



Toase-ehe Park Sanati Gohar Ofogh Petrochemical Co.

**CONCEPTUAL, BASIC and DETAIL DESIGN
ENGINEERING OF STYRENE PARK OFFSITE**

Document Title: Mechanical Datasheet For Styrene Vent Blower

Document No. : EI027-000-ED-ME-DSH-505



BINA EPC Contractor Co.
(Executor of Oil, Gas, Petrochemical & Power Industries)

Rev. R2

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STYREN PARK OFFSITE

Document Title:

MECHANICAL DATA SHEET FOR STYRENE VENT BLOWER

Rev.	Issued Date	DESCRIPTION	PREPARED	CHECKED	APPROVED
R2	28-Jul-20	FINAL ISSUE (FI)	E. Parnianchi	S. Behniyafar	R. Memar
R1	6-Jun-20	FINAL ISSUE (FI)	E. Parnianchi	S. Behniyafar	R. Memar
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Page	Revisions							Page	Revisions						
	R0	R1	R2	R3	R4	R5	R6		R0	R1	R2	R3	R4	R5	R6
1	x	x	x					41							
2	x	x	x					42							
3	x	x	x					43							
4	x	x						44							
5	x	x	x					45							
6	x	x						46							
7	x							47							
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 <p>پتروشیمی توسعه پارک صنعتی کوهر اوق</p>		<p align="center">Toase-eh Park Sanati Gohar Ofogh Petrochemical Co.</p> <p align="center">CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF STYRENE PARK OFFSITE</p>					 <p>BINA EPC Contractor Co. (Executor of Oil, Gas, Petrochemical & Power Industries)</p>	
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Rev	1	SERVICE	STYRENE VENTS BLOWER				ITEM	B-0001A-D	
3	GENERAL	TYPE	CENTRIFUGAL			SOURCE			
4		No. REQUIRED ITEMS	4			ARRANGEMENT	2 + 2		
5		NUMBER OF START-UP/UNIT OF TIME	(1)			INTERVAL BETWEEN START-UPS	(1)		
6		INSTALLATION	OUTDOOR UNDER THE SHELTER(3)			HAZ. AREA CLASSIFICATION	(17)		
7	HANDLED FLUID	SUCKED GAS				(2)			
8		COMPOSITION				(2)			
9		HAZARD IDENTIFICATION (RISK PHRASES)				(10,15)			
10		MIST OR DUST (YES/NO) IF YES INDICATE PARTICLE SIZE, %, DENSITY IN NOTES				NO			
11	OPERATING CONDITIONS	CORROSIVE / EROSION AGENTS				NO / NO			
12		SUCTION TEMPERATURE MIN / NORM / MAX	°C			/ AMB /			
13		RELATIVE HUMIDITY AT SUCTION CONDITION				(3)			
14		GAS DENSITY AT SUCTION CONDITION	kg/m³			2.9 (2,11)			
15		GAS DENSITY @ 0 °C and 1 bar a	kg/Nm³			1.293			
16		GAS VISCOSITY AT SUCTION TEMPERATURE	cP			0.02			
17		STATIC SUCTION PRESSURE	mbar			933 (5)			
18		CAPACITY MIN / NORM / RATED (FOR EACH FAN)	m³/h			/ 1080 / 1188 (6)			
19		STATIC DISCHARGE PRESSURE AT RATED CAPACITY	mbar			1080 (5)			
20		DYNAMIC DISCHARGE PRESSURE AT RATED CAPACITY	mbar			BY VENDOR			
21		SPEED AT DISCHARGE MIN / NORM / RATED	m/s			BY VENDOR			
22		TOTAL HEAD	mbar			87 (5)			
23		ESTIMATED EFFICIENCY AT RATED CONDITIONS	%			50			
24		FLOW RATE REGULATION (VALVE ON SUCTION-DISCHARGE/SPEED VARIATION/AERODYNAMIC/OTHER)				NO			
25		FLOWRATE REGULATION VALVE TYPE				N/A			
26		FLOWRATE REGULATION CONTROL (MANUAL / AUTOMATIC)				N/A			
27	START-UP CONDITIONS / W ITH DELIVERY VALVE				AUTO START / OPEN				
28	DESIGN DATA	DESIGN PRESSURE OF CASING	bar g			3.5 (18)			
29		DESIGN TEMPERATURE	°C			85 (18)			
30		MINIMUM AMBIENT TEMPERATURE	°C			5 (3)			
31		MATERIAL IN CONTACT WITH HANDLED FLUID				Carbon Steel (7)(22)			
32		MATERIAL TO BE AVOIDED IN CONTACT WITH HANDLED FLUID				BY VENDOR			
33		GASKETS (MATERIAL, TYPE) IN CONTACT WITH HANDLED FLUID				(9)			
34		CORROSION ALLOWANCE	mm			3			
35		NOISE LEVEL AT 1 m DISTANCE (WITH/WITHOUT MOTOR)	dB(A)			85			
36		IMPELLER TYPE (AXIAL / RADIAL /OTHER)				RADIAL (22)			
37	CONSTRUCTION DATA	INSPECTION DOOR / VOLUTE CLEANING LOWER DOOR				/			
38		SEALS	TYPE			LABYRINTH (22)			
39		HEATING / COOLING	FLUID / MAX AV. FLOW RATE / MAX AV. ΔP	m³/h / bar		/ N/A /			
40			REQ.DES PRESSURE /REQ.DES TEMP.	barg / °C		N/A			
41	CONNECTIONS	SUCTION LINE	DIAMETER / RATING / FACING / GASKET			6" / 150# / RF / (9)(22)			
42		DISCHARGE LINE	DIAMETER / RATING / FACING / GASKET			6" / 150# / RF / (9)(22)			
43		VENT / DRAIN / TYPE (WITH PLUG OR FLANGE)				NO / YES			
44		PRESSURE GAUGE / TEMPERATURE GAUGE / OTHER				/ N/A /			
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CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
STYRENE PARK OFFSITE



