

ORDERING INFORMATION

Model : M5XWTU

PLEASE FILL IN THIS SECTION



Model
Company
Name
P/O No.

FACTORY USE ONLY



Job No.	Approved by (Sales office)
Ser No.	Issued by (Sales office)
Sales Rep.	Approved by (Factory)
	Issued by (Factory)
	Ser No.

Specify the items you want to change. Default setting will be used if not specified.

■ INPUT SETTING

ITEM	SET VALUE	DEFAULT VALUE	COMMENTS	FACTORY INTERNAL CHECK
Input wiring	☐ Single-phase/2-wire ☐ Single-phase/3-wire ☐ 3-phase/3-wire	3-phase/3-wire		☐
CT rating, primary		5	1 to 20 000: Current (A) Valid only for the sensor type CLSE-R5. Selected sensor's rating is automatically set for other types of sensors.	☐
CT sensor type	☐ CLSE-R5 ☐ CLSE-05 ☐ CLSE-10 ☐ CLSE-20 ☐ CLSE-40 ☐ CLSE-60	CLSE-R5		☐
VT rating, primary		110	50 to 400 000 : Voltage (V) If VT is not used, enter the same value for primary and secondary. This value is used for calculation of rated power.	☐
VT rating, secondary		110	50 to 500 : Voltage (V) The secondary can be set up to 500V. However, this does not mean the unit accepts 500V for input. Do not use with the condition exceeding input rating written in the specification sheet of the unit.	☐
Low-end cutout, current		1.0	0.0 to 99.9 : (%) Rated current × Specified percentage	☐
Frequency input	☐ Voltage signal ☐ 50 Hz fixed ☐ 60 Hz fixed	Voltage signal		☐

■ DEMAND SETTING

ITEM	SET VALUE	DEFAULT VALUE	COMMENTS	FACTORY INTERNAL CHECK
Average (demand) current update interval		30	1 to 60: Internal timer (Unit: minutes)	☐
Average (demand) power update interval		30	1 to 60: Internal timer (Unit: minutes)	☐

■ STYLE SETTING

ITEM	SET VALUE	DEFAULT VALUE	COMMENTS	FACTORY INTERNAL CHECK
Power factor (PF1 through PF3, PF) sign		0	0: Standard (IEC), Identical to the active energy 1: Special type 1 (IEEE), Positive in LAG, Negative in LEAD	☐
Reactive power (Q1 through Q3, Q) sign		0	0: Standard (IEC), Positive from PF = 1.0 to 180° in LAG direction; Negative for the other direction 1: Special type 1 (inverts sign at outgoing), Positive in LAG, Negative in LEAD	☐

Note: '1,' '2,' '3' in expressions like Q1, Q2, Q3 indicate 'R,' 'S,' 'T' respectively

■ MEASURING MODE

ITEM	SET VALUE	DEFAULT VALUE	COMMENTS	FACTORY INTERNAL CHECK
Measuring mode	☐ Standard measuring ☐ Simple measuring	Standard measuring	Voltage and power factor are fixed at simple measuring.	☐
Power factor at simple measuring		1.0000	At simple measuring, VT's primary is applied for voltage.	☐

■ SPECIFY WHEN "EXTERNAL INTERFACE 1: ANALOG OUTPUT" IS SELECTED.

ITEM	SET VALUE	DEFAULT VALUE	COMMENTS	FACTORY INTERNAL CHECK
Measurement item		NULL	Specify the items by symbol from Table 1.	☐
Input 0%		0.00%	Specify from -15.00 - +140.00%.	☐
Input 100%		100.00%	Specify from -15.00 - +140.00%.	☐
Output 0% setting value		4 mA	Specify within the following range according to the output range. 0 - 20.0 mA / -5.0 - +5.0 V / -10.0 - +10.0 V	☐
Output 100% setting value		20 mA	Specify within the following range according to the output range. 0 - 20.0 mA / -5.0 - +5.0 V / -10.0 - +10.0 V	☐

Input as a percentage of the span shown in Table 1.

For Power P (Q), -P to P (-Q to Q) is 0 to 100%, and calculated with following formula.

$$\text{Input value [\%]} = \left(\frac{\text{Input engineering value}}{\text{Power value}^{(1)} \times 2} + 0.5 \right) \times 100$$

(1) P: Active power = VT rating primary × CT rating primary × n

Q: Reactive power = VT rating primary × CT rating primary × n

Single-phase/2-wire: n = 1, Single-phase/3-wire: n = 2, 3-phase/3-wire: n = $\sqrt{3}$

For Power S, 0 to S is 0 to 100%, and calculated with following formula.

$$\text{Input value [\%]} = \left(\frac{\text{Input engineering value}}{\text{Power value}^{(1)}} \right) \times 100$$

