Catalogue 2009

AC Inverter
From 90 kW up to 1.2 MW

SIEIDrive

AC Drive Cabinet Solution

High Power Systems

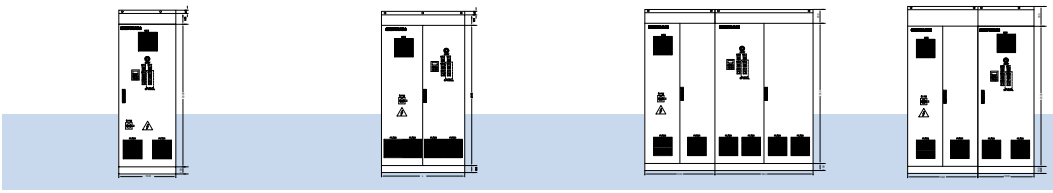
English

GEFRAN

SIEIDrive "AVy" inverters in the electrical cabinet configuration deliver advantageous technological solutions and considerably reduce assembly and commissioning times.

Available as standard for 90 kW to 1.2 MW power ratings, AVy inverters integrate electromechanical power and auxiliary devices and an entire set of accessories for correct use of an AC drive system.

The ideal configuration for immediate "start-up" of the motor and trouble-free control of high power systems.



Standard configuration

- Line circuit breaker
- Extra-fast line fuses
- Input inductance
- ECF3 type EMI filter (in compliance with EC Directive- EN61800-3); Category 4, 2nd environment, up to 100 m motor cables)
- Rectifier bridge and inverter bridge (separate or integrated according to power)
- Auxiliary electro-mechanics
- Control panel on door
- Protection rating P23 or IP54.

See page 17

Optional accessories

- Dedicated EMC filters (in compliance with EC Directive - EN61800-3)
- Output inductance (normalized for the entire range)
- Dynamic braking module
- Braking resistances (normalized for the entire range)
- Door personalization
- Man/machine interface.

See pages 10, 17

CE CEE - EN ... CENELEC EN ... IEC CEI

Approvals and Technical Standards

- CE:compliant with EC low voltage directive
- EMC: compliant with EC Directive - EN61800-3 on electromagnetic compatibility using optional filters
- Equipment constructed in accordance with harmonized technical standard CENELEC EN 60204-1 and the CEI 44-5 standard.

AC Drive Cabinet Solution

Mains voltage and powers

Power supply	Power range													
400...480 Vac, 3ph	90 kW	110 kW	132 kW	160 kW	200 kW	250 kW	315 kW	355 kW	400 kW	500 kW	630 kW	700 kW	800 kW	
460 Vac, 3ph	100 Hp	125Hp	150 Hp	200 Hp	250 Hp	300 Hp	450 Hp	500 Hp	500 Hp	600 Hp	700 Hp	800 Hp	1000 Hp	
690 Vac, 3ph	90 kW	110 kW	132 kW			250 kW				500 kW	630 kW		800 kW	1200 kW

IP23 or IP54/IP55 cabinet

Standard supply with IP23 and IP54 protection rating with forced ventilation and filters; IP55 (optional) with or without air conditioner.

Inverter

According to rated power, the inverters may feature protection rating IP20 with integrated rectifier bridge or "open frame" configurations with external power supply via "SM32" AC/DC converter.

Lifting supports

Metal rings and hooks for lifting are standard.

Special versions

Heat exchangers, air filters, conditioner, versions for special environments, etc

Input power supply unit

The "SM32" semi-controlled AC/DC three-phase converter provides the power supply voltage for the output power bridges when not integrated in the inverter.

Optional cards

Optional cards are available for connection to PROFIBUS, DeviceNet and CANopen® networks and I/O expansion cards, relays and encoders.

DeviceNet CANopen PROFIBUS

Busbars

Power connection via insulated copper busbars.

Input and output inductance

Integrated EMI filter

In compliance with EN61800-3 for reduction of electromagnetic interference.

Electro-mechanics

Circuit breaker and auxiliary electro-mechanics.

Control panel on door

The following are fitted on the door in the standard configurations:

- **start-stop buttons**
- **programming keypad**
- **reset and emergency button**
- **mains present and alarms light**
- **line circuit breaker handle**

On request, special versions for specific application requirements.

Programming menu

The programming structure of the AVy inverter promotes simple, rational system configuration and motor parameterization.

Inverter parameters, divided according to type of function, guarantee user-friendly interpretation of function modification, management and access operations.

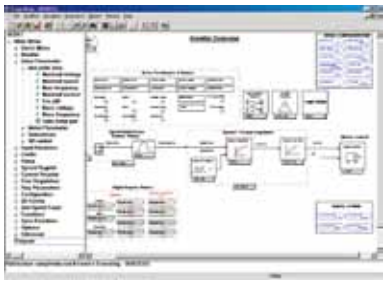
The classification of the main groups of parameters is indicated below:

- setting of basic parameters
- monitoring of functioning parameters and variables
- motor/inverter parameterization and setting of system thresholds
- parameterization of I/O
- parameterization of regulation functions
- parameterization of dedicated functions

EasyDrive

With EasyDrive configuration software, AVy series inverters can be programmed and used via PC.

In addition to complete management of the inverter, user-friendly programming promotes fast, easy understanding by users of any level, enabling fast commissioning, optimization and diagnostics.



EasyDrive runs under Windows, displaying dialogue windows and tool bars both for programming of the inverter and for management and saving of the configuration files.

The configurator can be installed on PCs with Windows 95 and later operating systems. EasyDrive is included in the CD-ROM furnished with the cabinet.

The following operations can be carried out via the configurator:

- RS485 serial communication via Modbus RTU or Jbus protocol
- parameter setting using the tree-like structure of the main menus
- read/write of all parameters /commands
- off-line user file configuration
- on-line programming in graphic environment
- parameter download/upload procedure
- saving of the user file
- guided programming procedure for commissioning via "Wizard" function
- graphic display of variables via "Trend recorder" oscilloscope function
- management of up to 32 inverters in a multidrop network

Specifications

Model	Size [kW]	Rated current		Overload			Inverter Dissipation [W]	Cabinet Airflow [m³/h]
		In input [A]	I cont max [A]	Light duty (***) In [A]	Heavy duty (*) In [A]	Heavy duty (**) In [A]		
400 ... 480V, 50/60Hz line	(The values indicated refer to a rated voltage of **400V**)							
AVy-11 0090-...-4-...	90 kW	200	185		252	229	2500	975
AVy-11 0110-...-4-...	110 kW	220	220		300	273	2800	975
AVy-11 0132-...-4-...	132 kW	260	250		340	309	3400	975
AVy-11 0160-...-4-...	160 kW	335	324		441	401	4400	1800
AVy-11 0200-...-4-...	200 kW	420	400		544	495	5000	2000
AVy-11 0250-C-...-4-...	250 kW - C	520	485		660	600	6300	2000
AVy-11 0315-CP-...-4-...	315 kW - CP	570	580	660			8000	2000
AVy-11 0250-S-...-4-...	250 kW - S	520	485		660	600	6300	3500
AVy-11 0315-S-LD-...-4-...	315 kW - S - LD	570	580	660			8000	3500
AVy-11 0315-S-...-4-...	315 kW - S	570	580		789	718	8000	3500
AVy-11 0355-S-LD-...-4-...	355 kW - S - LD	670	650	715			8000	3900
AVy-11 0355-S-...-4-...	355 kW - S	670	650		884	804	8000	3900
AVy-11 0400-S-LD-...-4-...	400 kW - S - LD	770	730	803			9000	3900
AVy-11 0500-S-...-4-...	500 kW - S	1100	980		1333	1213	10000	6900
AVy-11 0630-S-LD-...-4-...	630 kW - S - LD	1250	1160	1276			12600	6900
AVy-11 0630-S-...-4-...	630 kW - S	1250	1160		1578	1436	12600	6900
AVy-11 0700-S-LD-...-4-...	700 kW - S - LD	1450	1300	1430			15000	6900
AVy-11 0700-S-...-4-...	700 kW - S	1450	1300		1768	1609	15000	6900
AVy-11 0800-S-LD-...-4-...	800 kW - S - LD	1550	1400	1540			16000	6900

