

2009

AC Inverter • System series

# SIEDrive ADV200



The next generation...

English

**GEFRAN**

# SIEIDrive ADV200

## The “Powerful Platform” for advanced automation

The new inverter series “**SIEIDrive ADV200**” represents an innovative concept in drive technology, as a result of the constant technological research and of the experience that the Gefran Group has acquired keeping a constant presence aside that of the major sector players.

The new range has been engineered and developed to satisfy the real needs of System Integrators and OEM’s in order to provide them the best innovations and economical competitiveness in the international markets.

Based on full mechanical modularity and on a powerful, intuitive and “fully open” programming platform, **ADV200** offers absolute integration flexibility with high-end performance in any system architectures of the most advanced automation environments.



| AC mains supply (V) | Power range ADV200 (kW) |     |     |        |     |     |        |    |    |        |    |    |        |    |    |        |    |     |        |     |     |     |     |     |     |  |  |
|---------------------|-------------------------|-----|-----|--------|-----|-----|--------|----|----|--------|----|----|--------|----|----|--------|----|-----|--------|-----|-----|-----|-----|-----|-----|--|--|
|                     | 0.75                    | 1.5 | 2.2 | 3.0    | 4.0 | 5.5 | 7.5    | 11 | 15 | 18.5   | 22 | 30 | 37     | 45 | 55 | 75     | 90 | 110 | 132    | 160 | 200 | 250 | 315 | 355 | ... |  |  |
| 230                 |                         |     |     |        |     |     |        |    |    |        |    |    |        |    |    |        |    |     |        |     |     |     |     |     |     |  |  |
| 400                 | Size 1                  |     |     | Size 2 |     |     | Size 3 |    |    | Size 4 |    |    | Size 5 |    |    | Size 6 |    |     | Size 7 |     |     |     |     |     |     |  |  |
| 575                 |                         |     |     |        |     |     |        |    |    |        |    |    |        |    |    |        |    |     |        |     |     |     |     |     |     |  |  |
| 690                 |                         |     |     |        |     |     |        |    |    |        |    |    |        |    |    |        |    |     |        |     |     |     |     |     |     |  |  |

On progress powers up to 1.5MW.

# ... Versatile, Powerful, Reliable

## General Characteristics

|  |   |
|--|---|
| ⇒ AC mains supply  | 400VAC...690VAC, 50/60Hz  |
| ⇒ Power range  | from 0.75kW to 1.5MW  |
| ⇒ Control mode   | <ul style="list-style-type: none"><li>• FOC Open Loop</li><li>• FOC with Speed Feedback</li><li>• V/f and V/f with feedback</li><li>• PM Synchronous (on development)</li></ul> |
| ⇒ Overload according with IEC146 Class 1 and Class 2   |   |
| ⇒ Heavy and Light overload management  |   |
| ⇒ Up to 4 options on board   |   |
| ⇒ Fieldbus   | <ul style="list-style-type: none"><li>• CANopen</li><li>• DeviceNet</li><li>• Profibus DP</li><li>• Ethernet real.time GDNnet</li></ul>   |
| ⇒ The "Safety Stop" card is compliant with machine safety directives and meets the following standards:<br>PL=d under EN ISO 13849-1, SIL 2 under IEC 61508 and EN 954-1 Cat. 3. |   |
| ⇒ Multilanguage programming software (5 languages)   |   |
| ⇒ Advanced PLC according with the IEC61131-3 Standard  |   |
| ⇒ IP20 standard protection degree  |   |
| ⇒ IP54 protection degree with external heatsink  |   |
| ⇒ NEMA 1 protection degree with optional kit   |   |

## Applications



## Modularity

An innovative concept of integrated technology that offers full modularity. Mountable side by side and with accessories specifically dedicated to system solutions, **ADV200** has been engineered to make installation easy for any operator, both in existing systems and in specific machine solutions, always offering a real reduction of required space in the cabinet and the best manageability.



## Fast Access

Structured to offer simple and fast management of the product in any situation of installation and mounting.

From the **terminal** access to the rack assembling of the **options**, each operation is quick and easy.

