

Installation and Operation Manual

Flashlight Stroboscope STROBOPORT 1009 and STROBOPORT 1009 HG

Read and adhere to this manual **before** you install, operate, store or handle the unit



This installation and operation manual Edition 1.1009.2B003e is only valid
for the flashlight stroboscopes
STROBOPORT 1009 and STROBOPORT 1009 HG

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Introduction

The manual for the installation of the STROBOPORT 1009 has been prepared for persons (electrical engineers and service engineers) who have to make the installation and the maintenance of the unit. These persons have to be familiar with all regulations concerning electrical engineering and have to adhere to these in any case.

The operation manual for this unit has been prepared for persons who use the unit for the inspection and who have to make adjustments on it.

Carefully read this manual in order to become familiar with it and to operate the strobe correctly.

Correct use

The STROBOPORT 1009 is exceptionally destined for the professional use in the visual inspection of periodic motions. Any other use is regarded as incorrect use, and all risks are solely on the part of the user.

The installation and maintenance of this unit must only be made by electro-technical specialists.

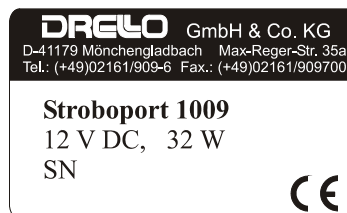
Any questions concerning the operation of the unit or special applications which are not answered in this manual should be directed to:

DRELLO GmbH & Co. KG Phone: +49-(0)2161-909-6
Max-Reger-Str. 35a Fax +49-(0)2161-909-700
D-41179 Mönchengladbach E-mail: info@drello.de

Information about DRELLO GmbH & Co. KG and his complete production program are under: www.drello.de

Name Plate

For the identification of the unit you find its serial number on the bottom side of the STROBOPORT 1009. Note down this serial number and mains voltage to have them available in the case of questions of order for spare parts.



Electro magnetic compatibility

The STROBOPORT 1009 meets the protection requirements of the European Directive 89/336.

Safety measures

Danger through electric current

- Operate the STROBOPORT 1009 and the peripherals only with the mains or battery voltage intended for it.
- Make sure that only qualified personnel (electrical engineers) are instructed with the installation and the maintenance of the unit.
- Separate the STROBOPORT 1009 from the mains voltage/rechargeable battery when there is an indication for a defect by smoke or a sharp smell.
- Make sure that no liquids enter into the unit (e.g. by cleaning). Never continue using the unit when liquids have entered into the stroboscope!
- If you do not intend to use the unit for a longer period separate the power unit from the mains voltage. Store the STROBOPORT 1009 only in dry rooms which are protected against weather.
- Make sure that the connected cables will not be bent, squeezed or damaged otherwise. Replace damaged cables immediately.
- If a safe operation is no more assured, separate the unit from the mains voltage/rechargeable battery and secure it against unintended switching on.
- A safe operation is no more possible in the following cases:
 - When the unit or the connection cable shows visible damages.
 - When the protective cover of the lamp is defective or even missing
 - When the unit does not work correctly.
 - When the unit was exposed to moisture or rain
 - In the case of formation of condensing water.
 - When objects have entered into the unit.
 - When the permissible storage/operation temperature has been exceeded or fell below a permissible value.

Danger through stroboscopic light flashes

Stroboscopes, when operated with a frequency of approx. 10 ... 20 Hz can in exceptional cases cause epileptic fits. This risk is the higher the bigger the contrast is between flash and ambient light. Also persons who until now had never such an epileptic fit can be affected by this. Consequential injuries, e.g. through a fall cannot be excluded.

- If possible operate the stroboscope at normal ambient light.
- Start the adjustment of the flash sequence from the expected top frequency value
- Make sure that persons which may be affected by epilepsy do not stand closely to the stroboscope while in use.

With a correctly adjusted STROBOPORT 1009 rotating machine parts will appear at a stand still. For persons who are not informed about this phenomenon there is the risk to touch the running machine or to be caught by it. The result are severe or fatal injuries.

- Inform all persons close to the illuminated area about the function principal of the STROBOPORT 1009 and remind them about the dangers which may result from the optical illusion.
- Make sure that the illuminated area is not accessible by other persons.

Operation

Allow for sufficient ventilation around the stroboscope. Insufficient ventilation will lead to overheating of the unit which may lead to severe damage and subsequent damages.

