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CLIENT	: Joint Venture of TEC, IDRO, JGC and DIC
OWNER	: National Iranian Oil Company (NIOC)
COMPANY	: Petropars Lmited.
PROJECT	: South Pars Gas Field Development Phases 6, 7, 8 Onshore Facilities - Expansion
Work No.	: BA 0651-35
Req. No.	: SPY-2-0103-ME-MR-335
P.O. No.	: DWGB510
ITEM No.	: SP6-2-0103-K-101A/B SP7-2-0103-K-101A/B SP8-2-0103-K-101A/B
SERVICE	: OFF GAS COMPRESSOR
MODEL	: KR60-4

EXPANSION

AS BUILT

DATA SHEET

ISSUE PURPOSE :	AB
RESULT CODE	:A,B,R,N (A)
NEXT STATUS	:FA,FI,AFC,AB ( )
RESUBMISSION DATE : ( )	
Approval or review hereunder shall not be construed to relieve Vendor / Subcontractor of his responsibilities and liabilities under the Contract.	
PJ DEPT. ( )	
RES DEPT. ( )	
RELA- ( ) TED ( ) DEPT. ( )	
DATE :	JUNE, 27, 2007
EO JOB No.	
DOC. No.	DWGB510-V-0103-K101A/B-108 Rev. 2

NIOC
Pars Oil & Gas Company

NATIONAL IRANIAN OIL COMPANY
SOUTH PARS GAS FIELD DEVELOPMENT
PHASES 6, 7 & 8
ONSHORE FACILITIES

PETROPARS LTD

TEC IDRO JGC DAELIM

PO No. DWGB510

REV No.	REVSION NOTE	DATE	DRAWN	DESIGNED	CHECKED		APPROVED		REVIEWED
			ENGINEERING DEPT.						QC
R2	△2 P.1, P.2 AS BUILT	APR. 11 2007	–	佐藤	平田	–	平田	–	–
R1	△1 P.1, P.2, P.4, P.8, P.9, P.12, P.14 P.15, P.17 PROCESS DATA CHANGED	SEP. 14 2005	–	佐藤	平田	–	平田	–	–
0	ISSUED △0 P.9, P.10 P.18	JUL. 15 2005	–	佐藤	平田	–	平田	–	–

O.No. 05-00186-G
05-00187-G
05-00188-G

S.No. 22S-09493

KOBELCO KOBE STEEL, LTD.
MACHINERY COMPANY

CAREER
03-00904-G
03-00905-G
03-00906-G

T.No. B033637

C		0
B		0
A		
配布先		合計

ISSUED BY
回転機技術部
レシプロ室

SEC. CODE 7100

A0 : A1 : A2 : A3 : A4 : 22 TOTAL : 22 SHEETS

Petropars Ltd | NIOC

JOB NO. DA-1000 ITEM NO. K-101A/B
PURCHASE ORDER NO. SPY-2-0103-ME-MR-335
DATA SHEET No. SP6-2-0103-ME-DT-004
REVISION NO. X0 DATE Apr. 1, 05
PAGE 2 OF 29 BY H.T

RECIPROCATING COMPRESSOR (API 618-4TH) DATA SHEET SI UNITS

1 APPLICABLE TO: ⊗ PROPOSAL ○ PURCHASE ○ AS BUILT — 2 X 70 % PER PHASE
2 FOR / USER PETROPARS Ltd SITE / LOCATION ASSALUYEH SERVICE OFF GAS COMP. NO REQ'D 6 NOTE 2
3 NOTE: ○ INDICATES INFO. TO BE COMPLETED BY PURCH. ☐ BY MANUFACTURER WITH PROPOSAL ☐ BY MANUFACTURER OR PURCHASER AS APPLICABLE
5 COMPR. MFGR. KOBE STEEL, LTD. TYPE MODEL NO.(S) KR60-4 SERIAL NO(S)
6 COMPR. THROWS: TOTAL NO. 4 NO. WITH CYLS 4 NOM. FRAME RATING 4900 kW @ RATED RPM OF 327
7 ☐ MAX/MIN ALLOWABLE SPEED / RPM
8 DRIVER MFGR. DRIVER NAMEPLATE kW / OPERATING RPM 3200 / 327
9 DRIVE SYSTEM: ⊗ DIRECT COUPLED ○ GEARED & COUPLED ○ V-BELT
10 TYPE OF DRIVER: ⊗ IND. MOTOR ○ SYN. MOTOR ○ STEAM TURBINE ○ GAS TURBINE ○ ENGINE ○ OTHER
11 NO NEGATIVE TOLERANCE APPLIES: ⊗ YES PURCHASER TO FILL IN "REQUIRED CAPACITY" LINES CYLINDERS: ⊗ LUBE
12 (NNT) ○ NO-PURCHASER TO FILL IN "MFGR'S RATED CAP." LINES ○ NON-LUBE
13 ⊗ MAX ACCEPTABLE AVG PISTON SPEED 3.8 m / sec
14 OPERATING CONDITIONS

15	○ SERVICE OR ITEM NO.	WINTER RICH GAS					
16	⊗ STAGE	1st	2nd	1st	2nd		
17	⊗ NORM. OR ALT CONDITION	WR-NORM (50%)		WR-MAX (70%)			
18	⊗ CERTIFIED PT (√) CHECK ONE			X			
19	⊗ MOLECULAR WEIGHT	43.0	29.7	43.0	29.7	△	
20	⊗ Cp/Cv (k) @ INLET TEMP. NOTE 1	1.180	1.337	1.180	1.337		
21	INLET CONDITIONS AT INLET TO: ⊗ PULSE DEVICES ○						
22	NOTE: ○ SIDE STREAM TO						
23	⊗ PRESSURE BARG PULP. SUPP. INLET	8.0	27	8.0	27		
24	☐ PRESSURE BARG @ CYL. FLANGE	7.9	26.7	7.9	26.7		
25	⊗ TEMPERATURE °C	58	49	58	49		
26	○ REF.: SIDE STREAM TEMPS						
27	☒ COMPRESSIBILITY (Z1) NOTE 1	0.894	0.838	0.894	0.838		
28	INTERSTAGE: ΔP INCLUDES: ☐ PULSE DEVICES ☐ PIPING ☐ SEPARATORS ☐ OTHER						
29	☐ ΔP BETWEEN STAGES. % / (BAR)	/		/			
30	DISCHARGE CONDITIONS: AT OUTLET FROM ☐ PULSE DEVICES ☐ ☐ OTHER						
31	☐ PRESSURE, (BARG) @ CYL FLANGE	28.6	77.6	29.4	77.6		
32	☒ PRESSURE, (BARG) @ PUL. SUPP. OUTLET	28.3	76.8	29.1	76.8		
33	☐ TEMPERATURE, ADIABATIC (°C)						
34	☐ TEMPERATURE, PREDICTED (°C)	110	110	111	110		
35	☒ COMPRESSIBILITY (Z2) OR (ZAVG) NOTE 1	0.799	0.783	0.799	0.783		
36	* REQUIRED CAPACITY RATED FOR PROCESS, AT INLET TO COMPRESSOR, NO NEGATIVE TOLERANCE (-0%)						
37	⊗ kg / HR CAPACITY SPECIFIED NOTE 2	39140	36936	54796	51710		
38	IS ○ WET ⊗ DRY LOAD	(71%)	(71%)				
39	○ m³/HR (760mm Hg & 0°C)	20389	27857	28545	39000		△2
40	MGFR.'S RATED CAPACITY (AT INLET COMPRESSOR) & kW @ CERTIFIED TOLERANCE OF + 3% FOR CAP & +3% FOR kW						
41	☐ kg / HR CAPACITY SPECIFIED	40351	38078	56491	53309		
42	IS ○ WET ○ DRY						
43	☐ INLET m/HR						
44	☐ m³/HR	286.4	1225	4010	1715		△2
45	☐ kW.	1005	1097	1340	1477		
46	☐ TOTAL kW @ COMPRESSOR SHAFT	2102		2817			
47	☐ TOTAL kW INC V-BELT & GEAR LOSSES	2102		2817			
48	* CAPACITY FOR NNT						

49 MANUFACTURER'S = REQUIRED + 0.97 REMARKS/SPECIAL REQUIREMENTS
50 REQUIRED = MANUFACTURER'S x 0.97 NOTE 1 VENDOR TO CONFIRM
51 NNT = NO NEGATIVE TOLERANCE. NOTE 2 VENDOR TO PROVIDE 2 X 70% COMPS. i.e. SIX COMPS

Petropars Ltd | NIOC

JOB NO. DA-1000 ITEM NO. K-101A/B
PURCHASE ORDER NO. SPY-2-0103-ME-MR-335
DATA SHEET No. SP6-2-0103-ME-DT-004
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PAGE 3 OF 28 BY H.T

RECIPROCATING COMPRESSOR (API 618-4TH) DATA SHEET SI UNITS

1 APPLICABLE TO: ⊗ PROPOSAL ○ PURCHASE ○ AS BUILT 2 X 70 % PER PHASE
2 FOR / USER PETROPARS Ltd SITE / LOCATION ASSALUYEH SERVICE OFF GAS COMP.. NO REQ'D 6 NOTE 2
3 NOTE: ○ INDICATES INFO. TO BE ◇ BY MANUFACTURE ☐ BY MANUFACTURER ☐ BY MANUFACTURER OR PURCHASER AS
4 COMPLETED BY PURCH. AFTER ORDER WITH PROPOSAL APPLICABLE
5 COMPR. MFGR. _____ TYPE MODEL NO.(S) _____ SERIAL NO(S) _____
6 COMPR. THROWS: TOTAL NO. _____ NO. WITH CYLS _____ NOM. FRAME RATING _____ kW @ RATED RPM OF _____
7 ☐ MAX/MIN ALLOWABLE SPEED _____ / _____ RPM
8 DRIVER MFGR. DRIVER NAMEPLATE kW / OPERATING RPM _____ / _____
9 DRIVE SYSTEM: ⊗ DIRECT COUPLED ○ GEARED & COUPLED ○ V-BELT
10 TYPE OF DRIVER: ⊗ IND. MOTOR ○ SYN. MOTOR ○ STEAM TURBINE ○ GAS TURBINE ○ ENGINE ○ OTHER
11 NO NEGATIVE TOLERANCE APPLIES: ⊗ YES PURCHASER TO FILL IN "REQUIRED CAPACITY" LINES CYLINDERS: ⊗ LUBE
12 (NNT) ○ NO-PURCHASER TO FILL IN "MFGR'S RATED CAP." LINES ○ NON-LUBE
13 ⊗ MAX ACCEPTABLE AVG PISTON SPEED 3.6 m / sec
14 OPERATING CONDITIONS

15	○ SERVICE OR ITEM NO.	SUMMER LEAN GAS					
16	⊗ STAGE	1st	2nd	1st	2nd		
17	⊗ NORM. OR ALT CONDITION	SL-MAX (50%)		SL-MIN (20%)			
18	⊗ CERTIFIED PT (√) CHECK ONE						
19	⊗ MOLECULAR WEIGHT	42.3	29.1	42.3	29.1		
20	⊗ Cp/Cv (k) @ INLET TEMP. NOTE 1	1.180	1.333	1.180	1.333		
21	INLET CONDITIONS AT INLET TO: ⊗ PULSE DEVICES ○						
22	NOTE: ○ SIDE STREAM TO						
23	⊗ PRESSURE BARG PULP. SUPP. INLET	8.0	27	8.0	27		
24	☐ PRESSURE BARG @ CYL. FLANGE	7.9	26.7	7.9	26.7		
25	⊗ TEMPERATURE °C	58	49	58	49		
26	○ REF.: SIDE STREAM TEMPS						
27	☒ COMPRESSIBILITY (Z_1) NOTE 1	0.897	0.844	0.892	0.844		
28	INTERSTAGE: ΔP INCLUDES: ☐ PULSE DEVICES ☐ PIPING ☐ SEPARATORS ☐ OTHER						
29	☐ Δ P BETWEEN STAGES. % / (BAR)	/		/			
30	DISCHARGE CONDITIONS: AT OUTLET FROM ☐ PULSE DEVICES ☐ ☐ OTHER						
31	☐ PRESSURE, (BARG) @ CYL FLANGE	28.0	77.6	27.8	77.6		
32	☒ PRESSURE, (BARG) @ PUL. SUPP. OUTLET	27.7	76.8	27.5	76.8		
33	☐ TEMPERATURE, ADIABATIC (°C)						
34	☐ TEMPERATURE, PREDICTED (°C)	110	110	110	110		
35	☒ COMPRESSIBILITY (Z2) OR (ZAVG) NOTE 1	0.808	0.793	0.808	0.793		
36	* REQUIRED CAPACITY RATED FOR PROCESS, AT INLET TO COMPRESSOR, NO NEGATIVE TOLERANCE (-0%)						
37	⊗ kg / HR CAPACITY SPECIFIED NOTE 2	23150	20975	(9260)	(8390)		
38	IS ○ WET ⊗ DRY LOAD	(42 %)	(42 %)	(30 %)	(30 %)		
39	○ m^3 /HR (760mm Hg & 0°C)	12259	16146	8783	11706		2
40	MGFR.'S RATED CAPACITY (AT INLET COMPRESSOR) & kW @ CERTIFIED TOLERANCE OF +3% FOR CAP & +3% FOR kW						
41	☐ kg / HR CAPACITY SPECIFIED	23866	21624	17100	15677		
42	IS ○ WET ○ DRY						
43	☐ INLET m /HR						
44	☐ m^3 /HR	1722	710	1234	1515		2
45	☐ kW.	671	792	528	612		
46	☐ TOTAL kW @ COMPRESSOR SHAFT	1463		1140			
47	☐ TOTAL kW INC V-BELT & GEAR LOSSES	1463		1140			
48	* CAPACITY FOR NNT						

49 MANUFACTURER'S = REQUIRED + 0.97 REMARKS/SPECIAL REQUIREMENTS _____
50 REQUIRED = MANUFACTURER'S x 0.97 NOTE 1 VENDOR TO CONFIRM
51 NNT = NO NEGATIVE TOLERANCE NOTE 2 VENDOR TO QUOTE 2 X 70% COMPS. i.e. SIX COMPS

