

LIFT CONTROL SYSTEMS • ICS-ADL300

THE INTEGRATED PREMIUM SOLUTION FOR ELEVATORS



GEFRAN



Gefran, With forty years of experience, Gefran is the world's leading designer and producer of solutions for **measuring, controlling, and driving industrial production processes**.

We have branches in 14 countries and a network of over 80 worldwide distributors.

QUALITY AND TECHNOLOGY

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

This makes Gefran 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 optimization 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 and lift needs.

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

SERVICES

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

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





HOME LIFT



LOW RISE



MEDIUM RISE



HIGH RISE

LIFT CONTROL SYSTEMS

Modernizations of existing systems, new systems with and without machine room, applications with synchronous and asynchronous motors with and without gearbox, can be tackled in a targeted and simple way with Gefran drives

Flexible and complete thanks to a wide range of options and dedicated accessories, the inverters of the SIEIDrive - LIFT series are the fast, immediate solution for all application requirements.

The thousands of systems operating all over the world are the best evidence of Gefran's skill and the absolute quality of the product.

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.**

ICS-ADL300 • DESCRIPTION

THE INTEGRATED SOLUTION FOR ELEVATORS

ICS (Integrated Control System) is the new elevator platform developed by Gefran, in which the control card is integrated into the inverter and communication takes place via a dedicated internal interface, which guarantees complete interoperability and very fast response times.

“ LIFT Controller
inside ”

The system also incorporates the typical car functions, thanks to two specific external cards: car roof card and operator card, connected to the control unit by dedicated fieldbuses.

“ Lower costs with
Plug & Play logic ”

Unlike traditional systems, in which the inverter and control card are separate units which require dedicated wiring and programming, the integrated solution reduces design, installation and maintenance costs, thanks to Plug & Play logic.

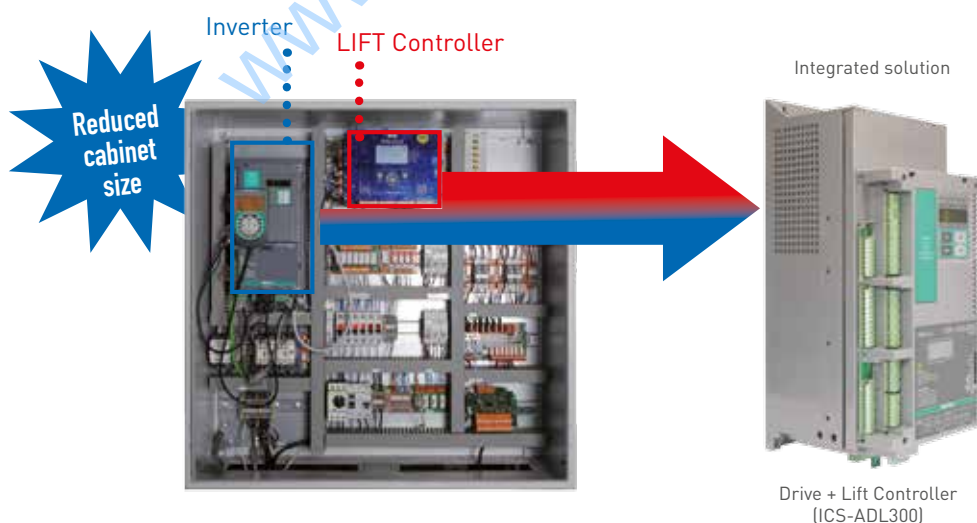
“ One programming environment for
drive and control card ”

A single configuration environment structured into thematic menus allows the fast and user-friendly programming of the inverter and the control card. The possibility to configure various user profiles (installer, maintenance personnel, expert programmer), each with specific credentials, limits access to a limited subset of menus.

Cutting-edge software with all of the advanced functions required by modern systems, allows the proposal of the product for a wide range of applications, such as High Rise, Medium Rise and Low Rise, both at high and low speed, with different traffic profiles. Applicable to freight and passenger elevators, with control panel in a room-less machine configuration (RLM).

“ The first Certificated Contactorless
Integrated Lift ”

The complete system is the ideal solution for manufacturers who work solely with Gefran for both the inverter and the control system, and especially for those who want to propose cost-effective and innovative solutions for modernizations and new installations.

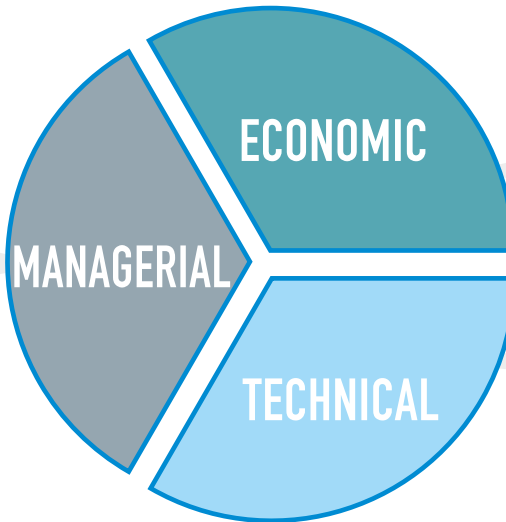


An example of elevator control panel with separate inverter and control card

ADVANTAGES OF AN INTEGRATED SOLUTION

SINGLE INTERFACE FOR:

- Customer Service
- Handling Orders
- Delivery Times



SIMPLIFIED INSTALLATION AND MAINTENANCE:

- Less wiring time
- Smaller cabinet
- Rapid and easy configuration
- Less maintenance time
- Less system complexity
- Less troubleshooting time

PREMIUM FUNCTIONALITY:

- High performance
- Comfort
- Safety
- Quality
- Specific certifications
- CONTACTORLESS operation

HIGH PERFORMANCE

- Express arrival.
- 200% overload for 10 sec.
- Integrated braking unit up to 55kW.
- Position control.

SAFETY

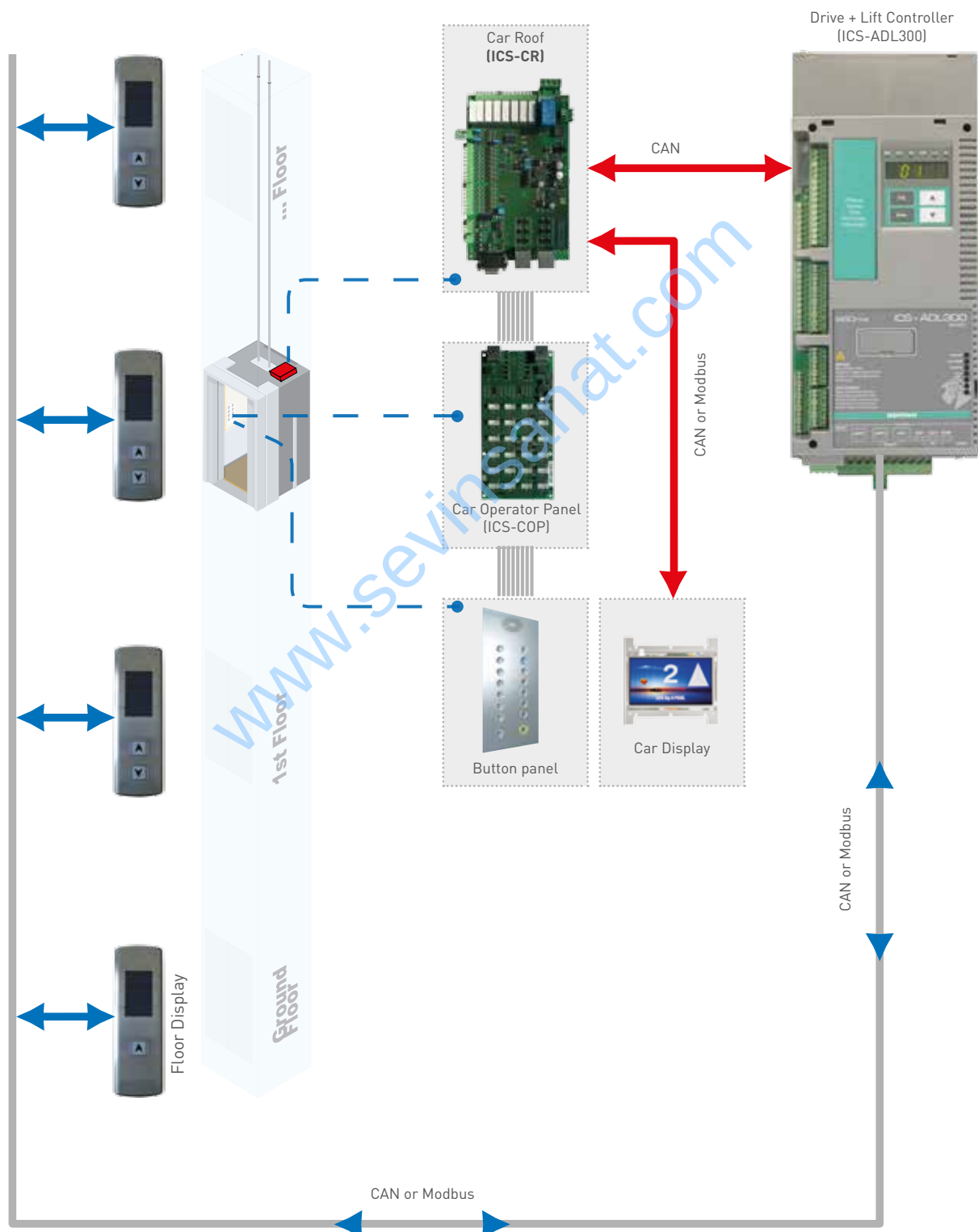
- EN81-1 + A3 certification (also for contactorless configurations).
- Safety Torque Off (STO) EN61800-5-2-2007 SIL3 certification.
- Integrated safety.
- cULus (UL508C)

