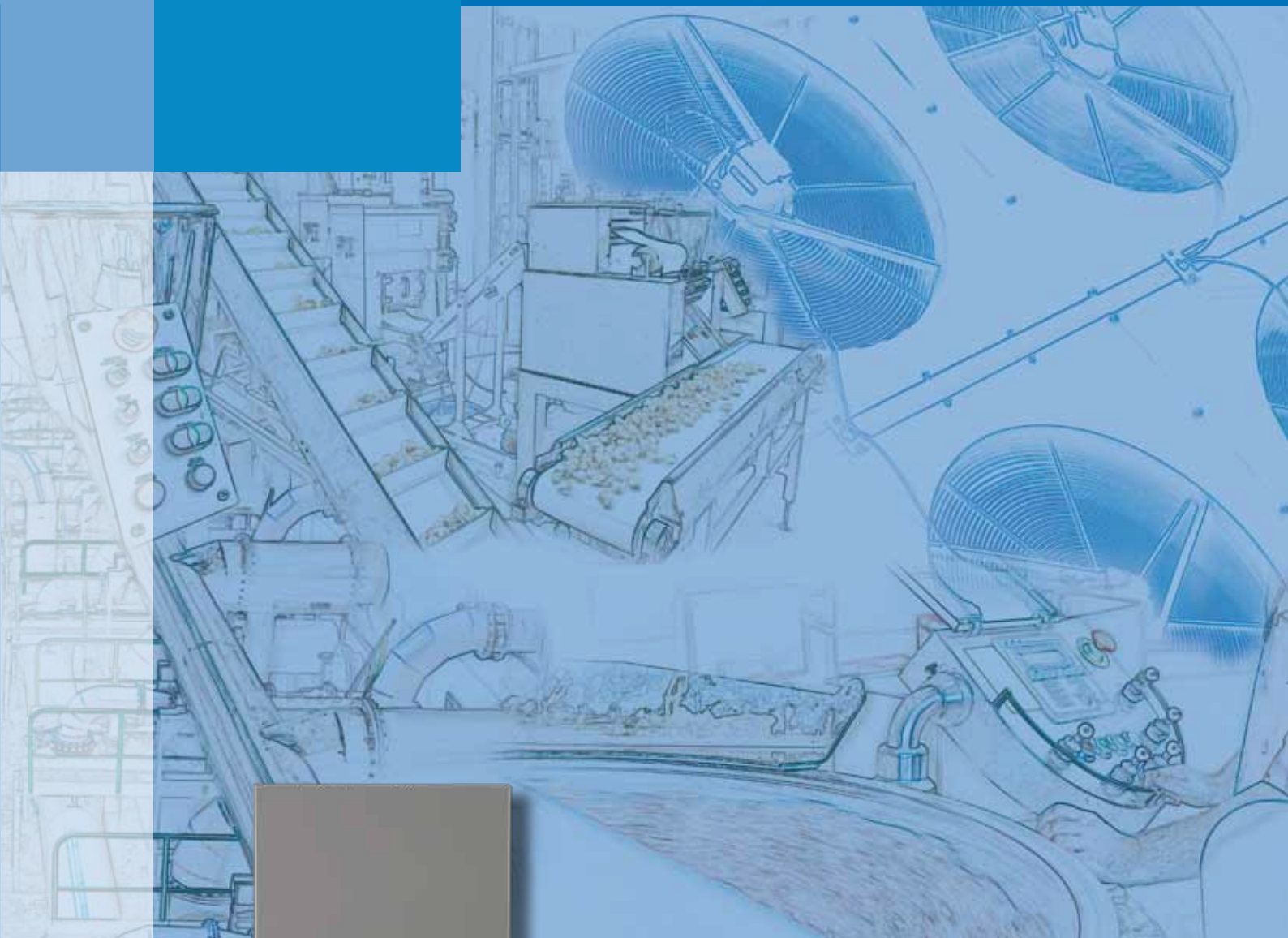


2011

AC Inverter  
General Purpose Drive

# SIEDrive ADV100



## Evolution in AC Drive technology

English



# GEFRAN

# SIEIDrive ADV100

The GEFTRAN range of **ADV100** inverters is specifically designed to give the utmost **flexibility of application** to modern automation systems and ensure ease of use, while guaranteeing advanced control capabilities for all asynchronous motors.