Petropars Ltd | NIOC

JOB NO. DA-1000 ITEM NO. K-101A/B
PURCHASE ORDER NO. SPY-2-0103-ME-MR-335
DATA SHEET No. SP6-2-0103-ME-DT-004
REVISION NO. X0 DATE Apr. 1, 05
PAGE 4 OF 29 BY H.T

RECIPROCATING COMPRESSOR (API 618-4TH) DATA SHEET SI UNITS

1 APPLICABLE TO: ⊗ PROPOSAL ○ PURCHASE ○ AS BUILT — 2 X 70 % PER PHASE
2 FOR / USER PETROPARS Ltd SITE / LOCATION ASSALUYEH SERVICE OFF GAS COMP. NO REQ'D 6 NOTE 2
3 NOTE: ○ INDICATES INFO. TO BE COMPLETED BY PURCH. ◇ BY MANUFACTURE AFTER ORDER ☐ BY MANUFACTURER WITH PROPOSAL ☒ BY MANUFACTURER OR PURCHASER AS APPLICABLE
5 COMPR. MFGR. ____ TYPE MODEL NO (S) ____ SERIAL NO(S) ____
6 COMPR. THROWS: TOTAL NO. ____ NO. WITH CYLS ____ NOM. FRAME RATING ____ KW @ RATED RPM OF ____
7 ☐ MAX/MIN ALLOWABLE SPEED ____ / ____ RPM
8 DRIVER MFGR. DRIVER NAMEPLATE KW / OPERATING RPM ____ / ____
9 DRIVE SYSTEM: ☒ DIRECT COUPLED ○ GEARED & COUPLED ○ V-BELT
10 TYPE OF DRIVER: ⊗ IND. MOTOR ○ SYN. MOTOR ○ STEAM TURBINE ○ GAS TURBINE ○ ENGINE ○ OTHER
11 NO NEGATIVE TOLERANCE APPLIES: ☒ YES PURCHASER TO FILL IN "REQUIRED CAPACITY" LINES — CYLINDERS: ⊗ LUBE
12 (NNT) ○ NO-PURCHASER TO FILL IN "MFGR'S RATED CAP." LINES — ○ NON-LUBE
13 ⊗ MAX ACCEPTABLE AVG PISTON SPEED 3.8 m / sec
14 OPERATING CONDITIONS

		START-UP (NOTE 3)					
		1st	2nd	1st	2nd	1st	2nd
		AIR		NITROGEN			
15	○ SERVICE OR ITEM NO.						
16	⊗ STAGE						
17	⊗ NORM. OR ALT CONDITION						
18	⊗ CERTIFIED PT (√) CHECK ONE						
19	⊗ MOLECULAR WEIGHT	29.0		28.0			
20	⊗ Cp/Cv (k) @ INLET TEMP. NOTE 1						
21	INLET CONDITIONS — AT INLET TO: ☒ PULSE DEVICES ○						
22	NOTE: ○ SIDE STREAM TO						
23	⊗ PRESSURE BARG PULP. SUPP. INLET	0.0	1.42	6.0	16.4		
24	☒ PRESSURE BARG @ CYL. FLANGE	-0.05	1.40	5.88	16.3		
25	⊗ TEMPERATURE °C	48	58	48	58		
26	○ REF.: SIDE STREAM TEMPS						
27	☒ COMPRESSIBILITY (Z_1) NOTE 1	1.00	1.00	1.00	1.00		
28	INTERSTAGE: Δ P INCLUDES: ☒ PULSE DEVICES ☒ PIPING ☒ SEPARATORS ☒ OTHER						
29	☒ Δ P BETWEEN STAGES, % / (BAR)	/		/		/	
30	DISCHARGE CONDITIONS: AT OUTLET FROM ☒ PULSE DEVICES ☒ ☒ OTHER						
31	☒ PRESSURE, (BARG) @ CYL FLANGE	1.50	3.54	16.7	25.2		
32	☒ PRESSURE, (BARG) @ PUL. SUPP. OUTLET	1.48	3.5	16.6	25.0		
33	☐ TEMPERATURE, ADIABATIC (°C)						
34	☐ TEMPERATURE, PREDICTED (°C)	150	124	147	100		
35	☒ COMPRESSIBILITY (Z2) OR (ZAVG) NOTE 1	1.00	1.00	1.00	1.00		
36	* REQUIRED CAPACITY — RATED FOR PROCESS, AT INLET TO COMPRESSOR, NO NEGATIVE TOLERANCE (-0%)						
37	⊗ kg / HR — CAPACITY SPECIFIED NOTE 2	4530	4530	35440	35440		
38	IS ○ WET ☒ DRY						
39	○ m^3 /HR (760mm Hg & 0°C)						
40	MGFR.'S RATED CAPACITY (AT INLET COMPRESSOR) & KW @ CERTIFIED TOLERANCE OF + 3% FOR CAP & +3% FOR KW.						
41	☒ kg / HR — CAPACITY SPECIFIED	4672	4672	35536	35536		
42	IS ○ WET ○ DRY						
43	☒ INLET m /HR						
44	☒ m^3 /HR						
45	☐ KW.	183	120	1205	567		
46	☐ TOTAL KW @ COMPRESSOR SHAFT	303		1772			
47	☐ TOTAL KW INC V-BELT & GEAR LOSSES	303		1772			
48	* CAPACITY FOR NNT						

49 MANUFACTURER'S = REQUIRED + 0.97
50 REQUIRED = MANUFACTURER'S x 0.97
51 NNT = NO NEGATIVE TOLERANCE

REMARKS/SPECIAL REQUIREMENTS
NOTE 1: VENDOR TO CONFIRM. NOTE 2: VENDOR TO QUOTE 2 X 70% COMPS. I.e. SIX COMPS
NOTE 3: VENDOR TO ADVISE EACH OPRATING CONDITION FOR START UP WITH N2 AND AIR
52

Petropars Ltd | IDAG | JGC | DAELIM | NIOC

JOB NO	BA-0651-35
ITEM NO	K-101A/B
PURCHASE ORDER NO	SPY-2-0103-ME-MR-335
DATA SHEET No.	SP6-2-0103-ME-DT-004
REVISION NO.	E0
DATE	AUG. 3, 05
PAGE	5 OF 29
BY	H.T

RECIPROCATING COMPRESSOR (API 618-4TH) DATA SHEET SI UNITS

OPERATING CONDITIONS (Continued)

GAS ANALYSIS ⊗ MOL % ○	M.W.	WINTER-RICH (NORMAL) 1st	WINTER-RICH (NORMAL) 2nd	SUMMER-LEAN (NORMAL) 1st	SUMMER-LEAN (NORMAL) 2nd	START-UP 1st&2nd	START-UP 1st&2nd	REMARKS:
AIR	28 966						100	
OXYGEN	32.000							
NITROGEN	28 016	0.0716	0.6068	0.0751	0.5679	100		⚠
WATER VAPOR	18 016	1.5076	0.4478	2.0626	0.4486			WATER SATURATED
CARBON MONOXIDE	28 010							APPLICABLE SPECIFICATIONS
CARBON DIOXIDE	44 010	2.0172	2.9920	1.8331	2.6305			⊗ NACE MR-0175 (2.14.1.10)
HYDROGEN SULFIDE	34 076	2.8229	2.4831	2.5941	2.2562			⊗ API-618-RECIPROCATING
HYDROGEN	2 016							COMPRESSORS
METHANE	16 042	19.5576	51.5740	22.2547	54.2591			FOR PETROLEUM, CHEMICAL AND
ETHYLENE	28 052							GAS INDUSTRY SERVICES
ETHANE	30 068	13.8856	13.7112	13.8664	13.5041			○
PROPYLENE	42.078							○
PROPANE	44 094	20.7268	13.0129	17.0587	10.7879			○
I-BUTANE	58.120	12.2976	5.5749	11.4939	5.2611			○
n-BUTANE	58.120	17.1965	7.0830	18.2741	7.5743			○
I-PENTANE	72.146	4.2475	1.2065	4.5655	1.3109			○
n-PENTANE	72.146	3.8410	0.8489	4.2153	1.0542			○
n- HEXANE	86 178	0.9905	0.1304	0.8912	0.1242			○
CYCLOHEXANE	84 163	0.0609	0.0076	0.0616	0.0084			○
MCYCLOHEXANE	98.190	0.0156	0.0017	0.0117	0.0018			○
BENZENE	78.115	0.0565	0.0084	0.0631	0.0098			○
M-MERCAPTAN	48.103	0.0664	0.0328	0.0544	0.0271			
E-MERCAPTAN	62.130	0.4021	0.1441	0.3857	0.1390			
n-PMERCAPTAN	104.210	0.0724	0.0125	0.0669	0.0118			
MCYCLOPENTAN	84 163	0.0770	0.0104	0.0832	0.0119			
n-HEPTANE	100.206	0.0614	0.0065	0.0481	0.0071			
TOLUENE	92.113	0.0025	0.0003	0.0024	0.0004			
n-OCTANE	114 220	0.0017	0.0008	0.0014	0.0009			
p-XYLENE	106 160	0.0003	0.0002	0.0003	0.0003			
n-NONANE	128.250	0.0000	0 0001	0.0000	0.0001			
COS	60.070	0.0027	0 0019	0.0028	0.0019			
n-BMERCAPTAN	90.180	0.0046	0.0005	0.0034	0.0004			
MEG		0.0132	0.0000	0.0204	0.0000			
☐ TOTAL		100	100	100	100	100	100	
☐ AVG MOL WGT		43.0	29.7	42.3	29.1	28.0	29 0	
☐ Cp/Cv (k) @ 65°C OR								

NOTE: IF WATER VAPOR AND/OR CHLORIDES ARE PRESENT, EVEN IN MINUTE TRACES, IN THE GAS BEING COMPRESSED, IT MUST BE INCLUDED ABOVE

SITE / LOCATION CONDITIONS

ELEVATION 100 m BAROMETER 997 m BAR AMBIENT TEMP: MAX 48 °C MIN 5 °C

○ MIN DESIGN METAL TEMP ____ °C (2.14.8 RELATIVE HUMIDITY: MAX: 100 (@5°C) % MIN 65 %

COMPRESSOR LOCATION ○ INDOOR ○ HEATED ⊗ UNHEATED ⊗ AT GRADE LEVEL ○ ELEVATED ____ m

○ OUTDOOR ○ NO ROOF ⊗ UNDER ROOF ○ PARTIAL SIDES ○ ELEVATED ⊗ ON-SHORE

○ OFF-SHORE ○ WEATHER PROTECTION REQ ⊗ TROPICALIZAZION REQ ○ WINTERIZATION REQUIRED

UNUSUAL CONDITIONS: ⊗ CORROSIVES ⊗ DUST ⊗ FUMES ⊗ OTHER SALIFEROUS

APPLICABLE SPECIFICATIONS: API 618, RECIPROCATING COMPRESSORS FOR GEN. REFINERY SERVICE

⊗ GOVENERNING SPECIFICATION SPY-Y-0000-ME-SP-003 ⊗ VENDOR HAVING UNIT RESPONSIBILITY COMPRESSOR VENDOR

NOISE SPECIFICTAION: ⊗ APPLICABLE TO THE PACKAGE 90 dBA SEE SPECIFICATION SPY-Y-0000-TY-SP-014

AREA CLASSIFICATION:

	HAZARDOUS							NON HAZARDOUS
MAIN UNIT	⊗ ZONE	2	GAS GROUP	IIB	TEMP.CLASS	T3		○
LO CONSOLE	⊗ ZONE	2	GAS GROUP	IIB	TEMP.CLASS	T3		○
CW CONSOLE	⊗ ZONE	2	GAS GROUP	IIB	TEMP.CLASS	T3		○

IF WATER COOLING FOR PACKING AND CYLINDER REQUIRED; THE VENDOR SHALL SUPPLY A CLOSED WATER CIRCUIT AIR COOLED SYSTEM

Petropars Ltd | IPCO | JGC | DAEELIM | NIOC

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PAGE 8 OF 29	BY H.T

RECIPROCATING COMPRESSOR (API 618-4TH) DATA SHEET SI UNITS

1 SCOPE OF BASIC SUPPLY

2 PURCHASER TO FILL IN ○ ☒ AFTER COMMODITY INDICATE ☐☒ BY COMPRESSOR MANUFACTURER ○ BY PURCHASER

3 ⊗ DRIVER (☒ ○) ○ VARIABLE SPEED SPEED RANGE _____ RPM TO _____ RPM
4 ⊗ INDUCTION MOTOR ○ SYNCHRONOUS MOTOR ○ STEAM TURBINE ○ ENGINE ○ OTHER _____
5 ○ API-541 ○ API - 546 ○ API 611 ○ API 612 ⊗ IEC 34
6 ○ OUTBOARD BEARING ○ PROVISION FOR DRY AIR PURGE FOR OUTBOARD BEARING
7 ○ SLIDE BASE FOR DRIVER (☒ ○) SOLE PLATE FOR DRIVER (☒ ○)
8 ○ MOTOR STARTING EQUIPMENT (☒ ○) DEFINE _____
9 ○ GEAR(☒ ○) ○ BASEPLATE FOR GEAR ○ API 613
10 ⊗ COUPLING(S) (☒ ○) ⊗ LOW SPD. ○ HI-SPD ○ QUILL SFT. ○ KEYLESS DRIVE ○ KEYED DRIVE ○ OTHER _____
11 ○ API-671 ⊗ RESILIENT RUBBER BLOCK HOLSET TYPE
12 ○ V-BELT DRIVE (☒ ○) ○ SHEAVES & V-BELTS (
13 ⊗ DRIVE GUARD(S) (☒ ○) ○ MANUFACTURER'S STD ⊗ NON SPARKING ○ API-671 APPENDIX C
14 ⊗ SEE SPECIFICATION SPY-Y-0000-ME-SP-018

