

## Universal uni-/bipolar signal transmitter

### 4184



- Measures DC inputs up to  $\pm 300\text{ V}$  /  $\pm 100\text{ mA}$  with spans as low as  $25\text{ mV}$  /  $0.5\text{ mA}$
- 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 ( $6\dots 18\text{ VDC}$ ).
- Designed according to strict safety requirements and is therefore suitable for application in SIL 2 installations.
- Suitable for the use in systems up to Performance Level "d" according to ISO-13849.

#### Technical characteristics

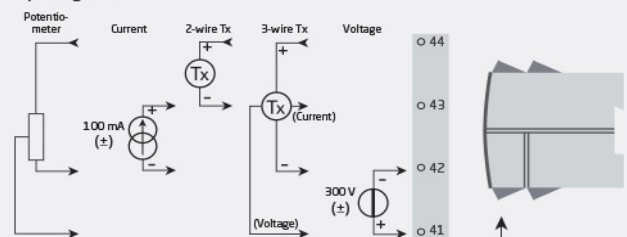
- The latest analog and digital techniques are used to obtain maximum accuracy and immunity to interference.
- Possibility of output safety readback by selecting S4...20 mA output.
- The current output can drive up to  $1000\text{ Ohms}$ , with an adjustable response time of  $0.0\dots 60.0\text{ seconds}$ .
- Exceptional mA output load stability of  $< 0.001\%$  of span /  $100\text{ Ohm}$ .
- 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  $2.3\text{ kVAC}$ , 3-port galvanic isolation level.
- Excellent signal to noise ratio of  $> 60\text{ dB}$ .

#### Mounting / installation / programming

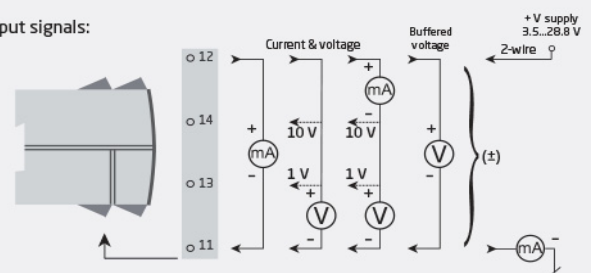
- Very low power consumption means units can be mounted side by side without an air gap – even at  $60^\circ\text{C}$  ambient temperature.
- Configuration, monitoring, 2-point process calibration and more are accomplished using PR's 45xx detachable displays.
- All programming can be password-protected.

#### Applications

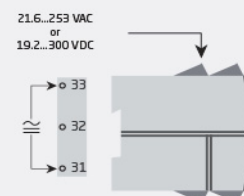
##### Input signals:



##### 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/ 4501/451x.....	109 x 23.5 x 116 / 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 <sup>2</sup> 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 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
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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
EAC.....	TR-CU 020/2011

**Approvals**

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