

SYSTEM INVERTER AND REGENERATIVE POWER SUPPLY UNIT

SIEIDrive ADV200 - ADV100 - AFE200

GEFRAN





THE ACKNOWLEDGED INTERNATIONAL LEADER

Thanks to forty years of experience, Gefran is the world leader in the design and production of solutions for **measuring, controlling, and driving industrial production processes**. We have 14 branches in 12 countries and a network of over 80 worldwide distributors.



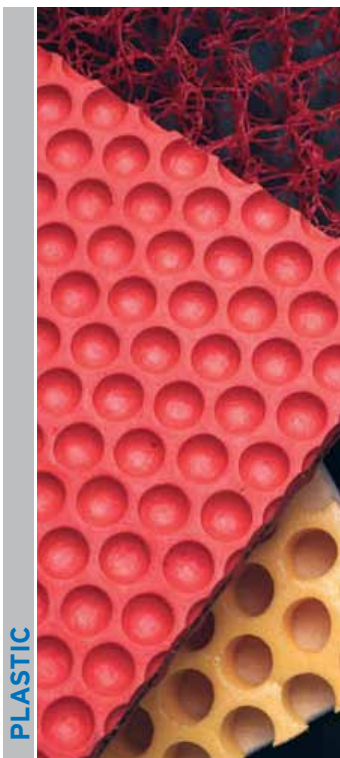
QUALITY AND TECHNOLOGY

Gefran components are a **concentrate of technology**, the result of constant research and of **cooperation with major research centres**.

For this reason, Gefran is synonymous with quality and expertise in the design and production of:

- > **sensors** for measuring main variables such as **temperature, pressure, position and force**
- > **state-of-the-art components and solutions for indication and control**, satisfying demands for optimisation of processes and intelligent management of energy consumption
- > **automation platforms** of various complexities
- > **electronic drives and electric motors** in AC and DC for all industrial automation, HVAC, water treatment, lift, and photovoltaic needs.

Gefran's know-how and experience guarantee continuity and tangible solutions.



PLASTIC



METAL



TEXTILE



INDUSTRIAL HOISTING



PERFORMANCE

In addition to foreseeing the market's application needs, Gefran forms partnerships with its customers to find **the best way to optimise and boost the performance of various applications.** Gefran products communicate with one another to provide integrated solutions, and can dialogue with devices by other companies thanks to compatibility with numerous fieldbuses.



SERVICES

PRE AND POST SALES

A team of Gefran experts works with the customer to select the ideal product for its application and to help install and configure devices (technohelp@gefran.com).

TRAINING

Gefran offers a wide range of courses at different levels for the technical-commercial study of the Gefran product range as well as specific courses *on demand*.



TEST BENCHES



MATERIAL HANDLING



CONVEYORS



MATERIAL RECYCLING MACHINERY

ADV200



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.



The ADV200 are also available on a range of panel-mounted inverters configuration.

It are designed as a compact, ready-for-use solution fully compatible with the maximum operating conditions of the drive.

Panels are available with power ratings from 90 kW to 1.2 MW with standard input bridge or the “Active Front End” solution, in two main versions Ready to use and Basic.

POWER RANGE

| Models | Power (kW) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------|------------|------|------|--------|-----|-----|--------|-----|-----|--------|----|------|--------|----|----|--------|----|----|--------|--------|-----|--------|--------|-----|---------------------|---------------------|-----|-----|-----|-----|-----|------|------|------|--|--|--|--|--|
| | 0.37 | 0.55 | 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 | 400 | 500 | 630 | 710 | 900 | 1000 | 1350 | 1650 | | | | | |
| ADV200-4 | | | | Size 1 | | | Size 2 | | | Size 3 | | | Size 4 | | | Size 5 | | | Size 6 | | | Size 7 | | | Parallel size 7 (*) | | | | | | | | | | | | | | |
| ADV200-DC | | | | | | | | | | Size 3 | | | Size 4 | | | Size 5 | | | Size 6 | | | Size 7 | | | Parallel size 7 (*) | | | | | | | | | | | | | | |
| ADV200-6 | | | | | | | | | | | | | | | | | | | S.5 | Size 6 | | | Size 7 | | | Parallel size 7 (*) | | | | | | | | | | | | | |

Power ratings of up to 1.2 MW on request.



(*) Inverters of over 400 kW comprise one master MASTER unit and one or more SLAVE units..

GENERAL CHARACTERISTICS

| | | | |
|---|---|----------------------------------|-------------------------------|
| Power supply | ADV200-4: 3 x 380V _{AC} -15% ... 500V _{AC} +5% | | |
| | ADV200-4/4A-DC: 450...750V _{DC} ; | | |
| | ADV200-6/6A-DC: 840 ... 1120V _{DC} (5750 ... 61320); 600 ... 1120V _{DC} (≥ 71600). | | |
| | ADV200-6: 3 x 690V _{AC} ±10%; 50-60 HZ ± 2% (5750 ... 61320), 3 x 500...690V _{AC} ±10%; 50-60 HZ ± 2% (71600 ... 1000kW), | | |
| Power ratings | ADV200-4: from 0.75kW to 1.0MW | ADV200-DC: from 18.5kW to 1.65MW | ADV200-6: from 75kW to 1.65MW |
| Maximum output voltage | 0,98 x V _{in} | | |
| Maximum output frequency f₂ | 500Hz (1007 ... 72000), 200Hz (72500 ... 1000kW) | | |
| IGBT braking unit | Sizes 1007 ... 5550: Internal (with external resistor); braking torque 150 % MAX Sizes ≥ 5750: External optional (BUy series) | | |
| Overload (for Synchronous motor) | ADV200-4, ADV200-4-DC, ADV200-6-DC Heavy Duty: 160 % x I _n (1' each 5'), 200 % x I _n (for 3"). Light Duty: 110 % x I _n (1' each 5'). | | |
| | ADV200-6 (5750 ... 6110) Heavy Duty: 150 % x I _n (1' each 5'), 200 % x I _n (for 3"). Light Duty: n.d. | | |
| | ADV200-6 (72000 ... 1.65MW) Heavy Duty: 160 % x I _n (1' each 5'), 200 % x I _n (for 3"). Light Duty: 110 % x I _n (for 60"). | | |
| Overload (for Asynchronous motor) | ADV200-4, ADV200-4-DC, ADV200-6-DC Heavy Duty: 150 % x I _n (1' each 5'), 180 % x I _n (for 0.5"). Light Duty: 110 % x I _n (1' each 5'). | | |
| | ADV200-6 (5750 ... 6110) Heavy Duty: 136 % x I _n (for 60"), 183 % x I _n (for 0.5"). Light Duty: n.d. | | |
| | ADV200-6 (72000 ... 1.65MW) Heavy Duty: 150 % x I _n (for 60"), 180 % x I _n (for 0.5"). Light Duty: 110 % x I _n (for 60"). | | |
| Control mode | Open-loop vector control Vector control with feedback Open loop V/f and V/f with feedback | | |
| Optional cards | Integration of up to 3 options onboard the drive "Safety STO" card compliant with SIL3 machine safety directive (for ADV200-...+SI models) | | |
| Multi-language programming SW | GF-eXpress (5 languages) | | |
| PLC | PLC with advanced IEC61131-3 programming environment | | |
| Rated protection | IP20-rated protection (IP00 size 7 and parallel) | | |
| Fieldbus management | DeviceNet, CANopen®, Modbus RTU, EtherCAT, GDN _{ET} , PROFIBUS, Ethernet IP, PROFINET | | |

| Precision | Control mode | Speed control precision (*) | | Range di controllo | |
|------------------|---------------------------|------------------------------------|-------------------|----------------------------|----------|
| | | Asynch. | FOC with feedback | ± 0.01% motor speed rating | 1 : 1000 |
| | | | Open-loop FOC | ± 30% motor slip rating | 1 : 100 |
| | | | V/F | ± 60% motor slip rating | 1 : 30 |
| | | Synch. | FOC with feedback | ± 0.01% motor speed rating | 1 : 1500 |
| Open-loop FOC | ± 0,1% motor speed rating | | 1 : 20 | | |

(*) for standard 4-pole motor

| | | |
|--------------------------------------|---|--|
| Standard supply configuration | Programming keypad | Integrated KB_ADV |
| | Regulation | <ul style="list-style-type: none"> • 2 bipolar analog inputs (Voltage/Current) • 2 bipolar analog outputs (1: Voltage/Current, 1: Voltage) • 6 digital inputs (PNP/NPN) • 2 digital outputs (PNP/NPN) • 2 relay outputs, single contact • RS485 serial line (Modbus RTU) |
| | Power | <ul style="list-style-type: none"> • Integrated choke DC side (up to 132 kW) • Integrated mains filter • Integrated dynamic braking module (up to 55kW) |
| | Reference resolution | <ul style="list-style-type: none"> • Digital = 15bit + sign • Analog input = 11-bit + sign • Analog output = 11-bit + sign |
| Conformity | Immunity/Emissions | CEE - EN 61800-3 |
| | Safety standards | EN 50178, EN 61800-5-1, UL508C, UL840 degree of pollution 2 STO (Safe Torque Off): IEC 61508 SIL 3, EN 954-1 Cat. 3 EN 61508 and EN 61800-5-2 |
| Environmental conditions | Ambient temperature | -10°C ... +40°C (+14°F ...+104°F), +40°C...+50°C (+104°F...+122°F) with derating |
| | Altitude | Max 2000 m.(up to 1000 m without derating) |
| Markings |  | Complies with the EEC directive concerning low voltage equipment |
| |  | ADV200-4 and ADV200-4/4A-DC: UL and cULus, Complies with directives for the American and Canadian markets. |

