



Measured Values and Parameters

**SUNNY BOY 2000HF/2500HF/3000HF**

**SUNNY BOY 3000TL/4000TL/5000TL**

**SUNNY TRIPOWER 10000TL/12000TL/15000TL/17000TL**

**WINDY BOY 3600TL/5000TL**

Technical Description





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# 1 Notes on this Manual

## 1.1 Scope of Validity

This manual describes measured values, operating parameters, and event messages for the following SMA inverters:

- Sunny Boy 2000HF (SB 2000HF-30)
- Sunny Boy 2500HF (SB 2500HF-30)
- Sunny Boy 3000HF (SB 3000HF-30)
- Sunny Boy 3000TL (SB 3000TL-20)
- Sunny Boy 4000TL (SB 4000TL-20)
- Sunny Boy 5000TL (SB 5000TL-20)
- Sunny Tripower 10000TL (STP 10000TL-10)
- Sunny Tripower 12000TL (STP 12000TL-10)
- Sunny Tripower 15000TL (STP 15000TL-10)
- Sunny Tripower 17000TL (STP 17000TL-10)
- Windy Boy 3600TL (WB 3600TL-20)
- Windy Boy 5000TL (WB 5000TL-20)


The information is valid for the inverter's current firmware version.

## 1.2 Target Group

This manual is for operators and installers. Some parameters in this manual may only be changed by trained and qualified personnel.

## 1.3 Symbols Used

The following types of safety precautions and general information are used in this manual:

	<b>DANGER!</b>
"DANGER" indicates a hazardous situation which, if not avoided, will result in death or serious injury.	



### Information

Information provides tips that are valuable for the optimal installation and operation of your product.

## 1.4 Communication Protocols



### Communication protocol DATA I, DATA II, and DATA II+

Depending on the mode of communication (RS485 or *Bluetooth*® Wireless Technology), the inverter uses a different communication protocol. Measured values, operating parameters, and event messages will be displayed in different ways.

- Communication via RS485: DATA I
- Communication via *Bluetooth* and Sunny Data Control from version 4.0: DATA II (only SB XXXXTL-20 from firmware version 1.70 to 2.00)
- Communication via *Bluetooth* and Sunny Explorer: DATA II+ (SB XXXXTL-20 only from firmware version 2.00)



## 1.5 Measured Values

The inverter measures signals during operation. The signals are depicted and stored in a communication device or communication software in the form of measured values.


The measured values in this manual are categorized according to communication protocol. For an explanation of the values for Data I and Data II, refer to the descriptions under Data II+. The type of inverter will determine which measured values your inverter will display. Some measured values can be viewed only by the installer.

## 1.6 Operating Parameters

The various operating parameters control the functionality of the inverter. They can only be viewed and changed using a communication device or communication software.

The operating parameters in this manual are categorized according to communication protocol. For an explanation of the parameters for Data I and Data II, refer to the descriptions under Data II+. The type of inverter will determine which operating parameters your inverter will display. Some operating parameters can only be viewed and changed by the installer. There are also display parameters that cannot be changed.

Parameters designated with \* are safety-related grid monitoring parameters. In order to change SMA Grid Guard parameters, you will need to enter the SMA Grid Guard Code. The application form is located in the download area at [www.SMA.de/en](http://www.SMA.de/en), in the "Certificate" category for each inverter. The default settings vary according to the selected country standard.

	<b>DANGER!</b> Danger to life through changing the inverter's internal safety specifications.
Unauthorized changes to the SMA Grid Guard parameters will void the operating license.	
<ul style="list-style-type: none"><li>• Only change SMA Grid Guard parameters with the express permission of the utility operator.</li></ul>	

## 1.7 Event Messages

Section 2.3 "Event Messages" (page 17) for Data I and section 4.3 "Event Messages" (page 81) for Data II+ contain an overview of the event messages sent by the inverter when an update is carried out or an error arises. Some event messages can only be viewed by the installer.

## 2 DATA I

### 2.1 Measured Values

Name	Description
A.Ms.Amp, B.Ms.Amp, A1.Ms.Amp, A2.Ms.Amp, A3.Ms.Amp, A4.Ms.Amp, A5.Ms.Amp, B1.Ms.Amp	See "DC current input" (page 26)
A.Ms.Vol, B.Ms.Vol	See "DC voltage input" (page 26)
A.Ms.Watt, B.Ms.Watt	See "DC power input" (page 26)
ComRev	See "Communication version" (page 29)
Default	See "Condition" (page 24)
dI	See "Residual current" (page 26)
E-total	See "Total yield" (page 26)
Error-Cnt	See "Number of events for installer" (page 24)
Fac	See "Grid frequency" (page 27)
Grid-on	See "Number of grid connections" (page 26)
GridMs.A.phsA	See "Phase currents, phase L1" (page 27)
GridMs.A.phsB	See "Phase currents, phase L2" (page 27)
GridMs.A.phsC	See "Phase currents, phase L3" (page 27)
GridMs.Hz	See "Grid frequency" (page 27)
GridMs.PhV.phsA	See "Phase voltages, phase L1" (page 27)
GridMs.PhV.phsB	See "Phase voltages, phase L2" (page 27)
GridMs.PhV.phsC	See "Phase voltages, phase L3" (page 27)
GridMs.TotPF	See "Displacement power factor" (page 27)
GridMs.TotVA	See "Apparent power" (page 27)
GridMs.TotVANom	See "Normalized total apparent power" (page 27)
GridMs.TotVAr	See "Reactive power" (page 27)
GridMs.VA.phsA	See "Apparent power L1" (page 28)
GridMs.VA.phsB	See "Apparent power L2" (page 28)
GridMs.VA.phsC	See "Apparent power L3" (page 28)
GridMs.VAr.phsA	See "Reactive power L1" (page 28)
GridMs.VAr.phsB	See "Reactive power L2" (page 28)
GridMs.VAr.phsC	See "Reactive power L3" (page 28)
GridMs.W.phsA	See "Phase power, phase L1" (page 27)
GridMs.W.phsB	See "Phase power, phase L2" (page 27)
GridMs.W.phsC	See "Phase power, phase L3" (page 27)
h-On	See "Feed-in time" (page 26)

<b>Name</b>	<b>Description</b>
h-total	See "Operating time" (page 26)
Hardware-BFS	See "Hardware version of the central assembly" (page 72)
Inv.OuWModSet	See "Temporal control of the power limitation" (page 34)
Inv.TmpLimStt	See "Derating" (page 24)
Ipv DC-A	See "DC current input" (page 26)
Ipv DC-B	See "DC current input" (page 26)
Ipv DC-C	See "DC current input" (page 26)
Iso.FlItA	See "Residual current" (page 26)
LCD.swRev	See "Firmware version of the display" (page 71)
MPPShdw.CycTms	See "Cycle time of the OptiTrac Global Peak algorithm" (page 41)
MPPShdw.IsOn	See "OptiTrac Global Peak switched on" (page 41)
Mt.TotOpTmh	See "Feed-in time" (page 26)
Mt.TotTmh	See "Operating time" (page 26)
Op.EvtCntIstl	See "Number of events for installer" (page 24)
Op.EvtCntUsr	See "Number of events for user" (page 24)
Op.GriSwCnt	See "Number of grid connections" (page 26)
Op.GriSwStt	See "Grid relay status" (page 24)
Op.InvCtl.Stt	See "Status, device control" (page 25)
Op.PlntCtl.Stt	See "Status, plant control" (page 24)
Pac	See "Power" (page 27)
PlntCtlStt	See "Status, plant control" (page 24)
PPV DC-A	See "DC power input" (page 26)
PPV DC-B	See "DC power input" (page 26)
PPV DC-C	See "DC power input" (page 26)
Riso	See "Insulation resistance" (page 26)
Sac	See "Apparent power" (page 27)
Vac L1	See "Phase voltages, phase L1" (page 27)
Vac L2	See "Phase voltages, phase L2" (page 27)
Vac L3	See "Phase voltages, phase L3" (page 27)
Vpv DC A	See "DC voltage input" (page 26)
Vpv DC B	See "DC voltage input" (page 26)
Vpv DC C	See "DC voltage input" (page 26)

## 2.2 Operating Parameters

Name	Description
A.Const.VSet, B.Const.VSet	See "Voltage setpoint" (page 40)
A.StrTms, B.StrTms	See "Start delay" (page 40)
A.VStr, B.VStr	See "Critical voltage to start feed-in" (page 40)
ACVtgRPro	See "Voltage increase protection*" (page 69)
AID.Alpha	See "Escalation factor*" (page 60)
AID.AngFact	See "Escalation factor*" (page 60)
Aid.AsymDetMax	See "Permissible grid unbalance of islanding detection*" (page 63)
Aid.AsymDetMaxT	See "Trip.time of islanding detection unbalance detect.*" (page 62)
Aid.AsymDetStt	See "Status of islanding detection unbalance detection*" (page 63)
Aid.HzMonStt	See "Status of islanding detection frequency monitor*" (page 62)
Aid.HzMonTmms	See "Tripping time of islanding detection frq. monitor*" (page 61)
AMaxOfs	See "Tripping threshold DC current monitoring*" (page 44)
AMaxOfsTms	See "Tripping time DC current monitoring*" (page 45)
BT.swRev	See "Firmware version of the Bluetooth component" (page 71)
BtPwr	See "Maximum Bluetooth transmission power*" (page 71)
CmpMain.SerNum	See "Serial number of the central assembly" (page 72)
CmpMain.Susyld	See "SUSyID of the central assembly" (page 72)
Cntry	See "Set country standard" (page 43)
CntrySet	See "Set country standard*" (page 43)
ComRev	See "Communication version" (page 29)
CoolSys.FanTst	See "Fan test" (page 31)
CPLD.RevVer	See "Revision status of the logic component" (page 72)
CPLD.swRev	See "Firmware version of the logic component" (page 72)
DGS-ArGraMod	See "Reactive current droop, full dynamic grid support configuration" (page 74)
DGS-ArGraNom	See "Gradient K or reactive current droop, full dynamic grid support configuration" (page 75)
DGS-DbVolNomMax	See "Upper limit, voltage dead band, full dynamic support configuration" (page 75)
DGS-DbVolNomMin	See "Lower limit, voltage dead band, full dynamic grid support configuration" (page 75)
DGS-DGSMod	See "Operating mode of dynamic grid support, dynamic grid support configuration" (page 74)
DGS-HystVolNom	See "Hysteresis voltage, dynamic grid support configuration" (page 74)
DGS-PWMTms	See "PWM inversion delay, dynamic grid support configuration" (page 74)

Name	Description
DGS-PWMVolNom	See "PWM inverse voltage, dynamic grid support configuration" (page 74)
dlSens.hwRev	See "Hardware version of the residual current mon. unit" (page 71)
dlSens.RevVer	See "Revision status of the residual current mon. unit" (page 72)
dlSens.swRev	See "Firmware version of the residual current mon. unit" (page 71)
E_total	See "Set total yield" (page 41)
Fac-delta-Fast	See "Frequency monitoring lower minimum threshold*" (page 54)
Fac-delta+Fast	See "Frequency monitoring upper maximum threshold*" (page 51)
Fac-Limit delta	See "Endpoint of the power control via frequency" (page 42)
Fac-Max	See "Frequency monitoring lower maximum threshold*" (page 52)
Fac-Max-Fast-Tm	See "Frq. monitoring upper max. threshold trip. time*" (page 55)
Fac-Max-Tm	See "Frq. monitoring lower max. threshold trip. time*" (page 56)
Fac-Min	See "Frequency monitoring upper minimum threshold*" (page 53)
Fac-Min-Fast-Tm	See "Frq. monitoring lower min. threshold trip. time*" (page 58)
Fac-Min-Tm	See "Frq. monitoring upper min. threshold trip. time*" (page 56)
Fac-Start delta	See "Start point of the power control via frequency" (page 42)
Failure current Max	See "Maximum module ground current*" (page 49)
Firmware-BFR	See "Firmware version of the logic component" (page 72)
FrqCtl.ChgMax	See "Maximum allowable frequency drift*" (page 58)
FrqCtl.ChgMaxTm	See "Tripping time when exceeding max. frequency drift*" (page 59)
FrqCtl.hhLim	See "Frequency monitoring median maximum threshold*" (page 52)
FrqCtl.hhLimTms	See "Frq. monitoring median max. threshold trip. time*" (page 55)
FrqCtl.hLim	See "Frequency monitoring lower maximum threshold*" (page 52)
FrqCtl.hLimTms	See "Frq. monitoring lower max. threshold trip. time*" (page 56)
FrqCtl.lLim	See "Frequency monitoring upper minimum threshold*" (page 53)
FrqCtl.lLimTms	See "Frq. monitoring upper min. threshold trip. time*" (page 56)
FrqCtl.lllLim	See "Frequency monitoring median minimum threshold*" (page 54)
FrqCtl.lllLimTms	See "Frq. monitoring median min. threshold trip. time*" (page 57)
FrqCtl.Max	See "Frequency monitoring upper maximum threshold*" (page 51)
FrqCtl.MaxTms	See "Frq. monitoring upper max. threshold trip. time*" (page 55)
FrqCtl.Min	See "Frequency monitoring lower minimum threshold*" (page 54)
FrqCtl.MinTms	See "Frq. monitoring median min. threshold trip. time*" (page 57)
FrqCtl.ReconMax	See "Upper frequency for reconnection*" (page 58)
FrqCtl.ReconMin	See "Lower frequency for reconnection*" (page 59)
GndFltRea	See "Measures in the case of a ground fault" (page 50)
Grid connection	See "Phase assignment" (page 42)
GridMs.PhV.phsA	See "Phase voltages, phase L1" (page 27)

<b>Name</b>	<b>Description</b>
GridMs.PhV.phsB	See "Phase voltages, phase L2" (page 27)
GridMs.PhV.phsC	See "Phase voltages, phase L3" (page 27)
GriFltMonTms	See "Reconnection time upon grid interruption*" (page 48)
GriFltReConTms	See "Reconnection time upon short interruption*" (page 47)
GriFltTms	See "Maximum duration of a short interruption*" (page 45)
GriStrTms	See "Reconnection time upon restart*" (page 48)
h_Total	See "Set feed-in time" (page 41)
Hardware-BFS	See "Hardware version of the central assembly" (page 72)
HP.hwRev	See "Hardware version of the central assembly" (page 72)
HP.RevVer	See "Revision status of the central assembly" (page 73)
HP.swRev	See "Firmware version of the central assembly" (page 72)
HzRtg	See "Nominal frequency*" (page 46)
Inst.-Code	Entering SMA Grid Guard Code The SMA Grid Guard Code must be entered to change the SMA Grid Guard parameters.
IntvTmsMax	See "Time-out for communication fault indication" (page 73)
Inv.OutPhsSet	See "Phase assignment" (page 42)
Inv.OutWModSet	See "Temporal control of the power limitation" (page 34)
Inv.StopTms	See "Deactivation delay" (page 32)
Iso.LeakRisMin	See "Minimum insulation resistance*" (page 45)
KD-Wind-Reg	See "Power controller settings kd component" (page 37)
KI-Wind-Reg	See "Power controller settings ki component" (page 37)
KP-Wind-Reg	See "Power controller settings kp component" (page 37)
KP.hwRev	See "Hardware version of the communication assembly" (page 72)
KP.swRev	See "Firmware version of the communication assembly" (page 72)
MainModel	See "Device class" (page 29)
Md.GndAmpMax	See "Maximum module ground current*" (page 49)
Md.GndAmpMaxTmms	See "Tripping time maximum module ground current*" (page 49)
Md.GndMdt	See "Module grounding prescribed?" (page 49)
Md.GndModReq	See "Prescribed module grounding type" (page 50)
Mdl.hwRev	See "Hardware version of the RS485 module" (page 72)
Mdl.swRev	See "Firmware version of the RS485 Module" (page 72)
Memory Function	See "Reset operating data" (page 30)
Mlt.BatCha.Pwr	See "Minimum On power for MFR battery bank" (page 36)
Mlt.BatCha.Tmm	See "Minimum time before reconnection of MFR battery bank" (page 36)
Mlt.ComCtl.Sw	See "Status of MFR with control via communication" (page 36)
Mlt.MinOnPwr	See "Minimum On power for MFR self-consumption" (page 35)

Name	Description
Mlt.MinOnPwrTmm	See "Minimum power On time, MFR self-consumption" (page 35)
Mlt.MinOnTmm	See "Minimum On time for MFR self-consumption" (page 36)
Mlt.OpMode	See "Operating mode of multifunction relay" (page 35)
Model	See "Device type" (page 29)
Mt.TotkWhSet	See "Set total yield" (page 41)
Mt.TotOpTmhSet	See "Set feed-in time" (page 41)
Mt.TotTmhSet	See "Set operating time" (page 41)
OffGri.HzdLim	See "Endpoint of the power control via frequency" (page 42)
OffGri.HzdStr	See "Start point of the power control via frequency" (page 42)
Op.FncSetstl	See "Reset operating data" (page 30)
Op.OpModSet	See "Operating condition" (page 31)
Op.PvProMod	See "Operating mode of string failure detection" (page 39)
Op.PvValRslstl	See "Reset operating data for string failure detection" (page 39)
Op.StoFncSet	See "Load parameter" (page 31)
Op.TmsRmg	See "Waiting time until feed-in" (page 24)
Operating Mode	See "Operating condition" (page 31)
P-HystEna	See "Activation of stay-set indicator function, linear instantaneous power gradient configuration" (page 79)
P-HzStop	See "Difference between reset frequency and grid frequency, linear instantaneous power gradient configuration" (page 79)
P-HzStr	See "Difference between starting frequency and grid frequency, linear instantaneous power gradient configuration" (page 79)
P-W	See "Active power limitation P, active power configuration" (page 80)
P-WCilHzMod	See "Operating mode of active power reduction in case of overfrequency P(f)" (page 79)
P-WGra	See "Active power gradient, linear instantaneous power gradient configuration" (page 79)
P-WMod	See "Operating mode of feed-in management" (page 80)
P-WNom	See "Active power limitation P, active power configuration" (page 80)
PF-PF	See "cosPhi setpoint, cosPhi configuration, direct specification" (page 78)
PF-PFExt	See "Excitation type for cosPhi, cosPhi configuration, direct specification" (page 78)
PF-PFExtStop	See "Excitation type at end point, cosPhi(P) characteristic curve configuration" (page 77)
PF-PFExtStr	See "Excitation type at starting point, cosPhi(P) characteristic curve configuration" (page 77)
PF-PFStop	See "cosPhi at end point, cosPhi(P) characteristic curve configuration" (page 77)

