LEROY SOMER ®

selected
indicator
1.50
1 to 8
0
9
1.49

- r d y
M

Keypad contr
mode referen

1
2
3
4
5
6
7
8

>1 an
1.15 =

CE

*This manual is to be given to
the end user*

Drive
active
10.02
IN
IN
IN
P

A
IN

Reference
enabled indicator
1.11
OR
IN
OUT
IN

H

Brake apply
frequency
12.45
+
-

Bra

Speed
feedback
3.02

12.46
Pre-brake
release delay

PROXIDRIVE

IP66 variable speed drive

Advanced user guide

PROXIDRIVE
IP66 variable speed drive

NOTE

LEROY-SOMER reserves the right to modify the characteristics of its products at any time in order to incorporate the latest technological developments. The information contained in this document may therefore be changed without notice.

⚠ CAUTION

For the user's own safety, this variable speed drive must be connected to an approved earth (⏚ terminal).

If accidentally starting the installation is likely to cause a risk to personnel or the machines being driven, it is essential to supply the equipment via a circuit-breaking device (power contactor) which can be controlled via an external safety system (emergency stop, detection of errors on the installation).

The variable speed drive is fitted with safety devices which, in the event of a fault, control stopping and thus stop the motor. The motor itself can become jammed for mechanical reasons. Voltage fluctuations, and in particular power cuts, may also cause the motor to stop.

The removal of the causes of the shutdown can lead to restarting, which may be dangerous for certain machines or installations. In such cases, it is essential that the user takes appropriate precautions against the motor restarting after an unscheduled stop.

The variable speed drive is designed to be able to supply a motor and the driven machine above its rated speed.
If the motor or the machine are not mechanically designed to withstand such speeds, the user may be exposed to serious danger resulting from their mechanical deterioration.
It is important that the user checks that the installation can withstand it, before programming a high speed.

The variable speed drive which is the subject of this manual is designed to be integrated in an installation or an electrical machine, and can under no circumstances be considered to be a safety device. It is therefore the responsibility of the machine manufacturer, the designer of the installation or the user to take all necessary precautions to ensure that the system complies with current standards, and to provide any devices required to ensure the safety of equipment and personnel.

Using the drive for hoisting: when using this application, it is essential to follow the special instructions in an application-specific manual which is available on request. It is the responsibility of the user to obtain this manual from his usual LEROY-SOMER contact.

LEROY-SOMER declines all responsibility in the event of the above recommendations not being observed.

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Manual corresponding to software versions higher than or equal to 2.10

PROXIDRIVE
IP66 variable speed drive

SAFETY AND OPERATING INSTRUCTIONS FOR VARIABLE SPEED DRIVES
(In accordance with the low voltage directive 73/23/EEC modified by 93/68/EEC)

⚠ • **Throughout the manual, this symbol warns of consequences which may arise from inappropriate use of the drive, since electrical risks may lead to material or physical damage as well as constituting a fire hazard.**

1 - General
Depending on their degree of protection, the variable speed drives may contain unprotected live parts, which may be moving or rotating, as well as hot surfaces, during operation.
Unjustified removal of protection devices, incorrect use, faulty installation or inappropriate operation could represent a serious risk to personnel and equipment.
For further information, consult the manual.
All work relating to transportation, installation, commissioning and maintenance must be performed by experienced, qualified personnel (see IEC 364 or CENELEC HD 384, or DIN VDE 0100 and national specifications for installation and accident prevention).
In these basic safety instructions, qualified personnel means persons competent to install, mount, commission and operate the product and possessing the relevant qualifications.

2 - Use
Variable speed drives are components designed for integration in installations or electrical machines.
When integrated in a machine, commissioning must not take place until it has been verified that the machine conforms with directive 89/392/EEC (Machinery Directive). It is also necessary to comply with standard EN 60204, which stipulates in particular that electrical actuators (which include variable speed drives) cannot be considered as circuit-breaking devices and certainly not as isolating switches.
Commissioning can take place only if the requirements of the Electromagnetic Compatibility Directive (89/336/EEC, modified by 92/31/EEC) are met.
The variable speed drives meet the requirements of the Low Voltage Directive 73/23/EEC, modified by 93/68/EEC. The harmonised standards of the DIN VDE 0160 series in connection with standard VDE 0660, part 500 and EN 60146/VDE 0558 are also applicable.
The technical characteristics and instructions concerning the connection conditions specified on the nameplate and in the documentation provided must be observed without fail.

3 - Transportation, storage
All instructions concerning transportation, storage and correct handling must be observed.
The climatic conditions specified in the technical manual must be observed.

4 - Installation
The installation and cooling of equipment must comply with the specifications in the manual supplied with the product.
The variable speed drives must be protected against any excessive stress. In particular, there must be no damage to parts and/or modification of the clearance between components during transportation and handling. Avoid touching the electronic components and contact parts.
The variable speed drives contain parts which are sensitive to electrostatic stresses and may be easily damaged if handled incorrectly. Electrical components must not be exposed to mechanical damage or destruction (risks to health!).

5 - Electrical connection
When work is performed on variable speed drives which are powered up, the national accident prevention regulations must be respected.
The electrical installation must comply with the relevant specifications (for example conductor cross-sections, protection via fused circuit-breaker, connection of protective conductor). More detailed information is given in the manual.
Instructions for an installation which meets the requirements for electromagnetic compatibility, such as screening, earthing, presence of filters and correct insertion of cables and conductors, are given in the documentation supplied with the variable speed drives. These instructions must be followed in all cases, even if the variable speed drive carries the CE mark. Adherence to the limits given in the EMC legislation is the responsibility of the manufacturer of the installation or the machine.

6 - Operation
Installations in which variable speed drives are to be integrated must be fitted with additional protection and monitoring devices as laid down in the current relevant safety regulations, such as the law on technical equipment, accident prevention regulations, etc. Modifications to the variable speed drives using control software are permitted.
Active parts of the device and the live power connections must not be touched immediately after the variable speed drive is powered down, as the capacitors may still be charged. In view of this, the warnings fixed to the variable speed drives must be observed.
During operation, all doors and protective covers must be kept closed.

7 - Servicing and maintenance
Refer to the manufacturer's documentation.

This manual is to be given to the end user.

PROXIDRIVE
IP66 variable speed drive

FOREWORD

CAUTION

- **This manual complements installation and maintenance manual ref. 3739.**
- **Before setting the drive parameters, all instructions relating to installation, connection and commissioning of the drive contained in document ref. 3739 must have been followed to the letter.**

MENU ORGANISATION
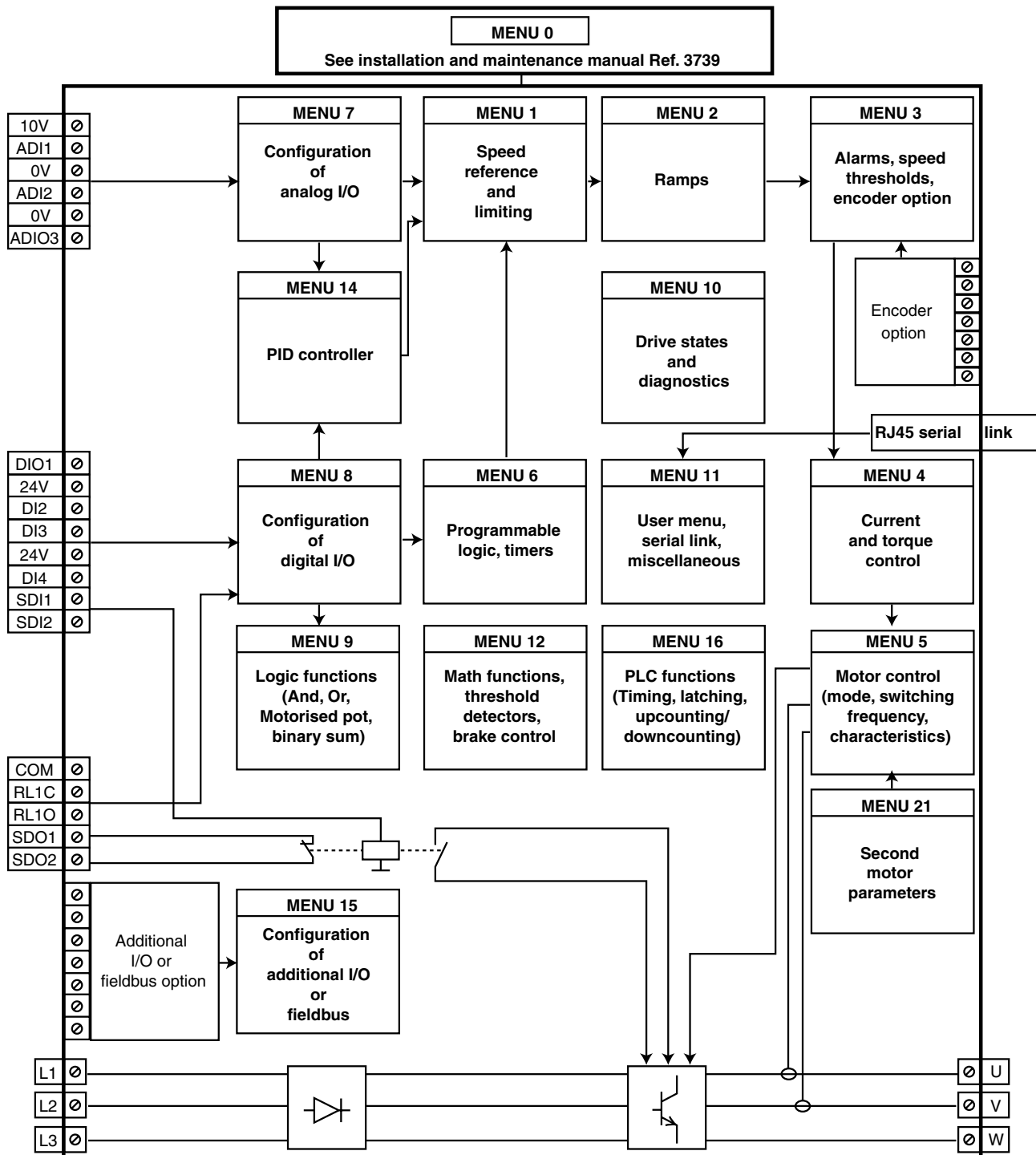
PROXIDRIVE
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Explanations of the symbols used in this document.

1.06   : A shadowed number in bold refers to a parameter.

ADI1 : Refers to a drive input or output terminal.

1.21   : Parameters which appear in a rectangle or identified R-W are parameters with Read and Write access.
They can be designated as an assignment destination for connection to:
- digital inputs for bit parameters
- analog inputs for non-bit parameters
- internal function outputs (threshold detectors, logical or arithmetical operations, etc).
Parameters identified R-W/P cannot be assigned.
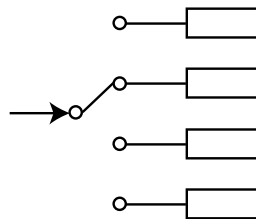
1.01   : Parameters which appear in a diamond or identified RO/P are parameters with Read Only access which are write-protected. They are used to provide information concerning operation of the drive and can be designated as an assignment source for connection to:
- digital outputs for bit parameters
- analog outputs for non-bit parameters
- internal function inputs (threshold detectors, logical or arithmetical operations, etc).
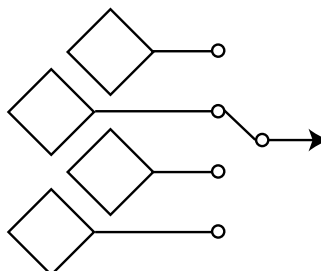
1.36   : Parameters which appear in a hexagon or identified R-A are parameters which can only be assigned to:
- digital inputs for bit parameters
- analog inputs for non-bit parameters.
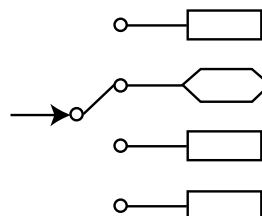
◧   : Indicates a parameter used when the drive is configured in open loop Flux Vector Control mode or U/F.
◨   : Indicates a parameter used when the drive is configured in closed loop Flux Vector Control mode.

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• **Effective parameter adresses of menu 0 in factory setting**

Menu 0	Name	Address
01	Minimum reference clamp	1.07
02	Maximum reference clamp	1.06
03	Acceleration rate	2.11
04	Deceleration rate	2.21
05	Preset configuration select	11.46

Menu 0	Name	Address
06	Motor rated current	5.07
07	Motor rated speed	5.08
08	Motor rated voltage	5.09
09	Rated power factor (cos φ)	5.10
10	Parameter-setting level	11.44

Menu 0	Configuration 0 (05 = A1.A2)		Configuration 1 (05 = A1.Pr)		Configuration 2 (05 = A2.Pr)	
	Name	Address	Name	Address	Name	Address
11	ADI1 mode	7.06	ADI1 mode	7.06	ADI1 mode	7.06
12	ADI2 mode	7.11	Preset reference 2 (PR2)	1.22	Preset reference 2 (PR2)	1.22
13	Not used		Preset reference 3 (PR3)	1.23	Preset reference 3 (PR3)	1.23
14	Not used		Preset reference 4(PR4)	1.24	Preset reference 4 (PR4)	1.24
15 à 24	Not used					

Menu 0	Configuration 3 (05 = 4Pr)		Configuration 4 (05 = 8Pr)		Configuration 5 (05 = E.Pot)	
	Name	Address	Name	Address	Name	Address
11	Preset reference 1 (PR1)	1.21	Preset reference 1 (PR1)	1.21	ADI1 mode	7.06
12	Preset reference 2 (PR2)	1.22	Preset reference 2 (PR2)	1.22	Motorised pot reset	9.28
13	Preset reference 3 (PR3)	1.23	Preset reference 3 (PR3)	1.23	Motorised pot mode	9.21
14	Preset reference 4 (PR4)	1.24	Preset reference 4 (PR4)	1.24	Motorised pot bipolar select	9.22
15	Not used		Preset reference 5 (PR5)	1.25	Motorised pot rate	9.23
16	Not used		Preset reference 6 (PR6)	1.26	Motorised pot scale factor	9.24
17	Not used		Preset reference 7 (PR7)	1.27	Motorised pot output	9.03
18	Not used		Preset reference 8 (PR8)	1.28	Not used	
19 à 24	Not used					

Menu 0	Configuration 6 (05 = Torq)		Configuration 7 (05 = PID)		Configuration 10 (05 = HoiS)	
	Name	Address	Name	Address	Name	Address
11	ADI1 mode	7.06	ADI1 mode	7.06	Not used	
12	ADI2 mode	7.11	ADI2 mode	7.11	Preset reference 2 (PR2)	1.22
13	Not used		PID proportional gain	14.10		
14	Not used		PID integral gain	14.11		
15	Not used		PID derivative gain	14.12		
16	Not used		PID upper limit	14.13		
17	Not used		PID lower limit	14.14		
18	Not used		PID output scaling	14.15	Not used	
19	ADI2 input scaling	7.12	ADI2 input scaling	7.12		
20	Not used		ADIO3 input scaling	7.16		
21	Not used		PID reference	14.20		
22	Not used		PID feedback	14.21		
23	Not used		PID main reference	14.19		
24	Not used		PID output	14.01		

Menu 0	Configuration 11 (05 = Pad)		Configuration 12 (05 = HuAC)	
	Name	Address	Name	Address
11	Power-up keypad control mode reference	1.51	Not used	
12	Reference on power-up (PR1)	1.21	ADI2 mode	7.11
13	Enable the local control FWD key	6.11	Not used	
14	Enable the local control Stop key	6.12	Not used	
15	Enable the keypad REV key	6.13	Not used	
16 à 24	Not used			

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Menu 0	Libellé	Address
25	User drive mode	11.31

Menu 0	Open loop (25 = 11.31 = 0 or 1)				Closed loop (25 = 11.31 = 2) or Servo (25 = 11.31 = 3)	
	Name	**Address**	**Name**	**Address**	**Name**	**Address**
26	Open loop mode			5.14	Drive encoder type	3.38
	Vectoriel (26 = 5.14 ≠ 2)		**U/F (26 = 5.14 = 2)**			
27	Not used		Not used		Drive encoder lines/rev	3.34
28	Not used		Not used		Drive encoder filter	3.42
29	Not used		Boost	5.15	Speed controller proportional gain Kp1	3.10
30	Not used		Dynamic V to F	5.13	Speed controller integral gain Ki1	3.11
31	Currrent controller Kp proportional gain	4.13	Not used		Current controller proportional gain	4.13
32	Current controller Ki integral gain	4.14	Not used		Current controller integral gain	4.14
33	Not used				Ramp by-pass	2.02
34 et 35	Not used					

Menu 0	Name	Address
36	Brake controller enable	12.41
37	Upper current threshold	12.42
38	Lower current threshold	12.43
39	Brake release frequency	12.44
40	Brake apply frequency / speed	12.45
41	Pre-brake release delay / brake apply speed relay	12.46
42	Post-brake release time	12.47
43	Brake apply delay	12.48
44	Enable position controller during brake release	12.49
45	Not used	
46	Start/Stop logic select	6.04
47	Drive enable mode select	8.10
48	ADIO3 mode	7.15
49	ADIO3 control	7.33
50	DIO1 control	8.41
51	Jog reference	1.05
52	Bipolar reference enable	1.10
53	Skip reference (critical speed)	1.29
54	Skip reference band	1.30
55	Ramp mode select	2.04
56	S ramp enable	2.06
57	Stop mode	6.01

Menu 0	Name	Address
58	Main loss mode	6.03
59	Catch a spinning motor	6.09
60	Switching frequency	5.18
61	Motor rated frequency	5.06
62	Number of motor poles	5.11
63	Autotune	5.12
64	Parameter cloning	11.42
65	Load default	11.43
66	User security code	11.30
67	Unit displayed at power-up	11.22
68	Selection of load display	4.21
69	Unit for displaying the speed	5.34
70	Customer unit	11.21
71	Last trip	10.20
72	Penultimate trip	10.21
73	ADI1 level	7.01
74	ADI2 level	7.02
75	ADIO3 level	7.03
76	Pre-offset reference	1.60
77	Pre-ramp reference	1.03
78	Current magnitude	4.01
79	Motor rpm	5.04
80	DC bus voltage	5.05

Notes

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PROXIDRIVE
IP66 variable speed drive
MENU 1: SPEED REFERENCE: SELECTION, LIMITING AND FILTERS

1 - MENU 1: SPEED REFERENCE: Selection, limiting and filters

1.1 - List of parameters in Menu 1

Parameter	Name	Type	Adjustment range	Factory setting	User setting
1.01	Frequency/speed reference selected	RO/P	± 1.06	-	-
1.02	Pre-skip filter reference	RO/P	± 1.06 or 1.07 to 1.06	-	-
1.03	Pre-ramp reference	RO/P	± 1.06 or 1.07 to 1.06	-	-
1.04	Reference offset	R-W	± 1.06	0	
1.05	Jog reference	R-W	0 to 16000 rpm	45 rpm	
1.06	Maximum reference clamp	R-W	0 to 32000 rpm	Eur: 1500 rpm / USA: 1800 rpm	
1.07	Minimum reference clamp	R-W	0 to 1.06	0	
1.08	Not used				
1.09	Reference offset select	R-W	0 or 1	0	
1.10	Bipolar reference enable	R-W	0 or 1	0	
1.11	Reference enabled indicator	RO/P	0 or 1	-	-
1.12	Reverse selected indicator	RO/P	0 or 1	-	-
1.13	Jog selected indicator	RO/P	0 or 1	-	-
1.14	Reference selector	R-W	0 to 4	0	
1.15	Preset selector	R-W	0 to 9	0	
1.16	Preset reference selector timer	R-W	0 to 9999 s	0	
1.17	Keypad control mode reference	R-W	± 1.06	-	-
1.18 to 1.20	Not used				
1.21 to 1.28	Preset reference 1 to Preset reference 8	R-W	± 1.06	0	
1.29	Skip reference 1	R-W	0 to 32000 rpm	0	
1.30	Skip reference band 1	R-W	0 to 300 rpm	15 rpm	
1.31	Skip reference 2	R-W	0 to 32000 rpm	0	
1.32	Skip reference band 2	R-W	0 to 300 rpm	15 rpm	
1.33 and 1.34	Not used				
1.35	Reference in rejection zone	RO/P	0 or 1	-	-
1.36	Analog reference 1	R-A	1.07 to 1.06 (1.10 = 0) / ± 1.06 (1.10 = 1)	-	-
1.37	Analog reference 2	R-A	1.07 to 1.06 (1.10 = 0) / ± 1.06 (1.10 = 1)	-	-
1.38	Percentage trim	R-W	± 100.0%	-	
1.39 and 1.40	Not used				
1.41 and 1.42	Reference select	R-A	0 or 1	-	-
1.43 and 1.44	Not used				
1.45 to 1.47	Preset reference select	R-A	0 or 1	-	-
1.48	Reference timer reset flag	R-W	0 or 1	0	-

PROXIDRIVE
IP66 variable speed drive
MENU 1: SPEED REFERENCE: SELECTION, LIMITING AND FILTERS

Parameter	Name	Type	Adjustment range	Factory setting	User setting
1.49	Reference selected indicator	RO/P	1 to 4	-	-
1.50	Preset reference selected indicator	RO/P	1 to 8	-	-
1.51	Power-up keypad control mode reference	R-W	0 to 2	0	
1.52 to 1.59	Not used				
1.60	Pre-offset reference	RO	± 1.06	-	-
1.61 to 1.68	Not used				
1.69	Number of scanned references	R-W	1 to 8	8	-
1.70	Scan time selection	R-W	0 or 1	0	-
1.71	RP1 --> RP2 time	R-W	0 to 9999 s	0	-
1.72	RP2 --> RP3 time	R-W	0 to 9999 s	0	-
1.73	RP3 --> RP4 time	R-W	0 to 9999 s	0	-
1.74	RP4 --> RP5 time	R-W	0 to 9999 s	0	-
1.75	RP5 --> RP6 time	R-W	0 to 9999 s	0	-
1.76	RP6 --> RP7 time	R-W	0 to 9999 s	0	-
1.77	RP7 --> RP8 time	R-W	0 to 9999 s	0	-
1.78	Feedback time	R-W	0 to 9999 s	0	-

PROXIDRIVE
IP66 variable speed drive
MENU 1: SPEED REFERENCE: SELECTION, LIMITING AND FILTERS

Notes

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IP66 variable speed drive
MENU 1: SPEED REFERENCE: SELECTION, LIMITING AND FILTERS

1.2 - Menu 1 diagrams

1.2.1 - Selection of reference (speed)

Scan timer parameter settings

1.16	Preset reference selector timer		1.73	RP3 --> RP4 time
1.48	Reference timer reset flag		1.74	RP4 --> RP5 time
1.69	Number of scanned references		1.75	RP5 --> RP6 time
1.70	Scan time selection		1.76	RP6 --> RP7 time
1.71	RP1 --> RP2 time		1.77	RP7 --> RP8 time
1.72	RP2 --> RP3 time		1.78	Feedback time

PROXIDRIVE
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MENU 1: SPEED REFERENCE: SELECTION, LIMITING AND FILTERS

1.2.2 - Limiting and filters
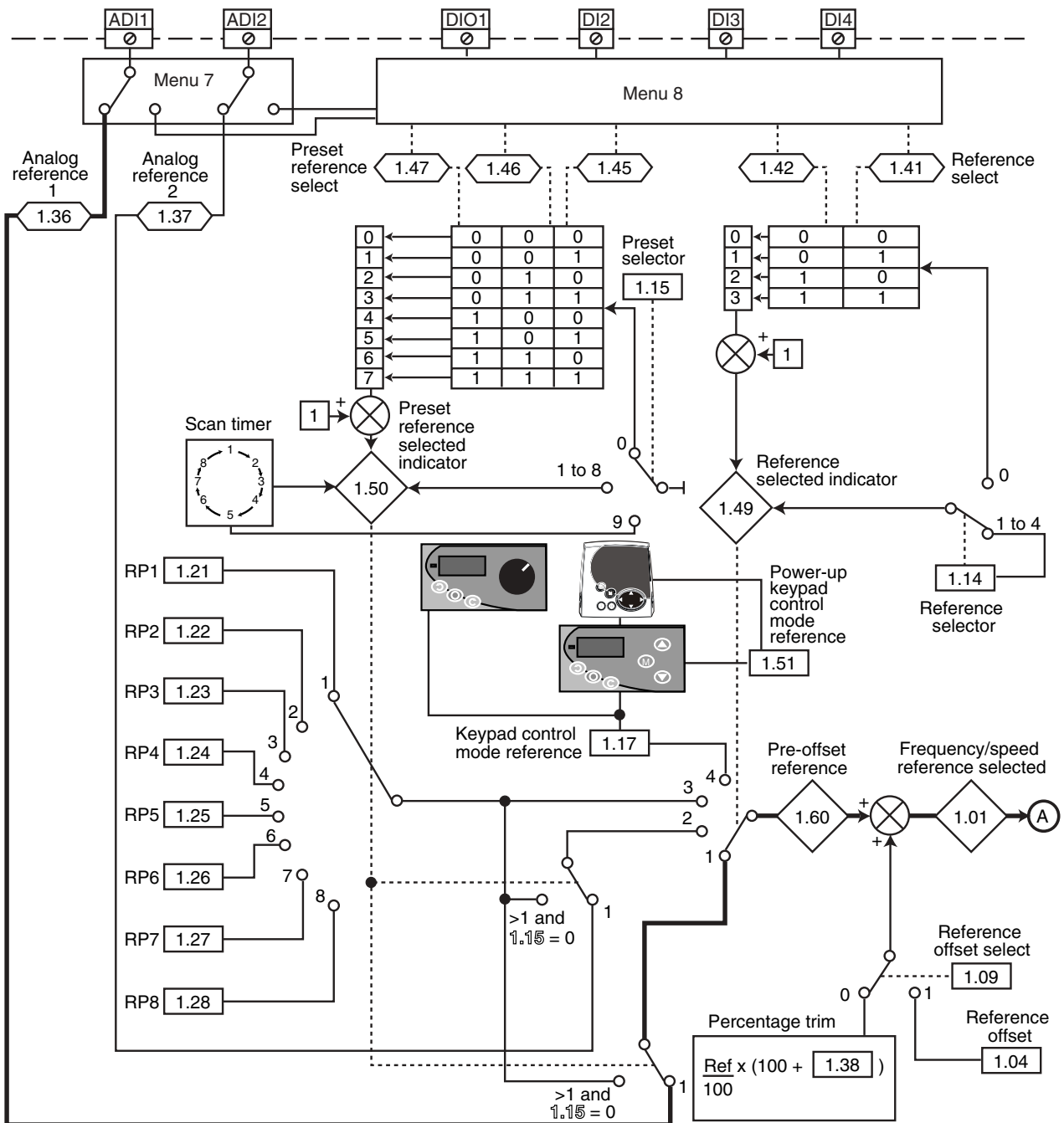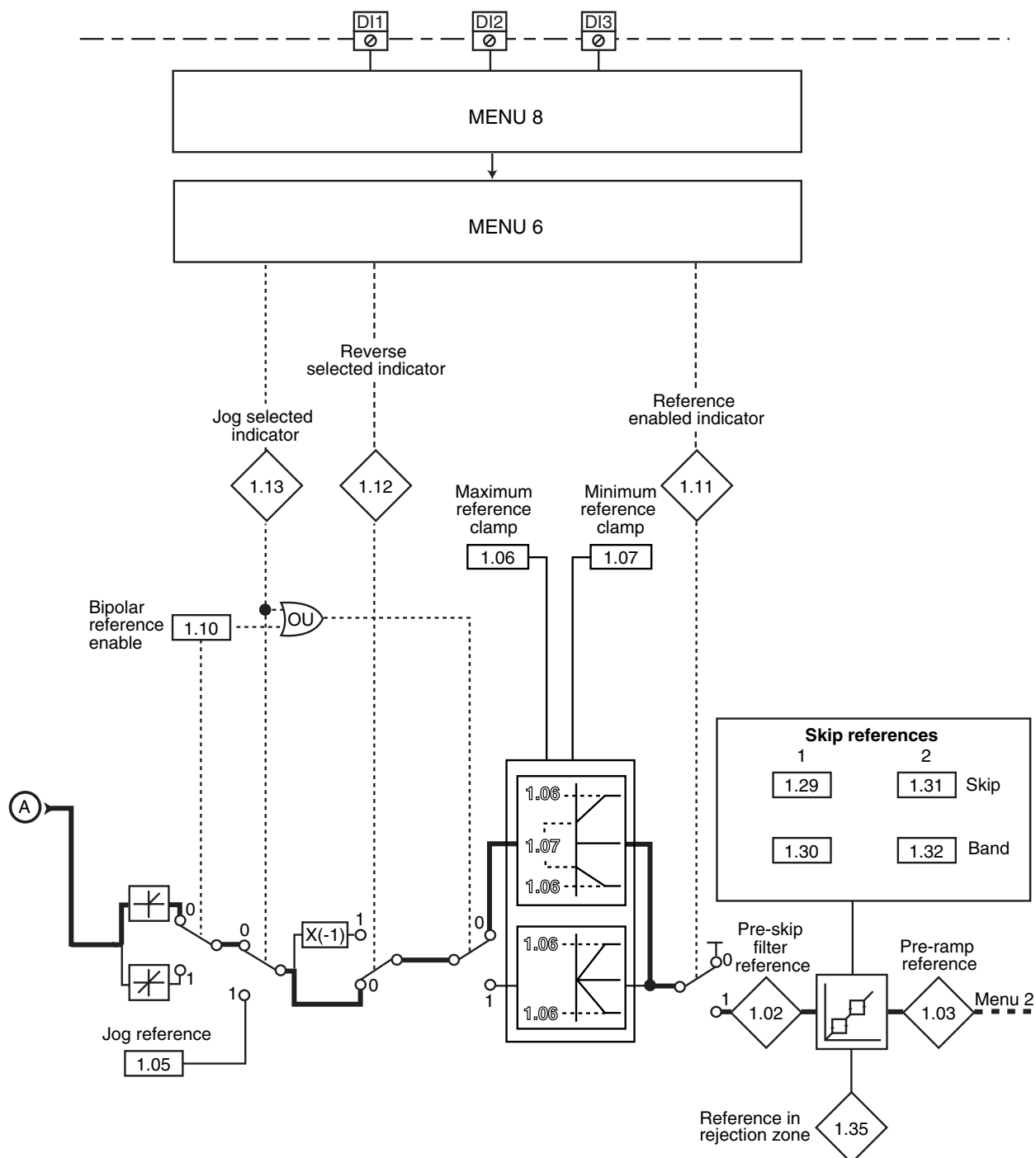
PROXIDRIVE
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MENU 1: SPEED REFERENCE: SELECTION, LIMITING AND FILTERS

1.3 - Explanation of parameters in menu 1

◇ 1.01 :Frequency/speed reference selected

Adjustment range : ± 1.06
Indicates the reference value.

◇ 1.02 :Pre-skip filter reference

Adjustment range : ± 1.06 or 1.07 to 1.06
Reference after limiting but before the skips.

◇ 1.03 :Pre-ramp reference

Adjustment range : ± 1.06 or 1.07 to 1.06
Indicates the reference after the skips but before the acceleration or deceleration ramps.

▭ 1.04 :Reference offset
Adjustment range : ± 1.06
Factory setting   : 0
This reference is added to (positive value) or subtracted from (negative value) the reference selected if 1.09 equals 1 (OFFS). It can be used to correct the selected main reference to obtain an accurate setting.

▭ 1.05 :Jog reference
Adjustment range : 0 to 16000 rpm
Factory setting   : 45 rpm
Operating speed when the jog input has been selected.

▭ 1.06 :Maximum reference clamp
Adjustment range : 0 to 32000 rpm
Factory setting   : **Eur = 1500 rpm**
              USA = 1800 rpm

⚠ **• Before setting the maximum reference clamp, check that the motor and the driven machine can withstand it.**
Defines maximum speed in both directions of rotation.

▭ 1.07 :Minimum reference clamp
Adjustment range : 0 to 1.06
Factory setting   : 0
In unipolar mode, defines the minimum speed.
CAUTION:
• This parameter is inactive during jog operation.
• If the value of 1.06 is lower than that of 1.07, the value of 1.07 is automatically changed to the new value of 1.06.

▭ 1.08 :Not used

▭ 1.09 :Reference offset select
Adjustment range : 0 or 1
Factory setting   : 0
0 (ProP): A value proportional to this reference is added to the main reference. The percentage is adjusted by parameter 1.38.
1 (OFFS): A fixed value set in 1.04 is added to the main reference.

▭ 1.10 :Bipolar reference enable
Adjustment range : 0 or 1
Factory setting   : 0
0 (PoS): All negative references are treated as zero.
1 (nEg): Used for changing the direction of rotation by the reference polarity. May come from the preset references.
Note : Without PX-I/O option, the inputs are unipolar.

◇ 1.11 :Reference enabled indicator

Adjustment range : 0 or 1
Used to control enabling of the run command.
0 (StoP): Stop.
1 (run): Run.

◇ 1.12 :Reverse selected indicator

Adjustment range : 0 or 1
Used to control enabling of the direction of rotation.
0 (Fd): Forward.
1 (rS): Reverse.

◇ 1.13 :Jog selected indicator

Adjustment range : 0 or 1
Used to control enabling of the jog command.
0 (OFF): Jog operation not enabled.
1 (Jog): Jog operation enabled.

▭ 1.14 :Reference selector
Adjustment range : 0 to 4
Factory setting   : 4
0 (SEL): The speed reference is selected by combining the digital inputs assigned to parameters 1.41 and 1.42.
1 (Ana1): The speed reference comes from analog input 1.
2 (Ana2): The speed reference comes from analog input 2.
3 (Pr): The speed reference comes from the preset references.
4 (Pad): The speed reference comes from the local control or the LCD console.
If the reference comes from the local control or the LCD console, the Run/Stop commands also come from the local control or the LCD console. In this case, the sequencing bits 6.30 to 6.34 are disabled.

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MENU 1: SPEED REFERENCE: SELECTION, LIMITING AND FILTERS

1.15 **:Preset selector**
Adjustment range : 0 to 9
Factory setting : 0
This parameter is used to select the preset references. It works as follows:
0 (Sel): Is used to select the reference by combining the digital inputs assigned to parameters 1.45 to 1.47.
1 (Pr1): Preset reference 1.
2 (Pr2): Preset reference 2.
3 (Pr3): Preset reference 3.
4 (Pr4): Preset reference 4.
5 (Pr5): Preset reference 5.
6 (Pr6): Preset reference 6.
7 (Pr7): Preset reference 7.
8 (Pr8): Preset reference 8.
9 (Cycl): The reference is selected automatically by a scan timer.

1.16 **:Preset reference selector timer**
Adjustment range : 0 to 9999 s
Factory setting : 0
When 1.15 = 9 (cycl), is used to set the time between each reference where the scan time is identical between each preset reference (1.70 is set to 0).

1.17 **:Keypad control mode reference**
Adjustment range : ± 1.06
Indicates the reference value coming from the local control or the LCD console.

1.18 to **1.20** : **Not used**

1.21 to **1.28** : **Preset references 1 to 8**
Adjustment range : ± 1.06
Factory setting : 0
In order, 1.21 to 1.28 are used to define preset references RP1 to RP8.

1.29 and **1.31** :**Skip references 1 and 2**
Adjustment range : 0 to 32000 rpm
Factory setting : 0
Two skips are available to avoid a machine running at critical speeds. When one of these parameters is at 0, the function is deactivated.

1.30 and **1.32** :**Skip reference bands 1 and 2**
Adjustment range : 0 to 300 rpm
Factory setting : 15 rpm
Define the skip band around the avoided speed. The total skip will therefore equal the threshold set ± skip band. When the reference is within the window determined in this way, the drive will restore the speed corresponding to the lower or upper value in the window.

1.33 and **1.34** :**Not used**

1.35 **:Reference in rejection zone**
Adjustment range : 0 or 1
This parameter is at 1 when the selected reference is within one of the skip reference zones.
In this case, the motor speed does not correspond to the requested reference.

1.36 and **1.37** :**Analog references 1 and 2**
Adjustment range : 1.07 to 1.06 (1.10 = 0)
± 1.06 (1.10 = 1)
The analog inputs assigned to these parameters are automatically scaled so that 100.0% of the input corresponds to the maximum reference (1.06). Similarly the input level 0% will correspond to the minimum reference 1.07 or 0 according to 1.10.
Unipolar mode (1.10 = 0)
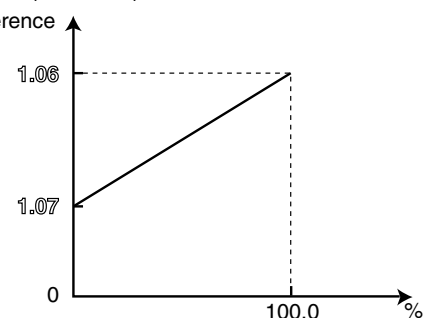
Bipolar mode (1.10 = 1), this mode is only available with PX-I/O option.
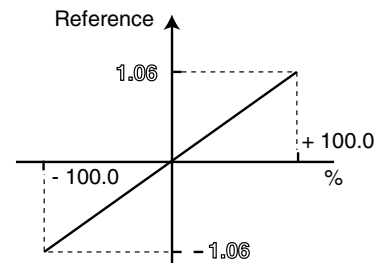
1.38 **:Percentage trim**
Adjustment range : ± 100.0%
An offset proportional to the selected reference can be added to this reference.
The multiplication coefficient is determined by the analog input assigned to 1.38.

$$\text{Final ref} = \frac{\text{selected reference} \times (1.38 + 100)}{100}$$

1.39 and **1.40** :**Not used**

1.41 and **1.42** :**Reference select**
Adjustment range : 0 or 1
Used to assign the digital inputs to selection of the speed reference.

1.41	1.42	Selected reference
0	0	Analog input 1
1	0	Analog input 2
0	1	Preset references
1	1	Reference via keypad

1.43 and **1.44** :**Not used**

PROXIDRIVE
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MENU 1: SPEED REFERENCE: SELECTION, LIMITING AND FILTERS

1.45 to 1.47 : **Preset reference select**
Adjustment range : 0 or 1
Used to assign the digital inputs to selection of the preset references.

