

Primary Current Injection Test System

- High current output up to 7000 A
- Powerful output up to 35 kVA
- Modular design for easy transport
- Primary current injection testing
- Protection relay testing
- Low voltage Breaker testing
- Heat runs
- CT testing

A P P L I C A T I O N

KAM test system is designed for primary injection testing of protection relays and circuit breakers, for commissioning and revamping of substations and electrical network.

OUTPUT CURRENT

Model	Steady Current A	Steady Power VA	Peak Current 5 s	Peak Power 5 s	Peak Current 1 s	Peak Power 1 s
KAM 2/5	500; 1000; 2000	2000	6000	5000	7000	5000
KAM 5/12.5	500; 1000; 2000	5000	6000	12500	7000	15000
KAM 5/12.5G	750; 1500; 3000	5000	6000	12500	7000	15000
KAM 10/25	500; 1000; 2000	10000	6000	25000	7000	35000
Duty Cycle	Continuous	Continuous	5 seconds	5 seconds	1 second	1 second



KAM SPECIFICATION

The test system KAM is a high current unit consisting of a control unit and one or two external power transformers, that can be easily taken in proximity of bus-bars, thus keeping to the minimum the test cable length.

KAM range comprises **four models**:

- . KAM 2/5;
- . KAM 5/12.5;
- . KAM 5/12.5G;
- . KAM 10/25.
- Current range or voltage output selection: by means of a five-position I/V selector switch: 500A – 1000A – 2000A – 6000A – V (750 – 1500 – 3000 – 6000 – V for the G model).
- Current and power range selection.
- Coarse and fine output adjustment.
- Current metering: by 4 and half digit instrument, with hold function.
- Adjustable voltage output characteristics:
 - . Range: 0 to 270 V AC;
 - . Current output: 0 to 15 A.

Timer

Metering: from current injection to contact tripping (relay tests) or current injection duration (circuit breaker tests); switch selection.

Timer range: 999.99 s or 99.999 s; switch selectable. Accuracy: $\pm 0.01\% \pm 1$ digit.

Display on 5 digits, and with built-in 10 MHz quartz oscillator
Input contacts dry or wet.

Voltage range: 24 V to 220 V, DC or AC.

Power supply

Power supply: 230 V $\pm 15\%$; 50/60 Hz.

Protections

Magneto-thermal circuit breaker on the mains supply.

Fuses on DC supplies.

Alarm light and buzzer if the output current exceeds 120% of the selected range.

Current cannot be injected if the transformer is not connected.

Thermal protection on the power transformers, with alarm light.

Impulse current cut-off is not reset at power down.

Fuse protection on the auxiliary voltage output: T5.

The adjustable, not isolated voltage, is not available unless with V selection.

Case

Control unit: aluminium case with cover and handles.

Power transformers: aluminium case with handles and wheels.

Weight and dimensions

CONTROL UNIT

KAM 2/5, KAM 5/12.5 and KAM 5/12.5G: 33 kg.

KAM 10/25: 37 kg.

Dimensions: 300 x 620 x 260 mm.

POWER TRANSFORMERS

Number: one for KAM 2/5; two for KAM 5/12.5, KAM 5/12.5G, and KAM 10/25.

Weight: KAM 2/5: 70 kg. KAM 5/12.5 and KAM 5/12.5G: 70 kg and 85 kg. KAM 10/25: 104 kg and 125 kg.

Dimensions: KAM 2/5, KAM 5/12.5 and KAM 5/12.5G: 310 x 270 x 400 mm; KAM 10/25: 450 x 270 x 400 mm.

Transformers are supplied with a C-shaped plate, for their interconnection.

Accessories supplied with the unit

Each KAM unit is supplied complete with the following accessories:

- . Interconnection cables between the control box and the transformers, 2 m long.
- . Mains cable.
- . Cable to the trip contact, 2 m long.
- . Operating manual.

Cables for connection to the load are not provided as standard accessories.

OPTIONAL CONNECTION CABLES

The following connection cables are available upon request:

1. Code 15085. Set made of 4 cables, 200 sq. mm. cross section, length 0.5 m, terminated with ring terminals on both sides, and complete with 2 screw-driven clamps to lock the cable to the bar. Cables are to be used in parallel, in order to reach 400 sq. mm in all, and allow reaching 6000 A peak on all types of test sets.

