

DECKBLATT ZUM ORIGINAL-DOKUMENT DES HERSTELLERS

# 15KW | DATENBLATT GERÄTE

**HERSTELLER** Delta Elektronik BV  
**PRODUKTSERIE** SM15k-Serie

Ihr direkter Ansprechpartner für Delta-Produkte!

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Kontaktieren Sie uns für technische Beratung oder ein individuelles Angebot!

Wir freuen uns auf das Gespräch mit Ihnen.



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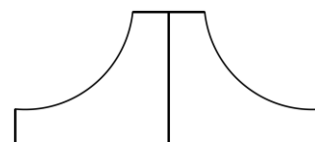
**Immer die passende Lösung für Industrie-  
Stromversorgungen, Heizfolien & Messtechnik**



## SM15K - Series 15kW DC POWER SUPPLIES

### Bi-Directional - Constant Power

| Models       | Voltage range | Current range |
|--------------|---------------|---------------|
| SM70-CP-450  | 0 – 70 V      | - 450 – 450 A |
| SM210-CP-150 | 0 – 210 V     | -150 – 150 A  |
| SM500-CP-90  | 0 – 500 V     | -90 – 90 A    |
| SM1000-CP-45 | 0 – 1000V     | -45 – 45 A    |
| SM1500-CP-30 | 0 – 1500 V    | -30 – 30 A    |



#### Features

- Bi-directional power supply, standard 15kW Source & Sink
- Flexible output with constant power characteristic
- Power regeneration technology: sink power is not dissipated but fed back into the grid
- Designed for long life at continuous full power
- Excellent dynamic response to load changes, digital controlled with the possibility to adapt to the type of load
- Very low heat dissipation, efficiency 95% or more
- Protected against all overload and short circuit conditions

#### Functionalities

- Operation on a wide range of three phase AC input voltages
- Standard ethernet & web interface
- EMC surpasses CE requirements: low emission & high immunity
- Low audible noise: temperature controlled cooling fans
- Durable digital encoders for voltage & current adjustment and menu operation
- Large user display, menu driven operations