Name	Description
PF-PFStr	See "cosPhi at starting point, cosPhi(P) characteristic curve configuration" (page 78)
PF-WNomStop	See "Active power at end point, cosPhi(P) characteristic curve configuration" (page 78)
PF-WNomStr	See "Active power at starting point, cosPhi(P) characteristic curve configuration" (page 78)
PhAngMax	See "Maximum allowable phase shift*" (page 61)
PhAngMaxTms	See "Tripping time when exceeding max. frequency drift*" (page 59)
Pkg.swRev	See "Software package" (page 30)
Plimit	See "Maximum active power device" (page 34)
Pmax	See "Currently set active power limit" (page 33)
PvPro.hwRev	See "Hardware version of string protection" (page 72)
PvPro.swRev	See "Firmware version of string protection" (page 72)
Q-HystVolNom	See "Voltage spread, reactive power/voltage characteristic curve configuration Q(U)" (page 77)
Q-VArGraNom	See "Reactive power gradient, reactive power/voltage characteristic curve configuration Q(U)" (page 76)
Q-VArMaxNom	See "Symmetrical limit for maximum reactive power, reactive power/voltage characteristic curve configuration Q(U)" (page 77)
Q-VArMod	See "Operating mode of static voltage stabilisation" (page 76)
Q-VArNom	See "Reactive power setpoint Q" (page 76)
Q-VArTms	See "Adjustment time for characteristic operating point, reactive power/voltage characteristic curve configuration Q(U)" (page 76)
Q-VolRefNom	See "Specified voltage $U_{Q0}$ , reactive power/voltage characteristic curve configuration Q(U)" (page 77)
Q-VolWidNom	See "Voltage spread, reactive power/voltage characteristic curve configuration Q(U)" (page 77)
Riso-Min	See "Minimum insulation resistance*" (page 45)
Serial Number	See "Serial number" (page 30)
SerNumSet	See "Serial number" (page 30)
Slimit	See "Maximum apparent power device" (page 33)
SMA-SN	See "Serial number" (page 30)
Smax	See "Currently set apparent power limit" (page 32)
T-Start	See "Critical voltage to start feed-in" (page 40)
T-Stop	See "Deactivation delay" (page 32)
UdcWindStart	See "Critical voltage to end feed-in" (page 37)
Vac-Max	See "Frq. monitoring median min. threshold trip. time*" (page 57)
Vac-Max-Fast	See "Voltage monitoring upper maximum threshold*" (page 64)



Name	Description
Vac-Max-FastTm	See "Voltage monitoring upper max. threshold trip. time*" (page 67)
Vac-Max-Tm	See "Voltage monitoring lower max. threshold trip. time*" (page 68)
Vac-Min	See "Voltage monitoring upper minimum threshold*" (page 66)
Vac-Min-Tm	See "Voltage monitoring upper min. threshold trip. time*" (page 68)
VArGra	See "Reactive power gradient" (page 73)
Vconst-Setpoint	See "Voltage setpoint" (page 40)
VolCtl.hhLim	See "Voltage monitoring median maximum threshold*" (page 65)
VolCtl.hhLimTms	See "Voltage monitoring median max. threshold trip.time*" (page 67)
VolCtl.hLim	See "Voltage monitoring lower maximum threshold*" (page 65)
VolCtl.hLimTms	See "Voltage monitoring lower max. threshold trip. time*" (page 68)
VolCtl.lLim	See "Voltage monitoring upper minimum threshold*" (page 66)
VolCtl.lLimTms	See "Voltage monitoring upper min. threshold trip. time*" (page 68)
VolCtl.lllLim	See "Voltage monitoring of median minimum threshold*" (page 66)
VolCtl.lllLimTms	See "Voltage monitoring median min. threshold trip.time*" (page 69)
VolCtl.Max	See "Voltage monitoring upper maximum threshold*" (page 64)
VolCtl.MaxTmms	See "Voltage monitoring upper max. threshold trip. time*" (page 67)
VolCtl.ReconMax	See "Max. voltage for reconnection*" (page 70)
VolCtl.ReconMin	See "Min. voltage for reconnection*" (page 70)
VolCtl.Rpro	See "Voltage increase protection*" (page 69)
Vpv-Start	See "Voltage setpoint" (page 40)
VRef	See "Reference voltage" (page 42)
VRefOfs	See "Reference correction voltage" (page 42)
VRtg	See "Grid nominal voltage*" (page 46)
WGra	See "Active power gradient" (page 73)
WGraReconEna	See "Activation of active power gradient for reconnection after grid fault" (page 73)
Wind_a0	See "Power characteristic curves coefficient for Udc^0" (page 38)
Wind_a1	See "Power characteristic curves coefficient for Udc^1" (page 38)
Wind_a2	See "Power characteristic curves coefficient for Udc^2" (page 38)
Wind_a3	See "Power characteristic curves coefficient for Udc^3" (page 38)

## 2.3 Event Messages

Name	Description
ComFlt	See "Communication disturbed" (page 88)
DcAmpMax	See "DC overcurrent" (page 87)
DcMinFlt	See "Start conditions not met" (page 87)

<b>Name</b>	<b>Description</b>
DcVMax	See "DC overvoltage" (page 85)
DevFlt	See "Interference of device" (page 88)
DscDcAcDscon	Disconnect device from generator and grid.
DscDcChk	Ensure DC supply
DscDcCon	Connect the ESS, do not open the lid
DscDcNotDscon	Do not disconnect the ESS
DscFanCln	Clean the fan
DscFuChk	See "Check fuse" (page 84)
DscGnChk	Check generator
DscGndModRv	See "Grounding error" (page 87)
DscGnSw	Disconnect generator
DscLgtProChkA	Check lightning protector A/PE
DscOvVProChk	Check varistors
DscParaChk	Check parameters
DscSupChk	Check connection
FanFlt	See "Fan fault" (page 90)
FltAmpMax	See "High discharge current" (page 86)
FltdAmpMax	See "Residual current too high" (page 86)
FltPhPh	See "Installation fault" (page 85)
GGNoChange	See "Grid parameter unchanged" (page 94)
GGWait	See "Changing of grid parameters not possible" (page 92)
GndFuFlt	See "Grounding error" (page 87)
GrdGuardLock	See "Grid parameter locked" (page 92)
GriFlt	See "Grid Fault" (page 82)
HzFlt	See "Frequency not permitted" (page 84)
InfoDerat	See "Derating occurred" (page 91)
InstabOp	See "Unstable operation" (page 85)
InstCdNok	See "Installer code invalid" (page 92)
InstCdOk	Installer code valid
InstFltGri	See "Installation failure grid connection" (page 85)
ItnlDataStoFail	See "Data storage not possible" (page 89)
LeakRis	Insulation resistance
MsgDcInFlt / MsgDcInRv	See "String ... defective" (page 87)
MsgLgtProIna	Lightning protection inactive
MsgOvHeat	Overheating
NoGri	Grid failure
OvLod	See "Overload" (page 88)

<b>Name</b>	<b>Description</b>
OvTmp	See "Overtemperature" (page 88)
OvVPro	See "Varistor defective" (page 90)
PEOpn	See "PE connection missing" (page 85)
PhNChg	See "L / N swapped" (page 85)
SDFail	See "SD card defective" (page 89)
SDFileRead	SD card is read
SDNoParaFile	See "SD card defective" (page 89)
SDSetPara	Set parameter
SDSetParaNok	Parameter setting failed
SDSetParaOk	Parameters set successfully
SDUpdAkt	No new update on the SD card
SDUpdFileNok	See "Update file defective" (page 89)
SDUpdFileOk	Update file OK
SDUpdNoFile	See "No update file found" (page 89)
SlfDiag	See "Self diagnosis" (page 90)
SlfTst	Self-test
SlfTstErr	Abort self-test
StringAFlt	See "Input A defective" (page 89)
StringBFlt	See "Input B defective" (page 89)
TmpSns	See "Sensor fault fan permanently on" (page 89)
UpdBT	Bluetooth update active
UpdBTErr	See "Update Bluetooth failed" (page 90)
UpdEnd	Update complete
UpdHP	Main CPU update active
UpdHPErr	See "Update main CPU failed" (page 90)
Updi485	RS485I module update active
Updi485Err	See "Update RS485I module failed" (page 90)
UpdKom	Communication update active
UpdLang	Language table update active
UpdLangErr	See "Update language table failed" (page 90)
UpdLCD	Display update active
UpdLCDErr	See "Update display failed" (page 90)
UpdPvPro	String protection update active
UpdPvProErr	String prot. update failed
WtDcMin	See "Waiting for DC start conditions" (page 87)
WtGri	See "Waiting for grid voltage" (page 84)

## 3 DATA II

### 3.1 Measured Values

Name	Description
Energy	See "Total yield" (page 26)
Grid-on	See "Number of grid connections" (page 26)
GridMs.A.phsA	See "Phase currents, phase L1" (page 27)
GridMs.A.phsB	See "Phase currents, phase L2" (page 27)
GridMs.A.phsC	See "Phase currents, phase L3" (page 27)
GridMs.Hz	See "Grid frequency" (page 27)
GridMs.PhV.phsA	See "Phase voltages, phase L1" (page 27)
GridMs.PhV.phsB	See "Phase voltages, phase L2" (page 27)
GridMs.PhV.phsC	See "Phase voltages, phase L3" (page 27)
GridMs.TotPF	See "Displacement power factor" (page 27)
GridMs.TotVA	See "Apparent power" (page 27)
GridMs.TotVAr	See "Reactive power" (page 27)
GridMs.VA.phsA	See "Apparent power L1" (page 28)
GridMs.VA.phsB	See "Apparent power L2" (page 28)
GridMs.VA.phsC	See "Apparent power L3" (page 28)
GridMs.VAr.phsA	See "Reactive power L1" (page 28)
GridMs.VAr.phsB	See "Reactive power L2" (page 28)
GridMs.VAr.phsC	See "Reactive power L3" (page 28)
GridMs.W.phsA	See "Phase power, phase L1" (page 27)
GridMs.W.phsB	See "Phase power, phase L2" (page 27)
GridMs.W.phsC	See "Phase power, phase L3" (page 27)
Inv.TmpLimStt	See "Derating" (page 24)
InvCtlStt	See "Status, device control" (page 25)
Iso.FlIA	See "Residual current" (page 26)
Mt.TotOpTmh	See "Feed-in time" (page 26)
Mt.TotTmh	See "Operating time" (page 26)
Op.EvtCntlStl	See "Number of events for installer" (page 24)
Op.EvtCntUsr	See "Number of events for user" (page 24)
Op.EvtNo	See "Current event number" (page 25)
Op.GriSwCnt	See "Number of grid connections" (page 26)
Op.GriSwStt	See "Grid relay status" (page 24)
Op.Health	See "Condition" (page 24)
Op.Prio	See "Recommended action" (page 25)

Name	Description
Op.TmsRmg	See "Waiting time until feed-in" (page 24)
Pac	See "Power" (page 27)
Riso	See "Insulation resistance" (page 26)

## 3.2 Operating Parameters

Name	Description
A.Const.VSet, B.Const.VSet	See "Voltage setpoint" (page 40)
A.StrTms, B.StrTms	See "Start delay" (page 40)
A.VStr, B.VStr	See "Critical voltage to start feed-in" (page 40)
Aid.AngFact	See "Escalation factor*" (page 60)
AMaxOfs	See "Tripping threshold DC current monitoring*" (page 44)
AMaxOfsTms	See "Tripping time DC current monitoring*" (page 45)
BT.RevVer	See "Revision status of the Bluetooth component" (page 71)
BT.swRev	See "Firmware version of the Bluetooth component" (page 71)
BTpwr	See "Maximum Bluetooth transmission power*" (page 71)
Cntry	See "Set country standard" (page 43)
CntrySet	See "Set country standard*" (page 43)
ComRev	See "Communication version" (page 29)
CoolSys.FanTst	See "Fan test" (page 31)
CPLD.RevVer	See "Revision status of the logic component" (page 72)
CPLD.swRev	See "Firmware version of the logic component" (page 72)
dlSens.hwRev	See "Hardware version of the residual current mon. unit" (page 71)
dlSens.RevVer	See "Revision status of the residual current mon. unit" (page 72)
dlSens.swRev	See "Firmware version of the residual current mon. unit" (page 71)
FrqCtl.ChgMax	See "Maximum allowable frequency drift*" (page 58)
FrqCtl.ChgMaxTm	See "Tripping time when exceeding max. frequency drift*" (page 59)
FrqCtl.hLim	See "Frequency monitoring lower maximum threshold*" (page 52)
FrqCtl.hLimTms	See "Frq. monitoring lower max. threshold trip. time*" (page 56)
FrqCtl.lLim	See "Frequency monitoring upper minimum threshold*" (page 53)
FrqCtl.lLimTms	See "Frq. monitoring upper min. threshold trip. time*" (page 56)
FrqCtl.Max	See "Frequency monitoring upper maximum threshold*" (page 51)
FrqCtl.MaxTms	See "Frq. monitoring upper max. threshold trip. time*" (page 55)
FrqCtl.Min	See "Frequency monitoring lower minimum threshold*" (page 54)
FrqCtl.MinTms	See "Frq. monitoring median min. threshold trip. time*" (page 57)
FrqCtl.ReconMax	See "Upper frequency for reconnection*" (page 58)
FrqCtl.ReconMin	See "Lower frequency for reconnection*" (page 59)

Name	Description
GriFltMonTms	See "Reconnection time upon grid interruption*" (page 48)
GriFltReConTms	See "Reconnection time upon short interruption*" (page 47)
GriFltTms	See "Maximum duration of a short interruption*" (page 45)
GriStrTms	See "Reconnection time upon restart*" (page 48)
HP.hwRev	See "Hardware version of the central assembly" (page 72)
HP.RevVer	See "Revision status of the central assembly" (page 73)
HP.swRev	See "Firmware version of the central assembly" (page 72)
HzRtg	See "Nominal frequency*" (page 46)
IntvTmsMax	See "Time-out for communication fault indication" (page 73)
Inv.OutPhsSet	See "Phase assignment" (page 42)
Inv.OutWModSet	See "Temporal control of the power limitation" (page 34)
Inv.StopTms	See "Deactivation delay" (page 32)
Iso.LeakRisMin	See "Minimum insulation resistance*" (page 45)
KD	See "Power controller settings kd component" (page 37)
KI	See "Power controller settings ki component" (page 37)
KP	See "Power controller settings kp component" (page 37)
KP.hwRev	See "Hardware version of the communication assembly" (page 72)
KP.RevVer	See "Revision status of the communication assembly" (page 72)
KP.swRev	See "Firmware version of the communication assembly" (page 72)
LCD-swRev	See "Firmware version of the display" (page 71)
LCD.RevVer	See "Revision status of the Bluetooth component" (page 71)
Mdl.hwRev	See "Hardware version of the RS485 module" (page 72)
Mdl.RevVer	See "Revision status of the RS485 module" (page 72)
Mdl.swRev	See "Firmware version of the RS485 Module" (page 72)
Model	See "Device type" (page 29)
Mt.TotkWhSet	See "Set total yield" (page 41)
Mt.TotOpTmhSet	See "Set operating time" (page 41)
Mt.ToiTmhSet	See "Set feed-in time" (page 41)
OffGri.HzdLim	See "Endpoint of the power control via frequency" (page 42)
OffGri.HzdStr	See "Start point of the power control via frequency" (page 42)
Op.FncSetlst	See "Reset operating data" (page 30)
Op.OpModSet	See "Operating condition" (page 31)
Op.PvProMod	See "Operating mode of string failure detection" (page 39)
Op.PvValRslstl	See "Reset operating data for string failure detection" (page 39)
Op.StoFncSet	See "Load parameter" (page 31)
PC1	See "Power characteristic curves coefficient for Udc^0" (page 38)
PC2	See "Power characteristic curves coefficient for Udc^1" (page 38)

