

Pump performance data

New Kerosene Loading Pumps

Doc No. : B-OG1-1406-0122- 001-100

Item No. : 19-P-0101 A/B/C N

Issued date : 16 / JUL / 2014

Model : RTPD250-860

► Application Code

- Pump design : API610 (ISO13709)
- Connection Flange, Suc./Dis. : ASME B16.5 / ASME B16.5
- Test : API610 (ISO13709)

► Pressure data

- Max. discharge pressure : 25.07 kg/cm².g
- Max. allowable working P @38 °C : 40.9 kg/cm².g
- Hydrostatic test pressure : 61.4 kg/cm².g
- Normal suction pressure :
- Differential pressure @ rated : 21.26 kg/cm².g
- Discharge pressure, @ rated : 21.26 kg/cm².g
- Stuffing box pressure @ rated :

► Design Condition

- Capacity : 846.3 m³/h
- Pump head : 281.6 m
- Suction pressure, rated/max : / 1.2 kg/cm².g
- Frequency : 50 Hz
- Ambient Temperature : ~ 50 °C
- Barometer : 1.033 kg/cm².g
- Casing design Temp., min/max : / 90 °C

(Vertical pump)

- Total Head (Vertical pump) : 281.6 m
- Lift head (water surface – D.Flange):
- Head @ Discharge .Flange :

► Considered Liquid data

- Liquid type : Kerosene
- Temperature : 90 °C
- Density : 0.755 S.G
- Viscosity : 0.85 cP
- Vapor pressure : 0.02 kg/cm².a

► Pump Construction

► Pump Performance

- Speed : 1480 rpm
- Impeller dia, min/rated/max : 587 / 629 / 733 mm
- Rated Impeller dia ratio to max : 86 %
- Shut off head of rated impeller : 316.1 m
- Shut off head ratio to rated : 112.3 %
- Possible Impeller head rise @ Rt.flow : 405.5 m
(with exchanging Max. dia. Impeller)
- Impeller head rise available % : 144 %
- Min. flow rate, %@Rt. : 511 m³/h, 60.38 %
- Max flow rate, %@Rt. : 1016 m³/h, 120.052 %
- Allowable operating region (AOR) : 511 ~ 1016 m³/h
- Preferred operating region (POR) : 732 ~ 1254.8 m³/h
- Efficiency, rated flow rate : 72.6 %
- Efficiency, max flow rate : 74.3 %
- Best efficiency, %, flowrate : 74.4 %, 1045.7 m³/h
- Rated/BEP flowrate % : 81 %
- NPSH required, min/rated/max flow : 4 m / 4 m / 4.2 m
- NPSH margin, min/rated/max flow : 20.6 m / 20.6 m / 20.4 m
- Suction Specific speed :
- Expected sound pressure level :

(Vertical pump)

- Installation type, if vertical pump :
- Recommend dimension for Intake vertical pump
- accordance with HI Standard without Anti-Vortex Device

► Drive & Power

- Driver type : Motor
- BHP, Shutoff/Rated/Max flow : 325 / 674.1 / 738.9 kW
- Driver Rating : 750 kW
- Power margin, Shutoff/Rated/Max : 230.8 % / 111.3 % / 101.5 %

► Sealing & Cooling information

- Sealing type : MECH. Seal
- Seal Flushing Piping Plan : 11 / 52
- Customer cooling utility : Water
- Cooling Piping Plan :



CENTRIFUGAL PUMP DATA SHEET
SI UNIT
API STANDARD 610, 10TH EDITION

JOB NO. _____ ITEM NO.(S) 04-P-104 A
REQ/SPEC NO. _____ /
PURCH ORDER NO. _____ DATE 2014.05.27
INQUIRY NO. _____ BY _____

