



'Metron' Actuators

Description

'Metron' actuators are highly reliable, compact single shot devices which can push, pull, cut or shear with a power to weight ratio in excess of 10,000:1. They operate within milliseconds of receiving the appropriate electrical impulse, a rate which is almost impossible to achieve with a mechanical source of energy.

The short reaction times and high power to weight ratios are achieved by sophisticated pyrotechniques developed by Chemring Energetics UK Ltd over many years. Within the metal body of each device, rapid expansion of hot combustion products generates very high pressures which are used to do mechanical work, e.g. drive a piston or cutter.

Electric initiation is achieved by the use of specifically developed fuseheads which are sufficiently varied to offer a range of sensitivities. To take into account the wide range of uses to which these devices are subjected, 'Metron' actuators may be supplied with different fuseheads e.g. when power supplies are limited a fusehead with high sensitivity may be required whereas a low sensitivity may be preferred under circumstances where spurious electric current can be induced.

Their ability to rapidly convert small electric signals into high mechanical work output, their compact size, high reliability and good environmental resistance make 'Metron' actuators ideal for automatic or remote controlled applications in Fire Protection, Security, Defence and Aerospace industries.

Nomenclature

Each device in the 'Metron' actuators range is uniquely defined by a standard nomenclature. Actuators are grouped into four main types:

Nomenclature

Piston Protractors:	DR 2000 series
Retractors	DR 3000 series
Gas Generators	DR 4000 series
Guillotines	DR 5000 series
Igniters	DR9000 series

Within each of these series a range of cable finishes may be supplied.

The cable finish is defined by C(x) where x is a number corresponding to the type of finish e.g. DR2003/ C1 corresponds to a piston protractor defined as DR2003 with cable finish C1.

The electrical characteristics are defined by the DR number within each series e.g. DR 2001 uniquely determines the physical dimensions and the electrical characteristics of that protractor. DR 2006 uniquely determines the physical dimensions and electrical characteristics of the protractor.

Types of cable finishes and electrical characteristics are described in the Technical Information section.



Fusehead Examples	Type 1	Type 2	Type 3
Nominal Energy	6 millijoules	30 millijoules	600 millijoules
Resistance Range (ohms) (1)	0.9-1.6	0.15-0.30	10-16
Maximum No Fire Current (2):			
30 sec. Pulse	0.15A	0.4A	0.03A
0.050 sec. Pulse	0.3A	0.95A	0.05A
Minimum Single Firing Current (3):			
D.C.	0.6A	2.5A	0.14A
10 ms. Pulse	0.3A	0.95A	0.05A
Recommended Single Firing Current	1A	5A	0.15A
Recommended Series Firing Current (4)	3A	10A	0.3A
Maximum Monitoring Current	0.01A	0.1A	0.01A

Operating Characteristics

Single Actuator Firing

The required battery or power supply voltage may be calculated from the product of the recommended firing current (I) for the device in question and the total circuit resistance (R) i.e. $V = IR$

Multiple Actuator Firing

When more than one actuator is to be fired in a circuit, Chemring Energetics UK Ltd recommend series firing as being the simplest method. In multiple firing circuits all actuators must be of the same electrical sensitivity (eg Type 1). On no account must devices of different manufacture or electrical sensitivity be mixed in the same circuit.

Where parallel firing is considered necessary, extreme care must be taken to ensure balanced resistances and the possibility of the actuator circuit remaining intact after firing must be borne in mind.

Insulation

Before firing, an insulation of not less than 100 megaohms at 100 V DC exists between the shunted leads and the body of the device.

Electrostatic Sensitivity

'Metron' actuators will withstand a discharge of 300pf at 5kV minimum between the shunted leads and the body of the device

Device Function Time

The function times of the actuators vary with current applied and load to be moved. Typical values may be 10-20 milliseconds.

Hazardous Atmospheres

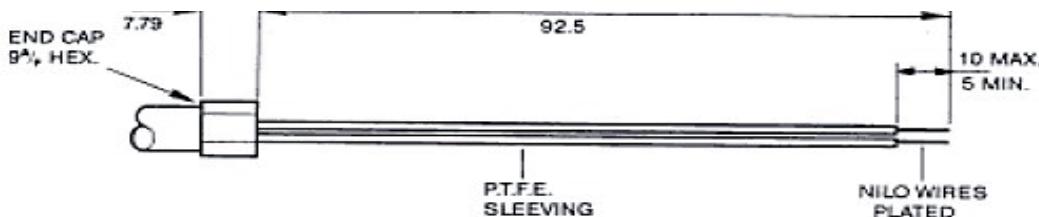
1. Incendivity tests in 9% methane/ air mixtures have been carried out in accordance with the M and Q Testing Memorandum No. 13 published by the UK Health and Safety Executive. The tests gave no ignition in 200 firings of 'Metron' protractors.
2. 'Metron' protractors have been fired by an I.S. low voltage electrical supply in an explosive gas mixture. The test mixture was 40% hydrogen, 20% oxygen and 40% nitrogen, as described in Appendix I, of BASEEFA. Certification Standard SFA 3007:1981. The tests (conducted in the gas mixture giving the most severe conditions specified in accepted standards for apparatus intended to be used in hydrogen/ air mixtures) gave no ignitions in 200 firings.

