

Nuovo Pignone

FIRENZE

Centrifugal Compressor Data Sheet

CENTRIFUGAL COMPRESSOR
DATA SHEET (API 617-6TH)
S.I. UNITS

JOB NO. _____ ITEM NO. _____
PURCHASE ORDER NO. _____
SPECIFICATION NO. _____
REVISION NO. 0 DATE 24/02/2005
PAGE 2 OF 6 BY RB

1 APPLICABLE TO: PROPOSAL PURCHASE AS BUILT
2 FOR _____ UNIT _____
3 SITE _____ SERIAL NO. _____
4 SERVICE _____ NO. REQUIRED TWO
5 CONTINUOUS INTERMITTENT STAND BY DRIVER TYPE (3.1.1) GAS TURBINE
6 MANUFACTURER NUOVO PIGNONE MODEL 2BCL506-8/A DRIVER ITEM NO. BD-KT-49400
7 NOTE: INFORMATION TO BE COMPLETED: BY PURCHASER BY MANUFACTURER

OPERATING CONDITIONS

(ALL DATA ON PER UNIT BASIS)

OTHER CONDITIONS (3.1.2)

GAS HANDLED (ALSO SEE PAGE _____)
 Flow Rate (1.013bar & 0°C) (Nm³/h)
 WEIGHT FLOW, kg/h (WET)

INLET CONDITIONS

PRESSURE (BAR -a)
 TEMPERATURE (°C)
 RELATIVE HUMIDITY %
 MOLECULAR WEIGHT (%)
 Cp/Cv (K₁) OR (K_{AVG})
 COMPRESSIBILITY (Z₁) OR (Z_{AVG})
 INLET VOLUME, (am³/h) (WET)

DISCHARGE CONDITIONS

PRESSURE (BAR -a)
 TEMPERATURE (°C)
 Cp/Cv (K₂) OR (K_{AVG}) (NOTE 1)
 COMPRESSIBILITY (Z₂) OR (Z_{AVG}) (NOTE 1)

KW REQUIRED @ COMPRESSOR SHAFT (ALL LOSSES INCLUDED)

SPEED (RPM)

ESTIMATED SURGE, (m³/h) (AT SPEED ABOVE)

POLYTROPIC HEAD (Nm/kg)

POLYTROPIC EFFICIENCY (%)

CERTIFIED POINT

PERFORMANCE CURVE NUMBER

PROCESS CONTROL

METHOD SUCTION THROTTLING VARIABLE INLET
FROM _____ (BAR) (kPa abs) GUIDE VANES
TO _____ (BAR) (kPa abs) (3.4.2.4)

SPEED VARIATION DISCHARGE COOLED BYPASS
FROM _____ % BLOWOFF FROM _____
TO 105 % TO _____ TO _____

SIGNAL SOURCE (3.4.2.1)

TYPE ELECTRONIC PNEUMATIC OTHER
RANGE _____ MA _____ (BAR) (kPa abs)

ANTI-SURGE BYPASS MANUAL AUTOMATIC NONE

REMARKS:

49 NOTE 1: IF GAS ANALYSIS IS GIVEN, MANUFACTURER SHALL SUPPLY DATA, OTHERWISE DATA SHALL BE SUPPLIED BY USER.

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PAGE 3 OF 6 BY RB

1 APPLICABLE TO: PROPOSAL PURCHASE AS BUILT
2 FOR _____ UNIT _____
3 SITE _____ SERIAL NO. _____
4 SERVICE _____ NO. REQUIRED TWO
5 CONTINUOUS INTERMITTENT STAND BY DRIVER TYPE (3.1.1) GAS TURBINE
6 MANUFACTURER NUOVO PIGNONE MODEL 2BCL506-8/A DRIVER ITEM NO. BD-KT-49400
7 NOTE: INFORMATION TO BE COMPLETED: BY PURCHASER BY MANUFACTURER

OPERATING CONDITIONS

(ALL DATA ON PER UNIT BASIS)

OTHER CONDITIONS (3.1.2)