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Vent blower Data Sheet

Rev.

CONSTRUCTION		SURFACE PREPARATION AND PAINT	
1	2 ROTATION:(VIEWED FROM COUPLING END) <input checked="" type="checkbox"/> CW <input type="checkbox"/> CCW	● MANUFACTURER'S STANDARD	
3	COUPLINGS (30)	○ SPECIFICATION NO. _____	
4	<input type="checkbox"/> MANUFACTURER _____ <input type="checkbox"/> MODEL _____	FAN	
5	<input type="checkbox"/> RATING _____ (KW per 100 r/min)	● PRIMER _____	
6	● SPACER LENGTH min 150 (mm) ● SERVICE FACTOR min 1.5	● FINISH COAT According to Project's Paint specification EI027-000-EB-PI-SPC-014	
7	<input checked="" type="checkbox"/> COUPLING BALANCE TO ISO 1940	BASEPLATE	
8	<input type="checkbox"/> COUPLING WITH PROPRIETARY CLAMPING DEVICE	● PRIMER _____	
9	<input type="checkbox"/> COUPLING PER ISO 14691	● FINISH COAT According to Project's Paint specification	
10	<input type="checkbox"/> COUPLING PER ISO 1044	● DETAILS OF LIFTING DEVICES _____	
11	<input type="checkbox"/> COUPLING PER API 671 <input type="checkbox"/> OTHER	SHIPMENT	
12	● NON-SPARK COUPLING GUARD	○ DOMESTIC ○ EXPORT ● EXPORT BOXING REQUIRED	
13	○ COUPLING GUARD STANDARD PER _____	● OUTDOOR STORAGE MORE THAN 12 MONTHS	
14		SPARE ROTOR ASSEMBLY PACKGED FOR	
15	SPARE PARTS		● HORIZONTAL STORAGE ○ VERTICAL STORAGE
16	● START-UP ● NORMAL MAINTENANCE	○ TYPE OF SHIPPING PREPARATION	
17	○ OTHER	BEARINGS AND LUBRICATION	
18	OTHER PURCHASER REQUIREMENT	BEARING(TYPE/NUMBER)	
19	● COORDINATION MEETING REQUIRED	<input checked="" type="checkbox"/> RADIAL Tapered roller / 2	
20	○ TORSIONAL ANALYSIS REQUIRED	<input type="checkbox"/> THRUST _____ / _____	
21	○ TORSIONAL ANALYSIS REPORT	LUBRICATION	
22	● PROGRESS REPORTS	<input type="checkbox"/> GREASE <input checked="" type="checkbox"/> OIL	
23	● OUTLINE OF PROCEDURES FOR OPTIONAL TESTS	○ PURGE OIL MST ○ PURE OIL MIST	
24	● ADDITIONAL DATA REQUIRING 20 YEARS RETENTION	● CONSTANT LEVEL OILER PREFERENCE _____	
25	QA INSPECTION AND TESTING	<input type="checkbox"/> OIL VISC. ISO GRADE	
26	● SHOP INSPECTION	MASSES	
27	● PERFORMANCE CURVE APPROVAL	<input type="checkbox"/> BLOWER _____ (kg)	
28	● MATERIAL CERTIFICATION REQUIRED	<input type="checkbox"/> BASEPLATE _____ (kg)	
29	● CASING ● IMPELLER ● SHAFT	<input type="checkbox"/> DRIVER _____ (kg)	
30	○ OTHER	<input type="checkbox"/> TOTAL _____ (kg)	
31	● CASTING REPAIR PROCEDURE APPROVAL REQ'D	QA INSPECTION AND TESTING(CONT.)	
32	● INSPECTION REQUIRED FOR CONNECTION WELDS	TEST NON-WIT WIT. OBSERVE	
33	<input type="checkbox"/> MAG. PARTICLE <input type="checkbox"/> LIQUID PENETRANT	● HYDROSTATIC ○ ○ ●	
34	<input type="checkbox"/> RADIOGRAPHIC <input type="checkbox"/> ULTRASONIC	● PERFORMANCE ○ ● ○	
35	● INSPECTION REQUIRED FOR CASTINGS	● SOUND LEVEL TEST ○ ● ○	