APPLICABLE TO:		<input checked="" type="radio"/> PROPOSALS	<input type="radio"/> PURCHASE	<input type="radio"/> AS BUILT						
FOR	현대건설(주)		NO. REQ'D:	TOTAL 1	(WORKING _____)	STAND-BY _____)			
SITE			SERVICE	CIRCULATING WATER PUMPS						
MFR.NAME	HYOSUNG GOODSPRINGS INC.		MODEL	USP150-500	SERIAL NO. _____					
NOTES: INFORMATION BELOW TO BE COMPLETED				<input type="radio"/> BY PURCHASER	<input checked="" type="checkbox"/> BY MANUFACTURE	<input type="checkbox"/> BY MANUFACTURE OR PURCHASER				
<input type="radio"/> DATA SHEETS							REVISIONS			
	ITEM NO.	ATTACHED	ITEM NO.	ATTACHED	ITEM NO.	ATTACHED	NO	DATE	BY	
PUMP	04-P-104 A	<input checked="" type="radio"/>		<input type="radio"/>		<input type="radio"/>	1	2014/08/28	J.Y.PARK	
MOTOR		<input type="radio"/>		<input type="radio"/>		<input type="radio"/>	0	2014/06/23	J.Y.PARK	
GEAR		<input type="radio"/>		<input type="radio"/>		<input type="radio"/>				
TURBINE		<input type="radio"/>		<input type="radio"/>		<input type="radio"/>				
APPLICABLE OVERLAY STANDARD(S):										
<input type="radio"/> OPERATING CONDITIONS (5.1.3)					<input type="radio"/> LIQUID (5.1.3)					
FLOW, NORMAL		(m³ /h)	RATED	382	(m³ /h)	LIQUID TYPE OR NAME		Water		
OTHER						<input type="radio"/> HAZARDOUS	<input type="radio"/> FLAMMABLE	<input type="radio"/> (5.1.5)		
SUCTION PRESSURE MAX./RATED/MIN.		52.6 / 46.8	/	(kg/cm² .g)		MIN	NORMAL	MAX	DESIGN	
DISCHARGE PRESSURE		51.3		(kg/cm² .g)			20		290	
DIFFERENTIAL PRESSURE		4.53		(kg/cm² .g)		VAPOR PRESS(kg/cm² .a)		47.4	47.4	
DIFF.HEAD		57.4 (m)	NPSHA	4.6 (m)		RELATIVE DEINITY(S.G)		1	0.79	
PROCESS VARIATIONS (5.1.4)										
STARTING CONDITIONS (5.1.4)										
SERVICE :		<input type="radio"/> CONT.	<input type="radio"/> INTERMITTENT(STARTS/DAY).			SPECIFIC HEAT, Cp		(KJ/kg.K)		
		<input type="radio"/> PARALLEL OPERATING REQ'D(5.1.13).				<input type="radio"/> CHLORIDE CONCENTRATION (6.5.2.4)		(mg/kg)		
		<input type="radio"/> SITE DATA (5.1.3)				<input type="radio"/> H2S CONCENTRATION		(molfraction)wet (5.12.1.12C)		
CORROSIVE/EROSIVE AGENT (5.12.1.9)										
LOCATION: (5.1.30)										
<input checked="" type="radio"/> INDOOR		<input type="radio"/> HEATED	<input type="radio"/> OUTDOOR	<input type="radio"/> UNHEATED	MATERIALS (5.12.1.1)					
<input type="radio"/> ELECTRICAL AREA CLASSIFICATION (5.1.24 / 6.1.4)					<input type="radio"/> ANNEX H CLASS (5.12.1.1)	C-6				
CL	CL2	GR	IIA	DIV	<input type="radio"/> MIN DESIGN METAL TEMPS (5.12.4.1)	(°C)				
<input type="radio"/> WINTERIZATION REQ'D			<input type="radio"/> TROPICALIZATION REQ'D		<input type="radio"/> REDUCED HARDNESS MATERIALS REQ'D. (5.12.1.12)					
SITE DATA(5.1.30)										