GAS HANDLED (ALSO SEE PAGE _____)
 Flow Rate (1.013bar & 0°C) (Nm³/h)
 WEIGHT FLOW, kg/h (WET)

	CASE4		CASE5		CASE6	
110715	103139	340780	288191	280010	274229	
106200(*)	95717(*)	313200(*)	313583(*)	268592	259376	

INLET CONDITIONS

PRESSURE (BAR -a)
 TEMPERATURE (°C)
 RELATIVE HUMIDITY %
 MOLECULAR WEIGHT (%)
 Cp/Cv (K₁) OR (K_{AVG})
 COMPRESSIBILITY (Z₁) OR (Z_{AVG})
 INLET VOLUME, (am³/h) (WET)

6,3	28,7	30	74,2	20	61,00
27,3	30	29,9	29,4	28,7	30
21,5	20,8	20,6	20,6	21,5	21,2
1,245	1,271	1,274	1,297	1,259	1,289
0,98	0,917	0,915	0,802	0,937	0,821
19187	3701	11675	3802	14683	3417

DISCHARGE CONDITIONS

PRESSURE (BAR -a)
 TEMPERATURE (°C)
 Cp/Cv (K₂) OR (K_{AVG}) (NOTE 1)
 COMPRESSIBILITY (Z₂) OR (Z_{AVG}) (NOTE 1)

29	111,1	74,7	139,7	61,4	139,7
151,5	167,0	107,6	90,3	120,1	108,7
1,2	1,218	1,245	1,259	1,228	1,244
0,976	0,956	0,922	0,872	0,936	0,891

KW REQUIRED @ COMPRESSOR SHAFT (ALL LOSSES INCLUDED)
 SPEED (RPM)
 ESTIMATED SURGE, (m³/h) (AT SPEED ABOVE)
 POLYTROPIC HEAD (Nm/kg)
 POLYTROPIC EFFICIENCY (%)
 CERTIFIED POINT
 PERFORMANCE CURVE NUMBER

7920	7704	13336	9226	13611	10735
9325	9325	6781	6781	7581	7581
16692	3114	10858	3551	12187	3417
207854	185144	115003	70711	140371	94323
78,6	64,8	77,4	61,8	79,3	63,8

(*) Higher value than the requested due to short distance from expected surge line

PROCESS CONTROL

METHOD SUCTION THROTTLING VARIABLE INLET
FROM _____ (BAR) (kPa abs) GUIDE VANES
TO _____ (BAR) (kPa abs) (3.4.2.4)

SPEED VARIATION DISCHARGE COOLED BYPASS
FROM _____ % BLOWOFF FROM _____
TO 105 % TO _____ TO _____

SIGNAL SOURCE (3.4.2.1)

TYPE ELECTRONIC PNEUMATIC OTHER _____
RANGE _____ MA _____ (BAR) (kPa abs) _____

ANTI-SURGE BYPASS MANUAL AUTOMATIC NONE

REMARKS:

NOTE 1: IF GAS ANALYSIS IS GIVEN, MANUFACTURER SHALL SUPPLY DATA, OTHERWISE DATA SHALL BE SUPPLIED BY USER.

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CENTRIFUGAL COMPRESSOR DATA SHEET (API 617-6TH) S.I. UNITS

JOB NO. 2841361 ITEM NO. BD-K 49400
PURCHASE ORDER NO. _____
SPECIFICATION NO. _____
REVISION NO. 0 DATE 24/02/2005
PAGE 3 OF 6 BY RB

1 APPLICABLE TO: PROPOSAL PURCHASE AS BUILT
2 FOR _____ UNIT _____
3 SITE _____ SERIAL NO. _____
4 SERVICE _____ NO. REQUIRED TWO
5 CONTINUOUS INTERMITTENT STAND BY DRIVER TYPE (3.1.1) GAS TURBINE
6 MANUFACTURER NUOVO PIGNONE MODEL 2BCL506-8/A DRIVER ITEM NO. BD-KT-49400
7 NOTE: INFORMATION TO BE COMPLETED: BY PURCHASER BY MANUFACTURER

OPERATING CONDITIONS

(ALL DATA ON PER UNIT BASIS)

