Technical Information TI 075R/24/ae

# Paperless Recorder PR20

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





- 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

















## **System Function**

#### **Measurement Principle**

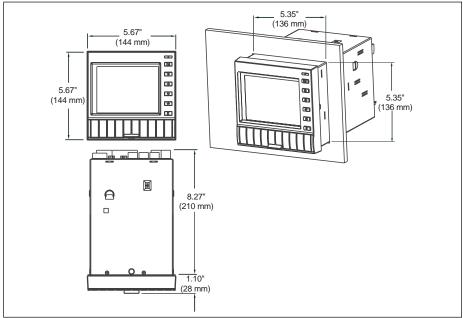
Electronic recording, plotting and archiving of analog and digital input signals from measuring devices.

#### **Measurement System**

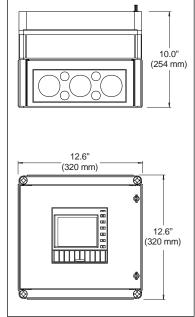
All connected analog measurement points are measured in parallel every 250 ms. Galvanic isolation channel to channel is 500 V. Damping is presettable from 0 to 999.9 seconds per analog input. Data storage is done in the internal memory (power failure secure via FLASH technology) and in the integrated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

Long term storage of data is done in the PC. The data can be trasferred 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.

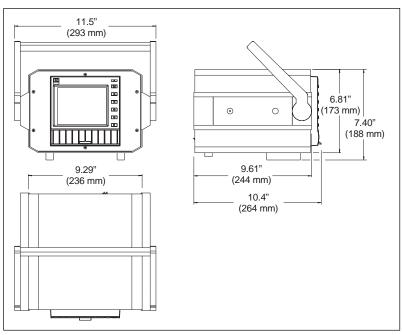
## Dimensions and Mounting Details



Panel mounted PR20

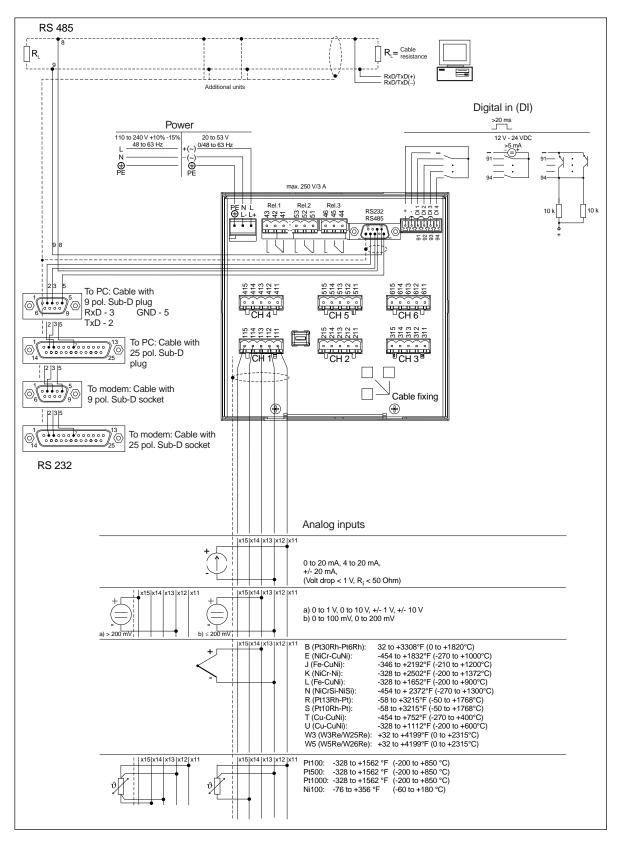


Wall mount / field enclosure



Desk top / portable PR20

## **Wiring Connections**



## **Technical Data**

## **Input Signals**

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

Voltage (mV):	Measurement Range / min. span	Accuracy	
	0 to 100 mV / 5 mV; linear	± 80mV	
	0 to 200 mV / 5 mV; linear	± 240mV	
	0 to 1 V / 5 mV; linear/square	± 1 mV	
	0 to 10 V / 5 mV; linear/square	± 10 mV	
	-1 to +1V / 5 mV; linear	± 20 mV	
	-10 to +10 V / 5 mV; linear	± 20 mV	
Input impedance:	>1 Mw (range < 200 mV); > 530 kw (r	>1 Mw (range < 200 mV); > 530 kw (range <sup>3</sup> 200mV)	