15 ○ PULSATION SUPPRESSORS WITH INTERNALS (☒ ○) ○ INITIAL INLET & FINAL DISCHARGE (○ SUPPORTS (☒ ○)
16 ○ INTERSTAGE ○ SUPPORTS (☒ ○)
17 ⊗ PULSATION SUPPRESSORS WITHOUT INTRNL(☒ ○ ⊗ INITIAL INLET & FINAL DISCHARGE ⊗ SUPPORTS (☒ ○)
18 ⊗ INTERSTAGE ⊗ SUPPORTS (☒ ○)
19 ○ SUPPRESOSORS) TO HAVE MOISTURE REMOVAL SECTION ○ INITIAL INLET ONLY ○ ALL INLET SUPPRESSORS
20 ⊗ ACOUSTICAL SIMUL. STUDY(☒ ○) DESIGN APPROACH ○ 1. W/SIMPLIFIED ANALYSIS OF PIPING SYSTEM
21 ☒ DIGITAL ☐ ANALOG (Check one only) ○ 2. SEE 3.9.2.1 AND APPENDIX M
22 NOTE: SEE APPENDIX N FOR STUDY ⊗ 3 SEE 3.9.2.1 AND APPENDIX M
23 INFORMATION REQUIRED FOR STUDY STUDY TO CONSIDER ALL SPECIFIED LOAD CON., INCL ⊗ SINGLE ACT., PLUS
24 ⊗ COMP. OPER. IN PARALLEL ⊗ ALTERNATE GASES
25 ○ WITH EXISTING COMPRESSORS AND PIPING SYSTEMS
26 ○ STUDY TO BE WITNESSED ⊗ COMPRESSOR VALVE DYNAMIC RESPONSE
27 ⊗ VENDOR REVIEW OF PURCHASER PIPING ARRANGEMENT ⊗ PULSATION SUPPRESSION DEVICE LOW CYCLE FATIGUE ANALYSIS
28 ⊗ PIPING SYSTEM FLEXIBILITY

29 PACKAGED: ⊗ NO ⊗ YES(☒ ○) DEFINE BASIC SCOPE OF PACKING IN REMARKS SECTION, PAGE 10
30 ○ SKID ⊗ SOLEPLATE ⊗ BASEPLATE ○ BOLTS OR STUDS FOR SOLEPLATE TO FRAME ○ RAILS ○ CHOCK BLOCKS ⊗ SHIMS
31 ○ SUITABLE FOR COLUMN MOUNTING (UNDER SKID AND/OR BASEPLATE)
32 ⊗ LEVELING SCREWS ⊗ NON-SKID DECKING ○ SUB-SOLEPLATES
33 ○ DIRECTED GROUTED ○ CEMENTED/MORTAR GROUT ⊗ EPOXY GROUT; MFG/TYPE _____ / _____
34 ○ INTERCOOLER (S)(☐ ○) SEPARATOR(S) (☐ ○) AFTERCOOLER(S)(☐ ○) INTERCOOLERS:
35 ○ INTERSTAGE PIP. (☐ ○) PIPING MATCHMARKED ○ SHOP FITTED ○ MACHINE MOUNTED
36 ○ CONDENSATE SEPARATION & COLLECTION FACILITY SYSTEM PER ○ OFF MOUNTED
37 ⊗ INLET STRAINER(S) (☐ ⊗) ⊗ INITIAL INLET ⊗ SIDESTREAM INLET ⊗ SPOOL PIECE FOR INLET STRAINERS NOTE1
38 ⊗ MANIFOLD PIPING : ⊗ DRAINS ⊗ VENTS ⊗ RELIEF VALVES ○ AIR/GAS SUPPLY FLANGE FINISH
39 ⊗ RELIEF VALVE(S) (☐ ⊗) ○ INITIAL INLET ○ INTERSTAGE ☒ FINAL DISCHARGE ○ API-618 FLANGE FINISH REF.
40 ○ RUPTURE DISC(S)(☐ ○) THRU STUDS IN PIPING FLANGES
41 ⊗ CRANKCASE RAPID PRESSURE RELIEF DEVICES(S)(☒ ○) ○ FLANGE FINISH PER ANSI 16.5
42 ⊗ SPECIAL PIPING REQUIREMENTS PER 3.7.1.12.24 (DEFINE IN REMARKS SECTION NEXT PAGE) ⊗ SPECIAL FINISH NOTE 1 PG 9

43 ○ INITIAL INLET INTERSTAGE SUCTION PIPING ARR'D FOR: INSULATION (☐ ○) HEAT TRACING (☐ ○)
44 ○ FOR ATMOSPHERIC INLET AIR COMPR. ONLY: INLET AIR FILTER(☐ ○) INLET FILTER-SILENCER(☐ ○)
45 ○ PREFERRED TYPE OF CYLINDER COOLING (☐ ○) ○ FORCED ○ SUPPLY _____ STAGE CYL'(S)
46 ○ STATIC (STAND-PIPE) _____ STAGE CYL'(S)
47 ⊗ NOTE: MANUFACTURER SHALL RECOMMEND ⊗ CYL. COOLING WATER PIPING (☒ ○)
48 BEST TYPE OF COOLING AFTER ○ SINGLE INLET/OUTLET MANIFOLD & VALVES
49 FINAL ENGINEERING REVIEW OF ALL ○ INDIVIDUAL INLET/OUTLET PER CYL VALVE(S)
50 OPERATING CONDITIONS ⊗ CLOSED SYS. WITH WATER PUMP, COOLER SURGE TANK & PIPING
51 ○ SHOP RUN ARRANGED FOR HEATING JACKET AS WELL AS COOLING
52 NOTE 1: VENDOR TO ADVISE MESH SIZE OF ○
53 INLET STRAINERS

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JOB NO. DA-1000	ITEM NO. K-101A/B
PURCHASE ORDER NO. SPY-2-0103-ME-MR-335	
DATA SHEET No. SP6-2-0103-ME-DT-004	
REVISION NO. X0	DATE Apr. 1, 05
PAGE 9 OF 29	BY H.T

RECIPROCATING COMPRESSOR (API 618-4TH) DATA SHEET SI UNITS

SCOPE OF BASIC SUPPLY (CONTINUED)

PURCHASER TO FILL IN ☐ ☒ AFTER COMMODITY INDICATE ☐ ☒ BY COMPRESSOR MANUFACTURER ☐ BY PURCHASER

☒ SEPARATE COOLING CONSOLE(☒ ☐) ☒ ONE FOR EA UNIT ☐ ONE COMMON ALL UNITS (PHASE) DUAL PUMP (AUX. & MAIN)
ARRANGED FOR HEATING JACKET WATER AS WELL AS COOLING

FRAME LUBE OIL SYSTEM(☒ ☐) ☒ AUX PUMP ☒ DUAL FILTERS WITH TRANSFER VALVE ☒ SHOP RUN
☒ CONTINUOUS FLOW IN SENSING LINE TO PRESSURE TRANSMITTERS

☒ SEPARATE LUBE OIL CONSOLE(☒ ☐)*** ☐ EXTENDED TO MOTOR OUTBOARD BEARING ☐ SHOP RUN

☒ API-614 APPLIES (REFER TO NOTE OF 2.12.2 ☒ NO ☒ YES *** IF THERE IS INSUFFICENT SPACE ON THE BASEPLATE

NOTE: PIPING BETWEEN ALL CONSOLES AND COMPRESSOR UNIT BY PURCHASER

☒ CAPACITY CONTROL(☒ ☐) ☐ SEE DATA SHEET PAGE 6 FOR DETAILS ☒ IN INSTRUMENT & CONTROL PANEL
(Type C) ☐ SEPARATE MACHINE MOUNTED PANEL ☐ SEPARATE FREE STANDING PANEL
☐ PNEUMATIC ☐ ELECTRIC ☒ ELECTRONIC ☒ HYDRAULIC
☒ PROGRAMMABLE CONTROLLER

☒ INSTRUMENT & CONTROL PANEL (☒ ☐) ☒ ONE FOR EACH UNIT ☐ ONE COMMON TO ALL UNITS
☐ ☐ MACHINE MOUNTED ☒ FREE STANDING (OFF UNIT) IN THE (LER)

SEE INSTRUMENTATION DATA SHEET FOR DETAILS OF PANEL, ADDITIONAL REMARKS AND INSTRUMENTATION

NOTE: ALL TUBING, WIRING & CONNECTIONS BETWEEN OFF-UNIT FREE STANDING PANELS AND COMPRESSOR UNIT BY PURCHASER

☒ HEATERS (☒ ☐) ☒ FRAME LUBE OIL ☒ CYL. LUBRICATORS ☒ COOLING WATER ☐ DRIVER(S) ☐ GEAR OIL
☒ ELECTRIC ☐ STEAM

☒ BARRING DEVICE (☒ ☐) ☐ MANUAL ☐ PNEUMATIC ☒ ELECTRIC ☒ FLYWHEEL LOCKING DEVICE (☒ ☐)

☒ ROD PRESSURE PACKING COOLING SYSTEM(☒ ☐) ☐ SEPARATE CONSOLE ☐ FILTERS

☒ SPECIAL CORROSION PROTECTION: ☐ NO ☒ YES ☒ MFR'S STANDARD ☐ OTHER

☒ HYDRAULIC TENSIONING TOOLS ☐ NO ☒ YES

☒ MECHANICAL RUN TEST: ☐ NO ☒ YES (AT SITE) ☒ MFG'S STANDARD ☐ OTHER
☒ COMPLETE SHOP RUN TEST OF ALL MACHINE MOUNTED EQUIPMENT, PIPING & APPURTENANCES

PAINTING: ☐ MANUFACTURER'S STANDARD ☒ SPECIAL SEE SPY-2-0000-TY-SP-001

NAMEPLATES: ☐ U.S. CUSTOMARY UNITS ☒ SI UNITS (METRIC)

SHIPMENT: ☐ DOMESTIC ☒ EXPORT ☒ EXPORT BOXING REQUIRED (☒ ☐)
☐ STANDARD 6 MONTH STORAGE PREPARATION (☐ ☐) PER SPEC
☒ OUTDOOR STORAGE FOR OVER 6 MONTHS (☒ ☐) PER SPEC AS PER PACKING INSTRUCTION
☒ COMMISSIONING SPARES ☒ TWO YEARS SPARES (OPTION)

☒ INITIAL INSTALLATION AND OPERATING TEMP ALIGNMENT CHECK AT JOBSITE BY VENDOR REPRESENTATIVE

☒ COMPRESSOR MANUFACTURE'S USER'S LIST FOR SIMILAR SERVICE

☒ PERFORMANCE DATA REQUIRED PER 5.3.3 ☒ kW VS. SUCTION PRESSURE CURVES
☒ ROD LOAD/GAS LOAD CHARTS
☒ VALVE FAILURE DATA CHARTED
☒ SPEED/TORQUE CURVE DATA

☐ kW VS CAPACITY PERFORMANCE CURVES OR TABLES REQUIRED FOR UNLOADING STEPS AND/OR VARIABLE SUCTION PRESSURES ☒ DATA FOR STEPLESS CONTROLLERS AND FOR OPERATION

REMARKS/SPECIAL REQUIREMENTS:

NOTE 1 PIPING MATERIALS SPECIFICATION SPY-2-0000-PI-SP-100

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RECIPROCATING COMPRESSOR (API 618-4TH) DATA SHEET SI UNITS

JOB NO. DA-1000 ITEM NO. K-101A/B
PURCHASE ORDER NO. SPY-2-0103-ME-MR-335
DATA SHEET No. SP6-2-0103-ME-DT-004
REVISION NO. X0 DATE Apr. 1, 05
PAGE 10 OF 29 BY H.T

UTILITY CONDITIONS

ELECTRICAL POWER:	AC VOLTS	PHASE	HERTZ	DC VOLTS
⊗ MAIN DRIVER	6000	3	50	
⊗ AUXILIARY MOTORS	400	3	50	
⊗ HEATERS	230	1	50	

INSTRUMENT	AC VOLTS	PHASE	HERTZ	DC VOLTS
ALARM				24
SHUTDOWN				24
CONTROL	110	1	50	

INSTRUMENT AIR: NORMAL PRESSURE 7.5 BARG MAX/MIN 8.1 / 4.5 BARG

STEAM FOR:		DRIVERS			HEATERS		
INLET	PRES	BARG	MAX/MIN	BARG	INLET	PRES	BARG	MAX/MIN	BARG
(NORM)	TEMP	°C	MAX/MIN	°C	(NORM)	TEMP	°C	MAX/MIN	°C
EXHAUST:	PRES	BARG	MAX/MIN	BARG	EXHAUST:	PRES	BARG	MAX/MIN	BARG
(NORM)	TEMP	°C	MAX/MIN	°C	(NORM)	TEMP	°C	MAX/MIN	°C

COOLING WATER FOR:		COMPRESSOR CYLINDERS			COOLERS				
TYPE OF WATER		CLOSED CIRCUIT BY VENDOR			TYPE OF WATER		AIR COOLERS REQUIRED		
SUPPLY	PRES	3 BARG	MAX/MIN	BARG	SUPPLY	PRES	BARG	MAX/MIN	BARG
(NORM)	TEMP	64 °C	MAX/MIN	°C	(NORM)	TEMP	°C	MAX/MIN	°C
RETURN	PRES	1 BARG	MAX/MIN	BARG	RETURN	PRES	BARG	MAX/MIN	BARG
(NORM)	TEMP	70 °C	MAX/MIN	°C	(NORM)	TEMP	°C	MAX/MIN	°C

COOLING WATER FOR ROD PACKING: CLOSED CIRCUIT BY VENDOR
TYPE FLUID CLOSED CIRCUIT SUPPLY PRESS 3 BARG @ 47 °C RETURN 1 @ 53 °C

FUEL GAS: NORMAL PRESSURE BARG MAX/MIN / BARG LHV MJ/m³
COMPOSITION

REMARKS/SPECIAL REQUIREMENTS:

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JOB NO. DA-1000 ITEM NO. K-101A/B
PURCHASE ORDER NO. SPY-2-0103-ME-MR-335
DATA SHEET No. SP6-2-0103-ME-DT-004
REVISION NO. X0 DATE Apr. 1, 05
PAGE 11 OF 29 BY H.T

