

SEFRAM 86

Contrôleur d'ordre de phase et de rotation moteur
Phase rotation tester and motor rotation tester

Notice d'utilisation
User's Manual

Sefram



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1. Introduction

Remarque

Cet instrument a été conçu et testé selon les prescriptions de la norme internationale IEC Publication 348, Safety Requirements for Electronic Measuring Apparatus, IEC-1001 (EN61010).

Suivre scrupuleusement les prescriptions de sécurité lors de l'utilisation.

ATTENTION

Lire les prescriptions de sécurité avant toute utilisation

2. Prescriptions de sécurité

- Lire ces prescriptions avant toute utilisation de l'appareil.
- N'utiliser l'appareil que dans les limites spécifiées. En dehors des limites, l'appareil pourrait être endommagé et la sécurité de l'utilisateur non garantie.
- Conditions d'utilisation:
 - (1). Utilisation à l'intérieur
 - (2). Catégorie d'installation : CAT III 600V
 - (3). Degré de pollution : 2.
 - (4). Altitude d'utilisation : 2000 mètres maximum
 - (5). Humidité relative : 80% Max.
 - (6). Température d'utilisation : 0°C ~ 40 °C.
 - (7) Température de stockage : -10°C ~60°C.
- Les symboles suivant sont utilisés sur l'appareil :



Double isolement



Danger ! Risque de choc électrique



Attention ! Se référer au manuel

3. Caractéristiques

- L'appareil inclus 4 fonctions :
 - 1) test de phase ouverte.
 - 2) ordre de phases.
 - 3) sens de rotation moteur.
 - 4) test de la pile (bat OK).
- Cet appareil est l'outil idéal pour l'installation de dispositifs électrique ou électrotechnique.
- Alimentation par pile.
- Conforme à la norme IEC 1010
- Livré avec kit de connexion.

4. Description de l'appareil

Ce contrôleur d'ordre de phase et de rotation moteur a trois cordons colorés .

Chacun de ces cordons correspond à une douille de la même couleur

L_1 = Rouge qui se connecte à L_1 sur le contrôleur

L_2 = Blanc qui se connecte à L_2 sur le contrôleur

L_3 = Bleu qui se connecte à L_3 sur le contrôleur

Les pinces crocodiles sont aussi colorées.

Les pinces crocodiles se connectent aux phases à tester. Le contrôleur a trois NEONS qui, lorsqu'ils s'allument, corresponde à l'indication de présence de chaque phase.



Ces néons s'allument seulement avec une tension supérieure à 100V entre phases.

Les abréviations peuvent être différentes dans chaque pays ($L_1=R=U$; $L_2=S=V$; $L_3=T=W$)

Une LED $L_1-L_2-L_3$ s'allume lorsque les phases tournent dans le sens des aiguilles d'une montre.

Une LED $L_2-L_1-L_3$ s'allume lorsque les phases tournent dans le sens inverse des aiguilles d'une montre.

Une LED BAT OK s'allume pour confirmer que la pile n'est pas vide et que le contrôleur est en marche.

5. Méthode de mesure

- **Utilisation en testeur d'ordre de phase et d'absence de phase:**
 - (1). Brancher les cordons sur les entrées RST en respectant les couleurs
 - (2). Brancher au dispositif à contrôler (source d'énergie)
 - (3). S'assurer que les lampes de présence de phase sont toutes allumées. Sinon, il y a rupture ou absence sur une ou plusieurs phases.
 - (4). Appuyer sur le bouton rouge (TEST) pour vérification de l'ordre des phases

Si la lampe « sens des aiguilles d'une montre » est allumée, les phases sont dans l'ordre $L_1-L_2-L_3$ (R-S-T) (il suffit de suivre les cordons)

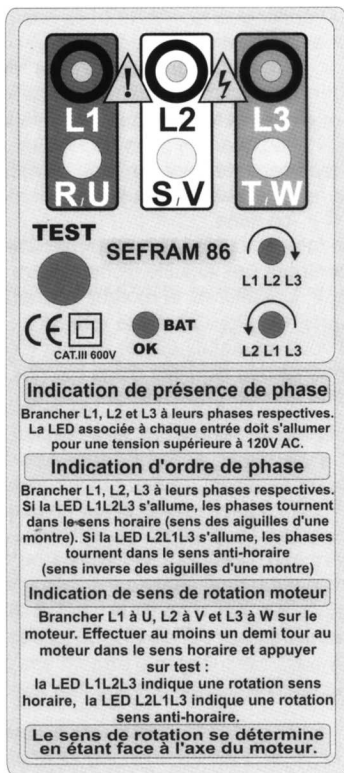
Si la lampe $L_2-L_1-L_3$ (S-R-T) « sens inverse des aiguilles d'une montre » est allumée, l'ordre des phases n'est pas correct. Revoir le branchement.
- **Sens de rotation d'un moteur**
 - (1). Brancher les cordons sur $L_1-L_2-L_3$ et sur le moteur (triphase). Appuyer sur le bouton rouge (TEST). Le voyant BAT OK doit s'éclairer et

traduit le fait que la pile est en bon état. Si une des 2 diodes rouges s'allume en l'absence de rotation du moteur, débrancher le SEFRAM 86 et vérifier que le moteur n'est pas connecté à une source d'énergie.

