



FINAL DOSSIER

W.E. MARSHALL CO.

For

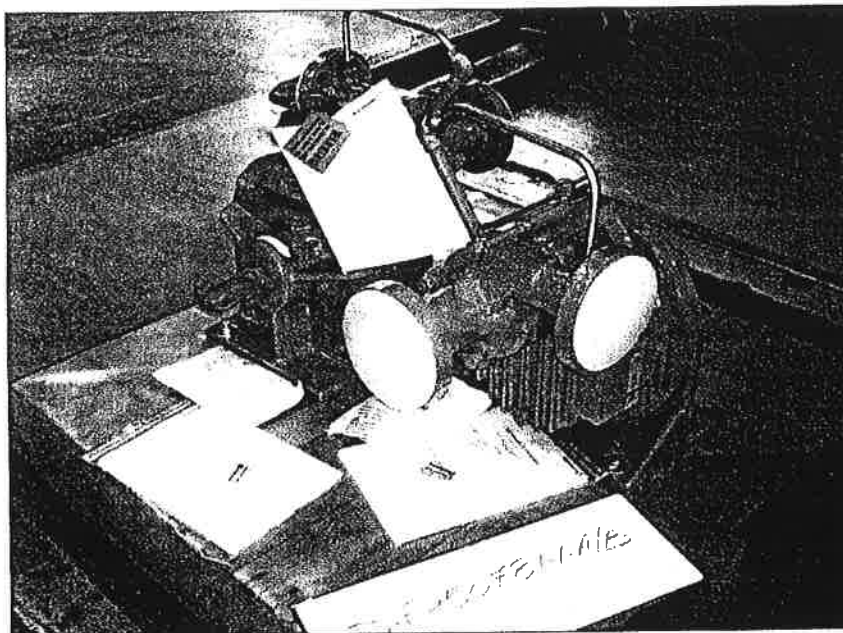
W.E. MARSHALL CO

Final Destination : *U.S.A*

(02) FMP2-EKR-50 Sunflo Units

Your PO N° S15024

Our S/N : D-F450781-1 AB



FILE 1 OF 1

SUNDSTRAND INTERNATIONAL - S.A.
Z.I. DIJON SUD - B.P.30 - 21604 LONGVIC CEDEX FRANCE



CUSTOMER : W.E. MARSHALL CO.

ATTN : BILL MC CLUSKEY

FROM : C. GILLOT

SERIAL NUMBER : D-F450781-1A/B

PUMP MODEL : FMP-2EKR-50

CUSTOMER PO N° : S15024

ITEM N° : N/A

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- ☐ ALL PROCEDURES
- ☒ SUNFLO PUMP INSTRUCTION MANUAL
- ☐ MOTOR INSTRUCTION MANUAL

Yours faithfully

REV : FINAL
SN : D-F450781-1 AB

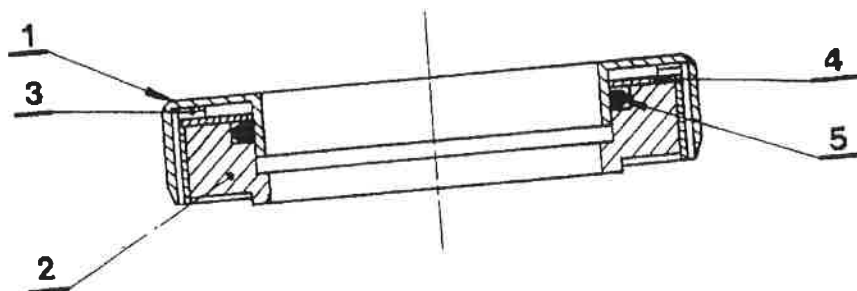
JOB ORDER RELEASE
SUNFLO PUMP TECHNICAL SHEET

CUSTOMER : W.E. MARSHALL CO.		P.O. No. : S15024	
ENG./USER : W.E. MARSHALL CO.		ITEM No. : N/A	
MODEL : FMP2-EKR-50		No. REQ : 2	
OPERATING CONDITIONS		MATERIALS	
Liquid : WATER		pumpcase	<input type="checkbox"/> 410 SS
Suction P. : barg (maxi allowable 9 barg)			<input checked="" type="checkbox"/> 316 SS
Disch. pressure : barg			18-8
Diff. Head : 240 m		seal house	special : cast iron
NPSHr : 1.5 m			<input checked="" type="checkbox"/> 316 SS
NPSHa : m			special : aluminium
Flow : 12 m³/h		frame	<input checked="" type="checkbox"/> aluminium
Temp. : 108 C			carbon steel
S.G. : 0.95 kg/dm³		gearbox	<input checked="" type="checkbox"/> aluminium
Visc. : 0.26 cp			carbon steel
CONSTRUCTION		FLUSH KITS	
Impeller dia. : 120.02 mm		Flush plan : API PLAN 11	
Diffuser dia. : 9.53 mm		Material : <input type="checkbox"/> carbon steel	
<input type="checkbox"/> impeller trim <input checked="" type="checkbox"/> inducer		<input checked="" type="checkbox"/> 316 SS	
conf. <input checked="" type="checkbox"/> frame mount <input type="checkbox"/> close coupled		PERFORMANCE	
orifice <input type="checkbox"/> discharge <input type="checkbox"/> Nitrile (UA) <input type="checkbox"/> Fluorocarbon (UC)		Efficiency : 50.61 %	
o-ring <input type="checkbox"/> PTFE (TA) <input checked="" type="checkbox"/> other : UV		BKW : 16.27 kW	
nozzles <input checked="" type="checkbox"/> flanged <input type="checkbox"/> NPT		Max head : 282.90 m	
<input checked="" type="checkbox"/> casted execution		Min flow : 2.30 m³/h	
<input type="checkbox"/> welded execution		SCPR rated/max: 1.06 bar	
suction : 2" 600 LBS RF		cooling : gearbox : N/A m³/h	
discharge : 1" 1/2 - 600 LBS RF		flush plan : N/A m³/h	
seal <input checked="" type="checkbox"/> single <input type="checkbox"/> double		TESTING	
<input type="checkbox"/> tandem <input type="checkbox"/> other :		Perfo. : non-witn NPSH : no	
HIGH TEMPERATURE SEAL		Hydro. : no Vibra. : non-witn	
MOTOR		Other : no	
Sundstrand : NO	Frame :	GEARBOX	
Mfr.:	Enclosure :	Speed : input : 2960 rpm	
kW :	Protection :	output : 9146 rpm	
rpm:	Insulation :	Lubrication <input checked="" type="checkbox"/> splash	
Volts, Phase, Cycles		<input type="checkbox"/> forced	
Coupling : <input type="checkbox"/> Codari		Oil seal <input type="checkbox"/> lipseal	
<input type="checkbox"/> Metastream		<input checked="" type="checkbox"/> face seal	
<input type="checkbox"/> other		MODULE E-PG01UT06	