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

Thermocouples:   Measurement Range / min. span   Accuracy				
(0 to +1820°C / 500 K)  E (NiCr-CuNi)  -454 to + 1832°F / 180°F (-270 to +1000°C / 100 K)  J (Fe-CuNi)  -346 to +2192°F / 180°F (-210 to +1200°C / 100 K)  K (NiCr-Ni)  -328 to +2502°F / 180°F (-200 to +1372°C / 100 K)  L (Fe-CuNi)  N (NiCrSi-NiSi)  -454 to +2372°F / 180°F (-200 to +990°C / 100 K)  K (Pt13Rh-Pt)  -58 to +3215°F / 900°F (-50 to +1768°C / 500 K)  T (Cu-CuNi)  -328 to +1652°F / 180°F (-270 to +1300°C / 100 K)  K (Pt13Rh-Pt)  -58 to +3215°F / 900°F (-50 to +1768°C / 500 K)  T (Cu-CuNi)  -328 to +1652°F / 180°F (-270 to +400°C / 100 K)  -58 to +3215°F / 900°F (-50 to +1768°C / 500 K)  T (Cu-CuNi)  -328 to +1112°F / 180°F (-270 to +400°C / 100 K)  -454 to +752°F / 180°F (-270 to +400°C / 100 K)  W3 (W3Re/W25Re)  W3 (W3Re/W25Re)  W5 (W5Re/W26Re)  Measurement:  Current 500 mA  Comparison Point  Accuracy:  L (0 to +2315°C)  Comparison Point  Accuracy:  L (210 to +1000°C / 100 K)  ± 0.15% from +400°C / 100 K) ± 0.1% from -112°F (± 0.1% from -112°F (± 0.1% from -80°C) ± 0.1% from -80°C) ± 0.1% from 32°F (± 0.15% from 0°C) ± 0.15% from 32°F (± 0.15% from 0°C) ± 0.15% from 0°C) ± 0.15% from 32°F (± 0.15% from 0°C) ± 0.11% from -238°F (± 0.19% from -150°C) ± 0.1% from -238°F (± 0.1% from -150°C) ± 0.1% from -238°F (± 0.1% f	Thermocouples:	Measurement Range / min. span	Accuracy	
E (NiCr-CuNi)  -454 to + 1832°F / 180°F (-270 to +1000°C / 100 K)  J (Fe-CuNi)  -346 to +2192°F / 180°F (-210 to +1200°C / 100 K)  K (NiCr-Ni)  -328 to +2502°F / 180°F (-200 to +1372°C / 100 K)  L (Fe-CuNi)  N (NiCrSi-NiSi)  -454 to + 2372°F / 180°F (-270 to +1300°C / 100 K)  R (Pt13Rh-Pt)  -58 to +3215°F / 900°F (-50 to +1768°C / 500 K)  T (Cu-CuNi)  -328 to +1562°F / 180°F (-50 to +1768°C / 500 K)  T (Cu-CuNi)  -454 to +2372°F / 180°F (-50 to +1768°C / 500 K)  T (Cu-CuNi)  -454 to +2372°F / 180°F (-50 to +1768°C / 500 K)  T (Cu-CuNi)  -454 to +752°F / 180°F (-270 to +400°C / 100 K)  U (Cu-CuNi)  -328 to +4199°F (-200 to +600°C / 100 K)  W3 (W3Re/W25Re)  W5 (W5Re/W26Re)  -32 to +4199°F (0 to +2315°C)  W6 (± 0.1% from -112°F (± 0.1% from -80°C)  ± 0.15% from 32°F (± 0.15% from 32°F (± 0.15% from 0°C)  ± 0.15% from 0°C)  ± 0.15% from -238°F (± 0.1% from -150°C)  ± 0.1% from -238°F (± 0.1% from -150°C)  ± 0.1% from -238°F (± 0.1% from -150°C)  ± 0.1% from -10°C)  ± 0.1% fr	B (Pt30Rh-Pt6Rh)	+32 to +3308°F / 900°F	± 0.15% from +752°F	
(-270 to +1000°C / 100 K)  J (Fe-CuNi)  -346 to +2192°F / 180°F (-210 to +1200°C / 100 K)  K (NiCr-Ni)  -328 to +2502°F / 180°F (-200 to +1372°C / 100 K)  L (Fe-CuNi)  -328 to +1652°F / 180°F (-200 to +900°C / 100 K)  N (NiCrSi-NiSi)  -454 to +2372°F / 180°F (-270 to +1300°C / 100 K)  R (Pt13Rh-Pt)  -58 to +3215°F / 900°F (-50 to +1768°C / 500 K)  T (Cu-CuNi)  -454 to +752°F / 180°F (-50 to +1768°C / 500 K)  T (Cu-CuNi)  -454 to +752°F / 180°F (-270 to +400°C / 100 K)  T (Cu-CuNi)  -454 to +752°F / 180°F (-270 to +400°C / 100 K)  U (Cu-CuNi)  -328 to +1112°F / 180°F (-200 to +600°C / 100 K)  W3 (W3Re/W25Re)  