

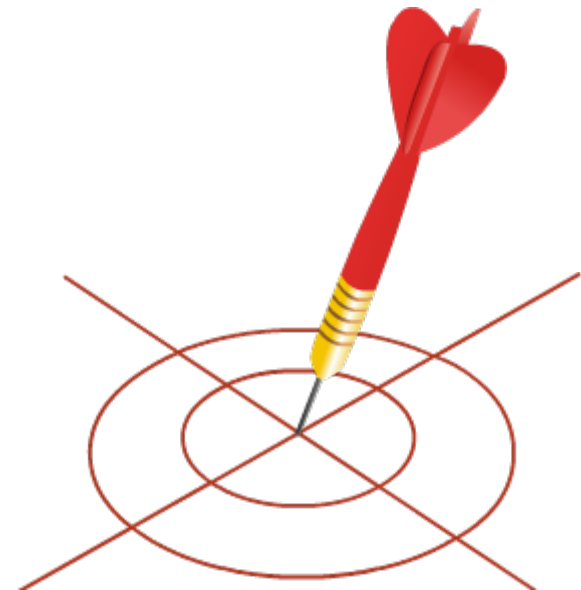
Welcome to the Session on  
**“Different Types of Single and  
Three-Phase Energy Meters”**

# Learning Objective



By the end of this session, you will be able to:

- Differentiate between the various types of single and three-phase energy meters and their tamper-proof features



