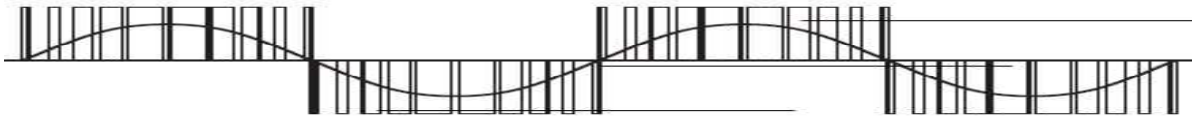
INVERTER SERIE 400

(BRUSHLESS ASYNCHRONOUS VECTOR DRIVE)



FLYCUT

REGULATOR

ELECTRONIC GEAR

WINDER

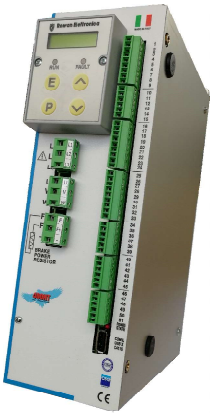
POSITIONER

LIFT

CLOSED LOOP VECTOR CONTROL

V/F SCALAR CONTROL WITH HIGH TORQUE

MULTIBUS
SERIAL COMMUNICATION



Rowan Elettronica
Motors, drives, accessories and services for automations
Via U. Foscolo 20 - 36030 CALDOGNO (VICENZA) - ITALY
Tel.: 0444 - 905566 Fax: 0444 - 905593
Email: info@rowan.it http:// www.rowan.it
Capitale Sociale Euro 78.000,00 i.v.
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UNI EN ISO 9001

Description of symbols in the manual

Caution ! It means that the following subject is very important and must be read carefully

It means that the following subject is linked to a generic danger for safety.

It means that the following subject shows the presence of a dangeruos voltage. It indicates that high voltage may cause dangerous accidents or death.

When using the device or the internal cards take care on avoiding the generation of electrostatic discharges (ESD) that may cause irreparable damages to some of the components.

Caution ! GENERAL WARNINGS BEFORE INSTALLATION

- Before installation, connection or any operation on the inverter or on the motor, read this manual carefully, in order to perform correct operations and to pay attention to safety rules.
  Any use of the Rowan inverters and motors which may differ from what is written on this manual is strictly forbidden.
- **Before installation, connection or any operation on the inverter with "STO" function is absolutely necessary read and comprehend the "Manual of safe for inverter series C350, C400 and C700" content; this document must be considered an integrity part of this manual**
- This instruction manual is addressed to skilled personnel, who is know the installation and use norms in accordance with safety and protection standards. Both the motor and the inverter when connected may be dangerous for things and people. The user is responsible for a correct installation, which must be in accordance with the directives in force.
- The inverter belongs to the restricted sales distribution class in compliance with EN61800-3 standard. In a domestic environment this product may cause radio interferences, in which case the user may be required to take adequate safety measures.
- The inverter, the possible external filter and the motor must be earthed permanently and properly and must be protected from the supply voltage in accordance with the directives in force.
- The max. inverter protection is obtained by B differentials, preferably 300mA-type. Internal or external anti-EMI filters has a leakage current to the ground; Please remind that the EN50178 directive says that, in case of leakage current >3,5mA, the earth wire must be steady and doubled.
- When the inverter cover needs to be removed, as e.g. for DIP switches setting or for maintenance, it is **compulsory** to wait for at least 5 minutes after inverter quenching for the internal capacitors to discharge. Internal components and terminals subject to dangerous voltages (L1, L2, L3, U, V, W, F, F+, -) can be touched **only in absence** of power supply and when the power supply between F+ and – terminals is <50Vdc.

Dangerous situations

- In peculiar setup conditions of the inverter, after power losses, the motor might start automatically. The motor rotation manual controls which can be set by the keyboard must be used with great attention, in order to prevent mechanical damages and accidents against people. Setup errors might cause unintentional starts. At first start, in case of faults on the inverter or of lack of power supply, it may not be possible to control the motor speed and the direction. The RUN contact can't be held as valid for a safety stop; in some setup conditions or of inverter faults, its disabling may not be followed by a prompt stop of the motor. Only the inverter electromechanical disconnection from the power supply excludes any action on the motor.

The installation of the inverter in areas at risk, in presence of inflammable substances, combustible vapours and dusts may cause fires and explosions; the inverters must be installed far from this kind of areas.

Avoid the penetration of water or any liquids into the machine in any case.

Do not perform dielectric rigidity tests on the drive parts.

Responsibility and warranty

- **ROWAN ELETTRONICA s.r.l.** declines any responsibility for any inaccurancies contained in this manual, due to printing and/or transcription mistakes. It reserves the right to make any variations that it considers necessary for better functioning of the product, without prior notification.

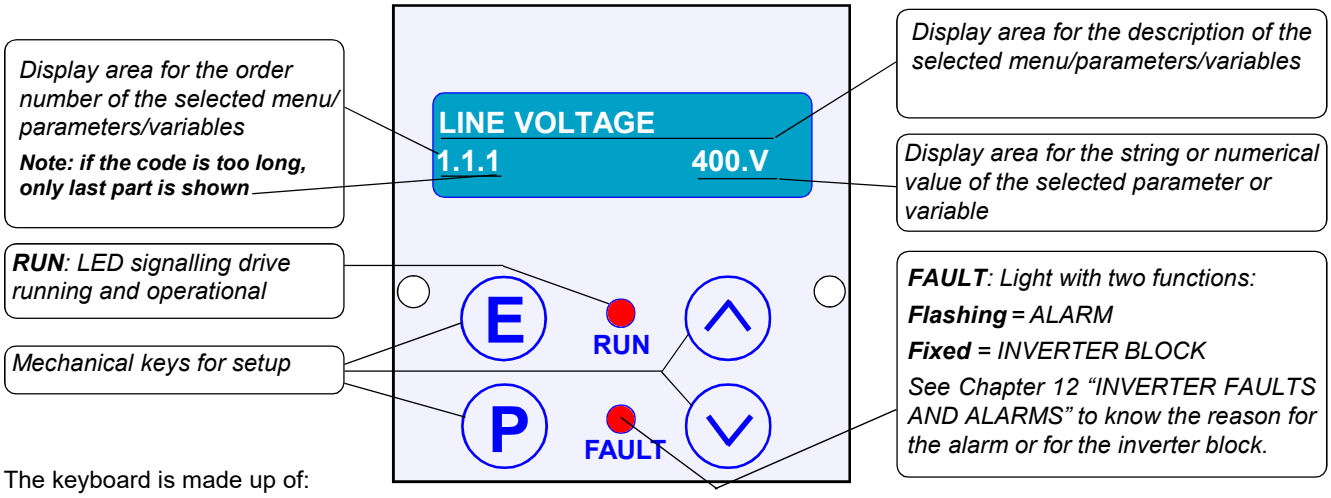
- **Regarding the data and characteristics** mentioned in the manual, a max. +/-10% tolerance has been allowed, if not otherwise indicated. Diagrams are simple examples and should be perfected by the customer.

- **The product warranty** is considered ex-works in according to the conditions written on the specific document to be asked ROWAN Commercial Department or in the website www.rowan.it.

Keyboard general description

The keyboard enables to change operation parameters (saved in eeprom) and to visualise useful data during the working phases such as: speed reference, motor reference and frequency, motor current, line voltage and last fault occurrence. Thanks to serial connection, the keyboard can be distanced from the panel of a control panel by a max. 25m distance.

ROWAN ELETTRONICA s.r.l. supplies on request the keyboard distancing cable.



The keyboard is made up of:

- an alphanumeric LED display, 2x16 characters, backlit
- four mechanical keys that give the feel of the key that has been pressed
- two signalling LEDs, one for run (RUN) and one block for fault (FAULT)

Keys function

E ESCAPE key enables to return to the menu or to the higher level and save the settings

P PROGRAM key enables to enter the submenus, to modify parameters one number at time

UP key enables to scroll the displayed variables ONWARDS and to set the numerical variables in the parameters modification selected from the "PROGRAM" key

DOWN key enables to scroll the displayed variables BACKWARDS and to set the numerical variables in the parameters selected from the "PROGRAM" key

Display state in starting phase

The machine starts in DISPLAY MENU and shows one among the 10 default variables from the 2.1 DISPLAY VARIABLE menu. Use UP and DOWN keys to scroll variables. The last variable selected is displayed when starting.

Procedure to modify a parameter

To start the settings, be necessary to press the P button, enter in BASIC DATA menu, where there are the most important parameters for the quick start. At the end of menu, repressing P button you enter in the inverter parameters complete menu (see table in the Chap.10). Press E button to exit or to return at the previous levels.

For example, if you want to modify in the BASIC DATA menu, the parameter 1.1.2 MOTOR NOM CURRENT:

Press the P key, so par. 1.1.1 LINE VOLTAGE will be displayed.

Press UP key to select par.1.1.2 MOTOR NOM CURRENT.

Press P key; the display area for the numerical value to be set will start flashing to signal that it is now possible to modify its value by UP and DOWN keys.

- Press UP key to increase the value and DOWN key to decrease it.

> To modify other numbers, press impulsively the P key, each pression will select the next number to the left, till the most significative, then return at the less significative number and so on.

> In case of positive or negative sign parameter, the sign appears after the most significative number; to modify press the P key till selecting it, then with the UP key set the + sign and the DOWN key to select - sign

> To save the set value press the ESCAPE key (the number will stop flashing)

> ESCAPE key always enables to exit from the programming and to return to higher menus to DISPLAY STATUS. The parameters modifying procedure by string selection is alike and in that case UP and DOWN keys will select the available strings in the menu instead of numerical values.

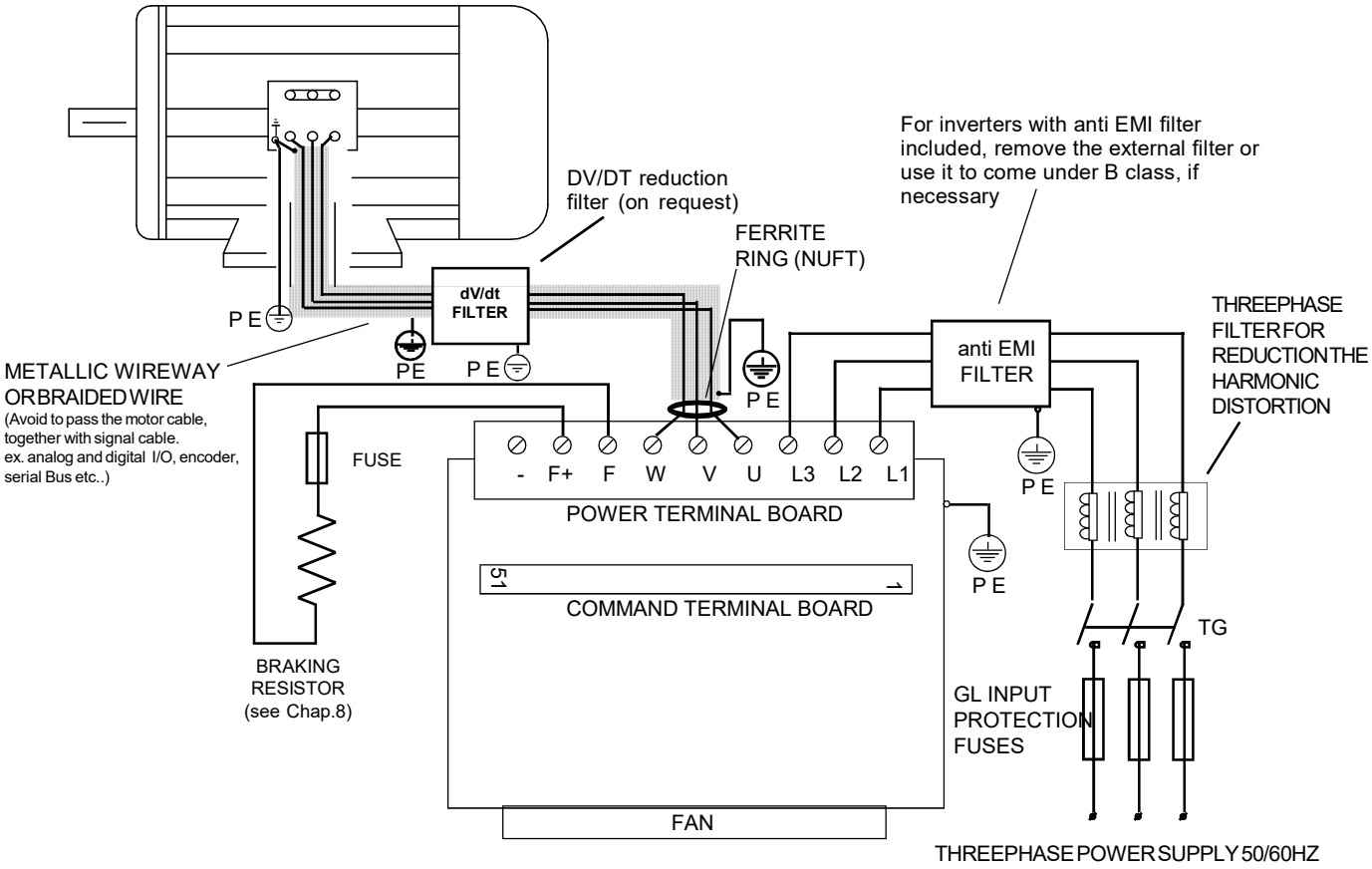
Caution ! ➔ ***The keyboard doesn't contain any parameter buffer.***

Quick installation aims

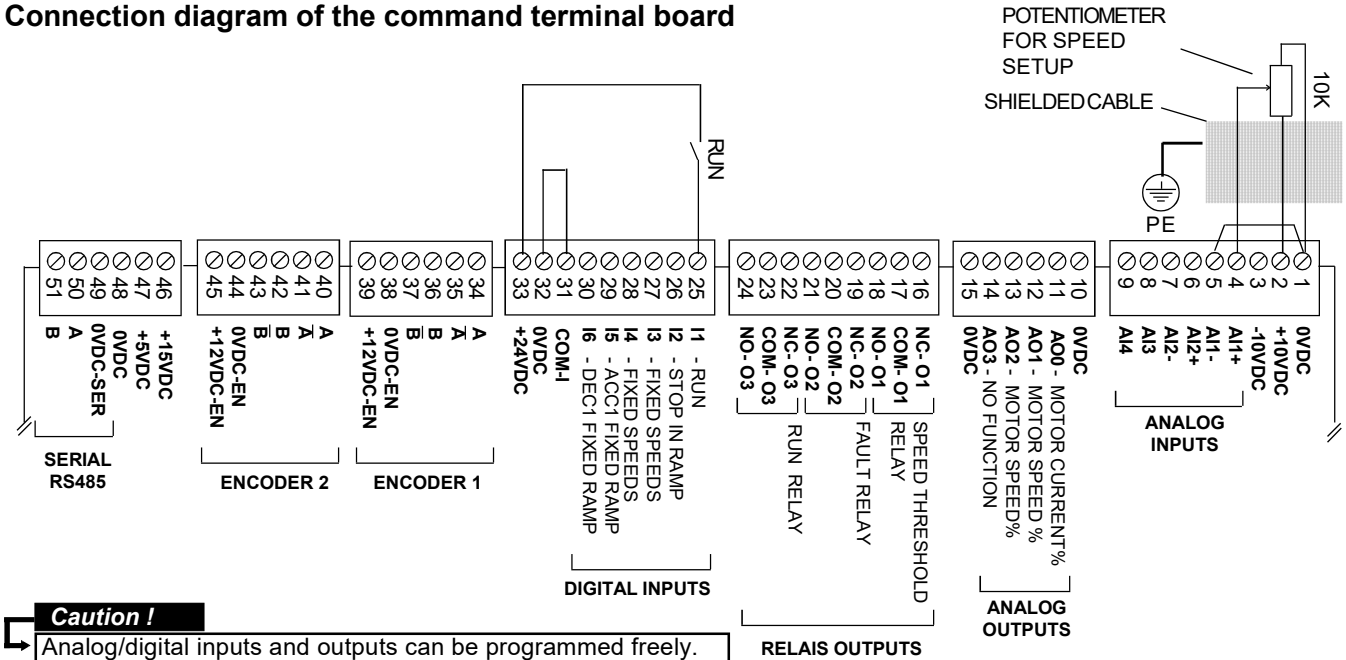
The aim of this paragraph is to teach the user, quickly and correctly, speed setup by a potentiometer of a normal asynchronous motor in V/F (Voltage/Frequency) scalar mode.

Connection diagrams for scalar mode

- **Connection diagram of the power terminal *(example with star-connected motor)***



- **Connection diagram of the command terminal board**



Caution !

Analog/digital inputs and outputs can be programmed freely. The functions shown in this diagrams concern standard programming in SCALAR MODE.

Installation

Read carefully the Chapter 1: GENERAL WARNINGS BEFORE INSTALLATION before installing. The inverter must install in a technical characteristics environment declared in Chapter 5.

Help, the cooling down air flux from below to the upside, keeping in mind a 100mm space upside and below the inverter; moreover 50mm space on both lateral of the drive; more details infromation of the correct installation are contains i the complete manual MANU.C400S

See Chapter 2: KEYBOARD OPERATING INSTRUCTIONS.

Connect the inverter follows the **Scalar control diagram connections** in the previous page.

Start programming by RUN contact off. The run contact cannot be held as valid in case of safety stop, since in case of particular programming conditions or of inverter fault, its disconnection might not determine the sudden motor stop.

For safety reasons, it is better to be close to the emergency button to activate the safety function of the system, the inverter's STO function too if it is present (see Safety Manual MANU.STO.350-400-700).

The storage of the inverter for longer than 2 years could damage the DC link capacitors, which should be restored: in order to do that, it is suggested to supply power to the inverter in OFF run for at least 2 hours.

Supply power to the inverter and check the correct setting of the potentiometer as follows:

- Select the **SPEED REFERENCE** variable by UP and DOWN keys.

- Regulate the potentiometer at its minimum and maximum and check the setting between 0 up to 1500 rpm in **SPEED REFERENCE**; keep the potentiometer to minimum position with SPEED REFERENCE at 0 rpm.

Press ESCAPE key until parameter MOT CONTROL TYPE is displayed:

MOT CONTROL TYPE	
100.1	V/F

This parameter enables to select the following motor control modes:

V/F = Scalar mode

VECT_ENC = Vector mode control with closed loop speed feedback from encoder.

Leave the default setting: **V/F**

Press UP key to select the parameter

APPLICATION	
100.5	SPEED

This parameter enables to select the application concerning the motor function in the final system. Leave the default setting: SPEED (Motor speed control)

Press ESCAPE key to return to DISPLAY STATUS

Press PROGRAM key to modify the following parameters from the BASIC DATA menu:

LINE VOLTAGE	
1.1.1	400.V

Set the inverter supply voltage to the L1, L2, L3 terminals.
Choose the voltage which is the closest to the supply voltage true value.
Setup range from 150.V to 600.V

MOTOR NOM CURREN	
1.1.2	10.0A

Set the nominal current of the motor which is connected to the inverter.
Setup range: from 0.0A to a standard parameter value.

MOTOR NOM FREQUE	
1.1.3	50.0Hz

Set the nominal frequency of the motor (frequency to nominal voltage).
See the value on the motor plate. Setup range from 1.0 Hz to 800.0 Hz

MOTOR NOM VOLTAG	
1.1.4	400.V

Set the nominal voltage of the motor (nominal voltage to frequency).
See the values on the motor plate according to the type of connection (star network or delta connection) Setup range from 1.V to 2000.V

MOTOR POLES	
1.1.5	4_POLES

Set the nr of motor poles
See the value on the motor plate. Setup range: 2_POLES, 4_POLES, 6_POLES, 8_POLES

RAMP ACCEL. TIME	
1.2.1	10.00s

Set the motor acceleration ramp
Setup range: from 0.01s to 600.00s

RAMP DECEL. TIME	
1.2.2	10.00s

Set the motor deceleration ramp.
Setup range: from 0.01s to 600.00s

MAX MOTOR SPEED	
1.3.1	1500.rpm

Set the motor max. speed
Setup range: from 0 rpm to 30000 rpm

MIN MOTOR SPEED	
1.3.2	0.rpm

Set the motor min. speed
Setup range: from 0 rpm to par. 1.3.1 MAX MOTOR SPEED

FIXED BOOST	
1.5.1	1.0%

Set the fixed boost voltage on the motor, active from 0.0Hz to 20.0Hz
Setup range: from 0.0% to 25.0%

Caution !
Boost voltage must not cause an absorption rate which is higher than the motor nominal current. For the first test, set 1.0% as default value

TEST MANU SPEED	
1.4.1	300.rpm

Set the motor speed for the first rotation test, which will be performed later by the manual commands of the keyboard.
Setup range: from 0 rpm to par. 1.3.1 MAX MOTOR SPEED.
Set to 500rpm.

JOG TEST MANU	
1.4.2	NO

On this parameter, the motor rotation test is enabled by UP and DOWN keys

Select YES to enter the test; the following screen will be displayed:

UP=DX DOWN=SX	
SPEED	0.rpm

- **Perform the rotation test by UP and DOWN pointers:**
  - Close the rate contact by switching RUN light on.
  - Press UP and DOWN pointers to drive the motor on both rotation directions.

  SPEED will display the motor speed, which must correspond with the value set in par. 1.4.1.
- Press ESCAPE to end the rotation test by the keyboard; the display will show par. 1.4.2
- Press the UP key; the following will be displayed:

BASIC DATA OK	
E=ESC	P=CONTINUE

The screen indicates that the setup of the basic parameters to activate the open ring control is over and that we can exit the programming by pressing ESCAPE key. This way you go back to DISPLAY STATUS. Later on, if further functions differring from the aim of the quick installation are necessary, you can scroll the complete menu of the available parameters by PROGRAM key.

- **Perform the rotation test setting the speed by the potentiometer:**
- Press ESCAPE key and select **MOTOR SPEED** variable by UP and DOWN keys.
- Set the potentiometer and verify the motor rotates at the displayed speed.
- Select the **MOTOR CURRENT** variable and verify the correct absorption by the motor.
- Invert the two phases of the motor (e.g. U and V) to change the rotation direction. By 3.1.1.3 REVERSE SPEED, it is possible to program a command to invert the rotation direction.
- Go on following the instructions on Chapter 4: QUICK INSTALLATION IN VECTORIAL MODE, if this kind of function in necessary. Otherwise **the basic installation has come to its end.**

Caution! → It is possible to check the I/O status by the following variables from the menu **2.1 GENERAL VARIABLE**:
2.1.20 DIG. INPUT I1..8 and **DIG. INPUT I9..14** as for digital inputs
2.1.22 DIG . OUTPUT O1..8 as for digital outputs

For further information about all the scalar control function, consult the inverter complete manual MANU.400S

Procedure to restore default setups

It is possible to restore all setups and return to standard ones by following the instruction below:
- Disable the run (RUN light OFF)
- Keep ESCAPE key pressed until **100.1 MOTOR CONTROL TYPE** parameter is displayed
- Press UP key to select **100.6 SETUP** menu

Press PROGRAM key to select the parameter:

RESTORE SETUP	
100.6.1	DEFAULT

Check **DEFAULT** is selected

Press UP key to select the parameter:

ENABLE RESTORE	
100.6.2	NO

Select **YES** and confirm by PROGRAM key; **YES** will be displayed until all default setups are restored. Then **NO** will be displayed.

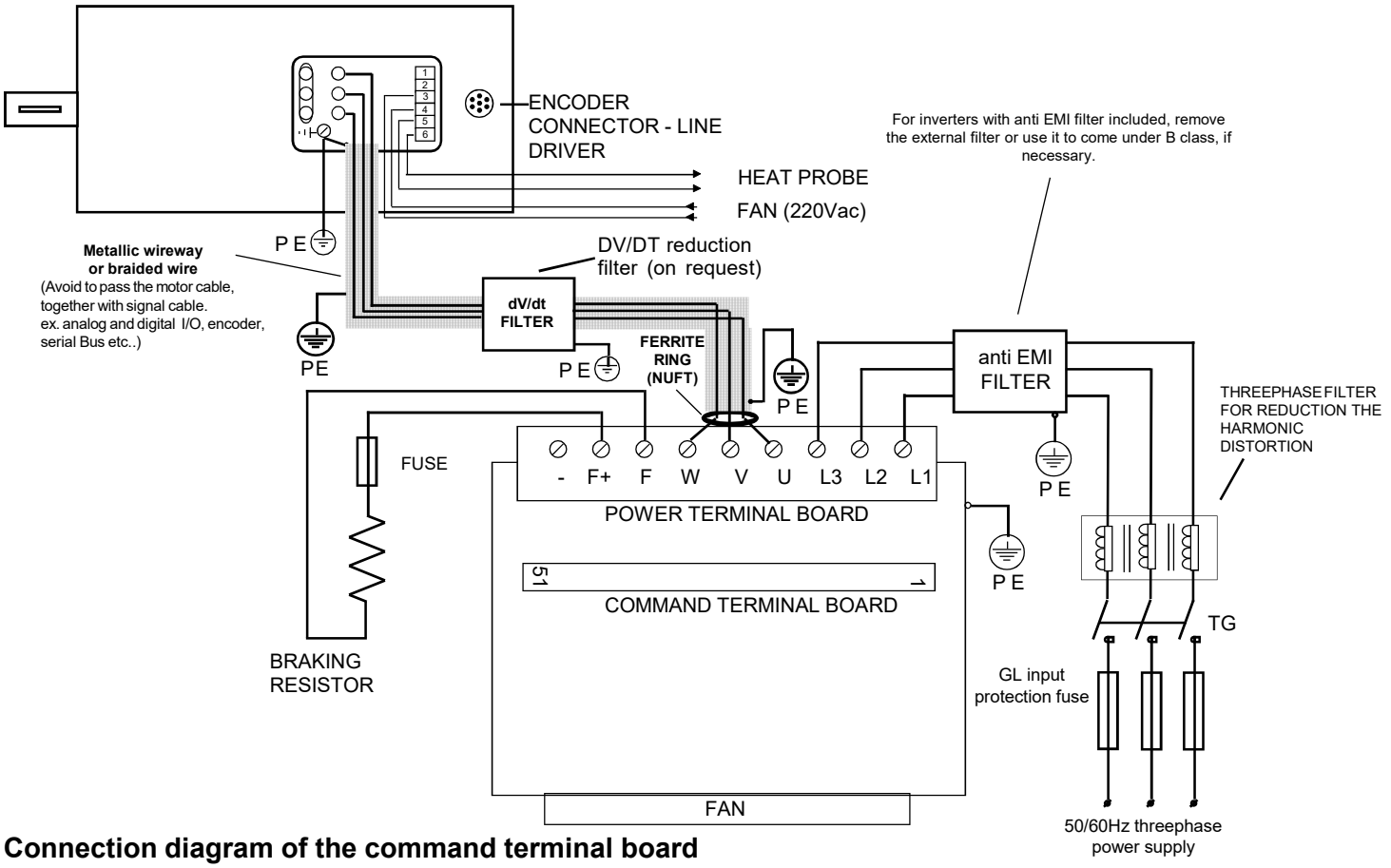
Caution ! → After this kind of operation all customized setups are reset definitively.

QUICK INSTALLATION AIMS

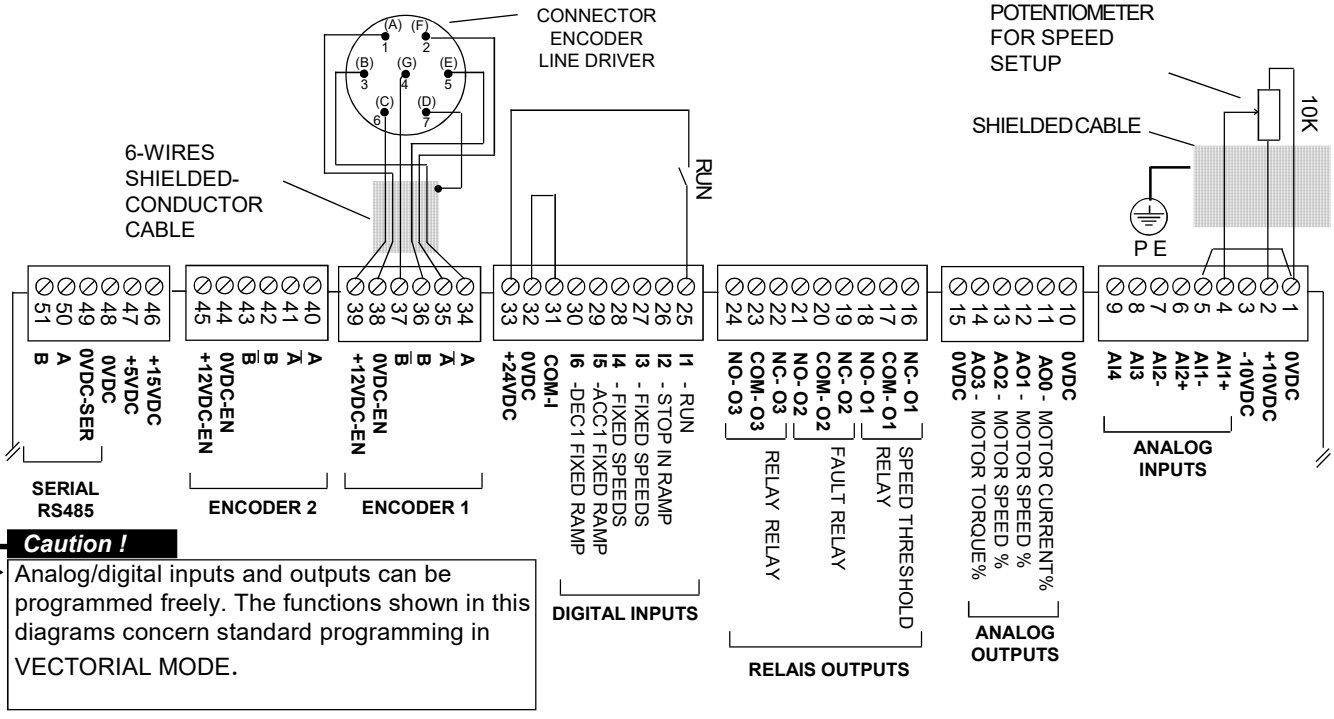
The aim of this paragraph is to teach the user, quickly and correctly, speed setup by a potentiometer of a Rowan asynchronous threephase motor in vector control (FIELD ORIENTATION technique) with closed loop speed feedback from encoder.

Connection diagrams

- **Connection diagram of the power terminal *(example with star-connected motor)***



- **Connection diagram of the command terminal board**



Caution !

Analog/digital inputs and outputs can be programmed freely. The functions shown in this diagrams concern standard programming in VECTORIAL MODE.

Installation

- Connect the inverter with ref. to the ***Vector connection diagrams*** on the previous page.
- Follow **Chapter 3: QUICK INSTALLATION IN SCALAR MODE**, by getting out of the **"Motor/Inverter pairing off"** tables on Chapter 13 the **common setup** of the following parameters: 1.1.2 MOTOR NOM CURREN, 1.1.3 MOTOR NOM FREQUE, 1.1.4 MOTOR NOM VOLTAGE, 1.1.5 MOTOR POLES, depends the inverter pair with Rowan vector motor. As for motors which haven't been manufactured by Rowan, get the information from the motor plate.
- While performing the final rotation test to verify the speed setup by the potentiometer, check the following variables as well, by selecting them by UP and DOWN keys.

SPEED REFERENCE	***ENCODER SPEED***
0.rpm	***0.rpm***

- Adjust the potentiometer, so that **SPEED REFERENCE** displays the max. speed.
- Check the display in **ENCODER SPEED** variable; on this variable a different speed from that displayed in **SPEED REFERENCE** may be visualized, but **this must be of the same sign**:
  - if the speed sign in **ENCODER SPEED** is opposite to that in **SPEED REFERENCE**, invert the A and A- encoder channels connected to 34-35 terminals.
  - if in the **ENCODER SPEED** parameter doesn't present any value, check the correct encoder connection.

- Disable the run (RUN light off)
- Press ESCAPE key until **100.1 MOT CONTROL TYPE** parameter is displayed.
- Press PROGRAM key and set **VECT_ENC** fuction in **par.100.1 MOT CONTROL TYPE.**
- Press ECSAPE key to return to DISPLAY STATUS.
- Press PROGRAM key to modify the following parameters from BASIC DATA menu:
- Set the encoder pulse nr per rotation in **par.1.6.1 E1 ENCODER LINES**. See the values on the plate of the motor encoder.

The following parameters can be got out of Chapter 13: G-SERIES ROWAN MOTORS- **"Motor/Inverter pairing off"** table.

- par. **1.6.2 KG GAIN**, set the speed regulator proportional gain.
- par. **1.6.3 KI GAIN**, set the speed regulator integral gain.
- par. **1.6.4 VECT MAGNET CURR**, set the motor magnetizing current in % ratio to nominal current.
- par. **1.6.5 ROTOR CONSTANT**, set the motor rotor constant in Hz.
- par. **1.10.1 MAX TORQUE**, set the max. torque value in % ratio to nominal torque.
- par. **1.10.15 ADAPT PERC TORQ**, set the torque displays/setups adaptation value in %.
- par. **1.10.16 ADAPT TORQ (Nm)**, set the torque displays/setups adaptation value in nr.
- par. **1.12.1 PWM FREQUENCY**, set the value 5.00Hz, optimum PWM frequency for vectorial control.

At the end of BASIC DATA parameters, continue pushing the P key, enter in the menù 1.1 INV MOTOR DATA and set the follows parameters, always in ref. of table in the Chap.13:

- par. **1.1.10 MOTOR LOAD FUNC**
- par. **1.6.13.1 KP ID REGULATOR**
- par. **1.6.13.2 KP ID REGULATOR**
- par. **1.6.13.3 KP IQ REGULATOR**
- par. **1.6.13.4 KP IQ REGULATOR**

- Press ESCAPE key more than once to return to DISPLAY STATUS.
- Start with the potentiometer set so that the speed in **SPEED REFERENCE** is 0 rpm.
- Enable the RUN (RUN light on) and check the correct sped adjustment on the potentiometer, by verifying the display of the following variables: **SPEED REFERENCE**, **MOTOR SPEED** and **ENCODER SPEED**. All variables must display the same speed rate and the same sign.
- Select **MOTOR CURRENT** variable and check the motor absorbption is correct if considered the present load conditions.

Caution !

Default speed adjustment through AI1 analog input is monodirectional; if you need it to be bidirectional, set par. **4.3.1.3 TYPE INPUT = -10V/+10V**

End of quick installation.

For further information about all the Vector control function, consult the inverter complete manual MANU.400S

Inverter supply voltage to L1, L2, L3 terminals

Threephase voltage supply ....from 180VAC to 270VAC (standard power supply 220/240VAC)
.....from 320VAC to 460VAC (standard power supplies 380/440/415 VAC) just for models from 400/5 to 400/G
.....from 320VAC to 490VAC (standard power supply 380/460VAC) just for models from 400/P to 400/3,5
....from 380VAC to 560VAC (standard power supplies 440/460VAC) on request
.....from 560VAC to 760VAC (standard power supply 690VAC) on request just from 400/5

U V W motor output

Types of motor .....asynchronous threephase motor, Rowan G-Series vectorial
Motor control ..... V/F SCALAR
..... FIELD ORIENTED VECTORIAL, WITH ENCODER FEEDBACK
Output voltage ..... from 0 to 100% of the voltage supply
Output frequency ..... 0Hz - 800Hz
Wave form .....sine wave
Technique of reconstitution of the waveform .....PWM (Pulse With Modulation)
PWM frequency ..... set from 0.50KHz to 16.00KHz
% Overload capacity compared to the max nominal current set in the inverter with PWM 5Khz:
- 110% of the inverter nominal current in non-stop service
- over 110%, starts the thermal control with overload fault intervention if it exceeds the following indicative limits of the inverter (varies according to the size of the inverter):
..... 110% In for 300sec, 175% In for 30 sec, 250% In 3 sec

Regenerative braking control

With braking module ..... included in all inverters 400-Series
Regenerated energy dissipation system.....external resistance connected to F+ and F clamps

Digital inputs

Nr of digital inputs ..... 6 as standard (I1..I6) + 8 by 404S optional board (I7..I14)
Input insulation .....optoinsulated in case of external power supply
Connection logic ..... NPN or PNP
Activation voltage ..... 15Vdc min., 30Vdc max.
Programming ..... I1 input with fixed run function. The remaining are completely programmable
Input resistance ..... about 3,6Kohm
Enabling/disabling times .....10ms, 20ms with pulse control

Pulse digital inputs

Encoder nr. ..... 2 as standard + 1 by 404S optional card
Zero Encoder inputs nr ..... 2 by 404S optional card
Input insulation .....optoinsulated
Connection logic ..... encoder line driver push/pull output
Encoders voltage supply ..... 12Vdc, short circuit protected (5Vdc or 24Vdc on request)
Max. frequency 125Khz
Load in ON state of the single-channel encoder 10mA
Logic state 1 voltage (12Vdc encoder) ..... more than 6Vdc
Logic state 1 voltage (5Vdc encoder) ..... more than 2,7Vdc
Logic state 1 voltage (24Vdc encoder) ..... more than 12Vdc

Relay outputs

Relay nr 3 (O1, O2, O3)
Programming ..... completely programmable
Contact nr per relay .....one NO/NC exchange
Contact current-carrying capacity 0.5A 120Vac- 1A 24Vac
Enabling / Disabling times.....5ms

Digital outputs

Output nr ..... 5 (O4, O5, O6, O7, O8) available only with 404S optional board
Output insulation .....optoinsulated in case of external power supply
Connection logic ..... NPN or PNP
Programming ..... completely programmable
Operating voltage supply ..... max. 100Vdc
Max. current 80mA
Enabling/disabling times 12ms

Analog inputs

AI1 ..... differential +/-10Vdc...12bit (14 bit on request)...sampling time 1ms
AI2 ..... differential +/-10Vdc, 4-20mA, 0-20mA...12 bit...sampling time 5ms
AI3, AI4 ..... +/-10Vdc...12bit...sampling time 5ms
AI5 (available only with 404S optional board)..... +/-10Vdc...10bit...sampling time 16ms
AI6, AI7, AI8, AI9 (available only with 404S optional board)..... 0/+10Vdc...10bit...sampling time 16ms
Programming ..... completely programmable

Analog outputs

AO0 ..... 12bit...updating time from 2,6ms (just for FAST associated variables) to 6,6ms
AO1 ..... 12bit...updating time 6,6ms
AO2, AO3 ..... 8bit...updating time 20 ms
Output voltage ..... +/-10Vdc
Output current ..... max. 10mA
Programming ..... completely programmable

RS485 serial connection

RS485 standard comunication ..... MODBUS RTU...ROWAN
Baudrate ..... 1200..2400..4800..9600..19200..38400..57600..76800..115200
Insulation ..... .optoinsulated

Optional board comunications..... PROFIBUS DPV1, CANOPEN, MODBUS TCP/IP, ETHERCAT, PROFINET

Available voltage supply

+10Vdc, -10Vdc (for potentiometers supply) ..... .max. 10mA
+24Vdc (for inputs or other devices) ..... short circuit protected...max.250mA
For encoder sensor supply:
* +12Vdc (standard)..... insulated...short circuit protected...max.200mA
* +5Vdc (on request)..... insulated...short circuit protected...max.500mA
+5Vdc ..... short circuit protected...max.200mA
15Vdc ..... short circuit protected...max.200mA

Protections

Inverter ..... Fault for thermal/electronic protection (I x I x t) on overloading on U, V, W clamps
..... Fault for protection on max. peak current U, V, W
..... Fault for programmable time-threshold protection on output current on U, V,W clamps
..... Fault for short circuit among U, V, W phases (all models) and between the phases and ground (from /5 to /G)
..... Fault for BUSDC overvoltage
..... Fault for overheating of IGBT modules
..... Alarm without fault for BUSDC capacitors work life end
..... Fault for short circuit on F and F+ terminals for braking resisitor connection
Motor ..... Fault for thermal/electronic protection (I x I x t) on prolonged overloading
..... Fault for overspeed
Braking resistor ..... Fault for threshold thermal/electronic protection on prolonged overloading

Special applications

..... ELECTRIC SHAFT, POSITIONER, FLY CUT(Only Code 400A)
..... DIE CUTTER (Only Code 400F)
..... REGULATOR (Only Code 400R)
..... WINDER / UNWINDER (Only Code 400W)
..... Motor with brake in LIFTING systems (LIFT function, in all versions)

Environmental characteristics

Working temperature ..... from -5°C to +40°C
Heatsink temperature ..... rom -5°C to +70°C
Storage temperature ..... from -25°C to +70°C
Altitude ..... max. 1000mt a.s.l. (over this the load must be reduced by 1% every 100mt)
Protection level ..... IP20, IP54 on request
Relative humidit ..... from 5% to 95% without condensation

Law conformity and electromagnetic compatibility

The 400-Series drivers have been designed to operate in an industrial environment. They are **EC** products in compliance with the **EMC 2014/30/UE directive** with reference to the **CEI EN 61800-3 (Cat.C2)** product standard, if connected following the wiring system in Chap. 3,4 and 7.

