-4-6015-540					
CONDITION	R.P.M.	T.D. HEAD	G.P.M.	E.F.F.	S.P. GR.	EYE DIA.	EYE AREA	DISCH. PIPE I.D.	SUCT. PIPE I.D.	TESTED BY	DATE	START	STOP		
FIELD	3560	3149	1360	80.5	918	5.75	17	5.7610	7.9810	TW	4/20/90	9:00 AM	10:12 AM		
TEST															
REMARKS:															
NPSH = Hs + Hatm + Hv2/2G +/- He - Hvp															
NPSH FORMULA >															
NPSH = Hs + Hatm + Hv2/2G +/- He - Hvp															
STG.	SPEED	CAPACITY	HY	GAGE	DISCHARGE	SUCTION	TOTAL	POWER	PUMP	CORRECTED TO	B.H.P.	VIBRATION	WATER		
	R.P.M.	METER	FT PER 1000	TO GAGE	"AA" DEADWT	Hg COLUMN	DYNAMIC HEAD	C.T. = 40:1	EFF %	OF	AT	TRANSDUCER AT	TEMP.		
		IN. HG.	G.P.M.	ELEV.	R.S.I.	FEET OF WATER	FEET OF WATER	WATTS READ		G.P.M.	T.D.H.	SHAFT			
1	3592	0.00	0.0	1.72	1727	3989.4	29.6	350	0.0	3889.5	603.5	0.918			
2	3590	1.20	410.8	0.3	1712	3954.7	30.2	475	47.9	3859.5	828.5				
3	3585	5.80	903.1	1.4	1614	3728.3	29.3	642	73.0	3649.0	1132				
4									NPSH	Hs	Hatm	He	Hvp		
5	3585	5.90	910.9	1.4	1564	3612.8	-16.5	640	19.43	-16.50	34.27	0.53	3.60		
6	3581	13.35	1370.2	3.2	1416	3271.0	26.6	774	80.6	3209.6	1369	1257			
7									NPSH	Hs	Hatm	Hv2/2G			
8	3581	13.35	1370.2	3.2	1390	3210.9	-4.0	773	32.88	-4.00	34.27	1.20	3.60		
9	3577	24.35	1850.5	5.9	1100	2541.0	29.9	871	75.1	2493.1	1543	1417			
10									NPSH	Hs	Hatm	Hv2/2G			
11	3577	24.40	1852.4	5.9	1080	2494.8	21.8	870	58.92	21.80	34.27	2.19	3.60		
12															
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24															
25															

CERTIFIED TEST PERFORMANCE
SULTZER-BINGHAM PUMPS, INC.
PORTLAND, OREGON
DATE: 4/20/90
SEE CURVE 346700

CERTIFIED BY: *Tm W*

COMMENTS

VIBRATION MEASURED ON BEARING HOUSINGS.

CUSTOMER RUST INTERNATIONAL
 SERIAL NO. 1D379
 CUST. IT.# 03-4-6015-540
 CUST. P.O.# 2939B-121
 SIZE & TYPE 6 X 8 X 11D MSD
 DATE 4/20/90 BY TW
 START 9:00 AM STOP 10:12 AM
 TEST SPEED 3600 RPM
 INSTRUMENT IRD-350

			DISPLACEMENT -- MILS				VELOCITY IN/SEC				REMARKS
FREQ. CPM			ALL	3600			ALL				
GPM	LOC.		PASS				PASS				
411	DRIVE END	H	1.0	.75							
		V	1.0	.15							
		A									
	THRUST END	H	0.90	.55							
		V	1.10	.24							
		A	0.75	.20							
903	D.E.	H	0.80	.75							
		V	0.22	.13							
		A									
	T.E.	H	0.74	.59							
		V	0.35	.24							
		A	0.36	.20							
1370	D.E.	H	0.78	.75							
		V	0.22	.16							
		A									
	T.E.	H	0.70	.56							
		V	0.36	.25							
		A	0.40	.20							
1851	D.E.	H	0.80	.72							
		V	0.27	.18							
		A									
	T.E.	H	0.70	.52							
		V	0.48	.25							
		A	0.60	.08							

