311 8368 to 311 8336. + * 311 8411

The universal recorder for a wide range of applications in industry and electrical engineering - SERVOGOR 122

SERVOGOR 122 AC

Compact, ergonomic single- and two-channel flatbed recorder for direct recording of continuous- and alternating voltage and current in the Yt- and XY-mode.

Measuring unit

Measuring range: (calibrated)	**Voltage** 0.6 - 1.5 - 3 - 6 - 15 - 30 - 60 - 150 - 300 - 600 V AC/DC Zoom range 9 ... 15 V, 18 ... 30 V, 36 ... 60 V, 90 ... 150 V, 180 ... 300 V, 360 ... 600 V AC/DC **Current** 6 - 15 - 30 - 60 mA, 0.15 - 0.3 - 0.6 - 1.5 - 6 A AC/DC
Accuracy:	VDC: 1% of range VAC: 50...500 Hz 1.5% of range 500 Hz...2kHz 3% of range ADC: 1.5% of range AAC: 50...500 Hz 2% of range 500 Hz...2 kHz 3.5% of range

SERVOGOR 122 DC

Compact, ergonomic single- and two-channel flatbed recorder for direct recording of continuous voltage and temperature in the Yt- and XY-mode.

Measuring unit

Measuring range: (calibrated)	**Voltage** 1 - 2 - 5 - 10 - 20 - 50 - 100 - 200 - 500 mV DC 1 - 2 - 5 - 10 - 20 - 50 - 100 - 200 - 500 V DC (max. 300 V) Accuracy: 0.5% of range +5 µV
Measuring range: (calibrated)	**Temperatur** 0...100°C, 0...200°C, 0...500°C, 0...1000°C, -50...150°C, 100...300°C, 300...500°C, 300...800°C, 500...1000°C Cold junction compensation with DIL switch on the rear side switchable Accuracy: 2% of range

Technical Data for SERVOGOR 122 AC / 122 DC

Instrument Yt-Mode

Form:	Flatbed
Number of channels:	1 or 2
Position of use:	horizontal or inclination of up to +/- 30°
Recording width:	200 mm (standard) 210 mm (with recalibration of the instrument)
Recording paper:	Roll, 230 mm wide, 25 m long
Paper scaling:	Y: steps 0 ... 100 (SE 122 DC) Y: steps 0 ... 30 (SE 122 AC) t: divisions in cm
Recording Pens:	Disposable Pens, rec. lenght approx. 1000 m; Refillable ink-pen with chargeable capillary or fibre writing tips, recording lenght per filling approx. 1500 m.
Pen lift:	electromagnetic, standard also ext. trigger by TTL- or CMOS-signal or switch (active low)
Dead zone:	0.3 % of recording width
Linearity:	0.2 % of recording width
Recording speed:	40 cm / s (servosystem)
Cutoff frequency:	>1.5 Hz (-3dB)
Output:	plotter output on the chart paper of the set measurement parameters and date and time, triggered at the push of a button

Instrument XY-Mode

Channel number:	Channel 1: X-registration Channel 2: Y-registration
Recording lenght:	200 mm

Time unit

Chart advance:	Quarz driven, step width 0.078 mm
Chart speed:	11 speeds for advance, with selector switch 1-2-6-12-30cm/h and 1-2-6-12-30-60cm/min, userdefined speeds programmable.
Paper positioning:	progressive motordrive with switch for forward and reverse
Remote control:	via 15-pole standard plug, using TTL, CMOS or external switch (activ low). STOP/ENABLE: chart advance stop REVERSE: chart advance is reversed PULSE: chart advance by external pulse PEN: recording pen lowered PRESET SPEED: switch to one of the selectable 11 paper speeds RS 232 interface

General

Operating temperature range:	0...+50°C
Transport temp. range:	-20...+70°C
Climatic rating:	B3 accordance with IEC 654-1
Mains supply:	Power supply: main voltage and and line-side plug according to contry of destination, 10 - 18V DC
Power consumption:	1 channel version: approx. 4.2 W, 2 channel version: approx. 6.0 W
Dimensions (H/W/D):	137 x 320 x 323 mm
Weight:	1 channel version: 2585 gram 2 channel version: 2735 gram

