PPI / NARGAN	DEHDASHT PETROCHEMICAL INDUSTRY COMPANY DEHDASHT HIGH DENSITY POLYETHYLENE PROJECT	PGPIC
	DOCUMENT TITLE: Economizer Data Sheet	POI: IFA
Contract No.: DPIC/98-12	DOCUMENT NUMBER: DPIC9812-000-VD-1002-ME-DS-0076	Rev. No.: D1

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DOCUMENT TITLE:

Economizer Data Sheet (E-PK6101-3)

PURCHASER'S COMMENT/APPROVAL STATUS		Purchaser: NARGAN
1	AP: Approved (Released for Manufacturing)	Requisition No.: DPIC98-12-001-000-ME-MR-4150-0001-D1
2	AN: Approved With Minor Comments (Fabrication may Proceed)	
3	NF: Approved With Comments (Fabrication not Proceed)	Item No. (Tag No.): PK-6101
4	RJ: Rejected	
5	NR: Not be Returned	Vendor Doc. No.: DPIC9812-000-VD-1002-ME-DS-0076-D1
Date:	Signature:	

REV	DATE ISSUE	PREPARED	CHECKED	APPROVED
D1	25.Dec.21	A.VOSOUGH	DR.A.NEJATI	DR.A.NEJATI
D0	30.Oct.21	A.VOSOUGH	DR.A.NEJATI	DR.A.NEJATI

KASRAVAND Engineering & Construction

PPI / NARGAN	**DEHDASHT PETROCHEMICAL INDUSTRY COMPANY** **DEHDASHT HIGH DENSITY POLYETHYLENE PROJECT**	شرکت صنایع پتروشیمی خلیج فارس PGPIC شرکت صنایع پتروشیمی دهدشت (سهامی عام)
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	PPI / NARGAN	**DEHDASHT PETROCHEMICAL INDUSTRY COMPANY** **DEHDASHT HIGH DENSITY POLYETHYLENE PROJECT**					PGPIC	
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	Contract No.: DPIC/98-12	**DOCUMENT NUMBER: DPIC9812-000-VD-1002-ME-DS-0076**						**Rev. No.: D1**
1	SERVICE	**ECONOMIZER**					ITEM	**E-PK6101-3**
2	DIAM. X LENGTH	**581** X **6000** mm		MOUNTIN	**HORIZONTAL**		TYPE	**BEM**
3	NO. OF UNIT	**1**		SURFACE PER UNIT	**115.39**	m²	IN PARALLEL	**1**
4	SHELLS PER UNIT	**1**		SURFACE PER SHELL	**115.39**	m²	IN SERIES	**1**
5	TEMA CLASS	**R**		REQUIRED OVERDESIGN			CODE	**TEMA. 9TH ED.**
6	**PERFORMANCE**							
7				SHELL SIDE			TUBE SIDE	
8	FLUID CIRCULATED			**PROPYLENE**			**PROPYLENE**	
9	FLUID QUANTITY, TOTAL		kg/h	**19500.0**			**7038.39**	
10				IN	OUT		IN	OUT
11	VAPOUR		kg/h	-	-		**2041.13**	**7038.39**
12	LIQUID		kg/h	**19500**	**19500**		**4997.26**	-
13	NON CONDENSABLES		kg/h	-	-		-	-
14	TEMPERATURE		°C	**48.55**	**16**		**12.37**	**15**
15	DENSITY at T and P (Vap./Liq.)		kg/m³	**461.4**	**520.94**		**17.36 / 526.76**	**17.11**
16	VISCOSITY at T and P (Vap./Liq.)		cP	**0.0598**	**0.894**		**0.0087 / 0.0933**	**0.0087**
17	MOLECULAR WEIGHT,Vap						**42.08**	**42.08**
18	SPECIFIC HEAT (Vap./Liq.)		kJ/kg.K	**3.332**	**2.5836**		**1.65 / 2.578**	**1.655**
19	THERMAL CONDUCTIVITY (Vap./Liq.)		W/m.K	**0.0897**	**1061**		**0.0162 / 0.1081**	**0.0165 /**
20	LATENT HEAT		kj/kg				**360**	**360**
21	INLET PRESSURE (abs)		bar	**20.020**			**8.3**	
22	VELOCITY (Mean/Max)		m/s		**/ 0.21**			**/ 3.42**
23	PRESSURE DROP (Allowable/Calculated)		bar	**0.2**	**0.02**		**0.1**	**0.049**
24	FOULING RESISTANCE (Min)		m²·K/W	**0.00017**			**0.00017**	
25	TYPE OF CLEANING MAINTENANCE			☑ NONE ☐ MECH ☐ CHEM.			☑ NONE ☐ MECH ☐ CHEM.	
26	HEAT EXCHANGED	**508.3**	kW	MTD (CORRECTED)			**14.2**	°C
27	TRANSFER RATE: SERVICE:	**314.69**	CALCULATED:	**353.27**	CLEAN:		**409.33**	W/m²·K
28	**CONSTRUCTION**							
29	DESIGN PRESSURE		barg	**23**			**23**	
30	VACUUM PRESSURE		barg				**-1.01**	
31	TEST PRESSURE		barg	**29.9**			**29.9**	
32	DESIGN TEMPERATURE		**°C**	**125**			**125**	
33	MIN. DESIGN METAL TEMPERATURE		**°C**				**-45**	
34	NUMBER PASSES PER SHELL			**1**			**3**	
35	CORROSION ALLOWANCE			**3**			**3**	
36	PARTICULAR SERVICE			**-**			**-**	
37	PROVIDE X-RAY			**FULL**			**FULL**	
38	PROVIDE STRESS RELIEVING			☐ CHANNEL ☐ BUNDLE ☐ SHELL				

