RISH EM 3490DS*i*

CONTENT

Touch Screen Dual Source Energy meter with TOD

Installation & Operating Instructions

1. Introduction

This Instrument is a panel mounted 96 x 96mm DIN Quadratic Dual source energy meter. It measures important electrical parameters like AC voltage, AC Current, Frequency, Power,Phase Angle, Power Factor, Demand and Energy(Active / Reactive / Apparent).The instrument integrates accurate measurement of technology (All Voltage & Current measurements are True RMS upto 56th Harmonic) with 320x240 Pixels touch screen TFTLCD display.

This Instrument provides Run hour , On Hour , No of Interruptions, Energy(Active / Reactive / Apparent) in different registers for Utility (Normal mode) & Generator (in power back up) in three phase/ single phase network.The switch over from utility to generator or vice versa is sensed through the sensing Voltage applied at Generator sense terminal at the rear side of the instrument. If voltage is present at sensing terminal the instrument will measure Generator parameters and if absent then it will measure utility parameters.

This instrument can be configured and programmed at site for the following:PTPrimary, PTSecondary, CTPrimary, CTSecondary (5Aor1A), 3 phase 3W or 3phase 4W system , Time Of Day metering, Power Quality Parameter , Billing metering.

measurement readings & configration can be also accessed via Modbus Interface and front panel touch screen.

Main menu is divided into 8 submenus.Every submenu contains list of options. By touching the icons on the main menu, submenu can be accessed.

System,Voltage andcurrent menu,Power / Demand submenu contains measurement of basic electrical parameters. Power quality submenu can be used to access harmonics. Energy option shows energy (Active / Reactive / Apparent) for utility & generator on single screen as well as old energy(Active / Reactive / Apparent) for utility & generator. TOD option gives running TOD data, TOD energy, cost as well as demand for utility. Generator option gives access to generator event logging, ACCL, dailyAnalysis and billing data (energy & demand) in bar-graph representation.Setup Option can be used for complete meter settings.

TABLE 1:

Measured Parameters	Units of Measurement
System Voltage	Volts
System Current	Amps
Voltage VL1-N(4wire/1P2W only)	Volts
Voltage VL2-N(4wire only)	Volts
Voltage VL3-N(4wire only)	Volts
Voltage VL1-L2 [#]	Volts
Voltage VL2-L3[#]	Volts
Voltage VL3-L1[#]	Volts
Current L1	Amps
Current L2[#]	Amps
Current L3[#]	Amps
Neutral Current (4 wire only)	Amps
Frequency/speed	Hz/RPM
Active Power (System / Phase (4 wire only)/1P2W)	KW
Reactive Power (System / Phase (4 wire only)/1P2W)	KVAr
Apparent Power (System / Phase (4 wire only)/1P2W)	KVA
Power Factor (System / Phase (4 wire only)/1P2W)	——
Phase Angle (Phase(4 wire only)/1P2W)	Degree
Active UTL Energy (up to 14 Digit resolution)	kWh
Active GEN Energy (up to 14 Digit resolution)	kWh
Reactive UTL Energy (up to 14 Digit resolution)	kVArh
Reactive GEN Energy (up to 14 Digit resolution)	kVArh
Apparent UTL Energy (up to 14 Digit resolution)	kVAh
Apparent GEN Energy (up to 14 Digit resolution)	kVAh

[#]**Note : These parameters are not measured in case of 1 Phase 2 Wire network**

TABLE 1(continued):

Measured Parameters	Units of Measurement
Current Demand(UTL& GEN)	Amps
KVA Demand(UTL&GEN)	KVA
KW Demand(UTL& GEN)	KW
VAr Demand(UTL&GEN)	VAr
Max Current Demand(UTL&GEN)	Amps
Max kVA Demand(UTL&GEN)	KVA
Max KW Demand(UTL& GEN)	KW
Max VAr Demand(UTL&GEN)	VAr
Run Hour(UTL& GEN)	Hours
On Hour(UTL& GEN)	Hours
Total Run &On Hour	Hours
Number of Interruptions	Counts
Old Run Hour(UTL& GEN)	Hours
Old ON Hour(UTL& GEN)	Hours
Old Total Run &On Hour	Hours
Old Number of Interruptions	Counts
Phase Sequence (4 wire only)	——
V1 THD*	%
V2 THD*#	%
V3 THD*#	%
I1 THD	%
I2 THD#	%
I3 THD#	%

*Note : THD Parameters are L-N in case of 3P 4W & L-L in case of 3P 3W .
#Note : These parameters are not measured in case of 1 Phase 2 Wire network

TABLE 1(continued):

Measured Parameters	Units of Measurement
System Voltage THD	%
System Current THD	%
True representation of Voltage Waveform	——
True representation of Current Waveform	——
Fundamental Voltage V1, V2, V3 [#]	Volts
Fundamental Current I1, I2, I3 *[#]	Amps
Fundamental Active Power L1, L2, L3 (4wire only/1P2W[#])	KW
Fundamental Reactive Power L1, L2, L3 (4wire only/1P2W[#])	KVAr
Fundamental Apparent Power L1, L2, L3 (4wire only/1P2W[#])	KVA
Fundamental Power Factor L1, L2, L3 (4wire only/1P2W[#])	——
RMS Voltage of Harmonic N of phase L1, L2, L3[#]	Volts
Voltage Harmonic Distortion of Harmonic N of L1, L2, L3[#]	%
RMS current of Harmonic N of L1, L2, L3 *[#]	Amps
Current Harmonic Distortion of Harmonic N of L1, L2, L3 *[#]	%
Harmonic N Active Power L1, L2, L3 (4wire only/1P2W[#])	KW
Harmonic N Reactive Power L1, L2, L3 (4wire only/1P2W[#])	KVAr
Harmonic N Apparent Power L1, L2, L3 (4wire only/1P2W[#])	KVA
Harmonic N Power Factor L1, L2, L3 (4wire only/1P2W[#])	——
Active energy (UTL) per zone of current date	Kwh
Active energy (UTL) cost per zone of current date	——
Reactive energy (UTL) per zone of current date	KVArh

NOTE:
N is the harmonic no of selected harmonic.
* These parameters are not measured for L2 in 3 phase 3 wire network.
 # These parameters are not measured for L2,L3 in 1 phase 2 wire network.

TABLE 1(continued):

Measured Parameters	Units of Measurement
Reactive energy (UTL) cost per zone of current date	KVArh
Apparent energy (UTL)per zone of current date	KVAh
Apparent energy(UTL) cost per zone of current date	——
Active energy (UTL) per date up to last 31 days	KWh
Active energy (UTL) cost per date up to last 31 days	——
Active energy (GEN) per date up to last 31 days	KWh
Active energy (GEN) cost per date up to last 31 days	——
Reactive energy (UTL) per date up to last 31 days	KVArh
Reactive energy (UTL) cost per date up to last 31 days	——
Reactive energy (GEN) per date up to last 31 days	KVArh
Reactive energy (GEN) cost per date up to last 31 days	——
Apparent energy(UTL) per date up to last 31 days	KVAh
Apparent energy(UTL) cost per date up to last 31 days	——
Apparent energy(GEN) per date up to last 31 days	KVAh
Apparent energy(GEN) cost per date up to last 31 days	——
Active energy (UTL) per billing cycle up to last 12 billing cycle	KWh
Active energy (UTL)cost per billing cycle up to last 12 billing cycle	——
Active energy (GEN) per billing cycle up to last 12 billing cycle	KWh
Active energy (GEN) cost per billing cycle up to last 12 billing cycle	——
Reactive energy (UTL) per billing cycle up to last 12 billing cycle	KVArh
Reactive energy (UTL) cost per billing cycle up to last 12 billing cycle	——
Reactive energy (GEN) per billing cycle up to last 12 billing cycle	KVArh
Reactive energy (GEN) cost per billing cycle up to last 12 billing cycle	——

TABLE 1(continued):

Measured Parameters	Units of Measurement
Apparent energy(UTL) per billing cycle up to last 12 billing cycle	KVAh
Apparent energy (UTL) cost per billing cycle up to last 12 billing cycle	——
Apparent energy(GEN) per billing cycle up to last 12 billing cycle	KVAh
Apparent energy (GEN) cost per billing cycle up to last 12 billing cycle	——
Active Demand (UTL) per zone of current date	KW
Reactive Demand (UTL) per zone of current date	KVAr
Apparent Demand (UTL) per zone of current date	KVA
Active Demand (UTL) per date up to last 31 days	KW
Active Demand (GEN) per date up to last 31 days	KW
Reactive Demand (UTL) per date up to last 31 days	KVAr
Reactive Demand (GEN) per date up to last 31 days	KVAr
Apparent Demand (UTL) per date up to last 31 days	KVA
Apparent Demand (GEN) per date up to last 31 days	KVA
Active Demand (UTL) per billing cycle up to last 12 billing cycle	KW
Active Demand (GEN) per billing cycle up to last 12 billing cycle	KW
Reactive Demand (UTL) per billing cycle up to last 12 billing cycle	KVAr
Reactive Demand (GEN) per billing cycle up to last 12 billing cycle	KVAr
Apparent Demand (UTL) per billing cycle up to last 12 billing cycle	KVA
Apparent Demand (GEN) per billing cycle up to last 12 billing cycle	KVA

TABLE 1(continued):

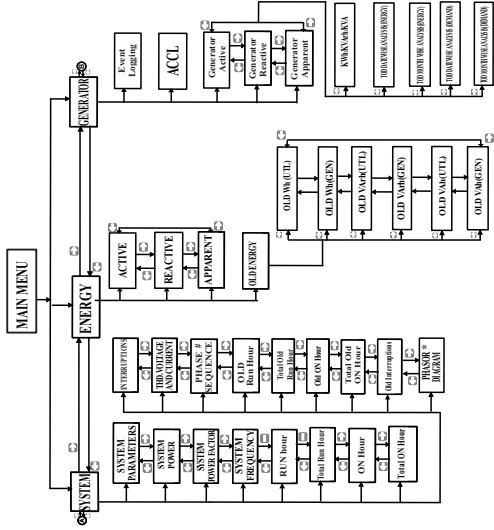| Measured Parameters	Units of Measurement
Old Active Energy(UTL&GEN)	KWh
Old Reactive Energy(UTL&GEN)	KVArh
Old Apparent Energy (UTL&GEN)	KVAh
Old Active demand (UTL&GEN)	KW
Old Reactive demand(UTL&GEN)	KVArh
Old Apparent demand(UTL&GEN)	KVAh
Old Current demand(UTL&GEN)	Amps

2. Measurement Reading Screens

In normal operation the user is presented with one of the measurement reading screens out of several screens. These screens from particular submenu may be scrolled through one at time in incremental order by touching the " ➡ key" and in decremental order by touching " ⬅ key" on that screen. Flowchart of measurement screen is shown on next page.