COMFORT

- Floor alignment with less than 2 mm tolerance
- No vibrations.
- Anti-rollback.
- Contactorless.

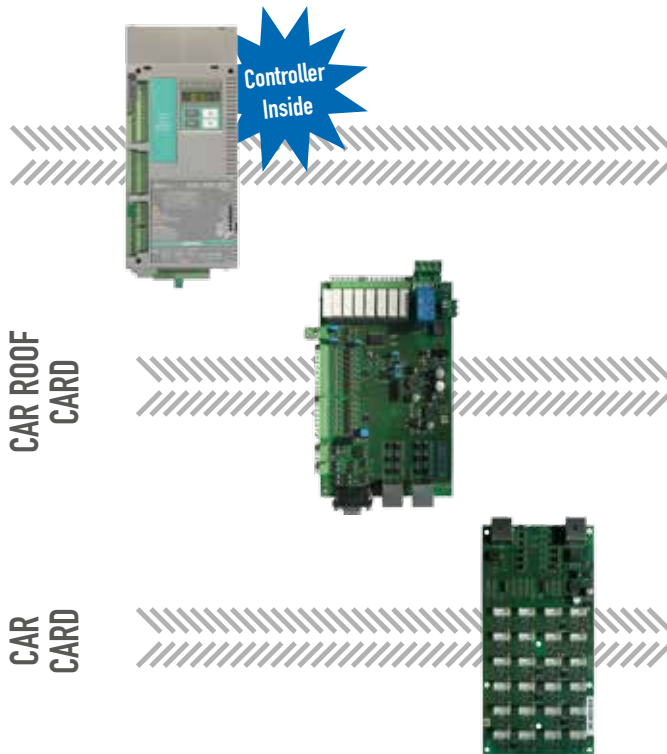
ICS SYSTEM ARCHITECTURE

- Complete control system for passenger and freight elevators
- Perfect for Low Rise, Medium Rise and High Rise systems
- Plug & Play installation of system parts
- **The first integrated lift capable of using displays with Modbus communication on serial RS485 and with CAN communication.**



SYSTEM COMPONENTS

ICS-ADL300 + CARDS



ICS-ADL300 BASIC

- Built-in I/Os and Feedback card (Absolute Sincos + Digital Incremental or EnDat + SSI).
- Integrated Control card (Inside).
- Power Range 4kW – 75 kW 3ph version.
- Power Range 1.5kW – 5.5kW 1ph version.

CAR ROOF PANEL (ICS-CR)

- The ICS-CR card manages the complete operation of the car and sends all the information to the controller via a dedicated CAN bus communication.
- It manages the operation of car doors, ventilation and lighting, as well as the load sensor.

CAR OPERATOR PANEL (ICS-COP)

- Interface card between button panels and Car Roof Card (ICS-CR).
- Collects commands received by car and transfers them to the car roof card and then to the control card.

WE THINK «OPEN» TO MEET THE NEEDS OF THE MARKETPLACE

Gefran supplies the ICS solution with floor and car display with either an RS485 interface or a CAN interface.

«OPEN» solutions are possible with the display (RS485 or CAN) supplied by third parties.

RS485

- +24V
- RS485 A
- RS485 B
- +24V

CAN

- CAN L
- CAN SHLD
- CAN H

OPTIONS



CAR DISPLAY (ICS-CD)

- 7 inch car TFT display.
- Communication with ICS-CPU control system via dedicated CAN channel (CAN 1) or RS485.
- UNI EN 81-70.
- Button panel and buttons (optional).

SIMPLEX FLOOR DISPLAY (ICS-FD)

- 2.8 inch floor display.
- Double figure in segments.
- Communication with ICS-CPU control system via dedicated CAN channel (CAN 2) or RS485.
- Indication of direction and signals.
- UNI EN 81-70.
- Button panel and buttons (optional).

MAIN FUNCTIONS



- > **Maintenance and Inspection mode:** during maintenance and inspection, the operator can run the car at a controlled speed by using the button panel in the control panel or on the car roof.
- > **Independent Run mode:** when this automatic mode is selected, the elevator closes the doors automatically and ignores all of the calls coming from outside, for a non-stop run to the destination floor.
- > **Operator mode:** the elevator excludes automatic mode and works in the presence of an operator who controls all operations. During car movement, the operator can ignore all of the calls coming from outside or accept them selectively, controlling the car's direction and opening of the doors.
- > **Return to floor in case of fire:** when the system receives the fire signal, the elevator ignores all floor calls and keeps the doors closed until the car reaches the evacuation floor.
- > **Firefighter control:** when fire mode is active, automatic operation of the doors is disabled and opening is controlled manually from inside the car, which can happen only when the car has reached the landing floor.
- > **Automatic return to floor:** if no calls from inside the car or from the floors are not received after a certain (programmable) time, the car is returned to the landing floor.
- > **Return to floor at night:** during the night, every time the elevator completes a run it always returns to the selected floor.
- > **Deceleration at floor:** when the doors open, the cables can be subject to considerable elastic deformation due to the entrance/exit of people or goods into/from the car. When the doors are open, the system realigns the car to the floor with millimetric precision.
- > **Overload:** if the car is loaded with a weight exceeding its nominal capacity, the elevator goes into overload condition. A buzzer and a signal light indicate overload status and prevent closing of the doors.
- > **Earthquake:** in case of earthquake, the system receives a signal from the earthquake sensors that takes the car to the nearest floor, opens the doors, and puts the car in stop status.



> **Anti-vandalism:** based on the number of people in the car, the system determines the maximum allowed number of requests. If this number exceeds the set limit, the system considers it an improper use and cancels all calls. The passengers then have to re-select their destinations.

> **Full collective:** calls from floors are recorded with the car available or not available. Calls from floors and requests in car are executed in logical order based on the direction of the car. Two call buttons on each intermediate floor are required: one up and one down (only one button at the top and bottom floors).

> **Down (up) collective:** calls from floors are recorded by pushing the single button on each floor. If the car is free or going down (up), it responds to calls from the highest (lowest) floor, then to the others, during its downward run toward the main floor. Calls in the car are recorded instantaneously and executed in logical order based on the direction of the car.

> **Call management with full car:** when the car runs with a full load, the system ignores floor calls. These calls are stored and served during the next run (Simplex systems) or by the other car (Duplex systems).

