

Technical Information

PrimeSTACK

2PS1200R17KE3-4WHV



Vorläufige Daten
preliminary data

Key data

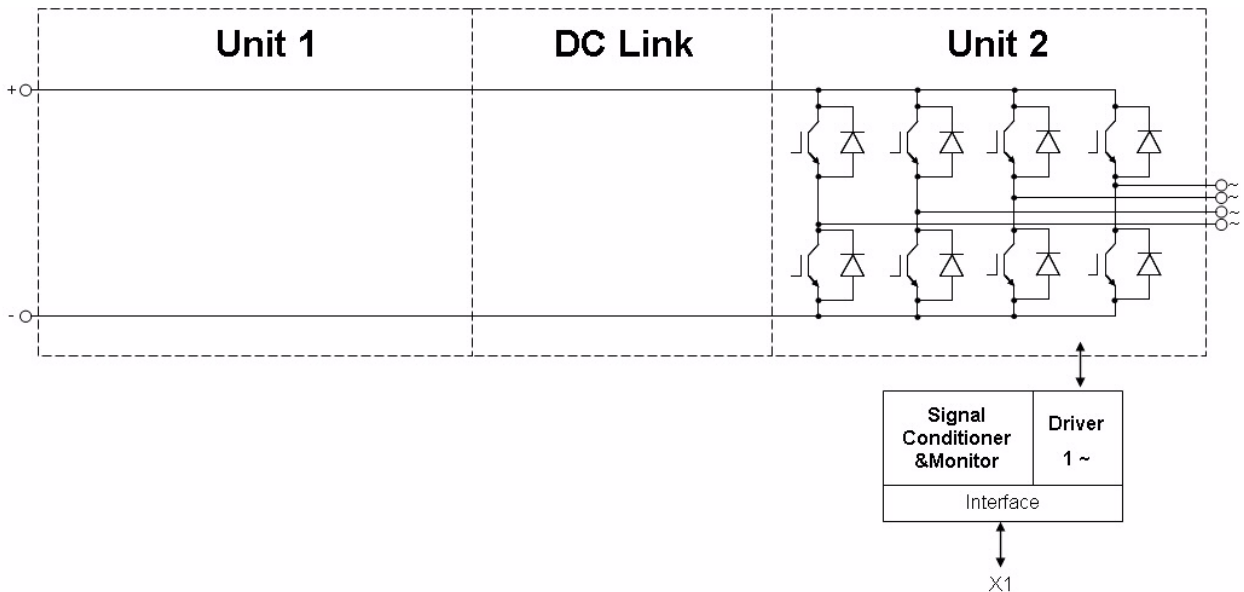
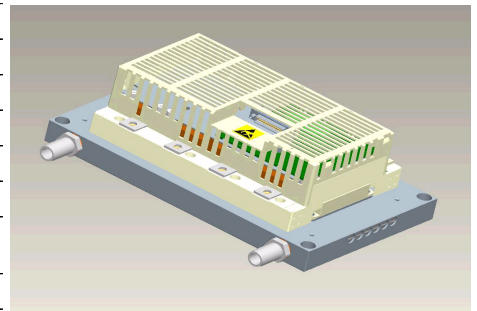
1x 1070A AC at 690V AC, water cooled

General information for:

Stacks for various inverter application. Semiconductors, heat sinks, drivers and sensors included. These are only technical data!

Please read carefully the complete documentation and maintain the proper design environment! Especially note the EMC environment and the controller's functionality.

| | |
|---------------------------|---|
| Topology | 1/2 B2I |
| Application / Modulation | Inverter / Sine |
| Load type | resistive, inductive |
| Cooling | water cooled |
| Market | common industrial, drives, power supply |
| Monitors | current, voltage, temperature |
| Semicond. (Unit 1) | none |
| DC Link | none |
| Semicond. (Unit 2) | IGBT 4x FF300R17KE3 |
| Interface IGBT | electrical CMOS |
| Standards | EN50178, UL94, prepared for UL508C |
| Product ID (eupec) | 32132 |
| Mechanical drawing number | 38000088 |
| Electrical drawing number | 2PS-C4-V |



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Notes

Overvoltage and Overcurrent shutdown reaction time:
- This parameter refers to the customers controller.