2. Code 16085. Set made of 4 cables, 200 sq. mm. cross section, length 1 m, terminated with ring terminals on both

sides, and complete with 2 screw-driven clamps to lock the cable to the bar. Cables are to be used in parallel, in order to reach 400 sq. mm in all, and allow reaching 6000 A peak KAM-5/12.5, and 2000 A on KAM-2/5.

3. Code 17085. Set made of 4 cables, 200 sq. mm. cross section, length 2.5 m, terminated with ring terminals on both sides, and complete with 2 screw-driven clamps to lock the cable to the bar. Cables are to be used in parallel, in order to reach 400 sq. mm in all, and allow reaching 6000 A peak on KAM-10/25, and 2000 A on KAM-5/12.5. With series connection, you get 5 m, and you can reach 2000 A on KAM 10/25.

4. Code 18085. Set made of 4 cables, 200 sq. mm. cross section, length 5 m, terminated with ring terminals on both sides, and complete with 2 screw-driven clamps to lock the cable to the bar. Cables can be connected in parallel, in order to reach 400 sq. mm in all, they allow reaching 2000 A on KAM-10/25. If connected in series, you have 10 m, and you can reach 1000 A on KAM-5/12.5.

5. Code 19085. In addition to the above cables, we can provide a cable set made of three cables, each of which, in its turn, is made of four pairs of 25 sq. mm twisted pairs: this arrangement reduces the reactive component of the cable impedance, and is designed to reach 2000 A on KAM 5/12.5 at the distance of 6 m. The set is complete with 2 screw-driven clamps to lock the cable to the bar. Cables can be connected in series or in parallel, according to the desired test current and the distance to the target. The weight of each cable is 15 kg, so that the set is 45 kg: this is to be considered, if cables cannot be lifted and screwed to the clamp separately.

6. Code 20085. Cable set made of four cables, each of which, in its turn, is made of four pairs of 25 sq.mm twisted pairs: this arrangement reduces the reactive component of the cable impedance, and is designed to reach 3000 A on KAM 5/12.5G at the distance of 1,8 m. The set is complete with 2 screwdriven clamps to lock the cable to the bar. Cables can be connected in series or in parallel, according to the desired test current and the distance to the target.

All the above cables are provided with two high current screw-driven clamps for the connection to bars, having the following characteristics:

- Material: aluminium.
- Opening range: from 5 to 60 mm.
- Short-circuit current rating: 41 kA / 1 s.
- Applicable standard: EN 61230.
- Hole to lift the clamp on the conductor, and ring to screw it up.

APPLICABLE STANDARDS

Electromagnetic compatibility

Directive no. 2004/108/EC.

Applicable Standard : EN61326-1 + A1 + A2.

Low voltage directive

Directive n. 2006/95/EC.

Applicable standards, for a class I instrument, pollution degree 2, Installation category II: IEC EN 61010-1.

In particular:

- Dielectric Rigidity: 1.4 kV, 1 minute.
- Isolation resistance: > 2 MOhm.
- Earth resistance : < 0.1 Ohm.
- Dispersion current: < 5 mA.
- Inputs/outputs protection: IP 2X .
- Operating temperature: 0 - 50°C; storage: -25°C to 70°C.
- Relative humidity : 5 - 95%, not condensing.

ORDERING INFORMATION

CODE	MODULE
30084	KAM 2/5 Digital Hold
	Compatible connection cables:
16085	4 cables of 200 sq. mm, connected in parallel, 1m long (2000A max)
15085	4 cables of 200 sq. mm, connected in parallel, 0,5 m long (6000A max 5 seconds)
80085	KAM 5/12.5 Digital Hold
	Compatible connection cables:
17085	4 cables of 200 sq. mm, connected in parallel, 2,5 m long (2000A max)
19085	1 set of 3 cables, each of which, in its turn, is made of 4 pairs of 25 sq. mm twisted pairs, 6m long (2000A max)
16085	4 cables of 200 sq. mm, connected in parallel, 1m long (6000A max 5 seconds)
50085	KAM 5/12.5-G Digital Hold
	Compatible connection cables:
20085	1 set of 4 cables, each of which, in its turn, is made of 4 pairs of 25 sq. mm twisted pairs. They can be connected in series or in parallel, 1,80m long (3000A max)
15085	4 cables of 200 sq. mm, connected in parallel, 0,5 m long (6000A max 5 seconds)
60086	KAM 10/25 Digital Hold
	Compatible connection cables:
18085	4 cables of 200 sq. mm, connected in parallel, 5 m long (2000A max)
17085	4 cables of 200 sq. mm, connected in parallel, 2,5 m long (2000A max)



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