RECIPROCATING COMPRESSOR (API 618-4TH) DATA SHEET SI UNITS

1	CYLINDER DATA				
2	SERVICE ITEM NO.	70% WINTER RICH	50% WINTER RICH	50% SEMI LEAN	20% SEMI LEAN
3	STAGE	1ST	1ST	1ST	1ST
4	INLET PRESSURE BARG } @ CYLINDER	⚠ 7.9			
5	DISCHARGE PRESS. BARG } FLANGES	29.4			
6	CYLINDERS PER STAGE	2			
7	SINGLE OR DOUBLE ACTING (SA OR DA)	DA			
8	BORE mm	546			
9	STROKE mm	343			
10	RPM RATED/ MAX ALLOW	327 /		/	
11	PISTON SPEED m/s RATED/ MAX ALLOW	3.74 /	3.8	/	
12	CYLINDER LINER YES/NO	YES			
13	LINER NOMINAL THICKNESS	12			
14	PISTON DISPLACEMENT m^3/HR	6194			
15	CYLINDER DESIGN CLEARANCE % AVERAGE	15.3			
16	VOLUMETRIC EFFICIENCY % AVERAGE	58.7			
17	VALVES, INLET/DISCHARGE, QTY PER CYL	4 / 4	/	/	/
18	TYPE OF VALVES	PLATE			
19	VALVE LIFT, INLET/DISCHARGE mm	2.0 / 1.5	/	/	/
20	VALVE VELOCITY, API 4TH EDITION m/s				
21	SUCTION VALVE (S)	28.			
22	DISCHARGE VALVE(S)	37			
23	ROD DIAMETER mm	102			
24	MAX ALLOW COMBINED ROD LOADING kN C*	623			
25	MAX ALLOW COMBINED ROD LOADING kN T*	623			
26	CALCULATE GAS ROD LOAD kN C*	⚠ 510			
27	CALCULATE GAS ROD LOAD kN T*	480			
28	COMBINED ROD LOAD (GAS+INERTIA) kN C*	358			
29	COMBINED ROD LOAD (GAS+INERTIA) kN T*	332			
30	ROD REV. DEGREES MIN @ X-HD PIN**	171			
31	RECIP WT. (PISTON, ROD X-HD & NUTS)	1170			
32	MAX ALLOW WORKING PRESSURE BARG	33			
33	MAX ALLOW WORKING TEMPERATURE	160			
34	HYDROSTATIC TEST PRESSURE BARG	50			
35	HELIUM TEST PRESSURE BARG	—			
36	INLET FLANGE SIZE/RATING	10" 1300#	/	/	/
37	FACING	FF			
38	DISCHARGE FLANGE SIZE/RATING	10" 1300#	/	/	/
39	FACING	FF			
40	DISCHARGE RELIEF VALVE SETTING BASE ON DATA FOR INLET PRESSURES GIVEN ABOVE:				
41	RECOMMENDED SETTING BARG	31.1			
42	GAS ROD LOAD kN C*	⚠ 550			
43	GAS ROD LOAD kN T*	578			
44	COMBINED ROD LOAD kN C*	384			
45	COMBINED ROD LOAD kN T*	367			
46	ROD REVERSAL, DEG. MIN @ X-HD PIN **	171			
47	NOTE: CALCULATE AT INLET PRESSURES				
48	GIVEN ABOVE & RECOMMENDED PSV				
49	SETTING				
50	SETTLE-OUT GAS PRESSURE				
51	(DATA REQUIRED FOR STARTING)				
52	*C = COMPRESSION	*T = TENSION		**X-HD = CROSSHEAD	
53					

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JOB NO. DA-1000	ITEM NO. K-101A/B
PURCHASE ORDER NO. SPY-2-0103-ME-MR-335	
DATA SHEET No. SP6-2-0103-ME-DT-004	
REVISION NO. X0	DATE Apr. 1, 05
PAGE 12 OF 29	BY H.T

RECIPROCATING COMPRESSOR (API 618-4TH) DATA SHEET SI UNITS

1	CYLINDER DATA				
2	SERVICE ITEM NO.	70% WINTER RICH	50% WINTER RICH	60% SEMI LEAN	20% SEMI LEAN
3	STAGE	2ND	2ND	2ND	2ND
4	INLET PRESSURE BARG } @ CYLINDER	26.7			
5	DISCHARGE PRESS. BARG } FLANGES	77.6			
6	CYLINDERS PER STAGE	2			
7	SINGLE OR DOUBLE ACTING (SA OR DA)	DA			
8	BORE mm	337			
9	STROKE mm	343			
10	RPM RATED/ MAX ALLOW	327 /		/	
11	PISTON SPEED m/s RATED/ MAX ALLOW	3.74 /	3.8	/	
12	CYLINDER LINER YES/NO	YES			
13	LINER NOMINAL THICKNESS	12			
14	PISTON DISPLACEMENT m^3/HR	2285			
15	CYLINDER DESIGN CLEARANCE % AVERAGE	19.3			
16	VOLUMETRIC EFFICIENCY % AVERAGE	65.2			
17	VALVES, INLET/DISCHARGE, QTY PER CYL	2 / 2	/	/	/
18	TYPE OF VALVES	PLATE			
19	VALVE LIFT, INLET/DISCHARGE mm	1.5 / 1.5	/	/	/
20	VALVE VELOCITY, API 4TH EDITION m/s				
21	SUCTION VALVE (S)	26			
22	DISCHARGE VALVE(S)	26			
23	ROD DIAMETER mm	102			
24	MAX ALLOW COMBINED ROD LOADING kN C*	623			
25	MAX ALLOW COMBINED ROD LOADING kN T*	623			
26	CALCULATE GAS ROD LOAD kN C*	474			
27	CALCULATE GAS ROD LOAD kN T*	390			
28	COMBINED ROD LOAD (GAS+INERTIA) kN C*	392			
29	COMBINED ROD LOAD (GAS+INERTIA) kN T*	296			
30	ROD REV. DEGREES MIN @ X-HD PIN**	177			
31	RECIP WT. (PISTON, ROD X-HD & NUTS)	900			
32	MAX ALLOW WORKING PRESSURE BARG	86			
33	MAX ALLOW WORKING TEMPERATURE	160			
34	HYDROSTATIC TEST PRESSURE BARG	129			
35	HELIUM TEST PRESSURE BARG	—			
36	INLET FLANGE SIZE/RATING	8" / 900#	/	/	/
37	FACING	FF	⊘		
38	DISCHARGE FLANGE SIZE/RATING	8" / 900#	/	/	/
39	FACING	FF			
40	DISCHARGE RELIEF VALVE SETTING BASE ON DATA FOR INLET PRESSURES GIVEN ABOVE:				
41	RECOMMENDED SETTING BARG	84.5			
42	GAS ROD LOAD kN C*	△ 536			
43	GAS ROD LOAD kN T*	445			
44	COMBINED ROD LOAD kN C*	443			
45	COMBINED ROD LOAD kN T*	347			
46	ROD REVERSAL, DEG. MIN @ X-HD PIN **	180			
47	NOTE: CALCULATE AT INLET PRESSURES				
48	GIVEN ABOVE & RECOMMENDED PSV				
49	SETTING				
50	SETTLE-OUT GAS PRESSURE				
51	(DATA REQUIRED FOR STARTING)				
52	*C = COMPRESSION	*T = TENSION		**X-HD = CROSSHEAD	
53					

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JOB NO. DA-1000	ITEM NO. K-101A/B
PURCHASE ORDER NO. SPY-2-0103-ME-MR-335	
DATA SHEET No. SP6-2-0103-ME-DT-004	
REVISION NO. X0	DATE Apr. 1, 05
PAGE 13 OF 29	BY H.T

RECIPROCATING COMPRESSOR (API 618-4TH) DATA SHEET SI UNITS

		1st	2nd
1	☒ CONSTRUCTION FEATURES		
2	SERVICE ITEM NO.		
3	STAGE	1st	2nd
4	CYLINDER SIZE (BORE DIA)	546	337
5	ROD RUN-OUT-NORMAL COLD VERTICAL		
6	(PER APPENDIX C)		
7	MATERIALS OF CONSTRUCTION		
8	CYLINDER(S)	NODULAR IRON	⊘ FORGED STEEL
9	CYLINDER LINER(S)	Ni-RESIST	→
10	PISTON(S)	CAST IRON	CARBON STEEL
11	PISTON RINGS	PTFE	→
12	WEAR BANDS ⊗ REQUIRED	PTFE	→
13	PISTON ROD(S): MTRL/YIELD kN/mm²	4140 EQUIV. /	→ /
14	THRD ROOT STRESS @ MACRL. *@X-HE END		
15	PISTON ROD HARNESS, BASE MATERIAL,	HRC 22	→
16	PISTON ROD COATING ○ REQUIRED	WC COATING	→
17	COATING HARDNESS, Rc	HRC 50	→
18	VALVE SEAT/SEAT PLATE	11-13 Cr SS / THERMO PLASTIC	→ / →
19	VALVE SEAT MIN HARDNESS, Rc		
20	VALVE SEAT GUARDS (STOPS)	11-13 Cr SS	→
21	VALVE DISC	—	—
22	VALVE SPRING	NIMONIC 90	→
23	ROD PRESSURE PACKING RINGS	PTFE	→
24	ROD PRESSURE PACKING CASE	CARBON STEEL	→
25	ROD PRESSURE PACKING SPRINGS	INCONEL	→
26	SEAL/BUFFER PACKING, DISTANCE PIECE	PTFE	→
27	SEAL BUFFER PACKING, INTERMEDIATE	—	—
28	WIPER PACKING RINGS	BABBIT	
29	MAIN JOURNAL BEARINGS, CRANKSHAFT	ALUMINUM / STEEL	
30	CONNECTING ROD BEARING, CRANKPIN	ALUMINUM / STEEL	
31	CONNECTING ROD BUSHING, X-HD END	BRONZE	
32	CROSSHEAD (X-HD) PIN BUSHING	—	
33	CROSSHEAD PIN	FORGED STEEL	
34	CROSSHEAD SHOES	BABBIT / CAST IRON	
35	CYLINDER INDICATOR VALVES ○		
36	INDICATOR CONNECTIONS ABOVE 345		
37	FLUOROCARBON SPRAYED CYLINDER ○		
38	INSTRUMENTATION IN ○ COLD SIDE		
39	CONTACT /PROCESS GAS ○ HOT SIDE		
40	*MAXIMUM ALLOWABLE COMBINED ROD LOAD	USE ○ IN APPROPRIATE COLUMN WHERE APPLICABLE	

41 ☒ COMPRESSOR CYLINDER ROD PACKING
42 ○ FULL FLOATING PACKING
43 ⊗ VENTED TO: ⊗ FLARE @ TBA BARG ○ ATMOSPHERE
44 ○ SUCTION PRESSURE @ ____ BARG
45 ⊗ FORCED LUBRICATED ○ NON-LUBE ⊗ TFE
46 ☒ WATER COOLED ALL STAGE(S) 2 m3/HR REQ'D
47 ☐ OIL COOLED ____ STAGE(S) ____ m3/HR REQ'D
48 ○ WATER FILTER ○ PROV. FUTURE WATER/OIL COOLING
49 ☒ VENT/BUFFER GAS SEAL PACKING ARR. (REF. APPENDIX I FIG I-1)
50 ☒ CONSTANT OR ○ VARIABLE DISPOSAL SYSTEM
51 ☒ BUFFER GAS PRESSURE 2 BARG
52 ○ SPLASH GUARDS FOR WIPER PACKING
53

DISTANCE PIECES: ○ TYPE A ○ TYPE B ○ TYPE C ⊗ TYPE D MINIMUM
Ref. Appendix G Fig. G-3

COVERS: ⊗ SOLID METAL ○ SCREEN ○ LOUVERED

CYLINDER COMPARTMENT:	⊗ VENTED TO	~~FLARE~~ ATMOS.	BARG
	○ PURGED AT		BARG
	○ PRESSURIZED TO		BARG
	○ WITH RELIEF VALVE		BARG
INBOARD COMPARTMENT:	⊗ VENTED TO	ATMOS	BARG
	○ PURGED AT		BARG
	○ PRESSURIZED TO		BARG
	○ WITH RELIEF VALVE		BARG

☐ DISTANCE PIECE MAWP BARG

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RECIPROCATING COMPRESSOR (API 618-4TH) DATA SHEET SI UNITS

JOB NO. DA-1000 ITEM NO. K-101A/B
PURCHASE ORDER NO. SPY-2-0103-ME-MR-335
DATA SHEET No. SP6-2-0103-ME-DT-004
REVISION NO. X0 DATE Apr. 1, 05
PAGE 14 OF 29 BY H.T

CONSTRUCTION FEATURES (CONTINUED)

⊗ FABRICATED CYLINDER, HEADS, & CONNECTION SKETCHES FOR DESIGN REVIEW BY PURCHASER. (2.14.5.2.8)

⊗ BUFFER GAS PACKING ARR. — Ref: Appendix I
☒ OIL WIPER PACKING PURGE — Figures I-1, I-2 &I-3
⊗ INTERMEDIATE PARTITION PURGE
INERT BUFFER PURGE GAS: ⊗ N2 ○ OTHER
⊗ VENT, DRAIN, PURGE PIPING BY MFG'R ○ NO ⊗ YES

○ COUPLING(S) ⊗ LOW-SPEED ○ HI-SPEED

	Between Compressor & Driver-or-Gear	Between Driver & Gear
◇ BY MANUFACTURER		
◇ MODEL		
◇ TYPE	RIGID	

API-671 APPLIES ○ YES ☒ NO

☐ V-BELT DRIVE

	DRIVEN SHEAVE (Compressor Shaft)	DRIVE SHEAVE (Driver Shaft)
RPM (EXPECTED)		
PITCH DIA. (mm)		
◇ QTY & GROOVE X-SEC.		
POWER TRANSMITT'D,(kW)		Incl. Belt Losses

DRIVER NAMEPLATE RATING, (kW)
◇ CENTER DISTANCE (mm)
◇ QTY, TYPE, X-SEC., & LENGTH BELTS, (mm)
◇ BELT SERVICE FACTOR (RELATIVE TO DRIVER NAMEPLATE kW RATING)

⊗ INSPECTION AND SHOP TESTS (REF. 4.1.3)

	REQ'D	WITN.	OBSER.
*SHOP INSPECTION	⊗	○	○
ACTUAL RUNNING CLEARANCES AND RECORDS	⊗	⊗	○
MFG STANDARD SHOP TESTS	⊗	⊗	○
CYLINDER HYDROSTATIC TEST	⊗	⊗	○
CYLINDER PNEUMATIC TEST	⊗	⊗	○
CYLINDER HELIUM LEAK TEST	○	○	○
CYL. JACKET WATER HYDRO TEST	⊗	○	○
*MECHANICAL RUN TEST (4 HR)	⊗	⊗	○
BAR-OVER TO CHECK ROD RUNOUT	⊗	⊗	○
*LUBE OIL CONSOLE RUN/TEST (4 HR)	⊗	○	○
*COOLING H2O CONSOLE RUN/TEST	⊗	○	○
RADIOGRAPHY BUTT WELDS	⊗	○	○
⊗ GAS ○ OIL ⊗ FAB CYLS. MAG PARTICLE/LIQUID PENETRANT OF WELDS SPECIFY ADDITIONAL REQUIREMENTS (4.2.1.3)	⊗	○	○
ULTRASONIC TEST ON CRANK SHAFT PISTON & PISTON ROD	⊗	○	○
QC OF INACCESSIBLE WELDS (2.14.5.2.4)	⊗		
SHOP FIT-UP OF PULSATION SUPPL. DEVICES & ALL ASSOCIATED GAS PIPING	⊗	⊗	○
*CLEANLINESS OF EQUIP., PIPING, & APPURTENANCES	⊗	○	○
*HARDNESS OF PARTS, WELDS & HEAT AFFECTED ZONES	⊗	○	○
*NOTIFICATION TO PURCHASER OF ANY REPAIRS TO MAJOR COMPONENTS	⊗		
FUNSTIONAL TEST OF CONTROL SYSTEM INCLUDING CAPACITY CONTROL	⊗	⊗	○

*SPECIFIC REQUIREMENTS TO BE DEFINED, FOR EXAMPLE, DISMANTLING, AUX EQUIPMENT OPERATIONAL & RUN TESTS.

