



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).
- 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

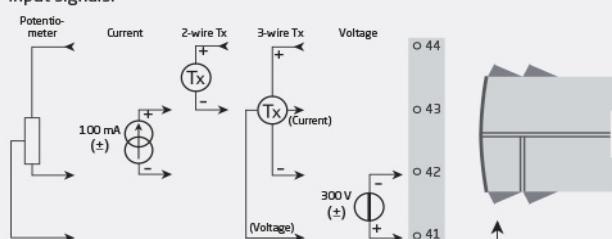
- The latest analog and digital techniques are used to obtain maximum accuracy and immunity to interference.
- Possibility of output safety readback by selecting S4...20 mA output.
- The current output can drive up to 1000 Ohms, with an adjustable response time of 0.0...60.0 seconds.
- Exceptional mA 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

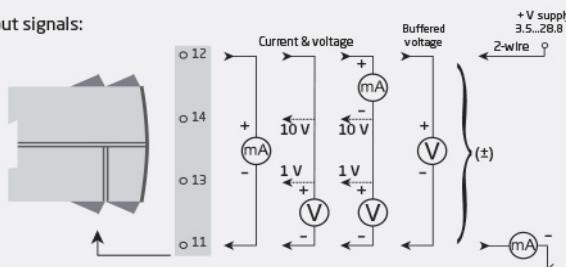
- Very low power consumption means units can be mounted side by side without an air gap – even at 60°C ambient temperature.
- Configuration, monitoring, 2-point process calibration and more are accomplished using PR's 4500 series of detachable displays.

Applications

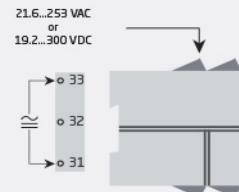
Input signals:



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/ 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 |