36	<input type="checkbox"/> MAG. PARTICLE <input type="checkbox"/> LIQUID PENETRANT	○ CLEANLINESS PRIOR TO FINAL ● ○ ○	
37	<input type="checkbox"/> RADIOGRAPHIC <input type="checkbox"/> ULTRASONIC	ASSMBLY	
38	REMARKS	● 4h MECH. RUN TEST ○ ● ○	
39		● VENDOR KEEP REPAIR AND HT RECORDS ● ○ ○	
40	IMPELLER TYPE (AXIAL / RADIAL / OTHER) RADIAL	● VENDOR SUBMIT TEST PROCEDURE ● ○ ○	
41	RADIAL IMPELLER <input type="checkbox"/> Open <input type="checkbox"/> Closed	● SUBMIT INSPECTION CHECK LIST ● ○ ○	
42	<input type="checkbox"/> Between Bearing <input type="checkbox"/> Overhung		
43	<input type="checkbox"/> Diameter: VTS		
44			
45	DRIVER CONNECTION TO FAN	SHIPMENT	
46	<input checked="" type="checkbox"/> DIRECT <input type="checkbox"/> JOINT <input type="checkbox"/> BELT	○ DOMESTIC ○ EXPORT ● EXPORT BOXING REQUIRED	
47		● OUTDOOR STORAGE MORE THAN 12 MONTHS	
48	MATERIAL	SPARE ROTOR ASSEMBLY PACKGED FOR	
49	MATERIAL IN CONTACT WITH HANDLED FLUID CS (7)(22)	● HORIZONTAL STORAGE ○ VERTICAL STORAGE	
50	MATERIAL TO BE AVOIDED IN CONTACT WITH HANDLED FLUID	○ TYPE OF SHIPPING PREPARATION	
51	VTA	REMARKS	
52	CASING CS (VTA)		
53	ROTOR CS (VTA)		
54	SHAFT		
55	SHAFT SLEEVE		
56	BASE PLATE		
57	BOLTS		
58	SEALS		
59	REMARKS		
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1	NOTE 1	Continuous operation; 1 unit for each package in stand - by.	
2	NOTE 2	Gas mole composition and molar mass:	
3		Fluid: molar mass mole composition	
4		Air/ Nitrogen 28.84/28 ~100%	
5		Water 18.02 see note 3	
6		Styrene 104 traces (max 3.5 g/Nm3)	
7	NOTE 3	For site condition refer to EI027-000-ED-PR-SPC-002	
8	NOTE 4	Absorbed and installed power to be confirmed / defined by Vendor.	
9	NOTE 5	To be confirmed according to final layout.	
10	NOTE 6	Normal capacity: 1080 Nm3/h, Rated capacity: 1188 Nm3/h	R2
11	NOTE 7	Basic material: carbon steel; other parts: Vendor's standard	
12	NOTE 8	Blower: API 673 2nd Edition	
13	NOTE 9	Gasket type A: plastic flat gasket in graphite with peripheral insert in SS.	
14	NOTE 10	Risk phases: Styrene: R10, R20, R36/38; Water: None;	
15	NOTE 11	Vendor shall include, if necessary, flexible connections at blower suction and delivery sides.	
16	NOTE 12	Gas compressibility factor: 1; gas molecular mass: about 28.84 kg/kmol.	
17	NOTE 13	Gas CP/CV: 1.4	
18	NOTE 14	Vendor shall specify the temperature increase of the fluid at design condition. Maximum temperature at delivery side: 70°C.	
19	NOTE 15	Classification as per NFPA 704 Health Hazard Classification: 2	
20		Fire Hazard Classification: 3 Reactivity Hazard Classification: 2	
21	Note 16	Coupling guard shall be non spark type and full enclosed. The surface temperature shall be lower than 65 °C	
22	Note 17	Refer to Hazardous area Classification Job Specification, P9255-000-DE-SF-SPC-004	
23	Note 18	Mechanical design to be defined by blower Vendor	