ADV200

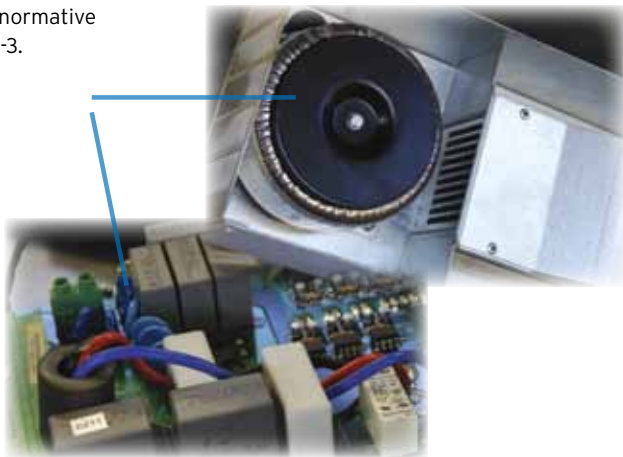
Modularity

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.



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.



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.



Programming Keypad

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 **10 language** programming (English, Italian, French, German, Spanish, Polish, Romanian, Russian, Turkish and Portuguese).



- › 4 lines display for 21 characters
- › Clear alphanumeric text
- › Full information of any parameters
- › Fast Navigating Keys
- › Key for displaying the last 10 parameters that have been changed
- › DISP key for rapid display of operating parameters
- › Upload - Download and storage of 5 complete sets of drive parameters
- › Remotable up to 10 meters.

Options

ADV200 manages up to 3 option cards:

> Encoder interface



> Fieldbus interface



> I/O expansions



Modbus

| Option | Code | Description |
|-----------------------|-------|---|
| EXP-DE-I1R1F2-ADV | S5L30 | TTL/HTL digital incremental encoder expansion card 1 encoder input - 1 encoder output - 2 freeze channels |
| EXP-DE-I2R1F2-ADV | S5L35 | TTL/HTL digital incremental encoder expansion card 2 encoder inputs - 1 encoder output - 2 freeze channels |
| EXP-SE-I1R1F2-ADV | S5L31 | Sinusoidal incremental encoder expansion card 1 encoder input - 1 encoder output - 2 freeze channels |
| EXP-SESC-I1R1F2-ADV | S5L32 | Sincos incremental encoder expansion card 1 encoder input - 1 encoder output - 2 freeze channels |
| EXP-EN/SSI-I1R1F2-ADV | S5L33 | Absolute EnDat/SSI encoder expansion card 1 encoder input - 1 encoder output - 2 freeze channels |
| EXP-HIP-I1R1F2-ADV | S5L34 | Absolute Hiperface encoder expansion card 1 encoder input - 1 encoder output - 2 freeze channels |
| EXP-ASC-I1-ADV | S5L42 | Absolute SinCos expansion card 1 encoder input |
| EXP-RES-I1R1-ADV | S5L43 | Resolver expansion card 1 Resolver input - 1 Resolver repetition output |

| | | |
|--------------------|-------|---|
| EXP-CAN-ADV | S527L | Expansion card for CANopen® and DeviceNet interface |
| EXP-PDP-ADV | S530L | Expansion card for Profibus_DP interface |
| EXP-ETH-GD-ADV200 | S5L29 | Ethernet GD-net interface expansion card |
| EXP-ETH-CAT-ADV200 | S5L09 | EtherCAT interface expansion card |
| EXP-ETH-IP-ADV200 | S5L19 | Ethernet IP interface expansion card |
| EXP-ETH-PN-ADV | S5L60 | Profinet interface expansion card |

| | | |
|----------------------|-------|---|
| EXP-IO-D5R8-ADV | S5L38 | 5 digital inputs / 1 digital output / 8 relay output |
| EXP-IO-D6A4R1-ADV | S526L | 4 digital inputs / 2 digital outputs / 2 analog inputs / 2 analog outputs / 2 double contact relays |
| EXP-FL-XCAN-ADV | S5L41 | Master CAN controller and Fast Link interface |
| EXP-IO-SENS-100-ADV | S5L40 | To acquire signals from PT100 (PT1000), (NI1000), 0-10V, 0/4...20mA, KTY84, PTC |
| EXP-IO-SENS-1000-ADV | S5L37 | |

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 3 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).

Back-Up Supply

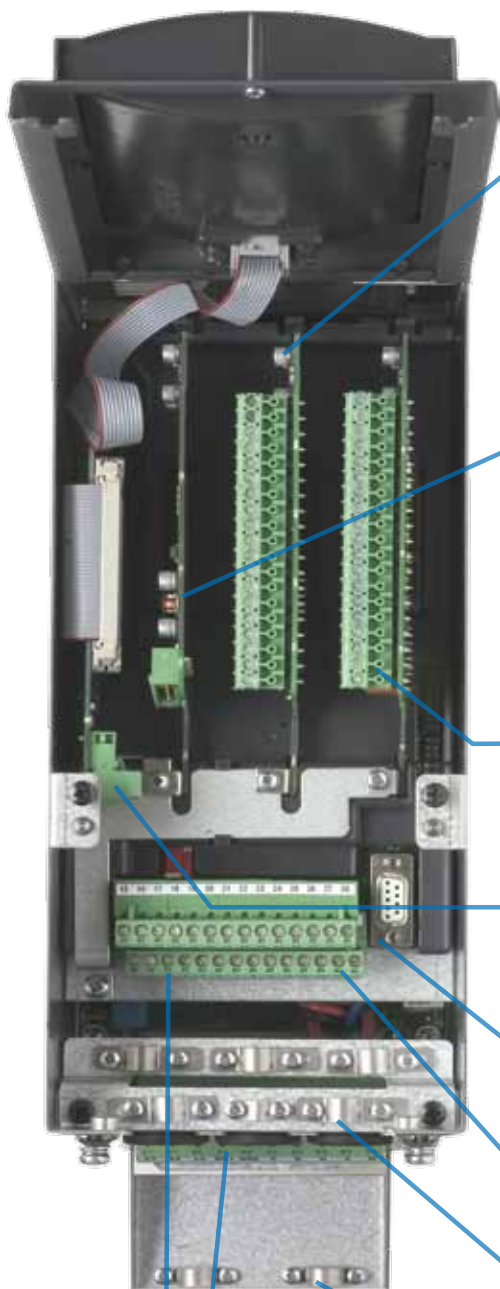
ADV200 can be supplied through an external +24Vdc supply in order to be kept active in case of mains input loss, ensuring in this situation the operation of all monitoring functions, programming and any connected fieldbus network.

Cables shield

OMEGA clamp to grounding 360° of shielded cables.

Smart Connections

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



ADV200-4 • CHOOSING THE INVERTER - INPUT AND OUTPUT DATA

The combinations of motor power ratings and inverters listed in the table envisage the use of motors in which the voltage rating is equal to that of the mains power.

For motors with different voltage ratings the inverter must be chosen according to the current rating of the motor.

The combinations listed in the table thus show the current that can be delivered by the drive during continuous operation and overload conditions, according to the mains voltage.

The same engineering criteria apply for operations with additional derating factors (see drive instruction manual).

