

# Section 7: SKIIPACK<sup>®</sup> 4)

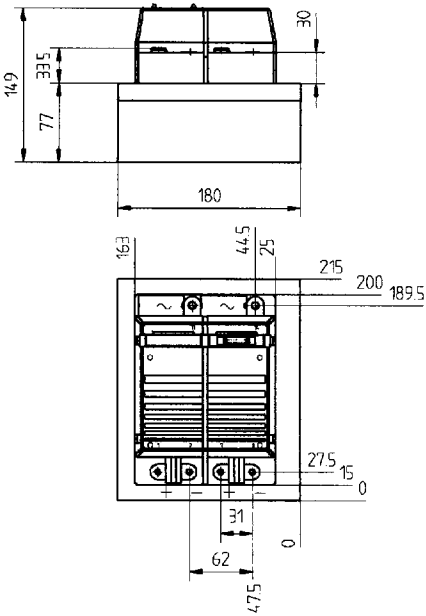
## Large IGBT Power Packs

### SKIIPACK = SEMIKRON Integrated Intelligent Power Pack

| Type   | <sup>2)</sup> Options; W...<br>control connection<br>W = wire<br>F = fibre optic<br>T = Temp.sense | V <sub>CEs</sub><br>V | I <sub>C</sub> <sup>3)</sup><br>@ T <sub>lm</sub><br>=25°C<br>A | V <sub>CEsat</sub><br>@ I <sub>C</sub><br>25 °C<br>typ./chip<br>V | P <sub>tot</sub> <sup>1)</sup><br>@ T <sub>J</sub> =150°C<br>@ T <sub>amb</sub><br>= 35 °C<br>W | R <sub>th</sub><br>IGBT<br>/ Diode <sup>5)</sup><br>°C/W | Case  | Circuit diagram             |  |
|--|--|-----------------------|---|---|---|--|-------|-----------------------------|--|
| SKiP 462 GB 060 250 W/WT <sup>6)</sup>   |  | 600                   | 400   | 2,1   | 1140  | 0,114/0,14   | S2    |                             |  |
| SKiP 662 GB 060 251 W/WT <sup>6)</sup>   |  | 600                   | 600   | 2,1   | 1370  | 0,08/0,14  | S2    |                             |  |
| SKiP 962 GB 060 350 W/WT-F/F T <sup>6)</sup>   |  | 600                   | 900   | 2,1   | 1840  | 0,053/0,09   | S3    |                             |  |
| SKiP 1262 GB 060 451 W/WT-F/F T <sup>6)</sup>  |  | 600                   | 1200  | 2,1   | 2170  | 0,04/0,07  | S4    |                             |  |
| SKiP 402 GB 120 201 W/WT   |  | 1200                  | 400   | 3,15  | 1670  | 0,05/0,14  | S2    |                             |  |
| SKiP 612 GB 120 203 W/WT   |  | 1200                  | 600   | 3,15  | 1800  | 0,04/0,14  | S2    |                             |  |
| SKiP 602 GB 120 301 W/WT-F/F T   |  | 1200                  | 600   | 3,15  | 2180  | 0,033/0,093  | S3    |                             |  |
| SKiP 912 GB 120 303 W/WT-F/F T   |  | 1200                  | 900   | 3,15  | 2330  | 0,027/0,093  | S3    |                             |  |
| SKiP 912 GB 120 031  |  | 1200                  | 900   | 3,15  | 2330  | 0,027/0,093  | S3    |                             |  |
| SKiP 802 GB 120 401 W/WT-F/F T   |  | 1200                  | 800   | 3,15  | 2370  | 0,025/0,07   | S4    |                             |  |
| SKiP 802 GB 120 040  |  | 1200                  | 800   | 3,15  | 2370  | 0,025/0,07   | S4    |                             |  |
| SKiP 1212 GB 120 402 W/WT-F/F T  |  | 1200                  | 1200  | 3,15  | 2500  | 0,02/0,07  | S4    |                             |  |
| SKiP 1212 GB 120 041   |  | 1200                  | 1200  | 3,15  | 2500  | 0,02/0,07  | S4    |                             |  |
| SKiP 592 GB 160 270 W/WT   |  | 1600                  | 500   | 3,8   | 1800  | 0,04/0,14  | S2    |                             |  |
| SKiP 792 GB 160 370 W/WT-F/F T   |  | 1600                  | 700   | 3,8   | 2330  | 0,027/0,09   | S3    |                             |  |
| SKiP 792 GB 160 034  |  | 1600                  | 700   | 3,8   | 2330  | 0,027/0,09   | S3    |                             |  |
| SKiP 1092 GB 160 470 W/WT-F/F T  |  | 1600                  | 1000  | 3,8   | 2670  | 0,02/0,07  | S4    |                             |  |
| SKiP 1092 GB 160 044   |  | 1600                  | 1000  | 3,8   | 2670  | 0,02/0,07  | S4    |                             |  |