Order information	Orderl-No.
SERVOGOR 122 AC - 1 Channel	A 2510 31000 00
SERVOGOR 122 AC - 2 Channels *	A 2510 32000 00
SERVOGOR 122 DC - 1 Kanal	A 2510 21000 00
SERVOGOR 122 DC - 2 Kanal	A 2510 22000 00
Accessories for SERVOGOR 122 AC/DC	
Disposable felt pen, channel 1, red	195 5360 74
Disposable felt pen, channel 2, blue	195 5360 75
Ink pen set, channel 1, red	195 7070 00
Ink pen set, channel 2, blue	195 7070 74
Recording paper (divisions 0...30, 200 mm)	A 6212 93080 03
Recording paper (divisions 0...30, 210 mm)	A 6212 93090 03
Recording paper (divisions 0...100, 200 mm)	195 2710 00
Recording paper (divisions 0...100, 210 mm)	195 2710 74
Paper take up	A 2510 00010 00
WINDOWS® Software SERVOSOFT 122 (D)	A 2510 80100 01
WINDOWS® Software SERVOSOFT 122 (E)	A 2510 80100 02
WINDOWS® Software SERVOSOFT 122 (F)	A 2510 80100 03
Serial interface cord RS232 9/9pole	A 6417 20022
Serial interface cord RS232 9/25pole	A 6417 20023
Carrying case for 1- and 2- channel recorder	A 2510 99002 00

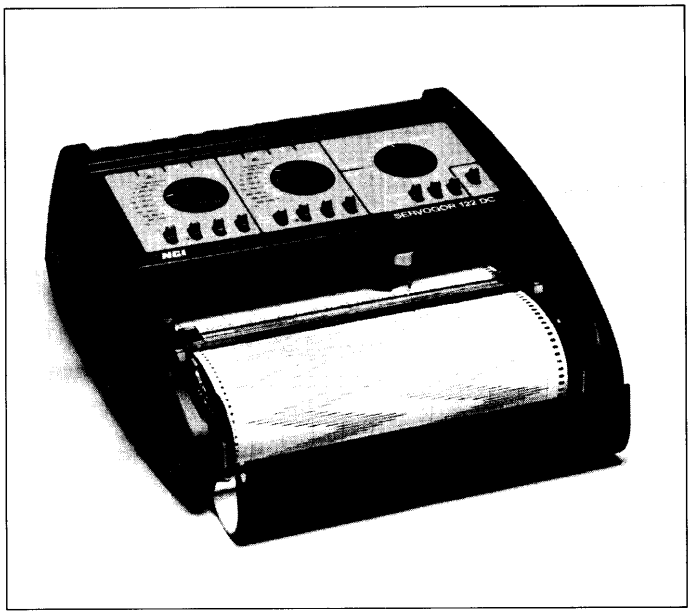
Printed in Austria.
Technical modifications reserved.
Publication A 98439 E (02.98 · 5 · GD)

LEM NORMA GmbH
Palmersstraße 2
A-2351 WIENER NEUDORF
PHONE: +43(0)2236 691-0
FAX: +43(0)2236 63 080
Internet: http://www.lem.com

LEM UK LTD
Geneva Court, 1 Penketh Place, West Pimbo
Skelmersdale, Lancashire WN8 9QX
PHONE: 01691 - 720 777
FAX: 01695 - 507 04

LEM Instruments Inc.
23822 Hawthorne Boulevard #100
Torrance, CA 90505
PHONE: 1-310-373-0966
FAX: 1-310-373-9056

NGI
NORMA GOERZ INSTRUMENTS



NGI Norma Goerz Instruments

SERVOGOR 122 DC
Compact Flatbed Recorder

Description

Compact, economic single and two-channel flatbed Recorder for direct recording of continuous- and alternating voltage and current in the Yt- and XY mode.

The Instrument includes a RS 232 Interface, which offers a high data transmition rate of 128 samples per second, so the SE 122 is well suited as data recorder.
The measuring data can be reprinted on the SE 122, after transmiting and storing with a PC.

The recorder is designed with respect to high quality, easy operation and quick service.

The SERVOGOR122 is the recorder with an universial concept, for a wide range of applications in industry and electrical engineering.
It is versatile useable for applications in development departments and testing divisions, also in service and maintenance.

