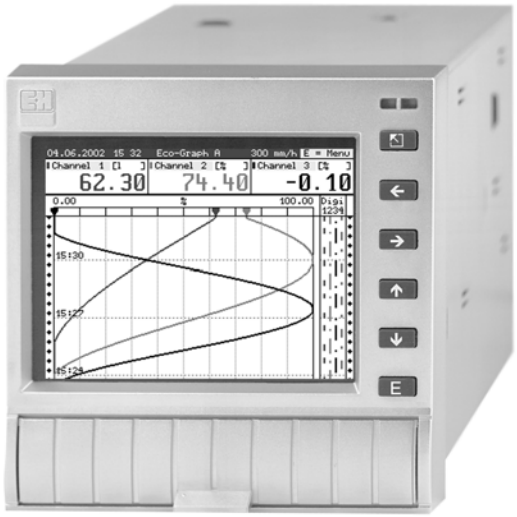
Level | Pressure | Flow | Temperature | Liquid Analysis | Registration | Systems Components | Services | Solutions

Technical Information

Ecograph A

Advanced Paperless Recorder

User friendly paperless recorder, for recording analogue signals, counter values and quantities. Swift overview using the integrated signal analysis.



Application

The “Advanced Paperless Recorder Ecograph A” is a compact measured value acquisition system with continuous savings due to the lack of costs for both pens and paper.
Ecograph A records measured value processes, quantities, operating times, monitors alarm set point violations and stores the data both internally and on diskette. A swift overview can be gained by using the integrated signal analysis giving intermediate, daily, monthly and yearly reports. The measured data can be read out, visualised and analysed using the ReadWin® 2000 PC operating software.
Unit and channel set-up can be done on the unit or using PC.
Ideally suited for the water/waste water market the Ecograph A can also be used in all other industrial branches for recording/ monitoring processes and sequences.

Features and benefits

- Electronic recording replaces paper recorders
- Universal inputs measure all signal types (U, I, RTD, TC)
- Digital inputs can be used as event inputs, operation time counters or impulse counters
- Quick set-up and integrated operating manual makes commissioning in minutes a possibility
- Flash memory reliably stores data even on power failure
- ReadWin® 2000 PC software package part of delivery
- Serial interface, Ethernet or modem communication
- Totalisation (integration) of analogue input signals as standard
- Min., max., average value recording
- Display of the last 7 analyses front end on the unit
- Loop power supply as an option
- ATEX approval for Ex-Zone 2

CE Ex

TI097R/09/en
Nr. 51004977

Endress+Hauser
People for Process Automation

Function and system design

Measuring principle

Electronic recording, plot, analysis and archiving analogue and digital input signals.

Measuring system

All connected analogue measurement points are measured parallel every 250 ms.
Galvanic isolation channel – channel: test voltage 500 V.
Damping presettable 0...999.9 seconds per analogue input,System basic damping can be ignored.
Data storage is done in an internal memory (power failure secure FLASH technology) and in the integrated diskette drive.
Long term archiving is done in the PC, whereby the data can be transferred to the PC either by diskette or using a serial interface. Using the delivered PC software the units can be set up, read out and the measured data can be archived and displayed on screen.

Input

Current (mA)

Description	Measurement range limits / min. range	Accuracy
Current range	0...20 mA / 0.5 mA; linear/square	± 20 μA
	4...20 mA / 0.5 mA; linear/square	± 20 μA
	-20...+20 mA / 0.5 mA; linear	± 44 μA
	load tensionmax. 100 mA	≤ 1 V

Voltage (mV)

Description	Measurement range limits / min. range	Accuracy
Voltage range	0...100 mV / 5 mV; linear	± 80 μV
	0...200 mV / 5 mV; linear	± 240 μV
	0... 1 V / 5 mV; linear/quadr.	± 1 mV
	0... 10 V / 5 mV; linear/quadr.	± 10 mV
	-1... +1 V / 5 mV; linear	± 20 mV
	-10... +10 V / 5 mV; linear	± 20 mV
	Input impedance: > 1 MΩ (MB < 200 mV) > 530 kΩ (MB ≥ 200 mV)	

Resistance thermometer (RTD)