> **Double stop management:** once the selected destination floor is reached, the elevator can manage independent opening of the two car doors based on the recorded call (for example, there may be two separate offices or services on the same floor).

> **Time management:** the elevator can exclude a specific floor or a specific stop in a programmable time band (for example, use of the swimming pool in a hotel is blocked from midnight to 6 AM).

> **Energy efficiency:** the system can switch off the lights and air conditioning if it receives no calls for a certain time.

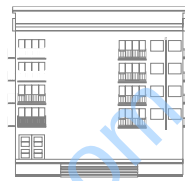
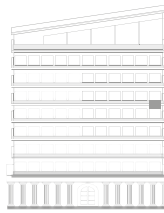
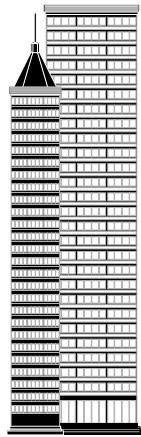
SYSTEM CHARACTERISTICS

	ICS-ADL300
Applications	• Passengers & freight elevators • High Rise Buildings & Home Lift • Gearless & Geared motors • For machine room & and Room-less (MRL) systems • New installations & modernizations
Number of elevators	Simplex - Duplex - Group (up to 8)
Number of stops	Up to 64
Number of floors	Up to 64
Speed range	Up to 3 m/s
Car door operation	Up to 3 independent doors
Car display/button panel	Up to 2
Communication & Wiring system type	CAN bus serial communication (shielded cables) or RS485 serial communication
Call management	Full Selective - Down Selective - Up Selective
Stand-by Mode	External +24VDC power supply
Safety (EN81-1 + A3)	Two Contactors - One Contactor - CONTACTORLESS
Approvals	CE, UL508C
Commissioning with full load	Motor phasing and self-learning with the motor stopped are performed automatically with a single command
Express arrival	The arrival at the floor follows an optimized speed curve, with no jolts
Deceleration at floor	The system automatically corrects the arrival at the floor before opening the doors
Position of the Floor & Self-learning	The system automatically learns and memorises the distances and position of the floor
Emergency Mode	In the event of failure of the power circuit, the car automatically goes to the nearest floor

APPLICATIONS AND GUIDE TO SELECTION

Different applications require specific products for both regenerative and traditional solutions.

The product-solution match is not binding. The following table gives a number of examples based on systems already installed.



	HIGH RISE	MID RISE	LOW RISE	HOME LIFT
Profile	- Height: 90+ m - Floors: 30+ - Speed Range: 2.5...5 m/s	- Height: 18...90 m - Floors: 6...30 - Speed Range: 0.8...2.5 m/s	- Height: 12...18 m - Floors: 3...6 - Speed Range: 0.6 ... 0.8 m/s	- Height: 4...8 m - Floors: 1...2 - Speed Range: 0.3 ... 0.6 m/s
Requirements	- High Speed - Reliability - Smooth Acceleration and Ride comfort - Limited passengers' waiting and travel time - Regenerative Solution	- Cost Saving - Space Saving - Low Energy Consumption - Smooth Acceleration and Ride comfort - Regenerative Solution		- Cost Saving - Space Saving (MRL) - Low Energy Consumption - Easy Commissioning
Specific functions	- Premium components and design - Pre-torque and precise landing at floor - Door pre-opening - AFE regenerative units.	- Optimized hardware solutions - Pre-torque and precise landing at floor - Contactless - External +24VDC power supply for stand-by control - AFE Regenerative units.		- Optimized hardware solutions - Contactless - External +24VDC power supply for stand-by control - Rapid commissioning.
Regenerative	 AFE200 + ICS-ADL300			
Non Regenerative	 ICS-ADL300-4, ICS-ADL300-2T			 ICS-ADL300-2M
	 ICS-VDL100			

GENERAL CHARACTERISTICS

UNIVERSAL MECHANICAL STRUCTURE

The extremely compact **ICS-ADL300** reduces the size of conventional lift systems and it is suitable for installation in roomless systems.

I/O MANAGEMENT

ICS-ADL300, integrates as standard:

- n. 25 Digital Inputs NPN/PNP + 1 Digital Input (Enable);
- n. 8 Digital Outputs;
- n. 4 Analog Inputs;
- n. 6 Relay Outputs;
- n. 4 Digital Inputs «Heavy Current Detection»

SD CARD PORT

The SD memory card makes saving and loading data and configurations with the **ICS-ADL300** very simple.



Special adapter required
KIT KEY SD-CARD, cod. S574L.

ENCODER MANAGEMENT

The **ICS-ADL300** interfaces with all the main feedback devices:

ICS-ADL300, integrates as standard:

- Input for 5 Vdc TTL incremental digital encoder (Sincos version)
- Input for absolute SinCos encoder (Sincos version)
- Input for absolute Endat / SSI encoder (-ED version)

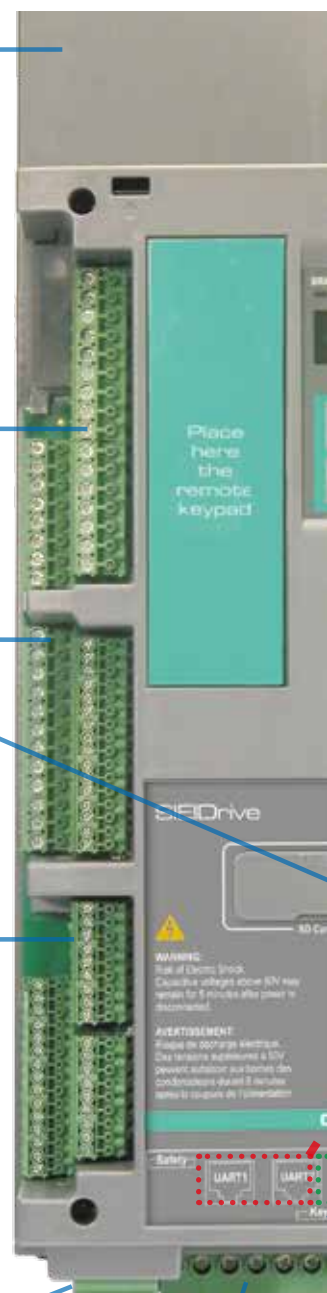
"SAFETY" INPUTS

for use with a single output contactor or in contactorless mode.

BACK-UP POWER SUPPLY

The **ICS-ADL300** guarantees operation even in the event of a power failure.

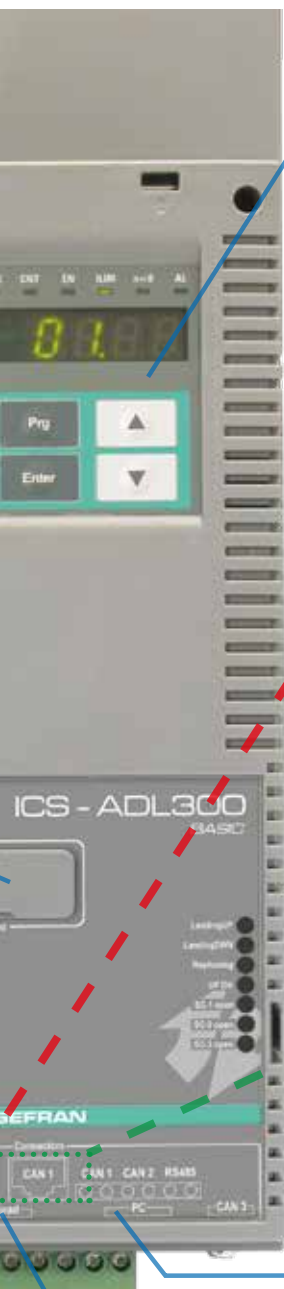
It features an automatic return-to-floor function managed by an external device such as UPS or buffer battery via a single phase 230V AC power supply (with EMS module).



INTEGRATED KEYPAD

The integrated programming keypad allows fast programming and immediate start-up.

- 1-line x 4-character alphanumeric LED display with sign
- Simple parameter modification
- Menu and individual parameters displayed in numerical format
- Fast navigation keys
- Alarms / messages and startup wizard displayed in text format
- Resetting of alarms from keypad.