Heat sink with aluminum cooling channel.
Composites of fluid: Water and 52 vol. % Antifrogen N

Electrical data

DC Link

| | | | min | typ | max | units |
|----------------------|---------------------|----------|-----|------|------|-------|
| Voltage | | V_{DC} | | 1100 | 1200 | V |
| Overvoltage shutdown | within 5000 μ s | | | 1200 | | V |

Unit 2 AC

| | | | min | typ | max | units |
|----------------------------------|---|----------------------|-------|------|-------|------------|
| Voltage | depending on controller | V_{Unit2} | | 690 | | V_{RMS} |
| Continuous current | $V_{Unit2} = 690V_{RMS}$, $V_{DC} = 1100V$, $T_{inlet} = 40^{\circ}C$, $T_J \leq 125^{\circ}C$, $f_{Unit2} = 50Hz$, $f_{sw2} = 2000Hz$, $\cos(\phi) = 0,85$ | I_{Unit2} | | | 1070 | A_{RMS} |
| Continuous current overload cap. | $T_{inlet} = 40^{\circ}C$, for overload capability 150% for 60s | | | 716 | | A_{RMS} |
| Short time current | $T_{inlet} = 40^{\circ}C$, 10s, every 180s, initial load = 865 A_{RMS} | I_{Unit2} | | | 1081 | A_{RMS} |
| DC current | no rotating field, $T_{inlet} = 40^{\circ}C$ | $I_{Unit2 DC}$ | | | 525,0 | A_{av} |
| Overcurrent shutdown | within 15 μ s | | | 2500 | | A_{peak} |
| Switching frequency | | f_{sw2} | | | 6000 | Hz |
| Power losses | $V_{Unit2} = 690V$, $V_{DC} = 1100V$, $T_{inlet} = 40^{\circ}C$, $T_J \leq 125^{\circ}C$, $f_{Unit2} = 50Hz$, $f_{sw2} = 2000Hz$, $\cos(\phi) = 0,85$, $I_{Unit2} = 1070A_{RMS}$ | P_{loss2} | | 4510 | | W |
| Power factor | | $\cos(\phi)_{Unit2}$ | -1,00 | | 1,00 | |

General data

| | | | min | typ | max | units |
|---------------------------------------|---|----------------|-------------|-----|--------|------------|
| Power losses (PCB) | | $P_{loss aux}$ | | | t.b.d. | W |
| EMC test | according to IEC61800-3 at named interfaces | power | V_{Burst} | 2 | | kV |
| | | control | V_{Burst} | 1 | | kV |
| | | aux (24V) | V_{Surge} | 1 | | kV |
| Insulation management is designed for | | V_{Line} | | 690 | | V_{RMS} |
| Insulation test voltage | according to EN50178, f = 50Hz, t = 60s | V_{isol} | | 2,5 | | kV_{RMS} |

