



# Commercial, Industrial and Utility System Solutions

P O W E R  
- I N G ●  
T O M O -  
R R O W ●

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GR-CA-023-01



# About Growatt



## Fast growing new energy enterprise

### ► Leading brand, focus on string inverter



0.75-253kW  
capacity



1,700,000+  
shipped totally



17GW+  
total shipment capacity



business covered  
100 countries and regions



11798870.9T  
CO<sub>2</sub> emission reduction

### ► Continuous investment in innovation



1200 employees  
20% R&D engineers



8% revenue  
in R&D investment



70+ patents  
and copyrights

### ► Offices and service centers globally



# POWERING TOMORROW WITH GROWATT



MAX 185~253KTL3 HV



MAX 50~100KTL3 LV/MV



MAC 50~70KTL3-X LV/MV



MID 15~25KTL3-X



MID 30~40KTL3-X



Growatt 30000~50000TL3-S



Growatt 12000~15000TL3-S



## High Yields

Max efficiency up to 99%  
Multiple MPP trackers



## Easy to Use

Integrated DC switch  
Type II SPD on AC and DC side



## Simple O&M

Online smart service (OSS)  
One click diagnose



## Safe & Reliable

Fuse free design  
IP65 protection

# INTERNATIONAL HONORS AND AWARDS



MAX 50~100KTL3 LV/MV



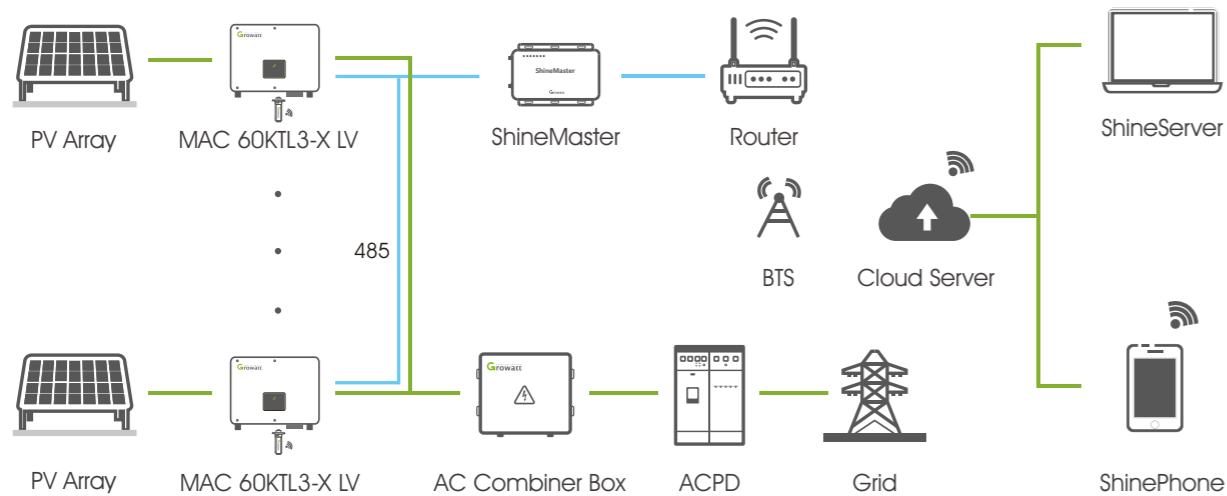
Growatt MAX series 80kW inverter won the Award of PV Inverter for Commercial Use with excellent quality and high functionality, ranking first of commercial inverters. MAX is the only C&I inverter that has won this honor.



2018-2020  
Top brand PV inverters

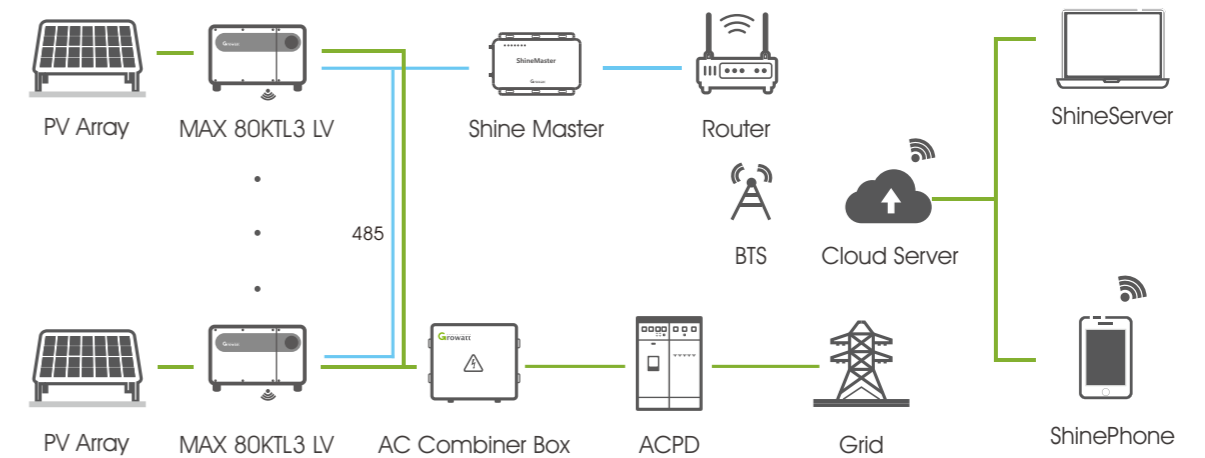


## Low voltage on-grid system flat site 300kW solution



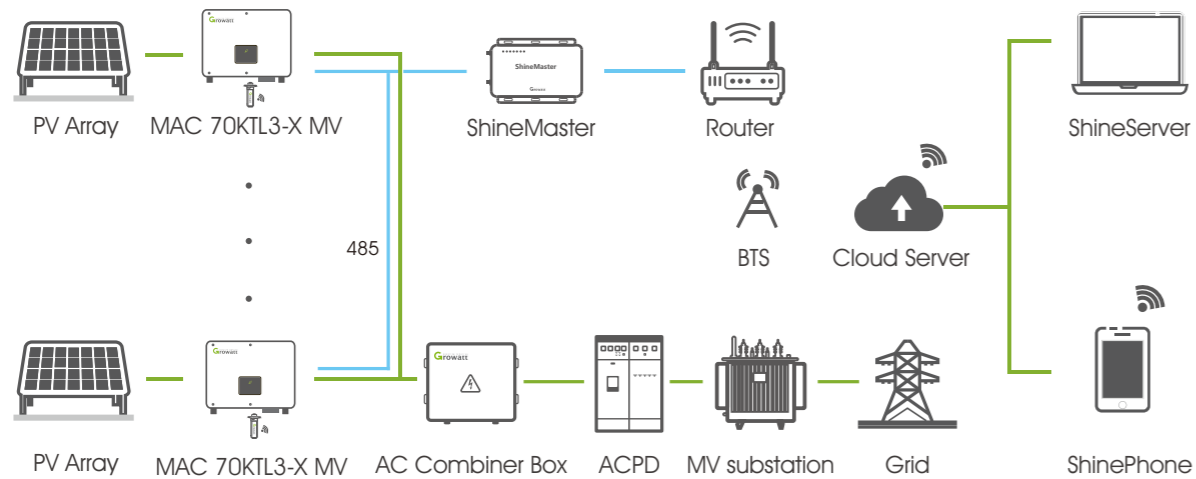
System configuration		
Inverter model	MAC 60KTL3-X LV	5units
Module spec	60 cells, monocrystal 360W	388.8KWp, 1080pcs, 18pcs/srting, 60 strings
AC combiner	6 input / 1 output	1 unit
Monitoring	GPRS/RS485	5/1
System characteristics	<ul style="list-style-type: none"> <li>• 1.3DC AC ratio, reduce the cost per watt.</li> <li>• up to 3 MPPTs, compatible with different angles and different modules.</li> <li>• wire/wireless monitoring solutions, data upload via different channels, flexible applications.</li> <li>• intelligent monitoring platform, easy maintenance, save investment and time.</li> </ul>	

