



MANUAL

## SMART 7KT

Discrete Panel Meter

7KT0110 (VA meter) and  
7KT0120 (VAF Meter)

SMART 7KT power monitoring devices

**SIEMENS**

# Index

## **SMART 7KT**

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7KT0110 (VA meter) and  
7KT0120 (VAF Meter)

Manual

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# Introduction

# 1

## 1.1 Purpose of this document

This present manual describes the SMART 7KT discrete panel meter.

It is intended for the use of:

- Planners
- Plant operators
- Commissioning engineers
- Service and maintenance personnel

## 1.2 Required basic knowledge

A general knowledge of the field of electrical engineering is required to understand this manual.

Knowledge of the relevant safety regulations and standards is required for installing and connecting the device.

## 1.3 Components of the product

The carton for the products contain

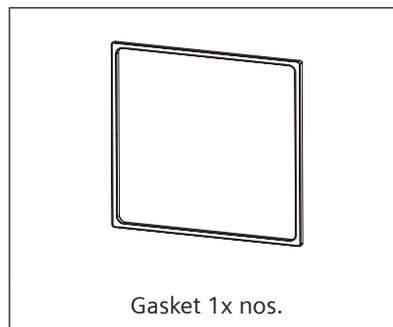
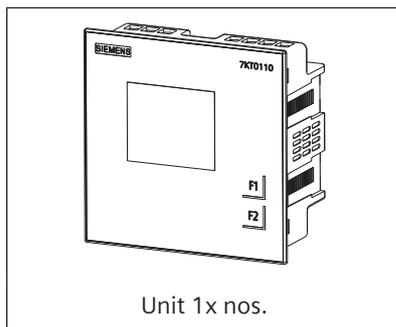
1 SMART 7KT meter

1 set of clamps (4 clamps) for mounting the meter on the panel door

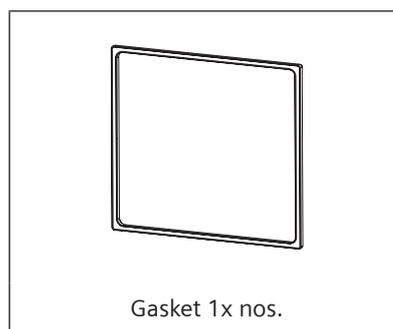
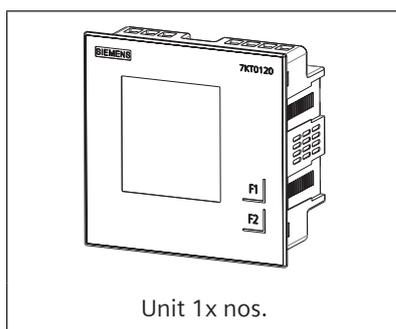
1 Gasket

1 Operating instruction

### 7KT0110



### 7KT0120



# Safety precautions

# 2

	<b>DANGER</b>	
	<p><b>Hazardous voltage will cause death or serious injury.</b> Turn off and lock out all power supply before working on this device.</p>	
	<b>NOTICE</b>	
	<p>Installation and maintenance must be carried out by qualified personnel.</p> <p>This product has been designed for environment A. Use of this product in environment B may cause unwanted electromagnetic disturbances in which case the user may require to take adequate mitigation measures.</p> <p><b>Risk of damage: Please ensure the proper isolation of meter during the IR (Meggering) test.</b></p>	

All safety related codifications, symbols and instructions that appear in this operating manual or on the equipment must be strictly followed to ensure the safety of the operating personnel as well as the instrument. If the equipment is not used in a manner specified by the manufacturer it might impair the protection provided by the equipment.

Do not use the equipment if there is any mechanical damage.

Ensure that the equipment is supplied with correct voltage.

 <p><b>CAUTION:</b></p> <ol style="list-style-type: none"> <li>1. Read complete instructions prior to installation and operation of the unit.</li> <li>2. Risk of electric shock.</li> <li>3. The equipment in its installed state must not come in close proximity to any heating sources, oils, steam, caustic vapors or other unwanted process by products.</li> </ol>
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# Technical specification

