

Universal uni-/bipolar signal transmitter

4184



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



Application

- Fast $< 20\text{ ms}$ 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 $\pm 300\text{ VDC}$ and $\pm 100\text{ mA}$.
- 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., $\pm 1\text{ volt}$ input = $\pm 10\text{ volt}$ or $4\dots 20\text{ mA}$ output.
- Configurable input limits control the output value for increased safety.
- $\pm 20\text{ VDC}$ buffered voltage output for controlling devices like the PVG 32 valve ($6\dots 18\text{ VDC}$).
- The 4184 has been designed according to strict safety requirements and is therefore suitable for application in SIL 2 installations.

Technical characteristics

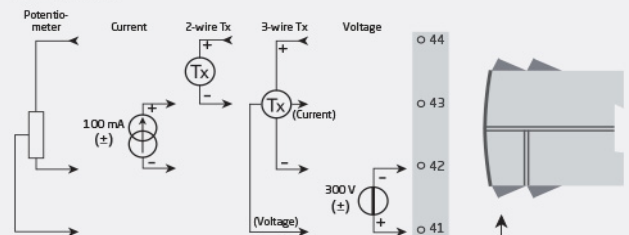
- The latest analog and digital techniques are used to obtain maximum accuracy and immunity to interference.
- Possibility of output safety readback by selecting S4...20 mA output.
- The current output can drive up to 1000 Ohms , with an adjustable response time of $0.0\dots 60.0\text{ seconds}$.
- Exceptional 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.
- Each unit is tested to a high 2.3 kVAC , 3-port galvanic isolation level.
- Excellent signal to noise ratio of $> 60\text{ dB}$.

Mounting / installation / programming

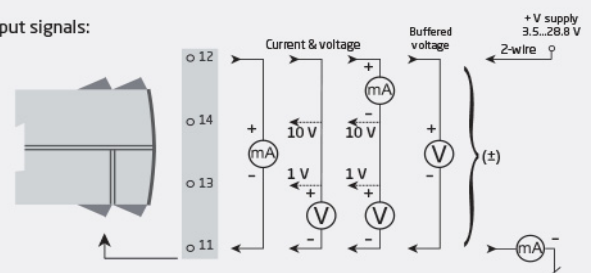
- Very low power consumption means units can be mounted side by side without an air gap – even at 60°C ambient temperature.
- Configuration, monitoring, 2-point process calibration and more are accomplished using PR's 45xx detachable displays.
- All programming can be password-protected.

Applications

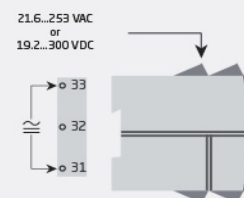
Input signals:



Output signals:



Power connection:



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/ 4501/4511.....	109 x 23.5 x 116 / 131 mm
Weight approx.....	155 g
Weight incl. 4501 / 4511 (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
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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 45xx
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
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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
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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

LVD.....	2014/35/EU
EMC.....	2014/30/EU
RoHS.....	2011/65/EU

Approvals

UL.....	UL 508 / C22.2 no. 14
SIL.....	Hardware assessed for use in SIL applications