

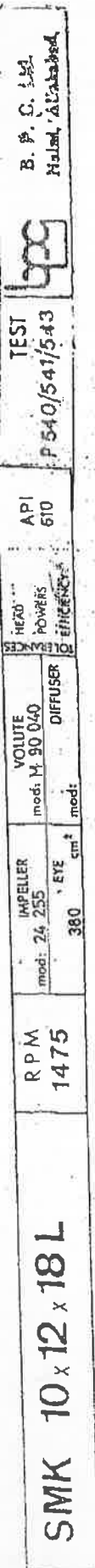
Bpc slo. 20201013-01.

GENERAL										
1										
2	Project:	Brahmaputra Petroch. Compl. Project				Job No.:	6907			
3	Owner:	M/s BCPL				Site:	LEPETKATA-India			
4	Purchaser:	M/s BCPL				Unit:	LLDPE/HDPE		Unit No: 117	
5	Item No.:	117-PA-848 A/B				Service:	PELLET WATER PUMP			
6	No. Req'd.:	Two		Working:	One	Standby:	One	Parallel Operation Required:	Yes	No
7	Applicable to	☐ Proposal		☒ Purchase		☐ As Built				
8	Scope option & Information specified by purchaser ☐ Information Req'd. from & option left to vendor. Vendor to cross ☒ the selected option.									
9	Driver: Working	Elec. Motor		Standby	Elec. Motor		Driver Supplied & Mounted By:		☒ Pump Mfr.	☐ Other
10	OPERATING CONDITIONS									
11	Liquid Handled	WATER + TRACES OF PE FINES (≤500 μm (Rem 3)				Capacity (m³/hr): Min/Nor/Rated:	360/432/600			
12	Pumping Temp. (°C):	60				Discharge Pressure (kg/cm², g):	6.8			
13	Specific Gravity at P.T./15°C:	0.983				Suction Pressure: Nor/ Max. (kg/cm², g):	1.2/1.4			
14	Vapor Pressure at P.T. (kg/cm², A):	0.20				Diff. Pressure (kg/cm²) @ Rated Capacity:	5.6			
15	Viscosity at P.T. (cP/est):	0.46		Corr./Eros. By:	NO		Diff. Head (m) @ Rated Capacity:	57		
16	Solids in suspension	☒ Yes ☐ No		Size:			NPSH Available (m):	>7(Rem 3)		
17	MANUFACTURERS SPECIFICATIONS									
18	Pump Manufacturer:	BHARAT PUMPS & COMPRESSORS LTD.				Model No.:	SMK 10X12X18L			
19	CONSTRUCTION					PERFORMANCE				
20	Casing Mounting:	☒ Centerline		☐ Foot	☐ Inline	Proposal Curve No.	1470-642-04			
21	Casing Split:	☐ Axial		☒ Radial		Visc. Corr. Factor: C _n	C _d	C _H		
22	Type:	☐ Single Volute		☒ Double Volute		NPSH Req'd. (Water) (m):	3.3		F/L Speed (rpm):	1450
23	Casing Connection:	☒ Vent		☒ Drain	☐ Gauge	No. of stages:	ONE		Efficiency (%):	80
24	Nozzles	Size	ANSI Rating	Facing	Position	Rated BkW(0% Tol.):	114.5kW		Max. BkW rtd. imp.:	127.2kW
25	Suction	12"	300#	RF Sm. Fin.	END	BkW @ MCF(p=1.0):	88.6 kW		Rec. Driver Rating: (kW)	132kW
26	Discharge	10"	300#	RF Sm. Fin.	TOP	Max. head rtd imp.(m):	68.7		Cap@ BEP(m³/hr):	675
27	Imp. φ (mm)	Max: 470	Rated: 455	Min: 376	Type: Closed	MCF (m³/hr): Stable	315		Thermal	315
28	Brg.: Type/No. Radiat:	1XNU316		Thrust:	2X7314B	Lub: Oil	M.A.W.P @ 15°C/P.T./Design Temp.(kg/cm², A) 42kg/cm² G			
29	Cplg.: Make/Type:	RATHI/UNIQ		Fleximetal w spacer	Nonspark Guard	☒ Yes ☐ No	Hydrostatic Test pressure (kg/cm², G): 63			
30	Driver Half cplg. mounted by:	☒ Pump Mfr.		☐ Others		Rotation facing coupling end:	☐ CW ☒ CCW			
31	Packing Type:	NA		Size: NA	No. of rings: NA	Seal flush/ Quench plan:	32, 61 (Rem. 4&5)		Mat:	SS
32	Mech. Seal: Make	#		Model:	API Code: C2A1A3261		Ext. seal flush fluid:			
