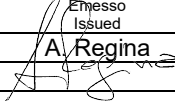
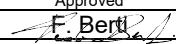


# TECHNICAL DATA SHEET

## INGENIO MAX

400-500 kVA

3-Ph (IN) / 3-Ph (OUT)

Rev.	Descrizione Description	Data Date	Emesso Issued	Approvato Approved	Lingua Language	Pagina Page	di Pag. of Pag.
E	VR125-19	31/07/19	 A. Regina	 F. Berti	E	1	8
					Codice / Code <b>OMT87002</b>		

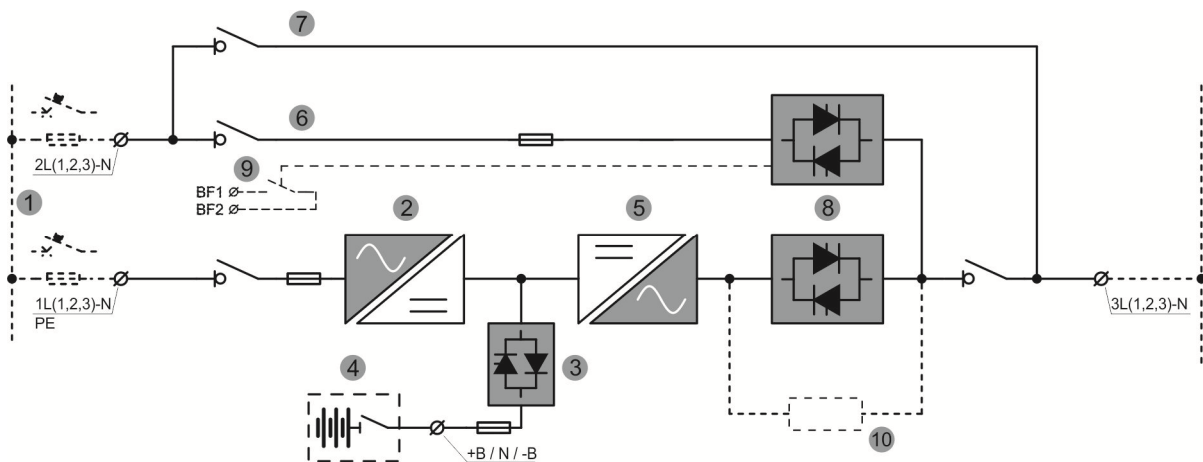
## GENERAL INFORMATION

POWER		kVA	400	500		
UPS type			ON LINE - Double Conversion			
Rated apparent output power (cos $\varphi$ = 1)		kVA	400	500		
Rated active output power (cos $\varphi$ = 1)		kW	400	500		
AC/AC efficiency* (VFI - ON LINE Double Conversion) * Certified by TÜV NORD GmbH	@ 25% load	%	Without inverter contactor	# With inverter contactor	Without inverter contactor	# With inverter contactor
	@ 50% load		≥ 95,2	≥ 95,8	≥ 95,2	≥ 95,6
	@ 75% load		≥ 96,0	≥ 96,4	≥ 96,1	≥ 96,4
	@ 100% load		≥ 95,9	≥ 96,3	≥ 96,0	≥ 96,3
AC/AC efficiency* (VFD ECO MODE) * Certified by TÜV NORD GmbH	@ 25% load	%	97			
	@ 50% load		98,4			
	@ 75% load		98,8			
	@ 100% load		98,9			
Heat dissipation at rated load, VFI mode (cos $\varphi$ = 1)		kW	17,5	21,9		
Ambient temperature	UPS BATTERY	° C	0 ÷ 40 0 ÷ 25			
Storage temperature	UPS BATTERY	° C	-10 ÷ 70 -15 ÷ 40			
Relative humidity (non condensing)		%	< 95			
Altitude		m	< 1000 (above sea level)			
Power derating for altitude > 1000 m			According to EN 62040-3 0,5% every 100 m			
Cooling			Forced			
Required cooling air volume		m <sup>3</sup> /h	4000	4600		
Acoustic noise (according to EN 62040-3)		dB	< 72			
Number of cells for standard Lead acid battery			360 ÷ 372			
Protection degree			IP20			
Electromagnetic compatibility			According to EN 62040-2 (CE marking)			
Safety			According to EN 62040-1			
Test and performance			According to EN 62040-3			
Colour			RAL 9005 ( other on request)			
Accessibility			Front access			
Installation			Against the wall			
Overall dimension	W	mm	1430			
	D		970			
	H		1978			
Weight (without batteries)		kg	1080	1250		
Weight with batteries (maximum)			n.a.			
Input / Output terminals			Cables input from bottom			
Handling			Base provided for fork-lift			

# See the section Option (Last page)

POWER	kVA	400	500
Storage and transport conditions		According to EN 62040-3	
Reference standards		EN 62040-1 - EN62040-2 - EN62040-3 ISO 9001:2008 - ISO 14001	
Front panel		Touch-screen 10"	
Voltage-free contact interface		Optional for signalisations / alarms	
Serial communication interface		Standard: RS232/USB Optional: RS485 (ModBus RTU protocol)	
Parallel configuration (optional)		Up to 5+1 (parallel redundant) Up to 6 (power parallel) <sup>(1)</sup>	
Parallel configuration (optional)		Up to 5+1 (parallel redundant) Up to 6 (power parallel) <sup>(1)</sup>	

<sup>(1)</sup> For higher configurations contact the manufacturer



1. Separate mains input for rectifier and bypass
2. Rectifier battery-charger
3. Battery static switch
4. External battery
5. Inverter
6. Emergency line (bypass)
7. Maintenance bypass line
8. Inverter (SSI) and bypass(SSB) static switch
9. Contact for external back-feed protection
10. Energy enhancement kit (Option)