Cable Finishes

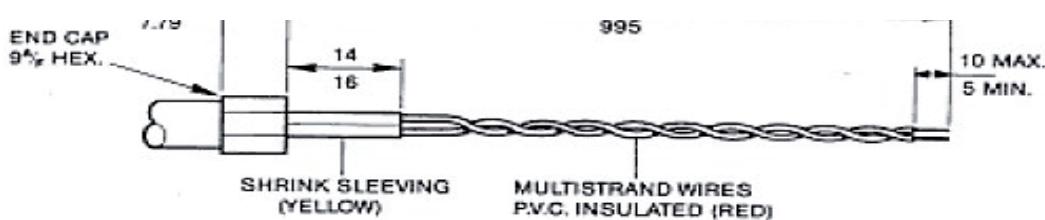
Available with all products except where specified otherwise)

Type	Description
C1	Hexagonal end cap. Fly leads (approx 95mm long). PTFE Sleeves.
C2	Hexagonal end cap. Multistrand leads. 500mm or 1000mm long (red).
C3	Hexagonal end cap. Plastic overmould. Multistrand leads. 500mm or 1000mm long (red).
C4	Hexagonal end cap. Multistrand leads. 500mm or 1000mm long (blue).
C6	Hexagonal end cap. Plastic overmould. White heat resistant cable.
C7	Hexagonal end cap with spigot. Ray Chem space cable.
C9	Round end cap. Red multistrand leads. 500mm or 1000mm long.
C10	Round end cap. Blue multistrand leads. 500mm or 1000mm long.
C11	Round end cap. Plastic overmould. Red multistrand leads. 500mm or 1000mm long.
C13	No end cap. Fly leads (approx 95mm long). PTFE sleeves. (Available for DR2001, DR2013, DR5001 and DR5008)
C14	Hexagonal adaptor. Plastic overmould. White resistant cable and amphenol inline connector. (Only available DR4000)
C22	Hexagonal end cap. Fly leads. PTFE sleeving. (Only available for DR4001)
C23	Hexagonal end cap. Plastic overmould. Multistrand leads. 500mm or 1000mm long. (Only available for DR4001)
C24	Hexagonal end cap. Plastic overmould. White heat resistant cable. (Only available for DR4001)
C25	Hexagonal end cap. Shrink sleeving. Ray Chem space cable. (Only available for DR2017)
C27	Hexagonal end cap. Fly leads (approx 95mm long). PTFE sleeves. Passivated finish.
C29	As C1 but with hexagonal end cap given fixed datum from front end.
C35	Round end cap, 'ATUM' sleeving. Shielded cable. 500mm or 1000mm long.

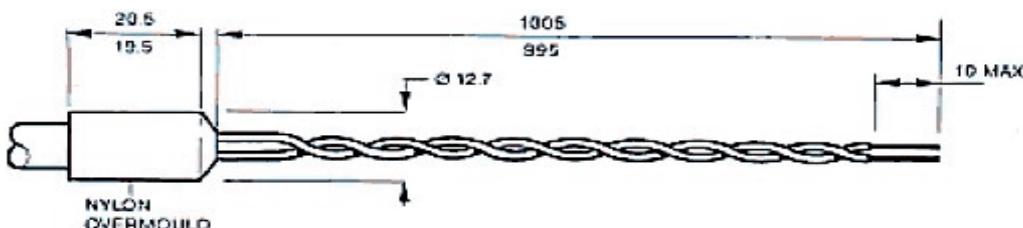
C1



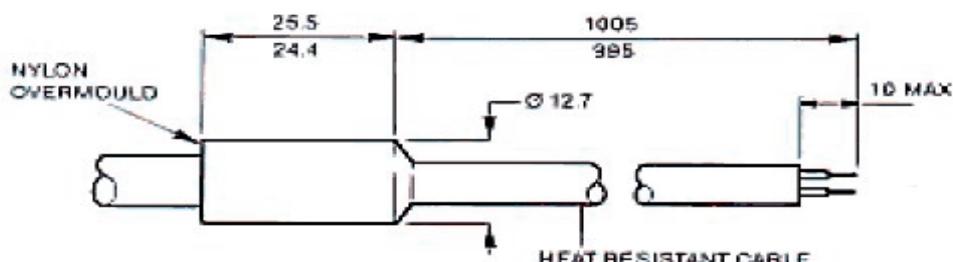
C2



C3



C6



C35

