



## Series C 600

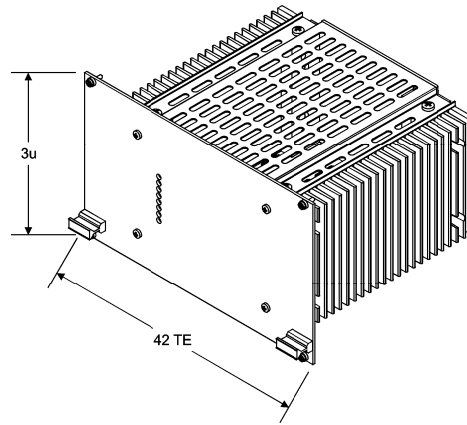
max. 500Watt

Input, output, case isolated against each other

VDC- input voltage range									output			
10-16	output A	18-36	output A	36-75	45-90	80-160	160-320	320-380	A	VDC	adjustable	
											min.	max.
C 600	50	C 620	70	C 630	C 640	C 650	C 670	C 670 Z	80	5	4,5	5,5
C 601	30	C 621	40	C 631	C 641	C 651	C 671	C 671 Z	45	9	8	10
C 602	25	C 622	35	C 632	C 642	C 652	C 672	C 672 Z	40	12	11	13
C 603	20	C 623	28	C 633	C 643	C 653	C 673	C 673 Z	32	15	14	16
C 604	12	C 624	18	C 634	C 644	C 654	C 674	C 674 Z	20	24	23	26
C 605	10	C 625	15	C 635	C 645	C 655	C 675	C 675 Z	17	28	26	30
C 609	6,0	C 629	8,0	C 639	C 649	C 659	C 679	C 679 Z	9,0	48	45	55
C 606	5,0	C 626	7,0	C 636	C 646	C 656	C 676	C 676 Z	7,5	60	58	68
C 607	2,5	C 627	3,5	C 637	C 647	C 657	C 677	C 677 Z	4,0	110	100	130
C 608	1,2	C 628	1,8	C 638	C 648	C 658	C 678	C 678 Z	2,1	220	200	250

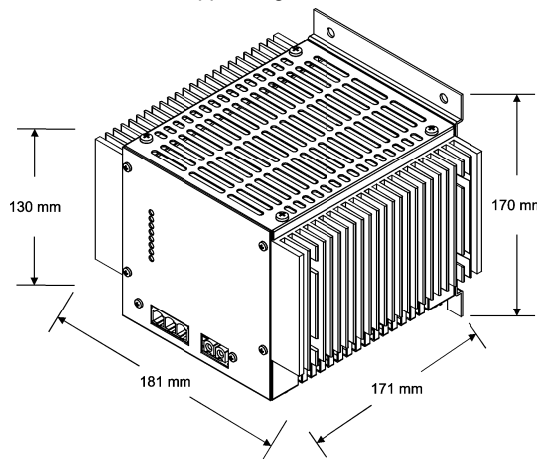
VAC- input voltage range		output			
185-264	93-138 / 185-264	A	VDC	adjustable	
				min.	max.
C 680	C 690	80	5	4,5	5,5
C 681	C 691	45	9	8	10
C 682	C 692	40	12	11	13
C 683	C 693	32	15	14	16
C 684	C 694	20	24	23	26
C 685	C 695	17	28	26	30
C 689	C 699	9,0	48	45	55
C 686	C 696	7,5	60	58	68
C 687	C 697	4,0	110	100	130
C 688	C 698	2,1	220	200	250

<b>output</b>	OVP- adjustment	trimmer on front side 110-130% $U_{nom}$
	overload protection	UI- characteristic, constant current limit
	adjustment current limit	trimmer on front side 80-110% $I_{nom}$
	sense lines	depending on type
	voltage adjustment	trimmer on front side
	function control	green LED on front panel
<b>input</b>	turn off at $U_{in}$	fixed <95% $U_{min}$ >105% $U_{max}$
<b>additional Information</b>	specifications page 37 general description DC- input page 71 and AC- input page 72 additional options page 39 - 41	



