

TEIKOKU CANNED MOTOR PUMP DATA SHEET

Messrs : Evonik Degussa Corporation

No. QFH-1387A

Aug. 10 2015

Order No. : ☐ ※1
 Job No. : ---
 Project Name : ---
 Item No. : ☐ ※1
 Item Name : ---
 Model : ☒ DA61-2417J4BM-0508T1V-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) : 38.6	Capacity (L/min) : 466.9	Casing : SCS14 (CF-8M 316 SS)																										
	(m3/h) : 28.01	Impeller : SCS14 (CF-8M 316 SS)																										
Suction Press. (barA) : 0.53~2.53	Discharge Press. (barA) : ---	Adapter : SCS14 (CF-8M 316 SS)																										
NPSHava. (m) : 4.8	NPSHreq. (m) : 2.8	RBH : SUS316 (316 SS)																										
Liquid : ACA Residue		Motor Flange : SUS316L (316L SS)																										
Temperature (Des./Nor.) (°C) : 101.4 / ---		Stator Can : SUS316L (316L SS)																										
Specific gravity (Des./Nor.) : 1.11 / ---		Shaft : SUS316 (316 SS)																										
Viscosity (Des./Nor.) (mPa·s) : 68.5 / ---		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) : 0.017		+ Thrust Collar : SUS316 (316 SS)+Stellite																										
Solids Name : ---		Pump Gasket : ☒ SUS316 (316 SS)+Grafoil																										
Concentration (wt%) : ---	Particle Size (μm) : ---	Motor Gasket : PTFE																										
Flushing or Barrier Fluid : ☒ Acetic Anhydride		O-ring : PTFE																										
Liquid/S. Gr. (mPa·s) : ☒ 1.08 / ☒ 0.8		Mechanical Seal : SiC+Carbon																										
Press. (MPaG) : S.P. + 0.25 ± 0.05	Flow (mL/h) : Max. 3																											
Pump Design & Construction		Performance																										
Design Press ☒ (bar) : ☒ 7.5	Temp. (°C) : 101.4	Impeller Type : CLOSE																										
Code Applied : None	Nameplate : English	No. of Stage : 1																										
Nozzle Connection : ASME Finish : SMOOTH FINISH <table border="1"> <thead> <tr> <th>Nozzle</th><th>Rating</th><th>Size</th><th>Facing</th><th>Position</th></tr> </thead> <tbody> <tr> <td>Suction</td><td>150LB EQ.</td><td>3"</td><td>RF</td><td>END</td></tr> <tr> <td>Discharge</td><td>150LB EQ.</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> </tbody> </table>		Nozzle	Rating	Size	Facing	Position	Suction	150LB EQ.	3"	RF	END	Discharge	150LB EQ.	1-1/2"	RF	TOP	Drain	---	---	---	---	Reverse	---	---	---	---	Min. Flow (L/min) : --- Min. Flow (m3/h) : ---	
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Drain	---	---	---	---																								
Reverse	---	---	---	---																								
Jacket Design Press. (MPa) : ---		Spare Parts																										
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Motor (Stop)	---	---	---	---																								
Customer : Evonik Corporation PO# : 4701013179/4701319034 Project : ACA G600 Project# : 4142.00940 Evonik's Pump# : P-4520/P-4520S Requisition# : C0078-010		Vendor Drawings and Data																										
Power Supply & Drive Motor		Dimensional Dwg. : 6E-8518 Allowable Piping : --- Terminal Box : 6E-1622 Forces and Moments : 4N-6993-12 Sectional View Dwg. : 3E-7392 ☒ Thermowell : 4N-7445 Material List : P-32823 Est. Performance Curve : SFH-1387A Connection Diagram : 4N-9071 Mechanical Seal : 4N-4024-11 Recommended Spare : --- Spare Parts List : SC-1033																										
Frame No. : 417 Duty : Cont Voltage (V) : 460 Frequency (Hz) : 60 Phase : 3 Pole : 2 Output (kW/hp) : 17/22.80 Rated Amp. (A) : 33 Start Amp. (A) : 136 Thermal Class : 220 Start Method : DIRECT R.P.M. (rpm) : 3600 Direction : C.C.W. (Viewed from Pump Suction) Voltage for protection (V) : 120 Protection Device : Thermostat b Dry Run Protection Relay : --- Terminal Box : Stud/Thread/ 1 Power Cable Conduit : NPT1-1/2 Cable O.D. (Main) (mm) : --- Instrument Cable Conduit : NPT3/4 Cable O.D. (Sub) (mm) : --- ATEX Marking : ---		Other																										
Remarks :		Special Treatment : None Painting Color : Light Gray Rotating Direction : --- Monitoring : Yes Bearing Wear Monitor : Radial / Local																										

- T-USA#385330
 • Hazardous Area Classification : Class. 1, Div. 2, Gr. C&D T2
 • TDH generated at rated capacity is excessively high against the required head.
 Please throttle the discharge valve and adjust the pump load to avoid the over current.
☒ • 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-4520 / Order No. 4701013179, Item No. P-4520S / Order No. 4701319034

