



# Railway application DC/DC Converters 30 to 2000W

# Train DC/DC converters 30 to 2000W

Polyamp supplies switch mode DC/DC converters into the train industry since 1973. We have worldwide experience of train applications from the Arctic north of Sweden, humid and hot Bangkok and dry and hot Australia.

The application of DC/DC converters onboard train is to supply electric and electronics equipment with safe and stable voltage.

## Applications

### Safety related supply

Mostly all equipments used by the driver are safety related and any fault will make the train to run in another mode or stop.

- Driver computer
- ATC system
- Emergency starting
- Radio
- Head and backlight
  - o Xenon
  - o Halogen
  - o LED
- Alarm bells / horns
- Wipe washers
- Cameras

### Passenger comfort

- Displays & information systems
- Lamps Halogen/LED
- IT-equipments
- Sound system
- Toilets
- Coffee & Restaurant systems

### Operational system

- Drive line internal voltages
- Counting devises, ticketing
- Cameras
- Doors
- Lifts

### Applications can also be divided into:

- Trains
- Underground
- Trams
- Locomotives electric or diesel
- Special vehicles

### Transforming

To save weight and space, new trains use battery voltage up to 110Vd.c. As most electric and electronic equipment works with 12V and 24V, the DC/DC converter transforms the voltage. A DC/DC converter can also make the opposite e.g. supply from 24V to 110V.

### Filtering

The standards IEC60571 and EN50155 has special requirements on the d.c. supply voltage. Some equipment used in trains need a DC/DC converter that is made to handle those supply voltages. The main function is then as a filter and galvanic separation.

### Input variation

Input variation according to IEC60571 and EN50155 are nominal  $\pm 30\%$  including ripple but some other specifications makes the needed range  $\pm 40\%$ . The table below shows the variations.

Uin 0.1s- S2	Continous range	Code
14.4 - 33.6Vd.c.	16.8 - 30Vd.c.	24T
21.6 - 50.4Vd.c.	25.2 - 45Vd.c.	36T
28.8 - 67.2Vd.c.	33.6 - 60Vd.c.	48T
43.2 - 100.8Vd.c.	50.4 - 90Vd.c.	72T
66 - 154Vd.c.	77 - 137.5Vd.c.	110T

Those variations have been specified to cover most train applications. A modern train has a better d.c. supply system and can relax those requirements. Some markets still use the RIA12 requirements. We can make special models that meets the RIA12 surge requirement of 3.5x nominal input voltage.

### Train standard

Electronic equipment onboard trains have to meet requirements specified in the standards IEC60571 and EN50155. To be noted is that many requirements have to be agreed upon.

### Ambient temperature

The standard level is -25 to +55°C. Most specify -25 to +70°C (T3). We can make units up to +85°C.

### EMC

IEC62236-3-2 and EN50121-3-2 defines EMC performance of electronic equipments.

### Shock and vibration

Defined by IEC/EN61373 and we meet Body mounted class B. Our DC/DC converters are regularly used in military vehicles and fork lifts, which has higher vibration requirements.

## Single outputs 3 to 125V

### Train logistics

We have identified several types of deliveries into the train industry.

- 1 New trains
- 2 Adding a feature to a fleet
- 3 Train refurbishments & special equipments
- 4 Track side equipments

Most of the cases these do not need large bulk quantities. Modern production methods with just-in-time approaches needs small batch exact on time deliveries. Polyamp is recognised by its customer to handle such approaches within day to day accuracy.

### The number one choice in DC/DC converters.

With more than 35 years experience in development and manufacturing of DC/DC converters Polyamp have established a reputation of quality, reliability and on time deliveries. During these years Polyamp DC/DC converters have been used in a wide range of applications:

Forklifts, Electrical Vehicles, Trains and Track Side, Process Control and Power Plants (including nuclear), Power / DC Distribution, Telecom and Radiocom, Industry, Naval, Air Traffic Control, Military, Radio applications.

## Single outputs 3 to 125V

- Single outputs 3 to 125V
- 2 & 3 outputs 5 to 60V
- Inputs 10V up to 600V
- Sturdy mechanics, meets mobile requirements.
- Easy robust mounting:  
DIN, Wall, chassis and 19"-rack
- Convection cooled with operating temperature range -25 to +55°C, some models +70°C or EN50155 T3
- Tropical coating standard or optional
- High efficiency
- Safety EN60950
- MTBF >300000h @+40°C
- Usefull life 20 years



PM50/PM80



PSE50 - 250



PE60



PM150/PM240



PSC50 - 240



PM250



PU300/PU500



PSC400, PSC600, PSC800



PU600/PU1000



PC1000, PC1400, PC2000

	Output Voltage										Input Voltage		
	5-10	12	15	18	24	28	36	48	60	110	125 V	DC	
PM50												50W	10 - 270
PM80												80W	18 - 300
PSE50												50W	10 - 270
PE60												96W	24 - 110
PSE100												100W	10 - 270
PM150												150W	10 - 270
PSC150												150W	10 - 550
PSC240												240W	10 - 550
PM240												240W	18 - 300
PSC250												250W	18 - 270
PSE250												250W	18 - 270
PM250												250W	11 - 300
PU300												300W	10 - 270
PSC400												400W	10 - 270
PU500												500W	18 - 300
PU600												600W	20 - 270
PSC600												600W	18 - 270
PSC800												800W	18 - 270
PU1000												1000W	18 - 600
PC1000												1000W	14 - 300
PC1400												1400W	30 - 300
PC2000												2000W	38 - 300

## The Company

Polyamp is a privately owned business located in Sollentuna, Stockholm, Sweden, with production facilities in Sweden in Åtvidaberg some 240km south of Stockholm and in Switzerland in La Chaux-de-Fonds.

Established for over 40 years, the Company has developed from a National Contractor to its present status of an "International Supplier of high quality Power Electronic equipment".



*Head office and Systems Division  
in Sollentuna (Stockholm)*



*Main factory in Åtvidaberg*



*La Chaux-de-Fonds factory*



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