24	Note 19	No.2 set of blower gaskets shall be included in the scope of supply for commissioning and start-up spare parts.	
25	Note 20	The degree of protection of motors and auxiliaries shall be at least IP 55. The degree of protection of terminal box and bearing housings shall be IP 55.	
26	Note 21	Electrical motors shall be in full compliance with documents:	
27		"General Electrical Specification for Packages", EI027-000-ED-EL-SPC-001	
28		"General Specification for low Voltage Motors", EI027-000-ED-EL-SPC-002	
29	Note 22	It will be confirmed by vendor.	
30	Note 23	Flexible joints at suction and discharge are recommended to be considered.	
31	Note 24	Use of gear box is not preferred.	
32	Note 25	Refrence P&ID; "P&ID for Styrene Storage Tank (TK-0001A/B) "EI027-000-ED-PR-PID-522".	
33	Note 26	For Hazardeous are classification refere to: "Hazardous area Layout" EI027-000-ED-SA-LAY-022	
34	Note 27	"Paint Specification" EI027-000-EB-PI-SPC-014	
35	Note 28	Connecting piping information: SUCTION 6" 150#, DISCHARGE 6" 150#	
36	Note 29	Max. Temperature for equipment exposed to sunlight is 85 deg C.	
37	Note 30	Rotor, coupling and impeller shall be balanced to G 2.5 ISO 1940	
38	Note 31	The surface temperature shall be lower than 65 deg C.	
39	Note 32	For complementary information please refer to the relevant process data sheet document no. EI027-000-ED-PR-DSH-504.	R2
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<i>DESIGN DATA(20)(21)</i>					U. of M.	Project Requirements	Manufacturer Data (1)
1	LOCATION AND DESIGN CONDITIONS						
1.1	Altitude		m	20			
1.2	Outdoor Temperature		°C	5 / 52		/	
1.3	Design Temperature		°C	5 / 48		/	
1.4	Design Humidity		%	48			
1.5	Tropicalization			Required			
1.6	Item						
2	MOTOR BASIC DATA						
2.1	Rated power		kW	9 / Confirmed and finalized by vendor			
2.2	Service			Continuous			
2.3	Type of supply			From Network			
2.4	System voltage		V	400			
2.5	System frequency		Hz	50			
2.6	System voltage variation		%	± 5			
2.7	System frequency variation		%	± 2			
2.8	Combined voltage-frequency variation		%				
2.9	Starting method			DOL			
2.10	Starting voltage drop (Usd)		%	15			
2.11	System state of neutral point			TN-S			
2.12	Double speed			Not Required			
2.13	Number of poles			4			
2.14	Degree of protection			IP 55			
2.15							
2.16	Shape			By vendor			
2.17	Gas Safety execution frame			Required			
2.18	Gas Safety execution terminal boxes			Required			
2.19	Dust Safety execution			Not Required			
2.20	Insulation class			F			
2.21	Temperature rise (2)		°C	B			
2.22	Type of cooling			IC411			
2.23	Balancing class						
2.24	No load Noise (SPL 1 meter)		dB(A)	85			
2.25	Type of driven machine			Blower			
2.26	Required power (KWU)		kW	8.1			
2.27	Type of coupling			Direct			
2.28	Moment of inertia = mr ²		kgm ²	By vendor			