## Low voltage on-grid system rugged site 300kW solution



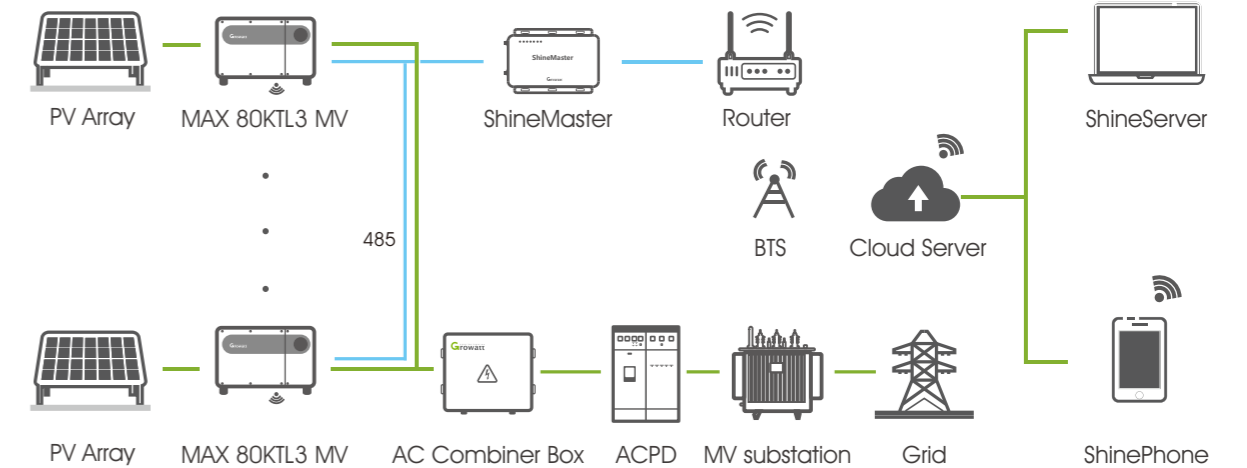
System configuration		
Inverter model	MAX 80KTL3 LV	4units
Module spec	60 cells, monocrystal 370W	414.4KWp, 1120pcs, 20pcs/srting, 56 strings
AC combiner	4 input / 1 output	1 unit
Monitoring	GPRS/RS485	4/1
System characteristics	<ul style="list-style-type: none"> <li>• 1.3DC AC ratio, reduce the cost per watt.</li> <li>• up to 7 MPPTs, compatible with different angles and different modules.</li> <li>• wire/wireless monitoring solutions, inbuilt wireless module, flexible applications.</li> <li>• intelligent monitoring platform, easy maintenance, save investment and time.</li> </ul>	

## Medium voltage on-grid system flat site 1 MW solution



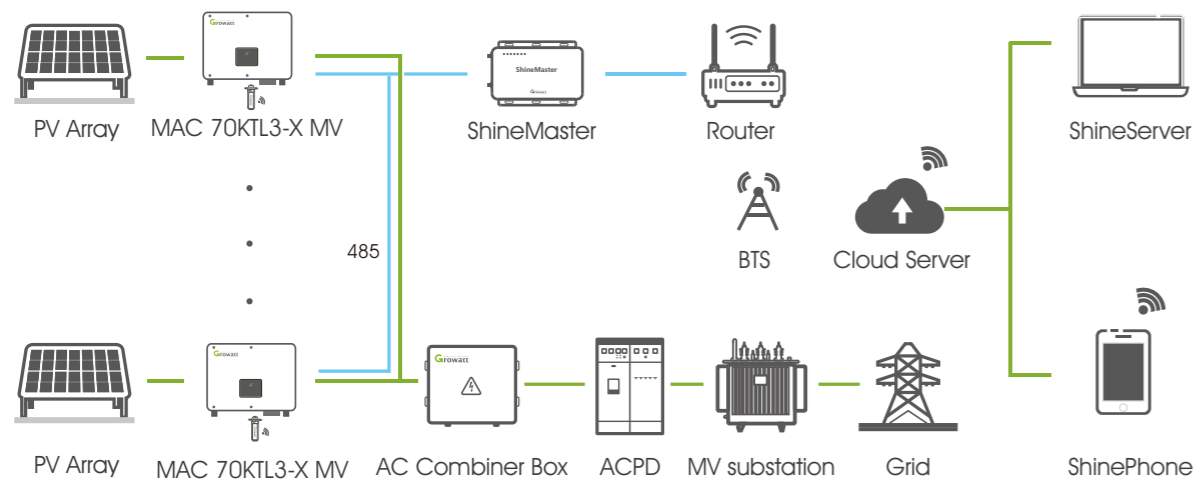
System configuration		
Inverter model	MAC 70KTL3-X MV	14 units
Module spec	60 cells, monocrystal 360W	1270KWp, 3528pcs, 21 pcs/string, 168 strings
AC combiner	6 input / 1 output	3units
Step-up transformer	1000KVA, 480V/10KV	1unit
Monitoring	GPRS/RS485	14/1
System characteristics	<ul style="list-style-type: none"> <li>◆ 1.3DC AC ratio, reduce the cost per watt.</li> <li>◆ up to 3 MPPTs, compatible with different angles and different modules.</li> <li>◆ wire/wireless monitoring solutions, data upload via different channels, flexible applications.</li> <li>◆ intelligent monitoring platform, easy maintenance, save investment and time.</li> </ul>	

## Medium voltage on-grid system rugged site 1 MW solution



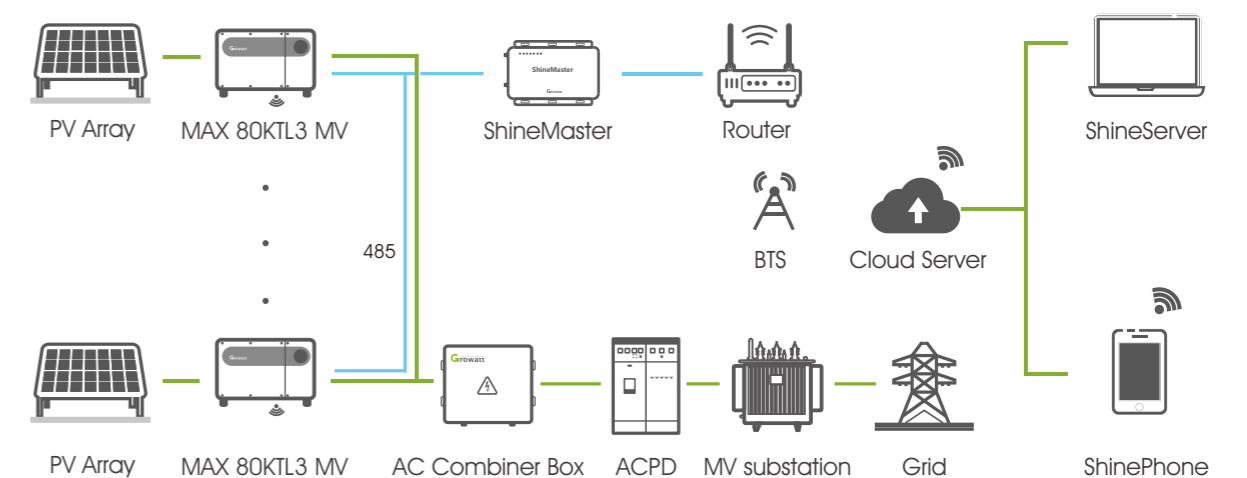
System configuration		
Inverter model	MAX 80KTL3 MV	12units
Module spec	60 cells, monocrystal 370W	1243.2KWp, 3360pcs, 20 pcs/string, 168 strings
AC combiner	6 input / 1 output	2units
Step-up transformer	1600KVA, 480V/10KV	1unit
Monitoring	GPRS/RS485	12/1
System characteristics	<ul style="list-style-type: none"> <li>◆ 1.3DC AC ratio, reduce the cost per watt.</li> <li>◆ up to 7 MPPTs, compatible with different angles and different modules.</li> <li>◆ wire/wireless monitoring solutions, inbuilt wireless module, flexible applications.</li> <li>◆ intelligent monitoring platform, easy maintenance, save investment and time.</li> </ul>	