Name	Description
PC3	See "Power characteristic curves coefficient for $U_{dc}^2$ " (page 38)
PC4	See "Power characteristic curves coefficient for $U_{dc}^3$ " (page 38)
PEOpnMon	See "PE connection monitoring" (page 47)
PhAngMax	See "Maximum allowable phase shift*" (page 61)
PhAngMaxTms	See "Tripping time when exceeding max. frequency drift*" (page 59)
Pkg.swRev	See "Software package" (page 30)
PLimit	See "Maximum active power device" (page 34)
Pmax	See "Currently set active power limit" (page 33)
SerNumSet	See "Serial number" (page 30)
Slimit	See "Maximum apparent power device" (page 33)
Smax	See "Currently set apparent power limit" (page 32)
StopVol	See "Critical voltage to end feed-in" (page 37)
VArGra	See "Reactive power gradient" (page 73)
VolCtl.hhLim	See "Voltage monitoring median maximum threshold*" (page 65)
VolCtl.hhLimTms	See "Voltage monitoring median max. threshold trip.time*" (page 67)
VolCtl.hLim	See "Frequency monitoring lower maximum threshold*" (page 52)
VolCtl.hLimTms	See "Voltage monitoring lower max. threshold trip. time*" (page 68)
VolCtl.lLim	See "Voltage monitoring upper minimum threshold*" (page 66)
VolCtl.lLimTms	See "Voltage monitoring upper min. threshold trip. time*" (page 68)
VolCtl.lllLim	See "Voltage monitoring of median minimum threshold*" (page 66)
VolCtl.lllLimTms	See "Voltage monitoring median min. threshold trip.time*" (page 69)
VolCtl.Max	See "Voltage monitoring upper maximum threshold*" (page 64)
VolCtl.MaxTmms	See "Voltage monitoring upper max. threshold trip. time*" (page 67)
VolCtl.Rpro	See "Voltage increase protection*" (page 69)
VRef	See "Reference voltage" (page 42)
VRefOfs	See "Reference correction voltage" (page 42)
VRtg	See "Grid nominal voltage*" (page 46)
WGra	See "Active power gradient" (page 73)
WGraReconEna	See "Activation of active power gradient for reconnection after grid fault" (page 73)

## 4 DATA II+

### 4.1 Measured Values

#### 4.1.1 Status - Operation

Name	Description	Value	Explanation
<b>Number of events for user</b>	Counter for events relevant for the plant operator		
<b>Number of events for installer</b>	Counter for events relevant for the installer		
<b>Derating</b>	Status display for the derating due to excess temperatures	not active	Temperature derating not effective
		Active	Temperature derating effective
<b>Grid relay status</b>	State of grid relay	Open	Relay open
		Closed	Relay closed
<b>Waiting time until feed-in</b>	Standby time after an error event to the next connection attempt		
<b>Condition</b>	Current diagnostic status of the inverter	Error	
		Warning	
		OK	

#### 4.1.2 Status - Operation - Plant Control

Name	Description	Value	Explanation
<b>Status, plant control</b>	Inverter controlled by the utility operator	Off	Plant control off
		On	Plant control on
		Active	Plant control currently active



### 4.1.3 Status - Operation - Device control

Name	Description	Value	Explanation
<b>Status, device control</b>	Inverter control via local settings on the device	Off	Device control off
		On	Device control on
		active	Device control currently active

### 4.1.4 Status - Current event

Name	Description	Value	Explanation
<b>Current event number</b>	Number of current event		
<b>Recommended action</b>	Displays the recommended service staff	Call installer	
		Call SMA	
		Inactive	
		none	
<b>Fault correction measure</b>	Instructions for correction of error		
<b>Message</b>	Inverter event message		

### 4.1.5 Status - Device status

Name	Description
<b>Nominal power in Fault Mode</b>	Nominal power in error mode in W
<b>Nominal power in Ok Mode</b>	Nominal power in OK mode in W
<b>Nominal power in Warning Mode</b>	Nominal power in warning mode in W

### 4.1.6 DC Side - DC measurements

Name	Description
<b>DC power input</b>	DC power input in W (for SB 4000TL-20 / SB 5000TL-20 / STP XXXXXTL-10: [001] = Input A, [002] = Input B)
<b>DC voltage input</b>	DC voltage input in V (for SB 4000TL-20 / SB 5000TL-20 / STP XXXXXTL-10: [001] = Input A, [002] = Input B)
<b>DC current input</b>	DC current input in A (for SB 4000TL-20 / SB 5000TL-20 / STP XXXXXTL-10: [001] = Input A, [002] = Input B)

### 4.1.7 DC Side - Insulation monitoring

Name	Description
<b>Residual current</b>	Discharge current of the PV plant in A (inverter and PV generator)
<b>Insulation resistance</b>	Insulation resistance of the PV plant before the grid switch-on in k $\Omega$ (see Riso-U...093310 Technical Data)

### 4.1.8 AC Side - Operation

Name	Description
<b>Number of grid connections</b>	Number of grid connections

### 4.1.9 AC Side - Measured values

Name	Description
<b>Operating time</b>	Total number of operating hours of inverter
<b>Feed-in time</b>	Total number of grid-feeding operational hours
<b>Total yield</b>	Total amount of feeding-in energy in kWh
<b>Day yield</b>	Total amount of feeding-in energy for day in kWh

#### 4.1.10 AC Side - Grid measurements

Name	Description
<b>Reactive power</b>	Total reactive power in %
<b>Power</b>	Delivered active power in W (total)
<b>Grid frequency</b>	Grid frequency in Hz
<b>Normalized total apparent power</b>	Percentage of total apparent power in %
<b>Apparent power</b>	Total apparent power in VA
<b>Displacement power factor</b>	Displacement power factor of all phases (total)

#### 4.1.11 AC Side - Grid measurements - Power per phase

Name	Description
<b>Phase power, phase L1</b>	Active power phase L1 in W
<b>Phase power, phase L2</b>	Active power phase L2 in W
<b>Phase power, phase L3</b>	Active power phase L3 in W

#### 4.1.12 AC Side - Grid measurements - Phase voltages

Name	Description
<b>Phase voltages, phase L1</b>	Grid voltage phase L1 in V
<b>Phase voltages, phase L2</b>	Grid voltage phase L2 in V
<b>Phase voltages, phase L3</b>	Grid voltage phase L3 in V

#### 4.1.13 AC Side - Grid measurements - Phase currents

Name	Description
<b>Phase currents, phase L1</b>	Grid current phase L1 in A
<b>Phase currents, phase L2</b>	Grid current phase L2 in A
<b>Phase currents, phase L3</b>	Grid current phase L3 in A

#### 4.1.14 AC Side - Grid measurements - Reactive power

Name	Description
<b>Reactive power L1</b>	Reactive power phase L1 in VAr
<b>Reactive power L2</b>	Reactive power phase L2 in VAr
<b>Reactive power L3</b>	Reactive power phase L3 in VAr

#### 4.1.15 AC Side - Grid measurements - Apparent power

Name	Description
<b>Apparent power L1</b>	Apparent power phase L1 in VA
<b>Apparent power L2</b>	Apparent power phase L2 in VA
<b>Apparent power L3</b>	Apparent power phase L3 in VA

## 4.2 Operating Parameters

### 4.2.1 Type Label

#### Device class

Display of inverter device class

Inverter	Unit	Value range	Default settings
	–	<ul style="list-style-type: none"> <li>Solar Inverters</li> <li>Wind Turbine Inverter</li> </ul>	Solar inverters
WB XXXXTL-20			Wind Turbine Inverter

#### Device name

Entry of a selected name in the inverter description

Inverter	Unit	Value range	Default settings
	–	1 ... 30 characters	–

#### Device type

Display of inverter device type

Inverter	Unit	Value range	Default settings
SB 2000HF-30	–	fixed	SB 2000HF-30
SB 2500HF-30			SB 2500HF-30
SB 3000HF-30			SB 3000HF-30
SB 3000TL-20			SB 3000TL-20
SB 4000TL-20			SB 4000TL-20
SB 5000TL-20			SB 5000TL-20
STP 10000TL-10			STP 10000TL-10
STP 12000TL-10			STP 12000TL-10
STP 15000TL-10			STP 15000TL-10
STP 17000TL-10			STP 17000TL-10
WB 3600TL-20			WB 3600TL-20
WB 5000TL-20			WB 5000TL-20

#### Communication version

Communication protocol version number

Inverter	Unit	Value range	Default settings
	–	fixed	–

## Software package

Software version of components in inverter

Inverter	Unit	Value range	Default settings
	–	fixed	–

## Serial number

Inverter serial number display

Inverter	Unit	Value range	Default settings
	–	fixed	–

## 4.2.2 Device - Operation

### Reset operating data

Reset operating counter to default setting.

Inverter	Unit	Value range	Default settings
	–	<ul style="list-style-type: none"> <li>• Return operating counter to default setting</li> <li>• Execute all</li> <li>• N° grid conn. at grid conn.pt.</li> <li>• Operating time (resetting the hours of operation)</li> <li>• Feed-in time (resetting the feed-in hours)</li> <li>• Total yield (resetting the "total yield" meter)</li> <li>• Reset operation inhibition (release the operation inhibition)</li> <li>• Day yield (resetting the feed-in energy on all phases for the current day)</li> </ul>	–

## Operating condition

Select the desired operating mode.

Inverter	Unit	Value range	Default settings
SB XXXXHF-30 SB XXXXTL-20 STP XXXXXTL-10	–	<ul style="list-style-type: none"> <li>MPP: Maximum Power Point.</li> <li>VolDCConst: constant voltage mode (setpoint is defined by "constant voltage setpoint")</li> </ul>	MPP
WB XXXXTL-20		<ul style="list-style-type: none"> <li>Stp: disconnection from grid, no operation</li> <li>Turbine: power specification via characteristic curve</li> </ul>	Turbine

## Load parameter

Return all operating parameters to default setting, except for SMA Grid Guard parameters, which are protected by the Grid Guard Code.

Inverter	Unit	Value range	Default settings
	–	<ul style="list-style-type: none"> <li>Load preset</li> </ul>	–

## 4.2.3 Device - Cooling system

### Fan test

Setting the parameter to "on" checks the fan function. More information can be found in the inverter installation guide.

Inverter	Unit	Value range	Default settings
SB XXXXHF-30 SB 4000TL-20 SB 5000TL-20 STP XXXXXTL-10 WB XXXXTL-20	–	<ul style="list-style-type: none"> <li>Off: fan test off</li> <li>On: fan test on</li> </ul>	Off

## 4.2.4 Device - System

### Find device

To identify the controlled inverters, set the parameter to "blink LED". The *Bluetooth* LED on the device will blink.

Inverter	Unit	Value range	Default settings
	–	<ul style="list-style-type: none"> <li>• Off</li> <li>• LED blinking</li> </ul>	Off

## 4.2.5 Device - Inverter

### Deactivation delay

This parameter defines the amount of time the inverter will wait before disconnecting from the grid when the feed-in conditions are no longer met.

Inverter	Unit	Value range	Default settings
	s	1 ... 3 600	2

### Currently set apparent power limit

Set the inverter's AC apparent power limit.

Inverter	Unit	Value range	Default settings
STP 10000TL-10	VA	0 ... 10 100	10 000
STP 12000TL-10		0 ... 12 120	12 000
STP 15000TL-10		0 ... 15 150	15 000
STP 17000TL-10		0 ... 17 170	17 000



## Currently set active power limit

Set the inverter's AC power limit to the static active and reactive power specifications.

Inverter	Unit	Value range	Default settings
SB 2000HF-30	W	0 ... 2 060	2 000
SB 2500HF-30		0 ... 2 560	2 500
SB 3000HF-30		0 ... 3 060	3 000
SB 3000TL-20		0 ... 3 060	3 000
SB 4000TL-20		0 ... 4 060	4 000
SB 5000TL-20		0 ... 5 060	5 000
STP 10000TL-10		0 ... 10 100	10 000
STP 12000TL-10		0 ... 12 120	12 000
STP 15000TL-10		0 ... 15 150	15 000
STP 17000TL-10		0 ... 17 170	17 000
WB 3600TL-20		0 ... 4 060	3 600
WB 5000TL-20		0 ... 5 060	5 000

## Maximum apparent power device

Display of maximum achievable apparent power

Inverter	Unit	Value range	Default settings
STP 10000TL-10	VA	0 ... 10 000	10 000
STP 12000TL-10		0 ... 12 000	12 000
STP 15000TL-10		0 ... 15 000	15 000
STP 17000TL-10		0 ... 17 000	17 000

## Maximum active power device

Displays the upper limit of the AC output active power and reactive power

Inverter	Unit	Value range	Default settings
SB 2000HF-30	W	fixed	2 000
SB 2500HF-30			2 500
SB 3000HF-30			3 000
SB 3000TL-20			3 000
SB 4000TL-20			4 000
SB 5000TL-20			5 000
STP 10000TL-10			10 000
STP 12000TL-10			12 000
STP 15000TL-10			15 000
STP 17000TL-10			17 000
WB 3600TL-20			3 600
WB 5000TL-20			5 000

## Temporal control of the power limitation

This parameter defines the time intervals of the power measurements for determining the output power limitation.

It is preset in accordance with the selected country standard and the performance category.

Inverter	Unit	Value range	Default settings
	–	<ul style="list-style-type: none"> <li>LIM10M: 10 minute average</li> <li>LIMFST: Instantaneous values</li> </ul>	–

Inverter	Setting													
	Other standard	AS4777.3	C10/11	DK5940E2.2	EN 50438	EN50438CZ	G 83/1	Off-grid	Offgrid60	PPC	RD1663-A	RD1663/661-A	VDE0126-1-1	VDE0126-1-1 B
SB 3000TL-20	LIM FST													
SB 4000TL-20	LIM FST													
SB 5000TL-20	LIM FST	LIM FST	LIM FST	LIM FST	LIM FST	LIM FST	LIM FST	LIM FST	LIM FST	LIM FST	LIM FST	LIM FST	LIM 10M	LIM 10M

## 4.2.6 Device - Multifunction relay

### Operating mode of multifunction relay

You configure the desired operating mode and further settings via parameters.

Inverter	Unit	Value range	Default settings
	–	<ul style="list-style-type: none"> <li>• FltInd: fault indication</li> <li>• FanCtl: fan control</li> <li>• SelfCsmpr: self-consumption</li> <li>• ComCtl: control via communication</li> <li>• BatCha: battery bank</li> </ul>	Fault indication

## 4.2.7 Device - Multifunction relay - Self-consumption

### Minimum On power for MFR self-consumption

Trigger threshold for self-consumption function

Inverter	Unit	Value range	Default settings
SB 2000HF-30	W	100 ... 2 000	1 500
SB 2500HF-30		100 ... 2 500	
SB 3000HF-30		100 ... 3 000	
SB 3000TL-20		100 ... 3 000	
SB 4000TL-20		100 ... 4 000	
SB 5000TL-20		100 ... 5 000	
STP 10000TL-10		100 ... 10 000	
STP 12000TL-10		100 ... 12 000	
STP 15000TL-10		100 ... 15 000	
STP 17000TL-10		100 ... 17 000	
WB 3600TL-20		100 ... 3 600	
WB 5000TL-20		100 ... 5 000	

### Minimum power On time, MFR self-consumption

Minimum time for which the minimum start-up power must be fed for the relay to switch

Inverter	Unit	Value range	Default settings
	min	0 ... 1 440	30

### Minimum On time for MFR self-consumption

Minimum duration for which the relay remains switched on.

Inverter	Unit	Value range	Default settings
	min	1 ... 1 440	120

## 4.2.8 Device - Multifunction relay - Control via communication

### Status of MFR with control via communication

State of the multifunction relay with the operating mode 'Control via communication'

Inverter	Unit	Value range	Default settings
	–	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>	Off

## 4.2.9 Device - Multifunction relay - Battery bank

### Minimum On power for MFR battery bank

Threshold for switching the relay in operating mode 'Charging the battery'

Inverter	Unit	Value range	Default settings
SB 2000HF-30	W	100 ... 2 000	1 500
SB 2500HF-30		100 ... 2 500	
SB 3000HF-30		100 ... 3 000	
SB 3000TL-20		100 ... 3 000	
SB 4000TL-20		100 ... 4 000	
SB 5000TL-20		100 ... 5 000	
STP 10000TL-10		100 ... 10 000	
STP 12000TL-10		100 ... 12 000	
STP 15000TL-10		100 ... 15 000	
STP 17000TL-10		100 ... 17 000	
WB 3600TL-20		100 ... 3 600	
WB 5000TL-20		100 ... 5 000	

### Minimum time before reconnection of MFR battery bank

Minimum time between switching the relay off and back on

Inverter	Unit	Value range	Default settings
	min	1 ... 1 440	30

## 4.2.10 Device - Configuration of "Turbine" operating mode

### Power controller settings kd component

This parameter defines the control speed of the power characteristic curve. The inverter reacts to changes in the DC input voltage by adjusting its output power using the power characteristic curve. The higher this parameter is set, the larger the power jump in response to the changes in the DC input voltage. Values that are too high lead to vacillations and instability in the system. Values that are too low delay the optimal load of the turbine and thereby reduce the yield.

Inverter	Unit	Value range	Default settings
WB XXXXTL-20	–	0 ... +30	0

### Power controller settings ki component

This parameter defines the control speed of the power characteristic curve. The inverter reacts to changes in the DC input voltage by adjusting its output power using the power characteristic curve. The higher this parameter is set, the larger the power jump in response to the changes in the DC input voltage. Values that are too high lead to vacillations and instability in the system. Values that are too low delay the optimal load of the turbine and thereby reduce the yield.