1.45	1.46	1.47	Selected reference	1.50
0	0	0	Preset reference 1 (RP1)	1
1	0	0	Preset reference 2 (RP2)	2
0	1	0	Preset reference 3 (RP3)	3
1	1	0	Preset reference 4 (RP4)	4
0	0	1	Preset reference 5 (RP5)	5
1	0	1	Preset reference 6 (RP6)	6
0	1	1	Preset reference 7 (RP7)	7
1	1	1	Preset reference 8 (RP8)	8

1.48 **:Reference timer reset flag**
Adjustment range : 0 or 1
Factory setting : 0
When this parameter changes to 1, the preset reference scan timer is reset to 0. In this case, the reference is once again RP1.
Can be used to control cycle starting via a digital input.

1.49 **:Reference selected indicator**

Adjustment range : 1 to 4
Indicates which reference has been selected.

1.50 **:Preset reference selected indicator**

Adjustment range : 1 to 8
Indicates the selected preset reference.

1.51 **:Power-up keypad control mode reference**
Adjustment range : 0 to 2
Factory setting : 0
0 (rSet): On power-up, the keypad reference is reset to zero.
1 (Prec): On power-up, the keypad reference retains the value it had before power-down.
2 (Pr1): On power-up, the keypad reference retains the preset reference 1 value (1.21).

1.52 to 1.59 : **Not used**

1.60 **:Pre-offset reference**

Adjustment range : ± 1.06
Indicates the value of the selected reference before offset.

1.61 to 1.68 : **Not used**

1.69 **:Number of scanned references**
Adjustment range : 1 to 8
Factory setting : 8
Used to configure the number of preset references integrated in the scan timer.
For example, if 1.69 = 3, the scan timer will run a cycle RP1 --> RP2 --> RP3 --> RP1 etc.

1.70 **:Scan time selection**
Adjustment range : 0 or 1
Factory setting : 0
0 (Iden): The time between each preset reference is the same for all references.
1 (diFF): The time between each preset reference is different.

1.71 **:RP1 --> RP2 time**
Adjustment range : 0 to 9999 s
Factory setting : 0
If 1.70 is set to 1, used to adjust the RP1 --> RP2 scan time.

1.72 **:RP2 --> RP3 time**
Adjustment range : 0 to 9999 s
Factory setting : 0
If 1.70 is set to 1, used to adjust the RP2 --> RP3 scan time.

1.73 **:RP3 --> RP4 time**
Adjustment range : 0 to 9999 s
Factory setting : 0
If 1.70 is set to 1, used to adjust the RP3 --> RP4 scan time.

1.74 **:RP4 --> RP5 time**
Adjustment range : 0 to 9999 s
Factory setting : 0
If 1.70 is set to 1, used to adjust the RP4 --> RP5 scan time.

1.75 **:RP5 --> RP6 time**
Adjustment range : 0 to 9999 s
Factory setting : 0
If 1.70 is set to 1, used to adjust the RP5 --> RP6 scan time.

1.76 **:RP6 --> RP7 time**
Adjustment range : 0 to 9999 s
Factory setting : 0
If 1.70 is set to 1, used to adjust the RP6 --> RP7 scan time.

1.77 **:RP7 --> RP8 time**
Adjustment range : 0 to 9999 s
Factory setting : 0
If 1.70 is set to 1, used to adjust the RP7 --> RP8 scan time.

1.78 **:Feedback time**
Adjustment range : 0 to 9999 s
Factory setting : 0
Used to set the time between the last scan reference and the RP1 reference.

PROXIDRIVE
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MENU 2: RAMPS

2 - MENU 2: RAMPS

2.1 - List of parameters in Menu 2

Parameter	Name	Type	Adjustment range	Factory setting	User setting
2.01	Post-ramp reference	RO/P	If 1.10 = 0 and 2.02 = 0: 0 to 1.06 If 1.10 = 0 and 2.02 = 1: 1.07 to 1.06 If 1.10 = 1: ± 1.06	-	-
2.02	Ramp by-pass (■)	R-W	0 or 1	0	
2.03	Ramp hold	R-W	0 or 1	0	
2.04	Ramp mode select	R-W	0 to 3	1	
2.05	Not used				
2.06	S ramp enable	R-W	0 or 1	0	
2.07	S ramp acceleration limit	R-W	2 to 10	10	
2.08	Standard ramp voltage	R-W	T = 0 to 800V	Eur: 690V USA: 750V	
2.09	Not used				
2.10	Acceleration rate selector	R-W	0 to 9	1	
2.11 to 2.18	Acceleration rate 1 to Acceleration rate 8	R-W	0.1 to 600.0 s/1000 rpm	3.0 s/1000 rpm	
2.19	Jog acceleration rate	R-W	0.1 to 600.0 s/1000 rpm	0.2 s/1000 rpm	
2.20	Deceleration rate selector	R-W	0 to 9	1	
2.21 to 2.28	Deceleration rate 1 to Deceleration rate 8	R-W	0.1 to 600.0 s/1000 rpm	5.0 s/1000 rpm	
2.29	Jog deceleration rate	R-W	0.1 to 600.0 s/1000 rpm	0.2 s/1000 rpm	
2.30 to 2.50	Not used				
2.51	Ramp hold condition	R-W	0 or 1	0	

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MENU 2: RAMPS

2.2 - Menu 2 diagrams

2.2.1 - Acceleration ramps
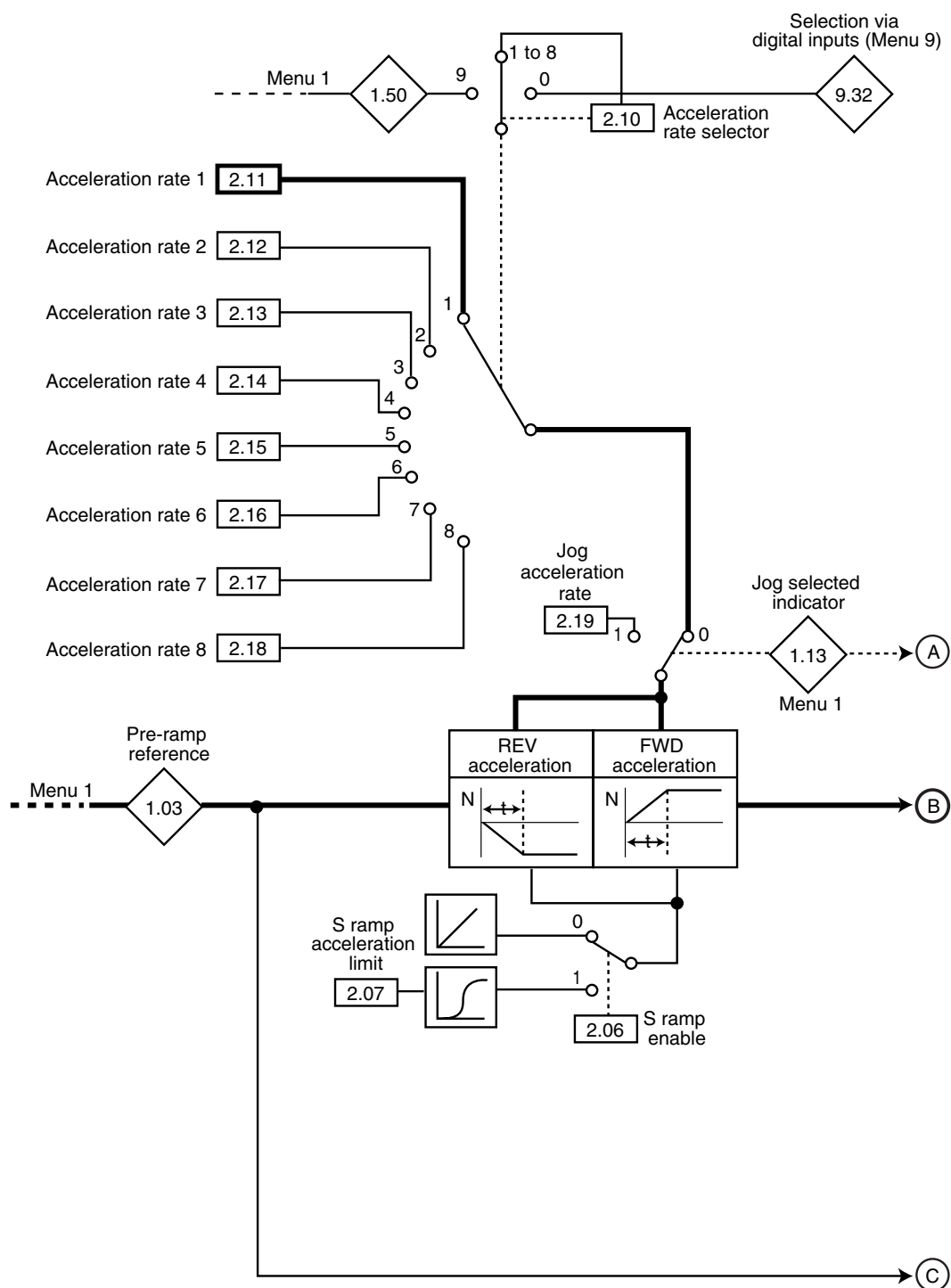
PROXIDRIVE
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2.2.2 - Deceleration ramps

Selection via
digital inputs (Menu 9)

9.32

Deceleration
rate selector

2.20

0

1 to 8

9

1.50

Menu 1

2.21 Deceleration rate 1

2.22 Deceleration rate 2

2.23 Deceleration rate 3

2.24 Deceleration rate 4

2.25 Deceleration rate 5

2.26 Deceleration rate 6

2.27 Deceleration rate 7

2.28 Deceleration rate 8

1

2

3

4

5

6

7

8

Jog
deceleration
rate

2.29

A

1

0

FWD
deceleration

N

REV
deceleration

N

B

2.04 Ramp mode select

2.08 Standard ramp voltage

Menu 4
Current
controller

Post-ramp
reference

2.01

Menu 3

Ramp hold

2.03

0

1

Ramp by-pass
(■)

2.02

0

1

Ramp hold
condition

2.51

0

1

V min

0

0

C

PROXIDRIVE
IP66 variable speed drive
MENU 2: RAMPS

2.3 - Explanation of parameters in menu 2

2.01 **:Post-ramp reference**

Adjustment range : • If 1.10 = 0 and 2.02 = 0: 0 to 1.06
• If 1.10 = 0 and 2.02 = 1: 1.07 to 1.06
• If 1.10 = 1: ± 1.06
Measurement of the post-ramp reference. Used for diagnostics.
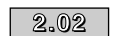
2.02 **:Ramp by-pass (■)**
Adjustment range : 0 or 1
Factory setting : 0
0 (raMP): Active ramps.
1 (no): Ramps short-circuited.
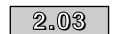
2.03 **:Ramp hold**
Adjustment range : 0 or 1
Factory setting : 0
0 (raMP): Ramp freed.
1 (StoP): The ramp is held and acceleration (or deceleration) is therefore interrupted.
CAUTION:
The ramp hold function is disabled if a stop command is given.
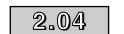
2.04 **:Ramp mode select**
Adjustment range : 0 to 3
Factory setting : 1
0 (Fst): Deceleration ramp imposed. If the deceleration ramp which has been set is too fast in relation to the inertia of the load, the DC bus voltage exceeds its maximum value (set in 2.08) and the drive passes into overvoltage trip state "OU".
CAUTION:
Select mode 2.04 = 0 (Fst) when a braking resistor is being used.
1 (Std): Standard deceleration ramp with automatic extension of the ramp time in order to avoid causing a DC bus overvoltage fault on the drive (threshold set in 2.08).
2 (StdH): The drive allows the motor voltage to be increased up to 1.2 times the rated voltage set in 5.09 (motor rated voltage), to avoid reaching the maximum DC bus voltage threshold (threshold set in 2.08). However, if this is not adequate, the standard deceleration ramp time is extended, to avoid causing a DC bus overvoltage trip on the drive.
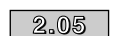For the same quantity of energy, mode 2 enables faster deceleration than mode 1.
3 (FstH): Same as mode 2, but the ramp is imposed. If the configured ramp is too fast, the drive passes into OU trip state.
CAUTION:
In mode 2 and 3, the motor must be able to tolerate additional losses relating to the increase in voltage at its terminals.

2.05 **:Not used**
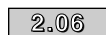
2.06 **:S ramp enable**
Adjustment range : 0 or 1
Factory setting : 0
0 (Lin): The ramp is linear.
1 (S-rP): A curved part (defined in 2.07) at the start and end of the ramp avoids load swinging.
CAUTION:
The S ramp is deactivated during controlled decelerations (2.04 = 1 or 2).
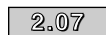
2.07 **:S ramp acceleration limit**
Adjustment range : 2 to 10
Factory setting : 10
Used to modify the ramp curve by the same value at the start and end of the ramp.
The value 4 represents a time for the curved part of 25% of the total ramp and 10 represents a time for the curved part of 10%.
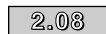
2.08 **:Standard ramp voltage**
Adjustment range : 0 to 800V
Factory setting : Eur: 690V, USA: 750V
This threshold is used when the drive is configured in standard deceleration mode (2.04 = 1 or 2).
If this threshold is too low, the machine will stop in freewheel mode. If this threshold is too high and there are no resistors connected, the drive will trip due to DC bus overvoltage ("OU" trip).
The minimum value of this parameter must be 50V higher than the DC bus voltage obtained with the maximum supply voltage. (U bus = U supply x √2).
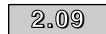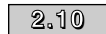
2.09 **:Not used**

2.10 **:Acceleration rate selector**
Adjustment range : 0 to 9
Factory setting : 1
This parameter is used to select the acceleration ramp as follows:
0 (Sel): Selection of the acceleration ramp via digital input. The choice of ramp comes from the binary/decimal converter in menu 9 (9.32).
1 (Acc1): Acceleration ramp 1
2 (Acc2): Acceleration ramp 2
3 (Acc3): Acceleration ramp 3
4 (Acc4): Acceleration ramp 4
5 (Acc5): Acceleration ramp 5
6 (Acc6): Acceleration ramp 6
7 (Acc7): Acceleration ramp 7
8 (Acc8): Acceleration ramp 8
9 (rP.Pr): The ramp is automatically associated with the corresponding preset speed.

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2.11 to 2.18 : **Acceleration rates 1 to 8**
Adjustment range : 0.1 to 600.0 s/1000 rpm
Factory setting : 3.0 s/1000 rpm
Sets the time for acceleration from 0 to 1000 rpm.

$$2.11 \text{ to } 2.18 = \frac{t(s) \times 1000 \text{ rpm}}{(N2 - N1) \text{ rpm}}$$

Value of 2.11 to 2.18
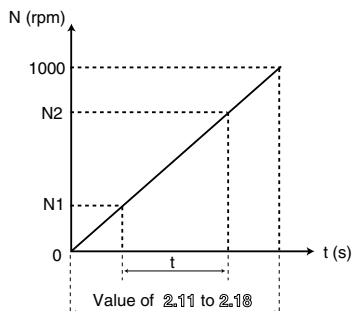
2.11 : Acceleration rate 1 (main ramp in its factory setting)
2.12 : Acceleration rate 2
2.13 : Acceleration rate 3
2.14 : Acceleration rate 4
2.15 : Acceleration rate 5
2.16 : Acceleration rate 6
2.17 : Acceleration rate 7
2.18 : Acceleration rate 8

2.19 :**Jog acceleration rate**
Adjustment range : 0.1 to 600.0 s/1000 rpm
Factory setting : 0.2 s/1000 rpm
Sets the time for acceleration from 0 to 1000 rpm.

$$2.19 = \frac{t(s) \times 1000 \text{ rpm}}{(N2 - N1) \text{ rpm}}$$
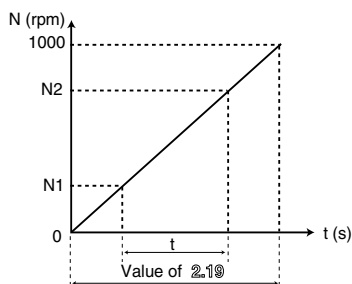
Value of 2.19

2.20 :**Deceleration rate selector**
Adjustment range : 0 to 9
Factory setting : 1
This parameter is used to select the deceleration ramp as follows:
0 (Sel): Selection of the deceleration ramp via digital input. The choice of ramp comes from the binary/decimal converter in menu 9 (9.32).
1 (Dec1): Deceleration ramp 1
2 (Dec2): Deceleration ramp 2
3 (Dec3): Deceleration ramp 3
4 (Dec4): Deceleration ramp 4
5 (Dec5): Deceleration ramp 5
6 (Dec6): Deceleration ramp 6
7 (Dec7): Deceleration ramp 7
8 (Dec8): Deceleration ramp 8
9 (rPPr): The ramp is automatically associated with the corresponding preset speed.

2.21 to 2.28 : **Deceleration rates 1 to 8**
Adjustment range : 0.1 to 600.0 s/1000 rpm
Factory setting : 5.0 s/1000 rpm
Sets the time for deceleration from 1000 rpm to 0.

$$2.21 \text{ to } 2.28 = \frac{t(s) \times 1000 \text{ rpm}}{(N2 - N1) \text{ rpm}}$$

Value of 2.21 to 2.28
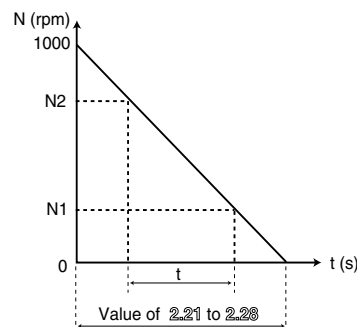
2.21 : Deceleration rate 1 (main ramp in its factory setting)
2.22 : Deceleration rate 2
2.23 : Deceleration rate 3
2.24 : Deceleration rate 4
2.25 : Deceleration rate 5
2.26 : Deceleration rate 6
2.27 : Deceleration rate 7
2.28 : Deceleration rate 8

2.29 :**Jog deceleration rate**
Adjustment range : 0.1 to 600.0 s/1000 rpm
Factory setting : 0.2 s/1000 rpm
Sets the time for deceleration from 100 Hz to 0.

$$2.29 = \frac{t(s) \times 1000 \text{ rpm}}{(N2 - N1) \text{ rpm}}$$

Value of 2.29
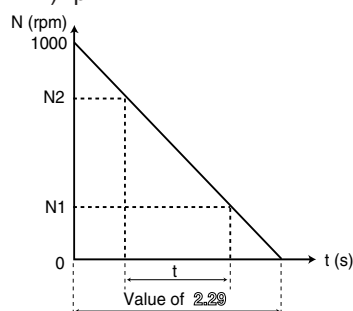
2.30 to 2.50 : **Not used**

2.51 :**Ramp hold condition**
Adjustment range : 0 or 1
Factory setting : 0
0 (ALL): When 2.03 = 1, the ramp is always held.
1 (>Min): When 2.03 = 1, the ramp is freed between 0 and V min (1.07).

Notes

3 - MENU 3: FREQUENCY THRESHOLDS - ENCODER OPTION

3.1 - List of parameters in Menu 3

Parameter	Name		Type	Adjustment range	Factory setting	User setting
3.01	Final speed reference	◨	RO/P	$\pm 2 \times 10^6$ rpm	-	
3.02	Speed feedback		RO/P	$\pm 2 \times 10^6$ rpm		-
3.03	Speed error	◨	RO/P	$\pm 2 \times 10^6$ rpm		-
3.04	Speed controller output	◨	RO/P	$\pm 300.0\%$	-	-
3.05	Zero speed threshold		R-W	0 to 500 rpm	30 rpm	
3.06	At speed lower limit		R-W	0 to 500 rpm	30 rpm	
3.07 to 3.09	Not used					
3.10	Speed controller proportional gain (Kp1)	◨	R-W	0 to 32000	200	
3.11	Speed controller integral gain (Ki1)	◨	R-W	0 to 32000	100	
3.12	Speed controller differential feedback gain (Kd1)	◨	R-W	0 to 32000	0	
3.13	Speed controller proportional gain (Kp2)	◨	R-W	0 to 32000	200	
3.14	Speed controller integral gain (Ki2)	◨	R-W	0 to 32000	100	
3.15	Speed controller differential feedback gain (Kd2)	◨	R-W	0 to 32000	0	
3.16	Speed controller gain select	◨	R-W	0 or 1	0	
3.17	Speed controller set-up method	◨	R-W	0 to 2	0	
3.18	Motor and load inertia	◨	R-W	0.001 to 32.000 Kkgm^2	0.001 Kkgm^2	
3.19	Not used					
3.20	Bandwidth	◨	R-W	0.1 to 255.0 Hz	10.0 Hz	
3.21	Damping factor	◨	R-W	0 to 10.0	1.0	
3.22	Hard speed reference	◨	R-W	0 to 2×10^6 rpm	0	
3.23	Hard speed reference selector	◨	R-W	0 or 1	0	
3.24	Not used					
3.25	Encoder phase angle	◨	R-W	0 to 359.9°	0	
3.26 to 3.28	Not used					
3.29	Drive encoder position	◨	RO/P	0 to 16383	-	
3.30 to 3.33	Not used					
3.34	Drive encoder lines per revolution		R-W	0 to 32000 lpr	1024 lpr	
3.35 to 3.37	Not used					
3.38	Drive encoder type		R-W	0 to 8	If 11.31 = 0 to 2: 0 / If 11.31 = 3: 3	
3.39 to 3.41	Not used					
3.42	Drive encoder filter	◨	R-W	0 to 10 ms	0	
3.43	Maximum drive encoder reference		R-W	0 to 32000	5000	
3.44	Drive encoder reference scaling		R-W	0 to 2.0000	1.0000	
3.45	Drive encoder reference	◨	RO/P	0 to 100%	-	
		◨	RO/P	$\pm 100\%$	-	
3.46	Drive encoder reference destination		R-W/P	0.00 to 21.51	0.00	

▨ : Function not available in version V2.10.

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Parameter	Name		Type	Adjustment range	Factory setting	User setting
3.47 to 3.50	Not used					
3.51	Vmin alarm threshold		R-W	0 to 500 rpm	90 rpm	
3.52	Vmax alarm threshold		R-W	0 to 500 rpm	90 rpm	
3.53 to 3.60	Not used					
3.61	Drive encoder source		R-W/P	0.00 to 21.51	0.00	
3.62	Drive encoder frequency		RO/P	0 to 5000 Hz	-	-
3.63	Maximum drive output reference		R-W	0 to 32000	5000	
3.64	Drive output reference scaling		R-W	0 to 2.0000	1.0000	
3.65	Drive output reference		RO/P	0 to 100%	-	
3.66	Drive output destination		R-W/P	0.00 to 21.51	0.00	
3.67	Reference select	▣	R-W	0 or 1	0	
3.68 to 3.70	Not used					
3.71	Drive output reference source		R-W/P	0.00 to 21.51	0.00	
3.72	Drive output period		RO/P	0 to 5000 Hz	-	

░░░ : Function not available in version V2.10.

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MENU 3: FREQUENCY THRESHOLDS - ENCODER OPTION

Notes

PROXIDRIVE
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MENU 3: FREQUENCY THRESHOLDS - ENCODER OPTION

3.2 - Menu 3 diagrams

3.2.1 - Basic version
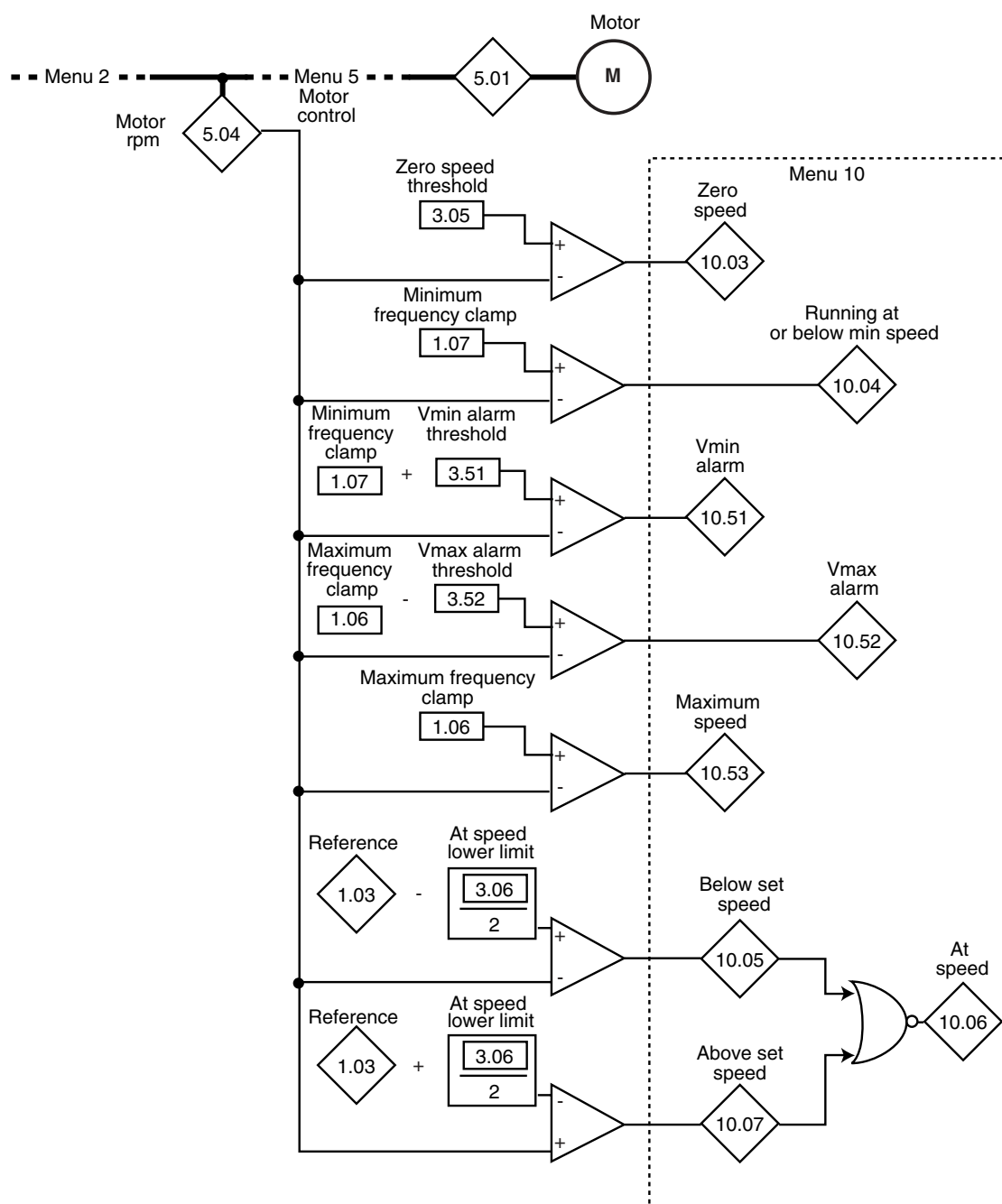
PROXIDRIVE
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MENU 3: FREQUENCY THRESHOLDS - ENCODER OPTION

3.2.1 - Basic version (continued)

Drive encoder input
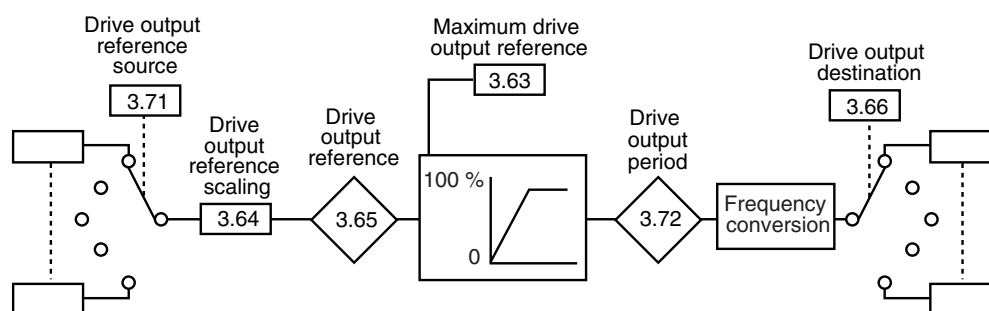
Drive encoder source

3.61

Drive encoder frequency

Frequency conversion

3.62

Maximum drive encoder reference

3.43

100 %

0

Drive encoder reference

3.45

Drive encoder reference scaling

3.44

Drive encoder reference destination

3.46

Drive encoder output

Drive output reference source

3.71

Drive output reference scaling

3.64

Drive output reference

3.65

Maximum drive output reference

3.63

100 %

0

Drive output period

3.72

Frequency conversion

Drive output destination

3.66

PROXIDRIVE
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MENU 3: FREQUENCY THRESHOLDS - ENCODER OPTION

3.2.2 - With encoder option

Encoder feedback option
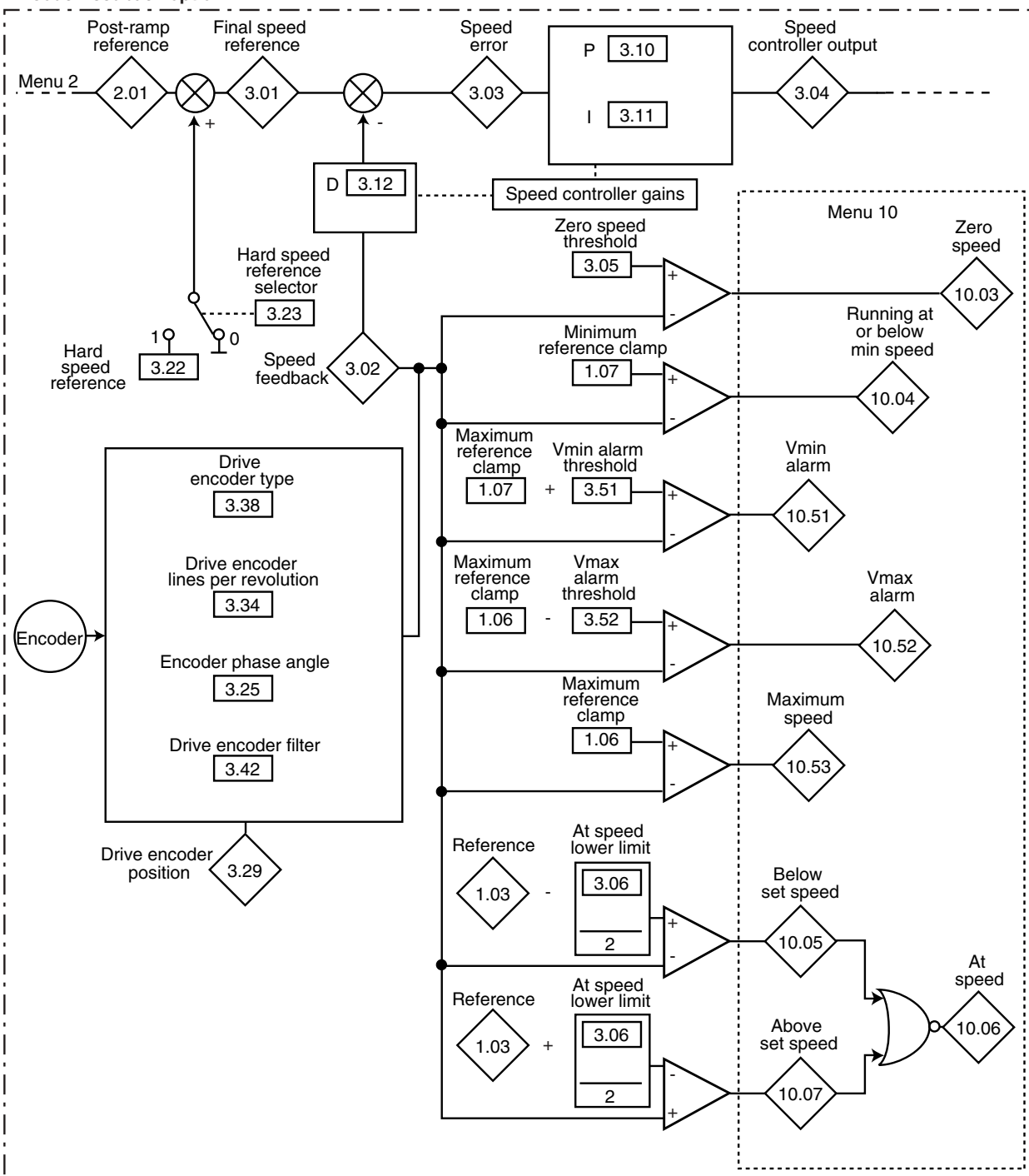
PROXIDRIVE
IP66 variable speed drive
MENU 3: FREQUENCY THRESHOLDS - ENCODER OPTION

3.2.2 - With encoder option (continued)

Drive encoder input

Drive encoder output
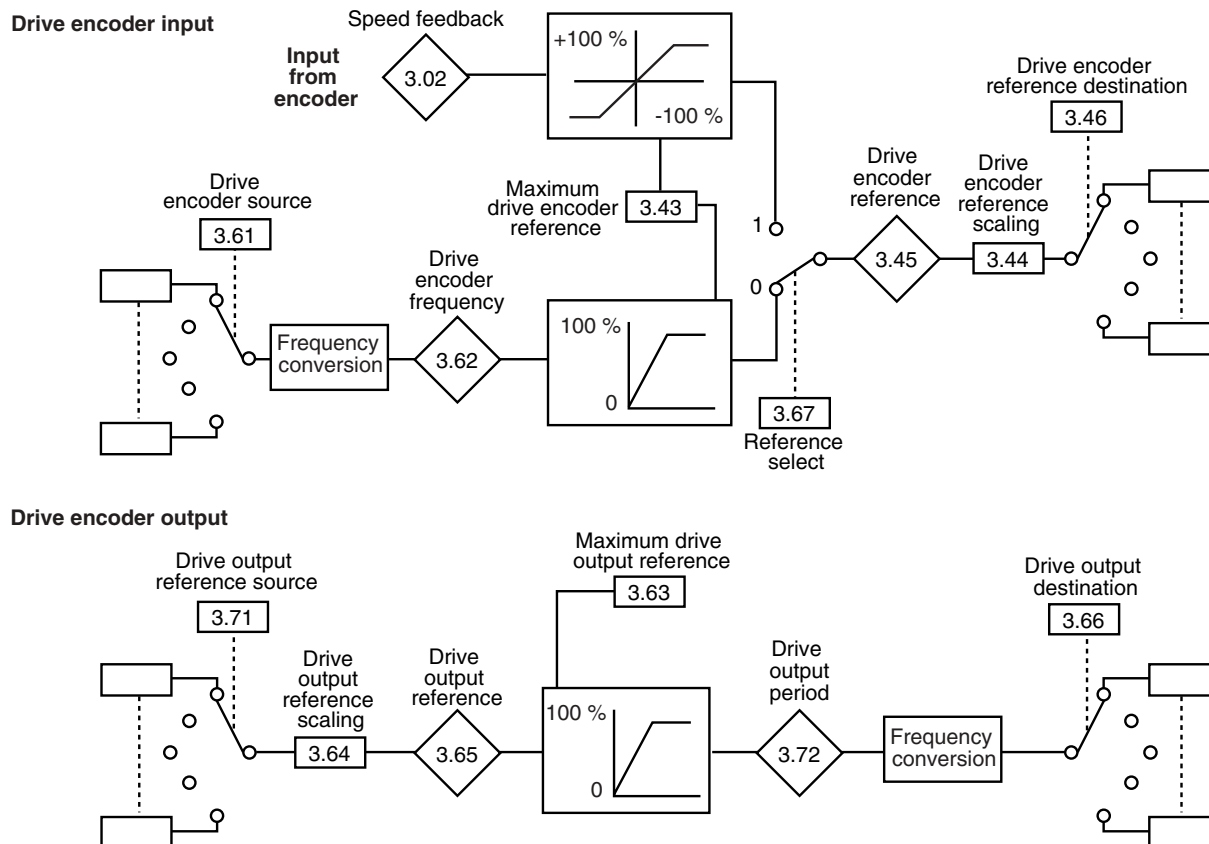
PROXIDRIVE
IP66 variable speed drive
MENU 3: FREQUENCY THRESHOLDS - ENCODER OPTION

3.3 - Explanation of parameters in menu 3

Parameters marked with the symbol ▣ can only be accessed when an encoder feedback option is present.

3.01 :Final speed reference (▣)

Adjustment range : ± 2 x 1.06 rpm
Represents the sum of the post ramp reference and the hard speed reference if this has been enabled.

3.02 :Speed feedback

Adjustment range : ± 2 x 1.06 rpm
Actual speed from the encoder.

3.03 :Speed error (▣)

Adjustment range : ± 2 x 1.06 rpm
Difference between the final speed reference and the speed feedback.

3.04 :Speed controller output (▣)

Adjustment range : ± 300.0%
The speed controller output produces a torque reference to be used in determining the value of the active current.

3.05 :Zero speed threshold
Adjustment range : 0 to 500 rpm
Factory setting   : 30 rpm
If the motor speed 2.01 is at or below the level defined by this parameter, the zero speed alarm 10.03 will be at 1, otherwise it will be at 0.

3.06 :At speed lower limit
Adjustment range : 0 to 500 rpm
Factory setting   : 30 rpm
Defines the window within which the "At speed" alarm is activated.
10.06 is at 1 when the post-ramp reference equals the reference ± (3.06/2).

3.07 to 3.09 : Not used

3.10 :Speed controller proportional gain (Kp1) (▣)
Adjustment range : 0 to 32000
Factory setting   : 200
Adjusts the stability of the motor speed in the event of sudden variations in the reference.
Increase the proportional gain until vibration occurs in the motor, then reduce the value by 20 to 30%, checking that the motor remains stable in the event of sudden variations in speed, both at no load and on load.

3.11 :Speed controller integral gain (Ki1) (▣)
Adjustment range : 0 to 32000
Factory setting   : 100
Adjusts the stability of the motor speed on load impact.
Increase the integral gain so that the same speed is obtained on load and at no load in the event of load impact.

3.12 :Speed controller differential feedback gain (Kd1) (▣)
Adjustment range : 0 to 32000
Factory setting   : 0
Adjusts the stability of the motor speed in the event of load shedding or sudden variations in the reference.
Reduces overshoots.
In general, leave the setting at 0.
Function not available in version V2.10.

3.13 :Speed controller proportional gain (Kp2) (▣)
Adjustment range : 0 to 32000
Factory setting   : 200
Adjusts the stability of the motor speed in the event of sudden variations in the reference.
The drive takes account of Kp1 (3.10) or Kp2 (3.13) depending on the value of 3.16.

3.14 :Speed controller integral gain (Ki2) (▣)
Adjustment range : 0 to 32000
Factory setting   : 100
Adjusts the stability of the motor speed on load impact.
The drive takes account of Ki1 (3.11) or Ki2 (3.14) depending on the value of 3.16.

