

Infrastructure IoT system specifications Documentation EN Blueprint for JATH Blueprint

R1

Made for: JTEKT Automotive (Thailand) co. Ltd.

By: TOMAS TECH CO.,LTD.



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Revision History

Date	Version	File name	Details
25/Jan/2024	R1	Infrastructure IoT system specifications Documentation EN Blueprint for JATH Blueprint R1	First edition

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7. Sign off

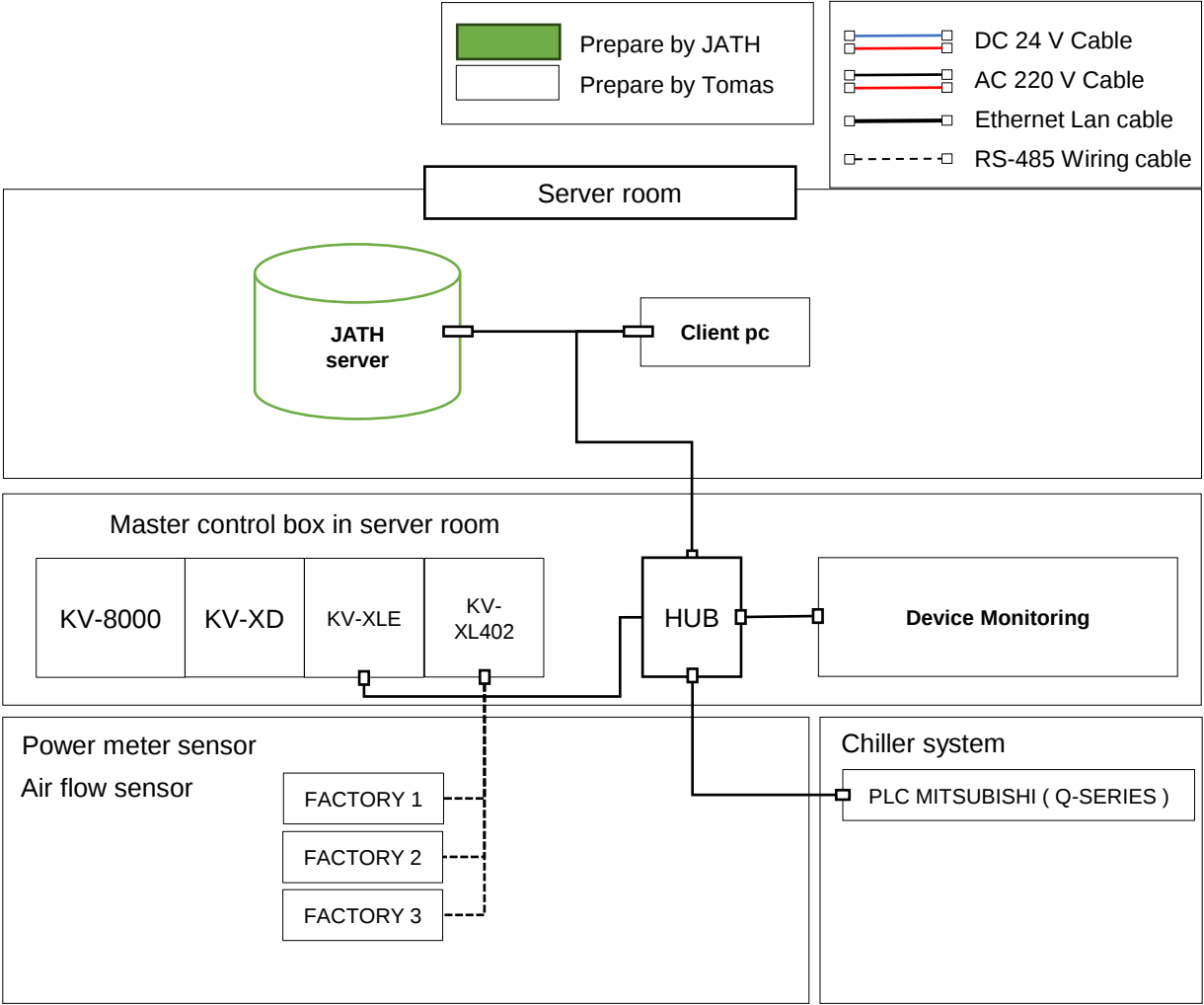
1. Overview

Infrastructure project Created to collect information on various equipment used for installation, extract information from e.g. MDB, Air, Chiller can also view various data through a system called IoT. Can view real-time data and store data for viewing retrospectively.

2. Overall configuration diagram

Overall configuration diagram (Hardware configuration)

#	Item	Qty	IP Address	Preparation By
1	Server PC for Record data window server	1		JATH
2	KV-8000	1	192.168.XXX.1	TOMAS
3	KV-XLE02	1	192.168.XXX.2	TOMAS
4	KV-XD02	1	192.168.XXX.4	TOMAS
6	KV-XL402	1		TOMAS
5	KVM-16G	2		TOMAS
6	ME96SSEB-MB POWER METER	135	*Modbus system	TOMAS
7	Ultrasonic Flowmeter TRZ100R-C/5P 4inch	3		TOMAS
8	Ultrasonic Flowmeter TRZ150R-C/5P 6inch	5		TOMAS
9	CHILLER SYSTEM (MITSUBISHI I-Q)	1	192.168.XXX.10	JATH
10	Master control box	1		TOMAS
11	Ethernet hub	1		TOMAS



2. Overall configuration diagram

Power meter installation 1-4

Factory	No	Name	Phase	Voltage (V.)	CT Spec (A. / A.)
1	1	MDB-1	Must be check	Must be check	1250 / 5
1	2	MDB-2	Must be check	Must be check	4000 / 5
1	3	MDB-3	Must be check	Must be check	4000 / 5
2	4	MDB-4	Must be check	Must be check	2500 / 5
2	5	MDB-5	Must be check	Must be check	6300 / 5
2	6	MDB-6	Must be check	Must be check	6300 / 5
2	7	MDB-7	Must be check	Must be check	2000 / 5
2	8	MDB-8	Must be check	Must be check	3200 / 5
2	9	MDB-9	Must be check	Must be check	6300 / 5
1	10	MDB-10	Must be check	Must be check	2500 / 5
2	11	MDB-11	Must be check	Must be check	6300 / 5
3	12	MDB-12	Must be check	Must be check	5000 / 5
3	13	MDB-13	Must be check	Must be check	6300 / 5
1	14	AC-1/1	Must be check	Must be check	225 / 5
1	15	AC-1/2	Must be check	Must be check	175 / 5
1	16	AC-1/3	Must be check	Must be check	175 / 5
1	17	AC-1/4	Must be check	Must be check	175 / 5
1	18	AC-1/5	Must be check	Must be check	225 / 5
2	19	AC-2/1	Must be check	Must be check	300 / 5
2	20	AC-2/2	Must be check	Must be check	300 / 5
2	21	AC-2/4 (P-4-5)	Must be check	Must be check	600 / 5
2	22	AC-2/5 (P-4-6)	Must be check	Must be check	600 / 5
2	23	AC-2/6	Must be check	Must be check	1000 / 5
3	24	AC-3/1	Must be check	Must be check	250 / 5
3	25	AC-3/2	Must be check	Must be check	250 / 5
1	26	P-1-2	3PH	210V.	100 / 5
1	27	P-1-3	3PH	210V.	400 / 5
1	28	P-1-4	3PH	210V.	400 / 5
1	29	P-1-5	3PH	210V.	200 / 5
1	30	P-1-6	3PH	210V.	300 / 5
1	31	P-1-7	3PH	210V.	300 / 5
1	32	P-1-8	3PH	210V.	250 / 5
1	33	P-1-9	3PH	210V.	800 / 5
1	34	P-2-1	3PH	210V.	300 / 5
1	35	P-2-2	3PH	210V.	400 / 5
1	36	P-2-3	3PH	210V.	200 / 5
1	37	P-2-4	3PH	210V.	400 / 5
1	38	P-2-5	3PH	210V.	300 / 5
1	39	P-2-6	3PH	210V.	800 / 5
1	40	P-2-7	3PH	210V.	300 / 5