Repair

Do not repair the STROBOPORT yourself. Always refer to the service department of company DRELLO GmbH & Co. KG. Incorrectly executed work on the unit may lead to personnel injury, material damage or damages on the unit itself.

Maintenance

Maintenance work as described in this manual must only be made by qualified personnel. The relevant regulations for the electrical engineering have to be observed and maintained thereby.

Carry out only the maintenance work described in this manual. All other work on this unit may lead to personnel injury, material damage and damage on the unit itself.

Symbols used

The security advice in this manual are classified in two stages:



DANGER!

Safety advice which non-observance may lead to danger for persons are marked with this symbol. This symbol is used in cases of imminent danger. The possible consequences of non-observance can be death or serious injuries.



ATTENTION!

This symbol is used in front of warnings concerning damages on the unit or other materials.

In some chapters you find the following advice symbol:



Advice

This symbol refers to special advice for the use of the unit

Product description

Functional description

The STROBOPORT 1009 is a portable handheld flashlight stroboscope. It delivers pulses to the integrated lamp, which illuminates then rotating or oscillating objects by light flashes. In case the frequency of the light flashes coincides with the motion of the object and the light flashes are very short, there appears for the eye the impression to see a „frozen“ object. This optical illusion is a less tiring possibility for the observer to inspect periodic motions visually. The stroboscope allows for example the observation of fast mechanical motions in electrical engineering and electrical craft, control of passer marks at continuous roll printing, control at marking in cable production and revolution counting at pumps, ventilators and blowers.

The device has one flash frequency range:

- 60 ... 26100 flashes per minute
- 1 ... 435 flashes per second

The STROBOPORT displays the actual adjusted flash frequency digitally.

Manual control of flash frequency

For this, adjust the flash frequency manually with the turning knob.

External control of flash frequency

In case an external pulse generator is connected, this one controls flash frequency. At external control you will also achieve the desired „frozen“ image, even when the speed of the object changes.

Storage of settings

The STROBOPORT stores per flash frequency range always the flash frequency and the phase shifting which were adjusted last

Image shifting

The STROBOPORT allows for shifting of the object to be controlled into the optimum position for observation. In fact, you only change the flash trigger moment, so that another part of the object is illuminated.

Scope of delivery

- Flashlight-Stroboscope STROBOPORT 1009 Part. No. 1.1009.60002
- Flashlight-Stroboscope STROBOPORT 1009 Part No. 1.1009.60006
- optionally with handle
- Manual Part No. 1.1009.2B003e

Standard accessories for the STROBOPORT 1009 with mains supply

- socket power unit and mains cable NG 1009 Part No. 1.1009.20002

Standard accessories for the STROBOPORT 1009 with separate battery

- Attachable battery 12V 2,6Ah Part No.1.AKKU.21202,6
- battery charger LA 3015 Part No. 59.3015.20003

Accessories

Recommendable accessories

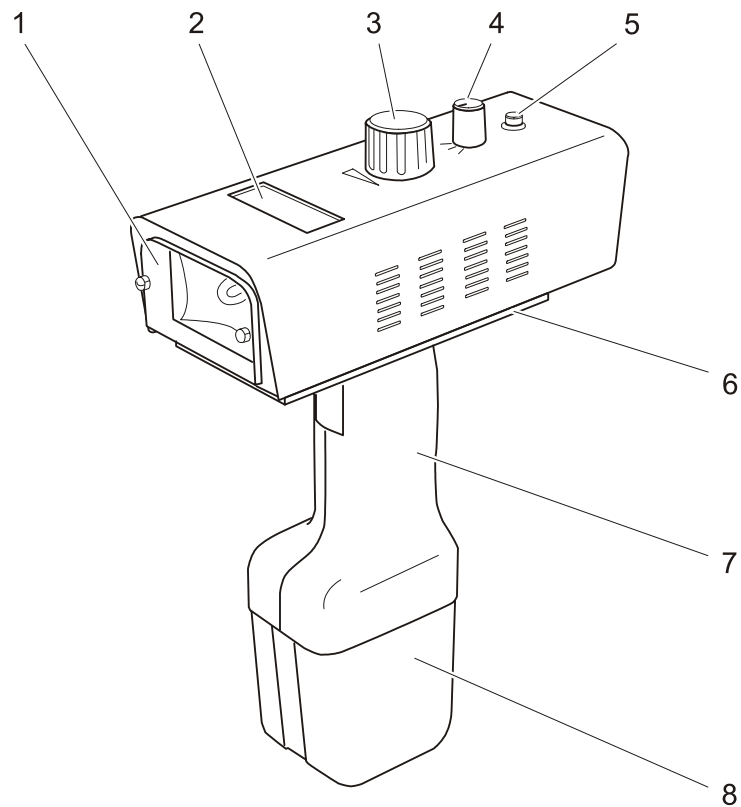
- spare flash tube Xenon 318-1 Part No. 1.B318.20001
- carrying bag TT 1009 Part No. 1.1009.2TT
- carrying case TKA 1009 Part No. 1.1009.2TKA
- spare battery Part No.1.1009.21202,6

