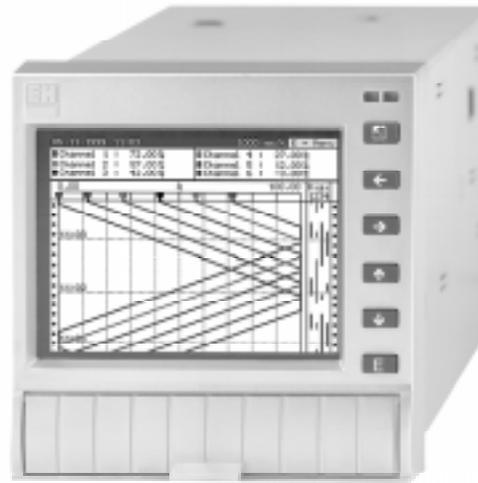
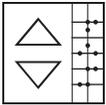
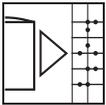
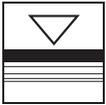


Paperless Recorder *eco-graph*

**Economical and time saving recorder
operates without the need for paper or
pens and is exceedingly simple to operate**



Application Areas

- Technological and economical alternative to standard paper recorders
- Recording and monitoring processes and sequences in all industries
- Measurement archiving secure from power failure and manipulation

Features and Benefits

- Electronic recording replaces pen and strip chart recorders, saves consumable costs
- Universal inputs measure most signal types for universal applications
- Quick set up and integrated operating manual provide fast commissioning, save set up time
- Flash memory ensures reliable archiving, even during power failure
- ReadWin® PC software package included with Eco-graph, saves software purchase costs
- Compact construction, fits anywhere

Endress + Hauser

The Power of Know How



System Function

Measurement Principle

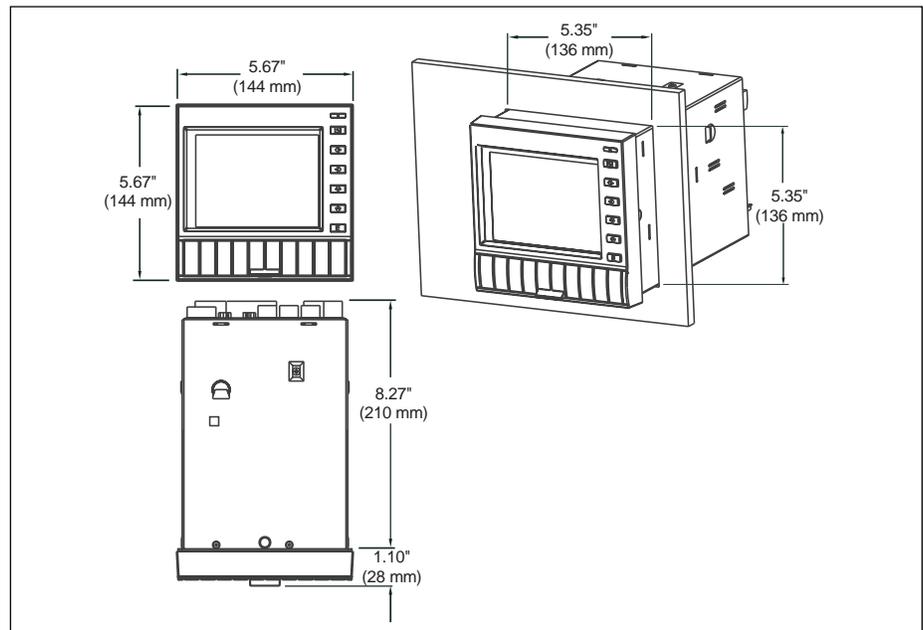
Electronic recording, plotting and archiving of analog and digital input signals from measuring devices.