W5 (W5Re/W26Re)  Measurement:  Current 500 mA  Comparison Point:  Comparison Point  Accuracy:  ± 1.8°F (± 1.0k) (can be calibrated front end)  Input Resistance:  (+0.1% from -140°C)  ± 0.1% from -112°F (± 0.1% from -112°F (± 0.1% from -112°F (± 0.1% from -112°F (± 0.1% from -12°F (± 0.1% from -23°F (± 0.15% from 32°F (± 0.15% from 0°C)  ± 0.15% from 0°C)  ± 0.15% from 0°C)  ± 0.15% from 0°C)  ± 0.15% from -238°F (± 0.15% from -238°F (± 0.1% from -238°F (± 0.1% from -238°F (± 0.1% from -150°C)  ± 0.1% from -150°C)  ± 0.1% from -238°F (± 0.1% from -238°F (± 0.1% from -150°C)  ± 0.1% from -238°F (± 0.1% from -238°F (± 0.1% from -238°F (± 0.1% from -238°F (± 0.1% from -150°C)  ± 0.1% from -10°C)  ± 0.15% from 32°F (± 0.15% from 0°C)  ± 0.15% from 32°F (± 0.15% from 0°C)  ± 0.15% from 32°F (± 0.15% from 0°C)  ± 0.15% from 32°F (± 0.1% from -150°C)  ± 0.15% from 32°F (± 0.1% from -150°C)  ± 0.1% from -112°F (± 0.1% from -150°C)  ± 0.1% from -112°F (± 0.1% from -150°C)  ± 0.1% from -112°F (± 0.1% from -112°F (± 0.1% from -150°C)  ± 0.1% from -112°F (± 0.1% from -150°C)  ± 0.1% from -112°F (± 0.1% from -112°F (± 0.1% from -150°C)  ± 0.1% from -112°F (± 0.1% from -112°F		(0 to +1820°C / 500 K)	(± 0.15% from +400°C)	
J (Fe-CuNi)  -346 to +2192°F / 180°F (-210 to +1200°C / 100 K)  K (NiCr-Ni)  -328 to +2502°F / 180°F (-200 to +1372°C / 100 K)  L (Fe-CuNi)  N (NiCrSi-NiSi)  -454 to +2372°F / 180°F (-270 to +1300°C / 100 K)  R (Pt13Rh-Pt)  -58 to +3215°F / 900°F (-50 to +1768°C / 500 K)  T (Cu-CuNi)  -454 to +752°F / 180°F (-50 to +1768°C / 500 K)  C (+0.1% from -112°F (+0.1% from -80°C)  S (Pt10Rh-Pt)  -58 to +3215°F / 900°F (-50 to +1768°C / 500 K)  T (Cu-CuNi)  -454 to +752°F / 180°F (-270 to +1300°C / 100 K)  C (+0.15% from 32°F (+50 to +1768°C / 500 K)  T (Cu-CuNi)  -454 to +752°F / 180°F (-270 to +400°C / 100 K)  U (Cu-CuNi)  -454 to +752°F / 180°F (-270 to +400°C / 100 K)  W3 (W3Re/W25Re)  +32 to +4199°F (-200 to +600°C / 100 K)  W5 (W5Re/W26Re)  22 to +4199°F (0 to +2315°C)  Measurement:  Current 500 mA  Comparison Point:  Comparison Point  Accuracy:  ± 1.8°F (± 1.0k) (can be calibrated front end)  Input Resistance:  900 kW	E (NiCr-CuNi)	-454 to + 1832°F / 180°F	± 0.1% from -112°F	
(-210 to +1200°C / 100 K) (± 0.1% from -100°C)  K (NiCr-Ni) -328 to +2502°F / 180°F (± 0.1% from -30°C)  L (Fe-CuNi) -328 to +1652°F / 180°F (± 0.1% from -80°C)  L (Fe-CuNi) -328 to +1652°F / 180°F (± 0.1% from -80°C)  N (NiCrSi-NiSi) -454 to +2372°F / 180°F (± 0.1% from -112°F (-270 to +1300°C / 100 K) (± 0.1%)  R (Pt13Rh-Pt) -58 to +3215°F / 900°F (± 0.15% from 32°F (-50 to +1768°C / 500 K) (± 0.15% from 32°F (-50 to +1768°C / 500 K) (± 0.15% from 32°F (-50 to +1768°C / 500 K) (± 0.15% from 0°C)  T (Cu-CuNi) -454 to +752°F / 180°F (-270 to +400°C / 100 K) (± 0.15% from 0°C)  U (Cu-CuNi) -328 to +1112°F / 180°F (± 0.1% from -238°F (-200 to +600°C / 100 K) (± 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%)  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 kW		(-270 to +1000°C / 100 K)	(± 0.1% from -80°C)	