Se mettre en face de l'axe moteur et le faire tourner à la main dans le sens des aiguilles d'une montre. Si la LED $L_1-L_2-L_3$ indiquant le sens de rotation identique à celui de l'axe, un branchement correct des phases fera tourner le moteur dans ce sens.

- (2). En faisant tourner le moteur dans le sens contraire des aiguille d'une montre, si la LED $L_2-L_1-L_3$ s'allume, le moteur tournera dans le sens des aiguilles d'une montre.
- (3). Si vous souhaitez que le moteur tourne en sens inverse des aiguilles d'une montre, il faudra effectuer un branchement $L_2-L_1-L_3$

6. Face avant



7. Spécifications

Tension d'entrée pour le test de la présence de phase:

100V AC à 600V AC max.

Tension d'entrée pour le test du sens de rotation de moteur:

2V AC à 600V AC max.

Fréquence: 10 à 4000 Hz.

Circuit de mesure: électronique (pas de dispositif mécanique)

Alimentation: Pile 9V Type 6F22

Consommation: 18mA en test de rotation moteur
0mA pour le test de présence de phase.

Sécurité: IEC-1010 Cat III. - 600V .

Dimensions: 153(L) x 72(l) x 35(H) mm.

Masse: 182g environ avec pile

Accessoires: Cordons avec pinces crocodile
(Rouge, jaune et bleu),
Housse de transport,
Manuel d'utilisation

Protection: Par circuit à haute impédance et
par fusible F200mA/ 250V pour la
Partie contrôleur d'ordre de phase

8. Maintenance

- Remplacement de la pile
 - (1). Remplacer la pile lorsque la LED BAT OK ne s'allume plus lorsque vous pressez TEST.
 - (2). Débrancher les cordons de test. Dévisser le fond le boîtier et remplacer la pile par une du même type (9V 6F22).
 - (3). Revisser le fond de boîtier

- Remplacement du fusible
 - (1). Il est nécessaire de remplacer le fusible lorsque le lampes indiquent une absence de phase sur R ou T, malgré une permutation des branchements.
 - (2). Débrancher les cordons de test. Dévisser le fond le boîtier et remplacer le fusible par un modèle F200mA/250V.
 - (3). Revisser le fond de boîtier.

- Nettoyage:

Nettoyer périodiquement le boîtier à l'aide d'un chiffon doux et humide. Ne pas utiliser de solvant

Si l'appareil n'est pas utilisé pour une période de plus de 2 mois, enlever la pile.

SAFETY RULES

CAUTION



**RISK OF ELECTRIC
SHOCK**

This tester has been designed with your safety in mind. However, no design can completely protect against incorrect use. Electrical circuits can be dangerous and/or lethal when lack of caution or poor safety practices are used.

Do not carry out field measurements on either the power system grounding, during periods of forecast lightning activity, in areas that encompass the station being measured or of the power network connected to the station being measured. In the event that lightning occurs, stop all testing and isolate any temporarily installed test spikes.

Preparations for testing of power system grounding can leave personnel vulnerable to exposure caused by faults at or fed from the system under test, transferred potentials from remote test grounds, and inadvertent line energisations.

While the probability of the occurrence of one of these events is low, personnel safety will, nevertheless, be enhanced by the following:

When working near high tension systems rubber gloves and shoes should be worn.

Work on clean, dry crushed rock or an insulating blanket.

Avoid bare hand to hand contact between the tester and extended test leads.

When using the tester with test leads, ensure that they are safe and properly authorized

Disconnect the tester from any external circuit when changing the batteries.

CAUTION



READ THE MANUAL

Follow the instructions in the Manual for every measurement. Read and understand the general instructions before attempting to use this tester

SAFETY CHECK

Before using the tester check the condition of the batteries. This is done by switching the tester ON.

If the BAT OK led does not light up, the battery need replacing.

Battery and fuse replacement are described later in this user's manual..

When changing the battery, fuses, or removing the cover to access the internal circuitry, always disconnect the test leads.

When replacing the fuse use only the type specified, 5 x 20mm, 200mA, 250V fuse, and insert correctly into the fuse holder.