APPENDIX K COMPLIANCE: ○ VENDOR ○ PURCHASER

☒ CYLINDER LUBRICATION
○ NON-LUBE STAGE(S)/SERVICE
⊗ LUBRICATED STAGE(S)/SERVICE
TYPE OF LUBE OIL: ○ SYNTHETIC ○ HYDROCARBON
LUBRICATOR DRIVE BY: ☐ COMP. CRANKSHAFT, DIRECT ☐ CHAIN, FROM CRANKSHAFT ☒ ELECTRIC MOTOR ○ OTHER
⊗ VENDORS STD.
◇ LUBRICATOR MFR
◇ MODEL
TYPE LUBRICATOR: (2.13) ☒ SINGLE PLUNGER PER POINT ⊗ DIVIDER BLOCKS
◇ COMPARTMT, TOTAL QTY.
◇ PLUNGERS (PUMPS), TOTAL QTY.
◇ SPARE PLUNGERS, QTY.,
◇ SPARE COMPARTMT W/OUT PLUNGERS
○ HEATERS: ○ ELECTRIC W/THERM.(S) ○ STEAM

☐ ESTIMATED WEIGHTS AND NOMINAL DIMENSIONS

☐ TOTAL COMPR. WT, LESS DRIVER & GEAR	60,000	kg
◇ WT, OF COMPLETE UNIT, (LESS CONSOLES)		kg
◇ MAXIMUM ERECTION WEIGHT		kg
◇ MAXIMUM MAINTENANCE WEIGHT		kg
◇ DRIVER WEIGHT/GEAR WEIGHT	/	kg
◇ LUBE OIL/COOLING H2O CONS.	/	kg
◇ FREE STANDING PANEL		kg

SPACE REQUIREMENTS:	LENGTH	WIDTH	HEIGHT	
◇ COMPLETE UNIT				mm
◇ LUBE OIL CONSOLE				mm
◇ COOLING H2O CONSOLE				mm
◇ FREE STANDING PANEL				mm

☐ PISTON ROD REMOVAL DIST. 7500 mm

OTHER EQUIPMENT WEIGHT SHIPPED LOOSE (DEFINE)

◇ PULSATION SUPP., WEIGHT		kg
◇ PIPING		kg
◇ INTERSTAGE EQUIPMENT		kg

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JOB NO. DA-1000	ITEM NO. K-101A/B
PURCHASE ORDER NO. SPY-2-0103-ME-MR-335	
DATA SHEET No. SP6-2-0103-ME-DT-004	
REVISION NO. X0	DATE Apr. 1, 05
PAGE 15 OF 29	BY H.T

RECIPROCATING COMPRESSOR (API 618-4TH) DATA SHEET SI UNITS

☐ UTILITY CONSUMPTION

ELECTRIC MOTORS

For Induction Motors See Note of 3.1.2.5 and Motor Data Sheet	NAMEPLATE kW	LOCKED ROTOR AMPS	FULL LOAD STEADY STATE AMPS	MAIN DRIVER NON-STEADY STATE AMPS AT COMPRESSOR RATED POWER (Induction Motors Only)
◇ MAIN DRIVER	3200			____ AMPS @ COMPRESSOR RATED POWER OF ____ kW @ CURRENT PULSATIONS OF ____ %
◇ MAIN LUBE OIL PUMP	–			
◇ AUX LUBE OIL PUMP	5.5			
◇ MAIN COOLING WATER PUMP	4.0			
◇ AUX COOLING WATER PUMP	4.0			
◇ ROD PACKING COOLING PUMP	–			
◇ CYLINDER LUBRICATOR	0.75			
TURNING	4.0			
LUBE OIL / COOLING				
WATER COOLER FAN	11.0 △			
HYDRAULIC PUMP	4.0			

ELECTRIC HEATERS

	WATTS	VOLTS	HERTZ	
◇ FRAME OIL HEATER(S)	6 K	230	50	>3kW 400V 3PH 50Hz
◇ COOLING WATER HEATER(S)	15 K	230	50	>3kW 400V 3PH 50Hz
◇ CYL. LUBRICATOR HEATER(S)		230	50	

STEAM

	FLOW	PRESSURE	TEMPERATURE	BACK PRESSURE
◇ MAIN DRIVER	kg/h @	BARG	°C	BARG
◇ FRAME OIL HEATER(S)	kg/h @	BARG	°C	BARG
◇ CYL. LUB. HEATER(S)	kg/h @	BARG	°C	BARG
	kg/h @	BARG	°C	BARG
	kg/h @	BARG	°C	BARG

COOLING WATER REQUIREMENTS

	FLOW (m³/h)	INLET TEMP (°C)	OUTLET TEMP (°C)	INLET PRESS (BARG)	OUTLET PRESS (BARG)	MAX PRESS (BARG)
☒ CYLINDER JACKETS	12 (Circulating water)					
◇ INTERCOOLER(S)						
◇ AFTERCOOLER						
◇ FRAME LUBE OIL COOLER	(AIR COOLED)					
◇ ROD PRESSURE PACKING* △	2 (Circulating water)					
ROD PACKING WATER COOLER	6					
◇ TOTAL QUANTITY, (m³/h)	~~14~~					

REMARKS/SPECIAL REQUIREMENTS:

*ROD PACKING COOLANT MAY BE OTHER THAN WATER

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JOB NO. DA-1000 ITEM NO. K-101A/B
PURCHASE ORDER NO. SPY-2-0103-ME-MR-335
DATA SHEET No. SP6-2-0103-ME-DT-004
REVISION NO. X0 DATE Apr. 1, 05
PAGE 16 OF 29 BY H.T

RECIPROCATING COMPRESSOR (API 618-4TH) DATA SHEET SI UNITS

1 ○ FRAME LUBE OIL SYSTEM

2 ⊗ BASIC LUBE OIL SYSTEM FOR FRAME: ○ SPLASH ⊗ PRESSURE (FORCED) ⊗ HEATERS REQUIRED:
3 ☐ REF: TYPE MAIN BEARINGS: ○ TAP'RD ROLL'R ○ PRECISION SL'VE ⊗ ELEC. W/THERMOSTAT(S) ○ STEAM
4 ⊗ PRESSURE SYSTEM: ⊗ MAIN OIL PUMP DRIVEN BY: ⊗ COMP. CRANKSHAFT ○ ELEC. MOTOR ○ OTHER
5 ☒ PSV FOR MAIN PUMP EXTERNAL TO CRANKCASE
6 ⊗ AUX OIL PUMP DRIVEN BY: ⊗ ELEC. MOTOR ○ OTHER
7 ☐ HAND OPERATED PRE-LUBE PUMP FOR STARTING ○ OPERATIONAL TEST & 4 HOUR MECH RUN TEST
8 ⊗ API-614 LUBE SYSTEM: ⊗ NO ⊗ YES (See Note of 2.12.2) ⊗ CHECK VALVE ON MAIN PUMP (FIG G-5)
9 ⊗ CONTINUOUS FLOW THROUGH OIL (3.7.2.7)
10 ⊗ SEP. CONSOLE FOR PRESS. LUBE SYS: ⊗ ONE CONSOLE FOR EA. COMP. ○ ONE CONSOLE FOR ____ COMPRESSORS
11 Note: Instrumentation to be listed on ⊗ CONSOLE TO BE OF DECK PLATE TYPE CONSTRUCTION SUITABLE FOR
12 Instrumentation Data Sheets. MULTI-POINT SUPPORT AND GROUTING WITH GROUT & VENT HOLES.
13 ⊗ ELECTRICAL CLASSIFICATION ; (ZONE 2 , GAS GROUP IIB TEMP CL. T3 ○ NON-HAZARDOUS

14 ☐ BASIC SYS. REQ'MTS (NORM. OIL FLOWS & VOLUMES)

15 ☐ LUBE OIL	FLOW (m³/h)	PRESSURE (BARG)	VISCOSITY (SSU @ 40°C)	VISCOSITY (SSU @ 100°C)	SUMP VOLUME (m³)
17 ☐ COMPRESSOR FRAME	10	2.5	ISO VG100		0.7
18 ◇ DRIVER					
19 ◇ GEAR					

20 ☐ SYSTEM PRESSURES: ☐ DESIGN 10 (BARG) ☐ HYDROTEST 15 (BARG)
21 ☐ PRESS. CONTROL VALVE SET @ ____ BARG ☐ PUMP RELIEF VALVE(S) SET @ 7.5 BARG

22 ⊗ PIPING MATERIALS:

23	CARBON STEEL	STAINLESS STEEL WITH SS FLANGES	STAINLESS STEEL WITH CARBON STEEL FLANGES
24 ⊗ UPSTREAM OF PUMPS & FILTERS	○	⊗	○
25 ⊗ DOWNSTREAM OF FILTERS	○	⊗	○
26 ○	○	○	○
27 ○	○	○	○

28 ☒ PUMPS (Gear. or Screw Type Only)

29	◇ RATED FLOW (m³)	◇ PRESSURE (BARG)	◇ COLD START REQ'D (kW)	◇ DRIVER (kW)	◇ SPEED (RPM)	COUPLING REQ'D	MECH. SEAL REQ'D
30 MAIN	12.6	4		–	327	○	○
31 AUXILIARY	12.6	4		5.5	1470	⊗	⊗

32 ☐ PUMP CASING MATERIAL (Ref. 2.12.3.1): MAIN PUMP CAST IRON AUX PUMP CAST STEEL
33 ⊗ GUARD(S) REQ. FOR COUPLING(S): ○ MAIN PUMP ⊗ AUX PUMP ⊗ GUARD TYPE OR CODE SPY-Y-0000-ME-SP-018
34 ⊗ AUXILIARY PUMP CONTROL: ○ MANUAL ⊗ AUTOMATIC ○ ON-OFF-AUTO SEL. SWITCH: ○ BY PURCH. ○ BY MFR.
35 ⊗ WIRING TO TERMINAL BOX: ○ BY PURCH. ⊗ BY MFR.
36 ○ SWITCHES ○ RTD'S/THERMOCOUPLES

37 ⊗ COOLERS: ○ SHELL & TUBE ○ SINGLE ○ DUAL W/TRANSFER VALVE ○ MFG'S STD. ○ TEMA C ○ TEMA R (API-660 Data Shts Attached)
38 ○ REMOVABLE BUNDLE ○ WATER COOLED ⊗ AIR COOLED W/AUTO TEMP CONTROL (API-661 Data Shts - Attached)
39 ○ W/BYPASS & TEMP CONTROL VALVE: ○ MANUAL ○ AUTO ○ SEE SEPARATE HEAT EXCHANGER DATA SHT
40 ⊗ API 661 AIR COOLED WATER CIRCUIT

41 ⊗ FILTER(S) ○ SINGLE ⊗ DUAL W/TRANSFER VALVE ⊗ ASME CODE DESIGN ○ ASME CODE STAMPED
42 ☐ DESIGN PRESSURE, 10 BARG ☐ ΔP CLEAN, 0.3 BAR ☐ ΔP COLLAPSE, 5 BAR
43 ☐ MICRON RATING, 10 µm ☐ CARTRIDGE MATERIAL, S.S. ◇ CARTRIDGE P/N
44 ☐ BONNET MATERIAL, ____ ☐ CASING MATERIAL, C.S. ⊗ FURN.SPARE CARTR.,QTY 2

45 ☐ SYS. COMPONENT SUPP.