Measurement System

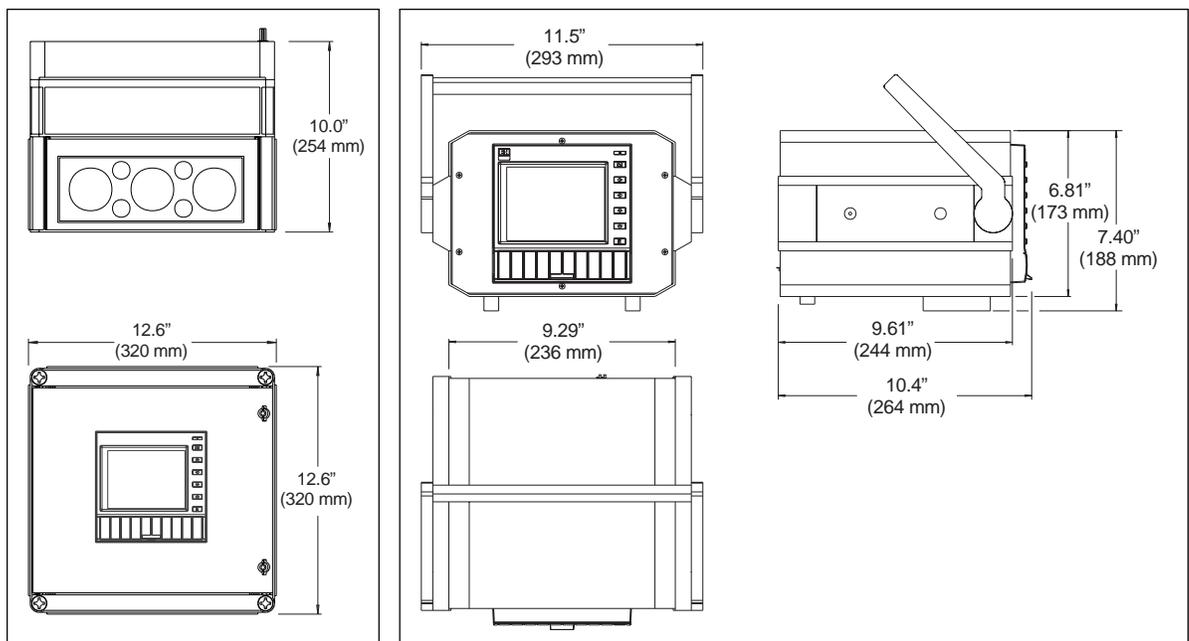
All connected analog measurement points are measured in parallel every 250 ms. Galvanic isolation channel to channel is 500 V. Damping is presettable from 0 to 999.9 seconds per analog input. Data storage is done in the internal memory (power failure secure via FLASH technology) and in the integrated diskette drive.

Long term storage of data is done in the PC. The data can be transferred to the PC either by diskette or by using a serial interface. The ReadWin PC application software, provided free with the recorder, can configure the unit, display values real time, and display measured values.