3.15 :Speed controller differential feedback gain (Kd2) (▣)
Adjustment range : 0 to 32000
Factory setting   : 0
Adjusts the stability of the motor speed in the event of load shedding or sudden variations in the reference.
The drive takes account of Kd1 (3.12) or Kd2 (3.15) depending on the value of 3.16.
Function not available in version V2.10.

3.16 :Speed controller gain select (▣)
Adjustment range : 0 or 1
Factory setting   : 0
This parameter can be modified when the drive is disabled or enabled.
0 (gai.1): Selection of Kp1 (3.10), Ki1 (3.11) and Kd1 (3.12) gains.
1 (gai.2): Selection of Kp2 (3.13), Ki2 (3.14) and Kd2 (3.15) gains.

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PROXIDRIVE
IP66 variable speed drive
MENU 3: FREQUENCY THRESHOLDS - ENCODER OPTION

`3.17` **:Speed controller set-up method (▣)**
Adjustment range : 0 to 2
Factory setting : 0
0 (User): The speed controller operates with the gains entered by the user.
1 (Auto): The speed controller operates with the gains calculated from the total inertia entered in `3.18`, the bandwidth entered in `3.20` and the damping factor entered in `3.21`.
2 (Pr.16): For applications with very high inertia for which a very high proportional gain is necessary, this mode causes the proportional gain set in `3.10` or `3.13` to be multiplied by 16.
Function not available in version V2.10.

`3.18` **:Motor and load inertia (▣)**
Adjustment range : 0.001 to 32.000 Kkgm^2
Factory setting : 0.001 Kkgm^2
Corresponds to the total inertia applied to the motor (motor inertia + load inertia).
This parameter is used to calculate the gains automatically (see `3.17`), and to provide a torque correction during acceleration if necessary.

`3.19` **:Not used**

`3.20` **:Bandwidth (▣)**
Adjustment range : 0.1 to 255.0 Hz
Factory setting : 10.0 Hz
Used to set the bandwidth taken into account with speed controller operating mode 1 (see `3.17`).

`3.21` **: Damping factor (▣)**
Adjustment range : 0 to 10.0
Factory setting : 1.0
Used to set the damping factor taken into account with speed controller operating mode 1 (see `3.17`).

`3.22` **:Hard speed reference (▣)**
Adjustment range : 0 to 2 x `1.06` rpm
Factory setting : 0
This hard speed reference is an additional reference which is not affected by the ramps.
Function not available in version V2.10.

`3.23` **:Hard speed reference selector (▣)**
Adjustment range : 0 or 1
Factory setting : 0
Used to add an unramped speed reference to the main reference.
(Function not available in version V2.10).

`3.24` **:Not used**

`3.25` **:Encoder phase angle (▣)**
Adjustment range : 0 to 359.9°
Factory setting : 0
Indicates the result of the phasing test. It is stored when the drive is powered down and will only be modified automatically after a new phasing test.

⚠ **• The phase angle, where it is known, can be entered manually. Any incorrect value can cause the motor to turn in the wrong direction or put the drive in the trip state.**

`3.26` to `3.28` **: Not used**

`3.29` **:Drive encoder position (▣)**

Adjustment range : 0 to 16383
Indicates the encoder position in relation to the line it was on at power-up.

`3.30` to `3.33` **: Not used**

`3.34` **:Drive encoder lines per revolution**
Adjustment range : 0 to 32000 lpr
Factory setting : 1024 lpr
Used to configure the number of lines per encoder revolution. Converts the encoder input into a speed.

`3.35` to `3.37` **: Not used**

`3.38` **:Drive encoder type**
Adjustment range : 0 to 8
Factory setting : 0 if `11.31` = 0 to 2
3 if `11.31` = 3
0 (Incr.) : Quadrature incremental encoder.
1 (Fd): Incremental encoder with Frequency/Direction output.
2 (Fr): Incremental encoder with FWD/REV outputs.
3 (CoMM): Incremental encoder with commutation channels.
4 (haLL): Hall effect sensor
5 (tyP1): Sensorless mode 1.
6 (tyP2): Sensorless mode 2.
7 (tyP3): Sensorless mode 3.
8 (tyP4): Sensorless mode 4.

`3.39` to `3.41` **: Not used**

`3.42` **:Drive encoder filter (▣)**
Adjustment range : 0 to 10 ms
Factory setting : 0
This parameter is used to apply a sliding window filter to the drive encoder speed feedback. This is particularly useful to reduce the current demand when the load has high inertia and significant gain is required on the speed controller. If the filter is not enabled in these conditions, it is possible for the speed controller output to change constantly from one current limit to another, and disable the integral term of the speed controller.
The filter is inactive if `3.42` = 0.

`3.43` **:Maximum drive encoder reference**
Adjustment range : 0 to 32000
Factory setting : 5000
Adjusts the input frequency which should correspond to 100% of the destination numerical value.

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MENU 3: FREQUENCY THRESHOLDS - ENCODER OPTION

3.44 **:Drive encoder reference scaling**
Adjustment range : 0 to 2.0000
Factory setting : 1.0000
Used for scaling the numerical reference to be converted into pulses.

3.45 **:Drive encoder reference**

Adjustment range : 0 to 100% (■); ± 100% (■)
Indicates the value of the numerical reference resulting from conversion of the pulse signal.

3.46 **:Drive encoder reference destination**
Adjustment range : 0.00 to 21.51
Factory setting : 0.00
Used to select the destination of the numerical reference resulting from conversion of the pulse signal. Only "non-bit" type parameters can be programmed. If an unsuitable parameter is selected, 3.46 will be frozen at 0.

3.47 to **3.50** : Not used

3.51 **:Vmin alarm threshold**
Adjustment range : 0 to 500 rpm
Factory setting : 90 rpm
Triggers an alarm 10.51 when the motor speed (5.04) < Vmin (1.07) + 3.51 in open loop mode or speed (3.02) + 3.51 in closed loop mode.

3.52 **:Vmax alarm threshold**
Adjustment range : 0 to 500 rpm
Factory setting : 90 rpm
Triggers an alarm (10.52) when the motor speed (5.04) > Vmax (1.06) - 3.52 in open loop mode or speed (3.02) - 3.52 in closed loop mode.

3.53 to **3.60** : Not used

3.61 **:Drive encoder source**
Adjustment range : 0.00 to 21.51
Factory setting : 0.00
Used to select the source of pulses. Only "bit" type parameters can be programmed. If an unsuitable parameter is selected, 3.61 will be frozen at 0.
Note: Only use inputs ADI1, ADI2, DIO1, DI2 and DI3 as the drive encoder source. The maximum input frequency should be 5 kHz. If the input frequency is more than 5 kHz, use an encoder feedback option, and set 3.67 to 1 (EnCd).

3.62 **:Drive encoder frequency**

Adjustment range : 0 to 5000 Hz
Drive encoder frequency which will be converted to a numerical reference.
Example of application:
Pulses from an inductive sensor connected on a digital input are converted into a reference which is assigned to the speed reference.

3.63 **:Maximum drive output reference**
Adjustment range : 0 to 32000
Factory setting : 5000
Adjusts the pulse frequency which should correspond to 100% of the original numerical value.
Function not available in version V2.10.

3.64 **:Drive output reference scaling**
Adjustment range : 0 to 2.0000
Factory setting : 1.0000
Used for scaling the reference from the drive encoder.
Function not available in version V2.10.

3.65 **:Drive output reference**

Adjustment range : 0 to 100%
Indicates the analog reference value.
Function not available in version V2.10.

3.66 **:Drive output destination**
Adjustment range : 0.00 to 21.51
Factory setting : 0.00
Used to select the destination for the numerical reference which will be used to generate pulses. Only "non-bit" parameters can be programmed. If an unsuitable parameter is selected, 3.66 will be frozen at 0.
Function not available in version V2.10.

3.67 **:Reference select (■)**
Adjustment range : 0 or 1
Factory setting : 0
0 (Freq): An analog reference is generated from a frequency signal.
1 (Encd): The encoder signal is used to generate an analog reference (eg: speed reference).

3.68 to **3.70** : Not used

3.71 **:Drive output reference source**
Adjustment range : 0.00 to 21.51
Factory setting : 0.00
Used to select the source of the numerical reference which will be converted into pulses.
Function not available in version V2.10.

3.72 **:Drive output period**

Adjustment range : 0.5 to 3200.0s
Drive output period resulting from conversion of the numerical reference.
Example of application:
A potentiometer connected to an analog input generates a period which is converted into pulses whose frequency is proportional to the reference. The pulses are assigned to the run command.
Function not available in version V2.10.

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MENU 4: CURRENT AND TORQUE CONTROL

4 - MENU 4: CURRENT AND TORQUE CONTROL

4.1 - List of parameters in Menu 4

Parameter	Name		Type	Adjustment range	Factory setting	User setting
4.01	Current magnitude		RO/P	0 to max. drive current (A)	-	-
4.02	Active current		RO/P	± max. drive current	-	-
4.03	Not used					
4.04	Current demand		RO/P	± active current limit (% active In)	-	-
4.05 and 4.06	Not used					
4.07	Active current limit		R-W	0 to +300.0% (% active In)	165.0%	
4.08	Torque reference		R-W	± 300.0% (% active In)	0	
4.09 and 4.10	Not used					
4.11	Torque mode selector		R-W	0 or 1	0	
4.12	Current demand filter	▣	R-W	0 to 10 ms	0	
4.13	Current controller Kp gain		R-W	0 to 250	20	
4.14	Current controller Ki gain		R-W	0 to 250	40	
4.15	Thermal time constant		R-W	0 to 250 s	89 s	
4.16	Thermal protection mode		R-W	0 or 1	0	
4.17	Reactive current		RO/P	0 to + max. drive current	-	
4.18	Overriding current limit		RO/P	0 to + 300% (% active In)	-	-
4.19	Overload accumulator		RO/P	0 to 100.0%	-	-
4.20	Percentage load		RO/P	± active current limit (% active In)	-	-
4.21	Selection of load display		R-W	0 or 1	0	

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MENU 4: CURRENT AND TORQUE CONTROL

4.2 - Menu 4 diagrams

4.2.1 - Basic version
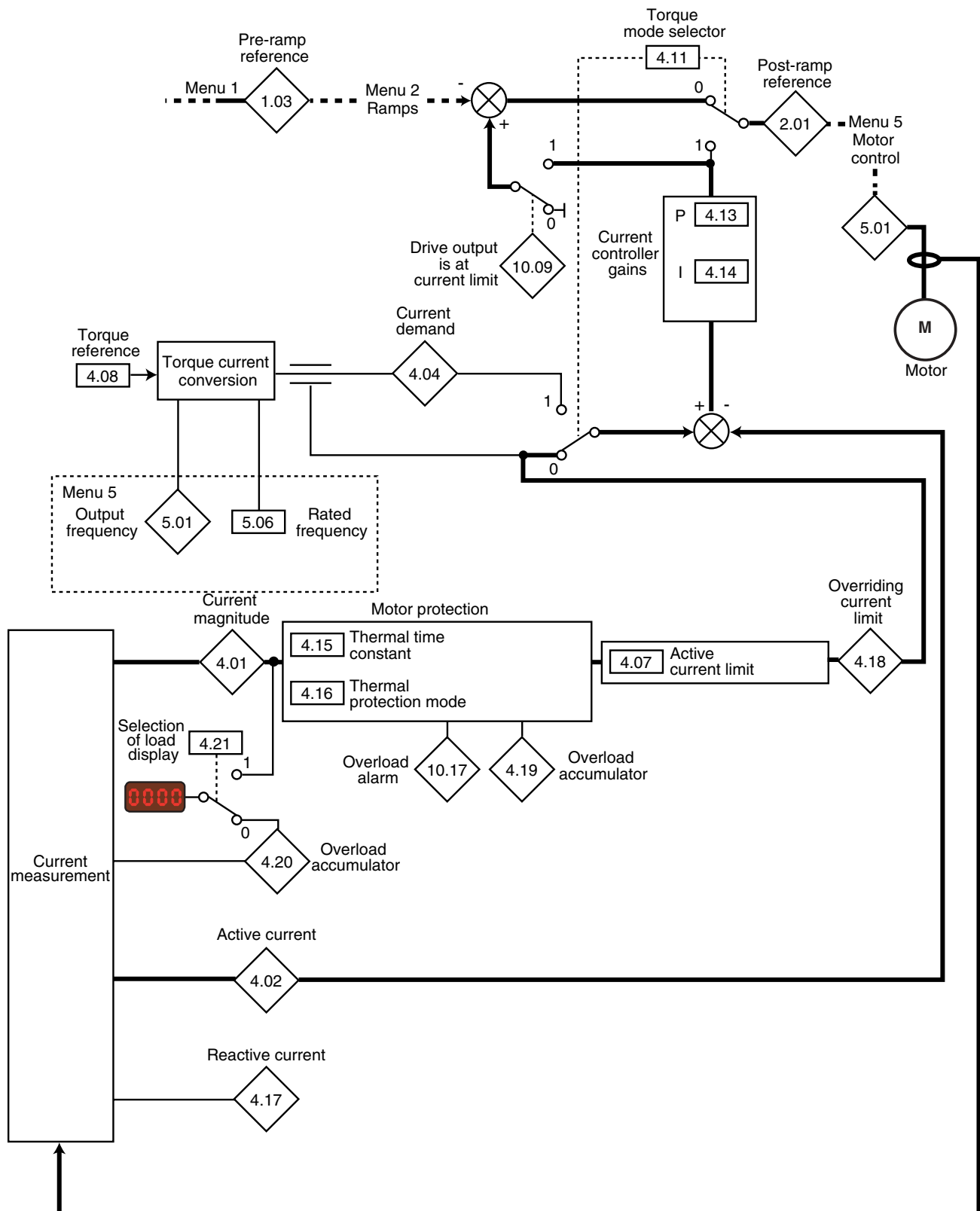
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MENU 4: CURRENT AND TORQUE CONTROL

4.2.2 - With encoder option

DC bus supervision

Standard ramp voltage 2.08 5.05 DC bus voltage

Torque mode selector 4.11

Speed controller output

Menu 1 3.04 0

Torque/Current conversion

Current demand 4.04

Current demand filter 4.12

P 4.13

Current controller gains

I 4.14

Reactive I internal measurement

1

Torque reference 4.08

Overrinding current limit 4.18

M

Motor

Menu 5

Motor rated current 5.07

Rated power factor (cos φ) 5.10

Current limit calculation

Current magnitude 4.01

Motor protection

4.15 Thermal time constant

4.16 Thermal protection mode

Active current limit 4.07

Selection of load display 4.21

1

Overload alarm 10.17 4.19 Overload accumulator

0000

0

4.20 Percentage load

Current measurement

Active current 4.02

Reactive current 4.17

PROXIDRIVE
IP66 variable speed drive
MENU 4: CURRENT AND TORQUE CONTROL

4.3 - Explanation of parameters in menu 4

4.01 **:Current magnitude**

Adjustment range : 0 to max. drive current (A)
Reading of the rms current in each drive output phase.
This is the result of the vectorial sum of the reactive current and the active current.

4.02 **:Active current**

Adjustment range : ± max. drive current
Reading of the active current delivered by the drive.
The active current gives a fairly precise image of the motor torque between 10 Hz and 50 Hz.
A negative value indicates operation in regen mode with driving load whereas a positive value indicates operation in motor mode.

4.03 **Not used**

4.04 **:Current demand**

Adjustment range : ± active current limit (%active In)
The current demand is the result of conversion of the torque reference 4.08 corrected by the active current limit 4.07.

4.05 and **4.06** **:Not used**

4.07 **:Active current limit**
Adjustment range : 0 to +300.0% (% active In)
Factory setting   : 165.0%
Determines the active current limit which applies both in motor and in regen mode in both directions of rotation.
With frequency control (4.11 = 0), the output frequency will automatically be adjusted in order to adhere to the current limit.
The current limit is an active current limit whereas the maximum current permitted by the drive is a total current.
The maximum value 4.07 can therefore take the following value:

$$\text{Max. active I} = \frac{\sqrt{\text{total max I}^2 - \text{reactive I}^2}}{\text{Active In}} \times 100 \quad \%$$

max. total I = 150% drive In
active In = motor In x cos φ

$$\text{Reactive current} = \sqrt{\text{motor In}^2 - \text{active In}^2}$$

4.08 **:Torque reference**
Adjustment range : ± 300.0% (% active In)
Factory setting   : 0
Main torque reference when the drive is configured for torque control.
Give a positive reference for the torque to be applied clockwise and conversely, a negative reference for the torque to be applied anti-clockwise.

4.09 and **4.10** **:Not used**

4.11 **:Torque mode selector**
Adjustment range : 0 or 1
Factory setting   : 0
0 (SPd): Speed control with current limiting by parameter 4.07.
1 (trq): Torque control. The speed reference is no longer active and the torque reference may be given by analog reference 2 (if it is programmed on the torque reference, parameter 4.08). The output frequency is adjusted so that the active current measured by the drive equals the reference.

⚠ • **With torque control (4.11 = 1),** the machine races if the resistive torque drops to zero. It is therefore imperative to ensure that parameter 1.06, which limits the maximum speed, is set so as to ensure the safety of equipment and personnel.
When racing occurs, the maximum speed reached is 1.06 + 30%.

4.12 **:Current demand filter (▣)**
Adjustment range : 0 to 10 ms
Factory setting   : 0
This filter is used to produce a time constant intended to reduce any noise generated by the speed controller.

4.13 **:Current controller Kp gain**

4.14 **:Current controller Ki gain**
Adjustment range : 0 to 250
Factory setting   : 4.13 = 20
                      4.14 = 40
Due to a certain number of internal drive factors, oscillations may occur in the following cases:
- Frequency control with current limiting around the rated frequency and on load impacts
- Torque control on machines with a low load and around the rated speed
- On a mains supply break or on a controlled deceleration ramp when control via the DC bus is requested.
To reduce these oscillations, we recommend that you first:
- increase the proportional gain 4.13
- then reduce the integral gain 4.14.

4.15 **:Thermal time constant**
Adjustment range : 0 to 250 s
Factory setting   : 89 s
This parameter is used to define the motor thermal protection. If this is known, the motor thermal time constant should be entered directly in 4.15. Otherwise it should be calculated as a function of the maximum time for which the motor can tolerate 150% I_N.

$$4.15 = \frac{\text{maximum duration at 150\% } I_N}{0.674}$$

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MENU 4: CURRENT AND TORQUE CONTROL

4.16 **:Thermal protection mode**

Adjustment range : 0 or 1
Factory setting   : 0
0 (deF): The drive will trip when the threshold defined in parameter 4.15 is reached.
1 (Auto): The limiting current will automatically be reduced below 100% I_N when the threshold defined in parameter 4.15 is reached.

4.17 **:Reactive current**

Adjustment range : 0 to + max. drive current
Reactive current reading.

4.18 **:Overriding current limit**

Adjustment range : 0 to +300% (% max. active In)
Depending on the system operation, indicates the rms current limit in real time.

4.19 **:Overload accumulator**

Adjustment range : 0 to 100.0%
The accumulator increases according to the formula

$$4.19 = \frac{4.01^2 \ (1 - e^{-t/4.15})}{(5.07 \times 1.05)^2} \times 100 \ \%$$

When 4.19 reaches 100%, the drive passes into " It Ac " trip state or causes the limiting current to be reduced.

4.20 **:Percentage load**

Adjustment range : ± active current limit (%active In)
This parameter indicates the drive load level. A positive value indicates operation in motor mode whereas a negative value indicates operation in regen mode (driving load).

4.21 **:Selection of load display**

Adjustment range : 0 or 1
Factory setting   : 0
This parameter is used to obtain an indication of the load or the total current on the display.

4.21	LED display	Functions
0	**Ld**	**Display of the drive load level 4.20.**
1	A	Display of the total motor current 4.01.

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MENU 4: CURRENT AND TORQUE CONTROL

Notes

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IP66 variable speed drive
MENU 5: MOTOR CONTROL

5 - MENU 5: MOTOR CONTROL

5.1 - List of parameters in Menu 5

Parameter	Name		Type	Adjustment range	Factory setting	User setting
5.01	Output frequency		RO/P	±400.0 Hz	-	-
5.02	Output voltage		RO/P	0 to 5.09 Volts	-	-
5.03	Output power		RO/P	± [drive I max x 5.09 x √3/1000] kW	-	-
5.04	Motor rpm		RO/P	± 2 x 1.06 rpm	-	-
5.05	DC bus voltage		RO/P	TL: 0 to 420V	-	-
				T: 0 to 830V		
5.06	Rated frequency		R-W	0 to 400.0 Hz	Eur: 50.0 Hz	-
					USA: 60.0 Hz	
5.07	Motor rated current		R-W	0 to drive rated current (A)	Motor rated current corresponding to rating	
5.08	Rated speed		R-W	0 to 9999 rpm	Motor rated speed corresponding to rating	
5.09	Rated voltage		R-W	0 to 480V	Eur TL : 200V USA TL : 230V Eur T : 400V USA T : 460V	
5.10	Rated power factor (cos φ)		R-W	0 to 1.00	0.85	
5.11	Number of motor poles		R-W	0 to 4	0	
5.12	Autotune		R-W	0 to 2	0	
5.13	Dynamic V to F		R-W	0 or 1	0	
5.14	Voltage mode select	◨	R-W	0 to 5	3 then 1	
5.15	Low frequency voltage boost		R-W	0 to 25.0% of 5.09	5.0%	
5.16	Not used					
5.17	Stator resistance		R-W	0 to 32.000 Ω	0	
5.18	Maximum switching frequency		R-W	0 to 5	1	
5.19	High stability space vector modulation		R-W	0 or 1	0	
5.20	Quasi-square enable	◨	R-W	0 or 1	0	
5.21 and 5.22	Not used					
5.23	Voltage offset		RO	0 to 25.5 Volts	-	-
5.24	Transient inductance		R-W	0 to 3200.0 mH	0	
5.25	Stator inductance (Ls)	◨	R-W	0 to 3200.0 mH	150.0 mH	
5.26 to 5.31	Not used					
5.32	Motor torque per amp (Kt)	◨	R-W	0.01 to 320.00 NmA^{-1}	1.00 NmA^{-1}	
5.33	Motor volts per 1000 rpm (Ke)	◨	R-W	0 to 10000 V	98V	
5.34	Unit for displaying the speed		R-W	0 to 2	1	
5.35	Disable auto-switching frequency change		R-W	0 or 1	0	
5.36 to 5.50	Not used					
5.51	q axis inductance	◨	R-W	0 to 999.9 mH	150.0 mH	

⬛ : Function not available in version V2.10.

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MENU 5: MOTOR CONTROL

5.2 - Menu 5 diagram

Voltage control

Post-ramp reference

Slip compensation

Output frequency

5.12	Autotune
5.13	Dynamique V to F
5.14	Voltage mode select
5.15	Low frequency voltage boost

Menu 2

2.01

5.01

Output voltage 5.02

DC bus voltage 5.05

Motor 2 parameter select

0   1   11.45

Modulation

5.18	Maximum switching frequency
5.19	High stability space vector modulation
5.20	Quasi-square enable
5.35	Disable auto-switching frequency change

	Motor 1	Motor 2	
	5.06	21.06	Rated frequency
	5.07	21.07	Rated current
	5.08	21.08	Rated speed
	5.09	21.09	Rated voltage
	5.10	21.10	Rated power factor (cos φ)
	5.11	21.11	Number of poles
	5.17	21.12	Stator resistance
	5.23	21.13	Voltage offset

Motor rpm

5.04

M

Menu 6 programmable logic

Motor 1 inductance

5.24

Motor 2 inductance

21.14

Motor 2 parameters active

21.15

Output power

Absorbed power
V x I x √3

5.03

Menu 4

4.02

Active current

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5.3 - Explanation of parameters in menu 5

◇ 5.01 :**Output frequency**

Adjustment range : ±400.0 Hz
5.01 is the drive output frequency.

◇ 5.02 :**Output voltage**

Adjustment range : 0 to 5.09 Volts
This is the rms voltage at the drive output.

◇ 5.03 :**Output power**

Adjustment range : ± (drive I max.) x 5.09 x $\frac{\sqrt{3}}{1000}$ kW

5.03 is the calculated motor active power.

5.03 = 4.01 x 5.02 x (cos φ x $\frac{\sqrt{3}}{1000}$ kW).

If this parameter has been assigned to an analog output via menu 7, 10V corresponds to the max. power measurable by the drive (I max = 150% of drive rated current).

◇ 5.04 :**Motor rpm**

Adjustment range : ± 2 x 1.06 rpm
The motor speed is calculated from the post- ramp frequency reference (2.01) according to the formula:

5.04 (rpm) = $\frac{60 \times 2.01}{\text{number of pairs of motor poles}}$

◇ 5.05 :**DC bus voltage**

Adjustment range : TL = 0 to 420V
            T = 0 to 860V
Indicates the DC bus voltage measurement.

5.06 : **Rated frequency**
Adjustment range : 0 to 400.0 Hz
Factory setting   : Eur = 50.0 Hz
            USA = 60.0 Hz
This is the point at which motor operation changes from constant torque to constant power.
During standard operation, it is the frequency indicated on the motor nameplate.

5.07 :**Motor rated current**
Adjustment range : 0 to drive rated current (A)
Factory setting   : Motor rated current corresponding to the drive rating (see par. 5.4)
This is the value of the motor rated current indicated on the nameplate. The overload is calculated from this value.

5.08 :**Rated speed**
Adjustment range : 0 to 9999 rpm
Factory setting   : Motor rated speed corresponding to the drive rating (see par. 5.4)
This is the rated speed of the motor indicated on the nameplate.

5.09 :**Rated voltage**
Adjustment range : 0 to 480V
Factory setting   : **Eur TL : 200V**,
            USA TL : 230V
            Eur T : 400V,
            USA T : 460V.
Defines the voltage/frequency ratio as follows:
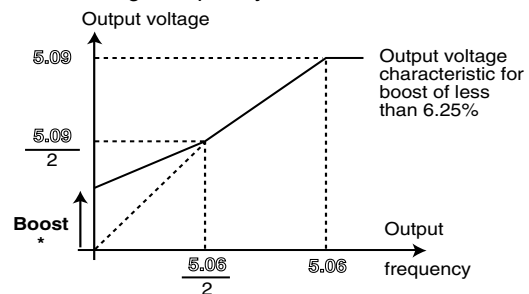
* If the fixed boost has been selected 5.14 = 2.

5.10 :**Rated power factor (Cos φ)**
Adjustment range : 0 to 1.00
Factory setting   : 0.85
The power factor is measured automatically during an autotune phase in level 2 (see 5.12) and set in this parameter. If it is not possible to carry out the autotune procedure, enter the Cos φ value indicated on the motor nameplate.

5.11 :**Number of motor poles**
Adjustment range : 0 to 4
Factory setting   : 0
When this parameter is at 0 (Auto), the drive automatically calculates the number of poles according to the rated speed (5.08) and the rated frequency (5.06). However, the value can be entered directly in accordance with the table below:

Motor rated speed rpm	Display	5.11
3000	2 P	1
1500	4 P	2
1000	6 P	3
750	8 P	4

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MENU 5: MOTOR CONTROL

5.12 **:Autotune**

Adjustment range : 0 to 2
Factory setting   : 0

⚠️ • **The measurement taken when 5.12 = 2 should be taken with the motor uncoupled since the variable speed drive drives the motor at 2/3 of its rated speed. Check that this operation does not present any safety risks, and ensure that the motor is stopped before the autotune procedure.**
       • **After modifying the motor parameters, repeat autotuning.**

0 (no): No autotune
1 (StoP): Measurement of motor characteristics when stopped.
The stator resistance and the voltage offset are stored in 5.17 and 5.23 respectively.
Procedure:
- Ensure that the motor parameters have been set and that the motor is standstill.
- Enable the drive.
- Give a run command. The display indicates "Auto" and "tunE" alternately. Wait for the display to stabilise at 0.
- Disable the drive and remove the run command.
The motor is then ready to operate normally.
Parameter 5.12 returns to 0 as soon as autotuning is complete.
CAUTION:
This autotune is performed automatically even though 5.12 = 0, in the following cases:
- Initial commissioning of the drive
- Return to factory settings, after the drive has been enabled and a run command given

2 (rot): Measurement of motor characteristics with rotation.
The stator resistance and the voltage offset are stored in 5.17 and 5.23 respectively, and the reactive current and the leakage inductance are used to calculate the power factor 5.10. This mode is used to obtain optimum performance.
Procedure:
- Ensure that the motor parameters have been set and that the motor is standstill.
- Enable the drive.
- Give a run command. The motor accelerates up to 2/3 of the rated speed, then performs a freewheel stop. During autotuning, the display indicates "Auto" and "tunE" alternately. Wait for the display to stabilise at 0.
Disable the drive and remove the run command.
The motor is then ready to operate normally.
Parameter 5.12 returns to 0 as soon as autotuning is complete.

5.13 **:Dynamic V to F**

Adjustment range : 0 or 1
Factory setting   : 0
0 (Lin): The V/F ratio is fixed and set by the base frequency (5.06).
1 (dyn): Dynamic V/F ratio.
Generates a voltage/frequency characteristic which varies with the load. It is for use in quadratic torque applications (pumps/fans/compressors). It can be used in constant torque applications with low dynamics to reduce motor noise.
CAUTION:
5.13 is only active if 5.14 = 2 (UtoF).

5.14 **:Voltage mode select** 🔒

Adjustment range : 0 to 5
Factory setting   : 3
Determines the open loop control mode. Modes 0, 1, 3 or 4 are used in flux vector control mode. The difference between these modes is the method used to identify the motor parameters, particularly the stator resistance. As these parameters vary with the temperature and are essential to obtain optimum performance, the machine cycle should be taken into account when selecting the most appropriate mode. Modes 2 and 5 correspond to a U/F ratio control mode. This ratio is linear in mode 2 and square in mode 5.
0 (r.run): The stator resistance and the voltage offset are measured each time the drive receives a run command.
These measurements are only valid if the machine is stopped, and totally defluxed. The measurement is not taken when the run command is given less than 2 seconds after the previous stop. This is the most effective flux vector control mode. However, the operating cycle should be compatible with the 2 seconds required between a stop command and a new run command.

1 (r.no): The stator resistance 5.17 and voltage offset 5.23 are not measured.
This mode is of course the least effective. It should only be used when mode 0 (r.run) is incompatible with the operating cycle. If this were to be the case, during commissioning, an autotune (5.12) should be performed to read the values measured in 5.17 and 5.23 and use them with mode 1 (r.no) during normal operation.

2 (UtoF): Voltage-frequency ratio with fixed boost adjustable via parameters 5.15 and 5.09.
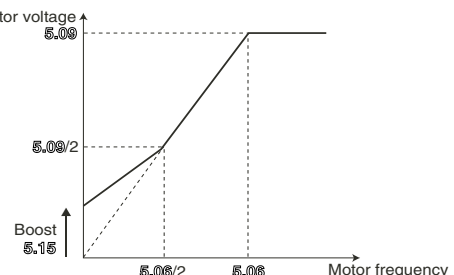
CAUTION:
Use this mode to control several motors.

3 (r.FSt): The stator resistance 5.17 and voltage offset 5.23 are measured the first time the drive is enabled.

4 (r.On): The stator resistance 5.17 and voltage offset 5.23 are measured the first time the drive is enabled following each power-up.

5 (SqrE): Square law characteristic.
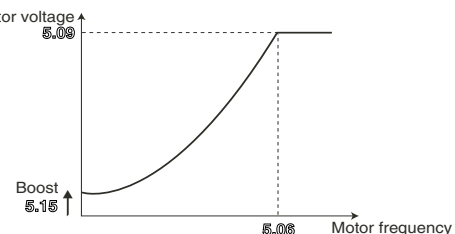
⚠️ • **In mode 4 (r.On), a voltage is briefly applied to the motor. For safety, no electrical circuit must be accessible once the drive has been powered up.**

PROXIDRIVE
IP66 variable speed drive
MENU 5: MOTOR CONTROL

5.15 **:Low frequency voltage boost**
Adjustment range : 0 to 25.0% of motor Un (5.09)
Factory setting : 5.0% motor Un
For operation in U/F mode (5.14 at 2), parameter 5.15 is used to overflux the motor at low speed so that it delivers more torque on starting. It is a percentage of the rated motor voltage (5.09).
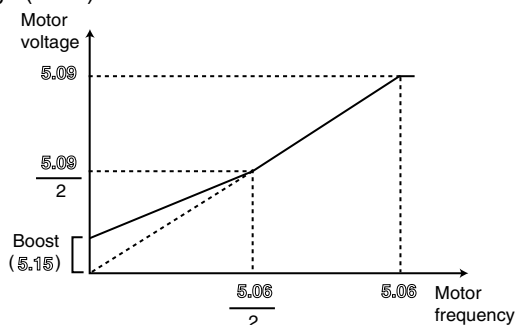
5.16 **:Not used**

5.17 **:Stator resistance**
Adjustment range : 0 to 32.000 Ω
Factory setting : 0
This parameter stores the motor stator resistance for flux vector control (see parameter 5.14).
The stator resistance value is only read if 5.14 = 0.
If the stator resistance cannot be measured (motor not connected, value higher than the max. rating) an "rS" fault appears.
During autotuning (5.12 = 1 or 2), the value of the stator resistance is automatically stored in 5.17.

5.18 **:Maximum switching frequency**
Adjustment range : 0 to 5
Factory setting : 1
Sets the PWM switching frequency.

Frequency	5.18
3 kHz	0
4.5 kHz	**1**
5.5 kHz	2
6 kHz	3
9 kHz	4
11 kHz	5

CAUTION:
**A high switching frequency reduces the magnetic noise, however it increases the motor temperature rise and the level of radio-frequency interference emission, and reduces the starting torque.**
If the temperature of the IGBTs becomes too high, the drive can reduce the switching frequency selected by the user (see 5.35 and 10.18).

5.19 **:High stability space vector modulation**
Adjustment range : 0 or 1
Factory setting : 0
0 (OFF): Function disabled.
1 (On): Function enabled. Instabilities can occur:
- at 50% of the rated motor frequency for an underloaded motor
- around and above the motor rated speed, when this is underloaded or very heavily loaded.
This function is used to eliminate these instabilities.
It also enables a slight reduction in the drive temperature rise. However, using this mode may result in a slight increase in motor noise.

5.20 **:Quasi-square enable** ▮▶
Adjustment range : 0 or 1
Factory setting : 0
0 (OFF): Function disabled.
1 (On): The maximum drive output voltage is higher, resulting in an increase in motor torque. This is beneficial for applications where it is desirable to reduce speed pick-up times in the event of long cycles.
However, the motor torque may show some slight ripples when it is only lightly loaded.
Function not available in version V2.10.

5.21 and **5.22** **:Not used**

5.23 **:Voltage offset**

Adjustment range : 0 to 25.5 volts
This voltage offset is measured by the drive (see parameter 5.14). It is used to correct imperfections in the drive, especially voltage drops in the IGBTs and idle times. This parameter plays an important role in low-speed operation, ie. when the drive output voltage is low.
During autotuning (5.12 = 1 or 2), the value of the voltage offset is automatically stored in 5.23.

5.24 **:Transient inductance**
Adjustment range : 0 to 3200.0 mH
Factory setting : 0
During autotuning with rotation (5.12 = 2), the total motor leakage inductance is stored in this parameter.

5.25 **:Stator inductance (Ls)** ▮▶
Adjustment range : 0 to 3200.0 mH
Factory setting : 150.0 mH
This is the motor stator inductance at rated flux.

5.26 to **5.31** **: Not used**

5.32 **:Motor torque per amp (Kt)** ▮▶
Adjustment range : 0.01 to 320.00 NmA^{-1}
Factory setting : 1.00 NmA^{-1}
Indicates the motor torque per Amp of active current used to calculate the drive speed controller gains (3.17 = 1).
Function not available in version V2.10.

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MENU 5: MOTOR CONTROL

5.33 **: Motor volts per 1000 rpm (Ke)** ▣
Adjustment range : 0 to 10000 V
Factory setting : 98V
Used to set the motor voltage per 1000 rpm. Is used to adjust the current controller integral gain to prevent current peaks when the drive is enabled with a spinning motor.

5.34 **:Unit for displaying the speed**
Adjustment range : 0 to 2
Factory setting : 1

5.34	Drive display	Function
0	Fr	Output frequency expressed in Hz (5.01)
1	**SP**	**Motor speed expressed in rpm (5.04)**
2	Cd	Customer unit defined using a coefficient determined in parameter 11.21 as follows: Cd = 5.04 motor speed in rpm x 11.21

5.35 **:Disable auto-switching frequency change**
Adjustment range : 0 or 1
Factory setting : 0
0 (Auto): In the event of increased temperature of the IGBTs, the switching frequency is automatically reduced.
1 (no): Automatic adjustment of the switching frequency is disabled. In this case, the drive passes into the trip state if the temperature of the IGBTs is too high.

5.36 to **5.50** **:Not used**

5.51 **:q axis inductance** ▣
Adjustment range : 0 to 999.9 mH
Factory setting : 150.0 mH
This is the motor stator inductance in quadrature with the total inductance Ls (5.25), used to control a synchronous motor with projecting poles.

5.4 - Default settings according to drive rating

Default settings of 5.07 and 5.08 vary according to drive rating.
• **50 Hz (Eur) default setting :**

Rating	5.07	5.08
1 TL	17	1400
1,2 TL	27	1429
1,5 TL	34	1428
2 TL	42	1436
2,5 TL	60	1437
3,5 TL	80	1438
4,5 TL	108	1447
5,5 TL	138	1451

Rating	5.07	5.08
1,5 T	20	1400
2 T	25	1429
2,5 T	35	1428
3,5 T	51	1436
4,5 T	72	1437
5,5 T	91	1438
8 T	119	1447
11 T	152	1451

• **60 Hz (USA) default setting :**

Rating	5.07	5.08
1 TL	18	1680
1,2 TL	29	1715
1,5 TL	39	1714
2 TL	56	1723
2,5 TL	74	1724
3,5 TL	100	1726
4,5 TL	135	1736
5,5 TL	167	1741

Rating	5.07	5.08
1,5 T	18	1680
2 T	26	1715
2,5 T	34	1714
3,5 T	48	1723
4,5 T	62	1724
5,5 T	76	1726
8 T	110	1736
11 T	140	1741

Note : Default setting values of 21.07 and 21.08 are the same as the ones of 5.07 and 5.08.