SISA - Office & Plant of Dijon
 13-15, Boulevard EIFFEL - 21604 Longvic Cedex
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**PROCESS SIDE
 MECHANICAL SEAL DRAWING
 PART
 No. SE04UT12M1D7UV**



COMPLETE SEAL ASSEMBLY

ITEM No	SUNDSTRAND P/N	DESCRIPTION	QUANTITY
P2-77	SE04UT12M1D7UV	Mechanical seal Process	1

	MATERIALS	DESCRIPTION	QUANTITY
1	DB	Retainer & Drive Seal Assembly	1
2	RZ	Seal Face	1
3	HJ	Spring	1
4	DB	Backing Ring	1
5	UV	« O » Ring	1

MATERIAL :

UV Tetrafluoroethylene
 DB 316 Stainless Steel
 HJ Inconel X750
 RZ Carbon

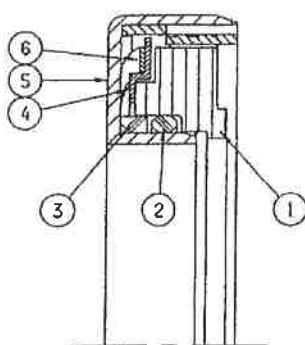
CERTIFIED
 28/03/2008

CUSTOMER : W.E. MARSHALL CO.
 P.O. No. : S15024
 ITEM O/No : N/A
 S/N No. : D-F450781-1 A/B
 MODEL : FMP-2EKR-50



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OIL SIDE PART No. SE04UT15RA11UC



COMPLETE SEAL ASSEMBLY

ITEM No	SUNDSTRAND P/N	DESCRIPTION	QUANTITY
P2-30	SE04UT15RA11UC	Mechanical seal Oil	1

	MATERIALS	DESCRIPTION	QUANTITY
1	RA	Seal face	1
2	UC	O-ring	1
3	DB	Spacer	1
4	DB	Disc	1
5	DB	Retainer Assembly	1
6	DB	Spring	1

MATERIAL :

UC Fluorocarbon
 DB 316 Stainless Steel
 RA Carbon

CERTIFIED
 28/03/2008

CUSTOMER : W.E. MARSHALL CO.
 P.O. No. : S15024
 ITEM O/No : N/A
 S/N No. : D-F450781-1 A/B
 MODEL : FMP-2EKR-50

SUNFLO FINAL PART LIST

Sundstrand International SA



13- Boulevard Eiffel, B.P. 30, 21604 LONGVIC CEDEX FRANCE Phone(33) 3.80.38.33.00 Fax: (33) 3.80.38.33.71 www.sundyne.com

Rev. 0 By Christine Gillot - Date : 28/03/08

FMP2000

Customer Name :	W E MARSHALL COMPANY/U.S.A.
Customer Order No :	S15024
Model :	FMP2-EKR-50
SyteLine Co-Line :	F450781-1
Serial Number :	D-F450781-1-A/B J32130
Item No :	N/A
Quantity Ordered:	2

ITEM	PART NUMBER	DESCRIPTION	QTY	
			Each	Total
**	E-OR01AA180892	MULTIPLE ORIFICE 1/2"NPT	1	2
**	E-PL02AA26	ATEX IDENTIFICATION PLATE	1	2
**	F19-153	HYDRAULIC TUBING	1	2
**	F19-356DB-PA	HYDRAULIC CONNECTOR	1	2
**	F19-410DB-PA	HYDRAULIC ELBOW	1	2
10	PL02UT01	PLATE, DENTIFICATION	1	2
	PL02UT05	PLATE, IDENTIFICATION	1	2
6	PL02UT03	TAG, BEFORE STARTING	1	2
60	PL02UT04	TAG, BEFORE STARTING	1	2
85	TA01UT02A	TAG, MOTOR ROTATION	1	2
P2-1	06-028AF	FLATWASHER, 3/4, GEARBOX/PEDESTAL	4	8
2-10	GA01UT01	GAGE, SIGHT GLASS	2	4
P2-100	HO11UT03A	HOUSING, FRAME MOUNT	1	2
P2-102	ST06AA01BB4	STUD, INDUCER	1	2
P2-11	GK01UT02	GASKET, SIGHT GLASS	4	8
P2-114	13-034	RING, RETAINING, FRAME	1	2
P2-116	SL03UT01	SLINGER, FRAME	1	2
P2-117	14-161UN	O-RING	1	2
P2-12	RE13UT01	RETAINER, SIGHTGLASS	2	4
P2-121	GK01UT03	GASKET, GEARBOX	1	2
P2-127	KE01AA01BB25069	KEY, INPUT SHAFT	1	2
P2-13	42-025	SCREW, SIGHT GLASS	4	8
P2-14	26-067	PLUG, GEARBOX DRAIN	1	2
P2-148	14-199UV	O-RING	1	2

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Rev. 0 By Christine Gillet - Date : 28/03/08

FMP2000

Customer Name :	W E MARSHALL COMPANY/U.S.A.
Customer Order No :	S15024
Model :	FMP2-EKR-50
SyteLine Co-Line :	F450781-1
Serial Number :	D-F450781-1-A/B J32130
Item No :	N/A
Quantity Ordered:	2

ITEM	PART NUMBER	DESCRIPTION	QTY	
			Each	Total
P2-15	HO05UT05A2	HOUSING, GEARBOX	1	2
P2-16	SH10UT01	SHROUD, OIL	1	2
P2-17	02-011AF	SCREW, 3/4, GEARBOX/PEDESTAL	4	8
P2-18	14-054UV	O-RING	1	2
P2-19	HO08UT09DB	SEAL HOUSING	1	2
P2-2	04-008AF	NUT, 3/4, GEARBOX/PEDESTAL	4	8
-20	14-061UV	O-RING	1	2
P2-22	SL01UT03DB1	SLEEVE, SHAFT	1	2
P2-23	21-026	BALL BEARING, HIGH SPEED SHAFT	1	2
P2-25	RJ09UT01RJ	MATING RING,OIL SIDE	1	2
P2-25	RJ09UT01RJ	MATING RING, PROCESS	1	2
P2-28	14-069UV	O-RING	1	2
P2-29	26-014DH	PLUG, PIPE 1/2" NPT, SEAL HOUSING	1	2
P2-3	GE03AA02136	GEAR, SPUR, INPUT SHAFT	1	2
P2-30	SE04UT15RA11UC	MECH.SEAL, OIL SIDE	1	2
P2-31	CV01UT01C	COVER PLATE	1	2
P2-32	HO07UT66DB3D1A1	PUMPCASE,FLANGED 600LBS CASTED	1	2
P2-33	JM01UT08DBC4725	IMPELLER	1	2
P2-37	21-027	BALL BEARING,HS.SHAF	1	2
P2-38	SH01UT04E	SHAFT ASSY	1	2
P2-42	02-030BB	SCREW, 5/8, PUMPCASE	4	8
P2-43	07-008AF	LOCKWASHER,PUMPCASE	4	8
P2-46	07-001AF	LOCKWASHER, GEARBOX/PEDESTAL	4	8
P2-54	13-047	RING, RETAINING	1	2