INDUCTION MOTOR DATA: Siemens Energy & Automation, Inc.
Norwood, Ohio

Customer: SULZER BINGHAM PUMPS

Serial Number: 1-5110-64984-01

Horsepower: 1750

Service Factor: 1.0

Voltage: 4800

Frequency, hertz: 60

Number of Phases: 3

Enclosure: WP11

Type: FODS

Frame Size: 3020 SS6

Full Load Speed, rpm: 3570

Insulation Class: F-VPI

	Full	.75	.50
	Load	Load	Load
Efficiency, per cent:	96.1	96.4	96.4
Power Factor, per cent:	90.0	89.2	85.5

Full Load Current, amps: 218

Locked Rotor Current, %FLA: 650

NEMA Design Letter: N/A

kVA/hp Code: G

Full Load Torque, lb.ft.: 2575

Starting Torque, % FLT: 60

Breakdown Torque, % FLT: 200

Rotor Inertia (wk2), lb-ft²:

Motor Weight, lbs:

Bearing Type:

Calculated Data

Prepared by:

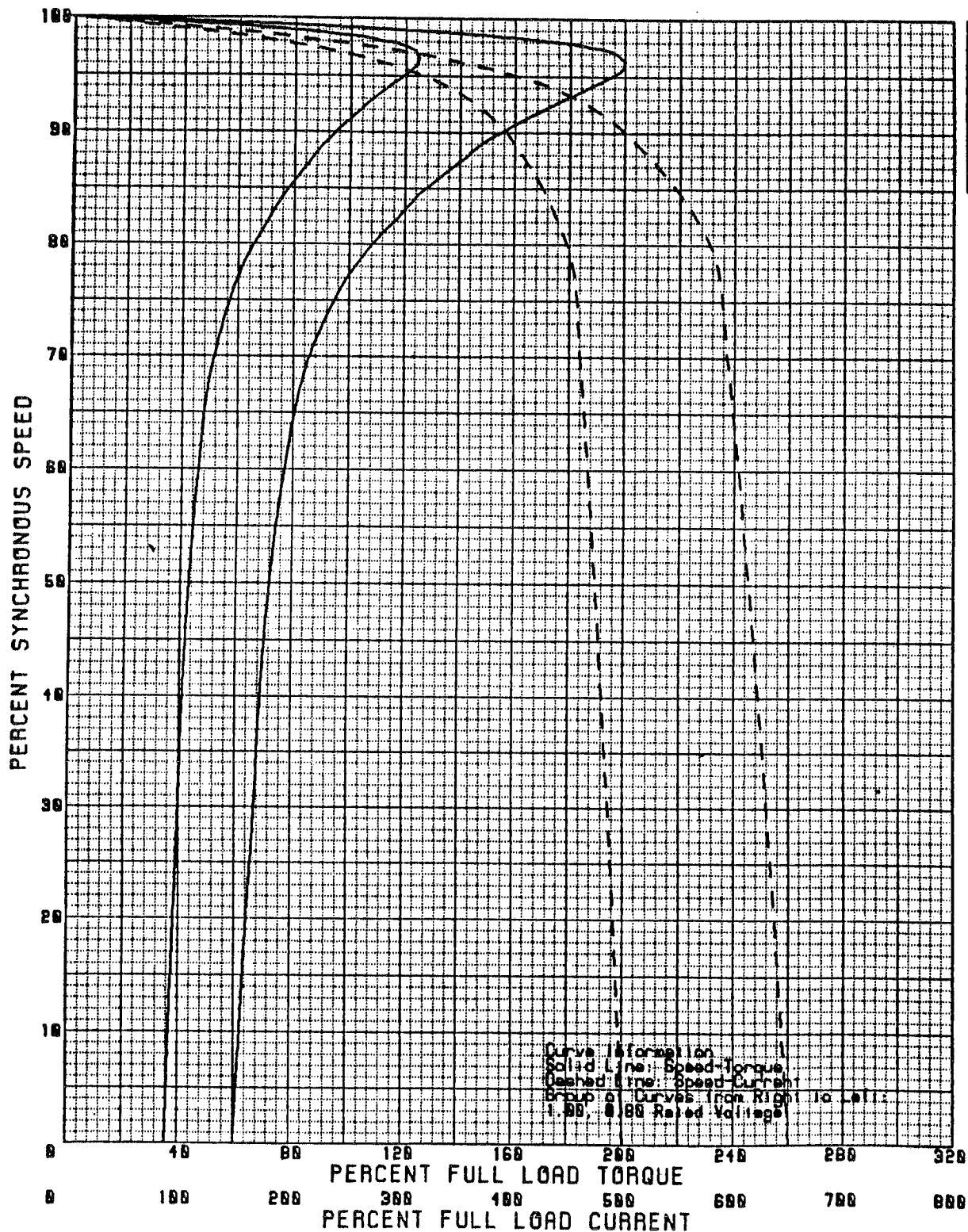
(EE/ME)