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IP66 variable speed drive
MENU 6: PROGRAMMABLE LOGIC AND TIMERS

6 - MENU 6: PROGRAMMABLE LOGIC AND TIMERS

6.1 - List of parameters in Menu 6

Parameter	Name		Type	Adjustment range	Factory setting	User setting
6.01	Stop mode		R-W	0 to 4	1	
6.02	Not used					
6.03	Mains loss mode		R-W	0 to 2	0	
6.04	Start/stop logic select		R-W	0 to 2	0	
6.05	Not used					
6.06	Injection braking level		R-W	0 to 4.07	100.0%	
6.07	Injection braking time		R-W	0 to 25.0 s	1 s	
6.08	Hold zero speed		R-W	0 or 1	0	
6.09	Catch a spinning motor		R-W	0 or 3	0	
6.10	Enable reduced-voltage operation		R-W	0 or 1	0	
6.11	Enable forward key		R-W	0 or 1	CP version: 1	
					SET version: 0	
6.12	Enable stop key		R-W	0 or 1	1	
6.13	Enable reverse key		R-W	0 or 1	0	
6.14	Not used					
6.15	Drive enable		R-W	0 or 1	1	
6.16	Not used					
6.17	Reset energy meter		R-W	0 or 1	0	
6.18 and 6.19	Not used					
6.20	Powered-up time: years.days		RO/P	0 to 9.364 years, days	-	-
6.21	Powered-up time: hours.minutes		RO/P	0 to 23.59 hrs, min	-	-
6.22	Run time: years.days		RO/P	0 to 9.364 (years, days)	-	-
6.23	Run time: hours.minutes		RO/P	0 to 23.59 (hrs, min)	-	-
6.24	Energy meter: MWh		RO/P	0 to 999.9 MWh	-	-
6.25	Energy meter: kWh		RO/P	0 to 99.99 kWh	-	-
6.26 to 6.29	Not used					
6.30	Sequencing bit: Run forward		R-A	0 or 1	0	-
6.31	Sequencing bit: Jog		R-A	0 or 1	0	
6.32	Sequencing bit: Run reverse		R-A	0 or 1	0	-
6.33	Sequencing bit: Forward/reverse		R-A	0 or 1	0	-
6.34	Sequencing bit: Run		R-A	0 or 1	0	-
6.35 to 6.38	Not used					
6.39	Sequencing bit: Stop		R-A	0 or 1	0	-
6.40 and 6.41	Not used					
6.42	Control word		R-W	0 to 32767	0	
6.43	Control word enable		R-W	0 to 3	0	

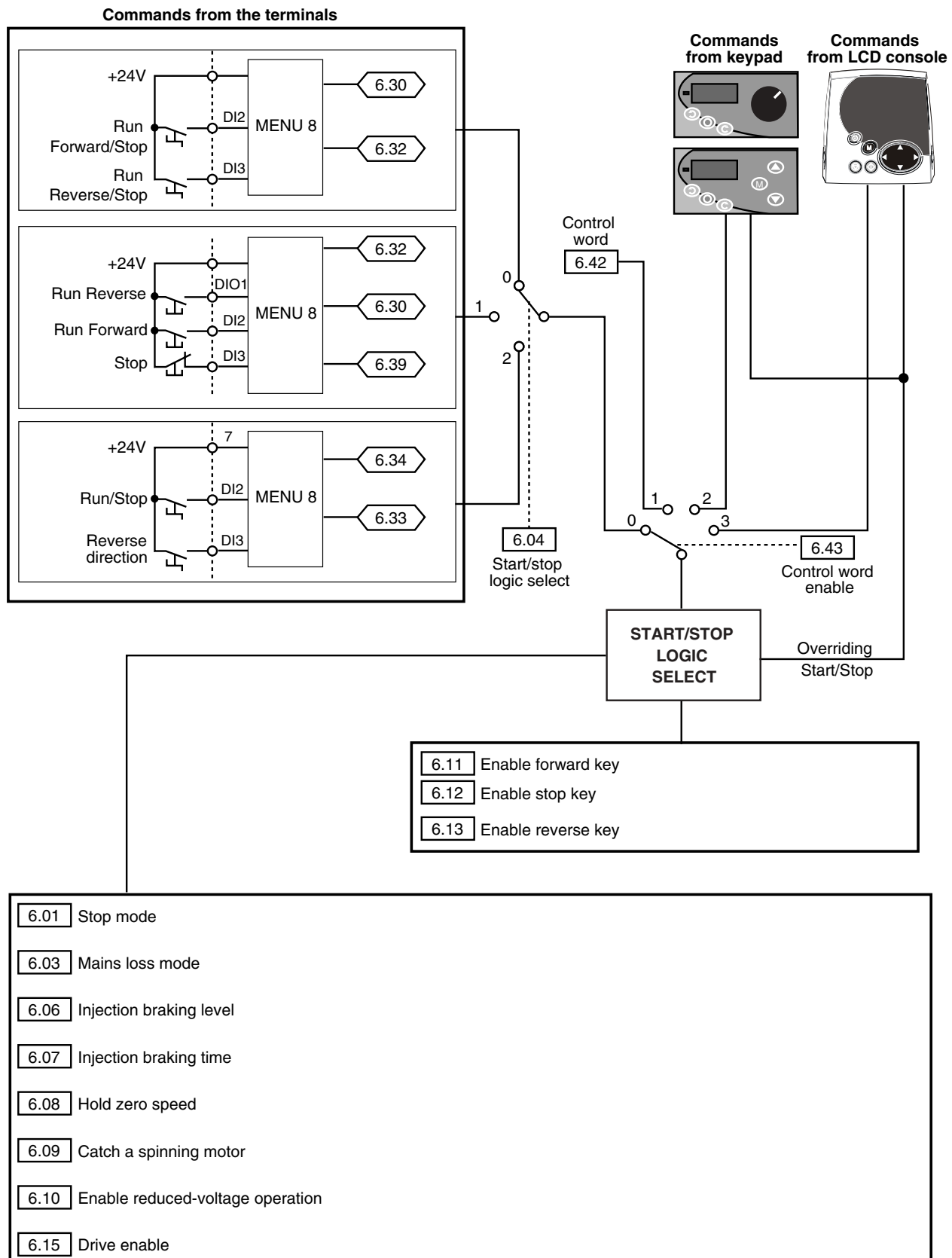# PROXIDRIVE
IP66 variable speed drive
MENU 6: PROGRAMMABLE LOGIC AND TIMERS

6.2 - Menu 6 diagrams

6.2.1 - Programmable logic

Commands from the terminals

LEROY-SOMER

PROXIDRIVE
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MENU 6: PROGRAMMABLE LOGIC AND TIMERS

6.2.2 - Timer, energy meter and alarms
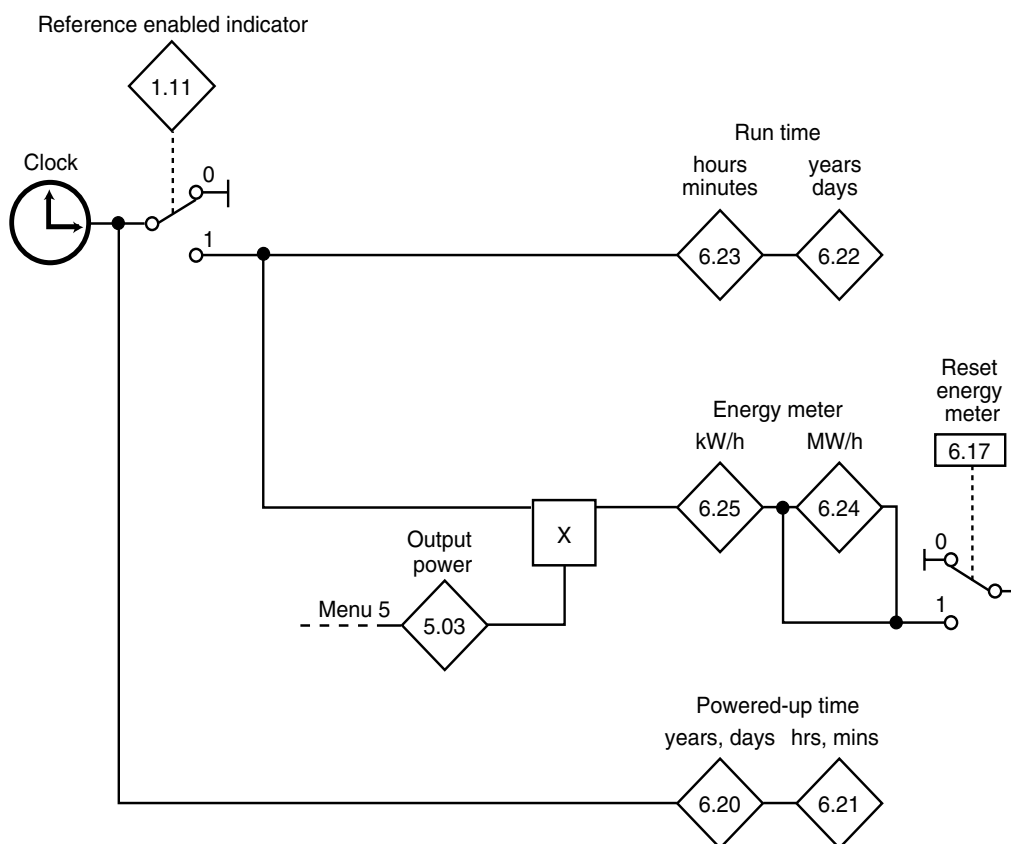
PROXIDRIVE
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MENU 6: PROGRAMMABLE LOGIC AND TIMERS

6.3 - Explanation of parameters in menu 6

| 6.01 | :Stop mode |

Adjustment range :

6.01	LED display	Function
0	FrEE	Freewheel stop
1	**rAMP**	**Stop on deceleration ramp**
2	rPdC	Deceleration ramp + DC injection for an imposed period of time
3	dC-o	DC injection braking stop for an imposed period of time 🔋
4	dC-t	DC injection stop for an imposed period of time 🔋

Factory setting   : 1 (rAMP)

0 (FrEE): Freewheel stop.
The power bridge is deactivated as soon as the stop command is given.
The drive cannot receive another run command for 2 s, the motor demagnetisation time.
The display indicates "rdY", 2 seconds after the stop command. The machine stopping time depends on its inertia.
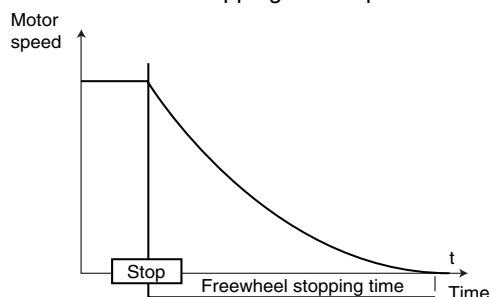
1 (rAMP): Stop on deceleration ramp.
The drive decelerates the motor according to the deceleration mode chosen in parameter 2.04.
One second after the stop, the display indicates "rdY".
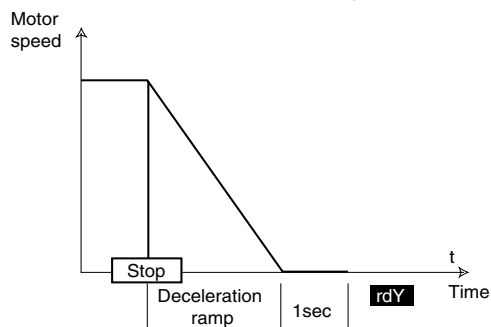
2 (rP.dC): Stop on deceleration ramp with DC injection for an imposed period of time.
The drive decelerates the motor according to the deceleration mode chosen in parameter 2.04.
When zero frequency is reached, the drive injects direct current with an amplitude which can be set in parameter 6.06 for a time defined by parameter 6.07.
The drive then displays "rdY".
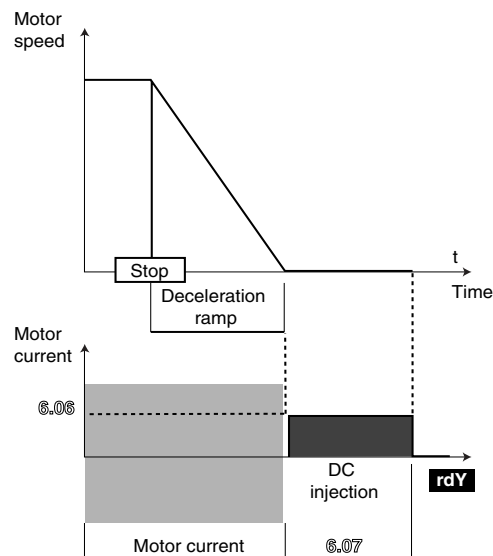
3 (dC-O): Stop by DC injection braking, and elimination at zero speed.
The drive decelerates the motor by setting a low frequency current resulting in almost zero speed, which the drive detects automatically.
The drive then injects direct current with an amplitude which can be set in parameter 6.06 for a time defined by parameter 6.07. The drive then displays "rdY". No run command can be taken into account until "rdY" is displayed.
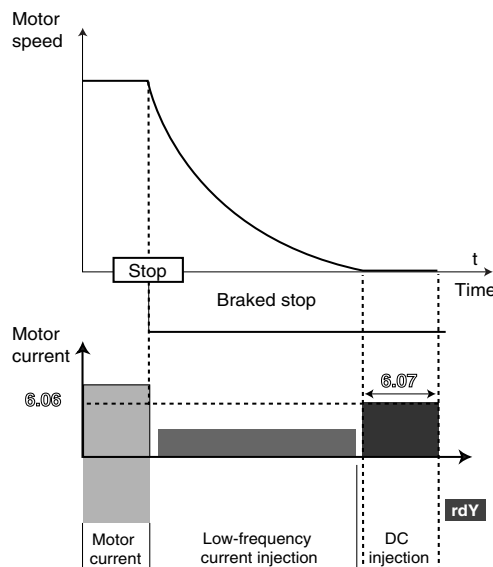
PROXIDRIVE
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MENU 6: PROGRAMMABLE LOGIC AND TIMERS

4 (dC-t): Stop on DC injection with an imposed period of time. The drive decelerates the motor by imposing a current defined by parameter 6.06 for a time defined by parameter 6.07 then the drive displays "rdY". No run command can be taken into account until "rdY" is displayed.
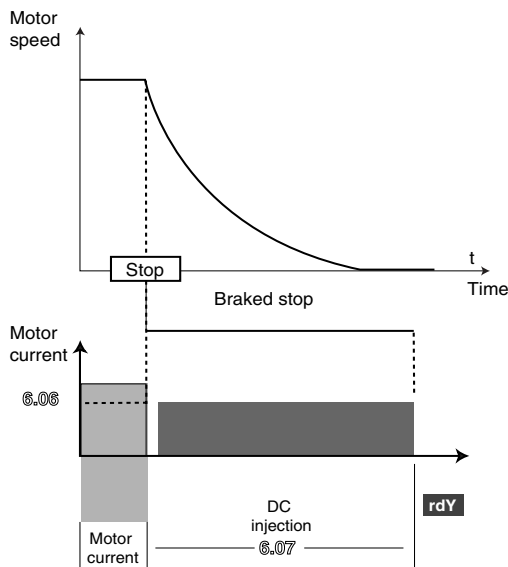
| 6.02 | :Not used |

| 6.03 | :Mains loss mode |

Adjustment range : 0 to 2
Factory setting   : 0

6.03	LED display	Function
0	**diS**	**Transparent to micro-breaks**
1	StOP	Deceleration down to stop
2	rd.th	Deceleration until return of the mains

0 (diS): The drive does not take account of mains supply breaks and continues to operate while there is sufficient voltage on the DC bus.
1 (StOP): In the event of a mains supply break, the drive will decelerate on a ramp, automatically calculated by the drive, so that the motor sends back the energy to the drive DC bus and therefore continues to power its control electronics. On returning to normal conditions, deceleration continues until the motor stops, but according to the deceleration mode configured in 2.04.
2 (rd.th): In the event of a mains supply break, the drive will decelerate on a ramp, automatically calculated by the drive, so that the motor sends back the energy to the drive DC bus and therefore continues to power its control electronics. On returning to normal conditions, the motor reaccelerates up to the reference speed.

| 6.04 | :Start/stop logic select |

Adjustment range : 0 to 2
Factory setting   : 0
Used to choose one of 3 Run/Stop command and Direction of rotation management modes.
0 (Lchd) : DI2 terminal used as FWD/Stop
**   DI3 terminal used as REV/Stop**
**   Commands given by latched contacts.**
1 (Puls) : DI2 terminal used as FWD
            DI3 terminal used as Stop
            DIO1 terminal used as REV
            Commands given by pulsed contact.
In this mode, the DI4 input can be assigned by the customer but only as a stay-put contact and the stop command via DI3 cannot be reassigned. To switch from FWD to REV or vice versa, go via a stop command.
2 (r.InP) : DI2 terminal used as Run/Stop
            DI3 terminal used to select the direction of rotation.
            Commands given by latched contacts.
These three configurations result in automatic assignment of the digital inputs. If, within a configuration, an input is not used by the application (no Reverse operation for example), the corresponding input can be reassigned by means of menu 8.
Note: Modifications to 6.04 must be made with the drive disabled.

| 6.05 | :Not used |

| 6.06 | :Injection braking level |

Adjustment range : 0 to 4.07
Factory setting   : 100.0%
This parameter defines the level of current used for DC injection braking.
CAUTION:
For efficient braking, the value of parameter 6.06 should be 60% minimum.

| 6.07 | :Injection braking time |

Adjustment range : 0 to 25.0 s
Factory setting   : 1 s
This parameter defines the DC injection braking time when 6.01 is at 2, 3 or 4.

| 6.08 | :Hold zero speed |

Adjustment range : 0 or 1
Factory setting   : 0
0 (OFF): The drive output is deactivated at zero speed.
1 (On): The drive output remains active at zero speed in order to hold the torque at standstill. The drive output is deactivated when 6.08 changes to 0. While holding zero speed, the display indicates "StoP".
Note : When the drive is in " Stop " state, and Run command is not enabled after one minute, the drive changes back to "rdy" state (drive output deactivated).

6.09 **:Catch a spinning motor**
Adjustment range : 0 to 3
Factory setting   : 0
If this parameter is enabled (6.09 = 1 to 3), when there is a run command or after a mains supply break, the drive executes a procedure to calculate the motor frequency and direction of rotation. It will automatically recalibrate the output frequency to the measured value and reaccelerate the motor up to the reference frequency.

6.09	Functions
0 (no)	Catch a spinning motor function disabled
1 (On.2d)	Enable to catch a spinning motor which is rotating clockwise or anti-clockwise
2 (On.Fd)	Enable to catch a spinning motor which is rotating clockwise only
3 (On.rS)	Enable to catch a spinning motor which is rotating anti-clockwise only

⚠ **• If the load is stationary at the time of the run command or when the mains supply returns, this operation may cause the machine to rotate in both directions before the motor accelerates.**
        • Before enabling this function, check that there is no danger to equipment and personnel.

6.10 **:Enable reduced-voltage operation**
0 (OFF): The DC bus undervoltage detection thresholds are unchanged.
1 (On): Used to modify the DC bus undervoltage detection thresholds in 400V (T) drives, in order to be at the same levels as 230V drives. This enables a 400V (T) rated motor to be supplied with 230V when necessary, without the drive passing into the trip state.
Note: This parameter is not active for "TL" ratings (6.10 is fixed at 1).

6.11 **:Enable forward key**

Adjustment range: 0 or 1
Factory setting   : CP version = 1
                          SET version = 0
0 (OFF): Local control FWD key disabled.
1 (On): Local control FWD key enabled.

6.12 **:Enable stop key**
Adjustment range : 0 or 1
Factory setting   : 1
0 (OFF): Local control Stop key disabled.
1 (On): Local control Stop key enabled.
If the Stop key is enabled, it is taken into account even if control is via the terminals.
If a stop is ordered via the local console while a run command is present, the run command on the terminals must be opened to authorise restarting.

6.13 **:Enable reverse key**
Adjustment range : 0 or 1
Factory setting   : 0
0 (OFF): Local control REV key disabled.
1 (On): Enables the local control REV key.

6.14 **:Not used**

6.15 **:Drive enable**
Adjustment range : 0 or 1
Factory setting   : 1
0 (diSb): Drive disabled.
1 (Enab): Drive enabled.
CAUTION:
Disabling via the drive terminals overrides 6.15 (see 8.10). If the drive is disabled via the terminals, the user can then disable or enable the drive via 6.15.

6.16 **:Not used**

6.17 **:Reset energy meter**
Adjustment range : 0 or 1
Factory setting   : 0
When this parameter is at 1, the counters 6.24 and 6.25 are reset to 0.

6.18 and **6.19** **:Not used**

6.20 **:Powered-up time: years.days**

Adjustment range : 0 to 9.364 years, days
This parameter records for how many years and days the drive has been powered up.

6.21 **:Powered-up time: hours.minutes**

Adjustment range : 0 to 23.59 hrs, min
This parameter records for how many hours and minutes the drive has been powered up.
After 23.59, 6.21 returns to 0 and 6.20 is incremented by one day.

6.22 **:Run time: years.days**

Adjustment range : 0 to 9.364 (years, days)
This parameter records the number of years and days of operation since the drive was first powered up.

6.23 **:Run time: hours.minutes**

Adjustment range : 0 to 23.59 (hrs, min)
This parameter records the number of hours and minutes of operation since the drive was first powered up.
After 23.59, 6.23 returns to 0 and 6.22 is incremented by 1 day.

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MENU 6: PROGRAMMABLE LOGIC AND TIMERS

6.24 **:Energy meter: MWh**

Adjustment range : 0 to 999.9 MWh
This parameter records the drive energy consumption in MWh.
This counter can be reset to 0 by changing parameter 6.17 to 1.

6.25 **:Energy meter: kWh**

Adjustment range : 0 to 99.99 kWh
This parameter records the drive energy consumption in kWh.
This counter can be reset to 0 by changing parameter 6.17 to 1.

6.26 to **6.29** **: Not used**

6.30 to **6.34** and **6.39** **:Sequencing bits**

Adjustment range : 0 or 1
Factory setting   : 0
The drive logic command manager (6.04) uses these bits as inputs rather than linking directly to the terminals. This enables the customer to define the use for each drive terminal according to the needs of each application. Although these parameters are read/write type, they are volatile and are not stored when the drive is powered down. Each time the drive is powered up they will be reset to 0.
6.30 : Run forward
6.31 : Jog
6.32 : Run reverse
6.33 : Forward/reverse
6.34 : Run
6.39 : Stop

6.35 to **6.38** **: Not used**

6.40 and **6.41** **:Not used**

6.42 **:Control word**
Adjustment range : 0 to 32767
Factory setting   : 0
The control word is used to control the drive via a serial link. Each function has a corresponding binary code:

Bit	Binary codes	Function	Equivalent parameter
0	1	Drive enable	6.15
1	2	Run forward	6.30
2	4	Jog	6.31
3	8	Run reverse	6.32
4	16	Forward/Reverse	6.33
5	32	Run	6.34
6	64	Reserved	
7	128	Reserved	
8	256	Analog ref./Preset ref.	1.42
9	512	Reserved	
10	1024	Reserved	
11	2048	Reserved	
12	4096	Reserved	
13	8192	Reset drive	10.33
14	16384	Reserved	

6.42 is used to give commands to the drive. It should correspond to the binary sum of the commands to be given to the drive.
So that the control word can be taken into account, parameter 6.43 should be at 1.

6.43 **:Control word enable**
Adjustment range : 0 or 3
Factory setting   : 0
0 (terM): Commands are given by the terminals.
1 (buS): Commands are given by the control word 6.42.
2 (Pad): Commands are given by the keypad.
3 (Lcd): Commands are given by the LCD console.
Note: Modifications to 6.43 must be made with the drive disabled.
CAUTION:
• The Stop keys on keypads or the console, if enabled, are always taken into account irrespective of the origin of the commands.
If a stop is caused by the Stop key on the keypad or console whereas the origin of the commands comes from the terminals or the fieldbus (6.43 = 0 or 1) and a run command is present, the run command will have to go back to 0 then 1 in order to be taken into account.
• When the safety function is enabled 8.10 = 1 (sEcu), the value of 6.43 is automatically fixed at 0 (terM). The user can modify this value, but this will disable the safety function, and will force 8.10 to 0 (Enab).

Notes

PROXIDRIVE
IP66 variable speed drive
MENU 7: ASSIGNMENT OF ANALOG INPUTS AND OUTPUTS

7 - MENU 7: ASSIGNMENT OF ANALOG INPUTS AND OUTPUTS

7.1 - List of parameters in Menu 7

| Parameter	Name	Type	Adjustment range	Factory setting	User setting
7.01	ADI1input level	RO/P	0 to 100.0% (analog)	-	-
			0.00% or 100.0% (digital)		
7.02	ADI2 input level	RO/P	0 to 100.0% (analog)	-	-
			0.00% or 100.0% (digital)		
7.03	ADIO3 input or output level	RO/P	0 to 100.0%		
7.04 and 7.05	Not used				
7.06	ADI1 mode	R-W	0 to 7	6	
7.07	Not used				
7.08	ADI1 input scaling	R-W	0 to 2.50	1.00	
7.09	ADI1 input invert	R-W	0 or 1	0	
7.10	ADI1 input destination	R-W/P	0.00 to 21.51	1.36	
7.11	ADI2 input mode	R-W	0 to 8	4	
7.12	ADI2 input scaling	R-W	0 to 2.50	1.00	
7.13	ADI2 input invert	R-W	0 or 1	0	
7.14	ADI2 input destination	R-W/P	0.00 to 21.51	1.37	
7.15	ADIO3 mode	R-W	0 to 10	10	
7.16	ADIO3 scaling	R-W	Input: 0 to 2.50	1.00	
			Output: 0 to 32.00		
7.17	ADIO3 input invert	R-W	0 or 1	0	
7.18	ADIO3 input destination/output source	R-W/P	0.00 to 21.51	5.04	
7.19 to 7.26	Not used				
7.27	ADI1 input current loop loss	RO/P	0 or 1	-	-
7.28	ADI2 input current loop loss	RO/P	0 or 1	-	-
7.29	ADIO3 input or output current loop loss	RO/P	0 or 1	-	-
7.30 to 7.32	Not used				
7.33	ADIO3 output control	R-W	0 to 4	0	
7.34	IGBT junction temperature	RO/P	0 to 200.0 °C	-	-
7.35 to 7.57	Not used				
7.58	ADI1 min. threshold	R-W	0 to 1.00	0	
7.59	ADI2 min. threshold	R-W	0 to 1.00	0	
7.60	ADIO3 min. threshold	R-W	0 to 1.00	0	
7.61	Potentiometer min. threshold	R-W	0 to 1.00	0	
7.62	Potentiometer input scaling	R-W	0 to 2.50	1.00	
7.63	Potentiometer input invert	R-W	0 or 1	0	
7.64	Potentiometer input destination	R-W/P	0.00 to 21.51	0.00	
7.65	PTC status	RO/P	0 or 1	-	
7.66	Internal braking resistor temperature	RO/P	0 to 200.0 °C	-	-
7.67	Local control potentiometer input	RO/P	0 to 100.0%	-	-

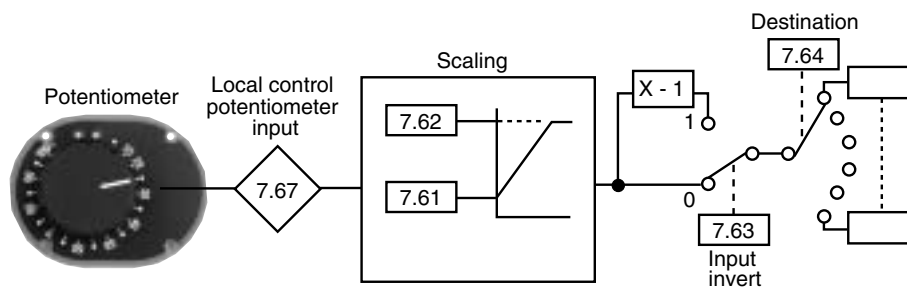# PROXIDRIVE
IP66 variable speed drive
MENU 7: ASSIGNMENT OF ANALOG INPUTS AND OUTPUTS

7.2 - Menu 7 diagram

7.2.1 - Assignment of analog I/O
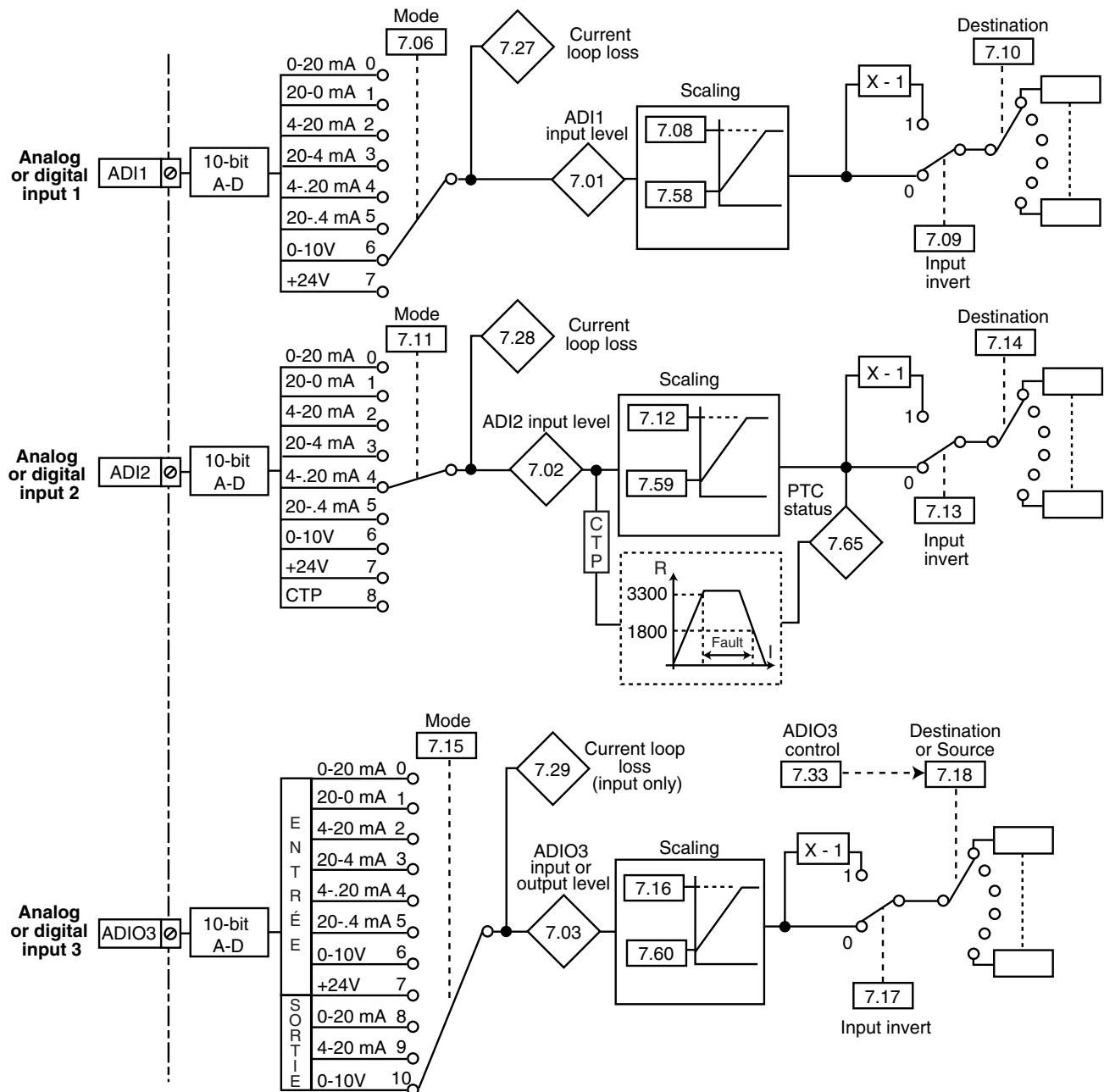
7.2.2 - Local controls

7.2.3 - Temperature indications

7.34 IGBT junction temperature   7.66 Internal braking resistor temperature

PROXIDRIVE
IP66 variable speed drive
MENU 7: ASSIGNMENT OF ANALOG INPUTS AND OUTPUTS

7.3 - Explanation of parameters in menu 7

Note : The sampling period is 6 ms for menu 7 analog inputs and outputs.

`7.01` and `7.02` :ADI1 and ADI2 level

Adjustment range
As analog input : 0 to 100.0% of the adjustment range for the parameter assigned to the input
As digital input : 0.00% (corresponds to logical 0) or 100.0% (corresponds to logical 1)
Used to read the value of the analog input or the state of the corresponding digital input.
This input uses an analog/digital converter with 10-bit resolution.

`7.03` :ADIO3 input or output level

Adjustment range : 0 to 100.0% of the adjustment range for the parameter assigned to the analog input or output.
Used to read the corresponding analog input or output. This input (or output) uses an analog/digital converter with 10-bit resolution.
The sampling period is 2 ms maximum.

`7.04` and `7.05` :Not used

`7.06` :ADI1 mode
Adjustment range : 0 to 7
Factory setting : 6
Used to define the type of signal on the ADI1 input.

7.06	LED display	Description
0	0-20	0-20mA current signal, 0mA corresponds to the minimum reference
1	20-0	20-0mA current signal, 20mA corresponds to the minimum reference
2	4-20	4-20mA current signal with detection of signal loss. 4mA corresponds to the minimum reference
3	20-4	20-4mA current signal with detection of signal loss. 20mA corresponds to the minimum reference
4	4-.20	4-20mA current signal without detection of signal loss. 4mA corresponds to the minimum reference
5	20-.4	20-4mA current signal without detection of signal loss. 20mA corresponds to the minimum reference
6	**uolt**	**0-10V voltage signal**
7	d-In	The input is configured as a digital input

`7.07` :Not used

`7.08` and `7.12` :ADI1 and ADI2 input scaling

Adjustment range : 0 to 2.50
Factory setting : 1.00
These parameters are used, if necessary, to scale the analog inputs. However, this rarely proves necessary since the maximum input level (100%) automatically corresponds to the max. value of the destination parameter.
Not used when the input is used as a digital input.

`7.09` and `7.13` :ADI1 and ADI2 input invert
Adjustment range : 0 or 1
Factory setting : 0
This parameter is used to invert the input signal.
0 (OFF): Input signal not inverted.
1 (On): Input signal inverted.

`7.10` :ADI1 input destination
Adjustment range : 0.00 to 21.51
Factory setting : 1.36 : Analog input 1 assigned to analog reference 1
This address should contain the number of the parameter which you wish to assign to input ADI1.
Only numerical parameters can be assigned if the input is configured as an analog input and bit parameters if the input is configured as a digital input.
If an unsuitable parameter is programmed, no assignment will be taken into account.

`7.11` :ADI2 input mode
Adjustment range : 0 to 8
Factory setting : 4
Used to define the type of signal on the ADI2 input.

7.11	LED display	Description
0	0-20	0-20mA current signal, 0mA corresponds to the minimum reference
1	20-0	20-0mA current signal, 20mA corresponds to the minimum reference
2	4-20	4-20mA current signal with detection of signal loss. 4mA corresponds to the minimum reference
3	20-4	20-4mA current signal with detection of signal loss. 20mA corresponds to the minimum reference
4	**4-.20**	**4-20mA current signal without detection of signal loss. 4mA corresponds to the minimum reference**
5	20-.4	20-4mA current signal without detection of signal loss. 20mA corresponds to the minimum reference
6	uolt	0-10V voltage signal
7	d-In	The input is configured as a digital input
8	PTC	The input is configured to manage the motor PTC sensors

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MENU 7: ASSIGNMENT OF ANALOG INPUTS AND OUTPUTS

7.14 **:ADI2 input destination**
Adjustment range : 0.00 to 21.51
Factory setting : 1.37 : Analog input 2 assigned to analog reference 2
This address should contain the number of the parameter which you wish to assign to input ADI2.
Only numerical parameters can be assigned if the input is configured as an analog input and bit parameters if the input is configured as a digital input.
If an unsuitable parameter is programmed, no assignment will be taken into account.

7.15 **:ADIO3 mode**
Adjustment range : 0 to 10
Factory setting : 10
Used to define whether ADIO3 is used as an input or output and the type of signal used.

7.15	LED display	Description
0	0-20	0-20mA current input, 0mA corresponds to the minimum reference
1	20-0	20-0mA current input, 20mA corresponds to the minimum reference
2	4-20	4-20mA current input with detection of signal loss. 4mA corresponds to the minimum reference
3	20-4	20-4mA current input with detection of signal loss. 20mA corresponds to the minimum reference
4	4-.20	4-20mA current input without detection of signal loss. 4mA corresponds to the minimum reference
5	20-.4	20-4mA current input without detection of signal loss. 20mA corresponds to the minimum reference
6	uolt	0-10V voltage input
7	d-In	The input is configured as a digital input
8	0-20 o	0-20mA current output, where 20mA corresponds to the maximum value of the assigned parameter
9	4-20 o	4-20mA current output, where 20mA corresponds to the maximum value of the assigned parameter
10	**0-10 o**	**0-10V voltage output, where 10V corresponds to the maximum value of the assigned parameter**

7.16 **:ADIO3 scaling**
Adjustment range : Input: 0 to 2.50
                  Output: 0 to 32.00
Factory setting : 1.00
This parameter is used if necessary to scale the analog output (or input). However, this rarely proves necessary since the maximum value of the analog output (or input) automatically corresponds to the maximum value of the parameter which has been assigned.

7.17 **:ADIO3 input invert**
Adjustment range : 0 or 1
Factory setting : 0
Used to invert the input or output signal.
0 (OFF): Signal not inverted.
1 (On): Signal inverted.

7.18 **:ADIO3 input destination/output source**
Adjustment range : 0.00 to 21.51
Factory setting : 5.04
This address should contain the number of the parameter which you wish to assign to ADIO3.
Only numerical parameters can be addressed. If an unsuitable parameter is programmed, the corresponding output (or input) will take the value 0.

7.19 to **7.26** : **Not used**

7.27 to **7.29** : **ADI1 to AD1O3 current loop loss**

Adjustment range : 0 or 1
This parameter changes to 1 when in 4-20 mA current mode with detection of signal loss, the analog signal changes to less than 3 mA.
7.27 : Corresponds to ADI1.
7.28 : Corresponds to ADI2.
7.29 : Corresponds to ADIO3. Detection does not work if ADIO3 is used as an output.

