

Data Sheet

Digital Displacement[®] Pump Gen 1

DDP096 and DPC12



The Danfoss Digital Displacement[®] Pump Gen 1 (DDP096) with Digital Pump Controller (DPC12) is the most efficient, medium-power, variable displacement open circuit pump on the market today.

Our technology utilizes a radial design which enables pistons in real time, using ultra-fast mechatronic valves controlled by a dedicated controller. The DPC12 controls each piston individually, making the pump displacement electronically variable and resulting in fast, accurate flow control. By using only as many pistons as required to meet the demand, the DDP096 has high efficiency and low idle losses across a very wide operating range.

Replacing a standard pump with a single- or multi-outlet 96cc Digital Displacement[®] Pump can dramatically increase the productivity of hydraulic machinery, enhancing control, reducing energy consumption and heralding a brighter, digital future. Customers can profit from better fuel consumption and the potential to downsize engines or battery packs. Whichever route is taken, our technology can deliver benefits today, tomorrow and long into the future.



Features

A more intelligent approach

- Efficient radial piston pump with exceptional part-load performance
- Low idle losses even when pressurized
- Virtually no leakage at zero flow output
- Direct digital control
 - Fast response
 - No control hysteresis
 - Control response independent of output pressure
 - Various control modes including pressure, load sense, flow, displacement, torque, power and combinations of these
 - CAN-bus interface with performance and diagnostic information

- Sensored outputs
- Tunable parameters
- PLUS+1[®] Compliant
- Zero to full displacement (or the reverse) in half a revolution*
- Options for multiple independent outlets from a single pump, through-shaft capability and auxiliary mounting

What it all means

- A faster control means...
 - Increasing productivity
 - Increasing usable hydraulic power even with the same size prime mover
- Improved efficiency means ...

- Downsizing or down-speeding the prime mover without loss of productivity or control
- Longer work-cycles or smaller batteries for next generation electric machines

* Half a revolution plus about 8.5ms for communication and processing time. For example, at 1800 rpm this is 16.2 ms + 8.5ms = 24.7 ms.

Technical Specifications (pump)

Parameter	Value	Units
Max displacement	96 [5.86]	cm ³ /rev [in ³ /rev]
Continuous outlet pressure	420 [6090]	bar [psi]
Max outlet pressure	450 [6530]	bar [psi]
Max operating speed	1850	rpm
Flow at rated speed (Theoretical)	144 [38] @ 1500 rpm 173 [45.6] @ 1800 rpm	lpm [US gpm]
Weight (Approximate)	52 [114]	kg [lb]
Rotation	Clockwise	
Front mounting flange	SAE C 4-Bolt	
Front input shaft	23T 16/32	
Endcap	Radial non-thru drive single outlet	
Inlet port	2 inch code 61	
Outlet port	1 inch code 62	
Oil type	Mineral hydraulic fluids	
Max power limit	45	kW

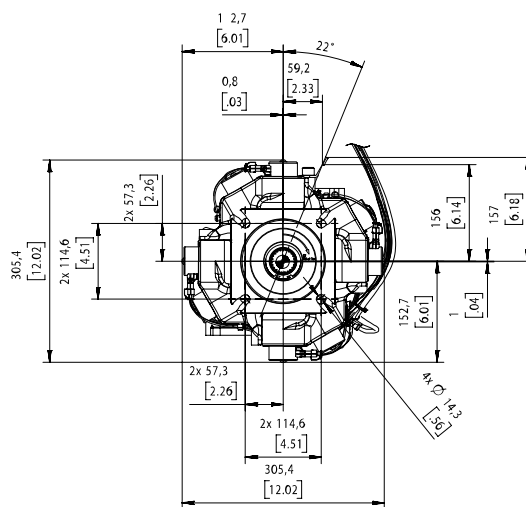
Technical Specifications (controller)

Parameter	Value	Units
DC supply voltage	24	V
Operating temperature range	-40 to +70	°C
Storage temperature range	-55 to +85	°C
IP rating	IP67 and IP69K*	
Weight (Approximate)	3	kg

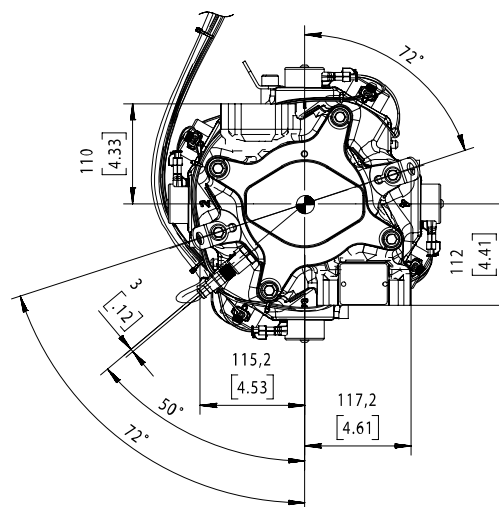
* IP67 and IP69K ratings are only valid when the mating connectors are in place and unused connector pin positions have sealing plugs installed.