| Input and Output Data ADV200-4 | | | | | | | | |
|--------------------------------|--|---------------------------------|-----------------|------------|--|------------------------------|-------------------------------|------------------------------|
| Sizes ADV200-4 | AC input current for continuous operation I _n | | Inverter Output | | P _n mot (Recommended asynchronous motor rating, fsw = default) | | | |
| | Heavy Duty (150% overload) | Light Duty (110% overload) | Heavy Duty | Light Duty | Heavy Duty (150% overload) | | Light Duty (110% overload) | |
| | @ 400 V _{AC} [Arms] | @ 400 V _{AC} [Arms] | [kVA] | [kVA] | @400 V _{AC} [kW] | @460 V _{AC} [Hp] | @400 V _{AC} [kW] | @460 V _{AC} [Hp] |
| 1007 | 2.1 | 3.7 | 1.7 | 3 | 0.75 | 1 | 1.5 | 2 |
| 1015 | 3.7 | 4.9 | 3 | 4 | 1.5 | 2 | 2.2 | 3 |
| 1022 | 4.9 | 6.5 | 4 | 5.3 | 2.2 | 3 | 3 | 5 |
| 1030 | 6.5 | 8.1 | 5.3 | 6.6 | 3 | 5 | 4 | 5 |
| 1040 | 8.1 | 11.1 | 6.6 | 9 | 4 | 5 | 5.5 | 7.5 |
| 2055 | 11.1 | 14 | 9 | 11.4 | 5.5 | 7.5 | 7.5 | 10 |
| 2075 | 14 | 19.6 | 11.4 | 15.9 | 7.5 | 10 | 11 | 15 |
| 2110 | 19.6 | 26.4 | 15.9 | 21.5 | 11 | 15 | 15 | 20 |
| 3150 | 26.4 | 32.3 | 21.5 | 26.3 | 15 | 20 | 18.5 | 25 |
| 3185 | 32.3 | 39 | 26.3 | 32 | 18.5 | 25 | 22 | 30 |
| 3220 | 39 | 53 | 32 | 43 | 22 | 30 | 30 | 40 |
| 4300 | 53 | 64 | 43 | 52 | 30 | 40 | 37 | 50 |
| 4370 | 64 | 74 | 52 | 60 | 37 | 50 | 45 | 60 |
| 4450 | 74 | 100 | 60 | 73 | 45 | 60 | 55 | 75 |
| 5550 | 100 | 143 | 73 | 104 | 55 | 75 | 75 | 100 |
| 5750 | 143 | 171 | 104 | 125 | 75 | 100 | 90 | 125 |
| 5900 | 171 | 200 | 125 | 145 | 90 | 125 | 110 | 150 |
| 61100 | 200 | 238 | 145 | 173 | 110 | 150 | 132 | 175 |
| 61320 | 238 | 285 | 173 | 208 | 132 | 175 | 160 | 200 |
| 71600 | 300 | 350 | 208 | 267 | 160 | 200 | 200 | 250 |
| 72000 | 350 | 420 | 267 | 319 | 200 | 250 | 250 | 300 |
| 72500 | 420 | 580 | 319 | 409 | 250 | 300 | 315 | 400 |
| 73150 | 580 | 640 | 409 | 450 | 315 | 400 | 355 | 450 |
| 73550 | 640 | 710 | 450 | 506 | 355 | 450 | 400 | 500 |
| 400 kW | 665 | 800 | 506 | 603 | 400 | 500 | 500 | 650 |
| 500 kW | 800 | 1100 | 603 | 776 | 500 | 650 | 630 | 850 |
| 630 kW | 1100 | 1215 | 776 | 852 | 630 | 850 | 710 | 950 |
| 710 kW | 1215 | 1350 | 852 | 956 | 710 | 950 | 800 | 1100 |
| 900 kW | 1650 | 1800 | 1108 | 1247 | 900 | 1200 | 1000 | 1300 |
| 1000 kW | 1800 | 2020 | 1247 | 1420 | 1000 | 1300 | 1200 | 1600 |

| Rated output current In (fsw = default) | | | | | | | | Switching frequency fsw | |
|--|-----------------------------|---|-----------------------------|--|-----------------------------|---|-----------------------------|-------------------------|--------------|
| Heavy Duty | | | | Light Duty | | | | Default | Higher |
| For Asynchronous motors (150% overload) | | For Synchronous motors (160% overload) | | For Asynchronous motors (110% overload) | | For Synchronous motors (110% overload) | | | |
| @400 V _{AC} [A] | @460 V _{AC} [A] | @400 V _{AC} [A] | @460 V _{AC} [A] | @400 V _{AC} [A] | @460 V _{AC} [A] | @400 V _{AC} [A] | @460 V _{AC} [A] | | |
| 2.5 | 2.3 | 2.3 | 2.1 | 4.3 | 3.9 | 3.9 | 3.5 | 8 | 10, 12 |
| 4.3 | 3.9 | 3.9 | 3.5 | 5.8 | 5.2 | 5.2 | 4.7 | 8 | 10, 12 |
| 5.8 | 5.2 | 5.2 | 4.7 | 7.6 | 6.8 | 6.8 | 6.1 | 4 | 6, 8, 10, 12 |
| 7.6 | 6.8 | 6.8 | 6.1 | 9.5 | 8.6 | 8.6 | 7.7 | 4 | 6, 8, 10, 12 |
| 9.5 | 8.6 | 8.6 | 7.7 | 13 | 11.7 | 11.7 | 10.5 | 4 | 6, 8, 10, 12 |
| 13 | 11.7 | 11.7 | 10.5 | 16.5 | 14.9 | 15 | 13.5 | 4 | 6, 8, 10, 12 |
| 16.5 | 14.9 | 15 | 13.5 | 23 | 20.7 | 21 | 18.9 | 4 | 6, 8, 10, 12 |
| 23 | 20.7 | 21 | 18.9 | 31 | 27.9 | 28 | 25.2 | 4 | 6, 8, 10, 12 |
| 31 | 27.9 | 28 | 25.2 | 38 | 34.2 | 34 | 30.6 | 4 | 6, 8, 10, 12 |
| 38 | 34.2 | 34 | 30.6 | 46 | 41.4 | 41 | 36.9 | 4 | 6, 8, 10, 12 |
| 46 | 41.4 | 41 | 36.9 | 62 | 55.8 | 56 | 50.4 | 4 | 6, 8, 10, 12 |
| 62 | 55.8 | 56 | 50.4 | 75 | 67.5 | 68 | 61.2 | 4 | 6, 8, 10, 12 |
| 75 | 67.5 | 68 | 61.2 | 87 | 78.3 | 78 | 70.2 | 4 | 6, 8, 10, 12 |
| 87 | 78 | 78 | 70.2 | 105 | 94.5 | 95 | 85.5 | 4 | 6, 8 |
| 105 | 94.5 | 95 | 85.5 | 150 | 135 | 135 | 121.5 | 4 | 6, 8 |
| 150 | 135 | 135 | 122 | 180 | 162 | 162 | 146 | 4 | 6, 8 |
| 180 | 162 | 162 | 146 | 210 | 189 | 189 | 170 | 4 | 6, 8 |
| 210 | 189 | 189 | 170 | 250 | 225 | 225 | 203 | 4 | 6, 8 |
| 250 | 225 | 225 | 203 | 300 | 270 | 270 | 243 | 4 | 6, 8 |
| 300 | 270 | 270 | 243 | 385 | 347 | 347 | 312 | 4 | - |
| 385 | 347 | 347 | 312 | 460 | 414 | 414 | 373 | 4 | - |
| 460 | 414 | 414 | 373 | 590 | 531 | 521 | 469 | 2 | 4 |
| 590 | 531 | 521 | 469 | 650 | 585 | 585 | 527 | 2 | - |
| 650 | 585 | 585 | 527 | 730 | 657 | 657 | 591 | 2 | - |
| 730 | 657 | 657 | 591 | 870 | 783 | 783 | 705 | 4 (1) | - |
| 870 | 783 | 783 | 705 | 1120 | 1008 | 1008 | 907 | 2 | 4 (1) |
| 1120 | 1008 | 1008 | 907 | 1230 | 1107 | 1107 | 996 | 2 | - |
| 1230 | 1107 | 1107 | 996 | 1380 | 1242 | 1242 | 1118 | 2 | - |
| 1600 | 1440 | 1440 | 1296 | 1800 | 1620 | 1620 | 1458 | 2 | - |
| 1800 | 1620 | 1620 | 1458 | 2050 | 1845 | 1845 | 1661 | 2 | - |

(1) from fw 6.03.

ADV200-DC • CHOOSING THE INVERTER - INPUT AND OUTPUT DATA

The combinations of motor power ratings and inverters listed in the table envisage the use of motors in which the voltage rating is equal to that of the mains power.

For motors with different voltage ratings the inverter must be chosen according to the current rating of the motor.

The combinations listed in the table thus show the current that can be delivered by the drive during continuous operation and overload conditions, according to the mains voltage.

The same engineering criteria apply for operations with additional derating factors (see drive instruction manual).