Description	Measurement range limits / min. range	Accuracy
Pt 100	-200...+850 °C / 15 K	± 0.8 K (2/3-Leiter); ± 0.5 K (4-Leiter)
Pt 100[1)]	-200...+650 °C / 15 K	± 0.8 K (2/3-Leiter); ± 0.5 K (4-Leiter)
Pt 500	-200...+850 °C / 15 K	± 0.8 K (2/3-Leiter); ± 0.5 K (4-Leiter)
Pt 1000	-200...+850 °C / 15 K	± 0.8 K (2/3-Leiter); ± 0.5 K (4-Leiter)
Ni 100	-60...+180 °C / 15 K	± 0.4 K (2/3-Leiter); ± 0.4 K (4-Leiter)
1) Linearisation to JIS (C 1604-81)		
Connections	2/3- or 4-wire circuits (screened cables)	
Cablecompensation	≤ 30 Ω per cable	
Measurement current	≤ 500 µA	
Open or closed circuit monitoring: Indicates '——' in the display		

Thermocouples (TC)

Description	Measurement range limits / min. range	Accuracy
B (Pt30Rh-Pt6Rh)	0 . . .+1820 °C / 500 K	± 0.15% ab +400 °C
E (NiCr-CuNi)	-270 . . .+1000 °C / 100 K	± 0.1% ab -80 °C
J (Fe-CuNi)	-210 . . .+1200 °C / 100 K	± 0.1% ab -100 °C
K (NiCr-Ni)	-200 . . .+1372 °C / 100 K	± 0.1% ab -80 °C
L (Fe-CuNi)	-200 . . . +900 °C / 100 K	± 0.1%
N (NiCrSi-NiSi)	-270 . . .+1300 °C / 100 K	± 0.1% ab -80 °C
R (Pt13Rh-Pt)	-50 . . .+1768 °C / 500 K	± 0.15% ab 0 °C
S (Pt10Rh-Pt)	-50 . . .+1768 °C / 500 K	± 0.15% ab 0 °C
T (Cu-CuNi)	-270 . . . +400 °C / 100 K	± 0.1% ab -150 °C
U (Cu-CuNi)	-200 . . . +600 °C / 100 K	± 0.1% ab -150 °C
W3 (W3Re/W25Re)	0 . . . +2315 °C	± 0.1%
W5 (W5Re/W26Re)	0 . . . +2315 °C	± 0.1%
Measurement current	≤ 500 µA	
Comparison point	Comparison points "CJC" (to IEC 60 584) selectable: – internal compensation of the terminal temperature – external: 0, 20, 50, 60, 70, 80 °C	
Comparison point accuracy	± 1.0 K (can be calibrated front end)	
Input resistance	900 kΩ	
Cable open circuit monitor: Indicates "——" in the display		

Accuracy

Referenceconditions

Ambient temperature: 25 °C ± 5 °C
Air humidity: 55 ± 10 % r.h.

Measurement accuracy

see tables in section "Input"

Switch on drift/warm up time

> 0.5 h

Ambient temperature influence

0.01%/K of FSD

Optional in-/outputs / interfaces

Digital I/O

4 digital inputs	To DIN 19 240: Logical “0" equals -3...+5 V, Active with logical ”1" equals +12...+30 V, max. 25 Hz, max. 32 V, Input current approx. 1.5 mA
Auxiliary voltage output	for powering digital inputs with potential free contacts24 V DC, max. 30 mA, short circuit protected, unstabilised
3 relays	Changeover contact, 230 V AC / 3 A, for alarm condition transmission; at desktop version: max. 30 V_{eff} / 60 V DC.
Serial interfaces	Type (RS 232 / RS 485) and unit address can be selected Max. cable length using screened cable: 2 m (RS 232) / 1000 m (RS 485), Galvanically isolated from the system