Trigger unit for external flash synchronisation

- Proximity trigger NJ5/8-L-6K8 Part No. 0.0NJ5.20010
for electromagnetic scanning

Operation elements and Connections

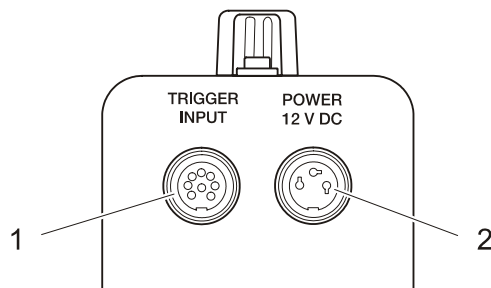
Total view



- 1** transparent plastic cover
for protection of the flash tube
- 2** display
for digital display of flash frequency or phase shifting
- 3** turning knob
for setting flash frequency at manual control and image shifting at
external control

- 4 rotary switch
For powering STROBOPORT 1009 ON/OFF and for choosing of the display flashing rate/min or flashing rate/sec.
- 5 Red button
for switching between mode flash frequency and image shifting
- 6 Mounting plate
of the handle and integrated battery (optionally)
- 7 Handle
for attachable battery (optionally)
- 8 Battery
for attaching into the handle (optionally)
- 9

Back side



- 10 8 pin socket
for connection of external pulse generator
- 11 3 pin socket
for DC supply

Preparing STROBOPORT

Ambient conditions



ATTENTION!

Choose an operation place which ensures that the unit is not exposed to extreme temperatures or extreme humidity. The ambient temperature must be between 0 and 50°C.

Make sure that the DC voltage is identical with the supply voltage mentioned on the name plate.

Provide for sufficient ventilation of the unit.

Avoid bright room illumination to utilise the full capacity of the STROBOPORT 1009.

Ensure that the unit is protected from vibrations or shocks.

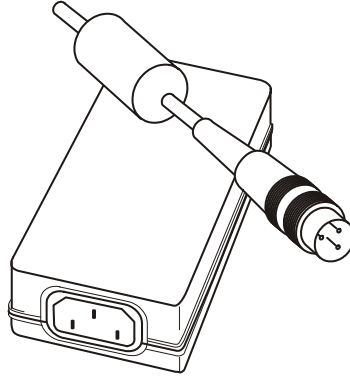
Connection of STROBOPORT with mains supply



Danger for electric current

Do only connect the unit to power supply when it is switched off!

- Make sure that the unit is switched off, the little rotary knob must show OFF.



- Put the 3-pin plug of the socket power unit NG 1009 into the 3-pin connection socket on the backside of the STROBOPORT and tighten it.
- First connect mains cable to the socket power unit and then to the power supply.

The STROBOPORT 1009 is ready for operation now.

