

ACOPOSInverter S44

Variable speed drives for
asynchronous motors

User's Manual

Version: 1.20 (March 2011)
Model number: MAACPIS44-ENG



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Energy savings

Speed control process regulating enables significant energy savings, particularly with pump and fan applications. Furthermore some ACOPOSinverter S44 functions enable to enhance these savings: [Motor control type C L E](#) page [56](#), [Sleep/wake L L S](#) page [73](#) and [PID feedback assignment P I F](#) page [71](#).

Manual history

Version	Date	Comment
1.20	March 2011	Added codes: section "Configuration Mode - Complete Menu (FULL)", Editorial modifications
1.10	January 2010	Added section "Connection to RS485 bus"
1.00	January 2010	First edition

Manual history

Important information

NOTICE

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to a Danger or Warning safety label indicates that an electrical hazard exists, which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

DANGER

DANGER indicates an imminently hazardous situation, which, if not avoided, **will result** in death or serious injury.

WARNING

WARNING indicates a potentially hazardous situation, which, if not avoided, **can result** in death, serious injury or equipment damage.

CAUTION

CAUTION indicates a potentially hazardous situation, which, if not avoided, **can result** in injury or equipment damage.

CAUTION

CAUTION, used without the safety alert symbol, indicates a potentially hazardous situation which, if not avoided, **can result** in equipment damage.

PLEASE NOTE

The word "drive" as used in this manual refers to the controller portion of the adjustable speed drive as defined by NEC.

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by B&R for any consequences arising out of the use of this product.

Before you begin

Read and understand these instructions before performing any procedure with this drive.

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Read and understand this manual before installing or operating the ACOPOSinverter S44 drive. Installation, adjustment, repair, and maintenance must be performed by qualified personnel.
- The user is responsible for compliance with all international and national electrical code requirements with respect to grounding of all equipment.
- Many parts of this drive, including the printed circuit boards, operate at the line voltage. DO NOT TOUCH. Use only electrically insulated tools.
- DO NOT touch unshielded components or terminal strip screw connections with voltage present.
- DO NOT short across terminals PA/+ and PC/- or across the DC bus capacitors.
- Before servicing the drive:
 - Disconnect all power, including external control power that may be present.
 - Place a "DO NOT TURN ON" label on all power disconnects.
 - Lock all power disconnects in the open position.
 - WAIT 15 MINUTES to allow the DC bus capacitors to discharge. Then follow the "Bus Voltage Measurement Procedure", page [14](#) to verify that the DC voltage is less than 42 V. The drive LEDs are not indicators of the absence of DC bus voltage.
- Install and close all covers before applying power or starting and stopping the drive.

Failure to follow these instructions will result in death or serious injury.

DANGER

UNINTENDED EQUIPMENT OPERATION

- Read and understand this manual before installing or operating the ACOPOSinverter S44 drive.
- Any changes made to the parameter settings must be performed by qualified personnel.

Failure to follow these instructions will result in death or serious injury.

WARNING

DAMAGED DRIVE EQUIPMENT

Do not operate or install any drive or drive accessory that appears damaged.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Before you begin

WARNING

LOSS OF CONTROL

- The designer of any control scheme must
 - consider the potential failure modes of control paths and, for certain critical control functions,
 - provide a means to achieve a safe state during and after a path failure.Examples of critical control functions are emergency stop and overtravel stop.
- Separate or redundant control paths must be provided for critical control functions.
- System control paths may include communication links. Consideration must be given to the implications of unanticipated transmission delays or failures of the link.^a

Failure to follow these instructions can result in death, serious injury, or equipment damage.

a. For additional information, refer to NEMA ICS 1.1 (latest edition), "Safety Guidelines for the Application, Installation, and Maintenance of Solid State Control" and to NEMA ICS 7.1 (latest edition), "Safety Standards for Construction and Guide for Selection, Installation and Operation of Adjustable-Speed Drive Systems."

CAUTION

INCOMPATIBLE LINE VOLTAGE

Before turning on and configuring the drive, ensure that the line voltage is compatible with the supply voltage range shown on the drive nameplate. The drive may be damaged if the line voltage is not compatible.

Failure to follow these instructions can result in injury or equipment damage.

Using motors in parallel

Set [Motor control type](#) [L L L](#) page [56](#) to [S L d](#).

CAUTION

RISK OF DAMAGE TO THE MOTOR

Motor thermal protection is no longer provided by the drive. Provide an alternative means of thermal protection on every motor.

Failure to follow these instructions can result in equipment damage

Software enhancements

Since it was first marketed, the ACOPOSinverter S44 has been equipped with additional functions.

Enhancements made to hardware revision D0 in comparison to C0

- New parameters:
 - Sleep threshold Offset **S L E**. See page [74](#).
 - PI feedback supervision threshold **L P I**. See page [75](#).
 - PI feedback supervision function time delay **t P I**. See page [75](#).
 - Maximum frequency detection hysteresis **A P D**. See page [75](#).
 - PI feedback supervision **PI I**. See page [75](#).
 - Fallback speed **L F F**. See page [75](#).
 - Time delay before automatic start for the overload fault **F t D**. See page [76](#).
 - Time delay before automatic start for the underload fault **F t U**. See page [77](#).
 - Selecting the operating mode **PI d E**. See page [77](#).
 - Starting frequency of the auxiliary pump **F D n**. See page [77](#).
 - Time delay before starting the auxiliary pump **t D n**. See page [77](#).
 - Ramp for reaching the auxiliary pump nominal speed **r D n**. See page [77](#).
 - Auxiliary pump stopping frequency **F D F**. See page [77](#).
 - Time delay before the auxiliary pump stop command **t D F**. See page [78](#).
 - Ramp for auxiliary pump stopping **r D F**. See page [78](#).
 - Zero flow detection period **n F d**. See page [78](#).
 - Zero flow detection activation threshold **F F d**. See page [78](#).
 - Zero flow detection offset **L F d**. See page [78](#).
- New menu Pump sub-menu **PPI P -**. See page [76](#). For pumping applications.
- New quick REMOTE/LOCAL configuration switching using the embedded buttons. See page [33](#).

1. Receive and inspect the drive

- ☐ Check that the part number printed on the label is the same as that on the purchase order.
- ☐ Remove the ACOPOSinverter from its packaging and check that it has not been damaged in transit.

2. Check the line voltage

- ☐ Check that the line voltage is compatible with the voltage range of the drive (page [11](#)).

3. Mount the drive

- ☐ Mount the drive in accordance with the instructions in this document (page [13](#)).
- ☐ Install any options required.

4. Wire the drive (page [16](#))

- ☐ Connect the motor, ensuring that its connections correspond to the voltage.
- ☐ Connect the line supply, after making sure that the power is off.
- ☐ Connect the control part.

5. Configure the drive (page [32](#))

- ☐ Apply input power to the drive but do not give a run command.
- ☐ Set the motor parameters (in Conf mode) only if the factory configuration of the drive is not suitable.
- ☐ Perform auto-tuning.

6. Start

Steps 2 to 4 must be performed with the **power off**.



Setup - Preliminary recommendations

Prior to switching on the drive

DANGER

UNINTENDED EQUIPMENT OPERATION

Ensure that all logic inputs are inactive to help prevent an accidental startup.

Failure to follow these instructions will result in death or serious injury.

Prior to configuring the drive

DANGER

UNINTENDED EQUIPMENT OPERATION

- Read and understand this manual before installing or operating the ACOPOSinverter S44 drive.
- Any changes made to the parameter settings must be performed by qualified personnel.
- Ensure that all logic inputs are inactive to help prevent an accidental startup when modifying parameters.

Failure to follow these instructions will result in death or serious injury.

Using the drive with motor having a different size

The motor could have different rating than drive. In case of smaller motor, there is no specific calculation. The motor current has to be set on [Motor thermal current](#) **I_{LH}** parameter page [93](#). In case of higher size of motor, possible up to 2 sizes (example is using a 4 kW (5.5 HP) on a 2.2 kW (3 HP) drive) it is necessary to ensure motor current and actual motor power will not pass over nominal power of drive.

Line contactor

CAUTION

RISK OF DAMAGE TO THE DRIVE

- Avoid operating the contactor frequently to avoid premature aging of the filter capacitors.
- Power cycling must be MORE than 60 seconds.

Failure to follow these instructions can result in equipment damage.

Use with a smaller rated motor or without a motor

- In factory settings mode, [Output Phase loss](#) **OPL** page [93](#) is active (**OPL** set to **YES**). To check the drive in a test or maintenance environment without having to switch to a motor with the same rating as the drive (particularly useful in the case of high power drives), deactivate [Output Phase loss](#) **OPL** (**OPL** set to **NO**).
- Set [Motor control type](#) **CTE** page [56](#) to **Std** in Motor control menu **drC**.

CAUTION

RISK OF DAMAGE TO THE MOTOR

Motor thermal protection will not be provided by the drive if the motor rating current is less than 20% of the rated drive current. Provide an alternative means of thermal protection.

Failure to follow these instructions can result in equipment damage.

Drive ratings

Single-phase supply voltage: 100 to 120 V 50/60 Hz

For three Phase Output 200/240 V motors

Motor		Line supply (input)				Drive (output)			Model number	Size
Power indicated on plate (1)		Maximum line current		Apparent power	Power dissipated at nominal current (1)	Nominal current In	Max. transient current for			
		at 100 V	at 120 V				60 s	2 s		
kW	HP	A	A	kVA	W	A	A	A		
0.18	0.25	6	5	1	18	1.4	2.1	2.3	8I44S100018.000-1	1
0.37	0.5	11.4	9.3	1.9	29	2.4	3.6	4	8I44S100037.000-1	2
0.75	1	18.9	15.7	3.3	48	4.2	6.3	6.9	8I44S100075.000-1	4

Single-phase supply voltage: 200 to 240 V 50/60 Hz

For three Phase Output 200/240 V motors

Motor		Line supply (input)				Drive (output)			Model number	Size
Power indicated on plate (1)		Maximum line current		Apparent power	Power dissipated at nominal current (1)	Nominal current In	Max. transient current for			
		at 200 V	at 240 V				60 s	2 s		
kW	HP	A	A	kVA	W	A	A	A		
0.18	0.25	3.4	2.8	1.2	18	1.4	2.1	2.3	8I44S200018.000-1	1
0.37	0.5	5.9	4.9	2	27	2.4	3.6	4	8I44S200037.000-1	2
0.55	0.75	8	6.7	2.8	34	3.5	5.3	5.8	8I44S200055.000-1	3
0.75	1	10.2	8.5	3.5	44	4.2	6.3	6.9	8I44S200075.000-1	3
1.5	2	17.8	14.9	6.2	72	7.5	11.2	12.4	8I44S200150.000-1	4
2.2	3	24	20.2	8.4	93	10	15	16.5	8I44S200220.000-1	4

Three-phase supply voltage: 200 to 240 V 50/60 Hz

For three Phase Output 200/240 V motors

Motor		Line supply (input)				Drive (output)			Model number	Size
Power indicated on plate (1)		Maximum line current		Apparent power	Power dissipated at nominal current (1)	Nominal current In	Max. transient current for			
		at 200 V	at 240 V				60 s	2 s		
kW	HP	A	A	kVA	W	A	A	A		
0.18	0.25	2	1.7	0.7	16	1.4	2.1	2.3	8I44T200018.000-1	1
0.37	0.5	3.6	3	1.2	24	2.4	3.6	4	8I44T200037.000-1	2
0.75	1	6.3	5.3	2.2	41	4.2	6.3	6.9	8I44T200075.000-1	3
1.5	2	11.1	9.3	3.9	73	7.5	11.2	12.4	8I44T200150.000-1	5
2.2	3	14.9	12.5	5.2	85	10	15	16.5	8I44T200220.000-1	5
3	4	19	15.9	6.6	94	12.2	18.3	20.1	8I44T200300.000-1	6
4	5.5	23.8	19.9	8.3	128	16.7	25	27.6	8I44T200400.000-1	6

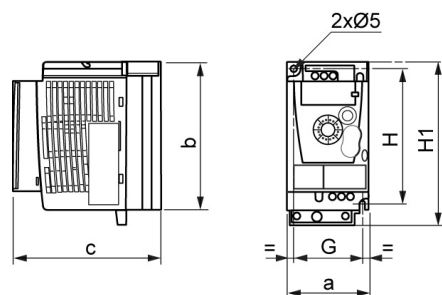
(1) These power ratings are for a switching frequency of 4 kHz, in continuous operation. The switching frequency is adjustable from 2 to 16 kHz.

Above 4 kHz, the drive will reduce the switching frequency if an excessive temperature rise occurs. The temperature rise is detected by a probe in the power module. Nonetheless, derating should be applied to the nominal drive current if continuous operation above 4 kHz is required:

- 10% derating for 8 kHz
- 20% derating for 12 kHz
- 30% derating for 16 kHz

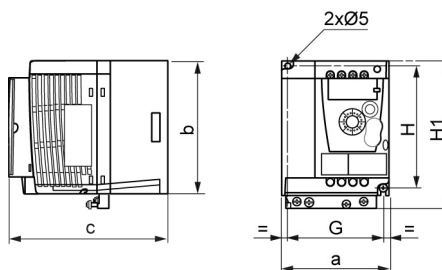
Dimensions and weights

8I44S100018.000-1, 8I44S100037.000-1, 8I44S200018.000-1, 8I44S200037.000-1, 8I44S200055.000-1, 8I44S200075.000-1, 8I44T200018.000-1, 8I44T200037.000-1 and 8I44T200075.000-1



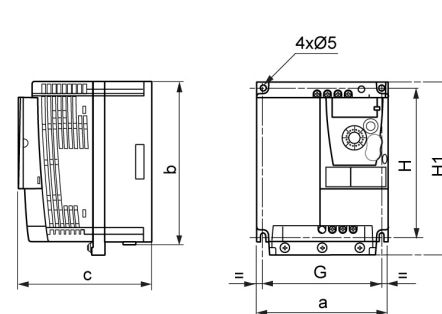
	a mm (in.)	b mm (in.)	c mm (in.)	G mm (in.)	H mm (in.)	H1 mm (in.)	Ø mm (in.)	For screws	Weight kg (lb)
8I44S100018 8I44S200018 8I44T200018	72 (2.83)	142 (5.59)	102.2 (4.02)	60 (2.36)	131 (5.16)	143 (5.63)	2 x 5 (2 x 0.20)	M4	0.7 (1.5)
8I44S100037 8I44S200037 8I44T200037	72 (2.83)	130 (5.12)	121.2 (4.77)	60 (2.36)	120 (4.72)	143 (5.63)	2 x 5 (2 x 0.20)	M4	0.8 (1.8)
8I44S200055 8I44S200075 8I44T200075	72 (2.83)	130 (5.12)	131.2 (5.17)	60 (2.36)	120 (4.72)	143 (5.63)	2 x 5 (2 x 0.20)	M4	0.8 (1.8)

8I44S100075.000-1, 8I44S200150.000-1, 8I44S200220.000-1, 8I44T200150.000-1 and 8I44T200220.000-1



	a mm (in.)	b mm (in.)	c mm (in.)	G mm (in.)	H mm (in.)	H1 mm (in.)	Ø mm (in.)	For screws	Weight kg (lb)
8I44S100075	105 (4.13)	130 (5.12)	156.2 (6.15)	93 (3.66)	120 (4.72)	142 (5.59)	2 x 5 (2 x 0.20)	M4	1.3 (2.9)
8I44S200150 8I44S200220	105 (4.13)	130 (5.12)	156.2 (6.15)	93 (3.66)	120 (4.72)	142 (5.59)	2 x 5 (2 x 0.20)	M4	1.4 (3.1)
8I44T200150 8I44T200220	105 (4.13)	130 (5.12)	131.2 (5.17)	93 (3.66)	120 (4.72)	143 (5.63)	2 x 5 (2 x 0.20)	M4	1.2 (2.6)

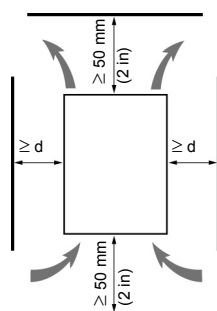
8I44T200300.000-1 and 8I44T200400.000-1



	a mm (in.)	b mm (in.)	c mm (in.)	G mm (in.)	H mm (in.)	H1 mm (in.)	Ø mm (in.)	For screws	Weight kg (lb)
8I44T200300 8I44T200400	140 (5.51)	170 (6.69)	141.2 (5.56)	126 (4.96)	159 (6.26)	184 (7.24)	4 x 5 (4 x 0.20)	M4	2.0 (4.4)

Mounting

Mounting and temperature conditions



Install the unit vertically, at $\pm 10^\circ$.

Do not place it close to heating elements.

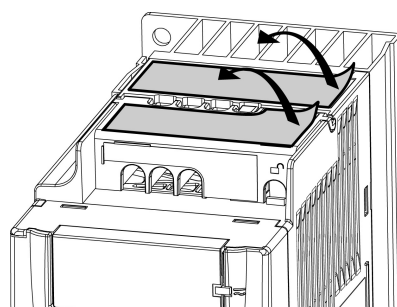
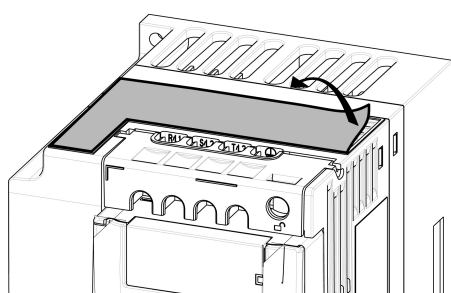
Leave sufficient free space to ensure that the air required for cooling purposes can circulate from the bottom to the top of the unit.

Free space in front of unit: 10 mm (0.4 in.) minimum.

When IP20 protection is adequate, we recommend that the vent cover(s) on the top of the drive be removed, as shown below.

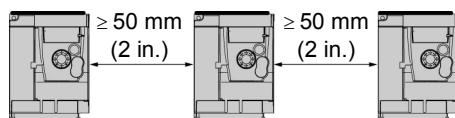
We recommend that the drive is installed on a dissipative surface.

Removing the vent cover(s)



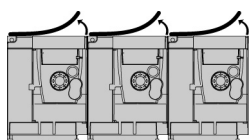
Mounting types

Type A mounting



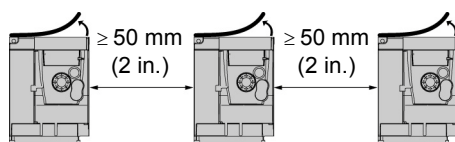
Free space ≥ 50 mm (2 in.) on each side, with vent cover fitted. Mounting type A is suitable for drive operation at surrounding air temperature less than or equal to 50°C (122°F).

Type B mounting



Drives mounted side-by-side, vent cover should be removed (the degree of protection becomes IP20).

Type C mounting



Free space ≥ 50 mm (2 in.) on each side. Vent cover should be removed for operation at surrounding air temperature above 50°C (122°F). The degree of protection becomes IP20.

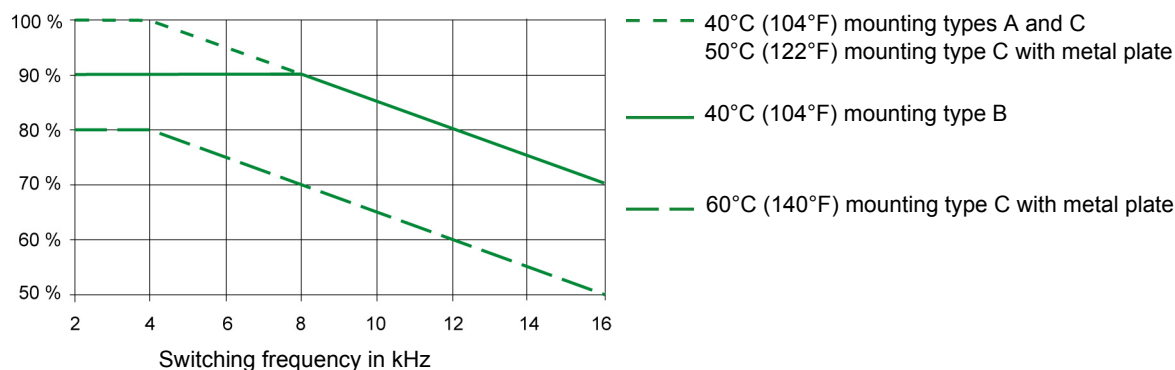
With these types of mounting, the drive can be used up to an ambient temperature of 50°C (122°F), with a switching frequency of 4 kHz. Fanless drives need derating.

Mounting

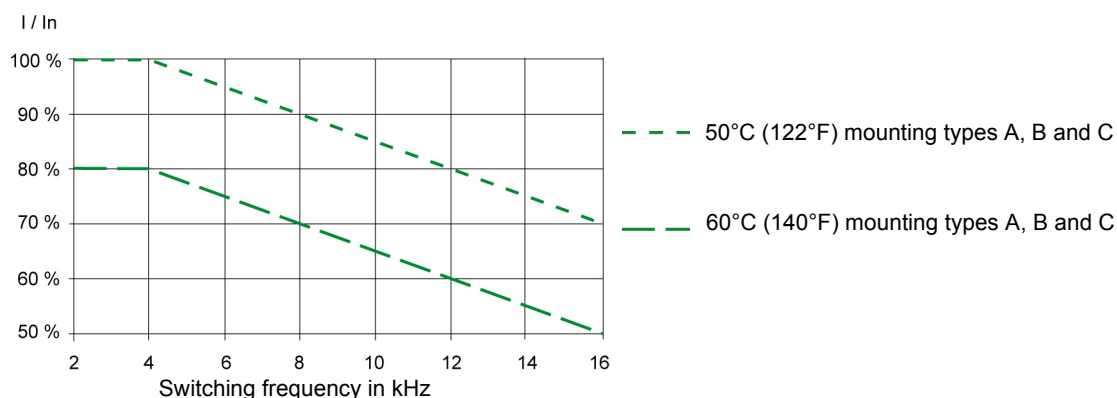
Derating curves

Derating curves for the nominal drive current (I_n) as a function of temperature, switching frequency and mounting type.

8I44S100018.000-1, 8I44S100037.000-1, 8I44S200018.000-1 to 8I44S200075.000-1 and 8I44T200018.000-1 to 8I44T200075.000-1,
 I / I_n



8I44S100075.000-1, 8I44S200150.000-1, 8I44S200220.000-1 and 8I44T200150.000-1 to 8I44T200400.000-1



For intermediate temperatures (e.g. 55°C (131°F)), interpolate between two curves.

Bus voltage measurement procedure

⚡ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Read and understand the precautions in "Before you begin" on page 6 before performing this procedure.

Failure to follow these instructions will result in death or serious injury.

The DC bus voltage can exceed 400 VDC. Use a properly rated voltage-sensing device when performing this procedure. To measure the DC bus voltage:

- 1 Disconnect all power.
- 2 Wait 15 minutes to allow the DC bus to discharge.
- 3 Measure the voltage of the DC bus between the PA/+ and PC/- terminals to ensure that the voltage is less than 42 Vdc.
- 4 If the DC bus capacitors do not discharge completely, contact your local B&R office. Do not repair or operate the drive.

Mounting

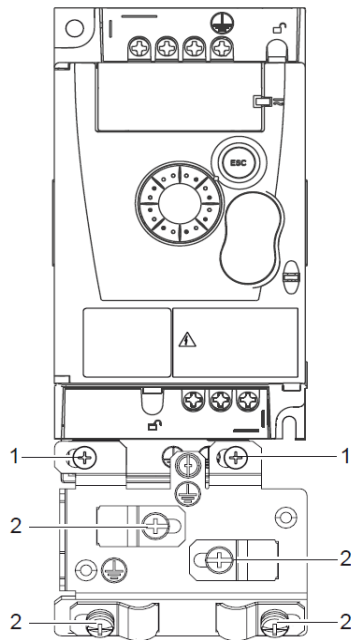
Installing the EMC plates

EMC mounting plate: size 1 8I0XP001.100-1, size 2 8I0XP002.100-1 or size 3 8I0XP003.100-1 to be ordered separately

Mount the EMC plate to the holes in the ACOPOSinverter S44 using the 2 screws supplied, as shown in the drawings below.

Size 1, model number 8I0XP001.100-1:

8I44S100018.000-1, 8I44S100037.000-1,
8I44S200018.000-1 to 8I44S200075.000-1 and
8I44T200018.000-1 to 8I44T200075.000-1

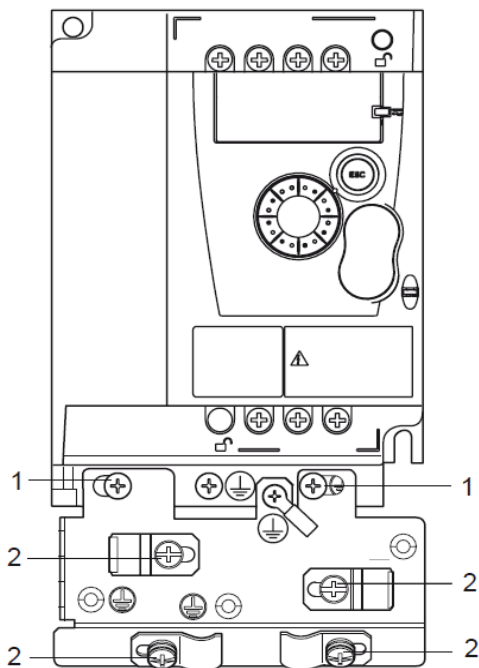


1. 2 mounting screws

2. 4 x M4 screws for attaching EMC clamps

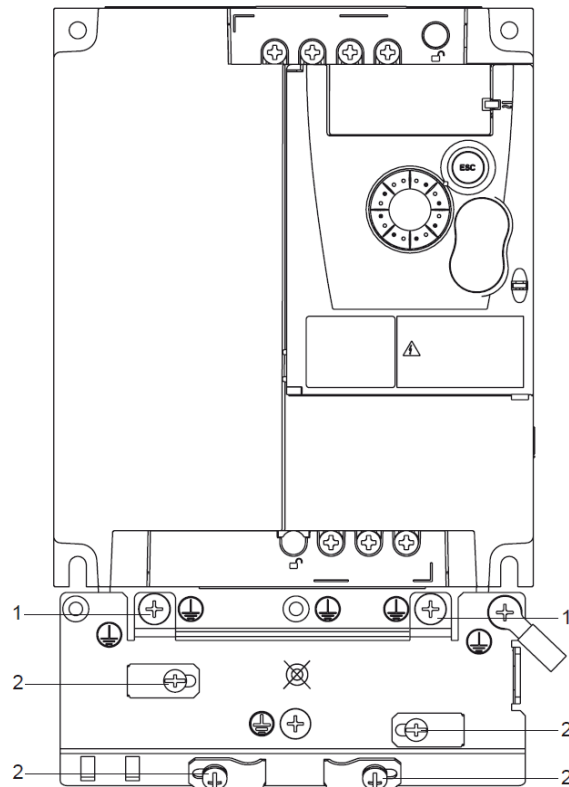
Size 2, model number 8I0XP002.100-1:

8I44S100075.000-1, 8I44S200150.000-1,
8I44S200220.000-1, 8I44T200150.000-1 and
8I44T200220.000-1



Size 3, model number 8I0XP003.100-1:

8I44T200300.000-1 and 8I44T200400.000-1



Wiring

Recommendations

Keep the power cables separate from control circuits with low-level signals (detectors, PLCs, measuring apparatus, video, telephone). Always cross control and power cables at 90° if possible.

Power and circuit protection

Follow wire size recommendations according to local codes and standards.

Before wiring power terminals, connect the ground terminal to the grounding screws located below the output terminals (see Access to the motor terminals if you use ring terminals, page 21).

The drive must be grounded in accordance with the applicable safety standards. 8I44S2****.000-1 drives have an internal EMC filter, and as such the leakage current is over 3.5 mA.

When upstream protection by means of a "residual current device" is required by the installation standards, a type A circuit breaker should be used for single-phase drives and type B for 3-phase drives. Choose a suitable model incorporating:

- HF current filtering
- A time delay which prevents tripping caused by the load from stray capacitance on power-up. The time delay is not possible for 30 mA devices. In this case, choose devices with immunity against accidental tripping, for example RCDs with **SI** type leakage current protection.

If the installation includes several drives, provide one "residual current device" per drive.

Control

For control and speed reference circuits, we recommend using shielded twisted cables with a pitch of between 25 and 50 mm (1 and 2 in.), connecting the shield to ground as outlined on page 26.

Length of motor cables

For motor cable lengths longer than 50 m (164 ft) for shielded cables and longer than 100 m (328 ft) for unshielded cables, please use motor chokes.

Equipment grounding

Ground the drive according to local and national code requirements. A minimum wire size of 10 mm² (6 AWG) may be required to meet standards limiting leakage current.

⚡ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- The drive panel must be properly grounded before power is applied.
- Use the provided ground connecting point as shown in the figure below.
- Do not loop the ground cables of mains supply and grounding connection point on the bottom of the drive.

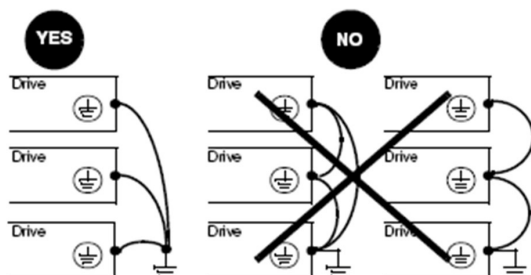
Failure to follow these instructions will result in death or serious injury.

⚡ ⚠ DANGER

8I44S100075.000-1, 8I44S200075.000-1 AND 8I44T200075.000-1 - GROUND CONTINUITY HAZARD

An anodized heatsink can create an insulation barrier to the mounting surface. Ensure that you follow the recommended grounding connections.

Failure to follow these instructions will result in death or serious injury.



- Ensure that the resistance of the ground is one ohm or less.
- When grounding several drives, you must connect each one directly, as shown in the figure to the left.
- Do not loop the ground cables or connect them in series.

WARNING

RISK OF DRIVE DESTRUCTION

- The drive will be damaged if input line voltage is applied to the output terminals (U/T1,V/T2,W/T3).
- Check the power connections before energizing the drive.
- If replacing another drive, verify that all wiring connections to the drive comply with wiring instructions in this manual.

Failure to follow these instructions can result in death, serious injury or equipment damage.

WARNING

INADEQUATE OVERCURRENT PROTECTION

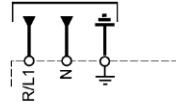
- Overcurrent protective devices must be properly coordinated.
- The Canadian Electrical Code and the National Electrical Code require branch circuit protection. Use the fuses recommended in this manual, page [115](#).
- Do not connect the drive to a power feeder whose short-circuit capacity exceeds the drive short-circuit current rating listed in this manual, page [115](#).

Failure to follow these instructions can result in death, serious injury or equipment damage.

General wiring diagram

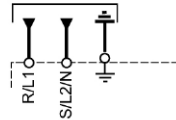
8I44S1****.000-1

Single-phase supply 100 to 120 V



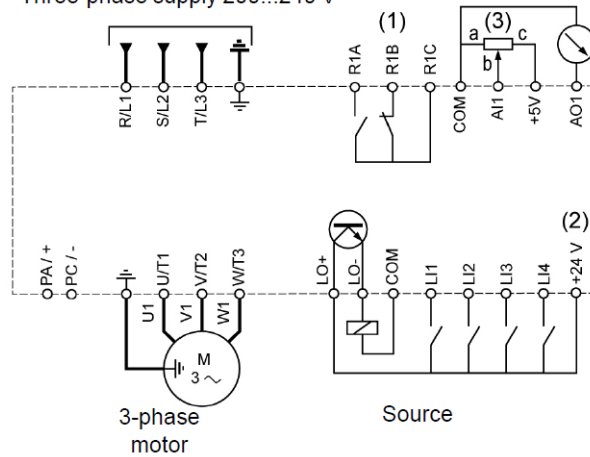
8I44S2****.000-1

Single-phase supply 200...240 V



8I44T2****.000-1

Three-phase supply 200...240 V



(1) R1 relay contacts, for remote indication of the drive status

(2) Internal + 24 V \equiv . If an external source is used (+ 30 V \equiv maximum), connect the 0 V of the source to the COM terminal, and do not use the + 24 V \equiv terminal on the drive.

(3) Reference potentiometer (10 k Ω maximum)

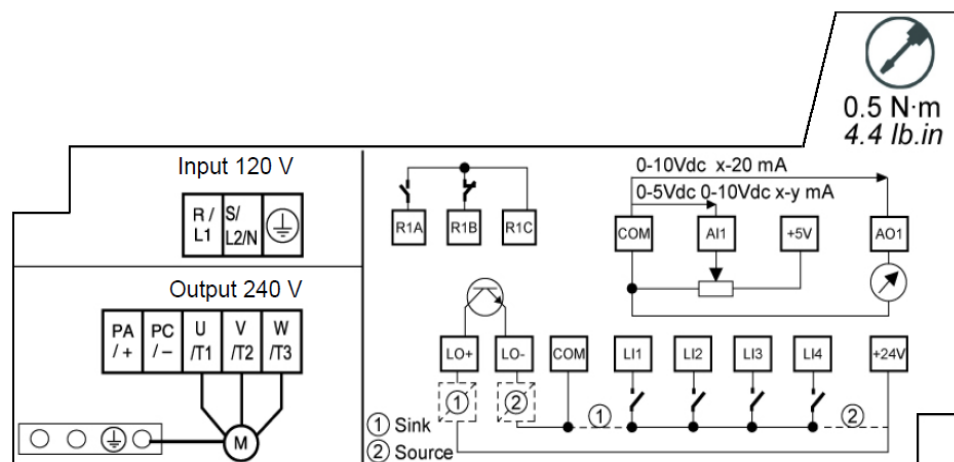
Note:

- Use transient voltage surge suppressors for all inductive circuits near the drive or coupled to the same circuit (relays, contactors, solenoid valves, etc).

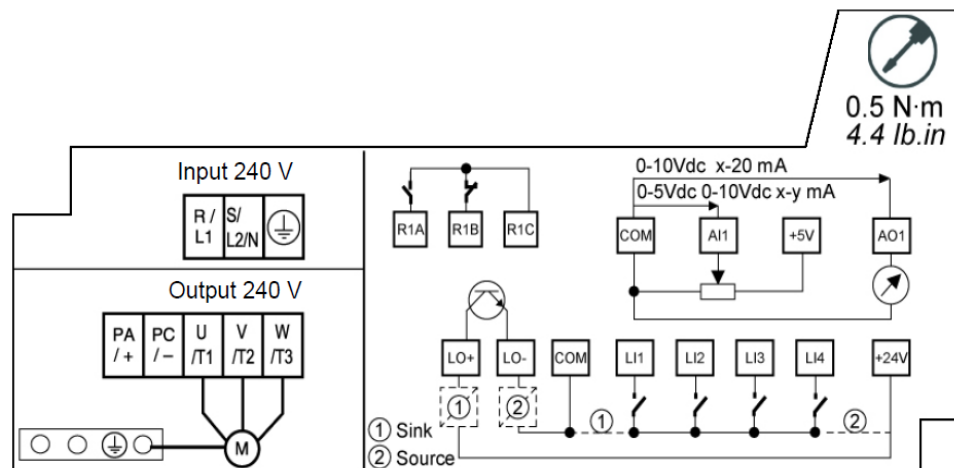
Wiring

Wiring labels

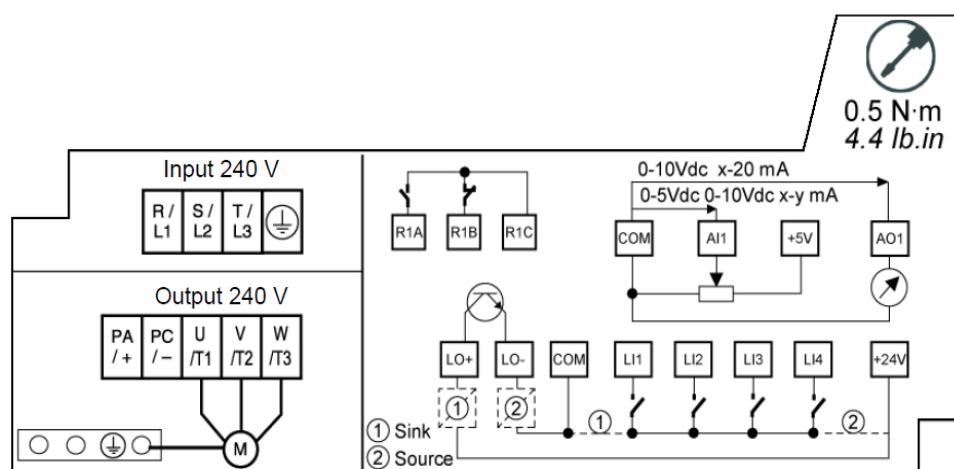
8144S1*****.000-1



8144S2*****.000-1



8144T2*****.000-1

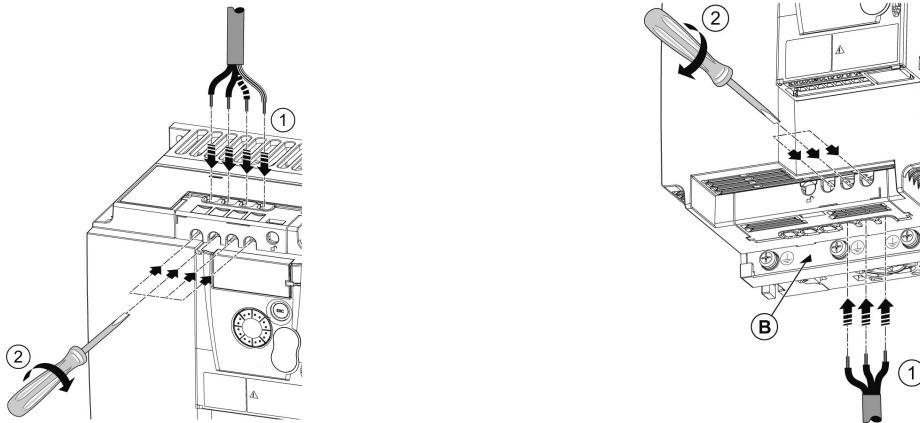


Power terminals

Line supply is at the top of the drive, the motor power supply is at the bottom of the drive. The power terminals can be accessed without opening the wiring trap if you use stripped wire cables.

Access to the power terminals

Access to the terminals if you use stripped wire cables



⚡ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Replace the wiring trap before applying power.

Failure to follow these instructions will result in death or serious injury.

