Technical Information

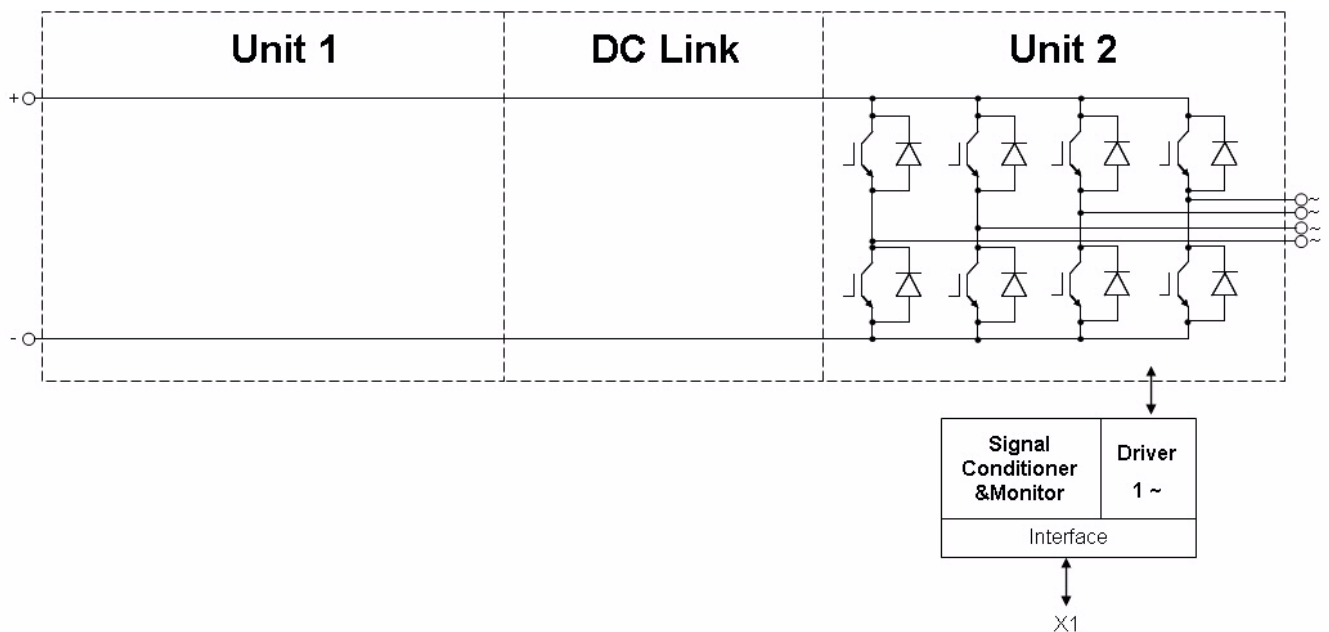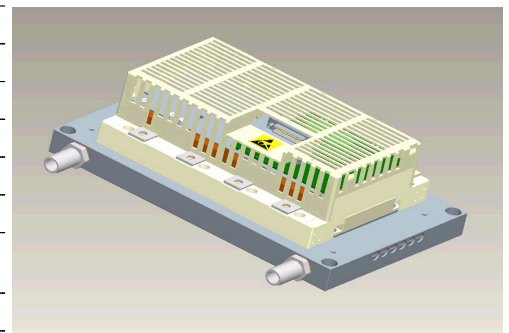PrimeSTACK **2PS1200R17KE3-4WHV**

Infineon

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

prepared by: Hoelbe Oliver	date of publication: 2008-09-18
approved by: Jürgen Schiele	revision: 2.1

Vorläufige Daten
preliminary data

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 5000µs			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°C, T_J ≤ 125°C, f_{Unit2} = 50Hz, f_{sw2} = 2000Hz, cos(phi) = 0,85	I_{Unit2}			1070	A_{RMS}
Continuous current overload cap.	T_{inlet} = 40°C, for overload capability 150% for 60s			716		A_{RMS}
Short time current	T_{inlet} = 40°C, 10s, every 180s, initial load = 865A_{RMS}	I_{Unit2}			1081	A_{RMS}
DC current	no rotating field, T_{inlet} = 40°C	$I_{Unit2\ DC}$			525,0	A_{av}
Overcurrent shutdown	within 15µs			2500		A_{peak}
Switching frequency		f_{sw2}			6000	Hz
Power losses	V_{Unit2} = 690V, V_{DC} = 1100V, T_{inlet} = 40°C, T_J ≤ 125°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}

