SMF 400 (POWER METER)

Λ**SUPPLY VOLTAGES:** 3 X 240.0V AC **[PTR SELECTABLE]**

Λ**CURRENT INPUT:** -/**5**Amp & -/**1**Amp. **[SELECTABLE]**

Λ**AUXILIARY SUPPLY:** **80 TO 270V AC.**

Λ□**STANDARDS USED :** STABLE AC VOLTAGE & CURRENT SOURCE, PHASE SHIFTING TRANSFORMER, POWER METER & INTEGRATOR WITH BASIC ACCURACY OF 0.35%, STANDARD ENERGY METER OF ACCURACY CLASS 0.5s TRACEABLE TO NATIONAL STANDARDS.

Λ□**TRACEABILITY:** THE ABOVE METER(S) WAS TESTED AND CALIBRATED AGAINST "MTE"0.05 STANDARD (MASTER CALIBRATING INSTRUMENT) MODEL PRS 1.3.THE MTE STANDARD METER IS TRACEABLE TO INTERNATIONAL STANDARDS.

ΛRESULT OF TEST: Pass ΛTEST ENGINEER: Λ **DATE: 14/08/2024**

WARRANTY

THE EQUIPMENT SUPPLIED UNDER THIS T.C. IS GURANTEED AGAINST DESIGN, MANUFACTURING AND WORKMANSHIP DEFECTS FOR A PERIOD OF 5 YEARS FROM THE ABOVE DATE. STEFAN ELECTIC UNDERTAKES TO REPLACE / REPAIR THE FAULTY UNIT AT OUR WORKS FREE OF COST. THE MANUFACTUR'S LIABILITY IS LIMITED TO THE VALUE OF GOODS SUPPLIED. THE MANUFACTURER WILL TAKE NO RESPONSIBILITY FOR ANY CONSEQUENTIAL DAMAGE CLAIMED WHATSOEVER. THIS WARRANTY CERTIFICTE IS REQUIRED TO BE PRODUCED FOR OBTAINING ANY REPAIR OR REPLACEMENT / SERVICE FROM THE MANUFACTURER. THE MANUFACTURING RESERVES THE RIGHT TO DETERMINE THE REASON FOR DEFECT / DAMAGE BEFORE PROVIDING SERVICE.

Λ**Display Parameters:**

Page 1.		**Page 2.**		**Page 3.**		**Page 4.**	
Phase to Neutral Voltage		**Phase to Phase Voltage**		**Phase Current**		**Phase PF**	
Vrn	R Phase	Vry	RY Phase	Ir	R Phase Current	PFr	R Phase PF
Vyn	Y Phase	Vyb	YB Phase	Iy	Y Phase Current	PFy	Y Phase PF
Vbn	B Phase	Vbr	BR Phase	Ib	B Phase Current	PFb	B Phase PF
Page 5.		**Page 6.**		**Page 7.**		**Page 8.**	
KWr	R Phase KW	KVARr	R Phase KVAR	KVAr	R Phase KVA	KVA	System KVA
KWy	Y Phase KW	KVARy	Y Phase KVAR	KVAy	Y Phase KVA	KW	System KW
KWb	B Phase KW	KVARb	B Phase KVAR	KVAb	B Phase KVA	PF	System PF & Hz Frequency
Page 9.		**Page 10.**		**Page 11.**		**Page 12.**	
KVAR	System KVAR	Kwh	System Kwh	Kvah	System Kvah	Kvarh	System Kvarh
Page 13.		**Page 14.**		**Page 15.**		**Page 16.**	
Phase-wise Voltage THD%		**Phase-wise Current THD%**		**Demand KW & KVA**		**Maximum Demand KW & KVA**	
Vr_THD	R Phase THD	Ir_THD	R Phase THD	D_KVA	Demand KVA	MD_KVA	Maximum Demand KVA
Vy_THD	Y Phase THD	Iy_THD	Y Phase THD	D_KW	Demand KW	MD_KW	Maximum Demand KW
Vb_THD	B Phase THD	Ib_THD	B Phase THD				
Page 17.		**Page 18.**					
Voltage Imbalance%		**Current Imbalance%**					
Vr_Imb	R Phase	Ir_Imb	R Phase				
Vy_Imb	Y Phase	Iy_Imb	Y Phase				
Vb_Imb	B Phase	Ib_Imb	B Phase				

***NOTE** : LEAD side power factor indicated with minus(-) sign.

Λ**In ideal condition the back light will turn off after 5 min. And if any key is pressed back light will on.**