## Integrated Quality

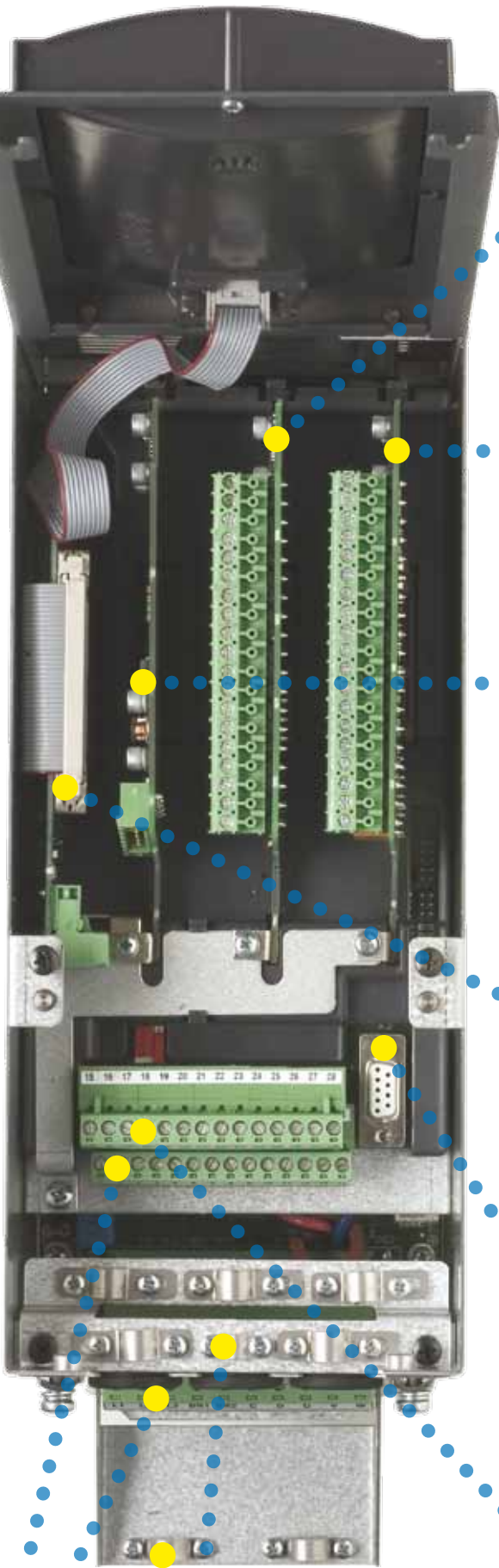
ADV200 **integrates** the fundamental devices for an absolute quality level, such as the **DC choke** that ensures maximum reliability in any conditions of working and the **input filter** that renders the drive in compliance with the EMC normative EN61800-3.



## Smart Connections

Dedicated accessories and fully removable terminals, ensure simple and fast installation and start-up in compliance with the EMC normative.

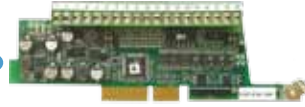




## Options

ADV200 manages up to 3 option cards:

- Encoder interface



- Fieldbus interface



- I/O expansions



## Safety Card

Integrated on board the drive as the 4th option, the **EXP-SFTy** card allows the motor to be disabled without the use of a safety contactor on the drive output. It guarantees compliance with the machine safety directive and meets the following standards:

- PL=d under EN ISO 13849-1
- SIL 2 under IEC 61508
- EN 954-1 Cat. 3.



## Serial Line

Integrated standard RS485 serial line with **Modbus RTU** protocol, for peer-to-peer or multidrop connections (with **OPT-485-ADV** card).

### Modbus

## Back-Up Supply

ADV200 can be supplied through an external +24Vdc supply in order to be kept active in case of mains input loss, ensuring in this situation the operation of all monitoring functions, programming and any connected fieldbus network.

## Cables shield

OMEGA clamp to grounding 360° of shielded cables.

## Programming Keypad

The man/machine interface is simple, fast and very functional thanks to the programming keypad **KB\_ADV**.



- 4 lines display for 25 characters
- Clear alphanumeric text
- Full information of any parameters
- Fast Navigating Keys
- Custom Menu recalling Key
- Upload - Download and storage of 5 complete sets of drive parameters
- Removable up to 10 meters



## Programming Software

Structured with 2 setting modes **Easy** and **Export**, to satisfy each level of user's skill and programming needs both for complex or easy installation.

A powerful platform but at the same time with a structure of menu/parameters that offers quick understanding, also facilitated by functionality of the keypad and the display.

Intuitive navigation and easy start-up function thanks to the "Wizard" tool.