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Controller interface data

| | | | min | typ | max | units |
|------------------------------------|---|------------------|---------------------------|------|------|----------|
| Auxiliary voltage | | V_{aux} | 13 | 24 | 30 | V_{av} |
| Auxiliary power requirement | $V_{aux} = 24V_{av}$ | P_{aux} | 40 | | | W |
| Driver and interface board | see separate technical information | | DR240 | | | |
| Driver core | | | EiceDRIVER 2ED300C17-S | | | |
| Digital input level | resistor to GND 10,0k Ω , capacitor to GND 1nF, high = on, min 15mA | V_{in} | 0,0 | | 15,0 | V |
| Digital output level | open collector, low = ok, max 15mA | V_{out} | 0,0 | | 30,0 | V |
| Analog current outputs Unit 2 | load max 1mA; at 1070A | $V_{ana\ out}$ | 4,30 | 4,39 | 4,48 | V |
| Analog DC Link voltage output | load max 1mA; at 1100V | $V_{DC\ out}$ | 8,07 | 8,23 | 8,39 | V |
| Analog temperature output | load max 1mA; at $T_{NTC} = 67^{\circ}C$ correspond to $T_j = 125^{\circ}C$ | $V_{T\ out}$ | 6,78 | 6,92 | 7,06 | V |
| Overtemperature shutdown | at $T_{NTC} = 67^{\circ}C$ correspond to $T_j = 125^{\circ}C$ | $V_{T\ out\ OT}$ | | 6,92 | | V |
| Overvoltage shutdown reaction time | after overvoltage message by PrimeSTACK interface | | | | 50 | μs |
| Overcurrent shutdown reaction time | after overvoltage message by PrimeSTACK interface | | | | 10 | μs |

Heat sink water cooled / Thermal data

| | | | min | typ | max | units |
|---------------------------------|--|-------------------------------|-----|-----|-----|----------------------|
| Water flow | according cooling water specification from eupec | $\Delta V / \Delta t_{Water}$ | 10 | | | dm ³ /min |
| Water pressure drop | | Δp_{Water} | | 250 | | mbar |
| Water pressure | | | | | 8 | bar |
| Cooling water inlet temperature | | T_{inlet} | -25 | | 40 | $^{\circ}C$ |
| Water connection | | | | 3/4 | | in |

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IGBT data unit 2

| Type | assumed | | min | typ | max | units |
|--|--|---------------|-----|----------|-----|-------|
| collector-emitter saturation voltage | $I_c = 300A; V_{ge} = 15V; T_{vj} = 125^\circ C$ | $V_{CE\ sat}$ | | 2,4 | | V |
| parameter for linear model | $T_{vj} = 25^\circ C$ | V_{ce1} | | 1,025 | | V |
| parameter for linear model | $T_{vj} = 25^\circ C$ | r_{ce1} | | 3,25 | | mΩ |
| parameter for linear model | $T_{vj} = 125^\circ C$ | V_{ce2} | | 0,975 | | V |
| parameter for linear model | $T_{vj} = 125^\circ C$ | r_{ce2} | | 4,75 | | mΩ |
| turn-on / turn-off energy loss per pulse | $T_{vj} = 25^\circ C$ | E_1 | | 71 / 64 | | mJ |
| turn-on / turn-off energy loss per pulse | $T_{vj} = 125^\circ C$ | E_2 | | 105 / 94 | | mJ |
| thermal resistance, junction to case | per IGBT | R_{thjc} | | 0,085 | | K/W |
| thermal resistance, case to heatsink | per IGBT | R_{thch} | | 0,033 | | K/W |

Diode data unit 2

| Type | assumed | | min | typ | max | units |
|--------------------------------------|---|------------|-----|-------|-----|-------|
| forward voltage | $I_F = 300A; V_{ge} = 0V; T_{vj} = 125^\circ C$ | V_F | | 1,9 | | V |
| parameter for linear model | $T_{vj} = 25^\circ C$ | V_{F1} | | 1,035 | | V |
| parameter for linear model | $T_{vj} = 25^\circ C$ | r_{F1} | | 2,55 | | mΩ |
| parameter for linear model | $T_{vj} = 125^\circ C$ | V_{F2} | | 0,925 | | V |
| parameter for linear model | $T_{vj} = 125^\circ C$ | r_{F2} | | 3,25 | | mΩ |
| reverse recovery energy | $T_{vj} = 25^\circ C$ | E_{rec1} | | 40 | | mJ |
| reverse recovery energy | $T_{vj} = 125^\circ C$ | E_{rec2} | | 72 | | mJ |
| thermal resistance, junction to case | per Diode | R_{thjc} | | 0,13 | | K/W |
| thermal resistance, case to heatsink | per Diode | R_{thch} | | 0,051 | | K/W |