33	Base Plate Drain Rim Type :	☒ Yes ☐ No		Fdn. Bolts:	☒ Yes ☐ No		Seal Barrier fluid:	LPM: Kg/cm²/Gl °C		
34	Throat Bush:	☒ Yes ☐ No		Mat.:	☒ Yes ☐ No		Ext. quench fluid:	LPM: Kg/cm²/Gl °C		
35	Materials (API-610 Matl. Class):	A-8		MOC	ASTM Grades		C.W. Plan :	LPM: Kg/cm²/Gl °C		
36	I - Cast Iron (Ductile)	Casing			A 351 Gr. CF3M	Weight(kg): Pump+Base+Coupling:	2,345		Driver:	950
37	B - Bronze	Impeller			A 743 Gr. CF3M	AUXILIARY PIPING INTERFACE CONNECTIONS				
38	S - CS	Inner Case parts				(All interface conn. shall be termnd. with a flng. block valves)				
39	C - 11-13% Chr. Stl.	Sleeve Packed				Size	Rating(ANSI)	Facing		
40	H - Hardened	Sleeve Seal			AISI 316L	Lantern Ring Inlet/Outlet				
41	f - Faced	Casing ring			A 743 Gr. CF3M	Ext. Seal flush fluid Inlet/Outlet				
42	K - SS 304	Impeller ring			A 743 Gr. CF3M	Seal Quench fluid Inlet				
43	L - SS 316	Shaft			AISI 316L	Seal pot vent/ drain				
44	X - AISI 410	Throttle Bush			A 743 Gr. CF3M	Casing vent/ drain	1/4"	300#	RF	
45	O - Duplex	Throat Bush			A 743 Gr. CF3M	C.W Inlet/ Outlet				
46	Y-CS Charpy	Balance Drum				Base plate drain (only flanged)	2"	150#		
47	☒ Driver suitable for Pump starting with open Disc. Valve condition.									
48	INSPECTION & TESTS (EACH PUMP)									
49		Witness		Observe		Witness		Observe		
50	☒ Shop Test / Inspection	☐		☐		☒ NPSH As Req'd. ☒ Per Spec. ☐ Mandatory		☐		☐
51	☒ Material Certificates	☐		☐		☒ Dismantle Insp. & Re-assembly after Test		☒		☐
52	☒ Hydrostatic	☐		☐		☒ Utilisation/ Dimensional Check		☒		☐
53	☒ Performance/Sound Level	☐		☐		☒ Check for direction of rotation of pump & driver.		☒		☐
54	Applicable Specification: API Std. 610, 8 th Edition, along with EIL Std. Spec. No. 6-41-0005 Rev. 2 & Job Specification.									
55	REMARKS:- 1) Max. allowable casing working pressure shall not be less than 8.2 kg/cm² g @ 100 °C.									
56	2) Down Stream Design Pressure is 8.2 kg/cm² g @ 100 °C. Maximum shut-off pressure, considering max suction pressure & max. Sp. Gr.									
57	including tolerances shall not exceed Downstream Design Pressure.									
58	3) Partially aerated water.									
59	4) Shaft seal type shall be C2A1A 3261 as per API 682 2 nd Edn.5) Cooling Water @ Ambient temp shall be used for seal flushing.									
60	# EBIPL/FSL/JC									

REVIEW CODE ☒ 1 ☒ 2 ☒ 3

Signature & Name
Date/दिनांक
P. No.
6907/1698

01/10/2010	0	HM	SM
10/11/2009	A	MG	SM
DATE	REV	JOB ENGINEER	REV. & APPROVED BY



B. S. C. Ltd.
Hull, England

TEST
P540/541/543

API
610

HEAD
POWERS

VOLUME	mod: M 90 040
DIFFUSE	

IMPELLER
mod: 24 255
EYE

RPM
1475SMK 10_x12_x18L

dwg: 856 326

ITEM No. 117-PA-248-115
COA No. : 2010022-03 Rev. 2

For upper figures, please contact us.

