KS1

3 PHASE DETECTOR CE

INSTRUCTION MANUAL

SANWA ELECTRIC INSTRUMENT CO., LTD.
Dempa Bldg., 4-4 Sotokanda 2-Chome
Chiyoda-ku, Tokyo, Japan

① 06.11 Ⓢ

Thank you for your selection of 3 phase detector Model KS1. This product has been designed and manufactured in accordance with the safety standards applicable to IEC 61010-1 Electronic Measuring Equipment and has passed the inspection.

[1] SAFETY PRECAUTIONS - Before use, read the manual thoroughly. -

1-1 Explanation of Symbols:
⚠ : Attention! Refer to operation instructions
⚠**WARNING** :Intended to prevent personal injury such as burn and electric shock and other serious accidents.
⚠**CAUTION** :Intended to prevent misuse that could result in personal injury and damage to equipment including this instrument.
⚠ : Risk of electric shock ～ : AC
⧈ : Double insulation or reinforced insulation

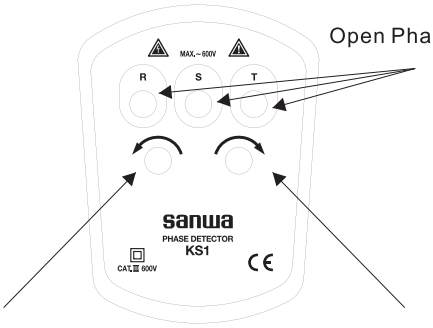
1-2 The instructions given under the heading of ⚠**WARNING** and ⚠**CAUTION** must be followed to prevent accidents.

⚠WARNING

1. Never use it on the power line that exceeds 600VAC to ground. The measurement classification category of this instrument is 600 V (CAT. III).
2. Pay special attention to voltages above 33VAC(46.7 Vpeak) and 70VDC that are hazardous to the human body
3. Make sure to connect alligator clips with R, S and T properly.
4. Do not use the instrument if the instrument or alligator clips are damaged or broken.
5. Do not use the instrument with lower case removed.
6. During measurement, keep your fingers behind the finger guard of alligator clips.
7. Be sure to use a fuse of the specified rating or type.
8. Do not use the instrument near flammable gases or solvents.
9. Do not use the instrument with wet hands or in a damp environment.
10. Do not disassemble or modify the instrument nor use components not specified by the manufacturer.
11. The instrument is for indoor use.
12. Inspect the instrument at least once a year.

PER IEC61010 OVERVOLTAGE INSTALLATION CATEGORY
OVERVOLTAGE CATEGORY II
Equipment of OVERVOLTAGE CATEGORY II is energy-consuming equipment to be supplied from the fixed installation.
Examples include household, office, and laboratory appliances.
OVERVOLTAGE CATEGORY III
Equipment of OVERVOLTAGE CATEGORY III is equipment in fixed installations.
Examples include switches in the fixed installation and some equipment for industrial use with permanent connection to the fixed installation.
OVERVOLTAGE CATEGORY IV
Equipment of OVERVOLTAGE CATEGORY IV is for use at the origin of the installation.
Examples include electricity instruments and primary over-current protection equipment.

[3] NAMES OF COMPONENT UNIT



Phase Rotation Indicator (Counterclockwise direction)

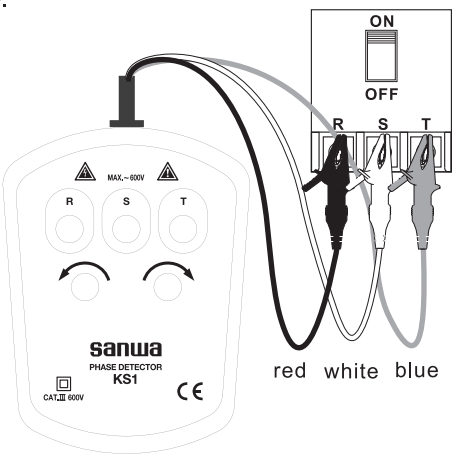
Phase Rotation Indicator (Clockwise direction)

[4] SPECIFICATIONS

Measurement: Open phase and Rotating direction
Voltage range: 3 phase AC 100V ~ 600V
Frequency: 45Hz ~ 70Hz
Time limit: AC110:Continuous, AC220V:3 hours, AC480V:12 minutes
Fuse: 0.2A/250V
Environment condition: Altitude 2000m or below, pollution degree II
Operating temperature / humidity: 0°C~ 40°C, 80%RH max., no condensation
Standards: IEC61010-1 CAT.III 600V, IEC61326, IEC61010-031
Dimensions: Main unit 102(L) x 78(W) x 32.5(D) mm
Alligator clips Approx. 0.6m (Red, White and Blue)
Weight: Approx. 212 g (Alligator clips included)
Accessaries: Carrying pouch(C-KS) x 1, Instruction manual, Calibration Assurance card

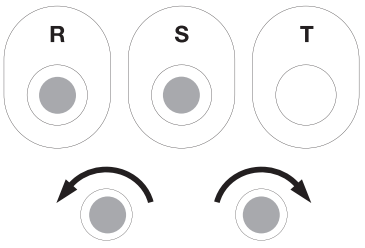
[5] MEASURING PROCEDURE

1. Connect the alligator clips to 3 phase input terminals by R-S-T as shown below.



Remarks: Illustrations of “Indicator is on” and “indicator is off” in this manual
Indicator is on: ● Indicator is off: ○

2. Checking open phase
When there is no open phase, indications of R, S and T are on.
If one of phase is open, its indicator (R, S or T) is off.