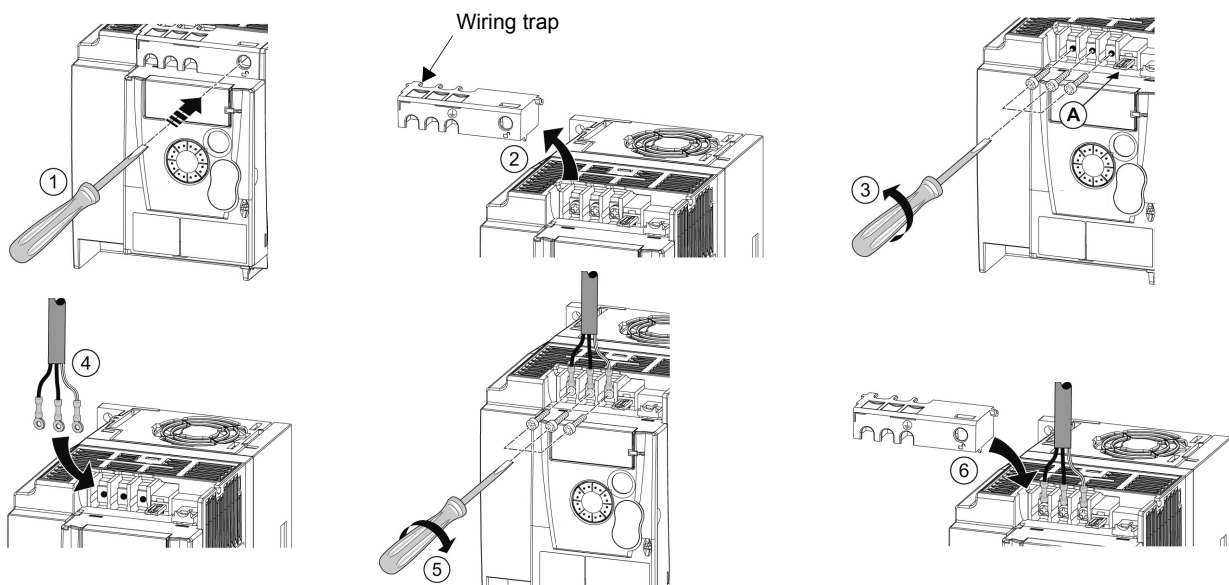
⚠ CAUTION

RISK OF BODY INJURY

Use pliers to remove snap-off of the wiring trap.

Failure to follow these instructions can result in injury or equipment damage.

Access to the line supply terminals to connect ring terminals

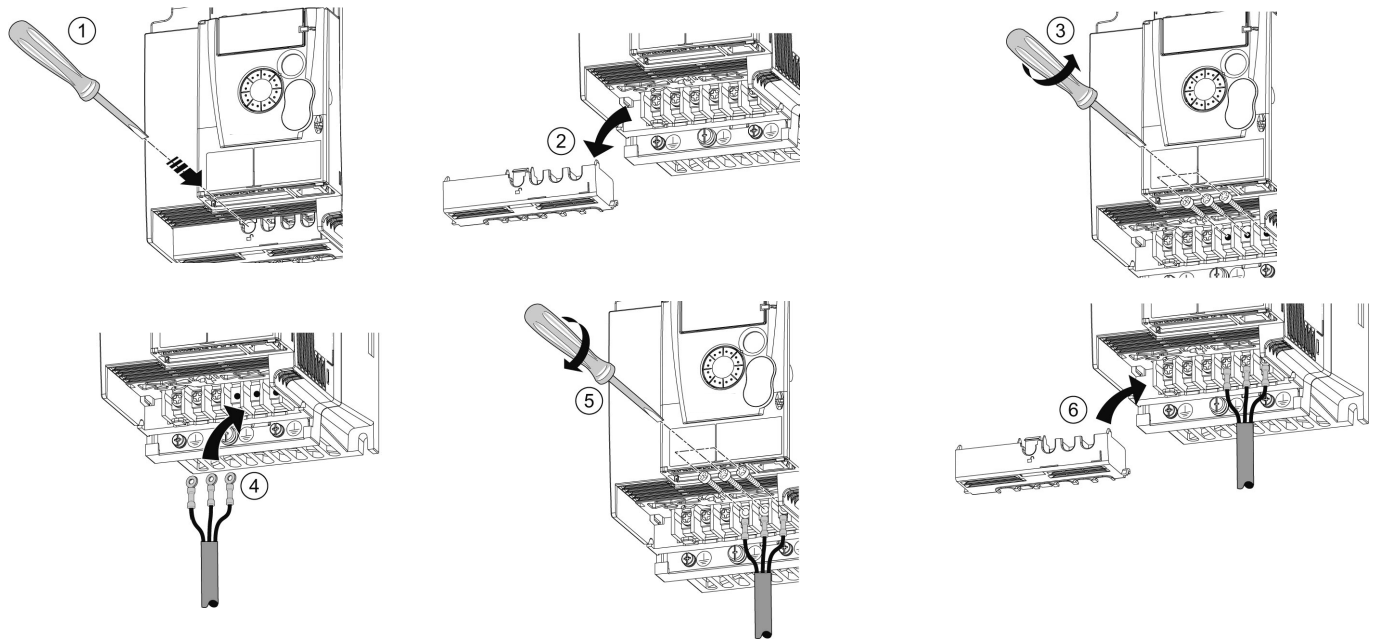


A) IT jumper on 8l44S2****.000-1

B) Grounding screws located below the output terminals

Power terminals

Access to the motor terminals if you use ring terminals



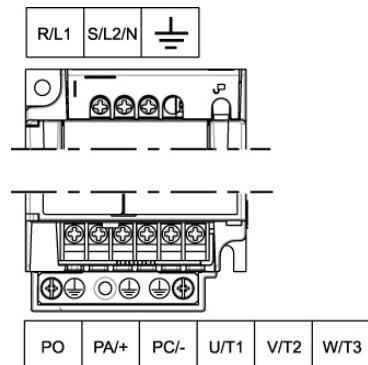
Characteristics and functions of power terminals

Terminal	Function	For ACOPOSinverter S44
\perp	Ground terminal	All ratings
R/L1 - S/L2/N	Power supply	1-phase 100 to 120 V
R/L1 - S/L2/N		1-phase 200 to 240 V
R/L1 - S/L2 - T/L3		3-phase 200 to 240 V
PA/+	dc Bus +	All ratings
PC/-	dc Bus -	All ratings
PO	Not used	
U/T1 - V/T2 - W/T3	Outputs to the motor	All ratings

Power terminals

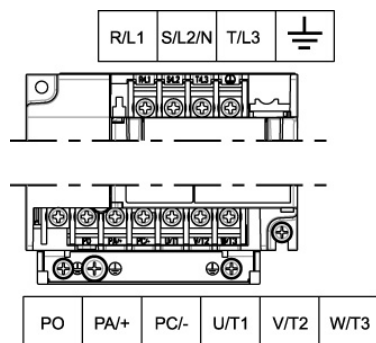
Arrangement of the power terminals

8I44S100018.000-1, 8I44S100037.000-1,
8I44T200018.000-1 to 8I44T200075.000-1 and
8I44S200018.000-1 to 8I44S200075.000-1



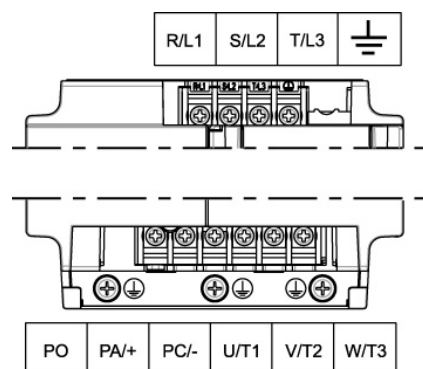
	Applicable wire size (1) mm ² (AWG)	Recommended wire size (2) mm ² (AWG)	Tightening torque (3) N·m (lb.in)
8I44S100018.000-1 8I44S100037.000-1 8I44T200018.000-1 to 8I44T200075.000-1 8I44S200018.000-1 to 8I44S200075.000-1	2 to 3.5 (14 to 12)	2 (14)	0.8 to 1 (7.1 to 8.9)

8I44S100075.000-1, 8I44S200150.000-1,
8I44S200220.000-1, 8I44T200150.000-1 and
8I44T200220.000-1



	Applicable wire size (1) mm ² (AWG)	Recommended wire size (2) mm ² (AWG)	Tightening torque (3) N·m (lb.in)
8I44S100075.000-1 8I44S200150.000-1 8I44S200220.000-1	3.5 to 5.5 (12 to 10)	5.5 (10)	1.2 to 1.4 (10.6 to 12.4)
8I44T200150.000-1	2 to 5.5 (14 to 10)	2 (14)	
8I44T200220.000-1		3.5 (12)	

8I44T200300.000-1 and 8I44T200400.000-1



	Applicable wire size (1) mm ² (AWG)	Recommended wire size (2) mm ² (AWG)	Tightening torque (3) N·m (lb.in)
8I44T200300.000-1 8I44T200400.000-1	5.5 (10)	5.5 (10)	1.2 to 1.4 (10.6 to 12.4)

(1) The value in bold corresponds to the minimum wire gauge to permit secureness

(2) 75°C (167 °F) copper cable (minimum wire size for rated use)

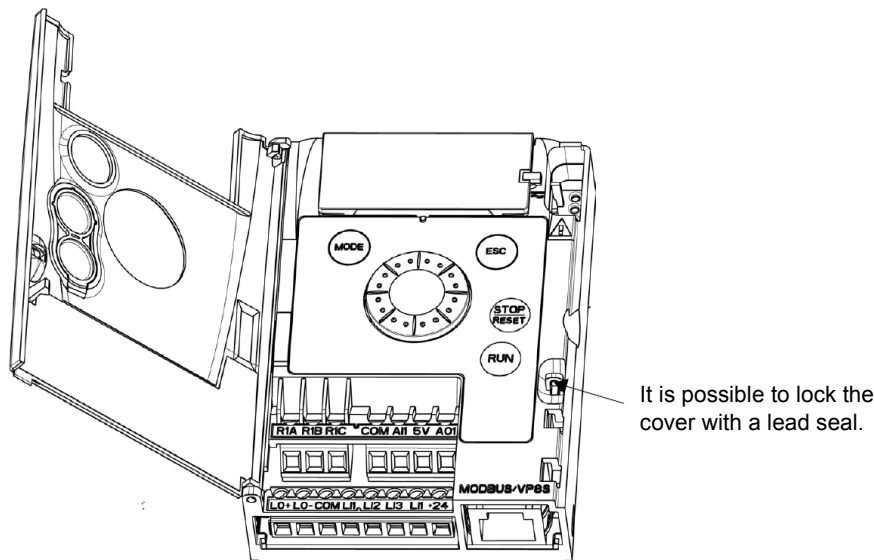
(3) Recommended to maximum value

Control terminals

Keep the control circuits away from the power cables. For control and speed reference circuits, we recommend using shielded twisted cables with a pitch of between 25 and 50 mm (1 and 2 in.), connecting the shielding as outlined on page 26.

Access to the control terminals

To access the control terminals, open the cover.
Note: For information regarding HMI button functions, see "HMI description" on page 32.



Arrangement of the control terminals

	R1A	Normally open (NO) contact of the relay
	R1B	Normally closed (NC) contact of the relay
	R1C	Common pin of the relay
	COM	Common of analog and logic I/Os
	AI	Analog Input
	5V	+5 V supply provided by the drive
	AO1	Analog Output
	LO+	Logic Output (collector)
	LO-	Common of the Logic Output (emitter)
	COM	Common of analog and logic I/Os
	LI1	Logic Input
	LI2	Logic Input
	LI3	Logic Input
	LI4	Logic Input
	+24V	+24 V supply provided by the drive
	RJ45	Connection for Modbus network adapter
	D1, D0, 0V	Connection for Modbus network

Note: To connect cables, use a slotted screwdriver 0.6 x 3.5.

ACOPOSinverter S44 Control terminals	Applicable wire size (1) mm² (AWG)	Tightening torque (2) N·m (lb.in)
R1A, R1B, R1C	0.75 to 1.5 (18 to 16)	0.5 to 0.6 (4.4 to 5.3)
Other terminals	0.14 to 1.5 (26 to 16)	

(1)The value in bold corresponds to the minimum wire gauge to permit secureness
(2)Recommended to maximum value

Control terminals

Characteristics and functions of the control terminals

Terminal	Function	Electrical characteristics
R1A	NO contact of the relay	Min. switching capacity: • 5 mA for 24 V $\overline{\text{---}}$ Maximum switching capacity: • 2 A for 250 V \sim and for 30 V $\overline{\text{---}}$ on inductive load ($\cos \varphi = 0.4$ and $L/R = 7$ ms) • 3 A for 250 V \sim and 4 A for 30 V $\overline{\text{---}}$ on resistive load ($\cos \varphi = 1$ and $L/R = 0$) • response time: 30 ms maximum
R1B	NC contact of the relay	
R1C	Common pin of the relay	
COM	Common of analog and logic I/Os	
AI1	Voltage or current analog input	• resolution: 10 bits • precision: $\pm 1\%$ at 25°C (77°F) • linearity: $\pm 0.3\%$ (of full scale) • sampling time: 20 ms \pm 1 ms Analog voltage input 0 to +5 V or 0 to +10 V (maximum voltage 30 V) impedance: 30 k Ω Analog current input x to y mA, impedance: 250 Ω
5V	+5 V power supply for reference potentiometer	• precision: $\pm 5\%$ • maximum current: 10 mA
AO1	Voltage or current analog output (collector)	• resolution: 8 bits • precision: $\pm 1\%$ at 25°C (77°F) • linearity: $\pm 0.3\%$ (of full scale) • refresh time: 4 ms (maximum 7 ms) Analog voltage output: 0 to +10 V (maximum voltage +1%) • minimum output impedance: 470 Ω Analog current output: x to 20 mA • maximum output impedance: 800 Ω
LO+	Logic output	• voltage: 24 V (maximum 30 V) • impedance: 1 k Ω , maximum 10 mA (100 mA in open collector) • linearity: $\pm 1\%$ • refresh time: 20 ms \pm 1 ms
LO-	Common of the logic output (emitter)	
LI1 LI2 LI3 LI4	Logic inputs	Programmable logic inputs • +24 V power supply (maximum 30 V) • impedance: 3.5 k Ω • state: 0 if < 5 V, state 1 if > 11 V in positive logic • state: 1 if < 10 V, state 0 if > 16 V or switched off (not connected) in negative logic • sampling time: < 20 ms \pm 1 ms
+24V	+24 V supply provided by the drive	+ 24 V -15% +20% protected against short-circuits and overloads. Maximum customer current available 100 mA
D1 D0 0V	Connection for Modbus network	DATA DATA\ GND

Control terminals

Control connection diagrams

The **Logic inputs type** **n P L** parameter page [50](#) is used to adapt the operation of the logic inputs to the technology of the programmable controller outputs.

Below hardware revision C0:

- Set the parameter to **P D S** for Source operation
- Set the parameter to **n E E** for Sink operation

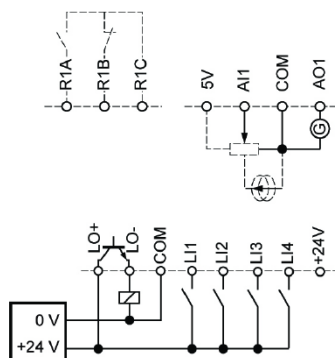
From hardware revision D0:

- Set the parameter to **P D S** for Source operation
- Set the parameter to **n E E** for internal Sink operation
- Set the parameter to **E n E E** for external Sink operation.

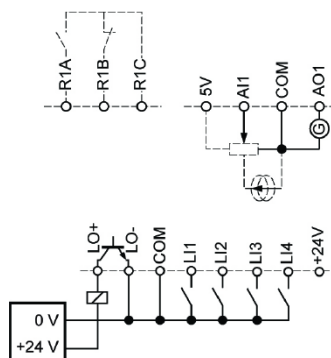
Note: The modification will be taken into account only at the next control power on.

From upgrade version 1.1.0.0 the setting **E n E E** is adjustable.

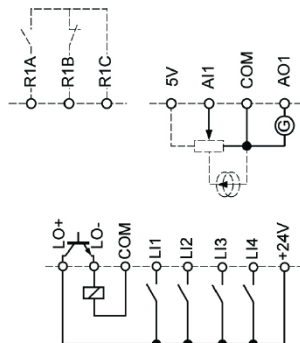
Source - using external supply



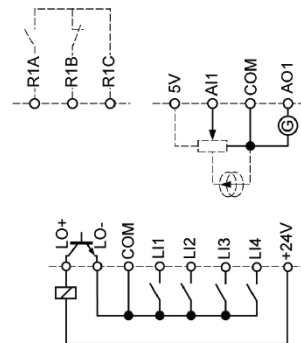
Sink - using external supply



Source - using internal supply



Sink - using internal supply



⚠ DANGER

UNINTENDED EQUIPMENT OPERATION

- The accidental grounding of logic inputs configured for Sink Logic can result in unintended activation of drive functions.
- Protect the signal conductors against damage that could result in unintentional conductor grounding.
- Follow NFPA 79 and EN 60204 guidelines for proper control circuit grounding practices.

Failure to follow these instructions will result in death or serious injury.

⚠ DANGER

UNINTENDED EQUIPMENT OPERATION

- Do not use a PLC to command the logic input of the drive in sink mode.
- If this behaviour is required, contact local B&R office for additional information.

Failure to follow these instructions will result in death or serious injury.

Electromagnetic compatibility (EMC)

IMPORTANT: The high frequency equipotential ground connection between the drive, motor, and cable shielding does not eliminate the need to connect the ground (PE) conductors (green-yellow) to the appropriate terminals on each unit. See Wiring recommendations on page [16](#).

Principle and precautions

- Grounds between the drive, motor, and cable shielding must have high frequency equipotentiality.
- When using shielded cable for the motor, use a 4-conductor cable so that one wire will be the ground connection between the motor and the drive. The size of the ground conductor must be selected in compliance with local and national codes. The shield can then be grounded at both ends. Metal ducting or conduit can be used for part or all of the shielding length, provided there is no break in continuity.
- When using shielded cable for Dynamic Brake (DB) resistors, use a 3-conductor cable so that one wire will be the ground connection between the DB resistor assembly and the drive. The size of the ground conductor must be selected in compliance with local and national codes. The shield can then be grounded at both ends. Metal ducting or conduit can be used for part or all of the shielding length, provided there is no break in continuity.
- When using shielded cable for control signals, if the cable is connecting equipment that is close together and the grounds are bonded together, then both ends of the shield can be grounded. If the cable is connected to equipment that may have a different ground potential, then ground the shield at one end only to prevent large currents from flowing in the shield. The shield on the ungrounded end may be tied to ground with a capacitor (for example: 10 nF, 100 V or higher) in order to provide a path for the higher frequency noise. Keep the control circuits away from the power circuits. For control and speed reference circuits, we recommend using shielded twisted cables with a pitch of between 25 and 50 mm (0.98 and 1.97 in.) Keep the control circuits away from the power circuits. For control and speed reference circuits, we recommend using shielded twisted cables with a pitch of between 25 and 50 mm (0.98 and 1.97 in.)
- Ensure maximum separation between the power supply cable (line supply) and the motor cable.
- The motor cables must be at least 0.5 m (20 in.) long.
- Do not use surge arresters or power factor correction capacitors on the variable speed drive output.
- If using an additional input filter, it should be mounted as close as possible to the drive and connected directly to the line supply via an unshielded cable. Link the drive via the filter output cable.
- For installation of the optional EMC plate and instructions for meeting IEC 61800-3 standard, refer to the section entitled "Installing the EMC plates".

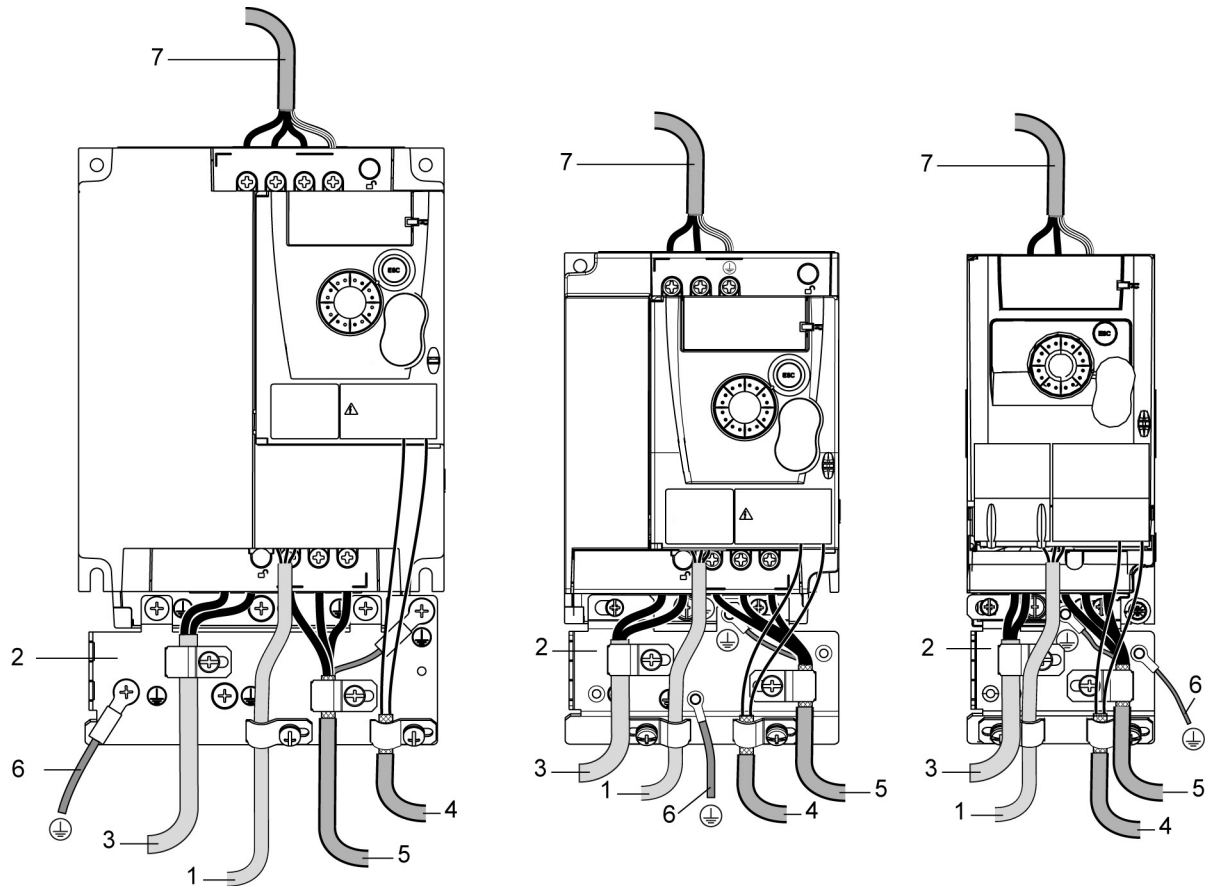
DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Do not expose cable shielding except where connected to ground at the metal cable glands and underneath the grounding clamps.
- Ensure that there is no risk of the shielding coming into contact with live components.

Failure to follow these instructions will result in death or serious injury.

Installation diagram (example)



- 1.** Non-shielded wires for the output of the status relay contacts
- 2.** EMC plate not supplied with the drive, to be mounted as indicated on the diagram
- 3.** PA and PC terminals
- 4.** Shielded cable for connecting the control/signalling wiring
For applications requiring several conductors, use small cross-sections (0.5 mm², 20 AWG).
The shielding must be connected to ground at both ends. The shielding must be continuous and intermediate terminals must be in EMC shielded metal boxes.
- 5.** Shielded cable for motor connection with shielding connected to ground at both ends
This shielding must be continuous, and if there are any intermediate terminals, these must be in an EMC shielded metal box. The motor cable PE grounding conductor (green-yellow) must be connected to the grounded casing.
- 6.** Grounding conductor, cross-section 10 mm² (6 AWG) according to IEC 61800-5-1 standard.
- 7.** Power input (non shielded cable)

Attach and ground the shielding of cables 4 and 5 as close as possible to the drive:

- Expose the shielding
- Use cable clamps of an appropriate size on the parts from which the shielding has been exposed, to attach them to the casing.
The shielding must be clamped tightly enough to the metal plate to ensure correct contact.
- Types of clamp: stainless steel (delivered with the optional EMC plate).

EMC conditions for 8I44S2****.000-1

C1 EMC category is reached if length of shielded cable is 5 m (16.4 ft) maximum and [Switching frequency 5 F r](#) page 58 is 4, 8 or 12 kHz. C2 EMC category is reached if length of shielded cable is 10 m (32.8 ft) maximum and [Switching frequency 5 F r](#) is 4, 8 or 12 kHz and if length of shielded cable is 5 m (16.4 ft) maximum for all other values of [Switching frequency 5 F r](#).

Internal EMC filter on 8I44S2****.000-1

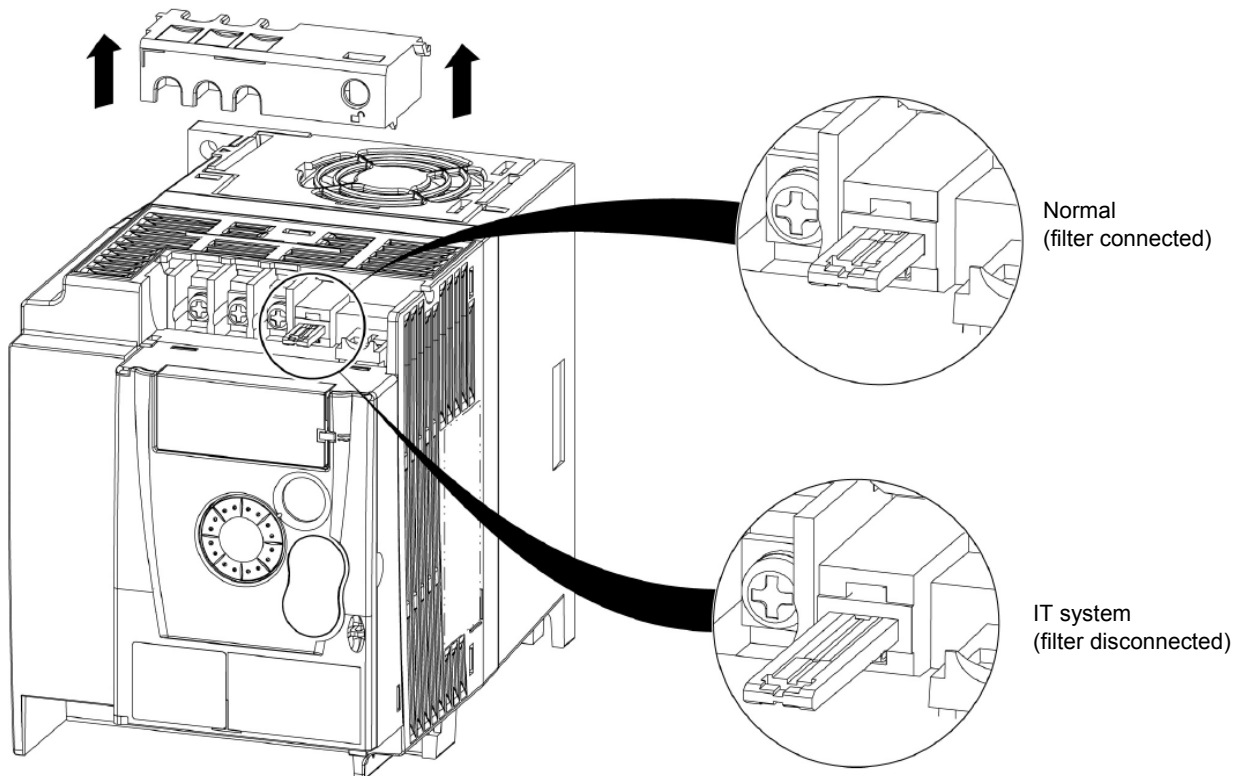
All 8I44S2****.000-1 drives have a built-in EMC filter. As a result they exhibit leakage current to ground. If the leakage current creates compatibility problems with your installation (residual current device or other), then you can reduce the leakage current by opening the IT jumper as shown below. In this configuration EMC compliance is not guaranteed.

CAUTION

DRIVE LIFETIME REDUCTION

On 8I44S2****.000-1 ratings, if the filters are disconnected, the drive's switching frequency must not exceed 4 kHz. Refer to [Switching frequency 5 F r](#) page 58 for adjustment.

Failure to follow these instructions can result in equipment damage.



Check list

Read carefully the safety information in the user manual and the catalogue. Before starting up the drive, please check the following points regarding mechanical and electrical installations, then use and run the drive.
For complete documentation, refer to www.br-automation.com.

1. Mechanical installation

- For drive mounting types and recommendations on the ambient temperature, please refer to the Mounting and temperature conditions instructions on page [13](#).
- Mount the drive vertically as specified, see Mounting and temperature conditions instructions on page [13](#).
- The use of the drive must be in agreement with the environments defined by the standard 60721-3-3 and according to the levels defined in the catalogue.
- Mount the options required for your application, refer to the catalogue.

2. Electrical installation

- Connect the drive to the ground, see Equipment grounding on page [16](#).
- Ensure that the input power voltage corresponds to the drive nominal voltage and connect the line supply as shown in General wiring diagram on page [18](#).
- Ensure you use appropriate input power fuses and circuit breaker on page [115](#).
- Wire the control terminals as required, see Control terminals on page [23](#). Separate the power cable and the control cable according to the EMC compatibility rules on page [26](#).
- The 8I44S2*****.000-1 range integrates an EMC filter. The leakage current can be reduced using the IT jumper as explained in the paragraph Internal EMC filter on 8I44S2*****.000-1 on page [28](#).
- Ensure that motor connections correspond to the voltage (star, delta).

3. Use and run the drive

- Start the drive and you will see **Standard motor frequency** **b F r** page [44](#) at the first power on. Check that the frequency defined by the frequency **b F r** (the factory setting is 50 Hz) is in accordance with the frequency of the motor, see First power-up on page [33](#). For the following power on, you will see **r d y** on the HMI.
- MyMenu (upper part of CONF mode) allows you to configure the drive for most applications (see page [44](#)).
- **Factory / recall customer parameter set** **F L 5** function page [45](#) allows you to reset the drive with factory settings.

Factory configuration

Drive factory settings

The ACOPOSinverter S44 is factory-set for the most common operating conditions (motor rating according to drive rating):

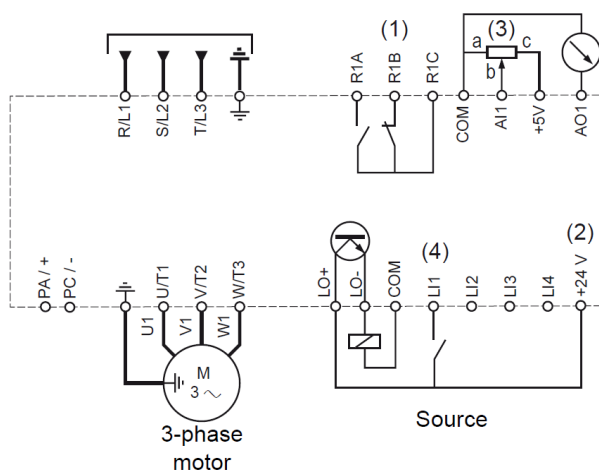
- Display: drive ready (**r d y**) motor stopped or motor frequency reference while running
- Automatic adaptation of the deceleration ramp in the event of overvoltage on braking
- No automatic restarting after a detected fault is cleared
- Logic inputs:
 - LI1: forward (2-wire transitional control)
 - LI2, LI3, LI4: no assignment
- Logic output: LO1: no assignment
- Analog input: AI1 (0 to + 5 V) speed reference
- Relay R1: the contact opens in the event of a detected fault (or drive off)
- Analog output AO1: no assignment

Code	Description	Value	page
b F r	Standard motor frequency	50 Hz	44
U n S	Rated motor voltage	230 V	56
A C C	Acceleration	3 seconds	63
d E C	Deceleration	3 seconds	63
L S P	Low speed	0 Hz	44 88
H S P	High speed	50 Hz	89
C t t	Motor control type	Standard U/F law	56
U F r	IR compensation (law U/F)	100%	57
I t h	Motor thermal current	equal to nominal motor current (value determined by drive rating)	93
S d C I	Automatic DC injection current	0.7 x nominal drive current, for 0.5 seconds	66
S F r	Switching frequency	4 kHz	58

If the above values are compatible with the application, the drive can be used without changing the settings.

Drive factory wiring diagram

8I44T2****.000-1



(1) R1 relay contacts, for remote indication of the drive status

(2) Internal + 24 V \equiv . If an external source is used (+ 30 V \equiv maximum), connect the 0 V of the source to the COM terminal, and do not use the + 24 V \equiv terminal on the drive.

(3) Reference potentiometer (10 k Ω maximum)

(4) Forward

Basic functions

Status relay, unlocking

The R1 status relay is energized when the drive power is applied with no fault detected. It de-energizes in the event of a detected fault or when the drive power is removed.

The drive is reset after a detected fault:

- by switching off the drive until the display disappears completely, then switching on again
- automatically in the cases described in the "automatic restart" function, **F L E** - menu, **Automatic restart A L r** page **90** set to **Y E 5**
- via a logic input when this input is assigned to the "drive reset" function, **F L E** - menu, **Detected fault reset assignment r 5 F** page **90** set to L*H.

Drive thermal detection

Thermal detection is provided by a built-in PTC probe in the power module.

Drive ventilation

Ratings up to 0.75 kW (1 HP) do not include a fan.

The fan runs only when the drive thermal state requires ventilation.

Motor thermal detection

Function:

Thermal detection by calculating the I^2t .

Note: The motor thermal state memory returns to zero when the drive power is cycled if **Motor thermal state memo M L M** page **93** is not set to **Y E 5**.

CAUTION

RISK OF DAMAGE TO THE MOTOR

The use of external overload protection is required under the following conditions:

- Repowering up the product since there is no motor thermal state memory
- Running multiple motors
- Running motors rated at less than 20% of the nominal drive current
- Using motor switching

Failure to follow these instructions can result in equipment damage.

CAUTION

MOTOR OVERHEATING

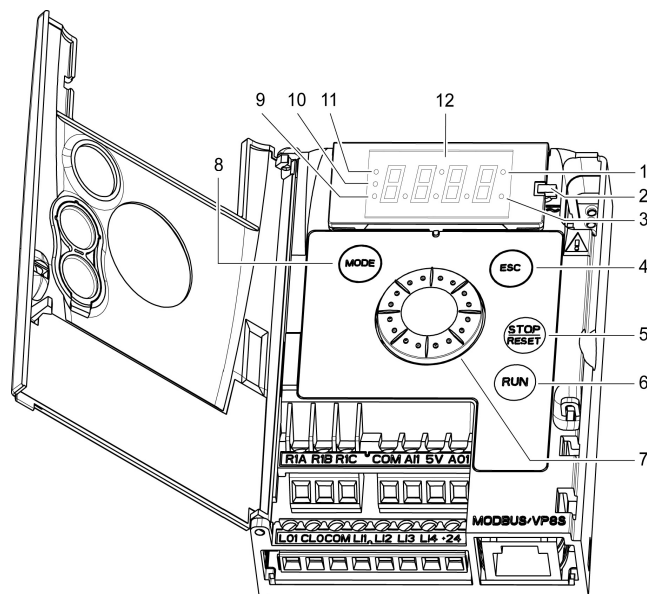
- This drive does not provide direct thermal protection for the motor.
- Use of a thermal sensor in the motor may be required for protection at all speeds or loading conditions.
- Consult the motor manufacturer for the thermal capability of the motor when operated over the desired speed range.


Failure to follow these instructions can result in equipment damage.

Programming

HMI description

Functions of the display and keys



1. Value LED (a) (b)
2. Charge LED
3. Unit LED (c)
4. ESC button: Exits a menu or parameter, or aborts the displayed value to return to the previous value in the memory. In LOCAL configuration, 2 s press on ESC button switches between the control/programming modes.
5. STOP button: stops the motor (could be hidden by door if function disabled). **Important: See instructions for "RUN/STOP" cover removal.**
6. RUN button: Starts running in LOCAL configuration and in REMOTE configuration if the function is configured (could be hidden by door if function disabled).
7. Jog dial
 - Acts as a potentiometer in LOCAL configuration and in REMOTE configuration if the function is configured.
 - For navigation when turned clockwise or counterclockwise
 - and selection / validation when pushedThis action is represented by this symbol 
8. MODE button
 - Switches between the control/programming modes. 3s press on MODE button switches between the REMOTE/LOCAL configurations. The MODE button is only accessible with the HMI door open.
9. CONFIGURATION mode LED (b)
10. MONITORING mode LED
11. REFERENCE mode LED
12. Four "7-segment" displays

Note: In LOCAL configuration, the three Leds 9, 10, 11 are blinking simultaneously in programming mode and are working as a Led chaser in control mode.
The LOCAL mode can be used from hardware revision D0

- (a) If illuminated, indicates that a **value** is displayed, for example, **0.5** is displayed for "0.5"
(b) When changing a value the Configuration mode LED and the value LED are on steady
(c) If illuminated, indicates that a **unit** is displayed, for example, AMP is displayed for "Amps"

⚠ WARNING

LOSS OF CONTROL

The stop buttons on ACOPOSinverter S44 drive and on the remote keypad display can be programmed to not have priority. To retain stop key priority, set **Stop key priority PSE** page **61** to **YES**. Do not set **PSE** to **NO** unless exterior stopping method(s) exist.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

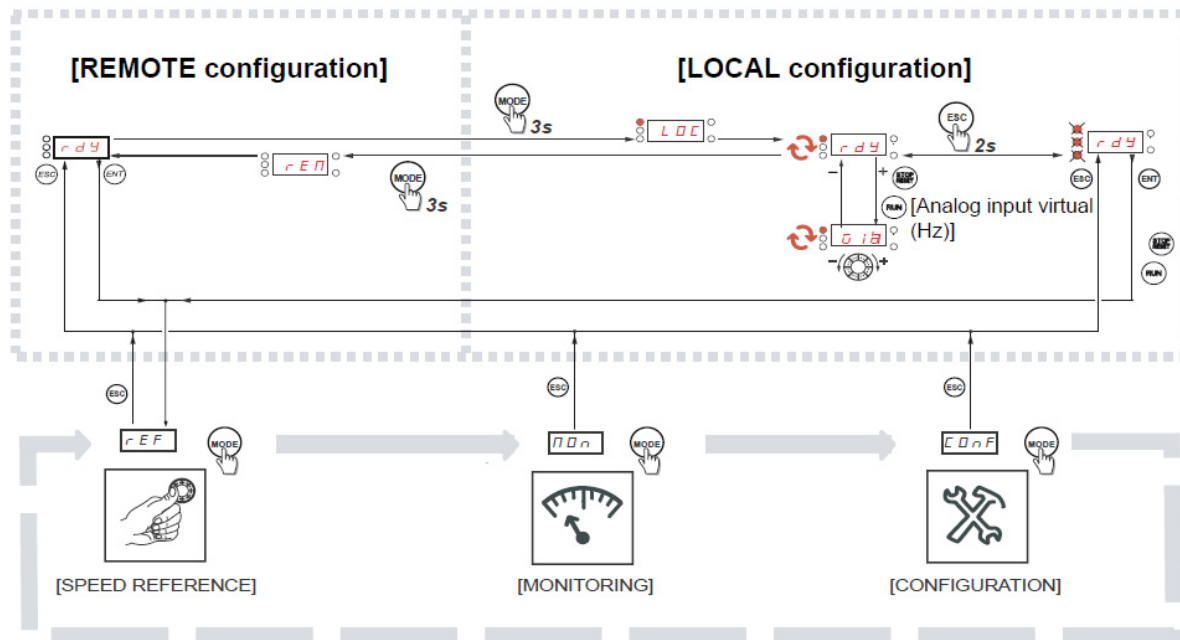
Programming

First power-up

At first power-up you are prompted to set **Standard motor frequency** **b F r** page 44. Next time power is applied **r d y** appears. Operating mode selection is then possible using the MODE key as detailed below.

Menus structure

Access to menus and parameters is possible through 3 modes: Reference **r E F** page 36, Monitoring **π D n** page 37 and Configuration **C D n F** page 43. Switching between these modes is possible at any time using the MODE key or Jog Dial on keyboard. The first press on the MODE key moves from the current position to the top of the branch. A second press switches to the next mode.