2. Overall configuration diagram

Power meter installation 2-4

Factory	No	Name	Phase	Voltage	CT Spec
2	41	P-2-8	3PH	210V.	630 / 5
1	42	P-2-9	3PH	210V.	600 / 5
1	43	P-2-10	Must be check	Must be check	600 / 5
1	44	P-2-11	Must be check	Must be check	400 / 5
1	45	P-3-1	3PH	210V.	400 / 5
1	46	P-3-2	3PH	210V.	400 / 5
1	47	P-3-3	3PH	210V.	400 / 5
1	48	P-3-4	3PH	210V.	400 / 5
1	49	P-3-5	3PH	210V.	400 / 5
1	50	P-3-6	3PH	210V.	400 / 5
1	51	P-3-7	3PH	210V.	400 / 5
1	52	P-3-8	3PH	210V.	400 / 5
1	53	P-3-9	3PH	210V.	630 / 5
1	54	P-3-10	3PH	210V.	300 / 5
1	55	P-3-11	3PH	210V.	400 / 5
1	56	P-3-12	3PH	210V.	1600 / 5
1	57	P-3-13	3PH	210V.	Must be check
1	58	P-3-14	3PH	210V.	1600 / 5
1	59	P-3-15	3PH	210V.	800 / 5
1	60	P-3-16	3PH	210V.	630 / 5
1	61	P-3-17	3PH	210V.	800 / 5
2	62	CT-1	Must be check	Must be check	160 / 5
2	63	CT-2	Must be check	Must be check	125 / 5
2	64	CT-3	Must be check	Must be check	250 / 5
1	65	P-4-5	3PH	400V.	1250 / 5
1	66	P-4-6	3PH	400V.	1250 / 5
2	67	P-5-1	3PH	210V.	600 / 5
2	68	P-5-2	3PH	210V.	600 / 5
2	69	P-5-3	3PH	210V.	600 / 5
2	70	P-5-4	3PH	210V.	600 / 5
2	71	P-5-5	3PH	210V.	600 / 5
2	72	P-5-6	3PH	210V.	600 / 5
2	73	P-5-7	3PH	210V.	600 / 5
2	74	P-5-8	3PH	210V.	600 / 5
2	75	P-5-9	3PH	210V.	600 / 5
2	76	P-5-10	3PH	210V.	600 / 5
2	77	P-5-11	3PH	210V.	Must be check
2	78	P-5-12	3PH	210V.	Must be check
2	79	P-5-13	3PH	210V.	600 / 5
2	80	P-5-14	3PH	210V.	Must be check

2. Overall configuration diagram

Power meter installation 3-4

Factory	No	Name	Phase	Voltage	CT Spec
2	81	P-5-15	3PH	210V.	Must be check
2	82	P-5-16	3PH	210V.	Must be check
2	83	P-5-17	3PH	210V.	Must be check
2	84	P-6-1	3PH	210V.	600 / 5
2	85	P-6-2	3PH	210V.	600 / 5
2	86	P-6-3	3PH	210V.	600 / 5
2	87	P-6-4	3PH	210V.	600 / 5
2	88	P-6-5	3PH	210V.	600 / 5
2	89	P-6-6	3PH	210V.	600 / 5
2	90	P-6-7	3PH	210V.	600 / 5
2	91	P-6-8	3PH	210V.	600 / 5
2	92	P-6-9	3PH	210V.	600 / 5
2	93	P-6-10	3PH	210V.	600 / 5
2	94	P-6-11	3PH	210V.	1250 / 5
2	95	P-6-12	3PH	210V.	1000 / 5
2	96	P-6-13	3PH	210V.	1600 / 5
2	97	P-6-14	3PH	210V.	1600 / 5
2	98	P-6-15	3PH	210V.	800 / 5
2	99	P-6-16	3PH	210V.	500 / 5
2	100	P-6-17	3PH	210V.	1600 / 5
2	101	P-6-18	3PH	210V.	1000 / 5
2	102	P-6-19	3PH	210V.	Must be check
2	103	P-7-1	3PH	380V.	500 / 5
2	104	P-7-2	3PH	380V.	500 / 5
2	105	P-7-3	3PH	380V.	500 / 5
2	106	P-7-4	3PH	380V.	500 / 5
2	107	P-7-5	3PH	380V.	500 / 5
2	108	P-7-6	3PH	380V.	500 / 5
2	109	P-7-7	3PH	380V.	1600 / 5
2	110	P-7-8	Must be check	Must be check	400 / 5
2	111	P-8-1	3PH	380V.	150 / 5
2	112	P-8-2	3PH	380V.	400 / 5
2	113	P-8-3	3PH	380V.	400 / 5
2	114	P-8-4	3PH	380V.	630 / 5
2	115	P-8-5	3PH	380V.	350 / 5
2	116	P-8-6	3PH	380V.	350 / 5
2	117	P-8-7	Must be check	Must be check	100 / 5
2	118	P-8-8	3PH	380V.	100 / 5
2	119	P-8-9	3PH	380V.	100 / 5
2	120	P-8-10	3PH	380V.	100 / 5

2. Overall configuration diagram

Power meter installation 4-4

Factory	No	Name	Phase	Voltage	CT Spec
2	121	P-8-11	3PH	380V.	1000 / 5
2	122	P-8-12	3PH	380V.	1250 / 5
2	123	P-8-13	3PH	380V.	500 / 5
2	124	P-9-1	3PH	380V.	600 / 5
2	125	P-9-2	3PH	380V.	500 / 5
2	126	P-9-3	Must be check	Must be check	500 / 5
2	127	P-10-1	3PH	380V.	1600 / 5
2	128	P-10-2	3PH	380V.	1000 / 5
2	129	P-10-3	Must be check	Must be check	800 / 5
2	130	P-11-1	Must be check	Must be check	1600 / 5
2	131	P-11-2	Must be check	Must be check	1600 / 5
2	132	P-11-3	Must be check	Must be check	1600 / 5
3	133	P-12-1	3PH	380V.	250 / 5
2	134	P-12-7	3PH	380V.	Must be check
3	135	P-13-1	Must be check	Must be check	1250 / 5
3	136	P-13-2	3PH	200V	1250 / 5
3	137	P-13-3	3PH	200V	1250 / 5
3	138	P-13-4	3PH	200V	1600 / 5
3	139	P-13-5	3PH	200V	250 / 5
3	140	P-13-6	3PH	200V	400 / 5
3	141	P-13-7	3PH	200V	400 / 5
3	142	P-13-8	3PH	200V	400 / 5

2. Overall configuration diagram

Flow meter

Factory	No	Name	Data	Daimeter
1	1	Air compressor	Flow rate, Pressure, Temperature	4"
1	2	Air compressor	Flow rate, Pressure, Temperature	4"
1	3	Air compressor	Flow rate, Pressure, Temperature	4"
2	4	Air compressor	Flow rate, Pressure, Temperature	6"
2	5	Air compressor	Flow rate, Pressure, Temperature	6"
2	6	Air compressor	Flow rate, Pressure, Temperature	6"
2	7	Air compressor	Flow rate, Pressure, Temperature	6"
3	8	Air compressor	Flow rate, Pressure, Temperature	6"

2. Overall configuration diagram

Chiller system

*****Must be check at site**

3. System functional specification

Dashboard operation display



Accumulated energy consumption per day/30 minutes is displayed as cumulative energy consumption/basic unit
Monitoring of accurate consumption trends by time of day



Displayed in terms of CO2/ costs.
In order to convert automatically according to the set rate,
Eliminate the need for manual input



Excel Batch write from setting file is also possible.

