

TECHNICAL SPECIFICATION

INGENIO PLUS

30 - 40 kVA

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

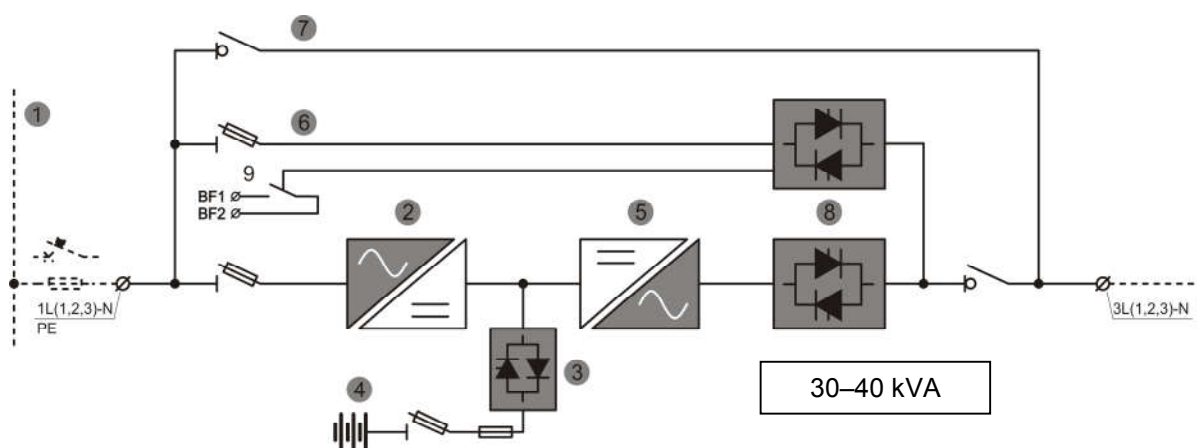
Rev.	Descrizione Description	Data Date	Emesso Issued	Approvato Approved	Lingua Language	Pagina Page	di Pag. of Pag.
C	VR138-17	23.10.17	A. Regina	F. Bert	I	1	8
					Codice / Code		
					OMS02046		

GENERAL INFORMATION

POWER		kVA	30	40
UPS type			ON LINE - Doppia Conversione	
Rated apparent output power (cos φ = 1)		kVA	30	40
Rated active output power (cos φ = 1)		kW	30	40
AC/AC efficiency (VFI - ON LINE Double Conversion)	@ 25% load	%	92,0	92,0
	@ 50% load		93,5	93,5
	@ 75% load		94,0	94,0
	@ 100% load		94,0	94,0
AC/AC efficiency (VFD ECO MODE - from 50% of load)		%	≥ 98,0	
Heat dissipation at rated load, VFI mode (cos φ = 1)		kW	1,91	2,55
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		m³/h	450	750
Acoustic noise (according to EN 62040-3)		dB	< 57	
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 and top access	
Installation			10 cm from the wall	
Overall dimension	W	mm	465	
	D		650	
	H		1230	
Weight (without batteries)		kg	120	140
Weight with batteries (maximum)			365	385
Input / Output terminals			Cables input from bottom	
Handling			With wheels	
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			Liquid Cristal Display	

Voltage-free contact interface		Optional for signalisations / alarms
Serial communication interface		Optional: RS485 (ModBus RTU protocol)
Parallel configuration (optional)		Up to 5+1 (parallel redundant) Up to 6 (power parallel)

BLOCK DIAGRAM



1. Common mains input for rectifier and bypass (Optional separate input for bypass)
2. Rectifier battery-charger
3. Battery static switch
4. Internal battery (Optional external cabinet)
5. Inverter
6. Emergency line (bypass)
7. Maintenance bypass line
8. Inverter (SSI) and bypass(SSB) static switch
9. Back-feed protection external contact

RECTIFIER AND BATTERY CHARGER

POWER		kVA	30	40
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	%	< 5	
	@ 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		
- at rated load			10	10
- max current with DCM function			15	15
Rectifier bridge type			IGBT-based PFC	
Input protections			Fuses	
Rated current abosorbed from mains @ Vnom (at rated load and battery charged)		A	46	61
Maximum current abosorbed from mains at minimum voltage (at rated load and max recharging current)		A	73	91
Rectifier soft-start (walk-in)		s	5 ÷ 30 (programmable)	
Rectifier sequential start-up (hold-off)		s	1 ÷ 300 (programmable)	

BATTERY

POWER		kVA	30	40
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	31,1	41,5
Power drawn by the inverter (at rated load and minimum battery voltage)		A	50	67
Battery protection			Fuses	
Battery test			Provided as standard	

