



EscoDrives EDS3 Quickstart Manual

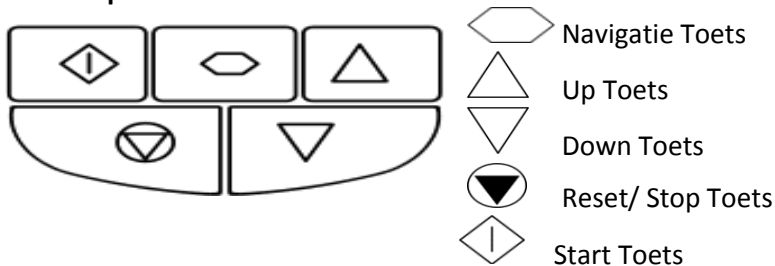
Inleiding

Deze manual is bedoeld als hulpdocument voor het snel in gebruik nemen van de EscoDrive EDS3 frequentieregelaars. In de fabrieksmanual staan de instellingen volledig en in meer detail toegelicht.

Hoe stel ik de regelaar in?

- 1 Via de Toetsen op het Front
- 2 Via EscoDrives Tools software programma d.m.v. EscoDrives Stick Bluetooth communicatie of RS485.

Toetsen op het front:



Parameters Veranderen:



- 1 Druk de Navigatie toets 2 Seconden in
- 2 Kies met de Up en Down toetsen de gewenste Parameter
- 3 Druk kort op de Navigatietoets om de parameter instelling te zien
- 4 Verander de waarde met de Up en Down toetsen
- 5 Druk kort op de Navigatie toets om te bevestigen en terug te gaan naar het Parametermenu. Nu kunt u een volgende parameter instellen.
- 6 Om terug te gaan naar het Operating Display drukt u 2 seconden op de Navigatie toets



Parametermenu:

De Parameters zijn ingedeeld in:

P-01 tot P-14	Standaard parameters
P-15-tot P-50	Extended parameters
P-51 tot P-60	Advanced parameters

LET OP:

Om de Extended parameters P-15-P-50 te kunnen instellen moet wachtwoord 101 worden ingevuld bij P-14
 Om de Advanced parameters P-51-P-60 te kunnen instellen moet wachtwoord 201 worden ingevuld bij P-14

Macro functies:

Om de regelaar snel in te kunnen stellen zijn er een aantal Macro Functies. De insteek hiervan is om het aantal parameters dat moet worden ingevuld te verlagen door deze te groeperen en met één basis instelling te wijzigen in plaats van alle bijbehorende parameters afzonderlijk.

P-12 Primary Command Source: ofwel hoe wordt de regelaar bediend:

Zie P-15 voor de functie indeling van de ingangen en uitgangen in relatie tot de instellingen gedaan in P-12!
 Zie P-16 en P47 om de analoge ingangen in te stellen op bijvoorbeeld 0-10 Volt of 4-20 mA

0:	Via de digitale en analoge ingangen	
1:	Via de toetsen op het front of extern keypad	Alleen Forward Run
2:	Via de toetsen op het front of extern keypad	Forward en Reverse Run
3:	Via Modbus RS485	Acceleratie/ Deceleratie volgens parameter P-03 en P-04
4:	Via Modbus RS485	Acceleratie/ Deceleratie via Modbus
5:	In PI control	Via analoge ingang
6:	In PI control	Via extern feedback signaal plus analoge ingang 1
7:	Via CANopen	Acceleratie/ Deceleratie volgens parameter P-03 en P-04
8:	Via CANopen	Acceleratie/ Deceleratie via CANopen
9:	In Slave mode	Krijgt zijn instellingen van een Escodrive in Master Mode

LET OP: Behalve bij 5 of 6 moet alsnog altijd Digitale ingang 1 actief zijn voordat de regelaar gaat draaien!

