OWNER:	BUSHEHR PETROCHEMICAL COMPANY MEG PLANT							CONTRACTOR	
MC:	MECHANICAL DATA SHEET FOR EMERGENCY INSTRUMENT AIR COMPRESSOR (20-C-7080)								
	Project	Area	Phase	Unit	Dis.	Doc.	Seq.	Contract No : 52-98/445	
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MECHANICAL DATA SHEET FOR EMERGENCY INSTRUMENT AIR COMPRESSOR (20-C-7080)

Rev.	Date	Description	Prepared By	Checked By	Approved	AC code.
05	28-4-2022	Approved for Construction	KP	KP	JR	
04	6-4-2022	Approved for Construction	KP	KP	JR	
03	11-3-2022	Approved for Construction	KP	KP	JR	
02	9-12-2021	Approved for Construction	KP	KP	JR	
01	4-11-2021	for approval	KP	KP	JR	
00	12-8-2021	for approval	KP	KP	JR	

Class:1 | Phase: P

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LIST OF REVISED PAGES

REV / PAGES	00	01	02	03	04	05		REV / PAGES								REV / PAGES							
1	X	X	X	X				46								91							
2	X	X	X	X				47								92							
3	X	X	X	X				48								93							
4	X	X	X	X				49								94							
5	X	X	X	X				50								95							
6	X	X	X	X				51								96							
7	X	X	X	X				52								97							
8	X	X	X	X				53								98							
9	X	X	X	X				54								99							
10	X	X	X	X				55								100							
11	X	X	X	X				56								101							
12	X	X	X	X				57								102							
13	X	X	X	X				58								103							
14	X	X	X	X				59								104							
15	X	X	X	X	X			60								105							
16	X	X	X	X	X			61								106							
17	X	X	X	X				62								107							
18	X	X	X	X				63								108							
19	X	X	X	X				64								109							
20	X	X	X	X				65								110							
21								66								111							
22								67								112							
23								68								113							
24								69								114							
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26								71								116							
27								72								117							
28								73								118							
29								74								119							
30								75								120							
31								76								121							
32								77								122							
33								78								123							
34								79								124							
35								80								125							
36								81								126							
37								82								127							
38								83								128							
39								84								129							
40								85								130							
41								86								131							
42								87								132							
43								88								133							
44								89								134							
45								90								135							

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APPLICABLE TO: ● PROPOSALS ○ PURCHASE ○ AS BUILT

FOR/USER BUPC SITE/LOCATION ASSALUYEH SERVICE EMERGENCY INSTRUMENT AIR COMP NO. REQ'D ONE SET 1(STAGE)

NOTE: ○ INDICATES INFO. TO BE COMPLETED BY PURCH. ☐ BY MANUFACTURER WITH PROPOSAL ◇ BY MANUFACTURER AFTER ORDER ◯ BY MANUFACTURER OR PURCHASER AS APPLICABLE

COMPR. MFGR Airpack TYPE MODEL NO(S) SERIAL NO(S) TBD

COMPR.THROWS: TOTAL NO. 1 NO. WITH CYLS. 2 NOMINAL FRAME RATING 15 BkW @ RATED RPM OF 400

☐ MAX/MIN ALLOWABLE SPEED 690 / 400 RPM

DRIVER MFGR. WEG DRIVER NAMEPLATE kW/OPERATING RPM 15 kW / 3000

DRIVE SYSTEM: ○ DIRECT COUPLED ○ GEARED & COUPLED ● V-BELT

TYPE OF DRIVER: ● IND. MOTOR ○ SYN. MOTOR ○ STEAM TURBINE ○ GAS TURBINE ○ ENGINE ○ OTHER

NO NEGATIVE TOLERANCE APPLIES: ○ YES - PURCHASER TO FILL IN "REQUIRED CAPACITY" LINES. CYLINDERS: ○ LUBE

(NNT) ○ NO - PURCHASER TO FILL IN "MFGR.'S RATED CAP." LINES ● NON-LUBE

● MAX ACCEPTABLE AVG PISTON SPEED 3.5 m/s

OPERATING CONDITIONS (EACH MACHINE)

● OPERATING CASE	1								
● STAGE	1								
○ SIMULATION BASIS									
● NORM. OR ALT. CONDITION	Norm								
● CERTIFIED PT. (X) MARK ONE									
● MOLECULAR WEIGHT	29								
● Cp/Cv (K) @ 65°C OR °C	1.4								

INLET CONDITIONS: AT INLET TO: ● PULSE DEVICES ○ COMPRESSOR CYLINDER FLANGES

NOTE: ○ SIDE STREAM TO _____ STAGE(S), THESE INLET PRESS. ARE FIXED

● PRESSURE @ PUL. SUPP. INLET (bara)	8 (Min.:7, Max:8.5)							
◯ PRESSURE (Bara) @ CYL. FLANGE	8 (Min.:7, Max:8.5)							
● TEMPERATURE (°C)	AMB.(Min.:10 , Max.:45)							
○ INLET Cp/Cv	1.4							
■ COMPRESSIBILITY (Z_S)	1							

INTERSTAGE: INTERSTAGE Δ P INCL: ● PULSE DEVICES ● PIPING ● COOLERS ● SEPARATORS ○ OTHER

◯ Δ P BETWEEN STAGES, % / BAR	/	/	/	/	/	/	/

DISCHARGE CONDITIONS: AT OUTLET FROM: ● PULSE DEVICE ○ COMP. CYL. FLANGES ○ OTHER

◯ PRESSURE @ CYL. FLANGE (bara)	8 (Min.:7, Max:8.5)							
● PRESS. (bara) @ PUL. SUPP. OUTLET	21							
☐ TEMP., ADIABATIC, °C	180							
☐ TEMP., PREDICTED, °C	164							
☐ COMPRESSIBILITY (Z_2) OR (Z_{AVG})	0,04							

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

● kg/h CAPACITY SPECIFIED	55							
○ WET ● DRY								
○ m³ /h (760 mm HG & 0°C)	43							

*** MFGR.'S RATED CAPACITY** (AT INLET TO COMPRESSSOR) & kW @ CERTIFIED TOLERANCE OF ±3% FOR CAP. & ±3% FOR kW

◯ kg/h CAPACITY SPECIFIED	374							
○ WET ● DRY								
◯ INLET m³/h	173							
◯ Nm³/h	173							
☐ kW/STAGE	11							
◯ ABSORBED POWER ESTIMATED, kW	12							
☐ TOTAL kW INCLUDING	13							
V-BELT & GEAR LOSSES								

*** CAPACITY FOR NNT**

MANUFACTURER'S = REQUIRED ÷ 0.97

THEREFORE REQUIRED = MFR'S x 0.97

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GAS ANALYSIS AT OPERATING CONDITIONS
MOLE PERCENT

● SERVICE/ITEM NO.							
● STAGE							
○ NORMAL OR ALT							
	M.W.	NORMAL					
AIR	28.966	100					
NITROGEN	28.016						
WATER 'H2O	18.016						
CARBON MONOXIDE CO	28.010						
CARBON DIOXIDE CO2	44.010						
HYDROGEN H_2	2.016						
METHANE CH_4	16.042						
ETHANE	30.068						
PROPANE	44.094						
i-BUTANE	58,12						
n-BUTANE	58,12						
i-PENTANE	72,146						
OXYGEN O2	32.00						
HYDRO.SULFIDE	34,076						
ETHYLENE	28,052						
PROPYLENE	42,078						
n-PENTANE	72,146						
HEXANE PLUS							
AMMONIA	17,031						
HYDRO. CHLORIDE	36,461						
CHLORINE	70,914						
TOTAL:							
☐ CALCULATED MOL WT.		28,97					
☐ Cp/Cv (K) @ 65° OR Suction temperature °C		45					

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

REMARKS

APPLICABLE SPECIFICATIONS

● API-618-RECIPROCATING COMPRESSORS FOR PETROLEUM, CHEMICAL AND GAS INDUSTRY SERVICES

● Doc. No. 1216-DE-00-RE-MSS-302

SITE CONDITION (SEE PROJECT SITE CONDITION FOR MORE DETAIL)

ELEVATION 8,5 m BAROMETER 1,013 (BARA) AMBIENT TEMPS: MAX 55 °C MIN 5 °C

○ MIN DESIGN METAL TEMP 5 °C (2.14.8) RELATIVE HUMIDITY: MAX 76% MIN 74% %

COMPRESSOR LOCATION: ○ INDOOR HEATED ● UNHEATED ● AT GRADE LEVEL ○ ELEVATED: M

● OUTDOOR NO ROOF ● UNDER ROOF ○ PARTIAL SIDES ○ PLATFORM: ● ON-SHORE

○ OFF-SHORE ● WEATHER PROTECTION REQ. ● TROPICALIZATION REQ.

