

TEIKOKU CANNED MOTOR PUMP DATA SHEET

Messrs : Evonik Degussa Corporation

No. QFH-1385A

Aug. 10 2015

Order No. : ☒ ※1
 Job No. : —
 Project Name : —
 Item No. : ☒ ※1
 Item Name : —
 Model : ☒ DA61-216J4BM-0405R1V-A

CERTIFIED
 Drawing conforms to the
 customer's latest specifications

Qty : ☒ 2

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) : 21	Capacity (L/min) : 216.4 (m3/h) : 12.98	Casing : SCS14 (CF-8M 316 SS)	Impeller : SCS14 (CF-8M 316 SS)																									
Suction Press. (barA) : 0.57~5.38	Discharge Press. (barA) : —	Adapter : SCS14 (CF-8M 316 SS)	RBH : SUS316 (316 SS)																									
NPSHava. (m) : 5.3	NPSHreq. (m) : 3.2	Motor Flange : SUS316L (316L SS)	Stator Can : SUS316L (316L SS)																									
Liquid : Finished ACA		Shaft : SUS316 (316 SS)	Rotor Can : SUS316L (316L SS)																									
Temperature (Des./Nor.) (°C) : 80.3 / —		Bearing : Carbon Graphite	Shaft Sleeve : SUS316 (316 SS) + Stellite																									
Specific gravity (Des./Nor.) : 0.96 / —		Pump Gasket : ☒ SUS316 (316 SS) + Grafoil	Motor Gasket : PTFE																									
Viscosity (Des./Nor.) (mPa·s) : 0.51 / —		O-ring : PTFE	Mechanical Seal : SiC+Carbon																									
Mechanical Design Temperature (°C) : —																												
Specific Heat (kJ/(kg·K)) : —	Melting Temp. (°C) : —																											
Vapor Press. (BarA) : 0.016																												
Solids Name : —																												
Concentration (wt%) : —	Particle Size (μm) : — S.Gr. : —																											
Flushing or Barrier Fluid : Finished ACA																												
Liquid/S.Gr. (mPa·s) : 0.96 / 0.51																												
Press. (MPaG) : S.P. + 0.2 ± 0.05	Flow (mL/h) : Max. 3																											
Pump Design & Construction		Performance																										
Design Press ☒ (bar) : ☒ 7.54	Temp. (°C) : 80.3	Impeller Type : CLOSE	No. of Stage : 1																									
Code Applied : None	Nameplate : English	Min. Flow (L/min) : —	Min. Flow (m3/h) : —																									
Nozzle Connection : ASME Finish : SMOOTH FINISH <table border="1"> <tr> <th>Nozzle</th> <th>Rating</th> <th>Size</th> <th>Facing</th> <th>Position</th> </tr> <tr> <td>Suction</td> <td>150LB</td> <td>2"</td> <td>RF</td> <td>END</td> </tr> <tr> <td>Discharge</td> <td>150LB</td> <td>1-1/2"</td> <td>RF</td> <td>TOP</td> </tr> <tr> <td>Drain</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> </tr> <tr> <td>Reverse</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> </tr> </table>		Nozzle	Rating	Size	Facing	Position	Suction	150LB	2"	RF	END	Discharge	150LB	1-1/2"	RF	TOP	Drain	—	—	—	—	Reverse	—	—	—	—		
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Drain	—	—	—	—																								
Reverse	—	—	—	—																								
Jacket Design Press. (MPa) : — <table border="1"> <tr> <th>Utilities Required</th> <th>Media</th> <th>Condition (Max)</th> <th>Flow (Min.)</th> <th>Connection</th> </tr> <tr> <td>Casing</td> <td>NONE</td> <td>—</td> <td>—</td> <td>—</td> </tr> <tr> <td>Motor</td> <td>COOLING</td> <td>☒ CW ☒ 35°C</td> <td>0.3 m3/h</td> <td>NPT 1/2</td> </tr> <tr> <td>Heat Ex./Ext. Circ.</td> <td>COOLING</td> <td>☒ CW ☒ 35°C</td> <td>0.9 m3/h</td> <td>NPT 1/2</td> </tr> <tr> <td>Motor (Stop)</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> </tr> </table>		Utilities Required	Media	Condition (Max)	Flow (Min.)	Connection	Casing	NONE	—	—	—	Motor	COOLING	☒ CW ☒ 35°C	0.3 m3/h	NPT 1/2	Heat Ex./Ext. Circ.	COOLING	☒ CW ☒ 35°C	0.9 m3/h	NPT 1/2	Motor (Stop)	—	—	—	—		
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Motor (Stop)	—	—	—	—																								
Customer : Evonik Corporation PO# : 4701013179/4701319034 Project : ACA G600 Project# : 4142.00940 Evonik's Pump# : P-4420/P-4420S Requisition# : C0078-010																												
Power Supply & Drive Motor		Vendor Drawings and Data																										
Frame No. : 216	Duty : Cont	Dimensional Dwg. : 6E-8508	Allowable Piping Forces and Moments : 4N-6993-02																									
Voltage (V) : 460	Frequency (Hz) : 60	Terminal Box : 4N-8988-01	☒ Thermowell : 4N-7445																									
Output (kW/hp) : 2.5/3.35	Rated Amp. (A) : 5	Sectional View Dwg. : ☒ 6E-8554																										
Thermal Class : 220	Start Method : DIRECT	Material List : P-32821																										
R.P.M. (rpm) : 3600	Direction : C.C.W. (Viewed from Pump Suction)	Est. Performance Curve : SFH-1385A																										
Voltage for protection (V) : 120	Protection Device : Thermostat b	Connection Diagram : ☒ 4N-4415-01																										
Dry Run Protection Relay : —		Mechanical Seal : 4N-4024-06																										
Terminal Box : Stud/Thread/ 1		Recommended Spare Parts List : SC-1031																										
Power Cable Conduit : NPT1	Cable O.D. (Main) (mm) : —																											
Instrument Cable Conduit : NPT3/4	Cable O.D. (Sub) (mm) : —																											
ATEX Marking : —																												
		Other																										
		Special Treatment : None																										
		Painting Color : Light Gray																										
		Rotating Direction																										
		Monitoring : Yes																										
		Bearing Wear Monitor : Radial / Local																										