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Rev. 0 By Christine Gillot - Date : 28/03/08

FMP2000

Customer Name :	W E MARSHALL COMPANY/U.S.A.
Customer Order No :	S15024
Model :	FMP2-EKR-50
SyteLine Co-Line :	F450781-1
Serial Number :	D-F450781-1-A/B J32130
Item No :	N/A
Quantity Ordered :	2

ITEM	PART NUMBER	DESCRIPTION	QTY	
			Each	Total
P2-55	06-048	WASHER, FLAT	1	2
P2-56	07-047	WASHER, SPRING WAVY	1	2
P2-57	JN12AC09DB10	INDUCER	1	2
P2-58	14-052UV	O-RING	1	2
P2-62	02-048AF	SCREW, INPUT SHAFT	1	2
P2-63	07-010AF	LOCKWASHER, INPUT SHAT	1	2
P2-64	06-029AA	FLATWASHER, INPUT SHAF	1	2
P2-65	KE01AA01BB25069	KEY, IMPELLER	1	2
P2-7	GK01UT01	GASKET, OIL SHROUD	1	2
P2-77	SE04UT12M1D7UV	MECHANICAL SEAL	1	2
P2-8	25-005	PLUG, FILL & VENT	1	2
P2-95	21-033	BALL BEARING, INPUT	2	4
P2-96	SH05UT05	SHAFT, INPUT	1	2
P2-99	KE01AA01BB38250	KEY, 3/8 X 3/8 X 2 1/2 LG, INPUT SHAFT	1	2
S1	07-003AF	LOCKWASHER, SIGHT GLAS	4	8
S10	14-069UV	O-RING	1	2
S2	E-PL02AA11	PLATE, WARRANTY	1	2

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Rev. 0 By Christine Gillot - Date : 28/03/08

sh01ut04e

Customer Name :	W E MARSHALL COMPANY/U.S.A.
Customer Order No :	S15024
Model :	FMP2-EKR-50
SyteLine Co-Line :	F450781-1
Serial Number :	D-F450781-1-A/B J32130
Item No :	N/A
Quantity Ordered:	2

ITEM	PART NUMBER	DESCRIPTION	QTY	
			Each	Total
**	GE05AA0244	GEAR	1	2
**	KE02AA04BB	KEY	1	2
**	SH05UT0301	SHAFT	1	2

SUNFLO RECOMMENDED SPARE PARTS

Sundstrand International SA



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Rev. 0 By Christine Giffot - Date : 28/03/08

FMP2000

Customer Name :	W E MARSHALL COMPANY/U.S.A.
Customer Order No :	S15024
Model :	FMP2-EKR-50
SyteLine Co-Line :	F450781-1
Serial Number :	D-F450781-1-A/B J32130
Item No :	N/A
Quantity Ordered :	2

Module Drwg : E-PG01UT06-05-XKR-1-B-2-UA-1-A-003-A-2-2-M-0

Class1:	Minimum recommended spare parts necessary to perform a startup, and inspection of a new unit.
Class2:	Minimum recommended spare parts necessary to cover 1-2 years of normal operation.
Class3:	Minimum recommended spare parts necessary for critical services or units that will be installed in remote locations.

ITEM	PART NUMBER	DESCRIPTION	Quantity per Unit		
			Class 1	Class 2	Class 3
P2-121	GK01UT03	GASKET, GEARBOX	1	2	2
P2-148	14-199UC	O-RING, SEALHSG/GBOX	1	2	2
P2-18	14-054UV	O-RING	1	2	2
P2-20	14-061UV	O-RING	1	2	2
P2-22	SL01UT03DB1	SLEEVE, SHAFT	0	1	1
P2-23	21-026	BALL BEARING, HIGH SPEED SHAFT	0	1	1
25	RJ09UT01RJ	MATING RING, PROCESS	1	1	2
P2-25	RJ09UT01RJ	MATING RING,OIL SIDE	1	1	2
P2-30	SE04UT15RA11UC	MECH.SEAL, OIL SIDE	1	1	2
P2-37	21-027	BALL BEARING,HS SHAF	0	1	1
P2-58	14-052UV	O-RING	1	2	2
P2-7	GK01UT01	GASKET, OIL SHROUD	1	2	2
P2-77	SE04UT12M1D7UV	MECHANICAL SEAL	1	1	2
P2-9	PG02UT06	HIGH SPEED SHAFT ASY	0	1	1
P2-95	21-033	BALL BEARING, INPUT	0	2	2
P2-99	KE01AA01BB38250	KEY, 3/8 X 3/8 X 2 1/2 LG, INPUT SHAFT	1	1	1
S10	14-069UC	O-RING,OIL SEAL/SHSG	0	1	1

PERFORMANCE TEST RESULTS rev 0

Customer : **W.E. MARSHALL CO.**

Test date : **20-févr-08**

Order : **S15024**

Model : **FMP2-EKR-50**

Item N° : **0**

Serial number: **F450781-1-A**

Final diameter impeller (mm) = 120.02

Discharge orifice : NO

Final diameter impeller (inch) = 4.725

Test motor : 50HP

Characteristics : 50 HP 3000 RPM

Test fixture : NONE

NPSH Velocity Head Coefficient .. = 0.0000292

Customer input speed (rpm) = 2980

Customer output speed (rpm) = 9208

Test input speed (rpm) = 2960

Test output speed (rpm) = 9146

Test mechanical losses (kw) = 0.75

Customer mechanical losses (kw) = 0.75

Customer viscosity (cp) = 0.26

No viscosity correction applied

CQ = 1

CH = 1

CP = 1

Customer specific gravity = 0.95

FLOW			HEAD		POWER			EFFIC.	NPSH		
% flow	test flow (us gpm)	custom. flow (m3/h)	test delta P (psi)	custom. head (meter)	motor absorb. (kw)	test motor efficienc.	custom. pump (kw)	custom. pump effic.	test suction (inch/hg)	vapor pressure (inch/hg)	custom. npsb (meter)
19	10.06	2.30	394.0	280.8	12.70	0.78445	9.68	17.27			
60	31.27	7.15	397.0	282.9	15.90	0.81668	12.61	41.53			
100	52.49	12.00	372.0	265.1	19.90	0.84240	16.27	50.61			
125	65.61	15.00	313.0	223.1	22.20	0.85299	18.38	47.13			
139	73.00	16.69	239.0	170.3	23.50	0.85806	19.57	37.60			