Structure of parameter tables

The modes, sections, menus, sub-menus and parameter tables description is organized as below.
Note: Parameters containing the sign (↺) in the code column can be modified with the drive running or stopped

Example:

1

2

3

4

5

6

7

8

9

10

Code	Name / Description	Adjustment range	Factory setting
Fun -	Function menu		
CtL -	Control menu		
FLD	<input type="checkbox"/> Forced local assignment		n0
n0 L1H L2H L3H L4H	<input type="checkbox"/> No <input type="checkbox"/> L1h <input type="checkbox"/> L2h <input type="checkbox"/> L3h <input type="checkbox"/> L4h		

1. Name of mode

2. Name of section, if any

3. Menu code on 4-digit display, followed by a "-"

4. Sub-menu code on 4-digit display, followed by a "-", if any

5. Parameter code
6. Value code

7. Name of menu




8. Name of sub-menu

9. Parameter description



10. Possible value(s) / state of parameter, if any

Function compatibility table

	Preset speed (page 69)	PI regulator (page 71)	Jog operation (page 67)	Auto DC injection (page 66)	Catch on the fly (page 91)	Fast stop (page 65)	Freewheel (page 65)
Preset speed (page 69)			↑				
PI regulator (page 71)			●				
Jog operation (page 67)	←	●		↑			
Auto DC injection (page 66)			↑				↑
Catch on the fly (page 91)							↑
Fast stop (page 65)							↑
Freewheel (page 65)				←	↑	←	

 Incompatible functions
  Compatible functions
  Not applicable

Priority function (function which can be active at the same time)


 The function indicated by the arrow has priority over the other

Stop functions have priority over run commands.
 Speed references via logic command have priority over analog references.

Reference Mode rEF

Use the reference mode to monitor and if local control is enabled ([Reference channel 1 F r I](#) page 44 set to **A I U I**) adjust the actual reference value by rotating the jog dial.

When local control is enabled, the jog dial on the HMI acts as a potentiometer to change the reference value up and down within the limits preset by other parameters (LSP or HSP). There is no need to press the ENT key to confirm the change of the reference.

If local command mode is disabled, using [Command channel 1 C d I](#) page 62, only reference values and units are displayed. The value will be "read only" and cannot be modified by the jog dial (the reference is no longer given by the jog dial but from an AI or other source).

The actual reference displayed depends on the choice made in [Reference channel 1 F r I](#) page 61.

Organization tree

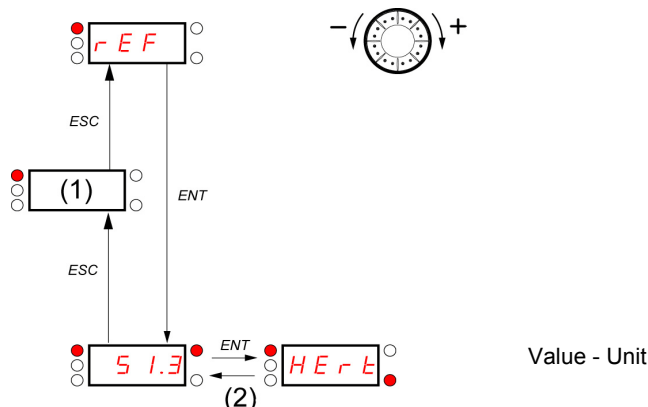
(1) Depending on the active reference channel

Possible values:

L F r
A I U I
F r H
r P I
r P C

(2) 2s or ESC

Displayed parameter value and unit of the diagram is given as examples



Code	Name/Description	Adjustment range	Factory settings
L F r (1)	<input type="checkbox"/> External reference value Frequency reference visible if reference channel active is remote display. Reference channel 1 F r I page 61 set to L C C or Forced local reference F L O C page 62 set to L C C . This parameter allows to modify the frequency reference with the jog dial. Visibility depends on the drive settings.	-400 to +400 Hz	-
A I U I (1)	<input type="checkbox"/> Analog input virtual This parameter allows to modify the frequency reference with an analog input. Reference channel 1 F r I page 61 set to A I U I or Forced local reference F L O C page 62 set to A I U I or PID manual reference P I N page 73 set to A I U I . Visibility depends on the drive settings.	0 to 100 % of HSP	-
F r H A I I L C C P d b A I U I	<input type="checkbox"/> Speed reference Actual frequency reference. This parameter is in read-only mode. Visibility depends on the drive settings. <input type="checkbox"/> Terminal <input type="checkbox"/> Remote display <input type="checkbox"/> Modbus <input type="checkbox"/> Integrated display with Jog dial	0 Hz to HSP	-
r P I (1)	<input type="checkbox"/> Internal PID reference This parameter allows to modify the PID internal reference with the jog dial. Visibility depends on the drive settings.	0 to 100%	-
r P C	<input type="checkbox"/> PID reference value This parameter is the PID reference expressed as a %.	0 to 100%	-

(1) It is not necessary to press the ENT key to confirm the modification of the reference.

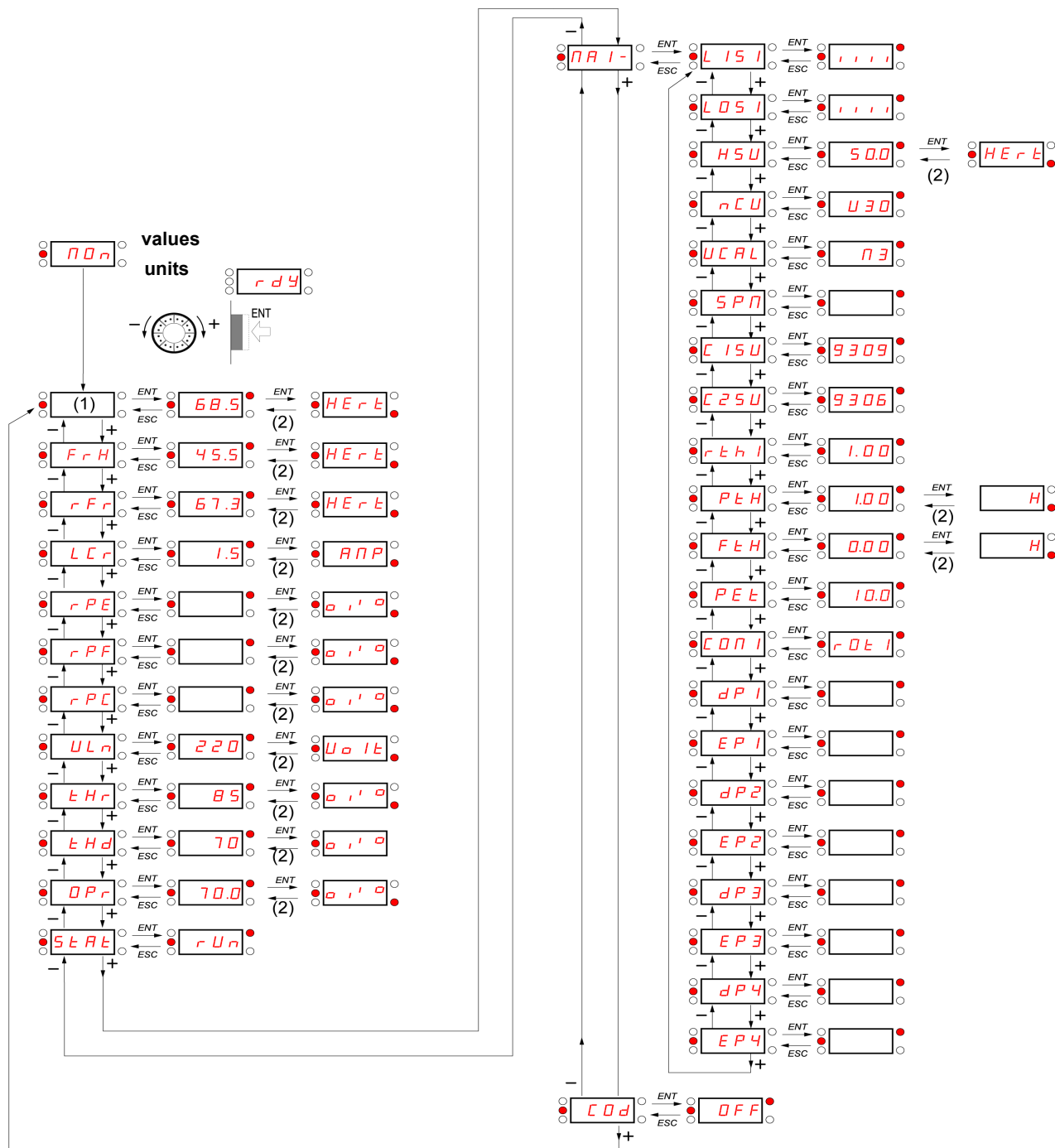
Parameter that can be modified during operation or when stopped.

Monitoring mode MOn

When the drive is running, the value displayed is that of one of the monitoring parameters. The default value displayed is the motor [Output frequency](#) rFr page 38.

While the value of the desired new monitoring parameter is being displayed, press a second time on the jog dial button to display the units.

Organization tree



(1) Depending on reference channel active.

Possible values:

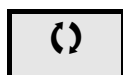
LFr
 AIU

(2) 2 sec or ESC

Displayed parameter values and units of the diagram are given as examples.

Monitoring mode MOn

Code	Name/Description	Unit
L F r ()	<input type="checkbox"/> External reference value External keypad or local force mode configured. Forced local reference F L D C page 62 set to L C C and Forced local assignment F L D page 62 different to n D . Displays the speed reference coming from the remote keypad. This value is not visible in factory setting.	Hz
A I U I ()	<input type="checkbox"/> Analog input virtual Embedded keypad active or local force mode configured, Forced local reference F L D C page 62 set to A I U I and Forced local assignment F L D page 62 different to n D . Displays the speed reference coming from the jog dial. This value is not visible in factory setting.	%
F r H	<input type="checkbox"/> Speed reference Actual frequency reference	Hz
r F r	<input type="checkbox"/> Output frequency This function provides the estimated motor speed. It corresponds to the estimated motor frequency (on the motor shaft). In Standard law S t d page 56, the Output frequency r F r is equal to stator frequency. In Performance law P E r F page 56, the Output frequency r F r motor speed is equal to the estimated motor speed. Range: -400 to 400 Hz	Hz
L C r	<input type="checkbox"/> Motor current Estimation of the effective motor current from phase current measurements with an accuracy of 5%. During DC injection, the current displayed is the maximum value of current injected in the motor.	A
r P E	<input type="checkbox"/> PID error Visible only if the PID function is configured (PID feedback assignment P I F page 71 set to A I I). See PID diagram on page 70	%
r P F	<input type="checkbox"/> PID Feedback Visible only if PID function configured (PID feedback assignment P I F page 71 set to A I I). See PID diagram on page 70	%
r P C	<input type="checkbox"/> PID reference Visible only if PID function configured (PID feedback assignment P I F page 71 set to A I I). See PID diagram on page 70	%
U L n	<input type="checkbox"/> Main voltage Line voltage from the point of view of the DC bus, motor running or stopped	V
t H r	<input type="checkbox"/> Motor thermal state Display of the motor thermal state. Above 118%, the drive trips in Motor overload D L F page 101.	%
t H d	<input type="checkbox"/> Drive thermal state Display of the drive thermal state. Above 118%, the drive trips in Drive overheat D H F page 101.	%
D P r	<input type="checkbox"/> Output power This parameter displays the motor power (on the shaft) that is estimated by the drive	%

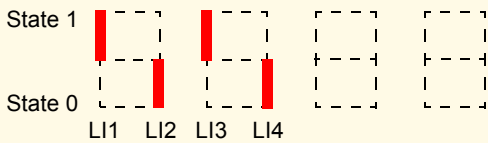
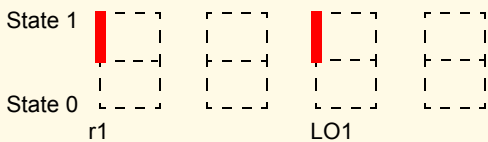


Parameter that can be modified during operation or when stopped.

Monitoring mode MOn

Code	Name/Description
StAt	<div> <div> <div>Product status</div> <div> <p>This parameter shows the state of the drive and motor</p> <ul style="list-style-type: none"> <input type="checkbox"/> Drive ready <input type="checkbox"/> Drive running, the last six segments to the right of the code also indicate direction and speed <input type="checkbox"/> Acceleration, the last six segments to the right of the code also indicate direction and speed <input type="checkbox"/> Deceleration, the last six segments to the right of the code also indicate direction and speed <input type="checkbox"/> DC injection braking in progress <input type="checkbox"/> Current limit, the four segments located on right down of display are blinking <input type="checkbox"/> Freewheel stop control <input type="checkbox"/> Auto-adapted deceleration <input type="checkbox"/> Controlled stop on mains phase loss <input type="checkbox"/> Auto-tuning in progress <input type="checkbox"/> Fast stop <input type="checkbox"/> No line power. When the control part is energized via the RJ45 connector and there is no power on the main input and no run order is present. <input type="checkbox"/> Drive is running and using the withdrawal reference LFF <input type="checkbox"/> Remote configuration <input type="checkbox"/> Local configuration <p>Attention: From hardware revision D0 the parameters FF, EN and LOC are visible.</p> </div> </div> </div>
rdY	
rUn	
ACC	
dEc	
dCb	
CLl	
nSt	
Obt	
CEL	
tUn	
FSt	
nLP	
FF	
EN	
LOC	

Monitoring mode MOn

Code	Name/Description	Unit
MAI-	Maintenance menu Parameters of MAI menu can't be selected for monitoring	
LIS1	<input type="checkbox"/> State of logic inputs LI1 to LI4 Can be used to visualize the state of the 4 logic inputs LI.  Example above: LI1 and LI3 are at 1; LI2 and LI4 are at 0.	-
LOS1	<input type="checkbox"/> State of the logic output LO1 and relay R1 Can be used to visualize the state of the LO. 	-
HSU	<input type="checkbox"/> Display of high speed value Display of high speed value. Range Low speed LSP page 44 to Maximum frequency LFr page 56. Visible only if 2 HSP assignment SH2 or 4 HSP assignment SH4 page 89 is configured.	Hz
PCU	<input type="checkbox"/> Drive Power rating Indicates the drive rating. This is part the of the drive reference, see page 11. Possible values: 018 = 0.18 kW (0.25 HP) 037 = 0.37 kW (0.50 HP) 055 = 0.55 kW (0.75 HP) 075 = 0.75 kW (1 HP) U15 = 1.5 kW (2 HP) U22 = 2.2 kW (3 HP) U30 = 3 kW (4 HP) U40 = 4 kW (5 HP)	-
UCAL	<input type="checkbox"/> Drive voltage rating Drive rate supply voltage. This is part the of the drive reference, see page 11. Possible values: F1 = 100-120 V 1 phase in, 200-240 V 3 phase out M2 = 200-240 V 1 phase in, 200-240 V 3 phase out M3 = 200-240 V 3 phase in, 200-240 V 3 phase out	-
SPn	<input type="checkbox"/> Specific Product Number This parameter is used in order to identify the possible specification of the product. Visible only if SPn is different to zero.	-
C1SU	<input type="checkbox"/> Card 1 Software Version Application software version. Example: 1105 for 1.1 ie 05. 1 (version, major). 1 (version, minor). 05 (ie, evolution number)	-
C2SU	<input type="checkbox"/> Card 2 Software Version Motor software version. Example: 1105 for 1.1 ie 05. 1 (version, major). 1 (version, minor). 05 (ie, evolution number)	-

Monitoring mode MOn

Code	Name/Description	Unit																														
PAR1-	Maintenance menu (continued)																															
rtHI	<div><input type="checkbox"/> Run elapsed time display</div> <div>Total time the motor has been powered up. Range: 0 to 65535 hours. Value displayed is as described in the table below. Parameter resettable by services</div> <table><tr><th>Hours</th><th>Display</th></tr><tr><td>1</td><td>0.01</td></tr><tr><td>10</td><td>0.10</td></tr><tr><td>100</td><td>1.00</td></tr><tr><td>1000</td><td>10.0</td></tr><tr><td>10000</td><td>100</td></tr></table>	Hours	Display	1	0.01	10	0.10	100	1.00	1000	10.0	10000	100	0.01																		
Hours	Display																															
1	0.01																															
10	0.10																															
100	1.00																															
1000	10.0																															
10000	100																															
PEH	<div><input type="checkbox"/> Power On time display</div> <div>Total time the drive has been powered on. Range: 0 to 65535 hours. Value displayed is as described in the table above. Parameter resettable by services.</div>	0.01																														
FtH	<div><input type="checkbox"/> Fan time display</div> <div>Range: 0 to 65535 hours. Value displayed is as described in the table above. Parameter resettable by customer.</div>	0.01																														
PEE ()	<div><input type="checkbox"/> Process elapsed time</div> <div>Range: 0 to 65535 hours. Value displayed is as described in the table above. Parameter resettable by customer.</div>	0.01																														
CONI rOtO rOtI rItO rItI	<div><input type="checkbox"/> Modbus communication status</div> <div><input type="checkbox"/> Modbus no reception, no transmission = communication idle <input type="checkbox"/> Modbus no reception, transmission <input type="checkbox"/> Modbus reception, no transmission <input type="checkbox"/> Modbus reception and transmission</div>	-																														
dPI	<div><input type="checkbox"/> Last detected fault 1</div> <div>This parameter describes the last detected fault</div>	-																														
EPI	<div><input type="checkbox"/> State of drive at detected fault 1</div> <div>This parameter describes the state at the moment of the 1st detected fault</div> <table><tr><td>bit 0</td><td>bit 1</td><td>bit 2</td><td>bit 3</td><td>bit 4</td></tr><tr><td>ETA.1: Switched on</td><td>ETA.5: Quick stop</td><td>ETA.6: Switch on disabled</td><td>Forced local enabled</td><td>ETA.15 : Motor rotation in forward direction (or stopped)</td></tr></table> <table><tr><td>bit 5</td><td>bit 6</td><td>bit 7</td><td>bit 8</td><td>bit 9</td></tr><tr><td>ETI.4: Run order present</td><td>ETI.5: DC injection running</td><td>ETI.7: Motor thermal threshold reached</td><td>ETI.8: Reserved</td><td>ETI.9: Product in acceleration</td></tr></table> <table><tr><td>bit 10</td><td>bit 11</td><td>bit 12</td><td>bit 13 - 14</td><td>bit 15</td></tr><tr><td>ETI.10 : Product in deceleration</td><td>ETI.11 : Current limitation or torque limitation is running</td><td>Fast stop in progress</td><td>ETI.14= 0 + ETI.13=0 : Drive controlled by terminal or local keypad ETI.14= 0 + ETI.13=1 : Drive controlled by remote keypad ETI.14= 1 + ETI.13=0 : Drive controlled by Modbus ETI.14= 1 + ETI.13=1 : Reserved</td><td>ETI.15 : Reverse direction applied to the ramp</td></tr></table>	bit 0	bit 1	bit 2	bit 3	bit 4	ETA.1: Switched on	ETA.5: Quick stop	ETA.6: Switch on disabled	Forced local enabled	ETA.15 : Motor rotation in forward direction (or stopped)	bit 5	bit 6	bit 7	bit 8	bit 9	ETI.4: Run order present	ETI.5: DC injection running	ETI.7: Motor thermal threshold reached	ETI.8: Reserved	ETI.9: Product in acceleration	bit 10	bit 11	bit 12	bit 13 - 14	bit 15	ETI.10 : Product in deceleration	ETI.11 : Current limitation or torque limitation is running	Fast stop in progress	ETI.14= 0 + ETI.13=0 : Drive controlled by terminal or local keypad ETI.14= 0 + ETI.13=1 : Drive controlled by remote keypad ETI.14= 1 + ETI.13=0 : Drive controlled by Modbus ETI.14= 1 + ETI.13=1 : Reserved	ETI.15 : Reverse direction applied to the ramp	-
bit 0	bit 1	bit 2	bit 3	bit 4																												
ETA.1: Switched on	ETA.5: Quick stop	ETA.6: Switch on disabled	Forced local enabled	ETA.15 : Motor rotation in forward direction (or stopped)																												
bit 5	bit 6	bit 7	bit 8	bit 9																												
ETI.4: Run order present	ETI.5: DC injection running	ETI.7: Motor thermal threshold reached	ETI.8: Reserved	ETI.9: Product in acceleration																												
bit 10	bit 11	bit 12	bit 13 - 14	bit 15																												
ETI.10 : Product in deceleration	ETI.11 : Current limitation or torque limitation is running	Fast stop in progress	ETI.14= 0 + ETI.13=0 : Drive controlled by terminal or local keypad ETI.14= 0 + ETI.13=1 : Drive controlled by remote keypad ETI.14= 1 + ETI.13=0 : Drive controlled by Modbus ETI.14= 1 + ETI.13=1 : Reserved	ETI.15 : Reverse direction applied to the ramp																												



Parameter that can be modified during operation or when stopped.

Monitoring mode MOn

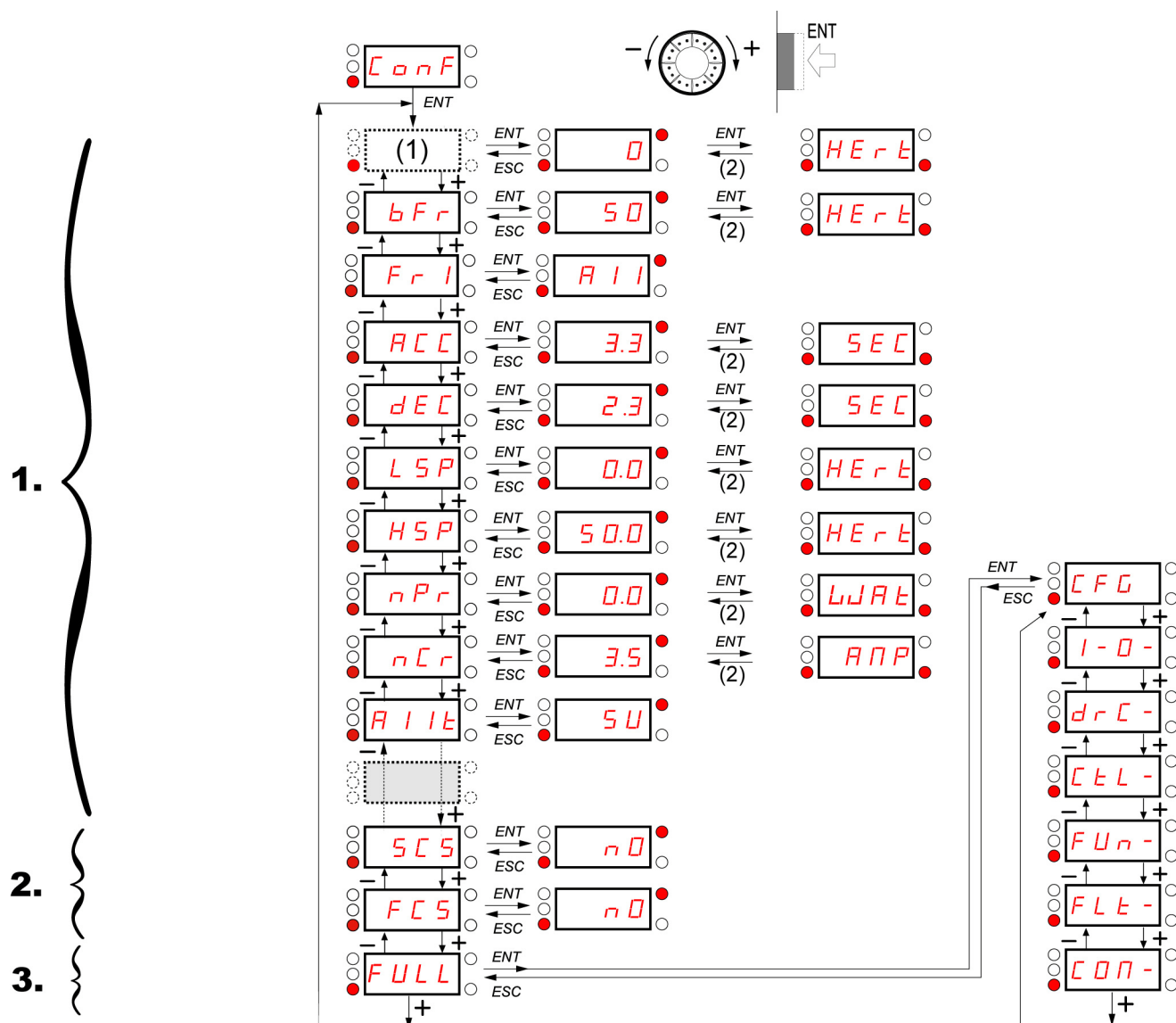
Code	Name/Description	Adjustment range	Factory setting
PA 1 -	Maintenance menu (continued)		
DP 2	<input type="checkbox"/> Last detected fault 2 This parameter describes the 2nd detected fault	-	
EP 2	<input type="checkbox"/> State of drive at detected fault 2 This parameter describes the state at the moment of the 2nd detected fault. See EP 1 .	-	
DP 3	<input type="checkbox"/> Last detected fault 3 This parameter describes the 3rd detected fault	-	
EP 3	<input type="checkbox"/> State of drive at detected fault 3 This parameter describes the state at the moment of the 3rd detected fault. See EP 1 .	-	
DP 4	<input type="checkbox"/> Last detected fault 4 This parameter describes the 4th detected fault	-	
EP 4	<input type="checkbox"/> State of drive at detected fault 4 This parameter describes the state at the moment of the 4th detected fault. See EP 1 .	-	
CD OFF On	<input type="checkbox"/> HMI Password Possible state value: <input type="checkbox"/> Code disabled <input type="checkbox"/> Code activated Range 2 to 9999 If you have lost your code, please contact your local B&R office. This parameter is used to restrict access to the drive. To lock the drive, go to the HMI Password CD parameter, enter a code within the above range. Once activated, the code state changes to On : The protection enables only access to REF (see page 36) and Non (see page 37) modes. Return to factory settings or access to FULL section are disabled. Download configuration from B&R Automation Studio is possible. To unlock the drive, go to the CD parameter, enter the valid code, then press ENT. Code protection removal is then possible and carried out by entering OFF using the jog dial, then press ENT. 1) Different factory setting in Automation Studio. Is set to 44.	2 to 9999	OFF ¹⁾

Configuration Mode ConF

Configuration mode includes 3 parts:

1. MyMenu includes 11 factory set parameters (among them 9 visible by default).
2. store/recall parameter set: these 2 functions are used to store and recall customer settings.
3. FULL: This menu provides access to all other parameters. It includes 6 sub-menus:
 - Macro-configuration **CFG** - page 46
 - Input Output menu **I-O** - page 47
 - Motor control menu **drc** - page 57
 - Control menu **ctl** - page 61
 - Function menu **Fun** - page 63
 - Fault detection management menu **FLt** - page 90
 - Communication menu **CON** - page 96

Organization tree



Displayed parameter values are given as examples only



Configuration Mode - MyMenu

Code	Name/Description	Adjustment range	Factory setting
LFr 	<input type="checkbox"/> External reference value <p>This parameter allows to modify the frequency reference with the jog dial. External keypad or local force mode configured. Forced local reference FLDC page 62 set to LCC and Forced local assignment FLQ page 62 different to nD. Visibility depends on the drive settings.</p>	-400 Hz to 400 Hz	-
AUII 	<input type="checkbox"/> Analog input virtual <p>This parameter allows to modify the frequency reference when</p> <ul style="list-style-type: none"> • Forced local reference FLDC page 62 is set to AUII • and Forced local assignment FLQ page 62 is different to nD <p>Visible if reference channel active is integrated display (Reference channel 1 FrI set to AUII).</p>	0% to 100%	-
BFr SD SD	<input type="checkbox"/> Standard motor frequency <input type="checkbox"/> 50 Hz <input type="checkbox"/> 60 Hz <p>Set to 50 Hz or 60 Hz, taken from the motor rating plate. Changing BFr sets back parameters: FrS, Ftd and HSP: 50 Hz or 60 Hz IEH is set to nCr nCr according to drive rating nPr Watt or HP nSP according to drive rating tFr 60 Hz or 72 Hz</p>		50 Hz
FrI AII LCC ndb AUII	<input type="checkbox"/> Reference channel 1 <p>This parameter allows selection of the reference source.</p> <input type="checkbox"/> Terminal <input type="checkbox"/> Remote display <input type="checkbox"/> Modbus <input type="checkbox"/> Integrated display with Jog dial 1) Different factory setting in Automation Studio. Is set to Modbus ndb .		AI1 ¹⁾
ACC 	<input type="checkbox"/> Acceleration <p>Acceleration time between 0 Hz and the Rated motor frequency FrS page 56. Make sure that this value is compatible with the inertia being driven.</p>	0.0 s to 999.9 s	3.0 s
DEC 	<input type="checkbox"/> Deceleration <p>Time to decelerate from the Rated motor frequency FrS page 56 to 0 Hz. Make sure that this value is compatible with the inertia being driven.</p>	0.0 s to 999.9 s	3.0 s
LSP 	<input type="checkbox"/> Low speed <p>Motor frequency at minimum reference If HSP, HSP2, HSP3 and HSP4 are already set then LSP is limited to the minimum of those values.</p>	0 Hz to HSP	0 Hz
HSP 	<input type="checkbox"/> High speed <p>Motor frequency at maximum reference. Check that this setting is appropriate for the motor and the application. The values of HSP, HSP2, HSP3 and HSP4 are independent but each HSP value is linked to the values of Low speed LSP and Maximum frequency tFr page 56 according to the following rules:</p> <ul style="list-style-type: none"> • HSPx is limited to LSP and tFr ($LSP \leq HSPx \leq tFr$) • If tFr is decreased below the current HSPx value, then HSPx automatically decreases to the new value of tFr • Once HSP, HSP2, HSP3 and HSP4 are set, LSP is limited to their minimum 	LSP to tFr (Hz)	50 or 60 Hz according to BFr, max TFr



Parameter that can be modified during operation or when stopped.

Configuration Mode - MyMenu

Code	Name/Description	Adjustment range	Factory setting
nPr	<input type="checkbox"/> Rated Motor Power Visible only if Motor parameter choice nPL page 59 is set to nPr . If nPr is available CaS disappears. Rated motor power given on the nameplate. Motors can range from five ratings lower up to two ratings higher than the drive rating. Performance is optimized when there is a maximum of one rating difference. If Standard motor frequency bFr page 44 is set to 50Hz, the Rated motor power nPr unit will be kW, otherwise it will be HP.	According to drive rating	According to drive rating
nCr	<input type="checkbox"/> Rated motor current Rated motor current given on the nameplate. Rated motor current nCr modifies Motor thermal current IEH page 93.	0.25 In to 1.5 In (1)	According to drive rating
A1IE SU IOU OA	<input type="checkbox"/> AI1 type This function makes interface from the analog input signal to a drive internal value. <input type="checkbox"/> Voltage: 0-5 Vdc <input type="checkbox"/> Voltage: 0-10 Vdc <input type="checkbox"/> Current: x-y mA. Range determined by the AI1 current scaling parameter of 0% CrLI and AI1 current scaling parameter of 100% CrHI settings below, see page 51.		5V
SCS nD ScrI  2 s	<input type="checkbox"/> Store customer parameter set This function creates a backup of the present configuration: <input type="checkbox"/> Function inactive <input type="checkbox"/> Saves the current configuration in the drive memory. SCS automatically switches to nD as soon as the save has been performed. When a drive leaves the factory the current configuration and the backup configuration are both initialized with the factory configuration.		nO
FCS nD rECI InI InII  2 s	<input type="checkbox"/> Factory / recall customer parameter set This function permits to restore a configuration. <input type="checkbox"/> Function inactive FCS automatically changes to nD as soon as one of the following actions has been performed. <input type="checkbox"/> The current configuration becomes identical to the backup configuration previously saved by SCS . FCS automatically changes to nD as soon as this action has been performed. rECI is only visible if the backup has been carried out. If this value appears, InII is not visible. <input type="checkbox"/> The current configuration becomes identical to the factory setting. If this value appears, InII is not visible. <input type="checkbox"/> The current configuration becomes identical to the backup configuration previously defined by Automation Studio. If this value appears, InI and rECI are not visible.		nO
<div style="background-color: black; color: white; text-align: center; padding: 5px;">⚠ DANGER</div> <div style="background-color: yellow; padding: 5px;"> UNINTENDED EQUIPMENT OPERATION Check that the modification of the current configuration is compatible with the wiring diagram used. Failure to follow these instructions will result in death or serious injury. </div>			



To change the assignment of this parameter press the "ENT" key for 2 s.

How to control the drive locally

In factory settings "RUN", "STOP" and the jog dial are inactive. To control the drive locally, adjust the following parameter: set **Reference channel 1** **FrI** page 44 to **A1UI** (Integrated display with jog dial).

Configuration Mode - Complete menu (FULL)

Code	Name/Description	Adjustment range	Factory setting																																																																																																
CFG	<input type="checkbox"/> Macro-configuration		StS																																																																																																
S L S P I d S P d	<div style="background-color: black; color: white; text-align: center; padding: 5px;"> ⚠ DANGER </div> <div style="background-color: yellow; padding: 10px;"> <p>UNINTENDED EQUIPMENT OPERATION</p> <p>Check that the selected macro configuration is compatible with the wiring diagram used.</p> <p>Failure to follow these instructions will result in death or serious injury.</p> <p>Macro configuration provides a shortcut to configure a set of parameters suited to a specific field of application.</p> <p>3 macro configurations are available:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Start/stop. Only forward is assigned <input type="checkbox"/> PID regulation. Activate PID function, dedicated AI1 for feedback and AIV1 for reference <input type="checkbox"/> Speed. Allocate LI to preset speed which provides a means of speeding up the configuration of functions for a specific field of application <p>Selecting a macro configuration assigns the parameters in this macro configuration.</p> <p>Each macro configuration can still be modified in the other menus.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Input / output or parameter</th> <th>Start / Stop</th> <th>PID regulation</th> <th>Speed</th> </tr> </thead> <tbody> <tr> <td>AI1</td> <td>Ref. channel 1</td> <td>PID feedback</td> <td>No</td> </tr> <tr> <td>AIV1</td> <td>No</td> <td colspan="2">Reference channel 1</td> </tr> <tr> <td>AO1</td> <td colspan="3">No</td> </tr> <tr> <td>LO1</td> <td colspan="3">No</td> </tr> <tr> <td>R1</td> <td colspan="3">No drive detected fault</td> </tr> <tr> <td>L1h (2-wire)</td> <td colspan="3">Forward</td> </tr> <tr> <td>L2h (2-wire)</td> <td>No</td> <td></td> <td>Reverse</td> </tr> <tr> <td>L3h (2-wire)</td> <td>No</td> <td>Auto/Manual</td> <td>2 preset speeds</td> </tr> <tr> <td>L4h (2-wire)</td> <td>No</td> <td></td> <td>4 preset speeds</td> </tr> <tr> <td>L1h (3-wire)</td> <td colspan="3">Stop</td> </tr> <tr> <td>L2h (3-wire)</td> <td colspan="3">Forward</td> </tr> <tr> <td>L3h (3-wire)</td> <td>No</td> <td></td> <td>Reverse</td> </tr> <tr> <td>L4h (3-wire)</td> <td>No</td> <td>Auto/Manual</td> <td>2 preset speeds</td> </tr> <tr> <td>F r I (Reference channel 1)</td> <td></td> <td>R I U I</td> <td>R I U I</td> </tr> <tr> <td>C L E (Motor control type)</td> <td></td> <td>P U N P</td> <td></td> </tr> <tr> <td>r I n (Reverse inhibition)</td> <td></td> <td>Y E S</td> <td></td> </tr> <tr> <td>R I I E (AI1t type)</td> <td></td> <td>O R</td> <td></td> </tr> <tr> <td>L F L I (4-20 mA loss)</td> <td></td> <td>Y E S</td> <td></td> </tr> <tr> <td>S P 2 (Preset speed 2)</td> <td></td> <td></td> <td>10. 0</td> </tr> <tr> <td>S P 3 (Preset speed 3)</td> <td></td> <td></td> <td>25. 0</td> </tr> <tr> <td>S P 4 (Preset speed 4)</td> <td></td> <td></td> <td>50. 0</td> </tr> <tr> <td>Π P C (Motor parameter choice)</td> <td></td> <td></td> <td>C O S</td> </tr> <tr> <td>R d C (Automatic DC injection)</td> <td>Y E S</td> <td>Y E S</td> <td>Y E S</td> </tr> </tbody> </table> </div>			Input / output or parameter	Start / Stop	PID regulation	Speed	AI1	Ref. channel 1	PID feedback	No	AIV1	No	Reference channel 1		AO1	No			LO1	No			R1	No drive detected fault			L1h (2-wire)	Forward			L2h (2-wire)	No		Reverse	L3h (2-wire)	No	Auto/Manual	2 preset speeds	L4h (2-wire)	No		4 preset speeds	L1h (3-wire)	Stop			L2h (3-wire)	Forward			L3h (3-wire)	No		Reverse	L4h (3-wire)	No	Auto/Manual	2 preset speeds	F r I (Reference channel 1)		R I U I	R I U I	C L E (Motor control type)		P U N P		r I n (Reverse inhibition)		Y E S		R I I E (AI1t type)		O R		L F L I (4-20 mA loss)		Y E S		S P 2 (Preset speed 2)			10. 0	S P 3 (Preset speed 3)			25. 0	S P 4 (Preset speed 4)			50. 0	Π P C (Motor parameter choice)			C O S	R d C (Automatic DC injection)	Y E S	Y E S	Y E S
Input / output or parameter	Start / Stop	PID regulation	Speed																																																																																																
AI1	Ref. channel 1	PID feedback	No																																																																																																
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R I I E (AI1t type)		O R																																																																																																	
L F L I (4-20 mA loss)		Y E S																																																																																																	
S P 2 (Preset speed 2)			10. 0																																																																																																
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S P 4 (Preset speed 4)			50. 0																																																																																																
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R d C (Automatic DC injection)	Y E S	Y E S	Y E S																																																																																																



To change the assignment of this parameter press the "ENT" key for 2 s.

Configuration Mode - Complete menu (FULL)

Code	Name/Description	Adjustment range	Factory setting
I - 0 -	Input Output menu		
E C C	<div><div>Type of control</div><div><div><div>2-wire control (see page 50)</div><div>The open or closed state of the input controls the running or stopping.</div><div>Example of "source" wiring:</div><div><div><div>+24</div><div>LI1</div><div>LIx</div></div><div><div></div><div></div><div></div></div></div><div>LI1: forward</div><div>LIx: reverse</div></div><div><div>3-wire control</div><div>"forward" or "reverse" pulse is sufficient to command starting, a "stop" pulse is sufficient to command stopping</div><div>Example of "source" wiring:</div><div><div><div>+24</div><div>LI1</div><div>LI2</div><div>LIx</div></div><div><div>E</div><div>E</div><div>E</div></div></div><div>LI1: stop</div><div>LI2: forward</div><div>LIx: reverse</div></div></div></div>	2C	
2 C			
3 C			
2 s			
<div><div><div><div></div><div>DANGER</div></div><div><div>UNINTENDED EQUIPMENT OPERATION</div><div>When this parameter is changed, 2 wire type control E C E page 50 and all the assignments involving the logic inputs will revert to their default values.</div><div>The macro configuration selected will also be reset if it has been customized (loss of custom settings).</div><div>Check that this change is compatible with the wiring diagram used.</div><div>Failure to follow these instructions will result in death or serious injury.</div></div></div></div>			



To change the assignment of this parameter press the "ENT" key for 2 s.

