

TEIKOKU CANNED MOTOR PUMP DATA SHEET

Messrs : Evonik Degussa Corporation

No. QFH-1373A

2015/8/21

Order No. : ☒ ※1

Job No. : ---

Project Name : ---

Item No. : ☒ ※1

Item Name : ---

Model : ☒ DA61-2518J4BL-0810T1V-AQty : ☒ 2

CERTIFIED
Drawing conforms to the
customer's latest specifications

Sign For Receipt
(For customer)

TEIKOKU ELECTRIC MFG. CO., LTD.

Approved by	Checked by	Designed by
R. Takeuchi	R. Matsumura	M. Morii

Operating Conditions				Materials			
Total Head (m) : 34.3		Capacity (L/min) : 1503		Casing : SCS14(CF-8M 316 SS)			
		(m3/h) : 90.2		Impeller : SCS14(CF-8M 316 SS)			
Suction Press. (barA) : 1.33		Discharge Press. (barA) : ---		Adapter : SCS14(CF-8M 316 SS)			
NPSHava. (m) : 12.35		NPSHreq. (m) : 6		RBH : SUS316(316 SS)			
Liquid : AcCH				Motor Flange : SUS316L(316L SS)			
Temperature (Des./Nor.) (°C) : -2 / ---				Stator Can : ALLOY C-276			
Specific gravity (Des./Nor.) : 1.02 / ---				Shaft : SUS316(316 SS)			
Viscosity (Des./Nor.) (mPa·s) : 6.11 / ---				Rotor Can : SUS316L(316L SS)			
Mechanical Design Temperature (°C) : ---				Bearing : Carbon Graphite			
Specific Heat (kJ/(kg·K)) : ---		Melting Temp. (°C) : ---		Shaft Sleeve : ---			
Vapor Press. (BarA) : 0.032				+ Thrust Collar : SUS316+Stellite(316 SS+Stellite)			
Solids Name : ---				Pump Gasket : <input checked="" type="checkbox"/> SUS316(316 SS)+Grafoil			
Concentration (wt%) : ---		Particle Size (μm) : --- S.Gr. : ---		Motor Gasket : <input checked="" type="checkbox"/> SUS316(316 SS)+Grafoil			
Flushing or Barrier Fluid : ACA				O-ring : PTFE			
Liquid/S.Gr. (cP) : 1 / 0.5				Mechanical Seal : SiC+Carbon			
Press. (MPaG) : S.P. + 0.3 ± 0.05		Flow (m3/h) : ---					
Pump Design & Construction				Performance			
Design Press <input checked="" type="checkbox"/> (bar) : <input checked="" type="checkbox"/> 10.34		Temp. (°C) : -2		Impeller Type : CLOSE			
Code Applied : None		Nameplate : English		No. of Stage : 1			
Nozzle Connection : ASME Finish : SMOOTH FINISH							
Nozzle	Rating	Size	Facing	Position			
Suction	150LB	4"	RF	END			
Discharge	150LB	3"	RF	TOP			
Drain	150LB	1/2"	RF	BOTTOM			
Reverse	---	---	---	---			
Jacket Design Press. (psi) : 125							
Utilities Required	Media	Condition(Max)	Flow(Min.)	Connection			
Casing	NONE	---	---	---			
Motor	COOLING	Brine	-15 °C	0.72 m3/h NPT 1/2			
Heat Ex./Ext. Circ.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Motor(Stop)	---	---	---	---			
<div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> Customer : Evonik Corporation PO# : 4701013179/4701319034 Project : ACA G600 Project# : 4142. 00940 Evonik's Pump# : P-1020/P-1020S Requisition# : C0078-010 </div>							
Power Supply & Drive Motor				Vendor Drawings and Data			
Frame No. : 518		Duty : Cont		Dimensional Dwg. : <input checked="" type="checkbox"/> 3E-7473		Allowable Piping	
Voltage(V) : 460		Frequency(Hz) : 60		Terminal Box : 4N-9083-01		Forces and Moments : 4N-6993-05	
Output(kW/hp) : 29/38.89		Rated Amp. (A) : 55		Sectional View Dwg. : 6E-8533			
Thermal Class : 220		Start Method : DIRECT		Material List : P-32842			
R.P.M. (rpm) : 3600		Direction : C.C.W. (Viewed from Pump Suction)		Est. Performance Curve : SFH-1373A			
Voltage for protection(V) : 120		Protection Device : Thermostat b		Connection Diagram : 4N-9082			
Dry Run Protection Relay : ---				Mechanical Seal : 4N-4024-15			
Terminal Box : Stud/Thread/ 1				Recommended Spare			
Power Cable Conduit : NPT2		Cable O.D. (Main) (mm) : ---		Spare Parts List : SC-1044			
Instrument Cable Conduit : NPT3/4		Cable O.D. (Sub) (mm) : ---					
ATEX Marking : ---							
Other							
Special Treatment : None							
Painting Color : LightGray							
Rotating Direction : ---							
Monitoring : None							
Bearing Wear Monitor : Radial / Local							

Remarks :

•T-USA#385330

•Hazardous Area Classification: Class.1, Div.2, Gr.C&D T2

☒ •Mechanical Design Temperature: 170°C (Pumps do not run at this temperature. Pumps are not expected to function post experience of this temperature.)

☒ •※1 Item No. P-1020 / Order No. 4701013179, Item No. P-1020S / Order No. 4701319034

