Technical Information

ModSTACK™ 6MS2400R17KE3-3G-C20MVTIOIN

Vorläufige Daten
preliminary data

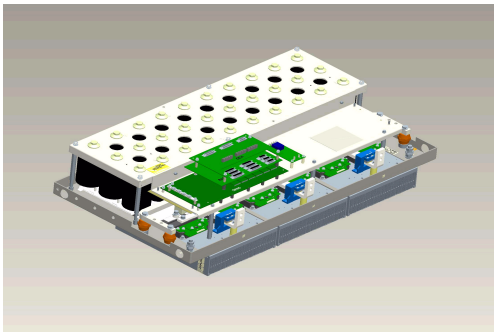
Key data

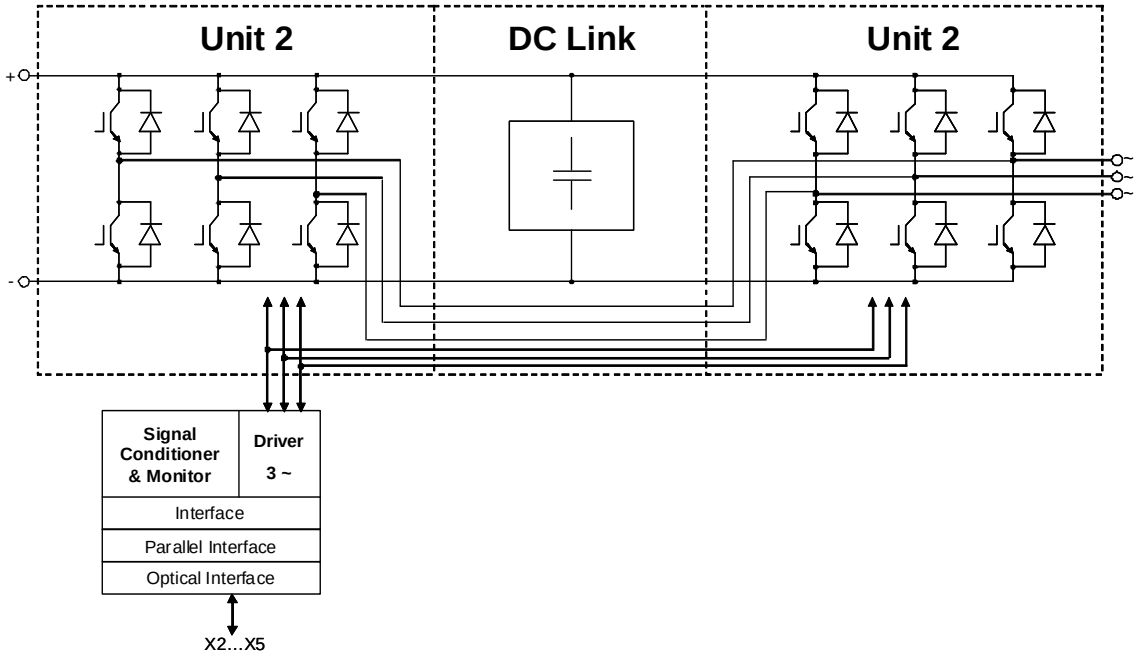
3x 800A rms at 400V rms, forced air (fan not implemented)

General information

Stacks for various inverter application. Semiconductors, heat sinks, capacitors, 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		DC Link + B6I
Application / Modulation		Inverter / Sine
Load type		resistive, inductive
Cooling		forced air (fan not implemented)
Market		common industrial, drives, power supply
Implemented sensors		current, voltage, temperature
Semicond. (Unit 1)		none
DC Link		18.8mF
Semicond. (Unit 2)	IGBT	6x FF1200R17KE3_B2
Driver signals IGBT		optical
Standards		EN50178
Sales - name		6MS24017E33G32859
Internal ID		32859
Mechanical drawing number		32859_MB
Electrical drawing number		ModSTACK B6_01_OEA101_Rev02





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Electrical data

DC Link			min	typ	max	units
Voltage		V_{DC}		932	1200	V
Overvoltage shutdown	within 150µs			1250		V

