

# HEXAN-C

# COTEL

## THREE-PHASE PROTECTION RELAY TEST SET

**Current (25 A/ph) & Voltage (300 V/ph)**  
**Extremely versatile**  
**Very user friendly**  
**Run from PC OR integrated Custom interface**  
**Modular & Configurable**  
**Rugged and portable**



The **HEXAN-C** applies the latest technologies for component integration and power supply design to offer a complete three-phase test system of reduced dimensions and weight. The experience acquired during the development of the HEXAN enables us to integrate a custom interface into the front panel. Control by software is also possible for complex relays or those which require more automation. THE **HEXAN-C** is particularly adapted to the testing of electric protection relays, as well as to the verification of meters and converters

The **integrated custom interface** displays and enables easy adjustment of the three voltages, the three currents, the frequency, the phase angle of electrical networks generated by the HEXAN. A simple menu accesses the testing of reclosers, voltage decoupling protections, neutral shifting...

The double network for switching instantaneously between good and faulty networks with digital timer synchronising is very user friendly.

The **alternative control by PC** is available with the HEXAN software. The connexion is easy with the serial **RS232** or **USB** on the front panel. The **Manusoft software** supplied gives the the user a simple front panel on the PC screen with potentiometers having advanced tools. Injecting is aided by the Fresnel diagram. The software is compatible with windows® XP/2000/VISTA.

### HEXAN test software modules

<b>AH-PDMI</b>	Minimum Impedance Relay (Railway application)
<b>AH-PRODI</b>	Distance Protection (Electrical transmission)
<b>AH-CTF</b>	Generator Protection
<b>AH-SC</b>	Synchro coupler
<b>AH-MITI</b>	Overcurrent protection (constant & inverse time relays)
<b>AH-SMARTEST</b>	Automatic relay tester & state sequencer
<b>AH-RH7T</b>	Harmonic generator

INJECTION SECONDAIRE TRIPHASÉE

# SPECIFICATIONS

## Amplifiers

**Protection against overload & short circuit on the voltage & current outputs. All connections for amplifier outputs are 4 mm banana plug**

### Voltages

Amplifiers **13 V/130 V** for 6X0 models

3x Ph-N	<b>3x 0...130V</b>
1x Ph-Ph	<b>1x 0...260 V</b>
Puissance :	<b>3x 60 VA at 130 V</b>
Résolution :	<b>400 µV at 13V ; 4 mV at 130 V</b>
Précision :	<b>0.1 %</b>
Distorsion :	<b>0.1 % THD*</b>

Amplifiers **130 V/260 V** for 6X1 models

3x Ph-N	<b>3x 0...260 V</b>
1x Ph-Ph	<b>1x 0...520 V</b>
Puissance :	<b>3x 60 VA at 260 V</b>
Résolution :	<b>4 mV at 130 V ; 8 mV at 260 V</b>
Précision :	<b>0.1 %</b>
Distorsion :	<b>0.1 % THD*</b>

Amplifiers **150 V/300 V** for 6X2 models

3x Ph-N	<b>3x 0...300 V</b>
1x Ph-Ph	<b>1x 0...600 V</b>
Puissance :	<b>3x 70 VA at 300 V</b>
Résolution :	<b>5 mV at 150 V ; 9 mV at 300 V</b>
Précision :	<b>0.1 %</b>
Distorsion :	<b>0.1 % THD*</b>

### Currents

Amplifiers **15 A 40 VA** for 60X models

3x Ph-N	<b>3x 0...15 A</b>
1x Ph-N	<b>1x 0...45 A</b>
Puissance :	<b>3x 40 VA at 15 A</b>
Résolution :	<b>460 µA</b>
Précision :	<b>0.1 %</b>
Distorsion :	<b>0.1 % THD*</b>

Amplifiers **15 A 110 VA** for 65X models

3x Ph-N	<b>3x 0...15 A</b>
1x Ph-N	<b>1x 0...45 A</b>
Puissance :	<b>3x 110 VA at 15 A</b>
Résolution :	<b>460 µA</b>
Précision :	<b>0.1 %</b>
Distorsion :	<b>0.1 % THD*</b>