| Input and Output Data ADV200-DC | | | | | | | | | | | | |
|---------------------------------|---|--|--|--|-----------------|-----------------|--|-------------|-------------|-------------------------------|-------------|-------------|
| Sizes ADV200-DC | DC input current for continuous operation I_N | | | | Inverter Output | | Pn mot (Recommended asynchronous motor rating, fsw = default) | | | | | |
| | Heavy Duty (150% overload) | | Light Duty (110% overload) | | Heavy Duty | Light Duty | Heavy Duty (150% overload) | | | Light Duty (110% overload) | | |
| | -4/4A @ 540 V _{DC} [Arms] | -6/6A @ 930 V _{DC} [Arms] | -4/4A @ 540 V _{DC} [Arms] | -6/6A @ 930 V _{DC} [Arms] | @ 400V [kVA] | @ 400V [kVA] | (1) [kW] | (2) [HP] | (3) [HP] | (1) [kW] | (2) [HP] | (3) [HP] |
| | | | | | | | | | | | | |
| 3185 | 39 | - | 48 | - | 26.3 | 32 | 18.5 | 25 | | 22 | 30 | |
| 3220 | 48 | - | 65 | - | 32 | 43 | 22 | 30 | | 30 | 40 | |
| 4300 | 65 | - | 80 | - | 43 | 52 | 30 | 40 | | 37 | 50 | |
| 4370 | 80 | - | 90 | - | 52 | 60 | 37 | 50 | | 45 | 60 | |
| 4450 | 90 | - | 125 | - | 60 | 73 | 45 | 60 | | 55 | 75 | |
| 5550 | 125 | - | 175 | - | 73 | 104 | 55 | 75 | | 75 | 100 | |
| 5750 | 175 | - | 210 | - | 104 | 125 | 75 | 100 | | 90 | 125 | |
| 5900 | 210 | - | 240 | - | 125 | 145 | 90 | 125 | | 110 | 150 | |
| 61100 | 240 | - | 290 | - | 145 | 173 | 110 | 150 | | 132 | 175 | |
| 61320 | 290 | - | 350 | - | 173 | 208 | 132 | 175 | | 160 | 200 | |
| 71600 | 370 | 190 | 430 | 235 | 208 | 267 | 160 | 200 | 150 | 200 | 250 | 200 |
| 72000 | 430 | 235 | 510 | 300 | 267 | 319 | 200 | 250 | 200 | 250 | 300 | 250 |
| 72500 | 510 | 300 | 710 | 370 | 319 | 409 | 250 | 300 | 250 | 315 | 400 | 350 |
| 73150 | 710 | 370 | 780 | 420 | 409 | 450 | 315 | 400 | 350 | 355 | 450 | 400 |
| 73550 | 780 | 420 | 850 | 470 | 450 | 506 | 355 | 450 | 400 | 400 | 500 | 450 |
| 400 kW | 860 | 514 | 1020 | 637 | 506 | 603 | 400 | 500 | 450 | 500 | 650 | 500 |
| 500 kW | 1020 | 653 | 1420 | 797 | 603 | 776 | 500 | 650 | 550 | 630 | 850 | 700 |
| 630 kW | 1420 | 814 | 1560 | 925 | 776 | 852 | 630 | 850 | 700 | 710 | 950 | 800 |
| 710 kW | 1560 | 926 | 1700 | 1032 | 852 | 956 | 710 | 950 | 800 | 800 | 1100 | 900 |
| 900 kW | 2130 | 1236 | 2610 | 1445 | 1108 | 1247 | 900 | 1200 | 1000 | 1000 | 1300 | 1100 |
| 1 MW | 2340 | 1445 | 2550 | 1542 | 1247 | 1420 | 1000 | 1300 | 1100 | 1200 | 1600 | 1300 |
| 1.35 MW | - | 1684 | - | 1855 | - | - | 1350 | - | 1500 | - | - | 1600 |
| 1.65 MW | - | 2058 | - | 2254 | - | - | 1650 | - | 1800 | - | - | 2000 |

(1) ADV200-...-4/4A-DC = @400 V_{AC}; ADV200-...-6/6A-DC = @690 V_{AC};

(2) ADV200-...-4/4A-DC = @460 V_{AC};

(3) ADV200-...-6/6A-DC = @575 V_{AC}.

| Rated output current I _n (fsw = default) | | | | | | | | | | | |
|---|----------------------|----------------------|-------------------------------|----------------------|----------------------|----------------------------|----------------------|----------------------|--------------------------|----------------------|----------------------|
| Light Duty (110% overload) | | | Heavy Duty (160% overload) | | | Light Duty (110% overload) | | | | | |
| (For Asynchronous motors) | | | (For Synchronous motors) | | | (For Asynchronous motors) | | | (For Synchronous motors) | | |
| @540 V _{DC} | @650 V _{DC} | @930 V _{DC} | @540 V _{DC} | @650 V _{DC} | @930 V _{DC} | @540 V _{DC} | @650 V _{DC} | @930 V _{DC} | @540 V _{DC} | @650 V _{DC} | @930 V _{DC} |
| [A] | [A] | [A] | [A] | [A] | [A] | [A] | [A] | [A] | [A] | [A] | [A] |
| 38 | 34.2 | - | 34 | 30.6 | - | 46 | 41.4 | - | 41 | 36.9 | - |
| 46 | 41.4 | - | 41 | 36.9 | - | 62 | 55.8 | - | 56 | 50.4 | - |
| 62 | 55.8 | - | 56 | 50.4 | - | 75 | 67.5 | - | 68 | 61.2 | - |
| 75 | 67.5 | - | 68 | 61.2 | - | 87 | 78.3 | - | 78 | 70.2 | - |
| 87 | 78 | - | 78 | 70.2 | - | 105 | 94.5 | - | 95 | 85.5 | - |
| 105 | 94.5 | - | 95 | 85.5 | - | 150 | 135 | - | 135 | 121.5 | - |
| 150 | 135 | - | 135 | 122 | - | 180 | 162 | - | 162 | 146 | - |
| 180 | 162 | - | 162 | 146 | - | 210 | 189 | - | 189 | 170 | - |
| 210 | 189 | - | 189 | 170 | - | 250 | 225 | - | 225 | 203 | - |
| 250 | 225 | - | 225 | 203 | - | 300 | 270 | - | 270 | 243 | - |
| 300 | 270 | 170 | 270 | 243 | 153 | 385 | 347 | 210 | 347 | 312 | 189 |
| 385 | 347 | 210 | 347 | 312 | 189 | 460 | 414 | 265 | 414 | 373 | 238 |
| 460 | 414 | 265 | 414 | 373 | 238 | 590 | 531 | 330 | 521 | 469 | 297 |
| 590 | 531 | 330 | 521 | 469 | 297 | 650 | 585 | 375 | 585 | 527 | 337 |
| 650 | 585 | 375 (3) | 585 | 527 | 337 | 730 | 657 | 415 (3) | 657 | 591 | 373 |
| 730 | 657 | 400 | 657 | 591 | 360 | 870 | 783 | 500 | 783 | 705 | 450 |
| 870 | 783 | 500 | 783 | 705 | 450 | 1120 | 1008 | 630 | 1008 | 907 | 567 |
| 1120 | 1008 | 630 | 1008 | 907 | 567 | 1230 | 1107 | 710 | 1107 | 996 | 639 |
| 1230 | 1107 | 710 (3) | 1107 | 996 | 639 | 1380 | 1242 | 790 (3) | 1242 | 1118 | 711 |
| 1600 | 1440 | 900 | 1440 | 1296 | 810 | 1800 | 1620 | 1000 | 1620 | 1458 | 900 |
| 1800 | 1620 | 1000 (3) | 1620 | 1458 | 900 | 2050 | 1845 | 1150 (3) | 1845 | 1661 | 1035 |
| - | - | 1300 (3) | - | - | 1170 (3) | - | - | 1450 | - | - | 1305 |
| - | - | 1600 | - | - | 1440 | - | - | 1770 | - | - | 1593 |

| Sizes ADV200-DC-4/4A | Switching frequency fsw | |
|-------------------------|-------------------------|------------------|
| | Default | Higher |
| 3185 ... 4370 | 4 kHz | 6, 8, 10, 12 kHz |
| 4450 ... 61320 | 4 kHz | 6, 8 kHz |
| 71600 ... 72000 | 4 kHz | - |
| 72500 ... 73150 | 2 kHz | -(6) |
| 400 kW | 4 kHz (5) | - |
| 500 kW | 2 kHz | 4 kHz (5) |
| 630 kW ... 1 MW | 2 kHz | - |

| Sizes ADV200-DC-6/6A | Switching frequency fsw | |
|-------------------------|-------------------------|---------|
| | Maximum (default) | Minimum |
| 71600 | 2 kHz / 4 kHz (4) | 2 kHz |
| 72000 | 2 kHz / 4 kHz (4) | 2 kHz |
| 72500 ... 73550 | 2 kHz | 2 kHz |
| 400 kW ... 1.65 MW | 2 kHz | 2 kHz |

- (3) Current values with an ambient temperature of 35°C.
(4) 4 kHz in "variable frequency" mode (PAR 658 Switch freq. mode =1).
(5) from fw 6.03
(6) 72500 = 4 kHz

ADV200-6 • CHOOSING THE INVERTER - INPUT AND OUTPUT DATA

The combinations of motor power ratings and inverters listed in the table envisage the use of motors in which the voltage rating is equal to that of the mains power.

For motors with different voltage ratings the inverter must be chosen according to the current rating of the motor.

The combinations listed in the table thus show the current that can be delivered by the drive during continuous operation and overload conditions, according to the mains voltage.