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Environmental conditions

| | | | min | typ | max | units |
|----------------------------|---|---------------|------|-----|------|------------------|
| Storage temperature | | T_{stor} | -40 | | 85 | °C |
| Ambient temperature | | T_{amp} | -25 | | 55 | °C |
| Operating temperature | see chapter Heat sink water cooled / Thermal data | | | | | |
| Cooling air velocity (PCB) | | $V_{Air PCB}$ | 2,0 | | | m/s |
| Air pressure | standard atmosphere | p_{Air} | 900 | | 1100 | hPa |
| Humidity | no condensation | Rel. F | 5 | | 85 | % |
| Installation height | | | 0 | | 1000 | m |
| Vibration | according to IEC60721 | | | | 5 | m/s ² |
| Shock | according to IEC60721 | | | | 40 | m/s ² |
| Protection degree | | | IP00 | | | |
| Pollution degree | | | 2 | | | |
| Torque at DC Terminals | | M_{DC} | 6,0 | | 10,0 | Nm |
| Torque at AC Terminals | | M_{AC} | 16,0 | | 20,0 | Nm |
| Dimensions | width × depth × height | | 260 | 360 | 120 | mm |
| Weight with heat sink | approximation | | | 9,4 | | kg |
| Weight without heat sink | approximation | | | 3,8 | | kg |