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CONSTRUCTION OF ONE SHELL

TUBE TYPE :	☑ PLAIN	☐ FINNED	SHELL OD	610	mm	BAFFLE TYPE	Single segmental	
TUBE OD:	25.4	mm	SHELL ID	581	mm	ORIENTATION	Horizontal	
TUBE THK (avg):	2.6	mm	IMPINGEMENT PROTECTION	NO		BAFFLE NO.	20	#
TUBE LENGTH:	6000	mm	OUTER TUBE LIMIT	566.949	mm	BAFFLE THK.	6	mm
TUBE NO:	241	#	TUBESHEET THK	62	mm	BAFFLE CUT	28.5	%
PITCH:	32	mm	TUBE TO TUBESHEET JOINT			C/C SPACING	300	mm
☑ 30°	☐ 60°		☑ WELD ☑ EXPAND ☑ GROOVES			INLET SPACING	412	mm
☐ 90°	☐ 45°		TUBE TO TUBESHEET WELD TYPE			CLEARANCE TO SHELL	4.76	mm
			☐ SEAL ☑ FULL STRENGTH			CLEARANCE TO TUBE	0.79	mm
			☐ PARTIAL STRENGTH					

MATERIALS

TUBES	SA-334 GR 6 SEAMLESS	SELL SIDE :		BODY FLANGE :		
SHELL	SA-516 GR70N	NOZZLES:	SA-333 GR6	SHELL:	SA-350 LF2	
CHANNEL	SA-516 GR70N	FLANGES:	SA-350 LF2	CHANNEL:	SA-350 LF2	
SHELL COVER	SA-516 GR70N	TUBE SIDE :		BOLTS	SA320 L7	
TUBE SHEET	SA-350 LF2	NOZZLES:	SA-333 GR6	NUTS	SA 194 Gr. 4	
CROSS BAFFLES	SA-516 GR70N	FLANGES:	SA-350 LF2	GASKET	JACKETED METAL	
SADDEL/LEG	SA-283GR.C					

INSULATION AND PAINTING

	SHELL SIDE	CHANNEL SIDE
INSULATION (TYPE / THK)	-	-
PAINTING		
PRIMER	ZINCETHYL SILICATE (1X70µm)	
MID COATING		
TOP COATING		