The same engineering criteria apply for operations with additional derating factors (see drive instruction manual).

| Input and Output Data ADV200-6 | | | | | | | | | | | | |
|--------------------------------|---------------------------------|---------------------------------|---|------------------------------|------------------------------|------------------------------|--|---------------|--|---------------|---|---------|
| Sizes ADV200-6 | AC input current | | Pn mot (Recommended asynchronous motor rating, fsw = default) | | | | Rated output current In (for Asynchronous motor) (fsw = default) | | Rated output current In (For Synchronous motors) (fsw = default) | | Switching frequency "Fixed frequency" mode (PAR 658 Switch freq. mode =0, default) | |
| | Heavy Duty | Light Duty | Heavy Duty | | Light Duty | | Heavy Duty | Light Duty | Heavy Duty | Light Duty | Maximum (default) | Minimum |
| | @ 690 V _{AC} [Arms] | @ 690 V _{AC} [Arms] | @690 V _{AC} [kW] | @575 V _{AC} [kW] | @690 V _{AC} [kW] | @575 V _{AC} [kW] | [A] | [A] | [A] | [A] | (kHz) | (kHz) |
| 5750 | 90 | - | 75 | - | - | - | 92 | - | 75 | - | 4 | 2 |
| 6900 | 109 | - | 90 | - | - | - | 110 | - | 90 | - | 4 | 2 |
| 61100 | 129 | - | 110 | - | - | - | 133 | - | 110 | - | 2 | 2 |
| 61320 | 157 | - | 132 | - | - | - | 159 | - | 130 | - | 2 | 2 |
| 71600 | 172 | 210 | 160 | 150 | 200 | 200 | 170 | 210 | 153 | 189 | 4 | 2 |
| 72000 | 214 | 263 | 200 | 200 | 250 | 250 | 210 | 265 | 189 | 238 | 2 | 2 |
| 72500 | 263 | 336 | 250 | 250 | 315 | 350 | 265 | 330 | 238 | 297 | 2 | 2 |
| 73150 | 336 | 382 | 315 | 350 | 355 | 400 | 330 | 375 | 297 | 337 | 2 | 2 |
| 73550 | 382 | 420 | 355 | 400 | 400 | 450 | 375 (1) | 415 | 337 (1) | 373 | 2 | 2 |
| 400 kW | 420 | 520 | 400 | 450 | 500 | 500 | 400 | 500 | 360 | 450 | 2 | 2 |
| 500 kW | 533 | 651 | 500 | 550 | 630 | 700 | 500 | 630 | 450 | 567 | 2 | 2 |
| 630 kW | 665 | 755 | 630 | 700 | 710 | 800 | 630 | 710 | 567 | 639 | 2 | 2 |
| 710 kW | 756 | 843 | 710 | 800 | 800 | 900 | 710 (1) | 790 | 639 (1) | 711 | 2 | 2 |
| 900 kW | 1009 | 1180 | 900 | 1000 | 1000 | 1100 | 900 | 1000 | 810 | 900 | 2 | 2 |
| 1 MW | 1180 | 1259 | 1000 | 1100 | 1150 | 1300 | 1000 (1) | 1150 | 900 (1) | 1035 | 2 | 2 |
| 1.35 MW | 1375 | 1515 | 1350 | 1500 | 1500 | 1600 | 1300 (1) | 1450 | 1170 (1) | 1305 | 2 | 2 |
| 1.65 MW | 1680 | 1840 | 1650 | 1800 | 1800 | 2000 | 1600 | 1770 | 1440 | 1593 | 2 | 2 |

(1) Current values with an ambient temperature of 35°C.

WEIGHTS AND DIMENSIONS

| Sizes ADV200-4 | Dimensions: Width x Height x Depth | | Weight | |
|-----------------|------------------------------------|-----------------------|--------|-------|
| | mm | inches | kg | lbs |
| 1007...1040 | 118 x 322 x 235 | 4.65 x 12.7 x 9.25 | 5.8 | 12.8 |
| 2055 ... 2110 | 150 x 392 x 250 | 5.91 x 15.43 x 9.84 | 10.2 | 22.5 |
| 3150...3185 | 180 x 517 x 250 | 7.09 x 20.35 x 9.84 | 16.4 | 36.2 |
| 3220 | | | 22 | 48.5 |
| 4300...4450 | 268 x 616 x 270 | 10.55 x 24.25 x 10.63 | 32 | 70.6 |
| 5550...5900 | 311 x 767 x 325 | 12.24 x 40.2 x 12.8 | 60 | 132.3 |
| 61100 ... 61320 | 422 x 878 x 360 | 16.61 x 34.6 x 14.2 | 90 | 198.4 |
| 71600...72000 | 417 x 1407 x 485 | 16.42 x 55.4 x 19.1 | 130 | 286.6 |
| 72500 | | | 140 | 308.7 |
| 73150 ... 73550 | | | 150 | 330.7 |
| 400kW | 837 x 1407 x 485 | 33.0 x 55.4 x 19.1 | 260 | 573.2 |
| 500kW | | | 280 | 617.4 |
| 630 - 710kW | | | 450 | 992.1 |
| 900kW - 1MW | | | 450 | 992.1 |

| Sizes ADV200-DC | Dimensions: Width x Height x Depth | | Weight | | | |
|-----------------|------------------------------------|-----------------------|-------------------|-----|-------------------|--------|
| | mm | inches | (ADV200-...-4-DC) | | (ADV200-...-6-DC) | |
| | | | kg | lbs | kg | lbs |
| 3185 | 180 x 517 x 250 | 7.09 x 20.35 x 9.84 | 12 | | 26.5 | |
| 3220 | | | 18 | | 39.7 | |
| 4300...4450 | 268 x 616 x 270 | 10.55 x 24.25 x 10.63 | 24 | | 52.9 | |
| 5550 ... 5900 | 311 x 730.4 x 325 | 12.24 x 30.55 x 12.8 | 40 | | 88.2 | |
| 61100 | 421 x 924.5 x 360 | 16.57 x 36.4 x 14.17 | 68 | | 149.9 | |
| 61320 | 421 x 924.5 x 360 | 16.57 x 36.4 x 14.17 | 68 | | 149.9 | |
| | | | | | | |
| | mm | inches | kg | lbs | kg | lbs |
| 71600...72000 | 417 x 1407 x 485 | 16.42 x 55.4 x 19.1 | 120 | 267 | 135 | 288 |
| 72500 | | | 130 | 287 | 145 | 320 |
| 73150 ... 73550 | | | 140 | 307 | 155 | 342 |
| 400kW | 837 x 1407 x 485 | 33.0 x 55.4 x 19.1 | 240 | 529 | 270 | 595 |
| 500kW | | | 260 | 573 | 290 | 639 |
| 630 - 710kW | | | 420 | 926 | 310 | 683 |
| 900kW - 1MW | | | 420 | 926 | 465 | 1025 |
| 1.35 MW | 1677 x 1407 x 485 | 66.02 x 55.4 x 19.1 | - | - | 600 | 1322,7 |
| 1.65 MW | 2097 x 1407 x 485 | 82.56 x 55.4 x 19.1 | - | - | 750 | 1653,5 |

| Sizes ADV200-6 | Dimensions: Width x Height x Depth | | Weight | |
|----------------------|------------------------------------|---------------------|--------|--------|
| | mm | inches | kg | lbs |
| 5750 | 520 x 942 x 318 | 20.5 x 37.1 x 12.5 | | |
| 6900 - 61100 - 61320 | 520 x 1134 x 319 | 20.5 x 44.6 x 12.6 | | |
| 71600...72000 | 417 x 1407 x 485 | 16.42 x 55.4 x 19.1 | 135 | 298 |
| 72500 | | | 145 | 320 |
| 73150 ... 73550 | | | 155 | 342 |
| 400kW | 837 x 1407 x 485 | 33.0 x 55.4 x 19.1 | 270 | 595 |
| 500kW | | | 290 | 639 |
| 630 - 710kW | | | 310 | 683 |
| 900kW - 1MW | | | 465 | 1025 |
| 1.35 MW | 1677 x 1407 x 485 | 66.02 x 55.4 x 19.1 | 600 | 1322,7 |
| 1.65 MW | 2097 x 1407 x 485 | 82.56 x 55.4 x 19.1 | 750 | 1653,5 |

ADV100



The GEFAN 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.

POWER RANGE

| Models | Power (kW) | | | | | | | | | | | | |
|--------|------------|-----|--------|----|--------|------|----|--------|----|----|--------|----|----|
| | 4.0 | 5.5 | 7.5 | 11 | 15 | 18.5 | 22 | 30 | 37 | 45 | 55 | 75 | 90 |
| ADV100 | Size 1 | | Size 2 | | Size 3 | | | Size 4 | | | Size 5 | | |

WEIGHTS AND DIMENSIONS



| Sizes ADV100 | Dimensions: Width x Height x Depth | | Weight | |
|---------------|------------------------------------|-----------------------|--------|-------|
| | mm | inches | kg | lbs |
| 1040 - 1055 | 159.2 x 331.1 x 158.7 | 6.27 x 13.04 x 6.25 | 5.8 | 12.8 |
| 2075 - 2110 | 159.2 x 382.1 x 158.7 | 6.27 x 15.04 x 6.25 | 7.8 | 17.2 |
| 3150 ... 3220 | 227.8 x 387 x 178 | 8.97 x 15.24 x 7.01 | 10.5 | 23.15 |
| 4300 ... 4450 | 268 x 612 x 276 | 10.55 x 24.09 x 10.87 | 32 | 70.6 |
| 5550...5900 | 311 x 748 x 330.5 | 12.24 x 29.4 x 123.01 | 60 | 132.3 |

ADV100 • GENERAL CHARACTERISTICS

| | |
|--------------------------------------|---|
| Power supply | 3 x 230V _{AC} -15% ... 500V _{AC} +5%, 50/60Hz ±2% |
| Power ratings | from 4kW to 90kW |
| Voltage | Maximum output 0.98 x V _{in} |
| Control Mode | Open-loop vector control Vector control with feedback Open loop V/f and V/f with feedback |
| Overload | 150% I _n for 60 seconds every 5 minutes |
| | 180% I _n for 0.5 seconds every 5 minutes |
| Optional cards | Integration of up to 2 options onboard the drive |
| Multi-language programming SW | GF-eXpress (5 languages) |
| Rated protection | Standard IP20 |
| Reference resolution | <ul style="list-style-type: none"> • Digital = 15bit + sign • Analog input = 11-bit + sign • Analog output = 11-bit + sign |
| Fieldbus management | CANopen / DeviceNet communication (integrated in ADV120-...-C models) |

| | Control mode | Speed control precision (*) | Range di controllo |
|------------------|---------------------|------------------------------------|---------------------------|
| Precision | FOC with feedback | ± 0,01% motor speed rating | 1 : 1000 |
| | Open-loop FOC | ± 30% motor slip rating | 1 : 100 |
| | V/F | ± 60% motor slip rating | 1 : 30 |
| | | | |