INVERTER

POWER		kVA	30	40
Inverter bridge type			IGBT (High frequency PWM)	
Rated apparent power at $\cos \varphi = 1$		kVA	30	40
Rated active power at $\cos \varphi = 1$		kW	30	40
DC/AC efficiency	@ 25% load	%	96,0	
	@ 50% load		97,0	
	@ 75% load		97,0	
	@ 100% load		96,5	
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	44	58
Overload capability	>100...125%	min	10	
	>125...150%	s	30	
	>150%	ms	100	
Short circuit current ⁽²⁾		A	101	133
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	

⁽²⁾ Value referred to short-circuit mode IK1 - IK2 - IK3

BYPASS

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	%	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

SOFTWARE ENABLED FUNCTIONS

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

OPTIONS

1. BATTERY TEMPERATURE VOLTAGE COMPENSATION
2. ISOLATION TRANSFORMER (IF INTERNAL NOT AVAILABLE WITH OPTION TRIPPING COIL)
3. SEPARATED BYPASS INPUT KIT
4. VOLTAGE ADAPTATION AUTO-TRANSFORMER (OPTIONAL)
5. INTERNAL BACK-FEED PROTECTION
6. REMOTE STATUS / ALARMS CARD
7. SERIAL INTERFACE RS-485 (ModBus protocol RTU)
8. SNMP ADAPTER
9. KIT PARALLELO
10. PARALLEL CARD INTERFACE KIT
11. WALL MOUNTED FUSED SWITCH BOX
12. DIESEL MODE OPERATION
13. KIT FOR CONT. AUX MCB EXT. / BYP. SW EXT. / OCB EXT. / EPO EXT.
14. SPECIAL PAINT

TECHNICAL DATA SHEET

INGENIO Plus

60 – 80 – 100 – 125 – 160 kVA

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

Rev.	Descrizione Description	Data Date	Emesso Issued	Approvato Approved	Lingua Language	Pagina Page	di Pag. of Pag.
F	Revision (VR105-17)	28.08.17	A. Regina	F. Berti	I	1	8
					Codice / Code		
					OML46011		