## Medium voltage on-grid system flat site 1.6MW solution



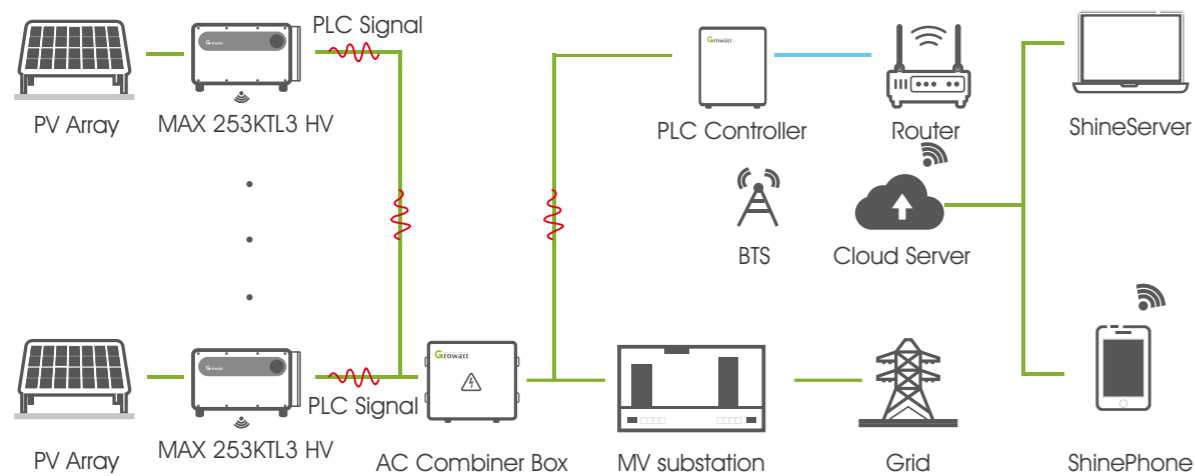
System configuration		
Inverter model	MAC 70KTL3-X MV	22units
Module spec	60 cells, monocrystal 360W	1995.8KWp, 5544pcs, 21pcs/srting, 264 strings
AC combiner	6 input / 1 output	4units
Step-up transformer	1600KVA, 480V/10KV	1 unit
Monitoring	GPRS/RS485	22/1
System characteristics	<ul style="list-style-type: none"> <li>◆ 1.3DC AC ratio, reduce the cost per watt.</li> <li>◆ up to 3 MPPTs, compatible with different angles and different modules.</li> <li>◆ wire/wireless monitoring solutions, data upload via different channels, flexible applications.</li> <li>◆ intelligent monitoring platform, easy maintenance, save investment and time.</li> </ul>	

## Medium voltage on-grid system rugged site 1.6MW solution



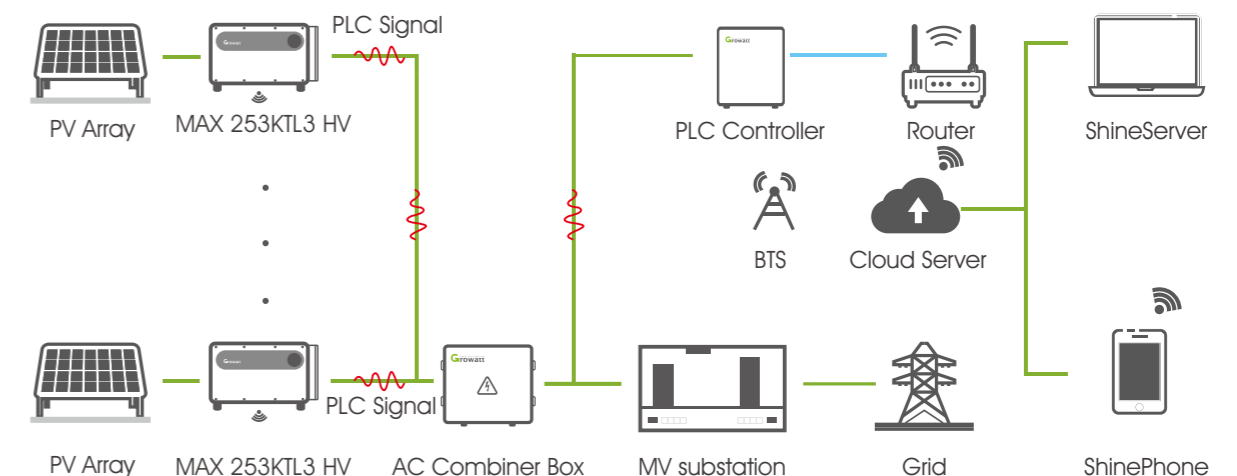
System configuration		
Inverter model	MAX 80KTL3 MV	20units
Module spec	60 cells, monocrystal 370W	2072KWp, 5600pcs, 20pcs/srting, 280 strings
AC combiner	6 input / 1 output	4units
Step-up transformer	1600KVA, 480V/10KV	1 unit
Monitoring	GPRS/RS485	20/1
System characteristics	<ul style="list-style-type: none"> <li>◆ 1.3DC AC ratio, reduce the cost per watt.</li> <li>◆ up to 7 MPPTs, compatible with different angles and different modules.</li> <li>◆ wire/wireless monitoring solutions, inbuilt wireless module, flexible applications.</li> <li>◆ intelligent monitoring platform, easy maintenance, save investment and time.</li> </ul>	

## Medium voltage on-grid system 5MW solution



System configuration		
Inverter model	MAX 253KTL HV	20units
Module spec	72 half-cut cells, monocrystal 400W	6720KWp, 28 pcs/string, 600strings
AC combiner	10 input / 1 output	2units
Step-up transformer	5MVA, 800V/33KV	1 unit
Monitoring	PLC Controller	1 unit
System characteristics	<ul style="list-style-type: none"> <li>◆ 1.33DC AC ratio, reduce the cost per watt.</li> <li>◆ up to 15 MPPTs, compatible with different angles and different modules.</li> <li>◆ wireless monitoring solutions, flexible applications.</li> <li>◆ intelligent monitoring platform, easy maintenance, save investment and time.</li> </ul>	

## Medium voltage on-grid system 6.25MW solution

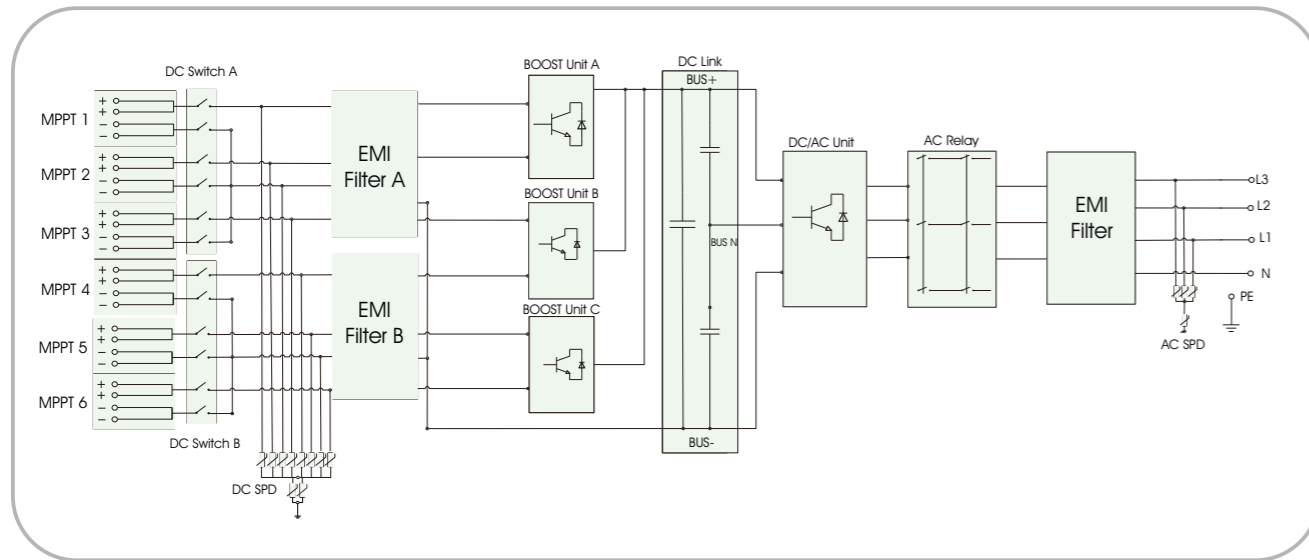


System configuration		
Inverter model	MAX 253KTL HV	24units
Module spec	72 half-cut cells, monocrystal 400W	8064KWp, 28 pcs/string, 720strings
AC combiner	10 input / 1 output	3units
Step-up transformer	6.25MVA, 800V/33KV	1 unit
Monitoring	PLC Controller	1 unit
System characteristics	<ul style="list-style-type: none"> <li>◆ 1.33DC AC ratio, reduce the cost per watt.</li> <li>◆ up to 15 MPPTs, compatible with different angles and different modules.</li> <li>◆ wireless monitoring solutions, flexible applications.</li> <li>◆ intelligent monitoring platform, easy maintenance, save investment and time.</li> </ul>	