- Extremly efficient size and small "footprint"
- Large rotary switches for easy, errorfree operation
- Yt and XY operating mode
- integrated pen synchronisation
- 15 measuring ranges for voltages 1 mV up to 500 V DC
  additional 9 measuring ranges for temperatures
  -50 up to 1000°C
- calibrated zero suppression -100% and -200%
- programable paperspeed
- plotter output of measurement parameters, incl. date and time
- serial interface , PC-customer software
- integrated real time clock and pen synchronisation
- limit contacts (alarm outputs)
- electrical pen lift
- Optional paper take up unit
- wide range of accessories

Standards and regulations applied

IEC654-1 as per climatic cat. B3	Operating regulations for electrical equipment and system
IEC359	Store- and transport conditions
IEC68-2-6	Mechanical stress vibration, shock
IEC1010-1, UL1244, CSA C22 No.231	Safety regulations for electronic measuring instruments
VDE 0411 part 1 DIN/IEC66E	Protection class II Overvoltage category II pollution degree II
DIN41662/UL198G	Specifications and standards for fuse-links
IEC801 part 1-5	Electromagnetic compatibility.
VDE 0871/6.78	Stipulation for radio interference suppression on electrical equipment and systems
FCC CLASS B	Radio interference suppression class B
Quality standard	developed, constructed and produced at DIN ISO 9001.

Technical Data

Instrument Yt-Mode

Form	Flatbed
Number of channels	1 or 2
Position of use	horizontal or inclination of up to ± 30°
Recording width	200 mm (standard) 210 mm (with recalibration of the instrument possible)
Recording paper-format	Roll, 230 mm wide, 25m long
Paper scaling	Y: division 0...10, steps 0...100 t: divisions in centimeter
Recording Pens	Disposable pens, recording length approx. 1000m; Refillable ink-pen with changeable capillary or fiber writing tibs refillable, recording length per filling approx. 1500m
Pen lift	electromagnetic, standard also ext. trigger by TTL or CMOS-signal or switch (active low)
Dead zone	0.3 % of recording width
Linearity	0.2 % of recording width
Response time	<0.5s for 5% up to 95%
Damping	Accords with DIN43782; overshooting / rounded ≤1% of recording width
Recording speed	40 cm/s (servo system)
Cutoff frequency	≥1.5 Hz (-3dB)
Output	plotter output on the chart paper of the set measurement parameters and date and time, triggered at the push of a button

Instrument XY- Mode

Channel Number	channel 1: X Registration channel 2: Y Registration
Recording length	200mm

Time unit

Chart advance	Quartz driven, step width 0.078 mm
Chart speeds	11 speeds for advance, with selector switch 1-2-6-12-30 cm/h and 1-2-6-12-30-60 cm/min userdefined speeds programable
Paper positioning	progressive motordrive with switch for forward and reverse
Chart advance accuracy	0.01%
Temperature	0.01% / 10° Celsius
Remote control input	Via 15-pole standard plug, using TTL, CMOS or external switch (active on low)
Remote control	STOP/ENABLE: chart advance stop, and activation of „PULSE" advance control REVERSE: direction of chart advance is reversed PULSE: Chart advance controlled by external pulse (128Hz = 60cm/min) PEN: Recording pen lowered PRESET SPEED: switch to one of the selectable 11 paper speeds LIMIT: Min and Max limit contact for each channel (output)

Measuring unit

Measuring ranges voltage (calibrated)	1 - 2 - 5 - 10 - 20 - 50 - 100 - 200 and 500 mV DC; 1 - 2 - 5 - 10 - 20 - 50 - 100 - 200 and 500 V DC (max. 300 V)
Accuracy	0.5% of full scale +5 µV
Temperature influence	0.2 % / 10°C or 10µV / 10°C
Zero point suppr. (calibrated)	-100% and -200%
Outside field interference (0.5mT, Net-frequency)	<0.5%
Input resistance	1 MΩ constant
Source resistance	100 Ω max. 1kΩ
Measuring Input	floating, asymmetric, Safety jacks 4 mm
Potential relative	max. 300 V to earth
Overloading max.	300 V all measuring ranges
Interference suppression	AC SMR ≥ 60 dB over 50 Hz, AC CMR ≥ 90 dB at 50/60 Hz DC CMR ≥120 dB
Measuring ranges temperature (calibr.)	0...100°C, 0...200°C, 0...500°C, 0...1000°C, -50...150°C, 100...300°C, 300...500°C, 300...800°C, 500...1000°C
Cold junction compensation	with DIL switch on the rear side switchable
Thermocouple	K - standard thermoelement special model J or T - elements
Accuracy	2% of range +5 µV
Measuring input	floating, asymmetric thermo plug
Potential relative to earth	max. 50 V
Interference suppression	AC SMR ≥ 40 dB over 50 Hz, AC CMR ≥ 60 dB at 50/60 Hz DC CMR ≥90 dB
Zero point	progressive zero point adjustment; check ability with applied measuring signal
Event marker	positive neddle pulse, with approx. 3mm amplitude, pulse duration approx. 200ms triggered by external TTL or CMOS signal (active low)
Alarm outputs	one min- and one max alarm per channel