12 GAS HANDLED (ALSO SEE PAGE _____)
13 Flow Rate (1.013bar & 0°C) (Nm³/h)
14 WEIGHT FLOW, kg/h (WET)
15

INLET CONDITIONS

17 PRESSURE (BAR -a)
18 TEMPERATURE (°C)
19 RELATIVE HUMIDITY %
20 MOLECULAR WEIGHT (%)
21 Cp/Cv (K₁) OR (K_{AVG})
22 COMPRESSIBILITY (Z₁) OR (Z_{AVG})
23 INLET VOLUME, (am³/h) (WET)

DISCHARGE CONDITIONS

25 PRESSURE (BAR -a)
26 TEMPERATURE (°C)
27 Cp/Cv (K₂) OR (K_{AVG}) (NOTE 1)
28 COMPRESSIBILITY (Z₂) OR (Z_{AVG}) (NOTE 1)
29
30 KW REQUIRED @ COMPRESSOR SHAFT(ALL LOSSES INCLUDED)
31 SPEED (RPM)
32 ESTIMATED SURGE, (m³/h) (AT SPEED ABOVE)
33 POLYTROPIC HEAD (Nm/kg)
34 POLYTROPIC EFFICIENCY (%)
35 CERTIFIED POINT
36 PERFORMANCE CURVE NUMBER

	OTHER CONDITIONS (3.1.2)				
	CASE7	CASE8	CASE9		
215970	208906	144909	136832	110316	100079
212944	200387	148691	134305	116640(*)	100458(*)
13	47,3	8	36,0	6,3	28,6
27,3	30	25,4	30	24,8	30
22,1	21,5	23,0	22	23,7	22,5
1,248	1280	1,236	1,269	1,23	1,260
0,956	0,855	0,97	0,884	0,975	0,903
17694	3071	19450	3781	18856	3208
47,7	139,8	36,3	139,5	28,9	110,0
130,1	131,8	142,3	160,4	139,9	159,0
1,213	1,232	1,197	1,215	1,191	1,211
0,95	0,918	0,962	0,942	0,966	0,938
12363	10872	9909	9697	7638	7218
8331	8331	8973	8973	8836	8836
13447	3411	16533	3015	16593	2978
162925	129649	187185	168948	183163	165740
79,8	66,9	79,1	65,7	78,8	0,65
X	X				

(*) Higher value than the requested due to short distance from expected surge line

PROCESS CONTROL

38 METHOD SUCTION THROTTLING VARIABLE INLET
39 FROM _____ (BAR) (kPa abs) GUIDE VANES
40 TO _____ (BAR) (kPa abs) (3.4.2.4)

SPEED VARIATION DISCHARGE COOLED BYPASS
FROM _____ % BLOWOFF FROM _____
TO 105 % TO _____ TO _____

42 SIGNAL SOURCE (3.4.2.1) _____
43 TYPE ELECTRONIC PNEUMATIC OTHER _____
44 RANGE _____ MA _____ (BAR) (kPa abs) _____

46 ANTI-SURGE BYPASS MANUAL AUTOMATIC NONE

48 REMARKS: _____
49 NOTE 1: IF GAS ANALYSIS IS GIVEN, MANUFACTURER SHALL SUPPLY DATA, OTHERWISE DATA SHALL BE SUPPLIED BY USER.

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PAGE 3 OF 6 BY RB

OPERATING CONDITIONS (Continued)