| SKiP 262 GD 060 351 W/WT <sup>6)</sup>   |  | 600                   | 200   | 2,1   | 1550  | 0,23/0,28  | S3 D  |                             |  |
| SKiP 362 GD 060 352 W/WT <sup>6)</sup>   |  | 600                   | 300   | 2,1   | 1840  | 0,16/0,28  | S3 D  |                             |  |
| SKiP 102 GD 120 304 W/WT   |  | 1200                  | 150   | 3,15  | 1930  | 0,14/0,42  | S3 D  |                             |  |
| SKiP 202 GD 120 300 W/WT   |  | 1200                  | 200   | 3,15  | 2180  | 0,1/0,28   | S3 D  |                             |  |
| SKiP 312 GD 120 302 W/WT   |  | 1200                  | 300   | 3,15  | 2330  | 0,08/0,28  | S3 D  |                             |  |
| SKiP 192 GD 160 371 W/WT   |  | 1600                  | 150   | 3,8   | 2090  | 0,11/0,28  | S3 D  |                             |  |
| SKiP 292 GD 160 372 W/WT   |  | 1600                  | 250   | 3,8   | 2330  | 0,08/0,28  | S3 D  |                             |  |
| SKiP 262 GDL 060 452 W/WT <sup>6)</sup>  |  | 600                   | 200   | 2,1   | 1750  | 0,23/0,28  | S4 DL | <p>(with brake chopper)</p> |  |
| SKiP 362 GDL 060 453 W/WT <sup>6)</sup>  |  | 600                   | 300   | 2,1   | 2060  | 0,16/0,28  | S4 DL |                             |  |
| SKiP 102 GDL 120 403 W/WT  |  | 1200                  | 150   | 3,15  | 2150  | 0,14/0,42  | S4 DL |                             |  |
| SKiP 202 GDL 120 400 W/WT  |  | 1200                  | 200   | 3,15  | 2430  | 0,1/0,28   | S4 DL |                             |  |
| SKiP 312 GDL 120 404 W/WT  |  | 1200                  | 300   | 3,15  | 2560  | 0,08/0,28  | S4 DL |                             |  |
| SKiP 192 GDL 160 471 W/WT  |  | 1600                  | 150   | 3,8   | 2330  | 0,11/0,28  | S4 DL |                             |  |
| SKiP 292 GDL 160 472 W/WT  |  | 1600                  | 250   | 3,8   | 2590  | 0,08/0,28  | S4 DL |                             |  |
| <sup>1)</sup> Mounted on heatsink: Case S2 on P16/180F fan not attached <sup>7)</sup> R <sub>thsa</sub> = 0,044 °C/W<br>Case S3 on P16/260 F      R <sub>thsa</sub> = 0,036 °C/W<br>Case S4 on P16/340 F      R <sub>thsa</sub> = 0,033 °C/W |  |                       |   |   |   |  |       |                             |  |
| <sup>2)</sup> Available options of integrated drivers  |  |                       |   |   |   |  |       |                             |  |
| <sup>3)</sup> All data apply to one switch   |  |                       |   |   |   |  |       |                             |  |
| <sup>4)</sup> 1600 V types have V <sub>iso</sub> (AC; rms; 1 min) = 4 kV, others: 2,5 kV   |  |                       |   |   |   |  |       |                             |  |
| <sup>5)</sup> All diodes are CAL diodes. CAL = Controlled Axial Lifetime technology  |  |                       |   |   |   |  |       |                             |  |
| <sup>6)</sup> Preliminary data   |  |                       |   |   |   |  |       |                             |  |
| <sup>7)</sup> Recommended fan type: D2E-133-2A or D2E-133-2K   |  |                       |   |   |   |  |       |                             |  |