7.30 to **7.32** : **Not used**

7.33 **:ADIO3 control**
Adjustment range : 0 to 4
Factory setting : 0
This parameter is used to assign the ADIO3 function quickly when it is being used as an output.
7.33 causes 7.18 to be configured automatically in accordance with the table below.

Value	Mnemonic	ADIO3 function	Value of 7.18
0	**SPd**	**Motor rpm**	5.04
1	Ld	Motor load	4.02
2	A	Motor current	4.01
3	Puur	Output power	5.03
4	Adv	Any assignment	0.00

If ADIO3 is used as an input, 7.33 is forced to 4.

7.34 **:IGBT junction temperature**

Adjustment range : 0 to 200.0 °C
Indicates the measured temperature of the IGBT junction. The drive passes into the trip state when the temperature reaches 110°C and can be reinitialised when the temperature falls back below 100°C.

7.35 to **7.57** : **Not used**

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MENU 7: ASSIGNMENT OF ANALOG INPUTS AND OUTPUTS

7.58   **: ADI1 min. threshold**
Adjustment range : 0 to 1.00
Factory setting : 0
This parameter is a multiplication coefficient applied to the max value of the ADI1 destination parameter. With an analog input value of 0, it is used to obtain a different value from the destination parameter min value.
Value 0 = (7.58 x destination parameter max value) + destination parameter min value.
Example: ADI1 is assigned to a parameter with an adjustment range of 0 - 30000. If 7.58 = 0.01, 0 - 100% on ADI1 corresponds to 300 - 30000.

7.59   **: ADI2 min. threshold**
Adjustment range : 0 to 1.00
Factory setting : 0
This parameter is a multiplication coefficient applied to the max value of the ADI2 destination parameter. With an analog input value of 0, it is used to obtain a different value from the destination parameter min value.
Value 0 = (7.59 x destination parameter max value) + destination parameter min value.
Example: ADI2 is assigned to a parameter with an adjustment range of 0 - 30000. If 7.59 = 0.01, 0 - 100% on ADI2 corresponds to 300 - 30000.

7.60   **: ADIO3 min. threshold**
Adjustment range : 0 to 1.00
Factory setting : 0
This parameter is a multiplication coefficient applied to the max value of the ADIO3 destination parameter. With an analog input value of 0, it is used to obtain a different value from the destination parameter min value.
Value 0 = (7.60 x destination parameter max value) + destination parameter min value.
Example: ADIO3 is assigned to a parameter with an adjustment range of 0 - 30000. If 7.60 = 0.01, 0 - 100% on ADIO3 corresponds to 300 - 30000.
Note: This parameter only applies when ADIO3 is configured as an input.

7.61   **: Potentiometer min. threshold**
Adjustment range : 0 to 1.00
Factory setting : 0
This parameter is a multiplication coefficient applied to the max value of the potentiometer input destination parameter. With an analog input value of 0, it is used to obtain a different value from the destination parameter min value.
Value 0 = (7.61 x destination parameter max value) + destination parameter min value.
Example: the potentiometer input is assigned to a parameter with an adjustment range of 0 - 30000. If 7.61 = 0.01, 0 - 100% on the potentiometer input corresponds to 300 - 30000.

7.62   **:Potentiometer input scaling**
Adjustment range : 0 to 2.50
Factory setting : 1.00
These parameters are used, if necessary, to scale the potentiometer input. This rarely proves necessary since the maximum input level automatically corresponds to the max. value of the destination parameter.

7.63   **:Potentiometer input invert**
Adjustment range : 0 or 1
Factory setting : 0
This parameter is used to invert the polarity of the potentiometer input.
0 (OFF): Input not inverted.
1 (On): Input inverted.

7.64   **:Potentiometer input destination**
Adjustment range : 0.00 to 21.51
Factory setting : 0.00
Used to define the destination for the reference from the potentiometer. With the local control option, the destination of the potentiometer input is assigned to parameter 1.36 (analog reference 1).
In this case, 1.36 is unassigned from 7.10 (analog input 1). The destination can then be modified at any time by the user. In this case, 1.36 can then be assigned to another analog input.

7.65   **:PTC status**

Adjustment range : 0 or 1
Indicates the status of the PTC sensor.
0 : PTC not tripped.
1 : PTC tripped.

7.66   **:Internal braking resistor temperature**

Adjustment range : 0 to 200.0 °C
Indicates the temperature measured on the braking resistor. The drive passes into the trip state when the temperature reaches 110°C and can be reinitialised when the temperature falls back below 100°C.

7.67   **:Local control potentiometer input**

Adjustment range : 0 to 100.0%
Used to read the value of the potentiometer input from the local controls.

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MENU 7: ASSIGNMENT OF ANALOG INPUTS AND OUTPUTS

Notes

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MENU 8: ASSIGNMENT OF DIGITAL INPUTS AND OUTPUTS

8 - MENU 8: ASSIGNMENT OF DIGITAL INPUTS AND OUTPUTS

8.1 - List of parameters in Menu 8

Parameter	Name	Type	Adjustment range	Factory setting	User setting
8.01	DIO1 input or output state	RO/P	0 or 1	-	-
8.02	DI2 input state	RO/P	0 or 1	-	-
8.03	DI3 input state	RO/P	0 or 1	-	-
8.04	DI4 input state	RO/P	0 or 1	-	-
8.05 and 8.06	Not used				
8.07	Relay status	RO/P	0 or 1	-	-
8.08	Not used				
8.09	Drive enable indicator	RO/P	0 or 1	-	-
8.10	Drive enable mode select	R-W/P	0 or 1	1	
8.11	DIO1 input or output invert	R-W	0 or 1	0	
8.12	DI2 input invert	R-W	0 or 1	0	
8.13	DI3 input invert	R-W	0 or 1	0	
8.14	DI4 input invert	R-W	0 or 1	0	
8.15 and 8.16	Not used				
8.17	Relay source invert	R-W	0 or 1	0	
8.18 and 8.19	Not used				
8.20	Digital I/O read word	RO	0 to 511	-	
8.21	DIO1 input destination/output source	R-W/P	0.00 to 21.51	10.03	
8.22	DI2 input destination	R-W/P	0.00 to 21.51	6.30	
8.23	DI3 input destination	R-W/P	0.00 to 21.51	6.32	
8.24	DI4 input destination	R-W/P	0.00 to 21.51	1.41	
8.25 and 8.26	Not used				
8.27	Relay source	R-W/P	0.00 to 21.51	10.01	
8.28 to 8.30	Not used				
8.31	DIO1 input or output select	R-W	0 or 1	1	
8.32 to 8.40	Not used				
8.41	DIO1 control	R-W	0 to 9	0	
8.42 to 8.60	Not used				
8.61	DIRF input state	RO/P	0 or 1	-	-
8.62	DISP input state	RO/P	0 or 1	-	-
8.63	DIRR input state	RO/P	0 or 1	-	-
8.64 to 8.70	Not used				
8.71	DIRF input invert	R-W	0 or 1	0	
8.72	Not used				
8.73	DIRR input invert	R-W	0 or 1	0	

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MENU 8: ASSIGNMENT OF DIGITAL INPUTS AND OUTPUTS

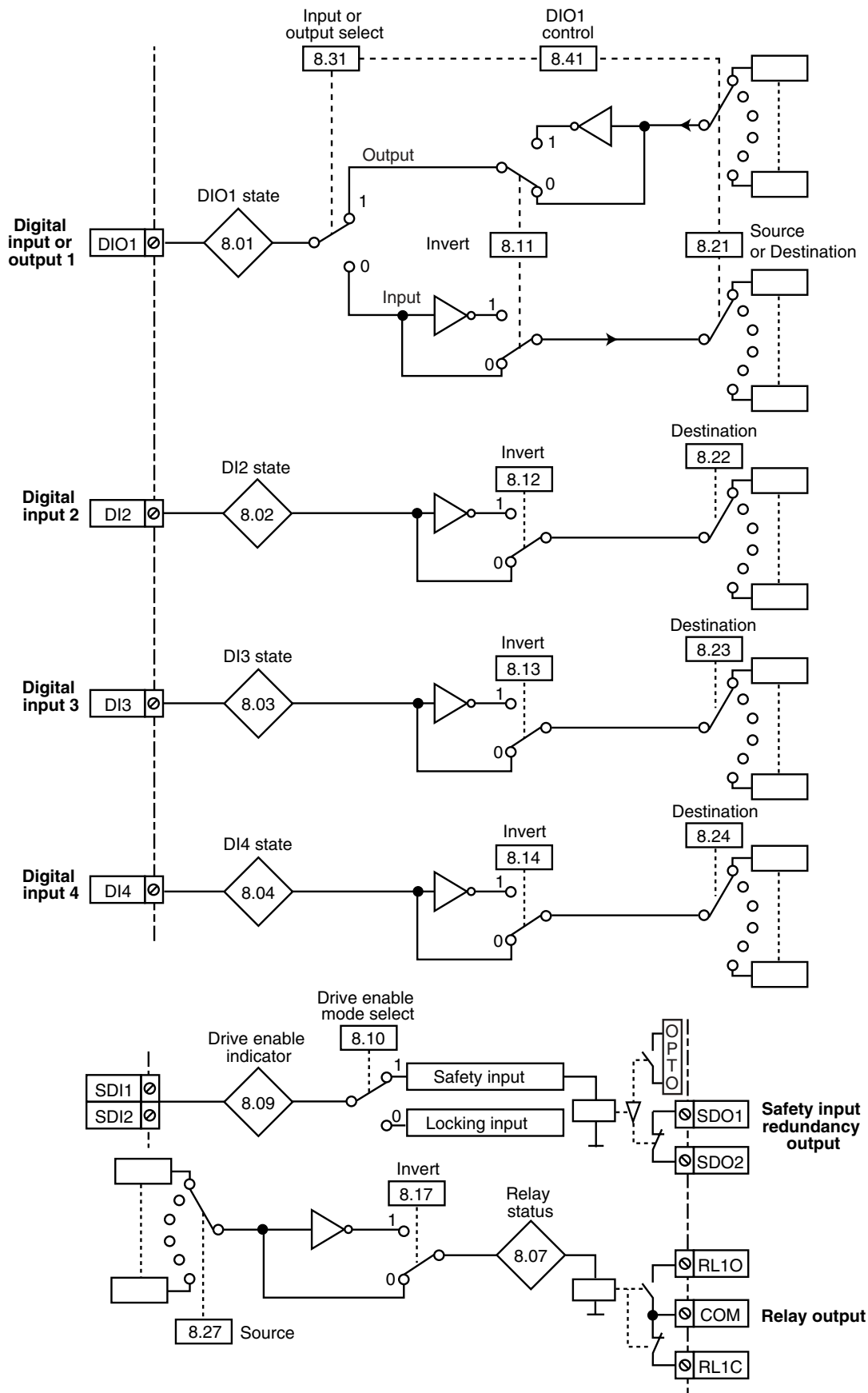| Parameter	Name	Type	Adjustment range	Factory setting	User setting
8.74 to 8.80	Not used				
8.81	DIRF input destination	R-W	0.00 to 21.51	0.00	
8.82	Not used				
8.83	DIRR input destination	R-W	0.00 to 21.51	0.00	

PROXIDRIVE
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MENU 8: ASSIGNMENT OF DIGITAL INPUTS AND OUTPUTS

8.2 - Menu 8 diagrams

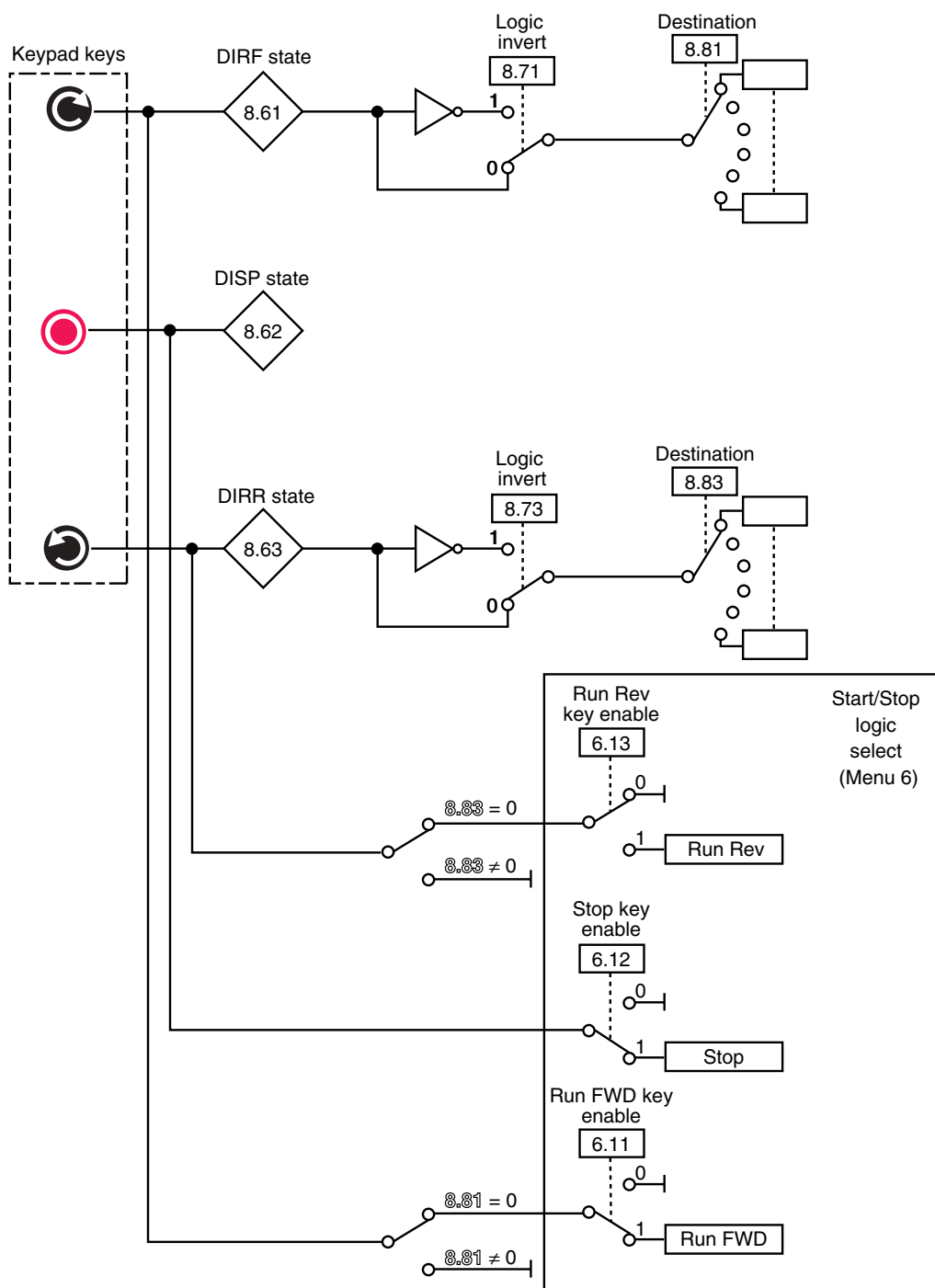### 8.2.1 - Assignment of digital inputs and the relay output

PROXIDRIVE
IP66 variable speed drive
MENU 8: ASSIGNMENT OF DIGITAL INPUTS AND OUTPUTS

8.2.2 - Local controls

Keypad keys

DIRF state
8.61

Logic invert
8.71
1
0

Destination
8.81

DISP state
8.62

DIRR state
8.63

Logic invert
8.73
1
0

Destination
8.83

Run Rev key enable
6.13
0
1   Run Rev

Start/Stop logic select (Menu 6)

8.83 = 0
8.83 ≠ 0

Stop key enable
6.12
0
1   Stop

Run FWD key enable
6.11
0
1   Run FWD

8.81 = 0
8.81 ≠ 0

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MENU 8: ASSIGNMENT OF DIGITAL INPUTS AND OUTPUTS

8.3 - Explanation of parameters in menu 8

Note : The sampling period is 2 ms for digital inputs or outputs.

8.01 :DIO1 input or output state

Adjustment range : 0 or 1
This parameter indicates the state of the input or output.
0 (OFF): Inactive.
1 (On): Active.

8.02 :DI2 input state

Adjustment range : 0 or 1
This parameter indicates the input state.
0 (OFF): Inactive.
1 (On): Active.

8.03 :DI3 input state

Adjustment range : 0 or 1
This parameter indicates the input state.
0 (OFF): Inactive.
1 (On): Active.

8.04 : DI4 input state

Adjustment range : 0 or 1
This parameter indicates the state of the input.
0 (OFF): Inactive.
1 (On): Active.

8.05 and **8.06** :Not used

8.07 :Relay status

Adjustment range : 0 or 1
This parameter indicates the state of the relay output.
0 (OPen): RL1O open, RL1C closed.
1 (CloS): RL1O closed, RL1C open.

8.08 :Not used

8.09 :Drive enable indicator

Adjustment range : 0 or 1
This parameter indicates the state of the safety input (on terminal block).
0 (diSb): Drive disabled.
1 (Enab): Drive enabled.

8.10 :Drive enable mode select
Adjustment range : 0 or 1
Factory setting : 1
0 (Enab): The SDI input is used as a simple disabling input.
1 (SEcu): The SDI input is used as a safety input. In order to conform to safety standard EN 954-1 category 3, the drive must be wired in accordance with the diagram recommended in the installation and commissioning manual ref. 3739.
Note: Modifications to 8.10 must be made with the drive disabled.

⚠ **• The safety input function is disabled automatically 8.10 = 0 (Enab), when the drive is controlled by the keypad or a fieldbus, for example, when using preset configuration 11 "Pad" or when 6.43 = 1 to 3.**

8.11 : DIO1 input or output invert
Adjustment range : 0 or 1
Factory setting : 0
This parameter is used to invert the digital input or output.
0 (OFF): Not inverted.
1 (On): Inverted.

8.12 :DI2 input invert
Adjustment range : 0 or 1
Factory setting : 0
This parameter is used to invert the digital input.
0 (OFF): Not inverted.
1 (On): Inverted.

8.13 :DI3 input invert
Adjustment range : 0 or 1
Factory setting : 0
This parameter is used to invert the digital input.
0 (OFF): Not inverted.
1 (On): Inverted.

8.14 : DI4 input invert
Adjustment range : 0 or 1
Factory setting : 0
This parameter is used to invert the digital input or output.
0 (OFF): Not inverted.
1 (On): Inverted.

8.15 and **8.16** :Not used

8.17 :Relay source invert
Adjustment range : 0 or 1
Factory setting : 0
This parameter is used to invert the relay status.
0 (OFF): Not inverted.
1 (On): Inverted.
CAUTION:
When the safety function is enabled 8.10 = 1 (sEcu), the value of 8.17 is fixed at 0, and cannot be modified.

8.18 and **8.19** :Not used

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MENU 8: ASSIGNMENT OF DIGITAL INPUTS AND OUTPUTS

8.20 :Digital I/O read word

Adjustment range : 0 to 511
This parameter is used to determine the state of the I/O with a single read operation.
Each bit of this word represents the state of parameters 8.01 to 8.09.

Bit	0	1	2	3	4	5	6	7	8
State	8.01	8.02	8.03	8.04	8.61	8.62	8.07	8.63	8.09

8.21 : DIO1 input destination/output source

Adjustment range : 0.00 to 21.51
Factory setting : 10.03 Zero frequency
This parameter is used to select the DIO1 input destination or output source.
Any unprotected "bit" type parameter can be assigned.
If an unsuitable parameter is addressed to an input or output, no assignment is taken into account.

8.22 : DI2 input destination

Adjustment range : 0.00 to 21.51
Factory setting : 6.30 Run FWD/Stop
This parameter is used to select the destination of input DI2.
Any unprotected "bit" type parameter can be assigned to the input.
If an unsuitable parameter is addressed to an input or output, no assignment is taken into account.

8.23 :DI3 input destination

Adjustment range : 0.00 to 21.51
Factory setting : 6.32 Run REV/Stop
This parameter is used to select the destination of input DI3.
Any unprotected "bit" type parameter can be assigned to the input.
If an unsuitable parameter is addressed to an input or output, no assignment is taken into account.
Note: In pulsed mode 6.04 = 1 (Puls), 8.23 is frozen at 6.39. To unfreeze it, you need to modify the value of 6.04.

8.24 :DI4 input destination

Adjustment range : 0.00 to 21.51
Factory setting : 1.41: Selection of analog reference 1 or 2
This parameter is used to select the destination of input DI4.
Any unprotected "bit" type parameter can be assigned to the input.
If an unsuitable parameter is addressed to an input or output, no assignment is taken into account.

8.25 and 8.26 :Not used

8.27 :Relay source

Adjustment range : 0.00 to 21.51
Factory setting : 10.01 Drive ready
This parameter is used to select the source for the output relay.
Any unprotected "bit" type parameter can be assigned.
If an unsuitable parameter is addressed to an input or output, no assignment is taken into account.
CAUTION:
When the safety function is enabled 8.10 = 1 (sEcu), the value of 8.27 is fixed at 10.01, and cannot be modified.

8.28 to 8.30 : Not used

8.31 :DIO1 input or output select

Adjustment range : 0 or 1
Factory setting : 1
Used to configure terminal DIO1 as an input or output.
0 (In): Terminal configured as an input.
1 (Out): Terminal configured as an output.

8.32 to 8.40 : Not used

8.41 :DIO1 control

Adjustment range : 0 to 9
Factory setting : 0
This parameter is used to assign the DIO1 function quickly.
Depending on the value of 8.41, 8.21 and 8.31 are automatically configured according to the table below.

Value	Mnemonic	DIO1 function	Value of 8.21	Value of 8.31
0	**n = 0**	**Zero speed output**	10.03	**1**
1	At.SP	Reference reached output	10.06	1
2	Lo.SP	Minimum speed output	10.04	1
3	At.Ld	Rated load reached output	10.08	1
4	act	Drive output active	10.02	1
5	alar	Drive general alarm output	10.19	1
6	I.Lt	Current limit output	10.09	1
7	JoG	Jogging input	6.31	0
8	rESE	Reset input	10.33	0
9	Adv	Any assignment	0.00	1

8.42 to 8.60 : Not used

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MENU 8: ASSIGNMENT OF DIGITAL INPUTS AND OUTPUTS

8.61 :DIRF input state

Adjustment range : 0 or 1
This parameter indicates the state of the input.
0 (OFF): Inactive.
1 (On): Active.

8.62 :DISP input state

Adjustment range : 0 or 1
This parameter indicates the state of the input.
0 (OFF): Inactive.
1 (On): Active.
To use this state and assign it to another function, disable
stop function by $6.12 = 0$.

8.63 :DIRR input state

Adjustment range : 0 or 1
This parameter indicates the state of the input.
0 (OFF): Inactive.
1 (On): Active.

8.64 to 8.70 : Not used

8.71 :DIRF input invert
Adjustment range : 0 or 1
Factory setting : 0
This parameter is used to invert the digital input.
0 (OFF): Not inverted.
1 (On): Inverted.

8.72 :Not used

8.73 :DIRR input invert
Adjustment range : 0 or 1
Factory setting : 0
This parameter is used to invert the digital input.
0 (OFF): Not inverted.
1 (On): Inverted.

8.74 to 8.80 : Not used

8.81 :DIRF input destination
Adjustment range : 0.00 to 21.51
Factory setting : 0.00
This parameter is used to assign the input destination. The
user can modify the input destination at any time. In this case,
the input is automatically unassigned from the logic
commands.
CAUTION :
6.30, 6.32 **and** 6.34 **parameters cannot be assigned to**
8.81.

8.82 :Not used

8.83 :DIRR input destination
Adjustment range : 0.00 to 21.51
Factory setting : 0.00
This parameter is used to assign the input destination. The
user can modify the input destination at any time. In this case,
the input is automatically unassigned from the logic
commands.
CAUTION :
6.30, 6.32 **and** 6.34 **parameters cannot be assigned to**
8.83.

Notes

PROXIDRIVE
IP66 variable speed drive
MENU 9: PROGRAMMABLE LOGIC, MOTORISED POT AND BINARY SUM

9 - MENU 9: PROGRAMMABLE LOGIC, MOTORISED POT AND BINARY SUM

9.1 - List of parameters in Menu 9

| Parameter	Name	Type	Adjustment range	Factory setting	User setting
9.01 - 9.02 9.61 - 9.71	Logic functions 1 to 4 output	RO	0 or 1	-	-
9.03	Motorised pot output	RO	± 100.0%	-	-
9.04 - 9.14 9.64 - 9.74	Logic functions 1 to 4 source 1	R-W/P	0.00 to 21.51	0.00	
9.05 - 9.15 9.65 - 9.75	Logic functions 1 to 4 source 1 invert	R-W	0 or 1	0	
9.06 - 9.16 9.66 - 9.76	Logic functions 1 to 4 source 2	R-W/P	0.00 to 21.51	0.00	
9.07 - 9.17 9.67 - 9.77	Logic functions 1 to 4 source 2 invert	R-W	0 or 1	0	
9.08 - 9.18 9.68 - 9.78	Logic functions 1 to 4 output invert	R-W	0 or 1	0	
9.09 - 9.19	Not used				
9.10 - 9.20 9.60 - 9.70	Logic functions 1 to 4 destination	R-W/P	0.00 to 21.51	0.00	
9.11 to 9.13	Not used				
9.21	Motorised pot mode	R-W	0 to 3	2	
9.22	Motorised pot bipolar select	R-W	0 or 1	0	
9.23	Motorised pot rate	R-W	0 to 250 s	20 s	
9.24	Motorised pot scale factor		0 to 2.50	1.00	
9.25	Motorised pot destination	R-W/P	0.00 to 21.51	0.00	
9.26	Motorised pot up	R-A	0 or 1	-	
9.27	Motorised pot down	R-A	0 or 1	-	
9.28	Motorised pot reset	R-W	0 (no) or 1 (RSet)	0 (no)	
9.29	Binary sum ones input	R-A	0 or 1	-	-
9.30	Binary sum twos input	R-A	0 or 1	-	-
9.31	Binary sum fours input	R-A	0 or 1	-	-
9.32	Binary sum output	RO	0 to 39	-	-
9.33	Binary sum destination	R-W/P	0.00 to 21.51	0.00	
9.34	Binary sum offset	R-W	0 to 32	0	
9.35 to 9.69	Not used				
9.62 and 9.63	Not used				
9.72 and 9.73	Not used				

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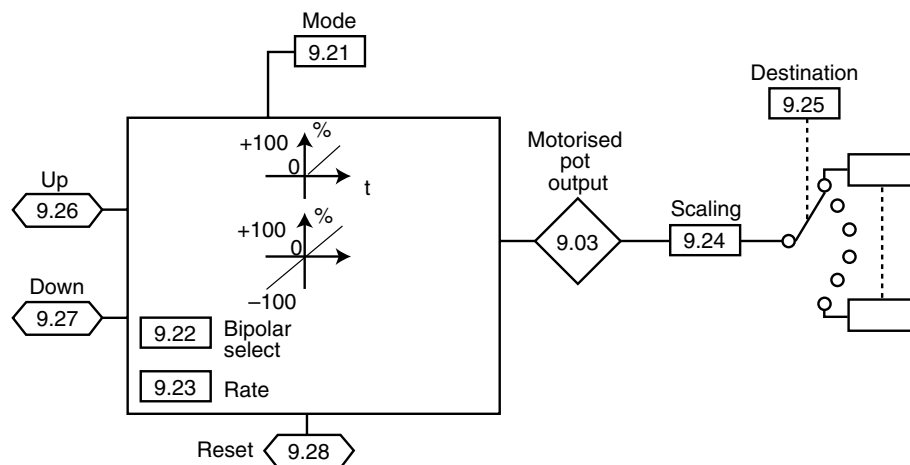### MENU 9: PROGRAMMABLE LOGIC, MOTORISED POT AND BINARY SUM
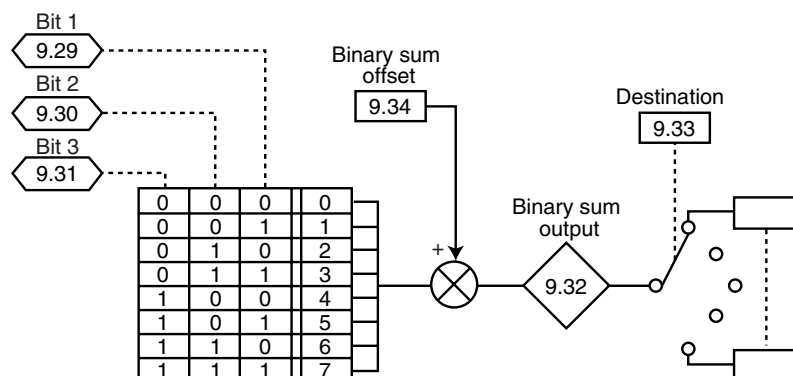
9.2 - Menu 9 diagrams

9.2.1 - Logic functions
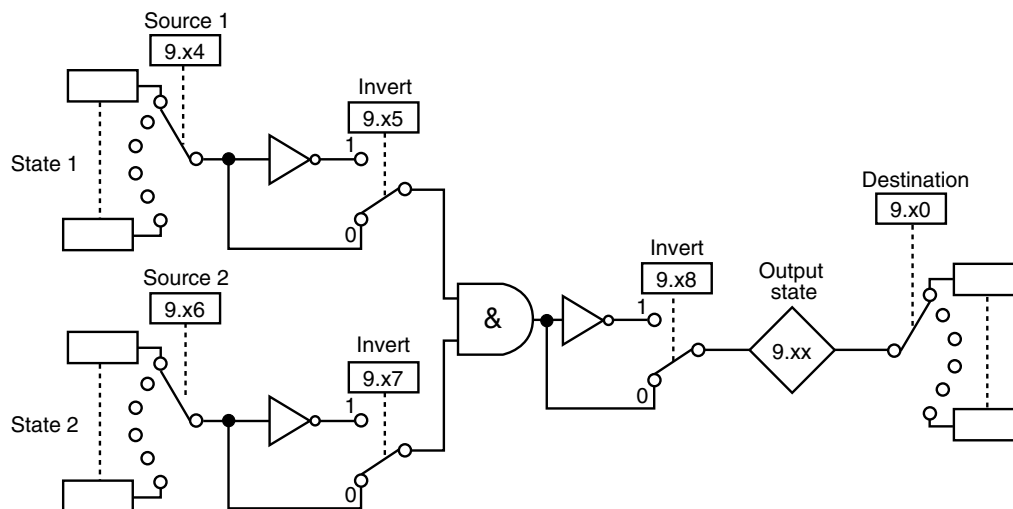
	Source 1	**Source 2**	**Source 1 invert**	**Source 2 invert**	**Output invert**	**Output state**	**Source destination**
Function 1	9.04	9.06	9.05	9.07	9.08	9.01	9.10
Function 2	9.14	9.16	9.15	9.17	9.18	9.02	9.20
Function 3	9.64	9.66	9.65	9.67	9.68	9.61	9.60
Function 4	9.74	9.76	9.75	9.77	9.78	9.71	9.70

9.2.2 - Motorised pot function

9.2.3 - Binary sum function

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MENU 9: PROGRAMMABLE LOGIC, MOTORISED POT AND BINARY SUM

9.3 - Explanation of parameters in menu 9

◇ 9.01 **:Logic function 1 output**

◇ 9.02 **:Logic function 2 output**

◇ 9.61 **:Logic function 3 output**

◇ 9.71 **:Logic function 4 output**

Adjustment range : 0 or 1
Indicate the state of the logic function outputs.

◇ 9.03 **:Motorised pot output**

Adjustment range : ± 100.0%

9.04 **:Logic function 1 source 1**

9.14 **:Logic function 2 source 1**

9.64 **:Logic function 3 source 1**

9.74 **:Logic function 4 source 1**
Adjustment range : 0.00 to 21.51
Factory setting   : 0.00
These parameters are used to select the logic function source 1.
Only "bit" type parameters can be used on these inputs.
If an unsuitable parameter is addressed on one of the function 1 inputs, the output will be frozen at 0.

9.05 **:Logic function 1 source 1 invert**

9.15 **:Logic function 2 source 1 invert**

9.65 **:Logic function 3 source 1 invert**

9.75 **:Logic function 4 source 1 invert**
Adjustment range : 0 or 1
Factory setting   : 0
This parameter is used to invert logic function source 1.
0 (OFF): Source 1 not inverted.
1 (On): Source 1 inverted.

9.06 **:Logic function 1 source 2**

9.16 **:Logic function 2 source 2**

9.66 **:Logic function 3 source 2**

9.76 **:Logic function 4 source 2**
Adjustment range : 0.00 to 21.51
Factory setting   : 0.00
These parameters are used to select the logic function source 2.
Only "bit" type parameters can be used on these inputs.
If an unsuitable parameter is addressed on one of the function 1 inputs, the output will be frozen at 0.

9.07 **:Logic function 1 source 2 invert**

9.17 **:Logic function 2 source 2 invert**

9.67 **:Logic function 3 source 2 invert**

9.77 **:Logic function 4 source 2 invert**
Adjustment range : 0 or 1
Factory setting   : 0
These parameters are used to invert the logic function source 2.
0 (OFF): Source 2 not inverted.
1 (On): Source 2 inverted.

9.08 **:Logic function 1 output invert**

9.18 **:Logic function 2 output invert**

9.68 **:Logic function 3 output invert**

9.78 **:Logic function 4 output invert**
Adjustment range : 0 or 1
Factory setting   : 0
These parameters are used to invert the logic function output.
0 (OFF): Output not inverted.
1 (On): Inverted output.

9.09 and 9.19 **:Not used**

9.10 **:Logic function 1 output destination**

9.20 **:Logic function 2 output destination**

9.60 **:Logic function 3 output destination**

9.70 **:Logic function 4 output destination**
Adjustment range : 0.00 to 21.51
Factory setting   : 0.00
These parameters define the internal parameter which will be assigned by the logic function outputs.
Only unprotected "bit" type parameters can be addressed.
If an unsuitable parameter is programmed, the destination will not be taken into account.

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9.21 **:Motorised pot mode**
Adjustment range : 0 to 3
Factory setting   : 2
0 (Rst.e): The reference is reset to 0 on each power-up. The up/down and reset inputs are active at all times.
1 (Pre.e): On power-up, the reference is at the same level as before power-down. The up/down and reset inputs are active at all times.
2 (Rst.d): The reference is reset to 0 on each power-up. The up/down inputs are only active when the drive output is active. The reset input is active at all times.
3 (Pre.d): On power-up, the reference is at the same level as before power-down. The up/down inputs are only active when the drive output is active. The reset input is active at all times.

9.22 **:Motorised pot bipolar select**
Adjustment range : 0 or 1
Factory setting   : 0
0 (Pos): The up/down pot reference is limited to positive values (0 to 100.0%).
1 (biPo.): The up/down pot reference can change from -100% to +100%.

9.23 **:Motorised pot rate**
Adjustment range : 0 to 250 s
Factory setting   : 20 s
This parameter defines the time it takes for the up/down pot reference to change from 0 to 100.0%.
It will take twice as long to change from -100.0% to +100.0%.
Defines the potentiometer sensitivity.

9.24 **:Motorised pot scale factor**
Adjustment range : 0 to 2.50
Factory setting   : 1.00
The maximum value of the up/down pot reference automatically takes the maximum value of the parameter to which it is assigned.
This parameter can therefore be used to adapt the maximum value of the up/down pot reference to the maximum value required by the application.
Example:
- The up/down reference is addressed to a preset reference.
- The maximum value of a preset reference is 32000 rpm.
- We want the maximum value of the up/down reference to correspond to 1500 rpm.

$$\implies 9.24 = \frac{1500}{32000} = 0.05$$

9.25 **:Motorised pot destination**
Adjustment range : 0.00 to 21.51
Factory setting   : 0.00
This parameter is used to define the numerical parameter which the up/down pot reference will control.
Example: the up/down pot reference acts as a speed reference. The up/down pot reference can be sent to a preset reference.
$\implies 9.25 = 1.21$.

9.26 **:Motorised pot up**
Adjustment range : 0 or 1
A digital input must be assigned to this parameter for controlling the motorised pot up function.

9.27 **:Motorised pot down**
Adjustment range : 0 or 1
A digital input must be assigned to this parameter for controlling the motorised pot down function.

9.28 **:Motorised pot reset**
Adjustment range : 0 (no) or 1 (RSEt)
Factory setting   : 0 (no)
When this parameter is at 1 (RSEt), the motorised pot reference is reset to zero.

9.29 to **9.31** **: Binary sum inputs**

Adjustment range : 0 or 1
Used to modify remotely, using a combination of digital inputs, a parameter whose selection includes more than two possible options.
9.29: Binary sum ones input.
9.30: Binary sum twos input.
9.31: Binary sum fours input.

9.31	9.30	9.29	Decimal conversion
0	0	0	0
0	0	1	1
0	1	0	2
0	1	1	3
1	0	0	4
1	0	1	5
1	1	0	6
1	1	1	7

9.32 **:Binary sum output**

Adjustment range : 0 to 39
Used to read the decimal value of the binary sum output.

9.33 **:Binary sum destination**
Adjustment range : 0.00 to 21.51
Factory setting   : 0.00
Used to define the parameter which the decimal output will control.
Any bit, switch or numerical type parameter can be assigned to the decimal output.

9.34 **:Binary sum offset**
Adjustment range : 0 to 32
Factory setting   : 0
Used to add an offset to the binary/decimal converter output.