Note : performance test carried out with water (SG = 1 and viscosity = 1)

APPROVED BY : E.HYPOLITE

Date : 27-févr-08

DESIGN VALIDATION

28 FEB. 2008

Accepted by: EGIRARD

CUSTOMER :

PERFORMANCE TEST CURVES rev 0

Customer : **W.E. MARSHALL CO.**

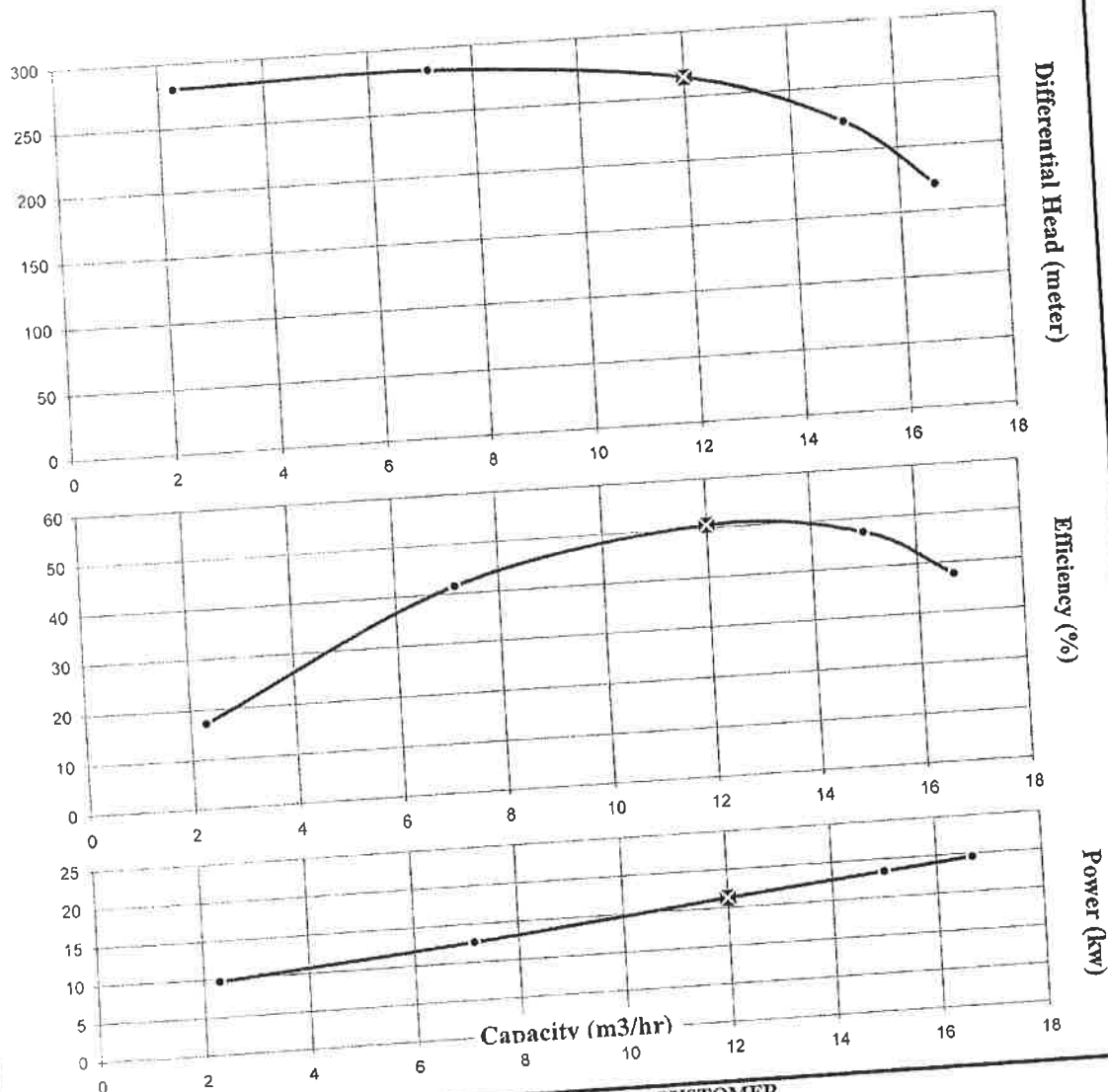
Order : **S15024**

Item N° : **0**

Test date : **20-févr-08**
Model : **FMP2-EKR-50**
Serial number: **F450781-1-A**
Speed (rpm) : **9208**



SISA - Office & Plant of Dijon
15-17, Boulevard EIFFEL - 21024 Longvic Cedex
Téléphone : +33 380 383 300 / Fax +33 380 383 360



APPROVED BY : **E.HYPOLITE**
Date : **27-févr-08**

CUSTOMER

VIBRATION TEST REPORT rev 0

Customer : W.E. MARSHALL CO.

Test date : 20-févr-08

Order : S15024

Model : FMP2-EKR-50

Item N° : 0

Serial number: F450781-1-A

Test motor : 50HP

Characteristics : 50 HP 3000 RPM

Test fixture : NONE

Test input speed (rpm) = 2960

Test output speed (rpm) = 9146

VIBRATIONS MM/SEC RMS				
FLOW %	Unfiltered frequency Maxi = 5.30	Input shaft frequency Maxi = 2.70	Idler shaft frequency Maxi = 2.70	High speed shaft frequency Maxi = 2.70
19	1.880	1.497		0.129
60	1.840	1.512		0.148
100	1.790	1.541		0.142
125	1.880	1.610		0.151
139	2.050	1.521		0.152

The test readouts were recorded through a Bently Nevada model TK 81
and with a velocity probe model 9200-09-01-00

APPROVED BY : E.HYPOLITE

Date : 27-févr-08



CUSTOMER :

SUNDSTRAND INTERNATIONAL - S.A.