LI assignment information

It is possible with ACOPOSinverter S44 to use multi assignment function (ie: **AC 2** and **rr 5** on the same LI).

It is also possible on some functions to assign LIH (high) or LIL (low), which means that the assigned function will be activated to high (LIH) or low level (LIL) of LI.

Configuration Mode - Complete menu (FULL)

I - D -

d r C -

C k L -

F U N -

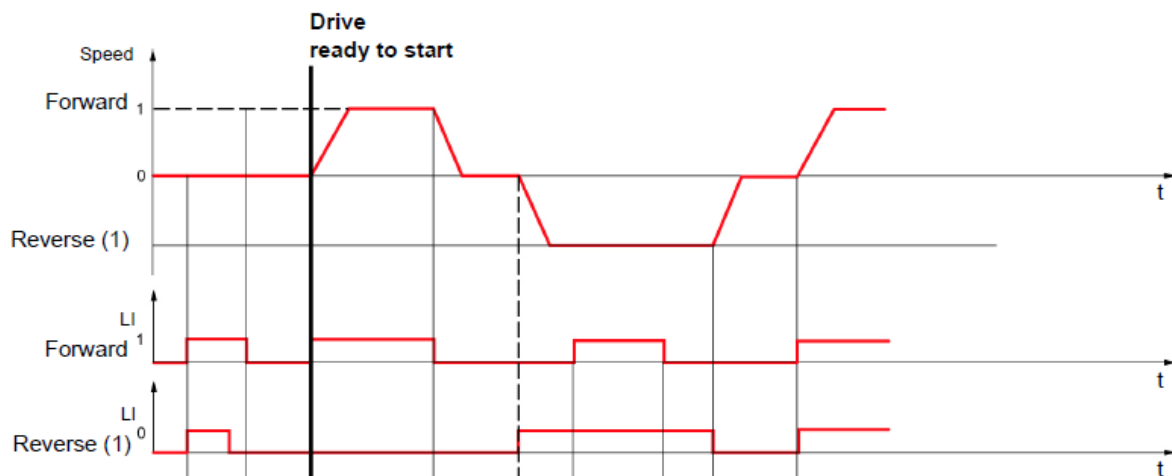
F L k -

C D N -

2 wire control diagram (see page 50)

Drive powered and ready

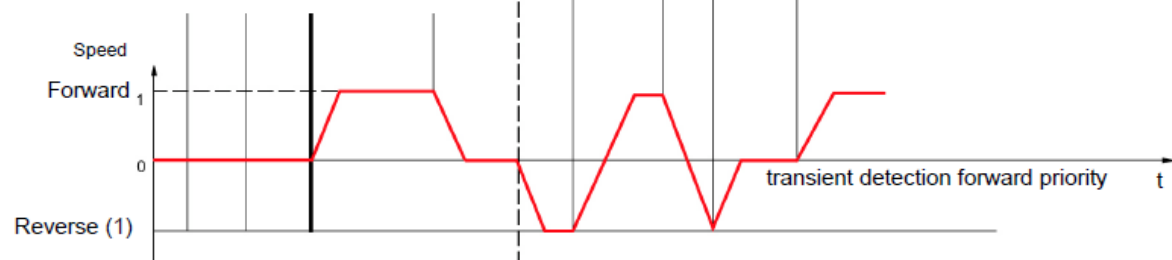
2-Wire with transient detection



2-Wire without transient detection



2-Wire without transient detection

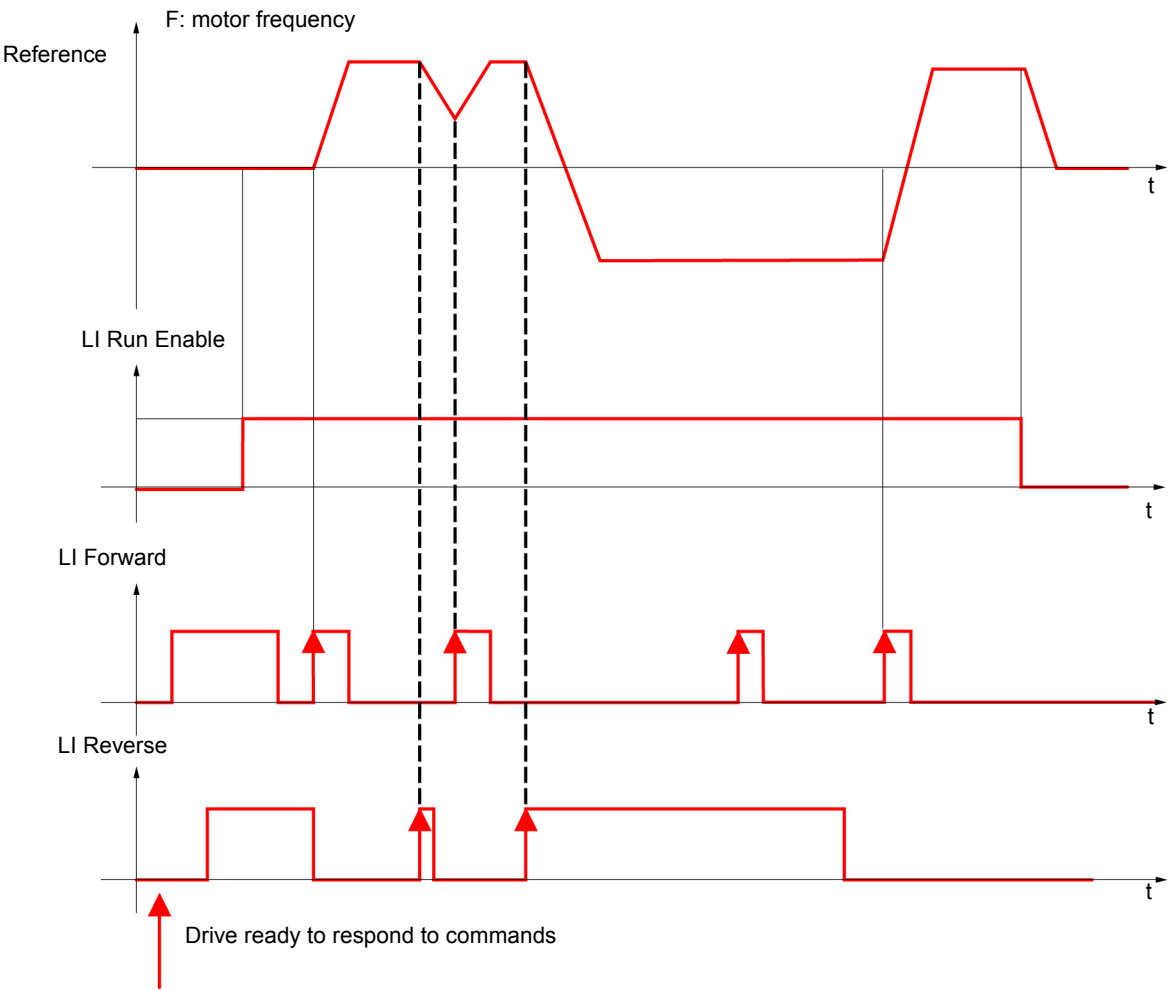


(1) Reverse is not factory assigned. See [Reverse direction](#) r r 5 page 65.

Forward and Reverse realised in same time provides motor starting in Forward direction.

Configuration Mode - Complete menu (FULL)

3-wire control diagram



I - 0 -
dr C -
C L L -
F U N -
F L L -
C O N -

Configuration Mode - Complete menu (FULL)

I - 0 -
dr C -
C L L -
F U N -
F L L -
C O N -

Code	Name/Description	Adjustment range	Factory setting
I - 0 -	Input Output menu (continued)		
E C C	<input type="checkbox"/> 2 wire type control		trn
	<div style="background-color: black; color: white; text-align: center; padding: 5px;"> ⚠ DANGER </div> <p>UNINTENDED EQUIPMENT OPERATION Check that the modification of the 2 wire type control is compatible with the wiring diagram used.</p> <p>Failure to follow these instructions will result in death or serious injury.</p> <p>2-wire type control parameter can only be accessed if Type of control E C C page 47 is set to 2 C.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Level: State 0 or 1 is taken into account for run or stop <input type="checkbox"/> Transition: A change of state (transition or edge) is necessary to initiate operation, to help prevent accidental restarts after a power supply interruption <input type="checkbox"/> Priority FW: State 0 or 1 is taken into account for run or stop, but the "forward" input takes priority over the "reverse" input 		
n P L	<input type="checkbox"/> Logic inputs type		POS
P O S	<p><u>Below hardware revision C0:</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Positive: the inputs are active (state 1) at a voltage equal to or higher than 11 V (for example +24 V terminal). They are inactive (state 0) when the drive is disconnected or at a voltage lower than 5 V. <input type="checkbox"/> Negative: the inputs are active (state 1) at a voltage lower than 10 V (for example COM terminal). They are inactive (state 0) at a voltage equal to or higher than 16 V or when the drive is disconnected. <p><u>From hardware revision D0:</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Positive: the inputs are active (state 1) at a voltage equal to or higher than 11 V (for example +24 V terminal). They are inactive (state 0) when the drive is disconnected or at a voltage lower than 5 V. <input type="checkbox"/> Negative using internal supply: the inputs are active (state 1) at a voltage lower than 10 V (for example COM terminal). They are inactive (state 0) at a voltage equal to or higher than 16 V or when the drive is disconnected. <input type="checkbox"/> Negative using external supply : the inputs are active (state 1) at a voltage lower than 10 V (for example COM terminal). They are inactive (state 0) at a voltage equal to or higher than 16 V. <p>Note: The modification will be taken into account only at the next control power on. From upgrade version 1.1.0.0 the setting E n E G is adjustable.</p> <p>See Control connection diagrams, page 25.</p>		

Configuration Mode - Complete menu (FULL)

I - D -
d r C -
C E L -
F U N -
F L E -
C O N -

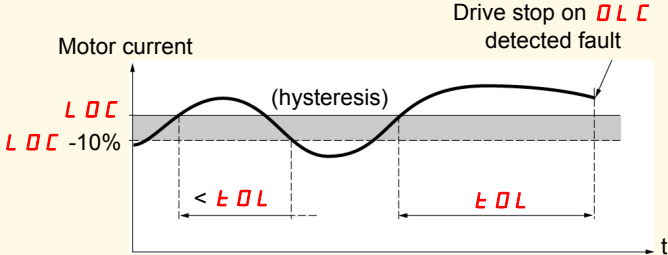
Code	Name/Description	Adjustment range	Factory setting
I - D -	Input Output menu (continued)		
A I I -	AI1 configuration menu		
A I I E	<input type="checkbox"/> AI1 type This function makes interface from the analog input signal to a drive internal value. <input type="checkbox"/> Voltage: 0-5 Vdc <input type="checkbox"/> Voltage: 0-10 Vdc <input type="checkbox"/> Current: x-y mA. Range determined by the AI1 current scaling parameter of 0% C r L I and AI1 current scaling parameter of 100% C r H I settings below. This parameter is already included in "my menu" section, page 45.		5V
C r L I	<input type="checkbox"/> AI1 current scaling parameter of 0% Visible only if AI1 type A I I E is set to D A	0 to 20 mA	4 mA
C r H I	<input type="checkbox"/> AI1 current scaling parameter of 100% Visible only if AI1 type A I I E is set to D A	0 to 20 mA	20 mA
I - D -	Input Output menu (continued)		
r I n D F L E r U n F E A F L A C E A S r A E S A U L A O L A A P I	<input type="checkbox"/> R1 assignment <input type="checkbox"/> Not assigned <input type="checkbox"/> No error detected <input type="checkbox"/> Drive run <input type="checkbox"/> Frequency threshold reached <input type="checkbox"/> HSP reached <input type="checkbox"/> I threshold reached <input type="checkbox"/> Frequency reference reached <input type="checkbox"/> Motor thermal reached <input type="checkbox"/> Underload alarm <input type="checkbox"/> Overload alarm <input type="checkbox"/> AI1 AI. 4-20 - Visible only if A I I E is set to D A (see above)		FLt

Configuration Mode - Complete menu (FULL)

I - O -
d r C -
C t L -
F U N -
F L E -
C O N -

Code	Name/Description	Adjustment range	Factory setting
I - O -	Input Output menu (continued)		
L O I -	LO1 Configuration menu (LO1-)		
L O I	<input type="checkbox"/> LO1 assignment Allows to adapt the logic output to the application need. Same values as r I . See previous page. When n d E = Y E S , output L O I is forced to P N P (see page 77). Note: At the Automation Studio the parameter L O I has to be set to P N P , when n d E = Y E S .		nO
L O I S	<input type="checkbox"/> LO1 status (output active level) <div style="border: 1px solid black; padding: 10px; text-align: center;"> ⚠ WARNING LOSS OF CONTROL When L O I S = n E G and L O I is set to F L E, The output will be active when the drive will detect a fault. The drive status will not be detected if the wiring is damaged for any reason. Do not select "n E G" unless you are sure that your signal will be present in any case. Failure to follow these instructions can result in death, serious injury, or equipment damage. </div>		POS
P O S n E G	<input type="checkbox"/> Positive : hight activation level <input type="checkbox"/> Negative : low activation level		

Configuration Mode - Complete menu (FULL)

Code	Name/Description	Adjustment range	Factory setting
I - 0 -	Input Output menu (continued)		
tOL	<div><input type="checkbox"/> Application Overload time delay</div> <p>This function can be used to stop the motor in the event of an application overload. This is not a motor or drive thermal overload. If the motor current exceeds the Application Overload threshold LDC, an Application Overload time delay tOL is activated. Once this time delay tOL has elapsed, if the current is still greater than the overload threshold LDC -10%, the drive will stop running and display OLC Process overload.</p> <p>Overload detection is only active when the system is in steady state (speed reference reached). A value of 0 will disable application overload detection.</p> <div></div>	0 to 100 s	0 s
FtO ()	<div><input type="checkbox"/> Time delay before automatic start for the overload fault</div> <p>If Ar = YES the drive restarts automatically after an overload fault OLC once this time delay has elapsed. Minimum time permitted between an overload being detected and any automatic restart. In order for an automatic restart to be possible, the value of Maximum restart time Ar page 90 must exceed that of this parameter by at least one minute.</p> <p>Visible only if Application Overload time delay tOL above is not set to 0.</p>	0 to 6 min	0 min
LDC ()	<div><input type="checkbox"/> Application Overload threshold</div> <p>Visible only if Application Overload time delay tOL above is not set to 0.</p> <p>This parameter is used to detect an "application overload". LDC can be adjusted between 70 and 150% of the nominal drive current. This is not a motor or drive thermal overload.</p>	70 to 150% of nCr	90% of nCr

()

Parameter that can be modified during operation or when stopped.

Configuration Mode - Complete menu (FULL)

I - D -
d r C -
C t L -
F U N -
F L t -
C O N -

Code	Name/Description	Adjustment range	Factory setting
I - D -	Input Output menu (continued)		
ULt	<input type="checkbox"/> Application underload time delay ULt can be adjusted between 0 and 100 s. If the motor current undershoots the underload threshold LUL for longer than the adjustable time delay ULt, the drive will stop running and display ULF (Process underload fault) page 102. <div> <p>Motor current</p> <p>Drive stop on ULF detected fault</p> <p>(hysteresis)</p> <p>LUL + 10%</p> <p>LUL</p> <p>< ULt</p> <p>ULt</p> <p>t</p> </div> <p>Underload detection is only active when the system is in steady state (speed reference reached). A value of 0 will disable application underload detection.</p>	0 to 100 s	0 s
LUL ()	<input type="checkbox"/> Application Underload threshold Visible only if Application underload time delay ULt is not set to 0. This parameter is used to detect an application underload condition on the motor. Application Underload threshold LUL can be adjusted between 20 and 100% of the nominal drive current.	20 to 100% of nCr	60%
FtU ()	<input type="checkbox"/> Time delay before automatic start for the underload fault If Rtr = YES the drive restarts automatically after an underload fault ULF once this time delay has elapsed. Minimum time permitted between an overload being detected and any automatic restart. In order for an automatic restart to be possible, the value of Maximum restart time tAr page 90 must exceed that of this parameter by at least one minute. Visible only if Application underload time delay ULt above is not set to 0.	0 to 6 min	0 min
Ftd ()	<input type="checkbox"/> Motor frequency threshold Visible only if R1 assignment r / page 51 or a LO1 assignment L D / page 52 is set to F t A.	0 to 400 Hz	50 or 60 Hz According to drive rating
Ctd ()	<input type="checkbox"/> Motor current threshold Visible only if R1 assignment r / page 51 or a LO1 assignment L D / page 52 is set to C t A.	0 to 1.5 In (1)	In
ttd ()	<input type="checkbox"/> Motor thermal state threshold Visible only if R1 assignment r / page 51 is set to t S A. Trip threshold for motor thermal alarm (logic output or relay).	0 to 118% of tHr	100%

(1) In = nominal drive current

() Parameter that can be modified during operation or when stopped.

Configuration Mode - Complete menu (FULL)

I - 0 -

d r C -

C t L -

F U N -

F L t -

C O N -

Code	Name/Description	Adjustment range	Factory setting
I - 0 -	Input Output menu (continued)		
A O I -	AO1 configuration menu		
A O I	<div><input type="checkbox"/> AO1 assignment</div> <div>This parameter is used to set the value of an analog output.</div> <div><input type="checkbox"/> Not assigned</div> <div><input type="checkbox"/> Motor current, between 0 and 2 In (In = rated drive current indicated on the drive nameplate)</div> <div><input type="checkbox"/> Output frequency, from 0 to Maximum frequency t F r</div> <div><input type="checkbox"/> Ramp output, from 0 to Maximum frequency t F r</div> <div><input type="checkbox"/> PID reference, between 0 and 100% of the PID set point - Visible only if PID feedback assignment P I F page 71 is set to A I I</div> <div><input type="checkbox"/> PID feedback, between 0 and 100% of the PID feedback - Visible only if PID feedback assignment P I F page 71 is set to A I I</div> <div><input type="checkbox"/> PID error, between - 5 % and + 5 % of the PID feedback - Visible only if PID feedback assignment P I F page 71 is set to A I I</div> <div><input type="checkbox"/> Output power, between 0 and 2.5 times Rated Motor Power n P r</div> <div><input type="checkbox"/> Motor thermal state, between 0 and 200% of the rated thermal state</div> <div><input type="checkbox"/> Drive thermal state, between 0 and 200% of the rated thermal state</div>	nO	
A O I t	<div><input type="checkbox"/> AO1 type</div> <div>This parameter provides the interface between the drive internal value and an analog output signal.</div> <div><input type="checkbox"/> Voltage: 0-10 Vdc</div> <div><input type="checkbox"/> Current: 0-20 mA</div> <div><input type="checkbox"/> Current: 4-20 mA</div>	0A	
I O U O A 4 A			

Configuration Mode - Complete menu (FULL)

I - 0 -
d r C -
C L L -
F U N -
F L L -
C O N -

Code	Name/Description	Adjustment range	Factory setting
d r C -	Motor control menu		
b F r	<input type="checkbox"/> Standard motor frequency See page 44 .		50 Hz
n P r	<input type="checkbox"/> Rated motor power See page 45 .	According to drive rating	According to drive rating
C o S	<input type="checkbox"/> Rated motor cos phi Visible only if Motor parameter choice n P C page 59 is set to C o S . If Rated motor cos phi C o S is available Rated motor power n P r disappears. Motor nameplate power factor (pf). Note: Do not confuse this with motor "Service Factor". Setting C o S to or very near to 1 may result in unsatisfactory motor operation. If the motor power factor is not indicated on the nameplate, leave this parameter at the factory default (approximately 0.80)	0.5 to 1	According to drive rating
U n S	<input type="checkbox"/> Rated motor voltage Rated motor voltage given on the nameplate. If the line voltage is less than the rated motor voltage, Rated motor voltage U n S should be set to the value of the line voltage applied to the drive terminals.	100 to 480 V	230 V
n C r	<input type="checkbox"/> Rated motor current Rated motor current given on the nameplate. Rated motor current n C r modifies Motor thermal current I t H page 93 . This parameter is already included in "my menu" section, page 45 .	0.25 In to 1.5 In (1)	According to drive rating
F r S	<input type="checkbox"/> Rated motor frequency Rated motor frequency given on the nameplate. The factory setting is 50 Hz, or preset to 60 Hz if Standard motor frequency b F r page 44 is set to 60 Hz.	10 to 400 Hz	50 Hz
n S P	<input type="checkbox"/> Rated motor speed Rated motor speed given on the nameplate	0 to 24000 rpm	According to drive rating
t F r	<input type="checkbox"/> Maximum frequency Maximum frequency t F r gives the upper value possible for High speed H S P page 89 . The factory setting is 60 Hz, or preset to 72 Hz if Standard motor frequency b F r is set to 60 Hz.	10 to 400 Hz	60 Hz
C L L P E r F S E d P U N P	<input type="checkbox"/> Motor control type Allows selection of the motor control type suitable for the application and the required performances. <input type="checkbox"/> Performance: SVCU; Sensorless vector control with internal speed loop based on voltage feedback calculation. For applications needing high performance during starting or operation. <input type="checkbox"/> Standard: U/F 2 points (Volts/Hz) without internal speed loop For simple applications that do not require high performance. Simple motor control law keeping a constant Voltage Frequency ratio, with a possible adjustment of the curve bottom. This law is generally used for motors connected in parallel. Some specific applications with motors in parallel and high performance levels may require P E r F . <input type="checkbox"/> Pump: U ² /F; dedicated to variable torque pump and fan applications that do not require high starting torque.		Std

(1)In = nominal drive current

Configuration Mode - Complete menu (FULL)

I - D -

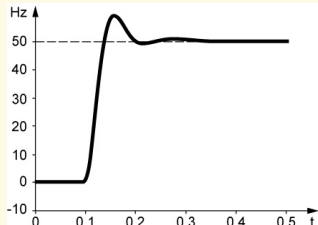
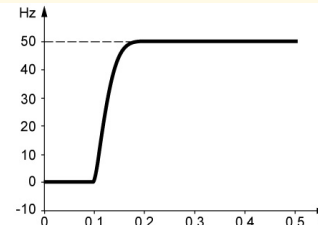
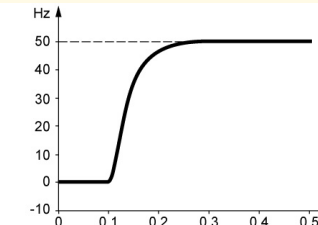
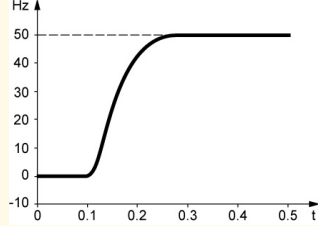
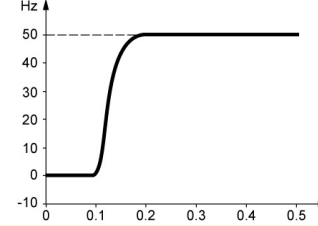
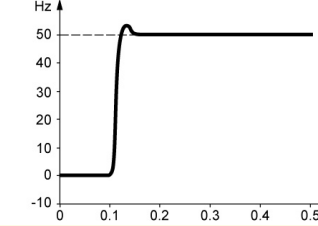
d r C -

C L L -

F U N -

F L L -

C O N -

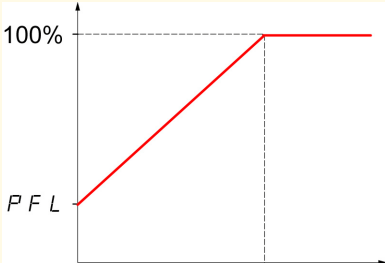
Code	Name/Description	Adjustment range	Factory setting
d r C -	Motor control menu (continued)		
U F r ()	<input type="checkbox"/> IR compensation (law U/F) Used to optimize torque at very low speed, or to adapt to special cases (for example: for motors connected in parallel, decrease IR compensation (law U/F) U F r). If there is insufficient torque at low speed, increase IR compensation (law U/F) U F r . A too high value can cause the motor not to start (locking) or a change to current limiting mode.	25 to 200%	100%
S L P ()	<input type="checkbox"/> Slip compensation Visible only if Motor control type C L L page 56 is not set to P U N P Used to adjust the slip compensation around the value set by the nominal motor slip, or to adapt to special cases (example: for motors connected in parallel, decrease Slip compensation S L P). If the set slip compensation is lower than the actual slip compensation, the motor doesn't run at nominal speed at steady state but at a speed lower than the reference. If the set slip compensation is greater than the actual slip compensation, motor speed is unstable.	0 to 150%	100%
S L A ()	<input type="checkbox"/> Frequency loop stability The S L A parameter can be used to reduce overshoots and oscillations at the end of acceleration. After a period of acceleration or deceleration, S L A adapts the return to a steady state to the dynamics of the machine; A too high value causes an extended response time. A too low value causes an overspeed, or even instability.	0 to 100%	20%
	<div> <div> <p>Low S L A In this case, increase S L A</p>  </div> <div> <p>Correct S L A</p>  </div> <div> <p>High S L A In this case, reduce S L A</p>  </div> </div> <p>Visible only if Motor control type C L L page 56 is set to P E r F .</p>		
F L G ()	<input type="checkbox"/> Frequency loop gain The F L G parameter adjusts the slope of the speed increase according to the inertia of the machine being driven. A too high value causes an overspeed, or even instability. A too low value causes an extended response time	0 to 100%	20%
	<div> <div> <p>Low F L G In this case, increase F L G</p>  </div> <div> <p>Correct F L G</p>  </div> <div> <p>High F L G In this case, reduce F L G</p>  </div> </div> <p>Visible only if Motor control type C L L page 56 is set to P E r F .</p>		



Parameter that can be modified during operation or when stopped.

Configuration Mode - Complete menu (FULL)

1 - 0 -
d r C -
C L L -
F U N -
F L L -
C O N -

Code	Name/Description	Adjustment range	Factory setting
d r C -	Motor control menu (continued)		
PFL ()	<input type="checkbox"/> Flux Profile It defines the magnetizing current at zero frequency, as a % of the rated magnetizing current Adjustment of PUMP law. 	0 to 100%	20%
	Visible only if Motor control type C L L page 56 is set to P U N P		
SFr ()	<input type="checkbox"/> Switching frequency Switching frequency setting In the event of overheating, the drive automatically decreases the switching frequency. It is restored to its original value when the temperature returns to normal.	2 to 16 kHz	4 kHz
	<div style="text-align: center;">CAUTION</div> <div> RISK OF DAMAGE TO THE DRIVE On 8I44S2****.000-1 ratings, if the filters are disconnected, the drive's switching frequency must not exceed 4 kHz. Failure to follow these instructions can result in equipment damage. </div>		
SFL HF1 HF2	<input type="checkbox"/> Switching frequency type The motor switching frequency will always be modified (reduced) when the internal temperature of the drive is too high. <input type="checkbox"/> HF1: Heating optimization. Allows the system to adapt the switching frequency according to the motor frequency. <input type="checkbox"/> HF2: Motor noise optimization (for high switching frequency) Allows system to keep a constant chosen switching frequency (SFr) whatever the motor frequency (rFr). In the event of overheating, the drive automatically decreases the switching frequency. It is restored to its original value when the temperature returns to normal.		HF1
nrd nO YES	<input type="checkbox"/> Motor noise reduction Noise means audible noise. Depending on the environment it must be possible to adjust the motor noise. Random frequency modulation avoids possible resonance noises that can occur at fixed frequency. <input type="checkbox"/> No <input type="checkbox"/> Yes		nO



Parameter that can be modified during operation or when stopped.

Configuration Mode - Complete menu (FULL)

I - 0 -


dr C -

CEL -

FUN -

FLt -

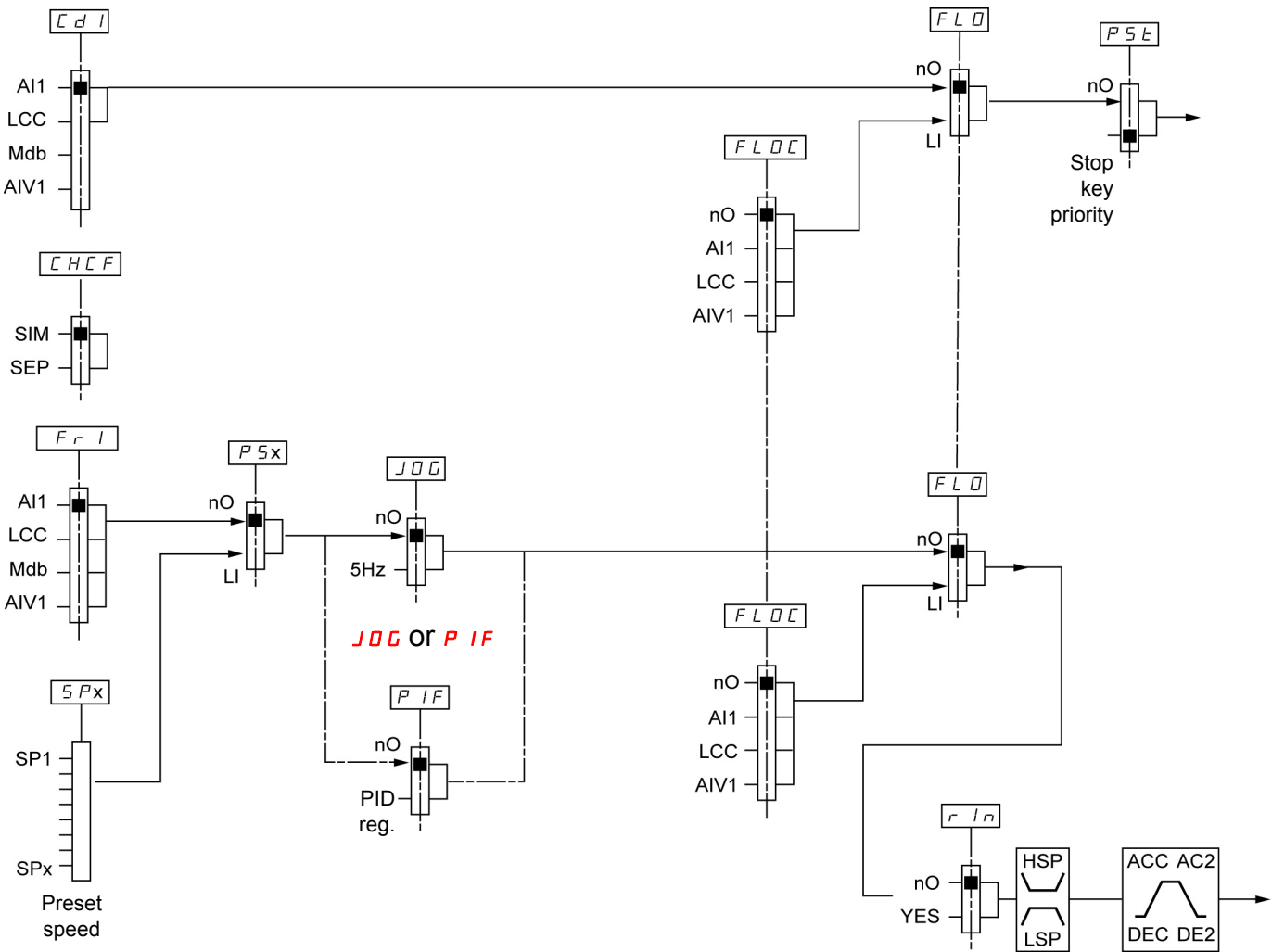
CON -

Code	Name/Description	Adjustment range	Factory setting
dr C -	Motor control menu (continued)		
tUn	<input type="checkbox"/> Auto-tuning		nO
	<div style="text-align: center;">⚡ ⚠ DANGER</div> <p>HAZARD OF ELECTRIC SHOCK OR ARC FLASH</p> <ul style="list-style-type: none"> During auto-tuning, the motor operates at rated current. Do not service the motor during auto-tuning. <p>Failure to follow these instructions will result in death or serious injury.</p>		
	<div style="text-align: center;">⚠ WARNING</div> <p>LOSS OF CONTROL</p> <p>The following parameters, described on page 56, must be correctly configured before starting auto-tuning: UnS, Frs, nCr, nSP and nPr or CoS.</p> <p>If one or more of these parameters is modified after auto-tuning has been performed, tUn will return to nO and the procedure must be repeated.</p> <p>Failure to follow these instructions can result in death, serious injury, or equipment damage.</p>		
nO YES dOnE	<div> <input type="checkbox"/> No: When factory parameters of standard motors <input type="checkbox"/> Yes: Launches auto-tuning <input type="checkbox"/> Done: If auto-tuning has already been performed </div> <p>Attention:</p> <ul style="list-style-type: none"> Auto-tuning must be performed with the motor connected and cold. Parameters Rated Motor Power nPr page 45 and Rated motor current nCr page 45 must be consistent. Auto-tuning is performed only if no stop command has been activated. If a freewheel stop or fast stop function has been assigned to a logic input, this input must be set to 1 (active at 0). Auto-tuning takes priority over any run or prefluxing commands, which will take effect after the auto-tuning sequence. Auto-tuning may last for 1 to 2 seconds. Do not interrupt, wait for tUn value to change to dOnE or nO. From hardware revision D0 the parameter Auto-tuning tUn could only be set to YES, acyclic with the ASIOACC_library per application, when drive is in the "Ready to switch on" or "Switched on" state of the state machine (see CiA402, page 110). <p> Note: During auto-tuning the motor operates at rated current.</p>		
nPr CoS	<input type="checkbox"/> Motor parameter choice		nPr
	<p>This parameter allows to choose which motor parameter will be configured (nPr or CoS).</p> <div> <input type="checkbox"/> Rated Motor Power nPr page 45 <input type="checkbox"/> Rated motor cos phi CoS page 56 </div>		

Configuration Mode - Complete menu (FULL)

Control menu

Control channel diagram



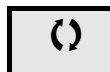
Configuration Mode - Complete menu (FULL)

I - 0 -
d r C -
C L L -
F U N -
F L L -
C O N -

Code	Name/Description	Adjustment range	Factory setting
C L L -	Control menu		
F r I	<input type="checkbox"/> Reference channel 1 This parameter is already included in "my menu" section, page 44. 1) Different factory setting in Automation Studio. Is set to Modbus n d b .		AI1 ¹⁾
L F r ()	<input type="checkbox"/> External reference value This parameter is already included in "my menu" section, page 44.	-400 Hz to 400 Hz	-
A I U I ()	<input type="checkbox"/> Analog input virtual This parameter is already included in "my menu" section, page 44.	0% to 100%	
r I n n O Y E S	<input type="checkbox"/> Reverse inhibition Inhibition of movement in reverse direction, does not apply to direction requests sent by logic inputs. - Reverse direction requests sent by logic inputs are taken into account - Reverse direction requests sent by the display are not taken into account - Reverse direction requests sent by the line are not taken into account - Any reverse speed reference originating from the PID, etc., is interpreted as a zero reference (0 Hz). <input type="checkbox"/> No <input type="checkbox"/> Yes		nO
P S t ⌚ 2 s n O Y E S	<input type="checkbox"/> Stop key priority This parameter can enable or disable the stop button located on the drive and remote display. Disabling the stop button is effective if the active command channel is different from the drive keypad or remote display <div style="text-align: center;">⚠ WARNING</div> <div> LOSS OF CONTROL You are going to disable the stop button located on the drive and remote display. Do not select "n O" unless exterior stopping method(s) exist. Failure to follow these instructions can result in death, serious injury, or equipment damage. </div> <input type="checkbox"/> No: Stop inactive <input type="checkbox"/> Yes: Stop active It is advised in case this function is set to Y E S to use the front door cover or the option display cover on "run" and "stop" keys.		YES
C H C F S I N S E P	<input type="checkbox"/> Channel configuration Channel configuration C H C F allows the selection of: - Not separate mode, (command and reference come from the same channel) - Separate mode (command and reference come from different channel) <input type="checkbox"/> Not separate mode <input type="checkbox"/> Separate mode		SIM



To change the assignment of this parameter press the "ENT" key for 2 s.



Parameter that can be modified during operation or when stopped.

Configuration Mode - Complete menu (FULL)

I - 0 -

drC -

CtL -

FUN -

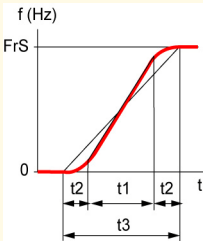
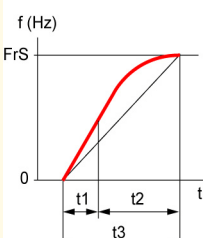
FLt -

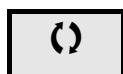
CON -

Code	Name/Description	Adjustment range	Factory setting
CtL -	Control menu (continued)		
CdI	<input type="checkbox"/> Command channel 1 This parameter allows selection of the command channel. <input type="checkbox"/> Terminals <input type="checkbox"/> Local <input type="checkbox"/> Remote display <input type="checkbox"/> Modbus This parameter is available if Channel configuration CHCF page 61 is set to Separate		tEr
FLD nO L1H - L4H	<input type="checkbox"/> Forced local assignment <input type="checkbox"/> Function inactive <input type="checkbox"/> L1h to L4h: Forced local mode is active when the input is at state 1.		nO
FLDC nO A11 LCC A1U1	<input type="checkbox"/> Forced local reference Visible only if Forced local assignment FLD is not set to nO . <input type="checkbox"/> Not assigned <input type="checkbox"/> Terminal <input type="checkbox"/> Remote display <input type="checkbox"/> Integrated display with jog dial		nO

Configuration Mode - Complete menu (FULL)

I - 0 -
dr C -
C L L -
FUN -
FL L -
CON -

Code	Name/Description	Adjustment range	Factory setting
F U n -	Function menu		
r P t -	Ramp menu		
ACC ()	<div><input type="checkbox"/> Acceleration</div> <div>Acceleration time between 0 Hz and the Rated motor frequency F r S page 56. Make sure that this value is compatible with the inertia being driven. This parameter is already included in "my menu" section, page 44.</div>	0.0 s to 999.9 s	3.0 s
DEC ()	<div><input type="checkbox"/> Deceleration</div> <div>Time to decelerate from the Rated motor frequency F r S page 56 to 0 Hz Make sure that this value is compatible with the inertia being driven. This parameter is already included in "my menu" section, page 44.</div>	0.0 s to 999.9 s	3.0 s
r P t L I n S U ()	<div><input type="checkbox"/> Ramp shape assignment</div> <div><div><input type="checkbox"/> Linear <input type="checkbox"/> S shape <input type="checkbox"/> U shape</div><div><div><div><div>S shape</div><div><div>S shape deceleration graph: frequency f (Hz) vs time t. The curve starts at FrS, falls linearly for t2, then curves for t1, and finally reaches 0 for t2. The total time is t3.</div></div><div><div><div>U shape</div><div><div>U shape deceleration graph: frequency f (Hz) vs time t. The curve starts at FrS, falls linearly for t1, then curves for t2, and finally reaches 0 for t3.</div></div></div><div><div>The rounding coefficient is fixed, t1 = 0.6 set ramp time (linear) t2 = 0.4 set ramp time (round) t3 = 1.4 set ramp time</div><div>The rounding coefficient is fixed, t1 = 0.5 set ramp time (linear) t2 = 1.0 set ramp time (round) t3 = 1.5 set ramp time</div></div></div></div></div></div></div>	Lin	
r P S n 0 L 1 H L 2 H L 3 H L 4 H L 1 L L 2 L L 3 L L 4 L	<div><input type="checkbox"/> Ramp switching commutation</div> <div><div><input type="checkbox"/> Function inactive <input type="checkbox"/> L1H: LI1 active High <input type="checkbox"/> L2H: LI2 active High <input type="checkbox"/> L3H: LI3 active High <input type="checkbox"/> L4H: LI4 active High <input type="checkbox"/> L1L: LI1 active low <input type="checkbox"/> L2L: LI2 active low <input type="checkbox"/> L3L: LI3 active low <input type="checkbox"/> L4L: LI4 active low</div><div>See LI assignment information on page 47.</div></div>	nO	

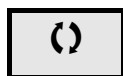


Parameter that can be modified during operation or when stopped.