9.35 to **9.59** **: Not used**

9.62 and **9.63** **:Not used**

9.72 and **9.73** **:Not used**

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PROXIDRIVE
IP66 variable speed drive
MENU 10: DRIVE STATES AND DIAGNOSTICS

10 - MENU 10: DRIVE STATES AND DIAGNOSTICS

10.1 - List of parameters in Menu 10

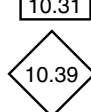| Parameter	Name	Type	Adjustment range	Factory setting	User setting
10.01	Drive healthy	RO/P	0 or 1	-	-
10.02	Drive active	RO/P	0 or 1	-	-
10.03	Zero speed	RO/P	0 or 1	-	-
10.04	Running at or below min speed	RO/P	0 or 1	-	-
10.05	Below set speed	RO/P	0 or 1	-	-
10.06	At speed	RO/P	0 or 1	-	-
10.07	Above set speed	RO/P	0 or 1	-	-
10.08	Load reached	RO/P	0 or 1	-	-
10.09	Drive output is at current limit	RO/P	0 or 1	-	-
10.10	Regenerating	RO/P	0 or 1	-	-
10.11	Braking IGBT active	RO/P	0 or 1	-	-
10.12	Braking resistor alarm	RO/P	0 or 1	-	-
10.13	Direction commanded	RO/P	0 or 1	-	-
10.14	Direction running	RO/P	0 or 1	-	-
10.15	Mains loss	RO/P	0 or 1	-	-
10.16	Not used				
10.17	Overload alarm	RO/P	0 or 1	-	-
10.18	Drive over temperature alarm	RO/P	0 or 1	-	-
10.19	Drive warning	RO/P	0 or 1	-	-
10.20	Trip 1 (most recent fault)	RO/P	0 to 50	-	-
10.21	Trip 2	RO/P	0 to 50	-	-
10.22	Trip 3	RO/P	0 to 50	-	-
10.23	Trip 4	RO/P	0 to 50	-	-
10.24	Trip 5	RO/P	0 to 50	-	-
10.25	Trip 6	RO/P	0 to 50	-	-
10.26	Trip 7	RO/P	0 to 50	-	-
10.27	Trip 8	RO/P	0 to 50	-	-
10.28	Trip 9	RO/P	0 to 50	-	-
10.29	Trip 10 (oldest fault)	RO/P	0 to 50	-	-
10.30	Full power braking time	R-W	0 to 400.0 s	3.0 s	
10.31	Full power braking period	R-W	0 to 25.0 min	0	
10.32	Not used				
10.33	Drive reset	R-W	0 or 1	0	
10.34	No. of auto-reset attempts	R-W	0 to 5	0	
10.35	Auto-reset delay	R-W	0 to 25.0 s	1.0 s	
10.36	Hold drive healthy until last attempt	R-W	0 or 1	0	
10.37	Action on trip detection	R-W	0 or 1	0	
10.38	User trip	R-W/P	0 to 50	0	
10.39	Braking energy overload accumulator	RO/P	0 to 100.0%	-	-
10.40	Decimal value of binary states 10.01 to 10.15	RO/P	0 to 16383	-	-
10.41 to 10.50	Not used				
10.51	V_{min} alarm	RO	0 or 1	-	
10.52	V_{max} alarm	RO	0 or 1	-	
10.53	Maximum speed	RO	0 or 1	-	
10.54 to 10.57	User alarms 1 to 4	R-W	0 or 1	0	

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Parameter	Name	Type	Adjustment range	Factory setting	User setting
10.58 to 10.60	Not used				
10.61	User trip 1	R-W	0 or 1	0	
10.62	Stop mode on user trip 1	R-W	0 or 1	0	
10.63	User trip 2	R-W	0 or 1	0	
10.64	Stop mode on user trip 2	R-W	0 or 1	0	
10.65	User trip 3	R-W	0 or 1	0	
10.66	Stop mode on user trip 3	R-W	0 or 1	0	
10.67	User trip 4	R-W	0 or 1	0	
10.68	Stop mode on user trip 4	R-W	0 or 1	0	

Notes

PROXIDRIVE
IP66 variable speed drive
MENU 10: DRIVE STATES AND DIAGNOSTICS

10.2 - Menu 10 diagrams

10.2.1 - Operating states

10.01 Drive healthy	10.17 Overload alarm
10.02 Drive active	10.18 Drive over temperature alarm
10.03 Zero speed	10.19 Drive warning
10.04 Running at or below min speed	10.20 Trip 1 (most recent fault)
10.05 Below set speed	10.21 Trip 2
10.06 At speed	10.22 Trip 3
10.07 Above set speed	10.23 Trip 4
10.08 Load reached	10.24 Trip 5
10.09 Drive output is at current limit	10.25 Trip 6
10.10 Regenerating braking	10.26 Trip 7
10.11 Braking IGBT active	10.27 Trip 8
10.13 Direction commanded	10.28 Trip 9
10.14 Direction running	10.29 Trip 10 (oldest fault)
10.15 Mains loss	10.40 Decimal value of binary states 10.01 to 10.15
	10.51 V_{min} alarm
	10.52 V_{max} alarm
	10.53 Maximum speed

PROXIDRIVE
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MENU 10: DRIVE STATES AND DIAGNOSTICS

10.2.2 - Braking resistor and trip management configuration

Braking resistor

◇ 10.12   Braking resistor alarm

☐ 10.30   Full power braking time

☐ 10.31   Full power braking period

◇ 10.39   Braking energy overload accumulator

Trip management

☐ 10.33   Drive reset

☐ 10.34   No. of auto-reset attempts

☐ 10.35   Auto-reset delay

☐ 10.36   Hold drive healthy until last attempt

☐ 10.37   Action on trip detection

☐ 10.38   User trip

☐ 10.54   User alarm 1

☐ 10.55   User alarm 2

☐ 10.56   User alarm 3

☐ 10.57   User alarm 4

☐ 10.61   User trip 1

☐ 10.62   Stop mode on user trip 1

☐ 10.63   User trip 2

☐ 10.64   Stop mode on user trip 2

☐ 10.65   User trip 3

☐ 10.66   Stop mode on user trip 3

☐ 10.67   User trip 4

☐ 10.68   Stop mode on user trip 4

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MENU 10: DRIVE STATES AND DIAGNOSTICS

10.3 - Explanation of parameters in menu 10

10.01 **:Drive healthy**

Adjustment range : 0 or 1
This parameter is at 1 when the drive is not in the trip state. If parameter 10.36 is at 1, this bit will remain at 1 during the trip phase if an auto-reset is supposed to occur. Once the number of auto-resets is reached, the next trip causes this bit to change to zero.

10.02 **:Drive active**

Adjustment range : 0 or 1
This parameter is at 1 when the drive output is active.

10.03 **:Zero speed**

Adjustment range : 0 or 1
This parameter is at 1 when the absolute value of the ramp output is at or below the threshold defined by parameter 3.05.
10.03 changes back to 0 when the speed exceeds 3.05 + 10 rpm.

10.04 **:Running at or below min speed**

Adjustment range : 0 or 1
In bipolar mode (1.10 = 1), this parameter is the same as parameter 10.03.
In unipolar mode (1.10 = 0), this parameter is at 1 if the absolute value of the ramp output is at or below the minimum speed 1.07 + (30 rpm/number of pairs of motor poles).
10.04 changes back to 0 when the speed exceeds [1.07 + (30 rpm/number of pairs of motor poles) + 10 rpm].
The minimum speed is defined by parameter 1.07.

10.05 **:Below set speed**

Adjustment range : 0 or 1
This parameter is at 1 when the absolute value of the motor speed is higher than 1.03 - (3.06 ÷ 2).
10.05 changes back to 0 when the speed esceeds [1.03 - (3.06 ÷ 2) + 10 rpm].

10.06 **:At speed**

Adjustment range : 0 or 1
This parameter is at 1 when the absolute value of the motor speed is between 1.03 - (3.06 ÷ 2) and 1.03 + (3.06 ÷ 2).

10.07 **:Above set speed**

Adjustment range : 0 or 1
This parameter is at 1 when the absolute value of the motor speed is higher than 1.03 + (3.06 ÷ 2).
10.07 changes back to 0 when the speed exceeds [1.03 + (3.06 ÷ 2) - 10 rpm].

10.08 **:Load reached**

Adjustment range : 0 or 1
This parameter is at 1 when the active current 4.02 is at or above the rated active current.
Rated active current = 5.07 x 5.10.

10.09 **:Drive output is at current limit**

Adjustment range : 0 or 1
This parameter is at 1 when the drive current limits are active.

10.10 **:Regenerating**

Adjustment range : 0 or 1
This parameter is at 1 when the power is being transferred from the motor to the DC bus (driving load).

10.11 **:Braking IGBT active**

Adjustment range : 0 or 1
This parameter is at 1 when the power is being dissipated into the optional braking resistor (if this is connected).

10.12 **:Braking resistor, overload alarm**

Adjustment range : 0 or 1
This parameter is at 1 when the external braking resistor is active and the cumulative braking power exceeds 75% or if the temperature of the internal resistor exceeds 100°C.

10.13 **:Direction commanded**

Adjustment range : 0 or 1
This parameter is at 1 if the pre-ramp reference is negative (reverse).
It is reset to zero if the pre-ramp reference is positive (forward).

10.14 **:Direction running**

Adjustment range : 0 or 1
This parameter is at 1 if the post-ramp reference is negative (reverse).
It is reset to zero if the post-ramp reference is positive (forward).

10.15 **:Mains loss**

Adjustment range : 0 or 1
This parameter is at 1 when the bus voltage level indicates mains loss. This parameter is only enabled when parameter 6.03 does not equal 0.

10.16 **:Not used**

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◇ **10.17** :**Overload alarm**

Adjustment range : 0 or 1
This parameter is at 1 when the motor current exceeds 105% of the programmed rated motor current and the cumulative load exceeds 75% of the motor overload capacity. If the motor current is not reduced, the drive will trip on a I x t fault, or will reduce the current automatically according to the protection mode configured in **4.16**.

◇ **10.18** :**Drive over temperature alarm**

Adjustment range : 0 or 1
This parameter is at 1 when the measured temperature of the IGBTs is higher than 100°C, or when the drive automatically reduces the configured switching frequency, because the heatsink has overheated.

◇ **10.19** :**Drive warning**

Adjustment range : 0 or 1
This parameter is at 1 when at least one of alarms **10.12**, **10.17** or **10.18** is active.

◇ **10.20** to ◇ **10.29** : **Last 10 trips stored**

Adjustment range: 0 to 50
Contains the last 10 drive trips.
10.20 : indicates the most recent trip.
10.29 : indicates the oldest trip.
The possible trips are :

N°	Display mnemonic	LCD display	Reason for trip
2	OU	DC over volt	DC bus overvoltage
3	OI.AC	Over current	Overcurrent at drive output
4	OI.br	Brak. IGBT	IGBT transistor overcurrent
6	phAC	Out Ph. loss	Loss of a motor phase
7	O.SP	Over speed	Overspeed
11	enC2	Encoder rot	The measured position does not vary (the encoder is incorrectly connected or not supplied with power or the shaft is not turning)
12	rot	A/B reversed	The A, B, A\, B\ signals are the wrong way round
13	tun3	UVW revers.	The u, v, w commutation signals are the wrong way round
14	tun4	U sign.miss.	Some signals are present, but U is missing
15	tun5	V sign.miss.	Some signals are present, but V is missing
16	tun6	W sign.miss.	Some signals are present, but W is missing
17	tun7		The number of pairs of poles set is incorrect (the revolutions measured mechanically with A, B and electrically with U, V, W are inconsistent, given the number of pairs of poles entered)
18	tunE	Autotun.fail	Autotune fault

N°	Display mnemonic	LCD display	Reason for trip
19	it.br	Brak. resist.	Braking resistor overload I x t
20	it.AC	Motor I²t	Motor overload I x t
21	Oht1	Dv over heat	IGBT overheating detected by internal sensor
22	Oht2	BR over heat	Internal braking resistor overheating detected by thermal sensor
24	th	Motor PTC	Motor thermal sensor has tripped
26	O.Ld1	24V over Id	Overload on the +24V power supply or digital output
27	CL1	ADI1 loss	Loss of the current reference on analog input ADI1
28	CL2	ADI2 loss	Loss of the current reference on analog input ADI2
29	CL3	ADIO3 loss	Loss of the current reference on analog input ADIO3
30	SCL	COM loss	Loss of serial link communication
31	EEF	EEPROM fail.	EEPROM fault or transfer problem with XPressKey
32	Ph	In Ph. loss	Loss of a phase
33	rS	Stator res.	Trip during the measurement of the stator resistance
34	F.bus	Fielbus loss.	Disconnection of the fieldbus during operation
35	Secd	Sec. disable	Safety input fault
36	Enc1	U sign. loss	Loss of channel U
37	Enc2	V sign. loss	Loss of channel V
38	Enc3	W sign. loss	Loss of channel W
41	tr01	User 1	User trip 1 via digital input
42	tr02	User 2	User trip 2 via digital input
43	tr03	User 3	User trip 3 via digital input
44	tr04	User 4	User trip 4 via digital input
45	tr05	User 5	User trip 5 via serial link
46	tr06	User 6	User trip 6 via serial link
47	tr07	User 7	User trip 7 via serial link
48	tr08	User 8	User trip 8 via serial link
49	tr09	User 9	User trip 9 via serial link
50	tr10	User 10	User trip 10 via serial link

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10.30 :Full power braking time
Adjustment range : 0 to 400.0 s
Factory setting : 3.0 s
This parameter defines for how long the braking resistor can withstand the maximum braking voltage (780V or 390V) without damage. It is used to determine the time before the drive trips due to braking overload.
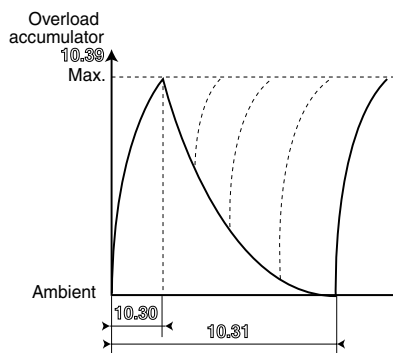**CAUTION:**
If this parameter is left at 0, the braking resistor will not be protected.

10.31 :Full power braking period
Adjustment range : 0 to 25.0 min
Factory setting : 1.0 min
This parameter defines the time period which must elapse between two consecutive braking periods of maximum braking power as defined by parameter 10.30. It is used to configure the thermal time constant for the resistor used.

CAUTION:
If this parameter is left at 0, the braking resistor will not be protected.

10.32 :Not used

10.33 :Drive reset
Adjustment range : 0 or 1
Factory setting : 0
A 0 to 1 change in this parameter will cause a drive reset.
If a remote drive reset is required, a terminal must be assigned to this parameter.
If the drive trips due to IGBT overcurrent, either at the output bridge or the braking transistor, the drive cannot be reset for 10 seconds (IGBT recovery time).

10.34 :No. of auto-reset attempts
Adjustment range : 0 to 5
Factory setting : 0
0: The drive will not be reset automatically. A command must be sent.
1 to 5: The drive will be reset automatically as many times as has been programmed.
When the counter reaches the authorised number of drive resets, the drive is disabled and will not auto-reset. The last trip can only be reset via a command.
If no trips occur, the counter is decremented by one value every 5 minutes.

10.35 :Auto reset delay automatic
Adjustment range : 0 to 25.0 s
Factory setting : 1.0 s
This parameter defines the time between the drive tripping and the auto-reset (as long as the stop has lasted the minimum time for trips involving overcurrents).

10.36 :Hold drive healthy until last attempt
Adjustment range : 0 or 1
Factory setting : 0
0 (no): 10.01 **(drive ready) is reset each time the drive trips, without taking account of any auto-resets which could occur.**
1 (yeS): Parameter 10.01 is held at 1 during the trip phases which are reset automatically.

10.37 :Action on trip detection
Adjustment range : 0 or 1
Factory setting : 0
0 (Free): Freewheel stop on all trip types.
1 (Ctld): The drive will control deceleration before tripping on low-priority trips it.AC, Oht1, Oht2, th, OLd1, CL1, CL2, CL3, SCL, EEF, Fbus, tr05, tr10.

10.38 :User trip
Adjustment range : 0 to 50
Factory setting : 0
This parameter is used to generate user trips, via the serial link.
Trips generated by the user will be indicated by trxx in the trip table, xx being the trip code. Only values ≥ 45 can generate a trip.
Users wishing to reset the drive via the serial link can do so by giving this parameter the value 100.

10.39 :Braking energy overload accumulator

Adjustment range : 0 to 100.0%
This parameter gives an indication of the braking resistor temperature modelled according to parameters 10.30 and 10.31. A zero value means that the resistor is close to the ambient temperature and 100% is the maximum temperature (trip level).

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MENU 10: DRIVE STATES AND DIAGNOSTICS

◇ **10.40** :**Decimal value of binary states** 10.01.**to** 10.15

Adjustment range : 0 to 16383

This parameter is used with a serial communications interface. The value of this parameter is the addition of the drive bits envisaged for read-only mode, with the following binary weights:
- 10.01 = 2^0,
- 10.02 = 2^1,
- 10.03 = 2^2,
- 10.04 = 2^3,
- 10.05 = 2^4,
- 10.06 = 2^5,
- 10.07 = 2^6,
- 10.08 = 2^7,
- 10.09 = 2^8,
- 10.10 = 2^9,
- 10.11 = 2^{10},
- 10.12 = 2^{11},
- 10.13 = 2^{12},
- 10.14 = 2^{13},
- 10.15 = 2^{14}.

10.41 to **10.50** : **Not used**

◇ **10.51** : V_{min} **alarm**

Adjustment range : 0 or 1

Changes to 1 when the motor speed (5.04) < V_{min} (1.07 or 21.02) + 3.51 in open loop mode or speed (3.02) < V_{min} (1.07 or 21.02) + 3.51 in closed loop mode.
0: Inactive.
1: Active.
10.51 changes back to zero when the speed exceeds (5.04) < V_{min} (1.07 or 21.02) + 3.51 + 10 rpm in open loop, or exceeds (3.02) < V_{min} (1.07 or 21.02) + 3.51 + 10 rpm.
Note : In bipolar mode alarm 10.51 is not active.

◇ **10.52** : V_{max} **alarm**

Adjustment range : 0 or 1

Changes to 1 when the motor speed (5.04) > V_{max} (1.06 or 21.01) - 3.52 in open loop mode or speed (3.02) > V_{max} (1.06 or 21.01) - 3.52 in closed loop mode.
0: Inactive.
1: Active.
10.52 changes back to 0 when the speed falls below to (5.04) > V_{max} (1.06 or 21.01) - 3.52 - 10 rpm in open loop, or (3.52) > V_{max} (1.06 or 21.01) - 3.52 - 10 rpm.

◇ **10.53** : **Maximum speed**

Adjustment range : 0 or 1

Changes to 1 when the motor speed (5.04) > V_{max} (1.06 or 21.01) - 15 rpm.
0: Inactive.
1: Active.
10.53 changes back to 0 when the speed falls below to (5.04) > V_{max} (1.06 or 21.01) - 3.53 - 25 rpm.

10.54 to **10.57** : **User alarms 1 to 4**

Adjustment range : 0 or 1
Factory setting : 0
When these parameters change to 1, the display alternates between the messages "Alar. " and "USr(1to4)" (drive not tripped).
0: Inactive.
1: Active.
Note:
User alarm 1 overrides user alarm 2.
User alarm 2 overrides user alarm 3.
User alarm 3 overrides user alarm 4.

10.58 to **10.60** : **Not used**

10.61 :**User trip 1**

Adjustment range : 0 or 1
Factory setting : 0
0 (OFF): The drive has not tripped.
1 (On): The drive trips, may or may not control deceleration according to the configuration of 10.62 and generates a trip code tr01.
Note: Auto-reset (10.34) is not possible.

10.62 :**Stop mode on user trip 1**

Adjustment range : 0 or 1
Factory setting : 0
0 (Free): On user trip 1, the drive performs a freewheel stop.
1 (ctld): On user trip 1, the drive performs a controlled stop according to the configuration of 6.01.

10.63 :**User trip 2**

Adjustment range : 0 or 1
Factory setting : 0
0 (OFF): The drive has not tripped.
1 (On): The drive trips, may or may not control deceleration according to the configuration of 10.64 and generates a trip code tr02.
Note: Auto-reset (10.34) is not possible.

10.64 :**Stop mode on user trip 2**

Adjustment range : 0 or 1
Factory setting : 0
0 (Free): On user trip 2, the drive performs a freewheel stop.
1 (ctld): On user trip 2, the drive performs a controlled stop according to the configuration of 6.01.

10.65 :**User trip 3**

Adjustment range : 0 or 1
Factory setting : 0
0 (OFF): The drive has not tripped.
1 (On): The drive trips, may or may not control deceleration according to the configuration of 10.66 and generates a trip code tr03.

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10.66 **:Stop mode on user trip 3**
Adjustment range : 0 or 1
Factory setting   : 0
0 (Free): On user trip 3, the drive performs a freewheel stop.
1 (ctld): On user trip 3, the drive performs a controlled stop according to the configuration of 6.01.

10.67 **:User trip 4**
Adjustment range : 0 or 1
Factory setting   : 0
0 (OFF): The drive has not tripped.
1 (On): The drive trips, may or may not control deceleration according to the configuration of 10.68 and generates a trip code tr04.

10.68 **:Stop mode on user trip 4**
Adjustment range : 0 or 1
Factory setting   : 0
0 (Free): On user trip 4, the drive performs a freewheel stop.
1 (ctld): On user trip 4, the drive performs a controlled stop according to the configuration of 6.01.

11 - MENU 11: SERIAL LINK - DRIVE CHARACTERISTICS - MISCELLANEOUS
11.1 - List of parameters in Menu 11

Parameter	Name	Type	Adjustment range	Factory setting	User setting
11.01	Parameter 46 set-up	R-W	0.00 to 21.51	6.04	
11.02	Parameter 47 set-up	R-W	0.00 to 21.51	8.10	
11.03	Parameter 48 set-up	R-W	0.00 to 21.51	7.15	
11.04	Parameter 49 set-up	R-W	0.00 to 21.51	7.33	
11.05	Parameter 50 set-up	R-W	0.00 to 21.51	8.41	
11.06	Parameter 51 set-up	R-W	0.00 to 21.51	1.05	
11.07	Parameter 52 set-up	R-W	0.00 to 21.51	1.10	
11.08	Parameter 53 set-up	R-W	0.00 to 21.51	1.29	
11.09	Parameter 54 set-up	R-W	0.00 to 21.51	1.30	
11.10	Parameter 55 set-up	R-W	0.00 to 21.51	2.04	
11.11	Parameter 56 set-up	R-W	0.00 to 21.51	2.06	
11.12	Parameter 57 set-up	R-W	0.00 to 21.51	2.07	
11.13	Parameter 58 set-up	R-W	0.00 to 21.51	6.01	
11.14	Parameter 59 set-up	R-W	0.00 to 21.51	6.09	
11.15	Parameter 60 set-up	R-W	0.00 to 21.51	5.18	
11.16	Parameter 61 set-up	R-W	0.00 to 21.51	5.06	
11.17	Parameter 62 set-up	R-W	0.00 to 21.51	5.11	
11.18	Parameter 63 set-up	R-W	0.00 to 21.51	5.12	
11.19	Parameter 64 set-up	R-W	0.00 to 21.51	11.42	
11.20	Parameter 65 set-up	R-W	0.00 to 21.51	11.43	
11.21	Customer unit	R-W	0 to 9.999	1.000	
11.22	Unit displayed at power-up	R-W	0 or 2	0	
11.23	Serial address	R-W	0 to 247	1	
11.24	Serial mode	RO/P	0 or 1	-	
11.25	Baud rate	R-W	0 to 9	6	
11.26	Minimum comms transmit delay	R-W	0 to 250 ms	2	
11.27	Modbus RTU frame format	R-W	0 to 3	0	
11.28	Not used				
11.29	Software version	RO/P	1.00 to 9.99	-	
11.30	User security code	R-W	0 to 9999	0	
11.31	User drive mode	R-W	0 to 3	1	
11.32	Drive current rating	RO/P	1.5 to 75.0 A	-	-
11.33	Drive voltage rating	RO/P	200 to 480 V	-	-
11.34 to 11.40	Not used				
11.41	Status mode time-out	R-W	10 to 250 s	240 s	
11.42	Parameter cloning	R-W	0 to 3	0	
11.43	Load defaults	R-W/P	0 to 2	0	
11.44	Parameter-setting level	R-W	0 to 2	0	
11.45	Motor 2 parameters select	R-W	0 or 1	0	
11.46	Preset configuration select	R-W/P	0 to 13	CP version = 11 Other = 0	
11.47	Display duration in alternating mode	R-W	0 to 250 s	5 s	
11.48	Last preset configuration	RO	0 to 12	-	
11.49 to 11.58	Not used				
11.59	Drive version	R-W	0 to 99	-	
11.60	Product code	RO/P	0 to 32000	-	-
11.61	Advanced menus code	R-W	0 to 9999	149	

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MENU 11: SERIAL LINK - DRIVE CHARACTERISTICS - MISCELLANEOUS

11.2 - Menu 11 diagram

Menu 0 configuration

11.01	Parameter 46 set-up	11.11	Parameter 56 set-up
11.02	Parameter 47 set-up	11.12	Parameter 57 set-up
11.03	Parameter 48 set-up	11.13	Parameter 58 set-up
11.04	Parameter 49 set-up	11.14	Parameter 59 set-up
11.05	Parameter 50 set-up	11.15	Parameter 60 set-up
11.06	Parameter 51 set-up	11.16	Parameter 61 set-up
11.07	Parameter 52 set-up	11.17	Parameter 62 set-up
11.08	Parameter 53 set-up	11.18	Parameter 63 set-up
11.09	Parameter 54 set-up	11.19	Parameter 64 set-up
11.10	Parameter 55 set-up	11.20	Parameter 65 set-up

Drive configuration

11.29	Software version	11.33	Drive voltage rating
11.31	User drive mode	11.48	Last preset configuration
11.32	Drive current rating	11.59	Drive variant

Parameter setting

11.30	User security code
11.42	Parameter cloning
11.44	Parameter-setting level

Display

11.21	Customer unit
11.22	Unit displayed at power-up
11.41	Status mode time-out
11.47	Display duration in alternating mode

Serial link

11.23	Serial address
11.24	Serial mode
11.25	Baud rate
11.26	Minimum comms transmit delay
11.27	Modbus RTU frame format

Miscellaneous

11.43	Load defaults
11.45	Motor 2 parameters select
11.46	Preset configuration select

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11.3 - Explanation of parameters in menu 11

11.01 to **11.20** : **Menu 0 set-up**
Adjustment range : 0.00 to 21.51
Factory settings : See table below.
These parameters are used, in order, to determine parameters 46 to 65 in menu 0. These parameters are independent of the preset configuration.

Parameter	Default value	Menu 0 destination
11.01	6.04	46
11.02	8.10	47
11.03	7.15	48
11.04	7.33	49
11.05	8.41	50
11.06	1.05	51
11.07	1.10	52
11.08	1.29	53
11.09	1.30	54
11.10	2.04	55
11.11	2.06	56
11.12	2.07	57
11.13	6.01	58
11.14	6.09	59
11.15	5.18	60
11.16	5.06	61
11.17	5.11	62
11.18	5.12	63
11.19	11.42	64
11.20	11.43	65

11.21 : **Customer unit**
Adjustment range : 0 to 9.999
Factory setting : 1.00
This is a multiplication coefficient applied to the motor speed for expressing the speed in a unit defined by the user (see 5.34).
Example: to obtain a reading in m/min for an application where the product is moving 200 mm for each motor revolution ==> 11.21 = 0.2.

11.22 : **Unit displayed at power-up**
Adjustment range : 0 to 2
Factory setting : 0
0 (Spd): On power-up, the speed is displayed.
The unit depends on the setting of 5.34 (frequency in Hz, speed in rpm or a unit defined by the user).
1 (Load): On power-up, the load is displayed.
The unit displayed depends on the setting of 4.21 (motor load as a % or output current in A).
2 (SP.Ld): Displays the speed and the load alternately, or the current. The display time of each value can be configured in 11.47.

11.23 : **Serial address**
Adjustment range : 0 to 247
Factory setting : 1
Used to define the drive address in the case of control or supervision via the serial link. Avoid values containing a zero as they are used to address the drive sets.

11.24 : **Serial mode**
Adjustment range : 0 or 1
Protocol used for communication via the serial link.
0 : LSnt: LS Net protocol.
1 : rtu: Modbus RTU protocol**.**

11.25 : **Baud rate**
Adjustment range : 0 to 9
Factory setting : 6
Used to select the data transfer speed in Modbus RTU.

Speed feedback	Display	11.25
300	0.3	0
600	0.6	1
1200	1.2	2
2400	2.4	3
4800	4.8	4
9600	9.6	5
19200	19.2	6
38400	38.4	7
57600	57.6	8
115200	115.2	9

Note : If CT Comms Cable is used, the baud rate is limited to 38400 bauds.

11.26 : **Minimum comms transmit delay**
Adjustment range : 0 to 250 ms
Factory setting : 2 ms
As the serial link is 2-wire type, Rx is connected to Tx and Rx\ to Tx\. A communication fault may occur if the receiver is responding to a request before the sender has had time to switch. Parameter 11.26 is used to introduce a time between reception and the data feedback. After transmission of a request, the drive needs 1.5 ms before receiving the next command. The adjustment is made in 2 ms intervals.

11.27 : **Modbus RTU frame format**
Adjustment range : 0 to 3
Factory setting : 0
0 (OP.2S): No parity, 2 stop bits.
1 (OP.1S): No parity, 1 stop bit.
2 (eP.1S): Even parity, 1 stop bit.
3 (oP.1S): Odd parity, 1 stop bit.

11.28 : **Not used**

11.29 : **Software version**

Adjustment range : 1.00 to 9.99
Indicates the drive software version

11.30 : **User security code**
Adjustment range : 0 to 9999
Factory setting : 0
If this parameter is other than 0 and 11.44 is set to 2 (Loc), no parameter modification can take place. To modify a parameter, the user must enter a code equivalent to the value of 11.30.

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11.31 User drive mode
Adjustment range : 0 to 3
Factory setting : 0
0 (oP.LP): The drive is controlled in open loop mode. The open loop control mode is defined by parameter 5.14.
1 (oP.LP): The drive is controlled in open loop mode. The open loop control mode is defined by parameter 5.14.
2 (cL.LP): The drive controls an induction motor in closed loop flux vector control mode. The encoder type and control mode are defined by parameter 3.38.
3 (SruO): The drive controls a servo motor. The encoder type and control mode are defined by parameter 3.38.
This parameter is used to select the control mode.
Returning to factory settings does not change the operating mode.
The choice of operating mode can only be made when the drive is stopped.
Note : Changing from open loop mode (25 = 0 or 1) to closed loop mode (25 = 2 or 3) or conversely, parameters 12.45 "Brake apply frequency or speed" and 12.46 "Pre-brake reference release delay/brake apply speed delay" are set back to their default value.

11.32 :Drive current rating
Adjustment range : 1.5 to 75.0 A
This parameter indicates the drive rated current corresponding to the permitted total motor current.

11.33 :Drive voltage rating
Adjustment range : 200 to 480V
This parameter indicates the drive rated voltage.

11.34 to 11.40 : Not used

11.41 :Status mode time-out
Adjustment range : 10 to 250 s
Factory setting : 240 s
If, when in parameter-setting mode, there is no action on the keypad for the time set in 11.41, the display returns automatically to read-only mode. When the user returns to parameter-setting mode, the display is positioned on the last parameter which was accessed.

11.42 :Parameter cloning
Adjustment range : 0 to 3
Factory setting : 0
Disable the drive before performing parameter cloning or transfer with XPressKey (SDI2 terminal open).
0 (no): No action.
1 (rEad): When this parameter is stored at 1 and the drive output is not active, the display alternates between "rEad" and "hEy ? ". Pressing the Key button causes the parameters contained in the copy key to be stored in the drive. When the transfer is complete, the parameter reverts to 0. The rEad function can also be activated via the pushbutton located on the copy key. The first press on the button corresponds to parameter 11.42 changing to 1 and the second press confirms it. Without exception, if confirmation is not received within 10 seconds of the first press, the action is cancelled.
2 (Prog): When this parameter is stored at 2 and the drive output is not active, the display alternates between "Prog" and "hEy ? ". Pressing the "Key" button causes the parameters contained in the drive to be stored in the copy key. When the transfer is complete, the parameter reverts to 0. If confirmation is not received within 10 seconds of the first press, the action is cancelled.
3 (Auto): Any modification of a parameter is automatically saved to the copy key. The action is confirmed at the time of storing (M button). No data is written to the copy key on a return to factory settings.
CAUTION:
The copy key contains parameters relating to the drive rating. If the parameters are copied into a drive with a different rating, the parameters relating to the drive and the motor characteristics will not be copied and the message "C.rtg" will flash on the display to alert the user of the need to enter motor parameters.
If the user confirms the transfer by pressing on XPressKey button, the parameters are transfered to the drive except motor parameters (06, 07, 08, 31, 32).
CAUTION :
Do not transfer parameters between two drives with different voltage/frequency (400V (T) drive to 200V (TL) drive or vice versa, and 200V (TL) 50Hz drive into 200V (TL) 60Hz drive or vice versa.

11.43 :Load defaults
Adjustment range : 0 to 2
Factory setting : 0
CAUTION:
Disable the drive before changing 11.43.
0 (no): Return to factory settings is not performed.
1 (Eur): Configures the drive to factory settings for 50Hz mains supply.
2 (USA): Configures the drive to factory settings for 60Hz mains supply.

11.44 :Parameter-setting level
Adjustment range : 0 to 2
Factory setting : 0
This parameter determines the access level in menu 0.

11.44	LED display	Access level
0	L1	Access to parameter 01 to 10
1	L2	Access to parameter 01 to 80
2	Loc	All parameters can be read, but none can be modified, unless a code the same as parameter 11.30 is entered at the time of accessing the parameter.

The locking procedure using a security code is described in section 4.3.6 of the installation and commissioning manual ref. 3739.

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MENU 11: SERIAL LINK - DRIVE CHARACTERISTICS - MISCELLANEOUS

11.45   :**Motor 2 parameters select**
Adjustment range : 0 or 1
Factory setting   : 0
This parameter is used to select the set of parameters corresponding to the characteristics of motor 2.

11.45 = 0 (motor 1)	11.45 = 1 (motor 2)	Description
1.06	21.01	Maximum reference clamp
1.07	21.02	Minimum reference clamp
1.14	21.03	Reference selector
2.11	21.04	Acceleration ramp
2.21	21.05	Deceleration ramp
5.06	21.06	Rated frequency
5.07	21.07	Rated current
5.08	21.08	Rated speed
5.09	21.09	Rated voltage
5.10	21.10	Rated power factor (cos φ)
5.11	21.11	Number of motor poles
5.17	21.12	Stator resistance
5.23	21.13	Voltage offset
5.24	21.14	Transient inductance
-	21.15	Motor 2 parameters active
5.25	21.24	Stator inductance (Ls)
5.33	21.30	Motor volts per 1000 rpm (Ke)
5.51	21.51	q axis inductance

CAUTION:
• **Switching from one set of motor parameters to the other is performed with the drive disabled.**
• **When the second set of motor parameters is selected, all points on the display are illuminated except for the comma.**

11.46   :**Preset configuration select**
Adjustment range : 0 to 13
Factory setting   : CP version = 11
                              Others = 0.
Used to select a configuration which automatically assigns the I/O and defines parameters 11 to 24.
Note: Modifications to 11.46 must be made with the drive disabled.
11.46 is stored permanently. If one of the relevant parameters is modified by the user after automatic configuration, 11.46 automatically switches to mode 13 (OPEn).

Menu 0	Preset configuration													
	0	1	2	3	4	5	6	7	8	9	10	11	12	13
	A1.A2	A1.Pr	A2.Pr	4Pr	8Pr	E.Pot	TorQ	Pid	PUMP	A.CtP	HoiS	Pad	HuAC	OPEn
11	7.06	7.06	7.06	1.21	1.21	7.06	7.06	7.06	7.06		-	1.51	-	
12	7.11	1.22	1.22	1.22	1.22	9.28	7.11	7.11	7.11		1.22	1.21	7.11	
13		1.23	1.23	1.23	1.23	9.21	-	14.10	14.10			6.11		
14		1.24	1.24	1.24	1.24	9.22	-	14.11	14.11			6.12		
15					1.25	9.23	-	14.12	16.30			6.13		
16					1.26	9.24	-	14.13	16.37					
17					1.27	9.03	-	14.14	16.17					
18					1.28		-	14.15	14.15					
19							7.12	7.12	7.12					
20								7.16	16.10					
21								14.20	16.26					
22								14.21	16.16					
23								14.19	16.38					
24								14.01	16.28					

0 (A1.A2) : A current reference input and a voltage reference input selectable via digital input.
1 (A1.Pr) : A voltage input and 3 preset references, selectable by 2 digital inputs.
2 (A2.Pr) : A current input and 3 preset references, selectable by 2 digital inputs.
3 (4Pr) : 4 preset references, selectable by 2 digital inputs.
4 (8Pr) : 8 preset references, selectable by 3 digital inputs.
5 (E.Pot) : Motorised potentiometer (up, down).
6 (TorQ) : Torque or speed control.
7 (Pid) : PID regulation.
8 (PUMP) : Pump regulation. **(Not available in version V2.10).**
9 (A.CtP) : A voltage or current reference and a PTC input.
10 (HoiS) : Control of a travelling crane or hoist.
11 (Pad) : Local control via the keypad.
12 (HuAC) : Auto/manual mode.
13 (OPEn) : No configuration, parameter-setting mode is open.

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MENU 11: SERIAL LINK - DRIVE CHARACTERISTICS - MISCELLANEOUS

11.47 :Display duration in alternating mode
Adjustment range : 0 to 250 s
Factory setting   : 5 s
In alternating display mode 11.22 = 2, used to define how long each value is displayed for.

11.48 :Last preset configuration

Adjustment range : 0 to 12
This parameter stores and indicates the last preset configuration selected by 11.46. The value 13 (OPEn) is not taken into account.

11.49 to 11.58 : Not used

11.59 :Drive variant
Adjustment range : 0 to 99
Indication of the type of drive.
0 (N): drive with display only. The parameters can only be set via the LCD console or from a PC.
1 (CP): drive fitted with local controls (1 FWD key (⊚), 1 REV key (⊚), 1 Stop key (⊚) and 1 potentiometer). The parameters are set as described above.
2 (SEt): drive fitted with 6 keys (1 FWD key (⊚), 1 REV key (⊚), 1 Stop key (⊚), one (⊙) key, 1 (⊙) key and one Mode (ⓜ) key). The user menu parameters are set using the ⊙ , ⊙ and ⓜ keys. Advanced parameters can be accessed via the LCD console or PC.
3 to 99: reserved.
CAUTION:
After modifying this parameter, return to factory settings (see 11.43).

11.60 :Product code

Adjustment range : 0 to 32000
This product code gives information on the rating, size, hardware index, and the drive version.
Should the nameplate not be visible, this code can be given to your LEROY-SOMER contact.

11.61 :Advanced menus code
Adjustment range : 0 to 9999
Factory setting   : 149
This parameter is used to limit access to menus 1 to 21 when setting the parameters via the LCD console.
If this parameter does not equal 0, the value of parameter 11.61 should be entered to enable switching from Menu 0 to Menu 1.
In factory settings mode, simply enter the value 149 to access all menus.