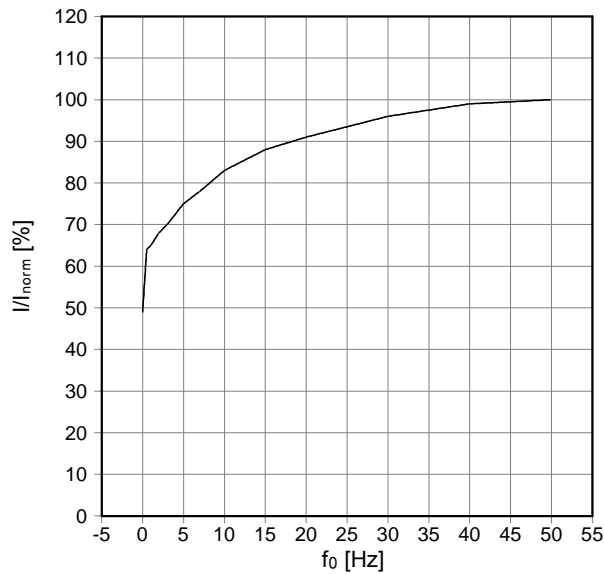
Matching Code

082-12000-1011-0330-0150-400-400-00-060427

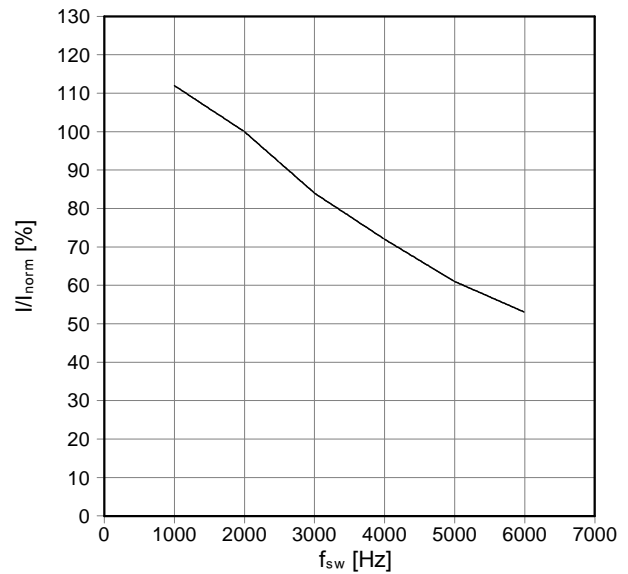
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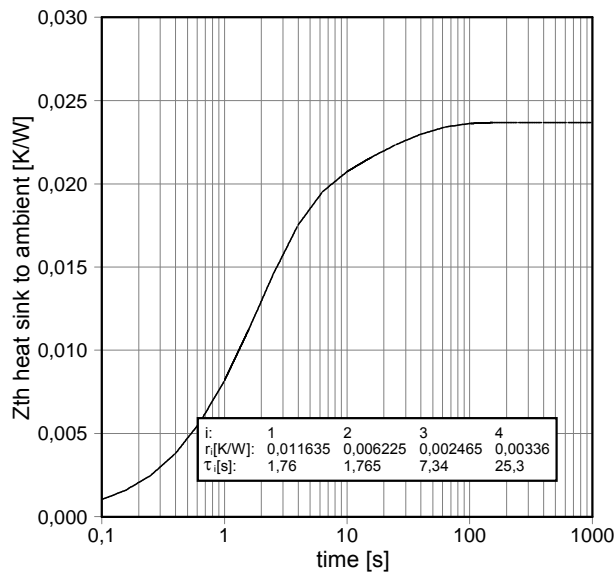
fo - derating curve IGBT (motor)
cos(phi) = 0,85