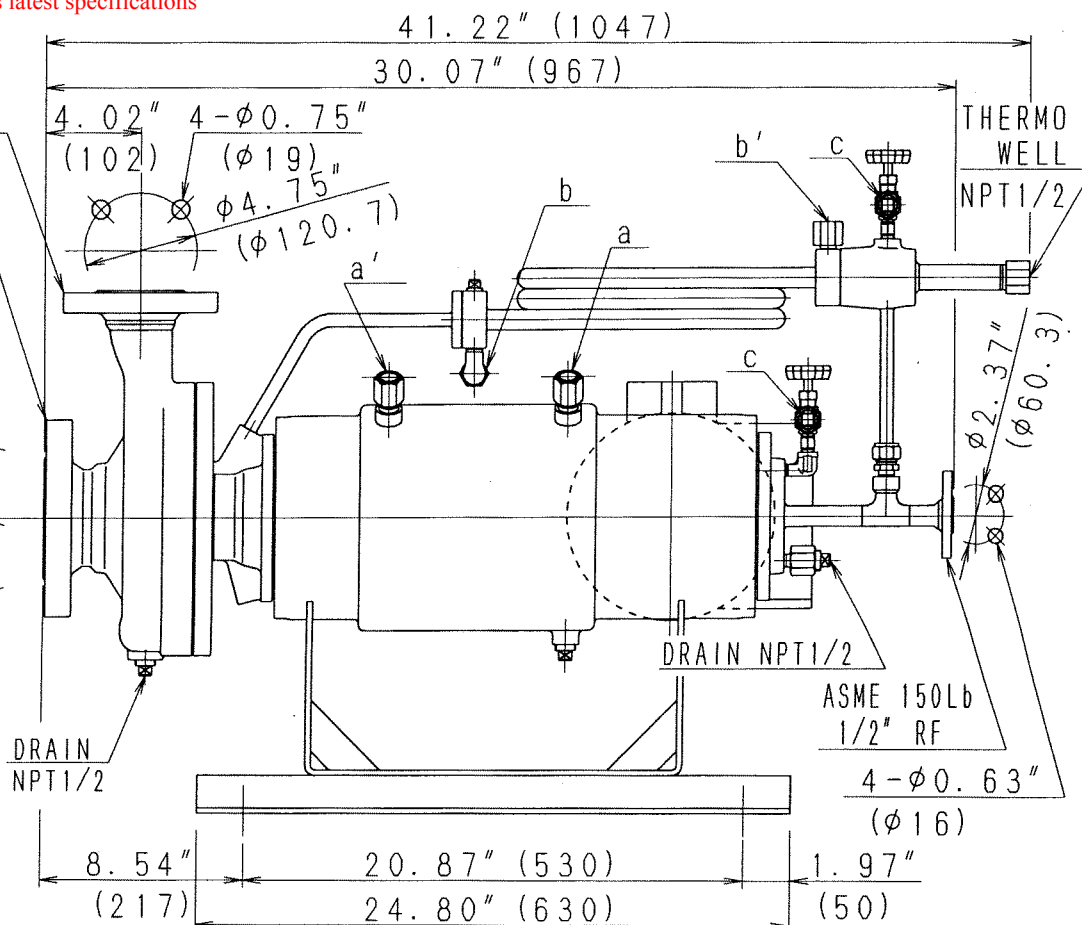
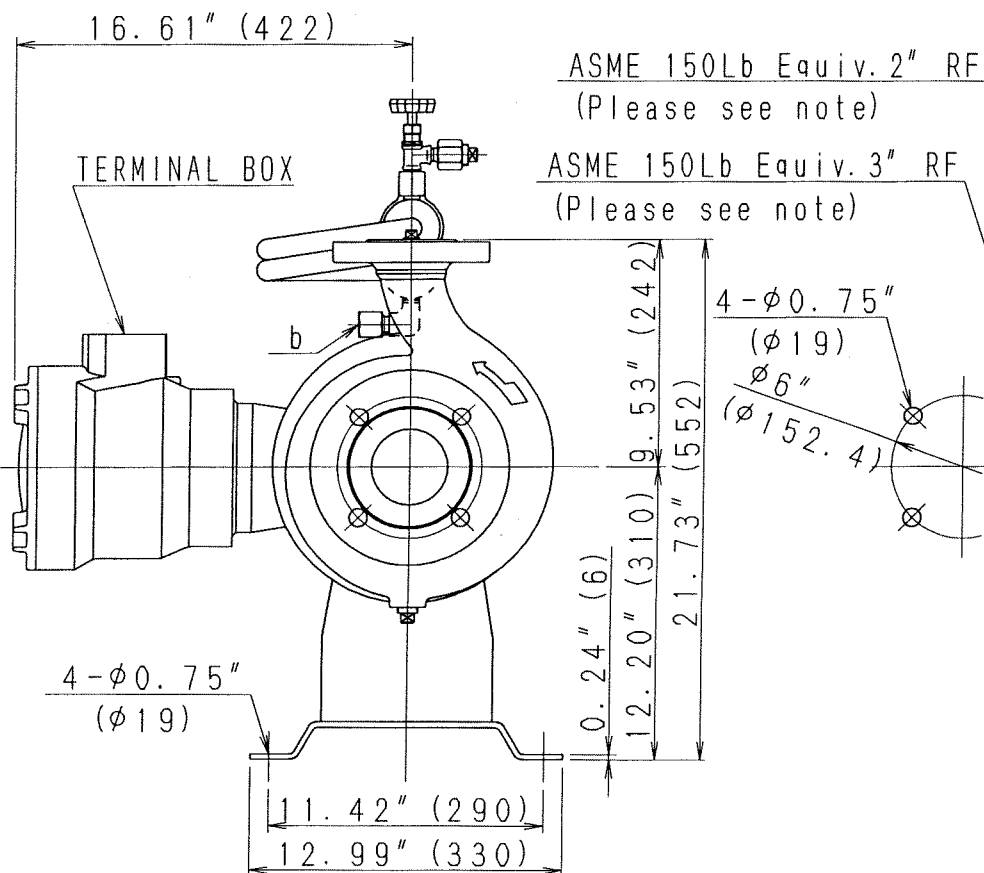
REVISIONS	B: Revised 1 Point (Aug. 21'15) M. Morii
	C: Revised 7 points. Added 2 points, Deleted 1 point (2015. 10. 29) M. Morii
	D: Revised 4 points, Added 1 point (2015. 11. 16) M. Morii
	E: Revised 3 points (2016. 1. 6) M. Morii

