



STREAM	INLET		OUTLET	
	HEADER O.D. X WALL	NOZZLE O.D. X WALL	HEADER O.D. X WALL	NOZZLE O.D. X WALL
A (HP-AIR)	16.000 X .375 (406 X 9.5)	12.750 X .375 (324 X 9.5)	10.000 X .250 (254 X 6.4)	8.625 X .322 (219 X 8.2)
B (HP-AIR)	13.000 X 1.000 (330 X 25.4)	6.625 X .432 (168 X 11.0)	10.750 X .750 (273 X 19.1)	6.625 X .432 (168 X 11.0)
C (HPC-AIR)	10.750 X .750 (273 X 19.1)	4.500 X .237 (114 X 6.0)	5.563 X .375 (141 X 9.5)	3.500 X .216 (89 X 5.5)
D (HP-GDX)	6.625 X .375 (168 X 9.5)	2.375 X .154 (60 X 3.9)	10.750 X .500 (273 X 12.7)	4.500 X .237 (114 X 6.0)
E (HP-GAN)	2.875 X .203 (73 X 5.2)	1.900 X .145 (48 X 3.7)	10.750 X .375 (273 X 9.5)	3.500 X .216 (89 X 5.5)
F (LP-GAN)	10.750 X .250 (273 X 6.4)	10.750 X .365 (273 X 9.3)	14.000 X .250 (356 X 6.4)	12.750 X .375 (324 X 9.5)
G (UN)	14.000 X .250 (356 X 6.4)	14.000 X .250 (356 X 6.4)	18.000 X .250 (457 X 6.4)	14.000 X .250 (356 X 6.4)

ALL MATERIAL IN TABLE ABOVE IS 5083 ALUMINUM

Reviewed
 TÜV SÜDdeutscher Druck und Betrieb GmbH
 Pressure
 Equipment Directive 97/23/EC
 Testing Laboratory
 MAR 29 2005

REVISION RECORD	A		B	
	DATE	BY	DATE	BY
ADDED PRODUCTION	11-3-04	SMITH		
CHANGED	11-15-04	EBERT		
DATE	11-15-04			
PROD ENG	11-17-04	GOETHEL		
DATE				
MFG ENG				
DATE				
WELD ENG				
DATE				

SYD ENGR SPEC	A		B	
	DATE	BY	DATE	BY
11-600	11-3-04	SMITH		
NOTE 9	11-15-04	EBERT		
1,2,1,3,2,2,4,1	11-17-04	GOETHEL		
NOTE 10				
1,2,1,3,2,2,4,1				
NOTE 11				
1,2,1,3,2,2,4,1				
NOTE 12				
1,2,1,3,2,2,4,1				

CHART HEAT EXCHANGERS, LP. ALL RIGHTS RESERVED	A		B	
	DATE	BY	DATE	BY
11-600	11-3-04	SMITH		
NOTE 9	11-15-04	EBERT		
1,2,1,3,2,2,4,1	11-17-04	GOETHEL		
NOTE 10				
1,2,1,3,2,2,4,1				
NOTE 11				
1,2,1,3,2,2,4,1				
NOTE 12				
1,2,1,3,2,2,4,1				

