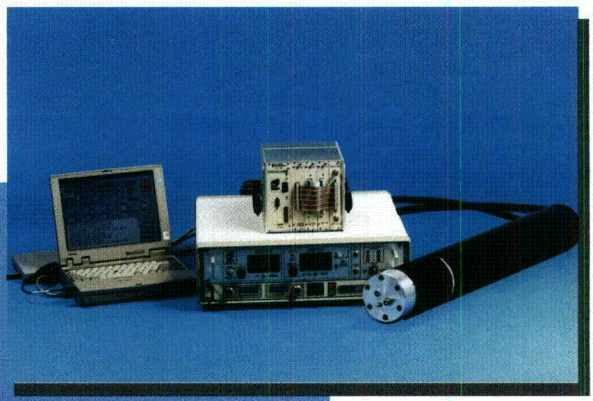
SODERN

NEUTRON GENERATOR GENIE 16

GENIE 16, a simple and safe means to produce neutrons !

Suitable for: Neutron Activation Analysis - Prompt Gamma Neutron Analysis - Elemental Analysis Using Gamma Rays from Inelastic Scattering - Thermal Neutron Decay - Thermal/Epithermal Neutron Decay - Combination Experiments...

New Neutron Generator



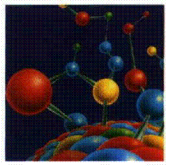
GENIE 16RT

GENIE 16R

Generator especially designed to be :

- **Modular** : Optimized shape according to the requirement
  Continuous type / Pulsed neutron emission type / Remote control type
- **Safe** : No radiation in «off» position
- **Portable** : 30 Kg
- **Low cost** : From 350000 FF* VAT excluded.

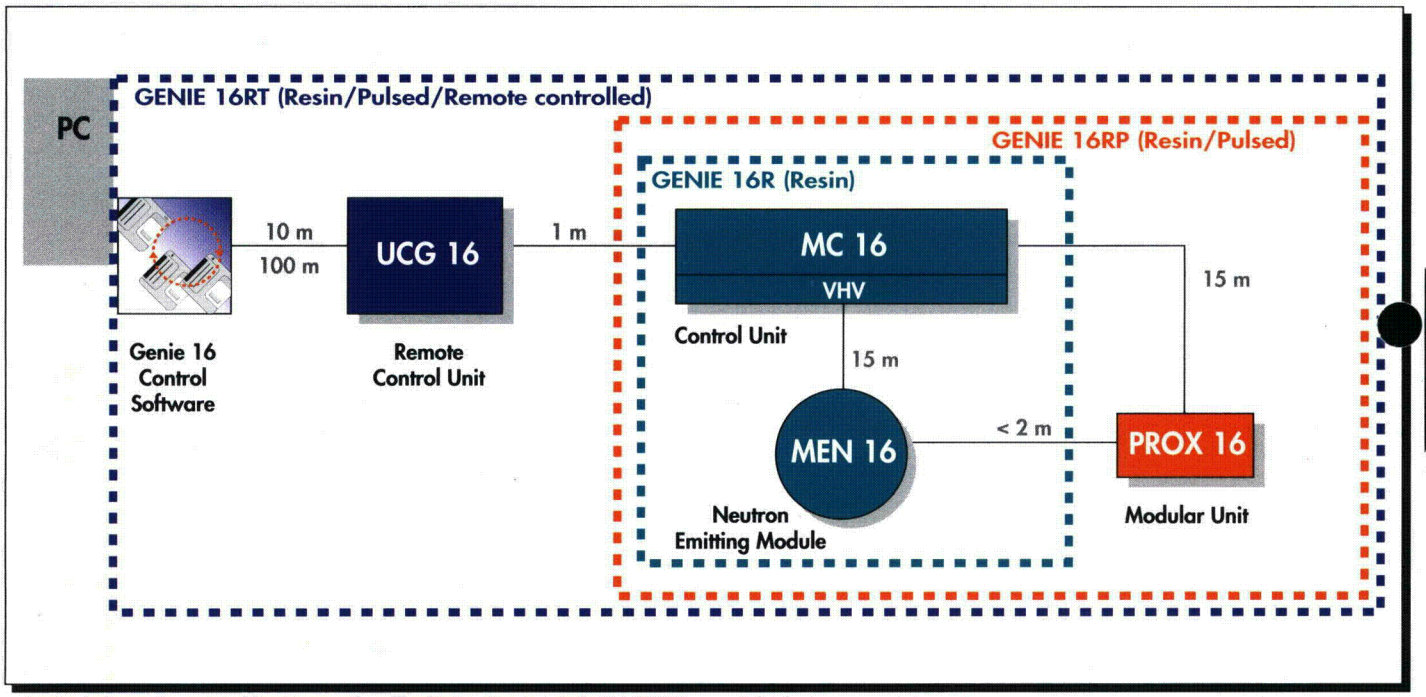
* Indicative unit price in french francs (June 98) for GENIE 16R (including continuous emission, molded neutron emission module, hand controls).