As for the models without internal filter, they are in compliance with the EMC directive only if connected to the relevant filtering devices supplied separately.Moreover, the drives conform to **B.T. LVD 2014/35/Ue directive**, with reference to **CEI EN 61439-1/2** and **CEI EN 60204-1** standards.

Caution! This product belongs to the restricted sales distribution class in compliance with **EN61800-3 (Cat.C2) standard**. In a domestic environment this product may cause radio interferences, in which case the user may be required to take adequate safety measures.

SUMMARY TABLE OF POWER ELECTRICAL FEATURES FOR INVERTERS SERIES 400 FROM /P TO /6

INVERTER POWER SIZE				/P	/R	/0	/0M	/1	/L	/2	/2,5	/3	/3,5	/5	/6
MAX. POWERS APPLICABLE IN U- V- W OUTPUTS	LINE 230Vac	Pmotor* kW		0,63	1,3	1,7	2,3	3,5	4,5	6,5	8,1	10	13	18,5	22
		Smax* kVA		1,2	1,8	2,7	3,6	4,7	6	8,7	10,5	13	17	23,8	28,6
	LINE 400Vac	Pmotor* kW		1,1	2,25	3	4	6	7,5	11	15	18,5	22	30	37
		Smax* kVA		2	3	4,8	6,4	8	10	15	20	25	30	41	50
	LINE 690Vac	Pmotor* kW		-	-	-	-	-	-	-	-	-	-	50	55
		Smax* kVA		-	-	-	-	-	-	-	-	-	-	60	65
NOMINAL CURRENT IN L1- L2- L3 INPUTS	LINE 230-400Vac	A		3	5	7	9	12	15	22	30	35	45	60	72
	LINE 230-400Vac with reactance	A		2,25	3,75	5,2	7	9,2	11,5	17,5	25	29	36	48	58
NOMINAL CURRENT IN U- V- W OUTPUTS	LINE 230-400Vac	A	MAX SETTABLE	3	5	7	9	12	15	22	30	35	45	60	72
			ABSOLUTE*	3,3	5,5	7,7	9,9	13,2	16,5	24,2	33	38,5	49,5	66	79,2
	LINE 690Vac	A	MAX SETTABLE	-	-	-	-	-	-	-	-	-	-	50	55
			ABSOLUTE*	-	-	-	-	-	-	-	-	-	-	55	60,5
MAX. CARD BLOCK CURRENT IN U - V - W OUTPUTS		A		8,5	13	20	25	34	42	62	84	98	126	170	200
L1- L2- L3 INPUT PROTECTION FUSES gL or GG TYPE		A		4	6	10	16	16	20	25	32	40	63	80	80
BRAKING CURRENT F F+ OUTPUT IN CONTINUOUS SERVICE WITH REACTANCE	LINE 230-400Vac	A		5,3	5,3	11	11	11	14	25	36	36	42	64	125
	LINE 690Vac	A		-	-	-	-	-	-	-	-	-	-	64	125
MINIMUM BRAKING RESISTOR F F+ OUTPUT	LINE 230Vac	OHM		150	150	73	73	73	57	32	22	22	19	12	6
	LINE 400Vac	OHM		150	150	73	73	73	57	32	22	22	19	12	6
	LINE 690Vac	OHM		-	-	-	-	-	-	-	-	-	-	17	9
MAX. DISSIPATED POWER (HOLDER WITH 4KHz PWM)		kW		0,13	0,16	0,17	0,24	0,34	0,43	0,58	0,78	0,89	1,21	1,54	1,76
COOLING FAN				NO	NO	NO	SI	SI	SI	SI	SI	SI	SI	SI	SI
INTERNAL EMI FILTER		LINE 230-400Vac		SI	SI	SI	SI	SI	SI	SI	SI	SI	SI	SI	SI
		LINE 690Vac		-	-	-	-	-	-	-	-	-	-	NO	NO

* **Pmotor KW** = Maximum motor power applied to the inverter output according to 4 poles asynchronous motor standard label value. In case of a motor with different poles, check the compatibility with the inverter output maximum current (6 - 8 poles)

* **Smax KVA** = Max. applicable power with cosphi = 1

* **ABSOLUTE** = The maximum current limit in continuous service on the U-V-W output, without inverter fault.

SUMMARY TABLE OF POWER ELECTRICAL FEATURES FOR INVERTERS SERIES 400 FROM /6,5 TO /G

INVERTER POWERE SIZE				/6,5	/7	/8	/8,5	/9	/A	/B	/C	/D	/E	/F PWM 5KHz	/F PWM 3KHz	/G PWM 5KHz	/G PWM 3KHz
MAX. POWERS APPLICABLE IN U- V- W OUTPUTS	LINE 230Vac	Pmotor* kW		26	32	45	52	63	76	90	121	147	170	200	228	260	288
		Smax* kVA		35	42	55	65	81	97	119	162	183	219	270	308	310	345
	LINE 400Vac	Pmotor* kW		45	55	75	90	110	132	160	220	250	315	355	400	450	500
		Smax* kVA		60	73	95	114	142	170	208	282	318	381	453	516	540	600
	LINE 690Vac	Pmotor* kW		62	75	105	135	160	200	250	345	355	-	443	500	540	600
		Smax* kVA		78	96	131	167	203	250	298	385	418	-	497	561	600	668
NOMINAL CURRENT IN L1- L2- L3 INPUTS	LINE 230-400Vac	A		87	106	138	165	205	245	300	410	460	550	655	745	780	868
	LINE 230-400Vac with reactance	A		70	82	110	135	164	200	240	325	370	460	550	627	655	730
NOMINAL CURRENT IN U- V- W OUTPUTS	LINE 230-400Vac	A	MAX SETTABLE	87	106	138	165	205	245	300	410	460	550	655	746	780	868
			ABSOLUTE*	95	116	151	181	225	269	330	451	506	605	720	820	858	954
	LINE 690Vac	A	MAX SETTABLE	65	80	110	140	170	210	250	330	350	-	412	470	490	560
			ABSOLUTE*	71	88	121	154	187	231	275	363	385	-	453	517	539	616
MAX. CARD BLOCK CURRENT IN U - V - W OUTPUTS		A		245	300	385	460	575	685	840	1000	1290	1540	1800		2090	
L1- L2- L3 INPUT PROTECTION FUSES gL or GG TYPE		A		100	125	160	200	250	315	400	500	630	630	1000		1250	
BRAKING CURRENT F F+ OUTPUT IN CONTINUOUS SERVICE WITH REACTANCE	LINE 230-400Vac	A		125	125	187	187	187	114	114	250	250	250	250		250	
	LINEA 690Vac	A		125	125	187	187	187	114	114	250	250	-	250		250	
MINIMUM BRAKING RESISTOR F F+ OUTPUT	LINE 230Vac	OHM		6	6	4	4	4	6,5	6,5	3	3	3	3		3	
	LINE 400Vac	OHM		6	6	4	4	4	6,5	6,5	3	3	3	3		3	
	LINE 690Vac	OHM		9	9	6	6	6	10	10	4,5	4,5	-	4,5		4,5	
MAX. DISSIPATED POWER (HOLDER WITH 4KHz PWM)		kW		2,12	2,31	3,31	3,47	-	-	-	-	-	-	-		-	
MAX. DISSIPATED POWER (HOLDER WITH 2KHz PWM)		kW		-	-	-	-	4,11	4,81	5,60	8,11	9,64	11,31	14,89		17,74	
COOLING FAN				SI	SI	SI	SI	SI	SI	SI	SI	SI	SI	SI		SI	
INTERNAL EMI FILTER		LINE 230-400Vac		SI	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO		NO	
		LINE 690Vac		NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO		NO	
INVERTER 650KW / 400V IN CLIMATE CABINET ON REQUEST																	

* **Pmotor KW** = Maximum motor power applied to the inverter output according to 4 poles asynchronous motor standard label value. In case of a motor with different poles, check the compatibility with the inverter output maximum current (6 - 8 poles)

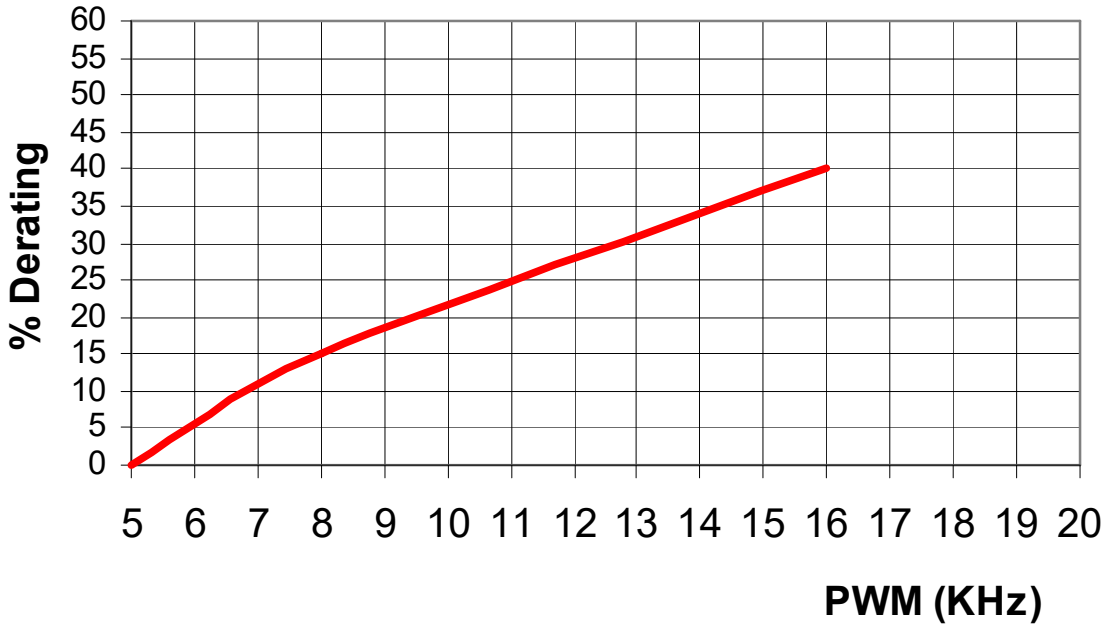
* **Smax KVA** = Max. applicable power with cosphi = 1

* **ABSOLUTE** = The maximum current limit in continuous service on the U-V-W output, without inverter fault.

Inverter derating according to PWM frequencies

CAUTION! Direct max. powers in the tables are allowed for PWM frequencies up to 5KHz. For higher frequencies the inverter must be derated following the diagrams on the right.

As for PWM frequency setup, see parameter group: 1.12.PWM GENERATOR



Efficiency level and power losses of Rowan Inverter

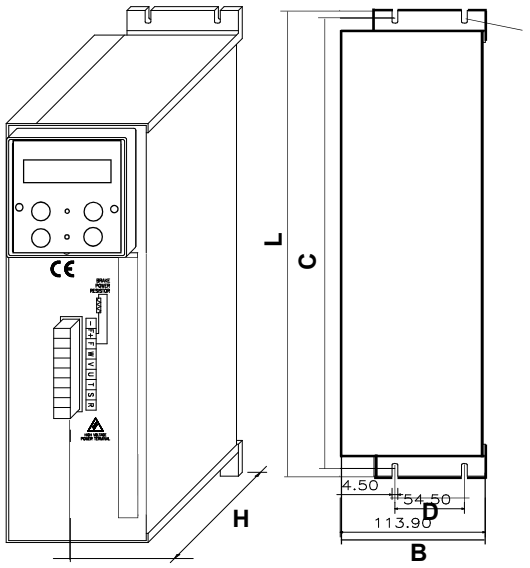
Three-phase Rowan Inverters driving motors rated for direct line start operation on 50/60Hz lines fall within the scope of Commission Regulation (EU) nr 2019/1781 laying down ecodesign requirements for electric motors and variable speed drives pursuant to Directive 2009/125/EC of the European Parliament.
It shall apply from 1 July 2021.

Regulation requires that Variable Speed Drives (VSD) fall within the efficiency class IE2 and to provide to users "power losses in % of the rated apparent output power at the following different operating points for relative motor stator frequency versus relative torque-producing current (0;25) (0;50) (0;100) (50;25) (50;50) (50;100) (90;50) (90;100), as well as standby losses, generated when the VSD is powered up but is not providing current to the load, rounded to one decimal place".

As required by Regulation power dissipations of Rowan inverters do not exceed the maximum power losses corresponding to the IE2 efficiency level.
Below the table with power losses for each inverter:

Inverter (CDM) Efficiency Level according to Reg. EU n°2019/1781 (nomenclature as described in CEI EN 61800-9-2)												
POWER SIZES	Efficiency Level	$S_{r,equ}$ [kVA]	$P_{L,STANDBY}$ [W]	$p_{L,CDM}$ (0;25)	$p_{L,CDM}$ (0;50)	$p_{L,CDM}$ (0;100)	$p_{L,CDM}$ (50;25)	$p_{L,CDM}$ (50;50)	$p_{L,CDM}$ (50;100)	$p_{L,CDM}$ (90;50)	$p_{L,CDM}$ (90;100)	$P_{L,CDM}$ (90;100) [kW]
/P	IE2	2	15,0	4,0%	4,3%	5,0%	4,1%	4,5%	5,6%	4,8%	6,3%	0,13
/R	IE2	3	15,0	2,4%	2,7%	3,3%	2,5%	2,9%	3,9%	3,2%	4,7%	0,16
/0	IE2	5	15,0	1,9%	2,0%	2,5%	2,0%	2,2%	3,0%	2,5%	3,5%	0,17
/0M	IE2	6	20,0	1,9%	2,1%	2,5%	2,0%	2,3%	3,1%	2,6%	3,8%	0,24
/1	IE2	8	20,0	1,6%	1,8%	2,5%	1,7%	2,1%	3,2%	2,3%	4,1%	0,34
/L	IE2	10	20,0	1,6%	1,8%	2,5%	1,7%	2,0%	3,2%	2,3%	4,1%	0,43
/2	IE2	15	22,0	1,4%	1,6%	2,3%	1,5%	1,9%	2,9%	2,1%	3,8%	0,58
/2,5	IE2	21	25,0	1,5%	1,8%	2,6%	1,6%	2,0%	3,1%	2,2%	3,8%	0,78
/3	IE2	24	27,2	1,4%	1,6%	2,3%	1,5%	1,8%	2,9%	2,1%	3,7%	0,89
/3,5	IE2	31	28,5	1,5%	1,7%	2,5%	1,6%	2,0%	3,1%	2,2%	3,9%	1,21
/5	IE2	42	22,0	1,2%	1,4%	2,0%	1,3%	1,6%	2,7%	1,9%	3,7%	1,54
/6	IE2	50	22,0	1,1%	1,3%	2,0%	1,2%	1,6%	2,6%	1,9%	3,5%	1,76
/6,5	IE2	60	22,0	1,1%	1,3%	2,0%	1,2%	1,5%	2,7%	1,8%	3,5%	2,12
/7	IE2	73	22,0	0,9%	1,1%	1,8%	1,0%	1,4%	2,4%	1,6%	3,1%	2,31
/8	IE2	96	22,3	1,0%	1,2%	1,9%	1,1%	1,5%	2,6%	1,8%	3,5%	3,31
/8,5	IE2	114	22,5	0,9%	1,1%	1,8%	1,0%	1,4%	2,4%	1,6%	3,0%	3,47
/9	IE2	142	23,0	0,8%	0,9%	1,5%	0,9%	1,2%	2,1%	1,4%	2,9%	4,11
/A	IE2	170	23,0	0,7%	0,9%	1,4%	0,8%	1,1%	2,0%	1,4%	2,8%	4,81
/B	IE2	208	23,0	0,7%	0,8%	1,3%	0,8%	1,1%	1,9%	1,3%	2,7%	5,60
/C	IE2	284	57,0	0,7%	0,9%	1,5%	0,8%	1,1%	2,1%	1,3%	2,9%	8,11
/D	IE2	319	64,0	0,7%	0,9%	1,6%	0,8%	1,2%	2,2%	1,4%	3,0%	9,64
/E	IE2	381	66,0	0,7%	1,0%	1,6%	0,8%	1,2%	2,2%	1,4%	3,0%	11,31
/F	IE2	517	83,0	0,7%	0,9%	1,5%	0,8%	1,1%	2,1%	1,4%	2,9%	14,89
/G	IE2	601	86,0	0,7%	0,9%	1,5%	0,8%	1,1%	2,2%	1,4%	2,9%	17,74

Drives dimensions and weights for inverters from 400/P to 400/L



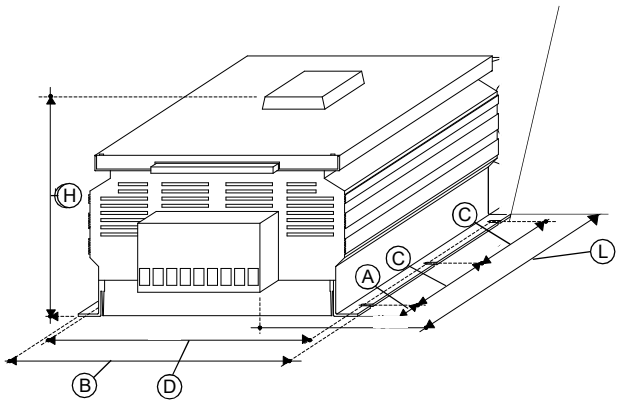
Fixing holes are intended for 4MA screws

INVERTER SIZES	H	B	L	C	D	WEIGHT (Kg)	EMI INTERNAL FILTER
/P	200	90	285	275	60	2,7	YES
/R	200	114	285	275	60	2,8	YES
/0- 0/M	200	134	365	353	60	3,5	YES
/1	200	134	365	353	60	3,6	YES
/L	200	134	365	353	60	4	YES

All dimensions are in mm

Drives dimensions and weights for inverters from 400/2 to 400/G

Fixing holes are intended for 4MA screws



All dimensions are in mm

INVERTER SIZES	H	B	L	A	C*	D	WEIGHT (Kg)	EMI INTERNAL FILTER
/2	180	265	385	75	200x1	253	8	SI
/2,5 /3	200	315	430	95	200x1	305	10	SI
/3,5	280	310	420	75	235x1	295	14,5	SI
/5	280	280	515	65	233x1	265	18,5	SI
/6 /6,5	295	380	570	60	360x1	365	30	SI
/7	295	380	570	60	360x1	365	30	NO
/8	295	380	620	110	360x1	365	40	NO
/8,5	295	480	830	100	300x2	465	55	NO
/9 /A	295	480	950	100	300x2	465	80	NO
/B	295	480	1070	100	300x2	465	85	NO
/C	295	480	1270	100	450x2	465	100	NO
/D /E /F	400	680	1250	110	225x4	655	170	NO
/G	400	885	1270	110	225x4	860	200	NO

* The number of C quotes depends of the numbers of fixing holes.

- As for models from /5 to /G, a version with EXTERNAL CABINET COOLING is available on request
WARNING! The version of the inverters at 690Vac is higher than 6 cm (add 60mm to the size H)

Warnings for a correct mechanical installation

- Make sure that the characteristics of the area in which the inverter is to be installed fall within the recommended characteristics given in Chapter 5: TECHNICAL FEATURES (temperature, humidity, protection level, altitude).

-Install the inverter in a place dedicated to the panel power parts. Avoid placing it near low voltage analog or digital boards (i.e.: opposite side of the panel).

- Favour the cooling air flow as much as possible. Do not stack drives, leave a space of at least 100 mm under and above it and of at least 50 mm sideways.

- Avoid vibrations and knocks.

- Leave enough room to install anti-disturbance filters, should they be necessary.

The drive should be installed vertically with the fans in the lower part and inserted in well ventilated panels. The inverter should also be fixed to a rigid, flat surface in order to force the air that is pushed up from the ventilators through the heat dissipator. If the inverter is installed inside any kind of container, this must have air vents in the higher parts and fans with a grill in the lower part to let hot air out above the highest border of the inverter, as shown in the diagram below.The air flow coming out from the upper part of the inverter should not be obstacled in its way towards the expulsion fans.

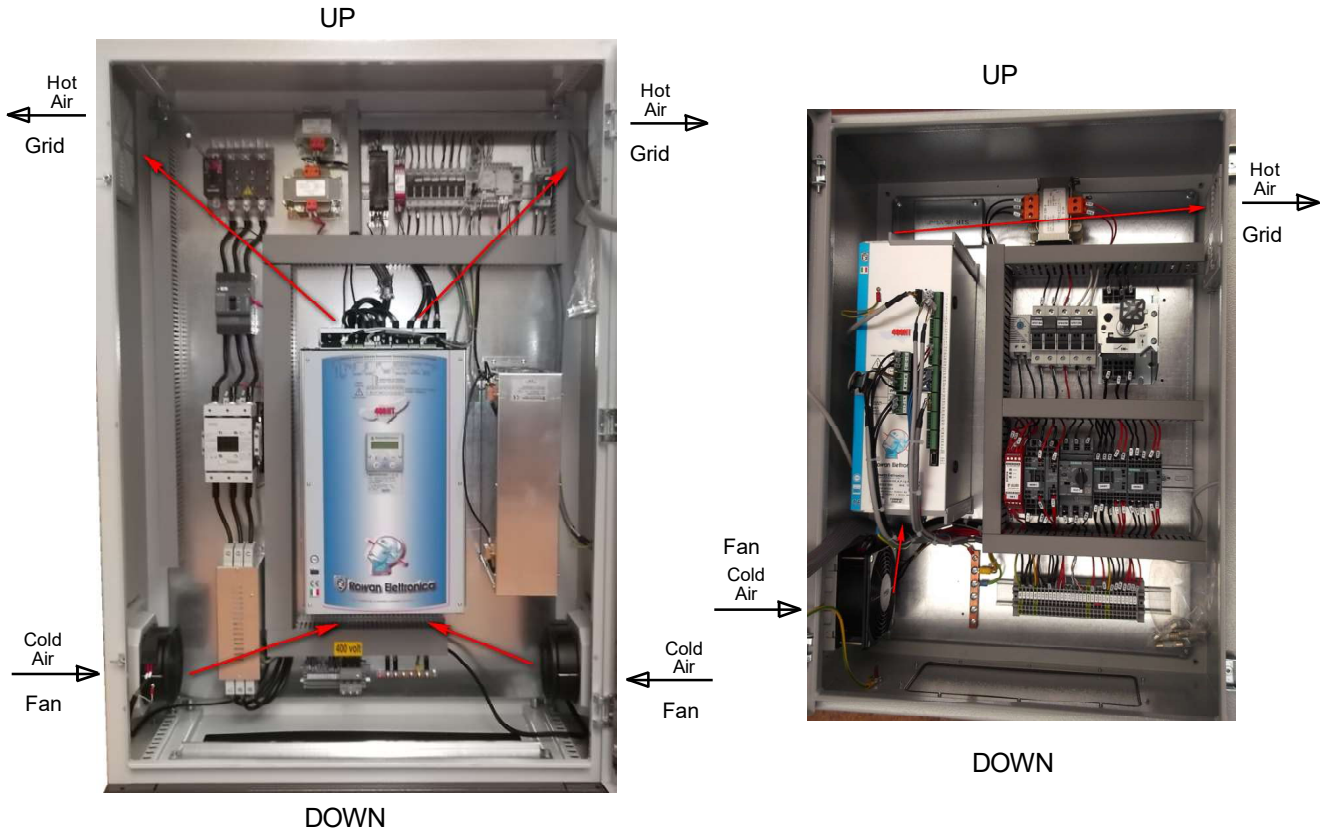
In particular aggressive areas, or if it is not possible to ventilate the panel enough, use heat exchangers or air conditioners. To calculate the internal cabinet air rechange system, evalute the MAX DISSIPATE POWER OF THE CABINET with 5kHz PWM explained in Chap. 5. In case of higher PWM frequency, increase accordingly with the diagram of derating.

Please remember that if the fault relay (Default O2) is used to block the inverter power supply in case of faults, cooling fans will be stopped as well. If Fault 14 occurs (Power module overheating cooler), the inverter should be powered, but run will stop (I1), in order to speed up dissipator cooling. In this way O2 relay won't deactivate and cooling fans will continue working

All inverters from /5 to /G have a thermostat on the cooler activating cooling fans when the dissipator temperature goes over 50°C; fans are deactivated when the dissipator temperature is lower than 40°C.

IMPORTANT: it's suggested once a year at least, to check the clamps tightening of inverter and motor, especially the power one, to avoid possible slackening with overheating consequences from the contact and the connection wire.

HOW TO PLACE AN INVERTER IN A PANEL



General warnings before connection of the threephase power supply

TN- (Threephase + Neutral to Ground) and TT- (Threephase + Ground) network connections

Rowan inverters are designed to be powered by this kind of threephase nertworks, electrically symmetrical to Ground. The inverter must be connected to earth.

IT- (Threephase without Ground) network connections

For IT-feed, the use of a Ground trial delta/star isolation transformer is compulsory, or any isolation loss by one of the devices connected to the same network might cause inverter faults.

Wiring system and electromagnetic compatibility E.M.C.

The Series 400 drives have been designed to work in industrial environments in accordance with the safety standards dictated by the CEI EN 60204-1 general directive. As far as Electromagnetic Compatibility (EMC) is concerned, they conform with EMC 2014/30/UE directive, with reference to the CEI EN 61800-3 (cat. 2) product norm. In order to meet these requirements drives **without internal filter must be connected via anti E.M.I. filtering device** (Electro Magnetic Interference) as indicated in the connection diagram given below, made up of a threephase supply filter. To chose the suitable filter see: **"Table of threephase anti E.M.I. filters and ferrite toroids for different inverters"**

- The U- V- W wires **must** also be passed through a ferrite ring several times, which should be positioned as close as possible to the drive.

During the wiring phase, the operator must be respected the following rules:

- **It is compulsory** not to pass the command terminal board connecting wires through the same channel as the power wires of the same drive or of other device (keep a distance of at least 30 cm between them).

- **It is compulsory** to connect braided wire analog inputs/outputs through a **different** channel from the one used for power cables.

- **It is compulsory** to connect the encoder (LINE DRIVER) from the motor to the drive by a 6-wires braided cable. The 6 wires must be connected to the inverter terminal board as indicated in the connection diagrams in this manual.

Caution !

The cable shield used must be connected both at pin nr. 7 (D) of the encoder connector and at the inverter common ground point (with ground bar or galvanized plate, using clamps). Avoid the shield stretch through use of wires, otherwise reduce as a possible the length.

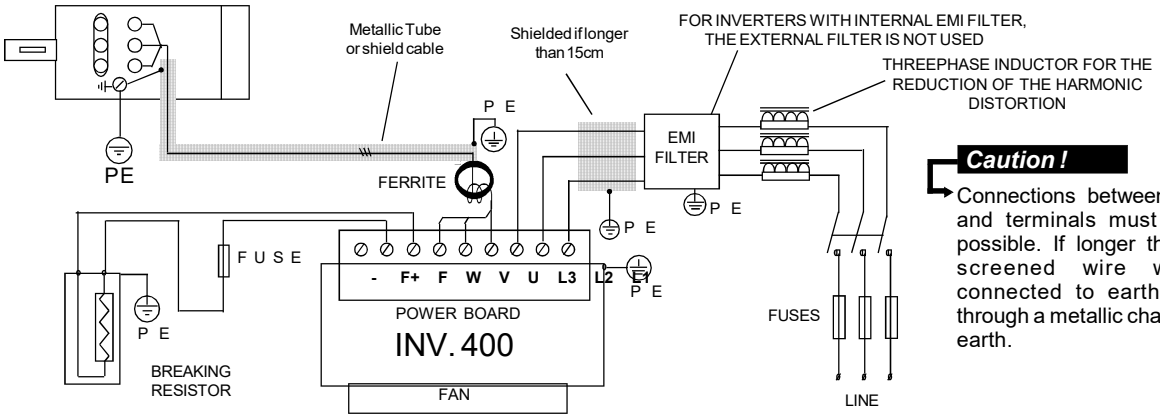
The encoder connection cable must pass through a **different** channel from that of the power wires of the same drive or of other device. Moreover:

- **It is compulsory** to connect the end of each shield one by one, to the common Ground point of the panel. Avoid Ground loops.

- **It is compulsory** The motor-card power connection, **must** be performed by means of a braided cable or by wires inserted into a metallic tube without continuity solution, connection both the end to plant Ground (as diagram below)

- **It is compulsory** use the three-phase filter to reduce the harmonic distortion. (reactance)

If the working development need, install the reduction harmonic distortion filter, between the EMI filter and the line



Caution !

Connections between L1-L2-L3 filters and terminals must be as short as possible. If longer than 15cm, use a screened wire with screening connected to earth, or pass wires through a metallic channel connected to earth.

For the filter to work properly, for a higher protection against electrostatic discharges and for safety reasons, PE terminal must be connected to earth before powering the drive.

- Anti EMI filters and inverters with internal filter must be used only with TN or TT network connection.

- Before connecting the inverter and the EMI filter, make sure the earth wire is properly functioning, to avoid faults or even damages to the devices.

- In case of two phases are interrupt, the Ground leakage current can be to reach 6 times the normal values.

- Keep in mind that the EN50178 norms specify that in case of leakage current >3,5mA, the Earth wire must be steady and doubled.

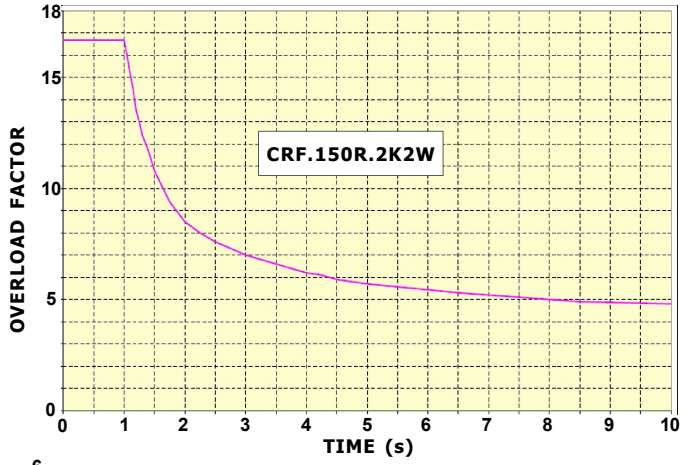
- The maximum protection for the inverter - and for a correct works - is obtained with type B differentials, preferably a 300mA type.

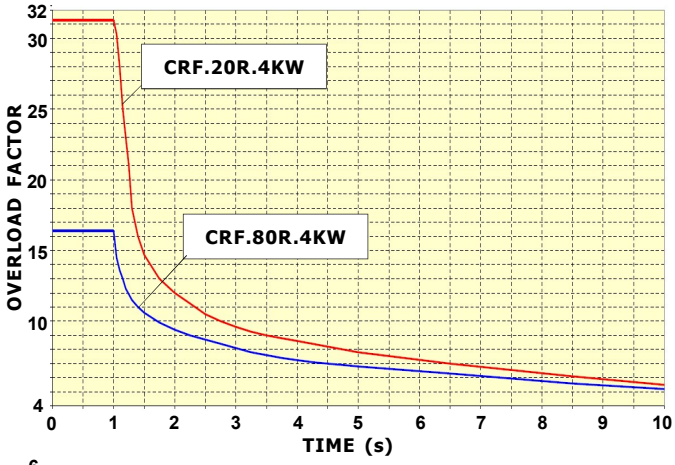
- In a domestic environment this product may cause radio interferences, in which case the user may be required to take adequate safety measures.

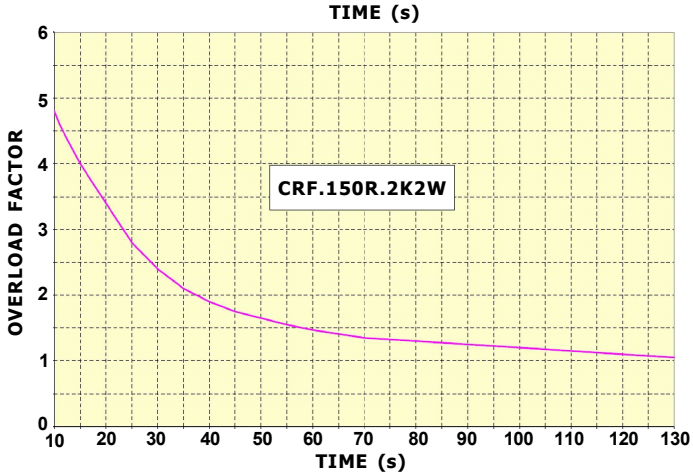
Table of braking resistors for Rowan inverters

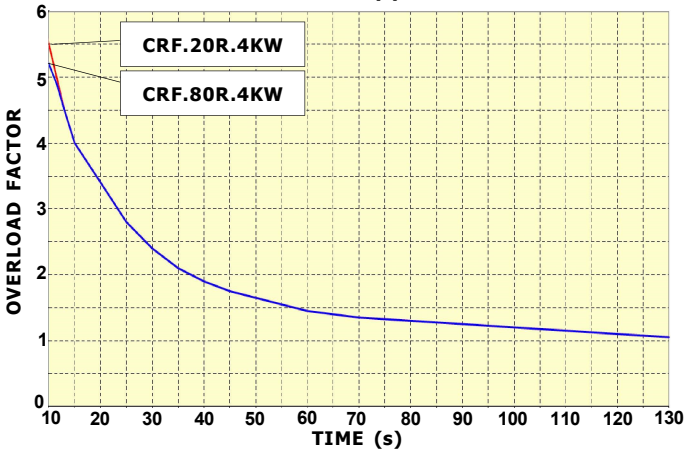
DATA	units	RES.180R. 600	CRF.150R. 2K2	CRF.20R. 2K5	CRF.30R. 2K5	CRF.40R. 2K5	CRF. 20R. 4KW	CRF. 80R. 4KW
NOMINAL POWER	W	600	2200	2500	2500	2500	4000	4000
RESISTOR	ohm	180	150	20	20	40	20	80
NOMINAL CURRENT	A	1.8	3.8	11	9	7.9	14.1	7.0
MAX CURRENT FOR 5 sec	A	2.5 (5s ON - 25s OFF)	9.2 (5s ON - 30min OFF)	16.7 (5s ON - 1min OFF)	12.9 (5s ON - 1min OFF)	10.6 (5s ON - 1min OFF)	39.5 (5s ON - 30min OFF)	18.0 (5s ON - 30min OFF)
FUSE TYPE gL	A	2	4	16	10	10	16	8

To facilitate the choice of the type of resistance CRF (and any combinations series / parallel) as a function of the working cycle, are depicted below the curves of overload. WARNING! The curves refer to a single overload with a maximum ambient temperature of 40 ° C and a resistor installed in a location where it is ensured proper air circulation. The average time that the resistor employ to move back to the ambient temperature is between 20 and 30 minutes, depending on the cooling conditions.









There may be 2 typical cases of installation for braking resistors:

Installation in a cabinet

This kind of installation is generally used in case of intermittant use of the resistors, with high, but distanced current peaks, in order for cabinet and other devices temperatures not to increase too much over their continuous duty cycle limits. In this case, current and power nominal values must be applied, but with **5% duty cycle**.

- **RES.180R.600** and **RES.xxR.2K5** resistors, made of ceramics and protected by an ultra slim covering, must be fixed in close contact with the panel components supporting sheet.

- **RES.CRF.xxR.xKxW** resistors, closed in a IP22 panel without ventilation, must be mounted vertically.

External installation

This kind of installation is used when it is neccessary to dissipate in countinuos duty cycle as much power as possible of the brake resistor, with or without ventilation. The current and power in duty cycle 100% characteristics shown in the table are related to the following mounting conditions:

- **RES.180R.600** and **RES.xxR.2K5** resistors must be fixed onto a cooler, which is able to discharge **0,5W/°C**.

Caution! with this features, the flat resisitor external temperature may reach about **300°C**.

Arrange for proper protections against accidental contacts.

Non ventilated resistors in IP22 cabinet **CRF.xxR.xKxW**, and ventilated **CRF.xxR.xKxW.V** must be mounted in vertical position.

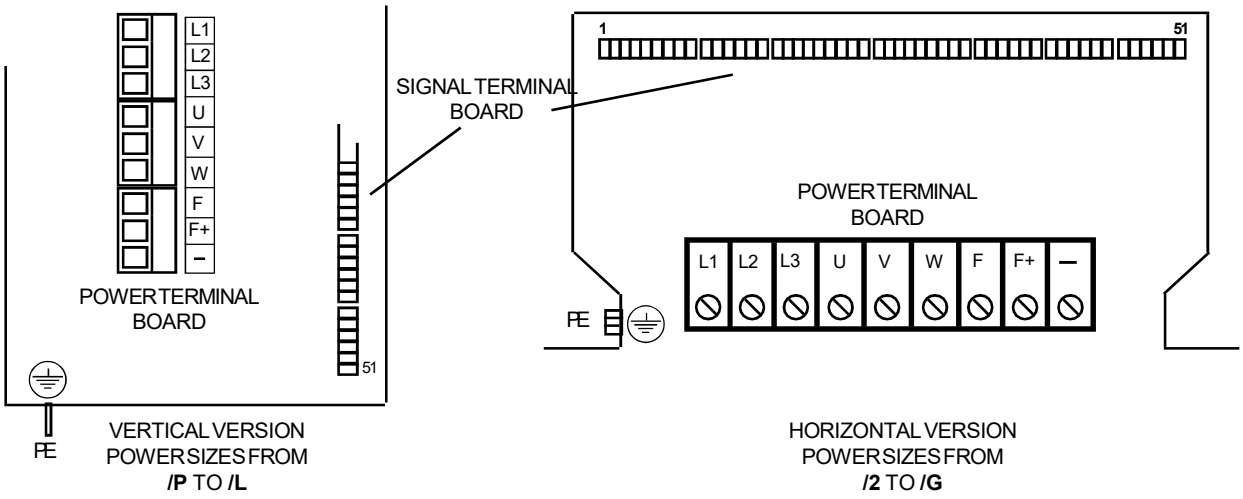
Caution! with this features, the temperature of the air coming out from the container slits may reach about **400°C**.