Index	Conversion rate	Batch write from setting file	Batch write from setting file	Batch write from setting file	Batch write from setting file
1	1.000	1.000	1.000	1.000	1.000
2	1.000	1.000	1.000	1.000	1.000
3	1.000	1.000	1.000	1.000	1.000
4	1.000	1.000	1.000	1.000	1.000
5	1.000	1.000	1.000	1.000	1.000
6	1.000	1.000	1.000	1.000	1.000
7	1.000	1.000	1.000	1.000	1.000
8	1.000	1.000	1.000	1.000	1.000
9	1.000	1.000	1.000	1.000	1.000
10	1.000	1.000	1.000	1.000	1.000
11	1.000	1.000	1.000	1.000	1.000
12	1.000	1.000	1.000	1.000	1.000
13	1.000	1.000	1.000	1.000	1.000
14	1.000	1.000	1.000	1.000	1.000
15	1.000	1.000	1.000	1.000	1.000
16	1.000	1.000	1.000	1.000	1.000
17	1.000	1.000	1.000	1.000	1.000
18	1.000	1.000	1.000	1.000	1.000
19	1.000	1.000	1.000	1.000	1.000
20	1.000	1.000	1.000	1.000	1.000

Display any item in a stacked graph
Displays the numerical value for each energy item
The details can be checked by focusing on the necessary items.



- Csv storage of historical data
Historical data can be managed with SD cards
FTP can also upload to higher PC
- Display historical data by year, month and day
Checking the transition from the past,
Identify the day of loss.



3. System functional specification

Dashboard operation display

Page Title	Contents
Today(Real time)	This screen displays the amount of each energy item used every 30 minutes today (in real time) and the amount converted.
Past	This screen displays historical data. Search using category filters is possible, Annual, monthly, and daily details can be displayed.
Item (Monitor)	Monitor screen for each item.
Item (setting)	This screen is used to configure settings for each item.
Setting	This screen is used to configure the overall system settings.

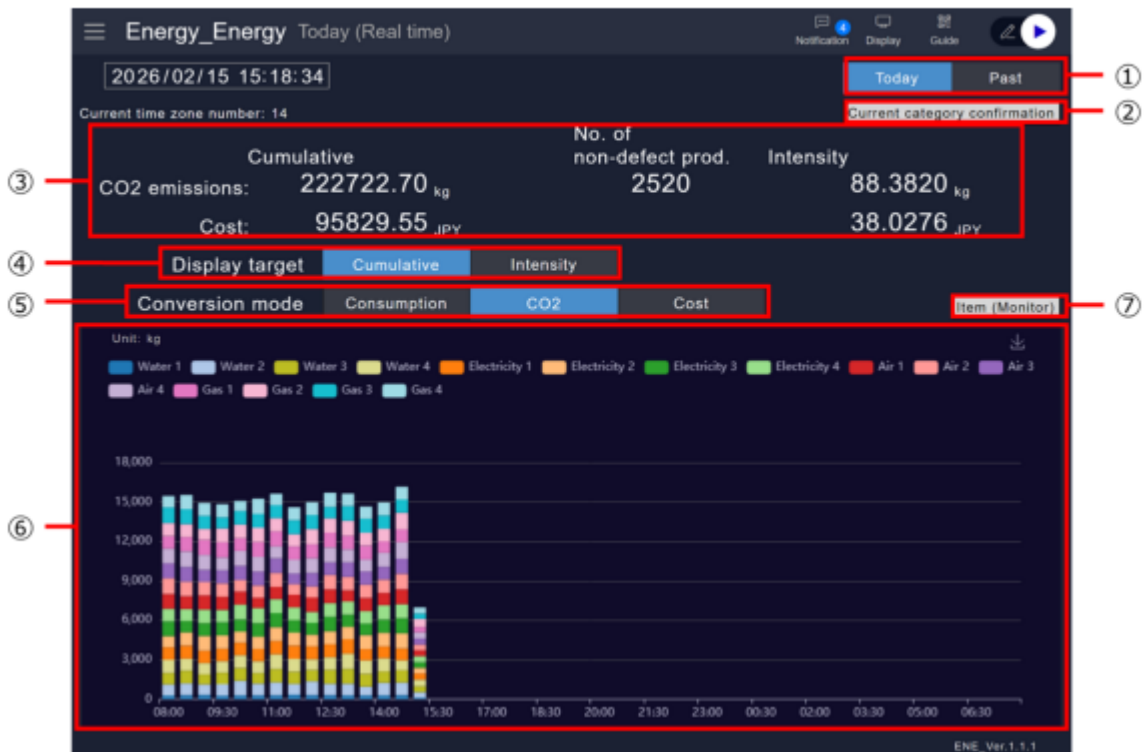
Refer to the descriptions for each screen for what each screen displays and how to set it up.



3. System functional specification

Today (Real time)

Displays acquired energy consumption and conversions in 30-minute time periods.



① **Switching between today and the past**
[Toggles between "Today (real time)"/Past.]

② **Current Category Confirmation**
The current category, [based on the category filter](#) function.
Display.

③ **Cumulative total**
Displays cumulative amount of CO2 and costs.
Conversion is performed according to the set rate and units.
When the good is zero, the unit of measure is displayed at [-----].

④ **Display object**
Switches between [Cumulative total/Unit base] in the graph display.

⑤ **Convert mode**
Consumption/CO2 Conversion/Cost Conversion] in the graph display.
Switch.

