

PRESENTATION :

This mini buck regulator, with multiple current and voltage configurations, is housed in an all-aluminum case and molded in a resin that homogenizes its internal temperature and makes it insensitive to humidity (IP67), dust, shocks and vibrations. It delivers:

- an available power of **152W under 4V** up to **640W under 40V**
- a current of 38A to 16A, as the output voltage increases from 4V to 40V

To optimize the performances of this mini controller (efficiency up to 98%), please see the table below; it directly determines the most suitable operating modes:

- output current " $i_{out\ max}$ " according to chosen " V_{out} "
- (extrapolated) knowledge of efficiencies according to " i_{out} " and " V_{out} "

INPUT VOLTAGE V_{in} : any voltage, from 17V to 60V, necessarily a few volts higher than the chosen output

OUTPUT VOLTAGE V_{out} and possible choices:

- either adjustable from 4 to 40V with inbuilt trimmer "10 rounds" Ø 3mm (photo ①)
- or controllable by 1V to 10V, from 4V to 40V; ex: 6V → 24V (photo ②)
- or adjustable from 4 to 40V by external resistor of 20kΩ to 1.46kΩ (photo ③)
- or factory-set fixed value, previously chosen (photo ④)

OUTPUT CURRENT i_{out} :

- 0 to 38A, according to the load and optimizations of the table, for $V_{out} \geq 4V$
- examples of *maximum* permitted currents for $V_{out} = 24V$:
 - ♦ $i_{out\ max} = 25A$ for V_{in} minimized at 28V; efficiency = 97%
 - ♦ $i_{out\ max} = 21A$ for V_{in} fixed at 44V; efficiency = 96%
 - ♦ $i_{out\ max} = 17A$ for V_{in} increased at 60V; efficiency = 95%
- adjustable from 3.8A to 38A with inbuilt trimmer having axis Ø 3mm (photo ①)
- or controllable by 1 to 10V, from 3.8 to 38A; ex: 5V → 19A (photo ②)
- or linearly adjustable (1A/Ω) from 3.8 to 38A, with ext R of 3.8 to 38Ω (photo ③)
- or factory-set on a fixed value (ex: 35A), for V_{out} fixed at 12V (photo ④)

NB: stability, at constant current, better than 2%, V_{out} varying from 4V to $V_{out\ max}$

ISOLATION: no; $-V_{in}$ and $-V_{out}$ terminals are internally connected

LINE and LOAD RÉGULATIONS: better than 2%

RESIDUAL: < 0.5% of V_{out}

SWITCHING FREQUENCY: ≈ 650kHz

ON/OFF and remote regulation S+: options (photo ⑤)

THERMAL CHARACTERISTICS

- thermal resistance of the case: 6°C / W
- maximum case temperature: 100°C
- storage temperature: -50°C to +120°C
- suggested heatsink: black alu, 200 x 200 x 3mm (thermal R ≈ 1°C/W)

CASE

- all aluminum: 50.5 x 50.5 x 26 mm (see photo ④)
- weight: 160g
- fastening: 2 unthreaded through-holes Ø 4.2mm, and 2 M4 blind holes on support side, center-to-center distances: 40.5 x 40.5 mm

SCREW TERMINAL BLOCK

- for "power" connections: *special*, 4 connections 33mm²
- additive connections: 4 or 5 connections for wires Ø ≤ 1.8mm

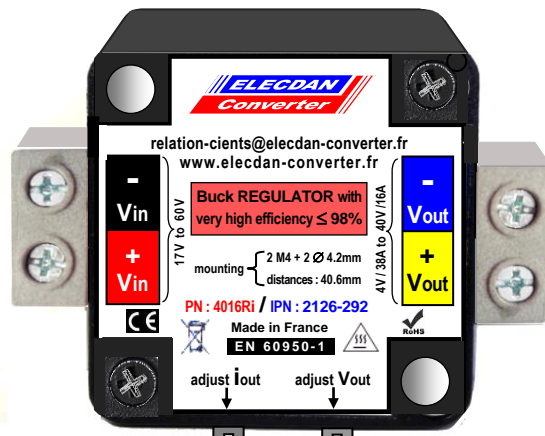
STANDARDS and SPECIFICATIONS

- CSA / 60950-1 / RoHS
- MTBF > 1,500,000 hours, at full load, base at 45°C

Scale: 1 - Dimensions in mm (thickness: 25)

Version ①: inbuilt i_{out} and V_{out} settings

SKU: 4016Ri



Version ②: i_{out} and V_{out} settings by "1 to 10V" control

SKU: 4016RP



SKU	Version	Settings		Unit price VAT excl. (€)
		I _{out} 3.8 to 38A	V _{out} 4 to 40V	
4016Ri	①	inbuilt	inbuilt	
4016RP	②	1V to 10V	1V to 10V	
4016RR	③	3.8 to 38Ω	20kΩ to 460Ω	
4016RC...	④	factory setting	factory setting	
ON or S+	⑤	option to be specified when ordering		
V _{in} : 17 to 60V ; V _{in} ≥ V _{out} + 3V				
Please contact us for quantity prices				

6 examples of output voltages V_{out} , extreme or characteristic, and linear optimization of i_{out} currents and efficiencies, according to the Δ difference " $V_{in\ max} - V_{in\ min}$ "

