

API STANDARD 610 GOVERNS UNLESS OTHERWISE NOTED

NOTE: INFORMATION TO BE COMPLETED BY PURCHASER MANUFACTURER SERVICE OIL TRANSFER

FOR LILLE FRIGG TRANSFER PUMPS PUMP MFR. RUHR PUMPEN

SITE FRIGG TCP2, M35 SIZE & TYPE 6x25 SVN INLINE

UNIT CENTRIFUGAL PUMP NC.STAGES 1

SERIAL NO. 8.618 - 1433 A/B

NO.PUMPS REQUIRED 2 NO.MOTOR DRIVEN 2 NO.TURBINE DRIVEN N.A.

PUMP ITEM NO. CP 618 A/B PUMP ITEM NO. N.A.

MOTOR ITEM NO. CM 631 A/B TURBINE ITEM NO. N.A.

MOTOR PROVIDED BY PUMP MFR. TURBINE PROVIDED BY N.A.

MOTOR MOUNTED BY PUMP MFR. TURBINE MOUNTED BY N.A.

LIQUID	OPERATING CONDITIONS	SITE CONDITIONS
NAME <u>CONDENSATE</u>	CAPACITY (m ³ /h) NOTE 6	TEMP.(°C)MAX. <u>25</u> MIN. <u>-10</u>
PUMPING TEMPERATURE(°C)	NORMAL <u>388</u> RATED <u>417</u>	REL.HUM.(%)MAX. <u>99</u> MIN. <u>35</u>
NORMAL <u>60.3</u> MAX. <u> </u> MIN. <u> </u>	DISCH.PRESS.(barg) <u>23.1</u>	ALTITUDE (m) <u>SEA-LEVEL</u>
RELATIVE DENSITY @ <u>0.791</u> °C <u>60.3</u>	SUCT.PRESS.(barg)	<input checked="" type="radio"/> INDOOR <input type="radio"/> HEATED <input type="radio"/> ROOF
VAPOUR PRESS. (bar @) <u>15.0</u>	MAX. <u> </u> RATED <u>14.5</u>	<input type="radio"/> OUTDOOR <input checked="" type="radio"/> UNHEATED <input type="radio"/> SUN
VISCOSITY (cP) @ <u>1.79</u> °C <u>60.3</u>	DIFF.PRESS.(bar) <u>8.6</u>	AREA CLASSIFICATION <u>2</u>
CORROSION/EROSION CAUSED BY:	DIFF.HEAD (m) <u>110.5</u>	OTHER <u> </u>
PRODUCED WATER AND MAX OF 0.45 MOL % CO ₂	NPSH AVAILABLE (m) <u>6.2</u>	REMARKS: <u> </u>
REMARKS: <u> </u>	HYD.POWER(KW) <u>99.2</u>	

PERFORMANCE (TO BE COMPLETED BY MANUFACTURER)

PROPOSAL CURVE NO. <u>70807</u>	MIN.CONTINUOUS FLOW (m ³ /h)	NPSH REQUIRED (m WATER)
SPEED (rpm) <u>1480</u>	THERMAL <u>85</u> STABLE <u>85</u>	3% HEAD DROP <u>4.5</u>
EFFICIENCY (%) <u>71</u>	MAX.HEAD RATED IMP. (m) <u>738</u>	SUCTION SPECIFIC SPEED <u>9716</u>
RATED POWER (KW) <u>140</u>	MAX.POWER RATED IMP. (KW) <u>144</u>	

REMARKS:

CONSTRUCTION (TO BE COMPLETED BY PURCHASER & MANUFACTURER)

NOZZLES: NOTE 3	SIZE	RATING	FACING	LOCATION	MISC.CONN: NOTE 3	SIZE	LOCATION
SUCTION	8"	ANSI 300 LBS	RF	SIDE	DRAIN	NPT 3/4"	BOTTOM
DISCHARGE	6"	ANSI 300 LBS	RF	SIDE	VENT	NPT 1/2"	TOP
BAL.DRUM					PRESS.GAUGE		
					WARM UP		

CASING MOUNT: FOOT IMPELLER DIAMETER (mm)

CENTRELINE BRACKET RATED 673 MAX. 668 MIN. 540 BEARINGS (TYPE/NO.)

