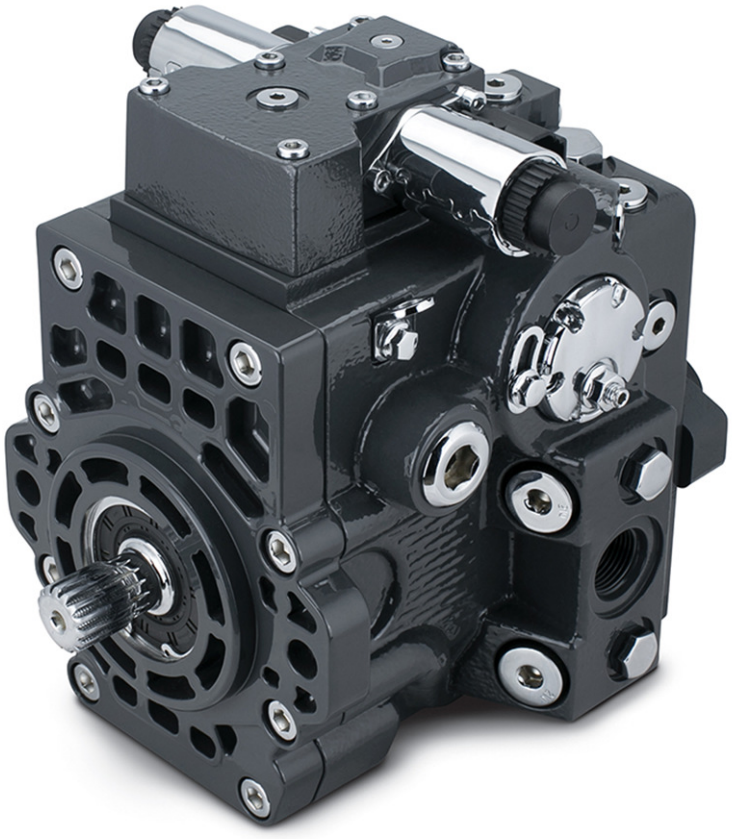
ENGINEERING
TOMORROW

Electrical Installation

MP1 Pumps
Non-Feedback Proportional Electric (NFPE) Control



Revision history

Table of revisions

Date	Changed	Rev
January 2018	add control current table	0103
November 2017	New cover image	0102
October 2017	First Edition	0101

Contents

Literature References

MP1 Reference Literature

Literature title	Description	Literature number
MP1 Axial Piston Pumps Technical Information	Complete product electrical and mechanical specifications	BC00000352

Latest version of technical literature

Danfoss product literature is online at: *http://powersolutions.danfoss.com/literature/*

Product Overview

Product Image

MP1 NFPE control

Nomenclature

Model code

Prod		A			B		C			D		F		H	J		T	K			E	M			N			Z		L	V			G			W			X			Y			
MP1	P																																												

***D** - Control*

Code	Description
SN1	NFPE, 12V, Manual Over-Ride, Inch ports
SN2	NFPE, 24V, Manual Over-Ride, Inch ports
MN1	NFPE, 12V, Manual Over-Ride, Metric ports
MN2	NFPE, 24V, Manual Over-Ride, Metric ports

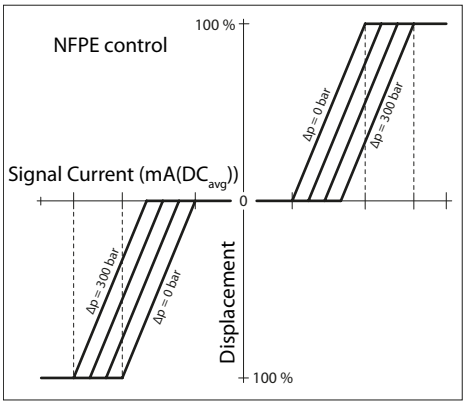
Only certain control options for the MP1 pump utilize Non-Feedback Proportional Electric Control (NFPE). Please refer to the pump's nomenclature to determine if the pump is equipped with the proper option. The nomenclature can be found on the pump's nametag.