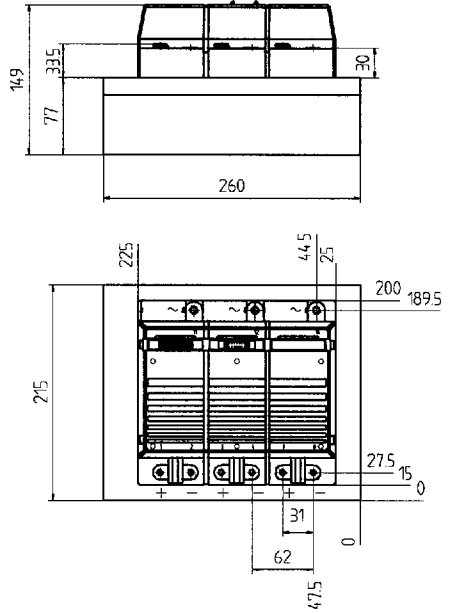
**Case S2**

**SKiiPACK 2 - GB**



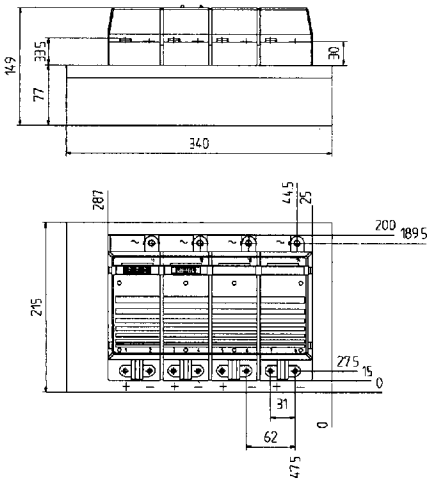
**Case S3**

**SKiiPACK 3 - GB**



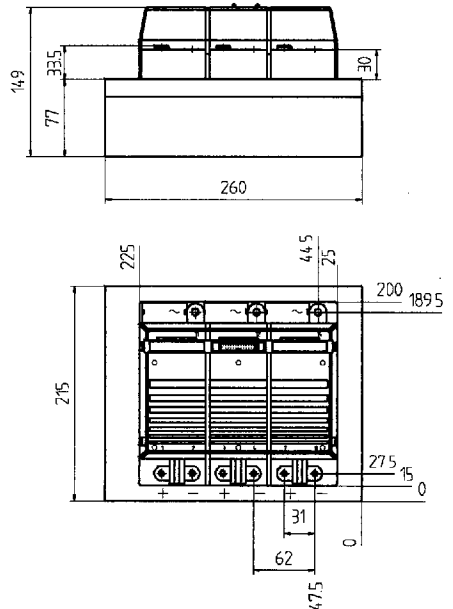
**Case S4**

**SKiiPACK 4 - GB**



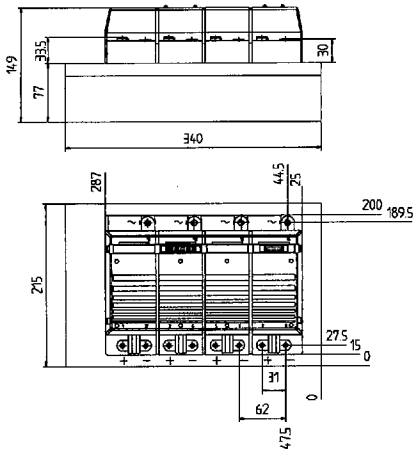
**Case S3 - D**

**SKiiPACK 3 - GD**



Case S4 - DL

SKIIPACK 4 - GDL



**SKIIPACK**

**Type Designation System**

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩  
**SKIIP 6 0 2 G B 120 301 WT**

- ① SKiiP = SEMIKRON integrated intelligent Power
- ② I<sub>C</sub>/100 i.e. 6 = 600 A
- ③ kind of IGBT chips used
- ④ 2 = version 2
- ⑤ G = IGBT
- ⑥ internal el. circuit:  
 B = half bridge  
 D = 3 phase bridge (IEC - B6CI)  
 DL = 3 phase bridge with brake chopper (GAL)
- ⑦ V<sub>CE</sub>/10 i.e. 120 = 1200 V
- ⑧ driver unit: 0 = without driver  
 2 = SKIIPACK 2  
 3 = SKIIPACK 3  
 4 = SKIIPACK 4
- ⑨ driver unit version number
- ⑩ Options:  
 control connections: W = Wire  
 F = Fiber optic  
 T = Temperature sensor  
 C = Current sensor (available '96)

