

Scope of Supply

Customer	Trask-Decrow Machinery, Inc.	Sulzer Reference ID	USA.0095-XPD.21.0761-B0
Project Name	Aristide Energy Bio 2	Inquiry Date	
Inquiry Number/ID		Bid Submitted Date	
Item number	001	Date Last Saved	15 Jul 2021 8:34 PM
Application	Not specified	Type / Size / Stages	CPE 12-1 (1.5x1x8) O / 1
Pump speed	3510 rpm		

Pump and Accessories

Qty	Description
1	CPE 12-1 (1.5x1x8) O Chemical end suction single stage process pump Dimension designation: AA Quality requirements Quality requirements CE 2006/42/EC ASME B73.1-2012 Pump and accessories Hydraulic performance acceptance grade Guaranteed efficiency Impeller Impeller type: Semi-Open Materials of construction Volute case : Duplex CD6MN (ASTM A890 3A) Impeller : Duplex CD6MN (ASTM A890 3A) Case cover: Duplex CD6MN (ASTM A890 3A) Wetted non casted alloys: 316SS or better Shaft: Duplex 2205 (UNS S32205 / EN1.4462) Bearing adapter: Ductile Iron (ASTM A395 60-40-18) Bearing housing : Grey cast iron (ASTM A48 CL35B) Surface treatment Painting method: Standard, atmospheric-corrosivity C4, ISO 12944-2 (less or equal than 300F) Color shade: Light grey (NCS1700) Volute case Flange drilling: ASME B16.5 Class 150, Flat Face 1 Flow straightener: Austenitic SS (AISI 316/316L) Casing connections Casing drain Recirculation pipe (Discharge) Pressure (Suction & Discharge) Casing fasteners: Hex bolt, 316SS Gasket material: PTFE/ Glass Shaft seal Sealing unit type: Cartridge single, shaft installation Shaft seal fluid: Recirculation flushing Seal chamber type: Large bore 1 Mechanical seal type: AES, CURC+ Mechanical seal body: 316 SS Shaft seal faces: SiC/SiC Shaft seal elastomer material: FKM, Fluorocarbon Flush plan schematic: Piping Plan 11 1 Flush piping type: PTFE lined, Stainless Steel braided hose - 3/8"; fittings included Bearing unit Bearing lubrication type: Oil bath equipped with oil slinger Bearing seal: Inpro VBX isolator

Pump and Accessories

Qty	Description
	Coupling
	Coupling service factor: 1.50
1	Coupling size: Rex Viva VS110
1	Coupling guard : Painted galvanized steel
	Baseplate
1	Baseplate type: ANSI style 1 (Formed steel)
	Baseplate Size: ANSI Base #148
	Baseplate color shade: Light grey (NCS1700)
	Other parts
	Shaft seal guards material: Stainless steel (304SS)
	Packing
	Packing Type: Standard domestic packing