(1) S: Apparent power = VT rating primary × CT rating primary × n

Single-phase/2-wire: n = 1, Single-phase/3-wire: n = 2, 3-phase/3-wire: n = $\sqrt{3}$

<Calculation Example>

3-phase/3-wire, VT 3300 V / 110 V, CT 250 A / 5A

Input engineering range -1000 - +1000 kW

$$\text{Input 0 [\%]} = \left(\frac{-1000 \text{ kW}}{1429 \times 2} + 0.5 \right) \times 100 = 15.01 \text{ [\%]}$$

$$\text{Input 100 [\%]} = \left(\frac{1000 \text{ kW}}{1429 \times 2} + 0.5 \right) \times 100 = 84.99 \text{ [\%]}$$

Limit value (output range) of output signal is as following.

0 - 20 mA range: 0 - 23 mA

-5 V - +5 V range: -5.75 V - +5.75 V

-10 V - +10 V range : -11.5 V - + 11.5 V

■ SPECIFY WHEN “EXTERNAL INTERFACE 2: PULSE / ALARM OUTPUT” IS SELECTED.

ITEM	SET VALUE	DEFAULT VALUE	COMMENTS	FACTORY INTERNAL CHECK
Function	☐ Energy count pulse ☐ Alarm	Energy count pulse		☐
Operation mode	☐ Normal open ☐ Normal close	Normal open		☐

Specify when “energy count pulse” is selected

ITEM	SET VALUE	DEFAULT VALUE	COMMENTS	FACTORY INTERNAL CHECK
Energy to measure		EP	Specify the items by symbol from Table 2.	☐
Energy per 1 pulse		1.0	Specify from 0.1 - 10,000 kWh / kvarh / kVAh.	☐
Pulse width (msec.)		100	Specify from 100 - 2000 msec. (in 100 msec. increments)	☐

Specify when “alarm” is selected

ITEM	SET VALUE	DEFAULT VALUE	COMMENTS	FACTORY INTERNAL CHECK
Power ON delay time (sec.)		0	Specify from 0 - 999.	☐
Latching	☐ Disable ☐ Enable	Disable	Power OFF or OFF until canceled by CFG.	☐
Target item		–	Specify the items by symbol from Table 3.	☐
Upper limit value		0	Specify from upper limit range in Table 3.	☐
Lower limit value		0	Specify from lower limit range in Table 3.	☐
Deadband (%)		0.0	Specify from 0 - 99.9%.	☐
Alarm ON delay time (sec.)		0	Specify from 0 - 999 sec.	☐

■ SPECIFY WHEN “EXTERNAL INTERFACE 3: MODBUS COMMUNICATION” IS SELECTED.

ITEM	SET VALUE	DEFAULT VALUE	COMMENTS	FACTORY INTERNAL CHECK
Node address		1	1 - 247	☐
Baud rate	☐ 1200 bps ☐ 2400 bps ☐ 4800 bps ☐ 9600 bps ☐ 19200 bps ☐ 38400 bps	38400 bps		☐
Parity bit	☐ None ☐ Odd ☐ Even	Odd		☐
Stop bit	☐ 1 bit ☐ 2 bits	1 bit		☐

Table 1 Analog Output Signal Allocation

TERM	DESCRIPTION
CT1 (rated current)	Rated current when CLSE-R5 is used as a CT secondary is the value set for primary side. Other than that, the rated current is rated value of the sensor used.
VT1 (rated voltage)	Rated voltage is the setting value of VT primary.
P (rated power)	Rated power is calculated by following formula with using VT1. $P = CT1 \times VT1 \times n$ $n = \text{single-phase/2-wire: 1, single-phase/3-wire: 2, 3-phase/3-wire: } \sqrt{3}$