Model	Size [Hp]	Rated current		Overload			Inverter Dissipation [W]	Cabinet Airflow [m³/h]
		In input [A]	I cont max [A]	Light duty (***) In [A]	Heavy duty (*) In [A]	Heavy duty (**) In [A]		
400 ... 480V, 50/60Hz line	(The values indicated refer to a rated voltage of **460V**)							
AVy-11 0090-...-4-...	100 Hp	160	161		219	220	2200	975
AVy-11 0110-...-4-...	125 Hp	190	191		260	236	2500	975
AVy-11 0132-...-4-...	150 Hp	215	218		297	298	3000	975
AVy-11 0160-...-4-...	200 Hp	270	282		383	348	4000	1800
AVy-11 0200-...-4-...	250 Hp	360	348		473	430	4500	2000
AVy-11 0250-C-...-4-...	300 Hp - C	425	422		574	522	5600	2000
AVy-11 0315-CP-...-4-...	450 Hp - CP	560	566	622			7000	2000
AVy-11 0250-S-...-4-...	300 Hp - S	425	422		574	522	5600	3500
AVy-11 0315-S-LD-...-4-...	450 Hp - S - LD	560	566	622			7000	3500
AVy-11 0315-S-...-4-...	450 Hp - S	560	566		770	701	7000	3500
AVy-11 0355-S-LD-...-4-...	500 Hp - S - LD	600	585	643			7000	3900
AVy-11 0355-S-...-4-...	500 Hp - S	600	585		796	724	7000	3900
AVy-11 0400-S-LD-...-4-...	500 Hp - S - LD	680	657	723			7500	3900
AVy-11 0500-S-...-4-...	600 Hp - S	900	882		1200	1092	10000	6900
AVy-11 0630-S-LD-...-4-...	700 Hp - S - LD	1040	1044	1148			12600	6900
AVy-11 0630-S-...-4-...	700 Hp - S	1040	1044		1420	1292	12600	6900
AVy-11 0700-S-LD-...-4-...	800 Hp - S - LD	1200	1170	1287			15000	6900
AVy-11 0700-S-...-4-...	800 Hp - S	1200	1170		1590	1447	15000	6900
AVy-11 0800-S-LD-...-4-...	1000 Hp - S - LD	1400	1260	1386			16000	6900

Model	Size [kW]	Rated current		Overload			Inverter Dissipation [W]	Cabinet Airflow [m³/h]
		In input [A]	I cont max [A]		Heavy Duty (*) In [A]	Heavy Duty (**) In [A]		
690V, 50/60Hz line								
AVy-11 0090-...-6-...	90 kW	140	110		150	136	2000	975
AVy-11 0110-...-6-...	110 kW	160	139		181	164	2000	975
AVy-11 0132-...-6-...	132 kW	170	159		216	196	2400	975
AVy-11 0250-...-6-...	250 kW	300	280		381	346	5000	2000
AVy-11 0500-...-6-...	500 kW	620	590		802	730	8000	3900
AVy-11 0630-...-6-...	630 kW	720	700		952	866	10000	3900
AVy-11 0800-...-6-...	800 kW	820	800		1088	990	15000	5000
AVy-11 1200-...-6-...	1200 kW	1220	1200		1632	1485	20000	5000

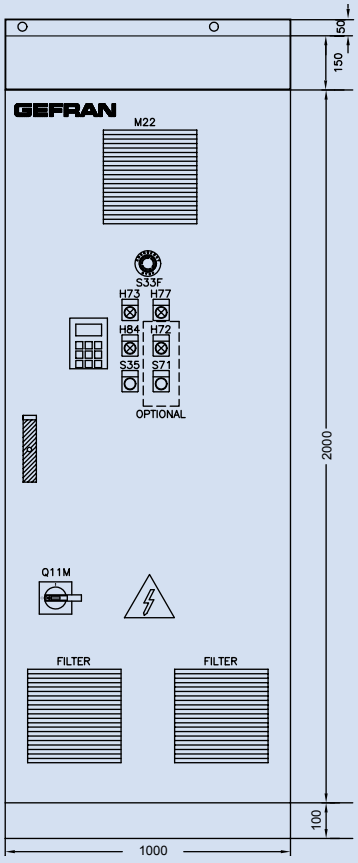
(*) IEC 146 class 1: 136% In * 60" each 300"; (**) IEC 146 class 2: 150% In*0.91 * 60" each 300"; (***): IEC 146 class 1: 110% In* 60" each 300".

Specifications

General specifications		
Main characteristics	Control method	Closed-loop flux vector control: - sinusoidal encoder (speed accuracy: 0.01%), - digital encoder (speed accuracy: 0.02%) Closed-loop flux vector control without feedback from encoder (Sensorless), speed accuracy: 0.1% above 100rpm, 0.2% below 100rpm V/f scalar control (speed accuracy according to slip of the motor)
	Output frequency	200Hz with and without feedback from encoder
	Overload	**High overload** capacity according to IEC 146 class 1 (136% in * 60" every 300") and class 2 (150% in *0.91 * 60" every 300"), **standard overload** according to IEC 146 class 1 (110% in * 60" every 300")
	Self-tuning	Off-line self-tuning of speed-current-flux regulators and identification of motor data (possible with motor stopped or rotating) On-line self-tuning: motor parameter compensation according to changes in temperature
	Control functions	Multi-speed function (7 programmable), 5 independent, programmable ramps (linear and S), Motor-potentiometer function, Flying Restart function, Droop function, double motor management, PID block functions, Mains loss detection through controlled stopping and/or energy optimization, Management of virtual or remote I/Os
	Safety functions	Thermal protection of electronics for motor and Drive
Keypad		LCD programming keypad or led type diagnostic module
Serial line		Integrated RS485 serial line (ModBus RTU protocol)
Standard inputs/outputs		3 programmable differential analog inputs (Voltage/Current), 2 programmable analog outputs, 8 digital inputs: 4 non programmable + 4 programmable, 2 programmable digital outputs, 2 programmable relay outputs
Encoder input		Integrated encoder input: sinusoidal 1Vpp (+5V) and digital TTL (+5V)
Configuration software		"EasyDrive" high level configuration SW for PC including: - graphic environment programming of inverter function blocks - saving of user file - guided programming procedure for commissioning via "Wizard" - graphic display of variables and functions via "Trend recorder"
Field bus		Interfacing with field bus: Profibus, CANopen® and DeviceNet (with optional card)
Safety card		EXP-SFTy safety card for disabling of IGBT modules in compliance with "prevention of unexpected start-up" standard EN 1037. The EXP-SFTy card is already integrated in some models (see pages 10-11 and 13-14); for all other sizes, the card is optional (can be factory fitted on request).
Operating conditions	Protection rating	IP23 or IP54 in standard cabinet with forced ventilation and filters; IP55 in custom cabinet (with or without air conditioners)
	Pollution level	Configurations to specifications on request
	Altitude	Up to 2000 meters a.s.l.; above 1000 meters, current must be reduced by 1.2% every 100 meters of increase.
	Operating temperature	IP23 standard version: from 0°C to 40 °C. For temperatures above 40°C, IP55 versions with optional air conditioner or heat exchanger
	Storage/transportation temperature	From 90 to 315 kW: -20°C…+55°C, from 355 to 1200 kW: -25°C…+70°C
	Humidity	IP23: versions from 5% to 85%, relative humidity (without condensation) or formation of ice (class 3K3 in accordance with EN 50178)
	Vibrations	According to IEC68-2-6. Possibility of special configurations to customer's specs
	Immunity to interference	According to EN 61000-6-2
Color		Grey RAL 7035

Standard IP23/IP54 configurations

90 ... 132 kW sizes

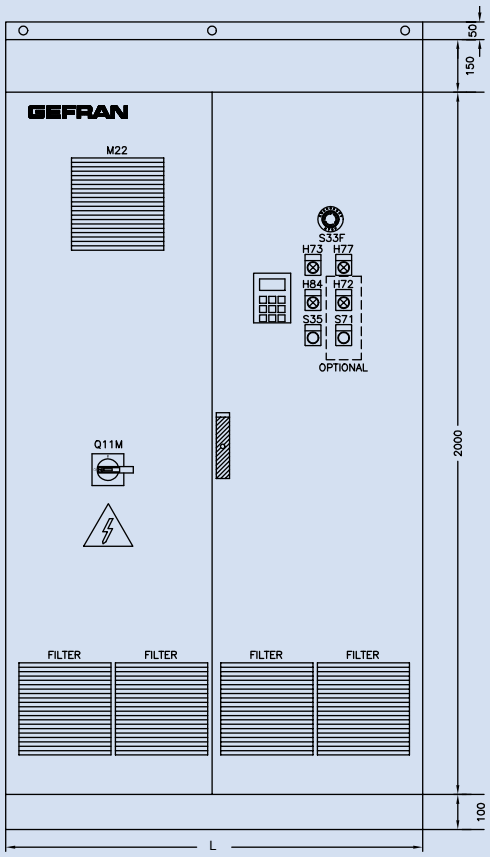


Dimensions

400-480V models (kW)	Dimensions: mm (inches)			Weight kg. (lbs)
	Width	Height	Depth	
90	1000 (39.37)	2300 (90.55)	600 (23.62)	-
110				
132				