K (NiCr-Ni)  -328 to +2502°F / 180°F (-200 to +1372°C / 100 K)  L (Fe-CuNi)  -328 to +1652°F / 180°F (-200 to +900°C / 100 K)  N (NiCrSi-NiSi)  -454 to +2372°F / 180°F (-270 to +1300°C / 100 K)  R (Pt13Rh-Pt)  -58 to +3215°F / 900°F (-50 to +1768°C / 500 K)  T (Cu-CuNi)  -454 to +752°F / 180°F (-50 to +1768°C / 500 K)  T (Cu-CuNi)  -454 to +752°F / 180°F (-50 to +1768°C / 500 K)  T (Cu-CuNi)  -454 to +752°F / 180°F (-50 to +1768°C / 500 K)  T (Cu-CuNi)  -454 to +752°F / 180°F (-270 to +400°C / 100 K)  U (Cu-CuNi)  -328 to +1112°F / 180°F (-200 to +600°C / 100 K)  W3 (W3Re/W25Re)  W5 (W5Re/W26Re)  -32 to +4199°F (0 to +2315°C)  W6 (w5Re/W26Re)  -32 to +4199°F (0 to +2315°C)  -32 to +4199°F (0 to +2315°C)  -32 to +4199°F (0 to +2315°C)  -33 to +4199°F (0 to +2315°C)  -34 to +4199°F (0 to +2315°C)  -35 to +4199°F (0 to +2315°C)  -37 to +400°C / 100 K) (± 0.1%)  -38 to +1112°F / 180°F (± 0.1% from -150°C)  ± 0.1% from -238°F (± 0.1% from -150°C)  ± 0.1% from -238°F (± 0.1% from -150°C)  ± 0.1% from -238°F (± 0.1% from -238°F (± 0.1% from -238°F (± 0.1% from -150°C)  ± 0.1% from -238°F (± 0.1% from -238°F	J (Fe-CuNi)	-346 to +2192°F / 180°F	± 0.1% from -148°F	
(-200 to +1372°C / 100 K) L (Fe-CuNi) C-328 to +1652°F / 180°F (-200 to +900°C / 100 K) L (± 0.1% from -80°C) ± 0.1% L (± 0.1%) L (± 0.1% from -112°F L (-270 to +1300°C / 100 K) L (± 0.1% from -80°C) L (± 0.1% from 32°F L (-50 to +1768°C / 500 K) L (± 0.15% from 0°C) L (± 0.15% from 0°C) L (50 to +1768°C / 500 K) L (± 0.15% from 0°C) L (50 to +1768°C / 500 K) L (± 0.15% from 0°C) L (50 to +1768°C / 500 K) L (± 0.15% from 0°C) L (50 to +1768°C / 100 K) L (50 to +1768°C / 1		(-210 to +1200°C / 100 K)	(± 0.1% from -100°C)	
L (Fe-CuNi) -328 to +1652°F / 180°F (-200 to +900°C / 100 K) -454 to +2372°F / 180°F (-270 to +1300°C / 100 K) -458 to +2372°F / 180°F (-50 to +1768°C / 500 K) -58 to +3215°F / 900°F (-50 to +1768°C / 500 K) -454 to +2372°F / 180°F (-50 to +1768°C / 500 K) -58 to +3215°F / 900°F (-50 to +1768°C / 500 K) -58 to +3215°F / 900°F (-50 to +1768°C / 500 K) -454 to + 752°F / 180°F (-270 to +400°C / 100 K) -328 to +1112°F / 180°F (-270 to +400°C / 100 K) -328 to +1112°F / 180°F (-200 to +600°C / 100 K) -328 to +4199°F (0 to +2315°C) -32 to +4199°F (0 to +2315°C) -32 to +4199°F (0 to +2315°C) -32 to +4199°F (0 to +2315°C) -33 to +4199°F (0 to +2315°C) -34 to +4199°F (0 to +2315°C) -35 to +4199°F (0 to +2315°C) -36 to +4199°F (0 to +2315°C) -37 to +400°C / 100 K) -38 to +4199°F (0 to +2315°C) -454 to +752°F / 180°F -40.1% from -150°C) -454 to +752°F / 180°F -40.1% from -238°F -40.1% from -150°C) -454 to +752°F / 180°F -40.1% from -238°F -40.1% from -150°C) -454 to +752°F / 180°F -40.1% from -238°F -40.1% from -23	K (NiCr-Ni)	-328 to +2502°F / 180°F	± 0.1% from -112°F	
(-200 to +900°C / 100 K)  N (NiCrSi-NiSi)  -454 to +2372°F / 180°F (-270 to +1300°C / 100 K)  R (Pt13Rh-Pt)  -58 to +3215°F / 900°F (-50 to +1768°C / 500 K)  S (Pt10Rh-Pt)  -58 to +3215°F / 900°F (-50 to +1768°C / 500 K)  T (Cu-CuNi)  -454 to +752°F / 180°F (-50 to +1768°C / 500 K)  T (Cu-CuNi)  -454 to +752°F / 180°F (-270 to +400°C / 100 K)  U (Cu-CuNi)  -328 to +1112°F / 180°F (-200 to +600°C / 100 K)  W3 (W3Re/W25Re)  +32 to +4199°F (0 to +2315°C)  W5 (W5Re/W26Re)		(-200 to +1372°C / 100 K)	(± 0.1% from -80°C)	