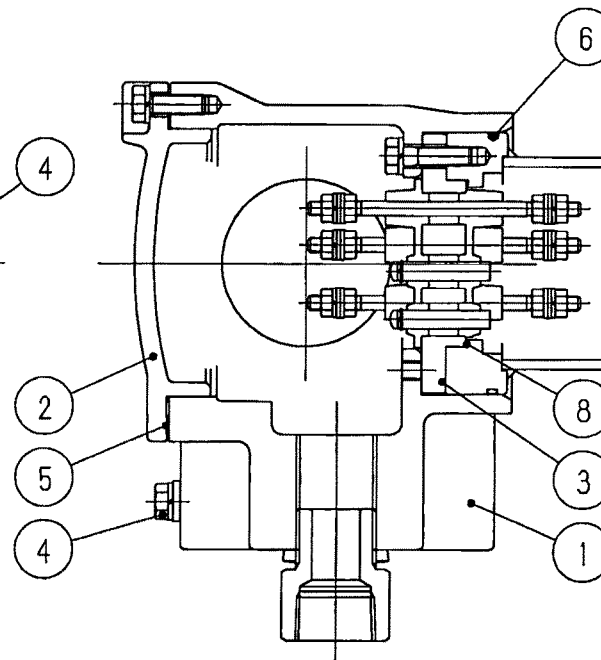
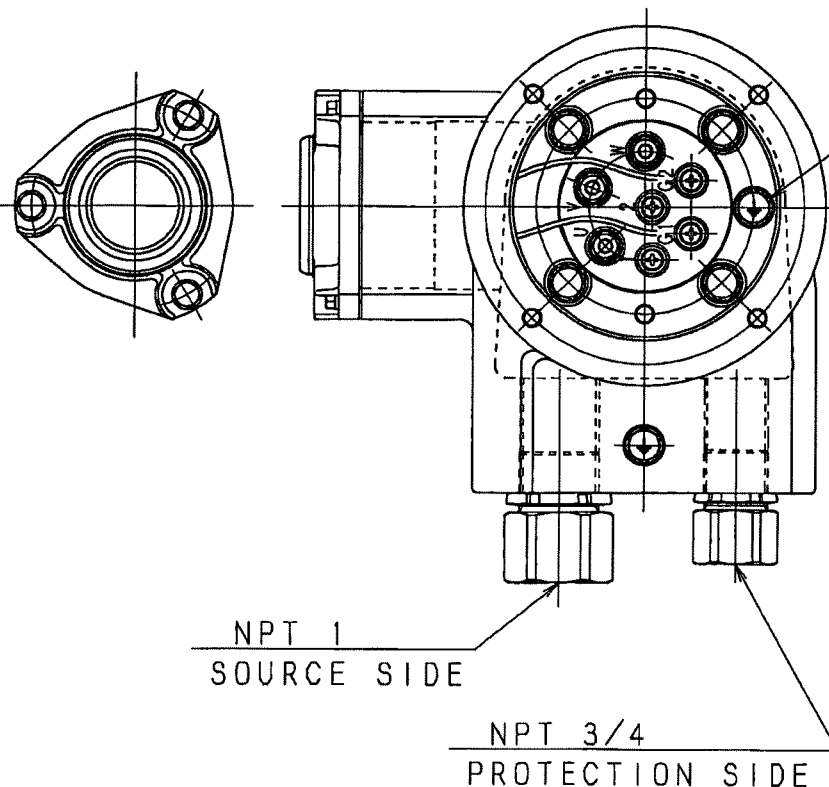
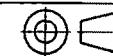
Remarks :

