SIEIDrive LIFT

Lift vector AC Drives

AGy -L

....Instruction manual

GEFRAN

Table of Contents

English

Safety Symbol Legend

Warning	Indicates a procedure, condition, or statement that, if not strictly observed, could result in personal injury or death.
Caution	Indicates a procedure, condition, or statement that, if not strictly observed, could result in damage to or destruction of equipment.
Attention	Indicates a procedure, condition, or statement that should be strictly followed in order to optimize these applications.
Note!	Indicates an essential or important procedure, condition, or statement.

1 - Safety Precautions

Warning

According to the EEC standards the AGy -L and accessories must be used only after checking that the machine has been produced using those safety devices required by the 89/392/EEC set of rules, as far as the machine industry is concerned. These standards do not apply in the Americas, but may need to be considered in equipment being shipped to Europe.

drive systems cause mechanical motion. It is the responsibility of the user to insure that any such motion does not result in an unsafe condition. Factory provided interlocks and operating limits should not be bypassed or modified.

Electrical Shock and Burn Hazard:

When using instruments such as oscilloscopes to work on live equipment, the oscilloscope's chassis should be grounded and a differential amplifier input should be used. Care should be used in the selection of probes and leads and in the adjustment of the oscilloscope so that accurate readings may be made. See instrument anufacturer's instruction book for proper operation and adjustments to the instrument.

Fire and Explosion Hazard:

Fires or explosions might result from mounting Drives in hazardous areas such as locations where flammable or combustible vapors or dusts are present. Drives should be installed away from hazardous areas, even if used with motors suitable for use in these locations.

Strain Hazard:

Improper lifting practices can cause serious or fatal injury. Lift only with adequate equipment and trained personnel.

Drives and motors must be ground connected according to the NEC.

Replace all covers before applying power to the drive. Failure to do so may result in death or serious injury.

Adjustable frequency drives are electrical apparatus for use in industrial installations. Parts of the Drives are energized during operation. The electrical installation and the opening of the device should therefore only be carried out by qualified personnel. Improper installation of motors or Drives may therefore cause the failure of the device as well as serious injury to persons or material damage. drive is not equipped with motor overspeed protection logic other than that controlled by software. Follow the instructions given in this manual and observe the local and national safety regulations applicable.

Always connect the drive to the protective ground (PE) via the marked connection terminals (PE2) and the housing (PE1). AGy -L Drives and AC Input filters have ground discharge currents greater than 3.5 mA. EN 50178 specifies that with discharge currents greater than 3.5 mA the protective conductor ground connection (PE1) must be fixed type and doubled for redundancy.

The drive may cause accidental motion in the event of a failure, even if it is disabled, unless it has been disconnected from the AC input feeder.

Never open the device or covers while the AC Input power supply is switched on. Minimum time to wait before working on the terminals or inside the device is listed in section 1.1.

Warning

If the front plate has to be removed because of ambient temperature higher than 40 degrees, the user has to ensure that no occasional contact with live parts may occur.

Do not connect power supply voltage that exceeds the standard specification voltage fluctuation permissible. If excessive voltage is applied to the drive, damage to the internal components will result.

Caution

Do not operate the drive without the ground wire connected. The motor chassis should be grounded to earth through a ground lead separate from all other equipment ground leads to prevent noise coupling.

The grounding connector shall be sized in accordance with the NEC or Canadian Electrical Code.

The connection shall be made by a UL listed or CSA certified closed-loop terminal connector sized for the wire gauge involved. The connector is to be fixed using the crimp tool specified by the connector manufacturer.

Do not perform a megger test between the drive terminals or on the control circuit terminals.

Because the ambient temperature greatly affects drive life and reliability, do not install the drive in any location that exceeds the allowable temperature. Leave the ventilation cover attached for temperatures of 104° F (40° C) or below.

If the Drive's Fault Alarm is activated, consult the chapter 10. TROUBLESHOOTING of this instruction book, and after correcting the problem, resume operation. Do not reset the alarm automatically by external sequence, etc.

Be sure to remove the desicant dryer packet(s) when unpacking the drive. (If not removed these packets may become lodged in the fan or air passages and cause the drive to overheat).

The drive must be mounted on a wall that is constructed of heat resistant material. While the drive is operating, the temperature of the Drive's cooling fins can rise to a temperature of 194° F (90°C).

Do not touch or damage any components when handling the device. The changing of the isolation gaps or the removing of the isolation and covers is not permissible.

Protect the device from impermissible environmental conditions (temperature, humidity, shock etc.)

No voltage should be connected to the output of the drive (terminals U2, V2 W2). The parallel connection of several drives via the outputs and the direct connection of the inputs and outputs (bypass) are not permissible.

A capacitative load (e.g. Var compensation capacitors) should not be connected to the output of the drive (terminals U2, V2, W2).

The electrical commissioning should only be carried out by qualified personnel, who are also responsible for the provision of a suitable ground connection and a protected power supply feeder in accordance with the local and national regulations. The motor must be protected against overloads.

No dielectric tests should be carried out on parts of the drive. A suitable measuring instrument (internal resistance of at least 10 kΩ/V) should be used for measuring the signal voltages.

In case of a three phase supply not symmetrical to ground, an insulation loss of one of the devices connected to the same network can cause functional problem to the drive, if the use of a delta/wye transformer is avoided (see par. 3.4).

Note!

If the Drives have been stored for longer than two years, the operation of the DC link capacitors may be impaired and must be "reformed".

Before commissioning devices that have been stored for long periods, connect them to a power supply for two hours with no load connected in order to regenerate the capacitors, (the input voltage has to be applied without enabling the drive).

Note!

The terms "Inverter", "Controller" and "Drive" are sometimes used interchangably throughout the industry. We will use the term "drive" in this document.

English

1.1 Discharge time of the DC-Link

Type	I_{2N}	Time (seconds)
2040	8.3	205
2055	11	
2075	15.4	
3110	21.6	220
3150	28.7	
4185	34	60
4221	40	
4301	54	
4371	68	90
5450	81	120
5550	99	
6750	124	
7900	161	
71100	183	
71320	218	
81600	282	
82000	348	

tab030g

Tabella 1.1 DC Link Discharge Times

This is the minimum time that must be elapsed since a drive is disconnected from the AC Input before an operator may service parts inside the drive to avoid electric shock hazard.

Condition: These values consider a turn off for a drive supplied at 480Vac +10%, without any option, (the charge for the switching supply is the regulation card, the keypad and the 24Vdc fans “if mounted”).
The drive is disabled. This represents the worst case condition.

2 - Introduction

AGy -L is a series of dedicated drives used to control lift asynchronous motors ranging from 4.0 to 200 kW.
Thanks to the special lift application software, it is best used in case of plant modernization and, in general, in all open loop applications up to 1 m/s and higher in all closed loop applications, by using EXP-ENC-AGy option.

The easy and adaptable programming procedure can be managed via the alphanumeric keyboard or via the PC configurator and it allows the drive fast commissioning.

Available options on demand:

- External EMC input filters
- External Input / Output chokes
- External braking resistors (connected between terminals C and BR1)
- Multilingual programming keypad complete with alphanumeric display: KBG-LCD-L (IT-ENG) (cod. S504K)
- Remote keypad kit
- E2PROM PRG-KEY key (cod. S6F38)
- I/O expansion card: EXP-D6A1R1-AGy (cod. S524L)
- 120 Vac digital input interface card: EXP-D8-120 (cod. S520L)
- Profibus interface card: SBI-PDP-AGy (cod. S5H28)
- Emergency Module MW22.

3 - Environment

3.1 Environmental Conditions

T_A Ambient temperature	[°C]	0 ... +40; +40...+50 with derating,
	[°F]	32 ... +104; +104...+122 with derating
Installation location		Pollution degree 2 or better (free from direct sunligth, vibration, dust, corrosive or inflammable gases, fog, vapour oil and dripped water, avoid saline environment)
Installation altitude		Up to 1000m (3281 feet) above sea level; for higher altitudes a current reduction of 1.2% for every 100m (328 feet) of additional height applies.
Operation temperature (1)		0...40°C (32°...104°F)
Operation temperature (2)		0...50°C (32°...122°F)
Air humidity (operation)		5 % to 85 %, 1 g/m³ to 25 g/m³ without moisture condensation or icing (Class 3K3 as per EN50178)
Air pressure (operation)	[kPa]	86 to 106 (Class 3K3 as per EN50178)

(1) Over 40°C (104°F): - current reduction of 2% of rated output current per K
- remove front plate (better than class 3K3 as per EN50178).

(2) - Current derated to 0.8 rated ouput current
- Over 40°C (104°F): removal of the top cover (better than class 3K3 as per EN50178)

3.2 Storage and transport

Temperature:

storage		-25...+55°C (-13...+131°F), (class 1K4 as per EN50178)
		-20...+55°C (-4...+131°F), for devices with keypad
transport		-25...+70°C (-13...+158°F), class 2K3 as per EN50178,
		-20...+60°C (-4...+140°F), for devices with keypad

Air humidity :

storage		5% to 95 %, 1 g/m³ to 29 g/m³ (Class 1K3 as per EN50178)
transport:		95 % (3) 60 g/m (4)
		A light condensation of moisture may occur for a short time occasionally if the device is not in operation (class 2K3 as per EN50178)

Air pressure:

storage	[kPa]	86 to 106 (class 1K4 as per EN50178)
transport	[kPa]	70 to 106 (class 2K3 as per EN50178)

(3) Greatest relative air humidity occurs with the temperature @ 40°C (104°F) or if the temperature of the device is brought suddenly from -25 ...+30°C (-13°...+86°F).

(4) Greatest absolute air humidity if the device is brought suddenly from 70...15°C (158°...59°F).

3.3 Standard

General standards	EN 61800-1, IEC 143-1-1.
Safety	EN 50178, UL 508C
Climatic conditions	EN 60721-3-3, class 3K3. EN 60068-2-2, test Bd.
Clearance and creepage	EN 50178, UL508C, UL840. Overvoltage category for mains connected circuits: III; degree of pollution 2
Vibration	EN 60068-2-6, test Fc.
EMC compatibility	EN61800-3:2004
Rated input voltages	IEC 60038
Protection degree	IP20 according to EN 60529
	IP54 for the cabinet with externally mounted heatsink, only for sizes from 2040 to 3150
Approvals	CE, UL, cUL.

English

3.4 Input

Type		2040	2055	2075	3110	3150	4185	4220	4300	4370	5450	5550	6750	7900	71100	71320	81600	82000
U_{LN} AC Input voltage	[V]	230 V -15% … 480 V +10%, 3Ph																
AC Input frequency	[Hz]	50/60 Hz ±5%																
I_N AC Input current for continuous service :																		
- Connection with 3-phase reactor																		
@ 230Vac; IEC 146 class 1	[A]	7	9.5	14 *	18.2	25 *	32.5	39	55	69	84	98	122	158	192	220	275	n.a.
@ 400Vac; IEC 146 class 1	[A]	7.9	10.7	15.8 *	20.4	28.2 *	36.7	44	62	77	94	110	137	177	216	247	309	365
@ 460Vac; IEC 146 class 1	[A]	7	9.3	13.8 *	17.8	24.5 *	32.5	37	53	66	82	96	120	153	188	214	268	318
- Connection without 3-phase reactor																		
@ 230Vac; IEC 146 class 1	[A]	11	15.5	21.5 *	27.9	35.4 *	For these types an external inductance is recommended											
@ 400Vac; IEC 146 class 1	[A]	12	16.9	24.2 *	30.3	40 *												
@ 460Vac; IEC 146 class 1	[A]	10.4	14.7	21 *	26.4	34.8 *												
Max short circuit power without line reactor (Zmin=1%)	[kVA]	650	850	1200	1700	2250	2700	3200	4200	5500	6400	7900	9800	12800	14500	17300	22400	27700
Overvoltage threshold (Overvoltage)	[V]	440VDC (for 230VAC mains), 820VDC (for 400VAC mains), 820VDC (for 460VAC mains)																
Undervoltage threshold (Undervoltage)	[V]	230VDC (for 230VAC mains), 380VDC (for 400VAC mains), 415VDC (for 460VAC mains)																
Braking IGBT Unit Standard internal (with external resistor); MAX Braking torque:		150%		70%	90%		150%											

input-g

*: For the specified power sizes, the external reactor is strongly recommended

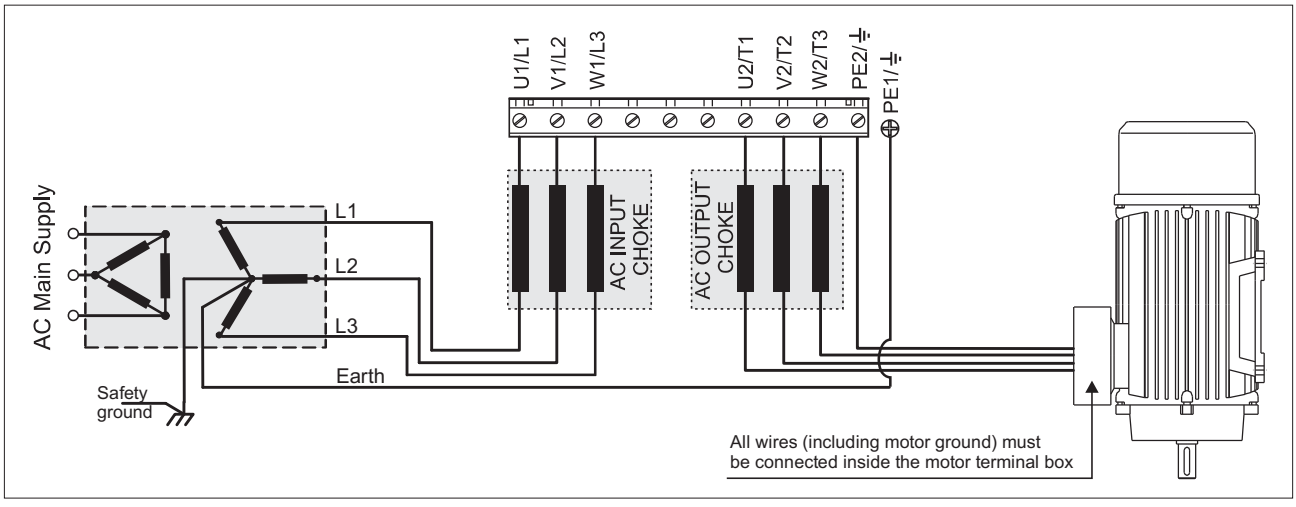
Power Supply and Grounding

1) Drives are designed to be powered from standard three phase lines that are electrically symmetrical with respect to ground (TN or TT network).
2) In case of supply with IT network, the use of delta/wye transformer is mandatory, with a secondary three phase wiring referred to ground.

Caution

In case of a three phase supply not symmetrical to ground, an insulation loss of one of the devices connected to the same network can cause functional problem to the drive, if the use of a delta/wye transformer is avoided.

Please refer to the following connection sample.



Mains connection and inverter output

The drivea must be connected to an AC mains supply capable of delivering a symmetrical short circuit current lower or equal to the values indicated on table. For the use of an AC input choke see chapter 4.

Note from the table the allowable mains voltages. The cycle direction of the phases is free.
Voltages lower than the min. tolerance values can cause the block of the inverter.

Adjustable Frequency Drives and AC Input filters have ground discharge currents greater than 3.5 mA. EN 50178 specifies that with discharge currents greater than 3.5 mA the protective conductor ground connection (PE1) must be fixed type.

AC Input Current

Note! The Input current of the drive depends on the operating state of the connected motor. The tables (chapter 3.4) shows the values corresponding to rated continuous service, keeping into account typical output power factor for each size.

3.5 AC Output

Type		2040	2055	2075	3110	3150	4185	4221	4301	4371	5450	5550	6750	7900	71100	71320	81600	82000
Inverter Output (IEC 146 class1), Continuous service (@ 400Vac)	[kVA]	6.5	8.5	12	16.8	22.4	26.5	32	42	55	64	79	98	128	145	173	224	277
Inverter Output (IEC 146 class 2) 150% overload for 60s (@ 400Vac)	[kVA]	5.9	7.7	10.9	15.3	20.3	24.1	29	38.2	50	58.3	72	89.2	116.5	132	157.5	204	252
P_N mot (recommended motor output):																		
@ U_{LN}=230Vac; f_{SW}=default; IEC 146 class 1	[kW]	2.2	3	4	5.5	7.5	10	11	18.5	22	22	30	37	55	55	75	90	100
@ U_{LN}=230Vac; f_{SW}=default; IEC 146 class 2	[kW]	2.2	3	4	5.5	7.5	9	11	15	18.5	22	30	37	45	55	55	90	100
@ U_{LN}=230Vac; f_{SW}=default; IEC 146 class 1	[Hp]	3	4	5	7.5	10	10	15	25	30	30	40	50	75	75	100	125	125
@ U_{LN}=230Vac; f_{SW}=default; IEC 146 class 2	[Hp]	3	4	5	7.5	10	10	15	20	25	30	40	50	60	75	75	100	125
@ U_{LN}=400Vac; f_{SW}=default; IEC 146 class 1	[kW]	4	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	160	200
@ U_{LN}=400Vac; f_{SW}=default; IEC 146 class 2	[kW]	4	5.5	7.5	11	15	18.5	22	30	37	45	55	55	90	90	110	160	200
@ U_{LN}=460Vac; f_{SW}=default; IEC 146 class 1	[Hp]	5	7.5	10	15	20	25	30	40	50	60	75	100	125	150	150	200	250
@ U_{LN}=460Vac; f_{SW}=default; IEC 146 class 2	[Hp]	5	7.5	10	15	20	20	25	30	40	50	60	75	100	125	150	200	250
U_2 Max output voltage	[V]	0.94 x U_{LN} (AC Input voltage)																
f_2 Max output frequency	[Hz]	500									200							
I_{2N} Rated output current:																		
@ U_{LN}=230-400Vac; f_{SW}= default; IEC 146 class 1	[A]	9.6	12.6	17.7	24.8	33	39	47	63	79	93	114	142	185	210	250	324	400
@ U_{LN}=230-400Vac; f_{SW}=default; IEC 146 class 2	[A]	8.7	11.5	16.1	22.5	30	35	43	58	72	85	104	129	168	191	227	295	364
@ U_{LN}=460Vac; f_{SW}=default; IEC 146 class 1	[A]	8.3	11	15.4	23.1	29.7	34	40	54	68	81	99	124	161	183	218	282	348
@ U_{LN}=460Vac; f_{SW}=default; IEC 146 class 2	[A]	7.6	10	14.0	21.0	27.0	31	36	50	62	74	90	112	146	166	198	257	317
f_{SW} switching frequency (Default)	[kHz]	8									4							
f_{SW} switching frequency (Higher)	[kHz]	16									8						4	-
Derating factor:																		
Voltage Factor K_V at 460 Vac *		0.87			0.93	0.9	0.87											
Temp. Factor K_T for ambient temperature		0.8 @ 50°C (122°F)																
Switching frequency K_F		0.7 for higher f_{sw}																

Output-g

*: Linear shapes for K_V, K_T, respectively in the ranges [400, 460] Vac, [40, 50]°C, (104, 122)°F.

The output of the drive is ground fault and phase to phase output short protected.

Nota! The connection of an external voltage to the output terminals of the drive is not permissible! It is allowed to disconnect the motor from the drive output, after the drive has been disabled.

The rated value of direct current output (I_{CONT}) depends on the supply voltage (K_v), the ambient temperature (K_T) and the switching frequency (K_F) if higher than the default setting:
$I_{CONT} = I_{2N} \times K_V \times K_T \times K_{SW}$ (Values of derating factor are the listed on table), with an overload capacity $I_{MAX} = 1.5 \times I_{CONT}$ for 60 seconds.

Model	Continuous current @400V	Overload factor	T1 Overload time	Overload current	T2 Overload pause time @90% Cont curr	T3 Overload pause time @ 0% Cont curr	LOW Frequency < 3Hz overload factor	LOW Frequency < 3Hz overload time
	[A]		[sec]	[A]	[sec]	[sec]		[sec]
2040	9.6	1.83	10	17.6	124	24	1.5	2
2055	12.6			23.1				
2075	17.7			32.4				
3110	24.8			45.4				
3150	33			60.4				
4185	39			71.4				
4221	47			86.0			1.36	
4301	63			115.3				
4371	79			144.6				

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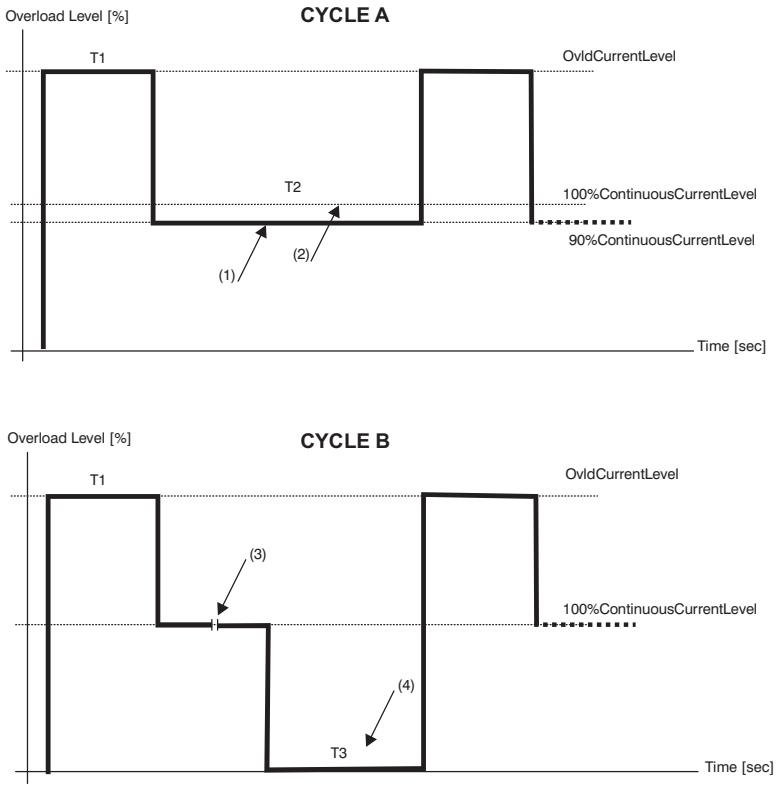
Table 3.5.1-A: Overload Availability (Sizes 2040 ... 4371)



(1) Load current must be reduced to 90% level to allow next overload cycle.
(2) Drive current is limited to 100% level when drive overload alarm is selected as Ignore or Warning.
(3) No limit on duration of this time interval @100% Cont current.
(4) Next overload cycle is allowed after T3.