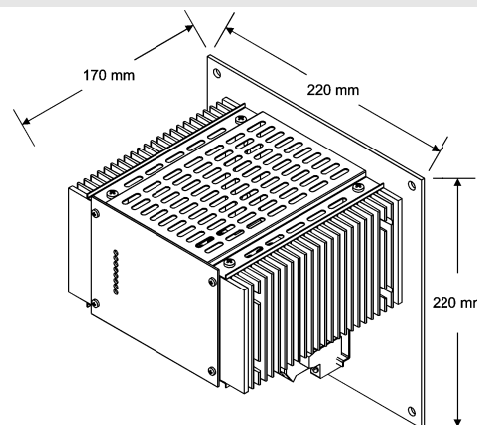
## 19"- Cassette

construction	19"- cassette 3u, 19"- standard depth 160mm 42TE front panel aluminum natural color anodized
heat sink	40mm: output $\leq 10\text{VDC}$ /input $\leq 36\text{VDC}$ and with options L, E, R, otherwise 25mm
connectors	2 x H15: output $\leq 23\text{VDC}$ /input $\leq 36\text{VDC}$ and with options K, E, R, N, otherwise 1 x H15 Pos. "A" / mating connector page 59
weight	app. 3,2kg with 25mm heat sink, app. 3,8kg with 40mm heat sink



## Chassis Mount (CM)

construction	coated metal housing, protection class IP 20. Assembly drawing page 86.
connectors	mating connectors
weight	app. 4,0kg



## Mounting Plate with connection terminals (W)

construction	mounting plate (connectors are changed against wires). Assembly drawing page 87.
connectors	connection terminals
weight	app. 4,5kg

## Input

Input voltage range	refer to the table of types in the various series
Ripple (DC)-input	<15% p-p allowed
Frequency (AC)-input	40-70Hz, 16/400Hz possible upon request
Power factor (AC)-input	0,65-0,75 capacitive, depending on type/load
Crest factor (AC)-input	2,0-2,5 depending on type
Inrush current	typ. 10-50 times nominal input current - also see "General Information"
	limit: option H (NTC), 0,5-60Ω, depending on type, AC-input ≤1600W standard
No-load input current	2-10W depending on type
Switch-on time	typ. 2s
Hold-up time	typ. 2ms at input 12VDC, increases with the input voltage
	typ. 15ms at 220VDC/VAC - also see "General Information"
Ripple feed-back (DC)	<1,8mV psophometrical acc. ETS 300132-2
Turn on/off	≤ 95% U <sub>min</sub> ≥ 105% U <sub>max</sub>
Spikes	acc. EN 61000-4-5, Class 3 also see page 2
Bursts	acc. EN 61000-4-4, Level 3 also see page 2

## Main output

Output voltage	adjustable - refer to the table of types in the various series
Output current	refer to the table of types in the various series
Line regulation	0,1%, measured directly at the connection terminal
Load regulation	0,2%, measured directly at the connection terminal
	with options E, R, C: combined 2% or 1V (the lower value is applicable)
Ripple	<1%+30mV p-p typ. - see "General Information"
Response time	typ. 2ms
Load transient 10-100-10%	typ. 6%
On/off overshoot	none
Overload protection	electronical - adjustable UI-characteristic, automatic return
Over voltage protection	electronical - adjustable pulse frequency app. 5Hz, automatic return, no effect on external over voltage - also see "General Information"
Remote sensing	existing - also see "General Information"
Parallel operation	possible (options E, R, C, Ci)
Series operation	possible (option U)

## General

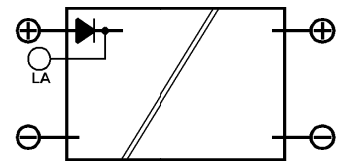
Temperature coefficient	typ. 0,02%/°C
Operating temperature	-20°C to +70°C
Current derating	from +45°C to +70°C by 2,5%/°C with free natural convection, with forced air cooling upon inquiry (no automatic derating)
Storage temperature	-40°C to +85°C
Humidity	75% without condensation, >75% option T necessary
Efficiency at full load	65%-92%, depending on type, - also see table "Efficiency"
Switching frequency	typ. 33kHz / 20kHz
MTBF at 40°C	depending on type, app. 100 000h acc. MIL-HDBK217
	app. 2100 fit acc. SN29500