REVIEWS

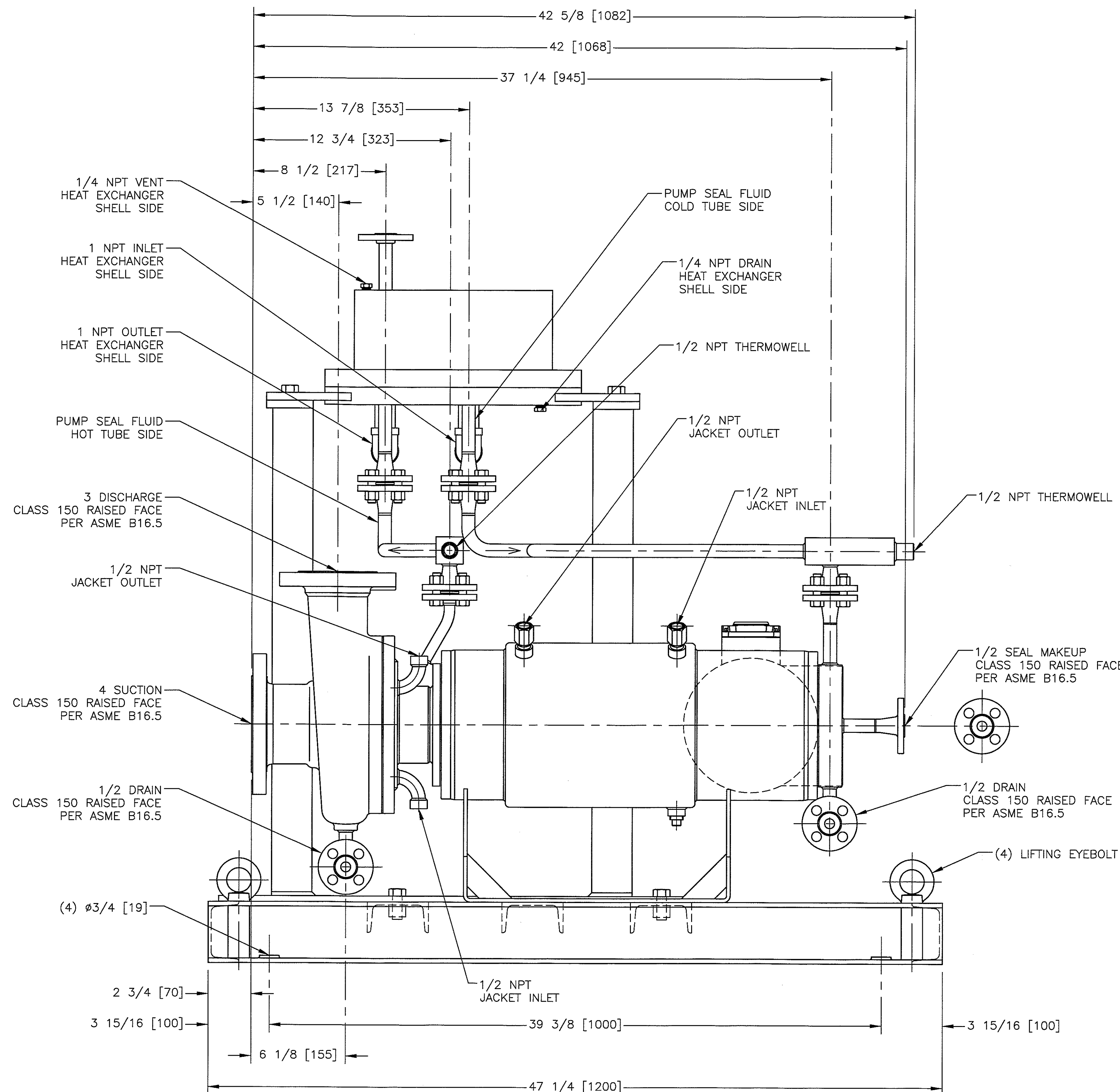
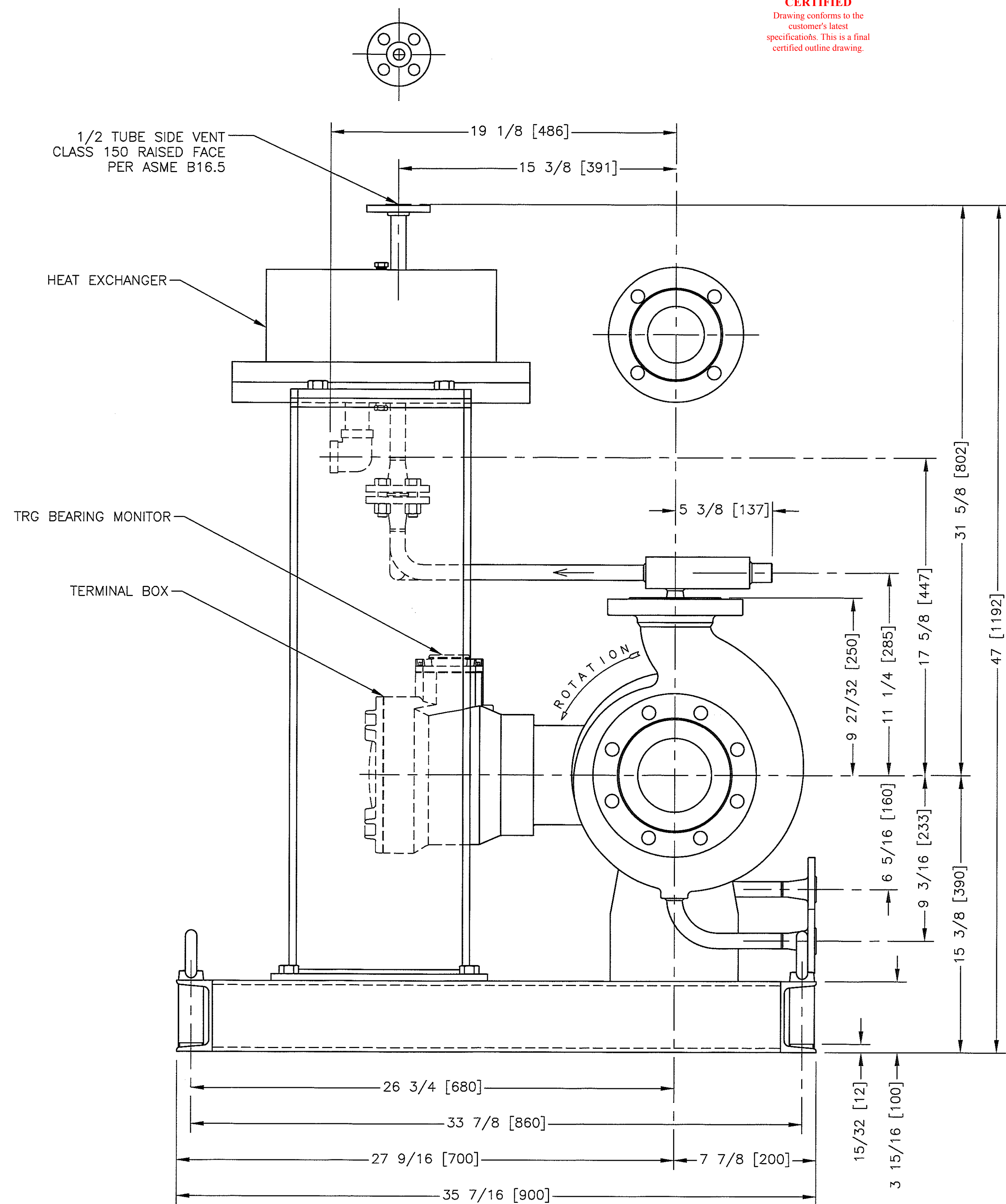
B: Added 1 Point. (Aug. 27' 15) M. Morii

C: Revised 12 points. Added 2 points. Deleted 1 point. (2016. 3. 14) M. Morii

D: Deleted 1 point. (Mar. 23' 16) M. Morii

DWG. NO. **3E-7473**

CERTIFIED
Drawing conforms to the
customer's latest
specifications. This is a final
certified outline drawing.