Figure 3.5.1-A: Overload Duty Cycle (Sizes 2040 ... 4371)

Model	Continuous current @400V	SLOW Overload factor	T1 SLOW Overload time	SLOW Overload current	T2 SLOW Overload pause time @90% Cont curr	FAST Overload factor	TF FAST Overload time [sec]	FAST Overload current	LOW Frequency < 3Hz overload factor	LOW Frequency < 3Hz overload time
	[A]		[sec]	[A]	[sec]		[sec]	[A]		[sec]
5450	93	1.36	60	126.5	300	1.83	0.5	170.2	1.36	2
5550	114			155				208.6		
6750	142			193.1				259.9		
7900	185			251.6				338.6		
71100	210			285.6				384.3		
71320	250			340				457.5		
81600	324			440.6		1.4	1.0	453.6		
82000	400			544.0		1.4	1.0	560.0		

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Table 3.5.1-B: Overload Availability (Sizes 5450... 82000)

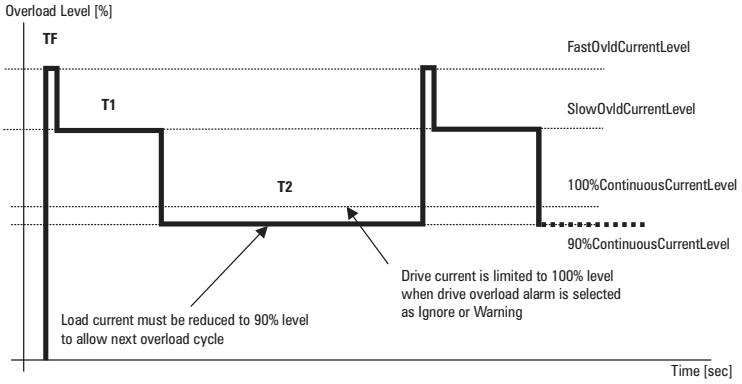


Figure 3.5.1-B: Overload Duty Cycle (Sizes 5450... 82000)

English

3.6 Open-Loop and Closed-Loop control section

No. 3 Programmable Analog inputs: _____ Analog input 1 ±10 V 0.5 mA max, 10 bit + sign / unipolar or bipolar (0...10V=default)
Analog input 2 ±10 V 0.5 mA max, 10 bit + sign / unipolar or bipolar (±10 V =default)
Analog input 3 0...20 mA, 4...20mA 10 V max, 10 bit (4...20mA=default)

No. 2 Programmable Analog outputs: _____ ±10 V / 5 mA max
Analog output 1 = -10...+10V, 10 bit, Frequency output absolute value (default)
Analog output 2 = -10...+10V, 10 bit, Output current (default)

No. 8 Programmable Digital inputs: _____ 0...24V / 6 mA
Digital input 8 = Fault reset src (default)
Digital input 7 = Ext fault src (default)
Digital input 6 = Freq Sel 3 src (default)
Digital input 5 = Freq Sel 2 src (default)
Digital input 4 = Freq Sel 1 src (default)
Digital input 3 = Run Rev src (default)
Digital input 2 = Run Fwd src (default)
Digital input 1 = Enable src (default)

No. 4 Programmable Digital outputs: _____ Digital outputs 1 = Contactor (default)
Digital outputs 2 = freq<thr1 (default)
Digital outputs 3 = Brake cont (default)
Digital outputs 4 = Not in alarm (default)

Note! Dig. out. 1 / 2 > open collector type: 50V / 50mA
Dig. out. 3 / 4 > relay output type: 230Vac-1A / 30Vdc-1A

Internal voltage supply: _____ + 24Vdc (±10 %), 50mA (Terminal 1)
+ 10Vdc (±3 %), 10mA (Terminal 29)
- 10Vdc (±3 %), 10mA (Terminal 32)
+ 24Vdc (±10 %), 300mA (Terminal 9)

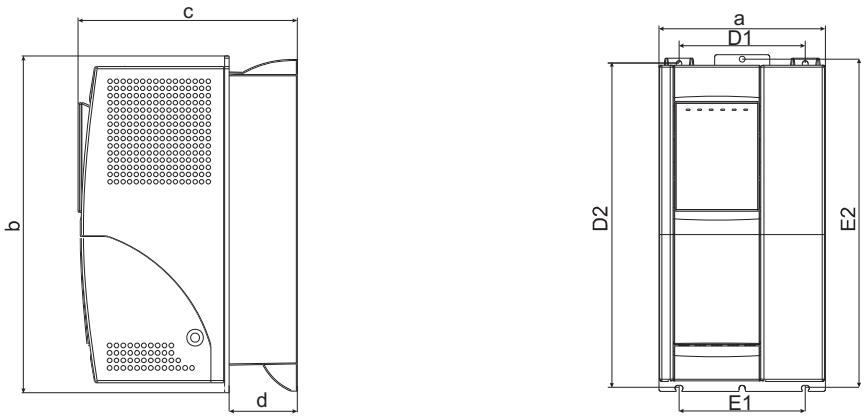
No.1 Digital Encoder Input _____ Voltage: 5/8/24 V
Type: 1 channel / 2 channels. No zero.
Max frequency: 150kHz

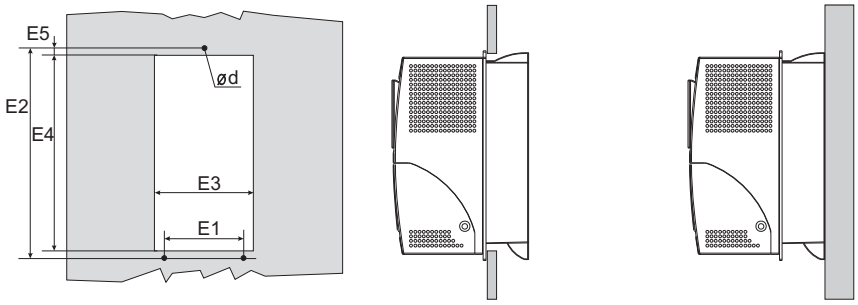
3.7 Accuracy

Reference value _____ 0.1 Hz (Resolution of Reference preset via terminals)
0.1 Hz (Resolution of Reference preset via interface)

3.8 Dimensions and installation guidelines

Sizes from 2040 to 3150





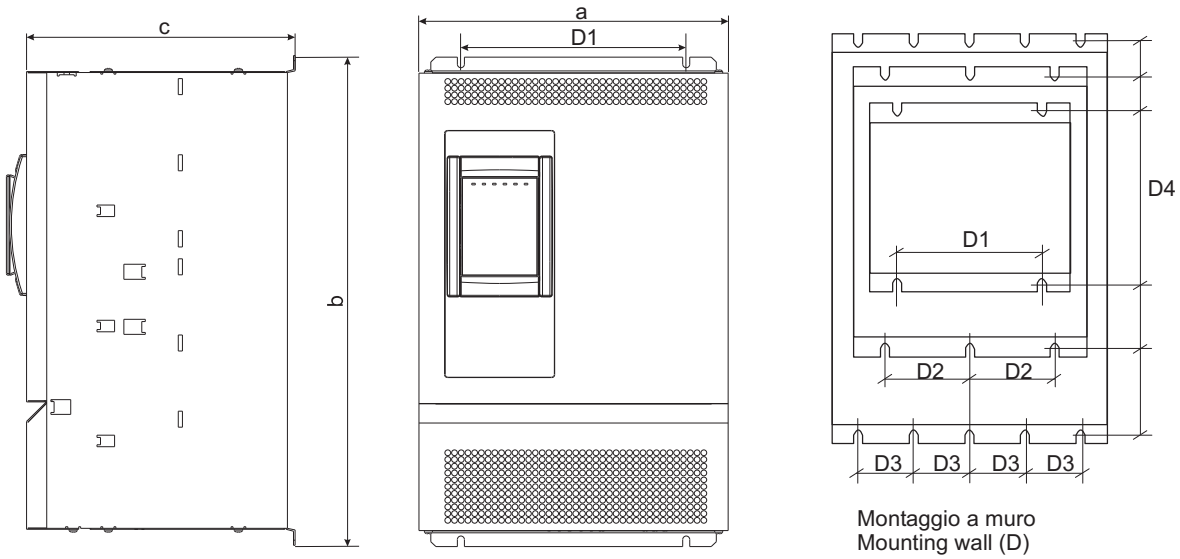
Montaggio con dissipatore esterno
Mounting with external dissipator (E)

Montaggio a muro
Mounting wall (D)

Type	Dimensions: mm (inch)												Weight
	a	b	c	d	D1	D2	E1	E2	E3	E4	E5	Ø d	kg (lbs)
2040	151.5 (5.9)	306.5 (12.0)	199.5 (7.8)	62 (2.4)	115 (4.5)	296.5 (11.6)	115 (4.5)	299.5 (11.7)	145.5 (5.7)	284 (11.2)	9 (0.35)	M5	4.95 (10.9)
2055													
2075													
3110	208 (8.2)	323 (12.7)	240 (9.5)	84 (3.3)	168 (6.6)	310.5 (12.2)	164 (6.5)	315 (12.4)	199 (7.8)	299.5 (11.8)			8.6 (19)
3150													

dim1-g

Sizes from 4185 to 82000



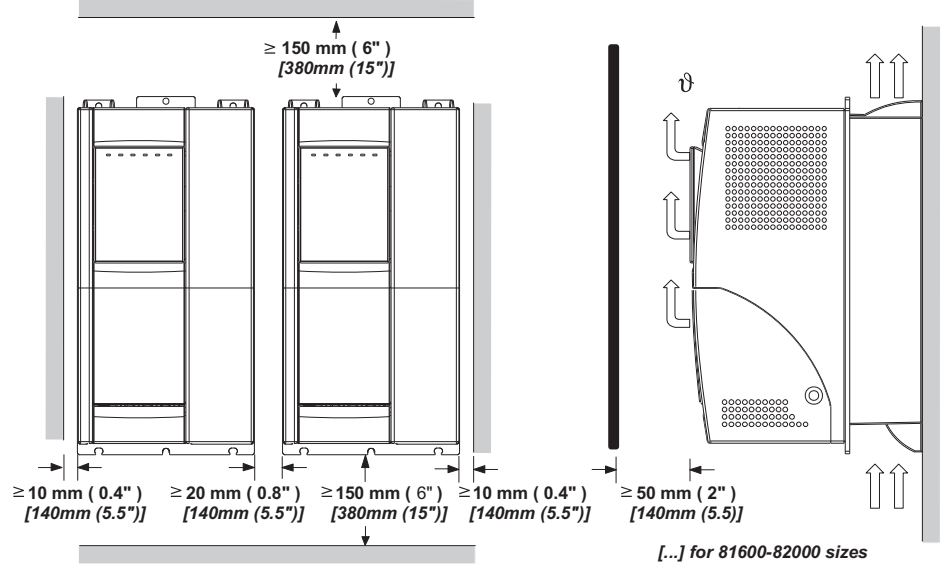
Montaggio a muro
Mounting wall (D)

Type	Dimensions: mm (inch)								Weight
	a	b	c	D1	D2	D3	D4	Ø	kg (lbs)
4185	309 (12.1)	489 (19.2)	268 (10.5)	225 (8.8)	-	-	475 (18.7)	M6	18 (39.6)
4221									
4301			308 (12.1)						22 (48.59)
4371									22.2 (48.9)
5450	376 (14.7)	564 (22.2)		-	150 (5.9)		550 (21.6)		34 (74.9)
5550									
6750	509 (20)	741 (29.2)	297.5 (11.7)	-	-	100 (3.9)	725 (28.5)		59 (130)
7900		909 (35.8)					891 (35)		75.4 (166.1)
71100									80.2 (176.7)
71320									86.5 (190.6)
81600		965 (38)	442 (17.4)				947 (37.3)		109 (240.3)
82000									

dim2-g

Mounting Clearance

The Drives must be mounted in such a way that the free flow of air is ensured.
The clearance to the device must be at least 150 mm (6 inches).
A space of at least 50 mm (2 inches) must be ensured at the front.
On sizes 81600 and 82000 the top and bottom clearance must be at least 380 mm (15 inches), on front and sides must be ensured a space of at least 140 mm (5.5 inches).
Devices that generate a large amount of heat must not be mounted in the direct vicinity of the frequency inverter.
Fastening screws should be re-tightened after a few days of operation.



4 - Wiring Procedure

4.1 Power Section

Terminals	Function
U1/L1, V1/L2, W1/L3	AC mains voltage (230V -15% ... 480V +10%)
BR1	Braking unit resistor command (braking resistor must be connected between BR1 and C)
C, D	Intermediate circuit connection (770 Vdc, 1.65 x I_{2N})
U2/T1, V2/T2, W2/T3	Motor connection (AC line volt 3Ph, 1.36 I_{2N})
PE2	Motor ground connection
EM (**)	Emergency module signal required to interface the drive with the EMS device (Emergency Module Supplier), max 0,22A
FEXT	(**) Logic fan control signal repeated on an external fan (*) 250V, 1A.
PE1	Ground connection

(*) Fans will be always start when the drive is enabled. Fans will stop when the drive is disabled after a period of 300 sec. and heatsink temperature is below 60°C.
(**) EM and FEXT terminals are available on sizes 3110 ... 5550.

Note! Use 60°C / 75°C copper conductor only.

Caution The grounding conductor of the motor cable may conduct up to twice the value of the rated current if essere there is a ground fault at the output of the drive.

External fuses of the power section

The inverter must be fused on the AC Input side. **Use superfast semiconductor fuses only.**
Connections with three-phase inductance on AC input will improve the DC link capacitors life time.

Type	Fuses			Fuses		
	230 … 400 Vac, 50Hz	460 Vac, 60Hz		230 … 400 Vac, 50Hz	460 Vac, 60Hz	
	Connections without three-phase reactor on AC input			Connections with three-phase reactor on AC input		
2040	GRD2/20 or Z14GR20	A70P20	FWP20	GRD2/16 or Z14GR16	A70P20	FWP20
2055	GRD2/25 or Z14GR25	A70P25	FWP25	GRD2/20 or Z14GR20	A70P20	FWP20
2075	GRD3/35 or Z22GR40	A70P35	FWP35	GRD2/25 or Z14GR25	A70P25	FWP25
3110	GRD3/50 or Z22GR40	A70P40	FWP40	GRD3/50 or Z22GR40	A70P35	FWP35
3150	GRD3/50 or Z22GR50	A70P40	FWP40	GRD3/50 or Z22GR50	A70P40	FWP40
4185	For these types an external reactor is mandatory if the AC input impedence is equal or less than 1%			GRD3/50 or Z22GR50	A70P50	FWP50
4221						
4301				S00C+üf1/80/80A/660V or Z22gR80	A70P80	FWP80
4371				S00C+üf1/80/100A/660V or M00üf01/100A/660V	A70P100	FWP100
5450				S00C+üf1/80/160A/660V or M00üf01/160A/660V	A70P175	FWP175
5550						
6750				S1üf1/110/250A/660V or M1üf1/250A/660V	A70P300	FWP300
7900						
71100				S2üf1/110/400A/660V or M2üf1/400A/660V	A70P400	FWP400
71320						
81600						
82000				S2üf1/110/500A/660V or M2üf1/500A/660V	A70P500	FWP500

fusibili-g

Fuse manufacturers: Type GRD... , Z14... 14 x 51 mm, S... , M... ,Z22... 22 x 58 mm Jean Müller, Eltville
A70... Ferraz
FWP... Bussmann

External fuses of the Power Section DC input side

Use the following fuses when a Line Regen converter is used.

Type	230 … 400 Vac, 50Hz	460 Vac, 60Hz	
	Fuses	Fuses	
2040	Z14GR16	A70P20-1	FWP20A14F
2055	Z14GR20	A70P20-1	FWP20A14F
2075	Z14GR32	A70P30-1	FWP30A14F
3110	Z14GR40	A70P40-4	FWP40B
3150	Z22GR63	A70P60-4	FWP60B
4185 - 4221	S00C+/üf1/80/80A/660V	A70P80	FWP80
4301	S00C+/üf1/80/100A/660V	A70P100	FWP100
4371	S00C+/üf1/80/125A/660V	A70P150	FWP150
5450	S00C+/üf1/80/160A/660V	A70P175	FWP175
5550	S00üF1/80/200A/660V	A70P200	FWP200
6750	S1üF1/110/250A/660V	A70P250	FWP250
7900	S1üF1/110/315A/660V	A70P350	FWP350
71100	S1üF1/110/400A/660V	A70P400	FWP400
71320	S1üF1/110/500A/660V	A70P500	FWP500
81600			
82000	S1üF1/110/600A/660V	A70P600	FWP600

fusibili dc-g

Chokes / Filters

Note! A three-phase inductance should be connected on the AC Input side in order to limit the input RMS current of the Drives. The inductance can be provided by an AC Input transformer.

Type	3-Phase AC Input Chokes						EMI filters, class (*)		EMI filters, class (**)	
	Mains inductance [mH]	Rated current [A]	Saturation current [A]	Freq. [Hz]	Model	Weight kg (lbs)	Model	Weight kg (lbs)	Model	Weight kg (lbs)
2040	1.63	8.7	18	50/60	**LR3y-2040**	2 (4.4)	EMI FFP 480-24	1.4 (3.1)	-	-
2055	1.29	11.8	24.5	50/60	**LR3y-2055**	2.2 (4.4)	EMI FFP 480-24	1.4 (3.1)	EMI-C 480-25	0.96 (2.1)
2075	0.89	17.4	36.5	50/60	**LR3y-2075**	4.9 (10.8)	EMI FFP 480-24	1.4 (3.1)	EMI-C 480-25	0.96 (2.1)
3110	0.68	22.4	46.5	50/60	**LR3y-3110**	5 (11)	EMI FFP 480-30	1.6 (3.5)	EMI-C 480-25	0.96 (2.1)
3150	0.51	30	61	50/60	**LR3y-3150**	6.2 (13.7)	EMI FFP 480-40	2.3 (5.1)	-	-
4185	0.35	41	83	50/60	**LR3-022**	7.8 (17.2)	EMI 480-45	1.3 [2.9]	-	-
4221	0.35	41	83	50/60			EMI 480-45	1.3 [2.9]	-	-
4301	0.24	58	120	50/60	**LR3-030**	9.5 (20.9)	EMI 480-70	2.6 [5.7]	-	-
4371	0.18	71	145	50/60	**LR3-037**	9.5 (20.9)	EMI 480-70	2.6 [5.7]	-	-
5450	0.13	102	212	50/60	**LR3-055**	12.5 (27.6)	EMI 480-100	2.6 [5.7]	-	-
5550	0.13	102	212	50/60			EMI 480-100	2.6 [5.7]	-	-
6750	0.148	173	350	50/60	**LR3-090**	55 (121.3)	EMI 480-150	4.4 [9.7]	-	-
7900	0.148	173	350	50/60			EMI 480-180	4.4 [9.7]	-	-
71100	0.085	297	600	50/60	**LR3-160**	44 (97.0)	EMI 520-280	28 (61.7)	-	-
71320	0.085	297	600	50/60			EMI 520-280	28 (61.7)	-	-
81600	0.085	297	600	50/60			EMI 520-450	45 (99.2)	-	-
82000	0.085	380	710	50/60	**LR3-200**	54 (119)	EMI 520-450	45 (99.2)	-	-

indutt-filtri-g

(*): EN61800-3, 1st environment restricted distribution.
(**) Class A, for drive/motor cable 5 meters max length.

Braking Resistors

The braking resistors can be subject to unforeseen overloads due to possible failures.

The resistors have to be protected using thermal protection devices. Such devices do not have to interrupt the circuit where the resistor is inserted but their auxiliary contact must interrupt the power supply of the drive power section. In case the resistor foresees the precence of a protection contact, such contact has to be used together with the one belonging to the thermal protection device.

Recommended resistors for use with internal braking unit:

Type	P_{NBR} [kW]	R_{BR} [Ohm]	E_{BR} [kJ]	Resistor Type	Weight kg (lbs)	Dimensions : mm (inch)				
						length	heigth	depth	fix 1	fix 2
2040	0.6	100	22	**MRI/T600 100R**	1.5 (3.3)	320 (12.6)	120 (4.7)	100 (3.9)	360 (14.2)	-
2055 … 2075	0.9	68	33	**MRI/T900 68R**	2.7 (6.0)	320 (12.6)	160 (6.3)	120 (4.7)	380 (15.0)	-
3110	1.3	49	48	**MRI/T1300 49R**	3.7 (8.2)	320 (12.6)	320 (12.6)	120 (4.7)	380 (15.0)	-
3150	2.1	28	90	**BR T2K0-28R**	6.2 (13.7)	625 (24.6)	100 (3.9)	250 (9.8)	605 (23.8)	40 (1.6)
4185 ... 4221	4	15.4	180	**BR T4K0-15R4**	7.0 (15.4)	625 (24.6)	100 (3.9)	250 (9.8)	605 (23.8)	40 (1.6)
4301 ... 4371	4	11.6	180	**BR T4K0-11R6**	7.0 (15.4)	625 (24.6)	100 (3.9)	250 (9.8)	605 (23.8)	40 (1.6)
5450 ... 5550	8	7.7	360	**BR T8K0-7R7**	11.5 (25.)	625 (24.6)	160 (6.3)	250 (9.8)	605 (23.8)	60 (2.4)

Res-fren-g

Parameters description:

P_{NBR} Nominal power of the braking resistor

R_{BR} Braking resistor value

E_{BR} Max surge energy which can be dissipated by the resistor

English

4.2 Cooling fans

Szes 2040 ... 5550
No connection is required, the internal fans are power supplied by an internal circuit.

Sizes 6750 ... 82000
Power supply for these fans have to be provided as follow:
- 6750: 0.8A@115V/60Hz, 0.45A@230V / 50Hz
- 7900 ... 71320: 1.2A@115V/60Hz, 0.65A@230V / 50Hz
- 81600, 82000: 1.65A@115V/60Hz, 0.70A@230V / 50Hz

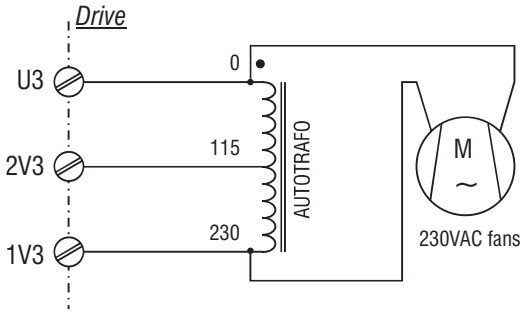


Figure 4.2.1: UL Type Fans Connections on 7900 ... 71320

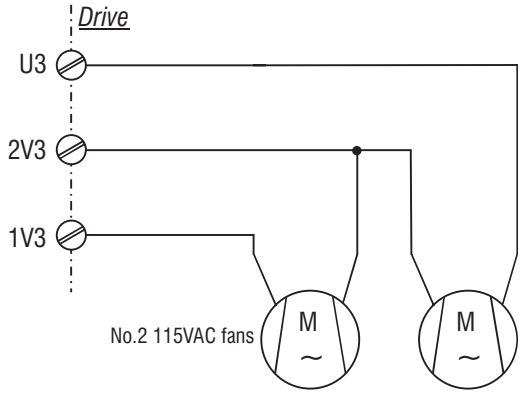


Figure 4.2.2: UL Type Fans Connections on 6750, 81600, 82000

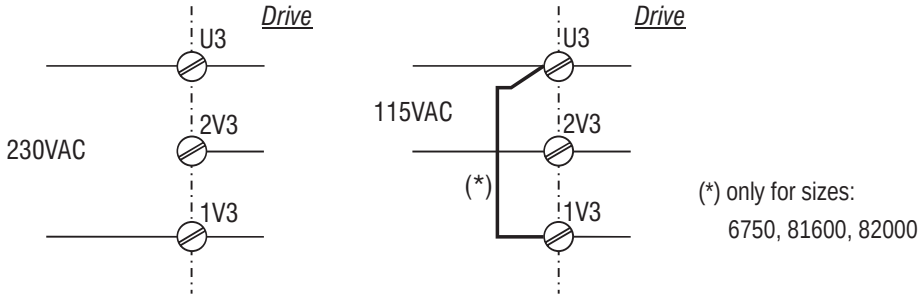
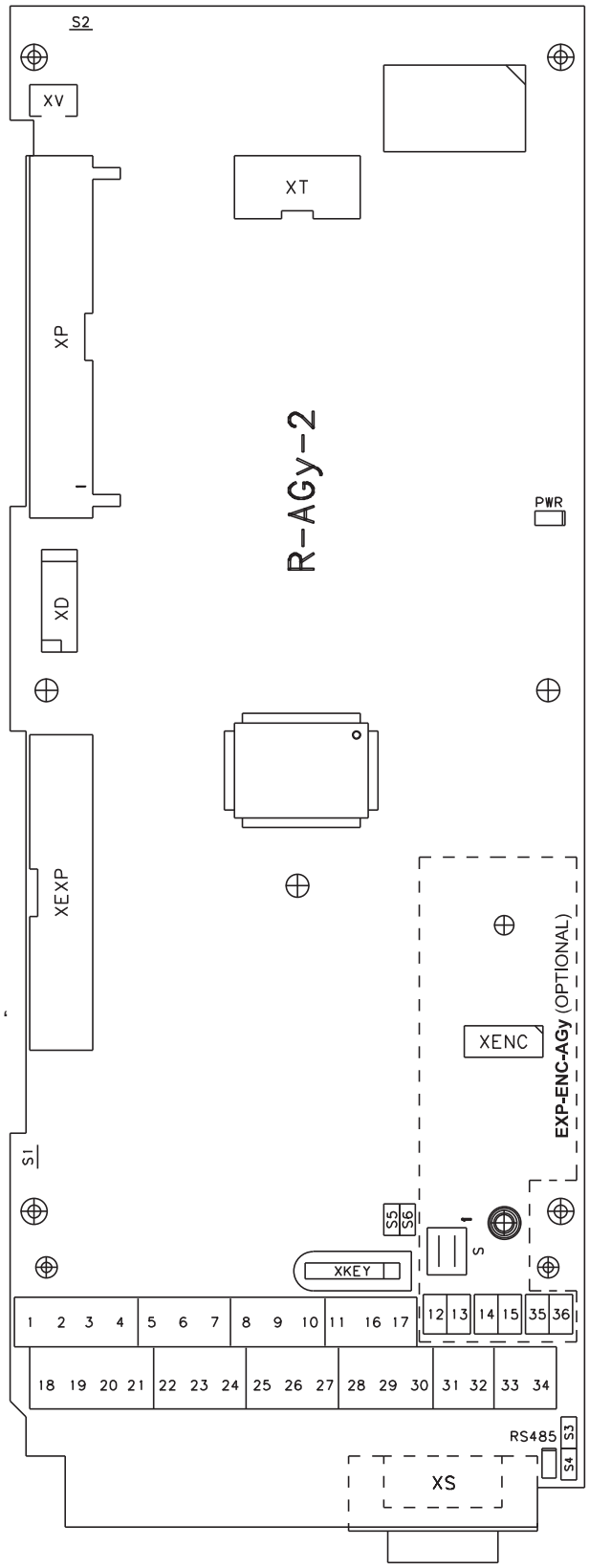


Figure 4.2.3: Example for External Connection

Note! An internal fuse (2.5A 250VAC slo-blo) for 7900 ... 71320 sizes is provided. On 6750, 81600 and 82000 sizes the fuse must be mounted externally.