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | SM70-CP-450                                                                                                                                                                                                                | SM210-CP-150                                                                                                                                                                                                       | SM500-CP-90                                                                                                                                                                                                                                | SM1000-CP-45                                                                                                                                                                                                      | SM1500-CP-30                                                                                                                                                                                                                               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Output rating</b><br>Voltage range<br>Current range                                                                                                                                                                                                                                                                                                                                                                                                               | 0 - 70 V<br>- 450 - 450 A                                                                                                                                                                                                  | 0 - 210 V<br>- 150 - 150 A                                                                                                                                                                                         | 0 - 500 V<br>- 90 - 90 A                                                                                                                                                                                                                   | 0 - 1000 V<br>- 45 - 45 A                                                                                                                                                                                         | 0 - 1500 V<br>- 30 - 30 A                                                                                                                                                                                                                  |
| <b>Regenerative mode</b><br>Minimum sink voltage<br><i>Note: Unit switches automatically between source ↔ sink.</i><br>Absolute maximum sink voltage<br>Minimum sink current                                                                                                                                                                                                                                                                                         | 1.2 V @ - 450 A<br>0.8 V @ - 215 A<br>0.8 V @ - 45 A<br>74 V<br>0.4%                                                                                                                                                       | 3.0 V @ - 150 A<br>1.5 V @ - 75 A<br>1.5 V @ - 15 A<br>220 V<br>0.4%                                                                                                                                               | 7.0 V @ - 90 A<br>5.0 V @ - 30 A<br>2.0 V @ - 10 A<br>525 V<br>0.4%                                                                                                                                                                        | 12.0 V @ - 45 A<br>8.5 V @ - 15 A<br>2.5 V @ - 5 A<br>1050 V<br>0.4%                                                                                                                                              | 19.5 V @ - 30 A<br>14 V @ - 10 A<br>4.5 V @ - 3 A<br>1575 V<br>0.4%                                                                                                                                                                        |
| <b>AC Input</b><br>Rated voltage range<br>Rated frequency<br>Rated current<br><br>Current, 15kW<br>Power factor, 15kW / 7.5kW<br><br>Internal fuses<br>Standby input power ( $V_o=I_o=0$ ) <sup>1</sup><br>Standby input power ( $V_o=V_{max}$ ) <sup>1</sup>                                                                                                                                                                                                        | 380 - 480 V<br>50 / 60 Hz<br>Maximum 27 A<br><br>23 A<br>0.996 / 0.988<br><br>30 AT<br>100 W<br>180 W                                                                                                                      |                                                                                                                                                                                                                    |                                                                                                                                                                                                                                            |                                                                                                                                                                                                                   |                                                                                                                                                                                                                                            |
| <b>Efficiency (Sink &amp; Source mode):</b><br>15 kW, $I_{out}=100\%$<br>15 kW, $U_{out}=100\%$                                                                                                                                                                                                                                                                                                                                                                      | 95 %<br>96 %                                                                                                                                                                                                               |                                                                                                                                                                                                                    |                                                                                                                                                                                                                                            |                                                                                                                                                                                                                   |                                                                                                                                                                                                                                            |
