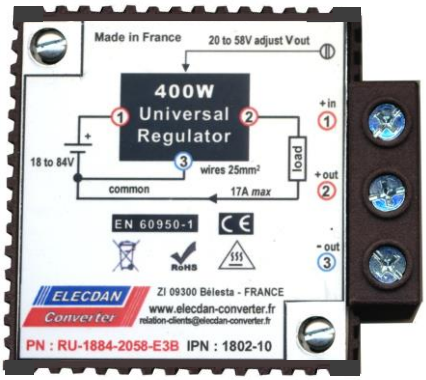
DC / DC electric power conversion?

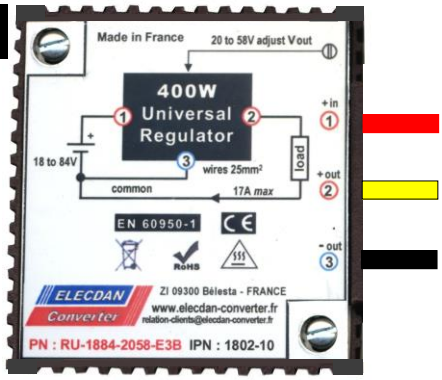
E3B



SKU: **RU-1785-1860 / B**

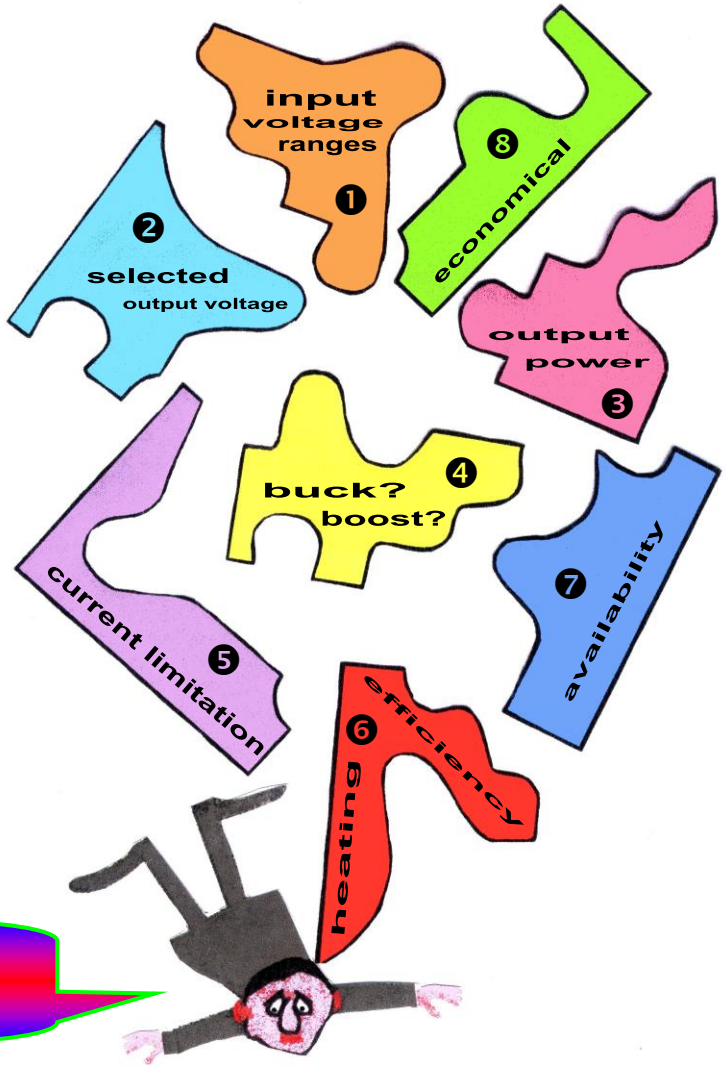
Price: € 203

E3F

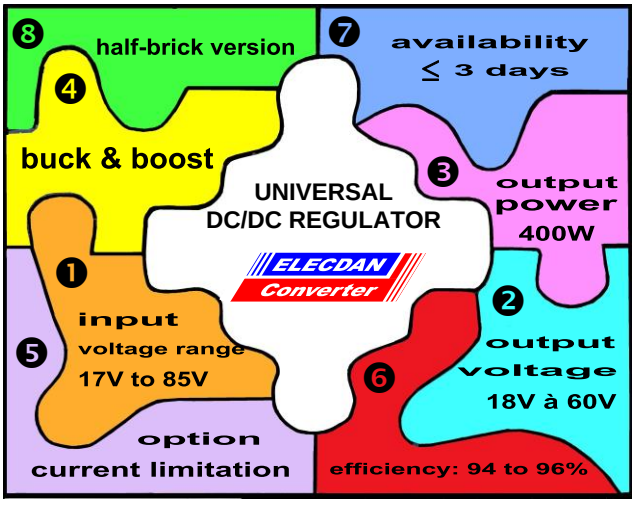


SKU: **RU-1785-1860 / F**

Price: € 196



Don't let the sum of technical & economical constraints overwhelm you!



