The Clinical Evaluation Report for UA-1010, UA-1020 and UA-1030T

1. General details

Model Name : Digital Blood Pressure Monitor UA-1010, 1020 and 1030T

Manufacturer : A&D Company Limited

2. Description of the device and its intended application

Overview : This is non invasive blood pressure measuring device for measuring SBP(Systolic Blood Pressure), DPB (Diastolic Blood Pressure) and pulse rate.
The method of measuring blood pressure is Oscillometric method.
The device starts measurement when the start button is pressed after wrapping the cuff around the upper arm.
The measurement time is around 1 or 2 minutes.

Component : The Blood Pressure Monitor consists of plastic chassis, main unit which is composed of some general electrical part and cuff.

Sterilization treatment : Not sterilized

Single use or reusable : Reusable instrument

Invasive or non invasive : Non invasive

3. Intended therapeutic and/or diagnostic indications and claims

Intended use : Measure SBP , DBP and pulse rate to manage blood pressure for ordinary peoples.

Security-related item :
There are no notable concerns about safety like the same type of non-invasive blood pressure measuring devices being already released.

4. Context of the evaluation and choice of clinical data types

Generally, clinical tests of non-invasive blood pressure measuring devices are being carried out according to the public protocols such as DIN、BHS、ESH、AAMI SP-10, EN 1060-4.
Each protocol is generally accepted that it is sufficient to assess efficacy and safety.
In this time, we chose the AAMI SP-10 Protocol.

The clinical test result of UA-1010/1020/1030T is equated with UA-787 because both design of blood pressure measurement devices are basically same (Attachment: Comparison between UA-1010/1020/1030T and UA-787), so the clinical test report used in this time is for UA-787 (Attachment: Test Report R01006).

5. Summary of the clinical data and appraisal

The clinical test report using this clinical evaluation was carrying out according to AAMI SP-10 protocol, and it's sufficient as UA-1010/1020/1030T clinical evaluation data.

6. Data analysis

6.1 Performance

The accuracy of blood pressure measurement required in AAMI SP-10 and other protocols is within ±5mmHg for Mean Difference and within 8mmHg for Standard Deviation .
The result of clinical test is −0.05 mmHg for SBP Mean difference , 4.23 mmHg for SBP Standard Deviation , −2.61 mmHg for DBP Mean Difference , 5.13 mmHg for DBP Standard Deviation.
As a result, the accuracy of blood pressure measurement meet the standard.

6.2 Safety

There is no notable concern about safety because 'Conclusion' in the clinical test report includes about [The unit is an effective device for measuring human blood pressure in clinical field. The patient can be easily measured by oneself for easy of use. Therefore, it is concluded that this unit is useful for clinical check at home.].

6.3 Product Literature and Instructions for Use

The instruction manual includes that it's appropriate to AAMI SP-10.

Additionally, clinical precaution statements to measure accurately are described in the space of 'How To Take Proper Measurement' and 'Notes For Proper Measurement' in the instruction manual. (Refer to Device File UA-1010/1020/1030T Annex B.6.1-A)

7. Conclusions

The clinical test using in this clinical evaluation was confirmed to be carried out according to EN ISO 14155-1:2003 and EN ISO 14155-2:2003 (Attachment: Test Report R09039), and the test is also appropriate to Essential Requirements of MDD and MEDDEV, 2.7.1 rev3 December 2009.
And all the risks in the use of UA-1010/1020/1030T are confirmed that it's acceptable level. (Refer to Risk Management File RISK-NIBP-HHC_ALL)
Additionally, the function, performance and safety of UA-1010/1020/1030T are confirmed that it's sufficient to reach the purpose intended by sixth clause.

Tested by K. Murata Apr.5.2011 K. Murata

Manager of R&D section 24
A&D Company Limited

Qualifications : Refer to Education and Training Ledger 24 section

Comparison between UA-1010/1020/1030T and UA-787

Contents

Comparative result

UA-1010/1020/1030T and UA-787 are equal in intended use, use method, the product structure, the performance, and safety.

Tested by K. Murata Apr.5.2011 K. Murata

1. Intended use

Intended use of UA-1010/1020/1030T is measuring SBP, DBP and pulse rate to manage blood pressure for ordinary peoples.
Intended use of UA-787 is measuring SBP, DBP and pulse rate to manage blood pressure for ordinary peoples.
Intended use of both is the same.

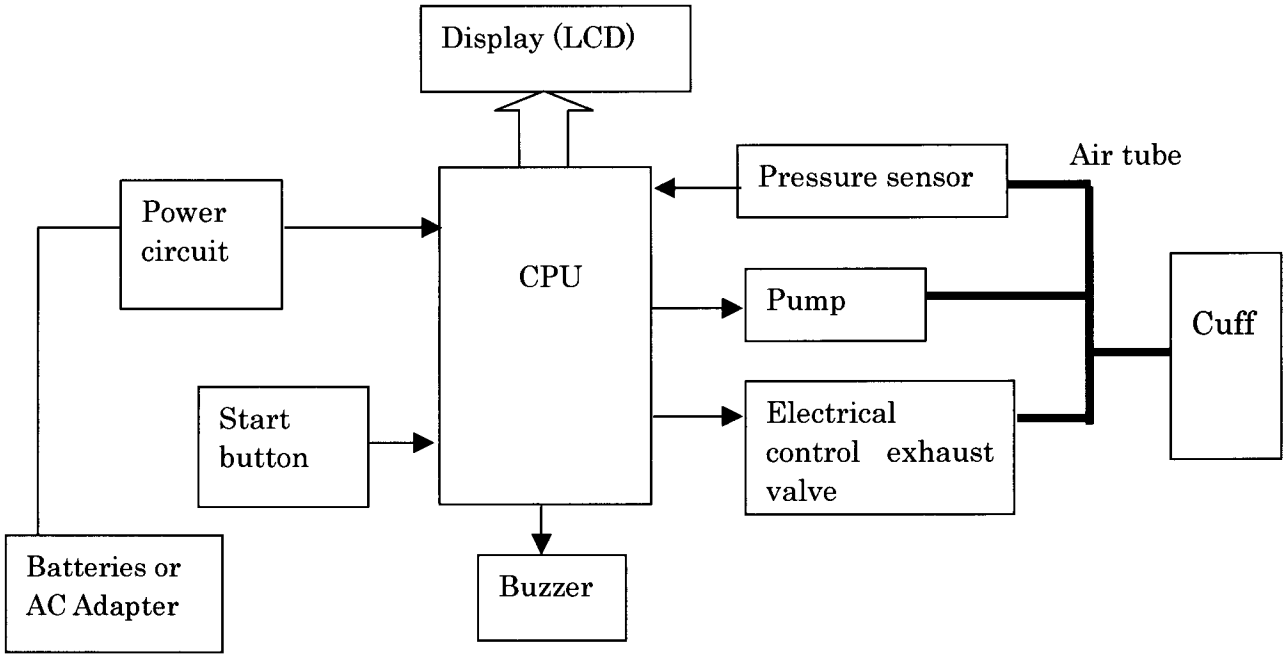
2. Performance Specification

Model	UA-1010/1020/1030T	UA-787	Determination
Measurement type	Oscillometric	Oscillometric	Same
Display	Digital	Digital	
Measurement range	0 ~ 299 mmHg (pressure) 40 ~ 180 beats/min. (pulse)	20 ~ 280 mmHg (pressure) 40 ~ 200 beats/min. (pulse)	UA-1010/1020 /1030T has higher performance.
Accuracy	±3mmHg (pressure) ±5% (pulse)	±3mmHg (pressure) ±5% (pulse)	Same
Pressurization	Automatic using a micro pump	Automatic using a micro pump	Same
Power source	R6P or LR6 batteries x 4 or AC adapter	R6P or LR6 batteries x 4 or AC adapter	Same
Depressurization	Electrical control exhaust valve	Electrical control exhaust valve	Same
Deflation	Electrical control exhaust valve	Electrical control exhaust valve	Same

Performance Specification of both is almost the same.