| <b>Regulation</b><br>Load 0 - 100% CV<br>Line 342 - 528 V <sub>AC</sub> <sup>2</sup> CV<br>Load 0 - 100% CC<br>Line 342 - 528 V <sub>AC</sub> <sup>1,3</sup> CC                                                                                                                                                                                                                                                                                                      | 6 mV<br>< 1 mV<br>35 mA<br>4 mA                                                                                                                                                                                            | 5 mV<br>< 1 mV<br>12 mA<br>3 mA                                                                                                                                                                                    | 4 mV<br>< 1 mV<br>8 mA<br>1 mA                                                                                                                                                                                                             | 10mV<br><1mV<br>2mA<br>1mA                                                                                                                                                                                        | 10 mV<br>< 1 mV<br>2 mA<br>1 mA                                                                                                                                                                                                            |
| <b>Ripple + noise</b> <sup>5</sup><br>Source mode:<br>rms (BW=300 kHz) CV<br>p-p (BW=20 MHz) CV<br><br>rms (BW=300 kHz) CC<br>p-p (BW=20 MHz) CC<br><br>rms (BW=300 kHz) CV<br>p-p (BW=20 MHz) CV<br><br>rms (BW=300 kHz) CC<br>p-p (BW=20 MHz) CC<br><br>Sink mode:<br>rms (BW=300 kHz) CV<br>p-p (BW=20 MHz) CV<br><br>rms (BW=300 kHz) CC<br>p-p (BW=20 MHz) CC<br><br>rms (BW=300 kHz) CV<br>p-p (BW=20 MHz) CV<br><br>rms (BW=300 kHz) CC<br>p-p (BW=20 MHz) CC | 33 V / 450 A<br>10 mV<br>60 mV<br><br>100 mA<br>-<br><br>70 V / 215 A<br>10 mV<br>60 mV<br><br>100 mA<br>-<br><br>33 V / 450 A<br>8 mV<br>50 mV<br><br>100 mA<br>-<br><br>70 V / 215 A<br>8 mV<br>50 mV<br><br>100 mA<br>- | 100 V / 150 A<br>30 mV<br>150 mV<br><br>-<br>-<br><br>210 V / 71.5 A<br>20 mV<br>125 mV<br><br>-<br>-<br><br>100 V / 150 A<br>30 mV<br>150 mV<br><br>-<br>-<br><br>210 V / 71.5 A<br>20 mV<br>125 mV<br><br>-<br>- | 167 V / 90 A<br>10 mV<br>55 mV<br><br>45 mA<br>200 mA<br><br>500 V / 30 A<br>25mV<br>115mV<br><br>45 mA<br>200 mA<br><br>167 V / 90 A<br>7 mV<br>35 mV<br><br>45 mA<br>200 mA<br><br>500 V / 30 A<br>10 mV<br>50 mV<br><br>90 mA<br>320 mA | 333V / 45A<br>25mV<br>150mV<br><br>45mA<br>200mA<br><br>1000V / 15A<br>35mV<br>250mV<br><br>45mA<br>200mA<br><br>333V / 45A<br>15mV<br>75mV<br><br>60mA<br>-<br><br>1000V / 15A<br>25mV<br>125mV<br><br>60mA<br>- | 500 V / 30 A<br>25 mV<br>150 mV<br><br>12 mA<br>70 mA<br><br>1500 V / 10 A<br>35mV<br>250mV<br><br>5 mA<br>25 mA<br><br>500 V / 30 A<br>15 mV<br>130 mV<br><br>10 mA<br>60 mA<br><br>1500 V / 10 A<br>25 mV<br>200 mV<br><br>3 mA<br>12 mA |
| <b>Programming &amp; monitoring accuracy</b> <sup>4</sup><br>Voltage<br>Current                                                                                                                                                                                                                                                                                                                                                                                      | ± 0.08%<br>± 0.15%                                                                                                                                                                                                         |                                                                                                                                                                                                                    |                                                                                                                                                                                                                                            |                                                                                                                                                                                                                   |                                                                                                                                                                                                                                            |
| <b>Temperature coefficient, per °C</b> <sup>1,5</sup><br>CV<br>CC                                                                                                                                                                                                                                                                                                                                                                                                    | 20 ppm<br>50 ppm                                                                                                                                                                                                           |                                                                                                                                                                                                                    |                                                                                                                                                                                                                                            |                                                                                                                                                                                                                   |                                                                                                                                                                                                                                            |
| <b>Stability over 8 hours</b> <sup>1,5</sup><br>25 ± 1 °C<br>CV<br>CC <sup>3</sup>                                                                                                                                                                                                                                                                                                                                                                                   | 50 ppm<br>80 ppm                                                                                                                                                                                                           |                                                                                                                                                                                                                    |                                                                                                                                                                                                                                            |                                                                                                                                                                                                                   |                                                                                                                                                                                                                                            |