NEAR CENTRELINE INLINE ROTATION (VIEWED FROM CPLG) CW RADIAL SLEEVE THRUST E-MOTOR

VERTICAL SUMP CCW LUBRICATION TYPE: API 614

VERTICAL BARREL (CAN) IMP.MOUNT BTWN BRGS OVERHUNG GREASE RING OIL OIL MIST

CASING SPLIT AXIAL FLOOD FLINGER PRESSURE

RADIAL PACKING: MANUFACTURER N.A. COUPLING:

CASING TYPE: SINGLE VOLUTE TYPE N.A. MANUFACTURER RUHR PUMPEN

DIFFUSER DOUBLE VOLUTE SIZE/NO.RINGS N.A. TYPE 60/100 MODEL RIGID

STAGGERED MECHANICAL SEAL: DRIVER HALF-COUPLING MOUNTED BY:

MAX.ALLOWABLE PRESSURE (BAR) API CLASS CODE BSAFN/X PUMP MFR DRIVER MFR PURCHASER

@15°C 35 MANUFACTURER BW/IP GLAND TYPE/MATERIAL ANSI 316

@ NORMAL PUMP TEMP. 35 MODEL GQBLK 3437/90 GLAND PLATE TAPS REQUIRED :

HYDRO TEST PRESSURE (barg) 53 MANUFACTURER CODE 5044/504X QUENCH FLUSH DRAIN VENT

REMARKS:

NOTE 1: SUPPLIER TO STATE MINIMUM FLOW REQUIRED BY THE PUMP. 85 m³/h

NOTE 2: DESIGN TEMPERATURE (°C): -10 TO +75.

NOTE 3: THE PUMP INTERFACE PIPEWORK WILL BE IN ACCORDANCE WITH SPEC. No. S-10-20-0002.

NOTE 4: AVAILABLE SPACE FOR EACH PUMP IS APPROXIMATELY
LENGHT (NOZZLE-NOZZLE)xWIDTHxHEIGHT mm: 1450x800x2900
SUPPLIER TO STATE SPACE REQUIREMENTS FOR MAINTENANCE.

CLIENT : <u>ELF PETROLEUM NORGE A/S</u>	BY : <u>ZLS</u>	ITEM No. : <u>CP 618 A/B</u>
PROJECT : <u>FRØY INTEGRATION WORK ON TCP2</u>	CHECKED :	P.O.No. : <u>PO-FF-22-26-1028</u>
PROJECT No. : <u>SOE038</u>	APPROVED :	DATA SHEET No. : <u>DS-FF-22-26-1019</u>
SERVICE : <u>OIL TRANSFER</u>	DATE : <u>14.12.93</u>	REV. No. : <u>02</u>
DATA SHEET FOR : <u>CENTRIFUGAL PUMP</u>		PAGE <u>2</u> OF <u>5</u>

 **VERITEC**  **elf petroleum norge a/s**
p.o.box 168-4001 Stavanger

VERITEC
 DATE: 06.12.92
 APPROVED: S. EGGLEND
 BY: I. STERRI
 ORIGINAL SHEET 1

MATERIALS (TO BE COMPLETED BY PURCHASER AND MANUFACTURER)

TABLES H-1 CLASS CASE/IMP.WEAR RINGS NOTE 7 BASEPLATE
 BARREL/CASE ASTM A216 WCB SHAFT 42 CRM0 4V 900-1100N/9MM MATERIAL/TYPE -
 IMPELLER ASTM A743 CA-15 SLEEVE 1.4402 API 610STD.NO. -
 REMARKS: PUMP MATERIALS AND STANDARD TO DIN STANDARDS, INCLUDING WELDING AND NDT QUALIFICATIONS.