PROXIDRIVE
IP66 variable speed drive
MENU 12: THRESHOLD DETECTORS, VARIABLE SELECTORS AND BRAKE CONTROL FUNCTION

12 - MENU 12: THRESHOLD DETECTORS, VARIABLE SELECTORS AND BRAKE CONTROL FUNCTION

12.1 - List of parameters in Menu 12

| Parameter	Name		Type	Adjustment range	Factory setting	User setting
12.01 - 12.02 12.61 - 12.71	Threshold detector 1 to 4 output		RO	0 or 1	-	-
12.03 - 12.23 12.63 - 12.73	Threshold detector 1 to 4 source		R-W/P	0.00 to 21.51	0.00	
12.04 - 12.24 12.64 - 12.74	Threshold detector 1 to 4 level		R-W	0 to 100.0%	0	
12.05 - 12.25 12.65 - 12.75	Threshold detector 1 to 4 hysteresis		R-W	0 to 25.0%	0	
12.06 - 12.26 12.66 - 12.76	Threshold detector 1 to 4 output invert		R-W	0 or 1	0	
12.07 - 12.27 12.67 - 12.77	Threshold detector 1 to 4 destination		R-W/P	0.00 to 21.51	0.00	
12.08 - 12.28	Variable selector 1 and 2 source 1		R-W/P	0.00 to 21.51	0.00	
12.09 - 12.29	Variable selector 1 and 2 source 2		R-W/P	0.00 to 21.51	0.00	
12.10 - 12.30	Variable selector 1 and 2 mode		R-W	0 to 9	0	
12.11- 12.31	Variable selector 1 and 2 destination		R-W/P	0.00 to 21.51	0.00	
12.12- 12.32	Variable selector 1 and 2 output		RO/P	± 100.00%	-	-
12.13- 12.33	Variable selector 1 and 2 source 1 scaling		R-W	± 4.000	1.000	
12.14- 12.34	Variable selector 1 and 2 source 2 scaling		R-W	± 4.000	1.000	
12.15- 12.35	Variable selector 1 and 2 control		R-W	0 to 100.00	0	
12.16 to 12.22	Not used					
12.36 to 12.39	Not used					
12.40	Brake release		RO	0 or 1	-	
12.41	Brake controller enable		R-W	0 to 3	0	
12.42	Upper current threshold		R-W	0 to 200%	30%	
12.43	Lower current threshold		R-W	0 to 200%	10%	
12.44	Brake release frequency		R-W	0 to 20.0 Hz	1.0 Hz	
12.45	Brake apply frequency	▣	R-W	0 to 20.0 Hz	2.0 Hz	
	Brake apply speed	▣	R-W	0 to 100 rpm	5 rpm	
12.46	Pre-brake release delay	▣	R-W	0 to 25.00 s	0.30 s	
	Brake apply speed delay	▣	R-W			
12.47	Post-brake release delay		R-W	0 to 25.00 s	1.00 s	
12.48	Brake apply delay		R-W	0 to 25.00 s	1.00 s	
12.49	Enable position controller during brake release	▣	R-W	0 or 1	0	
12.50	Not used					
12.51	Manual brake release		R-A	0 or 1	0	

▭ : Function not available in version V2.10.

PROXIDRIVE
IP66 variable speed drive
MENU 12: THRESHOLD DETECTORS, VARIABLE SELECTORS AND BRAKE CONTROL FUNCTION

12.2 - Menu 12 diagrams

12.2.1 - Threshold detectors
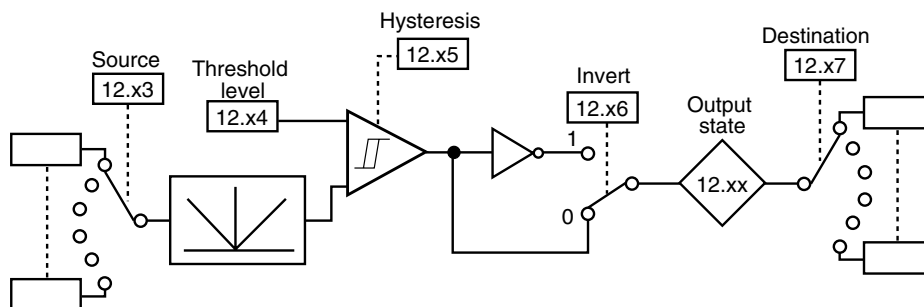
|	**Source**	**Threshold level**	**Hysteresis**	**Output state**	**Invert**	**Destination**
Threshold	12.03	12.04	12.05	12.01	12.06	12.07
Threshold	12.23	12.24	12.25	12.02	12.26	12.27
Threshold	12.63	12.64	12.65	12.61	12.66	12.67
Threshold	12.73	12.74	12.75	12.71	12.76	12.77

12.2.2 - Processing of internal variables
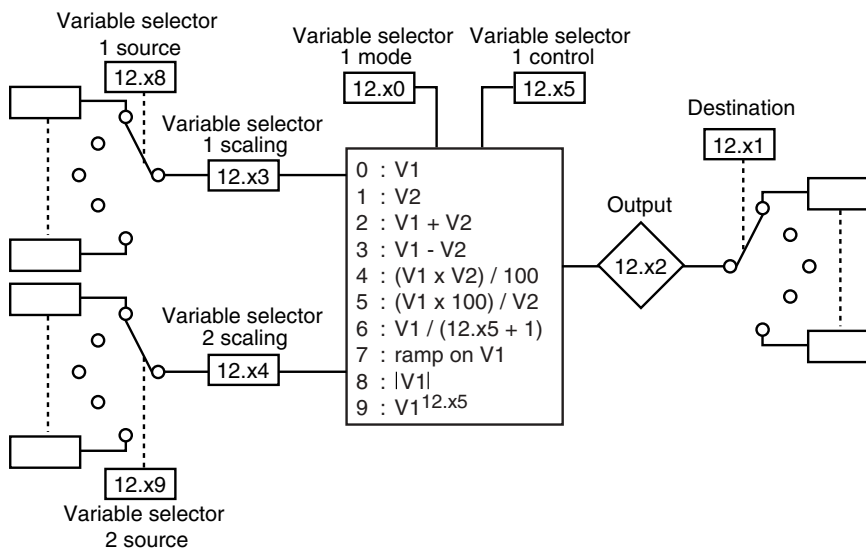
	Variable source 1	**Variable scaling 1**	**Variable source 2**	**Variable scaling 2**	**Function selection**	**Associated parameter**	**Output destination**	**Output**
Block 1	12.08	12.13	12.09	12.14	12.10	12.15	12.11	12.12
Block 2	12.28	12.33	12.29	12.34	12.30	12.35	12.31	12.32

PROXIDRIVE
IP66 variable speed drive
MENU 12: THRESHOLD DETECTORS, VARIABLE SELECTORS AND BRAKE CONTROL FUNCTION

12.2.3 - Brake control in open loop mode
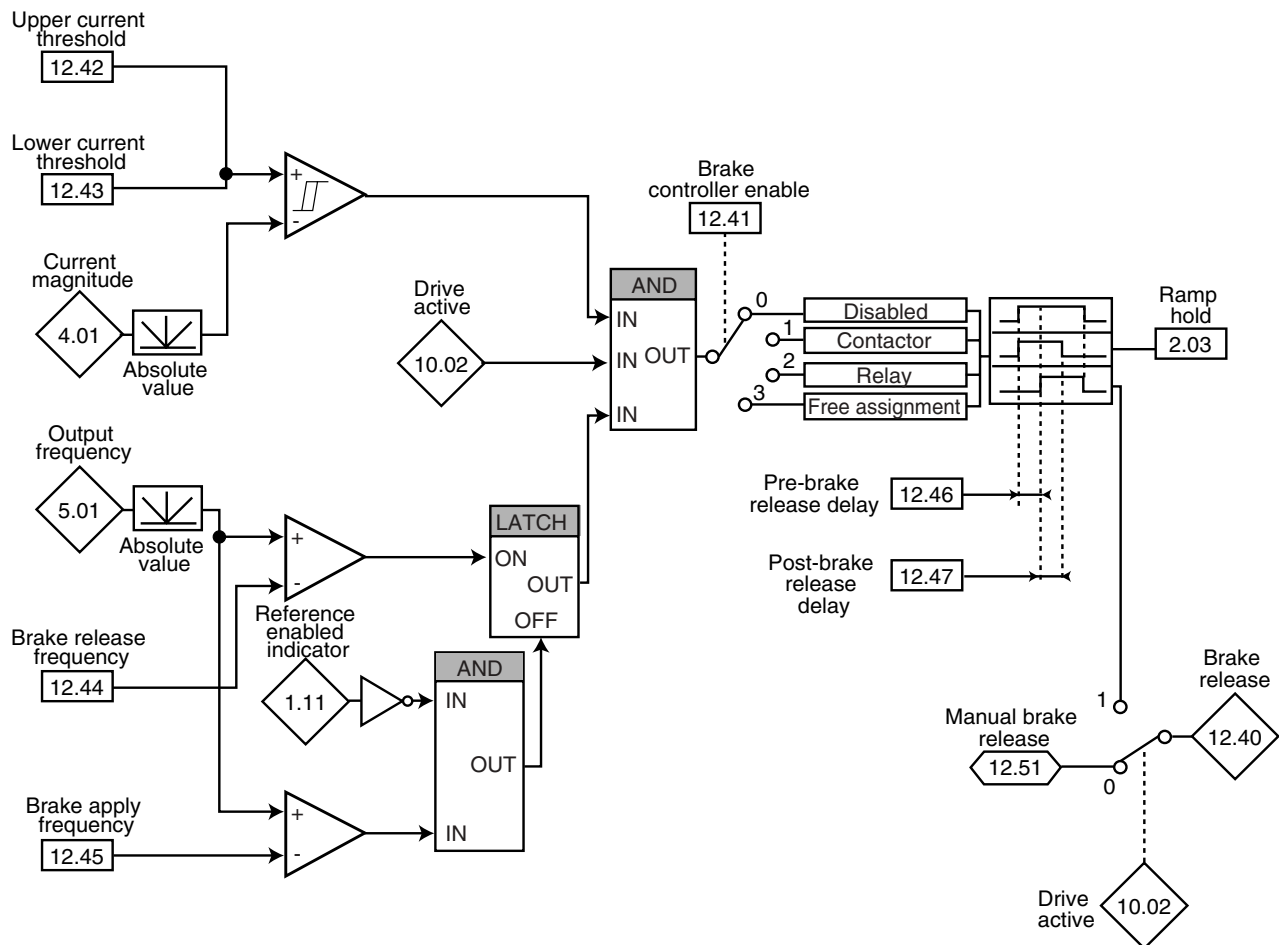
Sequencing

PROXIDRIVE
IP66 variable speed drive
MENU 12: THRESHOLD DETECTORS, VARIABLE SELECTORS AND BRAKE CONTROL FUNCTION

12.2.4 - Brake control in closed loop mode
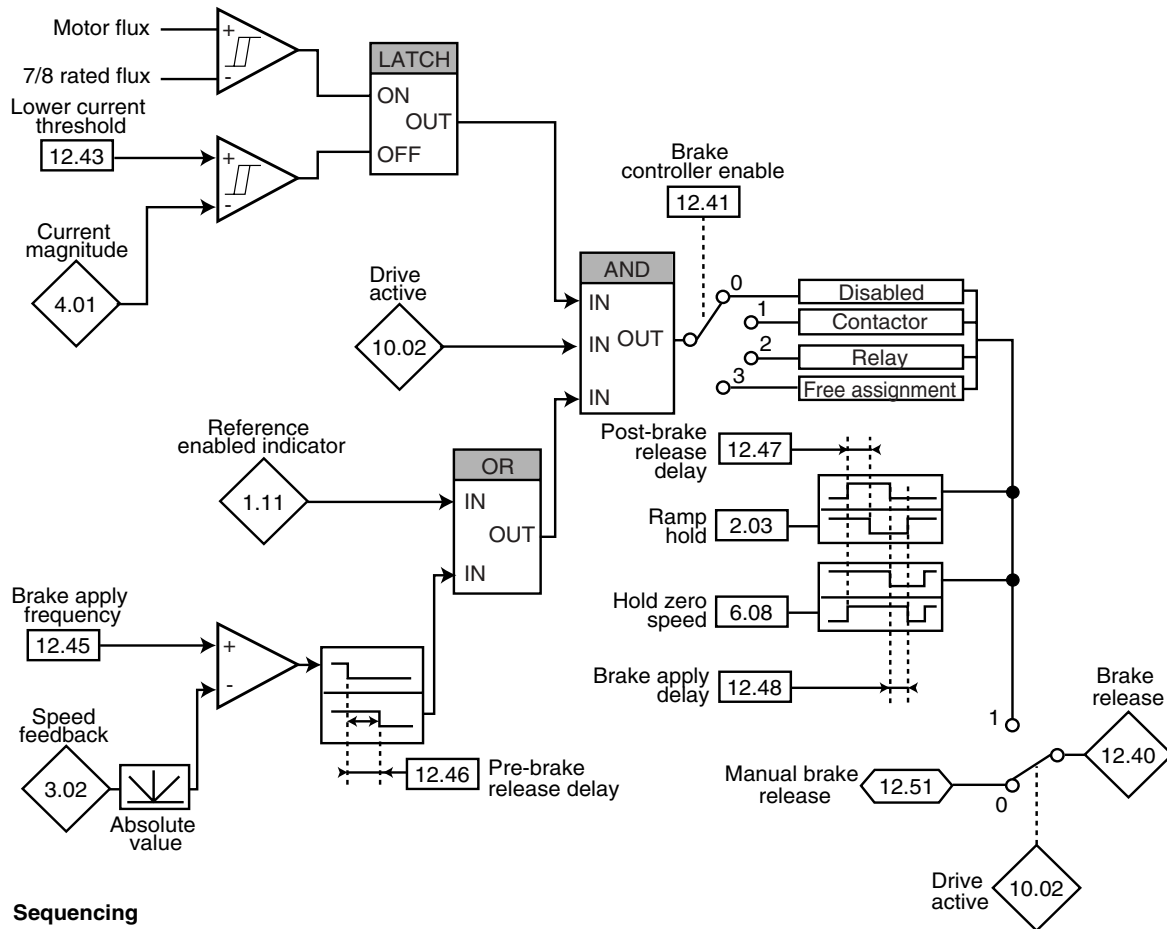
Sequencing
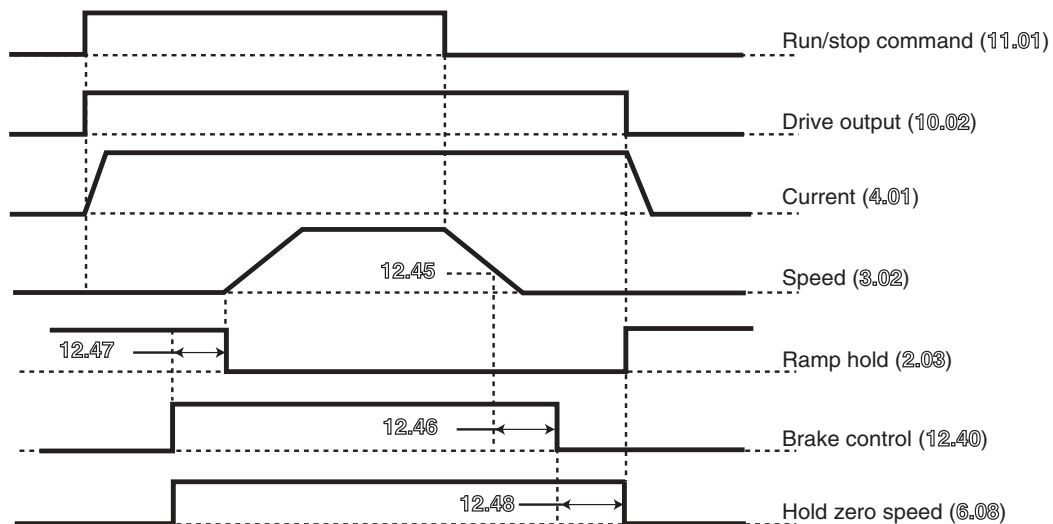
PROXIDRIVE
IP66 variable speed drive
MENU 12: THRESHOLD DETECTORS, VARIABLE SELECTORS AND BRAKE CONTROL FUNCTION

12.3 - Explanation of parameters in menu 12

⟨12.01⟩ **:Threshold detector 1 output**

⟨12.02⟩ **:Threshold detector 2 output**

⟨12.61⟩ **:Threshold detector 3 output**

⟨12.71⟩ **:Threshold detector 4 output**

Adjustment range : 0 or 1
0 : The input variable is the same as or less than the detector threshold.
1 : The input variable is higher than the detector threshold.

12.03 **:Threshold detector 1 source**

12.23 **:Threshold detector 2 source**

12.63 **:Threshold detector 3 source**

12.73 **:Threshold detector 4 source**
Adjustment range : 0.00 to 21.51
Factory setting : 0.00
These parameters define the variable which is to be compared to the configured threshold.
The absolute value of the variable is taken into account. Only non-bit parameters can be programmed as the source.
If an unsuitable parameter is programmed, the input value is taken to equal 0.

12.04 **:Threshold detector 1 level**

12.24 **:Threshold detector 2 level**

12.64 **:Threshold detector 3 level**

12.74 **:Threshold detector 4 level**
Adjustment range : 0 to 100.0%
Factory setting : 0
These parameters are used to adjust the detector trip threshold.
The threshold is expressed as a percentage of the maximum value of the compared variable.

12.05 **:Threshold detector 1 hysteresis**

12.25 **:Threshold detector 2 hysteresis**

12.65 **:Threshold detector 3 hysteresis**

12.75 **:Threshold detector 4 hysteresis**
Adjustment range : 0 to 25.0%
Factory setting : 0
These parameters define the window within which the detector output will not change state.
The output will change to 1 when the variable reaches the threshold value + (hysteresis /2).
The output will change to 0 when the variable drops below the threshold value - (hysteresis /2).
The hysteresis is expressed as a percentage of the maximum value of the compared variable.

12.06 **:Threshold detector 1 invert**

12.26 **:Threshold detector 2 invert**

12.66 **:Threshold detector 3 invert**

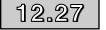12.76 **:Threshold detector 4 invert**
Adjustment range : 0 or 1
Factory setting : 0
These parameters are used to invert the detector output.
0 : Output not inverted.
1 : Output inverted.

12.07 **:Threshold detector 1 destination**

12.27 **:Threshold detector 2 destination**

12.67 **:Threshold detector 3 destination**

12.77 **:Threshold detector 4 destination**
Adjustment range : 0.00 to 21.51
Factory setting : 0.00
These parameters define the internal parameter which will be assigned by the detector output.
Only bit type parameters can be programmed.
If an unsuitable parameter is programmed, the output is not sent to any address.

12.08 **:Variable selector 1 source 1**

12.28 **:Variable selector 2 source 1**
Adjustment range : 0.00 to 21.51
Factory setting : 0.00
These parameters define the source parameter for variable 1 to be processed.
Only "numerical" parameters (read-only) can be assigned.
If an unsuitable parameter is selected, the value of the variable will be 0.

PROXIDRIVE
IP66 variable speed drive
MENU 12: THRESHOLD DETECTORS, VARIABLE SELECTORS AND BRAKE CONTROL FUNCTION

| 12.09 | :Variable selector 1 source 2 |

| 12.29 | :Variable selector 2 source 2 |

Adjustment range : 0.00 to 21.51
Factory setting   : 0.00
These parameters define the source parameter for variable 2 to be processed.
Any "numerical" parameter (read-only) can be assigned.
If an unsuitable parameter is selected, the value of the variable will be 0.

| 12.10 | :Variable selector 1 mode |

| 12.30 | :Variable selector 2 mode |

Adjustment range : 0 to 9
Factory setting   : 0
These parameters are used to define the function of the internal variables processing block.

	LED	Output	Comment
0	In1	= V1	Used to transfer an internal variable
1	In2	= V2	Used to transfer an internal variable
2	IP2	= V1 + V2	Addition of 2 variables
3	I-2	= V1 - V2	Subtraction of 2 variables
4	IM2	= (V1 x V2) ÷ 100	Multiplication of 2 variables
5	Id2	= (V1 x 100) ÷ V2	Division of 2 variables
6	Filt	= V1 ÷ (12.x5 +1)	Creation of a first-order filter
7	raMP	= ramped V1	Creation of a linear ramp. 12.x5 is used to adjust the ramp value
8	abso	= |V1|	Absolute value
9	Puur	= V1$^{12.x5}$	V1 at power 12.x5

• If 12.10 or 12.30 equals 2, 3, 4 or 5:
When the result of the calculation is higher than or equal to 32767, output 12.11 or 12.31 is limited to 32767.
When the result of the calculation is less than or equal to -32768, output 12.11 or 12.31 is limited to -32768.
• If 12.10 or 12.30 equals 5:
To avoid a calculation error if V2 = 0, the result of the operation will be 0.
• If 12.10 or 12.30 equals 9:
To avoid a calculation error, it is the absolute value of the V1 signal which is taken into account before calculating its square root or cube root.

| 12.11 | :Variable selector 1 destination |

| 12.31 | :Variable selector 2 destination |

Adjustment range : 0.00 to 21.51
Factory setting   : 0.00
These parameters are used to select the destination of the processed variable.
Any unprotected "non-bit" parameter can be assigned.
If an unsuitable parameter is selected, the value of the variable taken into account is zero.

| 12.12 | :Variable selector 1 output |

| 12.32 | :Variable selector 2 output |

Adjustment range : ± 100.00%
Indicates the value of the function output as a percentage of the adjustment range for the destination parameter.

| 12.13 | :Variable selector 1 source 1 scaling |

| 12.33 | :Variable selector 2 source 1 scaling |

Adjustment range : ± 4.000
Factory setting   : 1.000
Used to scale variable 1 before processing.
CAUTION:
The value of the scaling output can only be between -32767 and +32767. Take this into account depending on the adjustment range of the source parameter.

| 12.14 | :Variable selector 1 source 2 scaling |

| 12.34 | :Variable selector 2 source 2 scaling |

Adjustment range : ± 4.000
Factory setting   : 1.000
Used to scale variable 2 before processing.
CAUTION:
The value of the scaling output can only be between -32767 and +32767. Take this into account depending on the adjustment range of the source parameter.

| 12.15 | :Variable selector 1 control |

| 12.35 | :Variable selector 2 control |

Adjustment range : 0 to 100.00
Factory setting   : 0
Depending on its function, the internal variables processing block may need an associated parameter.
If the block is used to create a first-order filter, the associated parameter is used as a coefficient; if it is used to generate a ramp, this parameter is used to adjust the ramp value (in seconds). The ramp time corresponds to the time taken for the source parameter max value to change from 0 to 100%.
If the block is used as power, this parameter is used as follows:

Function	Associated parameter value
$V1^2$	2.00
$V1^3$	3.00
$\sqrt{V1}$	12.00
$\sqrt[3]{V1}$	13.00

| 12.16 | to | 12.22 | : Not used |

| 12.36 | to | 12.39 | : Not used |

PROXIDRIVE
IP66 variable speed drive
MENU 12: THRESHOLD DETECTORS, VARIABLE SELECTORS AND BRAKE CONTROL FUNCTION

12.40 :Brake release

Adjustment range : 0 or 1
Indicates the state of the brake control output.
0 (OFF): The brake is applied.
1 (On): The brake is released.

12.41 :Brake controller enable
Adjustment range : 0 to 3
Factory setting   : 0
Used to enable brake control and to select to which digital output it will be assigned.
0 (dis): Brake control is disabled.
1 (COnt): Brake control is enabled and routed to the integrated brake contactor option.
2 (rEI): Brake control is enabled and routed to the relay. In this case, the "drive healthy" indication is rerouted to digital output DIO1 ($8.27 = 12.40$ and $8.21 = 10.01$).
3 (USEr): Brake control is enabled. The output is not assigned automatically; it is up to the user to select the destination for parameter 12.40.
WARNING :
Secure function is prior to brake controller :
if $8.10 = 1$ (SEcu) and $12.41 = 2$ (rEI), brake controller is enabled but relay remains routed to 10.01 "Drive healthy", and 12.41 changes to 3 (USEr) free selection. Therefore, disable secure function by setting $8.10 = 0$ (Enab) before setting $12.41 = 2$ (rEI).

12.42 :Upper current threshold
Adjustment range : 0 to 200%
Factory setting   : 30%
Used to set the current threshold at which the brake will be controlled. This current level should ensure sufficient torque at the time the brake is released.

12.43 :Lower current threshold
Adjustment range : 0 to 200%
Factory setting   : 10%
Used to set the current threshold below which brake control will be disabled. It should be set so as to detect loss of the motor power supply.

12.44 :Brake release frequency
Adjustment range : 0 to 20.0 Hz
Factory setting   : 1.0 Hz
Used to set the frequency threshold at which the brake will be controlled. This frequency level should ensure sufficient torque is provided to drive the load in the right direction when the brake is released. This threshold is usually set at a value slightly above the frequency corresponding to the motor slip at full load.
Example:
- 1500 rpm = 50 Hz
- Rated on-load speed = 1470 rpm
- Slip = 1500 - 1470 = 30 rpm
- Slip frequency = 30/1500 x 50 = 1 Hz

12.45 :Brake apply frequency ▣ or speed ▣
Adjustment range:0 to 20.0 Hz ▣, 0 to 100 rpm ▣
Factory setting   :2.0 Hz ▣, 5 rpm ▣
Used to set the frequency or speed threshold at which brake control will be disabled. This threshold enables the brake to be applied before zero speed so as to avoid load veering while the brake is being engaged.
If the frequency or speed drops below this threshold when no stop request has been made (change of direction of rotation), brake control will remain activated. This exception can be used to avoid the brake being applied as the motor passes through zero speed.

12.46 :Pre-brake release delay (▣)
        Brake apply speed delay (▣)
Adjustment range : 0 to 25.00 s
Factory setting   : 0.30 s
▣ : This time delay is triggered when all the conditions for brake release have been met. It allows enough time to establish an adequate level of flux in the motor and to ensure that the slip compensation function has become fully active. When this time delay has elapsed, brake control is enabled ($12.40 = 1$).
During the whole pre-brake delay period, the ramp applied to the reference is held constant ($2.03 = 1$).

▣ : This time delay is used to delay the brake apply command in relation to the passage below the minimum speed threshold (12.45). It is useful for avoiding repeated oscillation of the brake when it is being applied around zero speed.

12.47 :Post-brake release delay
Adjustment range : 0 to 25.00 s
Factory setting   : 1.00 s
This time delay is triggered when brake control is enabled. It is used to allow time for the brake to release before unlocking the ramp ($2.03 = 0$).

12.48 :Brake apply delay
Adjustment range : 0 to 25.00 s
Factory setting   : 0
This time delay is used to maintain the torque at standstill ($6.08 = 1$) while the brake is applied. When this time delay has elapsed, the drive output is deactivated.

12.49 :Enable position controller during brake release (▣)
Adjustment range : 0 or 1
Factory setting   : 0
0 (OFF): The ramp is held when the drive output is not active, until the post-brake release delay (12.47) has expired. This enables the speed reference to remain at 0 until the brake is released.
1 (On): Position controller enabled while the ramp is held. This function avoids the load moving during the brake release phase.
Function not available in version V2.10.

12.50 :Not used

12.51 :Manual brake release
Adjustment range : 0 or 1
Factory setting   : 0
When the drive output is active ($10.02 = 1$) the brake control output 12.40 is enabled when the release conditions determined by the brake control function are met. When the drive output is inactive, the brake control output, 12.40 is forced to 1 if 12.51 is at 1.
12.51 can be assigned to a digital input but cannot be written to.
0: Inactive.
1: Active.

Notes

13 - MENU 13: RESERVED

Notes

14 - MENU 14: PID CONTROLLER

14.1 - List of parameters in Menu 14

Parameter	Name	Type	Adjustment range	Factory setting	User setting
14.01	PID output	RO/P	± 100.0%	-	-
14.02	PID main reference source	R-W/P	0.00 to 21.51	0.00	
14.03	PID reference source	R-W/P	0.00 to 21.51	0.00	
14.04	PID feedback source	R-W/P	0.00 to 21.51	0.00	
14.05	PID reference source invert	R-W	0 or 1	0	
14.06	PID feedback source invert	R-W	0 or 1	0	
14.07	PID reference slew rate limit	R-W	0 to 600.0 s	0	
14.08	PID enable	R-W	0 or 1	0	
14.09	PID optional enable source	R-W/P	0.00 to 21.51	10.01	
14.10	PID P gain	R-W	0 to 2.50	1.00	
14.11	PID I gain	R-W	0 to 2.50	0.50	
14.12	PID D gain	R-W	0 to 2.50	0	
14.13	PID upper limit	R-W	0 to 100.0%	100.0%	
14.14	PID lower limit	R-W	± 100.0%	-100.0%	
14.15	PID scaling	R-W	0 to 2.50	1.00	
14.16	PID destination	R-W/P	0.00 to 21.51	0.00	
14.17	PID hold integrator	R-W	0 or 1	0	
14.18	PID symmetrical limit enable	R-W	0 or 1	0	
14.19	PID main reference	RO/P	± 100.0%	-	-
14.20	PID reference	RO/P	± 100.0%	-	-
14.21	PID feedback	RO/P	± 100.0%	-	-
14.22	PID error	RO/P	± 100.0%	-	-

14.2 - Menu 14 diagram
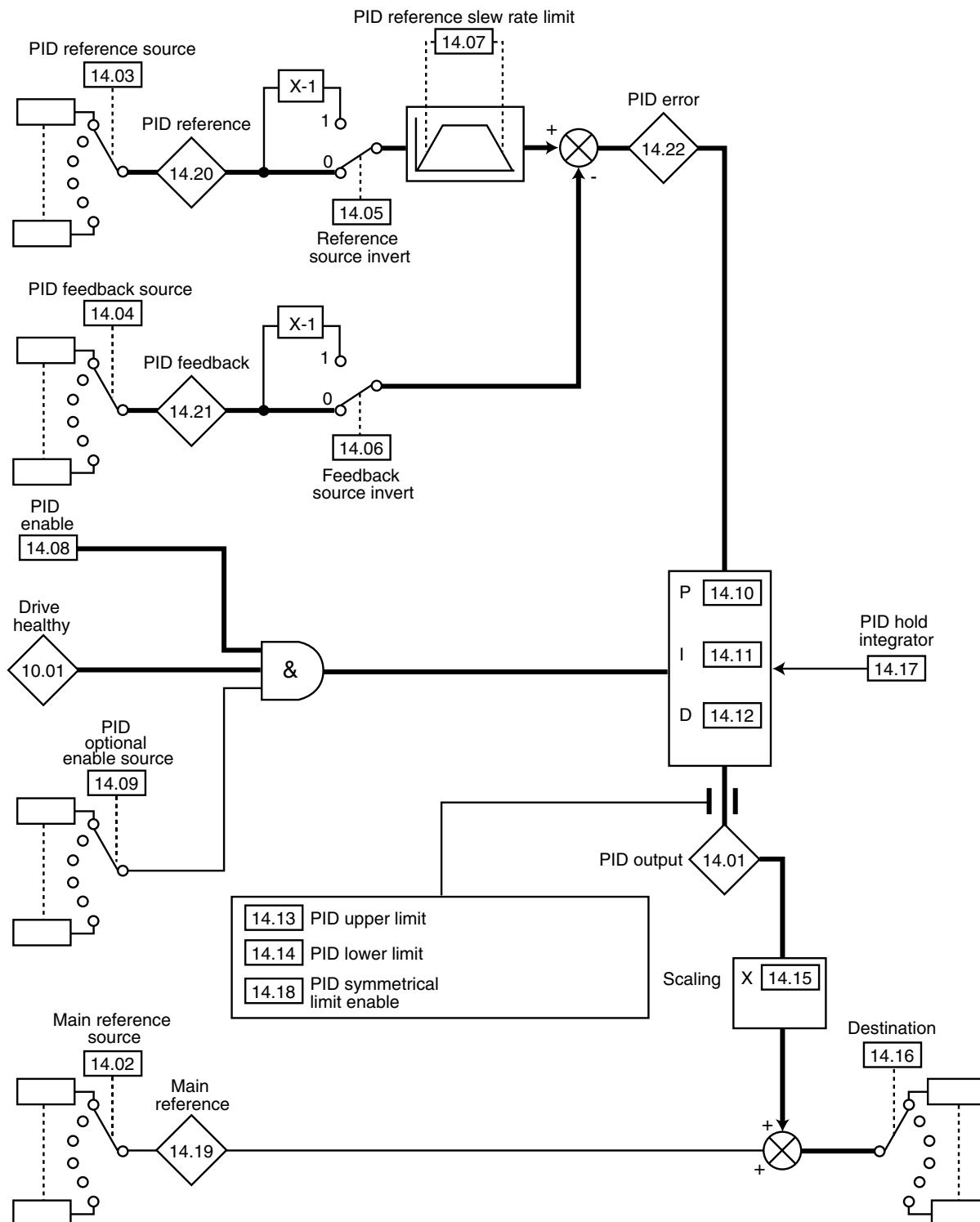
Note : PID function is disabled if 14.16 value remains to 0.00.

PROXIDRIVE
IP66 variable speed drive
MENU 14: PID CONTROLLER

14.3 - Explanation of parameters in menu 14

⟨14.01⟩ :PID output

Adjustment range : ± 100.0%
This parameter indicates the level of the PID controller output before scaling.

14.02 :PID main reference source
Adjustment range : 0.00 to 21.51
Factory setting : 0.00
This parameter defines the variable which acts as a main reference on the PID controller.
Only non-bit parameters can be programmed as the source.
If an unsuitable parameter is programmed, the input value is taken to equal 0.
All the PID variables are automatically scaled so that these variables have an adjustment range of ± 100.0% or 0 to 100.0% if they are unipolar.

14.03 :PID reference source
Adjustment range : 0.00 to 21.51
Factory setting : 0.00
This parameter defines the variable which acts as a reference on the PID controller.
Only non-bit parameters can be programmed as the source.
If an unsuitable parameter is programmed, the input value is taken to equal 0.
All the PID variables are automatically scaled so that these variables have an adjustment range of ± 100.0% or 0 to 100.0% if they are unipolar.

14.04 :PID feedback source
Adjustment range : 0.00 to 21.51
Factory setting : 0.00
This parameter defines the variable which acts as a feedback on the PID controller.
Only non-bit parameters can be programmed as the source.
If an unsuitable parameter is programmed, the input value is taken to equal 0.
All the PID variables are automatically scaled so that these variables have an adjustment range of ± 100.0% or 0 to 100.0% if they are unipolar.

14.05 and 14.06 :PID source invert
Adjustment range : 0 or 1
Factory setting : 0
These parameters are used to invert the sign for the PID reference and feedback.
0 (OFF): Input not inverted.
1 (On): Input inverted.
14.05: PID reference source inverted.
14.06: PID feedback source inverted.

14.07 :PID reference slew rate limit
Adjustment range : 0 to 600.0 s
Factory setting : 0
This parameter defines the time taken for the PID reference to go from 0 to 100.0% after an abrupt variation of the input from 0 to 100%. A variation of -100.0% to +100.0% will take twice as long.

14.08 :PID enable
Adjustment range : 0 or 1
Factory setting : 0
0 (OFF): The PID controller is disabled.
1 (On): The PID controller is enabled.
CAUTION:
If it is necessary to modify the values of 14.10, 14.11 and 14.12, set 14.08 to 0 first and then back to 1 so that this change is taken into account by the drive.

14.09 :PID optional enable source
Adjustment range : 0.00 to 21.51
Factory setting : 10.01
This parameter is used to enable the PID controller on a condition in addition to 14.08.
For the PID controller to be enabled, 14.08, 10.01 and the additional condition must be at 1.
Only bit parameters can be assigned.
If an unsuitable parameter is chosen, the input will automatically take the value 1 to avoid locking the enable output.
Note: Parameter 0.00 does not disable the enable output.

14.10 :PID P gain
Adjustment range : 0 to 2.50
Factory setting : 1.00
This is the proportional gain applied to the PID error.
After this parameter has been modified, refer to 14.08.

14.11 :PID I gain
Adjustment range : 0 to 2.50
Factory setting : 0.50
This is the gain applied to the PID error before integration.
After this parameter has been modified, refer to 14.08.

14.12 :PID D gain
Adjustment range : 0 to 2.50
Factory setting : 0
This is the gain applied to the PID error before derivation.
After this parameter has been modified, refer to 14.08.

14.13 :PID upper limit
Adjustment range : 0 to 100.0%
Factory setting : 100.0%
This parameter is used to limit the maximum value of the PID output (see 14.18).

14.14 :PID lower limit
Adjustment range : ± 100.0%
Factory setting : -100.0%
This parameter is used to limit the maximum negative value or the minimum positive value of the PID output.
This parameter is inactive if 14.18 = 1. (See 14.18)

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IP66 variable speed drive
MENU 14: PID CONTROLLER

`14.15` **:PID scaling**

Adjustment range : 0 to 2.50
Factory setting   : 1.00
This parameter is used to scale the PID output before it is added to the main reference.
The sum of both references is automatically scaled according to the adjustment range of the parameter to which it is addressed.

`14.16` **:PID destination**

Adjustment range : 0.00 to 21.51
Factory setting   : 0.00
Used to define to which parameter the PID output is addressed.
Only unprotected non-bit parameters can be assigned.
If an unsuitable parameter is assigned, the output will not be sent to any address.
If the PID output is supposed to affect the speed, it is advisable to address it to a preset reference.

`14.17` **:PID hold integrator**

Adjustment range : 0 or 1
Factory setting   : 0
0 (OFF): Integration occurs normally when the PID loop is active.
1 (On): The integrator value is frozen and remains at this value until 14.17 changes back to 0.
In both cases, when the PID controller has been disabled, the integrator value is reset to 0.

`14.18` **:PID symmetrical limit enable**

Adjustment range : 0 or 1
Factory setting   : 0
When 14.18 is set to 1, 14.13 and 14.14 take the same value and 14.13 is the parameter which takes effect.

`14.19` **:PID main reference**

Adjustment range : ± 100.0%
This parameter indicates the value of the main reference.

`14.20` **:PID reference**

Adjustment range : ± 100.0%
This parameter indicates the value of the PID reference.

`14.21` **:PID feedback**

Adjustment range : ± 100.0%
This parameter indicates the value of the PID feedback.

`14.22` **:PID error**

Adjustment range : ± 100.0%
This parameter indicates the error between the main reference and the feedback.