○ WINTERIZATION REQUIRED

UNUSUAL CONDITIONS: ○ CORROSIVES ● DUST ● FUMES ● OTHER Sand storm , Thunder & Lightening, Sea Breeze

ELECTRICAL CLASSIFICATIONS

	HAZARDOUS						NON-HAZRDOUS
MAIN UNIT	● ZONE	2	GROUP	IIB	TEMP CLASS	T3	○
L.O. CONSOLE	● ZONE	2	GROUP	IIB	TEMP CLASS	T3	○
CW CONSOLE	○ ZONE		GROUP		TEMP CLASS		○

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PART LOAD OPERATING CONDITIONS

CAPACITY CONTROL BY: ● MFG'S CAP. CONTROL ○ PURCHASERS BY-PASS ○ BOTH ○ OTHER _____

FOR: ○ PART LOAD COND. ○ START-UP ONLY ○ BOTH

WITH: ● AUTO LOADING DELAY INTERLOCK ● AUTO IMMEDIATE UNLOADING

USING: ○ FIXED VOLUME POCK. ● SUCTION VALVE UNLOADERS: ○ FINGER ● PLUG ○ OTHER

ACTION: ○ DIRECT (AIR-TO-UNLOAD) ● REVERSE (AIR-TO-LOAD/FAIL SAFE)

NUMBER OF STEPS: ● ONE ○ THREE ○ FIVE ○ OTHER _____

○ RAIN COVER REQUIRED OVER UNLOADERS

ALL UNLOADING STEPS BASIS MANUFACTURERS CAPACITY SHOWN ON PAGE 1.

INLET AND DISCHARGE PRESSURE ARE ○ **AT CYLINDER FLANGES** ● **PULSATION SUPPRESSOR FLANGES**

○ SERVICE OR ITEM NO.							
○ STAGE	1						
○ NORMAL OR ALTERNATE CONDITION	Normal						
○ PERCENT CAPACITY	100						
○ WEIGHT FLOW, kg/h	223						
○ m^3 /h (760 mm HG & 0°C)	173						
POCKETS/VALVES OPERATION *	Valves						
POCKET CLEARANCE ADDED %	NA						
TYPE UNLOADERS, PLUG/FINGER	Plug						
○ INLET TEMPERATURE, °C	45						
○ INLET PRESSURE, (BARA)	8 (Min.:7, Max:8.5)						
○ DISCHARGE PRESSURE, (BARA)	21,5						
DISCHARGE TEMP., ADIABATIC °C	180						
DISCHARGE TEMP., PREDICTED °C	164						
VOLUMETRIC EFF.,%HE/%CE(AVER)	75	/	/	/	/	/	
CALC. GAS ROD LOAD, kN, C **	11,06						
CALC. GAS ROD LOAD, kN, T **	0,36						
◇ COMB. ROD LOAD, kN C (GAS & INERTIA)	10,83						
◇ COMB. ROD LOAD, kN T (GAS & INERTIA)	0,2						
◇ ROD REV., DEGREES MIN @ X-HD PIN ***	195						
BkW/STAGE	12						
TOTAL kW @ COMPRESSOR SHAFT	12						
TOTAL kW INCL. V-BELT & GEAR LOSSES	13						

* SHOW OPERATION WITH THE FOLLOWING SYMBOLS:

HEAD END = HE
OR
CRANK END = CE
PLUS
SUCTION VALVE(S) UNLOADED = S
OR
FIXED POCKET OPEN = F
OR
VARIABLE POCKET OPEN = V

* * C = COMPRESSION T = TENSION *** X - HD = CROSSHEAD

☐ MINIMUM PRESSURE REQUIRED TO OPERATE CYLINDER UNLOADING DEVICES, 6 _____ (BARG)

CYLINDER UNLOADING MEDIUM: ● AIR ○ NITROGEN ○ OTHER _____

● PRESSURE AVAILABLE FOR CYLINDER UNLOADING DEVICES, MAX/MIN 8,0 / 6,0 (BARG)

SPECIAL REMARK:

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1 ● SCOPE OF BASIC SUPPLY

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

3 ● DRIVER (■ ○ ⬡): VARIABLE SPEED SPEED RANGE NOT APPLICABLE RPM TO NOT APPLICABLE RPM

4 ● INDUCTION MOTOR ○ SYNCHRONOUS MOTOR ○ STEAM TURBINE ○ ENGINE ○ OTHER _____

5 ○ API-541 ○ API-546 ○ API-611 ○ API-612

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 Local power distribution board

9 ○ GEAR (□ ○ ⬡): ○ BASEPLATE FOR GEAR ○ API-613 ○ API-677

10 ○ COUPLING(S) (□ ○ ⬡): ● LOW SPD. ○ HI-SPD. ○ QUILL SHAFT ○ KEY-LESS DRV. ○ KEY'D DRV. ○ OTHER _____

11 ○ API 671

12 ○ V-BELT DRIVE (■ ○ ⬡): ○ SHEAVES & V-BELTS (□ ○ ⬡) ○ STATIC CONDUCTING V-BELTS ○ BANDED V-BELTS

13 ● DRIVE GUARD(S) (■ ○ ⬡): ● MANUFACTURER'S STD. ● NON-SPARKING ○ CALIF CODE ○ API-671 APPENDIX C

14 ○ OTHER _____

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 ○ SUPPRESSOR(S) TO HAVE MOISTURE REMOVAL SECTION: ○ INITIAL INLET ONLY ○ ALL INLET SUPPRESSORS

20 ● ACOUSTICAL SIMUL. STUDY (■ ○ ⬡): DESIGN APPROACH ● 1, EMPRICAL PULSATION SUPPRESSION DEVICE SIZING

21 ■ DIGITAL ◯ ANALOG ○ 2, ACOUSTIC SIMULATION AND PIPING RESTRAINT ANALYSIS

22 ○ 3, ACOUSTIC SIMULATION AND PIPING RESTRAINT ANALYSIS PLUS MECHANICAL ANALYSIS

23 STUDY TO CONSIDER: ALL SPECIFIED LOAD COND., INCL. ● SINGLE ACT., PLUS

24 ○ COMP.OPER.IN PARALLEL ○ ALTERNATE GASES

25 ○ WITH EXISTING COMP. AND PIPING SYSTEMS

26 ○ STUDY TO BE WITNESSED ○ COMPRESSOR VALVE DYNAMIC RESPONSE

27 ● VENDOR REVIEW OF PURCHASER'S PIPING ARRANGEMENT ○ PULSATION SUPPRESSEN DEVICE LOW CYCLE FATIGUE ANALYSIS

28 ○ PIPING SYSTEM FLEXIBILITY

29 PACKAGED: ○ NO ● YES (■ ○ ⬡) DEFINE BASIC SCOPE OF PACKAGING IN REMARKS SECTION .

30 ● SKID ● SOLEPLT. ● BASEPLT. ● BOLTS OR STUDS FOR SOLEPLT. TO FRAME ○ RAILS ○ CHOKE BLOCKS ○ SHIMS

31 ○ SUITABLE FOR COLUMN MOUNTING (UNDER SKID AND/OR BASEPLATE)

32 ● LEVELING SCREWS ○ NON-SKID DECKING ○ SUB SOLEPLATES

33 ● DIRECT GROUTED ● CEMENTED/MORTAR GROUT ○ EPOXY GROUT; MFG/TYPE _____ / _____

34 ○ INTERCOOLER(S) (□ ○ ⬡) ○ SEPARATOR(S) (□ ○ ⬡) ○ AFTERCOOLER(S) (■ ○ ⬡)

35 **INTERCOOLERS:**

36 ○ INTERSTAGE PIPE (□ ○ ⬡) ○ PIPING MATCHMARKED ○ SHOP FITTED ○ MACHINE MTD.

37 ○ CONDENSATE SEPARATION & COLLECTION FACILITY SYSTEM PER 3.8.12 ○ OFF MOUNTED

38 ● INLET STRAINER(S) (■ ○ ⬡): ● INITIAL INLET ○ SIDESTREAM INLET ○ SPOOL PIECE FOR INLET STRAINERS

39 ● MANIFOLD PIPING; ○ DRAINS ○ VENTS ● RELIEF VALVES ● AIR/GAS SUPPLY ○ FLANGE FINISH

40 ● RELIEF VALVE(S) (■ ○ ⬡): ○ INITIAL INLET ○ INTERSTAGE ● FINAL DISCHARGE ○ API-618 FLANGE FINISH

41 ○ RUPTURE DISC(S) (□ ○ ⬡) ○ THRU STUDS IN PIPING FLANGES

42 ○ CRANKCASE RAPID PRESSURE RELIEF DEVICE(S) (□ ○ ⬡) ● FLANGE FINISH PER ANSI 16.5

43 ○ SPECIAL PIPING REQUIREMENTS ○ SPECIAL FINISH _____

44 ○ INITIAL INLET, ○ INTERSTAGE SUCTION PIPING ARR'D FOR: INSULATION (PP) (■ ○ ⬡) HEAT TRACING (□ ○ ⬡)

45 ○ FOR ATMOSPHERIC INLET AIR COMPR. ONLY: ○ INLET AIR FILTER (□ ○ ⬡) ○ INLET FILTER -SILENCER (□ ○ ⬡)