CUSTOMER: EVONIK CORPORATION
PO#: 4701013179 / 4701319034
PROJECT: ACA G600
PROJECT#: 4142.00940
EVONIK'S PUMP#: P-1020/P-1020S
REQUISITION#: C0078-010
WEIGHT: 1120 LBS.
PUMP AND HEAT EXCHANGER WILL HAVE 2" OF CELLULAR GLASS INSULATION.

ORIGINAL

TEIKOKU USA INC
CHEMPUMP
Containment, Reliability & Safety by Design

UNLESS OTHERWISE STATED:	DRAWN	DATE	TITLE
-ALL UNITS IN INCHES	E.W.M.	3/8/16	
-DIMS. IN BRACKETS ARE IN mm	CHECKED	DATE	
-DIMS. MARKED * ARE ±1/16 [±2]	CMH	3/11/16	
-ALL OTHER DIMS. ARE ±1/4 [±6]	APPROVED	DATE	
ANGLE DIMS. ARE ±5	CMH	3/11/16	
NOTE: ROUNDING TO NEAREST INCH/mm PRECLUDES INCH/mm CONVERSION	SCALE		
1	3/31/16	CHGD. H/E DIMS. & LOC., S.O.25379	ADD CUSTOMER COMMENTS
NO.	DATE & PRD. NO.	REVISIONS	BY
1	3/31/16	CHGD. H/E DIMS. & LOC., S.O.25379	ADD CUSTOMER COMMENTS
NO.	DATE & PRD. NO.	REVISIONS	BY

OUTLINE
DA61-518-0810T

DRAWING NO.
65859

REV.
1

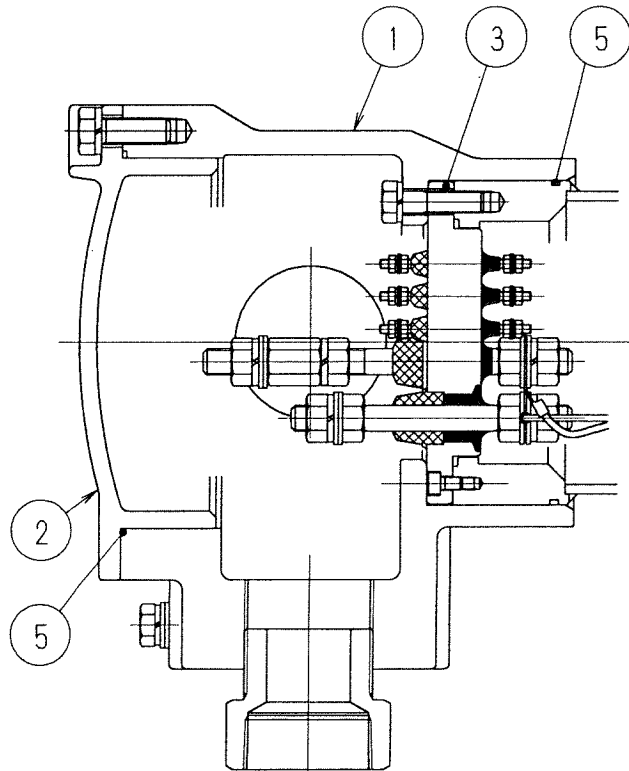
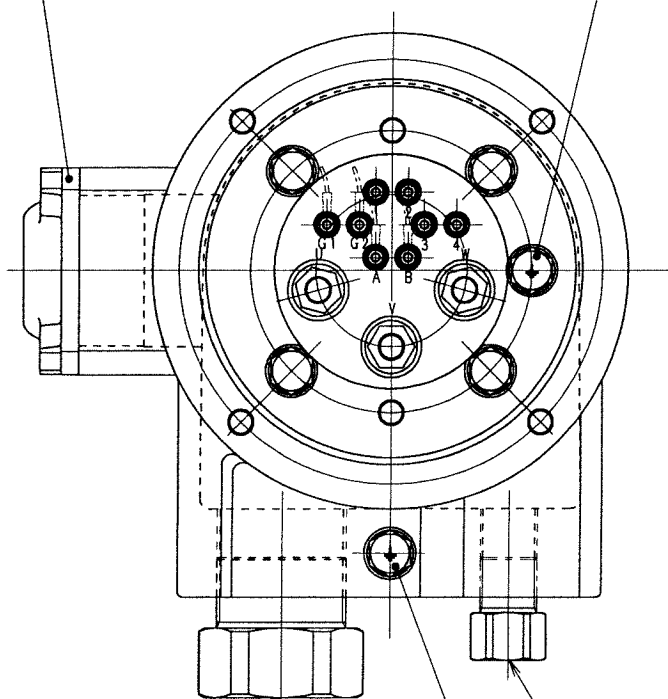
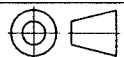
4N-9083-01

6

4

3

4



No.	名称 NAME
1	端子箱 TERMINAL BOX
2	端子蓋 TERMINAL COVER
3	端子板 TERMINAL PLATE
4	アース端子 EARTH TERMINAL
5	リング O-RING
6	TRGメータ TRG METER

NPT 2
SOURCE SIDENPT 3/4
PROTECTION SIDE

端子記号 TERMINAL MARK

U, V, W.....電源 SOURCE (M12)

1, 2, 3, 4.....サーモスタット THERMOSTAT (M4)

G1, G2, A, B.....TRGメータ TRG METER (M4)