3. Block Diagram

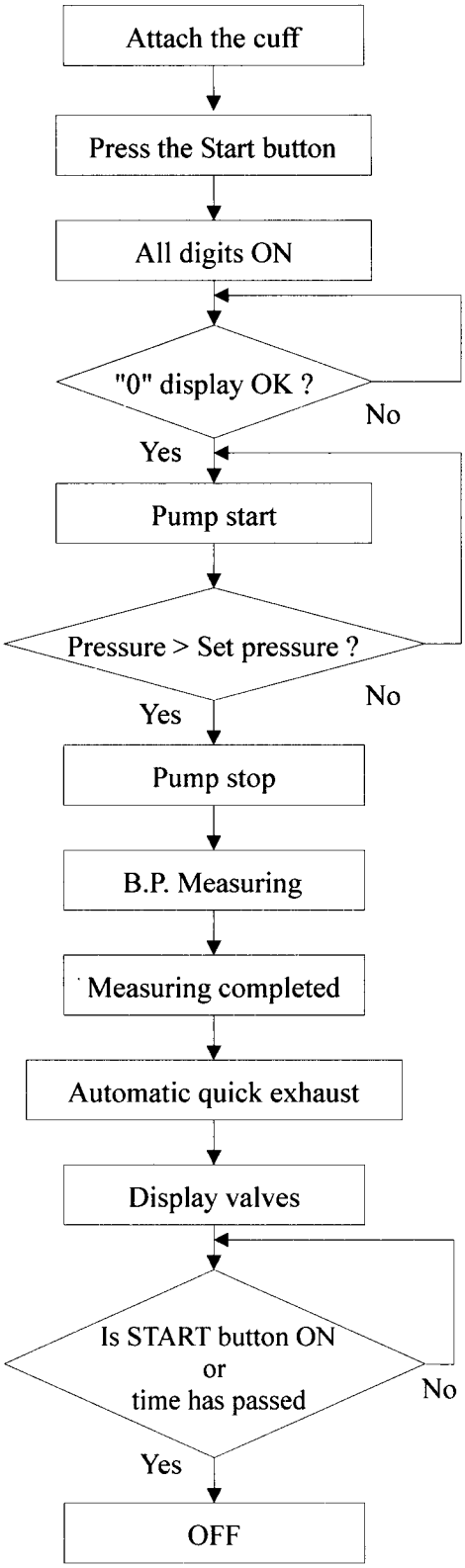
Block diagram of UA-1010/1020/1030T and UA-787 is shown below. And they are same.



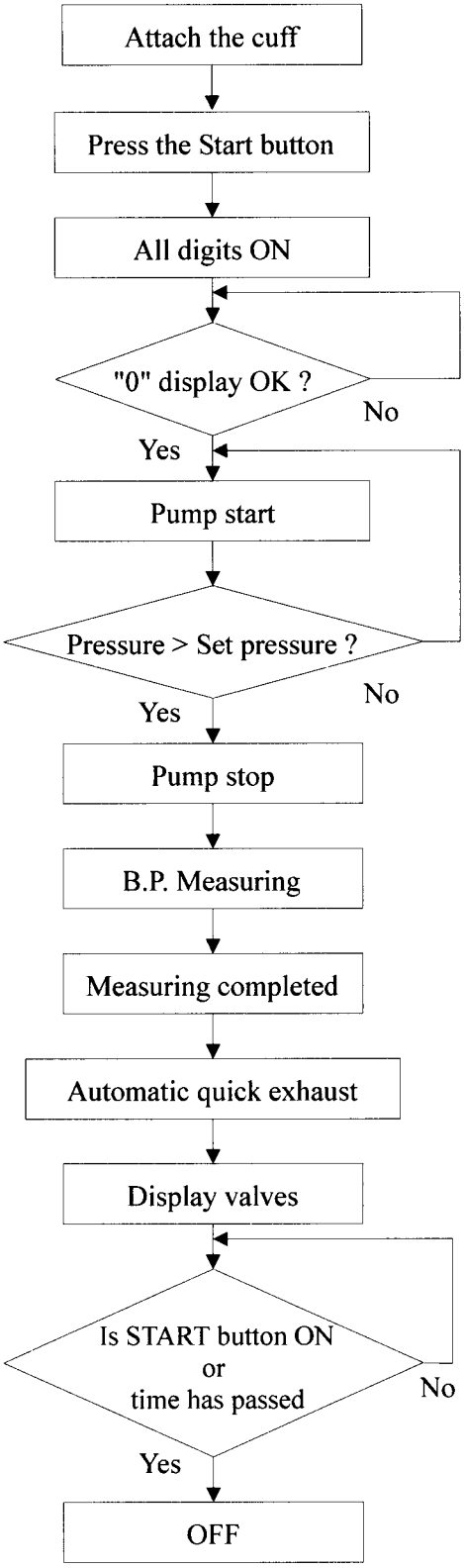
4. Operating Flowchart

Operating method of both is the same.

UA-1010/1020/1030T



UA-787



5. Key-component Comparison

Component	UA-1010/1020/1030T	UA-787	Determination
Pressure detection sensor	Electrostatic capacity type pressure sensor	Electrostatic capacity type pressure sensor	Same
Inflation	Micro pump	Micro pump	Same
Deflation	Electrical control exhaust valve	Electrical control exhaust valve	Same
Quick-deflation	Electrical control exhaust valve	Electrical control exhaust valve	Same
CPU	CPU 8bits (Custom-made)	CPU 8bits (Custom-made)	Same
Display	LCD	LCD	Same

Key-component of both is the same.

6. Safety Comparison

	UA-1010/1020/1030T	UA-787	Determination
Protection for electroshock	Internal power source :BF type AC adapter : class II	Internal power source :BF type AC adapter : class II	Same
Measurement pressure (Maximum)	299mmHg	280 mmHg	UA-1010/1020/1030T has higher performance.
Measurement time (Maximum)	180 sec.	180 sec.	Same
Maximum pressurization value at single failure condition	299 mmHg	320 mmHg	UA-1010/1020/1030T is more safety.

Safety of both is almost the same.

Test Report

Equipment Under Test :

- **UA-787**

Test Report No.

- **R01006**

Items

Title : Clinical Test report

Method : We done Clinical test of UA-787/PC/V in accordance with ANSI/AAMI SP-10-1987.

This clinical test report is an examination done in Japan, and the thing to have rewritten this to the form of ANSI/AAMI.
Refer to Design Planning "DB770-00".

Result : ・Mean deifference SBP=－0.05mmHg、DBP= －2.61mmHg
・Standard Deviation SBP=4.23mmHg、DBP=5.13mmHg
We got the satisfactory data for standard of ANSI/AAMI SP-10-1987.

Conclusion : This UA-787/PC/V has no problem for Clinical test and has enough accuracy for ANSI/AMMI SP-10-1987.

Tested by : S.Ozaki **Date :** 07.MAY.2001 **sign :** S. Ozaki

Checked by : H.Yokoi **Date :** 07.MAY.2001 **sign :** H. Yokoi

Manufacturer 's Name and Address:

- **A&D Company, Limited. R&D Technical Center**
- **1-243,Asahi, Kitamoto-shi, Saitama, JAPAN**

Clinical test of the BP measurement UA-787/PC/V

Summary

The accuracy of the blood pressure monitors (model UA-787/PC/V – hereinafter called D.U.T) has been assessed by the indirect method according to the recommendations of the association for the advancement of medical instrumentation (AAMI).

85 subjects, aged 19-90 with a range of systolic blood pressure (SBP) of 71-202 mmHg and diastolic blood pressure (DBP) of (52-114) mmHg were studied.

The monitor was compared with two observers using the mercury type sphygmomanometer.

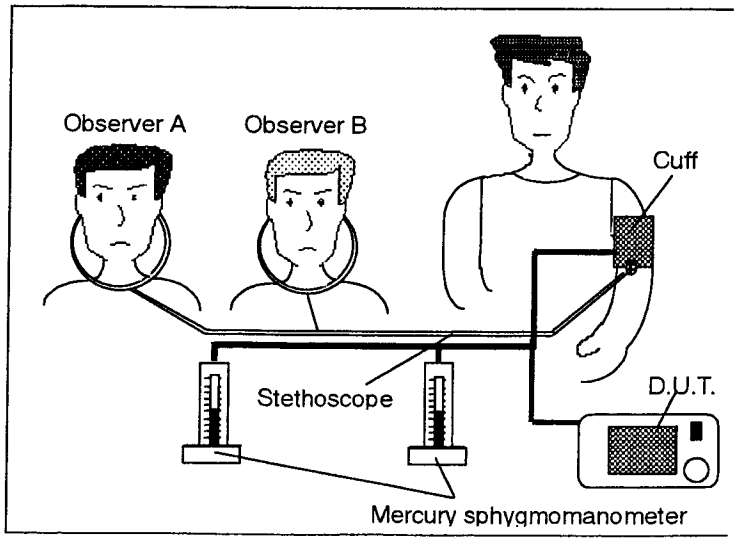
The standard deviation of the difference between observers was 2.12 mmHg for SBP and 2.29 mmHg for DBP. These differences were not significant.

The two observers have done their are three measurements have been done on each subject and comparison measurements. Mean error was calculated –0.50 mmHg (SBP) and –2.61mmHg (DBP), and standard deviation was figured as 4.23mmHg (SBP) and 5.13(DBP). Both mean error and standard deviation are considered below AAMI standard.

1. Methodology

All the measurement was done in accordance with Electric or Automated Sphygmomanometer (ANSI/AAMI SP-10 1992) 4.4.2.1 auscultatory method as the reference standard by AMMI.

The measurement was done three times on each subject and reference measurement by Mercury sphygmomanometer by two observers was made simultaneously. (See figure Shown below)



Remark:

A measurement was done after calibration of pressure on Mercury sphygmomanometers 1,2 and D.U.T. has been completed.

2. Subjects

The subjects were chosen from hypertension outpatient clinic and normal volunteer to satisfy age, sex and range of blood pressures classified by AAMI standard.

