DELTA ELEKTRONIKA BV

P.O. BOX 27
4300 AA ZIERIKZEE
NETHERLANDS
TEL. +31 111 413656
FAX +31 111 416919
www.DeltaPowerSupplies.com

SM 3000 with Power Sink Option

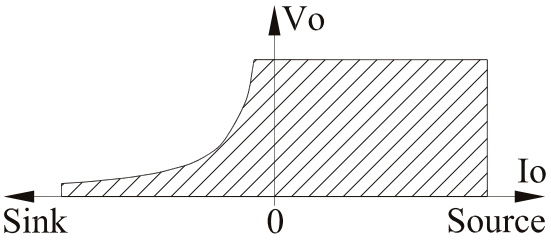
2 Quadrant operation: Source and Sink

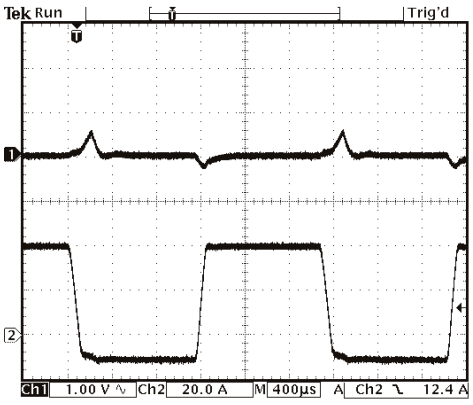
order codes: **SM 15-200 D - P127**
SM 30-100 D - P128
SM 45-70 D - P129
SM 70-45 D - P130

SM30-100D - P128

The Power Sink option permits the power supply to absorb bursts of power fed back to the unit. An internal module senses the status of power supply and sinks current across the output terminals, thus maintaining a constant output voltage.
The Power Sink Option allows a faster response when the power supply is step programmed to a lower voltage at small load conditions.

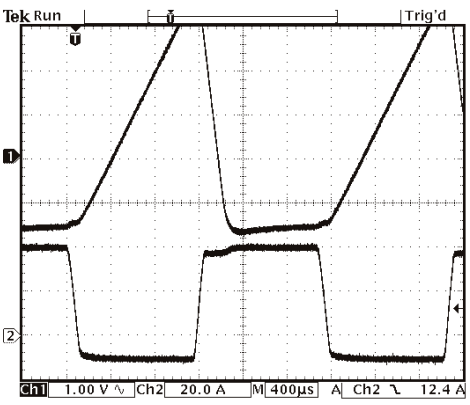
- Can absorb 300 W peak power
- Maintains output voltage setting regardless output power is positive or negative (source and sink)
- Ideal solution for supplying electric motors with PWM-speed control. These systems often return power to the power supply during a braking action
- Ideal solution for ATE systems requiring fast down programming at no load conditions
- Generation Automotive waveforms (fast)





SM45-70D **with** Power Sink Option
Current –10 A means the load delivers 10 A to the power supply (sink operation)

Upper trace: output voltage
Lower trace: output current
(current switching from +40 A to –10 A at Vo=15 V)

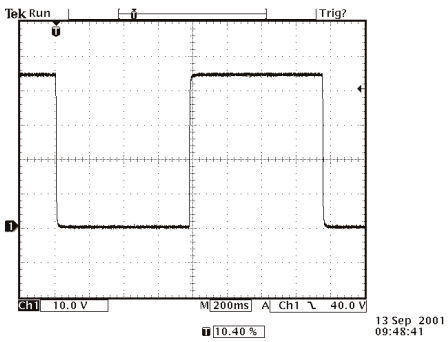


SM45-70D **without** Power Sink Option
*The output voltage is out of control when the output current is **negative***

Upper trace: output voltage
Lower trace: output current
(current switching from +40 A to –10 A at Vo=15 V)