FH1373A

REVISIONS

Customer :Evonik Corporation
PO# :4701013179/4701319034
Project :ACA G600
Project# :4142.00940
Evonik's Pump# :P-1020/P-1020S
Requisition# :C0078-010

APPROVED

R. Takeuchi

CHECKED

R. Matsumura

DRAWN

M. Morii

Aug-19/15

SCALE

FREE

DWG. TITLE

端子箱

TERMINAL BOX

SIZE : L FMCII

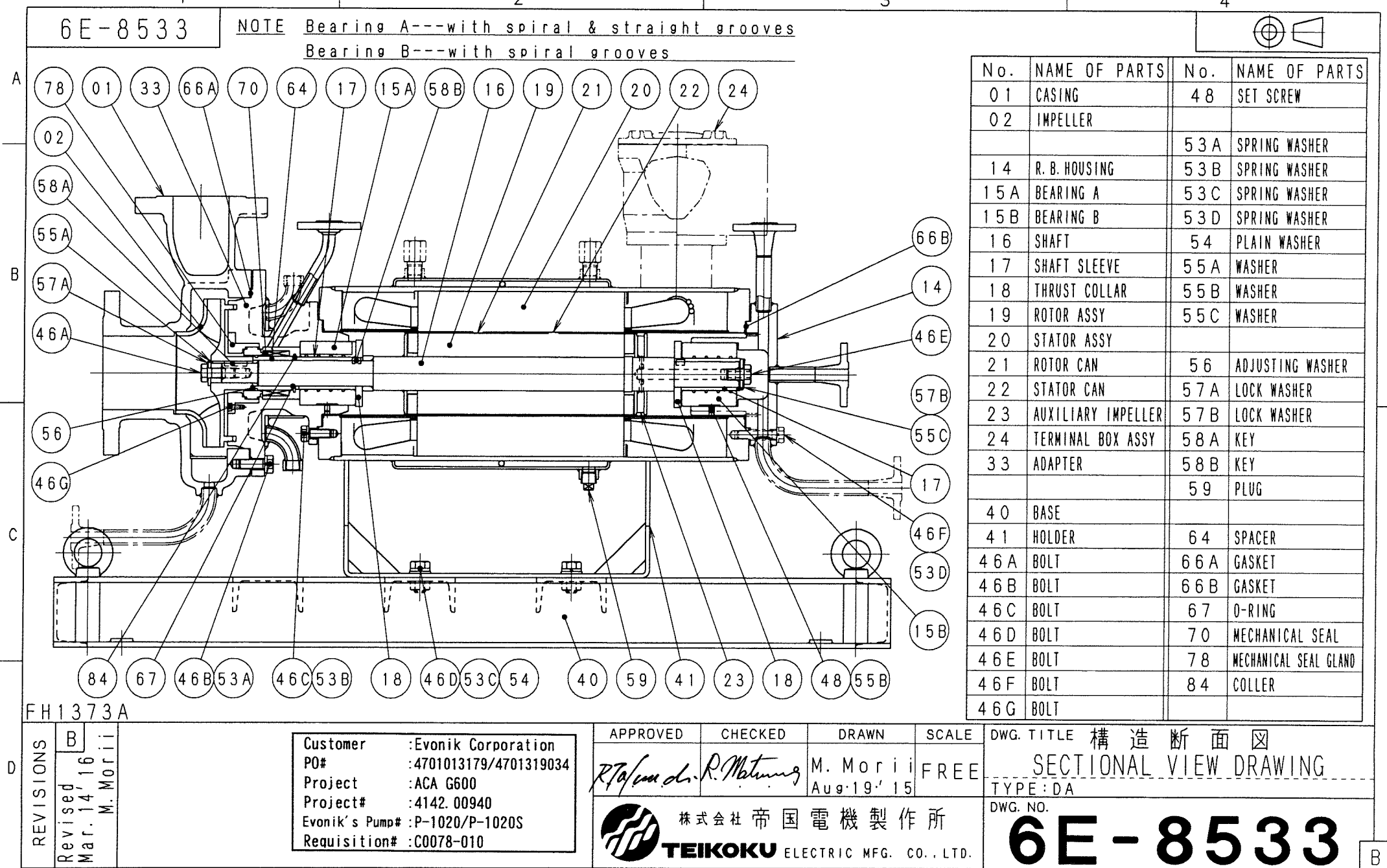
DWG. NO.



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4N-9083-01



MATERIAL LIST

(1/1)

NO.	NAME	MATERIAL (JIS Std./Eq. ASTM, AISI Std.)	REMARKS
01	CASING	SCS14 / CF-8M 316SS	
02	IMPELLER	SCS14 / CF-8M 316SS	
14	R. B. HOUSING	SUS316 / 316 SS	
15A	BEARING A	Carbon Graphite	
15B	BEARING B	Carbon Graphite	
16	SHAFT	SUS316 / 316 SS	
17	SHAFT SLEEVE	SUS316 / 316 SS + Stellite	
18	THRUST COLLAR	SUS316 / 316 SS + Stellite	
19	ROTOR ASS' Y	-----	
20	STATOR ASS' Y	-----	FRAME: SUS304 / 304 SS
21	ROTOR CAN	SUS316L / 316L SS	
22	STATOR CAN	ALLOY C-276	
23	AUXILIARY IMPELLER	SUS316L / 316L SS	
24	TERMINAL BOX ASS' Y	FC200 / Cl. No. 35 etc.	
33	ADAPTER	SCS14 / CF-8M 316SS	
40	BASE	SS400 / Carbon Steel	
41	HOLDER	SS400 / Carbon Steel	
46A	BOLT	SUS316 / 316 SS	
46B	BOLT	B SCM435 / AISI4137	
46C	BOLT	B SCM435 / AISI4137	
46D	BOLT	S20C / AISI 1020	
46E	BOLT	SUS316 / 316 SS	
46F	BOLT	B SCM435 / AISI4137	
46G	BOLT	SUS316 / 316 SS	
48	SET SCREW	SUS316 / 316 SS	
53A	SPRING WASHER	B SWRH / Carbon Steel	
53B	SPRING WASHER	B SWRH / Carbon Steel	
53C	SPRING WASHER	SWRH / Carbon Steel	
53D	SPRING WASHER	B SWRH / Carbon Steel	
54	PLAIN WASHER	SPCC / Carbon Steel	
55A	WASHER	SUS316L / 316L SS	
55B	WASHER	SUS316L / 316L SS	
55C	WASHER	SUS316L / 316L SS	
56	ADJUSTING WASHER	SUS316L / 316L SS	
57A	LOCK WASHER	SUS316L / 316L SS	
57B	LOCK WASHER	SUS316L / 316L SS	
58A	KEY	SUS316 / 316 SS	
58B	KEY	SUS316 / 316 SS	
59	PLUG	B SUS304 / 304 SS	
64	SPACER	SUS316 / 316 SS	
66A	GASKET	B SUS316 / 316 SS+Grafoil	
66B	GASKET	B SUS316 / 316 SS+Grafoil	
67	O-RING	PTFE	
70	MECHANICAL SEAL	SiC + Carbon	
78	GLAND	SUS316 / 316 SS	
84	COLLAR	SUS316 / 316 SS	

