



DATA SHEET
FOR
RECIPROCATING COMPRESSORS
P 307/ P308/ P309 (EXISTING)

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00	06/07/2012	EMISSIONE FINALE	A.De Michele	F. Alese	E. Carosi		
REV.	DATA	DESCRIPTION	PREP.	CONTR.	APPR.		
 		CLIENT: ENI S.p.A. LOCATION: Porto Marghera (VE) PLANT: Nuovo Stoccaggio GPL/Propano Porto Marghera, FEED 1° fase					
		FORM.	PROJECT	DOCUMENT	PAGE		REV
		A4	P-1442	PDG-0300-008	1	di	7



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1 APPLICABLE TO: PROPOSAL PURCHASE AS-BUILT

2 SERVICE: PROPANE/GPL REFRIGERATED STORAGE SYSTEM (1) N° REQ'D: 3

3 NOTE: INDICATES INFO. TO BE COMPLETED BY PURCH. BY MANUFACTURER WITH PROPOSAL BY MANUFACTURER AFTER ORDER BY MANUFACTURER OR PURCH. AS APPLICABLE

5 COMPR. MANUFACTURER _____ TYPE MODEL _____ SERIAL NO _____

6 COMPR. THROWS: TOTAL NO. _____ NO. WITH CYLS. _____ NOMINAL FRAME RATING _____ kW @ RATED RPM OF _____

7 DRIVER MANUFACTURER _____ DRIVER NAMEPLATE kW/OPERATING RPM _____ / _____

8 DRIVER SYSTEM: DIRECT COUPLED GEARED AND COUPLED V-BELTS

9 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 CAPACITY" LINES NON - LUBE

OPERATING CONDITIONS (EACH MACHINE)

14	● SERVICE / ITEM NO.	PROPANE	PROPANE	GPL	GPL
15	● STAGE	1	2	1	2
16	● NORMA. OR ALT. CONDITION	Normal	Normal	Alternative	Alternative
17	● MOLECULAR WEIGHT AT INTAKE	44.1	44.1	47.7	47.7
18	● Cp/Cv (K) @ 65°C OR _____ °C	1,172 @ -42.2° C	1,164@30°C	1,148 @ -23.4°C	1,149 @ 40°C

20 INLET CONDITIONS: AT INLET TO. PULSATION SUPP. DEVICES COMPR. CYLINDER FLANGES

21 SIDE STREAM TO _____ STAGE(S), THESE INLET PRESS. ARE FIXED

23	● PRESS.(barg) @ PULS. SUPP. INLET	0		0	
24	● PRESSURE (barA) @ CYL. FLANGE	1.01	4.69	1.01	4.66
25	● TEMPERATURE (°C)	-42.2	30	-23.4	40
26	<input type="radio"/> ACTUAL DISCHARGE				
27	<input type="checkbox"/> COMPRESSIBILITY (Z _s)				

29 INTERSTAGE: ΔP INCLUDES: PULS. SUPP. DEVICES PIPING COOLERS SEPARATORS OTHERS _____

31 ΔP BETWEEN STAGES, % / BAR

/	/	/	/	/
---	---	---	---	---

32 DISCHARGE CONDITIONS: AT OUTLET FROM PULS. SUPP. DEVICES COMPR. CYL FLANGES OTHERS _____

34	● PRESSURE (BARA) @ CYL FLANGE	4.89	16.54	4.87	16.38
35	● PRESS. (barg) @ SUPP. OUTLET		15.37		15.2
36	<input type="checkbox"/> TEMP. ADIABATIC °C	14 (5)	82 (5)	29 (5)	89 (5)
37	<input checked="" type="checkbox"/> TEMP. PREDICTED °C	30 (5)	82 (5)	41 (5)	88 (5)
38	<input type="checkbox"/> COPRESSIBILITY (Z _b)				

39 REQUIRED CAPACITY RATED FOR PROCESS, AT INLET TO COMPRESSOR, NO NEGATIVE TOLERANCE (-0%)

41	● CAPACITY kg/h <input type="radio"/> WET <input checked="" type="radio"/> DRY	2386 (4) (5)	2386 (4) (5)	2230 (4) (5)	2230 (4) (5)
42	<input type="radio"/> Nm ³ /h				

44 MFGR'S RATED CAPACITY (AT INLET TO COMPRESSOR) & kW @ CERTIFIED TOLERANCE OF ± 3% FOR kW

46 CAPACITY kg/h NORM. WET DRY

47 INLET kg / h MAX.

48 Nm³/h

49 BREAK HP / STAGE

50 TOTAL kW @ COMPRESSOR SHAFT BKW (W/GEARLOSS)

51 TOTAL kW INCLUDING ALL LOSSES

52 CAPACITY FOR NNT

53

54 MANUFACTURER'S = REQUIRED × 0.97

55

56 REQUIRED = MANUFACTURER'S × 0.97

57

58

NOTES:

1) Compression of Propane /GPL vapour released from a refrigerated storage system

2) To be defined by Vendor

3) To be confirmed by Vendor

4) Design mass flow rate for each compressor (P-310ANEW or P-310BNEW) during peak conditions. Both compressors will operate in parallel.