# 3

	7KT0110 (VA meter)	7KT0120 (VAF meter)
	Power Monitoring Device Panel instrument for voltage and current LED display Vaux: 95V to 240V AC x/1 or 5 A, Class 1	Power Monitoring Device Panel instrument for voltage, current and frequency LED display Vaux: 95V to 240V AC x/1 or 5 A, Class 1
<b>Measurements</b>		
measuring procedure	True RMS	True RMS
<ul style="list-style-type: none"> <li>for voltage measurement</li> <li>for current measurement</li> </ul>	True RMS	True RMS
type of measured value detection	complete	complete
voltage curve	Sinusoidal or distorted	Sinusoidal or distorted
measurable line frequency		
<ul style="list-style-type: none"> <li>initial value</li> <li>full-scale value</li> </ul>	45 Hz 65 Hz	45 Hz 65 Hz
operating mode for measured value detection automatic line frequency detection	–	Yes
<b>Supply voltage</b>		
design of the power supply	SMPS power supply	SMPS power supply
type of voltage of the supply voltage	AC	AC
<b>Degree of protection class</b>		
protection class IP on the front	IP54	IP54
protection class IP of the terminal	IP20	IP20
<b>Suitability</b>		
suitability for operation	Installation in stationary panels in closed rooms	Installation in stationary panels in closed rooms
<b>Product Functions</b>		
product function		
<ul style="list-style-type: none"> <li>voltage measurement</li> <li>current measurement</li> <li>frequency measurement</li> </ul>	Yes Yes –	Yes Yes Yes
<b>Display and operation</b>		
design of the display	LED	LED
height of the display	39 mm	50 mm
width of the display	40.5 mm	45.4 mm
color of the background of the display	Black	Black
national language on the display screen is supported	EN	EN
number of keys	2	2
<b>Fault limits</b>		
reference condition for metering accuracy	In accordance with IEC61557-12	In accordance with IEC61557-12
formula for relative total measurement inaccuracy		
<ul style="list-style-type: none"> <li>for measured variable voltage</li> <li>for measured variable current</li> <li>for measured variable frequency</li> </ul>	Class 1 as per IEC 61557-12 Class 1 as per IEC 61557-12 –	Class 1 as per IEC 61557-12 Class 1 as per IEC 61557-12 Class 0.1 as per IEC 61557-12

	7KT0110 (VA meter)	7KT0120 (VAF meter)
<b>Measuring inputs</b>		
measurable supply voltage between L and N at AC maximum rated value	240 V	240 V
measurable supply voltage between L and N at AC		
• minimum	11 V	11 V
• maximum	300 V	300 V
measurable supply voltage between the line conductors at AC maximum rated value	415 V	415 V
measurable supply voltage between the line conductors at AC		
• minimum	19 V	19 V
• maximum	519 V	519 V
voltage measuring range extension with external voltage transformers	up to 500kV	up to 500kV
line conductors and neutral conductors internal resistance for voltage measurement	1.12 MΩ	1.12 MΩ
measuring category for voltage measurement	CAT III	CAT III
measurable current	1A / 5A	1A / 5A
relative measurable current at AC		
• minimum	1 %	1 %
• maximum	120 %	120 %
current measuring range extension with external current transformers	Up to 10kA	Up to 10kA
measuring category for current measurement	CAT III	CAT III
measurable line frequency	–	45...65 Hz
<b>Connections</b>		
type of electrical connection		
• at the measurement inputs for voltage	screw-type terminals	screw-type terminals
• at the measurement inputs for current	screw-type terminals	screw-type terminals
<b>Mechanical Design</b>		
mounting	flush panel-door mounted	flush panel-door mounted
size of Power Monitoring Device	size 96	size 96
height	99 mm	99 mm
width	99 mm	99 mm
cut-out	91.5 mm x 91.5 mm	91.5 mm x 91.5 mm
depth	52 mm	52 mm
installation depth	49 mm	49 mm
net weight	207 g	223 g
mounting position	Vertical	Vertical
<b>Environmental conditions</b>		
ambient temperature during operation		
• minimum	-10 °C	-10 °C
• maximum	55 °C	55 °C
ambient temperature during storage		
• minimum	-20 °C	-20 °C
• maximum	75 °C	75 °C
relative humidity at 25 °C without condensation during operation maximum	85 %	85 %
installation altitude at height above sea level maximum	2 000 m	2 000 m
degree of pollution	2	2

#### IEC Standards

Description	Standard
Accuracy	IEC 61557-12
EMC requirements	IEC 61326-1
Degree of protection test (IP)	IEC 60529
Safety requirements	IEC 61010-1 and IEC 61010-2-030

#### Certifications

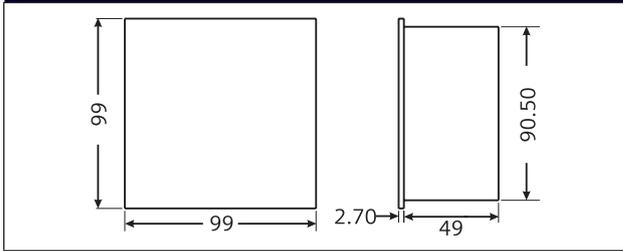
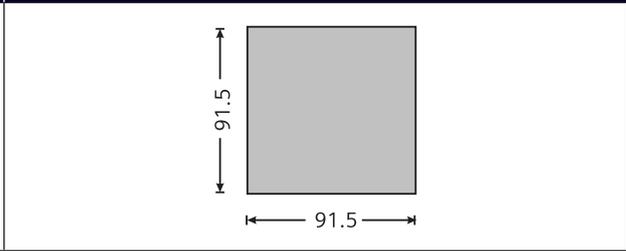
SMART 7KT discrete panel meter conforms to IEC standards, IPC electronics assembly standard and 

