PERFORMANCE MADE SMARTER

Universal uni-/bipolar signal transmitter

4184

- Measures DC inputs up to ±300 V / ±100 mA with spans as low as 25 mV / 0.5 mA
- Passive/active current output and buffered voltage output
- Fast < 20 ms response time and excellent 0.05% accuracy
- Universally powered by 21.6…253 VAC / 19.2...300 VDC

Application

- Fast < 20 ms response time for measuring signals produced by torque, position, current & acceleration sensors.
- User configurable bipolar or unipolar I/O means the 4184 is suitable for nearly any DC voltage or current conversion.
- Freely programmable between ±300 VDC and ±100 mA.
- The excitation source allows measurement of a 2-wire or 3-wire transmitter, or a potentiometer.
- Converts narrow bipolar inputs to wide bipolar or unipolar outputs, e.g., ±1 volt input = ±10 volt or 4...20 mA output.
- Configurable input limits control the output value for increased safety.
- ±20 VDC buffered voltage output for controlling devices like the PVG 32 valve (6...18 VDC).
- The 4184 provides the required failure data (SFF and PFDAVG) for SIL 2 applications as per IEC 61508 / IEC 61511.
- Failure rates for 4184 correspond to Performance Level “d” according to ISO-13849.

Technical characteristics

- The latest analog and digital techniques are used to obtain maximum accuracy and immunity to interference.
- Possibility of output safety readback by selecting S4...20 mA output.
- The current output can drive up to 1000 Ohms, with an adjustable response time of 0.0…60.0 seconds.
- Exceptional mA output load stability of < 0.001% of span / 100 Ohm.
- Meets the NAMUR NE21 recommendations, ensuring high accuracy in harsh EMC environments.
- Meets the NAMUR NE43 recommendations, allowing the control system to easily detect a sensor error.
- Tested to a high 2.3 kVAC, 3-port galvanic isolation level.

Mounting / installation / programming

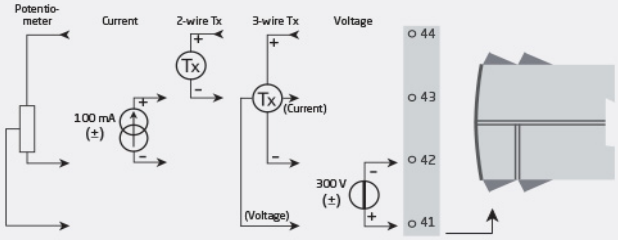
- Very low power consumption means units can be mounted side by side without an air gap – even at 60°C ambient temperature.
- Configuration, monitoring, 2-point process calibration and more are accomplished using PR's 4500 series of detachable displays.

Note

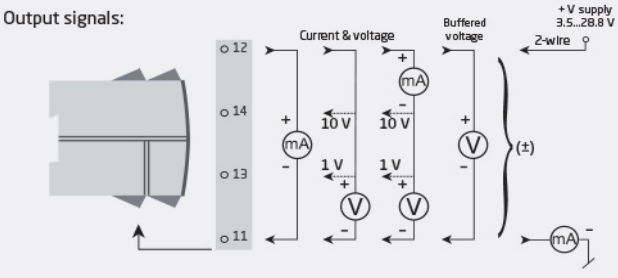
- If you need an installation instruction in hard copy, you can order it for free when placing your order.

Applications

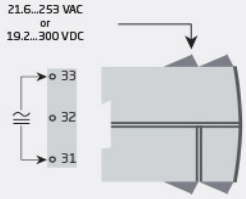
Input signals:



Output signals:



Power connection:



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Order:

Type
4184

Environmental Conditions

Operating temperature	-20°C to +60°C
Storage temperature	-20°C to +85°C
Calibration temperature	20...28°C
Relative humidity	< 95% RH (non-cond.)
Protection degree	IP20

Mechanical specifications

Dimensions (HxWxD)	109 x 23.5 x 104 mm
Dimensions (HxWxD) w/ PR 4500	109 x 23.5 x 131 mm
Weight approx.	155 g
Weight incl. 4501 / 451x (approx.)	170 g / 185 g
DIN rail type	DIN EN 60715/35 mm
Wire size	0.13...2.08 mm^2 AWG 26...14 stranded wire
Screw terminal torque	0.5 Nm