5) Verified by Vendor

59 REPRESENTS PURCHASER'S MIN. REQUIREMENTS. VENDOR TO COMPLETE REMINDER IF UNFILLED AND APPLICABLE



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GAS ANALYSIS AT OPERATING CONDITIONS

% BY WEIGHT

NOTES

- SERVICE / ITEM NO
- STAGE
- NORMAL OR ALT.

		M.W.	PROPANE	GPL				
8	PROPANE	C ₃ H ₈	44.1	100	69			
9	N-BUTANE	C ₄ H ₁₀	58.1	0	31			
30	TOTAL		100	100				
32	■ AVERAGE MOL.WT.		44.09	47.70				
33	■ CP / CV (K) @ 65°C OR	°C	1.172	1.148				
34			@ -42.2°C	@ -23.4°C				

APPLICABLE SPECIFICATIONS

- API 618 III EDIT.- RECIPROCATING COMPRESSORS FOR GEN. REFINERY SERVICE

NOTE: IF WATER VAPOR IS PRESENT, EVEN MINUTE TRACES, IN THE GAS BEING COMPRESSED, IT MUST BE INCLUDED ABOVE.

● SITE / LOCATION CONDITIONS

ELEVATION 2.7 (1) m BAROM. _____ mmHg DESIGN TEMP. 40 (2) °C AMBIENT TEMPER. MAX. 36°C (3) MIN -15 (3) °C
 RELATIVE HUMIDITY: MAX. 90% MIN 80% %
 COMPRESSOR LOCATION : INDOOR HEATED UNHEATED AT GRADE LEVEL ELEVATED _____ m
 OUTDOOR NO-ROOF UNDER ROOF PARTIAL SIDES PLATFORM ON-SHORE
 OFF-SHORE WEATHER PROTECTION REQUIRED TROPICALIZATION REQUIRED
 WINTERIZATION PROVIDED
 UNUSUAL CONDITION DUST FUMES OTHER _____
 HAZARDOUS NON HAZARDOUS

SITE ELECTRICAL CLASSIFICATION : _____

NOTES:

- (1) ASML to be confirmed during detailed engineering phase.
- (2) Design temperature for electrical equipment (Dry bulb temperature).
- (3) Dry Bulb temperature.



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PART LOAD OPERATING CONDITIONS

CAPACITY CONTROL BY : MFG'S CAP. CONTROL PURCHASER BY - PASS BOTH OTHER _____

FOR: PART LOAD CONDITION START - UP ONLY BOTH

USING : FIXED VOLUME POCKET SUCTION VALVE UNLOADERS FINGER PLUG OTHER _____

ACTION DIRECT (AIR TO UNLOAD) REVERSE (AIR TO LOAD / FAIL SAFE)

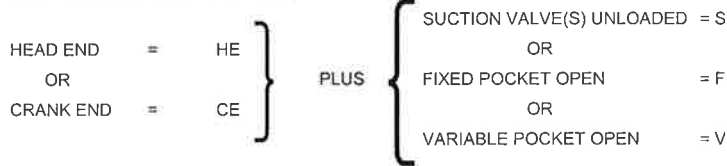
NUMBER OF STEPS ONE THREE FIVE OTHER _____