Range of age:

	<=24	25 - 44	45 - 64	>=65	Total
Male	9	7	18	15	49
Female	3	4	11	18	36
Total	12	11	29	33	85
%	14	13	34	39	100

Table 1

Range and distribution of systolic, diastolic pressure and heart rate :

Systolic	<100	100 - 139	140 – 179	>=180	Max: 202
N	18	135	77	25	Min: 71
Diastolic	<60	60 – 79	80 – 99	>=100	Max: 114
N	19	112	99	25	Min: 52
Heart rate	<60	60 – 69	70 – 79	>=80	Max: 109
N	35	96	50	74	Min: 36

Table 2

3. Observer differences

The data by the Mercury sphygmomanometer measurement by two observers were inspected for all the subjects' data for t value.

					Regression Line	
	Mean	SD	t	γ	A	B
Systolic	-0.20	2.12	0.09	1.00	-0.82	1.01
Diastolic	-0.59	2.29	0.48	1.00	1.80	0.97

$t_{0.975} = 1.990$ at n=255

The hypothesis that the two observers measure the same average blood pressure was accepted ($p<5\%$), as t value is smaller than 1.99. This proves the observations by two observers were valid.

4. Results

Statistical analysis was made as shown below.

Statistical data was calculated by the following approach.

Reference data: Reference data was calculated by the average of 6 data, since th ree measurements have been done on each subject by two observers.

Device Data: Device data was calculated by the average of three measured data.

		SBP	DBP
Mean Difference		-0.50	-2.61
Standard Deviation		4.23	5.13
Correlation Coefficient		0.99	0.93
Regression Line	A	2.37	5.27
	B	0.98	1.04

Table 3

Fig. 1a and 1b are correlation of observer1 readings with observer2 readings.

Fig. 3a and 3b are correlation of D.U.T. readings with mean of the observer's reading.

Fig. 2a,2b and 4a,4b are standard error of estimate.

Mean difference and standard deviation of D.U.T. was below AAMI standard (mean ±5 mmHg, SD 8 mmHg.).

Averaged data for all the subjects and all row data and correlation plots are shown in following pages.

We also analyzed the test data with the format suggested by AAMI SP-10 TableD.1. As follow:

	#of Obs.	Range	Mean of Diff.	S.D. of Diff.	%Exceeding 5mmHg	10mmHg	15mmHg
Obs1-Obs2							
Systolic	510	71-202	-0.2	2.12	0.78%	0%	0%
Diastolic	510	52-114	-0.59	2.29	0.59%	0%	0%
DUT-Avg.Obs							
Systolic	255	76-209	-0.5	4.23	13.70%	1.89%	0%
Diastolic	255	42-115	-2.64	5.13	7.05%	1.57%	0%