Our BUCK-BOOST regulator provides a simple, immediate and economical solution to most of your typical problems.

The ease of use of this **regulator**, both **step-down** and **step-up**,

- accepting any input voltage, from 17 to 85V (holding at 16V),
- delivering any output voltage, from 18 to 60V,
- generating 400W, with a very high efficiency, up to >96%,
- with optional functions, adjustable or controllable,
- benefiting from our free assistance "integration and control",
- compact and with multiple mechanical presentations,

simplifies the usual problems of DC-DC energy conversion.

ELECTRICAL DATA

- Input voltage "V_{in}": 17 to 85V (*accidental maximum*: 86V)
- Zero of input and output: common
- **Output voltage** "V_{out}": 18 to 60V
  - manual adjustment with inbuilt 10-turn axis (trimmer)
  - factory setting upon request
  - external adjustment through a resistance (optional)
  - control according to chosen V_{out} range (optional)
- **Output power** "P_{out}": 400W, independently of V_{out} (24 to 60V) and V_{in} (17 to 85V)
- **Output current** "i_{out}": 0 to 17A
  - i_{out} *max* (7 to 17A) determined by your choice of output voltage and under power 400W
  - standard limitation of i_{out} : by hiccup, as soon as P_{out} reaches ≈405W
  - optional limitation of i_{out} by constant current, from <1A to 17A, with adjustment: either with inbuilt 10-turn axis (trimmer), or external, or with controllable range
- Line and load regulation: better than 5.10^{-3}
- Nominal efficiency: 94 to > 96%
- Startup time: <250 ms
- Dynamic response time (i_{out} = 50 to 100%): < 1 ms
- Ripple: ≤ 1% of V_{out}
- Switching frequency: fixed ≈ 230 kHz

PROTECTIONS

- Protection against overloads and short-circuits: standard, by hiccup (pulsing i_{out}), ≈ 2.5A RMS
- Optional complementary limitation at constant current, adjustable from <1A to 17A, for V_{out} ≥18V
- Thermal protection (automatic reset)
- Vibrations and shocks: sealing IP65 to IP67 (depending on the chosen presentation)

THERMAL PERFORMANCES

- Storage / Operation: -55°C to +115°C / -40°C to +85°C
- Temperature coefficient: 2.10^{-4} / °C
- Thermal resistances "Rt": 7°C/W to 2°C/W, depending on chosen case
- How to calculate temperature rise "ΔT°" with natural convection:
  - ΔT° = losses (in W) x Rt (in °C/W)
  - Losses ≤ 25W for P_{out} = 400W (and ≤ 10W for P_{out} = 100W), as the minimum efficiency varies from >94% to >91% when P_{out} varies from 400W to 100W
  - ΔT° is divided by 2 with pulsed air at 2m/s

STANDARDS & SPECIFICATIONS

- Marking CE; UL60950-1 / EN60950-1; RoHS
- MTBF: > 500 000 hours at 25°C

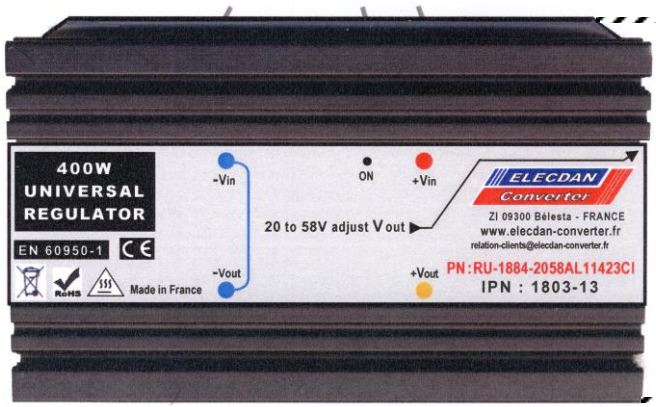
OPTIONS

- Please see paragraphs "output voltage" and "output current"
- "On / off" remote control; other presentations (page 3)

