NPC-RT

Fixed Equipments Datasheets

Equipments Datasheets	Numbers
Cyclones	6
Hoppers	3
Drums	4
Heat Exchangers	4
Reactors	6
Tower	1
Total:	**24**

Table 1. Cyclones

Items	Tag ID.	Description
1	CY-251	LOOP PREPOLY (60 LT) SAMPLING CYCLONE
2	CY-261	LOOP PREPOLY (200 LT) SAMPLING CYCLONE
3	CY-411	1ST G.P.R. PRC CONTROL PURGING CYCLONE
4	CY-412	1ST G.P.R. SAMPLING CYCLONE
5	CY-421	2ND G.P.R. PRC CONTROL PURGING CYCLONE
6	CY-422	2ND G.P.R. SAMPLING CYCLONE
Numbers		**6**

PROJECT:PP-PE PILOT PLANT	**Client:** شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی
TITLE:DATA SHEET FOR LOOP PREPOLY (60 LT) SAMPLING CYCLONE (CY-251)	

DATA SHEET FOR LOOP PREPOLY (60 LT) SAMPLING CYCLONE (CY-251)

	Document No.: 200-DAS-A4-EQ-0058	**Rev. : 01**
	Owner Job No.:	**Type: DAS**
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PROJECT:PP-PE PILOT PLANT	**Client:**
TITLE:DATA SHEET FOR LOOP PREPOLY (60 LT) SAMPLING CYCLONE (CY-251)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

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Revision	**Date**	**Prepared By**	**Checked By**	**Approved By**	**Status**

Document Revision

	Document No.: 200-DAS-A4-EQ-0058	**Rev. : 01**
	Owner Job No.:	**Type: DAS**
		Page : B

PROJECT:PP-PE PILOT PLANT

Client:

شرکت ملی صنایع پتروشیمی
شرکت پژوهش و فناوری پتروشیمی

TITLE:DATA SHEET FOR LOOP PREPOLY (60 LT) SAMPLING CYCLONE (CY-251)

1	Item No.:CY-251	Quantity: 1	Location: Outdoor	Service:	Continuous

DESIGN CONDITIONS

			Vessel	Jacket	Internal Coil
5	Operating Temperature(Min./Max.)	^{0}C	-30/+20	-/-	-/-
6	Operating Pressure	barg	30	-	-
7	Density	kg/m^3	550	-	-
8	Design Pressure(int./ext.)	barg	45/-	-/-	-/-
9	Design Temperature	^{0}C	-60/+180	-/-	-/-
10	Volume(total)	Liters	9.4	-	-
11	Hydro Test Pressure	barg	as per UG99b(33)	-	-
12	Corrosion Allowance(shell/head)	mm	0/0	-/-	-/-
13	Cladding (shell/head)	mm	-/-	-/-	-/-
14	Content @ normal operation		Hydrocarbons+Slurry	-	-
15	Thickness(shell/head)	mm	8/20	-/-	-/-
16	Welding Radiography(shell/head)	%	100/100	-/-	-/-
17	Joint Efficiency(shell/head)		1/1	-/-	-/-
18	Top Head Type		Welded Flat	-	-
19	Bottom Head Type		Cone	-	-

20	Design code:	ASME SEC. VIII DIV.1	Inspection code:	ASME SEC. IX
21	Cylinder Deminsion(IDxCyl.):	1 pipe 6" x 350 mm	Lethal Service:	○ Yes ● No
22	M.D.M.T @ D.P:	-60 ^{0}C	M.A.T:	- ^{0}C
23	M.A.W.P:	47.16 barg Limted by: Body Flange	Stamp:	Not Required
24	Impact Test:	Not Required	P.W.H.T:	Not Required
25	N.D.T:	Required	Vessel linning detail:	
26	HIC/SSC resistance:	- / -	Painting & Coating:	as per code
27	Insulation thickness:	30 mm	Insulation type:	HOT
28	Fireproofing :	1 NO	Vessel located on:	Structrue
29	Seismic code:	UBC 1997	Seismic Zone:	3
30	Impotance factor:	1.25	Soil Profile:	SD
31	Wind code:	UBC	Wind velocity:	120 km/hr @ 10 m
32	Impotance factor:	1.15	Exposure:	C

	Support loading data(Note 5)				
		Earthquake	Wind	Weight(kg) (Note 5)	
34				Fabricated:	64.8
35	Shearing load(kgf)	16	15	Empty:	99.1
36	Moment(kg.m)	2.4	5.9	Test:	108
				Operation:	99.2

MISCELLANEOUS(Note 2,10)

39	○ Baffle	○ Impingement plate	○ Weir plate
40	○ Diffuser	○ Distributer	○ Trunnion
41	○ Vortex breaker	○ Tubesheet	○ Template
42	○ Boot / Cap	○ Demister	● Pickling & passivation
43	● Insulation Support	○ Wire mesh	● Earthing boss
44	○ Fire Proofing	● Name plate	● Dip pipe
45	○ Fire Proofing Support 1	○ Internal lining	
46	○ Ladder & platform (int. & ext.)	○ Sand blast & painting	
47	○ Heating coil	○ Internal clips	
48	● Lifting lug	● External clips	

PROJECT:PP-PE PILOT PLANT

Client:

شرکت ملی صنایع پتروشیمی
شرکت پژوهش و فناوری پتروشیمی

TITLE:DATA SHEET FOR LOOP PREPOLY (60 LT)
SAMPLING CYCLONE (CY-251)

MATERIALS(NOTE 2)

Shell(Main/CONE)		SA312-304L	/ 1	SA182-304L	Earth lug	SA240-316L
Head(Main/Jacket)		SA182-304L	/	-	Stiffening rings	-
Nozzle Necks	Plate	-	/	-	Gaskets	Double O ring
(Main/Jacket)	Pipe	SA312-304L	/	-	Ext. bolt/Nuts	SA193-B7/SA194-2H
Cladding		-			Int. bolt/Nuts	SA193-B8/SA194-8
Nozzle flanges		1 SA182-304L			Wire mesh	-
Blind flanges		SA182-304L			Welded clip	SA240-304L
Reinforcing pad		-			Int. welded	SA240-304L
Fitting		SA403-304L			Int. removable	SA240-304L
Support	Leg	-			Anchor/Setting bolts	SA307-B
	Lug	SA240-304L			Ladder/Platform	-
	leg/lug pad	-			Insulation Mateial	MINERAL WOOL
Lifting lug		SA240-304L				

NOZZLE DETAILS(NOTE 2,3,4,7,8)

Item	NPS (Inch)	Flanges Rating	Flanges Type	Flanges NOTE	SCH. /THK.	Service	Proj.	Rein. PAD Width	Rein. PAD Thk.	Standards	Remarks
Top Head											
P1	1"	600#	WN	RF	40S	Vent	see P. 4	-	-	ANSI B16.5	
Shell											
P2	1 1/2"	600#	WN	RF	40S	Product Inlet	see P. 4	-	-	ANSI B16.5	Tangential
Bottom Head											
P3	1 1/2"	600#	WN	RF	40S	Product Outlet	see P. 4	-	-	ANSI B16.5	

PROJECT:PP-PE PILOT PLANT	Client: شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی
TITLE:DATA SHEET FOR LOOP PREPOLY (60 LT)SAMPLING CYCLONE (CY-251)	

NOZZLE LOADING DATA(NOTE 1)

Nozzle Name	FL (kgf)	FA (kgf)	FC (kgf)	MC (kg.m)	MT (kg.m)	ML (kg.m)

REFRENCE DOCUMENTS

No.	Document No.	Document Title
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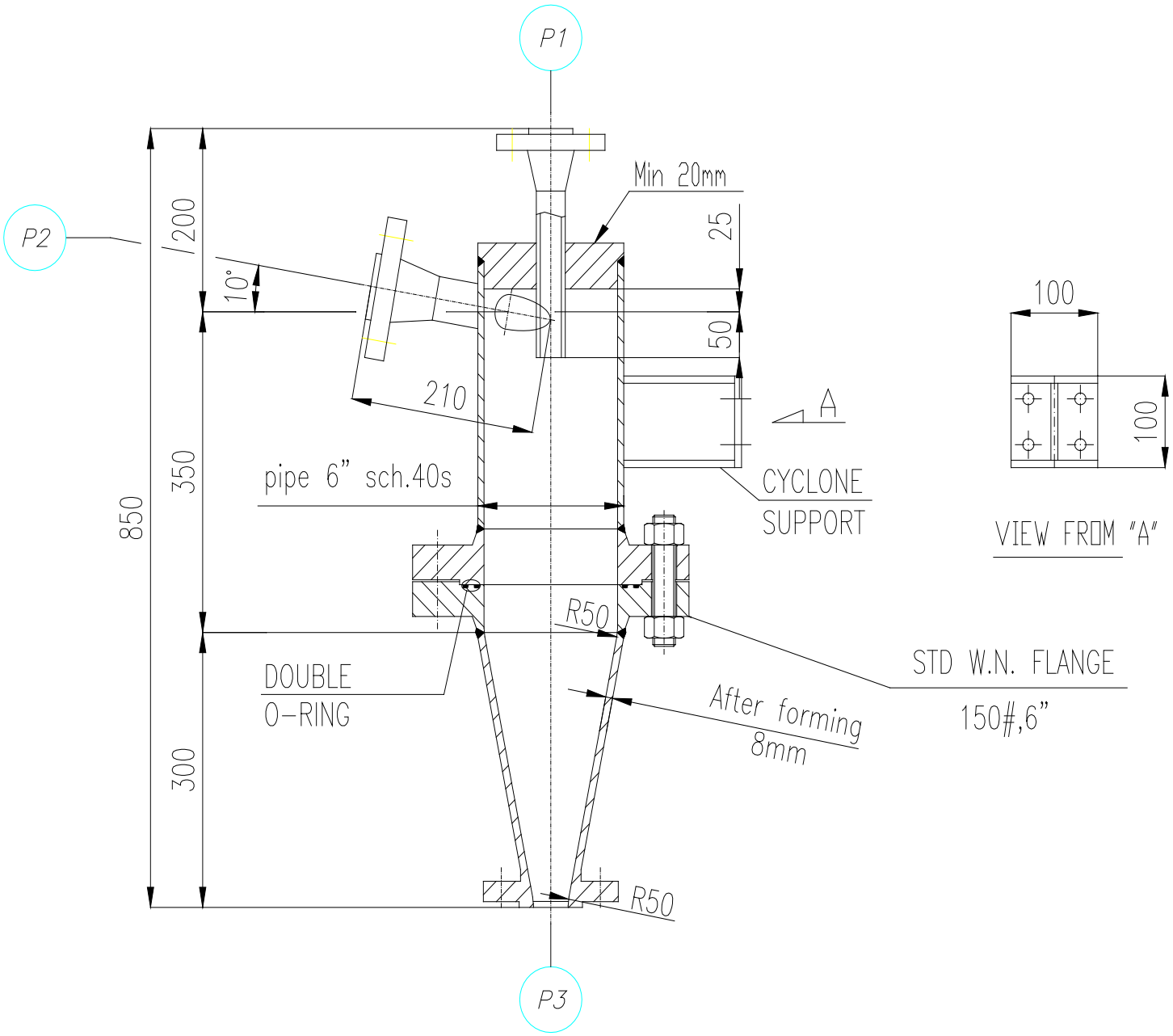
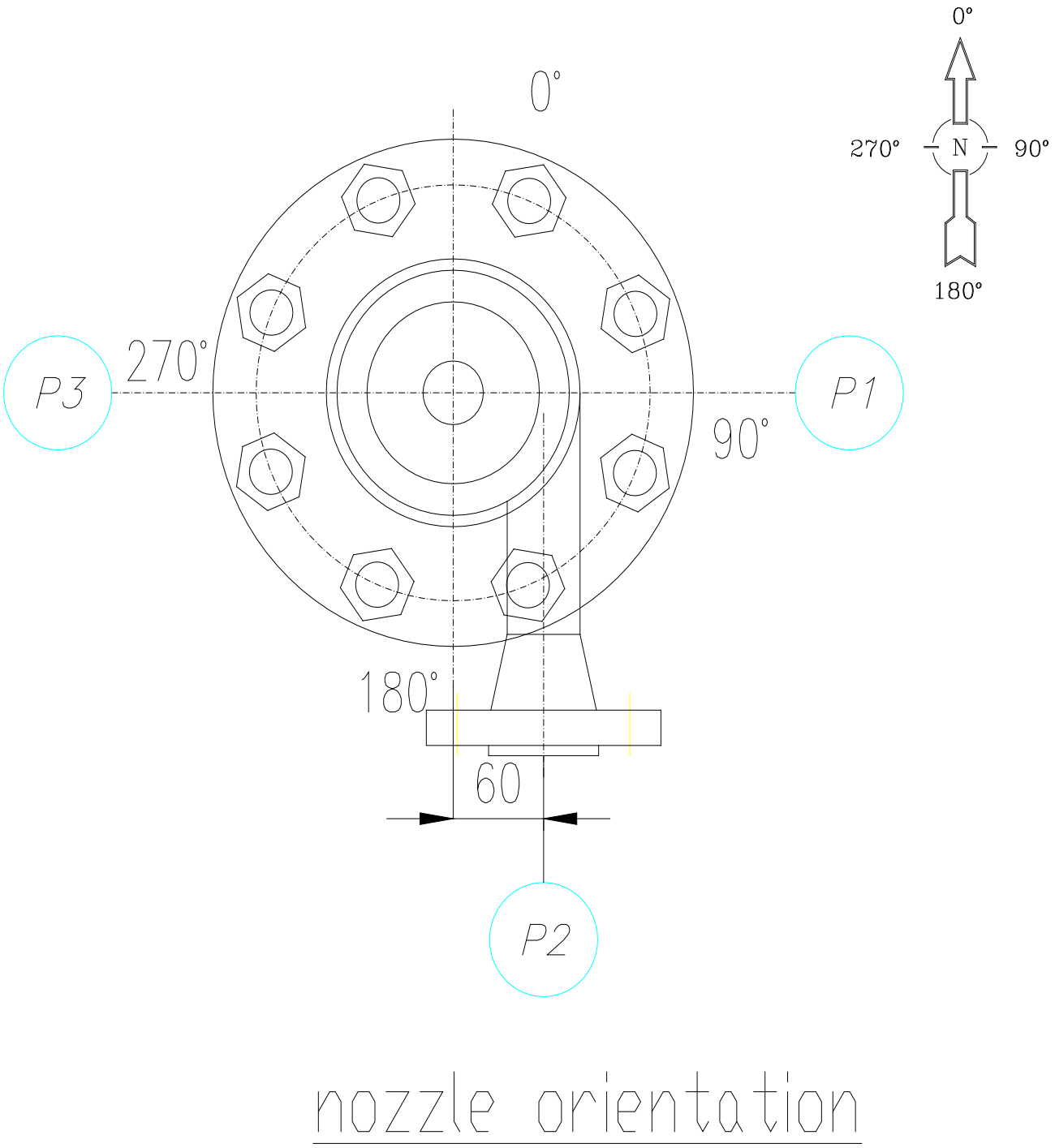
Sketch(Note 3)



side view

PROJECT:PP-PE PILOT PLANT	Client: شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی
TITLE:DATA SHEET FOR LOOP PREPOLY (60 LT) SAMPLING CYCLONE (CY-251)	

Sketch(Note 3)



General Notes:

1- SHALL BE SPECIFIED BY VENDOR .
2- SHALL BE VERIFIED BY VENDOR.
3- ALL DIMENSIONS ARE IN MILLIMETER, UNLESS OTHERWISE NOTED.
4- NOZZLE CHARACTERISTICS SHALL BE VERIFIED BY VENDOR.
5- THICKNESSES, WEIGHTS AND LOADS ARE INDICATED FOR ESTIMATION PURPOSE ONLY ; THE MANUFCTURER SHALL CONFIRM THESE ITEMS AND IS RESPONSIBLE FOR MECHANICAL DESIGN.
6- STATED THICKNESS IS MINIMUM AFTER FORMING. THICKNESS OF STRAIGHT FLANGE OF ELLIPTICAL/TORISPHERICAL HEADS SHALL BE IN NO CASE SMALLER THAN VESSEL SHELL THICKNESS. VENDOR SHALL CHECK AND GUARANTEE THEM ON STRENGTH.
7- SHELL/NOZZLE THICKNESS AT CONNECTION/ATACHMENT AREA SHALL BE VERIFIED BY LOCAL ALCULATION.
8- UNLESS OTHERWISE NOTED OUTSIDE PROJECTION OF NOZZLES ARE MEASURED FROM C.L./T.L. OF VESSEL TO THE EXTREME FACE OF NOZZLE FLANGE.
9- LOCATION AND NUMBER OF LIFTING LUGS ON VESSEL SHALL BE SPECIFIED ON VENDOR DRAWINGS.
10- ALL WELDED ATTACHMENTS TO THE VESSEL TO BE SUPPLIED BY THE VESSEL MANUFACTURER .
11- SETTING BOLTS SHALL BE HOT DIP GALVANIZED.
12- SURFACE PREPARATAION,PICKLING&PASSIVATION SHALL BE ACC. TO APPROVED VENDOR DOCUMENT BY PURCHASER.
13- ALL REINF.PADS SHALL HAVE 1/4"(6mm) TELL TALE HOLE.
14-FINISHING OF THE GASKET CONTACTING FACE SHALL BE SMOOTH FINISH RA=3.2 µm (125 µinch)
15-INTERNAL FINISHING SHALL BE SMOOTH FINISH RA= 0.4 µm (16µinch)
16- DESIGN TEMPERATURE (INT/EXT.) : 180/- ◦C

PROJECT:PP-PE PILOT PLANT	Client:
TITLE:DATA SHEET FOR LOOP PREPOLY (200 LT) SAMPLING CYCLONE (CY-261)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

DATA SHEET FOR LOOP PREPOLY (200 LT) SAMPLING CYCLONE (CY-261)

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PROJECT:PP-PE PILOT PLANT	**Client:**
TITLE:DATA SHEET FOR LOOP PREPOLY (200 LT) **SAMPLING CYCLONE (CY-261)**	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

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Document Revision

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PROJECT:PP-PE PILOT PLANT

Client:

شرکت ملی صنایع پتروشیمی

شرکت پژوهش و فناوری پتروشیمی

TITLE:DATA SHEET FOR LOOP PREPOLY (200 LT) SAMPLING CYCLONE (CY-261)

1	Item No.:CY-261	Quantity: 1	Location: Outdoor	Service:	Continuous

DESIGN CONDITIONS

			Vessel	Jacket	Internal Coil
5	Operating Temperature(Min./Max.)	^{0}C	-30/+60	-/-	-/-
6	Operating Pressure	barg	30	-	-
7	Density	kg/m^3	550	-	-
8	Design Pressure(int./ext.)	barg	45/-	-/-	-/-
9	Design Temperature	^{0}C	-60/+180	-/-	-/-
10	Volume(total)	Liters	9.4	-	-
11	Hydro Test Pressure	barg	as per UG99b(33)	-	-
12	Corrosion Allowance(shell/head)	mm	0/0	-/-	-/-
13	Cladding (shell/head)	mm	-/-	-/-	-/-
14	Content @ normal operation		Hydrocarbons+Slurry	-	-
15	Thickness(shell/head)	mm	8/20	-/-	-/-
16	Welding Radiography(shell/head)	%	100/100	-/-	-/-
17	Joint Efficiency(shell/head)		1/1	-/-	-/-
18	Top Head Type		Welded Flat	-	-
19	Bottom Head Type		Cone	-	-

20	Design code:	ASME SEC. VIII DIV.1	Inspection code:	ASME SEC. IX
21	Cylinder Deminsion(IDxCyl.):	1 PIPE 6" x 350 mm	Lethal Service:	○ Yes ● No
22	M.D.M.T @ D.P:	-60 ^{0}C	M.A.T:	- ^{0}C
23	M.A.W.P: 47.16 barg	Limted by: Body Flange	Stamp:	Not Required
24	Impact Test:	Not Required	P.W.H.T:	Not Required
25	N.D.T:	Required	Vessel linning detail:	NIL
26	HIC/SSC resistance:	- / -	Painting & Coating:	as per code
27	Insulation thickness:	40 mm	Insulation type:	HOT
28	Fireproofing :	1 NO	Vessel located on:	Structrue
29	Seismic code:	UBC 1997	Seismic Zone:	3
30	Impotance factor:	1.25	Soil Profile:	SD
31	Wind code:	UBC	Wind velocity:	120 km/hr @ 10 m
32	Impotance factor:	1.15	Exposure:	C

	Support loading data(Note 5)				
34		Earthquake	Wind	Weight(kg) (Note 5)	
35	Shearing load(kgf)	16	15	Fabricated:	64.8
36	Moment(kg.m)	2.4	5.9	Empty:	99.1
				Test:	108
				Operation:	99.2

MISCELLANEOUS(Note 2,10)

39	○ Baffle	○ Impingement plate	○ Weir plate
40	○ Diffuser	○ Distributer	○ Trunnion
41	○ Vortex breaker	○ Tubesheet	○ Template
42	○ Boot / Cap	○ Demister	● Pickling & passivation
43	● Insulation Support	○ Wire mesh	● Earthing boss
44	○ Fire Proofing	● Name plate	● Dip pipe
45	○ Fire Proofing Support 1	○ Internal lining	
46	○ Ladder & platform (int. & ext.)	○ Sand blast & painting	
47	○ Heating coil	○ Internal clips	
48	● Lifting lug	● External clips	

PROJECT:PP-PE PILOT PLANT

Client:

شرکت ملی صنایع پتروشیمی
شرکت پژوهش و فناوری پتروشیمی

TITLE:DATA SHEET FOR LOOP PREPOLY (200 LT)
SAMPLING CYCLONE (CY-261)

MATERIALS(NOTE 2)

Shell(Main/Cone)		SA312-304L	1	SA182-304L	Earth lug	SA240-316L
Head(Main/Jacket)		SA182-304L	/	-	Stiffening rings	-
Nozzle Necks	Plate	-	/	-	Gaskets	Double O ring
(Main/Jacket)	Pipe	SA312-304L	/	-	Ext. bolt/Nuts	SA193-B7/SA194-2H
Cladding		-			Int. bolt/Nuts	SA193-B8/SA194-8
Nozzle flanges		1 SA182-304L			Wire mesh	-
Blind flanges		SA182-304L			Welded clip	SA240-304L
Reinforcing pad		-			Int. welded	SA240-304L
Fitting		SA403-304L			Int. removable	SA240-304L
Support	Leg	-			Anchor/Setting bolts	SA307-B
	Lug	SA240-304L			Ladder/Platform	-
	leg/lug pad	-			Insulation Mateial	MINERAL WOOL
Lifting lug		SA240-304L				

NOZZLE DETAILS(NOTE 2,3,4,7,8)

Item	NPS (Inch)	Flanges			SCH. /THK.	Service	Proj.	Rein. PAD		Standards	Remarks
		Rating	Type	Face				Width	Thk.		
Top Head											
P1	1"	600#	WN	RF	40S	Vent	see P. 4	-	-	ANSI B16.5	
Shell											
P2	1 1/2"	600#	WN	RF	40S	Product Inlet	see P. 4	-	-	ANSI B16.5	Tangential
Bottom Head											
P3	1 1/2"	600#	WN	RF	40S	Product Outlet	see P. 4	-	-	ANSI B16.5	

PROJECT:PP-PE PILOT PLANT	**Client:**
TITLE:DATA SHEET FOR LOOP PREPOLY (200 LT) **SAMPLING CYCLONE (CY-261)**	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

NOZZLE LOADING DATA(NOTE 1)

Nozzle Name	FL (kgf)	FA (kgf)	FC (kgf)	MC (kg.m)	MT (kg.m)	ML (kg.m)

REFRENCE DOCUMENTS

No.	Document No.	Document Title
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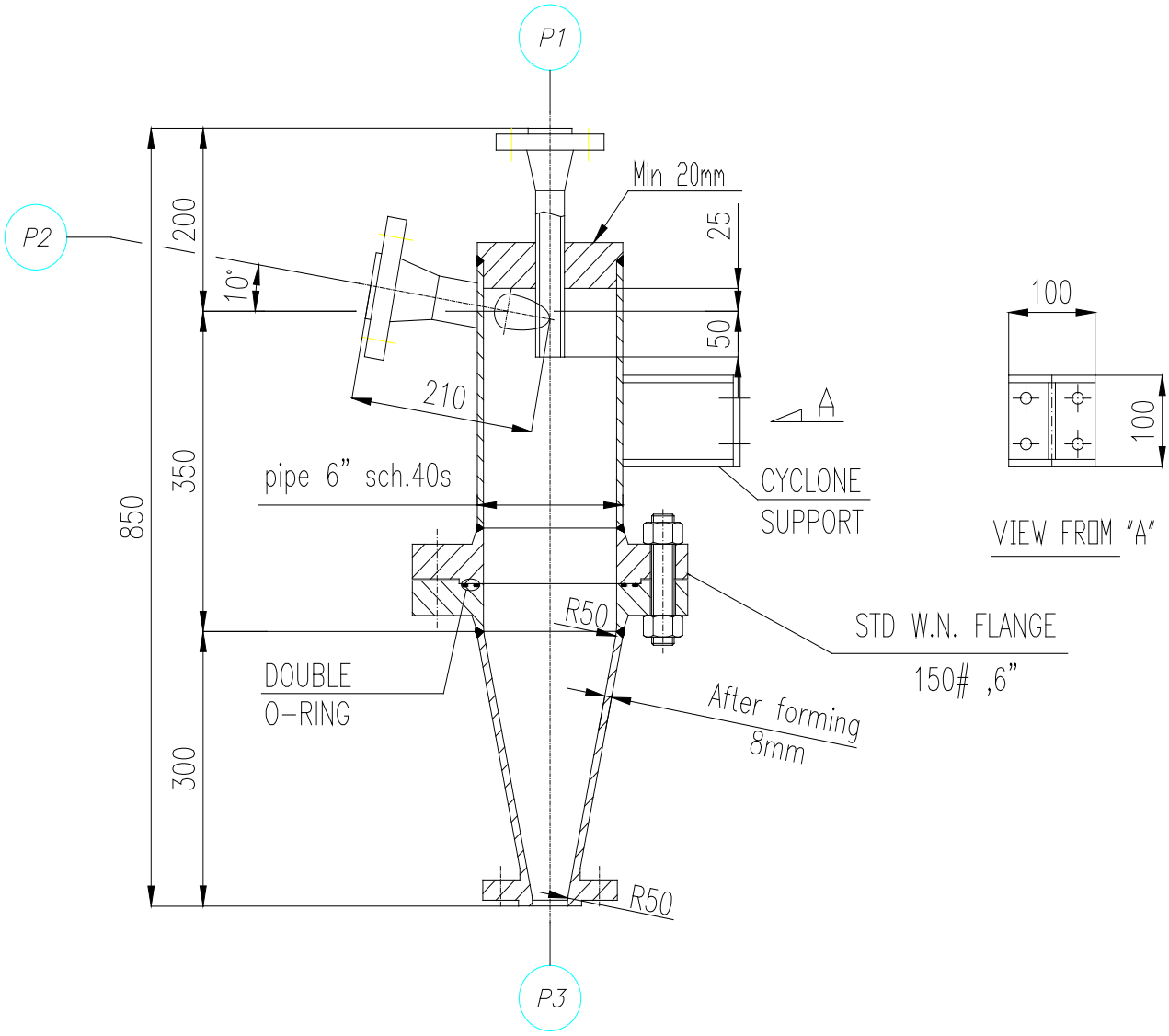
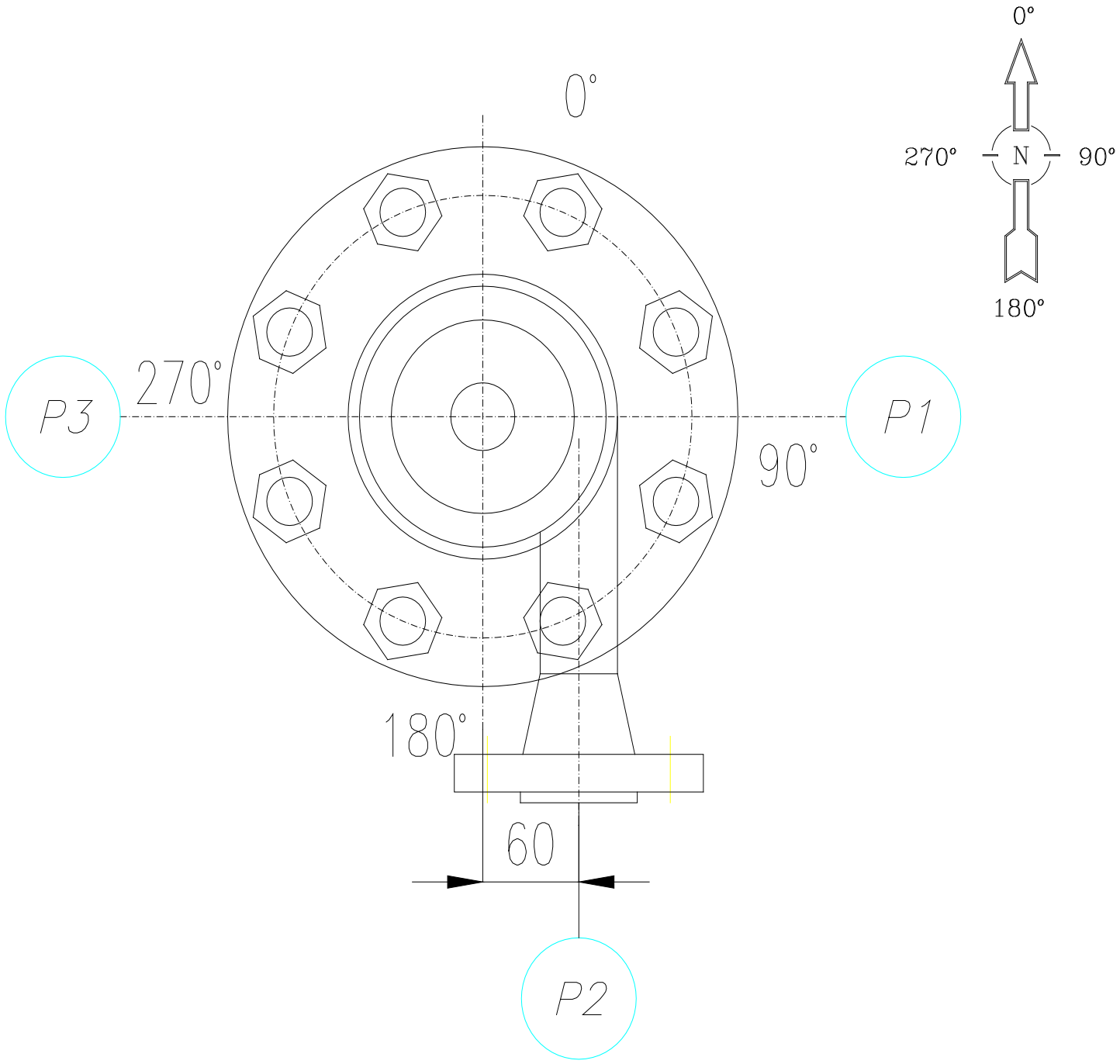
Sketch(Note 3)



side view

PROJECT:PP-PE PILOT PLANT	Client:
TITLE:DATA SHEET FOR LOOP PREPOLY (200 LT) SAMPLING CYCLONE (CY-261)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

Sketch(Note 3)



nozzle orientation

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		Page 5 of 6

General Notes:

1- SHALL BE SPECIFIED BY VENDOR .
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7- SHELL/NOZZLE THICKNESS AT CONNECTION/ATACHMENT AREA SHALL BE VERIFIED BY LOCAL CALCULATION.
8- UNLESS OTHERWISE NOTED OUTSIDE PROJECTION OF NOZZLES ARE MEASURED FROM C.L./T.L. OF VESSEL TO THE EXTREME FACE OF NOZZLE FLANGE.
9- LOCATION AND NUMBER OF LIFTING LUGS ON VESSEL SHALL BE SPECIFIED ON VENDOR DRAWINGS.
10- ALL WELDED ATTACHMENTS TO THE VESSEL TO BE SUPPLIED BY THE VESSEL MANUFACTURER .
11- SETTING BOLTS SHALL BE HOT DIP GALVANIZED.
12- SURFACE PREPARATAION,PICKLING&PASSIVATION SHALL BE ACC. TO APPROVED VENDOR DOCUMENT BY PURCHASER.
13- ALL REINF.PADS SHALL HAVE 1/4"(6mm) TELL TALE HOLE.
14-FINISHING OF THE GASKET CONTACTING FACE SHALL BE SMOOTH FINISH RA=3.2 µm (125 µinch)
15-INTERNAL FINISHING SHALL BE SMOOTH FINISH RA= 0.4 µm (16µinch)
16- DESIGN TEMPERATURE (INT/EXT.) : 180/- ◦C

DATA SHEET FOR 1ST G.P.R. PRC CONTROL PURGING CYCLONE (CY-411)

PROJECT:PP-PE PILOT PLANT	**Client:**
TITLE:DATA SHEET FOR1ST G.P.R. PRC CONTROL PURGING CYCLONE(CY-411)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

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4	X	X											
5	X	X											
6	X	X											

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Document revision

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PROJECT:PP-PE PILOT PLANT

Client:

شرکت ملی صنایع پتروشیمی

شرکت پژوهش و فناوری پتروشیمی

TITLE:DATA SHEET FOR1ST G.P.R. PRC CONTROL PURGING CYCLONE(CY-411)

Item No.:CY-411 Quantity: 1 Location: Outdoor Service: Continuous

DESIGN CONDITIONS

		Vessel	Jacket	Internal Coil
Operating Temperature(Min./Max.)	^{0}C	-30/+80	-/-	-/-
Operating Pressure	barg	24	-	-
Density	kg/m^3	500	-	-
Design Pressure(int./ext.)	barg	32/-	-/-	-/-
Design Temperature	^{0}C	-60/+180	-/-	-/-
Volume(total)	Liters	5.6	-	-
Hydro Test Pressure	barg	as per UG99b(33)	-	-
Corrosion Allowance(shell/head)	mm	0/0	-/-	-/-
Cladding (shell/head)	mm	-/-	-/-	-/-
Content @ normal operation		Hydrocarbons+Polymer	-	-
Thickness(shell/head)	mm	7/15	-/-	-/-
Welding Radiography(shell/head)	%	100/100	-/-	-/-
Joint Efficiency(shell/head)		1/1	-/-	-/-
Top Head Type		Welded Flat	-	-
Bottom Head Type		Cone	-	-

Design code:	ASME SEC. VIII DIV.1		Inspection code:	ASME SEC. IX
Cylinder Deminsion(IDxCyl.):	PIPE 5" x 315 mm		Lethal Service:	○ Yes ● No
M.D.M.T @ D.P:	1 -60 ^{0}C		M.A.T:	- ^{0}C
M.A.W.P:	35.5 barg	Limted by: ANSI FLANGE	Stamp:	Not Required
Impact Test:	Not Required		P.W.H.T:	Not Required
N.D.T:	Required		Vessel linning detail:	NIL
HIC/SSC resistance:	- / -		Painting & Coating:	as per code
Insulation thickness:	30 mm		Insulation type:	HOT
Fireproofing :	1 NO		Vessel located on:	Structrue
Seismic code:	UBC 1997		Seismic Zone:	3
Impotance factor:	1.25		Soil Profile:	SD
Wind code:	UBC		Wind velocity:	120 km/hr @ 10 m
Impotance factor:	1.15		Exposure:	C

Support loading data(Note 1)		
	Earthquake	Wind
Shearing load(kgf)	-	-
Moment(kg.m)	-	-

Weight(kg) (Note 5)	
Fabricated:	37.7
Empty:	66
Test:	71.3
Operation:	66.1

MISCELLANEOUS(Note 2,10)

○ Baffle	○ Impingement plate	○ Weir plate
○ Diffuser	○ Distributer	○ Trunnion
○ Vortex breaker	○ Tubesheet	○ Template
○ Boot / Cap	○ Demister	● Pickling & passivation
● Insulation Support	○ Wire mesh	● Earthing boss
○ Fire Proofing	● Name plate	● Dip pipe
○ Fire Proofing Support 1	○ Internal lining	
○ Ladder & platform (int. & ext.)	○ Sand blast & painting	
○ Heating coil	○ Internal clips	
● Lifting lug	● External clips	

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PROJECT:PP-PE PILOT PLANT

Client:

شرکت ملی صنایع پتروشیمی
شرکت پژوهش و فناوری پتروشیمی

TITLE:DATA SHEET FOR1ST G.P.R. PRC CONTROL PURGING CYCLONE(CY-411)

MATERIALS(NOTE 2)

Shell(Main/Cone)		SA312-304L	1	SA182-304L	Earth lug	SA240-316L
Head(Main/Jacket)		SA182-304L	/	-	Stiffening rings	-
Nozzle Necks	Plate	-	/	-	Gaskets	Double O ring
(Main/Jacket)	Pipe	SA312-304L	/	-	Ext. bolt/Nuts	SA193-B7/SA194-2H
Cladding		-			Int. bolt/Nuts	SA193-B8/SA194-8
Nozzle flanges		1 SA182-304L			Wire mesh	-
Blind flanges		SA182-304L			Welded clip	SA240-304L
Reinforcing pad		-			Int. welded	SA240-304L
Fitting		SA403-304L			Int. removable	SA240-304L
Support	Leg	-			Anchor/Setting bolts	SA307-B
	Lug	SA240-304L			Ladder/Platform	-
	leg/lug pad	-			Insulation Mateial	MINERAL WOOL
Lifting lug		SA240-304L				

NOZZLE DETAILS(NOTE 2,3,4,7,8)

Item	NPS (Inch)	Flanges Rating	Type	Face	SCH. /THK.	Service	Proj.	Rein. PAD Width	Rein. PAD Thk.	Standards	Remarks
Top Head 1											
P1	1"	600#	WN	RF	40S	Gas Outlet	see P. 4	-	-	ANSI B16.5	
1											
Shell											
P2	1"	600#	WN	RF	40S	Product/Gas Inlet	170	-	-	ANSI B16.5	Tangential
Bottom Head 1											
P3	1"	600#	WN	RF	40S	Product Outlet	see P. 4	-	-	ANSI B16.5	

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PROJECT:PP-PE PILOT PLANT

Client:

شرکت ملی صنایع پتروشیمی

شرکت پژوهش و فناوری پتروشیمی

TITLE:DATA SHEET FOR1ST G.P.R. PRC CONTROL PURGING CYCLONE(CY-411)

NOZZLE LOADING DATA(NOTE 1)

Nozzle Name	FL (kgf)	FA (kgf)	FC (kgf)	MC (kg.m)	MT (kg.m)	ML (kg.m)

REFRENCE DOCUMENTS

No.	Document No.	Document Title
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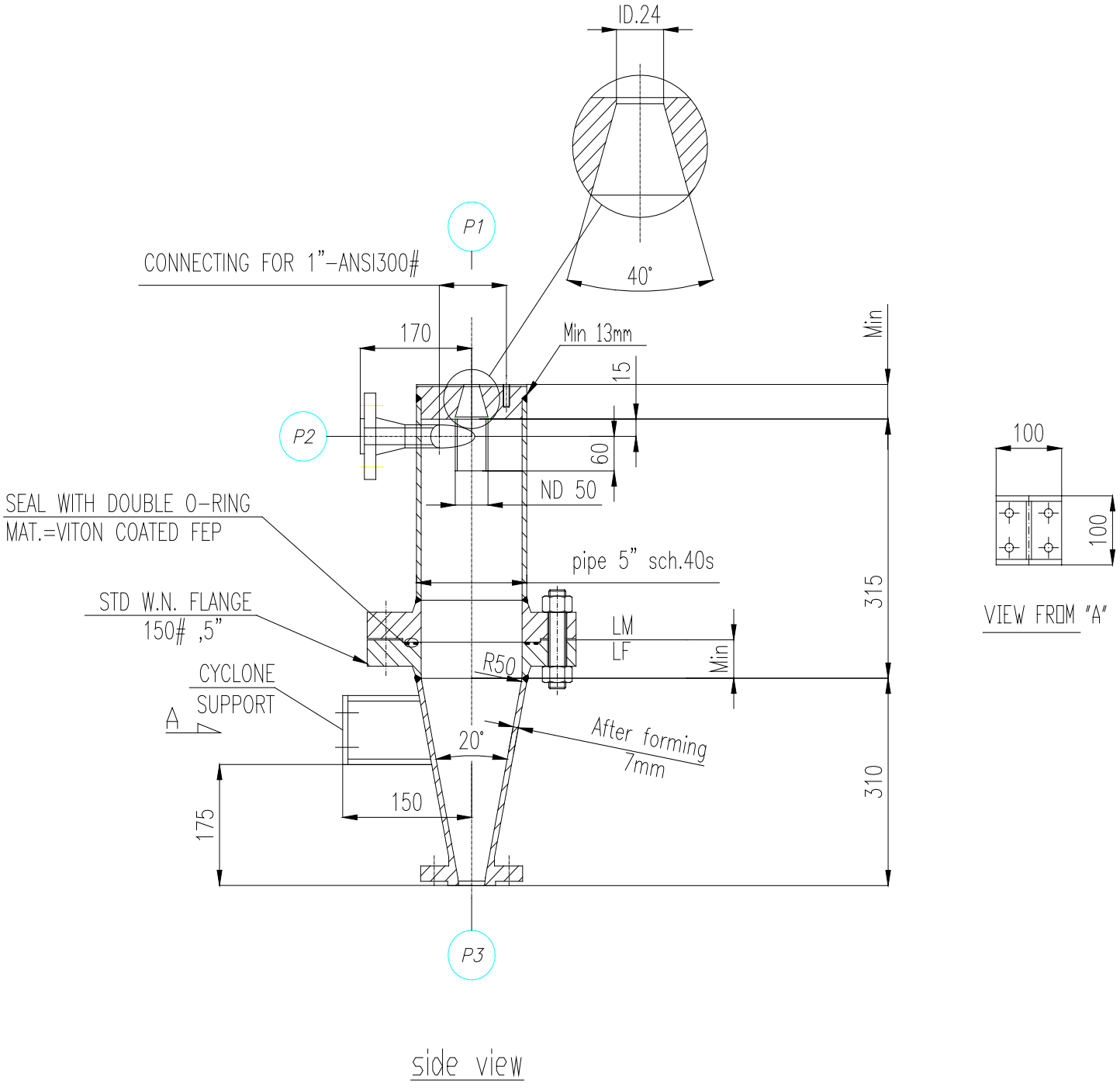
PROJECT:PP-PE PILOT PLANT	**Client:**
TITLE:DATA SHEET FOR1ST G.P.R. PRC CONTROL PURGING CYCLONE(CY-411)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

Sketch(Note 3)



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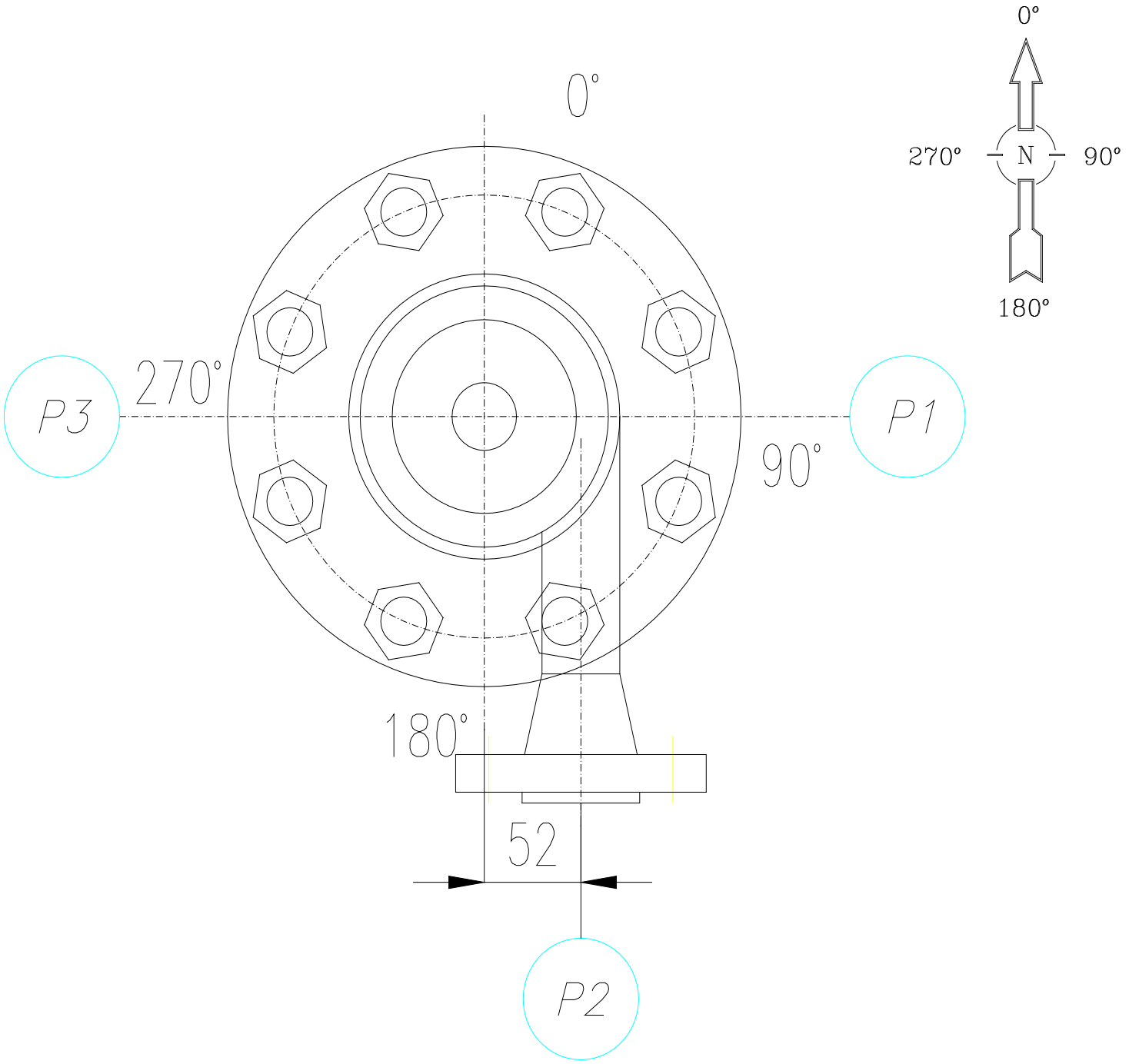
PROJECT:PP-PE PILOT PLANT	**Client:** شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی
TITLE:DATA SHEET FOR1ST G.P.R. PRC CONTROL PURGING CYCLONE(CY-411)	

Sketch(Note 3)



nozzle orientation

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PROJECT:PP-PE PILOT PLANT	Client:
TITLE:DATA SHEET FOR1ST G.P.R. PRC CONTROL PURGING CYCLONE(CY-411)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

General Notes:

1- SHALL BE SPECIFIED BY VENDOR .
2- SHALL BE VERIFIED BY VENDOR.
3- ALL DIMENSIONS ARE IN MILLIMETER, UNLESS OTHERWISE NOTED.
4- NOZZLE CHARACTERISTICS SHALL BE VERIFIED BY VENDOR.
5- THICKNESSES, WEIGHTS AND LOADS ARE INDICATED FOR ESTIMATION PURPOSE ONLY; THE MANUFCTURER SHALL CONFIRM THESE ITEMS AND IS RESPONSIBLE FOR MECHANICAL DESIGN.
6- STATED THICKNESS IS MINIMUM AFTER FORMING. THICKNESS OF STRAIGHT FLANGE OF ELLIPTICAL/TORISPHERICAL HEADS SHALL BE IN NO CASE SMALLER THAN VESSEL SHELL THICKNESS. VENDOR SHALL CHECK AND GUARANTEE THEM ON STRENGTH.
7- SHELL/NOZZLE THICKNESS AT CONNECTION/ATACHMENT AREA SHALL BE VERIFIED BY LOCAL CALCULATION.
8- UNLESS OTHERWISE NOTED OUTSIDE PROJECTION OF NOZZLES ARE MEASURED FROM C.L./T.L. OF VESSEL TO THE EXTREME FACE OF NOZZLE FLANGE.
9- LOCATION AND NUMBER OF LIFTING LUGS ON VESSEL SHALL BE SPECIFIED ON VENDOR DRAWINGS.
10- ALL WELDED ATTACHMENTS TO THE VESSEL TO BE SUPPLIED BY THE VESSEL MANUFACTURER .
11- SETTING BOLTS SHALL BE HOT DIP GALVANIZED.
12- SURFACE PREPARATAION ,PICKLING&PASSIVATION SHALL BE ACC. TO APPROVED VENDOR DOCUMENT BY PURCHASER.
13- ALL REINF.PADS SHALL HAVE 1/4"(6mm) TELL TALE HOLE.
14-FINISHING OF THE GASKET CONTACTING FACE SHALL BE SMOOTH FINISH RA=0.8 µm (32 µinch)
15-INTERNAL FINISHING SHALL BE SMOOTH FINISH RA= 0.4 µm (16 µinch)