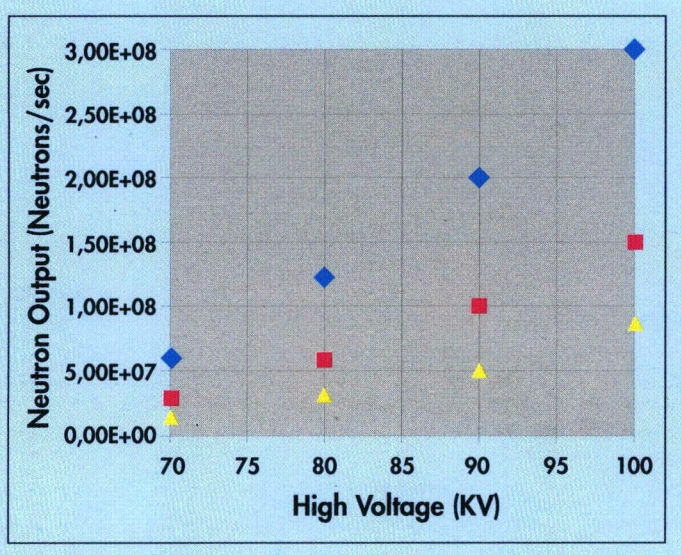
GENIE 16R	Continuous emission !
GENIE 16RP	Pulsed emission !
GENIE 16RT	Remotely controlled !

MAIN VERSIONS

According to your requirements, 3 main versions are available:



NEUTRON OUTPUT



- ⇨ *14 MeV neutron energy*
- ⇨ *Emission in 4π steradian*
- ⇨ *Continuous or pulsed emission*

⇨ *Variation of neutron production rate with applied high voltage for 3 values of current :*

- ◆ *Tube current = 80 µA (with MEN16G only)*
- ■ *Tube current = 40 µA*
- ▲ *Tube current = 20 µA*

GENIE 16R MEN16R unit + MC16 unit

GENIE 16RP MEN16R unit + MC16 unit + PROX16 unit

GENIE 16RT MEN16R unit + MC16 unit + PROX16 unit + UCG16 unit

Neutron Emitting Module (MEN16R)

Molded tube in an epoxy resin insulator - SODITRON sealed tube inside.

Size / Weight	:	*100 mm diameter - 730 mm length - 7 Kg*
Min. Distance to target	:	*less than 50 mm*
Tritium content	:	*120 GBq*
Average power	:	*limited to 5 W. Ventilation required from 2 W*
Operating T° / Storage T°	:	*0 to 40 °C / -20 to 70 °C*
Typical tube lifetime	:	*8000 hours at 5.10^7 n/s or 4000 hours at 1.10^8 n/s*
Refurbishment	:	*by changing the MEN16R for a new one*

Control Unit (MC16)

Size / Weight	:	*Rack 19" / 3U / 23 Kg*
Power supply	:	*100 VA*
Main functions	:	*Parameter adjustment switches with data display* *Neutron flux stabilization by Working point Electronic Regulation System - Operating timer* *3 opto insulated safety loops - Safety key*
Safety	:	*1 modulation input (TTL - 1 kΩ)*
Cable	:	*Interconnecting cable with MEN16R - Lenght = 15 m*

Modulator Unit (PROX16) for GENIE 16 «P type»

Allows the Genie 16 neutron generator to be used in pulsed mode.

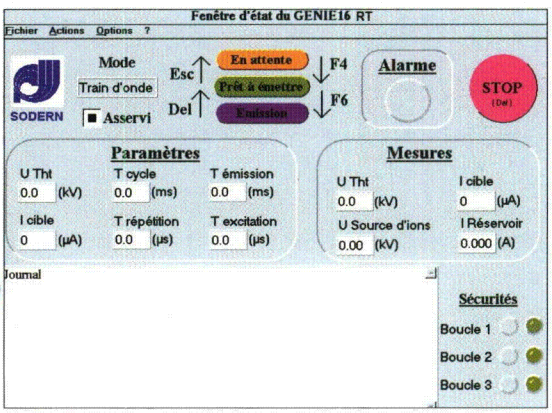
Size / Weight	:	*100 mm diameter compatible - 160 mm length - < 1 Kg*
Pulsing parameters		
Pulse rate	:	*adjustable from 10 Hz to 10 KHz and continuous*
Duty factor	:	*adjustable between 3% to continuous*
Neutron pulse rise and fall time	:	*< 1.5 µsec*
Cable	:	*Interconnecting cable with MC16 - Length = 15 m*

Remote Control Unit (UCG16) for GENIE 16 «T type»