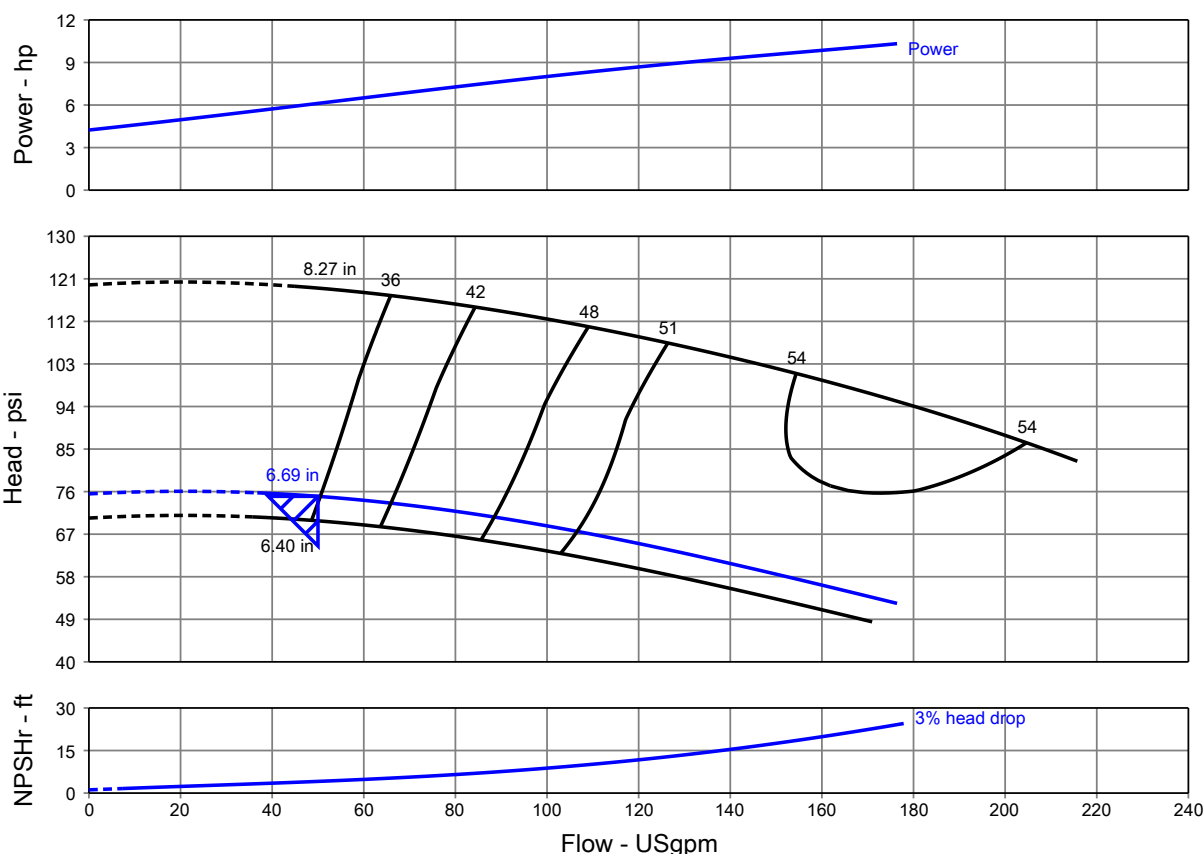
Driver

Qty	Description
	Motor
1	Motor detail: SIEMENS Explosion proof 2 poles 10HP TEFC 215T 208-230/460V CI FOOT-mounted

Pump Performance Datasheet

Customer	: Trask-Decrow Machinery, Inc.	Sulzer Reference ID	: USA.0095-XPD.21.0761-B0
Inquiry Number/ID	:	Type / Size	: CPE 12-1 (1.5x1x8) O
Item number	: 001	Stages	: 1
Service	: Feedstock Process Pumps	Based on curve number	: CPE12-1_O_1800 Rev 1
Quantity	: 1	Date of Last Update	: 15 Jul 2021 8:34 PM

Operating Conditions		Liquid	
Flow, rated	: 50.00 USgpm	Liquid type	: Other
Differential head / pressure, rated (requested)	: 75.00 psi	Additional liquid description	: Bio Mixture, B100, Oil
Suction pressure, rated / max	: 0.00 / 0.00 psi.g	Solids diameter, max	: 0.00 in
NPSH available, rated	: Ample	Solids concentration, by volume	: 0.00 %
Site Supply Frequency	: 60 Hz	Temperature, rated / max	: 140.0 / 180.0 deg F
Performance		Fluid density, rated / max	: 0.900 / 0.900 SG
Speed criteria	: Synchronous	Viscosity, rated	: 10.00 cP
Speed, rated	: 3510 rpm	Vapor pressure, rated	: 0.34 psi.a
Impeller diameter, rated	: 6.69 in	Material	
Impeller diameter, maximum	: 8.27 in	Material selected	: Duplex Steel - ASTM A890 3A (41 / J0265)
Impeller diameter, minimum	: 6.40 in	Pressure Data	
Efficiency	: 35.78 %	Maximum casing/bowl working pressure	: 75.75 psi.g
NPSH (3% head drop) / margin required	: 4.12 / 0.00 ft	Maximum allowable working pressure	: 266.0 psi.g
Ns (imp. eye flow) / Nss (imp. eye flow)	: 766 / 4,175 US Units	Maximum allowable suction pressure	: N/A
MCSF	: 7.45 USgpm	Hydrostatic test pressure	: 399.0 psi.g
Head, maximum, rated diameter	: 75.75 psi	Driver & Power Data (@Max density)	
Head rise to shutoff	: 0.69 %	Driver sizing specification	: Maximum power
Flow, best eff. point	: 147.1 USgpm	Margin over specification	: 0.00 %
Flow ratio, rated / BEP	: 33.98 %	Service factor	: 1.15 (used)
Diameter ratio (rated / max)	: 80.95 %	Power, hydraulic	: 2.19 hp
Head ratio (rated dia / max dia)	: 63.01 %	Power, rated	: 6.11 hp
Cq/Ch/Ce/Cn [ANSI/HI 9.6.7-2010]	: 0.99 / 1.00 / 0.91 / 1.00	Power, maximum, rated diameter	: 10.32 hp
Selection status	: Acceptable	Minimum recommended motor rating	: 10.00 hp / 7.46 kW