PROJECT:PP-PE PILOT PLANT	Client:
TITLE:DATA SHEET FOR 1ST G.P.R. SAMPLING CYCLONE(CY-412)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

DATA SHEET FOR
1ST G.P.R. SAMPLING CYCLONE
(CY-412)

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PROJECT:PP-PE PILOT PLANT	**Client:**
TITLE:DATA SHEET FOR 1ST G.P.R. SAMPLING CYCLONE(CY-412)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

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Revision	**Date**	**Prepared By**	**Checked By**	**Approved By**	**Status**

Document Revision

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PROJECT:PP-PE PILOT PLANT

Client:

شرکت ملی صنایع پتروشیمی

شرکت پژوهش و فناوری پتروشیمی

TITLE:DATA SHEET FOR 1ST G.P.R. SAMPLING CYCLONE(CY-412)

Item No.:CY-412 Quantity: 1 Location: Outdoor Service: Continuous

DESIGN CONDITIONS

		Vessel	Jacket	Internal Coil
Operating Temperature(Min./Max.)	^{0}C	-30/+80	-/-	-/-
Operating Pressure	barg	24	-	-
Density	kg/m^3	500	-	-
Design Pressure(int./ext.)	barg	32/-	-/-	-/-
Design Temperature(int./ext.)	^{0}C	-60/+180	-/-	-/-
Volume(total)	Liters	7.6	-	-
Hydro Test Pressure	barg	as per UG99b(33)	-	-
Corrosion Allowance(shell/head)	mm	0/0	-/-	-/-
Cladding (shell/head)	mm	-/-	-/-	-/-
Content @ normal operation		Hydrocarbons+Polymer	-	-
Thickness(shell/head)	mm	8/35	-/-	-/-
Welding Radiography(shell/head)	%	100/100	-/-	-/-
Joint Efficiency(shell/head)		1/1	-/-	-/-
Top Head Type		ANSI/Bolted Falnge	-	-
Bottom Head Type		Cone	-	-

Design code:	ASME SEC. VIII DIV.1	Inspection code:	ASME SEC. IX
Cylinder Deminsion(IDxCyl.):	PIPE 6" x 300 mm	Lethal Service:	○ Yes ● No
M.D.M.T @ D.P:	-60 ^{0}C	M.A.T:	- ^{0}C
M.A.W.P:	35.5 barg Limted by: ANSI Flange	Stamp:	Not Required
Impact Test:	Not Required	P.W.H.T:	Not Required
N.D.T:	Required	Vessel linning detail:	NIL
HIC/SSC resistance:	- / -	Painting & Coating:	as per code
Insulation thickness:	30 mm	Insulation type:	HOT
Fireproofing :	1 NO	Vessel located on:	Structrue
Seismic code:	UBC 1997	Seismic Zone:	3
Impotance factor:	1.25	Soil Profile:	SD
Wind code:	UBC	Wind velocity:	120 km/hr @ 10 m
Impotance factor:	1.15	Exposure:	C

Support loading data(Note 1)		
	Earthquake	Wind
Shearing load(kgf)	-	-
Moment(kg.m)	-	-

Weight(kg) (Note 5)	
Fabricated:	62.5
Empty:	109.5
Test:	116.5
Operation:	109.5

MISCELLANEOUS(Note 2,10)

○ Baffle	○ Impingement plate	○ Weir plate
○ Diffuser	○ Distributer	○ Trunnion
○ Vortex breaker	○ Tubesheet	○ Template
○ Boot / Cap	○ Demister	● Pickling & passivation
● Insulation Support	○ Wire mesh	● Earthing boss
○ Fire Proofing	● Name plate	● Dip pipe
○ Fire Proofing Support 1	○ Internal lining	
○ Ladder & platform (int. & ext.)	○ Sand blast & painting	
○ Heating coil	○ Internal clips	
● Lifting lug	● External clips	

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PROJECT:PP-PE PILOT PLANT	**Client:**
TITLE:DATA SHEET FOR 1ST G.P.R. SAMPLING CYCLONE(CY-412)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

MATERIALS(NOTE 2)

Shell(Main/Cone)		SA312-304L	1 /	SA182-304L	Earth lug	SA240-316L
Head(Main/Jacket)		SA182-304L	/	-	Stiffening rings	NA
Nozzle Necks (Main/Jacket)	Plate	-	/	-	Gaskets	Spiral wound
	Pipe	SA312-304L	/	-	Ext. bolt/Nuts	SA193-B7/SA194-2H
Cladding		-			Int. bolt/Nuts	SA193-B8/SA194-8
Nozzle flanges		1 SA182-304L			Wire mesh	-
Blind flanges		SA182-304L			Welded clip	SA240-304L
Reinforcing pad		-			Int. welded	SA240-304L
Fitting		SA403-304L			Int. removable	-
Skirt	Upper part	-			Anchor/Setting bolts	SA307-B
	Lower part	SA240-304L			Ladder/Platform	-
	Base ring	-			Insulation Mateial	Mineral wool
Lifting lug		SA240-304L				

NOZZLE DETAILS(NOTE 2,3,4,7,8)

Item	NPS (Inch)	Flanges Rating	Type	Face	SCH. /THK.	Service	Proj.	Rein. PAD Width	Rein. PAD Thk.	Standards	Remarks
Top Head 1											
P1	1 1/2"	600#	WN	RF	40S	Gas Outlet	see P. 4	-	-	ANSI B16.5	
Shell 1											
P2	1"	600#	WN	RF	40S	Product/Gas Inlet	230	-	-	ANSI B16.5	Tangential
Bottom Head 1											
P3	1 1/2"	600#	WN	RF	40S	Product Outlet	see P. 4	-	-	ANSI B16.5	

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PROJECT:PP-PE PILOT PLANT	**Client:**
TITLE:DATA SHEET FOR 1ST G.P.R. SAMPLING CYCLONE(CY-412)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

NOZZLE LOADING DATA(NOTE 1)

Nozzle Name	FL (kgf)	FA (kgf)	FC (kgf)	MC (kg.m)	MT (kg.m)	ML (kg.m)

REFRENCE DOCUMENTS

No.	Document No.	Document Title
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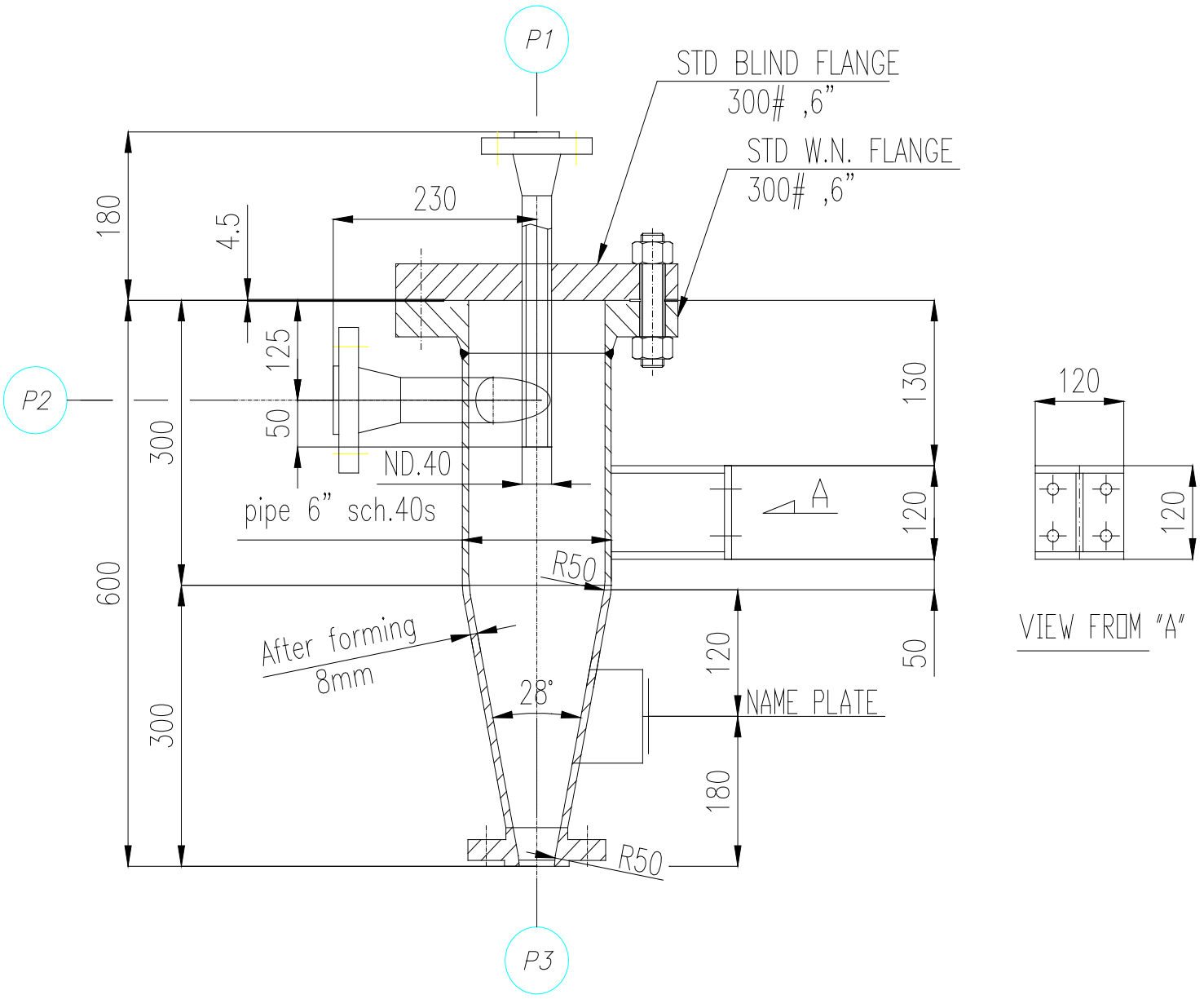
PROJECT:PP-PE PILOT PLANT	Client: شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی
TITLE:DATA SHEET FOR 1ST G.P.R. SAMPLING CYCLONE(CY-412)	

Sketch(Note 3)



SIDE VIEW

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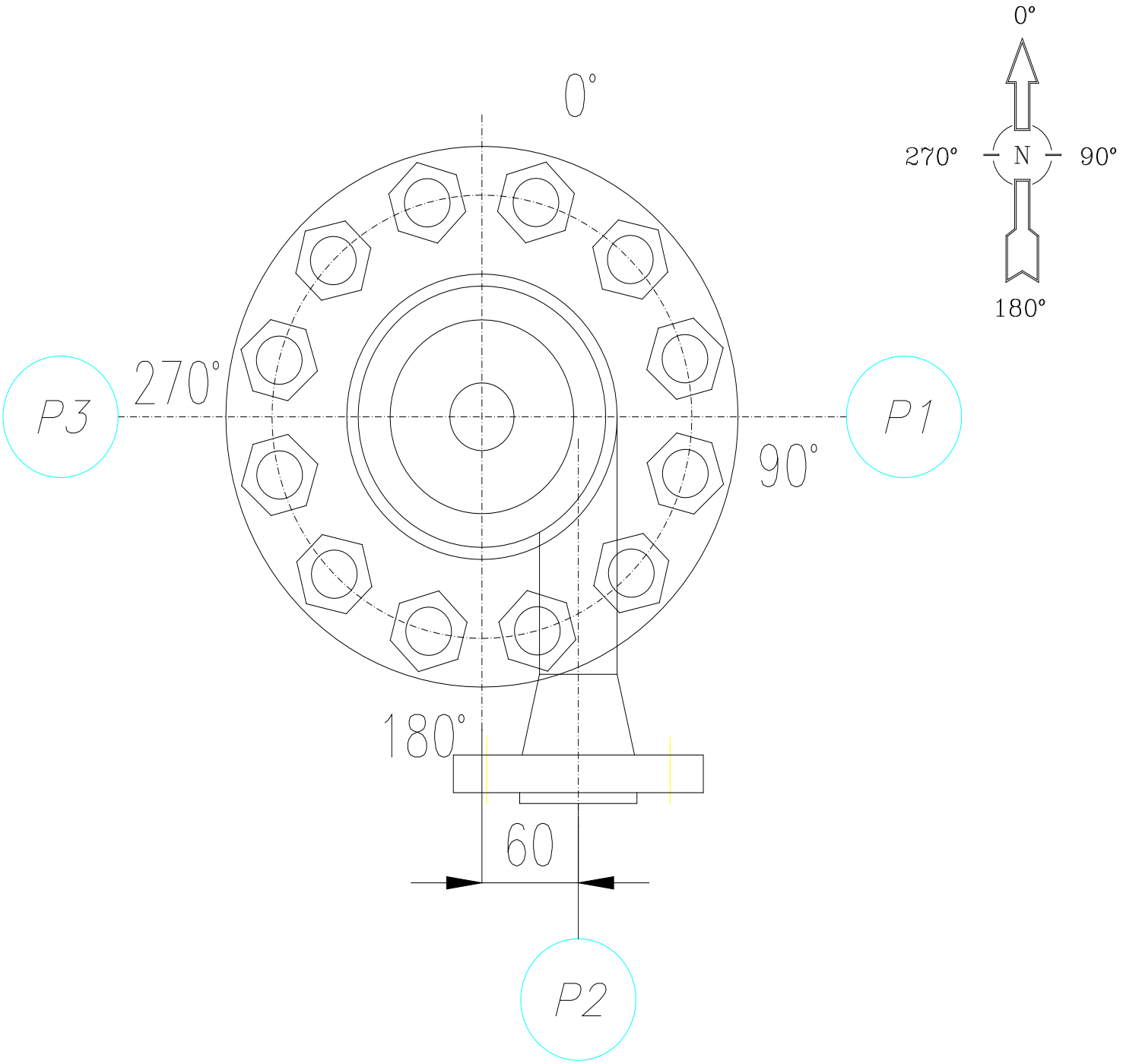
PROJECT:PP-PE PILOT PLANT	Client: شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی
TITLE:DATA SHEET FOR 1ST G.P.R. SAMPLING CYCLONE(CY-412)	

Sketch(Note 3)



nozzle orientation

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PROJECT:PP-PE PILOT PLANT	Client: شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی
TITLE:DATA SHEET FOR 1ST G.P.R. SAMPLING CYCLONE(CY-412)	

General Notes:

1- SHALL BE SPECIFIED BY VENDOR .
2- SHALL BE VERIFIED BY VENDOR.
3- ALL DIMENSIONS ARE IN MILLIMETER, UNLESS OTHERWISE NOTED.
4- NOZZLE CHARACTERISTICS SHALL BE VERIFIED BY VENDOR.
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7- SHELL/NOZZLE THICKNESS AT CONNECTION/ATACHMENT AREA SHALL BE VERIFIED BY LOCAL CALCULATION.
8- UNLESS OTHERWISE NOTED OUTSIDE PROJECTION OF NOZZLES ARE MEASURED FROM C.L./T.L. OF SEL TO THE EXTREME FACE OF NOZZLE FLANGE.
9- LOCATION AND NUMBER OF LIFTING LUGS ON VESSEL SHALL BE SPECIFIED ON VENDOR DRAWINGS.
10- ALL WELDED ATTACHMENTS TO THE VESSEL TO BE SUPPLIED BY THE VESSEL MANUFACTURER .
11- SETTING BOLTS SHALL BE HOT DIP GALVANIZED.
12- SURFACE PREPARATAION,PICKLING&PASSIVATION SHALL BE ACC. TO APPROVED VENDOR DOCUMEN BY PURCHASER.
13- ALL REINF.PADS SHALL HAVE 1/4"(6mm) TELL TALE HOLE.
14-FINISHING OF THE GASKET CONTACTING FACE SHALL BE SMOOTH FINISH RA=6.3 µm (250 µinch)
15-INTERNAL FINISHING SHALL BE SMOOTH FINISH RA= 0.4 µm (16µinch)

PROJECT:PP-PE PILOT PLANT	Client: شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی
TITLE:DATA SHEET FOR 2nd G.P.R. PRC control purging cyclone(CY-421)	

DATA SHEET FOR
2nd G.P.R. PRC control purging cyclone
(CY-421)

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PROJECT:PP-PE PILOT PLANT

Client:

شرکت ملی صنایع پتروشیمی

شرکت پژوهش و فناوری پتروشیمی

TITLE:DATA SHEET FOR 2nd G.P.R. PRC control purging cyclone(CY-421)

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PROJECT:PP-PE PILOT PLANT

Client:

شرکت ملی صنایع پتروشیمی

شرکت پژوهش و فناوری پتروشیمی

TITLE:DATA SHEET FOR 2nd G.P.R. PRC control purging cyclone(CY-421)

Item No.:CY-421 Quantity: 1 Location: Outdoor Service: Continuous

DESIGN CONDITIONS

		Vessel	Jacket	Internal Coil
Operating Temperature(Min./Max.)	^{0}C	-30/+80	-/-	-/-
Operating Pressure	barg	24	-	-
Density	kg/m^3	500	-	-
Design Pressure(int./ext.)	barg	32/-	-/-	-/-
Design Temperature(int./ext.)	^{0}C	-60/+180	-/-	-/-
Volume(total)	Liters	5.6	-	-
Hydro Test Pressure	barg	as per UG99b(33)	-	-
Corrosion Allowance(shell/head)	mm	0/0	-/-	-/-
Cladding (shell/head)	mm	-/-	-/-	-/-
Content @ normal operation		Hydrocarbons+Polymer	-	-
Thickness(shell/head)	mm	7/15	-/-	-/-
Welding Radiography(shell/head)	%	100/100	-/-	-/-
Joint Efficiency(shell/head)		1/1	-/-	-/-
Top Head Type		Welded Flat	-	-
Bottom Head Type		Cone	-	-

Design code:	ASME SEC. VIII DIV.1		Inspection code:	ASME SEC. IX
Cylinder Deminsion(IDxCyl.):	1 pipe 5" x 315 mm		Lethal Service:	○ Yes ● No
M.D.M.T @ D.P:	-60 ^{0}C		M.A.T:	- ^{0}C
M.A.W.P:	35.5 barg	Limted by: ANSI FLANGE	Stamp:	Not Required
Impact Test:	Not Required		P.W.H.T:	Not Required
N.D.T:	Required		Vessel linning detail:	NIL
HIC/SSC resistance:	- / -		Painting & Coating:	as per code
Insulation thickness:	30 mm		Insulation type:	HOT
Fireproofing :	1 NO		Vessel located on:	Structrue
Seismic code:	UBC 1997		Seismic Zone:	3
Impotance factor:	1.25		Soil Profile:	SD
Wind code:	UBC		Wind velocity:	120 km/hr @ 10 m
Impotance factor:	1.15		Exposure:	C

Support loading data(Note 1)		
	Earthquake	Wind
Shearing load(kgf)	-	-
Moment(kg.m)	-	-

Weight(kg) (Note 5)	
Fabricated:	37.7
Empty:	66
Test:	71.3
Operation:	66.1

MISCELLANEOUS(Note 2,10)

○ Baffle	○ Impingement plate	○ Weir plate
○ Diffuser	○ Distributer	○ Trunnion
○ Vortex breaker	○ Tubesheet	○ Template
○ Boot / Cap	○ Demister	● Pickling & passivation
● Insulation Support	○ Wire mesh	● Earthing boss
○ Fire Proofing	● Name plate	● Dip pipe
○ Fire Proofing Support 1	○ Internal lining	
○ Ladder & platform (int. & ext.)	○ Sand blast & painting	
○ Heating coil	○ Internal clips	
● Lifting lug	● External clips	

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PROJECT:PP-PE PILOT PLANT

Client:

شرکت ملی صنایع پتروشیمی
شرکت پژوهش و فناوری پتروشیمی

TITLE:DATA SHEET FOR 2nd G.P.R. PRC control purging cyclone(CY-421)

MATERIALS(NOTE 2)

Shell(Main/Cone)		SA312-304L	1 /	SA182-304L	Earth lug	SA240-316L
Head(Main/Jacket)		SA182-304L	/	-	Stiffening rings	-
Nozzle Necks (Main/Jacket)	Plate	-	/	-	Gaskets	Double O ring
	Pipe	SA312-304L	/	-	Ext. bolt/Nuts	SA193-B7/SA194-2H
Cladding		-			Int. bolt/Nuts	SA193-B8/SA194-8
Nozzle flanges		1 SA182-304L			Wire mesh	-
Blind flanges		SA182-304L			Welded clip	SA240-304L
Reinforcing pad		-			Int. welded	SA240-304L
Fitting		SA403-304L			Int. removable	SA240-304L
Skirt	Upper part	-			Anchor/Setting bolts	SA307-B
	Lower part	SA240-304L			Ladder/Platform	-
	Base ring	-			Insulation Mateial	MINERAL WOOL
Lifting lug		SA240-304L				

NOZZLE DETAILS(NOTE 2,3,4,7,8)

Item	NPS (Inch)	Flanges Rating	Flanges Type	Flanges Face	SCH. /THK.	Service	Proj.	Rein. PAD Width	Rein. PAD Thk.	Standards	Remarks
Top Head		1									
P1	1"	600#	WN	RF	40S	Gas Outlet	see P. 4	-	-	ANSI B16.5	
Shell		1									
P2	1"	600#	WN	RF	40S	Product/Gas Inlet	170	-	-	ANSI B16.5	Tangential
Bottom Head		1									
P3	1"	600#	WN	RF	40S	Product Outlet	see P. 4	-	-	ANSI B16.5	

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PROJECT:PP-PE PILOT PLANT	**Client:**
TITLE:DATA SHEET FOR 2nd G.P.R. PRC control purging cyclone(CY-421)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

NOZZLE LOADING DATA(NOTE 1)

Nozzle Name	FL (kgf)	FA (kgf)	FC (kgf)	MC (kg.m)	MT (kg.m)	ML (kg.m)

REFRENCE DOCUMENTS

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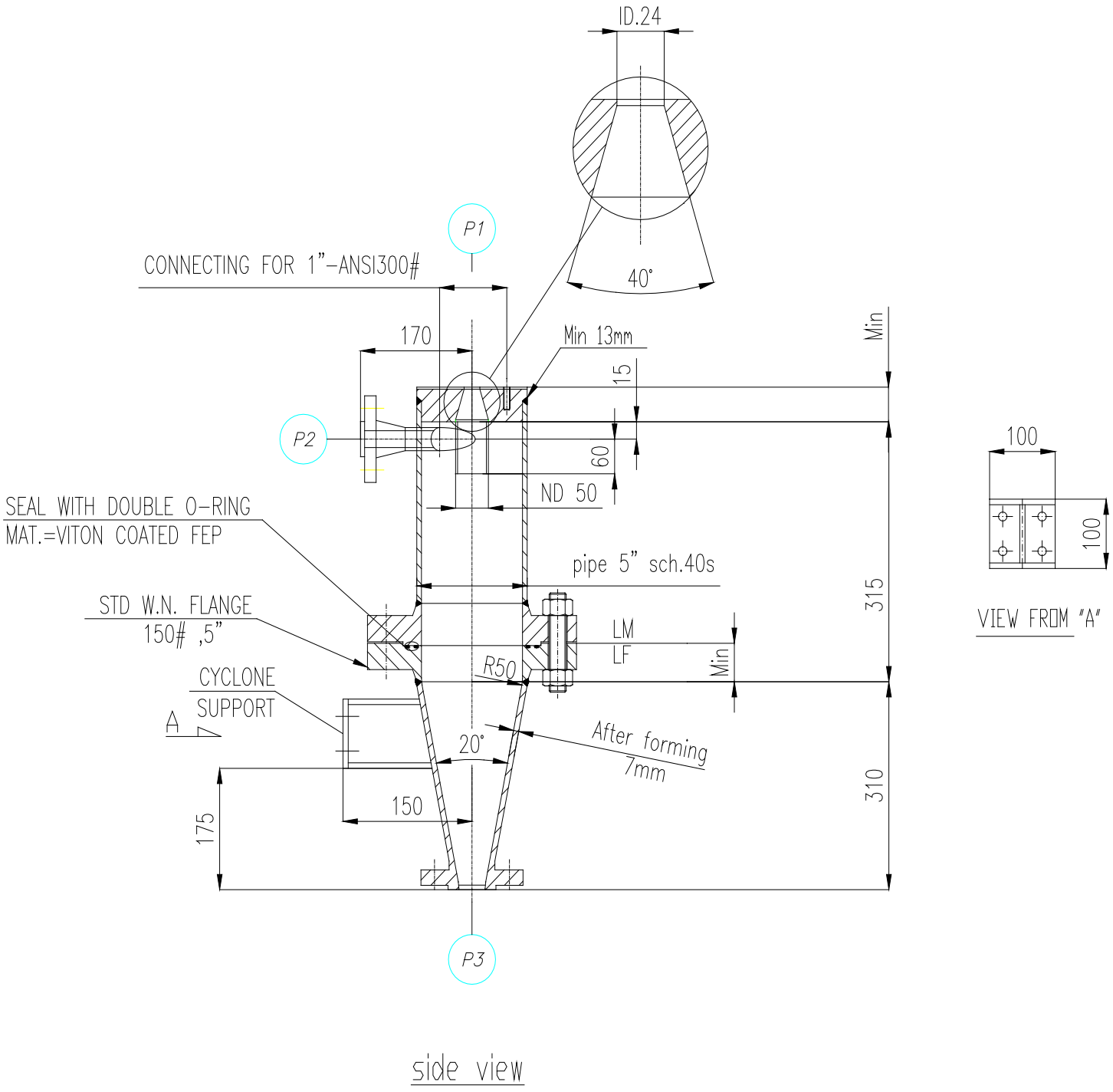
PROJECT:PP-PE PILOT PLANT	**Client:**
TITLE:DATA SHEET FOR 2nd G.P.R. PRC control purging cyclone(CY-421)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

Sketch(Note 3)



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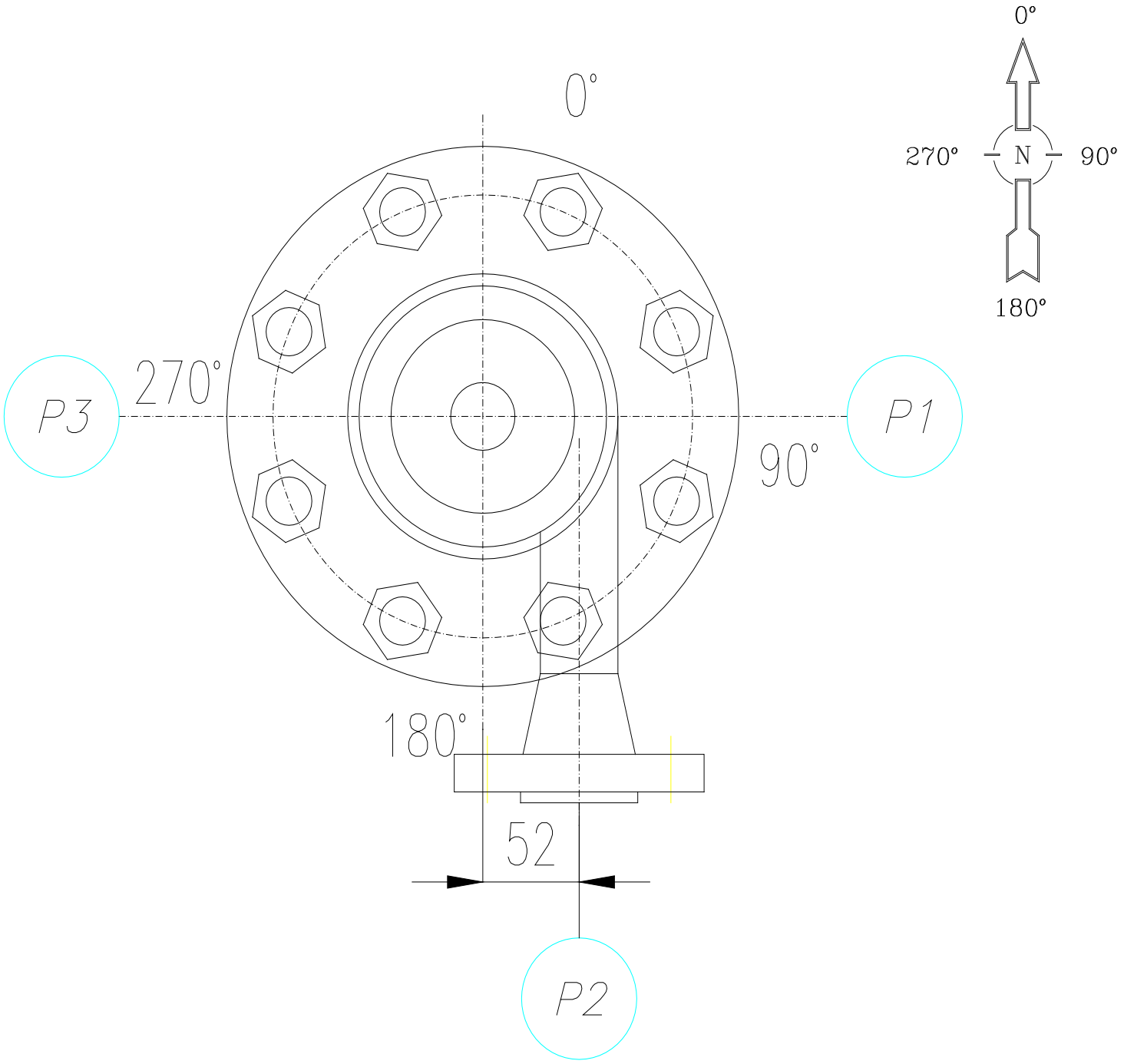
PROJECT:PP-PE PILOT PLANT	**Client:** شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی
TITLE:DATA SHEET FOR 2nd G.P.R. PRC control purging cyclone(CY-421)	

Sketch(Note 3)



nozzle orientation

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PROJECT:PP-PE PILOT PLANT	Client: شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی
TITLE:DATA SHEET FOR 2nd G.P.R. PRC control purging cyclone(CY-421)	

General Notes:

1- SHALL BE SPECIFIED BY VENDOR .
2- SHALL BE VERIFIED BY VENDOR.
3- ALL DIMENSIONS ARE IN MILLIMETER, UNLESS OTHERWISE NOTED.
4- NOZZLE CHARACTERISTICS SHALL BE VERIFIED BY VENDOR.
5- THICKNESSES, WEIGHTS AND LOADS ARE INDICATED FOR ESTIMATION PURPOSE ONLY ; THE MANUFCTURER SHALL CONFIRM THESE ITEMS AND IS RESPONSIBLE FOR MECHANICAL DESIGN.
6- STATED THICKNESS IS MINIMUM AFTER FORMING. THICKNESS OF STRAIGHT FLANGE OF ELLIPTICAL/TORISPHERICAL HEADS SHALL BE IN NO CASE SMALLER THAN VESSEL SHELL THICKNESS. VENDOR SHALL CHECK AND GUARANTEE THEM ON STRENGTH.
7- SHELL/NOZZLE THICKNESS AT CONNECTION/ATACHMENT AREA SHALL BE VERIFIED BY LOCAL CALCULATION.
8- UNLESS OTHERWISE NOTED OUTSIDE PROJECTION OF NOZZLES ARE MEASURED FROM C.L./T.L. OF VESSEL TO THE EXTREME FACE OF NOZZLE FLANGE.
9- LOCATION AND NUMBER OF LIFTING LUGS ON VESSEL SHALL BE SPECIFIED ON VENDOR DRAWINGS.
10- ALL WELDED ATTACHMENTS TO THE VESSEL TO BE SUPPLIED BY THE VESSEL MANUFACTURER .
11- SETTING BOLTS SHALL BE HOT DIP GALVANIZED.
12- SURFACE PREPARATAION,PICKLING&PASSIVATION SHALL BE ACC. TO APPROVED VENDOR DOCUMENT BY PURCHASER.
13- ALL REINF.PADS SHALL HAVE 1/4"(6mm) TELL TALE HOLE.
14-FINISHING OF THE GASKET CONTACTING FACE SHALL BE SMOOTH FINISH RA=0.8 µm (32 µinch)
15-INTERNAL FINISHING SHALL BE SMOOTH FINISH RA= 0.4 µm (16 µinch)

PROJECT:PP-PE PILOT PLANT	Client: شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی
TITLE:DATA SHEET FOR 2ND G.P.R. SAMPLING CYCLONE(CY-422)	

DATA SHEET FOR
2ND G.P.R. SAMPLING CYCLONE
(CY-422)

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PROJECT:PP-PE PILOT PLANT	**Client:**
TITLE:DATA SHEET FOR 2ND G.P.R. SAMPLING CYCLONE(CY-422)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

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Revision	**Date**	**Prepared By**	**Checked By**	**Approved By**	**Status**

Document Revision

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PROJECT:PP-PE PILOT PLANT

Client:

شرکت ملی صنایع پتروشیمی

شرکت پژوهش و فناوری پتروشیمی

TITLE:DATA SHEET FOR 2ND G.P.R. SAMPLING CYCLONE(CY-422)

Item No.:CY-422 Quantity: 1 Location: Outdoor Service: Continuous

DESIGN CONDITIONS

		Vessel	Jacket	Internal Coil
Operating Temperature(Min./Max.)	^{0}C	-/80	-/-	-/-
Operating Pressure	barg	24	-	-
Density	kg/m^3	500	-	-
Design Pressure(int./ext.)	barg	32/-	-/-	-/-
Design Temperature	^{0}C	-60/+180	-/-	-/-
Volume(total)	Liters	7.6	-	-
Hydro Test Pressure	barg	as per UG99b(33)	-	-
Corrosion Allowance(shell/head)	mm	0/0	-/-	-/-
Cladding (shell/head)	mm	-/-	-/-	-/-
Content @ normal operation		Hydrocarbons+Polymer	-	-
Thickness(shell/head)	mm	8/35	-/-	-/-
Welding Radiography(shell/head)	%	100/100	-/-	-/-
Joint Efficiency(shell/head)		1/1	-/-	-/-
Top Head Type		ANSI/Bolted Falnge	-	-
Bottom Head Type		Cone	-	-

Design code:	ASME SEC. VIII DIV.1	Inspection code:	ASME SEC. IX
Cylinder Deminsion(IDxCyl.): (1)	PIPE 6" x 300 mm	Lethal Service:	○ Yes ● No
M.D.M.T @ D.P:	-60 ^{0}C	M.A.T:	- ^{0}C
M.A.W.P: 35.5 barg	Limted by: ANSI Flange	Stamp:	Not Required
Impact Test:	Not Required	P.W.H.T:	Not Required
N.D.T:	Required	Vessel linning detail:	NIL
HIC/SSC resistance:	- / -	Painting & Coating:	as per code
Insulation thickness:	30 mm	Insulation type:	HOT
Fireproofing (1)	NO	Vessel located on:	Structrue
Seismic code:	UBC 1997	Seismic Zone:	3
Impotance factor:	1.25	Soil Profile:	SD
Wind code:	UBC	Wind velocity:	120 km/hr @ 10 m
Impotance factor:	1.15	Exposure:	C

Support loading data(Note 1)		
	Earthquake	Wind
Shearing load(kgf)	-	-
Moment(kg.m)	-	-

Weight(kg) (Note 5)	
Fabricated:	62.5
Empty:	109.5
Test:	116.5
Operation:	109.5

MISCELLANEOUS(Note 2,10)

○ Baffle	○ Impingement plate	○ Weir plate
○ Diffuser	○ Distributer	○ Trunnion
○ Vortex breaker	○ Tubesheet	○ Template
○ Boot / Cap	○ Demister	● Pickling & passivation
● Insulation Support	○ Wire mesh	● Earthing boss
○ Fire Proofing	● Name plate	● Dip pipe
○ Fire Proofing Support (1)	○ Internal lining	
○ Ladder & platform (int. & ext.)	○ Sand blast & painting	
○ Heating coil	○ Internal clips	
● Lifting lug	● External clips	

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PROJECT:PP-PE PILOT PLANT	**Client:**
TITLE:DATA SHEET FOR 2ND G.P.R. SAMPLING CYCLONE(CY-422)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

MATERIALS(NOTE 1)

Shell(Main/Cone)		SA312-304L	/	SA182-304L	Earth lug	SA240-316L
Head(Main/Jacket)		SA182-304L	/	-	Stiffening rings	-
Nozzle Necks (Main/Jacket)	Plate	-	/	-	Gaskets	Spiral wound
	Pipe	SA312-304L	/	-	Ext. bolt/Nuts	SA193-B7/SA194-2H
Cladding		-			Int. bolt/Nuts	SA193-B8/SA194-8
Nozzle flanges		SA182-304L			Wire mesh	-
Blind flanges		SA182-304L			Welded clip	SA240-304L
Reinforcing pad		-			Int. welded	SA240-304L
Fitting		SA403-304L			Int. removable	-
Support	Leg	-			Anchor/Setting bolts	SA307-B
	Lug	SA240-304L			Ladder/Platform	-
	leg/lug pad	-			Insulation Mateial	Mineral wool
Lifting lug		SA240-304L				

NOZZLE DETAILS(NOTE 2,3,4,7,8)

Item	NPS (Inch)	Flanges Rating	Flanges Type	Flanges Face	SCH. /THK.	Service	Proj.	Rein. PAD Width	Rein. PAD Thk.	Standards	Remarks
Top Head											
P1	1 1/2"	600#	WN	RF	40S	Gas Outlet	See P.4	-	-	ANSI B16.5	
Shell											
P2	1"	600#	WN	RF	40S	Product Inlet	230	-	-	ANSI B16.5	Tangential
Bottom Head											
P3	1 1/2"	600#	WN	RF	40S	Product Outlet	See P.4	-	-	ANSI B16.5	

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PROJECT:PP-PE PILOT PLANT

Client:

شرکت ملی صنایع پتروشیمی

شرکت پژوهش و فناوری پتروشیمی

TITLE:DATA SHEET FOR 2ND G.P.R. SAMPLING CYCLONE(CY-422)

NOZZLE LOADING DATA(NOTE 1)

Nozzle Name	FL (kgf)	FA (kgf)	FC (kgf)	MC (kg.m)	MT (kg.m)	ML (kg.m)

REFRENCE DOCUMENTS

No.	Document No.	Document Title
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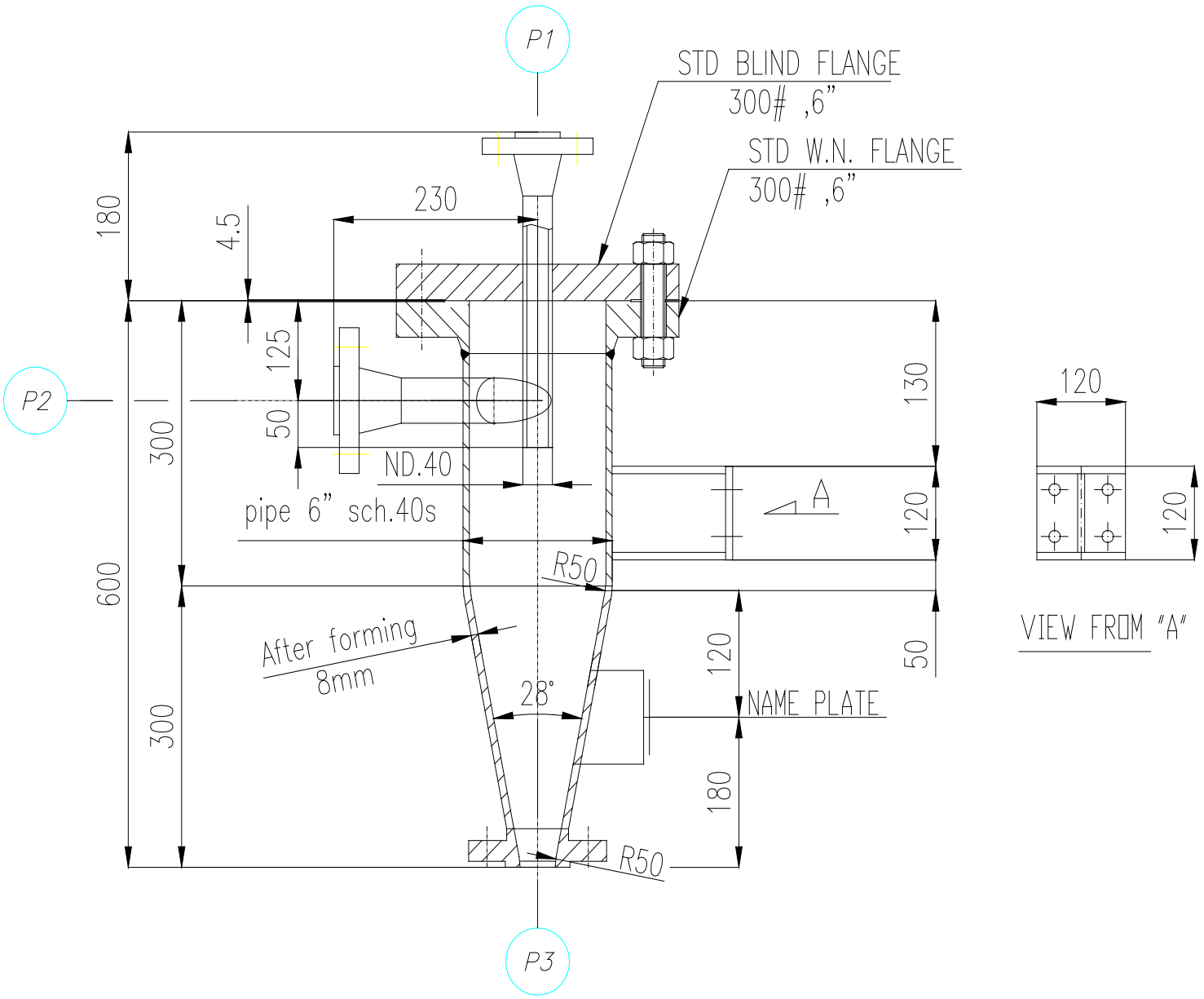
PROJECT:PP-PE PILOT PLANT	Client: شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی
TITLE:DATA SHEET FOR 2ND G.P.R. SAMPLING CYCLONE(CY-422)	

Sketch(Note 3)



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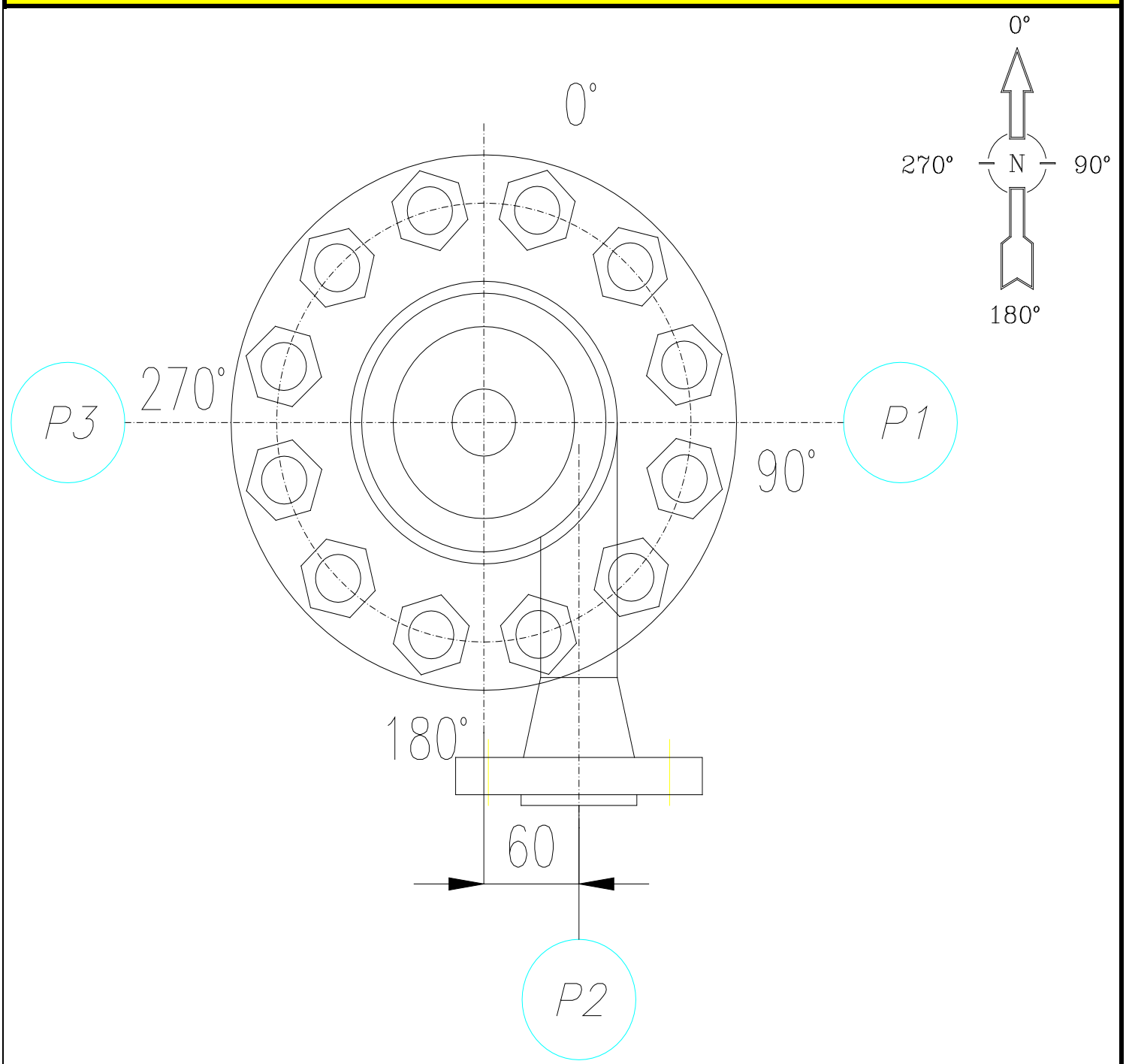
PROJECT:PP-PE PILOT PLANT	Client: شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی
TITLE:DATA SHEET FOR 2ND G.P.R. SAMPLING CYCLONE(CY-422)	

Sketch(Note 3)



nozzle orientation

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PROJECT:PP-PE PILOT PLANT	Client: شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی
TITLE:DATA SHEET FOR 2ND G.P.R. SAMPLING CYCLONE(CY-422)	

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11- SETTING BOLTS SHALL BE HOT DIP GALVANIZED.
12- SURFACE PREPARATAION,PICKLING&PASSIVATION SHALL BE ACC. TO APPROVED VENDOR DOCUMEN BY PURCHASER.
13- ALL REINF.PADS SHALL HAVE 1/4"(6mm) TELL TALE HOLE.
14-FINISHING OF THE GASKET CONTACTING FACE SHALL BE SMOOTH FINISH RA=6.3 µm (250 µinch)
15-INTERNAL FINISHING SHALL BE SMOOTH FINISH RA= 0.4 µm (16µinch)

Table 2. Hoppers

Items	Tag ID.	Description
7	HP-421	2ND G.P.R. FEEDING HOPPER
8	HP-422	2ND G.P.R. DISCHARGE HOPPER
9	HP-423	2ND G.P.R. DISCHARGE HOPPER
Numbers		**3**

PROJECT:PP-PE PILOT PLANT	Client: شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی
TITLE:DATA SHEET FOR 2ND G.P.R. FEEDING HOPPER (HP-421)	

DATA SHEET FOR
2ND G.P.R. FEEDING HOPPER (HP-421)