- T-USA#385330
- Hazardous Area Classification : Class. 1, Div. 2, Gr. C&D T2
- ☒ -Mechanical Design Temperature : 250°C (Pumps do not run at this temperature. Pumps are not expected to function post experience of this temperature.)
- ☒ -※1 Item No. P-4420 / Order No. 4701013179, Item No. P-4420S / Order No. 4701319034

REVISEMENTS

B: Revised 1 Point (Aug. 21'15) M. Morii
 C: Revised 5 points, Added 2 points, Deleted 1 point
 (2015. 10. 29) M. Morii
 D: Revised 3 points, Added 1 point (2015. 11. 16) M. Morii
 E: Revised 5 points (2016. 1. 6) M. Morii

4N-8988-01



No.	NAME
1	TERMINAL BOX
2	TERMINAL COVER
3	TERMINAL PLATE
4	EARTH TERMINAL
5	GASKET
6	O-RING
7	TRG METER
8	O-RING

TERMINAL MARK

U·V·W----SOURCE (M6)
 1·2-----THERMOSTAT (M4)
 G1·G2----TRG METER (M4)

FG2021A

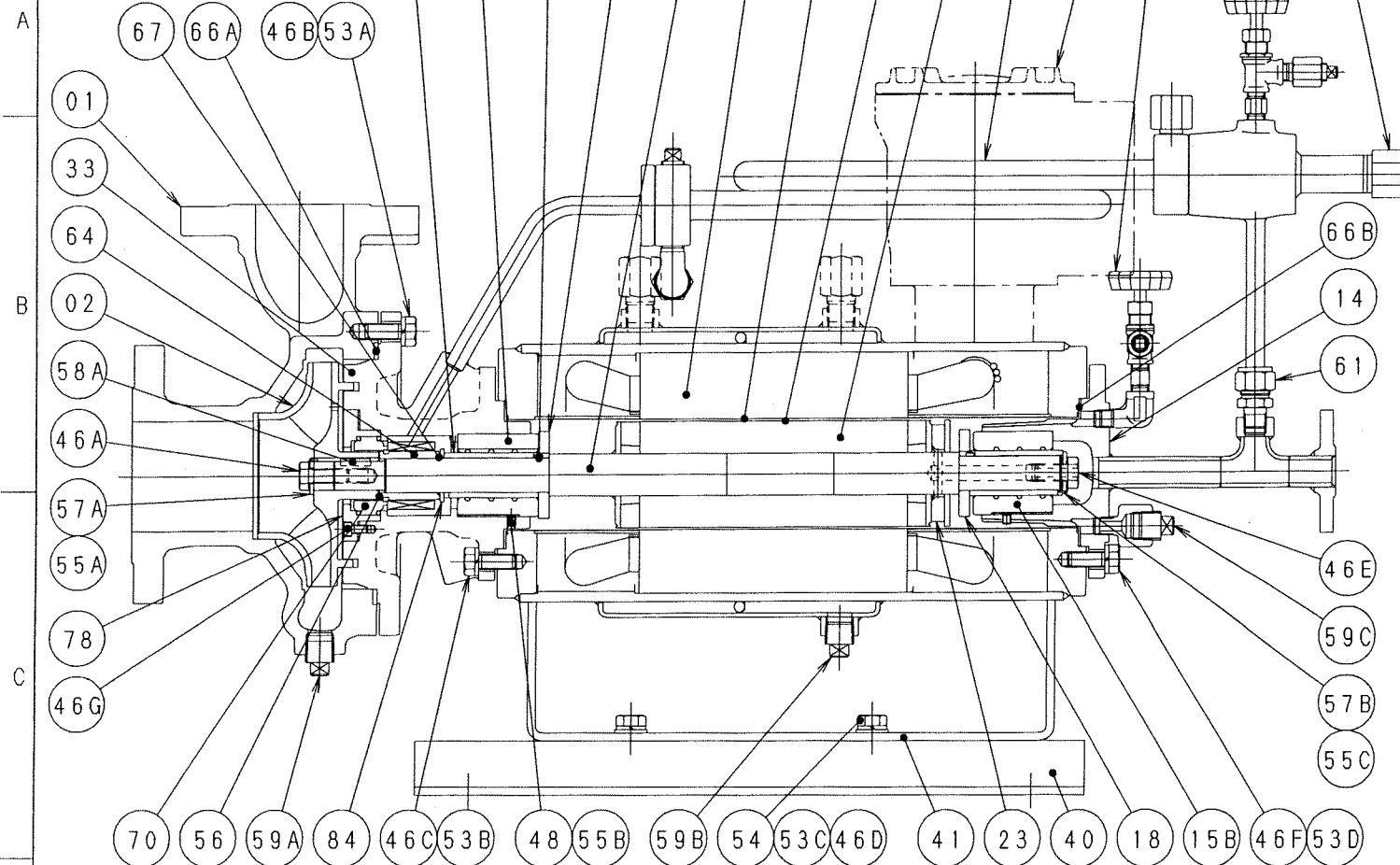
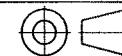
REVISIONS