# Types of Energy Meters – Electromechanical Meter



Electromechanical meter



Electromechanical meter with metal case

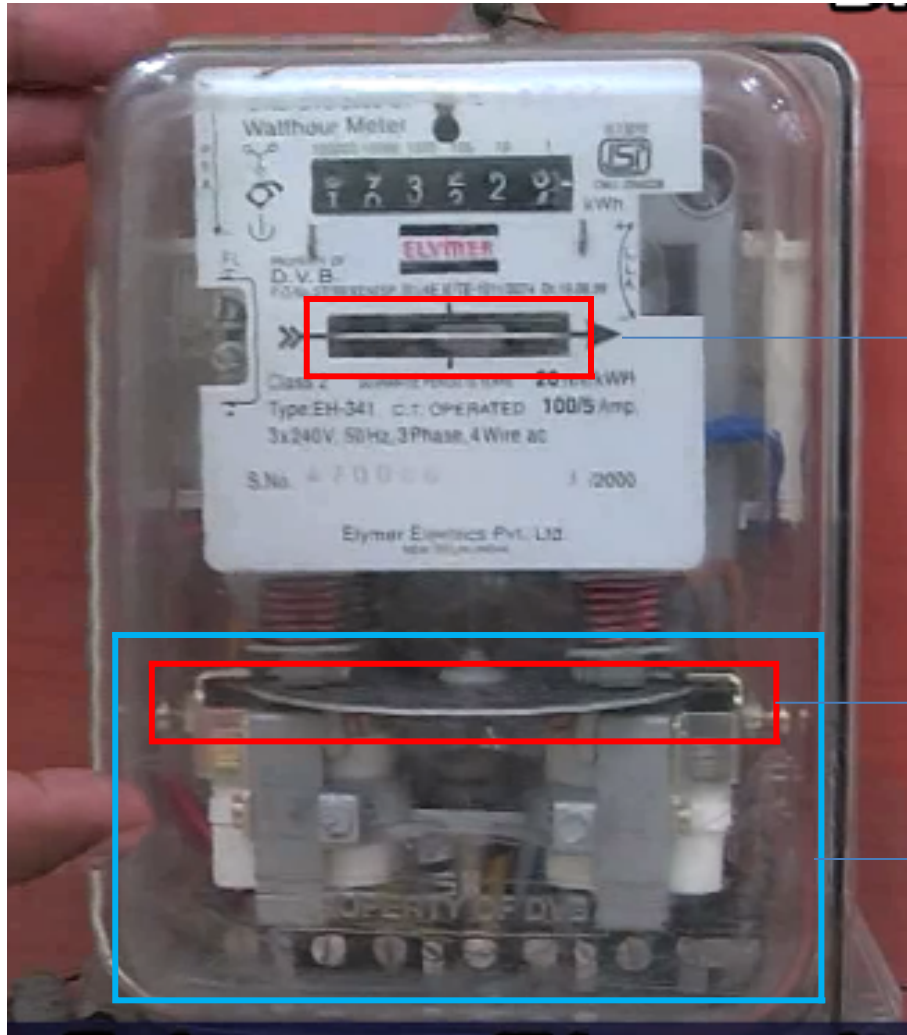


Electromechanical meter with polycarbonate body





# Types of Energy Meters – Electromechanical Meter



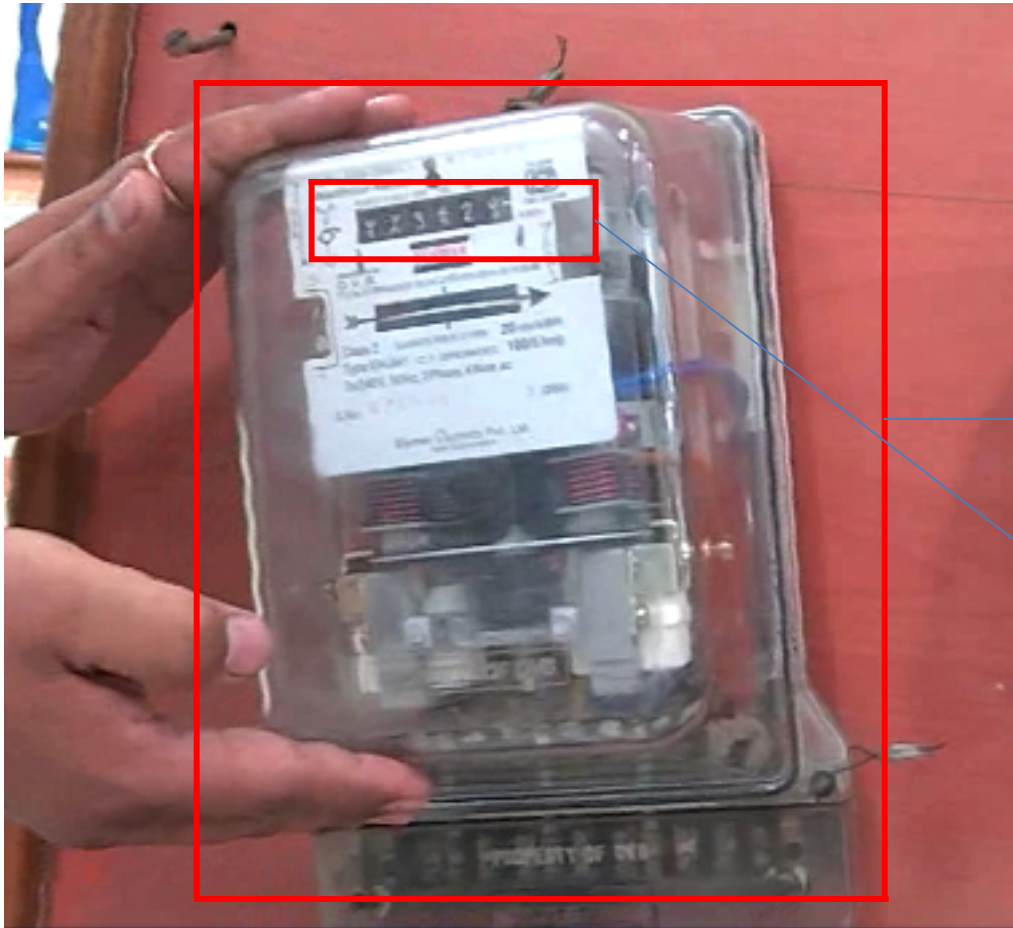
Revolving disc

Spindle

Counter



# Types of Energy Meters – Electromechanical Meter



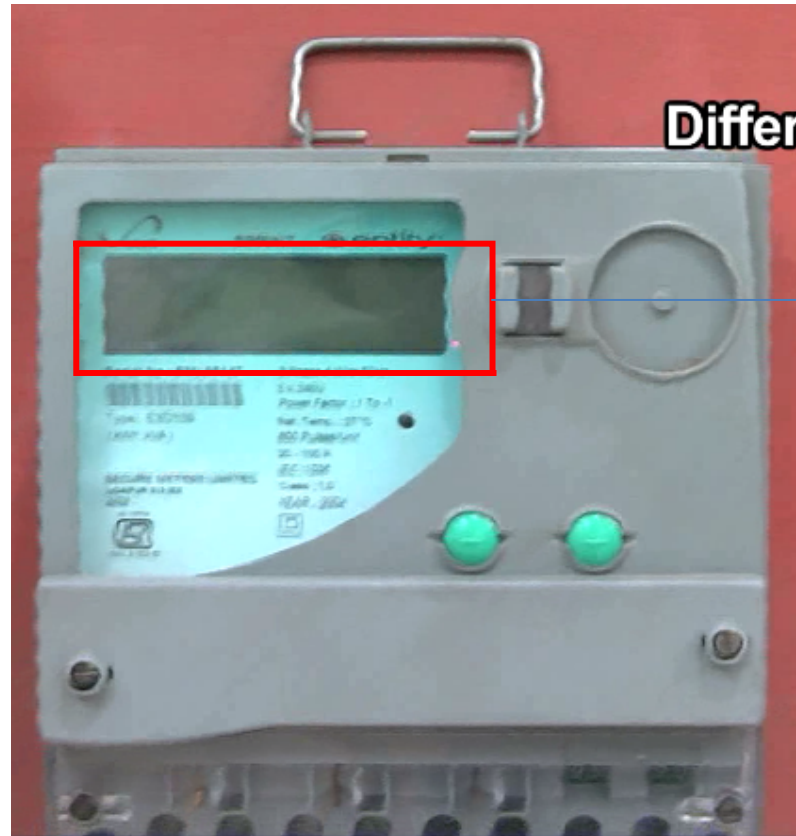
**Twist or tilt of meter reduces its revolution speed**

**Meter reading will be suspect**

# Types of Energy Meters – Electronic Meter



Electronic meter



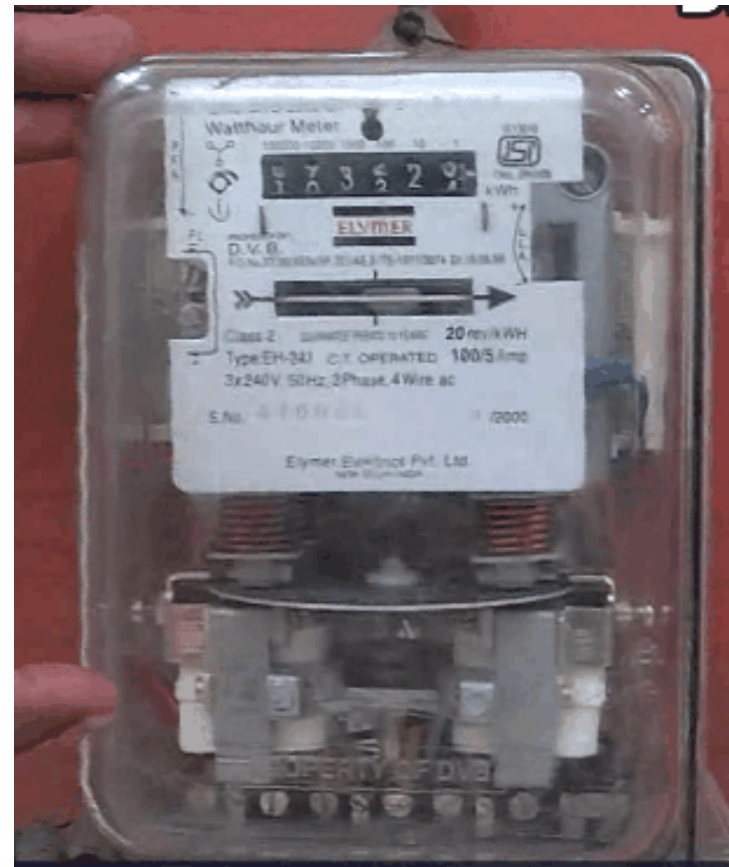
LCD display for clear visibility of reading