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PROJECT:PP-PE PILOT PLANT	**Client:**
TITLE:DATA SHEET FOR 2ND G.P.R. FEEDING HOPPER (HP-421)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

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PROJECT:PP-PE PILOT PLANT

Client:

شرکت ملی صنایع پتروشیمی
شرکت پژوهش و فناوری پتروشیمی

TITLE:DATA SHEET FOR 2ND G.P.R. FEEDING HOPPER (HP-421)

Item No.: HP-421 Quantity: 1 Location: Outdoor Service: Continuous

DESIGN CONDITIONS

		Vessel	Jacket	Internal Coil
Operating Temperature(Min./Max.)	^{0}C	-30/+80	-/-	-/-
Operating Pressure	barg	24	-	-
Density	kg/m^3	500	-	-
Design Pressure(int./ext.)	barg	32	-/-	-/-
Design Temperature	^{0}C	-60/+180	-/-	-/-
Volume(total)	m^3	0.062	-	-
Hydro Test Pressure	barg	as per UG99b(33)	-	-
Corrosion Allowance(shell/head)	mm	0/0	-/-	-/-
Cladding (shell/head)	mm	-/-	-/-	-/-
Content @ normal operation		Hydrocarbons+Polymer	-	-
Thickness(shell/Cone)	mm	9.5/8 (1)	-/-	-/-
Welding Radiography(shell/head)	%	100/100	-/-	-/-
Joint Efficiency(shell/head)		1/1	-/-	-/-
Top Head Type		ANSI/Bolted Falnge	-	-
Bottom Head Type		Cone	-	-

Design code:	ASME SEC. VIII DIV.1	Inspection code:	ASME SEC. IX
Cylinder Deminsion(IDxT.L-T.L): (1)	300 x 1250 mm	Lethal Service:	○ Yes ● No
M.D.M.T @ D.P:	-60 ^{0}C	M.A.T:	- ^{0}C
M.A.W.P:	32.17 barg Limted by: CONE	Stamp:	Not Required
Impact Test:	Not Required	P.W.H.T:	Not Required
N.D.T:	Required	Vessel linning detail:	NIL
HIC/SSC resistance:	NA / NA	Painting & Coating:	as per code
Insulation thickness: (1)	40 mm	Insulation type:	HOT
Fireproofing : (1)	NO	Vessel located on:	Structrue
Seismic code:	UBC 1997	Seismic Zone:	3
Impotance factor:	1.25	Soil Profile:	SD
Wind code:	UBC	Wind velocity:	120 km/hr @ 10 m
Impotance factor:	1.15	Exposure:	C

Support loading data(Note 5)		
	Earthquake	Wind
Shearing load(kgf)	70	50
Moment(kg.m)	40	25

Weight(kg) (Note 5)		
Fabricated:	275
Empty:	285
Test:	340
Operation:	315

MISCELLANEOUS(Note 2,10)

○ Baffle	○ Impingement plate	○ Weir plate
○ Diffuser	○ Distributer	○ Trunnion
○ Vortex breaker	○ Tubesheet	○ Template
○ Boot / Cap	○ Demister	● Pickling & passivation
● Insulation Support	○ Wire mesh	● Earthing boss
○ Fire Proofing	● Name plate	● Dip pipe
○ Fire Proofing Support (1)	○ Internal lining	
○ Ladder & platform (int. & ext.)	○ Sand blast & painting	
○ Heating coil	○ Internal clips	
● Lifting lug	● External clips	

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PROJECT:PP-PE PILOT PLANT	Client:
TITLE:DATA SHEET FOR 2ND G.P.R. FEEDING HOPPER (HP-421)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

MATERIALS(NOTE 2)

Shell(Main/Cone)		SA312-304L	1	SA182-304L	Earth lug	SA240-316L
Head(Main/Jacket)		SA182-304L	/	-	Stiffening rings	-
Nozzle Necks	Plate	-	/	-	Gaskets	Spiral wound
(Main/Jacket)	Pipe	SA312-304L	/	-	Ext. bolt/Nuts	SA193-B7/SA194-2H
Cladding		-			Int. bolt/Nuts	SA193-B8/SA194-8
Nozzle flanges		1 SA182-F304L			Wire mesh	-
Blind flanges		SA182-F304L			Welded clip	SA240-304L
Reinforcing pad		SA240-304L			Int. welded	SA240-304L
Fitting		SA403-304L			Int. removable	SA312-304L
Support	Leg	-			Anchor/Setting bolts	SA307-B
	Lug	SA240-304L			Ladder/Platform	-
	leg/lug pad	SA240-304L			Insulation Mateial	MINERAL WOOL
Lifting lug		SA240-304L				

1 NOZZLE DETAILS(NOTE 2,3,4,7,8)

Item	NPS (Inch)	Flanges Rating	Flanges Type	Flanges Face	SCH. /THK.	Service	Proj.	Rein. PAD Width	Rein. PAD Thk.	Standards	Remarks
Top Head											
P1	4"	600#	WN	RF	80S	Gas outlet	See dwg	50	20	ANSI B16.5	
Shell											
P2	2"	600#	LWN	RF	40S	Product inlet	See dwg	-	-	ANSI B16.5	Tangential
Bottom Head											
P3	2"	600#	WN	RF	40S	Product outlet	See dwg	-	-	ANSI B16.5	

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PROJECT:PP-PE PILOT PLANT

Client:

شرکت ملی صنایع پتروشیمی

شرکت پژوهش و فناوری پتروشیمی

TITLE:DATA SHEET FOR 2ND G.P.R. FEEDING HOPPER (HP-421)

NOZZLE LOADING DATA(NOTE 2)

Nozzle Name	FL (kgf)	FA (kgf)	FC (kgf)	MC (kg.m)	MT (kg.m)	ML (kg.m)
P1	429	429	322	65	97	84

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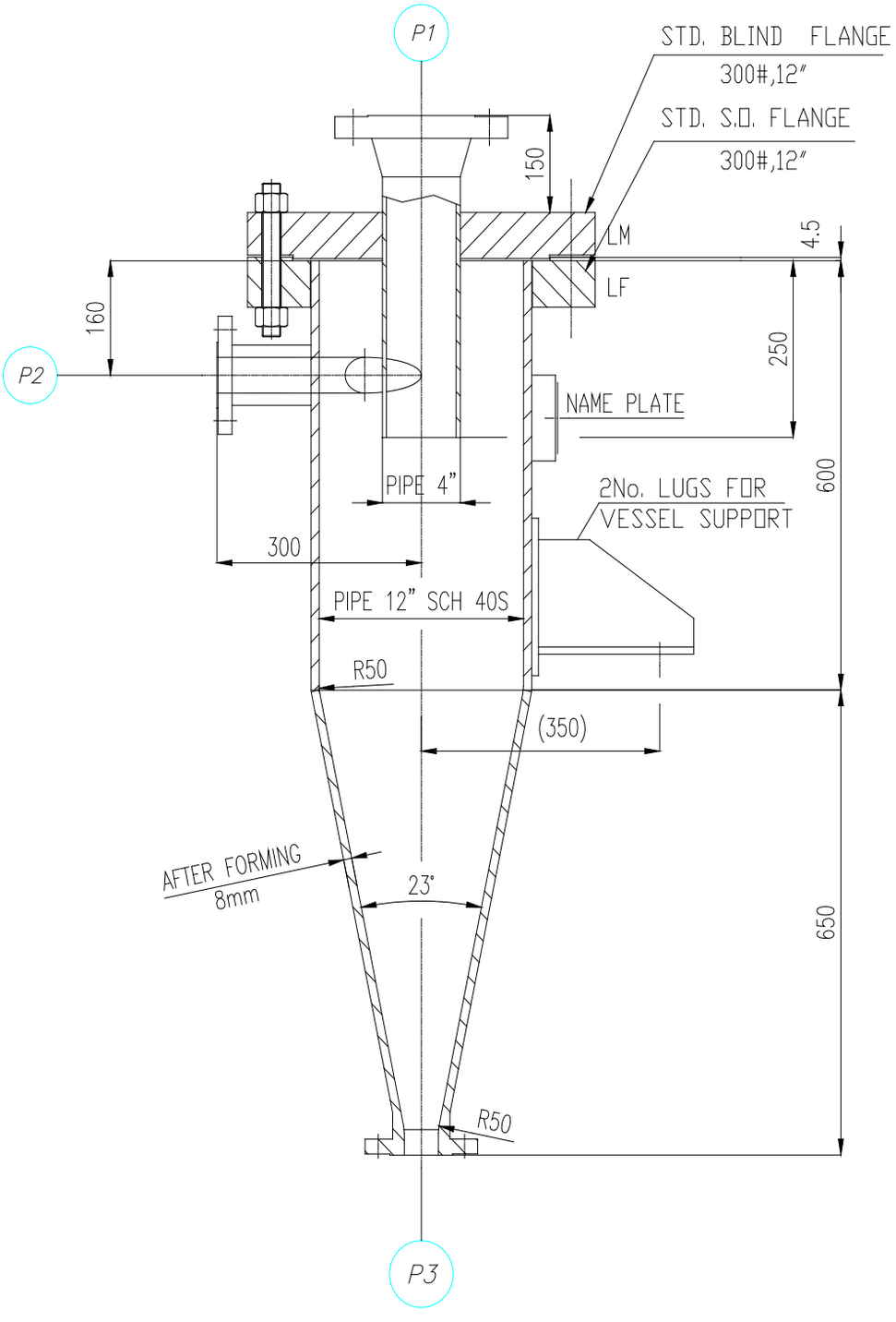
PROJECT:PP-PE PILOT PLANT	**Client:**
TITLE:DATA SHEET FOR 2ND G.P.R. FEEDING HOPPER (HP-421)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

Sketch(Note 3)



SIDE VIEW

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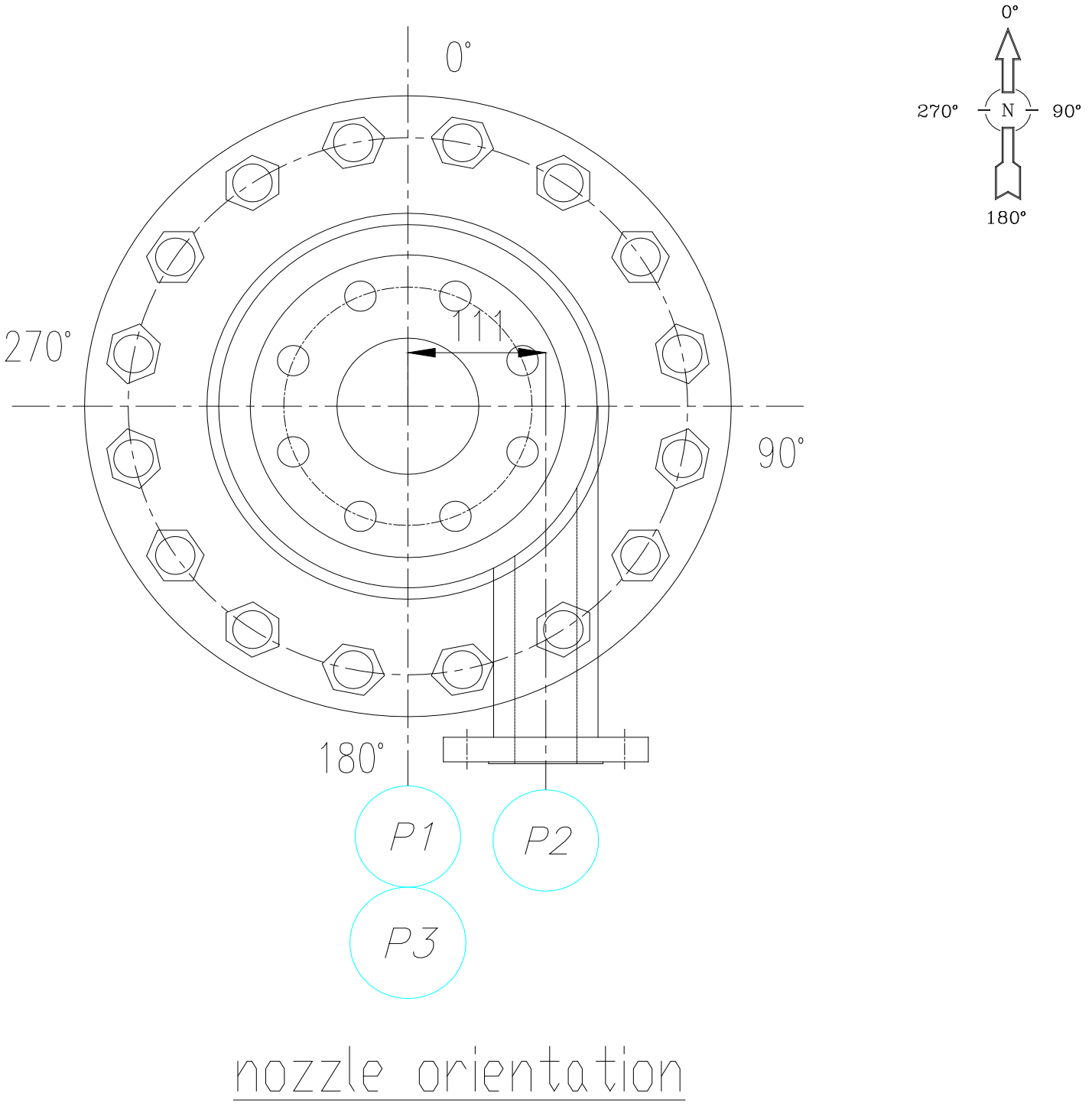
PROJECT:PP-PE PILOT PLANT	Client:
TITLE:DATA SHEET FOR 2ND G.P.R. FEEDING HOPPER (HP-421)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

Sketch(Note 3)



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PROJECT:PP-PE PILOT PLANT	**Client:**
TITLE:DATA SHEET FOR 2ND G.P.R. FEEDING HOPPER (HP-421)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

General Notes:

1- SHALL BE SPECIFIED BY VENDOR .
2- SHALL BE VERIFIED BY VENDOR.
3- ALL DIMENSIONS ARE IN MILLIMETER, UNLESS OTHERWISE NOTED.
4- NOZZLE CHARACTERISTICS SHALL BE VERIFIED BY VENDOR.
5- THICKNESSES, WEIGHTS AND LOADS ARE INDICATED FOR ESTIMATION PURPOSE ONLY ; THE MANUFCTURER SHALL CONFIRM THESE ITEMS AND IS RESPONSIBLE FOR MECHANICAL DESIGN.
6- STATED THICKNESS IS MINIMUM AFTER FORMING. THICKNESS OF STRAIGHT FLANGE OF ELLIPTICAL/TORISPHERICAL HEADS SHALL BE IN NO CASE SMALLER THAN VESSEL SHELL THICKNESS.VENDOR SHALL CHECK AND GUARANTEE THEM ON STRENGTH.

7- SHELL/NOZZLE THICKNESS AT CONNECTION/ATACHMENT AREA SHALL BE VERIFIED BY LOCAL CALCULATION.

8- UNLESS OTHERWISE NOTED OUTSIDE PROJECTION OF NOZZLES ARE MEASURED FROM C.L./T.L. OF VESSEL TO THE EXTREME FACE OF NOZZLE FLANGE.
9- LOCATION AND NUMBER OF LIFTING LUGS ON VESSEL SHALL BE SPECIFIED ON VENDOR DRAWINGS.
10- ALL WELDED ATTACHMENTS TO THE VESSEL TO BE SUPPLIED BY THE VESSEL MANUFACTURER .
11- SETTING BOLTS SHALL BE HOT DIP GALVANIZED.

12- SURFACE PREPARATAION,PICKLING&PASSIVATION SHALL BE ACC. TO APPROVED VENDOR DOCUMENT BY PURCHASER.

13- ALL REINF.PADS SHALL HAVE 1/4"(6mm) TELL TALE HOLE.
14-FINISHING OF THE GASKET CONTACTING FACE SHALL BE SMOOTH FINISH RA=6.3 µm (250 µinch)
15-INTERNAL FINISHING SHALL BE SMOOTH FINISH RA= 0.4 µm (16µinch)

PROJECT:PP-PE PILOT PLANT	Client:
TITLE:DATA SHEET FOR 2ND G.P.R. DISCHARGE HOPPER (HP-422)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

DATA SHEET FOR
2ND G.P.R. DISCHARGE HOPPER(HP-422)

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PROJECT:PP-PE PILOT PLANT	**Client:**
TITLE:DATA SHEET FOR 2ND G.P.R. DISCHARGE HOPPER (HP-422)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

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Revision	**Date**	**Prepared By**	**Checked By**	**Approved By**	**Status**

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PROJECT:PP-PE PILOT PLANT

Client:

شرکت ملی صنایع پتروشیمی
شرکت پژوهش و فناوری پتروشیمی

TITLE:DATA SHEET FOR 2ND G.P.R. DISCHARGE HOPPER (HP-422)

Item No.: HP-422 Quantity: 1 Location: Outdoor Service: Continuous

DESIGN CONDITIONS

		Vessel	Jacket	Internal Coil
Operating Temperature(Min./Max.)	°C	-30/+80	-/-	-/-
Operating Pressure	barg	24	-	-
Density	kg/m³	500	-	-
Design Pressure(int./ext.)	barg	32	-/-	-/-
Design Temperature	°C	-60/+180	-/-	-/-
Volume(total)	m³	0.065	-	-
Hydro Test Pressure	barg	as per UG99b(33)	-	-
Corrosion Allowance(shell/head)	mm	0/0	-/-	-/-
Cladding (shell/head)	mm	-/-	-/-	-/-
Content @ normal operation		Hydrocarbons+polymer	-	-
Thickness(shell/Cone)	mm	9.5/8	1 -/-	-/-
Welding Radiography(shell/head)	%	100/100	-/-	-/-
Joint Efficiency(shell/head)		1/1	-/-	-/-
Top Head Type		ANSI/Bolted Falnge	-	-
Bottom Head Type		Cone	-	-

Design code:	ASME SEC. VIII DIV.1	Inspection code:	ASME SEC. IX
Cylinder Deminsion(IDxT.L-T.L)	1 PIPE 12" x 1250 mm	Lethal Service:	○ Yes ● No
M.D.M.T @ D.P:	-60 °C	M.A.T:	- °C
M.A.W.P:	32.17 barg Limted by: CONE	Stamp:	Not Required
Impact Test:	Not Required	P.W.H.T:	Not Required
N.D.T:	Required	Vessel linning detail:	NIL
HIC/SSC resistance:	NA / NA	Painting & Coating:	as per code
Insulation thickness:	1 40 mm	Insulation type:	HOT
Fireproofing :	1 NO	Vessel located on:	Structrue
Seismic code:	UBC 1997	Seismic Zone:	3
Impotance factor:	1.25	Soil Profile:	SD
Wind code:	UBC	Wind velocity:	120 km/hr @ 10 m
Impotance factor:	1.15	Exposure:	C

Support loading data(Note 5)

	Earthquake	Wind
Shearing load(kgf)	70	50
Moment(kg.m)	35	25

Weight(kg) (Note 5)

Fabricated:	280
Empty:	295
Test:	350
Operation:	325

MISCELLANEOUS(Note 2,10)

○ Baffle	○ Impingement plate	○ Weir plate
○ Diffuser	○ Distributer	○ Trunnion
○ Vortex breaker	○ Tubesheet	○ Template
○ Boot / Cap	○ Demister	● Pickling & passivation
● Insulation Support	○ Wire mesh	● Earthing boss
○ Fire Proofing	● Name plate	● Dip pipe
○ Fire Proofing Support 1	○ Internal lining	
○ Ladder & platform (int. & ext.)	○ Sand blast & painting	
○ Heating coil	○ Internal clips	
● Lifting lug	● External clips	

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PROJECT:PP-PE PILOT PLANT	Client:
TITLE:DATA SHEET FOR 2ND G.P.R. DISCHARGE HOPPER (HP-422)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

MATERIALS(NOTE 2)

Shell(Main/CONE)		SA312-304L	1 /	SA182-F304L	Earth lug	SA240-316L
Head(Main/Jacket)		SA182-304L	/	-	Stiffening rings	-
Nozzle Necks (Main/Jacket)	Plate	-	/	-	Gaskets	Spiral wound
	Pipe	SA312-304L	/	-	Ext. bolt/Nuts	SA193-B7/SA194-2H
Cladding		-			Int. bolt/Nuts	SA193-B8/SA194-8
Nozzle flanges		SA182-F304L			Wire mesh	-
Blind flanges		SA182-F304L			Welded clip	SA240-304L
Reinforcing pad		SA240-304L			Int. welded	SA312-304L
Fitting		SA403-304L			Int. removable	-
Support	Leg	-			Anchor/Setting bolts	SA307-B
	Lug	SA240-304L			Ladder/Platform	-
	leg/lug pad	SA240-304L			Insulation Mateial	MINERAL WOOL
Lifting lug		SA240-304L				

1 NOZZLE DETAILS(NOTE 2,3,4,7,8)

Item	NPS (Inch)	Flanges			SCH. /THK.	Service	Proj.	Rein. PAD		Standards	Remarks
		Rating	Type	Face				Width	Thk.		
Top Head											
P1	4"	600#	WN	RF	80S	Gas outlet	See dwg	50	20	ANSI B16.5	
Shell											
P2	2"	600#	LWN	RF	40S	Product inlet	See dwg	-	-	ANSI B16.5	Tangential
Bottom Head											
P3	2"	600#	WN	RF	40S	Product outlet	See dwg	-	-	ANSI B16.5	

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PROJECT:PP-PE PILOT PLANT

Client:

شرکت ملی صنایع پتروشیمی

شرکت پژوهش و فناوری پتروشیمی

TITLE:DATA SHEET FOR 2ND G.P.R. DISCHARGE HOPPER (HP-422)

NOZZLE LOADING DATA(NOTE 2)

Nozzle Name	FL (kgf)	FA (kgf)	FC (kgf)	MC (kg.m)	MT (kg.m)	ML (kg.m)
P1	571	571	429	115	172	149

REFRENCE DOCUMENTS

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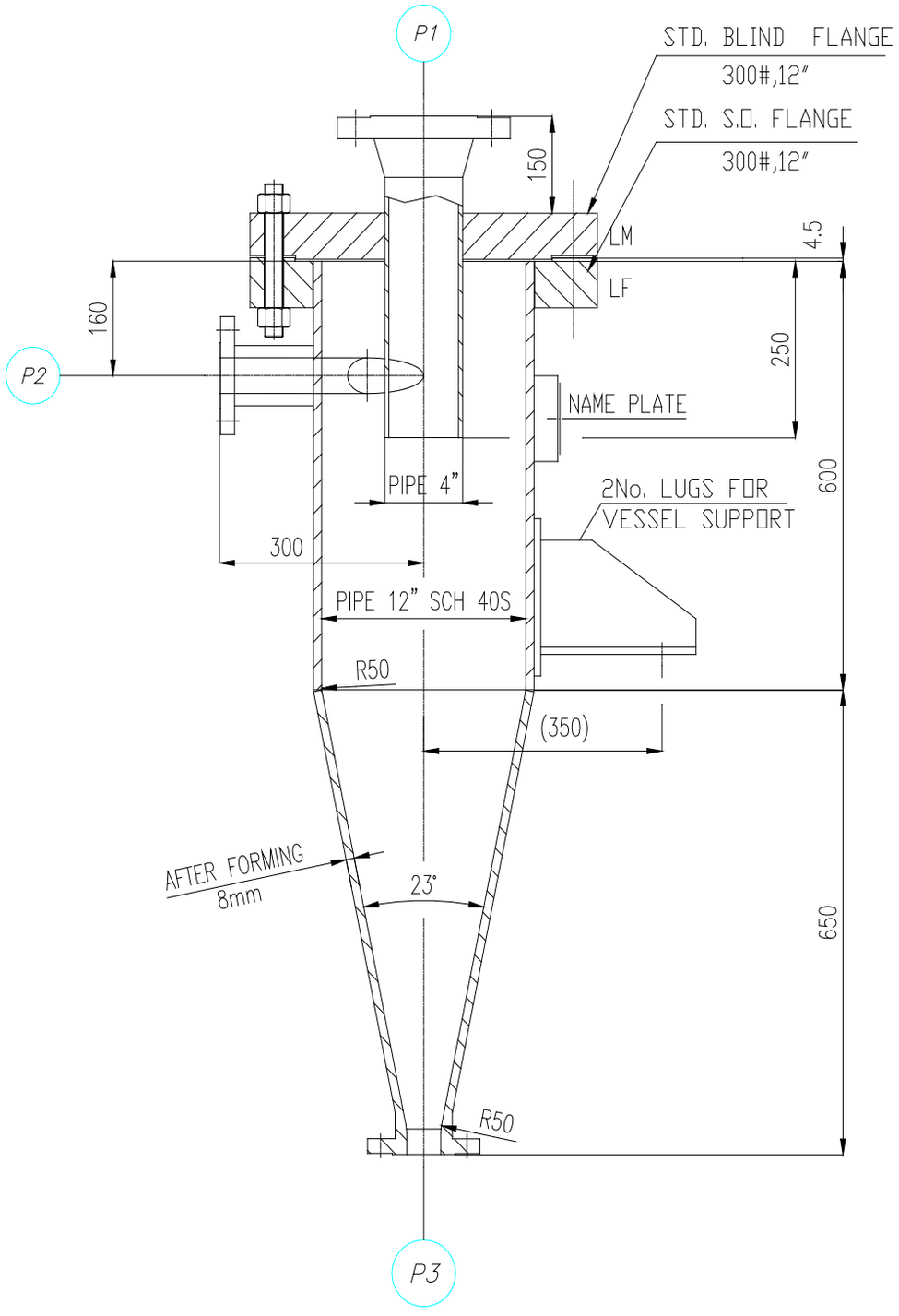
PROJECT:PP-PE PILOT PLANT	**Client:**
TITLE:DATA SHEET FOR 2ND G.P.R. DISCHARGE HOPPER (HP-422)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

Sketch(Note 3)



SIDE VIEW

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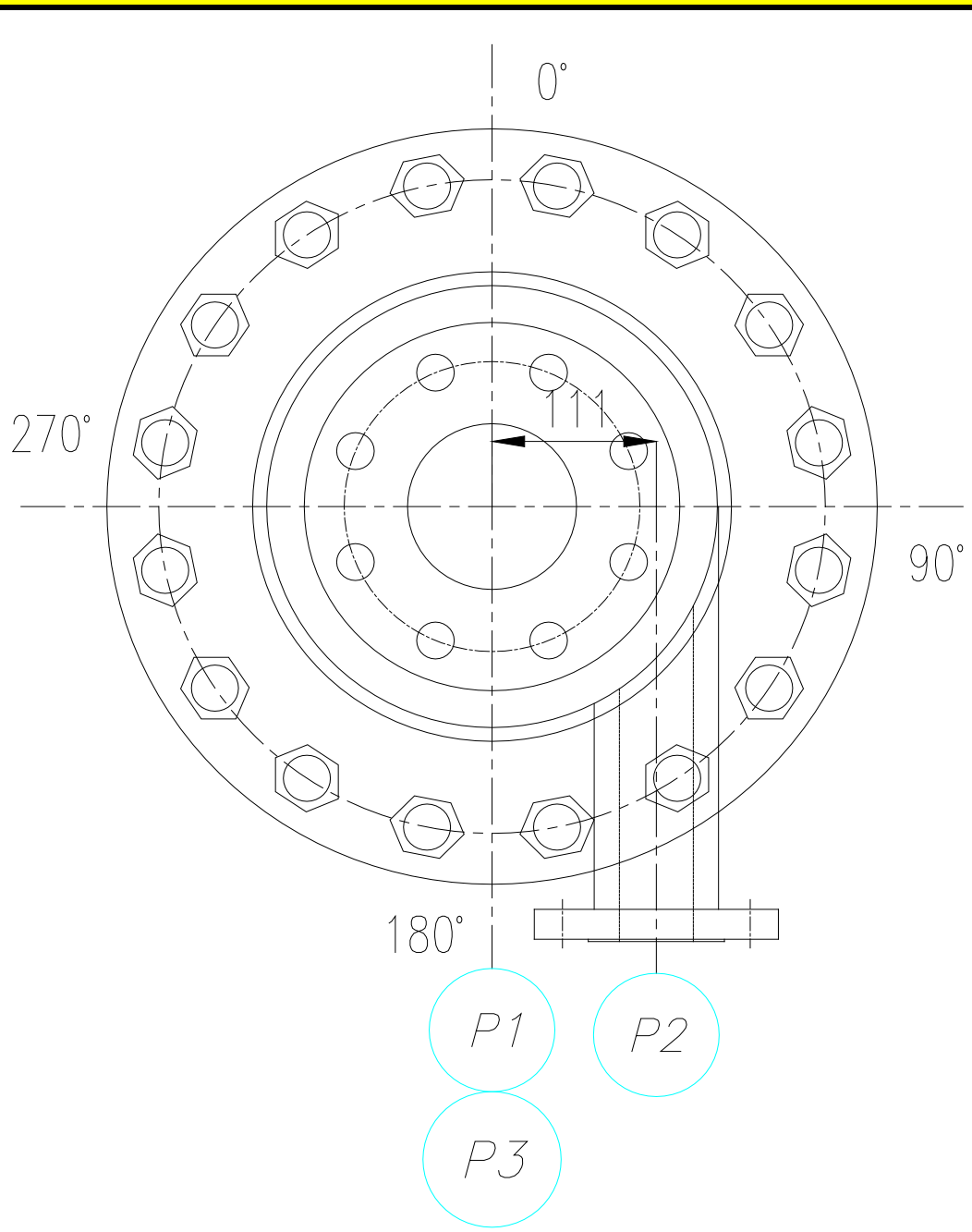
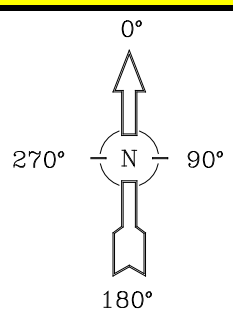
PROJECT:PP-PE PILOT PLANT	Client:
TITLE:DATA SHEET FOR 2ND G.P.R. DISCHARGE HOPPER (HP-422)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

Sketch(Note 3)





nozzle orientation

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PROJECT:PP-PE PILOT PLANT	Client: شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی
TITLE:DATA SHEET FOR 2ND G.P.R. DISCHARGE HOPPER (HP-422)	

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PROJECT:PP-PE PILOT PLANT	Client:
TITLE:DATA SHEET FOR 2ND G.P.R. DISCHARGE HOPPER(HP-423)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

DATA SHEET FOR
2ND G.P.R. DISCHARGE HOPPER(HP-423)

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PROJECT:PP-PE PILOT PLANT	**Client:**
TITLE:DATA SHEET FOR 2ND G.P.R. DISCHARGE HOPPER(HP-423)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

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PROJECT:PP-PE PILOT PLANT				**Client:**	
TITLE:DATA SHEET FOR 2ND G.P.R. DISCHARGE HOPPER(HP-423)				شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی	
1	Item No.: HP-423	Quantity: 1	Location: Outdoor	Service:	Continuous
2	**DESIGN CONDITIONS**				
3					
4			**Vessel**	**Jacket**	**Internal Coil**
5	Operating Temperature(Min./Max.)	^{0}C	-30/+80	-/-	-/-
6	Operating Pressure	barg	24	-	-
7	Density	kg/m^3	500	-	-
8	Design Pressure(int./ext.)	barg	32	-/-	-/-
9	Design Temperature	^{0}C	-60/+180	-/-	-/-
10	Volume(total)	m^3	0.065	-	-
11	Hydro Test Pressure	barg	as per UG99b(33)	-	-
12	Corrosion Allowance(shell/head)	mm	0/0	-/-	-/-
13	Cladding (shell/head)	mm	-/-	-/-	-/-
14	Content @ normal operation		Hydrocarbons+polymer	-	-
15	Thickness(shell/Cone)	mm	9.5/8 △1	-/-	-/-
16	Welding Radiography(shell/head)	%	100/100	-/-	-/-
17	Joint Efficiency(shell/head)		1/1	-/-	-/-
18	Top Head Type		ANSI/Bolted Falnge	-	-
19	Bottom Head Type		Cone	-	-

20	Design code:	ASME SEC. VIII DIV.1	Inspection code:	ASME SEC. IX
21	Cylinder Deminsion(IDxT.L-T.L) △1	PIPE12" x 650 mm	Lethal Service:	○ Yes ● No
22	M.D.M.T @ D.P:	-60 ^{0}C	M.A.T:	- ^{0}C
23	M.A.W.P: 32.17 barg	Limted by: CONE	Stamp:	Not Required
24	Impact Test:	Not Required	P.W.H.T:	Not Required
25	N.D.T:	Required	Vessel linning detail:	NIL
26	HIC/SSC resistance:	NA / NA	Painting & Coating:	as per code
27	Insulation thickness: △1	40 mm	Insulation type:	HOT
28	Fireproofing :	NO	Vessel located on:	Structrue
29	Seismic code:	UBC 1997	Seismic Zone:	3
30	Impotance factor:	1.25	Soil Profile:	SD
31	Wind code:	UBC	Wind velocity:	120 km/hr @ 10 m
32	Impotance factor:	1.15	Exposure:	C

33	**Support loading data(Note 5)**			**Weight(kg) (Note 5)**	Fabricated:	280
34		Earthquake	Wind		Empty:	290
35	Shearing load(kgf)	70	50		Test:	345
36	Moment(kg.m)	35	25		Operation:	310

37	**MISCELLANEOUS(Note 2,10)**					
38						
39	○ Baffle	○ Impingement plate	○ Weir plate			
40	○ Diffuser	○ Distributer	○ Trunnion			
41	○ Vortex breaker	○ Tubesheet	○ Template			
42	○ Boot / Cap	○ Demister	● Pickling & passivation			
43	● Insulation Support	○ Wire mesh	● Earthing boss			
44	○ Fire Proofing	● Name plate	● Dip pipe			
45	○ Fire Proofing Support △1	○ Internal lining				
46	○ Ladder & platform (int. & ext.)	○ Sand blast & painting				
47	○ Heating coil	○ Internal clips				
48	● Lifting lug	● External clips				

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PROJECT:PP-PE PILOT PLANT	**Client:**
TITLE:DATA SHEET FOR 2ND G.P.R. DISCHARGE HOPPER(HP-423)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

MATERIALS(NOTE 2)

Shell(Main/Jacket)		SA312-304L	1	SA182-F304L	Earth lug	SA240-316L
Head(Main/Jacket)		SA182-304L	/	-	Stiffening rings	-
Nozzle Necks (Main/Jacket)	Plate	-	/	-	Gaskets	Spiral wound
	Pipe	SA312-304L	/	-	Ext. bolt/Nuts	SA193-B7/SA194-2H
Cladding		-			Int. bolt/Nuts	SA193-B8/SA194-8
Nozzle flanges		1 SA182-F304L			Wire mesh	-
Blind flanges		SA182-F304L			Welded clip	SA240-304L
Reinforcing pad		SA240-304L			Int. welded	SA240-304L
Fitting		SA403-304L			Int. removable	-
Support	Leg	-			Anchor/Setting bolts	SA307-B
	Lug	SA240-304L			Ladder/Platform	-
	leg/lug pad	SA240-304L			Insulation Mateial	MINERAL WOOL
Lifting lug		SA240-304L				

1 NOZZLE DETAILS(NOTE 2,3,4,7,8)

Item	NPS (Inch)	Flanges Rating	Flanges Type	Flanges Face	SCH. /THK.	Service	Proj.	Rein. PAD Width	Rein. PAD Thk.	Standards	Remarks
Top Head											
P1	4"	600#	WN	RF	80S	Gas outlet	See dwg	50	20	ANSI B16.5	
Shell											
P2	2"	600#	LWN	RF	40S	Product inlet	See dwg	-	-	ANSI B16.5	Tangential
Bottom Head											
P3	2"	600#	WN	RF	40S	Product outlet	See dwg	-	-	ANSI B16.5	

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PROJECT:PP-PE PILOT PLANT

Client:

شرکت ملی صنایع پتروشیمی
شرکت پژوهش و فناوری پتروشیمی

TITLE:DATA SHEET FOR 2ND G.P.R. DISCHARGE HOPPER(HP-423)

NOZZLE LOADING DATA(NOTE 2)

Nozzle Name	FL (kgf)	FA (kgf)	FC (kgf)	MC (kg.m)	MT (kg.m)	ML (kg.m)
P1	571	571	429	115	172	149

REFRENCE DOCUMENTS

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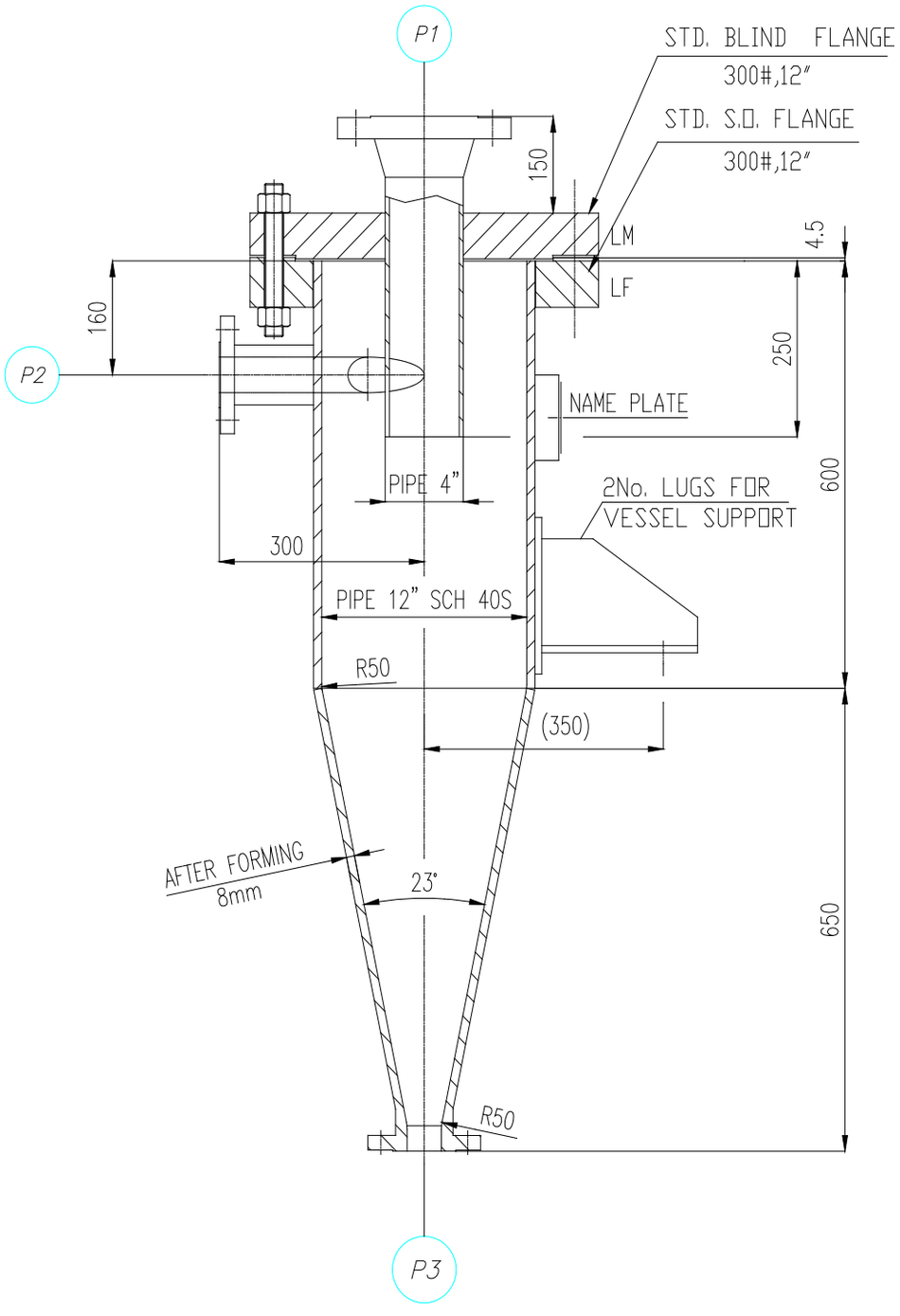
PROJECT:PP-PE PILOT PLANT	**Client:**
TITLE:DATA SHEET FOR 2ND G.P.R. DISCHARGE HOPPER(HP-423)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

Sketch(Note 3)



SIDE VIEW

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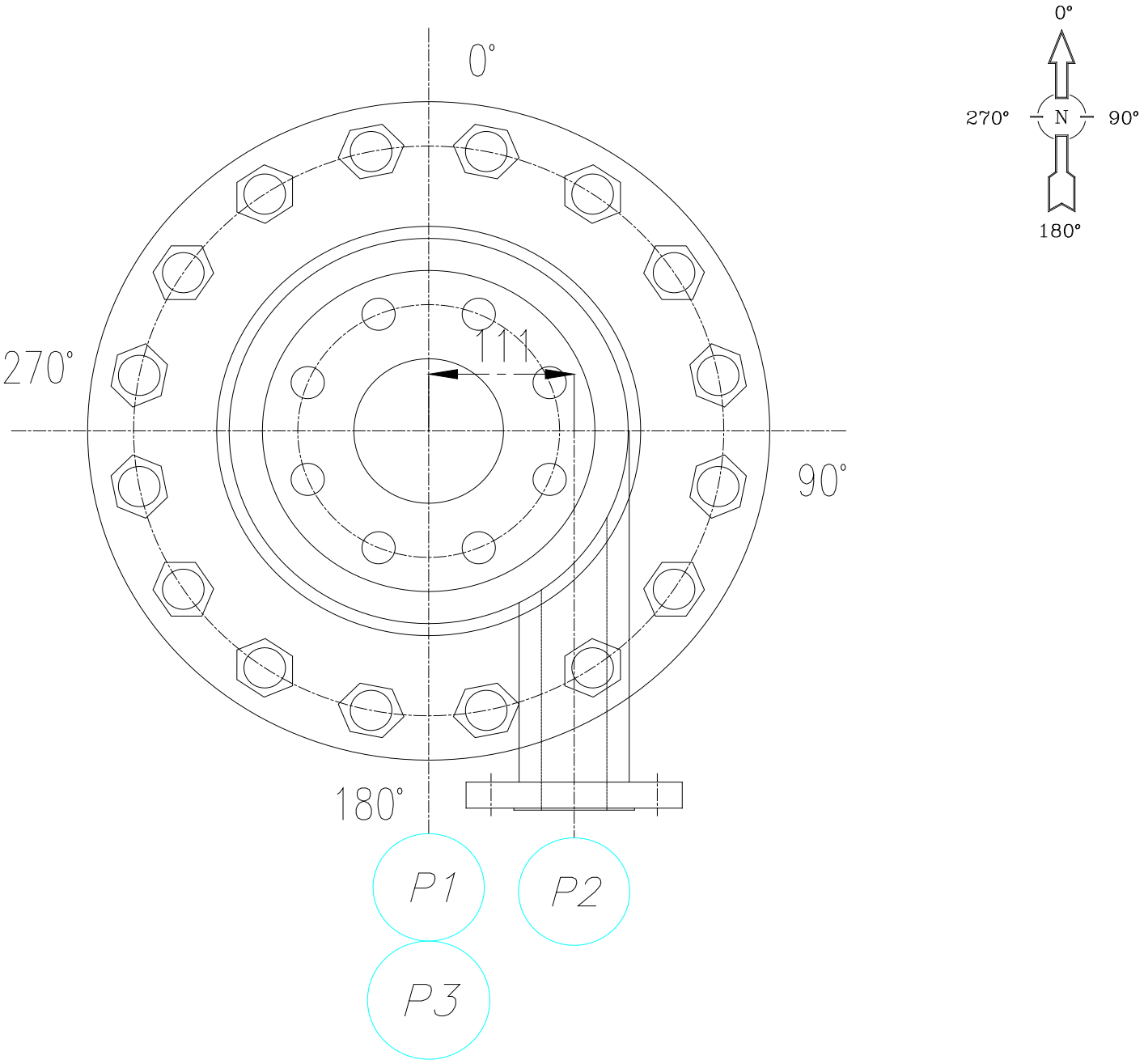
PROJECT:PP-PE PILOT PLANT	Client:
TITLE:DATA SHEET FOR 2ND G.P.R. DISCHARGE HOPPER(HP-423)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

Sketch(Note 3)



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PROJECT:PP-PE PILOT PLANT	**Client:**
TITLE:DATA SHEET FOR 2ND G.P.R. DISCHARGE HOPPER(HP-423)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

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7- SHELL/NOZZLE THICKNESS AT CONNECTION/ATACHMENT AREA SHALL BE VERIFIED BY LOCAL CALCULATION.

8- UNLESS OTHERWISE NOTED OUTSIDE PROJECTION OF NOZZLES ARE MEASURED FROM C.L./T.L. OF VESSEL TO THE EXTREME FACE OF NOZZLE FLANGE.
9- LOCATION AND NUMBER OF LIFTING LUGS ON VESSEL SHALL BE SPECIFIED ON VENDOR DRAWINGS.
10- ALL WELDED ATTACHMENTS TO THE VESSEL TO BE SUPPLIED BY THE VESSEL MANUFACTURER .
11- SETTING BOLTS SHALL BE HOT DIP GALVANIZED.

12- SURFACE PREPARATAION,PICKLING&PASSIVATION SHALL BE ACC. TO APPROVED VENDOR DOCUMENT BY PURCHASER.