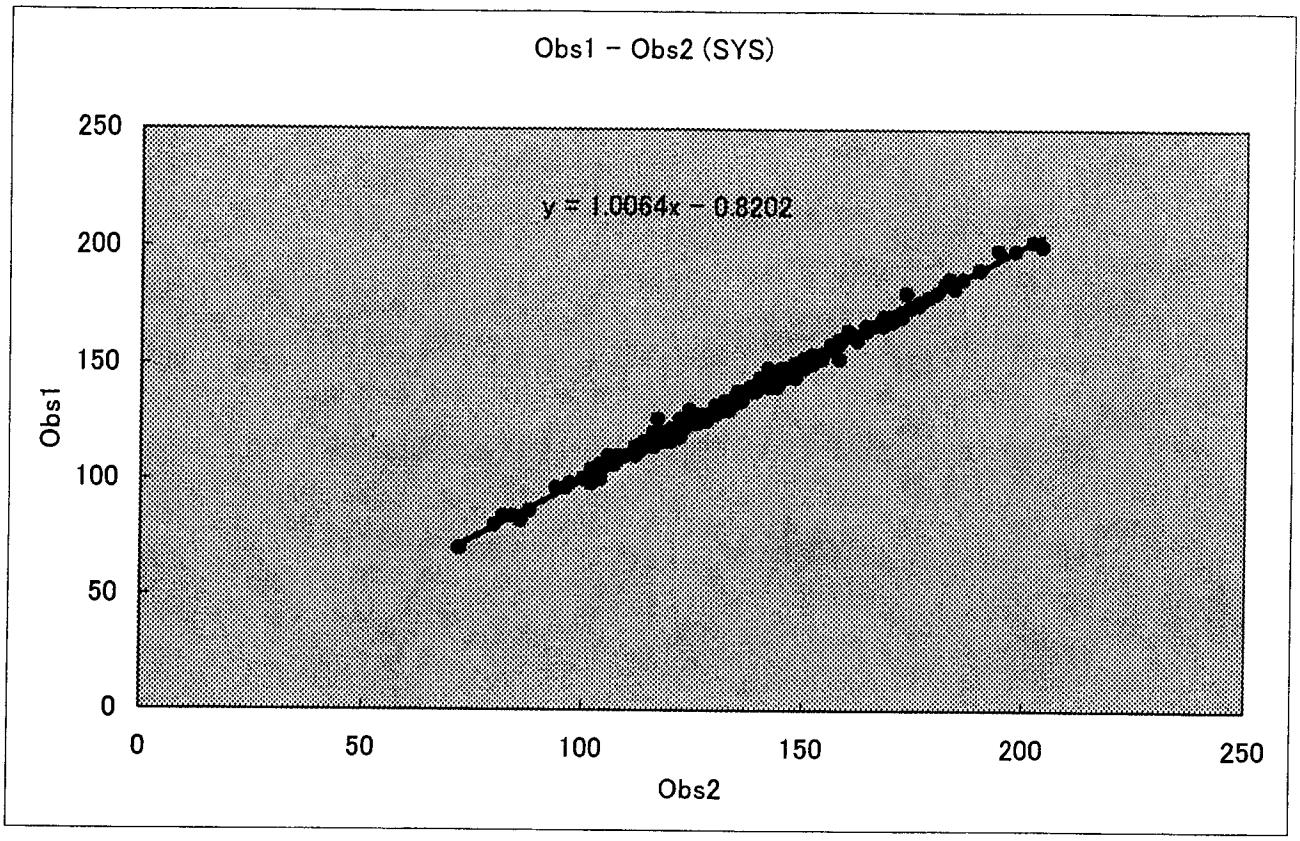

Obs1 - Obs2 (SYS)
y = 1.0064x - 0.8202
Obs1
Obs2
0
50
100
150
200
250

FIG-1a

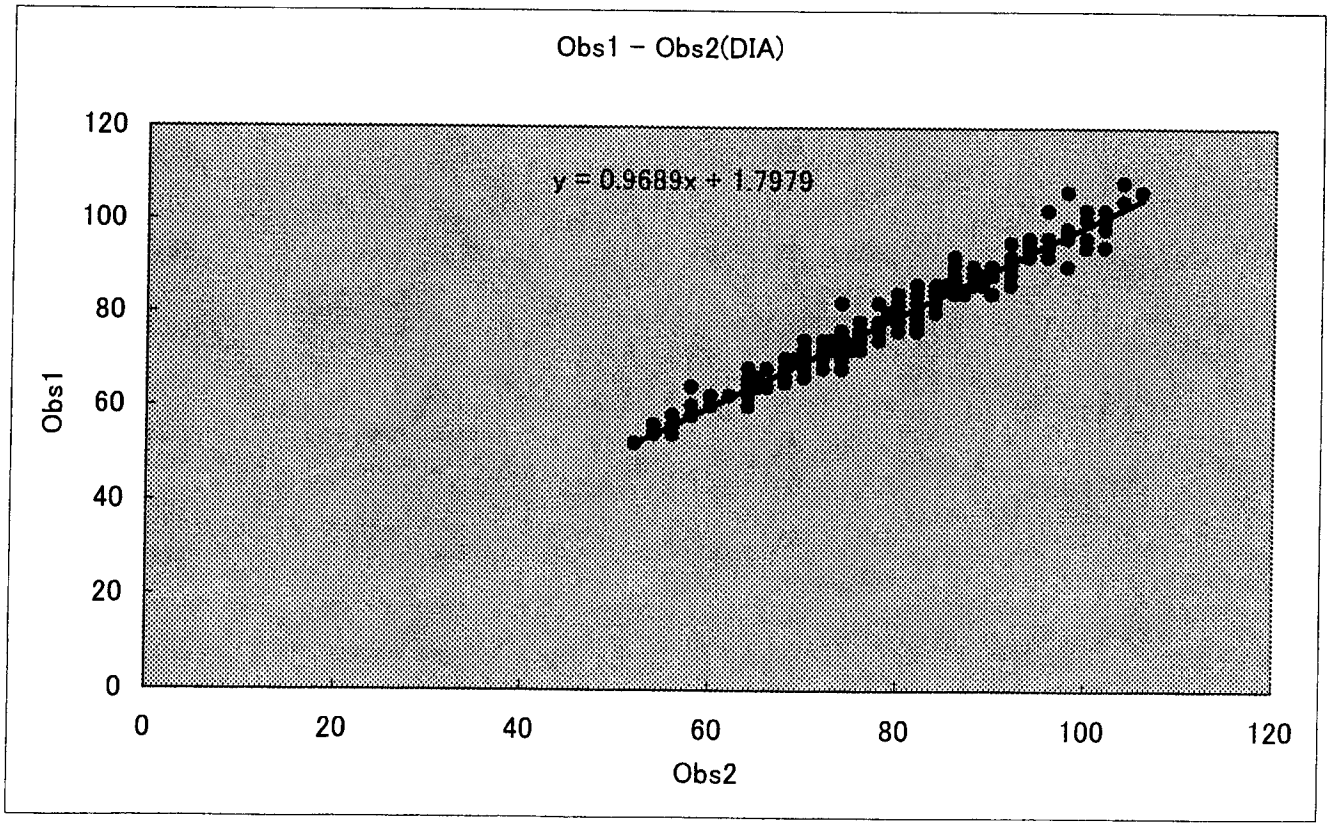

Obs1 - Obs2(DIA)
y = 0.9689x + 1.7979
Obs1
Obs2
0
20
40
60
80
100
120

FIG-1b

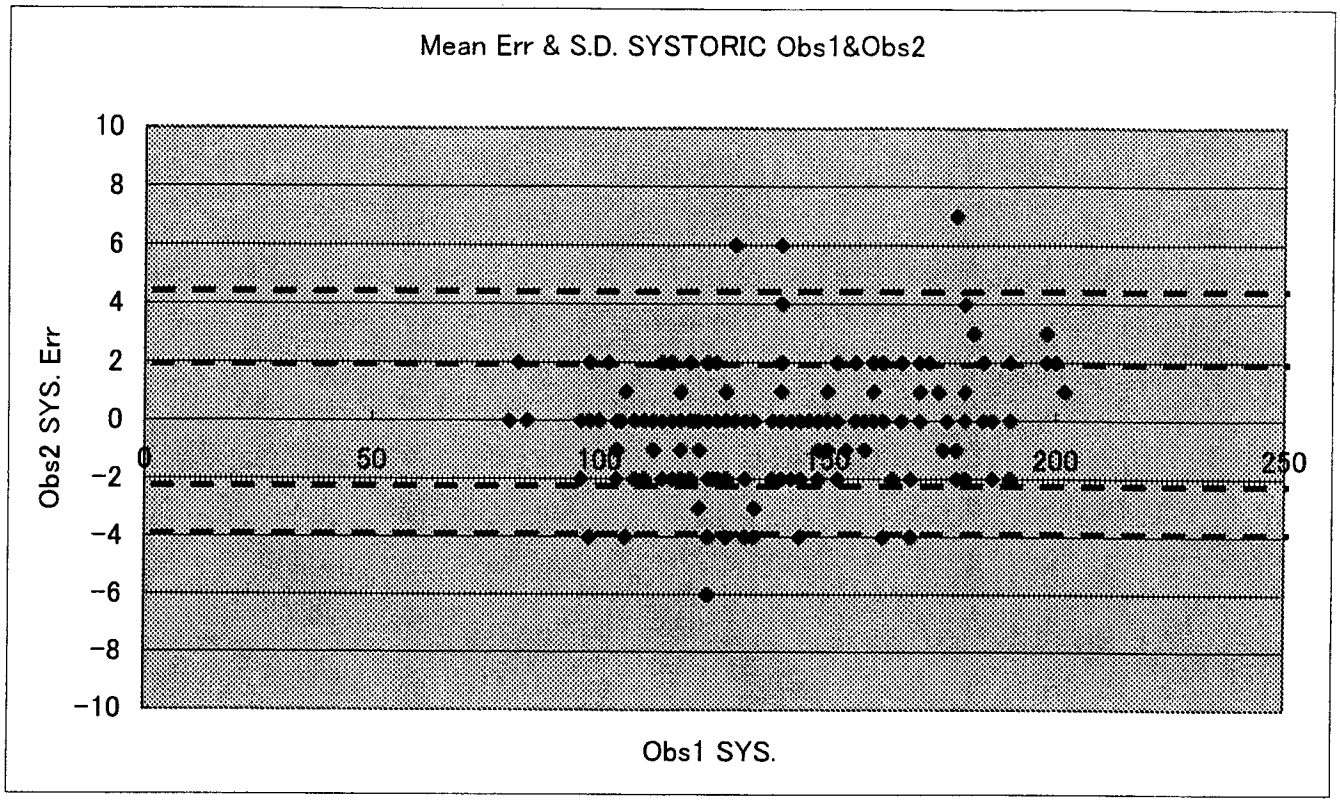

Mean Err & S.D. SYSTORIC Obs1&Obs2
Obs2 SYS. Err
10
8
6
4
2
0
-2
-4
-6
-8
-10
0
50
100
150
200
250
Obs1 SYS.

FIG-2a

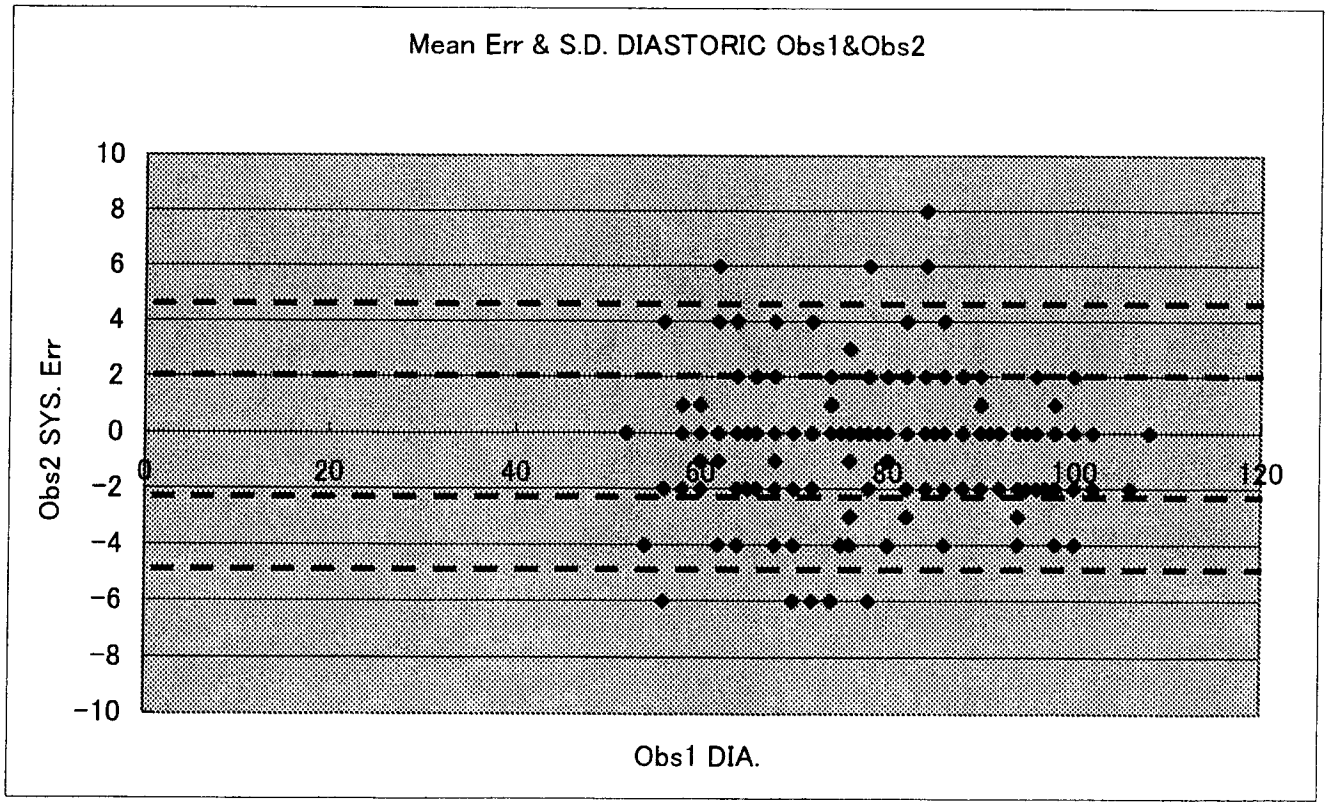

Mean Err & S.D. DIASTORIC Obs1&Obs2
Obs2 SYS. Err
10
8
6
4
2
0
-2
-4
-6
-8
-10
0
20
40
60
80
100
120
Obs1 DIA.