MECHANICAL DESIGN DATA

EXPANSION JOINT: ☐ YES ☑ NO ☐ BY MFR. MATERIAL:

		SHELL 1	SHELL 2	TUBE SHEET	LIFE CYCLES NO
MEAN SHELL METAL TEMPERATURE	°C	24.32	-	-	-
MEAN TUBE METAL TEMPERATURE	°C	18.44	-	-	-
MINIMUM TUBE METAL TEMPERATURE	°C	13.05	-	-	-
MAXIMUM TUBE METAL TEMPERATURE	°C	43.21	-	-	-

WEIGHT	EMPTY:	4058	kg	HYDROTEST:	5602	kg	

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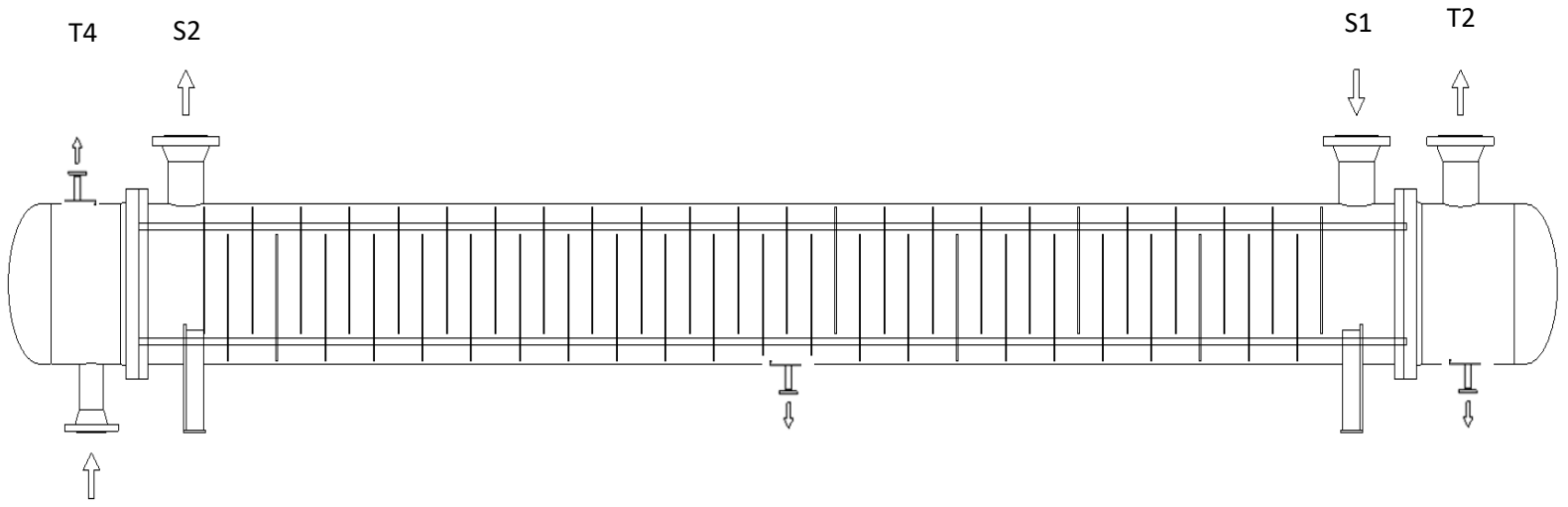
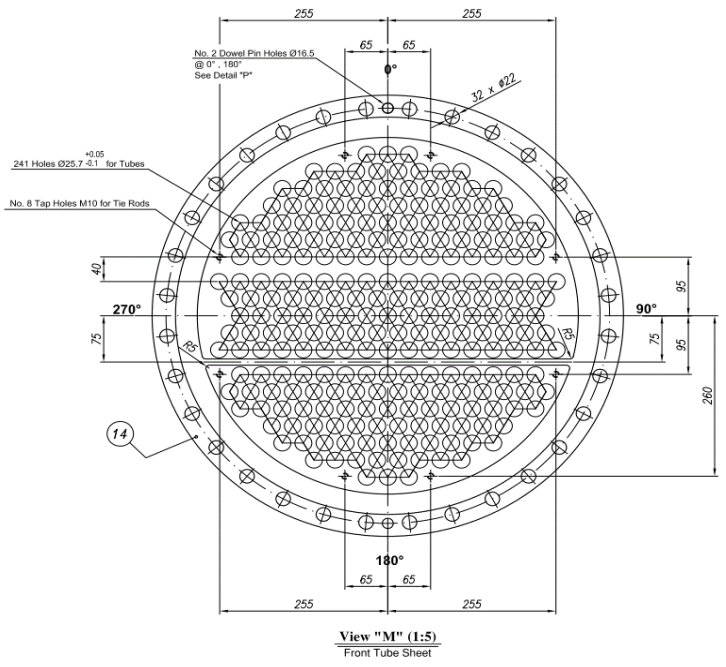