Connection of STROBOPORT with integrated battery

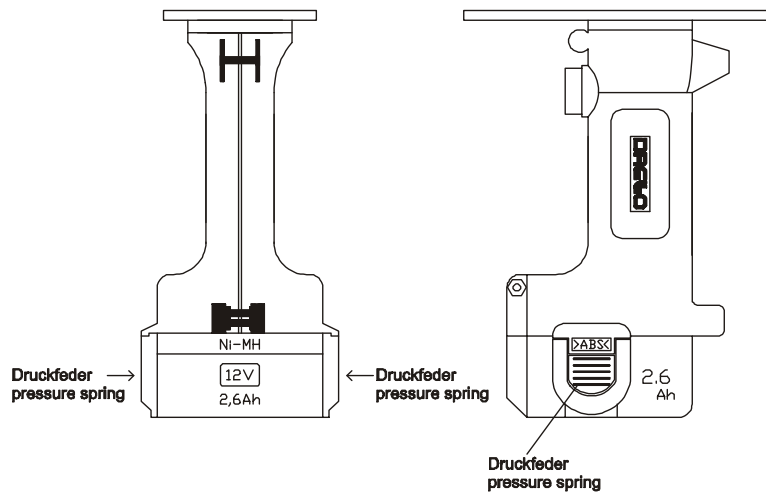
This STROBOPORT version (see front page and total view) has battery integrated in the handle, which facilitates the handling of the unit considerably. You have your hands free for working with the STROBOPORT and you can move freely.

To prepare the battery

To ensure a long lasting operation of the battery-operated STROBOPORT, make sure that the battery is charged before operation. Charge the battery before first use and if possible always at the end of a longer application. So no waiting periods come up and you avoid unnecessary interruptions in operation.

Do only use the batteries mentioned under "Scope of delivery" in this manual and also the battery charger which is listed herein.

- Withdraw the battery from the handle of the STROBOPORT 1009 by pushing the pressure spring and at same time withdrawing the battery downwards.



-
- Plug in the battery plug into the connection socket of the battery charger.
- Connect mains cable of the battery charger to power supply and charge the battery now. For this, strictly adhere to the user manual of the battery charger.

- Disconnect the battery charger from power supply, as soon as battery is re-charged.
- Disconnect battery from battery charger.

Connection of battery



Danger through electric current

Connect only the switched-off unit to the battery.

- Make sure that the STROBOPORT is switched off. The little rotary knob must show OFF.
- Pull the battery into the connection at the handle of the STROBOPORT. You must hear when bolt is clicking into place.

The STROBOPORT 1009 is ready for operation now.

Powering on/off



Danger through electric current

Take care that after connection of the unit no cables are crashed or damaged elsewhere.

- Turn the rotary knob to the desired display flashing rate/min or flashing rate/sec in order to switch on the unit. After a short self-test the STROBOPORT flashes with the latest stored flash frequency.
- Turn rotary knob to OFF in order to switch off the unit.



Note

The built-in temperature control switches off the flashing operation automatically when unit is overheated. After about 5 minutes the STROBOPORT can be operated again. Switch off will be done in connection with the socket power unit NG 1009 at maximum power input "Range 2" after 7 MINUTES.

Operation

Before starting operation, unit has to be connected to mains/battery and possibly to the trigger unit and it has to be checked that everything is properly fixed.

- Switch on the unit (refer to last chapter)

The STROBOPORT operates with the latest stored flash frequency in the chosen flash frequency range.

Manual control of flash frequency

The STROBOPORT 1009 has one flash frequency range. Within these range you may adjust the flash frequency by means of the turning knob.

- Display of the flashing rate by means of the rotary knob.
Display flashing rate per second, turn the rotary knob right
Display flashing rate per minute, turn the rotary knob left.
- Start object moving to adapt the flash frequency.
- First turn rotary button clockwise to the max. possible flash frequency.
- Now turn rotary button slowly counter-clockwise until the object to be controlled seems to be standing still.
-

Measuring numbers of revolutions

- The digital display shows always the current adjusted flash frequency.
- Start with the upper flash frequency limit and adapt the flash frequency to the motion of the object.
- Learn the flash frequency from the digital display.

In stroboscopic revolution measurement however the result may be ambiguous, as the object does not only appear to stand still when its speed agrees with the flash frequency, but also when its speed is an integral multiple of the flash frequency. When the object is flashed at every second, third, fourth, etc. revolution, it also seems to be frozen

If you want to know, whether the revolution of the object is above the maximum flash frequency of the STROBOPORT, you can employ the following method:

- Note the current measured flash frequency = f_1
- Reduce the flash frequency again slowly, until the object appears to be frozen.
- Note down the new flash frequency = f_2

You can obtain speed n with the following equation: $n = z \times f1$ mit $z = \frac{f2}{f1 - f2}$

As to measurements of objects which are rotating symmetrically, as for example spoke wheels, you will always then obtain a frozen image, when the object under study rotates between the single flashes by one or more partitions. That means that the ambiguity is even higher. In this case place a mark at the object to determine the speed.

