


Datasheet Series SCL

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| Model | SCL1804 |  |
| Order no. | 28-003-000-01 | |
| Basic operating modes | CC, CV, CR, CP | |
| Standard interfaces | RS-232, USB, LAN, CAN | |
| Max. input voltage Vmax | 40 V | |
| Min. input voltage Vmin ¹⁾ | 0.6 V | |
| Max. load current Imax | 1200 A | |
| Continuous power ²⁾ | 1800 W | |
| Current-dependent power reduction | 0 V | |
| Voltage setting | 0 ... 40 V | |
| Current setting | 0 ... 1200 A | |
| Resistance setting | 0.0005 ... 0.336 Ohm | |
| Power setting ³⁾ | 0 ... 1800 W | |
| Rise and fall time fast / medium / slow ⁴⁾ | 2000 µs | |
| Load terminals (rear) ⁵⁾ | FKS30/10-SM12 | |
| Power consumption | 100 VA | |
| Noise max. ca. ⁶⁾ | 69 dB(A) | |
| Weight ca. | 21.5 kg | |
| Housing / 3D model ⁷⁾ | 19" - 2 U / SCL_M1 | |
| Width x Height x Depth | 482 x 111 x 554 mm | |

1. Minimum input voltage for maximum static load current.
2. For ZV variants, a current-dependent power reduction of $(1.2 \text{ V} \times \text{set current})$ must be calculated.
3. The setting range extends max. to the possible shorttime power.
4. Rise and fall times are defined of 10 % ... 90 % and 90 % ... 10 % of the maximum current (CC mode, fast regulation speed, tolerance $\pm 20 \%$). Rise and fall time at setting "medium": ca. 150 µs, "slow": ca. 2 ms.
5. FKS30/10-SM12: Flat copper bars 30 x 10 mm vertical with hole for screw M12
Models with copper bars (FKS) are delivered with safety covers.
6. Measured on the front from distance of 1 m.
7. Device height incl. equipment feet. Maximum width and depth incl. handle. Installation depth without connection cable. 1 U = 44.45 mm.

| Operating modes, functions | | |
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| Basic operating modes | CC, CP, CR, CV | |
| Combined operating modes | CC+CV, CR+CC+CV, CP+CC+CV, CV+CC | |
| Functions | DC load MPP Tracking energy storage device test internal resistance measurement list function rectangular function PWM function modulation (sine, triangle, square) data acquisition (internally or to USB flash drive) sweep function save and recall of device settings watchdog in remote operation | |
| User interface | 4.3" TFT touch display | |
| Accuracy of setting | | |
| | of setting | of corresponding range |
| Voltage | ±0.1 % | ±0.05 % |
| Current | ±0.2 % | ±0.05 % |
| Resistance (at 5 % to 100 % of voltage range) | ±1.4 % | ±0.5 % of resistance range ±0.3 % of current range |
| Power (at V and I > 30 % of range) | ±0.35 % | ±0.1 % |
| (at V and I > 5 % and < 30 % of range) | ±0.7 % | ±0.25 % |
| Resolution | 14 bits | |
| Accuracy of adjustable protections | | |
| | of setting | of corresponding range |
| Overcurrent protection | ±1 % | ±0.2 % |
| Undervoltage protection | ±0.5 % | ±0.2 % |
| Resolution | 12 bits | |
| Accuracy of measurement slow | | |
| | of measured value (real value) | of corresponding range |
| Voltage | ±0.025 % | ±0.01 % |
| Current | ±0.2 % | ±0.05 % |
| Resistance | is calculated from current and voltage | |
| Power | is calculated from current and voltage | |
| Resolution | 23 bits | |
| Sampling time | 250 ms, not triggerable | |
| Accuracy of display | | |
| Number of decimal places | 4 | |
| Accuracy | accuracy of measurement slow ±1 digit of the display value | |
| Accuracy of measurement fast | | |
| | of measured value (real value) | of corresponding range |
| Voltage | ±0.2 % | ±0.05 % |
| Current | ±0.2 % | ±0.1 % |
| Resistance | is calculated from current and voltage | |
| Power | is calculated from current and voltage | |
| Resolution | 16 bits | |
| Sampling time | 200 µs ... 1,000 s, resolution 200 µs | |
| Accuracy of trigger voltage and current | | |
| Trigger voltage | ±1 % of voltage range | |
| Trigger current | ±1 % of current range | |
| Sampling time | 200 µs | |