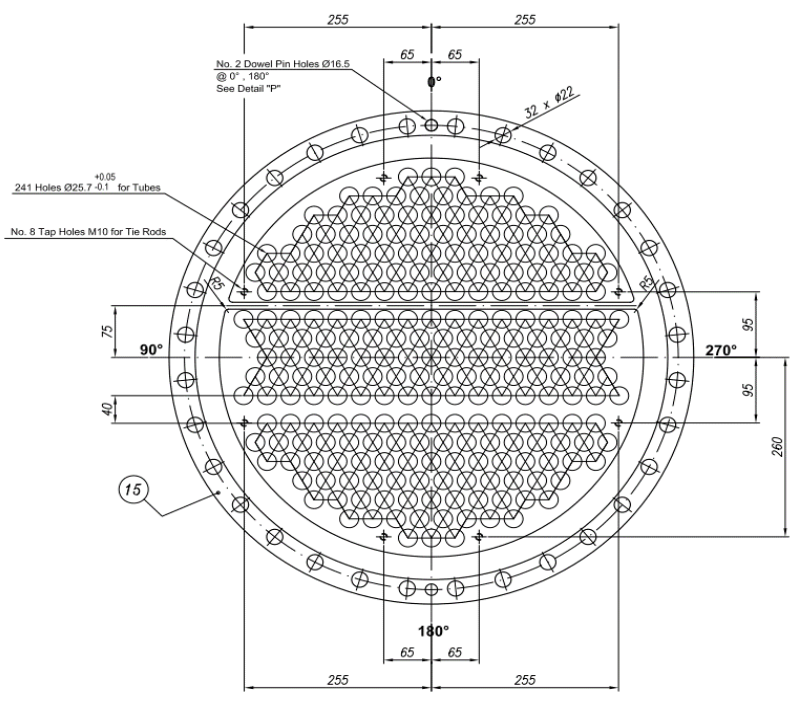
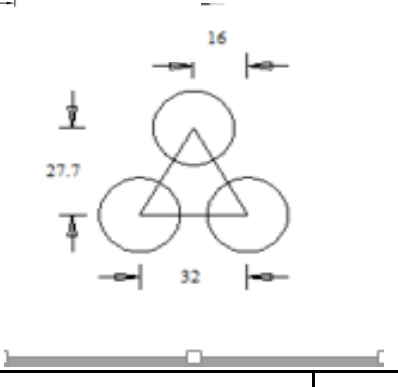




View "M" (1:5)
Front Tube Sheet



View "N" (1:5)
Rear Tube Sheet



Tag.	No.	Description	Size	Rating	Facing	PROJECTION (mm)
T3	1	DRAIN	1"	300#	RF	200
T4	1	VENT	3/4"	300#	RF	200
S3	1	DRAIN	2"	300#	RF	200
S2	1	PROPYLENE OUTLET	6"	300#	RF	200
S1	1	PROPYLENE INLET	6"	300#	RF	200
T2	1	PROPYLENE OUTLET	6"	300#	RF	200
T1	1	PROPYLENE INLET	4"	300#	RF	200