690V models (kW)	Dimensions: mm (inches)			Weight kg. (lbs)
	Width	Height	Depth	
90	1000 (39.37)	2300 (90.55)	800 (31.50)	-
110				
132				

160 ... 250 kW sizes



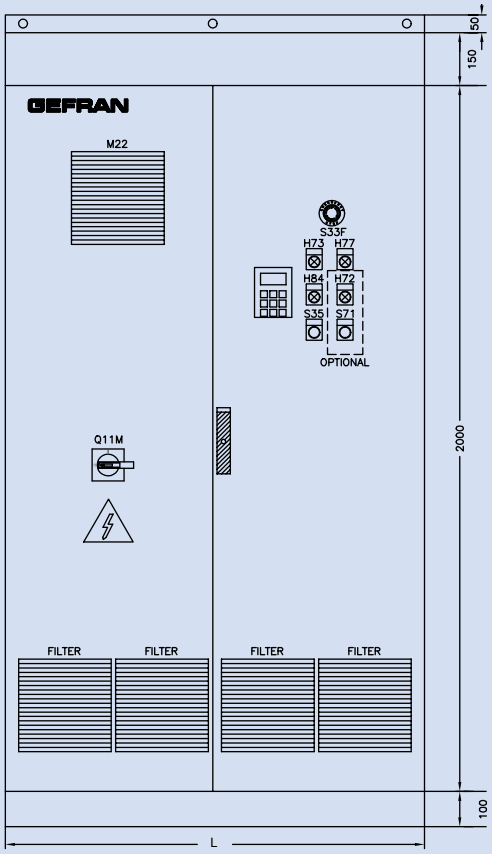
Dimensions

400-480V models (kW)	Dimensioni : mm (inches)			Weight kg. (lbs)
	Width	Height	Depth	
160	1200 (47.24)	2300 (90.55)	600 (23.62)	-
200				

690V models (kW)	Dimensioni : mm (inches)			Weight kg. (lbs)
	Width	Height	Depth	
250	1200 (47.24)	2300 (90.55)	800 (31.50)	-

Standard IP23/IP54 configuration

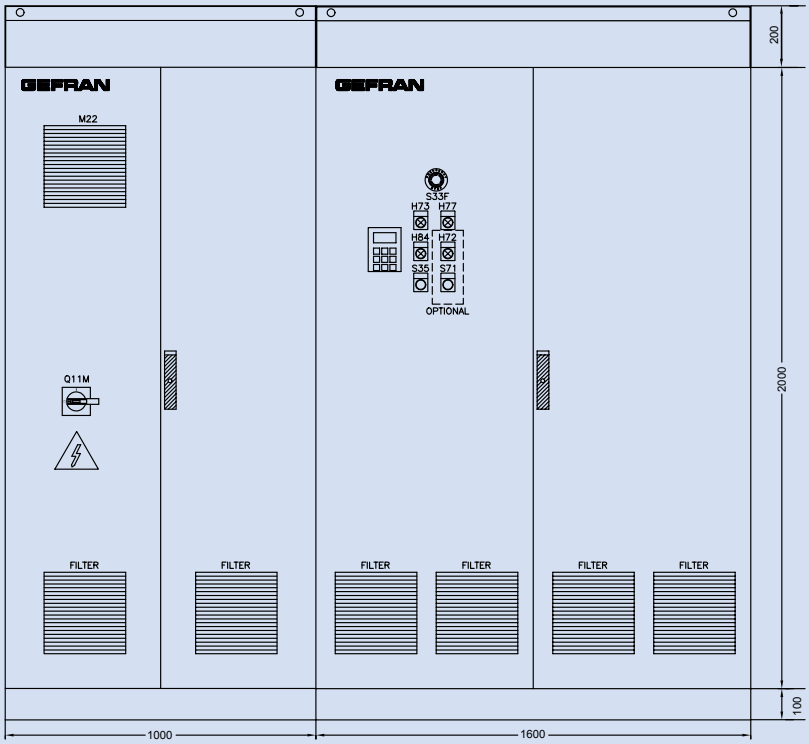
250 ... 400 kW sizes (C, CP, S, S-LD models)



Dimensions

400-480V models (kW)	Dimensions: mm (inches)			Weight kg. (lbs)
	Width	Height	Depth	
250-C	1200 (47.24)	2300 (90.55)	600 (23.62)	-
315-CP				
250-S				
315-S 315-S-LD				
355-S 355-S-LD	1600 (62.99)			
400-S-LD				

500 ... 800 kW sizes (S, S-LD models)

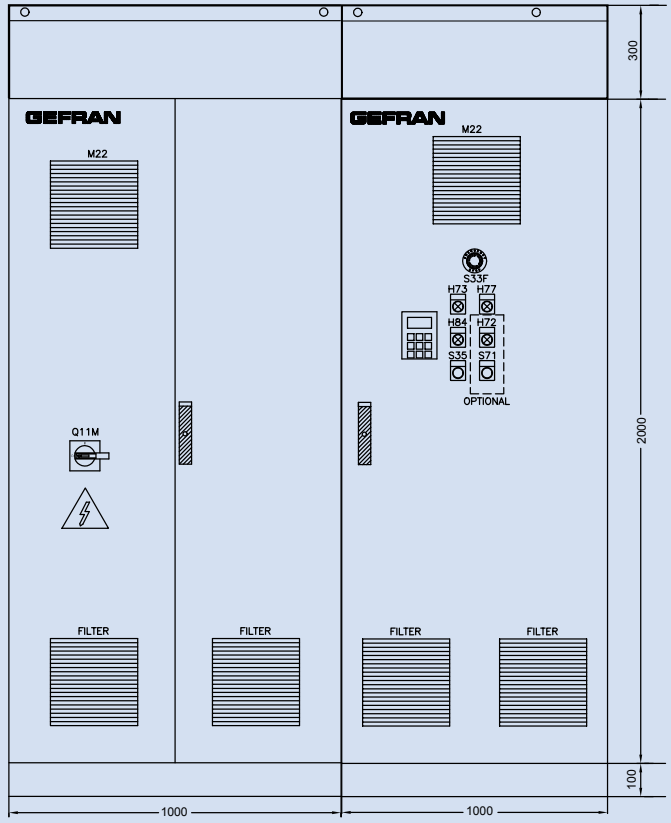


Dimensions

400-480V models (kW)	Dimensions: mm (inches)			Weight kg. (lbs)
	Width	Height	Depth	
500-S	2600 (102.36)	2300 (90.55)	800 (31.50)	-
630-S 630-S-LD				
700-S 700-S-LD				
800-S-LD				