| Dynamic function LIST | |
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| Operating modes | CC, CV, CR, CP |
| No. of load levels | max. 300, with corresponding ramp and dwell times |
| Accuracy of load levels | see accuracy of setting |
| Dwell time ¹⁾ | 200 µs ... 1,000 s |
| Ramp time ¹⁾ | 0 ... 1,000 s |
| Resolution | 200 µs |
| Accuracy of setting times | ±0.02 % |
| Sampling time | see accuracy of measurement fast |
| Delay at triggered start | max. 300 µs |
| Dynamic function rectangular | |
| Operating modes | CC, CV, CR |
| No. of load levels | 2 |
| Accuracy of load levels | see accuracy of setting |
| Pulse times ¹⁾ , resolution | 1 µs ... 9999.999 ms, resolution 1 µs |
| Accuracy of setting times | 0.02 % |
| Dynamic function PWM | |
| Operating modes | CC, CV, CR |
| No. of load levels | 2 |
| Accuracy of load levels | see accuracy of setting |
| Frequency ¹⁾ , resol. | 0.1 Hz ... 10 kHz, resolution 0.1 Hz |
| Duty cycle, resol. | 1 ... 99 %, resolution 1 % |
| Dynamic function modulation | |
| Operating modes | CC, CV |
| Waveforms | sine, square, triangle |
| Frequency ¹⁾ , resol. | 0.1 Hz ... 10 kHz, resolution 0.1 Hz |
| Modulation depth | 0 ... 100 % |
| Data acquisition | |
| to external USB flash drive | |
| Sampling time | 0.1 ... 30.0 s, resolution 0.1 s |
| Measurement data | timestamp, voltage, current |
| No. of measurement points | limited by flash drive memory capacity |
| File format | .csv |
| Accuracy | see accuracy of measurement slow |
| to internal memory | |
| Sampling time | 200 µs ... 1,000 s, resolution 200 µs, synchronized with dynamic function |
| Measurement data | timestamp, voltage, current |
| No. of measurement points | max. 40,000 |
| Accuracy | see accuracy of measurement fast |
| Settings memory | |
| No. of memory positions | 9, selectable (incl. programmed list) |
| I/O port: inputs and outputs | |
| Inputs | analog load setting I and V with 0 ... 5 V and 0 ... 10 V analog protection setting I and V with 0 ... 10 V load input activation (low active) operating mode selection CC/CV control speed selection remote shut-down (high active) readable digital input (by SCPI command) trigger input (high active) control input (activates analog signals, low active) |
| Digital input level | logical low: 0 ... 0.8 V, logical high: 3 ... 30 V |

The specified accuracies refer to an ambient temperature of 23 ±5 °C. The specified accuracies are valid when the sense lines are connected and when the unit is connected to undisturbed voltages (ripple and noise < 0.1 %). At voltages with higher disturbance values the accuracy can change for the worse.

1. The applicable time or frequency range is limited by the rise/fall time of the respective model.
2. positive/negative DC voltage or RMS value of a sinusoidal AC voltage
3. only 0 ... 10 V

Technical Data

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|---|---|---|
| Outputs | analog voltage monitor output 0 ... 10 V analog current monitor output 0 ... 10 V load input activation state (low active) overload status (OV, OCP, OPP, OTP, low active) programmable logic output (by SCPI command) trigger output (low active) | |
| Digital output level | Standard: logical low: 0 ... 0.8 V, logical high: 5 V, max. 10 mA (push-pull) Isolated: logical low: 0 ... 0.8 V, logical high: 5 V/24 V selectable, max. 10 mA (push-pull) | |
| I/O port: accuracy of analog control 0 ... 5 V or 0 ... 10 V | | |
| | of setting | of corresponding range |
| Voltage | ±0.1 % | ±0.05 % |
| Current | ±0.2 % | ±0.1 % |
| Overcurrent protection ³⁾ | ±1 % | ±0.2 % |
| Undervoltage protection ³⁾ | ±0.5 % | ±0.2 % |
| | input resistance of analog inputs >10 kΩ | |
| I/O port: accuracy of analog monitor outputs 0 ... 10 V | | |
| | of analog signal of actual value | offset voltage |
| Voltage | ±0.2 % | ±15 mV |
| Current | ±0.2 % | ±15 mV |
| | minimum load > 2 kΩ | |
| I/O port: permissible voltages | | |
| | standard I/O port | isolated I/O port (option SCL06) |
| Vin-io (GND - neg. load input) | max. 2 V | max. 185 V ²⁾ |
| VioPE (GND - PE) | max. 60 V ²⁾ | max. 125 V ²⁾ |

