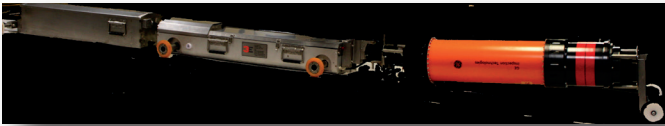




PIPELINE CRAWLERS

PIPELINE WELDED JOINT INSPECTION



Smart X

INTRODUCTION

3E Smart system crawlers are X-ray or Gamma ray crawlers for the inspection of welded joint in pipes of internal diameter 6" to 48" (or 72" with suitable adapters).

The systems are battery operated and travel at about 12m per minute. The system uses an electronic locating device or a small gamma source for location and positioning purposes, giving an accuracy of movement of 5 mm, ideal for positioning the x-ray tube or gamma source to inspect a welded joint.

The wheel axles on the crawlers are variable and extendable to ensure centering of the unit within the pipe.

The sensor controller, either electronic or gamma (Cs 137), stops the crawler at a defined position and after a short period, commences the inspection.

Once the inspection has been completed the radiation ceases and the crawler automatically moves to the next predefined position.

The two types of crawlers are the Smart 6, for pipes 6" to 18" and the Smart 10 for pipes 10" to 48" or up to 72" with suitable adapters.



Smart G

CLIENT BENEFITS

- Four wheel drive/brake
- Reliable and robust in harsher operation conditions
- Safe and easy to use
- Admits re-programming of operation routines to adapt its performance to different working conditions/requirements
(programming performed by qualified personnel)

KEY BENEFITS

AXLE DRIVE

Each axle has an individual drive motor to move the crawler within the pipe. Therefore if one set of wheels does not touch the pipe then the other keeps the crawler moving.

VERSATILITY OF USE

The modular design allows the drive unit to be easily converted to use either the gamma or the x-ray equipment. The systems work with different x-ray tubes and gamma projectors.

QUALITY CONSTRUCTION

The materials used in the construction of the crawlers are of the highest quality to withstand even the harshest environments.

USER FRIENDLY

The designs of the systems have ensured a user friendly interface with safety circuits to ensure safe and reliable operation.



SPECIFICATION

Inspection autonomy:	Smart 10: 1,5 Km/day (Propulsion Batteries 24V, 24Ah) (Optional: 2 Km/day (Propulsion Batteries 24V, 42Ah)) Smart 6: 1 Km/day (Propulsion Batteries 24V, 5Ah) (Optional 2 Km/day (Propulsion Batteries 24 V, 10 Ah))
Equipment positioning:	Electromagnetic control and/or Cs 137 (20mCi) emitter
Translation speed:	11m/min (C-0618), 12.5m/min (C-1048)
Exposure time:	1-999 sec. (1 sec. stepped)
Admissible slope:	35%.
Acceptable temperature:	-40 °C up to 70 °C
Exposition delay:	12 sec. (Programmable)
Maximum pipeline curvature:	C-0618: 40d (for pipes of d = 6") 10d (for pipes of d = 8"- 18") C-1048:40d (for pipes of d= 10"- 12") 10d (for pipes of d=14"- 48")
Minimum/maximum diameter (Standard Size):	6" (152,4 mm)/48" (457,2 mm)
Driving motor feed:	C-0618: Ni-Cd batteries 24V, 5 Ah Ni-Cd batteries 24V, 10 Ah (option) C-1048: Pb batteries 24V, 24 Ah Pb batteries 24V, 42 Ah (option)
Stopping precision:	+/- 5 mm.



3E CRAWLER SYSTEM SMART 6

AUTOMATIC SYSTEM FOR RADIOGRAPHIC INSPECTION OF PIPELINE WELDS

3E Crawler system Smart 6 is a crawler system for X-ray inspection of 6" to 18" pipeline welded joints.