<input type="radio"/> ALITITUDE		(m)	BAROMETER	1.033	(kg/cm² .a)	<input type="radio"/> BARREL/CASE	N/A / A216 Gr WCB	IMPELLER	A743 Gr CA15	
<input type="radio"/> RANGE OF AMBIENT TEMPS:		MIN/MAX	/	50	(°C)	<input type="radio"/> CASE/IMPELLER WEAR RINGS	A276 Tp 420 / A276 Tp 420			
<input type="radio"/> RELATIVE HUMIDITY:		MIN/MAX	/	(%)	<input type="radio"/> SHAFT	A276 Tp 410				
UNUSUAL CONDITIONS : (5.1.30)		<input type="radio"/> DUST	<input type="radio"/> FUMES		<input type="radio"/> DIFFUSERS					
<input checked="" type="radio"/> PERFORMANCE :										
<input type="checkbox"/> MANUFACTURER		LATER			PROPOSAL CURVE NO.	P-OG1-1405-0172-001-102				<input checked="" type="checkbox"/> 1450 (r/min)
<input type="checkbox"/> 75 (kW)		<input type="checkbox"/> 1500 (r/min)	<input type="checkbox"/> IMPELLER DIA.RATED	446	MAX	513	MIN	394	(mm)	
<input checked="" type="checkbox"/> FRAME		250S	<input type="checkbox"/> ENCLOSURE	TE	<input type="checkbox"/> IMPELLER TYPE	Closed				
<input type="checkbox"/> HORIZONTAL		<input type="checkbox"/> VERTICAL	<input type="checkbox"/> SERVICE FACTOR	<input type="checkbox"/> RATED POWER	62.7 (kW)	EFFICIENCY	75.2 (%)			
<input type="checkbox"/> VOLTS/PHASE/HERTZ		380 / 3 / 50	<input type="checkbox"/> MINIMUM CONTINOUS FLOW:							
<input type="checkbox"/> TYPE		INDUCTION	<input type="checkbox"/> THERMAL		STABLE	133	(m³ /h)			
<input type="checkbox"/> MINIMUM STARTING VOLTAGE (6.1.5)			<input type="checkbox"/> PREFERRED OPER.REGION	311.4	TO	533.7	(m³ /h)			
<input type="checkbox"/> INSULATION		F	<input type="checkbox"/> ALLOWABLE OPER.REGION	133	TO	533.7	(m³ /h)			
<input checked="" type="checkbox"/> FULL LOAD AMPS			<input type="checkbox"/> MAX HEAD@RATED IMPELLER	65.58	(m)					
<input checked="" type="checkbox"/> LOCKED ROTOR AMPS			<input type="checkbox"/> MAX POWER@RATED IMPELLER	73.5	(kW)					
<input type="checkbox"/> STARTING METHOD		D.O.L	<input type="checkbox"/> NPSHR AT RATED FLOW	2.3	(m)					
<input type="checkbox"/> LUBE			<input type="checkbox"/> MAX.SUCTION SPECIFIC SPEED:							
BEARINGS (TYPE/NUMBER) :										
<input checked="" type="checkbox"/> RADIAL		Anti-friction	/	Later	<input type="checkbox"/> MAX.SOUND PRESS.LEVEL REQ'D	(dBA)				
<input checked="" type="checkbox"/> TRUST		Anti-friction	/	Later	<input type="checkbox"/> EST MAX. SOUND PRESS.LEVEL	(dBA)				
<input type="checkbox"/> VERTICAL THRUST CAPACITY			<input type="checkbox"/> EST MAX. SOUND POWER.LEVEL		<input type="checkbox"/> (dBA)	(dBA)				
UP	(N)	DOWN	(N)							
COOLING WATER : (5.1.19) SOURCE										
SUPPLY TEMP.		(°C)	MAX.RETURN TEMP.		(°C)					
NORM.PRESS.		(kg/cm² .g)	DESIGN PRESS.		(kg/cm² .g)					
MIN.RET.PRESS.		(kg/cm² .g)	MAX.ALLOW.DP.		(kg/cm² .g)					
CHLORIDE CONCENTRATION:		0			(mg/kg)					