AUXILIARY PIPING (TO BE COMPLETED BY PURCHASER AND MANUFACTURER)

SEAL FLUSH PIPING PLAN 13 AUXILIARY FLUSH PLAN 61 1) COOLING WATER PIPING PLAN N.A.
 TUBING CARBON STEEL TUBING CARBON STEEL TUBING CARBON STEEL
 PIPE STAINLESS STEEL PIPE STAINLESS STEEL PIPE STAINLESS STEEL
 PIPING ASSEMBLY: EXTERNAL SEAL FLUSH FLUID COPPER
 THREADED FLANGED SIGHT FLOW INDICATORS REQUIRED
 SEAL WELDED SOCKET WELDED - m³/h - barg TOTAL COOLING WATER REQ'D - m³/h
 REMARKS: NOTE 1) CONNECTED WITH PRESSURE TRANSMITTER PACKING COOLING INJECTION REQ'D.
 - m³/h - barg

INSPECTION AND TEST (TO BE COMPLETED BY PURCHASER)

TEST	NON-WIT	WIT	OBSERVED	CASTING REPAIR PROC. APPROVAL	INSPECTION REQ'D FOR
PERFORMANCE	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> MAG.PARTICLE <input type="checkbox"/> DYE PENETRANT
HYDROSTATIC	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> INSPECTION REQ'D FOR NOZZLE WELDS	<input type="checkbox"/> RADIOGRAPHIC <input type="checkbox"/> ULTRASONIC
NPSH	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> MAG.PARTICLE <input type="checkbox"/> DYE PENETRANT	REMARKS <u>(*) ONLY IF PROBLEMS OCCURED DURING TEST.</u>
<input checked="" type="checkbox"/> SHOP INSPECTION	<input checked="" type="checkbox"/> MAT.L CERT.	<input checked="" type="checkbox"/> INSPECTION REQ'D FOR CASTINGS	<input checked="" type="checkbox"/> RADIOGRAPHIC	<input type="checkbox"/> ULTRASONIC	
<input checked="" type="checkbox"/> DISMANTLE AND INSPECT AFTER TEST (*)					

NOTE 5 MOTOR DRIVER (TO BE COMPLETED BY PURCHASER AND MANUFACTURER)

160 KW 1486 r/min TEMPERATURE RISE(°C) 80 BEARINGS 7322 BEM/ 6319 C3
 FRAME 355 FULL LOAD AMPS 27 LUBE GREASE
 Volts/Phase/Hertz 5500 /3/50 LOCKED ROTOR AMPS - VERTICAL SHAFT SOLID HOLLOW
 TYPE HXR 355LA4 INSULATION F/B VERTICAL THRUST CAPACITY (N) LOAD
 ENCLOSURE IP55 MANUFACTURER ABB RADIAL 5000 DOWN 18500
 REMARKS: TERMINAL BOX IP56

VERTICAL PUMPS (TO BE COMPLETED BY PURCHASER AND MANUFACTURER)

PIT FOR SUMP DEPTH (m) GUIDE BUSHINGS: FLOAT AND ROD
 PUMP LENGTH (m) BOWL LINE SHAFT CBN STL SS BRZ NONE
 MIN.SUBMERGENCE REQ'D. (m) GUIDE BUSHING LUBE PUMP THRUST (N) UP DOWN
 COLUMN PIPE FLANGED THREADED WATER OIL GREASE AT MIN.FLOW
 LINE SHAFT OPEN ENCLOSED FLOAT SWITCH AT DESIGN FLOW
 REMARKS: AT RUN OUT

MASSES (TO BE COMPLETED BY MANUFACTURER)

MASS OF PUMP (Kg)	<u>870</u>	MASS OF PUMP (Kg)		REMARKS:
MASS OF BASEPLATE (Kg)	<u>170</u>	MASS OF BASEPLATE (Kg)		
MASS OF MOTOR (Kg)	<u>2000</u>	MASS OF TURBINE (Kg)		
MASS OF AUX. (Kg)	<u>330</u>	MASS OF GEAR (Kg)		
TOTAL MASS (Kg)	<u>3250</u>	TOTAL MASS (Kg)		

ADDITIONAL INFORMATION

NOTE 5: FOR MOTOR DETAILS, SEE MOTOR DATA SHEET, DOC. No. SD-FF-22-23-1055/1056.