4.3 Regulation Section



LED	Color	Function
PWR	green	LED turns on when the voltage + 5V is present
RS 485	yellow	LED turns on when Serial interface is supplied

Connector	No. of pins	Function
XV	2	Reserved (Fans control)
XT	10	KGB-1 and/or KGB-LCD-A keypad connector
XENC	10	EXP-ENC-AGY optional board connection (for encoder feedback)
XS	9	9-pole SUB-D connector of RS485 serial line
XKEY	5+1	QUIX-PRG key connection
XP	40	Reserved (power board connection)
XEXP	34	Reserved (expansion boards connection)
XD	10	Reserved (FW download connection)

Jumper	Default	Function
S1	ON	Jumper to disconnect 0V24 (regulation section) from ground. ON = 0V24 connected to ground OFF = 0V24 disconnected from ground
S2	ON	Jumper to disconnect 0V (regulation section) from ground. ON = 0V connected to ground OFF = 0V disconnected from ground
S5 S6	ON	Selection of the internal/external supply of the RS485 serial interface ON = Serial interface supplied from the regulation section OFF = Serial interface supplied from external source and galvanic insulation from the regulation card
S3 S4	ON	Terminating resistor for the serial interface RS485: OFF = No termination resistor ON = Termination resistor IN

Switch	Default	Switch function of EXP-ENC-AGy board
S-1	OFF	OFF = HTL output logic encoder level (+24V) ON = TTL output logic encoder level (+5V)
S-2	OFF	OFF = HTL output logic encoder level (+24V) ON = TTL output logic encoder level (+5V)

English

Term.	Designation	Function
1	**Digital Output 4-NO**	
2	**Digital Output 4-COM**	Programmable digital relay output, default: [2] Drive OK (max 1A 30Vdc/250Vac)
3	**Digital Output 4-NC**	
4	**Digital Input 8**	Programmable digital input - Default: Fault Reset src
5	**Digital Input 7**	Programmable digital input - Default: Ext fault src
6	**Digital Input 6**	Programmable digital input - Default: Freq Sel 3 src
7	**Digital Input 5**	Programmable digital input - Default: Freq Sel 2 src
8	**COM-IN Digital Inputs**	Supply reference for Digital inputs (max 6mA @ +24V)
9	**+ 24V OUT**	+ 24 V potential voltage reference (max 300mA)
10	**0 V 24 - GND Dig. Inputs**	0 V 24 reference for Digital inputs
11	**0 V 24 - GND Dig. Inputs**	0 V 24 reference for Digital inputs
16	**Digital Output 1**	Programmable digital output - Default: [51] Contactor
17	**Digital Output 2**	Programmable digital output - Default: [32] Freq<thr1

Term.	Designation	Function
18	**Digital Output 3 - NO**	
19	**Digital Output 3 - COM**	Programmable digital relay output Default: [54]Brake cont, (max 1A 30Vdc/250Vac)
20	**Digital Output 3 - NC**	
21	**GROUND REF**	Ground shield cable reference
22	**Digital Input 1**	Programmable digital input - Default: Enable src
23	**Digital Input 2**	Programmable digital input- Default: Run Fwd src
24	**Digital Input 3**	Programmable digital input - Default: Run Rev src
25	**Digital Input 4**	Programmable digital input - Default: Freq sel 1 src
26	**Analog Output 1**	Programmable analog output - Default: [0] Output freq, (±10V / max 5mA)
27	**Analog Input 2**	Programmable VOLTAGE analog input - Default: n.a. , (±10V / max 0,5mA)
28	**Analog Input 3**	Programmable CURRENT analog input - Default: n.a. , (max 20mA)
29	**+10V OUT**	+ 10 V potential voltage reference, (max 10mA)
30	**Analog Input 1**	Programmable VOLTAGE analog input - Default: n.a. ,(±10V / max 0,5mA)
31	**0 V 10 - GND**	0 V 10 reference for analog inputs/outputs
32	**-10V OUT**	- 10 V potential voltage reference, (max 10mA)
33	**Analog Output 2**	Programmable analog output - Default: [2] Output curr,(±10V / max 5mA)
34	**COM Digital outputs**	Common reference for Digital outputs (open-collector)

n.a. = not assigned

Caution

+24Vdc voltage, which is used to externally supply the regulation card has to be stabilized and with a maximum ±10% tolerance. The maximum absorption is 1A.

It is not suitable to power supply the regulation card only through a unique rectifier and capacitive filter.

ENC-EXP-AGy card

The EXP-ENC-AGy card allows the connection of a digital encoder TTL (+5V) or HTL (+24V)
Default setting = HTL (+24V).

See chapter 8 - Encoder Interface - for further information.

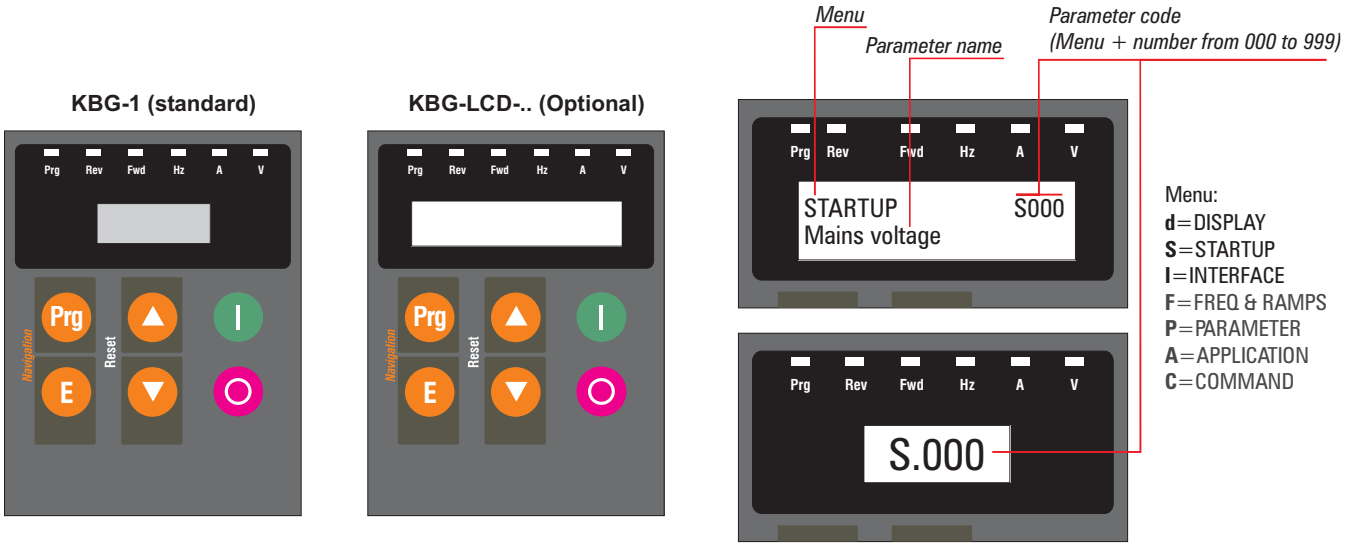
5 - Drive Keypad Operation

In this chapter the parameters management is described, by using the drive keypad.

5.1 Keypad

Caution

Changes made to parameter have immediate effect on drive operation, but are not automatically stored in permanent memory. An explicit command is required to permanently store the parameters: "**C.000 Save parameters**".



English

Prg Scroll menù: Allows navigation thruogh the drive main menu (**d.xxx, S.xxx, I.xxx, F.xxx, P.xxx, A.xxx and C.xxx**). Also used to exit the editing mode of a parameter without appling the changes.

E Enter key: Used to enter the editing mode of the selected parameter or to confirm the value.

▲ UP key: Used to scroll up through parameters or to increase numeric values while in editing mode; it can also be used to increase motorpotentiometer reference value, when **F.000 Motorpot ref** parameter is displayed (F, FREQ RAMP menu).

▼ DOWN key: Used to scroll down through parameters or to decrease numeric values while in editing mode; it can also be used to decrease motorpotentiometer reference values, when **F.000 Motorpot ref** parameter is displayed (F, FREQ RAMP menu).

I Start key: Used to **START** the drive via keypad; requirements:

+24V between 22 & 8 terminals (Enable)

+24 V between 23 & 8 terminals (Run Fwd) or + 24 V between 24 & 8 terminals (Run Rev)

P.000 Cmd source sel = [**1**] **CtlWrd & kpd** parameter setting

O Stop key: Used to **STOP** the drive via keypad;

Keypad LED's meaning:

PRG (Yellow Led): flashes if the parameters have not been permanently saved to memory.

REV (Green Led): reverse running (*)

Fwd (Green Led): forward running (*)

Hz, A, V (Red Leds): Indicates the unit of measurement of the parameter currently displayed (**).

Note: (*) Green LEDs blinking denote the action of the motor stall prevention.

(**) Red LEDs blinking denote an active alarm condition.

5.2 Language selection

Nota! Available on optional keypad KBG-LCD-... only.

1 - Switch-on the drive

2 - Press the **Prg** key for about 5 sec., the display will show:

Drv 03.03.00.00
Keypad V3.000

3 - Press the ▼ the display will show:

Language:
English

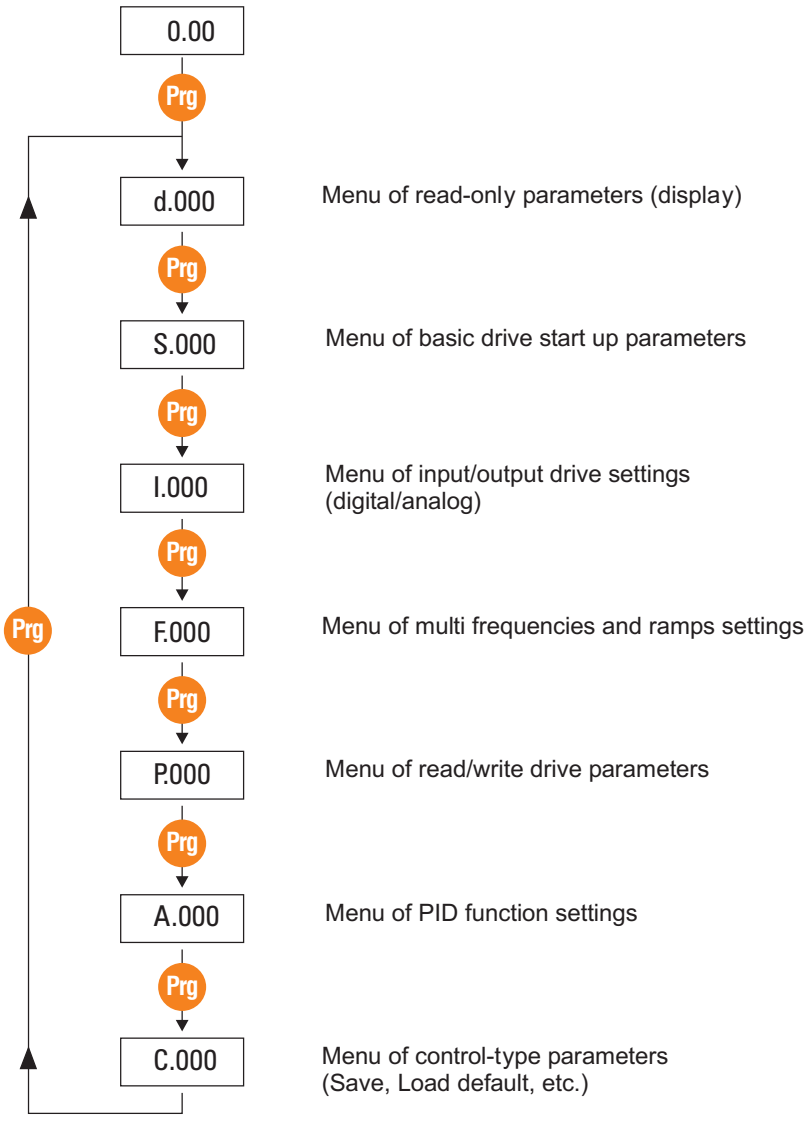
4 - To select a new language, press▲ or ▼

5 - Press the **E** key to confirm.

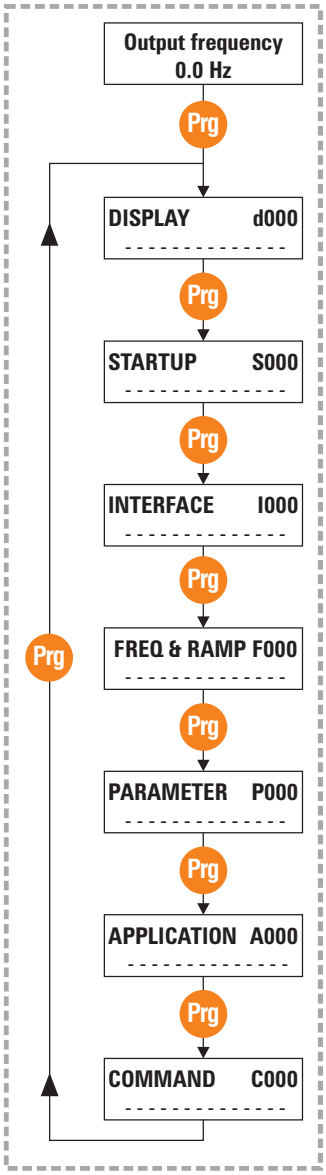
5.3 Moving through the drive main menu

Soon after, the keypad display will show**d.000 Output frequency** parameter of DISPLAY menu.

KBG-1 (standard)



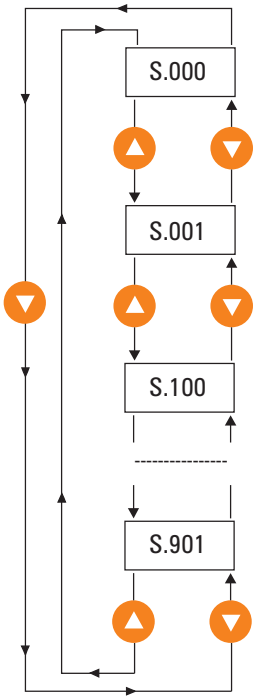
KBG-LCD-.. (Optional)



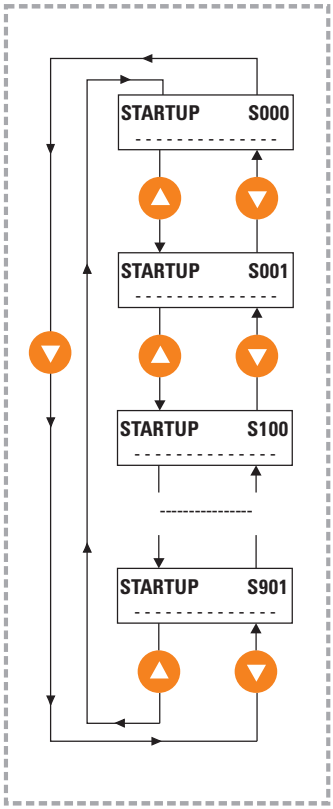
5.4 Scrolling through the drive parameters

STARTUP menu example:

KBG-1 (standard)



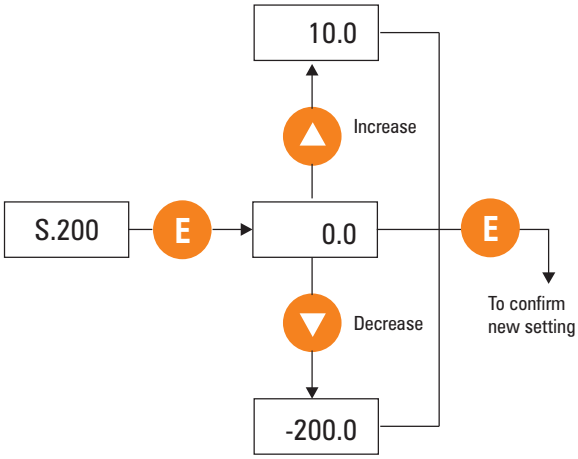
KBG-LCD-.. (Optional)



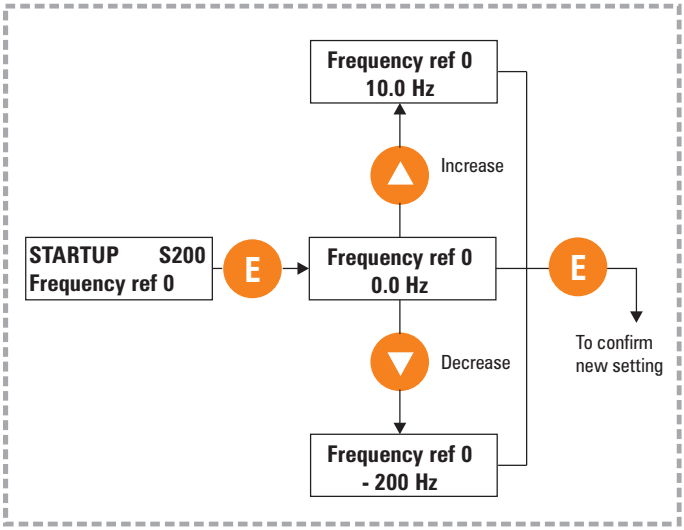
5.5 Parameters modification

Example: how to change a frequency reference (STARTUP menù).

KBG-1 (standard)



KBG-LCD-.. (Optional)



Note! Same procedure is also valid to Enable/Disable a function (ex.: **S.301 Auto boost en**) or program the drive I/Os (i.e.: **I.100 Dig output 1 cfg**, etc. …).

English

6 - Commissioning suggestions

Attention

Before changing the parameter settings make sure that the starting values are default values.

Change the parameters one at the time; if the change on any parameter is not effective, restore the parameter initial value before changing another one.

- In order to avoid problems linked to running comfort, it is advisable to perform a preliminary control of the motor parameters.

  Check in the **STARTUP** menu that the value set in the following parameters corresponds to the motor nameplate data:

S.100 Base voltage	Inverter maximum output voltage (Vrms).
S.101 Base frequency	Motor base frequency (Hz).
S.150 Motor rated curr	Motor rated current (Arms).
S.151 Motor pole pairs	Number of motor polepairs.
S.152 Motor power fact	(cos phi) Motor input power factor with rated current and voltage.

- In order to avoid too high settings of the acceleration and deceleration values (jerk), make sure that the slowing-down distances correspond to those listed in the table:

  Suggested slowing-down distances

Plant rated speed	(m/s)	0.8	1.0	1.2	1.4	1.6	1.8	2
Suggested slowing-down distance	(mm)	1000	1300	1700	2000	2300	2600	3000

tab 060-g

  Such distances grant a high running comfort with the factory set jerk values.

- The default speed levels can be selected on the terminals 25, 7 and 6. It is advisable to use the frequencies as follows:

S.200 Frequency ref 0	Slow speed: it is the floor reaching speed (frequency)
S.201 Frequency ref 1	High speed: it is the rated speed (frequency) required by the motor for that specific plant.

  Other speeds (maintenance, rephasing procedure etc.) can be selected as per table 7.2.

- In the open loop plants (without encoder), the boost can be increased if the lift car tends to rotate in the opposite direction during the starting phase or if it can not start in spite the running speed has been set (**S.300 Manual boost**, default = 3). The boost should be gradually increased by 1% at the time. Too high values cause the intervention of the current limit alarm.

7 - Default lift configuration

Lift commands are part of a dedicated control word. Each command is assigned to a physical digital input terminal. All the main commands are given from the DI on the standard regulation board (see table 7.1).
Similarly, lift digital outputs are configured to perform the most common functions needed to realize a standard application, such as run and brake contactor control logic.
In AGy -L drives, commands are always coming from **Lift Control Word**. It is possible to issue the **Run Fwd** or **Run Rev** commands from keypad, in order to simplify the startup procedure.
Frequency references are coming from the multi-speed selector, which is the required setting for most applications. However, it is possible to use other sources for the frequency reference, such as analog inputs or Motopotentiometer.
Ramps are initialized to a standard set of jerks and acceleration/deceleration that should meet the requirements of most low speed applications. It is possible, though not recommended, to disable the S-shape and use linear profiles (F.250 = 0). In that case the jerk parameters will have no effect.

7.1 Command Logic

In the standard version, drive commands may come from several different sources (keypad, terminals, serial line etc.).
In the Lift version the parameter defining the source of the commands can only assume the following values:
P.000 Sel comandi src= "[0]CtrlWordOnly"

Command assignment

Drive command	Source parameter	Deafult setting		Possible setting	IPA
		Setting	Terminal		
Enable src	I.000	[2] DI 1	22	[0] False [1] True [2] DI 1 [3] DI 2 [4] DI 3 [5] DI 4 [6] DI 5 [7] DI 6 [8] DI 7 [9] DI 8 [10] DI Exp 1 [11] DI Exp 2 [12] DI Exp 3 [13] DI Exp 4 [14] AND 1 [15] AND 2 [16] AND 3 [17] OR 1 [18] OR 2 [19] OR 3 [20] NOT 1 [21] NOT 2 [22] NOT 3 [23] NOT 4 [24] FrqSel match [25] Short Floor flg	100
Run Fwd src	I.001	[3] DI 2	23	See list of I.000	101
Run Rev src	I.002	[4] DI 3	24	See list of I.000	102
Freq Sel 1 src	I.003	[5] DI 4	25	See list of I.000	103
Freq Sel 2 src	I.004	[6] DI 5	7	See list of I.000	104
Freq Sel 3 src	I.005	[7] DI 6	6	See list of I.000	105
Freq Sel 4 src	I.006	[0] False		See list of I.000	106
Ramp Sel 1 src	I.007	[25] Short Floor Flg		See list of I.000	107
Ramp Sel 2 src	I.008	[0] False		See list of I.000	108
Ext fault src	I.009	[8] DI 7	5	See list of I.000	109
Alarm Reset	I.010	[9] DI 8	4	See list of I.000	110
Bak pwr act src	I.011	[0] False		See list of I.000	111
Forced stop src	I.012	[0] False		See list of I.000	185

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Table 7.1 – Command assignment

Each command may come from any of the drive digital input terminals (either standard or expanded), or can be a logical combination of terminal inputs, obtained by using the drive internal programmable area
It is anyway possible to assign commands different from the default ones:
For example, if we want the **Enable** command to come from the digital input 3 of the drive (terminal 24 on the regulation board), we have to set parameter **I.000 Enable src** to the value "[4] DI 3".

Note: If the source of a command is specified as an expanded DI, and the I/O expansion board is not mounted, the command will always be inactive (FALSE).

A brief description of each command follows.

Enable src The **Enable** command must always be present, in order to activate the inverter output bridge. If the **Enable** input is not present, or the Enable signal is removed at any time during the Lift sequence, the output stage of the drive is disabled, and the Run contactor is open, regardless of the status of all the other inputs.

Run Fwd src (Upward command)
Closing the input 23, the upward Lift sequence is started (see Figure 7.1).

Run Rev src (Downward command)
Closing the input 24, the downward Lift sequence is started (see Figure 7.1).

Note: The direction of the motion can also be reversed by setting a negative frequency reference. With a negative frequency reference, the **Run Fwd src** command will cause a downward motion, while a **Run Rev src** command will cause the cabin to move upward.

Note: The lifting sequence will not start if both **Run Fwd src** and **Run Rev src** commands are activated at the same time.

Freq Sel 1 ... 4 src (Selection of the speed reference)
The binary code defined by the status of these signals selects the frequency reference (speed) for the ramp generator (see Fig.7.2), according to the following table:

Freq Sel 4	Freq Sel 3	Freq Sel 2	Freq Sel 1	Code	Active frequency reference
Terminal XX	*Terminal 6*	*Terminal 7*	*Terminal 25*		
0	0	0	0	**0**	S.200 Frequency ref 0
0	0	0	1	**1**	S.201 Frequency ref 1
0	0	1	0	**2**	S.202 Frequency ref 2
0	0	1	1	**3**	S.203 Frequency ref 3
0	1	0	0	**4**	S.204 Frequency ref 4
0	1	0	1	**5**	S.205 Frequency ref 5
0	1	1	0	**6**	S.206 Frequency ref 6
0	1	1	1	**7**	S.207 Frequency ref 7
1	0	0	0	**8**	F.108 Frequency ref 8
1	0	0	1	**9**	F.109 Frequency ref 9
1	0	1	0	**10**	F.110 Frequency ref 10
1	0	1	1	**11**	F.111 Frequency ref 11
1	1	0	0	**12**	F.112 Frequency ref 12
1	1	0	1	**13**	F.113 Frequency ref 13
1	1	1	0	**14**	F.114 Frequency ref 14
1	1	1	1	**15**	F.115 Frequency ref 15 (Emergency run freq)

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Table 7.2 – Multi-frequencies selection

Note: The last multi-frequency has also a special meaning when using the backup power supply. If the drive is being fed by the backup power supply, the frequency reference is clamped to the value defined by the parameter **F.115**.

If the backup power supply is not used, **F.115** can be used as one of the multi-frequencies and is selected by setting to TRUE all the selectors (**Freq Sel 1** to **Freq Sel 4**).

Ramp Sel 1 ... 2 The binary code defined by the status of these signals selects the set of parameters for ramp profile (jerks, acceleration and deceleration). By default, the first ramp selector is commanded by the **ShortFloorFl** (see chapter 7.3), while the second ramp selector is fixed to FALSE. Therefore, the first ramp set is normally active, and the drive will automatically switch to the second ramp set whenever a short floor is detected (see Fig.7.5).

External fault Activation of this command, will cause the drive to trip with an external fault alarm. If the alarm occurs while a lift sequence is in process, the sequence is immediately aborted and the Run contactor is open. In order to restore drive operation, an explicit **Alarm Reset** command is needed.

Fault reset src (Alarm reset) Activation of this command will restore drive operation after a trip.

Bak pwr act src This command tells to the drive that a backup power supply is being used. See chapter 9 for a detailed description.

In order to simplify the drive startup, it is possible to issue **Run Fwd src** or **Run Rev src** commands from the "**I-O**" keys of the drive keypad.

Typical example:

The user wants to execute tuning of the motor resistance, but does not want to issue the start sequence from the external PLC. In this case, it is possible to program the drive as follows:

- Set parameter **P.000 Cmd source sel** = **"[1] CtlWrd & kpd**"
- Set parameter **I.000 Enable src** = "**[1] True"**
- Set parameter **I.001 RunFwd src** = "**[1] True**"
- Issue the command for tuning, by setting **C.100 Measure stator R** = **[1]**; the drive keypad will show the message "**tune**".
- Press the "**I**" key; the keypad will show the message "**run**", meaning that the tuning procedure is in progress. Wait until the procedure ends, and the keypad will show the message "**done**".