Pen synchronisation

Pen misalignment	2.5 mm

Serial Interface

Interface	RS232C
Baudrate	1200, 2400, 9600, 19200 Baud, 8 data bits, 1 stop bit, no parity
Handshake	RTS, CTS
Data transfer	bidirectional 128 samples/sec (64 per channel)

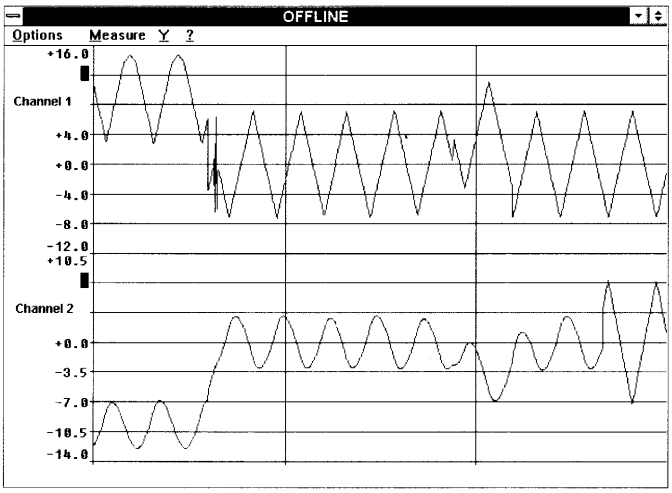
General

Reference temp. range	23 ±2°C
Operating temp. range	0 up to +50°C
Transport temp. range	-20 up to +70°C
Rel. humidity Abs. humidity	10 up to 95% 1 up to 15 g/m^3
Climate rating	B3 in accordance with IEC 654-1
Test voltage	3 kV V AC between measuring unit channel 1 and chassis 3 kV AC between measuring input channel 2 and chassis 3 kV AC between measuring units
Main supply	Power supply: main voltage and line-side plug according to country of destination
Power consumption	max. 15 VA
Fuse	thermal fuse
Extern Supply (alternate to main supply)	10 - 18 V DC
Power consumption	1 channel version ca. 4.2 W 2 channel version ca. 6.0 W
Fuse	inert fuse
Dimensions (HxWxD)	137 x 320 x 323 mm
Weight	1 channel version: 2585 gram 2 channel version: 2735 gram

Options

PC-Usersoftware

Software **SERVOSOFT**
for viewing, evaluation, documentation, post-editing and archiving of measured datas.



Special features:

- remote control of the SERVOGOR 122 via RS232
- viewing and archiving of the real time sampled measuring data
- viewing and archiving of stored measured data
- free scaling of the axis
- measurring functions inside an measuring window
- export functions of the whole- and parts of the curve
- zoom function
- integrated Online Help
- Microsoft Windows ® Application

Hardware requirements:

IBM compatible PC min. 386
main memory min. 4 Mbyte RAM
color grafic adaptor, supported by Windows
minimum VGA capability

Software requirements

MS-Windows 3.1 or higher

Ordering Information

Please indicate the order code for each instrument and accessory.

Recorder SERVOGOR 122 DC	Order code
SERVOGOR 122 DC 1-channel	A 2510 21000 00
SERVOGOR 122 DC 2-channel	A 2510 22000 00

Scope of delivery:

Power supply according to country of destination (alternate)

230 V/CEE 7/SEV 1011 Europe (with the exeption of the UK) and all countries not specifically listed	A 6403 92002 03
120 V/NEMA 5-15 P (USA, Canada, Japan, Mexico, Taiwan, Latin America)	A 6403 92001 03
230V /BS 1363A (U.K., Commonwealth)	A 6403 94001 03
240V/AS C 112 (Australian, New Zealand)	A 6403 94002 03

Operating Manual according to country of destination (alternate)

German	A 2510 11 GA 1D
English	A 2510 11 GA 1E
French	A 2510 11 GA 1F

1 roll of standard paper
1 disposable felt-pen per channel

Accessories

Paper take up (in the main device integrateable)	A 2510 00010 00
Carrying case for single and 2- channel recorder	A 2510 99002 00
Carrying case for single and 2- channel recorder (water and dust proofed)	A 2510 99006 00
Dust cover	A 2510 96134 00
Plug for remote control and alarm outputs, 15-pole	on request
Powercord (12V supply)	on request

