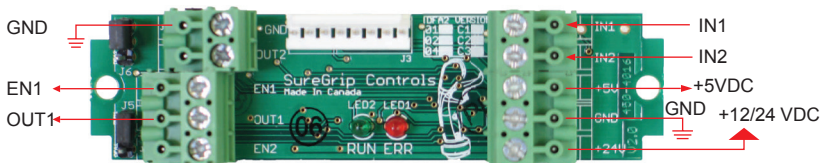


TECHNICAL INFORMATION

Sauer Danfoss PVG/PVE Series Proportional Valve Driver Single Input

Danfoss Adapter Driver Board (Part# DFA2-01)



OUT1: PROPORTIONAL CONTROL OUTPUT
EN1: VALVE ENABLE OUTPUT

IN1: PROPORTIONAL CONTROL INPUT 1
IN2: PROPORTIONAL CONTROL INPUT 2

Applications

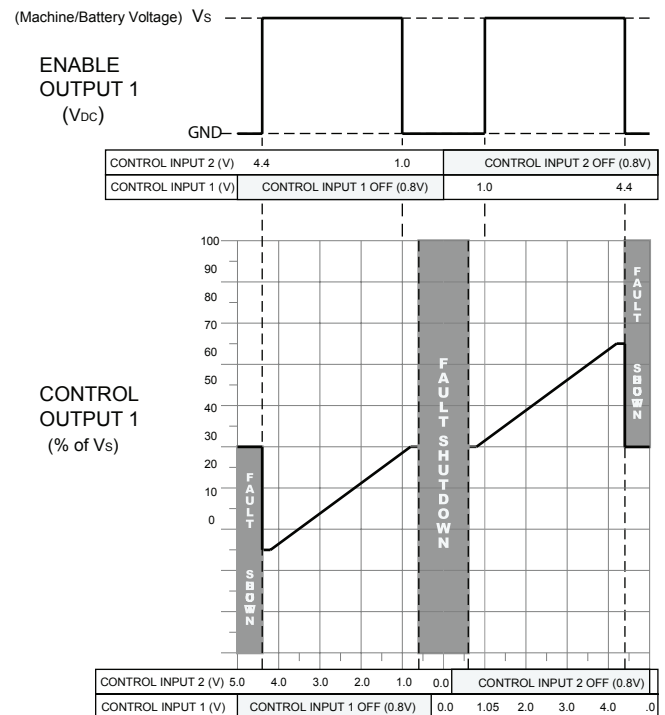
- Configured for Variable Voltage Module Type Control Inputs
- Specifically Designed to Control Sauer Danfoss PVG/PVE Series Proportional Valves

Features

- Wide Supply Range +6V to +30V
- Power Supply and Control Input Protection
- High Current Valve Enable Output
- 300ms Ramp Rate on Control Signal Output
- Fault Detection

DFA2-01 Specification

Items	Parameter	Function	Operating Range			Unit
			Min	Typ	Max	
Electrical:						
+12/24VDC	Supply Voltage		6	12, 24	30	V
Inputs:			$V_{IN(MIN)}$	$V_{IN(NEUTRAL)}$	$V_{IN(Max)}$	
IN1	Control Input 1	Analog Proportional Input 1	0.8 (+/-0.05)		4.2 (+/-0.05)	V
IN2	Control Input 2	Analog Proportional Input 2	0.8 (+/-0.05)		4.2 (+/-0.05)	V
$V_{IL(OFF)}$	Input Under Voltage	Low Safety Shut-down Input Voltage		≤ 0.6		V
$V_{IH(OFF)}$	Input Over Voltage	High Safety Shut-down Input Voltage		≥ 4.4		V
Outputs:			$V_{OUT(MIN)}$	$V_{OUT(NEUTRAL)}$	$V_{OUT(Max)}$	
OUT1	Control Output 1	Analog Proportional Output 1	25 (+/-5)	50 (+/- 2)	75 (+/-5)	%Vs
OUT2	Control Output 2	N/A				
I_{OUT1}	Control Current	Control Signal Output Current			10	mA
EN1	Valve Enable Output 1	Vs if either IN1 or IN2 is activated, 0V otherwise	0		+Vs	V
EN2	Valve Enable Output 2	N/A				
V_{EN1}	Enable Voltage	Enable Signal Output Voltage	0	Vs	Vs	V
I_{EN1}	Enable Current	Enable Signal Output Current			2.5	A
Reference Power Supply:			Min	Typ	Max	
V_{OUT}	Input Control Voltage	Input Control Device Supply Voltage	4.75	5	5.25	V
I_{OUT}	Input Control Current	Input Control Device Supply Current			30	mA
Environmental Specifications:						
Operating Temperature Range			-40 to +85			°C