It features an intuitive programming environment to enable immediate motor start-up and system functions to implement control architectures for the most advanced application solutions, all with maximum **energy efficiency**.

The ADV100 is based on a **fully modular** structure with a choice of standard configurations, optional cards and integrated accessories such as EMC filters and mains chokes. All these elements offer real advantages in terms of product optimisation and **savings in panel space and wiring costs**, bringing considerable economic benefits.

## I/O configuration

The ADV100 inverter features a new I/O card, as standard, specially developed for standard application **configuration and to limit costs**; a higher card can be supplied on request for advanced applications:

### EXP-IO-D6A4R2-F-ADL card, standard on ADV110 and ADV120::

- 1 enable input (Enable)
- 6 digital inputs (DI)
- 2 differential analog inputs (AI), 1 voltage ( $\pm 10V$ , 11 bit + sign) and 1 voltage/current ( $\pm 10V$ , 11 bit + sign; 0... 20 mA, 11 bit).
- 2 analog outputs (AO);  $\pm 10V$ , 11 bit + sign
- 2 relay outputs (RO), single contact

### Optional cards on request:

- **EXP-IO-D4-ADL:** 1DI (Enable) + 2 (Prog.DI) + 2 (RO)
- **EXP-IO-D5R3-F-ADL:** 1DI (Enable) + 5 (Prog.DI) + 3 (RO)
- **EXP-IO-D8R4-ADL:** 1DI (Enable) + 8 (Prog. DI) + 4 (RO)
- **EXP-IO-D8A4R4-ADL:** 1DI (Enable) + 8 (Prog. DI) + 2 (AI) + 2 (AO) + 4 (RO)
- **EXP-IO-D12A2R4-ADL:** 1DI (Enable) + 8 (Prog. DI) + 4 (DO) + 2 (AI) + 4 (RO)
- **EXP-IO-D16R4-ADL:** 1DI (Enable) + 12 (Prog. DI) + 4 (DO) + 4 (RO)

## Encoder

The ADV100 interfaces with **incremental digital encoders (DE)** for field-oriented vector control (FOC) of asynchronous motors:

### EXP-DE-I1-ADL card, standard on ADV120:

- channels A+ A-, B+ B-, differential line drivers, optoisolated
- management of loss of encoder signals
- TTL and HTL electrical interface.

### EXP-DE-I1R1F2-ADL card, optional upon request:

- channels A+ A-, B+ B-, Z+ Z-, differential line drivers, optoisolated
- management of loss of encoder signals
- encoder signal repetition
- TTL and HTL electrical interface.

## SD Card

The SD memory card (standard on ADV120-...-C models) makes **saving and loading data and configurations** with the ADV100 very simple.



Special adapter required (Key SD-Card)



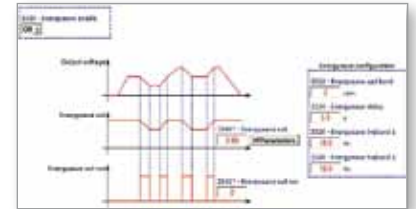
## Two self-tuning modes

Self-tuning of motor parameters:

- "Reduced" for faster start-up
- "Complete" to obtain maximum efficiency.

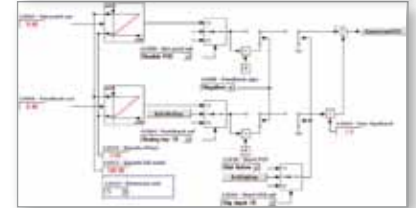
## Energy Saving

The ADV100 has a dedicated function that **decreases** the voltage applied at the motor terminals, and thus **current absorption**, in reduced load conditions.



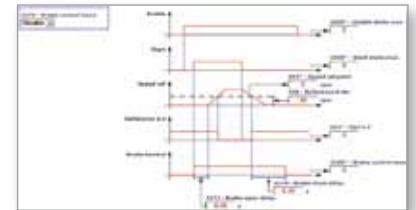
## PID control

The ADV100 **integrates** a complete, easy-to-program, smart **PID controller**, with value settings in engineering units, leakage function and programmable stand-by.



## Brake Control

The SIEIDrive ADV100 can control an **electromechanical parking brake** mounted on the motor.