Old parameters:

The Old parameters shows old run hour, on hour, total run hour, total on hour, interruptions, active demand, reactive demand, VA demand, current demand, active energy(UTL&GEN), reactive energy(UTL&GEN), apparent energy(UTL&GEN). Previous values are not lost, when user reset parameter manually all the min max values of particular reset are stored in old parameters. Previous values will be overwritten when user reset the parameter next time.

Harmonic Analysis : When this option is selected from Power Quality menu, meter shows the graphical analysis of the harmonics selected in Setup -> Power Quality Setup -> Harmonic Setup L1/L2/L3. Harmonics are plotted considering fundamental as 100 %. When particular bar is touched, further details of that particular harmonic / fundamental are shown. User can view RMS values of voltage and current , voltage & current harmonic distortion % , kW / kVAR / k VA / PF (in 3p 4w /1p 2w) of that selected harmonic by using side arrow keys.
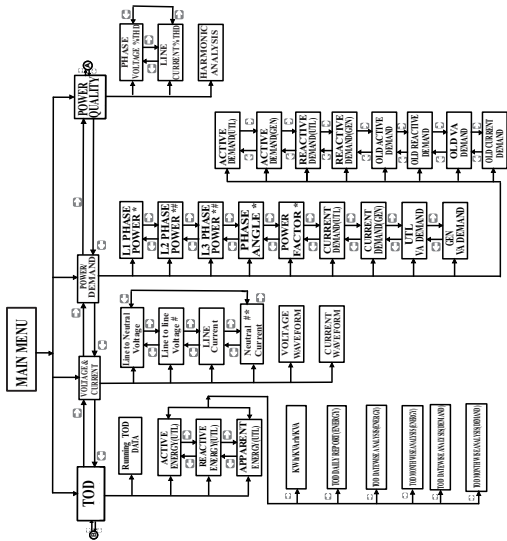
Measurement Parameter Screens

MAIN MENU

SYSTEM — ENERGY — GENERATOR

SYSTEM:
SYSTEM PARAMETERS → SYSTEM POWER → SYSTEM POWER FACTOR → SYSTEM FREQUENCY → RUN hour → Total Run Hour → ON Hour → Total ON Hour

INTERRUPTION → THD VOLTAGE AND CURRENT → PHASE # SEQUENCE → OLD Run Hour → Total Old Run Hour → Old ON Hour → Total Old ON Hour → Old Interruption → PHASOR * DIAGRAM

ENERGY:
ACTIVE → REACTIVE → APPARENT → OLD ENERGY

OLD Wh (UTL) → OLD Wh(GEN) → OLD Varh(UTL) → OLD Varh(GEN) → OLD Vah(UTL) → OLD Vah(GEN)

GENERATOR:
Event Logging → ACCL → Generator Active → Generator Reactive → Generator Apparent

KWh&KVarh&KVA → TODAY'S POWER ON &TODAY'S ENERGY(KWH) → TODAY'S POWER VAR &TODAY'S ENERGY(KVARH) → TODAY'S POWER VA &TODAY'S ENERGY(KVAH) → TODAY'S POWER PF &TODAY'S ENERGY(KWH/KVAH)

NOTE: SCREENS MARKED WITH * ARE AVAILABLE
IN 4W SYSTEM (NOT IN 3 WIRE SYSTEM)
SCREENS MARKED WITH # ARE NOT AVAILABLE IN 1PHASE 2 WIRE SYSTEM

13

MAIN MENU

TOD
- Running TOD DATA
- ACTIVE ENERGY(TOD)
- REACTIVE ENERGY(TOD)
- APPARENT ENERGY(TOD)
- KWH/KVAH/KVARH
- TOD DAILY REPORT OF ENERGY(s)
- TOD1 POWER (VA/KW/KVAR(s))
- TOD POWER/VA/A (S/D/R/A)(s)
- TOD R A POWER/VA/A (S/D/R/A/W)
- TOD POW/VA/A (S/D/R/A/W/D/MD)

VOLTAGE & CURRENT
- Line to Neutral Voltage
- Line to line Voltage #
- LINE Current
- Neutral #* Current
- VOLTAGE WAVEFORM
- CURRENT WAVEFORM

POWER DEMAND
- L1 PHASE POWER *
- L2 PHASE POWER *
- L3 PHASE POWER *
- PHASE ANGLE *
- POWER FACTOR *
- CURRENT DEMAND(UTL)
- CURRENT DEMAND(GN)
- UTL VA DEMAND
- GN VA DEMAND
- ACTIVE DEMAND(UTL)
- ACTIVE DEMAND(GN)
- REACTIVE DEMAND(UTL)
- REACTIVE DEMAND(GN)
- OLD ACTIVE DEMAND
- OLD REACTIVE DEMAND
- OLD VA DEMAND
- OLD CURRENT DEMAND

POWER QUALITY
- PHASE VOLTAGE %THD
- LINE CURRENT% THD
- HARMONIC ANALYSIS

NOTE: SCREENS MARKED WITH * ARE AVAILABLE

IN 4W SYSTEM (NOT IN 3 WIRE SYSTEM)

SCREENS MARKED WITH # ARE NOT AVAILABLE IN 1PHASE 2 WIRE SYSTEM

14

TOD:

Running TOD Data :This screens shows the running season, day type, day of week, running zone, running tarrif.

Daily report: This screens shows the zone wise energy , its applicable tariff rate, cost & demand of that zone in table format. The total energy accumulated for current day and related cost is also shown.

Daily Analysis : This screen shows the graphical trend of per date energy. Up to last 30 days data is shown. By touching on the bar , energy and cost of that date can be seen.

Monthly Analysis : This screen shows the graphical trend of energy per billing cycle. Up to last 12 billing cycle data is shown. By touching on the bar in graph, energy and cost of that month can be seen.

Demand TOD:

Date wise Analysis : This screen shows the graphical trend of per date Demand. Up to last 30 days data is shown. By touching on the bar, Demand of that date can be seen.

Monthly Analysis : This screen shows the graphical trend of Demand per billing cycle. Up to last 12 billing cycle data is shown. By touching on the bar in graph,Demand of that month can be seen.

2.1 Generator Event Logging:

No.	Date	Start	Stop	Duration
01	01/11/16	10:51	10:55	00:04
02	02/11/16	23:55	--:--	00:05
03	03/11/16	--:--	02:00	02:00
04	4/11/16	10:00	--:--	--:--

This screen shows the no. of generator event that instrument has detected with the timestamp of start time, stop time, duration of event. It will stamp the events on daily basis i.e. If generator is not stopping on that day then in next event it will again show the date, start time, stop time and duration if generator stops otherwise next log will be created. Instrument stores 20 daily event on FIFO basis.

For example on date 02/11/2016 if generator starts at 23.55 and it is continuously on till 00.00 then stop time will be --:-- and duration will be 00.05.if generator stops on next day at 02.00 then start time of next event will be --:-- and duration will be 02.00.

2.2 ACCL(Auto Connect Current Limiter):

ACCL screen is present in generator menu.Parameter Tab shows the selected parameter (Refer table 5).

Trip point tab shows the trip point percentage that user has entered in set up menu. according to the percentage of the nominal value of selected parameter reference value is calculated and it will be shown in the box with corresponding unit.

Current value shows the actual reading and its value in percentage

switch indicate the state of the relay.

ACCL	GEN
Parameter	CURRENT IL1
Trip Point	10.00 %	0.500 A
Current Value	20.00 %	1.000 A
Relay Trip		RESET
MAIN	GEN

After completing the no. of attempt that user has entered in set up menu, RESET button will be displayed on the screen for manual reset.for detail functioning of ACCL please refer 5.3.

2.3. Run Hour

RUN HOUR	UTL
UTILITY	
000001.20	Hrs
GENERATOR	
000001.19	Hrs
← MAIN SYSTEM →	
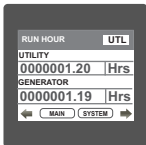
This Screen shows the no. of hours the load is connected Even if the Auxiliary supply is interrupted count of Run hour will be maintained in internal memory & displayed in the format "hours. min". Run hour of Utility and Generator are displayed sepearately. For example if Displayed count for generator is 000001.19 hrs it indicates 1 hours & 19 minutes.After 999999.59 run hours display will restart from zero.To reset run hour manually see section Resetting Parameter 3.2.5.1

2.4.Total Run Hour

TOTAL RUN HOUR	UTL
000002.39	
Hrs	
← MAIN SYSTEM →	

This Screen shows the total no. of hours the load is connected Even if the Auxiliary supply is interrupted count of Run hour will be maintained in internal memory & displayed in the format "hours. min".

2.5. ON Hour

| ON HOUR	UTL
UTILITY	
0000001.20	Hrs
GENERATOR	
0000001.19	Hrs
← MAIN SYSTEM →	
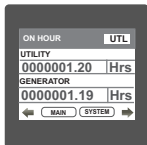
This Screen shows the no. of hours the Auxillary Supply is ON. Even if the Auxillary supply is interrupted count of On hour will be maintained in internal memory & displayed in the format "hours. min". On hour of Utility & Generator are displayed seperately. For example if Displayed count is 000001.20hrs it indicates 1 hours & 20 minutes. After 999999.59 On hours display will restart from zero. To reset On hour manually see section Resetting Parameter 3.2.5.1

2.6. Total On Hour

TOTAL ON HOUR	UTL
000002.39	
Hrs	
← MAIN SYSTEM →	

This Screen shows the total no. of hours the Auxillary Supply is ON. Even if the Auxillary supply is interrupted count of On hour will be maintained in internal memory & displayed in the format "hours. min".

2.7. Interruption

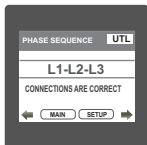| INTERRUPTIONS	UTL
UTILITY	
000012.00	
GENERATOR	
000005.00	
← MAIN SYSTEM →	
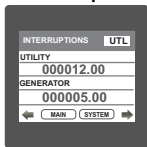
This Screen Displays the total no. of times the Auxillary Supply was Interrupted. Even if the Auxillary supply is interrupted count will be maintained in internal memory
To reset No of Interruption manually see section Resetting Parameter 3.2.5.1

2.8. Phase sequence

PHASE SEQUENCE UTL

ERROR

NOTE : WRONG PHASE SEQUENCE.
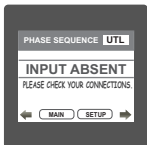PLEASE CHECK YOUR CONNECTIONS.