Efficiency →		92 to 87%	97 to 94%	98 to 95%	98 to 96%		
Output	Vout voltage	4V	12V	15V	24V	30V	40V
	Possible external adjustment by R	20kΩ	1.9kΩ	1.43kΩ	0.81kΩ	0.63kΩ	0.46kΩ
	i_{out} current	38 to 30A	35 to 20A	32 to 18A	26 to 18A	21 to 20A	16A
	Maximum power	190W	420W	480W	624W	630W	640W
Input voltage $V_{in\ min}$ and \max →		17 to 50V	17 to 60V	18 to 60V	27 to 60V	33 to 60V	44 to 60V

Some applications of this Mini-Regulator

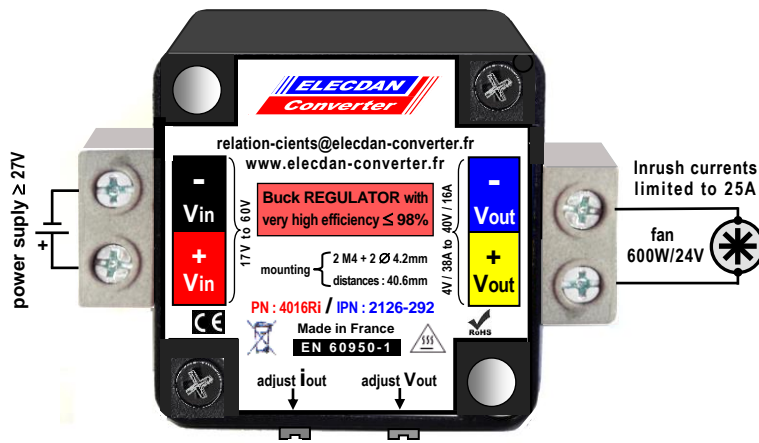
Controlled automatism



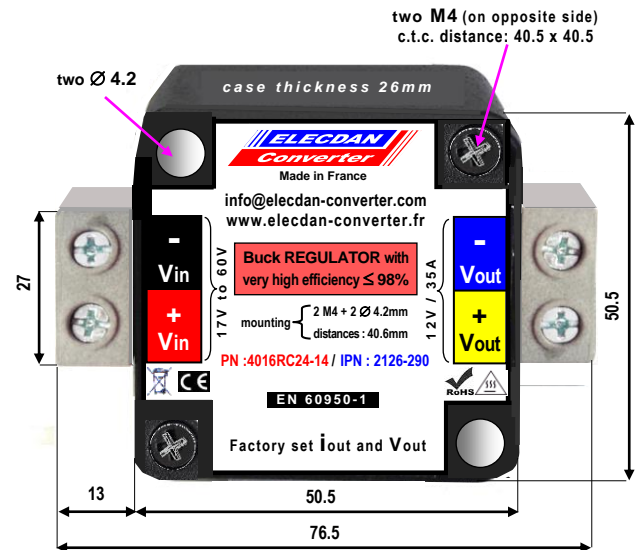
Version ③: I_{out} and V_{out} settings
by external resistors
SKU: 4016RR



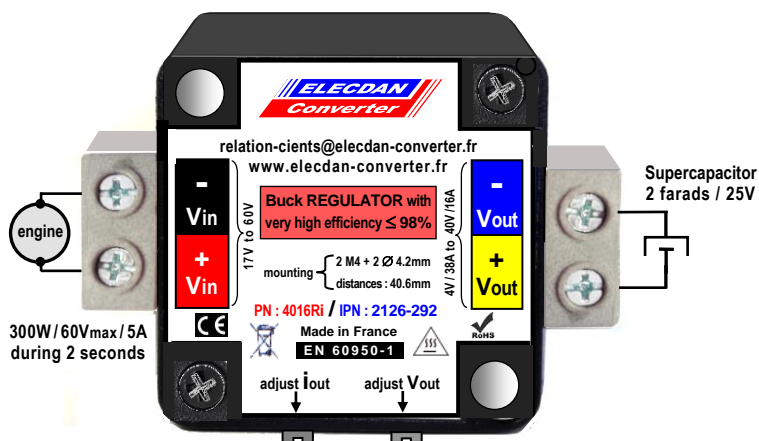
Determination of I_{max} and speed of an industrial fan by integrated settings



Version ④: Custom; I_{out} and V_{out}
have a fixed, factory-set value.
Example of SKU: **4016RC12-35**

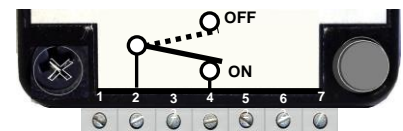


Recovery of braking energy of ≈ 600 joules

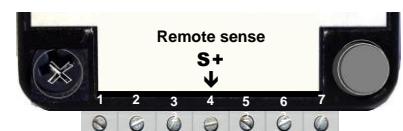


Version ⑤ ① or ②
(lower part of the case)

⑤ ① Remote ON / OFF Add SKU: **ON**



⑤ ② Remote sense Add SKU: **S+**



Please see also:

- **Micro Buck Regulator**; same case, less powerful: **400W**, but with wider ranges; 8.5 to 55V → 4V / 25A to 40V / 10A
- **Super Buck-Boost regulator**, power up to **2.8kW**
 - * surface \approx half-brick
 - * 8 to 60V → 0 to 60V / 50A
 - * 9 to 88V → 0 to 88V / 27.5A
- **Mini Regulator 336W** with inbuilt MPPT for solar direct drive (SDD)
Dimensions: 50.5 x 50.5 x 26 mm (alu case) or 39 x 32 x 23 mm (PA12)