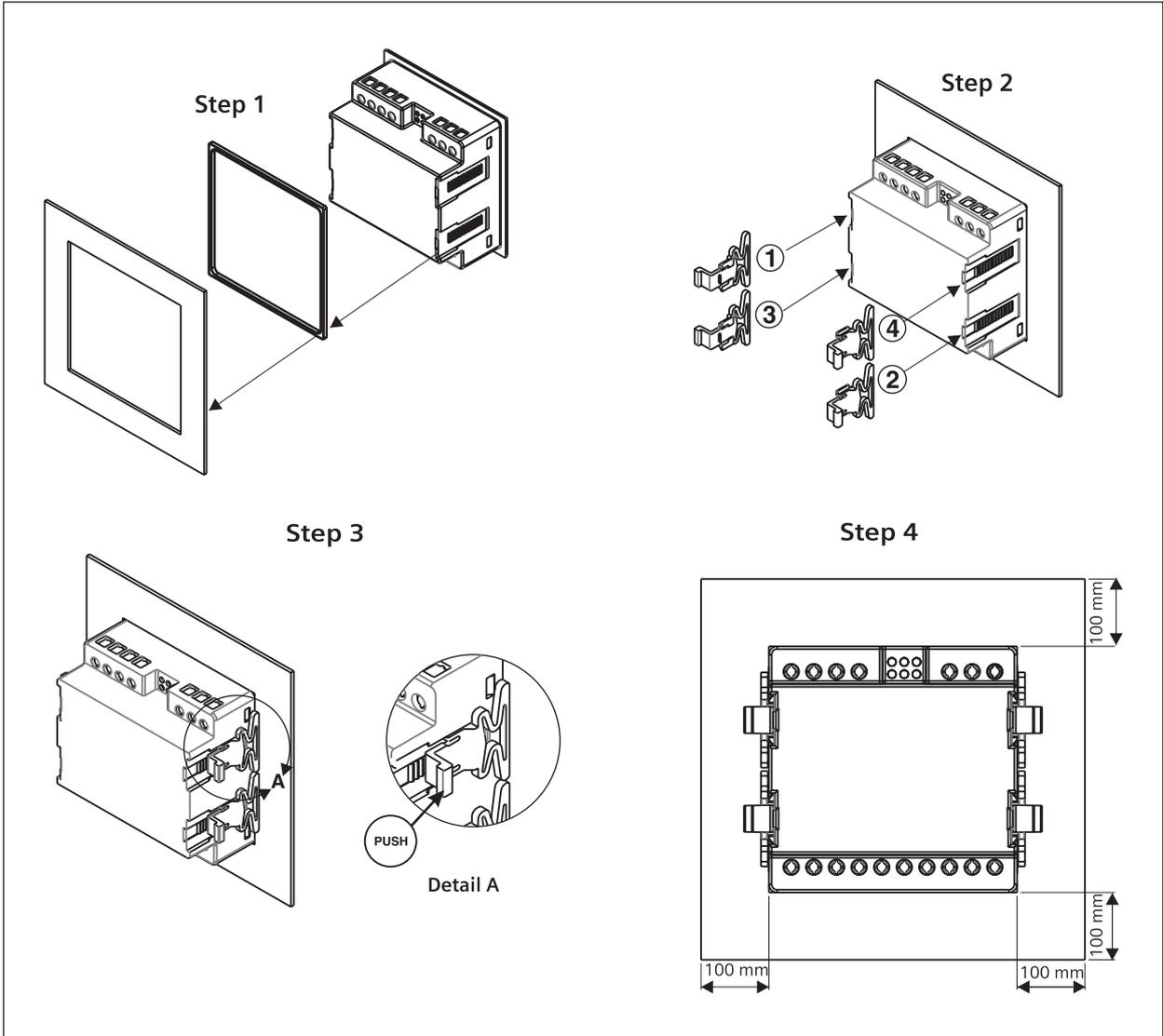
# Assembly

# 4

## Installation

For installing the meter  
Prepare the panel cutout with proper dimensions as shown below.

OUTLINE Dimensions (in mm)	PANEL CUTOUT Dimensions (in mm)
	