Nota: The motor output contacts must be closed during the tuning procedure, in order to allow current to flow into the motor. Either hard-wire the RUN contactor closed during tuning procedure, or connect the dedicated output of the drive to the RUN contactor.

- Once the tuning procedure is finished, restore the original settings for the parameters above, following the order:

  I.001 Run Fwd src = "[3] DI 2"
  I.000 Enable src = "[2] DI 1"
  P.000 Cmd source sel = **"[0] CtrlWordOnly"**

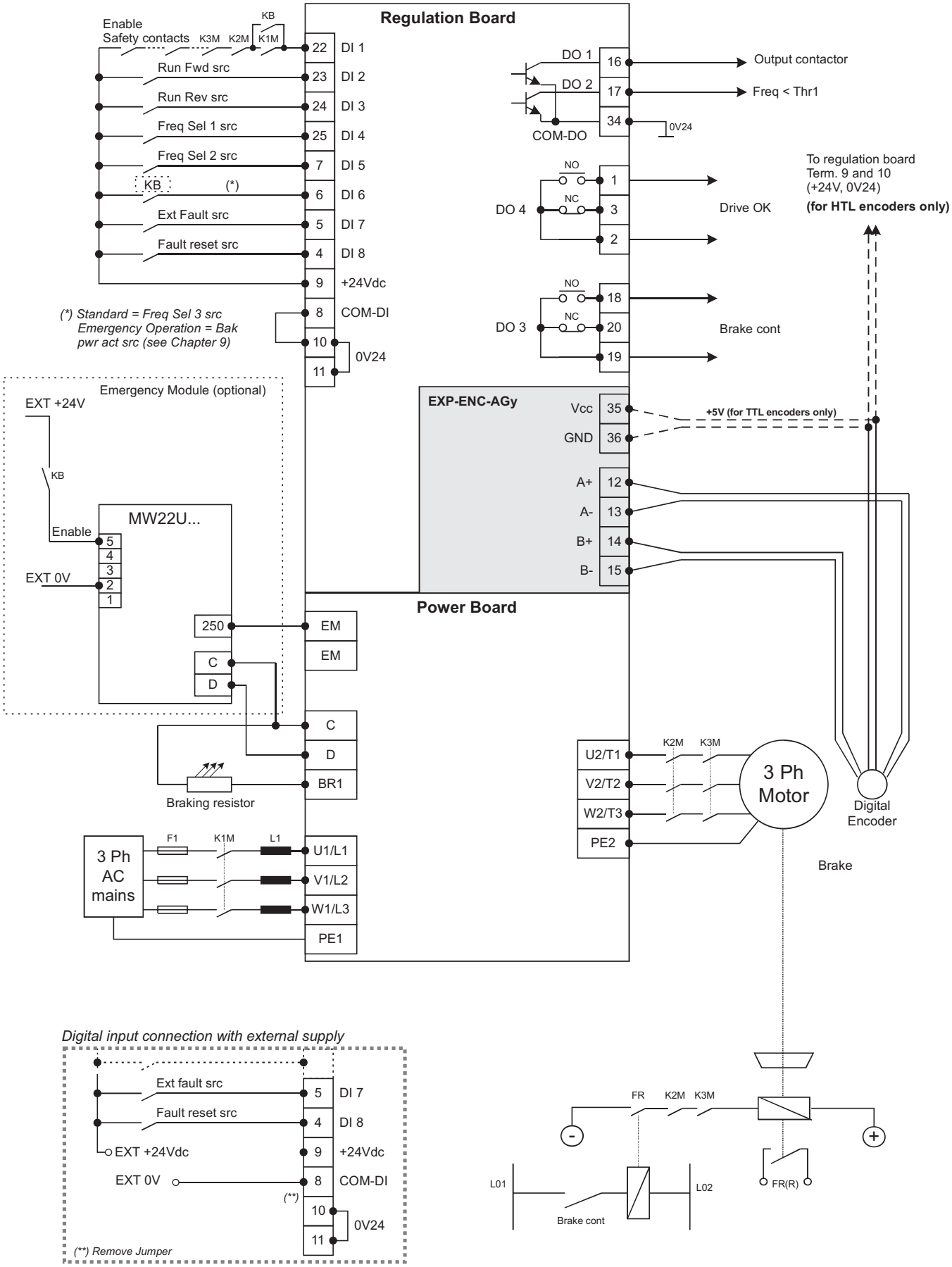

Fig.7.1 – Lift standard wiring and connection of Emergency Module MW22U (optional)

7.2 Lift Sequence

Timing diagrams of the lift sequence are reported in Fig. 7.2 and Fig. 7.3.

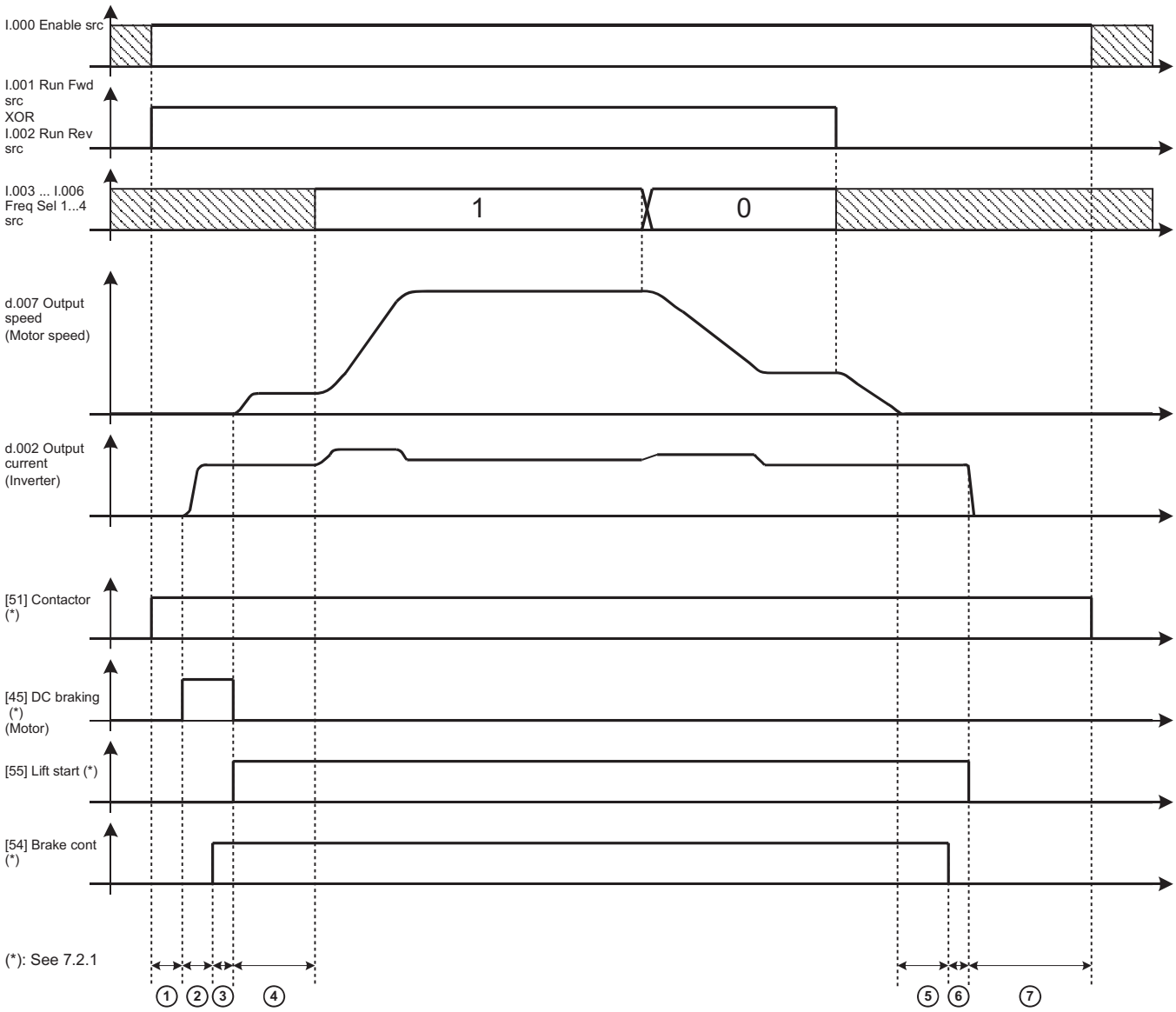

Fig. 7.2 – Standard lift sequence

1. S.250 Cont close delay (Default : 0,20)
2. S.251 Magnet time (Default : 1)
3. S.252 Brake open delay (Default : 0,20)
4. S.253 Smooth start dly (Default : 0)
5. S.254 DCBrake stp time (Default : 1)
6. S.255 Brake close dly (Default : 0,20)
7. S.256 Cont open delay (Default : 0,20)

Note: Lift sequence will not start if there is no current flowing on any of the motor windings during the initial injection of DC-current. The minimum amount of current necessary to release the mechanical brake and initiate the lift sequence is defined by **A.087 Current pres thr**. By setting the parameter to “0”, current check is disabled, and the lift sequence will start even if the motor is disconnected from the drive.

English

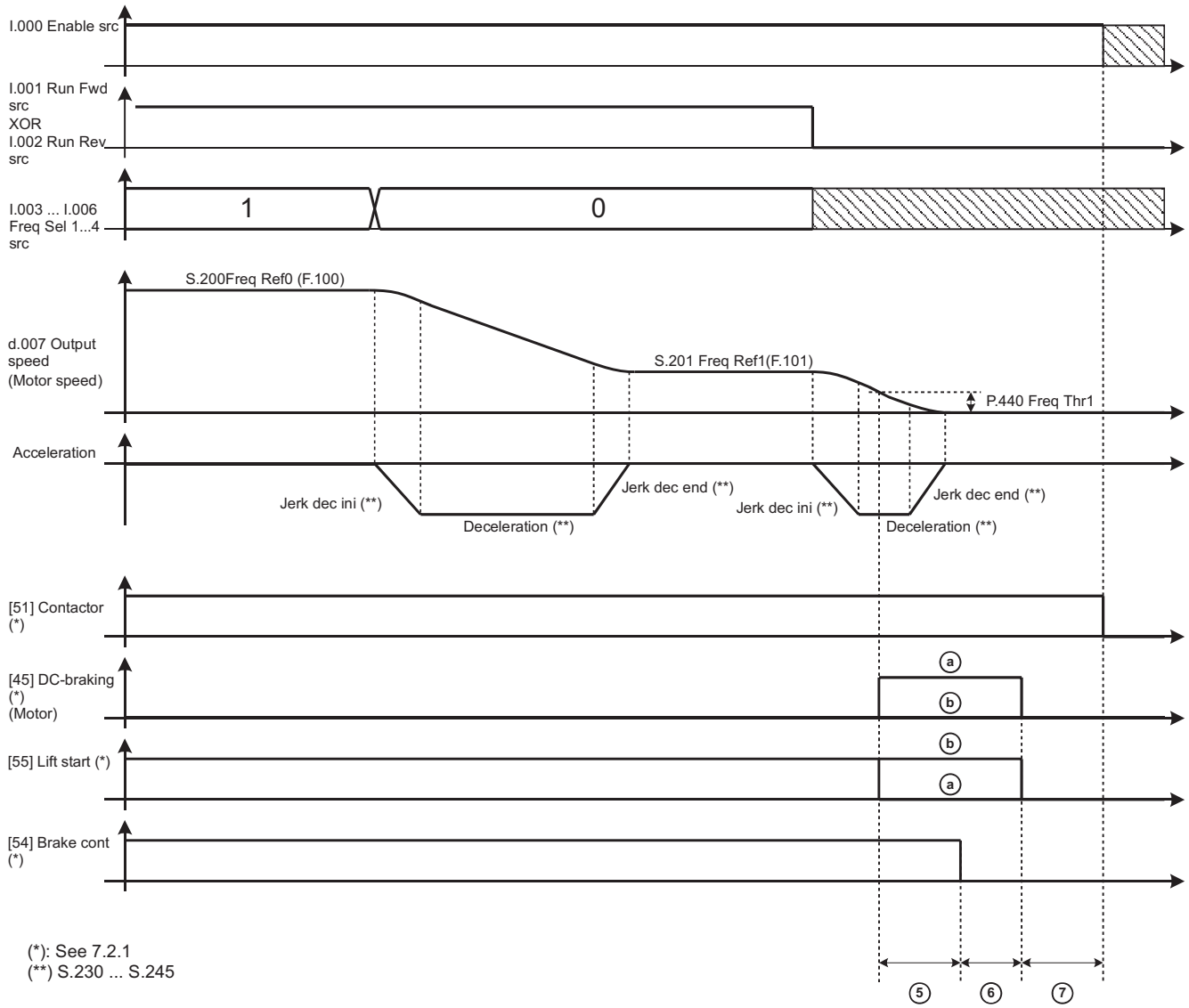

Fig. 7.3 – Detailed stopping sequence

a) S.260 Lift Stop Mode = [0] DC brake at stop (Default)
b) S.260 Lift Stop Mode = [1] Normal stop

7.2.1 Lift-dedicated digital output functions

Several specific functions can be programmed on the drive digital outputs, in order to check the correctness of the lift sequence and to improve the interaction with the external sequencer. Here follows a list of the functions that can be useful in lift applications.

DO Programming code	*Function description*
[0] Drive ready	TRUE when the drive is ready to accept a valid RUN command. Meaning that the drive is not in alarm, the dc-link pre-charge is completed and the safe-start interlock logic is cleared.
[1] Alarm state	TRUE when the drive is in alarm status. Alarm reset is needed to restore operation
[2] Not in alarm	TRUE when the drive is not in Alarm status.
[3] Motor run	TRUE when the inverter output bridge is enabled and operating.
[4] Motor stop	TRUE when the inverter output bridge is not operating (all six switches are open).
[5] Rev rotation	TRUE when the motor is rotating counter-clockwise.
[31] Freq > thr1	TRUE when the motor speed (measured or estimated) is above the threshold defined by parameters P.440 and P.441.
[32] Freq < thr1	TRUE when the motor speed (measured or estimated) is below the threshold defined by parameters P.440 and P.441. This function is normally used to detect zero speed (see sequence in Fig.7.2). This signal is available as default on terminal 17, **Digital output 2**.
[45] DC braking	TRUE when DC injection is in progress.
[51] Contactor	TRUE when the Run contactor has to be closed, either for upward or downward motion.

This signal is available as default on terminal 16, **Digital output 1**.

[52] Contactor UP	TRUE when the Run contactor for upward motion has to be closed.
[53] Contactor DOWN	TRUE when the Run contactor for downward motion has to be closed.
[54] Brake cont	TRUE when the mechanical brake has to be released.
[55] Lift start	TRUE when the inverter output bridge is operating and no DC injection is being operated.

7.2.2 Speed indication

At power-on the drive keypad shows the speed of the lift car (parameter **d.007**), expressed in mm/s. Likewise, all the variables related to the speed of the motor (**d.008, d.302**) are expressed in mm/s. The conversion between electrical Hz and car speed is automatically performed by the drive, as explained in the following chapter. The conversion ratio can also be overwritten by the user, by setting parameter **P.600**.
The parameter to be shown at power-on can be configured by setting the parameter **P.580**.

7.3 Ramp Function

Four independent jerks are available for each profile, together with linear acceleration and deceleration times. All profile parameters are expressed in terms of car linear quantities. The equivalence between car speed v(m/s) and inverter output frequency f(Hz) is automatically performed by the drive, based on the value of the following parameters:

- f_b: **S.101 Base frequency** (Hz)
- v_N: **S.180 Car max speed** (m/s)

The ramp profile is shown in Fig.6. Profile number 1 has been used as an example, but the same applies to all the four available profiles. The increase or decrease of the jerk values causes the increase or decrease of the running comfort.

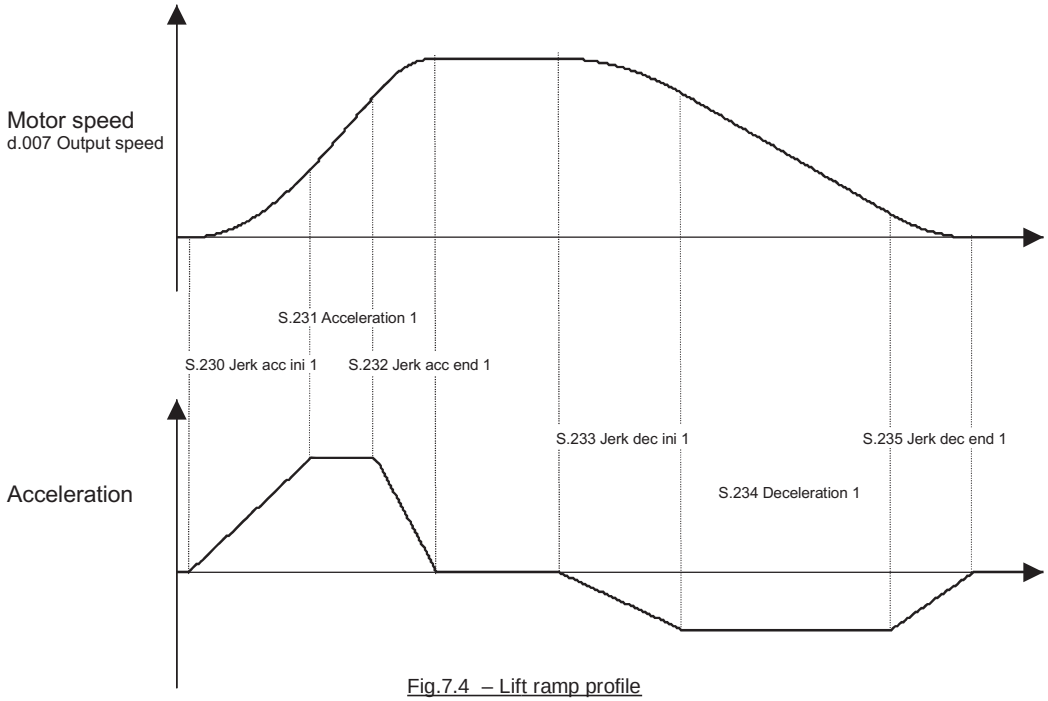

Fig.7.4 – Lift ramp profile

7.3.1 Space calculation and acceleration / deceleration ramps settings

The space covered by the lift car during acceleration and deceleration ramps can be calculated off-line by the drive, by executing the command: **C.060 Calculate space** . The results of the calculation can be monitored into the parameters:

d.500 Lift space	space covered by the lift car (expressed in meters) when accelerating from zero to the maximum speed (defined by **S.180**) and then immediately decelerating back to zero(one floor travel)
d.501 Lift accel space	space covered by the lift car (expressed in meters) when accelerating from zero to the maximum speed (defined by **S.180**).
d.502 Lift decel space	pace covered by the lift car (expressed in meters) when decelerating from the maximum speed (defined by **S.180**) to zero.

Knowing the space needed to accelerate and decelerate the lift car with the ramp set in use, is useful to determine whether the ramps are compatible with the position of the floor sensors before actually starting the drive. For example, if the

deceleration ramp is too slow, as compared to the re-aligning distance, the lift car could stop after the floor level.
If acceleration and/or deceleration ramps are too fast, the drive may reach the output current limit. In this case, the drive will automatically clamp the current to a safe value, with a resulting loss of output torque. If the drive remains in limit condition for the time specified by the parameter **P.181 - Clamp alm HldOff**(default setting is 1 second), an alarm will be issued ("LF - Limiter fault") and the lift sequence will be aborted. It is strongly recommended not to operate the drive in current limit, since the desired speed profile cannot be achieved in that case, resulting in undesired oscillations. If the drive reaches the current limit during the acceleration or deceleration phases, it is advised to slow down the ramps, until the limit condition is avoided.

7.3.2 Short Floor Function

Sometimes, the space between adjacent floors is not constant, and there is one floor that may be nearer to the next one. That situation is normally referred as "**Short Floor**". It could happen that due to the reduced distance, the lift is required to decelerate to the leveling speed, when the acceleration ramp to normal speed is still in progress. This will lengthen the approaching phase, unless countermeasures are taken.

The drive is able to detect a Short Floor, by looking at the sequence.
The flag "**ShortFloorFl**" is set if the deceleration command is given during the acceleration phase.

I.007 Ramp sel 1 src = **"[25] ShortFloorFl**"

The flag is reset when the stop command is given, or when the sequence is aborted.
"**ShortFloorFl**" is default used to control the short floor, using the second set of ramps.
The regulation of the parameters from **S.240** to **S. 245** allows to define the area to be covered before reaching the floor. In case of short floor, if the lift overcomes the floor it means that the lift speed was too high and it is therefore necessary to increase the jerk values (parameters **S.242, S.243, S.244**). If the plant works for a too long time with a low speed before reaching the floor, the jerk values have to be decreased (parameters**S.242, S.243, S.244**).
A typical short floor sequence is reported in Fig. 7.5 .

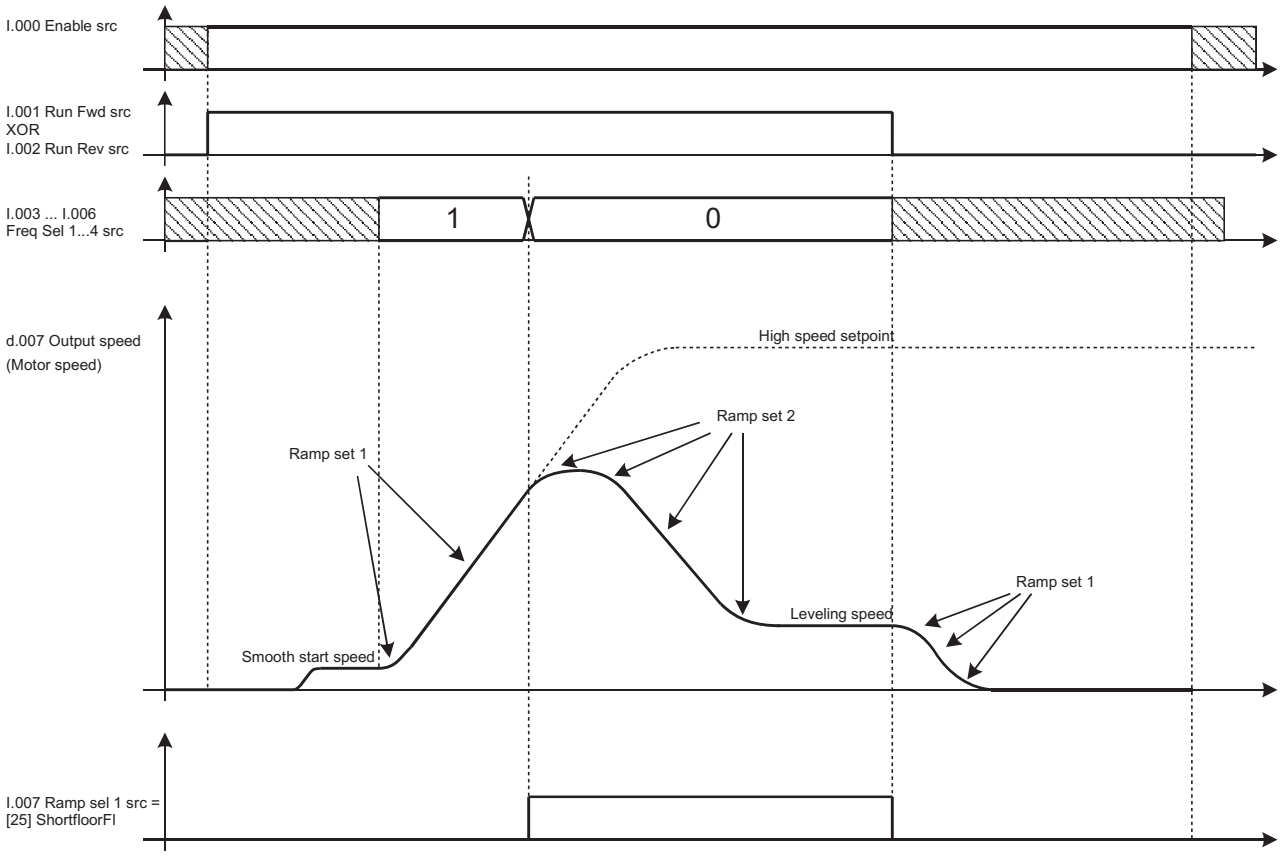

Fig. 7.5 – Short floor sequence

Ramp references:

1	**S.240 Jerk acc ini 2**	4	**S.243 Jerk dec ini 2**
2	**S.241 Acceleration 2**	5	**S.244 Deceleration 2**
3	**S.242 Jerk acc end 2**	6	**S.245 Jerk dec end 2**

7.4 Startup Menu

Lift version has parameters that are organized with access levels, as follows:

Access level	Accessible parameters
1	- Basic display parameters - Command for save parameters - P.998
2 (Default)	- All level 1 parameters - Startup parameters - All commands
3	All parameters

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The access level is set by the parameter **P.998 Param access lev.**

Note! When using E@syDrives configurator, all parameters are accessible, regardless of what is specified by parameter P.998.

In order to make drive installation easy, all the parameters needed for standard setup are gathered in the **STARTUP** menu. This menu consists of links to parameters present in different drive menus. Therefore, making a change to any of the parameters in Startup, is equivalent to make the same change to the linked parameter in another menu.