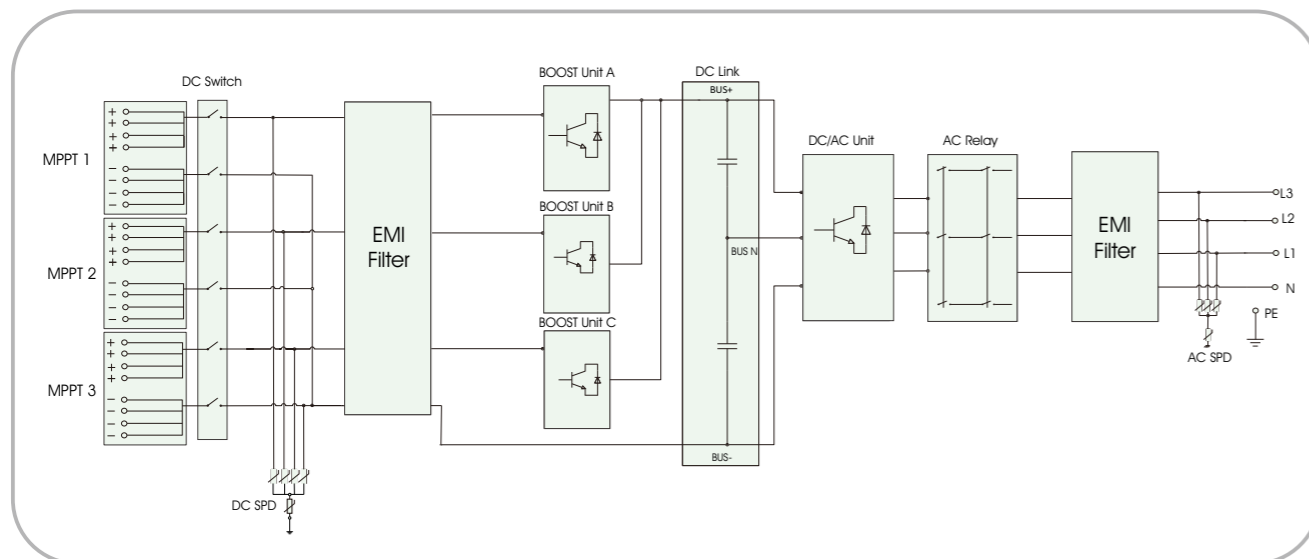


# Typical Topology

## MAX Series Inverter Circuit Topology



## MAC Series Inverter Circuit Topology



# Export Limitation Solution

## What is Export Limitation Function?

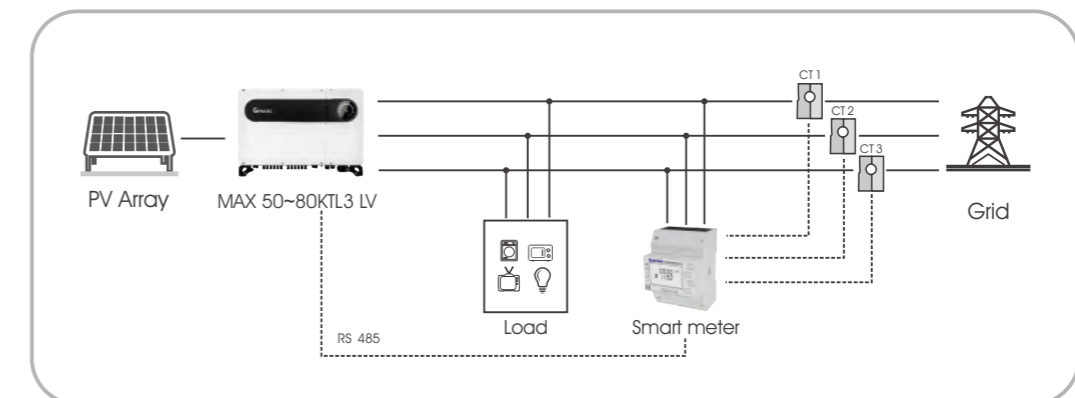
Growatt offers different export limitation solutions, all inverters firmware already support it, which can dynamically adjust inverter production.

## Growatt Export Limitation Solution Benefits

- ◆ The limit power can be set according network restriction
- ◆ Fast response time
- ◆ Failsafe operation protection function

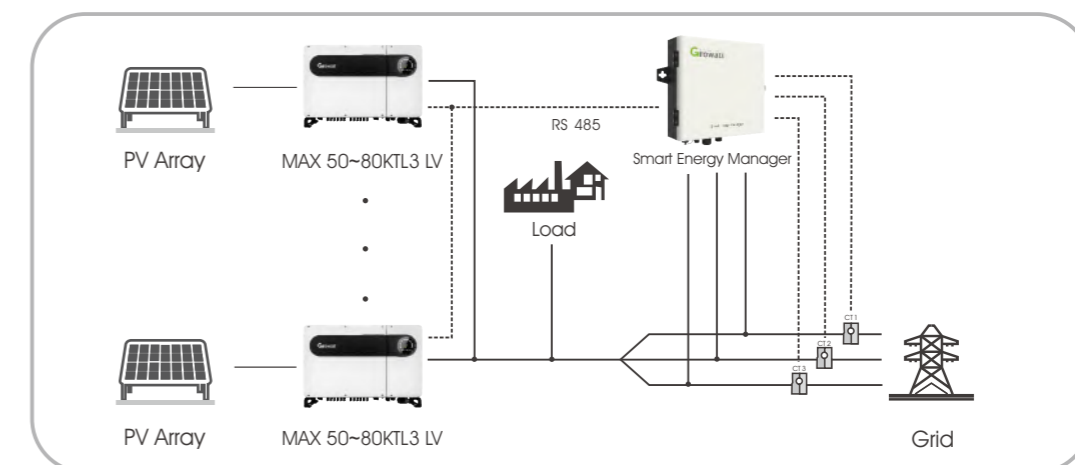
## Export Limitation for Single Inverter

If the system is only one inverter, then use one three phase meter can do the export limitation, for MAX inverter, need use meter with 3CTs.



## Export Limitation for Multiple Inverters

If the system with multiple inverters, then use Smart Energy Manager to do the export limitation, maximum can communicate 64 inverters. It can also monitoring system self-consumption on Growatt monitoring portal.



# Growatt 12000~15000TL3-S



- Max. Efficiency 98.3%
- Supports export limitation
- Max. DC voltage 1000VDC
- Dual MPP trackers
- Integrated DC switch
- Natural cooling

Datasheet	12000TL3-S	13000TL3-S	15000TL3-S
<b>Input Data</b>			
Max. recommended PV power (for module STC)	14400W	15600W	18000W
Max. DC voltage		1000V	
Start Voltage		160V	
MPPT voltage range		160V-1000V	
Nominal voltage		600V	
Max. input current		20A/10A	
Number of independent MPP trackers/strings per MPP tracker		2/2+1	
<b>Output (AC)</b>			
Rated AC output power	12kW	13kW	15kW
Max. AC apparent power	13.2kVA	14.3kVA	16.5kVA
Max. output current	19A	20.6A	23.8A
AC nominal voltage	230V/400V 184~275V ; 320-478V		
AC grid frequency	50/60Hz ± 5Hz		
Power factor	0.8leading - 0.8lagging		
THDI	<3%		
AC grid connection type	3W+N+PE		
<b>Efficiency</b>			
Max. efficiency		98.3%	
Euro - eta		98%	
MPPT efficiency		99.5%	
<b>Protection Devices</b>			
DC reverse polarity protection		yes	
DC switch		yes	
Output over current protection		yes	
Output AC overvoltage Protection - Varistor		yes	
Ground fault monitoring		yes	
Grid monitoring		yes	
Integrated all-pole sensitive leakage current monitoring unit		yes	
<b>General Data</b>			
Dimensions (W / H / D) in mm		480/427/200	
Weight		23.5kg	
Operating temperature range		-25 °C ... +60 °C	
Self-Consumption (night)		<0.5W	
Topology		Transformerless	
Cooling concept		Natural	
Environmental Protection Rating		IP65	
Altitude		3000m	
Relative Humidity		0~100%	
<b>Features</b>			
DC connection		H4/MC4(opt)	
AC connection		Screw terminal	
Display		LCD	
Interfaces:RS232/RS485/RF/Ethernet/Wi-Fi		yes/yes/opt/opt/opt	
Warranty:5 years/10 years		yes/opt	

CE, IEC 62109-1/2, VDE 0126-1-1, Greece, VFR 2014, VDE-AR-N4105, G99, EN50438, CEI 0-21, AS4777, IEC 61727, IEC 62116, CQC

\* The AC voltage range and frequency range may vary depending on specific country grid standard. All specifications are subject to change without notice.