Loop power supply

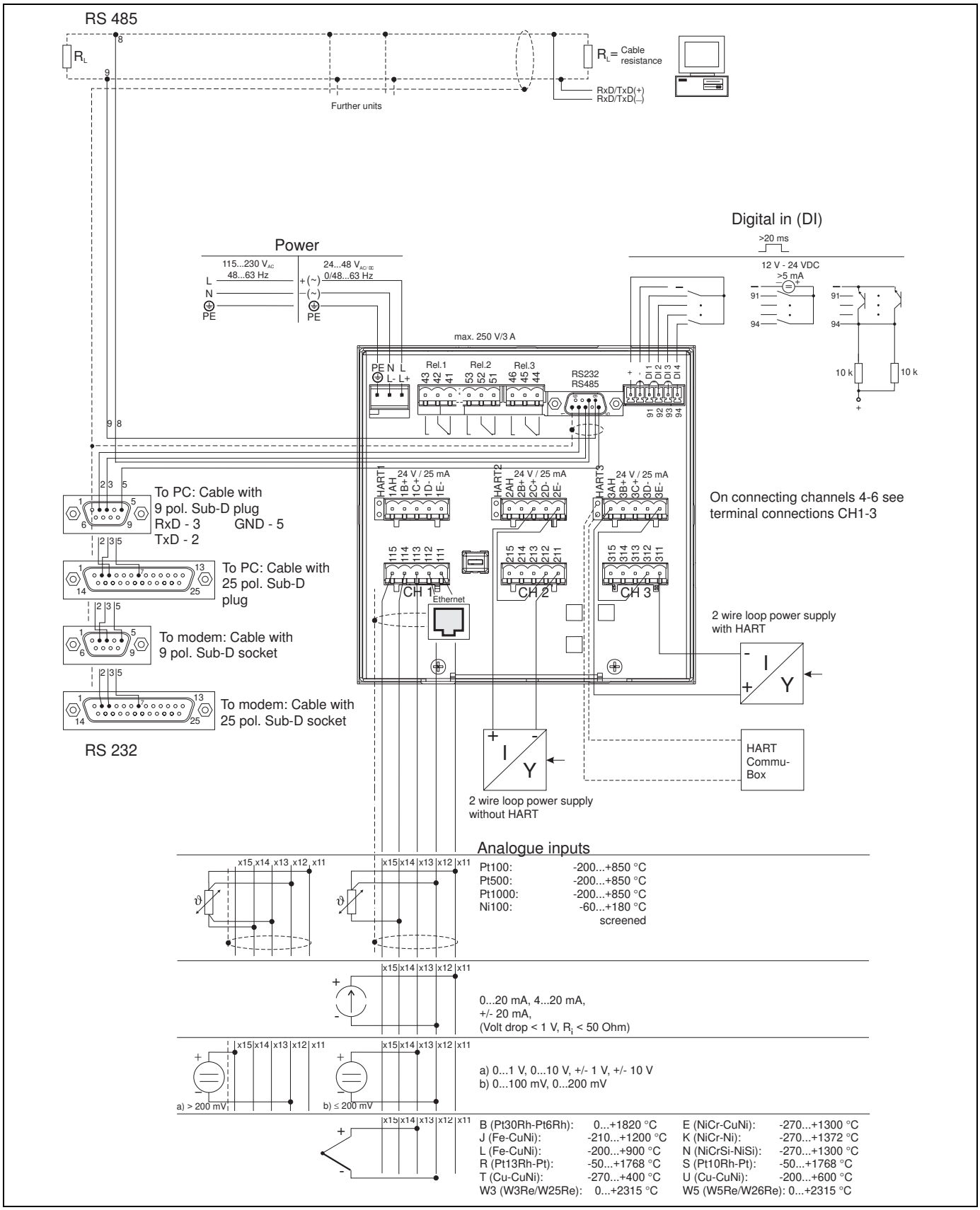
Outputs	24 V, ± 20% max. 25 mA (internal current limiter)
Communication resistance	The resistors (250 Ω) for HART® commmunication are built in (∅ 2.0 mm sockets)
Galvanic isolation	500 V test voltage to all other circuits

Ethernet interface

Ethernet interface	Internal Ethernet interface 10BaseT, connector type RJ45, screened cable, allocation of the IP address in the Ecograph A setup menu.