46 ● PREFERRED TYPE OF CYLINDER COOLING (■ ○ ⬡): ● FORCED ○ THERMOSYPHON _____ STAGE CYL'(S)

47 ○ STATIC (STAND-PIPE) _____ STAGE CYL'(S)

48 NOTE: MANUFACTURER SHALL RECOMMENDBEST TYPE OF COOLING AFTERFINAL ENGINEERING ● CYL. COOLING WATER PIPING (■ ○ ⬡) ○ MATCH M'RKED

49 REVIEW OF ALLOPERATING CONDITIONS ● SINGLE INLET/OUTLET MANIFOLD & VALVES ● SIGHT GL'SS(S)

50 ● INDIVIDUAL INLET/ OUTLET PER CYL. ● VALVE(S)

51 ○ CLOSED SYS. WITH WATER PUMP, COOLER, SURGE TANK, & PIPING

52 ○ SHOP RUN ○ ARR'D FOR HEATING JACKET AS WELL AS COOLING

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SCOPE OF BASIC SUPPLY (Con't)

○ SEPARATE COOLING CONSOLE (□ ○ ⬡): ○ ONE FOR EA. UNIT ○ ONE CMMN TO ALL UNITS ○ DUAL PUMPS (AUX .& MAIN)
○ ARRANGED FOR HEATING JACKET WATER AS WELL AS COOLING
○ ROD PRESS. PACKING COOLING SYSTEM (□ ○ ⬡) ○ SEPARATE CONSOLE ○ COMBINE WITH JKT SYSTEM ○ FILTERS
● FRAME LUBE OIL SYSTEM (■ ○ ⬡): ○ AUX. PUMP ○ DUAL FILTERS WITH TRANSFER VALVE ○ SHOP RUN
○ CONTINUOUS FLOW IN SENSING LINE TO PRESSURE SWITCHES
○ SEPARATE LUBE OIL CONSOLE (□ ○ ⬡): ○ EXTENDED TO MOTOR OUTBOARD BEARING ○ SHOP RUN
API 614 APPLIES ○ NO ○ YES
NOTE: PIPING BETWEEN ALL CONSOLES AND COMPRESSOR UNIT BY PURCHASER

● CAPACITY CONTROL (■ ○ ⬡): ○ SEE DATA SHEET PAGE 5 FOR DETAILS ● INSTRUMENT & CONTROL PANEL
○ 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)

○ BUFFER GAS CONTROL PANEL (□ ○ ⬡)= ○ ONE FOR EACH UNIT ○ ONE COMMON TO ALL UNITS
○ MACHINE MOUNTED ○ FREE STANDING (OFF UNIT)

SEE INSTRUMENTATION DATA SHEETS 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 ● MFG'S STANDARD ○ OTHER **Approved test procedure**
○ COMPLETE SHOP RUN TEST OF ALL MACHINE MOUNTED EQUIPMENT, PIPING & APPURT.'(S)

PAINTING: ● MANUFACTURER'S STANDARD ○ SPECIAL Project specification for color
NAMEPLATES: ○ U.S. CUSTOMARY UNITS ● SI UNITS
SHIPMENT: ○ DOMESTIC ○ EXPORT ● EXPORT BOXING REQUIRED (■ ○ ⬡)
○ STANDARD 6 MONTH STORAGE PREPARATION (□ ○ ⬡), PER SPEC _____
● OUTDOOR STORAGE FOR OVER 12 MONTHS (■ ○ ⬡), PER SPEC _____
○ INITIAL INSTALLATION AND OPERATING TEMP ALIGNMENT CHECK AT JOBSITE BY VENDOR REPRESENTATIVE

○ COMPRESSOR MANUFACTURER'S USER'S LIST FOR SIMILAR SERVICE
● PERFORMANCE DATA REQUIRED PER 9.3.3: ○ BkW VS. SUCTION PRESSURE CURVES
○ ROD LOAD/GAS LOAD CHARTS
○ VALVE FAILURE DATA CHARTED
● SPEED/TORQUE CURVE DATA
○ BkW VS. CAPACITY PERFORMANCE CURVES OR TABLES REQUIRED FOR UNLOADING STEPS AND/OR VARIABLE SUCTION/DISCHARGE PRESSURES

OWNER: شرکت پتروشیمی بوشهر BUPC

CONTRACTOR: Chagalesh-Enerchimi-Steam Joint Venture BUPC-MEG PLANT PROJECT — Airpack

MC:

BUSHEHR PETROCHEMICAL COMPANY
MEG PLANT

MECHANICAL DATA SHEET FOR EMERGENCY INSTRUMENT AIR COMPRESSOR (20-C-7080)

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17811-11G

UTILITY CONDITIONS

ELECTRICAL POWER:	AC VOLTS	/ PHASE	/ HERTZ	DC VOLTS		AC VOLTS	/ PHASE	/ HERTZ	DC VOLTS
● MAIN DRIVER	400	/ 3	/ 50		INSTRUMENT	110	/ 1	/ 50	/ 24
● AUXILIARY MOTORS	400	/ 3	/ 50		ALARM & SHTDWN		/	/ 50	/ 24
● HEATERS	Below 0.2 Kw : 230	1	50		SOLENOID VALVES			50	24

INSTRUMENT AIR: NORMAL PRESSURE **6** barg MAX/MIN 7,0 / 9,0 barg

STEAM FOR: DRIVERS

INLET: PRESS	(BARG) (kPa)	MAX/MIN	/	(BARG) (kPa)	
(NORM.) TEMP	°C	MAX/MIN	/	°C	
EXH'ST: PRESS	(BARG) (kPa)	MAX/MIN	/	(BARG) (kPa)	
(NORM.) TEMP	°C	MAX/MIN	/	°C	

HEATERS

INLET: PRESS	(BARG) (kPa)	MAX/MIN	/	(BARG) (kPa)	
(NORM.) TEMP	°C	MAX/MIN	/	°C	
EXH'ST: PRESS	(BARG) (kPa)	MAX/MIN	/	(BARG) (kPa)	
(NORM.) TEMP	°C	MAX/MIN	/	°C	

COOLING WATER FOR: **COMPRESSOR CYLINDERS**

TYPE WATER					
SUPPLY PRESS	5,5 (BARA)	MAX/MIN	5,5 / 5,5	(BARA)	
(NORM.) TEMP	35 °C	MAX/MIN	35 / 35	°C	
RETURN: PRESS	2,5 (BARG)	MAX/MIN	2,5 / 2,5	(BARG)	
(NORM.) TEMP	45 °C	MAX/MIN	45 / 45	°C	

COOLERS

TYPE WATER					
SUPP.: PRESS	5,5 (BARG	MAX/MIN	5,5 / 5,5	(BARG)	
(NORM.) TEMP	35 °C	MAX/MIN	35 / 35	°C	
R'T'RN: PRESS	1,5 (BARG)	MAX/MIN	2,5 / 2,5	(BARG)	
(NORM.) TEMP	45 °C	MAX/MIN	45 / 45	°C	

COOLING FOR ROD PACKING:

TYPE FLUID _____ SUPPLY PRESS _____ (BARG) @ _____ °C RETURN _____ @ _____ °C

FUEL GAS: NORMAL PRESSURE _____ (BARG) (kPa) MAX/MIN _____ / _____ (BARG) (kPa) LHV _____ MJ/m³

COMPOSITION _____

REMARKS/SPECIAL REQUIREMENTS:

OWNER:

CONTRACTOR:

Chagalesh-Enerchimi-Steam Joint Venture
BUPC-MEG PLANT PROJECT

MC:

BUSHEHR PETROCHEMICAL COMPANY
MEG PLANT

MECHANICAL DATA SHEET FOR EMERGENCY INSTRUMENT AIR COMPRESSOR (20-C-7080)

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CYLINDER DATA AT FULL LOAD CONDITION

