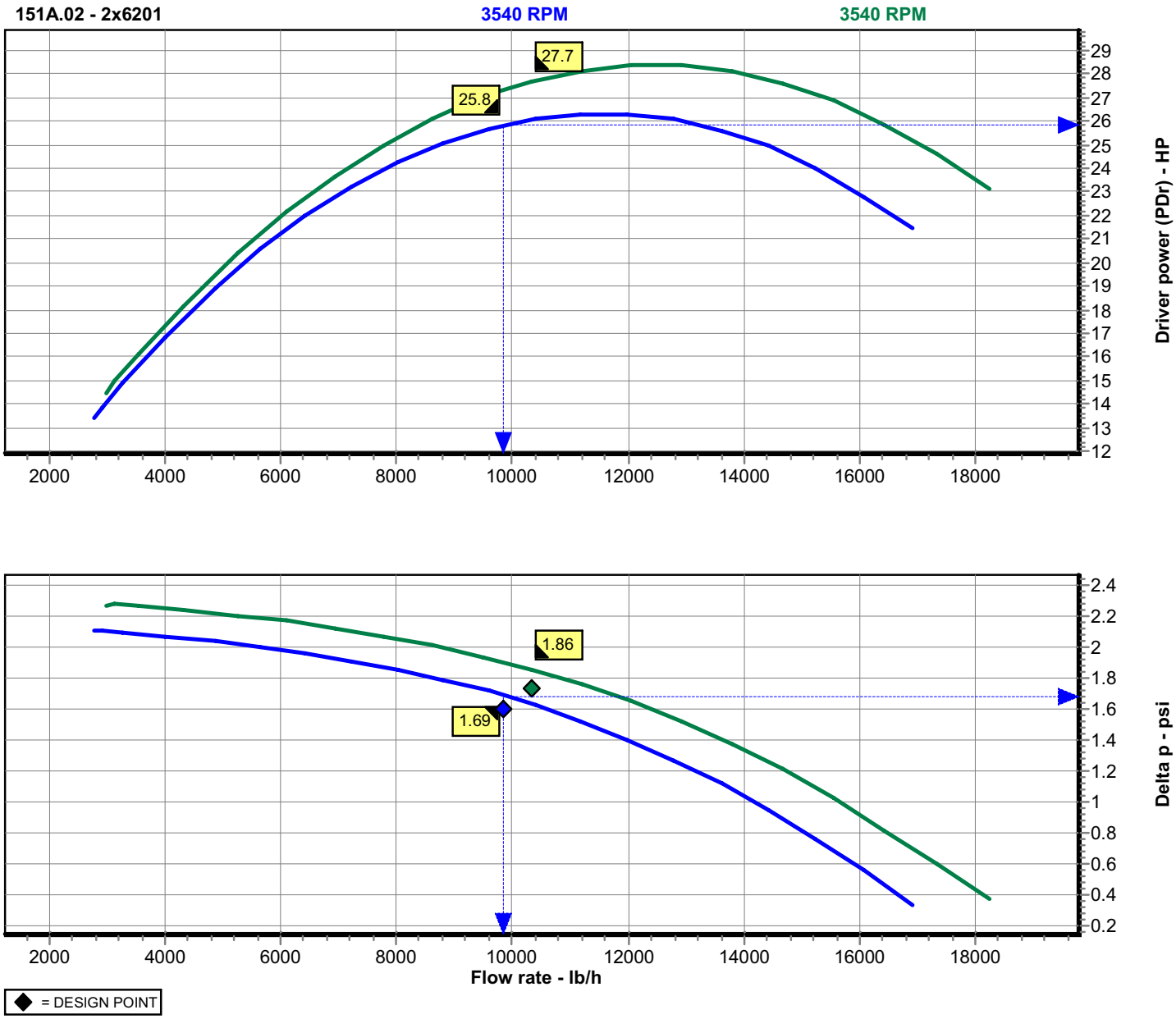
Continental Industrie - Blower / Exhauster Selection - design data

Customer	:	AIR PRODUCTS	Project-No	:	WORLD ENERGY
Application	:	180 GAS HANDLING	Date	:	07-06-2022
Gas booster	:	151A.02 - 25.8 HP - 3540 RPM	Impeller	:	2x6201
Drive arrang.	:	direct drive, 2-poles motor 60 Hz	Suggested motor	:	30.0 HP
Printed	:	07 June 2022 15:34			

---- PERFORMANCE CURVE ----



GAS : t1 = 122.0 °F pBar = 14.657 psia RH / inlet = 63.68 % rho1 = 0.062 lb/ft3 Cp1 = 1048.97 J/(kg K)

GAS : t1 = 80.0 °F pBar = 14.657 psia RH / inlet = 100.00 % rho1 = 0.067 lb/ft3 Cp1 = 1048.97 J/(kg K)

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---- OPERATING CONDITIONS ----

Operation :	:	Gas booster		
Barometric pressure	:	69 ft asl	-->	14.657 psia
Gauge pressure / inlet	:	13.84 PSIA	-->	-0.817 psig
Variable losses / inlet	:	0 inchH2O	-->	0.000 psig
Gauge pressure / outlet	:	15.44 PSIA	-->	0.783 psig
Variable losses / outlet	:	0 inchH2O	-->	0.000 psig
Design temperature / inlet	:	122 F	-->	122.0 °F
Relative Humidity / inlet	:	63.68 %	-->	63.68 %
Design flow rate	:	9849 lb/h	-->	2637.8 icfm