Pump Dimensions

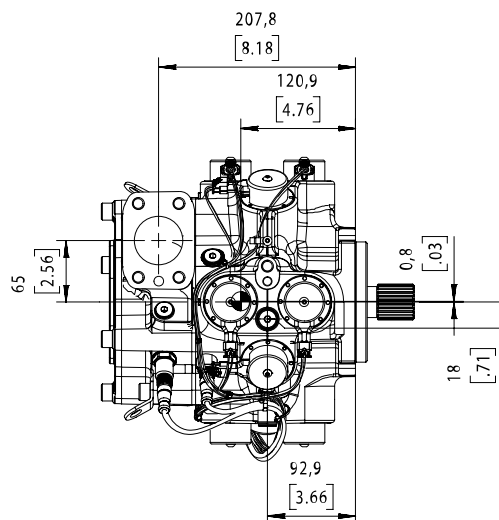
Shaft end view



End cap view

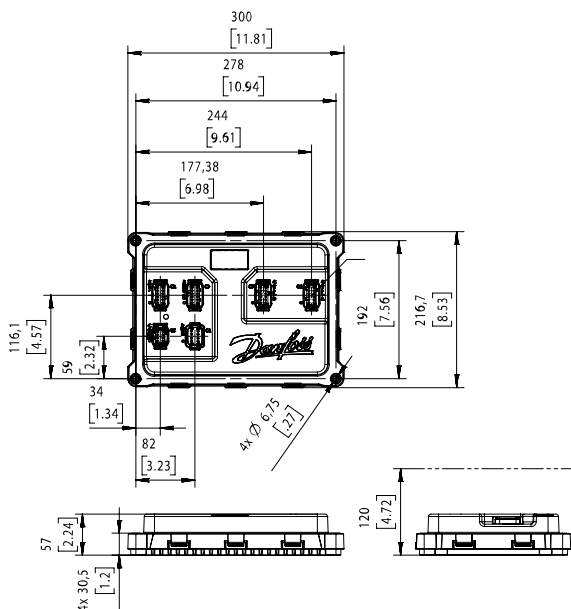


Top view



Controller dimensions and connectors

Controller dimensions



For complete technical information about the Digital Displacement® Pump DDP096 and DPC12 see document BC306384089197.

Comprehensive technical literature is online at www.danfoss.com

Connector 2 pinout

Pin #	Name	Description
C2p01	CANH	
C2p02	CANL	
C2p03	CAN Shield	
C2p04	DigIn1	Reserved - do not connect, install sealing pin in mating connector
C2p05	PLS1+	Load Sense Pressure Sensor 1 + Signal
C2p06	PLS1-	Load Sense Pressure Sensor 1 - Signal
C2p07	PLS2+	Reserved - do not connect, install sealing pin in mating connector
C2p08	PLS2-	Reserved - do not connect, install sealing pin in mating connector
C2p09	PLS3+	Reserved - do not connect, install sealing pin in mating connector
C2p10	PLS3-	Reserved - do not connect, install sealing pin in mating connector
C2p11	PLS4+	Reserved - do not connect, install sealing pin in mating connector
C2p12	PLS4-	Reserved - do not connect, install sealing pin in mating connector

System Connection, mating receptacle: DEUTSCH DTM06-12SD (Brown)

Connector 1 pinout

Pin #	Name	Description
C1p01	LS+	Logic Supply Input (externally fused), powers everything except coil drivers
C1p02	VC+	Coil Supply Input (externally fused), powers coil drivers
C1p03	VC+	Coil Supply Input (externally fused), powers coil drivers
C1p04	VC+	Coil Supply Input (externally fused), powers coil drivers
C1p05	VC-	Coil Supply Return, internally connected to other Supply Returns
C1p06	VC-	Coil Supply Return, internally connected to other Supply Returns
C1p07	VC-	Coil Supply Return, internally connected to other Supply Returns
C1p08	LS-	Logic Supply Return, internally connected to other Supply Returns