# Growatt 30000~50000TL3-S



- Max. Efficiency 99%
- Anti-PID function
- String fuse and string monitoring
- Dual MPP trackers
- Type II DC and AC SPDs
- Supports Export limitation

Datasheet	30000TL3-S	33000TL3-S	40000TL3-NS	50000TL3-S
<b>Input Data</b>				
Max recommended PV Power (for module STC)	37500W	41250W	50000W	60000W
Max DC voltage			1000V	
Start Voltage			250V	
MPPT voltage range			200V-1000V	
Nominal voltage			580V	695V
Max. input current			34A/34A	
Max. input current per string			12A	
Number of MPP trackers / strings per MPP tracker			2/4	
<b>Output (AC)</b>				
Rated AC output power	30kW	33kW	40kW	48kW
Max. AC apparent power	33.3kVA	36.6kVA	44.4kVA	53.3kVA
Max. output current	48.3A	53A	64.5A	64.5A
AC nominal voltage	230V/400V			
AC grid frequency	50Hz/60Hz			
Power factor	0.8 leading - 0.8 lagging			
THDI	<3%			
AC grid connection type	3W+N+PE			3W+N+PE/3W+PE
<b>Efficiency</b>				
Max. efficiency	98.9%	98.9%	98.8%	99%
Euro - eta	98.4%	98.4%	98.5%	98.5%
MPPT efficiency	99.5%			
<b>Protection Devices</b>				
DC reverse polarity protection			yes	
DC Switch			yes	
DC Surge protection			Type II	
Ground fault monitoring			yes	
Output short circuit protection			yes	
AC Surge protection			Type II	
String Fuse protection			yes	
String fault monitoring			yes	
Anti-PID protection			yes	
<b>General Data</b>				
Dimensions (W / H / D) in mm			470/754/270	
Weight			48kg	
Operating temperature range			-25 °C ... +60 °C	
Altitude			4000m	
Self-consumption night			< 1W	
Topology			Transformerless	
Cooling concept			Smart cooling	
Environmental Protection Rating			IP65	
Relative humidity			0~100%	
<b>Features</b>				
Display			LED+LCD	
Interfaces:RS232/RS485/WIFI/LAN/GPRS			yes / yes / opt / opt / opt	
Warranty:5 years / 10 years			yes / opt	

CE, IEC 62109-1/2, IEC 61727, IEC 62116, VDE 0126-1-1, Greece, VFR 2014, CEI 0-21, CEI 0-16, VDE-AR-N4105, EN50438, EN50549, G99/3, AS 4777, PEA, IEC 60529, IEC 60068, IEC 61683, DRRG, C10/11, UNE217001, UNE206007, PO12.2, MFA, PEA

\* The AC voltage range and frequency range may vary depending on specific country grid standard. All specifications are subject to change without notice.

# MID 17~25KTL3-X



- Max. efficiency 98.6%
- 40% compact and lighter
- Data storage up to 25 years
- Dual MPP trackers
- Supports export control
- DC side 2 in 1 connection enabled
- Touch key and OLED display
- Type II SPD on AC DC side

Datasheet	MID 17KTL3-X	MID 20KTL3-X	MID 22KTL3-X	MID 25KTL3-X
<b>Input Data (DC)</b>				
Max. recommended PV power (for module STC)	25500W	30000W	33000W	37500W
Max. DC voltage	1100V			
Start Voltage	250V			
Nominal voltage	580V			
MPPT voltage range	160V-1000V			
No. of MPP trackers	2			
No. of PV strings per MPP tracker	2	2	2	2/3
Max. input current per MPP tracker	25A			
Max. short circuit current per MPP tracker	32A			
<b>Output Data (AC)</b>				
Rated AC output power	17000W	20000W	22000W	25000W
Max. AC apparent power	18800VA	22000VA	24400VA	27700VA
Nominal AC voltage(range*)	220V/380V, 230V/400V (340-440V)			
AC grid frequency.(range*)	50/60 Hz (45-55Hz/55-65 Hz)			
Max. output current	27.4A	31.9A	35.5A	40.2A
Adjustable power factor	0.8leading...0.8lagging			
THDI	<3%			
AC grid connection type	3W+N+PE			
<b>Efficiency</b>				
Max. efficiency	98.75%			
European efficiency	98.6%			
MPPT efficiency	99.9%			
<b>Protection Devices</b>				
DC reverse polarity protection	Yes			
DC Switch	Yes			
AC/DC surge protection	Type II / Type II			
Insulation resistance monitoring	Yes			
AC short-circuit protection	Yes			
Ground fault monitoring	Yes			
Grid monitoring	Yes			
Anti-islanding protection	Yes			
Residual-current monitoring unit	Yes			
String monitoring	Optional			
AFCI protection	Optional			
<b>General Data</b>				
Dimensions (W / H / D)	525/395/222mm			
Weight	23kg			
Operating temperature range	-25 °C ... +60 °C			
Self-Consumption (night)	<1W			
Topology	Transformerless			
Cooling	Smart air cooling			
Protection degree	IP65			
Relative Humidity	0-100%			
Altitude	4000m			
DC connection	H4/MC4(Optional)			
AC connection	Cable gland+OT terminal			
Display	OLED+LED/WIFI+APP			
Interfaces: RS485 / USB / WIFI / GPRS / RF / LAN	Yes/Yes /Optional/Optional/Optional/Optional			
Warranty: 5 years / 10 years	Yes /Optional			

CE, VDE0126, Greece, EN50549, C10/C11, UTE C 15-712, IEC62116, IEC61727, IEC 60068, IEC 61683, CEI0-21, N4105, TOR Erzeuger, G98/G99, G100, UNE217001, UNE206007, PO12.2, KSC8565

\* The AC voltage range and frequency range may vary depending on specific country grid standard.  
All specifications are subject to change without notice.

# MID 30~40KTL3-X



- Max. efficiency 98.8%
- 40% compact and lighter
- Data storage up to 25 years
- Dual MPP trackers
- Supports export control
- DC side 2 in 1 connection enabled
- Self-consumption monitoring
- AFCI function optional

Datasheet	MID 30KTL3-X	MID 33KTL3-X	MID 36KTL3-X	MID 40KTL3-X
<b>Input data (DC)</b>				
Max. recommended PV power (for module STC)	45000W	49500W	54000W	60000W
Max. DC voltage	1100V			
Start Voltage	250V			
Normal Voltage	600V			
MPPT voltage range	200-1000V			
No. of MPP trackers	3	3	4	4
No. of PV strings per MPP tracker	2			
Max. input current per MPP tracker	26A			
Max. short-circuit current per MPP tracker	32A			
<b>Output data (AC)</b>				
AC nominal power	30000W	33000W	36000W	40000W
Max. AC apparent power	33300VA*	36600VA	39600VA	44000VA
Nominal AC voltage (range*)	220V/380V, 230V/400V (340-440V)			
AC grid frequency (range*)	50/60 Hz (45-55Hz/55-65 Hz)			
Max. output current	50.5A	55.5A	60.0A	66.6A
Adjustable power factor	0.8leading...0.8lagging			
THDI	<3%			
AC grid connection type	3W+N+PE			
<b>Efficiency</b>				
Max. efficiency	98.8%			
European efficiency	98.5%			
MPPT efficiency	99.9%			
<b>Protection Devices</b>				
DC reverse polarity protection	Yes			
DC Switch	Yes			
AC/DC surge protection	Type II / Type II			
Insulation resistance monitoring	Yes			
AC short-circuit protection	Yes			
Ground fault monitoring	Yes			
Grid monitoring	Yes			
Anti-islanding protection	Yes			
Residual-current monitoring unit	Yes			
String monitoring	Optional			
Anti-PID function	Optional			
AFCI protection	Optional			
<b>General data</b>				
Dimensions (W / H / D)	575/420/225mm			
Weight	30kg			
Operating temperature range	-35°C ... +60°C			
Nighttime power consumption	<1W			
Topology	Transformerless			
Cooling	Smart air cooling			
Protection degree	IP66			
Relative humidity	0-100%			
Altitude	4000m			
DC connection	H4/MC4(Optional)			
AC connection	Cable gland+OT terminal			
Display	OLED+LED/WIFI+APP			
Interfaces: RS485 / USB / WIFI / GPRS / RF / LAN	Yes/Yes /Optional/Optional/Optional/Optional			
Warranty: 5 years / 10 years	Yes /Optional			

CE, VDE0126, Greece, EN50549, C10/C11, UTE C 15-712, IEC62116, IEC61727, IEC 60068, IEC 61683, CEI0-21, CEI0-16, N4105, TOR Erzeuger, G98/G99, G100, AS/NZS 3100, AS4777, UNE217001, UNE206007, PO12.2, KSC8565

\* For Belgium C10/C11 and VDE-AR-N4105, MID 30KTL3-X max. output power is limit to 30KVA.  
\* The AC voltage range and frequency range may vary depending on specific country grid standard.  
All specifications are subject to change without notice.

