



The SERVOGOR 790 is a potentiometer recorder in DIN A4 version, which records the functional dependence of two DC voltages $Y = f(X)$ in perpendicular coordinates or, with the help of the integrated time unit, a DC voltage as a function of time $Y = f(t)$

Similarly, it is also used to represent non-electrical quantities provided they can be converted into direct voltages and currents.

A number of additional features, such as measurement input via plug-in device as well as limit contacts, event marker, monitor output and input inversion, enable the device to adapt in the best possible way to a variety of measurement tasks.

The device is fitted with a DC servo-system (enclosed potentiometer) and makes widespread use of integrated circuits. Current limiting in the end stage and a limit switch protect the device against overloading. The recordings are made with disposable felt pens.

TECHNICAL SPECIFICATIONS

Model	Flatbed
Normal position	horizontal up to a max. inclined position of 85° (rack mounting)
Recording surface	280 mm (X) x 180 mm (Y)
Recording medium	single-sheet graph paper DIN A4 (297 x 210 mm)
Scale	linear, 0 ... 28 (X) and 0 ... 18 (Y)
Dead zone	0,3 % of the full scale value
Setting speed	approx. 0,6 s (X) and 0,4 s (Y)
Recording speed	approx. 0,6 m/s (X) and 0,8 m/s (Y)
Critical frequency	approx. 1 Hz (DIN 43782)
Attenuation	as per DIN 43782 overshoot/rounding ± 1 % of the recording width
Paper hold	electrostatic
Pen lift	electromagnetically, standard; external control by means of TTL signal (open collector) C-MOS signal or switch (active low)
Pen types	disposable felt pens: recording length approx. 1000 m

FEATURES

XY- AND XY-YT RECORDERS

- Recording surface 280 x 180 mm, paper format up to size DIN A4
- Electrostatic platen, electrically controlled pen lift, also remotely controllable
- Recording with disposable felt pens or ink pens with capillary or felt tips

YX-YT RECORDERS

- X co-ordinates commutable on a time basis;
- 8 deflection speeds
- Deflection length on the time axis: 280 mm
- Single or repeated deflection of the writing element
- External additional functions: Start, Hold, Reset, Pen down

TIME UNIT (FOR YX-YT-RECORDERS)

Time base	Quartz-operated, deflection switchable for single or repeated deflection on X coordinates
Temperature sensitivity	0.01 % / 10 °C
Deflection speeds	0.1-0.2-0.5-1-2-5-10-20 s/cm
Deflection accuracy	0.5 %
Zero	Fixed setting at scale 0
Deflection length	280 mm
Actuation	By means of switch on control panel, single or repeated periodic deflection with automatic reset with pen raised
Additional functions	By means of TTL (open collector) or C-MOS signal (15 V) or switch (reference point "-") on measurement input X)
Start	Pen lowered and start of single deflection
Hold	Holding of single or repeated deflection and pen raised
Reset	Reset with pen raised during single or repeated deflection
Pen down	Pen down in XY mode

GENERAL

Ambient conditions	Reference temperature range: +20 °C ... +25 °C Operating temperature range: 0 °C ... +50 °C Storage and shipment temperature range: -40 °C ... +70 °C
Climatic category	B2 as per IEC 654-1
Type of protection	Protection category 1 with protective conductor
Mains voltage	110 V, 230 V, 240 V, ± 10 % switchable with mains voltage selector; 50/60 Hz. Mains connection on the device directly connected with the power cable (Power cable with line-side plug according to the country of destination)
Power input	20 VA
Fuses	slow fuse, DIN 41662/Ø5 x 20 mm or UL 198 G/Ø6.3 x 32 mm 220/230/240 V DIN T 125 / UL 0.125 AT 110/115 V DIN T 250 / UL 0.250 AT
Dimensions	404 x 133 x 366 mm (W x H x D), Width without side elements: 384 mm

RECORDER

SERVOGOR 790 XY- Recorder	
1 mV/cm to 10 V/cm	R 887 9011 00
0,1 mV/cm to 50 V/cm	R 887 9055 00
SERVOGOR 790 XY-Yt-Recorder	
1 mV/cm to 10 V/cm	R 887 9011 01
0,1 mV/cm to 50 V/cm	R 887 9055 01

SUPPLEMENTARY DEVICES

Measuring input via plug-in (Specify per channel)	R 887 9906 00
Multifunction supplementary device (Limit contacts, event marker, input inversion, monitor output (also for X channel in XY version)	R 881 2902 00
19" Rack-mounting frame	R 887 9900 00