## Construction

Isolation	acc. EN 50178, EN 60950, Class I
Creepage distances	acc. EN 50178, EN 60950 - also see page 2
Air distances	in/out, in/ground, Series 200-2600: 4mm, Series 3500-4800: 6,5mm
RFI-interference	in/out, in/ground, Series 200-2600: 3mm, Series 3500-4800: 5mm
EMC / CE	acc. EN 55011 Class "A", optionally "B" upon inquiry
	EN 61000-6-4, EN 61000-6-2
	Grounding of input and/or output potentials and/or connecting input to output may cause changes of EMC and/or ripple values.
Connectors	15-pole terminal acc. DIN 41612, "H15", >50A additional 2-pole high current connector "H130"

**L Polarity / Feed-Back Protection**

The input circuitry of the unit is protected against wrong polarity through a series diode. However, this also causes extra losses and reduces the overall efficiency.



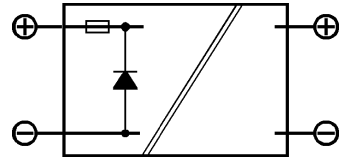
**LA Option L with cathode led out**

Additional external buffer-capacitors can be connected to the cathode. Due to higher inrush current it may only be possible in combination with Option H - ask Powertronic.

calculation formula ( $I_{Diode}=2 \times P_{out \max} / U_{in \min}$ )

**Q Polarity Protection**

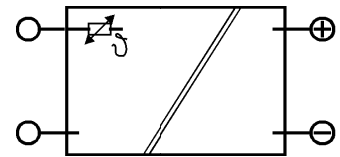
To avoid the losses caused by a series diode (Option L / LA), a diode with opposite polarity is connected in parallel to the input. This blows an internal (< 6,3A possible) or external fuse if the input is connected to a supply of wrong polarity.



calculation formula ( $I_{Diode}=3 \times P_{out \max} / U_{in \min}$ )

**H Inrush Current Limiting**

A thermistor is connected in series with the input lines which changes its resistance from high to low when it gets hot. It does not reduce the current surge if the input power is interrupted for a short period of time not allowing the thermistor to cool down.

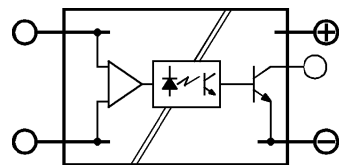


**Technical Data**

NTC-rating from 0,5Ω / 40A to 5Ω / 20A

**P Powerfail Alarm**

An open collector of a transistor signals if the input voltage drops below a specified limit. At low voltage the transistor is blocked.

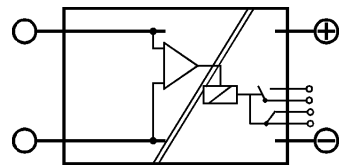


**Technical Data**

Standard setting DC app. 70% of nominal input  
AC app. 85% of nominal input  
Reference potential negative output  
Transistor data 24VDC / 20mA max.

**N Powerfail Alarm**

Potential- free relay contacts signal if the input voltage drops below a specified limit. The relay is without current at low voltage (NOC=open, NCC=closed).

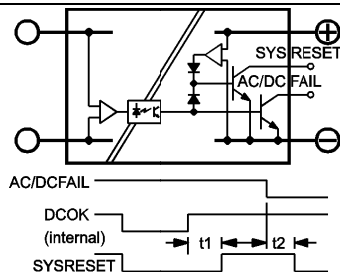


**Technical Data**

Standard setting DC app. 70% of nominal input  
AC app. 85% of nominal input  
Contact ratings 250VDC / 1 A / 40W  
Operating temperature up to +55°C for relay

**S SYSRESET (for VMEbus)**

This option delivers the necessary signals AC/DC fail and SYSRESET.

