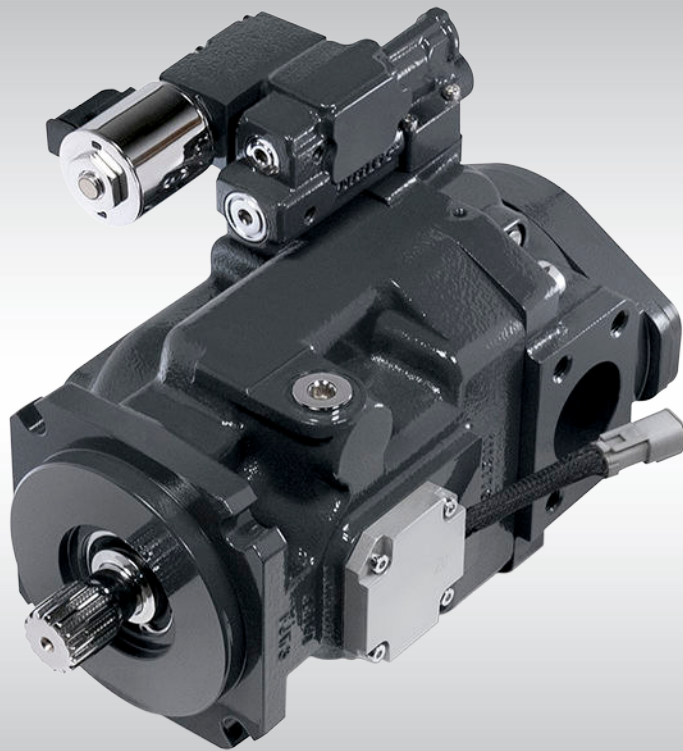




Electrical Installation

S45 Pump

Angle Sensor



Electrical Installation S45 Pump Angle Sensor

Revision history*Table of revisions*

Date	Changed	Rev
September 2015	Minor layout revision	AG
February 2015	Minor layout correction	AF
January 2015	Minor updates	AE
October 2014	First edition (in Danfoss layout)-then minor updates	AD

Electrical Installation S45 Pump Angle Sensor

Contents**Literature references**

Literature references.....	4
Latest version of technical literature.....	4

Product overview

Product image.....	5
Order code.....	5
Description/theory of operation.....	5
Angle sensor characteristics.....	6
Angle sensor electrical specifications.....	6

Electrical installation

Angle sensor pinout.....	8
Pin compatibility.....	8
Mating connector.....	8

Electrical Installation S45 Pump Angle Sensor

Literature references**Literature references***References*

Literature ID number	Title	Description
520L0519	<i>S45 Axial Piston Open Circuit Pumps Technical Information</i>	Complete product electrical and mechanical specifications
L1423101	<i>PLUS+1® Compliant S45 Pump Angle Sensor Function Block User Manual</i>	Compliant function block set-up information

Latest version of technical literature

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

Electrical Installation S45 Pump Angle Sensor

Product overview

Product image

S45 Angle Sensor



F200050

Order code

S45 Pump model code

R	S	P	C	D	E	F	G	H	J	K	L	M	N

P200152

The angle sensor option requires a housing, which is modified for installation of the sensor (K-module) and the swashplate, which is modified for the magnet carrier to be mounted to (M-module).

K-module housing

Code	Description	Frame
A1R	SAE-C flange 4-bolt, SAE O-ring boss ports, single seal, angle sensor	F, E
A2R	SAE-C flange 4-bolt, SAE O-ring boss ports, single seal, angle sensor	J
AFR	SAE-C flange 2-bolt at 45°, SAE O-ring boss ports, single seal, angle sensor	J

M-module housing

Code	Description	Frame
ANS	Angle sensor hardware	J, F, E

Description/theory of operation

The S45 Pump angle sensor option allows users to measure the angle of pump displacement. The angle sensor is an electronic sensor mounted to the housing of the pump, which reads the pump stroke angle based on the swashplate position. Interfacing with the angle sensor is achieved through a 4-pin Deutsch® DTM04-4P plug attached to a flexible connection cable. The sensor is mounted to the pump within an aluminum housing to prevent magnetic interference.

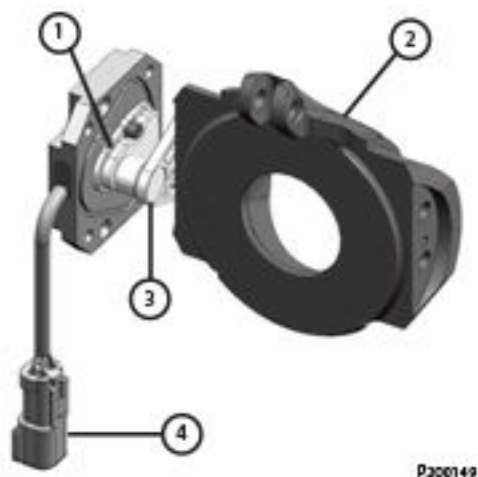
Angle sensor intended functionality:

- Electronic torque limiting
- Duty cycle recording
- Troubleshooting

Angle sensor unintended functionality is displacement/flow control.