<sup>1</sup> After 1 hour warm up<sup>2</sup> Remote voltage sense<sup>3</sup> Local voltage sense<sup>4</sup> Excluding INT MOD ANA<sup>5</sup> Measured at full load

|                                                                                                                                                                                                                                                                                                                                                | SM70-CP-450                                                                                                                                                                          | SM210-CP-150                                                                                                                               | SM500-CP-90                                                                                                                                | SM1000-CP-45                                                                                                                                 | SM1500-CP-30                                                                                                                                 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Programming speed</b> <sup>6, 7</sup><br><b>Rise time (10 - 90%)</b><br>Output voltage step<br>Load = 15 kW<br>Load = 1500 W<br><br>Output voltage step<br>Load = 15 kW<br>Load = 1500 W<br><b>Fall time (90 - 10%)</b><br>Output voltage step<br>Load = 15 kW<br>Load = 1500 W<br><br>Output voltage step<br>Load = 15 kW<br>Load = 1500 W | 0 → 33 V<br>2.2 ms<br>1.5 ms<br><br>0 → 70 V<br>5.5 ms<br>3.5 ms<br><br>33 → 0 V<br>1.5 ms<br>1.5 ms<br><br>70 → 0 V<br>2.6 ms<br>3.5 ms                                             | 0 → 100 V<br>1.6 ms<br>1.3 ms<br><br>0 → 210 V<br>3 ms<br>2.7 ms<br><br>100 → 0 V<br>1.3 ms<br>1.3 ms<br><br>210 → 0 V<br>2.5 ms<br>2.5 ms | 0 → 167 V<br>1.5 ms<br>1 ms<br><br>0 → 500 V<br>4.5 ms<br>3.5 ms<br><br>167 → 0 V<br>0.8 ms<br>0.9 ms<br><br>500 → 0 V<br>2.5 ms<br>3.5 ms | 0 → 333 V<br>1.5 ms<br>1 ms<br><br>0 → 1000 V<br>4.5 ms<br>3.5 ms<br><br>333 → 0 V<br>0.9 ms<br>1.0 ms<br><br>1000 → 0 V<br>2.8 ms<br>3.5 ms | 0 → 500 V<br>1.5 ms<br>1 ms<br><br>0 → 1500 V<br>4.5 ms<br>3.5 ms<br><br>500 → 0 V<br>0.8 ms<br>0.9 ms<br><br>1500 → 0 V<br>2.8 ms<br>3.5 ms |
| <b>Recovery time</b> <sup>8, 9</sup><br>Condition<br>Recovery within<br>di/dt of load step<br>Time<br>Maximum deviation<br><br>Condition<br>Recovery within<br>di/dt of load step<br>Time<br>Maximum deviation                                                                                                                                 | 33V, 225 → 450A<br>100 mV<br>5 A/μs<br>100 μs<br>0.8 V<br><br>70V, 112 → 215A<br>100 mV<br>2 A/μs<br>100 μs<br>0.3 V                                                                 | 100V, 75 → 150A<br>500 mV<br>2.4 A/μs<br>100 μs<br>1.4 V<br><br>210V, 36 → 72A<br>250 mV<br>1.15 A/μs<br>100 μs<br>0.75 V                  | 167V, 45 → 90A<br>750 mV<br>0.8 A/μs<br>100 μs<br>2.8 V<br><br>500V, 15 → 30A<br>500 mV<br>0.25 A/μs<br>150 μs<br>1.2 V                    | 333V, 22.5 → 45A<br>2.5 V<br>0.4 A/μs<br>100 μs<br>9.0 V<br><br>1000V, 7.5 → 15A<br>1 V<br>0.15 A/μs<br>150 μs<br>3.0 V                      | 500V, 15 → 30A<br>2.8 V<br>0.25 A/μs<br>100 μs<br>9.0 V<br><br>1500V, 5 → 10A<br>1.2 V<br>0.085 A/μs<br>150 μs<br>3.5 V                      |
| <b>DC output capacitance</b><br>X-capacitors (typical)<br>Y-capacitors (typical)                                                                                                                                                                                                                                                               | 22000 μF<br>950 nF                                                                                                                                                                   | 1170 μF<br>950 nF                                                                                                                          | 560 μF<br>145 nF                                                                                                                           | 141 μF<br>145 nF                                                                                                                             | 58 μF<br>145 nF                                                                                                                              |
| <b>Output impedance</b> <sup>10</sup><br>0-1 kHz<br>1-100 kHz<br><b>CV</b><br><b>CV</b>                                                                                                                                                                                                                                                        | < 0.75 mΩ<br>< 40 mΩ                                                                                                                                                                 | < 5 mΩ<br>< 40 mΩ                                                                                                                          | < 16 mΩ<br>< 160 mΩ                                                                                                                        | < 150 mΩ<br>< 800 mΩ                                                                                                                         | < 250 mΩ<br>< 2 Ω                                                                                                                            |
| <b>Pulsating load</b><br>Max. tolerable AC component<br>of load current<br>f > 1 kHz<br>f < 1 kHz                                                                                                                                                                                                                                              | 60 A <sub>RMS</sub><br>450 A <sub>pk</sub>                                                                                                                                           | 15 A <sub>RMS</sub><br>150 A <sub>pk</sub>                                                                                                 | 15 A <sub>RMS</sub><br>90 A <sub>pk</sub>                                                                                                  | 3 A <sub>RMS</sub><br>45 A <sub>pk</sub>                                                                                                     | 2.5 A <sub>RMS</sub><br>30 A <sub>pk</sub>                                                                                                   |
| <b>Hold-up time</b><br>V <sub>out</sub> = 100%, P <sub>out</sub> = 15 kW<br>I <sub>out</sub> = 100%, P <sub>out</sub> = 15 kW<br>V <sub>out</sub> = 100%, P <sub>out</sub> = 7.5 kW                                                                                                                                                            | 10 ms<br>10 ms<br>25 ms                                                                                                                                                              | 10 ms<br>10 ms<br>20 ms                                                                                                                    | 15 ms<br>15 ms<br>35 ms                                                                                                                    | 15 ms<br>15 ms<br>35 ms                                                                                                                      | 15 ms<br>15 ms<br>35 ms                                                                                                                      |