CAN 1

CAN 2



ICS-FD
Floor display

CONFIGURATION TECHNOLOGY

For peer-to-peer programming via PC, **ICS-ADL300** integrates as standard the RS232 serial line with **Modbus RTU** protocol.

OPTIONAL PROGRAMMING KEYPAD

The optional KB-ADL programming keypad featuring full display of parameters and variables in 5 languages makes the **ICS-ADL300** 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).

The keypad can be used remotely from distances of up to 15 m. A 70 cm-long connection cable is supplied as standard.

Up to 5 sets of parameters can be saved using the KB-ADL keypad and sent to other drives.



- 5 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

TECHNICAL CHARACTERISTICS OF THE INVERTER

MODEL	ICS-ADL300-2T	ICS-ADL300-2M	ICS-ADL300-4
Control mode	Field Oriented Control	Field Oriented Control	Field Oriented Control
Power	5.5 ... 37kW	1.1 ... 5.5kW	4 ... 75kW
Voltage	3 x 200-230Vac, $\pm 10\%$ 50/60Hz	1 x 200 Vac, $\pm 10\%$ 1 x 230 Vac, $-15\%+10\%$ 50/60Hz	3 x 230-400-480Vac, $-15\%+10\%$, 50/60Hz
Motor type	Asynchronous / Synchronous	Asynchronous / Synchronous	Asynchronous / Synchronous
Speed control (Accuracy)	$\pm 0.01\%$ Motor rated speed (1)	$\pm 0.01\%$ Motor rated speed (1)	$\pm 0.01\%$ Motor rated speed (1)
Overload	up to 200% In * 10" (up to 11kW) up to 180% In * 10" (≥ 15 kW)	up to 200% In * 3"	up to 200% In * 10" (up to 22kW) up to 180% In * 10" (≥ 30 kW)
Max output frequency	300Hz	300Hz	300Hz
EMI filter	Integrated (ICS-ADL300.-F models) (EN 12015; EN 61800-3 category C2 and C3)	Optional external (EN 12015; EN 61800-3 category C2 and C3)	Integrated (ICS-ADL300.-F models) (EN 12015; EN 61800-3 category C2 and C3)
Choke	DC side choke: no AC side choke: external optional	no	DC side choke: integrated (sizes ≥ 4300), external optional on lower sizes AC side choke: external optional
Braking unit	Integrated up to 30kW with external resistor	Integrated with external resistor	Integrated up to 55kW with external resistor
Port for SD card	yes		
Dimensions for roomless applications	yes		
Emergency operation	Optional (UPS or buffer battery with EMS module)		
Max system speed	3.0 m/s	1.0 m/s	3.0 m/s
Serial communication	RS232 connector, used for programming (PC) and control (Modbus communication standard in all drives). RS485 connector (for optional keypad).		
Protection class	IP20		
Immunity / Emissions	In compliance with EN 12015 electromagnetic compatibility directive, using internal filter (ICS-ADL300-...-2M series with optional external filter)		
Operating temperature	$-10...+45^{\circ}\text{C}$ ($32^{\circ}...113^{\circ}\text{F}$), $+45^{\circ}\text{C}...+50^{\circ}\text{C}$ ($+113...+122^{\circ}\text{F}$) with derating		
Altitude	Max 2000 m. (up to 1000 m without derating)		
Markings	CE, Complies with the EC Directive concerning low voltage equipment (Directives LVD 2014/35/EC, EMC 2014/30/EC, Lift 2014/33/EC) cULus (UL508C)		

WEIGHTS AND DIMENSIONS

INVERTER	Dimensions: Width x Height x Depth		Weight	
	mm	inches	kg	lbs
ICS-ADL300-1...	162 x 343 x 188	6.38 x 13.50 x 7.4	5.8	12.8
ICS-ADL300-2...	162 x 396 x 188	6.38 x 15.59 x 7.4	7.8	17.2
ICS-ADL300-3...	235 x 401 x 208.4	9.25 x 15.79 x 8.21	10.5	23.5
ICS-ADL300-4...	267.6 x 616 x 305	10.53 x 24.25 x 12.01	32	70.6
ICS-ADL300-5...	311 x 767 x 360.4	12 x 30.2 x 14.18	60	132.3

CARDS	Dimensions: Width x Height x Depth		Weight	
	mm	inches	g	oz.
Car Roof (ICS-CR)	180 x 110 x 20	7.09 x 4.33 x 0.79	200	7.05
Car Operator (ICS-COP)	130 x 80 x 20	5.12 x 3.15 x 0.79	65	2.29

DISPLAY	Dimensions: Width x Height	
	mm	inches
Car Display (ICS-CD)	154 x 86	6.1 x 3.4
Simplex Floor Display (ICS-FD)	67.5 x 70	2.65 x 2.75

GF_eXpress PROGRAMMING SOFTWARE

GF_eXpress is the software tool used to configure all the drives available in the GEFran catalogue.

Product selection is immediate by mean of a drop down menu and thanks to the graphical interface the configuration is easy and intuitive.

Configure your Drive

The configuration of the drive is organized in various contextual menus, available in 6 different languages, where the operator through a graphical layout is guided step by step in the configuration process, with clear indication of the available parameters and the range of possible values to set.

The specific menu "Lift" groups all the parameters strictly related to the elevator systems. Divided by functional contexts, the setting of parameters about mechanical data, lift sequences, acceleration and deceleration ramps, multispeed setting, is fast and easy.

For the commissioning two modes are available: easy and expert, where the operator can select to perform a faster configuration with a limited set of parameters, or a refined configuration where the setting of more parameters is required.

The selected product can be configured using a text interface or a guided graphical interface.

To check and monitor the configuration, the integrated Oscilloscope can simultaneously monitor up to 8 curves.

The reference value for the curve being displayed can be selected from among all the variables that are available for the selected drive.



Save time with Wizard and Still Autotune

Thanks to the Wizard, the start-up of the motor is easy and fast by filling the parameters requested step by step.

The still autotune is quickly performed, avoiding operators to decouple the car from the ropes, assuring a safe working environment, and a faster commissioning.

Export your configuration

All details for configuration of each single device are sent out in XML format to facilitate expansion of the catalogue and parameters. The parameters can be exported and printed.



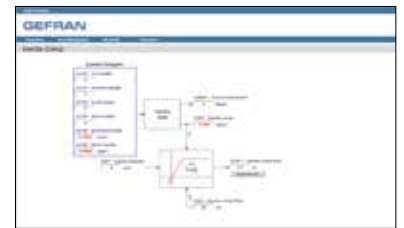
Customize the tool

Based on different needs and context, the tool allows to create and store recipes, where the configuration can be saved with a sub-set of configured parameters.

Custom parameter menus with a limited sub-set of data can be created, to enable a better and more effective device configuration.

It's possible the management of parameter archives for multiple configurations.

GF_eXpress is indisputably the perfect tool to allow a fast, flexible, intuitive and easy commissioning of the drive for the elevator systems.



TECHNICAL DATA

Operating systems:

> Windows © 2000, XP, Vista, Windows 7.

Minimum PC requirements:

- > Pentium class CPU
- > RAM 512 MB
- > Free space of > 200 MB
- > Graphic card min. VGA (1024x768)
- > N. 1 RS232 or USB serial port
- > N. 1 Ethernet port
- > CD-ROM drive

SOFTSCOPE: INTEGRATED SOFTWARE OSCILLOSCOPE

SoftScope is a software oscilloscope with synchronous sampling (buffered with a minimum sampling time of 1ms).

Using SoftScope the user can fast and easily display some specific variables.

To give an example: commissioning variables, variables to test performance of the systems, or variables to tune for control system optimization, can be monitored without the need of external oscilloscopes.

To understand if the approach to the floor is following the wished ramps or there is some rollback in the system, thanks to the SoftScope the analysis is faster and accurate.

It's possible to analyse the speed profile of the car showing details about actual floor approach, ramps, jerks.