Pump Performance - Additional Data

Customer : Trask-Decrow Machinery, Inc.		Sulzer Reference ID : USA.0095-XPDP.21.0761-B0				
Inquiry Number/ID :		Type / Size : CPE 12-1 (1.5x1x8) O				
Item number : 001		Stages : 1				
Service : Feedstock Process Pumps		Speed, rated : 3510 rpm				
Quantity : 1		Intellicode :				
		Date of Last Update : 15 Jul 2021 8:34 PM				
Performance Data		Stage, Speed and Solids Limits				
Head, maximum diameter, rated flow : 119.0 psi		Stages, maximum : 1				
Head, minimum diameter, rated flow : 69.82 psi		Stages, minimum : 1				
Head, maximum, rated diameter : 75.75 psi		Pump speed limit, maximum : 3600 rpm				
Efficiency adjustment factor, total : 1.18		Pump speed limit, minimum : 900 rpm				
Power adjustment, total : -1.07 hp		Curve speed limit, maximum : 3600 rpm				
Head adjustment factor, total : 1.00		Curve speed limit, minimum : 900 rpm				
Flow adjustment factor, total : 1.00		Variable speed limit, maximum : -				
Flow adjustment factor, efficiency only (shift BEP) : 1.00		Variable speed limit, minimum : 900 rpm				
Flow adjustment factor, end-of-curve only, total : 1.00		Solids diameter limit : 0.40 in				
MCSF adjustment factor : 1.00		Typical Driver Data				
Flow max adjustment factor : 1.00		Driver speed, full load : 3525 rpm				
NPSHR adjustment factor, total : 1.32		Driver speed, rated load : 3554 rpm				
NPSHR slope correction factor : 1.00		Driver efficiency, 100% load : N/A				
User applied performance adjustment comments :		Driver efficiency, 75% load : N/A				
NPSH margin dictated by pump supplier : 0.00 ft		Driver efficiency, 50% load : N/A				
NPSH margin dictated by user : 0.00 ft						
NPSH margin used (added to 'required' values) : 0.00 ft						
Mechanical Limits						
Torque, rated power, rated speed : 0.17 hp/100 rpm						
Torque, maximum power, rated speed : 0.29 hp/100 rpm						
Torque, driver power, full load speed : 0.28 hp/100 rpm						
Torque, driver power, rated speed : 0.28 hp/100 rpm						
Torque, pump shaft limit : 2.82 hp/100 rpm						
Radial load, worst case : -						
Radial load limit : -						
Impeller peripheral speed, rated : -						
Impeller peripheral speed limit : -						
Various Performance Data		Flow (USgpm)	Head (psi)	Efficiency (%)	NPSHr (ft)	Power (hp)
Shutoff, rated diameter		0.00	75.52	-	-	4.24
Shutoff, maximum diameter		0.00	119.7	-	-	9.13
MCSF		7.45	75.84	7.32	1.61	4.50
Rated flow, minimum diameter		50.00	69.82	36.64	-	5.56
Rated flow, maximum diameter		50.00	119.0	29.61	-	11.73
BEP flow, rated diameter		147.1	59.19	53.50	16.90	9.50
120% rated flow, rated diameter		60.00	74.17	39.90	4.82	6.51
End of curve, rated diameter		176.4	52.37	52.19	24.12	10.32
End of curve, minimum diameter		171.0	48.47	52.10	22.65	9.28
End of curve, maximum diameter		215.8	82.43	53.02	36.31	19.57
Maximum value, rated diameter		-	75.75	53.50	-	10.32
Maximum value, maximum diameter		-	-	54.87	-	19.57
System differential pressure		@ Density, rated		@ Density, max		
Differential pressure, rated flow, rated diameter (psi)		75.00		75.00		
Differential pressure, shutoff, rated diameter (psi)		75.52		75.52		
Differential pressure, shutoff, maximum diameter (psi)		119.7		119.7		
Discharge pressure		@ Suction pressure, rated	@ Suction pressure, max	@ Suction pressure, rated	@ Suction pressure, max	
Discharge pressure, rated flow, rated diameter (psi.g)		75.00	75.00	75.00	75.00	
Discharge pressure, shutoff, rated diameter (psi.g)		75.52	75.52	75.52	75.52	
Discharge pressure, shutoff, maximum diameter (psi.g)		119.7	119.7	119.7	119.7	
Ratios						
Maximum flow / rated flow, rated diameter : 352.81 %		Head rated diameter / head minimum diameter, rated flow : 107.42 %				