Control of object motion

To observe large objects, which are not completely illuminated by the flash tube, you can increase or reduce the flash frequency slightly. By this you will obtain an apparently reverse respectively forward motion of the object motion, which allows for observation of one revolution or of one period. The built-in phase shifter offers a further possibility, refer also to chapter "Image shifting" see next page.

External control of flash frequency

For the external control of the flash frequency different pulse generators are available (refer to chapter "Accessories"). The pulses are synchronous with the object. By this you obtain also the desired frozen image in case the object changes its speed.



Note

In case external signals are lower or higher than the selected flash frequency range, stroboscope does not flash.

- Pull the connection cable of the pulse generator to the 8-pole socket INPUT on the backside of the STROBOPORT 1009.

Switching over to external control is done automatically as soon as the trigger signal is received by the trigger socket. The digital display shows the real flash frequency/rotation speed.

Image shifting

In case you adapted the desired flash frequency manually or via pulse generator, you want however to observe another part of the object. This can be done by changing the trigger moment. For this

- Press the red button
On the display for short time the text *PHA* appears and thereafter the adjusted value in degrees (0,0 ...540.0°)
- Turn the rotary knob slightly left or right until you can see the desired part of the object.
- Press red button again.
On the display for short time the text *Fr.E* appears and thereafter again the current flash frequency.

Maintenance

The STROBOPORT 1009 is maintenance free except of regular cleaning of the plastic disc and replacement of the flash tube.

Check each time the cables on safety and tight seat before you start operating with the STROBOPORT. Have a damaged cable exchanged immediately.

Troubleshooting – Causes and Solutions

This chapter describes faults at the STROBOPORT 1009, possible causes and their remedy. Do not try to do any repair works by yourself, which are not described in this chapter. For all other faults contact always DRELLLO GmbH & Co. KG.

Fault	possible cause	Solution
Flash tube does not flash.	The battery is nearly empty and the unit stops flashing	Recharge empty battery. If available, exchange it against a charged battery.
	Flash tube is worn out or defective.	Exchange flash tube, refer to next chapter.
Flash tube flashes irregularly	Flash tube is worn out or defective.	
Flash tube is blackened	Flash tube is worn out	

Replacing flash tube

The flash tube of the STROBOPORT 1009 is located behind the protection plastic disc. When replacing flash tube always wear cotton gloves.



Burning hazard

During operation the unit and especially the flash tube become extremely hot. Wait at least 5 minutes to let the unit and the flash tube cool down.



Caution!

Before replacing the flash tube you must ensure for sufficient grounding to avoid static discharges, by which electronic components in the interior of the unit can be destroyed.

- Disconnect STROBOPORT 1009 from power supply and wait until it is cooled down.
- Loosen the two tightening screws at the plastic cover, and carefully take the cover out of the housing and place it beside the unit..
- Pull carefully the flash tube out of its connector.
- Insert new flash tube
Only use the replacement flash tube 318-1 of DRELLO.
- Clean the cover, insert it again in dry condition and fix it with the two fastening screws.

Replacing Fuses

There are two fuses inside the STROBOPORT. In order to replace them, you have to open the unit. Opening of the unit must only be made by qualified personnel (Electrical Engineers) and only for the purpose of replacing fuses.



Danger through electric current

There are dangerous voltages applied at the capacitors inside the unit. Before opening the unit, disconnect it from power supply and wait at least 5 minutes for discharging of the voltages.



Burning hazard

During operation the unit and especially the flash tube becomes extremely hot. Wait at least 5 minutes for cooling down the unit and the flash tube.



Attention

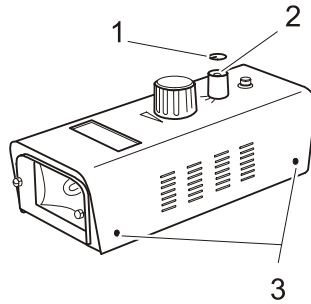
Take care for sufficient grounding to avoid static discharges, by which electronic components inside the unit can be destroyed.



Attention!