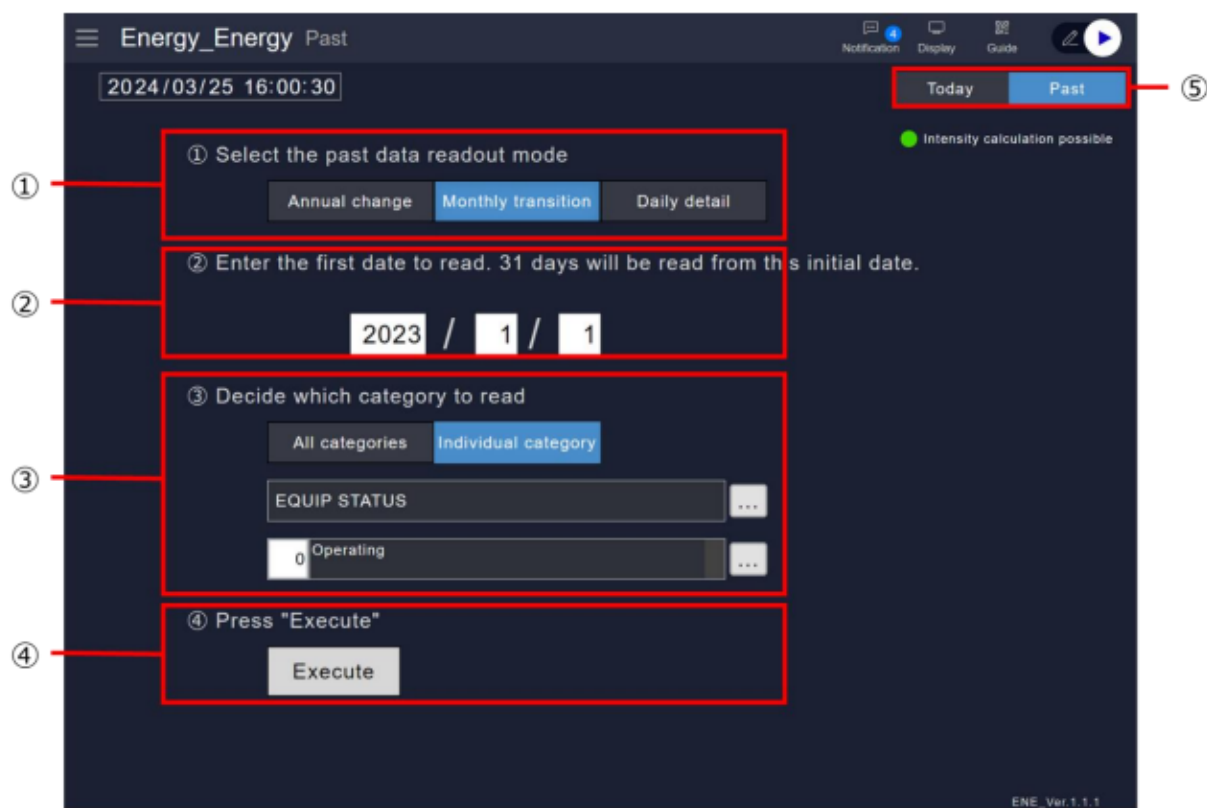
⑥ **Accumulation Bar Chart**
Display the accumulation bar graph. [Display an accumulation bar graph](#)

⑦ **Item (Monitor)**
Displays the Item (Monitor) screen.

3. System functional specification

Past

Set the readout settings for past data. Click "Execute" to display the past data.



① **read mode**

Select the readout mode from [Annual Transition/Monthly Transition/Daily Details].

② **first date of reading**

Specify the head used for graph display and cumulative total display.

③ **readout category**

Specifies the category to be read.

④ **execution (e.g. program)**

Press Run to display the graph.

⑤ **Switching between today and the past**
[Toggles between "Today (real time)/Past."]

4.3.1. Annual, Monthly, and Daily Details

When the readout of historical data is executed, a graph is displayed.

From the Annual Trends and Monthly Trends pages, detailed graphs can be viewed by clicking directly on the accumulation bar graphs.

3. System functional specification

Item monitor

Displays current sensor input values, consumption, converted CO2, and converted cost for each energy item.

Energy_Energy Item (Monitor)

2024/03/25 10:25:19

Monitor Setting

Production count 990

Cumulative Intensity

Valid	No.	Color	Item name	Sensor input value	Consumption (cumulative)	CO2 (cumulative)	Cost (cumulative)	Today graph
●	0	Blue	Water 1	35458.792 L	1508.398 L	1508.39 kg	1508.39 JPY	Open
●	1	Light Blue	Water 2	36121.714 L	1375.731 L	4402.34 kg	1705.90 JPY	Open
●	2	Yellow	Water 3	36168.712 L	1395.967 L	4453.13 kg	1744.95 JPY	Open
●	3	Light Yellow	Water 4	36473.708 L	1428.291 L	4541.96 kg	1799.64 JPY	Open
●	4	Orange	Electricity 1	36767.758 kWh	1447.960 kWh	4590.03 kg	1838.90 JPY	Open
●	5	Light Orange	Electricity 2	37165.626 kWh	1542.122 kWh	4873.10 kg	1973.91 JPY	Open
●	6	Green	Electricity 3	37822.602 kWh	1386.690 kWh	4368.07 kg	1788.83 JPY	Open
●	7	Light Green	Electricity 4	37862.927 kWh	1544.045 kWh	4848.30 kg	2007.25 JPY	Open
●	8	Red	Air 1	38377.995 m3	1557.502 m3	4874.98 kg	2040.32 JPY	Open
●	9	Light Red	Air 2	39082.354 m3	1540.933 m3	4807.71 kg	2034.03 JPY	Open

ENE Ver.1.1.

③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫

① **Monitor/Setting Switching**

Toggle [Monitor/Settings].

② **Cumulative total/Intensity Switchover**

Toggle [cumulative/unit] of consumption, CO2, and cost.

When the number of good items is zero, the unit of measure is displayed at [-----].

③ **Validity**

The valid state of the item.

④ **No.**

A number for each item.

⑤ **Variety**

The [Display Color](#) of the item on the graph.

⑥ **Item name**

The item name is displayed.

⑦ **Sensor input value**

The sensor input value multiplied by the multiplier.

⑧ **Amount of consumption**

Today's consumption.

⑨ **CO2**

Today's CO2 equivalent.

⑩ **Cost**

Today's cost conversion amount.

⑪ **Today's graph**

Select the appropriate item and display [Today \(Real Time\) Display](#).