Pump Performance - Additional Data

Construction

Flange Drilling	: ASME B16.5 Class 150	Material Shaft	: Duplex 2205 (UNS S32205 / EN 1.4462)
Impeller Type	: All Impeller Forms	Sealing	: Mechanical seal / Gland packing

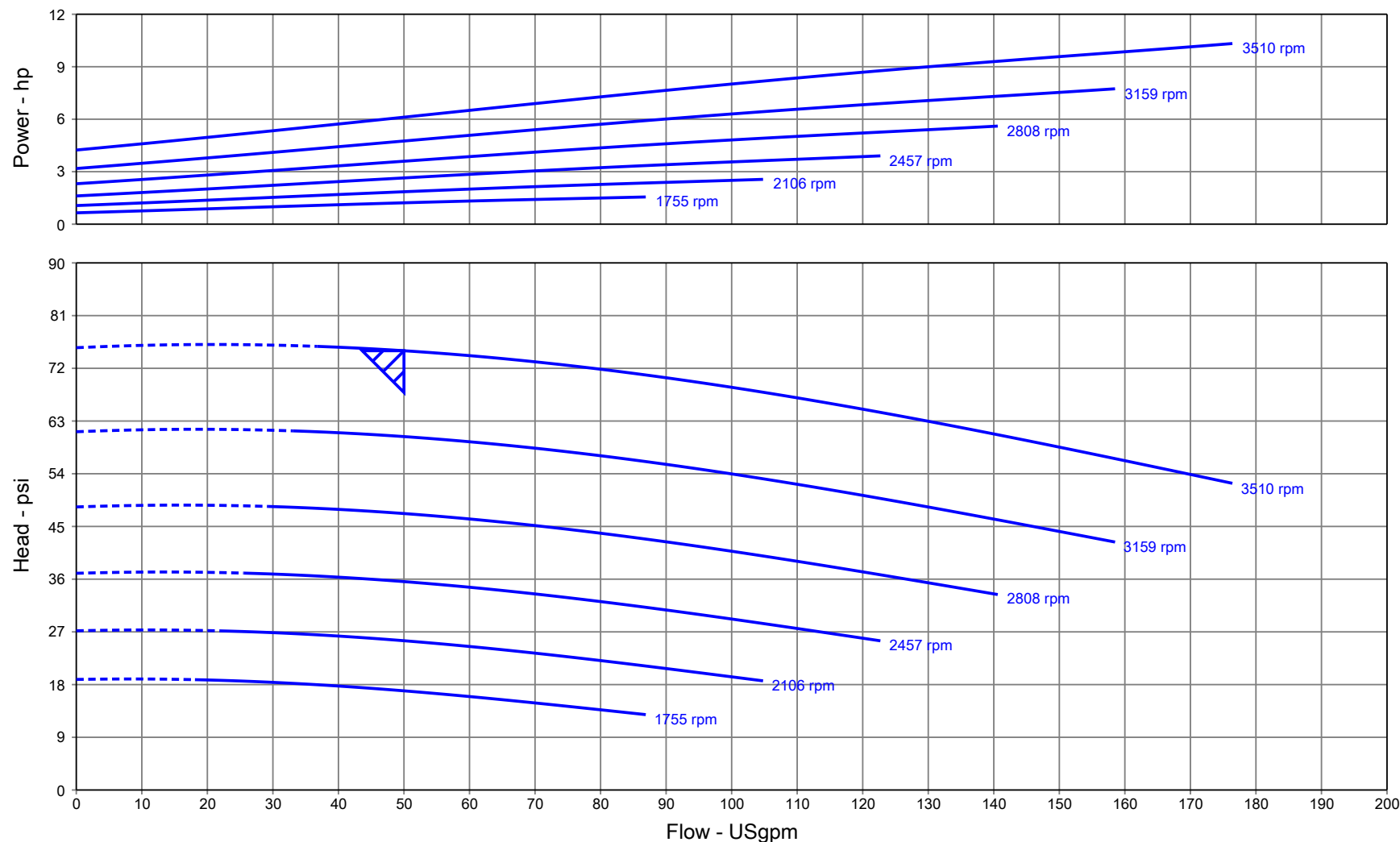
Efficiency Basis

Hydraulic performance acceptance tests	: HI 14.6-2011 / ISO 9906:2012 Grade 1B
--	---