← MAIN SETUP →
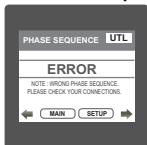
Phase Rotation Error screen

Meter shows phase rotation error if the phase sequence
R-Y-B (L1-L2-L3) is not maintained This screen indicates that
Phase sequence is incorrect. User must check this screen in order to get
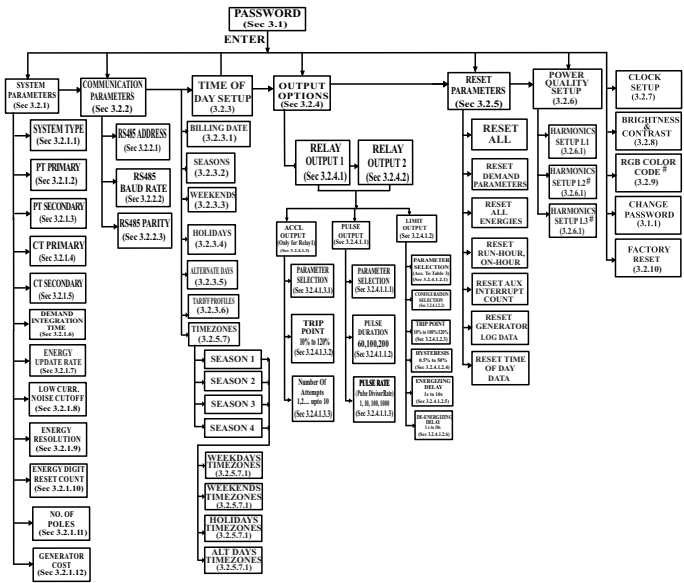correct readings When meter is connected.

PHASE SEQUENCE UTL

L1-L2-L3

CONNECTIONS ARE CORRECT

← MAIN SETUP →

Correct Phase sequence

This Screen indicates the phase sequence connected to
meter is correct.

PHASE SEQUENCE UTL

INPUT ABSENT

PLEASE CHECK YOUR CONNECTIONS.

← MAIN SETUP →

This Screen indicates that either of the phases or all three
phases (Voltages) are absent.

Setup Parameter Screens

PASSWORD (See 3.1)
ENTER

| SYSTEM PARAMETERS (See 3.2.1) | COMMUNICATION Parameters (See 3.2.2) | TIME OF DAY SETUP (3.2.3) | OUTPUT OPTIONS (See 3.2.4) | RESET PARAMETERS (See 3.2.5) | POWER QUALITY SETUP (3.2.6) | CLOCK SETUP (3.2.7) |

SYSTEM PARAMETERS (See 3.2.1)
- SYSTEM TYPE (See 3.2.1.1)
- PT PRIMARY (See 3.2.1.2)
- PT SECONDARY (See 3.2.1.3)
- CT PRIMARY (See 3.2.1.4)
- CT SECONDARY (See 3.2.1.5)
- DEMAND INTEGRATION TIME (See 3.2.1.6)
- ENERGY UPDATE RATE (See 3.2.1.7)
- LOW CURR. NOISE CUTOFF (See 3.2.1.8)
- ENERGY RESOLUTION (See 3.2.1.9)
- ENERGY DIGIT RESET COUNT (See 3.2.1.10)
- NO. OF POLES (See 3.2.1.11)
- GENERATOR COST (See 3.2.1.12)

COMMUNICATION Parameters (See 3.2.2)
- RS485 ADDRESS (See 3.2.2.1)
- RS485 BAUD RATE (See 3.2.2.2)
- RS485 PARITY (See 3.2.2.3)

TIME OF DAY SETUP (3.2.3)
- BILLING DATE (3.2.3.1)
- SEASONS (3.2.3.2)
- WEEKENDS (3.2.3.3)
- HOLIDAYS (3.2.3.4)
- ALTERNATE DAYS (3.2.3.5)
- TARIFF PROFILES (3.2.3.6)
- TIMEZONES (3.2.5.7)
  - SEASON 1
  - SEASON 2
  - SEASON 3
  - SEASON 4
    - WEEKDAYS TIMEZONES (3.2.5.7.1)
    - WEEKENDS TIMEZONES (3.2.5.7.1)
    - HOLIDAYS TIMEZONES (3.2.5.7.1)
    - ALT DAYS TIMEZONES (3.2.5.7.1)

OUTPUT OPTIONS (See 3.2.4)
- RELAY OUTPUT 1 (See 3.2.4.1)
- RELAY OUTPUT 2 (See 3.2.4.2)

RELAY OUTPUT 1 (See 3.2.4.1)
- ACCL OUTPUT (Only for Relay) (See 3.2.4.1.3)
  - PARAMETER SELECTION (See 3.2.4.1.3.1)
  - TRIP POINT 10% to 120% (See 3.2.4.1.3.2)
  - Number Of Attempts 1,2..... upto 10 (See 3.2.4.1.3.3)
- PULSE OUTPUT (See 3.2.4.1.1)
  - PARAMETER SELECTION (See 3.2.4.1.1.1)
  - PULSE DURATION 60,100,200 (See 3.2.4.1.1.2)
  - PULSE RATE (Pulse Divisor Rate) 1, 10, 100, 1000 (See 3.2.4.1.1.3)
- LIMIT OUTPUT (See 3.2.4.1.2)
  - PARAMETER SELECTION (See 3.2.4.1.2.1) Acc. To Table)1
  - CONFIGURATION SELECTION (See 3.2.4.1.2.2)
  - TRIP POINT 10% to 100%/120% (See 3.2.4.1.2.3)
  - HYSTERESIS 0.5% to 50% (See 3.2.4.1.2.4)
  - ENERGIZING DELAY 1s to 10s (See 3.2.4.1.2.5)
  - DE-ENERGIZING DELAY 1 s to 10s (See 3.2.4.1.2.6)

RESET PARAMETERS (See 3.2.5)
- RESET ALL
- RESET DEMAND PARAMETERS
- RESET ALL ENERGIES
- RESET RUN-HOUR, ON-HOUR
- RESET AUX INTERRUPT COUNT
- RESET GENERATOR LOG DATA
- RESET TIME OF DAY DATA

POWER QUALITY SETUP (3.2.6)
- HARMONICS SETUP L1 (3.2.6.1)
- HARMONICS SETUP L2# (3.2.6.1)
- HARMONICS SETUP L3# (3.2.6.1)

CLOCK SETUP (3.2.7)
- BRIGHTNESS CONTRAST (3.2.8)
- RGB COLOR CODE # (3.2.9)
- CHANGE PASSWORD (3.1.1)
- FACTORY RESET (3.2.10)

NOTE: SCREENS MARKED WITH # ARE NOT AVAILABLE IN 1PHASE 2 WIRE SYSTEM

3. Programming

The following sections comprise step by step procedures for configuring the instrument for individual user requirements.

To access the set-up screens touch on the " ⚙ SETUP " icon in Main Menu. This will take the User into the Password Protection Entry Stage(Section 3.1).

3.1. Password Protection

Password protection can be enabled to prevent unauthorised access to set-up screens, by default password is "0000".

Password protection is enabled by selecting any four digit number.

SETUP			
ENTER PASSWORD			
1	2	3	DEL
4	5	6	ENTER
7	8	9	
0		BACK	

After touching " ⚙ SETUP " icon Password protection screen is displayed. Screen consists of 0 to 9 digit input keypad for entering the password very similar to any calculator in touchscreen mobile. "Enter Password" is displayed on screen at start so that user can enter password using displayed keypad.

Touching " 1 key" will display 1 in display area, similarly user can enter remaining 3 digits.

For deleting any digit while entering password, user can touch " DEL key".

After entering the complete password user needs to confirm password by touching " ENTER key".

Password confirmed.

If Entered password is correct then "Password Accepted" is displayed & user will enter into setup menu.

Password Incorrect.

If Entered password is wrong then "Password Rejected" is displayed & user need to re-enter the password.

After wrong password is entered, user needs to touch " ENTER key" for trying another password.

3.1.1 Change Password

```
SETUP
ENTER CURRENT PASSWORD
1  2  3  DEL
4  5  6
7  8  9  ENTER
0     BACK
```

Change Password Option is the 10th option in list of "SETUP" submenu, so can be accessed by a simple touch anywhere in " Change Password" row.
In this screen user first needs to enter the current password.

```
SETUP
ENTER NEW PASSWORD
1  2  3  DEL
4  5  6
7  8  9  ENTER
0     BACK
```

After input of correct password,"PASSWORD ACCEPTED"is displayed & now user can enter the new 4 digit password.

```
SETUP
PASSWORD CHANGED
1  2  3  DEL
4  5  6
7  8  9  ENTER
0     BACK
```

New Password confirmed.

After entering new password user needs to touch " ENTER key" to confirm.

After confirming "PASSWORD CHANGED" is displayed on screen, which ensures successful changing of the password.

3.2 Menu selection.

After entering in the SUBMENU 8 - SETUP, user will be asked to enter password & after input of correct password list of following parameters will be displayed on screen :-

   3.2.1 SYSTEM PARAMETERS

   3.2.2 COMMUNICATION PARAMETERS

Touching on SYSTEM PARAMETER will open the system parameters list screen.Then these screens from particular parameter may be scrolled through one at a time in incremental order by touching the " ➡ key" and in decremental order by touching " ⬅ key" on given touch screen.

3.2.1 System Parameters Selection

After entering in the "SYSTEM PARAMETERS", List of following parameters will be displayed :-

3.2.1.1 SYSTEM TYPE
3.2.1.2 PT PRIMARY(L-L)
3.2.1.3 PT SECONDARY(L-L)
3.2.1.4 CT PRIMARY
3.2.1.5 CT SECONDARY
3.2.1.6 DEMAND INTEGRATION TIME

3.2.1.7 ENERGY UPDATE RATE
3.2.1.8 LOW CURRENT NOISE CUTOFF
3.2.1.9 ENERGY RESOLUTION
3.2.1.10 ENERGY DIGIT RESET COUNT
3.2.1.11 NUMBER OF POLES
3.2.1.12 GENERATOR TARIFF RATE

3.2.1.1 System Type

This screen is used to set the system type . Two types: 3 phase 3 wire & 3 phase 4 wire system are displayed on screen. Touching radio button in front of particular type will select that type. Touch on " (OK) key" will confirm the system type. Touching the " (BACK) key" will keep the old selected setting and will return to previous menu.