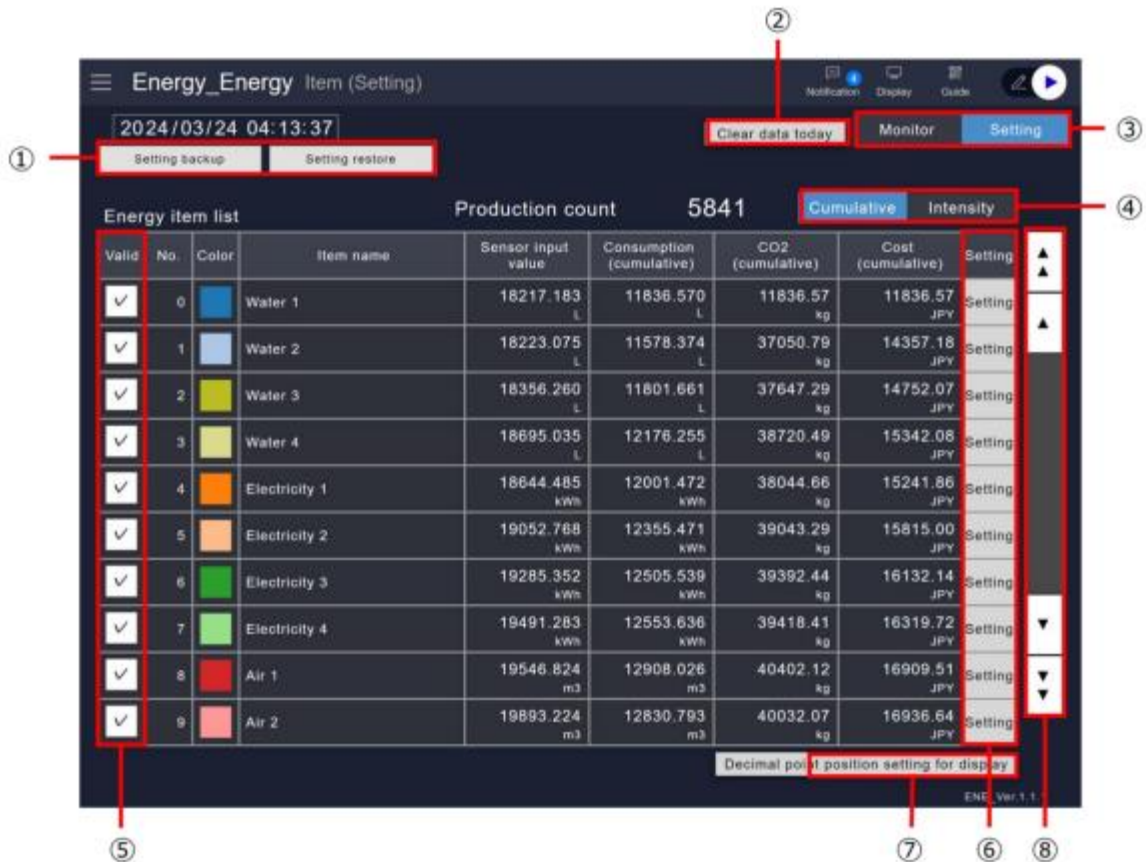
⑫ **Scroll**

Scroll through the items to be displayed.

3. System functional specification

Item (Setting)

Configure settings for each energy item.



① Configuration backup/restore

Execute [Configuration File Backup/Restore](#).

② Data cleared today

Today's energy data file and CSV file.
Delete.

③ Monitor/Setting Switch

Toggle [Monitor/Settings].

④ Cumulative total/Intensity switchover

Toggle [Accumulated/Unit] for consumption, CO2, and cost.

⑤ Validity

Activate items with checkboxes.

Used to calculate and graph cumulative totals.

⑥ Setting

[Energy Item Settings](#).

⑦ Decimal point position setting for display

Open the [Decimal Point Position Setting](#).

⑧ Scroll

Scroll through the displayed items.

3. System functional specification

Setting

Configure settings related to the application.

The screenshot shows the 'Energy_Energy Setting' application interface. It features a top navigation bar with a hamburger menu, the title 'Energy_Energy Setting', and user information. Below the navigation bar, there are two tabs: 'Settings backup' and 'Settings restore'. A green status indicator shows 'Link with Production Result App' with 'App ID: 5' and a 'Get settings' button. The main content area is divided into several sections: 'System setting' with 'Storage path' and 'Start time of the day (hour: minute)'; 'Unit conversion' with 'CO2 equivalent / Unit' and 'Cost conversion / Unit'; 'CSV output' with 'CSV output function'; and 'Category filter' with a table of categories. Red callout lines point to specific elements: 1 points to the 'Settings backup' tab, 2 points to the 'Get settings' button, 3 points to the 'Storage path' field, 4 points to the 'Valid' button in the 'Unit conversion' section, 5 points to the 'Valid' button in the 'CSV output' section, and 6 points to the 'Category filter' table.

System setting	
Storage path	/U0_CARD/K_UA006_ENE
Start time of the day (hour: minute)	08 : 00

Unit conversion	
CO2 equivalent / Unit	Invalid Valid kg
Cost conversion / Unit	Invalid Valid JPY

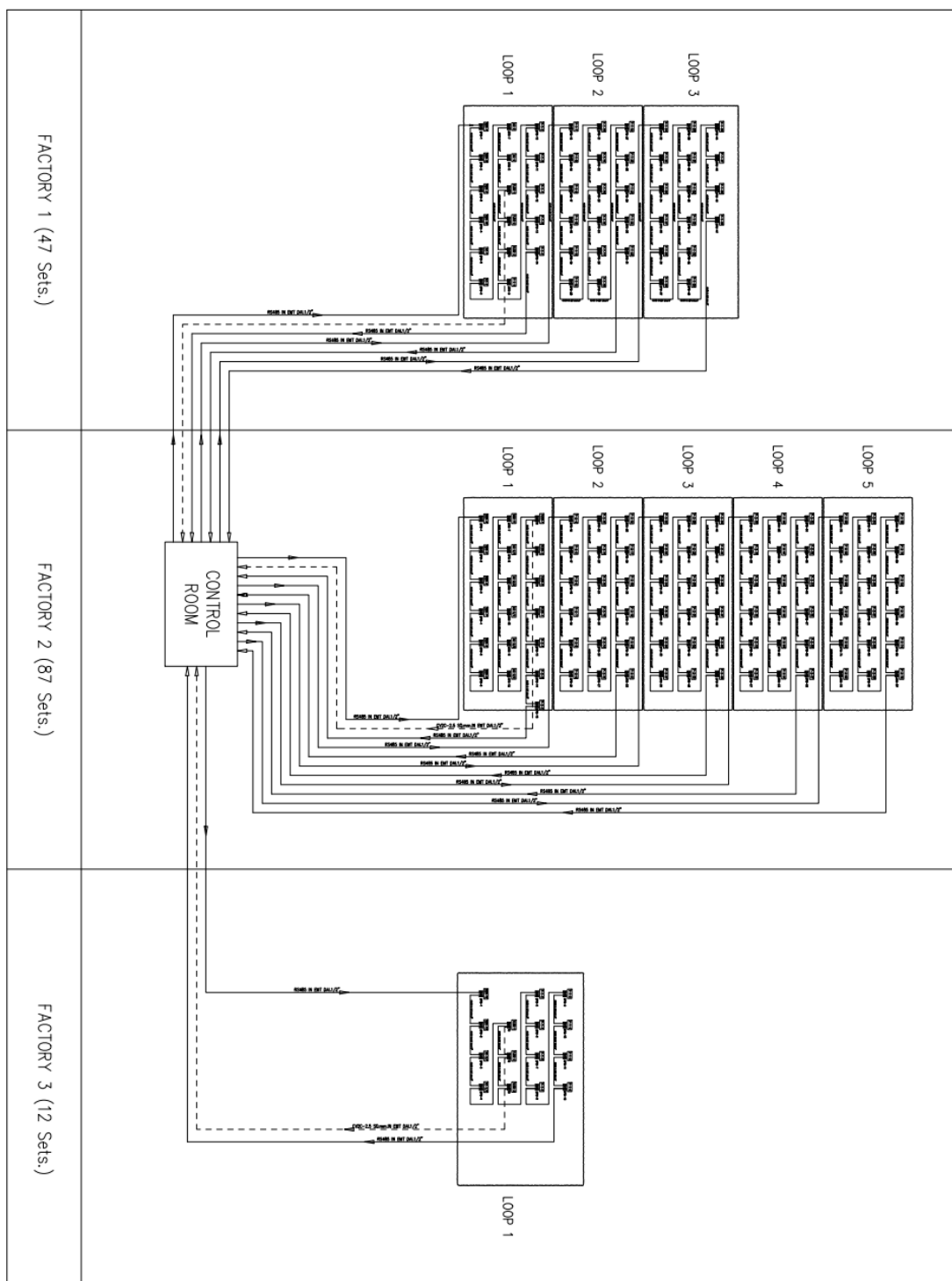
CSV output	
CSV output function	Invalid Valid

Category filter	
Storage path	/U0_CARD/Category
Category 0	Activation/Title/Details Invalid Valid EQUIP STATUS
Category number device/Variable	EM0
Category 1	Activation/Title/Details Invalid Valid Alarm Content
Category number device/Variable	EM2
Category 2	Activation/Title/Details Invalid Valid
Category number device/Variable	EM4
Category 3	Activation/Title/Details Invalid Valid
Category number device/Variable	EM6

- ① **Configuration backup/restore**
Execute [Configuration File Backup/Restore](#).
- ② **Setting acquisition**
When linking the Production Result Application, acquire the settings of Production Result Application.
- ③ **System setup**
Set the [Storage Path](#) and the [Day Start Time](#)
- ④ **Unit conversion setting**
[Unit Conversion](#) settings.
- ⑤ **CSV output settings**
Enables/disables the [CSV Log Output Function](#).
- ⑥ **Category filter**
Configure the [Category Filter Function](#).