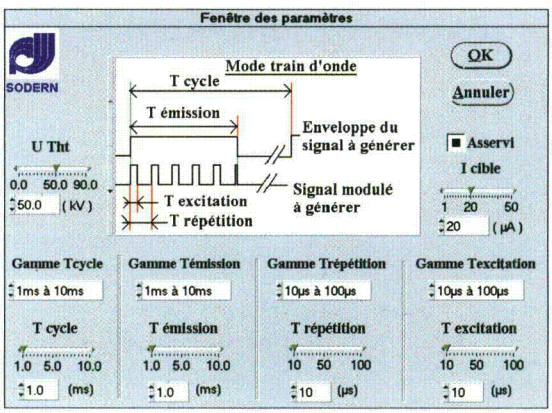
Allows the Genie 16 neutron generator to be remotely controlled from a personal computer.

UCG16 Size / Weight	:	*215 mm diameter - 195 mm length - < 8 Kg*
Power supply	:	*25 VA*
Data link	:	*RS232 for short distance remote control* *RS485 for long distance remote control*
Output	:	*2 synchronization output (TTL - 1 KΩ)*
Cable	:	*10 meters RS232 type - 100 meters RS485 type (option)*

Supplied with the Genie 16 software for Window®95. (In English or in French)



Frame including Control and visual display, and operating review editor. (French version)



Pulsing parameters frame. (French version)

GENIE 16R

GENIE 16RP

GENIE 16RT

OTHER VERSIONS

Gas Insulated Neutron Emitting Module (MEN16G)

Emitting probe in stainless steel is also available, with SF6 insulation, so only the neutron tube has to be changed. SODITRON sealed tube inside.

Size / Weight	:	*< 100 mm diameter - 750 mm length - 8 Kg*
Typical neutron flux	:	*variable up to 2.10^8 n/s*
Min. Distance to target	:	*less than 50 mm*
Tritium content	:	*120 GBq*
Average power	:	*limited to 10 W. Ventilation required from 5 W*
Operating T° / Storage T°	:	*0 to 60 °C / -20 to 70 °C*
Typical tube lifetime	:	*8000 hours at 5.10^7 n/s or 4000 hours at 1.10^8 n/s*
Refurbishment	:	*by changing the tube (in user's premises or in factory)*

Neutron Tube filled with deuterium only

SODITRON sealed tube D+D is also available on request.
2.5 MeV neutron energy - Neutron flux variable up to 2.10^6 n/s.
No tritium inside.

BY PRODUCT: on request

High neutron yield per pulse version

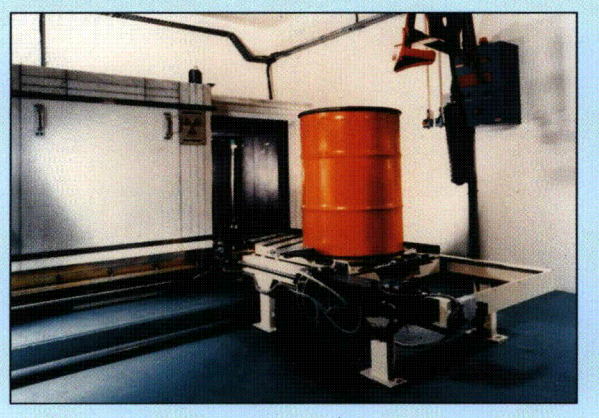
High neutron yield per pulse (peak output up to 1.10^{11} n/s), with duty cycles of about 0.2% (typically 20 µsec / 100 Hz); in this option, the life-span of the tube and its output are reduced, because of higher erosion of the target.

Specific Neutron Emitting Module

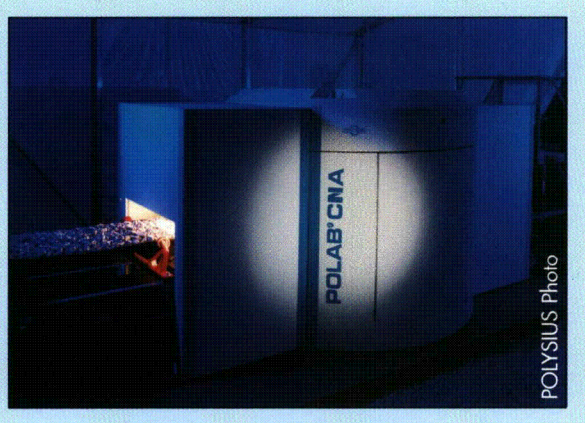
RULES IN FORCE

The neutron tubes are under the heading of equipment submitted for approval under nuclear non proliferation rules and for verification of the final destination. The sale requires a validated export licence and an undertaking not to re-export. The tube must be returned to Sodern at the end of its life or at the latest ten years after the delivery date.

SODERN neutron generators are already used for some industrial purposes such as...



...Active inspection of alpha emitting wastes at the CEA-COGEMA facilities



...On-line bulk material analysis

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