13- ALL REINF.PADS SHALL HAVE 1/4"(6mm) TELL TALE HOLE.
14-FINISHING OF THE GASKET CONTACTING FACE SHALL BE SMOOTH FINISH RA=6.3 µm (250 µinch)
15-INTERNAL FINISHING SHALL BE SMOOTH FINISH RA= 0.4 µm (16µinch)

Table 3. Drums

Items	Tag ID.	Description
10	V-342	HEXENE UNLOADING HYDRAULIC GUARD
11	D-351	RECYCLE PUMP DRUM
12	V-401	C-401 SUCTION DRUM
13	V-402	C-401 DISCHARGE DRUM
Numbers		**4**

PROJECT:PP-PE PILOT PLANT	Client: شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی
TITLE:Data Sheet for Hexene unloading hydraulic guard(V-342)	

Data Sheet for Hexene unloading hydraulic guard(V-342)

	Document No.: 300-DAS-A4-EQ-0073	Rev.: 3
	Owner Job No.:	Type: DAS
		Page A

PROJECT:PP-PE PILOT PLANT	**Client:**
TITLE:Data Sheet for Hexene unloading hydraulic guard(V-342)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

REV. / PAGE	0	1	2	3	4	5	REV. / PAGE	0	1	2	3	4	5
A	X	X	X	X									
B	X	X	X	X									
1	X	X	X	X									
2	X	X	X	X									
3	X	X	X	X									
4	X	X	X	X									
5		X	X	X									
6		X	X	X									

Revision	Date	Prepared By	Checked By	Approved By	Status
5					
4					
3	18/11/2011	H.R	A.A	H.R	AFC
2					
1					
0					

Document Revision

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PROJECT:PP-PE PILOT PLANT

Client:

شرکت ملی صنایع پتروشیمی
شرکت پژوهش و فناوری پتروشیمی

TITLE:Data Sheet for Hexene unloading hydraulic guard(V-342)

Item No.:V-342 Quantity: 1 Location: Outdoor Service: Continuous

DESIGN CONDITIONS

		Vessel	Jacket	Internal Coil
Operating Temperature(Min./Max.)	^{0}C	AMB	-/-	-/-
Operating Pressure	barg	ATM	-	-
Density	kg/m^3	850	-	-
Design Pressure(int./ext.)	barg	6/-	-/-	-/-
Design Temperature	^{0}C	-30÷+120	-/-	-/-
Volume(total)	m^3	0.033	-	-
Hydro Test Pressure	barg	as per UG99b(33)	-	-
Corrosion Allowance(shell/head)	mm	0/0	-/-	-/-
Cladding (shell/head)	mm	-/-	-/-	-/-
Content @ normal operation		OIL	-	-
Thickness(shell/head)	mm	9.27/ #300	-/-	-/-
Welding Radiography(shell/head)	%	Full/Full	-/-	-/-
Joint Efficiency(shell/head)		1/1	-/-	-/-
Top Head Type		ANSI/Bolted Falnge	-	-
Bottom Head Type		STD CAP	-	-

Design code:	ASME SEC. VIII DIV.1		Inspection code:	as per code
Cylinder Deminsion(IDxT.L-T.L):	PIPE 10" x 580 mm		Lethal Service:	○ Yes ● No
M.D.M.T @ D.P:	-30 ^{0}C		M.A.T:	- ^{0}C
M.A.W.P:	- barg Limted by: -		Stamp:	NIL
Impact Test:	Not Required		P.W.H.T:	Not Required
N.D.T:	Required		Vessel linning detail:	N/A
HIC/SSC resistance:	N/A / N/A		Painting & Coating:	as per code
Insulation thickness:	3 40 mm		Insulation type:	IA
Fireproofing thickness:	(Note 17) mm		Vessel located on:	Foundation
Seismic code:	UBC 1997		Seismic Zone:	3
Impotance factor:	1.25		Soil Profile:	SD
Wind code:	UBC		Wind velocity:	120 km/hr @ 10 m
Impotance factor:	1.15		Exposure:	C

Support loading data(Note 5)	Earthquake	Wind
Shearing load(kgf)	35	25
Moment(kg.m)	30	20

Weight(kg) (Note 5)	
Fabricated:	165 kg
Empty:	170 kg
Test:	195 kg
Operation:	185 kg

MISCELLANEOUS

○ Baffle	○ Impingement plate	○ Weir plate
○ Diffuser	○ Distributer	○ Trunnion
○ Vortex breaker	○ Tubesheet	○ Template
○ Boot / Cap	○ Demister	● Pickling & passivation
● Insulation Support	○ Wire mesh	● Earthing boss
● Fire Proofing	● Name plate	● Dip pipe
○ Fire Proofing Support	○ Internal lining	
○ Ladder & platform (int. & ext.)	○ Sand blast & painting	
○ Heating coil	● Internal clips	
● Lifting lug	○ External clips	

3

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PROJECT:PP-PE PILOT PLANT						**Client:**						
TITLE:Data Sheet for Hexene unloading hydraulic guard(V-342)						شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی						
1												
2	**MATERIALS(NOTE 2)**											
3												
4	Shell(Main/Jacket)		SA312-304 / -			Earth lug	SA240-316					
5	Head(Main/Jacket)		SA403-304 / -			Stiffening rings	NA					
6	Nozzle Necks	Plate	- / -			Gaskets	to be specified by vendor					
7	(Main/Jacket)	Pipe	SA312-304 / -			Ext. bolt/Nuts	SA193-BB/SA194-B					
8	Cladding		NA			Int. bolt/Nuts	SA193-BB/SA194-B					
9	Nozzle flanges		SA182-304			Wire mesh	NA					
10	Blind flanges		SA182-304			Welded clip	SA240-304					
11	Reinforcing pad		SA240-304			Int. welded	SA240-304					
12	Fitting		SA403-304			Int. removable	SA312-304					
13	Support	Leg	SA283-C			Anchor/Setting bolts	SA-307 B					
14		Lug	NA			Ladder/Platform	NA					
15		leg/lug pad	SA240-304			Insulation Mateial	MINERAL WOOL					
16	Lifting lug		SA240-304									
17	**NOZZLE DETAILS(NOTE 2,3,8)**											
18												
19	Item	NPS (Inch)	Flanges			SCH. /THK.	Service	Proj.	Rein. PAD		Standards	Remarks
20			Rating	Type	Face				Width	Thk.		
21	Top Head											
22	P1	1/2"	300#	WN	RF	40S	Nitrogen Inlet	-	-	-	ANSI B16.5	SEE DWG.
23	P2	1"	300#	WN	RF	40S	SEO Inlet	-	-	-	ANSI B16.5	SEE DWG.
24	P3	1"	300#	WN	RF	40S	Vent	-	-	-	ANSI B16.5	SEE DWG.
25												
26												
27												
28	Shell											
29	K1	3"	150#	-	-	40S	Sight Glass	55	-	-	ANSI B16.5	PAD FLANGE
30												
31												
32												
33												
34												
35	Bottom Head											
36	P4	1"	300#	WN	RF	40S	Drain	185	-	-	ANSI B16.5	
37												
38												
39												
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PROJECT:PP-PE PILOT PLANT

Client:

شرکت ملی صنایع پتروشیمی

شرکت پژوهش و فناوری پتروشیمی

TITLE:Data Sheet for Hexene unloading hydraulic guard(V-342)

NOZZLE LOADING DATA(NOTE 6)

Nozzle Name	FA (kN)	FB (kN)	FC (kN)	MA (N.m)	MB (N.m)	MC (N.m)
P1						
P2						
P4						

REFRENCE DOCUMENTS

No.	Document No.	Document Title
1		
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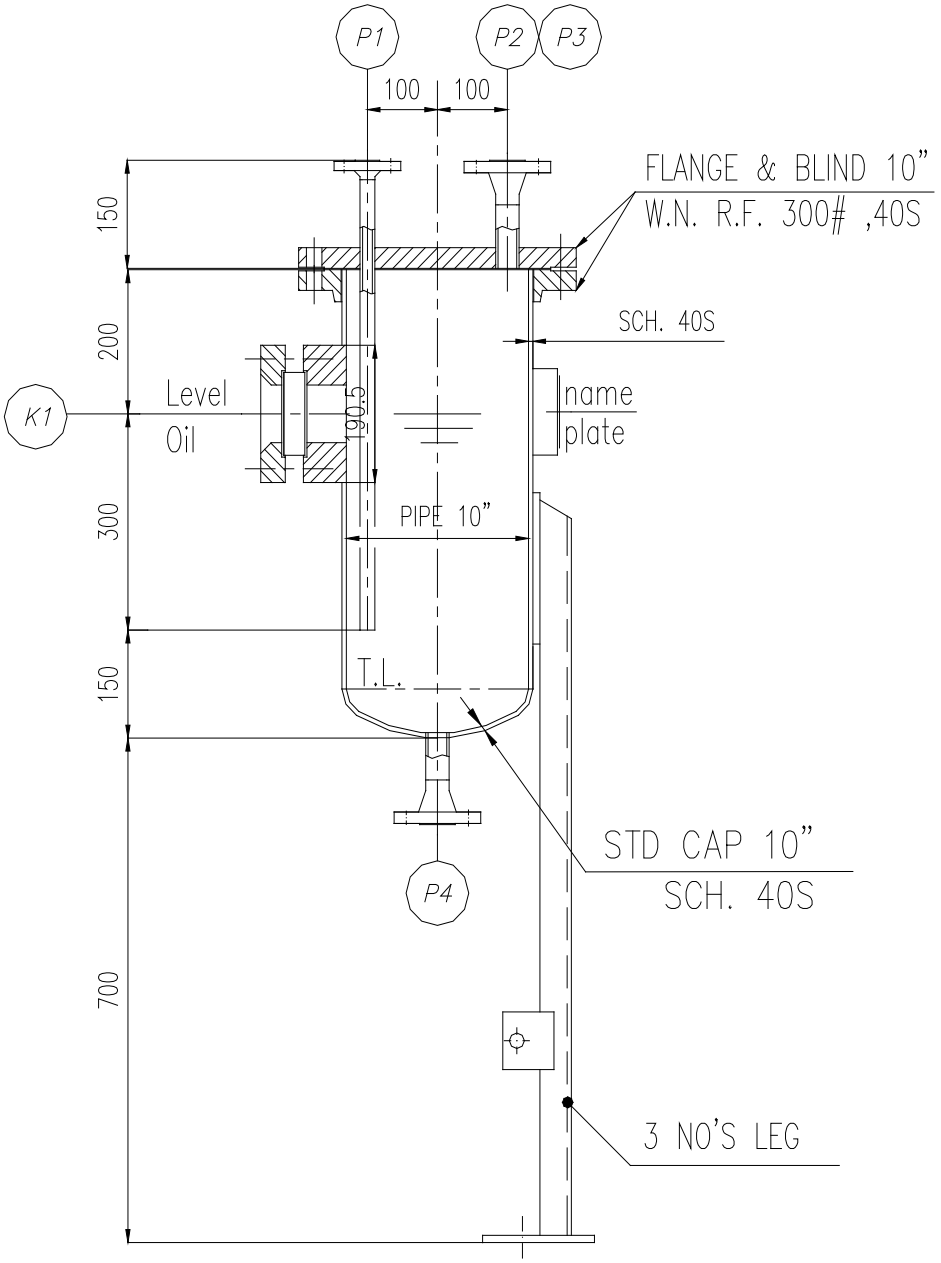
PROJECT:PP-PE PILOT PLANT	Client:
TITLE:Data Sheet for Hexene unloading hydraulic guard(V-342)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی



SIDE VIEW

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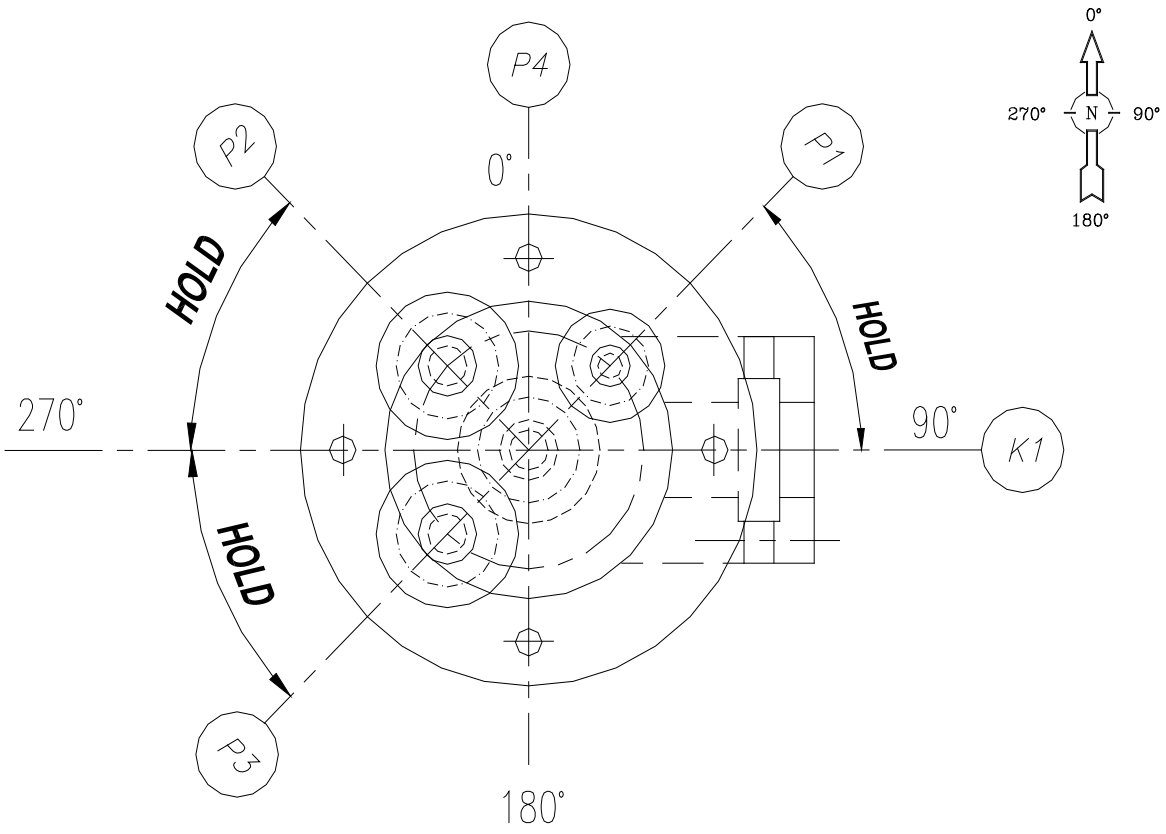

Orientated (HOLD)

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PROJECT:PP-PE PILOT PLANT	**Client:**
TITLE:Data Sheet for Hexene unloading hydraulic guard(V-342)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

General Notes:

1- SHALL BE VERIFIED BY VENDOR.
2- ALL DIMENSIONS ARE IN MILLIMETER, UNLESS OTHERWISE NOTED.
3- NOZZLE CHARACTERISTICS SHALL BE VERIFIED BY VENDOR.
4- THICKNESSES INDICATED ON ENG. DRAWING ARE Min. PURCHASER REQUIREMENT. VENDOR SHALL CHECK AND GUARANTEE THEM ON STRENGTH.
5- THICKNESSES, WEIGHTS AND LOADS ARE INDICATED FOR ESTIMATION PURPOSE ONLY ; THE MANUFCTURER SHALL CONFIRM THESE ITEMS AND IS RESPONSIBLE FOR MECHANICAL DESIGN.
6- SHALL BE SPECIFIED BY VENDOR .
7-SURFACE PREPARATAION,PICKLING&PASSIVATION SHALL BE ACC. TO APPROVED VENDOR DOCUMENT BY PURCHASER
8- SHELL/NOZZLE THICKNESS AT CONNECTION/ATACHMENT AREA SHALL BE VERIFIED BY LOCAL CALCULATION.
9- ALL WELDED ATTACHMENTS TO THE VESSEL TO BE SUPPLIED BY THE VESSEL MANUFACTURER .
10- ALL NDT (RT, UT AND PT/MT) SHALL BE PERFORMED BEFORE AND AFTER PWHT .
11- ALL REINF.PADS SHALL HAVE 1/4"(6mm) TELL TALE HOLE.
12- SETTING BOLTS SHALL BE HOT DIP GALVANIZED.
13- STATED THICKNESS IS MINIMUM AFTER FORMING. THICKNESS OF STRAIGHT FLANGE OF ELLIPTICAL/TORISPHERICAL HEADS SHALL BE IN NO CASE SMALLER THAN VESSEL SHELL THICKNESS.
14- ALL TAILED DIMENSIONS ARE MEASURED FROM B.L.□
15- UNLESS OTHERWISE NOTED OUTSIDE PROJECTIONS OF NOZZLES ARE MEASURED FROM C.L. OF VESSEL TO THE EXTREME FACE OF NOZZLE FLANGE.
16- FLANGE FACE FINISHING SHALL BE SMOOTHED WITH 125-250 MICROINCH AVEREGAE ROUGHNESS
17- WILL BE SPECIFIED LATER.
18- LOCATION AND NUMBER OF LIFTING LUGS ON VESSEL SHALL BE SPECIFIED ON VENDOR DRAWINGS.

PROJECT: PP-PE Pilot Plant		client:
TITLE: Data Sheet for Pump Suction Drum (D-351)		شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

Data Sheet for
Pump Suction Drum (D-351)

REVIEWED & EXECUTED BY :	**ENGINEERING :**	**Document No.: 300-DAS-A4-EQ-0180**	**Rev.: 01**
		Owner Job No.:	**Type: DAS**
		Contract Job No.:	**Page: A**

PROJECT: PP-PE Pilot Plant		client: شرکت ملی صنایع پتروشیمی
TITLE: Data Sheet for Pump Suction Drum (D-351)		

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Rev	Data	Prepared By	Checked By	Approved by	Status
6					
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1	1399/11/20	AA.SH			IFA

Document Revision

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		Owner Job No.:	**Type: DAS**
		Contract Job No.:	**Page : B**

PROJECT: PP-PE Pilot Plant	**client:** شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی
TITLE: Data Sheet for Pump Suction Drum (D-351)	

Type: Vertical Drum | Manufacturer: | Belongs to.:
Item No.: D-351 | No. required: 1 | P&ID-No.: 300-P&ID-A3-FS-0031
Description: I : Pump Suction Drum | | Area: 300
Service/mode of operation: ☑ continuous ☐ discontinuous

General Data

Shell diameter N.D.: 400 mm			Nominal volume: 0.125 m³	Height (cyl.): 1000 mm
Internals:	☐ NO	☑ YES	Type: Demister (above of the vessel with 50 mm thk., see drawing)	
Other features:	☑ NO	☐ YES	Type:	
Location:	☐ indoors	☑ outdoors		
Supports: 3 No.s Leg Support (Distance between Flange P6 to earth to be 700 mm)				
Others:				

Operating Conditions

	Vessel	Jacket	Internal Coil
Nominal Volume m³	0.125		
Medium/physical properties	1-Butene		
Max. operating temperature °C	105		
Operating pressure barg	20		
Physical state (g/l/s)	l		
Density kg/m³	462		
pH-value min/max.			
Operating volume m³	0.08		
Errosive/Corrosive due to	0		
Concentration %			
Min./max. level during operation mm			

Design Data

Design code:ASME | Inspection by: ASME SEC IX | Design code section:SEC. VIII DIV.1

	Vessel	Jacket	Internal Coil
Volume (total) m³	0.15		
Design pressure barg	31		
Testing over-pressure/medium barg	TO BE SPECIFIED BY VENDOR		
Design temperature °C	- 60 / 230		
Corrosion allowance mm			
Welding radiography (Shell / Head) %	SPOT / FULL		
Pressure/vacuum test; type bar	-		
Nominal volume m³	0.125		
Surface coating	-		
Surface finish/treatment	Ra= 1.6 µm		
Safety device			

Others: ratio: L (cyl.)/D = 2.5

Weld finish:	☐ NO	☑ YES	Type: Internal, Grinded and Polished	
Thermal treatment:	☐ NO	☐ YES		
Empty weight [kg]: 550		Operating weight [kg]:	Shop test weight [kg]:	Fabricated Weight [kg]:
Insulation:	☐ NO	☑ YES	Type: Hot	Thickness [mm]: 30
Seismic factor:	☐ none	☑ factor: 0.3		Wind Velocity [Km/hr]:120@10 m

LOADS AT BASE (*) : [[WIND: 120 km/hr Shear[kgf]: 80 , Moment[kgf.m]: 40 , SEISMIC: Shear[kgf]: 304 , Moment[kgf.m]: 220]]

Comments

REVIEWED & EXECUTED BY :	**ENGINEERING :**	**Document No.: 300-DAS-A4-EQ-0180**	**Rev.: 01**
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PROJECT: PP-PE Pilot Plant	client: شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی
TITLE: Data Sheet for Pump Suction Drum (D-351)	

Type: Vertical Drum | Manufacturer: | Belongs to.:

Item No.: D-351 | No. required: 1 | P&ID-No.: 300-P&ID-A3-FS-0031

Description: : Pump Suction Drum | Area: 300

Service/mode of operation: ☑ continuous ☐ discontinuous

	Material of Construction (*)			
		Standard/certificate	Standard/certificate	Standard/certificate
		Vessel	**Jacket**	**Internal Coil**
	Shell (Thk.: 12 mm) Note 6	SA240-304L		
	Heads (Thk.: 12 mm) Note 6	SA240-304L		
	Flange	S.S 304L (with cladding)		
	Tubes/flanges	-		
	Screws/nuts	SA193-B7 / SA194-2H		
	Gaskets	Spiral Wound		
	Internals	S.S 304L		
	Manhole	-		
	Welding efficiency (shell / head)	0.85 / 1		
	Supports	SAME AS SHELL		
	Lugs / insulation	SAME AS SHELL / Hot		
	Transport lugs	SAME AS SHELL		
	Grounding device	S.S		
	Tray / type	-		

Details concerning transport, scope of supplies & services

Transport volume [m³]: | transport weight [kN]: | Protective coating: ☐ No ☐ Yes Type:

Registration: | Date of delivery: | Place of delivery

site of inspection:

Quality Control :

Language of documentation: ☑ English ☐ German

Drawings:

Nozzle Details

	Designation	DN	Rating	Facing	Type	Standard	SCH.	Comments
	Top head							
P1	Off-Gas	1/2"	300#	RF	WN	ANSI B16.5	80S	
P2	PG	1/2"	300#	RF	WN	ANSI B16.5	80S	
P3	Spare	1/2"	300#	RF	WN	ANSI B16.5	80S	with blind flange
	Bottom head							
P6	Powder Slurry Outlet	1"	300#	RF	WN	ANSI B16.5	80S	
	Shell							
K1	LI&LT Conection	1"	300#	RF	WN	ANSI B16.5	80S	
K2	LI&LT Conection	1"	300#	RF	WN	ANSI B16.5	80S	
P4	Inlet	1/2"	300#	RF	WN	ANSI B16.5	80S	
P5	Outlet	1/2"	300#	RF	WN	ANSI B16.5	80S	

COMMENTS

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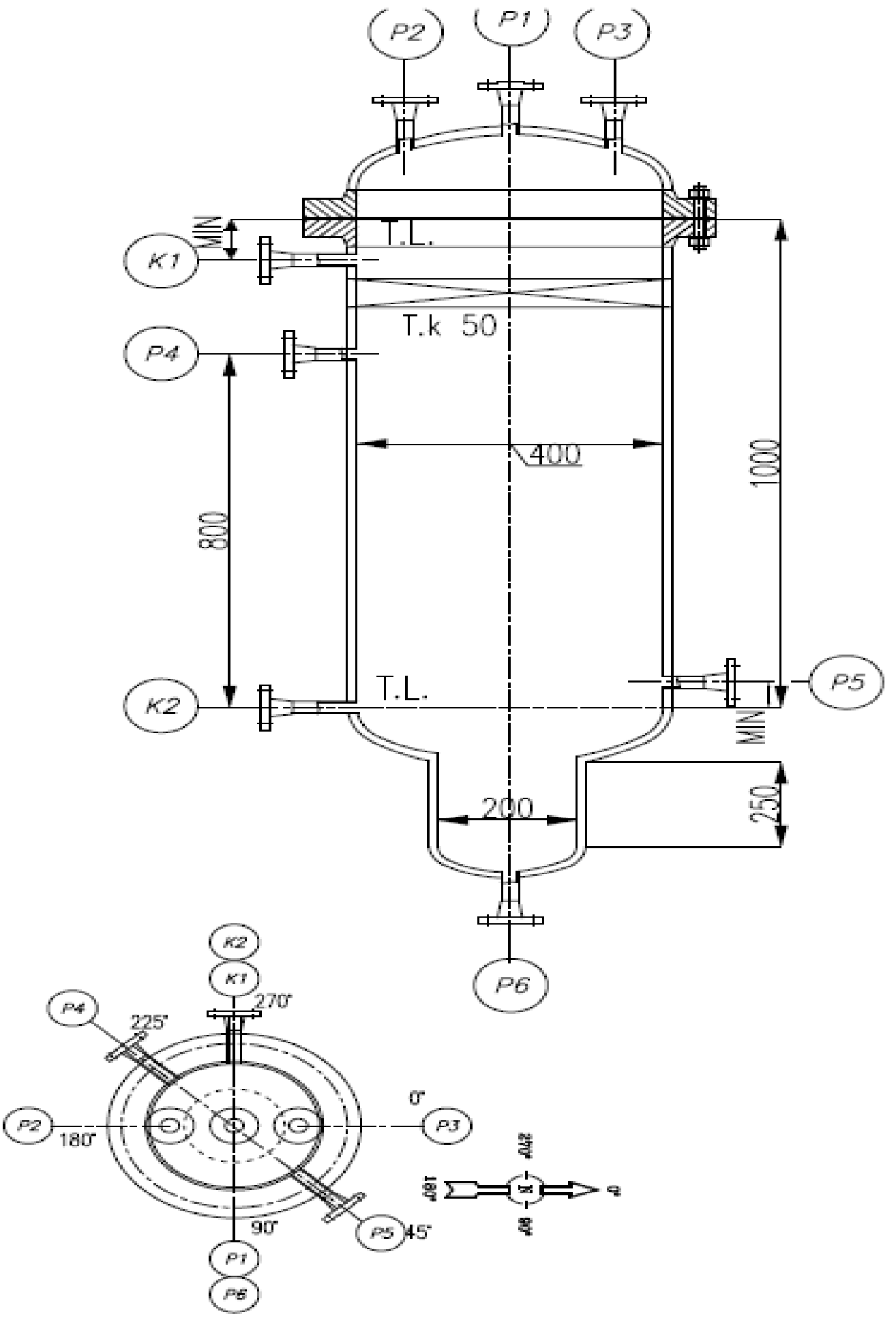
PROJECT: PP-PE Pilot Plant		client: شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی
TITLE: Data Sheet for Pump Suction Drum (D-351)		



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PROJECT: PP-PE Pilot Plant		client:
TITLE: Data Sheet for Pump Suction Drum (D-351)		شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

GENERAL NOTES:

1- UNLESS OTHERWISE NOTED ALL DIMENSIONS ARE IN MILLIMETERS.

2- ALL TAILES DIMENSIONS ARE MEASURED FROM VESSEL B.L.

3- UNLESS OTHERWISE NOTED OUTSIDE PROJECTION OF NOZZLES ARE MEASURED FROM C.L./T.L. OF VESSEL TO THE EXTREME FACE OF NOZZLE .

4- FLANGE FACE FINISHING SHALL BE SMOOTH 125-250 MICROINCH AVERAGE ROUGHNESS .

5- STATED THICKNESS IS MINIMUM AFTER FORMING. THICKNESS OF STRAIGHT FLANGE OF ELLIPTICAL/TORISPHERICAL HEADS SHALL BE IN NO CASE SMALLER THAN VESSEL SHELL THICKNESS.

6- THICKNESS INDICATED ON THIS DRAWING ARE MIN.PURCHASER REQUIREMENT. VENDOR SHALL CHECK AND GUARANTEE THEM ON STRENGTH.

7- SHELL / NOZZLE THICKNESS AT CONNECTION / ATTACHMENT AREA SHALL BE VERIFIED BY LOCAL STRESS CALCULATION
PECIAL BLINDED BODY FLANGE , SHALL BE DESIGNED BY VESSEL MANUFACTURER .

8- INDICATED WEIGHTS WILL BE FINALIZED AFTER VENDOR CALCULATION APPROVAL .

REVIEWED & EXECUTED BY :	ENGINEERING :	Document No.: 300-DAS-A4-EQ-0180	Rev.: 01
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PROJECT:PP-PE PILOT PLANT	Client: شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی
TITLE:DATA SHEET FOR C-401 SUCTION DRUM (V-401)	

TITLE:DATA SHEET FOR C-401 SUCTION DRUM (V-401)

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PROJECT:PP-PE PILOT PLANT	**Client:**
TITLE:DATA SHEET FOR C-401 SUCTION DRUM (V-401)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

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Document Revision

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PROJECT:PP-PE PILOT PLANT	**Client:**
TITLE:DATA SHEET FOR C-401 SUCTION DRUM (V-401)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

1	Item No.:V-401	Quantity: 1	Location: Outdoor	Service:	Continuous
2	**DESIGN CONDITIONS**				
3					
4			**Vessel**	**Jacket**	**Internal Coil**
5	Operating Temperature(Min./Max.)	^{0}C	-30/+50	-/-	-/-
6	Operating Pressure	barg	1.5	-	-
7	Density	kg/m^3	2.517	-	-
8	Design Pressure(int./ext.)	barg	35	-/-	-/-
9	Design Temperature(int./ext.)	^{0}C	-60/+180	-/-	-/-
10	Volume(total)	m^3	0.31	-	-
11	Hydro Test Pressure	barg	as per UG99b(33)	-	-
12	Corrosion Allowance(shell/head)	mm	0/0	-/-	-/-
13	Cladding (shell/head)	mm	- / -	-/-	-/-
14	Content @ normal operation		Propane+Ethylene+Hydroger	-	-
15	Thickness(shell/head)	mm	14/14	-/-	-/-
16	Welding Radiography(shell/head)	%	Full/Full	-/-	-/-
17	Joint Efficiency(shell/head)		1/1	-/-	-/-
18	Top Head Type		2:1 Elipsoidal	-	-
19	Bottom Head Type		2:1 Elipsoidal	-	-

20	Design code:	ASME SEC. VIII DIV.1	Inspection code:	ASME SEC. IX
21	Cylinder Deminsion(IDxT.L-T.L):	534 x 1100 mm	Lethal Service:	○ Yes ● No
22	M.D.M.T @ D.P:	-45 ^{0}C	M.A.T:	- ^{0}C
23	M.A.W.P:	71.474 barg Limted by: Cylinder	Stamp:	Not Required
24	Impact Test:	Not Required	P.W.H.T:	Not Required
25	N.D.T:	Required	Vessel linning detail:	NIL
26	HIC/SSC resistance:	NA / NA	Painting & Coating:	as per code
27	Insulation thickness:	30 mm	Insulation type:	ET & IH
28	Fireproofing :	Yes	Vessel located on:	Foundation
29	Seismic code:	UBC 1997	Seismic Zone:	3
30	Impotance factor:	1.25	Soil Profile:	SD
31	Wind code:	UBC	Wind velocity:	120 km/hr @ 10 m
32	Impotance factor:	1.15	Exposure:	C

33	**Support loading data(Note 5)**			**Weight(kg) (Note 5)**	Fabricated:	450
34		Earthquake	Wind		Empty:	450
35	Shearing load(kgf)	50	55		Test:	693
36	Moment(kg.m)	60	65		Operation:	450

37	**MISCELLANEOUS(Note 2,10)**		
38			
39	○ Baffle	○ Impingement plate	○ Weir plate
40	○ Diffuser	○ Distributer	○ Trunnion
41	○ Vortex breaker	○ Tubesheet	○ Template
42	○ Boot / Cap	○ Demister	● Pickling & passivation
43	● Insulation Support	○ Wire mesh	● Earthing boss
44	○ Fire Proofing	● Name plate	○ Dip pipe
45	● Fire Proofing Support	○ Internal lining	
46	○ Ladder & platform (int. & ext.)	○ Sand blast & painting	
47	○ Heating coil	○ Internal clips	
48	● Lifting lug	● External clips	

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PROJECT:PP-PE PILOT PLANT	Client:
TITLE:DATA SHEET FOR C-401 SUCTION DRUM (V-401)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

MATERIALS(NOTE 2)

Shell(Main/Jacket)		SA240-304 /	Earth lug	SA240-316
Head(Main/Jacket)		SA240-304 /	Stiffening rings	-
Nozzle Necks (Main/Jacket)	Plate	- /	Gaskets	Spiral Wound
	Pipe	SA312-304 /	Ext. bolt/Nuts	SA193-B7/SA194-2H
Cladding		-	Int. bolt/Nuts	SA193-B8/SA194-8
Nozzle flanges		SA182-F304	Wire mesh	-
Blind flanges		SA182-F304	Welded clip	SA240-304
Reinforcing pad		SA240-304	Int. welded	-
Fitting		SA403-304	Int. removable	-
Saddle	Leg	SA240-304	Anchor/Setting bolts	SA307 B
	Base plate	SA283-C	Ladder/Platform	-
	leg/lug pad	SA240-304	Insulation Mateial	MINERAL WOOL
Lifting lug		SA240-304		

NOZZLE DETAILS(NOTE 2,3,4,7,8)

Item	NPS (Inch)	Flanges Rating	Flanges Type	Flanges Face	SCH. /THK.	Service	Proj.	Rein. PAD Width	Rein. PAD Thk.	Standards	Remarks
Top Head											
P1	1"	900#	LWN	RF	t=14.3	Vent	See dwg	-	-	ANSI B16.5	
P2	1"	900#	LWN	RF	t=14.3	Gas Outlet	See dwg	-	-	ANSI B16.5	
P3	1"	900#	LWN	RF	t=14.3	Recycle	See dwg	-	-	ANSI B16.5	
Shell											
P4	1"	900#	LWN	RF	t=14.3	Product Inlet	See dwg	-	-	ANSI B16.5	
K1	1 1/2"	900#	LWN	RF	t=16	Temperature	See dwg	-	-	ANSI B16.5	
Bottom Head											
P5	1/2"	900#	LWN	RF	t=12.65	Drain	See dwg	-	-	ANSI B16.5	
		1			1						

*)Finishing of the gasket contacting face : smooth finish Ra=3.2µm (125µinch)

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PROJECT:PP-PE PILOT PLANT

Client:

شرکت ملی صنایع پتروشیمی

شرکت پژوهش و فناوری پتروشیمی

TITLE:DATA SHEET FOR C-401 SUCTION DRUM (V-401)

NOZZLE LOADING DATA(NOTE 1)

Nozzle Name	FA (kN)	FB (kN)	FC (kN)	MA (N.m)	MB (N.m)	MC (N.m)

REFRENCE DOCUMENTS

No.	Document No.	Document Title
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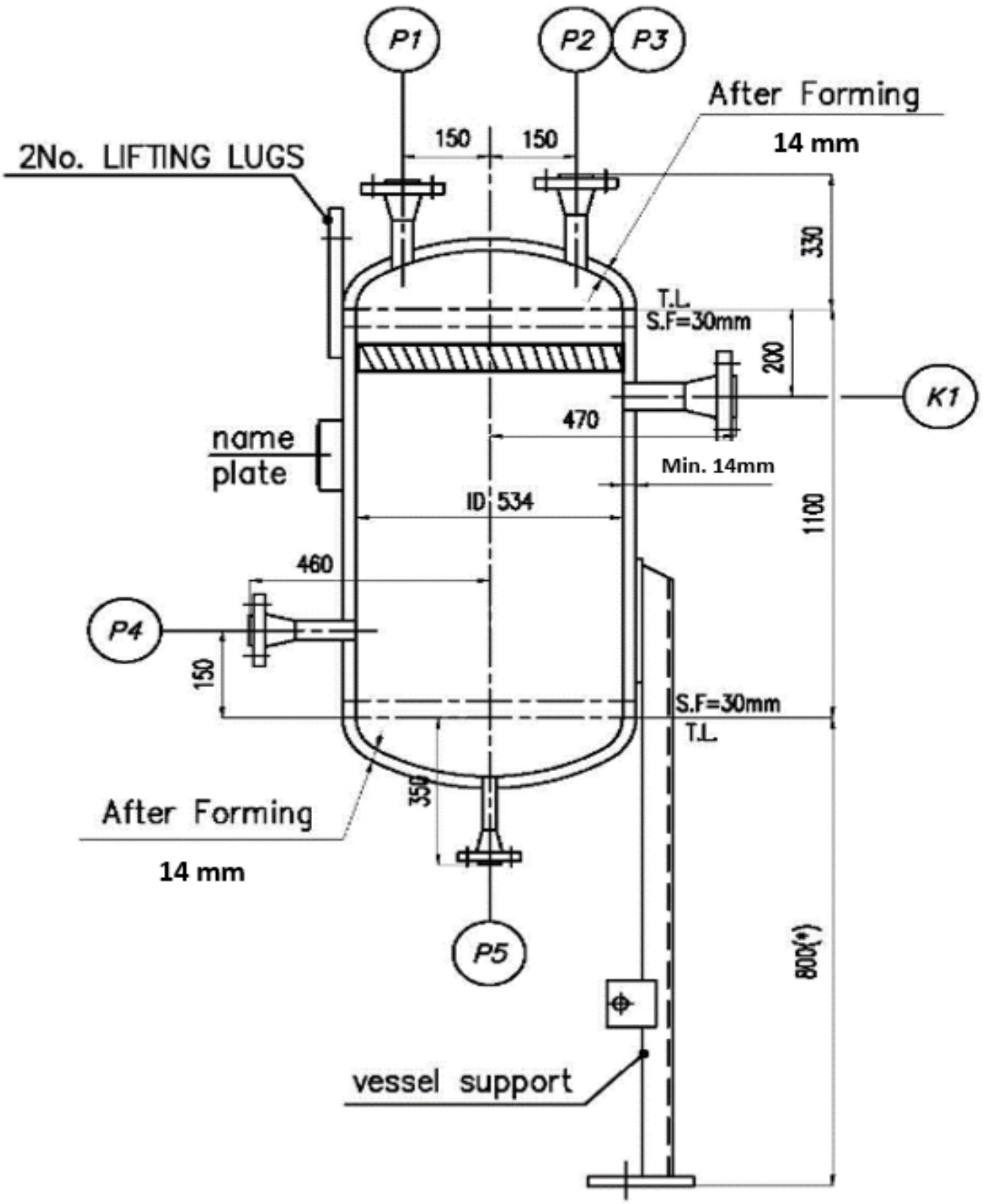
PROJECT:PP-PE PILOT PLANT	Client:
TITLE:DATA SHEET FOR C-401 SUCTION DRUM (V-401)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی



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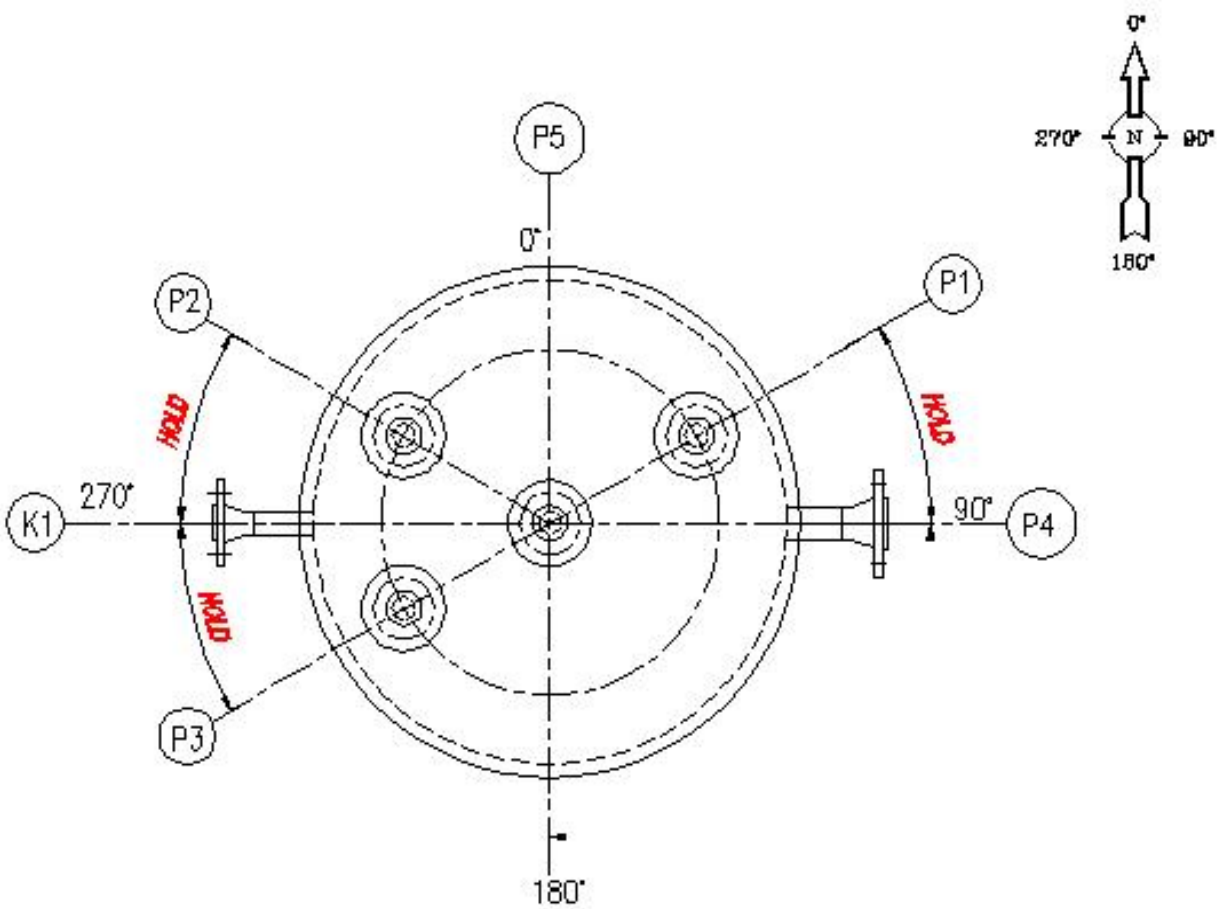
PROJECT:PP-PE PILOT PLANT	Client:
TITLE:DATA SHEET FOR C-401 SUCTION DRUM (V-401)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی



Orientation (HOLD)

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General Notes:

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6- STATED THICKNESS IS MINIMUM AFTER FORMING. THICKNESS OF STRAIGHT FLANGE OF ELLIPTICAL/TORISPHERICAL HEADS SHALL BE IN NO CASE SMALLER THAN VESSEL SHELL THICKNESS.VENDOR SHALL CHECK AND GUARANTEE THEM ON STRENGTH.
7- SHELL/NOZZLE THICKNESS AT CONNECTION/ATACHMENT AREA SHALL BE VERIFIED BY LOCAL CALCULATION.
8- UNLESS OTHERWISE NOTED OUTSIDE PROJECTION OF NOZZLES ARE MEASURED FROM C.L./T.L. OF VESSEL TO THE EXTREME FACE OF NOZZLE FLANGE.
9- LOCATION AND NUMBER OF LIFTING LUGS ON VESSEL SHALL BE SPECIFIED ON VENDOR DRAWINGS.
10- ALL WELDED ATTACHMENTS TO THE VESSEL TO BE SUPPLIED BY THE VESSEL MANUFACTURER .
11- SETTING BOLTS SHALL BE HOT DIP GALVANIZED.
12- SURFACE PREPARATAION,PICKLING&PASSIVATION SHALL BE ACC. TO APPROVED VENDOR DOCUMENT BY PURCHASER.
13- ALL REINF.PADS SHALL HAVE 1/4"(6mm) TELL TALE HOLE.
14- FINISHING OF THE GASKET CONTACTING FACE: SMOOTH FINISH RA=3.2μM (125μINCH)

TITLE:DATA SHEET FOR C-401 DISCHARGE DRUM (V-402)

PROJECT:PP-PE PILOT PLANT	**Client:**
TITLE:DATA SHEET FOR C-401 DISCHARGE DRUM (V-402)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

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PROJECT:PP-PE PILOT PLANT	**Client:**
TITLE:DATA SHEET FOR C-401 DISCHARGE DRUM(V-402)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

Item No.:V-401 Quantity: 1 Location: Outdoor Service: Continuous

DESIGN CONDITIONS

		Vessel	Jacket	Internal Coil
Operating Temperature(Min./Max.)	^{0}C	-30/+75	-/-	-/-
Operating Pressure	barg	27	-	-
Density	kg/m^3	32	-	-
Design Pressure(int./ext.)	barg	35	-/-	-/-
Design Temperature(int./ext.)	^{0}C	-60/+180	-/-	-/-
Volume(total)	m^3	0.31	-	-
Hydro Test Pressure	barg	as per UG99b(33)	-	-
Corrosion Allowance(shell/head)	mm	0/0	-/-	-/-
Cladding (shell/head)	mm	- / -	-/-	-/-
Content @ normal operation		Propane+Ethylene+Hydroger	-	-
Thickness(shell/head)	mm	14/14	-/-	-/-
Welding Radiography(shell/head)	%	Full/Full	-/-	-/-
Joint Efficiency(shell/head)		1/1	-/-	-/-
Top Head Type		2:1 Elipsoidal	-	-
Bottom Head Type		2:1 Elipsoidal	-	-

Design code: ASME SEC. VIII DIV.1	Inspection code: ASME SEC. IX
Cylinder Deminsion(IDxT.L-T.L): 534 x 1100 mm	Lethal Service: ○ Yes ● No
M.D.M.T @ D.P: -45 ^{0}C	M.A.T: - ^{0}C
M.A.W.P: 71.474 barg Limted by: Cylinder	Stamp: Not Required
Impact Test: Not Required	P.W.H.T: Not Required
N.D.T: Required	Vessel linning detail: NIL
HIC/SSC resistance: NA / NA	Painting & Coating: as per code
Insulation thickness: 30 mm	Insulation type: ET & IH
Fireproofing : Yes	Vessel located on: Foundation
Seismic code: UBC 1997	Seismic Zone: 3
Impotance factor: 1.25	Soil Profile: SD
Wind code: UBC	Wind velocity: 120 km/hr @ 10 m
Impotance factor: 1.15	Exposure: C

Support loading data(Note 5)		
	Earthquake	Wind
Shearing load(kgf)	50	55
Moment(kg.m)	60	65

Weight(kg) (Note 5)		
Fabricated:	450	
Empty:	450	
Test:	693	
Operation:	450	

MISCELLANEOUS(Note 2,10)

○ Baffle	○ Impingement plate	○ Weir plate
○ Diffuser	○ Distributer	○ Trunnion
○ Vortex breaker	○ Tubesheet	○ Template
○ Boot / Cap	○ Demister	● Pickling & passivation
● Insulation Support	○ Wire mesh	● Earthing boss
○ Fire Proofing	● Name plate	○ Dip pipe
● Fire Proofing Support	○ Internal lining	
○ Ladder & platform (int. & ext.)	○ Sand blast & painting	
○ Heating coil	○ Internal clips	
● Lifting lug	● External clips	

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PROJECT:PP-PE PILOT PLANT	**Client:**
TITLE:DATA SHEET FOR C-401 DISCHARGE DRUM (V-402)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

MATERIALS(NOTE 2)

Shell(Main/Jacket)		SA240-304 /	Earth lug	SA240-316
Head(Main/Jacket)		SA240-304 /	Stiffening rings	-
Nozzle Necks (Main/Jacket)	Plate	- /	Gaskets	Spiral Wound
	Pipe	SA312-304 /	Ext. bolt/Nuts	SA193-B7/SA194-2H
Cladding		-	Int. bolt/Nuts	SA193-B8/SA194-8
Nozzle flanges		SA182-F304	Wire mesh	-
Blind flanges		SA182-F304	Welded clip	SA240-304
Reinforcing pad		SA240-304	Int. welded	-
Fitting		SA403-304	Int. removable	-
Saddle	Leg	SA240-304	Anchor/Setting bolts	SA307 B
	Base plate	SA283-C	Ladder/Platform	-
	leg/lug pad	SA240-304	Insulation Mateial	MINERAL WOOL
Lifting lug		SA240-304		

NOZZLE DETAILS(NOTE 2,3,4,7,8)

Item	NPS (Inch)	Flanges Rating	Flanges Type	Flanges Face	SCH. /THK.	Service	Proj.	Rein. PAD Width	Rein. PAD Thk.	Standards	Remarks
Top Head											
P1	1"	900#	LWN	RF	t=14.3	Vent	See dwg	-	-	ANSI B16.5	
P2	1"	900#	LWN	RF	t=14.3	Gas Outlet	See dwg	-	-	ANSI B16.5	
P3	1"	900#	LWN	RF	t=14.3	Recycle	See dwg	-	-	ANSI B16.5	
Shell											
P4	1"	900#	LWN	RF	t=14.3	Product Inlet	See dwg	-	-	ANSI B16.5	
K1	1 1/2"	900#	LWN	RF	t=16	Temperature	See dwg	-	-	ANSI B16.5	
Bottom Head											
P5	1/2"	900#	LWN	RF	t=12.65	Drain	See dwg	-	-	ANSI B16.5	
		1			1						

*)Finishing of the gasket contacting face : smooth finish Ra=3.2µm (125µinch)

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PROJECT:PP-PE PILOT PLANT

Client:

شرکت ملی صنایع پتروشیمی

شرکت پژوهش و فناوری پتروشیمی

TITLE:DATA SHEET FOR C-401 DISCHARGE DRUM (V-402)

NOZZLE LOADING DATA(NOTE 1)

Nozzle Name	FA (kN)	FB (kN)	FC (kN)	MA (N.m)	MB (N.m)	MC (N.m)