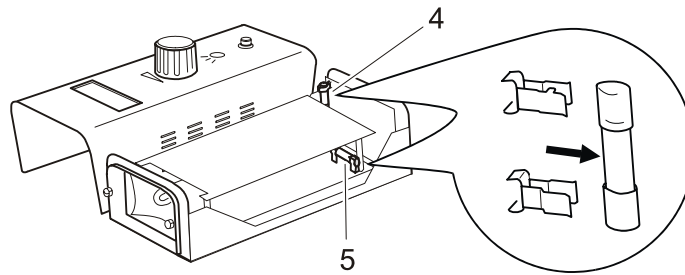
Before replacing a new fuse, make sure what was the cause for the defect.

- Disconnect STROBOPORT from mains/battery supply and wait till it is cooled down.



- Carefully loosen with a knife or a small screw driver the cap of the rotary knob (1) and take it away.
- Unscrew the screw (2) inside the rotary knob by means of a screw driver and pull away the rotary knob from the housing.

- Unscrew the four lateral located tightening screws of the housing cover (3) by means of a hexagonal recess wrench and take the cover carefully from the STROBOPORT.



- One fuse (4) is located on the vertical board in the back part of the unit.



Attention!

Only use a fuse with the values:

250 V, T 4 A / 5 × 20 mm

- One fuse (5) is located on the lower horizontal board in the back part of the unit.



Attention!

Only use a fuse with the values:

250 V, M 0,4 A / 5 × 20 mm

- Take away the defective fuse from the fuse holder or carefully get it out by means of a screw driver
- Insert new fuse with the correct values
- Put on the housing cover again and tighten it by means of the four hexagon socket head screws
- Screw the rotary knob again on the unit
- Position the cap on the rotary knob correctly and press it on tightly.

Annex

Repair

Contact for each repair of the STROBOPORT 1009:

DRELLO GmbH & Co. KG

customer's service

Max-Reger-Straße 35a
D-41179 Mönchengladbach

Phone

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-(0)2161-909-6

Fax

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-(0)2161-909-700

E-mail

[ser](mailto:vice@drello.de)

vice@drello.de

Technical Data

Mains supply	12 V DC
Power consumption	approx. 32 VA
Flash frequency range	60 ... 26100 flashes/minute 1.. 435 flashes/second
Manuel control of flash frequency	Micro-Controller via rotary knob
External Control of flash frequency	through rectangular signal +3.. +20 V
Measurement value display of LED	5 decades, 7 segments: flashes/min and degree 0,0 ... 540,0°
Accuracy of time base:	0,001 % (quartz time base)
Illumination intensity	approx. 480 lux at a flash frequency of 3800 flashes/min at 50 cm distance
Illuminated area	approx. 75 mm dia at 50 cm distance
Flash energy	0,05 ... 0,14 Joule/flash depending on adjusted flash frequency range
Fuses:	4,0 A, slow blow fuse 0,4 A
Permissible ambient conditions:	temperature: 0 ... 50 °C rel. humidity: 60 % non-condensing
Permissible storage conditions:	temperature: -20 ... +70 °C dry storage
Housing	sturdy light metal housing
Dimensions (W × H × D)	81 × 55 × 195 mm (base part)
Weight:	approx. 630 g
Norms:	VDE 0110b, VDE 0411, VDE 05501 IEC 348 EN 50082-2, EN 55011B, EN 55140, EN 55141, EN 61000-4-2, EN 61000-4-4

- Industrial Stroboscopes
- Video Inspection Systems
- Measuring Equipment for Ballistics
- Seed Counting Equipment



Declaration of conformity

according to ISO/IEC Guide 22 and EN 45014

Manufacturer: DRELO GmbH & Co.KG
Address: Max Reger Straße 35a
 D- 41179 Mönchengladbach

We declare that the products

Product name: Flashlight - Stroboscope
Modell: Stroboport 1009
Accessories: NG 1009, Flashtube, Sensor, HG 1009
 Battery, Battery charger, External pick up
 Carrying bag, Carrying case.

correspond to the following product specifications:

Safety: VDE 0110b, VDE 0411, IEC 348
EMV: EN 55081-1, EN 55082-1
Additional Information: The product corresponds to the EMC regulations 89/336/EEC and is consequently labeled with the CE mark.
 This product has been tested with calibrated test units which can be traced back to PTB standards.

H. G. Siegel-Drewell
Signature/Stamp:

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Date: January 1st, 2007

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