LEROY® SOMER

15 - MENU 15: RESERVED

PROXIDRIVE
IP66 variable speed drive
MENU 15: RESERVED

Notes

PROXIDRIVE
IP66 variable speed drive
MENU 16: PLC FUNCTIONS

16 - MENU 16: PLC FUNCTIONS

16.1 - List of parameters in Menu 16

| Parameter	Name	Type	Adjustment range	Factory setting	User setting
16.01 - 16.11 16.21 - 16.31	Timer relays 1 to 4 output state	RO	0 or 1	-	-
16.02 - 16.12 16.22 - 16.32	Timer relays 1 to 4 input source	R-W/P	0.00 to 21.51	0.00	
16.03 - 16.13 16.23 - 16.33	Timer relays 1 to 4 type	R-W	0 or 1	0	
16.04 - 16.14 16.24 - 16.34	Timer relays 1 to 4 unit of time	R-W	0 to 2	0	
16.05 - 16.15 16.25 - 16.35	Timer relays 1 to 4 value	R-W	0 to 60.0	0	
16.06 to 16.08	Not used				
16.09 - 16.19 16.29 - 16.39	Timer relays 1 to 4 output destination	R-W	0.00 to 21.51	0.00	
16.10 16.16 to 16.18 16.20 16.26 to 16.28 16.30 16.36 to 16.38 16.40	Not used				
16.41 - 16.51 16.61 - 16.71	Latching relays 1 to 4 output state	RO	0 or 1	-	-
16.42 - 16.52 16.62 - 16.72	Latching relays 1 to 4 ON source	R-W	0.00 to 21.51	0.00	
16.43 - 16.53 16.63 - 16.73	Latching relays 1 to 4 OFF source	R-W	0.00 to 21.51	0.00	
16.44 to 16.48 16.50 16.54 to 16.58 16.60 16.64 to 16.68 16.70 16.74 to 16.78	Not used				
16.49 - 16.59 16.69 - 16.79	Latching relays 1 to 4 output destination	R-W	0.00 to 21.51	0.00	
16.80	Current counter value	RO	0 to 9999	-	-
16.81	Counter output state	RO	0 or 1	-	-
16.82	Upcounting counter input	R-A	0 or 1		
16.83	Downcounting counter input	R-A	0 or 1		
16.84	Counter output trip threshold	R-W	0 to 9999	0	
16.85	Initial counter values	R-W	0 to 9999	0	
16.86	Counter power-up status	R-W	0 or 1	0	
16.87	Counter enable source	R-W/P	0.00 to 21.51	0.00	
16.88	Counter initialisation	R-W	0 or 1	0	
16.89	Counter output destination	R-W/P	0.00 to 21.51	0.00	

PROXIDRIVE
IP66 variable speed drive
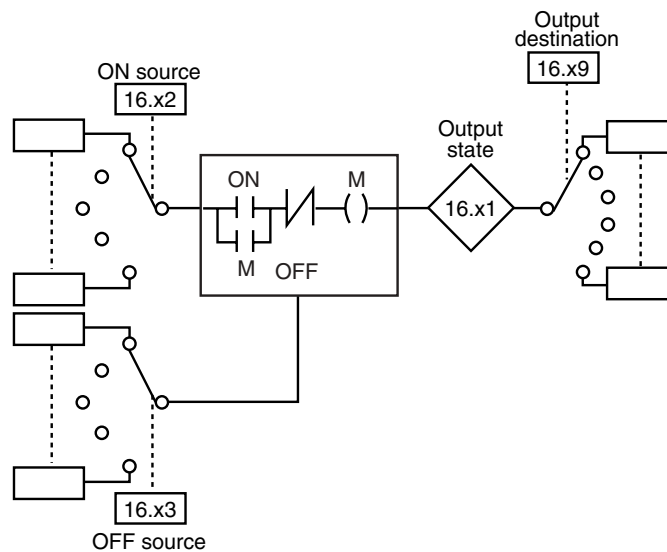MENU 16: PLC FUNCTIONS

16.2 - Menu 16 diagrams

16.2.1 - Timer relays
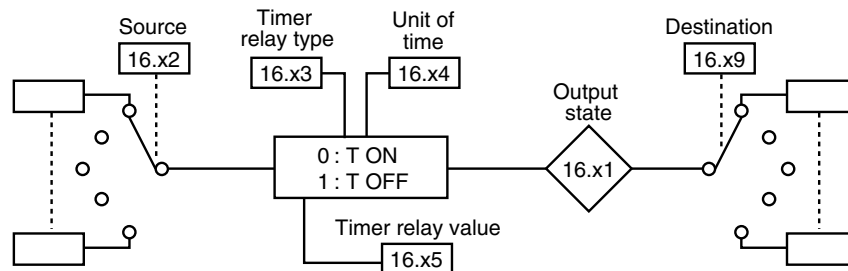
	Source	Timer type selection	Time delay	Unit of time	Output state	Destination
Timer 1	16.02	16.03	16.05	16.04	16.01	16.09
Timer 2	16.12	16.13	16.15	16.14	16.11	16.19
Timer 3	16.22	16.23	16.25	16.24	16.21	16.29
Timer 4	16.32	16.33	16.35	16.34	16.31	16.39

16.2.2 - Latching relays

	ON source	OFF source	Output state	Output destination
LR 1	16.42	16.43	16.41	16.49
LR 2	16.52	16.53	16.51	16.59
LR 3	16.62	16.63	16.61	16.69
LR 4	16.72	16.73	16.71	16.79

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16.2.3 - Counter
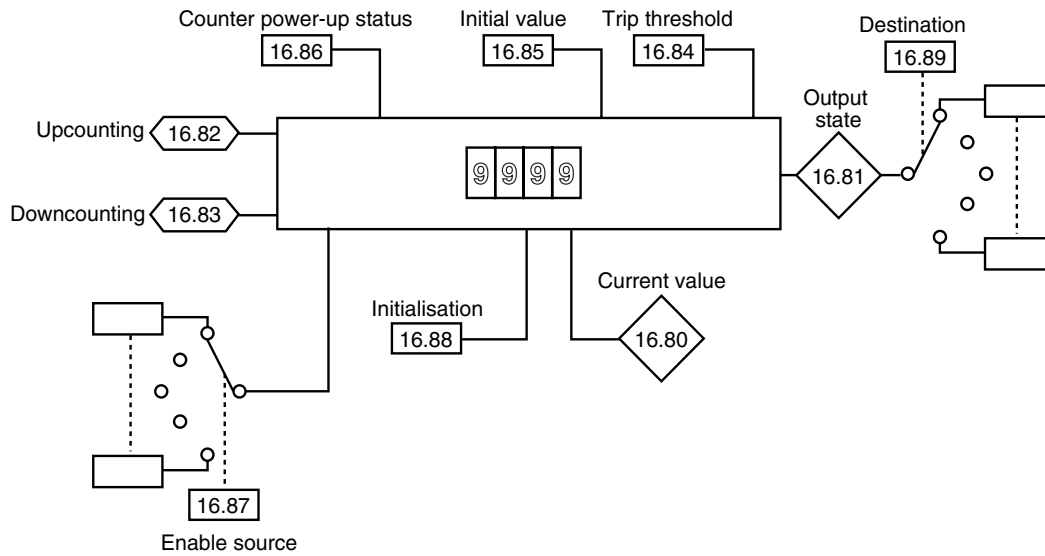
16.3 - Explanation of parameters in menu 16

⬦ 16.01   :Timer relay 1 output state

⬦ 16.11   :Timer relay 2 output state

⬦ 16.21   :Timer relay 3 output state

⬦ 16.31   :Timer relay 4 output state

Adjustment range : 0 or 1
These parameters indicate the state of the timer relay outputs.

16.02   :Timer relay 1 input source

16.12   :Timer relay 2 input source

16.22   :Timer relay 3 input source

16.32   :Timer relay 4 input source
Adjustment range : 0.00 to 21.51
Factory setting   : 0.00
These parameters are used to select the input source for the timer relays.
Only "bit" type parameters can be assigned to these inputs. If an unsuitable parameter is addressed on an input, the input will be frozen at 0.

16.03   :Timer relay 1 type

16.13   :Timer relay 2 type

16.23   :Timer relay 3 type

16.33   :Timer relay 4 type
Adjustment range : 0 or 1
Factory setting   : 0
0 (On): The relay is used for on-delay timing. The output changing to 1 is delayed in relation to the input changing to 1.
1 (OFF): The relay is used for off-delay timing. The output changing to 0 is delayed in relation to the input changing to 0.

16.04   :Timer relay 1 unit of time

16.14   :Timer relay 2 unit of time

16.24   :Timer relay 3 unit of time

16.34   :Timer relay 4 unit of time
Adjustment range : 0 to 2
Factory setting   : 0
0 (Sec): The unit of time for the timer relay is the second.
1 (Min): The unit of time for the timer relay is the minute.
2 (hour): The unit of time for the timer relay is the hour.

16.05   :Timer relay 1 value

16.15   :Timer relay 2 value

16.25   :Timer relay 3 value

16.35   :Timer relay 4 value
Adjustment range : 0 to 60.0
Factory setting   : 0
These parameters are used to set the timer delay period. The unit depends on the configuration of 16.04, 16.14, 16.24 and 16.34.

16.06   to 16.08 : Not used

16.09   :Timer relay 1 output destination

16.19   :Timer relay 2 output destination

16.29   :Timer relay 3 output destination

16.39   :Timer relay 4 output destination
Adjustment range : 0.00 to 21.51
Factory setting   : 0.00
These parameters are used to select the destination for the timer relay outputs.
Only "bit" type parameters can be assigned to these outputs. If an unsuitable parameter is addressed on an output, the output will be frozen at 0.

16.10 , 16.16 to 16.18 : Not used

16.20 , 16.26 to 16.28

16.30 , 16.36 to 16.38

and 16.40

⬦ 16.41   :Latching relay 1 output state

⬦ 16.51   :Latching relay 2 output state

⬦ 16.61   :Latching relay 3 output state

⬦ 16.71   :Latching relay 4 output state

Adjustment range : 0 or 1
These parameters indicate the state of the latching relay outputs.

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16.42 **:Latching relay 1 ON source**

16.52 **:Latching relay 2 ON source**

16.62 **:Latching relay 3 ON source**

16.72 **:Latching relay 4 ON source**
Adjustment range : 0.00 to 21.51
Factory setting   : 0.00
These parameters are used to select the enable source for the timer relays. A pulse on an input causes the corresponding output to change to 1.
Only "bit" type parameters can be assigned to these inputs. If an unsuitable parameter is addressed on an input, the input will be frozen at 0.

16.43 **:Latching relay 1 OFF source**

16.53 **:Latching relay 2 OFF source**

16.63 **:Latching relay 3 OFF source**

16.73 **:Latching relay 4 OFF source**
Adjustment range : 0.00 to 21.51
Factory setting   : 0.00
These parameters are used to select the disable source for the timer relays. A pulse on an input causes the corresponding output to change to 0.
Only "bit" type parameters can be assigned to these inputs.
If an unsuitable parameter is addressed on an input, the input will be frozen at 0.

16.44 to 16.48 , 16.50 **:Not used**

16.54 to 16.58 , 16.60

16.64 to 16.68 , 16.70

and 16.74 to 16.78

16.49 **:Latching relay 1 output destination**

16.59 **:Latching relay 2 output destination**

16.69 **:Latching relay 3 output destination**

16.79 **:Latching relay 4 output destination**
Adjustment range : 0.00 to 21.51
Factory setting   : 0.00
These parameters are used to select the destination for the latching relay outputs.
Only "bit" type parameters can be assigned to these outputs. If an unsuitable parameter is addressed on an output, the output will be frozen at 0.

16.80 **:Current counter value**

Adjustment range : 0 to 9999
Indicates the current counter value.

16.81 **:Counter output state**

Adjustment range : 0 or 1
0: The current counter value is less than the trip threshold.
1: The current counter value has reached the trip threshold.

16.82 **:Upcounting counter input**
Adjustment range : 0 or 1
A pulse on this input increments the counter value by 1.
Note: Only inputs DI3 and DI4 can be assigned to this parameter, and the frequency is 5 kHz maximum.

16.83 **:Downcounting counter input**
Adjustment range : 0 or 1
A pulse on this input decrements the counter value by 1.
Note: Only inputs DI3 and DI4 can be assigned to this parameter, and the frequency is 5 kHz maximum.

16.84 **:Counter output trip threshold**
Adjustment range : 0 to 9999
Factory setting   : 0
Used to determine the trip threshold which will cause the counter output to change to 1.

16.85 **:Initial counter value**
Adjustment range : 0 to 9999
Factory setting   : 0
Used to determine a threshold value from which the counter will upcount or downcount.

16.86 **:Counter power-up status**
Adjustment range : 0 or 1
Factory setting   : 0
0 (Prec): On power-up, the counter adopts the value it had before power-down.
1 (O): On power-up, the counter takes the value of 16.85.

16.87 **:Counter enable source**
Adjustment range : 0.00 to 21.51
Factory setting   : 0.00
Used to select the internal bit which enables upcounting or downcounting. As long as this input is not enabled, pulses on the upcounter or downcounter inputs are not taken into account.
Only "bit" type parameters can be programmed. If an unsuitable parameter is addressed, the input will be frozen at 0.

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16.88 **:Counter initialisation**
Adjustment range : 0 or 1
Factory setting   : 0
When this parameter changes to 1, the counter is initialised
with the initial value.

16.89 **:Counter output destination**
Adjustment range : 0.00 to 21.51
Factory setting   : 0.00
Determines the internal parameter which will be assigned by
the counter output.
Only "bit" type parameters can be programmed.
If an unsuitable parameter is assigned, the output is not sent
to any address.

17 - MENUS 17 TO 20 : RESERVED

Notes

18 - MENU 21: OPERATING PARAMETERS FOR A SECOND MOTOR

18.1 - List of parameters in Menu 21

Parameter	Name		Type	Adjustment range	Factory setting	User setting
21.01	Motor 2 maximum reference clamp		R-W	0 to 32000 rpm	Eur: 1500 rpm USA: 1800 rpm	
21.02	Motor 2 minimum reference clamp		R-W/P	0 to 32000 rpm	0	
21.03	Motor 2 reference selector		R-W	0 to 4	0	
21.04	Motor 2 acceleration rate		R-W	0 to 600.0 s/1000 rpm	3.0 s/1000 rpm	
21.05	Motor 2 deceleration rate		R-W	0 to 600.0 s/1000 rpm	5.0 s/1000 rpm	
21.06	Motor 2 rated frequency		R-W	0 to 400.0 Hz	Eur: 50.0 Hz USA: 60.0 Hz	
21.07	Motor 2 rated current		R-W	0 to drive rated current (A)	Motor rated current (A) corresponding to drive rating	
21.08	Motor 2 rated speed		R-W	0 to 9999 rpm	Motor rated speed (rpm) corresponding to drive rating	
21.09	Motor 2 rated voltage		R-W	0 to 480V	Eur TL : 200V USA TL : 230V Eur T : 400V USA T : 460V	
21.10	Motor 2 rated power factor (cos φ)		R-W	0 to 1.00	0.85	
21.11	Motor 2 number of poles		R-W	0 to 4	0	
21.12	Motor 2 stator resistance		R-W	0 to 32.000 Ω	0	
21.13	Motor 2 voltage offset		RO	0 to 25.5V	-	
21.14	Motor 2 inductance		R-W	0 to 3200.0 mH	0	
21.15	Motor 2 parameters active		RO/P	0 or 1	-	
21.16 to 21.23	Not used					
21.24	Motor 2 stator inductance L_S	◼	R-W	0 to 3200.0 mH	150.0 mH	
21.25 to 21.29	Not used					
21.30	Motor volts per 1000 rpm (Ke)	◼	R-W	0 to 10000 V	98 V	
21.31 to 21.50	Not used					
21.51	q axis inductance	◼	R-W	0 to 999.9 mH	150.0 mH	

▦ : Function not available in version V2.10.

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MENU 21: OPERATING PARAMETERS FOR A SECOND MOTOR

18.2 - Explanation of parameters in menu 21

21.01 :Motor 2 maximum reference clamp
Adjustment range : 0 to 32000 rpm
Factory setting : **Eur = 1500 rpm**
                   USA = 1800 rpm
This parameter defines the maximum speed in both directions of rotation.
This parameter is equivalent to 1.06 in motor 1.

21.02 :Motor 2 minimum reference clamp
Adjustment range : 0 to 32000 rpm
Factory setting : 0
In unipolar mode, this parameter defines the minimum speed.
CAUTION:
This parameter is inactive during jog operation.
This parameter is equivalent to 1.07 in motor 1.

21.03 :Motor 2 reference selector
Adjustment range : 0 to 4
Factory setting : 0
0 (SEL): The speed reference is selected by combining the digital inputs assigned to parameters 1.41 and 1.42.
1 (Ana1): The speed reference comes from analog input 1.
2 (Ana2): The speed reference comes from analog input 2.
3 (Pr): The speed reference comes from preset references.
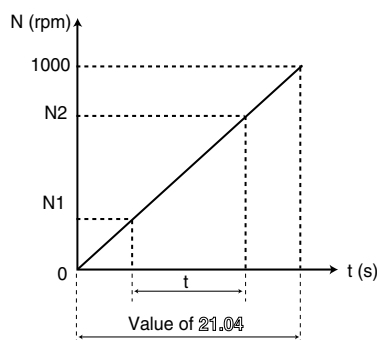**4 (O):** No speed reference is taken into account.

21.04 :Motor 2 acceleration rate
Adjustment range : 0 to 600.0s/1000 rpm
Factory setting : 3.0s/1000 rpm
Sets the time for acceleration from 0 to 1000 rpm.

$$21.04 = \frac{t(s) \times 1000\ rpm}{(N2 - N1)\ rpm}$$

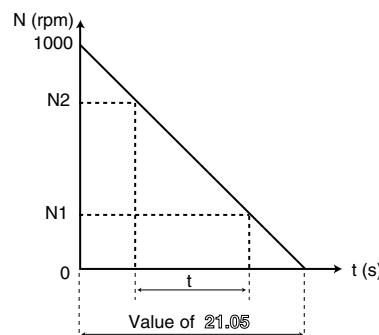**This parameter is equivalent to 2.11 in motor 1.**

21.05 :Motor 2 deceleration rate
Adjustment range : 0 to 600.0s/1000 rpm
Factory setting : 5.0s/1000 rpm
Sets the time for deceleration from 1000 rpm to 0.

$$21.05 = \frac{t(s) \times 1000\ rpm}{(N2 - N1)\ rpm}$$

This parameter is equivalent to 2.21 in motor 1.

21.06 :Motor 2 rated frequency
Adjustment range : 0 to 400.0 Hz
Factory setting : **Eur = 50.0 Hz**
                   USA = 60.0 Hz
This is the point at which motor operation changes from constant torque to constant power.
During standard operation, it is the frequency indicated on the motor nameplate.
This parameter is equivalent to 5.06 in motor 1.

21.07 :Motor 2 rated current
Adjustment range : 0 to drive rated current (A)
Factory setting : Motor rated current corresponding to the drive rating
This is the value of the motor rated current indicated on the nameplate. Above this value the motor is overloaded.
This parameter is equivalent to 5.07 in motor 1.

21.08 :Motor 2 rated speed
Adjustment range : 0 to 9999 rpm
Factory setting : Motor rated speed corresponding to the drive rating
This is the on-load speed of the motor indicated on the nameplate.
This parameter is equivalent to 5.08 in motor 1.

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MENU 21: OPERATING PARAMETERS FOR A SECOND MOTOR

21.09 :Motor 2 rated voltage

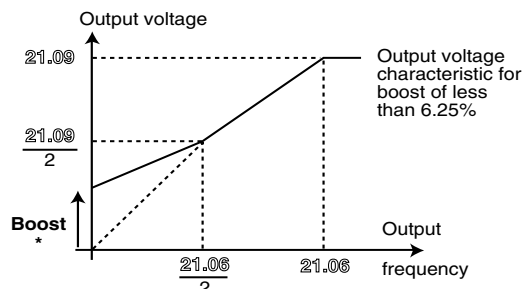Adjustment range : TL = 0 to 240 V
T = 0 to 480V
Factory setting : **Eur TL = 200V**
USA TL = 230V
Eur T = 400V
USA T= 460V
Defines the voltage/frequency ratio as follows:

* If the fixed boost has been selected 5.14 = 2.
This parameter is equivalent to 5.09 in motor 1.

21.10 :Motor 2 power factor (Cos φ)

Adjustment range : 0 to 1.00
Factory setting : 0.85
The power factor is measured automatically during an autotune phase in level 2 (see 5.12) and set in this parameter. If it has not been possible to carry out the autotune procedure, enter the Cos φ value indicated on the motor nameplate.
This parameter is equivalent to 5.10 in motor 1.

21.11 :Motor 2 number of poles

Adjustment range : 0 to 4
Factory setting : 0
When this parameter is at 0 (Auto), the drive automatically calculates the number of poles according to the rated speed (21.08) and the rated frequency (21.06). However, the value can also be entered directly as a number of pairs of poles.

Motor rated speed rpm	Number of poles	21.11
3000	2	1
1500	4	2
1000	6	3
750	8	4

This parameter is equivalent to 5.11 in motor 1.

21.12 :Motor 2 stator resistance

Adjustment range : 0 to 32.000 Ω
Factory setting : 0
This parameter stores the motor stator resistance for flux vector control mode (see parameter 5.14).
The stator resistance value is only read if 5.14 = 0.
If the stator resistance cannot be measured (motor not connected, value higher than the max. rating) an "rS" fault appears.
During autotuning (5.12 = 1 or 2), the value of the stator resistance is stored automatically.
This parameter is equivalent to 5.17 in motor 1.

21.13 :Motor 2 voltage offset

Adjustment range : 0 to 25.5 volts
This voltage offset is measured by the drive (see parameter 5.14). It is used to correct imperfections in the drive, especially voltage drops in the IGBTs and idle times. This parameter plays an important role in low-speed operation, ie. when the drive output voltage is low.
During autotuning (5.12 = 1 or 2), the value of the voltage offset is stored automatically.
This parameter is equivalent to 5.23 in motor 1.

21.14 :Motor 2 inductance

Adjustment range : 0 to 3200.0 mH
Factory setting : 0
During autotuning with rotation (5.12 = 2), the total motor leakage inductance is stored in this parameter.
This parameter is equivalent to 5.24 in motor 1.

21.15 :Motor 2 parameters active

Adjustment range : 0 or 1
21.15 changes from 0 to 1 when the motor 2 parameters are active.
They are taken into account when 11.45 is set to 1 and the drive is disabled or in the trip state. During drive operation, 11.45 can be set to 1, but the characteristics of motor 2 are not taken into account. This parameter can be assigned to a digital output, in order to control closing of the second motor contactor when the motor 2 characteristics have been enabled.

21.16 to 21.23 : Not used

21.24 :Motor 2 stator inductance L$_S$ ■

Adjustment range : 0 to 3200.0 mH
Factory setting : 150.0 mH
This is the motor stator inductance at rated flux.
This parameter is equivalent to 5.25 in motor 1.

21.25 to 21.29 : Not used

21.30 :Motor volts per 1000 rpm (Ke) ■

Adjustment range : 0 to 10000 V
Factory setting : 98V
Used to set the motor voltage per 1000 rpm. Is used to adjust the current controller integral gain to prevent current peaks when the drive is enabled with a spinning motor.
This parameter is equivalent to 5.33 in motor 1.
Function not available in version V2.10.

21.31 to 21.50 : Not used

21.51 :q axis inductance ■

Adjustment range : 0 to 999.9 mH
Factory setting : 150.0 mH
This is the motor stator inductance in quadrature with the total inductance Ls 21.24, used to control a synchronous motor with projecting poles.
This parameter is equivalent to 5.51 in motor 1.
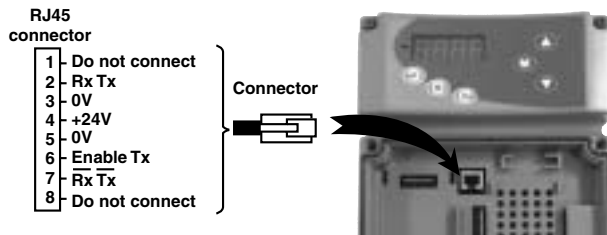
19 - OPERATION WITH MODBUS RTU

19.1 - Serial link

The PROXIDRIVE incorporates as standard an RS485/2 wire serial link port accessible with an RJ45 connector.

19.1.1 - Location and connection

RJ45 connector
1 - Do not connect
2 - Rx Tx
3 - 0V
4 - +24V
5 - 0V
6 - Enable Tx
7 - $\overline{Rx}$ $\overline{Tx}$
8 - Do not connect

Connector

19.1.2 - Protocols

The drive handles the following protocols:
- Modbus RTU
- LS Net
The drive automatically recognises the protocol used, and this can be read in 11.24 "Serial mode".

19.1.3 - Parameter setting

Depending on the application, the following parameters need to be modified.
11.23 : Serial address
11.25 : Serial link baud rate
11.27 : Modbus frame format
For more information on these parameters, refer to menu 11, section 11.3.

19.1.4 - Networking

The PROXIDRIVE serial port allows the drive to communicate with an RS 485 2 wire network.
• The network should therefore be connected in a "daisy-chain" (not a star).
• At minimum, terminals 2, 3, 7 and the shielding must be connected.

The CT Comms cable option allows a PC to be connected directly to the PROXIDRIVE. This cable, with a SUB-D 9 connector at one end and RJ45 at the other, incorporates an isolated RS232/RS485 converter.
CAUTION:
Do not use this cable to network several PROXIDRIVEs ("24Vs" should not be connected).

19.2 - Parameter setting using the PC

With PROXISOFT parameter-setting software, setting up the PROXIDRIVE from a PC is very user-friendly.
- Quick configuration: the drive parameters are set very quickly from a "quick configuration" screen.
- Supervision during commissioning: used to supervise the various data relating to operation on a single screen.
- File storing: used to save all the parameter files thus enabling very quick duplication of an already existing setting.
To connect the PC to the PROXIDRIVE, use the CT Comms cable option described above or use a RS232/RS485 2 wire converter (example: Amplicon 485 FI).
For PCs equipped with USB ports, ask your usual LEROY-SOMER contact.

19.3 - Control word and status word

PROXIDRIVE run commands can be managed by a single parameter 6.42, called the "control word".
In fact, the value of 6.42 corresponds to a word in which each bit is associated with a command. The command is enabled when the bit is at 1, and disabled when the bit is at 0.
To enable commands with a control word, configure 6.43 = 1 (run commands via the terminals are no longer active), when the drive is locked.

Parameter 10.40, called the status word, is used to group data on the drive. The value of 10.40 corresponds to a 15 bit word, and each bit is associated with a drive status parameter.

6.42 : **Control word**

Control word bits 6.42	Corresponding parameters	Functions
0	6.15	Drive unlocking
1	6.30	Run forward
2	6.31	Jog
3	6.32	Run reverse
4	6.33	Forward/Reverse
5	6.34	Run
6	-	Reserved
7	-	Reserved
8	1.42	Analog reference/preset reference
9	-	Reserved
10	-	Reserved
11	-	Reserved
12	-	Reserved
13	10.33	Drive reset/Reset
14	-	Reserved

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10.40 : **Status word**

Status word bits 10.40	Corresponding parameters	Drive status
0	10.01	Drive healthy
1	10.02	Drive active
2	10.03	Zero speed
3	10.04	Running at or below min speed
4	10.05	Below set speed
5	10.06	At speed
6	10.07	Above set speed
7	10.08	Load reached
8	10.09	Drive output is at current limit
9	10.10	Regenerating
10	10.11	Braking IGBT active
11	10.12	Braking resistor alarm
12	10.13	Direction commanded
13	10.14	Direction running
14	10.15	Mains loss

19.4 - MODBUS RTU

19.4.1 - General

The MODBUS RTU protocol is a master-slave type protocol (individual master for each network).

Description	Characteristics
Normal physical layer for multi-drop operation	RS485 2 wire
Bit stream	Standard UART asynchronous symbols with Non Return to Zero (NRZ)
Symbol	Each symbol consists of: 1 start bit 8 data bits (transmitted least significant bit first) 1 or 2 stop bits depending on 11.27
Baud rate	300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 bauds

Note: If the CT Comms cable is used, the baud rate is limited to 38400 bauds.

19.4.2 - Description of exchanges

Exchanges are initiated by the master, which transmits its request: if the slave concerned has understood it, it sends its response. Each frame (question or response) contains four types of data:
- the address of the slave concerned which receives the question frame (master request) or the address of the slave which sends the response frame (encoded on a byte)
- the function code which selects a command (read or write words, bits etc) for question and response frames (encoded on a byte)
- the data field containing the parameters relating to the command (encoded on "n" bytes)
- the frame CRC, calculated on sixteen bits, which is used to detect transmission errors.
The frame is terminated with a minimum silence period of 3.5 character times (for example, at 19200 baud the minimum silence period is 1/19200 x 11 bits x 3.5, ie. 2 ms). This silence period indicates the end of the message, and the slave can begin processing the transmitted data.
All data is coded in hexadecimal format.

Slave address	Function code	Message data	16 bit CRC	Silence interval

All master requests will lead to a response from an individual slave. The slave will respond within the maximum allotted time (the minimum response time is never less than the silence period).
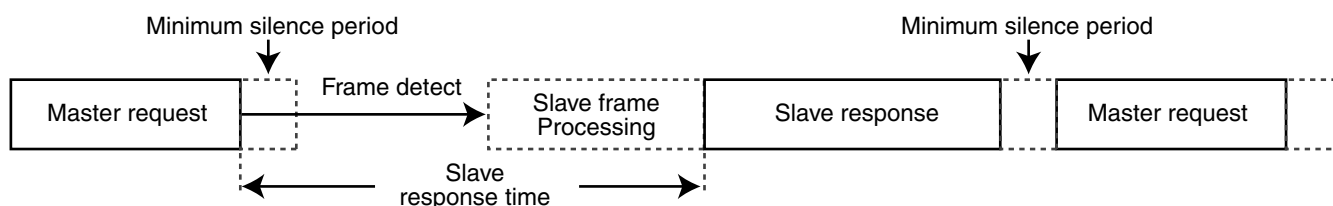
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19.4.3 - Parameter mapping

PROXIDRIVE drives are parameterized using the **menu.param** notation.
Indexes "menu" and "param" are in the range 0 through 99. The menu.param is mapped into the MODBUS RTU register space as **menu x 100 + param**.

To correctly map the parameters, the slave device increments (+1) the received register address.
Example: X = menu; Y = parameter

Drive parameter	Register address (protocol level)
X.Y	(X x 100) + (Y − 1)
Examples:	
1.02	101
1.00	99
0.01	0
12.33	1232

19.4.4 - Data encoding

MODBUS RTU uses a "big-endian" representation for addresses and data items (except the CRC which is "little-endian"). This means that when a numerical quantity larger than a single byte is transmitted, the most significant byte is sent first.
For example:

16 – bits 0x1234   would be: 1st 2nd …
0x12 0x34

19.4.5 - Function codes

The function code determines the context and format of the message data.

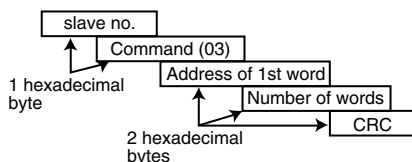| Function code	Description
3	Read multiple 16 bit registers
6	Write single 16 bit register
16	Write multiple 16 bit registers
23	Read and write multiple 16 bit registers

• Function code 3: read multiple
Reads a contiguous array of registers. The slave imposes an upper limit on the number of registers which can be read. If the limit is exceeded, the slave does not respond.
Note: 99 parameters maximum can be read.
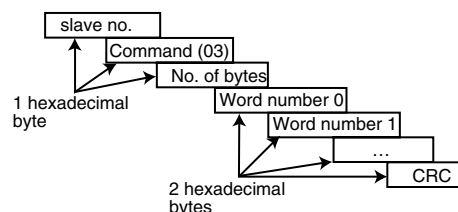
Frame sent by the Master:

Bytes	Description
0	Slave address (1 through 247)
1	Function code 0x03
2	Start register address MSB
3	Start register address LSB
4	Number of 16 bit registers MSB
5	Number of 16 bit registers LSB
6	CRC LSB
7	CRC MSB

Frame returned by the slave:

Bytes	Description
0	Slave address
1	Function code 0x03
2	Length of register data in read block (in bytes)
3	Register data 0 MSB
4	Register data 0 LSB
5	Register data 1 MSB
6	Register data 1 LSB
...	…
n	CRC LSB
n + 1	CRC MSB

Where n = 3 + number of bytes in read block.

• Function code 6: Write single register
Writes a value to a single 16 bit register. The normal response is an echo of the request, returned after the register contents have been written.

Frame sent by the master:

Bytes	Description
0	Slave address (0 through 247)
1	Function code 0x06
2	Register address MSB
3	Register address LSB
4	Register data MSB
5	Register data LSB
6	CRC LSB
7	CRC MSB
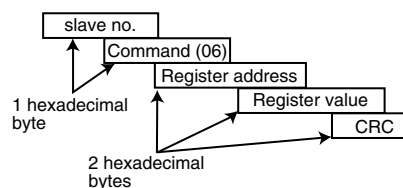
Frame sent by the slave:

Bytes	Description
0	Slave address
1	Function code 0x06
2	Register address MSB
3	Register address LSB
4	Register data MSB
5	Register data LSB
6	CRC LSB
7	CRC MSB

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### • Function code 16: write multiple

Writes a contiguous array of registers. The slave imposes an upper limit on the number of registers which can be written. If the limit is exceeded, the slave does not respond.
Note: 12 parameters maximum can be written.

Frame sent by the Master:

Bytes	Description
0	Slave address (1 through 247)
1	Function code 0x10
2	Start register address MSB
3	Start register address LSB
4	Number of 16 bit registers MSB
5	Number of 16 bit registers LSB
6	Length of register data to write (in bytes)
7	Register data 0 MSB
8	Register data 0 LSB
9	Register data 1 MSB
10	Register data 1 LSB
...	…
n	CRC LSB
n + 1	CRC MSB

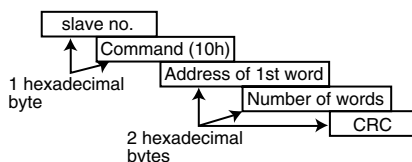Where n = 7 + number of bytes in write block.
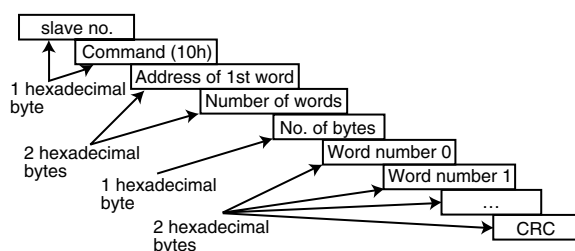
Frame returned by the slave:

Bytes	Description
0	Slave address (1 through 247)
1	Function code 0x03
2	Start register address MSB
3	Start register address LSB
4	Number of 16 bit registers written MSB
5	Number of 16 bit registers written LSB
6	CRC LSB
7	CRC MSB

• Function code 23: read/write

Writes and reads two contiguous arrays of registers. The slave imposes an upper limit on the number of registers which can be written. If the limit is exceeded, the slave does not respond.
Note: 99 parameters maximum can be read and 10 parameters maximum can be written.

Frame sent by the Master:

Bytes	Description
0	Slave address (1 through 247)
1	Function code 0x17
2	Start register address to read MSB
3	Start register address to read LSB
4	Number of 16 bit registers to read MSB
5	Number of 16 bit registers to read LSB
6	Start register address to write MSB
7	Start register address to write LSB
8	Number of 16 bit registers to write MSB
9	Number of 16 bit registers to write LSB
10	Length of register data to write (in bytes)
11	Register data 0 MSB
12	Register data 0 LSB
13	Register data 1 MSB
14	Register data 1 LSB
...	…
n	CRC LSB
n + 1	CRC MSB

Where n = 11 + number of bytes in write block.

Frame returned by the slave:

Bytes	Description
0	Slave address (1 through 247)
1	Function code 0x17
2	Length of register data in read block (in bytes)
3	Register data 0 MSB
4	Register data 0 LSB
5	Register data 1 MSB
6	Register data 1 LSB
...	…
n	CRC LSB
n + 1	CRC MSB

Where n = 3 + number of bytes in read block.

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19.4.6 - Example

Drive address = 11.
Reading of 3 parameters from 1.08.
0108 becomes 0107 which equals 006B in hexadecimal
(modbus address = parameter address - 1).

• Request

	Example (hex)	RTU (binary)
Slave address	B	0000 1011
Function	03	0000 0011
Start reg. address (MSB)	00	0000 0000
Start reg. address (LSB)	6B	0110 1011
Nb of 16 bit reg. (MSB)	00	0000 0000
Nb of 16 bit reg. (LSB)	03	0000 0011
Check		CRC (16 bits)
Total bytes:		8

• Response

	Example (hex)	RTU (binary)
Slave address	B	0000 1011
Function	03	0000 0011
Number of bytes	06	0000 0110
Register data 0 (MSB)	02	0000 0010
Register data 0 (LSB)	2B	0010 1011
Register data 1 (MSB)	00	0000 0000
Register data 1 (LSB)	00	0000 0000
Register data 2 (MSB)	00	0000 0000
Register data 2 (LSB)	63	0110 0011
Check		CRC (16 bits)
Total bytes:		11

19.4.7 - Wait time

With MODBUS RTU, when the master sends a message to a slave, it imposes a wait time between the end of its request and the start of the response from the slave, which is used to detect a missing response if applicable.

19.4.8 - Exceptions

If the message is incorrect and the frame is not received, or if the CRC trips, the slave will not produce an exception, and in this case the master will not receive a response from the slave ("timeout"). If a write request (function code 16 or 23) exceeds the maximum size accepted by the slave, then the slave will reject the message. No exception will be transmitted and the master will not receive a response.

19.4.9 - CRC

This control word is used to detect transmission errors. It is calculated on 16 bits from all the bytes in the question and response frames.
Algorithm:
START
CRC = 0xFFFF;
Number of bytes processed = 0;
Next byte = first byte;
REPEAT{
Byte to be processed = next byte;
CRC = CRC or exclusive byte to be processed;
REPEAT eight times
IF (CRC odd)
THEN CRC = CRC/2 or exclusive 0xA001; else CRC = CRC/2
Number of bytes processed = Number of bytes processed + 1;
}WHILE (number of bytes processed < Number of bytes to be processed)
END.

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