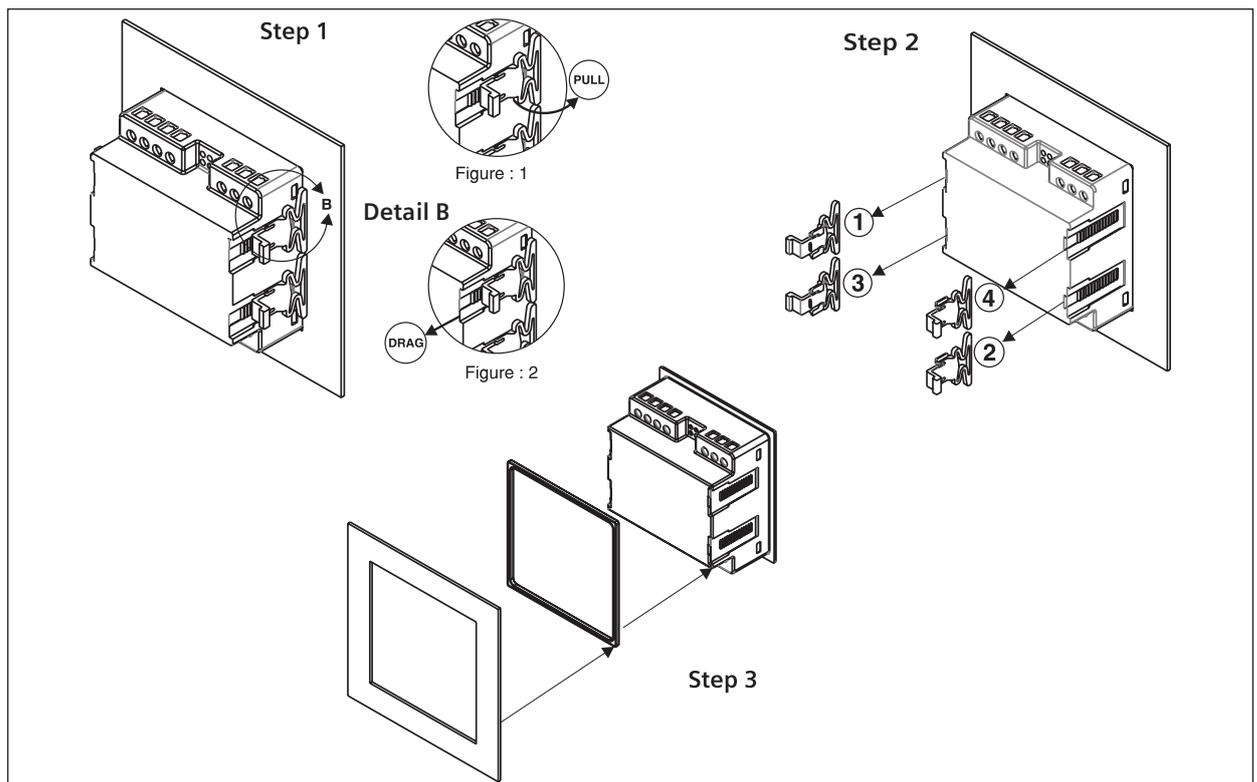
## Installation Guidelines

1. This equipment, being built-in-type, normally becomes a part of main control panel and in such case the terminals do not remain accessible to the end user after installation and internal wiring.
2. Conductors must not come in contact with the internal circuitry of the equipment or else it may lead to a safety hazard that may in turn endanger life or cause electrical shock to the operator.
3. Circuit breaker or mains switch must be installed between power source and supply terminals to facilitate power 'ON' or 'OFF' function. However this switch or breaker must be installed in a convenient position normally accessible to the operator.
4. Before disconnecting the secondary of the external current transformer from the equipment, make sure that the current transformer is short circuited to avoid risk of electrical shock and injury.
5. The equipment shall not be installed in environmental conditions other than those mentioned in this manual.
6. The equipment does not have a built-in-type fuse. Installation of external fuse of 0.5 A, Class gG type for electrical circuitry is highly recommended.
7. Remove the scratch-guard from the meter display during commissioning of the panel.

## Wiring Guidelines

1. To prevent the risk of electric shock, power supply to the equipment must be kept OFF while doing the wiring arrangement.
2. Wiring shall be done strictly according to the terminal layout. Confirm that all connections are correct.
3. Use lugged terminals.
4. To reduce electromagnetic interference use of wires with adequate ratings and twists of the same in equal size shall be made with shortest connections.
5. Layout of connecting cables shall be away from any internal EMI source.
6. Cable used for connection to power source, must have a cross-section of 1mm<sup>2</sup> to 2.5mm<sup>2</sup>. These wires shall have current carrying capacity of 6A.
7. Copper cable should be used (Stranded or Single core cable).