Product Overview

Theory of operation

The Non Feedback Proportional Electric (NFPE) control is an electrical automotive control in which an electrical input signal activates one of two proportional solenoids that port charge pressure to either side of the pump servo cylinder. The NFPE control has no mechanical feedback mechanism. The pump displacement is proportional to the solenoid signal current, but it also depends upon pump input speed and system pressure.

NFPE proportional actuation



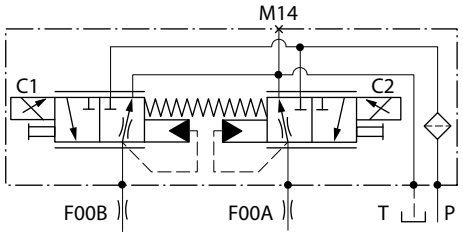
Hydrostatic drive line power

Warning

Unintended vehicle or machine movement hazard. The loss of hydrostatic drive line power, in any mode of operation (forward, neutral, or reverse) may cause the system to lose hydrostatic braking capacity. You must provide a braking system, redundant to the hydrostatic transmission, sufficient to stop and hold the vehicle or machine in the event of hydrostatic drive power loss.

Hydraulic schematic

NFPE Schematic



Product Overview

Electrical specifications

Control current

Voltage	a*	b	c	Pin connections
12 V	600 mA	1080 mA	1360 mA	any order
24 V	300 mA	540 mA	680 mA	

* Factory test current, for vehicle movement or application actuation expect higher or lower value.

MP1 pump NFPE electrical specifications

Voltage	12V	24V
Rated power	18 W	18 W
Coil resistance at 20° C [70° F]	3.66 Ω	14.20 Ω
Coil resistance at 80°C [176°F]	4.52 Ω	17.52 Ω
PWM frequency range	70 to 200 Hz	70 to 200 Hz
Recommended PWM frequency*	100 Hz	100 Hz
Inductance	33 mH	140 mH

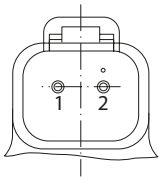
* PWM signal required for optimum control performance. Verify the PWM frequency is set correctly in the PLUS+1® controller. The default is set at 4000 Hz which will significantly reduce NFPE performance.

Electrical installation

Pinout

DEUTSCH connector

Pin location



Pinout

Pin	Function
1	PWM signal
2	Ground

Pinout (alternative)

Pin	Function
1	Ground
2	PWM signal

Pin compatibility

PLUS+1® module pin type

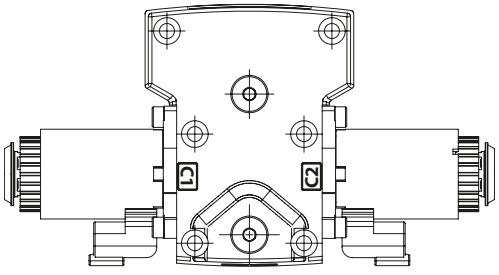
Pin	Function
1, 2	PWMOUT/DOUT/PVG Power supply
1, 2	PWMOUT/DOUT/PVGOUT
1, 2	Power ground -

Warning

Unintended vehicle or machine movement hazard. Verify the wiring harness to ensure the correct PLUS +1® pin is properly connected to each control pin.

Input/output matrix

NFPE/C1 and C2 location



Electrical installation

Pump output flow direction versus control signal

Shaft rotation	CW		CCW	
Coil energized	**C1**	**C2**	**C1**	**C2**
Port A	in	out	out	in
Port B	out	in	in	out
Servo port pressurized	M5	M4	M5	M4

Mating connector

DEUTSCH connector parts list

Description	Quantity	Ordering number
Connector	1	DEUTSCH DT06-2S
Wedge lock	1	DEUTSCH W2S
Socket contact (16 and 18 AWG)	2	DEUTSCH 0462-201-16141
Mating connector kit	1	Danfoss K29657

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