(*) for standard 4-pole motor

| | | |
|--------------------------------------|---|--|
| Standard supply configuration | Regulation | <ul style="list-style-type: none"> • 2 bipolar analog inputs (Voltage/Current) • 2 bipolar analog outputs (1: Voltage/Current, 1: Voltage) • 6 digital inputs (PNP/NPN) • 2 digital outputs (PNP/NPN) • 2 relay outputs, single contact • RS232 serial line (Modbus RTU) |
| | Power | <ul style="list-style-type: none"> • Integrated choke DC side (≥ size 4300) • Integrated mains filter (≥ size 4300) • Integrated dynamic braking module (up to size 5550) |
| Options | | Multilingual programming keypad with LCD screen (5 lines x 20 characters) and memory for 5 parameter sets |
| | | Input choke |
| | | Output chokes |
| | | Braking resistors |
| | | Incremental digital encoder feedback card (EXP-DE-IIRIF2-ADL) |
| | | I/O expansion cards |
| | | CANopen / DeviceNet communication (integrated in ADV120-...-C models) |
| Conformity | Immunity/Emissions | CEE - EN 61800-3 |
| | Safety standards | EN 50178, EN 61800-5-1, UL508C, UL840 degree of pollution 2. |
| Condizioni Ambientali | Ambient temperature | -10 ...40°C, +40°C...+50°C with derating |
| | Altitude | Max 2000 m.(up to 1000 m without derating) |
| Markings |  | Complies with the EEC directive concerning low voltage equipment |
| |  | Complies with directives for the American and Canadian markets. |

ADV100



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:

Standard on ADV110 and ADV120:

| Card | Code | Description |
|---------------------|-------|---|
| EXP-IO-D6A4R2-F-ADL | S580L | <ul style="list-style-type: none"> • 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 | S567L | 1DI (Enable) + 2 (Prog. DI) + 2 (RO) |
| EXP-IO-D5R3-F-ADL | S5L08 | 1DI (Enable) + 5 (Prog. DI) + 3 (RO) |
| EXP-IO-D8R4-ADL | S568L | 1DI (Enable) + 8 (Prog. DI) + 4 (RO) |
| EXP-IO-D8A4R4-ADL | S570L | 1DI (Enable) + 8 (Prog. DI) + 2 (AI) + 2 (AO) + 4 (RO) |
| EXP-IO-D12A2R4-ADL | S569L | 1DI (Enable) + 8 (Prog. DI) + 4 (DO) + 2 (AI) + 4 (RO) |
| EXP-IO-D16R4-ADL | S566L | 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:

Standard on ADV120:

| | | |
|---------------|-------|---|
| EXP-DE-I1-ADL | S5L36 | <ul style="list-style-type: none"> • channels A+ A-, B+ B-, differential line drivers, optoisolated • management of loss of encoder signals • TTL and HTL electrical interface |
|---------------|-------|---|

Optional card upon request:

| | | |
|-------------------|-------|---|
| EXP-DE-I1R1F2-ADL | S5L04 | <ul style="list-style-type: none"> • 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 |
|-------------------|-------|---|



Special adapter required SD-ADL, cod. S574L.

SD Card

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





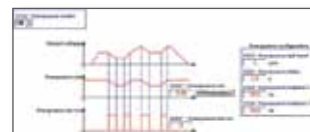
Two self-tuning modes

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.



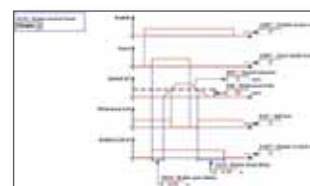
> PID control

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 **K-ADV100** programming keypad (cod. S5P3T) featuring full display of parameters and variables in 5 languages makes the ADV100 extremely intuitive and easy to use.

It has a strip of magnetic material on the back so that it can be attached to the front of the drive or other metal surface (e.g. door of the electrical panel).

- > 4 line x 21 character display
- > Alphanumeric plaintext
- > Complete information regarding each parameter
- > Fast navigation keys
- > Key for displaying the last 10 parameters that have been changed
- > DISP key for rapid display of operating parameters
- > Uploading-Downloading and saving of 5 complete sets of drive parameters
- > Remote control from a distance of up to 15 metres (a 70 cm-long connection cable is supplied as standard).

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.



ADV100 • CHOOSING THE INVERTER - INPUT AND OUTPUT DATA

The combinations of motor power ratings and inverters listed in the table envisage the use of motors in which the voltage rating is equal to that of the mains power.

For motors with different voltage ratings the inverter must be chosen according to the current rating of the motor.

The combinations listed in the table thus show the current that can be delivered by the drive during continuous operation and overload conditions, according to the mains voltage.

The same engineering criteria apply for operations with additional derating factors (see drive instruction manual).

| Input Data ADV100 | | | | | |
|-------------------|--|-----------|------------------------------|--------------------------------|-----------|
| Sizes ADV100 | AC input current for continuous operation In | | Overload | | In [A] |
| | @ 230-400 Vac | @ 480 Vac | 150 % x In (1' each 5') | 180 % x In (0,5" each 5') | |
| | [Arms] | [Arms] | [A] | [A] | |
| 1040 | 11 | 10 | 14.3 | 17.1 | 9.5 |
| 1055 | 16 | 14 | 19.5 | 23.4 | 13 |
| 2075 | 20 | 18 | 24.8 | 29.7 | 16.5 |
| 2110 | 28 | 26 | 34.5 | 41.4 | 23 |
| 3150 | 40 | 38 | 46.5 | 55.8 | 31 |
| 3185 | 47 | 44 | 57 | 68.4 | 38 |
| 3220 | 53 | 49 | 69 | 82.8 | 46 |
| 4300 | 53 | 50 | 93 | 111.6 | 62 |
| 4370 | 64 | 60 | 112.5 | 135 | 75 |
| 4450 | 74 | 71 | 130.5 | 156.6 | 87 |
| 5550 | 100 | 92 | 157.5 | 189 | 105 |
| 5750 | 143 | 135 | 225 | 270 | 150 |
| 5900 | 171 | 165 | 270 | 324 | 180 |

| Output Data ADV100 | | | | | | | |
|--------------------|---|--|------------------------------|-------------------------------|-----------------------------|-------------------------|-----------------|
| Sizes ADV100 | Inverter Output for continuous operation [kVA] | Pn mot (Recommended rating, fsw = default) | | I2n (Rated output current) | | Switching frequency fsw | |
| | | @400 V _{AC} [kW] | @460 V _{AC} [HP] | @400 V _{AC} [A] | @460 V _{AC} [A] | Default [KHz] | Higher [KHz] |
| | | | | | | | |
| 1040 | 7.6 | 4 | 5 | 9.5 | 8.6 | 4 | 6, 8, 10, 12 |
| 1055 | 11.1 | 5.5 | 7.5 | 13 | 11.7 | 4 | 6, 8, 10, 12 |
| 2075 | 13.9 | 7.5 | 10 | 16.5 | 14.9 | 4 | 6, 8, 10, 12 |
| 2110 | 19.4 | 11 | 15 | 23 | 20.7 | 4 | 6, 8, 10, 12 |
| 3150 | 27.7 | 15 | 20 | 31 | 27.9 | 4 | 6, 8, 10, 12 |
| 3185 | 32.6 | 18.5 | 25 | 38 | 34.2 | 4 | 6, 8, 10, 12 |
| 3220 | 36.7 | 22 | 30 | 46 | 41.4 | 4 | 6, 8, 10, 12 |
| 4300 | 36.7 | 30 | 40 | 62 | 55.8 | 4 | 6, 8, 10, 12 |
| 4370 | 44.3 | 37 | 50 | 75 | 67.5 | 4 | 6, 8, 10, 12 |
| 4450 | 51.3 | 45 | 60 | 87 | 78 | 4 | 6, 8 |
| 5550 | 69.3 | 55 | 75 | 105 | 94.5 | 4 | 6, 8 |
| 5750 | 99.1 | 75 | 100 | 150 | 135 | 4 | 6, 8 |
| 5900 | 118.5 | 90 | 125 | 180 | 162 | 4 | 6, 8 |

AFE200



AFE200 is the range of **regenerative power supply units** incorporating **Active Front End technology**.

Ideal for powering the batteries of drives connected on the same DC Bus or even for managing single-drive configurations.