Z.I. DIJON SUD - B.P.30 - 21604 LONGVIC CEDEX FRANCE

Sundyne **PERFORMANCE TEST RESULTS rev 0**Customer : **W.E. MARSHALL CO.**Test date : **20-févr-08**Order : **S15024**Model : **FMP2-EKR-50**Item N° : **0**Serial number: **F450781-1-B**

Final diameter impeller (mm) = 120.02	Discharge orifice : NO
Final diameter impeller (inch) = 4.725	
Test motor : 50HP	Characteristics : 50 HP 3000 RPM
Test fixture : NONE	NPSH Velocity Head Coefficient .. = 0.0000292
Customer input speed (rpm) = 2980	Customer output speed (rpm) = 9208
Test input speed (rpm) = 2960	Test output speed (rpm) = 9146
Test mechanical losses (kw) = 0.75	Customer mechanical losses (kw) = 0.75
Customer viscosity (cp) = 0.26	No viscosity correction applied
Customer specific gravity = 0.95	CQ = 1
	CH = 1
	CP = 1

FLOW			HEAD		POWER			EFFIC.	NPSH		
% flow	test flow (us gpm)	custom. flow (m3/h)	test delta P (psi)	custom. head (meter)	motor absorb. (kw)	test motor efficienc.	custom. pump (kw)	custom. pump effic.	test suction (inch/hg)	vapor pressure (inch/hg)	custom. npsh (meter)
19	10.06	2.30	391.0	278.6	12.70	0.78445	9.68	17.14			
60	31.27	7.15	397.0	282.9	15.90	0.81668	12.61	41.53			
100	52.49	12.00	371.0	264.4	19.90	0.84240	16.27	50.47			
125	65.61	15.00	317.0	225.9	22.20	0.85299	18.38	47.73			
139	73.00	16.69	257.0	183.2	23.50	0.85806	19.57	40.44			

Note : performance test carried out with water (SG = 1 and viscosity = 1)

APPROVED BY : E.HYPOLITE

Date : 27-févr-08

DESIGN VALIDATION

28 FEV. 2008

Accepted by: E.GIRARD

CUSTOMER :

PERFORMANCE TEST CURVES rev 0

Customer : **W.E. MARSHALL CO.**

Order : **S15024**

Item N° : **0**

Test date : **20-févr-08**

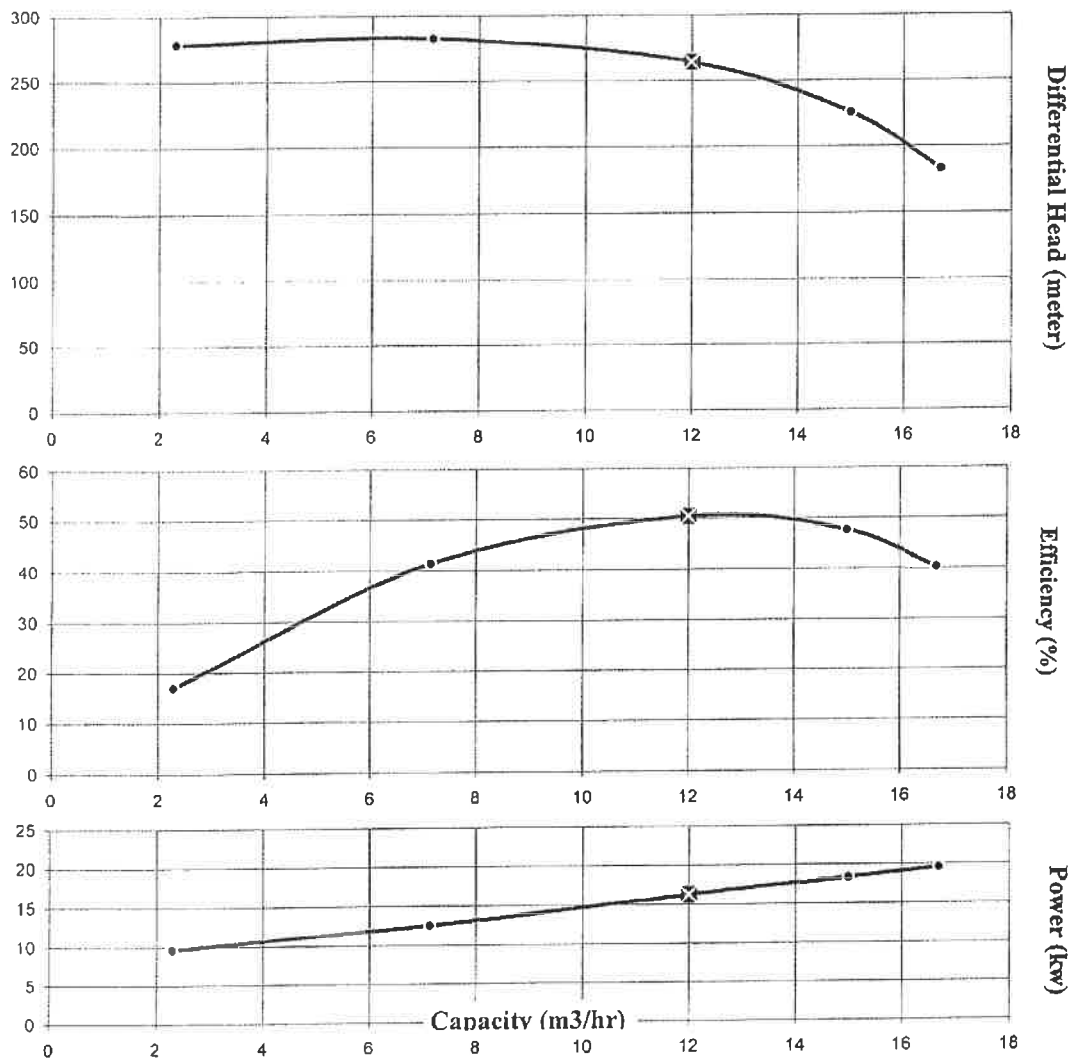
Model : **FMP2-EKR-50**

Serial number : **F450781-1-B**

Speed (rpm) : **9208**



SISA - Office & Plant of Dijon
15-15, Boulevard EIFFEL - 21604 Langéa Cedex
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APPROVED BY : **E.HYPOLITE**

Date : **27-févr-08**

CUSTOMER

VIBRATION TEST REPORT rev 0

Customer : W.E. MARSHALL CO.

Test date : 20-févr-08

Order : S15024

Model : FMP2-EKR-50

Item N° : 0

Serial number: F450781-1-B

Test motor : 50HP

Characteristics : 50 HP 3000 RPM

Test fixture : NONE

Test input speed (rpm) = 2960

Test output speed (rpm) = 9146

FLOW %	VIBRATIONS MM/SEC RMS			
	Unfiltered frequency Maxi = 5.30	Input shaft frequency Maxi = 2.70	Idler shaft frequency Maxi = 2.70	High speed shaft frequency Maxi = 2.70
19	1.860	1.435		0.094
60	1.920	1.682		0.081
100	1.960	1.659		0.082
125	1.990	1.672		0.084
139	1.980	1.591		0.095

The test readouts were recorded through a Bently Nevada model TK 81
and with a velocity probe model 9200-09-01-00

APPROVED BY : E.HYPOLITE

Date : 27-févr-08



CUSTOMER :



SISA - Office & Plant of Dijon
13-15, Boulevard EIFFEL - 21604 Longvic Cedex
Téléphone : +33 380 383 300 / Fax : +33 380 383 366

CUSTOMER : W. E. MARSHALL CO.
P.O. N° : S15024
ITEM N° : N/A
S/N N° : D-F450781-1A/B
MODEL : FMP-2EKR-50

MATERIAL CERTIFICATE OF CONFORMITY :