Power supply

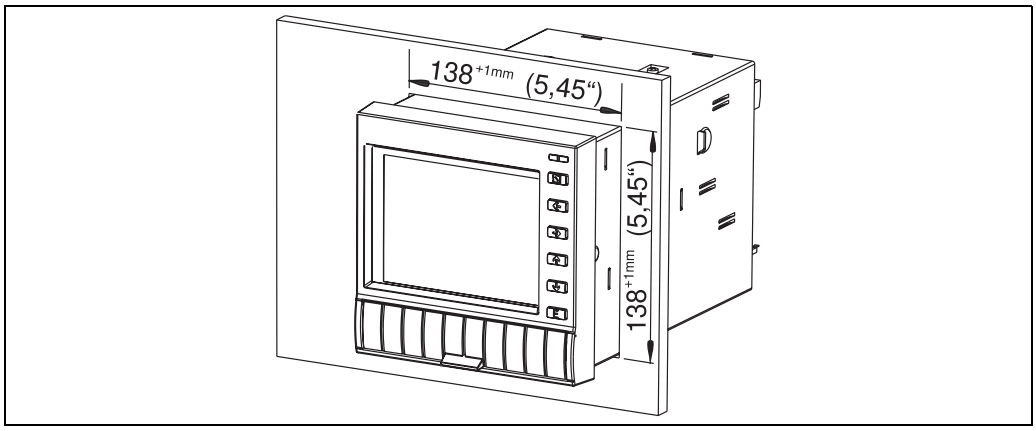
Electrical connections (terminal and socket layout) with option 'loop power supply'



Supply voltage	Standard voltage: 115 to 230 V_{AC} +10% -15% Low voltage: 24 to 48 $V_{AC/DC}$ +10% -15%
Frequency	Standard voltage: 48 to 63 Hz Low voltage: 0/48 to 63 Hz
Power consumption	22 VA
Electrical safety	IEC 61010-1, Protection class I Standard voltage: Over voltage category II Low voltage: Over voltage category III

Installation conditions

Installation angle	Usage angle to DIN 16 257, NL 90 ± 30°
Installation notes	**General** – Keyed screw plug on terminal strips – Cable size max. 2.5 mm^2 (with ferrules) **Panel mounted:**



- Installation depth approx. 210 mm incl. terminals;
- Installation depth approx. 227 mm incl. optional back plane cover (lead-sealable)
- Panel cut-out138^{+1} x 138^{+1} mm
- Panel thickness 2 to 40 mm
- Fixing to DIN 43834