## Power ratings, EMI filter and choke



- Size 1 = from 4 to 5.5 kW (\*)
- Size 2 = from 7.5 to 11 kW (\*)
- Size 3 = from 15 to 22 kW (\*)
- Size 4 = from 30 to 45 kW (\*\*)
- Size 5 = from 55 to 90 kW (\*\*\*)

(\*) Without EMI filter and input choke

(\*\*) EMI filter (EN 61800-3 : C3 Category / 2nd Environment / 20m Motor cable length) and choke integrated

(\*\*\*) EMI filter (EN 61800-3 : C3 Category / 2nd Environment / 30m Motor cable length) and choke integrated

## Programming keypad

The optional **KB-ADV100** programming keypad featuring full display of parameters and variables in 5 languages makes the ADV100 extremely intuitive and easy to use.



## Serial communication

The ADV100 integrates the RS232 serial line with Modbus RTU protocol as standard for peer-to-peer programming with PC.






## Wide range of power supplies

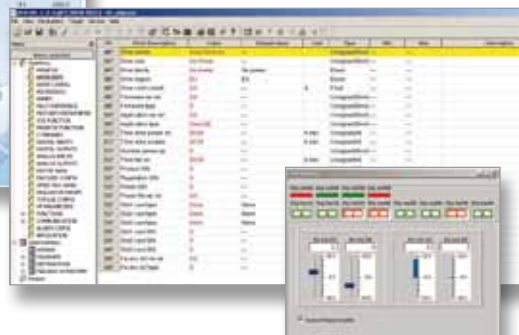
A single product for all power supply types, from 230VAC to 500VAC.



# General Characteristics

<b>Power supply</b>	3 x 230VAC (-15%) ... 3 x 500VAC (+5%)		
<b>Power ratings</b>	from 4kW to 90kW		
<b>Control and Performance</b>	<b>Control mode</b>	<b>Speed control precision (*)</b>	<b>Control range</b>
	Field-oriented vector control with feedback	0.01 % Motor rated speed	1 : 1000
	Open-loop vector control	± 30 % Motor slip rating	1 : 100
	Open-loop V/f control	± 60 % Motor slip rating	1 : 30
(*) for standard 4-pole motor			
<b>Standard supply configuration</b>	<b>ADV100</b>	Neutral version without I/O card and encoder card (on request).	
	<b>ADV110</b>	EXP-IO-D6A4R2-F-ADL card included: 1 enable input (Enable) + 6 digital inputs (DI) + 2 analog inputs (AI) + 2 analog outputs (AO) + 2 relay outputs (RO)	
	<b>ADV120</b>	EXP-IO-D6A4R2-F-ADL card included: 1 enable input (Enable) + 6 digital inputs (DI) + 2 analog inputs (AI) + 2 analog outputs (AO) + 2 relay outputs (RO) + EXP-DE-I1-ADL encoder card (2-channel incremental digital encoder). (*)	
(*) CANopen / DeviceNet and SD-Card port integrated into -C models.			
<b>Conformity</b>	Climatic conditions	EN 60721-3-3	
	Electrical safety:	EN 50178, EN 61800-5-1, UL508C, UL840 pollution level 2 (PD2, OV3)	
	Vibration:	EN 60068-2-6	
	EMC:	EN 61800-3	
	Protection class:	IP20	
<b>Environmental conditions</b>	Ambient temperature:	-10°C ... +40°C (14°F ... 104°F), +40°C...+50°C (104°F...122°F) with derating Operation at temperatures of > 50°C (122°F) is not allowed	
	Altitude of installation:	Max 2000 m a.s.l., up to 1000 m without current limitations	
<b>Maximum output frequency</b>	<ul style="list-style-type: none"> <li>• 500Hz (V/f)</li> <li>• 300Hz (Field-oriented vector control with feedback)</li> <li>• 150Hz (Sensorless)</li> </ul>		
<b>Switching frequency</b>	4 kHz constant, 8/4 kHz variable according to temperature and output frequency		
<b>Line choke</b>	<ul style="list-style-type: none"> <li>• Sizes 1040 .. 3220: external optional</li> <li>• Sizes 4300 .. 5900: integrated standard</li> </ul>		
<b>Temperature control</b>	Motor, drive, brake resistor		
<b>Braking unit</b>	<ul style="list-style-type: none"> <li>• Sizes 1040 .. 3220: internal standard</li> <li>• Sizes 4300 .. 5550: internal optional (ADV...-XBX- models.)</li> <li>• Sizes 5750 .. 5900: external optional</li> </ul>		
<b>RS232 serial line</b>	Modbus RTU or Jbus as standard		
<b>Overload</b>	150% In for 60 seconds every 5 minutes 180% In for 0.5 seconds every 5 minutes		
<b>Options</b>	<ul style="list-style-type: none"> <li>• Multilingual programming keypad with LCD screen (5 lines x 20 characters) and memory for 5 parameter sets</li> <li>• Input choke (standard from size 4300)</li> <li>• Output chokes</li> <li>• Braking resistors</li> <li>• Incremental digital encoder feedback card (EXP-DE-I1R1F2-ADL)</li> <li>• I/O expansion cards</li> <li>• CANopen / DeviceNet communication (integrated in ADV120...-C models)</li> <li>• External EMC filter (4...45 kW: C2 Category / 1st Environment / Motor cable length 30m; ≥ 55kW: C3 Category / 2nd Environment / Motor cable length 100m).</li> </ul>		
<b>Certification</b>	   (certification pending)		