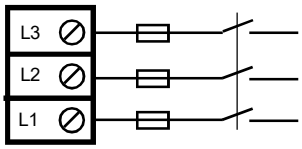
Arrange for proper protections against accidental contacts.

Caution! the ohmic value of the braking resistor can't be lower than that estimated in: **"OUTPUT F F+MIN. BRAKING RESISTOR"** tables of Chapter 5: TECHNICAL FEATURES.
In inverter from /3 size up to /F size, the output for connecting the braking resistance (F and F+) is protected against the short circuit (indicated by the inverter blockage with FAULT13). In sizes from /P up to /2 there is no protection, therefore we suggest using a protection fuse on terminal F+.

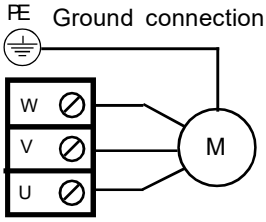
For safety reasons, insert a protection fuse in series connection with the resistance on F+ terminal, as shown in the table.

Power terminal board description

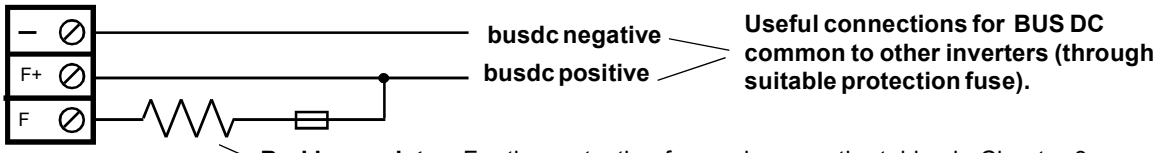




THREEPHASE FEEDING.
For protection fuses values, see the "Electric and power characteristics summary tables for the inverter Series 400" in Chapter 5: TECHINCAL FEATURES.



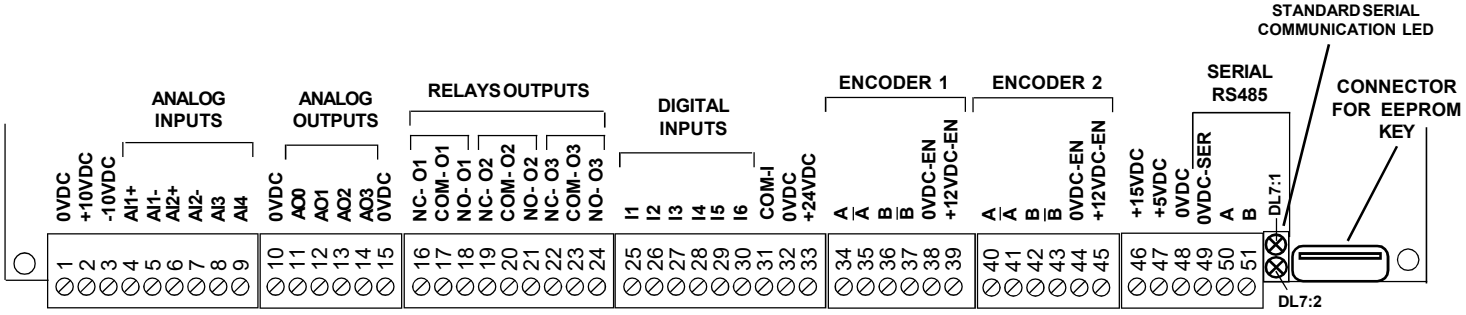
Threephase asynchronous motor connection



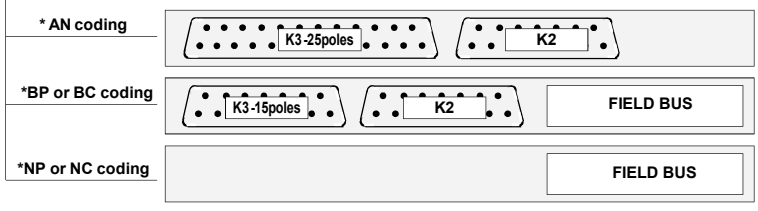
Useful connections for BUS DC common to other inverters (through suitable protection fuse).

Braking resistor. For the protection fuse value, see the tables in Chapter 8: BRAKING RESISTORS.

Standard signal terminal boards description and Eeprom key connector



OPTIONAL EXPANSION DRIVE with I/O and FIELD BUS



*see chapt.18 DRIVES CODING

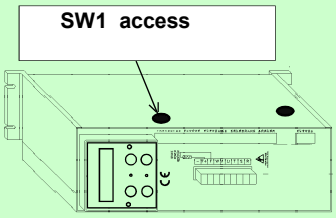
K2, K3-25poles, K3-15poles: see paragraph from this chapt. CONNECTORS DESCRIPTION of THE OPTIONAL EXPANSION DRIVE.
FIELD BUS: slot for ANYBUS module with field bus on request PROFIBUS, CANOPEN, MODBUS TCP/IP, ETHERCAT, PROFINET.

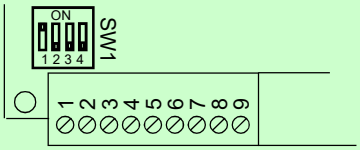
0VDC	1	Common Negative
+10VDC	2	Voltage reference for external potentiometers +10Vdc/10mA
-10VDC	3	Voltage reference for external potentiometers -10Vdc/10mA
AI1+	4	**10Vdc differential** analog input, programmable, 14 bit resolution.
AI1-	5	Default setup: 0/+10VDC input (**par. 4.3.1.3 TYPE INPUT= 0/+10V**)
		Default function: SPEED REFERENCE (**par. 3.1.1.1 SPEED SOURCE= AI1**)
AI2+	6	+/-**10Vdc, 0-20mA, 4-20mA differential** analog input, programmable, 12 bit resolution.
AI2-	7	Default setup: 4-20mA input (**par. 4.3.2.3 TYPE INPUT= 4/20mA**)
		Default function: NONE

It is possible to set AI2 input for a +Vdc/+10Vdc or +/-10Vdc voltage input; in order to do so, it is necessary to set SW1 (1, 2, 3) microswitches which are inner the inverter. The default setup is for 0-20mA, 4-20mAinput, with micro 1 ON, micro 2 OFF, micro 3 OFF.

To change the input setup, you must follow the instructions below:

- Remove the drive covering for inverters /2 - /G,
  remove the cap as shown in the pitcure for /P - /L sizes.
- Set micro 1 OFF, micro 2 ON, micro 3 ON.
- Set **par. 4.3.2.3 TYPE INPUT= 0/+10V**, if you have a 0Vdc/+10Vdc signal.
- Set **par. 4.3.2.3 TYPE INPUT= -10/+10V**, if you have a -10Vdc/ +10Vdc signal.
- Set the offset again following **par. 4.3.2.2 OFFSET** and the scale bottom following **par. 4.3.2.1 SCALE**, for the correct setup range.





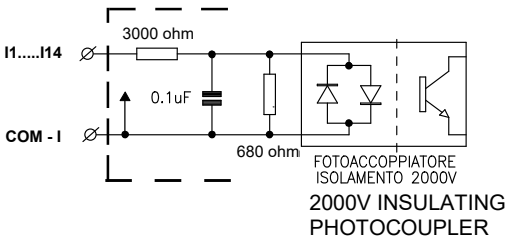
Leave out the cover form the inverter just in case of lack of supply and only when the continuos voltage between terminal (F+) and terminal (-) is lower than 50Vdc.

Before handling the card, provide for discharging yourself electrostatically; a lot of components may be distroyed by electrostatic discharges (ESD).
Select only the microswitches and avoid touching all other components.

0VDC	1	**+/-10Vdc non differential** analog input, programmable, 12 bit resolution.
AI3	8	Default setup: 0/+10VDC input (**par. 4.3.3.3 TYPE INPUT= 0/+10V**)
		Default function: TORQUE REFERENCE (**par. 1.10.2 TORQUE SOURCE=AI3**) just in case of
0VDC	1	**+/-10Vdc non differential** analog input, programmable, 12 bit resolution.
AI4	9	Default setup: 0/+10VDC input (**par. 4.3.3.3 TYPE INPUT= 0/+10V**)
		Default function: NONE
0VDC	10	Common negative
0VDC	10	**+/-10Vdc** analog output, programmable, 12 bit resolution.
AO0	11	Default setup: 0/+10VDC output (**par. 4.4.2.4 TYPE OUTPUT= DIRECT**)
		Default function: MOTOR CURRENT (**par. 4.4.2.1 VAR DISPLAY=1**)
0VDC	10	**+/-10Vdc** analog output, programmable, 12 bit resolution.
AO1	12	Default setup: 0/+10VDC output (**par. 4.4.3.4 TYPE OUTPUT= DIRECT**)
		Default function: MOTOR SPEED (**par. 4.4.3.1 VAR DISPLAY=3**)
0VDC	15	**+/-10Vdc** analog output, programmable, 8 bit resolution.
AO2	13	Default setup: 0/+10VDC output (**par. 4.4.4.4 TYPE OUTPUT= DIRECT**)
		Default function: MOTOR SPEED (**par. 4.4.4.1 VAR DISPLAY =*3***)
0VDC	15	**+/-10Vdc** analog output, programmable, 8 bit resolution.
AO3	14	Default setup: 0/+10VDC output (**par. 4.4.5.4 TYPE OUTPUT= DIRECT**)
		Default function: MOTOR TORQUE (**par. 4.4.5.1 VAR DISPLAY= 5**)
0VDC	15	Common negative

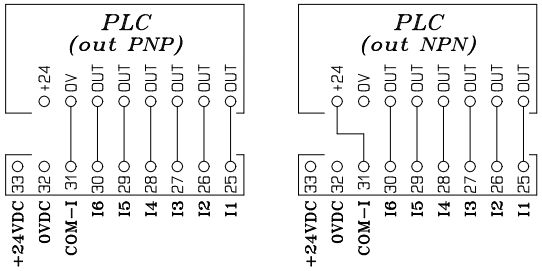
NC- O1	16	**O1 relay** programmable digital output contact. Contact current-carrying capacity 0,5A-120Vac/ 2A-30Vdc. Default function: MOTOR SPEED THRESHOLD (ZERO RELAY) (**par. 3.1.3.3 OUT THRESHOLD1= O1**) Relay ON with motor speed over the threshold in **par. 3.1.3.1 SPEED THRESHOLD1** Relay OFF with motor speed under the threshold in **par. 3.1.3.1 SPEED THRESHOLD1**
COM - O1	17	
NO - O1	18	
NC- O2	19	**O2 relay** programmable digital output contact. Contact current-carrying capacity 0,5A-120Vac/ 2A-30Vdc. Default function:INVERTER IN FAULT (**par. 1.9.5 OUT FAULT= O2**) Relay ON for normal functioning, OFF for inverter in fault. **When switch on the inverter, the relay is in OFF state for about 5sec, then it goes in ON state in absence of FAULTS**
COM - O2	20	
NO - O2	21	
NC- O3	22	**O3 relay** programmable digital output contact. Contact current-carrying capacity 0,5A-120Vac/ 2A-30Vdc Default function: INVERTER RUN (**par. 1.9.4 OUT RUN= O3**) Relay ON for running inverter, OFF for inverter in OFF running or in fault.
COM - O3	23	
NO - O3	24	
I1	25	Non programmable digital input with inverter RUN fixed function. **Even if this input is already active, the inverter starts running about 6sec after its supplying**
I2	26	Programmable digital input Default function: STOP IN RAMP (**par. 3.1.1.2 IN STOP SPEED= I2**) Input OFF, the motor accelerates in ramp to reach the set speed. Input ON, the motor decelerates in ramp and then it keeps the stationary position.
I3	27	Programmable digital input Default function: FIXED SPEEDS ACTIVATION (**par. 3.1.6.8 IN1 SPEED= I3**) For speeds activation, see Chapter 10: PARAMETERS AND VISUALISATIONS, par. MENU PARAMETERS DESCRIPTION: **3.1.6 FIXED SPEED** in MANU.400S.GB.
I4	28	Programmable digital input Default function: FIXED SPEEDS ACTIVATION (**par. 3.1.6.9 IN2 SPEED= I4**)For speeds activation, see Chapter 10: PARAMETERS AND VISUALISATIONS, par. MENU PARAMETERS DESCRIPTION: **3.1.6 FIXED SPEED** in MANU.400S.GB.
I5	29	Programmable digital input. Default function: FIXED 1 ACC. RAMP ACTIVATION (**par. 3.1.7.4 IN1 ACC= I5**) For fixed ramps activation, see Chapter 10: PARAMETERS AND VISUALISATIONS, par. MENU PARAMETERS DESCRIPTION: **3.1.7 FIXED ACC. RAM** in MANU.400S.GB
I6	30	Programmable digital input Default function: FIXED 1 DEC. RAMP ACTIVATION (**par. 3.1.8.4 IN1 DEC= I6**) For fixed ramps activation, see Chapter 10: PARAMETERS AND VISUALISATIONS, par. MENU PARAMETERS DESCRIPTION: **3.1.8 FIXED DEC. RAMPS** in MANU.400S.GB.
COM-I	31	Digital inputs polarisation terminal Connect to positive if the inputs are to be connected with **PNP** logic Connect to negative if the inputs are to be connected with **NPN** logic
OVDC	32	Common negative
+24VDC	33	+24VDC Digital inputs polarisation negative, +24VDC/250mA Protected by an auto-restore fuse operating at 650mA.

Electric drawing: inside of the digital input from Ito I4



2000V INSULATING PHOTOCOUPLER

Connection example: digital inputs with external logics (PLC type)



A	34	A channel
$\overline{A}$	35	Negative A channel
B	36	B channel
$\overline{B}$	37	Negative B channel
OVDC-EN	38	Negative encoder supply
+12VDC-EN	39	Positive encoder supply, 12Vdc (5Vdc on request).Protected against short circuit by an auto restore fuse operating at 250mA

ENCODER 1 CONNECTION
LINE DRIVER logic

A	40	A channel
$\overline{A}$	41	Negative A channel
B	42	B channel
$\overline{B}$	43	Negative B channel
OVDC-EN	44	Negative encoder supply
+12VDC-EN	45	Positive encoder supply, 12Vdc (5Vdc on request).Protected against short circuit by an auto restore fuse operating at 250mA

ENCODER 2 CONNECTION.
LINE DRIVER logic

Caution!

The full load on the positive supply of the encoders (terminals 39, 45 and pin 11 of K2 connector) must never exceed 200mA.

- The default voltage supply output of the encoder is +12Vdc: **+5Vdc on request**
- The default voltage supply input of the encoder is +12Vdc: **+5Vdc or +24Vdc on request**

In case of vector control, it is possible to setup manually or by a non programmed digital input, the feedback by ENCODER 1 or by ENCODER 2; this function can be set in **1.6.7 IN ENABLE ENC 2.** (See Chapter 10: PARAMETERS AND VISUALISATIONS, paragraph MENU PARAMETERS DESCRIPTION **1.6 ENCODER VECTOR** in MANU.400S.GB).

+15VDC	46	+15Vdc/200mA supply for signal transducers
0VDC	48	Protected against short circuit by an auto-restore fuse operating at 250mA

+5VDC	47	+5Vdc/200mA supply for signal transducers
0VDC	48	Protected against short circuit by an auto-restore fuse operating at 250mA

0VDC-SER	49	RS485 serial common negative
A	50	Channel A serial line
B	51	Channel B serial line

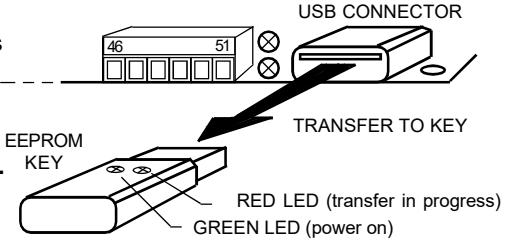
RS485 SERIAL LINE CONNECTION ACCORDING TO MODBUS RTU. ROWAN standards. For the activation, see the menu parameters **5. SERIAL COMUNIC.** and its related "INSTRUCTION MANUAL FOR INVERTER 400 SERIAL CONNECTION"

USB CONNECTOR USB CONNECTOR FOR PARAMETERS BIDIRECTIONAL TRANSFER FROM THE EEPROM KEY TO THE INVERTER AND VICEVERSA (See **Chapter 11: PARAMETER TRANSFER** in MANU.400S.GB)

- **Saving of the inverter memory into that of the EEPROM KEY. Procedure**:

  insert the key into the USB CONNECTOR; if the **green led** lights up, the key is supplied properly. Enter 100. parameters by pressing ESCAPE key for 5 s; to start saving, enter **par.100.6.9 Copy INV >> KEY**, enter **71**

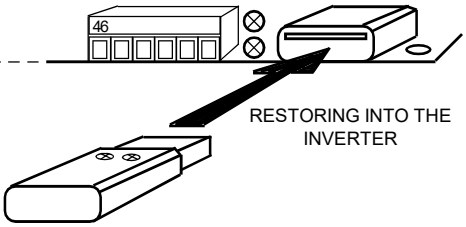
  When the **red led** on the key lights up, transfer is in progress; at the saving end, the red led extinguishes and the selection in **par.100.6.9** goes back to **0.**



- **Restoring of the EEPROM KEY memory into the inverter memory. Procedure**:

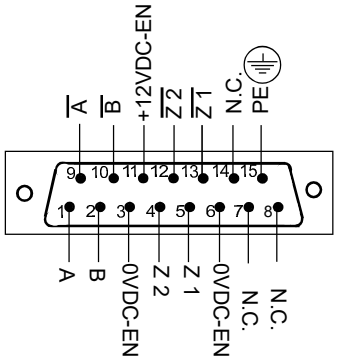
  insert the key into the USB CONNECTOR; if the **green led** lights up, the key is supplied properly. Enter 100. parameters by pressing ESCAPE key for 5 s; to start saving, enter **par.100.6.8 Copy KEY >> INV**, enter **37**.

  When the **red led** on the key lights up, transfer is in progress; at the saving end, the red led extinguishes and the selection in **par.100.6.8** goes back to **0.**



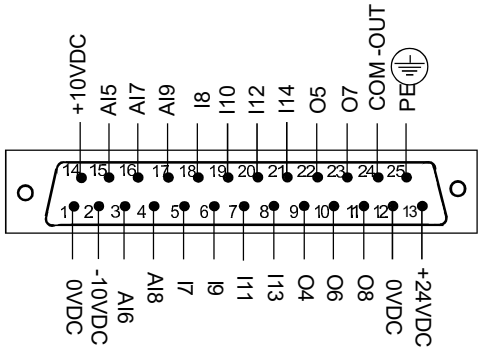
Optional B404S.A card-edge connectors description

CONNECTOR K2 (ZEROS / ENCODER 3)



A	**1** ●	A channel	ENCODER 3 CONNECTION LINE DRIVER logic
$\overline{A}$	**9** ●	Negative A channel	
B	**2** ●	B channel	
$\overline{B}$	**10** ●	Negative B channel	
Z 2	**4** ●	Z channel	ZERO ENCODER 2 OR PHASE SENSOR 2
$\overline{Z 2}$	**12** ●	Negative Z channel	
Z 1	**5** ●	Z channel	ZERO ENCODER 2 OR PHASE SENSOR 2
$\overline{Z 1}$	**13** ●	Negative Z channel	
0VDC-EN	**3** ●	Encoders/sensors common negative	
0VDC-EN	**6** ●	Encoders/sensors common negative	
+12VDC-EN	**11** ●	Encoders/sensors supply positive 12Vdc (5Vdc on request). Protected against short circuit by an auto-restore fuse operating at 250mA	
⏚ **PE**	**15** ●	Screened wire connection; the terminal is connected internally to the PE common mass point	
N.C.	**7,8,14** ●	Non connected pin	

K3 CONNECTOR I/O EXPANSION



0VDC	**1** ●	Common negative
0VDC	**12** ●	Common negative
+24VDC	**13** ●	Digital inputs/outputs polarisation negative, +24VDC/500mA Protected by an auto-restore fuse operating at 650mA
+10VDC	**14** ●	Voltage reference for external potentiometers +10Vdc/10mA
-10VDC	**2** ●	Voltage reference for external potentiometers -10Vdc/10mA

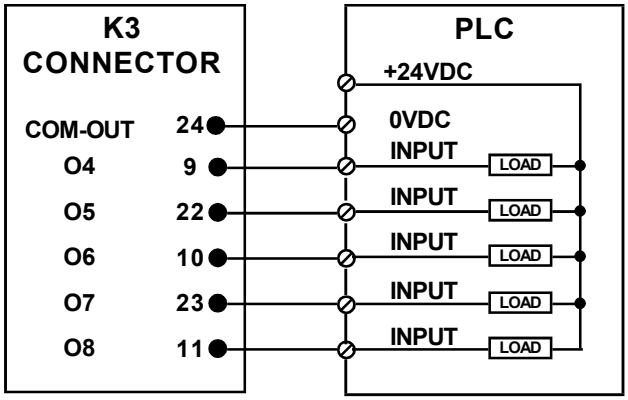
AI5	**15** ●	**+/-10Vdc non differential** analog input, programmable, 10 bit resolution. Default setup: 0/+10VDC input (**par. 4.3.5.3 TYPE INPUT= 0/+10V**) Standard function: NONE
AI6	**3** ●	**0/+10Vdc non differential** analog input, programmable, 10 bit resolution. Default function: NONE
AI7	**16** ●	**0/+10Vdc non differential** analog input, programmable, 10 bit resolution. Default function: NONE
AI8	**4** ●	**0/+10Vdc non differential** analog input, programmable, 10 bit resolution. Default function: NONE
AI9	**17** ●	**0/+10Vdc non differential** analog input, programmable, 10 bit resolution. Default function: NONE
I7	**5** ●	Programmable digital input. Default function: NONE
I8	**18** ●	Programmable digital input. Default function: NONE
I9	**6** ●	Programmable digital input. Default function: NONE
I10	**19** ●	Programmable digital input. Default function: NONE
I11	**7** ●	Programmable digital input. Default function: NONE
I12	**20** ●	Programmable digital input. Default function: NONE
I13	**8** ●	Programmable digital input. Default function: NONE
I14	**21** ●	Programmable digital input. Default function: NONE

Caution !

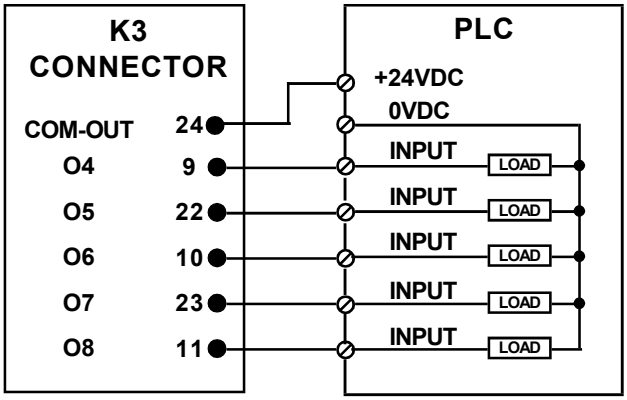
The internal electric diagram and the I7- I14 digital inputs polarisation (by 31 COM-I terminal) are the same as those described for I1- I6 standard inputs.

O4	**9** ●	Programmable digital output, NPN/PNP, max. 100VDC/80mA. Default function: NONE
O5	**22** ●	Programmable digital output, NPN/PNP, max. 100VDC/80mA. Default function: NONE
O6	**10** ●	Programmable digital output, NPN/PNP, max. 100VDC/80mA. Default function: NONE
O7	**23** ●	Programmable digital output, NPN/PNP, max. 100VDC/80mA. Default function: NONE
O8	**11** ●	Programmable digital output, NPN/PNP, max. 100VDC/80mA. Default function: NONE
COM-OUT	**24** ●	Digital outputs polarisation terminal Connect to positive if the inputs are to be connected with **PNP** logic Connect to negative if the inputs are to be connected with **NPN** logic
PE	**25** ●	Screened wire connection; the terminal is connected internally to the PE common mass point

Connection example:
digital outputs with PNP input logic



Connection example:
digital outputs with NPN input logic



To store parameter in eeprom sum 10000 at the MODBUS address

PARAMETER	RANGE min - max	Um	PRESET DEFAULT	Access type	ID MODBUS RAM (dec)	ID CAN RAM (hex)	ID PROFIBUS RAM (dec)	ID MODBUS TCP/IP RAM (dec)
1. MOTOR CONTROL								
1.1 INV / MOTOR DATA								
1.1.1 LINE VOLTAGE	150 - 600	V	400	rw	1087	-	-	-
1.1.2 MOTOR NOM CURREN	0.1 - par.99.15	A	*1)	rw	1000	-	-	-
1.1.3 MOTOR NOM FREQUE	1.0 - 800.0	Hz	50.0	rw	1001	-	-	-
1.1.4 MOTOR NOM VOLTAG	1 - 2000	V	400	rw	1002	-	-	-
1.1.5 MOTOR POLES	2 POLI, 4 POLI 6 POLI 8 POLI	-	4 POLES	rw	1003	-	-	-
1.1.6 NAMEPLATE SLIP	0 - 1000 rpm	rpm	*1)	rw	1004	-	-	-
1.1.7 NAMEPLATE KWatt	0.00 - 10000.00	Kw	*1)	rw	1005/1006	-	-	-
1.1.8 NAMEPLATE COS(PHI)	0.000 - 1.000	-	*1)	rw	1007	-	-	-
1.1.9 MOTOR PTC AI4	0.00 - 10.00	V	10.00	rw	4000	-	-	-
1.1.10 MOTOR LOAD FUNC	NO, YES	-	NO	rw	1044	-	-	-
1.2 SPEED RAMP								
1.2.1 RAMP ACCEL. TIME	0.01 - 600.00	s	10.00	rw	1008/1009	2038 (long)	68/69	4316 (long)
1.2.2 RAMP DECEL. TIME	0.01 - 600.00	s	10.00	rw	1010/1011	2039 (long)	70/71	4320 (long)
1.2.3 ENABLE S RAMP	NO, YES	-	NO	rw	1036	-	-	-
1.2.4 ROUNDING FILTER	0.01 - 300.00	s	0.5	rw	1037	-	-	-
1.2.5 FUNC. CHANGE RAMP	NO, YES	-	NO	rw	1042	-	-	-
1.2.6 ACC. UNDER SPEED	0.01 - 600.00	s	30.00	rw	1038/1039	-	-	-
1.2.7 SPEED ACC LEVEL	0.01 - 600.00	s	800	rw	1043	-	-	-
1.2.8 DEC. UNDER SPEED	0.01 - 600.00	s	30.00	rw	1040/1041	-	-	-
1.2.9 SPEED DEC LEVEL	0 - par.1.3.1	rpm	800	rw	4001	-	-	-
1.3 SPEED LIMIT								
1.3.1 MAX MOTOR SPEED	0 - 30000	rpm	1500	rw	1012	-	-	-
1.3.2 MIN MOTOR SPEED	0 - par.1.3.1	rpm	0	rw	1013	-	-	-
1.4 TEST MANUAL								
1.4.1 TEST MANU SPEED	0 - par.1.3.1	rpm	300	rw	4002	-	-	-
1.4.2 JOG TEST MANU	NO, YES	-	NO	rw	4003	-	-	-
1.5 VOLTS/Hz CONTROL								
1.5.1 FIXED BOOST	0.0 - 25.0	%	*1)	rw	1014	-	-	-
1.5.2 MIN SPEED % SLIP	0 - 500	%	200	rw	1015	-	-	-
1.5.3 V/F TYPE	V/F_1, V/F_2, V/F_3	-	V/F_1	rw	1016	-	-	-
1.5.4 STOP BOOST FREQ.	10.0 - par 1.1.3	Hz	25.0	rw	1088	-	-	-
1.5.5 ACCELER BOOST	0.0 - 25.0	%	0.0	rw	1017	-	-	-
1.5.6 ENABLEFLYING VF	NO, YES	-	NO	rw	1022	-	-	-
1.5.7 SLIP COMP ENABLE	NO, YES	-	NO	rw	1023	-	-	-
1.5.8 NOLOAD I x COS(PHI)	0.1 - 3000.0		*1)	rw	1024	-	-	-
1.5.9 OVERLOAD FUNC.								
1.5.9.1 ENABLE OVERLOAD	DISABLE, ON/OFF, REG/PI	-	DISABLE	rw	4004	-	-	-
1.5.9.2 MAX OVERLOAD CUR	100 - 300	%	100.0	rw	1018	-	-	-
1.5.9.3 MIN OVERLOAD SPE	0 - par.1.3.1	rpm	*1)	rw	1019	-	-	-
1.5.9.4 DEC.RAMP.OVERLOAD	0.01 - 300.00	s	10.00	rw	4005	-	-	-
1.5.9.5 KP REG OVERLOAD	0.00 - 250.00	-	20.00	rw	4006	-	-	-
1.5.9.6 KI REG OVERLOAD	0.00 - 250.00	-	10.00	rw	4007	-	-	-
1.5.9.7 MIN SPEED TIME	0.0 - 1800.0	s	0.0	rw	4008	-	-	-
1.5.9.8 MIN SPEED UNLOCK	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4009	-	-	-
1.5.10 HIGH TORQUE FUNC								
1.5.10.1 PERC UP V/F	0.0 - 25.0	%	*1)	rw	1020	-	-	-
1.5.10.2 KP UP V/F	0 - 100	-	*1)	rw	1021	-	-	-
1.5.10.3 HT MAX TIME MSEC	0.000 - 30.000	s	10.00	rw	4010	-	-	-
1.5.10.4 HT OVERL. SPEED	0 - 30000	rpm	1300	rw	4011	-	-	-
1.5.10.5 SPEED DISABLE HT	NO, YES		YES	rw	4012	-	-	-
1.5.11 CURRENT LIMIT								
1.5.11.1 MOD I LIM RAMP	DISABLE, STOP_RAMP, PI_RAMP	-	StopRAMP	rw	4013	-	-	-
1.5.11.2 I max ACC RAMP	0.1 - par.99	A	*1)	rw	4014	-	-	-
1.5.11.3 PERC SLEEP DEC	0 - 300	%	50	rw	4015	-	-	-
1.5.11.4 MOD I LIM STEADY	DISABLE ,PI_REG	-	PI_REG	rw	4016	-	-	-
1.5.11.5 I max STEADY	0.1 - par.99	A	*1)	rw	4017	-	-	-
1.5.11.6 KP REG PI	0 - 1000	-	1000	rw	4018	-	-	-
1.5.11.7 KI REG PI	0 - 1000	-	1	rw	4019	-	-	-
1.5.11.8 KP Imax BOOST	0 - 1000	-	300	rw	4020	-	-	-
1.5.11.9 KI Imax BOOST	0 - 1000	-	50	rw	4021	-	-	-

***1) Dipends on size**

To store parameter in eeprom sum 10000 at the MODBUS address

PARAMETER	RANGE min - max	Um	PRESET DEFAULT	Access type	ID MODBUS RAM (dec)	ID CAN RAM (hex)	ID PROFIBUS RAM (dec)	IDMODBUS TCP/IP RAM (dec)
1.5.12 SPEED JUMP								
1.5.12.1 JUMP SET 1	0 - 24000	rpm	0	rw	4022	-	-	-
1.5.12.2 JUMP SET 2	0 - 24000	rpm	0	rw	4023	-	-	-
1.5.12.3 JUMP BAND	0 - 600	rpm	0	rw	4024	-	-	-
1.6 ENCODER VECTOR								
1.6.1 E1 ENCODER LINES	1 - 5000	-	1000	rw	1025	-	-	-
1.6.2 KP GAIN	0 - 100	-	*1)	rw	1026	-	-	-
1.6.3 KI GAIN	0 - 100	-	*1)	rw	1027	-	-	-
1.6.4 VECT MAGNET CURR	0 .0 - 100.0	%	*1)	rw	1028	-	-	-
1.6.5 ROTOR COSTANT	0 .0 - 100.0	Hz	*1)	rw	1029	-	-	-
1.6.6 E2 ENCODER LINES	1 - 5000	-	2000	rw	1030	-	-	-
1.6.7 IN ENABLE ENC 2	NO, YES	-	REMOTE	rw	1031	-	-	-
1.6.8 ADAPT Id TABLE	10.0 - 200.0	%	100.0	rw	4025	-	-	-
1.6.9 BRUSHLESS	(empty)							
1.6.10 FT DERIVATIVE	1 - 1000	Hz	150	rw	4026	-	-	-
1.6.11 KD GAIN	0 - 100	-	0	rw	4027	-	-	-
1.6.12 DERIVATIVE MODE	FEEDBACK, ERROR, BOTH	-	FEEDBACK	rw	4028	-	-	-
1.6.13 KP KI REGULATOR								
1.6.13.1 KP ID REGULATOR	0.0000 - 3.0000	-	*1)	rw	4029	-	-	-
1.6.13.2 KI ID REGULATOR	0.0000 - 3.0000	-	*1)	rw	4030	-	-	-
1.6.13.3 KP IQ REGULATOR	0.0000 - 3.0000	-	*1)	rw	4031	-	-	-
1.6.13.4 KI IQ REGULATOR	0.0000 - 3.0000	-	*1)	rw	4032	-	-	-
1.6.14 KP UP NOM SPEED	0 - 100	-	5	rw	1090	-	-	-
1.6.15 FIELD WEAK TYPE	TABLE, FEEDBACK	-	TABLE	rw	1091	-	-	-
1.7 PARAM ESTIMATION								
1.7.1 ENABLE EST TAUR	NO, YES	-	NO	rw	1032	-	-	-
1.7.2 STATOR L	0.0 - 3000.0	mH	0.0	rw	1033	-	-	-
1.7.3 ROTOR L	0.0 - 3000.0	mH	0.0	rw	1034	-	-	-
1.7.4 MUTUAL INDUC	0.0 - 3000.0	mH	0.0	rw	1035	-	-	-
1.8 POWER LOSS CNTRL								
1.8.1 ENABLE LOSS CNTR	NO, YES	-	NO	rw	1045	-	-	-
1.8.2 START THRESHOLD	0 - 2000	V	450	rw	1046	-	-	-
1.8.3 + STOP THRESHOLD	0 - 2000	V	25	rw	1047	-	-	-
1.8.4 ACCEL TIME	0.01 - 600.00	s	15.00	rw	1048/1049	-	-	-
1.8.5 DECEL TIME	0.01 - 600.00	s	5.00	rw	1050/1051	-	-	-
1.8.6 START SPEED	0 - par.1.3.1	rpm	500	rw	1052	-	-	-
1.8.7 TIME LIMIT	0.001 - 30.000	s	10.000	rw	1053	-	-	-
1.9 I1 FUNCTION								
1.9.1 I1 SPEED STOP	NO, YES	-	NO	rw	1054	-	-	-
1.9.2 I1RESET FAULT	NO, YES	-	NO	rw	1055	-	-	-
1.9.3 I1 DC BRAKE	NO, YES	-	NO	rw	1056	-	-	-
1.9.4 OUT RUN	REMOTE, O1..O8	-	O3	rw	4033	-	-	-
1.9.5 OUT FAULT	REMOTE, O1..O8	-	O2	rw	4034	-	-	-
1.9.6 MECHANICAL BRAKE								
1.9.6.1 ENABLE MEC. BRAKE	NO, YES	-	NO	rw	4035	-	-	-
1.9.6.2 IN RUN - SPEED	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4036	-	-	-
1.9.6.3 OUT MEC. BRAKE	REMOTE, O1..O8	-	REMOTE	rw	4037	-	-	-
1.9.6.4 DELAY STOP	0.000 - 30.000	s	0.250	rw	4038	-	-	-
1.9.6.5 PERC In START	0 - 1000	%	30	rw	4039	-	-	-
1.9.6.6 DELAY START	0.000 - 30.000	s	30.000	rw	4040	-	-	-
1.9.6.7 DELAY RAMP START	0.000 - 30.000	s	0.200	rw	4041	-	-	-
1.9.6.8 % In LIMIT SPEED	0 - 1000	%	110	rw	4042	-	-	-
1.9.6.9 DELAY % In LIMIT	0.000 - 30.000	s	1.000	rw	4043	-	-	-
1.9.6.10 LIMIT SPEED	30 - 30000	rpm	1500	rw	4044	-	-	-
1.9.6.11 SPEED FAULT ENC.	0 - 30000	rpm	0	rw	4045	-	-	-
1.9.6.12 DELAY FAULT ENC.	0.000 - 30.000	s	0.200	rw	4046	-	-	-
						-	-	-
1.9.7 IN RESET FAULT	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4047	-	-	-

***1) Dipends on size**

OP * → OPERATOR-type setup (see "BASIC DATA menu in OPERATOR mode" at the beginning of Chapter 10).