Note : If system type is changed from 3 phase 4 wire to 3 phase 3 wire , relay parameter selection will be set to NONE.

Note :In case of 1 Phase 2 Wire, User cannot change the System type.

3.2.1.2 Potential Transformer Primary Value

The nominal full scale voltage will be displayed as Line to Line Voltages for all system types.

This screen can be accessed only from system parameters list menu. Here again 0 to 9 digit input keypad is provided to set value of PT Primary, & user can confirm this value with a simple touch "ENTER key". "K key" is used to multiply value by 1000.

In case presently displayed Potential Transformer Primary value together with the Current Transformer Primary value, previously set, would result in a maximum power of greater than 666.6 MVA per phase,"Invalid value" will be displayed. Then the valid range will be displayed.

Valid range of PT primary setting value is from **100 VL-L to 692.8 KVL-L.** If value outside the range is entered, It will display "INVALID VALUE" followed by correct range of parameter.

Note : Setting PT primary value will reset all TOD data & all energies.

While setting PT primary value if auxiliary supply gets off, reset TOD data after auxiliary supply gets on from reset parameter menu. Same is applicable for CT primary value also.

3.2.1.3 Potential Transformer secondary Value

The value must be set to the nominal full scale secondary voltage which will be obtained from the the Transformer when the potential transformer(PT)primary is supplied with the voltage defined in 3.2.1.2 potential transformer primary voltage. The ratio of full scale primary to full scale secondary is defined as the transformer ratio.

This screen can be accessed only from system parameters list menu. Here again 0 to 9 digit input keypad is provided to set value of PT Secondary, & user can confirm this value with a simple touch on "ENTER key".

Valid range of PT secondary setting value is from 100 to 500.0 VL-L. If value outside the range is entered, It will display "INVALID VALUE" followed by correct range of parameter.

Note : Setting PT secondary value will reset main energy.

3.2.1.4 Current Transformer Primary Value

The nominal Full Scale Current that will be displayed as the Line currents. This screen enables the user to display the Line currents inclusive of any transformer ratios, the values displayed represent the Current in Amps.

In case presently displayed Current Transformer Primary Value together with the Potential Transformer Primary Value results in a maximum power of greater than 666.6 MVA, "INVALID VALUE" will be displayed. Example:

If primary value of PT is set as 692.8kV L-L (max value) then primary value of Current is restricted to 1157A.

The "Maximum Power" restriction of 666.6 MVA refers to 120% of nominal current and 120% of nominal voltage, i.e, 462.96 MVA nominal power per phase. Valid range of CT primary setting value is from 1 to 9999. If value outside the range is entered, It will display "INVALID VALUE" followed by correct range of parameter.

Note : Setting CT primary value will reset all TOD data & all energies.

3.2.1.5 Current Transformer Secondary Value
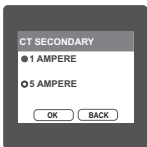
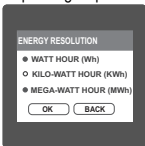This screen is used to set the secondary value for Current Transformer. Two options: 1 AMPERE & 5 AMPERE are displayed on screen. Touching radio button in front of particular option will select that option. Touch on " OK key" will confirm the setting. Touching the " BACK key" will keep the old selected setting and will return to previous menu.

CT SECONDARY
● 1 AMPERE
○ 5 AMPERE

[OK] [BACK]

Note : Setting CT Secondary value will reset main energy.

3.2.1.6 Demand Integration Time

This screen is used to set the period over which current and power readings are to be integrated. Four options: 8, 15, 20, 30 Minutes are displayed on screen. Touching radio button in front of particular option will select that option.

3.2.1.7 Energy update rate
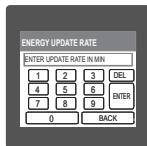
This screen allows user to enter energy update rate in min.

After entering particular value in min. the energy will be updated on modbus location from 30145 to 30153 of 3X register as per value that user has entered.

```
ENERGY UPDATE RATE
ENTER UPDATE RATE IN MIN
 1    2    3    DEL
 4    5    6    ENTER
 7    8    9
      0       BACK
```

User can set value from 1 min to 60 min. If user enters value more than 60 min. then "INVALID VALUE" will be displayed and valid band will be shown.

Touching the "BACK" key" will keep the old selected setting and will return to previous menu.

For example user has entered 2 min as energy update rate. then after every 2 min, energy counts will be updated on modbus.

Note:If update rate is changed then Modbus energy will be reset.

3.2.1.8 Low Current noise cutoff.

This screen allows the user to set Low noise current cutoff in mA.

```
LOW CURR NOISE CUTOFF
● 0 MILLI-AMPERE
○ 30 MILLI-AMPERE

   OK      BACK
```

Two options, 0 MILLI-AMPERE & 30 MILLI-AMPERE are displayed on screen. Touching radio button in front of particular option will select that option.

Touch on "OK" key" will confirm the setting.

Touching the "BACK" key" will keep the old selected setting and will return to previous menu.

3.2.1.9 Energy Resolution:

This screen enable user to set energy resolution in terms of Wh / kWh / MWh depending as per the user's requirement .This setting is applicable for all types of energy.

Three options: WATT HOUR, KILO-WATT HOUR & MEGA-WATT HOUR are displayed on screen. Touching radio button in front of particular option will select that option. If (PT primary * CT primary * Root3) > 30000 KW then two options: KILO-WATT HOUR & MEGA-WATT HOUR are displayed on screen.

Note : Default value is set to 'WATT HOUR' i.e. Energy resolution will be in terms of Wh / VARh / Vah respectively .
If energy resolution is changed then energy counter will be reset to zero.

3.2.1.10 Energy Digit Reset Count (Rollover Count)
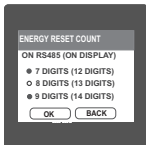
This screen enables the user to for setting maximum energy count after which energy will roll over to zero.This setting is applicable for all types of energy in 3X register on MODBUS will roll over to zero.The roll over count in 3X register on MODBUS is 5 digts.The values inside the brackets show rollover count for energy on display.

Note:If Energy Reset count is changed then energy counter will be reset to zero.

3.2.1.11 No. Of Poles

NO. OF POLES	
○ 2 ● 12 ● 22 ● 32	
● 4 ● 14 ● 24 ● 34	
● 6 ● 16 ● 26 ● 36	
● 8 ● 18 ● 28 ● 38	
● 10 ● 20 ● 30 ● 40	
OK	BACK
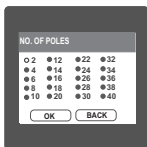
This screen enable user to set Number of poles depending as per the user's requirement .even no. of poles can be selected from 2 to 40 range.Touching radio button in front of particular option will select that option.

3.2.1.12 Generator Tariff Rate

GENERATOR TARIFF RATE			
ENTER TARIFF RATE			
1	2	3	DEL
4	5	6	ENTER
7	8	9	
	0	BACK	
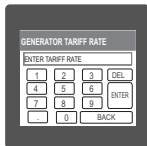
This screen enable user to set tariff rate for generator energy.user can set tariff rate from 0.001 to 299.If value outside this range is entered,it will display "INVALID VALUE"followed by correct range parameter.

3.2.2 Communication Parameter Selection

After entering in the "COMMUNICATION PARAMETERS" list of following parameters
will be displayed

> 3.2.2.1 RS485 ADDRESS
> 3.2.2.2 Rs485 BAUD RATE
> 3.2.2.3 Rs485 PARITY

3.2.2.1 RS 485 Address Setting

This screen applies to the RS 485 output only. This screen allows
the user to set RS485 address parameter for the instrument.
This screen can be accessed only from Communication
Parameters List menu.

The range of allowable address is 1 to 247.

If value outside the range is entered, it will display "INVALID VALUE"
followed by the correct range of parameter.

3.2.2.2 RS 485 Baud Rate

This screen allows the user to set Baud Rate of RS 485 port. Four options: 4800, 9600, 19200,
38400 Bauds are displayed on screen. Touching radio button in front of particular option will
select that option.

3.2.2.3 RS 485 Parity & Stop bit Selection

This screen allows the user to set Parity & number of stop bits. Four options: ODD PARITY WITH
ONE STOP BIT, NO PARITY WITH ONE STOP BIT, NO PARITY WITH TWO STOP BITS,
EVEN PARITY WITH ONE STOP BIT are displayed on screen. Touching radio button in front of
particular option will select that option.

3.2.3 Time Of Day Setup

Time Of Day Setup options allows easy configuration of TOD module Every time when this option is selected it will pop up a message to ask user to verify date & time. It will ask user if he wants to set date & time. When pressed yes user will be directed to clock setup. Pressing no will continue to Time Of Day setup.

Time Of Day :

Time-of-day metering is a rate option that is offered by many utilities. When elected by the customer, a meter that records time, and energy usage is installed in place of the existing electrical meter. The metering option benefits utility companies by decreasing the required capacity and customers by providing reduced demand and usage rates during off-peak times, which gives customers a chance to reduce their utility bill. The meter offers a flexible tariff structure. This feature provides a useful way of following different tariff structures during different times of the day for different seasons.

The Time of Day module compares meter's internal clock with the season ,day and time of day settings in these registers and determines applicable rate.

Seasons, Profiles, Timezone, Type of day

Seasons:
A year can be programmed for max. of 4 seasons. Each day of season can be assigned different profiles. start date of the season is to be entered. This will be active until next season starts.

Type of Day: it defines the day types used in module
Type are weekdays, weekends, holidays, alternate days.

Weekdays :
This register defines the days of the week for all seasons. the rates in the seasons (1,2,3,4) weekday timezone setup registers are used on these days.

Weekend:
This register defines the weekend days for all seasons. the rates in the season (1,2,3,4) weekend timezone setup registers are used on these days.

Holidays :
Holidays have higher priority than other day types. A max. of 30 holidays can be selected. the rates defined in the season(1,2,3,4) holiday timezone set up registers are used on these days.

Alternate days :
these days generally have different rates from weekdays, weekends, holidays. alternate day can be assigned a separate profile. maximum 30 alternate days can be selected.

Tariff Profiles:
Daily profile contains the tariff rates for particular zones, maximum 4 tariff can be programmed

Timezones:
A day can be divided into maximum 6 timezones as per tariff rate. The number and timing of these TOD timezones are programmable.

3.2.3.1 Billing date selection

BILLING DATE

ENTER DATE

1	2	3	DEL
4	5	6	
7	8	9	ENTER
0		BACK	
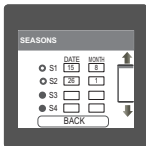
User can configure billing date. before billing date selection user will get confirmation screen asking for all TOD data reset. billing cycle will take place according to configured date.
For example, User has selected
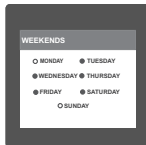billing date as 5, then billing cycle will takes place from 5 August to 4 September.

