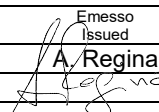
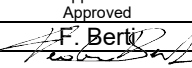


# TECHNICAL DATA SHEET

## INGENIO MAX

400 kVA

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

Rev.	Descrizione Description	Data Date	Emesso Issued	Approvato Approved	Lingua Language	Pagina Page	di Pag. of Pag.
D	VR11-19	04/02/19	 A. Regina	 F. Bertini	E	1	8
					Codice / Code <b>OMT87002</b>		

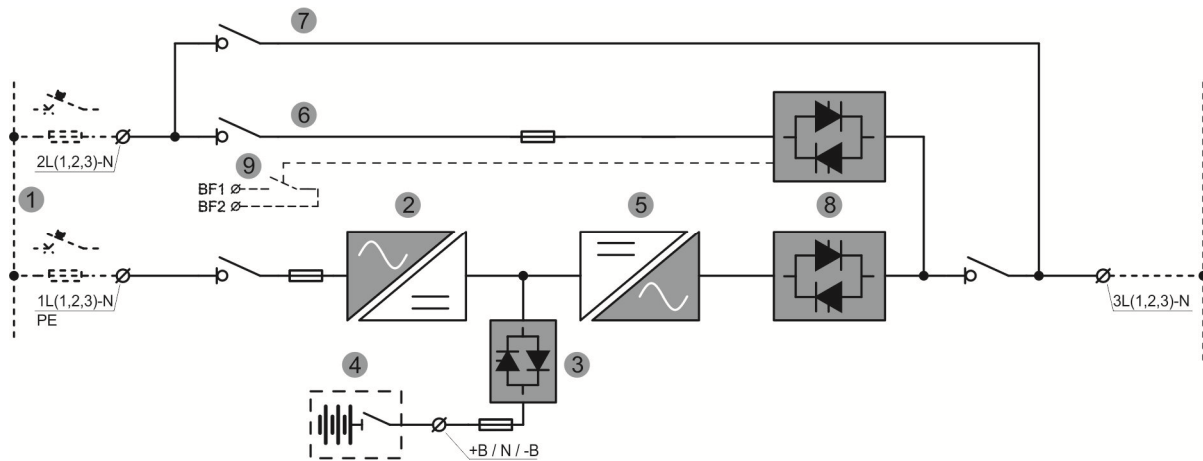
## GENERAL INFORMATION

<b>POWER</b>		<b>kVA</b>	<b>400</b>
UPS type			ON LINE - Double Conversion
Rated apparent output power (cos $\varphi = 1$ )		kVA	400
Rated active output power (cos $\varphi = 1$ )		kW	400
AC/AC efficiency* (VFI - ON LINE Double Conversion) * Certified by TÜV NORD GmbH	@ 25% load	%	> 94,8
	@ 50% load		≥ 96,0
	@ 75% load		≥ 96
	@ 100% load		≥ 95,6
AC/AC efficiency (VFD ECO MODE - from 50% of load)		%	≥ 98,0
Heat dissipation at rated load, VFI mode (cos $\varphi = 1$ )		kW	18,4
Ambient temperature	UPS	° C	0 ÷ 40
	BATTERY		0 ÷ 25
Storage temperature	UPS	° C	-10 ÷ 70
	BATTERY		-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
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 (altri su richiesta)
Accessibility			Front access
Installation			Against the wall
Overall dimension	W	mm	1430
	D		970
	H		1978
Weight (without batteries)		kg	1080
Weight with batteries (maximum)			n.a.
Input / Output terminals			Cables input from bottom
Handling			Base provided for fork-lift
Storage and transport conditions			According to EN 62040-3
Reference standards			EN 62040-1 - EN62040-2 - EN62040-3 ISO 9001:2008 - ISO 14001

POWER	kVA	400
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>

(1) For higher configurations contact the manufacturer

## BLOCK DIAGRAM



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

## RECTIFIER AND BATTERY CHARGER

<b>POWER</b>		<b>kVA</b>	<b>400</b>
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	%	< 10
	@ 50% load		< 4
	@ 75% load		< 3
	@ 100% load		< 3
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		A	50
- at rated load			
- max current with DCM function			100
Rectifier bridge type			IGBT-based PFC
Input protections			Fuses
Rated current absorbed from mains @ Vnom (at rated load and battery charged)		A	606
Maximum current absorbed from mains at minimum voltage (at rated load and max recharging current)		A	831
Rectifier soft-start (walk-in)		s	5 ÷ 30 (programmable)
Rectifier sequential start-up (hold-off)		s	1 ÷ 300 (programmable)

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**BATTERY**

<b>POWER</b>		<b>kVA</b>	<b>400</b>
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
Power drawn by the inverter (at rated load and minimum battery voltage)		A	658
Battery protection			Fuses
Battery test			Provided as standard

## INVERTER

<b>POWER</b>		<b>kVA</b>	<b>400</b>
Inverter bridge type			IGBT (High frequency PWM) – 3 level
Rated apparent power at $\cos \varphi = 1$		kVA	400
Rated active power at $\cos \varphi = 1$		kW	400
DC/AC efficiency	@ 25% load	%	96,0
	@ 50% load		97,0
	@ 75% load		97,0
	@ 100% load		98,1
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
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
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

Automatic bypass		Electronic thyristor switch
Input		3-phase / 4-wire
Protection		Fusibili
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: <ul style="list-style-type: none"> <li>- Short-circuit</li> <li>- Battery discharged</li> <li>- Inverter test</li> <li>- Inverter failure</li> </ul>
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