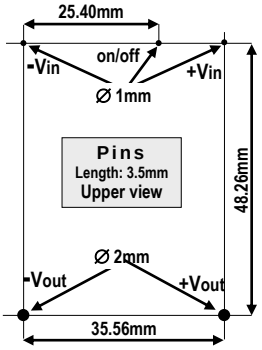
Mechanical configuration of four standard casings

FL

- Molded case, all aluminum, IP67: 114 x 64 x 34 mm; weight: 470g + 120g wires
- Thermal resistance: 2°C / W
- Mounting: 4 M3, center distances: 54 x 105mm
- Connections: 4 flying leads, ∅ 5mm copper section 6mm², length ≤ 60cm resistance: 2 milli-ohms per wire



CI

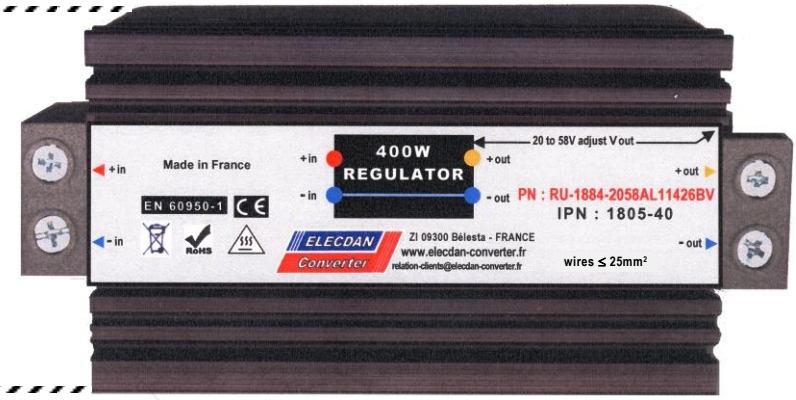


Half-brick type of set-up

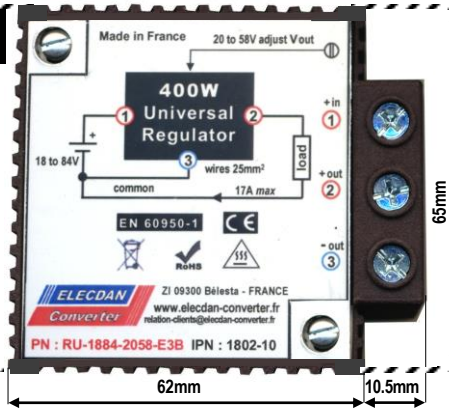
- Molded case, all aluminum, IP67: 114 x 64 x 23 mm for printed circuit board
- Thermal resistance: 2.5°C / W
- Mounting: 4 M3, distances: 54 x 105mm
- Connections: pins ∅ 1 or 2 mm

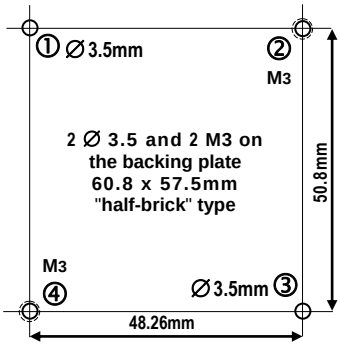
BV

- Molded case, all aluminum, IP67: (13 + 114 + 13) x 64 x 34 mm; weight: 490g
- Thermal resistance: 2°C / W
- Mounting: 4 M3, center distances: 54 x 105mm
- Connections: screw terminal block wire section: ≤ 25mm²