Double check the switch setting, and lead connections before making measurements.

DON'T TOUCH

Don't touch exposed wiring, connections or other "Live" parts of an electrical circuit. If in doubt, check the circuit first for voltage before touching it.

Do not use cracked or broken test leads.

**THIS INSTRUMENT SHOULD ONLY BE USED BY A
COMPETENT, SUITABLY TRAINED PERSON.**

REMEMBER

SAFETY IS NO ACCIDENT



CAUTION RISK OF ELECTRIC SHOCK



CAUTION READ THE MANUAL

GENERAL DESCRIPTION

This Test Instrument is a 3 Phases Presence and Rotation Indicator combined with a 3 Phases Motor Rotation Tester.

It can be utilized on a **3 Phase Powered System** (the supply side) or on a **Three Phases Unpowered Motor** (the load side) without having to worry about damage to the tester.

When utilized on a **3 Phase Powered System**, the instrument is then utilized as a 3 Phases Presence and Rotation Indicator.

When utilized on a **Three Phases Unpowered Motor**, the instrument is then utilized as a 3 Phases Motor Rotation Tester.

When utilized on a 3 Phases Powered System, this instrument is a rotary field indication instrument which display all three phases by lighting up it's corresponding Lamp. It display the rotation (clockwise or anti-clockwise) on a LED.

When utilized on a 3 Phases Unpowered Motor, it is also possible to determine the motor connections U, V, W without a live circuit to avoid subsequent damages of e.g. pumps to reversed motor rotation. It display the rotation (clock-wyze or anti-clock-wyze) on a LED.

This instrument represents the quickest and easiest way for servicing, repairing and electrical maintenance of 3 phase rotating machinery.

With this equipment, you can, before connecting Load to Supply:

On the supply side;

- Quickly verify the presence of the three Phases on a 3 Phases Power System.

- Confirm the Phase Rotation on a Powered 3 Phase System.

On the Motor Side (Load);

- Confirm the Phase Rotation on a unpowered 3 Phase Motor 3 Phases Alternator.

- Confirm that each winding is connected to the terminals of the motor, when the rotation Leds light up.

BRIEF PRODUCT DESCRIPTION

This 3 Phases and Motor Rotation Tester has 3 test leads which connects to the 4 mm female sockets on the tester, on the one side.

These Test leads are color coded.

- L1 = Red which connects to L1 on the tester.
- L2 = Yellow which connects to L2 on the tester.
- L3 = Blue which connects to L3 on the tester.

On the other side of the test leads are the probes, also color coded.

The tester has three neon lamps which are the Phase Presence indicators;

- Neon Lamp for Individual Phase Presence Indication = L1
- Neon Lamp for Individual Phase Presence Indication = L2
- Neon Lamp for Individual Phase Presence Indication = L3

Please note that any of these Neon lamp will only start to light up if more than 100Vac is present between any 2 phases.

A LED to display clockwise rotary direction.

A LED to display counter clockwise.

A LED to display and confirm operation and battery OK status.

A Push Button to switch the instrument ON.

OPERATING INSTRUCTIONS

Determination of the rotary field direction and phase presence

On a 3 Phase System, the sequence of the 3 phases determine the rotation of a 3 phase motor connected to that system.

The correct 3 Phase Sequence L1, L2, L3 results in a clockwise rotation of the connected motor.

Connect the Test Leads to the sockets of the Instrument, respecting the correct color. Red to L1, Yellow to L2, Blue to L3.

Clip the test probes to the three mains phases, L1, L2, L3

When connecting to a voltage superior to 100V AC, the corresponding neon lamp will start to glow, indicating the presence of the voltage on it's corresponding lead (L1, L2, L3 lamps).

Press the TEST button to turn the instrument "ON".

The green LED indicates that the instrument is ON and is busy testing.
The battery is OK when the green LED is ON.

Should the Green LED not come on while depressing the TEST button, replace the battery (see Battery Replacement).

If the LED (Right arrow) L1-L2-L3 is illuminated, clockwise rotary field is present.

If the LED(Left arrow) L2-L1-L3 is illuminated, a counter clockwise rotary field is present.

Please note that; the phase control is displayed even if the neutral conductor N is connected instead of L1, L2, or L3.

Also refer to table (as indicated on the back of instrument)

Determination of motor connections and rotation of motor

Connect test leads to instrument and to the motor connections.

These are also Color Coded;

U	=	Red	;	which connects to L1 on the tester.
V	=	Yellow	;	which connects to L2 on the tester.
W	=	Blue	;	which connects to L3 on the tester.

Press button On. The green LED indicates that the instrument is ready for testing.