To store parameter in eeprom sum 10000 at the MODBUS address

PARAMETER	RANGE min - max	Um	PRESET DEFAULT	Access type	ID MODBUS RAM (dec)	ID CAN RAM (hex)	ID PROFIBUS RAM (dec)	ID MODBUS TCP/IP RAM (dec)
1.10 TORQUE CONTROL								
1.10.1 MAX TORQUE	0 - par.99	%	200	rw	1057	-	-	-
1.10.2 TORQUE SOURCE	REMOTE, AI1..AI5, MOTOPOT, OPERATOR	-	AI3	rw	1058	-	-	-
1.10.3 TORQUE CONTROL	MAX_TORQ, SET_TORQ	-	MAX_TORQ	rw	1059	-	-	-
1.10.4 RAMP TORQUE	0.01 - 600.00	s	1.0	rw	1060	-	-	-
1.10.5 IN DX ENABLE LIM	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4048	-	-	-
1.10.6 IN SX ENABLE LIM	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4049	-	-	-
1.10.7 SAVE MOTOPOT.	NO, YES	-	YES	rw	4050	-	-	-
1.10.8 IN + TORQUE MOT.	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4051	-	-	-
1.10.9 IN - TORQUE MOT.	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4052	-	-	-
1.10.10 TORQUE THRESHOLD	0 - 300	%	100	rw	1061	-	-	-
1.10.11 THRESHOLD DELAY	0.1 - 30.0	s	5.0	rw	1062	-	-	-
1.10.12 OUT TORQUE THRES	REMOTE, O1..O8	-	REMOTE	rw	4053	-	-	-
1.10.13 SAVE SET MANUAL	NO, YES	-	YES	rw	4054	-	-	-
OP * 1.10.14 SET TORQUE OPERAT.								
SET MAN	0 - par.1.10.1	%	0	rw	4055	-	-	-
TORQUE	0 - 300	%	var.	ro	2021	-	-	-
1.10.15 ADAPT PERC TORQ.	10.0 - 200.0	%	100.0	rw	4056	-	-	-
1.10.16 ADAPT TORQ. [Nm]	10.0 - 200.0	%	100.0	rw	4057	-	-	-
1.10.17 IN EN. TORQ. FIL	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4058	-	-	-
1.10.18 TORQUE FIL	0.0 - 100.0	Hz	5.0	rw	4059	-	-	-
1.10.19 F. STOP FIL	0.0 - 100.0	Hz	25.0	rw	4060	-	-	-
1.11 CURRENT CONTROL								
1.11.1 CURRENT THRESHOL	0.0 - 3000.0	A	0.0	rw	1063	-	-	-
1.11.2 THRESHOLD DELAY	0.1 - 30.0	s	3.0	rw	1064	-	-	-
1.11.3 OUT CUR THRESHOL	REMOTE, O1..O8	-	REMOTE	rw	4061	-	-	-
1.11.4 RESET MAX Imax	NO, YES	-	NO	rw	4062	-	-	-
1.12 PWM GENERATOR								
1.12.1 PWM FREQUENCY	0.50 - par.99	KHz	5.00	rw	1065	-	-	-
1.12.2 START PWM FREQ.	0.50 - par.99	KHz	1.00	rw	1085	-	-	-
1.12.3 CHANGE PWM SPEED	0 - 30000	rpm	500	rw	1086	-	-	-
1.13 BRAKE UNIT								
1.13.1 ENABLE	NO, YES	-	YES	rw	1066	-	-	-
1.13.2 BRAKE RESISTANCE	0.1 - 200.0	ohm	*1)	rw	1067	-	-	-
1.13.3 NOMINAL CURRENT	0.0 - 3000.0	A	*1)	rw	1068	-	-	-
1.13.4 5 SEC CURRENT	0.0 - 3000.0	A	*1)	rw	1069	-	-	-
1.14 STALL FAULT								
1.14.1 STALL TIME	0.000 - 30.000	s	5.00	rw	1070	-	-	-
1.14.2 CURRENT LIMIT	0.1 - 3000.0	A	3000.0	rw	1071	-	-	-
1.15 AUTO RESTART								
1.15.1 ENABLE	NO, YES	-	NO	rw	1072	-	-	-
1.15.2 ATTEMPTS	1 - 100	-	5	rw	1073	-	-	-
1.15.3 RESTART DELAY	0.1 - 300.0	s	3.0	rw	1074	-	-	-
1.15.4 1° FAULT	1 - 100	-	1	rw	1075	-	-	-
1.15.5 2° FAULT	1 - 100	-	5	rw	1076	-	-	-
1.15.6 3° FAULT	1 - 100	-	6	rw	1077	-	-	-
1.15.7 4° FAULT	1 - 100	-	0	rw	1078	-	-	-
1.15.8 RESET TIME	0 - 100000	s	3600	rw	1079/1080	-	-	-
1.15.9 OUT RESTART END	REMOTE, O1..O8	-	REMOTE	rw	4063	-	-	-
1.16 DC BRAKING								
1.16.1 DC BRAKE TIME	0.1 - 300.0	s	10.0	rw	1081	-	-	-
1.16.2 DC BRAKE LEVEL	0.0 - 300.0	%	100.0	rw	1082	-	-	-
1.16.3 BRAKE LEVEL RAMP	0.1 - 300.0	s	10.0	rw	1083	-	-	-
1.16.4 DEFLUX TIME	2.0 - 30.0	s	20.0	rw	1084	-	-	-

OP * Setup OPERATOR importable in the menu BASIC DATA

VARIABLES	RANGE min / max	Um	Access type	ID MODBUS RAM (dec)	ID CAN RAM (hex)	ID PROFIBUS RAM (dec)	ID MODBUS TCP/IP RAM (dec)
2. DISPLAY VARIABLE							
2.1 GENERAL VARIABLE							
2.1.1 SPEED REFERENCE	- 30000 / +30000	rpm	ro	2000/2001	2001 (long)	1/2	4096 (long)
2.1.2 MOTOR SPEED	- 30000 / +30000	rpm	ro	2002/2003	2002 (long)	3/4	4100 (long)
2.1.3 MOTOR FREQUENCY	0.0 / 800.0	Hz	ro	2004/2005	2003 (long)	5/6	4104 (long)
2.1.4 MOTOR CURRENT	0.0 / 3000.0	A	ro	2006	2004	7	4108
2.1.5 BUS DC VOLTS	0 / 3000	V	ro	2007	2005	8	4112
2.1.6 MOTOR VOLTAGE	0 / 3000	V	ro	2008	2006	9	4116
2.1.7 MEMO MAX Imax	0.0 / 3000.0	A	ro	2009	2007	10	4120
2.1.8 ACTIVE POWER	0.00 / 900.00	Kw	ro	2010/2011	2008 (long)	11/12	4124 (long)
2.1.9 REACTIVE POWER	0.00 / 900.00	KVAr	ro	2012/2013	2009 (long)	13/14	4128 (long)
2.1.10 COS (PHI)	0.000 / 1.000	-	ro	2014	200A	15	4132
2.1.11 I x COS (PHI)	0.0 / 3000.0	A	ro	2015	200B	16	4136
2.1.12 MOTOR SLIP V/F	0 / 1000	rpm	ro	2016	200C	17	4140
2.1.13 CALC MOTOR TORQ.	-10000.0 / +10000.0	Nm	ro	2017/2018	200D (long)	18/19	4144 (long)
2.1.14 MOTOR TORQ.	-10000.0 / +10000.0	Nm	ro	2019/2020	200E (long)	20/21	4148 (long)
2.1.15 MOTOR TORQUE %	-300 / +300	%	ro	2021	200F	22	4152
2.1.16 LAST FAULT	0 - 100	-	ro	2022	2010	23	4156

***1) Dipends on size**

VARIABLES	RANGE min / max	Um	Access type	ID MODBUS RAM (dec)	ID CAN RAM (hex)	ID PROFIBUS RAM (dec)	ID MODBUS TCP/IP RAM (dec)
2.1.17 INVERTER I x I	0 - 10000	%	ro	2023	2011	24	4160
2.1.18 MOTOR I x I	0 - 10000	%	ro	2024	2012	25	4164
2.1.19 IGBT BRAKE CURR.	0.0 - 3000.0 A	A	ro	2025	2013	26	4168
2.1.20 DIG. INPUT I1..8	0 - 255	-	ro	2026/2027	2014 (long)	27/28	4172 (long)
2.1.21 DIG. INPUT I9.14	0 - 255	-	ro	2028/2029	2015 (long)	29/30	4176 (long)
2.1.22 DIG. OUTPUT O1.8	0 - 255	-	ro	2030/2031	2016 (long)	31/32	4180 (long)
2.1.23 ANALOG INPUT AI1	-100.00 - +100.00	%	ro	2032	2017	33	4184
2.1.24 ANALOG INPUT AI2	-100.00 - +100.00	%	ro	2033	2018	34	4188
2.1.25 ANALOG INPUT AI3	-100.00 - +100.00	%	ro	2034	2019	35	4192
2.1.26 ANALOG INPUT AI4	-100.00 - +100.00	%	ro	2035	201A	36	4256
2.1.27 ANALOG INPUT AI5	-100.00 - +100.00	%	ro	2036	201B	37	4200
2.1.28 ANALOG INPUT AI6	-100.00 - +100.00	%	ro	2037	201C	38	4204
2.1.29 ANALOG INPUT AI7	-100.00 - +100.00	%	ro	2038	201D	39	4208
2.1.30 ANALOG INPUT AI8	-100.00 - +100.00	%	ro	2039	201E	40	4212
2.1.31 ANALOG INPUT AI9	-100.00 - +100.00	%	ro	2040	201F	41	4216
2.1.32 ACTIVE VAR AO0	-100.00 - +100.00	%	ro	2041	2020	42	4220
2.1.33 ACTIVE VAR AO1	-100.00 - +100.00	%	ro	2042	2021	43	4224
2.1.34 ACTIVE VAR. AO2	-100.00 - +100.00	%	ro	2043	2022	44	4228
2.1.35 ACTIVE VAR AO3	-100.00 - +100.00	%	ro	2044	2023	45	4232
2.1.36 COUNT AUTORESTAR	0 - 100	-	ro	2045	2024	46	4236
2.1.37 MOTOR CONTROL I	0.0A - 3000.0	A	ro	2046	2025	47	4240
2.1.38 FIRMWARE VERSION	0.00 - 999999.99	A	ro	2047/2048	2026 (long)	48/49	4244 (long)
2.1.39 OPERATE HOURS	0.00h - 100000.00	h	ro	2049/2050	2027 (long)	50/51	4248 (long)
2.1.40 HARDWARE VERSION	0.00 a 300.00	-	ro	9100	-	-	-
2.1.41 LAST RESTORE	DEFAULT, SETUP_1, SETUP_2	-	ro	2074	-	-	-
2.1.42 POWER LOSS COUNT	0 - 30000	-	ro	2053	2028	52	4252
2.1.43 LAST TWO ERR COM	0 - 9999	-	ro	2054	2029	53	4256
2.1.44 COUNT ERROR COM	0 - 30000	-	ro	2055	202A	54	4260
2.1.45 SET TORQUE %	0 - 300	%	ro	2071	202B	55	4264
2.1.46 ENCODER SPEED	- 30000 - +30000	rpm	ro	2072	202C	56	4268
2.1.47 (visualizzazione doppia)							
SET	0 - 300	%	ro	-	-	-	-
TORQUE	0 - 300	%	ro	2021	-	-	-
2.1.48 (visualizzazione doppia)							
SET OP	- 30000 - +30000	rpm	ro	4119	-	-	-
SPEED	- 30000 - +30000	rpm	ro	2002/2003	-	-	-
2.1.49 I MAX MONITOR	0.0 - 3000.0	A	ro	2075	-	-	-
2.1.50 INVERTER ALARM	NONE, CAP_LIFE, PROG_IN, PROG_OUT, AXIS_LIM, COILDMIN, COILDMAX, CELLMAX, DANCUP, BREAK, STO_OPEN	-	ro	2073	202D	57	4272
2.1.51 ANYBUS TYPE	NONE (0), CAN_OPEN (32), PROFIBUS (5), MODB_TCP (147), ETHERCAT (135), PROFINET (150)	-	ro	2076	-	-	-
2.1.52 ANYBUS STATE	SETUP, NW_INIT, WAIT PROCESS, IDLE, PROCESS_ACTIVE, ERROR, EXCEPTION	-	ro	2077	2090	79	4668
2.1.53 ROTOR K CORRECT	0.25 - 2.00	-	ro	2088	-	-	-
2.1.54 IP ADDRESS	000.000.000.000 - 255.255.255.255	-	ro	2089 2090 2091 2092	-	-	-

** This manual is updated to the inverter C400 firmware version: **502XX.XX**

To store parameter in eeprom sum 10000 at the MODBUS address.

PARAMETER	RANGE min - max	Um	PRESET DEFAULT	Access type	ID MODBUS RAM (dec)	ID CAN RAM (hex)	ID PROFIBUS RAM (dec)	ID modbus TCP/IP RAM (dec)
2.2. DEFAULT DISPLAY								
2.2.1 DEFAULT DIS1	2.1.1 - *2)	-	2.1.1	rw	2056	-	-	-
2.2.2 DEFAULT DIS2	2.1.1 - *2)	-	2.1.2	rw	2057	-	-	-
2.2.3 DEFAULT DIS3	2.1.1 - *2)	-	2.1.3	rw	2058	-	-	-
2.2.4 DEFAULT DIS4	2.1.1 - *2)	-	2.1.4	rw	2059	-	-	-
2.2.5 DEFAULT DIS5	2.1.1 - *2)	-	2.1.46	rw	2060	-	-	-
2.2.6 DEFAULT DIS6	2.1.1 - *2)	-	2.1.5	rw	4064	-	-	-
2.2.7 DEFAULT DIS7	2.1.1 - *2)	-	2.1.15	rw	4065	-	-	-
2.2.8 DEFAULT DIS8	2.1.1 - *2)	-	2.1.49	rw	4066	-	-	-
2.2.9 DEFAULT DIS9	2.1.1 - *2)	-	2.1.16	rw	4067	-	-	-
2.2.10 DEFAULT DIS10	2.1.1 - *2)	-	2.1.38	rw	4068	-	-	-
2.3. FAULT HISTORY								
2.3.1 FAULT 1	0 - 100	-	var.	ro	2061	202E	58	4276
2.3.2 FAULT 2	0 - 100	-	var.	ro	2062	202F	59	4280
2.3.3 FAULT 3	0 - 100	-	var.	ro	2063	2030	60	4284
2.3.4 FAULT 4	0 - 100	-	var.	ro	2064	2031	61	4288
2.3.5 FAULT 5	0 - 100	-	var.	ro	2065	2032	62	4292
2.3.6 FAULT 6	0 - 100	-	var.	ro	2066	2033	63	4296
2.3.7 FAULT 7	0 - 100	-	var.	ro	2067	2034	64	4300
2.3.8 FAULT 8	0 - 100	-	var.	ro	2068	2035	65	4304
2.3.9 FAULT 9	0 - 100	-	var.	ro	2069	2036	66	4308
2.3.10 FAULT 10	0 - 100	-	var.	ro	2070	2037	67	4312
2.4. SETUP OPERATOR								
2.4.1 OPERATOR SET1	1.10.14 - *2)	-	3.1.9.2	ro	4069	-	-	-
2.4.2 OPERATOR SET2	1.10.14 - *2)	-	1.10.14	ro	4070	-	-	-
2.4.3 OPERATOR SET3	1.10.14 - *2)	-	3.1.9.2	ro	4071	-	-	-
2.4.4 OPERATOR SET4	1.10.14 - *2)	-	3.1.9.2	ro	4072	-	-	-
2.4.5 OPERATOR SET5	1.10.14 - *2)	-	3.1.9.2	ro	4073	-	-	-
2.4.6 ACTIVE SET OPER.	1 - 5	-	2	ro	4074	-	-	-

***2) Depends on application**

To store parameter in eeprom sum 10000 at the MODBUS address.

PARAMETER	RANGE min - max	Um	PRESET DEFAULT	Access type	ID MODBUS RAM (dec)	ID CAN RAM (hex)	ID PROFIBUS RAM (dec)	ID MODBUS TCP/IP RAM (dec)
3. APPLICATIONS								
3.1. SPEED								
3.1.1 SPEED COMMANDS								
3.1.1.1 SPEED SOURCE	REMOTE, AI1..AI5, MOTOPOT, OPERATOR	-	AI1	rw	3100	-	-	-
3.1.1.2 IN STOP SPEED	REMOTE, I2..I14, ENABLE	-	I2	rw	4075	-	-	-
3.1.1.3 IN REVERSE SPEED	REMOTE, I2..I14, ENABLE	-	ENABLE	rw	4076	-	-	-
3.1.2 SPEED MAX								
3.1.2.1 SET SPEED MAX1	30 - 24000	rpm	1250	rw	4077	-	-	-
3.1.2.2 SET SPEED MAX2	30 - 24000	rpm	1000	rw	4078	-	-	-
3.1.2.3 SET SPEED MAX3	30 - 24000	rpm	750	rw	4079	-	-	-
3.1.2.4 IN1 SPEED MAX	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4080	-	-	-
3.1.2.5 IN2 SPEED MAX	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4081	-	-	-
3.1.3 SPEED THRESHOLD								
3.1.3.1 SPEED THRESHOLD1	0 - 30000	rpm	100	rw	3101	-	-	-
3.1.3.2 THRESHOLD1 DELAY	0.1 - 30.0	s	0.0	rw	3102	-	-	-
3.1.3.3 OUT THRESHOLD1	REMOTE, O1..O8	-	O1	rw	4082	-	-	-
3.1.3.4 SPEED THRESHOLD2	0 - 30000	rpm	1500	rw	3103	-	-	-
3.1.3.5 THRESHOLD2 DELAY	0.1 - 30.0	s	1.0	rw	3104	-	-	-
3.1.3.6 OUT THRESHOLD2	REMOTE, O1..O8	-	REMOTE	rw	4083	-	-	-
3.1.3.7 SPEED THR STOP	0 - 300	rpm	0	rw	2051	-	-	-
3.1.4 MANUAL								
3.1.4.1 MANUAL SPEED	0 - par. 1.3.1	rpm	300	rw	3105	-	-	-
3.1.4.2 IN ENABLE MANUAL	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4084	-	-	-
3.1.4.3 IN JOG+	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4085	-	-	-
3.1.4.4 IN JOG-	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4086	-	-	-
3.1.5 MOTOPOTENTIOM.								
3.1.5.1 SAVE MOTOPOT.	NO, YES	-	YES	rw	4087	-	-	-
3.1.5.2 IN INCREASE MOT	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4088	-	-	-
3.1.5.3 IN DECREASE MOT	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4089	-	-	-
3.1.5.4 ACC DEC MOTP SET	0.01 - 600.00	s	10.00	rw	4090/4091	-	-	-
3.1.6 FIXED SPEED								
3.1.6.1 SET SPEED 1	-30000 - +30000	rpm	500	rw	4092	-	-	-
3.1.6.2 SET SPEED 2	-30000 - +30000	rpm	1000	rw	4093	-	-	-
3.1.6.3 SET SPEED 3	-30000 - +30000	rpm	- 500	rw	4094	-	-	-
3.1.6.4 SET SPEED 4	-30000 - +30000	rpm	1500	rw	4095	-	-	-
3.1.6.5 SET SPEED 5	-30000 - +30000	rpm	- 750	rw	4096	-	-	-
3.1.6.6 SET SPEED 6	-30000 - +30000	rpm	-1500	rw	4097	-	-	-
3.1.6.7 SET SPEED 7	-30000 - +30000	rpm	-1000	rw	4098	-	-	-
3.1.6.8 IN1 SPEED	REMOTE, I2..I14, ENABLE	-	I3	rw	4099	-	-	-
3.1.6.9 IN2 SPEED	REMOTE, I2..I14, ENABLE	-	I4	rw	4100	-	-	-
3.1.6.10 IN3 SPEED	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4101	-	-	-
3.1.7. FIXED ACC. RAMPS								
3.1.7.1 SET ACC1	0.01 - 600.00	s	1.00	rw	4102/4103	-	-	-
3.1.7.2 SET ACC2	0.01 - 600.00	s	2.00	rw	4104/4105	-	-	-
3.1.7.3 SET ACC3	0.01 - 600.00	s	3.00	rw	4106/4107	-	-	-
3.1.7.4 IN1 ACC	REMOTE, I2..I14, ENABLE	-	I5	rw	4108	-	-	-
3.1.7.5 IN2 ACC	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4109	-	-	-
3.1.8. FIXED DEC. RAMPS								
3.1.8.1 SET DEC1	0.01 - 600.00	s	1.00	rw	4110/4111	-	-	-
3.1.8.2 SET DEC2	0.01 - 600.00	s	2.00	rw	4112/4113	-	-	-
3.1.8.3 SET DEC3	0.01 - 600.00	s	3.00	rw	4114/4115	-	-	-
3.1.8.4 IN1 DEC	REMOTE, I2..I14, ENABLE	-	I6	rw	4116	-	-	-
3.1.8.5 IN2 DEC	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4117	-	-	-
3.1.9. MANUAL OPERATOR								
3.1.9.1 SAVE MAN OPERAT.	NO, YES	-	YES	rw	4118	-	-	-
OP * 3.1.9.2 SET MAN OPERATOR								-
SET OP	-30000 - +30000	rpm	0.rpm	rw	4119	-	-	-
SPEED	-30000 - +30000	rpm	var.	ro	2002/2003	-	-	-
3.1.10. SPECIAL FUNCTION								
3.1.10.1 MOTOR ENABLE OUT	MOT_1, MOT_2		MOT_1	rw	4120	-	-	-
3.1.10.2 OUT ENABLE MOT 1	REMOTE, O1..O8	-	REMOTE	rw	4121	-	-	-
3.1.10.3 OUT ENABLE MOT 2	REMOTE, O1..O8	-	REMOTE	rw	4122	-	-	-

OP * OPERATOR-type setup importable in the menù BASIC DATA.

Attention! Each set and display field of **position** or **speed** is in the **unit of measure** chosen as the **default setting.**

VARIABLES	RANGE min / max	Um	Access type	ID MODBUS RAM (dec)	ID CAN RAM (hex)	ID PROFIBUS RAM (dec)	ID MODBUS TCP/IP RAM (dec)
3.2 AXIS							
3.2.1. AXIS VARIABLE							
3.2.1.1 SLAVE QUOTA Um	+/- 9999999	Um	ro	3300/3301	2040 (long)	80/81	4348 (long)
3.2.1.2 MASTER QUOTA Um	+/- 9999999	Um	ro	3302/3303	2041 (long)	82/83	4352 (long)
3.2.1.3 SLAVE SPEED Um	+/- 9999999	Um	ro	3304/3305	2042 (long)	84/85	4356 (long)
3.2.1.4 MASTER SPEED Um	+/- 9999999	Um	ro	3306/3307	2043 (long)	86/87	4360 (long)
3.2.1.5 FOLLOWING ERR Um	+/- 9999999	Um	ro	3308/3309	2044 (long)	88/89	4364 (long)
3.2.1.6 SLAVE COUNTER	+/- 9999999	-	ro	4614/4615	-		-
3.2.1.7 MASTER COUNTER	+/- 9999999	-	ro	4616/4617	-		-
3.2.1.8 SLAVE FREQ. Hz	+/- 9999999	-	ro	4618/4619	-		-
3.2.1.9 MASTER FREQ. Hz	+/- 9999999	-	ro	4620/4621	-		-
3.2.1.10 SET SL/MA ACTIVE	0.00160 - 4.00000	-	ro	3310/3311	2045 (long)	90/91	4368 (long)
3.2.1.11 SET SIZE ACTIVE	1 - 9999999	-	ro	3312/3313	2046 (long)	92/93	4372 (long)
3.2.1.12							
SET	+/- 9999999	Um	ro	3314/3315	2047 (long)	94/95	4376 (long)
POS	+/- 9999999	Um	ro	3300/3301	2040 (long)	80/81	4348 (long)
			ro				
3.2.1.13 STEP	0 - 30000	-	ro	3316	2048	96	4380
3.2.1.14 POS SPEED ACTIVE	0 - par. 3.2.3.8	Um	ro	3317/3318	2049 (long)	97/98	4384 (long)
3.2.1.15							
SET	+/- 999999.9	mm	ro	3320/3321	204A (long)	99/100	4388 (long)
MEAS	+/- 999999.9	mm	ro	3322/3323	204B (long)	101/102	4392 (long)
			ro				
3.2.1.16 PHASE ERROR	+/- 999999.9	mm	ro	3324/3325	204C (long)	103/104	4396 (long)
3.2.1.17 SLAVE SHIFT	+/- 999999.9	mm	ro	3326/3327	204D (long)	105/106	4400 (long)
3.2.1.18 ACTIVE MODE	GEAR, POSIT, FLYCUT, ZEROGEAR	-	ro	3319	204E	107	4404

To store parameter in eeprom sum 10000 at the MODBUS address.

PARAMETER	RANGE min - max	Um	PRESET DEFAULT	Access type	ID MODBUS RAM (dec)	ID CAN RAM (hex)	ID PROFIBUS RAM (dec)	ID MODBUS TCP/IP RAM (dec)
3.2.2. AXIS FUNCTION								
3.2.2.1 FUNCTION	GEAR, POSIT, FLYCUT, ZEROGEAR	-	GEAR	rw	3350	204F	108	4408
3.2.2.2 IN1 AXIS FUNCTIO	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4500	-	-	-
3.2.2.3 IN2 AXIS FUNCTIO	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4501	-	-	-
3.2.2.4 IN3 AXIS FUNCTIO	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4502	-	-	-
3.2.3. COMMON PARAMETER								
3.2.3.1 ENC1 RESOLUTION	0.00466 - 4.00000	-	1.00000	rw	3606/3607	-	-	4492
3.2.3.2 ENC2 RESOLUTION	0.00466 - 4.00000	-	1.00000	rw	3608/3609	-	-	4496
3.2.3.3 ENC3 RESOLUTION	0.00466 - 4.00000	-	1.00000	rw	4503/4504	-	-	-
3.2.3.4 ENC2 REDUCER	0.001000 - 10.000000	-	1.000000	rw	4505/4506	-	-	-
3.2.3.5 KP	0 - 1000	-	100.	rw	3351	-	-	-
3.2.3.6 Um TYPE	/- - , /m , /mm , /°	-	/mm	rw	4507	-	-	-
3.2.3.7 VELOCITY UNIT	Um/min, Um/sec		Um/min	rw	4508	-	-	-
3.2.3.8 MAX SLAVE SPEED	0 - 999999999	-	var.	ro	3352/3353	-	-	-
3.2.3.9 DEC POINT QUOTA	0 - 3	-	1	rw	4509	-	-	-
3.2.3.10 NUM DIV 10 SPEED	/1, /10, /100, /1000, /10000		/10	rw	4510	-	-	-
3.2.3.11 MAX CORRECTION	0 - par. 3.2.3.11	-	10000	rw	3354/3355	-	-	-
3.2.3.12 AXIS ACC. TIME	0.00 - 30.00	s	10.00	rw	3580	-	-	-
3.2.3.13 AXIS DEC. TIME	0.00 - 30.00	s	10.00	rw	3581	-	-	-
3.2.3.14 FOLLOWING ERROR								
3.2.3.14.1 MAX FOLLOW ERROR	0 - 999999999	Um	10	rw	3356/3357	-	-	-
3.2.3.14.2 FOLLOWING DELAY	0.000 - 30.000	s	0.500	rw	4511	-	-	-
3.2.3.14.3 OUT FOLLOW ERROR	REMOTE, O1..O8	-	REMOTE	rw	4512	-	-	-
3.2.3.14.4 IN RESET ERROR	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4513	-	-	-
3.2.3.15 MANUAL								
3.2.3.15.1 MANUAL SPEED	0 - par. 3.2.3.8	-	10000	rw	3358/3359	2050	109/110	4412 (long)
3.2.3.15.2 IN AUTOM/MANUAL	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4514	-	-	-
3.2.3.15.3 IN MANUAL +	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4515	-	-	-
3.2.3.15.4 IN MANUAL -	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4516	-	-	-
3.2.3.15.5 MAN SPEED SOURCE	OPERATOR, AI1..AI4	-	OPERATOR	rw	4517	-	-	-
3.2.3.15.6 OUT SET MANUAL	REMOTE, O1..O8	-	REMOTE	rw	4518	-	-	-
3.2.3.16 PRESET								
3.2.3.16.1 PRESET MODE	ONE_SEN, TWO_SEN	-	ONE_SEN	rw	4519	-	-	-
3.2.3.16.2 PRESET SPEED1	+/- par. 3.2.3.8	-	100000	rw	3360/3361	-	-	-
3.2.3.16.3 PRESET SPEED2	+/- par. 3.2.3.8	-	1000	rw	3362/3363	-	-	-
3.2.3.16.4 PRESET QUOTA	+/- 9999999	Um	0	rw	3364/3365	2051	111/112	4416 (long)
3.2.3.16.5 IN SENS 1 PRESET	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4520	-	-	-
3.2.3.16.6 IN SENS 2 PRESET	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4521	-	-	-
3.2.3.16.7 IN START PRESET	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4522	-	-	-
3.2.3.16.8 OUT PRESET ON	REMOTE, O1..O8	-	REMOTE	rw	4523	-	-	-
3.2.3.16.9 Z1 SENS 2 PRESET	NO, YES	-	NO	rw	4524	-	-	-
3.2.3.17 COUNTER SL MA								
3.2.3.17.1 FORCED Q. SLAVE	+/- 9999999	Um	0	rw	3366/3367	2052	113/114	4420 (long)
3.2.3.17.2 IN FORCED Q. SL.	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4525	-	-	-
3.2.3.17.3 FORCED Q. MASTER	+/- 9999999	Um	0	rw	3368/3369	2053	115/116	4424 (long)
3.2.3.17.4 IN FORCED Q. MA.	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4526	-	-	-
3.2.3.17.5 IN SLAVE REVERSE	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4527	-	-	-
3.2.3.17.6 IN MASTER REVERS	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4528	-	-	-
3.2.3.18 COUNTER OUTPUT								
3.2.3.18.1 OUT SL DIRECTION	REMOTE, O1..O8	-	REMOTE	rw	4529	-	-	-
3.2.3.18.2 OUT SL STOP	REMOTE, O1..O8	-	REMOTE	rw	4530	-	-	-
3.2.3.18.3 Q. SL. THRESHOLD	+/- 9999999	Um	0	rw	3578/3579	2054	117/118	4428 (long)
3.2.3.18.4 OUT SL THRESHOLD	REMOTE, O1..O8	-	REMOTE	rw	4531	-	-	-
3.2.3.18.5 Q. SL. THRES 2	+/- 9999999	Um	0	rw	3582/3583	2055	119/120	4432 (long)
3.2.3.18.6 OUT SL THRES 2	REMOTE, O1..O8	-	REMOTE	rw	4532	-	-	-

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PARAMETER	RANGE min - max	Um	PRESET DEFAULT	Access type	ID MODBUS RAM (dec)	ID CAN RAM (hex)	ID PROFIBUS RAM (dec)	Id MODBUS TCP/IP RAM (dec)
3.2.4. GEAR FUNCTION								
3.2.4.1 TYPE SET RATIO	RATIO, SIZE_S/M, SIZE_M/S	-	RATIO	rw	4533	-	-	-
3.2.4.2 SOURCE SET RATIO	REMOTE, OPERATOR, TABLE, MOTOPOT	-	OPERATOR	rw	4534	-	-	-
OP * 3.2.4.3 SET RATIO SL/MS	0.004666 - 4.00000	-	1.00000	rw	4535/4536	-	-	-
3.2.4.4 SET SIZE PARAM.								
OP * 3.2.4.4.1 SET SIZE	1 - 9999999	Um	100	rw	4537/4538	-	-	-
3.2.4.4.2 K1 ADAPT SIZE	1 - 9999999	-	100000	rw	3370/3371	-	-	-
3.2.4.4.3 K2 ADAPT SIZE	1 - 9999999	-	999999999	rw	3372/3373	2056 (long)	121/122	4436 (long)
3.2.4.4.4 SIZE DEC POINT	0 - 3	-	0.	rw	4539	-	-	-
3.2.4.5 IN SLAVE ENC 1/2	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4540	-	-	-
3.2.4.6 IN MASTER ENC 2/3	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4541	-	-	-
3.2.4.7 MOTOPOT PARAM.								
3.2.4.7.1 RAMP MOTOPOT.	1 - 10000	s	100	rw	4542	-	-	-
3.2.4.7.2 IN UP MOTOPOT	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4543	-	-	-
3.2.4.7.3 IN DOWN MOTOPOT	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4544	-	-	-
3.2.4.7.4 IN FORCE MOTOPOT	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4545	-	-	-
3.2.4.7.5 RAMP START MOTOP	1 - 10000	s	5000	rw	4546	-	-	-
3.2.4.8 TABLE PARAM.								
3.2.4.8.1. TABLE RATIO / SIZE								
3.2.4.8.1.0 TABLE SET	0.00160 - 4.00000	-	1.00000	rw	3400/3401	-	-	-
3.2.4.8.1.1 TABLE SET	0.00160 - 4.00000	-	1.00000	rw	3402/3403	-	-	-
3.2.4.8.1.2 TABLE SET	0.00160 - 4.00000	-	1.00000	rw	3404/3405	-	-	-
3.2.4.8.1.3 TABLE SET	0.00160 - 4.00000	-	1.00000	rw	3406/3407	-	-	-
3.2.4.8.1.4 TABLE SET	0.00160 - 4.00000	-	1.00000	rw	3408/3409	-	-	-
3.2.4.8.1.5 TABLE SET	0.00160 - 4.00000	-	1.00000	rw	3410/3411	-	-	-
3.2.4.8.1.6 TABLE SET	0.00160 - 4.00000	-	1.00000	rw	3412/3413	-	-	-
3.2.4.8.1.7 TABLE SET	0.00160 - 4.00000	-	1.00000	rw	3414/3415	-	-	-
3.2.4.8.1.8 TABLE SET	0.00160 - 4.00000	-	1.00000	rw	3416/3417	-	-	-
3.2.4.8.1.9 TABLE SET	0.00160 - 4.00000	-	1.00000	rw	3418/3419	-	-	-
3.2.4.8.1.10 TABLE SET	0.00160 - 4.00000	-	1.00000	rw	3420/3421	-	-	-
3.2.4.8.1.11 TABLE SET	0.00160 - 4.00000	-	1.00000	rw	3422/3423	-	-	-
3.2.4.8.1.12 TABLE SET	0.00160 - 4.00000	-	1.00000	rw	3424/3425	-	-	-
3.2.4.8.1.13 TABLE SET	0.00160 - 4.00000	-	1.00000	rw	3426/3427	-	-	-
3.2.4.8.1.14 TABLE SET	0.00160 - 4.00000	-	1.00000	rw	3428/3429	-	-	-
3.2.4.8.1.15 TABLE SET	0.00160 - 4.00000	-	1.00000	rw	3430/3431	-	-	-
3.2.4.8.1.16 TABLE SET	0.00160 - 4.00000	-	1.00000	rw	3432/3433	-	-	-
3.2.4.8.1.17 TABLE SET	0.00160 - 4.00000	-	1.00000	rw	3434/3435	-	-	-
3.2.4.8.1.18 TABLE SET	0.00160 - 4.00000	-	1.00000	rw	3436/3437	-	-	-
3.2.4.8.1.19 TABLE SET	0.00160 - 4.00000	-	1.00000	rw	3438/3439	-	-	-
3.2.4.8.1.20 TABLE SET	0.00160 - 4.00000	-	1.00000	rw	3440/3441	-	-	-
3.2.4.8.1.21 TABLE SET	0.00160 - 4.00000	-	1.00000	rw	3442/3443	-	-	-
3.2.4.8.1.22 TABLE SET	0.00160 - 4.00000	-	1.00000	rw	3444/3445	-	-	-
3.2.4.8.1.23 TABLE SET	0.00160 - 4.00000	-	1.00000	rw	3446/3447	-	-	-
3.2.4.8.1.24 TABLE SET	0.00160 - 4.00000	-	1.00000	rw	3448/3449	-	-	-
3.2.4.8.1.25 TABLE SET	0.00160 - 4.00000	-	1.00000	rw	3450/3451	-	-	-
3.2.4.8.1.26 TABLE SET	0.00160 - 4.00000	-	1.00000	rw	3452/3453	-	-	-
3.2.4.8.1.27 TABLE SET	0.00160 - 4.00000	-	1.00000	rw	3454/3455	-	-	-
3.2.4.8.1.28 TABLE SET	0.00160 - 4.00000	-	1.00000	rw	3456/3457	-	-	-
3.2.4.8.1.29 TABLE SET	0.00160 - 4.00000	-	1.00000	rw	3458/3459	-	-	-
3.2.4.8.1.30 TABLE SET	0.00160 - 4.00000	-	1.00000	rw	3460/3461	-	-	-
3.2.4.8.1.31 TABLE SET	0.00160 - 4.00000	-	1.00000	rw	3462/3463	-	-	-
3.2.4.8.2 SET TABLE INPUT								
3.2.4.8.2.1 IN1 RATIO / SIZE	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4547	-	-	-
3.2.4.8.2.2 IN2 RATIO / SIZE	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4548	-	-	-
3.2.4.8.2.3 IN3 RATIO / SIZE	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4549	-	-	-
3.2.4.8.2.4 IN4 RATIO / SIZE	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4550	-	-	-
3.2.4.8.2.5 IN5 RATIO / SIZE	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4551	-	-	-
3.2.4.9 MAN PHASING PAR.								
3.2.4.9.1 MAN PHASING MODE	SPEED, SPACE	-	SPEED	rw	4552	-	-	-
3.2.4.9.2 SPEED STEP	0 - par. 3.2.3.8	-	1000	rw	3374/3375	-	-	-
3.2.4.9.3 SPACE STEP	0.000 - 30.000		10	rw	3376	-	-	-
3.2.4.9.4 IN UP PHASE	REMOTE, I2..I14, ENABLE		REMOTE	rw	4553	-	-	-
3.2.4.9.5 IN DOWN PHASE	REMOTE, I2..I14, ENABLE		REMOTE	rw	4554	-	-	-
3.2.4.10 ENC MASTER TYPE	U/D - QUAD		QUAD	rw	4555	-	-	-

OP * OPERATOR-type setup importable in the menù BASIC DATA.

To store parameter in eeprom sum 10000 at the MODBUS address.