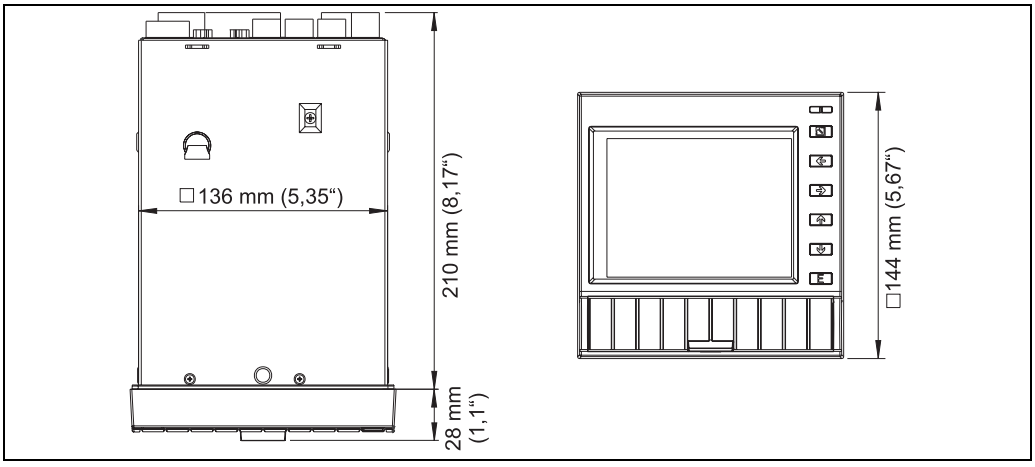
Ambient conditions

Ambient temperature	0 to +50 °C
Storage temperature	-20 to +70 °C (10 to 75% rh., without condensation)
Climate class	To IEC 60654-1: B1
Ingress protection	Front IP 54 (IEC 60529, Cat. 2) Rear IP 20 (IEC 60529, Cat. 2) Field housing IP 65
Electrical safety	To IEC 61010-1: environment < 2000 m height above sea level
Electromagnetic compatibility (EMC)	■ Immunity: IEC 61326-1 ■ NAMUR recommendation NE21: – ESD (electrostatic discharge): IEC 61 000-4-2 Level 3 (6/8 kV) – Electromagnetic fields: IEC 61 000-4-3: Level 3 (10 V/m): additional deviation< 0.4%; additional deviation on channel 4: 2% at approx. 460 MHz – Burst (fast transients): IEC 61 000-4-4 Level 3 (2/1 kV) – Surge on power cable: IEC 61 000-4-5: 2 kV asymmetrical, 1 kV symmetrical – Surge on signal cable: IEC 61 000-4-5: 1 kV asymmetrical with external protection – HF cable fed: IEC 61 000-4-6: 10 V; additional deviation < 0.3% – 50 Hz magnetic fields IEC 61 000-4-8: 30 A/m – Power failures IEC 61 000-4-11: > 20 ms
Normal mode noise rejection IEC 61298-3	40 dB on measurement range/10 (50/60 Hz ± 0.5 Hz), at voltage input
Common mode noise rejection IEC 61298-3	80 dB (50/60 Hz ± 0.5 Hz)
RF protection to IEC 61326	Class A (operation in industrial environment)

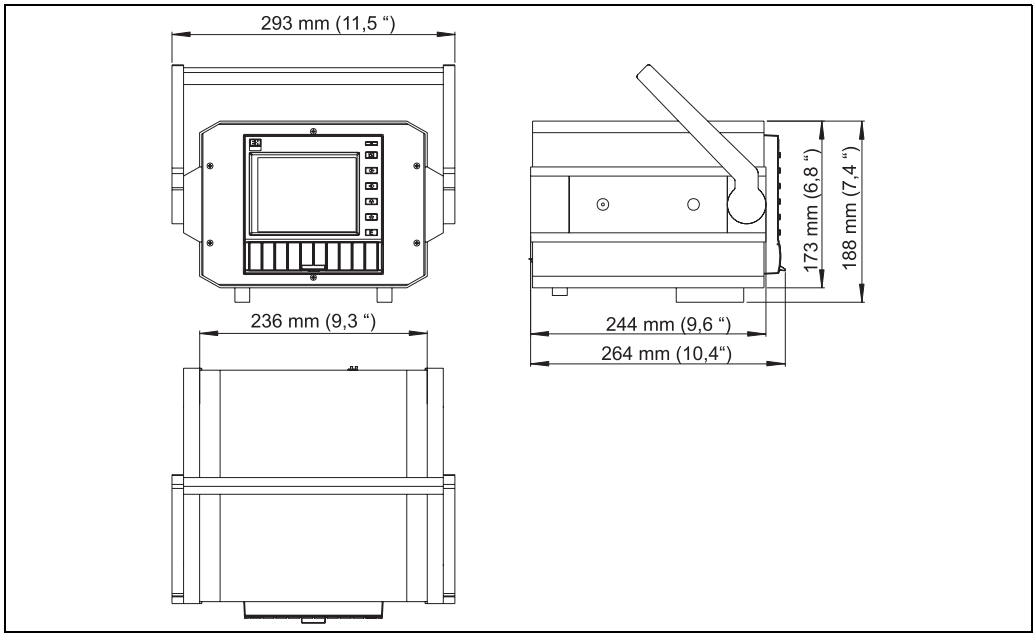
Mechanical construction

Design, Dimensions

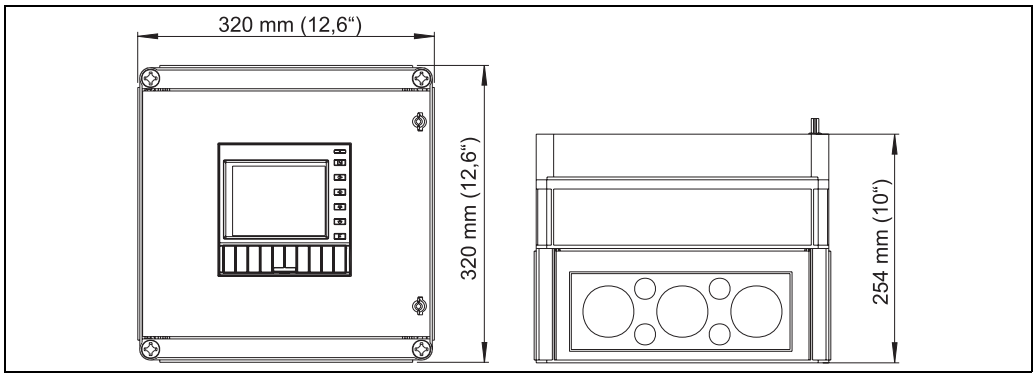
Panel version:



Desk top version:



Field housing IP 65:



Weight

- Panel version: approx. 3.5 kg
- Device in desk top housing: approx. 6.4 kg
- Device in field housing: approx. 7.75 kg

Materials

Front bezel / door from die cast metal, matt chromed
Casing/rear panel: galvanised sheet steel
Glass display protection

Human interface

Display elements

- Display: STN colour graphic display with 126 mm screen diagonal (5"), 76.800 dots (320 x 240 Pixel))
- Display modes: Curves/sequences, curves in zones, digital display, event list (alarm conditions/power failures), condition display, historical display in curve plot form with display of the digital values, date and time

Operating elements

Selectable operation using 6 front mounted push buttons interactive with on screen dialogue. Integrated operating manual (push button operation).
QUICK set up: Setting up date, time, feed rate
Selection of signal type, measurement type, engineering units and measurement range (per channel).
Automatic signal recognition and setting.

Real time clock

Switchable summer/normal time automatic Buffer ≥ 4 years (at ambient temp. 15...25 °C)

Remote operation

Setting up and archiving unit parameters per diskette or using the rear mounted serial interface (only with the "Digital I/O" option, see Ordering information), RS 232 (e.g. modem) or RS 485 with PC software ReadWin® 2000.

Measurement storage

Data storage:

- Selectable recording speeds ("Feed rate") 0 / 5 / 10 / 20 / 30 / 60 / 120 / 240 / 300 / 600 / 1000 mm/h
- Buffer ≥ 10 years for programme/measured value memory (Flash memory, non volatile), internal memory 1024 kSRAM or 2048 kSRAM.
- Cyclic copy of measured data to 3 ½" diskette for archiving 1.44 MB; Resolution is dependent on the preset feed rate
- Permanent storage of the preset unit parameters in the Flash memory (non volatile)

Comparison feed rate to storage interval

Function principle of the display and recording/storage:
Data is stored in defined intervals, dependent on the selected feed rate (it is possible to define a different feed rate/storage interval in alarm conditions).

Feed rate in mm/h	Feed rate in inch/h	Storage cycle in sec.
5	0.2	240
10	0.4	120
20	0.8	60
30	1.2	30
60	2.4	20
120	4.8	10
240	10.0	4
300	12.0	3
600	24.0	2
1000	40.0	1

Typical memory availablity

Conditions for the following table:
- no alarm violations/event storage
- no digital inputs

Analogue channels	Feed rate 5 mm/h (4 min)	Feed rate 20 mm/h (1 min)	Feed rate 60 mm/h (20 sec)	Feed rate 120 mm/h (10 sec)	Feed rate 1000 mm/h (1 sec)
Internal memory 1024 kB					
1	362 days, 23 h	90 days, 17 h	30 days, 5 h	15 days, 2 h	1 day, 12 h
3	217 days, 18 h	54 days, 10 h	18 days, 3 h	9 days, 1 h	21 h
6	136 days, 2 h	34 days	11 days, 8 h	5 days, 10 h	13 h
Internal memory 2048 kB					
1	848 days, 10 h	212 days, 2 h	70 days, 16 h	35 days, 8 h	3 days, 12 h
3	509 days, 1 h	127 days, 6 h	42 days, 10 h	21 days, 5 h	2 days, 2 h
6	318 days, 3 h	79 days, 12 h	26 days, 12 h	13 days, 6 h	1 day, 7 h
Diskette 1.44 MB					
1	677 days, 23 h	169 days, 11 h	56 days, 11 h	28 days, 5 h	2 days, 19 h
3	406 days, 19 h	101 days, 16 h	33 days, 21 h	16 days, 22 h	1 day, 16 h
6	254 days, 5 h	63 days, 13 h	21 days, 4 h	10 days, 14 h	1 day, 1 h

Certificates and approvals

CE mark

The unit complies to the legal requirements from the EC directives. Endress+Hauser confirms that the device has been successfully tested by applying the CE mark.