DATE

INDUCTION MOTOR CALCULATED SPEED VS TORQUE & CURRENT CURVES

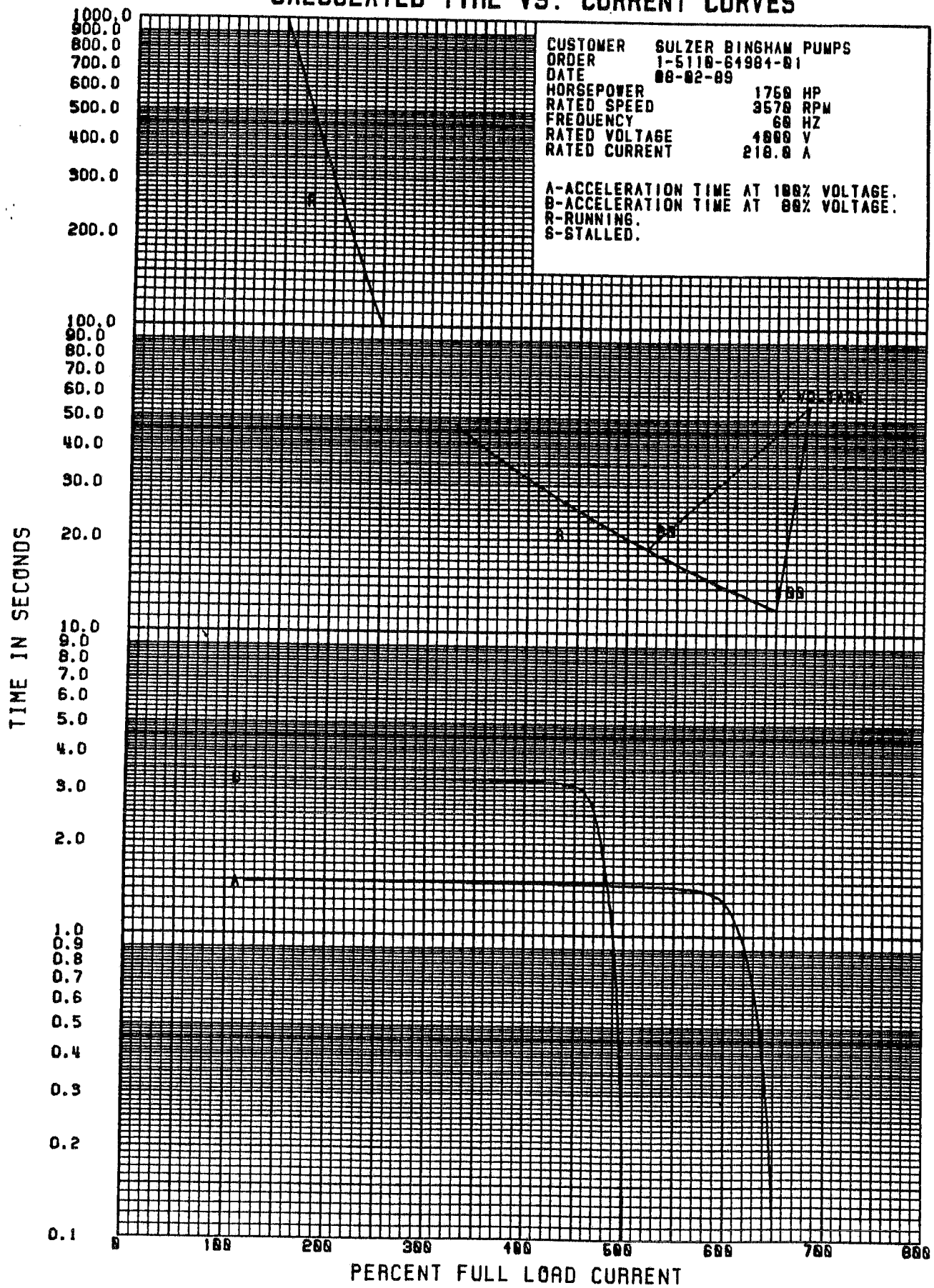
CUSTOMER: SULZER BINGHAM PUMPS
ORDER: 1-5110-64984-01
DATE: 08-02-89
RATED SPEED: 3570. RPM
FREQUENCY: 60. HZ