Power Connection, mating receptacle: DEUTSCH DT06-08SA (Grey)



Connector 3 pinout

Pin #	Name	Description
C3p01	STS Shaft	Shaft/Temperature Sensor Shaft Signal Input (SPEED, 2.5mA to 14.5mA)
C3p02	STS V+	Shaft/Temperature Sensor Shaft Signal Power (+15V)
C3p03	STS V-	Shaft/Temperature Sensor Temperature Sensor Ground (0V)
C3p04	STS Temp	Shaft/Temperature Sensor Temperature Signal Input (PUMP_TEMP)
C3p05	PP1+	Pump Pressure Sensor 1 + Signal
C3p06	PP1-	Pump Pressure Sensor 1 - Signal
C3p07	PP2+	Reserved - do not connect, install sealing pin in mating connector
C3p08	PP2-	Reserved - do not connect, install sealing pin in mating connector
C3p09	PP3+	Reserved - do not connect, install sealing pin in mating connector
C3p10	PP3-	Reserved - do not connect, install sealing pin in mating connector
C3p11	PP4+	Reserved - do not connect, install sealing pin in mating connector
C3p12	PP4-	Reserved - do not connect, install sealing pin in mating connector

Sensor Connection, mating receptacle: DEUTSCH DTM06-12SC (Green)

Connector 4 pinout

Pin #	Name	Description	Corresponding cylinder
C4p01	Coil 06+	Coil driver output positive	C2+
C4p02	Coil 05+	Coil driver output positive	B2+
C4p03	Coil 04+	Coil driver output positive	A2+
C4p04	Coil 03+	Coil driver output positive	C1+
C4p05	Coil 02+	Coil driver output positive	B1+
C4p06	Coil 01+	Coil driver output positive	A1+
C4p07	Coil 01-	Coil driver output negative	A1-
C4p08	Coil 02-	Coil driver output negative	B1-
C4p09	Coil 03-	Coil driver output negative	C1-
C4p10	Coil 04-	Coil driver output negative	A2-
C4p11	Coil 05-	Coil driver output negative	B2-
C4p12	Coil 06-	Coil driver output negative	C2-

Coil A Connection, mating receptacle: DEUTSCH DTM06-12SA (Grey)

Connector 5 pinout

Pin #	Name	Description	Corresponding cylinder
C5p01	Coil 12+	Coil driver output positive	C4+
C5p02	Coil 11+	Coil driver output positive	B4+
C5p03	Coil 10+	Coil driver output positive	A4+
C5p04	Coil 09+	Coil driver output positive	C3+
C5p05	Coil 08+	Coil driver output positive	B3+
C5p06	Coil 07+	Coil driver output positive	A3+
C5p07	Coil 07-	Coil driver output negative	A3-
C5p08	Coil 08-	Coil driver output negative	B3-
C5p09	Coil 09-	Coil driver output negative	C3-
C5p10	Coil 10-	Coil driver output negative	A4-
C5p11	Coil 11-	Coil driver output negative	B4-
C5p12	Coil 12-	Coil driver output negative	C4-

Coil B Connection, mating receptacle: DEUTSCH DTM06-12SB (Black)

Connector 6 pinout

Pin #	Name	Description
C6p01	Clk+	Reserved - do not connect, install sealing pin in mating connector
C6p02	Clk-	Reserved - do not connect, install sealing pin in mating connector
C6p03	Dout+	Reserved - do not connect, install sealing pin in mating connector
C6p04	Dout-	Reserved - do not connect, install sealing pin in mating connector
C6p05	Din+	Reserved - do not connect, install sealing pin in mating connector
C6p06	Din-	Reserved - do not connect, install sealing pin in mating connector
C6p07	Diag1 (Rx)	Reserved - do not connect, install sealing pin in mating connector
C6p08	Diag2 (Tx)	Reserved - do not connect, install sealing pin in mating connector

Comm Connection, mating receptacle: DEUTSCH DTM06-08SA (Grey)

Danfoss can accept no responsibility for possible errors in catalogues, brochures and other printed material. Danfoss reserves the right to alter its products without notice. This also applies to products already on order provided that such alterations can be made without subsequent changes being necessary in specifications already agreed. All trademarks in this material are property of the respective companies. Danfoss and the Danfoss logotype are trademarks of Danfoss A/S. All rights reserved.