Centrifugal Pump Datasheet

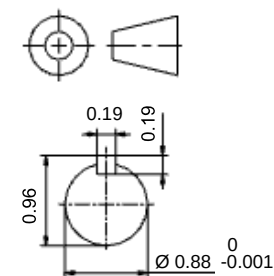
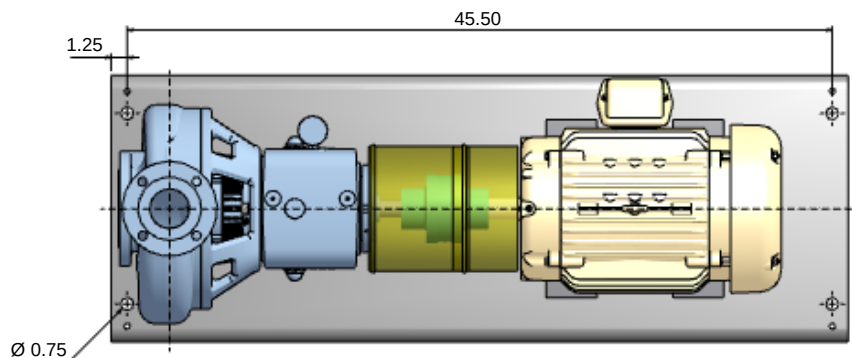
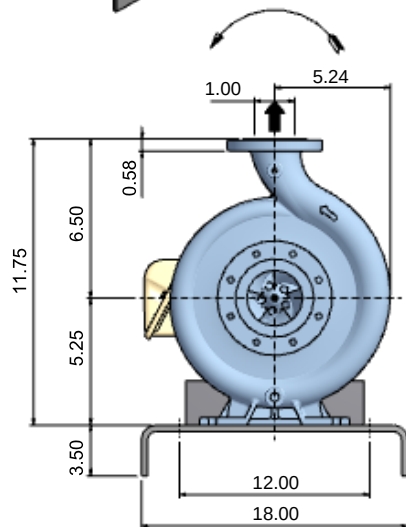
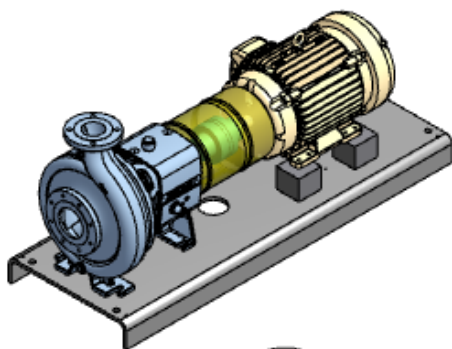
Customer:	Trask-Decrow Machinery, Inc.	Sulzer Reference ID:	USA.0095-XPDI.21.0761-B0			
Project name:	Aristide Energy Bio 2	Inquiry Date:				
Inquiry Number/ID:		Bid Submitted Date:				
Item number:	001	Date of Last Update:	2021-07-15 18:26:51			
Service:	Feedstock Process Pumps	Quantity:	1			
Operating Conditions		Pump Design Data				
Liquid type:	Other	Pump Type:	CPE			
Temperature, Rated / Max:	140.0 deg F / 180.0 deg F	Product Line:	CPE			
Fluid density, rated / max:	0.900 SG / 0.900 SG	Pump Size / No. of Stages:	CPE 12-1 (1.5x1x8) O / 1			
Vapor pressure, rated:	0.34 psi.a	Rotation (viewed from drive end):	Clockwise			
Viscosity, rated:	10.00 cP	Impeller type:	Semi-Open			
Consistency:	-	Casing mounting:	Foot			
Air Content:	-	Casing split:	Radial			
Discharge Flow, Rated:	50.00 USgpm	Casing Type:	Single volute			
Differential Head, Rated / Actual:	75.00 psi / 76.01 psi	Nozzle	Size	Rating	Face	Position
Suction pressure, rated / max:	0.00 psi.g / 0.00 psi.g	Suction	NPS 1.5	150#	FF	End
NPSH Available:	Ample	Discharge	NPS 1	150#	FF	Top
Performance		Lineshaft Diameter:	-			
Performance Curve No.(s):	CPE12-1_O_1800	Bearing Type, Radial:	Cylindrical roller bearing NUP207			
Pump speed:	3510 rpm	Lineshaft Bearing / Bowl Bearing (Vert. pumps only):	-			
Frequency:	60 Hz	Bearing Type, Thrust:	Double row angular contact ball bearing 3306			
Fixed / Variable Speed:	Fixed speed	Bearing lubrication:	Oil bath equipped with oil slinger			
Impeller diameter, rated:	6.69 in	Baseplate type:	ANSI style 1 (Formed steel)			
Impeller diameter, maximum:	8.27 in	Materials				