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JOB NO. _____ ITEM NO.(S) 04-P-104 A
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INQUIRY NO. _____ BY

1	Except Details specified on this Data Sheet,
2	all subjects including test shall be performed
3	in accordance with HGS's STANDARD
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CONSTRUCTION

 ROTATION : (VIEWED FROM COUPLING END) CW CCW

PUMP TYPE: (4.1)
 OH2 OH3 OH6 OTHER

 BB1 BB2 BB3 BB5

 VS1 VS2 VS3 VS4 VS5 VS6 VS7

CASING MOUNTING :
 CENTERLINE NEAR CENTERLINE FOOT

 IN-LINE SUMP COVER PLATE OTHER

 SEPARATE MOUNTING PLATE(8.3.8.3.1)

 SEPARATE SOLE PLATE(8.3.8.3.3)

CASING TYPE :
 SINGLE VOLUTE MULTIPLE VOLUTE DIFFUSER

 BETWEEN BEARINGS BARREL

CASE PRESSURE RATING :
 OH6 PUMP SUCTION REGION DESIGNED FOR MAWP (5.3.6)

 MAX. ALLOWABLE WORKING PRESSURE 60.3 (kg/cm² .g)
 @ 290 (°C)

 HYDROTEST PRESSURE 90.45 (kg/cm² .g)

 SUCTION PRESS. REGIONS MUST BE DESIGNED FOR MAWP(5.3.6)

 NOZZLE CONNECTIONS : (5.4.2)

SIZE(mm)	FLANGE RATING	FACING	POSITION
200	ASME B16.5, 600	RF	END
150	ASME B16.5, 600	RF	TOP

PRESSURE CASING AUX.CONNECTIONS : (5.4.3)

NO.	SIZE	TYPE
1	3/4	FLANGE+VALVE
SELF		

 MACHINED AND STUDDED CONNECTIONS (5.4.3.8)

 CYLINDRICAL THREADS REQUIRED(5.4.3.3)

ROTOR
 COMPONENT BLANCE TO ISO 1940 G1.0 (5.9.4.4)

 SHRINK RT-LIMITED MOVEMENT IMPELLERS(8.2.2.3)

COUPLINGS:(6.2.2)
 MANUFACTURER _____ MODEL _____

 RATING(kW per 100 r/min)

 SPACER LENGTH 180 (mm) SERVICE FACT _____

 RIGID

THROUGH COUPLINGS:
 MANUFACTURER _____ MODEL _____

 RATING(kW per 100 r/min) LUBE _____

 SPACER LENGTH (mm) SERVICE FACT _____

 RIGID

DRIVER HALF-CO尤LING MOUNTED BY:
 PUMP MFR. DRIVER MFR. PURCHASER

 CO尤LING WITH HYDRAULIC FIT(6.2.10)

 CO尤LING BALANCED TO ISO 1940-1G6.3 (6.2.3)

 CO尤LING WITH PROPRIETARY CLAMPING DEVICE (6.2.11)

 CO尤LING PER ISO 14691 (6.2.4)

 CO尤LING PER ISO 10441 (6.2.4)

 CO尤LING PER API671 (6.2.4) ASME B15.1

 NON SPARK CO尤LING GUARD (6.2.14C)

 CO尤LING GUARD STANDARD PER (6.2.14a)

BASE PLATES :
 API BASEPLATE NUMBER _____ (ANNEX D)

 NON-GROUT CONSTRUCTION (6.3.13)

 OTHER

MECHANICAL SEAL : (5.8.1)

 SEE ATTACHED ISO 21049/API682 DATA SHEET : SEAL PLAN # 23

SURFACE PREPARATION AND PAINT
 MANUFACTURERS STANDARD OTHER (SEE BELOW)
 SPECIFICATION NO.

PUMP :
 PUMP SURFACE PREARATION

 PRIMER

 FINISH COAT

BASEPLATE : (6.3.17)
 PUMP SURFACE PREARATION

 PRIMER

 FINISH COAT

 DETAIL OF LIFTING DEVICES (6.3.20)

SHIPMENT : (7.4.1)
 DOMESTIC EXPORT EXPORT BOXING REQUIRED

 OUTDOORS STORAGE MORE THAN 6MONTHS

SPARE ROTOR ASSEMBLY PACKAGED FOR :
 HORIZONTAL STORAGE VERTICAL STORAGE
 TYPE OF SHIPPING PREPARATION
 N2 PURGE(8.2.8.4)

HEATING AND COOLING
 HEATING JACKET REQ'D.(5.8.9)

 COOLING REQ'D

 COOLING WATER PIPING PLAN(6.5.3.1)

K

C.W. PIPING
 PIPE TUBING FITTINGS

C.W. PIPING MATERIALS :
 S.STEEL C.STEEL GALVANIZED

COOLING WATER REQUIREMENTS :
 BEARING HOUSING (m³ /h) @ (kg/cm² .g)