PARAMETER	RANGE min - max	Um	PRESET DEFAULT	Access type	ID MODBUS RAM (dec)	ID CAN RAM (hex)	ID PROFIBUS RAM (dec)	ID MODBUS TCP/IP RAM (dec)
3.2.5. POSIT FUNCTION								
3.2.5.1 SOURCE SET POSIT	REMOTE, OPERATOR, TABLE, MOTOPOT	-	OPERATOR	rw	4556	-	-	-
OP * 3.2.5.2 SET OPERATOR POS								
SET	+/- 9999999	mm	100.0	rw	3377/3378	-	-	-
POS	+/- 9999999	mm	var.	ro	3300/3301	2040	80/81	4348 (long)
3.2.5.3 TABLE SET QUOTA								
3.2.5.3.1 SET QUOTA TABLE								
3.2.5.3.1.0 TABLE SET	+/- 9999999	Um	10000.0	rw	3400/3401	-	-	-
3.2.5.3.1.1 TABLE SET	+/- 9999999	Um	10000.0	rw	3402/3403	-	-	-
3.2.5.3.1.2 TABLE SET	+/- 9999999	Um	10000.0	rw	3404/3405	-	-	-
3.2.5.3.1.3 TABLE SET	+/- 9999999	Um	10000.0	rw	3406/3407	-	-	-
3.2.5.3.1.4 TABLE SET	+/- 9999999	Um	10000.0	rw	3408/3409	-	-	-
3.2.5.3.1.5 TABLE SET	+/- 9999999	Um	10000.0	rw	3410/3411	-	-	-
3.2.5.3.1.6 TABLE SET	+/- 9999999	Um	10000.0	rw	3412/3413	-	-	-
3.2.5.3.1.7 TABLE SET	+/- 9999999	Um	10000.0	rw	3414/3415	-	-	-
3.2.5.3.1.8 TABLE SET	+/- 9999999	Um	10000.0	rw	3416/3417	-	-	-
3.2.5.3.1.9 TABLE SET	+/- 9999999	Um	10000.0	rw	3418/3419	-	-	-
3.2.5.3.1.10 TABLE SET	+/- 9999999	Um	10000.0	rw	3420/3421	-	-	-
3.2.5.3.1.11 TABLE SET	+/- 9999999	Um	10000.0	rw	3422/3423	-	-	-
3.2.5.3.1.12 TABLE SET	+/- 9999999	Um	10000.0	rw	3424/3425	-	-	-
3.2.5.3.1.13 TABLE SET	+/- 9999999	Um	10000.0	rw	3426/3427	-	-	-
3.2.5.3.1.14 TABLE SET	+/- 9999999	Um	10000.0	rw	3428/3429	-	-	-
3.2.5.3.1.15 TABLE SET	+/- 9999999	Um	10000.0	rw	3430/3431	-	-	-
3.2.5.3.1.16 TABLE SET	+/- 9999999	Um	10000.0	rw	3432/3433	-	-	-
3.2.5.3.1.17 TABLE SET	+/- 9999999	Um	10000.0	rw	3434/3435	-	-	-
3.2.5.3.1.18 TABLE SET	+/- 9999999	Um	10000.0	rw	3436/3437	-	-	-
3.2.5.3.1.19 TABLE SET	+/- 9999999	Um	10000.0	rw	3438/3439	-	-	-
3.2.5.3.1.20 TABLE SET	+/- 9999999	Um	10000.0	rw	3440/3441	-	-	-
3.2.5.3.1.21 TABLE SET	+/- 9999999	Um	10000.0	rw	3442/3443	-	-	-
3.2.5.3.1.22 TABLE SET	+/- 9999999	Um	10000.0	rw	3444/3445	-	-	-
3.2.5.3.1.23 TABLE SET	+/- 9999999	Um	10000.0	rw	3446/3447	-	-	-
3.2.5.3.1.24 TABLE SET	+/- 9999999	Um	10000.0	rw	3448/3449	-	-	-
3.2.5.3.1.25 TABLE SET	+/- 9999999	Um	10000.0	rw	3450/3451	-	-	-
3.2.5.3.1.26 TABLE SET	+/- 9999999	Um	10000.0	rw	3452/3453	-	-	-
3.2.5.3.1.27 TABLE SET	+/- 9999999	Um	10000.0	rw	3454/3455	-	-	-
3.2.5.3.1.28 TABLE SET	+/- 9999999	Um	10000.0	rw	3456/3457	-	-	-
3.2.5.3.1.29 TABLE SET	+/- 9999999	Um	10000.0	rw	3458/3459	-	-	-
3.2.5.3.1.30 TABLE SET	+/- 9999999	Um	10000.0	rw	3460/3461	-	-	-
3.2.5.3.1.31 TABLE SET	+/- 9999999	Um	10000.0	rw	3462/3463	-	-	-
3.2.5.3.2 SET TABLE INPUT								
3.2.5.3.2.1 IN1 SET QUOTA	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4557	-	-	-
3.2.5.3.2.2 IN2 SET QUOTA	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4558	-	-	-
3.2.5.3.2.3 IN3 SET QUOTA	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4559	-	-	-
3.2.5.3.2.4 IN4 SET QUOTA	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4560	-	-	-
3.2.5.3.2.5 IN5 SET QUOTA	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4561	-	-	-
3.2.5.3.3 SET SPEED TABLE								
3.2.5.3.3.0 SPEED SET	0 - par. 3.2.3.8	-	0	rw	3550/3551	-	-	-
3.2.5.3.3.1 SPEED SET	0 - par. 3.2.3.8	-	0	rw	3552/3553	-	-	-
3.2.5.3.3.2 SPEED SET	0 - par. 3.2.3.8	-	0	rw	3554/3555	-	-	-
3.2.5.3.3.3 SPEED SET	0 - par. 3.2.3.8	-	0	rw	3556/3557	-	-	-
3.2.5.3.3.4 SPEED SET	0 - par. 3.2.3.8	-	0	rw	3558/3359	-	-	-
3.2.5.3.3.5 SPEED SET	0 - par. 3.2.3.8	-	0	rw	3560/3361	-	-	-
3.2.5.3.3.6 SPEED SET	0 - par. 3.2.3.8	-	0	rw	3562/3363	-	-	-
3.2.5.3.3.7 SPEED SET	0 - par. 3.2.3.8	-	0	rw	3564/3365	-	-	-
3.2.5.3.3.8 IN1 SPEED SET	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4562	-	-	-
3.2.5.3.3.9 IN2 SPEED SET	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4563	-	-	-
3.2.5.3.3.10 IN3 SPEED SET	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4564	-	-	-
3.2.5.3.4 RAMP TIME TABLE								
3.2.5.3.4.0 RAMP TIME SET	0.01 - 30.0	s	1.00	rw	3570	-	-	-
3.2.5.3.4.1 RAMP TIME SET	0.01 - 30.0	s	1.00	rw	3571	-	-	-
3.2.5.3.4.2 RAMP TIME SET	0.01 - 30.0	s	1.00	rw	3572	-	-	-
3.2.5.3.4.3 RAMP TIME SET	0.01 - 30.0	s	1.00	rw	3573	-	-	-
3.2.5.3.4.4 RAMP TIME SET	0.01 - 30.0	s	1.00	rw	3574	-	-	-
3.2.5.3.4.5 RAMP TIME SET	0.01 - 30.0	s	1.00	rw	3575	-	-	-
3.2.5.3.4.6 RAMP TIME SET	0.01 - 30.0	s	1.00	rw	3576	-	-	-
3.2.5.3.4.7 RAMP TIME SET	0.01 - 30.0	s	1.00	rw	3577	-	-	-
3.2.5.3.4.8 IN1 RAMP SET	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4565	-	-	-
3.2.5.3.4.9 IN2 RAMP SET	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4566	-	-	-
3.2.5.3.4.10 IN3 RAMP SET	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4567	-	-	-
3.2.5.3.4.11 ENABLE TAB RAMP	NO, YES	-	NO	rw	4568	-	-	-

OP * OPERATOR-type setup importable in the menù BASIC DATA.

To store parameter in eeprom sum 10000 at the MODBUS address.

PARAMETER	RANGE min - max	Um	PRESET DEFAULT	Access type	ID MODBUS RAM (dec)	ID CAN RAM (hex)	ID PROFIBUS RAM (dec)	ID MODBUS TCP/IP RAM (dec)
OP * 3.2.5.4 SET STEP								
SET	1 - 30000	-	30000	rw	3379	2057	123	4440
STEP .	0 - 30000	-	var.	ro	3316	2048	96	4380
3.2.5.5 IN ABS/REL POSIT	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4569	-	-	-
3.2.5.6 ENABLE REL RESET	NO, YES	-	NO	rw	3380	2058	124	4444
3.2.5.7 MIN POSITION	+/- 9999999	Um	- 999999.9	rw	4570/4571	-	-	-
3.2.5.8 MAX POSITION	+/- 9999999	Um	+ 999999.9	rw	4572/4573	-	-	-
3.2.5.9 POSITION SPEED								
3.2.5.9.1 POS. SPEED SOURCE	REMOTE, AI1..AI5, OPERATOR, TABLE	-	OPERATOR	rw	3381	-	-	-
3.2.5.9.2 SET SOURCE RAMP	0.0 - 1000.0	s	1.0	rw	3382	-	-	-
OP * 3.2.5.9.3 POSITION SPEED	0 - par.3.2.3.8	-	10000.0	rw	4574/4575	-	-	-
3.2.5.9.4 MIN POSIT SPEED	0.0 - par.3.2.5.9.5	%	1.0	rw	4576	-	-	-
3.2.5.9.5 MAX POSIT SPEED	par.3.2.5.9.4 - 100.0	%	95.0	rw	4577	-	-	-
3.2.5.10 POS MAX ACC TIME	0.01 - 30.00	s	10.00	rw	3383	2059	125	4448
3.2.5.11 POS MAX DEC TIME	0.01 - 30.00	s	10.00	rw	3384	205A	126	4452
3.2.5.12 TOLERANCE								
3.2.5.12.1 POSIT TOLERANCE	0 - +9999999	Um	1.0	rw	3385/3386	-	-	-
3.2.5.12.2 TOLERANCE DELAY	0.000 - 30.000	s	0.100	rw	4578	-	-	-
3.2.5.12.3 OUT TOLERANCE	REMOTE, O1..O8	-	REMOTE	rw	4579	-	-	-
3.2.5.13 PRESTOP								
3.2.5.13.1 PRESTOP QUOTA	1 - +9999999	Um	0.0	rw	3387/3388	205B (long)	127/128	4456 (long)
3.2.5.13.2 OUT PRESTOP	REMOTE, O1..O8	-	REMOTE	rw	4580	-	-	-
3.2.5.14 IN START POSIT	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4581	-	-	-
3.2.5.15 IN END POSITION	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4582	-	-	-
3.2.5.16 IN DISABLE LIMIT	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4583	-	-	-
3.2.5.17 IN RESET STEP	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4584	-	-	-
3.2.5.18 OUT PROGRAM END	REMOTE, O1..O8	-	REMOTE	rw	4585	-	-	-
3.2.5.19 IN SELECT ENC1/2	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4586	-	-	-
3.2.5.20 FLY CHANGE SPEED	NO, YES	-	NO	rw	4587	-	-	-
3.2.5.21 JERK TIME	0.000 - 1.000	s	0.030	rw	4588	-	-	-

OP * OPERATOR-type setup importable in the menù BASIC DATA.

To store parameter in eeprom sum 10000 at the MODBUS address.

PARAMETER	RANGE min - max	Um	PRESET DEFAULT	Access type	ID MODBUS RAM (dec)	ID CAN RAM (hex)	ID PROFIBUS RAM (dec)	ID MODBUS TCP/IP RAM (dec)
3.2.6. FLYCUT FUNC.								
3.2.6.1 START MODE	MEASURE, INPUT	-	MEASURE	rw	3389	205C	129	4460
3.2.6.2 IN START FLYCUT	REMOTE, I2..I14, ENABLE, Z1, Z2	-	REMOTE	rw	3390	-	-	-
3.2.6.3 STOP MODE	MEASURE, INPUT	-	INPUT	rw	3391	205D	130	4464
3.2.6.4 IN STOP FLYCUT	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	3392	-	-	-
3.2.6.5 QUOTA HOME	+/- 9999999	Um	0.0	rw	3394/3395	205E (long)	131/132	4468 (long)
3.2.6.6 QUOTA RETURN	+/- 9999999	Um	1000.0	rw	3396/3397	205F (long)	133/134	4472 (long)
3.2.6.7 MASTER SHIFT	0 - +9999999	Um	0.0	rw	3398/3399	2060 (long)	135/136	4476 (long)
3.2.6.8 SOURCE MEASURE	REMOTE, OPERATOR	-	OPERATOR	rw	3393	-	-	-
OP * 3.2.6.9								
SET	+/- 9999999	Um	100.0	rw	4589/4590	-	-	-
MEAS	+/- 9999999	Um	var.	ro	3322/3323	-	-	-
						-	-	-
3.2.6.10 HOME POS.SPEED	0 - par.3.2.3.8	-	10000	rw	3584/3585	2061 (long)	137/138	4480 (long)
3.2.6.11 SYNC RAMP	0.01 - 30.00 s	s	0.50	rw	3602	-	-	-
3.2.6.12 MASTER MAX SPEED	0 - par.3.2.3.8	-	10000	rw	4592/4593	-	-	-
3.2.6.13 IN ENABLE FLYCUT	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4591	-	-	-
3.2.6.14 MAX FLYCUT ERROR	0 - +9999999	Um	1.0	rw	3600/3601	-	-	-
3.2.6.15 OUT FLYCUT ERROR	REMOTE, O1..O8	-	REMOTE	rw	4594	-	-	-
3.2.6.16 OUT ERR. DEL.	0.000 - 30.000 s	s	0.100	rw	4595	-	-	-
3.2.7. ZEROGEAR FUNC.								
3.2.7.1 IN ZERO ENABLE	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4596	-	-	-
3.2.7.2 IN ZERO MASTER	REMOTE, I2..I14, ENABLE, Z1	-	REMOTE	rw	4597	-	-	-
3.2.7.3 IN ZERO SLAVE	REMOTE, I2..I14, ENABLE, Z2	-	REMOTE	rw	4598	-	-	-
3.2.7.4 SOURCE SL.SHIFT	REMOTE, OPERATOR, MOTOPOT	-	OPERATOR	rw	3590	-	-	-
OP * 3.2.7.5 ZERO SLAVE SHIFT	0 - +9999999	Um	0.0	rw	4599/4600	-	-	-
3.2.7.6 IN UP SHIFT	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4601	-	-	-
3.2.7.7 IN DOWN SHIFT	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4602	-	-	-
3.2.7.8 SHIFT STEP	0 - +9999999	Um	0.0	rw	3588/3589	-	-	-
3.2.7.9 SPACE CORRECTION	0 - +9999999	Um	10.0	rw	3592/3593	2062 (long)	139/140	4484 (long)
3.2.7.10 MAX PHASE ERROR	0 - +9999999	Um	1.0	rw	3594/3595	-	-	-
3.2.7.11 OUT PHASE ERROR	REMOTE, O1..O8	-	REMOTE	rw	4603	-	-	-
3.2.7.12 PHASE ERR. DELAY	0.000 - 30.000 s	s	0.100	rw	3591	-	-	-
3.2.7.13 OUT ADVANCE ERR.	REMOTE, O1..O8	-	REMOTE	rw	4604	-	-	-
3.2.7.14 OUT DELAY ERR.	REMOTE, O1..O8	-	REMOTE	rw	4605	-	-	-
3.2.7.15 ERR RATIO CORR	0 - +9999999	Um	1.0	rw	4606/4607	-	-	-
3.2.7.16 RATIO CORR	0.00000 - 4.00000	-	0.00010	rw	4608/4609	-	-	-
3.2.7.17 MAX RATIO CORR	0.00000 - 4.00000	-	0.00000	rw	4610/4611	-	-	-
3.2.7.18 MIN SPEED CORR	0 - par.1.3.1	rpm	0	rw	4612	-	-	-
3.2.7.19 SYNC RAMP	0.01 - 30.00 s	s	0.50	rw	3602	-	-	-
3.2.7.20 ZEROGEAR FUNC	0 - 1		0	rw	4613	-	-	-
OP * 3.2.7.21 CUTTING SPACE	0 - +9999999	Um	0.0	rw	-	2063 (long)	141/142	4488 (long)
3.2.7.22 CUT SHIFT PULSES	0 - 9999999	-	0	rw	-	-	-	-
OP * 3.2.7.23 DEVELOP ROLLER	0 - +9999999	Um	0.0	rw	-	-	-	-
3.2.7.24 DEVELOP PULSES	0 - 9999999	-	0	rw	-	-	-	-
OP * 3.2.7.25 N. CUTTING DIES	0 - 99	-	0	rw	-	-	-	-
3.2.7.26 SPEED CORR. GAIN	0 - 9999999	-	0.0	rw	-	-	-	-

OP * → Set OPERATOR importable in the BASIC DATA menu

To store parameter in eeprom sum 10000 at the MODBUS address.

VARIABLES	RANGE min / max	Um	Access type	ID MODBUS RAM (dec)	ID CAN RAM (hex)	ID PROFIBUS RAM (dec)	ID MODBUS TCP/IP RAM (dec)
3.3 REGULATOR							
3.3.1. REGUL. VARIABLE							
3.3.1.1							
SET	+/- 1000.0	-	ro	3300	2100	80	8192
FDB	+/- 1000.0	-	ro	3304	2101	81	8208
3.3.1.2							
R.SET	+/- 1000.0	-	ro	3302	2102	82	8224
FDB	+/- 1000.0	-	ro	3304	2101	81	8208
3.3.1.3 REGULATOR ALARM	NONE / MIN_FDB / MAX_FDB / MAX_TEMP / OIL_LIFE / MIN_TEMP/FAST_MAX	-	ro	3306	2103	83	8240
3.3.1.4 TEMPERATURE	- 25 / +120	°C	ro	3308	2104	84	8256
3.3.1.5 OIL LIFE HOURS	0 / 100000.00	h	ro	3310/3311	2105 (long)	85/86	8272 (long)
3.3.1.6							
SPEED	+/- 30000	rpm	ro	3312	2002	3/4	4128
FDB	+/- 1000.0	-	ro	3304	2101	81	8208
3.3.1.7							
var.3.3.1.2 - var.3.3.1.6		-	-	-	-	-	-

PARAMETER	RANGE min - max	Um	PRESET DEFAULT	Access type	ID MODBUS RAM (dec)	ID CAN RAM (hex)	ID PROFIBUS RAM (dec)	ID MODBUS TCP/IP RAM (dec)
3.3.2. SPEED CONTROL								
3.3.2.1 SPEED COMMANDS								
3.3.2.1.1 SET SPEED SOURCE	REG_PI, REMOTE, AI1..AI5, MOTOP, OPERATOR	-	REG_PI	rw	4500	-	-	-
3.3.2.1.2 IN STOP SPEED	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4501	-	-	-
3.3.2.1.3 IN REVER SPEED	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4502	-	-	-
3.3.2.2 MAX MOTOR SPEED	0 - 30000	rpm	1500	rw	1012	-	-	-
3.3.2.3 RAMP ACCEL. TIME	0.00 - 600.00	s	10.00	rw	1008/1009	2038 (long)	68/69	4316 (long)
3.3.2.4 RAMP DECEL. TIME	0.00 - 600.00	s	10.00	rw	1010/1011	2039 (long)	70/71	4320 (long)
3.3.2.5 MOTOPOT. SPEED								
3.3.2.5.1 SAVE SPEED MOTP.	NO, YES	-	YES	rw	4503	-	-	-
3.3.2.5.2 IN INCR. MOT	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4504	-	-	-
3.3.2.5.3 IN DECR. MOT	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4505	-	-	-
3.3.2.6 OPERATOR SPEED								
3.3.2.6.1 SAVE OPERATOR	NO, YES	-	NO	rw	4506	-	-	-
OP * → 3.3.2.6.2 SET OPERAT SPEED								-
SET OP	+/- 30000	rpm	0	rw	4507	-	-	-
SPEED	+/- 30000	rpm	var.	ro	3312	-	-	
3.3.3. REGUL. SETUP								
3.3.3.1 SET SOURCE	REMOTE, AI1..AI5, OPERATOR, MOTOPOT	-	AI1	rw	4508	-	-	-
3.3.3.2 FEEDBACK SOURCE	AI1..AI5, CUR, TORQ	-	AI2	rw	4509	-	-	-
3.3.3.3 MAX REG SET	1.0 - 1000.0	-	10.0	rw	4510	-	-	-
3.3.3.4 MAX REG FEEDBACK	1.0 - 1000.0	-	12.0	rw	4511	-	-	-
3.3.3.5 KP	0.00 - 250.00	-	120.00	rw	3350	-	-	-
3.3.3.6 KI	0.00 - 250.00	-	30.00	rw	3351	-	-	-
3.3.3.7 REGULATOR ON/OFF	NO, YES	-	NO	rw	4512	-	-	-
3.3.3.8 NEGAT REG SENSE	NO, YES	-	NO	rw	4513	-	-	-
3.3.3.9 DAC OUT REG PI	NO, YES	-	NO	rw	4514	-	-	-
3.3.3.10 SET REG ACC/DEC								
3.3.3.10.1 SET ACC TIME	0.01 - 600.00	s	10.00	rw	3352/3353	-	-	-
3.3.3.10.2 SET DEC TIME	0.01 - 600.00	s	10.00	rw	3354/3355	-	-	-
3.3.3.11 MOTOPOTENTIOM.								
3.3.3.11.1 SAVE MOTOPOT.	NO, YES	-	YES	rw	4515	-	-	-
3.3.3.11.2 IN INCREASE MOT	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4516	-	-	-
3.3.3.11.3 IN DECREASE MOT	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4517	-	-	-
3.3.3.11.4 START ACC TIME	0.01 - 600.00	s	15.00	rw	4518/4519	-	-	-
3.3.3.11.5 START DEC TIME	0.01 - 600.00	s	15.00	rw	4520/4521	-	-	-

OP * → Set OPERATOR importable in the BASIC DATA menu

To store parameter in eeprom sum 10000 at the MODBUS address.

PARAMETER	RANGE min - max	Um	PRESET DEFAULT	Access type	ID MODBUS RAM (dec)	ID CAN RAM (hex)	ID PROFIBUS RAM (dec)	ID MOBUS TC/IP RAM (dec)
3.3.3.12 MANUAL OPERATOR								
3.3.3.12.1 SAVE MAN OPERAT.	NO, YES	-	NO	rw	4522	-	-	-
OP * → 3.3.3.12.2 SET MAN OPERAT.								
SET	+/-1000.0	-	0.0	rw	4523	-	-	-
FDB	+/-1000.0	-	var.	ro	3304	-	-	-
3.3.3.13 REGULATOR LIMIT								
3.3.3.13.1 MAX REG OUTPUT	0.0 - +100.0	%	100.0	rw	4524	-	-	-
3.3.3.13.2 MIN REG OUTPUT	0.0 - -100.0	%	0.0	rw	4525	-	-	-
3.3.3.13.3 MAX INTEGRAL OUT	0.0 - +100.0	%	100.0	rw	4526	-	-	-
3.3.3.13.4 MIN INTEGRAL OUT	0.0 - -100.0	%	-100.0	rw	4527	-	-	-
3.3.3.14 REGULATOR ALARM								
3.3.3.14.1 ENABLE MIN FDB	DISABLE, ALARM, FAULT	-	ALARM	rw	4528	-	-	-
3.3.3.14.2 ENABLE MAX FDB	DISABLE, ALARM, FAULT	-	ALARM	rw	4529	-	-	-
3.3.3.14.3 ENAB FASTMAX FDB	DISABLE, ALARM, FAULT	-	ALARM	rw	4530	-	-	-
3.3.3.14.4 DELAY OK MIN MAX	0.0 - 250.0	s	20.0	rw	4531	-	-	-
3.3.3.14.5 MIN FDB ALARM	1.0 - par.3.3.3.4	-	5.0	rw	3356	-	-	-
3.3.3.14.6 MAX FDB ALARM	1.0 - par.3.3.3.4	-	11.0	rw	3358	-	-	-
3.3.3.14.7 FASTMAX FDB ALAR	1.0 - par.3.3.3.4	-	12.0	rw	3383	-	-	-
3.3.3.14.8 DELAY MIN ALARM	0.0 - 250.0	s	5.0	rw	3360	-	-	-
3.3.3.14.9 DELAY MAX ALARM	0.0 - 250.0	s	5.0	rw	3362	-	-	-
3.3.3.14.10 OUT MIN ALARM	REMOTE, O1..O8	-	REMOTE	rw	4532	-	-	-
3.3.3.14.11 OUT MAX ALARM	REMOTE, O1..O8	-	REMOTE	rw	4533	-	-	-
3.3.3.14.12 OUT FASTMAX ALAR	REMOTE, O1..O8	-	REMOTE	rw	4534	-	-	-
3.3.3.14.13 DELAY EN FASTMAX	0.0 - 250.0	s	20.0	rw	4535	-	-	-
3.3.4. REGUL. FUNCTION								
3.3.4.1 MANUAL/AUTOMAT								
3.3.4.1.1 IMPULS. MAN/AUT	NO, YES	-	NO	rw	4536	-	-	-
3.3.4.1.2 IN MANU/AUTOMAT	REMOTE, I2..I14, ENABLE	-	I2	rw	4537	-	-	-
3.3.4.1.3 IN START AUTOMAT	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4538	-	-	-
3.3.4.1.4 IN STOP AUTOMAT	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4539	-	-	-
3.3.4.1.5 ENABLE RESTART	NO, YES	-	NO	rw	3364	-	-	-
3.3.4.2 MANUAL JOG								
3.3.4.2.1 IN MANUAL JOG+	REMOTE, I2..I14, ENABLE	-	I4	rw	4540	-	-	-
3.3.4.2.2 IN MANUAL JOG-	REMOTE, I2..I14, ENABLE	-	I5	rw	4541	-	-	-
3.3.4.2.3 MANUAL SPEED	REMOTE, I2..I14, ENABLE	rpm	1000	rw	3366	2106	87	5140
3.3.4.2.4 JOG ACC/ DEC	0.01 - 600.00	s	0.01	rw	4542/4543	-	-	-
3.3.4.3 FUNCTION								
3.3.4.3.1 ENABLE FUNCTION	FUNC_0, FUNC_1, FUNC_2, FUNC_3	-	FUNC_1	rw	4544	-	-	-
3.3.4.3.2 COMMON FUNCTION								
3.3.4.3.2.1 IN STOP SET REG.	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4545	-	-	-
3.3.4.3.3 FUNCTION 1								
3.3.4.3.3.1 PERC TRIGGER SET	0.0 - 50.0	%	5.0	rw	3368	-	-	-
3.3.4.3.3.2 MIN SPEED	0 - par.1.3.1	rpm	500	rw	3370	-	-	-
3.3.4.3.3.3 OFF RUN DELAY	0.0 - 1800.0	s	3.0	rw	3372	-	-	-
3.3.4.3.3.4 HYST ENABLE	NO, YES	-	NO	rw	4546	-	-	-
3.3.4.3.3.5 HYST PERC.	0.1 - 100.0	%	10.0	rw	4547	-	-	-

OP * → Set OPERATOR importable in the BASIC DATA menu

To store parameter in eeprom sum 10000 at the MODBUS address.

PARAMETER	RANGE min - max	Um	PRESET DEFAULT	Access type	ID MODBUS RAM (dec)	ID CAN RAM (hex)	ID PROFIBUS RAM (dec)	ID MODBUS TCP/IP RAM (dec)
3.3.4.3.4 FUNCTION 2								
3.3.4.3.4.1 GENERAL PARAMET.								
3.3.4.3.4.1.1 SET SPEED ADJ	0 - 30000	-	10000	rw	4548	-	-	-
3.3.4.3.4.1.2 FEEDB. INPUT AC	NO, YES	-	YES	rw	4549	-	-	-
3.3.4.3.4.1.3 FEEDBACK FILTER	0.001 - 10.000	s	0.500	rw	4550	-	-	-
3.3.4.3.4.1.4 IN ENABLE JOG	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4551	-	-	-
3.3.4.3.4.1.5 DAC 10V MAX SPE.	30 - 30000	rpm	1500	rw	4552	-	-	-
3.3.4.3.4.1.6 MAX SPE MAN/AUT	0.0 - 100.0	%	20.0	rw	4553	-	-	-
3.3.4.3.4.1.7 EN IN MOTPOT INT	NO, YES	-	NO	rw	4554	-	-	-
3.3.4.3.4.1.8 IN EN MOTPOT INT	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4555	-	-	-
3.3.4.3.4.1.9 OUT EXT RUN	REMOTE, O1..O8	-	REMOTE	rw	4556	-	-	-
3.3.4.3.4.1.10 IN REVERSE SPEED	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4557	-	-	-
3.3.4.3.4.2 SPEED MOTOPOT.								
3.3.4.3.4.2.1 SAVE SPEED MOTP.	NO, YES	-	YES	rw	4558	-	-	-
3.3.4.3.4.2.2 SET SPEED ACC.	0.01 - 600.00	s	10.00	rw	4560/4561	-	-	-
3.3.4.3.4.2.3 SET SPEED DEC.	0.01 - 600.00	s	6.00	rw	4562/4563	-	-	-
3.3.4.3.4.2.4 START SPEED ACC	0.01 - 600.00	s	30.00	rw	4564/4565	-	-	-
3.3.4.3.4.2.5 START SPEED DEC	0.01 - 600.00	s	30.00	rw	4566/4567	-	-	-
3.3.4.3.5 FUNCTION 3 (non attiva)								
3.3.5. TEMP. PROTECTION								
3.3.5.1 ENABLE TEMP FUNC	NO, YES	-	NO	rw	3374	-	-	-
3.3.5.2 SETUP NTC PTC								
3.3.5.2.1 NTC PTC SOURCE	AI1..AI5	-	AI3	rw	4568	-	-	-
3.3.5.2.2 EXTERNAL RES.ohm	0 - 100000	-	10000	rw	4569	-	-	-
3.3.5.2.3 NTC PTC TABLE								
3.3.5.2.3.1 RESIST. - 025 °C	0 - 1000000	ohm	45000	rw	4571/4572	-	-	-
3.3.5.2.3.2 RESIST. - 020 °C	0 - 1000000	ohm	36500	rw	4573/4574	-	-	-
3.3.5.2.3.3 RESIST. - 015 °C	0 - 1000000	ohm	27800	rw	4576/4577	-	-	-
3.3.5.2.3.4 RESIST. - 010 °C	0 - 1000000	ohm	22000	rw	4578/4579	-	-	-
3.3.5.2.3.5 RESIST. - 005 °C	0 - 1000000	ohm	17400	rw	4580/4581	-	-	-
3.3.5.2.3.6 RESIST. 000 °C	0 - 1000000	ohm	13600	rw	4582/4583	-	-	-
3.3.5.2.3.7 RESIST. + 005 °C	0 - 1000000	ohm	10600	rw	4584/4585	-	-	-
3.3.5.2.3.8 RESIST. + 010 °C	0 - 1000000	ohm	8700	rw	4586/4587	-	-	-
3.3.5.2.3.9 RESIST. + 015 °C	0 - 1000000	ohm	6700	rw	4588/4589	-	-	-
3.3.5.2.3.10 RESIST. + 020 °C	0 - 1000000	ohm	5200	rw	4590/4591	-	-	-
3.3.5.2.3.11 RESIST. + 025 °C	0 - 1000000	ohm	4200	rw	4592/4593	-	-	-
3.3.5.2.3.12 RESIST. + 030 °C	0 - 1000000	ohm	3380	rw	4594/4595	-	-	-
3.3.5.2.3.13 RESIST. + 035 °C	0 - 1000000	ohm	2850	rw	4596/4597	-	-	-
3.3.5.2.3.14 RESIST. + 040 °C	0 - 1000000	ohm	2200	rw	4598/4599	-	-	-
3.3.5.2.3.15 RESIST. + 045 °C	0 - 1000000	ohm	1850	rw	4600/4601	-	-	-
3.3.5.2.3.16 RESIST. + 050 °C	0 - 1000000	ohm	1500	rw	4602/4603	-	-	-
3.3.5.2.3.17 RESIST. + 055 °C	0 - 1000000	ohm	1200	rw	4604/4605	-	-	-
3.3.5.2.3.18 RESIST. + 060 °C	0 - 1000000	ohm	1000	rw	4606/4607	-	-	-
3.3.5.2.3.19 RESIST. + 065 °C	0 - 1000000	ohm	800	rw	4608/4609	-	-	-
3.3.5.2.3.20 RESIST. + 070 °C	0 - 1000000	ohm	645	rw	4610/4611	-	-	-
3.3.5.2.3.21 RESIST. + 075 °C	0 - 1000000	ohm	550	rw	4612/4613	-	-	-
3.3.5.2.3.22 RESIST. + 080 °C	0 - 1000000	ohm	440	rw	4614/4615	-	-	-
3.3.5.2.3.23 RESIST. + 085 °C	0 - 1000000	ohm	370	rw	4616/4617	-	-	-
3.3.5.2.3.24 RESIST. + 090 °C	0 - 1000000	ohm	285	rw	4618/4619	-	-	-
3.3.5.2.3.25 RESIST. + 095 °C	0 - 1000000	ohm	230	rw	4620/4621	-	-	-
3.3.5.2.3.26 RESIST. + 100 °C	0 - 1000000	ohm	180	rw	4622/4623	-	-	-
3.3.5.2.3.27 RESIST. + 105 °C	0 - 1000000	ohm	140	rw	4624/4625	-	-	-
3.3.5.2.3.28 RESIST. + 110 °C	0 - 1000000	ohm	100	rw	4626/4627	-	-	-
3.3.5.2.3.29 RESIST. + 115 °C	0 - 1000000	ohm	75	rw	4628/4629	-	-	-
3.3.5.2.3.30 RESIST. + 120 °C	0 - 1000000	ohm	50	rw	4630/4631	-	-	-
3.3.5.3 MAX TEMPERATURE	-125 - +120	°C	85	rw	3376	-	-	-
3.3.5.4 OVER TEMP SPEED	0 - 24000	rpm	1000	rw	3377	-	-	-
3.3.5.5 MAX TIME OVER T.	0.0 - 250.0	s	10.0	rw	3378	-	-	-
3.3.5.6 OUT OVER TEMP	REMOTE, O1..O8	-	REMOTE	rw	4632	-	-	-
3.3.5.7 OUT UNDER TEMP	REMOTE, O1..O8	-	REMOTE	rw	4633	-	-	-
3.3.6. OIL PROTECTION								
3.3.6.1 SET OIL LIFE	0.00 - 10000.00	h	1000.00	rw	3380/3381	-	-	-
3.3.6.2 RESET OIL LIFE	NO, YES	-	NO	rw	3382	-	-	-

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VARIABLES	RANGE min / max	Um	Access type	ID MODBUS RAM (dec)	ID CAN RAM (hex)	ID PROFIBUS RAM (dec)	ID MODBUS TCP/IP RAM (dec)
3.6 WINDER							
3.6.1. WINDER VARIABLES							
3.6.1.1							
STRETCH Kg	0.00 - 999.99	Kg	ro	3584/3585	2100 (long)	80/81	5116 (long)
TORQUE%	+/- 200.0	%	ro	3602	2101	82	5120
3.6.1.2							
STRETCH Kg	0.00 - 999.99	Kg	ro	3584/3585	2100 (long)	80/81	5116 (long)
CELL Kg	0.00 - 999.99	Kg	ro	3586/3587	2102 (long)	83/84	5124 (long)
3.6.1.3 DIAMETER	20.0 - 5000.0	mm	ro	3603	2103	85	5128
3.6.1.4 DIAMETER CALC	20.0 - 5000.0	mm	ro	3604	2104	86	5132
3.6.1.5 START DIAMETER	30.0 - 5000.0	mm	ro	3605	2105	87	5136
3.6.1.6 SONAR DIAM DIST	0.0 - 5000.0	mm	ro	3606	2106	88	5140
3.6.1.7 LINE SPEED	+/- 2000.00	m/min	ro	3588/3589	2107 (long)	89/90	5144 (long)
3.6.1.8 LINE QUOTA	+/- 999999.9	mm	ro	3590/3591	2108 (long)	91/92	5148 (long)
3.6.1.9 COIL TURN	+/- 1.000	-	ro	3607	2109	93	5152
3.6.1.10 COIL/ROLL SPEED	+/- 3000.0	rpm	ro	3608	210A	94	5156
3.6.1.11 COIL LINE SPEED	+/- 2000.00	m/min	ro	3592/3593	210B (long)	95/96	5160 (long)
3.6.1.12 THICKNESS	0.000 - 100.000	mm	ro	3594/3595	210C (long)	97/98	5164 (long)
3.6.1.13 WINDER ALARM	NONE, COIL_DMIN, COIL_DMAX, CELL_MAX, DANC_UP, BREAK	-	ro	3609	210D	99	5168
3.6.1.14 DANCER QUOTA	+/- 999999.9	mm	ro	3596/3597	210E (long)	100/101	5172 (long)
3.6.1.15 SONAR DANC DIST	0.0 - 5000.0	mm	ro	3610	210F	102	5176
3.6.1.16 SET LINE SPEED	+/- 2000.00	m/min	ro	3598/3599	2110 (long)	103/104	5180 (long)
3.6.1.17 ACTIVE MODE	SPE/TOR, STRETCH>, CELL>, DANCER>, MASTER>,STRETCH<, CELL<, DANCER<, MASTER<	-	ro	3611	2111	105	5184
3.6.1.18 OUT REG CELL	Par.3.6.7.10.4 - Par.3.6.7.10.3	rpm	ro	3612	-	-	-

PARAMETER	RANGE min - max	Um	PRESET DEFAULT	Access type	ID MODBUS RAM (dec)	ID CAN RAM (hex)	ID PROFIBUS RAM (dec)	ID MODBUS TCP/IP RAM (dec)
3.6.2. WINDER MODE								
3.6.2.1 DEFAULT MODE	SPE/TOR, STRETCH, CELL, DANCER, MASTER	-	STRETCH	rw	3350	2112	110	5188
3.6.2.2 IN1 WINDER MODE	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	3351	-	-	-
3.6.2.3 IN2 WINDER MODE	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	3352	-	-	-
3.6.2.4 IN3 WINDER MODE	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	3353	-	-	-
3.6.2.5 IN AXIAL/ TANG	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	3354	-	-	-
3.6.2.6 CALENDER	NO, YES	-	NO	rw	3355	2113	111	5192
3.6.3. COMMON PARAMETER								
3.6.3.1 IN AUTOM/MAN	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	3356	-	-	-
3.6.3.2 IN REVERSE	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	3357	-	-	-
3.6.3.3 IN COIL SELECT	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	3358	-	-	-
3.6.3.4 COIL1 RESOLUTION	0.00010 - 4.00000	-	0.05555	rw	3360/3361	2120 (long)	112/113	5244 (long)
3.6.3.5 COIL2 RESOLUTION	0.00010 - 4.00000	-	1.00000	rw	3362/3363	-	-	-
3.6.3.6 LINE SPEED IN	NONE, AI1..AI5, ENC2, ENC3	-	AI1	rw	3359	-	-	-
3.6.3.7 LINE QUOTA RES	0.00466 - 4.00000	-	1.0000	rw	3364/3365	2121 (long)	114/115	5248 (long)
3.6.3.8 LINE SPEED MAX	0.10 - 2000.00	m/min	200.0	rw	3366/3367	2122 (long)	116/117	5252 (long)
3.6.3.9 WINDER LINE SIGN	REMOTE, I2..I14, ENABLE	-	ENABLE	rw	3368	-	-	-
3.6.3.10 ZERO LINE	0.00 - 50.00	%	1.50	rw	3369	-	-	-
3.6.3.11 LINE RAMP ACC.	0.01 - 600.00	s	5.00	rw	3370	2123	118	5256
3.6.3.12 LINE RAMP DEC.	0.01 - 600.00	s	5.00	rw	3371	2124	119	5260
3.6.3.13 TORQUE RAMP	0.01 - 600.00	s	0.10	rw	3372	2125	120	5264
3.6.3.14 COIL DATA								
3.6.3.14.1 MIN DIAMETER	20.0 - 5000.0	mm	100.0	rw	3373	2126	121	5268
3.6.3.14.2 MAX DIAMETER	20.0 - 5000.0	mm	1000.0	rw	3374	2127	122	5272
3.6.3.14.3 FIX DIAMETER	30.0 - 5000.0	mm	200.0	rw	3375	2128	123	5276
3.6.3.14.4 WEIGHT DMIN	0.1 - 3000.0	Kg	10.0	rw	3376	-	-	-
3.6.3.14.5 WEIGHT DMAX	0.1 - 3000.0	Kg	100.0	rw	3377	-	-	-

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PARAMETER	RANGE min - max	Um	PRESET DEFAULT	Access type	ID MODBUS RAM (dec)	ID CAN RAM (hex)	ID PROFIBUS RAM (dec)	ID MODBUS TCP/IP RAM (dec)
3.6.3.15 COIL ALARM								
3.6.3.15.1 ENABLE DMIN	NO, YES	-	NO	rw	3378	-	-	-
3.6.3.15.2 ENABLE DMAX	NO, YES	-	NO	rw	3379	-	-	-
3.6.3.15.3 OUT DMIN ALARM	REMOTE, O1..O8	-	REMOTE	rw	3380	-	-	-
3.6.3.15.4 OUT DMAX ALARM	REMOTE, O1..O8	-	REMOTE	rw	3381	-	-	-
3.6.3.16 COIL THRESHOLD								
3.6.3.16.1 DIAM. THRESHOLD	20.0 - 5000.0	mm	1000.0	rw	3382	-	-	-
3.6.3.16.2 OUT DIAM THRES.	REMOTE, O1..O8	-	REMOTE	rw	3383	-	-	-
3.6.3.17 JOG COMMANDS								
3.6.3.17.1 IN ENABLE JOG	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	3384	-	-	-
3.6.3.17.2 IN JOG+	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	3385	-	-	-
3.6.3.17.3 IN JOG-	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	3386	-	-	-
3.6.3.17.4 JOG SPEED	0 - par.1.3.1	rpm	300	rw	3387	2129	124	5280
3.6.3.17.5 JOG TORQUE	0 - 400	%	10	rw	3388	212A	125	5284
3.6.4. DIAM DETECTORS								
3.6.4.1 SONAR								
3.6.4.1.1 IN SONAR BY DIAM	AI1..AI9	-	AI4	rw	3389	-	-	-
3.6.4.1.2 MIN DIST DIAM	1 - 5000	mm	100	rw	3390	-	-	-
3.6.4.1.3 MAX DIST DIAM	1 - 5000	mm	400	rw	3391	-	-	-
3.6.4.1.4 DISTANCE DIAM	1 - 5000	mm	250	rw	3392	-	-	-
3.6.4.2 POTENTIOMETER								
3.6.4.2.1 IN POT. BY DIAM	AI1..AI9	-	AI4	rw	3393	-	-	-
3.6.4.2.2 AI % AT DIAM MIN	0.00 - 100.00	%	0.00	rw	3394	-	-	-
3.6.4.2.3 AI % AT DIAM MAX	0.00 - 100.00	%	100.00	rw	3395	-	-	-
3.6.4.3 DIAM CALC PAR								
3.6.4.3.1 THICKNESS MAX	+/- 100.000	mm	5.000	rw	3396/3397	-	-	-
3.6.4.3.2 THICKNESS SOURCE	REMOTE, AI1..AI9, OPERATOR	-	OPERATOR	rw	3400	-	-	-
OP * 3.6.4.3.3 THICKNESS OPERAT	0.000 - par.3.6.4.3.1	mm	0.000	rw	3398/3399	-	-	-
3.6.4.3.4 START D.SOURCE	REMOTE, AI1..AI9, OPERATOR	-	OPERATOR	rw	3401	-	-	-
OP * 3.6.4.3.5 START DIAM OPER.	par.3.6.3.14.1 - par.3.6.3.14.2	mm	100.0	rw	3402	212B	126	5288
3.6.4.3.6 SAVE DIAM EEPROM	NO, YES	-	NO	rw	3403	-	-	-
3.6.4.3.7 IN RESTART DIAM	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	3404	-	-	-
3.6.4.3.8 CALC DELAY	0.00 - 30.00	s	4.00	rw	3405	-	-	-
3.6.4.3.9 DIAMETER FILTER	0.00 - 30.00	s	5.00	rw	3406	-	-	-
3.6.4.3.10 START DIAM FILT	0.00 - 30.00	s	1.00	rw	3407	-	-	-
3.6.4.3.11 START COIL TURNS	0.100 - 10.000	-	1.000	rw	3408	-	-	-
3.6.4.3.12 RUN COIL TURNS			5.000	rw	3409	-	-	-
3.6.4.3.13 IN BLOCK DIAM	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	3410	-	-	-
3.6.5 SPEED/TORQ MODE								
3.6.5.1 SPEED COMMANDS								
3.6.5.1.1 SET SPEED SOURCE	REMOTE, AI1..AI5, MOTOPOT, OPERATOR	-	AI1	rw	3100	-	-	-
3.6.5.1.2 IN STOP SPEED	REMOTE, I2..I14, ENABLE	-	I2	rw	4075	-	-	-
3.6.5.1.3 IN REVERSE SPEED	REMOTE, I2..I14, ENABLE	-	ENABLE	rw	4076	-	-	-
3.6.5.1.4 MAX MOTOR SPEED	0 - 24000	rpm	1500	rw	1012	-	-	-
3.6.5.1.5 RAMP ACCEL TIME	0.01 - 600.00	s	10.00	rw	1008/1009	-	-	-
3.6.5.1.6 RAMP DECEL TIME	0.01 - 600.00	s	10.00	rw	1010/1011	-	-	-
3.6.5.1.7 OPERATOR SPEED								
3.6.5.1.7.1 SAVE OPERATOR	NO, YES	-	YES	rw	4118			
3.6.5.1.7.2								
SET	0 - 30000	rpm	0	rw	4119	-	-	-
SPEED	+/-30000	rpm	var.	ro	2002/2003	-	-	-
3.6.5.2 TORQ COMMANDS								
3.6.5.2.1 SET TORQ SOURCE	REMOTE, AI1..AI5, MOTOPOT, OPERATOR	-	AI3	rw	1058	-	-	-
3.6.5.2.2 MAX TORQUE	0 - par.1.10.1	%	200	rw	1057	-	-	-
3.6.5.2.3 OPERATOR TORQUE								
3.6.5.2.3.1 SAVE OPERATOR	NO, YES	-	YES	rw	4054	-	-	-
3.6.5.2.3.2								
SET	0 - par.3.6.5.2.2	%	0	rw	4055	-	-	-
TORQUE	0 - 300	%	var.	ro	3602	-	-	-

OP * Set OPERATOR importable in the BASIC DATA menu

To store parameter in eeprom sum 10000 at the MODBUS address.