Amplifiers **5A / 25 A 175 VA** for 61X models

3x Ph-N	<b>3x 0...25 A</b>
1x Ph-N	<b>1x 0...75 A</b>
Puissance :	<b>3x 175 VA at 25 A</b>
Résolution :	<b>150µA at 5A ; 760 µA at 25A</b>
Précision :	<b>0.1 %</b>
Distorsion :	<b>0.1 % THD*</b>

### EMC

The product complies with 2004/108/CE on electromagnetic compatibility

### Safety

The product complies with low voltage 2006/95/CE and in particular NF EN 61010-1

\* THD : values at full load (100 % of range) and at 45-65 Hz

## Environmental conditions

Operating temperature : 0°C—40°C  
Storage temperature : -25°C—+70°C  
Relative humidity : 10 to 80% without condensation  
Pollution degree 2 ; Installation category II

## Software

Suitable for Windows® 2000/XP/VISTA  
Connection **USB (integrated without converter)** or

## RS232

## Case

### HEXAN Type II

Aluminium, with transport handle  
Dimensions : L=448, P=320, H=180,5 mm  
Weight : 13 kg

### HEXAN-C

Flight Case enclosure  
Dimensions : L=420, I=350, H=480 mm  
Weight : 20 kg

## Power supply

180-264 Vac, 50/60 Hz  
90-132/180-264 Vac, 47 at 63 Hz (option)  
Power : 900 VA Maximum  
2100 VA Maximum for 25 A models  
IEC 320 plug

## Timer inputs

Numbers : 4  
All inputs are isolated  
Sensing : Voltage free (dry) contact or voltage AC/DC up to 250V  
Connection : 4 mm security banana plug  
Precision : 0.02 % of value +/- 1 ms  
Resolution : 1 ms

## Logic Outputs

Number : 3  
Dry contact (NO/NC)  
Connection : 4 mm security banana plug

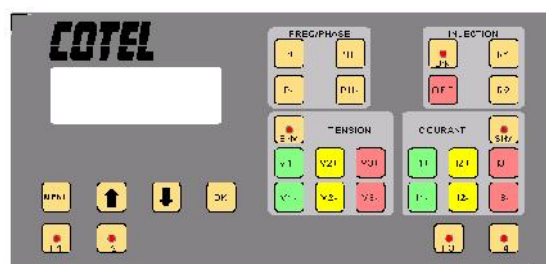
## Frequency

Range : 0.1...500 Hz  
Resolution : 500 µHz  
Precision : ± 1 mHz at 50 Hz  
DC voltage or current : all amplifiers are able to generate DC outputs up to their maximum ranges

# HEXAN-C

## Integrated custom commands

The HEXAN-C range of test sets can be used without a PC for simple testing of three phase relays. The front panel is very easy to use as it represents a simple test set with potentiometers. Its ease of use, its speed of implementation and its multiple preprogrammed functions (offices) make the HEXAN a valuable asset for the systematic testing of protection relays.



### Main functions of injection control :

The functions of Manusoft that simplify testing of coupling cabinets are implemented in the MCM :

- **Control of the three voltages and three currents** of the HEXAN. Each value is controlled by an up and down button,
- **Frequency 40 to 70 Hz** on the voltages and currents,
- **Phase shift** of the voltages from the currents  $-180^\circ$  /  $+180^\circ$ ,
- **Control of two networks: Pass and Fail,**
- **Injection mode direct or step by step,**
- **Simultaneous variation** of the three voltages and three currents by linking the controls,
- **Moving the neutral point** along  $V_1$ ,  $V_2$  or  $V_3$ ,
- **Variation of the phase-to-phase voltage:**  $U_{12}$ ,  $U_{23}$ ,  $U_{13}$ ,
- **Differential current mode,**
- **Vector jump,**
- **Programming of network sequences.**

### Timer section and digital injection control :

- Backlit graphical LCD display : for all injection parameters.
- Resolution : **1 ms**
- Range : **0-199.999 s**
- Timer start on injection or external event,
- Cycle measurement (e.g. rearming),
- Programming of volt-free contact in the HEXAN,
- Four independent timer inputs configurable to contact or voltage.