FIG-2b

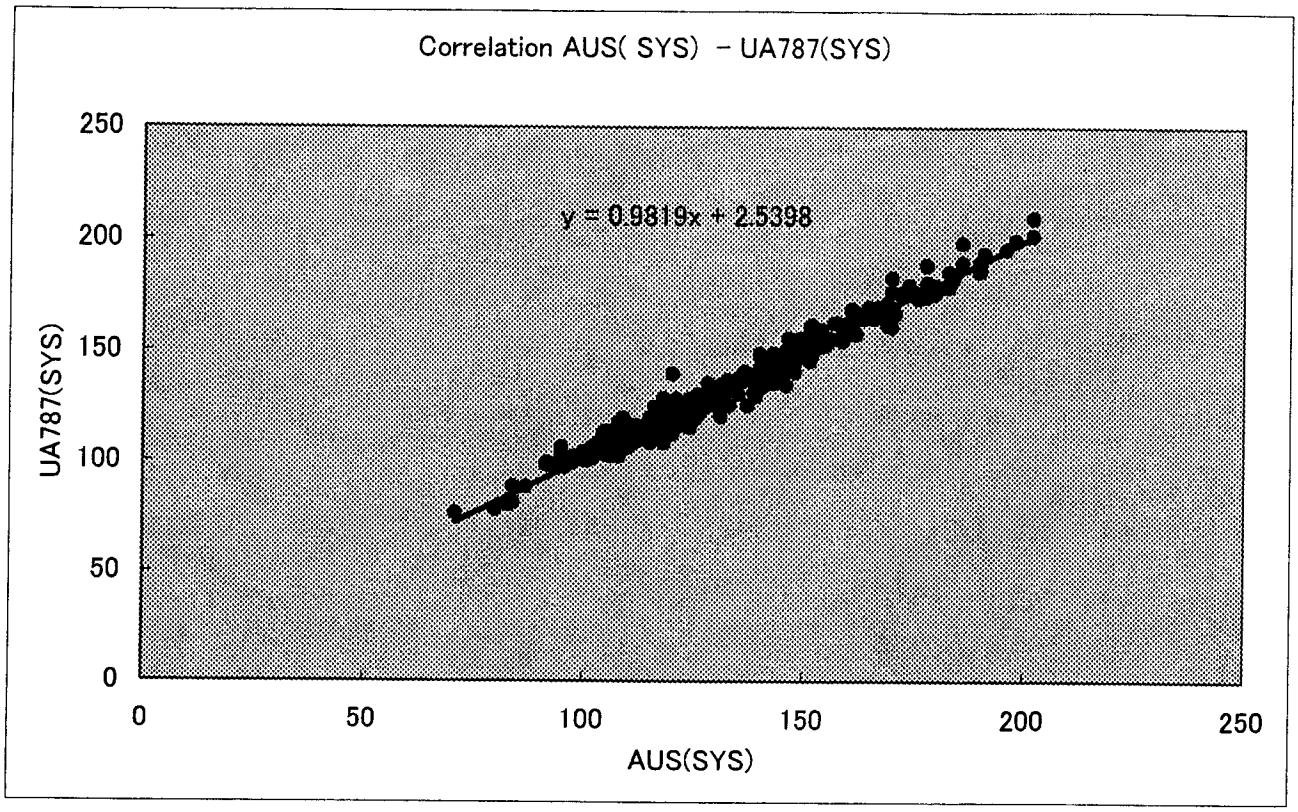

Correlation AUS(SYS) - UA787(SYS)
y = 0.9819x + 2.5398
UA787(SYS)
AUS(SYS)
0
50
100
150
200
250

FIG-3a

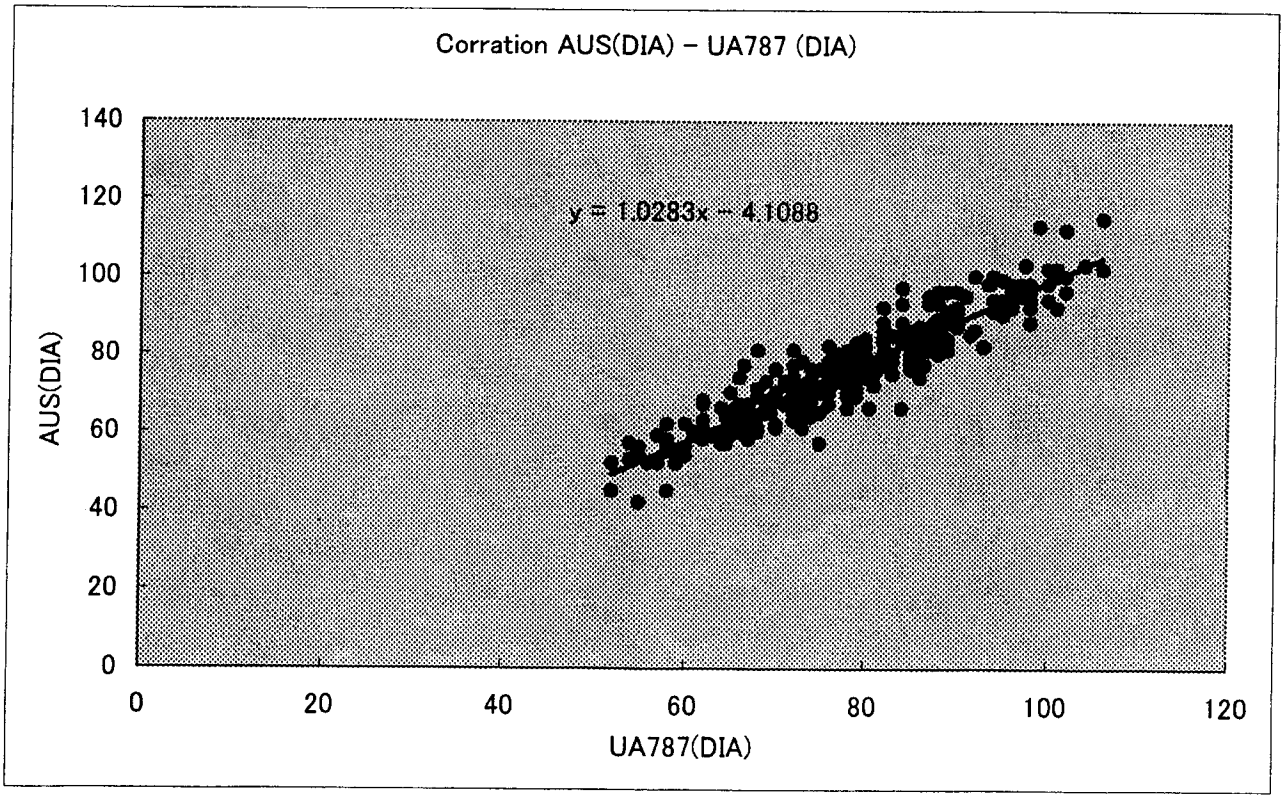

Corration AUS(DIA) - UA787 (DIA)
y = 1.0283x - 4.1088
AUS(DIA)
UA787(DIA)
0
20
40
60
80
100
120
140