| <b>Turn on delay</b> <sup>11</sup>                                                                                                                                                                                                                                                                                                             | 2.5 s after mains switch is turned on, the rated output voltage is reached                                                                                                           |                                                                                                                                            |                                                                                                                                            |                                                                                                                                              |                                                                                                                                              |
| <b>Inrush current</b> <sup>10</sup>                                                                                                                                                                                                                                                                                                            | 23 A                                                                                                                                                                                 |                                                                                                                                            |                                                                                                                                            |                                                                                                                                              |                                                                                                                                              |
| <b>Safety standards</b>                                                                                                                                                                                                                                                                                                                        | EN 60950 / EN 61010                                                                                                                                                                  |                                                                                                                                            |                                                                                                                                            |                                                                                                                                              |                                                                                                                                              |
| <b>Insulation</b><br>AC / DC terminals<br>Creepage / clearance<br>AC power terminals / case<br>DC power terminals / case                                                                                                                                                                                                                       | 3750V <sub>RMS</sub> (1 min.)<br>8 mm<br>2500 V <sub>RMS</sub><br>1000 V <sub>DC</sub> <sup>12</sup>                                                                                 |                                                                                                                                            |                                                                                                                                            |                                                                                                                                              | 3750 V <sub>RMS</sub> (1 min.)<br>8 mm<br>2500 V <sub>RMS</sub><br>1500 V <sub>DC</sub> <sup>12</sup>                                        |
| <b>EMC</b><br>Emission<br>Immunity                                                                                                                                                                                                                                                                                                             | <b>EN 61326-1</b> , class B equipment(for use in domestic establishments)<br><b>EN 61326-1</b> , equipment for use in industrial and domestic establishments                         |                                                                                                                                            |                                                                                                                                            |                                                                                                                                              |                                                                                                                                              |
| <b>Environmental conditions</b><br>Storage temperature<br>Operating temperature<br>Output automatically disabled at<br>overttemperature<br>Humidity<br><br>IP Rating<br>Pollution degree                                                                                                                                                       | - 40 to + 70 °C<br>- 20 to + 50 °C, Derate output to 75% at 60 °C<br><br>Maximum 95% RH, non condensing, up to 40 °C<br>Maximum 75% RH, non condensing, up to 50 °C<br><br>IP20<br>2 |                                                                                                                                            |                                                                                                                                            |                                                                                                                                              |                                                                                                                                              |
| <b>MTBF</b>                                                                                                                                                                                                                                                                                                                                    | 500 000 hrs                                                                                                                                                                          |                                                                                                                                            |                                                                                                                                            |                                                                                                                                              |                                                                                                                                              |