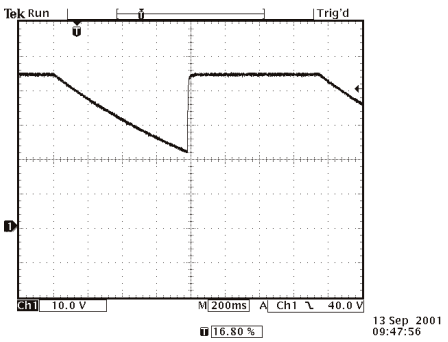
Power Sink Specifications	SM15-200D *option P127*	SM30-100D *option P128*	SM45-70D *option P129*	SM70-45D *option P130*
Sink Power Rating max. peak power (electronically limited) max. continuous power ($T_{amb.}$ = 25 °C) max. continuous power ($T_{amb.}$ = 50 °C)	300 W 30 W 15 W			
Max. duration Sink Peak Power P_{sink} = 300 W, $T_{amb.}$ = 25 °C	max. t_{on} = 60 s, following t_{off} = 1200 s (for cooling down)			
Duty Cycle for use at Peak Power P_{sink} = 300 W, $T_{amb.}$ = 25 °C P_{sink} <= 300 W, t_{on} <= 15 s t_{on} = time, power dissipation is > 0 W t_{off} = time, power dissipation is 0 W $P_{av} = P_{peak} * t_{on} / (t_{off} + t_{on})$	t_{on} <= 15 s / t_{off} >= 150 s average power <= 30 W			
Max. Sink Current (V_o >= 2 V and P <= 300 W)	Limited at 70 A			Limited at 45 A
Protection	Electronic Power Limit (300 W) limits the current. Sink circuit shuts down in case of thermal overload			
Recovery time / Deviation Vo = 6 V, I_o: +80 A → –20 A recovery within 100 mV / deviation: Vo = 15 V, I_o: +40 A → –10 A recovery within 100 mV / deviation: Vo = 24 V, I_o: +20 A → –6 A recovery within 100 mV / deviation: Vo = 42 V, I_o: +20 A → –3.5 A recovery within 100 mV / deviation: Vo = 60 V, I_o: +10 A → –2.5 A recovery within 100 mV / deviation: (*load current switches from positive to negative)*	di/dt = –1.5 A/µs 200 µs / 0.30 V di/dt = –1.0 A/µs 500 µs / 0.15 V - - - - - - *note: values are typical*	di/dt = –1.5 A/µs 300 µs / 0.60 V di/dt = –0.9 A/µs 350 µs / 0.30 V di/dt = –0.5 A/µs 500 µs / 0.30 V - - - - *note: values are typical*	- - di/dt = –0.9 A/µs 200 µs / 0.45 V di/dt = –0.6 A/µs 200 µs / 0.40 V di/dt = –0.6 A/µs 500 µs / 0.45 V - - *note: values are typical*	- - di/dt = –0.9 A/µs 200 µs / 0.75 V di/dt = –0.6 A/µs 200 µs / 0.45 V di/dt = –0.6 A/µs 480 µs / 0.45 V di/dt = –0.3 A/µs 1.0 ms / 0.50 V *note: values are typical*
Programming Down Speed Fall time at **no load** (90 - 10%) *(also see figures below)* Fall time at no load *without Power Sink*	(15 → 0 V) 6 ms 6 s	(30 → 0 V) 10 ms 8 s	(45 → 0 V) 6 ms 2 s	(70 → 0 V) 10 ms 5 s
Parallel and Series operation Refer to power sink manual for details and restrictions.	Using multiple units in parallel operation, only one unit can have a power sink. Using multiple units in series operation, all units must have a power sink.			

Notes:
- *The maximum sink current at higher voltages will not be the maximum specified current due to the power limit. For example at 30 V the maximum sink current will only be 10 A (30 V x 10 A = 300 W = maximum power).*
- *A higher sink current than the maximum current will cause the output voltage to rise.*



SM45-70D **with** Power Sink Option
fast discharge of output capacitors by the power sink circuit

trace: output voltage
Voltage Programming Speed at NO LOAD



SM45-70D **without** Power Sink Option
slow response time during voltage step down, time needed to discharge the output capacitors

trace: output voltage
Voltage Programming Speed at NO LOAD