T_{cool medium} = 40°C



fsw - derating curve IGBT (motor)
cos(phi) = 0,85
T_{cool medium} = 40°C



Transient thermal impedance per module
T_{cool medium} = 40°C



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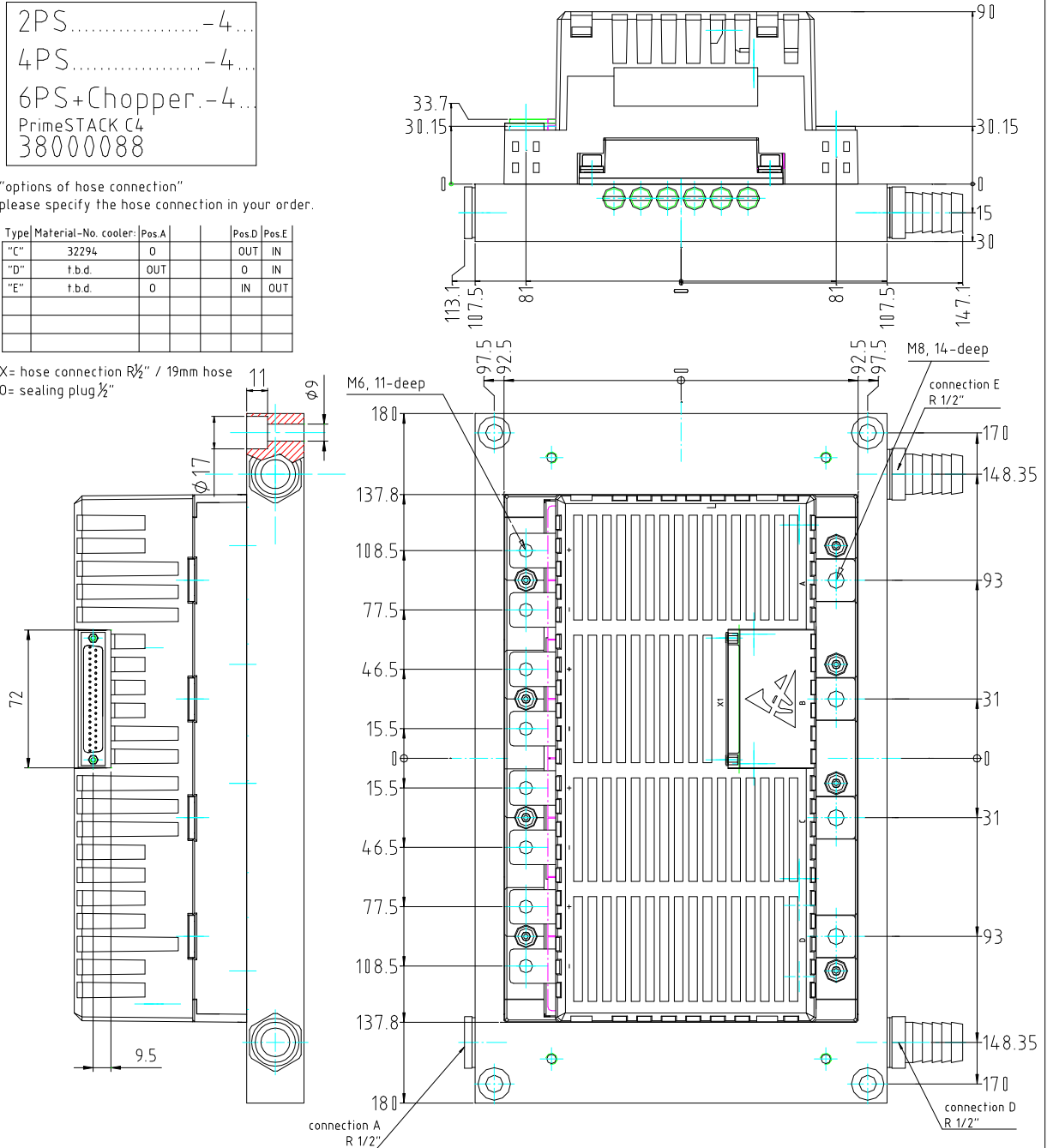
Mechanical drawing