# Electromechanical Meter Vs Electronic Meter



Electronic meter

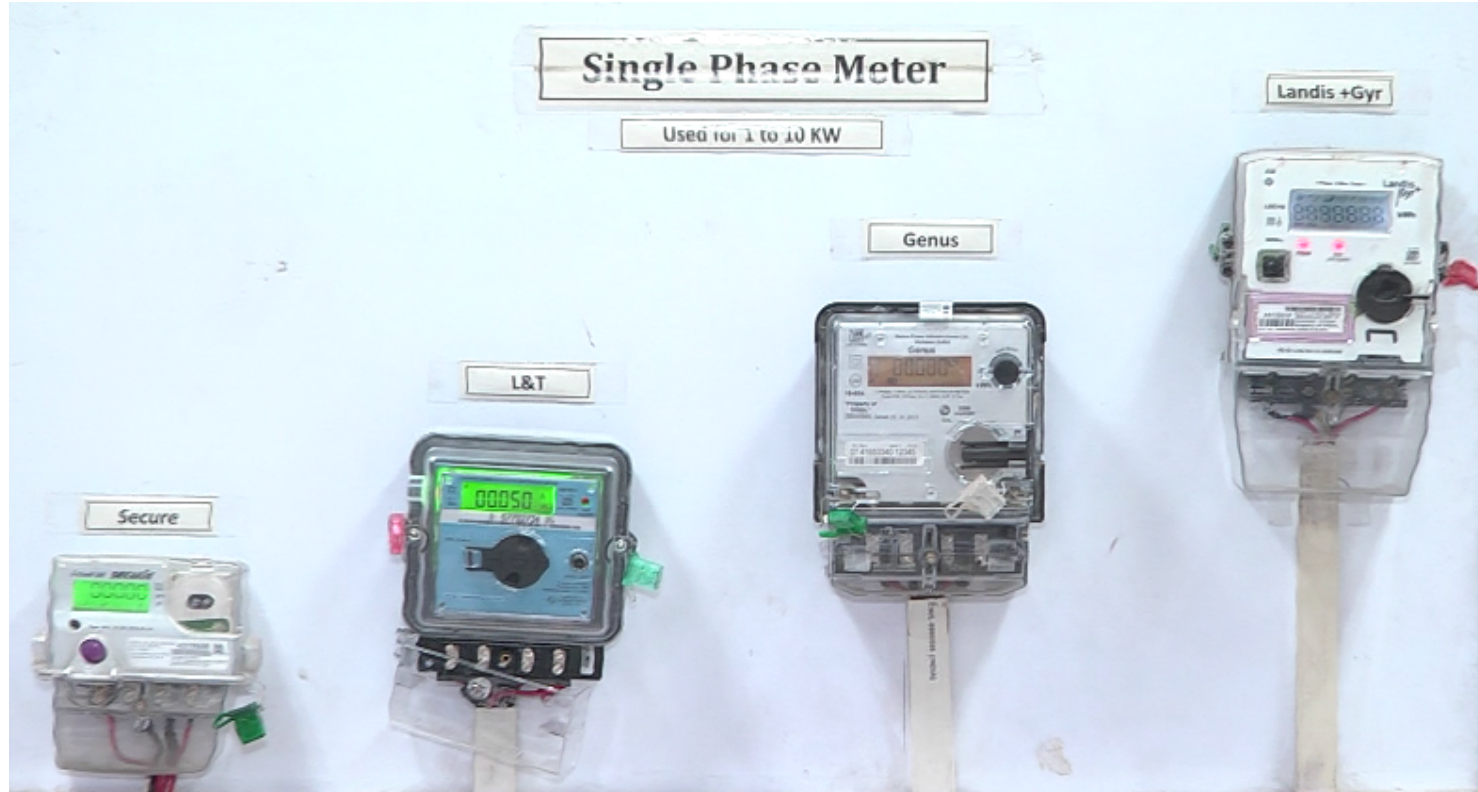
Vs



Electromechanical meter



# Types of Energy Meters – Single-Phase Meter



# Types of Energy Meters – Single-Phase Meter



**Meter packaging box**



**Meter in the box**

LABOR & TRAINING CENTER, MOHRE OWAYS  
TEST REPORT FOR CHECKED METER

MODEL : 570024  
VOLTAGE : 240V  
CURRENT : 20A/22-40A/25A/0

REF. METER : BY 3000 Class 0.05  
ACCURACY : CLASS : AS PER IEC 62053  
CUSTOMER : 0700

S. NO.	POWER FACTOR	ERROR (%) AT DIFFERENT LOADS					
		5%	10%	20%	100%	200%	
570024	0.8 LEAD		0.01	-0.02	-0.06	0.02	-0.06
	0.8 LAG		-0.04	0.03	-0.08	0.20	-0.15
	0.5 LAG		0.00	0.03	-0.04	0.11	0.00

500V TEST : PASSED  
10 LEAD TEST : PASSED  
10 LAG TEST : PASSED  
100V TEST : PASSED  
100V LAG TEST : PASSED

0.05% error for operational record book signature is not required. 05/01/2014

**Test certificate page**

# Types of Energy Meters – Single-Phase Meter



Seal of the manufacturing company

Seal of distribution company

LAKSHY & SONS, DELHI, INDIA  
TEST REPORT FOR ENERGY METER

MODEL : EM104      REF. NO. : SV 2000 Class 0.5S  
VOLTAGE : 230V      ACCURACY : CLASS : AS PER IS:13779  
CURRENT : 10A/20A/30A/40A      CUSTOMER : TPOA

LOAD	POWER FACTOR	ERRORS AT DIFFERENT %Ib				
		1%	5%	10%	20%	50%
STANDARD	0.8 LEAD	0.01	-0.02	-0.06	0.02	-0.06
	1PF	-0.04	0.03	-0.08	0.25	-0.15
	0.8 LAG	0.00	0.01	-0.04	0.11	0.04

50% TEST : PASSED      IR TEST : PASSED  
10% LOAD TEST : PASSED      HV TEST : PASSED  
DIVISION CURRENT TEST : PASSED

This is a computer generated report, hence signature is not required. 05/07/2014

Meter test report

Any single phase meter follows Indian Standard 13779.