Impeller diameter, minimum:	6.40 in	API Material Class:	-			
Efficiency:	35.78 %	Barrel / Can:	-			
NPSH (3% head drop):	4.12 ft / 0.00 ft	Case / Bowls:	Duplex CD6MN (ASTM A890 3A)			
Ns / Nss:	766 US: Ns (imp. eye flow) / N / 4,175 US: Ns (imp. eye flow) /	Column:	-			
Head, maximum, rated diameter:	75.75 psi	Discharge Head:	-			
Head rise to shutoff:	0.69 %	Impeller:	Duplex CD6MN (ASTM A890 3A)			
Flow, best eff. point:	147.1 USgpm	Case / Impeller Wear Rings:	Duplex CD6MN (ASTM A890 3A)			
Diameter ratio (rated / max):	80.95 %	Shaft:	Duplex 2205 (UNS S32205 / EN1.4462)			
Head ratio (rated dia / max dia):	63.01 %	Diffusers:	-			
Viscous Coefficients (CQ / CH / CE):	0.991832 / 0.996362 / 0.914145	Shaft Sealing, Flush & Cooling Piping Plans				
Pressure Data		Seal Size / Type:	- / Cartridge single, shaft installation			
Maximum Working Pressure:	75.75 psi.g	Seal Code:	AES, CURC+			
Working Pressure Limit:	266.0 psi.g	Seal Manufacturer:	-			
Suction Pressure Limit:	266.0 psi.g	Seal Flush Piping, Primary:	Piping Plan 11			
Hydrostatic Test Pressure (Suction/Discharge):	399.0 psi.g	Seal Flush Piping, Secondary:	-			
Suction pressure, rated / max:	0.00 psi.g / 0.00 psi.g	Cooling Water Piping:	N/A			
Discharge pressure, rated:	75.00 psi.g	Driver & Power Data				
Differential Pressure, Rated:	75.00 psi	Driver Size:	10.00 hp			
Equipment Weights (Approximate)		Volts/ Phase / Hz:	208-230/460V / 3 / 60 Hz			
Pump:	125.0 lb	Service factor:	1.15			
Driver:	173.0 lb	Power, rated:	6.11 hp			
Baseplate:	157.0 lb	Power, maximum, rated diameter:	10.32 hp			
Total Package	455.0 lb	Enclosure:	TEFC			
Accessories						
Driver:	SIEMENS Explosion proof 2poles 10HP TEFC NPE 215T 208-230/460V CI FOOT-mounted					
Coupling:	Rex Viva VS110					
Comments						
-						