Customer :Evonik Corporation
 PO# :4701013179/4701319034
 Project :ACA G600
 Project# :4142. 00940
 Evonik's Pump# :P-4420/P-4420S
 Requisition# :C0078-010

APPROVED	CHECKED	DRAWN	SCALE	DWG. TITLE
T. Takeuchi	R. Okamoto	K. Nakazumi Mar.26.'15	FREE	TERMINAL BOX
				SIZE : S Hermetic (Special)
				DWG. NO. 4N-8988-01

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TEIKOKU ELECTRIC MFG. CO., LTD.

6E-8554



No.	NAME OF PARTS	No.	NAME OF PARTS
01	CASING	48	SET SCREW
02	IMPELLER	53A	SPRING WASHER
14	R. B. HOUSING	53B	SPRING WASHER
15A	BEARING A	53C	SPRING WASHER
15B	BEARING B	53D	SPRING WASHER
16	SHAFT	54	PLAIN WASHER
17	SHAFT SLEEVE	55A	WASHER
18	THRUST COLLAR	55B	WASHER
19	ROTOR ASS'Y	55C	WASHER
20	STATOR ASS'Y	56	ADJUSTING WASHER
21	ROTOR CAN	57A	LOCK WASHER
22	STATOR CAN	57B	LOCK WASHER
23	AUXILIARY IMPELLER	58A	KEY
24	TERMINAL BOX ASS'Y	59A	PLUG
33	ADAPTER	59B	PLUG
35	HEAT EXCHANGER ASS'Y	59C	PLUG
36	VENT VALVE	60	PIN
40	BASE	61	DOUBLE JOINT
41	HOLDER	64	SPACER
46A	BOLT	66A	GASKET
46B	BOLT	66B	GASKET
46C	BOLT	67	O-RING
46D	BOLT	70	MECHANICAL SEAL
46E	BOLT	78	GLAND
46F	BOLT	84	COLLAR
46G	BOLT	900	THERMOWELL

NOTE

BEARING A...with spiral & straight grooves

BEARING B...with spiral grooves

FH1383A

D	
REVISIONS	
B	
Revised	Nov. 11, '15
M. Morii	
C	
Revised	Jan. 6, '16
M. Morii	

Customer :Evonik Corporation
PO# :4701013179/4701319034
Project :ACA G600
Project# :4142. 00940
Evonik's Pump# :P-4420/P-4420S
Requisition# :C0078-010

APPROVED

CHECKED

DRAWN

SCALE

R. Takemura
R. Matsumura

M. Morii
Aug. 21, '15

FREE

DWG. TITLE 構造断面図

SECTIONAL VIEW DRAWING

TYPE: DA

DWG. NO.



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TEIKOKU ELECTRIC MFG. CO., LTD.

6E-8554

C

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	SUSF316 or SCS14 / F 316 SS or CF-8M 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	-----	
21	ROTOR CAN	SUS316L / 316L SS	
22	STATOR CAN	SUS316L / 316L SS	
23	AUXILIARY IMPELLER	SUS316L / 316L SS	
24	TERMINAL BOX ASS' Y	FC200 / Cl. No. 35 etc.	
33	ADAPTER	SCS14 / CF-8M 316SS	
35	HEAT EXCHANGER ASS' Y	SUS316L / 316L SS etc.	
36	VENT FLANGE	SUS316 / 316 SS	
40	BASE	SS400 / Carbon Steel	
41	HOLDER	SS400 / Carbon Steel	
46A	BOLT	SUS316 / 316 SS	
46B	BOLT	CSM435 / AISI 4137	
46C	BOLT	SUS304 / 304 SS	
46D	BOLT	S20C / AISI 1020	
46E	BOLT	SUS316 / 316 SS	
46F	BOLT	SUS304 / 304 SS	
46G	BOLT	SUS316 / 316 SS	
48	SET SCREW	SUS316 / 316 SS	
53A	SPRING WASHER	CSWRH / Carbon Steel	
53B	SPRING WASHER	SUS304 / 304 SS	
53C	SPRING WASHER	SWRH / Carbon Steel	
53D	SPRING WASHER	SUS304 / 304 SS	
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	
59A	PLUG	SUS316 / 316 SS	
59B	PLUG	SS400 / Carbon Steel	
59C	PLUG	SUS316 / 316 SS	
60	PIN	SUS316 / 316 SS	
61	DOUBLE JOINT	SUS316 / 316 SS	
64	SPACER	SUS316 / 316 SS	
66A	GASKET	CSUS316 / 316 SS+Grafoil	
66B	GASKET	T/#9007-LC / PTFE	
67	O-RING	PTFE	
70	MECHANICAL SEAL	SiC + Carbon	
78	GLAND	SUS316 / 316 SS	
84	COLLAR	SUS316 / 316 SS	
900	THERMOWELL	SUS316 / 316 SS	