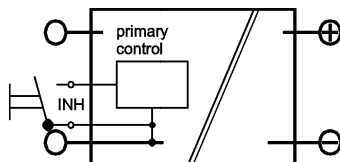


**Technical Data**

Standard setting DC app. 75% / AC < 90% of Unom  
Reference potential negative (main) output  
Transistor Data 24VDC / 20mA max.  
Delay time t1 >200ms  
Delay time t2 >2ms

**IE Inhibit**

Through the connection of the INH to the (rectified) negative input, the unit is shut off (oscillator is stopped) and no output voltage is available.



**Technical Data**

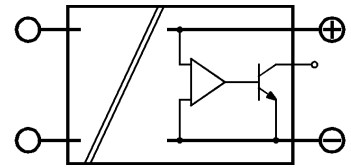
External trip/ switch element 30VDC/20mA, caution for isolation = primary potential

## D DC OK- Logic

The output is controlled against low voltage. An open collector of a transistor signals when the output voltage drops below a specified limit. At low voltage the transistor is blocked.

### Technical Data

Standard setting app. 85% nominal (see Table below)  
 Reference potential negative output  
 Transistor data 24VDC / 20mA max.

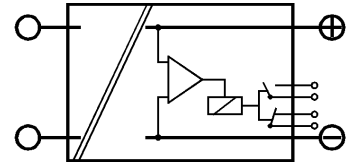


## K DC OK- Relay

In this version potential-free contacts signal if the output voltage drops below a specified limit. At low voltage the relay is without current (NOC=open, NCC=closed).

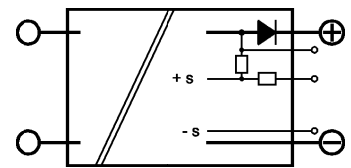
### Technical Data

Standard setting app. 85% nominal (see Table below)  
 Contact ratings 250VDC / 1A / 40W  
 Operating temperature up to +55°C for relay



## E Decoupling Diode

A series diode built into the units output allows infinite paralleling of the units for redundancy or higher power. For control purposes the anode of the diode is led out. It cannot be loaded  $\geq 0.5A$ . The sense signal is taken partially from the anode and partially from the load/cathode of the decoupling diode. This guarantees starting and operating under all conditions, but it also effects the regulation accuracy of 2% or 1V (whichever is less). In this way it gives a load sharing of 15-30% between the paralleled units.



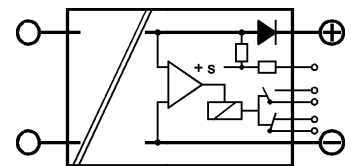
calculation formula ( $I_{Diode}=1 \times I_{out}$ )

## R Decoupling Diode with DC OK-Relay

This is a combination between Option E and Option K. The difference is that the anode is not led out. At low voltage the relay is without current (NOC=open, NCC=closed).

### Technical Data

Standard setting app. 85 % nominal (see Table below)  
 Contact ratings 250 VDC / 1 A / 40 W  
 Operating temperature up to +55°C for relay



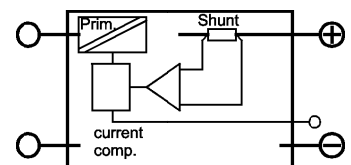
calculation formula ( $I_{Diode}=1 \times I_{out}$ )

## Standard Settings for the Alarm in Options D, K und R

nominal VDC	alarm $\leq$ VDC	nominal VDC	alarm $\leq$ VDC	nominal VDC	alarm $\leq$ VDC
5,0	4,5	24	20	60	51
12	10	28	24	110	95
15	13	48	41	220	190

## C Active Current Sharing

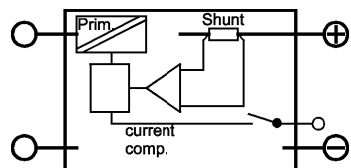
Through the use of an additional interconnecting wire between the parallel operating units, a control circuit provides active current sharing of 5% by changing the output voltage accordingly (2% or 1,5V whichever is lower). A connected unit not supplying an output voltage may reduce the load voltage up to 8%. If this tolerance is not acceptable please use option Ci



## Ci Active Current Sharing

Same as option c but "fault tolerant".