HP: 1750. HP
RATED VOLTAGE: 4000. V
RATED CURRENT: 218.0
PHASE: 3.



INDUCTION MOTOR

CALCULATED TIME VS. CURRENT CURVES



SIEMENS

Report of Test for Induction Motor

Order No. 1-5110-64984-01
 Purchaser SULZER BINGHAM PUMPS

Date of Test 2-20-90
 Purchaser's Order No. 211133

Nameplate Data

Rated hp	Service Factor	Rated Speed r/min	Phase	Frequency Hz	Volts	Ampere
1750	1.0	3570	3	60	4000	218

Type	Frame	(Temp Rise by Method Indicated)	(Ambient Temp and Insulation Class)	Time Rating	Design Letter	Code Letter for Locked kVA/hp
FODS	3020	80°C BY RES.	40°C CL.F	CONT.	—	G

Test Characteristics

No	No Load					Locked Rotor					Wound Rotor Open-Circuit Voltage	High Pot. Test Voltage	Stator Winding Resistance Between Terminals	
	Volts	Frequency Hz	Speed r/min	Am- peres	Kilo- watts	Volts	Frequency Hz	Am- peres	Kilo- watts				Ohms	Tem- perature °C
1	4000	60	3600	38.9	13.6	1740	60	397	104	1φ	NA	9000	.118	25
2	4000	60	3600	39.0	13.6	1740	60	471	221	3φ	NA	9000	.118	25
						1740	60	395	104	1φ				

Data from test on THESE motors.
 (this or duplicate)

Approved by Betty Koonce Date 2-23-90

SIEMENS

Report of Test for Induction Motor

Order No. 1-5110-64984-02 Date of Test 2-20-90
 Purchaser SULZER BINGHAM PUMPS Purchaser's Order No. 211133

Nameplate Data

Rated hp	Service Factor	Rated speed r/min	Phase	Frequency Hz	Volt	Ampere
1750	1.0	3570	3	60	4000	218

Type	Frame	(Temp Rise by Method Indicated)	(Ambient Temp and Insulation Class)	Time Rating	Design Letter	Code Letter for Locked kVA/hp
FDDS	3020 S56	80°C BY RES.	40°C CL.F	CONT.	—	G

Test Characteristics

No	No Load					Locked Rotor					Wound Rotor Open-Circuit Voltage	High Pot. Test Voltage	Stator Winding Resistance Between Terminals	
	Volt	Freq. Hz	Speed r/min	Amps	Kilo-watts	Volt	Freq. Hz	Amps	Kilo-watts				Ohms	Temp. °C
1	4000	60	3600	38.8	14.0	1740	60	474	223	3φ	NA	9000	.118	25
						1740	60	396	106	1φ				
2	4000	60	3600	38.7	14.4	1740	60	396	107	1φ	NA	9000	.118	26

Data from test on THESE motors.
 (this or duplicate)

Approved by Betty Koonce Date 2-22-90