ALL UNLOADING STEPS BASIS MANUFACTURERS CAPACITY SHOWN ON PAGE 1

INLET AND DISCHARGE PRESSURE ARE AT CYLINDER FLANGES

<input type="radio"/> SERVICE / ITEM NO						
<input checked="" type="checkbox"/> STAGE						
<input checked="" type="checkbox"/> NORMAL OR ALTERNATE CONDITION						
<input type="radio"/> % CAPACITY						
<input type="radio"/> WEIGHT FLOW , kg/h						
<input checked="" type="checkbox"/> Nm ³ /h						
<input type="checkbox"/> POCKETS / VALVES OPERATION *						
<input type="checkbox"/> TYPE UNLOADERS, PLUG / FINGER						
<input checked="" type="checkbox"/> INLET TEMPERATURE °C						
<input checked="" type="checkbox"/> INLET PRESSURE, BARA						
<input type="checkbox"/> DISCHARGE PRESSURE, BARA						
<input type="checkbox"/> DISCHARGE TEMP. (ADIABATIC) , °C						
<input type="checkbox"/> DISCHARGE TEMP. (PREDICTED) , °C						
<input type="checkbox"/> VOLUMETRIC EFF. %HE / %CE	/	/	/	/	/	/
<input type="checkbox"/> CALC. GAS ROAD LOAD, C * * N						
<input type="checkbox"/> CALC. GAS ROAD LOAD, T * * N						
<input type="checkbox"/> CALC. GAS ROAD LOAD, C (GAS & INERTIA) N						
<input type="checkbox"/> CALC. GAS ROAD LOAD, T (GAS & INERTIA) N						
<input type="checkbox"/> ROD REV., DEGREE MIN. @ X - HD PIN						
<input type="checkbox"/> kW / STAGE						
<input type="checkbox"/> TOTAL kW @ COMPRESSOR SHAFT						
<input type="checkbox"/> TOTAL kW (ALL LOSSES INCLUDED)						

* SHOW OPERATION WITH THE FOLLOWING SYMBOLS :



EXAMPLE : HE - F / CE - S = HEAD END FIXED POCKET OPEN / CRANK END SUCTION VALVE(S) UNLOADED.

* * C = COMPRESSION T = TENSION

MINIMUM PRESSURE REQUIRED TO OPERATE CYLINDER UNLOADING DEVICES, _____ BARA

KW VS CAPACITY PERFORMANCE CURVES OR TABLES REQUIRED FOR UNLOADING STEPS AND/OR VARIABLE SUCTION /

DISCHARGE PRESSURE: YES NO

NOTE AND / OR SKETCH



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UTILITY CONDITIONS

ELECTRICAL POWER	AC VOLTS	PHASE	HERTZ	DC VOLTS		AC VOLTS	PHASE	HERTZ	DC VOLTS
MAIN DRIVER	380	3	50		INSTRUMENT				
AUXILIARY MOTORS					ALARM & SHUTDOWN				
HEATERS									

AREA CLASSIFICATION HAZARDOUS NON HAZARDOUS

INSTRUMENT AIR: TO NSP1 NORMAL PRESSURE _____ BARG MAX. / MIN. _____ / _____ BARG

STEAM FOR DRIVERS

INLET NORM. _____ MAX. / MIN. _____ BARG
 TEMP. _____ MAX. / MIN. _____ °C
 EXHAUST NORM. _____ BARG
 TEMP. _____ MAX. / MIN. _____ °C

STEAM FOR HEATERS

INLET NORM. _____ MAX. / MIN. _____ BARG
 TEMP. _____ MAX. / MIN. _____ °C
 EXHAUST NORM. _____ BARG
 TEMP. _____ MAX. / MIN. _____ °C

COOLING WATER FOR COMPRESSOR CYLINDER

MACHINERY COOLING WATER (1)
 SUPPLY NORM. 5 (2) MAX. / MIN. _____ barg
 TEMP. 30(2) MAX. / MIN. _____ °C
 RETURN NORM. (3) MAX. / MIN. _____ barg
 TEMP. (3) MAX. / MIN. _____ °C

COOLING WATER FOR COOLERS

TYPE OF WATER (1) (4)
 SUPPLY NORM. 5 (2) MAX. / MIN. _____ barg
 TEMP. 30(2) MAX. / MIN. _____ °C
 RETURN NORM. (3) MAX. / MIN. _____ barg
 TEMP. (3) MAX. / MIN. _____ °C

COOLING FOR ROD PACKING:

TYPE OF FLUID MACHINERY _____ barg@ _____ °C RETURN _____ barg@ _____ °C

FUEL GAS: NORMAL PRESSURE _____ barg MAX / MIN _____ barg LHV _____ MJ/m3

COMPOSITION _____

CYLINDER UNLOADING MEDIUM: AIR NITROGEN OTHER _____

PRESSURE AVAILABLE FOR CYLINDER UNLOADING DIVICES, MAX / MIN _____ / _____ barg

NOTES:

- Cooling water supplied by cooling tower package (W 302 NEW).
- To be confirmed during detailed engineering phase.
- To be defined by Vendor
- The existing compressors intercoolers will be dismantleds. Vendor has confirmed the new configuration (without compression intercooling systems)