Configuration Mode - Complete menu (FULL)

I - 0 -
drC -
CLL -
FUN -
FLt -
CON -

Code	Name/Description	Adjustment range	Factory setting
FUn -	Function menu (continued)		
rPl -	Ramp menu (continued)		
AC2 ()	<input type="checkbox"/> Acceleration 2 Visible only if Ramp switching commutation rPS page 63 is not set to n0 . Second acceleration ramp time, adjustable from 0.0 to 999.9 s This ramp will be the active ramp when using PID for the start and wake-up phases only, see PID wake up level rSL page 74 .	0.0 to 999.9 s	5.0 s
DE2 ()	<input type="checkbox"/> Deceleration 2 Visible only if Ramp switching commutation rPS page 63 is not set to n0 . Second deceleration ramp time, adjustable from 0.0 to 999.9 s	0.0 to 999.9 s	5.0 s
brA n0 YES dYnA	<input type="checkbox"/> Decel Ramp Adaptation assignment <input type="checkbox"/> Function inactive. The drive will decelerate based on the normal deceleration adjustment. This setting is compatible with optional dynamic braking if used. <input type="checkbox"/> This function automatically increases deceleration time when stopping or reducing the speed of high inertia loads to help prevent DC bus overvoltage or overbraking. <input type="checkbox"/> Motor Braking: This mode allows the drive to attempt the most rapid stop possible without the use of a dynamic brake resistor. It uses motor losses to dissipate energy from regeneration. This function may be incompatible with positioning.		YES



Parameter that can be modified during operation or when stopped.

Configuration Mode - Complete menu (FULL)

I - 0 -
dr C -
C L L -
FUN -
FL L -
C O N -

Code	Name/Description	Adjustment range	Factory setting
F U n -	Function menu (continued)		
S t t -	Stop configuration menu		
S t t r n P F S t n S t	<input type="checkbox"/> Type of stop Stop mode on disappearance of the run command and appearance of a stop command <input type="checkbox"/> Ramp stop <input type="checkbox"/> Fast stop <input type="checkbox"/> Freewheel		rMP
n S t n O L 1 L L 2 L L 3 L L 4 L	<input type="checkbox"/> Freewheel stop assignment The stop is activated when the input or the bit changes to 0. If the input returns to state 1 and the run command is still active, the motor will only restart if Type of control L C C page 47 = 2 C and 2 wire type control L C L page 50 = L E L or P F O . If not, a new run command must be sent. <input type="checkbox"/> Function inactive <input type="checkbox"/> L1L: LI1 Active Low to stop <input type="checkbox"/> L2L: LI2 Active Low to stop <input type="checkbox"/> L3L: LI3 Active Low to stop <input type="checkbox"/> L4L: LI4 Active Low to stop		nO
F S t n O L 1 L L 2 L L 3 L L 4 L	<input type="checkbox"/> Fast stop assignment <input type="checkbox"/> Function inactive <input type="checkbox"/> L1L: LI1 Active Low to stop <input type="checkbox"/> L2L: LI2 Active Low to stop <input type="checkbox"/> L3L: LI3 Active Low to stop <input type="checkbox"/> L4L: LI4 Active Low to stop		nO
d C F ()	<input type="checkbox"/> Ramp divider Visible only if Fast stop assignment F S t , page 65 is not set to n O or if F S t is set to Type of stop S t t , page 65. The ramp that is enabled (Deceleration d E C page 44 or Deceleration 2 d E 2 page 64) is then divided by this coefficient when stop requests are sent. Value 10 corresponds to a minimum ramp time.	1 to 10	4








Code	Name/Description	Adjustment range	Factory setting
F U n -	Function menu (continued)		
r r S n O L 1 H L 2 H L 3 H L 4 H	<input type="checkbox"/> Reverse direction LI1 to LI4: choice of the input assigned to the reverse command <input type="checkbox"/> Function inactive <input type="checkbox"/> L1h: LI1 active high <input type="checkbox"/> L2h: LI2 active high <input type="checkbox"/> L3h: LI3 active high <input type="checkbox"/> L4h: LI4 active high		nO



Parameter that can be modified during operation or when stopped.

Configuration Mode - Complete menu (FULL)

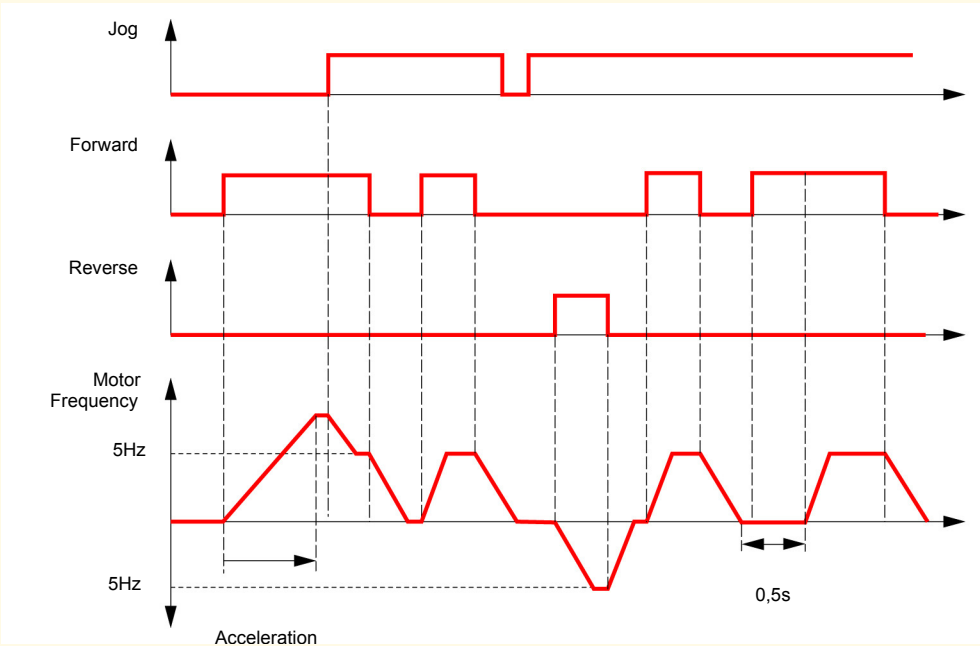
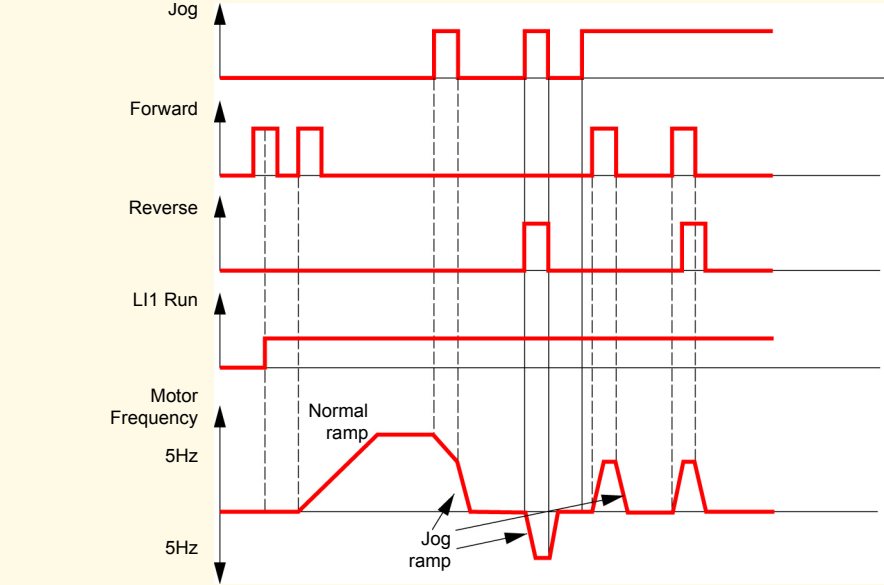
I - 0 -
 d r C -
 C t L -
 F U n -
 F L t -
 C o n -

Code	Name/Description	Adjustment range	Factory setting
F U n -	Function menu (continued)		
A d C -	Auto DC injection menu		
A d C	<input type="checkbox"/> Automatic DC injection		YES
	<div>  HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH </div> <p>When A d C = C t, the injection of current is done even if a run command has not been sent. Check this action will not endanger personnel or equipment in any way.</p> <p>Failure to follow these instructions will result in death or serious injury.</p>		
	<div>  WARNING </div> <p>NO HOLDING TORQUE</p> <ul style="list-style-type: none"> DC injection braking does not provide any holding torque at zero speed. DC injection braking does not work when there is a loss of power or when the drive detects a fault. Where necessary, use a separate brake to maintain torque levels. <p>Failure to follow these instructions can result in death, serious injury, or equipment damage.</p>		
	<input type="checkbox"/> Function inactive, no DC injected current. <input type="checkbox"/> Time limited DC injection <input type="checkbox"/> Continuous DC injection		
S d C I	<input type="checkbox"/> Automatic DC injection current	0 to 120% of nCr	70%
	<div>  CAUTION </div> <p>RISK OF DAMAGE TO THE MOTOR</p> <p>Check that the motor will withstand this current without overheating.</p> <p>Failure to follow this instruction can result in equipment damage.</p> <p>Visible only if Automatic DC injection A d C is not set to n 0. Injection current on stopping and continuous DC injection.</p>		
t d C I	<input type="checkbox"/> Automatic DC injection time	0.1 to 30 s	0.5 s
	<div>  CAUTION </div> <p>RISK OF DAMAGE TO THE MOTOR</p> <ul style="list-style-type: none"> Long periods of DC injection braking can cause overheating and damage the motor. Protect the motor by avoiding long periods of DC injection braking. <p>Failure to follow these instructions can result in equipment damage.</p> <p>Visible only if Automatic DC injection A d C is not set to n 0. Injection time on stopping.</p>		



Parameter that can be modified during operation or when stopped.

Configuration Mode - Complete menu (FULL)

Code	Name/Description	Adjustment range	Factory setting
Fun -	Function menu (continued)		
JOG	<div><div><div><div><div><div></div><div>Jog assignment</div></div></div><div><div><div></div><div>nO</div></div></div></div><div><div><div></div><div>This parameter provides step by step control of motor running, using a logic input associated with a 2 and 3-wire control logic input. The jog frequency is fixed at 5 Hz. Acceleration and deceleration ramps taken into account in the Jog function are 0.1 s.</div></div><div><div><div></div><div>Function inactive</div></div><div><div></div><div>L1h: LI1 active high</div></div><div><div></div><div>L2h: LI2 active high</div></div><div><div></div><div>L3h: LI3 active high</div></div><div><div></div><div>L4h: LI4 active high</div></div></div></div></div><div><div><div></div><div>2-wire control</div></div><div></div><div><div><div></div><div>3 wire control</div></div><div></div></div></div></div>		

Configuration Mode - Complete menu (FULL)

I - 0 -
d r C -
L L L -
FUN -
F L L -
L 0 0 -

Preset speeds

2, 4, or 8 speeds can be preset, requiring 1, 2 or 3 logic inputs respectively

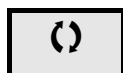
Combination table for preset speed inputs

8 speeds LI (PS8)	4 speeds LI (PS4)	2 speeds LI (PS2)	Speed reference
0	0	0	Reference
0	0	1	SP2
0	1	0	SP3
0	1	1	SP4
1	0	0	SP5
1	0	1	SP6
1	1	0	SP7
1	1	1	SP8

Configuration Mode - Complete menu (FULL)

I - 0 -
dr C -
CL L -
FUN -
FL L -
CON -

Code	Name/Description	Adjustment range	Factory setting
FUN -	Function menu (continued)		
PSS -	Preset speed menu		
P52 n0 L1H L2H L3H L4H	<input type="checkbox"/> 2 Preset speeds <input type="checkbox"/> Function inactive <input type="checkbox"/> L1h: LI1 active high <input type="checkbox"/> L2h: LI2 active high <input type="checkbox"/> L3h: LI3 active high <input type="checkbox"/> L4h: LI4 active high		n0
P54	<input type="checkbox"/> 4 Preset speeds as P52		n0
P58	<input type="checkbox"/> 8 Preset speeds as P52		n0
SP2 ()	<input type="checkbox"/> Preset speed 2 Visible only if 2 Preset speeds P52 is not set to n0 .	0 to 400 Hz	10 Hz
SP3 ()	<input type="checkbox"/> Preset speed 3 Visible only if 4 Preset speeds P54 is not set to n0 .	0 to 400 Hz	15 Hz
SP4 ()	<input type="checkbox"/> Preset speed 4 Visible only if 2 Preset speeds P52 and 4 Preset speeds P54 are not set to n0 .	0 to 400 Hz	20 Hz
SP5 ()	<input type="checkbox"/> Preset speed 5 Visible only if 8 Preset speeds P58 is not set to n0 .	0 to 400 Hz	25 Hz
SP6 ()	<input type="checkbox"/> Preset speed 6 Visible only if 2 Preset speeds P52 and 8 Preset speeds P58 are not set to n0 .	0 to 400 Hz	30 Hz
SP7 ()	<input type="checkbox"/> Preset speed 7 Visible only if 4 Preset speeds P54 and 8 Preset speeds P58 are not set to n0 .	0 to 400 Hz	35 Hz
SP8 ()	<input type="checkbox"/> Preset speed 8 Visible only if 2 Preset speeds P52 , 4 Preset speeds P54 and 8 Preset speeds P58 are not set to n0 .	0 to 400 Hz	40 Hz
JPF ()	<input type="checkbox"/> Skip frequency <input type="checkbox"/> This parameter prevents prolonged operation within an adjustable range around the regulated frequency. This function can be used to prevent a critical speed, which would cause resonance, being reached. Setting the function to 0 renders it inactive.	0 to 400 Hz	0 Hz

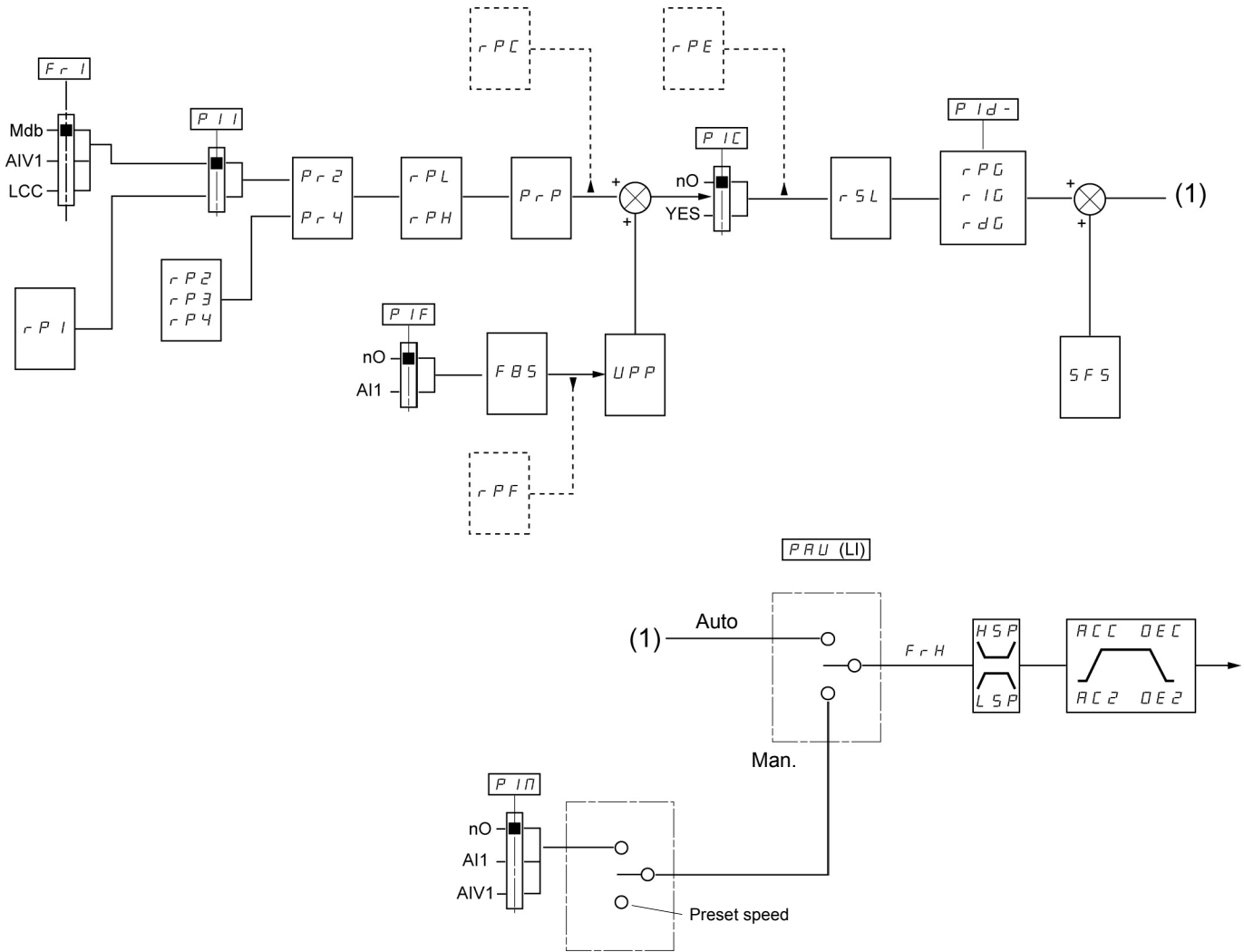


Parameter that can be modified during operation or when stopped.

Configuration Mode - Complete menu (FULL)

I - 0 -
d r C -
C t L -
F U n -
F L t -
C O n -

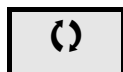
PID diagram



Configuration Mode - Complete menu (FULL)

I - 0 -
dr C -
C t L -
FUN -
FL t -
CON -

Code	Name/Description	Adjustment range	Factory setting
FUn -	Function menu (continued)		
PId -	PID menu		
P IF nO A I I	<input type="checkbox"/> PID feedback assignment <input type="checkbox"/> Not assigned <input type="checkbox"/> Terminal. Choice not possible if Fr1 is set to AI1		nO
r PG ()	<input type="checkbox"/> PID proportional gain Visible only if PID feedback assignment P IF is set to A I I .	0.01 to 100	1
r IG ()	<input type="checkbox"/> PID integral gain Visible only if PID feedback assignment P IF is set to A I I	0.01 to 100	1
r dG ()	<input type="checkbox"/> PID derivative gain Visible only if PID feedback assignment P IF is set to A I I	0.00 to 100.00	0.00
FbS ()	<input type="checkbox"/> PID feedback scale factor This parameter gives the relation between process range and feedback range. Visible only if PID feedback assignment P IF is set to A I I	0.1 to 100.0	1.0
P I I nO Y E S	<input type="checkbox"/> Activation internal PID reference Visible only if PID feedback assignment P IF is set to A I I <input type="checkbox"/> No <input type="checkbox"/> Yes		nO
P r 2 nO L 1 H L 2 H L 3 H L 4 H	<input type="checkbox"/> 2 preset PID assignment Visible only if PID feedback assignment P IF is set to A I I <input type="checkbox"/> Function inactive <input type="checkbox"/> L1h: LI1 active high <input type="checkbox"/> L2h: LI2 active high <input type="checkbox"/> L3h: LI3 active high <input type="checkbox"/> L4h: LI4 active high		nO



Parameter that can be modified during operation or when stopped.

Configuration Mode - Complete menu (FULL)

I - 0 -
dr C -
C t L -
FUN -
F L t -
C D n -

Code	Name/Description	Adjustment range	Factory setting
F U n -	Function menu (continued)		
P I d -	PID menu (continued)		
P r 4 n 0 L 1 H L 2 H L 3 H L 4 H	<input type="checkbox"/> 4 preset PID assignment Visible only if PID feedback assignment P I F page 71 is set to A I I . <input type="checkbox"/> Function inactive <input type="checkbox"/> L1h: LI1 active high <input type="checkbox"/> L2h: LI2 active high <input type="checkbox"/> L3h: LI3 active high <input type="checkbox"/> L4h: LI4 active high 2 preset PID assignment P r 2 page 71 must be assigned before assigning 4 preset PID assignment P r 4 .		nO
r P 2 ()	<input type="checkbox"/> 2 preset PID reference Visible only if PID feedback assignment P I F page 71 is set to A I I and 2 preset PID assignment P r 2 page 71 is not set to n 0 .	0 to 100%	25%
r P 3 ()	<input type="checkbox"/> 3 preset PID reference Visible only if PID feedback assignment P I F page 71 is set to A I I and 4 preset PID assignment P r 4 page 72 is not set to n 0 .	0 to 100%	50%
r P 4 ()	<input type="checkbox"/> 4 preset PID reference Visible only if PID feedback assignment P I F page 71 is set to A I I and 2 preset PID assignment P r 2 page 71 and 4 preset PID assignment P r 4 page 72 are not set to n 0 .	0 to 100%	75%
r P I ()	<input type="checkbox"/> Internal PID reference Visible only if PID feedback assignment P I F page 71 is set to A I I and if Activation internal PID reference P I I page 71 is set to Y E S or Reference channel 1 F r I page 44 is set to L C C .	0 to 100%	0%
P r P ()	<input type="checkbox"/> PID reference ramp Visible only if PID feedback assignment P I F page 71 is set to A I I .	0 to 100%	0%
r P L ()	<input type="checkbox"/> PID min value reference Visible only if PID feedback assignment P I F page 71 is set to A I I .	0 to 100%	0%
r P H ()	<input type="checkbox"/> PID max value reference Visible only if PID feedback assignment P I F page 71 is set to A I I .	0 to 100%	100%
S F S	<input type="checkbox"/> PID predictive speed This parameter allows to go directly to a set speed reference. Visible only if PID feedback assignment P I F page 71 is set to A I I .	0.1 to 400 Hz	nO



Parameter that can be modified during operation or when stopped.

Configuration Mode - Complete menu (FULL)

I - 0 -
dr C -
C t L -
FUN -
FL t -
CON -





Code	Name/Description	Adjustment range	Factory setting
FUn -	Function menu (continued)		
PId -	PID menu (continued)		
AC2 ()	<input type="checkbox"/> Acceleration 2 This parameter is active only when the system is starting. Second acceleration ramp time, adjustable from 0.1 to 999.9 s Time to accelerate from 0 to the Rated motor frequency F r 5 page 56. Make sure that this value is compatible with the inertia being driven. Visible only if PID feedback assignment P I F page 71 is set to A I I and PID predictive speed S F 5 page 72 is not set to n 0 .	0.1 to 999.9 s	5.0 s
P I C n 0 YES	<input type="checkbox"/> PID correction reverse This parameter will reverse the internal error value of PID system. <input type="checkbox"/> No <input type="checkbox"/> Yes Visible only if PID feedback assignment P I F page 71 is set to A I I .		nO
P A U n 0 L 1 H L 2 H L 3 H L 4 H	<input type="checkbox"/> PID auto/manual assignment At state 0 of input, PID is active. At state 1 of input, manual run is active <input type="checkbox"/> Function inactive <input type="checkbox"/> L1h: LI1 active high <input type="checkbox"/> L2h: LI2 active high <input type="checkbox"/> L3h: LI3 active high <input type="checkbox"/> L4h: LI4 active high Visible only if PID feedback assignment P I F page 71 is set to A I I .		nO
P I N n 0 A I I A I U I	<input type="checkbox"/> PID manual reference This parameter allows to disable the PID and to run on a standard manual system. <input type="checkbox"/> No <input type="checkbox"/> Terminal <input type="checkbox"/> AIV1 Visible only if PID feedback assignment P I F page 71 is set to A I I and PID auto/manual assignment P A U page 73 is not set to n 0 .		nO
L L S ()	<input type="checkbox"/> Low speed operating time Following operation at Low speed L 5 P page 88 for a defined period, a motor stop is requested automatically. The motor restarts if the frequency reference is greater than Low speed L 5 P and if a run command is still present. Important: n 0 value corresponds to an unlimited period. Visible only if PID feedback assignment P I F page 71 is set to A I I . This parameter is available if the Type of stop S t t page 65 is set to Ramp stop r P P . This parameter is already included in "Speed limit" section, page 88.	0.1 to 999.9 s	nO



Parameter that can be modified during operation or when stopped.

Configuration Mode - Complete menu (FULL)

1 - 0 -
d r C -
C L L -
F U N -
F L L -
C O N -

Code	Name/Description	Adjustment range	Factory setting
F U n -	Function menu (continued)		
P I d -	PID menu (continued)		
r 5 L	<input type="checkbox"/> PID wake up level	0 to 100%	0%
	<div>  DANGER </div> <div> UNINTENDED EQUIPMENT OPERATION Check that unintended restarts will not present any danger. Failure to follow these instructions will result in death or serious injury. </div> <p>If PID functions and Low speed operating time t L S are set at the same time, the PID regulator may try to set a speed lower than LSP, resulting in unwanted operation consisting of start, running at LSP, stopping and so on...</p> <p>Parameter PID wake up level r 5 L is used to set a minimum PID error threshold to restart after a prolonged stop at LSP.</p> <p>Visible only if PID feedback assignment P I F page 71 is set to A I I and Low speed operating time t L S page 73 is not set to n O.</p>		
U P P 	<input type="checkbox"/> Wake-up threshold	0 to 100%	0%
	<div>  DANGER </div> <div> UNINTENDED EQUIPMENT OPERATION Check that unintended restarts will not endanger personnel or equipment in any way. Failure to follow these instructions will result in death or serious injury. </div> <p>If PID correction reverse P I C page 73 is set to nO, enables to set the PID feedback threshold beyond which the PID regulator is reactivated (wake-up), following a stop caused by exceeding the t L S maximum time in low speed.</p> <p>If P I C is set to Y E S, enables to set the PID feedback threshold above which the PID regulator is reactivated (wake-up), following a stop caused by exceeding the t L S maximum time in low speed.</p> <p>Visible only if PID feedback assignment P I F page 71 is set to A I I and Low speed operating time t L S page 88 is not set to n O.</p>		
S L E 	<input type="checkbox"/> Sleep Threshold Offset	0 to HSP	1 Hz
	<p>Adjustable restart threshold (offset) following a stop after prolonged operation at Low speed L S P + Sleep Threshold Offset S L E, in Hz. The motor restarts if the reference rises above (L S P + S L E) and if a run command is still present.</p> <p>Visible only if Low speed time out t L S is not set to n O and if PID feedback assignment P I F page 71 is set to A I I.</p> <p>Note: This parameter could be used from hardware revision D0 and upgrade version 1.1.0.0.</p>		



Parameter that can be modified during operation or when stopped.

Configuration Mode - Complete menu (FULL)

I - 0 -
dr C -
C t L -
F u n -
F L L -
C O n -

Code	Name/Description	Adjustment range	Factory setting
FUn -	Function menu (continued)		
PId -	PID menu (continued)		
LPI ()	<input type="checkbox"/> PI feedback supervision threshold An alarm can be assigned to a relay or a logic output. Adjustment range: <input type="checkbox"/> No: Function inactive (it will not be possible to access the other function parameters) <input type="checkbox"/> between minimum and maximum PID feedback. Visible only if PID feedback assignment PIF page 71 is set to RII . Note: This parameter could be used from hardware revision D0 and upgrade version 1.1.0.0.	n0 to 100%	n0
LPI ()	<input type="checkbox"/> PI feedback supervision function time delay Visible only if PI feedback supervision threshold LPI above is not set to n0 . Note: This parameter could be used from hardware revision D0 and upgrade version 1.1.0.0.	0 to 600 s	0 s
APD ()	<input type="checkbox"/> Maximum frequency detection hysteresis Visible only if PI feedback supervision threshold LPI above is not set to n0 . Note: This parameter could be used from hardware revision D0 and upgrade version 1.1.0.0.	0 to HSP	0 Hz
NP I	<input type="checkbox"/> PI feedback supervision Fallback mode for the PI feedback supervision function. <input type="checkbox"/> YES : freewheel stop <input type="checkbox"/> FFF : switch to Fallback speed LFF as long as the fault is present and the run command is not disabled. Visible only if PI feedback supervision threshold LPI above is not set to n0 . Note: This parameter could be used from hardware revision D0 and upgrade version 1.1.0.0.		YES
LFF	<input type="checkbox"/> Fallback speed Fallback speed for PID regulator feedback supervision fault. Note: This parameter could be used from hardware revision D0 and upgrade version 1.1.0.0.	0 to HSP	0 Hz



Parameter that can be modified during operation or when stopped.

Configuration Mode - Complete menu (FULL)

I - 0 -
d r C -
C E L -
F U N -
F L E -
C O N -

Code	Name/Description	Adjustment range	Factory setting
F U n -	Function menu (continued)		
P I d -	PID menu (continued)		
P n P -	Pump sub-menu Note: This menu could be used from hardware revision D0 and upgrade version 1.1.0.0.		
t O L	<input type="checkbox"/> Application Overload time delay See page 53 Visible only if PID feedback assignment P I F page 71 is set to A I I .	0 to 100 s	0 s
L O C ()	<input type="checkbox"/> Application Overload threshold See page 53 Visible only if Application Overload time delay t O L above is not set to n 0 .	70 to 150% of nCr	90%
F E D ()	<input type="checkbox"/> Time delay before automatic start for the overload fault If A L r = Y E S the drive restarts automatically after an overload fault O L C once this time delay has elapsed. Minimum time permitted between an overload being detected and any automatic restart. In order for an automatic restart to be possible, the value of Maximum restart time t A r page 90 must exceed that of this parameter by at least one minute. Visible only if Application Overload time delay t O L above is not set to n 0 .	0 to 6 min	0 min
U L t	<input type="checkbox"/> Application underload time delay See page 54 Visible only if PID feedback assignment P I F page 71 is set to A I I .	0 to 100 s	0 s
L U L ()	<input type="checkbox"/> Application Underload threshold See page 54 Visible only if Application underload time delay U L t above is not set to n 0 .	20 to 100% of nCr	60%



Parameter that can be modified during operation or when stopped.

Configuration Mode - Complete menu (FULL)

I - 0 -
drC -
CLL -
FUN -
FLC -
CON -

Code	Name/Description	Adjustment range	Factory setting
FUn -	Function menu (continued)		
PId -	PID menu (continued)		
PnF -	Pump sub-menu (continued) Note: This menu could be used from hardware revision D0 and upgrade version 1.1.0.0.		
FtU ()	<input type="checkbox"/> Time delay before automatic start for the underload fault If ALr = YES the drive restarts automatically after an underload fault ULF once this time delay has elapsed. Minimum time permitted between an underload being detected and any automatic restart. In order for an automatic restart to be possible, the value of Maximum restart time tAr page 90 must exceed that of this parameter by at least one minute. Visible only if Application underload time delay ULt above is not set to n0 .	0 to 6 min	0 min
ndE	<input type="checkbox"/> Selecting the operating mode <input type="checkbox"/> n0 : single variable mode <input type="checkbox"/> YES : single variable mode with auxiliary pump When ndE = YES , output LO1 is forced to PnF (see page 52). Visible only if PID feedback assignment PIF page 71 is set to RII . Note: At the Automation Studio the parameter LOI has to be set to PnF , when ndE = YES .		n0
FOn ()	<input type="checkbox"/> Starting frequency of the auxiliary pump Above this frequency and after the pump starting time delay tOn , the auxiliary pump starts. Visible only if Selecting the operating mode ndE above is not set to n0 .	0 to tFr	HSP
tOn ()	<input type="checkbox"/> Time delay before starting the auxiliary pump This time is necessary to avoid the effects of transient pressure fluctuation and thus prevent oscillation (pump starting/stopping). Visible only if Selecting the operating mode ndE above is not set to n0 .	0 to 999.9 s	2 s
rOn ()	<input type="checkbox"/> Ramp for reaching the auxiliary pump nominal speed Visible only if Selecting the operating mode ndE above is not set to n0 .	0 to 999.9 s	2 s
FDF ()	<input type="checkbox"/> Auxiliary pump stopping frequency Below this frequency and after the time delay for stopping the auxiliary pump tDF , the pump stops. Visible only if Selecting the operating mode ndE above is not set to n0 .	0 to tFr	0 Hz



Parameter that can be modified during operation or when stopped.

Configuration Mode - Complete menu (FULL)

I - O -
 d r C -
 C E L -
F U N -
 F L E -
 C O N -

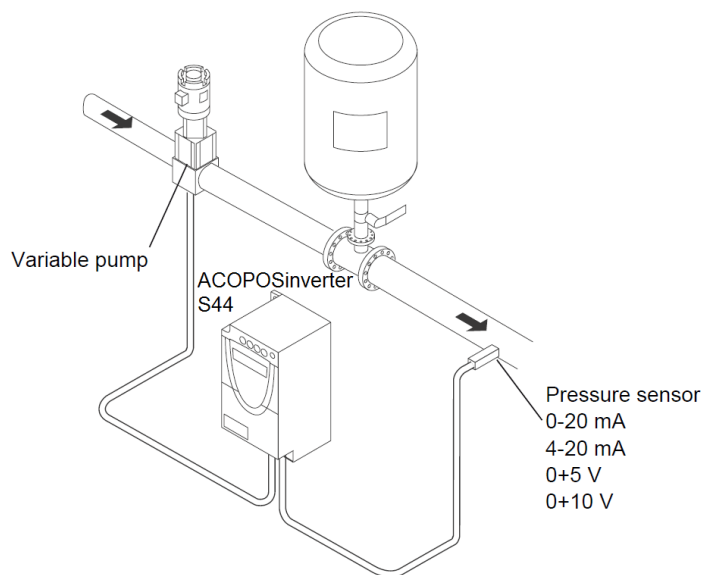
Code	Name/Description	Adjustment range	Factory setting
F U n -	Function menu (continued)		
P I d -	PID menu (continued)		
P n P -	Pump sub-menu (continued) Note: This menu could be used from hardware revision D0 and upgrade version 1.1.0.0.		
t O F ()	<input type="checkbox"/> Time delay before the auxiliary pump stop command This time is necessary to avoid the effects of transient pressure fluctuation and thus prevent oscillation (pump starting/stopping) Visible only if Selecting the operating mode n d E above is not set to n O .	0 to 999.9 s	2 s
r O F ()	<input type="checkbox"/> Ramp for auxiliary pump stopping Visible only if Selecting the operating mode n d E above is not set to n O .	0 to 999.9 s	2 s
n F d	<input type="checkbox"/> Zero flow detection period The value 0 deactivates zero flow detection. Visible only if PID feedback assignment P I F page 71 is set to R I I .	nO to 20 min	nO
F F d ()	<input type="checkbox"/> Zero flow detection activation threshold Below this threshold, if n F d > 0 and the auxiliary pump is stopped, zero flow detection is activated. Visible only if Zero flow detection period n F d above is not set to n O .	0 to 400 Hz	0 Hz
L F d ()	<input type="checkbox"/> Zero flow detection offset Visible only if Zero flow detection period n F d above is not set to n O .	0 to 400 Hz	0 Hz

() Parameter that can be modified during operation or when stopped.

Configuration Mode - Complete menu (FULL)

Architecture of the pumping installation

Single variable mode - 1 single variable speed pump



Enter the values given on the motor rating plate in the Motor control menu drC

1st level adjustment parameters

A C C Acceleration: 0.7 s

d E C Deceleration: 0.7 s

L S P Low speed: 30 Hz

H S P High speed: 60 Hz

Analog input menu Alt

A I I E Scale of analog input AI1: 0-20 mA

Motor control menu drC

S L P Nominal motor slip: 0 Hz

F L G Frequency loop gain: 70%

U F r IR compensation: 0%

Application functions menu FUn

t C E 2-wire type control: LEL

PI sub-menu

P I F Assignment of the PI function feedback: AI1

r P G PI regulator proportional gain: 5.00

r I G PI regulator integral gain: 8.00

r P I Internal PI regulator reference: 39%

r S L Restart error threshold: 40%

PI P I Supervision of the PI regulator function: LFF

L P I PI feedback supervision threshold: 17%

t P I PI feedback supervision function time delay: 1 s

L F F Fallback speed: 50 Hz

Pump sub-menu PMP

n F d Zero flow detection: 1 min

F F d Zero flow detection activation threshold: 50 Hz

L F d Zero flow detection offset: 5 Hz

t L S Sleep threshold operating time: 3 s

S F S Quick start threshold: 25 Hz

S L E Sleep threshold offset: 10 Hz

Automatic DC injection sub-menu AdC

A d C Automatic DC injection assignment: nO

Automatic restart function Atr

A t r Automatic restart: YES

Fault menu FLt

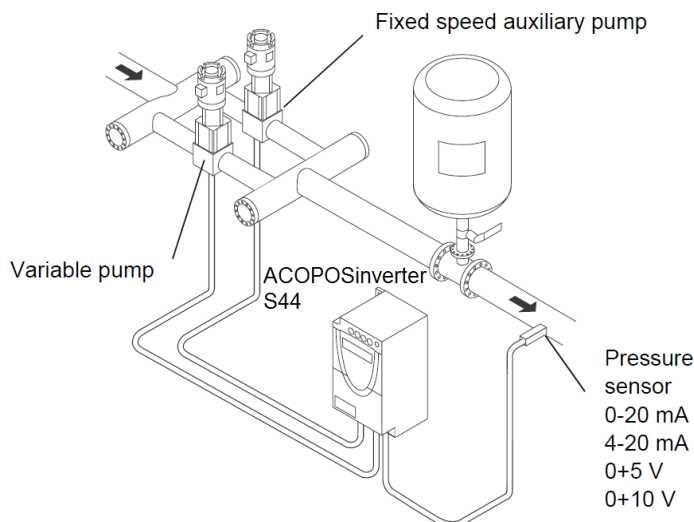
L O C Overload threshold: 11%

F t O Time delay before automatic start for the overload fault: 1 min

A P O Frequency hysteresis reached: 2 kHz

Configuration Mode - Complete menu (FULL)

Single variable with auxiliary pump mode - 1 variable speed pump (variable pump) and one fixed speed pump (auxiliary pump)



The auxiliary pump is controlled by the ACOPOSinverter S44 via logic output LO.