N (NiCrSi-NiSi)  -454 to +2372°F / 180°F (-270 to +1300°C / 100 K)  R (Pt13Rh-Pt)  -58 to +3215°F / 900°F (-50 to +1768°C / 500 K)  S (Pt10Rh-Pt)  -58 to +3215°F / 900°F (-50 to +1768°C / 500 K)  T (Cu-CuNi)  -454 to +752°F / 180°F (-270 to +400°C / 100 K)  U (Cu-CuNi)  -328 to +1112°F / 180°F (-200 to +600°C / 100 K)  W3 (W3Re/W25Re)  W5 (W5Re/W26Re)  W5 (W5Re/W26Re)  Measurement:  Comparison Point:  Comparison Point  Accuracy:  L 0.1% from -112°F (± 0.1% from 32°F (± 0.15% from 0°C)  ± 0.1% from -238°F (± 0.1% from -150°C)  ± 0.1% from -238°F (± 0.1% from -150°C)  ± 0.1% from -150°C)  ± 0.1% (± 0.1%)  ± 0.1% (± 0.1%)  ± 0.1% (± 0.1%)  ± 0.1% (± 0.1%)  ± 0.1% (± 0.1%)  10 to +2315°C)  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)	L (Fe-CuNi)	-328 to +1652°F / 180°F	± 0.1%	
(-270 to +1300°C / 100 K) (± 0.1% from -80°C) R (Pt13Rh-Pt) (-58 to +3215°F / 900°F (± 0.15% from 32°F (-50 to +1768°C / 500 K) (± 0.15% from 0°C) S (Pt10Rh-Pt) (-58 to +3215°F / 900°F (± 0.15% from 32°F (-50 to +1768°C / 500 K) (± 0.15% from 32°F (-50 to +1768°C / 500 K) (± 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 (-270 to +400°C / 100 K) (± 0.1% from -238°F (-200 to +600°C / 100 K) (± 0.1% from -238°F (-200 to +600°C / 100 K) (± 0.1% from -150°C) W3 (W3Re/W25Re) (0 to +2315°C) (± 0.1% (± 0.1%) (± 0.1%) W5 (W5Re/W26Re) (0 to +2315°C) (± 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 kW		(-200 to +900°C / 100 K)	(± 0.1%)	
R (Pt13Rh-Pt) -58 to +3215°F / 900°F (-50 to +1768°C / 500 K) -58 to +3215°F / 900°F (-50 to +1768°C / 500 K) -58 to +3215°F / 900°F (-50 to +1768°C / 500 K) -58 to +3215°F / 900°F (-50 to +1768°C / 500 K) -454 to +752°F / 180°F (-270 to +400°C / 100 K) -454 to +752°F / 180°F (-270 to +400°C / 100 K) -328 to +1112°F / 180°F (-200 to +600°C / 100 K) -328 to +1112°F / 180°F (-200 to +600°C / 100 K) -32 to +4199°F (0 to +2315°C) -32 to +4199°F (0 to +2315°C) -32 to +4199°F -32 to +4199°F -33 to +4199°F -34 to +4199°F -35 to +4199°F -36 to +2315°C) -37 to +2315°C) -38 to +4199°F -39 to +4199°F -40 to +2315°C) -39 to +4199°F -30 to +2315°C) -30 to +2315°C -30 to +231	N (NiCrSi-NiSi)	-454 to +2372°F / 180°F	± 0.1% from -112°F	
(-50 to +1768°C / 500 K) (± 0.15% from 0°C) S (Pt10Rh-Pt) (-58 to +3215°F / 900°F (± 0.15% from 32°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 (± 0.1% from -238°F (-270 to +400°C / 100 K) (± 0.1% from -150°C) U (Cu-CuNi) (-328 to +1112°F / 180°F (± 0.1% from -238°F (-200 to +600°C / 100 K) (± 0.1% from -150°C) W3 (W3Re/W25Re) (+32 to +4199°F (0 to +2315°C) (± 0.1% (± 0.1%) (± 0.1%) W5 (W5Re/W26Re) (0 to +2315°C) (± 0.1% (± 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 kW		(-270 to +1300°C / 100 K)		