Other characteristics
See on page 1470 - 719-00 1004

CHARACTERISTICS
: Wear rings with API clearance

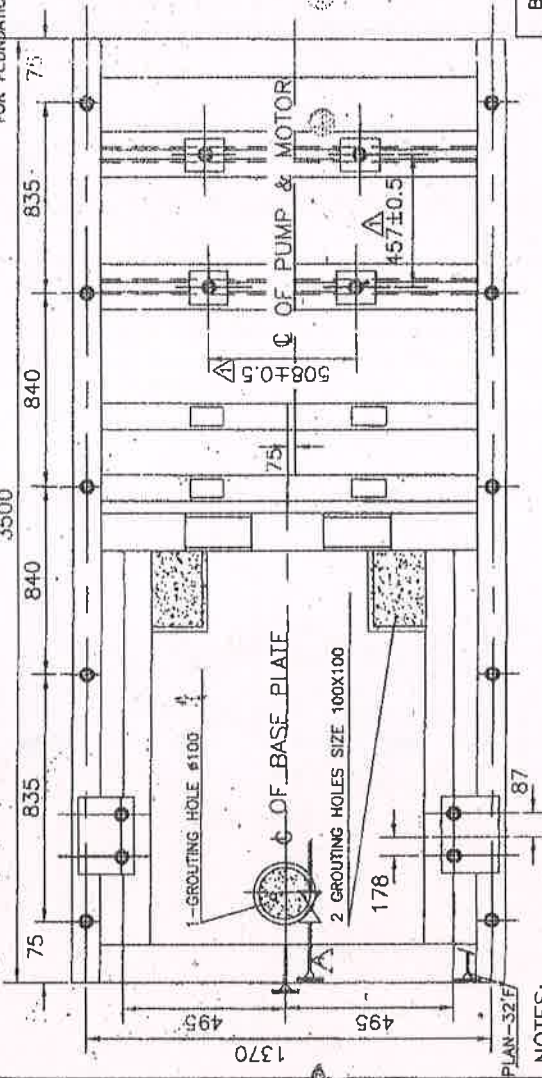
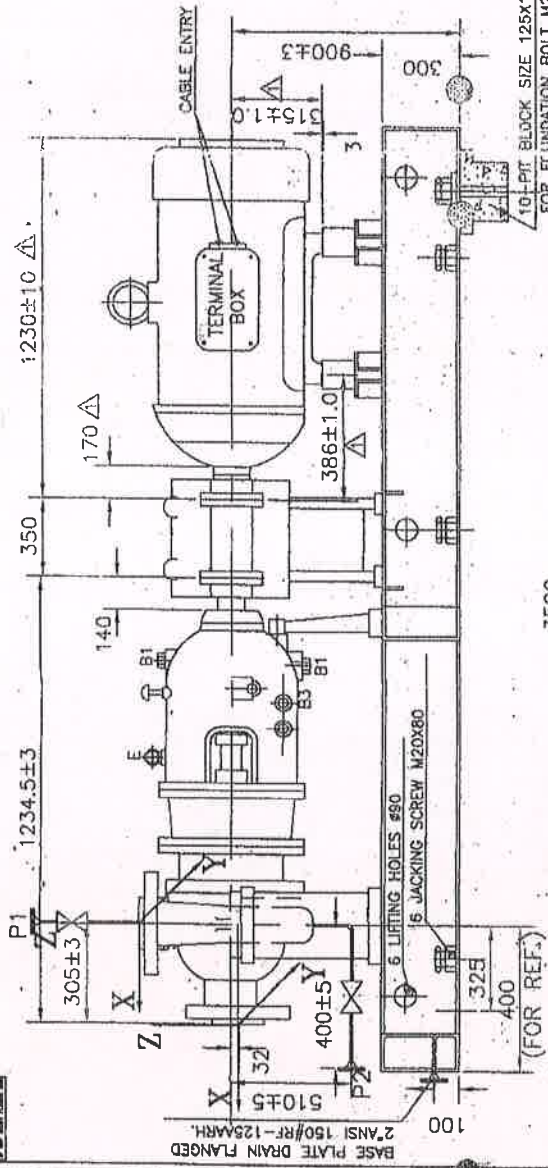
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1 STAGE