Standard IP23/IP54 configurations

500 ... 1200 sizes

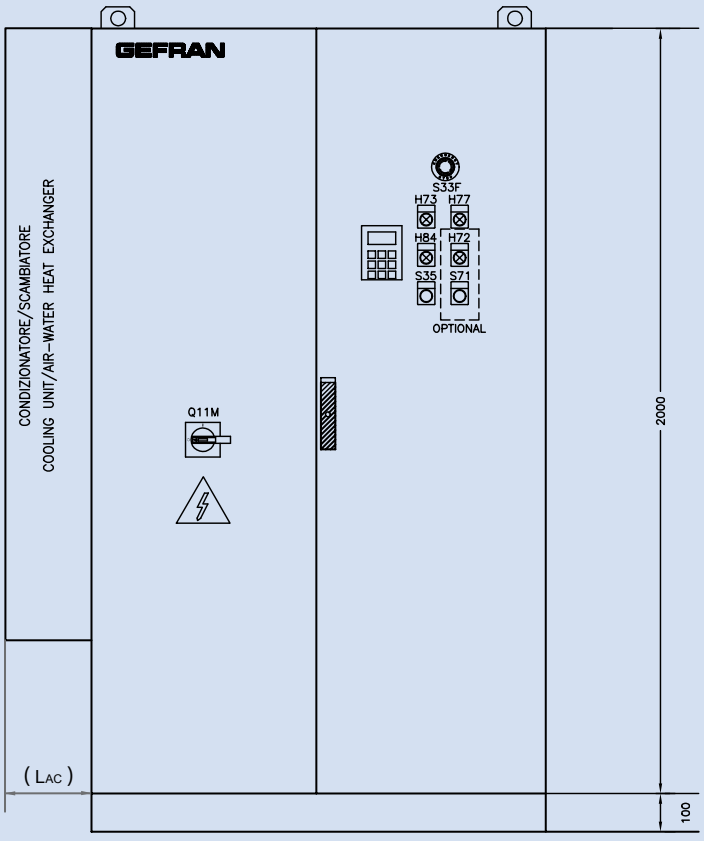


Dimensions

690V models (kW)	Dimensions: mm (inches)			Weight kg. (lbs)
	Width	Height	Depth	
500	2000 (78.74)	2400 (94.49)	800 (31.50)	-
630				
800				
1200				

Optional IP55+AC/HC configurations

All sizes • Optional models with air conditioner / heat exchanger



Dimensions

Dimensions: mm (inches)		Weight kg. (lbs)
Width	Height	
LAC = 380 (14.96) Add the measurement (Lac) to the width indicated in the IP23/IP54 tables (see above).	2100 (82.68)	+ 150 (330.7)

400/460 VAC
- 90 - 400kW = n.1 conditioner
- ≥ 500kW = n.2 conditioners

690 VAC
- 90 - 630kW = n.1 conditioner
- ≥ 800kW = n.2 conditioners

Models (kW)		90	110	132	160	200	250-C	315-CP	250-S	315-S-LD
Power supply voltage										
INPUT SIDE	P/N									
Main on/off switch		●	●	●	●	●	●	●	●	●
Extra-fast fuses		●	●	●	●	●	●	●	●	●
Input inductance		●	●	●	●	●	●	●	●	●
EMC filter in accordance with EN 61800-3 :										
• Category 4, 2nd environment, Length of motor cables 100 m (ECF3 type)		●	●	●	●	●	●	●	●	●
• Category 3, 2nd environment, Length of motor cables 100 m (EMI ... type)	EMI	O	O	O	O	O	O	O	O	O
SM32-.. power supply unit.		-	-	-	-	-	-	-	●	●
Internal ventilation of power supply unit									●	●
Main contact card	KM	O	O	O	O	O	O	O	O	O
OUTPUT SIDE										
Output inductance	LU	O	O	O	O	O	O	O	O	O
Outlet for motor fan		●	●	●	●	●	●	●	●	●
SAFETY										
SFTy safety card	SI	O	O	O	O	O	O	O	●	●
Fuses, Main On/Off Switch /Contact block: see INPUT SIDE										
PROTECTION RATING and COOLING SYSTEM										
IP23 (with forced ventilation)	IP23	●	●	●	●	●	●	●	●	●
IP54 (with forced ventilation + filters)	IP54	●	●	●	●	●	●	●	●	●
IP55 (1) Height: 2100 mm, see page 9	IP55	O	O	O	O	O	O	O	O	O
Air conditioner To be combined with protection rating IP55 (1) details on page 9	AC	O	O	O	O	O	O	O	O	O
Heat exchanger (to be combined with protection rating IP55)	HC	O	O	O	O	O	O	O	O	O
VARIOUS										
Internal lighting with service outlet		●	●	●	●	●	●	●	●	●
Braking unit (1) See page 20	BUy	O	O	O	O	O	O	O	O	O
Braking resistance (1) See page 20	BR	O	O	O	O	O	O	O	O	O
I/O expansion cards (max. 1 internal card) Details on pages 15-16	EXP..	O	O	O	O	O	O	O	O	O
Encoder cards (max. 1 internal card) Details on page 15	EXP..	O	O	O	O	O	O	O	O	O
Field bus (max 1 internal card) Details on page 16	SBI..	O	O	O	O	O	O	O	O	O
Space heater for cabinet	RA	O	O	O	O	O	O	O	O	O

Standard: ●, Optional: O, Not available: - , (1): specification of this option may affect the size of the cabinet.

315-S	355-S-LD	355-S	400-S-LD	500	630-LD	630	700-LD	700	800-LD	90	110	132	250	500	630	800	1200
400 ... 480V, 50/60Hz										690V, 50/60Hz							
●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
●	-	-	-	-	-	-	-	-	-	●	●	●	●	-	-	-	-
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Identification of the model

AVy — **AC Inverter, three-phase power supply, SIEIDrive series - AVy**

1 1 — **SIEIDrive inverter - AVy in cabinet**

0 0 9 0 — **Rated output power**

0090 = 90kW, 0110 = 110kW, 0132 = 132kW, 0160 = 160kW, 0200 = 200kW, 0250 = 250kW, 0315 = 315kW, 0355 = 355kW, 0400 = 400kW, 0500 = 500kW, 0630 = 630kW, 0700 = 700kW, 0800 = 800kW, 1200 = 1200 kW.

_ — **Inverter configuration**

[blank] = Standard IP20 inverter
C / CP = Compact IP20 inverter
S = Slim IP00 inverter

_ — LD = Inverter with standard overload (Low Duty)

K — **KBS programming keypad remote controlled from door**

X — **Without internal braking module**

X — **Standard software**

4 — **Power supply voltage**

4 = 400...480VAC, 50/60Hz; 6 = 690VAC, 50/60Hz

IP23 — **Protection rating**

IP23; IP54; IP55

. . . — **+ Options and expansion cards**

Options: enter the code indicated on pages 10-11
I/O expansion cards and Encoder: enter the code indicated on pages 15-16
Field bus cards: enter the code indicated on page 16

Example : AVy-11 0250-S-KXX-4-IP23+SI+EXP-D8R4+SBI-COP-33

AVy — **CA inverter, three-phase power supply, SIEIDrive series - AVy**

1 1 — **Inverter in cabinet**

0 2 5 0 — **Rated output power : 0250 = 250kW**

S — **Inverter version : S = Slim inverter**

K — **KBS programming keypad remote controlled from door**

X — **Without internal braking module**

X — **Standard software**

4 — **Power supply voltage : 4 = 400...480VAC, 50/60Hz;**

IP23 — **Protection rating : IP23**

. . . — **+ Options and expansion cards**

SI = with Safety card
EXP-D8R4 = with I/O expansion card
SBI-COP-33 = with CANopen® card
KM = Main contact block included