ATEX

EC guidelines 94/9/EG
II3G EEx nP IIC T4
(only when installed in simple pressurized housing as per IEC 60079-2)

Ordering information

Product structure

Ecograph A
Recorder, colour grafic, Paperless, signal analysis
2x limit / channel.
Plain text dialog operation + 6x operation button.
Online operation manual.
Incl. PC software package ReadWin 2000.
Display 7x usabel.
Integration, Signal analysis min. max. average, Mathematic Option, Ethernet optional
Display 5 inch

Input signal:												
3	3x universal U,I,TC,RTD											
6	6x universal U,I,TC,RTD											
8	3x universal + 3x loop power supply											
		Power supply:										
		1	115-230 VAC (-15%, +10%)									
		2	24-48VAC/DC (-15%, +10%)									
				Interface; Dig.Input; Outpout:								
				A	Not used							
				D	Ethernet; w/o RS232/485; w/o control in; w/o relay							
				E	RS232/485; 4x count/control in; 3x relay							
				F	Ethernet + RS232/485; 4x count/control in; 3x relay							
						Interface cable:						
						A	Not selected					
						B	RS232					
								Internal memory:				
								B	Max 700.000x meas. value, (60m record at 3 channel)			
								D	Works calib. certif.; max 700.000x (60m record at 3 channel)			
										Housing:		
										1	Panel 144x144mm, IP54	
										2	Desk top, plug earth. type	
										3	Desk top, plug US	
										4	Desk top, plug Suisse	
										5	Field housing, IP65	
												Operation language:
												A German
												B English
												C French
												D Italian
												E Spanish
												F Dutch
												G Danish
												H American
												L Schweden
												M Polish
												N Russian
												O Slovak
												Version:
												A Basic version
												B Basic version, w/o E+H Label
												C Floppy drive lock
												D w/o E+H Label + floppy drive lock
												Software:
												A Basic version
												B Mathematic
												Approval:
												1 Non-hazardous area
												A Zone 2, ATEX II3G EEx nP IIC T4, w/o floppy drive
RSG22-												⇐ **Order code**

Accessories

Included in delivery

Unit plug-on screwed terminals for power supply and signal inputsPanel mounting jack screws, operating manual, ReadWin® 2000 software package for PC

Accessories

The following accessories are available:

Order code	Accessory
RSG22A-A1	Screened terminal strips 3 channel unit for screened signal cables
RSG22A-A2	Screened terminal strips 6 channel unit for screened signal cables
RSG22A-E2	RS232-Ethernet interface 230 VAC für DIN-rail, incl. Interface cable (approx.2m)
RSG22A-E3	RS232-Ethernet interface 115 VAC für DIN-rail, incl. Interface cable (approx.2m)
RSG22A-E4	RS485-Ethernet interface 230 VAC for DIN-rail
RSG22A-E5	RS485-Ethernet interface 115 VAC for DIN-rail
RSG22A-H1	Field housing IP65
RSG22A-LA	Retrofit-kit lock cpl.
RSG22A-LB	Retrofit-kit lock cpl. neutral
RSG22A-S1	RS232 interf.cable,9pol.to PC connection
RSG22A-S2	RS232 interf.cable to modem connection
RSG22A-S3	RS232/RS485 adapter set 230VAC compact housing,without galv.isolation
RSG22A-S5	RS232/485 adapter set 115VAC compact housing,without galv.isolation
RSG22A-S6	RS232/RS485 adapter set, DIN rail, 230VAC with galv. isolation and interface cable for PC/ modem
RSG22A-S7	RS232/RS485 adapter set, DIN rail, 115VAC with galv. isolation and interface cable for PC/ modem
50078843	Terminal strip 3pol. for power supply
51001393	Terminal plug-in 3 pole
51001351	Terminals analogue input 5 pole
51005104	Terminals digital input 6 pole

Documentation

- ❑ Brochure "Recorder and data acquisition technology" (FA014R/09/en)
- ❑ Operating instructions Ecograph A (BA143R/09/)
- ❑ ATEX Safety instructions (XA024R/09/a3)

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