Inverter	Unit	Value range	Default settings
WB XXXXTL-20	–	0 ... +30	0.01

### Power controller settings kp component

This parameter defines the control speed of the power characteristic curve. The inverter reacts to changes in the DC input voltage by adjusting its output power using the power characteristic curve. The higher this parameter is set, the larger the power jump in response to the changes in the DC input voltage. Values that are too high lead to vacillations and instability in the system. Values that are too low delay the optimal load of the turbine and thereby reduce the yield.

Inverter	Unit	Value range	Default settings
WB XXXXTL-20	–	0 ... +30	1.2

### Critical voltage to end feed-in

This parameter defines the lower voltage limit at which the inverter will stop feeding in.

Inverter	Unit	Value range	Default settings
WB XXXXTL-20	V	80 ... 470	80

### Power characteristic curves coefficient for $U_{dc}^0$

This parameter serves to internally calculate the output characteristic curve.

Inverter	Unit	Value range	Default settings
WB 3600TL-20	–	– 2 000 000 ... +2 000 000	14.192
WB 5000TL-20			– 209.713

### Power characteristic curves coefficient for $U_{dc}^1$

This parameter serves to internally calculate the output characteristic curve.

Inverter	Unit	Value range	Default settings
WB 3600TL-20	–	– 2 000 000 ... +2 000 000	– 0.279
WB 5000TL-20			6.921

### Power characteristic curves coefficient for $U_{dc}^2$

This parameter serves to internally calculate the output characteristic curve.

Inverter	Unit	Value range	Default settings
WB 3600TL-20	–	– 2 000 000 ... +2 000 000	– 3.59
WB 5000TL-20			– 75.15

### Power characteristic curves coefficient for $U_{dc}^3$

This parameter serves to internally calculate the output characteristic curve.

Inverter	Unit	Value range	Default settings
WB 3600TL-20	–	– 2 000 000 ... +2 000 000	54.97
WB 5000TL-20			418.38

## 4.2.11 User Rights - Access Control

### Set installer password

Set new installer password.

Inverter	Unit	Value range	Default settings
	–	–	1111

### Set user password

Set new user password.

Inverter	Unit	Value range	Default settings
	–	–	0000

## 4.2.12 DC Side - Operation - String failure detection

### Operating mode of string failure detection

Switching the string failure detection on/off.

Inverter	Unit	Value range	Default settings
STP XXXXXTL-10	–	<ul style="list-style-type: none"> <li>• Stop: string protection off</li> <li>• Activated: string protection on</li> </ul>	Stop

### Reset operating data for string failure detection

Restart the teaching phase for string failure detection

Inverter	Unit	Value range	Default settings
STP XXXXXTL-10	–	Restart the teaching phase	–

## 4.2.13 DC Side - DC settings

### Critical voltage to start feed-in

Initial voltage required before the inverter begins feeding in power into the grid. If the value is set too low, this may lead to an increased number of connections to the grid, and thus to increased wear.

(for SB 4000TL-20 / SB 5000TL-20 / STP XXXXXTL-10: [001] = Input A, [002] = Input B)

Inverter	Unit	Value range	Default settings
SB XXXXTL-20 WB XXXXTL-20	V	125 ... 550	150
SB XXXXHF-30		220 ... 700	220
STP XXXXXTL-10		188 ... 800	188

### Start delay

Delay time for grid connection once start voltage is reached

(for SB 4000TL-20 / SB 5000TL-20 / STP XXXXXTL-10: [001] = Input A, [002] = Input B)

Inverter	Unit	Value range	Default settings
	s	1 ... 4	1

### Voltage setpoint

This parameter is active in the "constant voltage" operating mode, and defines the constant voltage setpoint.

(for SB 4000TL-20 / SB 5000TL-20 / STP XXXXXTL-10: [001] = Input A, [002] = Input B)

Inverter	Unit	Value range	Default settings
SB XXXXTL-20 WB XXXXTL-20	V	125 ... 550	550
SB XXXXHF-30		175 ... 700	700
STP XXXXXTL-10		188 ... 950	950



## 4.2.14 DC Side - DC settings - OptiTrac Global Peak

### OptiTrac Global Peak switched on

This parameter activates or deactivates the OptiTrac Global Peak function.

Inverter	Unit	Value range	Default settings
SB XXXXTL-20	–	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>	Off

### Cycle time of the OptiTrac Global Peak algorithm

The parameter defines the interval between two analyses. The inverter measures the operating point of the PV plant at the specified interval.

Inverter	Unit	Value range	Default settings
SB XXXXTL-20	min	6 ... 30	6

## 4.2.15 AC Side - Measured values

### Set operating time

Set the operating time ("operating time" measured value) of the inverter

Changing this may be necessary if you replace the inverter and want to use the operating time from the old device.

Inverter	Unit	Value range	Default settings
	h	0 ... 440 000	0

### Set feed-in time

Setting the feed-in time ("feed in time" measured value) of the inverter

Changing this may be necessary if you replace the inverter and want to use feed time from the old device.

Inverter	Unit	Value range	Default settings
	h	0 ... 440 000	0

### Set total yield

Set the total yield ("total yield" measured value) of the inverter

Changing this may be necessary if you replace the inverter and want to use the yields from the old device.

Inverter	Unit	Value range	Default settings
	kWh	0 ... 1 000 000 000	0

## 4.2.16 AC Side - Inverter

### Phase assignment

Identifying the connected feed-in phase

The set phase is also shown on the display, and the phase-dependent measured values are allocated to the AC current and AC voltage accordingly.

Inverter	Unit	Value range	Default settings
SB XXXXHF-30 SB XXXXTL-20 WB XXXXTL-20	–	<ul style="list-style-type: none"> <li>• Phase L1</li> <li>• Phase L2</li> <li>• Phase L3</li> </ul>	Phase L1

## 4.2.17 AC Side - Inverter - Plant control

### Reference voltage

Reference voltage used for the plant control

Inverter	Unit	Value range	Default settings
	V	215 ... 245	230

### Reference correction voltage

The existing deviance of the grid voltage from the reference voltage at the grid connection point.

Inverter	Unit	Value range	Default settings
	V	– 20 ... +20	0

## 4.2.18 AC Side - Island mode

### Endpoint of the power control via frequency

Setting the frequency-dependent power reduction

This parameter can be used to set the endpoint of the frequency performance curve.

Inverter	Unit	Value range	Default settings
	Hz	0 ... 5	2

### Start point of the power control via frequency

Setting the frequency-dependent power reduction

This parameter can be used to set the starting point of the frequency output characteristic curve.

Inverter	Unit	Value range	Default settings
	Hz	0 ... 5	1

## 4.2.19 Grid monitoring

### Set country standard \*

The desired standards of all country-specific parameters can be restored via this parameter.

Inverter	Value range	Default settings
	Other standard (OthStd) AS4777.3 (Australia) C10/11 (Belgium) CGC/GF001 (China) DK5940E2.2 (Italy) EN50438 (Europe) EN50438-CZ (Czech Republic) Enel-GUIDA (Italy) G83/1-1 (England) IEC61727/MEA (Thailand) IEC61727/PEA (Thailand) KEPCO Guide (South Korea) KEMCO 501/2008 (South Korea) MViGDirective: Medium Voltage Directive (Germany) MViGDirectiveInt: MViGDirective Internal (Medium Voltage Directive with internal decoupling protection) Off-grid (island mode 50Hz) Off-grid60 (island mode 60Hz) PPC (Greece) PPDS (Czech Republic) RD1663 (Spain) RD1663-A (Spain) RD1663/661-A (Spain) SI4777-2 (Israel) UL1741/auto (USA, automatic voltage detection) UL1741/208 (USA 208V) UL1741/240 (USA 240V) VDE0126-1-1 (Germany, Switzerland) VDE0126-1-1 A (Special setting for Germany, "voltage increase protection" parameter = 244 V instead of 253 V) VDE0126-1-1 B (Special setting for France, Bluetooth transmission power reduced in accordance with French requirements)	VDE0126-1-1

### Set country standard

Displays current setting for the country-specific standard

Inverter	Unit	Value range	Default settings
	–	<ul style="list-style-type: none"> <li>See "Set country standard*" (page 43)</li> <li>Special setting (Adj)</li> <li>Information not available (NaNStt)</li> </ul>	–

## 4.2.20 Grid monitoring - Country standard

### Tripping threshold DC current monitoring\*

This parameter sets the tripping threshold for the DC current monitoring. These parameters may only be changed after prior agreement with the SMA Serviceline.

Inverter	Unit	Value range	Default settings
SB XXXXHF-30 SB XXXXTL-20 STP XXXXTL-10	A	0.02 ... 5	-
STP XXXXTL-10		0.02 ... 2	

Setting	Inverter											
	SB 2000HF-30	SB 2500HF-30	SB 3000HF-30	SB 3000TL-20	SB 4000TL-20	SB 5000TL-20	STP 10000TL-10	STP 12000TL-10	STP 15000TL-10	STP 17000TL-10	WB 3600TL-20	WB 5000TL-20
Other standard	5	5	5	5	5	5	0.080	0.096	0.12	0.123	5	5
AS4777.3	0.043	0.054	0.065	0.080	0.090	0.100	0.073	0.087	0.109	0.123	0.090	0.100
C10/11	0.087	0.109	0.13	0.13	0.18	0.20	0.145	0.174	0.217	0.246	0.18	0.20
CGC/GF001	0.043	0.054	0.065	-	-	-	0.073	0.087	0.109	0.123	-	-
DK5940E2.2	0.041	0.052	0.062	0.080	0.090	0.100	-	-	-	-	0.090	0.100
EN 50438	1	1	1	1	1	1	1	1	1	1	1	1
EN50438 (CZ)	1	1	1	1	1	1	1	1	1	1	1	1
Enel-GUIDA	0.043	0.054	0.065	-	-	-	0.073	0.087	0.109	0.123	-	-
G83/1-1	1	1	1	0.02	0.02	0.02	1	1	1	1	0.02	0.02
IEC61727/MEA	0.043	0.054	0.065	-	-	-	0.073	0.087	0.109	0.123	-	-
IEC61727/PEA	0.043	0.054	0.065	-	-	-	0.073	0.087	0.109	0.123	-	-
KEMCO501/2008	0.043	0.054	0.065	-	-	-	0.073	0.087	0.109	0.123	-	-
KEPCO Guide	0.045	0.056	0.066	-	-	-	-	-	-	-	-	-
Medium Voltage Directive (Int)	-	-	-	-	-	-	1	1	1	1	-	-
Off-grid (50/60)	5	5	5	5	5	5	1	1	1	1	5	5
PPC	0.043	0.054	0.065	0.080	0.090	0.100	0.073	0.087	0.109	0.123	0.090	0.100
PPDS	-	-	-	-	-	-	1	1	1	1	-	-
RD1663-A	5	5	5	5	5	5	1	1	1	1	5	5
RD1663/661-A	5	5	5	5	5	5	1	1	1	1	5	5
SI4777-2	0.043	0.054	0.065	-	-	-	0.073	0.087	0.109	0.123	-	-
UL1741/auto	0.042	0.052	0.063	-	-	-	-	-	-	-	-	-
UL1741/V208	0.042	0.052	0.063	-	-	-	-	-	-	-	-	-
UL1741/V240	0.042	0.052	0.063	-	-	-	-	-	-	-	-	-
VDE0126-1-1	1	1	1	1	1	1	1	1	1	1	1	1
VDE0126-1-1 A	1	1	1	-	-	-	1	1	1	1	-	-
VDE0126-1-1 B	1	1	1	1	1	1	1	1	1	1	1	1

### Tripping time DC current monitoring\*

This parameter sets the standard deactivation time for DC current monitoring. These parameters may only be changed after prior agreement with the SMA Serviceline.

Inverter	Unit	Value range	Default settings
SB XXXXHF-30	ms	0 ... 10 000	—
SB XXXXTL-20		100 ... 10 000	
WB XXXXTL-20			

Inverter	Setting																			
	Other standard	AS4777.3	C10/11	CGC/GF001	DK5940E2.2	EN50438 (CZ)	Enel-GUIDA	G83/1-1	IEC61727 (MEA/PEA)	KEMCO501/2008	KEPCO Guide	Medium Voltage Directive (Int)	Off-grid (50/60)	PPC	PPDS	RD1663-A	RD1663/611-A	SI4777-2	UL1741	VDE0126-1-1 (A/B)
	10 000	2 000	200	2 000	100	200	500	5 000	2 000	2 000	2 000	200	10 000	500	200	10 000	10 000	2 000	2 000	200

### Maximum duration of a short interruption\*

This parameter sets the maximum duration of grid monitoring during grid disruptions.

Inverter	Unit	Value range	Default settings
	s	0 ... 400	3

### Minimum insulation resistance\*

This parameter sets the lower tripping threshold for insulation resistance.

Inverter	Unit	Value range	Default settings	
SB XXXXHF-30	k Ω	500 ... 3 000	1 000.00	
SB XXXXTL-20		500 ... 5 000	1 000.00	
WB XXXXTL-20		100 ... 5 000		550.00
STP 10000TL-10				458.70
STP 12000TL-10				366.30
STP 15000TL-10				323.40
STP 17000TL-10				

**Nominal frequency\***

Nominal frequency value of the set country standard

Inverter	Unit	Value range	Default settings
	Hz	44 ... 65	50

Inverter	Setting
	Other standard
50	AS4777.3
50	C10/11
50	CGC/GF001
50	DK5940E2.2
50	EN 50438
50	EN50438-CZ
50	Enel-GUIDA
50	G83/1-1
50	IEC61727 (MEA/PEA)
60	KEMCO501/2008
50	KEPCO Guide
50	Medium Voltage Directive (Int)
50 (60)	Off-grid (50/60)
50	PPC
50	PPDS
50	RD1663-A
50	SI4777-2
50	VDE0126-1-1 (A/B)

**Grid nominal voltage\***

Nominal voltage value of the set country standard

Inverter	Unit	Value range	Default settings
	V	100 ... 280	230

Inverter	Setting
	Other standard
	AS4777.3 (SI4777-2)
	C10/11
	CGC/GF001
	DK5940E2.2
	EN50438 (CZ)
	Enel-GUIDA
	G83/1-1
	IEC61727/MEA
	IEC61727/PEA
	KEMCO501/2008
	KEPCO Guide
	Medium Voltage Directive (Int)
	Off-grid (50/60)
	PPC
	PPDS
	RD1663-A
	RD1663/661-A
	UL1741/208V
	UL1741/240V
	UL1741/auto
	VDE0126-1-1 (A/B)
SB XXXXHF-30	230
SB XXXXTL-20	230
WB XXXXTL-20	230
STP XXXXXTL-10	230
	220
	230
	230
	230
	230
	220
	220
	230
	230
	230
	230
	208
	240
	120
	230

## PE connection monitoring

Parameter for the activation of PE connection monitoring

Inverter	Unit	Value range	Default settings
SB XXXXHF-30 SB XXXXTL-20 WB XXXXTL-20	–	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>	Off

## Reconnection time upon short interruption \*

This parameter sets the duration of the grid observation period following a brief grid disruption. The "Reconnection time upon grid interruption" parameter defines the duration of the brief grid disruption.

Inverter	Unit	Value range	Default settings
SB XXXXHF-30 SB XXXXTL-20 WB XXXXTL-20	s	0 ... 400	–
STP XXXXTL-10		0 ... 1 600	

Inverter	Setting												
	Other standard												
	5	60	5	300	0	20	0	180	30	300	300	180	0
	AS4777.3	C10/11	CGC/GF001	DK5940E2.2	EN50438 (CZ)	EneI-GUIDA	G83/1-1	IEC61727 (MEA/PEA)	KEMCO501/2008	KEPCO Guide	Medium Voltage Directive (Int)	Off-grid (50/60)	PPC
	PPDS	RD1663-A	RD1663/661-A	SI4777-2	UL1741 (208V/240V)	VDE0126-1-1 (A/B)							

### Reconnection time upon grid interruption \*

This parameter defines the duration of a brief grid interruption.

Inverter	Unit	Value range	Default settings
SB XXXXHF-30 SB XXXXTL-20 WB XXXXTL-20	s	0 ... 400	-
STP XXXXTL-10		0 ... 1 600	

Inverter	Setting
	Other standard
	AS4777.3
	C10/11
	CGC/GF001
	DK5940E2.2
	EN50438 (CZ)
	Enel-GUIDA
	G83/1-1
	IEC61727 (MEA/PEA)
	KEMCO501/2008
	KEPCO Guide
	Medium Voltage Directive (Int)
	Off-grid (50/60)
	PPC
	PPDS
	RD1663-A
	RD1663/661-A
	SI4777-2
	UL1741
	VDE0126-1-1 (A/B)
30	Other standard
60	AS4777.3
30	C10/11
300	CGC/GF001
0	DK5940E2.2
20	EN50438 (CZ)
0	Enel-GUIDA
180	G83/1-1
30	IEC61727 (MEA/PEA)
300	KEMCO501/2008
300	KEPCO Guide
180	Medium Voltage Directive (Int)
0	Off-grid (50/60)
180	PPC
30	PPDS
180	RD1663-A
180	RD1663/661-A
300	SI4777-2
300	UL1741
30	VDE0126-1-1 (A/B)

### Reconnection time upon restart \*

The parameter defines the time to reconnection to the grid after a restart.