Vol 1
12/12

Other characteristics

F=FORCES IN NEWTON, M=MOMENTS IN NEWTON METER



WT. OF PUMP: ~ 390kg.
 FLANGE SUCTON: Ø 12" ANSI 300# (1525AARH)
 PUMP SHAFT: Ø 65(1.0 ID TAPER)
 COMP. WITH SPACER Δ CUP GUARD NON SPARKING (ALUMINIUM)
 ROTATION Δ PUMP (FACING COUPLING END): CCW
 COOLING LIQUID - QTY. - PRESSURE: -
 EXTERNAL FLUSHING LIQUID: COOLING WATER QTY: 5-6lpm PRESSURE: 7.5-8kg/cm2
 COOLING API PLAN : N/A MATERIAL: -
 FLUSHING API PLAN: 32+61
 GD 2 VALVE (PUMP+COUPLING) 8.2 Kg.m2
 EXT. SEAL (GORGES) SEE DRAWINGS PER API 610-8th EDITION Δ

MOTOR DETAILS 	
WAVE :	CROMPTON GREAVE
FRAME SIZE :	ND315M
RW :	132 RPM 1485 (FULL LOAD)
DRAWING NO. NDB3, VERBYS	
WEIGHT: 950kgo.	

Signature & Name
हस्ताक्षर व नाम
Date/दिनांक
V.P. No.
बी.पी.नं. 6907 / 5462

BFC S/O	: 202010013-01	CONSULTANT: EIL
CLIENT	: BRAHMAPUTRA CRACKER & POLYMER LTD	PROJECT : BRAHMAPUTRA PETROCHEM. COMPLEX
SITE	: LEPETKATA-INDIA	JOB No : 6907
ITEM No	: 117-PA-848 A/B	
P.R.No.	: FOA NO. 6907-117-PA-P0-5249/0537/0213	DATED 30-07-2010.

[illegible]

Annex- 1(c)

6907-117-XZ-DS-5240
02.13

MEDIUM VOLTAGE SQUIRREL CAGE INDUCTION MOTOR

 Datasheet No.
6907-117-XZ-SP-5240-0213

PURCHASER'S DATA

A. Site conditions

1	Ambient temperature,	minimum:	1	°C
		maximum:	39.8	°C
		design:	40	°C
2	Relative humidity:		93	%

3	Atmospheric condition:	Humid & highly corrosive
4	Altitude:	4000 m
5	Location:	Outdoor
6		

B. Technical particulars

1	Motor tag no.:	117-PM-848 A/B
2	Driven equipment name:	CENTRIFUGAL PUMP
3	Voltage:	415, +8%
4	Phase:	3
5	Frequency:	50, +3%
6	Fault level:	NA
7	Method of starting:	Direct On Line
8	Winding connection:	Delta
9	No. of terminals:	6
10	Cable size:	2Rx3Cx185 Sq. mm
11	Cable type:	Al cond. PVC Insulated
12	Temperature rise:	80
13	Cooling:	TEFC
14	Insulation class:	B/F with temp rise limited to Class B.
15		

16	Hazardous area classification:	ZONE-2
17	Gas group/Temp class:	IIA/IB T3
18	Type of explosion protection:	Ex'n
19	Type of ingress protection:	IP55
20	Color shade:	CGL STD(532 as per IS 5.)
21	Thermistors:	☐ Required ☒ Not Required
22	RTD:	☐ Required ☒ Not Required
23	BTD:	☐ Required ☒ Not Required
24	RTD/BTD monitoring device:	☐ Required ☒ Not Required
25	Applicable specification:	EIL spec. 8-51-0032 6.6907-117-XZ-SP-5240-0213 REV. 0