TECHNICAL INFORMATION

Sauer Danfoss PVG/PVE Series Proportional Valve Driver Dual Input

Danfoss Adapter Driver Board (Part# DFA2-02)



OUT1: PROPORTIONAL CONTROL OUTPUT 1
EN1: VALVE ENABLE OUTPUT 1
OUT2: PROPORTIONAL CONTROL OUTPUT 2
EN2: VALVE ENABLE OUTPUT 2

IN1: PROPORTIONAL CONTROL INPUT 1
IN2: PROPORTIONAL CONTROL INPUT 2

Applications

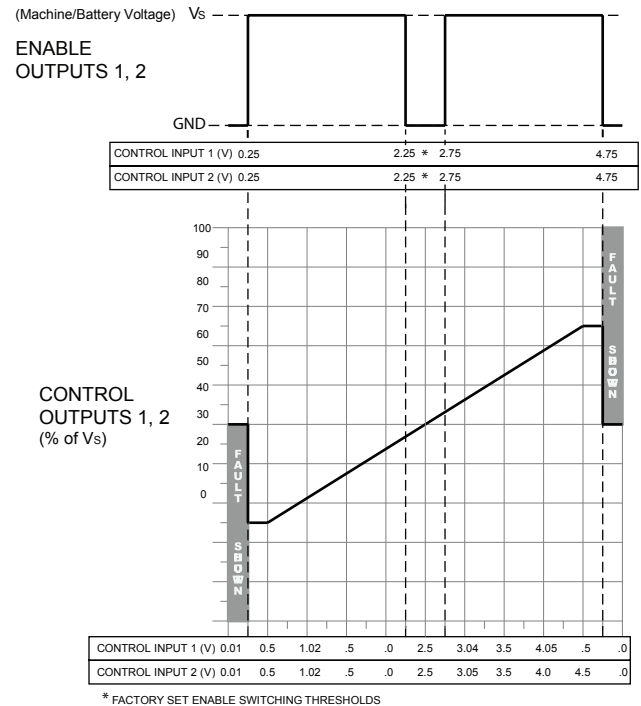
- Configured for Joystick Type Control Inputs (JSM, JSL Series Joysticks, Single Axis Proportional Slider Modules)
- Specifically Designed to Control Sauer Danfoss PVG/PVE Series Proportional Valves

Features

- Wide Supply Range +6V to +30V
- Power Supply and Control Input Protection
- High Current Valve Enable Output
- 300ms Ramp Rate on Control Signal Output
- Fault Detection