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| Input | | |
| Input resistance | >50 kΩ when load input is off standard models with diode function at reverse polarity up to nominal current ZV models have no reverse polarity protection! | |
| Input capacity | see model overview | |
| Max. input voltage Vmax | see model overview | |
| Min. input voltage Vmin | see model overview | |
| Input: permissible voltages | | |
| | standard I/O port | isolated I/O port (option SCL06) |
| Vin-PE (neg. load input - PE) | max. 60 V ²⁾ | max. 60 V ²⁾ |
| Vin+PE (pos. load input - PE) | max. 60 V ²⁾ | max. 60 V ²⁾ |
| Power | | |
| Continuous power | see model overview (at Ta = 21 °C) | |
| Derating | -1.2 %/°C for Ta > 21 °C | |

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| Protection and monitoring | |
| Protective devices | overcurrent overpower overtemperature |
| Monitoring | overvoltage indication reverse polarity indication undervoltage indication (if the input voltage is too low for the set current) |
| Terminals | |
| Load input | see model overview |
| Sense | PH2/7.62-BU16, see starting at page 123 |
| Operating conditions | |
| Operating temperature | 5 ... 40 °C |
| Stock temperature | -25 ... 65 °C |
| Max. operating height | 2,000 m above sea level |
| Pollution degree | 2 |
| Overvoltage category of mains | II |
| Max. humidity | 80 % at 31 °C, linear decreasing to 50 % at 40 °C |
| Min. distance rear panel to wall or other objects | 70 cm |
| Cooling | 2-stage air cooling |
| Cabinet installation | with minimum 1 U vented front panel each above and below the device |
| Noise, weight | see model overview |
| Mains voltage | see model overview |
| Mains cable | length max. 3 m cross-section of mains leads min. 1 mm ² |
| Power consumption | see model overview |

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| Housing | |
| Dimensions | see model overview |
| Color front rear top | RAL7035 (light grey) stainless steel RAL7037 (dusty grey) |
| Safety and EMC | |
| Protection class | 1 |
| Measuring category | 0 (CAT I according to EN 61010:2004) |
| Electrical safety | DIN EN 61010-1 DIN EN 61010-2-030 |
| EMC | DIN EN 61326-1 DIN EN 55011 DIN EN 61000-3-2 DIN EN 61000-3-3 |

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| Standard interfaces | |
| Data interfaces | RS-232, USB, LAN, CAN |
| I/O port | standard (not isolated) |
| Available options | |
| Data interface SCL02 | GPIB |
| Hardware extensions SCL06 | galvanically isolated I/O port |
| Calibration, warranty | |
| FCC-SCLxx | Factory Calibration Certificate, twice for free ⁴⁾ |
| Recommended calibration interval | 2 years |
| Warranty | 2 years |

Technical data of production series A, rev. 2. Subject to technical changes without notice.

The specified accuracies refer to an ambient temperature of 23 ±5 °C. The specified accuracies are valid when the sense lines are connected and when the unit is connected to undisturbed voltages (ripple and noise < 0.1 %). At voltages with higher disturbance values the accuracy can change for the worse.

1. The applicable time or frequency range is limited by the rise/fall time of the respective model.
2. positive/negative DC voltage or RMS value of a sinusoidal AC voltage
3. only 0 ... 10 V
4. The second calibration is free of charge if the particular device has been registered with H&H: www.hoerchl-hackl.com/service/device-registration