P-13 Operating Mode select: ofwel waarvoor wordt de regelaar gebruikt:

0:	Industrial mode	Voor algemeen gebruik
1:	Pump	Voor pompen
2:	Fan	Voor ventilatoren

P-15 Macro Functies afhankelijk van P-12:

STOP/RUN	Schakelcontact; contact gesloten is RUN, Contact open is STOP
Forward/ Reverse	Schakelt de draairichting om
AI1 REF	Analoge ingang 1 is de snelheidsreferentie ingang
P-xx REF	Preset speed ingang ingevuld bij de aangegeven Parameter
PR-REF	Preset speed P-20-P-23 volgens digitale ingang status
^-FAST STOP (P-24)-^	Als beide ingangen tegelijk bediend worden wordt Fast Stop Ramp time P-24 actief
E-TRIP	Externe ingang voor Trip melding E-trip of PTC-th afhankelijk van P-47
(NO)/(NC)	Normally Open contact (gesloten actief) of Normally Closed contact (open actief)



P-12 is 0: Digitale en analoge ingangen:

P-15	DI1		DI2		DI3 / AI2		DI4 / AI1		Diagram	
	0	1	0	1	0	1	0	1		
0	STOP	RUN	FWD ↻	REV ↻	AI1 REF	P-20 REF	Analog Input AI1		1	
1	STOP	RUN	AI1 REF	PR-REF	P-20	P-21	Analog Input AI1		1	
2	STOP	RUN	DI2	DI3	PR		P-20 - P-23	P-01	2	
			0	0	P-20					
			1	0	P-21					
			0	1	P-22					
3	STOP	RUN	AI1	P-20 REF	E-TRIP	OK	Analog Input AI1		3	
4	STOP	RUN	AI1	AI2	Analog Input AI2		Analog Input AI1		4	
5	STOP	RUN FWD ↻	STOP	RUN REV ↻	AI1	P-20 REF	Analog Input AI1		1	
		↑ FAST STOP (P-24) ↑								
6	STOP	RUN	FWD ↻	REV ↻	E-TRIP	OK	Analog Input AI1		3	
7	STOP	RUN FWD ↻	STOP	RUN REV ↻	E-TRIP	OK	Analog Input AI1		3	
		↑ FAST STOP (P-24) ↑								
8	STOP	RUN	FWD ↻	REV	DI3	DI4	PR		2	
					0	0	P-20			
					1	0	P-21			
					0	1	P-22			
9	STOP	START FWD ↻	STOP	START REV ↻	DI3	DI4	PR		2	
					0	0	P-20			
					1	0	P-21			
					0	1	P-22			
10	(NO)	START ↴	STOP	(NC)	AI1 REF	P-20 REF	Analog Input AI1		5	
P-15	DI1		DI2		DI3 / AI2		DI4 / AI1		Diagram	
	0	1	0	1	0	1	0	1		
11	(NO)	START FWD ↻	STOP	(NC)	(NO)	START REV ↻	Analog Input AI1		6	
		↑ FAST STOP (P-24) ↑								
12	STOP	RUN	FAST STOP (P-24)	OK	AI1 REF	P-20 REF	Analog Input AI1		7	
13	(NO)	START FWD ↻	STOP	(NC)	(NO)	START REV ↻	KPD REF	P-20 REF	13	
		↑ FAST STOP (P-24) ↑								
14	STOP	RUN	DI2		E-TRIP	OK	DI2	DI4	PR	11
			0	0			P-20			
			1	0			P-21			
			0	1			P-22			
15	STOP	RUN	P-23 REF	AI1	Fire Mode		Analog Input AI1		1	
16	STOP	RUN	P-23 REF	P-21 REF	Fire Mode		FWD	REV	2	
17	STOP	RUN	DI2		DI3 / AI2		DI2	DI4	PR	2
			0	0	P-20					
			1	0	P-21					
			0	1	P-22					
18	STOP	RUN	FWD ↻	REV ↻	Fire Mode		Analog Input AI1		1	



P12 is 1 of 2 Bediening via front of extern keypad:

P-15	DI1		DI2		DI3 / AI2		DI4 / AI1		Diagram
	0	1	0	1	0	1	0	1	
0	STOP	ENABLE	-	INC SPD ↑	-	DEC SPD ↓	FWD ↻	REV ↻	8
				↑	START	↑			
PI Speed Reference									
1	STOP	ENABLE	-	INC SPD ↑	-	DEC SPD ↓	KPD REF	P-20 REF	8
2	STOP	ENABLE	-	↑	START	↑			
3	STOP	ENABLE	-	INC SPD ↑	E-TRIP	OK	-	DEC SPD	9
				↑	START	↑			
4	STOP	ENABLE	-	INC SPD ↑	KPD REF	AI1 REF	AI1		10
5	STOP	ENABLE	FWD ↻	REV ↻	KPD REF	AI1 REF	AI1		1
6	STOP	ENABLE	FWD ↻	REV ↻	E-TRIP	OK	KPD REF	P-20 REF	11
7	STOP	RUN FWD	STOP	RUN REV ↻	E-TRIP	OK	KPD REF	P-20 REF	11
		↑ FAST STOP (P-24)		↑					
8	STOP	RUN FWD ↻	STOP	RUN REV ↻	KPD REF	AI1 REF	AI1		
14	STOP	RUN	-	-	E-TRIP	OK	-	-	
15	STOP	RUN	PR REF	KPD REF	Fire Mode		P-23	P-21	2
16	STOP	RUN	P-23 REF	KPD REF	Fire Mode		FWD ↻	REV ↻	2
17	STOP	RUN	KPD REF	P-23 REF	Fire Mode		FWD ↻	REV ↻	2
18	STOP	RUN	AI1 REF	KPD REF	Fire Mode		AI1		1

P12 is 3,4,7,8 of 9: Aansturing via Modbus of Canbus:

P-15	DI1		DI2		DI3 / AI2		DI4 / AI1		Diagram
	0	1	0	1	0	1	0	1	
0	STOP	ENABLE	FB REF (Fieldbus Speed Reference, Modbus RTU / CAN / Master-Slave defined by P-12)						14
1	STOP	ENABLE	PI Speed Reference						15
3	STOP	ENABLE	FB REF	P-20 REF	E-TRIP	OK	Analog Input AI1		3
5	STOP	ENABLE	FB REF	PR REF	P-20	P-21	Analog Input AI1		1
			↑	START (P-12 = 3 or 4 Only)	↑				
6	STOP	ENABLE	FB REF	AI1 REF	E-TRIP	OK	Analog Input AI1		3
			↑	START (P-12 = 3 or 4 Only)	↑				
7	STOP	ENABLE	FB REF	KPD REF	E-TRIP	OK	Analog Input AI1		3
			↑	START (P-12 = 3 or 4 Only)	↑				
14	STOP	ENABLE	-	-	E-TRIP	OK	Analog Input AI1		16
15	STOP	ENABLE	PR REF	FB REF	Fire Mode		P-23	P-21	2
16	STOP	ENABLE	P-23 REF	FB REF	Fire Mode		Analog Input AI1		1
17	STOP	ENABLE	FB REF	P-23 REF	Fire Mode		Analog Input AI1		1
18	STOP	ENABLE	AI1 REF	FB REF	Fire Mode		Analog Input AI1		1

P12 is 5 of 6: PI Control settings

P-15	DI1		DI2		DI3 / AI2		DI4 / AI1		Diagram
	0	1	0	1	0	1	0	1	
0	STOP	ENABLE	PI REF	P-20 REF	AI2		AI1		4
1	STOP	ENABLE	PI REF	AI1 REF	AI2 (PI FB)		AI1		4
3, 7	STOP	ENABLE	PI REF	P-20	E-TRIP	OK	AI1 (PI FB)		3
4	(NO)	START	(NC)	STOP	AI2 (PI FB)		AI1		12
5	(NO)	START	(NC)	STOP	PI REF	P-20 REF	AI1 (PI FB)		5
6	(NO)	START	(NC)	STOP	E-TRIP	OK	AI1 (PI FB)		
8	STOP	RUN	FWD ↻	REV ↻	AI2 (PI FB)		AI1		4
14	STOP	RUN	-	-	E-TRIP	OK	AI1 (PI FB)		16
15	STOP	RUN	P-23 REF	PI REF	Fire Mode		AI1 (PI FB)		1
16	STOP	RUN	P-23 REF	P-21 REF	Fire Mode		AI1 (PI FB)		1
17	STOP	RUN	P-21 REF	P-23 REF	Fire Mode		AI1 (PI FB)		1
18	STOP	RUN	AI1 REF	PI REF	Fire Mode		AI1 (PI FB)		1