Customer : Evonik Corporation
 PO# : 4701013179/4701319034
 Project : ACA G600
 Project# : 4142. 00940
 Evonik's Pump# : P-4420/P-4420S
 Requisition# : C0078-010

(DA) Added 1 Point (Aug. 21' 15) M. Morii Revised 3 Points (Oct. 29' 15) M. Morii Added 1 Point (Nov. 11' 15) M. Morii	APPROVED R. Takeuchi	CHECKED R. Matsumura	DRAWN K. Nakazumi Aug. 10 ' 15	P-32821
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FH1383A

TEIKOKU ELECTRIC MFG. CO., LTD.



ESTIMATED PERFORMANCE CURVE

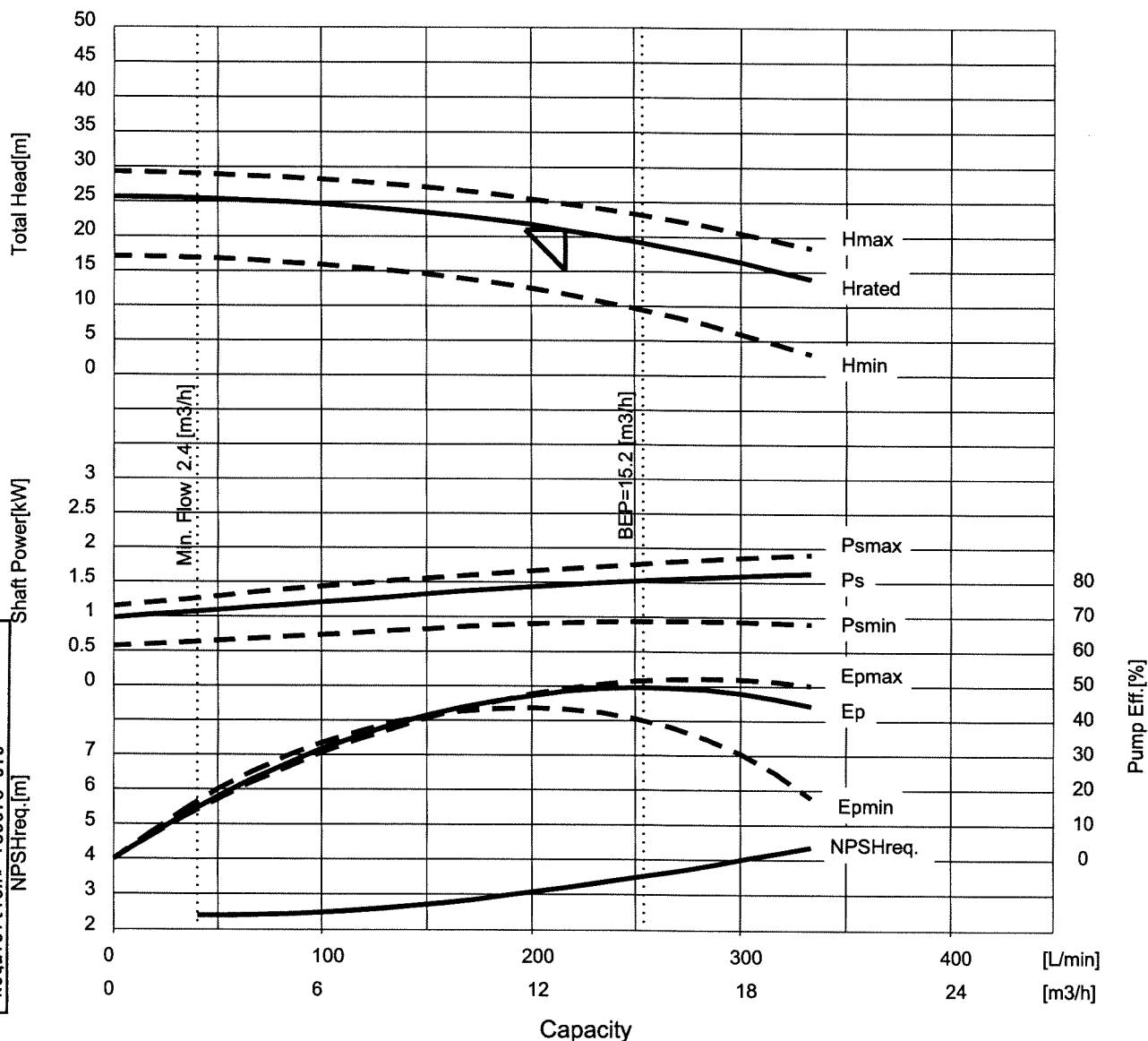
Date : Aug. 18. 2015
No : E18H0033-01
Dwg. No. : SFH-1385A