Multi-Speed Performance Curve

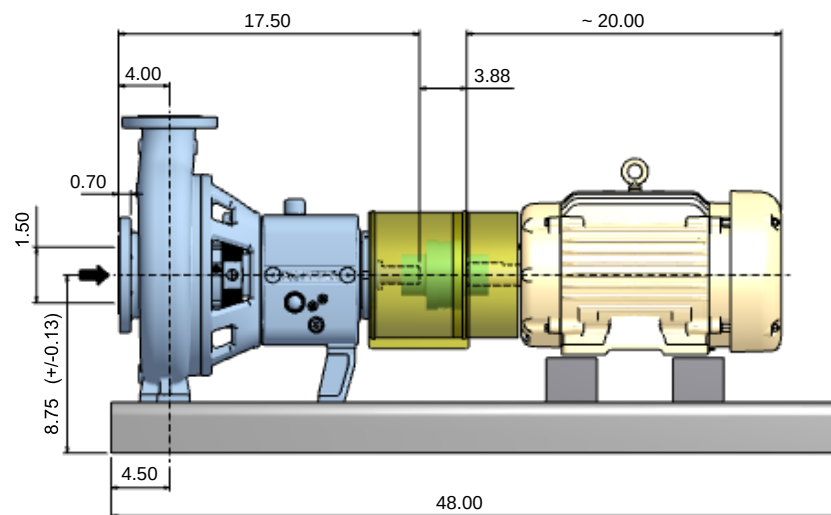


Customer	: Trask-Decrow Machinery, Inc.	Stages	: 1	Nominal speed	: 3525 rpm
Inquiry Number/ID	:	Based on curve number	: CPE12-1_O_1800 Rev 1	Flow, rated	: 50.00 USgpm
Item number	: 001	Efficiency	: 35.78 %	Differential head / pressure, rated	: 75.00 psi
Service	: Feedstock Process Pumps	Power, rated	: 6.11 hp	Speed, rated	: 3510 rpm
Quantity	: 1	NPSH (3% head drop)	: 4.12 ft	Impeller diameter, rated	: 6.69 in
Sulzer Reference ID	: USA.0095-XPD.21.0761-B0	Site Supply Frequency	: 60 Hz	Fluid density, rated / max	: 0.900 / 0.900 SG
Date of Last Update	: 15 Jul 2021 8:34 PM			Viscosity, rated	: 10.00 cP
Type / Size	: CPE 12-1 (1.5x1x8) O			Cq/Ch/Ce/Cn [ANSI/HI 9.6.7-2010]	: 0.99 / 1.00 / 0.91 / 1.00

Dimensions in inches - NOTE: DO NOT USE FOR CONSTRUCTION UNLESS CERTIFIED



Pump shaft



Both pump and motor are mounted directly on baseplate without riser blocks. Pump may need to be shimmed up to 0.13 in.

This pump size has tapped bolt holes in discharge flange.

MOTOR INFORMATION

Power	10.00 hp
Frame size	215T
Synchronous speed	3600 rpm
Voltage	208-230/460V
Frequency	60 Hz
Enclosure	TEFC

PUMP INFORMATION

Rated speed	3510 rpm
Pump Size	CPE 12-1 (1.5x1x8) O
No. of Stages	1

WEIGHTS

Pump	125.0 lb
Baseplate	157.0 lb
Motor	173.0 lb
TOTAL	455.0 lb

FLANGES

	Size	Drilling
Suction Flange	NPS 1.5	150#
Discharge Flange	NPS 1	150#

TENDER SUMMARY

Sulzer Reference ID	USA.0095-XPD.21.0761-B0
Project name	Aristide Energy Bio 2
Customer	Trask-Decrow Machinery, Inc.
Inquiry Number/ID	
Item number	001
Date Last Saved	2021-07-15 18:26:51
Service	Feedstock Process Pumps

SULZER
General Arrangement Drawing