PARAMETER	RANGE min - max	Um	PRESET DEFAULT	Access type	ID MODBUS RAM (dec)	ID CAN RAM (hex)	ID PROFIBUS RAM (dec)	ID MODBUS TCP/IP RAM (dec)
3.6.6 STRETCH MODE								
3.6.6.1 DIAMETER SOURCE	POT, SONAR, LINE_SPEED, LINE_QUOTA, COUNT	-	COUNT	rw	3423	-	-	-
3.6.6.2 STRETCH SOURCE	REMOTE, AI1..AI9, MOTOPOT, OPERATOR	-	AI3	rw	3426	-	-	-
3.6.6.3 STRETCH MAX SET	0.10 - 1000.00	Kg	15.00	rw	3424/3425	-	-	-
3.6.6.4 TORQ. MAN SOURCE	REMOTE, AI1..AI9	-	REMOTE	rw	3427	-	-	-
3.6.6.5 TORQUE MAX	0.0 - 100.0	%	100.0	rw	3428	-	-	-
3.6.6.6 CELL SOURCE	REMOTE, AI1..AI9	-	REMOTE	rw	3429	-	-	-
3.6.6.7 CELL MAX	0.10 - 1000.00	Kg	20.00	rw	3430/3431	-	-	-
3.6.6.8 CELL FILTER	0.00 - 30.00	s	1.00	rw	3432	-	-	-
3.6.6.9 OPERATOR STRETCH								
3.6.6.9.1 SAVE STRETCH OP	NO, YES	-	YES	rw	3433	-	-	-
OP * 3.6.6.9.2								
STRETCH	0.00 - par.3.6.6.3	Kg	0.00	rw	3434/3435	-	-	-
TORQUE	0.0 - par.3.6.6.5	%	0.0	rw	3602	-	-	-
3.6.6.10 STRETCH MOTOPOT								
3.6.6.10.1 SAVE STRETCH MOT	NO, YES	-	YES	rw	3436	-	-	-
3.6.6.10.2 IN INCREASE MOT	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	3437	-	-	-
3.6.6.10.3 IN DECREASE MOT	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	3438	-	-	-
3.6.6.10.4 AUT RAMP MOTOP	0.01 - 600.00	s	10.00	rw	3439	-	-	-
3.6.6.10.5 MAN RAMP MOTOP	0.01 - 600.00	s	10.00	rw	3440	-	-	-
3.6.6.11 WINDER MIN SPEED	0.0 - 100.0	%	3.0	rw	3441	-	-	-
3.6.6.12 OFFSET SPEED	0 - par.1.3.1	rpm	200	rw	3442	-	-	-
3.6.6.13 UNWIND SPEED ON	NO, YES	-	NO	rw	3443	-	-	-
3.6.6.14 FRICTION PAR.								
3.6.6.14.1 STATIC FRICTION	0.0 - 100.0	%	0.0	rw	3444	-	-	-
3.6.6.14.2 DYNAMIC FRICTION	0.0 - 100.0	%	0.0	rw	3445	-	-	-
3.6.6.15 INERTIA PAR.								
3.6.6.15.1 KICKSTART MODE								
3.6.6.15.1.1 KICK LEVEL	0.0 - 100.0	%	0.0	rw	3446	-	-	-
3.6.6.15.1.2 KICK ON TIME	0.01 - 600.00	s	0.01	rw	3447	-	-	-
3.6.6.15.1.3 KICK DEC TIME	0.01 - 600.00	s	0.01	rw	3448	-	-	-
3.6.6.15.2 INERTIA COMPENS.								
3.6.6.15.2.1 EN. COMP INERTIA	NO, YES	-	NO	rw	3562	-	-	-
3.6.6.15.2.2 COMP INERTIA KP	0 - 250	-	20	rw	3563	-	-	-
3.6.6.15.2.3 RAMP. THR. INERT.	1.0 - 100.0	%	1.5	rw	3564	-	-	-
3.6.6.15.2.4 RAMP INERT. TIME	0.0 - 300.0	s	10.0	rw	3565	-	-	-
3.6.6.16 STRETCH TREND								
3.6.6.16.1 TREND TYPE	CONSTANT, DEC_LIN, DEC_HYP	-	CONSTANT	rw	3455	-	-	-
3.6.6.16.2 CHANGE DIAM	30.0 - 5000.0	mm	5000.0	rw	3456	-	-	-
3.6.6.16.3 D.MAX REDUCTION	0.0 - 100.0	%	0.0	rw	3561	-	-	-
3.6.7 CELL MODE								
3.6.7.1 DIAMETER SOURCE	POT, SONAR, LINE_SPEED, LINE_QUOTA, COUNT	-	COUNT	rw	3423	-	-	-
3.6.7.2 STRETCH SOURCE	REMOTE, AI1..AI9, MOTOPOT, OPERATOR	-	AI3	rw	3426	-	-	-
3.6.7.3 STRETCH MAX SET	0.10 - 1000.00	Kg	15.00	rw	3424/3425	-	-	-
3.6.7.4 CELL SOURCE	REMOTE, AI1..AI9	-	REMOTE	rw	3429	-	-	-
3.6.7.5 CELL MAX	0.10 - 1000.00	Kg	20.00	rw	3430/3431	-	-	-
3.6.7.6 CELL FILTER	0.00 - 30.00	s	0.030	rw	3432	-	-	-
3.6.7.7 OPERATOR STRETCH								
3.6.7.7.1 SAVE STRETCH OP	NO, YES	-	YES	rw	3433	-	-	-
OP * 3.6.7.7.2								
STRETCH	0.00 - par.3.6.7.3	Kg	0.00 Kg	rw	3434/3435	-	-	-
CELL	0.10 - 1000.00	Kg	var.	ro	3586/3587	-	-	-
3.6.7.8 STRETCH MOTOPOT								
3.6.7.8.1 SAVE STRETCH MOT	NO, YES	-	YES	rw	3436	-	-	-
3.6.7.8.2 IN INCREASE MOT	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	3437	-	-	-
3.6.7.8.3 IN DECREASE MOT	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	3438	-	-	-
3.6.7.8.4 AUT RAMP MOTOP	0.01 - 600.00	s	10.00	rw	3439	-	-	-
3.6.7.9 SPEED REGULATOR								
3.6.7.9.1 SPEED KP GAIN	0 - 100	-	50	rw	3412	-	-	-
3.6.7.9.2 SPEED FILTER	0.001 - 1.000	s	0.030	rw	3413	-	-	-
3.6.7.10 CELL REGULATOR								
3.6.7.10.1 CELL KP GAIN	0 - 1000	-	50	rw	3414	-	-	-
3.6.7.10.2 CELL KI GAIN	0 - 1000	-	25	rw	3415	-	-	-
3.6.7.10.3 MAX CELL REG	0 - + par.1.3.1	rpm	200	rw	3416	-	-	-
3.6.7.10.4 MIN CELL REG	0 - - par.1.3.1	rpm	- 200	rw	3417	-	-	-
3.6.7.10.5 REG PROP DIAM	NO, YES	-	YES	rw	3420	-	-	-

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PARAMETER	RANGE min - max	Um	PRESET DEFAULT	Access type	ID MODBUS RAM (dec)	ID CAN RAM (hex)	ID PROFIBUS RAM (dec)	ID MODBUS TCP/IP RAM (dec)
3.6.7.11 CELL ALARM								
3.6.7.11.1 MAX CELL ENABLE	NO, YES	-	NO	rw	4500	-	-	-
3.6.7.11.2 MAX CELL ALARM	0.10 - par.3.6.7.5	Kg	20.00	rw	3418/3419	-	-	-
3.6.7.11.3 MAX CELL DELAY	0.01 - 30.00	s	0.10	rw	3421	-	-	-
3.6.7.11.4 OUT CELL ALARM	REMOTE, O1..O8	-	REMOTE	rw	4501	-	-	-
3.6.7.12 CELL THRESHOLD								
3.6.7.12.1 TENSION READY	0.01 - 1000.0	Kg	1.00	rw	3450/3451	-	-	-
3.6.7.12.2 TENS READY DELAY	0.01 - 30.00	s	0.10 s	rw	3422	-	-	-
3.6.7.12.3 TENS READY OUT	REMOTE, O1..O8	-	REMOTE	rw	4502	-	-	-
3.6.8 DANCER MODE								
3.6.8.1 DANCE DETECTORS								
3.6.8.1.1 DANC COMMON PAR								
3.6.8.1.1.1 DANCER SUPPLY	1 - 10000	mm	1000	rw	4503	-	-	-
3.6.8.1.1.2 DANCER OFFSET	0 - 500	mm	50	rw	4504	-	-	-
3.6.8.1.1.3 DANCE DET SOURCE	POT, SONAR	-	POT	rw	4505	-	-	-
3.6.8.1.2 SONAR								
3.6.8.1.2.1 IN SONAR BY DANC	AI1..AI9	-	AI3	rw	4506	-	-	-
3.6.8.1.2.2 MIN DIST DANC	1 - 5000	mm	100	rw	4507	-	-	-
3.6.8.1.2.3 MAX DIST DANC	1 - 5000	mm	400	rw	4508	-	-	-
3.6.8.1.2.4 DISTANCE 1	1 - 5000	mm	150	rw	4509	-	-	-
3.6.8.1.2.5 DISTANCE 2	1 - 5000	mm	300	rw	4510	-	-	-
3.6.8.1.2.6 SONAR DANCER POS	ABOVE, BELOW	-	BELOW	rw	4511	-	-	-
3.6.8.1.3 POTENTIOMETER								
3.6.8.1.3.1 IN POT BY DANC	AI1..AI9	-	AI3	rw	4512	-	-	-
3.6.8.1.3.2 AI% AT POS DOWN	0.00 - 100.00	%	0.00	rw	4513	-	-	-
3.6.8.1.3.3 AI% AT POS UP	0.00 - 100.00	%	100.00	rw	4514	-	-	-
3.6.8.2 DIAMETER SOURCE	POT, SONAR, LINE_SPEED, LINE_QUOTA,CNT+ERR	-	CNT+ERR	rw	3423	-	-	-
3.6.8.3 START DIAM MODE	MANUAL, AUTO	-	AUTO	rw	3560	-	-	-
3.6.8.4 DANCER BASE REG	0 - par.1.3.1	rpm	10	rw	3411	-	-	-
3.6.8.5 DIAM ERROR REG	0.0 par.3.6.3.14.2	mm	35.0	rw	3452/3453	-	-	-
3.6.8.6 SET DANCER POS	1.0 - 10000.0	mm	95.0	rw	3458/3459	-	-	-
3.6.8.7 SET DANCER POS2	1.0 - 10000.0	mm	25.0	rw	3460/3461	-	-	-
3.6.8.8 IN DANC POS2 SET	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4515	-	-	-
3.6.8.9 DANCER ERROR POS	1 - 90	%	50	rw	3449	-	-	-
3.6.8.10 THICKNESS CORR	0.000 - 100.000	mm	0.000	rw	3462/3463	-	-	-
3.6.8.11 DANCER ALARM								
3.6.8.11.1 UP POS ALARM EN	NO, YES	-	NO	rw	4516	-	-	-
3.6.8.11.2 MAX UP POS	1.0 - 10000.0	mm	475	rw	3550/3551	-	-	-
3.6.8.11.3 UP ALARM DELAY	0.01 - 30.00	s	0.10	rw	3454	-	-	-
3.6.8.11.4 OUT DANC ALARM	REMOTE, O1..O8	-	REMOTE	rw	4517	-	-	-
3.6.8.12 DANCER THRESHOLD								
3.6.8.12.1 DANC READY DELAY	0.01 - 30.00	s	0.10 s	rw	3457	-	-	-
3.6.8.12.2 DANC READY OUT	REMOTE, O1..O8	-	REMOTE	rw	4518	-	-	-
3.6.8.13 SIMPLE DANC PAR								
3.6.8.13.1 SPEED REG UP	0 - +par.1.3.1	rpm	1500	rw	3552	-	-	-
3.6.8.13.2 SPEED REG DOWN	0 - -par.1.3.1	rpm	- 1500	rw	3553	-	-	-
3.6.8.13.3 IN REWINDER	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4519	-	-	-
3.6.8.14 KP DANCER	0.00 - 10.00	-	2.00	rw	4520	-	-	-
3.6.9 MASTER MODE								
3.6.9.1 LINE COST FDB	DIAMETER, LINE	-	DIAMETER	rw	4521	-	-	-
3.6.9.2 DIAMETER SOURCE	POT, SONAR, LINE_SPEED, LINE_QUOTA, COUNT	-	COUNT	rw	3423	-	-	-
3.6.9.3 SET LINE SOURCE	REMOTE, AI1..AI5, OPERATOR	-	AI1	rw	4522	-	-	-
3.6.9.4 SET MAX LINE	0.10 - 2000.00	m/min	100.00	rw	3554/3555	-	-	-
3.6.9.5 LINE REGULATOR								
3.6.9.5.1 LINE COST KP	0 - 100	-	10	rw	3556	-	-	-
3.6.9.5.2 LINE COST KI	0 - 100	-	10	rw	3557	-	-	-
3.6.9.6 OPERATOR LINESET								
3.6.9.6.1 SAVE LINE OP	NO, YES	-	YES	rw	4523	-	-	-
3.6.9.6.2								-
SET	+/- par.3.6.9.4	m/min	0.00	rw	4524/4525	-	-	-
LIN	+/-2000.00	m/min	var.	rw	3588/3589	-	-	-
3.6.9.7 IN DISABLE SET	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4526	-	-	-
3.6.10 BREAK DETECTION								
NON ATTIVO								

OP * → OPERATOR-type setup importable in the menù BASIC DATA.

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PARAMETER	RANGE min - max	Um	PRESET DEFAULT	Access type	ID MODBUS RAM (dec)	ID CAN RAM (hex)	ID PROFIBUS RAM (dec)	ID MODBUS TCP/IP RAM (dec)
4. INPUT/OUTPUT								
4.1. DIGITAL INPUT								
4.1.1 INVERT I2	NO, YES	-	NO	rw	4123	-	-	-
4.1.2 INVERT I3	NO, YES	-	NO	rw	4124	-	-	-
4.1.3 INVERT I4	NO, YES	-	NO	rw	4125	-	-	-
4.1.4 INVERT I5	NO, YES	-	NO	rw	4126	-	-	-
4.1.5 INVERT I6	NO, YES	-	NO	rw	4127	-	-	-
4.1.6 INVERT I7	NO, YES	-	NO	rw	4128	-	-	-
4.1.7 INVERT I8	NO, YES	-	NO	rw	4129	-	-	-
4.1.8 INVERT I9	NO, YES	-	NO	rw	4130	-	-	-
4.1.9 INVERT I10	NO, YES	-	NO	rw	4131	-	-	-
4.1.10 INVERT I11	NO, YES	-	NO	rw	4132	-	-	-
4.1.11 INVERT I12	NO, YES	-	NO	rw	4133	-	-	-
4.1.12 INVERT I13	NO, YES	-	NO	rw	4134	-	-	-
4.1.13 INVERT I14	NO, YES	-	NO	rw	4135	-	-	-
4.2. DIGITAL OUTPUT								
4.2.1 INVERT O1	NO, YES	-	NO	rw	4136	-	-	-
4.2.2 INVERT O2	NO, YES	-	YES	rw	4137	-	-	-
4.2.3 INVERT O3	NO, YES	-	NO	rw	4138	-	-	-
4.2.4 INVERT O4	NO, YES	-	NO	rw	4139	-	-	-
4.2.5 INVERT O5	NO, YES	-	NO	rw	4140	-	-	-
4.2.6 INVERT O6	NO, YES	-	NO	rw	4141	-	-	-
4.2.7 INVERT O7	NO, YES	-	NO	rw	4142	-	-	-
4.2.8 INVERT O8	NO, YES	-	NO	rw	4143	-	-	-
4.3. ANALOG INPUT								
4.3.1 ANALOG INPUT AI1								
4.3.1.1 SCALE	+/- 300	%	100.00	rw	4144	-	-	-
4.3.1.2 OFFSET	+/- 50	%	0.00	rw	4145	-	-	-
4.3.1.3 TYPE INPUT	0/+10V, -10/+10V	-	0/+10V	rw	4146	-	-	-
4.3.2 ANALOG INPUT AI2								
4.3.2.1 SCALE	+/- 300	%	100.00	rw	4147	-	-	-
4.3.2.2 OFFSET	+/- 50	%	0.00	rw	4148	-	-	-
4.3.2.3 TYPE INPUT	0/+10V, -10/+10V, 0/20mA, 4/20mA	-	4/20mA	rw	4149	-	-	-
4.3.3 ANALOG INPUT AI3								
4.3.3.1 SCALE	+/- 300	%	100.00	rw	4150	-	-	-
4.3.3.2 OFFSET	+/- 50	%	0.00	rw	4151	-	-	-
4.3.3.3 TYPE INPUT	0/+10V, -10/+10V	-	0/+10V	rw	4152	-	-	-
4.3.4 ANALOG INPUT AI4								
4.3.4.1 SCALE	+/- 300	%	100.00	rw	4153	-	-	-
4.3.4.2 OFFSET	+/- 50	%	0.00	rw	4154	-	-	-
4.3.4.3 TYPE INPUT	0/+10V, -10/+10V	-	0/+10V	rw	4155	-	-	-
4.3.5 ANALOG INPUT AI5								
4.3.5.1 SCALE	+/- 300	%	100.00	rw	4156	-	-	-
4.3.5.2 OFFSET	+/- 50	%	0.00	rw	4157	-	-	-
4.3.5.3 TYPE INPUT	0/+10V, -10/+10V	-	0/+10V	rw	4158	-	-	-
4.3.6 ANALOG INPUT AI6								
4.3.6.1 SCALE	+/- 300	%	100.00	rw	4159	-	-	-
4.3.6.2 OFFSET	+/- 50	%	0.00	rw	4160	-	-	-
4.3.6.3 TYPE INPUT	0/+10V	-	0/+10V	rw	4161	-	-	-
4.3.7 ANALOG INPUT AI7								
4.3.7.1 SCALE	+/- 300	%	100.00	rw	4162	-	-	-
4.3.7.2 OFFSET	+/- 50	%	0.00	rw	4163	-	-	-
4.3.7.3 TYPE INPUT	0/+10V	-	0/+10V	rw	4164	-	-	-
4.3.8 ANALOG INPUT AI8								
4.3.8.1 SCALE	+/- 300	%	100.00	rw	4165	-	-	-
4.3.8.2 OFFSET	+/- 50	%	0.00	rw	4166	-	-	-
4.3.8.3 TYPE INPUT	0/+10V	-	0/+10V	rw	4167	-	-	-
4.3.9 ANALOG INPUT AI9								
4.3.9.1 SCALE	+/- 300	%	100.00	rw	4168	-	-	-
4.3.9.2 OFFSET	+/- 50	%	0.00	rw	4169	-	-	-
4.3.9.3 TYPE INPUT	0/+10V	-	0/+10V	rw	4170	-	-	-
4.4. ANALOG OUTPUT								
4.4.1. OUTPUT VARIABLES								
4.4.1.1 MOTOR CURRENT %	+/- 100.00	%	var.	ro	2078	-	-	-
4.4.1.2 SET SPEED F %	+/- 100.00	%	var.	ro	2079	-	-	-
4.4.1.3 MOTOR SPEED %	+/- 100.00	%	var.	ro	2080	-	-	-
4.4.1.4 MOTOR SPEED F %	+/- 100.00	%	var.	ro	2081	203C	74	4332
4.4.1.5 MOTOR TORQUE %	+/- 300.00	%	var.	ro	2082	-	-	
4.4.1.6 MOTOR TORQUE F %	+/- 300.00	%	var.	ro	2083	203D	75	4336
4.4.1.7 REMOTE SET 1 %	+/- 100.00	%	var.	ro	2084	-	-	-
4.4.1.8 REMOTE SET 2 %	+/- 100.00	%	var.	ro	2085	-	-	-
4.4.1.9 REMOTE SET 3 %	+/- 100.00	%	var.	ro	2086	-	-	-
4.4.1.10 REMOTE SET 4 %	+/- 100.00	%	var.	ro	2087	-	-	-
4.4.2. ANALOG OUTP. AO0								
4.4.2.1 VAR DISPLAY	1 - 10	-	1	rw	4171	-	-	-
4.4.2.2 SCALE	+/- 300.00	%	100.00	rw	4172	-	-	-
4.4.2.3 OFFSET	+/- 10.00	%	0.00	rw	4173	-	-	-
4.4.2.4 TYPE OUTPUT	DIRECT, ABS	-	DIRECT	rw	4174	-	-	-
4.4.3. ANALOG OUTP. AO1								
4.4.3.1 VAR DISPLAY	1 - 10	-	3	rw	4175	-	-	-
4.4.3.2 SCALE	+/- 300.00	%	100.00	rw	4176	-	-	-
4.4.3.3 OFFSET	+/- 10.00	%	0.00	rw	4177	-	-	-
4.4.3.4 TYPE OUTPUT	DIRECT, ABS	-	DIRECT	rw	4178	-	-	-

To store parameter in eeprom sum 10000 at the MODBUS address.

PARAMETER	RANGE min - max	Um	PRESET DEFAULT	Access type	ID MODBUS RAM (dec)	ID CAN RAM (hex)	ID PROFIBUS RAM (dec)	ID MODBUS TCP/IP RAM (dec)
4.4.4. ANALOG OUTP. AO2								
4.4.4.1 VAR DISPLAY	1 - 10	-	3	rw	4179	-	-	-
4.4.4.2 SCALE	+/- 300.00	%	100.00	rw	4180	-	-	-
4.4.4.3 OFFSET	+/- 10.00	%	0.00	rw	4181	-	-	-
4.4.4.4 TYPE OUTPUT	DIRECT, ABS	-	DIRECT	rw	4182	-	-	-
4.4.5. ANALOG OUTP. AO3								
4.4.5.1 VAR DISPLAY	1 - 10	-	5	rw	4183	-	-	-
4.4.5.2 SCALE	+/- 300.00	%	100.00	rw	4184	-	-	-
4.4.5.3 OFFSET	+/- 10.00	%	0.00	rw	4185	-	-	-
4.4.5.4 TYPE OUTPUT	DIRECT, ABS	-	DIRECT	rw	4186	-	-	-
5. SERIAL COMUNICAT								
5.1 ENABLE MODBUS	DISABLE, ENABLE	-	DISABLE	rw	258	-	-	-
5.2. MODBUS CONFIG								
5.2.1 PROTOCOL	MODBUS, ROWAN	-	MODBUS	rw	4187	-	-	-
5.2.2 ADDRESS	1 - 247	-	2	rw	4188	-	-	-
5.2.3 BAUD RATE	1200, 2400, 4800, 9600, 19200, 38400, 57600, 76800, 115200	-	9600	rw	4189	-	-	-
5.2.4 PARITY	NONE, EVEN, ODD	-	NONE	rw	4190	-	-	-
5.2.5 BIT STOP	1 - 2	-	1	rw	4191	-	-	-
5.2.6 RESET ERR. COUNT	NO, YES	-	NO	rw	601	-	-	-
5.2.7 INACTIVITY TIME	0.00 - 30.00	-	30.00	rw	602	-	-	-
5.3. ANYBUS CONFIG								
5.3.1 ANYBUS ADDRESS	0 - 250	-	0	rw	4192	-	-	-
5.3.2 CYCLIC CONFIG								
5.3.2.1 PZD1 READ	0 - 250	-	0	rw	4193	-	-	256
5.3.2.2 PZD2 READ	0 - 250	-	0	rw	4194	-	-	257
5.3.2.3 PZD3 READ	0 - 250	-	0	rw	4195	-	-	258
5.3.2.4 PZD4 READ	0 - 250	-	0	rw	4196	-	-	259
5.3.2.5 PZD5 READ	0 - 250	-	0	rw	4197	-	-	260
5.3.2.6 PZD6 READ	0 - 250	-	0	rw	4198	-	-	261
5.3.2.7 PZD7 READ	0 - 250	-	0	rw	4199	-	-	262
5.3.2.8 PZD8 READ	0 - 250	-	0	rw	4200	-	-	263
5.3.2.9 PZD1 WRITE	0 - 250	-	0	rw	4201	-	-	0
5.3.2.10 PZD2 WRITE	0 - 250	-	0	rw	4202	-	-	1
5.3.2.11 PZD3 WRITE	0 - 250	-	0	rw	4203	-	-	2
5.3.2.12 PZD4 WRITE	0 - 250	-	0	rw	4204	-	-	3
5.3.2.13 PZD5 WRITE	0 - 250	-	0	rw	4205	-	-	4
5.3.2.14 PZD6 WRITE	0 - 250	-	0	rw	4206	-	-	5
5.3.2.15 PZD7 WRITE	0 - 250	-	0	rw	4207	-	-	6
5.3.2.16 PZD8 WRITE	0 - 250	-	0	rw	4208	-	-	7
5.3.3 ETHERNET CONFIG								
5.3.3.1 DHCP Option	DISABLE, ENABLE	-	DISABLE	rw	4224	-	-	-
5.3.3.2 IP Field 1	0 - 255	-	0	rw	4225	-	-	-
5.3.3.3 IP Field 2	0 - 255	-	0	rw	4226	-	-	-
5.3.3.4 IP Field 3	0 - 255	-	0	rw	4227	-	-	-
5.3.3.5 IP Field 4	0 - 255	-	0	rw	4228	-	-	-
5.3.3.6 NETMASK Field 1	0 - 255	-	0	rw	4229	-	-	-
5.3.3.7 NETMASK Field 2	0 - 255	-	0	rw	4230	-	-	-
5.3.3.8 NETMASK Field 3	0 - 255	-	0	rw	4231	-	-	-
5.3.3.9 NETMASK Field 4	0 - 255	-	0	rw	4232	-	-	-
5.3.3.10 GATEWAY Field 1	0 - 255	-	0	rw	4233	-	-	-
5.3.3.11 GATEWAY Field 2	0 - 255	-	0	rw	4234	-	-	-
5.3.3.12 GATEWAY Field 3	0 - 255	-	0	rw	4235	-	-	-
5.3.3.13 GATEWAY Field 4	0 - 255	-	0	rw	4236	-	-	-
5.4 IN LOCAL RUN	REMOTE, I2 -14, ENABLE	-	REMOTE	rw	4237	-	-	-
PARAMETRI 100.								
100.1 MOT CONTROL TYPE	V/F, VECT_ENC	-	V/F	rw	100	203A	72	4324
100.2 RESET LAST FAULT	NO, YES	-	NO	rw	101	-	-	-
100.3 MENU OPERATOR	DEFAULT, BLOCK, OPERATOR, OP_BLOCK	-	DEFAULT	rw	4209	-	-	-
100.4 PAR.99 BLOCK	NO, YES	-	NO	rw	102	-	-	-
100.5 APPLICATION	SPEED, AXIS, REGUL, GEN_AFE, CUSTOM1, WINDER	-	SPEED	rw	103	203B	73	4328
100.6 SETUP								
100.6.1 RESTORE SETUP	DEFAULT, SETUP_1, SETUP_2	-	DEFAULT	rw	4210	-	-	-
100.6.2 ENABLE RESTORE	NO, YES	-	NO	rw	4211	-	-	-
100.6.3 SAVE SETUP	SETUP_1, SETUP_2	-	SETUP_1	rw	4212	-	-	-
100.6.4 ENABLE SAVE	NO, YES	-	NO	rw	4213	-	-	-
100.6.5 IN START RESTORE	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4214	-	-	-
100.6.6 IN RESTORE SETUP	REMOTE, I2..I14, ENABLE	-	REMOTE	rw	4215	-	-	-
100.6.7 TYPE RESTORE	FULL, QUICK	-	FULL	rw	4216	-	-	-
100.6.8 Copy KEY >> INV	0 - 100	-	0	rw	4217	-	-	-
100.6.9 Copy INV >> KEY	0 -100	-	0	rw	4218	-	-	-
100.7 ALARM SETUP								
100.7.1 ALARM PROG IN	NO, YES	-	YES	rw	4219	-	-	-
100.7.2 ALARM PROG OUT	NO, YES	-	YES	rw	4220	-	-	-

C400A INVERTER with POSITION CONTROL SYSTEM APPLICATION (AXIS)

Before to use the AXIS application, in its various function must know the Chap.1 GENERAL WARNINGS BEFORE INSTALLATION, the Chap.2 KEYBOARD OPERATING INSTRUCTIONS, and the Cap.4 QUICK INSTALLATION IN VECTOR MODE, so that the **inverter and the motor, already working in vector control with the default application (par.100.5 APPLICATION=SPEED).**
The AXIS application is active only in vector control not in scalar one, so the **par.100.1 MOT CONTROL TYPE** will have to set, in any case, with the selection **VECT_ENC**
To enable the AXIS application must set the **par.100.5 APPLICATION=AXIS.**
Each application parameter are contained in the menu **3.2 AXIS**:
- in the submenu 3.2.1 AXIS VARIABLE can be monitored the relative variuos variable function.
- in the submenu 3.2.2 COMMON PARAMETER set the parameters common in every functions: encoder resolution, program manual comands and zero search, manage counts, etc.

With AXIS application are possible the follows function:
- GEAR: MASTER/SLAVE function.
Every parameter that manages this function is contained in the menu 3.2.4 GEAR FUNCTION.
To active quickly the function GEAR, starting with the default setting:
- enable the function setting the par.3.2.2.1 FUNCTION = GEAR.
- connect the master encoder to the encoder 2 clamps.
- regulate the ratio with the par.3.2.4.3 SET RATIO SL/MS.

- POSIT: positioning function.
Every parameter that manages this function is contained in the menu 3.2.5 POSIT FUNCTION.
With this function is possible to execute 3 positioning type:
- **absolute**, set the par.3.2.5.5 IN ABS/REL POSIT = REMOTE.
Example of using: tool holder carriage
- **relative with zeroing**, set the parameters:
par.3.2.5.5 IN ABS/REL POSIT = ENABLE and the par.3.2.5.6 ENABLE REL RESET = YES
Example of using: feeder for a measure cutting.
- **relative without zeroing**, set the parameters:
par.3.2.5.5 IN ABS/REL POSIT = ENABLE and the par.3.2.5.6 ENABLE REL RESET = NO
Example of using: elevator a constant step.
To active quickly the function POSIT, starting with the default setting:
- enable the function setting the par.3.2.2.1 FUNCTION = POSIT.
- choose the relative positioning with zeroing with the par.3.2.5.6 ENABLE REL RESET = YES
- programming a input for positioning start in the par.3.2.5.14 IN START POSIT.
- set the positioning quote with the par.3.2.5.2 SET OPERATOR POS.

- FLYCUT: fly cutting function with master measurement or by command.
Every parameter that manages this function is contained in the menu 3.2.6 FLYCUT FUNC.
To active quickly the function FLYCUT, starting with the default setting:
- enable the function setting the par.3.2.2.1 FUNCTION = FLYCUT
- connect the master encoder to the encoder 2 clamps.
- program an input for the zero position sensor in the par.3.2.3.16.6 IN SENS2 PRESET.
- program an input for the start of zero research in the par.3.2.3.16.7 IN START PRESET.
- set the cut quote in the par.3.2.6.9 SET

- ZEROGEAR: MASTER/SLAVE function with phase synchronization and DIE CUTTER function (only in C400F inverters).
Every parameter that manages these functions are contained in the menu 3.2.7 ZEROGEAR FUNC.
To active quickly the MASTER/SLAVE function with phase synchronization, starting with the default setting:
- enable the function setting the par.3.2.2.1 FUNCTION = ZEROGEAR and the par.3.2.7.2 IN ZERO ENABLE = ENABLE
- connect the master encoder to the encoder 2 clamps.
- program an input for the master phase in the par.3.2.7.2 IN ZERO MASTER.
- program an input for the slave phase in the par.3.2.7.3 IN ZERO SLAVE.
- regulate the ratio with par.3.2.4.3 SET RATIO SL/MS to bring to 0 the phase error. (var.3.2.1.16 PHASE ERROR).

For further information about the AXIS application function, consult the specific manual MANU.400A.GB

C400R INVERTER with P.I.D. REGULATOR SYSTEM APPLICATION (REGULATOR)

Before to use the REGULATOR application, in its various function must know the Chap.1 GENERAL WARNINGS BEFORE INSTALLATION, the Chap.2 KEYBOARD OPERATING INSTRUCTIONS, and the Cap.4 QUICK INSTALLATION IN VECTOR MODE, so that the **inverter and the motor, already working in vector control with the default application (par.100.5 APPLICATION=SPEED).**
The REGULATOR application is active in vector control and in scalar one, so the **par.100.1 MOT CONTROL TYPE** could be set with **VECT_ENC (vettoriale) or V/F** selection.
To enable the REGULATOR application must set the **par.100.5 APPLICATION=REGULATOR.**
Every parameter that manages this function is contained in the menu **3.3 REGULATOR**:
- in the submenu 3.3.1 REGUL VARIABLE can be monitored the relative variuos variables.
- in the submenu 3.2.2 REGUL SETUP set the parameters common in every functions.
- in the submenu 3.2.3 REGUL FUNCTION set the parameters common in every functions: program manual comand, automatic, jog and the which function is active.

With REGULATOR application are possible the follows function:
- FUNC_0: **P**roportional / **I**ntegral regulator function.
Every parameter that manages this function is contained in the menu 3.3.3 REGUL. SETUP
To active quickly the function FUNC_0, starting with the default setting:
- enable the function setting the follows parameters:
  3.3.4.3 ENABLE FUNCTION = FUNC_0 e 3.3.2.1.1 SET SPEED SOURCE = REG_PI
- connect the feedback signal to the analog input AI2, 4-20mA.
- connect a potentiometer 0/+10Vdc to the analog input AI1 to regulate the set of the regulator.
- active the input I2 (AUTOMATIC) to enable the regulator control.
- stabilize the regulator with parameters 3.3.3.5 KP (proportional gain) e 3.3.3.6 KI (integral gain).

- FUNC_1: **P**roportional / **I**ntegral regulator function specific for the compressor control.
The basic parameters that manage this function are the same as the FUNC_0 contained in the menu 3.3.3 REGUL. SETUP, plus the specific parameters for the compressor control in the menu:
3.3.4.3.3 FUNCTION 1, 3.3.5 TEMP. PROTECTION, and 3.3.6 OIL PROTECTION.
The quick activation is the same as the FUNC_0, while for the complete start is necessary the specific manual MANU.400R.GB.

- FUNC_2: **P**roportional / **I**ntegral regulator function specific for the constant torque cutting system.
The basic parameters that manage this function are the same as the FUNC_0 contained in the menu 3.3.3 REGUL. SETUP, plus the specific parameters contained in the menu 3.3.4.3.4 FUNCTION 2.
The quick activation is the same as the FUNC_0, while for the complete start is necessary the specific manual MANU.400R.GB.

For further information about the REGULATOR application function, consult the specific manual MANU.400R.GB.