# MAC 50~70KTL3-X LV/MV



- 3 MPPTs
- Smart diagnosis
- Data storage up to 25 years
- High efficiency up to 98.8%
- Local WIFI connection
- DC side 2 in 1 connection enabled
- OLED display and touch button
- AC&DC type II SPD

Datasheet	MAC 50KTL3-X LV	MAC 50KTL3-X MV	MAC 60KTL3-X LV	MAC 60KTL3-X MV	MAC 70KTL3-X MV
<b>Input Data (DC)</b>					
Max. recommended PV power (for module STC)	75000W	75000W	90000W	90000W	105000W
Max.DC voltage	1100V				
Start voltage	250V				
Nominal voltage	600V	700V	600V	700V	700V
MPPT voltage range	200V-1000V				
No. of MPP trackers	3				
No. of PV strings per MPP tracker	4/3/3	4/3/3	4/4/4	4/4/4	4/4/4
Max. input current per MPP tracker	50A/37.5A/37.5A	50A/37.5A/37.5A	50A/50A/50A	50A/50A/50A	50A/50A/50A
Max. short-circuit current per MPP tracker	55A				
<b>Output Data (AC)</b>					
Rated AC output power	50000W	50000W	60000W	60000W	70000W
Max. AC apparent power	55500VA	55500VA	66600VA	66600VA	77700VA
Nominal AC voltage (range*)	230V/400V (340-440V)	277V/480V (425-540V)	230V/400V (340-440V)	277V/480V (425-540V)	277V/480V (425-540V)
AC grid frequency (range*)	50/60 Hz (45-55Hz/55-65 Hz)				
Max. output current	80.5A	66.9A	96.6A	80.2A	93.6A
Adjustable power factor	0.8leading ...0.8lagging				
THDi	<3%				
AC grid connection type	3W+N+PE	3W+PE	3W+N+PE	3W+PE	3W+PE
<b>Efficiency</b>					
Max. efficiency	98.8%				
European efficiency	98.5%				
MPPT efficiency	99.9%				
<b>Protection Devices</b>					
DC reverse polarity protection	Yes				
DC switch	Yes				
AC/DC surge protection	Type II / Type II				
Insulation resistance monitoring	Yes				
AC short-circuit protection	Yes				
Ground fault monitoring	Yes				
Grid monitoring	Yes				
Anti-islanding protection	Yes				
Residual-current monitoring unit	Yes				
<b>General Data</b>					
Dimensions(W / H / D)	680/508/281mm				
Weight	52kg				
Operating temperature range	-25°C ... +60°C				
Nighttime power consumption	<1W				
Topology	Transformerless				
Cooling	Smart air cooling				
Protection degree	IP65				
Relative humidity	0~100%				
Altitude	4000m				
DC connection	H4/MC4(Optional)				
AC connection	Cable gland+OT terminal				
Display	OLED+LED/WIFI+APP				
Interfaces: RS485 / USB /WIFI/ GPRS / RF	Yes/Yes /Optional/Optional/Optional				
Warranty: 5 years / 10 years	Yes /Optional				

CE, IEC62116, IEC61727, IEC 60068, IEC 61683, IEC60529, KSC8565

\* The AC voltage range and frequency range may vary depending on specific country grid standard. All specifications are subject to change without notice.

# MAX 50~80KTL3 LV



- 6/7 MPPTs
- Smart diagnosis
- Data storage up to 25 years
- High efficiency up to 99%
- Local WIFI connection
- DC side 2 in 1 connection enabled
- String monitoring
- AC&DC type II SPD

Datasheet	MAX 50KTL3 LV	MAX 60KTL3 LV	MAX 70KTL3 LV	MAX 80KTL3 LV
<b>Input Data (DC)</b>				
Max. recommended PV power (for module STC)	75000W	90000W	105000W	120000W
Max.DC voltage	1100V			
Start voltage	250V			
Nominal voltage	585V	585V	600V	600V
MPPT voltage range	200V-1000V			
No. of MPP trackers	6	6	7	7
No. of PV strings per MPP tracker	2			
Max. input current per MPP tracker	26A			
Max. short-circuit current per MPP tracker	32A			
<b>Output Data (AC)</b>				
AC nominal power	50000W	60000W	70000W	80000W
Max. AC apparent power	55500VA	66600VA	77700VA	88800VA
Nominal AC voltage (range*)	220V/380V, 230V/400V (340-440V)			
AC grid frequency (range*)	50/60 Hz (45-55Hz/55-65 Hz)			
Max. output current	80.5A	96.6A	112.7A	128.8A
Adjustable power factor	0.8leading ...0.8lagging			
THDi	<3%			
AC grid connection type	3W+N+PE			
<b>Efficiency</b>				
Max. efficiency	98.8%	98.8%	99%	99%
European efficiency	98.4%	98.4%	98.5%	98.5%
MPPT efficiency	99.9%			
<b>Protection Devices</b>				
DC reverse polarity protection	Yes			
DC switch	Yes			
DC surge protection	Type II / Type II			
Insulation resistance monitoring	Yes			
AC short-circuit protection	Yes			
Ground fault monitoring	Yes			
Grid monitoring	Yes			
Anti-islanding protection	Yes			
Residual-current monitoring unit	Yes			
String monitoring	Yes			
AFCl protection	Optional			
Anti-PID function	Optional			
<b>General Data</b>				
Dimensions (W / H / D)	860/600/300mm			
Weight	82kg	82kg	86kg	86kg
Operating temperature range	-25°C ... +60°C			
Self-consumption	<1W			
Topology	Transformerless			
Cooling	Smart air cooling			
Protection degree	IP65			
Relative humidity	0-100%			
Altitude	4000m			
DC connection	H4/MC4(Optional)			
AC connection	Cable gland+OT terminal			
Display	LED/WIFI+APP			
Interfaces: RS485 / USB /WIFI/ RF/GPRS	Yes/Yes /Optional/Optional/Optional			
Warranty: 5 years / 10 years	Yes /Optional			

CE, VDE0126, Greece, EN50438, EN50549, C10/C11, UTE C 15-712, IEC62116, IEC61727, IEC 60068, IEC 61683, CEI0-21, CEI 0-16, N4105, BDEW, DRRG, TOR Erzeuger, G98/G99, G100, AS/NZS3100, AS4777, UNE217001, UNE206007, PO12.2, NRS 097-2-1, MEA, PEA, KSC8565

\* The AC voltage range and frequency range may vary depending on specific country grid standard. All specifications are subject to change without notice.

# MAX 60~100KTL3 MV



- 6/7 MPPTs
- High efficiency up to 99%
- String monitoring
- Smart diagnosis
- Local WIFI connection
- AC&DC type II SPD
- Data storage up to 25 years
- DC side 2 in 1 connection enabled

Datasheet	MAX 60KTL3 MV	MAX 70KTL3 MV	MAX 80KTL3 MV	MAX 90KTL3 MV	MAX 100KTL3 MV
<b>Input Data (DC)</b>					
Max. recommended PV power(for module STC)	90000W	105000W	120000W	130000W	130000W
Max.DC voltage			1100V		
Start voltage			250V		
Nominal voltage	700V	700V	700V	730V	730V
Nominal voltage			200V-1000V		
No. of MPP trackers	6	7	7	7	7
No. of PV strings per MPP tracker			2		
Max. input current per MPP tracker			26A		
Max. short-circuit current per MPP tracker			32A		
<b>Output Data (AC)</b>					
AC nominal power	60000W	70000W	80000W	90000W	100000W
Max. AC apparent power	66600VA	77700VA	88800VA	100000VA	111000VA
Nominal AC voltage (range*)	277V/480V 425-540VAC	277V/480V 425-540VAC	277V/480V 425-540VAC	288V/500V 425-540VAC	288V/500V 425-540VAC
AC grid frequency (range*)			50/60 Hz (45-55Hz/55-65 Hz)		
Max. output current	80.2A	93.6A	107.0A	115.7A	128.6A
Adjustable power factor			0.8leading ...0.8lagging		
THDi			<3%		
AC grid connection type			3W+PE		
<b>Efficiency</b>					
Max. efficiency			99.0%		
European efficiency	98.5%	98.5%	98.6%	98.6%	98.6%
MPPT efficiency			99.9%		
<b>Protection Devices</b>					
DC reverse polarity protection			Yes		
DC switch			Yes		
AC/DC surge protection			Type II / Type II		
Insulation resistance monitoring			Yes		
AC short-circuit protection			Yes		
Ground fault monitoring			Yes		
Grid monitoring			Yes		
Anti-islanding protection			Yes		
Residual-current monitoring unit			Yes		
String monitoring			Yes		
AFCI protection			Optional		
Anti-PID function			Optional		
<b>General Data</b>					
Dimensions (W / H / D)			860/600/300mm		
Weight	82kg	86kg	86kg	86kg	86kg
Operating temperature range			-25°C ... +60°C		
Nighttime power consumption			<1W		
Topology			Transformerless		
Cooling			Smart air cooling		
Protection degree			IP65		
Relative humidity			0-100%		
Altitude			4000m		
DC connection			H4/MC4(Optional)		
AC connection			Cable gland+OT terminal		
Display			LED/WIFI+APP		
Interfaces: RS485 / USB /WIFI/ RF/GPRS			Yes/Yes /Optional/Optional/Optional		
Warranty: 5 years / 10 years			Yes /Optional		