 HEAT EXCHANGER (m³ /h) @ (kg/cm² .g)

TOTAL COOLING WATER (m³ /h)

 HEAT MEDIUM : STEAM OTHER

 HEATING PIPING : TUBING PIPE

 STEAM PIPING : TUBING PIPE

BEARING AND LUBRICATION
BEARING (TYPE/NUMBER) (5.10.1)
 RADIAL BALL / 6316

 THRUST BALL / 7318BDB

LUBRICATION (5.11.3, 5.11.4)
 GREASE FLOOD OIL(FLINGER) RING OIL

 HYDRODYNAMIC PURE OIL MIST PURGE OIL MIST

 CONSTANT LEVEL OILER PREFERENCE (5.10.2.2)

 OIL VISC.SIO GRADE VG46

 OIL PRESS. TO BE GREATER THAN COOLANT PRESSURE

 REVIEW AND APPROVE THRUST BEARING SIZE(8.2.5.2 d)

 OIL HEATER REQUIRED STEAM ELECTRIC

INSTRUMENTATION
 SEE ATTACHED API670 DATA SHEET

 ACCELEROMETER(6.4.2.1)

 PROVISION FOR VIBRATION PROBES(6.4.2.2)

 RADIAL _____ PER BRG. AXIAL _____ PER BRG.

 PROVISION FOR MOUNTING ONLY (5.10.2.11)

 FLAT SURFACE REQ'D (5.10.2.12)

 RADIAL BEARING METAL TEMP.

 THRUST BEARING METAL TEMP.

 TEMP. GAUGES (WITH THERMOWELLS)(8.1.3.6)

 PRESSURE GAUGE TYPE

 MONITORS AND CABLES SUPPLIED BY (6.4.2.4)

REMARKS:
MASSES (kg)

PUMP 1510 BASEPLATE 915

DRIVER 470 TOTAL 2895

GEAR

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 JOB NO. _____ ITEM NO.(S) 04-P-104 A
 REQ/SPEC NO. / DATE 2014.05.27
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 INQUIRY NO. _____