4. Drawing

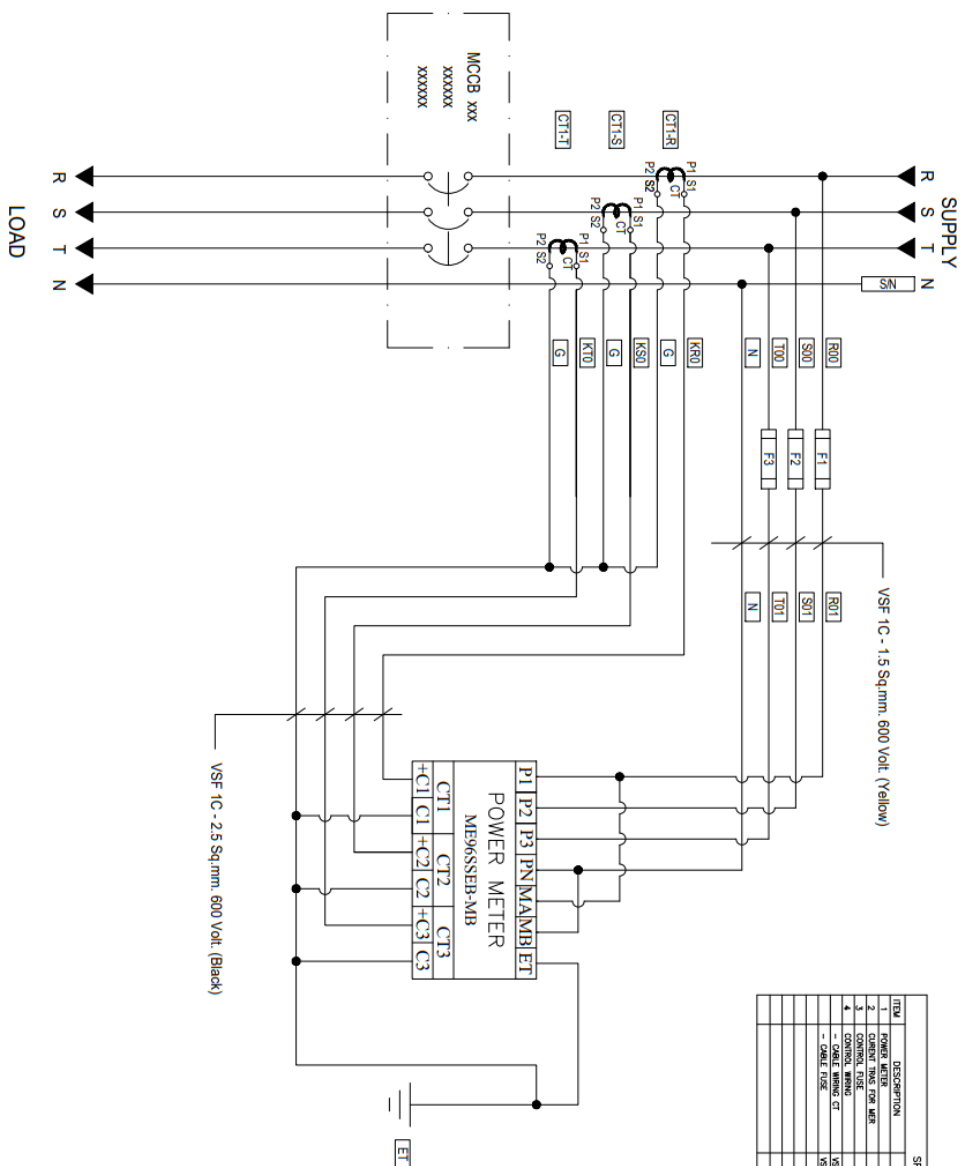
Power meter and Flow meter sensor wiring riser diagram



PROJECT:			
OWNER:		TOMAS TECH CO., LTD. 371 (20) Jomvicha Rd. Bang Phruang Bang Nu Mue, Bang Bang Yai, Bangkok 10260 Thailand Email: info@tomas.com	
LOCATION:		-	
LANDSCAPE ARCHITECT:			
STRUCTURAL ENGINEER:			
ELECTRICAL ENGINEER:			
SANITARY ENGINEER:			
MECHANICAL ENGINEER:			
DESIGNER:		☒ DESIGN ARCHITECT ☐ DESIGN ELECTRICAL ☐ DESIGN FOR AS-BUILT ☐ DESIGN OF CONSTRUCTION DOCUMENT PREPARED	
REVISION:		No. DATE DESCRIPTION 1 2024-01-15 POWER METER MOUNTING RIGID DIAGRAM	
DRAWING TITLE:		POWER METER MOUNTING RIGID DIAGRAM	
DESIGN DRAWING:		☒ YES ☐ NO	
AS-BUILT DRAWING:		☐ YES ☒ NO	
CHECKED BY:		APPROVED BY:	
DATE: 2024-01-15		DATE: 2024-01-15	
SHEET: 1		SHEET: 1	