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1		<input checked="" type="checkbox"/>	CONSTRUCTION FEATURE
2			
3	SERVICE / ITEM		
4	STAGE		
5	CYLINDER SIZE (BORE DIAM.) mm		
6	ROD RUN-OUT: NORMAL COLD VERTICAL mm		
7	(CALCULATED VALUE(S) PER APPENDIX C.3.1)		
8			MATERIALS OF CONSTRUCTION
9	CYLINDER(S)		
10	CYLINDER LINER(S)		
11	PISTON(S)		
12	PISTON RINGS		
13	RIDER RINGS <input type="radio"/> REQUIRED		
14	PISTON ROD(S) : MAT / YELD N/mm2		
15	THREAD ROOT STRESS @ MACRL @* X-HD END		
16	PISTON ROD HARDNESS ,BASE MATERIAL Rc		
17	PISTON ROD COATING <input type="radio"/> COATING		
18	COATING HARDNESS Rc		
19	VALVE SEATS / VALVE PLATE		
20	<input type="radio"/> VALVE SEAT MIN. HARDNESS Rc		
21	VALVE GUARD (STOPS)		
22	VALVE DISCS		
23	VALVE SPRINGS		
24	ROD PRESSURE PACKING RINGS		
25	ROD PRESSURE PACKING CASE		
26	SEAL / BUFFER PACKING , DISTANCE PIECE		
27	SEAL / BUFFER PACKING , INTERMEDIATE		
28	WIPER PACKING RINGS		
29	MAIN JOURNAL BEARINGS, CRANKSHAFT		
30	CONNECTING ROD BEARING, CRANKPIN		
31	CONNECTING ROD BUSHING, X-HD END		
32	CROSSHEAD (X-HD) PIN BUSHING		
33	CROSSHEAD PIN		
34	CROSSHEAD		
35	CROSSHEAD SHOES		
36	<input type="radio"/> CYLINDER INDICATOR VALVES		
37	<input type="radio"/> FLUOROCARBON SPRAYED CYLINDER		
38	RUNNING BORE		
39	* MAXIMUM ALLOWABLE CONTINUOUS ROD LOAD		
40	<input checked="" type="checkbox"/> COMPRESSOR CYLINDER ROD PACKING		DISTANCE PIECE(S): <input type="radio"/> TYPE A <input type="radio"/> TYPE B <input type="radio"/> TYPE C <input type="radio"/> TYPE D
41	<input type="radio"/> FULL FLOATING PACKING W / STAINLESS STEEL SPRINGS		COVERS : <input type="radio"/> SOLID METAL <input type="radio"/> SCREEN <input type="radio"/> LOUVRED
42	<input checked="" type="radio"/> VENTED TO : <input checked="" type="radio"/> FLARE @ 1.5(1) barg <input type="radio"/> SAFE LOCATION		<input type="radio"/> CYLINDER COMPARTMENT <input type="radio"/> VENTED TO _____ barg
43	<input type="radio"/> SUCTION PRESSURE @ _____ barg		<input type="radio"/> PURGED AT _____ barg
44	<input type="radio"/> FORCED LUBRICATED <input type="radio"/> NOT- LUBE <input type="radio"/> TFE		<input type="radio"/> PRESSURIZED TO _____ barg
45	<input type="radio"/> WATER COOLED STAGE(S) _____ m3/h REQ.D		<input type="radio"/> WITH RELIEF VALVE _____ barg
46	<input type="radio"/> OIL COOLED STAGE(S) _____ m3/h REQ.D		<input type="radio"/> FRAME COMPARTMENT <input type="radio"/> VENTED TO _____ barg
47	<input type="radio"/> WATER FILTER		<input type="radio"/> PURGED AT _____ barg
48	<input type="radio"/> VENT/BUFFER GAS SEAL PACKING ARRANG.		<input type="radio"/> PRESSURIZED TO _____ barg
49	<input type="radio"/> BUFFER GAS PRESSURE , _____ barg		<input type="radio"/> WITH RELIEF VALVE _____ barg
50	<input type="radio"/> SPLASH GUARDS FOR WIPER PACKING		
51	NOTES:		<input type="radio"/> SEAL BUFFER GAS PACKING ARRANG. Ref. : Appendix G Figure G-4
52	1) To be defined during detailed engineering phase		<input type="radio"/> FRAME END (ADIACENT TO WIPER PACKING)
53			<input type="radio"/> INTERMEDIATE PARTITION
54			<input type="radio"/> BUFFER PURGE GAS <input type="radio"/> N ₂ <input type="radio"/> OTHER _____
55			<input type="radio"/> VENT , DRAIN , PURGE PIPING BY MFG'R <input type="radio"/> YES <input type="radio"/> NO
56			