The list of parameters in Startup menu of the lift version follows:

Note! (*) = Size dependent

(ALIAS): On STARTUP menu only. **Parameter code of same parameter on other menu .**

Menu S - Startup

Code	Display (Description)	Def.	Min.	Max
S.000	**Mains voltage** (linked to P.020) Nominal voltage (Vrms) of the AC input mains.	**380**	**230**	**480**
S.001	**Mains frequency** (linked to P.021) Nominal frequency (Hz) of the AC input mains.	**50**	**50**	**60**
S.100	**Base voltage** (linked to P.061) Maximum inverter output voltage (Vrms). It should be set to motor rated voltage, as shown on the nameplate.	**380**	**50**	**528**
S.101	**Base frequency** (linked to P.062) Motor base frequency (Hz). It is the frequency at which the output voltage reaches the motor rated (data on motor nameplate).	**50**	**25**	**500**
S.150	**Motor rated curr** (linked to P.040) Motor rated current (Arms). It should be set according to motor nameplate.	**(*)**	**(*)**	**(*)**
S.151	**Motor pole pairs** (linked to P.041) Number of pole pairs of the motor (data on motor nameplate).	**2**	**1**	**60**
S.152	**Motor power fact** (linked to P.042) Motor input power factor at rated current and rated voltage. It should be set according to nameplate.	**(*)**	**(*)**	**(*)**
S.153	**Motor stator R** (linked to P.043) Equivalent resistance of the motor stator windings (Ohm). This value is important for correct operation of the automatic boost, and slip compensation functions. It should be set to half of the resistance measured between two of the motor input terminals, with the third terminal open. If unknown, it can be automatically measured by the autotuning command (see S.170).	**(*)**	**(*)**	**(*)**
S.170	**Measure stator R** (linked to C.100) The execution of this command allows the user to measure the equivalent stator resistance of the motor in use. After the command is issued, it is necessary to initiate a standard run sequence, by giving enable and start commands. The inverter will close the run contactor, but will not release the brake, allowing for current to flow in the windings. After the procedure is successfully completed, the value of S.153 is automatically updated.	**0.50**	**0.01**	**5.00**

Code	Display (Description)		Def.	Min.	Max
S.180	**Car max speed**	(linked to A.090)	**0.50**	**0.01**	**5.00**
	Speed of the lift car (m/s) when the inverter outputs the rated frequency.				
S.200	**Frequency ref 0**	(linked to F.100)	**10.0**	**-F.020**	**F.020**
	See description of S.207.				
S.201	**Frequency ref 1**	(linked to F.101)	**50.0**	**-F.020**	**F.020**
	See description of S.207.				
S.202	**Frequency ref 2**	(linked to F.102)			
S.203	**Frequency ref 3**	(linked to F.103)			
S.204	**Frequency ref 4**	(linked to F.104)			
S.205	**Frequency ref 5**	(linked to F.105)			
S.206	**Frequency ref 6**	(linked to F.106)			
S.207	**Frequency ref 7**	(linked to F.107)	**0.0**	**-F.020**	**F.020**
	Frequency references (Hz) of the inverter. The selection of any of the above references is performed by the dedicated selectors (Freq Sel 0 to 4). Although only 8 references are present in the startup menu, it is possible to use up to 16 different references, available in the menu F.				
S.220	**Smooth start frq**	(linked to F.116)	**2.0**	**-F.020**	**F.020**
	Frequency reference (Hz) used during the smooth start procedure.				
S.225	**Ramp factor 1**	(linked to A.091)	**1.00**	**0.01**	**2.50**
	Ramp accel/decel and jerks are defined by the parameters described below. However, for an easy setting, it is possible to use a common extension factor to speed-up or slow down the ramps. For example, if S.225 is set to 0.5, all the parameters related to the sets 1 and 3 of ramps (accels, decels and jerks) are halved, resulting in slower ramps.				
S.226	**Ramp factor 2**	(linked to A.092)	**1.00**	**0.01**	**2.50**
	Same as S.225, but it applies to the ramp sets 2 and 4.				
S.230	**Jerk acc ini 1**	(linked to F.251)	**0.50**	**0.01**	**10.00**
	Jerk (m/s^3) applied at the beginning of an acceleration with ramp set 1 (Ramp set 1 is the one used by default, during normal operation).				
S.231	**Acceleration 1**	(linked to F.201)	**0.60**	**0.01**	**5.00**
	Linear acceleration (m/s^2) with ramp set 1.				
S.232	**Jerk acc end 1**	(linked to F.252)	**1.40**	**0.01**	**10.00**
	Jerk (m/s^3) applied at the end of an acceleration with ramp set 1.				
S.233	**Jerk dec ini 1**	(linked to F.253)	**1.40**	**0.01**	**10.00**
	Jerk (m/s^3) applied at the beginning of a deceleration with ramp set 1.				
S.234	**Deceleration 1**	(linked to F.202)	**0.60**	**0.01**	**5.00**
	Linear deceleration (m/s^2) with ramp set 1.				
S.235	**Jerk dec end 1**	(linked to F.254)	**1.00**	**0.01**	**10.00**
	Jerk (m/s^3) applied at the beginning of a deceleration with ramp set 1.				
S.240	**Jerk acc ini 2**	(linked to F.255)	**0.50**	**0.01**	**10.00**
	Jerk (m/s^3) applied at the beginning of an acceleration with ramp set 2 (Ramp set 2 is the one used by default when a short floor is detected).				

Code	Display (Description)		Def.	Min.	Max
S.241	**Acceleration 2**	(linked to F.203)	**0.60**	**0.01**	**5.00**
	Linear acceleration (m/s^2) with ramp set 2.				
S.242	**Jerk acc end 2**	(linked to F.256)	**1.40**	**0.01**	**10.00**
	Jerk (m/s^3) applied at the beginning of a deceleration with ramp set 2.				
S.243	**Jerk dec ini 2**	(linked to F.257)	**1.40**	**0.01**	**10.00**
	Jerk (m/s^3) applied at the beginning of a deceleration with ramp set 2.				
S.244	**Deceleration 2**	(linked to F.204)	**0.60**	**0.01**	**5.00**
	Linear deceleration (m/s^2) with ramp set 2.				
S.245	**Jerk dec end 2**	(linked to F.258)	**1.00**	**0.01**	**10.00**
	Jerk (m/s^3) applied at the beginning of a deceleration with ramp set 2.				
S.250	**Cont close delay**	(linked to A.080)	**0.20**	**0.00**	**10.00**
	Delay time (s) for safe closing or the run contactor.				
S.251	**Magnet time**	(linked to A.081)	**1.00**	**0.00**	**10.00**
	Duration (s) of the initial magnetization of the motor with DC injection.				
S.252	**Brake open delay**	(linked to A.082)	**0.20**	**0.00**	**10.00**
	Delay time (s) between the open command and effective opening of the mechanical brake.				
S.253	**Smooth start dly**	(linked to A.083)	**0.00**	**0.00**	**10.00**
	Duration (s) of the smooth start phase.				
S.254	**DCBrake stp time**	(linked to A.084)	**1.00**	**0.00**	**10.00**
	Duration (s) of the stopping phase, after the speed has fallen below the zero threshold (defined by parameter P.440). During this phase, the inverter can either output a DC current, or maintain a low frequency, in order to compensate for the slip (default), as programmed by S.260.				
S.255	**Brake close dly**	(linked to A.085)	**0.20**	**0.00**	**10.00**
	Delay time (s) between the close command and the effective engagement of the mechanical brake.				
S.256	**Cont open delay**	(linked to A.086)	**0.20**	**0.00**	**10.00**
	Delay time (s) between the open command and the affective opening of the run contactor.				
S.260	**Lift stop mode**	(linked to A.220)	**[1] Normal stop**		
	After the car speed falls below the zero threshold (defined by P.440), the inverter can be programmed to brake with DC injection (S.260 = 0), or to maintain a low frequency output in order to compensate for the estimated slip (S.260 = 1). The latter is set by default. Possible selections: [0] DC brake at stop [1] Normal stop				
S.300	**Manual boost [%]**	(linked to P.120)	**3.0**	**0.0**	**25.0**
	Voltage boost (% of motor rated voltage) applied at low frequency in order to maintain the machine flux.				
S.301	**Auto boost en**	(linked to P.122)	**[0] Disable**		
	The automatic boost allows for precise compensation of the resistive voltage drop due to the winding resistance, keeping the flux at its rated value regardless of the load level and output frequency. For correct operation of this function, a precise value of the equivalent stator resistance is needed. Possible selections: [0] Disable [1] Enable				
S.310	**Slip compensat**	(linked to P.100)	**50**	**0**	**250**
	Amount of slip compensation (% of rated slip, calculated from nameplates) during motoring (power flows from motor to load).				
S.311	**Slip comp regen**	(linked to P.102)	**50**	**0**	**250**

Code	**Display** (Description)		Def.	Min.	Max
	Amount of slip compensation (% of rated slip, calculated from nameplates) during regeneration (power flows back from load to motor).				
S.312	**Slip comp filter**	(linked to P.101)	**0.3**	**0.0**	**10.0**
	Time constant (s) of the filter used for slip compensation. The lower this value, the faster the compensation, with improved speed control. Excessively fast slip compensation may cause unwanted oscillations.				
S.320	**DC braking level**	(linked to P.300)	**75**	**0**	**100**
	Amount of current (% of drive rated current) injected during magnetization and stopping phases.				
S.400	**Control mode**	(linked to P.010)	**[0] V/f OpenLoop**		
	Set this parameter to "[0] Open loop V/f" when there is no encoder feedback available. Set to "[1] Closed loop V/f" otherwise. Possible selections: [0] V/f OpenLoop [1] V/f ClsdLoop				
S.401	**Encoder ppr**	(linked to I.501)	**1024**	**1**	**9999**
	Resolution of the encoder in use, expressed in number of pulses per mechanical revolution (ppr). It is a nameplate data of the encoder.				
S.450	**Spd ctrl P-gainH**	(linked to P.172)	**2.0**	**0.0**	**100.0**
	Proportional gain of speed PI regulator.				
S.451	**Spd ctrl I-gainH**	(linked to P.173)	**1.0**	**0.0**	**100.0**
	Integral gain of speed PI regulator.				
S.452	**Spd PI High lim**	(linked to P.176)	**10.0**	**0.0**	**100.0**
	Maximum allowed output of the speed PI regulator (% of maximum frequency, F.020). It represents the maximum amount of slip that is allowed during motoring operation.				
S.453	**Spd PI Low lim**	(linked to P.177)	**-10.0**	**-100.0**	**0.0**
	Minimum allowed output of the speed PI regulator (% of maximum frequency, F.020). It represents the maximum amount of slip (negative) that is allowed during braking operation.				

Note! It is possible to configure gain scheduling for the speed PI regulator.

S.901	**Save parameters**	(linked to C.000)
	The execution of this command will save all the parameters into the permanent memory of the drive. All unsaved settings will be lost if the power is cycled.	

7.5 Menù Display

Code	Display	Description	Unit	Var.	IPA
d.000	**Output frequency**	Drive output frequency	**Hz**	**0.01**	**001**
d.001	**Frequency ref**	Drive frequency reference	**Hz**	**0.01**	**002**
d.002	**Output current**	Drive output current (rms)	**A**	**0.1**	**003**
d.003	**Output voltage**	Drive output voltage (rms)	**V**	**1**	**004**
d.004	**DC link voltage**	DC Bus drive voltage (DC)	**V**	**1**	**005**
d.005	**Power factor**	Power factor		**0.01**	**006**
d.006	**Power [kW]**	Inverter output power	**kW**	**0.01**	**007**
d.007	**Output speed**	Drive output speed	**mm/s**	**1**	**008**
d.008	**Speed ref**	Drive speed reference (d.001)*(P.600)	**mm/s**	**1**	**009**
d.050	**Heatsink temp**	Drive heatsink temperature (linear sensor measured)	**°C**	**1**	**010**
d.051	**Drive OL**	Drive overload (100% = alarm threshold)	**%**	**0.1**	**011**
d.052	**Motor OL**	Motor overload (100% = alarm threshold)	**%**	**0.1**	**012**
d.053	**Brake res OL**	Braking resistor overload (100%=alarm thr)	**%**	**0.1**	**013**
d.100	**Dig inp status**	Digital inputs status acquired by the drive (terminal or virtual)			**014**
d.101	**Term inp status**	Digital inputs terminal status of the drive regulat. Board			**015**
d.102	**Vir dig inp stat**	Virtual digital inputs status from drive serial link or field bus card			**016**
d.120	**Exp dig inp stat**	Expansion digital inputs status (optional terminal or virtual)			**017**
d.121	**Exp term inp**	Expansion digital inputs terminal status of the drive expansion board			**018**
d.122	**Vir exp dig inp**	Expansion virtual digital inputs status from drive serial link or field bus card			**019**
d.150	**Dig out status**	Digital outputs status on the terminals of the drive regulation board (commanded by DO functions or virtual DO)			**020**
d.151	**Drv dig out sta**	Digital outputs status, commanded by DO functions			**021**
d.152	**Vir dig out sta**	Virtual digital outputs status, commanded via serial link or field bus card			
022					
d.170	**Exp dig out sta**	Expansion digital outputs status on the terminals of the drive regulation board (commanded by DO functions or virtual DO)			**023**
d.171	**Exp DrvDigOutSta**	Expansion digital outputs status, commanded by DO functions			**024**
d.172	**Exp VirDigOutSta**	Expansion virtual digital outputs status (commanded via serial link or field bus card)			**025**
d.200	**An in 1 cnf mon**	Analog input 1 destination; it shows the function associated to this analog input [0] Null funct [1] Rif freq 1 [2] Rif freq 2 [3] Fatt liv Bst [4] Fatt liv OT [5] FattLiv Vred [6] Fatt liv DCB [7] FattEst Ramp [8] FattRif freq [9] VelPI LimFac [10] MltFrq ch 1 [11] MltFrq ch 2			**026**

English

Code	Display	Description	Unit	Var.	IPA
d.201	**An in 1 monitor**	Analog input 1 output block % value			**027**
d.202	**An in 1 term mon**	Analog input 1 input block % value			**028**
d.210	**An in 2 cnf mon**	Analog input 2 destination; it shows the function associated to this AI. As per d.200			**029**
d.211	**An in 2 monitor**	Analog input 2 output block % value			**030**
d.212	**An in 2 term mon**	Analog input 2 input block % value			**031**
d.220	**An in 3 cnf mon**	Analog input 3 destination; it shows the function associated to this AI. As per d.200			**032**
d.221	**An in 3 monitor**	Analog input 3 output block % value			**033**
d.222	**An in 3 term mon**	Analog input 3 input block % value			**034**
d.250	**LCW To PLC (0-7)**	Monitor of the control bits sent to the internal sequencer. Bit 0 to 7			**66**
d.251	**LCW To PLC(8-15)**	Monitor of the control bits sent to the internal sequencer. Bit 8 to 15			**67**
d.252	**LCW Fr PLC (0-7)**	Monitor of the control bits generated by the internal sequencer. Bit 0 to 7			**68**
d.253	**LCW Fr PLC(8-15)**	Monitor of the control bits generated by the internal sequencer. Bit 8 to 15			**69**
d.254	**LCW FrPLC(16-23)**	Monitor of the control bits generated by the internal sequencer. Bit 16 to 23			**70**
d.255	**LSW (0-7)**	Monitor of the drive status. Bit 0 to 7.			**71**
d.300	**EncPulses/Sample**	Number of encoder pulses, recorded in the time interval defined by parameter I.504.		**1/100**	**035**
d.301	**Encoder freq**	Encoder frequency reading (Motor frequency)	**Hz**	**0.01**	**036**
d.302	**Encoder speed**	Encoder speed reading (d.000)*(P.600)		**0.01/1**	**037**
d.350	**Option 1 state**	Drive option 1 state			**038**
d.351	**Option 2 state**	Drive option 2 state			**039**
d.353	**Sbi state**	Communication state between SBI and Master 0 Wait parametrization 1 Wait configuration 2 Data exchange 3 Error			**059**
d.354	**Sbi baudrate**	Communication speed between SBI and Master 0 12 Mbit / s 1 6 Mbit / s 2 3 Mbit / s 3 1.5 Mbit / s 4 500 Kbit / s 5 187.5 Kbit / s 6 93.75 Kbit / s 7 45.45 Kbit / s 8 19.2 Kbit / s 15 unknown			**060**
d.400	**PID reference**	PID reference signal	**%**	**0.1**	**041**
d.401	**PID feedback**	PID feedback signal	**%**	**0.1**	**042**
d.402	**PID error**	PID error signal	**%**	**0.1**	**043**
d.403	**PID integr comp**	PID integral component	**%**	**0.1**	**044**
d.404	**PID output**	PID output signal	**%**	**0.1**	**045**

Code	Display	Description	Unit	Var.	IPA
d.450	**Mdplc error**	Status of internal sequencer 0 No error 1 Internal sequencer error			**62**
d.500	**Lift space**	Space needed to accelerate the car from zero to max speed and then decelerate back to zero	**m**	**0.01**	**63**
d.501	**Lift space**	Space needed to accelerate the car from zero to max speed			
d.502	**Lift space**	Space needed to decelerate the car from max speed to zero	**m**	**0.01**	**65**
d.800	**1st alarm-latest**	Last alarm stored by the drive alarm list See par. 10.3			**046**
d.801	**2nd alarm**	Second to last alarm			**047**
d.802	**3rd alarm**	Third to last alarm			**048**
d.803	**4th alarm**	Fourth to last alarm			**049**
d.950	**Drive rated curr**	Drive rated current (it depends on the drive size)		**0.1**	**050**
d.951	**SW version (1/2)**	Software version - part 1 (03.01)		**0.01**	**051**
d.952	**SW version (2/2)**	Software version - part 2 (00.00)		**0.01**	**052**
d.957	**Drive size**	Drive size code 4 4kW - 230/400/460V 5 5.5kW - 230/400/460V 6 7.5kW - 230/400/460V 7 11kW - 230/400/460V 8 15kW - 230/400/460V 9 22kW - 230/400/460V 10 30kW - 230/400/460V 11 37kW - 230/400/460V 12 45kW - 230/400/460V 13 55kW - 230/400/460V 14 75kW - 230/400/460V 15 90kW - 230/400/460V 16 110kW - 230/400/460V 17 132kW - 230/400/460V 18 160kW - 230/400/460V 21 18.5kW - 230/400/460V 25 200kW - 230/400/460V			**057**
d.958	**Drive cfg type**	Drive configuration type [0]Standard: 400Vac, 50Hz [1] American: 460Vac, 60Hz			**061**
d.999	**Display Test**	Drive display test			

English

8 - Encoder Interface (EXP-ENC-AGy option board)

AGy -L provides an enhanced encoder interface for closed loop speed control.
Standard two channels quadrature digital encoders with 5V, 8V or 24V power supply can be used. Maximum input frequency on either channel is 150kHz.

8.1 Wiring

The EXP-ENC-AGy expansion card allows the connection of a digital encoder TTL (+5V) or HTL (+24V).
Default setting= HTL (+24V)

24V Encoder mains supply	When an HTL encoder is used, on terminals 9 and 10 of R-AGy-2 regulation card is available the following voltage: - terminal 9 : +24V OUT - terminal 10 : 0V24 - GND
8V, 5V Encoder mains supply	This DC supply is available on terminals 35 and 36 of EXP-ENCAGy card :

Term.	Designation	Function
12	**A+**	A channel positive
13	**A-**	A channel negative
14	**B+**	B channel positive
15	**B-**	B channel negative
35	**Vcc**	8V , 5V (*) Vcc Encoder mains supply
38	**GND**	GND Encoder mains supply

(*) selectable via software by I.505 parameter, into INTERFACE menu.

8.2 Setting of encoder power supply

24V HTL encoders can be supplied by using the +24V output, available on the standard regulation board (terminal 9); in that case terminals 35 and 36 on EXP-ENC-AGy card should be left unconnected.
The two jumpers **S1** on the EXP-ENC-AGy board must be **OFF** (default), meaning that A and B channels are HTL.

TTL encoders, requiring 5V or 8V power supply can be supplied by using terminals 35 and 36 of EXP-ENC-AGy.
The voltage level output on those terminals is determined by the drive parameter:**I.505 Enc power supply**.
Allowed settings are:

[0] 5.2V
[1] 5.6V
[2] 8.3V
[3] 8.7V

Proper setting is determined according to encoder specifications and cable length. The longer is the cable connecting the external power supply to the encoder, the higher should be the setting.
Select the two **jumpers S1**, on the EXP-ENC-AGy board, to **ON**, meaning that A and B channels are TTL.
Refer to **Fig.7.1** for a sample wiring diagram.

8.3 Encoder sign test

Before to use closed loop speed control it is necessary to verify if sign of acquired encoder speed corresponds to reference speed. For this:

1 - run the drive in open loop mode and set **S.400 Control mode** = [0] V/f OpenLoop; **I.500 Encoder enable** = [1] Enable)

2 - on Display menu select **d.001 Rif frequenza** and **d.301 Freq. encoder** parameters and compare the signs .

3 - in case of different signs please invert connection of encoder channels A+ , A- with B+, B-

8.4 Encoder cable break control function

The encoder cable break control function is available from card EXP-ENC-AGy rev. C with fw 3.04 and later.

To enable the function, set parameter**I.506 Enc fault enable** = 1 (Enabled)

Note! For instructions on how to connect single-channel encoders and enable the encoder cable break control function and for details of electrical specifications and configurations, please see the manual supplied with the EXP-ENC-AGy card.

9 - Emergency Operation

AGy -L is able to operate from a backup power supply (batteries, or single-phase 220Vac) in case of mains fault.
In figure 7.1, typical connection diagram of the Emergency Module MW22 is shown. When using this configuration, the following parameters have to be changed from default, in order to activate the emergency operation:

- **I.005 Freq Sel 3 src** = **"[0] False"**
- **I.011 Bak pwr act src** = **"[7] DI 6"**

When the drive detects an Under Voltage condition (either because of a mains fault or because the drive has been powered up from backup module), if the "**Bak Pwr Active**" command is active (contactor KB closed), the UV Alarm is automatically reset and the drive will enter the **Emergency Mode**.
While in Emergency mode, the drive is able to operate with a low DC-link voltage (supplied from the emergency module). Operation is exactly the same as in normal mode (Run command and frequency reference are issued as usual), but the inverter output frequency is clamped by the internal logic to the value specified in parameter **F.115 BakPwr max freq**

Note! While in Emergency Mode, the AC-mains contactor must be open.
If the AC-mains contactor is closed and the power is restored while the drive is still in Emergency Mode, the input bridge of the inverter may fail due to inrush current of DC-link capacitors.

Once the emergency operation is completed, the drive should be turned off, by opening contactor KB, in order not to discharge the batteries. When the drive is turned off, the AC mains contactor K1M can be closed, so that the drive is ready to operate when the power is restored.

10 - Troubleshooting

10.1 Drive Alarm Condition

The drive keypad will show on the 2nd line of alphanumeric display a blinking message with the code and name of the alarm occurred.
The figure below shows an example of **OV Overvoltage** alarm condition during **d.000 Output frequency** parameter displaying.

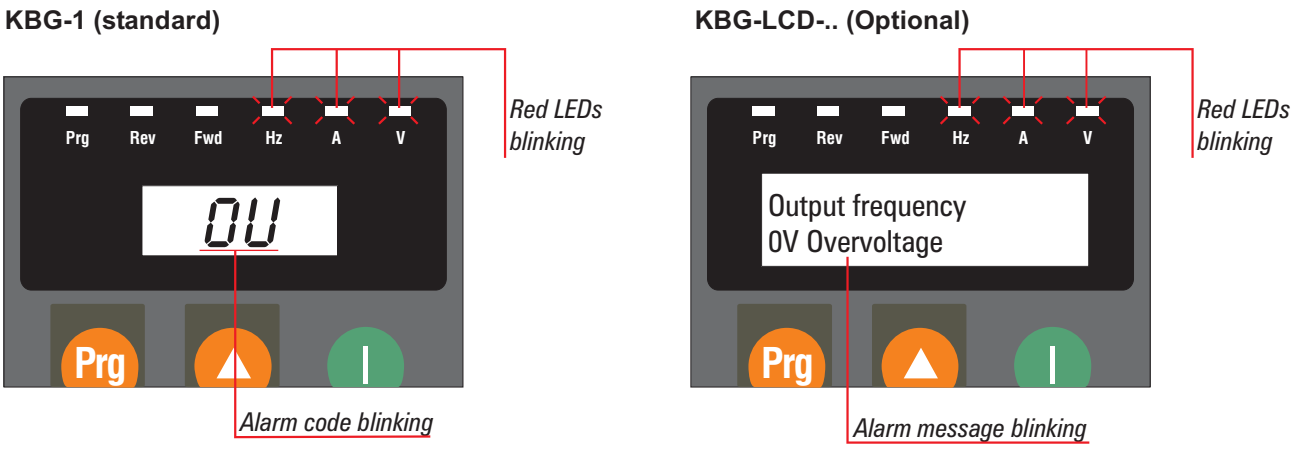


Figure 10.1.1: Alarm Displaying for LDC and 7 segments display

The active alarm can be acknowledged by pressing the **Prg** button on the keypad.
This operation will allow **menu navigation and parameter editing** while the drive is in alarm state (red LEDs blinking).

In order to resume drive operation, an Alarm reset command is necessary.

10.2 Alarm Reset

Alarm reset can be performed in three different ways:

- Alarm reset by keypad: pressing simultaneously **Up** and **Down** keys; the reset action will take effect when the buttons are released.