Customer : Evonik Corporation	
PO# : 4701013179/4701319034	
Project : ACA G600	
Project# : 4142. 00940	
Evonik's Pump# : P-1020/P-1020S	
Requisition# : C0078-010	

(DA) B Revised 9 Points, Deleted 2 Points. (2016. 3. 14 M. Morii)	APPROVED R. Takeuchi	CHECKED R. Matsumura	DRAWN M. Morii Aug. 20 '15	<h2 style="margin: 0;">P-32842</h2>
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FH1373A

TEIKOKU ELECTRIC MFG. CO., LTD.



ESTIMATED PERFORMANCE CURVE

Date : Aug. 19. 2015
No : E18H0037-00
Dwg. No. : SFH-1373A

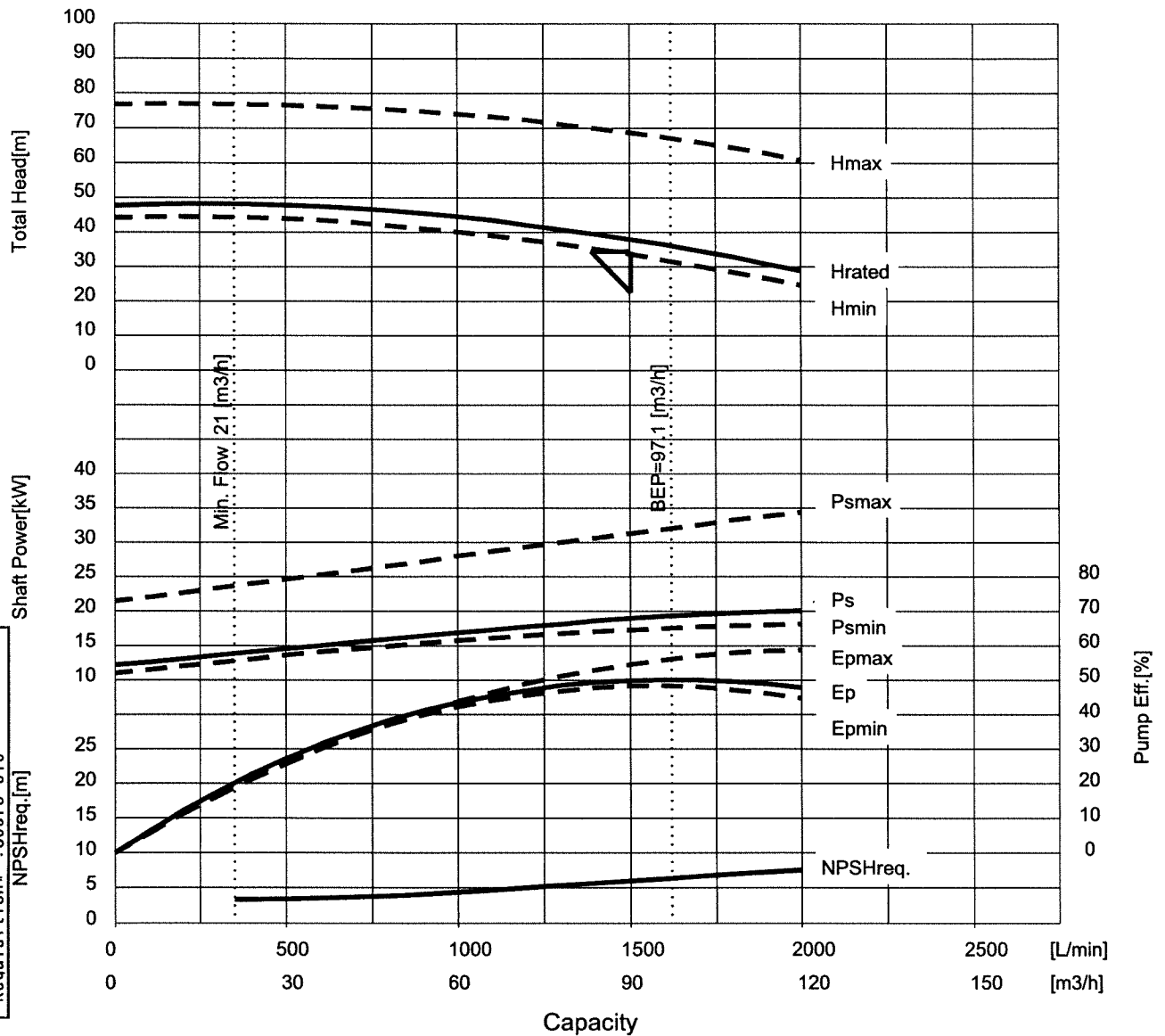
Item No. [Ⓐ] P-1020 / P-1020S

Item Name ****

Model [Ⓑ] DA61-2518J4BL-0810T1V-A

Frequency 60 Hz
Voltage 460 V
Phase 3
Pole 2
Output 29 kW
Current 55 A

Total Head 34.3 m
Capacity 1503 L/min 90.2 m³/h
Min.Flow 350 L/min 21 m³/h
Liquid AcCH
Temp. -2 degC
S.G. 1.02
NPSHavail. 12.35 m
Vis. 6.11 mPas
NPSHreq. 6 m



Remarks :