6E-8518

a, b -- JACKET INLET ---NPT1/2

a', b' -- JACKET OUTLET --NPT1/2

c -----AIR VENT -----NPT1/2

CERTIFIEDDrawing conforms to the
customer's latest specifications

FH1387A WEIGHT : 215kg (474Lb)

Note: Thickness and outside diameter follows those of ASME#300 flange.

REVISED	B	C	D
Revised	Aug. 21, '15	Revised	Nov. 16, '15
	M. Morii		M. Morii
Revised	Jan. 6, '16		
	M. Morii		

Customer : Evonik Corporation
 PO# : 4701013179/4701319034
 Project : ACA G600
 Project# : 4142. 00940
 Evonik's Pump# : P-4520/P-4520S
 Requisition# : C0078-010

APPROVED

CHECKED

DRAWN

SCALE

DWG. TITLE

外形図

DIMENSIONAL DRAWING

TYPE: DA-417-0508T1

DWG. NO.



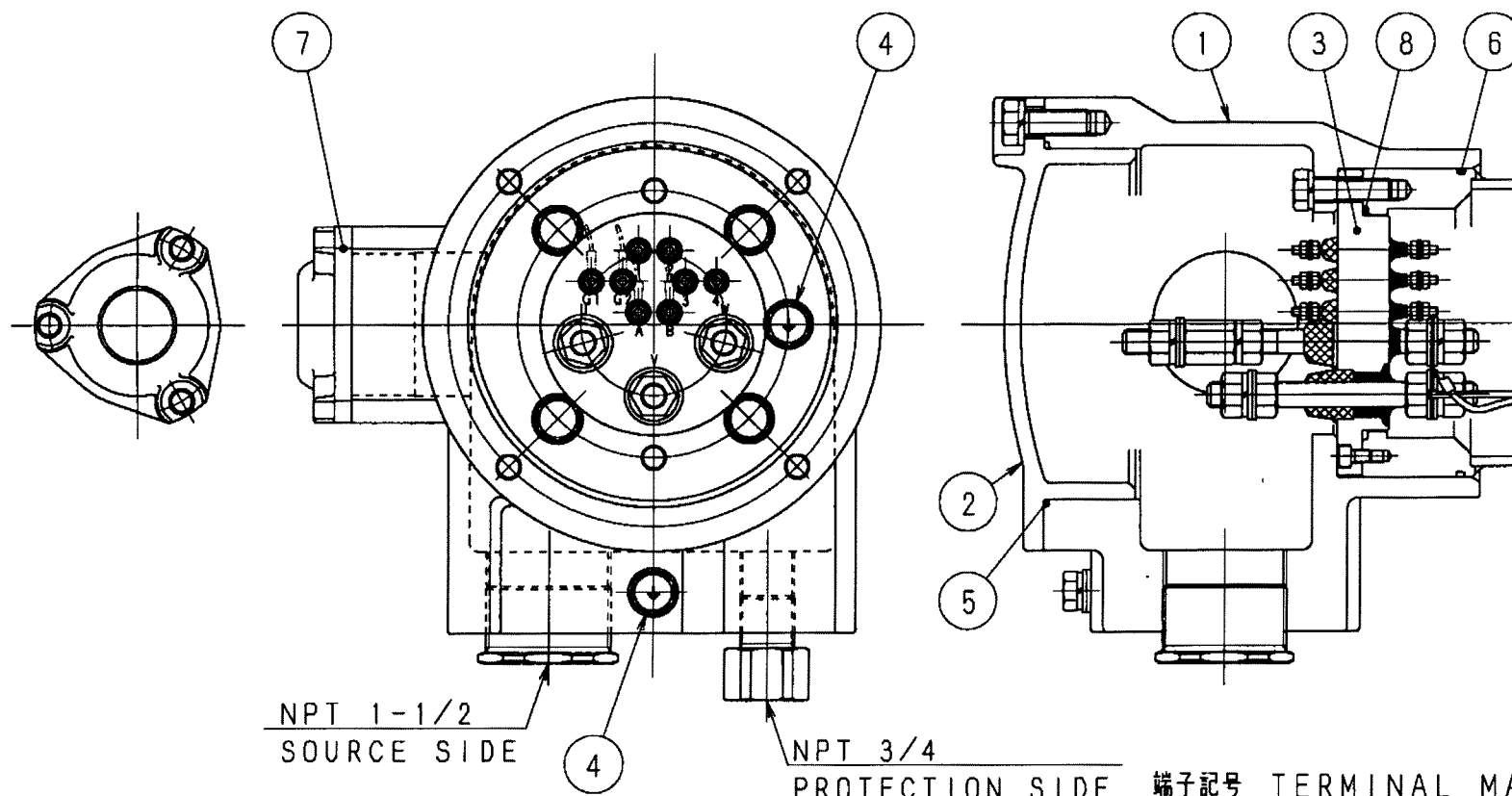
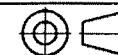
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TEIKOKU ELECTRIC MFG. CO., LTD.