Note: After changing of billing date all TOD data will be reset.

3.2.3.2 Seasons

SEASONS

	DATE	MONTH
O S1	15	8
O S2	26	1
O S3		
O S4		
BACK		

In seasons, user can define maximum 4 season for 12 months. By selecting radio button and entering valid date and month, seasons can be define. All the seasons must be in sequential order. Start date of the season is to be entered. This is will be active until the next season starts. At least 1 season must be selected for proper functioning of TOD module.

3.2.3.3 Weekends selection

WEEKENDS

O MONDAY ● TUESDAY

● WEDNESDAY ● THURSDAY

● FRIDAY ● SATURDAY

O SUNDAY

Select weekend by selecting the radio button(dark circle) in front of the day. These days will be considered as weekends for all seasons

3.2.3.4 Holidays selection

Any day can be assigned as a holiday. Holidays can have separate profile structure than other type of days. Maximum 30 holidays can be selected. To select holiday first activate holiday by touching radio button. Then touch on box to enter date and month.

3.2.3.5 Alternate days selection

Any day can be assigned as a Alternate day. Alternate days can have separate profile structure than other type of days. Maximum 30 Alternate days can be selected. Care must be taken that date which is set as alternate day should not be configure in any other day or vice versa.

3.2.3.6 Tariff Profiles

Profile contain a tariff rate that can be assign to particular timezone. Max 4 profile rate can be assign. User can assign profile rate for P1, P2, P3 & P4 between 0.001 to 299.0.

3.2.3.7 Timezones

TIMEZONES FOR

- SEASON 1
- SEASON 2
- SEASON 3
- SEASON 4

TOD SETUP

Time zone window shows the seasons which are selected. In time zone user can assign a time zone period at which different tariff profile are applicable.

3.2.3.7.1 Weekdays / Weekends / Holidays / Alternate days Timezones

SEASON 1 TIMEZONES

- WEEKDAYS TIMEZONES
- WEEKENDS TIMEZONES
- HOLIDAYS TIMEZONES
- ALT DAYS TIMEZONES

TOD SETUP

User can assign different timezone,tariff profile rate for different day types in each season. User can enter time zones for 4 types of day
Weekdays
Weekends
Holidays
Alternate days

WEEKDAYS TIMEZONES

	HOUR	MINUTE	PROFILE
T1	00	00	P1
T2	06	30	P2
T3	10	45	P2
T4	19	06	P2

BACK
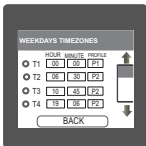
User should ensure that time zones and profile rate are assigned to all selected seasons and day types. The timezones for the day must be in sequential order and must not overlap. Minium 1 and maximum 6 time zones can be configured. For timezone1 the default time is assigned as 00:00. User has to select a profile rate for it.

Note: When using TOD module it is recommended to set energy resolution in KWh.

3.2.4. Output Option selection menu

After entering in the "OUTPUT OPTIONS", List of following parameters will be displayed :-

3.2.4.1 RELAY-1

3.2.4.2 RELAY-2

3.2.4.1 Relay 1 output selection menu

RELAY-1
- ● PULSE OUTPUT
- ○ LIMIT OUTPUT
- ● ACCL

OUTPUT OPTION

This screen applies to the Relay1 Output option Selection .
Three options : PULSE OUTPUT,LIMIT OUTPUT,ACCL displayed on screen. Touching any option will open screens of parameters related to that option.
Touch on " OUTPUT OPTION key" will take back to Output Options screen.

3.2.4.1.1 Pulse output

After entering in the "PULSE OUTPUT", List of following parameters will be displayed :-
3.2.4.1.1.1 ENERGY
3.2.4.1.1.2 PULSE DURATION
3.2.4.1.1.3 PULSE RATE
These settings are used to assign Relay1 in Pulse output mode.

3.2.4.1.1.1 Assignment of Energy to pulse output (Relay 1) :

This screen allows the user to assign energy to pulse output (for Relay 1)

```
RL-1 ENERGY ASSIGN.
○ ACTIVE ENERGY UTILITY
● ACTIVE ENERGY GENERATOR
● REACTIVE ENERGY UTILITY
● REACTIVE ENERGY GENERATOR
● APPARENT ENERGY UTILITY
● APPARENT ENERGY GENERATOR
   OK        BACK
```
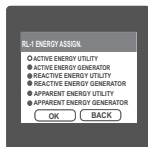
Following six options are displayed:-

Active Energy(Utility)   Reactive Energy (Generator)
Active Energy (Generator)   Apparent Energy (Utility)
Reactive Energy (Utility)   Apparent Energy (Generator)

Touching radio button in front of any particular option will select that option.
Touch on " OK key" will confirm the setting.

Touching the " BACK key" will keep the old selected setting and will return to previous menu.

3.2.4.1.1.2 Pulse Duration Selection:

This screen applies only to the Pulsed output mode of both the relays.

```
RL-1 PULSE DURATION
○ 60 MILLI-SECONDS
● 100 MILLI-SECONDS
● 200 MILLI-SECONDS
   OK        BACK
```

This screen allows the user to set Relay energisation time in milliseconds. Three options: 60, 100, 200 ms are displayed on screen. Touching radio button in front of particular option will select that option.

Touch on " OK key" will confirm the setting.

Touching the " BACK key" will keep the old selected setting and will return to previous menu.

3.2.4.1.1.3 Pulse Rate

This screen applies only to the Pulsed output mode of both the relays.

```
RL-1 PULSE RATE DIVISOR
● 1          ○ 100
● 10         ● 1000
   OK        BACK
```

The screen allows user to set the energy pulse rate divisor. Divisor values can be selected through 1,10, 100,1000.Touching radio button in front of particular value will select that value.

Touch on " OK key" will confirm the setting.

Touching the " BACK key" will keep the old selected setting and will return to previous menu.
Pulse rate divisor is set to 1, when Energy Resolution is set to kWh or Mwh Refer table 3.

3.2.4.1.2 Limit output

This screen is for Limit output mode selection. It allows the user to set Limit output corresponding measured value. After entering in Limit Output first time(was disabled previously), only "PARAMETER:" is displayed on screen. Now a simple touch on "PARAMETER:" will open list of parameters, Refer Table 4 "Parameter for Limit output" for assignment.

Now after assignment of any parameter, list of following setting parameters will be displayed:-

 3.2.4.1.2.1 PARAMETER
 3.2.4.1.2.2 CONFIGURATION
 3.2.4.1.2.3 TRIP POINT
 3.2.4.1.2.4 HYSTERESIS POINT
 3.2.4.1.2.5 ENERGIZING DELAY
 3.2.4.1.2.6 DE-ENERGIZING DELAY

3.2.4.1.2.1 Limit Parameter selection

This option allows the user to set Relay-1 limit to corresponding measured parameter. A simple touch on "PARAMETER" row will open screen having list of parameters. (Refer Table 4 "Parameters for limit output") . Touch on "⌐OK⌐key" will confirm the setting.

Touching the "⌐BACK⌐ key" will keep the old selected setting and will return to previous menu.

3.2.4.1.2.2 Limit1 Configuration select

This screen is used to set the Limit1 Configuration, four different types of configuration can be selected

HIGH ALARM & ENERGIZED RELAY
HIGH ALARM & DE-ENERGIZED RELAY
LOW ALARM & ENERGIZED RELAY
LOW ALARM & DE-ENERGIZED RELAY
(For detail refer to section 5.2)

Touching radio button in front of particular type will select that type.

Touch on "⌐OK⌐ key" will confirm the setting.

Touching the "⌐BACK⌐ key" will keep the old selected setting and will return to previous menu.

3.2.4.1.2.3 Trip point selection

This screen applies to the Trip point selection.

```
RELAY-1 TRIP POINT
ENTER TRIP POINT IN %
1   2   3   DEL
4   5   6   ENTER
7   8   9
0       BACK
```

This screen allows the user to set Trip point for instrument in %.
This screen can be accessed only from Limit Output settings list menu.
Here a 0 to 9 digit input keypad is provided to set value of Trip Point,
& user can confirm this value with a simple touch on " ENTER key."

" BACK key" is used to go back to Limit Output list menu.

The allowable range is from 10% to 120% for High Alarm & is from
10% to 100% for Low Alarm. For detail refer table 4.
If value outside this range is entered, it will display "INVALID VALUE"
followed by correct range of parameter.

3.2.4.1.2.4 Hysteresis selection

This screen applies to the Hysteresis selection.

```
RELAY-1 HYSTERISIS
SET HYSTERISIS IN %
1   2   3   DEL
4   5   6   ENTER
7   8   9
0   K   BACK
```

This screen allows the user to set Hysteresis in % for relay1.
This screen can be accessed only from Limit Output settings list menu.
Here a 0 to 9 digit input keypad is provided to set value of Hysteresis,
& user can confirm this value with a simple touch on " ENTER key".

" BACK key" is used to go back to Limit Output list menu.

The allowable range is 0.5% to 50 % of Trip point .
If value outside this range is entered, it will display "INVALID VALUE"
followed by correct range of parameter.

3.2.4.1.2.5 Energizing Delay time.

This screen allows the user to set Energizing Delay time for Relay 1
Limit Assigned Parameters .

This screen can be accessed only from Limit Output settings list menu.
Here a 0 to 9 digit input keypad is provided to set value of Delay, &
user can confirm this value with a simple touch on "ENTER key."

" BACK key" is used to go back to Limit Output list menu.

The allowable range is from 1 to 10 sec.
If value outside this range is entered, it will display "INVALID VALUE"
followed by correct range of parameter.

3.2.4.1.2.6 De-Energizing Delay time

This screen allows the user to set De-Energizing Delay time for Relay 1 Limit Assigned Parameters .

This screen can be accessed only from Limit Output settings list menu.
Here a 0 to 9 digit input keypad is provided to set value of Delay, & user can confirm this value with a simple touch on " ENTER key."

" BACK key" is used to go back to Limit Output list menu.

The allowable range is from 1 to 10 sec.
If value outside this range is entered, It will display "INVALID VALUE" followed by correct range of parameter.