NOTE 6: MINIMUM DUTY FLOW WILL BE 188 m³/h UNDER THE FOLLOWING CONDITIONS:

LIQUID (CONDENSATE)	OPERATING (CONDENSATE)
PUMPING TEMPERATURE °C: NORMAL 58.4	DISCH. PRESS. barg: 20.85
RELATIVE DENSITY: 0.798 AT °C 58.4	SUCT. PRESS. barg: 14.62
VAPOUR PRESSURE bara: 15	DIFF. PRESS. bar: 6.23
VISCOSITY cP: 1.99	DIFF. HEAD m: 79.5
	NPSH AVAILABLE m: 7.39
	HYD. POWER kW: 32.6

NOTE 7: CASING WEAR RING G-X 40 CRNI 37 4, IMPELLER RING G-X 20 CR 14 170-210 HB

CLIENT : ELF PETROLEUM NORGE A/S	BY : <u>AS</u>	ITEM No. : CP 618 A/B
PROJECT : FRØY INTEGRATION WORK ON TCP2	CHECKED :	P.O.No. : PO-FF-22-26-1028
PROJECT No. : SOE038	APPROVED :	DATA SHEET No. : DS-FF-22-26-1019
SERVICE : OIL TRANSFER	DATE : <u>14.12.93</u>	REV. No. : <u>02</u>
DATA SHEET FOR : CENTRIFUGAL PUMP		PAGE 3 OF 5



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APPROVED: S. EGGLELAND
 DATE: 24.11.92
 BY: L. STERRI
 ORIGINAL SHEET

1 FOR LILLE FRIGG OIL TRANSFER PUMPS No. REQUIRED TWO
 2 SITE FRIGG TCP2, M35 PUMP SIZE, TYPE & No. STAGES 1
 3 SERVICE OIL TRANSFER PUMPS MODEL 6x25 SVN INLINE
 4 MANUFACTURER THYSSEN RUHR PUMPEN SERIAL No. 8.618-1433 A/B
 5 UNIT CENTRIFUGAL PUMP