Item No. ☐ P-4420 / P-4420S
Model ☐ DA61-216J4BM-0405R1V-A

Item Name *****

Frequency 60 Hz
Voltage 460 V
Phase 3
Pole 2
Output 2.5 kW
Current 5 A

Total Head 21 m
Capacity 216.4 L/min 12.98 m³/h
Min. Flow 40 L/min 2.4 m³/h
Liquid Finished ACA
Temp. 80.3 degC
S.G. 0.96
NPSHavail. 5.3 m
Vis. 0.51 mPas
NPSHreq. 3.2 m



Customer : EVONIK CORPORATION
P.O.# : 4701013179/4701319034
Project : ACA G600
Project# : 4142. 00940
Evonik's Pump# : P-4420/P-4420S
Requisition# : C0078-010

Remarks :

- Shut-off head : 25.7m
- 21m, 48.5%, 1.46kW, 3454rpm @ rated flow
- 20m³/hr, 1.6kW @ EOC
- 1.904kW @ EOC (max. dia.)

- Ns : 23.36, SSS : 5367
- Impeller Dia(mm):130(Max)/122(Rated)/104(Min)
- Output:3.35(hp)

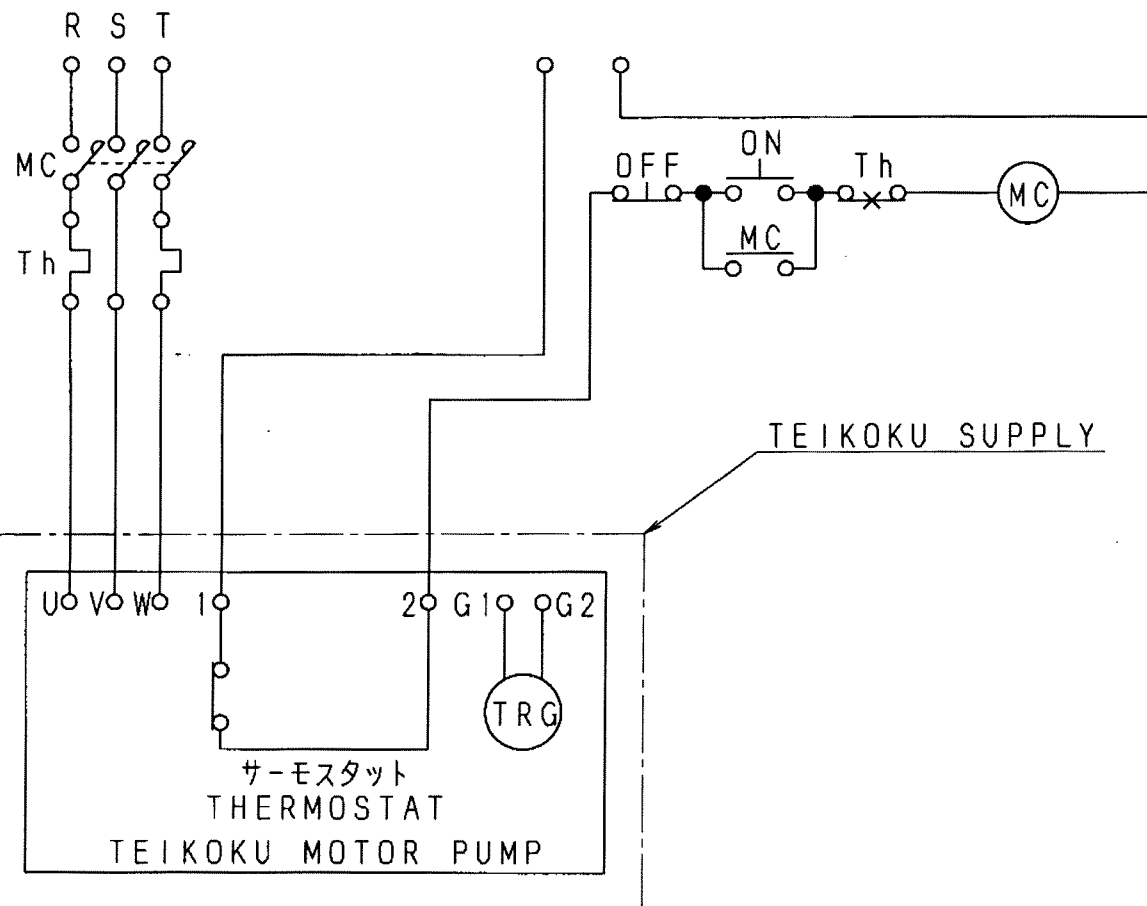
REV.	Date	Description
C	2015.11.16	Revised 1 Point. M.Morii
B	2015.10.29	Revised 1 Point. M.Morii

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

TEIKOKU ELECTRIC MFG. CO., LTD.