Λ□**INSTALLATION & COMMISSIONING:**

1. Push the unit into the panel and mount using the clamps provided.
2. Connect the three phases with the phase sequence being R-Y-B to the corresponding terminals on the unit. Make sure that the three phases coming to the unit come through control fuses of 1.0 Amp rating. This will protect the electronics inside from damage due to sever over voltages or phase faults in the system.
3. In case of three phases four wire systems, connect the neutral to the terminal marked N.
4. Connect the two wires from the R-phase CT to terminals marked M1 & L1 such that S1 from CT goes to M1 on the unit.
5. Connect the two wires from the Y-phase CT to terminals marked M2 & L2 such that S1 from CT goes to M2 on the unit.
6. Connect the two wires from the B-phase CT to terminals marked M3 & L3 such that S1 from CT goes to M3 on the unit.
7. Switch on the auxiliary supply. The unit will come alive. The first parameter to be displayed will be CT Primary and then Station ID. This is displayed only once at the time of start-up of the unit and then show first page.

□**CHANGING CT PRIMARY:**

Press the PF key for 10 seconds, the display will show present **CT primary**. Press same key to select CT Primary. At end of display page, "P" will start blinking which shows that parameter is selected for programming. Now, you can change CT Primary by pressing up ▲ or down PF key. The CT Primary can be changed in steps of 5A up to 200A, and in steps of 25A thereafter up to 8000A. After reaching 8000, if the key is kept in pressed condition, the CT Primary will rollover and start with 5A again. **When the desired CT Primary is reached, leave the key**. After 10 seconds, the meter will automatically reset and show the First PTR, Second CTR and Third STATION ID, which has been programmed, and then show page you have freeze last time when meter was in scroll mode otherwise it will show the page you have keep last time when meter was on manual mode.

STEFAN ELECTRIC

CHANGING CT SECONDARY:

Press the key for 10 seconds, the display will show present **CT primary**. Now, Press key to reach CT Secondary. Now to select CT secondary Press key at end of display page, "P" will start blinking which shows that parameter is selected for programming. Now, you can change CT Secondary by pressing up or down key. **When the desired CT Secondary is reached, leave the key**. After 10 seconds, the meter will automatically reset and show the First PTR, Second CTR and Third STATION ID, which has been programmed,

CHANGING SCROLL MODE:

Press the key for 10 seconds, the display will show present **CT primary**. Now, Press key to reach **SCROLL MODE** status (Yes or No). Press key to select Scroll. At end of display page, "P" will start blinking which shows that parameter is selected for programming. Now, you can change Scroll mode to YES or NO by pressing up or down key. After setting the desired Scroll Mode **leave the key**. After 10 seconds, the meter will automatically reset and show the First PTR, Second CT Primary and Third STATION ID, which has been programmed, and then show page you have freeze last time when meter was in scroll mode otherwise it will show the page you have keep last time when meter was on manual mode.

CHANGING PT RATIO:

Press the key for 10 seconds, the display will show present **CT primary**. Now, Press key to reach **Ptr**. Press key to select parameter for programming. At end of display page, "P" will start blinking which shows that parameter is selected for programming. Now, you can change PT Ratio by pressing up or down key. PT Ratio can be set to 1, 3.77, 4, 20, 30, 60, 100, 200, 300 or 600. When the desired PT Ratio is set, **leave the key**. After 10 seconds, the meter will automatically reset and show the First PTR, Second CT Primary and Third STATION ID, which has been programmed, and then show page you have freeze last time when meter was in scroll mode otherwise it will show the page you have keep last time when meter was on manual mode.

CHANGING STATION ADDRESS:

Press the key for 10 seconds, the display will show present **CT primary**. Now, Press key to reach **Addr**. Press key to select parameter for programming. At end of display page, "P" will start blinking which shows that parameter is selected for programming. Now, you can change Station Address by pressing up or down key. Station Address can be programmed from 1 to 255. When the desired Station Address is reached **leave the key**. After 10 seconds, the meter will automatically reset and show the First PTR, Second CT Primary and Third STATION ID, which has been programmed, and then show page you have freeze last time when meter was in scroll mode otherwise it will show the page you have keep last time when meter was on manual mode.

CHANGING DEMAND WINDOW:

Press the key for 10 seconds, the display will show present **CT primary**. Now, Press key to reach **DEMAND WINDOW**. Press key to select parameter for programming. At end of display page, "P" will start blinking which shows that parameter is selected for programming. Now, you can change demand window by pressing up or down key. Demand window can be programmed by selecting 15 or 30 minutes. When the desired demand window is reached **leave the key**. After 10 seconds, the meter will automatically reset and show the First PTR, Second CT Primary and Third STATION ID, which has been programmed, and then show page you have freeze last time when meter was in scroll mode otherwise it will show the page you have keep last time when meter was on manual mode.