CE VDE0126, Greece, EN50438, UTE C 15-712, IEC62116, IEC61727, IEC 60068, IEC 61683, N4105, G98/G99, G100

\* For current models and certificates, please see www.ginverter.com.  
\* The AC voltage range and frequency range may vary depending on specific country grid standard.  
All specifications are subject to change without notice.

# MAX 185~253KTL3-X HV



- Up to 15 MPPTs, fuse free design
- Smart diagnosis
- Intelligent string monitoring
- DC side 2 in 1 connection enabled
- Smart I/V scan and diagnosis
- Optional Anti-PID/Night SVG/AFCI function

Datasheet	MAX 185KTL3-X HV	MAX 216KTL3-X HV	MAX 250KTL3-X HV	MAX 253KTL3-X HV
<b>Input data (DC)</b>				
Max. DC voltage			1500V	
Start voltage			500V	
Nominal voltage			1080V	
MPP voltage range			500V-1500V	
No. of MPP trackers	9	9	12	15
No. of PV strings per MPP tracker			2	
Max. input current per MPP tracker			30A	
Max. short-circuit current per MPP tracker			50A	
<b>Output data (AC)</b>				
AC nominal power	185KW	216KW	250KW	253KW
Max. AC apparent power	185KVA@30°C 175KVA@40°C 160KVA@50°C	216KVA@30°C 200KVA@40°C 192KVA@50°C	250KVA@30°C 230KVA@45°C 220KVA@50°C	253KVA@30°C 230KVA@45°C 220KVA@50°C
Nominal AC voltage (range*)			800V (640-920V)	
AC grid frequency (range*)			50/60 Hz (45-55Hz/55-65 Hz)	
Max. output current	133.5A	155.9A	180.4A	182.6A
Adjustable power factor			0.8leading ...0.8lagging	
THDi			<3%	
AC grid connection type			3W+PE	
<b>Efficiency</b>				
Max. efficiency			99.0%	
European efficiency	98.7%	98.7%	98.7%	98.5%
MPPT efficiency			99.9%	
<b>Protection devices</b>				
DC reverse polarity protection			Yes	
DC switch			Yes	
AC/DC surge protection			Type II / Type II	
Insulation resistance monitoring			Yes	
AC short-circuit protection			Yes	
Ground fault monitoring			Yes	
Anti-islanding protection			Yes	
Residual-current monitoring unit			Yes	
String monitoring			Yes	
AFCI protection			Optional	
Anti-PID function			Optional	
Night SVG			Optional	
<b>General data</b>				
Dimensions (W / H / D)			1070/670/340mm	
Weight	95kg	95kg	99kg	109kg
Operating temperature range			-30°C ... +60°C	
Nighttime power consumption			< 1W	
Topology			Transformerless	
Cooling			Smart air cooling	
Protection degree			IP66	
Relative humidity			0-100%	
Altitude			4000m	
DC connection			Staubli MC4/Amphenol UTX	
AC connection			OT Terminal connectors (Max. 300mm <sup>2</sup> )	
Display			LED/WIFI+APP	
Interfaces: RS485 / USB /PLC			Yes/Yes /Optional	
Warranty: 5 years / 10 years			Yes /Optional	

CE, IEC62116/61727, IEC60068/61683, IEC60529, PEA, MEA, VDE0126, Greece, NRS097-2-1:2017, CEA2019

\* The AC voltage range and frequency range may vary depending on specific country grid standard.  
All specifications are subject to change without notice.

# Smart Energy Manager



- System self-consumption monitoring
- Export limitation for commercial projects
- Support online monitoring and online service
- Flexible CTs for different project size

Datasheet	Smart Energy Manager				
System Size	100KW	300KW	600KW	1MW	2MW
<b>Meter data</b>					
Normal voltage	230/400Vac				
Voltage range(L-L)	180-540Vac				
Grid connection	3W/N/PE				
Normal frequency	50/60 Hz				
Frequency range	45~55Hz/55-65 Hz				
<b>CT data</b>					
Max. input current (CT second side)	5A				
Max.current ( CT detection)	250A	600A	1200A	2000A	4000A
Accuracy ( @ rated CT current)	0.5				
<b>Communication</b>					
RS485	Yes				
Ethernet	Yes				
Max.inverter number	64				
Communication distance	Rs485: 500m Internet cable: 100m				
<b>General Data</b>					
Dimensions (W/H/D) in mm	350/330/107				
Weight	6kg				
Operation temperature range	-25°C ... +60°C				
Cooling concept	Natural Cooling				
Environmental Protection Rating	IP65				
Relative humidity	0~100%				
Altitude	2000m				
CE					

# Growatt ShineMaster



- Local webserver for easy configuration
- Supports export control with meters
- Up to 64 inverters connection
- Multi-function and high performance

Datasheet	ShineMaster
<b>Hardware Parameter</b>	
Power adapter	Input: 100-240V, 50/60Hz AC Output 5V(+/-5%), 1A DC
Power consumption	2.5W
<b>Application Parameters</b>	
Max. communication range	500m
Communication with inverters	RS485 (Modbus RTU protocol)
Communication with server	TCP(Modbus TCP protocol)
Support network	WLAN
Data transfer interval	5 Minutes
Default server URL	server.growatt.com
Supported servers	ShineServer
<b>General Data</b>	
Dimensions(W/H/D)	130/84/25mm
Weight	180g
Language	English
Mounting options	Wall-mounted
Ambient temperature range	-40°C ~ +60°C
Degree of protection	IP30
CE	



## ShineWiFi-X

- Cable free, easy installation
- Build-in storage, 1 month data
- USB communication port
- Online monitoring and maintenance

Datasheet	ShineWiFi-X
<b>Wireless Parameters</b>	
Wireless standard	802.11 b/g/n
Frequency range	2.4G~2.5G (2412M~2484M)
Transmit power	802.11b: 16±2 dBm (@11Mbps) 802.11g: 14±2 dBm (@54Mbps) 802.11n: 13±2 dBm (@HT20, MCS7)
Receiver sensitivity	CCK, 1 Mbps: -90dBm CCK, 11 Mbps: -85dBm 6 Mbps (1/2 BPSK): -88dBm 54 Mbps (3/4 64-QAM): -70dBm HT20, MCS7 (65 Mbps, 72.2 Mbps): -67dBm
<b>Hardware Parameters</b>	
Data interface	USB
Operation voltage	5V(+/-5%)
Rated power	1.2W
Display	LED
<b>Application Parameters</b>	
Supported servers	ShineServer
Inverter communication	USB (Modbus RTU protocol)
Server communication	TCP (Modbus TCP protocol)
Support network	2.4G WiFi
Max. communication range	50m
Configure type	APP configure
Data transfer interval	5 Minutes
Default server URL	server.growatt.com
<b>General Data</b>	
Dimensions(L/W/H)	135/79/29 mm
Weight	60g
Operation temperature	English, Chinese
CE	