# Types of Energy Meters – Single-Phase Meter

4 meters belonging to 4 different companies

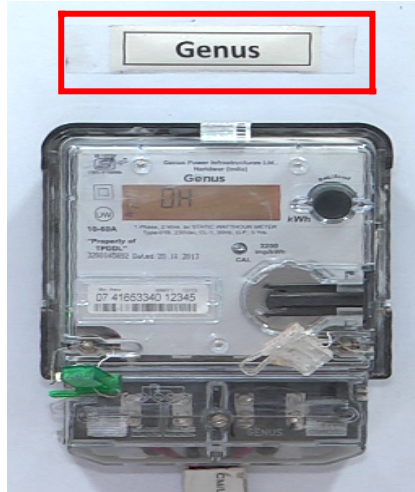
Secure



L&T



Genus



Landis + Gyr



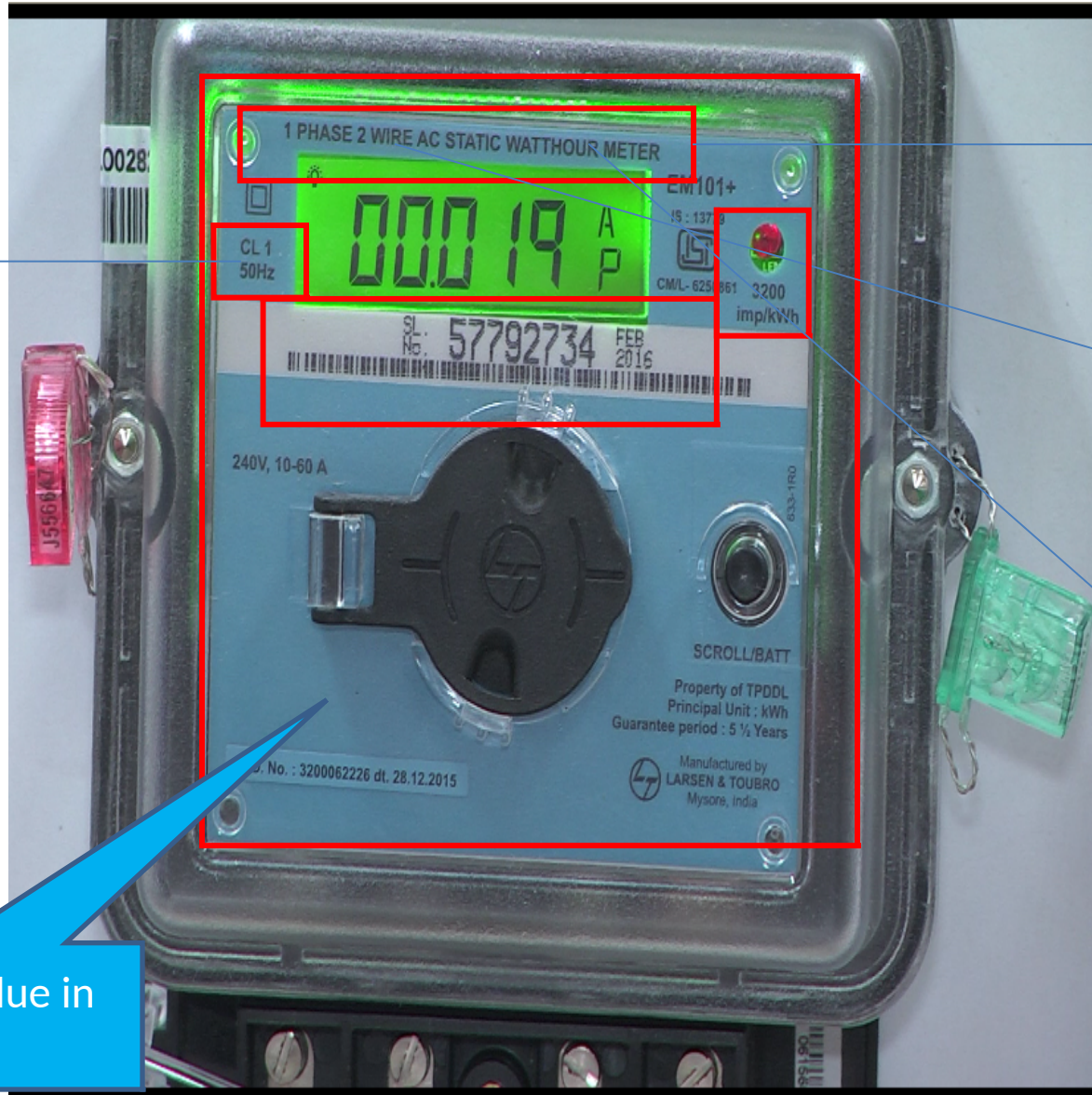
# Types of Energy Meters – Single-Phase Meter