1	SERVICE/ITEM NO.	Air					
2	STAGE	1					
3	INLET PRESSURE, (BARA) @ CYLINDER	8,0					
4	DISCHARGE PRESSURE, (BARA FLANGES	21,0					
5	CYLINDERS PER STAGE	2					
6	SINGLE OR DOUBLE ACTING (SA OR DA)	SA					
7	BORE, mm	90					
8	STROKE, mm	140					
9	RPM: RATED / MAX ALLOW	400/690					
10	PISTON SPEED, m/s: RATED / MAX ALLOW	<3,5					
11	CYLINDER LINER, YES/NO	yes					
12	LINER NOMINAL THICKNESS, mm	12,5					
13	PISTON DISPLACEMENT, m³/h	36,9					
14	CYLINDER DESIGN CLEARANCE, % AVERAGE						
15	VOLUMETRIC EFFICIENCY, % AVERAGE	73					
16	VALVES, INLET/DISCHARGE, QTY PER CYL.	1/1		/	/	/	/
17	TYPE OF VALVES	plate					
18	VALVE LIFT, INLET/DISCHARGE, mm	0,8 / 0,8	/	/	/	/	/
19	VALVE VELOCITY, API 4TH EDITION, m/s	19,9					
20	SUCTION VALVE(S)	16,65					
21	DISCHARGE VALVE(S)	16,65					
22	ROD DIAMETER, (mm)	30					
23	MAX ALLOW. COMBINED ROD LOADING, kN, C *	17,5					
24	MAX ALLOW. COMBINED ROD LOADING, kN, T *	17,5					
25	CALCULATED GAS ROD LOAD, kN, C *	11,06					
26	CALCULATED GAS ROD LOAD, kN, T *	0,36					
27	COMBINED ROD LOAD (GAS + INERTIA), kN, C *	10,83					
28	COMBINED ROD LOAD (GAS + INERTIA), kN, T *	0,20					
29	ROD REV., DEGREES MIN @ X-HD PIN**	195,00					
30	RECIP WT. (PISTON, ROD, X-HD & NUTS), kg**	10,74					
31	MAX ALLOW. WORKING PRESSURE, (BARG)	24					
32	MAX ALLOW. WORKING TEMPERATURE, °C	230					
33	HYDROSTATIC TEST PRESSURE, (BARG)	36					
34	HELIUM TEST PRESSURE, (BARG)	3					
35	INLET FLANGE SIZE/RATING at CYLINDER	150#	/	/	/	/	/
36	FACING at CYLINDER	RF					
37	DISCHARGE FLANGE SIZE/RATING at CYLINDER	300#	/	/	/	/	/
38	FACING at CYLINDER	RF					
39	DISCHARGE RELIEF VALVE SETTING DATA AT INLET PRESSURES GIVEN ABOVE:						
40	RECOMMENDED SETTING, (BARG)	~25					
41	GAS ROD LOAD, kN, C *	17,5					
42	GAS ROD LOAD, kN, T *	17,5					
43	COMBINED ROD LOAD, kN, C *	13,13					
44	COMBINED ROD LOAD, kN, T *	12,6					
45	ROD REVERSAL, °MIN @ X-HD PIN**	195					
46	NOTE: CALCULATED AT INLET PRESSURES						
47	GIVEN ABOVE & RECOMMENDED SETTING.						
48	SETTLE-OUT GAS PRESSURE	8,5 - 9,5					
49	(DATA REQUIRED FOR STARTING)						

* C = COMPRESSION * T = TENSION **X-HD = CROSSHEAD

NOTES/REMARKS:

OWNER:	BUSHEHR PETROCHEMICAL COMPANY MEG PLANT	CONTRACTOR:
MC:	MECHANICAL DATA SHEET FOR EMERGENCY INSTRUMENT AIR COMPRESSOR (20-C-7080)	

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	◯ CONSTRUCTION FEATURES						
SERVICE ITEM NO.							
STAGE	1						
CYLINDER SIZE (BORE DIA), mm	90						
ROD RUN-OUT: NORMAL COLD VERTICAL (per appendix C)							
	MATERIALS OF CONSTRUCTION						
CYLINDER(S)	DUCTILE CAST IRON						
CYLINDER LINER(S)	EN-GJL-250 (SLG)						
PISTON(S)	AlCu4PbMgMn T3						
PISTON RINGS	PTFE compound						
WEAR BANDS ◯ REQUIRED							
PISTON ROD(S): MATERIAL/YIELD, N/mm²	1.2316 (X36CrMo17QT)	>447					
THREAD ROOT STRESS @ MACRL * @ X-HD END							
PISTON ROD HARDNESS, BASE MATERIAL, Rc	49 HRC						
PISTON ROD COATING ◯ REQUIRED	plasma nitrided to = 1000 HV1						
COATING HARDNESS, Rc							
VALVE SEATS / SEAT PLATE	SS/SS						
VALVE SEAT MIN HARDNESS, Rc							
VALVE GUARDS (STOPS)	SS316						
VALVE DISCS	SS316						
VALVE SPRINGS	SS316						
ROD PRESSURE PACKING RINGS	NBR, 70-ShA						
ROD PRESSURE PACKING CASE	Niro (1.4305)						
ROD PRESSURE PACKING SPRINGS	-						
SEAL / BUFFER PACKING, DISTANCE PIECE	SK703 E (polymer)						
SEAL / BUFFER PACKING, INTERMEDIATE	SK703 E (polymer)						
WIPER PACKING RINGS	SK703 E (polymer)						
MAIN JOURNAL BEARINGS, CRANKSHAFT	-						
CONNECTING ROD BEARING, CRANKPIN	-						
CONNECTING ROD BUSHING, X-HD END	G-Cu Sn 12						
CROSSHEAD (X-HD) PIN BUSHING	-						
CROSSHEAD PIN	17Cr3 (1.7016)						
CROSSHEAD	EN-GJS-400-15						
CROSSHEAD SHOES	EN-GJS-400-15						
CYLINDER INDICATOR VALVES (**X**)							
INDICATOR CONNECTIONS ABOVE 5000 PSI							
FLUOROCARBON SPRAYED CYLINDER (**X**)							
INSTRUMENTATION IN (**X**) COLD SIDE							
CONTACT W/PROCESS GAS (**X**) HOT SIDE							

* MAXIMUM ALLOWABLE COMBINED ROD LOAD

USE (**X**) IN APPROPRIATE COLUMN WHERE APPLICABLE

● COMPRESSOR CYLINDER ROD PACKING
- ● FULL FLOATING PACKING
- ● VENTED TO: ◯ FLARE @ ____ ● ATM
  - ◯ SUCTION PRESSURE @ ____ (BARG)
- ◯ FORCED LUBRICATED ● NON-LUBE ◯ TFE
- ◯ WATER COOLED, ____ STAGE(S), ____ m³/h REQ'D
- ◯ OIL COOLED, ____ STAGE(S), ____ m³/h REQ'D
- ◯ WATER FILTER PROV.FUTURE WATER/OIL COOLING
- ◯ VENT/BUFFER GAS SEAL PACKING ARR. (Ref: Appndx I FIG I-1)
  - ◯ CONSTANT OR ◯ VARIABLE DISPOSAL SYSTEM
  - ◯ BUFFER GAS PRESSURE, ____ (BARG)
- ◯ SPLASH GUARDS FOR WIPER PACKING

DISTANCE PIECE(S): ◯ TYPE A ● TYPE B ◯ TYPE C ◯ TYPE D
Ref: Appendix G, Fig. G-3

COVERS: ● SOLID METAL ◯ SCREEN ◯ LOUVERED

CYLINDER COMPARTMENT: (Outboard Distance Piece)
- ● VENTED TO amb (BARG)
- ◯ PURGED AT ____ (BARG)
- ◯ PRESSURIZED TO ____ (BARG)
- ◯ WITH RELIEF VALVE

FRAME COMPARTMENT: (Inboard Distance Piece)
- ◯ VENTED TO ____ (BARG)
- ◯ PURGED AT ____ (BARG)
- ◯ PRESSURIZED TO ____ (BARG)
- ◯ WITH RELIEF VALVE

☐ DISTANCE PIECE MAWP 0 (BARG)

OWNER:	BUSHEHR PETROCHEMICAL COMPANY MEG PLANT	CONTRACTOR: Chagalesh-Enerchimi-Steam Joint Venture BUPC-MEG PLANT PROJECT
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○ CONSTRUCTION FEATURES (CONTINUED)

○ FABRICATED CYLINDER, HEADS, & CONNECTION SKETCHES FOR DESIGN REVIEW BY PURCHASER.

○ COUPLING(S)

	○ LOW-SPEED Between Compressor & Driver or Gear	○ HI-SPEED Between Driver & Gear
◆ BY MANUFACTURER		
◆ MODEL		
◆ TYPE		

API-671 APPLIES ● YES ○ NO

○ INSPECTION AND SHOP TESTS

	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 H_2O CONSOLE RUN/TEST	●	○	●
RADIOGRAPHY BUTT WELDS ○ GAS ○ OIL ○ FAB CYLS.	○	○	○
MAG PARTICLE/LIQUID PENETRANT OF WELDS SPECIFY ADDITIONAL REQUIREMENTS (4.2.1.3)	○	○	○
	○	○	○
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	●	●	
SOUND LEVEL TEST	●	○	○
DISMANTLING INSPECTION	○	○	○

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

APPENDIX K COMPLIANCE: ○ VENDOR ○ PURCHASER

NOTE: - INSPECTION AND TESTING SHALL BE AS PER SCOPE OF APPROVED ITP

○ BUFFER GAS PACKING ARR. — Ref: Appendix I Figures I-1, I-2 &I-3

○ OIL WIPER PACKING PURGE

○ INTERMEDIATE PARTITION PURGE

INERT BUFFER PURGE GAS: ○ N_2 ○ OTHER ______

● VENT, DRAIN, PURGE PIPING BY MFG'R ○ NO ● YES

■ V-BELT DRIVE

	DRIVEN SHEAVE (Compressor Shaft)	DRIVE SHEAVE (Driver Shaft)
RPM (EXPECTED)	400	1475
PITCH DIA. (Inches)		
◆ QTY & GROOVE X-SEC.	4	
POWER TRANSMITT'D	13	15 Incl. Belt Losses