REFRENCE DOCUMENTS

No.	Document No.	Document Title
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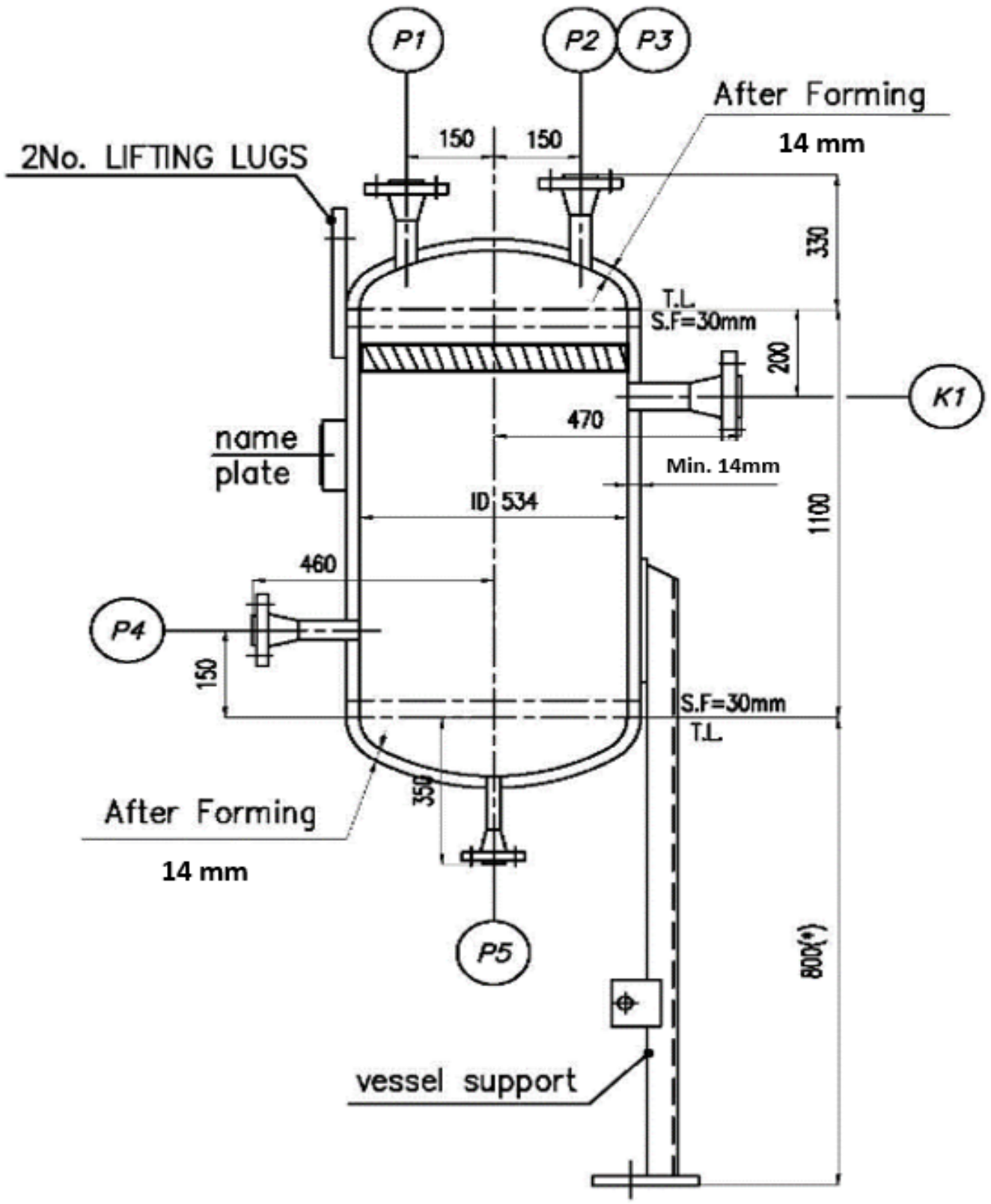

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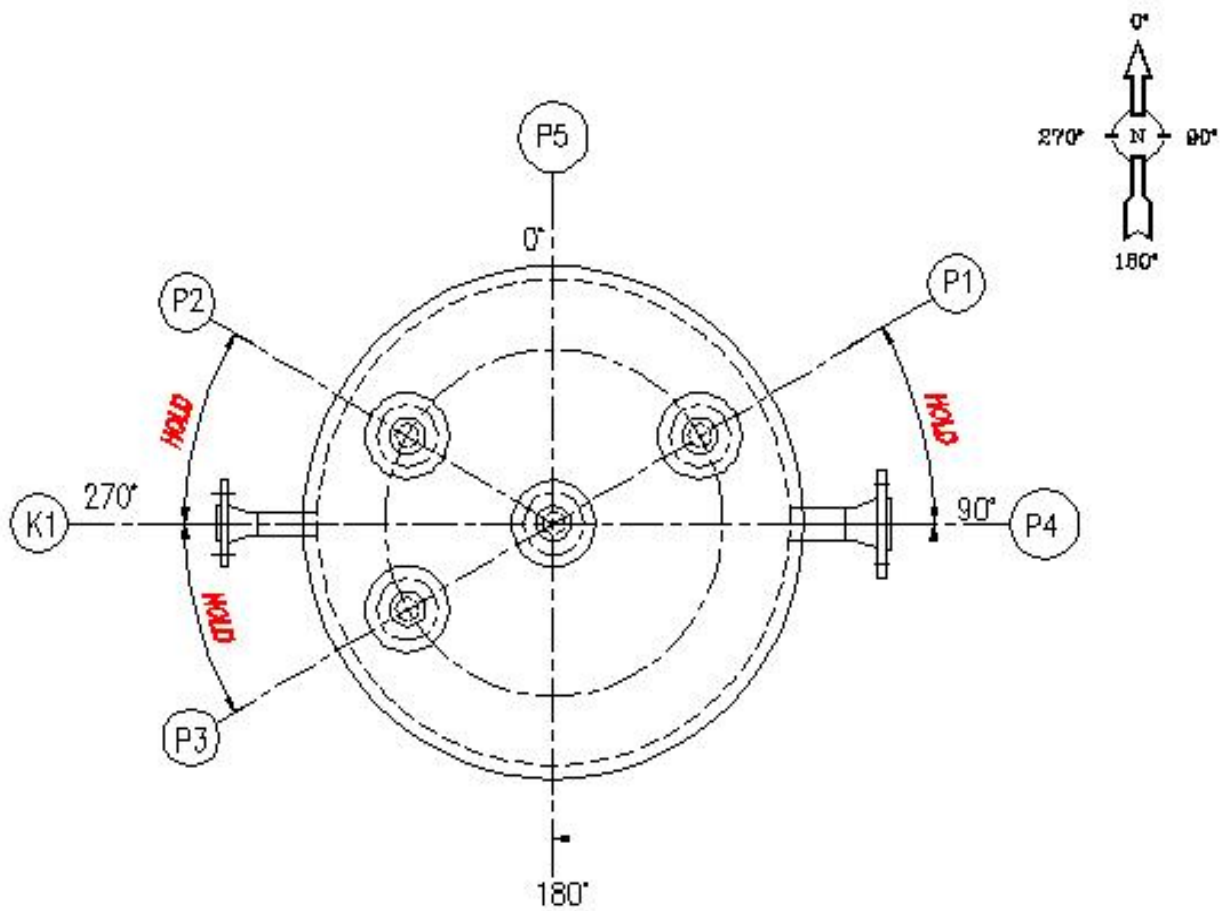

Orientation (HOLD)

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13- ALL REINF.PADS SHALL HAVE 1/4"(6mm) TELL TALE HOLE.
14- FINISHING OF THE GASKET CONTACTING FACE: SMOOTH FINISH RA=3.2μM (125μINCH)

Table 4. Heat Exchanger

Items	Tag ID.	Description
14	E-351	PROPANE RECOVERY CONDENSER
15	E-352	TOWER 351 REBOILER
16	E-411	1ST G.P.R. GAS COOLER
17	E-421	2ND G.P.R. GAS COOLER
Numbers		**4**

PROJECT : PP-PE PILOT PLANT	client:
TITLE : Data Sheet for Propane recovery condenser (E-351)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

Data Sheet for Propane recovery condenser (E -351)

licensor:	**Document No.: 300-DAS-A4-EQ-0172**	**Rev.: 01**
	Owner Job No.:	**Type: DAS**
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PROJECT: PP-PE PILOT PLANT	Client:
TITLE : Data Sheet for Propane recovery condenser (E-351)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

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Revision	Date	Prepared By	Checked By	Approved By	Status

Document revision

LICENSOR:	Document No.: 300-DAS-A4-EQ-0172	Rev.: 01
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PROJECT: PP-PE PILOT PLANT

client:

شرکت ملی صنایع پتروشیمی
شرکت پژوهش و فناوری پتروشیمی

TITLE : Data Sheet for Propane recovery condenser (E-351)

Heat Exchanger Specification Sheet

PP-PE Pilot Plant

Company: NPC-RT, Location:Arak; Country: Iran

Service of Unit: Propane tower condenser

Item No.: E-351 P&ID.No.:JS-300-PID-A1-FS-0404

Date: Rev No.: 01

Size	307/1850	mm	Type	BEM	Hor	Connected in	1 parallel	1 series	
Surf/unit(eff.)	11.8	m2	Shells/Unit		1	Surf/shell (eff.)	11.8	m2	

PERFORMANCE OF ONE UNIT

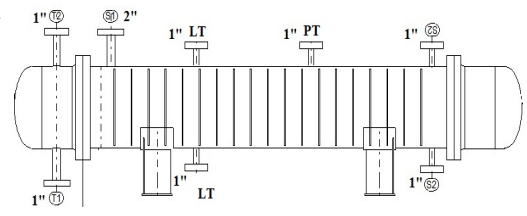
Fluid allocation		Shell side		Tube Side	
Fluid name		Hydrocarbons Vapor (E & P)		Cooling Water	
Fluid quantity, Total	kg/h	700		4200	
Vapor (In/Out)	kg/h	700	100		
Liquid	kg/h		526	4200	4200
Noncondensable	kg/h	75			
Temperature (In/Out)	C	53	40	27	37
Dew / Bubble point	C	52	28		
Density	kg/m3	42	457	1000	1000
Viscosity	cp	0.01	0.09	0.9	0.7
Molecular wt, Vap					
Molecular wt, NC					
Specific heat	kcal/(kg*C)	0.5	0.8	1	1
Thermal conductivity	kcal/(h m C)	0.02	0.08	0.5	0.5
Latent heat	kJ/kg	285	304		
Pressure	bar	20.5	20.4	4	3.8
Velocity	m/s	20		3	
Pressure drop, allow./calc.	bar	0.1	0.1	0.2	0.2
Fouling resist. (min)	m2*K//W				

Heat exchanged	49	kW			MTD corrected	14.2	C
Transfer rate, Service	292		Dirty	304	Clean	304	W/(m2*k)

CONSTRUCTION OF ONE SHELL

			Shell Side	Tube Side
Design/Test pressure		bar	31 / Code	31 / Code
Design temperature		C	-60~230	-60~230
Number passes per shell			1	2
Corrosion allowance		mm	0	0
Connections	In	in	2" / 300#	1" / 300#
Size/rating	Out		1" / 300#	1" / 300#
	Intermediate		1" / 300#	/ 300#

Sketch



Tube No.	111	OD	19.05	Tks-avg	2.1	mm	Length	1850 mm	Pitch	23.81	mm
Tube type	Plain	Material				S.S304L			Tube pattern	30	
Shell & Channel	S.S304L	Tks	10 mm			Shell cover					
Channel or bonnet		SA-312 TP304				Channel cover					
Tubesheet-stationary		SA-312 TP304				Tubesheet-floating					
Floating head cover						Impingement protection				Circular Plate on bundel	
Baffle-crossing	SA240-304L	Type	single seg	Cut(%d)	23	vert		Spacing:c/c	85	mm	
Baffle-long		Seal type						Inlet	121	mm	
Supports-tube		U-bend				Type					
Bypass seal				Tube-tubesheet joint		exp./seal wld					
Expansion joint				Type							
RhoV2-Inlet nozzle		Bundle entrance				Bundle exit				kg/(m*s2)	
Gaskets - Shell side		Tube side									
Floating head											
Code requirements	ASME Code Sec VIII Div 1					TEMA class		B			
Fabricated Weight [kg]: 515		Empty weight [kg]:		Shop test weight [kg]:				Bundle weight [kg]:			

LOADS AT BASE (*) : [[WIND: 120 km/hr Load[kgf]: , Moment[kg.m]: , SEISMIC: Load[kgf]: , Moment[kg.m]:]]

Remarks (*) : These item should be verified by vendor.

LICENSOR:	**Document No.: 300-DAS-A4-EQ-0172**	**Rev.: 01**
	Owner Job No.:	**Type: DAS**
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PROJECT: PP-PE PILOT PLANT	client: شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی
TITLE : Data Sheet for Propane recovery condenser (E-351)	

GENERAL NOTES

1- UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN MM.

2- UNLESS OTHERWISE NOTED , OUTSIDE PROJECTION OF NOZZLES ARE MEASURED FROM C.L./T.L. OF EXCHANGER TO THE EXTREME FACE OR BUTT LDED EDGE OF NOZZLE.

3-THE MECHANICAL DATA SPECIFIED ON DRAWINGS ARE MINUMUM PURCHASER'S REQUIREMENTS ADQEUACY AND COMPLIANCE OF DESIGN WITH APPLICABLE CODE

4- LIFTING LUGS SHALL BE DESIGNED AND EXACT LOCATION DETERMINED BY THE MANUFACTURER.

5- THE INDICATED WEIGHTS TO BE CONFIRMED /CHECKED BY MANUFACTURER.

6- ALL FLANGE BOLT HOLES TO STRADDLE CENTER LINES EXCEPT AS SHOOWN OTHERWISE.

7- NOZZLE /GIRTH FLANGE FACE FINISHING SHALL BE SMOOTH WITH 125 -250 MICROINCH AVERAGE ROUGHNESS.

8- DRILING AND TOLERANCES OF TUBESHEET SHALL BE PER TEMA STANDARD FIT.

9- THREADED HOLES IN TUBESHEET MUST NOT BE COMPLETELY DRILLED.

10- ALL TAILED DIMENSIONS ARE MEASURED FROM BASE LINE.

11- HANDLING LUGS FOR EXCHANGER COMPONENTS SHALL BE DESIGNED AND EXACT LOCATED BY MANUFACTURER.

12- DIMENSIONS REFER TO BAFFLES OR TUBE SUPPORTS ARE MEASURED FROM CENTER OF EACH ONE.

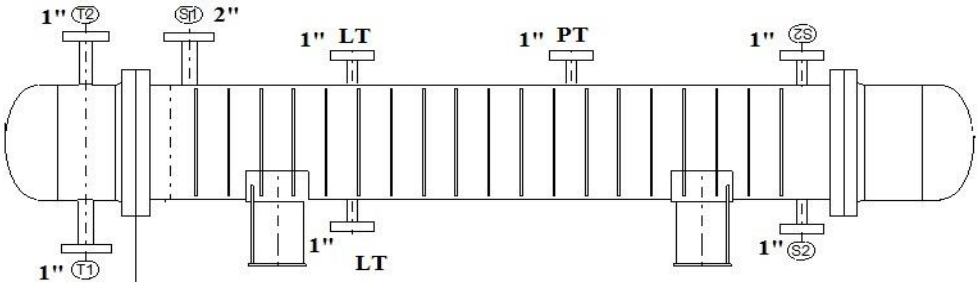
13- MANUFACURER SHALL PERFORM THE REQUIRED CHECKING /DESIGN OF SHELL EXPANSION JOINT.
WHERE EXPANSION JOINT IS REQUIRED , BLINDED LWN FLANGES FOR VENT AND DRAIN ON EXPANSION JOINT SHALL BE CONSIDERER.

14 - IMPACT TEST REQUIREMENTS FOR ALL PARTS MATERIAL SHALL BE CHECKED BY MANUFATURER RESULTS SHALL BE CONCLUDED IN CALCULATIONS AND THEN REFLECTED IN FABRICATION DRAWINGS.

15-ALL SHELL INTERNAL WELDS SHALL BE SMOOTH GRINDED.

16-SHELL / NOZZLE THICKNESS AT CONNECTION/ ATTACHMENT AREA SHALL BE VERIFIED BY LOCAL STRESS CALCULATION.

17-BASE LINE (B.L.)INDICATES THE GASKET FACE OF TUBESHEET .



LICENSOR:	Document No.: 300-DAS-A4-EQ-0172	Rev.: 01
	Owner Job No.:	Type: DAS
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PROJECT : PP-PE PILOT PLANT	client:
TITLE : Data Sheet for Reboiler Tower 351 (E-352)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

Data Sheet for Reboiler Tower 351 (E-352)

LICENSOR:	**Document No.: 300-DAS-A4-EQ-0179**	**Rev.: 01**
	Owner Job No.:	**Type: DAS**
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PROJECT: PP-PE PILOT PLANT	Client:
TITLE : Data Sheet for Reboiler Tower 351 (E-352)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

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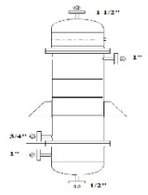
PROJECT: PP-PE PILOT PLANT

client:

شرکت ملی صنایع پتروشیمی
شرکت پژوهش و فناوری پتروشیمی

TITLE : Data Sheet for Reboiler Tower 351 (E-352)

Size	330 / 1000 mm		Type	BEM	Ver		Connected in	1	parallel	1	series			
Surf/unit(eff.)	9.1	m2	Shells/unit	1			Surf/shell (eff.)	9.1		m2				
PERFORMANCE OF ONE UNIT														
Fluid allocation			**Shell Side**					**Tube Side**						
Fluid name			LPS					Propane/1-Butene						
Fluid quantity, Total		kg/h	39					500						
Vapor (In/Out)		kg/h	39		0			0		500				
Liquid		kg/h	0		39			500		0				
Noncondensable		kg/h	0					0						
Temperature (In/Out)		C	120		120			100		110				
Dew / Bubble point		C	120		120			103		97				
Density (Vap / Liq)		kg/m3	1.1 /		/ 959			50 / 456		50 /				
Viscosity		cp	0.013 /		/ 0.284			0.011 / 0.091		0.011 /				
Molecular wt, Vap			18.02					53.21		53.21				
Molecular wt, NC														
Specific heat		kcal/(kg*C)	0.4826 /		/ 1.002			0.5081 / 0.5892		0.5081 /				
Thermal conductivity		kcal/(h*m*C)	0.023 /		/ 0.583			0.023 / 0.1		0.023 /				
Latent heat		kcal/kg	538.1		538.1			59.76		58.77				
Pressure		bar	2		1.99			20.9		20.8				
Velocity		m/s	15					3						
Pressure drop, allow./calc.		kgf/cm2	0.264		0.006			0.51		0.011				
Fouling resist. (min)		m2*h*C/kcal	0.0001					0.0002	0.00024	Ao based				
Heat exchanged	36	kW					MTD corrected	18	C					
Transfer rate, Service	130		Dirty	133			Clean	133	kcal/(h*m2*C)					

CONSTRUCTION OF ONE SHELL			**Shell Side**	**Tube Side**	**Sketch**
Design/Vac/Test pressure		bar	31 / /	31 / /	
Design temperature		C	-60~230	-60~230	
Number passes per shell			1	1	
Corrosion allowance		mm	0	0	
Connections	In	in	1 / 300#	1 / 300#	
Size/rating	Out		3/4 / 300#	1 1/2 / 300#	
Nominal	Intermediate		/ -	/ -	

Tube No.	161	OD	19.05	Tks- Avg	2.1	mm	Length	1000	mm	Pitch	23.81	mm	
Tube type	Plain			Material		S.S304L				Tube pattern	30		
Shell&Channel	S.S304L		ID	330	Tks	10	mm	Shell cover		-			
Channel or bonnet			SA-312 TP304					Channel cover		-			
Tubesheet-stationary			SA-312 TP304					Tubesheet-floating		-			
Floating head cover			-					Impingement protection		None			
Baffle-crossing	S.S304L		Type	Single segmer		Cut(%d)	33	V	Spacing: c/c	15	cm		
Baffle-long	-			Seal type					Inlet	15	cm		
Supports-tube				U-bend				Type					
Bypass seal				Tube-tubesheet joint					Exp.				
Expansion joint	-			Type									
RhoV2-Inlet nozzle			Bundle entrance			0			Bundle exit	0	kg/(m*s2)		
Gaskets - Shell side				Tube Side									
Floating head	-												
Code requirements	ASME Code Sec VIII Div 1							TEMA class		B - chemical service			
Weight/Shell	350		Filled with water			450			Bundle	170	kg		
Remarks	Wind velocity: 120 km/hr												

نازل خروجی مسیر تیوب (یک و نیم اینچ) در قسمت بالایی کپ بالا نصب و برای کپ پایین یک نازل نیم اینچ جهت تخلیه سیال تعبیه گردد.
برای مسیر شل؛ نازل یک اینچ در قسمت بالای شل نصب گردد.

LICENSOR:

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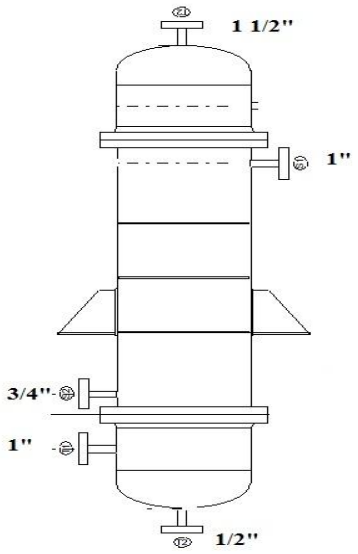
PROJECT:PP-PE PILOT PLANT	client: شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی
TITLE : Data Sheet for Reboiler Tower 351 (E-352)	

GENERAL NOTES

1- UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN MM.
2- UNLESS OTHERWISE NOTED , OUTSIDE PROJECTION OF NOZZLES ARE MEASURED FROM C.L./T.L. OF EXCHANGER TO THE EXTREME FACE OR BUTT WELDED EDGE OF NOZZLE.
3-THE MECHANICAL DATA SPECIFIED ON DRAWINGS ARE MINUMUM PURCHASER'S REQUIREMENTS ADQEUACY AND COMPLIANCE OF DESIGN WITH APPLICABLE CODE AND PROJECT SPECIFICATIONS IS MANUFACTURER'S RESPONSIBILITY.
4- LIFTING LUGS SHALL BE DESIGNED AND EXACT LOCATION DETERMINED BY THE MANUFACTURER.
5- THE INDICATED WEIGHTS TO BE CONFIRMED /CHECKED BY MANUFACTURER.
6- ALL FLANGE BOLT HOLES TO STRADDLE CENTER LINES EXCEPT AS SHOOWN OTHERWISE.
7- OUTSIDE EDGE OF ALL FLANGES / FORGINGS TO BE BEVELLED WITH 45 DEGREE ANGLE IN 5 MM DISTANCE.
8- NOZZLE /GIRTH FLANGE FACE FINISHING SHALL BE SMOOTH WITH 125 -250 MICROINCH AVERAGE ROUGHNESS.
9- DRILING AND TOLERANCES OF TUBESHEET SHALL BE PER TEMA STANDARD FIT.
10 - BOTH ENDS OF TIE RODS SHALL BE UNC THREADED ON 50 MM.
11- THREADED HOLES IN TUBESHEET MUST NOT BE COMPLETELY DRILLED.
13- DIAMETER OF HOLES FOR TIE RODS IN BAFFLE = TIE ROD DIA. + 0.5 MM.
14- ALL TAILED DIMENSIONS ARE MEASURED FROM BASE LINE.
15- EDGE OF HOLES IN BAFFLES SHALL BE ROUNDED (R=2MM)OR BEVELED.
16- HANDLING LUGS FOR EXCHANGER COMPONENTS SHALL BE DESIGNED AND EXACT LOCATED BY MANUFACTURER.
17- DIMENSIONS REFER TO BAFFLES OR TUBE SUPPORTS ARE MEASURED FROM CENTER OF EACH ONE.
18- MANUFACURER SHALL PERFORM THE REQUIRED CHECKING /DESIGN OF SHELL EXPANSION JOINT.
WHERE EXPANSION JOINT IS REQUIRED , BLINDED LWN FLANGES FOR VENT AND DRAIN ON EXPANSION JOINT SHALL BE CONSIDERER.
19 - IMPACT TEST REQUIREMENTS FOR ALL PARTS MATERIAL SHALL BE CHECKED BY MANUFATURER RESULTS SHALL BE CONCLUDED IN CALCULATIONS AND THEN REFLECTED IN FABRICATION DRAWINGS.
20-ALL NOZZLES SHALL BE RADIUSED WITH THE CONTOUR OF THE SHELL , CHANNEL AND HEADS INNER WALLS AS FOLLOWS:ITEM R = 6 MM ,
ALL THE OTHER ONES R=2MM . INTERNAL
21-ALL SHELL INTERNAL WELDS SHALL BE SMOOTH GRINDED.
22-SHELL / NOZZLE THICKNESS AT CONNECTION/ ATTACHMENT AREA SHALL BE VERIFIED BY LOCAL STRESS CALCULATION.
23-BASE LINE (B.L.)INDICATES THE GASKET FACE OF TUBESHEET .



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PROJECT : PPPE PILOT PLANT	client:
TITLE : Data Sheet for 1st G.P.R. gas cooler(E- 411)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

Data Sheet for 1st G.P.R. gas cooler(E- 411)

	Document No.: 400-DAS-A4-EQ-0094	**Rev.: 00**
	Owner Job No.:	**Type: DAS**
		Page A

PROJECT: PPPE PILOT PLANT	Client:
TITLE :Data Sheet for 1st G.P.R. gas cooler(E- 411)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

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Document revision

	Document No.: 400-DAS-A4-EQ-0094	Rev.: 00
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PROJECT: PPPE PILOT PLANT

client:

شرکت ملی صنایع پتروشیمی
شرکت پژوهش و فناوری پتروشیمی

TITLE :Data Sheet for 1st G.P.R. gas cooler(E- 411)

Heat Exchanger Specification Sheet

Basell Polyolefins;Project :Hostalen Pilot Plant

Company: NPC-RT;Location:Arak;Country :Iran

Service of Unit: I GPR COOLER

Item No.: E-411 P&ID.No.:

Date:17/8/2010 Rev No.: 00

Size	298.5/5200	mm	Type	BEM	ver	Connected in	1 parallel	1 series	
Surf/unit(eff.)	25.1	m2	Shells/Unit	1		Surf/shell (eff.)	25.1	m2	

PERFORMANCE OF ONE UNIT

Fluid allocation		Shell side		Tube Side	
Fluid name		cooling water		process gas	
Fluid quantity, Total	kg/h	30000		14000	
Vapor (In/Out)	kg/h			14000	14000
Liquid	kg/h	30000	30000		
Noncondensable	kg/h				
Temperature (In/Out)	C	59	62.02	80	65.69
Dew / Bubble point	C				
Density	kg/m3	986.1	984.47	27	28.74
Viscosity	cp	0.481	0.461	0.011	0.011
Molecular wt, Vap					
Molecular wt, NC					
Specific heat	kJ/(kg*k)	4.185	4.185	1.909	1.872
Thermal conductivity	W/(m*k)	0.642	0.645	0.027	0.026
Latent heat	kJ/kg	297.3	297.3		
Pressure	bar	3.5		19	
Velocity	m/s	0.45		6.52	
Pressure drop, allow./calc.	bar	0.689	0.14	0.689	0.034
Fouling resist. (min)	m2*K//W	0,0002		0.0005	

Heat exchanged	105187 W			MTD corrected	11.42	C
Transfer rate, Service	367.5	Dirty	367.3	Clean	520	W/(m^2*k)

CONSTRUCTION OF ONE SHELL — **Sketch**

		Shell Side	Tube Side
Design/Test pressure	bar	29.42 / 44.13	29.42 / 44.13
Design temperature	C	180	180
Number passes per shell		1	1
Corrosion allowance	mm	0	0
Connections	In	101.6 / 300 ANSI	152.4 / 300 ANSI
Size/rating	Out	101.6 / 300 ANSI	152.4 / 300 ANSI
mm/	Intermediate	/ 300 ANSI	/ 300 ANSI

Tube No.	61	OD	25.4	Tks-avg	2.11	mm	Length	5200 mm	Pitch	32	mm
Tube type	Plain	Material					SA-312 TP304		Tube pattern	30	

Shell	SS 304	Pipe 12" , Sch80S	Shell cover
Channel or bonnet		SS304	Channel cover
Tubesheet-stationary		SS304	Tubesheet-floating
Floating head cover			Impingement protection: Circular Plate on bundel

Baffle-crossing	SA240-304L	Type	single seg	Cut(%d)	31	vert	Spacing:c/c	200	mm
Baffle-long		Seal type					Inlet	274.6	mm
Supports-tube		U-bend				Type			
Bypass seal				Tube-tubesheet joint		exp./seal wld			
Expansion joint				Type					
RhoV2-Inlet nozzle	1072	Bundle entrance	335			Bundle exit	335	kg/(m*s2)	
Gaskets - Shell side	Comp. fiber	Tube side		Comp. fiber			(m=2.75	y=3700 psi)	
Floating head									

Code requirements	ASME Code Sec VIII Div 1	TEMA class	R
Fabricated Weight [kg]:1183.3	Empty weight [kg]: 1183.3	Shop test weight [kg]: 1581	Bundle weight [kg]: 434.26

LOADS AT BASE (*) : [[WIND: Load[kgf]: 45 , Moment[kg.m]: 25 , SEISMIC: Load[kgf]: 45 , Moment[kg.m]: 25]]

Remarks (*) : These item should be verified by vendor.

Simulation with velocity in bed reactor: 0.5 m/s

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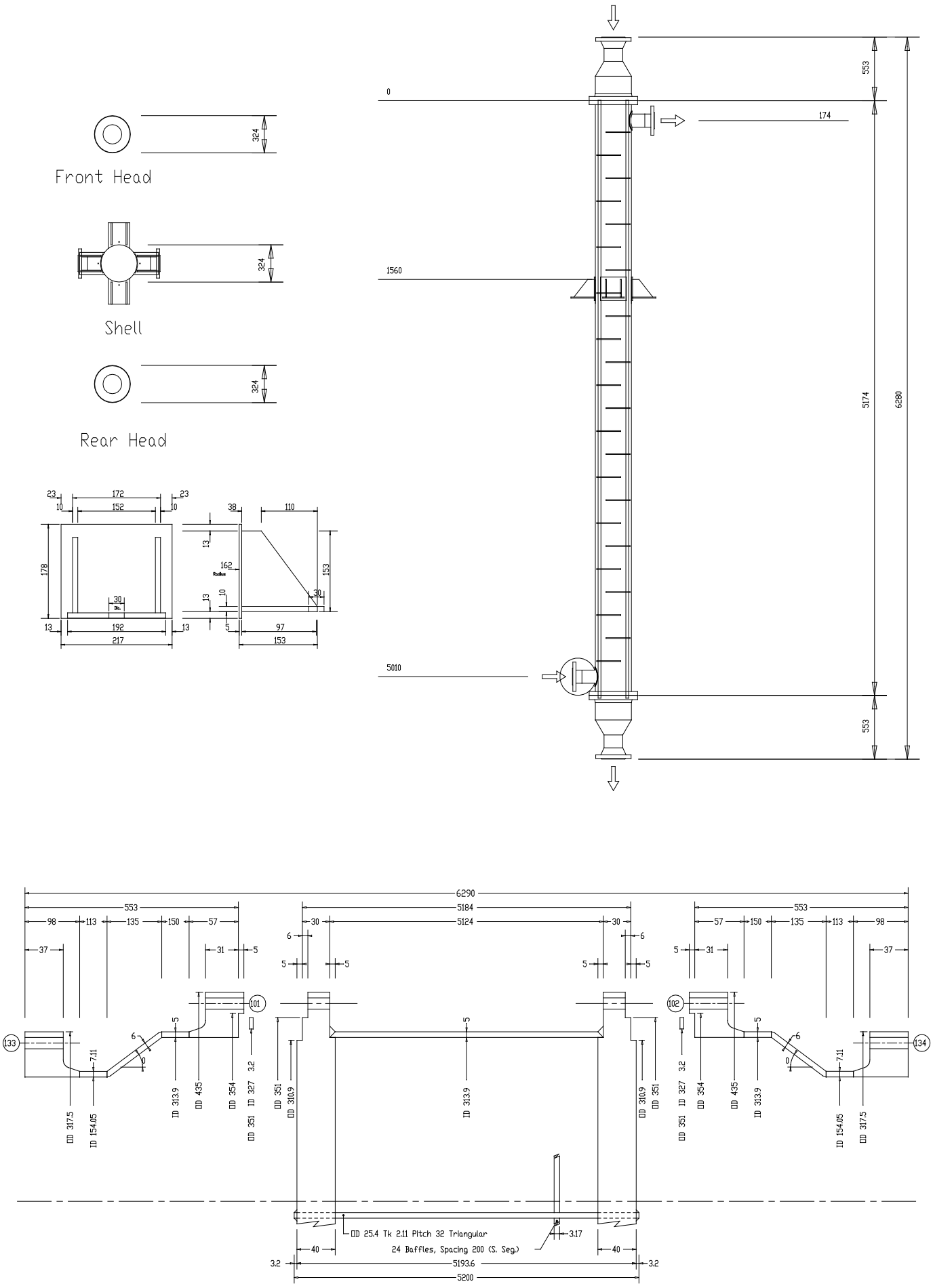
PROJECT: PPPE PILOT PLANT	client:
TITLE : Data Sheet for 1st G.P.R. gas cooler(E- 411)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی



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	Owner Job No.:	**Type: DAS**
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Row	Holes
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6	9
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3	6
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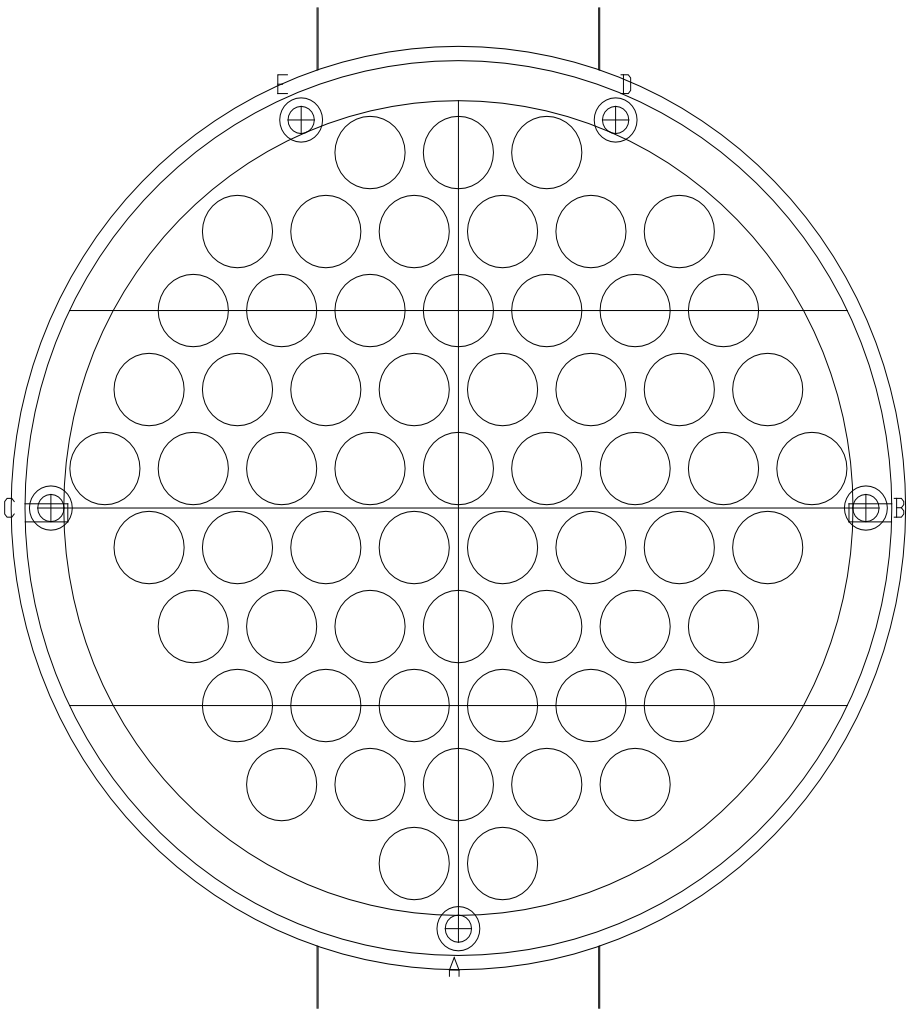
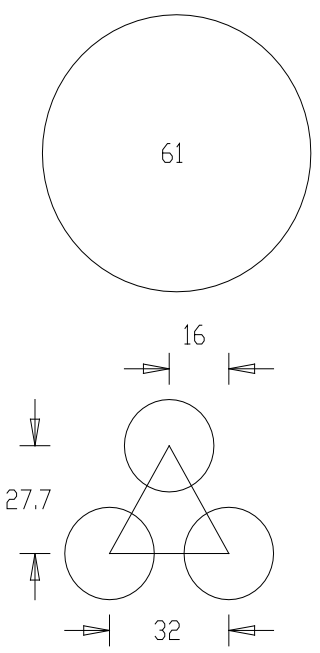
1	2
	61



Shell ID 313.9 mm
□.T.L. 285.8 mm
Baffle cut to C/L 69.3 mm



PROJECT: PPPE PILOT PLANT	client:
TITLE : Data Sheet for 1st G.P.R. gas cooler(E- 411)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

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9- DRILING AND TOLERANCES OF TUBESHEET SHALL BE PER TEMA STANDARD FIT.
10 - BOTH ENDS OF TIE RODS SHALL BE UNC THREADED ON 50 MM.
11- THREADED HOLES IN TUBESHEET MUST NOT BE COMPLETELY DRILLED.
13- DIAMETER OF HOLES FOR TIE RODS IN BAFFLE = TIE ROD DIA. + 0.5 MM.
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21-ALL SHELL INTERNAL WELDS SHALL BE SMOOTH GRINDED.
22-SHELL / NOZZLE THICKNESS AT CONNECTION/ ATTACHMENT AREA SHALL BE VERIFIED BY LOCAL STRESS CALCULATION.
23-BASE LINE (B.L.)INDICATES THE GASKET FACE OF TUBESHEET .

PROJECT : PPPE PILOT PLANT	client:
TITLE : Data Sheet for 2nd G.P.R. gas cooler(E -421)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

Data Sheet for 2nd G.P.R. gas cooler(E -421)

	Document No.: 400-DAS-A4-EQ-0096	**Rev.: 00**
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PROJECT: PPPE PILOT PLANT	Client:
TITLE :Data Sheet for 2nd G.P.R. gas cooler(E -421)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

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	Document No.: 400-DAS-A4-EQ-0096	Rev.: 00
	Owner Job No.:	Type: DAS
		Page B

PROJECT: PPPE PILOT PLANT

client:

شرکت ملی صنایع پتروشیمی
شرکت پژوهش و فناوری پتروشیمی

TITLE :Data Sheet for 2nd G.P.R. gas cooler(E- 421)

Heat Exchanger Specification Sheet

Basell Polyolefins;Project :Hostalen Pilot Plant

Company: NPC-RT;Location:Arak;Country :Iran

Service of Unit: II GPR COOLER

Item No.: E-421 P&ID.No.:

Date:23/8/2010 Rev No.: 00

Size	400-4800	mm	Type	BEM	ver	Connected in	1 parallel	1 series
Surf/unit(eff.)	45.8	m2	Shells/Unit		1	Surf/shell (eff.)	45.8	m2

PERFORMANCE OF ONE UNIT

Fluid allocation		Shell side		Tube Side	
Fluid name		Cooling water		Process gas	
Fluid quantity, Total	kg/h	50000		30000	
Vapor (In/Out)	kg/h			30000	30000
Liquid	kg/h	50000	50000		
Noncondensable	kg/h				
Temperature (In/Out)	C	62.5	65.15	75	66.82
Dew / Bubble point	C				
Density	kg/m3	984.2	982.7	26.57	27.43
Viscosity	cp	0.457	0.44	0.011	0.01
Molecular wt, Vap					
Molecular wt, NC					
Specific heat	kJ/(kg*k)	4.185	4.185	2.279	2.256
Thermal conductivity	W/(m*k)	0.646	0.649	0.052	0.051
Latent heat	kJ/kg				
Pressure	bar	3.5		25	
Velocity	m/s	0.49		7.25	
Pressure drop, allow./calc.	bar	0.689	0.14	0.689	0.041
Fouling resist. (min)	m2*K//W	0,0002		0.0005	

Heat exchanged	154346 W			MTD corrected	6.71 C
Transfer rate, Service	431.9	Dirty	431.8	Clean	721.4 W/(m^2*k)

CONSTRUCTION OF ONE SHELL — **Sketch**

		Shell Side	Tube Side
Design/Test pressure	bar	30/ /45	30/ /45
Design temperature	C	180	180
Number passes per shell		1	1
Corrosion allowance	mm	0	0
Connections	In	152.4 / 300 ANSI	203.2 / 300 ANSI
Size/rating	Out	152.4 / 300 ANSI	203.2 / 300 ANSI
mm/	Intermediate	/ 300 ANSI	/ 300 ANSI

Tube No. 121	OD 25.4	Tks-avg 2.11 mm	Length 4800 mm	Pitch 32 mm
Tube type Plain	Material		SS304	Tube pattern 30

Shell SS304	Pipe 18" , Sch80S	Shell cover	
Channel or bonnet	SS304	Channel cover	
Tubesheet-stationary	SS304	Tubesheet-floating	
Floating head cover		Impingement protection	Circular Plate on bundel

Baffle-crossing SS304	Type single seg	Cut(%d) 29	vert	Spacing:c/c 230 mm
Baffle-long	Seal type			Inlet 416.43 mm
Supports-tube	U-bend		Type	
Bypass seal		Tube-tubesheet joint	exp./seal wld	
Expansion joint		Type		
RhoV2-Inlet nozzle 590	Bundle entrance 330		Bundle exit	330 kg/(m*s2)
Gaskets - Shell side Comp. fiber	Tube side	Comp. fiber		(m=2.75 y=3700 psi)
Floating head				
Code requirements ASME Code Sec VIII Div 1		TEMA class	R	
Fabricated Weight [kg]:2105	Empty weight [kg]: 2105	Shop test weight [kg]: 2929		Bundle weight [kg]: 896

LOADS AT BASE (*) : [[WIND: Load[kgf]: 45 , Moment[kg.m]: 25 , SEISMIC: Load[kgf]: 45 , Moment[kg.m]: 25]]

Remarks (*) : These item should be verified by vendor.

Simulation with velocity in bed reactor: 0.5 m/s

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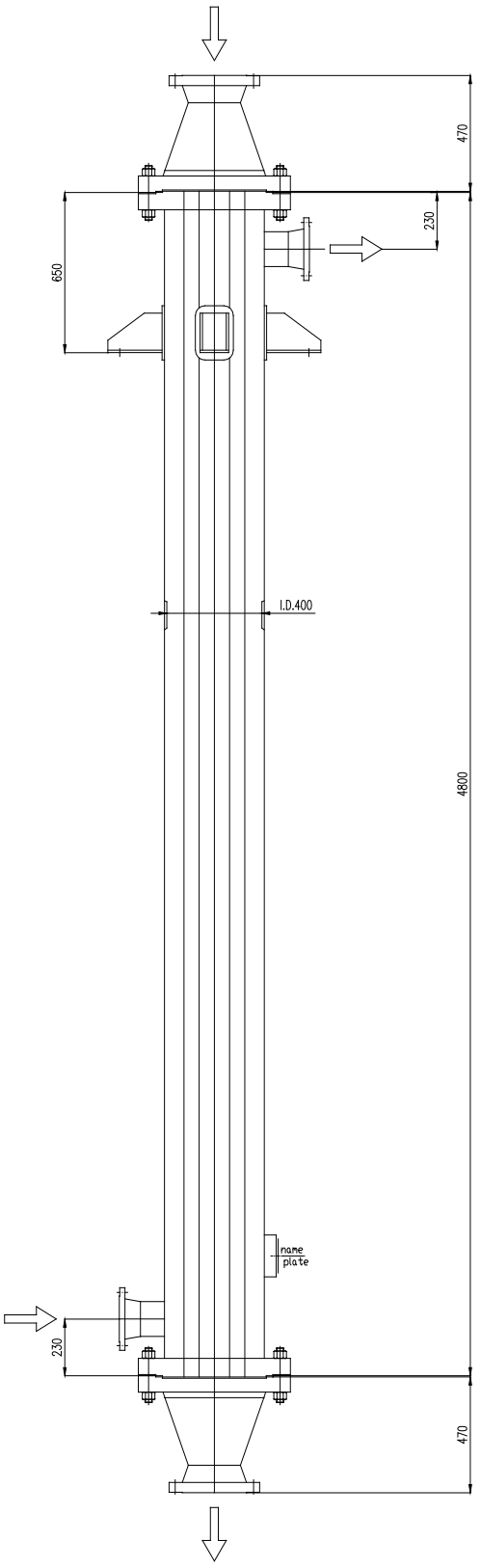
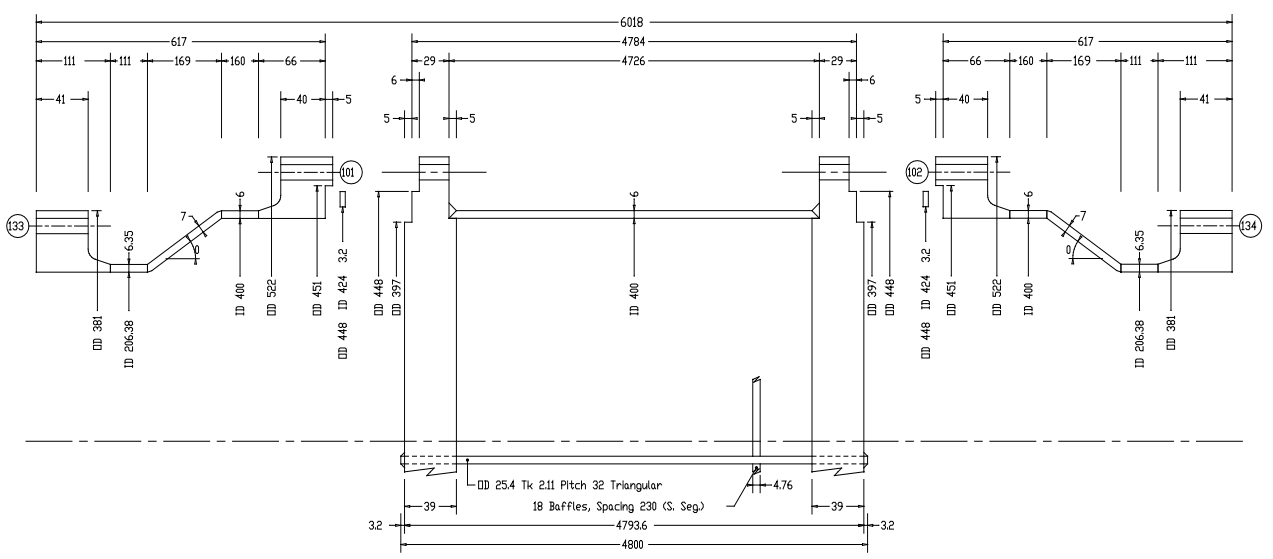
PROJECT: PPPE PILOT PLANT	client:
TITLE : Data Sheet for 2nd G.P.R. gas cooler(E -421)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی





side view

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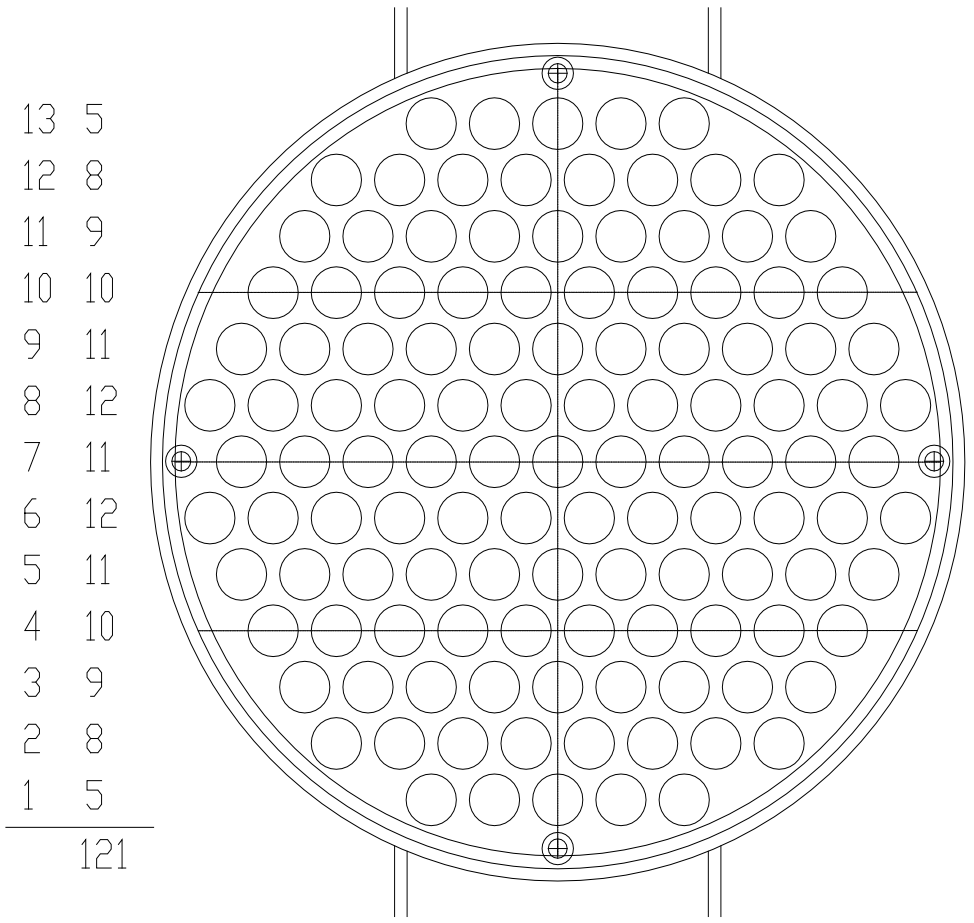
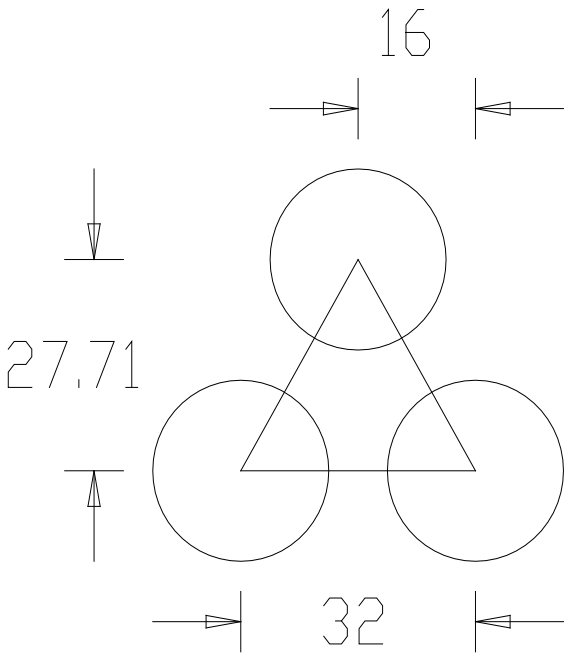
TITLE : Data Sheet for 2nd G.P.R. gas cooler(E -421)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی





Shell ID	400 mm
O.T.L.	387.3 mm
Baffle cut to C/L	83.1 mm

PROJECT: PPPE PILOT PLANT	client: شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی
TITLE : Data Sheet for 2nd G.P.R. gas cooler(E -421)	

GENERAL NOTES

1- UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN MM.
2- UNLESS OTHERWISE NOTED , OUTSIDE PROJECTION OF NOZZLES ARE MEASURED FROM C.L./T.L. OF EXCHANGER TO THE EXTREME FACE BUTT WELDED EDGE OF NOZZLE.
3-THE MECHANICAL DATA SPECIFIED ON DRAWINGS ARE MINUMUM PURCHASER'S REQUIREMENTS ADQEUACY AND COMPLIANCE OF DESIGN WITH APPLICABLE CODE AND PROJECT SPECIFICATIONS IS MANUFACTURER'S RESPONSIBILITY.
4- LIFTING LUGS SHALL BE DESIGNED AND EXACT LOCATION DETERMINED BY THE MANUFACTURER.
5- THE INDICATED WEIGHTS TO BE CONFIRMED /CHECKED BY MANUFACTURER.
6- ALL FLANGE BOLT HOLES TO STRADDLE CENTER LINES EXCEPT AS SHOOWN OTHERWISE.
7- OUTSIDE EDGE OF ALL FLANGES / FORGINGS TO BE BEVELLED WITH 45 DEGREE ANGLE IN 5 MM DISTANCE.
8- NOZZLE /GIRTH FLANGE FACE FINISHING SHALL BE SMOOTH WITH 125 -250 MICROINCH AVERAGE ROUGHNESS.
9- DRILING AND TOLERANCES OF TUBESHEET SHALL BE PER TEMA STANDARD FIT.
10 - BOTH ENDS OF TIE RODS SHALL BE UNC THREADED ON 50 MM.
11- THREADED HOLES IN TUBESHEET MUST NOT BE COMPLETELY DRILLED.
13- DIAMETER OF HOLES FOR TIE RODS IN BAFFLE = TIE ROD DIA. + 0.5 MM.
14- ALL TAILED DIMENSIONS ARE MEASURED FROM BASE LINE.
15- EDGE OF HOLES IN BAFFLES SHALL BE ROUNDED (R=2MM)OR BEVELED.
16- HANDLING LUGS FOR EXCHANGER COMPONENTS SHALL BE DESIGNED AND EXACT LOCATED BY MANUFACTURER.
17- DIMENSIONS REFER TO BAFFLES OR TUBE SUPPORTS ARE MEASURED FROM CENTER OF EACH ONE.
18- MANUFACURER SHALL PERFORM THE REQUIRED CHECKING /DESIGN OF SHELL EXPANSION JOINT.
WHERE EXPANSION JOINT IS REQUIRED , BLINDED LWN FLANGES FOR VENT AND DRAIN ON EXPANSION JOINT SHALL BE CONSIDERER.
19 - IMPACT TEST REQUIREMENTS FOR ALL PARTS MATERIAL SHALL BE CHECKED BY MANUFATURER RESULTS SHALL BE CONCLUDED IN CALCULATIONS AND THEN REFLECTED IN FABRICATION DRAWINGS.
20-ALL NOZZLES SHALL BE RADIUSED WITH THE CONTOUR OF THE SHELL , CHANNEL AND HEADS INNER WALLS AS FOLLOWS:ITEM R = 6 MM , ALL THE OTHER ONES R=2MM . INTERNAL
21-ALL SHELL INTERNAL WELDS SHALL BE SMOOTH GRINDED.
22-SHELL / NOZZLE THICKNESS AT CONNECTION/ ATTACHMENT AREA SHALL BE VERIFIED BY LOCAL STRESS CALCULATION.
23-BASE LINE (B.L.)INDICATES THE GASKET FACE OF TUBESHEET .