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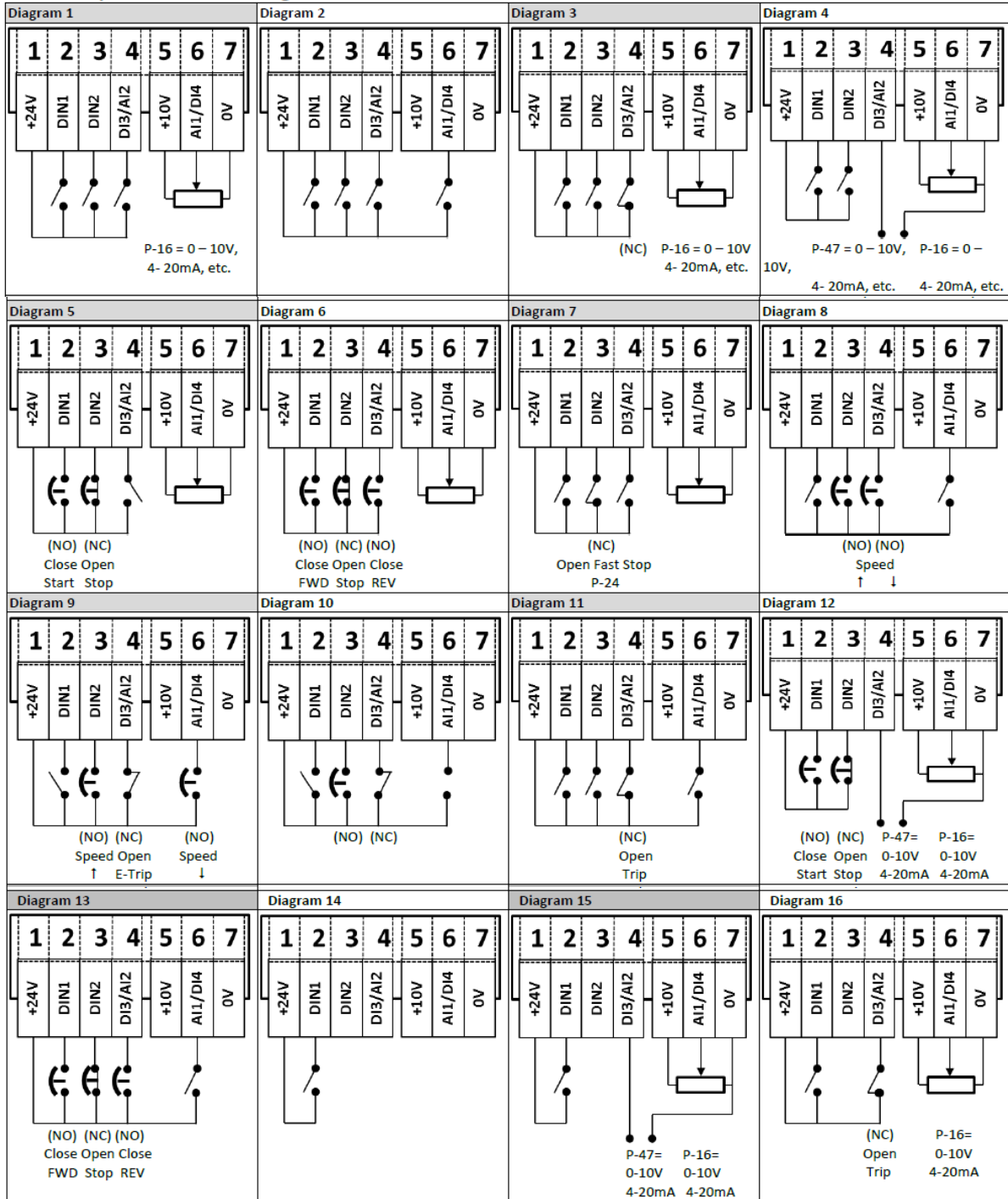
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Aansluitschema's behorende bij Diagram aangegeven bij P-15