L&T Meter

Sub-class 1

Nameplate – Blue in colour



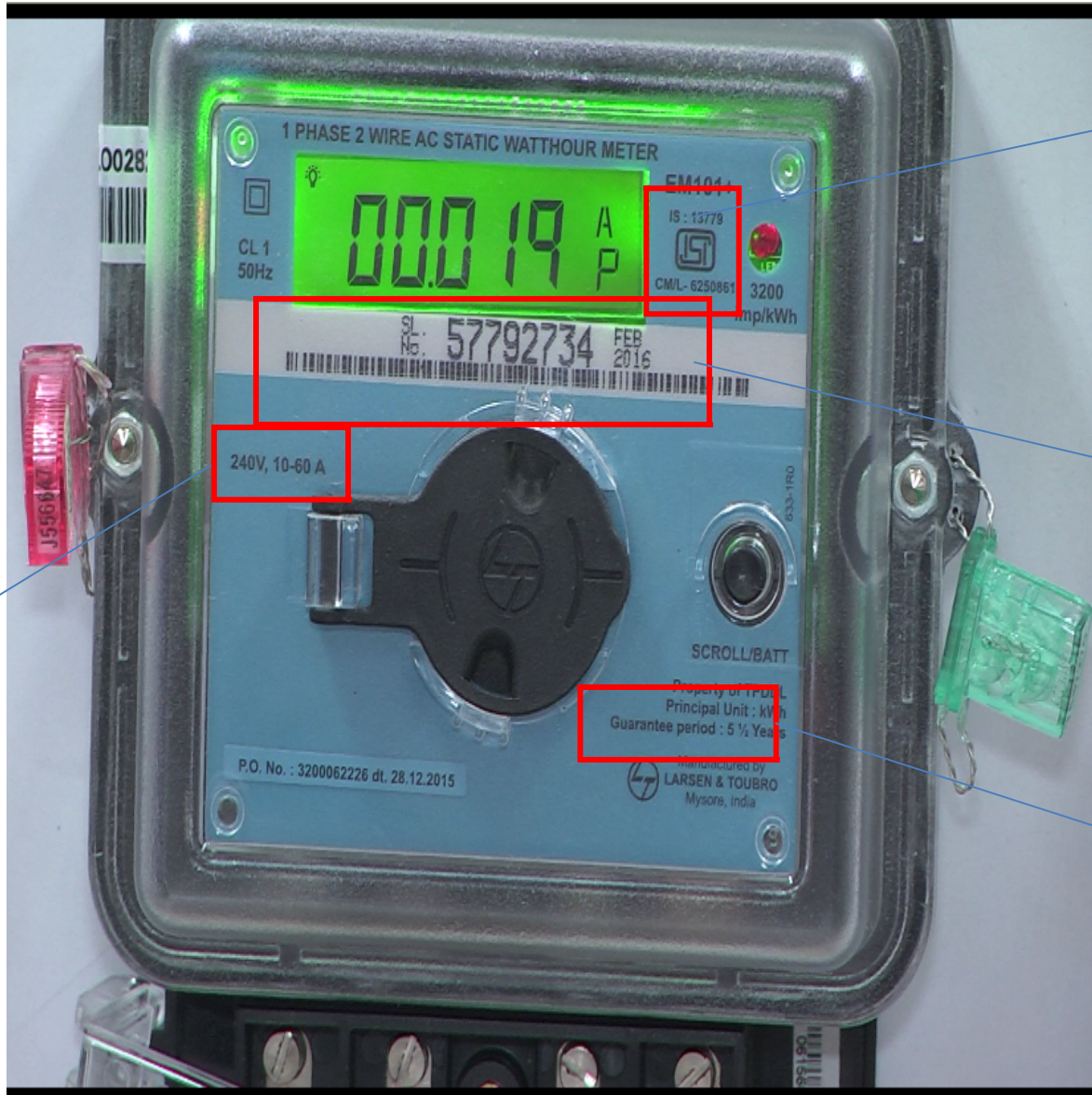
Mentioned as single-phase meter

2-wire means phase and neutral

AC static watt hour – no component of this meter is revolving



# Types of Energy Meters – Single-Phase Meter



Certified by Indian Standards

Meter number with manufacturing date

Volts and current range

Guarantee period

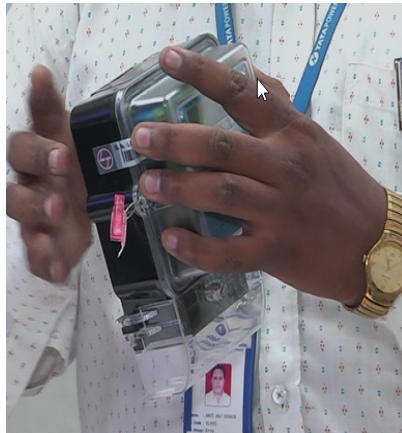


# Tamper Proof Features of Single-Phase Meter

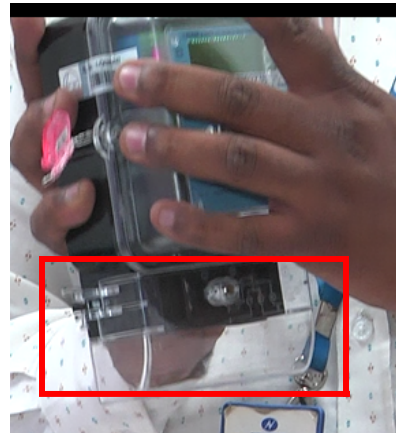
## Tamper Proof Features



Meter base



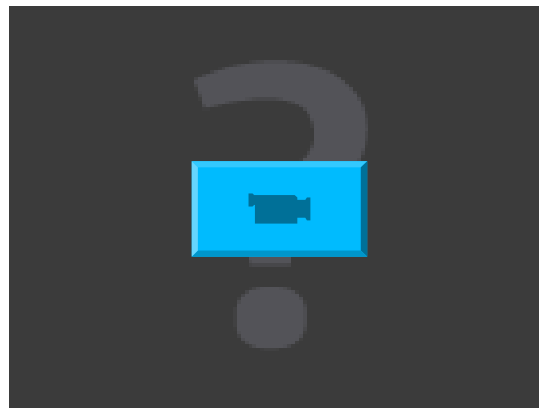
Meter cover



Meter block



Pasted with ultrasonic welding



# Tamper Proof Features of Single-Phase Meter



Display of date

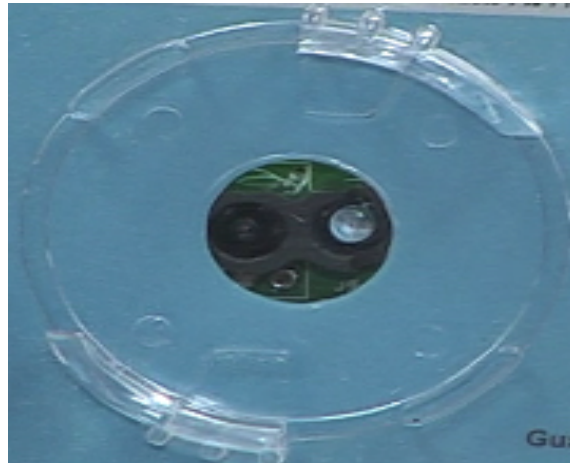


Display of time

# Tamper Proof Features of Single-Phase Meter



Port for communication



Optical port

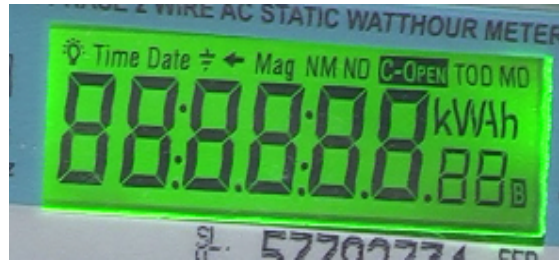


Scroll button

# Tamper Proof Features of Single-Phase Meter



Meter number



Visible even in darkness



Date is displayed



Time is displayed



Reading is displayed



Maximum Demand (MD)