VOLTAGE INPUT ACCESSORIES

Attenuator 100 x, 500 V max.	0328-322
Attenuator 10 x, 500 V max.	0328-324
Current shunt 0 - 20 mA	0328-320
Current shunt 4 - 20 mA	0328-321
Current shunt 0 - 16 A	3300-001
Temperature module type J	0336-706
Temperature module type K	0336-705
Temperature module type Pt-100	0336-704

RECORDING ACCESSORIES

Disposable felt pen, red	R 195 5360 74
Chart paper, DIN A4 block (50 sheets)	R 195 6220 00

DOCUMENTATION

Operators manual	
German SE 790	R 330 0018 01
English SE 790	R 330 0018 03
French SE 790	R 330 0018 04
Service manual	
German SE 790	R 331 0065 01
English SE 790	R 331 0065 03
French SE 790	R 331 0065 04

TEST VOLTAGE

1.5 kV power supply- and measuring unit – case
1.5 kV measuring units – case (CMM < 250 V)
1.5 kV measuring unit – power supply unit

EMC

IEC 61326-1, EN 55011 class B	
IEC 1000-4-2 IEC 801-2	8 kV (B)
IEC 1000-4-3 IEC 801-3	3 V/m (B)
IEC 1000-4-4 IEC 801-4	1 kV (B)
IEC 1000-4-5 IEC 801-5	0.5 kV (B)

SUPPLEMENTARY DEVICES DESCRIPTION

Measuring input via 8 pin connector

Connection of the measured quantity via plug-in device eight-pole standard plug-in parallel to the input sockets

Multi function supplementary device

Limit contacts: Two limits adjustable from 0...100 % of the recording width. Output via floating contacts. Switching power 42 V/0.2 A ~. Reproducibility 0.25 %, hysteresis 0.5 %

Event marker: Measured value registration of superposed needle pulses. Amplitude approx. 3 mm, pulse duration approx. 200 ms, triggered by external switch.

Input inversion: Input voltage inverted after the input amplifier; triggered by means of external switch.

Monitor output: Output voltage proportional to the deflection (+10 V for 100 % full-scale deflection). Connected with the measuring unit in terms of potential. Accuracy 0.5 % linearity 0.25 %, admittance terminating resistance >10 kW.

MEASUREMENT UNITS (for X- and Y-co-ordinates)	1 mV/cm to 10V/cm	0.1 mV/cm to 50 V/cm (max. 250 V)
Calibrated measurement ranges	1...10 mV/cm, 0.1...1...10 V/cm	0.1-0.2-0.5-1-2-5-10-20-50 mV/cm 0.05-0.1-0.2-0.5-1-2-5-10-20 V/cm
Accuracy	0.5 % of FSV (full scale value)	0.5% of FSV or 20 µV
Linearity	0.25 % of FSV	0.25% of FSV
Intermediate ranges (sensitivity increase)	continuously up to factor 10	continuously up to factor of 2.5
Zero: Continuous setting	-5 % ... +105 %	-5 % ... +105 %
Calibrated suppression		0-100-200 % manual, accuracy 0.2 % of the set value
Input (floating, asymmetrical)	Ø4 mm, safety sockets (standard distance 19 mm)	Ø4 mm, safety sockets (standard distance 19 mm)
Potential difference to earth	max. 300 V CAT. II	max. 300 V CAT. II
Overloading (max.)	250 V	0.1 mV/cm ... 0.2 V/cm: 50 V 0.5 V/cm to 50 V/cm: 250 V
Input resistance	1 mV/cm ... 0.1 V/cm: 1GΩ 1 V/cm ... 10 V/cm: 1MΩ	0.1 mV/cm ... 50 mV/cm: 1GΩ 0.1 V/cm ... 50 V/cm: 1MΩ
Input current	+ 10 nA	+ 10 nA
Source resistance	Nominal value 1 kΩ	100+, max. 1 kΩ
Interference suppression		
AC SMR	+ 40 dB	+ 40 dB
AC SMR	+ 80 dB	+ 80 dB
DC SMR	+ 90 dB	+ 90 dB
Temperature sensitivity	0,02 %/°C or 5 µV/°C (the largest value applies in each case)	0.02 %/°C or 1,5 µV/°C (the largest value applies in each case)
Influence of external field at 0.5 mT and mains frequency 50 to 60 Hz	0,2 %	0.5 %