Common specifications

Supply

Supply voltage, universal	21.6...253 VAC, 50...60 Hz or 19.2...300 VDC
Max. required power	≤ 2.5 W
Internal power dissipation	≤ 2.0 W

Isolation voltage

Test voltage	2.3 kVAC
Working voltage	250 VAC (reinforced) / 500 VAC (basic)

Response time

Response time (0...90%, 100...10%)	< 20 ms

Auxiliary supplies

2-wire loop supply	> 16 V @ 23 mA
3-wire loop supply	> 18...< 28 V @ 23...0 mA
Loop supply limitation	27...35 mA avg., < 80 mA peak
Reference voltage	2.5 VDC ±0.5%
Reference voltage, load	0...15 mA
Current limit, reference voltage	< 60 mA
Programming	PR 4500 communication interfaces
Signal dynamics, input	24 bit
Signal dynamics, output	18 bit
Signal / noise ratio	> 60 dB
Bandwidth	> 40 Hz
Accuracy	Better than 0.05% of selected range
EMC immunity influence	< ±0.5% of span
Extended EMC immunity: NAMUR NE21, A criterion, burst	< ±1% of span
Conducted emission, cl. A	150 kHz...10 MHz

Input specifications

Current input

Signal range	±100 mA
Programmable measurement ranges	0...1, 0...5, 1...5, 0...20, 4...20, ±1, ±5, ±10, ±20, ±50, ±100 mA
Custom configurable signal range	±100 mA
Min. measurement range (span)	0.5 mA
Input voltage drop	0.6 V @ 20 mA nom.

Voltage input

Signal range	±300 VDC
Programmable measurement ranges	0...0.1, 0...1, 0.2...1, 0...2.5, 0...5, 1...5, 0...10, 2...10, 0...100, 0...300, ±0.1, ±1, ±2.5, ±5, ±10, ±100, ±300 V
Custom configurable signal range	±300 V
Min. measurement range (span)	25 mV
Input resistance	Nom. 3 MΩ (> 2.5 VDC)
Input resistance	Nom. > 10 MΩ (≤ 2.5 VDC)

Potentiometer input

3-wire potentiometer input	0...100%
Reference voltage	2.5 V
Calibration resistance	5 kΩ
Min. potentiometer resistance	200 Ω

Output specifications

Current output

Signal range	0...23 mA (unipolar)
Signal range	-23...+23 mA (bipolar)
Custom config. output range	±20 mA
Min. signal range	4 mA
Load (@ current output)	≤ 1000 Ω / ± 20 V @ ±20 mA
Current limit	≤ 28 mA (unipolar)
Current limit	± 28 mA (bipolar)
Load stability	≤ 0.001% of span / 100 Ω
Response time, programmable	0.0...60.0 s

Passive 2-wire mA output

Programmable ranges	0...20 and 4...20 mA
Ext. 2-wire loop supply range	3.5...28.8 VDC

Voltage output

Programmable signal ranges	0/0.2...1; 0/1...5 ; 0/2...10 V
Programmable signal ranges	±1, ±5 and ±10 V
Programmable signal ranges	Direct or Inverted action
Load (@ voltage output)	≥ 500 kΩ
Response time, programmable	0.0...60.0 s

Shunted voltage output

Signal range	± 1.2 V / ± 12 V
Programmable standard ranges	0...1, 0...2.5, 0...5, 1...5, 0...10, 2...10 V ±1, ±2.5, ±5, ±10 V
Min. span	0.8 V
Custom config. output range	±10 V
Load, min	> 500 kΩ

Buffered voltage output

Signal range	± 23 V
Programmable standard ranges	0...1, 0.2...1, 0...2.5, 0...5, 1...5, 0...10, 2...10, 0...20, 4...20; ±1, ±2.5, ±5, ±10, ±20 V
Min. span	0.8 V
Custom config. output range	±20 V
Current limit	< 50 mA
Load, min	> 2 kΩ

Observed authority requirements

EMC	2014/30/EU & UK SI 2016/1091
LVD	2014/35/EU & UK SI 2016/1101
RoHS	2011/65/EU & UK SI 2012/3032
EAC	TR-CU 020/2011

Approvals

c UL us, UL 508	E248256
SIL	Hardware assessed for use in SIL applications