S (Pt10Rh-Pt)  -58 to +3215°F / 900°F (-50 to +1768°C / 500 K)  T (Cu-CuNi)  -454 to + 752°F / 180°F (-270 to +400°C / 100 K)  U (Cu-CuNi)  -328 to +1112°F / 180°F (-200 to +600°C / 100 K)  W3 (W3Re/W25Re)  +32 to +4199°F (0 to +2315°C)  W5 (W5Re/W26Re)  Measurement:  Current 500 mA  Comparison Point:  Comparison Point  Accuracy:  L 0.15% from 32°F (± 0.15% from 0°C)  ± 0.1% from -150°C)  ± 0.1% from -150°C)  ± 0.1% (± 0.1%) (± 0.1%)  ± 0.1% (± 0.1%)  Example 10 to +2315°C)  Current 500 mA  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)	R (Pt13Rh-Pt)	-58 to +3215°F / 900°F	± 0.15% from 32°F	
(-50 to +1768°C / 500 K) (± 0.15% from 0°C)  T (Cu-CuNi) (-454 to + 752°F / 180°F (± 0.1% from -238°F (-270 to +400°C / 100 K) (± 0.1% from -150°C)  U (Cu-CuNi) (-328 to + 1112°F / 180°F (± 0.1% from -238°F (-200 to +600°C / 100 K) (± 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%)  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 kW		(-50 to +1768°C / 500 K)	(± 0.15% from 0°C)	
T (Cu-CuNi)  -454 to + 752°F / 180°F  (-270 to +400°C / 100 K)  U (Cu-CuNi)  -328 to + 1112°F / 180°F  (-200 to +600°C / 100 K)  W3 (W3Re/W25Re)  +32 to +4199°F  (0 to +2315°C)  W5 (W5Re/W26Re)  Measurement:  Current 500 mA  Comparison Point:  Comparison Point  Accuracy:  L 0.1% from -150°C)  ± 0.1% from -150°C)  ± 0.1% from -150°C)  ± 0.1% (± 0.1%)  ± 0.1% (± 0.1%)  E 0.1% (±	S (Pt10Rh-Pt)	-58 to +3215°F / 900°F	± 0.15% from 32°F	
(-270 to +400°C / 100 K)		,	,	
U (Cu-CuNi)  -328 to + 1112°F / 180°F (-200 to +600°C / 100 K)  W3 (W3Re/W25Re)  +32 to +4199°F (0 to +2315°C)  W5 (W5Re/W26Re)  32 to +4199°F (0 to +2315°C)  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 kW	T (Cu-CuNi)	-454 to + 752°F / 180°F	± 0.1% from -238°F	
(-200 to +600°C / 100 K) (± 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%)  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 kW		,	(± 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 kW	U (Cu-CuNi)	-328 to + 1112°F / 180°F	± 0.1% from -238°F	
(0 to +2315°C) (± 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 kW		,	(± 0.1% from -150°C)	
W5 (W5Re/W26Re)   32 to +4199°F	W3 (W3Re/W25Re)	+32 to +4199°F	± 0.1%	
(0 to +2315°C) (± 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 kW		(0 to +2315°C)	(± 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 kW	W5 (W5Re/W26Re)	1 - 1 - 1 - 1 - 1 - 1	± 0.1%	
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 kW		(0 to +2315°C)	(± 0.1%)	
- 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 kw	Measurement:	Current 500 mA		
- 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 kw	Comparison Point:	Comparison points "CJC" (to IEC 60 5	584) selectable	
Comparison Point Accuracy: ± 1.8°F (± 1.0k) (can be calibrated front end)  Input Resistance: 900 kw		- internal compensation of the terminal temperature		
Accuracy: ± 1.8°F (± 1.0k) (can be calibrated front end)  Input Resistance: 900 kW		- external, 32, 68, 122, 140, 158, 176°F (0, 20, 50, 60, 70, 80°C)		
Accuracy: ± 1.8°F (± 1.0k) (can be calibrated front end)  Input Resistance: 900 kW	Comparison Point			
		± 1.8°F (± 1.0k) (can be calibrated front end)		
Open Circuit Monitor: Cable open circuit indicates "——" in the display	Input Resistance:	900 kw		
		Cable open circuit indicates " — " in the display		