6E-8518

D

6E-1622



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

端子記号 TERMINAL MARK

U, V, W POWER SOURCE (M12)

1, 2, 3, 4 THERMOSTAT (M4)

G1, G2, A, B TRG METER (M4)

CB2948A

REVISIONS

REV	DATE	BY	CHKD	APPD
B				
C				

Rewritten
Jun. 6, '11
C. Mitsumori

Rewritten
May. 22, '13
N. Kaiami

Customer : Evonik Corporation
 PO# : 4701013179/4701319034
 Project : ACA G600
 Project# : 4142. 00940
 Evonik's Pump# : P-4520/P-4520S
 Requisition# : C0078-010

APPROVED

CHECKED

DRAWN

SCALE

DWG. TITLE

端子箱

T. Takeuchi R. Matsumura
 Mar. 1, '10

R. Takeuchi
 Mar. 1, '10

FREE

TERMINAL BOX

SIZE : L FMCII

DWG. NO.



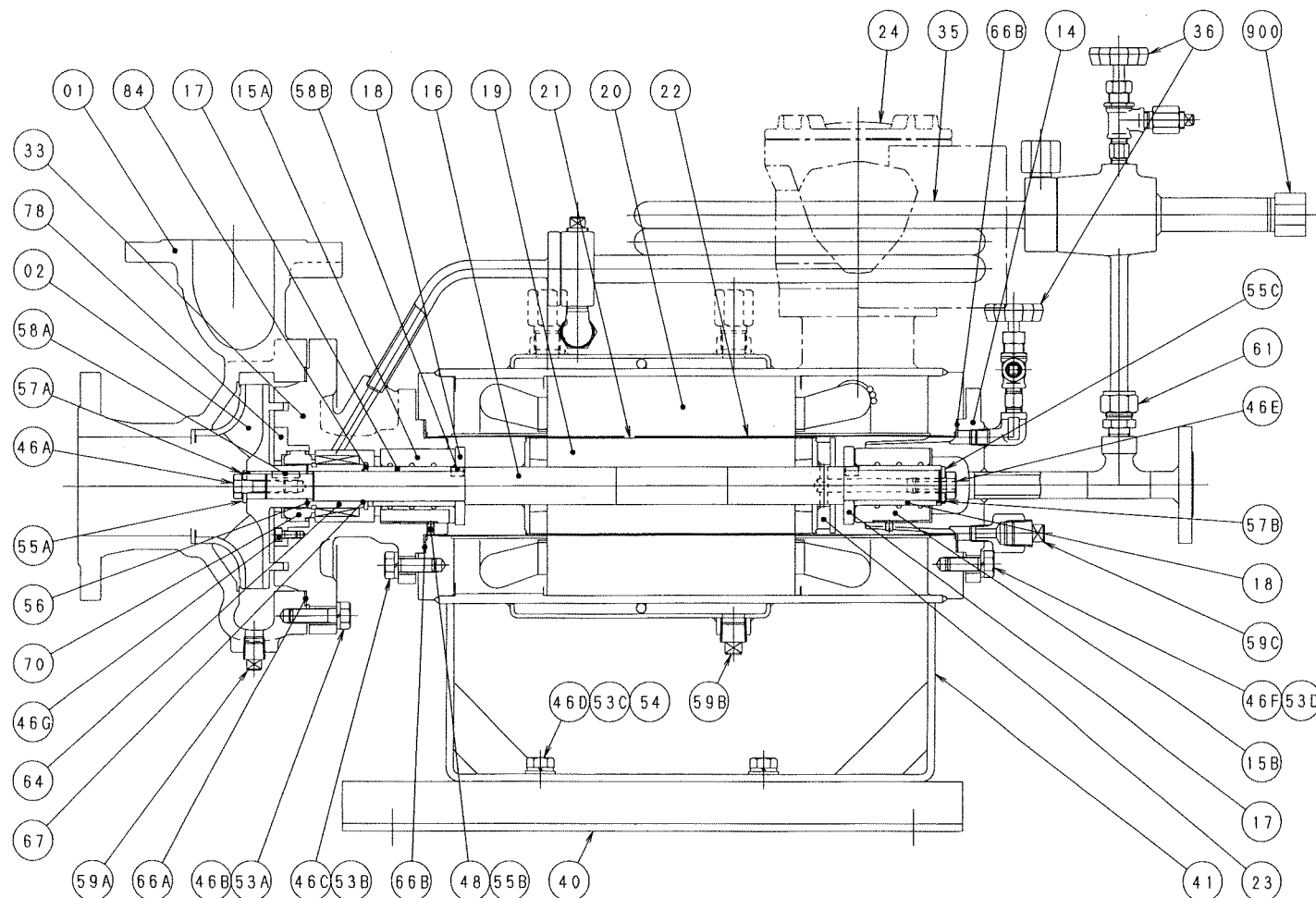
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TEIKOKU ELECTRIC MFG. CO., LTD.