| | |
|---------------|-------|
| 2PS..... | -4... |
| 4PS..... | -4... |
| 6PS+Chopper.. | -4... |
| PrimeSTACK C4 | |
| 38000088 | |

"options of hose connection"
please specify the hose connection in your order.

| Type | Material-No. cooler | Pos.A | Pos.D | Pos.E |
|------|---------------------|-------|-------|-------|
| "C" | 32294 | 0 | OUT | IN |
| "D" | t.b.d. | OUT | 0 | IN |
| "E" | t.b.d. | 0 | IN | OUT |
| | | | | |
| | | | | |

X= hose connection R $\frac{1}{2}$ " / 19mm hose
0= sealing plug $\frac{1}{2}$ "

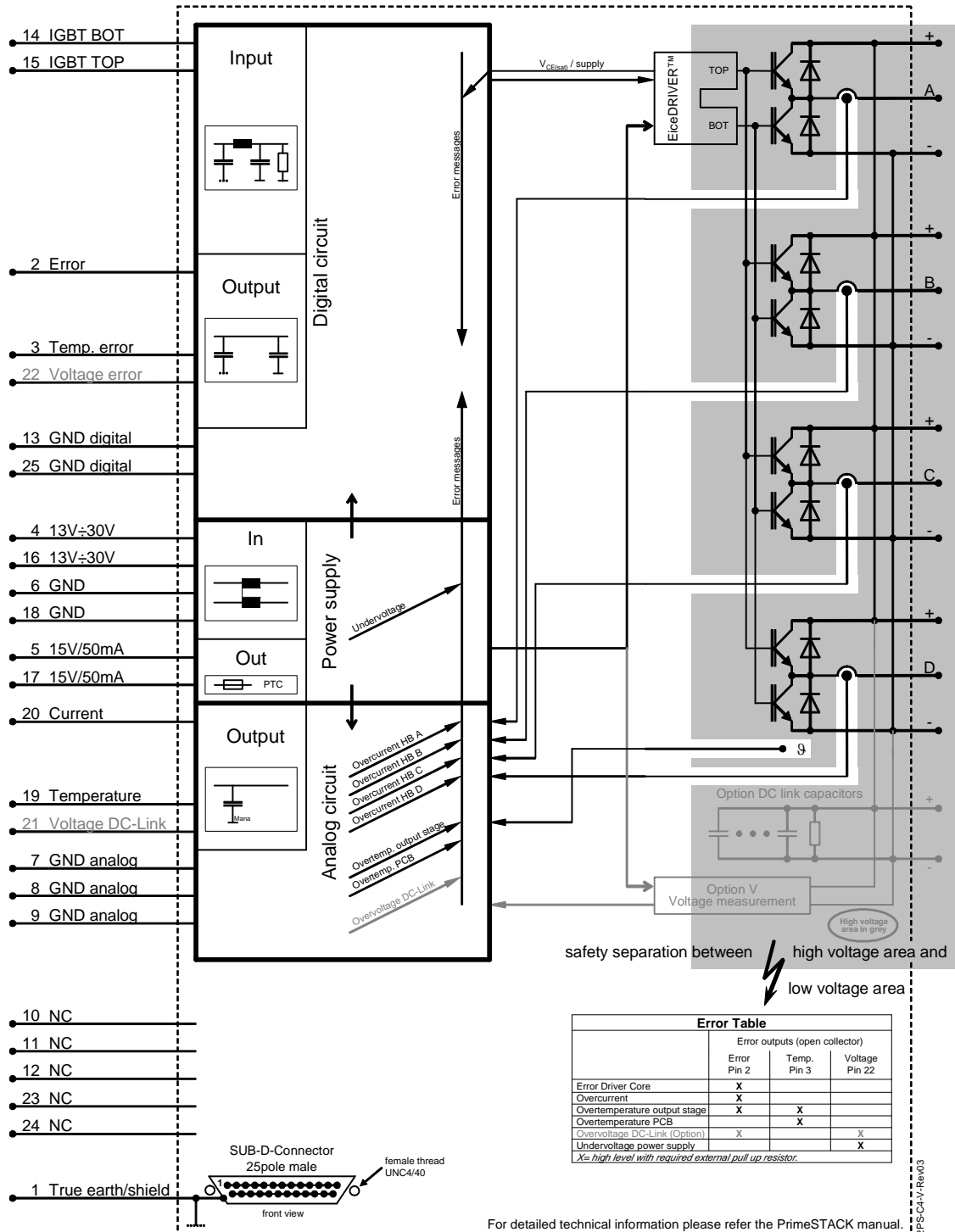


X1:

- 2PS : SUB-D-Connector 25 pole, male
- 4PS : SUB-D-Connector 37 pole, male
- 6PS+Chopper : SUB-D-Connector 37 pole, male

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Circuit diagram



| | Error Table | | |
|------------------------------|--------------------------------|-------------|----------------|
| | Error outputs (open collector) | | |
| | Error Pin 2 | Temp. Pin 3 | Voltage Pin 22 |
| Error Driver Core | X | | |
| Overcurrent | X | | |
| Overtemperature output stage | X | X | |
| Overtemperature PCB | | X | |
| Overvoltage DC-Link (Option) | X | | X |
| Undervoltage power supply | | | X |

X = high level with required external pull up resistor.

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Sicherheitshinweise

Bevor Sie mit der Installation und dem Betrieb der Baugruppe beginnen, lesen Sie bitte sorgfältig alle Sicherheitshinweise, Warnungen und beachten Sie die angebrachten Warnschilder. Vergewissern Sie sich, dass alle Warnschilder in leserlichem Zustand verbleiben und fehlende oder beschädigte Schilder ersetzt werden.

Safety Instructions

Prior to installation and operation, all safety notices and warnings and all warning signs attached to the equipment have to be carefully read. Make sure that all warning signs remain in a legible condition and that missing or damaged signs are replaced. To installation and operation, all safety notices and warnings and all warning signs attached to the equipment have to be carefully read. Make sure that all warning signs remain in a legible condition and that missing or damaged signs are replaced.

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