4. Drawing

Power meter and Flow meter sensor wiring riser diagram



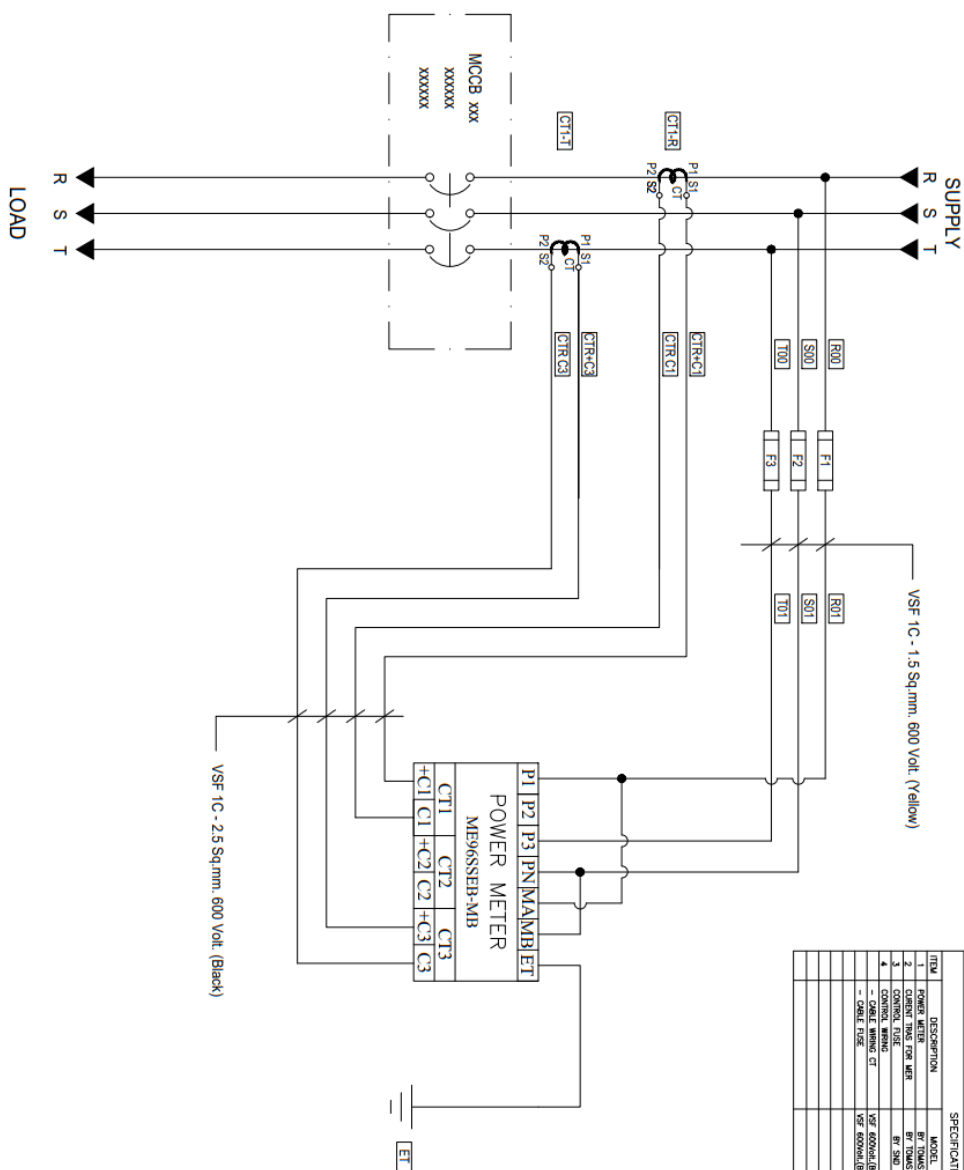
POWER METER WIRING DIAGRAM AC 3Ø 4W. 380/220 Volt.

SPECIFICATION				
ITEM	DESCRIPTION	MODEL	TYPE	BRAND
1	POWER WIRE	BY TOWNS	-	WIRTSCH
2	CABLE TIES FOR WIR	BY TOWNS	-	WIRTSCH
3	CONTROL WIRING	BY SUD	RT 18-32	ABB
4	- CABLE WIRING CT	BY 6000AH (BROU)	17 x 2.5 50mm (BROU)	BRONCO CABLE
	- CABLE TIEING	BY 6000AH (BROU)	17 x 2.5 50mm (BROU)	BRONCO CABLE

[illegible]

4. Drawing

Power meter and Flow meter sensor wiring riser diagram



POWER METER WIRING DIAGRAM AC 3Ø 3W. 220 Volt./ 200 Volt.

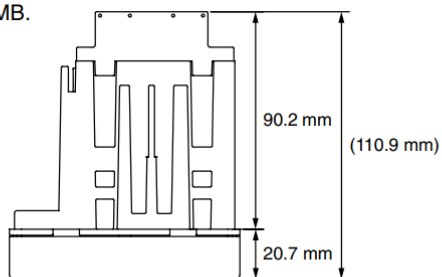
SPECIFICATION				
ITEM	DESCRIPTION	MODEL	TYPE	BRAND
1	POWER METER FOR AIR	BT TOWNS	-	WINSACH
2	CURRENT FLUX FOR AIR	BT TOWNS	-	WINSACH
3	CONVECT FLUX FOR AIR	BT SHD	RT 18-32	ABB
4	CONVECT WIRING			
5	- OMEGA WIRING CT	VSF 6000A (Block)	1/2 S 50mm (Block)	BAUMER OMEGA
6	- OMEGA FLUX	VSF 6000A (Block)	1/2 S 50mm (Block)	BAUMER OMEGA

PROJECT :			
OWNER :			
DESIGNER :		TOMAS TECH CO., LTD. 3711 DDI University of Asia, Poonnang Bang Sue Bangkok 10800, Thailand Tel. +662-2713811 E-mail: info@tomas.com	
ARCHITECT :			
LANDSCAPE ARCHITECT :			
STRUCTURAL ENGINEER :			
ELECTRICAL ENGINEER :			
SANITARY ENGINEER :			
MECHANICAL ENGINEER :			
DESIGNER :		☐ DESIGN ARCHITECTS ☐ DESIGN FOR ARCHITECT ☐ DESIGN FOR LAND ☐ DESIGN OF CONSTRUCTION PROJECT	
REVISION :		1. การแก้ไขแบบแปลน ตามรายการแก้ไข ตามใบแจ้งแก้ไข ตามใบแจ้งแก้ไข	
NO.	DATE	DESCRIPTION	
DRAWING TITLE			
POWER WATER WINDING DIAGRAM			
AC 3ø 3W/220/380V-60Hz			
DRAWING BY :			
CHECKED BY :			
APPROVED BY :	DATE :		
DESIGN NO. :	REV. :		
EE-03	Rev. 1		
I hereby declare that the above information is true and correct and I am not aware of any other information that may affect the design.			

5. Appendix

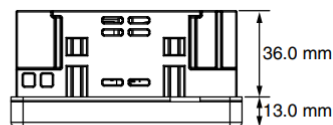
Power meter

- Realized downsizing for ME96SSEB-MB.



ME96SSEA-MB
(Conventional type)

It contributes to
space saving!



ME96SSEB-MB
(New type)