# Single-Phase Meter



MD 1



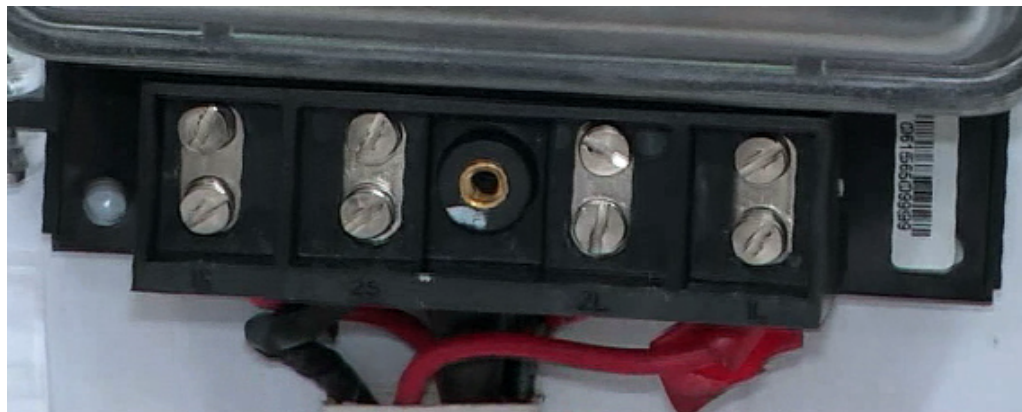
MD 2



MD 3

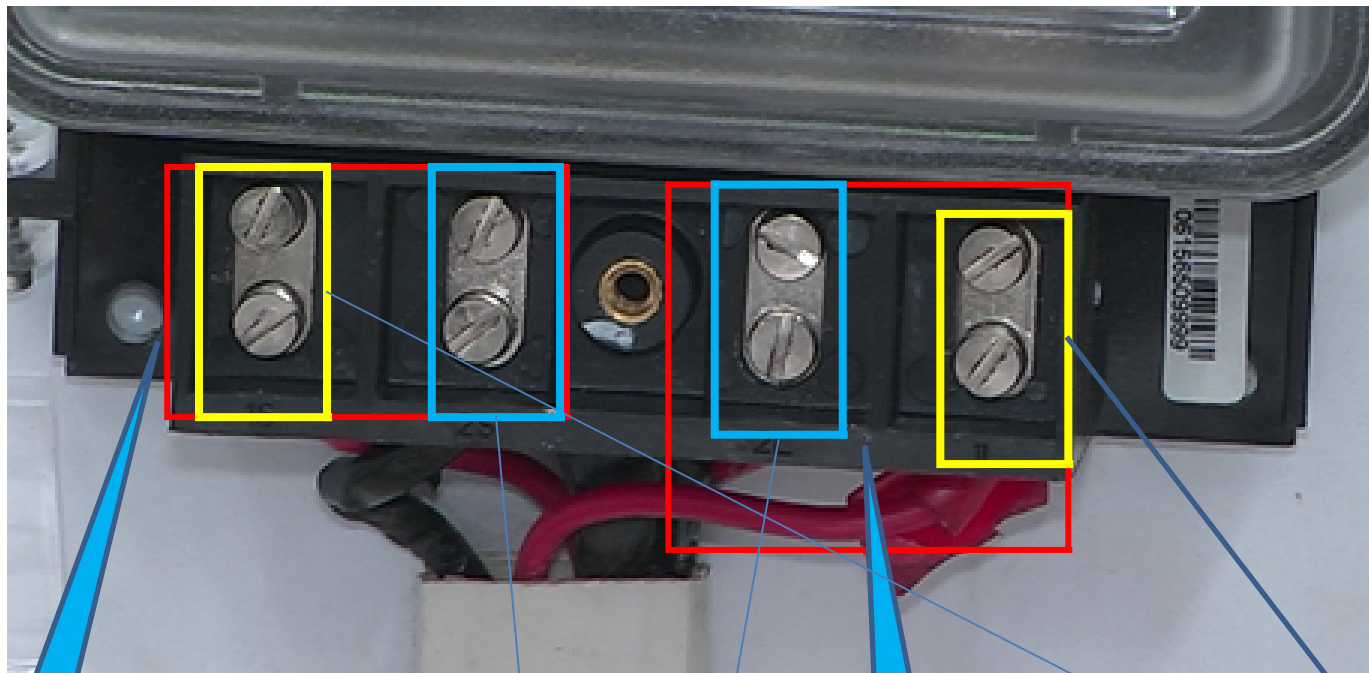


MD 4



4 terminals

# Tamper Proof Features of Single-Phase Meter



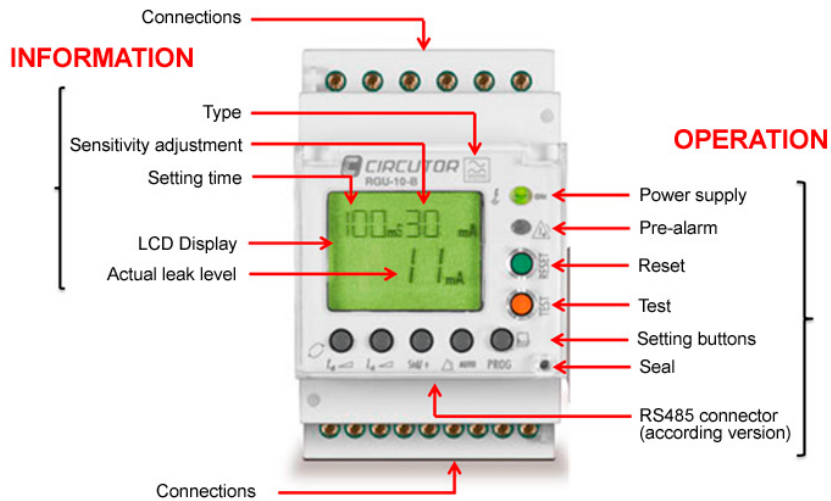
Terminals  
on left  
hand side

Neutral  