Enter the values given on the motor rating plate in the Motor control menu drC

1st level adjustment parameters

A C C Acceleration: 0.1 s

d E C Deceleration: 0.1 s

L S P Low speed: 35 Hz

Analog input menu Alt

A I I E Scale of analog input AI1: 0-20 mA

Motor control menu drC

S L P Nominal motor slip: 0 Hz

F L G Frequency loop gain: 70%

U F r IR compensation: 0%

Application functions menu FUn

t C t 2-wire type control: LEL

PI sub-menu

P I F Assignment of the PI function feedback: AI1

r P G PI regulator proportional gain: 5.00

r I G PI regulator integral gain: 8.00

r P I Internal PI regulator reference: 51%

r S L Restart error threshold: 42%

Pump sub-menu PMP

n d E Selecting the operating mode: YES

F D n Starting frequency of the auxiliary pump: 49 Hz

t D n Time delay before starting the auxiliary pump: 1 s

r D n Ramp for reaching the nominal speed of the auxiliary pump: 1 s

F D F Stopping frequency of the auxiliary pump: 39.6 Hz

t D F Time delay before the auxiliary pump stop command: 1 s

r D F Ramp for stopping the auxiliary pump: 1 s

n F d Zero flow detection: 1 min

F F d Zero flow detection activation threshold: 42 Hz

L F d Zero flow detection offset: 2 Hz

t L S Sleep threshold operating time: 5 s

S L E Sleep threshold offset: 3 Hz

L D I Assignment as logic/analog output PMP

Automatic DC injection sub-menu AdC

A d C Automatic DC injection assignment: nO

Automatic restart function Atr

A t r Automatic restart: YES

Fault menu FLt

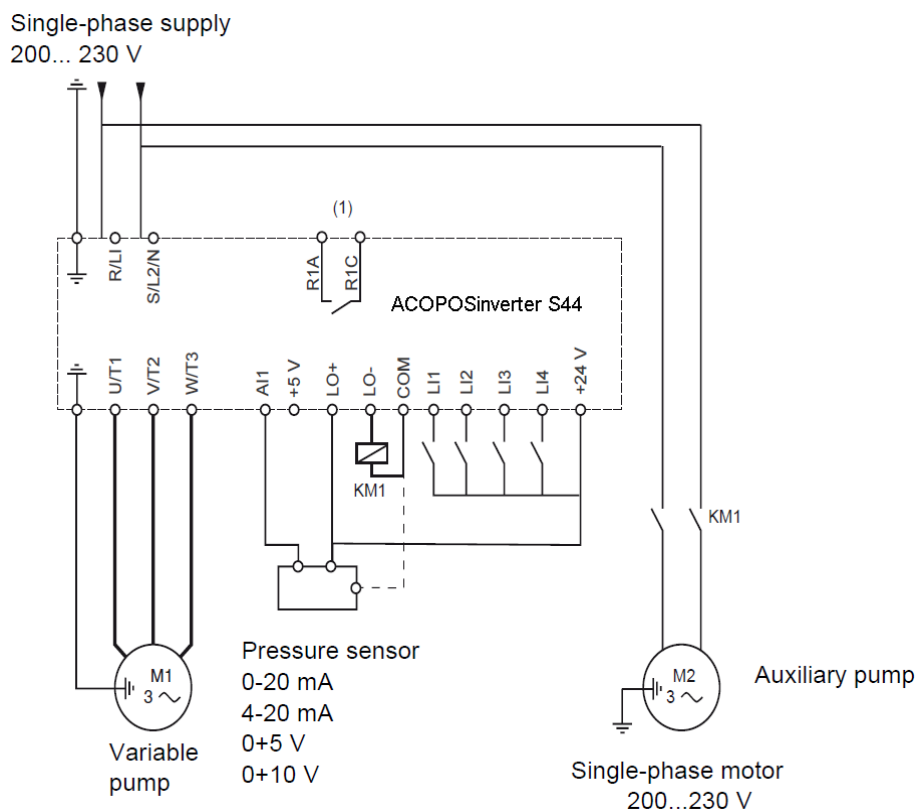
t U L Underload function time delay 5 s

L U L Underload threshold: 59%

F t U Time delay before automatic restart for the underload fault: 1 min

Configuration Mode - Complete menu (FULL)

Connection diagram



(1) Fault relay contacts, for remote indication of the drive status.

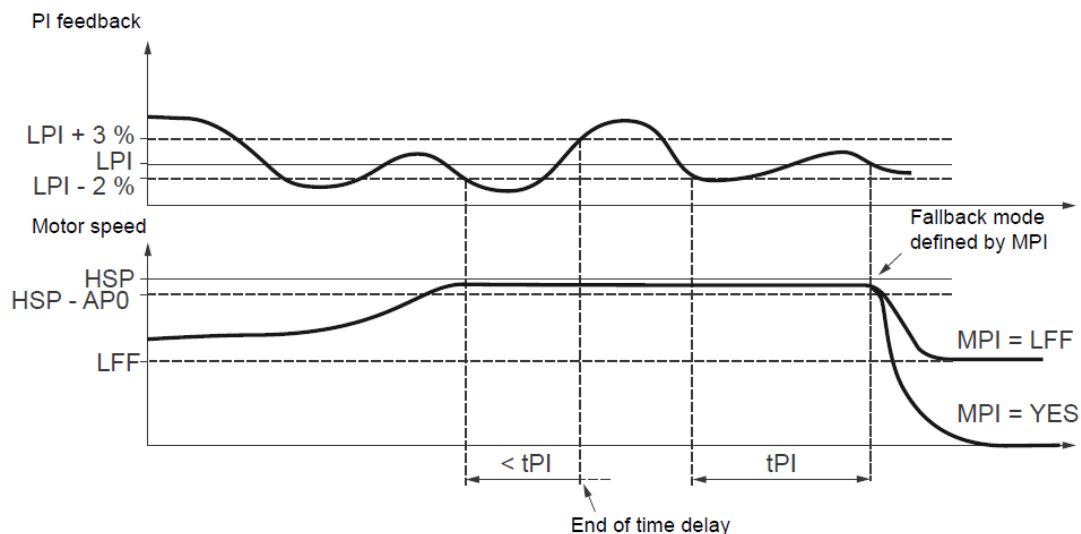
Note: Fit interference suppressors to all inductive circuits near the drive or connected to the same circuit (relays, contactors, solenoid valves, etc).

Note: This wiring example is in source using internal supply.

Configuration Mode - Complete menu (FULL)

PI feedback supervision (MPI)

Used to define the operating mode in the event of detection of a PI feedback lower than the limit set.



Once the variable pump is running at maximum speed (higher than $HSP - AP0$) and at the same time the PI feedback is lower than the supervision threshold $LPI - 2\%$, a time delay tPI is launched. If at the end of this time delay the value of the PI feedback is still lower than the supervision threshold $LPI + 3\%$, the drive switches to fallback mode as defined by parameter MPI.

- MPI = YES:

The drive will perform a freewheel stop and will display fault code SPIF.

- MPI = LFF:

The drive will run at a fixed frequency LFF. The parameter STAT in the monitoring menu MON will display the product status FRF.

If MPI = LFF the drive reverts to PI regulation as soon as the PI feedback is higher than the supervision threshold $LPI + 3\%$.

If MPI = YES the drive displays a fault, when the PI feedback is lower than the supervision threshold LPI , and stops.

In single variable with auxiliary pump mode ($MdE = YES$), the PI feedback supervision function is only active when both pumps are operating.

Configuration Mode - Complete menu (FULL)

Pump sub-menu PMP

The principal objective is to control a complete pumping installation using a single ACOPOSinverter S44 drive by providing constant pressure whatever the flow rate.

The system is operated using an auxiliary fixed speed pump, and one variable speed pump, which is unable to provide the full flow range required on its own. A PI regulator is used for drive control. The pressure sensor provides system feedback.

The variable speed pump is called a variable pump.

The fixed speed pump is called an auxiliary pump.

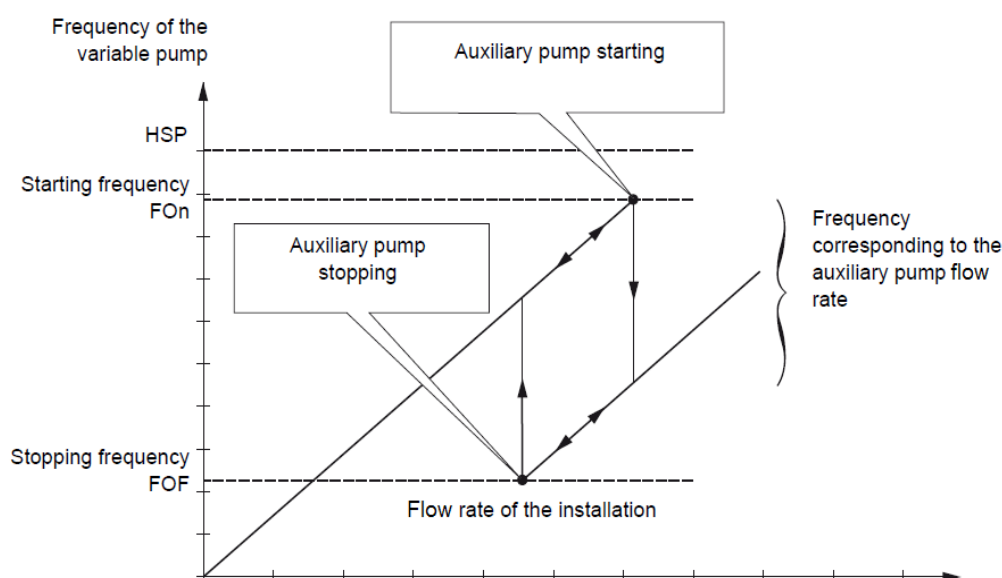
Selecting the operating mode

The ACOPOSinverter S44 offers 2 operating modes:

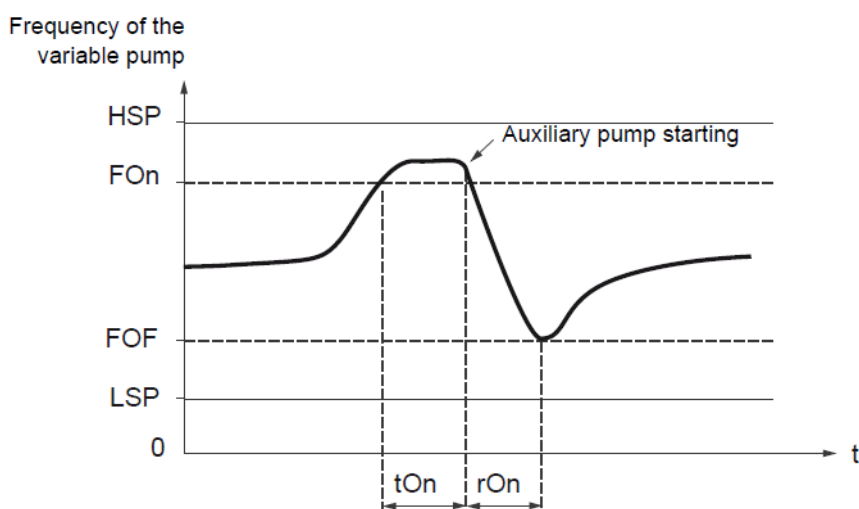
- Single variable mode: 1 single variable speed pump (variable pump).
- Single variable with auxiliary pump mode: 1 variable speed pump (variable pump) and one fixed speed pump (auxiliary pump).

Control of the auxiliary pump

The PI regulator output (frequency reference of the variable pump) is used to control starting or stopping of the auxiliary pump with hysteresis, as shown in the figure below:

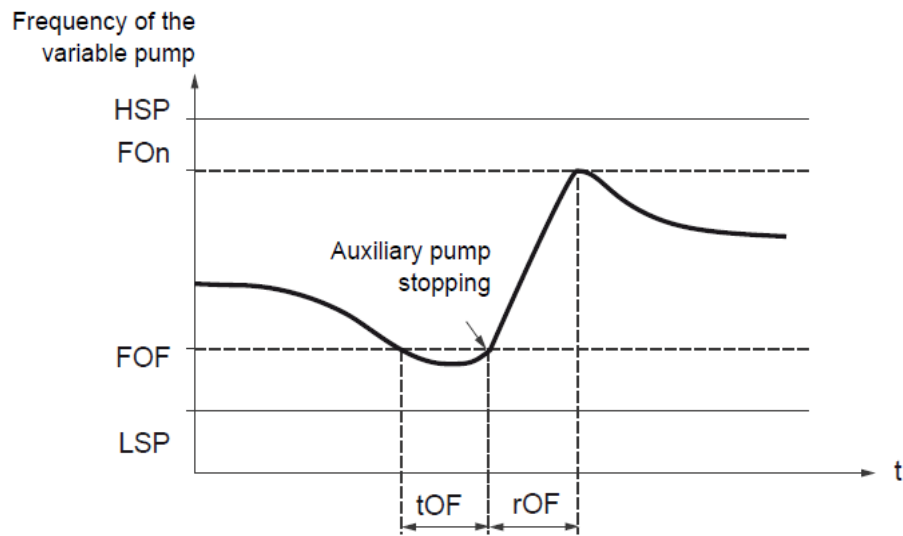


When the frequency exceeds the starting threshold (FOn), a time delay (t_{On}) is launched to avoid the effects of transient flow fluctuations. If after this time delay, the frequency remains higher than the starting threshold, the auxiliary pump is started. When the start command is sent, the variable pump will go from its current speed reference to the auxiliary pump stopping frequency (FOF) following a ramp (r_{On}) that equals the time taken for the auxiliary pump to reach its nominal speed. Parameter r_{On} is used to minimize the booster effect on starting the auxiliary pump.



Configuration Mode - Complete menu (FULL)

When the frequency is lower than the stopping threshold (FOF), a time delay is launched (tOF) to avoid the effects of transient flow fluctuations. If after this time delay, the frequency remains lower than the stopping threshold, the auxiliary pump is stopped. When the stop command is sent, the variable pump will go from its current speed reference to the auxiliary pump starting frequency (FOn) following a ramp (rOF) that equals the auxiliary pump stopping time. Parameter rOF is used to minimize the booster effect on stopping the auxiliary pump.

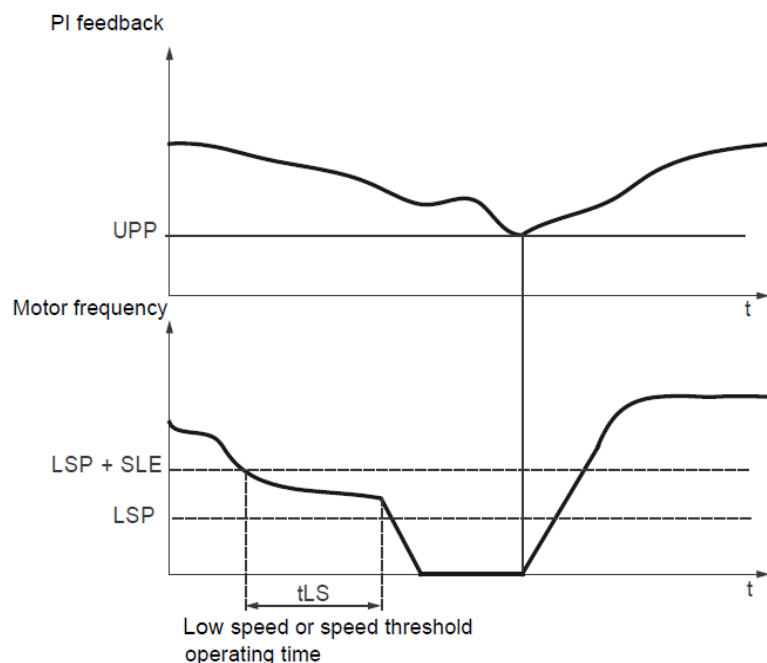


Configuration Mode - Complete menu (FULL)

"Sleep" function/"Wake-up" function

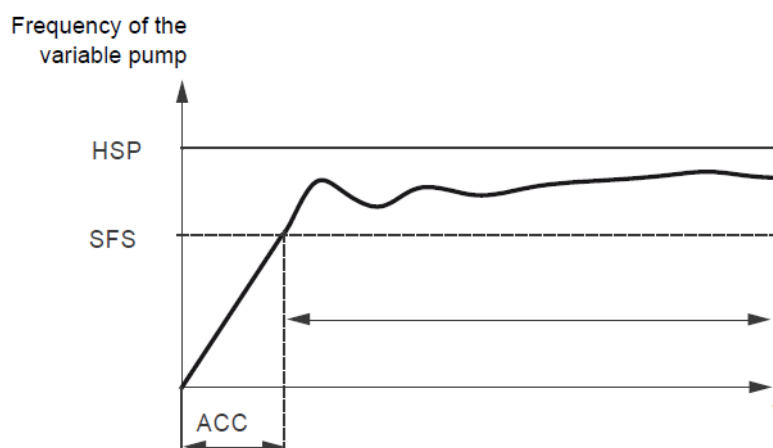
This function is used to stop the variable pump when there is zero flow (auxiliary pump stopped). In this case, if the frequency of the variable pump is lower than the "sleep" threshold ($LSP + SLE$), a time delay (tLS) is launched. If, after this time delay, the frequency remains lower than threshold $LSP + SLE$, the variable pump then stops. The installation is in "sleep" mode.

To switch to "wake-up" mode, the pressure feedback must drop to below the "wake-up" threshold UPP . The variable pump is then started.



Quick start function

The quick start function can be used to overcome problems linked to high rPG and rIG gains (instability on starting). The drive accelerates until it reaches the quick start threshold SFS following a ramp ACC . Once the threshold has been reached, the PI regulator is activated.



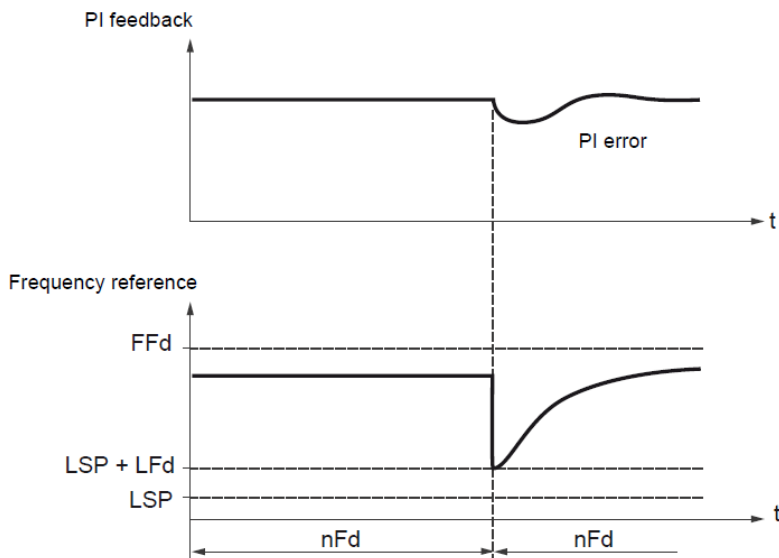
Configuration Mode - Complete menu (FULL)

Zero flow detection

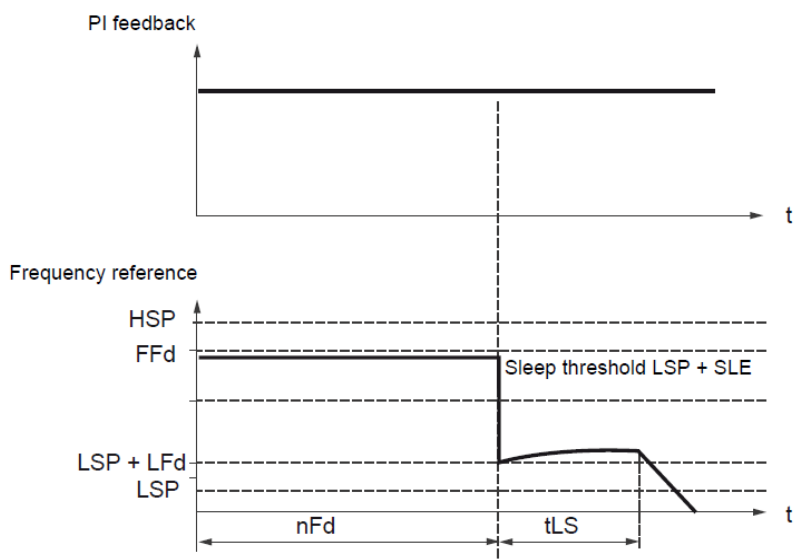
This function is only active when the auxiliary pump is stopped and the motor frequency is below threshold FFd .

This function is used in applications where zero flow cannot be detected by the sleep function alone. It forces the drive frequency reference to $LSP + LFd$ periodically (at each time interval nFd) in order to test for zero flow.

- If the request is still present, the PI error increases, causing the drive to restart.





- If the request is no longer present (zero flow), the PI error will not increase.




- Set the sleep function so that the drive switches to sleep mode when zero flow is detected ($LFd \leq SLE$).

Configuration Mode - Complete menu (FULL)

I - 0 -
dr C -
C L L -
F U n -
F L L -
C O n -

Code	Name/Description	Adjustment range	Factory setting
F U n -	Function menu (continued)		
C L I -	Current limitation menu		
L C 2	<input type="checkbox"/> 2nd current limitation commutation Assignment <input type="checkbox"/> Function inactive <input type="checkbox"/> L1H: LI1 active high <input type="checkbox"/> L2H: LI2 active high <input type="checkbox"/> L3H: LI3 active high <input type="checkbox"/> L4H: LI4 active high <input type="checkbox"/> L1L: LI1 active low <input type="checkbox"/> L2L: LI2 active low <input type="checkbox"/> L3L: LI3 active low <input type="checkbox"/> L4L: LI4 active low If the assigned input is at 0, the first current limitation is active. If the assigned input is at 1, the second current limitation is active. See LI assignment information on page 47 .		n0
C L I 	<input type="checkbox"/> Current limitation First current limitation	0.25 to 1.5 In (1)	1.5 In
C L 2 	<input type="checkbox"/> Current limitation 2 Second current limitation This function allows reduction of the drive current limit. Visible only if 2 nd current limitation commutation L C 2 is not set to n0 .	0.25 to 1.5 In (1)	1.5 In

(1)In = nominal drive current

 Parameter that can be modified during operation or when stopped.

Configuration Mode - Complete menu (FULL)

I - 0 -
drC -
CLL -
FUN -
FLC -
CON -

Code	Name/Description	Adjustment range	Factory setting
FUn -	Function menu (continued)		
SPL -	Speed limit menu		
LSP ()	<input type="checkbox"/> Low speed Motor frequency at minimum reference. This parameter is already included in "my menu" section, page 44 .	0 Hz to HSP	0 Hz
ELS ()	<input type="checkbox"/> Low speed operating time Following operation at Low speed LSP for a defined period, a motor stop is requested automatically. The motor restarts if the frequency reference is greater than Low speed LSP and if a run command is still present. Important: n0 corresponds to an unlimited period. This parameter is available if the Type of stop SEL page 65 is set to Ramp stop rPP .	0.1 to 999.9 s	n0



Parameter that can be modified during operation or when stopped.

Configuration Mode - Complete menu (FULL)

I - 0 -
dr C -
C t L -
FUN -
FL t -
C O n -

High speed configuration

The logic inputs enable selection of the desired high speed.

Desired High speed	Setting	
	Parameter	State
HSP	SH2	n0
	SH4	n0
HSP2	SH2	assigned
	SH4	n0
HSP3	SH2	n0
	SH4	assigned
HSP4	SH2	assigned
	SH4	assigned

Code	Name/Description	Adjustment range	Factory setting
FUN -	Function menu (continued)		
SPL -	Speed limit menu		
HSP ()	<input type="checkbox"/> High speed Motor frequency at maximum reference, can be set between Low speed LSP and Maximum frequency tFr page 56. If tFr is decreased below the value defined for HSP, then HSP automatically decreases to the new value of tFr. This parameter is already included in "my menu" section, page 44.	LSP to tFr	50 or 60 Hz according to BFr, max TFr
SH2 n0 L1H L2H L3H L4H	<input type="checkbox"/> 2 HSP assignment <input type="checkbox"/> Function inactive <input type="checkbox"/> L1h: LI1 active high <input type="checkbox"/> L2h: LI2 active high <input type="checkbox"/> L3h: LI3 active high <input type="checkbox"/> L4h: LI4 active high		n0
SH4 n0 L1H L2H L3H L4H	<input type="checkbox"/> 4 HSP assignment <input type="checkbox"/> Function inactive <input type="checkbox"/> L1h: LI1 active high <input type="checkbox"/> L2h: LI2 active high <input type="checkbox"/> L3h: LI3 active high <input type="checkbox"/> L4h: LI4 active high		n0
HSP2 ()	<input type="checkbox"/> High speed 2 Visible only if 2 HSP assignment SH2 is not set to n0.	LSP to tFr	as HSP
HSP3 ()	<input type="checkbox"/> High speed 3 Visible only if 4 HSP assignment SH4 is not set to n0.	LSP to tFr	as HSP
HSP4 ()	<input type="checkbox"/> High speed 4 Visible only if 2 HSP assignment SH2 and 4 HSP assignment SH4 are not set to n0.	LSP to tFr	as HSP



Parameter that can be modified during operation or when stopped.

Configuration Mode - Complete menu (FULL)

I - 0 -
d r C -
C E L -
F U N -
F L E -
C O N -

Code	Name/Description	Adjustment range	Factory setting
F L E -	Fault detection management menu		
r S F	<input type="checkbox"/> Detected fault reset assignment Manual fault reset. <input type="checkbox"/> Function inactive <input type="checkbox"/> L1h: LI1 active high <input type="checkbox"/> L2h: LI2 active high <input type="checkbox"/> L3h: LI3 active high <input type="checkbox"/> L4h: LI4 active high Faults are reset when the assigned input or bit changes to 1, if the cause of the fault has disappeared. The STOP/RESET button on the display terminal performs the same function. See also Diagnostics and Troubleshooting on page 99 .		nO
A E r -	Automatic restart menu		
A E r	<input type="checkbox"/> Automatic restart <div style="background-color: black; color: white; text-align: center; padding: 5px;">⚠ DANGER</div> <div> UNINTENDED EQUIPMENT OPERATION <ul style="list-style-type: none"> The automatic restart can only be used on machines or installations which do not pose any danger to either personnel or equipment. If the automatic restart is activated, R1 will only indicate a fault has been detected once the time-out period for the restart sequence has expired. The equipment must be used in compliance with national and regional safety regulations. </div> Failure to follow these instructions will result in death or serious injury. This function defines drive behavior upon detection of a fault. If validated, this function allows an automatic restart of the drive when the cause of the detected fault has disappeared and the other operating conditions permit the restart. <input type="checkbox"/> Function inactive <input type="checkbox"/> Automatic restart, after locking on a detected fault, if the cause has disappeared and the other operating conditions permit the restart. The restart is performed by a series of automatic attempts separated by increasingly longer waiting periods: 1 s, 5 s, 10 s, then 1 minute for the following attempts. The drive status relay remains activated if this function is active. The speed reference and the operating direction must be maintained. Use 2-wire control (Type of control E C C page 47 = 2 C and 2 wire type control E C E page 50 = L E L). If the restart has not taken place once the Max. automatic restart time E A r has elapsed, the procedure is aborted and the drive remains locked until it is turned off and then on again. The detected faults, which permit this function, are listed on page 101 .		nO
E A r	<input type="checkbox"/> Max. automatic restart time <input type="checkbox"/> 5 min <input type="checkbox"/> 10 min <input type="checkbox"/> 30 min <input type="checkbox"/> 1 hour <input type="checkbox"/> 2 hours <input type="checkbox"/> 3 hours <input type="checkbox"/> Infinite Visible only if Automatic restart A E r is not set to n O . It can be used to limit the number of consecutive restarts on a recurrent fault.		5 min

Configuration Mode - Complete menu (FULL)

Code	Name/Description	Adjustment range	Factory setting
FLt -	Fault detection management menu (continued)		
FLr	<input type="checkbox"/> Catch on the fly Used to enable a smooth restart if the run command is maintained after the following events: <ul style="list-style-type: none"> • Loss of line supply or disconnection • Reset of current fault or automatic restart • Freewheel stop. The speed given by the drive resumes from the estimated speed of the motor at the time of the restart, then follows the ramp to the reference speed. This function requires 2-wire level control.		nO
nO YES	<input type="checkbox"/> Function inactive <input type="checkbox"/> Function active		

Configuration Mode - Complete menu (FULL)

I - 0 -
d r C -
C t L -
F U N -
F L L -
C O N -

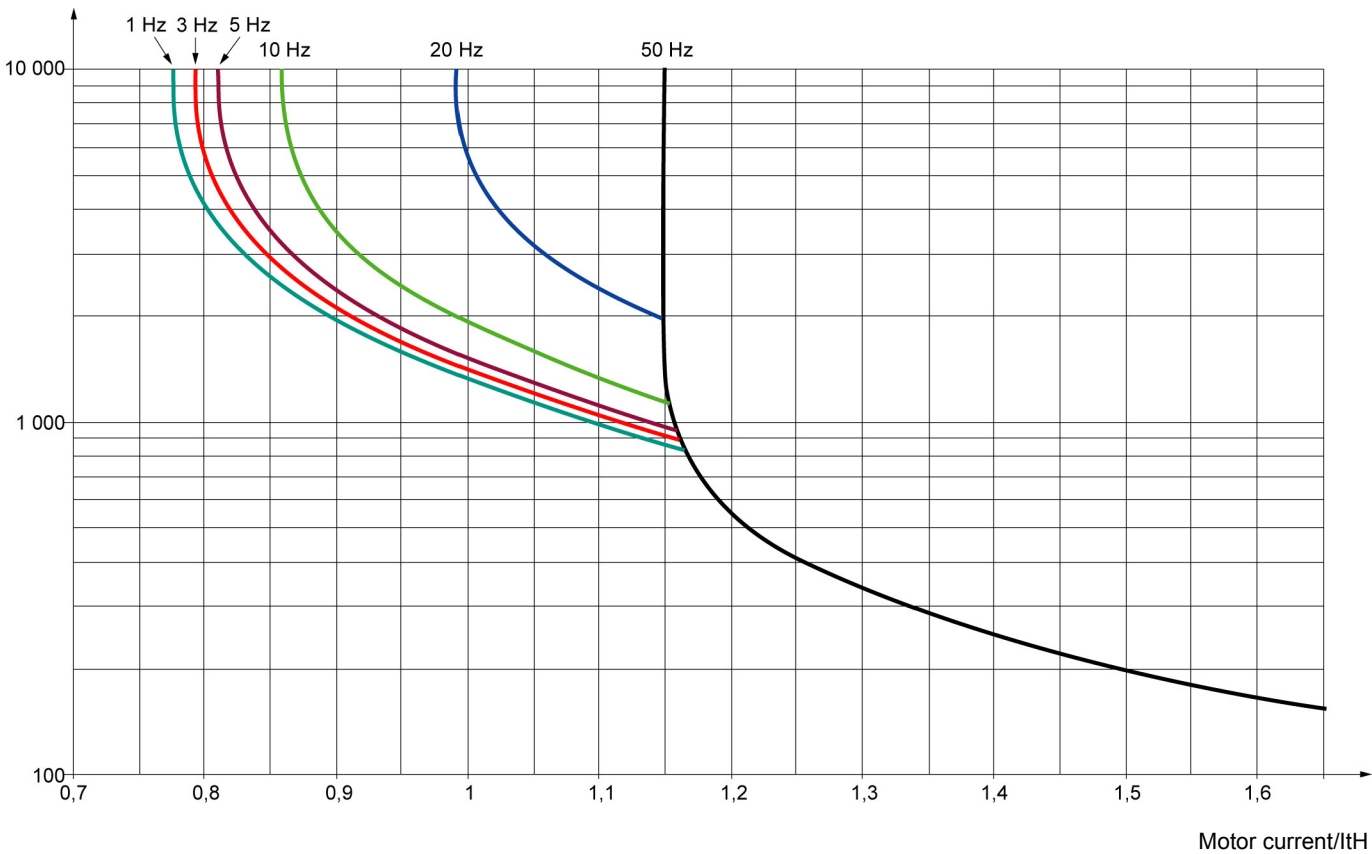
Motor thermal protection

Function:

Thermal protection by calculating the I^2t .

- Naturally-cooled motors:
The tripping curves depend on the motor frequency.
- Force-cooled motors:
Only the 50 Hz tripping curve needs to be considered, regardless of the motor frequency.

Trip time in seconds



CAUTION




RISK OF DAMAGE TO THE MOTOR

The use of external overload protection is required under the following conditions:

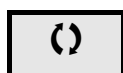
- Repowering up the product since there is no motor thermal state memory
- Running multiple motors
- Running motors rated at less than 0.2 times the nominal drive current
- Using motor switching

Failure to follow these instructions can result in equipment damage

Configuration Mode - Complete menu (FULL)

Code	Name/Description	Adjustment range	Factory setting
FLt -	Fault detection management menu (continued)		
EHt -	Motor thermal protection menu		
IEH 	<input type="checkbox"/> Motor thermal current Current used for the motor thermal detection. Set IEH to the nominal current on the motor rating plate.	0.2 to 1.5 In (1)	According to drive rating
EHt ACL FCL	<input type="checkbox"/> Motor protection type <input type="checkbox"/> Self-ventilated <input type="checkbox"/> Motor-ventilated		ACL
OLL nO YES	<input type="checkbox"/> Overload fault management Type of stop in the event of a motor thermal fault. <input type="checkbox"/> Fault ignored <input type="checkbox"/> Freewheel stop Setting Overload fault management OLL to nO inhibits the Motor overload OLF page 101.		YES
<p style="text-align: center;">CAUTION</p> <p>RISK OF DAMAGE TO THE MOTOR If OLL is set to nO, motor thermal protection is no longer provided by the drive. Provide an alternative means of thermal protection.</p> <p>Failure to follow these instructions can result in equipment damage.</p>			
nen nO YES	<input type="checkbox"/> Motor thermal state memo <input type="checkbox"/> Motor thermal state not stored at power off <input type="checkbox"/> Motor thermal state is stored at power off		nO
FLt -	Fault detection management menu (continued)		
OPL nO YES	<input type="checkbox"/> Output Phase loss <div style="text-align: center;">  DANGER</div> <p>HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH If OPL is set to nO, loss of cable is not detected. Provide an alternative means of thermal protection. Check this action will not endanger personnel or equipment in any way.</p> <p>Failure to follow these instructions will result in death or serious injury.</p> <input type="checkbox"/> Function inactive <input type="checkbox"/> Tripping on OPF1 (1 phase loss) or OPF2 (3 phase loss) fault with freewheel stop		YES
IPL nO YES	<input type="checkbox"/> Input Phase loss This parameter is only accessible in this menu on 3-phases drives. <input type="checkbox"/> Fault ignored. To be used when the drive is supplied via a single phase supply. <input type="checkbox"/> Fault with freewheel stop. If one phase disappears, the drive switches to fault mode Input Phase loss IPL but if 2 or 3 phases disappear, the drive continues to operate until it trips on an undervoltage fault.		According to drive rating


(1)In = nominal drive current



Parameter that can be modified during operation or when stopped.

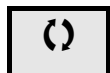
Configuration Mode - Complete menu (FULL)

1 - 0 -
dr C -
C L L -
F U N -
F L L -
C O N -

Code	Name/Description	Adjustment range	Factory setting
FL L -	Fault detection management menu (continued)		
U S b -	Undervoltage menu		
U S b 0 1	<input type="checkbox"/> Undervoltage fault management Behavior of the drive in the event of an undervoltage <input type="checkbox"/> Detected fault and R1 relay open <input type="checkbox"/> Detected fault and R1 relay closed		0
S L P n 0 r n P	<input type="checkbox"/> Undervoltage prevention Behavior in the event of the undervoltage fault prevention level being reached <input type="checkbox"/> No action (freewheel) <input type="checkbox"/> Stop following an adjustable ramp Undervoltage ramp deceleration time S L P		nO
S L P ()	<input type="checkbox"/> Undervoltage ramp deceleration time Ramp time if Undervoltage prevention S L P = r n P .	0.0 to 10.0 s	1.0 s
FL L -	Fault detection management menu (continued)		
S L r t n 0 Y E S	<input type="checkbox"/> IGBT test <input type="checkbox"/> No test <input type="checkbox"/> The IGBTs are tested on power up and every time a run command is sent. These tests cause a slight delay (a few ms). In the event of a fault, the drive will lock. The following faults can be detected: <ul style="list-style-type: none"> - Drive output short-circuit (terminals U-V-W): SCF display - IGBT: xtF, where x indicates the number of the IGBT concerned - IGBT short-circuited: x2F, where x indicates the number of the IGBT concerned 		nO
L F L I n 0 Y E S	<input type="checkbox"/> 4-20 mA loss behaviour <input type="checkbox"/> Fault ignored. This configuration is the only one possible if AI1 current scaling parameter of 0% C r L I page 51 is not greater than 3 mA or if AI1 type A I I t = I O U . <input type="checkbox"/> Freewheel stop		nO
I n H n 0 L 1 H L 2 H L 3 H L 4 H  2 s	<input type="checkbox"/> Detected fault inhibition assignment To assign fault inhibit, press and hold down the "ENT" key for 2 s. <input type="checkbox"/> Function inactive <input type="checkbox"/> L1h: LI1 active high <input type="checkbox"/> L2h: LI2 active high <input type="checkbox"/> L3h: LI3 active high <input type="checkbox"/> L4h: LI4 active high Following detected faults can be inhibited: I n F b, S O F, t n F, O H F, O L F, O P F 1, O P F 2, O S F, S L F 1, S L F 2, S L F 3, t J F, and U S F.		nO
<div style="text-align: center;">⚠ ⚠ DANGER</div> <div> LOSS OF PERSONNEL AND EQUIPMENT PROTECTION Enabling the fault inhibition parameter I n H will disable the drive controller protection features. <ul style="list-style-type: none"> • I n H should not be enabled for typical applications of this equipment. • I n H should be enabled only in extraordinary situations where a thorough risk analysis demonstrates that the presence of adjustable speed drive protection poses a greater risk than personnel injury or equipment damage. Failure to follow these instructions will result in death or serious injury. </div>			



To change the assignment of this parameter press the "ENT" key for 2 s.



Parameter that can be modified during operation or when stopped.

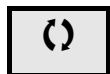
Configuration Mode - Complete menu (FULL)

I - 0 -
dr C -
C L L -
FUN -
F L L -
C O N -

Code	Name/Description	Adjustment range	Factory setting
F L L -	Fault detection management menu (continued)		
S L L n O Y E S	<input type="checkbox"/> Modbus fault management Behavior of the drive in the event of a communication fault with integrated Modbus. <input type="checkbox"/> Fault ignored <input type="checkbox"/> Freewheel stop		YES
	<div style="text-align: center;">⚠ WARNING</div> <div> LOSS OF CONTROL If Modbus fault mgt S L L is set to n O, communication control will be inhibited. For safety reasons, inhibition of communication fault should only be used for adjustment or special applications purpose. Failure to follow these instructions can result in death, serious injury, or equipment damage. </div>		
d r n n O Y E S	<input type="checkbox"/> Degraded line supply operation Lowers the tripping threshold of the USF fault to operate on a line supply down to 50% of nominal line voltage. In this case, the performance of the drive cannot be guaranteed <input type="checkbox"/> nO <input type="checkbox"/> Yes		nO
	<div style="text-align: center;">CAUTION</div> <div> RISK OF DAMAGE TO THE DRIVE When Derated operation = Y E S, use a line choke. Failure to follow these instructions can result in equipment damage. </div>		
r P r (↺) n O F E H	<input type="checkbox"/> Reset power run This reset will initialize the settings located on n O n section, menu n A I - , page 40 . <input type="checkbox"/> nO <input type="checkbox"/> Reset fan time display		nO



To change the assignment of this parameter press the "ENT" key for 2 s.



Parameter that can be modified during operation or when stopped.