Inverter	Unit	Value range	Default settings
SB XXXXHF-30SB XXXXTL-20WB XXXXTL-20	s	0 ... 400	-
STP XXXXTL-10		0 ... 1 600	

Inverter	Setting
	Other standard
	AS4777.3
	C10/11
	CGC/GF001
	DK5940E2.2
	EN50438 (CZ)
	Enel-GUIDA
	G83/1-1
	IEC61727 (MEA/PEA)
	KEMCO501/2008
	KEPCO Guide
	Medium Voltage Directive (Int)
	Off-grid (50/60)
	PPC
	PPDS
	RD1663-A
	RD1663/661-A
	SI4777-2
	UL1741
	VDE0126-1-1 (A/B)
30	Other standard
60	AS4777.3
30	C10/11
20	CGC/GF001
0	DK5940E2.2
20	EN50438 (CZ)
0	Enel-GUIDA
0	G83/1-1
30	IEC61727 (MEA/PEA)
0	KEMCO501/2008
0	KEPCO Guide
180	Medium Voltage Directive (Int)
0	Off-grid (50/60)
0	PPC
30	PPDS
180	RD1663-A
180	RD1663/661-A
300	SI4777-2
0	UL1741
30	VDE0126-1-1 (A/B)



## 4.2.21 Grid monitoring - Country standard - PV module

### Maximum module ground current\*

The inverter disconnects from the grid when this threshold is exceeded.

Inverter	Unit	Value range	Default settings
SB XXXXHF-30	A	0.3 ... 1.5	1

### Tripping time maximum module ground current\*

The inverter disconnects from the grid after the tripping time when the maximum module ground current is exceeded.

Inverter	Unit	Value range	Default settings
SB XXXXHF-30	ms	0 ... 2 000	–

Inverter	Setting																																						
	1 000	Other standard	1 000	AS4777-3	1 000	C10/11	1 000	CGC/GF001	1 000	EN50438	1 000	EnelGUIDA	1 000	G83/1-1	1 000	IEC61727 (MEA/PEA)	1 000	KEMCOS01/2008	1 000	Medium Voltage Directive (Int)	1 000	Offgrid (50/60)	1 000	PPC	1 000	PPDS	1 000	RD1663-A	1 000	RD1663/661-A	1 000	SI4777-2	160	UL1741/208V	160	UL1741/240V	160	UL1741/auto	1 000

### Module grounding prescribed?\*

Indicates whether a module grounding is required under the country standard.

Inverter	Unit	Value range	Default settings
SB XXXXHF-30	–	<ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> </ul>	No

Inverter	Setting																																		
	No	Other standard	No	AS4777-3	No	C10/11	No	EnelGUIDA	No	EN50438	No	EN50438-CZ	No	G83/1-1	No	KEPCO Guide	No	Offgrid (60Hz)	No	PPC	No	RD1663-A	No	RD1663	Yes	UL1741/208V	Yes	UL1741/240V	Yes	UL1741/auto	No	VDE0126-1-1	No	VDE0126-1-1 A	No

### Prescribed module grounding type

PV module grounding type

Inverter	Unit	Value range	Default settings
SB XXXXHF-30	–	<ul style="list-style-type: none"> <li>Positive</li> <li>Negative</li> <li>None prescribed</li> <li>Learning: learning the grounding type, store after 10 h</li> </ul>	Learning

### Measures in the case of a ground fault

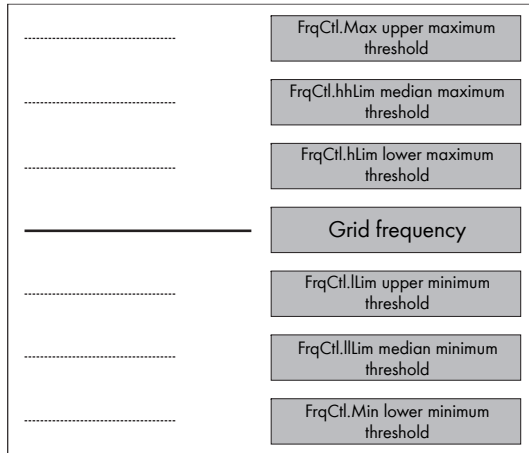
Regulates the inverter behavior in the event of a ground fault.

Inverter	Unit	Value range	Default settings
SB XXXXHF-30	–	<ul style="list-style-type: none"> <li>GndFltDscn: Disconnect from grid</li> <li>GndFltWrn: Warn</li> </ul>	Warn

Inverter	Setting																		
	GndFltWrn	Other standard	AS4777-3	C10/11	CGC/GF001	EN50438	Enel-GUIDA	G83/1-1	IEC61727 (MEA/PEA)	KEMCO501/2008	Medium Voltage Directive (Int)	Off-grid (50/60)	PPC	PPDS	RD1663-A	RD1663/661-A	SI4777-2	VDE0126-1-1	VDE0126-1-1 B

### 4.2.22 Grid monitoring - Frequency monitoring

The following parameters define the triggering times and corresponding triggering thresholds of the inverter frequency monitoring. The "set country standard" parameter can be used to restore the desired standard.



#### Frequency monitoring upper maximum threshold\*

The inverter switches off when this threshold is exceeded.

Inverter	Unit	Value range	Default settings
	Hz	50 ... 65	—

Inverter	Setting																		
	Other standard	AS4777-3	C10/11	CGC/GF001	DK5940E2.2	EN50438 (CZ)	Enel-GUIDA	G83/1-1	IEC61727 (MEA/PEA)	KEMCO501/2008	KEPCO Guide	Off-grid (50/60)	PPC	RD1663-A	RD1663/661-A	SI4777-2	UL1741	VDE0126-1-1	VDE0126-1-1 B
SB XXXXHF-30	65	56	65	65	65	65	65	56	65	62	—	65	65	65	65	65	65	65	65
SB XXXXTL-20 WB XXXXTL-20	65	55	51	—	50.3	51	—	51	—	—	—	55 (65)	55	55	55	—	—	51	51
STP XXXXTL-10	65	55	51	—	50.3	51	—	51	—	—	60.5	55 (65)	55	55	—	—	—	51	51

### Frequency monitoring median maximum threshold\*

The inverter switches off when this threshold is exceeded.

Inverter	Unit	Value range	Default settings
SB XXXXHF-30 STP XXXXTL-10	Hz	50 ... 65	65

### Frequency monitoring lower maximum threshold\*

The inverter switches off when this threshold is exceeded.

Inverter	Unit	Value range	Default settings
	Hz	50 ... 65	–

Inverter	Setting
	Other standard
50.5	AS4777.3
55	C10/11
50.2	CGC/CF001
50.5	DK5940E2.2
50.3	EN50438 (CZ)
51 (50.5)	EneI-GUIDA
50.3	G83/1-1
50.5	IEC61727 (MEA/PEA)
50.5	KEMCO501/2008
60.5	KEPCO Guide
60.3	Medium Voltage Directive (Int)
55 (51..5)	Off-grid (60)
54.5 ( 64.5)	PPC
50.5	PPDS
50.2	RD1663-A
51	SI4777-2
51	UL1741
60.5	VDE0126-1-1 (A/B)
50.2	

## Frequency monitoring upper minimum threshold\*

The inverter switches off below this threshold.

Inverter	Unit	Value range	Default settings
	Hz	44 ... 60	–

Inverter	Setting																		
	Other standard	AS4777.3	C10/11	CGC/GF001	DK5940E2.2	EN50438 (CZ)	Enel-GUIDA	G83/1-1	IEC61727 (MEA/PEA)	KEMCO501/2008	Medium Voltage Directive (Int)	Off-grid (60)	PPC	PPDS	RD1663-A	RD1663/661-A	SI4777-2	UL1741	VDE0126-1-1 (A/B)
SB XXXXHF-30	47.5	45	47.5	49.5	49.7	47 (49.5)	49.7	47	49.5	59.3	–	45 (55)	49.5	49.8	49	48	49	59.3	47.5
SB XXXXTL-20 WB XXXXTL-20	47.5	45	47.5	–	49.7	47 (49.5)	–	47	–	–	–	45 (55)	49.5	–	49	48	–	–	47.5
STP XXXXTL-10	47.5	45	47.5	49.5	49.7	47	49.7	47	49.5	59.3	44 (47.5)	45 (55)	49.5	–	48 (49)	48 (49)	49	–	47.5

## Frequency monitoring median minimum threshold\*

The inverter switches off below this threshold.

Inverter	Unit	Value range	Default settings
SB XXXXHF-30 STP XXXXTL-10	Hz	44 ... 60	44

Inverter	Setting												
	Other standard												
	44	AS4777.3											
	44	C10/11											
	44	CGC/GF001											
	44	DK5940E2.2											
	44	EN50438 (CZ)											
	44	Enel-GUIDA											
	44	G83/1-1											
	44	IEC61727 (MEA/PEA)											
	44	KEMCO501/2008											
	44	KEPCO Guide											
	44	Medium Voltage Directive (Int)											
	44	Off-grid (50/60)											
	44	PPC											
	49.5	PPDS											
	44	RD1663-A											
	44	SI4777-2											
	44	UL1741											
	44	VDE0126-1-1 (A/B)											

## Frequency monitoring lower minimum threshold\*

The inverter switches off below this threshold.

Inverter	Unit	Value range	Default settings
	Hz	44 ... 60	–

Inverter	Setting												
	Other standard												
	44	AS4777.3											
	44	C10/11											
	44	CGC/GF001											
	–	DK5940E2.2											
	45	EN50438 (CZ)											
	44	Enel-GUIDA											
	44	G83/1-1											
	44	IEC61727 (MEA/PEA)											
	58	KEMCO501/2008											
	–	KEPCO Guide											
	–	Medium Voltage Directive (Int)											
	44 (55)	Off-grid (50/60)											
	44	PPC											
	–	PPDS											
	44	RD1663-A											
	44	SI4777-2											
	57	UL1741											
	44	VDE0126-1-1 (A/B)											
SB XXXXHF-30	44												
SB XXXXTL-20	45												
WB XXXXTL-20	45												

**Frq. monitoring upper max. threshold trip. time \***

The inverter switches off after the tripping time after this threshold is exceeded.

Inverter	Unit	Value range	Default settings
	ms	0 ... 10 000	–

Inverter	Setting																	
	Other standard	AS4777.3	C10/11	CGC/GF001	DK5940E2.2	EN50438 (CZ)	Enef-GUIDA	G83/1-1	IEC61727 (MEA/PEA)	KEMCO 501/2008	KEPCO Guide	Off-grid (50/60)	PPC	RD1663-A	RD1663/661-A	SI4777.2	UL1741	VDE0126-1-1 (A/B)
SB XXXXHF-30	10 000	1 500	10 000	10 000	–	10 000	10 000	4 500	10 000	250	250	10 000	10 000	10 000	10 000	10 000	10 000	10 000
SB XXXXTL-20 WB XXXXTL-20	10 000	10 000	10 000	–	100	10 000	–	10 000	–	–	–	10 000	10 000	10 000	10 000	10 000	–	10 000
STP XXXXTL-10	10 000	10 000	10 000	–	100	10 000	–	10 000	–	250	250	10 000	10 000	10 000	10 000	–	10 000	10 000

**Frq. monitoring median max. threshold trip. time \***

The inverter switches off after the tripping time after this threshold is exceeded.

Inverter	Unit	Value range	Default settings
	ms	0 ... 10 000	10 000

**Frq. monitoring lower max. threshold trip. time \***

The inverter switches off after the tripping time after this threshold is exceeded.

Inverter	Unit	Value range	Default settings
SB XXXXHF-30	ms	0 ... 10 000	-
SB XXXXTL-20		100 ... 10 000	
WB XXXXTL-20			

Inverter	Setting												
	Other standard												
	AS4777.3												
	C10/11												
	CGC/GF001												
	DK5940E2.2												
	EN50438 (CZ)												
	Enel-GUIDA												
	G83/1-1												
	IEC61727 (MEA/PEA)												
	KEMCO501/2008												
	KEPCO Guide												
	Medium Voltage Directive (Int)												
	10 000 (100)												
	200												
	500												
	500												
	500												
	RD1663-A												
	RD1663/661-A												
	SI4777-2												
	UL1741												
	VDE0126-1-1 (A/B)												
	200												

**Frq. monitoring upper min. threshold trip. time \***

The inverter switches off after the tripping time below this threshold.

Inverter	Unit	Value range	Default settings
SB XXXXHF-30	ms	0 ... 300 000	-
STP XXXXTL-10		100 ... 10 000	
SB XXXXTL-20 WB XXXXTL-20			

Inverter	Setting												
	Other standard												
	AS4777.3												
	C10/11												
	CGC/GF001												
	DK5940E2.2												
	EN50438 (CZ)												
	Enel-GUIDA												
	G83/1-1												
	IEC61727 (MEA/PEA)												
	KEMCO501/2008												
	KEPCO Guide												
	Medium Voltage Directive												
	300 000												
	100												
	2 000												
	Off-grid (50/60)												
	500												
	500												
	500												
	RD1663-A												
	RD1663/661-A												
	SI4777-2												
	UL1741												
	VDE0126-1-1 (A/B)												
	200												



Inverter	Setting																				
	Other standard	AS4777.3	C10/11	CGC/GF001	DK5940E2.2	EN50438 (CZ)	Enel-GUIDA	G83/1-1	IEC61727 (MEA/PEA)	KEMCO501/2008	KEPCO Guide	Medium Voltage Directive	Medium Voltage Directive Int	Offgrid (50/60)	PPC	PPDS	RD1663-A	RD1663/661-A	SI4777-2	UL1741	VDE0126-1-1 (A/B)
SB XXXXHF-30	200	2 000	200	200	–	500 (200)	90	5 000	100	160	2 000	300 000	100	2 000	500	500	500	3 500	200	160	200

### Frq. monitoring median min. threshold trip. time \*

The inverter switches off after the tripping time below this threshold.

Inverter	Unit	Value range	Default settings
	ms	0 ... 300 000	–

Inverter	Setting																		
	Other standard	AS4777.3	C10/11	CGC/GF001	DK5940E2.2	EN50438 (CZ)	Enel-GUIDA	G83/1-1	IEC61727 (MEA/PEA)	KEMCO501/2008	Medium Voltage Directive (Int)	Offgrid (50/60)	PPC	PPDS	RD1663-A	SI4777-2	UL1741	VDE0126-1-1	VDE0126-1-1 B
	10 000	10 000	10 000	10 000	10 000	10 000	10 000	10 000	10 000	160	300 000	10 000	10 000	100	10 000	10 000	160	10 000	10 000

### Frq. monitoring lower min. threshold trip. time\*

The inverter switches off after the tripping time below this threshold.

Inverter	Unit	Value range	Default settings
	ms	0 ... 10 000	–

Inverter	Setting											
	Other standard	AS4777.3	C10/11	CGC/GF001	DK5940E2.2	EN50438(CZ)	Enel-GUIDA	G83/1-1	IEC61727 (MEA/PEA)	KEMCO501/2008	KEPCO Guide	Medium Voltage Directive (Int)
SB XXXXHF-30 STP XXXXTL-10	10 000	1 500	10 000	10 000	100	10 000	10 000	4 500	10 000	250	250	–
SB XXXXTL-20 WB XXXXTL-20	10 000	1 500	10 000	–	100	10 000	–	3 000	–	–	–	10 000
												10 000
												PPC
												PPDS
												RD1663-A
												SI4777-2
												ULI1741
												VDE0126-1-1 (A/B)

### Maximum allowable frequency drift\*

Maximum frequency change in a specified time.

Inverter	Unit	Value range	Default settings
	Hz/s	0 ... 10	–

### Upper frequency for reconnection\*

For connection, the grid frequency must be below the threshold.

Inverter	Unit	Value range	Default settings
	Hz	50 ... 65	–

Inverter	Setting											
	Other standard	AS4777.3	C10/11	DK5940E2.2	EN 50438	EN50438-CZ	G83/1-1	KEMCO501/2008	Medium Voltage Directive (Int)	Off-grid (50/60)	PPC	PPDS
	65	65	65	65	65	65	65	65	65 (50.2)	65	65	65
												RD1663-A
												ULI1741
												VDE0126-1-1
												VDE0126-1-1 A
												VDE0126-1-1 B

**Lower frequency for reconnection\***

The grid frequency must be above the threshold.

Inverter	Unit	Value range	Default settings
	Hz	44 ... 65	47.5

Inverter	Setting																
	Other standard	AS4777.3	C10/11	DK5940E2.2	EN 150438	EN50438-CZ	G83/1-1	KEMCO501/2008	Medium Voltage Directive (Int)	Off-grid (50/60)	PPC	PPDS	RD1663-A	UL1741	VDE0126-1-1	VDE0126-1-1 A	VDE0126-1-1 B
	44	44	44	44	44	44	44	44	44 [47.5]	44	44	44	44	-	44	44	44

**Tripping time when exceeding max. frequency drift\***

The inverter switches off after the tripping time after this threshold is exceeded.

Inverter	Unit	Value range	Default settings
	ms	0 ... 10 000	10 000

### 4.2.23 Grid monitoring - Country standard - Islanding detection

#### Escalation factor\*

Parameter for activation of the island grid identification.

These parameters may only be changed after prior agreement with the SMA Serviceline. This parameter can be used to set the starting point of the frequency output characteristic curve.