DFA2-02 Specification

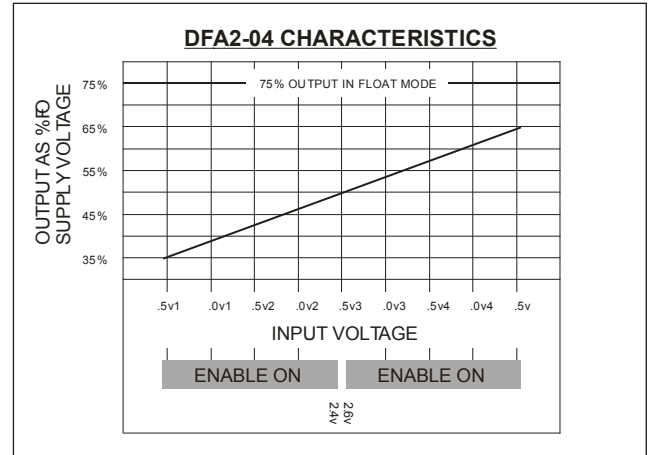
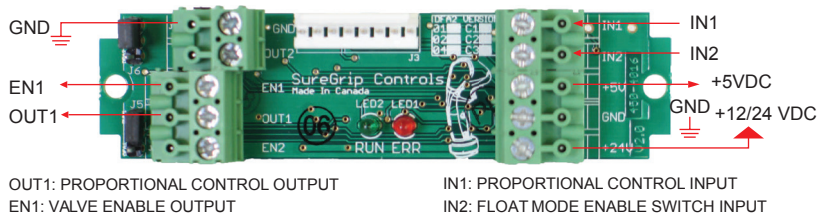
Items	Parameter	Function	Operating Range			Unit
			Min	Typ	Max	
Electrical:						
+12/24VDC	Supply Voltage		6	12, 24	30	V
Inputs:			$V_{IN(MIN)}$	$V_{IN(NEUTRAL)}$	$V_{IN(Max)}$	
IN1	Control Input 1	Analog Proportional Input 1	0.5 (+/-0.05)	2.5	4.5 (+/-0.05)	V
IN2	Control Input 2	Analog Proportional Input 2	0.5 (+/-0.05)	2.5	4.5 (+/-0.05)	V
$V_{IL(OFF)}$	Input Under Voltage	Low Safety Shut-down Input Voltage		≤ 2.5		V
$V_{IH(OFF)}$	Input Over Voltage	High Safety Shut-down Input Voltage		≥ 4.75		V
Outputs:			$V_{OUT(MIN)}$	$V_{OUT(NEUTRAL)}$	$V_{OUT(Max)}$	
OUT1	Control Output 1	Analog Proportional Output 1	25 (+/-5)	50 (+/- 2)	75 (+/-5)	%Vs
OUT2	Control Output 2	Analog Proportional Output 2	25 (+/-5)	50 (+/- 2)	75 (+/-5)	%Vs
I _{OUT1, OUT2}	Control Current	Control Signal Output Current			10	mA
EN1	Valve Enable Output 1	Vs if either IN1 or IN2 is activated, 0V otherwise	0		+Vs	V
EN2	Valve Enable Output 2	Vs if either IN1 or IN2 is activated, 0V otherwise	0		+Vs	V
$V_{EN1, EN2}$	Enable Voltage	Enable Signal Output Voltage	0	Vs	Vs	V
$I_{EN1, EN2}$	Enable Current	Enable Signal Output Current			2.5	A
Reference Power Supply:			Min	Typ	Max	
V _{OUT}	Input Control Voltage	Input Control Device Supply Voltage	4.75	5	5.25	V
I _{OUT}	Input Control Current	Input Control Device Supply Current	2		30	mA
Environmental Specifications:						
Operating Temperature Range						-40 to +85 °C



TECHNICAL INFORMATION

Sauer Danfoss PVG/PVE Series Proportional Valve Driver with Float Mode

Danfoss Adapter Driver Board (Part# DFA2-04)



Applications

- Configured for Joystick Type Control Inputs (JSM, JSL Series Joysticks, Proportional Slider Modules)
- Electro Hydraulic Valve Driver, Specifically Designed to Control Sauer Danfoss PVG/PVE Series Proportional Valves

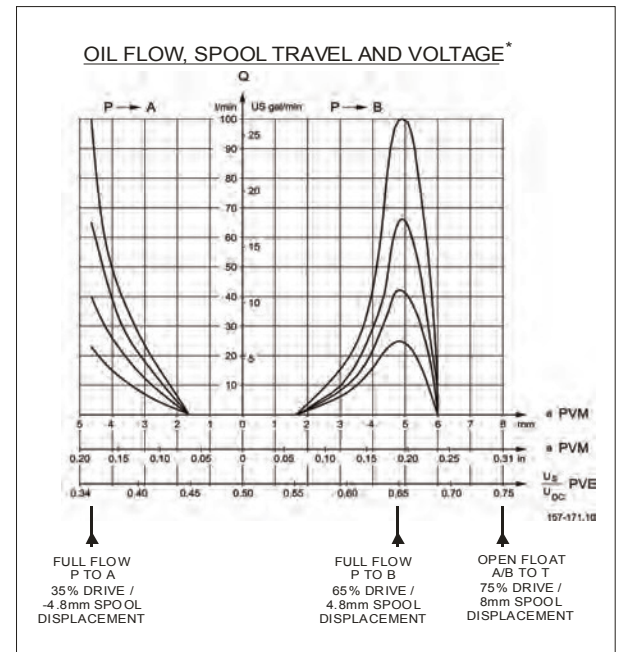
Features

- Normal Mode / Float Mode Operation
- Wide Supply Range +6V to +30V
- Power Supply and Control Input Protection
- High Current Valve Enable Output
- 300ms Ramp Rate on Control Signal Output
- Fault Detection

Float Mode Operation

The float mode enable switch is used to toggle the float mode on and off. The joystick can be in any position when the enable switch is activated, and can be returned back to the neutral position without disengaging the float mode.