- Alarm reset by digital input: it can be performed through a programmable digital input connected to command **I.010 Fault reset src** = **[9] Digital input 8** (terminal 4).

. Alarm reset by Autoreset function: it allows an automatic reset of some drive alarms (see table 10.3.1), by the settings of **P.380, P.381, P.382** and **P.383** parameters.

The figure below shows how to reset an alarm by keypad.

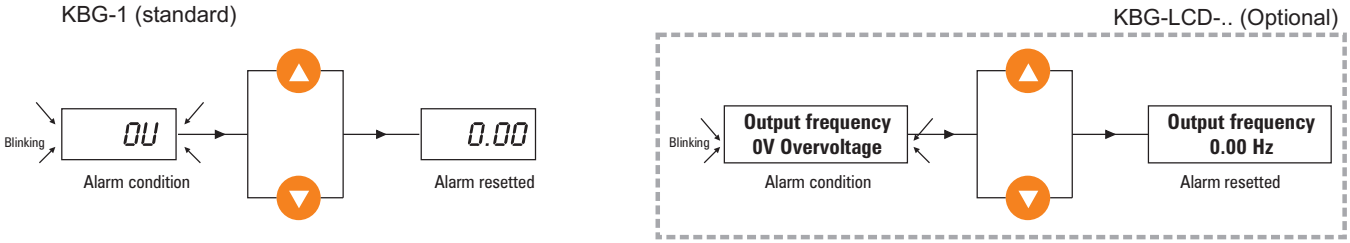


Figure 10.2.1: Alarm Reset

English

10.3 List of drive alarm events

Table 10.3.1 provides a description of the causes for all the possible alarms.

ALARM		DESCRIPTION	Numerical code from serial	AUTORESET	Bit H.062 H.063
Cod.	Name				
EF	EF Ext Fault	It trips when External fault input is active	1	YES	0
OC	OC OverCurrent	It trips when an Overcurrent value is detected by output current sensor	2	YES	1
OU	OV OverVoltage	It trips when the drive DC Bus voltage is higher than the maximun threshold for the given main voltage setting	3	YES	2
UU	UV UnderVoltage	It trips when the drive DC Bus voltage is lower than the maximun threshold for the given main voltage setting	4	YES	3
OH	OH OverTemperat	It trips when the drive heatsink temperature detected by the switch sensor exceeds its threshold (*)	5	NO	4
OLi	OLi Drive OL	It trips when the drive overload accumulator exceeded the trip threshold	6	NO	5
OLM	OLM Motor OL	It trips when the motor overload accumulator exceeded the trip threshold	7	NO	6
OLr	OLr Brake res OL	Its intervention occurs when the overload cycle of the external braking resistance does not correspond to the defined limits.	8	NO	7
Ot	Ot Inst OverTrq	It trips when the torque delivered by the motor exceeds the programmed level for the preset time	9	NO	8
PH	PH Phase loss	It trips when the supply phase lack: enabled 30 seconds after one of the supply phases has been disconnected	10	NO	9
FU	FU Fuse Blown	It trips when the drive input fuses are blown	11	NO	10
OCH	OCH Desat Alarm	IGBT desaturation or instantaneous overcurrent have been detected	12	YES	11
St	St Serial TO	It trips when the serial link time out exceeds the programmed level (I.604 parameter)	13	YES	12
OP1	OP1 Opt 1 Alm	Communication failure between drive regulation board and option 1 expansion board	14	NO	13
OP2	OP2 Opt 2 Alm	Communication failure between drive regulation board and option 2 expansion board	15	NO	14
bF	bF Bus Fault	Drive comunication Bus failure	16	NO	15
OHS	OHS OverTemperat	It trips when the drive heatsink temperature exceeds a safety level. (*)	17	NO	16
SHC	SHC Short Circ	Short Circuit between output phases or Ground fault	18	NO	17
Ohr		Reserved	19		18
Lf	LF Limiter fault	It trips when the output current limiter or the DC-Link voltage limiter fail. The failure can be caused by wrong settings of regulator gains or by the motor load.	20	NO	19
PLC	PLC Plc fault	PLC program not active. Lift application does not function. Run C.050 parameter to reset the alarm.	21	NO	20
EMS	Key Em Stp fault	Reserved	22	NO	21
UHS	UHS Under Temperat	It trips when the temperature of the drive heatsink is below a safety level (typically –5°C).	23	NO	22
ENC	Encoder fault	It trips in case of a power loss on the cable connecting the encoder to the drive.	24	NO	23
PHO	Phase Loss Output	See figure 7.2: it trips during the phase (2) if the current does not exceed the limit defined in parameter A.087.	25	NO	24

*) OH switch sensor threshold and OHS analog sensor threshold depend on the drive size (75 °C ... 85 °C)

Table 10.3.1 Alarm event list

11 - EMC Directive

EMC Directive

The possible Validity Fields of the EMC Directive (89/336) applied to PDS

"**CE marking**" summarises the presumption of compliance with the
Essential Requirements of the EMC Directive, which is formulated in the **EC Declaration of Conformity**
Clauses numbers [.] refer to European Commission document "Guide to the Application of Directive 89/336/EEC"
1997 edition. ISBN 92-828-0762-2

	Validity Field	Description
Relates to PDS or CDM or BDM directly	**-1-** **Finished Product/** **Complex component** available to general public [Clauses: 3.7, 6.2.1, 6.2.3.1 & 6.3.1] A PDS (or CDM/BDM) of the Unrestricted Distribution class	Placed on the market as a single commercial unit for distribution and final use. Free movement based on compliance with the EMC Directive - **EC Declaration of conformity required** - **CE marking required** - **PDS or CDM/BDM should comply with IEC 1800-3/EN 61800-3** The manufacturer of the PDS (or CDM/BDM) is responsible for the EMC behaviour of the PDS (or CDM/BDM), under specified conditions. EMC measures outside the item are described in an easy to understand fashion and could actually be implemented by a layman in the field of EMC. The EMC responsiblity of the assembler of the final product is to follow the manufacturer's recommendations and guidelines. ***NOTE:*** The manufacturer of the PDS (or CDM/BDM) is not responsible for the resulting behaviour of any system or installation which includes the PDS, see Validity Fields 3 or 4.
	-2- **Finished Product/** **Complex component** only for professional assemblers [Clauses: 3.7, 6.2.1, 6.2.3.2 & 6.3.2] A PDS (or CDM/BDM) of the Restricted Distribution class sold to be included as part of a system or installation	Not placed on the marked as a single commercial unit for distribution and final use. Intended only for professional assemblers who have a level of technical competence to correctly install. - **No EC Declaration of conformity** - **No CE marking** - **PDS or CDM/BDM should comply with IEC 1800-3/EN 61800-3** The manufacturer of the PDS (or CDM/BDM) is responsible for the provision of installation guidelines that will assist the manufacturer of the apparatus, system or installation to achieve compliance. The resulting EMC behaviour is the responsibility of the manufacturer of the apparatus, system, or installation, for which its own standards may apply.
Relates to application of PDS or CDM or BDM	**-3-** **Installation** [Clause: 6.5] Several combined items of system, finished product or other components brought together at a given place. May include PDSs (CDM or BDM), possibly of different classes - Restricted or Unrestricted	Not intended to be placed on the market as a single functional unit (no free movement). Each system included is subject to the provisions of the EMC Directive. - **No EC Declaration of conformity** - **No CE marking** - **For the PDSs or CDM/BDMs themselves see Validity Fields 1 or 2** **- Responsibility of the manufacturer of the PDS may include commissioning** The resulting EMC behaviour is the responsibility of the manufacturer of the installation in co-operation with the user (e.g. by following an appropriate EMC plan). Essential protection requirements of EMC Directive apply regarding the neighbourhood of the installation.
	-4- **System** [Clause: 6.4] Ready to use finished item(s). May include PDSs (CDM or BDM), possibly of different classes - Restricted or Unrestricted	Has a direct function for the final user. Placed on the market for distribution as a single functional unit, or as units intended to be easily connected together. - **EC Declaration of conformity required** - **CE marking required for the system** - **For the PDSs or CDM/BDMs themselves see Validity Fields 1 or 2** The resulting EMC behaviour, under specified conditions is the responsibility of the manufacturer of the system by using a modular or system approach as appropriate. ***NOTE:*** The manufacturer of the system is not responsible for the resulting behaviour of any installation which includes the PDS, see Validity Field 3.

Examples of application in the different Validity Fields:

1 **BDM to be used anywhere:** (example in domestic premises, or BDM available from commercial distributors), sold without any knowledge of the purchaser or the application. The manufacture is responsible that sufficient EMC can be achieved even by any unknown customer or layman (snap-in, switch-on).

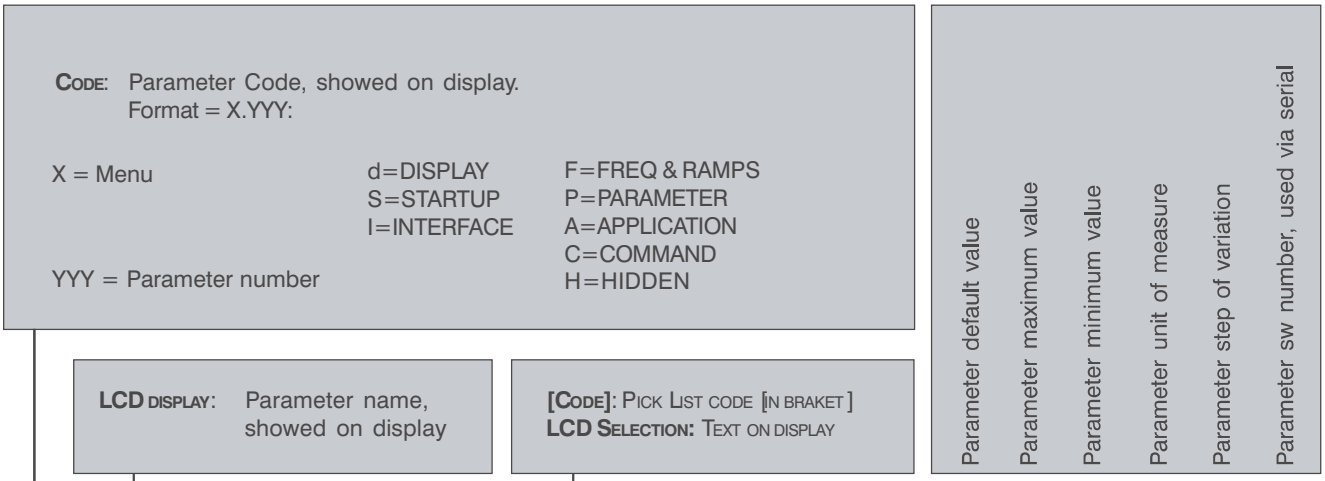
2 **CDM/BDM or PDS for general purpose:** to be incorporated in a machine or for industrial application This is sold as a subassembly to a professional assembler who incorporates it in a machine, system or installation. Conditions of use are specified in the manufacturer's documentation. Exchange of technical data allows optimisation of the EMC solution.. (See restricted distribution definition).

3 **Installation:** It can consist of different commercial units (PDS, mechanics, process control etc.). The conditions of incorporation for the PDS (CDM or BDM) are specified at the time of the order, consequently an exchange of technical data between supplier and client is possible. The combination of the various items in the installation should be considered in order to ensure EMC. Harmonic compensation is an evident example of this, for both technical and economical reasons. (E.g. rolling mill, paper machine, crane, etc.)

4 **System:** Ready to use finished item which includes one or more PDSs (or CDMs/BDMs); e.g. household equipment, air conditioners, standard machine tools, standard pumping systems, etc.

12 - Parameter list

Figure 12.1: Parameters Description Legend



PARAMETER			PICK LIST		DEFAULT	MIN	MAX	UNIT	VARIATION	IPA (ALIAS
CODE	LCD DISPLAY	DESCRIPTION	[CODE] LCD SELECTION	DESCRIPTION						
START-UP										
S.000	**Mains voltage**	Rated value of the line voltage	**230** **380** **400** **420** **440** **460** **480**		400	230	480	V		404 *(P.020)*
S.001	**Mains frequency**	Rated value of the line frequency	**50** **60**	50Hz 60Hz	50	50	60	Hz		405 *(P.021)*

Note! (ALIAS): On STARTUP menu only.
Parameter code of same parameter on other menu .

(*): Parameter value depends on the drive size.

(1): KBG-LCD-.. keypad: “Confirm? NO”
KBG-1 keypad: “off”

(2): LCD keypad: “Confirm? YES”
KBG-1 keypad: “do”

Code	PARAMETER		PICK LIST		Def.	Min	Max	Unit	Variat.	IPA
	LCD Display	DESCRIPTION	LCD Selection	Description						
DISPLAY										
d.000	Output frequency	Frequenza di uscita						Hz	0.01	001
d.001	Frequency ref	Riferimento di frequenza						Hz	0.01	002
d.002	Output current	Corrente di uscita (rms)						A	0.1	003
d.003	Output voltage	Tensione di uscita (rms)						V	1	004
d.004	DC link voltage	Tensione di DC Bus (DC)						V	1	005
d.005	Power factor	Fattore di potenza (Cos phi)							0.01	006
d.006	Power [kW]	Potenza di uscita dell'inverter						kW	0.01	007
d.007	Output speed	Velocita` del motore						mm/s	1	008
d.008	Speed ref	Riferim. di velocità del drive (d.001)*(P.600)						mm/s	1	009
d.050	Heatsink temp	Temperatura del dissipatore (misurata da sensore lineare)						°C	1	010
d.051	Drive OL	Sovraccarico del drive (100% = soglia di allarme)						%	0.1	011
d.052	Motor OL	Sovraccarico motore (100% = soglia allarme)						%	0.1	012
d.053	Brake res OL	Sovracc. resistenza frenatura (100% = soglia allarme)						%	0.1	013
d.100	Dig inp status	Stato ingressi digit. abilitati (morsettiera o virtuali)								014
d.101	Term inp status	Stato ingressi digitali sulla morsettiera della scheda di regolazione								015
d.102	Vir dig inp stat	Stato ingressi digitali virtuali da linea seriale o bus di campo								016
d.120	Exp dig inp stat	Stato ingressi digitali opzionali (morsettiera opzionale o virtuali)								017
d.121	Exp term inp	Stato ingressi digitali sulla morsettiera della scheda opzionale								018
d.122	Vir exp dig inp	Stato ingressi digitali virtuali opzionali da linea seriale o bus di campo								019
d.150	Dig out status	Stato uscite digitali sulla morsettiera della scheda di regolazione (comandate dalla funzione drive o virtuale)								020
d.151	Drv dig out sta	Stato uscite digitali comandate dalla funzione del drive								021
d.152	Vir dig out sta	Stato uscite digitali virtuali comandate via linea seriale o bus di campo								022
d.170	Exp dig out sta	Stato espansione uscite digitali sulla morsettiera della scheda di regolazione comandate dalla funzione drive o virtuale)								023
d.171	Exp DrvDigOutSta	Stato espansione uscite digitali comandate dalla funzione del drive								024
d.172	Exp VirDigOutSta	Stato espansione uscite digitali virtuali comandate via linea seriale o bus di campo								025
d.200	An in 1 cnf mon	Destinazione ingresso analogico 1; visualizza la funzione associata all'ingresso analogico	[0] Null funct [1] Freq ref 1 [2] Freq ref 2 [3] Bst lev fact [4] OT lev fact [5] Vred lev fac [6] DCB lev fact [7] RampExt fact [8] Freq Ref fact [9] SpdPI LimFac [10] MtfFrq ch 1 [11] MtfFrq ch 2							026
d.201	An in 1 monitor	Segnale d'uscita (%) del blocco dell'ingresso analogico 1								027
d.202	An in 1 term mon	Segnale in morsettiera (%) dell'ingresso analogico 1								028
d.210	An in 2 cnf mon	Programmazione ingresso analogico 2; mostra la funzione associata a questo ingresso analogico	Come per d.200							029
d.211	An in 2 monitor	Segnale d'uscita (%) del blocco dell'ingresso analogico 2								030
d.212	An in 2 term mon	Segnale in morsettiera (%) dell'ingresso analogico 2								031
d.220	An in 3 cnf mon	Programmazione ingresso analogico 3; mostra la funzione associata a questo ingresso analogico	Come per d.200							032
d.221	An in 3 monitor	Segnale d'uscita % del blocco dell'ingresso analogico 3								033
d.222	An in 3 term mon	Segnale in morsettiera (%) dell'ingresso analogico 3								034
d.250	DCW To PLC (0-7)	Verifica dei bit di controllo inviati al sequencer interno. Bit da 0 a 7.								66
d.251	DCW To PLC(8-15)	Verifica dei bit di controllo inviati al sequencer interno. Bit da 8 a 15.								67
d.252	DCW Fr PLC (0-7)	Verifica dei bit di controllo generati dal sequencer interno. Bit da 0 a 7								68

Code	PARAMETER		PICK LIST		Def.	Min	Max	Unit	Variat.	IPA
	LCD Display	DESCRIPTION	LCD Selection	Description						
d.253	LCW Fr PLC(8-15)	Monitor of the control bits generated by the internal sequencer. Bit 8 to 15								69
d.254	LCW FrPLC(16-24)	Monitor of the control bits generated by the internal sequencer. Bit 16 to 24								70
d.255	LSW (0-7)	Monitor of the drive status. Bit 0 to 7								71
d.300	EncPulses/Sample	Number of encoder pulses, recorded in the time interval defined by parameter I.504.							1/100	035
d.301	Encoder freq	Encoder frequency reading (Motor frequency)						Hz	0.01	036
d.302	Encoder speed	Encoder speed reading (d.000)*(P.600)							0.01/1	037
d.350	Option 1 state	Drive option 1 state (expansion board type programmed)								038
d.351	Option 2 state	Drive option 2 state (expansion board type programmed)								039
d.353	Sbi state	Communication state between SBI and Master	0 1 2 3	Wait parametrization Wait configuration Data exchange Error						059
d.354	Sbi baudrate	Communication speed between SBI and Master	0 1 2 3 4 5 6 7 8 15	12 Mbit / s 6 Mbit / s 3 Mbit / s 1.5 Mbit / s 500 Kbit / s 187.5 Kbit / s 93.75 Kbit / s 45.45 Kbit / s 19.2 Kbit / s unknown						060
d.400	PID reference	PID reference signal						%	0.1	041
d.401	PID feedback	PID feedback signal						%	0.1	042
d.402	PID error	PID error signal						%	0.1	043
d.403	PID integr comp	PID integral component						%	0.1	044
d.404	PID output	PID output signal						%	0.1	045
d.450	Mdplc error	Status of internal sequencer	0 1	No error Internal sequencer error						062
d.500	Lift space	Space needed to accelerate the car from zero to max speed and then decelerate back to zero						◇	0.01	063
d.501	Lift accel space	Space needed to accelerate the car from zero to max speed						◇	0.01	064
d.502	Lift decel space	Space needed to decelerate the car from max speed to zero						◇	0.01	065
d.800	1st alarm-latest	Last alarm stored by the drive alarm list	See paragraph 9.3							046
d.801	2nd alarm	Second to last alarm								047
d.802	3rd alarm	Third to last alarm								048
d.803	4th alarm	Fourth to last alarm								049
d.950	Drive rated curr	Drive rated current (it depends on the drive size)							0.1	050
d.951	SW version (1/2)	Software version - part 1	03.01						0.01	051
d.952	SW version (2/2)	Software version - part 2	00.00						0.01	052
d.957	Drive size	Drive size code	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 21 25	0.75kW - 230/400/460V 1.5kW - 230/400/460V 2.2kW - 230/400/460V 3kW - 230/400/460V 4kW - 230/400/460V 5.5kW - 230/400/460V 7.5kW - 230/400/460V 11kW - 230/400/460V 15kW - 230/400/460V 22kW - 230/400/460V 30kW - 230/400/460V 37kW - 230/400/460V 45kW - 230/400/460V 55kW - 230/400/460V 75kW - 230/400/460V 90kW - 230/400/460 110kW - 230/400/460V 132kW - 230/400/460V 160kW - 230/400/460V 18.5kW - 230/400460 200kW - 230/400460						057
d.958	Drive cfg type	Drive configuration type	[0]Standard:400 [1]American:460	Standard: 400Vac, 50Hz American: 460Vac, 60Hz						061
d.999	Display Test	Drive display test								099

Code	PARAMETER		PICK LIST		Def.	Min	Max	Unit	Variat.	IPA
	LCD Display	DESCRIPTION	LCD Selection	Description						
START-UP										
S.000	Mains voltage	Rated value of the line voltage	230 380 400 420 440 460 480		400	230	480	V		404 (P.020)
S.001	Mains frequency	Rated value of the line frequency	50 60		60	50	60	Hz		405 (P.021)
S.100	Base voltage	Motor base (rated) voltage			380	50	528	V	1	413 (P.061)
S.101	Base frequency	Rated frequency of the motor			50	25	250	Hz	0.1	414 (P.062)
S.150	Motor rated curr	Rated current of the motor			(*)	(*)	(*)	A	0.1	406 (P.040)
S.151	Motor pole pairs	Pole Pairs of the motor			2	1	60		0.01	407 (P.041)
S.152	Motor power fact	Motor power factor			(*)	0.01	1		0.01	408 (P.042)
S.153	Motor stator R	Measurement of the stator resistance of the motor			(*)	0	99.99	ohm		409 (P.043)
S.170	Measure stator R	Motor Autotune command	(1) (2)		(1)	(1)	(2)			806 (C.100)
S.180	Car max speed	Speed of the lift car when the inverter output frequency is equal to S.101			0.50	0.01	5.00	m/s	0.01	1323 (A.090)
S.200	Frequency ref 0	Digital reference frequency 0			10.0	-F.020	F.020		31	(F.100)
S.201	Frequency ref 1	Digital reference frequency 1			50.0	-F.020	F.020		31	(F.101)
S.202	Frequency ref 2	Digital reference frequency 2			0	-F.020	F.020		31	(F.102)
S.203	Frequency ref 3	Digital reference frequency 3			0	-F.020	F.020		31	(F.103)
S.204	Frequency ref 4	Digital reference frequency 4			0	-F.020	F.020		31	(F.104)
S.205	Frequency ref 5	Digital reference frequency 5			0	-F.020	F.020		31	(F.105)
S.206	Frequency ref 6	Digital reference frequency 6			0	-F.020	F.020		31	(F.106)
S.207	Frequency ref 7	Digital reference frequency 7			0	-F.020	F.020		31	(F.107)
S.220	Smooth start frq	Frequency reference during smooth start			2.0	-F.020	F.020		32	(F.116)
S.225	Ramp factor 1	Multiplier for acc/dec and jerks of ramp sets 1 and 3			1.00	0.01	2.50		0.01	1324 (A.091)
S.226	Ramp factor 2	Multiplier for acc/dec and jerks of ramp sets 2 and 4			1.00	0.01	2.50		0.01	1327 (A.092)
S.230	Jerk acc ini 1	Jerk applied at the beginning of an acceleration with ramp set 1			0.50	0.01	10.00	m/s^3	0.01	343 (F.251)
S.231	Acceleration 1	Linear acceleration with ramp set 1			0.60	0.01	5.00	m/s^2	0.01	329 (F.201)
S.232	Jerk acc end 1	Jerk applied at the end of an acceleration with ramp set 1			1.40	0.01	10.00	m/s^3	0.01	344 (F.252)
S.233	Jerk dec ini 1	Jerk applied at the beginning of a deceleration with ramp set 1			1.40	0.01	10.00	m/s^3	0.01	345 (F.253)
S.234	Deceleration 1	Linear deceleration with ramp set 1			0.60	0.01	5.00	m/s^2	0.01	330 (F.202)
S.235	Jerk dec end 1	Jerk applied at the end of a deceleration with ramp set 1			1.00	0.01	10.00	m/s^3	0.01	346 (F.254)
S.240	Jerk acc ini 2	Jerk applied at the beginning of an acceleration with ramp set 2			1.00	0.01	10.00	m/s^3	0.01	347 (F.255)
S.241	Acceleration 2	Linear acceleration with ramp set 2			0.60	0.01	5.00	m/s^2	0.01	331 (F.203)
S.242	Jerk acc end 2	Jerk applied at the end of an acceleration with ramp set 2			1.40	0.01	10.00	m/s^3	0.01	348 (F.256)
S.243	Jerk dec ini 2	Jerk applied at the beginning of a deceleration with ramp set 2			1.40	0.01	10.00	m/s^3	0.01	349 (F.257)