Configuration Mode - Complete menu (FULL)

I - 0 -
 d r C -
 C E L -
 F U N -
 F L E -
 C O N -

Code	Name/Description	Adjustment range	Factory setting
C O N -	Communication menu Note: For following parameters, the modifications will be taken into account only at the next control power on.		
A d d	<input type="checkbox"/> Modbus address Modbus address is adjustable from 0 F F to 2 4 7 . When 0 F F , communication is not active.	OFF to 247	OFF
E b r	<input type="checkbox"/> Modbus baud rate <input type="checkbox"/> 4.8 kbps <input type="checkbox"/> 9.6 kbps <input type="checkbox"/> 19.2 kbps <input type="checkbox"/> 38.4 kbps		19.2
E F D	<input type="checkbox"/> Modbus format <input type="checkbox"/> 8o1 <input type="checkbox"/> 8E1 <input type="checkbox"/> 8n1 <input type="checkbox"/> 8n2		8E1
E t O	<input type="checkbox"/> Modbus time out The drive detects a Modbus fault if it does not receive any Modbus request at its address within a predefined time period (time out).	0.1 to 30 s	10 s
I C S -	Input scanner menu (values are expressed in hexadecimal)		
n P A 1	<input type="checkbox"/> Com scanner read address parameter 1 Address of the 1st input word.		0C81
n P A 2	<input type="checkbox"/> Com scanner read address parameter 2 Address of the 2nd input word.		219C
n P A 3	<input type="checkbox"/> Com scanner read address parameter 3 Address of the 3rd input word.		0
n P A 4	<input type="checkbox"/> Com scanner read address parameter 4 Address of the 4th input word.		0
O C S -	Output scanner menu (values are expressed in hexadecimal)		
n C A 1	<input type="checkbox"/> Com scanner write address parameter 1 Address of the 1st output word.		2135
n C A 2	<input type="checkbox"/> Com scanner write address parameter 2 Address of the 2nd output word.		219A
n C A 3	<input type="checkbox"/> Com scanner write address parameter 3 Address of the 3rd output word.		0
n C A 4	<input type="checkbox"/> Com scanner write address parameter 4 Address of the 4th output word.		0

Configuration Mode - Complete menu (FULL)

Code	Name/Description	Adjustment range	Factory setting
CON -	Communication menu (continued)		
ISA -	Input scanner access menu (values are expressed in hexadecimal)		
PI 1	<input type="checkbox"/> Com scanner read address value 1 Value of the 1st input word		ETA VALUE
PI 2	<input type="checkbox"/> Com scanner read address value 2 Value of the 2nd input word		RFRD value
PI 3	<input type="checkbox"/> Com scanner read address value 3 Value of the 3rd input word		8000
PI 4	<input type="checkbox"/> Com scanner read address value 4 Value of the 4th input word		8000
OSA -	Output scanner access menu (values are expressed in hexadecimal)		
OC 1 ()	<input type="checkbox"/> Com scanner write address value 1 Value of the 1st output word		CMD value
OC 2 ()	<input type="checkbox"/> Com scanner write address value 2 Value of the 2nd output word		LFRD value
OC 3 ()	<input type="checkbox"/> Com scanner write address value 3 Value of the 3rd output word		8000
OC 4 ()	<input type="checkbox"/> Com scanner write address value 4 Value of the 4th output word		8000

()

Parameter that can be modified during operation or when stopped.

Maintenance

Servicing

The ACOPOSinverter S44 does not require any preventive maintenance. However, it is advisable to perform the following checks regularly:

- The condition and tightness of connections
- Ensure that the temperature around the unit remains at an acceptable level and that ventilation is effective. Average service life of fans: 10 years.
- Remove any dust from the drive
- Ensure proper fan operation
- Physical damage to covers

Assistance with maintenance, detected fault display

If a problem arises during setup or operation, ensure that the recommendations relating to the environment, mounting and connections have been observed.

The first fault detected is stored and displayed, flashing, on the screen: the drive locks and the status relay R1 contact opens.

Clearing the detected fault

In the event of a non resettable detected fault:

- Remove/cut the power to the drive.
- WAIT 15 MINUTES to allow the DC bus capacitors to discharge. Then follow the "Bus Voltage Measurement Procedure", page [14](#) to verify that the DC voltage is less than 42 V. The drive LEDs are not indicators of the absence of DC bus voltage.
- Find and correct the detected fault.
- Restore power to the drive to confirm the detected fault has been rectified.

Certain detected faults can be programmed for automatic restart after the cause has disappeared.

These detected faults can also be reset by cycling power to the drive or by means of a logic input or control bit.

Display menu

Use the display menu (MOn) to show the status of the drive and it's current values as an aid for finding the causes of detected faults.

Spares and repairs

Serviceable product: Refer to the catalogue for replacement of spare parts.

Procedure after a long time storage

WARNING

RISK OF EXPLOSION AT THE POWER UP

The capacitors after a long time storage can have issues. Following a storage time between 2 and 3 years:

- Use one AC supply variable connected between L1, L2 and L3
- Increase AC supply voltage to have:
 - 25% of rated voltage during 30 min
 - 50% of rated voltage during 30 min
 - 75% of rated voltage during 30 min
 - 100% of rated voltage during 30 min

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Diagnostics and Troubleshooting

Drive does not start, no error code displayed

- If the display does not light up, check the power supply to the drive (ground and input phases connection, see page 20).
- The assignment of the "Fast stop" or "Freewheel" functions will prevent the drive starting if the corresponding logic inputs are not powered up. The ACOPOSinverter S44 then displays **n S t** in freewheel stop and **F S t** in fast stop. This is normal since these functions are active at zero so that the drive will be stopped safely if there is a wire break. Assignment of LI to be checked in **C O n F / F U L L / F U n - / S t t -** menu.
- Make sure that the run command input(s) is activated in accordance with the selected control mode (parameters **Type of control t C C** page 47 and **2 wire type control t C t** page 50, in **C O n F / F U L L / I _ O -** menu).
- If the reference channel or command channel is assigned to Modbus, when the power supply is connected, the drive displays "**n S t**" freewheel and remain in stop mode until the communication bus sends a command.
- In factory setting "RUN" button is inactive. Adjust parameters **Reference channel 1 F r I** page 61 and **Command channel 1 C d I** page 62 to control the drive locally (**C O n F / F U L L / C t L -** menu). See How to control the drive locally page 45.

Fault detection codes that cannot be reset automatically

The cause of the detected fault must be removed before resetting by turning off and then on.

S O F and **t n F** faults can also be reset remotely by means of a logic input (parameter **Detected fault reset assignment r S F** page 90 in **C O n F / F U L L / F L t -** menu).

I n F b, **S O F** and **t n F** faults can be inhibited and cleared remotely by means of a logic input (parameter **Detected fault inhibition assignment I n H** page 94).

Code	Name	Possible causes	Remedy
C r F I	Precharge	<ul style="list-style-type: none">• Charging relay control fault or charging resistor damaged	<ul style="list-style-type: none">• Turn the drive off and then back on again• Check the connections• Check the stability of the main supply• Contact your local B&R office
I n F I	Unknown drive rating	<ul style="list-style-type: none">• The power card is different from the card stored	<ul style="list-style-type: none">• Contact your local B&R office
I n F 2	Unknown or incompatible power board	<ul style="list-style-type: none">• The power card is incompatible with the control card	<ul style="list-style-type: none">• Contact your local B&R office
I n F 3	Internal serial link	<ul style="list-style-type: none">• Communication fault between the internal cards	<ul style="list-style-type: none">• Contact your local B&R office
I n F 4	Invalid industrialization zone	<ul style="list-style-type: none">• Inconsistent internal data	<ul style="list-style-type: none">• Contact your local B&R office
I n F 9	Current measurement circuit failure	<ul style="list-style-type: none">• Current measurement is not correct due to hardware circuit	<ul style="list-style-type: none">• Contact your local B&R office
I n F b	Internal thermal sensor failure	<ul style="list-style-type: none">• The drive temperature sensor is not operating correctly• The drive is in short circuit or open	<ul style="list-style-type: none">• Contact your local B&R office
I n F E	Internal CPU	<ul style="list-style-type: none">• Internal microprocessor fault	<ul style="list-style-type: none">• Turn the drive off and then back on again• Contact local B&R office

Diagnostics and Troubleshooting

Fault detection codes that cannot be reset automatically (continued)

Code	Name	Possible causes	Remedy
OCF	Overcurrent	<ul style="list-style-type: none"> Parameters in the Motor control menu drC - page 56 are not correct Inertia or load too high Mechanical locking 	<ul style="list-style-type: none"> Check the parameters Check the size of the motor/drive/load Check the state of the mechanism Connect line motor chokes Reduce the Switching frequency 5Fr page 58 Check the ground connection of drive, motor cable and motor insulation
SCF1	Motor short circuit	<ul style="list-style-type: none"> Short-circuit or grounding at the drive output Ground fault during running status Commutation of motors during running status Significant current leakage to ground if several motors are connected in parallel 	<ul style="list-style-type: none"> Check the cables connecting the drive to the motor, and the motor insulation Connect motor chokes
SCF3	Ground short circuit		
SCF4	IGBT short circuit	<ul style="list-style-type: none"> Internal power component short circuit detected at power on 	<ul style="list-style-type: none"> Contact your local B&R office
SOF	Overspeed	<ul style="list-style-type: none"> Instability Overspeed associated with the inertia of the application 	<ul style="list-style-type: none"> Check the motor Overspeed is 10% more than Maximum frequency LFr page 56 so adjust this parameter if necessary Check the size of the motor/drive/load Check parameters of the speed loop (gain and stability)
LnF	Auto-tuning	<ul style="list-style-type: none"> Motor not connected to the drive One motor phase loss Special motor Motor is rotating (being driven by the load, for example) 	<ul style="list-style-type: none"> Check that the motor/drive are compatible Check that the motor is present during auto-tuning If an output contactor is being used, close it during auto-tuning Check that the motor is completely stopped

Diagnostics and Troubleshooting

Fault detection codes that can be reset with the automatic restart function, after the cause has disappeared

These faults can also be reset by turning on and off or by means of a logic input (parameter [Detected fault reset assignment](#) **r 5 F** page 90). OHF, OLF, OPF1, OPF2, OSF, SLF1, SLF2, SLF3 and tJF faults can be inhibited and cleared remotely by means of a logic input (parameter [Detected fault inhibition assignment](#) **I n H** page 94).

Code	Name	Possible causes	Remedy
L F F I	AI current lost fault	Detection if: <ul style="list-style-type: none"> Analog input AI1 is configured as current AI1 current scaling parameter of 0% C r L I page 51 is greater than 3 mA Analog input current is lower than 2 mA 	<ul style="list-style-type: none"> Check the terminal connection
O b F	Overbraking	<ul style="list-style-type: none"> Braking too sudden or driving load too high 	<ul style="list-style-type: none"> Increase the deceleration time Check the line supply voltage, to be sure that it is under the maximum acceptable (20% over maximum line supply during run status)
O H F	Drive overheating	<ul style="list-style-type: none"> Drive temperature too high 	<ul style="list-style-type: none"> Check the motor load, the drive ventilation and the ambient temperature. Wait for the drive to cool down before restarting. See Mounting and temperature conditions page 13.
O L C	Process overload	<ul style="list-style-type: none"> Process overload 	<ul style="list-style-type: none"> Check the process and the parameters of the drive to be in phase
O L F	Motor overload	<ul style="list-style-type: none"> Triggered by excessive motor current 	<ul style="list-style-type: none"> Check the setting of the motor thermal protection, check the motor load
O P F 1	1 output phase loss	<ul style="list-style-type: none"> Loss of one phase at drive output 	<ul style="list-style-type: none"> Check the connections from the drive to the motor In case of using downstream contactor, check the right connection, cable and contactor
O P F 2	3 output phase loss	<ul style="list-style-type: none"> Motor not connected Motor power too low, below 6% of the drive nominal current Output contactor open Instantaneous instability in the motor current 	<ul style="list-style-type: none"> Check the connections from the drive to the motor Test on a low power motor or without a motor: In factory settings mode, motor phase loss detection is active Output Phase loss detection O P L page 93 = y E 5. To check the drive in a test or maintenance environment, without having to use a motor with the same rating as the drive, deactivate motor phase loss detection Output Phase loss detection O P L = n 0 Check and optimize the following parameters: IR compensation (law U/F) U F r page 57, Rated motor voltage U n 5 page 56 and Rated motor current n C r page 45 and perform an Auto-tuning t U n page 59.
O S F	Main overvoltage	<ul style="list-style-type: none"> Line voltage too high: <ul style="list-style-type: none"> At drive power on only, the supply is 10% over the maximum acceptable voltage level Power with no run order, 20% over the maximum line supply Disturbed line supply 	<ul style="list-style-type: none"> Check the line voltage

Diagnostics and Troubleshooting

Fault detection codes that can be reset with the automatic restart function, after the cause has disappeared (continued)

Code	Name	Possible causes	Remedy
P H F	Input phase loss	<ul style="list-style-type: none"> • Drive incorrectly supplied or a fuse blown • Failure of one phase • 3-phase ACOPOSinverter S44 used on a single-phase line supply • Unbalanced load • This protection only operates with the drive on load 	<ul style="list-style-type: none"> • Check the power connection and the fuses • Use a 3-phase line supply • Disable the fault by setting Input Phase loss detection I P L page 93 = n 0
S C F 5	Load short circuit	<ul style="list-style-type: none"> • Short-circuit at drive output • Short circuit detection at the run order or DC injection order if parameter IGBT test S t r t page 94 is set to y E 5 	<ul style="list-style-type: none"> • Check the cables connecting the drive to the motor, and the motor's insulation
S L F 1	Modbus communication	<ul style="list-style-type: none"> • Interruption in communication on the Modbus network 	<ul style="list-style-type: none"> • Check the connections of communication bus • Check the time-out (Modbus time out t t 0 parameter page 96) • Refer to the user manual
S L F 3	HMI communication	<ul style="list-style-type: none"> • Communication interruption with the external display terminal 	<ul style="list-style-type: none"> • Check the terminal connection
S P I F	PI Feedback detected fault	<ul style="list-style-type: none"> • PID feedback below lower limit 	<ul style="list-style-type: none"> • Check the PID function feedback • Check the PI feedback supervision threshold L P I and PI feedback supervision function time delay t P I, page 75.
U L F	Process underload fault	<ul style="list-style-type: none"> • Process underload • Motor current below the Application Underload threshold L U L parameter page 54 during a period set by Application underload time delay U L t parameter page 54 to protect the application. 	<ul style="list-style-type: none"> • Check the process and the parameters of the drive to be in phase
t J F	IGBT overheat	<ul style="list-style-type: none"> • Drive overheated • IGBT internal temperature is too high according to ambient temperature and load 	<ul style="list-style-type: none"> • Check the size of the load/motor/drive • Reduce the Switching frequency S F r page 58 • Wait for the drive to cool before restarting

Diagnostics and Troubleshooting

Faults codes that will be reset as soon as their causes disappear

The USF fault can be inhibited and cleared remotely by means of a logic input (parameter [Detected fault reset assignment](#) **r 5 F** page [90](#)).

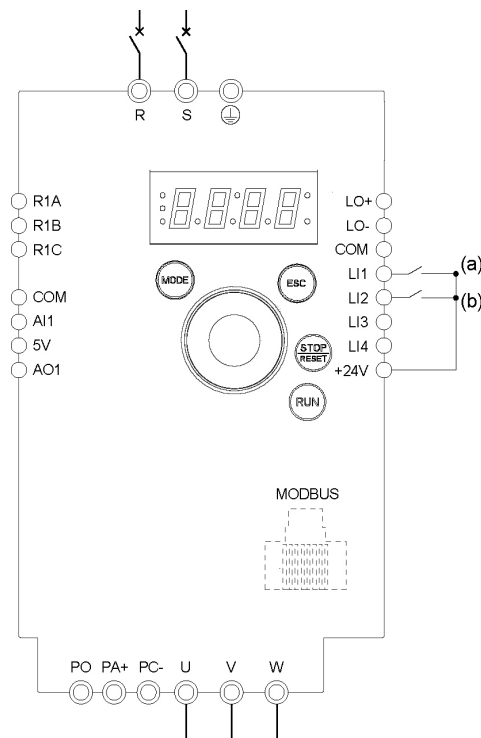
Code	Name	Possible causes	Remedy
C F F	Incorrect configuration	<ul style="list-style-type: none">HMI block replaced by an HMI block configured on a drive with a different ratingThe current configuration of customer parameters is inconsistent	<ul style="list-style-type: none">Return to factory settings or retrieve the backup configuration, if it is validIf the fault remains after reverting to the factory settings, contact your local B&R office
C F I (1) C F I 2	Invalid configuration	<ul style="list-style-type: none">Invalid configuration The configuration loaded in the drive via the bus or communication network is inconsistent. The configuration upload has been interrupted or is not fully finished.	<ul style="list-style-type: none">Check the configuration loaded previouslyLoad a compatible configuration
U S F	Undervoltage	<ul style="list-style-type: none">Line supply too lowTransient voltage dip	<ul style="list-style-type: none">Check the voltage and the parameters of Undervoltage Phase Loss Menu U 5 b - page 94.

(1) When the CFI is present in the past fault menu, it means the configuration has been interrupted or is not fully finished.

HMI block changed

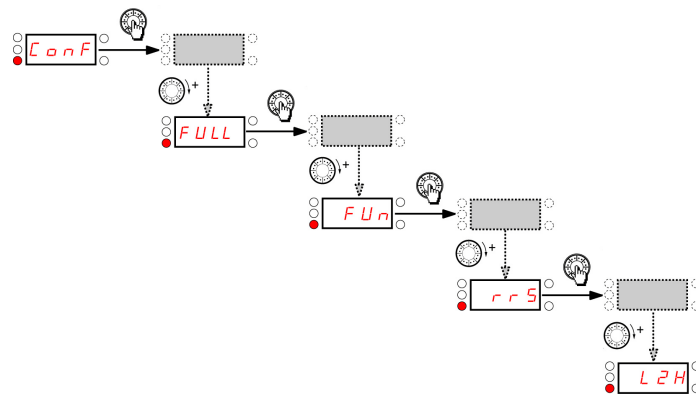
When an HMI block is replaced by an HMI block configured on a drive with a different rating, the drive locks in Incorrect configuration **C F F** fault mode on power-up. If the card has been deliberately changed, the fault can be cleared by returning to factory setting.

2-wire control (source)



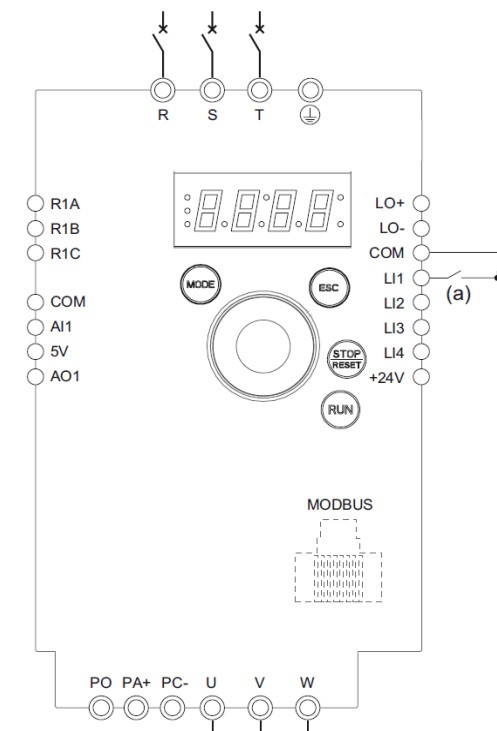
(a): Run Forward (b): Run Reverse

1. Connect the ground terminal to the grounding screws located below the output terminals.
2. Connect the power terminals.
3. Connect the logic inputs.
4. Turn on the drive without giving a run command.
5. Assign factory settings to the drive, **Factory / recall customer parameter set F C 5** page 45 set to **I n I**.
6. Set the motor parameters (in CO n F mode) only if the factory configuration of the drive is not suitable.
7. Perform an auto-tuning.
8. Set **Reverse direction r r 5** parameter page 65 to **L 1 2 H**



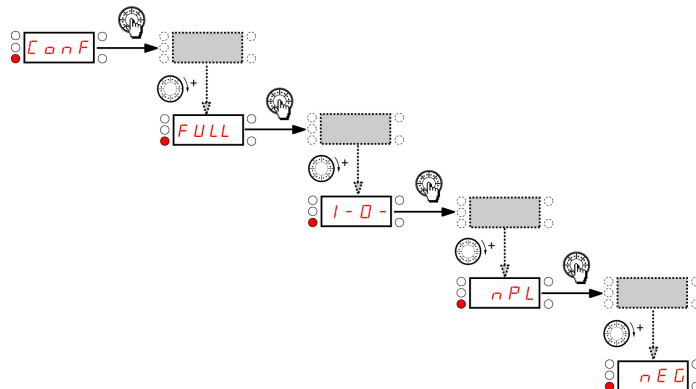
9. Start

3-wire control (sink)



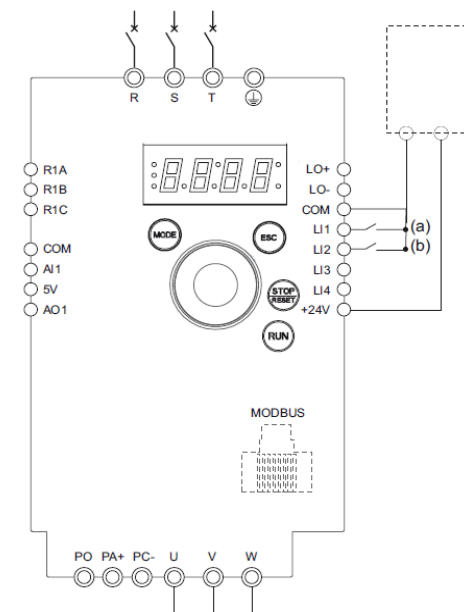
(a): Run Forward

1. Connect the ground terminal to the grounding screws located below the output terminals.
2. Connect the power terminals.
3. Connect the logic inputs.
4. Turn on the drive without giving a run command.
5. Assign factory settings to the drive, **Factory / recall customer parameter set F C 5** page 45 set to **I n I**.
6. Set **t C C** to **3 C** see page 47
7. Set the motor parameters (in **C O n F** mode) only if the factory configuration of the drive is not suitable.
8. Perform an auto-tuning.
9. Set **Logic inputs type n P L** parameter page 50 to **n E G**.



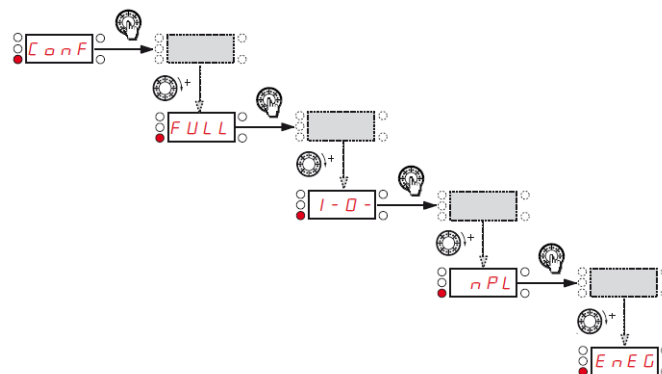
10. Start

2-wire control (sink)



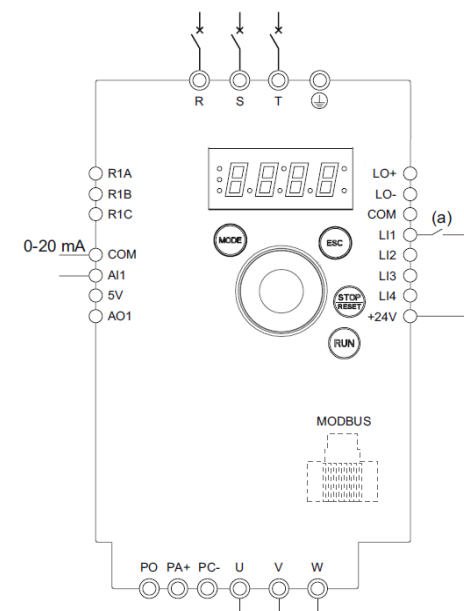
(a) Run Forward

1. Connect the ground terminal to the grounding screws located below the output terminals.
2. Connect the power terminals.
3. Connect the logic inputs.
4. Turn on the drive without giving a run command.
5. Assign factory settings to the drive, **Factory / recall customer parameter set F C 5** page 45 set to **I n I**.
6. Set **t C C** to **3 C** see page 47
7. Set the motor parameters (in **C O n F** mode) only if the factory configuration of the drive is not suitable.
8. Perform an auto-tuning.
9. Set **Logic inputs type n P L** parameter page 50 to **E n E G**



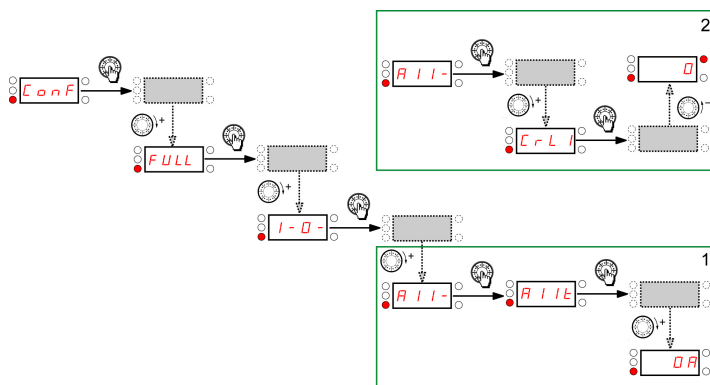
10. Start.

Speed control 0-20 mA (source)



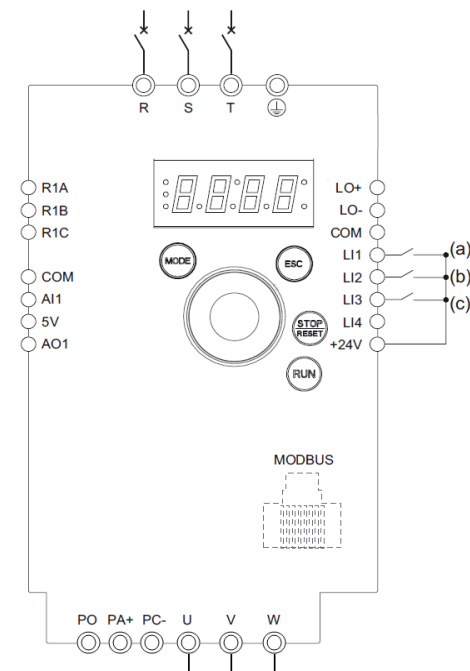
(a) Run Forward

1. Connect the ground terminal to the grounding screws located below the output terminals.
2. Connect the power terminals.
3. Connect the logic input LI1 and analog input AI1.
4. Turn on the drive without giving a run command.
5. Assign factory settings to the drive, **Factory / recall customer parameter set F C 5** page 45 set to **I n I**.
6. Set the motor parameters (in **C O n F** mode) only if the factory configuration of the drive is not suitable.
7. Perform an auto-tuning.
8. Set **AI1 type A I I t** page 45 to **O R** and **AI1 current scaling parameter of 0% C r L I** page 51 to 0 A. Check that **AI1 current scaling parameter of 100% C r H I** page 51 is set to 20 mA.



9. Start.

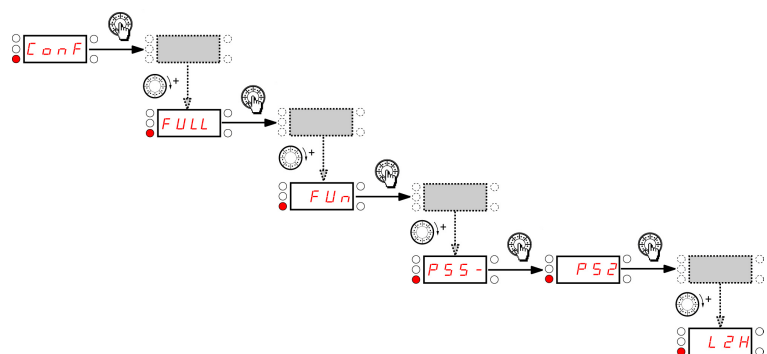
4 Preset speeds (source)



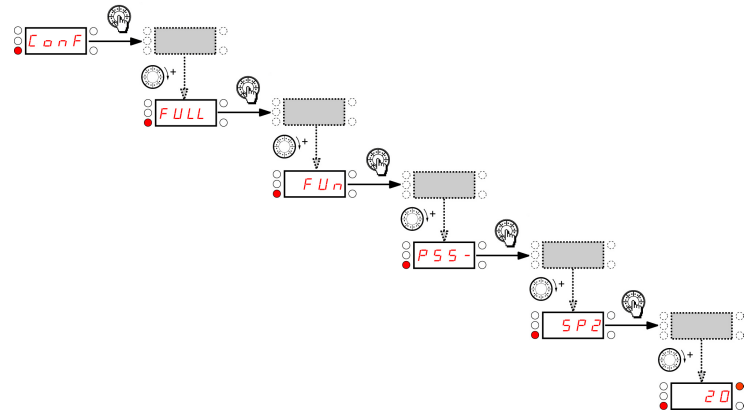
- (a): Run Forward
- (b): 2 preset speeds
- (c): 4 preset speeds

Important: Please refer to Function compatibility table page 35.

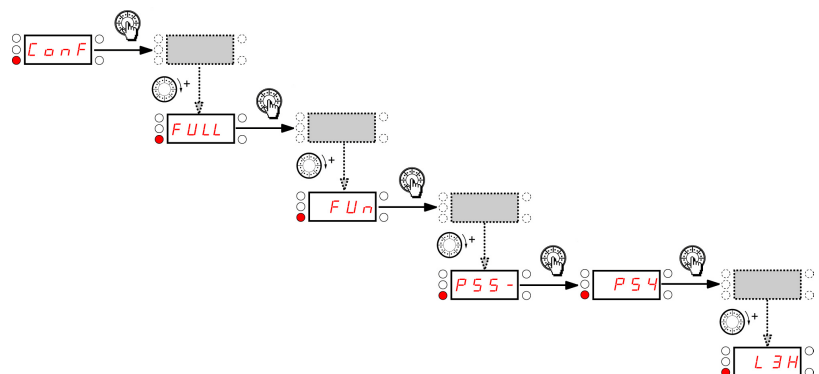
1. Connect the ground terminal to the grounding screws located below the output terminals.
2. Connect the power terminals.
3. Connect the logic inputs.
4. Turn on the drive without giving a run command.
5. Assign factory settings to the drive, **Factory / recall customer parameter set F C 5** page 45 set to **I n I**.
6. Set the motor parameters (in CO n F mode) only if the factory configuration of the drive is not suitable.
7. Perform an auto-tuning.
8. Set 2 Preset speeds **P 5 2** page 69 to **L 2 H**.



Set Preset speed 2 **S P 2** page 69 to 20 Hz.

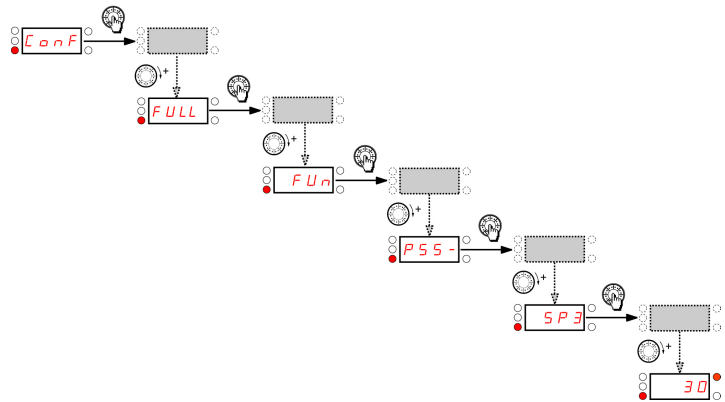


Set 4 Preset speeds **P 5 4** page 69 to **L 3 H**.



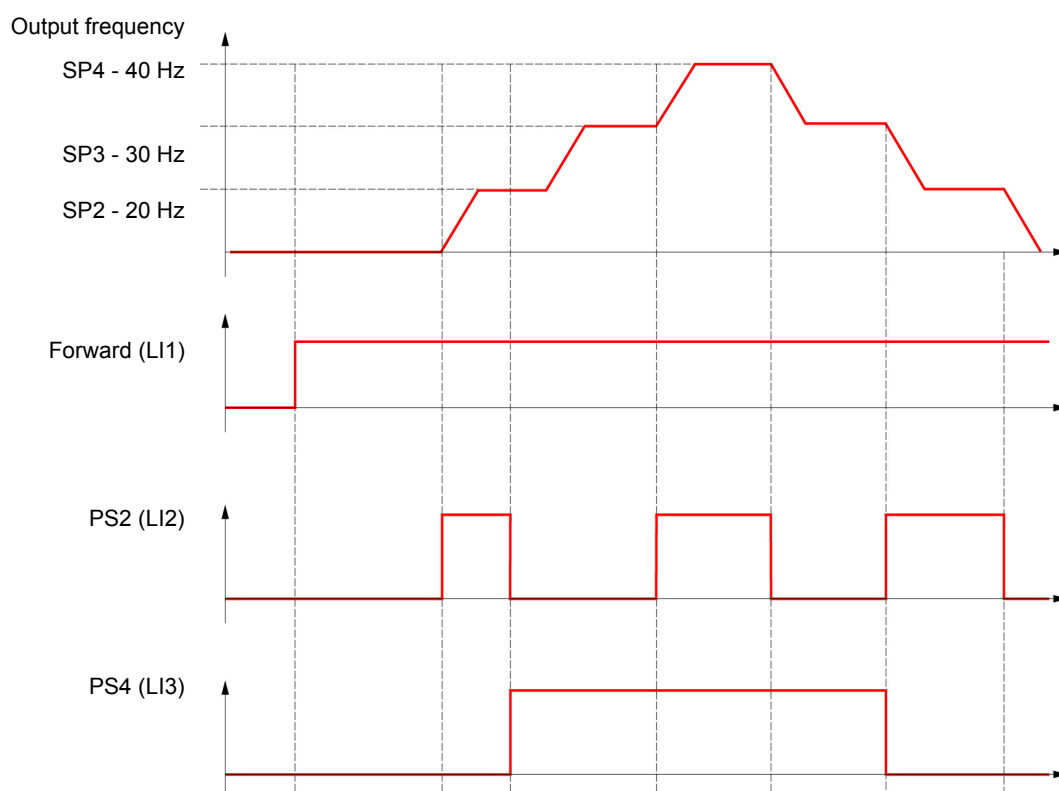
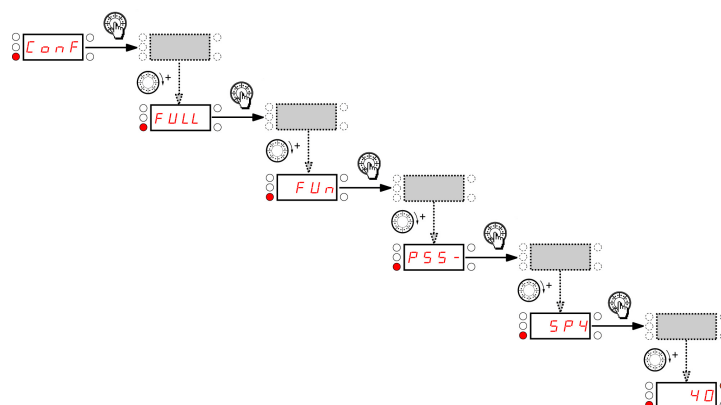
Application notes

Set Preset speed 3 **5 P 3** page 69 to 30 Hz.

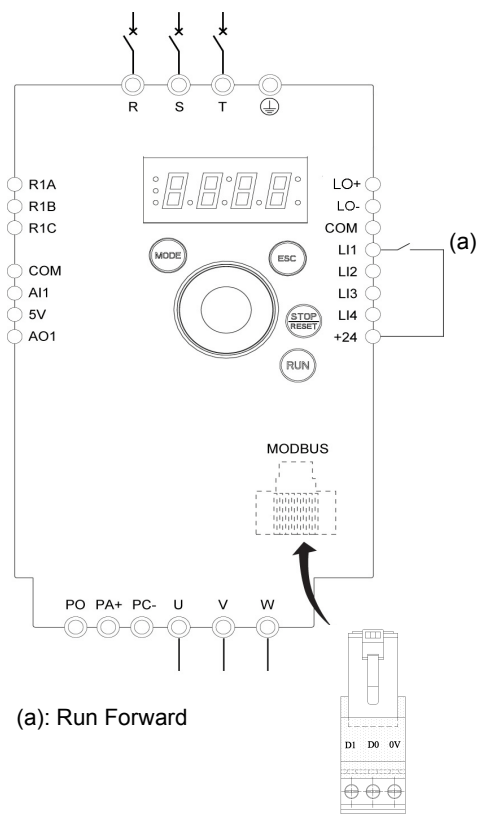


4 Preset speeds (source) continued

Set Preset speed 4 **5 P 4** page **69** to 40 Hz.

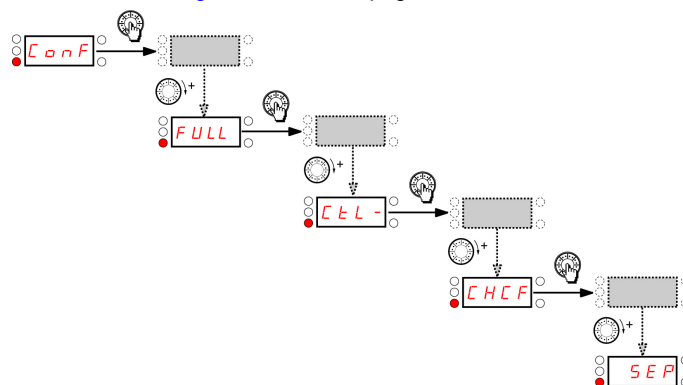


Terminals command channel with Modbus reference channel

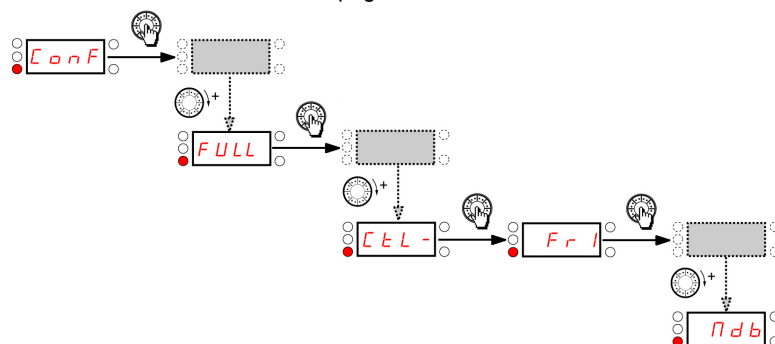


Important: Please refer to Function compatibility table page 35.