C400W INVERTER with WINDING / UN-WINDING SYSTEM APPLICATION (WINDER)

Before to use the WINDER application, in its various function must know the Chap.1 GENERAL WARNINGS BEFORE INSTALLATION, the Chap.2 KEYBOARD OPERATING INSTRUCTIONS, and the Cap.4 QUICK INSTALLATION IN VECTORIAL MODE, so that the **inverter and the motor, already working in vector control with the default application (par.100.5 APPLICATION=SPEED).**
The WINDER application is active only in vector control not in scalar one, so the **par.100.1 MOT CONTROL TYPE** will have to set, in any case, with the selection **VECT_ENC.**
To enable the WINDER application must set the **par.100.5 APPLICATION=WINDER.**
Each application parameter are contained in the menu **3.6 WINDER**:
- in the submenu 3.6.1 WINDER VARIABLES can be monitored the relative variables of the winding function.
- in the submenu 3.6.2 WINDER MODE can decide which type of winding function (in axis or tangent).
- in the submenu 3.6.3 COMMON PARAMETER set the parameters common in every functions: encoder resolution, program manual comand, automatic, jog, coil data, threshold/alarm on the diameter, ecc.
- in the submenu 3.6.4 DIAM DETECTORS set the parameters that configure the variuos diameter coil acquisition system (servodiameter); **for each winding function is necessary select the diameter aquisition method through the parameter DIAMETER SOURCE (3.6.6.1 - 3.6.7.1 - 3.6.8.2 - 3.6.9.2):**
- par. DIAMETER SOURCE = POT; the diameter can be read through a mechanic potentiometer feeler
- par. DIAMETER SOURCE = SONAR; the diameter can be read through a sonar or a laser.
- par. DIAMETER SOURCE = LINE_SPEED; the diameter is self-calculated based on line speed, read on analog input programmed (default analog input AI1).
- par. DIAMETER SOURCE = LINE_QUOTA; the diameter is self-calculated based on material measure of the coil through the encoder (connected to ENCODER 2 or ENCODER 3 clamps).
- par. DIAMETER SOURCE = COUNT; the diameter is self-calculated based on material thickness and the spire number of the coil.

Almost every winding function need the material speed detection of the material to wind (line speed); the system is bidirectional and following the speed sign the coil wind/unwind automatically.
The par.3.6.3.6 LINE SPEED IN permit to select the type of input uses to detect the line speed that can be an analog signal ±10Vdc (inputs AI1....AI5) or an encoder (inputs ENCODER 2 o ENCODER 3).
With the WINDER application are possible the follows winding functions:

- SPEED/TORQUE: function to regulate manually the motor parameters speed and torque (no servodiameter)
Every parameter that manages this function is contained in the menu 3.6.5 SPEED/TORQUE MODE.
To active quickly the function SPEED/TORQUE, starting with the default setting:
- enable the function setting the par.3.6.2.1 DEFAULT MODE = SPE/TOR.
- regulate the speed with a potentiometer who generates a signal from 0 to 10Vdc on the AI1 analog input.
- regulate the torque with a potentiometer who generates a signal from 0 to 10Vdc on the AI3 analog input.

- STRETCH: winding/unwinding function with constant stretch without feedback
Every parameter that manages this function is contained a menu 3.6.6 STRETCH MODE.
The function is activated setting par.3.6.2.1 DEFAULT MODE = STRETCH
The stretch can be set in various modes select through the par.3.6.6.2 STRETCH SOURCE, with a potentiometer, connected on the 0/10Vdc analog (default AI3), moto-potentiometer, parameter on inverter display, or in serial communication.
In this function is expected the transmission friction compensation (menù 3.6.6.14 FRICTION PAR.), the coil inertia compensation (menù 3.6.6.15 INERTIA PAR.), and the decreasing stretch (menù 3.6.6.16 STRETCH TREND).
Consult the winding system specific manual MANU.400W.GB, to the complete starting.

- CELL: winding/unwinding function with constant stretch with feedback by a load cell
Every parameter that manages this function is contained a menu 3.6.7 CELL MODE.
The function is activated setting par.3.6.2.1 DEFAULT MODE = CELL
The load cell signal already amplificated to 0/10Vdc must be connected to the programmed analog input in the par.3.6.6.6 CELL SOURCE.
The stretch can be set in various modes setting through the par.3.6.7.2 STRETCH SOURCE, with the potentiometer, connect on the 0/10Vdc analog input (default AI3), moto-potentiometer, parameter on inverter display, or in serial communication.
The precision and stability depend on 2 regulator PI configurable in the menu 3.6.7.9 SPEED REGULATOR. and 3.6.7.10 CELL. REGULATOR.
Consult the winding system specific manual MANU.400W.GB, to the complete starting.

- DANCER: winding/unwinding function with ansa control with a dancer
Every parameter that manages this function is contained in the menu 3.6.8 DANCER MODE.
The function is activated setting the par.3.6.2.1 DEFAULT MODE = DANCER
The dancer configuration parameters are contained in the menu 3.6.8.1 DANCE DETECTORS.
With the parameters, 3.6.8.1.1.1 DANCER SUPPLY and 3.6.8.1.1.2 DANCER OFFSET set the dancer excursion.
Through the par.3.6.8.1.1.3 DANCE DET SOURCE, can be select the following dancer ansa position detecting system:
- without touch with sonar detector or laser (configuration par. in the menu 3.6.8.1.2 SONAR).
- with potentiometer feeler with material touch (configuration par. in the menu 3.6.8.1.3 POTENTIOMETER).
In DANCER function also is possible the coil diameter auto-acquisition with the stationary line, during the dancer excursion from the lower position to the central position, for recover the material (par.3.6.8.3 START DIAM MODE = AUTO).
Exist another simplify ansa control function without servo-diameter (see the menu par.3.6.8.13 SIMPLE DANC PAR) in case of low-speed winding, where is compulsory work with the dancer in totally regulation cause the speed line reference is absent (par.3.6.3.6 LINE SPEED IN = NONE).
Consult the winding system specific manual MANU.400W.GB, to the complete starting.

- MASTER: winding/unwinding function with costant peripheral speed of the coil with the motor in axis
In this case the wind and unwind coil is **imposing** the line speed.
Every parameter that manages this function is contained in the menu 3.6.9 MASTER MODE.
The function is activated setting the par.3.6.2.1 DEFAULT MODE = MASTER
The coil peripheral speed (so the line speed) can be set in a various mode selected through the par.3.6.9.3 SET LINE SOURCE, with potentiometer connect on analg input 0/10Vdc (default AI1), on the inverter keypad or by serial communication.
According to the requirements, exist follows speed constant winding / unwinding modality, set with the par.3.6.9.1 LINE COST FDB:
- with the par.3.6.9.1 LINE COST FDB=DIAMETER, it refers to the auto acquisition diameter (is possible only in COUNT modality)
- with the par.3.6.9.1 LINE COST FDB=LINE it uses a P/I regulator that feedback the coil peripheral speed signal selecting in the par.3.6.3.6 LINE SPEED IN; the regulator gains, useful to stability the control, are contains in the menu 3.6.9.5 LINE REGULATOR.
Consult the winding system specific manual MANU.400W.GB, to the complete starting.

For further information about the WINDER application function, consult the specific manual MANU.400W.GB.

FAULT STATE: The inverter in this state, on display switch on the FAULT led and switch off the RUN led. To read the identification number of fault, selection through arrow bottom the variable 2.1.16

Common Faults list in all the C400 inverters:
LAST FAULT = 1 : the maximum current has been exceeded in the output U V W.
LAST FAULT = 2 : the BUSDC voltage ripple has been exceeded the critic value.
LAST FAULT = 4 : Short-circuit between phase-phase or phase Earth ground in U V W output, or heavy/rapid overload in the inverter output U V W.
LAST FAULT = 5 : the BUSDC voltage on the F+ and - clamps, has been exceed the instant max value.
LAST FAULT = 10 : Fault active in vector control. The intervention conditions are set in the par.1.9.6.11 e 1.9.6.12; this happens to check the encoder counter or with mechanic brake configuration (par.1.9.6.1 ENABLE MEC BRAKE=YES) on the speed threshold. Could be caused from 1) Encoder broke down, 2) Encoder board connection interrupt, 3) Overload excessive.
LAST FAULT = 11 : Output current U V W, has exceeded the set value in the par.1.14.2CURRENT LIMIT, for the time set in par.1.14.1 STALL TIME.
LAST FAULT = 12 : the maximum number of autorestart has been reached up, after fault, set in the par.1.15.2 ATTEMPTS. The numbers of autorestart done will be displayed in the variable 2.1.36 COUNT AUTORESTART.
LAST FAULT = 13 : Short circuit in the braking resistance connection on the F and F+ clamps, or value of resistance too low.
LAST FAULT = 14 : The dissipator and the power modules have exceeded 80°C
LAST FAULT = 15 : The inverter has been set with no compatible firmware.
LAST FAULT = 16 : Internal comunication error.
LAST FAULT = 17 : The motor speed (display in the var.2.1.46 ENCODER SPEED) has exceed the 10% of the value set in the parameter 1.3.1 MAX MOTOR SPEED (active only with ENC1 connect). If the problem happens in torque control of 6/8 poles motors, please contact the Rowan Elettronica technical department.
LAST FAULT = 18-19 : There is overloading on the braking resistance connect to F and F+ clamps.
18=nominal overload braking, **19**=5sec overload braking.
LAST FAULT = 20-21-22-23 : Overloading inverter on U V W output.
20=inverter overload I² 3sec, **21**=inverter overload I² 30sec, **22**=inverter overload I² 300sec,
23=inverter overload 110% In for 300sec.
LAST FAULT = 25 : indicates that FIVE consecutive faults number 4 has occurred, refer to Fault 4 description.
LAST FAULT = 30-31-32 : Overload of the motor connects on the inverter U V W output.
30=motor overload I² 30sec, **31**=motor overload I² 300sec, **32**=motor overload 110% for 300sec.
LAST FAULT = 33 : The thermic probe install in the motor (connected to the AI4 analog input) noted an overtemperature. To exclude the intervention, set the par.1.1.9 MOTOR PTC AI4=10.00V
LAST FAULT = 40 : Problem on the serial communication RS485; the communication is remained inactive for a time exceeds to a set value in the par.5.2.7 INACTIVITY TIME.
LAST FAULT = 50 : The stationary autotuning procedure (par.1.7.5 ENABLE AUTO TUN=STATIC) has been canceled cause it has determinate setting values are not reliable, probably cause the power motor is too high. Try to use the movement autotuning (par.1.7.5 ENABLE AUTO TUN=DYNAMIC)
LAST FAULT = 80-81-82-83-84-85-86 : Reporting the incompatibility of the Eeprom key C411S with the inverter at the moment of command with par.100.6 Copy KEY >> INV = 37 and prevents the paremeters transfer in the inverter.
80=Product Code, Firmware Version, Hardware Version; **81**=Product Code, Firmware Version
82=Product Code, Hardware Version; **83**=Product Code; **84**=Firmware Version, Hardware Version;
85=Firmware Version; **86**=Hardware Version.

C400A inverter fault list with the AXIS application active:
None fault planned.

C400R inverter fault list with the REGULATOR application active:
LAST FAULT = 100 : The FEEDBACK has exceeded the value set in the par.3.3.3.14.5 MIN FDB ALARM for the time in the par.3.3.3.14.8 DELAY MIN ALARM. The fault is active only with the par.3.3.3.14.1 ENABLE MIN FDB=FAULT
See the menu 3.3.3.14 REGULATOR ALARM.

LAST FAULT = 101 : The FEEDBACK has exceeded the value set in the par.3.3.3.14.6 MAX FDB ALARM for the time in the par.3.3.3.14.9 DELAY MAX ALARM. The fault is active only with the par.3.3.3.14.2 ENABLE MAX FDB= FAULT
See the menu 3.3.3.14 REGULATOR ALARM.

LAST FAULT = 102 : The FEEDBACK has exceeded the value set in the par.3.3.3.14.7 FASTMAX FDB ALAR for the initial time of the par.3.3.3.14.13 DELAY EN FASTMAX. The fault is active only with the par.3.3.3.14.3 ENAB FASTMAX FDB=FAULT
See the menu 3.3.3.14 REGULATOR ALARM.

C400W inverter fault list with the WINDER application active:
None fault planned

ALLARM STATE: The inverter is in this state when the display start to flashing the FAULT led without block anything; the number that the identify which is kind the alarm is contained in a variable who depends on the 400 inverter application.

Common Alarm list in all the C400 inverters:

var.2.1.50 INVERTER ALARM = NONE : None alarm active

var.2.1.50 INVERTER ALARM = CAP_LIFE : The capacitors of the BUSDC are at the end of the max hours suggested for the operation in safe; we suggest the revision of the inverter at Rowan Elettronica.

var.2.1.50 INVERTER ALARM = PROG_IN : Assigned more function on the same digital input. To disable the alarm set the par.100.7.1 ALARM PROG IN = NO.

var.2.1.50 INVERTER ALARM = PROG_OUT : Assigned more function on the same digital output. To disable the alarm set the par.100.7.2 ALARM PROG OUT = NO

var.2.1.50 INVERTER ALARM = STO_OPEN : Detection a supply interruption of the inverter Driver section. In the inverter with STO function, it presents with an open contact STO1 and STO2 clamps. When this alarm is active, the RUN contact is inhibited.

For the alarm AXIS_LIM, see **C400A inverter alarm list with the AXIS application active**

For the alarms COILDMIN, COILDMAX, CELLMAX, DANC UP, BREAK, see **C400W inverter alarm list with the WINDER application active.**

C400A inverter alarm list with the AXIS application active :

var.2.1.50 INVERTER ALARM = AXIS_LIM : The axis has exceeded the minimum and maximum software limits set in the parameters 3.2.5.7 MIN POSITION and 3.2.5.8 MAX POSITION.

C400R inverter alarm list with the REGULATOR application active :

var.3.3.1.3 REGULATOR ALARM = MIN_FDB : The FEEDBACK has exceeded the value set in the par.3.3.3.14.5 MIN FDB ALARM for the time in the par.3.3.3.14.8 DELAY MIN ALARM. The alarm is active only with the par.3.3.3.14.1 ENABLE MIN FDB=ALARM. See menu 3.3.3.14 REGULATOR ALARM.

var.3.3.1.3 REGULATOR ALARM = MAX_FDB : The FEEDBACK has exceeded the value set in the par.3.3.3.14.6 MAX FDB ALARM for the time in the par.3.3.3.14.9 DELAY MAX ALARM. The alarm is active only with the par.3.3.3.14.2 ENABLE MAX FDB=ALARM. See menu 3.3.3.14 REGULATOR ALARM.

var.3.3.1.3 REGULATOR ALARM = OIL_LIFE : The operation hours in RUN has been exceeded set in the par.3.3.6.1 SET OIL LIFE. The alarm can be disabled only with manual zeroing hours through the par.3.3.6.2 RESET OIL LIFE. See menu 3.3.6 OIL. PROTECTION.

var.3.3.1.3 REGULATOR ALARM =MAX_TEMP : The external probe temperature has exceeded the maximum value set in the parameter 3.3.5.3 MAX TEMPERATURE.
The alarm is active only in the FUNZIONE1; see menu 3.3.5 TEMP. PROTECTION.

var.3.3.1.3 REGULATOR ALARM =MIN_TEMP : The external probe temperature is less than -5°C.
The alarm is active only in the FUNZIONE1; see menu 3.3.5 TEMP. PROTECTION.

var.3.3.1.3 REGULATOR ALARM =FAST_MAX : The FEEDBACK has exceeded the value set in the par.3.3.3.14.7 FASTMAX FDB ALAR for the time in the par.3.3.3.14.13 DELAY EN FASTMAX. The alarm is active only with the par.3.3.3.14.3 ENAB FASTMAX FDB=ALARM. See menu 3.3.3.14 REGULATOR ALARM.

C400W inverter alarm list with the WINDER application active :

var.3.6.1.13 WINDER ALARM = NONE : None alarm active.

var.3.6.1.13 WINDER ALARM = COIL_DMIN : The coil diameter has reached up the minimum value set in the par.3.6.3.14.1 MIN DIAMETER. The alarm is active only if enable with the par.3.6.3.15.1 ENABLE DMIN = YES.

var.3.6.1.13 WINDER ALARM = COIL_DMAX : The coil diameter has reached up the minimum value set in the par.3.6.3.14.2 MAX DIAMETER. The alarm is active only if enable with the par.3.6.3.15.2 ENABLE DMAX = YES.

var.3.6.1.13 WINDER ALARM = CELL_MAX : The stretch on the material detected from the load cell, has reached up the maximum set value in the par.3.6.7.11.2 MAX CELL ALARM. The alarm is active only if enable the function CELL winding and if enable with the par.3.6.7.11.1 MAX CELL ENABLE = YES.

var.3.6.1.13 WINDER ALARM = DANC_UP : The dancer has reached up the maximum value set in the par.3.6.8.11.2 MAX UP POS. The alarm is active only if enable the function DANCER winding and if enable with the par.3.6.8.11.1 UP POS ALARM EN = YES.

Inverter setup parameters for vector motors 1st SERIES, * 4 POLES, 1500 rpm, STAR connection

MOTOR (MEC) Code		90 TGD4...	90M TGV4...	90L TGE4...	100 TGF4...	100L TGK4...	112 TGG4...	112L TGH4...	112X TGY4...	112XL TGJ4...
Nominal Power Nominal Torque		1.5 kW 10.0 Nm	2.2 kW 15.0 Nm	3.5 kW 23.5 Nm	3.0 kW 20.0 Nm	6.0 kW 40.0 Nm	4.0 kW 27.5 Nm	5.5 kW 37.5 Nm	7.5 kW 48.0 Nm	10.5 kW 70.0 Nm
INVERTER 400		/ R	/ 0	/ 1	/ 1	/ L	/ 1	/ L	/ L	/ 2
Parameters	unit									
1.1.1 LINE VOLTAGE	V	400	400	400	400	400	400	400	400	400
1.1.2 MOTOR NOM CURREN	A	4.4	6.2	9.0	8.0	13.5	10.0	13.0	15.0	22.0
1.1.3 MOTOR NOM FREQUE	Hz	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
1.1.4 MOTOR NOM VOLTAG	V	360	360	360	360	360	360	360	360	360
1.1.5 MOTOR POLES	-	4 POLES	4 POLES	4 POLES	4 POLES	4 POLES	4 POLES	4 POLES	4 POLES	4 POLES
1.1.10 MOTOR LOAD FUNC	-	NO	NO	NO	NO	NO	NO	NO	NO	NO
1.3.1 MAX MOTOR SPEED	rpm	1500	1500	1500	1500	1500	1500	1500	1500	1500
1.6.2 KP GAIN	-	25	20	20	20	25	30	35	35	45
1.6.3 KI GAIN	-	25	20	20	20	25	30	35	35	45
1.6.4 VECT MAGNET CURR	%	80.0	70.0	80.0	87.0	70.0	65.0	62.0	62.4	67.0
1.6.5 ROTOR COSTANT	Hz	12.0	13.0	15.0	14.0	8.3	5.5	7.0	4.9	5.2
1.10.15 ADAPT PERC TORQ.	%	144.0	145.0	140.0	165.0	135.0	127.0	132.0	123.4	117.5
1.10.16 ADAPT TORQ. [Nm]	%	154.0	123.0	128.0	140.0	120.0	114.0	113.0	118.0	112.5

MOTOR (MEC) Code		132 TGL4...	132L TGM4...	132XL TGN4...	160 TGP4...	160L TGR4...	160XL TGX4...
Nominal Power Nominal Torque		9.0 kW 60.0 Nm	11.0 kW 75.0 Nm	13.5 kW 90.0 Nm	15.0 kW 100.0 Nm	22.0 kW 150.0 Nm	31.0 kW 190.0 Nm
INVERTER 400		/ 2	/ 3	/ 3	/ 3	/ 3,5	/ 5
Parameters	unit						
1.1.1 LINE VOLTAGE	V	400	400	400	400	400	400
1.1.2 MOTOR NOM CURREN	A	21.0	25.0	30.0	32.0	45.0	58.0
1.1.3 MOTOR NOM FREQUE	Hz	50.0	50.0	50.0	50.0	50.0	50.0
1.1.4 MOTOR NOM VOLTAG	V	360	360	360	360	360	360
1.1.5 MOTOR POLES	-	4 POLES	4 POLES	4 POLES	4 POLES	4 POLES	4 POLES
1.1.10 MOTOR LOAD FUNC	-	NO	NO	NO	NO	NO	NO
1.3.1 MAX MOTOR SPEED	rpm	1500	1500	1500	1500	1500	1500
1.6.2 KP GAIN	-	50	50	50	50	20	50
1.6.3 KI GAIN	-	50	50	50	50	20	50
1.6.4 VECT MAGNET CURR	%	63.8	51.6	53.4	56.0	47.0	29.0
1.6.5 ROTOR COSTANT	Hz	5.6	5.4	4.4	2.7	3.9	6.6
1.10.15 ADAPT PERC TORQ.	%	117.6	122.0	115.0	115.0	110.0	111.0
1.10.16 ADAPT TORQ. [Nm]	%	100.0	103.3	97.5	102.0	103.5	110.0

* The current production (2013) of Rowan Elettronica vector motors, is made up of the 1st and 2nd SERIES:
- The vector motors of the 1st SERIES are identified by the technical characteristics described on a single label.
- The vector motors of the 2nd SERIES are identified by the technical characteristics described on two labels, they are all the motors that the Rowan Elettronica will produce from 2013 onwards, these motors will replace the 1st SERIES in end of production

Inverter setup parameters for vector motors 1st SERIES, * 4 POLES, 3000 rpm, DELTA connection

MOTOR (MEC) Code		63 TGA4...	63L TGI4...	71 TGB4...	71L TGQ4...	80 TGC4...		80L TGW4...		90 TGD4...		90M TGV4...	90L TGE4...		100 TGF4...		100L TGK4...	
Nominal Power Nominal Torque		0.28 kW 0.94 Nm	0.56 kW 1.88 Nm	0.56 kW 1.88 Nm	1.13 kW 3.75 Nm	1.13 kW 3.75 Nm		2.3 kW 7.5 Nm		2.3 kW 7.5 Nm		3.3 kW 11.0 Nm	5.3 kW 17.6 Nm		5.0 kW 15.0 Nm		9.0 kW 30.0 Nm	
INVERTER 400		/ P	/ P	/ P	/ R	/ P	/ R	/ R	/ 0	/ 0	/ 1	/ 1	/ L	/ 2	/ 1	/ L	/ 2	/ 3
Parameters	unit																	
1.1.1 LINE VOLTAGE	V	400	400	400	400	400		400		400		400	400		400		400	
1.1.2 MOTOR NOM CURREN	A	1.1	1.8	2.2	3.6	2.9		5.0	5.4	6.8		9.0	13		11.0		21.5	
1.1.3 MOTOR NOM FREQUE	Hz	100.0	100.0	100.0	100.0	100.0		100.0		100.0		100.0	100.0		100.0		100.0	
1.1.4 MOTOR NOM VOLTAG	V	410	410	410	410	410		410		410		410	410		410		410	
1.1.5 MOTOR POLES	-	4 POLES	4 POLES	4 POLES	4 POLES	4 POLES		4 POLES		4 POLES		4 POLES	4 POLES		4 POLES		4 POLES	
1.1.10 MOTOR LOAD FUNC	-	YES	YES	YES	YES	NO	YES	NO	YES	NO	YES	YES	NO	YES	NO	YES	NO	YES
1.3.1 MAX MOTOR SPEED	rpm	3000	3000	3000	3000	3000		3000		3000		3000	3000		3000	3000	3000	3000
1.6.2 KP GAIN	-	7	13	21	25	50	31	56	40	40	22	20	25	16	45	36	33	25
1.6.3 KI GAIN	-	7	13	21	25	50	31	56	40	40	22	20	25	16	45	36	33	25
1.6.4 VECT MAGNET CURR	%	87.0	85.0	85.0	81.8	74.0		64.0		75.0		75.0	80.0		73.0		82.0	
1.6.5 ROTOR COSTANT	Hz	65.0	30.0	15.0	10.5	10.2	16.3	7.7	11.0	8.0	14.0	12.5	9.6	14.9	8.0	9.8	6.3	8.1
1.10.15 ADAPT PERC TORQ.	%	245.0	173.0	172.4	144.9	128.5	130.6	131.7	143.0	150.0	150.0	149.0	155.0	154.3	140.0	139.6	145.0	144.4
1.10.16 ADAPT TORQ. [Nm]	%	100.0	76.3	67.8	61.2	75.6	63.0	73.7	70.0	56.8	53.9	59.5	63.0	62.3	62.5	56.8	61.0	56.9

MOTOR (MEC) Code		112 TGG4...		112L TGH4...		112X TGX4...		112XL TGJ4...		132 TGL4...		132L TGM4...		132XL TGN4...		160 TGP4...	160L TGR4...		160XL TGK4...	
Nominal Power Nominal Torque		6.0 kW 21.0 Nm		8.5 kW 28.0 Nm		10.8 kW 36.0 Nm		16.0 kW 53.0 Nm		14.0 kW 45.0 Nm		16.5 kW 56.0 Nm		20.0 kW 67.0 Nm		23.0 kW 75.0 Nm	34.0 kW 113.0 Nm		42.0 kW 143.0 Nm	
INVERTER 400		/ L	/ 2	/ 2	/ 3	/ 2	/ 3	/ 3	/ 3,5	/ 3	/ 3,5	/ 3	/ 3,5	/ 3,5	/ 5	/ 5	/ 6	/ 6,5	/ 6,5	/ 7
Parameters	unit																			
1.1.1 LINE VOLTAGE	V	400		400		400		400		400		400		400		400	400		400	
1.1.2 MOTOR NOM CURREN	A	14.7		20.0		22.0		34.0		30.0		34.0		44.0		48.0	72.0		75.0	
1.1.3 MOTOR NOM FREQUE	Hz	100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0	100.0		100.0	
1.1.4 MOTOR NOM VOLTAG	V	410		410		410		410		410		410		410		410	410		410	
1.1.5 MOTOR POLES	-	4 POLES		4 POLES		4 POLES		4 POLES		4 POLES		4 POLES		4 POLES		4 POLES	4 POLES		4 POLES	
1.1.10 MOTOR LOAD FUNC	-	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	YES	NO	YES	NO	YES
1.3.1 MAX MOTOR SPEED	rpm	3000		3000		3000		3000		3000		3000		3000		3000	3000		3000	
1.6.2 KP GAIN	-	50	32	45	34	35	27	45	26	50	29	50	32	50	42	42	30	25	50	41
1.6.3 KI GAIN	-	50	32	45	34	35	27	45	26	50	29	50	32	50	42	42	30	25	50	41
1.6.4 VECT MAGNET CURR	%	77.0		75.0		70.9		78.0		72.0		53.8		66.0		66.0	64.2		37.0	
1.6.5 ROTOR COSTANT	Hz	4.7	7.3	6.5	8.4	4.4	5.7	4.3	7.3	4.6	7.8	3.2	4.9	4.5	5.2	4.2	3.9	4.8	5.6	6.7
1.10.15 ADAPT PERC TORQ.	%	153.0	151.7	145.0	144.0	125.5	124.9	151.0	150.4	135.5	135.1	116.0	115.2	123.5	122.6	124.0	126.3	125.7	103.0	100.0
1.10.16 ADAPT TORQ [Nm]	%	65.0	64.7	61.0	56.9	61.9	57.7	66.0	70.0	57.5	60.5	54.0	51.0	57	55.8	57.9	61.6	61.2	57.0	55.0

* The current production (2013) of Rowan Elettronica vector motors, is made up of the 1st and 2nd SERIES:
- The vector motors of the 1st SERIES are identified by the technical characteristics described on a single label.
- The vector motors of the 2nd SERIES are identified by the technical characteristics described on two labels, they are all the motors that the Rowan Elettronica will produce from 2013 onwards, these motors will replace the 1st SERIES in end of production

Inverter setup parameters for vector motors 2nd SERIES, * 4 POLES, 1500 rpm, STAR connection

MOTOR (MEC) Code		63 TGA4...	63L TGI4...	71 TGB4...	71L TGQ4...	80 TGC4...	80L TGW4...	90 TGD4...	90M TGV4...	90M TGV4...	90L TGE4...	90L TGE4...	100 TGF4...	100L TGK4...	
Version		2	2	2	2	2	2	2	1	2	1	2	1	2	
Nominal Power Nominal Torque		0.25 kW 1.6 Nm	0.5 kW 3.2 Nm	0.6 kW 3.8 Nm	1.15 kW 7.3 Nm	1.2 kW 7.6 Nm	1.75 kW 11.2 Nm	1.9 kW 12.1 Nm	2.4 kW 15.3 Nm	2.7 kW 17.2 Nm	3.5 kW 22.3 Nm	3.7 kW 23.6 Nm	3.3 kW 21.0 Nm	6.3 kW 40.1 Nm	6.6 kW 42.0 Nm
INVERTER 400		/ P	/ P	/ P	/ R	/ R	/ R	/ R	/ 0	/ 0	/ 1	/ 0M	/ 0M	/ L	/ 2
Parameters	unit														
1.1.1 LINE VOLTAGE	V	400	400	400	400	400	400	400	400	400	400	400	400	400	400
1.1.2 MOTOR NOM CURREN	A	1.2	1.9	1.8	3.2	3.0	4.6	4.9	6.3	6.6	8.8	8.7	7.6	14.8	16.2
1.1.3 MOTOR NOM FREQUE	Hz	57.3	57.0	54.5	54.6	53.4	54.4	54.2	54.6	54.2	53.9	53.3	53.2	52.6	52.7
1.1.4 MOTOR NOM VOLTAG	V	345	357	365	368	365	356	378	384	385	396	392	380	379	385
1.1.5 MOTOR POLES	-	4 POLES	4 POLES	4 POLES	4 POLES	4 POLES	4 POLES	4 POLES	4 POLES	4 POLES	4 POLES	4 POLES	4 POLES	4 POLES	4 POLES
1.1.10 MOTOR LOAD FUNC	-	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
1.3.1 MAX MOTOR SPEED	rpm	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
1.6.2 KP GAIN	-	5	10	15	15	20	50	50	50	50	45	50	50	40	35
1.6.3 KI GAIN	-	5	10	15	15	20	50	50	50	50	45	50	50	40	35
1.6.4 VECT MAGNET CURR	%	79.2	80.6	74.4	71.9	68.0	68.7	60.0	66.7	66.7	67.0	65.0	75.0	61.7	61.7
1.6.5 ROTOR COSTANT	Hz	70.7	41.2	25.7	23.1	19.7	12.7	13.5	16.0	14.5	18.9	11.2	11.0	8.5	12.8
1.6.13.1 KP ID REGULATOR	-	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
1.6.13.2 KI ID REGULATOR	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1.6.13.3 KP IQ REGULATOR	-	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
1.6.13.4 KI IQ REGULATOR	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1.7.2 STATOR L	mH	538.2	372.6	461.3	301.5	327.1	198.4	197.1		153.4	127.1	121.1	136.0	81.7	
1.7.3 ROTOR L	mH	538.2	372.6	461.3	301.5	327.1	198.4	197.1		153.4	127.1	121.1	136.0	81.7	
1.7.4 MUTUAL INDUCT	mH	467.7	338.6	409.3	274.6	306.7	188.2	185.0		146.1	120.3	114.9	128.1	78.0	
1.10.15 ADAPT PERC TORQ.	%	163.8	168.9	149.7	144.9	135.7	135.1	125.7	142.5	130.0	136.6	138.0	139.0	129.0	126.4
1.10.16 ADAPT TORQ. [Nm]	%	88.7	115.6	128.4	123.9	129.8	121.5	116.0	121.2	118.0	113.0	138.5	142.0	104.5	97.8
1.12.1 PWM FREQUENCY	kHz	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00

MOTOR (MEC) Code		112 TGG4...	112L TGH4...	112X TGY4...	112XL TGJ4...	132 TGL4...		132L TGM4...	132XL TGN4...	160R TGT4...	160 TGP4...	160L TGR4...	160XL TGX4...	180 TGO4...	200 TGS4...
Version		1	2	5	2	2		2	2	2	2	4	1	2	2
Nominal Power Nominal Torque		4.6 kW 29.3 Nm	6.2 kW 39.5 Nm	7.2 kW 45.8 Nm	8.2 kW 52.2 Nm	9.7 kW 61.8 Nm	11.0 kW 70.0 Nm	13.0 kW 82.8 Nm	15.0 kW 95.5 Nm	10.0 kW 63.7 Nm	19.0 kW 121.0 Nm	22.5 kW 143.0 Nm	29.5 kW 187.8 Nm	37.0 kW 236.0 Nm	55.0 kW 350.0 Nm
INVERTER 400		/ 1	/ L	/ 2	/ 2	/ 2	/ 2,5	/ 2,5	/ 3	/ 2	/ 3,5	/ 5	/ 5	/ 6,5	/ 8
Parameters	unit														
1.1.1 LINE VOLTAGE	V	400	400	400	400	400	400	400	400	400	400	400	400	400	400
1.1.2 MOTOR NOM CURREN	A	10.8	14.0	17.6	21.9	22.0	23.7	28.5	34.1	22	44.3	49.0	60.0	87	120
1.1.3 MOTOR NOM FREQUE	Hz	52.6	52.2	52.2	51.9	52.7	52.0	51.7	51.5	51.2	51.3	51.1	51.2	51.1	51.1
1.1.4 MOTOR NOM VOLTAG	V	386	388	385	348	363	369	357	366	383	359	384	410	360	363
1.1.5 MOTOR POLES	-	4 POLES	4 POLES	4 POLES	4 POLES	4 POLES	4 POLES	4 POLES	4 POLES	4 POLES	4 POLES	4 POLES	4 POLES	4 POLES	4 POLES
1.1.10 MOTOR LOAD FUNC	-	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
1.3.1 MAX MOTOR SPEED	rpm	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
1.6.2 KP GAIN	-	50	50	50	50	50	41	51	50	50	50	50	50	50	50
1.6.3 KI GAIN	-	50	50	50	50	50	41	51	50	50	50	50	50	50	50
1.6.4 VECT MAGNET CURR	%	55.0	60.7	66.5	66.7	45.0	45.5	47.0	54.5	50.0	58.9	52.4	41.6	50	45
1.6.5 ROTOR COSTANT	Hz	9.4	7.0	9.6	6.6	4.5	6.9	5.0	4.3	3.8	4.6	4.0	3.7	3.3	3.4
1.6.13.1 KP ID REGULATOR	-	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.6
1.6.13.2 KI ID REGULATOR	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.06
1.6.13.3 KP IQ REGULATOR	-	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.6
1.6.13.4 KI IQ REGULATOR	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.06
1.7.2 STATOR L	mH	109.2	79.8	63.9	48.0	51.3		43.6	37.7	62.6	31.0	31.1	27.6	15.3	11.5
1.7.3 ROTOR L	mH	109.2	79.8	63.9	48.0	51.3		43.6	37.7	62.6	31.0	31.1	27.6	15.3	11.5
1.7.4 MUTUAL INDUCT	mH	101.3	76.0	61.0	46.1	49.6		53.6	36.4	59.4	29.4	29.9	26.5	14.7	11.2
1.10.15 ADAPT PERC TORQ.	%	122.5	127.2	130.0	131.0	108.5	112.8	113.3	121.7	110.0	133.5	122.5	120.5	113.0	110.0
1.10.16 ADAPT TORQ. [Nm]	%	108.5	106.8	101.0	93.0	90.8	102.6	101.4	95.8	95.0	97.7	106.8	112.5	88.0	88.5
1.12.1 PWM FREQUENCY	kHz	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00

* The current production (2013) of Rowan Elettronica vector motors, is made up of the 1st and 2nd SERIES:
- The vector motors of the 1st SERIES are identified by the technical characteristics described on a single label.
- The vector motors of the 2nd SERIES are identified by the technical characteristics described on two labels, they are all the motors that the Rowan Elettronica will produce from 2013 onwards, these motors will replace the 1st SERIES in end of production

Inverter setup parameters for vector motors 2nd SERIES, * 4 POLES, 3000 rpm, DELTA connection

MOTOR (MEC) Code		63 TGA4...	63L TGI4...	71 TGB4...	71L TGQ4...	80 TGC4...	80L TGW4...	90 TGD4...	90M TGV4...	90M TGV4...	90L TGE4...		90L TGE4...		100 TGF4...	100L TGK4...
Version		2	2	2	2	2	2	2	1	2	1		2		1	2
Nominal Power Nominal Torque		0.44 kW 1.4 Nm	0.94 kW 3.0 Nm	1.13 kW 3.6 Nm	1.9 kW 6.1 Nm	2.0 kW 6.4 Nm	2.9 kW 9.2 Nm	3.3 kW 10.5 Nm	3.8 kW 12.1 Nm	4.3 kW 13.7 Nm	5.5 kW 17.5 Nm		6.2 kW 19.7 Nm		5.8 kW 18.5 Nm	10.7 kW 34.1 Nm
INVERTER 400		/ P	/ R	/ P	/ R	/ R	/ 0M	/ 0M	/ 1	/ 1	/ L	/ 2	/ L	/ 2	/ L	/ 2,5
Parameters	unit															
1.1.1 LINE VOLTAGE	V	400	400	400	400	400	400	400	400	400	400		400		400	400
1.1.2 MOTOR NOM CURREN	A	1.9	3.2	3.0	4.8	4.7	7.2	7.7	9.8	10.7	13.7		14.5		12.7	23.6
1.1.3 MOTOR NOM FREQUE	Hz	106.8	106.9	105.0	104.4	103.7	103.2	103.6	102.9	102.7	103.3		102.9		102.5	102.4
1.1.4 MOTOR NOM VOLTAG	V	336	351	397	389	410	375	400	419	421	413		412		423	407
1.1.5 MOTOR POLES	-	4 POLES	4 POLES	4 POLES	4 POLES	4 POLES	4 POLES	4 POLES	4 POLES	4 POLES	4 POLES		4 POLES		4 POLES	4 POLES
1.1.10 MOTOR LOAD FUNC	-	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES		YES		YES	YES
1.3.1 MAX MOTOR SPEED	rpm	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000		3000		3000	3000
1.6.2 KP GAIN	-	20	33	50	50	50	50	50	50	50	54	35	78	50	50	51
1.6.3 KI GAIN	-	20	33	50	50	50	50	50	50	50	54	35	78	50	50	51
1.6.4 VECT MAGNET CURR	%	85.0	80.0	75.0	70.0	78.7	69.4	72.0	80.0	79.0	70.0		65.5		77.0	64.8
1.6.5 ROTOR COSTANT	Hz	47.4	42.0	20.0	15.0	15.0	13.5	14.6	13.0	17.0	12.4	19.3	9.6	15.0	11.0	9.8
1.6.13.1 KP ID REGULATOR	-	0.95	0.95	0.95	0.95	0.45	0.45	0.95	0.95	0.95	0.95		0.95		0.95	0.95
1.6.13.2 KI ID REGULATOR	-	0.1	0.1	0.1	0.1	0.045	0.045	0.1	0.1	0.1	0.1		0.1		0.1	0.1
1.6.13.3 KP IQ REGULATOR	-	0.95	0.95	0.95	0.95	0.45	0.45	0.95	0.95	0.95	0.95		0.95		0.95	0.95
1.6.13.4 KI IQ REGULATOR	-	0.1	0.1	0.1	0.1	0.045	0.045	0.1	0.1	0.1	0.1		0.1		0.1	0.1
1.7.2 STATOR L	mH	179.4	124.2	153.8	100.5	109.0	66.1	65.7		51.1	42.4		40.4		45.3	27.2
1.7.3 ROTOR L	mH	179.4	124.2	153.8	100.5	109.0	66.1	65.7		51.1	42.4		40.4		45.3	27.2
1.7.4 MUTUAL INDUCT	mH	155.9	112.9	136.4	91.5	102.2	62.7	61.7		48.7	40.1		38.3		42.7	26.0
1.10.15 ADAPT PERC TORQ.	%	189.9	158.0	151.2	135.5	156.3	133.5	140.0	164.0	163.5	136.5	136.7	130.0	130.0	144.5	129.7
1.10.16 ADAPT TORQ. [Nm]	%	56.8	56.5	73.7	65.0	80.0	63.5	71.0	68.5	66.0	52.0	52.0	52.7	52.5	63.0	57.7
1.12.1 PWM FREQUENCY	kHz	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00