terminals

Terminals  
on right  
hand side

Phase terminals

# Tamper Proof Features of Single-Phase Meter



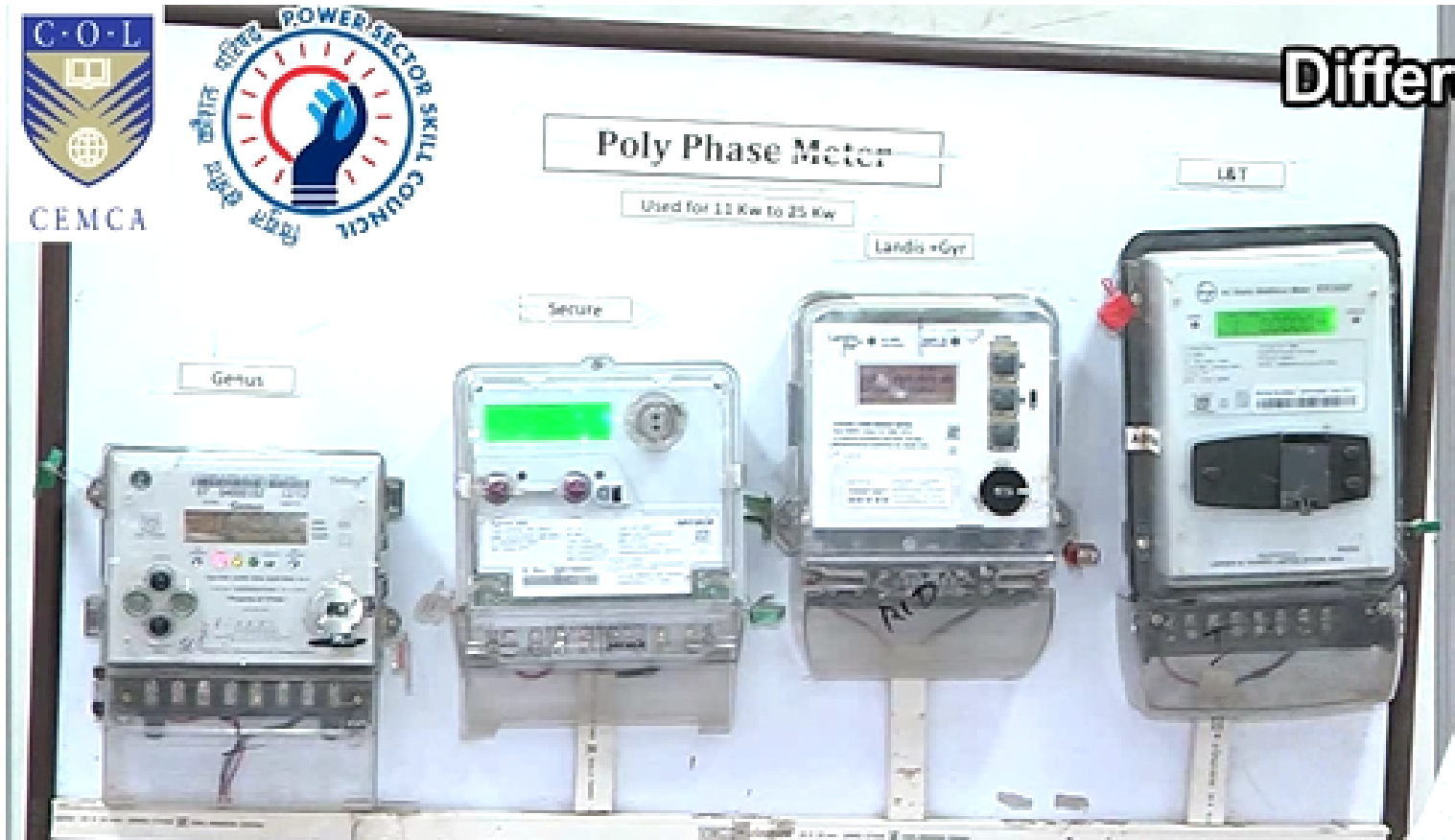
Earth leakage indicator



Time reversal indicator



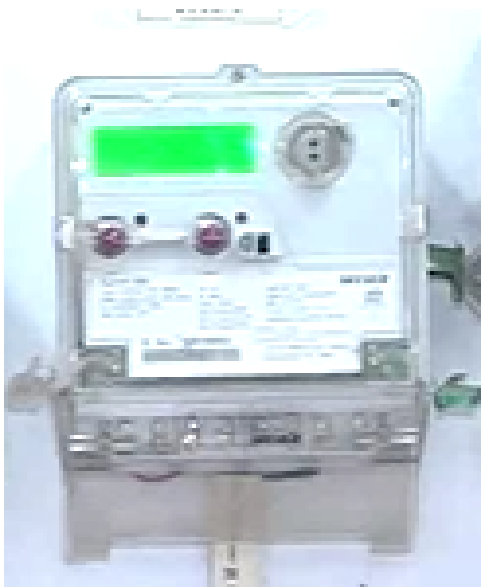
# Types of Energy Meters – Poly-Phase Meter