## GF-eXpress Programming Software



All drives in the SIEDrive range and automation devices manufactured by the GEFTRAN group (PLC, HMI, instrumentation, etc.) can be programmed via PC using the **GF-eXpress** configurator. This PC tool enables **complete programming and control of the product**, based on a powerful, user-friendly and intuitive software platform:

- Programming with parameter list or block diagrams
- Integrated oscilloscope
- Programming tool configuration in 5 languages
- Multi-drop network management with up to 32 inverters.

# Technical data

Sizes - ADV		1040	1055	2075	2110	3150	3185	3220	4300	4370	4450	5550	5750	5900		
<b>Input</b>																
ULN AC input voltage	VAC	three-phase network 230 VAC (-15%) ... 500 VAC (+5%)														
AC input frequency	Hz	50/60 Hz, ± 2%														
<b>AC input current for continuous duty</b>																
@ ULN = 230 ... 400 VAC	A	11	16	20	28	40	47	53	53	64	74	100	143	171		
@ ULN = 480 VAC	A	10	14	18	26	38	44	49	50	60	71	92	135	165		
<b>Output</b>																
Inverter output for continuous duty	kVA	7.6	11.1	13.9	19.4	27.7	32.6	36.7	36.7	44.3	51.3	69.3	99.1	118.5		
<b>Pn mot (Recommended motor power, fsw = default):</b>																
@ ULN = 400 VAC	kW	4	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90		
@ ULN = 460 VAC	Hp	5	7.5	10	15	20	25	30	40	50	60	75	100	125		
<b>Rated output current I2N :</b>																
@ ULN = 400 VAC	A	9.5	13	16.5	23	31	38	46	62	75	87	105	150	180		
@ ULN = 460 VAC	A	8.6	11.7	14.9	20.7	27.9	34.2	41.4	55.8	67.5	78	94.5	135	162		
Maximum output voltage U2	V	0.98 x ULN (ULN = AC input voltage)														
Maximum output frequency f2	Hz	500 Hz														
Switching frequency fSW (Default)	kHz	4														
Switching frequency fSW (Max)	kHz	12						8								
<b>Output current derating</b>																
Kt: for ambient temperature		0.9														
Kalt: for installation at more than 1000 metres a.s.l.		1.2 % for every increase of 100 metres at more than 1000 metres a.s.l.)														
Kf: for higher switching frequency		0.5						0.7								
<b>Overload</b>																
150% * IN (1 minute every 5 minutes)	A	14.3	19.5	24.8	34.5	46.5	57.0	69.0	93.0	112.5	130.5	157.5	225.0	270.0		
180% * IN (0.5 seconds every 5 minutes)	A	17.1	23.4	29.7	41.4	55.8	68.4	82.8	111.6	135.0	156.6	189.9	270.0	324.0		
<b>Dimensions</b>																
Width x Height x Depth	mm	159.2 x 331.1 x 158.67			159.2 x 382 x 158.67			227.8 x 387 x 178			268 x 612 x 276			311 x 748 x 330.5		
(Excluding optional power cable shielding kit)	inches	(6.27 x 13.04 x 6.25)			(6.27 x 15.04 x 6.25)			(8.97 x 15.24 x 7.01)			(10.55 x 24.09 x 10.87)			(12.24 x 29.45 x 13.01)		
Weight	kg	5.8			7.8			10.5			32			60		
	(lbs)	(12.8)			(17.2)			(23.15)			(70.6)			(132.28)		

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