---- GAS COMPOSITION ----

No.	Gasdescription, Formula	Vol.-%	MW kg/kmol	Cp1 J/(kg K)	rho1 lb/ft3	mGas lb/min
1.	Oxygen, O2	19.22	32.00	916.91	0.071	36.0
2.	Nitrogen, N2	71.69	28.02	1038.33	0.062	117.5
3.	Water Vapor, H2O	8.23	18.02	1863.13	0.040	8.7
4.	Argon, Ar	0.86	39.94	521.00	0.089	2.0
	Total :	100.00	28.06	1048.97	0.062	164.2

---- THERMODYNAMICAL DATA ----

p1	=	13.840 psi a	p2	=	15.530 psi a	p2/p1	= 1.1221
t1	=	122.0 °F	t2	=	148.2 °F	Ri	= 296.2611 J/(kg K)
Q1	=	2637.8 icfm	Q2	=	2456.5 cfm	Pad	= 18.7 HP
v1	=	57.77 ft/s	v2	=	53.80 ft/s		
kappa1	=	1.3936	rho2	=	0.0668 lb/ft3	PGas	= 25.4 HP

---- DESIGN POINT ----

Flow rate (Q0) :	:	9849.0	lb/h	
Delta p Pressure	:	1.69	psi	(deviation : + 5.7 %)
Driver (PDr) / Machine (P) shaft power	:	25.8	HP	(at 122.0 °F, 63.68 % rel. humidity)
Adiabatic efficiency (eta ad)	:	73.4	%	
Polytropic efficiency (eta poly)	:	73.9	%	
Blower mech. efficiency	:	98.5	%	
Transmission mech. efficiency	:	100.0	%	

---- DESIGN POINT - ALT1 ----

Flow rate (Q0) :	:	10341.0	lb/h	
Delta p Pressure	:	1.86	psi	(deviation : + 6.8 %)
Driver (PDr) / Machine (P) shaft power	:	27.7	HP	(at 80.0 °F, 100.00 % rel. humidity)
Adiabatic efficiency (eta ad)	:	73.1	%	
Polytropic efficiency (eta poly)	:	73.5	%	
Blower mech. efficiency	:	98.5	%	
Transmission mech. efficiency	:	100.0	%	

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---- SURGE / DESIGN POINT DATA ----

	Q1 icfm	Q0 lb/h	Q2 cfm	Pressure psi	P HP	PDr HP	eta ad %	eta pol %	t2 °F
SP	747.8	2792.27	702.80	2.10	13.43	13.43	49.32	50.32	170.1
DP	2637.8	9849.00	2456.54	1.69	25.82	25.82	73.45	73.88	148.2

turn down : 1889.9 icfm (71.6 %) (for Q1)
pressure rise DP--->SP : 0.4 psi (24.5 %)
power rise SP--->DP : 92.3 %

---- MACHINE SPECIFICATIONS ----

model	:	151A.02
impellers	:	2x6201
drive arrangement	:	direct drive, 2-poles motor 60 Hz

---- MACHINE DATA ----

suggested motor	:	30.0 HP (Power reserve : 16.2 %)
machine rotation speed	:	3540 RPM
common speed limit	:	4400 RPM (Std. Air design)
first critical speed	:	16398 RPM ---> (463.2 %)
impeller tip speed	:	386.8 ft/sec
moment of Inertia (WK2)	:	28.7 lbm.ft² (rotor)
starting torque	:	38.3 lbf.ft (at 122.0 °F at DP)
heat dissipation	:	2.2 BTU ----> 5584 BTU/h

---- SOUND DATA ----

I/O ports PWL	:	95 dB(A) (I/O ports), (Peak at 483 Hz)
Inlet system port PWL	:	75 dB(A) (piped)
Outlet system port PWL	:	75 dB(A) (piped)
Inlet SPL (1m)	:	66 dB(A) (piped)
Outlet SPL (1m)	:	66 dB(A) (piped)
Casing SPL (1m)	:	56 dB(A) (casing)
Blower + Ports SPL (1m)	:	62 dB(A) (casing + piped + piped)
Motor SPL (1m)	:	73 dB(A) (motor casing loaded)
Total unit SPL (1m)	:	71 dB(A) (blower + motor)
Total unit with Sound Enclosure SPL (1m)	:	66 dB(A) (blower unit + sound enclosure)

---- SPECIFICATIONS ----

inlet head	:	Flange DN300, PN10
outlet head	:	Flange DN300, PN10
bearings	:	Ball Bearings 6313/C3
lubrication	:	Oil Lubrication System
impellers	:	cast construction
impeller diameter	:	636 mm
shaft end	:	Ø 60m6, length 140 mm

---- MATERIALS ----		
inlet / outlet heads	:	Cast Iron EN GJL-250, min. wallthickness 8 mm
sections	:	Cast Iron EN GJL-250, Stainless Steel Baffles
bearing housing	:	Cast Iron EN GJL-250
impellers	:	Cast Aluminium EN AC-43100
shaft	:	Carbon Steel 42CrMo4, heat treated