<sup>6</sup> Measured on resistive load with power supply in CV mode, different conditions may influence the specified speed

<sup>7</sup> Signal latency depends on the interface used & data traffic

<sup>8</sup> Local voltage sense

<sup>9</sup> Remote sensing and long wiring may influence the values

<sup>10</sup> Typical

<sup>11</sup> Unit should be configured to switch on the output at startup

<sup>12</sup> See "Safety Instructions"

|                                                                                                                                    | SM70-CP-450                                                                                                                                                                                                                                                                                                               | SM210-CP-150                                                                    | SM500-CP-90                                                                   | SM1000-CP-45                                                                 | SM1500-CP-30                                                                  |
|------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|-------------------------------------------------------------------------------|------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| <b>Series operation</b><br>Maximum total voltage<br>Master / slave operation                                                       | Series operation not allowed                                                                                                                                                                                                                                                                                              |                                                                                 | 750V <sup>13</sup><br>1000V <sup>14</sup><br>Maximum 6 units <sup>15</sup>    | Series operation not allowed                                                 |                                                                               |
|                                                                                                                                    |                                                                                                                                                                                                                                                                                                                           |                                                                                 |                                                                               |                                                                              |                                                                               |
| <b>Parallel operation</b><br>Master / slave operation                                                                              | Maximum 60 units                                                                                                                                                                                                                                                                                                          |                                                                                 |                                                                               |                                                                              |                                                                               |
| <b>Remote sensing</b><br>Maximum voltage drop per load lead                                                                        | Default 1 V, can be set to 10 V                                                                                                                                                                                                                                                                                           |                                                                                 |                                                                               |                                                                              |                                                                               |
| <b>Limits</b><br>Adjustable<br>Voltage<br>Current<br>Power<br><br>Fixed<br>Voltage OverLoad level<br>Voltage Self-Protection level | 0 - 101 %<br>0 - 101 %<br>0 - 101 %<br><br>102.5 % - unit will continue to operate (OL-indication in display)<br>105 % - output is automatically disabled (PROT-indication in display)                                                                                                                                    |                                                                                 |                                                                               |                                                                              |                                                                               |
| <b>Potentiometers</b><br>Front panel control knob resolution                                                                       | 15 bits                                                                                                                                                                                                                                                                                                                   |                                                                                 |                                                                               |                                                                              |                                                                               |
| <b>Meter scale</b><br>Voltage<br>Current<br>Power<br>Accuracy read output                                                          | 4 digit<br>0.00 - 70.00V<br>-450.0 - 450.0A<br>-15000 - 15000W<br>0.2% + 2 digit                                                                                                                                                                                                                                          | 4 digit<br>0.0 - 210.0V<br>-150.0 - 150.0A<br>-15000 - 15000W<br>0.2% + 2 digit | 4 digit<br>0.0 - 500.0V<br>-90.0 - 90.0A<br>-15000 - 15000W<br>0.2% + 2 digit | 4 digit<br>0 - 1000V<br>-45.00 - 45.00A<br>-15000 - 15000W<br>0.2% + 2 digit | 4 digit<br>0 - 1500V<br>- 30.00 - 30.00A<br>-15000 - 15000W<br>0.2% + 2 digit |
| <b>Mounting</b>                                                                                                                    | Stacking of units allowed                                                                                                                                                                                                                                                                                                 |                                                                                 |                                                                               |                                                                              |                                                                               |
| <b>AC terminals</b> (CON A)                                                                                                        | Screw terminals for wire 4 mm <sup>2</sup> , 3 phase + earth (no neutral)                                                                                                                                                                                                                                                 |                                                                                 |                                                                               |                                                                              |                                                                               |
| <b>DC terminals</b> (CON B1 & B2)                                                                                                  | M12 bolts                                                                                                                                                                                                                                                                                                                 | M8 bolts                                                                        |                                                                               |                                                                              |                                                                               |
| <b>Programming connectors</b> (LAN)                                                                                                | Standard with RJ45-connector for Ethernet at rear panel, 100 Mb/s, full-duplex                                                                                                                                                                                                                                            |                                                                                 |                                                                               |                                                                              |                                                                               |
| <b>Interlock</b> (CON F)                                                                                                           | Input for contact at rear panel                                                                                                                                                                                                                                                                                           |                                                                                 |                                                                               |                                                                              |                                                                               |
| <b>Cooling</b><br>Audio noise level<br><br>Airflow direction<br>Thermal protection                                                 | Low noise, fan speed adapts to temperature of internal system<br>ca. 50 dBA at full load, 25 °C ambient temperature, 1 m distance<br>ca. 65 dBA at full load, 50 °C ambient temperature, 1 m distance<br>From left to right<br>Output shuts down in case of insufficient cooling (over temperature indication in display) |                                                                                 |                                                                               |                                                                              |                                                                               |
| <b>Dimensions</b><br>Front panel: h x w<br>behind front panel: h x w x d                                                           | 132 x 483 mm (19", 3 U)<br>128 x 448 x 591 mm (excluding feet)<br>No additional depth is required with optional interfaces assembled                                                                                                                                                                                      |                                                                                 |                                                                               |                                                                              |                                                                               |
| <b>Weight</b>                                                                                                                      | 27 kg                                                                                                                                                                                                                                                                                                                     |                                                                                 |                                                                               |                                                                              |                                                                               |