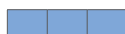
The AFE200 offers a number of advantages:

- “Clean Power” thanks to the unit power factor and reduced harmonic distortion ($\leq 3\%$)
- Enhanced system dynamics during drive and regeneration
- Considerable energy savings during regeneration transients
- Improved stability of the DC Bus circuit under load changes
- Significant cost-effectiveness with the single power supply system
- Elimination of uneconomical conventional braking systems and braking resistors

The AFE200 range has power ratings of **22kW to 1,65MW** for three-phase power supplies of **400Vac to 690Vac**. Ease of use and intuitive programming make it possible for users of any level to exploit the high-level performance of Active Front End technology for a broad range of applications where there is a need for real energy saving.

POWER RANGE

| Models | Power (kW) | | | | | | | | | | | | | | | | | | |
|----------|------------|-----|-----|-----|--------|-----|-----|-----|-----|---------------------|-----|-----|-----|-----|------|------|------|--|--|
| | 22 | 45 | 90 | 132 | 160 | 200 | 250 | 315 | 355 | 400 | 500 | 630 | 710 | 900 | 1000 | 1350 | 1650 | | |
| AFE200-4 | S.3 | S.4 | S.5 | S.6 | Size 7 | | | | | Parallel size 7 (*) | | | | | | | | | |
| AFE200-6 | | | | | Size 7 | | | | | Parallel size 7 (*) | | | | | | | | | |



Power ratings > 1.2 MW on request.

(*) AFE200 of over 400 kW comprise one master MASTER unit and one or more SLAVE units..

WEIGHTS AND DIMENSIONS

| Sizes AFE200 | Dimensions: Width x Height x Depth | | Weight | |
|------------------------|------------------------------------|-----------------------|--------|-------|
| | mm | inches | kg | lbs |
| 3220 | 180 x 517 x 250.1 | 7.09 x 20.35 x 9.85 | 18 | 39.7 |
| 4450 | 268 x 616 x 270 | 10.55 x 24.25 x 10.63 | 24 | 52.9 |
| 5900 | 311 x 730.4 x 325 | 12.24 x 30.55 x 12.8 | 40 | 88.2 |
| 61320 | 421 x 924.5 x 360 | 16.57 x 36.4 x 14.17 | 68 | 149.9 |
| 71600...72000 | 417 x 1407 x 485 | 16.42 x 55.4 x 19.1 | 130 | 286.6 |
| 72500 | | | 140 | 308.7 |
| 73150 ... 73550 | | | 150 | 330.7 |

AFE200

Flexible Modular Technology

The AFE200 is also based on a fully modular hardware with power structures that can be installed side by side.

Designed to facilitate installation and guarantee ease of use, project flexibility, optimisation of space and reduction of wiring costs.

The AFE200 is available in 5 hardware sizes

- from 22kW to 355kW in the stand-alone configuration
- from 400kW to 1.65MW in "parallel" configurations.

Pre-load system

External management of the intermediate circuit pre-load is a feature of the entire range. The dedicated AFE PRE-CHARGE KITS are supplied complete with fuses, resistors and contactor.

Total ease of use

The AFE200 is designed to enable simple, quick, economical connections to the system to be powered. All structures are extremely easy to handle and the terminal strips and optional card racks are readily accessible.

Tastiera di Programmazione

The KB_ADV programming keypad (supplied as standard) makes the man-machine interface simple, immediate and highly functional.

The programming software is available in 2 modes, Easy and Expert, suitable for users of any level and all programming requirements, however complex.

The powerful platform also features a menu/parameter structure that is easy to interpret and is facilitated by the keypad functions and display.

The "Wizard" tool ensures totally user-friendly **immediate start-up functions**. Standard features of the AFE200 include programming in **10 languages** (English, Italian, French, German, Spanish, Polish, Romanian, Russian, Turkish and Portuguese).



Management of optional cards

The AFE200 uses an intelligent rack system that allows the following optional cards to be installed at the same time:

- Fieldbus interface card
- I/O expansion card.

Back-up power supply

The AFE200 is compatible with a separate +24Vdc external power supply. This solution makes it possible to maintain all display and drive configuration functions and manage the connected fieldbuses in the event of a power failure.

Dedicated accessories

The dedicated accessories guarantee elimination of high-frequency harmonics, simple wiring and cable shielding to achieve immediate, EMC-compliant start-ups:

- Dedicated Pre-load kit (mandatory)
- Mains filter EMI type
- Mains filter LCL type (mandatory)



Serial line

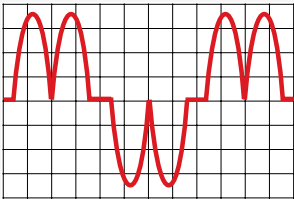
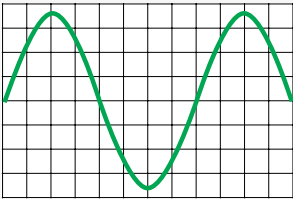
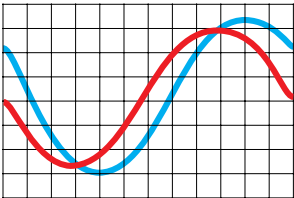
The RS485 serial line is incorporated as standard across the range to enable peer-to-peer or multidrop connections using Modbus RTU protocol.


- › 4 line x 21 character display
- › Alphanumeric plaintext
- › Complete information regarding each parameter
- › Fast navigation keys
- › Key for displaying the last 10 parameters that have been changed
- › DISP key for rapid display of operating parameters
- › Uploading-Downloading and saving of 5 complete sets of drive parameters
- › Remote control from a distance of up to 10 metres.

AFE200 • GENERAL CHARACTERISTICS

| | |
|--------------------------------------|---|
| Power supply | AFE200-...-4/4A: 380V _{AC} -15% ...500V _{AC} +5%, 50/60Hz AFE200-...-6/6A: 500V _{AC} -10% ...690V _{AC} +10%, 50/60Hz |
| DC-link rated voltage | AFE200-...-4/4A: 650...780 V _{DC} AFE200-...-6/6A: 820...1120 V _{DC} |
| Power ratings | from 22kW to 1.65MW |
| Cosphi | ≥ 0,99 |
| THD | ≤ 3% (Considering a network with voltage THD of less than 2%). |
| Overload | • Heavy duty: 150% for 60 sec every 300 sec., 180% 0.5 sec. • Light duty: 110% for 60 sec every 300 sec. |
| Optional cards | Integration of up to 2 options onboard the drive |
| Multi-language programming SW | GF-eXpress (5 languages) |
| Rated protection | IP20-rated protection (IP00 size 7 and parallel) |
| Reference resolution | Digital = 15bit + sign Analog input = 11-bit + sign Analog output = 11-bit + sign |
| Fieldbus management | DeviceNet, CANopen, Modbus RTU, EtherCAT, GD _{NET} , PROFIBUS, Ethernet IP, PROFINET. |

| | | |
|--------------------------------------|---|--|
| Standard supply configuration | Programming keypad | Integrated KB_ADV |
| | Regulation: | <ul style="list-style-type: none"> • 2 bipolar analog inputs (Voltage/Current) • 2 bipolar analog outputs (1: Voltage/Current, 1: Voltage) • 6 digital inputs (PNP/NPN) • 2 digital outputs (PNP/NPN) • 2 relay outputs, single contact • RS485 serial line (Modbus RTU) |
| Options | | LCL type line input filter, is composed by one Input choke and one LC filter (mandatory) |
| | | Pre-load kit, includes fusibles, resistors and pre-load contactor (mandatory) |
| | | External EMI mains filter |
| Conformity | Climatic conditions | EN 60721-3-3 |
| | Electrical safety | EN 50178, EN 61800-5-1, UL508C, UL840 pollution level 2 |
| | Vibrations | EN 60068-2-6, test Fc. |
| | EMC | EN61800-3 |
| Environmental conditions | Ambient temperature | -10°C ...+40°C, +40°C...+50°C with derating |
| | Altitude | Max 2000 m. |
| Markings |  | Complies with the EEC directive concerning low voltage equipment |
| |  | Complies with directives for the American and Canadian market (except types AFE200-...-6/6A). |

| | | |
|---|--|--|
| <p>Input current THD</p> <p>“Clean Power” Technology. The AFE200 integrates cutting-edge energy recovery and energy efficiency technology.</p> |  <p>From AC inverter</p> |  <p>From AFE200 power supply unit</p> |
| | <p>Mains input power factor</p> <p>The AFE200 uses advanced control algorithms to maintain the input current in phase with voltage.</p> |  <p>From AC inverter</p> |



AFE200 • CHOOSING THE POWER SUPPLY UNIT - INPUT AND OUTPUT DATA

The same engineering criteria apply for operations with additional derating factors (see drive instruction manual).