- NOTES:
- REFER TO BRAL-10M FOR INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS. ASSURE COMPLIANCE WITH REQUIREMENTS PARTICULARLY OPERATING CONDITIONS TO PREVENT OVER PRESSURIZATION, THERMAL SHOCK AND OPERATION OUTSIDE DESIGN TEMPERATURE RANGE. REFER TO DRAWING 918-6047 FOR UNCRACKED HEAT EXCHANGER LIFTING INSTRUCTIONS AND DRAWING 918-6671 FOR INSTRUCTIONS ON ROLLING HEAT EXCHANGER TO SIDE OTHER THAN SHIPPING SURFACE.
 - CUSTOMER TO DRILL APPROPRIATE HOLES OR SLOTS IN SUPPORT ANGLES FOR MOUNTING HEAT EXCHANGER AS DESCRIBED IN BRAL-10M.
 - HEAT EXCHANGER DESIGNED, CONSTRUCTED, AND STAMPED PER THE LATEST MANDATORY EDITION AND ADDENDA OF THE ASME PRESSURE VESSEL CODE, SECTION VIII, DIV. 1 AND REGISTERED WITH THE NATIONAL BOARD.
 - CORROSION ALLOWANCE: ALUMINUM = 0.0000 INCHES.
 - SEE DRAWING 15770C FOR MAXIMUM ALLOWABLE PIPE LOADS.
 - THE HEADERS AND NOZZLES ARE LABELED ON THE DRAWING WITH THEIR NOMINAL PIPE SIZE (NPS). IF A STANDARD SIZE IS NOT USED THE PIPING IS LISTED AT ITS ACTUAL OUTSIDE DIAMETER AND LABELED "OD". UNLESS SHOWN OTHERWISE ALL NOZZLES ARE ON THE HEAT EXCHANGER CENTERLINE.
 - TOLERANCE ON ALL DIMENSIONS IS $\pm .05$ INCH (6) UNLESS OTHERWISE NOTED. ANGULAR TOLERANCE ON NOZZLES IS CONTROLLED BY THE TOLERANCE ON THE CARTESIAN COORDINATE DIMENSIONS (X, Y, Z). IN NO CASE SHALL THE ANGULAR TOLERANCE EXCEED 3 DEGREES.
 - STREAM MAINT. (PSIG) (BARG) DESIGN TEMP. DEG. F (C) MAX. MIN. (C) MAX. MIN.
 - TESTING INFORMATION
 - INACTIVE AREAS - 15 PSIG (1.03 BARG)
 - STREAM FIRST AIR (PSIG) (BARG) PRETEST (PSIG) (BARG) HPHEU (PSIG) (BARG) LEAK (PSIG) (BARG)
 - MAXIMUM DRYING TEMP 250 DEG F. (121 DEG C.)
 - HELIUM VACUUM LEAK TEST
 - MAX. ALLOW. LEAKAGE
 - THE "D" STREAM TO BE CLEANED FOR OXYGEN SERVICE.
 - CONNECTIONS TO BE SUITABLY MARKED FOR FIELD TRIM.
 - UNIT TO SHIP WITH DRY AIR AT 5 PSIG (0.34 BARG) IN ALL STREAMS. GAUGES ARE REQUIRED.
 - ESTIMATED WEIGHT = 17600 LBS. (DRY) (7980 KG) (30500 LBS. (FILLED WITH WATER) (13800 KG) (WARNING DO NOT HYDRO TEST IN FIELD WITH WATER)
 - STREAM VOLUME
 - CUSTOMER NOTE
 - ESTIMATED BRAZE HEIGHT. ACTUAL BRAZE HEIGHT MAY VARY $\pm .12$ INCH/FOOT (± 10 MM/M) OF BRAZE HEIGHT. MAX DIMENSION INCLUDES TOLERANCE ON BRAZE HEIGHT PLUS HEADER ATTACHMENT PLATES.
 - CUSTOMER TO REMOVE PLASTIC PLUGS FOLLOWING INSTALLATION AND JUST PRIOR TO INSULATING UNIT.
 - CUSTOMER REQUIREMENT
 - ONE MITERED END PIECE JOINT TO BE SPOT RADIOGRAPH INSPECTED PER ASME PRESSURE VESSEL CODE, SECT. VIII, DIV. 1, PAR. UG-52.
 - ALL LONGITUDINAL NOZZLE JOINTS TO BE 100% RADIOGRAPH INSPECTED PER ASME PRESSURE VESSEL CODE, SECT. VIII, DIV. 1, PAR. UG-51.
 - ALL WELDS TO BE 100% BYE PENETRANT EXAMINED PER ASME CODE, SECTION VIII, DIVISION 1.
 - UNIT TO BE SHRINK WRAPPED IN PLASTIC W/DESICCANT.
 - PED NOTE
 - HEAT EXCHANGER TO COMPLY WITH EU PED 97/23/EC; ASSESSMENT MODULE "B & F".
 - PED NOTIFIED BODY IS TÜV INDUSTRIE SERVICE GMBH, SUD GRUPPE.
 - ASSESSMENT CATEGORY IS "IV". ALL WORKING FLUIDS ARE GROUP 1.
 - PRODUCTION NOTES
 - INSTALL TWO RELIEF VALVES NOT EXCEEDING 74 PSIG (5.1 BARG) ON F STREAM. PERFORM LEAK TEST AT 29 PSIG (2.0 BARG). REMOVE RELIEF VALVES AFTER TEST. PRIOR TO SHIPMENT.
 - INSTALL TWO RELIEF VALVES NOT EXCEEDING 74 PSIG (5.1 BARG) ON G STREAM. PERFORM LEAK TEST AT 29 PSIG (2.0 BARG). REMOVE RELIEF VALVES AFTER TEST. PRIOR TO SHIPMENT.