Dimensions and Mounting Details



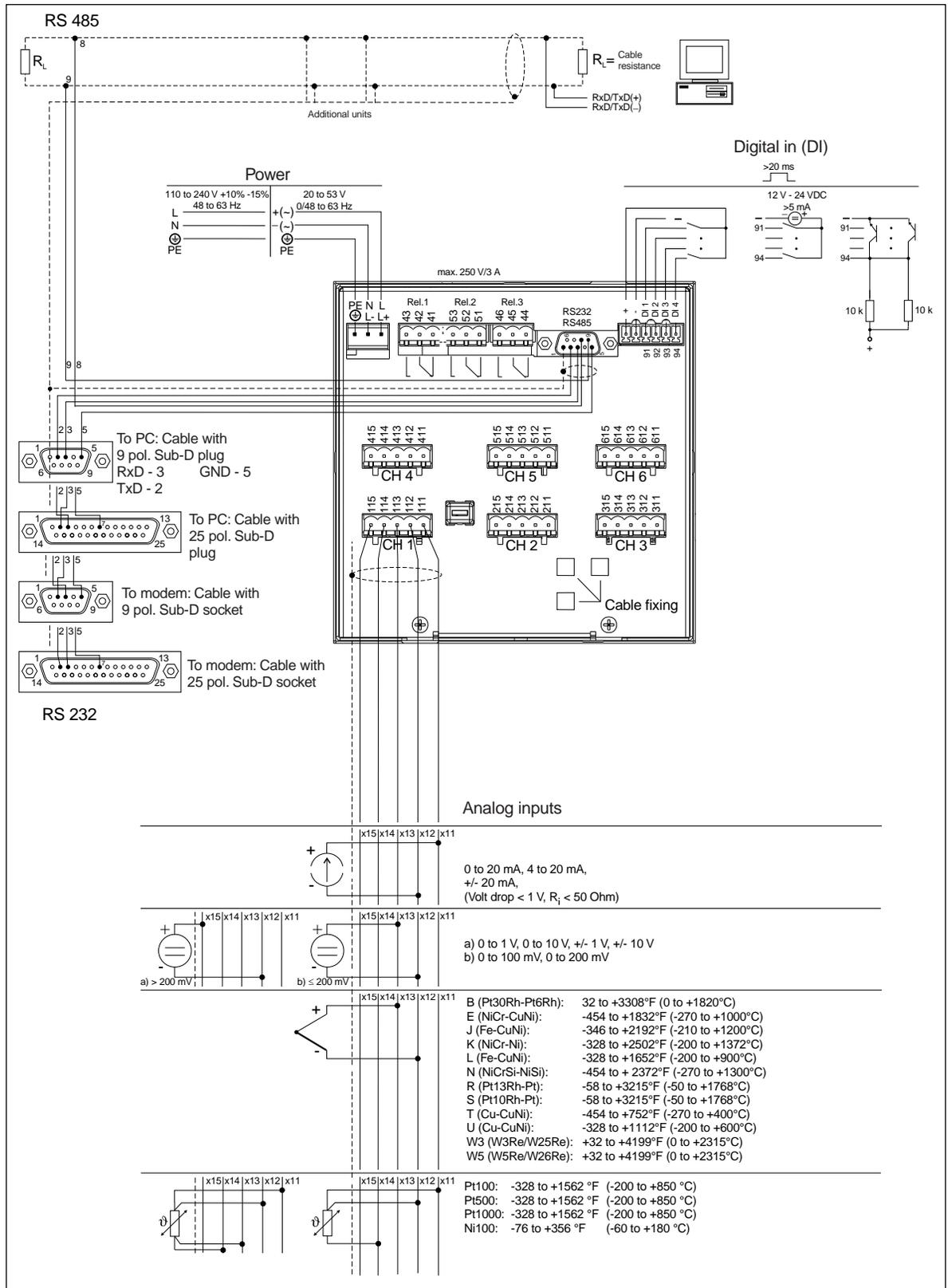
Panel mounted Eco-graph



Wall mount / field enclosure

Desk top / portable Eco-graph

Wiring Connections



Technical Data

Input Signals

Current (mA):	Measurement Range / min. span 0 to 20 mA / 0.5 mA; linear/square 4 to 20 mA / 0.5 mA; linear/square -20 to +20 mA / 0.5 mA; linear	Accuracy ± 20mA ± 20mA ± 44mA
Input impedance:	< 50 Ω , max. 100 mA (voltage drop < 1V)	

Voltage (mV):	Measurement Range / min. span 0 to 100 mV / 5 mV; linear 0 to 200 mV / 5 mV; linear 0 to 1 V / 5 mV; linear/square 0 to 10 V / 5 mV; linear/square -1 to +1V / 5 mV; linear -10 to +10 V / 5 mV; linear	Accuracy ± 80mV ± 240mV ± 1 mV ± 10 mV ± 20 mV ± 20 mV
Input impedance:	>1 M Ω (range < 200 mV); > 530 k Ω (range \geq 200mV)	

RTD, °F Range (°C Range / K):	Measurement Range / min. span PT 100, -328° to +1562°F / 27°F (-200 to +850°C / 15 K) Pt 100, (linearization to JIS, C1604-81), -328° to + 1202°F / 27°F (-200 to +650°C / 15 K) Pt 500, -328° to +1562°F / 27°F (-200 to +850°C / 15 K) Pt 1000, -328° to +1562°F / 27°F (-200 to +850°C / 15 K) Ni 100, -76° to +356°F / 27°F (-60 to +180°C / 15 K)	Accuracy ± 0.8 K (2/3-wire), ± 0.5 K (4-wire) ± 0.8 K (2/3-wire) ± 0.5 K (4-wire) ± 0.8 K (2/3-wire) ± 0.5 K (4-wire) ± 0.8 K (2/3-wire) ± 0.8 K (4-wire) ± 0.4 K (2/3- wire) ± 0.4 K (4-wire)
Connections:	2, 3 or 4-wire circuits	
Cable Compensation:	£ 30 Ω per cable	
Measurement Current:	500 mA	
Open Circuit Monitor:	Open or closed circuit monitoring, indicates " — " in the display	