Moving the joystick off neutral when float mode is active will deactivate float mode and return to normal joystick control.



TECHNICAL INFORMATION

DFA2-04 Specification

Items	Parameter	Function	Operating Range			Unit
			Min	Typ	Max	
Electrical:						
+12/24VDC	Supply Voltage		6	12, 24	30	V
Inputs:			V_{IN(MIN)}	V_{IN(NEUTRAL)}	V_{IN(Max)}	
IN1	Control Input 1	Analog Proportional Input	0.5 (+/-0.05)	2.5	4.5 (+/-0.05)	V
IN2	Control Input 2	Float Enable Momentary Switch Input	0		5	V
V _{IL(OFF)}	Input Under Voltage	Low Safety Shut-down Input Voltage		<= 0.25		V
V _{IH(OFF)}	Input Over Voltage	High Safety Shut-down Input Voltage		>= 4.75		V
Outputs:			V_{OUT(MIN)}	V_{OUT(NEUTRAL)}	V_{OUT(Max)}	
OUT1	Control Output: Normal Mode	Variable Analog Proportional Output	35 (+/-5)	50 (+/- 2)	65 (+/-5)	%Vs
	Control Output: Float Mode	Analog Proportional Output (Fixed)			75 (+/-5)	%Vs
OUT2	Control Output 2	N/A				%Vs
I _{OUT1}	Control Current	Control Signal Output Current			10	mA
EN1	Valve Enable Output 1	Vs if either IN1 or IN2 is activated, 0V otherwise	0		+Vs	V
EN2	Valve Enable Output 2	N/A	0		+Vs	V
V _{EN1}	Enable Voltage	Enable Signal Output Voltage	0	Vs	Vs	V
I _{EN1}	Enable Current	Enable Signal Output Current			2.5	A
Reference Power Supply:			Min	Typ	Max	
V _{OUT}	Input Control Voltage	Input Control Device Supply Voltage	4.75	5	5.25	V
I _{OUT}	Input Control Current	Input Control Device Supply Current	2		30	mA
Environmental Specifications:						
Operating Temperature Range				-40 to +85		°C

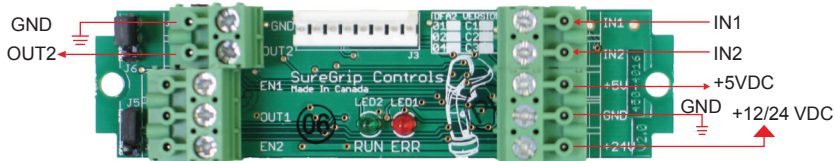
*Graph adapted from: PVG 32 Proportional Valves Technical Information , Sauer-Danfoss, 2001, p. 41
Danfoss is a registered trademark of Danfoss A/S. There is no endorsement of this product by Sauer Danfoss.

- (1) Input transient protected up to +/- 48.4VDC @ 11.3A for pulse widths ≤ 1ms.
- (2) Output range during normal operation is 35% - 65%Vs, and Fixed at 75%Vs with Float mode enabled.

TECHNICAL INFORMATION

Caterpillar ECM Compatible Driver Board

Danfoss Adapter Driver Board (Part# DFA2-C1)



OUT2: PWM CONTROL OUTPUT

IN1: PROPORTIONAL CONTROL INPUT 1
IN2: PROPORTIONAL CONTROL INPUT 2

Applications

- Configured for Variable Voltage Module Type Control Inputs
- Specifically Designed to Interface to Caterpillar ECM's

Features

- Wide Supply Range +6V to +30V
- Power Supply and Control Input Protection
- Variable PWM Control Signal Output