	MANUFACTURER	MODEL		MANUFACTURER	MODEL
46 ◇ MAIN PUMP			◇ OIL COOLER(S)		
47 ◇ AUXILIARY PUMP			◇ TRANSFER VALVE(S)		
48 ◇ MECHANICAL SEALS			◇ PUMP COUPLING(S)		
49 ◇ ELECTRIC MOTORS			◇ SUCTION STRAINER(S)		
50 ◇ STEAM TURBINES			◇ CHECK VALVE(S)		
51 ◇ OIL FILTER(S)			◇		

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JOB NO. DA-1000 ITEM NO. K-101A/B
PURCHASE ORDER NO. SPY-2-0103-ME-MR-335
DATA SHEET No. SP6-2-0103-ME-DT-004
REVISION NO. X0 DATE Apr. 1, 05
PAGE 17 OF 29 BY H.T

RECIPROCATING COMPRESSOR (API 618-4TH) DATA SHEET SI UNITS

1 ○ COOLING WATER SYSTEM

2 ⊗ BASIC COOLING SYS. FOR: ⊗ COMPRESSOR CYL.(S) ○ INTERCOOLER(S) ○ AFTERCOOLER ⊗ OIL COOLER(S)
3 ⊗ HEATERS REQ.'D FOR PRE-HEATING: ⊗ ELEC.,W/ THERMOSTAT(S) ○ STEAM
4 ⊗ PRESSURE FORCED CIRCULATING SYS: ○ OPEN, PIPING BY: ○ PURCH. ○ MFR ○ CLOSED, PIPING BY MFR.
5 MAIN WATER PUMP DRIVEN BY: ⊗ ELEC. MOTOR ○ STEAM TURBINE ○ OTHER
6 AUX WATER PUMP DRIVEN BY: ⊗ ELEC. MOTOR ○ STEAM TURBINE ○ OTHER
7 ⊗ SEP. CONSOLE FOR COOLING WATER SYS.: ⊗ ONE CONSOLE FOR EA. COMP. ○ ONE CONSOLE FOR ____ COMP'RS
8 NOTE: Instrumentation to be Listed on
9 Instrumentation Data Sheets ⊗ CONSOLE TO BE OF DECK PLATE TYPE CONSTRUCTION SUITABLE FOR MULTI-POINT SUPPORT AND GROUTING WITH GROUT & VENT HOLES.
10 ⊗ ELECTRICAL CLASSIFICATION: (ZONE 2 GAS GROUP IIB TEMP CL T3 ○ NON-HAZARDOUS

11 ⊗ BASIC SYS. REQ'MTS (NORM. COOLING WATER FLOW DATA) ○ COOL'G WATER TO BE ____ % ETHYL'NE GLYC'L

	FORCED COOL'G	THERMO SYPHON	STAND PIPE	FLOW (m³/h)	PRESSURE (BARG)	INLET TEMP (°C)	OUTLET TEMP (°C)	SITE FLOW IND'TR
CYLINDER(S), 1 STAGE	1 ⊗	○	○	12	3	64	70	⊗
CYLINDER(S), 2 STAGE	1 ⊗	○	○	(Circulating water)				⊗
CYLINDER(S), ___ STAGE	○	○	○					○
CYLINDER(S), ___ STAGE	○	○	○					○
CYLINDER(S), ___ STAGE	○	○	○					○
CYLINDER(S), ___ STAGE	○	○	○					○
PISTON ROD PACK'G TOTAL	⊗			2	3	47	53	⊗
INTERCOOLER(S) TOTAL	○			(Circulating water)				○
AFTERCOOLER	○							○
OIL COOLER(S)	⊗							⊗
ROD PACKING WATER COOLER	⊗			6	4.5	37	43	○
TOTAL FLOW								

26 ☐ SYS. PRESSURES: ☐ DESIGN, 5 BARG ☐ HYDROTEST, 7.5 BARG ☐ RELIEF VALVE(S), SET @ ____ BARG
27 ⊗ WATER RESERVOIR: ◇ SIZE, ____ mm DIA X ____ mm HT. ◇ CAPACITY, ____ m³ @ Normal Operating Level
28
29 ◇ RESERVOIR MATERIAL CARBON STEEL ◇ INTERNAL COATING, TYPE TAR EPOXY PAINT
30 ⊗ LEVEL GAUGE ⊗ LEVEL SWITCH ⊗ DRAIN VALVE ⊗ INSPECTION & CLEAN-OUT OPENINGS

31 ☒ PUMPS: (Centrifugal Only)

	◇ RAT'D FL'W (m³/h)	◇ PRESS. (BARG)	◇ REQ'D (kW)	◇ DRIVER (kW)	◇ SPEED (RPM)	COUPLING REQ'D	MECH.SEAL REQ'D
MAIN						⊗	⊗
AUXILIARY						⊗	⊗

35 ☐ PUMP CASING MATERIAL (Ref 2.12.3.1): MAIN PUMP CAST STEEL AUX PUMP CAST STEEL
36 ⊗ GUARD(S) REQ.'D FOR COUP'G(S) ⊗ MAIN PUMP ⊗ AUX PUMP ⊗ GUARD TYPE OR CODE SPY-Y-0000-ME-SP-018
37 ⊗ AUX.PUMP CONTROL: ○ MANUAL ⊗ AUTO ⊗ ON-OFF-AUTO SEL. SWITCH: ○ BY PURCH. ⊗ BY MANUFACTURER
38 ⊗ WIRING TO TERMINAL BOX: ○ BY PURCH. ⊗ BY MANUFACTURER

39 ⊗ COOLING WATER HEAT EXCH.: ○ SHELL & TUBE ⊗ SINGLE ○ DUAL W/TRANSFER VALVE ○ TEMA C ○ TEMA R(API-660 Data Shts Attached)
40
41 ⊗ AIR COOLED EXCHANGER W/AUTO TEMP CONTROL (API-661 Data Sheets Attached)
42 ⊗ W/BYPASS & TEM. CONTROL VALVE ○ MANUAL ⊗ AUTO ○ LOUVRES FOR AIR EXCH.
43 ○ SEE SEPARATE COOLER DATA SHEET FOR DETAILS; SPECIFY % GLYCOL ON BOTH SIDES
44 OF SHELL & TUBE

SYS. COMPONENT SUPP.	MANUFACTURER	MODEL		MANUFACTURER	MODEL
45					
46 ◇ MAIN PUMP			◇ TEMP CONTROL VALVE(S)		
47 ◇ AUXILIARY PUMP			◇ TRANSFER VALVE(S)		
48 ◇ MECHANICAL SEALS			◇ PUMP COUPLING(S)		
49 ◇ ELECTRIC MOTORS			◇		
50 ◇ STEAM TURBINES			◇		
51 ◇			◇		
52 ◇			◇		

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JOB NO. DA-1000 ITEM NO. K-101A/B
PURCHASE ORDER NO. SPY-2-0103-ME-MR-335
DATA SHEET No. SP6-2-0103-ME-DT-004
REVISION NO. X0 DATE Apr. 1, 05
PAGE 18 OF 29 BY H.T

RECIPROCATING COMPRESSOR (API 618-4TH) DATA SHEET SI UNITS

PULSATION SUPPRESSION DEVICES FOR RECIPROCATING COMPRESSORS

THESE SHEETS TO BE FILLED OUT FOR EACH SERVICE AND/OR STAGE OF COMPRESSION

APPLICABLE TO: ⊗ PROPOSALS ○ PURCHASE ○ AS BUILT

FOR/USER PETROPARS Ltd SOUTH PARS PHASES 6, 7 & 8

SITE/LOCATION ASSALUYEH IRAN — AMBIENT TEMPERATURE MIN/MAX 5 / 48 °C

COMPRESSOR SERVICE OFF GAS COMP. — NUMBER OF COMPRESSORS NOTE 2 SHT 4

COMPRESSOR MFG. KOBE STEEL — MODEL/TYPE KR60-4 / HORIZONTAL

SUPPRESSOR MFG.

NOTE: ○ Ind.Data Comp.'d Purch. ☐ By Compr/Supp.Mfg.w/Proposal ◇ By Mfg(s) after order ◎ By Mfg(s)/Purchaser as Applicable

GENERAL INFORMATION APPLICABLE TO ALL SUPPRESSORS

TOTAL NUMBER OF SERVICES AND/OR STAGES 2

TOTAL NUMBER OF COMPRESSOR CYL. 4 TOTAL NO.OF CRANKTHROWS 4 STROKE 343 mm SPEED 327 RPM

○ ASME CODE STAMP ○ GOVERNMENTAL CODES OF _____ CODE REGULATIONS APPLY

⊗ OTHER APPLICABLE PRESSURE VESSEL SPEC. OR CODE ASME VIII DIV 1

⊗ LUBE SERVICE ○ NON-LUBE SERV. ○ NO OIL ALLOWED INTERNALLY DRY TYPE INTER.CORR.COATING ○ YES. ○ NO

RADIOGRAPHY (X-RAY OF WELDS): ○ NONE ○ SPOT ⊗ 100% ○ IMPACT TEST ○ SPECIAL WELDING REQUIREMENTS

⊗ SHOP INSPECTION ⊗ ~~WITNESS~~ HYDROTEST ⊗ OUTDOOR STORAGE OVER 6 MONTHS ⊗ SPECIAL PAINT SPEC
○ WITNESSED ⊗ OBSERVED (AS PER PACKING INTSRACTION) SPY-2-0000-TY-SP-001

CYLINDER, GAS, OPERATING, AND SUPPRESSOR DESIGN DATA

	SERVICE OFF GAS COMP. STAGE NO. ONE	
☐ COMPRESSOR MANUFACTURER'S RATED CAPACITY ⚠	56491 kg/h ____ nm³/h ____ MMSCFD	
◎ LINE SIDE OPERATING PRESSURE	INLET, 8.0 BAR	DISCHARGE, 29.7 BARG
◎ OPERATING TEMP. WITHIN SUPPRESSORS	INLET, 58 °C	DISCHARGE, 111 °C
○ ALLOWABLE PRESSURE DROP THROUGH SUPPRESSORS	ΔΠ ____ BAR / ____ %	ΔΠ ____ BAR / ____ %
	INLET SUPPRESSOR	DISCHARGE SUPPRESSOR
○ SUPRESSOR TAG NUMBER		
○ COMBINATION INLET SUPP SEPARATOR/INTERNALS	⊗ YES ○ NO / ○ YES ⊗ NO	/ ○ YES ⊗ NO
◎ NO. (QTY) OF INLET & DISCH. SUPP. PER STAGE	1	2
○ ALLOWABLE PEAK-PEAK PULSE @ LINE SIDE NOZZLE	(BAR) / %	(BAR) / %
○ ALLOWABLE PEAK-PEAK PULSE @ CYL FLANGE NOZZLE	(BAR) / %	(BAR) / %
○ DESIGN FOR FULL VACUUM CAPABILITY	○ YES ⊗ NO	○ YES ⊗ NO
○ MIN. REQ'D WORKING PRESSURE & TEMPERATURE NOTE: After design, the actual Mawp & temp are to be determined based on the weakest component and stamped on the vessel. The actual Mawp is to be shown on pg.14 line 12 and on the U1A Forms.	BAR 33 @ 85 °C	BAR 33 @ 160 °C
○ INITIAL SIZING VOL. PER FORMULA OF 3.9.2.2.2 NOTE: This is a Reference	4.46 m³	1.36 m³
◇ AS BUILT VOLUME (m³)	____ m³	____ m³

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RECIPROCATING COMPRESSOR (API 618-4TH) DATA SHEET SI UNITS

JOB NO.	DA-1000
ITEM NO.	K-101A/B
PURCHASE ORDER NO.	SPY-2-0103-ME-MR-335
DATA SHEET No.	SP6-2-0103-ME-DT-004
REVISION NO.	X0
DATE	Apr. 1, 05
PAGE	19 OF 29
BY	H.T

1 PULSATION SUPPRESSION DEVICES FOR RECIPROCATING COMPRESSORS (CONT'D) — SERVICE: OFF GAS COMP.

2 THESE SHEETS TO BE FILLED OUT FOR EACH SERVICE AND/OR STAGE OF COMPRESSION — STAGE NO.: ONE

	CONSTRUCTION REQUIREMENTS & DATA	INLET SUPPRESSOR	DISCHARGE SUPPRESSOR
3			
4	○ SUPRESSOR TAG NUMBER		
5	○ BASIC MATERIAL REQUIRED, CS, SS, ETC.	CS	CS
6	◇ ACTUAL MATERIAL DESIGNATION SHELL/HEAD	/	/
7	○ SPECIAL HARDNESS LIMITATIONS, Ro ○ YES ○ NO	SHELL & HEADS WELDS	SHELL & HEADS WELDS
8	⊗ CORROSION ALLOWANCE., ⊗ REQUIRED	3 mm	3 mm
9	◇ WALL THICKNESS, SHELL/HEAD	/ mm	/ mm
10	☐ NOM. SHELL DIA X OVERALL LENGTH.	x mm	x mm
11	☐ PIPE OR ROLLED PLATE CONSTRUCTION	☐ PIPE ☒ ROLLED PLATE	☐ PIPE ☒ ROLLED PLATE
12	◇ ACT. MAX ALLOW. WORKING PRESS. AND TEMPERATURE	33 BARG @ 85 °C	33 BARG @ 160 °C
13	○ MINIMUM DESIGN METAL TEMP (2.14.8)	5 °C	5 °C
14	⊗ INLET SUPRESS. TO BE SAME MAWP AS DISCH'RGE SUPPRESS.	⊗ YES ○ NO	
15	◇ MAX EXPECTED PRESSURE DROP(D P, %) LINE PRESS	ΔΠ BAR / %	ΔΠ BAR / %
16	◇ WEIGHT (EACH)	kg	kg
17	○ INSUL-NUTS & ALLOW. FOR INSULATION REQUIRED (X)		
18	◇ EXPECTED P-P PULSE @ LINE SIDE/CYL FLG, % LINE PRESS	% / %	% / %
19	BASED ON FINAL SUPPRESSOR DESIGN		
20	⊗ SUPPORTS, TYPE / QUANTITY		
21	CONNECTION REQUIREMENTS & DATA		
22	⊗ LINE SIDE FLANGE. SIZE/RATING/FACING/TYPE	12"/300#/RF/WN	6"/300#/RF/WN
23	⊗ COMP CYL FLANGE(S), QTY/SIZE/RATING/FACING/TYPE	2/10"/300#/RF/WN	1/10"/300#/RF/WN
24	○ FLANGE FINISH, ○ PER 3.9.3.15 ○ SPECIAL (SPECIFY)		
25	>3.2 <6.4 ○ PER ANSI 16.5		
26	⊗ INSPECTION OPENINGS REQUIRED	⊗ YES ○ NO ⊗ BLINDED	⊗ YES ○ NO ⊗ BLINDED
27	○ SPEC. QTY. SIZE, /FLG TYPE & RATING		
28	◇ * QTY. SIZE, /FLG TYPE & RATING		
29	⊗ VENT CONNECTIONS REQUIRED	⊗ YES ⊗ NO	⊗ YES ⊗ NO
30	○ SPEC. QTY. SIZE, /FLG TYPE & RATING		
31	◇ * QTY. SIZE, /FLG TYPE & RATING		
32	⊗ DRAIN CONNECTIONS REQUIRED	⊗ YES ○ NO	⊗ YES ○ NO
33	○ SPEC. QTY. SIZE, /FLG TYPE & RATING		
34	◇ * QTY. SIZE, /FLG TYPE & RATING		
35	⊗ PRESSURE CONNECTIONS REQUIRED	⊗ YES ⊗ NO	⊗ YES ⊗ NO
36	○ SPEC. QTY. SIZE, /FLG TYPE & RATING		
37	◇ * QTY. SIZE, /FLG TYPE & RATING		
38	⊗ TEMPERATURE CONNECTIONS REQUIRED	⊗ YES ○ NO	⊗ YES ○ NO
39	○ SPEC. QTY. SIZE, /FLG TYPE & RATING		
40	⊗ CYL NOZZLE ○ MAIN BODY		
41	◇ * QTY. SIZE, /FLG TYPE & RATING		
42			
43			
44			
45			
46	OTHER DATA AND NOTES		
47	◇ COMPRESSOR MFG'S SUPP. OUTLINE OR DRAWING NO.		
48	◇ SUPP. MFG'S OUTLINE OR DRAWING NO.		