Table 5. Reactors

Items	Tag ID.	Description
18	R-211	PRECONTACT POT (1.5 lt)
19	R-221	PRECONTACT POT (7 lt)
20	R-251	LOOP PREPOLY (60 lt)
21	R-261	LOOP PREPOLY (200 lt)
22	R-411	1^{ST} GAS PHASE REACTOR
23	R-421	2^{ND} GAS PHASE REACTOR
Numbers		**6**

PROJECT:PP-PE PILOT PLANT	Client:
TITLE:Data Sheet for Precontact Pot (1,5 lt)(R-211)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

Data Sheet for Precontact Pot (1,5 lt)(R-211)

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TITLE:Data Sheet for Precontact Pot (1,5 lt)(R-211)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

REV. / PAGE	0	1	2	3	4	5	REV. / PAGE	0	1	2	3	4	5
A	X	X	X										
B	X	X	X										
1	X	X	X										
2	X	X	X										
3	X	X	X										
4	X	X	X										
5	X	X	X										
6	X	X	X										

Revision	Date	Prepared By	Checked By	Approved By	Status
5					
4					
3					
2	20/11/2011	H.R	A.A	H.R	AFC
1					
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PROJECT:PP-PE PILOT PLANT

Client:

شرکت ملی صنایع پتروشیمی
شرکت پژوهش و فناوری پتروشیمی

TITLE:Data Sheet for Precontact Pot (1,5 lt)(R-211)

1	Item No.:R-211	Quantity: 1	Location: Outdoor	Service:	Continuous

DESIGN CONDITIONS

			Vessel	Jacket	Internal Coil
4					
5	Operating Temperature(Min./Max.)	^{0}C	-30 /+ 20	- / 20	-/-
6	Operating Pressure	barg	30	2	-
7	Density	kg/m^3	600 - 650	1100	-
8	Design Pressure(int./ext.)	barg	65 / 10	10 / -	-/-
9	Design Temperature	^{0}C	-60/+180	+180	-/-
10	Volume(total)	m^3	0.0015	0.002	-
11	Hydro Test Pressure	barg	as per UG99b(33)	as per UG99b(33)	-
12	Corrosion Allowance(shell/head)	mm	0/0	1.5/1.5	-/-
13	Cladding (shell/head)	mm	-/-	-/-	-/-
14	Content @ normal operation		Hydrocarbons+Slurry	Glycole+Water	-
15	Thickness(shell/head)	mm	10/40	6	/
16	Welding Radiography(shell/head)	%	Full / Full	Full / Full	-/-
17	Joint Efficiency(shell/head)		1 / 1	1 / 1	-/-
18	Top Head Type		FORGED	N.A	-
19	Bottom Head Type		Welded Flat	N.A	-

20	Design code:	ASME SEC. VIII DIV.1	Inspection code:	ASME SEC. IX
21	Cylinder Deminsion(IDxT.L-T.L):	100 x 175 mm	Lethal Service:	○ Yes ● No
22	M.D.M.T @ D.P:	-60 ^{0}C	M.A.T:	- ^{0}C
23	M.A.W.P:	- barg Limted by: -	Stamp:	Required
24	Impact Test:	Not Required	P.W.H.T:	Not Required
25	N.D.T:	Required	Vessel linning detail:	NIL
26	HIC/SSC resistance:	NA / NA	Painting & Coating:	as per code
27	Insulation thickness:	30 mm	Insulation type:	COLD
28	Fireproofing :	2 NO	Vessel located on:	Structrue
29	Seismic code:	UBC 1997	Seismic Zone:	3
30	Impotance factor:	1.25	Soil Profile:	SD
31	Wind code:	UBC	Wind velocity:	120 km/hr @ 10 m
32	Impotance factor:	1.15	Exposure:	C

	Support loading data(Note 5)				
33				Fabricated:	-
34		Earthquake	Wind	Empty:	90
35	Shearing load(kgf)	-	-	Test:	-
36	Moment(kg.m)	-	-	Operation:	-

Weight(kg) (Note 5)

MISCELLANEOUS(Note 6)

39	○ Baffle	○ Impingement plate	○ Weir plate
40	○ Diffuser	○ Distributer	○ Trunnion
41	○ Vortex breaker	○ Tubesheet	○ Template
42	○ Boot / Cap	○ Demister	● Pickling & passivation
43	● Insulation Support	○ Wire mesh	● Earthing boss
44	○ Fire Proofing	● Name plate	○ Dip pipe
45	○ Fire Proofing Support	○ Internal lining	● Agitator
46	○ Ladder & platform (int. & ext.)	○ Sand blast & painting	
47	○ Heating coil	○ Internal clips	
48	● Lifting lug	● External clips	

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PROJECT:PP-PE PILOT PLANT							**Client:**					
TITLE:Data Sheet for Precontact Pot (1,5 lt)(R-211)							شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی					
1												
2	**MATERIALS(NOTE 1)**											
3												
4	Shell(Main/Jacket)		SA182-304L / SA240-304L				Earth lug	SA240-316L				
5	Head(Main/Jacket)		SA182-304L / NA				Stiffening rings	SA240-304L				
6	Nozzle Necks (Main/Jacket)	Plate	- / -				Gaskets	DOUBLE O-RING				
7		Pipe	SA312-304L / SA312-304L				Ext. bolt/Nuts	SA193-B7/SA194-2H				
8	Cladding		-				Int. bolt/Nuts	SA193-BB/SA194-8				
9	Nozzle flanges		SA182-304L				Wire mesh	NA				
10	Blind flanges		SA182-304L				Welded clip	SA240-304L				
11	Reinforcing pad		SA240-304L				Int. welded	SA240-304L				
12	Fitting		SA403-304L				Int. removable	SA240-304L				
13	Support	Leg	NA				Anchor/Setting bolts	SA307-B				
14		Lug	SA 36				Ladder/Platform	NA				
15		leg/lug pad	SA240-304L				Insulation Mateial	POLY-URETHANE				
16	Lifting lug		SA240-304L									
17	**NOZZLE DETAILS(NOTE 3)**											
18												

19	Item	NPS (Inch)	Flanges			SCH. /THK. (NOTE 5)	Service	Proj.	Rein. PAD (NOTE 5)		Standards	Remarks
20			Rating	Type	Face				Width	Thk.		
21	**Top Head**											
22	P1	3/8"	3000#	Thr.NPT	-	-	Catalyst Inlet	see Dwg	-	-	ANSI B2.1	Internal hole Φ7mm
23	P2	3/8"	3000#	Thr.NPT	-	-	Cocacatal. Inlet	see Dwg	-	-	ANSI B2.1	Internal hole Φ7mm
24	P3	3/8"	3000#	Thr.NPT	-	-	Spare	see Dwg	-	-	ANSI B2.1	Internal hole Φ7mm+with plug
25	K1	3/8"	3000#	Thr.NPT	-	-	PRA Connection	see Dwg	-	-	ANSI B2.1	Internal hole Φ7mm
26	S1	-				-	Stirrer Connection	see Dwg	-	-		See note 10
27												
28	**Shell (Jacket)**											
29	P6	1/2"	3000#	Thr.NPT	-	-	Thermost. Inlet	see Dwg	-	-	ANSI B2.1	Internal hole Φ15mm
30	P7	1/2"	3000#	Thr.NPT	-	-	Thermost. Outlet	see Dwg	-	-	ANSI B2.1	Internal hole Φ15mm
32												
33	**Bottom Head**											
34	P4	3/8"	3000#	Thr.NPT	-	-	Product Outlet	see Dwg	-	-	ANSI B2.1	Internal hole Φ7mm
35	P5	3/8"	3000#	Thr.NPT	-	-	Drain	see Dwg	-	-	ANSI B2.1	Internal hole Φ7mm
36	K2	3/8"	3000#	Thr.NPT	-	-	TRC Connection	see Dwg	-	-	ANSI B2.1	Female(for more detail see H-212)
37												
38												
39												
40												
41												
42												
43												
44												

PROJECT:PP-PE PILOT PLANT	**Client:**
TITLE:Data Sheet for Precontact Pot (1,5 lt)(R-211)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

NOZZLE LOADING DATA(NOTE 5)

Nozzle Name	FA (kN)	FB (kN)	FC (kN)	MA (N.m)	MB (N.m)	MC (N.m)

REFRENCE DOCUMENTS

No.	Document No.	Document Title
1		
2		
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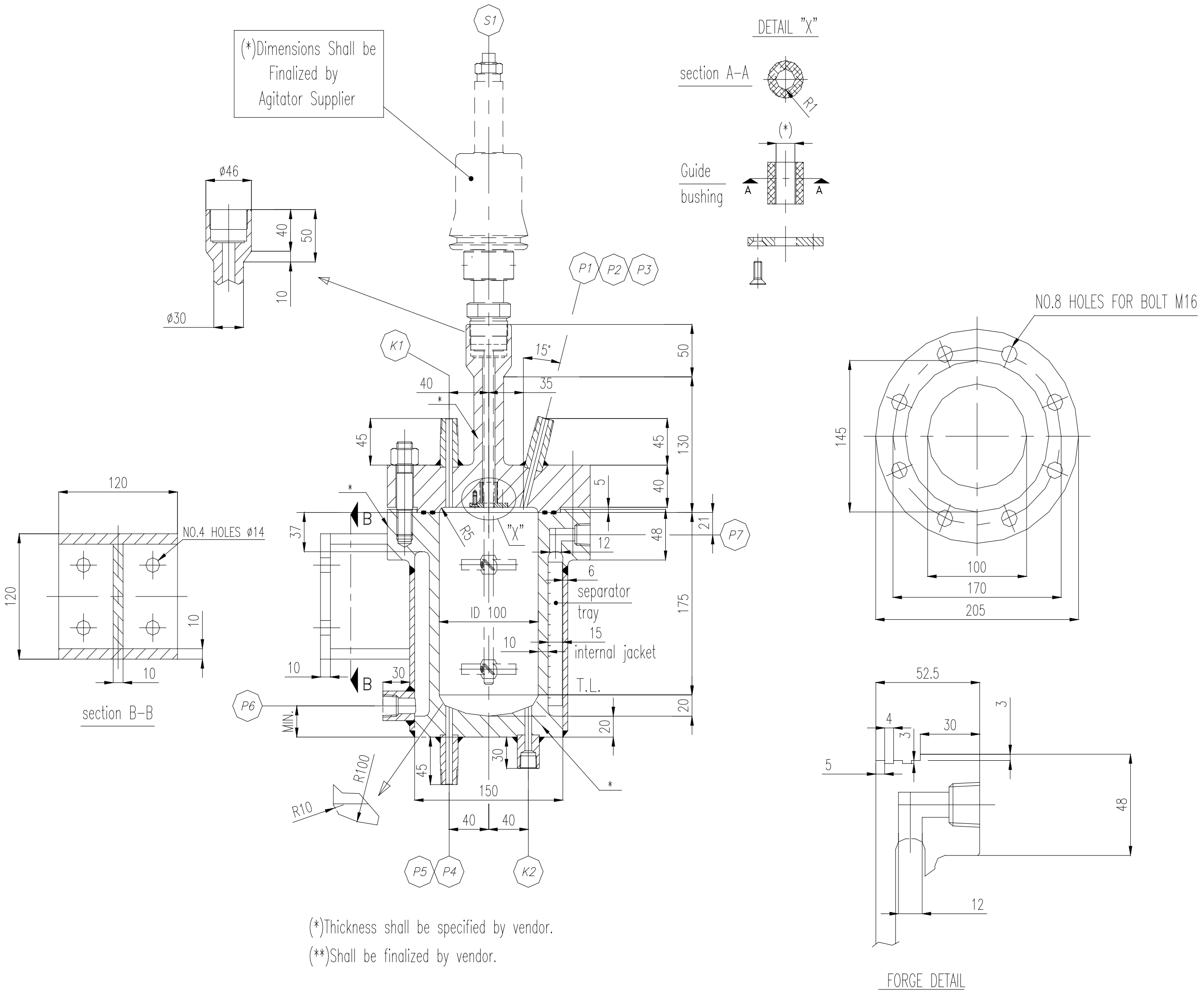
PROJECT:PP-PE PILOT PLANT	Client: شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی
TITLE:Data Sheet for Precontact Pot (1,5 lt)(R-211)	



Side View

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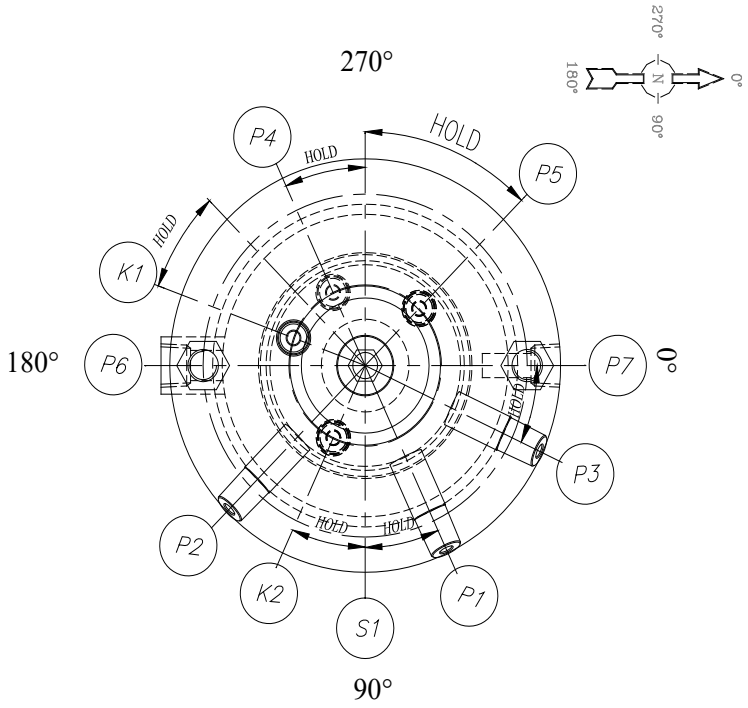
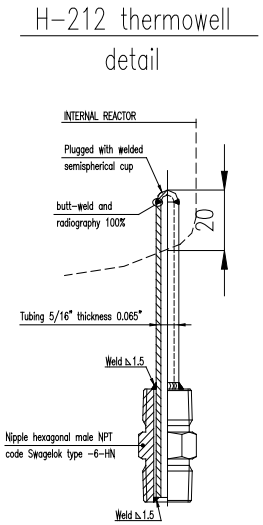


Orientation (HOLD)



General Notes:

1- SHALL BE VERIFIED BY VENDOR
2- ALL DIMENSIONS ARE IN MILLIMETER, UNLESS OTHERWISE NOTED
3- NOZZLE CHARACTERISTICS SHALL BE VERIFIED BY VENDOR
4- THICKNESSES, WEIGHTS AND LOADS ARE INDICATED FOR ESTIMATION PURPOSE ONLY ; THE MANUFCTURER SHALL CONFIRM THESE ITEMS AND IS RESPONSIBLE FOR MECHANICAL DESIGN.
5- SHALL BE SPECIFIED BY VENDOR .
6- ALL WELDED ATTACHMENTS TO THE VESSEL TO BE SUPPLIED BY THE VESSEL MANUFACTURER .
7- LOCATION AND NUMBER OF LIFTING LUGS ON REACTOR SHALL BE SPECIFIED ON VENDOR DRAWINGS.
8- SETTING BOLTS SHALL BE HOT DIP GALVANIZED.
9- SHELL/NOZZLE THICKNESS AT CONNECTION/ATACHMENT AREA SHALL BE VERIFIED BY LOCAL CALCULATION.
10- STIRRER CONNECTION AND MAGNETIC AGITATOR TYPE SHALL BE DEFINED BY RELATIVE SUPPLIER.
11- INTERNAL FINISHING SHALL BE SMOOTH FINISH RA=0.4µm (16µinch)

PROJECT:PP-PE PILOT PLANT	Client:
TITLE:Data Sheet for Precontact Pot (7 lt) (R-221)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

Data Sheet for Precontact Pot (7 lt) (R-221)

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TITLE:Data Sheet for Precontact Pot (7 lt) (R-221)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

REV. / PAGE	0	1	2	3	4	5	REV. / PAGE	0	1	2	3	4	5
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B	X	X	X										
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3	X	X	X										
4	X	X	X										
5	X	X	X										
6	X	X	X										

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Revision	**Date**	**Prepared By**	**Checked By**	**Approved By**	**Status**

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PROJECT:PP-PE PILOT PLANT

Client:

شرکت ملی صنایع پتروشیمی
شرکت پژوهش و فناوری پتروشیمی

TITLE:Data Sheet for Precontact Pot (7 lt) (R-221)

1	Item No.:R-221	Quantity: 1	Location: Outdoor	Service:	Continuous

DESIGN CONDITIONS

			Vessel	Jacket	Internal Coil
4					
5	Operating Temperature(Min./Max.)	^{0}C	-30 / +20	-30 / +20	-/-
6	Operating Pressure	barg	30	2	-
7	Density	kg/m^3	600 / 650	1100	-
8	Design Pressure(int./ext.)	barg	65 / 10	10 / -	-/-
9	Design Temperature	^{0}C	-60/+180	+180	-/-
10	Volume(total)	m^3	0.007	0.004	-
11	Hydro Test Pressure	barg	as per UG99b(33)	as per UG99b(33)	-
12	Corrosion Allowance(shell/head)	mm	0/0	1.5/1.5	-/-
13	Cladding (shell/head)	mm	-/-	-/-	-/-
14	Content @ normal operation		Hydrocarbons+Slurry	Glycole+Water	-
15	Thickness(shell/head)	mm	10/40	8	/
16	Welding Radiography(shell/head)	%	Full / Full	Full / Full	-/-
17	Joint Efficiency(shell/head)		1 / 1	1 / 1	-/-
18	Top Head Type		FORGED	N.A	-
19	Bottom Head Type		Welded Flat	N.A	-

20	Design code:	ASME SEC. VIII DIV.1	Inspection code:	ASME SEC. IX
21	Cylinder Deminsion(IDxT.L-T.L):	160 x 314 mm	Lethal Service:	○ Yes ● No
22	M.D.M.T @ D.P:	-60 ^{0}C	M.A.T:	- ^{0}C
23	M.A.W.P:	barg Limted by:	Stamp:	Required
24	Impact Test:	Not Required	P.W.H.T:	Not Required
25	N.D.T:	Required	Vessel linning detail:	NIL
26	HIC/SSC resistance:	NA / NA	Painting & Coating:	as per code
27	Insulation thickness:	30 mm	Insulation type:	COLD
28	Fireproofing :	2 NO	Vessel located on:	Structrue
29	Seismic code:	UBC 1997	Seismic Zone:	3
30	Impotance factor:	1.25	Soil Profile:	SD
31	Wind code:	UBC	Wind velocity:	120 km/hr @ 10 m
32	Impotance factor:	1.15	Exposure:	C

	Support loading data(Note 5)				
33				Fabricated:	-
34		Earthquake	Wind	Empty:	130
35	Shearing load(kgf)	-	-	Test:	-
36	Moment(kg.m)	-	-	Operation:	-

Weight(kg) (Note 5)

MISCELLANEOUS(Note 6)

39	○ Baffle	○ Impingement plate	○ Weir plate
40	○ Diffuser	○ Distributer	○ Trunnion
41	○ Vortex breaker	○ Tubesheet	○ Template
42	○ Boot / Cap	○ Demister	● Pickling & passivation
43	● Insulation Support	○ Wire mesh	● Earthing boss
44	○ Fire Proofing	● Name plate	○ Dip pipe
45	○ Fire Proofing Support	○ Internal lining	● Agitator
46	○ Ladder & platform (int. & ext.)	○ Sand blast & painting	
47	○ Heating coil	● Internal clips	
48	● Lifting lug	● External clips	

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PROJECT:PP-PE PILOT PLANT	**Client:**
TITLE:Data Sheet for Precontact Pot (7 lt) (R-221)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

MATERIALS(NOTE 1)

Shell(Main/Jacket)		SA240-304L / SA312-304L		Earth lug	SA240-316L
Head(Main/Jacket)		SA182-304L / NA		Stiffening rings	SA240-304L
Nozzle Necks (Main/Jacket)	Plate	- / -		Gaskets	DOUBLE O-RING
	Pipe	SA312-304L / SA312-304L		Ext. bolt/Nuts	SA193-B7/SA194-2H
Cladding		-		Int. bolt/Nuts	SA193-BB/SA194-8
Nozzle flanges		SA182-304L		Wire mesh	NA
Blind flanges		SA182-304L		Welded clip	SA240-304L
Reinforcing pad		SA240-304L		Int. welded	SA240-304L
Fitting		SA403-304L		Int. removable	SA240-304L
Support	Leg	NA		Anchor/Setting bolts	SA307-B
	Lug	SA 36		Ladder/Platform	NA
	leg/lug pad	SA240-304L		Insulation Mateial	POLY-URETHANE
Lifting lug		SA240-304L			

NOZZLE DETAILS(NOTE 3)

Item	NPS (Inch)	Flanges			SCH. /THK. (NOTE 5)	Service	Proj.	Rein. PAD (NOTE 5)		Standards	Remarks
		Rating	Type	Face				Width	Thk.		
Top Head											
P1	3/8"	3000#	Thr.NPT	-	-	Catalyst Inlet	see Dwg	-	-	ANSI B2.1	Internal hole Φ7mm
P2	3/8"	3000#	Thr.NPT	-	-	Cocacatal. Inlet	see Dwg	-	-	ANSI B2.1	Internal hole Φ7mm
P3	3/8"	3000#	Thr.NPT	-	-	Spare	see Dwg	-	-	ANSI B2.1	Internal hole Φ7mm+with plug
K1	1/2"	3000#	Thr.NPT	-	-	PRA Connection	see Dwg	-	-	ANSI B2.1	Internal hole Φ10mm
S1	-				-	Stirrer Connection	see Dwg	-	-		See note 10
Shell (Jacket)											
P6	1/2"	3000#	Thr.NPT	-	-	Thermost. Inlet	see Dwg	-	-	ANSI B2.1	Internal hole Φ15mm
P7	1/2"	3000#	Thr.NPT	-	-	Thermost. Outlet	see Dwg	-	-	ANSI B2.1	Internal hole Φ15mm
Bottom Head											
P4	3/8"	3000#	Thr.NPT	-	-	Product Outlet	see Dwg	-	-	ANSI B2.1	Internal hole Φ7mm
P5	1/2"	3000#	Thr.NPT	-	-	Drain	see Dwg	-	-	ANSI B2.1	Internal hole Φ10mm
K2	3/8"	3000#	Thr.NPT	-	-	TRC Connection	see Dwg	-	-	ANSI B2.1	Female(for more detail see H-222)

PROJECT:PP-PE PILOT PLANT	**Client:**
TITLE:Data Sheet for Precontact Pot (7 lt) (R-221)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

NOZZLE LOADING DATA(NOTE 5)

Nozzle Name	FA (kN)	FB (kN)	FC (kN)	MA (N.m)	MB (N.m)	MC (N.m)

REFRENCE DOCUMENTS

No.	Document No.	Document Title
1		
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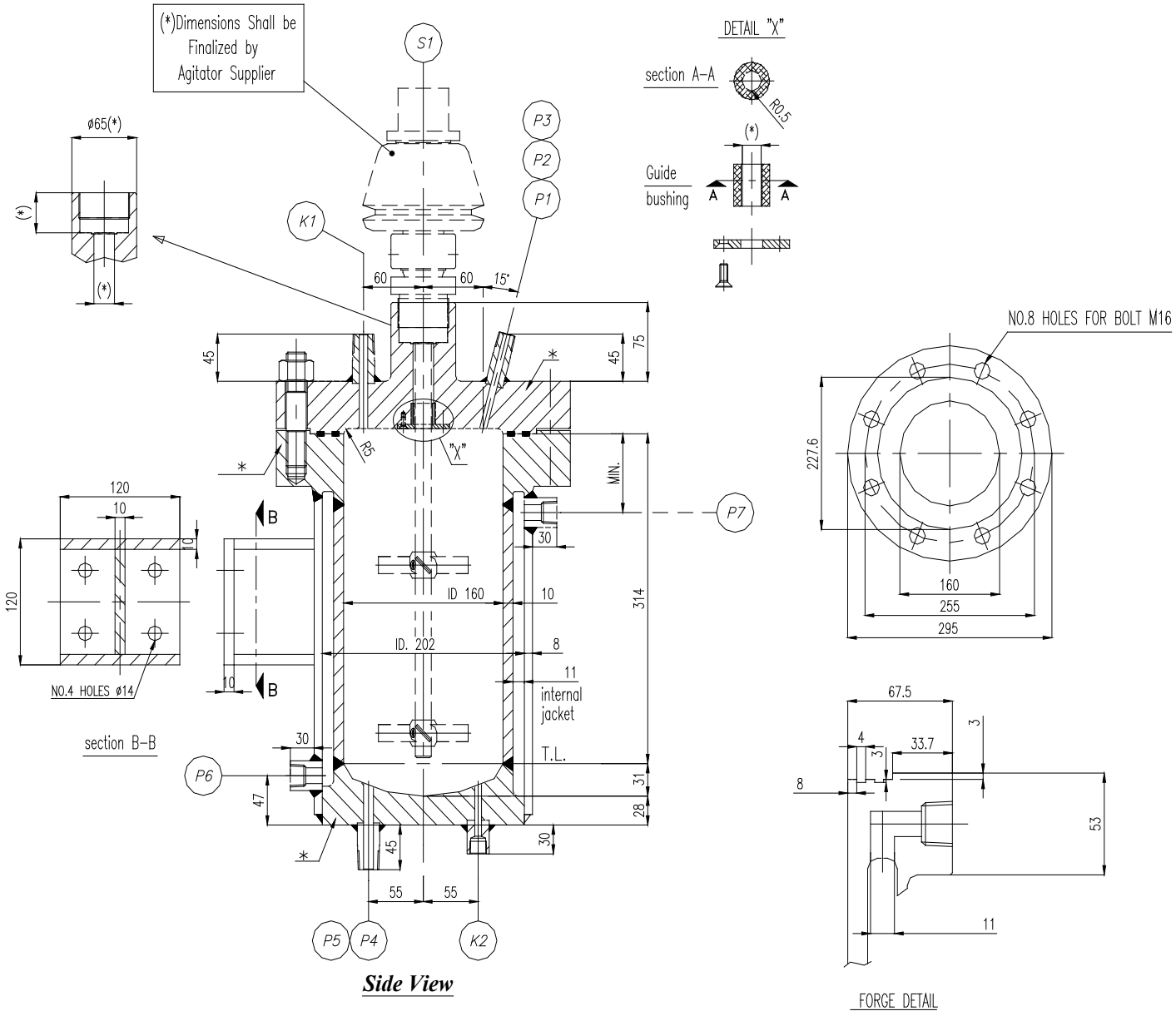
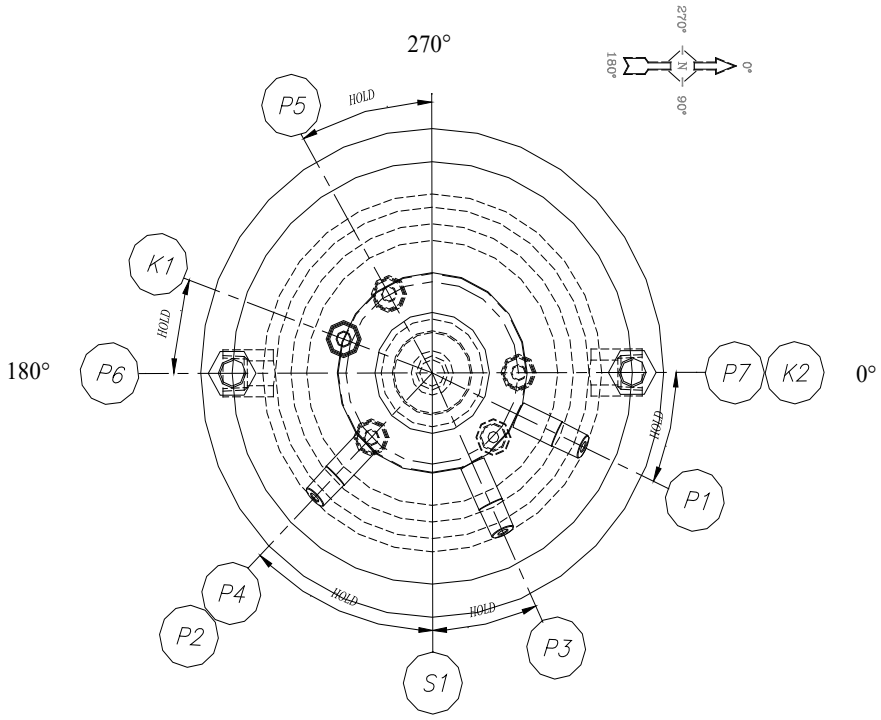
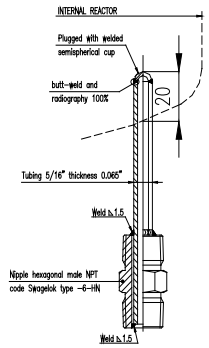

(*)Dimensions Shall be Finalized by Agitator Supplier
S1
P3
P2
P1
K1
ø65(*)
(*)
60
60
15°
45
45
75
*
R5
"X"
MIN.
P7
30
ID 160
10
314
ID. 202
8
11
internal jacket
T.L.
31
28
30
47
45
55
55
P6
P5
P4
K2
B
B
120
10
10
120
NO.4 HOLES ø14
section B-B
DETAIL "X"
section A-A
R0.5
Guide bushing
A
A
NO.8 HOLES FOR BOLT M16
227.6
160
255
295
67.5
4
3
33.7
3
8
53
11
FORGE DETAIL
Side View
(*)Thickness shall be specified by vendor.
(**)Shall be finalized by vendor.



Orientation (HOLD)

H-222 thermowell
detail



General Notes:

1- SHALL BE VERIFIED BY VENDOR
2- ALL DIMENSIONS ARE IN MILLIMETER, UNLESS OTHERWISE NOTED
3- NOZZLE CHARACTERISTICS SHALL BE VERIFIED BY VENDOR
4- THICKNESSES, WEIGHTS AND LOADS ARE INDICATED FOR ESTIMATION PURPOSE ONLY ; THE MANUFCTURER SHALL CONFIRM THESE ITEMS AND IS RESPONSIBLE FOR MECHANICAL DESIGN.
5- SHALL BE SPECIFIED BY VENDOR .
6- ALL WELDED ATTACHMENTS TO THE VESSEL TO BE SUPPLIED BY THE VESSEL MANUFACTURER .
7- LOCATION AND NUMBER OF LIFTING LUGS ON REACTOR SHALL BE SPECIFIED ON VENDOR DRAWINGS.
8- SETTING BOLTS SHALL BE HOT DIP GALVANIZED.
9- SHELL/NOZZLE THICKNESS AT CONNECTION/ATACHMENT AREA SHALL BE VERIFIED BY LOCAL CALCULATION.
10- STIRRER CONNECTION AND MAGNETIC AGITATOR TYPE SHALL BE DEFINED BY RELATIVE SUPPLIER.
11- INTERNAL FINISHING SHALL BE SMOOTH FINISH RA=0.4µm (16µinch)

PROJECT:PP-PE PILOT PLANT	Client: شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی
TITLE:Data Sheet for Loop prepoly (60 lt) (R -251)	

Data Sheet for
Loop prepoly (60 lt) (R -251)

	Document No.:200-DAS-A4-EQ-0026	Rev. : 02
	Owner Job No.:	Type: DAS
		Page : A

PROJECT:PP-PE PILOT PLANT	**Client:**
TITLE:Data Sheet for Loop prepoly (60 lt) (R -251)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

REV. / PAGE	0	1	2	3	4	5	REV. / PAGE	0	1	2	3	4	5
A	X	X	X										
B	X	X	X										
1	X	X	X										
2	X	X	X										
3	X	X	X										
4	X	X	X										
5	X	X	X										
6	X	X	X										

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Revision	**Date**	**Prepared By**	**Checked By**	**Approved By**	**Status**

	Document No.:200-DAS-A4-EQ-0026	**Rev. : 02**
	Owner Job No.:	**Type: DAS**
		Page : B

PROJECT:PP-PE PILOT PLANT

Client:

شرکت ملی صنایع پتروشیمی
شرکت پژوهش و فناوری پتروشیمی

TITLE:Data Sheet for Loop prepoly (60 lt) (R -251)

Item No.:R-251 Quantity: 1 Location: Outdoor Service: Continuous

DESIGN CONDITIONS

		Vessel	Jacket	Internal Coil
Operating Temperature(Min./Max.)	^{0}C	- 30/ +40	-30 / 40	-/-
Operating Pressure	barg	30	3	-
Density	kg/m^3	500 ~ 550	1100	-
Design Pressure(int./ext.)	barg	45 / 10	10 / -	-/-
Design Temperature	^{0}C	-60/+180	+180	-/-
Volume(total)	m^3	0.06	0.03	-
Hydro Test Pressure	barg	as per UG99b(33)	as per UG99b(33)	-
Corrosion Allowance(shell/head)	mm	0/0	1.5/1.5	-/-
Cladding (shell/head)	mm	-/-	-/-	-/-
Content @ normal operation		Hydrocarbons+Slurry	Glycole+Water	-
Thickness(shell/head)	mm	2 40S	2 80S	/
Welding Radiography(shell/head)	%	Full / Full	Full / Full	-/-
Joint Efficiency(shell/head)		1 / 1	1 / 1	-/-
Top Head Type		See Dwg	NA	-
Bottom Head Type		See Dwg	NA	-

Design code:	ASME SEC. VIII DIV.1	Inspection code:	ASME SEC. IX
Cylinder Deminsion(IDxT.L-T.L):	102 x 2800 mm	Lethal Service:	○ Yes ● No
M.D.M.T @ D.P:	-60 ^{0}C	M.A.T:	- ^{0}C
M.A.W.P:	- barg Limted by: -	Stamp:	Required
Impact Test:	Not Required	P.W.H.T:	Not Required
N.D.T:	Required	Vessel linning detail:	NIL
HIC/SSC resistance:	NA / NA	Painting & Coating:	NIL
Insulation thickness:	30 mm	Insulation type:	COLD
Fireproofing :	2 NO	Vessel located on:	Structrue
Seismic code:	UBC 1997	Seismic Zone:	3
Impotance factor:	1.25	Soil Profile:	SD
Wind code:	UBC	Wind velocity:	120 km/hr @ 10 m
Impotance factor:	1.15	Exposure:	C

Support loading data(Note 5)		
	Earthquake	Wind
Shearing load(kgf)	-	-
Moment(kg.m)	-	-

Weight(kg) (Note 5)		
Fabricated:	-	
Empty:	550	
Test:	-	
Operation:	-	

MISCELLANEOUS(Note 6)

○ Baffle	○ Impingement plate	○ Weir plate
○ Diffuser	○ Distributer	○ Trunnion
○ Vortex breaker	○ Tubesheet	○ Template
○ Boot / Cap	○ Demister	● Pickling & passivation
● Insulation Support	○ Wire mesh	● Earthing boss
○ Fire Proofing	● Name plate	○ Dip pipe
○ Fire Proofing Support	○ Internal lining	● Agitator
○ Ladder & platform (int. & ext.)	○ Sand blast & painting	
○ Heating coil	● Internal clips	
● Lifting lug	● External clips	

PROJECT:PP-PE PILOT PLANT							**Client:**					
TITLE:Data Sheet for Loop prepoly (60 lt) (R -251)							شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی					
1												
2	**MATERIALS(NOTE 1)**											
3												
4	Shell(Main/Jacket)		SA240-304L / SA240-304L				Earth lug	SA240-316L				
5	Head(Main/Jacket)		SA240-304L / SA240-304L				Stiffening rings	SA240-304L				
6	Nozzle Necks	Plate	- / -				Gaskets	SPIRAL WOUND				
7	(Main/Jacket)	Pipe	SA312-304L / SA312-304L				Ext. bolt/Nuts	SA193-B7/SA194-2H				
8	Cladding		-				Int. bolt/Nuts	SA193-BB/SA194-8				
9	Nozzle flanges		SA182-304L				Wire mesh	NA				
10	Blind flanges		SA182-304L				Welded clip	SA240-304L				
11	Reinforcing pad		SA240-304L				Int. welded	SA240-304L				
12	Fitting		SA403-304L				Int. removable	SA240-304L				
13	Support	Leg	NA				Anchor/Setting bolts	SA307-B				
14		Lug	SA283-C				Ladder/Platform	NA				
15		leg/lug pad	SA240-304L				Insulation Material	POLY-URETHANE				
16	Lifting lug		SA240-304L									
17	**NOZZLE DETAILS(NOTE 3)**											
18												

19	Item	NPS (Inch)	Flanges			SCH. /THK. (NOTE 5)	Service	Proj.	Rein. PAD (NOTE 5)		Standards	Remarks
20			Rating	Type	Face				Width	Thk.		
21	**Top Head**											
22	P1	3/4"	600#	RF	LWN	-	Product outlet	see Dwg	-	-	ANSI B16.5	Internal hole Φ20mm (See H-251)
23	P2	1"	600#	LF	PAD	-	Spare	see Dwg	-	-	ANSI B16.5	Blind flange with plug
24	P3	3/8"	3000#	Thr.NPT	-	-	Fluxing bush spare	see Dwg	-	-	ANSI B2.1	With plug(see Dwg)
25	K1	1 1/2"	600#	LF	PAD	-	SV Connection	see Dwg	-	-	ANSI B16.5	
26	K2	1/2"	600#	LF	PAD	-	TR Connection	see Dwg	-	-	ANSI B16.5	(See H-252)
27	S1	-				-	Agit. Connection	see Dwg	-	-		See note 11
28	**Shell (Jacket)**		2									
29	P9	2"	300#	RF	WN	40S	Thermost. Inlet	see Dwg	-	-	ANSI B16.5	Tangential
	P10a	2"	300#	RF	WN	40S	Thermost. Outlet	see Dwg	-	-	ANSI B16.5	Tangential
	P10b	2"	300#	RF	WN	40S	Thermost. Inlet	see Dwg	-	-	ANSI B16.5	Tangential
	P11	2"	300#	RF	WN	40S	Thermost. Outlet	see Dwg	-	-	ANSI B16.5	Tangential
30	P12	1/2"	3000#	Thr.NPT	-	-	Drain	see Dwg	-	-	ANSI B16.5	
32	P13	1/2"	3000#	Thr.NPT	-	-	Vent	see Dwg	-	-	ANSI B16.5	
32	P14	1/2"	3000#	Thr.NPT	-	-	Vent	see Dwg	-	-	ANSI B16.5	
32	P15	1/2"	3000#	Thr.NPT	-	-	Drain	see Dwg	-	-	ANSI B16.5	
33	**Bottom Head**											
34	P4	3/4"	600#	LF	PAD	-	Monomers Inlet	see Dwg	-	-	ANSI B16.5	
35	P5	1/2"	600#	LF	PAD	-	Product Inlet	see Dwg	-	-	ANSI B16.5	(See H-254)
36	P6	1"	600#	LF	PAD	-	Disch. Prod. Blow	see Dwg	-	-	ANSI B16.5	To install piston valve 1/2"
37	P7	1"	600#	LF	PAD	-	Disch. Prod.	see Dwg	-	-	ANSI B16.5	To install piston valve 1/2"
38	P8	3/4"	600#	RF	LWN	-	Spare	see Dwg	-	-	ANSI B16.5	Blind flange with plug
39	K3	1/2"	600#	LF	PAD	-	TRC Connection	see Dwg	-	-	ANSI B16.5	(See H-253)
40												
41												
42												
43												
44												

PROJECT:PP-PE PILOT PLANT	**Client:**
TITLE:Data Sheet for Loop prepoly (60 lt) (R -251)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

NOZZLE LOADING DATA(NOTE 5)

Nozzle Name	FA (kN)	FB (kN)	FC (kN)	MA (N.m)	MB (N.m)	MC (N.m)

REFRENCE DOCUMENTS

No.	Document No.	Document Title
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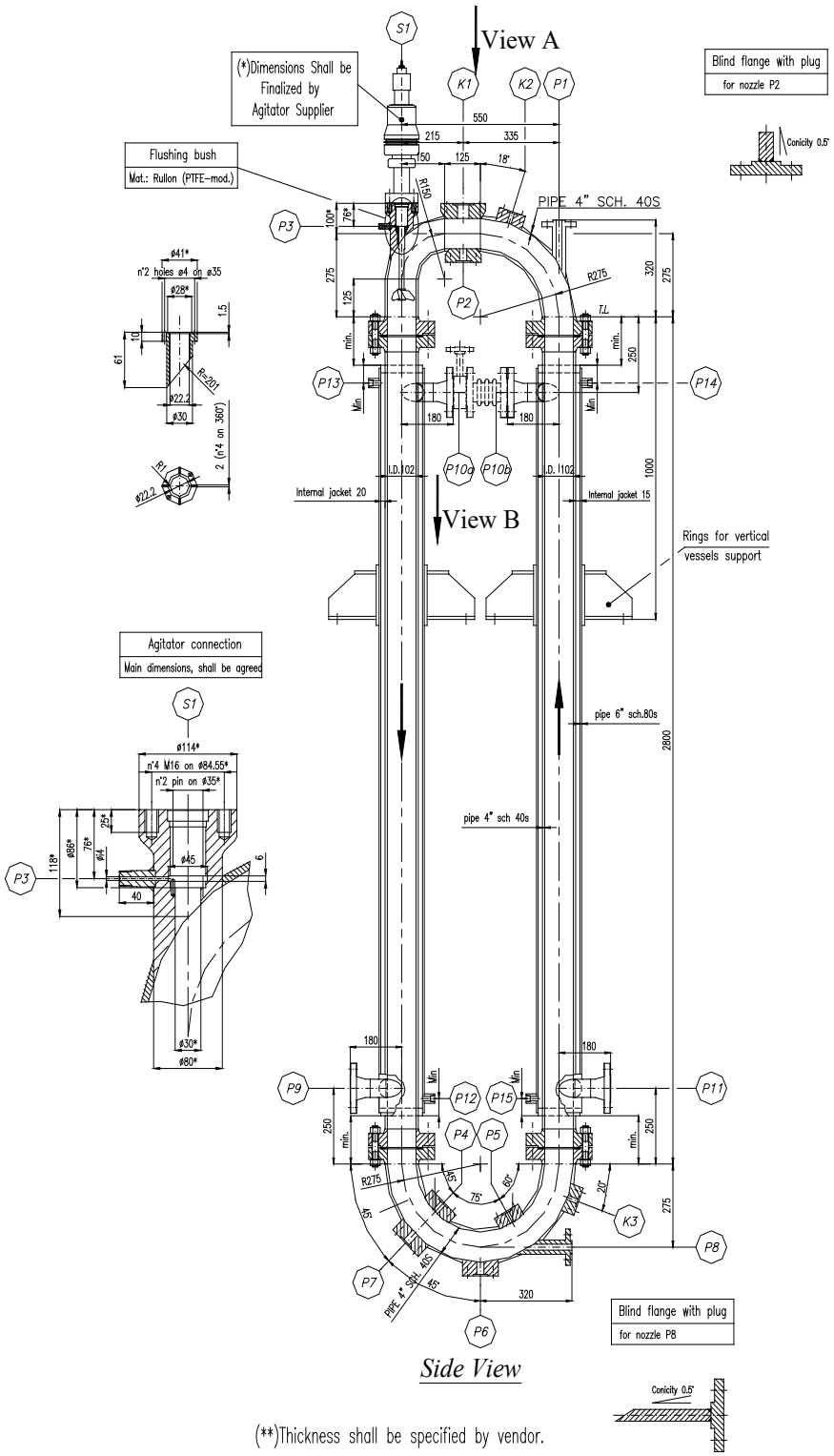
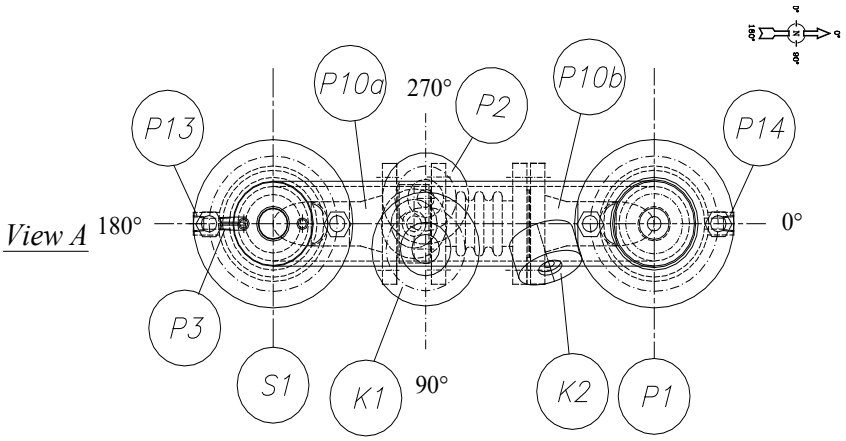
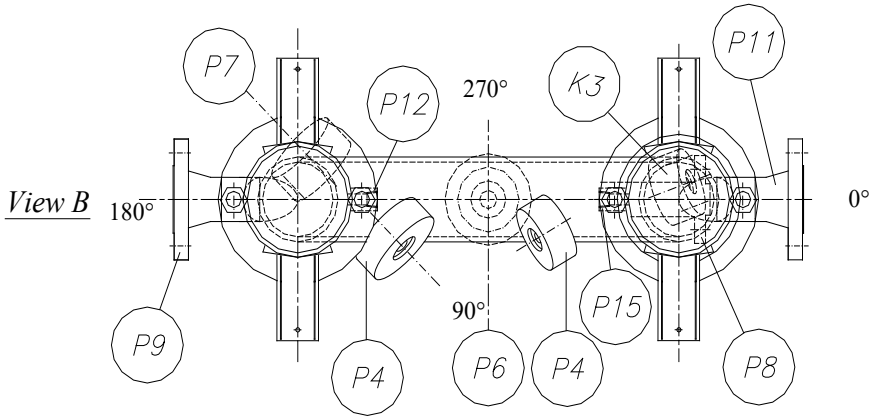
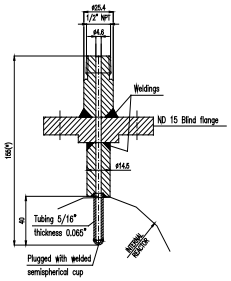

View A
(*)Dimensions Shall be Finalized by Agitator Supplier
Blind flange with plug
for nozzle P2
Conicity 0.5°
Flushing bush
Mat.: Rullon (PTFE-mod.)
PIPE 4" SCH. 40S
View B
Internal jacket 20
Internal jacket 15
Rings for vertical vessels support
Agitator connection
Main dimensions, shall be agreed
pipe 6" sch.80s
pipe 4" sch 40s
PIPE 4" SCH. 40S
Blind flange with plug
for nozzle P8
Conicity 0.5°
Side View
(**)Thickness shall be specified by vendor.