FIG-3b

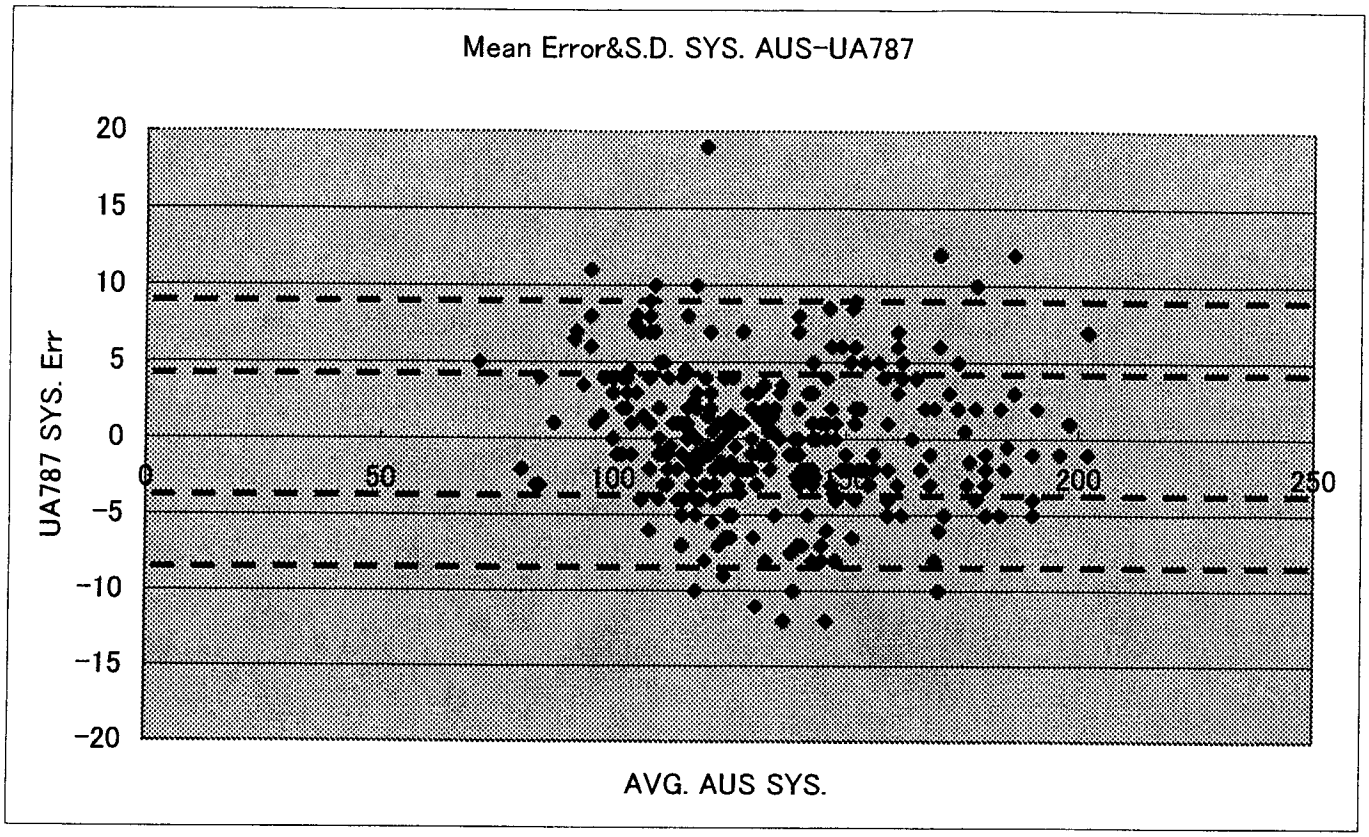

Mean Error&S.D. SYS. AUS-UA787
UA787 SYS. Err
20
15
10
5
0
-5
-10
-15
-20
0
50
100
150
200
250
AVG. AUS SYS.

FIG-4a

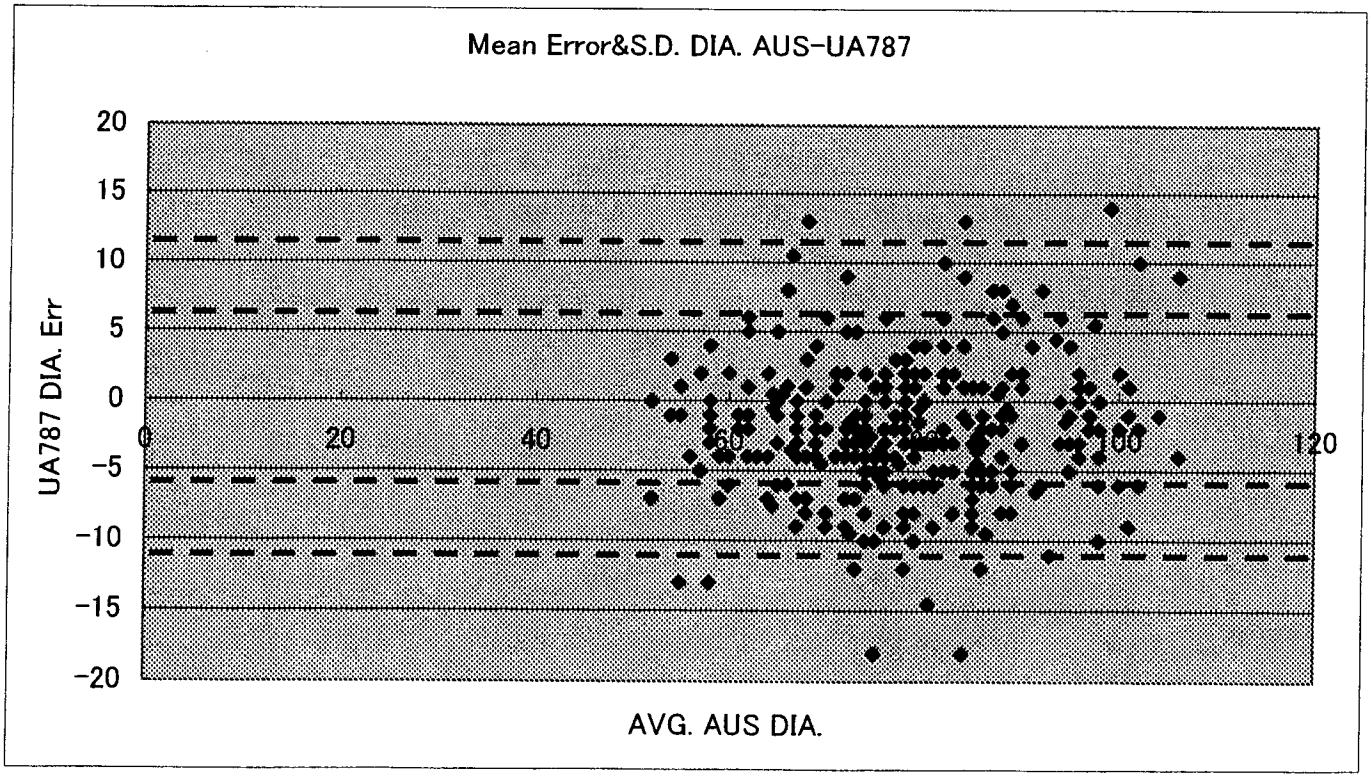

Mean Error&S.D. DIA. AUS-UA787
UA787 DIA. Err
20
15
10
5
0
-5
-10
-15
-20
0
20
40
60
100
120
AVG. AUS DIA.

FIG-4b

no	name	sex	age	ARM Size (cm)	Obs#1		Obs#2		Obs#1&2		UA-787			Diff UA787/Obs		Diff Obs1&2	
					SYS	DIA	SYS	DIA	SYS	DIA	SYS	DIA	PUL	SYS	DIA	SYS	DIA
1	KTO	f	74	25.0	202	96	202	98	202	97	201	96	100	−1	−1	0	−2
					186	86	186	86	186	86	198	87	80	12	1	0	0
					178	86	178	82	178	84	188	88	93	10	4	0	4
2	MO	f	74	20.0	184	84	182	86	183	85	185	86	89	2	1	2	−2
					164	82	164	84	164	83	164	85	84	0	2	0	−2
	H.T				160	82	158	74	159	78	160	75	83	1	−3	2	8
3	HI	f	56	25.5	184	94	182	100	183	97	185	96	108	2	−1	2	−6
					182	100	184	102	183	101	178	100	104	−5	−1	−2	−2
					178	98	178	98	178	98	174	88	106	−4	−10	0	0
4	TA	f	83	30.8	200	98	204	102	202	100	209	98	88	7	−2	−4	−4
					198	84	194	84	196	84	195	97	86	−1	13	4	0
					198	90	198	88	198	89	199	96	88	1	7	0	2
5	OI	m	90	24.6	132	74	132	76	132	75	131	76	80	−1	1	0	−2
					124	76	122	76	123	76	116	71	72	−7	−5	2	0
					126	76	117	78	122	77	116	73	79	−6	−4	9	−2
6	TA	m	68	18.4	128	100	126	102	127	101	124	100	86	−3	−1	2	−2
					128	94	126	102	127	98	125	96	86	−2	−2	2	−8
					120	90	117	98	119	94	117	94	84	−2	0	3	−8
7	AY	f	22	20.0	122	74	122	78	122	76	119	78	75	−3	2	0	−4
					116	64	114	66	115	65	108	65	74	−7	0	2	−2
					112	64	113	64	113	64	112	60	70	−1	−4	−1	0
8	AR	f	21	21.0	124	70	126	68	125	69	120	73	65	−5	4	−2	2
					118	72	118	70	118	71	113	72	68	−5	1	0	2
					118	70	122	68	120	69	112	65	65	−8	−4	2	2
9	FU	f	67	23.6	166	98	164	102	165	100	169	102	87	4	2	2	−4
					158	96	156	100	157	98	162	98	71	5	0	2	−4
					154	96	152	98	153	97	155	95	87	2	−2	2	−2
10	NU	m	69	29.0	134	102	136	100	135	101	137	102	78	2	1	−2	2
					148	106	146	106	147	106	149	102	84	2	−4	2	0
					146	100	146	100	146	100	150	94	80	4	−6	0	0
11	IW	m	64	29.0	152	90	152	88	152	89	154	88	64	2	−1	0	2
					148	88	146	89	147	89	144	88	65	−3	−1	2	−1
	H.T				152	86	152	86	152	86	153	84	64	1	−2	0	0
12	TB	f	43	27.2	96	66	94	68	95	67	106	60	64	11	−7	2	−2
					98	62	102	64	100	63	100	59	64	0	−4	−4	−2
					100	64	102	65	101	65	100	57	61	−1	−8	−2	−1
13	NA	m	54	28.6	150	94	148	94	149	94	155	91	55	6	−3	2	0
					152	100	152	102	152	101	161	100	64	9	−1	0	−2
	P.V.C				152	102	152	102	152	102	158	96	64	6	−6	0	0
14	YA	m	57	25.0	180	88	180	86	180	87	179	95	66	−1	8	0	2
					162	88	162	88	162	88	166	93	60	4	5	0	0
					166	86	166	88	166	87	164	93	61	−2	6	0	−2
15	FN	m	26	25.2	114	62	116	62	115	62	119	60	54	4	−2	−2	0
					110	58	108	58	109	58	119	58	55	10	0	2	0