49 NOTES * = AS BUILT

50

51

52

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JOB NO. DA-1000	ITEM NO. K-101A/B
PURCHASE ORDER NO. SPY-2-0103-ME-MR-335	
DATA SHEET No. SP5-2-0103-ME-DT-004	
REVISION NO. X0	DATE Apr. 1, 05
PAGE 20 OF 29	BY H.T

RECIPROCATING COMPRESSOR (API 618-4TH) DATA SHEET SI UNITS

PULSATION SUPPRESSION DEVICES FOR RECIPROCATING COMPRESSORS

THESE SHEETS TO BE FILLED OUT FOR EACH SERVICE AND/OR STAGE OF COMPRESSION

APPLICABLE TO: ⊗ PROPOSALS ○ PURCHASE ○ AS BUILT

FOR/USER PETROPARS Ltd SOUTH PARS PHASES 6, 7 & 8

SITE/LOCATION ASSALUYEH IRAN — AMBIENT TEMPERATURE MIN/MAX 5 / 48 °C

COMPRESSOR SERVICE OFF GAS COMP. — NUMBER OF COMPRESSORS NOTE 2 SHT 4

COMPRESSOR MFG. KOBE STEEL, LTD. — MODEL/TYPE KR60-4 / HORIZONTAL

SUPPRESSOR MFG.

NOTE: ○ Ind.Data Comp.'d Purch. ☐ By Compr/Supp.Mfg.w/Proposal ◇ By Mfg(s) after order ○ By Mfg(s)/Purchaser as Applicable

GENERAL INFORMATION APPLICABLE TO ALL SUPPRESSORS

TOTAL NUMBER OF SERVICES AND/OR STAGES 2

TOTAL NUMBER OF COMPRESSOR CYL. 4 TOTAL NO.OF CRANKTHROWS 4 STROKE 343 mm SPEED 327 RPM

○ ASME CODE STAMP ○ GOVERNMENTAL CODES OF _____ CODE REGULATIONS APPLY

⊗ OTHER APPLICABLE PRESSURE VESSEL SPEC. OR CODE ASME VIII DIV 1

⊗ LUBE SERVICE ○ NON-LUBE SERV. ○ NO OIL ALLOWED INTERNALLY DRY TYPE INTER.CORR.COATING ○ YES ○ NO

RADIOGRAPHY (X-RAY OF WELDS): ○ NONE ○ SPOT ⊗ 100% ○ IMPACT TEST ○ SPECIAL WELDING REQUIREMENTS

⊗ SHOP INSPECTION ⊗ ~~WITNESS~~ HYDROTEST ⊗ OUTDOOR STORAGE OVER 6 MONTHS ⊗ SPECIAL PAINT SPEC

○ WITNESSED ⊗ OBSERVED SPY-2-0000-TY-SP-001

CYLINDER, GAS, OPERATING, AND SUPPRESSOR DESIGN DATA

	SERVICE OFF GAS COMP.	STAGE NO. TWO
☐ COMPRESSOR MANUFACTURER'S RATED CAPACITY ⚠	53309 kg/h ____ nm³/h	____ MMSCFD
○ LINE SIDE OPERATING PRESSURE	INLET, 27 BAR	DISCHARGE, 76.8 BARG
○ OPERATING TEMP. WITHIN SUPPRESSORS	INLET, 49 °C	DISCHARGE, 110 °C
○ ALLOWABLE PRESSURE DROP THROUGH SUPPRESSORS	ΔΠ ____ BAR / ____ %	ΔΠ ____ BAR / ____ %
	INLET SUPPRESSOR	DISCHARGE SUPPRESSOR
○ SUPRESSOR TAG NUMBER		
○ COMBINATION INLET SUPP SEPARATOR/INTERNALS	⊗ YES ○ NO / ○ YES ⊗ NO	/ ○ YES ⊗ NO
○ NO. (QTY) OF INLET & DISCH. SUPP. PER STAGE	1	2
○ ALLOWABLE PEAK-PEAK PULSE @ LINE SIDE NOZZLE	(BAR) / %	(BAR) / %
○ ALLOWABLE PEAK-PEAK PULSE @ CYL FLANGE NOZZLE	(BAR) / %	(BAR) / %
○ DESIGN FOR FULL VACUUM CAPABILITY	○ YES ⊗ NO	○ YES ⊗ NO
○ MIN. REQ'D WORKING PRESSURE & TEMPERATURE NOTE: After design, the actual Mawp & temp are to be determined based on the weakest component and stamped on the vessel. The actual Mawp is to be shown on pg.14 line 12 and on the U1A Forms.	BAR 86 @ 85 °C	BAR 86 @ 160 °C
○ INITIAL SIZING VOL. PER FORMULA OF 3.9.2.2.2 NOTE: This is a Reference	1.84 m³	0.69 m³
◇ AS BUILT VOLUME (m³)	____ m³	____ m³

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RECIPROCATING COMPRESSOR (API 618-4TH) DATA SHEET SI UNITS

JOB NO. DA-1000 ITEM NO. K-101A/B
PURCHASE ORDER NO. SPY-2-0103-ME-MR-335
DATA SHEET No. SP6-2-0103-ME-DT-004
REVISION NO. X0 DATE Apr. 1, 05
PAGE 21 OF 29 BY H.T

1 PULSATION SUPPRESSION DEVICES FOR RECIPROCATING COMPRESSORS (CONT'D) — SERVICE: OFF GAS COMP.
2 THESE SHEETS TO BE FILLED OUT FOR EACH SERVICE AND/OR STAGE OF COMPRESSION — STAGE NO.: TWO

		INLET SUPPRESSOR	DISCHARGE SUPPRESSOR
3	CONSTRUCTION REQUIREMENTS & DATA		
4	○ SUPRESSOR TAG NUMBER		
5	○ BASIC MATERIAL REQUIRED, CS, SS, ETC.	CS	CS
6	◇ ACTUAL MATERIAL DESIGNATION SHELL/HEAD	/	/
7	○ SPECIAL HARDNESS LIMITATIONS, Rc ○ YES ○ NO	SHELL & HEADS WELDS	SHELL & HEADS WELDS
8	⊗ CORROSION ALLOWANCE., ⊗ REQUIRED	3 mm	3 mm
9	◇ WALL THICKNESS, SHELL/HEAD	/ mm	/ mm
10	☐ NOM. SHELL DIA X OVERALL LENGTH.	x mm	x mm
11	☐ PIPE OR ROLLED PLATE CONSTRUCTION	☐ PIPE ☒ ROLLED PLATE	☐ PIPE ☒ ROLLED PLATE
12	◇ ACT. MAX ALLOW. WORKING PRESS. AND TEMPERATURE	86 BARG @ 85 °C	86 BARG @ 160 °C
13	○ MINIMUM DESIGN METAL TEMP (2.14.8)	5 °C	5 °C
14	⊗ INLET SUPRESS. TO BE SAME MAWP AS DISCH'RGE SUPPRESS.	⊗ YES ○ NO	
15	◇ MAX EXPECTED PRESSURE DROP(D P, %) LINE PRESS	ΔΠ BAR / %	ΔΠ BAR / %
16	◇ WEIGHT (EACH)	kg	kg
17	○ INSUL NUTS & ALLOW. FOR INSULATION REQUIRED (X)		
18	◇ EXPECTED P-P PULSE @ LINE SIDE/CYL FLG, % LINE PRESS	% / %	% / %
19	BASED ON FINAL SUPPRESSOR DESIGN		
20	⊗ SUPPORTS, TYPE / QUANTITY		
21	CONNECTION REQUIREMENTS & DATA		
22	⊗ LINE SIDE FLANGE. SIZE/RATING/FACING/TYPE	10"/900#/RTJ/WN	4"/900#/RTJ/WN
23	⊗ COMP CYL FLANGE(S), QTY/SIZE/RATING/FACING/TYPE	2/8"/900#/RF/WN	1/8"/900#/RF/WN
24	○ FLANGE FINISH, ○ PER 3.9.3.15 ○ SPECIAL (SPECIFY)		
25	>3,2 <6,4 ○ PER ANSI 16.5		
26	⊗ INSPECTION OPENINGS REQUIRED	⊗ YES ○ NO ⊗ BLINDED	⊗ YES ○ NO ⊗ BLINDED
27	○ SPEC, QTY, SIZE, /FLG TYPE & RATING		
28	◇ * QTY, SIZE, /FLG TYPE & RATING		
29	⊗ VENT CONNECTIONS REQUIRED	⊗ YES ⊗ NO	⊗ YES ⊗ NO
30	○ SPEC. QTY. SIZE, /FLG TYPE & RATING		
31	◇ * QTY. SIZE, /FLG TYPE & RATING		
32	⊗ DRAIN CONNECTIONS REQUIRED	⊗ YES ○ NO	⊗ YES ○ NO
33	○ SPEC. QTY. SIZE, /FLG TYPE & RATING		
34	◇ * QTY. SIZE, /FLG TYPE & RATING		
35	⊗ PRESSURE CONNECTIONS REQUIRED	⊗ YES ⊗ NO	⊗ YES ⊗ NO
36	○ SPEC. QTY. SIZE, /FLG TYPE & RATING		
37	◇ * QTY. SIZE, /FLG TYPE & RATING		
38	⊗ TEMPERATURE CONNECTIONS REQUIRED	⊗ YES ○ NO	⊗ YES ○ NO
39	○ SPEC. QTY. SIZE, /FLG TYPE & RATING		
40	⊗ CYL NOZZLE ○ MAIN BODY		
41	◇ * QTY. SIZE, /FLG TYPE & RATING		
42			
43			
44			
45			
46	OTHER DATA AND NOTES		
47	◇ COMPRESSOR MFG'S SUPP. OUTLINE OR DRAWING NO.		
48	◇ SUPP. MFG'S OUTLINE OR DRAWING NO.		
49	NOTES * = AS BUILT		
50			
51			
52			

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PURCHASE ORDER NO. SPY-2-0103-ME-MR-335	
DATA SHEET No. SP6-2-0103-ME-DT-004	
REVISION NO. X0	DATE Apr. 1, 05
PAGE 22 OF 29	BY H.T

RECIPROCATING COMPRESSOR (API 618-4TH) DATA SHEET SI UNITS

1 ☐ INSTRUMENTATION

2 PURCHASER TO FILL IN (☐ ○ ⬡) AFTER COMMODITY TO INDICATE: ☐ BY COMP. MFR. ○ BY PURCH. ⬡ BY OTHERS

3 INSTRUMENT & CONTROL ⊗ ONE FOR EA. UNIT ○ ONE COMMON TO ALL UNITS VENDOR TO REVIEW

4 PANEL (☒ ○ ⬡): ○ MACHINE MT'ED ⊗ FREE STANDING (OFF UNIT) ○ LOCAL ⊗ REMOTE ○ OUTDOORS

5 ○ PNEUMATIC ○ ELEC. ⊗ ELECTRONIC ⊗ HYDRAULIC ⊗ PROGRAMMABLE CONTL'R

6 ○ NEMA 7, ZONE _____ ,GAS GROUP _____ ,TEMP CL _____ ⊗ NON-HAZARDOUS (For UCP)

7 ○ I/S BARRIERS (☐ ○ ⬡)

8 ○ NEMA 4, WATERTIGHT & DUSTTIGHT ○ PURGED TO NFPA 496,TYPE ○ X ○ Y ○ Z

9 ○ OTHER NEMA _____ LOW PURGE PRESS. ○ ALARM ○ SHUTDOWN

10 ○ VIB, ISOLATORS ○ STRIP HEATERS ○ PURGE CONN. ○ EXTRA CUTOUTS

11 ⊗ ANNUNCIATOR WITH FIRST-OUT INDICATION LOCATED ON CONTROL PANEL

12 ⊗ PURCHASER'S CONN. BROUGHT OUT TO TERMINAL BOX BY VENDOR

13 ADDITIONAL PANEL REMARKS:

14

15

16

17 ⊗ INSTRUMENTATION SUITABLE FOR: ○ INDOORS ⊗ OUTDOORS ○ OTHER _____

18 ○ PREFERRED INSTRUMENT SUPPLIERS, (TO BE COMPLETED BY PURCHASER), OTHERWISE MFR'S STANDARD APPLIES

19	PRESSURE GAUGES	MFR		SIZE & TYPE		MTL
20	TEMPERATURE GAUGES	MFR		SIZE & TYPE		MTL
21	LIQUID LEVEL GAUGES	MFR		TYPE		MTL
22	DIFF. PRESSURE GAUGES	MFR		SIZE & TYPE		MTL
23	PRESS. TRANSMITTERS	MFR		TYPE		MTL
24	LIQUID LEV. TRANSMITTER	MFR		TYPE		MTL
25	PRESSURE SWITCHES	MFR		TYPE		MTL
26	TEMPERATURE SWITCHES	MFR		TYPE		MTL
27	LIQUID LEVEL SWITCHES	MFR		TYPE		MTL
28	DIFF. PRESSURE SWITCHES	MFR		TYPE		MTL
29	CONTROL VALVES	MFR		TYPE		MTL
30	PRESSURE SAFETY VALVES	MFR		TYPE		MTL
31	SIGHT FLOW INDICATORS	MFR		TYPE		MTL
32	VIBRATION MONITORS & EQUIP.	MFR		TYPE		MTL
33	THERMOCOUPLES	MFR		TYPE		MTL
34	RTD'S	MFR		TYPE		MTL
35	SOLENOID VALVES	MFR		TYPE		MTL
36	ANNUNCIATOR	MFR		MODEL & (QTY SPARE POINTS)		( )
37	PROGRAMMABLE CONTROLLER	MFR		TYPE		MTL
38		MFR		TYPE		MTL
39		MFR		TYPE		MTL