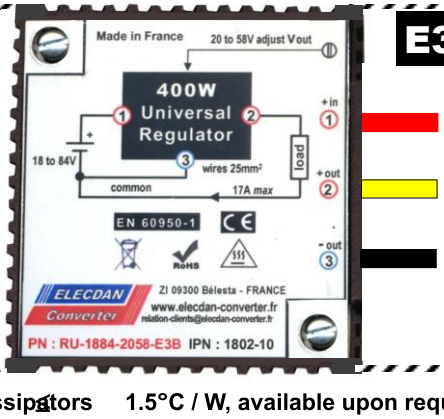


E3B





E3F



Optional heatsinks / dissipators 1.5°C / W, available upon request

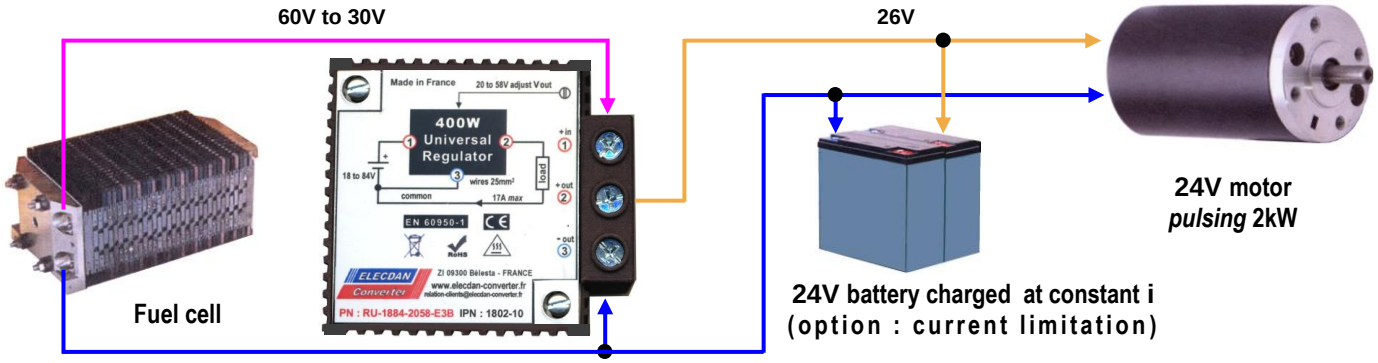
- Molded case IP65 ; (62 + 10.5) x 65 x (26 + 4) mm
- Weight: 200g
- Thermal resistance: 7°C / W
- Mounting: according to diagram (above), on thermally conductive wall
- Connections by screw terminal block with clamps; wire section: ≤ 25mm²

n°① et n°③ : smooth holes ∅ 3.5mm (tapped in option)

- Molded case IP65 ; 62 x 65 x 26mm
- Weight: 200g
- Thermal resistance: 7°C / W
- Mounting: according to diagram, on thermally conductive wall
- Connections by 3 wires; length: 20cm; copper section: 2.5mm²

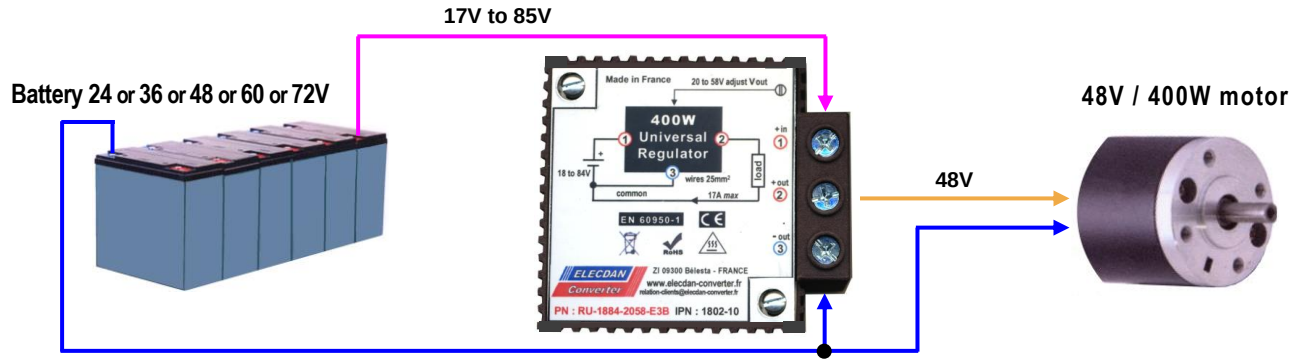
Four examples of applications using our innovative Buck-Boost Regulator

❶



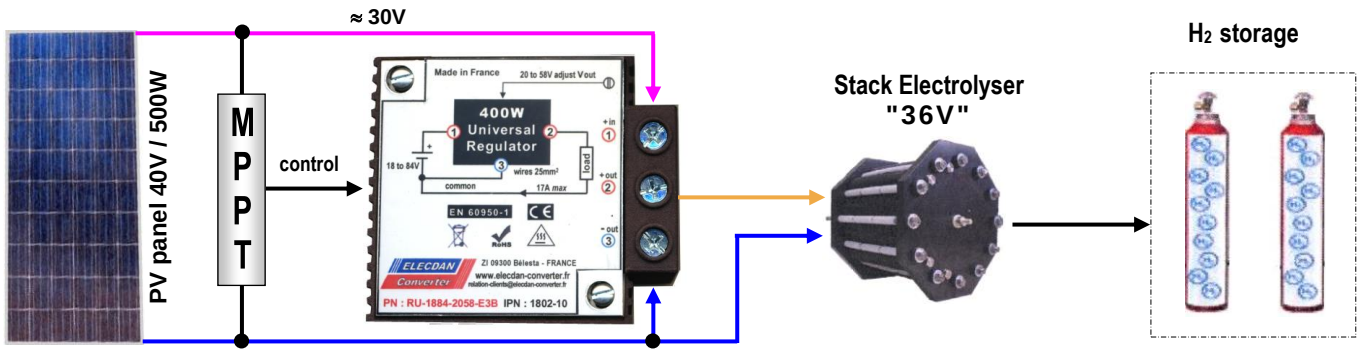
Fuel cell powering a 24V motor / 2 kW pulse