Thermocouples:	Measurement Range / min. span	Accuracy
B (Pt30Rh-Pt6Rh)	+32 to +3308°F / 900°F (0 to +1820°C / 500 K)	± 0.15% from +752°F (± 0.15% from +400°C)
E (NiCr-CuNi)	-454 to + 1832°F / 180°F (-270 to +1000°C / 100 K)	± 0.1% from -112°F (± 0.1% from -80°C)
J (Fe-CuNi)	-346 to +2192°F / 180°F (-210 to +1200°C / 100 K)	± 0.1% from -148°F (± 0.1% from -100°C)
K (NiCr-Ni)	-328 to +2502°F / 180°F (-200 to +1372°C / 100 K)	± 0.1% from -112°F (± 0.1% from -80°C)
L (Fe-CuNi)	-328 to +1652°F / 180°F (-200 to +900°C / 100 K)	± 0.1% (± 0.1%)
N (NiCrSi-NiSi)	-454 to +2372°F / 180°F (-270 to +1300°C / 100 K)	± 0.1% from -112°F (± 0.1% from -80°C)
R (Pt13Rh-Pt)	-58 to +3215°F / 900°F (-50 to +1768°C / 500 K)	± 0.15% from 32°F (± 0.15% from 0°C)
S (Pt10Rh-Pt)	-58 to +3215°F / 900°F (-50 to +1768°C / 500 K)	± 0.15% from 32°F (± 0.15% from 0°C)
T (Cu-CuNi)	-454 to + 752°F / 180°F (-270 to +400°C / 100 K)	± 0.1% from -238°F (± 0.1% from -150°C)
U (Cu-CuNi)	-328 to + 1112°F / 180°F (-200 to +600°C / 100 K)	± 0.1% from -238°F (± 0.1% from -150°C)
W3 (W3Re/W25Re)	+32 to +4199°F (0 to +2315°C)	± 0.1% (± 0.1%)
W5 (W5Re/W26Re)	32 to +4199°F (0 to +2315°C)	± 0.1% (± 0.1%)
Measurement:	Current £ 500 mA	
Comparison Point:	Comparison points "CJC" (to IEC 60 584) selectable - internal compensation of the terminal temperature - external, 32, 68, 122, 140, 158, 176°F (0, 20, 50, 60, 70, 80°C)	
Comparison Point Accuracy:	± 1.8°F (± 1.0k) (can be calibrated front end)	
Input Resistance:	900 k Ω	
Open Circuit Monitor:	Cable open circuit indicates " — " in the display	

Technical Data (con't)

Accuracy

Reference Conditions:	Ambient temperature 77°F ± 9°F (25°C ± 5°C) Air humidity: 55 ± 10% rh
Warm Up Time:	> 0.5 hour
Ambient Temp. Influence:	0.02% / °F (0.03% / K)

Power Supply

Input Power:	Standard, 110 to 240 VAC; -15%, + 10%; 48 to 63 Hz Low voltage, 20 to 53 VAC / VDC; 0/48 to 63 Hz
Power Consumption:	20 VA
Electrical Safety:	EN 61 010-1, protection class I; standard voltage, over voltage category II; low voltage, over voltage category III

Operating Conditions

Ambient Temperature:	+30° to +120°F (0° to +50°C)
Storage Temperature:	-5° to +160°F (-20° to +70°C)
Climatic Class:	To IEC 60 654-1: B1
Relative Air Humidity:	10 to 75% rh., without condensation, maximum water content 22 g/m ³ dry air
Ingress Protection:	Front, IP 54 (EN 60 529, Cat. 2) Rear, IP 20 (EN 60 529, Cat. 2)
Electromagnetic Compatibility:	Immunity: EN 50 081-1, EN 50 081-2, EN 61 326-1 NAMUR recommendation NE 21: - ESD (electrostatic discharge), EN 61 000-4-2 Level 3 (6/8 kV) - Electromagnetic fields, EN 61 000-4-3, Level 3 (10 V/m) for standard inputs; Level 2 (3 V/m) for measurement range < 1 V or resistance thermometer / thermocouple - Burst (fast transients), EN 61 000-4-4, Level 3 (2/1 kV) - Surge on power cable, EN 61 000-4-5, 2 kV asymmetrical, 1 kV symmetrical - Surge on signal cable, EN 61 000-4-5, 1 kV asymmetrical - HF cable fed, EN 61 000-4-6, 10 V for standard inputs; 3V for measurement range < 1V or resistance thermometer / thermocouple - 50/60 Hz magnetic fields EN 61 000-4-8, 30 A/m - Power failures EN 61 000-4-11, ≤ 20 ms
Normal Mode Noise Rejection (DIN IEC 770):	40 dB on measurement range / 10 (50/60 Hz ± 0.5 Hz), not on resistance thermometer measurements
Common Mode Noise Rejection (DIN IEC 770):	80 dB (50/60 Hz ± 0.5 Hz)
RF Protection:	To EN 55 011, 1991 Group 1 Class A (operation in industrial environment)

Construction

Material:	Panel mount: Front bezel / door from die cast metal, matt chromed. Casing and rear panel, galvanized sheet steel. Desktop (portable): Unit is installed inside a varnished sheet steel housing. Wall mount: Unit is installed inside a hardened plastic NEMA 4X (IP 65) housing.
Weight:	Approximately 8 pounds (3.5 kg)