40

41 ⊗ PRESSURE GAUGE REQUIREMENTS ⊗ LIQUID FILLED PRESSURE GAUGES: ⊗ YES ○ NO

42	FUNCTION	LOCALLY MOUNTED	PANEL GAUGE BOARD		LOCALLY MOUNTED	PANEL GAUGE BOARD
44	LUBE OIL MAIN PUMP DISCHAR.	(☒ ○ ⬡)	(☐ ○ ⬡)	PROCESS GAS: INLET PRESS.	(☐ ○ ⬡)	(☒ ○ ⬡)
45	LUBE OIL AUX. PUMP DISCHARG.	(☒ ○ ⬡)	(☐ ○ ⬡)	@ EA. STAGE	(☐ ○ ⬡)	(☒ ○ ⬡)
46	LUBE OIL PRESS. AT FRAME HEADER	(☐ ○ ⬡)	(☒ ○ ⬡)	DISCH. PRESS.	(☐ ○ ⬡)	(☒ ○ ⬡)
47	LUBE OIL FILTER D P	(☒ ○ ⬡)	(☐ ○ ⬡)	@ EA. STAGE	(☐ ○ ⬡)	(☒ ○ ⬡)
48	COOLING H2O INLET HEADER	(☒ ○ ⬡)	(☐ ○ ⬡)		(☐ ○ ⬡)	(☐ ○ ⬡)
49		(☐ ○ ⬡)	(☐ ○ ⬡)		(☐ ○ ⬡)	(☐ ○ ⬡)
50		(☐ ○ ⬡)	(☐ ○ ⬡)		(☐ ○ ⬡)	(☐ ○ ⬡)

51 REMARKS:

52

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JOB NO. DA-1000	ITEM NO. K-101A/B
PURCHASE ORDER NO. SPY-2-0103-ME-MR-335	
DATA SHEET No. SP6-2-0103-ME-DT-004	
REVISION NO. X0	DATE Apr. 1, 05
PAGE 23 OF 29	BY H.T

RECIPROCATING COMPRESSOR (API 618-4TH) DATA SHEET SI UNITS

INSTRUMENTATION (CONT'D)

TEMPERATURE MEASUREMENT REQUIREMENTS FUNCTION	LOCALLY MOUNTED	PANEL MOUNTED	GAUGE	THERMO CPL SYS	RTD SYS	I/S SYS
LUBE OIL ⊗ INLET TO ○ OUT OF FRAME	(☒ ○ ⬡)	(☐ ○ ⬡)	○	○	⊖	○
LUBE OIL ○ INLET TO ⊗ OUT OF COOLER	(☒ ○ ⬡)	(☐ ○ ⬡)	○	○	⊖	○
MAIN JRNL BEARINGS (THERMOCOUPLES OR RTD'S ONLY)	(☒ ○ ⬡)	(☒ ○ ⬡)	○	○	⊗	○
MOTOR BEARING(S) (THERMOCOUPLES OR RTD'S ONLY)	(☒ ○ ⬡)	(☒ ○ ⬡)	○	○	⊗	○
COOLING WATER HEADER: ⊗ INLET ⊖ OUTLET	(☒ ○ ⬡)	(☐ ○ ⬡)	○	○	⊖	○
CYL. COOLING WATER: ⊖ INLET ⊗ OUTLET ⊗ EA. CYL	(☒ ○ ⬡)	(☐ ○ ⬡)	○	○	⊖	○
PROCESS GAS: ⊗ INLET ⊗ DISCH. ⊗ EACH CYL	(☒ ○ ⬡)	(☐ ○ ⬡)	○	○	⊖	○
INTERCOOLER(S) ○ INLET ○ GAS ○ WATER	(☐ ○ ⬡)	(☐ ○ ⬡)	○	○	○	○
○ INLET ○ GAS ○ WATER	(☐ ○ ⬡)	(☐ ○ ⬡)	○	○	○	○
AFTERCOOLER: ○ INLET ○ GAS ○ WATER	(☐ ○ ⬡)	(☐ ○ ⬡)	○	○	○	○
○ INLET ○ GAS ○ WATER	(☐ ○ ⬡)	(☐ ○ ⬡)	○	○	○	○
COOLING WATER ⊖ INLET ⊗ OUTLET/COOLED PKG CASE(S)	(☒ ○ ⬡)	(☐ ○ ⬡)	○	○	⊖	○
PRESS. PGK CASE, CYL PIST ROD (THRM'CPLS OR RTD'S ONLY)	(☒ ○ ⬡)	(☒ ○ ⬡)		○	⊗	○
COMPRESSOR VALVES ○ SUCT. ○ DISCH. TC'S OR RTD'S ONLY	(☐ ○ ⬡)	(☐ ○ ⬡)	○	○	○	○
	(☐ ○ ⬡)	(☐ ○ ⬡)	○	○	○	○
	(☐ ○ ⬡)	(☐ ○ ⬡)	○	○	○	○

ALARM & SHUTDOWN SWITCH REQ'MTS

NOTE: ALARM & SHUTDOWN SWITCHES SHALL BE INDIVIDUALLY SEPARATE

CONTROL SYSTEM TYPE 'E'; SYSTEM BLOCK DIAGRAM No TBA. BY EPC CONTRACTOR

FUNCTION	ALARM	SHUT DOWN	ANNUNCIATION POINTS: ALARM IN LOCAL PNL BY MFR	ALARM IN CTL ROOM UCP BY MFR	SHUTDOWN IN LOCAL PNL BY MFR	SHUTDOWN IN CTL ROOM UCP BY MFR	TOTAL NO. OF POINTS
LOW LUBE OIL PRESS. @ BEARING HEADER	(☒ ○ ⬡)	(☒ ○ ⬡)	○	⊗	○	⊗	
HIGH LUBE OIL D P ACROSS FILTER	(☒ ○ ⬡)	(☐ ○ ⬡)	○	⊗	○	○	
LOW LUBE OIL LEVEL, FRAME	(☒ ○ ⬡)	(☒ ○ ⬡)	○	⊗	○	⊗	
AUX LUBE OIL PUMP, FAIL TO START	(☒ ○ ⬡)	(☐ ○ ⬡)	○	⊗	○	○	
CYL LUBE SYSTEM PROTECTION	(☒ ○ ⬡)	(☒ ○ ⬡)	○	⊗	○	⊗	
COMPR. VIBRATION, SHUTDOWN ONLY		(☐ ○ ⬡)	○	○	○	○	
VIBRATION, W/ CONTINUOUS MONITORING	(☒ ○ ⬡)	(☒ ○ ⬡)	○	⊗	○	⊗	
ROD DROP DETECTOR, CONTACT TYPE(1/CYL)	(☐ ○ ⬡)	(☐ ○ ⬡)	○	○	○	○	
ROD DROP PROXIMITY PROBE (1/CYL)	(☒ ○ ⬡)	(☒ ○ ⬡)	○	⊗	○	⊗	
OIL TEMP OUT OF FRAME	(☒ ○ ⬡)	(☐ ○ ⬡)	○	⊗	○	○	
HIGH GAS DISCH. TEMP EACH CYLINDER	(☒ ○ ⬡)	(☒ ○ ⬡)	○	⊗	○	⊗	
HIGH JACKET WATER TEMP., EA. CYL	(☒ ○ ⬡)	(☐ ○ ⬡)	○	⊗	○	○	
LOW SUCTION PRESS., FIRST STG INLET	(☒ ⊗ ⬡)	(☒ ⊗ ⬡)	○	⊗	○	⊗	
HI DISCH. PRESS. ⊗ FINAL ⊙ EA STG	(☒ ⊗ ⬡)	(☐ ○ ⬡)	○	⊗	○	○	
HI CYL. GAS D P, EACH STAGE	(☒ ⊗ ⬡)	(☐ ○ ⬡)	○	⊗	○	○	
HI LIQ. LEV., EA. MOISTURE SEPARATOR	(☒ ⊗ ⬡)	(☐ ○ ⬡)	○	⊗	○	○	
LOW PURGE GAS PRESS, DISTANCE PIECE(S)	(☒ ○ ⬡)	(☐ ○ ⬡)	○	⊗	○	○	
HIGH CROSS-HEAD PIN TEMP	(☒ ○ ⬡)	(☐ ○ ⬡)	○	⊖	○	○	
PRESS PKG CASE (PISTON ROD TEMP)	(☒ ○ ⬡)	(☐ ○ ⬡)	○	⊗	○	○	
	(☐ ○ ⬡)	(☐ ○ ⬡)	○	○	○	○	
				TOTAL NUMBER OF ANNUNCIATION POINTS			

⊗ SMART TRANSMITTERS REQUIRED

NOTE: TRANSMITTERS SHALL BE USED EXPECT FOR APPROVED PROPRIETARY SWITCHES

ALARM CONTACTS SHALL:
- ⊗ OPEN (DE-ENER.) TO SOUND ALARM & BE ENERGIZED WHEN COMPR. IS IN OPERATION
- ○ CLOSE (ENERGIZE) TO SOUND ALARM & BE DE-ENERGIZED WHEN COMPR. IS IN OPERATION

SHUTDOWN CONTACTS SHALL:
- ⊗ OPEN (DE-ENERGIZED) TO SHUTDOWN & BE ENERGIZED WHEN COMPR. IS IN OPERATION
- ○ CLOSE (ENERGIZE) TO SHUTDOWN & BE DE-ENERGIZE WHEN COMPR. IS IN OPERATION

REF: 3.6.5.1 FOR MINIMUM RECOMMENDED PROTECTION REQUIREMENTS

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PURCHASE ORDER NO. SPY-2-0103-ME-MR-335	
DATA SHEET No. SP6-2-0103-ME-DT-004	
REVISION NO. X0	DATE Apr. 1, 05
PAGE 24 OF 29	BY H.T

RECIPROCATING COMPRESSOR (API 618-4TH) DATA SHEET SI UNITS

○ INSTRUMENTATION (CONT'D)

⊗ MISCELLANEOUS INSTRUMENTATION — ○ INTERCLR(S) ○ AFTERCLR ⊗ OIL CLR ⊗ H2O CLR

SIGHT FLOW IND. (COOLING H2O ONLY)	(☒ ○ ⬡)	FOR:	⊗ CYL JACKET WATER ⊗ ROD PRESS. PKG CASES
PNEUMATIC PRESSURE TRANSMITTERS	(☐ ○ ⬡)	FOR:	
PRESSURE TRANSMITTERS (ELEC. OUTP.)	(☒ ○ ⬡)	FOR:	
LEVEL TRANSMITTERS (ELEC. OUTP.)	(☒ ○ ⬡)	FOR:	
ALARM HORN & ACKN'LMT TEST BUTTON	(☒ ○ ⬡)		
CABLE TRAY WIRING W/JUNCT. BOXES (CONSOLES)	(☒ ○ ⬡)		ARMOURED CABLE
TEST VALVES	(☒ ○ ⬡)	FOR:	
DRAIN VALVES	(☒ ○ ⬡)	FOR:	
GAUGE GLASS(ES)	(☒ ○ ⬡)	FOR:	
TACHOMETER	(☐ ○ ⬡)		SPEED RANGE ____ TO ____ RPM
CRANKSHAFT KEY PHASER AND TRANSDUCER	(☒ ○ ⬡)	FOR:	
	(☐ ○ ⬡)		
	(☐ ○ ⬡)		

○ SEPARATE LUBE OIL CONSOLE INSTRUMENTATION: PURCH. TO LIST REQ'MTS IN ADDITION TO ANY ABOVE REQ'MTS

(☐ ○ ⬡)	
(☐ ○ ⬡)	
(☐ ○ ⬡)	
(☐ ○ ⬡)	
(☐ ○ ⬡)	
(☐ ○ ⬡)	

○ SEPARATE COOLING WATER CONSOLE INSTRUMENT: PURCH. TO LIST REQ'MTS IN ADDITION TO ANY ABOVE REQ'MTS

(☐ ○ ⬡)	
(☐ ○ ⬡)	
(☐ ○ ⬡)	
(☐ ○ ⬡)	
(☐ ○ ⬡)	
(☐ ○ ⬡)	

○ RELIEF VALVES

LOCATION	BY	MANUFACTURER	TYPE	◇ SIZE	◇ SETTING
GAS DISCHARGE	(☐ ⊗ ⬡)	X			
AUX LUBE OIL PUMP	(☒ ○ ⬡)	X			
MAIN LUBE OIL PUMP	(☒ ○ ⬡)	X			
	(☐ ○ ⬡)				
	(☐ ○ ⬡)				
	(☐ ○ ⬡)				
	(☐ ○ ⬡)				
	(☐ ○ ⬡)				
	(☐ ○ ⬡)				
	(☐ ○ ⬡)				

NOTES:
SEE MOTOR DATA SHEET FOR ADDITIONAL MOTOR INSTRUMENTATION REQUIREMENTS
FOR TURBINE DRIVERS USE APPLICABLE API DATA SHEETS
FOR GEAR REDUCERS USE APPLICABLE API DATA SHEETS
ELECTRICAL & INSTRUMENTATION CONNECTIONS SHALL BE MADE DIRECTLY BY THE PURCHASER TO INDIVIDUAL INSTRUMENTS ON THE COMPRESSOR

ADDITIONAL INSTRUMENTATION REMARKS/SPECIAL REQUIREMENTS: