Deviceappendixes

Appendix

Required: Data that must be uploaded to ensure the use of the basic functions

Recommended: Data that some functions depend on, If it is missing, it will affect the use of some functions or the accuracy

Optional: Reserved field, will be better displayed if provided

Noted: All device identify fields are case sensitive.

Device type

Device type	Identifier
Watt–hour meter	1
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Fields of Energy Management device

Each device is independent in Energy Management. Device field data can be uploaded according to user needs.

Watt–hour meter

Data sampling frequency: once every 5 minutes is recommended, at least once every 30 minutes.

field description	unit	identify	type	Level	remarks
electric current of A phase	A	Ia	DOUBLE	Recommend	Affect Device Status and Historical Energy Consumption
electric current of B phase	A	Ib	DOUBLE	Recommend	Affect Device Status and Historical Energy Consumption
electric current of C phase	A	Ic	DOUBLE	Recommend	Affect Device Status and Historical Energy Consumption
voltage of A phase	V	Ua	DOUBLE	Recommend	Affect Device Status and Historical Energy Consumption
voltage of B phase	V	Ub	DOUBLE	Recommend	Affect Device Status and Historical Energy Consumption
voltaget of C phase	V	Uc	DOUBLE	Recommend	Affect Device Status and Historical Energy Consumption
voltage of AB line	V	Uab	DOUBLE	Optional	
voltage of BC line	V	Ubc	DOUBLE	Optional	
voltage of CA line	V	Uca	DOUBLE	Optional	
total active power	W	P	DOUBLE	Recommend	Affect Device Status and Historical Energy Consumption

active power of A phase	W	Pa	DOUBLE	Recommend	Affect Historical Energy Consumption
active power of B phase	W	Pb	DOUBLE	Recommend	Affect Historical Energy Consumption
active power of C phase	W	Pc	DOUBLE	Recommend	Affect Historical Energy Consumption
total reactive power	Var	Q	DOUBLE	Recommend	Affect Device Status and Historical Energy Consumption
reactive power of A phase	Var	Qa	DOUBLE	Recommend	Affect Historical Energy Consumption
reactive power of B phase	Var	Qb	DOUBLE	Recommend	Affect Historical Energy Consumption
reactive power of C phase	Var	Qc	DOUBLE	Recommend	Affect Historical Energy Consumption
total apparent power	VA	S	DOUBLE	Recommend	Affect Historical Energy Consumption
apparent power of A phase	VA	Sa	DOUBLE	Recommend	Affect Historical Energy Consumption
apparent power of B phase	VA	Sb	DOUBLE	Recommend	Affect Historical Energy Consumption

apparent power of C phase	VA	Sc	DOUBLE	Recommend	Affect Historical Energy Consumption
total power factor	/	COSQ	DOUBLE	Recommend	Affect Device Status, Historical Energy Consumption and Energy Dashboard
power factor of A phase	/	COSa	DOUBLE	Optional	
power factor of B phase	/	COSb	DOUBLE	Optional	
power factor of C phase	/	COSc	DOUBLE	Optional	
frequency	Hz	F	DOUBLE	Recommend	Affect Device Status
total positive active power	kW·h	Ep_imp	DOUBLE	Required	Affect watt–hour meter basic function
total negative active power	kW·h	Ep_exp	DOUBLE	Recommend	Affect Device Status
total positive reactive power	kvarh	Eq_imp	DOUBLE	Recommend	Affect Device Status
total negative reactive power	kvarh	Eq_exp	DOUBLE	Recommend	Affect Device Status

positive tip active electrical energy	kW·h	Ep_imp_1	DOUBLE	Recommend	Affect Device Status
positive peak active electrical energy	kW·h	Ep_imp_2	DOUBLE	Recommend	Affect Device Status
positive flat active electrical energy	kW·h	Ep_imp_3	DOUBLE	Recommend	Affect Device Status
positive valley active electrical energy	kW·h	Ep_imp_4	DOUBLE	Recommend	Affect Device Status
negative tip active electrical energy	kW·h	Ep_exp_1	DOUBLE	Optional	
negative peak active electrical energy	kW·h	Ep_exp_2	DOUBLE	Optional	
negative flat active electrical energy	kW·h	Ep_exp_3	DOUBLE	Optional	
negative valley active electrical energy	kW·h	Ep_exp_4	DOUBLE	Optional	
total harmonic of phase A current	0%	IaTHD	DOUBLE	Recommend	Affect Historical Energy Consumption
total harmonic of phase B current	0%	IbTHD	DOUBLE	Recommend	Affect Historical Energy Consumption

total harmonic of phase C current	0%	IcTHD	DOUBLE	Recommend	Affect Historical Energy Consumption
total harmonics of phase A voltage	0%	UaTHD	DOUBLE	Recommend	Affect Historical Energy Consumption
total harmonics of phase B voltage	0%	UbTHD	DOUBLE	Recommend	Affect Historical Energy Consumption
total harmonics of phase C voltage	0%	UcTHD	DOUBLE	Recommend	Affect Historical Energy Consumption
demand amount of positive active power	/	Dp_imp	DOUBLE	Recommend	Affect Device Status and Energy Dashboard
demand amount of negative active power	/	Dp_exp	DOUBLE	Recommend	Affect Device Status
demand amount of positive reactive power	/	Dq_imp	DOUBLE	Optional	
demand amount of negative reactive power	/	Dq_exp	DOUBLE	Optional	
Maximum daily active power demand	KW	Dp_imp_day	DOUBLE	Optional	
Maximum monthly active power demand	KW	Dp_imp_mon	DOUBLE	Optional	

Maximum monthly active power demand of last month	KW	Dp_imon	DOUBLE	Optional	
Voltage unbalance rate	%	VdisPer	DOUBLE	Recommend	Affect Device Status
Current unbalance rate	%	LdisPer	DOUBLE	Optional	
Phase A temperature on the outgoing side of the loop	℃	T_OUTa	DOUBLE	Optional	
Phase B temperature on the outgoing side of the loop	℃	T_OUTb	DOUBLE	Optional	
Phase C temperature on the outgoing side of the loop	℃	T_OUTc	DOUBLE	Optional	
the zero line current	A	In	DOUBLE	Optional	
meter communication status	/	M_STATUS	BOOL	Optional	Device communication status, 1: open, 0: closed

Steam meter

Data sampling frequency: once every 5 minutes is recommended, at least once every 30 minutes.

field description	unit	identify	type	level	remarks

mass cumulative flow	kg	quality_acc_flow	DOUBLE	Required	Affect steam meter basic function
heat cumulative flow	MJ	heat_acc_flow	DOUBLE	Recommend	Affect Historical Energy Consumption
mass instantaneous flow	kg/h	quality_inst_flow	DOUBLE	Recommend	Affect Historical Energy Consumption
heat instantaneous flow	MJ/h	heat_inst_flow	DOUBLE	Recommend	Affect Historical Energy Consumption
temperature	℃	temp	DOUBLE	Recommend	Affect Historical Energy Consumption
pressure	MPa	pressure	DOUBLE	Recommend	Affect Historical Energy Consumption
vapor density	kg/m3	steam_density	DOUBLE	Recommend	Affect Historical Energy Consumption

Water meter

Data sampling frequency: once every 5 minutes is recommended, at least once every 30 minutes.

field description	unit	identify	type	level	remarks
cumulative flow	t	ljll	DOUBLE	Required	Affect water meter basic function
instantaneous flow	m³/h	ssll	DOUBLE	Recommend	Affect Historical Energy Consumption
temperature	℃	temp	DOUBLE	Recommend	Affect Historical Energy Consumption
pressure	MPa	pressure	DOUBLE	Recommend	Affect Historical Energy Consumption

Inverter

Data sampling frequency: once every 5 minutes is recommended, at least once every 30 minutes.

field description	unit	identify	type	level	remarks
output current of A phase	A	la	DOUBLE	Recommend	Affect Device Status
output current of B phase	A	lb	DOUBLE	Recommend	Affect Device Status

output current of C phase	A	Ic	DOUBLE	Recommend	Affect Device Status
output voltage of A phase	V	Ua	DOUBLE	Recommend	Affect Device Status
output voltage of B phase	V	Ub	DOUBLE	Recommend	Affect Device Status
output voltage of C phase	V	Uc	DOUBLE	Recommend	Affect Device Status
voltage of AB line	V	Uab	DOUBLE	Recommend	Affect Device Status
voltage of BC line	V	Ubc	DOUBLE	Recommend	Affect Device Status
voltage of CA line	V	Uca	DOUBLE	Recommend	Affect Device Status
active power	kW	P	DOUBLE	Recommend	Affect Device Status
reactive power	kVar	Q	DOUBLE	Recommend	Affect Device Status
cumulative power generation	kW·h	Etotal	DOUBLE	Required	Affect inverter basic function
annual power generation	kW·h	Eyear	DOUBLE	Recommend	Affect Device Status

monthly power generation	kW·h	Emonth	DOUBLE	Recommend	Affect Device Status
daily power generation	kW·h	Eday	DOUBLE	Recommend	Affect Device Status
power factor	/	COSQ	DOUBLE	Recommend	Affect Device Status
frequency	Hz	F	DOUBLE	Recommend	Affect Device Status
inverter efficiency	%	EFF	DOUBLE	Recommend	Affect Device Status
PV1 input current	A	IPV1	DOUBLE	Recommend	Affect Device Status
PV2 input current	A	IPV2	DOUBLE	Recommend	Affect Device Status
PV3 input current	A	IPV3	DOUBLE	Recommend	Affect Device Status
PV4 input current	A	IPV4	DOUBLE	Recommend	Affect Device Status
PV5 input current	A	IPV5	DOUBLE	Recommend	Affect Device Status
PV6 input current	A	IPV6	DOUBLE	Recommend	Affect Device Status

PV7 input current	A	IPV7	DOUBLE	Recommend	Affect Device Status
PV8 input current	A	IPV8	DOUBLE	Recommend	Affect Device Status
PV9 input current	A	IPV9	DOUBLE	Recommend	Affect Device Status
PV10 input current	A	IPV10	DOUBLE	Recommend	Affect Device Status
PV11 input current	A	IPV11	DOUBLE	Recommend	Affect Device Status
PV12 input current	A	IPV12	DOUBLE	Recommend	Affect Device Status
PV13 input current	A	IPV13	DOUBLE	Recommend	Affect Device Status
PV14 input current	A	IPV14	DOUBLE	Recommend	Affect Device Status
PV15 input current	A	IPV15	DOUBLE	Recommend	Affect Device Status
PV16 input current	A	IPV16	DOUBLE	Recommend	Affect Device Status

PV17 input current	A	IPV17	DOUBLE	Recommend	Affect Device Status
PV18 input current	A	IPV18	DOUBLE	Recommend	Affect Device Status
PV19 input current	A	IPV19	DOUBLE	Recommend	Affect Device Status
PV20 input current	A	IPV20	DOUBLE	Recommend	Affect Device Status
PV1 input voltage	V	UPV1	DOUBLE	Recommend	Affect Device Status
PV2 input voltage	V	UPV2	DOUBLE	Recommend	Affect Device Status
PV3 input voltage	V	UPV3	DOUBLE	Recommend	Affect Device Status
PV4 input voltage	V	UPV4	DOUBLE	Recommend	Affect Device Status
PV5 input voltage	V	UPV5	DOUBLE	Recommend	Affect Device Status
PV6 input voltage	V	UPV6	DOUBLE	Recommend	Affect Device Status
PV7 input voltage	V	UPV7	DOUBLE	Recommend	Affect Device Status

PV8 input voltage	V	UPV8	DOUBLE	Recommend	Affect Device Status
PV9 input voltage	V	UPV9	DOUBLE	Recommend	Affect Device Status
PV10 input voltage	V	UPV10	DOUBLE	Recommend	Affect Device Status
PV11 input voltage	V	UPV11	DOUBLE	Recommend	Affect Device Status
PV12 input voltage	V	UPV12	DOUBLE	Recommend	Affect Device Status
PV13 input voltage	V	UPV13	DOUBLE	Recommend	Affect Device Status
PV14 input voltage	V	UPV14	DOUBLE	Recommend	Affect Device Status
PV15 input voltage	V	UPV15	DOUBLE	Recommend	Affect Device Status
PV16 input voltage	V	UPV16	DOUBLE	Recommend	Affect Device Status
PV17 input voltage	V	UPV17	DOUBLE	Recommend	Affect Device Status

PV18 input voltage	V	UPV18	DOUBLE	Recommend	Affect Device Status
PV19 input voltage	V	UPV19	DOUBLE	Recommend	Affect Device Status
PV20 input voltage	V	UPV20	DOUBLE	Recommend	Affect Device Status
negative electrode to ground voltage	V	UnegGD	DOUBLE	Recommend	Affect Device Status
internal air temperature	℃	Tinner	DOUBLE	Recommend	Affect Device Status

Gas meter

Data sampling frequency: once every 5 minutes is recommended, at least once every 30 minutes.

field description	unit	identify	type	level	remarks
cumulative flow under standard conditions	m3	acc_flow	DOUBLE	Required	Affect gas meter basic function
instantaneous flow under standard conditions	m3/h	standard_inst_flow	DOUBLE	Recommend	Affect Historical Energy Consumption

instantaneous flow under working condition	m3/h	working_inst_flow	DOUBLE	Recommend	Affect Historical Energy Consumption
temperature	℃	temp	DOUBLE	Recommend	Affect Historical Energy Consumption
pressure	MPa	pressure	DOUBLE	Recommend	Affect Historical Energy Consumption

Fields of HVAC Management device

Water chilling unit

Data sampling frequency: once every 5 minutes is recommended, at least once every 15 minutes.

field description	unit	identify	type	level	remark
status:	/	run_signal	INTEGER	Required	0: off, 1: on
load rate / current percentage	/	load_ratio	DOUBLE	Recommend	It is recommended to report at least one of load_ratio and active_power, and if both are uploaded, the load_ratio shall prevail
active power	KW	active_power	DOUBLE	Recommend	
chilled water outlet temperature setting	℃	chwst_setting	DOUBLE	Required	

chilled water outlet temperature	℃	chw_supply_temp	DOUBLE	Required	
chilled return water temperature	℃	chw_return_temp	DOUBLE	Required	
cooling water outlet temperature	℃	cw_supply_temp	DOUBLE	Optional	
cooling return water temperature	℃	cw_return_temp	DOUBLE	Optional	
evaporator saturation temperature	℃	eva_sat_temp	DOUBLE	Optional	
condenser saturation temperature	℃	con_sat_temp	DOUBLE	Optional	
evaporator pressure	MPa	eva_press	DOUBLE	Optional	
condenser pressure	MPa	con_press	DOUBLE	Optional	
fault alarm signal	/	fault_signal	INTEGER	Required	0: normal, 1: alarm
accumulated power consumption	kW·h	electricity	DOUBLE	Optional	

Cooling tower

Data sampling frequency: once every 5 minutes is recommended, at least once every 15 minutes.

field description	unit	identify	type	level	remark
status	/	run_signal	INTEGER	Required	0: off, 1: on
fan frequency	HZ	fan_freq	DOUBLE	Optional	
fan gear	/	fan_level	INTEGER	Optional	
fault alarm signal	/	fault_signal	INTEGER	Required	0: normal, 1: alarm
accumulated power consumption	kW·h	electricity	DOUBLE	Optional	
active power	kW·h	active_power	DOUBLE	Optional	

Water pump (All types)

Data sampling frequency: once every 5 minutes is recommended, at least once every 15 minutes.

field description	unit	identify	type	level	remark
status	/	run_signal	INTEGER	Required	0: off, 1: on
frequency	Hz	freq	DOUBLE	Recommend	Only for variable frequency pumps; if not provided, direct frequency control and anomaly analysis are not supported

field description	unit	identify	type	level	remark
fault alarm signal	/	fault_signal	INTEGER	Required	0: normal, 1: alarm
accumulated power consumption	kW·h	electricity	DOUBLE	Optional	
active power	kW	active_power	DOUBLE	Optional	

Instrument energy consumption

For summer strategy, it is recommended to install one watt–hour meter for each chiller, one watt–hour meter for a set of primary chilled water pumps, one watt–hour meter for a set of secondary chilled water pumps (if any), one watt–hour meter for a set of cooling water pumps, one watt–hour meter for a set of cooling towers, one watt–hour meter for a set of AHU(if any) and one watt–hour meter for a set of MAU(if any);

For winter strategy, it is recommended to install one watt–hour meter for a set of primary heating water pumps, one watt–hour meter for a set of secondary heating water pumps (if any), one watt–hour meter for a set of AHU and one watt–hour meter for a set of MAU;.

Data sampling frequency: once every 5 minutes is recommended, at least once every 15 minutes.

field description	unit	identify	type	level	remark
instrument energy consumption	kW·h	meter_energy	DOUBLE	Required	

System operation status in summer

Data sampling frequency: once every 5 minutes is recommended, at least once every 15 minutes.

field description	unit	identify	type	level	remark

air conditioning system id	/	system_id	STRING : VARCHAR(128)	Required	
accumulated cooling capacity	KJ	total_cooling	DOUBLE	Recommend	'total_cooling' or 'chw_flow' must upload one. 'chw_flow' higher priority if both upload. If not provided, calculation accuracy will be reduced and COP or efficiency can not be provided.
chilled water header flow	m3/h	chw_flow	DOUBLE	Recommend	
chilled water supply temperature	˚C	chw_supply_temp	DOUBLE	Required	
chilled water return temperature	˚C	chw_return_temp	DOUBLE	Required	
cooling water supply temperature	˚C	cw_supply_temp	DOUBLE	Required	
cooling water return temperature	˚C	cw_return_temp	DOUBLE	Required	

chilled water supply pressure	bar	chw_supply_press	DOUBLE	Recommend	If not provided, differential pressure control can not be provided.
chilled water return pressure	bar	chw_return_press	DOUBLE	Recommend	If not provided, differential pressure control can not be provided.
cooling water supply pressure	bar	cw_supply_press	DOUBLE	Optional	
cooling water return pressure	bar	cw_return_press	DOUBLE	Optional	
chilled water outlet temperature setting	℃	chwst_setting	DOUBLE	Optional	
cooling water outlet temperature setting	℃	cwst_setting	DOUBLE	Recommend	Affect outlet temperature control of the cooling water.
chilled water pump frequency	Hz	chwp_freq	DOUBLE	Optional	

chilled water control mode	/	chw_mode	INTEGER	Optional	1: differential pressure control; 0: frequency control
chilled water supply and return water pressure difference setting	bar	chw_press_setting	DOUBLE	Recommend	If not provided, differential pressure control can not be provided.
chilled water supply and return water temperature difference setting	℃	chw_temp_setting	DOUBLE	Recommend	If not provided, differential temperature control can not be provided.

System operation status in winter

Only required for heating system.

Data sampling frequency: once every 5 minutes is recommended, at least once every 15 minutes.

field description	unit	identify	type	level	remark
air conditioning system id	/	system_id	STRING : VARCHAR(128)	Required	

accumulated heat supply	KJ	total_heating	DOUBLE	Recommend	'total_heating' or 'hw_flow' must upload one. 'hw_flow' higher priority if both upload. If not provided, HVAC load forecasting can not be provided and calculation accuracy will be reduced
hot water header flow	m3/h	hw_flow	DOUBLE	Recommend	
hot water outlet temperature	℃	hw_supply_temp	DOUBLE	Required	
hot water return temperature	℃	hw_return_temp	DOUBLE	Required	
hot water outlet pressure	bar	hw_supply_press	DOUBLE	Recommend	If not provided, differential pressure control can not be provided.

hot water return pressure	bar	hw_return_press	DOUBLE	Recommend	If not provided, differential pressure control can not be provided.
hot water pump frequency	Hz	hwp_freq	DOUBLE	Optional	
hot water control mode	/	hw_mede	INTEGER	Optional	1: differential pressure control; 0: frequency contro
setting of water pressure difference between hot water supply and return	bar	hw_press_setting	DOUBLE	Recommend	If not provided, differential pressure control can not be provided.
setting of water temperature difference between hot water supply and return	℃	hw_temp_setting	DOUBLE	Recommend	If not provided, differential temperature control can not be provided.
chilled water total flow	m3	chw_acc_flow	DOUBLE	Optional	

field description	unit	identify	type	required	remark
instantaneous flow per minute	m3/min	inst_flow_m	DOUBLE	Optional	
instantaneous flow per second	m3/s	inst_flow_s	DOUBLE	Optional	

Air handling unit and make-up air unit

Only required for AHU and MAU control.

Data sampling frequency: once every 5 minutes is recommended, at least once every 15 minutes.

field description	unit	identify	type	required	remark
fresh air temperature	℃	fresh_temp	DOUBLE	Optional	
fresh air humidity	%	fresh_hum	DOUBLE	Optional	
supply air temperature setting	℃	supply_temp_setting	DOUBLE	Recommend	If not provided, air temperature control can not be provided.
supply air temperature	℃	supply_temp	DOUBLE	Required	
supply air humidity	%	supply_hum	DOUBLE	Required	
return air temperature	℃	return_temp	DOUBLE	Required	
return air humidity	%	return_hum	DOUBLE	Required	

return air CO2 concentration	PPM	return_CO2	DOUBLE	Optional	
fan frequency setting	Hz	fan_freq_setting	DOUBLE	Optional	
frequency of supply fan	Hz	supply_fan_freq	DOUBLE	Recommend	Only for variable frequency fans. if not provided, direct frequency control and anomaly analysis are not supported
frequency setting of supply fan	Hz	sff_setting	DOUBLE	Recommend	Only for variable frequency fans. if not provided, direct frequency control and anomaly analysis are not supported
status of supply fan	/	supply_run_signal	INTEGER	Required	0: off; 1: on
exhaust fan frequency	Hz	exhaust_fan_freq	DOUBLE	Optional	
exhaust fan frequency setting	Hz	eff_setting	DOUBLE	Optional	
status of exhaust fan	/	exhaust_run_signal	INTEGER	Recommend	Required if any exhaust fans. 0: not started; 1: started

opening setting of fresh air valve	%	fresh_valve_setting	DOUBLE	Recommend	Required if fresh air valve is adjustable
opening feedback of fresh air valve	%	fresh_valve_feedback	DOUBLE	Recommend	Required if fresh air valve is adjustable
opening setting of cooling valve	%	cool_valve_setting	DOUBLE	Optional	
feedback of opening of cooling valve	%	cool_valve_feedback	DOUBLE	Optional	
operation mode	/	run_mode	INTEGER	Optional	0: fixed fan frequency, 1: CO2 concentration control
start stop status of heat recovery runner	/	heat_return_state	INTEGER	Optional	0: off, 1: on
return air valve setting	%	return_valve_setting	DOUBLE	Optional	
return air valve feedback	%	return_valve_feedback	DOUBLE	Optional	
static pressure setting	Pa	static_pressure_setting	DOUBLE	Recommend	Required if supply fans adopt static pressure control

field description	unit	identify	type	level	remark
static pressure value	Pa	static_pressure	DOUBLE	Recommend	Required if supply fans adopt static pressure control

Indoor environment

It is recommended to install at least one indoor environment sensor per 500 square meters;

Data sampling frequency: once every 5 minutes is recommended, at least once every 15 minutes.

field description	unit	identify	type	level	remark
air conditioning system id	/	system_id	STRING : VARCHAR (128)	Required	
building id	/	building_id	STRING : VARCHAR (128)	Required	A combination of English letters, numbers and underscores. The underscore is not allowed at the beginning or end. Be unique under the current air–conditioning system Example value: building_1
building name	/	building_name	STRING : VARCHAR (128)	Optional	Chinese or English

floor id	/	floor_id	STRING : VARCHAR (128)	Required	A combination of English letters, numbers and underscores. The underscore is not allowed at the beginning or end. Sub–levels of building id. Be unique under the current air–conditioning system Example value: floor_1
floor name	/	floor_name	STRING : VARCHAR (128)	Optional	Chinese or English
campus id	/	campus_id	STRING : VARCHAR (128)	Optional	A combination of English letters, numbers and underscores. If there is no campus, leave it blank.
campus name	/	campus_name	STRING : VARCHAR (128)	Optional	Chinese or English. If there is no campus, leave it blank
fence id	/	fence_id	STRING : VARCHAR (128)	Optional	A combination of English letters, numbers and underscores. The underscore is not allowed at the beginning or end. Sub–levels of floor id. Custom logic cutting unit. Be unique under the current air–conditioning system. Example value: fence_1

indoor temperature	℃	temperature	DOUBLE	Required	
indoor co2 concentration	PPM	co2	DOUBLE	Recommend	If not provided, the corresponding statistics are not supported
indoor humidity	%	humidity	DOUBLE	Optional	

Indoor pedestrian flow

Optional, if not provided, HVAC load forecasting accuracy will be reduced and the corresponding statistics are not supported.

Data sampling frequency: once every 5 minutes is recommended, at least once every 15 minutes.

field description	unit	identify	type	level	remark
air conditioning system id	/	system_id	STRING : VARCHAR(128)	Required	
building id	/	building_id	STRING : VARCHAR(128)	Required	A combination of English letters, numbers and underscores. The underscore is not allowed at the beginning or end. Be unique under the current air–conditioning system Example value: building_1
building name	/	building_name	STRING : VARCHAR(128)	Optional	Chinese or English

floor id	/	floor_id	STRING : VARCHAR(128)	Required	A combination of English letters, numbers and underscores. The underscore is not allowed at the beginning or end. Sub–levels of building id. Be unique under the current air–conditioning system Example value: floor_1
floor name	/	floor_name	STRING : VARCHAR(128)	Optional	Chinese or English
campus id	/	campus_id	STRING : VARCHAR(128)	Optional	A combination of English letters, numbers and underscores. If there is no campus, leave it blank.
campus name	/	campus_name	STRING : VARCHAR(128)	Optional	Chinese or English. If there is no campus, leave it blank
fence id	/	fence_id	STRING : VARCHAR(128)	Optional	A combination of English letters, numbers and underscores. The underscore is not allowed at the beginning or end. Sub–levels of floor id. Custom logic cutting unit. Be unique under the current air–conditioning system Example value: fence_1
number of indoor personnel	person	person_num	BIGINT	Required	

Building and floor data

Data sampling frequency: Send the full amount of building and floor data for the first time to complete the initialization, and send the updated full amount of data every time when there is a modification。

field description	unit	identify	type	level	remark
air conditioning system id	/	system_id	STRING : VARCHAR(128)	Required	
building id	/	building_id	STRING : VARCHAR(128)	Required	A combination of English letters, numbers and underscores. The underscore is not allowed at the beginning or end. Be unique under the current air–conditioning system Example value: building_1
building name	/	building_name	STRING : VARCHAR(128)	Optional	Chinese or English
floor id	/	floor_id	STRING : VARCHAR(128)	Required	A combination of English letters, numbers and underscores. The underscore is not allowed at the beginning or end. Sub–levels of building id. Be unique under the current air–conditioning system Example value: floor_1

floor name	/	floor_name	STRING : VARCHAR(128)	Optional	Chinese or English
campus id	/	campus_id	STRING : VARCHAR(128)	Optional	A combination of English letters, numbers and underscores. If there is no campus, leave it blank.
campus name	/	campus_name	STRING : VARCHAR(128)	Optional	Chinese or English. If there is no campus, leave it blank
fence id	/	fence_id	STRING : VARCHAR(128)	Optional	A combination of English letters, numbers and underscores. The underscore is not allowed at the beginning or end. Sub–levels of floor id. Custom logic cutting unit. Be unique under the current air–conditioning system Example value: fence_1
number of indoor personnel	person	person_num	BIGINT	Required	

Boiler

Only required for boiler heating system.

Data sampling frequency: once every 5 minutes is recommended, at least once every 15 minutes.

field description	unit	identify	type	level	remark

status:	/	run_signal	INTEGER	Required	0: off, 1: on
water outlet temperature setting	℃	hwst_setting	DOUBLE	Required	
hot water outlet temperature	℃	hw_supply_temp	DOUBLE	Required	
hot water return temperature	℃	hw_return_temp	DOUBLE	Required	
fire level	/	fire_level	INTEGER	Optional	0: fierce fire, 1: small fire
fault alarm signal	/	fault_signal	INTEGER	Required	0: normal, 1: alarm
gas flow	m3/h	gas_flow	DOUBLE	Required	

Fields of weather

Real-time weather

Required, if not provided, HVAC Management is not available.

