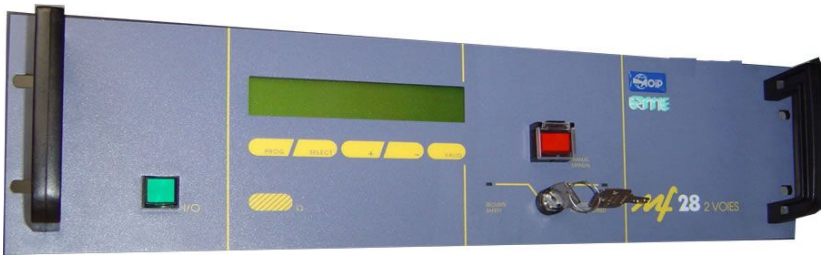

MF 28

Electrical firing unit on pyrotechnical elements

The electrical firing unit MF 28 is a highly accurate current generator, programmable in amplitude and duration, specifically developed for use on pyrotechnical elements where user safety is at stake.

The MF 28 accurately controls non-fire current as well as time and energy of activation. It can be used for instrumented, performance and product line tests (with process automation) on pyrotechnical elements.

Description

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Several protections are integrated into the instrument in order to guarantee a safe use in any critical environment and more particularly for pyrotechnical systems:

External safety input (door closing, barrier closing, etc.)

Safety key extractible in "SAFETY" position

Protected "MANUAL" triggering button

Safety pyrotechnical ohmmeter at measurement current of < 10 mA, allowing continuity tests to be performed (to limit and control current, even in case of failure)

DC output line to prevent build-up of electrical charges

Further key elements in MF 28 design guarantee the accurate control of the ignition:

Absence of any overshoot

Rising time < 10 µs at 1 A

Any potential residual discharges, inopportune firing causes, are automatically removed by automatic short-circuiting of shot-firing cables.

Technical features:

- Programmable current from 1 to 10 A
- Programmable timing
- Embedded line pyrotechnical ohmmeter
- Isolated floating shot firing cable
- 5 protection elements
- Load breakdown detection

- Manual or automated triggers
- 3 synchronisation outputs (zero time, crenel current, current image)
- Optional remote control of the cycle SAFE AUTHORIZATION OF FIRE

Yearly calibration is highly recommended in order to control the safety functions of your firing unit.

Technical support:

- Our technical staff can support you:
- Commissioning of your MF 28
- Management of units evolution (number and functional needs)
- On site breakdown servicing
- Unit integration on test bench
- On site investigation of any measurement issues

Specifications

Programmable current

Range	1 to 10 A in steps of 1 mA
Accuracy	1% of the scale

Programmable timing

Range	0.1 ms to 999 s in steps of: 10 µs from 0.01 ms up to 9.99 ms 100 µs from 10.0 ms to 99.9 ms 10 ms from 1.00 s to 9.99 s 100 ms from 10.0 s to 99.9 s 1 s from 100 s to 999 s
Accuracy	± 25 µs for all ranges

Output voltage

Output voltage	70 V in standard 15 to 120 V in option

Line ohmmeter

Range	0 – 10 Ω in standard 0 – 20 Ω in option
Accuracy	± 0.05 Ω (4 wire measurement) ± 0.1 Ω after line offset correction
Measuring current	3.3 mA

Current copy output

Range	0 – 10 V for each internal range
Accuracy	± 5%
Rise time	100 µs

Further features

Load breakdown detection	Activated: The line current is inhibited as soon as the igniter detects the first break None: No current inhibition
Synchronisations	Synchro 1: Fire pulse (0 – 5 V) Synchro 2: TTL presence copy line current (0 – 5 V)

	Synchro 3: Key position copy (closed contact)
Fault detection	- Line short-circuited: Rline < 0.5 Ω - Line open: Rline >= 10,0 Ω - Power supply fault: Rline * I > Power supply (120 V) - Transistor fault: Output transistor continuously conducting - Delay setpoint fault: The delay set point is not in the same range as the time setpoint - Ohmmeter measurement current fault - Power relay fault: 'Power relay has not switched to the firing position' or 'Power relay has already switched to the idle position' - Start already present before firing
External triggering BNC	F+ Internal matching on 50 Ω (1/2 Ω) Umax = 20 V F- Internal matching on 50 Ω (1/2 Ω) Umax = 5 V Fc Return at +12 V on 1 KΩ Umax = 20 V Oc Return at +12 V on 1 KΩ Umax = 20 V
Trigger types	- By protected manual internal pushbutton Ma - By external "Triggering" connector - On Leading Edge F+ - On Trailing Edge F- - On Closed Contact Fc - On Open contact Oc

General specifications

Size	Rack 19" - 3U 1 / 2 channels: 360 mm depth 4 channels: 460 mm depth
Supply	220 VAC – 50 / 60 Hz – 450 W
Communication ports	RS 232 in option

Safety specifications

Protections	Mains fuse x 2: 3.15 A del.

Models and accessories

Instrument:

MF28 1V 5A 2W	MF 28 – 1 channel – 5 A – 2 wires
MF28 1V 5A 4W	MF 28 – 1 channel – 5 A – 4 wires
MF28 1V 10A 2W	MF 28 – 1 channel – 10 A – 2 wires
MF28-1V-10A-4W	MF 28 – 1 channel – 10 A – 4 wires
MF28-2V-5A-2W	MF 28 – 2 channels – 5 A – 2 wires
MF28-2V-5A-4W	MF 28 – 2 channels – 5 A – 4 wires
MF28-2V-10A-2W	MF 28 – 2 channels – 10 A – 2 wires
MF28-2V-10A-4W	MF 28 – 2 channels – 10 A – 4 wires
MF28-4V-10A-2W	MF 28 – 4 channels – 10 A – 2 wires
MF28light-1V-10A-2W	MF 28 light – 1 channel – 10 A – 2 wires
MF28light-2V-10A-2W	MF 28 light – 2 channels – 10 A – 2 wires

Further configurations on request: 4 channels, specific firing current…