SPARE PARTS (TABLE 1.8)		QA INSPECTION AND TESTING			
<input type="radio"/> START-UP	<input type="radio"/> NORMAL MAINTENANCE	<input type="radio"/> SHOP INSPECTION(7.14) <input type="radio"/> PERFCURVE APPROVAL <input checked="" type="checkbox"/> TEST WITH SUBSTITUTE SEAL(7.3.3.2b)			
<input type="radio"/> SPECIFY	_____	TEST	NON-WIT	WIT	OBSERVE
OTHER PURCHASER REQUIREMENTS		<input type="radio"/> HYDROSTATIC TEST OF BOWL AND COLUMN(8.3.13.2)	0	0	0
<input type="radio"/> COORDINATION MEETING REQUIRED (9.1.3)		<input type="radio"/> HYDRO STATIC(7.3.2)	0	●	0
<input type="radio"/> MAXIMUM DISCHARGE PRESSURE TO INCLUDE (5.3.2)		<input type="radio"/> PERFORMANCE (7.3.3)	0	●	0
<input type="radio"/> MAX RELATIVE DENSITY <input type="radio"/> MAX DIA. IMPELLERS AND/OR NO. OF STAGES <input type="radio"/> OPERATION TO TRIP SPEED		<input type="radio"/> RETEST OF SEAL L'KGE(7.3.3.2d)	0	0	0
<input type="radio"/> OH3 BEARING HS6 LIFTER (8.1.2.6)		<input type="radio"/> RETEST REQUIRED AFTER FINAL HEAD ADJUSTMENT(7.3.3.5b)	0	0	0
<input type="radio"/> CONNECTION DESIGN APPROVAL (5.12.3.4)		<input type="radio"/> TRUE PEAK VELOCITY DATA (7.3.3.4d)	0	0	0
<input checked="" type="checkbox"/> TORSIONAL ANALYSIS REQUIRED (5.9.2.1)		<input type="radio"/> NPSH (7.3.4.2)	0	0	0
<input type="radio"/> TORSIONAL ANALYSIS REPORT (5.9.2.6)		<input type="radio"/> COMPLETE UNIT TEST(7.3.4.3)	0	0	0
<input type="radio"/> PROGRESS REPORTS (9.3.3)		<input type="radio"/> SOUND LEVEL TEST (7.3.4.4)	0	●	0
<input type="radio"/> OUTLINE OF PROCEDURES FOR OPTIONAL TEST(9.2.5)		<input type="radio"/> CLEANLINESS PRIOR TO FINAL ASSEMBLY (7.2.2.2)	0	0	0
<input type="radio"/> ADDITIONAL DATA REQUIRING 20 YEARS RETENTION (7.2.1.1f)		<input type="radio"/> NOZZLE LOAD TEST (6.3.6)	0	0	0
<input checked="" type="checkbox"/> PIPING AND APPURTENANCES		<input type="radio"/> CHECK FOR CO-PLANAR MOUNTING PAD SURFACES (6.3.3)	0	0	0
MAINFOLD PIPING TO SINGLE CONNECTION (6.5.1.6)		<input type="radio"/> MECHANICAL RUN UNTIL OIL TEMP.STABLE(7.3.4.7.1)	0	●	0
<input type="checkbox"/> VENT <input checked="" type="checkbox"/> DRAIN <input type="checkbox"/> COOLING WATER		<input type="radio"/> 4HR.MECHANICAL RUN AFTER OIL TEP. STABLE (7.3.4.7.3)	0	0	0
<input checked="" type="checkbox"/> MOUNT SEAL RESSERVOIR OFF BASEPLATE (6.5.1.4)		<input type="radio"/> 4HR.MECH. RUN TEST(7.3.4.7.2)	0	0	0
<input checked="" type="checkbox"/> FLANGES REQ'D IN PLACE OF SOCKET WELD UNIONS(6.5.2.8)		<input type="radio"/> RESONANCE TEST(8.3.9.2)	0	0	0
<input checked="" type="checkbox"/> INSTALLATION LIST IN PROPOSAL (9.2.3L)		<input type="radio"/> BRG HSG RESONANCE TEST(7.3.4.5)	0	0	0
CONNECTION BOLTING		<input type="radio"/> REMOVE/INSPECT HYDRODYNAMIC BEARINGS AFTER TEST(8.2.7.5)	0	0	0
<input type="checkbox"/> PTFE COATING <input type="radio"/> ASTM A153 GALVANIZED <input type="radio"/> PAINTED <input type="radio"/> SS		<input type="radio"/> AUXILIARY EQUIPMENT TEST(7.3.4.5)	0	0	0
<input type="radio"/> VERTICAL PUMPS		<input checked="" type="checkbox"/> IMPACT TESTING(5.12.4.3)	0	0	0
<input checked="" type="checkbox"/> PUMP THRUST : (+)UP (-)DOWN		<input type="radio"/> PER EN 13445 <input type="radio"/> PER ASME VIII			
AT MIN.FLOW _____ (N)		<input type="radio"/> VENDOR KEEP REPAIR AND HT RECORDS (7.2.1.1c)			
AT RATED FLOW _____ (N)		<input type="radio"/> VENDOR SUBMIT TEST PROCEDURES (7.3.1.2 / 9.2.5)			
MAX.THRUST _____ (N)		<input type="radio"/> VENDOR SUBMIT TEST DATA WITHIN 24HOURS (7.3.3.3e)			
<input checked="" type="checkbox"/> SOLEPLATE REQ'D(8.3.8.3.3) _____ (m) X _____ (m)		<input type="radio"/> INCLUDE PLOTTED VIBRATION SPECTRA (5.9.33)			