DRIVEN EQUIPMENT MANUFACTURER'S DATA

1	Suggested motor rating:	132	kW
2	Manufacturer:	BPC	
3	BkW at full load:	108.5	kW
4	kW at end of curve:	120.5	kW
5	Speed:	1450	RPM
6	Rotation viewed from coupling end:	CCW	
7	Driven equipment:	CENTRIFUGAL PUMP	
8	Coupling type:	DIRECT MEMBRANE	

9	Torque required:	starting: 20% Of FLT mkg maximum: 45% Of FLT mkg
10	GD ² of eqpt.:	8.2 kgm ²
11	Thrust up:	No Axial Thrust kg
	down:	kg
12	Starting condition:	CVC (No Load)

MOTOR MANUFACTURER'S DATA

1	Rating:	132	kW
2	Manufacturer:	CROMPTON GREAVES LTD.	
3	No. of poles:	4	
4	Frame designation:	ND315M	
5	Full load speed:	1485	RPM
6	Mounting:	B3	
7	Full load torque (FLT):	86.58	mkg
8	Starting torque:	225	% of FLT
9	Break down or pull out torque:	275	%
10	Full load current (FLC):	210.00	A
11	Starting current at 100% voltage:	600	% of FLC
12	Rotation viewed from coupling end:	Clockwise From DE	
13	Starting time at,		
	75% voltage:	1.5	sec.
	100% voltage:	1.00	sec.
14	Locked rotor withstand time (cold/hot) at,		
	75% voltage:	53/27	sec.
	100% voltage:	30/16	sec.
15	Space heater - voltage & power:	60WX2, 240V AC	
16	Applicable IS/IEC for hazardous area application:	IS:1231, IS:12076, IS:12085, IS:325,	

17	Efficiency at,	75% voltage:	95	%
		100% voltage:	95	%
18	Power factor at,	starting:	0.30-0.50	
		100% load:	0.92	
19	Moment of Inertia, GD ² :		14.00	kgm ²
20	NDE bearing type & no.:		6319-C3	
21	DE bearing type & no.:		6319-C3	
22	Type of lubrication:		UNIREX-N3	
23	Weight of motor:		950	kg
24	Thermistors, N.A. quantity:			no.
	make:			type:
25	RTD, N.A. quantity:			no.
	make:			type:
26	BTD, N.A. quantity:			no.
	make:			type:
27	Shaft voltage:	N.A.	NA	V
28	Critical speed, 1 st /2 nd stage:		>125%	RPM
29	Canby (FRP):	☐ Not Required ☒ Required		

1. Starting time calculations shall be based on operating conditions specified on Material Requisition eg. open valve condition/ closed valve condition, at no load/full load, as applicable.
2. All blank data shall be filled by vendor

Bo	19.11.08	23.08.10	ISSUED WITH MR PR (M/S 3P/10)	MHR VP	SV VKT	UAP
A	08.09.2008	16.11.09	ISSUED WITH MR	MHR JDM	SV VKG	UAP Ak
Rev. No.	Date	Purpose	Prepared by	Checked by	Approved by	

NOTE: 1) ALL PERFORMANCE FIGURES ARE SUBJECT TO IS 325 - 1996 TOLERANCES.

 2) FOR INVERTER DRIVEN MOTORS, MAX. ALLOWED % THD FOR VOLTAGE = 3%
AND TEMPERATURE RISE IS LIMITED TO CLASS F LIMITS

 3) FOR INVERTER DRIVEN MOTORS, VOLTAGE SPIKES ARE ALLOWED MAXIMUM 1600 V
AND MIN. RISE TIME OF 0.1 MICROSECOND. CABLE LENGTH TO BE SELECTED ACCORDINGLY.