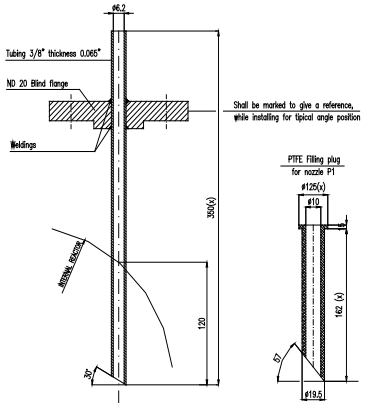




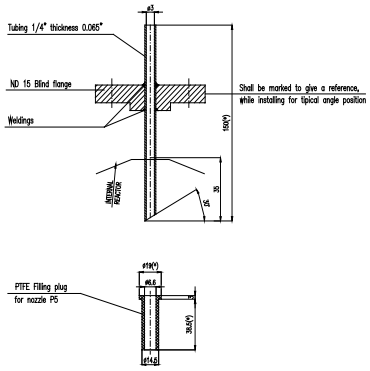
H−252 & H253
thermowell detail



H−251 thermowell
detail



H−254 thermowell
detail



General Notes:

1- SHALL BE VERIFIED BY VENDOR
2- ALL DIMENSIONS ARE IN MILLIMETER, UNLESS OTHERWISE NOTED
3- NOZZLE CHARACTERISTICS SHALL BE VERIFIED BY VENDOR
4- THICKNESSES, WEIGHTS AND LOADS ARE INDICATED FOR ESTIMATION PURPOSE ONLY ; THE MANUFCTURER SHALL CONFIRM THESE ITEMS AND IS RESPONSIBLE FOR MECHANICAL DESIGN.
5- SHALL BE SPECIFIED BY VENDOR .
6- ALL WELDED ATTACHMENTS TO THE VESSEL TO BE SUPPLIED BY THE VESSEL MANUFACTURER .
7- ALL NDT (RT, UT AND PT/MT) SHALL BE PERFORMED BEFORE AND AFTER PWHT .
8- LOCATION AND NUMBER OF LIFTING LUGS ON REACTOR SHALL BE SPECIFIED ON VENDOR DRAWINGS.
9- SETTING BOLTS SHALL BE HOT DIP GALVANIZED.
10- SHELL/NOZZLE THICKNESS AT CONNECTION/ATACHMENT AREA SHALL BE VERIFIED BY LOCAL CALCULATION.
11- STIRRER CONNECTION AND MAGNETIC AGITATOR TYPE SHALL BE DEFINED BY RELATIVE SUPPLIER.
12- INTERNAL PRODUCT FINISHING SHALL BE SMOOTH FINISH RA=0.4μm (16μinch)
13-FINISHING OF THE GASKET CONTACTING FACE SHALL BE SMOOTH FINISH RA=3.2μm (125μinch)

PROJECT:PP-PE PILOT PLANT	Client:
TITLE:Data Sheet for Loop prepoly (200 lt)(R -261)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

Data Sheet for
Loop prepoly (200 lt)(R -261)

	Document No.: 200-DAS-A4-EQ-0027	Rev. : 02
	Owner Job No.:	Type: DAS
		Page : A

PROJECT:PP-PE PILOT PLANT	**Client:**
TITLE:Data Sheet for Loop prepoly (200 lt)(R -261)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

REV. / PAGE	0	1	2	3	4	5	REV. / PAGE	0	1	2	3	4	5
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4	X	X	X										
5	X	X	X										
6	X	X	X										

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	Document No.: 200-DAS-A4-EQ-0027	**Rev. : 02**
	Owner Job No.:	**Type: DAS**
		Page : B

PROJECT:PP-PE PILOT PLANT

Client:

شرکت ملی صنایع پتروشیمی
شرکت پژوهش و فناوری پتروشیمی

TITLE:Data Sheet for Loop prepoly (200 lt)(R -261)

1	Item No.:R-261	Quantity: 1	Location: Outdoor	Service:	Continuous

DESIGN CONDITIONS

			Vessel	Jacket	Internal Coil
5	Operating Temperature(Min./Max.)	^{0}C	-30 / +40	-30 / +40	-/-
6	Operating Pressure	barg	30	3	-
7	Density	kg/m^3	430 / 550	1100	-
8	Design Pressure(int./ext.)	barg	45 / 10	10 / -	-/-
9	Design Temperature	^{0}C	-60/+180	+180	-/-
10	Volume(total)	m^3	0.2	0.1	-
11	Hydro Test Pressure	barg	as per UG99b(33)	as per UG99b(33)	-
12	Corrosion Allowance(shell/head)	mm	0/0	1.5/1.5	-/-
13	Cladding (shell/head)	mm	-/-	-/-	-/-
14	Content @ normal operation		Hydrocarbons+Slurry	Glycole+Water	-
15	Thickness(shell/head)	mm	2 11	2 40S	/
16	Welding Radiography(shell/head)	%	Full / Full	Full / Full	-/-
17	Joint Efficiency(shell/head)		1 / 1	1 / 1	-/-
18	Top Head Type		See Dwg	NA	-
19	Bottom Head Type		See Dwg	NA	-

20	Design code:	ASME SEC. VIII DIV.1	Inspection code:	ASME SEC. IX
21	Cylinder Deminsion(IDxT.L-T.L):	2 146 x 5250 mm	Lethal Service:	○ Yes ● No
22	M.D.M.T @ D.P:	-60 ^{0}C	M.A.T:	- ^{0}C
23	M.A.W.P:	- barg Limted by: -	Stamp:	Required
24	Impact Test:	Not Required	P.W.H.T:	Not Required
25	N.D.T:	Required	Vessel linning detail:	NIL
26	HIC/SSC resistance:	NA / NA	Painting & Coating:	NIL
27	Insulation thickness:	40 mm	Insulation type:	COLD
28	Fireproofing :	2 NO	Vessel located on:	Structrue
29	Seismic code:	UBC 1997	Seismic Zone:	3
30	Impotance factor:	1.25	Soil Profile:	SD
31	Wind code:	UBC	Wind velocity:	120 km/hr @ 10 m
32	Impotance factor:	1.15	Exposure:	C

	Support loading data(Note 5)				
33				Fabricated:	-
34		Earthquake	Wind	Empty:	1700
35	Shearing load(kgf)	-	-	Test:	-
36	Moment(kg.m)	-	-	Operation:	-

Weight(kg) (Note 5)

MISCELLANEOUS(Note 6)

39	○ Baffle	○ Impingement plate	○ Weir plate
40	○ Diffuser	○ Distributer	○ Trunnion
41	○ Vortex breaker	○ Tubesheet	○ Template
42	○ Boot / Cap	○ Demister	● Pickling & passivation
43	● Insulation Support	○ Wire mesh	● Earthing boss
44	○ Fire Proofing	● Name plate	○ Dip pipe
45	○ Fire Proofing Support	○ Internal lining	● Agitator
46	○ Ladder & platform (int. & ext.)	○ Sand blast & painting	
47	○ Heating coil	● Internal clips	
48	● Lifting lug	● External clips	

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PROJECT:PP-PE PILOT PLANT	Client:
TITLE:Data Sheet for Loop prepoly (200 lt)(R -261)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

MATERIALS(NOTE 1)

Shell(Main/Jacket)		SA240-304L / SA240-304L	Earth lug	SA240-316L
Head(Main/Jacket)		SA240-304L / NA	Stiffening rings	SA240-304L
Nozzle Necks (Main/Jacket)	Plate	- / -	Gaskets (NOTE 15)	SPIRAL WOUND
	Pipe	SA312-304L / SA312-304L	Ext. bolt/Nuts	SA193-B7/SA194-2H
Cladding		-	Int. bolt/Nuts	SA193-BB/SA194-8
Nozzle flanges		SA182-304L	Wire mesh	NA
Blind flanges		SA182-304L	Welded clip	SA240-304L
Reinforcing pad		SA240-304L	Int. welded	SA240-304L
Fitting		SA403-304L	Int. removable	SA240-304L
Support	Leg	NA	Anchor/Setting bolts	SA307-B
	Lug	SA283-C	Ladder/Platform	NA
	leg/lug pad	SA240-304L	Insulation Material	POLY-URETHANE
Lifting lug		SA240-304L		

NOZZLE DETAILS(NOTE 3)

	Item	NPS (Inch)	Flanges			SCH. /THK. (NOTE 5)	Service	Proj.	Rein. PAD (NOTE 5)		Standards	Remarks
			Rating	Type	Face				Width	Thk.		
	Top Head											
	P1	1"	600#	RF	LWN	t=14.3	Product outlet	see Dwg	-	-	ANSI B16.5	(See H-261)
	P2	1"	600#	LF	PAD	-	Spare	see Dwg	-	-	ANSI B16.5	Blind flange with plug (See Dwg)
	P3	1"	600#	LF	PAD	-	Spare	see Dwg	-	-	ANSI B16.5	Blind flange with plug (See Dwg)
	P4	3/8"	3000#	Thr.NPT	-	-	Flushing Bush	see Dwg	-	-	ANSI B2.1	Internal hole Φ7mm(to install valve1/4")
	K1	1 1/2"	600#	LF	PAD	-	SV Connection	see Dwg	-	-	ANSI B16.5	
	K2	1/2"	600#	LF	PAD	-	TR Connection	see Dwg	-	-	ANSI B16.5	(See H-263)
	S1	-				-	Agit. Connection	see Dwg	-	-		See note 10
	Shell (Jacket)		2									
	P10	3"	300#	RF	WN	40S	Thermost. Inlet	see Dwg	-	-	ANSI B16.5	Tangential
	P11a	3"	300#	RF	WN	40S	Thermost. Outlet	see Dwg	-	-	ANSI B16.5	Tangential
	P11b	3"	300#	RF	WN	40S	Thermost. Inlet	see Dwg	-	-	ANSI B16.5	Tangential
	P12	3"	300#	RF	WN	40S	Thermost. Outlet	see Dwg	-	-	ANSI B16.5	Tangential
	P13	1/2"	3000#	Thr.NPT	-	-	Drain	see Dwg	-	-	ANSI B16.5	
	P14	1/2"	3000#	Thr.NPT	-	-	Vent	see Dwg	-	-	ANSI B16.5	
	P15	1/2"	3000#	Thr.NPT	-	-	Vent	see Dwg	-	-	ANSI B16.5	
	P16	1/2"	3000#	Thr.NPT	-	-	Drain	see Dwg	-	-	ANSI B16.5	
	Bottom Head											
	P5	3/4"	600#	LF	PAD	-	Product Inlet	see Dwg	-	-	ANSI B16.5	(See H-264)
	P6	1"	600#	LF	PAD	-	Monomers Inlet	see Dwg	-	-	ANSI B16.5	
	P7	1"	600#	LF	PAD	-	Disch. Prod. Blow Down	see Dwg	-	-	ANSI B16.5	To install piston valve 1/2"
	P8	1"	600#	LF	PAD	-	Disch. Prod. Sampling	see Dwg	-	-	ANSI B16.5	To install piston valve 1/2"
	P9	1/2"	600#	LF	PAD	-	Spare	see Dwg	-	-	ANSI B16.5	Blind flange with plug (See Dwg)
	K3	1/2"	600#	LF	PAD	-	TRC Connection	see Dwg	-	-	ANSI B16.5	(See H-265)

PROJECT:PP-PE PILOT PLANT	**Client:**
TITLE:Data Sheet for Loop prepoly (200 lt)(R -261)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

NOZZLE LOADING DATA(NOTE 4)

Nozzle Name	FA (kN)	FB (kN)	FC (kN)	MA (N.m)	MB (N.m)	MC (N.m)
P10	429	429	322	65	97	84
P11a	429	429	322	65	97	84
P11b	429	429	322	65	97	84
P12	429	429	322	65	97	84

REFRENCE DOCUMENTS

No.	Document No.	Document Title
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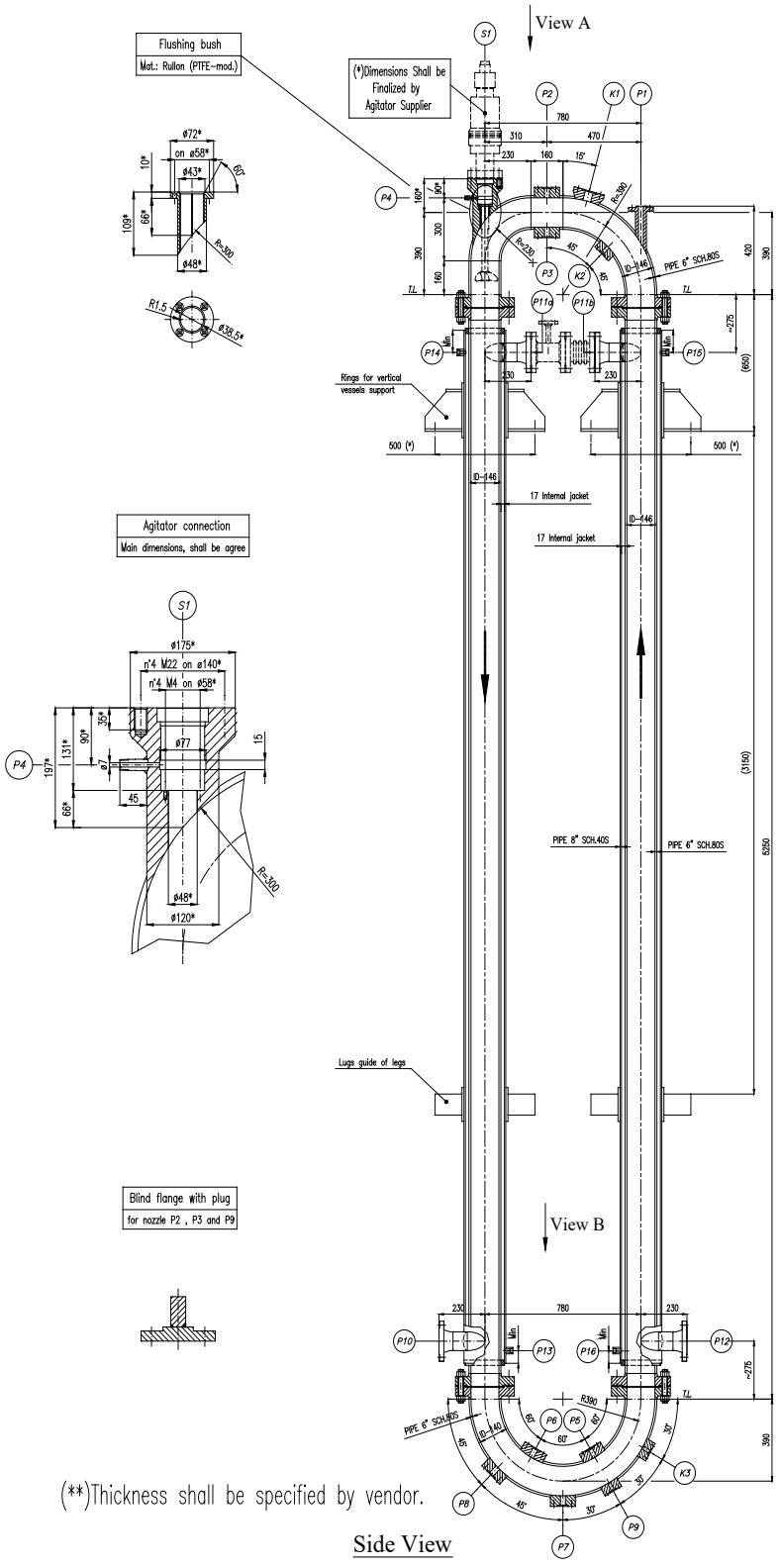
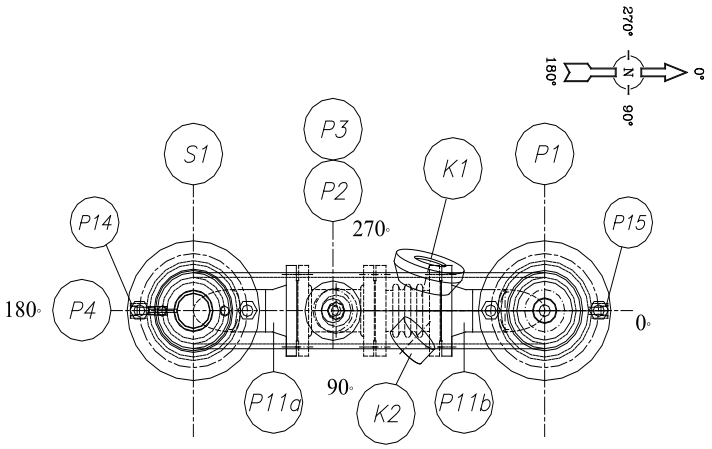
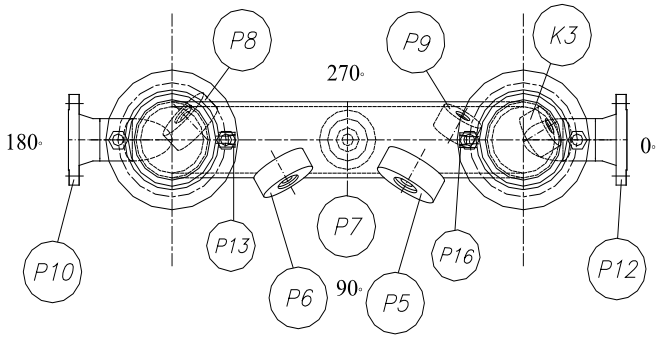

View A
Flushing bush
Mat.: Rulon (PTFE-mod.)
(*)Dimensions Shall be Finalized by Agitator Supplier
Agitator connection
Main dimensions, shall be agree
Blind flange with plug
for nozzle P2 , P3 and P9
Rings for vertical vessels support
Lugs guide of legs
17 Internal jacket
PIPE 8" SCH.40S
PIPE 6" SCH.80S
View B
(**)Thickness shall be specified by vendor.
Side View

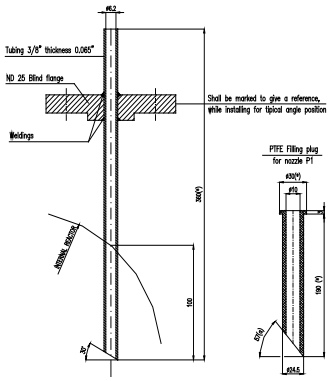


View A

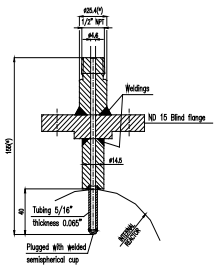


View B

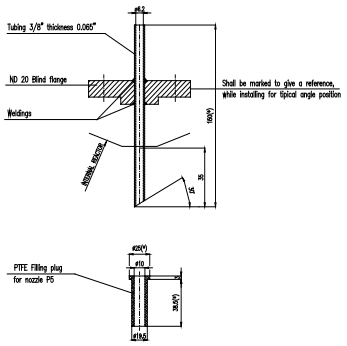
H−261 detail



H−263 & H−265 thermowell detail



H−264 detail



General Notes:

1- SHALL BE VERIFIED BY VENDOR
2- ALL DIMENSIONS ARE IN MILLIMETER, UNLESS OTHERWISE NOTED.
3- NOZZLE CHARACTERISTICS SHALL BE VERIFIED BY VENDOR
4- THICKNESSES, WEIGHTS AND LOADS ARE INDICATED FOR ESTIMATION PURPOSE ONLY ; THE MANUFCTURER SHALL CONFIRM THESE ITEMS AND IS RESPONSIBLE FOR MECHANICAL DESIGN.
5- SHALL BE SPECIFIED BY VENDOR .
6- ALL WELDED ATTACHMENTS TO THE VESSEL TO BE SUPPLIED BY THE VESSEL MANUFACTURER .
7- LOCATION AND NUMBER OF LIFTING LUGS ON REACTOR SHALL BE SPECIFIED ON VENDOR DRAWINGS.
8- SETTING BOLTS SHALL BE HOT DIP GALVANIZED.
9- SHELL/NOZZLE THICKNESS AT CONNECTION/ATACHMENT AREA SHALL BE VERIFIED BY LOCAL CALCULATION.
10- STIRRER CONNECTION AND MAGNETIC AGITATOR TYPE SHALL BE DEFINED BY RELATIVE SUPPLIER.
11- INTERNAL PRODUCT FINISHING SHALL BE SMOOTH FINISH Ra=0.4µm (16µinch)
12- FINISHING OF THE GASKET CONTACTING FACE SHALL BE SMOOTH FINISH Ra=3.2µm (125µinch)

PROJECT:PP-PE PILOT PLANT	Client:
TITLE:Data Sheet for 1st Gas phase reactor(R -411)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

Data Sheet for
1st Gas phase reactor(R-411)

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PROJECT:PP-PE PILOT PLANT	**Client:**
TITLE:Data Sheet for 1st Gas phase reactor(R -411)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

REV. / PAGE	0	1	2	3	4	5	REV. / PAGE	0	1	2	3	4	5
A	X	X	X										
B	X	X	X										
1	X	X	X										
2	X	X	X										
3	X	X	X										
4	X	X	X										
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Revision	**Date**	**Prepared By**	**Checked By**	**Approved By**	**Status**

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PROJECT:PP-PE PILOT PLANT	**Client:**
TITLE:Data Sheet for 1st Gas phase reactor(R -411)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

1	Item No.:R-411	Quantity: 1		Location: Outdoor	Service:	Continuous
2	**DESIGN CONDITIONS**					
3						
4			**Vessel**		**Jacket**	**Internal Coil**
5	Operating Temperature(Min./Max.)	^{0}C	-30 / +80		-/-	-/-
6	Operating Pressure	barg	24		-	-
7	Density	kg/m^3	500		-	-
8	Design Pressure(int./ext.)	barg	32		-/-	-/-
9	Design Temperature	^{0}C	-60/+180		-/-	-/-
10	Volume(total)	m^3	1.73		-	-
11	Hydro Test Pressure	barg	as per UG99b(33)		-	-
12	Corrosion Allowance(shell/head)	mm	0/0		-/-	-/-
13	Level during operation(min/max)	mm	50 / 1600		-/-	-/-
14	Content @ normal operation		Hydrocarbons+Polymer		-	-
15	Thickness(shell/head)	mm	2 10(15)		/	/
16	Welding Radiography(shell/head)	%	Full / Full		-/-	-/-
17	Joint Efficiency(shell/head)		1 / 1		-/-	-/-
18	Top Head Type		2:1 Elipsoidal		-	-
19	Bottom Head Type		2:1 Elipsoidal		-	-

20	Design code:	ASME SEC. VIII DIV.1	Inspection code:	ASME SEC. IX
21	Cylinder Deminsion(IDxT.L-T.L):	600(1000) X 3250 mm	Lethal Service:	○ Yes ● No
22	M.D.M.T @ D.P:	-60 ^{0}C	M.A.T:	- ^{0}C
23	M.A.W.P: - barg	Limted by: -	Stamp:	Not Required
24	Impact Test:	Not Required	P.W.H.T:	Not Required
25	N.D.T:	Required	Vessel linning detail:	NIL
26	HIC/SSC resistance:	NA / NA	Painting & Coating:	NIL
27	Insulation thickness:	50 mm	Insulation type:	HOT
28	Fireproofing : 2	NO	Vessel located on:	Structrue
29	Seismic code:	UBC 1997	Seismic Zone:	3
30	Impotance factor:	1.25	Soil Profile:	SD
31	Wind code:	UBC	Wind velocity:	120 km/hr @ 10 m
32	Impotance factor:	1.15	Exposure:	C

33	**Support loading data(Note 5)**			**Weight(kg) (Note 5)**	Fabricated:	-
34		Earthquake	Wind		Empty:	2200
35	Shearing load(kgf)	-	-		Test:	-
36	Moment(kg.m)	-	-		Operation:	-

37	**MISCELLANEOUS(Note 6)**		
38			
39	○ Baffle	○ Impingement plate	○ Weir plate
40	○ Diffuser	● Distributer	○ Trunnion
41	○ Vortex breaker	○ Tubesheet	○ Template
42	○ Boot / Cap	○ Demister	● Pickling & passivation
43	● Insulation Support	○ Wire mesh	● Earthing boss
44	○ Fire Proofing	● Name plate	● Dip pipe
45	○ Fire Proofing Support	○ Internal lining	
46	○ Ladder & platform (int. & ext.)	○ Sand blast & painting	
47	○ Heating coil	● Internal clips	
48	● Lifting lug	● External clips	

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PROJECT:PP-PE PILOT PLANT	Client:
TITLE:Data Sheet for 1st Gas phase reactor(R -411)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

MATERIALS(NOTE 1)

4	Shell(Main/Jacket)		SA240-304L / NA		Earth lug	SA240-316L
5	Head(Main/Jacket)		SA240-304L / NA		Stiffening rings	SA240-304L
6	Nozzle Necks	Plate	- / -		Gaskets	SPIRAL WOUND
7	(Main/Jacket)	Pipe	SA312-304L / NA		Ext. bolt/Nuts	SA193-B7/SA194-2H
8	Cladding		-		Int. bolt/Nuts	SA193-BB/SA194-8
9	Nozzle flanges		SA182-304L		Wire mesh	NA
10	Blind flanges		SA182-304L		Welded clip	SA240-304L
11	Reinforcing pad		SA240-304L		Int. welded	SA240-304L
12	Fitting		SA403-304L		Int. removable	SA240-304L
13	Support	Leg	NA		Anchor/Setting bolts	SA307-B
14		Lug	SA283-C		Ladder/Platform	NA
15		leg/lug pad	SA240-304L		Insulation Material	MINERAL WOOL
16	Lifting lug		SA240-304L			

NOZZLE DETAILS(NOTE 3)

	Item	NPS (Inch)	Flanges			SCH. /THK. (NOTE 5)	Service	Proj.	Rein. PAD (NOTE 5)		Standards	Remarks
			Rating	Type	Face				Width	Thk.		
21	**Top Head**		2									
22	P1	6"	400#	LF	PAD	-	Gas Outlet	see Dwg	-	-	ANSI B16.5	
23	P2	3"	400#	RF	WN	XXS	Spare	see Dwg	-	-	ANSI B16.5	With blind flange
24	P3	2"	400#	RF	WN	XXS	Spare	see Dwg	-	-	ANSI B16.5	With blind flange
25	P4	1"	400#	RF	WN	160	Monomers Inlet	see Dwg	-	-	ANSI B16.5	
26	P5	1"	400#	RF	WN	160	Vent	see Dwg	-	-	ANSI B16.5	
27	K1	2"	400#	LF	PAD	-	PRC Connection	see Dwg	-	-	ANSI B16.5	
28												
29	**Shell**		2									
30	P6	3"	400#	RF	WN	XXS	Flush Drum Inlet	see Dwg	-	-	ANSI B16.5	With pipe Inlet 2"
31	P7	1"	400#	RF	WN	80S	Prepoly Inlet	see Dwg	-	-	ANSI B16.5	With pipe Inlet 3/8"
32	P8	1"	400#	RF	WN	80S	Propane Inlet	see Dwg	-	-	ANSI B16.5	
33	P9	1"	400#	LF	PAD	80S	Sampling	see Dwg	-	-	ANSI B16.5	
34	P10	1"	400#	LF	PAD	80S	Product Discharge	see Dwg	-	-	ANSI B16.5	
35	P11	1"	400#	LF	PAD	-	Spare	see Dwg	-	-	ANSI B16.5	Blind flange with plug
36	P12	1"	400#	LF	PAD	-	Direct Discharge	see Dwg	-	-	ANSI B16.5	
37	K2a	4"	400#	RF	LWN	t=22.225	Dpcelle	see Dwg	-	-	ANSI B16.5	
38	K2b	4"	400#	RF	LWN	t=22.225	Dpcelle	see Dwg	-	-	ANSI B16.5	
39												
40	**Bottom Head**		2									
41	P13	6"	400#	LF	PAD	-	Gas Inlet	see Dwg	-	-	ANSI B16.5	
42												
43												
44												
45												
46												
47												
48												

PROJECT:PP-PE PILOT PLANT	**Client:**
TITLE:Data Sheet for 1st Gas phase reactor(R -411)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

NOZZLE LOADING DATA(NOTE 4)

Nozzle Name	FL (kN)	FA (kN)	FC (kN)	MC (N.m)	MT (N.m)	ML (N.m)
P1	857	857	643	257	386	335
P2	429	429	322	65	97	84
P6	429	429	322	65	97	84
P13	857	857	643	257	386	335

REFRENCE DOCUMENTS

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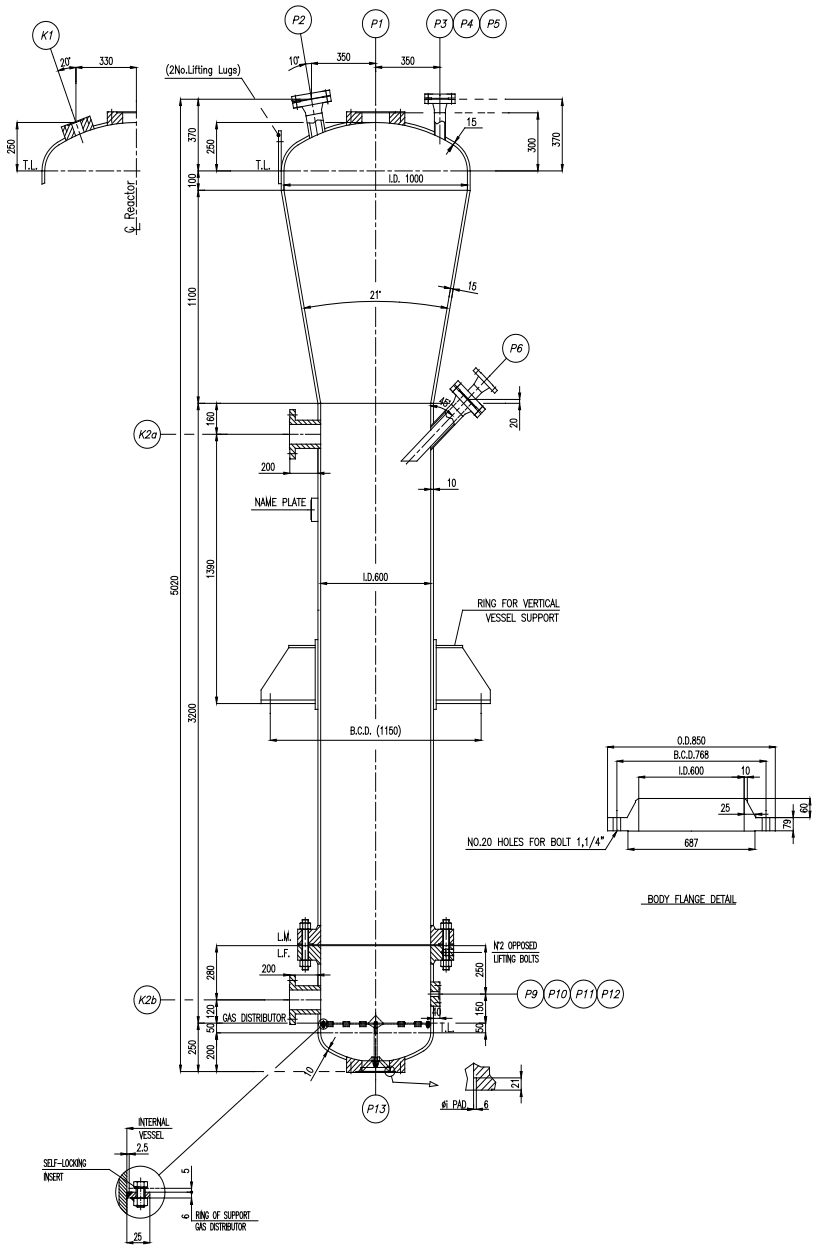
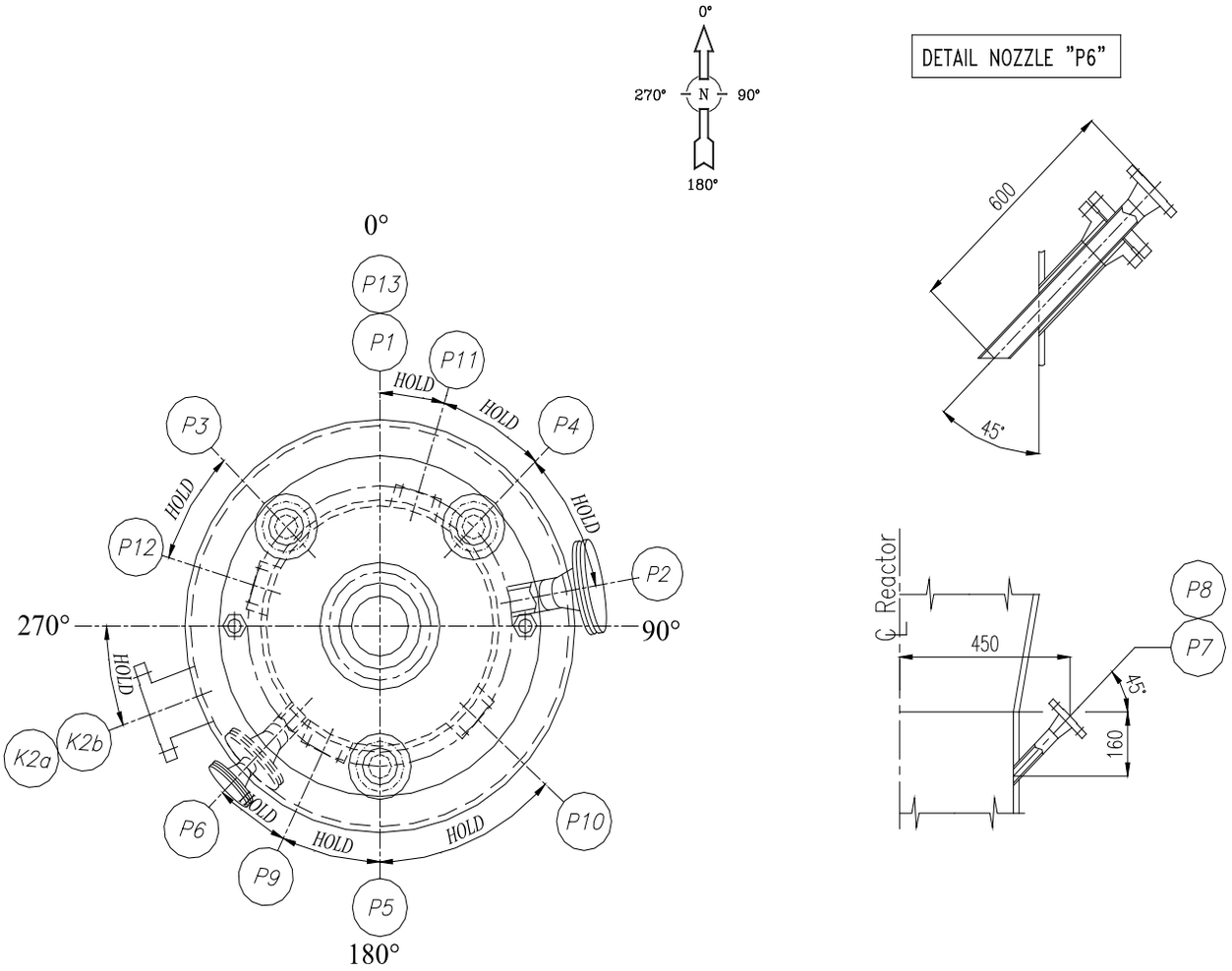


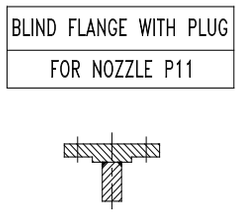
Side View

(**)Thickness shall be specified by vendor.

PROJECT:PP-PE PILOT PLANT	**Client:**
TITLE:Data Sheet for 1st Gas phase reactor(R -411)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی



Orientation (HOLD)



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PROJECT:PP-PE PILOT PLANT	**Client:**
TITLE:Data Sheet for 1st Gas phase reactor(R -411)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

Holes on grid plate

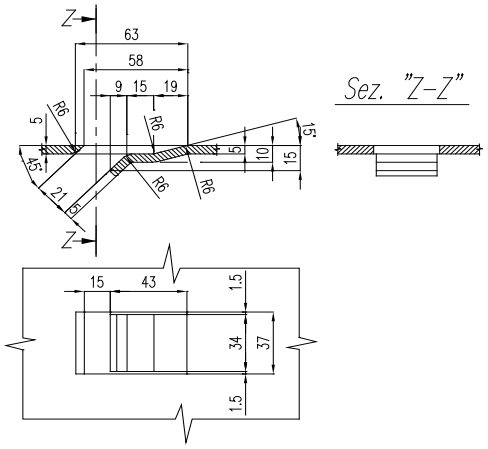
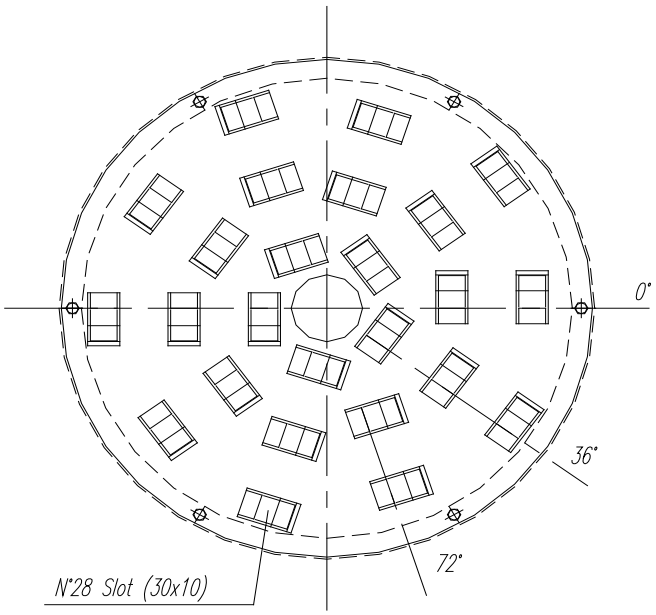
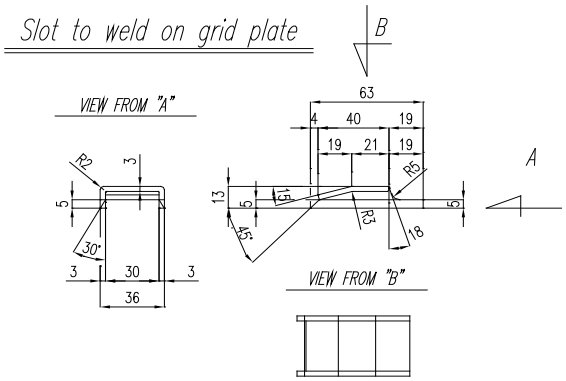


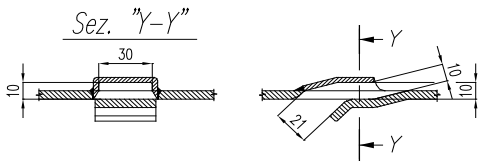
Plate distributor drawing

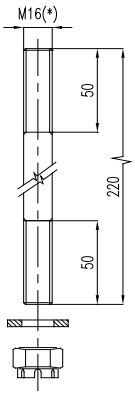


Slot to weld on grid plate



Slot assemblage drawing





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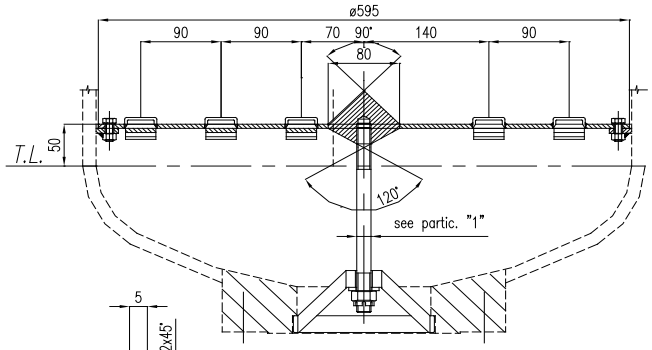

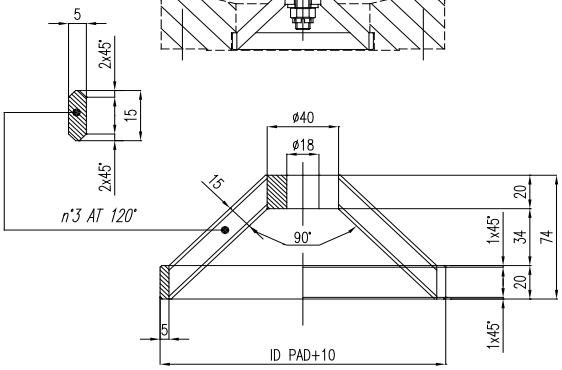

*) To be define by supplier

Side View

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General Notes:

1- SHALL BE VERIFIED BY VENDOR
2- ALL DIMENSIONS ARE IN MILLIMETER, UNLESS OTHERWISE NOTED
3- NOZZLE CHARACTERISTICS SHALL BE VERIFIED BY VENDOR
4- THICKNESSES, WEIGHTS AND LOADS ARE INDICATED FOR ESTIMATION PURPOSE ONLY ; THE MANUFCTURER SHALL CONFIRM THESE ITEMS AND IS RESPONSIBLE FOR MECHANICAL DESIGN.
5- SHALL BE SPECIFIED BY VENDOR .
6- ALL WELDED ATTACHMENTS TO THE VESSEL TO BE SUPPLIED BY THE VESSEL MANUFACTURER .
7- ALL NDT (RT, UT AND PT/MT) SHALL BE PERFORMED BEFORE AND AFTER PWHT .
8- LOCATION AND NUMBER OF LIFTING LUGS ON REACTOR SHALL BE SPECIFIED ON VENDOR DRAWINGS.
9- SETTING BOLTS SHALL BE HOT DIP GALVANIZED.
10- SHELL/NOZZLE THICKNESS AT CONNECTION/ATACHMENT AREA SHALL BE VERIFIED BY LOCAL CALCULATION.
11- INTERNAL FINISHING SHALL BE SMOOTH FINISH Ra=0.4μm (16μinch)
12- FINISHING OF THE GASKET CONTACTING FACE SHALL BE SMOOTH FINISH Ra=6.3μm (250μinch)

PROJECT:PP-PE PILOT PLANT	Client: شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی
TITLE:Data Sheet for 2st Gas phase reactor(R -421)	

Data Sheet for
2st Gas phase reactor(R -421)

	Document No.:400-DAS-A4-EQ-0098	Rev. : 02
	Owner Job No.:	Type: DAS
		Page : A

PROJECT:PP-PE PILOT PLANT	**Client:**
TITLE:Data Sheet for 2st Gas phase reactor(R -421)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

REV. / PAGE	0	1	2	3	4	5	REV. / PAGE	0	1	2	3	4	5
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Revision	**Date**	**Prepared By**	**Checked By**	**Approved By**	**Status**

	Document No.:400-DAS-A4-EQ-0098	**Rev. : 02**
	Owner Job No.:	**Type: DAS**
		Page : B

PROJECT:PP-PE PILOT PLANT

Client:

شرکت ملی صنایع پتروشیمی
شرکت پژوهش و فناوری پتروشیمی

TITLE:Data Sheet for 2st Gas phase reactor(R -421)