Unit 2 AC			min	typ	max	units
Voltage	depending on controller	V_{Unit2}		400		V_{RMS}
Continuous current	V_{Unit2} = 400V_{RMS}, V_{DC} = 932V, T_{inlet} = 25°C, $T_J \leq$ 125°C, f_{Unit2} = 2Hz, f_{sw2} = 2500Hz, cos(phi) = 0,87	I_{Unit2}			800	A_{RMS}
Continuous current overload cap.	T_{inlet} = 25°C, for overload capability 150% for 60s			573		A_{RMS}
Short time current	T_{inlet} = 25°C, 10s, every 180s, initial load = 717A_{RMS}	I_{Unit2}			896	A_{RMS}
DC current	no rotating field, T_{inlet} = 25°C	$I_{Unit2\ DC}$			350,0	A_{av}
Overcurrent shutdown	within 15µs			3800		A_{peak}
Switching frequency		f_{sw2}			2500	Hz
Power losses	V_{Unit2} = 400V, V_{DC} = 932V, T_{inlet} = 25°C, $T_J \leq$ 125°C, f_{Unit2} = 2Hz, f_{sw2} = 2500Hz, cos(phi) = 0,87, I_{Unit2} = 800A_{RMS}	P_{loss2}		9980		W
Power factor		$cos(phi)_{Unit2}$	-1,00		1,00	

General data				min	typ	max	units
Power losses (PCB and capacitor)			$P_{loss\ aux}$			220	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}

Important component data

			min	typ	max	units
DC Link capacitor		C_{DC}		18,80		mF
		type		Electrolytic Capacitor		

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Controller interface data

			min	typ	max	units
Auxiliary voltage		V_{aux}	18	24	30	V_{av}
Auxiliary power requirement	V_{aux} = 24V_{av}	P_{aux}		40		W
Driver and interface board	see separate technical information			TR110 / DR110		
Driver core				EiceDRIVER 2ED300C17-S		
Parallel interface board	see separate technical information			SAD101		
Digital input level	resistor to GND 1,8kΩ, capacitor to GND 4nF, high = on, min 15mA	V_{in}	0,0		15,0	V
Digital output level	open collector, low = ok, max 15mA	V_{out}	0,0		15,0	V
Analog current outputs Unit 2	load max 1mA; at 800A	$V_{ana\ out}$	3,99	4,07	4,15	V
Analog DC Link voltage output	load max 1mA; at 932V	$V_{DC\ out}$	6,56	6,69	6,82	V
Analog temperature output	load max 1mA; at T_{NTC} = 62°C correspond to T_j = 125°C	$V_{T\ out}$	9,21	9,40	9,59	V
Overtemperature shutdown	at T_{NTC} = 66°C correspond to T_j = 135°C	$V_{T\ out\ OT}$		10		V
Overvoltage shutdown reaction time	after overvoltage message by ModSTACK™ interface				50	µs
Overcurrent shutdown reaction time	after overcurrent message by ModSTACK™ interface				10	µs
Optical interface board	see separate technical information			OEA101		
Optical input power				12		µW
Optical output power					60	µW

Heat sink air cooled / Thermal data

			min	typ	max	units
Airflow	T_{Air} = 20°C, Pair = 1013hPa, dry- and dust free, measured on side of heat sink. according to DIN 41882	$\Delta V/\Delta t_{Air}$	3800			m³/h
Air pressure drop		Δp_{Air}		520		Pa
Cooling air inlet temperature	heat sink temperature > -25°C	T_{inlet}	-25		25	°C

IGBT data unit 2

			min	typ	max	units
Type	assumed					
collector-emitter saturation voltage	I_c = 1200A; V_{ge} = 15V; T_{vj} = 125°C	$V_{CE\ sat}$		2,4		V
parameter for linear model	T_{vj} = 25°C	V_{ce1}		1,1		V
parameter for linear model	T_{vj} = 25°C	r_{ce1}		0,75		mΩ
parameter for linear model	T_{vj} = 125°C	V_{ce2}		1		V
parameter for linear model	T_{vj} = 125°C	r_{ce2}		1,167		mΩ
turn-on / turn-off energy loss per pulse	T_{vj} = 25°C	E_1		240 / 305		mJ
turn-on / turn-off energy loss per pulse	T_{vj} = 125°C	E_2		350 / 445		mJ
thermal resistance, junction to case	per IGBT	R_{thjc}		0,019		K/W
thermal resistance, case to heatsink	per IGBT	R_{thch}		0,023		K/W

