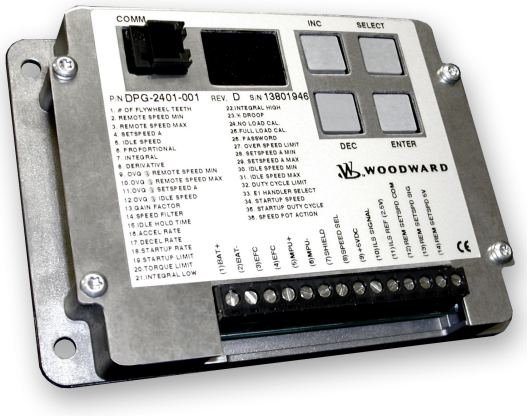
WOODWARD

Product Specification
36512



APECS® DPG-2401-00X

Digital Controllers for EFC Valves

DESCRIPTION

The DPG-2401-00X digital controller is designed for use with the electronic fuel control (EFC) valve used on Cummins engines fitted with PT (position throttle) type fuel pumps. This microprocessor-based, digital controller performs across a wide speed range and allows adjustment of all controller features through the built-in user interface. Properly tuned, this controller delivers fast engine response to speed or load change while providing precise stable isochronous operation.

Separately programmable Proportional, Integral, and Derivative gains are provided for tailoring controller response to many engine applications. Other adjustments include acceleration and deceleration ramp rates, startup and torque limits, idle speed set, and idle hold time.

The DPG-2401-00X controller can also provide droop speed control with 100 user-selectable droop levels. The controller's internal FAILSAFE reacts instantly to loss of the engine speed signal or loss of remote speed potentiometer signal.

ACTUATOR COMPATABILITY

Cummins EFC Valve

OTHER MODELS AVAILABLE

DPG-2100 Series – For Genset Applications

DPG-2200 Series – For Genset Applications

DPG-2400 Series – EFC Valve Applications

CALIBRATION TOOL

DPG Calibration Kit P/N 8447-1003

- Automatic calibration of remote speed potentiometer
- Isochronous speed control
- Droop operation: 0 to 10% of set speed with 1/10 percent resolution
- User friendly / operator adjustable
- Precision frequency control: 0.25%
- Superior temperature stability
- Reverse battery protection
- Input voltage range: 9–30 Vdc
- Smoke control on start up
- Remote setup
- Serial communications port
  - Paralleling input
  - ILS speed adjustment range: ± 5 %

SPECIFICATIONS

The controller's main electrical and mechanical specifications are listed here along with several performance characteristics.

Electrical

Operating Voltage Range:	9–30 Vdc *
Rated Output Current:	3.5 A Maximum (continuous)
Maximum Surge Current:	14 A (not to exceed ten seconds)
Connections:	Terminal strip with 14 terminals
Input Signal from Magnetic Pickup:	2.0 Vac RMS minimum during cranking

(*) All cabling for these controllers is limited to less than 30m (98.4').
Power cabling is limited to less than 10m (32.8') in total length.
See wiring diagram in User Manual 36525A for specific cable types required.

Mechanical

Ambient Operating Temperature:	-40°F to +185°F (-40°C to +85°C)
Sealing:	Oil, water, and dust resistant via conformal coating and die cast enclosure
Weight:	12 oz. (0.341 g)
Connection:	14-terminal Euro-style connector
Mechanical Vibration:	Suitable for mounting per SAE J1455; 1 to 500 Hz, 5G amplitude

Performance

Temperature Stability:	0.007 Hz @ 158ºF (70°C)
Steady State Speed Band:	± 0.25% over ambient operating temperature range
Engine Speed Measurement Range:	10 MPU Hertz to 14,000 MPU Hertz
Governing Speed Range:	500 MPU Hertz to 11,000 MPU Hertz
ILS Input Voltage Measurement Range:	2.3–2.7 Vdc
ILS Input Speed Adjust Range:	± 5% around the set speed
Droop Adjustment Range:	0 to 10 percent of the set speed
Droop Setting Resolution:	Tenths of a percent

PARAMETER REFERENCE

The following table lists each of the parameters and their default, minimum, and maximum values. Several of the parameters have minimum and maximum values set by other parameters. *Speed* and *Rate* values are shown as Hertz values.

DPG-2401-00X Parameter List

PARAMETER NAME		DEFAULT	MINIMUM	MAXIMUM
1. No. of Flywheel Teeth	-001	0	0	0
	-002	0	0	572
2. Remote Speed Min		1000	10	Remote Speed Max
3. Remote Speed Max		1000	Remote Speed Min	11,000
4. Set Speed A		***1000***	***Set Speed A Min***	***Set Speed A Max***
5. Idle Speed		500	Idle Speed Min	Idle Speed Max
6. Proportional		***25***	***1***	***99***
7. Integral		***50***	***0***	***99***
8. Derivative		***25***	***0***	***99***
9. OVG @ Remote Speed Min		20	1	99
10. OVG @ Remote Speed Max		0	0	99
11. OVG @ Set Speed A		***20***	***1***	***99***
12. OVG @ Idle Speed		20	1	99
13. Gain Factor		***20***	***1***	***99***
14. Speed Filter		***16***	***1***	***24***
15. Idle Hold Time		0	0	9999
16. Accel Rate		1000	1	11000
17. Decel Rate		1000	1	11000
18. Startup Rate		1000	1	11000
19. Startup Limit		1000	0	1000
20. Torque Limit		1000	0	1000
21. Integral Low Limit		0	0	Integral High Limit
22. Integral High Limit		99	Integral Low Limit	99
23. % Droop		0	0	100
24. No Load Cal		0	0	1000
25. Full Load Cal		1000	0	1000
26. Password		0	0	99
27. Over Speed Limit	-001	100	0	100
	-002	15000	10	15000
28. Set Speed A Min		10	10	Set Speed A
29. Set Speed A Max		11000	Set Speed A	11000
30. Idle Speed Min		10	10	Idle Speed
31. Idle Speed Max		11000	Idle Speed	11000
32. Duty Cycle Limit		95	10	95
33. E1 Handler Select	-001	0	0	1
	-002	0	0	2
34. Startup Speed		1000	10	11000
35. Startup Duty Cycle		30	5	95
36. Speed Pot Action		0	0	1

PO Box 1519
Fort Collins CO, USA
80522-1519
1000 East Drake Road
Fort Collins CO 80525
Ph: +1 (970) 482-5811
Fax: +1 (970) 498-3058

Distributors & Service
Woodward has an international network of distributors and service facilities. For your nearest representative, call the Fort Collins plant or see the Worldwide Directory on our website.

Corporate Headquarters
Rockford IL, USA
Ph: +1 (815) 877-7441

www.woodward.com

EUROPEAN COMPLIANCE FOR CE MARKING

EMC Directive
Declared to 89/336/EEC COUNCIL DIRECTIVE of 03 May 1989 on the approximation of the laws of the Member States relating to electromagnetic compatibility.

EMC Limitations
All cabling for these controllers is limited to less than 30m (98.4').

Power cabling is limited to less than 10m (32.8') in total length.

See User Manual 36525A for additional regulatory limitations and wiring diagrams with specific, required cable types.

For more information contact:

05/11/M