CHANGING DEMAND RESET:

Press the key for 10 seconds, the display will show present **CT primary**. Now, Press key to reach **DEMAND RESET** status (Yes or No). Press key to select demand reset. At end of display page, "P" will start blinking which shows that parameter is selected for programming. Now, you can change demand reset to YES or NO by pressing up or down key. After setting the desired demand reset **leave the key**. After 10 seconds, the meter will automatically reset and show the First PTR, Second CT Primary and Third STATION ID, which has been programmed, and then show page you have freeze last time when meter was in scroll mode otherwise it will show the page you have keep last time when meter was on manual mode.

STEFAN ELECTIC

Protocol details for RS485 MODBUS communication of STEFAN ELECTRIC meter SMF 400.

Communication Line Parameters: 9600 / 8 / N / 1

The register map is described below. All addresses are in decimal. All parameters are Unsigned long. If illegal address is sent in the query or the host tries to read more than 32 bytes of data in one query, exception message is generated.

The parameter name (description) and multiplication factors are also mentioned.
Reserved values are for future use. They are transmitted as zeroes.

3 Phase 3000 - 3019	3 phase 3030 - 3049	3 phase 3060 - 3079	3 phase 3090 – 3109	3 phase 3120 – 3139	3 phase 3120 – 3139	MF
3000-KVA	3030-KWh	3060-Vr_Thd	3090-D_KW*	3120-KVA-R	3150-D_KVA*	X100
3002-KW	3032-KVAh	3062-Vy_Thd	3092-MD_KW*	3122-KVA-Y	3152-MD_KVA*	X100
3004-KVAr	3034-KVARh	3064-Ir_Thd	3094-Vb_Thd	3124-KVA-B	3154-Vr_Imb	X100
3006-PF	3036-Hz*	3066-Iy_Thd	3096-Ib_Thd	3126-KW-R	3156-Vy_Imb	X1000
3008-Avg.VLL	3038-Vry	3068-Vyb	3098-Vbr	3128-KW-Y	3158-Vb_Imb	X100
3010-Avg.VLN	3040-Vr	3070-Vy	3100-Vb	3130-KW-B	3160-Ir_Imb	X100
3012-Avg.Amps.	3042-Ir	3072-Iy	3102-IB	3132-KVAR-R	3162-Iy_Imb	X100
3014-KVAR-B.	3044-PF-R	3074-PF-Y	3104-PF-B	3134-KVAR-Y	3164-Ib_Imb	X100

200-214	216-230	232-246	248-262	264-278	280-294	MF
200-KVA	216-KVAh	232-Vb	248-KW-Y	264-Vr_Thd	280-Vb_Imb	X100
202-KW	218-KVARh	234-Ir	250-KW-B	266-Vy_Thd	282-Ir_Imb	X100
204-KVAr	220-HZ	236-Iy	252-KVAR-R	268-Vb_Thd	284-Iy_Imb	X100
206-PF	222-Vry	238-Ib	254-KVAR-Y	270-Ir_Thd	286-Ib_Imb	X1000
208-Avg.VLL	224-Vyb	240-KVA-R	256-KVAR-B	272-Iy_Thd	288-D_KW	X100
210-Avg.VLN	226-Vbr	242-KVA-Y	258-PF-R	274-Ib_Thd	290-MD_KW	X100
212-Avg.Amps.	228-Vr	244-KVA-B	260-PF-Y	276-Vr_Imb	292- D_KVA	X100
214-KWH .	230-Vy	246-KW-R	262-PF-B	278-Vy_Imb	294- MD_KVA	X100

Hz - Hz has a multiplication factor of 100 & not 1000 .e.g. If Hz is 48.33, then it is sent as 4833.G

□□ for providing resolution, all parameters except PF are multiplied with 100 before transmitting. Thus if the KVA value as 278.99, it is sent out as 27899. ***PF has a MF of 1000, instead of 100***. Thus, a PF value of 0.987 is sent as 987. For lead side PF value of 0.987 is sent as 1987. Here, 1000 is added to indicate power factor is on lead side.

Demand KW, Demand KVA, Max. Demand KW & Max. Demand KVA has MF of 1.

If an attempt is made to read from some address other than the valid addresses, the exception response is sent.

EXCEPTION CODE:

In the event that the query from the HOST has no communication error, but there is some error in specifying the address of registers to be read, the meter returns an exception message .The format of the exception message will be as Under:

Unit Address	0x83	Exception code	CRC	CRC

Exception Code can have only one value: 03: If the address is not a valid start address or host has requested more than 32 bytes of data, this code is returned.

STEFAN ELECTRIC