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Diode data unit 2

			min	typ	max	units
Type	assumed					
forward voltage	I_F = 1200A; V_{ge} = 0V; T_{vj} = 125°C	V_F		1,9		V
parameter for linear model	T_{vj} = 25°C	V_{F1}		1,15		V
parameter for linear model	T_{vj} = 25°C	r_{F1}		0,542		mΩ
parameter for linear model	T_{vj} = 125°C	V_{F2}		1		V
parameter for linear model	T_{vj} = 125°C	r_{F2}		0,75		mΩ
reverse recovery energy	T_{vj} = 25°C	E_{rec1}		190		mJ
reverse recovery energy	T_{vj} = 125°C	E_{rec2}		340		mJ
thermal resistance, junction to case	per Diode	R_{thjc}		0,042		K/W
thermal resistance, case to heatsink	per Diode	R_{thch}		0,052		K/W

Environmental conditions

			min	typ	max	units
Storage temperature		T_{stor}	-40		65	°C
Ambient temperature	minimum 0°C for optional optical interface	T_{amb}	-25		55	°C
Operating temperature	see chapter Heat sink air cooled / Thermal data					
Cooling air velocity (PCB and capacitor)		$V_{Air\ PCB}$	2,0			m/s
Air pressure	standard atmosphere	p_{Air}	900		1100	hPa
Humidity	no condensation	Rel. F	0		95	%
Installation height			0		1000	m
Vibration	according to EN60068				10	m/s²
Continuous vibration	according to EN60068				20	m/s²
Shock	according to EN60068				100	m/s²
Protection degree			IP00			
Pollution degree			2			
Dimensions	width × depth × height		1090	596	330	mm
Weight with heat sink	approximation			110,0		kg

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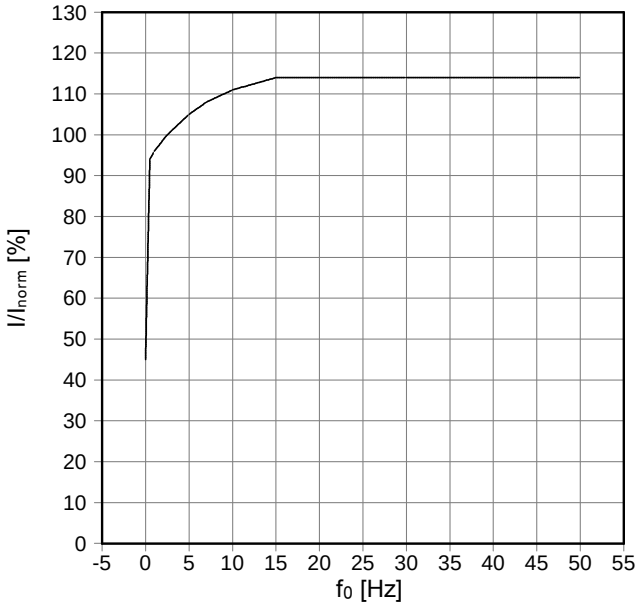
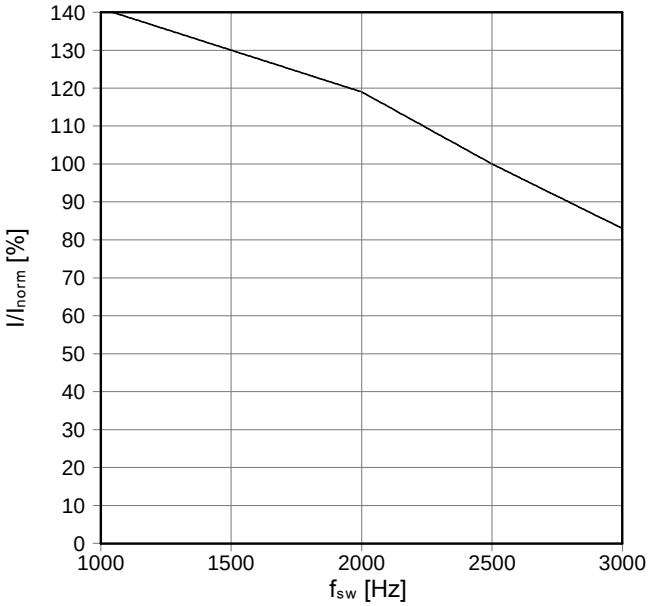
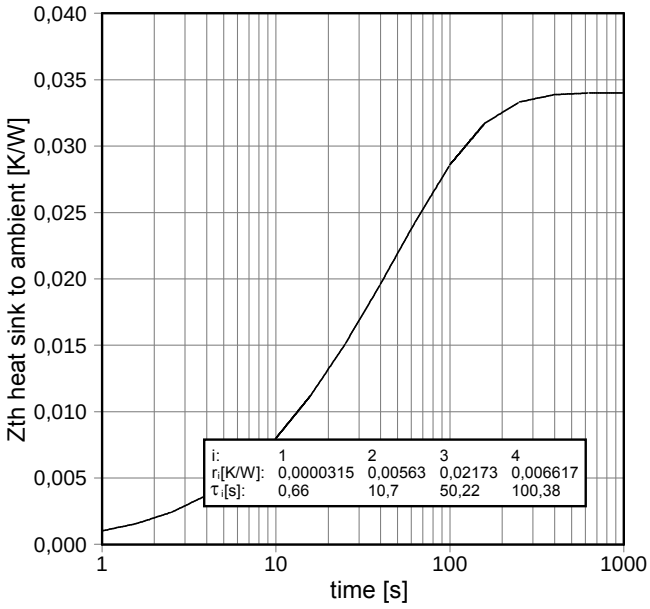
fo - derating curve IGBT (motor)
cos(phi) = 0,87
$T_{cool\ medium}$ = 25°C