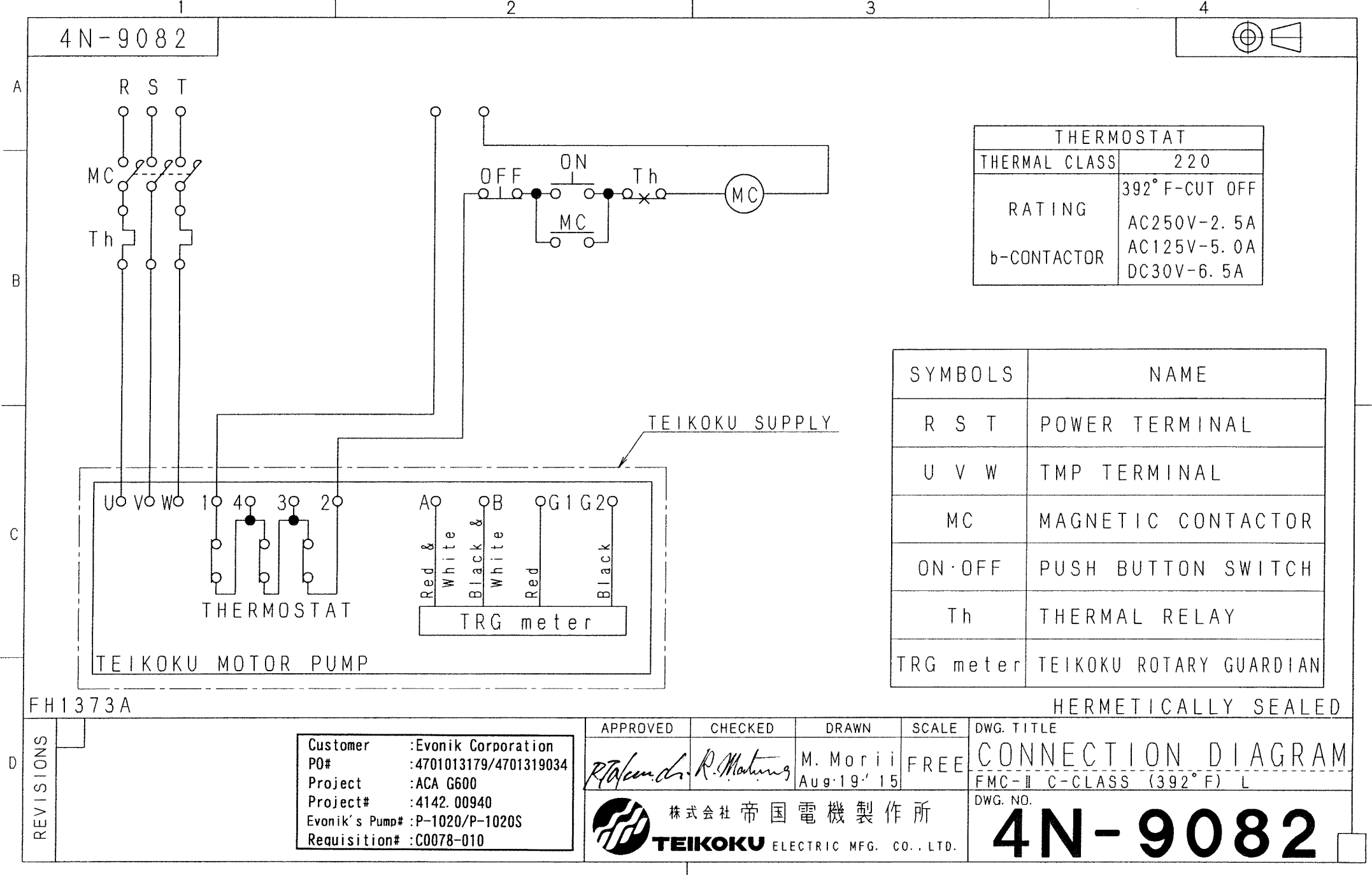
- Shut-off head : 47.6m
- 37.9m, 49.9%, 19kW, 3495rpm @ rated flow
- 120m³/hr, 20.1kW @ EOC
- 34.39kW @ EOC (max. dia.)
- Ns : 29.08, SSS : 9210
- Impeller Dia(mm):208(Max)/172(Rated)/166(Min)
- Output:38.89(hp)

B	2016.3.14	Revised 2 Points. M.Morii
REV.	Date	Description

APPROVED BY	CHECKED BY	DRAWN BY
R.Takeuchi	R.Matsumura	M.Morii

TEIKOKU ELECTRIC MFG. CO., LTD.

UNIS Version 3.0.2
NDTS11_15



THERMOSTAT	
THERMAL CLASS	220
RATING	392° F-CUT OFF
b-CONTACTOR	AC250V-2.5A
	AC125V-5.0A
	DC30V-6.5A

SYMBOLS	NAME
R S T	POWER TERMINAL
U V W	TMP TERMINAL
MC	MAGNETIC CONTACTOR
ON·OFF	PUSH BUTTON SWITCH
Th	THERMAL RELAY
TRG meter	TEIKOKU ROTARY GUARDIAN

FH1373A

HERMETICALLY SEALED

REVISIONS

D

Customer :Evonik Corporation

PO# :4701013179/4701319034

Project :ACA G600

Project# :4142. 00940

Evonik's Pump# :P-1020/P-1020S

Requisition# :C0078-010

APPROVED

R. Anderson

CHECKED

R. Maturing

DRAWN

M. Morii

SCALE


FREE

DWG. TITLE

CONNECTION DIAGRAM

DWG. NO.

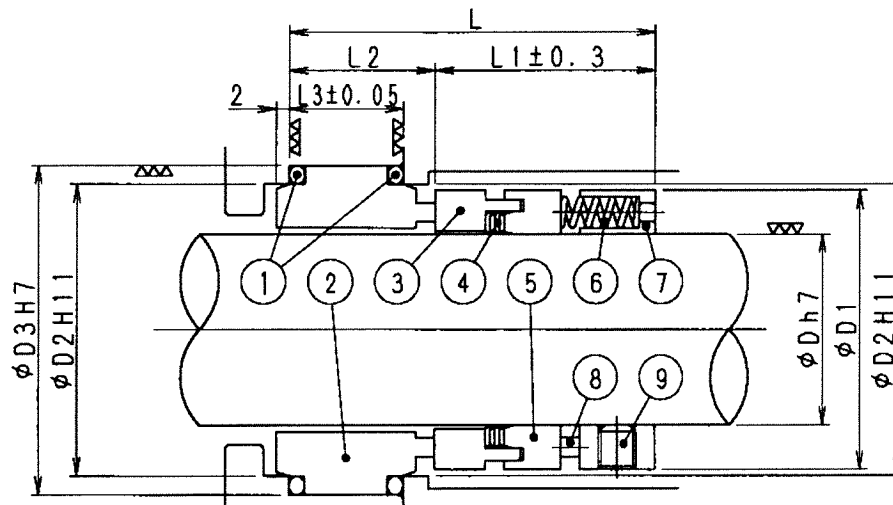
4N-9082



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TEIKOKU ELECTRIC MFG. CO., LTD.