ADV200 offers as standard 5 language programming (IT-ENG-FR-GER-SP) and the setup of "**customizable menu**"



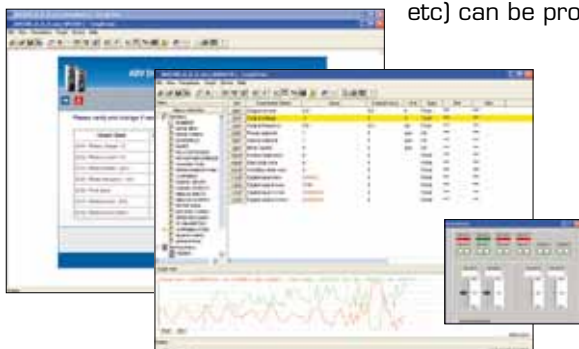
## Advanced Development Environment "MDPLC"

The advanced environment MDPLC is an integrated tool for the development of sophisticated application solutions, downloadable directly into the drive control board.

The MDPLC structure is in compliance with all the PLC languages according to the international standard **IEC 61131-3**.

## PC Configuration Tool "GF-eXpress"

All drives of the SIEIDrive series and the automation devices of the GEFran Group (PLC, HMI, Instrumentation, etc) can be programmed by the use of the PC tool **GF-eXpress**.



- Programming through parameter list or block diagrams
- Modbus RTU interface
- Management of the file from the drive or the memory keypad
- Integrated oscilloscope
- Tool configurable in 5 languages.

# Technical Data

## Performance

ADV200 offers the most advanced control technology thanks to a powerful 32 bit microcontroller, able to provide high performances in terms of motor control and accuracy contemporary with the management of today's sophisticated application systems.

|            | Control mode              | Speed regulation accuracy (*) | Control Range |
|------------|---------------------------|-------------------------------|---------------|
| ⇒ Accuracy | • FOC with Speed feedback | ± 0,01% Rated motor speed     | 1 : 1000      |
|            | • FOC open loop           | ± 30% Rated motor slip        | 1 : 100       |
|            | • V/F                     | ± 60% Rated motor slip        | 1 : 30        |

(\*) referred to standard 4 poles motor

## Standard Configuration Setting

|  |   |
|--|---|
| ⇒ KB_ADV programming keypad integrated |   |
| ⇒ Regulation Stage                     | <ul style="list-style-type: none"> <li>• 2 Bipolar Analogue Inputs (Voltage/Current)</li> <li>• 2 Bipolar Analogue Outputs (1: Voltage/Current, 1: Voltage)</li> <li>• 6 Digital Inputs (PNP / NPN)</li> <li>• 2 Digital Outputs (PNP / NPN)</li> <li>• 2 Relay Outputs, single contact</li> <li>• RS485 Serial Line (Modbus RTU protocol)</li> </ul> |
| ⇒ Power Stage                          | <ul style="list-style-type: none"> <li>• DC Choke integrated</li> <li>• EMC Filter integrated</li> <li>• Dynamic Braking Module integrated (up to 55kW)</li> </ul>  |



## Standards

|                        |  |
|------------------------|--|
| ⇒ Immunity / Emissions | CEE - EN 61800-3   |
| ⇒ Programming          | according to IEC 61131-3   |
| ⇒ Safety standard      | STO (Safe Torque Off): EN ISO 13849-1 PL=d, IEC 61508 SIL 2, EN 954-1 Cat. 3 |

## Environmental Condition

|                       |  |
|-----------------------|--|
| ⇒ Enclosures          | IP20 (IP54 dedicated series)                         |
| ⇒ Ambient temperature | 0 ...40°C, +40°C...+50°C with derating               |
| ⇒ Altitude            | Max 2000 m (up to 1000 m without current limitation) |

## Approvals

|   |   |
|---|---|
|  | in compliance with CEE directives, for low voltage devices.                                 |
|  | in compliance with American and Canadian market directives (Sizes 7 in certification phase) |