Standard cabinet codes

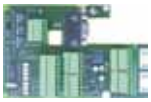
Models	Code	Description
IP23 - 400 ... 480V line		
AVy-11 0090-KXX-4-IP23	S1L01	Rated power 90kW
AVy-11 011 0-KXX-4-IP23	S1L02	Rated power 110kW
AVy-11 0132-KXX-4-IP23	S1L03	Rated power 132kW
AVy-11 0160-KXX-4-IP23	S1L04	Rated power 160kW
AVy-11 0200-KXX-4-IP23	S1L05	Rated power 200kW
AVy-11 0250-C-KXX-4-IP23	S1L06	Rated power 250kW
AVy-11 0315-CP-KXX-4-IP23	S1L07	Rated power 315kW
AVy-11 0250-S-KXX-4-IP23+SI	S1L08	Rated power 250kW, includes the EXP-SFTy safety card
AVy-11 0315-S-LD-KXX-4-IP23+SI	S1L09	Rated power 315kW, with standard overload. Includes the EXP-SFTy safety card
AVy-11 0315-S-KXX-4-IP23 +SI	S1L10	Rated power 315kW, includes the EXP-SFTy safety card
AVy-11 0355-S-LD-KXX-4-IP23+SI	S1L11	Rated power 355kW, with standard overload. Includes the EXP-SFTy safety card
AVy-11 0355-S-KXX-4-IP23 +SI	S1L12	Rated power 355kW Includes the EXP-SFTy safety card
AVy-11 0400-S-LD-KXX-4-IP23+SI	S1L13	Rated power 400kW, with standard overload. Includes the EXP-SFTy safety card
AVy-11 0500-S-KXX-4-IP23+LU+SI	S1L14	Rated power 500kW + integrated output inductance
AVy-11 0630-S-LD-KXX-4-IP23+LU+SI	S1L15	Rated power 630kW, Low Duty overload + integrated output inductance. Includes the EXP-SFTy safety card
AVy-11 0630-S-KXX-4-IP23+LU+SI	S1L16	Rated power 630kW + integrated output inductance. Includes the EXP-SFTy safety card
AVy-11 0700-S-LD-KXX-4-IP23+LU+SI	S1L17	Rated power 700kW, Low Duty overload + integrated output inductance. Includes the EXP-SFTy safety card
AVy-11 0700-S-KXX-4-IP23+LU+SI	S1L18	Rated power 700kW + integrated output inductance. Includes the EXP-SFTy safety card
AVy-11 0800-S-LD-KXX-4-IP23+LU+SI	S1L19	Rated power 800kW, Low Duty overload + integrated output inductance. Includes the EXP-SFTy safety card
IP23 - 690V line		
AVy-11 0090-KXX-6-IP23	S1L20	Rated power 90kW
AVy-11 011 0-KXX-6-IP23	S1L21	Rated power 110kW
AVy-11 0132-KXX-6-IP23	S1L22	Rated power 132kW
AVy-11 0250-KXX-6-IP23	S1L23	Rated power 250kW
AVy-11 0500-KXX-6-IP23	S1L24	Rated power 500kW
AVy-11 0630-KXX-6-IP23	S1L25	Rated power 630kW
AVy-11 0800-KXX-6-IP23+LU	S1L26	Rated power 800kW + integrated output inductance
AVy-11 1200-KXX-6-IP23+LU	S1L27	Rated power 1200kW + integrated output inductance

Models	Code	Description
IP54 - 400 ... 480V line		
AVy-11 0090-KXX-4-IP54	S1L28	Rated power 90kW
AVy-11 011 0-KXX-4-IP54	S1L29	Rated power 110kW
AVy-11 0132-KXX-4-IP54	S1L30	Rated power 132kW
AVy-11 0160-KXX-4-IP54	S1L31	Rated power 160kW
AVy-11 0200-KXX-4-IP54	S1L32	Rated power 200kW
AVy-11 0250-C-KXX-4-IP54	S1L33	Rated power 250kW
AVy-11 0315-CP-KXX-4-IP54	S1L34	Rated power 315kW
AVy-11 0250-S-KXX-4-IP54+SI	S1L35	Rated power 250kW, includes the EXP-SFTy safety card
AVy-11 0315-S-LD-KXX-4-IP54+SI	S1L36	Rated power 315kW, with standard overload. Includes the EXP-SFTy safety card
AVy-11 0315-S-KXX-4-IP54+SI	S1L37	Rated power 315kW, includes the EXP-SFTy safety card
AVy-11 0355-S-LD-KXX-4-IP54+SI	S1L38	Rated power 355kW, with standard overload. Includes the EXP-SFTy safety card
AVy-11 0355-S-KXX-4-IP54+SI	S1L39	Rated power 355kW Includes the EXP-SFTy safety card

(to be continued)

Models	Code	Description
AVy-11 0400-S-LD-KXX-4-IP54+SI	S1L40	Rated power 400kW, with standard overload. Includes the EXP-SFTy safety card
AVy-11 0500-S-KXX-4-IP54+LU+SI	S1L41	Rated power 500kW + integrated output inductance
AVy-11 0630-S-LD-KXX-4-IP54+LU+SI	S1L42	Rated power 630kW, Low Duty overload + integrated output inductance. Includes the EXP-SFTy safety card
AVy-11 0630-S-KXX-4-IP54+LU+SI	S1L43	Rated power 630kW + integrated output inductance. Includes the EXP-SFTy safety card
AVy-11 0700-S-LD-KXX-4-IP54+LU+SI	S1L44	Rated power 700kW, Low Duty overload + integrated output inductance. Includes the EXP-SFTy safety card
AVy-11 0700-S-KXX-4-IP54+LU+SI	S1L45	Rated power 700kW + integrated output inductance. Includes the EXP-SFTy safety card
AVy-11 0800-S-LD-KXX-4-IP54+LU+SI	S1L46	Rated power 800kW, Low Duty overload + integrated output inductance. Includes the EXP-SFTy safety card
IP54 - 690V line		
AVy-11 0090-KXX-6-IP54	S1L47	Rated power 90kW
AVy-11 011 0-KXX-6-IP54	S1L48	Rated power 110kW
AVy-11 0132-KXX-6-IP54	S1L49	Rated power 132kW
AVy-11 0250-KXX-6-IP54	S1L50	Rated power 250kW
AVy-11 0500-KXX-6-IP54	S1L51	Rated power 500kW
AVy-11 0630-KXX-6-IP54	S1L52	Rated power 630kW
AVy-11 0800-KXX-6-IP54+LU	S1L53	Rated power 800kW + integrated output inductance
AVy-11 1200-KXX-6-IP54+LU	S1L54	Rated power 1200kW + integrated output inductance

Expansion cards

	Type (P/N)	Code	Description
	EXP-D8R4	S5R80	Inverter standard input / output expansion card: - 8 digital inputs (+15VDC ...+24VDC ±10%, max 9mA) - 4 relay complete with exchange contact (250VAC - 5A max/ 24VDC - 400mA). Caution: the I/O expansions of this card are not completely supported by the models AVy-...-4.
	EXP-D14A4F	S5R81	Inverter standard input / output expansion card: - 8 digital inputs (+15VDC ...+30VDC, max 9mA) - 6 digital outputs (+15VDC ...+30VDC, max 50mA) - 2 differential analog inputs (voltage: ±10V, < 0.5mA; current: 0...20mA, 4...20mA) - 2 analog outputs (±10V, max 0,5mA) - 1 optocoupled digital encoder input interface (standard inputs: A+, A-, B+, B-, 0+, 0; Additional input for Encoder qualifier: C1+, C1-). Caution: the I/O expansions of this card are not completely supported by the models AVy-...-4.
	EXP-D20A6	S505L	Inverter standard input / output expansion card: - 12 digital inputs (+15VDC ...+30VDC, max 9mA) - 8 digital outputs (+15VDC ...+30VDC, max 50mA) - 2 differential analog inputs (voltage: ±10V, < 0.5mA; current: 0...20mA, 4...20mA) - 4 analog outputs (2 voltage: ±10V, max 0.5mA; 2 current: 0...20mA, 4...20mA) Caution: the I/O expansions of this card are not completely supported by the models AVy-...-4.
	EXP-F2E	S504L	Digital encoder input expansion and encoder repeater card: - 1 optocoupled digital encoder input and encoder input qualifier (A, A-, B, B-, C, C-; +5VDC or +15...24VDC selectable) - 1 optocoupled encoder data repeater TTL (@5V) or HTL (@15 to 24V).
	EXP-E	S507L	Digital encoder repeater expansion card: - 1 optocoupled encoder data repeater TTL (@5V) or HTL (@15 to 24V) output.
	EXP-FO	S503L	Digital encoder repeater expansion card: - 1 encoder data repeater TTL (@5V) output.
	EXP-FI	S508L	Digital encoder input expansion card: - 1 optocoupled digital encoder input (A, A-, B, B-, 0, 0-; +5VDC or +15...24VDC selectable) and encoder input qualifier (C, C-; 15VDC ... 30VDC).
	EXP-FIO	S509L	Digital encoder input expansion card and encoder repeater: - 1 optocoupled digital encoder input (A, A-, B, B-, 0, 0-; +5VDC or +15...24VDC selectable) and encoder input qualifier (C, C-; 15VDC ... 30VDC) - 1 encoder data repeater TTL (@5V) output..
	EXP-FIH	S510L	Digital encoder input expansion card: - 1 optocoupled digital encoder input (A, A-, B, B-; +15...24VDC).
	EXP-D8-120	S520L	Interface card for digital inputs at 120VAC - 8 inputs (115VAC ±10%, 50/60Hz, Iinput 4...5.5mA) - 8 outputs (24VDC ±10%, Ioutput 10mA max).
	EXP-RES	S513L	Resolver interface and TTL digital encoder simulation card: - 1 differential resolver input - Digital encoder simulation (A, A-, B, B-, I, I-; standard TTL).