3.2.4.1.3 ACCL

This screen is for ACCL output mode selection. It allows the user to set ACCL output corresponding measured value. After entering in ACCL Output first time(was disabled previously), "PARAMETER:" is displayed on screen. Now a simple touch on "PARAMETER:" will open list of parameters, Refer Table 5"Parameter for ACCL output" for assignment.
Now after assignment of any parameter, list of following setting parameters will be displayed:-
3.2.4.1.3.1 PARAMETER
3.2.4.1.3.2 TRIP POINT
3.2.4.1.3.3 NO. OF ATTEMPT

3.2.4.1.3.2 Trip point selection

This screen applies to the Trip point selection.

ACCL TRIP POINT

ENTER TRIP POINT IN %

| 1 | 2 | 3 | DEL |
4	5	6	ENTER
7	8	9	
0		BACK	

This screen allows the user to set Trip point for instrument in %. This screen can be accessed from ACCL Output settings list menu.

Here a 0 to 9 digit input keypad is provided to set value of Trip Point, & user can confirm this value with a simple touch on " ENTER key."

" BACK key" is used to go back to ACCL Output list menu.

The allowable range is from 10% to 120% ,If value outside this range is entered,it will display "INVALID VALUE"followed by correct range parameter.

3.2.4.1.3.3 No. of attempt selection

ACCL NO. OF ATTEMPT

- 1   - 6
- 2   - 7
- 3   - 8
- 4   - 9
- 5   - 10

OK   BACK
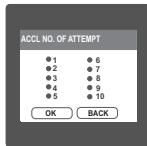
This screen enable user to set Number of attempts as per the user's requirement .user can select the no. of attempt from 1 to 10.Touching radio button in front of particular option will select that option.

3.2.4.2 Relay 2 Output Selection

Configuration of Relay 2 for Pulse or Limit Output is same as Relay 1. If you Select the Pulse output option for Relay 1 same setting will be applicable for Relay 2 except assignment of energy to Pulse output (i.e. Energy assignment of both relay can be different.)
Note: Relay 2 cannot be configured for ACCL

3.2.5 Reset Parameter Selection

After entering in the "RESET PARAMETERS", List of following parameters will be displayed :-

RESET ALL
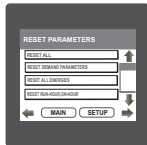RESET DEMAND PARAMETERS
RESET ALL ENERGIES
RESET RUN-HOUR, ON-HOUR
RESET AUX INTERRUPT COUNT
RESET GENERATOR LOG DATA
RESET TIME OF DAY DATA

3.2.5.1 Resetting Parameter

These screens allow the users to reset all the parameters
eg:- Energy, Demand, Run hour, On hour, No. of Interrupts,
Generator log data, TOD Data.Touching " ⬇ down" key scrolls list in
upward direction.

For resetting specific parameter user can touch on that parameter.

Touching on any parameter will display the confirmation dialog, now
a touch on " YES key" will confirm the resetting of that particular
Parameter.
Touching on " NO key" will move back to Reset parameters menu
For example resetting All Energies will display a confirmation
dialog as shown in the screen beside.

User can reset other parameters in similar manner. Resetting Generator
Log Data will reset all events in generator log.

**Note: While resetting any parameter if auxiliary supply gets off, reset that parameter again
after auxiliary supply gets on.**

3.2.6 Power Quality Setup

POWER QUALITY SETUP

HARMONICS SETUP L1

HARMONICS SETUP L2

HARMONICS SETUP L3

MAIN   BACK

In power quality setup, user can enter the harmonic no which user want to observe for each phase.

3.2.6.1 Harmonics Setup

HARMONICS SETUP L1

A	03	D	09
B	05	E	11
C	07	F	13

BACK
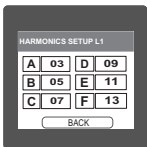
In harmonic setup, user can define the order of harmonics that user want to observe for each phase. Maximum 6 different harmonics number can be configured at a time. For setting of harmonic, touch on the rectangle and enter the number. Valid range for harmonic no is from 2 to 56. Entering wrong value will display "INVALID VALUE" and will show the valid range.

3.2.7 Clock Setup

User can set the date and time through this window. By touching the on date, month, year, hour and minute, keypad will pop up and user can enter the date and time through it.

Note: Changing date, month, year All TOD data will get reset.

DATE AND TIME SETUP		
DATE	MONTH	YEAR
11	08	2016
HOUR	MINUTE	
11	43	

MAIN   SETUP

3.2.8 Brightness & Contrast

The brightness & contrast of the TFT LCD screen can be varied by the user by sliding the sliders. Touching the " OK key" will confirm the current brightness contrast setting.

Touching the DEFAULT key will set brightness and contrast as per factory settings. Touching the BACK key will move back to the setup menu without making any changes.

BRIGHTNESS-CONTRAST

BRIGHTNESS

CONTRAST

DEFAULT   OK   BACK

3.2.9 RGB Color Code
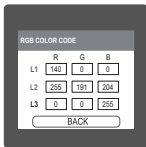
This screen allows user to set the values of Red, Green and Blue components of colors used to display the parameters of all three phases. Different colors can be assigned to each phase by using combination of Red, Green and Blue component values. L1,L2,L3 will be set to the assigned color.

To set these values, touch the corresponding rectangular section, 0 to 9 digit input keypad will appear. After entering the value using this keypad, user can confirm this value with a simple touch on "ENTER key".

"BACK key" is used to go back to previous screen.

The allowable range for these values is 0 to 255. If a value outside this range is entered, it will display "VALID RANGE IS : 0 to 255".

Note : Colors similar to background color are not recommended.

TABLE 2 : Standard color combinations

COLOR	R	G	B
Black	0	0	0
Blue	0	0	255
Brass	181	166	66
Bronze	204	128	51
Brown	166	41	41
Copper	184	115	51
Dark Blue	0	0	140
Dark Brown	102	66	33
Dark Green	0	51	33

COLOR	R	G	B
Dark Pink	232	84	128
Dark Purple	48	26	51
Dark Red	140	0	0
Dark Violet	148	0	212
Dark Yellow	156	135	13
Gold	212	176	56
Gray	128	128	128
Green	0	255	0
Indigo	74	0	130

COLOR	R	G	B
Light Blue	173	217	230
Maroon	176	48	97
Pink	255	191	204
Purple	161	33	240
Red	255	0	0
Silver	191	191	191
Violet	143	0	255
White	255	255	255
Yellow	255	255	0

3.2.10 Factory Reset

Factory reset option resets all the stored data to its default value.
After factory reset meter will restart automatically with default setup values.

Note: Do not interrupt auxiliary supply while factory reset is in process.
If auxiliary supply gets interrupted when factory reset is in process, do the factory reset again when auxiliary supply gets ON.

4. Touch screen calibration

This instrument is able to perform calibration to ensure the proper operation of the units touch screen functionalities. The calibration procedure will correct the problem of out of tolerance touch screen malfunction. Note that errors corrected by this calibration procedure are specific only to touch screen operation.


IMPORTANT.
Performing touch
screen calibration.
Press & hold the center
of the filled circle

Touch screen to
continue.

For starting touch screen calibration, touch the screen any where for 1 sec at system reset. After that touch screen calibration will start & the message shown besides will be displayed. Touch the screen to continue.

Press
on the filled
circle

Hold
the filled
circle



Release
the filled
circle

Follow the instructions displayed. Press & hold the center of the filled red circle for at least 2 seconds. Release when message for release is being displayed. For accurate results try to touch the center of the filled circle.

Press
on the filled
circle

Repeat the same procedure for the remaining 3 corner circles.

Hold screen for 1 sec
after system reset to
REPEAT the calibration
procedure.

Touch screen to
continue.
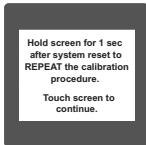
After successful calibration, the message shown besides would be displayed. Touch the screen to continue.

Error in calibration Touch screen to re-calibrate.
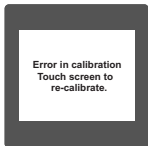
If the touch screen was not calibrated properly, "Error in calibration"message would be shown & the user will be asked to recalibrate the touch screen. In such case the meter will retain the previously stored touch - screen calibration values unless a successful calibration is being performed.

5. Relay output (Optional)   :

This instrument is provided with either 1 or 2 relay for pulse output,limit switch,ACCL

5.1 Pulse Output :

Pulse output is the potential free, very fast acting relay contact which can be used to drive an external mechanical counter for energy measurement.
This instrument's pulse output can be configured to any of the following parameter through setup parameter screen

1) Active Energy (UTL)
2) Active Energy (GEN)
3)Reactive Energy (UTL)
4)Reactive Energy (GEN)
5)Apparent Energy (UTL)
6)Apparent Energy(GEN)

TABLE 3 : Energy Pulse Rate Divisor

1.For Energy Output in Wh

Divisor	Pulse	System Power*
		Pulse rate
1	1per Wh	Up to 3600W
	1per kWh	Up to 3600kW
	1per MWh	Above 3600kW
10	1per 10Wh	Up to 3600W
	1per 10kWh	Up to 3600kW
	1per 10MWh	Above 3600kW
100	1per 100Wh	Up to 3600W
	1per 100kWh	Up to 3600kW
	1per 100MWh	Above 3600kW
1000	1 per 1000Wh	Up to 3600W
	1 per 1000kWh	Up to 3600kW
	1per 1000MWh	Above 3600kW
Pulse Duration 60 ms,100 ms or 200 ms		

2. For Energy Output in KWh

Divisor	Pulse	System Power*
		Pulse rate
1	1 per kWh	Up to 3600kW
	1per MWh	Above 3600kW

3. For Energy Output in MWh

Divisor	Pulse
	Pulse rate
1	1 per MWh

Above options are also applicable for Apparent and Reactive Energy.

* System power = 3 x CT(Primary) x PT(Primary)L-N for 3 Phase 4 Wire
 System power = Root3 x CT(Primary) x PT(Primary)L-L for 3 Phase 3 Wire
 System power = CT(Primary)xPT(Primary)L-N for 3 Phase 3 Wire

5.2 Limit Switch :

Limit switch can be used to monitor the measured parameter (Ref.Table:4)in relation with to a set limit.

The limit switch can be configured in one of the four mode given below:-

1) Hi alarm & Relay Energized Relay..
2) Hi alarm & De-Energized Relay.
3) Lo alarm & Energized Relay.
4) Lo alarm & De-Energized Relay.

Limit switch has user selectable Trip point, Hysteresis, Energizing Delay & De-Energizing delay.

Hi Alarm:

If Hi-Alarm Energized or Hi Alarm De-Energized option is selected then relay will get energized or De-energized,if selected parameter is greater than or equal to trip point.

Lo Alarm:

If Lo-Alarm Energized or Lo Alarm De-Energized option is selected then relay will get energized or De-energized,if selected parameter is less than or equal to trip point.