If a connected unit is not supplying an output voltage its current sharing signal is removed and the load voltage is not effected by this condition.

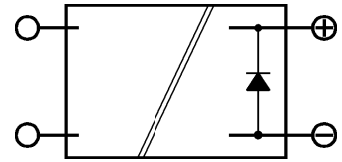


# Internal Options - Output

## U Polarity Protection

A diode connected with opposite polarity in the output prevents damages to the unit if an external voltage with the wrong polarity is applied. This option is necessary, if the unit outputs are connected in series. The diode can carry the nominal output current of the unit.

calculation formula ( $I_{\text{Diode}}=1 \times I_{\text{out}}$ )

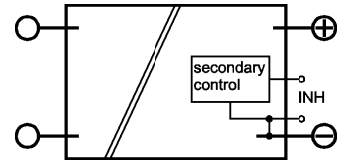


## IA Inhibit

The operation of the unit is inhibited when a voltage signal is applied in reference to the negative line of the output. This can also be used in combination with a thermal trip, which shuts the unit down. A galvanically isolated version is available upon request.

### Technical Data

Shut off 5VDC, max. 20mA, ref. to main output  
Turn on open input



## XU External Programming: Output voltage

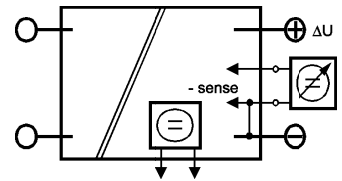
Voltage programming 0 – 10VDC (XUU)  
Current programming 4 – 20mA (XUI)

## XUR Monitoring (readout): Output voltage

Voltage signal 0 – 10VDC (XURU)  
Current signal 4 – 20mA (XURI)

### Technical Data

Reference potential negative sense of output  
Auxiliary voltage by current programming min. 10VDC  
 $\Delta U_{\text{out}}$  0-100%



## XI External Programming: Output current

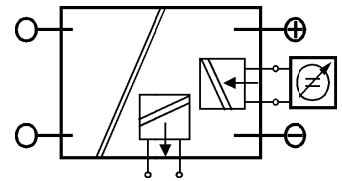
by internal or external insulation amplifier only  
Voltage programming 0 – 10VDC (XIU)  
Current programming 4 – 20mA (XII)

## XIR Monitoring (readout): Output current

Voltage signal 0 – 10VDC (XIRU)  
Current signal 4 – 20mA (XIRI)

### Technical Data

Reference potential none, galvanic isolated  
Auxiliary voltage by current programming min. 10VDC  
 $\Delta U_{\text{out}}$  0-100%



## XP External Programming

By an external 10-turn potentiometer output voltage and/or output current can be adjusted.

### Technical Data

$\Delta U_{\text{out}}$  0-100%  
 $\Delta I_{\text{out}}$  0-100%

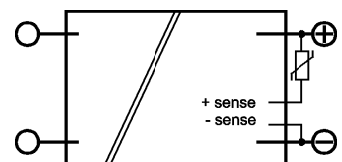


## Y Programmable by External Resistor

By using an external NTC or PTC, connected to a sense line of the unit, the output voltage can be programmed. e. g. for temperature controlled charging of batteries.

### Technical Data

Programming resistor factory fixed – including sense resistor  
Current app. 1mA  
 $\Delta U_{\text{out}}$  setting range of the unit



# Internal Options - Environmental

## V Increased Mechanical Strength

For special applications, e. g. in motorized vehicles, vessels and earthquake areas, the DC/DC and AC/DC supplies can be modified for higher vibration/shock resistance. In this case, larger components as elcaps, magnetics etc. are additionally fixed. To be specified individually.

## T Tropical Protection

In the units all of the PCB's and most of the components are coated with clear tropical protection varnish.