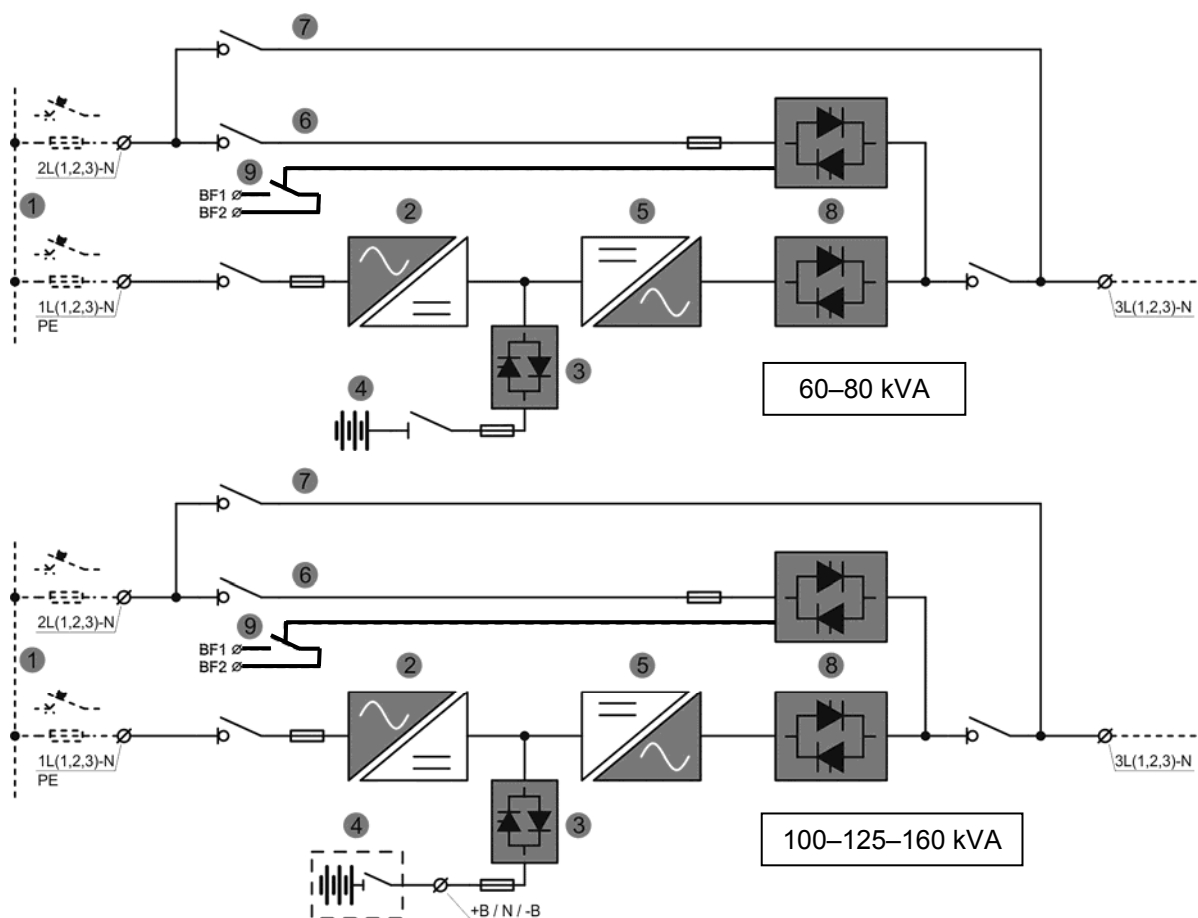
GENERAL INFORMATION

RATING		kVA	60	80	100	125	160
UPS type			ON LINE – Double Conversion				
Rated apparent output power (cos φ = 1)		kVA	60	80	100	125	160
Rated active output power (cos φ = 1)		kW	60	80	100	125	160
AC/AC efficiency (VFI - ON LINE Double Conversion)	@ 25% load	%	93,0	93,0	93,0	93,0	93,0
	@ 50% load		94,5	94,5	94,5	94,5	94,5
	@ 75% load		95,0	95,0	95,0	95,0	95,0
	@ 100% load		95,0	95,0	95,0	95,0	95,0
AC/AC efficiency (VFD ECO MODE - from 50% of load)		%	≥ 98,0				
Heat dissipation at rated load, VFI mode (cos φ = 1)		kW	3,2	4,2	5,3	6,6	8,4
Ambient temperature	UPS BATTERY	° C	0 ÷ 40 0 ÷ 25				
Storage temperature	UPS BATTERT	° C	-10 ÷ 70 -10 ÷ 60				
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		m³/h	1000	1000	1200	1200	1500
Acoustic noise (according to EN 62040-3)		dB	< 60				
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 and side access				
Installation			Against the wall				
Overall dimension	L	mm	560				
	P		940				
	H		1800				
Weight (without batteries)		kg	250	300	320	360	380
Weight with batteries (maximum)			800	850	n.a.	n.a.	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				

Front panel		Liquid Cristal Display Touch-screen (optional)
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) ⁽¹⁾

⁽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. Internal battery for 60-80 kVA (Optional external cabinet) – External for 100÷160 kVA
5. Inverter
6. Emergency line (bypass)
7. Maintenance bypass line
8. Inverter (SSI) and bypass(SSB) static switch

RECTIFIER AND BATTERY CHARGER

RATING		kVA	60	80	100	125	160
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	%	< 5				
	@ 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	15	15	15	20	20
- at rated load							
- max current with DCM function							
Rectifier bridge type			IGBT-based PFC				
Input protections			Fuses				
Rated current abosorbed from mains @ Vnom (at rated load and battery charged)		A	91	122	152	190	243
Maximum current abosorbed from mains at minimum voltage (at rated load and max recharging current)		A	136	175	212	267	334
Rectifier soft-start (walk-in)		s	5 ÷ 30 (programmable)				
Rectifier sequential start-up (hold-off)		s	1 ÷ 300 (programmable)				

BATTERY

RATING		kVA	60	80	100	125	160
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	61,9	82,5	103,1	128,9	164,9
Power drawn by the inverter (at rated load and minimum battery voltage)		A	100	133	166	208	266
Battery protection			Fuses				
Battery test			Provided as standard				

INVERTER

POWER		kVA	60	80	100	125	160
Inverter bridge type			IGBT (High frequency PWM)				
Rated apparent power at $\cos \varphi = 1$		kVA	60	80	100	125	160
Rated active power at $\cos \varphi = 1$		kW	60	80	100	125	160
DC/AC efficiency	@ 25% load	%	96,0				
	@ 50% load		97,0				
	@ 75% load		97,0				
	@ 100% load		97,0				
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	87	115	144	180	231
Overload capability	>100...125%	min	10 ⁽¹⁾				
	>125...150%	s	30				
	>150%	ms	100				
Short circuit current ⁽²⁾		A	265	330	400	490	640
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				

⁽¹⁾ For 160kVA Overload capability 10' >100%...110%, 5' >110...125%

⁽²⁾ Value referred to short-circuit mode IK1 - IK2 - IK3

BYPASS

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
Automatic bypass		No-break

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. VFI / VFD (ECO) OPERATING MODE MANAGEMENT
6. FREQUENCY CONVERTER

OPTIONS

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