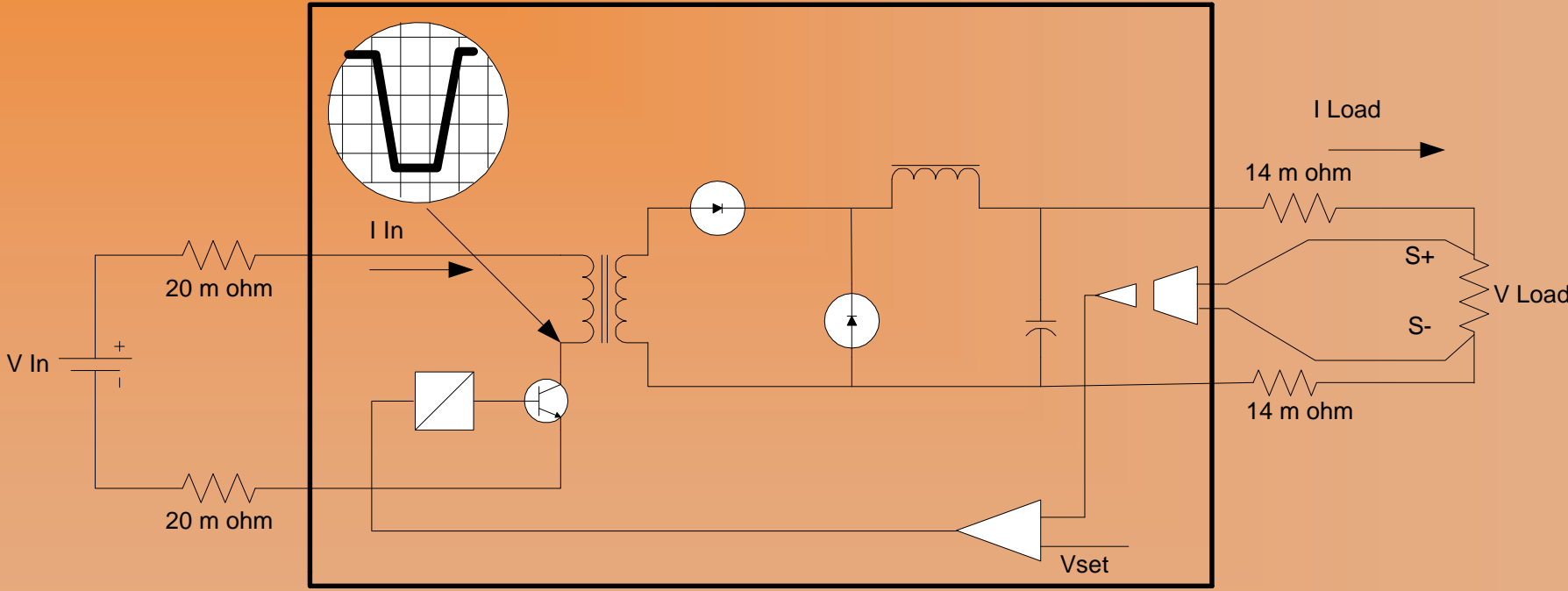


Magnetic field test setup



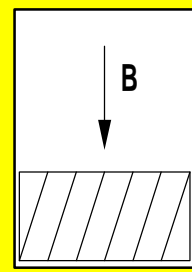
- Magnet: MNP24-1 at CERN Bldg. 168
- B: up to 10 kGauss
- Electronic load: Powertronic Mod. 2-9721 80 V 50 A
- Power supply Delta Elektronik SM7020 70 V 20 A
- Oscilloscope Tektronix 3032

DC-DC converter simplified model



Results (I)

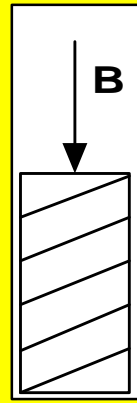
| B (KG) | I Load (A) | tf (ns) | tr (ns) | V in | V Load | I In (A) | P Loss (W) | Conv Effic | Tot Effic |
|--------|------------|---------|---------|------|--------|----------|------------|------------|-----------|
| 0 | 15 | 30 | 40 | 48 | 4 | 1.90 | 6.44 | 0.73 | 0.66 |
| 1 | 15 | 30 | 40 | 48 | 4 | 1.9 | 6.44 | 0.73 | 0.66 |
| 2 | 15 | 30 | 30 | 48 | 4 | 1.9 | 6.44 | 0.73 | 0.66 |
| 3 | 15 | 20 | 30 | 48 | 4 | 1.9 | 6.44 | 0.73 | 0.66 |
| 4 | 15 | 20 | 30 | 48 | 4 | 1.9 | 6.44 | 0.73 | 0.66 |
| 5 | 15 | 20 | 30 | 48 | 4 | 1.9 | 6.44 | 0.73 | 0.66 |
| 8 | 15 | 20 | 30 | 48 | 4 | 1.95 | 6.45 | 0.71 | 0.64 |



- B field \wedge to toroid plane
- Low power (I load: 15 A)
- B up to 8 kG
- No significant efficiency loss (as expected)

Results (II)

| B (KG) | I Load (A) | tf (ns) | tr (ns) | V in | V Load | I In (A) | P Loss (W) | Conv Effic | Tot Effic |
|--------|------------|---------|---------|------|--------|----------|------------|------------|-----------|
| 1 | 15 | 20 | 30 | 48 | 4 | 1.9 | 6.44 | 0.73 | 0.66 |
| 2 | 15 | 20 | 30 | 48 | 4 | 1.9 | 6.44 | 0.73 | 0.66 |
| 3 | 15 | 20 | 30 | 48 | 4 | 1.9 | 6.44 | 0.73 | 0.66 |
| 4 | 15 | 10 | 30 | 48 | 4 | 1.95 | 6.45 | 0.71 | 0.64 |
| 5 | 15 | 10 | 30 | 48 | 4 | 1.98 | 6.46 | 0.70 | 0.63 |
| 6 | 15 | 10 | 30 | 48 | 4 | 2 | 6.46 | 0.69 | 0.63 |
| 7 | 15 | 10 | 30 | 48 | 4 | 2.01 | 6.46 | 0.69 | 0.62 |
| 8 | 15 | 10 | 30 | 48 | 4 | 2.01 | 6.46 | 0.69 | 0.62 |

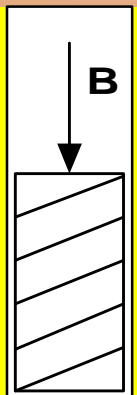


Worst case

- B field // to toroid plane
- Low power (I load: 15 A)
- B up to 8 kG
- Efficiency loss due to B : 5%

Results (III)

| B (KG) | I Load (A) | tf (ns) | tr (ns) | V in | V Load | I In (A) | P Loss (W) | Conv Effic | Tot Effic |
|--------|------------|---------|---------|------|--------|----------|------------|------------|-----------|
| 0 | 40 | 10 | 30 | 48 | 4 | 6 | 46.24 | 0.71 | 0.56 |
| 5 | 40 | 10 | 30 | 48 | 4 | 6 | 46.24 | 0.71 | 0.56 |
| 5 | 36 | 10 | 30 | 48 | 4 | 5.7 | 37.59 | 0.66 | 0.53 |
| 10 | 36 | 10 | 30 | 48 | 4 | 6 | 37.73 | 0.63 | 0.50 |



Worst case

- B field // to toroid plane
- High power (I load: up to 40 A)
- B up to 10 kG
- Efficiency loss due to B : 11%