(to be continued)

	Type (P/N)	Code	Description
	EXP-D16	S5R83	Expansion card for digital inputs and outputs (for sw 2.0 or higher only): - 8 optocoupled digital inputs (15...30VDC, Iinput 4.5...9mA) - 8 optocoupled digital outputs (15...30VDC, Ioutput 50mA max for any output).
	ENC-ADPT	S5D03	Connector / terminals encoder interface.
	EXP-SFTy	On request	Safety card for disabling IGBT module control, in accordance with the standard "Prevention of unexpected start-up" EN 1037. Option to be installed in factory, on request, for all AVy ranges. **Note**: EXP-SFTy card is integrated on some models (see pages 10-11 and 13-14)

Field Bus Interface

	Type (P/N)	Code	Description
	SBI-PDP-33	S5H44	- ProfiBus-DP protocol - Transmission speed: autoselect from 9.6 kbit/s to 12 Mbit/s - Bus address: 1...127, selectable via DIP switches - Data frame: configuration channel towards all the drive parameters; 4 I/O fast word for rapid access - Sync and Freeze supported.
	SBI-PDP-33-SA (Stand Alone Field bus interface)	S54H4	
	SBI-DN-33	S5Z29	- DeviceNet protocol - Transmission speed: 125, 250, 500 kbit/s, selectable via DIP switches - Bus address: 1...63, selectable via DIP switches - Data frame: Explicit messaging towards all the drive parameters; 1...6 I/O polling word for rapid access, selectable via DIP switch.
	SBI-DN-33-SA (Stand Alone Field bus interface)	S54H5	
	SBI-COP-33	S5Z42	Field bus interface: - CANopen® protocol - Transmission speed: up to 1 Mbit/s, selectable via DIP switches - Data frame: 1 SDO towards all the drive parameters, 2 PDO with 4 I/O word for rapid access - Bus address: 1...128, selectable via DIP switches.
	SBI-COP-33-SA (Stand Alone Field bus interface)	S5Z43	

EMC filters

SIEIDrive inverters used with the filters indicated in the table comply with European Standard EN 61800-3 on conducted and radiated radiofrequency emissions when used and installed as indicated by Gefran.

In the standard configurations of the cabinets, the ECF3 type EMI filter is installed as standard (Category 4, 2nd environment, up to 100 m motor cables)

For other details, see the Gefran Accessories catalogue.

Classification of category for definition of method of attenuation, EMC immunity and emission levels according to EN 61800-3.

To comply with the prescriptions of the Electromagnetic Compatibility Directive and for application of CE marking, the EMC category applicable to the drive installed in the OEM equipment must be defined.

After defining the category, it is possible to choose the most efficient method of attenuation (the EMI filters for conducted emissions are indicated in the tables).

The current standard classifies PDS according to various configurations of use and application environments.

Environments		
First environment	All environments powered directly by a public low voltage power line:	- Workshops, laboratories, small production firms - Apartments, houses - Community public services
Second environment	Industrial environment with own power supply network not connected directly to the public low-voltage power line. A transformer is present for the MV network.	
Categories of PDS		
Category C1	PDS with a rated voltage of less than 1000 V, for First Environment..	
Category C2	PDS with a rated voltage of less than 1000 V; non plug-in type and not mobile devices which, with regard to use in the First Environment must be installed and operated only by qualified personnel.	
Category C3	PDS with a rated voltage of less than 1000 V, suitable for the Second Environment but not for the First Environment.	
Category C4	PDS with a rated voltage of or exceeding 1000 V or with a rated current of or exceeding 400 A, or to be used in a complex system for the Second Environment.	

Drive (400 - 480 V)	Input filter AC mains voltage 230…400V ±15%			Input filter AC mains voltage 480V ±10%		
	Filter type	Filter code	Category / Environment / Motor cable length (max)	Filter type	Filter code	Category / Environment / Motor cable length (max)
90 kW	EMI FTF-480-180	S7GOF	C3 / 2° / 100 m	EMI FTF-480-180	S7GOF	C3 / 2° / 100 m
110 kW	EMI 480-250	S7DGG	C3 / 2° / 100 m	EMI 480-180	S7DGC	C3 / 2° / 100 m
132 kW	EMI 480-250	S7DGG	C3 / 2° / 100 m	EMI 480-250	S7DGG	C3 / 2° / 100 m
160 kW	EMI 480-320	S7DGH	C3 / 2° / 100 m	EMI 480-250	S7DGG	C3 / 2° / 100 m
200 kW	EMI 480-400	S7DGI	C3 / 2° / 100 m	EMI 480-320	S7DGH	C3 / 2° / 100 m
250 kW -C	EMI 480-600	S7DGL	C3 / 2° / 100 m	EMI 480-400	S7DGI	C3 / 2° / 100 m
315 kW -CP	EMI 480-600	S7DGL	C3 / 2° / 100 m	EMI 480-600	S7DGL	C3 / 2° / 100 m
250 kW -S	EMI 480-600	S7DGL	C3 / 2° / 100 m	EMI 480-600	S7DGL	C3 / 2° / 100 m
315 kW -S-LD	EMI 480-600	S7DGL	C3 / 2° / 100 m	EMI 480-600	S7DGL	C3 / 2° / 100 m
315 kW -S	EMI 480-600	S7DGL	C3 / 2° / 100 m	EMI 480-600	S7DGL	C3 / 2° / 100 m
355 kW -S-LD	EMI 480-800	S7DGM	C3 / 2° / 100 m	EMI 480-800	S7DGM	C3 / 2° / 100 m
355 kW -S	EMI 480-800	S7DGM	C3 / 2° / 100 m	EMI 480-800	S7DGM	C3 / 2° / 100 m
400 kW -S-LD	EMI 480-1000	S7DGN	C3 / 2° / 100 m	EMI 480-1000	S7DGN	C3 / 2° / 100 m
500 kW -S	EMI 480-1000	S7DGN	C3 / 2° / 100 m	EMI 480-1000	S7DGN	C3 / 2° / 100 m
630 kW -S-LD	EMI 520-1200	S7DEP	C3 / 2° / 100 m	EMI 480-1000	S7DGN	C3 / 2° / 100 m
630 kW -S	EMI 520-1200	S7DEP	C3 / 2° / 100 m	EMI 480-1000	S7DGN	C3 / 2° / 100 m
700 kW -S-LD	For information, contact the Gefran sales service					
700 kW -S						
800 kW -S-LD						

Drive (690 V)	Input filter - AC mains voltage 690V		
	Filter type	Filter code	Category / Environment / Motor cable length (max)
90 kW	EMI 690-180	S7DGP	C3 / 2° / 100 m
110 kW	EMI 690-180	S7DGP	C3 / 2° / 100 m
132 kW	EMI 690-180	S7DGP	C3 / 2° / 100 m
250 kW	EMI 690-320	S7DGR	C3 / 2° / 100 m
500 kW	EMI 690-600	S7DGS	C3 / 2° / 100 m
630 kW	EMI 690-1000	S7DGT	C3 / 2° / 100 m
800 kW	EMI 690-1000	S7DGT	C3 / 2° / 100 m
1200 kW	EMI 690-1200	S7DGK	C3 / 2° / 100 m

Output choke

If controlled via inverter and connected at a considerable distance (using above 100 meters), standard motors may require an output inductance in order to maintain the voltage waveform within permissible limits.

For further details, see the Gefran Accessories Catalogue.

Use of these inductances reduces distortion of the motor side waveform, usually avoiding the need to insert dv/dt filters.