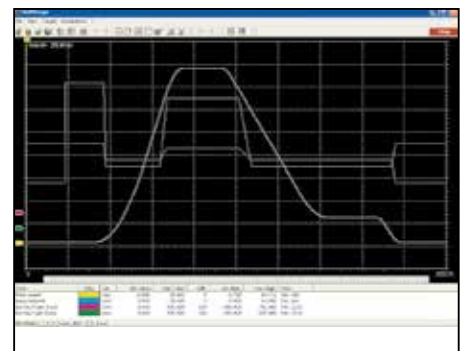
The curves can be displayed with different colours and they can be singularly enabled/disabled.

The zoom function allows enlargement of the details, while the cursor allows detection of the signal peaks and duration.

Trigger conditions (e.g. climbing leading edge of a specific signal), recording

quality (a multiple of the basic clock at 1ms), recording duration period are parameters that the tool allows to control.

The displayed curves can be printed and stored in ASCII format and can be used with the most common data processing tools (for example Excel, Matlab).



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CHOOSING THE INVERTER – INPUT DATA

SIZES - ICS-ADL300-...-4		1040	1055	2075	2110	3150	3185	3220	4300	4370	4450	5550	5750	
ULN • AC Input voltage	VAC	Three-phase network 230 - 400 - 480 Vac -15%+10%												
FLN • Input frequency	Hz	50/60 Hz, ± 5%												
Overvoltage threshold	VDC	820 VDC												
Undervoltage threshold	VDC	225 VDC (at 230 VAC); 391 VDC (at 400 VAC); 450 VDC (at 460 VAC); 470 VDC (at 480 VAC)												
DC-Link Capacity	µF	470	680	680	1020	1500	2250	2700	2350	2350	2800	4700	5600	
In • Effective input current (at In out)														
	at 230 VAC	A	12	17	23	31	42	50	55	55	72	89	97	136
	at 400 VAC	A	11	16	22	29	40	47	53	55	72	89	97	136
	at 480 VAC	A	10	15	20	26	37	45	50	49	65	81	89	122
THD with DC choke at I2n (according to EN 12015)		< 35%												
No-load consumption (Energy rating): Stand-by consumption “Fan Off”	W	20	20	20	20	20	20	20	25	25	25	25	25	

SIZES – ICS-ADL300-...-2T			2055	3075	3110	4150	4185	4220	5300	5370	
ULN • AC Input voltage	V _{AC}	Three-phase network: 200 Vac ±10%, 230 Vac ±10%									
FLN • Input frequency	Hz	50/60 Hz, ± 2%									
Overvoltage threshold	V _{DC}	500 V _{DC}									
Undervoltage threshold	V _{DC}	196 V _{DC} (@ 200 V _{AC}), 225 V _{DC} (@ 230 V _{AC}),									
DC-Link Capacity	μF		1020	1500	2700	2350	2350	2800	4700	5600	
In • AC input current without choke											
	@ 200-230 V _{AC}	A	31	42	53	55	72	89	97	136	
THD with DC choke @ I _{2n} (according to EN 12015)		< 35%									
No-load consumption (Energy rating): Stand-by consumption "Fan Off"	W		20	20	20	20	20	20	25	25	

SIZES - ICS-ADL300-...-2M		1011	1015	2022	2030	3040	3055
ULN • AC Input voltage	V _{AC}	Single-phase network: 1 x 200 -10%....+10%, 1 x 230 -15%....+10%					
FLN • Input frequency	Hz	50/60 Hz, ± 2%					
Overvoltage threshold	V _{DC}	410 Vdc					
Undervoltage threshold	V _{DC}	196 Vdc (@ 200 Vac); 225 Vdc (@ 230 Vac)					
DC-Link Capacity	μF	2200	2200	4050	4050	4950	4950
In • Effective input current (@ In out)							
	@ 230 Vac A	16	18	24	31	35	50
No-load consumption (Energy rating): Stand-by consumption “Fan Off”	W	20	20	20	20	20	20

CHOOSING THE INVERTER - OUTPUT DATA

SIZES - ICS-ADL300-...-4	1040	1055	2075	2110	3150	3185	3220	4300	4370	4450	5550	5750
In • Rated output current (fsw = default)												
	9	13.5	18.5	24.5	32	39	45	60	75	90	105	150
	9	13.5	18.5	24.5	32	39	45	60	75	90	105	150
	8.1	12.2	16.7	22	28.8	35.1	40.5	54	67.5	81	94	135
Pn mot (Recommended motor power, fsw = default)												
	2	3	4	5.5	7.5	9	11	15	18.5	22	30	37
	4	5.5	7.5	11	15	18.5	22	30	37	45	55	75
	5	7.5	10	15	20	25	30	40	50	60	75	100
Reduction factor *												
	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Overload	200% * 10 sec with output frequency more than 3 Hz 150% * 10 sec with output frequency less than 3 Hz							180% * 10 sec with output frequency more than 3 Hz 150% * 10 sec with output frequency less than 3 Hz				
	10											
Maximum Switching frequency	kHz											
U2 • Maximum output voltage	0.98 x ULN (ULN = AC Input voltage)											
f2 • Maximum output frequency	Hz											
IGBT braking unit	Standard internal (requires external resistor); braking torque 150% MAX											Optional External

SIZES - ICS-ADL300-...-2T	2055	3075	3110	4150	4185	4220	5300	5370
Rated output current CA (duty cycle 80%) @ U _{LN} =200-230 V _{AC} A @ U _{LN} =200-230 V _{AC} kVA								
	24.5	32	45	60	75	90	105	150
	9.8	12.8	17.9	23.9	29.9	35.8	41.8	59.8
P _N mot (Recommended motor power) @ U _{LN} =200-230 V _{AC} kW @ U _{LN} =200-230 V _{AC} Hp								
	5.5	7.5	11	15	18.5	22	30	37
	7.5	10	15	20	25	30	40	50
Reduction factor * K _T (2) K _{ALT} (3)								
	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Overload	200% *10 sec with output frequency more than 3 Hz 150% * 10 sec with output frequency less than 3 Hz						180% * 10 sec with out- put frequency more than 3 Hz 150% * 10 sec with output frequency less than 3 Hz	
Maximum Switching frequency	kHz 10 / 5 according to Heat-sink temperature							
U ₂ • Maximum output voltage	0.98 x U _{LN} (U _{LN} = AC Input voltage)							
f ₂ • Maximum output frequency	Hz 300							
IGBT braking unit	Standard internal (requires external resistor); braking torque 150% MAX							Optional External

* The derating factors shown in the table below are applied to the rated DC output by the user. They are not automatically implemented by the drive: I_{drive} = I_N x K_{alt} x K_t x K_v

(1) K_v : Derating factor for mains voltage at 460V_{AC} and power supply from AFE200.

(2) K_t : Derating factor for ambient temperature of 50°C (1% every °C above 45°C)

(3) K_{alt} : Derating factor for installation at altitudes above 1000 meters a.s.l. Value to be applied = 1.2% each 100 m increase above 1000 m.

E.g.: Altitude 2000 m, K_{alt} = 1.2% * 10 = 12% derating; I_N derated = (100 - 12) % = 88 % I_N

CHOOSING THE INVERTER – OUTPUT DATA

SIZES - ICS-ADL300-...-2M	1011	1015	2022	2030	3040	3055
In • Rated output current (fsw = default)						
@ ULN=230 VAC A	6	6.8	9.6	13	15	22
Pn mot (Recommended motor power, fsw = default)						
@ ULN=230 VAC kW	1.1	1.5	2.2	3	4	5.5
Hp	1.5	1.5 - 2	2 - 3	3	5	7.5
Reduction factor						
KT (1)	0.95	0.95	0.95	0.95	0.95	0.95
KALT (2)	1.2	1.2	1.2	1.2	1.2	1.2
Overload	200% * 3 sec with output frequency more than 3 Hz 150% * 3 sec with output frequency 0 ... 3 Hz					
Maximum Switching frequency	10					
U2 • Maximum output voltage	0.98 x ULN (ULN = AC Input voltage)					
f2 • Maximum output frequency	300					
IGBT braking unit	Standard internal (requires external resistor); braking torque 150% MAX					

* The derating factors shown in the table below are applied to the rated DC output by the user. They are not automatically implemented by the drive:

Idrive = In x Kalt x Kt

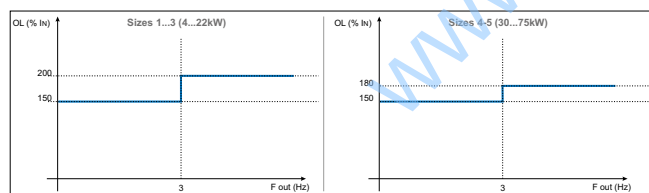
(1) Kt : Derating factor for ambient temperature of 50°C (1% every °C above 45°C)

(2) Kalt : Derating factor for installation at altitudes above 1000 meters a.s.l. Value to be applied = 1.2% each 100 m increase above 1000 m.