## RECTIFIER AND BATTERY CHARGER

POWER		kVA	400	500
Input			3-phase / 4-wire	
Rated input voltage		Vac	400	
Tolerance		%	-20 / +15	
Input frequency (selectable)		Hz	50 - 60	
Tolerance		%	+/- 10	
Input power factor			> 0,99	
Input current harmonic distortion (THDi) (at rated voltage and THDv < 0,5%)	@ 25% load	%	< 8	
	@ 50% load		< 4	
	@ 75% load		< 3	
	@ 100% load		< 2	
Output voltage static stability		%	+/- 1	
Output voltage ripple		%	< 1 (rms)	
Battery recharging characteristic			Intermittent charging with prevailing state of complete rest and control of the battery status IU (DIN 41773)	
Maximum battery recharging current				
- at rated load		A	50	70
- max current with DCM function			100	120
Rectifier bridge type			PFC a IGBT	
Input protections			Fuses	
Rated current absorbed from mains @ Vnom (at rated load and battery charged)		A	602	753
Maximum current absorbed from mains at minimum voltage (at rated load and max recharging current)		A	827	1046
Rectifier soft-start (walk-in)		s	5 ÷ 30 (programmable)	
Rectifier sequential start-up (hold-off)		s	1 ÷ 300 (programmable)	

## BATTERY

POWER		kVA	400	500
Battery type (standard)			Sealed lead acid (VRLA - maintenance free)	
Number of cells			360 - 372	
Floating voltage at 25 °C	360 el.	Vdc	812	
	372 el.		840	
Minimum discharge voltage	360 el.	Vdc	620	
	372 el.		632	
Power drawn by the inverter (at rated load $\cos \varphi = 1$ )		kW	407,7	509,7
Power drawn by the inverter (at rated load and minimum battery voltage)		A	658	822
Battery protection			Fuses	
Battery test			Provided as standard	

## INVERTER

POWER		kVA	400	500
Inverter bridge type			IGBT (High frequency PWM) 3 level	
Rated apparent power at $\cos \varphi = 1$		kVA	400	500
Rated active power at $\cos \varphi = 1$		kW	400	500
DC/AC efficiency	@ 25% load	%	Up to 96	
	@ 50% load		Up to 97	
	@ 75% load		Up to 97	
	@ 100% load		Up to 98	
Output			3-phase / 4-wire	
rated output voltage (selectable)		Vac	380 - 400 - 415	
Output voltage stability				
- Static (balanced load)		%	+/- 1	
- Static (unbalanced load)		%	+/- 2	
- Dynamic (load step 20%-100%-20%)		%	+/- 5	
- Output voltage recovery after load step		ms	< 20	
- Classification according to EN 62040-3			VFI-SS-111	
Phase angle accuracy				
- Balanced load		°	+/- 1	
- Unbalanced load (100% - 0% - 0%)		°	+/- 1	
Output frequency		Hz	50 - 60	
Output frequency stability				
- Internal clock (mains not present)		Hz	+/- 0,001	
- Inverter synchronized with mains		Hz	+/- 2 (other on request)	
- Maximum frequency slew rate		Hz/s	< 1	
Rated output current (@ 400 Vac)		A	577	722
Overload capability	>100...110%	min	10	
	>110...125%	min	5	
	>125...150%	sec	30	
	>150%	ms	100	
Short circuit current <sup>(1)</sup>		A	1400	1750
Short circuit characteristic			Current limited with electronic protection Automatic stop after 5 seconds	
Output waveform			Sinusoidal	
Output voltage harmonic distortion THDv				
- With linear load		%	< 1	
- With non-linear load		%	< 5	
- According to EN 62040-3			Fully compliant	
Max crest factor without derating			3 : 1	

<sup>(1)</sup> Value referred to short-circuit mode IK1 - IK2 - IK3

## BYPASS

POWER	kVA	400	500
Automatic bypass		Electronic thyristor switch	
Input		3-phase / 4-wire	
Protection		Fuses	
Rated input voltage (selectable)	Vac	380 - 400 - 415	
Tolerance (selectable)	%	+/- 10	
Input frequency (selectable)	Hz	50 - 60	
Tolerance (selectable)	%	+/- 10	
Transfer mode		No-break	
Inverter --> automatic bypass transfer		In case of: - Short-circuit - Battery discharged - Inverter test - Inverter failure	
Automatic bypass --> inverter transfer		Automatic Block on bypass in case of 6 transfers in 2 minutes, local reset by display	
Overload capability	%	150 continuously 1000 for 1 cycle	
Manual bypass		- Electronically controlled - No-break assisted re-start procedure	
Back-feed protection		NC contact for the control of an external device	

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## SOFTWARE ENABLED FUNCTIONS

1. DIESEL MODE OPERATION
2. RECTIFIER WALK-IN TIME
3. RECTIFIER DELAY ON STARTUP (HOLD-OFF TIME)
4. DYNAMIC CHARGING MODE (DCM)
5. VFD (ECO) OPERATING MODE MANAGEMENT
6. FREQUENCY CONVERTER

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## OPTIONS

1. BATTERY TEMPERATURE VOLTAGE COMPENSATION
2. REMOTE STATUS / ALARMS CARD
3. SERIAL INTERFACE RS-485 (ModBus protocol RTU)
4. SNMP ADPTER
5. PARALLEL CARD INTERFACE KIT
6. LOAD-SYNC CARD INTERFACE KIT
7. ISOLATION TRANSFORMER
8. WALL MOUNTED FUSED SWITCH BOX
9. SPECIAL PAINT
10. ENERGY ENHANCEMENT KIT