Data sampling frequency: at least once every 30 minutes.

field description	unit	identify	type	required	remark
region code	/	ad_code	STRING : VARCHAR(128)	Required	

longitude	/	longitude	STRING : VARCHAR(32)	Required	eg: 110.50
latitude	/	latitude	STRING VARCHAR(32)	Required	eg: 78.50
weather description	/	skycon	STRING VARCHAR(180)	Optional	value: see Weather description enumeration
temperature	℃	temperature	DOUBLE	Required	
humidity	%	humidity	DOUBLE	Required	
cloudrate	/	cloudrate	DOUBLE	Optional	rang: 0~1
short wave radiant flux	w/m2	dswrf	DOUBLE	Required	
wind speed	m/s	wind_speed	DOUBLE	Optional	
wind direction	°	wind_direction	DOUBLE	Optional	clockwise from north
pressure	Pa	pressure	DOUBLE	Optional	
precipitation	mm/hour	precipitation	DOUBLE	Required	

field description	unit	identify	type	level	remark
data upload time	/	record_time	STRING : VARCHAR(64)	Required	format：yyyy–mm–dd HH:mm:ss

Weather forecast

Required, if not provided, HVAC Management is not available.

If not provided, EMS load forecasting function is not available.

Provide hourly weather forecast for the next 48 hours or more, update 3 times a day is recommended, at least update 2 times a day.

field description	unit	identify	type	level	remark
region code	/	ad_code	STRING : VARCHAR(128)	Required	
longitude	/	longitude	STRING : VARCHAR(32)	Required	eg: 110.50
latitude	/	latitude	STRING : VARCHAR(32)	Required	eg: 78.50
weather description	/	skycon	STRING : VARCHAR(180)	Optional	value: see Weather description enumeration
temperature	˚C	temperature	DOUBLE	Required	
humidity	%	humidity	DOUBLE	Required	

cloudrate	/	cloudrate	DOUBLE	Optional	rang: 0~1
short wave radiant flux	w/m2	dswrf	DOUBLE	Required	
wind speed	m/s	wind_speed	DOUBLE	Optional	
wind direction	°	wind_direction	DOUBLE	Optional	
pressure	Pa	pressure	DOUBLE	Optional	
precipitation	mm/hour	precipitation	DOUBLE	Required	
data upload time	/	record_time	STRING : VARCHAR(64)	Required	format：yyyy–mm–dd HH:mm:ss
forecast time	/	forecast_time	STRING : VARCHAR(64)	Required	format：yyyy–mm–dd HH:mm:ss

Weather description enumeration

weather description	value of skycon	remark
sunny (daytime)	CLEAR_DAY	cloudrate < 0.2
sunny (night)	CLEAR_NIGHT	cloudrate < 0.2

cloudy (daytime)	PARTLY_CLOUDY_DAY	0.8 >= cloudrate > 0.2
cloudy (night)	PARTLY_CLOUDY_NIGHT	0.8 >= cloudrate > 0.2
cloudy	CLOUDY	cloudrate > 0.8
light haze	LIGHT_HAZE	PM2.5 100~150
moderate smog	MODERATE_HAZE	PM2.5 150~200
heavy smog	HEAVY_HAZE	PM2.5 > 200
light rain	LIGHT_RAIN	0.08~3.44 mm/h
moderate rain	MODERATE_RAIN	3.44~11.33 mm/h
heavy rain	HEAVY_RAIN	11.33~51.30 mm/h
storm rain	STORM_RAIN	>= 51.30 mm/h
fog	FOG	Low visibility, high humidity, low wind speed, low temperature
light snow	LIGHT_SNOW	0.08~3.44 mm/h
moderate snow	MODERATE_SNOW	3.44~11.33 mm/h
heavy snow	HEAVY_SNOW	11.33~51.30 mm/h

storm snow	STORM_SNOW	>= 51.30 mm/h
dust	DUST	AQI > 150, PM10 > 150, humidity < 30%, wind speed < 6 m/s
sand	SAND	AQI > 150, PM10> 150, humidity < 30%, wind speed > 6 m/s
wind	WIND	