4N-4024-15



G-No	D	D1	D2	D3	L	L1	L2	L3
1	20	34	36	42	58	35	23	18
2	22	36	38	44	58	35	23	18
3	24	38	40	46	58	35	23	18
4	25	39	41	47	58	35	23	18
5	28	42	44	50	58	35	23	18
6	30	44	46	52	58	35	23	18
7	32	46	48	54	58	35	23	18
8	33	47	49	55	58	35	23	18
9	35	49	51	57	58	35	23	18
10	38	54	58	64	63	38	25	20
11	40	56	60	66	63	38	25	20
12	42	58	62	68	63	38	25	20
13	43	59	63	69	63	38	25	20
14	45	61	65	71	63	38	25	20
15	48	64	68	74	63	38	25	20

G-No	D	D1	D2	D3	L	L1	L2	L3
16	50	66	70	76	64	39	25	20
17	52	68	72	78	65	40	25	20
18	53	69	73	79	65	40	25	20
19	55	71	75	81	65	40	25	20
20	58	76	83	89	69	41	28	22
21	60	78	85	91	69	41	28	22
22	62	80	87	93	69	41	28	22
23	63	81	88	94	69	41	28	22
24	65	83	90	96	69	41	28	22
25	68	86	93	99	71	41	30	24
26	70	90	95	101	72	42	30	24
27	75	95	104	110	72	42	30	24
28	80	100	109	115	73	42	31	25
29	90	110	119	125	76	45	31	25

No.	NAME	NOTES
1	O リング O RING	PTFE FF (TEFLON)
2	シール リング SEAL RING	CARBON
3	メーティング リング MATING RING ASS'Y	SIC RETAINER: TITANIUM
4	V パッキン V-PACKING	PTFE FF (TEFLON)
5	コンプレッション リング COMPRESSOIN RING	316 SS
6	コイル スプリング COIL SPRING	316 SS
7	カラー COLLAR	316 SS
8	ドライブ ピン DRIVE PIN	316 SS
9	セット スクリュー SET SCREW	316L SS

REVISIONS

B	C
Mar. 22 '01 G-29 Added (N. Maruo)	Aug. 19 '03 Revised (K. Nakazumi)

Customer : Evonik Corporation
PO# : 4701013179/4701319034
Project : ACA G600
Project# : 4142. 00940
Evonik's Pump# : P-1020/P-1020S
Requisition# : C0078-010

APPROVED

M. Sakai

CHECKED

T. Takeuchi

DRAWN

R. Takeuchi
Feb. 2 '98

SCALE

FREE

DWG. TITLE メカニカル シール
MECHANICAL SEAL
TYPE: LIE

DWG. NO.

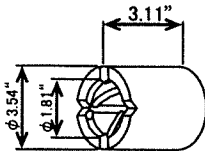
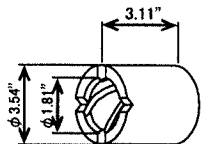
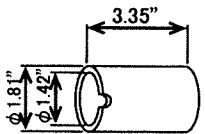
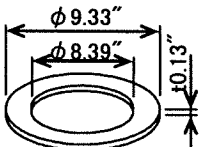
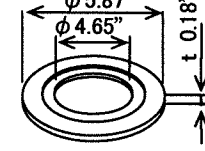
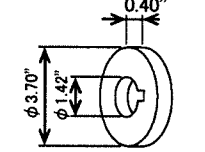
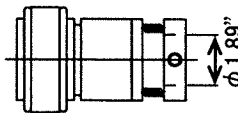

4N-4024-15



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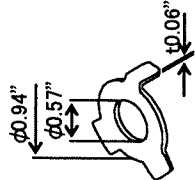
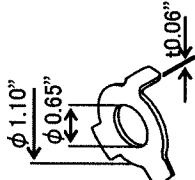

TEIKOKU ELECTRIC MFG. CO., LTD.

SPARE PARTS LIST FOR RECOMMEND

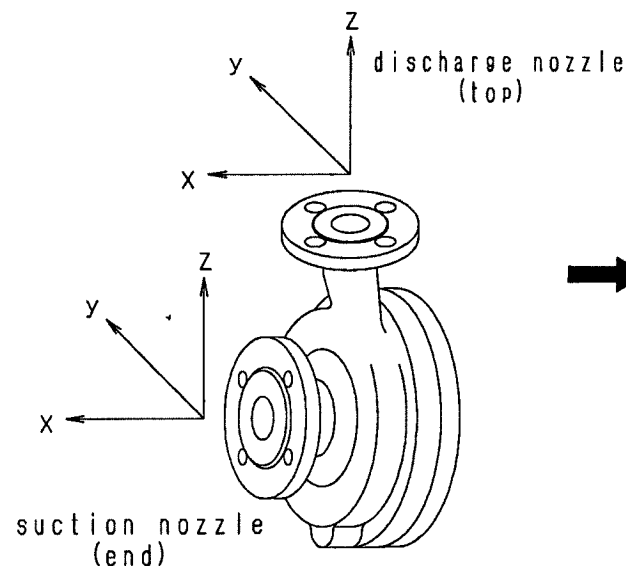
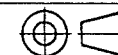
TYPE					SC-1044	1 2
DA-510-T						
No.	部 品 名 PARTS NAME	寸 法 DIMENSION	材 質 MATERIAL	数量/1 台 FOR 1SETS	備 考 REMARKS	
1	BEARING A (with spiral & straight grooves)		Carbon Graphite	1	#15A 90×46×79 (mm)	
2	BEARING B		Carbon Graphite	1	#15B 90×46×79 (mm)	
3	SHAFT SLEEVE		316 SS (SUS316) + Stellite	2	#17 46×36×85 (mm)	
4	GASKET		316 SS (SUS316) + Grafiol	1	#66A 237×213×3.2 (mm)	
5	GASKET		316 SS (SUS316) + Grafiol	2	#66B 149×118×4.5 (mm)	
6	THRUST COLLAR		316 SS (SUS316) + Stellite	2	#18 94×36×10 (mm)	
7	MECHANICAL SHEEL		Tun. Carbide + Carbon	1	#70 48 (mm)	
来歴. REV.	B:Revised (2016.3.14 M.Morii)  株式会社 帝国電機製作所 TEIKOKU ELECTRIC MFG. CO., LTD.		APPROVED	CHECKED	DRAWN	
			R. Takeuchi	R. Matsumura	M. Morii Aug. 21. '15	