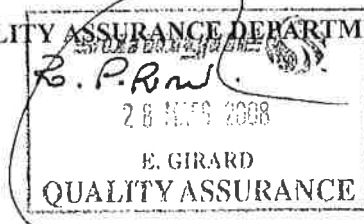
We hereby certify that the materials and parts used in the manufacture of the subject order are in strict accordance with all applicable specifications and are as follows:

Pump case	DB (CASTING)
Seal housing	DB (BAR)
Impeller	DB (CASTING)
Inducer	DB (CASTING)
Shaft sleeve	DB (BAR)
Shaft	AISI 4140
Gearbox housing	Aluminium
Pedestal	Aluminium
Seal rotating face	RJ
Pumpcase bolting	BB
Process O-Rings	Tetrafluoroethylene

MATERIAL IDENTIFICATION CODES :

AA (CASTING) : Low carbon steel : ASTM A216 grade WCB
AA (FORGED) : Low carbon steel : ASTM A105
AA (FORGING) : Low carbon steel : ASTM A668 grade D
AB : Ductile iron : ASTM A395
AD : Carbon steel : ASTM A194 grade 2H
AG (CASTING) : Carbon Steel : ASTM A352 grade LCB
BB : 4140 Steel : ASTM A193 grade B-7
DB (CASTING) : 316SST : ASTM A351 grade CF8M
DB (FORGED) : 316SST : ASTM A182 Grade F316
DB (FORGING) : 316SST : ASTM A473 type 316
DB (BAR) : 316SST : ASTM A276 type 316 condition A
DC (CASTING) : 410SST : ASTM A487 grade CA6NM or ASTM A743 grade CA6NM
DC (FORGING) : 410SST : ASTM A473 type 410
DD (BAR) : 17-4PH SST : ASTM A564 type 630 condition H-1150
DG : 316SST : ASTM A193 grade B8M class 2
DJ : Austenetic stainless steel - commercial quality 18-8 type stainless steel
DS : 304SST : ASTM A194 grade 8
GB : Aluminium Alloy : ASTM B618 temper T6 Alloy 355.0 or 356.0
LD (CASTING) : Titanium Alloy : ASTM B367 grade C-5
LD (BAR) : Titanium Alloy : ASTM B348 grade 5
RE : Tungsten carbide : cobalt binder (Approx. 6% binder)
RJ : Tungsten carbide with nickel binder
RV : Solid silicon carbide, reaction sintered

QUALITY ASSURANCE DEPARTMENT



SUNDSTRAND INTERNATIONAL S.A.



S.A. au capital de 1 860 000 €
RCS Dijon B 016 850 992 - APE 291B
Siret 850 992 00013 - V.A.T. N° FR 80016850992

13-15, BOULEVARD EIFFEL - B.P. 30
21604 LONGVIC CEDEX
FRANCE

TÉLÉPHONE : + 33 (0) 380 383 303
FAX : + 33 (0) 380 383 366
WEB SITE : www.sundyne.com

DECLARATION OF CONFORMITY

European Council Directive 89/392
&
Equipment and protective systems intended for use in
Potentially explosive atmospheres
EU Directive 94/9/EC

- Centrifugal pumps -

Manufacturer : SUNDSTRAND INTERNATIONAL S.A.
DIVISION SUNDYNE
13 - 15 Boulevard Eiffel
B.P. 30
21604 LONGVIC Cédex
France

Pump model : FMP2-EKR-50
Serial number : D-F450781-1 A
End user : W.E. MARSHALL COMPANY
P.O. end user : S15024
Item : N/A
Contractor : W.E. MARSHALL COMPANY
Year of construction : 2008
Area classification : Zone 2

Marking :  II 3 G c II C Tx

By constructional Safety, EN13463-1 and EN13463-5

- The maximum skin temperature depends on the operating conditions of the equipment (maximum suction temperature)

T class	Max suct t° (°C)
T3	184

All information relating to the conformity of the above equipment can be found within the Data book.

We certify that the above equipment has been appraised, surveyed and tested in accordance with the above-mentioned European Directives.

Location : Dijon

Date : 26th February 2008

Authorized signature :

M. Thibert
Quality and EH&S Manager

SUNDSTRAND INTERNATIONAL S.A.
DIVISION SUNDYNE
13 - 15, Boulevard Eiffel
B.P. 30
21604 LONGVIC CEDEX
FRANCE
TEL. 03 80 38 33 00 FAX 03 80 38 33 71

SUNDSTRAND INTERNATIONAL S.A.



S.A. au capital de 1 880 000 €
RCS : B 016 850 992 - APE 291B
Sire : 350 992 00013 - V.A.T. N° FR 80016850992

13-15, BOULEVARD EIFFEL - B.P. 30
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FRANCE

TÉLÉPHONE : + 33 (0) 380 383 300
FAX : + 33 (0) 380 383 366
WEB SITE : www.sundyne.com

DECLARATION OF INCORPORATION

Supply of Machinery according the European Council Directive 89/392 and amended by
93/44, 93/68 & 98/37/E

In accordance with Annex IIb

Herewith, we, Sundstrand International SA, inform that the manufactured Sunflo pump is intended to be incorporated into other machinery. It is not allowed to put the unit into service until the machinery into which the pump is incorporated is conform with the health and safety regulation defined by the European Directive.

Pump type : FMP2-EKR-50

Serial number : D-F450781-1-A

Applicable harmonized standards are :

EN 292/1
EN 292/2
EN 60204-1

An appropriate Quality system, according ISO 9001, is maintained at the Dijon factory to assure the final product quality.

Location : Dijon

Date : 26 February 2008

Authorized signature :

M. Thibert
Quality and EH&S Manager

SUNDSTRAND INTERNATIONAL S.A.
DIVISION SUNDYNE
13 - 15, Boulevard Eiffel
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21604 LONGVIC CEDEX
FRANCE
TEL. 03 80 38 33 00 FAX 03 80 38 33 71

Sundyne

Form: 13Q/E

Rev 3

WARNING NOTICE :**Safety precautions.**

Applicable to all Sundyne pumps & compressors:
BMC, BMP, LMC, LMV & Sunflo.

Sundyne manufactures centrifugal pumps to exacting International Quality Management System Standards (ISO 9001) as certified and audited by Lloyd's Register Quality Assurance Limited. Genuine parts and accessories are specifically designed and tested for use with these products to ensure continued product quality and performance. Sundyne cannot test all parts and accessories sourced from other vendors; incorrect design and/or fabrication of such parts and accessories may adversely affect the performance and safety features of these products. Failure to properly select, install or use authorized Sundyne pump parts and accessories is considered misuse. Damage or failure caused by misuse is not covered by Sundyne warranty. Additionally, modification of Sundyne products or removal of original components may impair the safety of these products and their effective operation.

