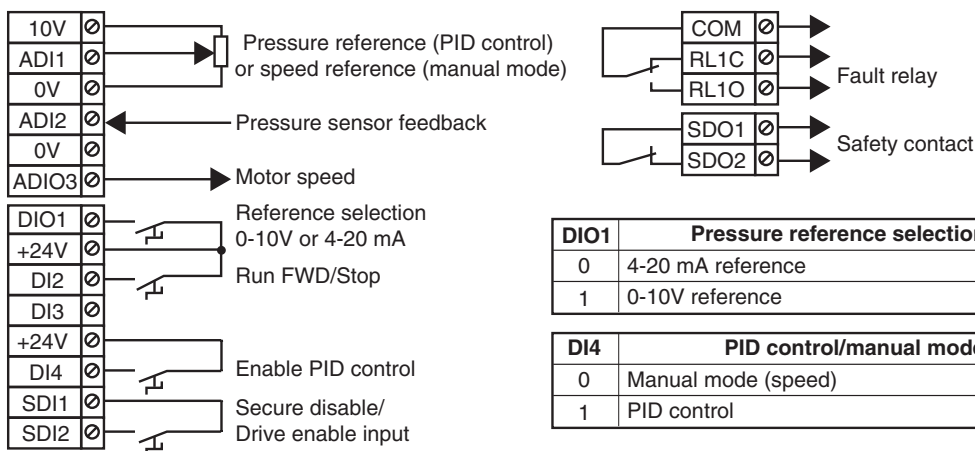# PROXIDRIVE
IP66/Nema 4X variable speed drive
ADDITION TO THE MANUAL REF. 3739en - 01.2007 / e - Supersedes section 4.3.7.9

4.3.7.9 - PUMP configuration: pump PID control
• Connection of the control terminal block (reminder)

DIO1	Pressure reference selection
0	4-20 mA reference
1	0-10V reference

DI4	PID control/manual mode
0	Manual mode (speed)
1	PID control

• Operation:
ADI1 is configured as 0-10V or 4-20 mA according to the state of DIO1.
ADI2 is configured as 4-20 mA (**12**) for the analog pressure sensor (max. consumption: 60 mA).

• Setting the pump:

 - Pump without pressure sensor (factory setting): the drive controls the flow according to the speed reference.
 - Pump with pressure sensor: the drive adjusts the speed to control the pressure.

Note: The DI4 input can be used to switch from "speed control" mode to "pressure control" mode.

• Commissioning:
- **Check that the drive has been disabled (terminal SDI2 open) and has not tripped before setting the drive parameters.**
- Set the max. speed in **02** (in min^{-1}; depends on the pump characteristics).
- Determining the direction of rotation: DI4 must be open to select manual mode. Close SDI2 and apply a speed reference to ADI1. Close then reopen DI2 briefly. If the pump direction of rotation is incorrect, power down the drive and swap two phases at the drive output. Open SDI2.
WARNING:
Don't modify acceleration and deceleration ramps 03 and 04 (this could alter the precision of regulation).
- Select the configuration by setting **05** = PUMP.
- Set motor parameters **06** to **09**.
- Select the reference type using DIO1.
  Example of setting: For PID control at 7 bars with a 0-10 bar sensor, when the reference selected by DIO1 is 0-10V, set a value of 7V on ADI1.
- Select the sensor signal type (**12**).
- Scale the reading of the reference (**19**) and sensor feedback (**20**) using parameter **18**.
  Example of setting: For scaling **19** and **20** when the adjustment range for the pressure sensor is 0-10 bars for example, set 10 in **18** for a reading in mbars (adjustment range 0 to 10,000).
- To stop the motor, open DI2.

- **Draining function**: In pressure control mode, if the pressure does not reach the threshold set in **16** (expressed as a %, depends on the pressure sensor used), after a period set in **17** (expressed in seconds), the drive trips due to draining "tr01". This protection is active on starting and during PID control.

- **Stop on minimum speed function**: When the speed is at minimum for a period of approximately 25 s, the drive automatically stops the motor. Restarting occurs when the pressure falls below 40% of the reference pressure set by the user.

- **Automatic run/stop function**: On a run command, the motor-drive unit will adjust the flow in order to maintain constant pressure in the network. As soon as the flow drops to zero, the pump stops automatically. Restarting occurs as soon as the pressure is less than a threshold which can be adjusted using **48** (factory setting 0.9, ie. 90% of the desired pressure).