# **Technical Data (con't)**

## Accuracy

Powe	r Sup	ply

## **Operating Conditions**

#### Construction

## **Operation and Display**

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)

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

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/m³ 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 $\pm$ 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)

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)

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 <sup>3</sup> 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**

- Selectable recording speeds ("Feed rate") 0 / 5 / 10 / 20 / 60 / 120 / 240 / 300 / 600 / 1000 mm/h  - Buffer <sup>3</sup> 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)			
Recording Len	igth (m = Chart pa	per, meters) app	proximately to:
Number of	Standard	Expanded	Floppy Disk
Channels	memory	memory	
	-	(option)	
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
Feed rate factor x Recording length (meters)			
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	
	120 / 240 / 3 - Buffer <sup>3</sup> 10 y (Flash memo - Cyclic copy of 1.44 MB; reserved; Permanent so Flash memo Recording Len Number of Channels  1 2 3 4 5 6 Feed rate factor 5 / 10 / 20 / 60 240 mm/h: 30 / 300 mm/h	120 / 240 / 300 / 600 / 1000 m  - Buffer <sup>3</sup> 10 years for programm (Flash memory, non volatile)  - Cyclic copy of measured data of 1.44 MB; resolution is depended and the present of 1.44 MB; resolution is depended and 1.44 MB; resolution is depended	120 / 240 / 300 / 600 / 1000 mm/h  - Buffer <sup>3</sup> 10 years for programmed / measured of (Flash memory, non volatile)  - Cyclic copy of measured data to 3-1/2" disketted 1.44 MB; resolution is dependent on the preset

## 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.

## **Ordering Information**

#### Paperless recorder Eco-graph

PR20 - 1 2 3 4 5 6 7

- Signal Inputs
  - 3 universal inputs (Voltage, current, thermocouple, RTD)
  - 4 3 universal inputs (Voltage, current, thermocouple, RTD) plus totalization
  - 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
  - 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
RS 232 interface cable for connection to modem
Connection set for connection to adapter set
RS 232 <-> RS 485 and RS 232 modem
RS 485 <-> RS 232 adapter set, with 115 V
power supply
RSG20A-S5

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