 ISSUED BY: Munira
LT MOTORS DIVISION, AHMEDNAGAR

EIL Job. No: 6907

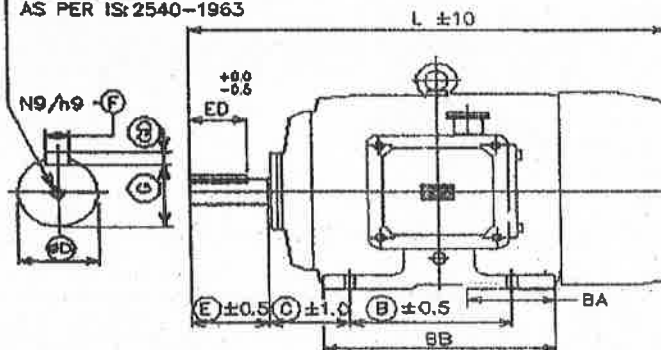
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REV.01
29/12/10
 Bharat Pumps & Compressor Ltd
Naini, Allahabad

 CODE-1 SUBJECT TO CORRECTIONS MARKED &
RESUBMIT IN AS BUILT DOCUMENTATION.

OUTLINE DIMENSION DRAWING FOR 3 PHASE SQUIRREL CAGE TEFC FOOT MOUNTED TB ON RHS INDUCTION MOTORS

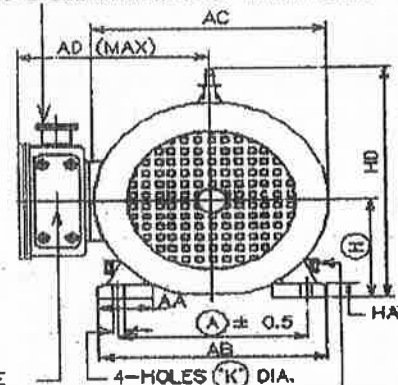
Y THREADED CENTRE HOLES
AS PER IS: 2540-1963



CABLE ENTRY PROVIDED AS PER CUSTOMER CABLE SIZE

RINGED DIMENSIONS ARE AS PER IS: 1231
ALL DIMENSIONS ARE IN mm

AUX. TERM BOX FOR SPACE HEATER
ABOVE 225 FRAME ONLY WHEN REQD.



EARTHING TERMINALS OF M8 FOR 80-132 FRAMES.
M8 FOR 180-225 FRAMES.
M12 FOR 250-355 FRAMES

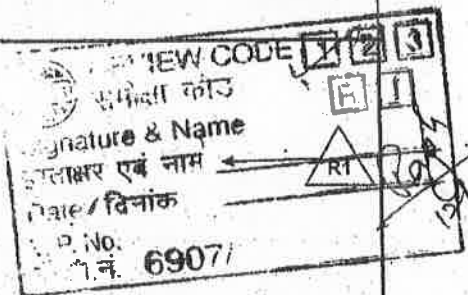
FRAME SIZE	FOOT FIXING										OVER ALL				
	A	B	B1	C	H TOL	AA	AB	BA	BB	K TOL	AD	AC	L	HD	HA
ND315M	508	457		216	315.0 / 314.0	110	597	164	533	28.5 / 28.0	530	590	1230	726	35

SHAFT AND KEY						
D TOL	E	ED	F TOL	GD TOL	G	Y
80.030 / 80.011	170	140	22.00 / 21.948	14.00 / 13.91	71.0 / 70.8	M20X40



REV.01
29/12/10

- 1) Auxiliary T.B. For Space Heater is Provided As Shown In Above Drawing.
- 2) Terminal Box Is Rotable In 360 Degree In Steps Of 90 Degree.
- 3) Lubrication Schedule : 1400 Hours (Re-lubrication)
Type Of Grease : Unirex N3
Quantity : 250 Gms.
Brand Name : Mobil
- 4) Space Heater Cable Size : 1R3C X 2.5 Sq.mm-PVC Insulated Cu.
- 5) Canopy Will Be Provided.
- 6) ERTL(E) : /TES/C184/0004/03-10 DTD. 24/3/10
CCE LET : A/P/HQ/MH/104/2109 (P251254) DTD. 17/6/10
- 7) Main cable : 2R X 3C X 185 mm² P.V.C INSULATED AL.