DRIVER NAMEPLATE HP RATING ______

◇ CENTER DISTANCE (INCHES) ______

◇ QTY, TYPE, X-SEC., & LENGTH BELTS ______

◇ BELT SERVICE FACTOR (RELATIVE TO DRIVER NAMEPLATE HP RATING) ______

○ 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 ______

◇ LUBRICATOR MFR ______

◇ MODEL ______

TYPE LUBRICATOR: (2.13) ○ SINGLE PLUNGER PER POINT ○ DIVIDER BLOCKS ______

◇ COMPARTM'T, TOTAL QTY. ______

◇ PLUNGERS (PUMPS), TOTAL QTY. ______

◇ SPARE PLUNGERS, QTY. ______

◇ SPARE COMPARTM'T W/OUT PLUNGERS ______

○ HEATERS: ○ ELECTRIC W/THERM.(S) ○ STEAM

□ ESTIMATED WEIGHTS AND NOMINAL DIMENSIONS

□ TOTAL COMPR. WT, LESS DRIVER & GEAR		kg
◆ WT, OF COMPLETE UNIT, (LESS CONSOLES)	3200	kg
◇ MAXIMUM ERECTION WEIGHT		kg
◆ MAXIMUM MAINTENANCE WEIGHT	211	kg
◆ DRIVER WEIGHT/GEAR WEIGHT	/ 211	kg
◇ LUBE OIL/COOLING H_2O CONS.	/	kg
◇ FREE STANDING PANEL		

SPACE REQUIREMENTS-mm:	LENGTH	WIDTH	HEIGHT
◇ COMPLETE UNIT			
◇ LUBE OIL CONSOLE			
◇ COOLING H_2O CONSOLE			
◇ FREE STANDING PANEL			
□ PISTON ROD REMOVAL DIST.			

OTHER EQUIPMENT SHIPPED LOOSE (DEFINE)

◇ PULSATION SUPP., WEIGHT	70	kg
◇ PIPING	50	kg
◇ INTERSTAGE EQUIPMENT		kg

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UTILITY CONSUMPTION

ELECTRIC MOTORS

	NAMEPLATE HP (kW)	LOCKED ROTOR AMPS	FULL LOAD AMPS	
◆ MAIN DRIVER	15	239	28,5	
◇ MAIN LUBE OIL PUMP				
◇ AUX LUBE OIL PUMP				
◇ MAIN COOLING WATER PUMP				
◇ AUX COOLING WATER PUMP				
◇ ROD PACKING COOLING PUMP				
◇ CYLINDER LUBRICATOR				

ELECTRIC HEATERS

	WATTS	VOLTS	HERTZ
◆ FRAME OIL HEATER(S)	75	230	50
◇ COOLING WATER HEATER(S)			
◇ CYL. LUBRICATOR HEATER(S)			
◇ MAIN DRIVER SPACE HEATER(S)			

STEAM-NOT APPLICABLE

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

COOLING WATER REQUIREMENTS-(NOTE 9)

	FLOW m³/h	INLET TEMP °C	OUTLET TEMP °C	INLET PRESS (BARG)	OUTLET PRESS (BARG)	MAX PRESS (BARG)
☐ CYLINDER JACKETS						
◆ INTERCOOLER(S)	1,7	35	45	4,5	3,5	6
◇ AFTERCOOLER						
◇ FRAME LUBE OIL COOLER						
◇ ROD PRESSURE PACKING*						
◆ CYLINDER COOLANT CONSOLE	0,90	35	45	4,5	3,5	6
◆ TOTAL QUANTITY, m³/h	2,6					

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FRAME LUBE OIL SYSTEM

BASIC LUBE OIL SYSTEM FOR FRAME: ● SPLASH (TBA) ○ PRESSURE (FORCED) ● HEATERS REQUIRED:

☐ REF: TYPE MAIN BEARINGS: ○ TAPERD ROLLER ○ PRECISION SLEEVE ● ELEC. W/THERMOSTAT(S) ○ STEAM

PRESSURE SYSTEM: ● MAIN OIL PUMP DRIVEN BY: ● COMP. CRANKSHAFT ○ ELEC. MOTOR ○ OTHER _____

☐ PSV FOR MAIN PUMP EXTERNAL TO CRANKCASE _____

○ AUX OIL PUMP DRIVEN BY: ○ ELEC. MOTOR ○ OTHER _____

☐ HAND OPERATED PRE-LUBE PUMP FOR STARTING ● OPERATIONAL TEST & 4 HOUR MECH RUN TEST

○ API-614 LUBE SYSTEM: ○ NO ○ YES ○ CHECK VALVE ON MAIN PUMP

○ CONTINUOUS FLOW THROUGH OIL (7.7.2.5)

○ **SEP. CONSOLE FOR PRESS. LUBE SYS:** ○ ONE CONSOLE FOR EA. COMP. ○ ONE CONSOLE FOR _____ COMPRESSORS

○ CONSOLE TO BE OF DECK PLATE TYPE CONSTRUCTION SUITABLE FOR MULTI-POINT SUPPORT AND GROUTING WITH GROUT & VENT HOLES.

○ ELECTRICAL CLASSIFICATION : ZONE 2 , GROUP IIB CLASS _____ T3 ○ NON-HAZARDOUS

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

■ LUBE OIL	FLOW m³/h	PRESSURE (BARG)	VISCOSITY cst @ 40°C	VISCOSITY cst @ 100°C	SUMP VOLUME m³
☐ COMPRESSOR FRAME					
◇ DRIVER					
◇ GEAR					

☐ SYSTEM PRESSURES: ☐ DESIGN _____ (BARG) ☐ HYDROTEST _____ (BARG)

☐ PRESSURE CONTROL VALVE SETTING VTS _____ (BARG) ☐ PUMP RELIEF VALVE(S) SET _____ (BAR

PIPING MATERIALS:

	CARBON STEEL	STAINLESS STEEL WITH SS FLANGES	STAINLESS STEEL WITH CARBON STEEL FLANGES
● UPSTREAM OF PUMPS & FILTERS	●	○	○
● DOWNSTREAM OF FILTERS	●	○	○
○ _____	○	○	○
○ _____	○	○	○

☐ PUMPS	◆ RATED FLOW	◆ PRESSURE (BARG)	◆ COLD START REQ'D kW	◆ DRIVER kW	◆ SPEED RPM	COUPLING REQ'D	MECH. SEAL REQ'D
MAIN	NA	2,0	NA	SHAFT DRIVEN	NA	○	○
AUXILIARY						○	○

■ PUMP CASING MATERIAL MAIN PUMP STEEL AUX PUMP _____

○ GUARD(S) REQ. FOR COUPLING(S): ○ MAIN PUMP ○ AUX PUMP ○ GUARD TYPE OR CODE _____

○ AUXILIARY PUMP CONTROL: ○ MANUAL ○ AUTOMATIC ○ ON-OFF-AUTO SEL. SWITCH: ○ BY PURCH. ○ BY MFR.

○ WIRING TO TERMINAL BOX: ○ BY PURCH. ○ BY MFR.

○ SWITCHES ○ RTD'S/THERMOCOUPLES

○ **COOLERS:** ○ SHELL & TUBE ○ SINGLE ○ DUAL W/TRANSFER VALVE ○ MFG'S STD. ○ TEMA C ○ TEMA R

○ REMOVABLE BUNDLE ○ WATER COOLED ○ AIR COOLED W/AUTO TEMP CONTROL

○ W/BYPASS & TEMP CONTROL VALVE: ○ MANUAL ○ AUTO ○ SEE SEPARATE HEAT EXCHANGER DATA SHTEET

○ **FILTER(S)** ○ SINGLE ○ DUAL W/TRANSFER VALVE ○ ASME CODE DESIGN ○ ASME CODE STAMPED

☐ DESIGN PRESSURE, _____ (BARG) ☐ △P CLEAN, _____ (BARG) ☐ △P COLLAPSE, _____ (BARG)

☐ MICRON RATING, _____ ☐ CARTRIDGE MATERIAL, _____ ◇ CARTRIDGE P/N _____

☐ BONNET MATERIAL, _____ ☐ CASING MATERIAL, _____ ● FURN.SPARE CARTR.,QTY _____

☐ SYS. COMPONENT SUPP.	MANUFACTURER	MODEL		MANUFACTURER	MODEL
◆ MAIN PUMP	Airpack		◇ OIL COOLER(S)		
◇ AUXILIARY PUMP			◇ TRANSFER VALVE(S)		
◆ MECHANICAL SEALS	Airpack		◇ PUMP COUPLING(S)		
◆ ELECTRIC MOTORS	WEG		◆ SUCTION STRAINER(S)	TBC	
◇ STEAM TURBINES			◆ CHECK VALVE(S)	TBC	
◆ OIL FILTER(S)	Airpack		◇		

OWNER:	BUSHEHR PETROCHEMICAL COMPANY MEG PLANT	CONTRACTOR:
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○ **COOLING WATER SYSTEM**

● **BASIC COOLING SYS. FOR:** ● COMPRESSOR CYL.(S) ○ INTERCOOLER(S) ● AFTERCOOLER ○ OIL COOLER(S)

○ HEATERS REQ.'D FOR PRE-HEATING: ○ ELEC.,W/ THERMOSTAT(S) ○ STEAM

● **PRESSURE FORCED CIRCULATING SYS:** ● OPEN, PIPING BY: ○ PURCH ● MFR ○ CLOSED, PIPING BY MFR.