E.g.: Altitude 2000 m, Kalt = 1.2% * 10 = 12% derating; In derated = (100 - 12) % = 88 % In

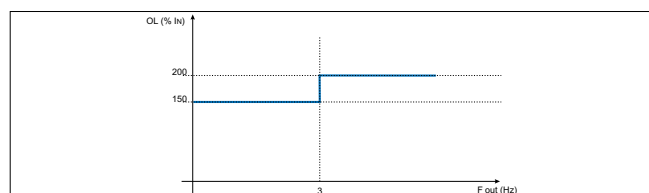
Derating values in overload condition (ICS-ADL300-...-4 / ICS-ADL300-...-2T)

In overload conditions the output current depends on the output frequency, as shown in the figure below.



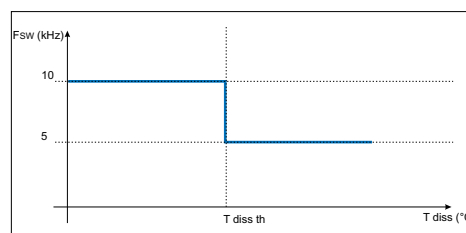
Derating values in overload condition (ICS-ADL300-...-2M)

In overload conditions the output current depends on the output frequency, as shown in the figure below.

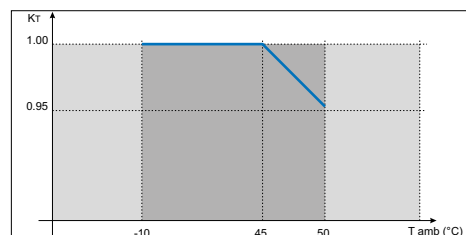


Derating values for switching frequency

The switching frequency is modified according to the temperature of the drive (measured on the heat sink), as shown in the figure below.



Ambient temperature reduction factor



Function not allowed
Range of ambient temperatures allowed

MODELS

MODELS	CODE	POWER [kW]	NOTE
ICS-ADL300-....-4 (3ph 230 - 400 - 480 Vac)			
ICS-ADL300-1040-KBL-4	S9ICS21	4	• Integrated keypad with LED display • Safety function • 8 Digital Inputs + Enable and 4 Relay Outputs • Integrated Braking unit • 5 Vdc TTL SinCos incremental digital encoder • Without EMI filter
ICS-ADL300-1055-KBL-4	S9ICS22	5,5	
ICS-ADL300-2075-KBL-4	S9ICS23	7.5	
ICS-ADL300-2110-KBL-4	S9ICS24	11	
ICS-ADL300-3150-KBL-4	S9ICS25	15	
ICS-ADL300-3185-KBL-4	S9ICS26	18.5	
ICS-ADL300-3220-KBL-4	S9ICS27	22	
ICS-ADL300-4300-KBL-4	S9ICS28	30	
ICS-ADL300-4370-KBL-4	S9ICS29	37	
ICS-ADL300-4450-KBL-4	S9ICS30	45	
ICS-ADL300-5550-KBL-4	S9ICS31	55	
ICS-ADL300-5750-KXL-4	S9ICS32	75	
ICS-ADL300-....-2T (3ph 200 - 230 Vac)			
ICS-ADL300-2055-KBL-2T	on request	5.5	• Integrated keypad with LED display • Safety function • 8 Digital Inputs + Enable and 4 Relay Outputs • Integrated Braking unit • 5 Vdc TTL SinCos incremental digital encoder • Without EMI filter • Without CAN
ICS-ADL300-3075-KBL-2T	on request	7.5	
ICS-ADL300-3110-KBL-2T	on request	11	
ICS-ADL300-4150-KBL-2T	on request	15	
ICS-ADL300-4185-KBL-2T	on request	18.5	
ICS-ADL300-4220-KBL-2T	on request	22	
ICS-ADL300-5300-KBL-2T	on request	30	
ICS-ADL300-5370-KXL-2T	on request	37	
ICS-ADL300-....-2M (1ph 200 - 230 Vac)			
ICS-ADL300-1011-KBL-2M	on request	1.1	• Integrated keypad with LED display • Safety function • 8 Digital Inputs + Enable and 4 Relay Outputs • Integrated Braking unit • 5 Vdc TTL SinCos incremental digital encoder • Without EMI filter • Without CAN
ICS-ADL300-1015-KBL-2M	on request	1.5	
ICS-ADL300-2022-KBL-2M	on request	2.2	
ICS-ADL300-2030-KBL-2M	on request	3	
ICS-ADL300-3040-KBL-2M	on request	4	
ICS-ADL300-3055-KBL-2M	on request	5.5	



ICS-ADL300B XXXX - KXL - F XX

Inverter Lift series
ICS-ADL300BMechanical dimensions of the
drive:

1 = size 1
2 = size 2
3 = size 3
4 = size 4
5 = size 5

Inverter power in kW:

004 = 0.4 kW
007 = 0.75 kW
015 = 1.5 kW
022 = 2.2 kW
037 = 3.7 kW
055 = 5.5 kW
075 = 7.5 kW
110 = 11.0 kW

Rated voltage:
2M=230 Vac, 1ph
2T=230 Vac, 3ph
4=400 Vac, 3ph

EMI FILTER:
F = included
(empty) = not included

Lift application:
L = included

Braking unit:
X = not included
B = included

Keypad:
K = Integrated
(1-line x 4-character alphanumeric LED display)

They are available on request versions with encoder Endat and versions with integrated EMI filter.

ACCESSORIES & OPTIONS

KEYPAD

	Models	Code	Description
	KB-ADL	S5P2T	Programming keypad with memory
	5-meter keypad cable	8S8F59	5-meter keypad extension
	10-meter keypad cable	8S874C	10-meter keypad extension

EXTERNAL BRAKING UNIT

	Models	Code	Description
	BUy 1020	S9D55	Braking unit for 230Vac...480Vac lines, In= 20Arms, UL mark
	BUy 1050	S9D56	Braking unit for 230Vac...480Vac lines, In= 50Arms, UL mark
	BUy 1085	S9D57	Braking unit for 230Vac...480Vac lines, In= 85Arms, UL mark

OTHERS

	Models	Code	Description
	KIT KEY SD-CARD	S72644	Adapter for SD card (memory for loading data)
	KIT-POWER-SHIELD	S726101	Power cable shielding kit for sizes 1 and 2
	KIT-POWER-SHIELD	S726501	Power cable shielding kit for size 3

DISPLAY

	Models	Code	Description
	ICS-FD	on request	Floor Display
	ICS-CD	on request	Car Display

There are a wide range of displays and control panels, for information contact the Gefran Sales Department.

