Options

- **A - Auxiliary output 5 V (12 V, 15 V, 24 V) added, max. 100 mA (just F300 type)**
- **B - Battery at the output - the converter used as a charger**

For DC/DC converters designed to work with a battery at the output an overload and short-circuit protection based on pulsation (F300, B600) cannot be used, therefore these DC/DC converters can stand short-circuit only a few seconds. Output voltage can be precisely set by a pot (see also option V, L2, E2, D, S2).

Cn - Case environmental protection (DIN)

- C0 – IP40 - standard protection (closed heatsink profile)
- C1 – IP42 - silicon stick, moulded rubber grommet
- C2 – IP53 - silicon stick, compression type cable gland(s)

Compression type cable gland(s) and an appropriate cable(s) are used together with a silicon stick. The cable lenght and its termination must be specified.

- C4 - IP00 - open frame design

- **D - "+D" wire for charging check light (12 V or 24 V nom. output only, max. 5 W)**

For systems with board battery - the light is on when the converter is off. When microcontroller used (M1, M2, M6), the function is more complex.

En – Serial diode

- E1 – on input
- E2 - on output

Fn - EMC filtering

- F0 - standard EMI suppression (EN 55022 - A)
- F1 - EMC non-specified (upon customer's request)
- F2 - improved EMC (EN 55022 - B)

- **H – Higher UVLO value adjusting**
- **I – Larger ambient temperature range (-40°C to +60°C)**

K - Keyswitch or remote ON/OFF

- K1 - Additional auxiliary wire from the switch box (board voltage)

Keyswitch may be used at systems with board battery, microcontroller used to control the recharging process (options M2) - this signal is utilised by the microcontroller.

- K2 – remote ON/OFF control

Ln - Indication LED on case

- L1 - connected to output
- L2 - converter work indication (independent on output battery connected)

Mn - Microcontroller used in the converter

- M2 - conservation voltage when recharged (IUoU characteristic) 14 V –> 14.4 V –> 13.6 V (only D600).
- M3 - under-, overvoltage, advanced overload, short-circuit and thermal protection (only F240, F300)

- **N - NTC inrush current limit at the input**

Sn - Built-in fuses

- S1 - input replaceable fuse

Built-in fuse protects input wires and/or the converter against burnout in case of input reverse connection or converter defect. If not S1, it is necessary to use an external fuse !

- S2 - output fuse

For systems with board battery - output wires and battery protection against burnout in case of output reverse connection or converter defect.

- S3 – output active electronic protection (S600)

- **T - Output overvoltage protection (thyristor crowbar at the input)**
- **U – Enhanced output voltage option for vehicle use**

Standard output voltage of DC/DC converters designed to work without battery at the output is fixed, set to 12.5 V / 24.5 V / 48.0 V (for nominal output 12 V / 24 V / 48 V). Option U means output voltage fixed, set to 13.6 V / 27.2 V / 54.4 V.

- **V - Pot for output voltage adjustment**

For systems with board battery - optimum recharging voltage adjustment (IU characteristic), or other requirements. The pot is accessible either between heatsink fins (F300, D600) or under a window for LED in a lid (F100, F240) or under a lid (Bxxx, Sxxx) or right on the PCB (B100). Standard factory set voltage is 13.6 V and its multiples, if not required different.

- **W - Extended input voltage range (upon customer's request)**

Xn - Special requirements (connectors, mounting etc.)

- X0 - crimp ferrules ended wires

This is recommended when the converter is to be connected to screw terminals.

- X1 - 6.35x0.8mm tab housing, 4 positions, tin plated brass

This is flexibly removable connection using a standard AMP connector.

- X2 - standard screw terminals (6 – 10 mm^2)
- X3 - VDFK4 screw terminals (Phoenix type) – up to 4 mm^2 wires
- X4 - on-board fast-on blades 6.35x0.8 mm
- X5 - MOLEX terminals (on-board connector)
- X6 - VDFK4 + standard screw terminals
- X7 - 6.35x0.8mm tab housing, 6 positions

Similar to X1; for converters with auxiliary output or higher output power.

- X8 - 6.35x0.8mm tab housing, 8 positions; for highest output power requirements
- X9 – isolated screw bolts M6 on a lid
- X13 – cable glands (opt. C2)
- X14 – isolated screw bolts M6 for output, cable gland for input
- others upon customer's request.

NOTES:

1. An order examples: F300 NS1 48V/12V, D600 BDL2M2S12VX6 144V/12V, F240 C2L1M3S1 72V/24V
2. All converter types have thermal protection (or PTC sensor or smart M3 system with microcontroller)
3. Standard option is number 0 and need not be specified (e.g. D600 C0F0L1NS1X0 = D600 L1NS1).
4. Within one letter (group), only one option can be selected except combinations S12.
5. Basic wire colour system: input blue (-), red (+), output brown (-), black (+)
6. Several various options may be simultaneously required. However, it is not always possible to mix arbitrary options together. This regards especially case environmental protection, connectors, mounting. See the table of options available for the specific converter type and furthermore some examples:
   - Compression cable gland use (option C2 - IP43) implies appropriate cable. Wires can be terminated either by crimp ferrules or by a connector (X1 or other). Cable length must be specified, too.
   - Options D, K, L2, Mn, S2 make sense only for the systems with board battery connected to the output of the converter.
   - Standard screw terminals or VDFK4 ones reduce case env. protection.