**Vorläufige Daten
preliminary data**

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 10,0kΩ, 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 $T_{NTC} = 67°C$ correspond to $T_j = 125°C$	$V_{T\,out}$	6,78	6,92	7,06	V
Overtemperature shutdown	at $T_{NTC} = 67°C$ correspond to $T_j = 125°C$	$V_{T\,out\,OT}$		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			dm³/min
Water pressure drop		Δp_{Water}		250		mbar
Water pressure					8	bar
Cooling water inlet temperature		T_{inlet}	-25		40	°C
Water connection				3/4		in

Vorläufige Daten
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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°C	$V_{CE\ sat}$		2,4		V
parameter for linear model	T_{vj} = 25°C	V_{ce1}		1,025		V
parameter for linear model	T_{vj} = 25°C	r_{ce1}		3,25		mΩ
parameter for linear model	T_{vj} = 125°C	V_{ce2}		0,975		V
parameter for linear model	T_{vj} = 125°C	r_{ce2}		4,75		mΩ
turn-on / turn-off energy loss per pulse	T_{vj} = 25°C	E_1		71 / 64		mJ
turn-on / turn-off energy loss per pulse	T_{vj} = 125°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°C	V_F		1,9		V
parameter for linear model	T_{vj} = 25°C	V_{F1}		1,035		V
parameter for linear model	T_{vj} = 25°C	r_{F1}		2,55		mΩ
parameter for linear model	T_{vj} = 125°C	V_{F2}		0,925		V
parameter for linear model	T_{vj} = 125°C	r_{F2}		3,25		mΩ
reverse recovery energy	T_{vj} = 25°C	E_{rec1}		40		mJ
reverse recovery energy	T_{vj} = 125°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

Vorläufige Daten
preliminary data

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/s²
Shock	according to IEC60721				40	m/s²
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
082-12000-1011-0330-0150-400-400-400-00-060427

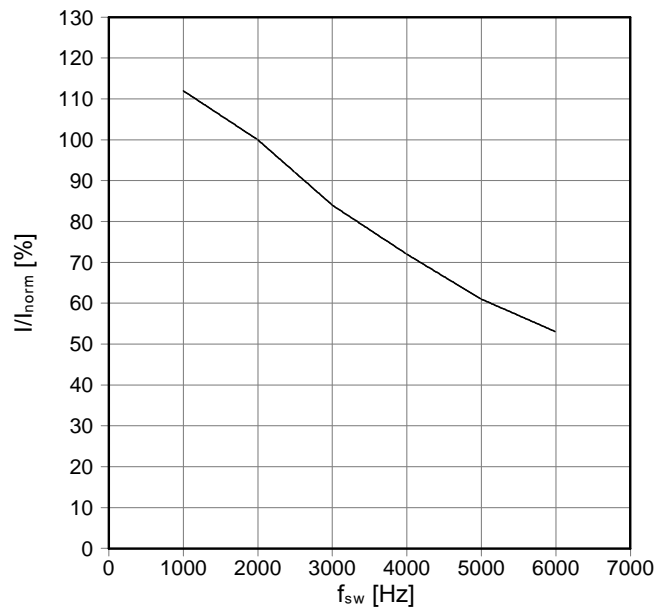|	
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Vorläufige Daten
preliminary data