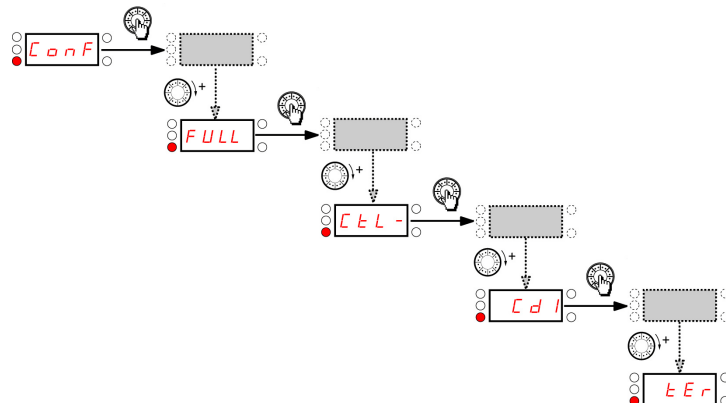
1. Connect the ground terminal to the grounding screws located below the output terminals.
2. Connect the power terminals.
3. Connect the logic input LI1 and plug RJ45 cable or Modbus network adapter to the Modbus socket.
4. Turn on the drive without giving a run command.
5. Assign factory settings to the drive, **Factory / recall customer parameter set F C 5** page 45 set to **I n I**.
6. Set the motor parameters (in COnF mode) only if the factory configuration of the drive is not suitable.
7. Perform an auto-tuning.
8. Set **Channel configuration C H C F** page 61 to **S E P**.



Set **Reference channel 1 F r I** page 61 to **n d b**.



Check that **Command channel 1 C d I** page 62 is set to **t E r**.



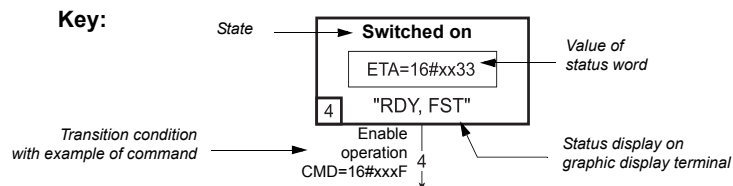
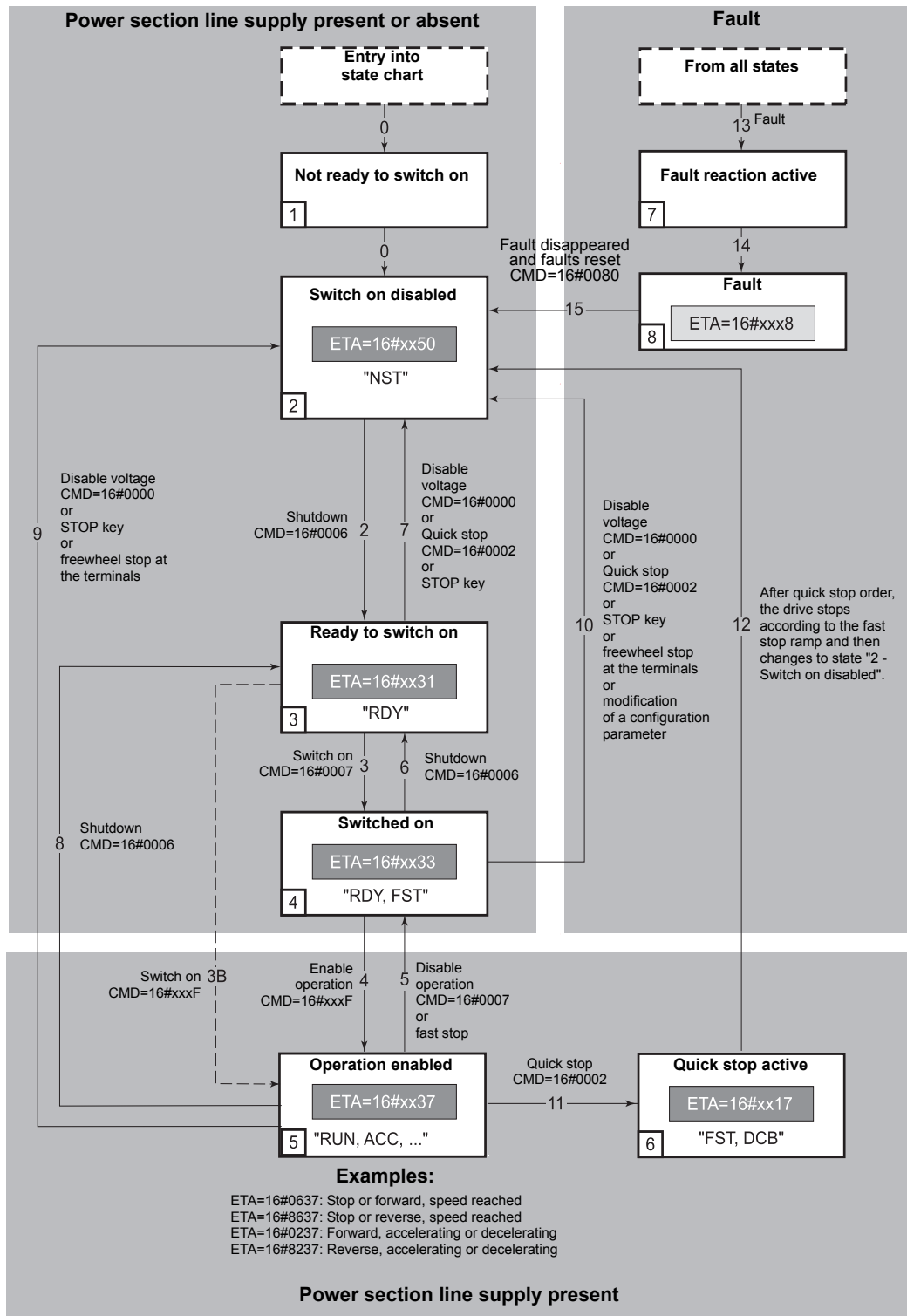
9. Start

ACOPOSinverter S44 state machine

Status chart based on IEC 61800-7*

The state machine below describes the interaction between the drive's state machine, monitored by the status word (ETA) parameter, and the Command Word (CMD).

*: Since 2007, CiA402 profile is part of the IEC standard 61800-7. Therefore DriveCom or CiA402 terminology is no more used.



ACOPoSiNverter S44 state machine

State machine description

The ACOPoSiNverter control process using the communication bus follows IEC 61800-7 profile status chart compatible with the DRIVECOM standard. Each state represents an aspect of the internal behaviour of the drive.

This chart evolves according to whether the control word is sent (CMD W8501) or an event occurs (example: lock following malfunction). The drive status can be identified by the value of the status word (ETA W3201).

Not ready to switch on (Initialization):

Communication is being initialized.
Transient state invisible to the communication bus.

Switch on disabled (Configuration):

Initialization of the drive is complete.
The configuration and adjustment parameters can be modified. The drive is locked.

Ready to switch on and Switched on (Drive initialized):

The drive is locked.
The power stage of the drive is ready to operate, but voltage has not yet been applied to the output.
The configuration and adjustment parameters can be modified, but modifying a configuration parameter returns the drive to the "Switch on disabled" state.

Operation enabled (Operational):

The drive is unlocked and voltage can be applied to the motor terminals.
Auto-tuning (tUn) requires an injection of current. The drive must therefore be in this state to perform this command.
The adjustment parameters can be modified even if a run command or a DC injection current is present. However, a configuration parameter can only be modified if the motor is stopped, and this returns the drive to the "Switch on disabled" state.

Quick stop active (Emergency stop active):

Fast stop
Restarting is only possible after the drive has changed to the "Switch on disabled" state.

Malfunction reaction active (Reaction on fault):

Transient state during which the drive performs an action appropriate to the type of fault detection.

Malfunction (Fault):

The drive is locked.

Summary

State	Power supplied to motor	Modification of configuration parameters
1 - Not ready to switch on	No	Yes
2 - Switch on disabled	No	Yes
3 - Ready to switch on	No	Yes
4 - Switched on	No	Yes, return to "2 - Switch on disabled" state
5 - Operation enabled	Yes, except at zero reference or "halt"	No
6 - Quick stop active	Yes, during fast stop	No
7 - Fault reaction active	Depends on fault management configuration	-
8 - Fault	No	Yes

ACOPOSinverter S44 state machine

Command word description CMD - 8501

bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
0 to 1 transition : Fault reset	Reserved (=0)	Reserved (=0)	0:Free wheel staying in "Operation Enabled"	Enable operation Drivecom state activation	Quick stop Drivecom state activation (bit active at 0)	Switch on disabled. Drivecom state activation (bit active at 0)	Switch on

bit 15	bit 14	bit 13	bit 12	bit 11	bit 10	bit 9	bit 8
Reserved	Not assignable	Reserved	Reserved	Direction of rotation asked 0: Forward 1: Reverse	Reserved (=0)	Reserved (=0)	0: RUN asked 1: STOP asked

Command	Transition address	Final state	bit 7	bit 3	bit 2	bit 1	bit 0	Example value
			Fault reset	Enable operation	Quick stop	Switch on disabled	Switch on	
Shutdown	2, 6, 8	3 - Ready to switch on	x	x	1	1	0	16#0006
Switch on	3	4 - Switched on	x	x	1	1	1	16#0007
Enable operation	4	5 - Operation enabled	x	1	1	1	1	16#000F
Disable operation	5	4 - Switched on	x	0	1	1	1	16#0007
Disable voltage	7, 9, 10, 12	2 - Switch on disabled	x	x	x	0	x	16#0000
Quick stop	11	6 - Quick stop active	x	x	0	1	x	16#0002
	7, 10	2 - Switch on disabled						
Fault reset	15	2 - Switch on disabled	0 to 1	x	x	x	x	16#0080

x: Value is of no significance for this command.
0 to 1: Command on rising edge.

ACOPOSinverter S44 state machine

Status word description ETA - 3201

bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
Reserved (always 0)	Switch on disabled	Quick stop (bit active at 0)	Powerstage is supplied (bit always on)	Malfunction, fault present	Operation enabled	Switched on	Ready to switch on

bit 15	bit 14	bit 13	bit 12	bit 11	bit 10	bit 9	bit 8
0: Motor rotation in forward direction (or stopped)	Stop via STOP key	Reserved (=0)	Reserved (=0)	Reference exceeded (< LSP or > HSP)	Reference reached (steady state)	Local mode (bit active at 0)	Reserved (=0)

Status	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0	ETA masked by 16#006F (1)
	Switched on disabled	Quick stop	Voltage enabled	Fault	Operation enabled	Switched on	Ready to switch on	
1 -Not ready to switch on	0	x	x	0	0	0	0	-
2 - Switch on disabled	1	x	x	0	0	0	0	16#0040
3 - Ready to switch on	0	1	x	0	0	0	1	16#0021
4 - Switched on	0	1	1	0	0	1	1	16#0023
5 - Operation enabled	0	1	1	0	1	1	1	16#0027
6 - Quick stop active	0	0	1	0	1	1	1	16#0007
7 - Fault reaction active	0	x	x	1	1	1	1	-
8 - Fault	0	x	x	1	0	0	0	16#0008 (2) or 16#0028

x: In this state, the value of the bit can be 0 or 1.

(1) This mask can be used by the PLC program to test the chart state.

(2) Fault following state "6 - Quick stop active".

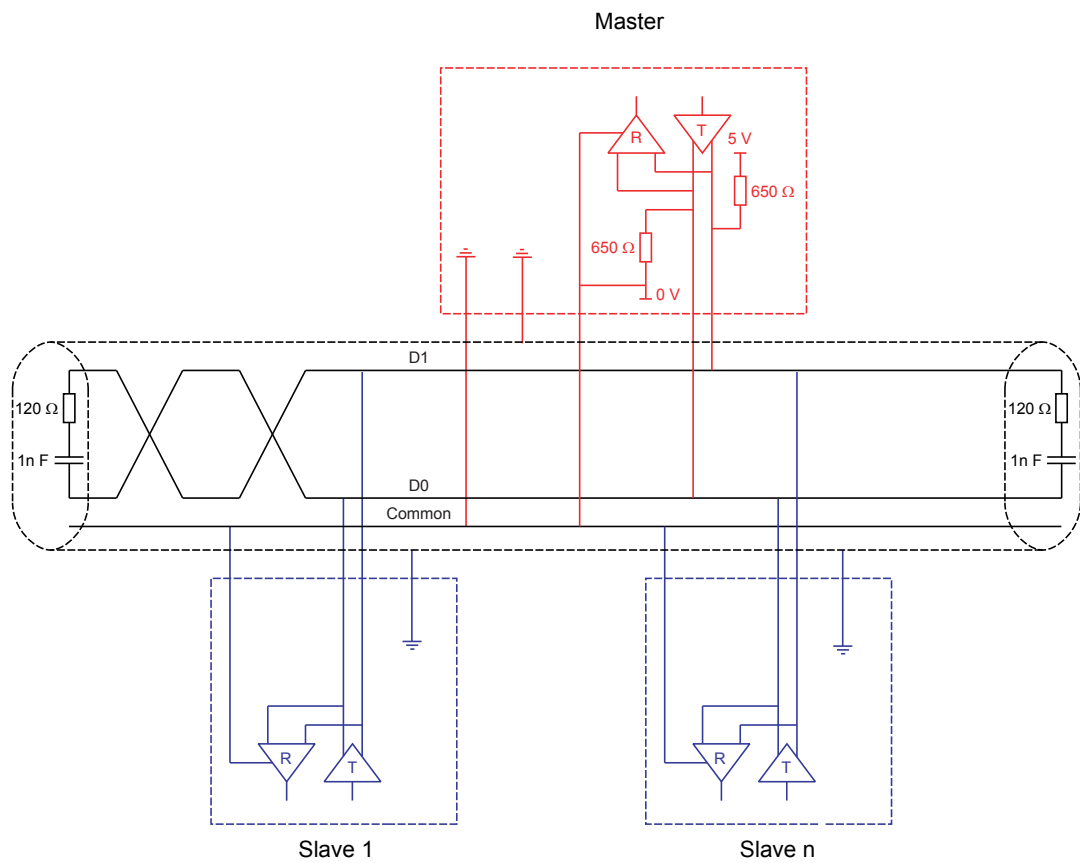
Connection to RS485 bus

Standard schematic

The standard schematic corresponds to the Modbus specification published on the Modbus.org site in 2002 (Modbus_over_serial_line_V1.pdf, Nov 2002) and in particular to the schematic of the 2-wire multidrop serial bus.

The ACOPOSinverter S44 drive follows this specification.

Schematic diagram:



Type of trunk cable	Shielded cable with 1 twisted pair and at least a 3 rd conductor
Maximum length of bus	1000 m at 19200 bps
Maximum number of stations (without repeater)	32 stations, ie. 31 slaves
Maximum length of tap links	<ul style="list-style-type: none">• 20 m for one tap link• 40 m divided by the number of tap links on a multiple junction box
Bus polarisation	<ul style="list-style-type: none">• One 390 to 650 Ω pulldown resistor at 5 V and Common This polarisation is recommended for the master.
Line terminator	One 120 Ω 0.25 W resistor in series with a 1 nF 10 V capacitor
Common polarity	Yes (Common), connected to the protective ground at one or more points on the bus

Recommended branch circuit protection

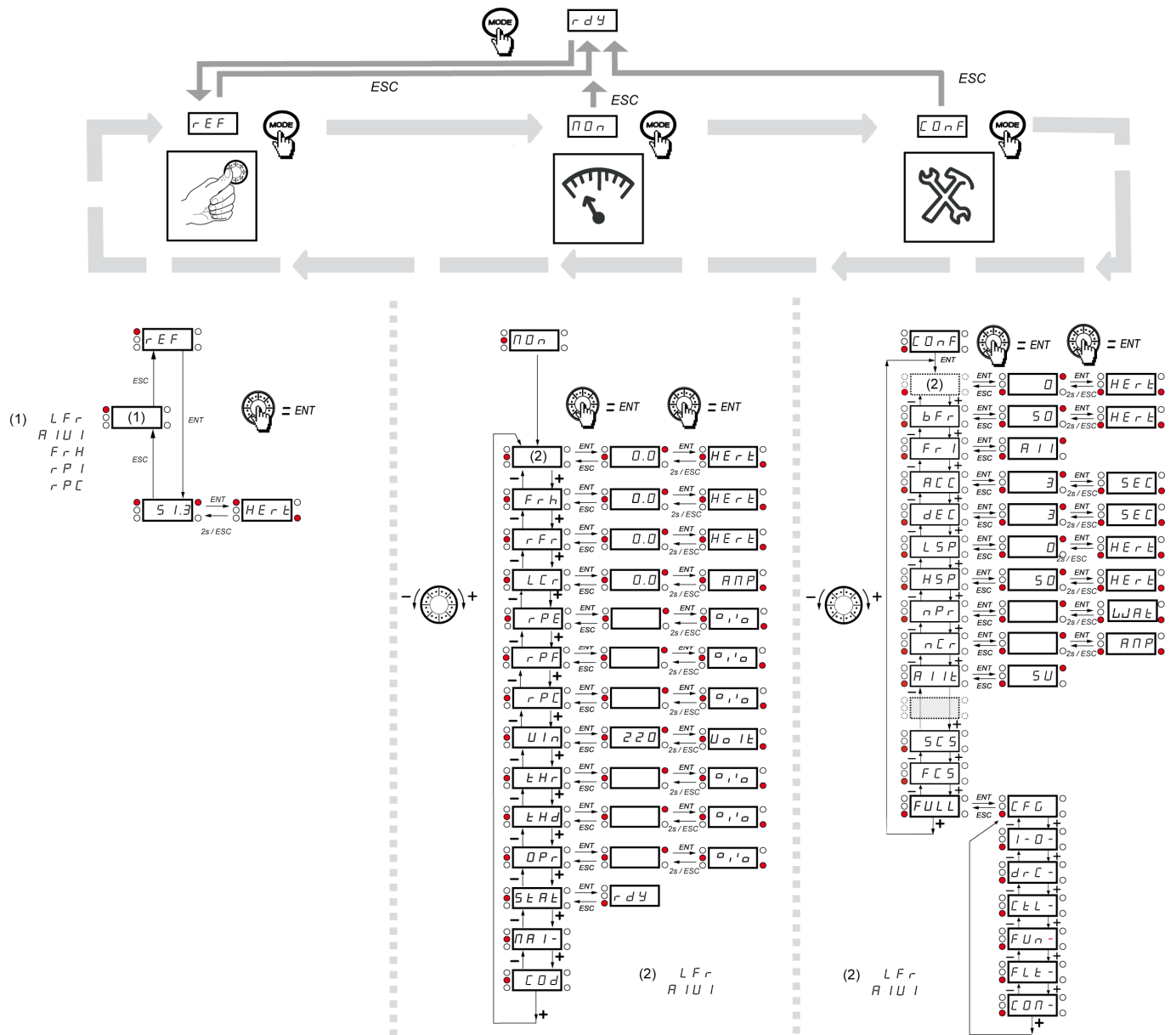
Model number	Voltage (Y)	Input withstand rating (1)	Output Interrupt rating (X) (2)	Branch circuit protection (Z1)	Rating (Z2)
	V	kA	kA		A
8I44S100018.000-1	100 - 120	1	5	Ferraz HSJ	15
8I44S100037.000-1	100 - 120	1	5	Ferraz HSJ	25
8I44S100075.000-1	100 - 120	1	5	Ferraz HSJ	40
8I44S200018.000-1	200 - 240	1	5	Fast Acting Class CC Ferraz ATDR	7
8I44S200037.000-1	200 - 240	1	5	Ferraz HSJ	15
8I44S200055.000-1	200 - 240	1	5	Ferraz HSJ	25
8I44S200075.000-1	200 - 240	1	5	Ferraz HSJ	25
8I44S200150.000-1	200 - 240	1	5	Ferraz HSJ	40
8I44S200220.000-1	200 - 240	1	5	Ferraz HSJ	45
8I44T200018.000-1	200 - 240	5	5	Fast Acting Class CC Ferraz ATDR	7
8I44T200037.000-1	200 - 240	5	5	Fast Acting Class CC Ferraz ATDR	7
8I44T200075.000-1	200 - 240	5	5	Ferraz HSJ	15
8I44T200150.000-1	200 - 240	5	5	Ferraz HSJ	25
8I44T200220.000-1	200 - 240	5	5	Ferraz HSJ	25
8I44T200300.000-1	200 - 240	5	5	Ferraz HSJ	40
8I44T200400.000-1	200 - 240	5	5	Ferraz HSJ	45

Suitable for use on a circuit capable of delivering not more than ___X___rms symmetrical kilo Amperes, ___Y___ Volts maximum, when protected by ___Z1___ with a maximum rating of ___Z 2___.

(1) Input withstand rating is that for which the product has been designed thermally. Installation on a supply greater than this level will require additional inductance to satisfy this level.

(2) Output interrupt rating relies on Integral solid state short circuit protection. This does not provide branch circuit protection. Branch circuit protection must be provided in accordance with the National Electrical Code and any additional local codes. This is dependant on the type of installation.

Organization tree



Parameter index

Code	Page	Name	Unit	Possible value / Function		Factory setting	User setting
<i>ACC2</i>	64 73	Acceleration 2	s	<i>0.0</i> to <i>999.9</i>	-	5 s	
<i>ACC</i>	44 63	Acceleration	s	<i>0.0</i> to <i>999.9</i>	-	3.0 s	
<i>ADC</i>	66	Automatic DC injection		<i>nO</i> <i>YES</i> <i>CE</i>	No Yes Continuous	YES	
<i>ADD</i>	96	Modbus address		<i>0FF</i> to <i>247</i>	-	Off	
<i>AI1E</i>	45 51	AI1 type	-	<i>5U</i> <i>10U</i> <i>0A</i>	Voltage Voltage Current	5V	
<i>AIU1</i>	36 38 44 61	Analog input virtual	%	<i>0</i> to <i>100</i>	-	-	
<i>AO1</i>	55	AO1 assignment		<i>nO</i> <i>OCr</i> <i>OFr</i> <i>OrP</i> <i>OPS</i> <i>OPF</i> <i>OPE</i> <i>OPr</i> <i>tHr</i> <i>tHd</i>	No Motor current Output frequency Ramp output PID reference PID feedback PID error Output power Motor thermal state Drive thermal state	nO	
<i>AO1E</i>	55	AO1 type		<i>10U</i> <i>0A</i> <i>4A</i>	Voltage Current Current	0A	
<i>APD</i>	75	Maximum frequency detection hysteresis	Hz	<i>0</i> to <i>HSP</i>	-	0 Hz	
<i>AR</i>	90	Automatic restart		<i>nO</i> <i>YES</i>	No Yes	nO	
<i>BFr</i>	44 56	Standard motor frequency	Hz	<i>50</i> <i>60</i>	-	50 Hz	
<i>brA</i>	64	Decel Ramp Adaptation assignment		<i>nO</i> <i>YES</i> <i>dy nA</i>	No Yes Motor braking	YES	
<i>C1SU</i>	40	Card 1 Software Version	-	-	-	-	-
<i>C2SU</i>	40	Card 2 Software Version	-	-	-	-	-
<i>Cd1</i>	62	Command channel 1		<i>tEr</i> <i>LOC</i> <i>LCC</i> <i>Ndb</i>	Terminals Local Remote display Modbus		
<i>CFG</i>	46	Macro-configuration	-	-	-	-	-
<i>CHCF</i>	61	Channel configuration		<i>SIN</i> <i>SEP</i>	Simultaneous mode Separate mode	SIM	
<i>CLI</i>	87	Current limitation	A	<i>0.25</i> to <i>1.5</i>	-	1.5 A	

Parameter index

Code	Page	Name	Unit	Possible value / Function		Factory setting	User setting
CL2	87	Current limitation 2	A	0.25 to 1.5	-	1.5 A	
COD	42	HMI Password	-	OFF On	Code disabled Code activated	OFF	
CON1	41	Modbus communication status	-	r0t0 r0t1 r1t0 r1t1	-	-	
COS	56	Rated motor cos phi	-	0.5 to 1	-	according to drive rating	
CrH1	51	AI1 current scaling parameter of 100%	mA	0 to 20	-	20 mA	
CrL1	51	AI1 current scaling parameter of 0%	mA	0 to 20	-	4 mA	
Ctd	54	Motor current threshold	In	0 to 1.5	-	InV	
Ctt	56	Motor control type	-	Std PERF PUMP	Standard Performance Pump	Std	
DCF	65	Ramp divider		1 to 10	-	4	
DE2	64	Deceleration 2	s	0.0 to 999.9	-	5 s	
DEC	44 63	Deceleration	s	0.0 to 999.9	-	3.0 s	
DP1	41	Last detected fault 1	-	see page 99		-	-
DP2	42	Last detected fault 2	-	see page 99		-	-
DP3	42	Last detected fault 3	-	see page 99		-	-
DP4	42	Last detected fault 4	-	see page 99		-	-
drn	95	Degraded line supply operation		nO YES	No Yes	nO	
EP1	41	State of drive at detected fault 1	-	-	-	-	-
EP2	42	State of drive at detected fault 2	-	-	-	-	-
EP3	42	State of drive at detected fault 3	-	-	-	-	-
EP4	42	State of drive at detected fault 4	-	-	-	-	-
FbS	71	PID feedback scale factor	PID	0.1 to 100.0	-	1.0	
FCS	45	Factory / recall customer parameter set	-	nO rEC In InI	No REC IN INI	nO	
FFd	78	Zero flow detection activation threshold	Hz			0 Hz	
FLG	57	Frequency loop gain	%	0 to 100	-	20%	
FLD	62	Forced local assignment		nO L1H L2H L3H L4H	Function inactive L1h: LI1 active high L2h: LI2 active high L3h: LI3 active high L4h: LI4 active high	nO	

Parameter index

Code	Page	Name	Unit	Possible value / Function		Factory setting	User setting
FLDC	62	Forced local reference		nO A I I L C C A I U I	No Terminal HMI Jog dial	nO	
FLr	91	Catch on the fly		nO Y E S	No Yes	nO	
FDn	77	Starting frequency of the auxiliary pump	Hz			0.1 Hz	
FDf	77	Auxiliary pump stopping frequency	Hz			0 Hz	
Fr I	44 61	Reference channel 1		A I I L C C n d b A I U I	Terminal HMI Modbus Jog dial	AI1	
Fr H	36	Speed reference		A I I L C C n d b A I U	Terminal HMI Modbus Jog dial		
Fr S	56	Rated motor frequency	Hz	10 to 400	-	50 or 60 Hz (to bFr)	
FSL	65	Fast stop assignment		nO L 1 L L 2 L L 3 L L 4 L	Function inactive L1L: LI1 active low L2L: LI2 active low L3L: LI3 active low L4L: LI4 active low	nO	
FLd	54	Motor frequency threshold	Hz	0 to 400	-	50 or 60 Hz	
FLH	41	Fan time display		0. 0 1 to 999	-	-	-
FLD	53 76	Time delay before automatic start for the overload fault	min			0 min	
FLU	54 77	Time delay before automatic start for the underload fault	min			0 min	
HSP	44 89	High speed	Hz	L 5 P to L F r	-	50 or 60 Hz	
HSP2	89	High speed 2	Hz	L 5 P to L F r	-	50 or 60 Hz according to BFr, max TFr	
HSP3	89	High speed 3	Hz	as HSP2	as HS2	as HSP2	
HSP4	89	High speed 4	Hz	as HSP2	as HS2	as HSP2	
HSU	40	Display of high speed value	-	-	-	-	-
LnH	94	Detected fault inhibition assignment		nO L 1 H L 2 H L 3 H L 4 H	Function inactive L1h: LI1 active high L2h: LI2 active high L3h: LI3 active high L4h: LI4 active high	nO	
IPL	93	Input Phase loss	-	nO Y E S	No Yes	YES	
ILh	93	Motor thermal current	A	0. 2 to 1. 5	-	according to drive rating	

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Code	Page	Name	Unit	Possible value / Function		Factory setting	User setting
JOG	67	Jog assignment		n0 L1H L2H L3H L4H	Function inactive L1h: LI1 active high L2h: LI2 active high L3h: LI3 active high L4h: LI4 active high	nO	
JPF	69	Skip frequency	Hz	0 to 400	-	0 Hz	
LC2	87	2 nd current limitation commutation		n0 L1H L2H L3H L4H L1L L2L L3L L4L	Function inactive L1h: LI1 active high L2h: LI2 active high L3h: LI3 active high L4h: LI4 active high L1L: LI1 active low L2L: LI2 active low L3L: LI3 active low L4L: LI4 active low	nO	
LCr	38	Motor current	A	-	-	-	-
LFd	78	Zero flow detection offset	Hz			0 Hz	
FFF	75	Fallback speed	Hz			0 Hz	
LFLL	94	4-20 mA loss behaviour		n0 YES	No Yes	nO	
LFr	38 44 61	External reference value	-	-400 to 400	-	0	
LISI	40	State of logic inputs LI1 to LI4	-	-	-	-	-
LOC	53 76	Application Overload threshold	% of NCR	70 to 150	-	90 %	
LOI	52	LO1 assignment		as r1	as r1	nO	
LOIS	52	LO1 status (output active level)		POS NEG	Positive Negative	POS	
LOSI	40	State of the logic output LO1 and relay R1	-	-	-	-	-
LPI	75	PI feedback supervision threshold				nO	
LSP	44 88	Low speed	Hz	0 to HSP	-	0 Hz	
LUL	54 76	Application Underload threshold	% of In	20 to 100	-	60 %	
ndE	77	Selecting the operating mode				nO	
nPr	59	Motor parameter choice	-	nPr COS	nPr COS	nPr	
nPI	75	Maximum frequency detection hysteresis				YES	
ntn	93	Motor thermal state memo	-	n0 YES	No Yes	nO	
nc1	97	Com scanner write address value 1					
nc2	97	Com scanner write address value 2					
nc3	97	Com scanner write address value 3					
nc4	97	Com scanner write address value 4					

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Code	Page	Name	Unit	Possible value / Function		Factory setting	User setting
n C A 1	96	Com scanner write address parameter 1				2135	
n C A 2	96	Com scanner write address parameter 2				219C	
n C A 3	96	Com scanner write address parameter 3				0	
n C A 4	96	Com scanner write address parameter 4					
n C r	45 56	Rated motor current	A (1)	0. 25 to 1. 5	-	according to drive rating	
n C U	40	Drive Power rating					
n F d	78	Zero flow detection period				nO	
n P 1	97	Com scanner read address value 1					
n P 2	97	Com scanner read address value 2					
n P 3	97	Com scanner read address value 3					
n P 4	97	Com scanner read address value 4					
n P A 1	96	Com scanner read address parameter 1	-			0C81	
n P A 2	96	Com scanner read address parameter 2	-			219C	
n P A 3	96	Com scanner read address parameter 3	-			0	
n P A 4	96	Com scanner read address parameter 4	-			0	
n P L	50	Logic inputs type	-	P O S N E G	Positive Negative	POS	
n P r	45 56	Rated Motor Power	kW or HP	-	-	according to drive rating	
n r d	58	Motor noise reduction		n O Y E S	No Yes	nO	
n S P	56	Rated motor speed	rpm	0 to 32767	-	according to drive rating	
n S t	65	Freewheel stop assignment		n O L 1 L L 2 L L 3 L L 4 L	Function inactive L1L: LI1 active low L2L: LI2 active low L3L: LI3 active low L4L: LI4 active low	nO	
O L L	93	Overload fault management	-	n O Y E S	No Yes	YES	
O P L	93	Output Phase loss	-	n O Y E S	No Yes	YES	
O P r	38	Output power	%	-	-	-	-

(1)In = nominal drive current

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Code	Page	Name	Unit	Possible value / Function		Factory setting	User setting
PRU	73	PID auto/manual assignment		n0 L1H L2H L3H L4H	Function inactive L1h: LI1 active high L2h: LI2 active high L3h: LI3 active high L4h: LI4 active high	nO	
PEt	41	Process elapsed time	0.01	-	-	-	-
PFL	58	Flux Profile	%	0 to 100		20%	
PIC	73	PID correction reverse	-	n0 YES	No Yes	nO	
PIF	71	PID feedback assignment		n0 A11	No Terminal	nO	
PII	71	Activation internal PID reference		n0 YES	No Yes	nO	
PIN	73	PID manual reference		n0 A11 A1U	No Terminal AIV	nO	
Pr2	71	2 preset PID assignment	-	n0 L1H L2H L3H L4H	Function inactive L1h: LI1 active high L2h: LI2 active high L3h: LI3 active high L4h: LI4 active high	nO	
Pr4	72	4 preset PID assignment		Pr2	as Pr2	nO	
PrP	72	PID reference ramp	s	0 to 99.9	-	0 s	
PS2	69	2 Preset speeds		n0 L1H L2H L3H L4H	Function inactive L1h: LI1 active high L2h: LI2 active high L3h: LI3 active high L4h: LI4 active high	nO	
PS4	69	4 Preset speeds		PS2	as PS2	nO	
PS8	69	8 Preset speeds		PS2	as PS2	nO	
PSt	61	Stop key priority		n0 YES	No Yes	YES	
PtH	41	Power On time display		0.01 to 999	-	-	-
r1	51	R1 assignment	-	n0 FLt rUn FtA FLA CtA SA tSA ULA OLA API	Not assigned No detected error Drive run Frequency threshold reached HSP reached I threshold reached Frequency reference reached Motor thermal reached Underload alarm Overload alarm AI1 AI. 4-20	FLt	
rdG	71	PID derivative gain		0.00 to 100.00	-	0.00	
rFr	38	Output frequency	Hz	-	-	-	
riG	71	PID integral gain		0.01 to 100	-	1	
rin	61	Reverse inhibition		n0 YES	No Yes	nO	

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Code	Page	Name	Unit	Possible value / Function		Factory setting	User setting
r D F	78	Ramp for auxiliary pump stopping	s			2 s	
r D n	77	Ramp for reaching the auxiliary pump nominal speed	s			2 s	
r P 2	72	2 preset PID reference	%	0 to 100	-	25%	
r P 3	72	3 preset PID reference	%	0 to 100	-	50%	
r P 4	72	4 preset PID reference	%	0 to 100	-	75%	
r P C	38	PID reference	-	-	-	-	-
r P E	38	PID error	-	-	-	-	-
r P F	38	PID Feedback	-	-	-	-	-
r P G	71	PID proportional gain		0. 0 1 to 100	-	1	
r P H	72	PID max value reference	% PID	0 to 100	-	100%	
r P I	72	Internal PID reference	% PID	0 to 100	-	0%	
r P L	72	PID min value reference	% PID	0 to 100	-	0%	
r P r	95	Reset power run		n 0 F E H	Function inactive Reset fan time display	nO	
r P S	63	Ramp switching commutation		n 0 L 1 H L 2 H L 3 H L 4 H L 1 L L 2 L L 3 L L 4 L	Function inactive L1h: LI1 active high L2h: LI2 active high L3h: LI3 active high L4h: LI4 active high L1L: LI1 active low L2L: LI2 active low L3L: LI3 active low L4L: LI4 active low	nO	
r P t	63	Ramp shape assignment		L 1 n S U	Linear S shape U shape	LIn	
r r S	65	Reverse direction	-	n 0 L 1 h L 2 H L 3 H L 4 H	Function inactive L1h: LI1 active high L2h: LI2 active high L3h: LI3 active high L4h: LI4 active high	nO	
r S F	90	Detected fault reset assignment	-	n 0 L 1 H L 2 H L 3 H L 4 H	Function inactive L1h: LI1 active high L2h: LI2 active high L3h: LI3 active high L4h: LI4 active high	nO	
r S L	74	PID wake up level	%	0 to 100	-	0%	
r t H I	41	Run elapsed time display	0.01h	0. 0 1 to 999	-	-	-
S C S	45	Store customer parameter set	-	n 0 S t r 1	No Yes	nO	
S d C I	66	Automatic DC injection current	A	0 to 1. 2		0.7 A	
S F r	58	Switching frequency	kHz	2 to 16	-	12	
S F S	72	PID predictive speed	-	n 0 to 400	-	nO	

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Code	Page	Name	Unit	Possible value / Function		Factory setting	User setting
S F t	58	Switching frequency type	-	H F 1 H F 2	HF1 HF2	HF1	
S H 2	89	2 HSP assignment	-	n 0 L 1 H L 2 H L 3 H L 4 H	Function inactive L1h: LI1 active high L2h: LI2 active high L3h: LI3 active high L4h: LI4 active high	nO	
S H 4	89	4 HSP assignment	-	as S H 2	as S H 2	nO	
S L E	74	Sleep Threshold Offset	Hz			1 Hz	
S L L	95	Modbus fault management		n 0 Y E S	No Yes	YES	
S L P	57	Slip compensation	% of nSL	0 to 150	-	100%	
S P 2	69	Preset speed 2	-	-	-	-	-
S P 3	69	Preset speed 3	-	-	-	-	-
S P 4	69	Preset speed 4	-	-	-	-	-
S P 5	69	Preset speed 5	Hz	0 to 400	-	25 Hz	
S P 6	69	Preset speed 6	Hz	0 to 400	-	30 Hz	
S P 7	69	Preset speed 7	Hz	0 to 400	-	35 Hz	
S P 8	69	Preset speed 8	Hz	0 to 400	-	40 Hz	
S P n	40	Specific Product Number	-	-	-	-	-
S t R	57	Frequency loop stability	%	0 to 100	-	20%	
S t R t	39	Product status	-	-	-	-	-
S t n	94	Undervoltage ramp deceleration time	s	0. 0 to 10. 0	-	1.0 s	
S t P	94	Undervoltage prevention	-	n 0 r n P	No Ramp stop	nO	
S t r t	94	IGBT test		n 0 Y E S	No Yes	nO	
S t t	65	Type of stop		r n P F S t n S t	Ramp stop Fast stop Freewheel	rMP	
t A r	90	Max. automatic restart time		5 10 30 1 H 2 H 3 H C t	5 min 10 min 30 min 1 h 2 h 3 h Infinite	5 min	
t b r	96	Modbus baud rate		4. 8 9. 6 19. 2 38. 4	4.8 kbps 9.6 kbps 19.2 kbps 38.4 kbps	19.2 kbps	
t C C	47	Type of control	-	2 C 3 C	2 wire control 3 wire control	2C	
t C t	50	2 wire type control	-	L E L t r n P F O	Level Transition Priority FW	trn	

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Code	Page	Name	Unit	Possible value / Function		Factory setting	User setting
t d C I	66	Automatic DC injection time	s	0. 1 to 30		0.5 s	
t F D	96	Modbus format	-	8 0 1 8 E 1 8 n 1 8 n 2	8o1 8E1 8n1 8n2	8E1	
t F r	56	Maximum frequency	Hz	10 to 400		60 or 72 Hz (to bFr)	
t H d	38	Drive thermal state	-	-	-	-	-
t H r	38	Motor thermal state	%	-	-	-	-
t H t	93	Motor protection type	-	A C L F C L	Self-ventilated Moto-ventilated	ACL	
t L S	73 88	Low speed operating time	s	0. 1 to 999. 9	-	nO	
t O F	78	Time delay before the auxiliary pump stop command	s			2 s	
t O L	53 76	Application Overload time delay	s	0 to 100	-	5 s	
t O n	77	Time delay before starting the auxiliary pump	s			2 s	
t P I	75	PI feedback supervision function time delay	s			0 s	
t t d	54	Motor thermal state threshold	% of tHr	0 to 118		100%	
t t O	96	Modbus time out	-	0. 1 to 30	-	10	
t U n	59	Auto-tuning	-	n O y E S d O n E	No Yes Done	nO	
U F r	57	IR compensation (law U/F)	%	25 to 200	-	100%	
U L n	38	Main voltage	V	-	-	-	-
U L t	54 76	Application underload time delay	s	0 to 100	-	5 s	
U n S	56	Rated motor voltage	V	100 to 480	-	230 V	
U P P	74	Wake-up threshold	%	0 to 100	-	0	
U S b	94	Undervoltage fault management	-	0 1	Detected fault + R1 open Detected fault + R1 closed	0	
U C A L	40	Drive voltage rating	-	-	-	-	-