<input checked="" type="checkbox"/> SEPARATE MOUNTING PLATE REQUIRED(8.3.8.3.1)		<input type="radio"/> RECORD FINAL ASSEMBLY RUNNING CLEARANCES			
<input checked="" type="checkbox"/> SOLEPLATE THICKNESS _____ (mm)		<input type="radio"/> SUBMIT COMPLETION OF INSPECTION CHECK LIST (7.1.6)			
COLUMN PIPE : <input type="checkbox"/> FLANGED <input checked="" type="checkbox"/> THREADED		<input type="radio"/> MATERIAL CERTIFICATION REQUIRED (5.12.1.8)			
<input type="checkbox"/> DIAMETER _____ (mm) <input checked="" type="checkbox"/> FLANGED _____ (mm)		<input type="radio"/> CASING <input type="radio"/> IMPELLER <input type="radio"/> SHAFT <input type="radio"/> OTHER	EN10204 3.1		
GUIDE BUSHINGS		<input type="radio"/> CASTING REPAIR PROCEDURE APPROVAL REQ'D (5.12.2.5)			
<input type="checkbox"/> NUMBER		<input checked="" type="checkbox"/> INSPECTION REQUIRED FOR CONNECTION WELDS (5.12.3.4e)			
<input type="checkbox"/> LINE SHAFT BEARING SPACING _____ (mm)		<input type="checkbox"/> MAG PARTICLE <input type="checkbox"/> LIQUID PENETRANT <input type="checkbox"/> RADIOGRAPHIC <input type="checkbox"/> ULTRASONIC			
GUIDE BUSHINGS LUBE :		<input type="checkbox"/> SUCTION CAN THICKNESS _____ (mm)			
<input type="checkbox"/> WATER <input type="checkbox"/> OIL <input type="checkbox"/> GREASE <input type="checkbox"/> PUMPPAGE <input type="checkbox"/> LINESHAFT: <input type="checkbox"/> OPEN <input type="checkbox"/> ENCLOSED		<input type="checkbox"/> LENGTH _____ (mm) <input type="checkbox"/> DIAMETER _____ (mm)			
LINESHAFT COUPLING :		<input type="checkbox"/> SLEEVE & KEY <input type="checkbox"/> THREADED			
<input type="checkbox"/> LINE SHAFT DIAMETER : _____ (mm)		<input type="checkbox"/> SUCTION STRAINER TYPE			
<input type="checkbox"/> SUCTION CAN THICKNESS _____ (mm)		<input type="checkbox"/> FLOAT & ROD <input type="radio"/> FLOAT SWITCH			
<input type="checkbox"/> LENGTH _____ (mm) <input type="checkbox"/> DIAMETER _____ (mm)		<input type="checkbox"/> IMPELLER COLLETS ACCEPTABLE (5.6.3)			
<input type="checkbox"/> SUCTION STRAINER TYPE		<input type="checkbox"/> HARDENED SLEEVES UNDER BEARING(8.3.10.5)			
<input type="checkbox"/> FLOAT & ROD <input type="radio"/> FLOAT SWITCH					
<input type="checkbox"/> IMPELLER COLLETS ACCEPTABLE (5.6.3)					
<input type="checkbox"/> HARDENED SLEEVES UNDER BEARING(8.3.10.5)					
SUMP ARRANGEMENT					
Refer to hydraulic institute standards for definitions					
<img alt="Diagram of a pump sump arrangement showing dimensions l1, l2, l3, l4, l5, l6, l7, l8, l9, l10, l11, l12, l13, l14, l15, l16, l17, l18, l19, l20, l21, l22, l23, l24, l25, l26, l27, l28, l29, l30, l31, l32, l33, l34, l35, l36, l37, l38, l39, l40, l41, l42, l43, l44, l45, l46, l47, l48, l49, l50, l51, l52, l53, l54, l55, l56, l57, l58, l59, l60, l61, l62, l63, l64, l65, l66, l67, l68, l69, l70, l71, l72, l73, l74, l75, l76, l77, l78, l79, l80, l81, l82, l83, l84, l85, l86, l87, l88, l89, l90, l91, l92, l93, l94, l95, l96, l97, l98, l99, l100, l101, l102, l103, l104, l105, l106, l107, l108, l109, l110, l111, l112, l113, l114, l115, l116, l117, l118, l119, l120, l121, l122, l123, l124, l125, l126, l127, l128, l129, l130, l131, l132, l133, l134, l135, l136, l137, l138, l139, l140, l141, l142, l143, l144, l145, l146, l147, l148, l149, l150, l151, l152, l153, l154, l155, l156, l157, l158, l159, l160, l161, l162, l163, l164, l165, l166, l167, l168, l169, l170, l171, l172, l173, l174, 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