- In the event of rapid variation of the reference or flow rate, optimize the setting of the proportional (**13**) and integral (**14**) gains.

- If the pump is overloaded, the speed will automatically be reduced so as to avoid the drive tripping.

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• **List of corresponding parameters 01 to 58**

Parameter	Name	Address	Type	Configuration setting	Adjustment range
01	Minimum reference clamp	1.07	R-W	0	0 to (parameter 02) min^{-1}
02	Maximum reference clamp	1.06	R-W	1500 min^{-1}(Eur) 1800 min^{-1} (USA)	0 to 32,000 min^{-1}
03	Acceleration rate	2.11	R-W	0.5 s/1000 min^{-1}	0.1 to 600.0 s/1000 min^{-1}
04	Deceleration rate	2.21	R-W	5.0 s/1000 min^{-1}	0.1 to 600.0 s/1000 min^{-1}
05	Preset configuration select	11.46	R-W	PUMP	A1.A2, A1.Pr, A2.Pr, 4Pr, 8Pr, E.Pot, TorQ, Pid, **PUMP**, A.CtP, HoiS, Pad, HuAC, OPEn
06	Motor rated current	5.07	R-W	Motor rated current (A)	0 to I$_{co}$ (A)
07	Motor rated speed	5.08	R-W	Motor rated speed (min^{-1})	0 to 9999 min^{-1}
08	Motor rated voltage	5.09	R-W	400V	0 to 480V
09	Rated power factor (cos φ)	5.10	R-W	0.85	0 to 1.00
10	Quick setup menu access	11.44	R-W	L2	L1, L2, Loc
11	Reserved parameter	-			
12	ADI2 mode	7.11	R-W	4-20 (*)	0-20, 20-0, 4-20, 20-4: current input (mA); 4-.20, 20-.4: current input without detection of signal loss (mA); volt: voltage input (0 to 10V); d-In: digital input; CtP: motor sensor
13	PID proportional gain	14.10	R-W	150.00	0 to 320.00
14	PID integral gain	14.11	R-W	75.00	0 to 320.00
15	Digital reference (1)	14.51	R-W	0.00	0 to 100.00%
16	Draining threshold	12.04	R-W	10.0%	0 to 100.0%
17	Draining time delay	16.05	R-W	10.0 s	0 to 60.0 s
18	Customer unit coefficient	14.53	R-W	10	0 to 30
19	Customer reference value	14.54	RO	-	0 to 1000 x **18**
20	Customer sensor feedback value	14.55	RO	-	0 to 1000 x **18**
21	Motor speed	5.04	RO	-	± 2 x **1.06** min^{-1}
22	Digital reference (1)	12.11	LE	See (1)	
23 and 24	Not used				
25 to 45	**Refer to sections 4.3.8.1 and 4.3.8.2 in the manual ref. 3739en/e, if necessary.**				
46	Run time: years.days	6.22	RO		0 to 9.364
47	Run time: hours.minutes	6.23	RO		0 to 23.59
48	Automatic restart threshold	7.62	R-W	0.9	0 to 2.50
49	Digital reference (1)	14.03	R-W	See (1)	
50	Digital reference (1)	7.68	R-W	See (1)	
51	Digital reference (1)	7.10	R-W	See (1)	
52	Reserved parameter	-		-	-
53	Reserved parameter	-		-	-
54	Parameter displayed at power-up	11.49	R-W	**0.00**	**0.00** to **21.51**
55	No. of auto-reset attempts	10.34	R-W	5	0 to 5
56	Auto-reset delay	10.35	R-W	3.0 s	0 to 25.0 s
57	Digital reference (1)	14.02	R-W	See (1)	
58	Stop mode	6.01	R-W	FrEE	FrEE, rAMP, rP.dC, dC-O, dC-t

(1) Digital pressure reference (replaces the 0-10V or 4-20 mA pressure reference on ADI1): To enable this function, configure the following settings: **49** = 14.51, **50** = 14.51, **57** = 14.51. Then **51** = 00.00 and **22** = 12.24. Then, set **15** to the desired reference value.

• **For additional drive parameter settings (parameters 59 to 80) and detailed explanations, refer to sections 4.3.8 and 4.4 in the manual ref. 3739en/e.**

(*) Any change in the value of this parameter causes parameter **05** to switch to "OPEn" (open parameter setting). This may result in modification of the wiring diagram for the control terminal block.

LEROY-SOMER