Inverter	Unit	Value range	Default settings
	–	0 ... 40	–

Inverter	Setting																		
	Other standard	AS4777.3	C10/11	CGC/GF001	DK5940E2.2	EN50438 (CZ)	Enel-GUIDA	G83/1-1	IEC61727 (MEA/PEA)	KEMCO501/2008	KEPCO Guide	Medium Voltage Directive (Int)	Off-grid (50/60)	PPC	PPDS	RD1663-A	SI4777-2	UL1741	VDE0126-1-1 (A/B)
	0	12	12	12	0	0	12	12	12	12	12	0	12	12	12	12	12	12	12

#### Tripping time when exceeding max. phase shift\*

Phase shift tripping time

Inverter	Unit	Value range	Default settings
	ms	100 ... 10 000	–

Inverter	Setting																
	Other standard	AS4777.3	C10/11	DK5940E2.2	EN 50438	EN50438-CZ	G 83/1	KEMCO501/2008	KEPCO Guide	Medium Voltage Directive (Int)	Off-grid (50/60)	PPC	PPDS	RD1663-A	VDE0126-1-1	VDE0126-1-1 A	VDE0126-1-1 B
	500	2 000	500	500	500	500	500	500	500	5 000	500	500	500	500	500	500	500

## Maximum allowable phase shift\*

The inverter switches off after the maximum allowable phase shift is exceeded.

Inverter	Unit	Value range	Default settings
	°	0 ... 25	—

Inverter	Setting
	Other standard
	AS4777.3
	C10/11
	DK5940E2.2
	EN 150438
	EN50438-CZ
	G 83/1
	KEMCO501/2008
	KEPCO Guide
	Medium Voltage Directive (Int)
	Off-grid (50/60)
	PPC
	PPDS
	RD1663-A
	VDE0126-1-1
	VDE0126-1-1 A
	VDE0126-1-1 B

## Tripping time of islanding detection frq. monitor\*

Time before grid is disconnected when allowable frequency deviation for islanding detection is exceeded.

Inverter	Unit	Value range	Default settings
	ms	0 ... 10 000	—

Inverter	Setting
	Other standard
	AS4777.3
	C10/11
	CGC/GRF001
	DK5940E2.2
	EN50438 (CZ)
	Enel-GUIDA
	G83/1-1
	IEC61727 (MEA/PEA)
	KEMCO501/2008
	Medium Voltage Directive (Int)
	Off-grid (50/60)
	PPC
	PPDS
	RD1663-A
	RD1663/661-A
	SI4777-2
	VDE0126-1-1 (A/B)

### Status of islanding detection frequency monitor\*

Switching the procedure on/off to monitor the frequency of islanding detection

Inverter	Unit	Value range	Default settings
	–	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>	–

Inverter	Setting																
	Other standard	AS4777.3	C10/11	CGC/GF001	EN50438 (CZ)	Enel-GUIDA	G83/1-1	IEC61727 (MEA/PEA)	KEMCO501/2008	Medium Voltage Directive (Int)	Off-grid (50/60)	PPC	PPDS	RD1663-A	RD1663/661-A	SI4777-2	VDE0126-1-1 (A/B)
	Off	On	On	On	Off	On	On	On	On	Off	Off	On	On	On	On	On	On

### Trip.time of islanding detection unbalance detect.\*

Time until grid disconnection when permissible grid imbalance is exceeded

Inverter	Unit	Value range	Default settings
	ms	0 ... 10 000	–

Inverter	Setting																
	Other standard	AS4777.3	C10/11	CGC/GF001	DK5940E2.2	EN50438 (CZ)	Enel-GUIDA	G83/1-1	IEC61727 (MEA/PEA)	KEMCO501/2008	Medium Voltage Directive (Int)	Off-grid (50/60)	PPC	PPDS	RD1663-A	SI4777-2	VDE0126-1-1 (A/B)
	5 000	2 000	5 000	2 000	5 000	5 000	5 000	5 000	2 000	500	5 000	5 000	5 000	5 000	500	2 000	5 000

## Status of islanding detection unbalance detection \*

Switching procedure on/off to detect imbalance of islanding detection

Inverter	Unit	Value range	Default settings
	–	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>	–

Inverter	Setting																
	Other standard	AS4777.3	C10/11	CGC/GF001	EN50438 (CZ)	EnelGUIDA	G83/1-1	IEC61727 (MEA/PEA)	KEMCO501/2008	Medium Voltage Directive (Int)	Off-grid (50/60)	PPC	PPDS	RD1663-A	RD1663/661-A	SI4777-2	VDE0126-1-1 (A/B)
	Off	On	On	On	Off	On	On	On	On	Off	Off	On	On	On	On	On	On

## Permissible grid unbalance of islanding detection \*

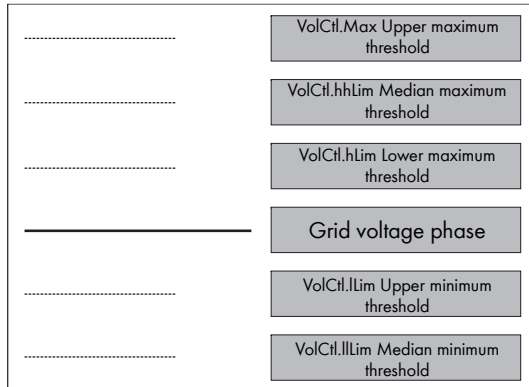
Maximum permitted imbalance of islanding detection

Inverter	Unit	Value range	Default settings
	%	0 ... 50	–

Inverter	Setting																
	Other standard	AS4777.3	C10/11	CGC/GF001	DK5940E2.2	EN50438 (CZ)	EnelGUIDA	G83/1-1	IEC61727 (MEA/PEA)	KEMCO501/2008	Medium Voltage Directive (Int)	Off-grid (50/60)	PPC	PPDS	RD1663-A	SI4777-2	VDE0126-1-1 (A/B)
	50	10	10	10	50	50	10	10	10	10	50	50	10	10	10	10	10

### 4.2.24 Grid monitoring - Voltage monitoring

The following parameters define the triggering times and corresponding triggering thresholds of inverter voltage monitoring. The "set country standard" parameter can be used to restore the desired standard.



#### Voltage monitoring upper maximum threshold\*

The inverter switches off when this threshold is exceeded.

Inverter	Unit	Value range	Default settings
	V	300 ... 420	—

Inverter	Setting																				
	Other standard	AS4777.3	C10/11	CGC/GF001	DK5940E2.2	EN50438 (CZ)	EneC-GUIDA	G83/1-1	IEC61727 (MEA/PEA)	KEMCO501/2008	KEPCO Guide	Medium Voltage Directive (Int)	Offgrid (50/60)	PPC	PPDS	RD1663-A	SI4777-2	UL1741/208V	UL1741/240V	UL1741/auto	VDE0126-1-1 (A/B)
SB XXXXHF-30	400	390	400	400	400	400	400	400	400	400	400	400	400	400	400	400	390	400	420	420	400
SB XXXXTL-20 WB XXXXTL-20	400	390	400	—	—	400	—	400	—	—	—	400	400	400	—	400	—	—	—	—	400
STP XXXXTL-10	400	390	400	400	400	400	400	390	400	400	400	400	400	400	400	400	390	400	420	420	400



### Voltage monitoring median maximum threshold\*

The inverter switches off when this threshold is exceeded.

Inverter	Unit	Value range	Default settings
SB XXXXTL-20 WB XXXXTL-20	V	230 ... 280	-
SB XXXXHF-30		130 ... 290	

Inverter	Setting												
	Other standard												
	280	AS4777.3	C10/11	CGC/GF001	DK5940E2.2	EN50438(CZ)	EneI-GUIDA	G83/1-1	IEC61727 (MEA/PEA)	KEMCO501/2008	KEPCO Guide	Medium Voltage Directive (Int)	Off-grid (50/60)
	280											PPC	PPDS
	280												RD1663-A
	280												SI47777-2
	280												UL1741/208V
	288												UL1741/240V
	144												UL1741/auto
	280												VDE0126-1-1 (A/B)

### Voltage monitoring lower maximum threshold\*

The inverter switches off when this threshold is exceeded.

Inverter	Unit	Value range	Default settings
SB XXXXTL-20 WB XXXXTL-20 STP XXXXTL-1.0	V	230 ... 280	-
SB XXXXHF-30		130 ... 290	

Inverter	Setting												
	Other standard												
	264.5	AS4777.3	C10/11	CGC/GF001	DK5940E2.2	EN50438 (CZ)	EneI-GUIDA	G83/1-1	IEC61727 (MEA/PEA)	KEMCO501/2008	KEPCO Guide	Medium Voltage Directive (Int)	Off-grid (50/60)
	270												PPC
	253												PPDS
	242												RD1663-A
	276												UL1741/208V
	264.5												UL1741/240V
	276												UL1741/auto
	264												VDE0126-1-1 (A/B)
	240												
	242												
	242												
	280 (264.5)												
	264.5												
	264.5												
	253												
	253												
	228.8												
	264												
	132												
	264.5												

## Voltage monitoring upper minimum threshold\*

The inverter switches off below this threshold.

Inverter	Unit	Value range	Default settings
SB XXXXHF-30	V	60 ... 240	-
SB XXXXTL-20		100 ... 230	
WB XXXXTL-20			
STP XXXXTL-10		45 ... 230	

Inverter	Setting
	Other standard
	AS4777.3
	C10/11
	GCG/GF001
	DK5940E2.2
	EN50438 (CZ)
	EnelGUIDA
	G83/1-1
	IEC61727/MEA
	IEC61727/PEA
	KEMCO501/2008
	KEPCO Guide
	Medium Voltage Directive (Int)
	46 (184)
	180
	Off-grid (50/60)
	PPC
	PPDS
	RD1663-A
	SI4777-2
	UL1741/208V
	UL1741/240V
	UL1741/400V
	VDE0126-1-1 (A/B)
	184
	195.5
	200
	184
	187
	184
	195.5
	184
	207
	209
	200
	193.6
	193.6
	46 (184)
	180
	184
	207
	195.5
	195.5
	183.1
	211.2
	105.6
	184

## Voltage monitoring of median minimum threshold\*

The inverter switches off below this threshold.

Inverter	Unit	Value range	Default settings
SB XXXXHF-30	V	60 ... 240	-
SB XXXXTL-20		100 ... 230	
WB XXXXTL-20			
STP XXXXTL-10		45 ... 230	

Inverter	Setting
	Other standard
	AS4777.3
	C10/11
	DK5940E2.2
	EN50438 (CZ)
	EnelGUIDA
	G83/1-1
	GCG/GF001
	IEC61727/MEA
	IEC61727/PEA
	KEMCO501/2008
	KEPCO Guide
	Medium Voltage Directive (Int)
	46 (103.5)
	100
	Off-grid (50/60)
	PPC
	PPDS
	RD1663-A
	SI4777-2
	UL1741/208V
	UL1741/240V
	UL1741/400V
	VDE0126-1-1 (A/B)
	100
	100
	100
	100
	100
	100
	100
	110
	115
	110
	110
	110
	110
	46 (103.5)
	100
	100
	184
	100
	115
	104
	120
	60
	100

**Voltage monitoring upper max. threshold trip. time \***

The inverter switches off after the tripping time after this threshold is exceeded.

Inverter	Unit	Value range	Default settings
	ms	0.1 ... 5	0.312

**Voltage monitoring median max. threshold trip.time \***

The inverter switches off after the tripping time after this threshold is exceeded.

Inverter	Unit	Value range	Default settings
SB XXXXHF-30	ms	0 ... 10 000	-
SB XXXXTL-20		50 ... 10 000	
WB XXXXTL-20			
STP XXXXTL-10		0 ... 60 000	

Inverter	Setting																		
	Other standard																		
	10 000	AS4777.3	C10/11	CGC/GF001	DK5940E2.2	EN50438(CZ)	Enel-GUIDA	G83/1-1	IEC61727 (MEA/PEA)	KEMCO501/2008	KEPCO Guide	Medium Voltage Directive (Int)	Off-grid (50/60)	PPC	PPDS	RD1663-A	SI4777-2	UL1741	VDE0126-1-1 (A/B)
	10 000	10 000	10 000	50	10 000	10 000	10 000	10 000	50	160	160	60 000	10 000	10 000	100	10 000	50	160	10 000

### Voltage monitoring lower max. threshold trip. time \*

The inverter switches off after the tripping time after this threshold is exceeded.

Inverter	Unit	Value range	Default settings
SB XXXXHF-30	ms	0 ... 10 000	-
SB XXXXTL-20		100 ... 10 000	
WB XXXXTL-20			
STP XXXXTL-10		0 ... 60 000	

Inverter	Setting
	Other standard
	AS4777.3
	C10/11
	CGC/GF001
	DK5940E2.2
	EN50438(CZ)
	Enel-GUIDA
	G83/1-1
	IEC61727 (MEA/PEA)
	KEMCO501/2008
	KEPCO Guide
	Medium Voltage Directive (Int)
	Offgrid (50/60)
	PPC
	PPDS
	RD1663-A
	SI4777-2
	UL1741
	VDE0126-1-1 (A/B)
	200
	2 000
	200
	2 000
	100
	200
	100
	5 000
	2 000
	2 000
	2 000
	60 000 (100)
	200
	500
	500
	500
	2 000
	1 000
	200

### Voltage monitoring upper min. threshold trip. time \*

The inverter switches off after the tripping time below this threshold.

Inverter	Unit	Value range	Default settings
SB XXXXHF-30	ms	0 ... 10 000	-
STP XXXXTL-10			
SB XXXXTL-20 WB XXXXTL-20		100 ... 10 000	

Inverter	Setting
	Other standard
	AS4777.3
	C10/11
	CGC/GF001
	DK5940E2.2
	EN50438 (CZ)
	Enel-GUIDA
	G83/1-1
	IEC61727 (MEA/PEA)
	KEMCO501/2008
	KEPCO Guide
	Medium Voltage Directive
	Medium Voltage Directive Int
	Offgrid (50/60)
	PPC
	PPDS
	RD1663-A
	SI4777-2
	UL1741
	VDE0126-1-1 (A/B)
	200
	2 000
	200
	2 000
	1 500 (200)
	200
	5 000
	2 000
	2 000
	2 000
	10 000
	1 000
	2 000
	500
	500
	500
	2 000
	2 000
	200

## Voltage monitoring median min. threshold trip.time \*

The inverter switches off after the tripping time below this threshold.

Inverter	Unit	Value range	Default settings
SB XXXXHF-30 STP XXXXTL-10	ms	0 ... 10 000	-
SB XXXXTL-20 WB XXXXTL-20		100 ... 10 000	

Inverter	Setting																			
	Other standard																			
	10 000	AS4777.3	C10/11	CGC/GF001	DK5940E2.2	EN50438 (CZ)	Enel-GUIDA	G83/1-1	IEC61727 (MEA/PEA)	KEMCO501/2008	KEPCO Guide	Medium Voltage Directive (Int)	Off-grid (50/60)	PPC	PPDS	RD1663-A	SI4777-2	UL1741	VDE0126-1-1 (A/B)	
	10 000	10 000	10 000	100	10 000	10 000	10 000	10 000	100	160	160	10 000 (300)	10 000	10 000	100	10 000	100	160	10 000	

## Voltage increase protection \*

Parameter for setting the 10-minute average for the rise-in voltage protection (applies only to Germany)

In Germany, inverters are permitted to feed into the public grid with up to 260 V AC. However, the DIN VDE 0126-1-1 standard stipulates that the 10-minute AC voltage average may not exceed 253 V. If the average over 10 minutes exceeds the threshold value of 253 V, the inverter disconnects itself from the grid. As soon as the 10-minute average decreases back to less than 253 V, the inverter will continue to feed power into the grid.

Inverter	Unit	Value range	Default settings
	V	230 ... 280	-

Inverter	Setting																				
	Other standard																				
	280	AS4777.3	C10/11	CGC/GF001	DK5940E2.2	EN50438 (CZ)	Enel-GUIDA	G83/1-1	IEC61727 (MEA/PEA)	KEMCO501/2008	KEPCO Guide	Medium Voltage Directive (Int)	Off-grid (50/60)	PPC	PPDS	RD1663-A	SI4777-2	UL1741	VDE0126-1-1 A	VDE0126-1-1 B	
	280	280	280	280	280	253	280	280	280	280	280	280	280	253	253	280	280	280	253	244	253



## 4.2.25 Plant communication

### Maximum Bluetooth transmission power\*

The maximum emitted transmission power is made up of the value of this parameter plus an antenna gain of up to 4 dBm. If the parameter is set to 16 dBm, the maximum transmission power is 20 dBm. When changing the parameter, observe the permitted threshold in the respective country.

Inverter	Unit	Value range	Default settings
	dBm	1 ... 20	–

Inverter	Setting																
	AS4777.3	C10/11	CGC/CG001	DK5940E2.2	EN 50438	EN50438-CZ	Enel-GUIDA	G83/1-1	IEC61727 (MEA/PEA)	KEPCO Guide	Offgrid (50/60)	PPC	RD1663-A	SI4777-2	VDE0126-1-1	VDE0126-1-1 A	VDE0126-1-1 B
	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16 <sup>1)</sup>

<sup>1)</sup> In case of older inverter firmware versions, the value 8 dBm may be set.