INPUT SIDE EXTERNAL FUSES			DC INPUT EXTERNAL FUSES	
Sizes ICS-ADL300-...-4	Europe		Europe	
	Model	Code	Model	Code
1040	GRD2/20	F4D15	GRD2/16	F4D14
1055	GRD2/25	F4D16	GRD2/16	F4D14
2075	GRD3/35	F4D20	GRD2/20	F4D15
2110	Z22GR40	F4M16	GRD3/35	F4D20
3150	Z22GR63	F4M17	GRD3/50	F4D21
3185	Z22GR80	F4M19	GRD3/50	F4D21
3220	Z22GR80	F4M19	S00C+/üf1/80/80A/690V	F4EAF
4300	Z22GR80	F4M19	S00C+/üf1/80/80A/690V	F4EAF
4370	Z22GR100	F4M21	S00C+/üf1/80/100A/690V	F4G18
4450	Z22GR100	F4M21	S00C+/üf1/80/125A/690V	F4EAJ
5550	S00/üf1/80/200A/690V	F4G23	S00C+/üf1/80/160A/690V	F4EAL
5750	S00/üf1/80/200A/690V	F4G23	S00/üf1/80/200A/690V	F4G23

INPUT SIDE EXTERNAL FUSES		
Sizes ICS-ADL300-...-2T	Europe	
	Model	Code
2055	GRD2/25	F4D16
3075	GRD3/35	F4D20
3110	Z22GR40	F4M16
4150	Z22GR63	F4M17
4185	Z22GR80	F4M19
4220	Z22GR80	F4M19
5300	Z22GR80	F4M19
5370	Z22GR100	F4M21
-2M		
1011	GRD2/25	F4D16
1015	GRD2/25	F4D16
2022	GRD3/35	F4D20
2030	Z22GR40	F4M16
3040	Z22GR63	F4M17
3055	Z22GR80	F4M19

Technical data for fuses, including dimensions, weights, power leakage, fuse carriers etc. are reported in the corresponding manufacturers' data sheets:

GRD... , Z22... , S... Jean Müller, Eltville
A70... Ferraz
FWP... Bussmann

	Sizes ICS-ADL300		Rated Choke [mH]	Rated current [A]	Saturation current [A]	Model	Code	Dimensions: W x H x D mm [inches]	Weight kg [lbs]
	...-4	...-2T							
INPUT CHOKE	1040	-	1.63	9	18	LR3y-2040	S7AAG	120 x 125 x 65 [4.7 x 4.9 x 2.6]	2 [4.4]
	1055	2055	1.29	13.5	24.5	LR3y-2055	S7AB5	120 x 125 x 75 [4.7 x 4.9 x 2.6]	2.2 [4.4]
	2075	3075	0.89	18	36.5	LR3y-2075	S7AB6	150 x 155 x 79 [5.9 x 6.1 x 3.1]	4.9 [10.8]
	2110	3110	0.68	24	46.5	LR3y-3110	S7AB7	150 x 155 x 79 [5.9 x 6.1 x 3.1]	5 [11]
	3150	4150	0.51	32	61	LR3y-3150	S7AB8	150 x 169 x 85 [5.9 x 6.7 x 3.3]	5.5 [12.1]
	3185	4185	0.35	39	83	LR3-022	S7FF4	180 x 182 x 130 [7.1 x 7.2 x 5.1]	7.8 [17.2]
	3220	4220	0.35	44.5	83	LR3-022	S7FF4	180 x 182 x 130 [7.1 x 7.2 x 5.1]	7.8 [17.2]
	4300	5300	0.24	53	124	LR3-030	S7FF3	180 x 160 x 185 [7.1 x 6.30 x 7.3]	8.2 [18.1]
	4370	5370	0.18	70	154	LR3-037	S7FF2	180 x 160 x 185 [7.1 x 6.30 x 7.3]	9.5 [20.9]
	4450	-	0.13	85	214	LR3-055	S7FF1	180 x 180 x 185 [7.1 x 7.1 x 7.3]	12 [26.5]
	5550	-	0.148	93	350	LR3-090	S7D19	300 x 205 x 265 [11.8 x 8.1 x 10.4]	30 [66.1]
	5750	-	0.148	130	350	LR3-090	S7D19	300 x 205 x 265 [11.8 x 8.1 x 10.4]	30 [66.1]
OUTPUT CHOKE	1040	-	0.87	16	34	LU3-005	S7FG3	180 x 170 x 110 [7.1 x 6.7 x 4.3]	5.8 [12.8]
	1055	2055	0.87	16	34	LU3-005	S7FG3	180 x 170 x 110 [7.1 x 6.7 x 4.3]	5.8 [12.8]
	2075	3075	0.51	27	57	LU3-011	S7FG4	180 x 180 x 130 [7.1 x 7.1 x 5.1]	8 [17.6]
	2110	3110	0.51	27	57	LU3-011	S7FG4	180 x 180 x 130 [7.1 x 7.1 x 5.1]	8 [17.6]
	3150	4150	0.43	32	68	LU3-015	S7FH2	180 x 160 x 170 [7.1 x 6.3 x 6.7]	7.5 [16.5]
	3185	4185	0.33	42	72	LU3-022	S7FH3	180 x 160 x 170 [7.1 x 6.3 x 6.3]	8 [17.6]
	3220	4220	0.33	42	72	LU3-022	S7FH3	180 x 160 x 170 [7.1 x 6.3 x 6.3]	8 [17.6]
	4300	5300	0.24	65	112	LU3-030	S7FH4	180 x 170 x 185 [7.1 x 6.3 x 7.3]	10 [22]
	4370	5370	0.18	80	140	LU3-037	S7FH5	180 x 170 x 185 [7.1 x 6.3 x 7.3]	10 [22]
	4450	-	0.12	120	205	LU3-055	S7FH6	240 x 170 x 216 [9.4 x 6.3 x 8.5]	16 [35.3]
	5550	-	0.12	120	205	LU3-055	S7FH6	240 x 170 x 216 [9.4 x 6.3 x 8.5]	16 [35.3]
	5750	-	0.07	200	330	LU3-090	S7FI0	180 x 195 x 165 [7.1 x 7.7 x 4.5]	15 [33.1]