LET OP: Deze regelaar kan dus niet via SINK/NPN logica worden aangesloten of door middel van een externe voedingsbron maar alleen volgens PNP Source logica op eigen voeding.

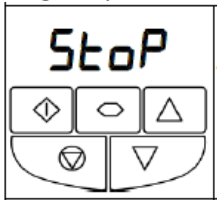




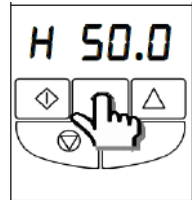
Bediening van de regelaar in Operating Display ofwel wanneer deze in bedrijf is:

Hier kan de regelaar eventueel gestart en gestopt worden en de gewenste snelheid en kan de frequentie worden uitgelezen.

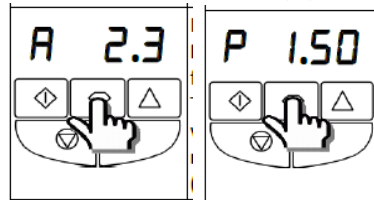
FR gestopt



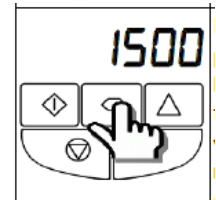
FR in Run



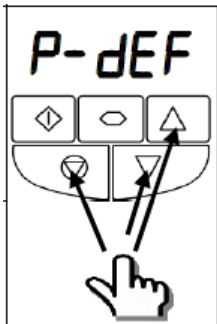
NAV toets voor Stroom (A) en Vermogen(P)



RPM (als P-10>0)

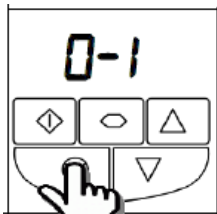


Parameters terug in de fabrieksinstellingen:



Druk gelijktijdig de UP, DOWN en STOP toets in voor 2 seconden en dan verschijnt er P-DEF in het display waarna alle parameters terug staan in de fabrieksinstellingen

Resetten van een Foutboodschap:



Zodra er een foutboodschap in het display verschijnt is deze te resetten met de STOP toets. Het is uiteraard aan te raden om eerst de foutoorzaak op te sporen en weg te nemen voordat de regelaar of aangesloten apparatuur onherstelbaar beschadigd raakt!

Read only Parameters ofwel Monitor Mode ofwel Status uitlezing:

Hier kunnen waarden uitgelezen worden zoals bijvoorbeeld de ingangsspanning of uitgangsspanning maar ook de laatste 4 foutboodschappen en de draaiuren etc.



- 1 Druk de Navigatie toets 2 Seconden in
- 2 Kies met de Up en Down toetsen Parameter P-00
- 3 Druk kort op de Navigatietoets om de eerste parameter te selecteren
- 4 Kies de parameter met de Up en Down toetsen
- 5 Druk kort op de Navigatie toets om de parameter waarde uit te lezen.
- 6 Om terug te gaan naar het Operating Display drukt u 2 seconden op de Navigatie toets



Foutboodschappen:

Fault Code	No.	Description	Suggested Remedy
no-FLt	00	No Fault	Not required
DI-b	01	Brake channel over current	Check external brake resistor condition and connection wiring
DL-br	02	Brake resistor overload	The drive has tripped to prevent damage to the brake resistor
O-I	03	Output Over Current	Instantaneous Over current on the drive output. Excess load or shock load on the motor. Note: Following a trip, the drive cannot be immediately reset. A delay time is inbuilt, which allows the power components of the drive time to recover to avoid damage.
I-otrP	04	Motor Thermal Overload (I2t)	The drive has tripped after delivering >100% of value in P-08 for a period of time to prevent damage to the motor.
PS-trP	05	Power stage trip	Check for short circuits on the motor and connection cable
O-volt	06	Over voltage on DC bus	Check the supply voltage is within the allowed tolerance for the drive. If the fault occurs on deceleration or stopping, increase the deceleration time in P-04 or install a suitable brake resistor and activate the dynamic braking function with P-34
U-volt	07	Under voltage on DC bus	The incoming supply voltage is too low. This trip occurs routinely when power is removed from the drive. If it occurs during running, check the incoming power supply voltage and all components in the power feed line to the drive.
O-t	08	Heatsink over temperature	The drive is too hot. Check the ambient temperature around the drive is within the drive specification. Ensure sufficient cooling air is free to circulate around the drive. Increase the panel ventilation if required. Ensure sufficient cooling air can enter the drive, and that the bottom entry and top exit vents are not blocked or obstructed.
U-t	09	Under temperature	Trip occurs when ambient temperature is less than -10°C. Temperature must be raised over -10°C in order to start the drive.
P-dEF	10	Factory Default parameters loaded	
E-tr iP	11	External trip	E-trip requested on digital input 3. Normally closed contact has opened for some reason. If motor thermistor is connected check if the motor is too hot.
SC-ObS	12	Optibus comms loss	Check communication link between drive and external devices. Make sure each drive in the network has its unique address.
FLt-dc	13	DC bus ripple too high	Check incoming supply phases are all present and balanced
P-LDSS	14	Input phase loss trip	Check incoming power supply phases are present and balanced.
h O-I	15	Output Over Current	Check for short circuits on the motor and connection cable Note: Following a trip, the drive cannot be immediately reset. A delay time is inbuilt, which allows the power components of the drive time to recover to avoid damage.
th-FLt	16	Faulty thermistor on heatsink	
dRA-F	17	Internal memory fault. (IO)	Press the stop key. If the fault persists, consult you supplier.
4-20 F	18	4-20mA Signal Lost	Check the analog input connection(s).
dRA-E	19	Internal memory fault. (DSP)	Press the stop key. If the fault persists, consult you supplier.
F-Ptc	21	Motor PTC thermistor trip	Connected motor thermistor over temperature, check wiring connections and motor
FR-F	22	Cooling Fan Fault (IP66 only)	Check / replace the cooling fan
O-hERt	23	Drive internal temperature too high	Drive ambient temperature too high, check adequate cooling air is provided
OUL-F	26	Output Fault	Indicates a fault on the output of the drive, such as one phase missing, motor phase currents not balanced. Check the motor and connections.
AtF-O 1	40	Autotuning Fault	The motor parameters measured through the autotuning are not correct.
AtF-O2	41		Check the motor cable and connections for continuity
AtF-O3	42		Check all three phases of the motor are present and balanced
AtF-O4	43		
AtF-O5	44		
SC-FD 1	50	Modbus comms loss fault	Check the incoming Modbus RTU connection cable Check that at least one register is being polled cyclically within the timeout limit set in P-36 Index 3
SC-FD2	51	CANopen comms loss trip	Check the incoming CAN connection cable Check that cyclic communications take place within the timeout limit set in P-36 Index 3



Status overzicht:

Par.	Description	Explanation
P00-01	1 st Analog input value (%)	100% = max input voltage
P00-02	2 nd Analog input value (%)	100% = max input voltage
P00-03	Speed reference input (Hz / RPM)	Displayed in Hz if P-10 = 0, otherwise RPM
P00-04	Digital input status	Drive digital input status
P00-05	User PI output (%)	Displays value of the User PI output
P00-06	DC bus ripple (V)	Measured DC bus ripple
P00-07	Applied motor voltage (V)	Value of RMS voltage applied to motor
P00-08	DC bus voltage (V)	Internal DC bus voltage
P00-09	Heatsink temperature (°C)	Temperature of heatsink in °C
P00-10	Run time since date of manuf. (Hours)	Not affected by resetting factory default parameters
P00-11	Run time since last trip (1) (Hours)	Run-time clock stopped by drive disable (or trip), reset on next enable only if a trip occurred. Reset also on next enable after a drive power down.
P00-12	Run time since last trip (2) (Hours)	Run-time clock stopped by drive disable (or trip), reset on next enable only if a trip occurred (under-volts not considered a trip) – not reset by power down / power up cycling unless a trip occurred prior to power down
P00-13	Trip Log	Displays most recent 4 trips with time stamp
P00-14	Run time since last disable (Hours)	Run-time clock stopped on drive disable, value reset on next enable
P00-15	DC bus voltage log (V)	8 most recent values prior to trip, 256ms sample time
P00-16	Heatsink temperature log (°C)	8 most recent values prior to trip, 30s sample time
P00-17	Motor current log (A)	8 most recent values prior to trip, 256ms sample time
P00-18	DC bus ripple log (V)	8 most recent values prior to trip, 22ms sample time
P00-19	Internal drive temperature log (°C)	8 most recent values prior to trip, 30 s sample time
P00-20	Internal drive temperature (°C)	Actual internal ambient temperature in °C
P00-21	CANopen process data input	Incoming process data (RX PDO1) for CANopen: PI1, PI2, PI3, PI4
P00-22	CANopen process data output	outgoing process data (TX PDO1) for CANopen: PO1, PO2, PO3, PO4
P00-23	Accumulated time with heatsink > 85°C (Hours)	Total accumulated hours and minutes of operation above heatsink temp of 85°C
P00-24	Accumulated time with drive internal temp > 80°C (Hours)	Total accumulated hours and minutes of operation with drive internal ambient above 80°C
P00-25	Estimated rotor speed (Hz)	In vector control modes, estimated rotor speed in Hz
P00-26	kWh meter / MWh meter	Total number of kWh / MWh consumed by the drive.
P00-27	Total run time of drive fans (Hours)	Time displayed in hh:mm:ss. First value displays time in hrs, press up to display mm:ss
P00-28	Software version and checksum	Version number and checksum. "1" on LH side indicates I/O processor, "2" indicates power stage
P00-29	Drive type identifier	Drive rating, drive type and software version codes
P00-30	Drive serial number	Unique drive serial number
P00-31	Motor current Id / Iq	Displays the magnetising current (Id) and torque current (Iq). Press UP to show Iq
P00-32	Actual PWM switching frequency (kHz)	Actual switching frequency used by drive
P00-33	Critical fault counter – (D-I)	These parameters log the number of times specific faults or errors occur, and are useful for diagnostic purposes.
P00-34	Critical fault counter – (D-uOLt)	
P00-35	Critical fault counter – (U-uOLt)	
P00-36	Critical fault counter – (D-t) O-temp (h/sink)	
P00-37	Critical fault counter – (DI - b) b O-I (chopper)	
P00-38	Critical fault counter – (D-HEAt) (control)	
P00-39	Modbus comms error counter (SC-FD I)	
P00-40	CANbus comms error counter (SC-FD2)	
P00-41	I/O processor comms errors (dAtA-F)	
P00-42	Power stage uC comms errors (PS-tRP)	
P00-43	Drive power up time (life time) (Hours)	Total lifetime of drive with power applied
P00-44	Phase U current offset & ref	Internal value
P00-45	Phase V current offset & ref	Internal value
P00-46	Phase W current offset & ref	Internal value
P00-47	Index 1 : Fire mode total active time Index 2 : Fire Mode Activation Count	Total activation time of Fire Mode Displays the number of times Fire Mode has been activated
P00-48	Scope channel 1 & 2	Displays signals for first scope channels 1 & 2
P00-49	Scope channel 3 & 4	Displays signals for first scope channels 3 & 4
P00-50	Bootloader and motor control	Internal value