| Input Data AFE200-4 | | | | | Input Data AFE200-6 | | | | |
|---------------------|--|-------------------------------|-------------------------------------|--------|---------------------|--|-------------------------------|-------------------------------------|--------|
| Sizes AFE200-4 | AC Input current for continuous operation In AFE200-4 | | Switching frequency fsw AFE200-4 | | Sizes AFE200-6 | AC Input current for continuous operation In AFE200-6 | | Switching frequency fsw AFE200-6 | |
| | Heavy Duty (150% overload) | Light Duty (110% overload) | Default | Higher | | Heavy Duty (150% overload) | Light Duty (110% overload) | Default | Higher |
| | @400 V _{Ac} [A] | @400 V _{Ac} [A] | | | | @690 V _{Ac} [A] | @690 V _{Ac} [A] | | |
| 3220 | 40 | 60 | 8 | - | - | - | - | - | - |
| 4450 | 80 | 100 | 8 | - | - | - | - | - | - |
| 5900 | 160 | 200 | 4 | 6.8 | - | - | - | - | - |
| 61320 | 230 | 280 | 4 | 6.8 | - | - | - | - | - |
| 71600 | 280 | 340 | 4 | - | 71600 | 150 | 190 | 4 | - |
| 72000 | 340 | 400 | 2 | 4 | 72000 | 190 | 240 | 2 | - |
| 72500 | 400 | 500 | 2 | 4 | 72500 | 240 | 300 | 2 | - |
| 73150 | 500 | 560 | 2 | - | 73150 | 300 | 340 | 2 | - |
| 73550 | 560 | 600 | 2 | - | 73550 | 340 (1) | 380 | 2 | - |
| 400 kW | 600 | 760 | 2 | - | 400 kW | 360 | 455 | 2 | - |
| 500 kW | 760 | 950 | 2 | - | 500 kW | 455 | 570 | 2 | - |
| 630 kW | 950 | 1060 | 2 | - | 630 kW | 570 | 645 | 2 | - |
| 710 kW | 1060 | 1050 | 2 | - | 710 kW | 645 (1) | 720 | 2 | - |
| 900 kW | 1400 | 1500 | 2 | - | 900 kW | 850 | 920 | 2 | - |
| 1 MW | 1500 | 1730 | 2 | - | 1 MW | 920 (1) | 1150 | 2 | - |
| | | | | | 1.35 MW | 1200 (1) | 1350 | 2 | - |
| | | | | | 1.65 MW | 1470 (1) | 1645 | 2 | - |

| Output Data AFE200-4 | | | | | | | Output Data AFE200-6 | | | | | |
|----------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|--|----------------------------|----------------------------|----------------------------|-------------------------------|-------------------------------|--|------|
| Sizes AFE200 | Output AFE-...-4/4A | | | | Output current rating In (DC) (fsw = default) | | | | Output AFE-...-6/6A | | Output current rating In (DC) (fsw = default) | |
| | Heavy Duty | | Light Duty | | Heavy Duty | | Light Duty | | HD | LD | HD | LD |
| | @ 400 V _{Ac} [kW] | @ 460 V _{Ac} [kW] | @ 400 V _{Ac} [kW] | @ 460 V _{Ac} [kW] | 650 V _{Dc} [A] | 750 V _{Dc} [A] | 650 V _{Dc} [A] | 750 V _{Dc} [A] | @ 690 V _{Ac} [kW] | @ 690 V _{Ac} [kW] | [A] | [A] |
| 3220 | 28 | 29 | 42 | 43 | 43 | 39 | 64 | 57 | - | - | - | - |
| 4450 | 55 | 57 | 69 | 72 | 85 | 76 | 107 | 96 | - | - | - | - |
| 5900 | 110 | 115 | 139 | 143 | 171 | 153 | 213 | 191 | - | - | - | - |
| 61320 | 159 | 165 | 194 | 201 | 245 | 220 | 298 | 268 | - | - | - | - |
| 71600 | 194 | 201 | 236 | 244 | 298 | 268 | 363 | 325 | 179 | 227 | 165 | 210 |
| 72000 | 236 | 244 | 277 | 287 | 363 | 325 | 426 | 383 | 227 | 287 | 210 | 265 |
| 72500 | 277 | 287 | 346 | 358 | 426 | 383 | 532 | 477 | 287 | 358 | 265 | 330 |
| 73150 | 346 | 358 | 388 | 402 | 532 | 477 | 597 | 536 | 358 | 406 | 330 | 375 |
| 73550 | 388 | 402 | 416 | 430 | 597 | 536 | 640 | 573 | 406 | 454 | 375 | 420 |
| 400 kW | 416 | 430 | 527 | 545 | 640 | 551 | 811 | 699 | 430 | 544 | 396 | 500 |
| 500 kW | 527 | 545 | 658 | 681 | 811 | 699 | 1012 | 873 | 544 | 681 | 500 | 627 |
| 630 kW | 658 | 681 | 734 | 760 | 1012 | 873 | 1129 | 974 | 681 | 771 | 627 | 711 |
| 710 kW | 734 | 760 | 797 | 825 | 1129 | 974 | 1226 | 1058 | 771 | 860 | 711 | 792 |
| 900 kW | 970 | 1004 | 1039 | 1075 | 1492 | 1287 | 1598 | 1378 | 1015 | 1100 | 935 | 1012 |
| 1 MW | 1039 | 1075 | 1200 | 1242 | 1598 | 1378 | 1846 | 1592 | 1100 | 1255 | 1012 | 1155 |
| 1.35 MW | - | - | - | - | - | - | - | - | 1434 | 1613 | 1320 | 1485 |
| 1.65 MW | - | - | - | - | - | - | - | - | 1757 | 1966 | 1615 | 1810 |

(1) Current values with an ambient temperature of 35°C.

GF-EXPRESS PROGRAMMING SOFTWARE

Applications

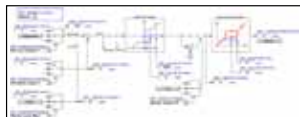
- > Parameter configuration of Gefran devices (Instruments, Drives, Sensors)
- > Tuning of control parameters with on-line tests and trends
- > Management of parameter archive for multiple configuration

Features

- > Guided product selection
- > Simplified settings
- > Multiple languages
- > Parameter printout
- > Creation and storing of recipes
- > Network autoscan
- > Oscilloscope



GF_express is the software used to configure the parameters of the automation components, drives and sensors in the Gefran catalogue. The procedures for selecting and configuring parameters are easy and intuitive, thanks to the graphic interface and devices are grouped according to product type and functions. Product searches are performed by means of a context search and a visual selection from among actual images of the products. This makes it possible to have a single library of devices for all Gefran products. All details for configuration of each single device are set out in XML format to facilitate expansion of the catalogue and parameters.



STANDARD APPLICATIONS

On request the cd-rom with following applications:

- > **Torque Winder (TW)**
Standard Winding/Un-Winding control, torque control in open-loop or closed-loop with load cell.
- > **Positioning control (POS)**
Single axis Standard Positioning with Absolute encoder management.
- > **Electric shaft (ELS)**
Standard Electronic Line Shaft control.

The experience GEFRAN has acquired in the major application sectors has also produced an extensive range of specific and/or custom solutions for managing the most complex configurations in machines.

SOFTSCOPE

SoftScope is a software oscilloscope with synchronous sampling (buffered with a minimum sampling time of 1ms). Using SoftScope the user can easily display in a fast way some specific variables, for example commissioning variables, variables to test performance levels achieved or to tune the control loops.

- SoftScope allows the definition of the following parameters:
- > Trigger conditions (e.g. climbing leading edge of a specific signal)
 - > Recording quality (a multiple of the basic clock at 1ms)
 - > Recording duration period
 - > System sizes to be recorded.

"MDPLC" ADVANCED DEVELOPMENT ENVIRONMENT

The Motion Drive Programmable logic controller (MDPLC) development environment is a tool for the development of industrial applications based on the SIEIDrive ADV200 series of drives.

It is an integrated tool that allows writing, compiling, downloading and debugging of the applications.

MDPLC allows complete personalisation of the drives according to the application requirements using a "friendly" and powerful graphic interface. The importance of the MDPLC's performance is particularly evident when defining advanced applications.

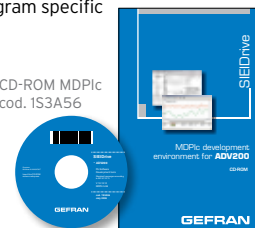
The primary feature of MDPLC is its ability to create an application code for the drives in assembly language, by compiling the application written in the MDPLC environment with PLC languages in compliance with the IEC 61131-3 international standard.

When using an MDPLC application with the ADV200, the drive's basic functions continue to be executed. Two MDPLC application programs can be stored on the drive. One of the two applications (1 or 2) is enabled via a parameter.

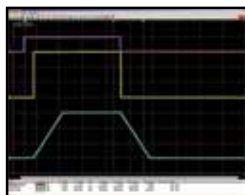
The languages that can be used to program specific custom applications are:

- Instruction List (IL)
- Structured Text (ST)
- Ladder Diagram (LD)
- Function Block Diagram (FBD)
- Sequential Flow Chart (SFC)

CD-ROM MDPLC cod. IS3A56

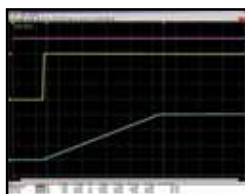


CD-ROM Standard Applications cod. IS3E15



Speed cycle
Start, ramp reference 1500 rpm, ramp output reaches 1500 rpm, Stop, ramp reference 0 rpm, ramp output reaches 0 rpm.

- 1) start command
- 2) ramp input speed reference
- 3) ramp output



Zoom
Ramp output phase from 0 rpm to 1500 rpm of the previous cycle.

- 1) start command
- 2) ramp input speed reference
- 3) ramp output



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