Code	PARAMETER		PICK LIST		Def.	Min	Max	Unit	Variat.	IPA
	LCD Display	DESCRIPTION	LCD Selection	Description						
S.244	Deceleration 2	Linear deceleration with ramp set 2			0.60	0.01	5.00	m/s^2	0.01	332 (F.204)
S.245	Jerk dec end 2	Jerk applied at the end of a deceleration with ramp set 2			1.00	0.01	10.00	m/s^3	0.01	350 (F.258)
S.250	Cont close delay	RUN contactor close delay			0.20	0	10	s	0.01	1316 (A.080)
S.251	Magnet time	Motor magnetization time			1	0	10	s	0.01	1317 (A.081)
S.252	Brake open delay	Brake contactor open delay			0.20	0	10	s	0.01	1318 (A.082)
S.253	Smooth start dly	Smooth start duration			0	0	10	s	0.01	1319 (A.083)
S.254	DCBrake stp time	Duration of 0Hz braking at stop			1	0	10	s	0.01	1320 (A.084)
S.255	Brake close dly	Brake contactor close delay			0.20	0	10	s	0.01	1321 (A.085)
S.256	Cont open delay	RUN contactor open delay			0.20	0	10	s	0.01	1322 (A.086)
S.260	Lift stop mode	Lift behavior at stop	[0] Dcb at stop [1] Normal stop	DC brake is performed after the output frequency is below P.440 threshold DC brake is not performed at stop	1	0	1			1350 (A.220)
S.300	Manual boost [%]	Manual boost at low revolutions			3.0	0.0	25.0	% of S.10	0.1	421 (P.120)
S.301	Auto boost en	Automatic boost function enabling	[0] Disable [1] Enable		0	0	1			423 (P.122)
S.310	Slip compensat	Amount of slip compensation during motoring			50	0	250	% of rated slip	1	419 (P.100)
S.311	Slip comp regen	Amount of slip compensation during regeneration			50	0	250	% of rated slip	1	500 (P.102)
S.312	Slip comp filter	Time constant of slip compensation			0.3	0	10	s	0.1	420 (P.101)
S.320	DC braking level	Current level used during DC brake at start and stop			75	0	100	% of d.95	1	449 (P.300)
S.400	Control mode	Drive control mode	[0] V/f OpenLoop [1] V/f ClsdLoop	Speed control without encoder feedback Speed control with encoder feedback	0	0	1			498 (P.010)
S.401	Encoder ppr	Pulses per revolution of the encoder in use			1024	1	9999		1	151 (I.501)
S.450	Spd ctrl P-gainL	Speed loop Proportional gain			2.0	0	100	%	0.1	503 (P.172)
S.451	Spd ctrl I-gainL	Speed loop Integral gain			1.0	0	100	%	0.1	504 (P.173)
S.452	Spd PI High lim	Speed PI regulator output upper limit			10	0	100	% of F.02	0.1	509 (P.176)
S.453	Spd PI Low lim	Speed PI regulator output lower limit			-10	-100	0	% of F.02	0.1	510 (P.177)
S.901	Save parameters	Save parameters	(1) (2)		(1)	(1)	(2)			800 (C.000)
			INTERFACE							
I.000	Enable src	Source of the Enable command of Lift Control Word	[0] False [1] True [2] DI 1 [3] DI 2 [4] DI 3 [5] DI 4	The command is never active The command is always active The command comes from DigInp1 The command comes from DigInp2 The command comes from DigInp3 The command comes from DigInp4	2	0	25			100

Code	PARAMETER		PICK LIST		Def.	Min	Max	Unit	Variat.	IPA
	LCD Display	DESCRIPTION	LCD Selection	Description						
			[6] DI 5	The command comes from DigInp5						
			[7] DI 6	The command comes from DigInp6						
			[8] DI 7	The command comes from DigInp7						
			[9] DI 8	The command comes from DigInp8						
			[10] DI Exp 1	The command comes from ExpDI 1						
			[11] DI Exp 2	The command comes from ExpDI 2						
			[12] DI Exp 3	The command comes from ExpDI 3						
			[13] DI Exp 4	The command comes from ExpDI 4						
			[14] AND 1	The command comes from the output of the block AND1						
			[15] AND 2	The command comes from the output of the block AND2						
			[16] AND 3	The command comes from the output of the block AND3						
			[17] OR 1	The command comes from the output of the block OR1						
			[18] OR 2	The command comes from the output of the block OR2						
			[19] OR 3	The command comes from the output of the block OR3						
			[20] NOT 1	The command comes from the output of the block NOT1						
			[21] NOT 2	The command comes from the output of the block NOT2						
			[22] NOT 3	The command comes from the output of the block NOT3						
			[23] NOT 4	The command comes from the output of the block NOT4						
			[24] FrqSel match	The command is coming from the output of the block Freq Sel match						
			[25] ShortFloorFl	The command is the short floor flag						
I.001	Run Fwd src	Source of the Run Forward command of LCW	As for I.000		3	0	25			101
I.002	Run Rev src	Source of the Run Reverse command of LCW	As for I.000		4	0	25			102
I.003	Freq Sel 1 src	Source of the Frequency Selector 1 of LCW	As for I.000		5	0	25			103
I.004	Freq Sel 2 src	Source of the Frequency Selector 2 of LCW	As for I.000		6	0	25			104
I.005	Freq Sel 3 src	Source of the Frequency Selector 3 of LCW	As for I.000		7	0	25			105
I.006	Freq Sel 4 src	Source of the Frequency Selector 4 of LCW	As for I.000		0	0	25			106
I.007	Ramp Sel 1 src	Source of the Ramp Selector 1 of LCW	As for I.000		25	0	25			107
I.008	Ramp Sel 2 src	Source of the Ramp Selector 1 of LCW	As for I.000		0	0	25			108
I.009	Ext fault src	Source of the External Fault command of LCW	As for I.000		8	0	25			109
I.010	Faul reset src	Source of the Fault Reset command of LCW	As for I.000		9	0	25			110
I.011	Bak pwr act src	Source of the Backup Power Supply Active command of LCW	As for I.000		0	0	25			111
I.012	Forced stop src	Source of the Forced Stop command of LCW			0	0	25			185
I.100	Dig output 1 cfg	Digital output 1 configuration	[0] Drive Ready [1] Alarm state [2] Not in alarm [3] Motor run [4] Motor stop [5] REV rotation [6] Steady state [7] Ramping [8] UV running		51	0	55			112

Code	PARAMETER		PICK LIST		Def.	Min	Max	Unit	Variat.	IPA
	LCD Display	DESCRIPTION	LCD Selection	Description						
			[9] Out trq>thr							
			[10] Current lim							
			[11] DC-link lim							
			[12] Limit active							
			[13] Autocapt run							
			[14] BU overload							
			[15] Neg pwrfact							
			[16] PID err ><							
			[17] PID err>thr							
			[18] PID err<thr							
			[19] PIDer><(inh)							
			[20] PIDerr>(inh)							
			[21] PIDerr<(inh)							
			[22] FWD enc rot							
			[23] REV enc rot							
			[24] Encoder stop							
			[25] Encoder run							
			[26] Extern fault							
			[27] No ext fault							
			[28] Serial TO							
			[29] freq=thr1							
			[30] freq!=thr1							
			[31] freq>thr1							
			[32] freq<thr1							
			[33] freq=thr2							
			[34] freq!=thr2							
			[35] freq>thr2							
			[36] freq<thr2							
			[37] HS temp=thr							
			[38] HS temp!=thr							
			[39] HS temp>thr							
			[40] HS temp<thr							
			[41] Output freq							
			[42] Out freq x 2							
			[43] CoastThrough							
			[44] EmgStop							
			[45] DC braking							
			[46] Drv OL status							
			[47] Drv OL warn							
			[48] Mot OL status							
			[49] Reserved							
			[50] Reserved							
			[51] Contactor	Active when the RUN contactor has to be closed, either for upward or downward motion						
			[52] Contactor UP	Active when the RUN contactor has to be closed for upward motion						
			[53] Contactor DW	Active when the RUN contactor has to be closed for downward motion						
			[54] Brake cont	Active when the mechanical brake has to be released						
			[55] Lift start	Active when the inverter output bridge is enabled and DC brake is not in progress						
I.101	Dig output 2 cfg	Digital output 2 configuration	As for I.100		32	0	55			113
I.102	Dig output 3 cfg	Digital output 3 configuration	As for I.100		54	0	55			114
I.103	Dig output 4 cfg	Digital output 4 configuration	As for I.100		2	0	55			115
I.150	Exp DigOut 1 cfg	Extended digital output 1 configuration	As for I.100		52	0	55			116
I.151	Exp DigOut 2 cfg	Extended digital output 2 configuration	As for I.100		53	0	55			117
I.152	Exp DigOut 3 cfg	Extended digital output 3 configuration	As for I.100		0	0	55			180
I.200	An in 1 Type	Setting of the Analog Input 1 type reference (voltage)	[0] +/- 10V [1] 0-10V/0-20mA	Bipolar ± 10V Unipolar +10V	1	0	1			118
I.201	An in 1 offset	Analog Input 1 offset			0	-99.9	99.9	%	0.1	119
I.202	An in 1 gain	Analog Input 1 gain			1	-9.99	9.99	%	0.01	120
I.203	An in 1 minimum	An Input 1 minimun value			0	0	99.99	%	0.1	121
I.204	An in 1 filter	Time constant of digital filter on Analog input 1			0.1	0.001	0.25	sec	0.001	122
I.205	An in 1 DeadBand	Analog Input 1 dead band			0	0	99.9	%	0.01	182

Code	PARAMETER		PICK LIST		Def.	Min	Max	Unit	Variat.	IPA
	LCD Display	DESCRIPTION	LCD Selection	Description						
I.210	An in 2 Type	Setting of the Analog Input 2 type reference (voltage)	[0] +/- 10V [1] 0-10V/0-20mA		0	0	1			123
I.211	An in 2 offset	Analog Input 2 offset			0	-99.9	99.9	%	0.1	124
I.212	An in 2 gain	Analog Input 2 gain			1	-9.99	9.99	%	0.01	125
I.213	An in 2 minimum	An Input 2 minimun value			0	0	99.99	%	0.01	126
I.214	An in 2 filter	Time constant of digital filter on Analog input 2			0.1	0.001	0.25	sec	0.001	127
I.215	An in 2 DeadBand	Analog Input 2 dead band			0	0	99.9	%	0.1	183
I.220	An in 3 Type	Setting of the Analog Input 3 type reference (current)	[1] 0-10V/0-20mA [2] 4-20mA	Bipolar ± 10V Unipolar +10V	1	1	2			128
I.221	An in 3 offset	Analog Input 3 offset			0	-99.9	99.9	%	0.1	129
I.222	An in 3 gain	Analog Input 3 gain			1	-9.99	9.99	%	0.01	130
I.223	An in 3 minimum	An Input 3 minimun value			0	0	99.99	%	0.01	131
I.224	An in 3 filter	Time constant of digital filter on Analog input 3			0.1	0.001	0.25	sec	0.001	132
I.225	An in 3 DeadBand	Analog Input 3 dead band			0	0	99.9	%	0.1	184
I.300	Analog out 1 cfg	Analog Output 1 configuration	[0] Freq out abs [1] Freq out [2] Output curr [3] Out voltage [4] Out trq (pos) [5] Out trq (abs) [6] Out trq [7] Out pwr (pos) [8] Out pwr (abs) [9] Out pwr [10] Out PF [11] Enc freq abs [12] Encoder freq [13] Freq ref abs [14] Freq ref [15] Load current [16] Magn current [17] PID output [18] DClink volt [19] U current [20] V current [21] W current [22] Freq ref fac	Output Frequency absolute value. Output Frequency. Output Current. Output Voltage. Output Torque positive value. Output Torque absolute value. Output Torque. Output Power positive value. Output Power absolute value. Output Power. Output Power Factor. Encoder frequency absolute value. Encoder frequency. Frequency reference absolute value. Frequency reference Load Current. Motor Magnetizing Current. PID regulator output. DC bus capacitors level. Output phase U current signal. Output phase V current signal. Output phase W current signal. Multiplier factor for frequency reference	0	0	22			133
I.301	An out 1 offset	Analog output 1 offset			0	-9.99	9.99		0.01	134
I.302	An out 1 gain	Analog output 1 gain			1	-9.99	9.99		0.01	135
I.303	An out 1 filter	Time constant of output filter			0	0	2.5	sec	0.01	136
I.310	Analog out 2 cfg	Analog Output 2 configuration	As for I.300		2	0	22			137
I.311	An out 2 offset	Analog output 2 offset			0	-9.99	9.99		0.01	138
I.312	An out 2 gain	Analog output 2 gain			1	-9.99	9.99		0.01	139
I.313	An out 2 filter	Time constant of output filter			0	0	2.5	sec	0.01	140
I.350	Exp an out 1 cfg	Expansion Analog Output 1 configuration (on Exp. board)	As for I.300		3	0	22			141
I.351	Exp AnOut 1 offs	Expansion Analog Output 1 offset			0	-9.99	9.99		0.01	142
I.352	Exp AnOut 1 gain	Expansion Analog Output 1 gain			1	-9.99	9.99		0.01	143
I.353	Exp AnOut 1 filt	Time constant of output filter			0	0	2.5	sec	0.01	144
I.400	Inp by serial en	Virtual Digital enabling			0	0	255			145
I.410	Exp in by ser en	Expansion Virtual Digital Inputs enabling			0	0	15			146
I.420	Out by serial en	Virtual Digital Outputs setting enabling			0	0	15			147
I.430	Exp OutBySer en	Expansion Virtual Digital Outputs enabling			0	0	3			148
I.450	An out by ser en	Virtual Analog Outputs enabling			0	0	255			149
I.500	Encoder enable	Enabling of the encoder measure	[0] Disable [1] Enable	Encoder measure disabled. Encoder measure enabled.	0	0	1			150
I.501	Encoder ppr	Encoder nameplate pulses per revolution			1024	1	9999			151

Code	PARAMETER		PICK LIST		Def.	Min	Max	Unit	Variat.	IPA
	LCD Display	DESCRIPTION	LCD Selection	Description						
I.502	Enc channels cfg	Encoder channels configuration	[0] One Channel [1] Two Channels	A (K1) encoder channel A and B (K1 and K2) encoder channels	1	0	1			152
I.503	Enc spd mul fact	Multiplier factor of the encoder pulses, set in the I.501			1	0.01	99.99			153
I.504	Enc update time	Encoder pulses sampling time	[0] 1ms [1] 4ms [2] 16ms [3] 0.25s [4] 1s [5] 5s		0	0	5			154
I.505	Enc power supply	Encoder power supply level	[0] 5.2V [1] 5.6V [2] 8.3V [3] 8.7V		0	0	3			181
I.506	Enc fault enable	Enable ENC alarm, Encoder cable break	[0] Disable [1] Enable	Encoder alarm disabled Encoder alarm enabled	0	0	1			197
I.600	Serial link cfg	Serial line configuration protocol & mode	[0] FoxLink 7E1 [1] FoxLink 701 [2] FoxLink 7N2 [3] FoxLink 8N1 [4] ModBus 8N1 [5] JBus 8N1	Type(DataBit) Parity (StopBit) FoxLink 7E1 (7) Even (1) FoxLink 7O1 (7) Odd (1) FoxLink 7N2 (7) None (2) FoxLink 7O1 (8) None (1) Modbus 8N1 (8) None (1) Jbus 8N1 (8) None (1)	4	0	5		0.1	155
I.601	Serial link bps	Serial line baudrate	[0] 600 baud [1] 1200 baud [2] 2400 baud [3] 4800 baud [4] 9600 baud [5] 19200 baud [6] 38400 baud	600 baud rate 1200 baud rate 2400 baud rate 4800 baud rate 9600 baud rate 19200 baud rate 38400 baud rate	4	0	6			156
I.602	Device address	Serial line address of the drive			1	0	99		1	157
I.603	Ser answer delay	Serial line answer delay time			1	0	250	msec	1	158
I.604	Serial timeout	Serial line transmission timeout			0	0	25	sec	0.1	159
I.605	En timeout alm	Setting time out alarm	[0] Disable [1] Enable	Drive NOT in alarm and signal on a digital output Drive IN alarm and signal on a digital output	0	0	1			160
I.700	Option 1 type	Expansion optional 1 card type (Note: Selected board must be installed on drive)	[0] Board Off [1] Board master [2] I/O Board [3] Board free [4] SBI Board	Reserved Reserved EXP-D6-A1R1-AGy Reseved SBI-PDP-AGy	0	0	4			161
I.701	Option 2 type	Expansion optional 2 card type (Note: Selected board must be installed on drive)	[0] Board Off [1] Board master [2] I/O Board [3] Board free [4] SBI Board	Reserved Reserved EXP-D6-A1R1-AGy Reserved SBI-PDP-AGy	0	0	4			162
I.750	SBI address	SBI Address			3	0	255			163
I.751	CAN baudrate	CAN Open baudraute	[0] 10 Kbit/s [1] 20 Kbit/s [2] 50 Kbit/s [3] 125 Kbit/s [4] 250 Kbit/s [5] 500 Kbit/s [6] 1000 Kbit/s		5	0	6			164
I.752	SBI Profibus mod	SBI Profibus Mode	[0] Custom [1] PPO1 [2] PPO2 [3] PPO3 [4] PPO4	Profidrive custom Profidrive type 1 Profidrive type 2 Profidrive type 3 Profidrive type 4	2	0	4			165
I.753	SBI CAN mode	Selection of the Bus protocol	[0] OFF [1] CAN Open [2] DeviceNet	None CAN Open protocol DeviceNet protocol	0	0	2			166
I.754	Bus flt holdoff	Delay time for Bus Fault Alarm			0.0	0.1	60.0	sec	0.1	179
I.760	SBI to Drv W 0	Word 0 from SBI to drive			0	0	1999			167
I.761	SBI to Drv W 1	Word 1 from SBI to drive			0	0	1999			168
I.762	SBI to Drv W 2	Word 2 from SBI to drive			0	0	1999			169
I.763	SBI to Drv W 3	Word 3 from SBI to drive			0	0	1999			170
I.764	SBI to Drv W 4	Word 4 from SBI to drive			0	0	1999			171
I.765	SBI to Drv W 5	Word 5 from SBI to drive			0	0	1999			172
I.770	Drv to SBI W 0	Word 0 from drive to SBI			1	0	1999			173
I.771	Drv to SBI W 1	Word 1 from drive to SBI			2	0	1999			174

Code	PARAMETER		PICK LIST		Def.	Min	Max	Unit	Variat.	IPA
	LCD Display	DESCRIPTION	LCD Selection	Description						
I.772	Drv to SBI W 2	Word 2 from drive to SBI			3	0	1999			175
I.773	Drv to SBI W 3	Word 3 from drive to SBI			4	0	1999			176
I.774	Drv to SBI W 4	Word 4 from drive to SBI			5	0	1999			177
I.775	Drv to SBI W 5	Word 5 from drive to SBI			6	0	1999			178
			FREQ & RAMP							
F.000	Motorpot ref	Motopot reference (it can be set using up and down commands)			0	0	F.020	Hz	0.01	300
F.010	Mp Acc/Dec time	Motorpot Accel. and Decel. ramp time			10	0.1	999.9	sec	0.1	301
F.011	Motorpot offset	Motopotentiometer minimum reference			0	0	F.020	Hz	0.1	302
F.012	Mp output mode	Unipolar / bipolar Motorpotentiometer	[0] Unipolar [1] Bipolar		0	0	1			303
F.013	Mp auto save	Motopotenziometer auto save function	[0] Disable [1] Enable		1	0	1			304
F.014	MpRef at stop	Behavior of the frequency reference from Motorpotentiometer during a Stop sequence	[0] Last value [1] Follow ramp	Mot. reference will retain its current value Mot. reference will ramp down to zero, following the deceleration ramp in use	0	0	1			351
F.020	Max ref freq	Motor maximum frequency value (for both directions)			50	25	250	Hz	0.1	305
F.021	Min ref freq	Minimum frequency value			0	0	F.020	Hz	0.1	306
F.050	Ref 1 channel	Source of the Reference 1	[0] Null [1] Analog inp 1 [2] Analog inp 2 [3] Freq ref x [4] Multispeed [5] Motorpotent [6] Analog inp 3 [7] Encoder [8] Profidrive	Null Analog input 1 Analog input 2 Frequency reference F.100 (S.203) Multi frequncies Motorpotientometer reference Analog input 3 Encoder signal Reference by Profibus	4	4	4			307
F.051	Ref 2 channel	Source of the Reference 2	[0] Null [1] Analog inp 1 [2] Analog inp 2 [3] Freq ref x [4] Multispeed [5] Motorpotent [6] Analog inp 3 [7] Encoder [8] Profidrive	Null Analog input 1 Analog input 2 Frequency reference F.101 Multispeed Motorpotientometer reference Analog input 3 Encoder signal Reference by Profibus	0	0	8			308
F.060	MltFrq channel 1	Source of the Multispeed 1		As for F.050, Reference 1 source	3	0	8			309
F.061	MltFrq channel 2	Source of the Multispeed 2		As for F.051, Reference 2 source	3	0	8			310
F.080	FreqRef fac src	Frequency reference multiplier factor source	[0] Null [1] Analog inp 1 [2] Analog inp 2 [3] Analog inp 3	Null Analog input 1 Analog input 2 Analog input 2	0	0	3			342
F.100	Frequency ref 0	Digital Reference frequency 0			10	-F.020	F.020	Hz	0.1	311
F.101	Frequency ref 1	Digital Reference frequency 1			50	-F.020	F.020	Hz	0.1	312
F.102	Frequency ref 2	Digital Reference frequency 2			0	-F.020	F.020	Hz	0.1	313
F.103	Frequency ref 3	Digital Reference frequency 3			0	-F.020	F.020	Hz	0.1	314
F.104	Frequency ref 4	Digital Reference frequency 4			0	-F.020	F.020	Hz	0.1	315
F.105	Frequency ref 5	Digital Reference frequency 5			0	-F.020	F.020	Hz	0.1	316
F.106	Frequency ref 6	Digital Reference frequency 6			0	-F.020	F.020	Hz	0.1	317
F.107	Frequency ref 7	Digital Reference frequency 7			0	-F.020	F.020	Hz	0.1	318
F.108	Frequency ref 8	Digital Reference frequency 8			0	-F.020	F.020	Hz	0.1	319
F.109	Frequency ref 9	Digital Reference frequency 9			0	-F.020	F.020	Hz	0.1	320
F.110	Frequency ref 10	Digital Reference frequency 10			0	-F.020	F.020	Hz	0.1	321
F.111	Frequency ref 11	Digital Reference frequency 11			0	-F.020	F.020	Hz	0.1	322
F.112	Frequency ref 12	Digital Reference frequency 12			0	-F.020	F.020	Hz	0.1	323
F.113	Frequency ref 13	Digital Reference frequency 13			0	-F.020	F.020	Hz	0.1	324
F.114	Frequency ref 14	Digital Reference frequency 14			0	-F.020	F.020	Hz	0.1	325
F.115	BakPwr max freq	Digital refer frequency 15. When in backup power mode, it defines the upper limit of the inverter output frequency			5	-F.020	F.020	Hz	0.1	326
F.116	Smooth start frq	Frequency reference during smooth start			2	-F.020	F.020	Hz	0.1	327
F.201	Acceleration 1	Linear acceleration with ramp set 1			0.6	0.01	5.0	m/s^2	0.01	329
F.202	Deceleration 1	Linear deceleration with ramp set 1			0.6	0.01	5.0	m/s^2	0.01	330

Code	PARAMETER		PICK LIST		Def.	Min	Max	Unit	Variat.	IPA
	LCD Display	DESCRIPTION	LCD Selection	Description						
F.203	Acceleration 2	Linear acceleration with ramp set 2			0.6	0.01	5.0	m/s^2	0.01	331
F.204	Deceleration 2	Linear deceleration with ramp set 2			0.6	0.01	5.0	m/s^2	0.01	332
F.205	Acceleration 3	Linear acceleration with ramp set 3			0.6	0.01	5.0	m/s^2	0.01	333
F.206	Deceleration 3	Linear deceleration with ramp set 3			0.6	0.01	5.0	m/s^2	0.01	334
F.207	Acceleration 4	Linear acceleration with ramp set 4			0.6	0.01	5.0	m/s^2	0.01	335
F.208	Deceleration 4	Linear deceleration with ramp set 4			0.6	0.01	5.0	m/s^2	0.01	336
F.250	Ramp S-shape	S-shaped ramp enable	[0] Disable [1] Enable	Linear ramps S-shaped ramps	1	0	1			337
F.251	Jerk acc ini 1	Jerk applied at the beginning of an acceleration with ramp sets 1 and 3			1.00	0.01	10.00	m/s^3	0.01	343
F.252	Jerk acc end 1	Jerk applied at the end of an acceleration with ramp sets 1 and 3			1.40	0.01	10.00	m/s^3	0.01	344
F.253	Jerk dec ini 1	Jerk applied at the beginning of a deceleration with ramp sets 1 and 3			1.40	0.01	10.00	m/s^3	0.01	345
F.254	Jerk dec end 1	Jerk applied at the end of a deceleration with ramp sets 1 and 3			1.00	0.01	10.00	m/s^3	0.01	346
F.255	Jerk acc ini 2	Jerk applied at the beginning of an acceleration with ramp sets 2 and 4			1.00	0.01	10.00	m/s^3	0.01	347
F.256	Jerk acc end 2	Jerk applied at the end of an acceleration with ramp sets 2 and 4			1.40	0.01	10.00	m/s^3	0.01	348
F.257	Jerk dec ini 2	Jerk applied at the beginning of a deceleration with ramp sets 2 and 4			1.40	0.01	10.00	m/s^3	0.01	349
F.258	Jerk dec end 2	Jerk applied at the end of a deceleration with ramp sets 2 and 4			1.00	0.01	10.00	m/s^3	0.01	350
F.260	Ramp extens src	Source for the Ramp time extension function	[0] Null [1] Analog inp 1 [2] Analog inp 2 [3] Analog inp 3	Null Analog input 1 Analog input 2 Analog input 3	0	0	3			338
F.270	Jump amplitude	Jump frequencies hysteresis			0	0	100	Hz	0.1	339
F.271	Jump frequency 1	Jump frequency 1			0	0	250	Hz	0.1	340
F.272	Jump frequency 2	Jump frequency 2			0	0	250	Hz	0.1	341
			PARAMETER							
P.000	Cmd source sel	It defines the use of START and STOP commands	[0] CtrlWordOnly [1] CtlWrd & kpd		0	0	1			400
P.002	Reversal enable	Reversal enabling	[0] Disable [1] Enable	Disabling reverse rotation Enabling reverse rotation	1	0	1			402
P.003	Safety	Safe start definition	[0] OFF [1] ON	START allowed with RUN temirnal connected at the power on START not allowed with RUN temirnal connected at the power on	1	0	1			403
P.010	Control mode	Drive control mode	[0] V/f open loop [1] V/f clsd loop	V/f control w/o encoder feedback V/f control with encoder feedback	0	0	1			498
P.020	Mains voltage	Rated value of the line voltage	230 380 400 420 440 460 480		400	230	480	V		404
P.021	Mains frequency	Rated value of the line voltage frequency	50 60		50	50	60	Hz		405
P.040	Motor rated curr	Rated current of the motor			(*)	(*)	(*)	A	0.1	406
P.041	Motor pole pairs	Pole Pairs of the motor			2	1	60			407
P.042	Motor power fact	Motor power factor			(*)	0.01	1		0.01	408
P.043	Motor stator R	Measurement of the stator resistance of the motor			(*)	0	99.99	ohm	0.01	409
P.044	Motor cooling	Motor type cooling	[0] Natural [1] Forced	Self ventilated Assisted ventilation	0	0	1			410
P.045	Motor thermal K	Motor thermal constant			30	1	120	min		411
P.060	V/f shape	V/F Curve Type	[0] Custom [1] Linear [2] Quadratic	V/F curve defined by the user Linear characteristic Quadratic characteristic	1	0	2			412
P.061	Base voltage	Motor base (rated) voltage			380	50	528	V	1	413
P.062	Base frequency	Base frequency			50	25	500	Hz	0.1	414