Customer :Evonik Corporation
 PO# :4701013179/4701319034
 Project :ACA G600
 Project# :4142. 00940
 Evonik's Pump# :P-1020/P-1020S
 Requisition# :C0078-010

SPARE PARTS LIST FOR RECOMMEND

TYPE				SC-1044		2 2
DA-510-T						
No.	部 品 名 PARTS NAME	寸 法 DIMENSION	材 質 MATERIAL	数量/1 台 FOR 1SETS	備 考 REMARKS	
8	LOCK WASHER		316L SS (SUS316L)	1	#57A 24×14.5×1.5 (mm)	
9	LOCK WASHER		316L SS (SUS316L)	1	#57B 28×16.5×1.5 (mm)	
来歴 REV.		 株式会社 帝国電機製作所 TEIKOKU ELECTRIC MFG. CO., LTD.		APPROVED	CHECKED	DRAWN
				_____	_____	_____

4N-6993-05

CASING

#No	PUMP TYPE	Fsx	Fsy	Fsz	Fdx	Fdy	Fdz	Msx	Msy	Msx	Mdx	Mdy	Mdz
1	0204	670	530	430	360	290	450	350	170	260	230	120	180
2	0405	890	710	580	530	430	670	400	230	350	350	170	260
3	0506	1110	890	730	710	580	890	710	350	540	460	230	350
4	0608	1330	1070	890	890	730	1110	950	470	720	710	350	540
5	0810	1780	1420	1160	1070	890	1330	1330	680	1000	950	470	720
6	1012	2450	1960	1600	1420	1160	1780	1820	930	1380	1330	680	1000
7	1215	3110	2490	2050	1960	1600	2450	2300	1180	1760	1820	930	1380
8	1520	4890	3780	3110	2490	2050	3110	3530	1760	2580	2300	1180	1760
9	2025	6670	5340	4450	3780	3110	4890	5020	2440	3800	3530	1760	2580
10	1015	3110	2490	2050	1420	1160	1780	2300	1180	1760	1330	680	1000
11	0408	1330	1070	890	530	430	670	950	470	720	350	170	260
12	0508	1330	1070	890	710	580	890	950	470	720	460	230	350
13	1515	3110	2490	2050	2490	2050	3110	2300	1180	1760	2300	1180	1760
14	1010	1780	1420	1160	1420	1160	1780	1330	680	1000	1330	680	1000
15	1212	2450	1960	1600	1960	1600	2450	1820	930	1380	1820	930	1380

Customer : Evonik Corporation
PO# : 4701013179/4701319034
Project : ACA G600
Project# : 4142. 00940
Evonik's Pump# : P-1020/P-1020S
Requisition# : C0078-010

NOTE : F = force (N) M = moment (N-m)

S = suction nozzle

d = discharge nozzle

See the figure for orientation of nozzle loads (x, y, z)

DQ1377

REVISIONS

B

Reritten
Aug. 7'08
K. Nakazumi

C

Revised
API610 8th
Edition to API610
10th Edition.
Sep. 3'08
Y. Shimizu

D

#11~#13
Added
Sep. 2'13
K. Nakazumi

E

#14, #15 Added
Mar. 20'15
K. Nakazumi

APPROVED

T. Takeuchi

CHECKED

S. Kimura

DRAWN

Y. Shimizu
Apr. 11'08

SCALE

FREE

DWG. TITLE

許容配管荷重
ALLOWABLE PIPING FORCES AND MOMENTS
SI Units API610 (10th)

DWG. NO.



株式会社 帝国電機製作所

TEIKOKU ELECTRIC MFG. CO., LTD.

4N-6993-05

E



HELIFLOW HEAT EXCHANGER SPECIFICATION SHEET

Customer:	Chempump Teikoku USA	Graham Ref.No.:	EG780 PHL16
Customer Ref:		Date:	Mar 8, 2016
Item:		Engineer:	NAS
Performance			
		Inside Coil	Outside Coil
Description of fluid circulated		ACA	50% ETH. GLY.
Specific Gravity		1.032	1.080
Specific Heat	BTU/lb F	0.443	0.740
Thermal Conductivity	BTU/hr ft F	0.079	0.244
Viscosity (Film For Liquids)	cP	7.355	11.295
Rate of Flow	gpm	5.00	5.00
Rate of Flow	lb/hr	2580.15	2699.11
Temperature Entering Heliflow	F	77.00	5.00
Temperature Leaving Heliflow	F	56.00	17.00
Calculated Pressure Drop	psi	2.23	1.37
Operating Pressure	psig	?	?
Design Pressure	psig	150.00	75.00
Hydrostatic Test Pressure	psig	195.00	98.00
Design Temperature	F	300.00	300.00
Connection Sizes	in	1/2"	1"
Connection Type		150# RF FLG	FNPT
Total Duty	BTU/hr	23987.46	
Total Surface Supplied	ft2	11.69	
Model		PSC-116T/6C6C	
Coil Spacing		STD	
Tubes 3/8 Dia 18 BWG	316SS	Manifolds	316SS
BasePlate	316SS	Bolts	Alloy Steel
Casing	316SS	Gaskets	Non-Asbestos
Tubes To Manifold Joint:	Welded		
Code of Construction:	GRAHAM STANDARD		
General			
Price F.O.B Batavia, N.Y.:			
Shipment:			
Weight	225.00 lb		
Remarks			
Buyer to review materials of construction for process compatibility.			
Buyer to verify fluid physical properties used in the design.			
Manifolds welded to baseplate.			
1/2" MNPT Tube Side Vent Included.			
Terms Conditions of Sale per GMC-1002-E unless otherwise indicated.			

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