UNIS Version 3.0.2
NDTS11_15

4N-4415-01



サーモスタット THERMOSTAT	#1	#2
耐熱クラス THERMAL CLASS	220	F
定格 RATING	220℃-CUT OFF	150℃-CUT OFF
b-接点 CONTACTOR	AC250V-6.3A AC110V-10A DC24V-1.5A	AC230V-13A AC115V-18A DC24V-18A

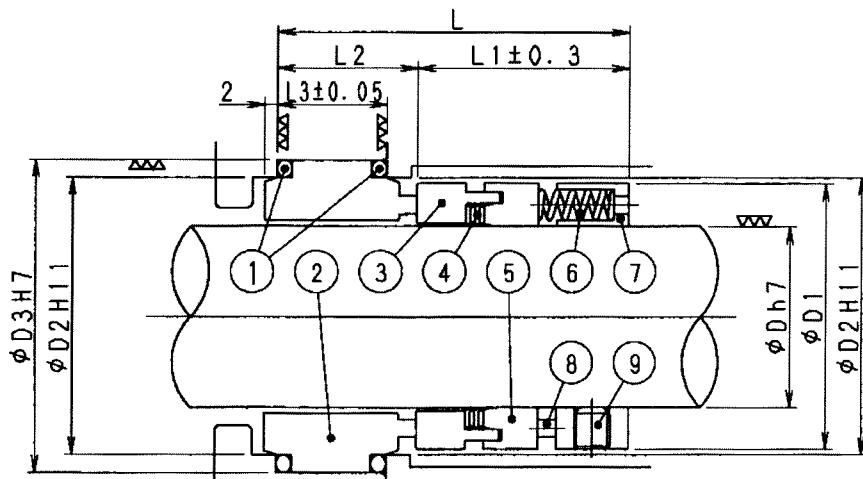
記 号 SYMBOLS	名 称 NAME
R S T	電源端子 POWER TERMINAL
U V W	TMP接続端子 TMP TERMINAL
MC	電磁開閉器 MAGNETIC CONTACTOR
ON・OFF	押釦スイッチ（起動・停止用） PUSH BUTTON SWITCH
Th	サーマルリレー THERMAL RELAY
TRG	テイククロータリーガード・イアン TEIKOKU ROTARY GUARDIAN

REVISIONS	
Rewritten	Ⓚ
Dec. 5, '01	
Y. Takeuchi	
Rewritten	Ⓢ
Oct. 30, '07	
Y. Iwasaki	

Customer : Evonik Corporation
PO# : 4701013179/4701319034
Project : ACA G600
Project# : 4142. 00940
Evonik's Pump# : P-4420/P-4420S
Requisition# : C0078-010

APPROVED	CHECKED	DRAWN	SCALE	DWG. TITLE
M. Sakai	T. Takeuchi	Y. Kii Jun 10 '96	FREE	結線図 ----- CONNECTION DIAGRAM -----
 株式会社 帝国電機製作所 TEIKOKU ELECTRIC MFG. CO., LTD.				DWG. NO. 4N-4415-01

4N-4024-06



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	シーリング 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
Mar. 22 '01
G-29 Added
(N. Maruo)

C
Aug. 19 '03
Revised
(K. Nakazumi)

Customer : Evonik Corporation
 PO# : 4701013179/4701319034
 Project : ACA G600
 Project# : 4142. 00940
 Evonik's Pump# : P-4420/P-4420S
 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: L1E

DWG. NO.

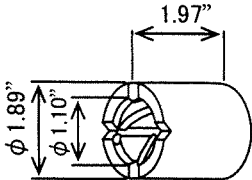
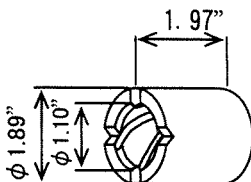
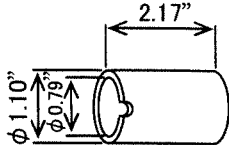
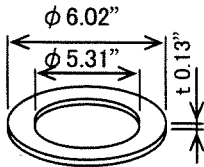
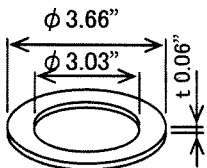
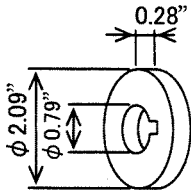


株式会社 帝国電機製作所
 TEIKOKU ELECTRIC MFG. CO., LTD.