fsw - derating curve IGBT (motor)
cos(phi) = 0,87
$T_{cool\ medium}$ = 25°C



Transient thermal impedance per module
$T_{cool\ medium}$ = 25°C



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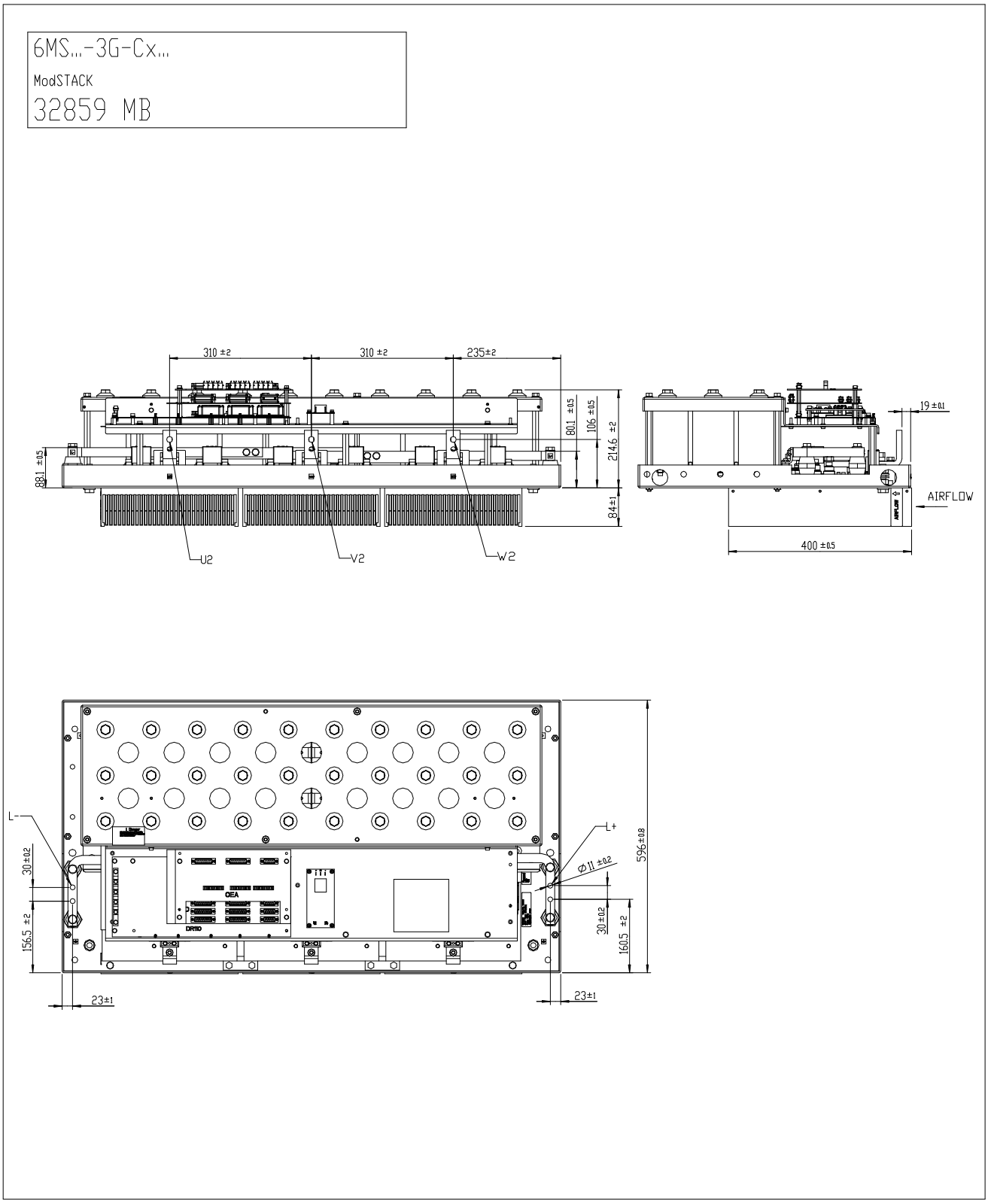
Mechanical drawing