MAIN WATER PUMP DRIVEN BY: ○ ELEC. MOTOR ○ STEAM TURBINE ○ OTHER _____

AUX WATER PUMP DRIVEN BY: ○ ELEC. MOTOR ○ STEAM TURBINE ○ OTHER _____

○ **SEP. CONSOLE FOR COOLING WATER SYS.:** ○ ONE CONSOLE FOR EA. COMP. ○ ONE CONSOLE FOR _____ COMP'RS

○ CONSOLE TO BE OF DECK PLATE TYPE CONSTRUCTION SUITABLE FOR MULTI-POINT SUPPORT AND GROUTING WITH GROUT & VENT HOLES.

○ ELECTRICAL CLASSIFICATION ZONE 2 IIB T3 _____ _____ ○ NON-HAZARDOUS

○ **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), ___ STAGE	●	○	○	0,9	4,5	35	45	●
CYLINDER(S), ___ STAGE	○	○	○					○
CYLINDER(S), ___ STAGE	○	○	○					○
CYLINDER(S), ___ STAGE	○	○	○					○
CYLINDER(S), ___ STAGE	○	○	○					○
CYLINDER(S), ___ STAGE	○	○	○					○
PISTON ROD PACK'G TOTAL	○							○
INTERCOOLER(S) TOTAL	○							○
AFTERCOOLER	○							○
OIL COOLER(S)	○							○
JACKET COOLER _____	○							○
TOTAL FLOW								

□ **SYS. PRESSURES:** □ DESIGN, _____ (BARG) (kPa) □ HYDROTEST, _____ (BARG) (kPa) ○ **RELIEF VALVE(S), SETTING** _____ PSIG

○ **WATER RESERVOIR:** ◇ SIZE, _____ mm DIA X _____ mm HT. ◇ CAPACITY _____ m @ Normal Operating Level

◇ RESERVOIR MATERIAL: c.s ◇ INTERNAL COATING, TYPE _____

○ LEVEL GAUGE ○ LEVEL SWITCH ○ DRAIN VALVE ○ INSPECTION & CLEAN-OUT OPENINGS

□ **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						○	○

□ PUMP CASING MATERIAL (Ref 6.14.2.1.5): MAIN PUMP _____ AUX PUMP _____

○ GUARD(S) REQ.'D FOR COUP'G(S) ○ MAIN PUMP ○ AUX PUMP ○ GUARD TYPE OR CODE _____

○ AUX.PUMP CONTROL: ○ MANUAL ○ AUTO ○ ON-OFF-AUTO SEL. SWITCH: ○ BY PURCH. ○ BY MANUFACTURER

○ WIRING TO TERMINAL BOX: ○ BY PURCH. ○ BY MANUFACTURER

○ **COOLING WATER HEAT EXCH.:** ○ SHELL & TUBE ○ SINGLE ○ DUAL W/TRANSFER VALVE ○ TEMA C ○ TEMA R(API-660)

○ AIR COOLED EXCHANGER W/AUTO TEMP CONTROL (API-661 Data Sheets Attached)

○ W/BYPASS & TEM. CONTROL VALVE ○ MANUAL ○ AUTO ○ LOUVERS FOR AIR EXCH.

○ SEE SEPARATE COOLER DATA SHEET FOR DETAILS; SPECIFY % GLYCOL ON BOTH SIDES OF SHELL & TUBE

SYS. COMPONENT SUPP.	MANUFACTURER	MODEL		MANUFACTURER	MODEL
◇ MAIN PUMP			◇ TEMP CONTROL VALVE(S)		
◇ AUXILIARY PUMP			◇ TRANSFER VALVE(S)		
◇ MECHANICAL SEALS			◇ PUMP COUPLING(S)		
◇ ELECTRIC MOTORS			◇ _____		
◇ STEAM TURBINES			◇ _____		

OWNER:	BUSHEHR PETROCHEMICAL COMPANY MEG PLANT	CONTRACTOR:
MC:	MECHANICAL DATA SHEET FOR EMERGENCY INSTRUMENT AIR COMPRESSOR (20-C-7080)	

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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: BUSHEHR PETROCHEMICAL COMPANY (BUPC)

SITE/LOCATION: ASSALUYE — AMBIENT TEMPERATURE MIN/MAX: 5 / 55 °C

COMPRESSOR SERVICE: EMERGENCY INSTRUMENT AIR COMP — NUMBER OF COMPRESSORS: 1 SET

COMPRESSOR MFG.: — MODEL/TYPE:

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:

TOTAL NUMBER OF COMPRESSOR CYL.: 2 — TOTAL NUMBER OF CRANKTHROWS: 1 — STROKE: mm RPM:

● ASME CODE DESIGN ○ GOVERNMENTAL CODES OF: CODE REGULATIONS APPLY

○ OTHER APPLICABLE PRESSURE VESSEL SPEC. OR CODE:

○ 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 12 MONTHS ○ SPECIAL PAINT SPEC: BU-20-D-000-PI-SPC-409

○ WITNESSED ○ OBSERVED

CYLINDER, GAS, OPERATING, AND SUPPRESSOR DESIGN DATA

SERVICE: EMERGENCY INSTRUMENT AIR COMP — STAGE NO.: 1

☐ COMPRESSOR MANUFACTURER'S RATED CAPACITY — LBS/HR: — SCFM: — MMSCFD:

	INLET SUPPRESSOR	DISCHARGE SUPPRESSOR
☐ LINE SIDE OPERATING PRESSURE	INLET, 7 to 8,5 (BARA)	DISCHARGE, 21 (BARA)
☐ OPERATING TEMP. WITHIN SUPPRESSORS	INLET, 5 to 55 °C	DISCHARGE, 180 °C
○ ALLOWABLE PRESSURE DROP THROUGH SUPPRESSORS	Δ P 0,169 (BAR) / 2,4 %	Δ P 1,522 (BAR) / 7,23 %
● SUPRESSOR TAG NUMBER	20-DC-7080-1	20-DC-7080-2
● COMBINATION INLET SUPP SEPARATOR/INTERNALS	○ YES ● NO / ○ YES ● NO	○ YES ● NO / ○ YES ● NO
◯ NO. (QTY) OF INLET & DISCH. SUPP. PER STAGE	1	1
○ ALLOWABLE PEAK-PEAK PULSE @ LINE SIDE NOZZLE	(BAR) / %	(BAR) / %
○ ALLOWABLE PEAK-PEAK PULSE @ CYL FLANGE NOZZLE	(BAR) 0,245 / 3,5 %	(BAR) 1,02 / 4,9 %
● 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 ONTHE WEAKEST COMPONENT AND STAMPED ON THE VESSEL, THE ACTUAL MAWP IS TO BE SHOWN ON PG. 14 LINE 12 AND ON THE U1A FORMS	(BARA) 13,5 @ 85 °C	(BARA) 25 @ 210 °C
● INITIAL SIZING VOL. PER FORMULA OF 7.9.3.2 NOTE: This is a Reference	0,3 m³	0,3 m³
◆ AS BUILT VOLUME (m³)	0,3 m³	0,3 m³

#2 : PULSATION DAMPING FOR INLET AND OUTLET OF EACH CYLINDER, BY VOLUME BOTTLES.