Above illustration shows that T is open phase.
Remarks:
- When there is open phase, both of Phase rotation indicators are
- on simultaneously.
  When fuse is broken, indicators of R or T are on.

3. Checking the rotating direction
Phase Rotation Indicator (clockwise direction) is on, phase sequence is R, S, and T in order of the power source terminals.

Phase Rotation indicator (counterclockwise direction) is on, It is incorrect. Alternate the connection of the two of the tree alligator clips.

Phase Rotation Indicator (Counterclockwise direction)

Phase Rotation Indicator (Clockwise direction)

Above illustration shows that phase sequence is R, S and T.

[6] MAINTENACE

⚠WARNING

1. The following instructions are very important for safety. Read this manual thoroughly to ensure correct maintenance.
2. Inspect the instrument at least once a year to ensure safety and maintain the instrument.

6-1 Maintenance and Inspection
Appearance: Is the instrument not damaged due to falling or other cause?
Test lead (Alligator clip): Are the core wires not exposed from the test leads?

If any of the above problem exists, stop using the instrument and request for repair.

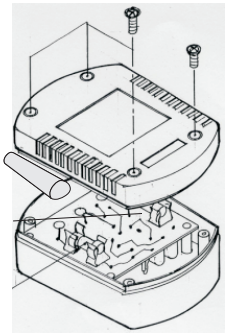
6-2 Information or inquiry of spare parts
For more information, please contact your dealer or Sanwa agent.

6-3 Storage

⚠CAUTION

1. The panel and case are not resistant to volatile solvent and must not be cleaned with thinner or alcohol.
2. The panel and case are not resistant to heat. Do not place the instrument near heat-generating devices.
3. Do not store the instrument in a place where it may be subjected to vibration or from where it may fall.
4. Do not store the instrument in places under direct sunlight, or hot, cold or humid places or places where condensation is anticipated.

6-4 Fuse replacement
Connect the alligator clips to 3 phase input terminals. If indicator of R or T is off, there is possibility that fuse(s) are broken. Please disconnect alligator clips from 3 phase input terminals, and then open the case to check whether fuse(s) is broken or not. If fuse(s) is broken, replace broken fuse as shown.



Fuse Part No.: F1202,
Fuse Specification: 0.2A/250V, 5x20mm
Be sure to use specified rating fuse.

[7] After-Sale Service

7-1 Warranty and Provision
Sanwa offers comprehensive warranty services to its end-users and to its product resellers. Under Sanwa's general warranty policy, each instrument is warranted to be free from defects in workmanship or material under normal use for the period of one (1) year from the date of purchase.

This warranty policy is valid within the country of purchase only, and applied only to the product purchased from Sanwa authorized agent or distributor.

Sanwa reserves the right to inspect all warranty claims to determine the extent to which the warranty policy shall apply. This warranty shall not apply to fuses, or any product or parts, which have been subject to one of the following causes:

1. A failure due to improper handling or use that deviates from the instruction manual.
2. A failure due to inadequate repair or modification by people other than Sanwa service personnel.
3. A failure due to causes not attributable to this product such as fire, flood and other natural disaster.
4. A failure or damage due to transportation, relocation or dropping after the purchase.

7-2 Repair
Customers are asked to provide the following information when requesting services:

1. Customer name, address, and contact information
2. Description of problem
3. Description of product configuration
4. Model Number
5. Product Serial Number
6. Proof of Date-of-Purchase
7. Where you purchased the product

Please contact Sanwa authorized agent / distributor / service provider, listed in our website, in your country with above information. An instrument sent to Sanwa / agent / distributor without those information will be returned to the customer.

Note :
1)Repair during the warranty period:
The failed instrument will be repaired in accordance with the conditions stipulated in 7-1 Warranty and Provision.
2)Repair after the warranty period has expired:
In some cases, repair and transportation cost may become higher than the price of the product. Please contact Sanwa authorized agent / service provider in advance. The minimum retention period of service functional parts is 6 years after the discontinuation of manufacture. This retention period is the repair warranty period. Please note, however, if such functional parts become unavailable for reasons of discontinuation of manufacture, etc., the retention period may become shorter accordingly.
4) Precautions when sending the product to be repaired. To ensure the safety of the product during transportation, place the product in a box that is larger than the product 5 times or more in volume and fill cushion materials fully and then clearly mark "Repair Product Enclosed" on the box surface. The cost of sending and returning the product shall be borne by the customer.

7-3 SANWA web site http://www.sanwa-meter.co.jp
e-mail: exp_sales@sanwa-meter.co.jp

The product specifications described in this manual and its appearance are subject to change without notice for improvement.