❷



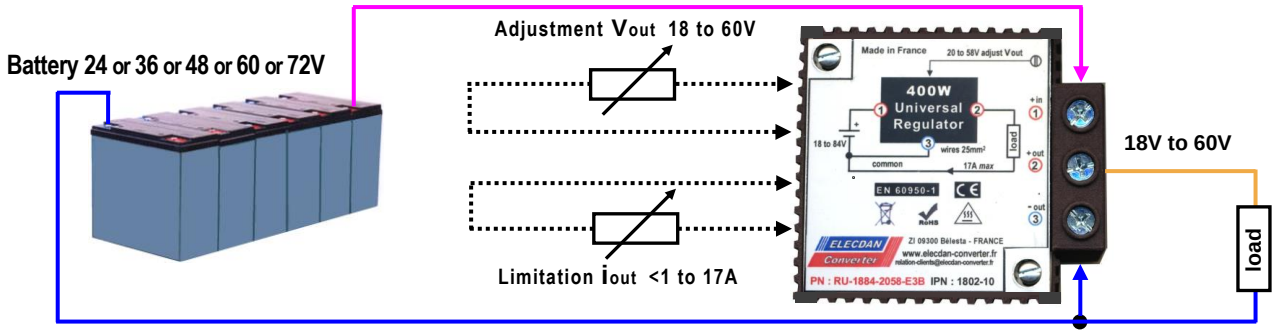
Battery (24V ... 72V) powering a 48V / 400 W engine

❸



Hydrogen generation from a photovoltaic panel

❹



Generator with adjustable current limitation and voltage (18 to 60V / < 1A to 17A)

❶ Buck-Boost 400W : Product references and prices, for standard cases: E3B with terminal blocks or E3F with wires; dimensions: 65 x 62 x 26mm

Prices depend on settings and options

Product number SKU B: output on terminal block FL: output on wires	Output and possible additional connections	Unit price (€)	
		block	wires
RU-1785-1860 / B or F	adjustable from 18 to 60V with inbuilt 10-turn axis (trimmer) of diameter 3mm	203	196
RU-1785-40/10 / B or F	factory-set fixed voltage, on request (e.g. 40V); the value of i max (10A) completes the voltage value (40V)	208	201
RU-1785-1860/E / B or F	adjustable, by external resistor, from 18 to 60V; 2 additional connections	228	221
RU-1785-/ Vpil / B or F	controllable voltage from 20 to 60V, by voltage from 2 to 6V; 2 additional connections	253	246
RU-1785-/ ipil / B or F	constant current limitation, adjustable from 5A to 10A	263	256
RU-1785…-/ ON / B or F	with ON/OFF function (add "ON" to the reference); 2 additional connections	+ 20	

❷ Buck-Boost 400W with **optional** all-aluminum iP67 molded cases (see diagrams on page 3)

Case reference to be specified on order	dimensions (different thicknesses) & connections	Option price (€)
BV	114 x 64 x 34 (clamp terminal block)	+ 85
Ci	114 x 64 x 23 (mounting on PCB)	+ 75
FL	114 x 64 x 34 ; overmoulded wire connections	+ 80

Example : RU-1785-1860 / F

Please also see our various complementary regulators, always with *very high efficiency*

❶ Micro BUCK Regulator (51 x 51 x 26mm), adjustable or controllable (see datasheet 5048). Exemples :
8.5 to 50V ➔ 4V / 100W
18 to 55V ➔ 15V / 300W
46 to 55V ➔ 40V / 400W

❷ Universal BUCK-BOOST 2.8kW max (datasheet 4928)
8 à 60V / 50A ➔ 0 to 60V / 0 to 50A

❸ Universal BUCK-BOOST 2.3kW max (datasheet 4995)
9 to 88V / 27.5A ➔ 0 to 88V / 0 to 27.5A"

❹ BUCK Regulator + MPPT ; 24V / 336W for **SDD (solar direct drive) motor control** from 350W / 30 to 45V photovoltaic panels