CV = Constant Voltage

CC = Constant Current

CP = Constant Power

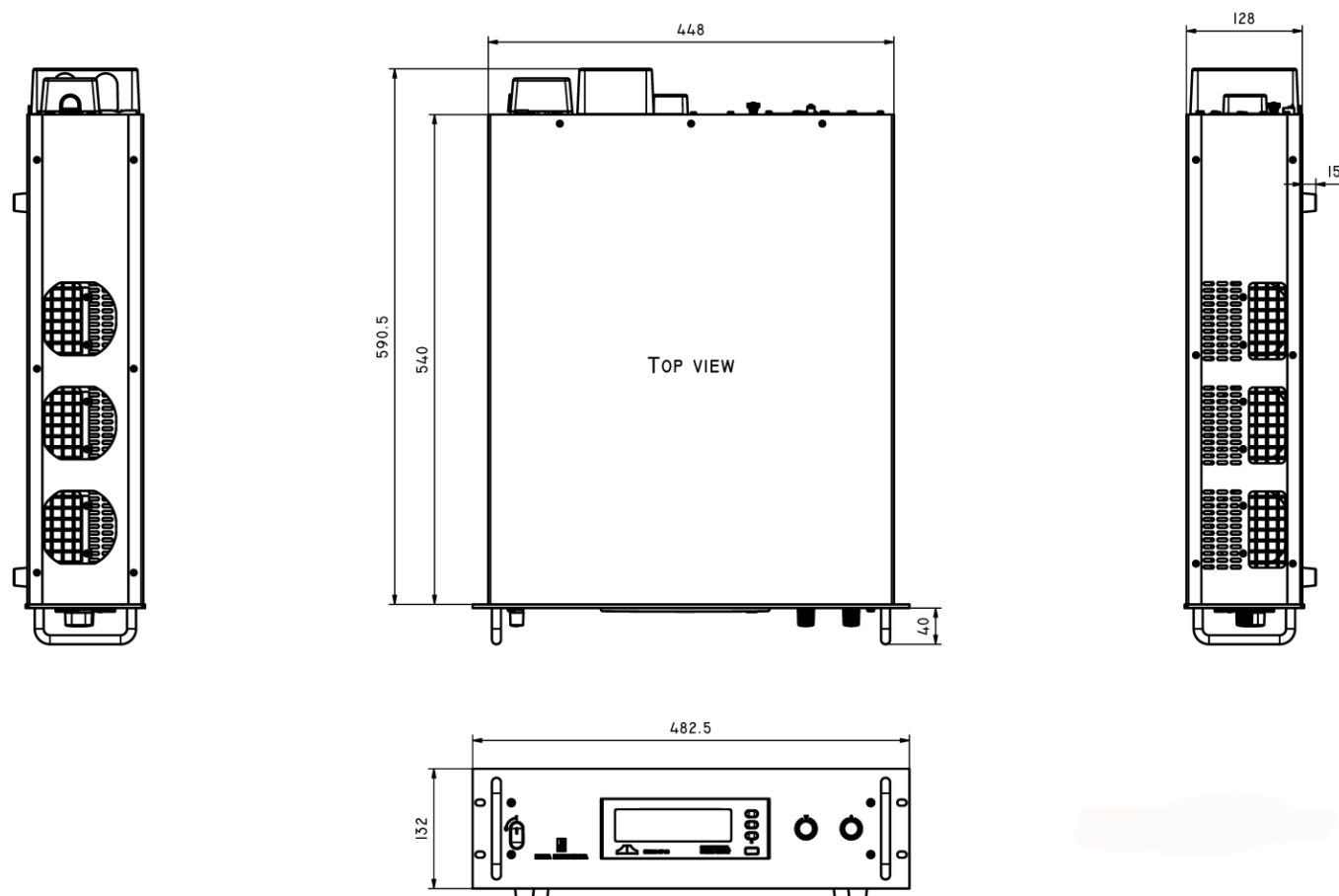
Specifications measured at  $T_{amb} = 25 \pm 5 \text{ }^{\circ}\text{C}$  and  $V_{in} = 400 \text{ V}_{AC}$ , 3 phase, 50 Hz unless otherwise noted. The information in this document is subject to change without notice.

<sup>13</sup> Units delivered before Q4 / 2018. Contact factory for upgrading to enable 1000V series operation for older units.