6E-1622

C

3E-7392



Customer :Evonik Corporation
 PO# :4701013179/4701319034
 Project :ACA G600
 Project# :4142. 00940
 Evonik's Pump# :P-4520/P-4520S
 Requisition# :C0078-010

NOTE

Bearing A...with spiral & straight grooves
 Bearing B...with spiral grooves

NO.	NAME OF PARTS
01	CASING
02	IMPELLER
14	R. B. HOUSING
15A	BEARING A
15B	BEARING B
16	SHAFT
17	SHAFT SLEEVE
18	THRUST COLLAR
19	ROTOR ASS'Y
20	STATOR ASS'Y
21	ROTOR CAN
22	STATOR CAN
23	AUXILIARY IMPELLER
24	TERMINAL BOX ASS'Y
33	ADAPTER
35	HEAT EXCHANGER ASS'Y
36	VENT VALVE

40	BASE
41	HOLDER
46A	BOLT
46B	BOLT
46C	BOLT
46D	BOLT
46E	BOLT
46F	BOLT
46G	BOLT
48	SET SCREW
53A	SPRING WASHER
53B	SPRING WASHER
53C	SPRING WASHER
53D	SPRING WASHER

NO.	NAME OF PARTS
54	PLAIN WASHER
61	DOUBLE JOINT
64	SPACER
66A	GASKET
66B	GASKET
67	O RING
70	MECHANICAL SEAL
78	MECHANICAL SEAL GLAND
84	COLLAR
900	THERMOWELL

D FH1387A

REVISED	B	C	D
Revised	M. Morii	M. Morii	M. Morii
Aug. 21 '15			
Revised			
Nov. 11 '15			
Revised			
Jan. 6 '16			

APPROVED	CHECKED	DRAWN	SCALE	DWG. TITLE
R. Takemura	R. Matsumura	M. Morii	FREE	構造断面図
		Aug. 10 '15		SECTIONAL VIEW DRAWING
				TYPE: DA
				DWG. NO.
				3E-7392



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D

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	
58B	KEY	SUS316 / 316 SS	
59A	PLUG	SUS316 / 316 SS	
59B	PLUG	SS400 / Carbon Steel	
59C	PLUG	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-4520/P-4520S
 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-32823
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FH1387A