| Sizes - ADV  |                          | 1007                                | 1015 | 1022 | 1030 | 1040 | 2055 | 2075 | 2110 | 3150 | 3185 | 3220 | 4300 | 4370  | 4450 | 5550 | 5750 | 5900 | 61100 | 61320 | 71600 | 72000 | 72500 | 73150 | 73550 |      |
|--|--------------------------|-------------------------------------|------|------|------|------|------|------|------|------|------|------|------|-------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|------|
| <b>ULN AC input voltage</b>                              | Vac                      | 400 Vac -15% ... 480 Vac +10%, 3 ph |      |      |      |      |      |      |      |      |      |      |      |       |      |      |      |      |       |       |       |       |       |       |       |      |
| <b>AC input frequency</b>                                | Hz                       | 50/60 Hz, ± 5%                      |      |      |      |      |      |      |      |      |      |      |      |       |      |      |      |      |       |       |       |       |       |       |       |      |
| <b>• CT : Costant Torque (150% overload)</b>             |                          |                                     |      |      |      |      |      |      |      |      |      |      |      |       |      |      |      |      |       |       |       |       |       |       |       |      |
| <b>AC Input Current for continuous service</b>           | A                        | 2.1                                 | 3.7  | 4.9  | 6.5  | 8.1  | 11.1 | 14   | 19.6 | 26.4 | 32.3 | 39   | 53   | 64    | 74   | 100  | 143  | 171  | 200   | 238   | 300   | 350   | 420   | 580   | 640   |      |
| <b>Inverter Output for continuous service</b>            | kVA                      | 1.7                                 | 3    | 4    | 5.3  | 6.6  | 9    | 11.4 | 15.9 | 21.5 | 26.3 | 32   | 43   | 52    | 60   | 73   | 104  | 125  | 145   | 173   | 208   | 267   | 319   | 409   | 450   |      |
| <b>Pn mot (Recommended motor output, fsw = default):</b> |                          |                                     |      |      |      |      |      |      |      |      |      |      |      |       |      |      |      |      |       |       |       |       |       |       |       |      |
|  | @ ULN = 400 Vac          | kW                                  | 0.75 | 1.5  | 2.2  | 3    | 4    | 5.5  | 7.5  | 11   | 15   | 18.5 | 22   | 30    | 37   | 45   | 55   | 75   | 90    | 110   | 132   | 160   | 200   | 250   | 315   | 355  |
|  | @ ULN = 460 Vac          | Hp                                  | 1    | 2    | 3    | 5    | 5    | 7.5  | 10   | 15   | 20   | 25   | 30   | 40    | 50   | 60   | 75   | 100  | 125   | 150   | 175   | 200   | 250   | 300   | 400   | 450  |
| <b>I2N Rated Output current:</b>                         |                          |                                     |      |      |      |      |      |      |      |      |      |      |      |       |      |      |      |      |       |       |       |       |       |       |       |      |
|  | @ ULN = 400 Vac          | A                                   | 2.5  | 4.3  | 5.8  | 7.6  | 9.5  | 13   | 16.5 | 23   | 31   | 38   | 46   | 62    | 75   | 87   | 105  | 150  | 180   | 210   | 250   | 300   | 385   | 460   | 590   | 650  |
|  | @ ULN = 460 Vac          | A                                   | 2.3  | 3.9  | 5.2  | 6.8  | 8.6  | 11.7 | 14.9 | 20.7 | 27.9 | 34.2 | 41.4 | 55.8  | 67.5 | 78   | 94.5 | 135  | 162   | 189   | 225   | 270   | 347   | 414   | 531   | 585  |
| <b>• VT : Variable Torque (110% overload)</b>            |                          |                                     |      |      |      |      |      |      |      |      |      |      |      |       |      |      |      |      |       |       |       |       |       |       |       |      |
| <b>AC Input Current for continuous service</b>           | A                        | 3.7                                 | 4.9  | 6.5  | 8.1  | 11.1 | 14   | 19.6 | 26.4 | 32.3 | 39   | 53   | 64   | 74    | 89   | 143  | 171  | 200  | 238   | 285   | 350   | 420   | 540   | 640   | 710   |      |
| <b>Inverter Output for continuous service</b>            | kVA                      | 3                                   | 4    | 5.3  | 6.6  | 9    | 11.4 | 15.9 | 21.5 | 26.3 | 32   | 43   | 52   | 60    | 73   | 104  | 125  | 145  | 173   | 208   | 267   | 319   | 409   | 450   | 506   |      |
| <b>Pn mot (Recommended motor output, fsw = default):</b> |                          |                                     |      |      |      |      |      |      |      |      |      |      |      |       |      |      |      |      |       |       |       |       |       |       |       |      |
|  | @ ULN = 400 Vac          | kW                                  | 1.5  | 2.2  | 3    | 4    | 5.5  | 7.5  | 11   | 15   | 18.5 | 22   | 30   | 37    | 45   | 55   | 75   | 90   | 110   | 132   | 160   | 200   | 250   | 315   | 355   | 400  |
|  | @ ULN = 460 Vac          | Hp                                  | 2    | 3    | 5    | 5    | 7.5  | 10   | 15   | 20   | 25   | 30   | 40   | 50    | 60   | 75   | 100  | 125  | 150   | 175   | 200   | 250   | 300   | 400   | 450   | 500  |
| <b>I2N Rated Output current:</b>                         |                          |                                     |      |      |      |      |      |      |      |      |      |      |      |       |      |      |      |      |       |       |       |       |       |       |       |      |
|  | @ ULN = 400 Vac          | A                                   | 4.3  | 5.8  | 7.6  | 9.5  | 13   | 16.5 | 23   | 31   | 38   | 46   | 62   | 75    | 87   | 105  | 150  | 180  | 210   | 250   | 300   | 385   | 460   | 590   | 650   | 730  |
|  | @ ULN = 460 Vac          | A                                   | 3.9  | 5.2  | 6.8  | 8.6  | 11.7 | 14.9 | 20.7 | 27.9 | 34.2 | 41.4 | 55.8 | 67.5  | 78.3 | 94.5 | 135  | 162  | 189   | 225   | 270   | 347   | 414   | 531   | 585   | 657  |
| <b>• Overload : Heavy duty</b>                           |                          |                                     |      |      |      |      |      |      |      |      |      |      |      |       |      |      |      |      |       |       |       |       |       |       |       |      |
|  | 150% * In (1' each 5')   | A                                   | 3.75 | 6.5  | 8.7  | 11.4 | 14.3 | 19.5 | 24.7 | 34.5 | 46.5 | 57   | 69   | 93    | 113  | 131  | 157  | 225  | 270   | 315   | 375   | 450   | 578   | 690   | 885   | 975  |
|  | 180% * In (0.5" each 5') | A                                   | 4.5  | 7.7  | 10.4 | 13.7 | 17.1 | 23.4 | 29.7 | 41.4 | 55.8 | 68.4 | 82.8 | 111.6 | 135  | 157  | 189  | 270  | 324   | 378   | 450   | 540   | 693   | 828   | 1062  | 1170 |
| <b>• Overload : Normal duty</b>                          |                          |                                     |      |      |      |      |      |      |      |      |      |      |      |       |      |      |      |      |       |       |       |       |       |       |       |      |
|  | 110% * In (1' each 5')   | A                                   | 4.7  | 6.4  | 8.4  | 10.5 | 14.3 | 18.1 | 25.3 | 34.1 | 41.8 | 50.6 | 68.2 | 82.5  | 95.7 | 116  | 165  | 198  | 231   | 275   | 330   | 424   | 506   | 649   | 715   | 803  |
| <b>U2 Max output voltage</b>                             | V                        | 0.98 x ULN (AC Input voltage)       |      |      |      |      |      |      |      |      |      |      |      |       |      |      |      |      |       |       |       |       |       |       |       |      |
| <b>f2 Max output frequency</b>                           | Hz                       | 500                                 |      |      |      |      |      |      |      |      |      |      |      |       |      |      |      |      |       |       |       |       |       |       |       |      |
| <b>fsw Switching frequency (Default)</b>                 |                          | 8                                   | 8    | 4    | 4    | 4    | 4    | 4    | 4    | 4    | 4    | 4    | 4    | 4     | 4    | 4    | 4    | 4    | 4     | 4     | 4     | 2     | 2     | 2     | 2     |      |
| <b>fsw Switching frequency (Max)</b>                     |                          | 12                                  | 12   | 12   | 12   | 12   | 12   | 12   | 12   | 12   | 12   | 12   | 12   | 12    | 8    | 8    | 8    | 8    | 8     | 8     | 8     | 4     | 4     | 2     | 2     | 2    |