4N-4024-06

C

RECOMMENDED SPARE PARTS LIST

TYPE				SC-1031		1 2
DA-210-R						
No.	PARTS NAME	DIMENSION	MATERIAL	FOR 1SETS	REMARKS	
1	BEARING A (with spiral & straight grooves)		Carbon Graphite	1	#15A 48×28×50 (mm)	
2	BEARING B		Carbon Graphite	1	#15B 48×28×50 (mm)	
3	SHAFT SLEEVE		316 SS (SUS316) + Stellite	2	#17 28×20×55 (mm)	
4	GASKET		316 SS (SUS316) + Grafoil	1	#66A 153×135×3.2 (mm)	
5	GASKET		PTFE	2	#66B 93×77×1.5 (mm)	
6	THRUST COLLOR		316 SS (SUS316) + Stellite	2	#18 53×20×7 (mm)	
来歴 REV.	改訂: Rewritten Oct. 29. '15 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	K. Nakazumi Aug. 15. '15

RECOMMENDED SPARE PARTS LIST

[illegible]



#No	PUMP TYPE	Fsx	Fsy	Fsz	Fdx	Fdy	Fdz	Msx	Msy	MsZ	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	460	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

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

REVISIONS	
B	Rewritten
	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

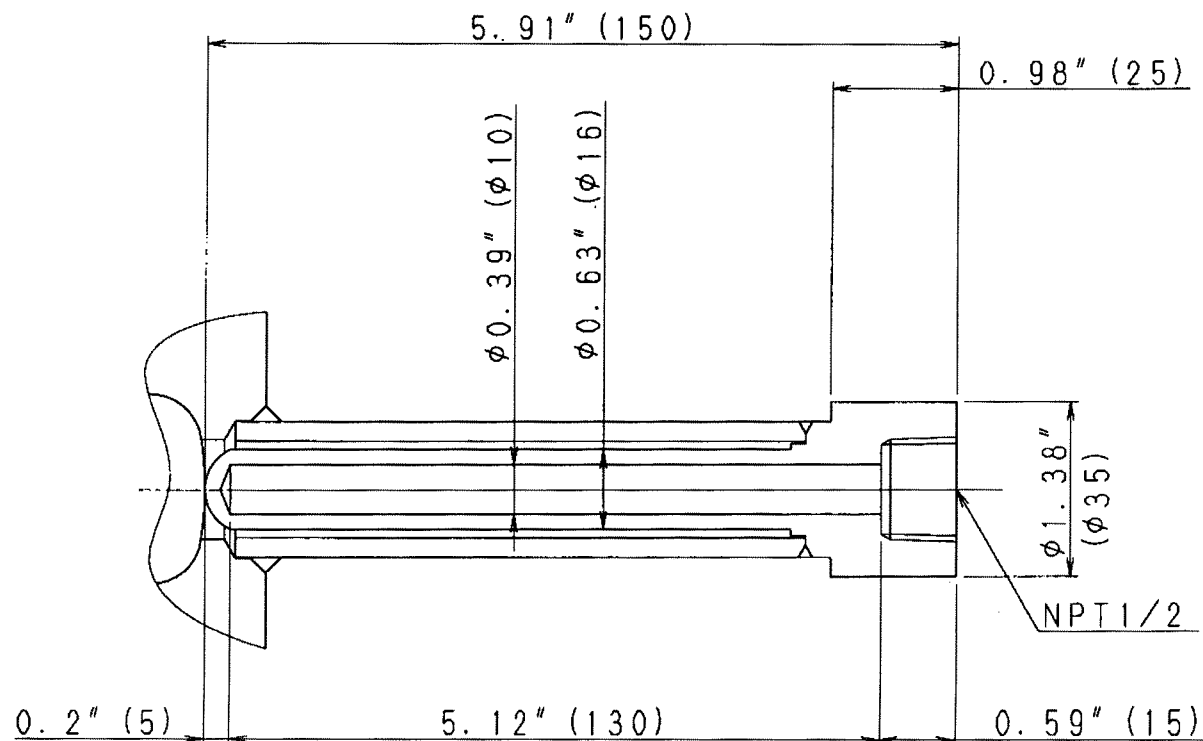
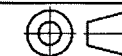
APPROVED	CHECKED	DRAWN	SCALE	DWG. TITLE
T. Takeuchi	S. Kimura	Y. Shimizu Apr. 11 '08	FREE	許容配管荷重 ALLOWABLE PIPING FORCES AND MOMENTS SI Units API 610 (10th)



株式会社 帝国電機製作所
TEIKOKU ELECTRIC MFG. CO., LTD.

DWG. NO.

4N-6993-02

1
4N-7445

FB1809A

FB1810A

REVISIONS

Customer	:Evonik Corporation
PO#	:4701013179/4701319034
Project	:ACA G600
Project#	:4142. 00940
Evonik's Pump#	:P-4420/P-4420S
Requisition#	:C0078-010

APPROVED

CHECKED

DRAWN

SCALE

DWG. TITLE

K. Yamamoto

FREE

THERMOWELL

株式会社 帝国電機製作所
TEIKOKU ELECTRIC MFG. CO., LTD.

DWG. NO.

4N-7445