MOTOR (MEC) Code		112 TGG4...	112L TGH4...		112X TGY4...	112XL TGJ4...		132 TGL4...		132L TGM4...	132XL TGN4...	160R TGT4...	160 TGP4...		160L TGR4...		160XL TGX4...	180 TGO4...		200 TGS4...
Version		1	2		5	2		2		2	2	2	2		4		1	2		2
Nominal Power Nominal Torque		7.7 kW 24.5 Nm	9.5 kW 30.2 Nm		11.0 kW 35.0 Nm	12.5 kW 39.8 Nm		16.5 kW 52.5 Nm		17.5 kW 55.7 Nm	20.0 kW 63.7 Nm	16.0 kW 50.9 Nm	28.5 kW 90.7 Nm		33.7 kW 107.3 Nm		44.0 kW 140.0 Nm	54.0 kW 169.0 Nm		75.0 kW 238.0 Nm
INVERTER 400		/ 2	/ 2	/ 3	/ 2,5	/ 3	/ 3,5	/ 3	/ 3,5	/ 3,5	/ 5	/ 3	/ 6	/ 6,5	/ 6	/ 6,5	/ 7	/ 8	/ 8,5	/ 8,5
Parameters	unit																			
1.1.1 LINE VOLTAGE	V	400	400		400	400		400		400	400	400	400		400		400	400		400
1.1.2 MOTOR NOM CURREN	A	17.5	21.2		25.7	32.6		35.5		38.5	47.5	33.4	64.5		71.0		89.5	125.0		165.0
1.1.3 MOTOR NOM FREQUE	Hz	102.0	101.8		101.7	101.6		101.4		101.1	101.0	101.0	101.3		100.8		100.9	100.8		100.8
1.1.4 MOTOR NOM VOLTAG	V	429	418		411	377		416		403	409	426	410		428		467	402		363
1.1.5 MOTOR POLES	-	4 POLES	4 POLES		4 POLES	4 POLES		4 POLES		4 POLES	4 POLES	4 POLES	4 POLES		4 POLES		4 POLES	4 POLES		4 POLES
1.1.10 MOTOR LOAD FUNC	-	YES	YES		YES	YES		YES		YES	YES	YES	YES		YES		YES	YES		YES
1.3.1 MAX MOTOR SPEED	rpm	3000	3000		3000	3000		3000		3000	3000	3000	3000		3000		3000	3000		3000
1.6.2 KP GAIN	-	50	64	50	51	76	50	76	50	50	50	50	61	50	37	50	50	50	50	50
1.6.3 KI GAIN	-	50	64	50	51	76	50	76	50	50	50	50	61	50	37	50	50	50	50	50
1.6.4 VECT MAGNET CURR	%	63.0	63.2		71.6	72.0		58.0		68.0	70.7	60	67.4		59.0		51.7	50.0		45
1.6.5 ROTOR COSTANT	Hz	9.8	6.7	8.7	7.0	5.4	8.2	4.1	6.3	4.7	5.1	3.2	3.6	4.5	3.2	3.6	4.1	3.4	4.0	2.4
1.6.13.1 KP ID REGULATOR	-	0.95	0.95		0.45	0.45		0.6		0.6	0.45	0.45	0.45		0.45		0.95	0.33		0.33
1.6.13.2 KI ID REGULATOR	-	0.1	0.1		0.045	0.045		0.06		0.06	0.045	0.045	0.045		0.045		0.1	0.033		0.033
1.6.13.3 KP IQ REGULATOR	-	0.95	0.95		0.45	0.45		0.6		0.6	0.45	0.45	0.45		0.45		0.95	0.33		0.33
1.6.13.4 KI IQ REGULATOR	-	0.1	0.1		0.045	0.045		0.06		0.06	0.045	0.045	0.045		0.045		0.1	0.033		0.033
1.7.2 STATOR L	mH	36.4	26.6		21.3	16.0		17.1		14.5	12.6	20.9	10.3		10.4		9.2	5.1		3.8
1.7.3 ROTOR L	mH	36.4	26.6		21.3	16.0		17.1		14.5	12.6	20.9	10.3		10.4		9.2	5.1		3.8
1.7.4 MUTUAL INDUCT	mH	33.8	25.3		20.3	15.4		16.5		17.9	12.1	19.8	9.8		10.0		8.8	4.9		3.7
1.10.15 ADAPT PERC TORQ.	%	136.6	134.8	134.9	141.7	151.1	151.2	143.2	143.5	145.5	148.5	130	134.8	135.5	119.0	130.0	143.0	118.5	119.0	116.0
1.10.16 ADAPT TORQ. [Nm]	%	57.1	57.3	54.4	59.4	52.1	49.7	59.8	57.0	56.4	59.5	55.8	55.0	54.8	52.3	57.5	64.3	44.0	44.0	46.3
1.12.1 PWM FREQUENCY	kHz	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00

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- The vector motors of the 1st SERIES are identified by the technical characteristics described on a single label.
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Inverter setup parameters for vector motors 2 POLES, 3000 rpm, STAR connection

MOTOR (MEC) Code		90 TGD2...	90M TGV2...	90L TGE2...	100 TGF2...	100L TGK2...	112 TGG2...	112L TGH2...	112X TGY2...	112XL TGJ2...
Version		1	1	2	1	1	2	1	2	2
Nominal Power Nominal Torque		2.0 kW 6.4 Nm	3.3 kW 10.5 Nm	4.5 kW 14.3 Nm	4.0 kW 12.7 Nm	7.5 kW 23.9 Nm	6.0 kW 19.1 Nm	8.3 kW 24.5 Nm	9.8 kW 31.2 Nm	11.2 kW 35.7 Nm
INVERTER 400		/ R	/ 0	/ 1	/ 0M	/ L	/ 1	/ 2	/ 2	/ 2,5
Parameters	unit									
1.1.1 LINE VOLTAGE	V	400	400	400	400	400	400	400	400	400
1.1.2 MOTOR NOM CURREN	A	4.2	7	9.4	9	15	12	17.7	20.6	23.4
1.1.3 MOTOR NOM FREQUE	Hz	53.4	52.5	52.0	52.2	51.6	51.6	51.5	51.2	51.0
1.1.4 MOTOR NOM VOLTAG	V	427	420	416	418	407	413	391	395	398
1.1.5 MOTOR POLES	-	2 POLES	2 POLES	2 POLES	2 POLES	2 POLES	2 POLES	2 POLES	2 POLES	2 POLES
1.1.10 MOTOR LOAD FUNC	-	NO	NO	NO	NO	NO	NO	NO	NO	NO
1.3.1 MAX MOTOR SPEED	rpm	3000	3000	3000	3000	3000	3000	3000	3000	3000
1.6.2 KP GAIN	-	50	50	40	50	50	50	50	50	51
1.6.3 KI GAIN	-	50	50	40	50	50	50	50	50	51
1.6.4 VECT MAGNET CURR	%	45.2	50.0	42.6	50.0	46.6	43.3	46.9	49.5	50.8
1.6.5 ROTOR COSTANT	Hz	12.5	7.6	8.6	6.8	4.5	4.7	5.8	4.1	3.8
1.6.13.1 KP ID REGULATOR	-	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
1.6.13.2 KI ID REGULATOR	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1.6.13.3 KP IQ REGULATOR	-	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
1.6.13.4 KI IQ REGULATOR	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1.7.2 STATOR L	mH	473.4	262.7	192.8	235.5	124.4	127.9	119.4	115.6	71.4
1.7.3 ROTOR L	mH	473.4	262.7	192.8	235.5	124.4	127.9	119.4	115.6	71.4
1.7.4 MUTUAL INDUCT	mH	458.6	253.5	187.3	229.9	120.8	122.7	116	113.3	69.5
1.10.15 ADAPT PERC TORQ.	%	126	125.5	123.5	128.5	121.2	117.5	116.6	117.7	123.3
1.10.16 ADAPT TORQ. [Nm]	%	72	65.9	61.0	81.5	57.6	61.0	52.0	53.2	57.9
1.12.1 PWM FREQUENCY	kHz	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00

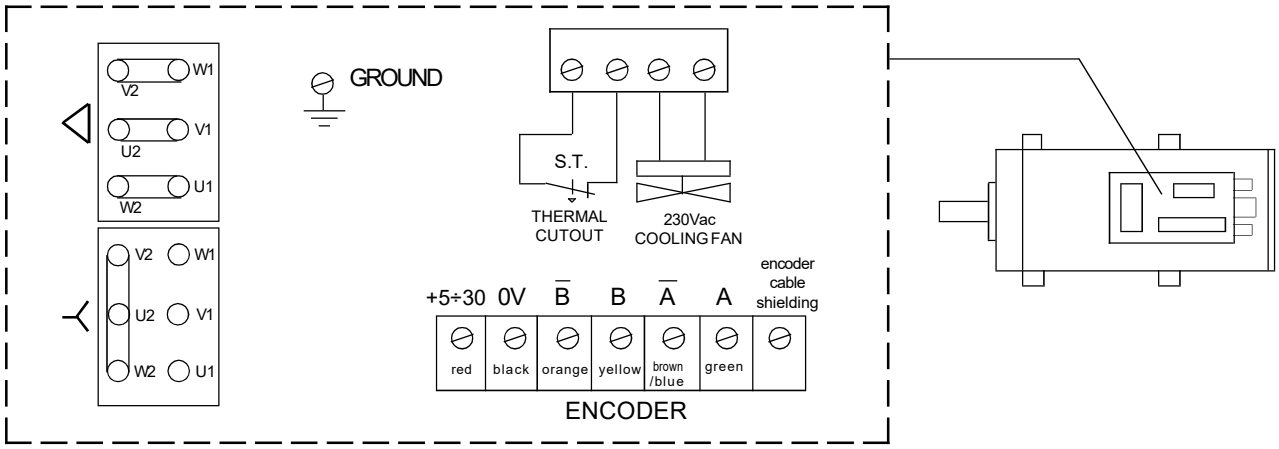
MOTOR (MEC) Code		132 TGL2...	132L TGM2...	132XL TGN2...	160R TGT2...	160 TGP2...	160L TGR2...	160XL TGX2...	180 TGO2...	200 TGS2...
Version		1	1	1	1	2	2	5	1	1
Nominal Power Nominal Torque		12.0 kW 38.2 Nm	14.0 kW 44.6 Nm	20.0 kW 63.7 Nm	12.5 kW 39.8 Nm	19.5 kW 62.1 Nm	26.5 kW 84.4 Nm	39.0 kW 124.1 Nm	48.0 kW 152.7 Nm	65.0 kW 207.0 Nm
INVERTER 400		/ 2,5	/ 2,5	/ 3,5	-	/ 3,5	/ 5	/ 6,5	-	-
Parameters	unit									
1.1.1 LINE VOLTAGE	V	400	400	400	-	400	400	400	-	-
1.1.2 MOTOR NOM CURREN	A	24.5	28.2	40.6	-	39.5	53.5	82.0	-	-
1.1.3 MOTOR NOM FREQUE	Hz	51.3	51.2	50.9	-	51.0	50.8	50.8	-	-
1.1.4 MOTOR NOM VOLTAG	V	390	410	407	-	408	381	406	-	-
1.1.5 MOTOR POLES	-	2 POLES	2 POLES	2 POLES	-	2 POLES	2 POLES	2 POLES	-	-
1.1.10 MOTOR LOAD FUNC	-	NO	NO	NO	-	NO	NO	NO	-	-
1.3.1 MAX MOTOR SPEED	rpm	3000	3000	3000	-	3000	3000	3000	-	-
1.6.2 KP GAIN	-	46	51	50	-	50	50	50	-	-
1.6.3 KI GAIN	-	46	51	50	-	50	50	50	-	-
1.6.4 VECT MAGNET CURR	%	43.7	44.7	58.0	-	57.2	47.5	31.1	-	-
1.6.5 ROTOR COSTANT	Hz	4.6	2.9	3.7	-	3.7	2.7	2.9	-	-
1.6.13.1 KP ID REGULATOR	-	0.95	0.95	0.95	-	0.95	0.95	0.95	-	-
1.6.13.2 KI ID REGULATOR	-	0.1	0.1	0.1	-	0.1	0.1	0.1	-	-
1.6.13.3 KP IQ REGULATOR	-	0.95	0.95	0.95	-	0.95	0.95	0.95	-	-
1.6.13.4 KI IQ REGULATOR	-	0.1	0.1	0.1	-	0.1	0.1	0.1	-	-
1.7.2 STATOR L	mH	86.9	80.6	56.0	-	62.8	41.5	37.2	-	-
1.7.3 ROTOR L	mH	86.9	80.6	56.0	-	62.8	41.5	37.2	-	-
1.7.4 MUTUAL INDUCT	mH	85.1	79.2	55.0	-	61.5	40.7	36.5	-	-
1.10.15 ADAPT PERC TORQ.	%	118.6	121.8	141.5	-	138.0	119.5	129.0	-	-
1.10.16 ADAPT TORQ. [Nm]	%	57.0	59.3	59.5	-	58.2	56.3	55.6	-	-
1.12.1 PWM FREQUENCY	kHz	5.00	5.00	5.00	-	5.00	5.00	5.00	-	-

Inverter setup parameters for vector motors
2 POLES, 5000 rpm, DELTA connection

MOTOR (MEC) Code		90 TGD2...	90M TGV2...	90L TGE2...	100 TGF2...	100L TGK2...	112 TGG2...	112L TGH2...	112X TGY2...	112XL TGJ2...	
Version		1	1	2	1	1	2	1	2	2	
Nominal Power Nominal Torque		3.0 kW 5.7 Nm	5.5 kW 10.5 Nm	6.5 kW 12.4 Nm	6.0 kW 11.5 Nm	11.0 kW 21.0 Nm	9.0 kW 17.2 Nm	12.0 kW 22.9 Nm	13.5 kW 25.8 Nm	14.5 kW 27.7 Nm	
INVERTER 400		/ 0	/ 1	/ L	/ L	/ 2,5	/ 2	/ 2,5	/ 2,5	/ 3	/ 3,5
Parameters	unit										
1.1.1 LINE VOLTAGE	V	400	400	400	400	400	400	400	400	400	
1.1.2 MOTOR NOM CURREN	A	6.2	12.0	14.0	14.0	22.8	19.2	26.2	29.7	33.8	
1.1.3 MOTOR NOM FREQUE	Hz	86.1	85.7	85.2	85.1	84.8	84.7	84.7	84.4	84.1	
1.1.4 MOTOR NOM VOLTAG	V	398	392	394	394	376	392	367	369	367	
1.1.5 MOTOR POLES	-	2 POLES	2 POLES	2 POLES	2 POLES	2 POLES	2 POLES	2 POLES	2 POLES	2 POLES	
1.1.10 MOTOR LOAD FUNC	-	YES	NO	YES	YES	NO	YES	NO	YES	YES	
1.3.1 MAX MOTOR SPEED	rpm	5000	5000	5000	5000	5000	5000	5000	5000	5000	
1.6.2 KP GAIN	-	50	50	50	50	51	50	46	51	76	50
1.6.3 KI GAIN	-	50	50	50	50	51	50	46	51	76	50
1.6.4 VECT MAGNET CURR	%	54.8	52.5	50.0	53.6	50.9	54.7	48.1	56.2	61.2	
1.6.5 ROTOR COSTANT	Hz	9.5	7.2	6.1	6.4	5.6	4.8	4.3	2.9	2.5	3.8
1.6.13.1 KP ID REGULATOR	-	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	
1.6.13.2 KI ID REGULATOR	-	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	
1.6.13.3 KP IQ REGULATOR	-	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	
1.6.13.4 KI IQ REGULATOR	-	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	
1.7.2 STATOR L	mH	157.8	87.6	64.3	78.5	41.5	42.6	39.8	38.5	23.8	
1.7.3 ROTOR L	mH	157.8	87.6	64.3	78.5	41.5	42.6	39.8	38.5	23.8	
1.7.4 MUTUAL INDUCT	mH	152.9	84.5	62.4	76.6	40.3	40.9	38.7	37.8	23.2	
1.10.15 ADAPT PERC TORQ.	%	115.0	122.0	124.5	130.5	114.1	119.0	114.9	117.1	133.5	134.2
1.10.16 ADAPT TORQ. [Nm]	%	37.5	35.0	32.7	32.0	32.4	32.0	30.9	31.3	30.9	29.6
1.12.1 PWM FREQUENCY	kHz	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00

MOTOR (MEC) Code		132 TGL2...	132L TGM2...	132XL TGN2...		160R TGT2...	160 TGP2...		160L TGR2...		160XL TGX2...		180 TGO2...	200 TGS2...
Version		1	1	1		1	2		2		5		1	1
Nominal Power Nominal Torque		16.5 kW 31.5 Nm	18.0 kW 35.3 Nm	26.0 kW 49.7 Nm		19.0 kW 36.3 Nm	25.0 kW 47.8 Nm		32.0 kW 61.1 Nm		50.0 kW 95.5 Nm		60.0 kW 114.6 Nm	80.0 kW 153.0 Nm
INVERTER 400		/ 3,5	/ 3,5	/ 5	/ 6	-	/ 5	/ 6	/ 6	/ 6,5	/ 7	/ 8	-	-
Parameters	unit													
1.1.1 LINE VOLTAGE	V	400	400	400		-	400		400		400		-	-
1.1.2 MOTOR NOM CURREN	A	36.2	40.9	57.8	57.0	-	55.3		72.0	73.3	106		-	-
1.1.3 MOTOR NOM FREQUE	Hz	84.3	84.3	84.0		-	84.0		83.9		84.0		-	-
1.1.4 MOTOR NOM VOLTAG	V	370	370	386		-	388		364		398		-	-
1.1.5 MOTOR POLES	-	2 POLES	2 POLES	2 POLES		-	2 POLES		2 POLES		2 POLES		-	-
1.1.10 MOTOR LOAD FUNC	-	YES	YES	YES		-	YES		YES		YES		-	-
1.3.1 MAX MOTOR SPEED	rpm	5000	5000	5000		-	5000		5000		5000		-	-
1.6.2 KP GAIN	-	50	40	50	50	-	60	50	73	60	50	50	-	-
1.6.3 KI GAIN	-	50	40	50	50	-	60	50	73	60	50	50	-	-
1.6.4 VECT MAGNET CURR	%	56.6	63.5	64	63.8	-	66.0		61.4		44.5		-	-
1.6.5 ROTOR COSTANT	Hz	3.8	3.0	2.7	3.1	-	2.5	3.1	2.0	2.5	2.0	2.9	-	-
1.6.13.1 KP ID REGULATOR	-	0.45	0.45	045		-	045		045		045		-	-
1.6.13.2 KI ID REGULATOR	-	0.045	0.045	0.045		-	0.045		0.045		0.045		-	-
1.6.13.3 KP IQ REGULATOR	-	0.45	0.45	045		-	045		045		045		-	-
1.6.13.4 KI IQ REGULATOR	-	0.045	0.045	0.045		-	0.045		0.045		0.045		-	-
1.7.2 STATOR L	mH	29.0	26.9	18.7		-	20.9		13.8		12.4		-	-
1.7.3 ROTOR L	mH	29.0	26.9	18.7		-	20.9		13.8		12.4		-	-
1.7.4 MUTUAL INDUCT	mH	28.4	26.4	18.3		-	20.5		13.6		12.2		-	-
1.10.15 ADAPT PERC TORQ.	%	129.0	135.5	137.8	132.5	-	137.1	137.8	132.1	132.4	127.5	127.7	-	-
1.10.16 ADAPT TORQ. [Nm]	%	30.2	31.2	35.4	33.5	-	35.4	34.5	32.0	31.8	33.0	31.6	-	-
1.12.1 PWM FREQUENCY	kHz	5.00	5.00	5.00		-	5.00		5.00		5.00		-	-

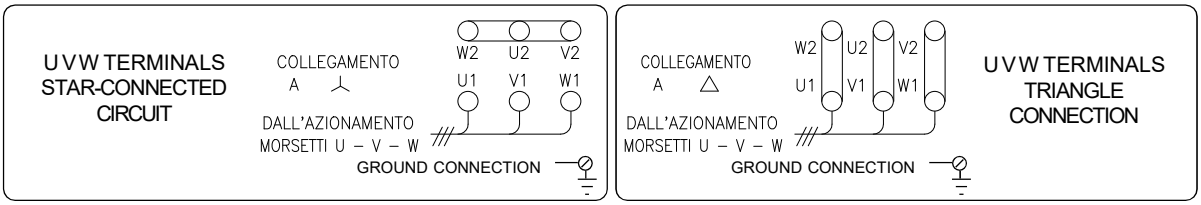
MEC 63 al 80L motors connection



In this motors series, the power connection can be performed at STAR or DELTA.
The terminals of power, services and encoder are all enclosed in the same terminal boxes.

MEC 90 to 200 motors three-phase supply connection

In this motors series, the power connection can be performed at STAR or DELTA:



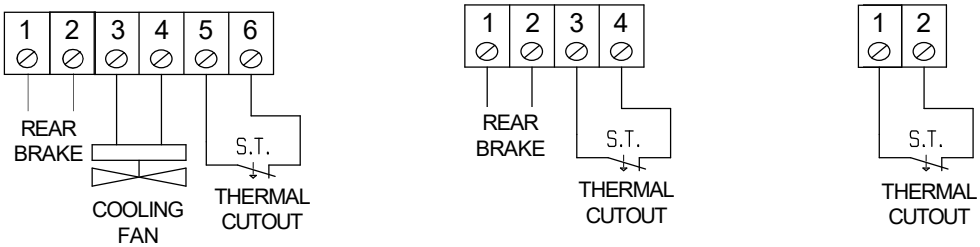
The star or delta connection depends by the combination with the inverter 400.

Refer to the tables "ROWAN G-SERIES VECTOR MOTORS SETTINGS" of the chapter 13 or the CATALOGUE ROWAN G SERIES MOTORS" if you want more insight into the combination technical characteristics between the inverter and the Rowan vectorial motors.

Thermal probe connection

The thermal probe is a N.C. type command, which opens when the motor windings temperature exceeds 150°C, a safety limit corresponding with H class (180°C). It is used as emercency device for the power contactor break, keeping in mind that the contact max. current-carrying capacity is 1A-230VAC.

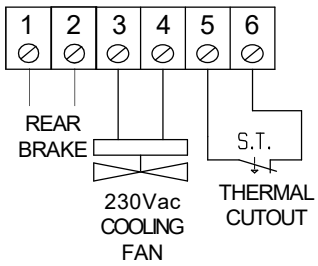
According to the type of motor, the thermal probe connection can be placed in the following terminal types:

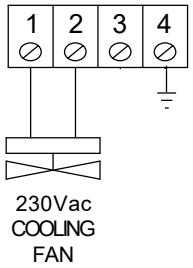


Fan connection

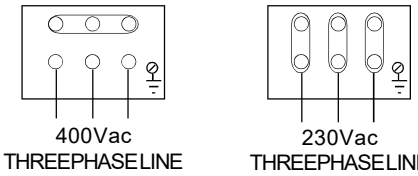
Supply the fan with power even if the motor is not operating, so that even pauses are used for cooling as well.
For the power characteristics, refer to the "CATALOGUE ROWAN G SERIES MOTORS"

According to the type of motor, the fan connection can be placed in the following terminal boards types:





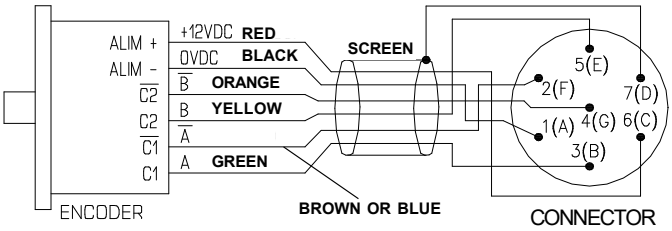
THREEPHASE COCHLEAR FANS (DIRECT CONNECTION IN THE FAN MOTOR HEADER)



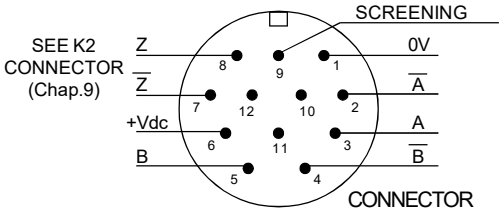
LINE DRIVER encoder connector

Rowan G series **standard** motors are equipped with LINE DRIVER encoder, with +12VDC power voltage, 1000 pulses/r resolution.Encoders with different resolutions and +5Vdc power voltage are available on request. In case of +5Vdc power voltage, the inverter as well must be modified.

Power supply and encoder phase signals are driven to the connector on the motor as shown in the drawing below:



encoder with zero



The standard encoder connection for speed feedback is related ENC
In this case, set the **par.1.6.7 IN ENC 2 = REMOTE.**
The number of pulses / rev encoder must be set in **par.1.6.1 E1 ENCODER LINES**

MOTOR ENCODER OUTPUT EMPLOY WITH SEVERAL C400 INVERTERS OR OTHER DEVICE

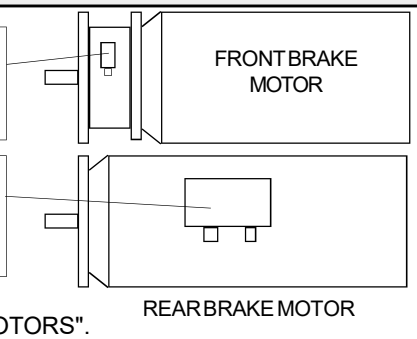
You can easily connect a motor encoder to other devices as long as:

- connection is by screening cable
- 20mA max absorption for each encoder channel both for 12Vdc and 5Vdc.

Brake connection

In the **standard front brake version**, the brake connection is performed by a connector with 4 pins numbered on the brake-holder bell. Connect the brake to connector terminals 1 and 2.

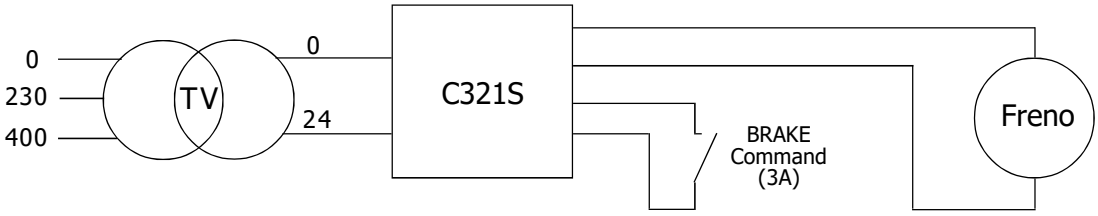
In the special rear brake version, the brake connection is performed by a facility terminal board placed close to the power terminal board.
Supply brake to terminals 1 and 2.



For the power characteristics, refer to the "CATALOGUE ROWAN G SERIES MOTORS".

The brake operates at 24 VDC direct voltage with following duty-cycle: 5 minutes in excited condition and 5 minutes rest.

For optimizing the BRAKE managing, Rowan Elettronica proposes the C321S card connected a follows:



The C321S gives a 34Vdc starting voltage and a following 24Vdc mantaining voltage. In this way the BRAKE release is faster and we avoid overtemperature during the continuous service.

INVERTERS ORDER CODE

Code : **C400 X / 1 . A . E . 12 . NN . NN . N**

ACTIVE APPLICATIONS (to be identified on the inverter by the nr on the right of the full stop, in var.2.1.38 FIRMWARE VERSION)

A	var. 2.1.38 = XXX01.XX	Active application: SPEED (speed control, scalar/vectorial) / AXIS (Positioner/electric axis)
R	var. 2.1.38 = XXX02.XX	Active application: SPEED (speed control, scalar/vectorial) / REGULATOR (P/I control)
G	var. 2.1.38 = XXX03.XX	Active application: SPEED (speed control, scalar/vectorial) / GEN_AFE (Sin Generator)
P	var. 2.1.38 = XXX04.XX	Active application: SPEED (speed control, scalar/vectorial) / CUSTOM1 (Custom Application)
W	var. 2.1.38 = XXX05.XX	Active application: SPEED (speed control, scalar/vectorial) / WINDER (Winding-Rewinding system)
F	var. 2.1.38 = XXX06.XX	Active application: SPEED (speed control, scalar/vectorial)) / AXIS (Positioner/electric axis) + (function of cutting die)

RELEASE HARDWARE

STO FUNCTION
S = WITH STO FUNCTION
N = WITHOUT STO FUNCTION

CUSTOMIZATION DIGITS
NN = NO CUSTOMIZATION

OPTIONAL EXPANSION CARD with I/O and FIELD BUS

Inputs / Outputs	Field bus
N = card without I/O **A** = card with I/O: - 1 line driver encoder - 2 zero input encoder - 8 digital inputs - 5 digital outputs - 5 analog inputs **B** = scheda con I/O: - 1 line driver encoder - 2 zero input encoder - 4 digital inputs - 2 digital outputs - 2 analog inputs	**N** = none **P** = PROFIBUS DPV1 **C** = CANOPEN **M** = MODBUS TCP/IP **E** = ETHERCAT **F** = PROFINET

NN = no expansion card

ENCODERS SUPPLY
05 = 5Vdc ENCODERS, CLAMPS OUTPUT 38-39 and 44-45 = +5Vd
12 = 12Vdc ENCODERS, CLAMPS OUTPUT 38-39 and 44-45 = +12Vdc
24 = 12Vdc ENCODERS, CLAMPS OUTPUT 38-39 and 44-45 = +12Vdc

POWER SUPPLY VOLTAGE (50/60Hz)

Power supply voltage for inverters from /P to /3,5	*Power supply voltage for inverters from /5 to /G*
D = 220/240VAC **P** = 380/460 VAC **M** = 220/240 VAC SINGLE PHASE **N** = 500 VAC	**D** = 220/240VAC **E** = 380/400/415 VAC **O** = 440/460 VAC **W** = 690 VAC

DRIVE POWER SIZE
P - R - 0 - 0M -1 - L - 2 - 2,5 - 3 - 3,5 - 5 - 6 6,5 - 7 - 8 - 8,5 - 9 - A - B - C - D - E - F - G

Eeprom key order code

Code : **C411S . A**

HARDWARE RELEASE

Manual Code Description

>MANU.400S.QUICKSTART = INVERTER SERIES 400 use manual for a quick installation of the basic SCALAR V/F speed control on normal asynchronous motors and vector speed control of ROWAN G SERIES vector motors with ENCODER, **valid for all inverter codes 400.**

>MANU.400S = INVERTER SERIES 400 installation and use manual.
It is the complete manual for inverter and motors installation, independently from the application.
It includes SPEED application instructions, **valid for all inverter codes 400.**

>MANU.400TS = INVERTER SERIES 400 SERIAL TRANSMISSION.
It is an enclosure of MANU.400S basic installation manual; it includes all instruction for RS485 serial transmission operation, as for MODBUS RTU, CANOPEN, PROFIBUS DVP1, MODBUS TCP/IP, ETHERCAT, PROFINET protocols, **valid for all inverter codes 400.**

>MANU.400A = AXIS instruction manual for inverter with **XXX01.XX** e **XXX06.XX** firmware version.
It is an enclosure of MANU.400S complete installation manual, necessary to start inverters 400A and 400F series with AXIS Application, equipped with functions:electronic gear, positioner, fly cut and cutting die (only 400F).

>MANU.400R = REGULATOR instruction manual for inverter with **XXX02.XX** firmware version.
It is an enclosure of MANU.400S complete installation manual, necessary to start inverters 400R series with REGULATOR Application and its functions (compressor, cut at costant current)

>MANU.400G = GEN_AFE instruction manual for inverter with **XXX03.XX** firmware version.
It is an enclosure of MANU.400S complete installation manual, necessary to start inverters 400G series with GEN application (Voltage and Frequency regulated Sin Generator) and AFE application (Active Front End) for the recovery of energy toward the power supply line.

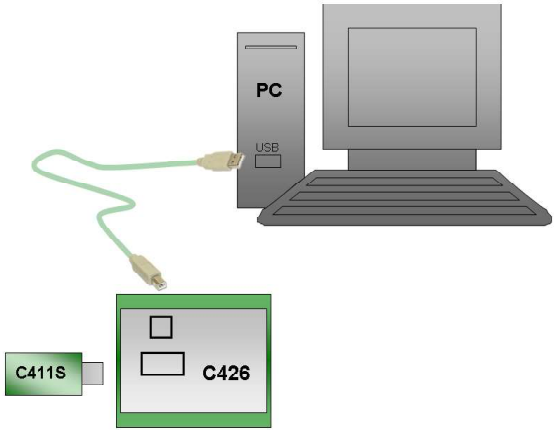
>MANU.400W = WINDER instruction manual for inverter with **XXX05.XX** firmware version.
It is an enclosure of MANU.400S complete installation manual, necessary to start inverters 400W series with WINDER application for winding - rewinding.

>**MANU.STO.350-400-700 =** Manual of safety STO function for the inverter 350, 400 and 700; for the inverter with STO this manual must be consider an integrity part of MANU.400S
>CATALOGUE MOTOR SERIES G = Complete catalog of the vector motors Rowan G series, with all the detailed specifications including the combination with the inverter 400 series.

• Software for eeprom key managing

On request, Rowan Elettronica provides the **"Rowan Key Manager"**; this software allows, through your PC, to elaborate the inverter parameters in eeprom key **cod. C411S**.

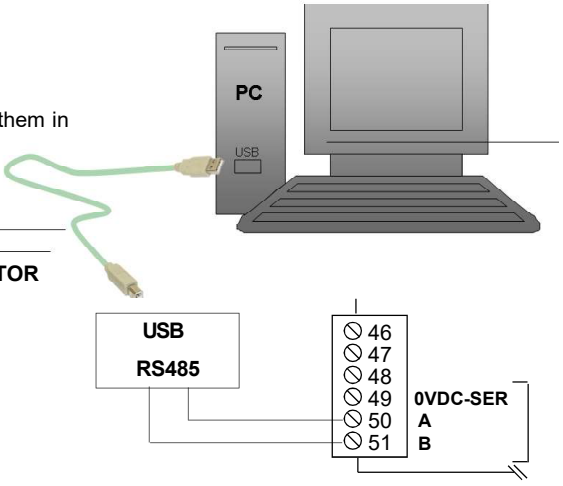
Through **"Rowan Key Manager"** it is allowed to:
> read all parameters contained in EEPROM key, in separated areas and save all datas in a file;
> export all parameters in Excel format and print them;
> save the elaborated data in the EEPROM key;
> read the total picture of the EEPROM key and save that in a file;
> import a total picture file on the key.
For all operations with C411S key an usb cable and interface board C426 are needed. Rowan Elettronica supplies the **KIT.426R.A**, that kit contains:
- installation cd with 2 versions of **"Rowan Key Manager"**:
  > **"Rowan Key Manager"** for 350S inverter;
  > **"Rowan Key Manager"** for 400S inverter;
- USB cable A-B-M-M type;
- EEPROM key **C411S**;
- interface board **C426**.



• Software for editing the inverter parameters through PC: ROWAN DATA EDITOR

On request, Rowan Elettronica provides the **"Rowan Data Editor"**, this software for Windows can be editing the inverter parameters directly from PC through RS485 serial connection:

Through **"Rowan Data Editor"** it is allowed to:
> read / modify all the inverter parameters and save them in a file.
> export the parameters read in format PDF or CSV.
> extract only the modificated parameters compared to default setup and save them in format PDF or CSV.
> with the "TEST MODE" function it is allowed command the inverter functions for a rotate motor test, monitoring the variable with the function "oscilloscope".
For all operations through PC and inverter is necessary a USB / RS485 converter (better if insulated)
On request Rowan Elettronica supplies the complete kit **KIT.ROWAN.DATAEDITOR** that contains:
- CD software installation **"Rowan Data Editor"**;
- Complete connection cable from PC with USB/RS485 interface.



Instruction for the correct autotuning procedure

C400 Inverter autotuning function

From the firmware 499.0x.00 version is available in the C400 inverter a procedure of auto-setting to control the asynchronous motors. The procedure execute a motor measures connected to the terminals U, V, W to determinate which are the parameters necessary to a correct vector control function.
Execute the installation procedure of the vector control describe in the Chapter 4, after settled the par.1.6.1 E1 ENCODER LINES value, is possible to activated the autotuning procedure.
The procedure is enable through the par.1.7.5 ENABLE AUTO TUN, normally in default settled NO. There are available 2 different autotuning procedure the choose depends the possibility and what the machine needs: STATIC, auto-setting "stationary" and DYNAMIC, auto-setting “on movement”.
The procedure is activable only in the SPEED application (par.100.5 APPLICATION = SPEED).

1.7.5 ENABLE AUTO TUN = STATIC

Settings STATIC you choose the auto-setting "stationary", the settings parameters are determinate through the measures on the motor without rotate the shaft. The motor can be connect to the load without create any problems.
Once set STATIC, enabling the run contact, the procedure starting and the run led switch-on. When the par.1.7.5 ENABLE AUTO TUN back equal to NO the procedure is finished.
Removing the run contact, the setup parameters of the vector control will be updated.
With a following run switch-on, the motor is controlled in vector control.
The execution of these procedure, is suggested for the motor lower than 30kW.

1.7.5 ENABLE AUTO TUN = DYNAMIC

With this setup you choose the autotuning procedure "on movement", during the execution the motor shaft rotate.
Mustn't connect to any load to the motor shaft.
Once setup DYNAMIC, enabling the run contact, the procedure starting and the run led switch-on.
When the par.1.7.5 ENABLE AUTO TUN back equal to NO the procedure is finished.
Removing the run contact, the setup parameters of the vector control will be updated.
With a following run switch-on, the motor is controlled in vector control.
The execution of these procedure, is suggested for the motor bigger than 30kW.

Updated parameters from the procedure:

At the end of the autotuning procedure, when removing the run contact, are updated the follows parameters:
(the accepted precision tolerance is the 10%).

1.6.4 VECT MAGNET CURR.
1.6.5 ROTOR CONSTANT
1.10.15 ADAPT PERC TORQ
1.7.2 STATOR L
1.7.3 ROTOR L
1.7.4 MUTUAL INDUC

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The **POSITIONER** function available for the C400A series has the specific manual **MANU.400A**. You can DOWNLOAD it from **www.rowan.it**

To get more detailed characteristics of the Rowan vectorial motors, you can download the catalog in the download area from our website **www.rowan.it**

Rowan Elettronica

Motors, drives, accessories and services for automations

Via Ugo Foscolo, 20 - CALDOGNO - VICENZA - ITALIA
Tel.: 0444 - 905566 (4 linee r.a.)
Fax: 0444 - 905593 E-mail: info@rowan.it
Internet Address: www.rowan.it