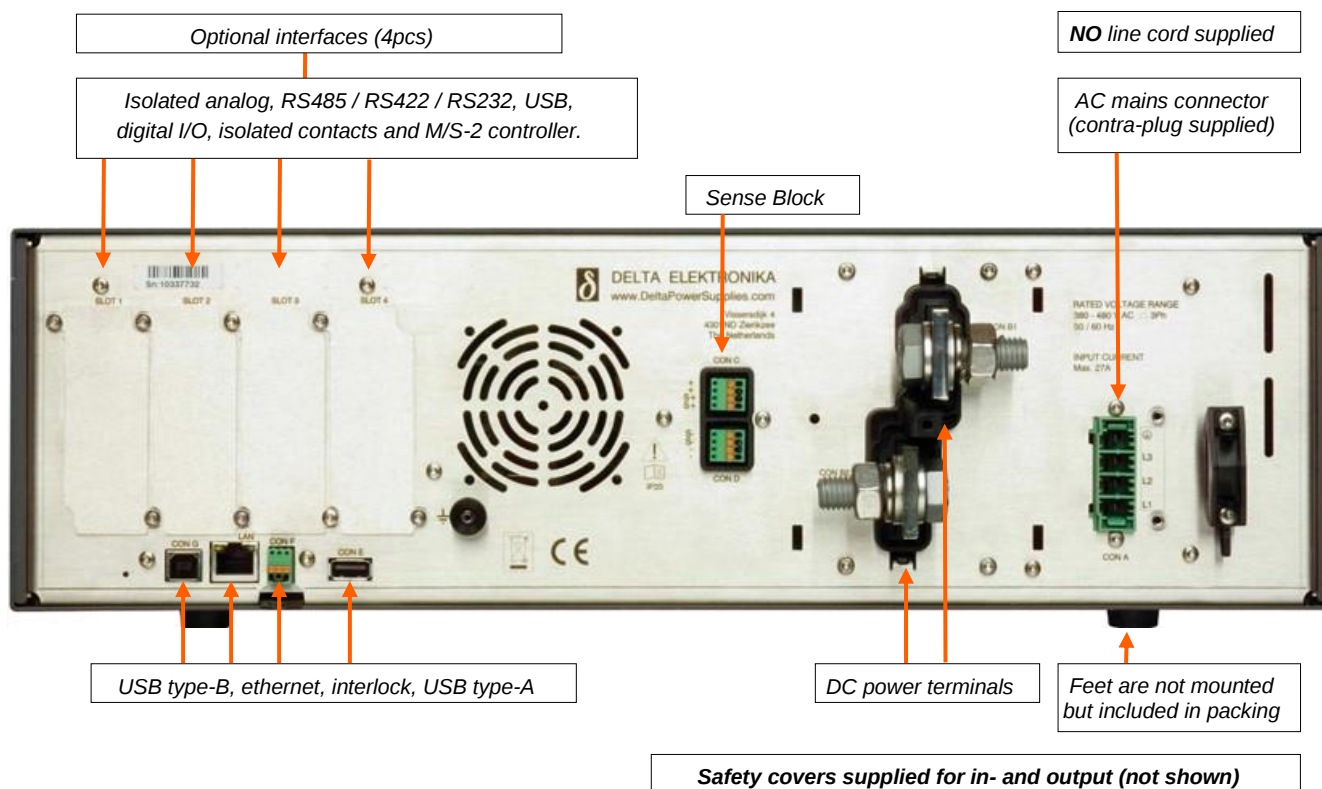
<sup>14</sup> Units delivered in Q4 / 2018 or later.

<sup>15</sup> See "Safety Instructions"

## Dimensions



## Rear view



## Typical Applications

- Solar inverter testing, PV-Simulation
- Automotive battery simulations
- Driving PWM-Controlled DC motors
- Car testing systems
- Controlled battery (dis)charging
- Accurate current sources
- ATE in industrial production lines
- Lasers
- Aerospace and military equipment
- Plasma chambers
- Sustainable energy

## Standard Features



### Bi-Directional Two-Quadrant Output

Full power Bi-Directional two quadrant operation maintains the DC output voltage constant whether the output power is positive or negative. Ideal for PWM-speed controlled DC-Motors and ATE systems.



### Digital CV-, CC- and CP-Settings

Reliable, long-life digital encoders are mounted at the front panel. Includes total front panel lock (also for CV- / CC-knobs) and a coarse or fine pitch adjustment depending on the turning speed.



### High Voltage Isolation

A high DC output isolation allows floating operation up to 1000 V for SM70-CP-450, SM210-CP-150, SM500-CP-90 and SM1000-CP-45 and up to 1500 V for SM1500-CP-30.



### Sequencer

Arbitrary Waveform generator or standalone automation.



### Ethernet Interface

Ethernet interface for programming and monitoring



### USB-Input

Not yet available: USB-Input for exchange of settings or for controlling the unit.

## Options



### Software control and Interfaces

Field installable interfaces:

- Master / Slave controller
- Isolated Contacts
- Serial controller with multiple protocols: RS 232, RS 485, RS 422 and USB (Device)
- Digital I/O
- Isolated Analog Programming

Order Codes:

- INT MOD M/S-2
- INT MOD CON
- INT MOD SER
- INT MOD DIG
- INT MOD ANA