## For demounting the meter



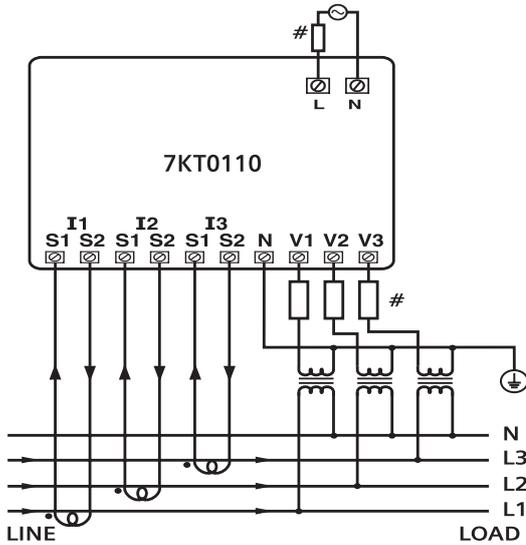
# Connection

# 5

## Typical Wiring Diagram - SMART 7KT0110

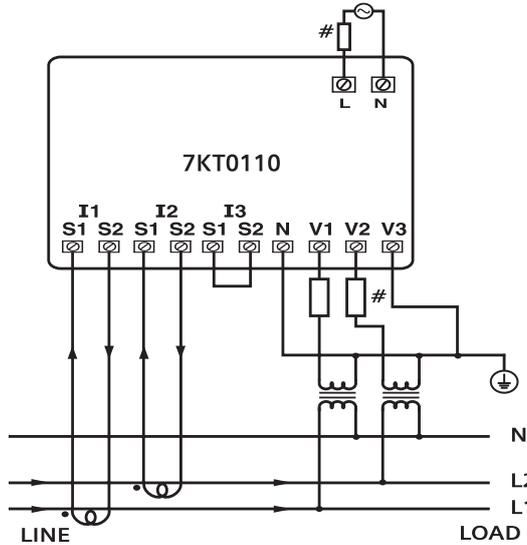
### 3 Phase - 4 Wire

3 Ø - 4 Wire, 3 CT's and 3 PT's



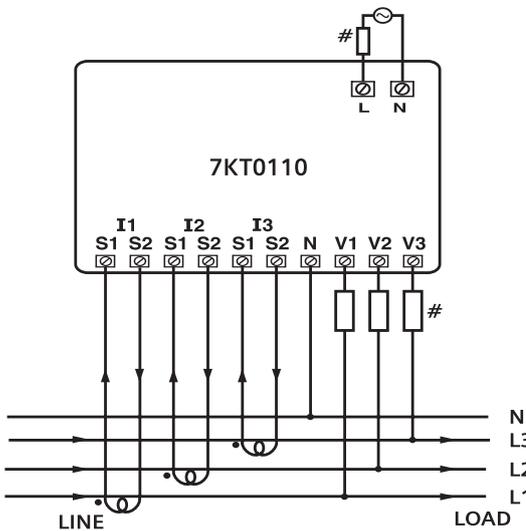
### 2 Phase - 3 Wire

2 Ø - 3 Wire, 2 CT's and 2 PT's



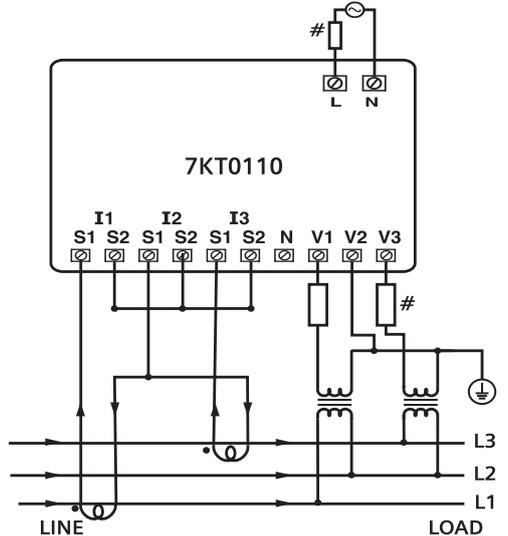
### 3 Phase - 4 Wire (commonly used)