PC-Usersoftware for SERVOGOR 122

SERVOSOFT 122 german	A 2510 80100 01
SERVOSOFT 122 english	A 2510 80100 02
SERVOSOFT 122 french	A 2510 80100 03

Interface cord

Serial interface cord (RS232) 1.5m long 9pol. / 9 pol.	A 6417 20022
Serial interface cord (RS232) 1.5m long 9pol. / 25 pol.	A 6417 20023

Recording Accessories

Disposable felt pen, channel 1, red	195 5360 74
Disposable felt pen, channel 2, blue	195 5360 75
Ink pen set, channel 1, red	195 7070 00
Ink pen set, channel 2, blue	195 7070 74
Recording paper (divisions 0...30, 200mm)	A 6212 93080 03
Recording paper (divisions 0...30, 210mm)	A 6212 93090 03

Measuring Accessories

Cable sets

Safety test lead set with probe clip (PVC)	A 6003 14204
Safety test lead set with probe clip (Silicon)	A 6003 14205
Test leads with pin plug / safety plug incl. alligator clip	A 6045 10211

Clip on transformer

0.1 ... 500 A; 1 mV / 1 A; AC/DC; ± 1,5% / ø30mm oder 63mm x 5mm	A 6805 01011

Shunts

1 - 10 A / 100 mV (max. 1.5 Jn)	999 2015 00
2 - 20 A / 200 mV; DC/AC; 0.2 %	A 6802 00501
10 - 20 mA / 100 mV (max. 1.5 Jn)	999 2016 00

Temperature Sensors

Surface Sensor (NiCr - Ni)	
-50°C...+500°C, 150mm long, ø5mm with spring	A 6912 06211
up to +600°C; 150 mm long ; connection cable 1.5 m, 1/2 DIN	A 6912 40201
up to +600°C; 150 mm long ; connection cable 1.5 m, 1/3 DIN	A 6912 20210
up to +1100°C; 500 mm long ; connection cable 1.5 m, 1/3 DIN	A 6912 20211
Immersion Sensor (NiCr - Ni)	
up to +600°C; 150 mm long ; connection cable 1.5 m, 1/3 DIN	A 6912 20310
up to +1100°C; 250 mm long ; connection cable 1.5 m, 1/2 DIN	A 6912 40301
up to +1100°C; 500 mm long ; connection cable 1.5 m, 1/3 DIN	A 6912 20311
Pierce Sensor (NiCr - Ni)	
-50°C...+800°C, 150 mm long, ø 3 mm	A 6912 06411
up to +600°C; 100 mm long ; connection cable 1.5 m, 1/3 DIN	A 6912 20410
Gas- and Air Sensor (NiCr - Ni)	
-50°C...+800°C, 150 mm long, ø 5 mm	A 6912 06611
up to +1000°C; 300 mm long ; connection cable 1.5 m, 1/2 DIN	A 6912 40602
up to +1000°C; 300 mm long, with CO^2-Takeing connection cable 1.5 m, 1/2 DIN	A 6912 40601
Oil Sensor for cars (NiCr - Ni)	
up to +180°C, 800 mm long, connection cable 1.5 m, 1/2 DIN	A 6912 40701
Flexible Sensor (NiCr - Ni)	
-50°C...1000°C, 1m long, ø 2mm	A 6912 06511

Documentation

Operating manual SERVOGOR 122 DC

German	SE122 DC	A 2510 11 GA 1D
English	SE122 DC	A 2510 11 GA 1E
French	SE122 DC	A 2510 11 GA 1F

Service manual SERVOGOR 122 DC

German / English	SE122 DC	on request

Represented by:

Printed in Austria Change without notice. TD SE 122 DC E 10/94

NGI Norma Goerz Instruments GmbH · A-2351 Wr. Neudorf · Palmersstraße 2 ·Tel.: (02236) 691-0 · Fax: (2236) 62 4 74
NGI Norma Goerz Instruments Inc. · 1711 Elmhurst Road · Elk Grove Village, IL 60007, USA · Tel.: (708) 437 6444 · Fax:(708) 437 6466
NGI Norma Goerz Instruments Ltd. · Crossford Court/Block C · Dane Road Sale, Manchester M33 1BZ, U.K. · Tel.: (061) 969 3612 · Fax: (061) 969 3613