### Range resolution :

- 100 mV for voltages
- 10 mA for currents
- 10 mHz for frequency generator
- $0.1^\circ$  for phase shifter.

# HEXAN range MANUSOFT software

Manusoft is suitable for all users since it requires no computing knowledge. It is an easy to use manual interface that enables rapid testing of protection devices. All the settings can be accessed with a few mouse clicks.

The electrical values are set using virtual potentiometers either using the mouse, by moving vectors in a Fresnel diagram or by typing in the values from the keyboard. There are a number of tools to help assist in testing: display and calculation of the symmetrical components, Fresnel diagrams, 4-channel timer with on-screen display, inter-channel timing, balanced networks, tools for creating two-phase and zero sequence faults, and eight memories to hold fault conditions. The test results are stored as files which can be used to produce test reports.

## Use For

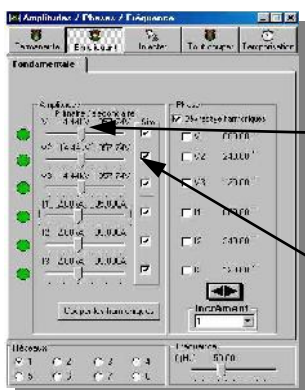
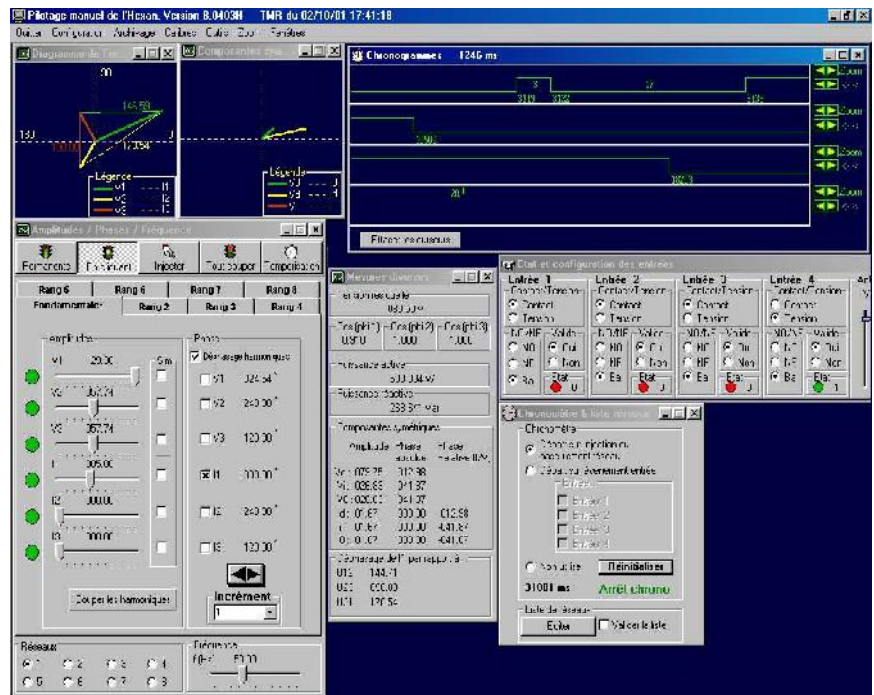
Finding threshold and response time measurement for re-lays of types :

- Overcurrent
- Voltage
- Power (single and three phases)

Fail network :

- Phase-earth
- Phase-Phase
- Three phases
- Simple or with reclosing

The precision and quality of the signal outputs enables testing of measurement transducers.



...Adjust your networks easily – with the mouse for coarse adjustment, the arrow keys for fine adjustment and you can even enter a value from the keyboard.

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Lock your generators to change the network values simultaneously.