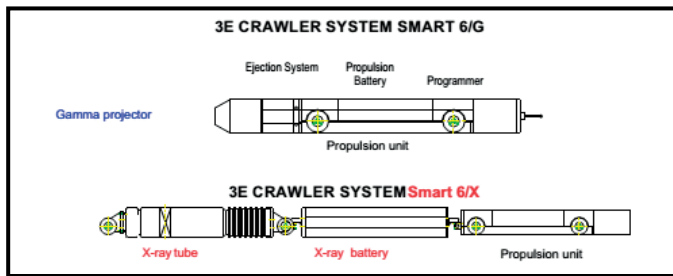


-3E Crawler system Smart 6-X

Significant characteristics of **3E Crawler system Smart 6** based on technical improvements, both in mechanics and electronics, are:

- Four wheels drive/brake
- Modular design and Interchangeability
- Robustness and reliability
- Simplicity and safety of handling
- Re-programmability of crawler performance to adapt to different work requirements (*)

(*) Re-program to be made by qualified staff of 3E



Inspection autonomy:

- 1 Km/day (Propulsion Batteries 24V, 5Ah)
- 2 Km/day (Propulsion Batteries 24V, 10Ah) (Optional)

Equipment positioning: Emitter Cs¹³⁷ (20 mCi) or Electromagnetic device

Translation speed: 11 m/min

Exposure time: 1-999 sec. (1 sec. stepped)

Admissible slope: 35%.

Acceptable temperature: -40 °C up to 70 °C

Exposition delay: 12 sec. (Programmable)

Maximum pipeline curvature:

- 40d (for pipes of d = 6")
- 10d (for pipes of d = 8" - 18")

Minimum/maximum diameter:

6" (152,4 mm)/18" (457,2 mm)

Driving motor feed:

- Ni-Cd batteries 24V, 5 Ah.
- Ni-Cd batteries 24V, 10 Ah (option)

Stopping precision: +/- 5 mm

STANDARD SYSTEM:

BASIC SYSTEM

- Propulsion chassis, Detector and Programmer (Control unit)
- Two propulsion batteries and Charger
- Operating and maintenance manual
- Tool box
- Transit/storage case
- Training

X-RAY INSPECTION KIT

(C-0618/X):

- One set of shafts for X-ray elements
- X-ray battery unit and Charger
- Assembling set

Crawler control unit:

Magnetic control unit or Emitter Cs¹³⁷ (20 mCi)

X-ray tube:

Compatible with different X Ray models in the market

3E CRAWLER SYSTEM SMART 10

AUTOMATIC SYSTEM FOR RADIOGRAPHIC INSPECTION OF PIPELINE WELDS

3E Crawler system Smart 10 is a crawler system for X-ray (Smart 10/X) and/or Gamma ray (Smart 10/G) inspection of 10" to 48" pipeline welded joints.



-3E Crawler system Smart 10/X

Significant characteristics of

3E Crawler system Smart 10

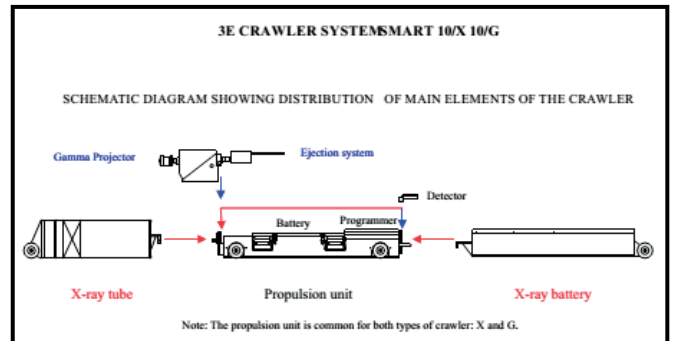
based on technical improvements, both in mechanics and electronics, are:

- Four wheels drive/brake
- Modular design and interchangeability
- Robustness and reliability
- Simplicity and safety of handling
- Re-programmability of crawler performance to adapt to different work requirements (*)

(*) Re-program to be made by qualified staff of 3E



-3E Crawler system Smart 1048/G



Inspection autonomy:

- 1,5 Km/day (Propulsion Batteries 24V, 24Ah)
- 2 Km/day (Propulsion Batteries 24V, 42Ah) (Optional)

Equipment positioning : Emitter Cs¹³⁷ (20 mCi) or Electromagnetic device

Translation speed : 12,5 m/min

Exposure time: 1-999 sec. (1 sec. stepped)

Admissible slope : 35%.

Acceptable temperature : -40 °C up to 70 °C

Maximum pipeline curvature : 40d (for pipes of d= 10" - 12")
10d (for pipes of d=14" - 48")

Minimum/maximum diameter : 10" (254 mm)/48" (1220 mm)

Driving motor feeding : Pb batteries 24V, 24 Ah

Pb batteries 24V, 42 Ah (option)

Stopping precision : +/- 5 mm

Exposition delay : 12 sec. (Programmable)