OWNER:	BUSHEHR PETROCHEMICAL COMPANY MEG PLANT	CONTRACTOR:
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PULSATION SUPPRESSION DEVICES FOR RECIPROCATING COMPRESSORS (CONT'D) — SERVICE _____

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

CONSTRUCTION REQUIREMENTS & DATA	INLET SUPPRESSOR	DISCHARGE SUPPRESSOR
● SUPRESSOR TAG NUMBER		
● BASIC MATERIAL REQUIRED, CS, SS, ETC.	Carbon Steel	Carbon Steel
◇ ACTUAL MATERIAL DESIGNATION — SHELL/HEAD	SA106 gr B / SA234	SA106 gr B / SA234
○ SPECIAL HARDNESS LIMITATIONS, Rc — ○ YES ● NO	SHELL & HEADS — WELDS	SHELL & HEADS — WELDS
● CORROSION ALLOWANCE., mm — ● REQUIRED	3 mm	3 mm
◆ WALL THICKNESS, mm — SHELL/HEAD	8,18 mm/ 8,18 mm	8,18 mm 8,18 mm
□ NOM. SHELL DIA X OVERALL LGTH. (mm/m³)	8" X 850 mm/ 30 mm³	8" x 850 mm, 30 mm³
□ PIPE OR ROLLED PLATE CONSTRUCTION	■ PIPE □ ROLLED PLATE	■ PIPE □ ROLLED PLATE
◆ ACT. MAX ALLOW. WORKING PRESS. AND TEMPERATURE	(BAR) 18,3 @ 85 °C	(BAR) 38,6 @ 210 °C
● MINIMUM DESIGN METAL TEMP (2.14.8)	°C	°C
○ INLET SUPRESS. TO BE SAME MAWP AS DISCH'RGE SUPPRESS.	○ YES ● NO	
◇ MAX EXPECTED PRESSURE DROP(Δ P, %) LINE PRESS	Δ P 0,0926 (BAR) / 1,3 %	Δ P 0,154 (BAR)/ 4,5 %
◇ WEIGHT (EACH)	59 kg	63 kg
○ INSUL CLIP	NA	NA
◇ EXPECTED P-P PULSE @ LINE SIDE/CYL FLG, % LINE PRESS BASED ON FINAL SUPPRESSOR DESIGN	%/ %	%/ %
○ SUPPORTS, TYPE/QUANTITY	YES, saddle 2	YES, saddle 2
CONNECTION REQUIREMENTS & DATA		
● LINE SIDE FLANGE. SIZE/RATING/FACING/TYPE	2" 150# RF WNF	2" 300# RF WNF
● COMP CYL FLANGE(S), QTY/SIZE/RATING/FACING/TYPE	2" 150# RF WNF	2" 300# RF WNF
○ FLANGE FINISH, ○ PER 3.9.3.15 >3.2 <6.4, ○ SPECIAL (SPECIFY), ● PER ANSI 16.5		
● INSPECTION OPENINGS REQUIRED	○ YES ● NO ○ BLINDED	○ YES ● NO ○ BLINDED
● SPEC. QTY. SIZE, /FLG TYPE & RATING	NA	NA
◇ * QTY. SIZE, /FLG TYPE & RATING		
● VENT CONNECTIONS REQUIRED	○ YES ● NO	○ YES ● NO
○ SPEC. QTY. SIZE, /FLG TYPE & RATING	NA	NA
◇ * QTY. SIZE, /FLG TYPE & RATING		
● DRAIN CONNECTIONS REQUIRED	● YES ○ NO	● YES ○ NO
○ SPEC. QTY. SIZE, /FLG TYPE & RATING	1/2"NPT	1/2"NPT
◇ * QTY. SIZE, /FLG TYPE & RATING		
● PRESSURE CONNECTIONS REQUIRED	○ YES ● NO	○ YES ● NO
○ SPEC. QTY. SIZE, /FLG TYPE & RATING	NA	BA
◇ * QTY. SIZE, /FLG TYPE & RATING		
● TEMPERATURE CONNECTIONS REQUIRED	○ YES ● NO	○ YES ● NO
○ SPEC. QTY. SIZE, /FLG TYPE & RATING	NA	NA
○ CYL NOZZLE ○ MAIN BODY		
◇ * QTY. SIZE, /FLG TYPE & RATING		
OTHER DATA AND NOTES		
◆ COMPRESSOR MFG'S SUPP. OUTLINE OR DRAWING NO.		
◇ SUPP. MFG'S OUTLINE OR DRAWING NO.		

OWNER: BUPC — شرکت پتروشیمی بوشهر

BUSHEHR PETROCHEMICAL COMPANY
MEG PLANT

CONTRACTOR: CCS — Chagalesh-Enerchimi-Steam Joint Venture, BUPC-MEG PLANT PROJECT; Airpack

MC:

MECHANICAL DATA SHEET FOR EMERGENCY INSTRUMENT AIR COMPRESSOR (20-C-7080)

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INSTRUMENTATION

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

INSTRUMENT & CONTROL PANEL (■ ◯ ⬡):
- ● ONE FOR EA. UNIT ◯ ONE COMMON TO ALL UNITS
- ◯ MACHINE MT'ED ● FREE STANDING (OFF UNIT) / ◯ LOCAL ● REMOTE ◯ INDOORS
- ◯ PNEUMATIC ◯ ELEC. ● ELECTRONIC ◯ HYDRAULIC ● PROGRAMMABLE CONTL'R
- ◯ NEMA 7, CLASS _____ , GROUP IIB , DIVISION _____ ◯ INTRINSICALLY SAFE (Exi)
- ● I/S BARRIERS (■ ◯ ⬡)
- ◯ NEMA 4, WATERTIGHT & DUSTTIGHT ◯ PURGED TO NFPA 496 TYPE ◯ X ◯ Y ◯ Z
- ● OTHER NEMA IP42 LOW PURGE PRESS. ◯ ALARM ◯ SHUTDOWN
- ◯ VIB, ISOLATORS ◯ STRIP HEATERS ◯ PURGE CONN. ◯ EXTRA CUTOUTS
- ● ANNUNCIATOR W/FIRST-OUT INDICATION LOCATED ON CONTROL PANEL
- ● PURCHASER'S CONN. BROUGHT OUT TO TERMINAL BOX BY VENDOR
- ● IP PROTECTION : IP 65 FOR LOCAL PANEL , IP 42 FOR CONTROL INDOOR PANEL.

BUFFER GAS CONTROL PANE ◯ ONE FOR EA. UNIT ◯ ONE COMMON TO ALL UNITS

● INSTRUMENTATION SUITABLE FOR: ◯ INDOORS ● OUTDOORS ● IP PROTECTION: IP-65 ◯ OTHER _____

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

PRESSURE GAUGES	MFR	as per instrument data sheets	SIZE & TYPE	as per instrument data sheets	MTL	
TEMPERATURE GAUGES	MFR	as per instrument data sheets	SIZE & TYPE	as per instrument data sheets	MTL	
LIQUID LEVEL GAUGES	MFR	as per instrument data sheets	TYPE	as per instrument data sheets	MTL	
DIFF. PRESSURE GAUGES	MFR	as per instrument data sheets	SIZE & TYPE	as per instrument data sheets	MTL	
PRESS. TRANSMITTERS	MFR	as per instrument data sheets	TYPE	as per instrument data sheets	MTL	
LIQUID LEV. TRANSMITTER	MFR	as per instrument data sheets	TYPE	as per instrument data sheets	MTL	
PRESSURE SWITCHES	MFR	as per instrument data sheets	TYPE	as per instrument data sheets	MTL	
TEMPERATURE SWITCHES	MFR	as per instrument data sheets	TYPE	as per instrument data sheets	MTL	
LIQUID LEVEL SWITCHES	MFR	as per instrument data sheets	TYPE	as per instrument data sheets	MTL	
DIFF. PRESSURE SWITCHES	MFR	as per instrument data sheets	TYPE	as per instrument data sheets	MTL	
CONTROL VALVES	MFR	as per instrument data sheets	TYPE	as per instrument data sheets	MTL	
PRESSURE SAFETY VALVES	MFR	as per instrument data sheets	TYPE	as per instrument data sheets	MTL	
SIGHT FLOW INDICATORS	MFR	as per instrument data sheets	TYPE	as per instrument data sheets	MTL	
VIBRATION MONITORS & EQUIP.	MFR	as per instrument data sheets	TYPE	as per instrument data sheets	MTL	
THERMOCOUPLES	MFR	as per instrument data sheets	TYPE	as per instrument data sheets	MTL	
RTD'S	MFR	as per instrument data sheets	TYPE	as per instrument data sheets	MTL	
SOLENOID VALVES	MFR	as per instrument data sheets	TYPE	as per instrument data sheets	MTL	
ANNUNCIATOR	MFR		MODEL & (QTY SPARE POINTS)		( )	
PROGRAMMABLE CONTROLLER	MFR		TYPE		MTL	
	MFR		TYPE		MTL	
	MFR		TYPE		MTL	

PRESSURE GAUGE REQUIREMENTS ● LIQUID FILLED PRESSURE GAUGES: ● YES ◯ NO

FUNCTION	LOCALLY MOUNTED	PANEL MOUNTED
LUBE OIL MAIN PUMP DISCHAR.	(☐ ◯ ⬡)	(☐ ◯ ⬡)
LUBE OIL AUX. PUMP DISCHARG.	(☐ ◯ ⬡)	(☐ ◯ ⬡)
LUBE OIL PRESS. AT FRAME HEADER	(☐ ◯ ⬡)	(☐ ◯ ⬡)
LUBE OIL FILTER Δ P	(☐ ◯ ⬡)	(☐ ◯ ⬡)
COOLING H_2O INLET HEADER	(■ ◯ ⬡)	(☐ ◯ ⬡)
_____	(☐ ◯ ⬡)	(☐ ◯ ⬡)
_____	(☐ ◯ ⬡)	(☐ ◯ ⬡)