3 Ø - 4 Wire, 3 CT'S



### 3 Phase - 3 Wire

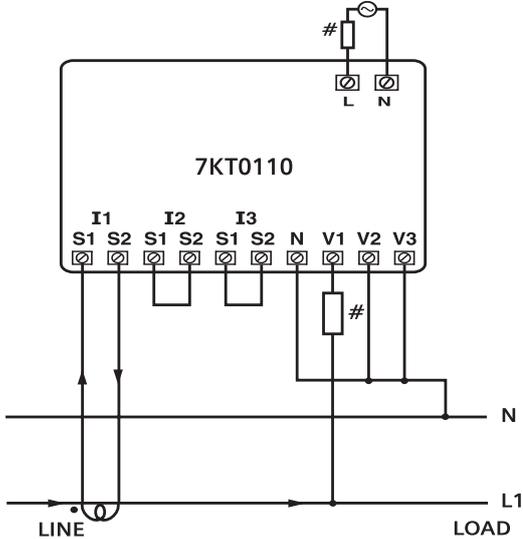
3 Ø - 3 Wire, 2 CT's and 2 PT's



**Typical Wiring Diagram - SMART 7KT0110**

1 Phase - 2 Wire

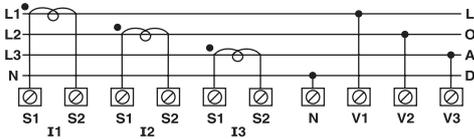
1 Ø - 2 Wire, 1 CT's



**Terminal Connections - SMART 7KT0110**



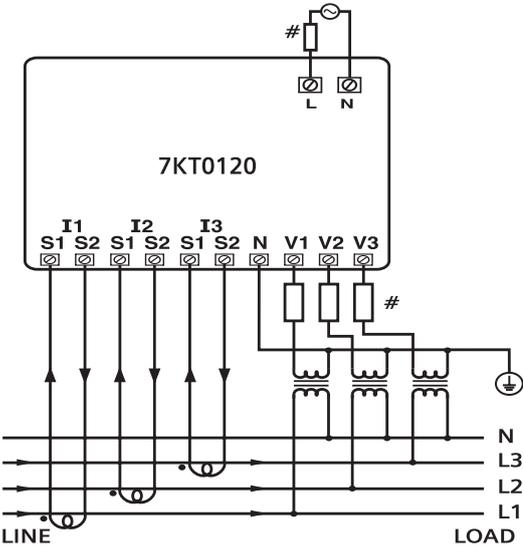
CONNECTIONS DIAGRAM



**Typical Wiring Diagram - SMART 7KT0120**

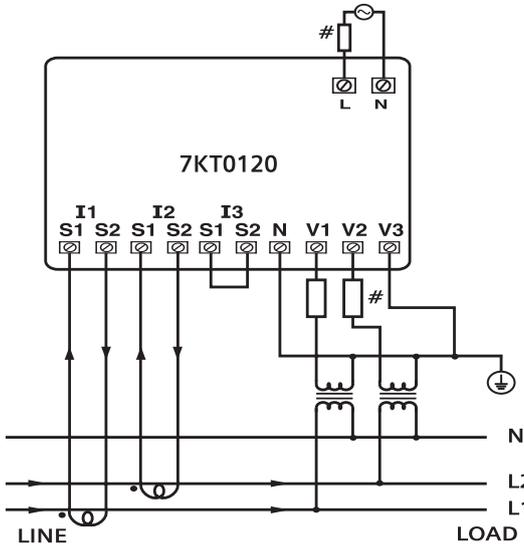
3 Phase - 4 Wire

3 Ø - 4 Wire, 3 CT's and 3 PT's



2 Phase - 3 Wire

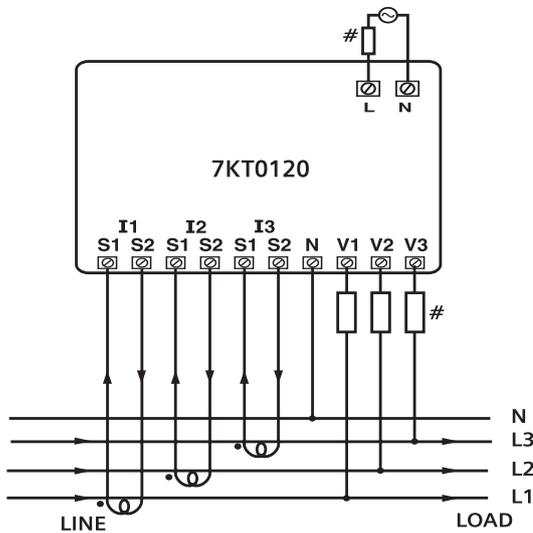
2 Ø - 3 Wire, 2 CT's and 2 PT's



**Typical Wiring Diagram - SMART 7KT0120 (Continued)**

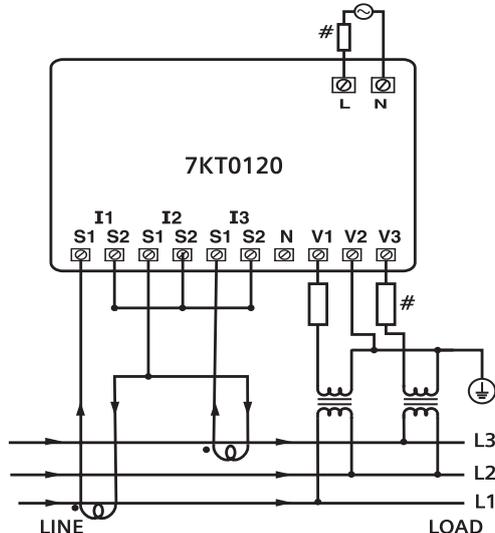
**3 Phase 4-Wire (commonly used)**

3 Ø - 4 Wire, 3 CT'S



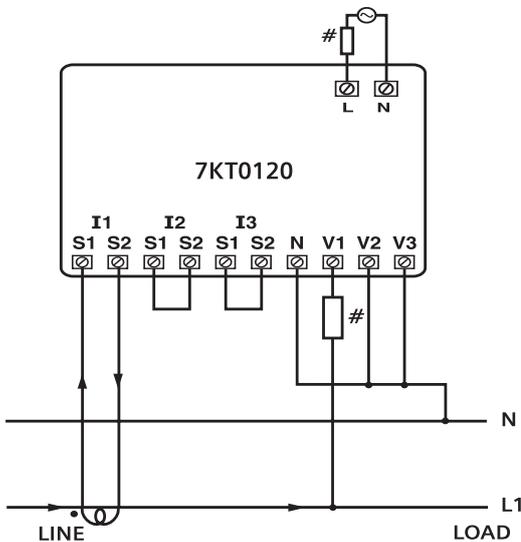
**3 Phase - 3 Wire**

3 Ø - 3 Wire, 2 CT's and 2 PT's



**1 Phase - 2 Wire**

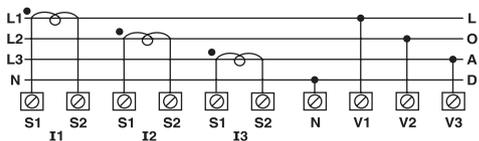
1 Ø - 2 Wire, 1 CT



**Terminal Connections - SMART 7KT0120**

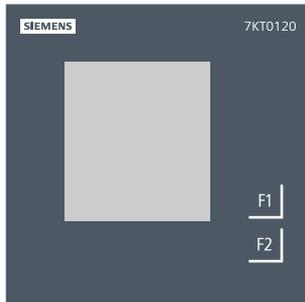


**CONNECTIONS DIAGRAM**



# Configuration

# 6



There are 2 dedicated function keys labelled as F1 and F2. Use these 2 keys to read meter parameters. Use the soft-touch keys to read the parameters.

The keys have multiple assignments. Function assignments and key labelling change according to the context of operator input.

A short touch on the key triggers the function once. Touching the key for longer switches on the autorepeat function after approximately 1 s. The function of the key is triggered repeatedly while the key is touched. Autorepeat is useful, for example, for fast incrementing of values when parameterizing the device.

Note: Image is representative

## SMART 7KT0110

### Serial Number Description:

Touch F1 for 10-15 secs to display 8 digit Serial number in 2 row & 2 pages.