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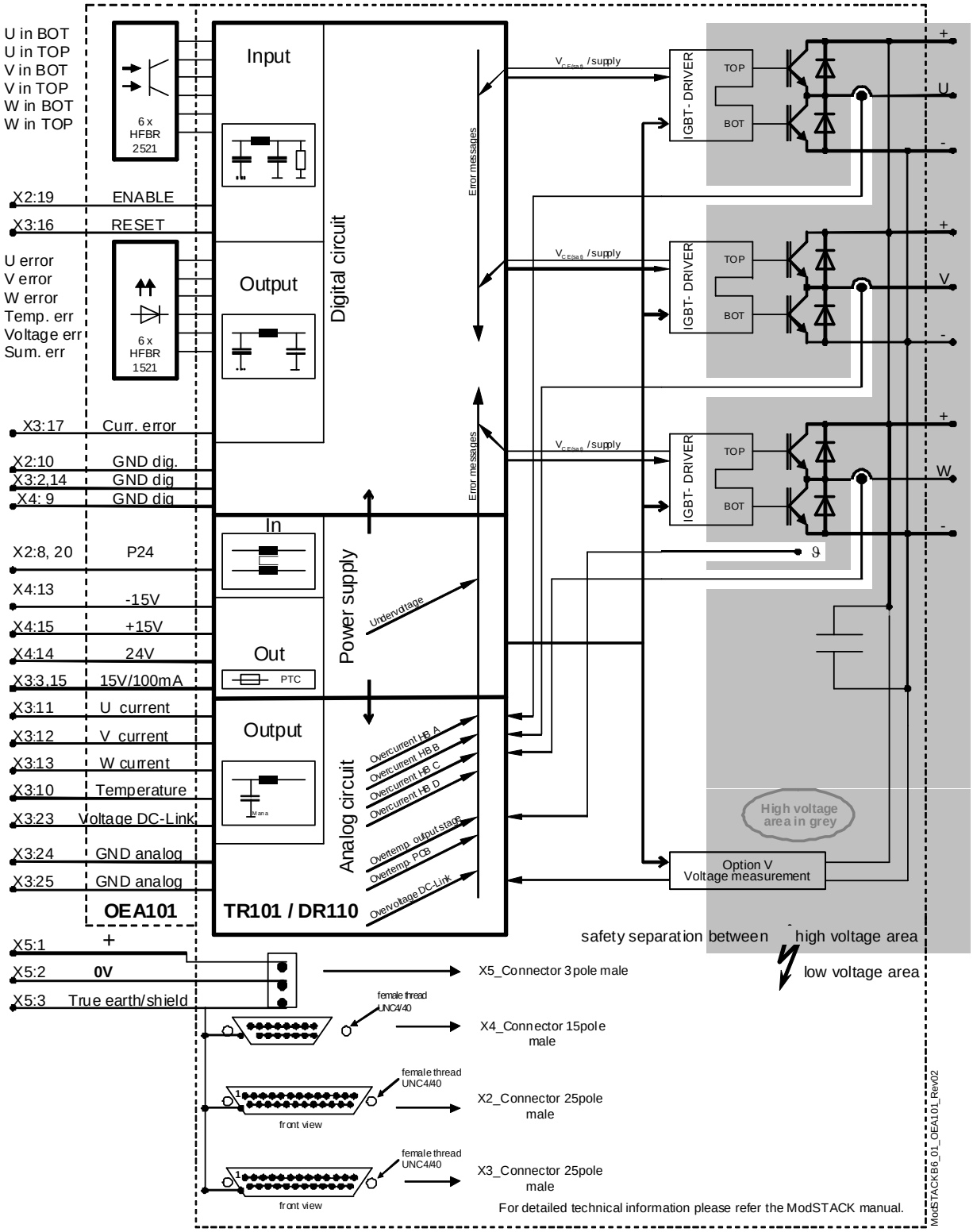
Circuit diagram



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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.

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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.