	LOCALLY MOUNTED	PANEL MOUNTED
PROCESS GAS: INLET PRESS.		
@ EA. STAGE	(■ ◯ ⬡)	(☐ ◯ ⬡)
DISCH. PRESS. @ EA. STAGE	(■ ◯ ⬡)	(☐ ◯ ⬡)
_____	(☐ ◯ ⬡)	(☐ ◯ ⬡)
_____	(☐ ◯ ⬡)	(☐ ◯ ⬡)
_____	(☐ ◯ ⬡)	(☐ ◯ ⬡)

REMARKS: _____

OWNER:	BUSHEHR PETROCHEMICAL COMPANY MEG PLANT	CONTRACTOR:
MC:	MECHANICAL DATA SHEET FOR EMERGENCY INSTRUMENT AIR COMPRESSOR (20-C-7080)	

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INSTRUMENTATION (CONT'D)

TEMPERATURE MEASUREMENT REQUIREMENTS

FUNCTION	LOCALLY MOUNTED	PANEL MOUNTED	GAUGE W/ CAPIL'RY	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	(■ ○ ⬡)	(■ ○ ⬡)	●	○	●	●
PROCESS GAS: ○ INLET ○ GAS ○ WATER	(□ ○ ⬡)	(□ ○ ⬡)	○	○	○	○
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

ALARM DEVICES ● TRANSMITTER

SHUTDOWN DEVICES ● TRANSMITTER

FUNCTION	ALARM	SHUT DOWN	ANNUNCIATION POINTS: ALARM IN PNL BY MFR	ALARM IN CTL ROOM PANEL OTH'RS	SHUTDOWN IN PNL BY MFR	SHUTDOWN IN CTL ROOM PANEL OTH'RS	TOTAL NO. OF POINTS
LOW LUBE OIL PRESS. @ BEARING HEADER	(□ ○ ⬡)	(■ ○ ⬡)	○	○	●	●	1
HIGH LUBE OIL Δ 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 Δ P, EACH STAGE	(□ ○ ⬡)	(□ ○ ⬡)	○	○	○	○	
HI LIQ. LEV., SEPARATOR	(□ ○ ⬡)	(□ ○ ⬡)	○	○	○	○	
LOW PURGE GAS PRESS, DISTANCE PIECE(S)	(□ ○ ⬡)	(□ ○ ⬡)	○	○	○	○	
HI X-HD PIN TEMP	(□ ○ ⬡)	(□ ○ ⬡)	○	○	○	○	
PRESS PKG CASE (PISTON ROD TEMP)	(□ ○ ⬡)	(□ ○ ⬡)	○	○	○	○	
LOW PRESSURE COOLING WATER INLET _____	(□ ○ ⬡)	(□ ○ ⬡)	○	○	○	○	
		TOTAL NUMBER OF ANNUNCIATION POINTS					

SWITCH CONTACT OPERATION

NOTE: EACH SWITCH SHALL BE MINIMUM SPDT ARRANGEMENT

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

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

REF: 7.6.6.2 FOR MINIMUM RECOMMENDED PROTECTION REQUIREMENTS

OWNER:	BUSHEHR PETROCHEMICAL COMPANY MEG PLANT	CONTRACTOR:
MC:	MECHANICAL DATA SHEET FOR EMERGENCY INSTRUMENT AIR COMPRESSOR (20-C-7080)	

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○ INSTRUMENTATION (CONT'D)

● MISCELLANEOUS INSTRUMENTATION — ○ INTERCLR(S) ○ AFTERCLR ○ OIL CLR ○ H_2O CLR

SIGHT FLOW IND. (COOLING H_2O ONLY)	(□ ○ ⬡)	FOR: ○ CYL JACKET WATER ○ ROD PRESS. PKG CASES	
PNEUMATIC PRESSURE TRANSMITTERS	(□ ○ ⬡)	FOR:	
PRESSURE TRANSMITTERS (ELEC. OUTP.)	(□ ○ ⬡)	FOR:	
PNEUMATIC LEVEL TRANSMITTERS	(□ ○ ⬡)		
ALARM HORN & ACKN'LMT TEST BUTTON	(□ ○ ⬡)		
CONDUIT & WIRING W/JUNCT. BOXES	(CON-SOLES) (□ ○ ⬡)		
TEST VALVES	(□ ○ ⬡)	FOR:	
DRAIN VALVES	(□ ○ ⬡)	FOR: Coolers	
GAUGE GLASS(ES)	(■ ○ ⬡)	FOR: Recirculating Oil,	
TACHOMETER	(□ ○ ⬡)	SPEED RANGE ____ TO ____ RPM	
CRANKSHAFT KEY PHASER AND TRANSDUCER	(□ ○ ⬡)	FOR:	
LEVEL GAUGE ON SUCTION SUPPRESSOR	(□ ○ ⬡)		
OIL LEVEL SWITCH ON CRAKCASE	(□ ○ ⬡)		

○ 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
EACH STAGE DISCHARGE	(■ ○ ⬡)	TBC		1" / 11/2"	26 barg
COOLING WATER OUTLET	(□ ○ ⬡)				
	(□ ○ ⬡)				
	(□ ○ ⬡)				
	(□ ○ ⬡)				
	(□ ○ ⬡)				
	(□ ○ ⬡)				
	(□ ○ ⬡)				
	(□ ○ ⬡)				
	(□ ○ ⬡)				

NOTES:
#1 SEE MOTOR DATA SHEET FOR ADDITIONAL MOTOR INSTRUMENTATION REQUIREMENTS

OWNER:	BUSHEHR PETROCHEMICAL COMPANY MEG PLANT							CONTRACTOR:	
MC:	MECHANICAL DATA SHEET FOR EMERGENCY INSTRUMENT AIR COMPRESSOR (20-C-7080)								
	Project	Area	Phase	Unit	Dis.	Doc.	Seq.	Contract No : 52-98/445	
17811-11G	BU	20	VD	303	ME	DSH	75	rev 05	Page: 20 OF 20

GENERAL NOTES

(1) COMPRESSOR STARTS BY MEANS OF A LOW-PRESSURE SWITCH ON DELIVERY PIPE AND STOPS WHEN HIGH PRESSURE IS REACHED .
THE REQUIRED LOW/HIGH PRESSURE TRANSMITTER (PT-71107) TO MAINTAIN THE REQUIRED DELIVERY PRESSURE.
THE OPERATION IS INTERMITTENT.
(2) VENDOR SHALL PROVIDE AFTER-COOLER .AFTERCOOLER OUTLET GAS TEMPERATURE TO BE 40 DEG C, AS CONFIRMED BY COOLER CALCULATION.
(3) DELETED
(4) DELETED
(5) FOR UTILITIES SUPPLY CONDITION AND CLIMATE CONDITION REFER TO "AMBIENT ,SITE CONDITION & UTILITY DATA" , (BU-20-B-000-PR-SPC-111)
(6) MINIMUM METAL TEMPRATURE = 0 DEG C
(7) DELETED
(8) DEW POINT AT INLET -170 DEG C, DEW POINT AT ATM. -194.6 DEG C
9) TYPE OF COMPRESSOR : VERTICAL
(10) VENDOR ALSO SHALL PROVIDE BELOW ITEMS:
SPARE PARTS
TEMPORARY STRAINER
(11)GENERAL NOTES :
A. PROVIDE CONTACTS OPEN FOR CUMULATIVE ALARM AND CUMULATIVE SHUTDOWN .
B. PROVIDE SAFETY VALVE ON COMPRESSOR DISCHARGE ,WITH LOCKED OPEN ISOLATING VALVE .
C. PROVIDE SEPARATE INSTRUMENT FOR ALARM AND SHUTDOWN.
D. THE VENDOR TOGETHER WITH THE INSTRUMENT DOCUMENTATION MUST SUPPLY. A COMPLETE LIST OF ALL THE ALARMS AND INTERLOCKS WITH ALL SET VALUES.
E. PROVIDE A VISUAL FLOWMETER ON COOLING WATER RETURN LINE.
F. NOISE PRESSURE LEVEL AT 1 M. SHALL BE LESS THAN 80 DB(A)
(12)VENDOR SHOULD FOLLOW DOC NO.: BU-20-D-000-IN-SPC-676 FOR SPECIFICATION OF APPLICABLE INSTRUMENT.
(13)PLC PACKAGE SYSTEM (UCP) WILL BE INSTALLED IN CONTROL/AUXILIARY ROOM.
LOCAL PANEL INCLUDING START/STOP PUSH BUTTONS ,LAMPS AND INDICATORS, TRIP RESET PUSH BUTTON ,AMMETER AND ETC
(AS PER PROJECT REQUIREMENTS) WILL BE INSTALLED IN FIELD.
INSTRUMENT WILL BE INSTALLED ON MACHINE OR FREE STANDING.
(14) DELETED
(15) THE CAPACITY TO BE SUPPLIED CONSIDERING NO NEGATIVE TOLERANCE. THE REQUIRED CAPACITY (NNT) IS 1.1*50=55 KG/H.
(16) COMPRESSOR TYPE IS RECIPROCATING