Trip point:

Trip point can be set in the range of 10% to 120 % of nominal value for Hi-Alarm & 10% to 100 % of nominal value for Lo-Alarm.

Hysteresis:

Hysteresis can be set in the range of 0.5% to 50 % of set trip point .
If Hi-alarm Energized or Hi-alarm De-energized is selected then relay will get De-energized or Energized respectively, if set parameter value is less than Hysteresis Similarly if Lo-alarm Energized or Lo-alarm De-Energized.

Energizing Delay:

The energizing delay can be set in the range from1 to 10 sec.

De-Energizing Delay:

The De-energizing delay can be set in the range from1 to 10 sec.

Note : In case of lo alarm if trip point is set at 100% then maximum 20% Hysterisis can be set..

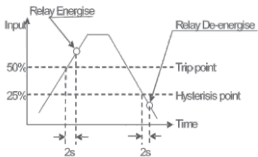**Example of different configuration.**
Parameter No: 4 (Current 1)
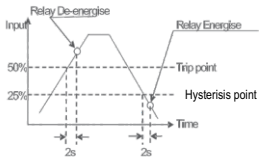Trip Point = 50%
Hysteresis = 50% of trip point
Energising Delay: 2s
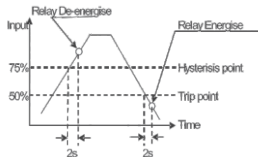De-energising Delay: 2s

1) Hi alarm & Energised relay

2) Hi alarm & De-energised relay

3) Lo alarm & Energised relay
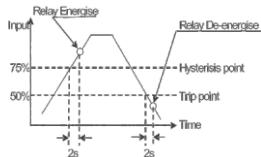
4) Lo alarm & De-energised relay

TABLE 4:Parameter for Limit output

Para-meter No.	Parameter	3P 4W	3P 3W	1P 2W	Trip Point Set Range	100% Value
0	None	✓	✓	✓	NA	NA
1	Volts 1	✓	✓	✓	10 - 120 %	Vnom (L-N)
2	Volts 2	✓	✓	✗	10 - 120 %	Vnom (L-N)
3	Volts 3	✓	✓	✗	10 - 120 %	Vnom (L-N)
4	IL1	✓	✓	✓	10 - 120 %	Inom
5	IL2	✓	✓	✗	10 - 120 %	Inom
6	IL3	✓	✓	✗	10 - 120 %	Inom
7	W1	✓	✗	✓	10 - 120 %	Nom [3]
8	W2	✓	✗	✗	10 - 120 %	Nom [3]
9	W3	✓	✗	✗	10 - 120 %	Nom [3]
10	VA1	✓	✗	✓	10 - 120 %	Nom [3]
11	VA2	✓	✗	✗	10 - 120 %	Nom [3]
12	VA3	✓	✗	✗	10 - 120 %	Nom [3]
13	VAr1	✓	✗	✓	10 - 120 %	Nom [3]
14	VAr2	✓	✗	✗	10 - 120 %	Nom [3]
15	VAr3	✓	✗	✗	10 - 120 %	Nom [3]
16	PF1	✓	✗	✓	10 - 90 %	90°[7]
17	PF2	✓	✗	✗	10 - 90 %	90°[7]
18	PF3	✓	✗	✗	10 - 90 %	90°[7]
19	Pa1	✓	✗	✓	10 - 90 %	360°[6]
20	Pa2	✓	✗	✗	10 - 90 %	360°[6]
21	Pa3	✓	✗	✗	10 - 90 %	360°[6]

TABLE 4:Continued

Para-meter No.	Parameter	3P 4W	3P 3W	1P 2W	Trip Point Set Range	100% Value
22	Volts Ave.	✓	✓	✗	10 - 120 %	Vnom [2]
24	Current Ave.	✓	✓	✗	10 - 120 %	Inom
27	Watts sum	✓	✓	✗	10 - 120 %	Nom [3]
29	VA sum	✓	✓	✗	10 - 120 %	Nom [3]
31	VAr sum	✓	✓	✗	10 - 120 %	Nom [3]
32	PF Ave.	✓	✓	✗	10 - 90 %	90°
34	PA Ave.	✓	✓	✗	10 - 90 %	360°
36	Freq.	✓	✓	✓	10 - 90 %	66 Hz [1]
43	Watt Demand Utility	✓	✓	✓	10 - 120 %	Nom [3]
44	Watt Max Demand Utility	✓	✓	✓	10 - 120 %	Nom [3]
46	Watt Demand Max Gen	✓	✓	✓	10 - 120 %	Nom [3]
51	VA Demand	✓	✓	✓	10 - 120 %	Nom [3]
52	VA Max Demand utility	✓	✓	✓	10 - 120 %	Nom [3]
50	VA Max Demand Gen	✓	✓	✓	10 - 120 %	Nom [3]
53	Current Demand.	✓	✓	✓	10 - 120 %	Inom
54	Current Max Demand.	✓	✓	✓	10 - 120 %	Inom
49	Current max Demand. Gen.	✓	✓	✓	10 - 120 %	Inom
55	Relay manual off oper.	✓	✓	✓	NA	NA
56	Relay manual on oper.	✓	✓	✓	NA	NA
101	VL1-L2	✓	✗	✗	10 - 120 %	Vnom (L-L)
102	VL2-L3	✓	✗	✗	10 - 120 %	Vnom (L-L)

TABLE 4:Continued

Para-meter No.	Parameter	3P 4W	3P 3W	1P 2W	Trip Point Set Range	100% Value
103	VL3-L1	✓	✗	✗	10 - 120 %	Vnom (L-L)
104	VL1 THD(%)	✓	✓	✓	5 - 100%	
105	VL2 THD(%)	✓	✓	✗	5 - 100%	
106	VL3 THD(%)	✓	✓	✗	5 - 100%	
107	IL1 THD(%)	✓	✓	✓	5 - 100%	
108	IL2 THD(%)	✓	✓	✗	5 - 100%	
109	IL3 THD(%)	✓	✓	✗	5 - 100%	
110	System voltage THD(%)	✓	✓	✗	5 - 100%	
111	System current THD(%)	✓	✓	✗	5 - 100%	
113	I Neutral	✓	✗	✗	5 - 100%	Inom
328	VAr demand	✓	✓	✓	10 - 120 %	Nom [3]
329	VAr max demand utility	✓	✓	✓	10 - 120 %	Nom [3]
331	VAr Max demand Gen	✓	✓	✓	10 - 120 %	Nom [3]

Note : (1) For Frequency 0% corresponds to 45 Hz and 100% corresponds to 66 Hz.

(2) For 3P 4W and 1Ph the nominal value is V_{L-N} and that for 3P 3W is V_{L-L}.

(3) Nominal Value for power is calculated from Nominal Voltage and current values.

(4) Nominal Value is to be considered with set CT/ PT Primary values.

(5) For single phase L1 Phase values are to be considered as System values.

(6) For Phase angle 0% corresponds to 0^0 &100% corresponds to 360^0

(7) For Power factor 0% corresponds to 0^0 &100% corresponds to 360^0

NA : Not Applicable

5.3 ACCL

ACCL can be used to monitor the measured parameter (Ref.Table:5) in relation with to a set limit.user can assign ACCL only for generator mode.

1.In case of Utility Load is always connected.

2.ACCL allows unrestricted supply from the generator, if selected parameter is in allowable limit.

3.If selected parameter exceeds the generator rating then load is disconnected for 8 second. During this period, user can disconnect the non essential loads and bring it within limit.

4.After 8 seconds load is automatically reconnected for 3 seconds. If user does not disconnect the non essential load then cycle will repeat for user defined number of attempt.

5.After completion of number of attempts, supply to the load from the generator is permanently disconnected.

6.Supply from the generator to load can be restored after manually pressing reset button.

Trip point:
Trip point can be set in the range of 10% to 120 % of nominal value

No. of attempts:
User can select no. of attempts in the range of 1 to10.

TABLE 5 : Parameters For ACCL output

Para-meter No.	Parameter	3P 4W	3P 3W	1P 2W	Trip Point Set Range
0	None	✓	✓	✓	NA
4	Input current IL1	✓	✓	✓	10-120%
5	Input current IL2	✓	✓	✗	10-120%
6	Input current IL3	✓	✓	✗	10-120%
10	Apparent power L1	✓	✗	✓	10-120%
11	Apparent power L2	✓	✗	✗	10-120%
12	Apparent power L3	✓	✗	✗	10-120%
24	Current Avg.	✓	✓	✗	10-120%
29	Apparent power sum	✓	✓	✗	10-120%

6. Phasor Diagram :

Quadrant 1: 0° to 90°
Quadrant 2: 90° to 180°
Quadrant 3: 180° to 270°
Quadrant 4: 270° to 360°
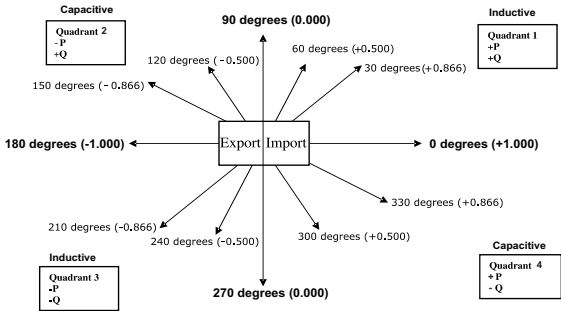
TABLE 6

Connections	Quadrant	Sign of Active Power (P)	Sign of Reactive Power (Q)	Sign of Power Factor (PF)	Inductive / Capacitive
Import	1	+ P	+ Q	+	L
Import	4	+ P	- Q	+	C
Export	2	- P	+ Q	-	C
Export	3	- P	- Q	-	L

Inductive means Current lags Voltage
Capacitive means Current leads Voltage

When the instrument displays Active power (P)with " + " (positive sign) , the connection is " **Import** " .

When the instrument displays Active power (P)with " - " (negative sign) , the connection is " **Export** " .

7. Installation

Mounting is by four side clamps, slide the side clamps through side slot till side clamp gets firmly locked in a groove (Refer fig.) Consideration should be given to the space required behind the instrument to allow for bends in the connection cables.

SLIDE IN THIS DIRECTION AND LOCK

PANEL →

Meter
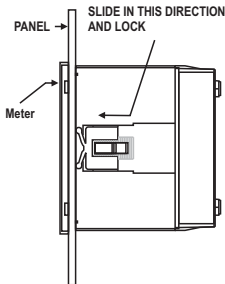
As the front of the enclosure conforms to IP54 it is protected from water spray from all directions, additional protection to the panel may be obtained by the use of an optional panel gasket. The terminals at the rear of the product should be protected from liquids.