Output inductance - AC mains voltage 230…480V						NOTE
Drive (kW)	Rated inductance [mH]	Rated current [A]	Saturation current [A]	Type	Code	
90 kW	0,07	180	310	LU3-090	S7F10	
110 kW	0,041	310	540	LU3-160	S7FH8	
132 kW	0,041	310	540	LU3-160	S7FH8	
160 kW	0,041	310	540	LU3-160	S7FH8	
200 kW	For information, contact the Gefran sales service			LU3-200	S7AF0	
250 kW -C	0,022	580	1100	LU3-315	S7FH9	
315 kW -CP	0,022	580	1100	LU3-315	S7FH9	
250 kW -S	0,022	580	1100	LU3-315	S7FH9	
315 kW -S-LD	0,022	580	1100	LU3-315	S7FH9	
315 kW -S	0,022	580	1100	LU3-315	S7FH9	
355 kW -S-LD	0,015	730	880	LU3-400	S7F08	
355 kW -S	0,015	730	880	LU3-400	S7F08	
400 kW -S-LD	0,015	730	880	LU3-400	S7F08	
500 kW -S	0,022	580	1100	LU3-315	S7FH9	(1)
630 kW -S-LD	0,022	580	1100	LU3-315	S7FH9	(1)
630 kW -S	0,022	580	1100	LU3-315	S7FH9	(1)
700 kW -S-LD	0,015	730	880	LU3-400	S7F08	(1)
700 kW -S	0,015	730	880	LU3-400	S7F08	(1)
800 kW -S-LD	0,015	730	880	LU3-400	S7F08	(1)

Output inductance - AC mains voltage 690V						NOTE
Drive (kW)	Rated inductance [mH]	Rated current [A]	Saturation current [A]	Type	Code	
90 kW	230	148	180	LU3-6-110	S7AE2	
110 kW	230	148	180	LU3-6-110	S7AE2	
132 kW	200	160	220	LU3-6-132		
250 kW	90	350	385	LU3-6-250	S7AD8	
500 kW	36	600	800	LU3-6-500	S7AF7	
630 kW	36	800	950	LU3-6-630	S7AD9	
800 kW	20	400	550	LU3-6-800/2	S7FO6	(1)
1200 kW	10	600	815	LU3-6-1200/2	S7FO1	(1)

(1) : 2 output balancing inductances already integrated in the standard cabinet.

External braking units

Type (code)	Code	Description	Max duty cycle
AC mains supply **230...460V**			
BUy 1020	S9D55	Braking unit 20 A rms, UL recognized	50 %
BUy 1050	S9D56	Braking unit 50 A rms, UL recognized	50 %
BUy 1085	S9D57	Braking unit 85 A rms, UL recognized	50 %
AC mains supply **690V**			
BUy 1065-6	S9D30	Braking unit 65 A rms, UL recognized	52 %

Braking resistances

The list of braking resistances to be combined with the BUy braking modules is provided below.
For further details regarding the resistances, consult the Gefran Accessories Catalogue.

Scaling of braking modules and related resistance
The information provided below is of general scope.
A list of normalized resistances to be used with the BUy-... series braking modules in the conditions specified is provided in the table. Bearing in mind that:

P_{PBR}	[W]	Peak power during braking
P_{NBR}	[W]	Rated power of the resistance
E_{BR}	[J]	Braking energy
V_{BR}	[V]	Braking voltage
I_{PBR}	[A]	Peak braking current
I_{AVBR}	[A]	Mean braking current
I_{PBU}	[A]	Peak current of the braking module
n1, n2	[rpm]	Initial and final speed
t_{BR}, T	[S]	Braking and cycle time
J_{TOT}	[Kg*m^2]	Total moment of inertia (in relation to axis)

the following applies:

$$P_{PBR} = J_{TOT} * \frac{n1-n2}{t_{BR}} * \frac{2\pi}{60}$$

$$E_{BR} = \frac{J_{TOT}}{2} * \left(\frac{2\pi}{60}\right)^2 * (n1^2 - n2^2)$$

$$I_{PBR} = \frac{P_{PBR}}{V_{BR}}$$

Ohmic value of the resistance:

$$R_{BR} = \leq \frac{V_{BR}}{I_{PBR}}$$

Continuous rated power of the resistance:

$$P_{NBR} = \frac{P_{PBR} * t_{BR}}{2T} = \frac{E_{BR}}{T}$$

Warning!
This formula calculates an average power value which may differ considerably from the instantaneous power in the case of very low duty cycles. Usually, the resistances are unable to withstand a peak power more than 5 or 10 times their rated value; for this reason, if the duty cycles are less than 10%, the values calculated here cannot be used as rated power of the resistance.

As, normally n2 = 0 (stop), the following is obtained: $E_{BR} = \frac{1}{2} P_{PBR} * t_{BR}$

Braking module characteristics: $I_{PBU} \geq I_{BR}$

That is to say, the permissible peak current of the BUy-... must be equal to or higher than the effective current. Similarly, for average current:

$$I_{AVBR} = \frac{E_{PBR}}{t_{BR} * V_{BR}} \qquad I_{ABU} \geq I_{AVBR}$$

Standard braking resistances

For simple selection of the braking resistance to be used, the values of the normalized resistances calculated according to typical application criteria of use are indicated below.

POVL	Overload power that may be generated by the inverter, equal to the rated power for factor 1.36 (inverter overload = Icont x 1.36)
PAVBR	Average power that can be dissipated by the resistance according to a typical 10% duty cycle
Duty cycle max	Ton / Ton + Toff (Depends on the size of the drive and of the BUy)
EBR	Maximum instantaneous energy that can be dissipated by the resistance
tOVLBR	Max. continuous braking time in overload conditions (POVL)
tBR	Max. continuous braking time in rated load conditions
PNBR	Continuative rated power of the resistance which must be equal to or higher than the average power PAVBR

The Ohmic value of the normalized resistances has been calculated in order to guarantee braking current according to limit use of the BUy:

- BUy-1020, 1050, 1085: 480VAC of inverter power, braking threshold 775VDC
- BUy-1065-6: 690VAC of inverter power, braking threshold 1150VDC

Any type of resistance other than those indicated in the table must be scaled to withstand the power POVL for a time equal to 1/10 of that of a hypothetical cycle where overload is followed by a period of zero power for 9/10 of total time.

P_{OVL} x 0.1 T = P_{AVBR} x T

The maximum braking time (and therefore the total duration of the cycle) will be determined by the maximum value of the permissible energy impulse EBR for the resistance during the braking phase according to the following ratio:

t_{OVLBR} and t_{BR} = 0.1 T = E_{BR} / P_{OVL}

As it is not possible to assess the operating temperature of the resistance, this must be fitted with a normally closed thermal contact (Klixon). The normalized resistances described here are already fitted with this device.

Drive type (kW)	BUy- (q.ty)	BUy- Type	POVL [kW]	PAVBR [kW]	EBR [kWsec]	tOVLBR [sec]	tBR [sec]	PNBR [kW]	Resistor model	Code
Power supply **400...460V**										
90	2	1050	120	12	2 x 220	6	8	2 x 8	2 x BR T8K0-7R7	S8T00I
110	2	1085	150	15	2 x 140	4,5	6	2 x 8	2 x BR T8K0-6R2	S8T00P
132	2	1085	180	18	2 x 350	6	8	2 x 12	2 x BR T12K0-5R1	S8T00L
160	2	1085	180 * (218)	18	2 x 350	6	8	2 x 12	2 x BR T12K0-5R1	S8T00L
250	3	1085	272 * (340)	27,2	3 x 350	6	8	3 x 12	3 x BR T12K0-5R1	S8T00L
315	3	1085	272 * (340)	27,2	3 x 350	6	8	3 x 12	3 x BR T12K0-5R1	S8T00L
400 ... 630	3	1085	400 * (500)	40	3 x 350	6	8	3 x 12	3 x BR T12K0-5R1	S8T00L
700 ... 800	For information, contact the Gefran sales service									
Power supply **690V**										
90	1	1065-6	128331	12833,1	120000	0,94	9,35	1x8	1xBR T8K0-9R2	S8T00Q
110	2	1065-6	156849	15684,9	240000	1,53	15,30	2x8	2xBR T8K0-9R2	S8T00Q
132	2	1065-6	188218,8	18821,88	240000	1,28	12,75	2x8	2xBR T8K0-9R2	S8T00Q
250	3	1065-6	356475	35647,5	360000	1,01	10,10	3x8	3xBR T8K0-9R2	S8T00Q
315	4	1065-6	449158,5	44915,85	480000	1,07	10,69	4x8	4xBR T8K0-9R2	S8T00Q
500	For information, contact the Gefran sales service									
630										
800										
1200										

Note! The values of the powers indicated with " *" are slightly lower than those calculated for POVL (value in brackets) so as not to introduce further resistance values. The fact that, with powers raised to this level, dynamic performance is generally lower or that it may be necessary to adopt a regenerative power unit, must be taken into account.