For Eg., 22010001

Page 1:

22

01

Page 2:

00

01

### CONFIGURATION

#### For the configuration setting mode:

- Touch & Hold F1 + F2 key for 5 sec to enter and exit from configuration menu.
- Touch F1 key to increment the configuration pages.
- Use F2 key to edit the value and shift the cursor for next digit to edit.
- Touch & Hold F2 key for 2 sec to save the parameter value.
- Touch and hold F1 Key for 5 second to set CT/PT primary values in kilo from normal and vice versa.

E.g.: If 1300 is to be set, first set the left most digit to 1, then hold the key for 2 sec to shift to kilo. The display will show 1.00k. The change the value after the decimal point to 3 to get the value of 1.3k. the hold the key for 2 sec to save the parameter.

Config. Page.	Function	Range or Selection	Factory Setting
1	Password	000-999	100
2	Change password	YES/NO	No
3	New Password	000-999	000
4	Network selection	3P4W, 3P3W, 1P2W	3P3
5	CT Primary #	1 to 10K, If CT Sec 1 5 to 10K, If CT Sec 5	5
6	CT Secondary	1 or 5	5
7	PT Primary #	100 to 500K	350
8	PT Secondary	100 to 500	350
11	Page Scrolling mode	auto (AUT), manual (MNL)	AUT
112	Factory default	YES/NO	NO

# Touch and hold F1 Key for 5 second to set CT/PT primary values in kilo from normal and vice versa.

## SMART 7KT0120

### Serial Number Description:

Touch F1 and hold the key for 10sec to display 8 digit Serial number in 3 row

For Eg., 22010001

Page 1:

22

010

001

### CONFIGURATION

#### For the configuration setting mode:

- Touch & Hold F1 + F2 key for 5 sec to enter and exit from configuration menu.
- Use F1 key to increment the configuration pages .
- Touch F2 key to edit the value and shift the cursor for next digit to edit.
- Use F2 key for 2 sec save the parameter value .
- Press F1 Key for 5 second to set CT/PT primary values in Kilo from normal and vice versa.

E.g.: If 1300 is to be set, first set the left most digit to 1, then hold the key for 2 sec to shift to kilo. The display will show 1.00k. The change the value after the decimal point to 3 to get the value of 1.3k. the hold the key for 2 sec to save the parameter.

Config. Page.	Function	Range or Selection	Factory default Setting
1	Password	000-999	100
2	Change password	YES/NO	NO
3	New Password	000-999	000
4	Network selection	3P4,3P3, 1P2	3P4
5	CT Primary <sup>#</sup>	1 to 10K, If CT Sec 1 5 to 10K, If CT Sec 5	5
6	CT Secondary	1/5	5
7	PT Primary <sup>#</sup>	100 to 500K	350
8	PT Secondary	100 to 500	350
9	Number of Poles	0 to 98	2
10	Reset Run & On hour	YES/NO	NO
11	Page Scrolling mode	auto (AUT), manual (MNL)	AUT
12	Factory default	YES/NO	NO

# Touch and hold F1 Key for 5 second to set CT/PT primary values in kilo from normal and vice versa.

## Reading of parameters- SMART 7KT0110 (VA meter)

### Online Page Description

There are two dedicated keys labelled as F1 and F2.

Use these 2 keys to read parameters. Touch these keys to read the parameters. Units of corresponding parameters on display will glow automatically.

Key F1: To Increment Main Page.

Key F2: To Increment subpages of respective Main Page

Touch Key	Screen	Online Page Description
<b>For 3P4W</b>		
Touch F1	<b>1st main page</b>	Displays Line to Neutral voltage (L1-N) & 1st phase current.
Touch F2	1st sub page	Displays Line to Neutral voltage (L2-N) & 2nd phase current.
Touch F2	2nd sub page	Displays Line to Neutral voltage (L3-N) & 3rd phase current.
Touch F2	3rd sub page	Displays Line to Line voltage (L1-L2) & 1st phase current.
Touch F2	4th sub page	Displays Line to Line voltage (L2-L3) & 2nd phase current.
Touch F2	5th sub page	Displays Line to Line voltage (L1-L3) & 3rd phase current.
Touch F2	6th sub page	Displays Average value of Line to Line voltage, Current of three phase
Touch F2	7th sub page	Displays Average value of Line to Neutral voltage, Current of three phase
Touch F1	<b>2nd main page</b>	Displays Maximum & Minimum Line to Neutral voltage(L1-N) .
Touch F2	1st sub page	Displays Maximum & Minimum Line to Neutral voltage (L2-N).
Touch F2	2nd sub page	Displays Maximum & Minimum Line to Neutral voltage (L3-N) .
Touch F1	<b>3rd main page</b>	Displays Maximum & Minimum Line to Line voltage(L1-L2) .
Touch F2	1st sub page	Displays Maximum & Minimum Line to Line voltage (L2-L3).
Touch F2	2nd sub page	Displays Maximum & Minimum Line to Line voltage (L1-L3) .
Touch F1	<b>4th main page</b>	Displays Maximum & Minimum current of 1st phase.
Touch F2	1st sub page	Displays Maximum & Minimum current of 2nd phase.
Touch F2	2nd sub page	Displays Maximum & Minimum current of 3rd phase.
<b>For 3P3W</b>		
Touch F1	<b>1st main page</b>	Displays Line to Line voltage (L1-L2) & 1st phase current.
Touch F2	1st sub page	Displays Line to Line voltage (L2-L3) & 2nd phase current.
Touch F2	2nd sub page	Displays Line to Line voltage (L1-L3) & 3rd phase current.
Touch F2	3rd sub page	Displays Average value of Line to Line voltage, Current of three phase
Touch F1	<b>2nd main page</b>	Displays Maximum & Minimum Line to Line voltage(L1-L2) .
Touch F2	1st sub page	Displays Maximum & Minimum Line to Line voltage (L2-L3).
Touch F2	2nd sub page	Displays Maximum & Minimum Line to Line voltage (L1-L3) .
Touch F1	<b>3rd main page</b>	Displays Maximum & Minimum current of 1st phase.
Touch F2	1st sub page	Displays Maximum & Minimum current of 2nd phase.
Touch F2	2nd sub page	Displays Maximum & Minimum current of 3rd phase.
<b>For 1P2W</b>		
Touch F1	<b>1st main page</b>	Displays Line to Neutral voltage (L1-N) & 1st phase current.
Touch F2	1st sub page	Displays Maximum & Minimum Line to Neutral voltage(L1-N) .
Touch F2	2nd sub page	Displays Maximum & Minimum current of 1st phase.