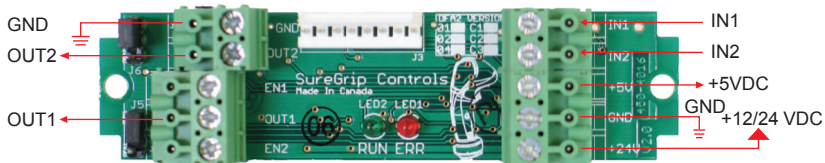
DFA2-C1 Specification

Items	Parameter	Function	Operating Range			Unit
			Min	Typ	Max	
Electrical:						
+12/24VDC	Supply Voltage		6	12, 24	30	V
Inputs:			$V_{IN(MIN)}$		$V_{IN(MAX)}$	
IN1	Control Input 1	Analog Proportional Input 1 (controls OUT2 50%- 80%)	0.8 (+/-0.05)		4.2 (+/-0.05)	V
IN2	Control Input 2	Analog Proportional Input 2 (controls OUT2 50%-20%)	0.8 (+/-0.05)		4.2 (+/-0.05)	V
Outputs:			Duty Cycle OUT(MIN)	Duty Cycle OUT(NEUTRAL)	Duty Cycle OUT(MAX)	
OUT1	Control Signal Output 1	N/A				
OUT2	Control Signal Output 2	PWM Control Output	20 (+/-2.5)	50 (+/-2.5)	80 (+/-2.5)	Duty Cycle (%)
f _{OUT2}	PWM Output Frequency	Fixed PWM Frequency of 500Hz		500 (+/-5%)		Hz
I _{OUT2}	Control Output Current	Control Signal Output Current			10	mA
Reference Power Supply:			Min	Typ	Max	
V _{OUT}	Input Control Voltage	Input Control Device Supply Voltage	4.75	5	5.25	V
I _{OUT}	Input Control Current	Input Control Device Supply Current	2		30	mA
Environmental Specifications:						
Operating Temperature Range						-40 to +85 °C

TECHNICAL INFORMATION

Caterpillar ECM Compatible Driver Board

Danfoss Adapter Driver Board (Part# DFA2-C2)



OUT1: PWM CONTROL OUTPUT 1
EN1: VALVE ENABLE OUTPUT 1
OUT2: PWM CONTROL OUTPUT 2
EN2: VALVE ENABLE OUTPUT 2

IN1: PROPORTIONAL CONTROL INPUT 1
IN2: PROPORTIONAL CONTROL INPUT 2

Applications

- Configured for Joystick Type Control Inputs (JSM/JSL Series Joysticks, Proportional Slider Modules)
- PWM Outputs Specifically Designed to Interface to Caterpillar ECM's

Features

- Wide Supply Range +6V to +30V
- Power Supply and Control Input Protection
- Variable PWM Control Signal Outputs
- High Current Valve Enable Outputs

DFA2-C2 Specification

Items	Parameter	Function	Operating Range			Unit
			Min	Typ	Max	
Electrical:						
+12/24VDC	Supply Voltage		6	12, 24	30	V
Inputs:						
			$V_{IN(MIN)}$	$V_{IN(NEUTRAL)}$	$V_{IN(MAX)}$	
IN1	Control Input 1	Analog Proportional Input 1	0.5 (+/-0.05)	2.5	4.5 (+/-0.05)	V
IN2	Control Input 2	Analog Proportional Input 2	0.5 (+/-0.05)	2.5	4.5 (+/-0.05)	V
Outputs:						
			Duty Cycle OUT(MIN)	Duty Cycle OUT(NEUTRAL)	Duty Cycle OUT(MAX)	
OUT1	Control Signal Output 1	PWM Output 1	20 (+/-2.5)	50 (+/-2.5)	80 (+/-2.5)	Duty Cycle (%)
OUT2	Control Signal Output 2	PWM Output 2	20 (+/-2.5)	50 (+/-2.5)	80 (+/-2.5)	Duty Cycle (%)
f _{OUT1, OUT2}	Fixed PWM Frequency of 500Hz	PWM Output Frequency		500 (+/-5%)		Hz
I _{OUT1, OUT2}		Control Signal Output Current			10	mA
Reference Power Supply:						
			Min	Typ	Max	
V _{OUT}	Input Control Voltage	Input Control Device Supply Voltage	4.75	5	5.25	V
I _{OUT}	Input Control Current	Input Control Device Supply Current	2		30	mA
Environmental Specifications:						
Operating Temperature Range						-40 to +85 °C