Ensure that all local environmental, health and safety regulations (including protection against fire, utilization of tools, lifting equipment and transport appliances) are respected at all times. Sundyne recommends that protective equipment be worn at all times when installing, performing maintenance or repairing equipment. The following minimal safety recommendations must be adhered to for optimum safety.

Before you start!

- ❖ Carefully read the **Installation, Operation & Maintenance manual** before starting any work.

Wearing Personal Protective Equipment

- ❖ Safety glasses, with the minimum requirement of side shields, must be worn at all times.
- ❖ Steel-toed shoes must be worn when lifting equipment greater than 7 kg or if pallet jacks or forklifts are operated.
- ❖ Hearing protection is strongly recommended at all times when noise levels exceed 85 dB during an eight hour period.
- ❖ Chemical resistant gloves must be used if chemical use is required.
- ❖ A dust mask respirator must be worn if chemicals have warning labels regarding fumes, dust or mists.

Protection from Falling

- ❖ Fall protection and associated preventative measures are required when working on equipment located 2m or higher from the ground.
- ❖ Follow local company fall prevention procedures prior to working on equipment.

Ensuring Electrical Safety

- ❖ All electrical sources must be powered-off before installation, service or repair of equipment occurs.
- ❖ Sundyne recommends that a Lockout/Tag-out program be followed prior to altering the equipment. Locks or tags must be provided to warn employees that equipment is temporarily unavailable. Once all work has been completed, the person installing the lock or tag must remove it according to local company procedure.

Preventative Machine Guards

- ❖ Preventative guards must remain in place on all equipment.
- ❖ Only remove the guards while performing maintenance or repair. Replace the guards immediately after working on the equipment and prior to start up.

Protection against burns

- ❖ Ensure that all hot surfaces are protected with suitable guards to protect operators from burning.

Testing Equipment

- ❖ Prior to performing a test on newly installed, maintained or repaired equipment; all personnel in the immediate area must be warned.
- ❖ Follow local company procedures prior to equipment testing at all times.

Using Chemicals

- ❖ Any chemicals to be used must be accompanied by a relevant Material Safety Data Sheet (MSDS), in accordance with local government legislation.
- ❖ An eye wash station (or equivalent) should be available in the event of injury. If any hazardous or flammable chemicals pass through the equipment a complete decontamination of the equipment is required.

Explosion/Fire Hazard

- ❖ Never use an acetylene torch or open flame to attempt to remove parts that have seized together in Sundyne equipment. Any residual process gas or liquid that is flammable can result in an explosion or fire with potential for serious injury or death.

Sundstrand International SA
13-15, Boulevard Eiffel - B.P. 30
21604 Longvic, CEDEX, France

WEB site: www.sundyne.com
Telephone: + 33 (0) 380 383 300
Fax: + 33 (0) 380 383 366

Sundyne

Form: 135/E

Rev 0

Safety requirements for the use of Sundyne units:

Applicable to all Sundyne pumps & compressors:
BMC, BMP, LMC, LMV & Sunflo.

This supplementary notice describes the special safety requirements to be adhered to when installing, using or repairing Sundyne units. Keep these safety instructions directly with the product or its associated documentation.

General safety precautions

- ❖ Ensure that all local environmental, health and safety regulations (including protection against fire, utilization of tools, lifting equipment and transport appliances) are respected at all times.
- ❖ The equipment supplied shall only be used for the purpose and duty conditions originally specified by the customer and given in the Sundyne specification sheet. Modification to the specified equipment, removal of components or failure to connect instrumentation (where applicable) may impair operator safety.

Installation

- ❖ Follow the guidelines and precautions described in the unit Instruction & Operation Manual including any addendums for ancillary equipment such as motors and couplings. Connect all vents, drains and utilities as shown on the General Arrangement drawing. Welding may invalidate the guarantee and should not be performed on site without authorization by Sundstrand International SA.
- ❖ The unit is equipped with earth lugs which should be connected to ground in order to avoid sparks due to the build up of static electricity. It is the local user's responsibility to make proper earth connections, verify resistances before starting the equipment and to regularly monitor for variations.
- ❖ Protect cooling water circuits (if applicable) against freezing.

Operation

- ❖ The normal operating conditions (including both minor and major overhaul intervals) depend to a great extent upon the service and duty cycle of the pump. It is important that you become familiar with the pump configuration before starting and operating the pump. Carefully review the Sundyne specification sheet, General Arrangement drawing, Instruction Manual and any other documentation supplied separately or with the unit.

- ❖ For gear driven units the gearbox oil level should be checked prior to initial start-up and periodically thereafter. See the instruction manual for more details.
- ❖ It is essential to ensure that the pump and connecting pipes are completely filled with liquid at all times during the pump operation.
- ❖ If a noise shroud with forced ventilation is fitted ensure that the fan is running to evacuate any build up of gases inside the shroud.

Maintenance

- ❖ The equipment owner shall ensure that only authorized personnel (sufficiently trained and qualified in the operation of the equipment and local safety regulations) conduct maintenance to the machine.
- ❖ Any interventions at the machine are performed during standstill only and electrically secured.
- ❖ To ensure correct operation use only Genuine Spare Parts purchased from Sundyne or an official Sundyne Representative.
- ❖ Care should be taken not to change the duty conditions (as originally specified by the customer and given in the Sundyne specification sheet) during maintenance. Contact Sundyne for any field changes to the agreed duty.
- ❖ See the instruction manual for maintenance intervals (including but not limited to oil changes, filter changes, bearing replacement etc). Increasing vibration levels, or decreasing oil pressure, are signs of wear. Regular monitoring of the operating conditions to allow preventive maintenance can prevent a breakdown.

Disclaimer

- ❖ It is the responsibility of the equipment owner to meet all local legal requirements with respect to safety at work, accident prevention, environmental protection and other regulations to protect their employees and the environment from adverse affects caused by dangerous materials.

Sundstrand International SA
13-15, Boulevard Eiffel - B.P. 30
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SUNDSTRAND INTERNATIONAL S.A.



S.A. capital de 1 860 000 €
RC n° B 016 850 992 - APE 2918
Siret 850 992 00013 - V.A.T. N° FR 80016850992

13-15, BOULEVARD EIFFEL - B.P. 30
21604 LONGVIC CEDEX
FRANCE

TÉLÉPHONE : + 33 (0) 380 383 300
FAX : + 33 (0) 380 383 366
WEB SITE : www.sundyne.com

DECLARATION OF CONFORMITY

European Council Directive 89/392
&
Equipment and protective systems intended for use in
Potentially explosive atmospheres
EU Directive 94/9/EC

- Centrifugal pumps -

Manufacturer : SUNDSTRAND INTERNATIONAL S.A.
DIVISION SUNDYNE
13 - 15 Boulevard Eiffel
B.P. 30
21604 LONGVIC Cédex
France

Pump model : FMP2-EKR-50
Serial number : D-F450781-1 B
End user : W.E. MARSHALL COMPANY
P.O. end user : S15024
Item : N/A
Contractor : W.E. MARSHALL COMPANY
Year of construction : 2008
Area classification : Zone 2

Marking :  II 3 G c II C Tx

By constructional Safety, EN13463-1 and EN13463-5

- The maximum skin temperature depends on the operating conditions of the equipment (maximum suction temperature)

T class	Max suct t° (°C)
T3	184

All information relating to the conformity of the above equipment can be found within the Data book.