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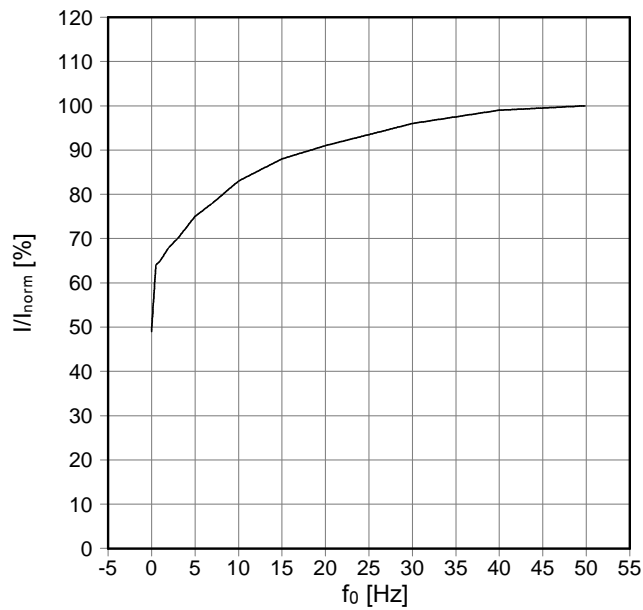
fsw - derating curve IGBT (motor)
cos(phi) = 0,85
$T_{cool\ medium}$ = 40°C

Transient thermal impedance per module
$T_{cool\ medium}$ = 40°C
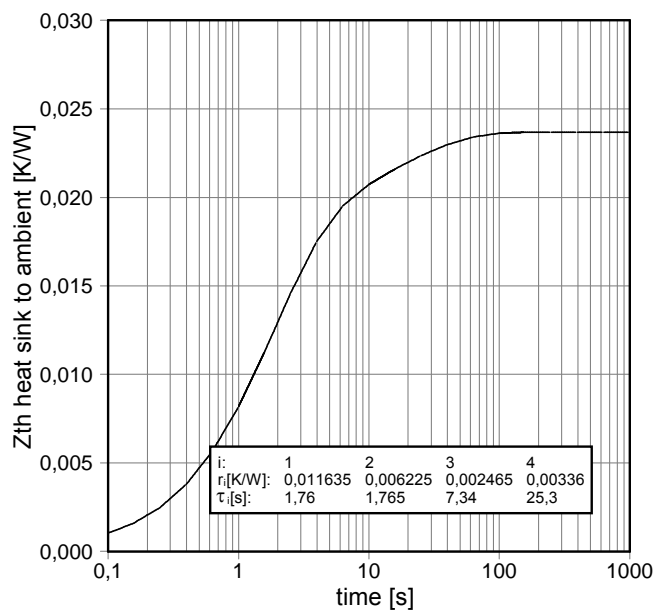
i:	1	2	3	4
r_i[K/W]:	0,011635	0,006225	0,002465	0,00336
τ_i[s]:	1,76	1,765	7,34	25,3

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Technical Information

PrimeSTACK **2PS1200R17KE3-4WHV**

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Vorläufige Daten
preliminary data