NOTES: (1) - The Manufacturer shall fill in only the last column on the right. In case of numeric values the Manufacturer shall repeat the required values or shall propose own values. In case of no numeric field, the Manufacturer shall write "Confirmed" , "Not Confirmed" or the required information.

(2) - Maximum absolute admitted temperature shall be indicated.

(3) - Refer to "Specification for Low Voltage Induction Motor" NIOEC-SP-60-02 + General Design Philosophy for Electric System, NIOEC-SP-60-00.

(4) In hazardous areas classified as zone 2, the motors shall be increased safety Exe according to IEC 60079-7 or flameproof Exd. The temperature class of Exe motors shall be suitable for the appropriate gas in the subject area and shall in no case be more than 200°C (T3).



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CONSTRUCTION DATA AND ACCESSORIES				U. of M.	Project Requirements	Manufacturer Data (1)
3	MOTOR PERFORMANCES AND CONSTRUCTION DATA					
3.1	Manufacturer code				By vendor	
3.2	Nominal speed			rad/s	By vendor	
3.3	Full load current (In)			A	By vendor	
3.4	Starting current and tolerance			%	By vendor	
3.5	Starting power factor				By vendor	
3.6	Starting time			s	By vendor	
3.7	Number of successive starts (cold/hot)				By vendor	/
3.8	Power factor 2/4				By vendor	
3.9	Power factor 3/4				By vendor	
3.10	Power factor 4/4				By vendor	
3.11	Efficiency 2/4			%	By vendor	
3.12	Efficiency 3/4			%	By vendor	
3.13	Efficiency 4/4			%	By vendor	
3.14	Nominal torque			Nm	By vendor	
3.15	Frame material				Stainless steel or cast iron	
3.16	Stator winding connection					
3.17	Main Terminal box position (3)				Right	
3.18	Cable entrance from				Right	
3.19	Number of cable entries				Later	
3.20	Cable entry threading				Metric	
3.21	Cable entry size				Later	
3.22	Power cable size			Nxmm ²	Later	
3.23	Bearing type				Roller	
3.24	Bearing nominal life L10			h		
3.25	Bearing insulation					
3.26	Lubricant type					
3.27	Lubricate code					
3.28	Total Mass			kg	By vendor	
3.29	Motor painting cycle				By vendor	
3.30	Motor finishing colour				By vendor	
4	ACCESSORIES					
4.1	Separate auxiliary box				Required	
4.2	Cable Glands				Not Required	
4.3	Cable gland material					
4.4	Cable overall / over armour diameter			mm	Later / Later	/
4.5	Winding temperature RTD or PTC				Not Required	
4.6	Space heater				Not Required	
4.7	Base plate				Required	
TEST REPORT AND CERTIFICATES						
5	TYPE TEST					
5.1	Safety execution - Test report No.					
5.2	Dust execution - Test report No.					
NOTES: (1) - The Manufacturer shall fill in only the last column on the right. In case of numeric values the Manufacturer shall repeat the required values or shall propose own values. In case of no numeric field, the Manufacturer shall write "Confirmed" , "Not Confirmed" or the required information. (3) - Looking from coupling side						