**Pin Arrays**  
**SKIIPACK GB**  
**Half bridge configuration**

| Pin | signals                | Opto |
|-----|------------------------|------|
| 1   | 14-pins DIN 41651      |      |
| 2   | reserved               |      |
| 3   | BOT IN                 | 3    |
| 4   | ERROR OUT              | 2    |
| 5   | TOP IN                 | 1    |
| 6   | Overtemp. OUT          |      |
| 7   | +24 V <sub>DC</sub> IN |      |
| 8   | +24 V <sub>DC</sub> IN |      |
| 9   | +15 V <sub>DC</sub> IN |      |
| 10  | +15 V <sub>DC</sub> IN |      |
| 11  | GND                    |      |
| 12  | GND                    |      |
| 13  | Temp. analog OUT       |      |
| 14  | GND analog             |      |
| 15  | reserved               |      |

**SKIIPACK GD**  
**3 phase bridge configuration**

| Pin | signals                |
|-----|------------------------|
| 1   | 26-pins DIN 41651      |
| 2   | reserved               |
| 3   | BOT HB 1 IN            |
| 4   | ERROR HB 1 OUT         |
| 5   | TOP HB 1 IN            |
| 6   | BOT HB 2 IN            |
| 7   | ERROR HB 2 OUT         |
| 8   | TOP HB 2 IN            |
| 9   | BOT HB 3 IN            |
| 10  | ERROR HB 3 OUT         |
| 11  | TOP HB 3 IN            |
| 12  | Overtemp. OUT          |
| 13  | reserved               |
| 14  | reserved               |
| 15  | +24 V <sub>DC</sub> IN |
| 16  | +24 V <sub>DC</sub> IN |
| 17  | +15 V <sub>DC</sub> IN |
| 18  | +15 V <sub>DC</sub> IN |
| 19  | GND                    |
| 20  | GND                    |
| 21  | Temp. analog OUT       |
| 22  | GND analog             |
| 23  | reserved               |
| 24  | reserved               |
| 25  | reserved               |
| 26  | reserved               |

**SKIIPACK GDL**

**3 phase bridge configuration with brake chopper**

| Pin | signals                |
|-----|------------------------|
| 1   | 26-pins DIN 41651      |
| 2   | reserved               |
| 3   | BOT HB 1 IN            |
| 4   | ERROR HB 1 OUT         |
| 5   | TOP HB 1 IN            |
| 6   | BOT HB 2 IN            |
| 7   | ERROR HB 2 OUT         |
| 8   | TOP HB 2 IN            |
| 9   | BOT HB 3 IN            |
| 10  | ERROR HB 3 OUT         |
| 11  | TOP HB 3 IN            |
| 12  | Overtemp. OUT          |
| 13  | reserved               |
| 14  | reserved               |
| 15  | +24 V <sub>DC</sub> IN |
| 16  | +24 V <sub>DC</sub> IN |
| 17  | +15 V <sub>DC</sub> IN |
| 18  | +15 V <sub>DC</sub> IN |
| 19  | GND                    |
| 20  | GND                    |
| 21  | Temp. analog OUT       |
| 22  | GND analog             |
| 23  | reserved               |
| 24  | reserved               |
| 25  | reserved               |
| 26  | reserved               |

| Pin | signals                |
|-----|------------------------|
| 1   | 14-pins DIN 41651      |
| 2   | reserved               |
| 3   | CHOPPER ext. ON        |
| 4   | ERROR OUT              |
| 5   | RESET                  |
| 6   | reserved               |
| 7   | +24 V <sub>DC</sub> IN |
| 8   | +24 V <sub>DC</sub> IN |
| 9   | +15 V <sub>DC</sub> IN |
| 10  | +15 V <sub>DC</sub> IN |
| 11  | GND                    |
| 12  | GND                    |
| 13  | reserved               |
| 14  | reserved               |