ESTIMATED PERFORMANCE CURVE

Date : Aug. 10. 2015
No : E18H0036-00
Dwg. No. : SFH-1387A

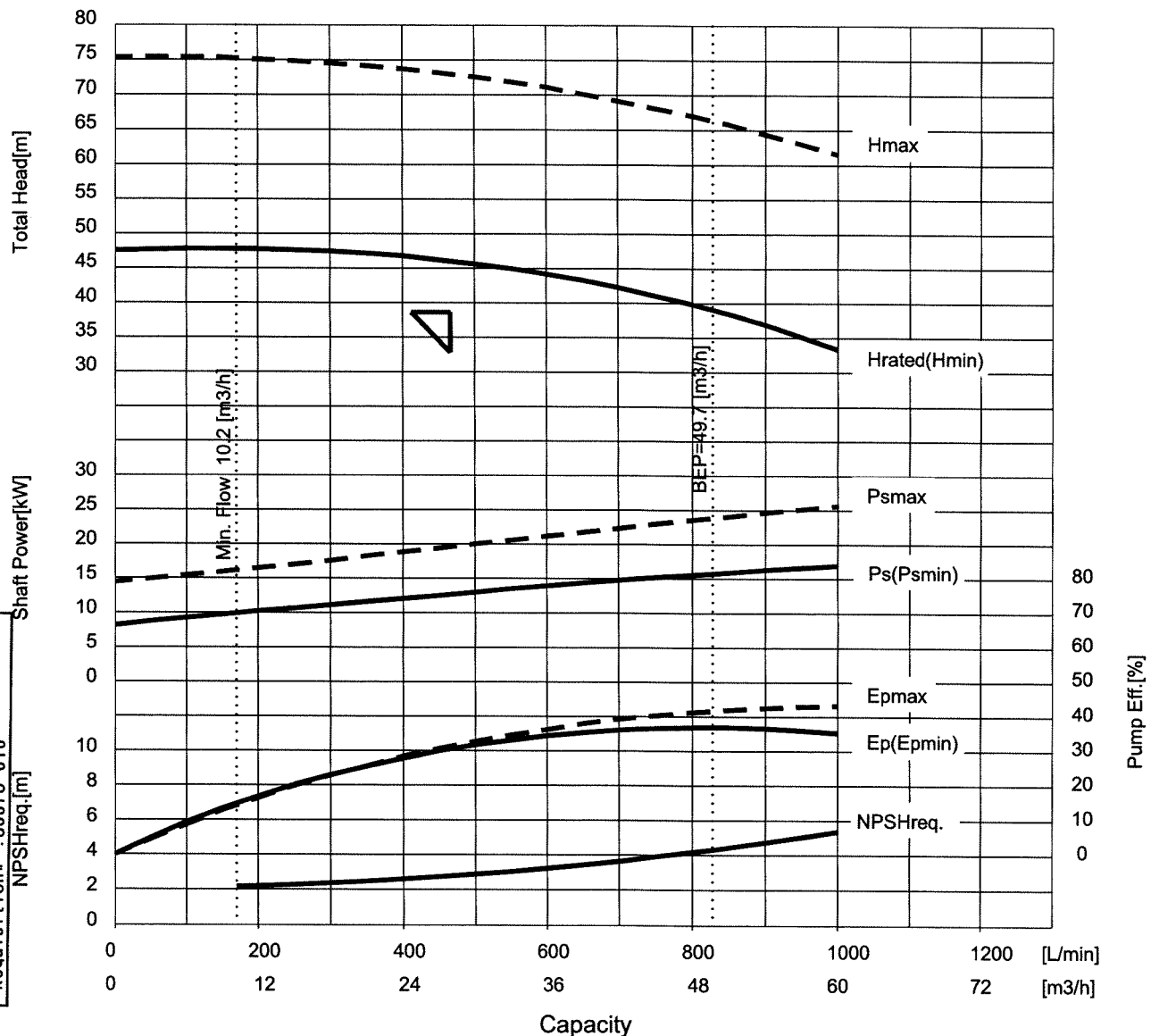
Item No. ☐ P-4520 / P-4520S

Item Name ****

Model ☐ DA61-2417J4BM-0508T1V-A

Frequency 60 Hz
Voltage 460 V
Phase 3
Pole 2
Output 17 kW
Current 33 A

Total Head 38.6 m
Capacity 466.9 L/min 28.01 m³/h
Min.Flow 170 L/min 10.2 m³/h
Liquid ACA Residue
Temp. 101.4 degC
S.G. 1.11
NPSHavail. 4.8 m
Vis. 68.5 mPas
NPSHreq. 2.8 m



Remarks :

- Shut-off head : 47.5m
- 46.1m, 30.6%, 12.7kW, 3469rpm @ rated flow
- 60m³/hr, 17kW @ EOC
- 25.65kW @ EOC (max. dia.)

- Ns : 20.26, SSS : 9014
- Impeller Dia(mm):208(Max)/166(Rated)/166(Min)
- Output:22.80(hp)

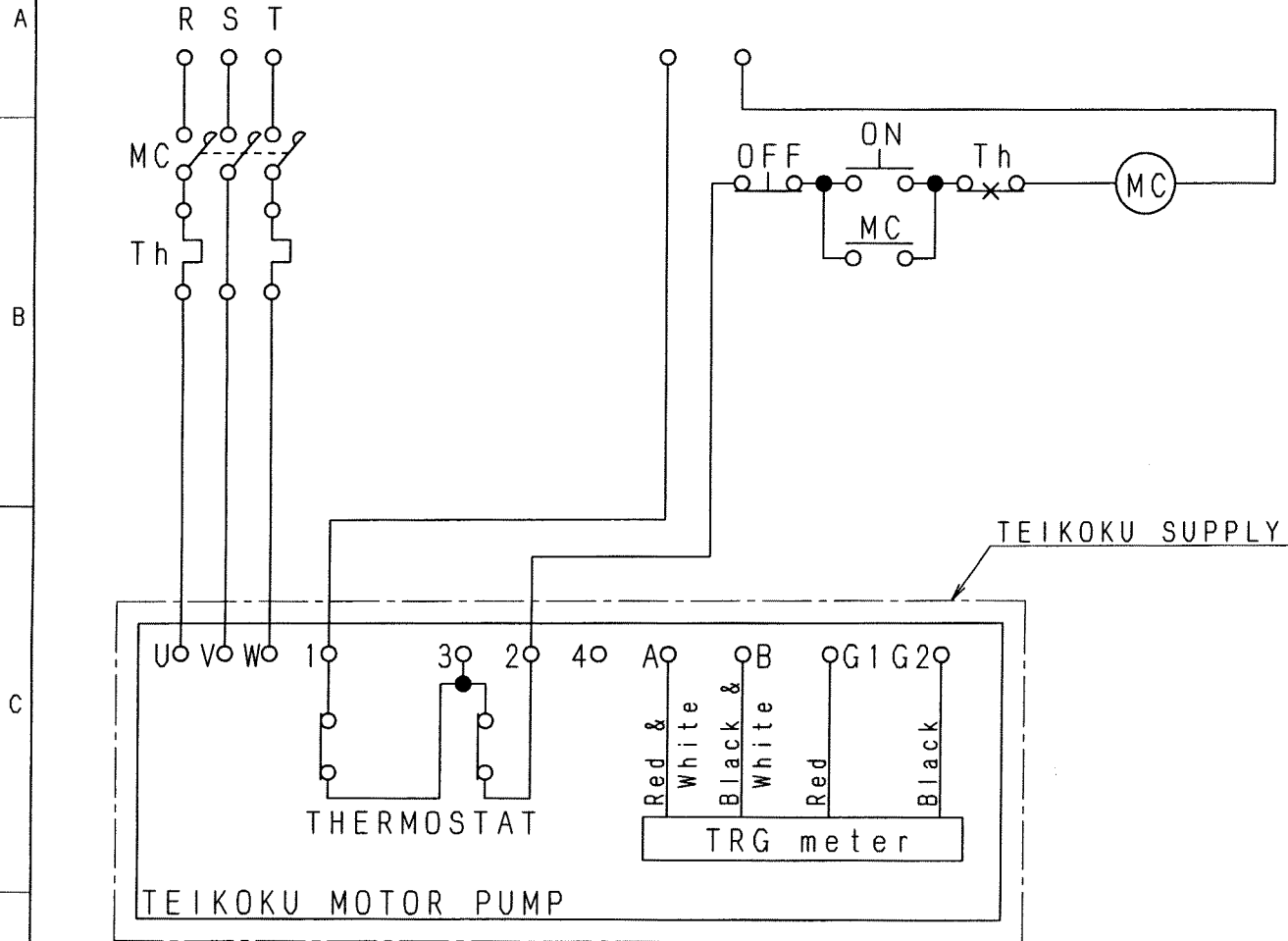
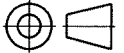
REV.	Date	Description
C	2015.11.16	Revised 2 Points. M.Morii
B	2015.10.29	Revised 1 Point. M.Morii

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-9071



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

FH1376A

HERMETICALLY SEALED

REVISIONS

Customer : Evonik Corporation
PO# : 4701013179/4701319034
Project : ACA G600
Project# : 4142.00940
Evonik's Pump# : P-4520/P-4520S
Requisition# : C0078-010

APPROVED

CHECKED

DRAWN

SCALE

DWG. TITLE

*R. To/can de R. Motunaga*M. Morii
Aug. 6 '15

FREE

CONNECTION DIAGRAM
FMC-II C-CLASS (392° F) L

DWG. NO.