Gefran "Drive Cabinet Solution" configurations are available on request in a "clean power energy" configuration using "**Active Front End**" regenerative power supply units with IGBT technology or traditional regenerative units with thyristor technology.

For the SR32 and AVRUy products with power ratings above those indicated, contact the Gefran sales service.

SR32

The SR32 series appliances are fully digital-controlled **AC/DC three-phase regenerative converters** that function in the four quadrants in order to supply constant voltage to the intermediate circuit (DC link) of the SIEIDrive inverters.

The SR32 converters are suitable for powering both single inverters and also several inverters inserted in a system and connected to the common DC link. In this way, part of the power regenerated can be exchange between the various drives that absorb or regenerate energy; the excess power is regenerated towards the mains via the converter.

The output voltage of the converter is maintained constant within the limits indicated even if the inverter operates in regenerative mode up to the full current delivered when functioning as a rectifier. Therefore, an inverter powered with the SR32 converter can be used in applications in which **continuous** regenerative functioning is required.

Type	Code	In (A)	IP	Drive
Power supply **230/400V, 3ph**				
SR32-400-185	S4RR1	185	IP20	
SR32-400-280	S4RR2	280	IP20	
SR32-400-420	S4RR3	420	IP20	
SR32-400-650	S4RR4	650	IP20	
SR32-400-1050	S4RR5	1050	IP20	
Power supply **480V, 3ph**				
SR32-480-185	S4RR1	185	IP20	
SR32-480-280	S4RR2	280	IP20	
SR32-480-420	S4RR3	420	IP20	
SR32-480-650	S4RR4	650	IP20	
SR32-480-1050	S4RR5	1050	IP20	

AVRUy

AVRUy is the series of **IGBT technology AC/DC AFE (Active Front End)** three-phase regenerative converters).

The main advantages of the AVRUy series include:

- unity power factor
- reduction of mains harmonics < 5%
- high level dynamic regeneration performance

Gefran Active Front End system dedicated to single-drive or multi-drive systems engineering applications powered by common DC Bus.

AVRUy is the ideal solution for recovery of kinetic energy or of potential energy as replacement for traditional resistance type braking systems and in multi-drive systems where energy exchange on the DC Bus is regenerated directly towards the mains

Type	Code	Pn (kW)	IP	Drive
Power supply **230/400/480V, 3ph**				
AVRUy4220-KXX	S9U15X	22	IP20	22 - 30 kW
AVRUy5450-KXX	S9U16	45	IP21	45 - 55 kW
AVRUy81600-KXX	S9U18	160	IP22	160 - 200 kW
AVRUy93150-KXX-IP00	S9U20X	315	IP00	315 - 400 kW

SR32

General characteristics
- Configuration of the display for reading of the measurements concerned.
- Freely configurable analog outputs for transfer of measurements to be displayed on an external instrument.
- Identification function for measurement of power circuit parameters and automatic calculation of certain regulation parameters that facilitate commissioning.
- Internal conditioning of the signals (gains, min/max limits, offset...).
- Control of power Feed Forward for particular applications with high dynamic requirements.
- Easy use of the appliance: via terminal strip, from keypad, via PC program, via connection with field Bus

Three-phase power supply
- 400 V –15% 10% , 50/60 Hz
- 480 V –15% 10% , 50/60 Hz

Insulation
High impedance galvanic separation between power and regulation sections.
Galvanic separation between regulation sector and terminals of the digital I/Os.

Safety functions
- High number of safety functions, some with particular configuration of the behavior of the converter in alarm condition.
- Messages saved for last ten alarm conditions and indication of the time at which the alarm occurred.
- Linear temperature sensor for easy control of the temperature of the heat sinks.
- Converter overload control based on simulation of the I2t function with possibility of pre-alarm.

Inputs/Outputs
- 2 programmable analog outputs
- 1 dedicated analog input
- 4 dedicated digital inputs
- 4 programmable digital inputs
- 4 programmable digital outputs
- 2 outputs on dedicated relays
- 1 programmable output on relay

Operating conditions
- Operating Temperature: from 0 to 55°C, above 40°C reduce the current by 1.25% every K
- Humidity: from 5% to 85%, 1 g/m^3 up to 25 g/m^3 without condensation and formation of ice
- Altitude: up to 1000 meters a.s.l., above this height, reduce the current by 1.2 % for every 100 meters of increase
- Pressure: from 86 kPa to 106 kPa (class 3K3 according to EN 50178).

Standards and markings
- **CE**: compliant with EC low voltage directive
- **EMC**: compliant with EC Directive on electromagnetic compatibility using optional filters
- **UL**/**cUL**, UL508C standard

AVRUy

General characteristics
- Reduction of mains harmonics < 5%
- Regeneration towards the mains
- Unitary power factor
- Possibility of operating as reactive power compensator
- Traditional resistance based braking systems not required
- Compliant with the IEC 555-2 and IEEE 519 standards.

Three-phase power supply
- 230 V ±15%, 400 V ±15%, 480 V ±10%, 50/60 Hz

Insulation
High impedance galvanic separation between power and regulation sections. Galvanic separation between regulation section and terminals of the digital I/Os.

Safety functions
- High number of safety functions, some with particular configuration of the behavior of the converter in alarm condition.
- Messages saved for last ten alarm conditions and indication of the time at which the alarm occurred.
- Linear temperature sensor for easy control of the temperature of the heat sinks.
- Drive overload control based on simulation of the I2t function.

Inputs/Outputs
- 2 programmable analog outputs
- 1 dedicated analog input
- 4 programmable digital inputs
- 3 programmable digital outputs on relay

Operating conditions
- Operating temperature: from 0 to 40°C, from 40°C to 50°C with derating
- Humidity: from 5% to 85%, 1 g/m^3 up to 25 g/m^3 without condensation or formation of ice (class 3K3 according to EN 50178)
- Altitude: up to 1000 meters a.s.l., above this height, reduce the current by 1.2 % for every 100 meters of increase
- Pressure: from 86 kPa to 106 kPa (class 3K3 according to EN 50178).

Standards and markings
- **CE**: compliant with EC low voltage directive
- **EMC**: compliant with EC Directive on electromagnetic compatibility using optional filters

Type	I_{LN} (1) @400V (A)	I_{LN} (1) @480V (A)	I_{LN} (2) (A)	$V_{DC-LINK}$ @400V (V_{DC})	$V_{DC-LINK}$ @480V (V_{DC})	Ventilation			Dimensions (Weight) Width x Height x Depth (mm)
						Voltage (V)	I_N (A)	Air flow (m^3/h)	
SR32-400-185	159	159	123	510 (3) - 410 (4)	610 (3) - 490 (4)	Internal supply	Internal supply	160	311 x 361 x 368 (18 kg)
SR32-400-280	240	240	185	510 (3) - 410 (4)	610 (3) - 490 (4)	Internal supply	Internal supply	320	311 x 361 x 368 (26 kg)
SR32-400-420	360	360	279	510 (3) - 410 (4)	610 (3) - 490 (4)	Internal supply	Internal supply	320	311 x 361 x 368 (30 kg)
SR32-400-650	557	557	432	510 (3) - 410 (4)	610 (3) - 490 (4)	Internal supply	Internal supply	680	311 x 361 x 368 (31 kg)
SR32-400-1050	900	900	697	510 (3) - 410 (4)	610 (3) - 490 (4)	230	0.75	1050	525 x 554 x 434 (63 kg)
AVRUy4220-KXX	48	42		675	780				243 x 582 x 362 (.. kg)
AVRUy5450-KXX	94	82		675	780				288 x 644 x 377 (..kg)
AVRUy81600-KXX	324	282		675	780				526 x 997 x 462 (..kg)
AVRUy93150-KXX-IP00	580	505		675	780				694 x 1443 x 481 (..kg)

(1) Current mains side Rect bridge terminals 1U/1V/1W; (2) Current mains side Rect bridge terminals 1U/1V/1W (@400/480V);
(3) Rect bridge input connected to the mains and Regen bridge to the auto-transformer, or Rect and Regen bridges connected in parallel and powered via an auto-transformer;
(4) Rect and Regen bridges connected in parallel and connected to the mains without auto-transformer

Standard and customized systems engineering solutions

AC Drive Cabinet Solution

Note :

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Rev. 0.1 - 16-10-2009
1WA02