Mechanical drawing

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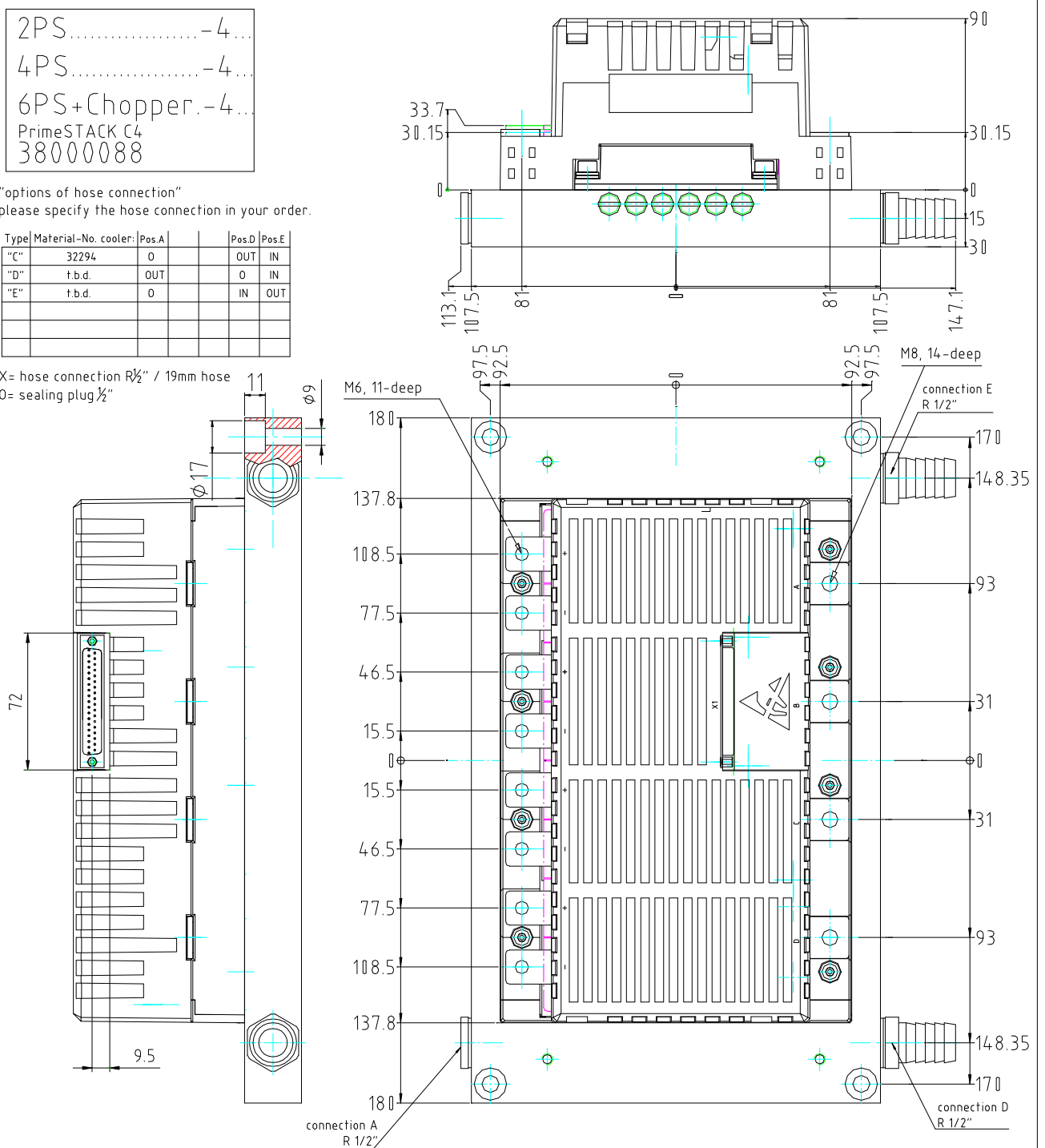6PS+Chopper.-4...
PrimeSTACK C4
38000088

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

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

X= hose connection R½" / 19mm hose
O= sealing plug ½"

M6, 11-deep

M8, 14-deep
connection E
R 1/2"

connection A
R 1/2"

connection D
R 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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Technical Information

PrimeSTACK **2PS1200R17KE3-4WHV**

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Vorläufige Daten
preliminary data

Circuit diagram

14 IGBT BOT
15 IGBT TOP

Input

2 Error

Output

3 Temp. error
22 Voltage error

13 GND digital
25 GND digital

4 13V÷30V
16 13V÷30V
6 GND
18 GND

In

5 15V/50mA
17 15V/50mA

Out
PTC

20 Current

Output

19 Temperature
21 Voltage DC-Link
7 GND analog
8 GND analog
9 GND analog

Digital circuit

Power supply

Analog circuit

Error messages

Error messages

Undervoltage

Overcurrent HB A
Overcurrent HB B
Overcurrent HB C
Overcurrent HB D

Overtemp. output stage
Overtemp. PCB

Overvoltage DC-Link

$V_{CE(sat)}$ / supply

EiceDRIVER™

TOP
BOT

+ A -
+ B -
+ C -
+ D -

ϑ

Option DC link capacitors

Option V
Voltage measurement

High voltage area in grey

safety separation between high voltage area and

low voltage area

10 NC
11 NC
12 NC
23 NC
24 NC

1 True earth/shield

SUB-D-Connector
25pole male

female thread
UNC4/40

front view

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.			

For detailed technical information please refer the PrimeSTACK manual.

2PS-C4-V-Rev03

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 - the conclusion of Quality Agreements;
 - to establish joint measures of an ongoing product survey,
   and that we may make delivery depended on the realization
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**Vorläufige Daten
preliminary data**

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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