ACCESSORIES & OPTIONS

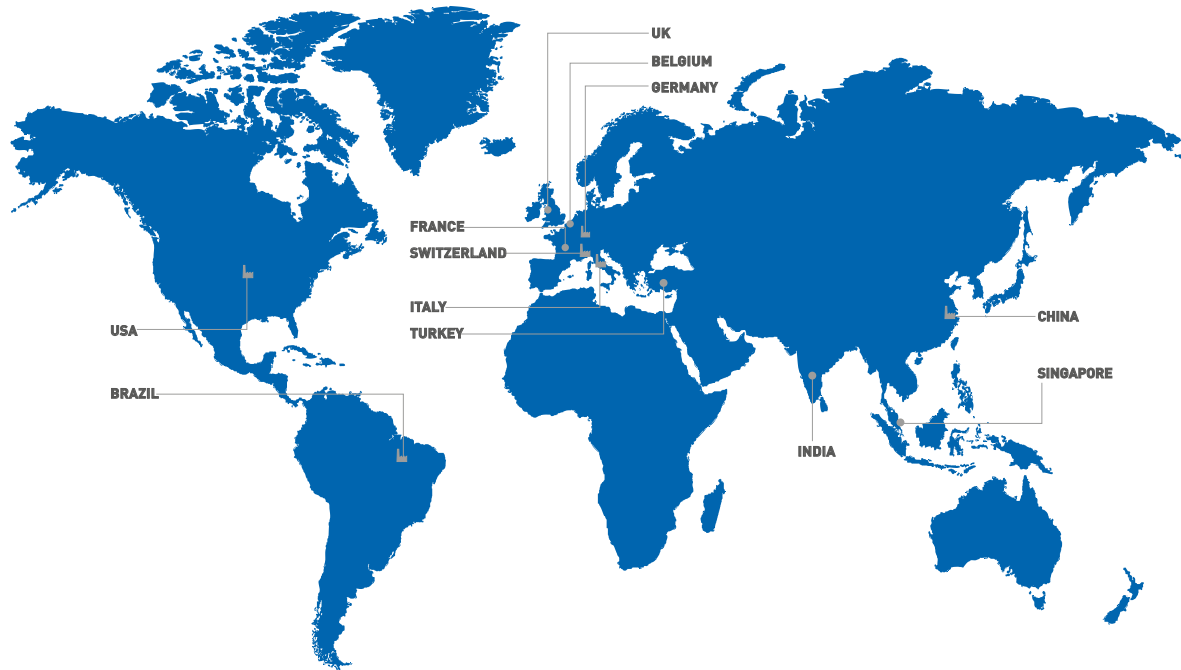
Sizes ICS-ADL300		Filter type (AC mains voltage 400 Vac $\pm 10\%$)	Code	Conducted emissions according to EN 12015-EN 61800-3 : Category / Motor cable length	Dimensions: W x H x D mm [inches]	Weight kg [lbs]
EMC FILTER	---4	...-2T				
	1040	-	EMI-FTF-480-7	S7GHL	190 x 40 x 70 [7.48 x 1.57 x 2.76]	0.6 [1.3]
	1055	2055	EMI-FTF-480-16	S7GHO	250 x 45 x 70 [9.84 x 1.77 x 2.76]	0.8 [1.8]
	2075	3075	EMI-FTF-480-16	S7GHO	250 x 45 x 70 [9.84 x 1.77 x 2.76]	0.8 [1.8]
	2110	3110	EMI-FTF-480-30	S7GHP	270 x 50 x 85 [10.63 x 1.97 x 3.35]	1 [2.2]
	3150	4150	EMI-FTF-480-30	S7GHP	270 x 50 x 85 [10.63 x 1.97 x 3.35]	1 [2.2]
	3185	4185	EMI-FTF-480-42	S7GOA	310 x 50 x 85 [12.20 x 1.97 x 3.35]	1.3 [2.9]
	3220	4220	EMI-FTF-480-42	S7GOA	310 x 50 x 85 [12.20 x 1.97 x 3.35]	1.3 [2.9]
	4300	5300	EMI-FTF-480-75	S7GOC	270 x 80 x 135 [10.63 x 3.15 x 5.31]	2.6 [5.7]
	4370	5370	EMI-FTF-480-75	S7GOC	270 x 80 x 135 [10.63 x 3.15 x 5.31]	2.6 [5.7]
	4450	-	EMI-FTF-480-100	S7GOD	270 x 90 x 150 [10.63 x 3.54 x 5.91]	3 [6.6]
	5550	-	EMI-FTF-480-130	S7GOE	270 x 90 x 150 [10.63 x 3.54 x 5.91]	3.6 [7.9]
	5750	-	EMI-FTF-480-180	S7GOF	400 x 120 x 170 [15.75 x 4.72 x 6.69]	6.2 [13.7]
	---2M					
	1011		EMI-FN2410-230-25	S7EMI1	130 x 93 x 76 [5.12 x 3.66 x 2.99]	-
	1015		EMI-FN2410-230-25	S7EMI1	130 x 93 x 76 [5.12 x 3.66 x 2.99]	-
	2022		EMI-FN2410-230-32	S7EMI2	130 x 93 x 76 [5.12 x 3.66 x 2.99]	-
	2030		EMI-FN2410-230-32	S7EMI2	130 x 93 x 76 [5.12 x 3.66 x 2.99]	-
	3040		EMI-FN2410-230-45	S7EMI3	130 x 93 x 76 [5.12 x 3.66 x 2.99]	-
	3055		EMI-FN2410-230-60	S7EMI4	165 x 115 x 100 [6.5 x 4.52 x 3.93]	-

Sizes ICS-ADL300		Ebr [1] [kJ]	Ebr [2] [kJ]	Pnbr [W]	Rbr [Ω]	Encl.	Resistor type	Code	Dimensions: W x H x D mm [inches]	Weight kg [lbs]
BRAKING RESISTORS (SPEED RANGE ≤ 1 m/s)	---4									
	1040	7.5	38	750	100	IP44	RFPD 750 DT 100R	S8SY4	200 x 70 x 108 [7.9 x 2.8 x 4.17]	1.7 [3.75]
	1055	7.5	38	750	68	IP44	RFPR 750 D 68R	S8SZ3	245 x 75 x 100 [9.6 x 2.95 x 3.9]	2.7 [5.95]
	2075	7.5	28	750	68	IP44	RFPR 750 D 68R	S8SZ3	245 x 75 x 100 [9.6 x 2.95 x 3.9]	2.7 [5.95]
	2110	7.5	28	1200	49	IP44	RFPR 1200 D 49R	S8SZ4	310 x 75 x 100 [12.2 x 2.95 x 3.9]	3.2 [7.1]
	3150	19	75	1500	28	IP44	RFPR 1900 D 28R	S8SZ5	365 x 75 x 100 [14.4 x 2.95 x 3.9]	4.2 [9.3]
	3185	40	150	4000	15.4	IP20	BRT4K0-15R4	S8T00G	625 x 100 x 250 [24.6 x 3.9 x 9.8]	7.0 [15.43]
	3220	40	150	4000	15.4	IP20	BRT4K0-15R4	S8T00G	625 x 100 x 250 [24.6 x 3.9 x 9.8]	7.0 [15.43]
	4300	40	150	4000	11.6	IP20	BRT4K0-11R6	S8T00H	625 x 100 x 250 [24.6 x 3.9 x 9.8]	7.0 [15.43]
	4370	40	150	4000	11.6	IP20	BRT4K0-11R6	S8T00H	625 x 100 x 250 [24.6 x 3.9 x 9.8]	7.0 [15.43]
	4450	40	150	8000	7.7	IP20	BRT8K0-7R7	S8T00I	625 x 165 x 250 [24.6 x 6.5 x 9.8]	10.0 [22.04]
	5550	40	150	8000	7.7	IP20	BRT8K0-7R7	S8T00I	625 x 165 x 250 [24.6 x 6.5 x 9.8]	10.0 [22.04]
	5750	External braking unit (BUy series, optional)								
	...-2T									
	2055	12	43	1200	49	IP44	RFPR 1200 D 49R	S8SZ4	310 x 75 x 100 [12.2 x 2.95 x 3.9]	3.2 [7.1]
	3075	19	75	1500	28	IP44	RFPR 1900 D 28R	S8SZ5	365 x 75 x 100 [14.4 x 2.95 x 3.9]	4.2 [9.3]
	3110	40	150	4000	15.4	IP20	BRT4K0-15R4	S8T00G	625 x 100 x 250 [24.6 x 3.9 x 9.8]	7.0 [15.43]
	4150	40	150	4000	11.6	IP20	BRT4K0-11R6	S8T00H	625 x 100 x 250 [24.6 x 3.9 x 9.8]	7.0 [15.43]
	4185	40	150	4000	11.6	IP20	BRT4K0-11R6	S8T00H	625 x 100 x 250 [24.6 x 3.9 x 9.8]	7.0 [15.43]
	4220	40	150	8000	7.7	IP20	BRT8K0-7R7	S8T00I	625 x 165 x 250 [24.6 x 6.5 x 9.8]	10.0 [22.04]
	5300	40	150	8000	7.7	IP20	BRT8K0-7R7	S8T00I	625 x 165 x 250 [24.6 x 6.5 x 9.8]	10.0 [22.04]
	5370	External braking unit (BUy series, optional)								
	...-2M									
	1011	1.5	11	200	100	IP44	RF 220 T 100R	S8T0CE	300 x 27 x 36 [8.7 x 1.06 x 1.41]	0.5 [1.10]
	1015	1.5	11	200	68	IP44	RF 220 T 68R	S8T00T	300 x 27 x 36 [8.7 x 1.06 x 1.41]	-
	2022	2.5	24	300	34	IP44	RF 300 D 34R	S8T0CH	260 x 38 x 106 [10.24 x 1.5 x 4.17]	1.4 [3.09]
	2030	2.5	24	300	34	IP44	RF 300 D 34R	S8T0CH	260 x 38 x 106 [10.24 x 1.5 x 4.17]	1.4 [3.09]
	3040	4.5	43	750	26	IP44	RFPD 750 DT 26R	S8T0CZ	200 x 70 x 106 [7.9 x 2.8 x 4.17]	1.7 [3.75]
	3055	4.5	43	750	26	IP44	RFPD 750 DT 26R	S8T0CZ	200 x 70 x 106 [7.9 x 2.8 x 4.17]	1.7 [3.75]

[1] Max overload energy, 1" - duty-cycle 10%.
[2] Max overload energy, 30" - duty-cycle 25%.

NOTE

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