



## 3/TRES

### THREE PHASE SECONDARY INJECTION RELAY TEST SETS

- ROBUST AND POWERFUL MANUAL TEST SET
- DESIGNED FOR TESTING ALL ELECTROMECHANICAL, SOLID STATE AND NUMERICAL RELAYS
- UNIVERSAL TESTING CAPABILITY
- EXTREMELY EASY TO USE



## APPLICATION

3/TRES CAN TEST  
ALL THE FOLLOWING RELAYS

RELAY TYPE	IEEE No
Distance relay	21
Synchronising relays	25
Under/over voltage	27/59
Directional Power relays	32
Field relays	40
Reverse phase current	46
Reverse phase voltage	47
Incomplete sequence	48
Overcurrent - Ground fault relays	50
Inverse time overcurrent relays	51
Power factor relay	55
Voltage balance	60
Ground detection	64
Directional overcurrent relays	67
Phase angle out of step relays	78
Automatic reclosing devices	79
Frequency relays	81
Pilot wire relays	85
Lockout relays	86
Differential relays	87
Directional voltage relays	91
Power directional relays	92
Tripping relays	94



## 3/TRES SPECIFICATION

### 3-PHASE CURRENT MODULE

#### AC CURRENT OUTPUTS

RANGE		CURRENT A
1	3 X	0...50
2	3 X	0...10
3	3 X	0...5
4	3 X	0...1
5	3 X	0...0.1

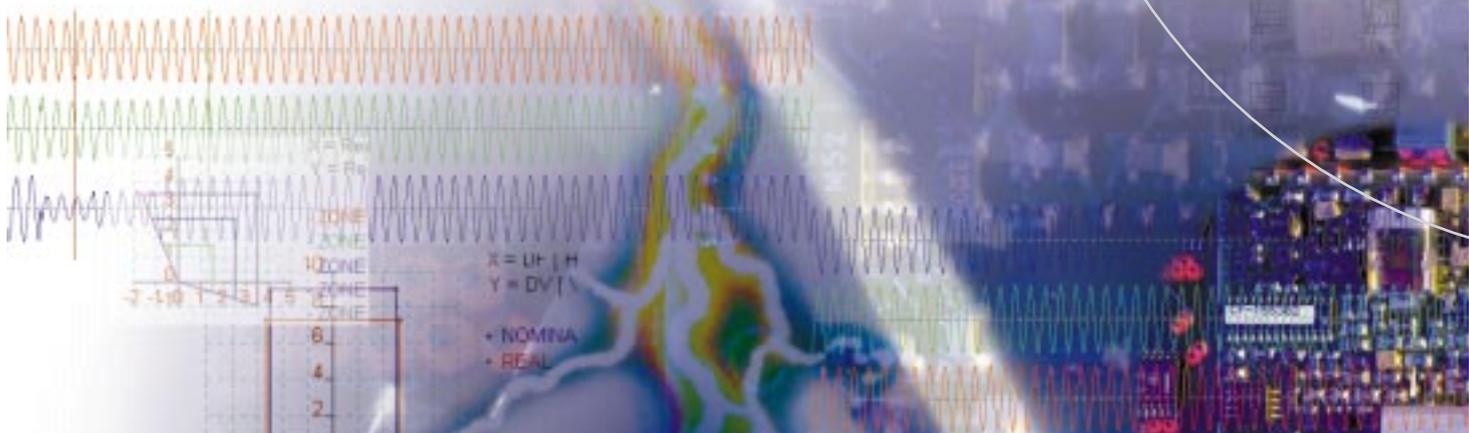
- Output power: 150 VA per phase; 450 VA single-phase.
- Duty cycle: continuous.
- Range selection: by three selector switches.
- Output adjustment: continuous, from 0 to 100% of the selected range.