**Types of Poly-phase Meters - Used for loads more than 10 kW**



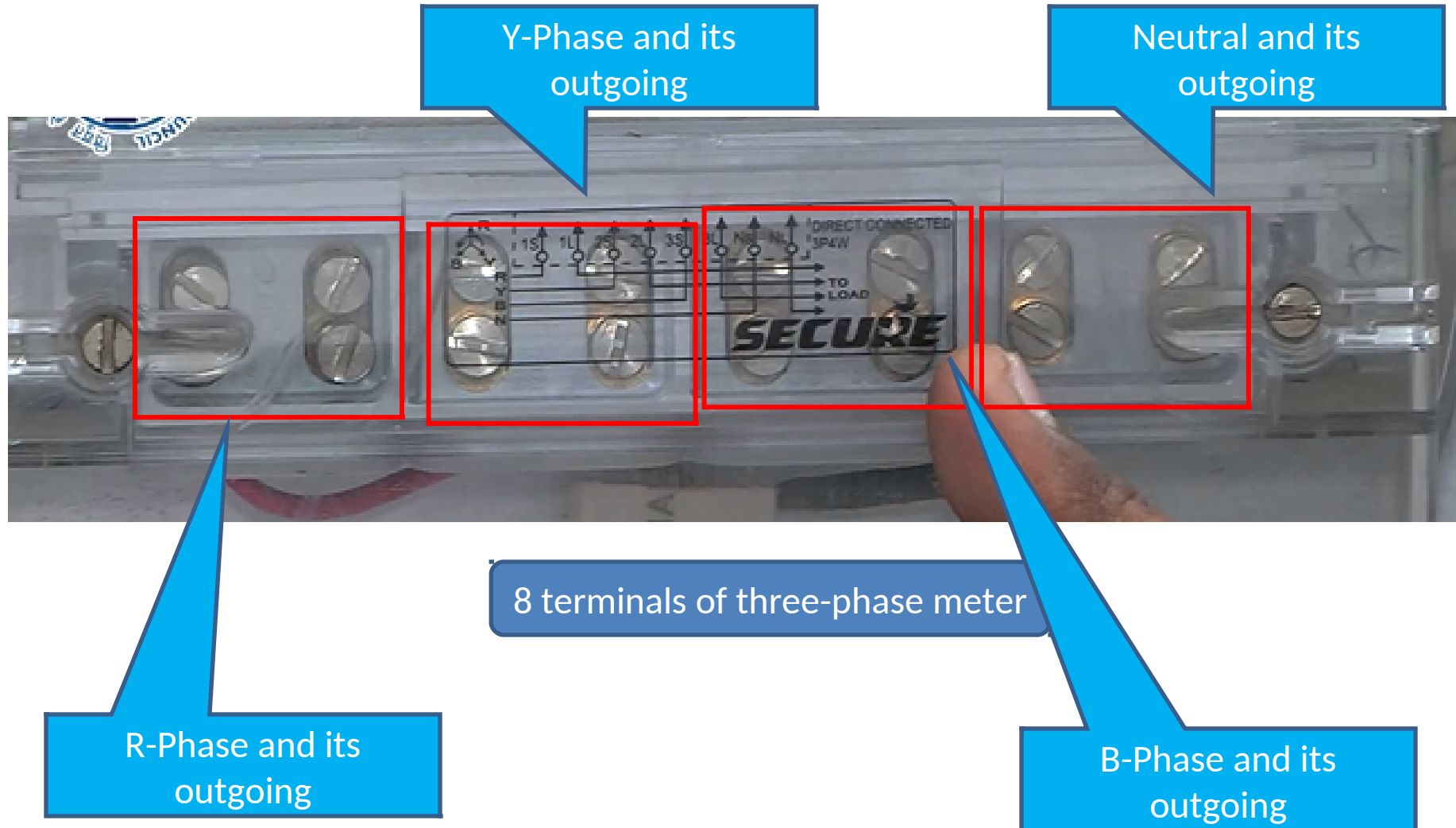
# Types of Energy Meters – Poly-Phase Meter



Poly-Phase Meter

- 1 Meter is used for category of 11 kW to 25 kW
- 2 Records consumption in kVAh and kVArh
- 3 Can check the load and power factor used by the consumer
- 4 Display shows a cover open symbol if the top cover is opened
- 5 Immune from magnetic and radio frequency influences
- 6 ESD of above 50KB is displayed, along with tampering done

# Types of Energy Meters – Poly-Phase Meter





# Types of Energy Meters – Poly-Phase Meter



Nameplate of the poly-phase meter

**SECURE**

**Sprint 350**

Type: E3D109, 3Ph, 4Wire  
(kWh, kVArh, kVAh, kW, kVA)  
3 x 230(400) V, 50Hz

Cl: 1.0

Ib: 20A

I<sub>max</sub>: 100A

800 Pulses/kWh

800 Pulses/kVArh

800 Pulses/kVAh

Left LED: kWh

Right LED: kVAh/kVArh

Mfg: 01/2014

Power Factor: -1 To 1

Additional comms: RS 232



M/L-9520172

Amperes of the meter

S. No.: 5201660



"Property of TPDDL"

P.O. No.: 3200046531 Dated: 06-DEC

Guarantee Period = 5 years

Secure Meters Ltd.,  
Damowala, H.P., India

Name of the company

800 impulses per kWh

# Types of Energy Meters – Poly-Phase Meter



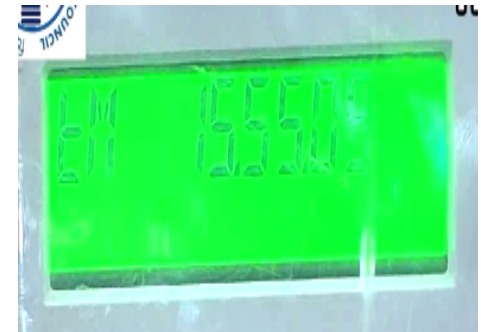
The meter shows requirements as per the 3 phases

Displays MD reading, date and time as well

Displays the instant load the consumer is using

Displays how much of power factor is running

Availability of the 3 phase sequence is visible



Display parameters

# Key Learning Outcomes



- A mechanical meter is usually in a metal case or polycarbonate body
- Electronic meters have an LCD display and the reading is clearly visible due to the back-lit screen
- Single-phase electronic meters are used for loads from 1 kW to 10 kW
- Poly-phase meter is also called three phase whole current electronic energy meter
- The three-phase meter records consumption in kVAh and kVArh