## Dimensions

|                                 |        |                    |                     |                     |                       |                      |                    |                       |                       |       |
|---------------------------------|--------|--------------------|---------------------|---------------------|-----------------------|----------------------|--------------------|-----------------------|-----------------------|-------|
| <b>(width x height x depth)</b> | mm     | 120 x 320 x 235.1  | 150 x 392 x 250.1   | 180 x 517 x 250.1   | 268 x 616 x 270       | 300 x 680 x 325      | 410 x 894 x 359    | 400 x 1200 x 485      | 417 x 1264 x 485      |       |
|                                 | inches | 4.72 x 12.6 x 9.26 | 5.91 x 15.43 x 9.85 | 7.09 x 20.35 x 9.85 | 10.55 x 24.25 x 10.63 | 11.81 x 26.77 x 12.8 | 16.1 x 35.2 x 14.1 | 15.75 x 47.24 x 19.09 | 16.42 x 49.76 x 19.09 |       |
| <b>Weight</b>                   | kg     | 5.8                | 10.2                | 16.4                | 22                    | 32                   | 60                 | 90                    | 130                   | 150   |
|                                 | lbs    | 12.8               | 22.5                | 36.2                | 48.5                  | 70.6                 | 132.3              | 198.4                 | 286.6                 | 330.7 |

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