ME96SSEB-MB

Model name			ME96SSEB-MB	
Phase wire system			3-phase 4-wire, 3-phase 3-wire (3CT, 2CT), 1-phase 3-wire, 1-phase 2-wire (common use)	
Rating	Current		5 A AC, 1 A AC (common use)	
	Voltage		3-phase 4-wire: max 277/480 V AC 3-phase 3-wire: (DELTA) max 220 V AC, (STAR) max 440 V AC 1-phase 3-wire: max 220/440 V AC 1-phase 2-wire: (DELTA) max 220 V AC, (STAR) max 440 V AC	
	Frequency		50/60 Hz (common use)	
Item			Measuring Item	Class
Measuring element	Current (A)		A1, A2, A3, AN, A _{avg}	±0.5%
	Current demand (DA)		DA1, DA2, DA3, DAN, DA _{avg}	
	Voltage (V)		V12, V23, V31, V _{avg} (L-L), V1N, V2N, V3N, V _{avg} (L-N)	
	Active power (W)		W1, W2, W3, ΣW	
	Reactive power (var)		var1, var2,var3, Σvar	
	Apparent power (VA)		VA1, VA2, VA3, ΣVA	
	Power factor (PF)		PF1, PF2, PF3, ΣPF	±0.5%
	Frequency (Hz)		Hz	±0.2%
	Active energy (Wh)		Imported, Exported	Class 0.5S (IEC62053-22)
	Reactive energy (varh)		Imported lag, Imported lead, Exported lag, Exported lead	Class 1S (IEC62053-24)
	Apparent energy (VAh)		Imported + Exported	±2.0%
	Harmonic current (HI)		Total	±2.0%
	Harmonic voltage (HV)		Total	
Operating time (h)		Operating time 1, Operating time 2	(Reference)	
Measuring method		Instantaneous value	A, V: RMS value calculation; W, var, VA, Wh, varh, VAh: Digital multiplication; PF: Power ratio calculation; Hz: Zero-cross; HI, HV: FFT	
		Demand value	DA: Thermal type calculation	
Display	Display type		LCD with LED backlight	
	The number of display digits or The number of segments	Digital section	First to Third line display: 4 digits, Fourth line display: 6 digits	
			A, DA, V, W, var, VA, PF: 4 digits; Hz: 3 digits; Wh, varh, VAh: 9 digits (6-digit or 12-digit is also available.); Harmonic distortion ratio/content rate: 4 digits; Harmonic RMS value: 4 digits; Operating time: 6 digits	
	Display update time interval		0.5 s, 1 s (selectable)	
Communication			MODBUS RTU communication	
Connectable Optional Plug-in Module			Cannot connect optional module	
Power interruption backup			Use of nonvolatile memory (Items: settings, MAX/MIN value, active energy, reactive energy, apparent energy, operating time)	
VA consumption	Voltage circuit		Each phase: 0.1 VA (at 110 V AC), 0.2 VA (at 220 V AC), 0.4 VA (at 440 V AC)	
	Current circuit		Each phase: 0.1 VA	
	Auxiliary power circuit		4 VA (at 110 V AC), 5 VA (at 220 V AC), 3 W (at 100 V DC)	
Auxiliary power			100 V to 240 V AC (±15%), 100 V to 240 V DC (-30% +15%)	
Weight			0.3 kg	
Dimensions			96 (H) × 96 (W) × 36 (D) mm	
Mounting method			Embedded	
Operating temperature/humidity			-5°C to +55°C (Daily average temperature: 35°C or less), 0% to 85% RH, Non condensing	
Storage temperature/ humidity			-25°C to +75°C (Daily average temperature: 35°C or less), 0% to 85% RH, Non condensing	

5. Appendix

Air Flow meter (TRZ100R-C/5P),(TRZ150R-C/5P)

■ Specifications

Common specifications for Ultrasonic Flowmeter for air ATZTA TRX/TRZ ver. 5

[illegible]

*1. This is normal flow rate indicated under the condition of 20°C as the temperature and 700kPa as the pressure

② At our shipping test facility,

Specifications for External Power Supply Type (D) / Built-in Battery Type(B)

[illegible]

RS485 Output Type Specifications

Model	AT21A TR208C4P-N/SP	AT21A TR208C4P-N/SP	AT21A TR208C4P-N/SP	AT21A TR208C4P-N/SP	AT21A TR208C4P-N/SP	AT21A TR208C4P-N/SP	AT21A TR208C4P-N/SP	AT21A TR208C4P-N/SP	AT21A TR208C4P-N/SP
Mechanical dimension	25mm	32mm	48mm	50mm	65mm	88mm	103mm	153mm	205mm
Power supply	24VDC±10%, 24VDC±10%, Power consumption not more than 1.5W								
Output	Current output	Same as the specifications for External Power Supply Type (S) and Built-in Battery Type (B)							
	Contact pulse output	Unit: pulse Nch Open-drain output 1 line: Maximum load: 24VDC 50mA Output type: Duty ratio (35 to 65% maximum frequency) or One-shot (Select ON/Off from 50,100,125,250,500ms) Pulse output unit 100μ (normal) / P, 1000μ (normal) / P @ Note 1							
	Communication @Note 3	1 line: Conform to Modbus/RTU Communication bit rate: Selection from 9600,19200,38400,57600,115200bps by button operation							
	Weight	1.5kg	1.4kg	1.2kg	1.2kg	1.4kg	1.2kg	5.8kg	25.0kg

Note 1) Nominal diameters 25 ~ 80 mm correspond measurement of Nitrogen.

Note 2) At the actual flow measurement setting, number of digits for accumulated flow volume, number of digits for instantaneous flow rate, and pulse output unit differ from the above table.

*Piling conditions : 25mm & 32mm : Fanchishing of straight pipe of 200 or more at the upstream side and 50 or more at the downstream side (in case of allocation of forward/reverse flow indicator mode, 200 or more for the both upstream and downstream)
40mm and above : Fanchishing of straight pipe of 100 or more at the upstream side and 50 or more at the downstream side (in case of allocation of forward/reverse flow indicator mode, 100 or more for the both upstream and downstream)

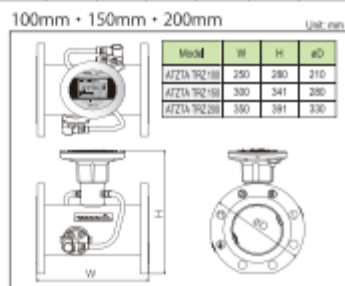
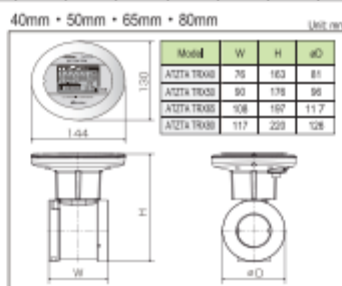
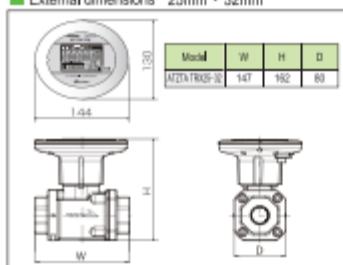
Note 2: In case of connection with a tracer device, command sendline interval should be set to 200 msec or longer.

Note 4) In case of connection with a logger device, command sending interval shall be set to 2.0 msec or longer.

Actual Flow Volume—Normal Flow Volume Conversion Table

Conversion condition		25mm		32mm		40mm		50mm		65mm		80mm		100mm		150mm		200mm	
Temperature (°C)	Gauge pressure (MPa)	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
20	0.7 (Np/ft)	4.4	260	8.1	480	6.6	500	16	1108	38	1773	37	2210	74	3680	180	8840	260	14700
30	0.5 (Np/ft)	3.2	190	5.8	350	7	430	13	880	31	1580	27	1800	53	2670	130	6420	210	10700
	0.7 (Np/ft)	4.3	250	7.8	480	9.5	570	16	1070	29	1713	36	2140	71	3560	170	8500	290	14250
Actual flow (m³/h)		0.6	38	1.1	65	1.3	83	2.5	150	4	240	5	308	10	500	24	1200	43	2000

■ External dimensions 25mm • 32mm



6. Q&A

Question	By	Date	Answer	By

7. Sign off

We hereby acknowledge and agree the above-mentioned blueprint requirements.
Any changes required after the sign off for this blueprint will be addressed through the change request process.

JTEKT Automotive (Thailand) co. Ltd.

Sign: _____

Name: _____

Title: _____

Date: _____

TOMAS TECH CO.,LTD.

Sign: _____

Name: _____

Title: _____

Date: _____

END OF BLUEPRINT##