TECHNICAL DATA SHEET

INGENIO ECS

30 - 40 kVA

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

According to the EN 50171

Rev.	Descrizione Description	Data Date	Emesso Issued	Approvato Approved	Lingua Language	Pagina Page	di Pag. of Pag.
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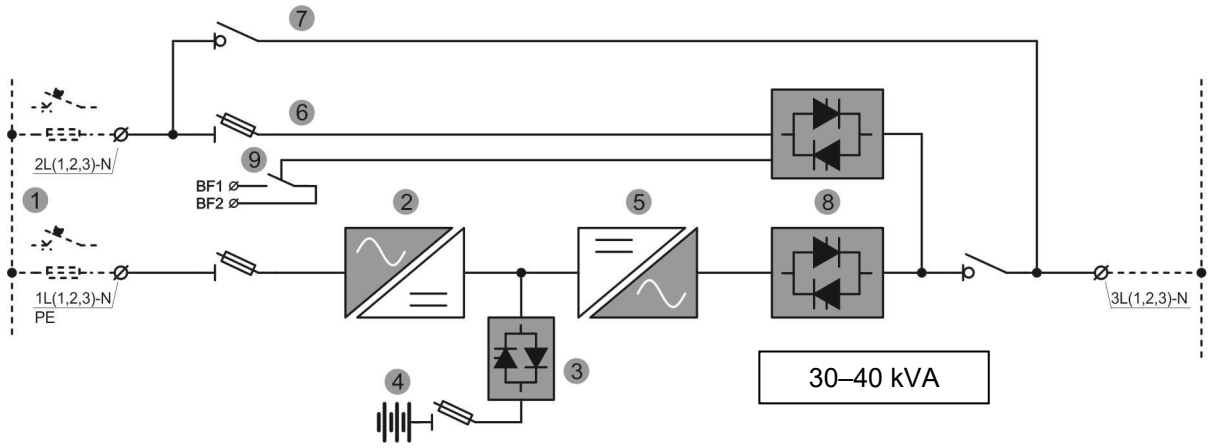
GENERAL INFORMATION

POWER		**kVA**	**30**	**40**
CPS 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
Rated active power according to EN 50171		kW	25	33.3
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	CPS	° C	0 ÷ 40	
	BATTERY		0 ÷ 25	
Storage temperature	CPS	° 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^3/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 (other on request)	
Accessibility			Front and top access	
Installation			10 cm from the wall	
Overall dimension	W	mm	465	
	D		670	
	H		1200	
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 50171 EN 62040-1 - EN62040-2 - EN62040-3	

POWER	kVA	30	40
Front panel		Liquid Cristal Display	
Voltage-free contact interface for signalisations & alarms		Included - Standard	
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. Separate mains input for rectifier and 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. Contact for external back-feed protection

RECTIFIER AND BATTERY CHARGER

POWER		**kVA**	**30**	**40**
Input			3-phase / 4-wire	
Rated input voltage Tolerance		Vac %	400 -20 / +15	
Input frequency (selectable) Tolerance		Hz %	50 - 60 +/- 10	
Input power factor			> 0,99	
Input current harmonic distortion (THDi) (at rated voltage and THDv < 0,5%)	@ 25% load @ 50% load @ 75% load @ 100% load	%	< 5 < 4 < 3 < 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 - at rated load - max current with DCM function		A	 10 15	 10 15
Rectifier bridge type			IGBT-based PFC	
Input protections			MCB	
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. 372 el.	Vdc	812 840	
Minimum discharge voltage	360 el. 372 el.	Vdc	620 632	
Power drawn by the inverter (at rated load cos φ = 1)		kW	31,1	41,5
Power drawn by the inverter (at rated load and minimum battery voltage)		A	50	67
Battery protection			Fuses	
Protection against reverse polarity			Provided as standard	
Protection against deep discharge			Provided as standard	
Battery test			Provided as standard	

INVERTER

POWER		**kVA**	**30**	**40**
Inverter bridge type			IGBT (High frequency PWM)	
Rated apparent power at cos φ = 1		kVA	30	40
Rated active power at cos φ = 1		kW	30	40
Rated active power according to EN 50171		kW	25	33.3
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 (@ EN 50171 rated active power)	>100…120%	min	Permanent	
	>120…150%	min	10	
	>150…180%	s	30	
	>180%	ms	100	
Short circuit current [1]		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	

[1] Value referred to short-circuit mode IK1 - IK2 - IK3

BYPASS

Automatic bypass		Electronic thyristor switch
Input		3-phase / 4-wire
Protection		MCB
Rated input voltage (selectable) Tolerance (selectable)	Vac %	380 - 400 - 415 +/- 10
Input frequency (selectable) Tolerance (selectable)	Hz %	50 - 60 +/- 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. DYNAMIC CHARGING MODE (DCM)

OPTIONS

1. BATTERY TEMPERATURE VOLTAGE COMPENSATION
2. ISOLATION TRANSFORMER (IF INTERNAL NOT AVAILABLE WITH OPTION TRIPPING COIL)
3. VOLTAGE ADAPTATION AUTO-TRANSFORMER (OPTIONAL)
4. SERIAL INTERFACE RS-485 (ModBus protocol RTU)
5. SNMP ADPTER
6. PARALLEL CARD INTERFACE KIT
7. EXTERNAL BATTERY CABINET
8. WALL MOUNTED FUSED SWITCH BOX
9. DIESEL MODE OPERATION
10. KIT FOR CONT. AUX MBCB EXT. / BYP. SW EXT. / OCB EXT. / EPO EXT.
11. SPECIAL PAINT