Operation and Display

Operating Elements:	Selectable operation using 6 front mounted push buttons interactive with on screen dialog. 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.
Display Elements:	STN color graphic with 5 inch (126 mm) diagonal screen, 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).
Real Time Clock:	Switchable summer/normal time automatic. Buffer ³ 2 weeks, at ambient temperature 59 to 77°F (15 to 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, refer to option, page 6) RS 232 (e.g. modem) or RS 485 with the ReadWin [®] PC software from Endress+Hauser

Technical Data (con't)

Measurement Storage

Data Security:	<ul style="list-style-type: none"> - Selectable recording speeds ("Feed rate") 0 / 5 / 10 / 20 / 60 / 120 / 240 / 300 / 600 / 1000 mm/h - Buffer ³ 10 years for programmed / measured value memory (Flash memory, non volatile) - Cyclic copy of measured data to 3-1/2" 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) 			
Typical Recording Length:	Recording Length (m = Chart paper, meters) approximately to:			
	Number of Channels	Standard memory	Expanded memory (option)	Floppy Disk
	1	38 m	89 m	71 m
	2	29 m	68 m	54 m
	3	23 m	54 m	43 m
	4	19 m	44 m	35 m
	5	16 m	37 m	30 m
	6	14 m	33 m	26 m
Calculation of the Recording Time:	$\frac{\text{Feed rate factor} \times \text{Recording length (meters)}}{\text{Feed rate (in mm/h)}}$			
	Feed rate factor for feed rate: 5 / 10 / 20 / 60 / 120 / 600 mm/h: 1139 240 mm/h: 911 30 / 300 mm/h: 854 1000 mm/h: 949			

Digital I/O Option

4 Digital Inputs:	To DIN 19 240: input resistance approximately 10 kW Logical "0" equals -3 to +5 V, Active with logical "1" equals +12 to +30 V, 1 Hz maximum, 32 V maximum, input current approximately 1.5 mA
Auxiliary Voltage Output:	For powering digital inputs with potential free relay contacts 24 VDC, maximum 30 mA, short circuit protected, unstabilized
3 Relays:	Changeover contact, 230 VAC / 3A, for alarm condition transmission
Serial Interfaces:	Type (RS 232 / RS 485) and unit address can be selected. Maximum cable length using shielded cable: 50 feet (15 m) for RS 232; 3280 feet (1000 m) for RS 485. Galvanically isolated from the system.

Certificates

CE Mark:	By attaching the CE mark, Endress+Hauser confirms that the instrument fulfills all the requirements of the relevant EC directives.
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Ordering Information

Paperless recorder Eco-graph

RSG20 - 1 2 3 4 5 6 7

- 1 Signal Inputs
 - 3 3 universal inputs (Voltage, current, thermocouple, RTD)
 - 4 3 universal inputs (Voltage, current, thermocouple, RTD) plus totalization
 - 6 6 universal inputs (Voltage, current, thermocouple, RTD)
 - 7 6 universal inputs (Voltage, current, thermocouple, RTD) plus totalization
- 2 Power Supply
 - 1 110 to 240 VAC (-15%, +10%)
 - 2 20 to 53 VAC / VDC
- 3 Digital In/Outputs/Interface/RS 232 Operation Cable
 - A Digital in/outputs/interface/operation cable not required
 - B 4 control inputs, 3 relays, RS 232/485 interface, without RS 232 operation cable
 - C 4 control inputs, 3 relays, RS 232/485 interface, with RS 232 operation cable
- 4 Internal Memory/Recording Length
 - A Memory for maximum 256,000 values recording length
 - B Memory for maximum 512,000 values recording length
- 5 Model
 - 1 Panel mounting, 5.7" x 5.7" (144 mm x 144 mm) bezel, IP 54 ingress protection
 - 3 Desk top version, connection cable with US plug
 - 5 With wall mounted housing, IP 65 rated
- 6 Language
 - H American
 - E Spanish
- 7 Special Version
 - A Standard version
 - B Neutral version (without Endress+Hauser Logo)

Accessories

The following accessories are included with the shipped unit:

Unit plug-on screw terminals for power supply and signal inputs

Panel mounting jack screws, operating manual and ReadWin® software package for PC.

Accessories

RS 232 connection cable for PC operation	RSG20A-S1
RS 232 interface cable for connection to modem	RSG20A-S2
Connection set for connection to adapter set	
RS 232 <-> RS 485 and RS 232 modem	RSG20A-S4
RS 485 <-> RS 232 adapter set, with 115 V power supply	RSG20A-S5

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FAX: (504) 366-3816

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FAX: (281) 999-1891

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The Power of Know How