The instrument should be mounted in a reasonably stable ambient temperature and where the operating temperature is within the range -10 to 55 $^{\circ}$C . Vibration should be kept to a minimum and the product should not be mounted where it will be subjected to excessive direct sunlight.

Caution

1. **In the interest of safety and functionality this product must be installed by a qualified engineer, abiding by any local regulations.**

2. **Voltages dangerous to human life are present at some of the terminal connections of this unit. Ensure that all supplies are de-energised before attempting any connection or disconnection.**

3. **These products do not have internal fuses therefore external fuses must be used to ensure safety under fault conditions.**

7.1 EMC Installation Requirements

This product has been designed to meet the certification of the EU directives when installed to a good code of practice for EMC in industrial environments, e.g.

1. Screened output and low signal input leads or have provision for fitting RF suppression components, such as ferrite absorbers, line filters etc., in the event that RF fields cause problems.

Note: It is good practice to install sensitive electronic instruments that are performing critical functions, in EMC enclosures that protect against electrical interference which could cause a disturbance in function.

2. Avoid routing leads alongside cables and products that are, or could be, a source of interference.

3. To protect the product against permanent damage, surge transients must be limited to 2kV pk. It is good EMC practice to suppress differential surges to 2kV at the source. The unit has been designed to automatically recover in the event of a high level of transients. In extreme circumstances it may be necessary to temporarily disconnect the auxiliary supply for a period of greater than 5 seconds to restore correct operation.

   The Current inputs of these products are designed for connection in to systems via Current Transformers only, where one side is grounded.

4. ESD precautions must be taken at all times when handling this product.

7.2 Case Dimension and Panel Cut Out

MAX PANEL THICKNESS 0.18",5mm
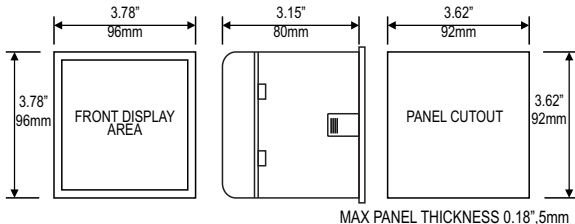
7.3 Wiring

Input connections are made directly to screw-type terminals with indirect wire pressure. Numbering is clearly marked in the plastic moulding. Choice of cable should meet local regulations. Terminal for both Current and Voltage inputs will accept upto $3mm^2$ x 2 diameter cables.

Note : It is recommended to use wire with lug for
connection with meter.

7.4 Auxiliary Supply

The instrument should ideally be powered from a dedicated supply, however it may be powered from the signal source, provided the source remains within the limits of the chosen auxiliary voltage.
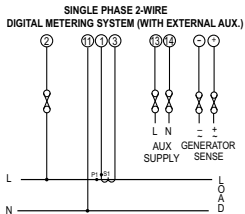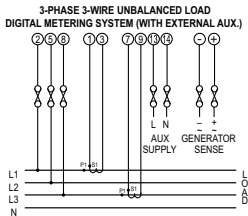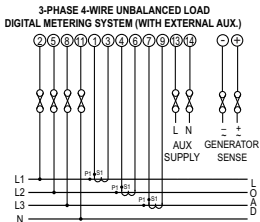
7.5 Fusing

It is recommended that all voltage lines are fitted with 1 amp HRC fuses.

7.6 Earth/Ground Connections

For safety reasons, CT secondary connections should be grounded in accordance with local regulations.

8. Connection Diagrams

3-PHASE 4-WIRE UNBALANCED LOAD
DIGITAL METERING SYSTEM (WITH EXTERNAL AUX.)

3-PHASE 3-WIRE UNBALANCED LOAD
DIGITAL METERING SYSTEM (WITH EXTERNAL AUX.)

SINGLE PHASE 2-WIRE
DIGITAL METERING SYSTEM (WITH EXTERNAL AUX.)

9. Specification :

System

3 Phase 3 Wire / 4 Wire programmable at site,1 phase 2 wire on order

Inputs

Nominal input voltage (AC RMS) (Three wire and Four wire)	Line-Neutral 57.73...288.675 V_{L-N} Line-Line 100... 500 V_{L-L}
Max continuous input voltage	347 V_{L-N}, (600 V_{L-L})
Max short duration input voltage	2 x Nominal Value (1s application repeated 10 times at 10s intervals)
Nominal input voltage burden	< 0.2VA approx. per phase
Nominal input current	1A / 5A AC rms
Max continuous input current	120% of Nominal Value
Nominal input current burden	< 0.2VA approx. per phase
Max short duration current input	20 x Nominal Value (1s application repeated 5 times at 5 min. intervals)
System CT primary values	Std. Values from 1 to 9999A (1 or 5 Amp secondary)

Auxiliary

Standard nominal Auxiliary supply voltages & Frequency | 60 - 300V AC- DC (45-66Hz),
a.c. supply voltage tolerance | +5 % / -5 % of Rated Value
a.c. supply frequency range | 45 to 66 Hz
a.c. supply burden | <6.5VA

Generator sense:

Monitoring Generator ON/OFF | 10 to 60 VDC/20 to 300 VAC

Operating Measuring Ranges

Voltage | $5\ V_{LN}.... 347\ V_{LN}, 9\ V_{LL}.... 600\ V_{LL}.$
Current | 5 .. 120 % of Nominal Value
Frequency | 45 .. 66 Hz

Accuracy

Voltage | $\pm$ 0.2 % of Nominal value
Current | $\pm$ 0.2 % of Nominal value
Frequency | $\pm$0.1% of mid frequency
Active Power | $\pm$ 0.2 % of Nominal value
Re- Active Power | $\pm$ 0.2 % of Nominal value
Apparent Power | $\pm$ 0.2 % of Nominal value
Active Energy | Class 0.5S as per IEC 62053 - 22
Apparant Energy | Class 0.5S as per IEC 62053 - 22
Re - Active Energy | Class 2 as per IEC 62053 - 23
Power Factor / Phase angle | $\pm$ 2 degree
Harmonics | $\pm$ 1 %
Total Harmonic Distortion | $\pm$ 1 %

Reference conditions (As per IEC / EN 60688) :

	Ambient 23 °C ± 1 °C
	Sinusoidal (distortion factor 0.005), 50 / 60 Hz
Current Range	5... 120% of Nominal Value.
Starting Current for energy as per IEC 62053 - 22 class 0.5S	1 mA for 1A range 5 mA for 5A range

Display

TFT LCD	3.5" Graphical LCD, resolution 320x240 pixels
Update	Approx. 1 seconds

Controls

User Interface	Resistive Touch screen

Real Time Clock (RTC) :

Uncertainty	+/- 2 minutes / months (23 °C ± 1 °C) (trimmable through display or MODBUS)

Standards

EMC	IEC 61326
Immunity	10V/m min-Level 3 industrial low level electromagnetic radiation environment IEC 61000-4-3.
Safety	IEC 61010-1 , Year 2001
IP for water & dust	IEC 60529

Isolation

Dielectric voltage withstand test between circuits and accessible surfaces	5.23 kV DC for 1 minute between all electrical circuits

Environmental

Operating temperature	-10 to 55 $^\circ$C
Storage temperature	-20 to +65 $^\circ$C
Relative humidity	0 .. 90 % RH
Warm up time	3 minute (minimum)
Shock	15g in 3 planes
Vibration	10 .. 150 .. 10 Hz, 0.75mm amplitude
Enclosure (front only)	IP 54 as per IEC 60529
Temperature Coefficient	0.05%/$^\circ$C

Enclosure

Style	96mm x 96mm DIN Quadratic
Material	Polycarbonate Housing , Self extinguish & non dripping as per UL 94 V-0
Terminals	Screw-type terminals
Depth	< 80 mm
Weight	0.600 kg Approx.

Pulse output Option (1 or 2 Relay) :

Relay	1NO
Switching Voltage & Current	240V AC , 5Amp.
Default Pulse rate Divisor	1 per Wh (up to 3600W),
	1 per kWh (up to 3600kW),
	1 per MWh (above 3600 kW)
Pulse rate Divisors	Programmable on site
10	1 per 10Wh (up to 3600W),
	1 per 10kWh (up to 3600kW),
	1 per 10MWh (above 3600 kW)
100	1 per 100Wh (up to 3600W),
	1 per 100kWh (up to 3600kW),
	1 per 100MWh (above 3600 kW)
1000	1 per 1000Wh (up to 3600W),
	1 per 1000kWh (up to 3600kW),
	1 per 1000MWh (above 3600 kW)
Pulse Duration	60ms , 100ms or 200ms

Note : Above conditions are also applicable for Reactive & Apparent Energy .
Note : Pulse rate divisor is set to 1, when Energy Resolution is set to kWh or MWh.
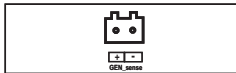
ModBus (RS 485) Option :

Protocol	ModBus (RS 485)
Baud Rate	38400 , 19200 , 9600 , 4800
	(Programmable)
Parity	Odd or Even, with 1 stop bit,
	Or None with 1 or 2 stop bits

Impulse Output :

Impulse Constant	4000 impulses / KWh

10. Connection for generator sense and Optional Pulse Output / RS 485 (rear view of instrument):
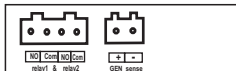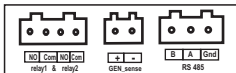
1. Generator sense

2. Generator sense+RS 485 Output
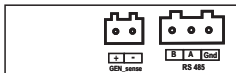
3. Generator sense+Relay1& Relay2 Output

4. Generator sense+Relay 1 & Relay2 output +RS 485 Output

The Information contained in these installation instructions is for use only by installers trained to make electrical power installations and is intended to describe the correct method of installation for this product.

It is the user's responsibility to determine the suitability of the installation method in the user's field conditions.

NOTE

NOTE

RISH EM 3490DS*i*

RISH EM 3490 DS*i*

ACTIVE ENERGY   UTL

UTILITY   Wh
000000031253

GENERATOR   Wh
000000029409

← MAIN   ENERGY →

Dual Source Energy Meter

RISH EM 3490 DS*i*

GEN EVENT LOGGING

MAIN   GEN

Dual Source Energy Meter

RISH EM 3490 DS*i*

ACCL
Parameter   CURRENT AVERAGE
Trip Point
Current Value
Relay Trip

MAIN   GEN

Dual Source Energy Meter

RISH EM 3490 DS*i*

MAIN   V/I

Dual Source Energy Meter

Dual Source Energy Meter