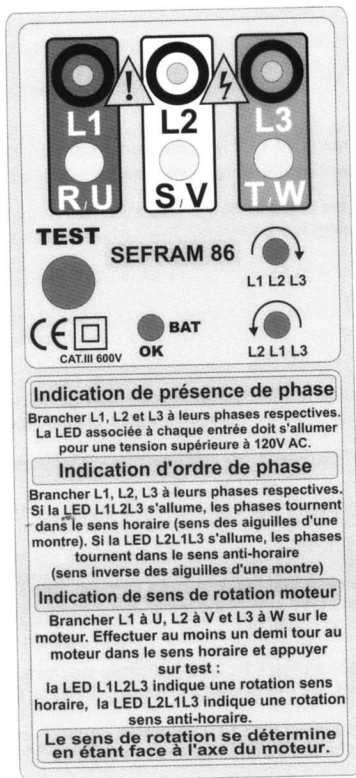
Turn the motor shaft by at least half rotation towards the right. Look at the Leds while doing that.

It is important to ensure that the user looks from the front side onto the driving shaft and the front side of the tester at the same time, so that motor rotation can be confirmed.

The red LED (Right arrow) L1-L2-L3 indicates clockwise motor rotation if the lines are connected as follows: L1 to U, L2 to V, L3 to W.

The red LED (Left arrow) L2-L1-L3 indicates counter- clockwise motor rotation if the lines are connected as follows: L1 to V, L2 to U, L3 to W.

FRONT PANEL LAYOUT



PRINCIPLE OF HOW IT WORK

The tester has two separate circuits:

The first circuit is the 3 Phase presence indicator, which is shown by the neon lamps and the second circuit is the three phase sequence indicator by leds.

A low battery, with a Power On indicator circuitry is also present.

3 Phase Presence Indication circuit:

This circuit uses neon lamps to indicate if a phase is present. These neon lamps are connected in series with a limiting resistor. Neon lamps will lights up when the voltage accross any two phases is more than 100Vac.

3 Phase sequence indicator circuit:

This circuit has an analog and a digital part. The analog signals are amplified (so that motor rotation with very low signals can be performed), then compared to a set of references. These results are digitally compared to give the results on the indicating LEDs.

Switch-ON and low Battery detector:

At switch ON, the battery voltage is measured and compared. If the battery voltage is below the threshold, the LED will not light up, thus replacing the battery indication.

PREPARATION FOR USE

Fuses:

In doubt, check the fuses using a ohm meter. Please note that this instrument will not indicate anything, should the fuses be blown.

Test Leads:

Check the test leads for defects or cracks. Replace if cracked or damaged. Only replace with the same type

Cleaning:

Use a damp cloth to clean the case. Do not use chemicals

REPLACING THE BATTERIES

Prior to battery replacement always disconnect the instrument from the circuit to which it's connected.

Remove the test leads from the instrument.

Remove the back cover to access the battery compartment.

Remove the bad battery from the battery compartment and dispose properly of that battery (see your local disposal facilities related to disposal of batteries).

Only replace with a new battery of the following type:

9 V, IEC 6 LR61.

Re-insert the (battery) back cover onto the instrument and tighten the screws.

FUSES REPLACEMENT

Unscrew the back cover and replace the faulty fuse(s) with the same type, then screw the cover back into place correctly

SPECIFICATIONS

ELECTRICAL

Determination of the Phase Presence

Nominal Voltage for Phase Presence Indication (the voltage required for the neon lamps L1, L2, L3 to lit up)..... From 100Vac to 450Vac.
Frequency Range From 10Hz to 400Hz.

Determination of the Phases Rotary Field Direction:

Direction (the voltage required to have the direction LEDs L1-L2-L3 or L2-L1-L3 to indicates)..... From 1 to 450Vac.
Frequency Range From 2Hz to 400Hz.

Determination of Motor Connections (requires > 1/2 turn)

Direction (the voltage required to have the direction LEDs L1-L2-L3 or L2-L1-L3 to indicates)..... From 1 to 450Vac.
Frequency Range From 2Hz to 400Hz.

Protection

OverLoad..... 550V (between all terminals)
Over Voltage Class III - 450V towards ground.

Fuses..... 5 x 20mm, 200mA, 250V fuse

General

Battery..... 9V, IEC 6LR61
Current Consumption Max 18 mA.

MECHANICAL

Size..... 151 x 72 x 35 mm
Material..... Polycarbonate/ABS
Weight (less carrying case)..... ±120g (with batteries)
Display..... Neon Lamps and Leds

ENVIRONMENTAL

Operating temperature Range: -15 °C to + 55 °C
Storage Temperature: -20 °C to + 70 °C

CLEANING

Clean the instrument case with an anti-static cleaner and wipe with dry cloth.

Pouch

Vinyl.

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