CUSTOMER	BHARAT PUMPS & COMPRESSORS	KW	132
P.O. NO.	8240-0537/0213	FRAME	ND315M
IND. NO.	NCMA18015/100	POLE	4
CLIENT	M/s BPCL, Assam Through M/s EIL	TAG NO.	117-PM-848 A, 117-PM-848 B.
PROJECT	Brahmaputra Petrochemical Complex		
DRN	SBK	DATE	29-Dec-10
CHD	SBK	DATE	29-Dec-10
APPROVED	DNB	DATE	29-Dec-10
SCALE: NTS	THIRD ANGLE PROJECTION		
ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED			
		GA DRAWING	
		Crompton Greaves AHMEDNAGAR	
		NDB3,V6RHS	

CODE-1 SUBJECT TO CORRECTIONS MAKE-
RESUBMIT IN AS BUILT DOCUMENTAT

Bharat Pumps & Compressor Ltd.
Naini, Allahabad

EIL Job. No: 6907

NOTES:

- [illegible]

GENERAL NOTES

A-179E-117-20-856, 117-12-856, 117-20-847,
117-20-848, 117-20-850A (V), 117-20-857,
117-20-858, 117-20-859A, 117-15-850,
117-20-855, 117-20-857A, 117-15-850,
117-20-855, 117-20-857A, 117-15-850,
117-12-850
PIPING CLASSES INSIDE CONVERTING PACKAGE TO BE

SEQUENCES LIST:

EXTRUDER START-UP
FOR DETAILS, REFER EXTRUDER
VENDOR SPEC. NO. AE-PT442.



ENGINEERS
INDIA LIMITED
INCORPORATED IN INDIA

PELLET WATER CIRCUIT

TRIP	DATE	TIME	FROM	TO	STATUS	REMARKS
1	10/10/2010	11:30	101	117	OK	
2	10/10/2010	11:30	101	117	OK	
3	10/10/2010	11:30	101	117	OK	
4	10/10/2010	11:30	101	117	OK	
5	10/10/2010	11:30	101	117	OK	
6	10/10/2010	11:30	101	117	OK	
7	10/10/2010	11:30	101	117	OK	
8	10/10/2010	11:30	101	117	OK	
9	10/10/2010	11:30	101	117	OK	
10	10/10/2010	11:30	101	117	OK	
11	10/10/2010	11:30	101	117	OK	
12	10/10/2010	11:30	101	117	OK	
13	10/10/2010	11:30	101	117	OK	
14	10/10/2010	11:30	101	117	OK	
15	10/10/2010	11:30	101	117	OK	
16	10/10/2010	11:30	101	117	OK	
17	10/10/2010	11:30	101	117	OK	
18	10/10/2010	11:30	101	117	OK	
19	10/10/2010	11:30	101	117	OK	
20	10/10/2010	11:30	101	117	OK	
21	10/10/2010	11:30	101	117	OK	
22	10/10/2010	11:30	101	117	OK	
23	10/10/2010	11:30	101	117	OK	
24	10/10/2010	11:30	101	117	OK	
25	10/10/2010	11:30	101	117	OK	
26	10/10/2010	11:30	101	117	OK	
27	10/10/2010	11:30	101	117	OK	
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30	10/10/2010	11:30	101	117	OK	
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33	10/10/2010	11:30	101	117	OK	
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44	10/10/2010	11:30	101	117	OK	
45	10/10/2010	11:30	101	117	OK	
46	10/10/2010	11:30	101	117	OK	
47	10/10/2010	11:30	101	117	OK	
48	10/10/2010	11:30	101	117	OK	
49	10/10/2010	11:30	101	117	OK	
50	10/10/2010	11:30	101	117	OK	
51	10/10/2010	11:30	101	117	OK	
52	10/10/2010	11:30	101	117	OK	
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54	10/10/2010	11:30	101	117	OK	
55	10/10/2010	11:30	101	117	OK	
56	10/10/2010	11:30	101	117	OK	

[illegible]

INEOS Technologies Technip	ADITIVE & PELLETING UNIT (APU) PELLET WATER CROUT PIPING & INSTRUMENTATION DIAGRAM	8/3/2003 10:00:21 AM
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