SYMBOL	DESCRIPTION	RANGE (0 - 100%)	SINGLE-PHASE 2-WIRE	SINGLE-PHASE 3-WIRE	3-PHASE 3-WIRE
NULL	Not assigned		✓	✓	✓
I	Current	0 - CT1	✓	✓	✓
U	Voltage	0 - VT1	✓	✓	✓
P	Active power	-P - P	✓	✓	✓
Q	Reactive power	-P - P	✓	✓	✓
S	Apparent power	-P - P	✓	✓	✓
PF	Power factor	-1.0000 - 1.0000	✓	✓	✓
F	Frequency	45.00 - 65.00	✓	✓	✓
I1	Current, Line 1	0 - CT1	✓	✓	✓
I2	Current, Line 2	0 - CT1			✓
I3	Current, Line 3	0 - CT1		✓	✓
IN	Neutral current	0 - CT1		✓	
U12	Delta voltage, 1-2	0 - VT1			✓
U23	Delta voltage, 2-3	0 - VT1			✓
U31	Delta voltage, 3-1	0 - VT1			✓
U1N	Phase voltage, Phase 1	0 - VT1	✓	✓	
U3N	Phase voltage, Phase 3	0 - VT1		✓	
P1	Active power, Phase 1	-(VT1 × CT1) - (VT1 × CT1)	✓	✓	
P3	Active power, Phase 3	-(VT1 × CT1) - (VT1 × CT1)		✓	
Q1	Reactive power, Phase 1	-(VT1 × CT1) - (VT1 × CT1)	✓	✓	
Q3	Reactive power, Phase 3	-(VT1 × CT1) - (VT1 × CT1)		✓	
S1	Apparent power, Phase 1	-(VT1 × CT1) - (VT1 × CT1)	✓	✓	
S3	Apparent power, Phase 3	-(VT1 × CT1) - (VT1 × CT1)		✓	
PF1	Power factor, Phase 1	-1.0000 - 1.0000	✓	✓	
PF3	Power factor, Phase 3	-1.0000 - 1.0000		✓	
THDI1	Current total harmonic distortion, Line 1	0.0 - 100.0	✓	✓	✓
THDI2	Current total harmonic distortion, Line 2	0.0 - 100.0			✓
THDI3	Current total harmonic distortion, Line 3 %/10	0.0 - 100.0		✓	✓
THDIN	Neutral current total harmonic distortion	0.0 - 100.0		✓	
THDU12	Delta voltage total harmonic distortion, 1 - 2	0.0 - 100.0			✓
THDU23	Delta voltage total harmonic distortion, 2 - 3 %/10	0.0 - 100.0			✓
THDU31	Delta voltage total harmonic distortion, 3 - 1	0.0 - 100.0			✓
THDU1N	Phase voltage total harmonic distortion, Phase 1	0.0 - 100.0	✓	✓	
THDU3N	Phase voltage total harmonic distortion, Phase 3 %/	0.0 - 100.0		✓	

SYMBOL	DESCRIPTION	RANGE (0 - 100%)	SINGLE-PHASE 2-WIRE	SINGLE-PHASE 3-WIRE	3-PHASE 3-WIRE
T-Q	Reactive power for bidirectional current		✓	✓	✓
T-PF	Power factor for bidirectional current		✓	✓	✓

Table 2 Selectable Energy Count Pulse

SYMBOL	DESCRIPTION
EP	Active energy, incoming
EQ	Reactive energy, LAG
ES	Apparent energy
EP-	Active energy, outgoing
EQ-	Reactive energy, LEAD
EQ+LAG	Reactive energy, incoming, LAG
EQ+LEAD	Reactive energy, incoming, LEAD
EQ-LAG	Reactive energy, outgoing, LAG
EQ-LEAD	Reactive energy, outgoing, LEAD
EQ+P	Reactive energy, incoming
EQ-P	Reactive energy, outgoing
EQA	Reactive energy, (incoming + outgoing) kvarh

Table 3 Alarm Output Settings

SYMBOL	DESCRIPTION	LOWER LIMIT	UPPER LIMIT	SINGLE-PHASE 2-WIRE	SINGLE-PHASE 3-WIRE	3-PHASE 3-WIRE
I1-3	1 - 3-wire current	0.000 A	20 000.000 A	✓	✓	✓
IN	Neutral current	0.000 A	20 000.000 A		✓	
U12-31	Delta voltage 1-2 - 3-1	0.00 V	400 000.00 V			✓
U1N-3N	Phase voltage, phase 1 - 3	0.00 V	400 000.00 V	✓	✓	
P	Active power	-2000 000 000 W	2000 000 000 W	✓	✓	✓
Q	Reactive power	-2000 000 000 var	2000 000 000 var	✓	✓	✓
S	Apparent power	0	2000 000 000 VA	✓	✓	✓
PF	Power factor	-1.0000	1.0000	✓	✓	✓
F	Frequency	45.00 Hz	65.00 Hz	✓	✓	✓
I1-3 AVG	Current average, Line 1 - 3	0.000 A	20 000.000 A	✓	✓	✓
IN AVG	Neutral current AVG	0.000 A	20 000.000 A		✓	
P AVG	Active power AVG	-2000 000 000 W	2000 000 000 W	✓	✓	✓
Q AVG	Reactive power AVG	-2000 000 000 var	2000 000 000 var	✓	✓	✓
S AVG	Apparent power AVG	0	2000 000 000 VA	✓	✓	✓
THD I1-3	Current total harmonic distortion, Line 1 - 3	0.0 %	999.9 %	✓	✓	✓
THD IN	Neutral current total harmonic distortion	0.0 %	999.9 %		✓	
THD U12-31	Delta voltage total harmonic distortion, 1-2 - 3-1	0.0 %	999.9 %			✓
THD U1N-3N	Phase voltage total harmonic distortion, Phase 1 - 3	0.0 %	999.9 %	✓	✓	