### 3-PHASE VOLTAGE MODULE

#### AC VOLTAGE OUTPUTS

RANGE		VOLTAGE V
1	3 X	0...250
2	3 X	0...125
3	3 X	0...62.5

- Power: 50 VA per phase.
- Duty cycle: continuous.
- Electronic generation.
- Range selection: range selector switch for all outputs.
- Adjustment: continuous, from 0 to 100% of the selected range.
- Setting of pre-fault and fault values.



## AUXILIARY DC VOLTAGE SUPPLY

Output range: adjustable from 10 to 240 V DC.

Output power: 35 W.

## PHASE ANGLE SHIFTER

Integral Phase Angle Shifter that allows phase shifting between current and voltage outputs.

Continuous adjustment between 0° and 360°.

Resolution: 1°.

## PHASE ANGLE METER

Phase angle metering: by means of a digital phase angle meters.

Display: 0° to ± 180°.

Accuracy: 1°.

## OUTPUT FREQUENCY

Frequency Range: 40 to 70 Hz.

Resolution: 10 mHz.

Accuracy ± 20 mHz.

## TIME MEASUREMENTS

Timer: digital, with automatic start and stop, for contact trip or close, either clean or under voltage (input range 24 to 220V, AC or DC).

Range: autoranging, from 0.000 s to 9999 s.

Accuracy: 0.1% of the range.

## RECLOSER TEST

3/TRES allows to test re-closer functions.

Time measurements: Trip; re-closing delay; re-close duration.

## OUTPUTS MEASUREMENTS

Measurements: 3 current, 3 voltage, 1 DC voltage.

Displays: 3 digits, for AC voltage, AC current and DC voltage outputs.

Accuracy: ±0,5% of the reading ±0.1% of the range.

## POWER SUPPLY

Three phase with neutral: 220 - 240 V (phase voltage); 50/60 Hz.

Single phase: 230 V AC ± 10% 50/60 Hz.

If the power supply is not as specified, it is possible to use an external optional auto-transformer.

Two types are available:

.AT/4. For a 110-V three phase supply (phase voltage), with or without neutral.

.AT/3. For a 220 - 280 V three phase supply (phase voltage), without neutral.

## CASE

Two aluminium cases with removable cover and carrying handles.

## WEIGHT AND DIMENSIONS

Weight:

. current module: 29 kg.

. voltage module: 24 kg.

Dimensions (both modules):

330 x 280 x 600 mm.

## ACCESSORIES SUPPLIED WITH THE UNIT

The test set is supplied complete with power supply cable, interconnection cables and operating manual.

## MODEL 3/TRES-C (EXTENDED PERFORMANCE)

This model performs the following additional features:

. Current outputs without a common point for testing in Aron connection.

. Output frequency with the additional range from 120 to 180 Hz.

This function allows testing the response of voltage relay to the third harmonic.

. Electronic feed-back controlled current generator.

. Output frequency: 100 Hz.

. Ranges: 2.5 - 5 - 7.5 A. Power: 25 VA

. It allows testing the second harmonic restraint of differential relays.

## APPLICABLE STANDARDS

### ELECTROMAGNETIC COMPATIBILITY

Directive no. 89/336/CEE dated May 3, 1989, modified by the directive 92/31/CEE dated May 5, 1992.

Applicable Standards:

EN 50081-2; EN 50082-2; EN 55011;

EN 61000-3-3; EN 50082-2; ENV 50140;

ENV 50141; ENV 50204; IEC 1000-4-2;

IEC1000-4-4; IEC 1000-4-6; IEC 1000-4-8.

### LOW VOLTAGE DIRECTIVE

Directive n. 73/23/CEE, modified by the directive 93/68/CEE.

Applicable standards, for a class I instrument, pollution degree 2, installation category II: CEI EN 61010-1.

In particular:

. Operating temperature: 0 - 45°C;

storage: -25°C to 70°C.

. Relative humidity: 10 - 80% without condensing.

E-3/TRES-7.00

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