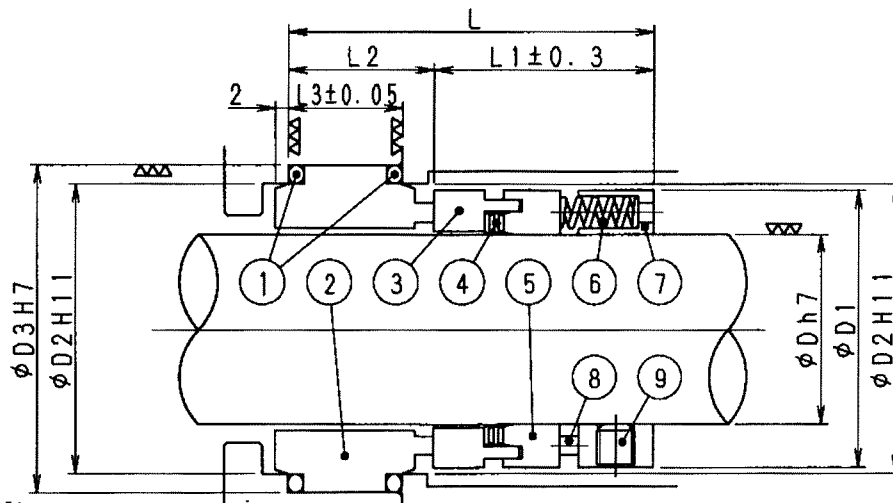


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TEIKOKU ELECTRIC MFG. CO., LTD.

4N-9071

4N-4024-11



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 COMPRESSOR 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-4520/P-4520S
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.

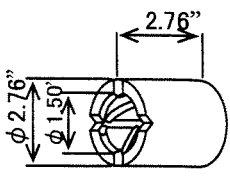
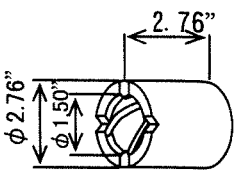
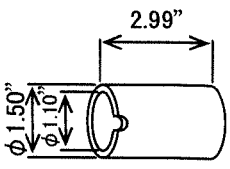
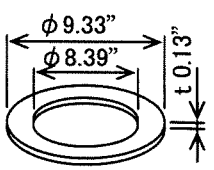
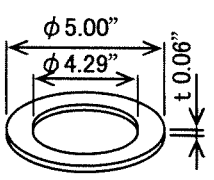
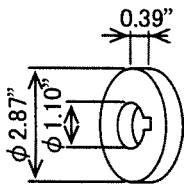
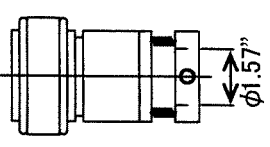


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TEIKOKU ELECTRIC MFG. CO., LTD.

4N-4024-11

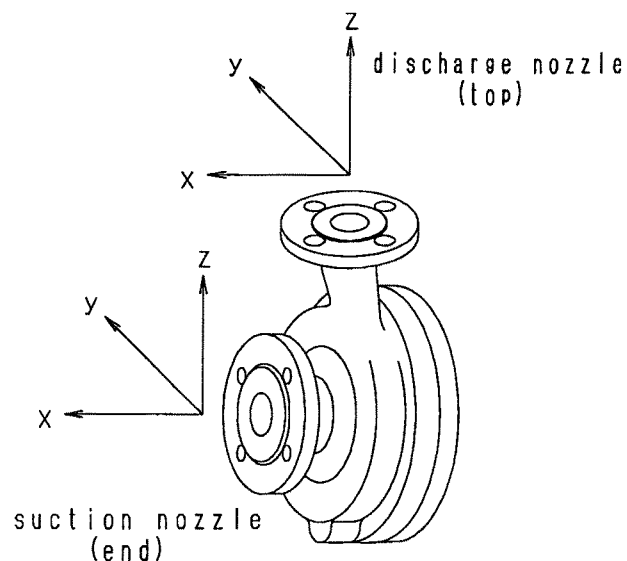
RECOMMENDED SPARE PARTS LIST

TYPE					1 2
DA-410-T					
No.	PARTS NAME	DIMENSION	MATERIAL	FOR 1SETS	REMARKS
1	BEARING A (with spiral & straight grooves)		Carbon Graphite	1	#15A 70×38×70 (mm)
2	BEARING B		Carbon Graphite	1	#15B 70×38×70 (mm)
3	SHAFT SLEEVE		316 SS (SUS316) + Stellite	2	#17 38×28×76 (mm)
4	GASKET		316 SS (SUS316) + Grafoil	1	#66A 237×213×3.2 (mm)
5	GASKET		PTFE (T/#9007-LC)	2	#66B 127×109×1.5 (mm)
6	THRUST COLLOR		316 SS (SUS316) + Stellite	2	#18 73×28×10 (mm)
7	MECHANICAL SEAL		SiC + Carbon	1	#70 40 (mm)
来歴. REV.	B: 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. 11. '15