Item No.:R-421 Quantity: 1 Location: Outdoor Service: Continuous

DESIGN CONDITIONS

		Vessel	Jacket	Internal Coil
Operating Temperature(Min./Max.)	^{0}C	-30 / +80	-/-	-/-
Operating Pressure	barg	24	-	-
Density	kg/m^3	500	-	-
Design Pressure(int./ext.)	barg	32	-/-	-/-
Design Temperature	^{0}C	-60/+180	-/-	-/-
Volume(total)	m^3	5.4	-	-
Hydro Test Pressure	barg	as per UG99b(33)	-	-
Corrosion Allowance(shell/head)	mm	0/0	-/-	-/-
Level during operation(min/max)	mm	50 / 2200	-/-	-/-
Content @ normal operation		Hydrocarbons+Polymer	-	-
Thickness(shell/head)	mm	15/24	/	/
Welding Radiography(shell/head)	%	Full / Full	-/-	-/-
Joint Efficiency(shell/head)		1 / 1	-/-	-/-
Top Head Type		2:1 Elipsoidal	-	-
Bottom Head Type		2:1 Elipsoidal	-	-

Design code:	ASME SEC. VIII DIV.1	Inspection code:	ASME SEC. IX
Cylinder Deminsion(IDxT.L-T.L):	900(1500) X 4300 mm	Lethal Service:	○ Yes ● No
M.D.M.T @ D.P:	-60 ^{0}C	M.A.T:	- ^{0}C
M.A.W.P:	- barg Limted by: -	Stamp:	Not Required
Impact Test:	Not Required	P.W.H.T:	Not Required
N.D.T:	Required	Vessel linning detail:	NIL
HIC/SSC resistance:	NA / NA	Painting & Coating:	NIL
Insulation thickness:	60 mm	Insulation type:	HOT
Fireproofing :	2 NO	Vessel located on:	Structrue
Seismic code:	UBC 1997	Seismic Zone:	3
Impotance factor:	1.25	Soil Profile:	SD
Wind code:	UBC	Wind velocity:	120 km/hr @ 10 m
Impotance factor:	1.15	Exposure:	C

Support loading data(Note 5)		
	Earthquake	Wind
Shearing load(kgf)	-	-
Moment(kg.m)	-	-

Weight(kg) (Note 5)		
Fabricated:	-	
Empty:	6400	
Test:	-	
Operation:	-	

MISCELLANEOUS(Note 6)

○ Baffle	○ Impingement plate	○ Weir plate
○ Diffuser	● Distributer	○ Trunnion
○ Vortex breaker	○ Tubesheet	○ Template
○ Boot / Cap	○ Demister	● Pickling & passivation
● Insulation Support	○ Wire mesh	● Earthing boss
○ Fire Proofing	● Name plate	● Dip pipe
○ Fire Proofing Support	○ Internal lining	
○ Ladder & platform (int. & ext.)	○ Sand blast & painting	
○ Heating coil	● Internal clips	
● Lifting lug	● External clips	

PROJECT:PP-PE PILOT PLANT	Client:
TITLE:Data Sheet for 2st Gas phase reactor(R -421)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

MATERIALS(NOTE 1)

Shell(Main/Jacket)		SA240-304L / NA		Earth lug	SA240-316L
Head(Main/Jacket)		SA240-304L / NA		Stiffening rings	SA240-304L
Nozzle Necks (Main/Jacket)	Plate	- / -		Gasket	SPIRAL WOUND
	Pipe	SA312-304L / NA		Ext. bolt/Nuts	SA193-B7/SA194-2H
Cladding		-		Int. bolt/Nuts	SA193-BB/SA194-8
Nozzle flanges		SA182-304L		Wire mesh	NA
Blind flanges		SA182-304L		Welded clip	SA240-304L
Reinforcing pad		SA240-304L		Int. welded	SA240-304L
Fitting		SA403-304L		Int. removable	SA240-304L
Support	Leg	NA		Anchor/Setting bolts	SA307-B
	Lug	SA283-C		Ladder/Platform	NA
	leg/lug pad	SA240-304L		Insulation Material	MINERAL WOOL
Lifting lug		SA240-304L			

NOZZLE DETAILS(NOTE 3)

Item	NPS (Inch)	Flanges			SCH. /THK. (NOTE 5)	Service	Proj.	Rein. PAD (NOTE 5)		Standards	Remarks
		Rating	Type	Face				O.D.	Thk.		
Top Head		2									
P1	10"	400#	LF	PAD	-	Gas Outlet	see Dwg	-	-	ANSI B16.5	
P2	1 1/2"	400#	RF	WN	XXS	Vent	see Dwg	-	-	ANSI B16.5	
P3	1"	400#	RF	WN	160	Monomers Inlet	see Dwg	-	-	ANSI B16.5	
P4	3"	400#	RF	WN	40S	Spare	see Dwg	190	22	ANSI B16.5	With blind flange
P5	3"	400#	RF	WN	40S	Spare	see Dwg	190	22	ANSI B16.5	With blind flange
K1	2"	400#	LF	PAD	-	PRC Connection	see Dwg	-	-	ANSI B16.5	
Shell		2									
P6	3"	400#	RF	WN	40S	Product Inlet	see Dwg	190	15	ANSI B16.5	With pipe Inlet 2"
P7	3"	400#	RF	WN	40S	Spare	see Dwg	190	15	ANSI B16.5	With blind flange
P8	1"	400#	RF	WN	160	Propane Inlet	see Dwg	-	-	ANSI B16.5	
P9	2"	400#	LF	PAD	-	Product Discharge	see Dwg	-	-	ANSI B16.5	
P10	2"	400#	LF	PAD	-	Product Discharge	see Dwg	-	-	ANSI B16.5	
P11	1"	400#	LF	PAD	-	Discharge to Sampling	see Dwg	-	-	ANSI B16.5	
P12	1 1/2"	400#	LF	PAD	-	Direct Discharge	see Dwg	-	-	ANSI B16.5	(See H-422)
P13	1 1/2"	400#	LF	PAD	-	Spare	see Dwg	-	-	ANSI B16.5	With blind flange
K2a	4"	400#	RF	LWN	t=22.225	Dpcelle	see Dwg	-	-	ANSI B16.5	
K2b	4"	400#	RF	LWN	t=22.225	Dpcelle	see Dwg	-	-	ANSI B16.5	
Bottom Head		2									
P14	8"	400#	LF	PAD	-	Gas Inlet	see Dwg	-	-	ANSI B16.5	

PROJECT:PP-PE PILOT PLANT	**Client:**
TITLE:Data Sheet for 2st Gas phase reactor(R -421)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

NOZZLE LOADING DATA(NOTE 4)

Nozzle Name	FL (kN)	FA (kN)	FC (kN)	MC (N.m)	MT (N.m)	ML (N.m)
P1	1428	1428	1071	714	1071	928
P4	429	429	322	65	97	84
P5	429	429	322	65	97	84
P6	429	429	322	65	97	84
P7	429	429	322	65	97	84
P14	1142	1142	857	457	686	594

REFRENCE DOCUMENTS

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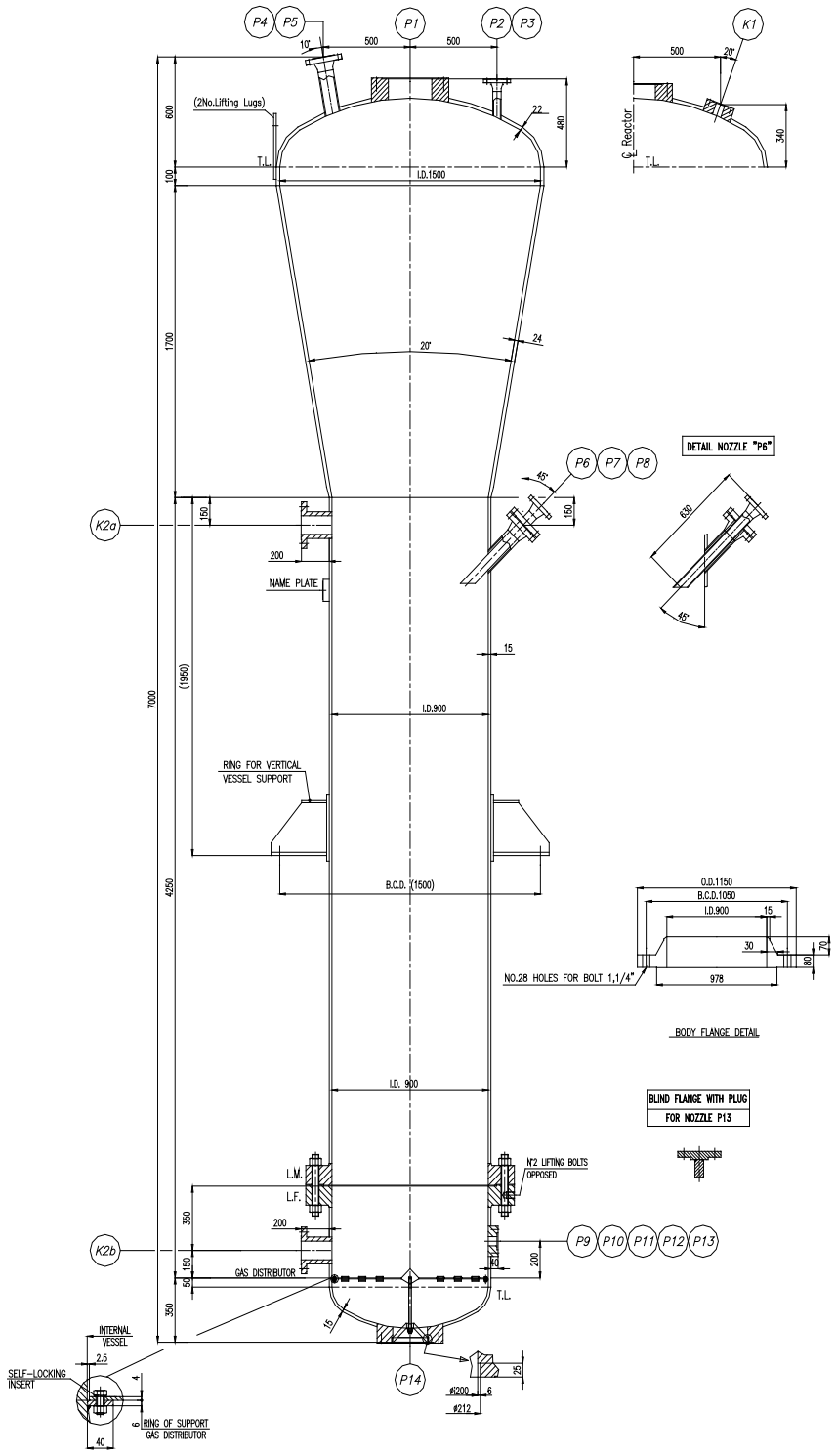
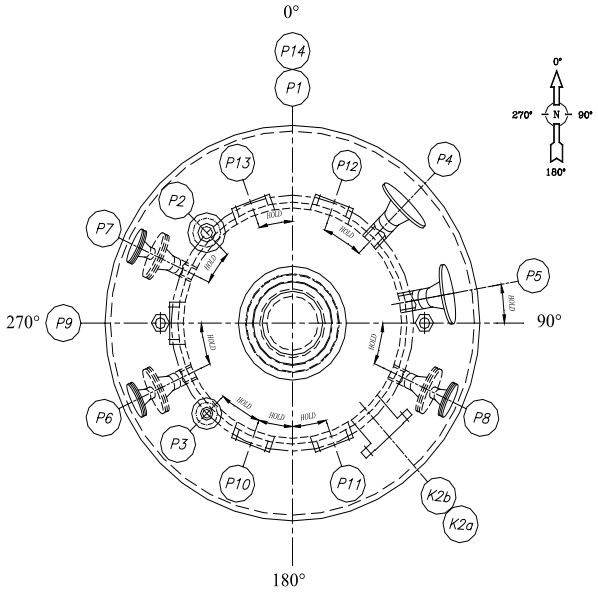


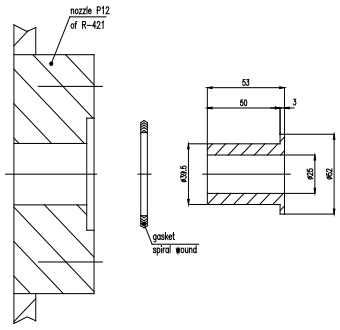
(**)Thickness shall be specified by vendor.

Side View



Orientation (HOLD)

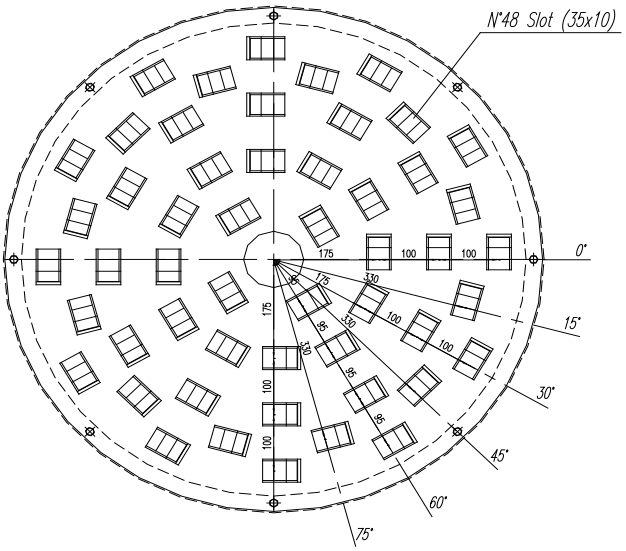
H-422
detail



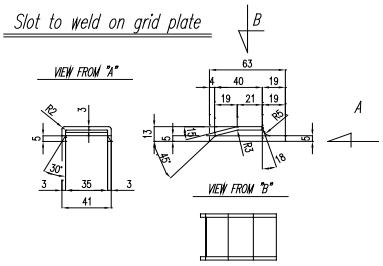
Notes

Material: Stainless Steel

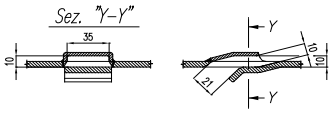
Plate distributor drawing

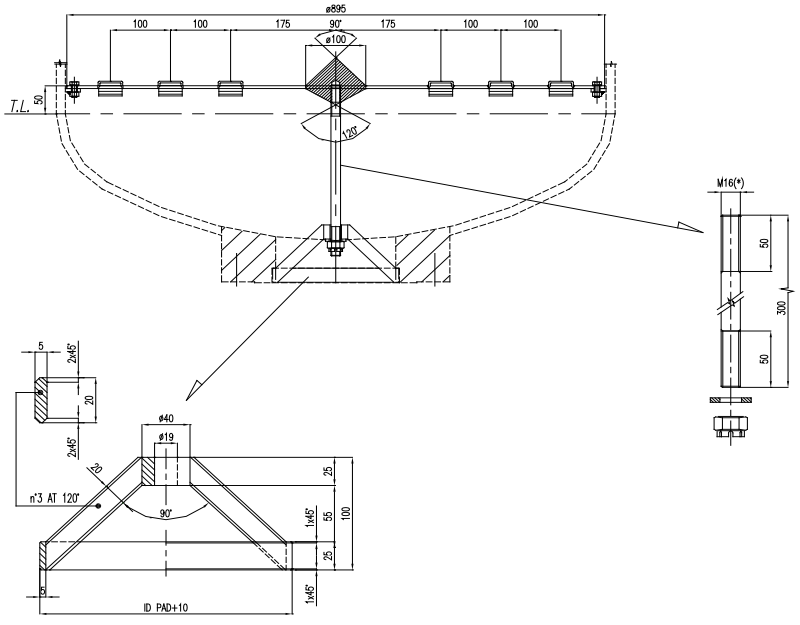


Slot to weld on grid plate

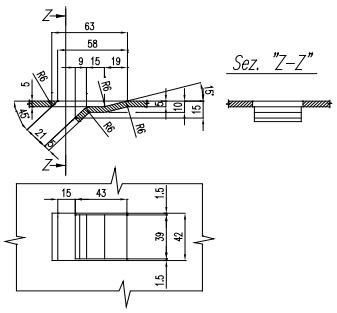


Slot assemblage drawing





Holes on grid plate



General Notes:

1- SHALL BE VERIFIED BY VENDOR
2- ALL DIMENSIONS ARE IN MILLIMETER, UNLESS OTHERWISE NOTED
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10- SHELL/NOZZLE THICKNESS AT CONNECTION/ATACHMENT AREA SHALL BE VERIFIED BY LOCAL CALCULATION.
11- INTERNAL FINISHING SHALL BE SMOOTH FINISH Ra=0.4μm (16μinch)
12- FINISHING OF THE GASKET CONTACTING FACE SHALL BE SMOOTH FINISH Ra=6.3μm (250μinch)

Table 6. Tower

Items	Tag ID.	Description
24	T-351	PROPANE RECOVERY TOWER
Numbers		**1**

PROJECT:PP-PE PILOT PLANT	Client: شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی
TITLE:DATA SHEET FOR PROPANE RECOVERY TOWER (T-351)	

DATA SHEET FOR
PROPANE RECOVERY TOWER (T-351)

Licensor:	Document No.: 300-DAS-A4-EQ-0164	Rev. : 00
	Owner Job No.:	Type: DAS
		Page : A

PROJECT:PP-PE PILOT PLANT	**Client:**
TITLE:DATA SHEET FOR PROPANE RECOVERY TOWER (T-351)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

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3	X												
4	X												
5	X												
6	X												
7	X												

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1					
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Revision	**Date**	**Prepared By**	**Checked By**	**Approved By**	**Status**

Document Revision

Licensor:	**Document No.: 300-DAS-A4-EQ-0164**	**Rev. : 00**
	Owner Job No.:	**Type: DAS**
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PROJECT:PP-PE PILOT PLANT					**Client:**		
TITLE:DATA SHEET FOR PROPANE RECOVERY TOWER (T-351)					شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی		
1	**Item No.:T-351**	**Quantity: 1**	**Location: Outdoor**	**Service: Continuous**			
2	**DESIGN CONDITIONS**						
3							
4	○ Gaseous	○ Liquid	○ Solid	○ Combustible	○ Explodable	○ Toxic	
5	Process fluid	See Note 8		**Packing Data**			
6	Composition	See Note 8		Type	RASCHING Rings		
7	Density kg/m^3	46		Dimensions (inch)	3/4		
8	Dynamic viscosity cP	0.01		Number	5		
9	Operating temperature ^{0}C	-30/105		Height of bed mm	2000		
10	Operating pressure barg	20					
11	Design temperature ^{0}C	-60/+230					
12	Design pressure barg	31					
13	Test Pressure barg	as per UG99b: 33					
14	Type of Support						
D	Volume m^3	1.3					
16	**Tray Data**						
17	Type	NA					
18	Number	NA					
19							
20	Design code:	ASME SEC. VIII DIV.1		Inspection code:	ASME SEC. IX		
21	Cylinder Deminsion(IDxT.L-T.L):	350 x 13297 mm		Lethal Service:	○ Yes	● No	
22	M.D.M.T @ D.P:	-60 ^{0}C		Thickness(shell/head):	2 10/10 mm		
23	M.A.W.P: - barg	Limted by: -		Stamp:	Not Required		
24	Impact Test:	Not Required		P.W.H.T:	Not Required		
25	N.D.T:	Required		Vessel linning detail:	NIL		
26	HIC/SSC resistance:	NA / NA		Painting & Coating:	as per code		
27	Insulation thickness:	30 mm		Insulation type:	HOT		
28	Fireproofing :	YES		Vessel located on:	Structrue		
29	Seismic code:	UBC 1997		Seismic Zone:	3		
30	Importance factor:	1.25		Soil Profile:	SD		
31	Wind code:	UBC		Wind velocity:	120 km/hr @ 15 m		
32	Importance factor:	1.15		Exposure:	C		
33	**Support loading data(Note 6)**			**Weight(kg) (Note 6)**	Fabricated:		
34		Earthquake	Wind		Empty:	2200	
35	Shearing load(kgf)	450	320		Test:		
36	Moment(kg.m)	500	400		Operation:		
37	**MISCELLANEOUS(Note 7)**						
38							
39	○ Baffle	● Impingement plate		○ Weir plate			
40	○ Diffuser	● Distributer		○ Trunnion			
41	○ Vortex breaker	○ Tubesheet		○ Template			
42	○ Boot / Cap	○ Demister		● Pickling & passivation			
43	● Insulation Support	○ Wire mesh		● Earthing boss			
44	○ Fire Proofing	● Name plate		● Dip pipe			
45	○ Fire Proofing Support	○ Internal lining					
46	○ Ladder & platform (int. & ext.)	○ Sand blast & painting					
47	○ Heating coil	● Internal clips					
48	● Lifting lug	● External clips					

Licensor:	**Document No.: 300-DAS-A4-EQ-0164**	**Rev. : 00**
	Owner Job No.:	**Type: DAS**
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PROJECT:PP-PE PILOT PLANT	Client:
TITLE:DATA SHEET FOR PROPANE RECOVERY TOWER (T-351)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

MATERIALS (NOTE 2)

4	Shell(Main/Jacket)		SA240-304L / -	Earth lug	SA240-316L
5	Head(Main/Jacket)		SA240-304L / -	Stiffening rings	-
6	Nozzle Necks	Plate	NA / -	Gaskets	Spiral Wound
7	(Main/Jacket)	Pipe	SA312-304L / -	Ext. bolt/Nuts	SA193-B7/SA194-2H
8	Cladding		-	Int. bolt/Nuts	SA193-BB/SA194-8
9	Nozzle flanges		SA182-304L	Wire mesh	-
10	Blind flanges		SA182-304L	Welded clip	SA240-304L
11	Reinforcing pad		SA240-304L	Int. welded	SA240-304L
12	Fitting		SA403-304L	Int. removable	SA240-304L
13	Support	Leg	SA285-C	Anchor/Setting bolts	SA307-B
14		Lug	SA283-C	Ladder/Platform	-
DA		leg/lug pad	SA240-304L	Insulation Mateial	MINERAL WOOL
16	Lifting lug		SA240-304L	Packing	SA240-316L
17	Packing Support		SA240-304L		

NOZZLE DETAILS (NOTE 3,4)

21 Item	NPS (Inch)	Flanges Rating	Type	Face (note 10)	SCH. /THK.	Service	Proj.	Rein. PAD Width	Rein. PAD Dia.	Standards	Remarks
Top Head											
P1	2"	300#	WN	RF	80S	Gas Outlet	See dwg	-	-	ANSI B16.5	
P10	2"	300#	WN	RF	80S	For PSV	See dwg			ANSI B16.5	
Shell											
P2	2" / 1"	300#	WN	RF	80S	Liquid Inlet	350	-	-	ANSI B16.5	With dip Pipe 1"
P3	2 1/2" / 1 1/2"	300#	WN	RF	80S	Gas Inlet	350	32	-	ANSI B16.5	with dip Pipe 1 1/2"
P4	2 1/2" / 1 1/2"	300#	WN	RF	80S	Gas Inlet	350	32	-	ANSI B16.5	with dip Pipe 1 1/2"
P7	2 1/2" / 1 1/2"	300#	WN	RF	80S	Vapor to Tower	See dwg	-		ANSI B16.5	with dip Pipe 1 1/2"
K1	1"	300#	WN	RF	80S	Temperature Transmitter	See dwg	-	-	ANSI B16.5	
K2	1"	300#	WN	RF	80S	Temperature Transmitter	350	-	-	ANSI B16.5	
K3	1"	300#	WN	RF	80S	Temperature Transmitter	350	-	-	ANSI B16.5	
P11	1" / 1/2"	300#	WN	RF	80S	Pump Outlet	350			ANSI B16.5	
P9	1"	300#	WN	RF	80S	Level Transmitter	See dwg			ANSI B16.5	
Bottom Head											
P5	1/2"	300#	WN	RF	80S	Liquid Outlet	See dwg	-	-	ANSI B16.5	
P6	1"	300#	WN	RF	80S	Liquid to Reboiler	See dwg			ANSI B16.5	
P8	1"	300#	WN	RF	80S	Level Transmitter	See dwg			ANSI B16.5	
K4	1"	300#	WN	RF	80S	Temperature Transmitte	See dwg			ANSI B16.5	

PROJECT:PP-PE PILOT PLANT	**Client:**
TITLE:DATA SHEET FOR PROPANE RECOVERY TOWER (T-351)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

NOZZLE LOADING DATA(NOTE 6)

Nozzle Name	FL (kgf)	FA (kgf)	FC (kgf)	MC (kg.m)	MT (kg.m)	ML (kg.m)
P1(2")	286	286	215	29	43	37
P2(1")	286	286	215	29	43	37
P3(1 1/2")	286	286	215	29	43	37
P4(1 1/2")	429	429	322	65	97	84

REFRENCE DOCUMENTS

No.	Document No.	Document Title
1	400-PID-A1-PR-0036	PROPANE RECOVERY
2		
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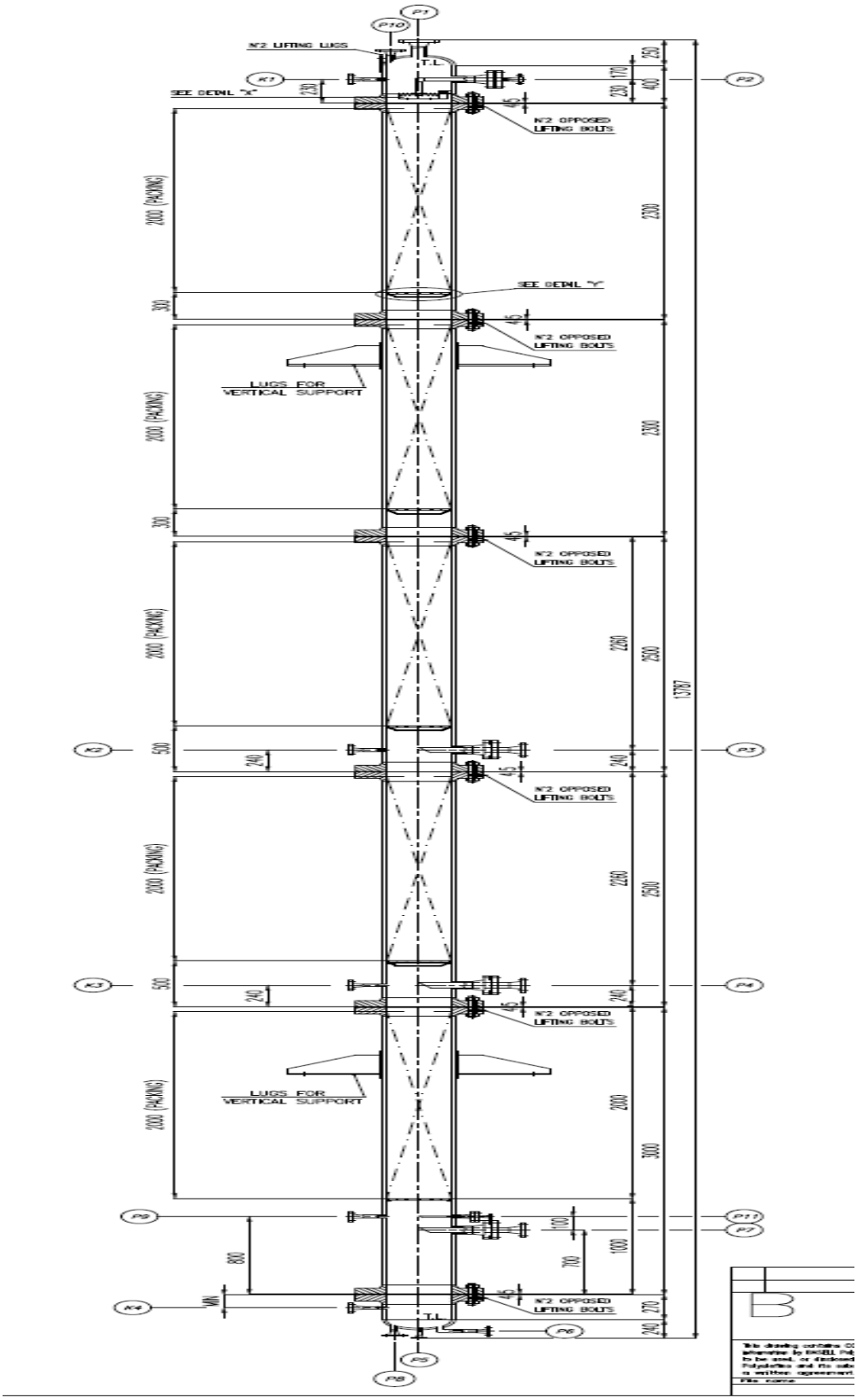
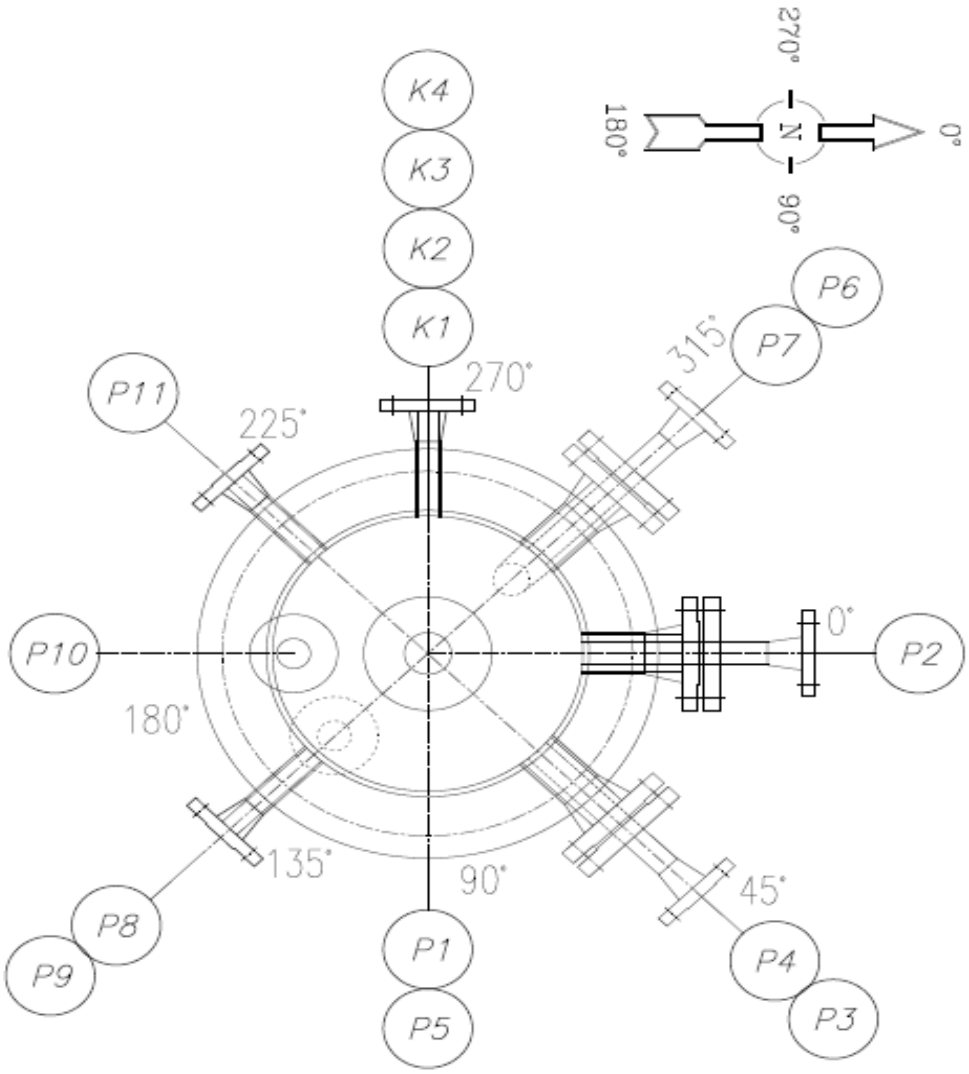

N°2 LIFTING LUGS
SEE DETAIL "X"
N°2 OPPOSED LIFTING BOLTS
SEE DETAIL "Y"
LUGS FOR VERTICAL SUPPORT
2000 (PACKING)
13787

PROJECT:PP-PE PILOT PLANT	Client: شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی
TITLE:DATA SHEET FOR PROPANE RECOVERY TOWER (T-351)	



ORIENTATION VIEW

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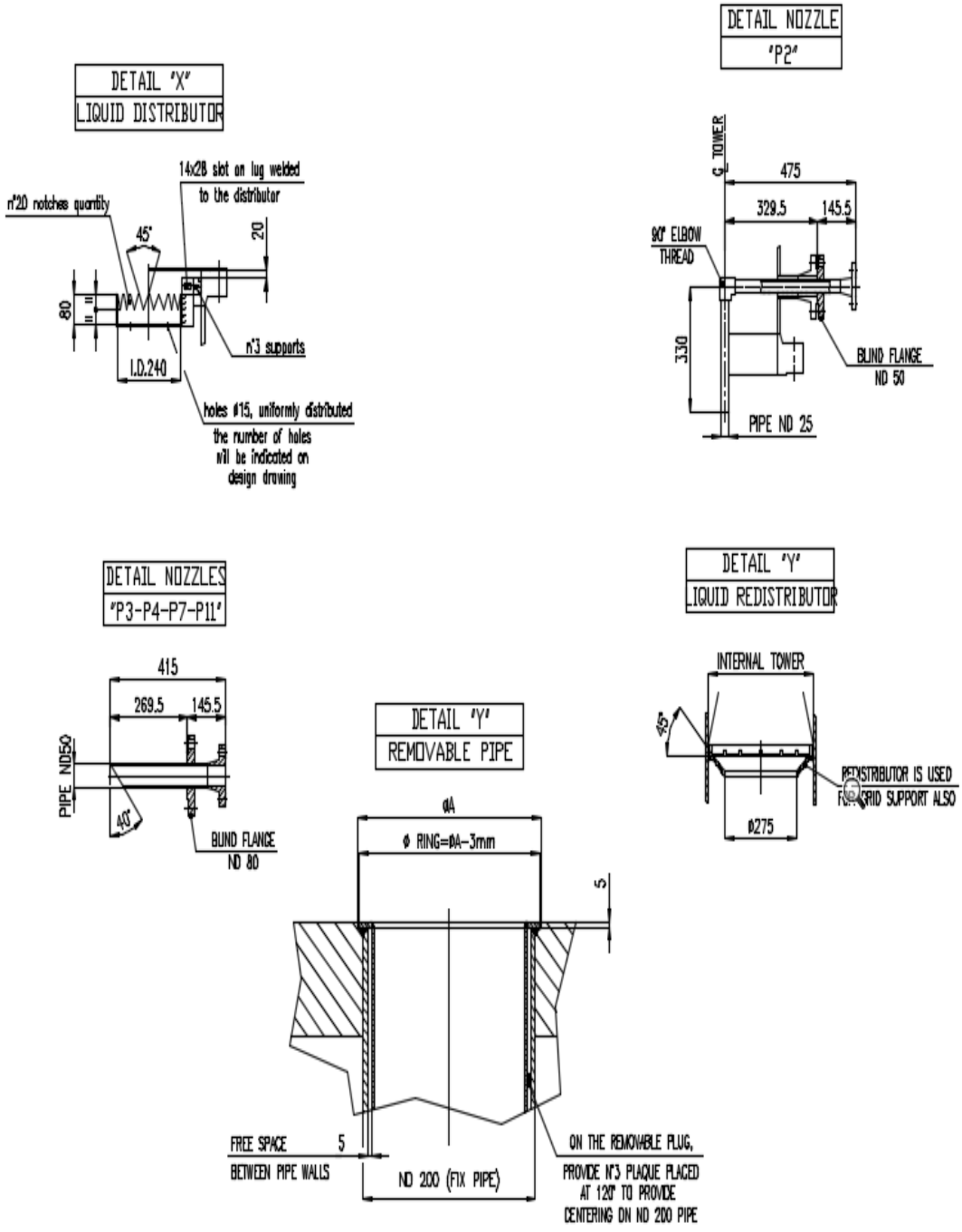
DETAIL "X"
LIQUID DISTRIBUTOR
14x28 slot on lug welded to the distributor
n°20 notches quantity
45°
20
80
n°3 supports
I.D.240
holes ø15, uniformly distributed
the number of holes will be indicated on design drawing
DETAIL NOZZLE
"P2"
C. TOWER
475
329.5
145.5
90° ELBOW THREAD
330
BLIND FLANGE ND 50
PIPE ND 25
DETAIL NOZZLES
"P3-P4-P7-P11"
415
269.5
145.5
PIPE ND50
45°
BLIND FLANGE ND 80
DETAIL "Y"
REMOVABLE PIPE
øA
ø RING=øA-3mm
5
FREE SPACE 5
BETWEEN PIPE WALLS
ND 200 (FIX PIPE)
ON THE REMOVABLE PLUG,
PROVIDE N°3 PLAQUE PLACED AT 120° TO PROVIDE CENTERING ON ND 200 PIPE
DETAIL "Y"
LIQUID REDISTRIBUTOR
INTERNAL TOWER
45°
ø275
REDISTRIBUTOR IS USED FOR GRID SUPPORT ALSO

General Notes:

1- SHALL BE SPECIFIED BY VENDOR.
2- SHALL BE VERIFIED BY VENDOR
3- ALL DIMENSIONS ARE IN MILLIMETER, UNLESS OTHERWISE NOTED
4- NOZZLE CHARACTERISTICS SHALL BE VERIFIED BY VENDOR
5- SETTING BOLTS SHALL BE HOT DIP GALVANIZED.
6- THICKNESSES, WEIGHTS AND LOADS ARE INDICATED FOR ESTIMATION PURPOSE ONLY ; THE MANUFCTURER SHALL CONFIRM THESE ITEMS AND IS RESPONSIBLE FOR MECHANICAL DESIGN.
7- ALL WELDED ATTACHMENTS TO THE VESSEL TO BE SUPPLIED BY THE VESSEL MANUFACTURER .
8-PROPANE 80% MIN.; ETHYLENE 10% MIN; HYDROCARBONS
9-FOR DETAIL REBOILER SEE REBOILER DATASHEET
10- FINISHING OF THE GASKET CONTACTING FACE: SMOOTH FINISH RA=3.2μM(125μINCH)
PROPANE RECOVERY TOWER (T-351)
12- PACKING TYPE : RASCHING RINGS 3/4"

National Petrochemical Company
Petrochemical Research & Technology Co.

PP-PE Pilot Plant

Title: Engineering Specification for Site Conditions

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Rev	Date	Prepared By	Checked By	Approved By	Approved By	Statues
		Discipline		PEM	PM	
5						
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0	12 Apr. 2021	M.Asgari	M.Nazeri Nasab	M.Asadi	N.Nouhjah	IFA

Document Revisions

Engineering Specification
for
Site Conditions

1. GENERAL

This engineering specification covers general information regarding site data and climatic conditions. The equipment supplied must be able to withstand the ambient conditions as described below for transport, storage and operation of the plant.

2. DEFINITIONS/ABBREVEATIONS

OWNER	Petrochemical Research & Technology Company
VENDOR	Companies Awarded by Owner for Procurement Services, Inspection Affairs or Transportation, Providing of Project's goods, following up all transport activities from VENDOR workshop to final destination as defined in the purchase order.
EQUIPMENT	Means any equipment, material and components to be permanently installed in the PLANT and special tools, test equipment and erection-, pre-commissioning-, commissioning-, start-up-, two years- and capital-spare-parts
CONTRACT	Means contract between OWNER and VENDOR
PURCHASE ORDER	Means document of commitment between Owner and VENDOR for the supply of EQUIPMENT
PLANT	Means the area within battery limits
SITE	Means the area NPC-RT, ARAK/IRAN

3 LOCATION

The town of Arak is situated about 300 km south-west of Tehran/Iran.
The site for NPC-RT Complex is located 22 km South-west of Arak.

4 SITE CONDITION

Materials shall be protected against corrosion during transit as necessary, when required, materials shall be painted or Coated in accordance with Particulars Contained in the purchase order and/or specification.

4.1 Temperature

- Ambient Temperature	
• Highest maximum on record	44°c
• Lowest minimum on record	-28°c
- Design temperature	
• Process design dry bulb	Max. 40°c Min. -16°c
• Process design wet bulb	21°c
• Mechanical design of equipment, steel structures, civil works,	Max. 44°c Min. –28
• Design temperature for outdoor electrical and instrument equipment	50°c
• Design temperature for air coolers	40°c
• Winterizing	-21°c
• Design temperature for equipment exposed to sunlight	83°c
• Soil temperature for cable sizing	30°c
• Design temperature for electrical equipment in substations	45°c
• Design temperature for chillers and condensing unit refrigeration	40°c

4.2 Humidity

- relative in January	Max. 86%

4.3 Barometric Pressure

• Min. / Max.	802 / 818 millibars
• Average	810 millibars

4.4 Rainfall

- Design	Max. 80 mm (24 hours) Max.40mm (1 hour)
- Sewer design	40 mm/h

Rainy season months are November through April.

4.5 Snow

- Snow load 175 kg/m^2

4.6 Wind

- Prevailing wind direction West-East
- Wind velocity at 10 m above grade 120 km/h max .
- Wind loads as per UBC 1985 edition chapter 23 vol. 1.

Wind force "H"–The wind force shall be computed as the product of the design wind pressure "P",the project area of the windward face "A",the appropriate shape factor "C" , and the standard projected area increase factor "I".

Thus H = PACI

Where H = Wind Force (kg)
P = Design Wind Pressure (kg/m^2) (see table 2.1)
A = Projected Area of the Windward Face (m^2)
C = Shape Factor (see table 2.2)
I = Project Area Increase Factor (see table 2.2)

Table 2.1 - Design Wind Pressure "p"

Height Zone (M.)	"p" Kg/m^2
0-10	100
10-20	120
20-30	133
30&up	150

Table 2.2-Factor "I"

Surface	Typical use	C	I
Cylindrical	Process vessels		
24" thru. 30" Dia.		0.6	1.50
36" thru. 48" Dia.		0.6	1.37
54" thru. 72" Dia.		0.6	1.28
78" thru. 96" Dia		0.6	1.20
102" and up		0.6	1.18
Spherical	Storage vessels (any diameter)	0.6	1.1
Flat	Closed structure	1.0	1.0
Steel or concrete open structure:			
Wind normal to one of the sides		2.2	1.0
Wind acting on corners:			

- 3 cornered structures	2.2	1.0
- 4 cornered structures	2.4	1.0
- Individual elements:		
Cylindrical sections with diameter equal to or less than 2 inches	0.8	1.0
Flat or angular section	1.3	1.0

4.7 Design data for Air Conditioning

4.7.1 Summer

- Technical offices and control rooms

  - Indoor required temp. (dry bulb) 25 °c ± 1°c
  - Relative humidity 50% ± 5%

- Electrical Substations
  - Indoor required temp. (dry bulb) 35 °c ± 1°c
  - Relative humidity 50% ± 10%

- Outdoor temperature (dry / wet bulb) 37/21°c

4.7.2 Winter

- Technical Offices and control Rooms
  - Indoor required temp. (dry bulb) 22 °c ± 1 °c
  - Relative humidity 45% ± 5%
- Electrical Substations
  - Indoor required temp. (dry bulb) 2 °c min.

1

- Outdoor temperature -16 °c

4.7.3 Fresh Air Changes

- Minimum for air conditioning system	25 m^3/h person
- Sanitary rooms	37 m^3/h m^2 surface
- Battery rooms	15 cph
- Kitchens	15 cph
- Toilets	20 cph

4.7.4 Pressurization

- Technical offices, control rooms electrical substation	5 mm w.g.
- Closed warehouses	2 mm w.g.
- Cold storage warehouses	3 mm w.g.

4.8 Earth Quake

Seismic factor in accordance with zone 3 of UBC , latest edition.

4.9 Others

- Frost line	:	1.0 m below grade level
- Water table	:	Approx. 15 m below grade level
- Thunder and lighting	:	To be considered
- Sand storm	:	To be considered
- Altitude above sea level	:	1888.48 m
- Ground resistivity	:	400 Ohm.m

5 SPECIFICATION OF UTILITIES

Run- off coefficients shall be as follows:

- Buildings and shelter roof	1.00
- Asphalt roads and yards concrete paved areas	0.85
- Macadamized roadways	0.40
- Unpaved areas	0.20

Unless otherwise deduced from soil report.

6 ELECTRICAL POWER SPECIFICATIONS

* Circuit Voltage

- A. C. control circuit

Voltage : 400 Volt

Frequency: 50Hz

Phase: ■ 3-phase ☐ single-phase

Wire: ■ 3-wire ☐ 2-wire

*Instrument circuit

A.C.

Voltage: 110 Volt

Frequency: 50Hz

Phase: ☐ 3-phase ■ single-phase

Wire: ☐ 3-wire ■ 2-wire

D.C.

Voltage: 24 Volt

Item	Tag ID.	Description	Diameter mm	Hight L	L/D	Operating Pressure bar	Design Pressure bar	Operating Temperature C	Design Temperature C	Weight KG	Thickness mm	Material
1	CY-251	LOOP PREPOLY (60 LT) SAMPLING CYCLONE	168 mm	9.4	50	30	45	-30/+20	-60/180	99.1	8	SA312-304L
2	CY-261	LOOP PREPOLY (200 LT) SAMPLING CYCLONE	168	9.4	50	30	45	-30/+60	-60/180	99.1	8	SA312-304L
3	CY-411	1ST G.P.R. PRC CONTROL PURGING CYCLONE	142	5.6	44	24	32	-30/+80	-60/180	66	7	SA312-304L
4	CY-412	1ST G.P.R. SAMPLING CYCLONE	168	7.6	36	24	32	-30/+80	-60/180	110	8	SA312-304L
5	CY-421	2ND G.P.R. PRC CONTROL PURGING CYCLONE	142	5.6	44	24	32	-30/+80	-60/180	66	7	SA312-304L
6	CY-422	2ND G.P.R. SAMPLING CYCLONE	168	7.6	36	24	32	-30/+80	-60/180	110	8	SA312-304L
7	HP-421	2ND G.P.R. FEEDING HOPPER	300	62	4.2	24	32	-30/+80	-60/180	285	9.5	SA312-304L
8	HP-422	2ND G.P.R. DISCHARGE HOPPER	324	65	3.9	24	32	-30/+80	-60/180	295	9.5	SA312-304L
9	HP-423	2ND G.P.R. DISCHARGE HOPPER	324	65	3.9	24	32	-30/+80	-60/180	290	9.5	SA312-304L
10	V-342	Hexene unloading hydraulic guard	273	33	2.1	Atm	6	Amb	-30/120	170	9.3	SA312-304L
11	D-351	T-351 recycle pump drum	400	125	2.5	20	31	-30/+105	-60/230	220	12	SA240-304L
12	V-401	C-401 Suction Drum	600	310	2	1.5	35	-30/+50	-60/180	450	14	SA240-304L
13	V-402	C-401 Discharge Drum	600	310	2	27	35	-30/+75	-60/180	450	14	SA240-304L
14	E-351	Propane recovery condenser	307	140	6	20	31	-30/+55	-60/+230	515	10	SA-312 TP304
15	E-352	Tower 351 Reboiler	352	85	3	20	31	-30/+120	-60/+230	520	10	SA-312 TP304
16	E-411	1st G.P.R. gas cooler	298.5	370	17	19	44	-30/+80	-60/180	1600	13	SA-312 TP304
17	E-421	2nd G.P.R. gas cooler	400	600	12	25	45	-30/+80	-60/180	3000	13	SA-312 TP304
18	R-211	Precontact Pot (1.5 lt)	100	1.5	1.8	30	65	-30/+20	-60/180	90	10	SA182-304L
19	R-221	Precontact Pot (7 lt)	160	7	2	30	65	-30/+20	-60/180	130	10	SA240-304L
20	R-251	Loop prepoly (60 lt)	102	60	27	30	45	-30/+40	-60/180	550	6	SA240-304L
21	R-261	Loop prepoly (200 lt)	146	200	36	30	45	-30/+40	-60/180	1700	11	SA240-304L
22	R-411	1st Gas phase reactor	600	1730	5.4	24	32	-30/+80	-60/180	2200	10	SA240-304L
23	R-421	2nd Gas phase reactor	900	5400	4.8	24	32	-30/+80	-60/180	6400	15	SA240-304L
24	T-351	PROPANE RECOVERY TOWER	350	1300	39	20	31	-30/+105	-60/+230	2200	10	SA240-304L