					106	60	106	60	106	60	113	54	56	7	−6	0	0
16	UA	m	32	28.2	116	74	120	74	118	74	121	66	64	3	−8	−4	0
					116	72	115	73	116	73	120	63	62	4.5	−10	1	−1
					120	72	122	74	121	73	123	61	64	2	−12	−2	−2
17	OZ	f	72	27.0	190	80	190	80	190	80	186	80	57	−4	0	0	0
					180	75	180	74	180	75	175	72	56	−5	−3	0	1
					175	75	176	76	176	76	176	72	57	0.5	−4	−1	−1
18	MT	f	57	22.6	98	54	102	54	100	54	103	57	58	3	3	−4	0
					82	52	86	52	84	52	88	52	56	4	0	−4	0
					98	60	97	58	98	59	99	52	58	1.5	−7	1	2
19	ZT	m	60	18.7	80	62	80	62	80	62	78	58	109	−2	−4	0	0
					84	56	84	56	84	56	81	52	104	−3	−4	0	0
					84	58	82	58	83	58	80	57	108	−3	−1	2	0
20	ST	m	62	26.8	190	108	190	104	190	106	185	115	68	−5	9	0	4
					186	106	186	98	186	102	189	112	70	3	10	0	8
					178	102	178	96	178	99	180	113	66	2	14	0	6
21	NO	f	69	21.8	190	79	190	82	190	81	189	66	92	−1	−15	0	−3
					186	74	183	78	185	76	184	70	93	−1	−6	3	−4
					180	72	173	76	177	74	175	72	92	−2	−2	7	−4
22	TN	m	36	26.0	104	62	103	62	104	62	108	61	49	4.5	−1	1	0
					100	68	104	72	102	70	101	61	53	−1	−9	−4	−4
					106	68	104	66	105	67	108	60	54	3	−7	2	2
23	SG	m	36	24.4	118	100	118	102	118	101	117	92	74	−1	−9	0	−2
					120	92	120	94	120	93	117	82	68	−3	−11	0	−2
					114	86	114	84	114	85	115	77	68	1	−8	0	2
24	AY	m	67	22.0	102	60	104	60	103	60	105	62	60	2	2	−2	0
					104	66	104	64	104	65	103	62	61	−1	−3	0	2
					96	64	96	64	96	64	97	60	57	1	−4	0	0
25	TJ	m	55	24.0	100	70	100	68	100	69	104	66	66	4	−3	0	2
					100	70	104	74	102	72	106	65	66	4	−7	−4	−4
					102	72	102	74	102	73	104	66	69	2	−7	0	−2
26	CB	m	42	28.6	142	96	144	96	143	96	141	96	68	−2	0	−2	0
					148	94	142	96	145	95	137	92	70	−8	−3	6	−2
					140	90	140	86	140	88	133	86	71	−7	−2	0	4
27	SS	m	64	22.6	140	85	140	84	140	85	139	83	68	−1	−2	0	1
					144	86	143	86	144	86	141	85	68	−3	−1	1	0
					140	82	140	82	140	82	140	80	70	0	−2	0	0
28	AK	m	59	22.9	126	74	128	70	127	72	124	70	36	−3	−2	−2	4
					120	72	120	72	120	72	119	68	43	−1	−4	0	0
					124	70	123	69	124	70	122	65	43	−2	−5	1	1
29	OK	m	81	20.0	116	76	116	76	116	76	124	72	83	8	−4	0	0
					108	66	108	68	108	67	117	67	79	9	0	0	−2
					108	64	108	64	108	64	115	66	80	7	2	0	0
30	HN	m	43	25.4	116	68	116	64	116	66	118	67	46	2	1	0	4
					120	80	118	82	119	81	115	78	53	−4	−3	2	−2
					124	74	124	73	124	74	122	71	51	−2	−3	0	1
31	YD	f	64	25.0	140	78	142	80	141	79	134	83	55	−7	4	−2	−2
					126	80	122	84	124	82	124	80	54	0	−2	4	−4
					126	84	125	86	126	85	124	76	53	−2	−9	1	−2

32	TI	f	84	24.8	180	96	180	96	180	96	177	97	97	−3	1	0	0
					176	96	176	96	176	96	173	96	98	−3	0	0	0
	I.H.D.				174	96	174	96	174	96	176	97	95	2	1	0	0
33	AI	m	73	22.0	124	86	126	92	125	89	126	81	88	1	−8	−2	−6
					105	78	105	78	105	78	113	80	81	8	2	0	0
	H.T.				118	85	118	85	118	85	121	80	83	3	−5	0	0
34	ID	f	72	15.6	120	72	122	74	121	73	128	78	72	7	5	−2	−2
					120	72	120	72	120	72	124	77	74	4	5	0	0
					124	76	124	76	124	76	125	76	71	1	0	0	0
35	FY	m	65	25.0	134	78	132	80	133	79	135	80	75	2	1	2	−2
					132	78	130	76	131	77	134	76	80	3	−1	2	2
					130	78	130	80	130	79	130	76	78	0	−3	0	−2
36	TD	f	56	26.4	116	78	120	78	118	78	117	76	70	−1	−2	−4	0
					110	76	110	76	110	76	112	74	70	2	−2	0	0
					102	74	104	74	103	74	106	68	68	3	−6	−2	0
37	MZ	f	80	23.4	150	72	152	76	151	74	149	73	66	−2	−1	−2	−4
					142	70	144	74	143	72	140	69	66	−3	−3	−2	−4
					134	74	135	74	135	74	135	69	69	0.5	−5	−1	0
38	TO	m	67	23.6	112	66	112	68	112	67	109	65	66	−3	−2	0	−2
					110	72	110	74	110	73	112	70	68	2	−3	0	−2
					114	70	116	70	115	70	110	68	67	−5	−2	−2	0
39	OD	f	58	21.0	128	78	130	80	129	79	132	80	73	3	1	−2	−2
					130	78	132	76	131	77	128	80	72	−3	3	−2	2
					132	76	134	76	133	76	125	77	70	−8	1	−2	0
40	RK	m	42	25.4	134	86	134	88	134	87	133	85	96	−1	−2	0	−2
					124	86	124	86	124	86	124	80	93	0	−6	0	0
					134	78	136	82	135	80	130	77	96	−5	−3	−2	−4
41	HD	f	50	22.4	170	96	170	94	170	95	176	94	64	6	−1	0	2
					174	86	174	89	174	88	176	88	63	2	0.5	0	−3
					154	88	154	88	154	88	152	86	64	−2	−2	0	0
42	AI	m	61	24.2	130	87	124	86	127	87	128	77	48	1	−10	6	1
					110	80	112	82	111	81	116	72	50	5	−9	−2	−2
					110	78	112	80	111	79	110	69	54	−1	−10	−2	−2
43	KB	f	70	23.0	148	76	148	80	148	78	140	70	64	−8	−8	0	−4
					144	78	142	78	143	78	135	69	66	−8	−9	2	0
					144	82	142	84	143	83	144	75	66	1	−8	2	−2
44	MD	f	54	22.0	120	78	118	78	119	78	118	66	76	−1	−12	2	0
					106	72	107	72	107	72	108	63	74	1.5	−9	−1	0
					110	74	110	74	110	74	112	66	79	2	−8	0	0
45	UD	f	73	26.0	140	78	144	78	142	78	145	79	83	3	1	−4	0
					144	78	140	78	142	78	137	76	79	−5	−2	4	0
	A.F.				144	76	146	76	145	76	138	82	82	−7	6	−2	0
46	KM	m	57	24.0	118	77	118	78	118	78	116	73	77	−2	−5	0	−1
					116	76	116	82	116	79	116	75	75	0	−4	0	−6
	A.F.				110	70	110	72	110	71	115	67	75	5	−4	0	−2
47	KD	f	40	23.0	104	58	102	58	103	58	107	45	54	4	−13	2	0
					86	54	88	56	87	55	88	42	56	1	−13	−2	−2
					70	52	72	52	71	52	76	45	69	5	−7	−2	0
48	KK	m	74	23.4	130	78	130	78	130	78	128	76	64	−2	−2	0	0