GAS ANALYSIS:								REMARKS:
<input type="radio"/> MOL % <input type="radio"/>		CASE1	CASE2	CASE3	CASE4	CASE5	CASE6	
1								
2								
3								
4								
5	H2O	0.217 / 0	0.309 / 0	0.465 / 0	0.581 / 0	0.156 / 0	0.21 / 0	
6	NITROGEN	0.777 / 0.783	0.786 / 0.795	0.81 / 0.824	0.839 / 0.855	0.737 / 0.738	0.701 / 0.708	
7	CARBON DIOXIDE	0.865 / 0.869	0.87 / 0.877	0.885 / 0.897	0.906 / 0.919	0.834 / 0.836	1.351 / 1.36	
8	METHANE	80.787 / 81.282	80.359 / 81.226	79.867 / 81.139	79.665 / 81.074	81.211 / 81.338	78.586 / 79.295	
9	ETHANE	8.683 / 8.698	8.647 / 8.68	8.573 / 8.641	8.509 / 8.601	8.734 / 8.748	9.167 / 9.178	
10	PROPANE	5.058 / 5.019	5.074 / 5.01	5.046 / 4.985	4.993 / 4.966	5.034 / 5.042	5.65 / 5.564	
11	I-BUTANE	0.619 / 0.605	0.631 / 0.607	0.635 / 0.606	0.628 / 0.603	0.599 / 0.6	0.714 / 0.686	
12	n-BUTANE	1.632 / 1.581	1.687 / 1.593	1.715 / 1.599	1.697 / 1.595	1.543 / 1.545	2.032 / 1.923	
13	I-PENTANE	0.394 / 0.367	0.437 / 0.382	0.474 / 0.398	0.477 / 0.405	0.343 / 0.344	0.467 / 0.415	
14	n-PENTANE	0.508 / 0.467	0.579 / 0.493	0.646 / 0.522	0.657 / 0.537	0.436 / 0.437	0.641 / 0.557	
15	n-HEXANE	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0.241 / 0.176	
16	C6+	0.26 / 0.203	0.348 / 0.216	0.479 / 0.252	0.551 / 0.29	0.213 / 0.213	0.111 / 0.076	
17	NAPHTA1	0.176 / 0.118	0.243 / 0.115	0.356 / 0.131	0.433 / 0.157	0.142 / 0.142	0.061 / 0.034	
18	NAPHTA2	0.022 / 0.009	0.03 / 0.006	0.047 / 0.006	0.061 / 0.008	0.016 / 0.016	0.004 / 0.001	
19	KEROSENE	0.001 / 0	0.001 / 0	0.002 / 0	0.003 / 0	0.001 / 0.001	0 / 0	
20	DR01						0.035 / 0.014	
21	PE01						0.027 / 0.014	
22								
23								
24								
25	TOTAL							
26								

27 LOCATION: (2.1.9)
28 INDOOR OUTDOOR GRADE
29 HEATED UNDER ROOF MEZZANINE
30 UNHEATED PARTIAL SIDES
31 ELEC. AREA CLASSIFICATION (2.1.15) CL GR DIV
32 WINTERIZATION REQ'D. (2.1.9) TROPICALIZATION REQ'D. (3.4.6.6)
33 SITE DATA
34 ELEVATION _____ m BAROMETER _____ PSIA
35 RANGE OF AMBIENT TEMPS:
36 DRY BULB WET BULB
37 NORMAL °C _____
38 MAXIMUM °C _____
39 MINIMUM °C _____
40 _____ °C _____
41 UNUSUAL CONDITIONS: DUST FUMES
42 _____ °C _____
43 OTHER (2.1.9) _____
44 _____
45 _____

46 REMARKS:
47 _____
48 _____
49 _____

NOISE SPECIFICATIONS: (2.1.10)
28 APPLICABLE TO MACHINE: 83 dBA @ 1 metre
29 SEE SPECIFICATION
30 APPLICABLE TO NEIGHBORHOOD:
31 SEE SPECIFICATION
32 ACOUSTIC HOUSING: YES NO
33 APPLICABLE SPECIFICATIONS:
34 API 617, CENTRIFUGAL COMPR. FOR GEN. REFINERY SERV.
35 VENDOR HAVING UNIT RESPONSIBILITY (2.9.1.7)
36 VIBRATIONS IN COMPLIANCE WITH API617 WITH NP STANDARD EXCEPTIONS
37 GOVERNING SPECIFICATION (IF DIFFERENT)

PAINTING:
38 MANUFACTURER'S STD.
39 OTHER _____

SHIPMENT: (4.4.1)
40 DOMESTIC EXPORT EXPORT BOXING REQ'D.
41 OUTDOOR STORAGE MORE THAN 6 MONTHS (4.4.1)
42 SPARE ROTOR ASSEMBLY PACKAGED FOR (4.4.3.10)
43 HORIZONTAL STORAGE VERTICAL STORAGE