RECOMMENDED SPARE PARTS LIST

TYPE		SC-1033			2 / 2	
No.	PARTS NAME	DIMENSION	MATERIAL	FOR 1SETS	REMARKS	
8	LOCK WASHER		316L SS (SUS316L)	2	#57A, #57B 24×14.5×1.5 (mm)	
9	LOCK WASHER		316L SS (SUS316L)	2	#57A, #57B 24×14.5×1.5 (mm)	
			Customer :Evonik Corporation PO# :4701013179/4701319034 Project :ACA G600 Project# :4142. 00940 Evonik's Pump#:P-4520/P-4520S Requisition#:C0078-010			
来歴 REV.		株式会社 帝国電機製作所 TEIKOKU ELECTRIC MFG. CO., LTD.	APPROVED	CHECKED	DRAWN	
			_____	_____	_____	

4N-6993-12

CASING

#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

Customer :Evonik Corporation
PO# :4701013179/4701319034
Project :ACA G600
Project# :4142.00940
Evonik's Pump# :P-4520/P-4520S
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	C	D	E
Rewritten				
Aug. 7' 08				
K. Nakazumi				
Revised				
API610 8th				
Edition to API610				
10th Edition.				
Sep. 3' 08				
Y. Shimizu				
#11~#13				
Added				
Sep. 2' 13				
K. Nakazumi				
#14, #15 Added				
Mar. 20' 15				
K. Nakazumi				

APPROVED	CHECKED	DRAWN	SCALE	DWG. TITLE
T. Takeuchi	S. Kimura	Y. Shimizu	FREE	許容配管荷重
		Apr. 11' 08		ALLOWABLE PIPING FORCES AND MOMENTS
				SI Units
				API610 (10th)



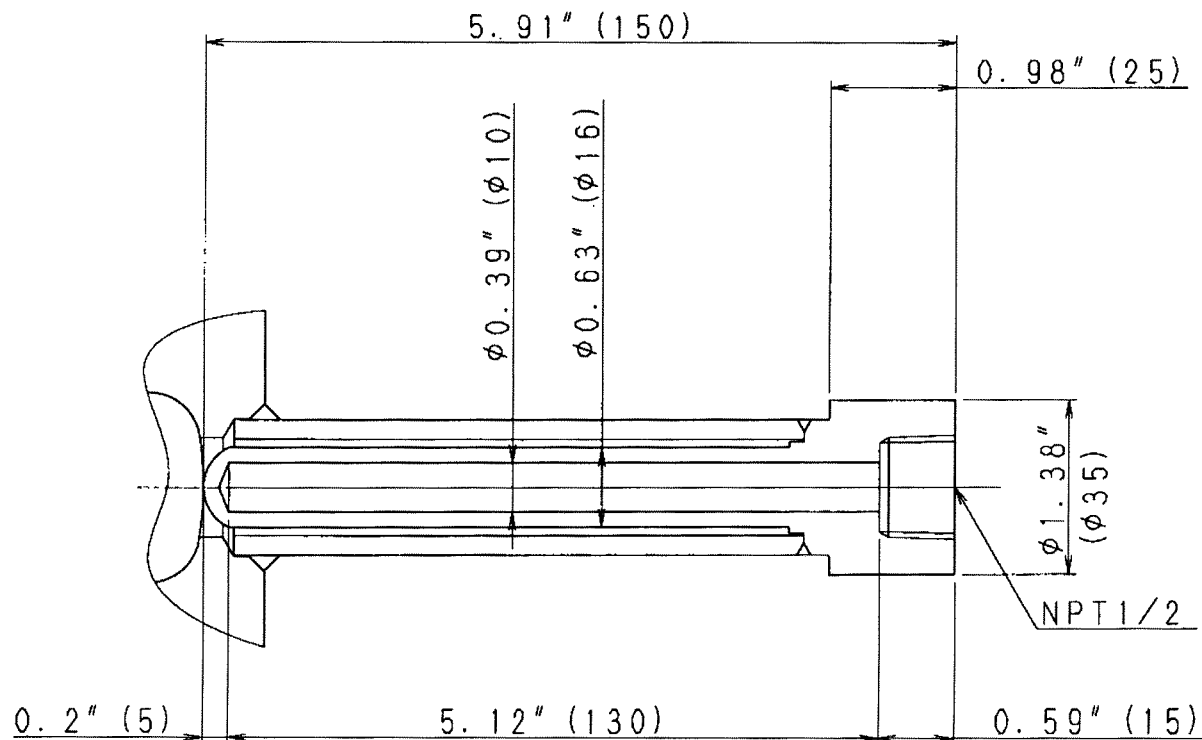
株式会社 帝国電機製作所

TEIKOKU ELECTRIC MFG. CO., LTD.

DWG. NO.

4N-6993-12 E

4N-7445



FB1809A
FB1810A

REVISIONS

Customer : Evonik Corporation
PO# : 4701013179/4701319034
Project : ACA G600
Project# : 4142.00940
Evonik's Pump# : P-4520/P-4520S
Requisition# : C0078-010

APPROVED

CHECKED

DRAWN

SCALE

DWG. TITLE

S. Takahashi *S. Takahashi*

K. Yamamoto
Apr. 22 '10

FREE

THERMOWELL



株式会社 帝国電機製作所

TEIKOKU ELECTRIC MFG. CO., LTD.

DWG. NO.

4N-7445