Datasheet	ShineGPRS
<b>General Data</b>	
Dimensions(L/H/W)mm	135/29/79 mm
Weight	70g
Language	English, Chinese
<b>Wireless Parameters</b>	
Certificate and approvals	CE
Network type	2G GSM(GPRS)
GSM/EGSM/DCS/PCS frequency range	850/900/1800/1900MHZ
UMTS/HSDPA frequency range	NA
Antenna gain	3dB
Speed	GPRS Max.85.6Kbps(DL),Max.85.6Kbps(UL)
<b>Hardware Parameters</b>	
Serial port speed	9600bps
Operating voltage	9V(+/-5%)
Rated power	3.6W
Operating temperature	-30°C ... +65°C
Storage temperature	-40°C ... +70°C
<b>Application Parameters</b>	
Servers	ShineServer
Communication with inverter	RS232(Modbus RTU protocol)
Communication with server	TCP(Modbus TCP protocol)
Network supported	2G GSM(GPRS)
Configuration interface	APP
SIM type	regular SIM card
Uploading interval	5 Mins(1-15 adjustable)
Default server IP	server.growatt.com
<b>Others</b>	
Warranty	2 years
CE	



## ShineGPRS

- No strings attached, easy to use
- Universal mobile networks supported
- Mobile network, long range
- Online monitoring and maintenance

Datasheet	Shine4G-X
<b>Wireless Parameters</b>	
Wireless type	4G
System and frequency band	LTE-FDD: B1/B3/B5/B7/B8/B20 LTE-TDD: B38/B40/B41 WCDMA: B1/B5/B8 GSM: 900/1800MHz
<b>Hardware Parameters</b>	
Data interface	USB
Operation voltage	5V(+/-5%)
Rated power	2W
Display	LED
<b>Application Parameters</b>	
Supported servers	ShineServer
Inverter communication	USB (Modbus RTU protocol)
Server communication	TCP (Modbus TCP protocol)
Support network	2G/3G/4G
SIM card type	Standard SIM card
Configure type	APP configure
Data transfer interval	5 Minutes
Default server URL	server.growatt.com
<b>General Data</b>	
Dimensions(L/W/H)	122/47/32mm
Weight	60g
Operation temperature	-30°C ~ +65°C
CE	



## Shine4G-X

- Cable free, plug-and-play
- USB communication port
- Build-in storage, 1 month data
- Online monitoring and maintenance



## ShineGPRS-X

- No strings attached, easy to use
- Universal mobile networks supported
- Mobile network, long range
- Online monitoring and maintenance

Datasheet	ShineGPRS-X
<b>General data</b>	
Dimensions(L/H/W)mm	122/32/47
Weight	70g
Language	English,Chinese
<b>Wireless parameters</b>	
Certificate and approvals	CE,RoHS
Network type	GSM/GPRS
GSM/GPRS/EDGE frequency range	850/900/1800/1900MHZ
<b>Hardware parameters</b>	
Serial port speed	9600bps/115200bps
Operating voltage	5V(+/-5%)
Rated power	3W
Operating temperature	-30°C ... +65°C
Storage temperature	-40°C ... +70°C
Ingress protection	IP65
<b>Application parameters</b>	
Servers	ShineServer
Communication with inverter	USB(Modbus RTU protocol)
Communication with server	TCP(Modbus TCP protocol)
Network supported	2G GSM
Configuration interface	APP
SIM type	regular SIM card
Uploading interval	5 Mins(1-15 adjustable)
Default server IP	server.growatt.com
CE	



## Growatt ShineLink

- Cable free, easy installation
- Multiple inverters supported, up to 8
- Build-in storage, 1 month data
- Online monitoring and maintenance
- Automatic IP addressing, plug and play
- 120 meters long range, wide coverage

Datasheet	ShineLink
<b>Communication Interface</b>	
Rf433	Yes
Rf433( in free-field conditions)	Up to 120 m
Rf433( two walls blocking)	20 m
<b>Power Supply</b>	
Power consumption	<2W standby, <5W peak
AC power supply input voltage	100V~240V(±10%)
AC power supply input frequency	50/60Hz
<b>General Specifications</b>	
Dimensions(L/H/W)mm	105/85/26mm
Weight	< 1kg
Mounting options	Tabletop/wall-mount
Degree of protection	IP30
Status display	LED
Ambient temperature range	-20 to 65 °C
Humidity	0-95% (non condensing)
<b>Features</b>	
Graphical user interface	Android/iOS APP
Remote firmware upgrades	Yes
Max. number of devices to monitor	8(RF433)
Warranty	2 years
CE	

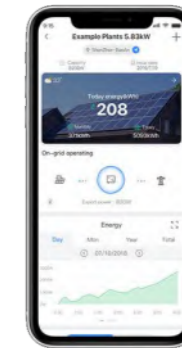
# EXCEPT THE STRENGTHS OF PRODUCT WITH GROWATT, YOU CAN ALSO ENJOY

## Powerful Monitoring Platform

ShineServer and ShinePhone are the new generation monitoring systems developed by Growatt and freely open to our users.



ShineServer



ShinePhone



## Powerful cloud server

- User data security
- Up to 10 years user data storage
- Continues data upload even local network outage

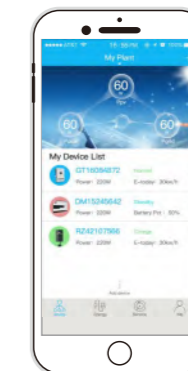
## Managing wherever you are and whatever you want

- Mobile APP platform
- Working mode adjustable
- Inverter parameters are adjustable

## Smart Online Service System (OSS)



OSS platform



APP platform

Growatt Online Smart Service (OSS in short) system is a smart customer service platform, which can offer a quick support for service, lowering service costs for both Growatt installers and distributors. With the help of Growatt OSS, service engineers almost can handle 60%+ problems by remote configuration and FW updating without on-site service.

Datasheet	ShineLink-X
<b>Communication Interface</b>	
Rf433	Yes
Rf433( in free-field conditions)	Up to 100 m
Rf433( two walls blocking)	20 m
<b>Power Supply</b>	
Power consumption	<2W standby, <5W peak
AC power supply input voltage	100V~240V(±10%)
AC power supply input frequency	50/60Hz
<b>General Specifications</b>	
Dimensions(L/H/W)mm	105/85/26mm
Weight	< 1kg
Mounting options	Tabletop/wall-mount
Degree of protection	IP30
Status display	LED
Ambient temperature range	-20 to 65 °C
Humidity	0-95% (non condensing)
<b>Features</b>	
Graphical user interface	Android/iOS APP
Remote firmware upgrades	Yes
Max. number of devices to monitor	8(RF433)
Warranty	2 years
CE	



## Growatt ShineLink-X

- Cable free, easy installation
- Automatic IP addressing, plug and play
- 120 meters long range, wide coverage
- Multiple inverters supported, up to 8
- Build-in storage, 1 month data
- Online monitoring and maintenance

• ShineWiFi/ShineGPRS/ShineLink compatible with TL3-S product.  
• ShineWiFi-X/ShineGPRS-X/4G-X/ShineLink-X compatible with TL3-X and MAX product.



# THAILAND 134MW SOLAR PLANT

▶ 134MW

▶ Phitsanulok, Thailand

▶ MAX 80KTL3 LV



# NANYANG 100MW HILL PLANT

▶ 100MW

▶ Henan, China

▶ Growatt 40000TL3-S



# NETHERLANDS POWER 1.5MW SOLAR PLANT

▶ 1.5MW    ▶ Netherlands    ▶ MAX 80KTL3 LV





## GANSU 9.65MW PROJECT

▶ 9.65MW    ▶ Gansu, China    ▶ MAX 70KTL3 MV

## NINGQIANG 7.4MW PROJECT

▶ 7.4MW    ▶ Ningqiang, China    ▶ MAX 60KTL3 LV



## WEIYUAN 2.2MW PROJECT

▶ 2.2MW    ▶ Weiyuan, Gansu    ▶ MAX 60KTL3 MV





## Nin Thuan 3MW PROJECT

▶ 3MW

▶ Vietnam

▶ MAX 80KTL3 LV



## Hong Kong 600KW PROJECT

▶ 600KW

▶ HongKong, China

▶ Growatt 40000TL3-NS





## FOSHAN 1.3MW PROJECT

▶ 1.3MW ▶ Foshan, Guangdong ▶ MAX 60KTL3 LV

## DEZHOU 1.29MW SOLAR PLANT

▶ 1.29MW ▶ Dezhou, China ▶ Growatt 40000TL3-NSE



# NETHERLAND 600KW SOLAR SYSTEM

- ▶ 600KW
- ▶ Netherlands
- ▶ Growatt 4000TL3-NS



# ANHUI 350KW SOLAR PLANT

- ▶ 350KW
- ▶ Anhui, China
- ▶ Growatt 4000TL3-NS