Code	PARAMETER		PICK LIST		Def.	Min	Max	Unit	Variat.	IPA
	LCD Display	DESCRIPTION	LCD Selection	Description						
P.063	V/f interm volt	V/F intermediate voltage			190	0	P.061	V	1	415
P.064	V/f interm freq	V/F intermediate frequency			25	1.0	P.062	Hz	0.1	416
P.080	Max output freq	Maximum output frequency			110	0	110	% of F.020	1	417
P.081	Min output freq	Minimum output frequency			0.0	0.0	25.0	% of F.020	0.1	418
P.100	Slip compensat	Amount of slip compensation during motoring			50	0	250	%	1	419
P.101	Slip comp filter	Time constant of slip compensation			0.3	0	10	sec	0.1	420
P.102	Slip comp regen	Amount of slip compensation during regeneration			50	0	250	%	1	500
P.120	Manual boost [%]	Torque boost level			3	0	25	% of P.061	1	421
P.121	Boost factor src	Boost level source	[0] Null [1] Analog inp 1 [2] Analog inp 2 [3] Analog inp 3	Null Analog input 1 Analog input 2 Analog input 3	0	0	3			422
P.122	Auto boost en	Automatic boost function enabling	[0] Disable [1] Enable	Automatic boost function Automatic boost function enabled	0	0	1			423
P.140	Magn curr gain	Magnetizing current regulator gain			0	0	100	%	0.1	424
P.160	Osc damping gain	Damping gain			10	0	100		1	425
P.170	Spd ctrl P-gainL	Speed loop proportional gain (low speed)			2.0	0.0	100.0	%	0.1	501
P.171	Spd ctrl I-gainL	Speed loop integral gain (low speed)			1.0	0.0	100.0	%	0.1	502
P.172	Spd ctrl P-gainH	Speed loop proportional gain (high speed)			2.0	0.0	100.0	%	0.1	503
P.173	Spd ctrl I-gainH	Speed loop integral gain (high speed)			1.0	0.0	100.0	%	0.1	504
P.174	Spd gain thr L	Speed loop gain scheduling low threshold			0.0	0.0	F.020	Hz	0.1	507
P.175	Spd gain thr H	Speed loop gain scheduling high threshold			0.0	0.0	F.020	Hz	0.1	508
P.176	Spd PI High lim	Speed regulator High limit			10.0	0.0	100.0	% of F.020	0.1	509
P.177	Spd PI Low lim	Speed regulator Low limit			-10.0	-100.0	0.0	% of F.020	0.1	510
P.178	SpdPI lim FacSrc	Speed regulator limits factor source	[0] Null [1] Analog inp 1 [2] Analog inp 2 [3] Analog inp 3	Null Analog input 1 Analog input 2 Analog input 3	0	0	3			511
P.180	SW clamp enable	Current clamp enable	[0] Disable [1] Enable		1	0	1			426
P.181	Clamp alm HldOff	Holf off time for current clamp alarm. Set to maximum (25.5s) to disable the alarm			5.0	0	25.5	s	0.1	512
P.200	Ramp CurLim mode	Enable current limitation during ramp	[0] None [1] PI Limitator [2] Ramp freeze		0	0	2			427
P.201	Accel curr limit	Current limit in acceleration phase			(*)	20	(*)	% of I nom		428
P.202	En lim in steady	Enable current limitation in steady state	[0] Disable [1] Enable		0	0	1			429
P.203	Curr lim steady	Current limit at constant speed			(*)	20	(*)	% of I nom	1	430
P.204	Curr ctrl P-gain	Current limiter proportional gain			10.0	0.1	100.0	%		431
P.205	Curr ctrl I-gain	Current limiter integral gain			30.0	0.0	100.0	%	0.1	432
P.206	Curr ctr feedfwd	Current limiter feed-forward			0	0	250	%	1	433
P.207	Decel curr limit	Current limit in deceleration phase			(*)	20	(*)	% of I nom	1	494
P.220	En DC link ctrl	Stall prevention during dec. for overvoltage	[0] None [1] PI Limitator [2] Ramp freeze	None PI Limit regulator On/Off Ramp	0	0	2			434
P.221	DC-lnk ctr Pgain	DC link voltage limiter proportional gain			3.0	0.1	100.0	%	0.1	435
P.222	DC-lnk ctr Igain	DC link voltage limiter integral gain			10.0	0.0	100.0	%	0.1	436
P.223	DC-link ctr FF	DC link voltage limiter feed-forward			0	0	250	%	1	437
P.240	OverTorque mode	Overtorque mode	[0] No Alm,Chk on [1] No Alm,Chk ss [2] Alm always [3] Alm steady st	0: Overtorque detection always active and Over-torque alarm disabled. 1: Overtorque detection in steady state and Over-torque alarm disabled. 2: Overtorque detection always active and Over-torque alarm enabled. 3: Overtorque detection in steady state and Over-torque alarm enabled.	0	0	3			438
P.241	OT curr lim thr	Current limit for overtorque			110	20	200	%	1	439
P.242	OT level fac src	Overtorque level factor source	[0] Null [1] Analog inp 1 [2] Analog inp 2 [3] Analog inp 3	Null Analog input 1 Analog input 2 Analog input 3	0	0	3			440
P.243	OT signal delay	Delay time for overtorque signaling			0.1	0.1	25	sec	0.1	441
P.260	Motor OL prot en	Enabling of motor overload protection	[0] Disable [1] Enable		1	0	1			444

Code	PARAMETER		PICK LIST		Def.	Min	Max	Unit	Variat.	IPA
	LCD Display	DESCRIPTION	LCD Selection	Description						
P.280	BU configuration	Braking unit configuration	[0] BU disabled [1] BU en OL dis [2] BU en OL en	BU disabled BU enabled & Overload disable BU & Overload enabled	1	0	2			445
P.281	Brake res value	Ohmic value of braking resistor			(*)	1	250	ohm	1	446
P.282	Brake res power	Braking resistor power			(*)	0.01	25	kW	0.01	447
P.283	Br res thermal K	Braking resistor thermal constant			(*)	1	250	sec	1	448
P.300	DC braking level	DC braking level			75	0	100	% of I nom	1	449
P.301	DCB lev fac src	DC braking level factor source	[0] Null [1] Analog inp 1 [2] Analog inp 2 [3] Analog inp 3	Null Analog input 1 Analog input 2 Analog input 3	0	0	3			450
P.321	Autocapture Ilim	Catch on flight current limit			120	20	(*)	% of I nom	1	456
P.322	Demagnetiz time	Demagnetization minimun time			(*)	0.01	10	sec	0.01	457
P.323	Autocap f scan t	Frequency scanning time during Pick Up			1	0.1	25	sec	0.1	458
P.324	Autocap V scan t	Voltage scanning time during Pick Up			0.2	0.1	25	V	0.1	459
P.340	Undervoltage thr	Undervoltage threshold			0	0	80	% of P.020	1	462
P.341	Max pwrloss time	Restart time from undervoltage			0	0	25	sec	0.1	463
P.342	UV alarm storage	Enabling of undervoltage alarm storage	[0] Disable [1] Enable		1	0	1			464
P.343	UV Trip Mode	Undervoltage tripping mode	[0] Disabled [1] CoastThrough [2] Emg stop	Function disabled Kinetic energy recovering Emergency stop mode	0	0	2			491
P.360	OV prevention	Automatic PickUp enabling after Overvoltage	[0] Disable [1] Enable		0	0	1			465
P.380	Autoreset attmps	Number of autoreset attempts			0	0	255			466
P.381	Autoreset clear	En. automatic reset of autorestart attempts			10	0	250	min	1	467
P.382	Autoreset delay	Autoreset time delay			5	0.1	50	sec	0.1	468
P.383	Autores flt rly	Alarm relay contacts behaviour during autoreset	[0] OFF [1] ON		1	0	1			469
P.400	Ext fault mode	External fault detection mode	[0] Alm alw,No AR [1] Alm run,No AR [2] Alm alw, ARes [3] Alm run, ARes	- Drive in alarm. Alarm always active. Alarm autoreset is not possible. - Drive in alarm. Alarm active only with running motor. Alarm autoreset is not possible. - Drive in alarm. Alarm always active. Alarm autoreset is possible. - Drive in alarm. Alarm active only with running motor. Alarm autoreset is possible.	0	0	3			470
P.410	Ph Loss detec en	Phase Loss detection enabling	[0] Disable [1] Enable		1	0	1			492
P.420	Volt reduc mode	Voltage reduction mode	[0] Always [1] Steady state	Always Costant speed only	0	0	1			471
P.421	V reduction fact				100	10	100	% of P.061	1	472
P.422	V fact mult src	Source of voltage reduction factor multiplier	[0] Null [1] Analog inp 1 [2] Analog inp 2 [3] Analog inp 3	Null Analog input 1 Analog input 2 Analog input 3	0	0	3			473
P.440	Frequency thr 1	Frequency 1 level detection			0.5	0	F.020	Hz	0.1	474
P.441	Freq prog 1 hyst	Hysteresis amplitude related to P-420			0.2	0	F.020	Hz	0.1	475
P.442	Frequency thr 2	Frequency 2 level detection			0	0	F.020	Hz	0.1	476
P.443	Freq prog 2 hyst	Hysteresis amplitude related to P-422			0.5	0	F.020	Hz	0.1	477
P.460	Const speed tol	Tolerance at constant speed			0	0	25	Hz	0.1	478
P.461	Const speed dly	Ramp end signalling delay			0.1	0	25	sec	0.1	479
P.480	Heatsnk temp lev	Heatsink temperature signalling level			70	10	110	°C	1	480
P.481	Heatsnk temp hys	Hysteresis band related to P.480			5	0	10	°C	1	481
P.500	Switching freq	Modulation frequency	[0] 1kHz [1] 2kHz [2] 3kHz [3] 4kHz [4] 6kHz [5] 8kHz [6] 10kHz [7] 12kHz [8] 14kHz [9] 16kHz [10] 18kHz		(*)	0	(*)			482

Code	PARAMETER		PICK LIST		Def.	Min	Max	Unit	Variat.	IPA
	LCD Display	DESCRIPTION	LCD Selection	Description						
P.501	Sw freq reduc en	Enabling of switching frequency reduction	[0] Disable [1] Enable		0	0	1			483
P.502	Min switch freq	Minimum switching frequency	As for P.500		(*)	0	P.500			495
P.520	Overmod max lev	Overmodulation level			0	0	100	%	1	484
P.540	Out Vlt auto adj	Automatic adjustment of output voltage			1	0	1			485
P.560	Deadtime cmp lev	Dead times compensation limit			(*)	0	255			486
P.561	Deadtime cmp slp	Dead times compensation slope			(*)	0	255			487
P.580	Startup display	IPA of the parameter to be displayed at power on			8	1	1999			488
P.600	Speed dsply fact	Speed conversion constant for display			10.00	0.01	99.99		0.01	489
P.998	Param access lev	Access level			2	1	3			499
P.999	Param prot code	Parameters protection code	0 Protection disable	Stopped motor: possibility to write all parameters. Running motor: some parameters are writing protected (IPA in bold)	0	0	3			490
			1 Protection enabled *(*) = only with motor stopped*	All parameters are writing protected excepted: - F000, F100..F116, multispeed function parameters - P999 Param prot code - C000 Save parameter (*) - C020 Alarm clear - H500..H511, serial line commands.						
			2 Protection enabled *(*) = only with motor stopped*	All parameters are writing protected excepted: - P999 Param prot code - C000 Save parameter (*) - C020 Alarm clear - H500..H511, serial line commands.						
			3 Protection disable	Stopped motor: possibility to write all parameters. Running motor: some parameters are writing protected (IPA in bold) Possibility to execute Save parameter also with running motor.						
APPLICATION										
A.000	PID mode	PID mode	[0] Disable	Null	0	0	6			1200
			[1] Freq sum	PID out in sum with ramp out ref (Feed forward)						
			[2] Freq direct	PID out not in sum with ramp out ref (no Feed forward)						
			[3] Volt sum	PID out in sum with voltage ref from V/f curve (Feed forward)						
			[4] Volt direct	PID out not in sum with voltage ref from V/f curve (no Feed forward)						
			[5] Stand alone	PID function as generic control (only with drive in RUN)						
			[6] St-Al always	PID function as generic control (any drive status)						
A.001	PID ref sel	PID reference selector	[0] Null	Null	0	0	7			1201
			[1] Analog inp 1	Analog input 1						

Code	PARAMETER		PICK LIST		Def.	Min	Max	Unit	Variat.	IPA
	LCD Display	DESCRIPTION	LCD Selection	Description						
			[2] Analog inp 2	Analog input 2						
			[3] Analog inp 3	Analog input 3						
			[4] Frequency ref	Frequency reference						
			[5] Ramp output	Ramp output						
			[6] Digital ref	Internal reference						
			[7] Encoder freq	Encoder frequency						
A.002	PID fbk sel	PID feedback selector	[0] Null	Null	0	0	7			1202
			[1] Analog inp 1	Analog input 1						
			[2] Analog inp 2	Analog input 2						
			[3] Analog inp 3	Analog input 3						
			[4] Encoder freq	Encoder frequency						
			[5] Output curr	Output peak current						
			[6] Output torque	Output torque						
			[7] Output power	Output power						
A.003	PID digital ref	PID digital reference			0	-100	100	%	0.1	1203
A.004	PID activat mode	PID active in steady state only	[0] Always		0	0	1			1204
			[1] Steady state							
A.005	PID-Encoder sync	Enabling of encoder / PID synchronism	[0] Disable		0	0	1			1205
			[1] Enable							
A.006	PID err sign rev	Error sign reversal	[0] Disable		0	0	1			1206
			[1] Enable							
A.007	PIDInteg init en	Integral term initialization at start	[0] Disable		0	0	1			1207
			[1] Enable							
A.008	PID update time	PID updating time			0	0	2.5	sec	0.01	1208
A.050	PID Prop gain 1	Proportional term gain 1			0	0	99.99		0.01	1209
A.051	PID Int tconst 1	Integral action time 1			99.99	0	99.99		0.01	1210
A.052	PID Deriv gain 1	Derivative action time 1			0	0	99.99		0.01	1211
A.053	PID Prop gain 2	Proportional term gain 2			0	0	99.99		0.01	1212
A.054	PID Int tconst 2	Integral action time 2			99.99	0	99.99		0.01	1213
A.055	PID Deriv gain 2	Derivative action time 2			0	0	99.99		0.01	1214
A.056	PID high limit	PID output upper limit			100	-100	100	%	0.1	1215
A.057	PID low limit	PID output lower limit			-100	-100	100	%	0.1	1216
A.058	PID max pos err	PID max. positive error			5	0.1	100	%	0.1	1217
A.059	PID min neg err	PID max. negative error			5	0.1	100	%	0.1	1218
A.080	Cont close delay	RUN contactor close delay			0.20	0	10	s	0.01	1316
A.081	Magnet time	Motor magnetization time			1	0	10	s	0.01	1317
A.082	Brake open delay	Brake contactor open delay			0.20	0	10	s	0.01	1318
A.083	Smooth start dly	Smooth start duration			0	0	10	s	0.01	1319
A.084	DCBrake stp time	Duration of 0Hz braking at stop			1	0	10	s	0.01	1320
A.085	Brake close dly	Brake contactor close delay			0.20	0	10	s	0.01	1321
A.086	Cont open delay	RUN contactor open delay			0.20	0	10	s	0.01	1322
A.087	Current pres thr	Current threshold for inverter output phases check			10	0	100	%	1	1325
A.088	Sel match code	Code to be compared to the status of Freq selectors			0	0	15			1326
A.090	Car max speed	Speed of the lift car when the inverter output frequency is equal to P.062			0.50	0.01	5.00	m/s	0.01	1323
A.091	Ramp factor 1	multiplier for acc/dec and jerks of ramp sets 1 and 3			1.00	0.01	2.50		0.01	1324
A.092	Ramp factor 2	multiplier for acc/dec and jerks of ramp sets 2 and 4			1.00	0.01	2.50		0.01	1327
A.220	Lift stop mode	Lift behavior at stop	[0] Dcb at stop	DC brake is performed after the output frequency is below P.440 threshold	1	0	1			1350
			[1] Normal stop	DC brake is not performed at stop						
A.300	AND1 In 1 src	Source of In 1 of logic block AND1	see list of I.000		0	0	25			1355
A.301	AND1 In 2 src	Source of In 2 of logic block AND1	see list of I.000		0	0	25			1356
A.302	AND2 In 1 src	Source of In 1 of logic block AND2	see list of I.000		0	0	25			1357
A.303	AND2 In 2 src	Source of In 2 of logic block AND2	see list of I.000		0	0	25			1358
A.304	AND3 In 1 src	Source of In 1 of logic block AND3	see list of I.000		0	0	25			1359
A.305	AND3 In 2 src	Source of In 2 of logic block AND3	see list of I.000		0	0	25			1360
A.306	OR1 In 1 src	Source of In 1 of logic block OR1	see list of I.000		0	0	25			1361
A.307	OR1 In 2 src	Source of In 2 of logic block OR1	see list of I.000		0	0	25			1362
A.308	OR2 In 1 src	Source of In 1 of logic block OR2	see list of I.000		0	0	25			1363
A.309	OR2 In 2 src	Source of In 2 of logic block OR2	see list of I.000		0	0	25			1364
A.310	OR3 In 1 src	Source of In 1 of logic block OR3	see list of I.000		0	0	25			1365
A.311	OR3 In 2 src	Source of In 2 of logic block OR3	see list of I.000		0	0	25			1366
A.312	NOT1 In src	Source of Input of logic block NOT1	see list of I.000		0	0	25			1367
A.313	NOT2 In src	Source of Input of logic block NOT2	see list of I.000		0	0	25			1368
A.314	NOT3 In src	Source of Input of logic block NOT3	see list of I.000		0	0	25			1369
A.315	NOT4 In src	Source of Input of logic block NOT4	see list of I.000		0	0	25			1370

Code	PARAMETER		PICK LIST		Def.	Min	Max	Unit	Variat.	IPA
	LCD Display	DESCRIPTION	LCD Selection	Description						
COMMAND										
C.000	Save parameters	Save parameters command	(1) (2)	No action. Save parameters command.	(1)	(1)	(2)			800
C.001	Recall param	Recall last set of saved parameters	(1) (2)	No action. Recall last set of saved parameters.	(1)	(1)	(2)			801
C.002	Load default	Recall of the factory parameters.	(1) (2)	No action. Load default parameters.	(1)	(1)	(2)			802
C.020	Alarm clear	Reset of the the Alarm List register	(1) (2)	No action. Clear alarm register command.	(1)	(1)	(2)			803
C.040	Recall key prog	Recall of the parameters in the external key	(1) (2)	No action. Recall parameter from PRG-KEY key.	(1)	(1)	(2)			804
C.041	Save pars to key	Storage of the inverter parameter on the external key	(1) (2)	No action. Storage of parameters to PRG-KEY key.	(1)	(1)	(2)			805
C.050	Rst mdplc prec run	Reset mdplc error at previous run	(1) (2)	No action. Reset mdplc error	(1)	(1)	(2)			809
C.060	Calculate space	Off line space evaluation	(1) (2)	No action. Start	(1)	(1)	(2)			809
C.070	Recall kbg prog	Recall of parameters from LCD keypad	(1) (2)	No action. Recall pars from keypad	(1)	(1)	(2)			809
C.071	Save pars to kbg	Storage of parameters into LCD keypad	(1) (2)	No action. Store pars into keypad	(1)	(1)	(2)			810
C.100	Measure stator R	Motor Autotune command	(1) (2)	No action. Autotune command.	(1)	(1)	(2)			806
HIDDEN										
This menu is not available on the keypad. The setting and the reading of the parameters here contained, can be performed exclusively via serial line or through SBI card.										
H.000		Virtual digital command			0	0	255			1000
H.001		Exp virtual digital command			0	0	255			1001
H.010		Virtual digital state			0	0	255			1002
H.011		Exp Virtual digital state			0	0	255			1003
H.020		Virtual An Output 1			0	-32768	32767			1004
H.021		Virtual An Output 2			0	-32768	32767			1005
H.022		Exp Virtual An Output 1			0	-32768	32767			1006
H.030		Profidrive Control word (see Profibus instruction manual)			0	0	65535			1007
H.031		Profidrive Status word (see Profibus instruction manual)			0	0	65535			1008
H.032		Profidrive reference (see Profibus instruction manual)			0	-16384	16383			1040
H.033		Profidrive actual reference (see Profibus instruction manual)			1	-16384	16383			1041
H.034		Drive status			0	0	65535			1042
H.040		Progress			0	0	100			1009
H.050		Drive output frequency at 32bit (LSW) (d.000)			0	-2^{31}	$2^{31}-1$			1010
H.051		Drive output frequency at 32bit (MSW) (d.000)			0	-2^{31}	$2^{31}-1$			1011
H.052		Drive reference frequency at 32bit (LSW) (d.001)			0	-2^{31}	$2^{31}-1$			1012
H.053		Drive reference frequency at 32bit (MSW) (d.001)			0	-2^{31}	$2^{31}-1$			1013
H.054		Output speed (d.000)*(P.600) at 32bit (LSW) (d.007)			0	-2^{31}	$2^{31}-1$			1014
H.055		Output speed (d.000)*(P600)at 32bit (MSW) (d.007)			0	-2^{31}	$2^{31}-1$			1015
H.056		Speed Ref (d.001)*(P.600) at 32bit (LSW) (d.008)			0	-2^{31}	$2^{31}-1$			1016
H.057		Speed Ref (d.001)*(P.600) at 32bit (MSW) (d.008)			0	-2^{31}	$2^{31}-1$			1017
H.058		Encoder freq at 32bit (LSW) (d.301)			0	-2^{31}	$2^{31}-1$			1018
H.059		Encoder freq at 32bit (MSW) (d.301)			0	-2^{31}	$2^{31}-1$			1019
H.060		Encoder speed (d.000)*(P.600) at 32bit (LSW) (d.302)			0	-2^{31}	$2^{31}-1$			1044
H.061		Encoder speed (d.000)*(P.600) at 32bit (MSW) (d.302)			0	-2^{31}	$2^{31}-1$			1045
H.062		Bitwise reading of active alarms (bit 0 to 15). Each bit is associated to a specific alarm, according to table 9.3.1.			0	0	$2^{31}-1$			1060

Code	PARAMETER		PICK LIST		Def.	Min	Max	Unit	Variat.	IPA
	LCD Display	DESCRIPTION	LCD Selection	Description						
H.063		Bitwise reading of active alarms (bit 16 to 31). Each bit is associated to a specific alarm, according to table 9.3.1.			0	0	2^{31} -1			1061
H.100		Remote Digital Inputs (0..15)			0	0	65535			1021
H.101		Remote Digital Inputs (16..31)			0	0	65535			1022
H.110		Remote Digital Outputs (0..15)			0	0	65535			1023
H.111		Remote Digital Outputs (16..31)			0	0	65535			1024
H.120		Remote Analog input 1			0	-32768	32767			1025
H.121		Remote Analog input 2			0	-32768	32767			1026
H.130		Remote Analog output 1			0	-32768	32767			1027
H.131		Remote Analog output 2			0	-32768	32767			1028
H.500		Hardware reset			0	0	1			1029
H.501		Alarm reset			0	0	1			1030
H.502		Coast to stop			0	0	1			1031
H.503		Stop with ramp			0	0	1			1032
H.504		Clockwise Start			0	0	1			1033
H.505		Anti-clockwise Start			0	0	1			1034
H.506		Clockwise Jog			0	0	1			1035
H.507		Anti-clockwise Jog			0	0	1			1036
H.508		Clockwise Flying restart			0	0	1			1037
H.509		Anti-clockwise Flying restart			0	0	1			1038
H.510		DC Brake			0	0	1			1039

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