## Reading of parameters- SMART 7KT0120 (VAF meter)

### Online Page Description

There are two dedicated keys labelled as F1 and F2.

Use these 2 keys to read parameters. Touch these keys to read the parameters. Units of corresponding parameters on display will glow automatically.

Key F1: To Increment Main Page.

Key F2: To Increment subpages of respective Main Page

Touch Key	Screen	Online Page Description
<b>For 3P4W</b>		
Touch F1	<b>1st main page</b>	Displays Line to Neutral voltage of three phase
Touch F2	1st sub page	Displays Line to Line voltage of three phase
Touch F2	2nd sub page	Displays Minimum Line to Neutral voltage of three phase
Touch F2	3rd sub page	Displays Maximum Line to Neutral voltage of three phase
Touch F2	4th sub page	Displays Minimum Line to Line voltage of three phase
Touch F2	5th sub page	Displays Maximum Line to Line voltage of three phase
Touch F1	<b>2nd main page</b>	Displays Current of three phase
Touch F2	1st sub page	Displays Minimum Current of three phase
Touch F2	2nd sub page	Displays Maximum Current of three phase
Touch F2	3rd sub page	Displays RPM*
Touch F2	4th sub page	Displays Run hour
Touch F1	<b>3rd main page</b>	Displays Average value of Line to Neutral voltage, Current of three phase and frequency.
Touch F2	1st sub page	Displays Average value of Line to Line voltage, Current of three phase and frequency.
Touch F2	2nd sub page	Displays ON hour
<b>For 3P3W</b>		
Touch F1	<b>1st main page</b>	Displays Line to Line voltage of three phase
Touch F2	1st sub page	Displays Minimum Line to Line voltage of three phase
Touch F2	2nd sub page	Displays Maximum Line to Line voltage of three phase
Touch F1	<b>2nd main page</b>	Displays Current of three phase
Touch F2	1st sub page	Displays Minimum Current of three phase
Touch F2	2nd sub page	Displays Maximum Current of three phase
Touch F2	3rd sub page	Displays RPM*
Touch F2	4th sub page	Displays Run hour
Touch F1	<b>3rd main page</b>	Displays Average value of Line to Line voltage, Current of three phase and frequency.
Touch F2	1st sub page	Displays ON hour
<b>For 1P2W</b>		
Touch F1	<b>1st main page</b>	Displays Line to Neutral voltage of 1st phase
Touch F2	1st sub page	Displays Minimum Line to Neutral voltage of 1st phase
Touch F2	2nd sub page	Displays Maximum Line to Neutral voltage of 1st phase
Touch F1	<b>2nd main page</b>	Displays Current of 1st phase
Touch F2	1st sub page	Displays Minimum Current of 1st phase
Touch F2	2nd sub page	Displays Maximum Current of 1st phase
Touch F2	3rd sub page	Displays RPM*
Touch F2	4th sub page	Displays Run hour
Touch F1	<b>3rd main page</b>	Displays Line to Neutral voltage, Current of 1st phase and frequency.
Touch F2	1st sub page	Displays ON hour

\* RPM = 120F/P

# | Maintenance

# 8

## **Guidelines**

- The equipment should be cleaned regularly to avoid blockage of ventilating parts.
- Clean the equipment with a clean dry or damp cloth. Do not use any cleaning agent other than water.

## **Disposal and recycling**

Dispose of or recycle the module in accordance with the applicable laws and regulations in your country.

These instructions do not purport to cover all details or variations in equipment, or to provide for every possible contingency in connection with installation, operation, or maintenance. Should additional information be desired, please contact the local Siemens sales office. The contents of this instruction manual shall not become part of or modify any prior or existing agreement, commitment, or relationship. The sales contract contains the entire obligation of Siemens. The warranty contained in the contract between the parties is the sole warranty of

Siemens. Any statements contained herein do not create new warranties or modify the existing warranty.

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