## 4.2.26 Device Components

Name	Description
<b>Firmware version of the Bluetooth component</b>	Software version of the component present in the inverter
<b>Serial number of the Bluetooth component</b>	Serial number of the component present in the inverter
<b>SUSyID of the Bluetooth component</b>	Identification number of the device family in the inverter
<b>Revision status of the Bluetooth component</b>	Conversion and repair status of the component present in the inverter
<b>Firmware version of the display</b>	Software version of the component present in the inverter
<b>SUSyID of the display</b>	Identification number of the device family in the inverter
<b>Revision status of the display</b>	Conversion and repair status of the component present in the inverter
<b>Firmware version of the residual current mon. unit</b>	Software version of the component present in the inverter
<b>Hardware version of the residual current mon. unit</b>	Version number of the component present in the inverter

<b>Name</b>	<b>Description</b>
<b>Revision status of the residual current mon. unit</b>	Conversion and repair status of the component present in the inverter
<b>Firmware version of the communication assembly</b>	Software version of the component present in the inverter
<b>Hardware version of the communication assembly</b>	Version number of the component present in the inverter
<b>Serial number of the communication assembly</b>	Serial number of the component present in the inverter
<b>SUSyID of the communication assembly</b>	Identification number of the device family in the inverter
<b>Revision status of the communication assembly</b>	Conversion and repair status of the component present in the inverter
<b>Firmware version of the logic component</b>	Software version of the component present in the inverter
<b>Revision status of the logic component</b>	Conversion and repair status of the component present in the inverter
<b>Firmware version of string protection</b>	Software version of the component present in the inverter
<b>Hardware version of string protection</b>	Version number of the component present in the inverter
<b>Firmware version of the RS485 Module</b>	Software version of the component present in the inverter
<b>Hardware version of the RS485 module</b>	Version number of the component present in the inverter
<b>Serial number of the RS485 module</b>	Serial number of the component present in the inverter
<b>SUSyID of the RS485 module</b>	Identification number of the device family in the inverter
<b>Revision status of the RS485 module</b>	Revision and repair status of the component in the inverter
<b>Firmware version of the central assembly</b>	Software version of the component present in the inverter
<b>Hardware version of the central assembly</b>	Version number of the component present in the inverter
<b>Serial number of the central assembly</b>	Serial number of the component present in the inverter
<b>SUSyID of the central assembly</b>	Identification number of the device family in the inverter



Name	Description
<b>Revision status of the central assembly</b>	Conversion and repair status of the component present in the inverter

## 4.2.27 Equipment & device control system

### Activation of active power gradient for reconnection after grid fault

Switching on/off the gradient for reconnecting after a grid fault

Inverter	Unit	Value range	Default settings
STP XXXXXTL-10	–	<ul style="list-style-type: none"> <li>On: gradient is taken into account</li> <li>Off: gradient is not taken into account</li> </ul>	Off

### Reactive power gradient

Adjustable gradient for limiting the reactive power change per second

Inverter	Unit	Value range	Default settings
STP XXXXXTL-10	%	1 ... 20	20

### Active power gradient

Gradient for limiting the maximum power change per second

Inverter	Unit	Value range	Default settings
STP XXXXXTL-10	%	1 ... 20	20

### Time-out for communication fault indication

When the plant control is active, the Power Reducer Box transmits plant control objects at specific time intervals. This parameter controls the permissible interval duration. If this duration is exceeded, the inverter triggers the "time interval expired" event 10223 in order to indicate an error in communication with the Power Reducer Box.

Inverter	Unit	Value range	Default settings
STP XXXXXTL-10	s	60 ... 86 400	1 800

## 4.2.28 Equipment & device control system - Configuration of dynamic grid support

### PWM inversion delay, dynamic grid support configuration

This parameter defines the time after a voltage drop in which the minimum voltage must be reached. If this time is exceeded, the inverter stops feeding in, but does not disconnect from the grid.

Inverter	Unit	Value range	Default settings
STP XXXXTL-10	s	0 ... 5	0

### Operating mode of dynamic grid support, dynamic grid support configuration

Dynamic grid support operating mode

Inverter	Unit	Value range	Default settings
STP XXXXTL-10	–	<ul style="list-style-type: none"> <li>• Limited Dynamic Grid Support</li> <li>• Complete Dynamic Grid Support</li> </ul>	Limited Dynamic Grid Support

### PWM inverse voltage, dynamic grid support configuration

Parameter for defining the limit of the adjustable PWM lock-out zone in relation to the plant control reference voltage

Inverter	Unit	Value range	Default settings
STP XXXXTL-10	%	0 ... 100	70

### Hysteresis voltage, dynamic grid support configuration

Hysteresis that is applied to the PWM lock-out limits with reference to the plant control reference voltage

Inverter	Unit	Value range	Default settings
STP XXXXTL-10	V	0 ... 100	5

### Reactive current droop, full dynamic grid support configuration

Parameter for selecting the corresponding reactive current droop guideline.

- **Medium Voltage Directive:** reactive current droop in accordance with the Medium Voltage Directive
- **SDLWindV:** reactive current droop in accordance with the Wind System Service Ordinance

Inverter	Unit	Value range	Default settings
STP XXXXTL-10	–	<ul style="list-style-type: none"> <li>• SDLWindV</li> <li>• Medium Voltage Directive</li> </ul>	Medium Voltage Directive

**Upper limit, voltage dead band, full dynamic support configuration**

Upper limit of the voltage dead band

Inverter	Unit	Value range	Default settings
STP XXXXXTL-10	%	0 ... 40	10

**Lower limit, voltage dead band, full dynamic grid support configuration**

Lower limit of the voltage dead band

Inverter	Unit	Value range	Default settings
STP XXXXXTL-10	%	- 40 ... 0	- 10

**Gradient K or reactive current droop, full dynamic grid support configuration**

Gradient slope

Inverter	Unit	Value range	Default settings
STP XXXXXTL-10	V	0 ... 10	2

## 4.2.29 Equipment & device control system - Configuration of static voltage stabilization

### Operating mode of static voltage stabilisation

Reactive power control operating mode

- **Off:** reactive power control deactivated
- **React. power/volt. char. Q(U):** reactive power is regulated depending on the grid voltage
- **Reactive power Q, direct spec.:** reactive power is regulated with a constant percentage
- **Q specified by plant control:** reactive power is regulated by the utility operator
- **cosPhi, direct specification:** reactive power is regulated with a constant output factor cosPhi
- **cosPhi, spec. by plant control:** reactive power is regulated with a cosPhi from the utility operator
- **cosPhi(P) characteristic curve:** reactive power is regulated depending on the cosPhi(P) characteristic curve

Inverter	Unit	Value range	Default settings
STP XXXXXTL-10	–	see above	cosPhi, direct specification

### Reactive power setpoint Q

Parameter for the "Reactive power Q, direct specification" operating mode, in conjunction with the "currently set active power limit" parameter

Inverter	Unit	Value range	Default settings
STP XXXXXTL-10	%	– 50 ... +50	0

### Reactive power gradient, reactive power/voltage characteristic curve configuration Q(U)

Characteristic curve increase relative to the "currently set active power limit" parameter

Inverter	Unit	Value range	Default settings
STP XXXXXTL-10	%	0 ... 10	0

### Adjustment time for characteristic operating point, reactive power/voltage characteristic curve configuration Q(U)

Adjustment time for the operating point of the characteristic curve

Inverter	Unit	Value range	Default settings
STP XXXXXTL-10	s	2 ... 60	10

### Voltage spread, reactive power/voltage characteristic curve configuration Q(U)

Voltage spread as a reactive power characteristic of the curve with reference to the reference voltage

Inverter	Unit	Value range	Default settings
STP XXXXTL-10	%	0 ... 20	0

### Symmetrical limit for maximum reactive power, reactive power/voltage characteristic curve configuration Q(U)

Defines a symmetrical limit of the maximum reactive power by means of the characteristic curve with respect to the "Currently set active power limit" parameter

Inverter	Unit	Value range	Default settings
STP XXXXTL-10	%	0 ... 50	0

### Specified voltage $U_{Q0}$ , reactive power/voltage characteristic curve configuration Q(U)

Voltage specification of the reactive power drop that represents the center point of the characteristic curve, with respect to the reference voltage

Inverter	Unit	Value range	Default settings
STP XXXXTL-10	%	80 ... 120	100

### cosPhi at end point, cosPhi(P) characteristic curve configuration

Displacement factor cosPhi for the end point

Inverter	Unit	Value range	Default settings
STP XXXXTL-10	–	0.8 ... 1	1

### Excitation type at end point, cosPhi(P) characteristic curve configuration

Excitation type of the displacement factor cosPhi at the starting point

Inverter	Unit	Value range	Default settings
STP XXXXTL-10	–	<ul style="list-style-type: none"> <li>• Overexcited</li> <li>• Underexcited</li> </ul>	Underexcited

### Excitation type at starting point, cosPhi(P) characteristic curve configuration

Excitation type of the displacement factor cosPhi at the starting point

Inverter	Unit	Value range	Default settings
STP XXXXTL-10	–	<ul style="list-style-type: none"> <li>• Overexcited</li> <li>• Underexcited</li> </ul>	Overexcited

### Active power at end point, $\cos\Phi(P)$ characteristic curve configuration

Active power at the end point with reference to the "currently set active power limit" parameter

Inverter	Unit	Value range	Default settings
STP XXXXXTL-10	%	0 ... 100	100

### Active power at starting point, $\cos\Phi(P)$ characteristic curve configuration

Active power at the starting point with reference to the "currently set active power limit" parameter

Inverter	Unit	Value range	Default settings
STP XXXXXTL-10	V	0 ... 100	0

### $\cos\Phi$ at starting point, $\cos\Phi(P)$ characteristic curve configuration

Displacement factor  $\cos\Phi$  for the starting point

Inverter	Unit	Value range	Default settings
STP XXXXXTL-10	–	0.8 ... 1	1

### Excitation type for $\cos\Phi$ , $\cos\Phi$ configuration, direct specification

Excitation type of the displacement factor  $\cos\Phi$

Inverter	Unit	Value range	Default settings
STP XXXXXTL-10	–	<ul style="list-style-type: none"> <li>• Overexcited</li> <li>• Underexcited</li> </ul>	Underexcited

### $\cos\Phi$ setpoint, $\cos\Phi$ configuration, direct specification

Specification of the displacement factor  $\cos\Phi$

Inverter	Unit	Value range	Default settings
STP XXXXXTL-10	–	0.8 ... 1	1

## 4.2.30 Equipment & device control system - Config. active power reduct. at overfrequency P(f)

### Operating mode of active power reduction in case of overfrequency P(f)

Operating mode of the power reduction depending on the frequency

Inverter	Value range	Default settings
	<ul style="list-style-type: none"> <li>Off: active power limitation deactivated</li> <li>Linear gradient: active power limitation activated</li> </ul>	Off

### Activation of stay-set indicator function, linear instantaneous power gradient configuration

On/Off switching of the stay-set indicator function for the frequency active power configuration line

Inverter	Unit	Value range	Default settings
	–	<ul style="list-style-type: none"> <li>Off</li> <li>On</li> </ul>	On

### Active power gradient, linear instantaneous power gradient configuration

Gradient of the characteristic curve relative to the instantaneous active power when limitation is activated

Inverter	Unit	Value range	Default settings
	%	10 ... 100	40

### Difference between reset frequency and grid frequency, linear instantaneous power gradient configuration

Frequency deviation for resetting the power control

(Resetting frequency = grid frequency + setting)

Inverter	Unit	Value range	Default settings
	Hz	0 ... 5	0.05

### Difference between starting frequency and grid frequency, linear instantaneous power gradient configuration

Starting frequency deviation for power control (starting frequency = grid frequency + setting)

Inverter	Unit	Value range	Default settings
	Hz	0 ... 5	0.2

## 4.2.31 Equipment & device control system - Configuration of feed-in management

### Operating mode of feed-in management

Active power limitation power mode

Inverter	Value range	Default settings
	<ul style="list-style-type: none"> <li>• Off</li> <li>• Active power limitation P in W</li> <li>• Active power limitation P in % (Pmax)</li> <li>• Active power limitation P via plant control</li> </ul>	Active power limitation P via plant control

### Active power limitation P, active power configuration

Setting for "active power limitation P in % (Pmax)" operating mode

Inverter	Unit	Value range	Default settings
	%	0 ... 100	100

### Active power limitation P, active power configuration

Setting for the "Active power limitation P in W" operating mode

Inverter	Unit	Value range	Default settings
SB 3000TL-20	W	0 ... 3 060	3 000
SB 4000TL-20		0 ... 4 060	4 000
SB 5000TL-20		0 ... 5 060	5 000
STP 10000TL-10		0 ... 17 170	10 100
STP 12000TL-10			12 120
STP 15000TL-10			15 150
STP 17000TL-10			17 170
WB 3600TL-20		0 ... 4 060	3 600
WB 5000TL-20		0 ... 5 060	5 000



## 4.3 Event Messages

Event messages smaller than 100 correspond to the error number displayed in the inverter display.

No.	Display text	Description
1	Grid fault	<p>The grid voltage has exceeded the permissible range. For safety reasons, the inverter disconnects itself from the grid.</p> <p><b>Cause:</b></p> <ul style="list-style-type: none"> <li>• The grid voltage at the point of connection of the inverter is too high.</li> <li>• Grid impedance at the connection point of the inverter is too high.</li> </ul> <p><b>Corrective measures:</b></p> <ul style="list-style-type: none"> <li>• Check the grid voltage and connection on the inverter.</li> </ul> <p>If the grid voltage lies outside the acceptable range because of local grid conditions, ask the utility provider if the voltage can be adjusted at the feed-in point or if it would agree to changes in the values of the monitored operational limits.</p> <p>If the grid voltage lies within the tolerance range, yet this error is still being displayed, contact the SMA Serviceline.</p>
101	Grid overvoltage (spot value)	Spot value for the grid voltage measurement with reasonable elimination of outliers exceeds a preset maximum value.
102	Grid overvoltage fast	The effective value of the grid voltage has exceeded the upper maximum grid voltage level for the set triggering time.
103	Grid overvoltage slow	The effective value of the grid voltage has exceeded the lower maximum grid voltage level for the set triggering time.

No.	Display text	Description
2	<b>Grid Fault</b>	<p>The grid voltage has fallen below the permissible range. For safety reasons, the inverter disconnects itself from the grid.</p> <p><b>Cause:</b></p> <ul style="list-style-type: none"> <li>• Grid disconnected.</li> <li>• AC cable damaged.</li> <li>• The grid voltage at the point of connection of the inverter is too low.</li> </ul> <p><b>Corrective measures:</b></p> <ul style="list-style-type: none"> <li>• Check for tripping of the line circuit breaker.</li> <li>• Check the grid voltage and connection on the inverter.</li> </ul> <p>If the grid voltage lies outside the acceptable range because of local grid conditions, ask the utility provider if the voltage can be adjusted at the feed-in point or if it would agree to changes in the values of the monitored operational limits.</p> <p>If the grid voltage lies within the tolerance range, yet this error is still being displayed, contact the SMA Serviceline.</p>
202	Grid undervoltage fast	The effective value of the grid voltage has fallen below the lower minimum grid voltage level for the set triggering time.
203	Grid undervoltage slow	The effective value of the grid voltage has fallen below the upper minimum grid voltage level for the set triggering time.
205	PLL outside limits	PLL is under 140 V for 30 ms.

No.	Display text	Description
3	Grid fault	<p>The average grid voltage over 10 minutes is no longer within the permissible range. The inverter disconnects to assure compliance with the voltage quality of the grid.</p> <p><b>Cause:</b></p> <ul style="list-style-type: none"> <li>• The grid voltage at the point of connection of the inverter is too high.</li> <li>• Grid impedance at the connection point of the inverter is too high.</li> </ul> <p><b>Corrective measures:</b></p> <ul style="list-style-type: none"> <li>• Check the grid voltage at the point of connection of the inverter:</li> </ul> <p>If, due to local grid conditions, the grid voltage exceeds the configured limiting value, ask the utility provider whether the voltage can be adjusted at the feed-in point, or whether it would agree to a modification of the limiting value for voltage quality monitoring.</p> <p>If the grid voltage is continually within the acceptable range, and this error is still displayed, contact the SMA Serviceline.</p>
301	Voltage increase protection	The effective value of the grid voltage is above the permitted threshold for a specified period of time (country parameters, e.g., 10 minutes).
303	Grid overvoltage slow	The effective value of the grid voltage is above the permitted grid voltage thresholds for a specified period of time. (slow)
4	Grid fault	<p>The internal inverter monitoring has detected an impermissibly high proportion of direct current in the grid current.</p> <p><b>Corrective measures:</b></p> <ul style="list-style-type: none"> <li>• Check the grid connection for direct current.</li> </ul> <p>If this is a recurrent phenomenon, check with the utility provider whether it is possible to raise the limiting value of monitoring.</p>
401	Island grid	The average grid frequency is outside the specified limit for a defined period of time.
404	Frequency change not permitted	Detection of excessive frequency change per second for grid operation (island grid detected).