We certify that the above equipment has been appraised, surveyed and tested in accordance with the above-mentioned European Directives.

Location : Dijon

Date : 26th February 2008

Authorized signature :

M. Thibert
Quality and EH&S Manager

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DIVISION SUNDYNE
13 - 15, Boulevard Eiffel
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FRANCE
TEL. 03 80 38 33 00 FAX 03 80 38 33 71

SUNDSTRAND INTERNATIONAL S.A.



S.A. capital de 1 860 000 €
RC B 016 850 932 - APE 291B
Siret : 850 992 00013 - V.A.T. N° FR 80016850992

13-15, BOULEVARD EIFFEL - B.P. 30
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TÉLÉPHONE : + 33 (0) 380 383 300
FAX : + 33 (0) 380 383 356
WEB SITE : www.sundyne.com

DECLARATION OF INCORPORATION

Supply of Machinery according the European Council Directive 89/392 and amended by
93/44, 93/68 & 98/37/E

In accordance with Annex IIb

Herewith, we, Sundstrand International SA, inform that the manufactured Sunflo pump is intended to be incorporated into other machinery. It is not allowed to put the unit into service until the machinery into which the pump is incorporated is conform with the health and safety regulation defined by the European Directive.

Pump type : FMP2-EKR-50

Serial number : D-F450781-1-B

Applicable harmonized standards are :

EN 292/1
EN 292/2
EN 60204-1

An appropriate Quality system, according ISO 9001, is maintained at the Dijon factory to assure the final product quality.

Location : Dijon

Date : 26 February 2008

Authorized signature :

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Quality and EH&S Manager

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Sundyne

Form: 130/E

Rev 3

WARNING NOTICE :**Safety precautions.**

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Explosion/Fire Hazard

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13-15, Boulevard Eiffel - B.P. 30
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WEB site: www.sundyne.com
Telephone: +33 (0) 380 383 300
Fax: +33 (0) 380 383 366

Sundyne

Form: 135/E

Rev 0

Safety requirements for the use of Sundyne units:

Applicable to all Sundyne pumps & compressors:
BMC, BMP, LMC, LMV & Sunflo.

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Operation

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- ❖ See the instruction manual for maintenance intervals (including but not limited to oil changes, filter changes, bearing replacement etc). Increasing vibration levels, or decreasing oil pressure, are signs of wear. Regular monitoring of the operating conditions to allow preventive maintenance can prevent a breakdown.

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Sundstrand International SA
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21604 Longvic CEDEX, France

WEB site: www.sundyne.com
Telephone: +33 (0) 380 383 300
Fax: +33 (0) 380 383 366

CUSTOMER	W.E.MARSHALL
PO NO.	S15024
NAME	SUNFLO P2-EKR-50
END USER	HYDRO-CHEM
HYDRO-CHEM PO#	PQ7080702
HYDRO-CHEM P/N	BFWDE66 / P-101A&B

MATERIAL KEY

TA - Teflon	UC - Viton-A
UN - Kalrez	UD - Ethylene Propylene
UA - Buna N	UV - Atlas

SUNFLO P2000 PUMP RECOMMENDED SPARE PARTS Model No: P2-EKR, FM (SINGLE SEAL)

ITEM NUMBER	PART NUMBER	PART DESCRIPTION	CLASS	1	2	3	PRICE**	AVAILABILITY
				QTY	QTY	QTY	EACH	ARO
P2-7	GK01UT01	GASKET,RUBBER,OIL SHROUD		0	1	1	\$15.12	1 WK
*P2-9	S/N D-F450781-1B HS	HIGH SPEED SHAFT ASSY		0	1	1	\$7,124.00	3 WK
P2-18	14-054UV	O-RING 936G		1	2	2	\$16.72	1 WK
P2-20	14-061UV	O-RING		1	2	2	\$74.67	1 WK
P2-22	SL01UT03DB1	SLEEVE,SHAFT		0	1	1	\$289.33	1 WK
P2-23	21-026	BEARING,BALL, OUTBOARD		0	1	1	\$221.33	1 WK
P2-25	RJ09UT01RJ	ROTATING FACE		2	2	4	\$258.67	1 WK
P2-28	14-069UV	O-RING		1	2	2	\$21.45	1 WK
P2-30	SE04UT15RA11UC	SEAL,MECHANICAL,GEARBOX		1	1	2	\$193.33	1 WK
P2-37	21-027	BEARING,BALL, INBOARD		0	1	1	\$258.67	1 WK
P2-58	14-052UV	O-RING 936F		1	2	2	\$7.67	1 WK
P2-77	SE04UT12M1D7UV	SEAL,MECHANICAL, PROCESS, AFLAS		1	1	2	\$288.00	1 WK
P2-117	14-161UN	O-RING		1	2	2	\$165.33	1 WK
P2-121	GK01UT03	GASKET,GEARBOX		0	1	1	\$20.96	1 WK
ADDITIONAL PARTS RECOMMENDED WITH FRAME MOUNTED UNITS:								
P2-95	21-033	BEARING,BALL, INPUT SHAFT		0	2	2	\$37.33	1 WK
P2-99	KE01AA01BB38250	KEY		0	1	1	\$48.00	1 WK
OPT. - O-RING KIT	RKORP2000UV	PREASSEMBLED KIT, AFLAS					\$452.00	1 WK

* ENTER UNIT SERIAL NUMBER

** PRICING AS OF 03-20-2008 GOOD FOR 30 DAYS

Class 1 Spares - Minimum recommended spare parts necessary to perform a startup and inspection of a new unit.

Class 2 Spares - Minimum recommended spare parts necessary to cover 1-2 years normal operation.

Class 3 Spares - Minimum recommended spare parts stock necessary for critical services or units that will be installed in remote locations.

9.12



SUNFLO
SERIES P-2000
FRAME MOUNTED PUMP WITH BEDPLATE
"CAST ON FLANGE" CONNECTIONS
Sundstrand Fluid Handling

14845 WEST 64th AVENUE, ARVADA, COLORADO 80004 and
VOLUNTEER 140 A, BOX 1, B-1831 DIEDEM, BELGIUM
and of MILTON ROY COMPANY

CELESTIAL CORPENT

1 HS

DATE _____

SH 1 OF 2