6 NOTE: INDICATES INFORMATION COMPLETED BY PURCHASER PURCHASER MANUFACTURER BY MANUFACTURER OR PURCHASER

<input type="checkbox"/> PUMP DATA	<input type="checkbox"/> LIQUID
<input type="checkbox"/> SPEED _____ RPM	<input type="checkbox"/> TYPE OR NAME OF LIQUID <u>OIL</u>
<input type="checkbox"/> SHAFT/SLEEVE DIAMETER AT SEAL _____ mm	<input type="checkbox"/> CONCENTRATION _____
<input type="checkbox"/> STEPPED SLEEVE MINIMUM DIAMETER _____ mm	<input type="checkbox"/> PUMPING TEMPERATURE _____
<input type="checkbox"/> STUFFING BOX I.D. _____ mm	NORMAL <u>60.3</u> °C MAX _____ °C MIN. <u>58.4</u> °C
<input type="checkbox"/> STUFFING BOX DEPTH _____ mm	<input type="checkbox"/> SPECIFIC GRAVITY _____
CASING MOUNT:	<input checked="" type="checkbox"/> NORMAL TEMP. <u>0.79</u> <input checked="" type="checkbox"/> MAX TEMP. _____
<input type="checkbox"/> CENTERLINE <input type="checkbox"/> NEAR CENTERLINE <input type="checkbox"/> FOOT	<input type="checkbox"/> SPECIFIC HEAT _____ (kJ/kg °C)
<input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> SEPARATE MOUNTING PLATE	VAPOR PRESSURE _____
<input checked="" type="checkbox"/> IN-LINE <input type="checkbox"/> SUMP	<input type="checkbox"/> NORMAL TEMP. <u>15.0</u> (kPa abs)
CASING SPLIT:	<input type="checkbox"/> MAX. TEMP. _____ (BAR)
<input type="checkbox"/> AXIAL <input type="checkbox"/> RADIAL	VISCOSITY _____
IMPELLER	<input type="checkbox"/> NORMAL TEMP. <u>1.79</u> cP
<input type="checkbox"/> BETWEEN BEARINGS <input type="checkbox"/> OVERHUNG	<input type="checkbox"/> MIN. TEMP. <u>1.98</u> cP
PUMP MATERIALS:	<input type="checkbox"/> MELTING POINT (OR POUR POINT) _____ °C
<input type="checkbox"/> TABLE H-1 CLASS _____	<input type="checkbox"/> CORROSIVE/EROSIVE AGENT _____
<input type="checkbox"/> SHAFT _____	<input type="checkbox"/> CONCENTRATION (% OR PPM) _____
<input type="checkbox"/> SLEEVE _____	<input type="checkbox"/> CHLORIDE CONCENTRATION (PPM) _____
<input type="checkbox"/> GLAND _____	<input type="checkbox"/> H ₂ S CONCENTRATION (PPM) _____
	SOLIDS CONTENT _____
	<input type="checkbox"/> NAME OF SOLIDS PRESENT _____
	<input type="checkbox"/> CONCENTRATION (PPM OR % WT) _____
	<input type="checkbox"/> PARTICLE SIZE _____
	<input type="checkbox"/> TOXIC <input type="checkbox"/> FLAMMABLE <input type="checkbox"/> OTHER _____

SITE AND UTILITY DATA

UNUSUAL CONDITIONS: DUST FUMES

OTHER: _____

UTILITY CONDITIONS:

STEAM: DRIVERS HEATING

MIN. _____ (kPa) _____ °C	_____ (kPa) _____ °C
MAX. _____ (kPa) _____ °C	_____ (kPa) _____ °C

ELECTRICITY: DRIVERS HEATING CONTROL SHUTDOWN

VOLTAGE _____

HERTZ _____

PHASE _____

COOLING WATER:

TEMP. INLET _____ °C MAX RETURN _____ °C

PRESS. NORM. _____ (kPa) _____ (kPa)

DESIGN _____ (BARG) _____ (BARG)

MIN. RETURN _____ (kPa) _____ (kPa)

MAX ALLOW ΔP _____ (BARG) _____ (BAR)

WATER SOURCE _____

INSTRUMENT AIR: _____ (kPa)

MAX/MIN. PRESS. _____ / _____ (BAR)

REMARKS: _____

OPERATION CONDITIONS

PUMP CAPACITY _____ m³/h

SUCTION PRESSURE _____

MINIMUM _____ (kPa BARG)

RATED _____ (kPa BARG)

MAXIMUM _____ (kPa BARG)

DISCHARGE PRESSURE _____ (kPa BARG)

DIFFERENTIAL PRESSURE _____ (kPa BAR)

NPSH _____ m _____ (kPa)

SEALING PRESSURE _____ (BARG) PRESSURE @ THROAT _____

SERVICE: CONTINUOUS INTERMITTENT (STARTS/DAY _____)

CYCLING: TEMPERATURE PRESSURE FREQUENCY _____

REMARKS: _____

CLIENT : ELF PETROLEUM NORGE A/S	BY : <u>263</u>	ITEM No. : CP 618 A/B
PROJECT : FRØY INTEGRATIONWORK ON TCP2	CHECKED :	P.O.No. : PO-FF-22-26-1028
PROJECT No. : SOE038	APPROVED :	DATA SHEET No. : DS-FF-22-26-1019
SERVICE : OIL TRANSFER	DATE : <u>14.12.93</u>	REV. No. : <u>02</u>
DATA SHEET FOR : PUMP SEAL DATA SHEET SI UNITS	PAGE 4 OF 5	



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APPROVED: L. STERRI
 DATE: 02.06.92
 S. EGGLELAND
 ORIGINAL SHEET 1