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PAGE 3 OF 6 BY RB

OPERATING CONDITIONS (Continued)

GAS ANALYSIS:		CASE7	CASE8	CASE9	REMARKS:
<input type="radio"/> MOL % <input type="radio"/>					
	MW				
5	H2O	0.289 / 0	0.41 / 0	0.498 / 0	
6	NITROGEN	0.685 / 0.699	0.657 / 0.678	0.635 / 0.658	
7	CARBON DIOXIDE	1.494 / 1.513	1.802 / 1.841	2.099 / 2.157	
8	METHANE	77.309 / 78.599	75.028 / 77.117	73.236 / 75.69	
9	ETHANE	9.261 / 9.297	9.454 / 9.552	9.642 / 9.797	
10	PROPANE	5.869 / 5.722	6.255 / 6.06	6.558 / 6.382	
11	i-BUTANE	0.77 / 0.717	0.862 / 0.779	0.927 / 0.838	
12	n-BUTANE	2.272 / 2.056	2.69 / 2.329	2.995 / 2.585	
13	i-PENTANE	0.567 / 0.454	0.736 / 0.529	0.849 / 0.598	
14	n-PENTANE	0.811 / 0.622	1.106 / 0.746	1.313 / 0.862	
15	n-HEXANE	0.392 / 0.218	0.708 / 0.301	0.983 / 0.39	
16	C6+	0.118 / 0.059	0.089 / 0.032	0.038 / 0.013	
17	NAPHTA1	0.063 / 0.022	0.045 / 0.011	0.019 / 0.004	
18	NAPHTA2	0.004 / 0.001	0.003 / 0	0.001 / 0	
19	KEROSENE	0 / 0	0 / 0	0 / 0	
20	DR01	0.051 / 0.011	0.083 / 0.01	0.11 / 0.012	
21	PE01	0.042 / 0.012	0.071 / 0.013	0.096 / 0.016	
22					
23					
24					
25	TOTAL				
26	AVG. MOL. WT.				

27 LOCATION: (2.1.9)
28 INDOOR OUTDOOR GRADE
29 HEATED UNDER ROOF MEZZANINE
30 UNHEATED PARTIAL SIDES
31 ELEC. AREA CLASSIFICATION (2.1.15) CL GR DIV
32 WINTERIZATION REQ'D. (2.1.9) TROPICALIZATION REQ'D. (3.4.6.6)
33 SITE DATA
34 ELEVATION _____ m BAROMETER _____ PSIA
35 RANGE OF AMBIENT TEMPS:
36 DRY BULB WET BULB
37 NORMAL °C _____
38 MAXIMUM °C _____
39 MINIMUM °C _____
40 _____ °C _____
41 UNUSUAL CONDITIONS: DUST FUMES
42 _____ °C _____
43 OTHER (2.1.9) _____
44 _____
45 _____

NOISE SPECIFICATIONS: (2.1.10)
 APPLICABLE TO MACHINE: 83 dBA @ 1 metre
SEE SPECIFICATION
 APPLICABLE TO NEIGHBORHOOD:
SEE SPECIFICATION
ACOUSTIC HOUSING: YES NO
APPLICABLE SPECIFICATIONS:
API 617, CENTRIFUGAL COMPR. FOR GEN. REFINERY SERV.
 VENDOR HAVING UNIT RESPONSIBILITY (2.9.1.7)
VIBRATIONS IN COMPLIANCE WITH API617 WITH NP STANDARD EXCEPTIONS
 GOVERNING SPECIFICATION (IF DIFFERENT)
PAINTING:
 MANUFACTURER'S STD.
 OTHER _____
SHIPMENT: (4.4.1)
 DOMESTIC EXPORT EXPORT BOXING REQ'D.
OUTDOOR STORAGE MORE THAN 6 MONTHS (4.4.1)
SPARE ROTOR ASSEMBLY PACKAGED FOR (4.4.3.10)

46 REMARKS: _____
47 _____
48 _____