					126	76	125	74	126	75	119	71	64	−7	−4	1	2
					122	74	122	72	122	73	120	69	66	−2	−4	0	2
49	KY	f	66	26.0	180	104	180	104	180	104	178	103	84	−2	−1	0	0
					166	84	168	84	167	84	169	85	93	2	1	−2	0
	A.F.				164	88	160	88	162	88	167	96	86	5	8	4	0
50	OG	m	77	25.4	144	76	144	76	144	76	144	78	70	0	2	0	0
					140	80	140	82	140	81	142	78	70	2	−3	0	−2
	A.F.				144	88	146	88	145	88	146	87	91	1	−1	−2	0
51	MY	m	61	26.4	132	74	134	76	133	75	135	57	41	2	−18	−2	−2
					136	74	136	76	136	75	136	65	66	0	−10	0	−2
	I.H.D.				140	76	140	76	140	76	147	67	66	7	−9	0	0
52	FS	m	66	23.0	134	74	135	74	135	74	136	74	76	1.5	0	−1	0
					138	64	138	66	138	65	137	70	80	−1	5	0	−2
					114	60	118	64	116	62	117	67	79	1	5	−4	−4
53	WB	f	40	21.8	110	66	112	70	111	68	108	71	94	−3	3	−2	−4
					110	76	110	76	110	76	110	73	96	0	−3	0	0
					102	70	102	72	102	71	104	73	90	2	2	0	−2
54	NT	m	73	27.6	126	66	126	66	126	66	121	74	82	−5	8	0	0
					116	70	116	70	116	70	118	76	80	2	6	0	0
					122	74	124	78	123	76	124	76	80	1	0	−2	−4
55	OM	m	71	20.0	190	102	192	102	191	102	193	100	68	2	−2	−2	0
					190	98	190	98	190	98	189	94	64	−1	−4	0	0
					184	98	184	98	184	98	182	96	65	−2	−2	0	0
56	WT	f	77	24.0	174	86	174	84	174	85	179	79	68	5	−6	0	2
					162	78	160	80	161	79	167	81	70	6	2	2	−2
					154	80	154	80	154	80	159	82	67	5	2	0	0
57	ST	m	50	22.4	162	88	160	88	161	88	164	80	56	3	−8	2	0
					168	88	168	88	168	88	167	84	60	−1	−4	0	0
					152	86	154	86	153	86	155	85	61	2	−1	−2	0
58	HY	m	59	26.4	124	78	124	78	124	78	128	81	66	4	3	0	0
					130	84	130	84	130	84	129	83	65	−1	−1	0	0
					128	82	130	84	129	83	127	80	66	−2	−3	−2	−2
59	HM	m	75	26.0	130	58	130	58	130	58	130	58	55	0	0	0	0
					114	54	114	54	114	54	110	53	56	−4	−1	0	0
					116	62	114	58	115	60	116	56	56	1	−4	2	4
60	KN	f	47	25.0	128	86	128	86	128	86	135	83	75	7	−3	0	0
					116	86	120	86	118	86	128	74	71	10	−12	−4	0
					122	90	122	88	122	89	120	81	73	−2	−8	0	2
61	OI	m	60	26.0	118	74	118	74	118	74	117	76	60	−1	2	0	0
					114	76	114	76	114	76	112	76	61	−2	0	0	0
					108	74	108	74	108	74	106	71	60	−2	−3	0	0
62	NH	f	70	25.6	112	74	112	74	112	74	116	64	86	4	−10	0	0
					114	70	116	70	115	70	116	62	80	1	−8	−2	0
					114	70	116	70	115	70	114	61	82	−1	−9	−2	0
63	KT	m	50	25.5	108	74	108	74	108	74	112	70	67	4	−4	0	0
					112	74	112	74	112	74	111	72	66	−1	−2	0	0
					108	80	108	76	108	78	102	72	69	−6	−6	0	4
64	KS	f	75	24.0	148	76	148	76	148	76	144	71	96	−4	−5	0	0
					150	72	154	70	152	71	148	72	93	−4	1	−4	2

					146	72	146	72	146	72	134	70	96	−12	−2	0	0
65	HN	f	47	24.0	118	82	116	82	117	82	115	86	67	−2	4	2	0
					118	84	118	84	118	84	108	66	62	−10	−18	0	0
					120	80	124	84	122	82	119	79	64	−3	−3	−4	−4
66	YR	m	57	22.4	148	84	148	84	148	84	149	93	72	1	9	0	0
					136	82	136	82	136	82	139	92	71	3	10	0	0
					138	80	140	84	139	82	138	88	74	−1	6	−2	−4
67	TD	m	53	31.0	100	75	100	76	100	76	100	70	64	0	−6	0	−1
					106	74	106	74	106	74	102	69	64	−4	−5	0	0
					102	80	100	78	101	79	100	71	65	−1	−8	2	2
68	KD	f	70	22.6	96	58	94	58	95	58	101	56	62	6	−2	2	0
					96	60	94	58	95	59	103	55	61	8	−4	2	2
					92	58	92	56	92	57	99	52	59	7	−5	0	2
69	OT	f	37	26.0	92	58	91	58	92	58	98	62	60	6.5	4	1	0
					98	66	98	66	98	66	102	60	64	4	−6	0	0
					94	64	93	64	94	64	97	57	65	3.5	−7	1	0
70	SW	m	24	24.6	110	58	112	56	111	57	116	65	68	5	8	−2	2
					106	52	108	54	107	53	108	52	64	1	−1	−2	−2
					110	52	110	56	110	54	108	56	76	−2	2	0	−4
71	AT	f	56	26.8	156	106	156	108	156	107	155	112	60	−1	5	0	−2
					158	88	156	92	157	90	152	83	57	−5	−7	2	−4
					158	90	160	90	159	90	154	81	60	−5	−9	−2	0
72	KJ	f	24	24.5	90	56	90	54	90	55	90	52	66	0	−3	0	2
					92	62	92	64	92	63	87	64	64	−5	1	0	−2
					92	68	92	68	92	68	93	59	70	1	−9	0	0
73	ED	f	65	26.6	142	102	142	100	142	101	148	103	62	6	2	0	2
					160	94	162	94	161	94	162	97	60	1	3	−2	0
					158	90	158	92	158	91	162	93	60	4	2	0	−2
74	IG	m	68	21.5	186	80	185	80	186	80	183	89	96	−3	9	1	0
					182	82	184	82	183	82	183	84	93	0	2	−2	0
					178	80	180	78	179	79	173	78	92	−6	−1	−2	2
75	WT	f	60	24.5	145	104	152	104	149	104	156	100	98	7.5	−4	−7	0
					144	102	142	102	143	102	141	93	96	−2	−9	2	0
					144	104	144	104	144	104	154	96	90	10	−8	0	0
76	TK	f	65	25.0	196	94	196	96	196	95	192	93	67	−4	−2	0	−2
					190	90	192	92	191	91	188	87	66	−3	−4	−2	−2
					194	98	192	98	193	98	194	93	68	1	−5	2	0
77	UC	m	63	25.0	158	104	158	104	158	104	160	101	72	2	−3	0	0
					146	102	145	102	146	102	146	97	74	0.5	−5	1	0
					138	98	138	100	138	99	136	90	68	−2	−9	0	−2
78	MZ	m	20	35.5	131	81	133	87	132	84	129	75	69	−3	−9	−2	−6
					131	91	130	87	131	89	122	83	67	−9	−6	1	4
					132	83	136	86	134	85	129	75	71	−5	−10	−4	−3
79	HK	m	20	37.3	123	75	135	78	129	77	129	77	68	0	0.5	−12	−3
					123	78	125	86	124	82	126	75	71	2	−7	−2	−8
					120	75	123	78	122	77	133	73	68	12	−4	−3	−3
80	IU	m	20	35.3	144	94	142	94	143	94	145	86	83	2	−8	2	0
					144	106	144	106	144	106	149	99	83	5	−7	0	0
					142	98	142	96	142	97	146	90	81	4	−7	0	2

81	NM	m	19	39.2	128	90	126	88	127	89	125	85	80	−2	−4	2	2
					128	92	126	90	127	91	126	84	83	−1	−7	2	2
					126	94	126	94	126	94	126	86	78	0	−8	0	0
82	MM	m	20	45.2	134	98	136	98	135	98	143	90	83	8	−8	−2	0
					130	98	134	98	132	98	138	99	81	6	1	−4	0
					132	96	128	96	130	96	129	96	83	−1	0	4	0
83	IY	m	22	36.9	144	103	150	102	147	103	147	96	92	0	−7	−6	1
					142	105	143	108	143	107	147	100	95	4.5	−7	−1	−3
					154	114	156	114	155	114	160	104	97	5	−10	−2	0
84	OB	m	21	40.3	142	90	142	96	142	93	139	84	65	−3	−9	0	−6
					140	96	144	99	142	98	137	88	63	−5	−10	−4	−3
					142	99	143	100	143	100	147	96	67	4.5	−4	−1	−1
85	KZ	m	21	35.5	129	85	128	89	129	87	134	82	68	5.5	−5	1	−4
					128	89	128	88	128	89	134	80	72	6	−9	0	1
					131	87	132	92	132	90	137	83	72	5.5	−7	−1	−5

5. Conclusion

The standard deviation and mean error of the different UA787/PC/V to auscultator method are considered below AMMI standard.

The correlation value of measurement result is highland the regression line of these data is almost 1.0.

This unit is an effective device for measuring human blood pressure in clinical field.

The patient can be easily measured by oneself for easy of use.

Therefore, it is concluded that this unit is useful for clinical check at home.

THE KITAZATO INSTITUTE MEDICAL CENTER HOSPITAL
Internal Medicin

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