No.	Display text	Description
5	<b>Grid fault</b>	<p>The grid frequency is not within the permissible range. For safety reasons, the inverter disconnects itself from the grid.</p> <p><b>Corrective measures:</b></p> <ul style="list-style-type: none"> <li>• If possible, check the grid frequency and observe how often major deviations occur.</li> </ul> <p>If repeated frequency variations occur and as a result this error occurs, ask the utility provider if it would agree to modify the operating parameters.</p> <p>Discuss the proposed parameters with the SMA Serviceline.</p>
501	Grid frequency disturbance	The average grid frequency is outside the specified limit for a defined period of time.
6	<b>Grid fault</b>	<p>The internal inverter monitoring has detected an impermissibly high proportion of direct current in the grid current.</p> <p><b>Corrective measures:</b></p> <ul style="list-style-type: none"> <li>• Check the grid connection for direct current.</li> </ul> <p>If the event arises frequently, ask the grid operator if the operating parameters can be changed.</p> <p>Discuss the proposed parameters with the SMA Serviceline.</p>
601	DC grid feed-in	The DC content in the grid current exceeds a defined limit. The grid current average is compared to the limit value.
7	<b>Frequency not permitted</b>	<p>The grid frequency has left the allowable range. For safety reasons, the inverter disconnects itself from the grid.</p> <p><b>Corrective measures:</b></p> <ul style="list-style-type: none"> <li>• Check the grid frequency and observe how often major deviations occur.</li> </ul> <p>If repeated frequency variations occur and as a result this error occurs, ask the utility provider if it would agree to modify the operating parameters.</p> <p>Discuss the proposed parameters with the SMA Serviceline.</p>
701	Grid frequency not permitted	The grid frequency measurement indicates too much deviation from the nominal value. PLL output outside the country parameter limits.
8	<b>Waiting for grid voltage</b> <b>Check fuse</b>	<p>The inverter is waiting for grid voltage.</p> <p><b>Corrective measures:</b></p> <ul style="list-style-type: none"> <li>• Check fuse.</li> <li>• Check AC installation.</li> <li>• Check whether there is a general black-out.</li> </ul>

No.	Display text	Description
801	Grid failure	PLL briefly interrupted (> 30 s)
9	<b>PE connection missing</b>	PE is not connected.
		<b>Corrective measures:</b> <ul style="list-style-type: none"> <li>• Check AC installation.</li> <li>• Connect PE cable to the AC terminal.</li> </ul>
901	PE not connected	Faulty installation detected. Active test prior to grid switch-on. Continuous operational monitoring
10	<b>L / N swapped</b>	Phase L and neutral conductor N swapped
		<b>Corrective measures:</b> <ul style="list-style-type: none"> <li>• Correct the connection.</li> </ul>
1001	L / N swapped	Faulty installation detected. Active test prior to grid switch-on.
11	<b>Installation fault</b>	Second phase connected to N.
		<b>Corrective measures:</b> <ul style="list-style-type: none"> <li>• Correct the connection.</li> </ul>
1101	2nd phase connected to N	Faulty installation detected. Active test prior to grid switch-on.
13	<b>Installation failure grid connection</b>	<b>Corrective measures:</b> <ul style="list-style-type: none"> <li>• Check AC installation.</li> </ul>
1302	Phase(s) or neutral conductor not connected	One or more phases and/or neutral conductors are not connected.
33	<b>Unstable operation</b>	The supply at the DC input of the inverter is not sufficient for stable operation.
		<b>Corrective measures:</b> <ul style="list-style-type: none"> <li>• Wait for higher irradiation.</li> <li>• If this event recurs at medium irradiation, check the PV plant design and correct the connection of the PV generator.</li> </ul>
34	<b>DC overvoltage</b>	The DC input voltage connected to the inverter is too high.
		<b>Corrective measures:</b> <ul style="list-style-type: none"> <li>• <b>Immediately disconnect the PV generator from the inverter. Otherwise, the inverter may be destroyed.</b></li> <li>• Check DC voltage of the strings to ensure they are maintaining the inverter's maximum input voltage</li> </ul>

No.	Display text	Description
3401	Overvoltage input A (SW)	The input voltage at string A exceeds the set maximum.
3402	Overvoltage input B (SW)	The input voltage at string B exceeds the set maximum.
3403	DC overvoltage	Overvoltage of PV generator
35	Insulation resistance	The inverter has detected a ground fault in the PV generator.
		<b>Corrective measures:</b> <ul style="list-style-type: none"> <li>• Check strings for ground faults</li> <li>• The installer of the PV generator must remedy the ground faults before you re-connect the affected string.</li> </ul>
3501	Insulation failure	The measured value of the active RISO measurement is below a specified limit. For safety reasons, the inverter disconnects itself from the grid.
3502	Ground fault detected	Ground fault detected
3503	Overcurrent Ground fuse	Too much current at the grounding set
36	High discharge current	The discharge current from the inverter and the PV generator is too high. The inverter interrupts grid feed immediately after exceeding a limiting value and then automatically re-connects to the grid.
		<b>Cause:</b> <ul style="list-style-type: none"> <li>• Sudden grounding error</li> <li>• Error current</li> <li>• Inverter malfunction</li> </ul>
		<b>Corrective measures:</b> <ul style="list-style-type: none"> <li>• Check strings for ground faults</li> <li>• The installer of the PV generator must remedy the ground faults before you re-connect the affected string.</li> </ul>
3601	High discharge current	Plant discharge current exceeds a set maximum. A reference value is continuously formed from the measured values of the residual current sensor.
37	Residual current too high	The residual current is too high.
		<b>Corrective measures:</b> <ul style="list-style-type: none"> <li>• Check strings for ground faults</li> <li>• The installer of the PV generator must remedy the ground faults before you re-connect the affected string.</li> </ul>

No.	Display text	Description
38	<b>DC overcurrent</b>	An overcurrent condition occurs on the DC side of the inverter and it switches off.
		<b>Corrective measures:</b> <ul style="list-style-type: none"> <li>If this event recurs frequently, check the PV generator design and connection.</li> </ul>
3801	Overcurrent input A (SW)	The measured input current exceeds the specified maximum. Spot value with reasonable elimination of outliers is above the threshold of 20 A.
3802	Overcurrent input B (SW)	The measured input current exceeds the specified maximum. Spot value with reasonable elimination of outliers is above the threshold of 20 A.
3803	DC overcurrent	Overcurrent at PV generator.
39	<b>Waiting for DC start conditions</b>	Generator voltage is not sufficient to create or maintain intermediate circuit.
		<b>Corrective measures:</b> <ul style="list-style-type: none"> <li>Wait for higher irradiation.</li> </ul>
39	<b>Start conditions not met</b>	The input power or the voltage of the PV modules is not sufficient for feeding into the grid.
		<b>Corrective measures:</b> <ul style="list-style-type: none"> <li>Wait for higher irradiation.</li> <li>If this event recurs at medium irradiation, check the PV plant design and correct the connection of the PV generator.</li> </ul>
40	<b>String ... defective</b>	<b>Corrective measures:</b> <ul style="list-style-type: none"> <li>Check PV generator.</li> </ul>
4001	Reverse currents or substring ... polarity rev.	Substring polarity reversed or reverse current at a string
4002	Substring ... failed	String protection detected a non-functioning substring
4003	Reverse currents or input ... polarity reversed	Reverse polarity at substring
42	<b>Grounding error</b>	The polarity of the grounding set does not correspond to the polarity set at the inverter.
		<b>Corrective measures:</b> <ul style="list-style-type: none"> <li>Check polarity of grounding set.</li> <li>Remove grounding set.</li> <li>Turn grounding set 180° and reconnect with correct polarity.</li> </ul>
4201	Wrong earthing type	Grounding set was incorrectly connected.

No.	Display text	Description
60	Interference of device	Memory error
		<b>Corrective measures:</b> <ul style="list-style-type: none"> <li>Contact the SMA Serviceline (see section 5 "Contact" (page 95)).</li> </ul>
61	Interference of device	FW error
		<b>Corrective measures:</b> <ul style="list-style-type: none"> <li>Contact the SMA Serviceline (see section 5 "Contact" (page 95)).</li> </ul>
62	Interference of device	DI converter
		<b>Corrective measures:</b> <ul style="list-style-type: none"> <li>Contact the SMA Serviceline (see section 5 "Contact" (page 95)).</li> </ul>
63	Interference of device	Measurement sequence
		<b>Corrective measures:</b> <ul style="list-style-type: none"> <li>Contact the SMA Serviceline (see section 5 "Contact" (page 95)).</li> </ul>
64	Interference of device	Hardware fault
		<b>Corrective measures:</b> <ul style="list-style-type: none"> <li>Contact the SMA Serviceline (see section 5 "Contact" (page 95)).</li> </ul>
65	Overtemperature	The inverter switches off due to too high temperature
		<b>Corrective measures:</b> <ul style="list-style-type: none"> <li>Ensure sufficient ventilation.</li> <li>Check heat removal.</li> </ul>
66	Overload	Overcurrent in grid or overvoltage in intermediate circuit
		<b>Corrective measures:</b> <ul style="list-style-type: none"> <li>Check DC voltage of the strings to ensure they are maintaining inverter's maximum input voltage.</li> </ul>
67	Communication disturbed	A fault has occurred in the internal communication of the inverter. However, the inverter continues feeding into the grid.
		<b>Corrective measures:</b> <ul style="list-style-type: none"> <li>Check communications module</li> <li>If this event occurs often, contact the SMA Serviceline (see section 5 "Contact" (page 95)).</li> </ul>



No.	Display text	Description
68	Input A defective	String A defective
		<b>Corrective measures:</b> <ul style="list-style-type: none"> <li>• Check PV generator.</li> </ul>
69	Input B defective	String B defective
		<b>Corrective measures:</b> <ul style="list-style-type: none"> <li>• Check PV generator.</li> </ul>
70	Sensor fault fan permanently on	Temperature sensors
		<b>Corrective measures:</b> <ul style="list-style-type: none"> <li>• Contact the SMA Serviceline (see section 5 "Contact" (page 95)).</li> </ul>
71	No update file found	<b>Corrective measures:</b> <ul style="list-style-type: none"> <li>• Perform update again</li> <li>• If this fault occurs often, contact the SMA Serviceline (see section 5 "Contact" (page 95)).</li> </ul>
	Parameter setting failed	
	Parameter file not found or defective	
	SD card defective	
	Update file defective	
7101	SD card defective	SD card cannot read and write data.
7102	Parameter file not found or defective	Parameter file not found or defective
7105	Parameter setting failed	Parameter setting failed
7106	Update file defective	Update file defective
7110	No update file found	No update file found
7111	Faulty parameter ...	A parameter necessary for communication is faulty or invalid.
72	Data storage not possible	Internal device fault: however, the inverter continues to feed in.
		<b>Corrective measures:</b> <ul style="list-style-type: none"> <li>• If this fault occurs often, contact the SMA Serviceline (see section 5 "Contact" (page 95)).</li> </ul>

No.	Display text	Description
73	Update main CPU failed	Internal device fault <b>Corrective measures:</b> <ul style="list-style-type: none"> <li>Contact the SMA Serviceline (see section 5 "Contact" (page 95)).</li> </ul>
	Update Bluetooth failed	Internal device fault: however, the inverter continues to feed in. <b>Corrective measures:</b> <ul style="list-style-type: none"> <li>Perform update again</li> <li>If this fault occurs often, contact the SMA Serviceline (see section 5 "Contact" (page 95)).</li> </ul>
	Update display failed	
	String prot. update failed	
	Update RS485I module failed	
	Update language table failed	
7301	Update string prot. failed	String prot. update failed
7303	Update main CPU failed	Update main CPU failed
7305	Update RS485I module failed	Update RS485I module failed
7307	Update Bluetooth failed	Update <i>Bluetooth</i> failed
7309	Update display failed	Update display failed
7311	Update language table failed	Update language table failed
74	Varistor defective	Varistor defective
		<b>Corrective measures:</b> <ul style="list-style-type: none"> <li>Check varistors.</li> </ul>
75	Fan fault	Fan fault
		<b>Corrective measures:</b> <ul style="list-style-type: none"> <li>Contact the SMA Serviceline (see section 5 "Contact" (page 95)).</li> </ul>
76	Communication disturbed	A fault has occurred in the internal communication of the inverter. However, the inverter continues feeding into the grid.
		<b>Corrective measures:</b> <ul style="list-style-type: none"> <li>If this event occurs often, contact the SMA Serviceline (see section 5 "Contact" (page 95)).</li> </ul>
77	Self diagnosis	The inverter carries out a self test.
	Interference of device	<b>Corrective measures:</b> <ul style="list-style-type: none"> <li>Contact the SMA Serviceline (see section 5 "Contact" (page 95)).</li> </ul>

No.	Display text	Description
78	<b>Fault overvoltage protector</b>	Overvoltage protector defective
79	<b>Fault reverse current</b>	<b>Corrective measures:</b> <ul style="list-style-type: none"> <li>Contact the SMA Serviceline (see section 5 "Contact" (page 95)).</li> </ul>
80	<b>Derating occurred</b>	The delivered power of the inverter was reduced below nominal power due to a too-high temperature for more than 10 minutes.
		<b>Corrective measures:</b> <ul style="list-style-type: none"> <li>If the event arises frequently, ensure adequate ventilation.</li> <li>Check heat removal.</li> </ul>
8001	Derating occurred	See above
81	<b>Communication disturbed</b>	A fault has occurred in the internal communication of the inverter. However, the inverter continues feeding into the grid.
		<b>Corrective measures:</b> <ul style="list-style-type: none"> <li>If this event occurs often, contact the SMA Serviceline (see section 5 "Contact" (page 95)).</li> </ul>
82	<b>Short circuit</b>	Interference of device
8202	Arcing danger DC plug input; reinsert ESS	The Electronic Solar Switch is disconnected during a short circuit. <b>Corrective measures:</b> <ul style="list-style-type: none"> <li>To avoid an arc, firmly reattach the Electronic Solar Switch.</li> </ul>
83	<b>Overvoltage protection</b>	Interference of device
8301	Lightning protection device at input A defective	Overvoltage protection at string A defective
8302	Lightning protection device at input B defective	Overvoltage protection at string B defective

No.	Display text	Description
90	<b>Changing of grid parameters not possible</b>	<p><b>Cause:</b></p> <ul style="list-style-type: none"> <li>The DC voltage for the writing procedure is not sufficient.</li> <li>The selected rotary switch setting for the country configuration is not programmed.</li> <li>The parameters to be changed are protected.</li> </ul> <p><b>Corrective measures:</b></p> <ul style="list-style-type: none"> <li>Check setting of the rotary switch.</li> <li>Enter Grid Guard Code.</li> <li>Ensure sufficient DC voltage is available.</li> </ul>
	<b>Installer code invalid</b>	<p><b>Corrective measures:</b></p> <ul style="list-style-type: none"> <li>Enter valid installer code.</li> </ul>
	<b>Grid parameter locked</b>	
	<b>Calibration failed</b>	<p><b>Corrective measures:</b></p> <ul style="list-style-type: none"> <li>If this event occurs often, contact the SMA Serviceline (see section 5 "Contact" (page 95)).</li> </ul>
9002	Installer code invalid	See above
9003	Grid parameter locked	See above
9005	Waiting for main CPU	<p><b>Cause:</b></p> <ul style="list-style-type: none"> <li>DC voltage at the DC input is not sufficient to run the main CPU.</li> <li>The selected rotary switch setting for the country configuration is not programmed.</li> <li>The parameters to be changed are protected.</li> </ul>
		<p><b>Corrective measures:</b></p> <ul style="list-style-type: none"> <li>Make sure that there is sufficient DC voltage available (green LED is glowing or flashing).</li> <li>Check setting of the rotary switch.</li> <li>Enter installer code.</li> </ul>
9100	Calibration failed	Calibration failed
100	<b>General fault</b>	General error message
		<p><b>Corrective measures:</b></p> <ul style="list-style-type: none"> <li>Contact the SMA Serviceline (see section 5 "Contact" (page 95)).</li> </ul>
10101	Setting of parameter ... failed	Setting of scalar parameter failed
10102	Parameter ... set successfully	Status parameter set successfully

No.	Display text	Description
10103	Setting of parameter ... failed	Setting of status parameter failed
10104	Parameter ... set successfully	Parameter "... " set successfully
10105	Setting of parameter ... failed	Setting of parameter "... " failed
10106	Update successful	Update successful
10107	Update failed	Update failed
10108	Time adjusted / old time	Time adjusted / old time
10109	Time adjusted / new time	Time adjusted / new time
10223	Time interval expired	The maximum time interval of the plant control object expired.
10224	Dynamic settings established	Dynamic settings established.
27103	Set parameter	Parameter is set
27104	Parameters set successfully	Parameters were set successfully
27107	Update file OK	Update file checked and no errors found.
27108	SD card is read	SD card is read
27109	No new update on the SD card	No new update on SD card
27201	Search for update completed successfully	Search for update completed successfully
27202	Search for update not compl. successfully: ...	Search for update not compl. successfully
27203	Update aborted	Update aborted
27204	Download of an update started	Download of an update started
27205	Download of an update completed successfully	Download of an update completed successfully
27206	Download of update not compl. successfully: ...	Download of update not compl. successfully
27207	New update available: Version ...	New update of specified version is available.
27301	Update communication	Communication update successful
27302	Update main CPU	Main CPU update successful
27303	Update string protection	String protection successfully updated
27304	Update RS485I module	RS485I module update successful
27306	Update Bluetooth	<i>Bluetooth</i> update successful
27308	Update display	Display update successful

No.	Display text	Description
27310	Update language table	Language table update successful
27311	Update started	"Update started" successful
27312	Update completed	"Update complete" successful
<b>290</b>	<b>Grid parameter unchanged</b>	The selected switch setting is not programmed or there is no country data set available on the SD card.
29001	Installer code valid	Installer code valid
29004	Grid parameter unchanged	Grid parameter unchanged

## 5 Contact

If you have technical problems with our products, please contact the SMA Serviceline. We require the following information in order to provide you with the necessary assistance:

- Inverter type
- Inverter serial number
- Type and number of the PV modules connected
- Event number or display message of the inverter
- Optional equipment, e.g. communication devices
- Type of fault signaling contact connected, if applicable

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