Product overview

Angle sensor

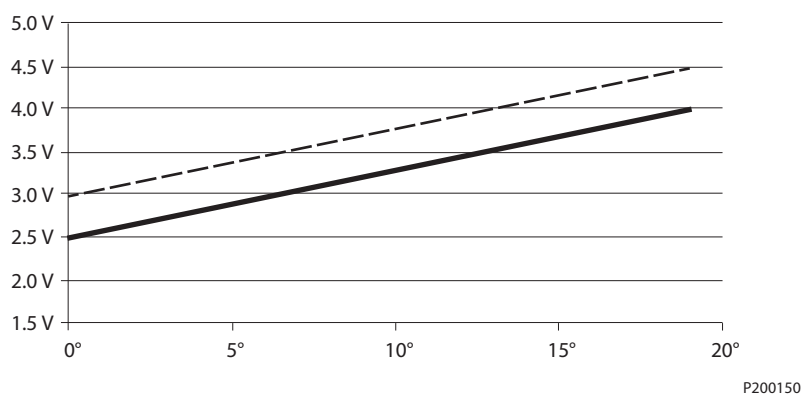


1. Anisotropic Magneto-Resistive (AMR) magnetic sensor
2. Swashplate
3. Magnet carrier
4. Deutsch® plug

Angle sensor characteristics

The angle sensor package incorporates two sensors, allowing two analog signal outputs for improved accuracy and troubleshooting. The sensor can be mounted in two orientations, either to the right side or the left side of the pump, when looking at the pump from the input shaft. Each mounting configuration yields a unique voltage versus swashplate angle characteristic curve.

Swash plate angle versus output voltage



Key: Primary output voltage (V) = —; Secondary output voltage (V) = - - -; Swash plate angle (°)

Angle sensor electrical specifications

Electrical specifications

Description	Minimum	Typical	Maximum	Unit	Note
Supply (V+)	4.75	5	5.25	Vdc	Sensor is ratiometric in the voltage range
Supply protection	—	—	28	Vdc	Sensor will switch off above 5.5 V
Supply current drawn	—	22	25	mA	Sensor supply at 5 V

Electrical Installation S45 Pump Angle Sensor

Product overview

Electrical specifications (continued)

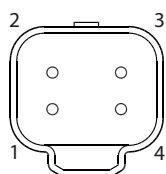
Description	Minimum	Typical	Maximum	Unit	Note
Output short circuit current (VDD to SIG 1/2 and GND to SIG 1/2)	—	—	7.5	mA	Additional 7.5 mA for each sensor signal, total sensor 7.5x2+22=37 mA typical for FSO
Sensitivity in sensing range at calibration temperature for primary and secondary sensor	70.02	78	85.8	mV	—
Resolution	—	0.03	—	degree	11 bit output channel
Hysteresis	—	—	—	—	Design of sensor eliminates any mechanical hysteresis
Environment temperature range	-40 (-40)	80 (176)	104 (220)	°C (°F)	If temperature limits are exceeded, the sensor will function at a reduced level of performance
Operating temperature range	20 (68)	50 (122)	95 (203)	°C (°F)	Temperature of oil
Storage temperature	-40 (-40)	—	125 (257)	°C (°F)	—
Accuracy for primary and secondary signals throughout operating temperature range when calibrated at 50 deg. C	—	Primary: ±0.65 Secondary: ±0.85	—	degree	Includes linearity, temperature drift, and repeatability. Does not include the error due to offsets and different ferrous environment
Refresh rate of the sensor	—	—	100	µs	Internal ADC refresh rate

Electrical Installation S45 Pump Angle Sensor

Electrical installation

Angle sensor pinout

Pin location



P200 151

Pin	Description
1	Supply -
2	Output signal 2
3	Output signal 1
4	Supply +

Pin compatibility

PLUS+1® module pin type

PLUS+1® module pin type	Acceptable use: device pin number
Sensor power +	4
Sensor power -	1
AIN/CAN0 shield	2, 3
AIN/CAN1 shield	2, 3
AIN/CAN2 shield	2, 3
DIN/AIN	2, 3
DIN/AIN/FreqIN	2, 3
AIN/Temp/Rheo	2, 3

Mating connector

Parts list

Mating connector	Ordering number
4 pin Deutsch® Plug DTM06-4S Series bag assembly	Danfoss: 11028348



Products we offer:

- Bent Axis Motors
- Closed Circuit Axial Piston Pumps and Motors
- Displays
- Electrohydraulic Power Steering
- Electrohydraulics
- Hydraulic Power Steering
- Integrated Systems
- Joysticks and Control Handles
- Microcontrollers and Software
- Open Circuit Axial Piston Pumps
- Orbital Motors
- PLUS+1® GUIDE
- Proportional Valves
- Sensors
- Steering
- Transit Mixer Drives

Danfoss Power Solutions is a global manufacturer and supplier of high-quality hydraulic and electronic components. We specialize in providing state-of-the-art technology and solutions that excel in the harsh operating conditions of the mobile off-highway market. Building on our extensive applications expertise, we work closely with our customers to ensure exceptional performance for a broad range of off-highway vehicles.

We help OEMs around the world speed up system development, reduce costs and bring vehicles to market faster.

Danfoss – Your Strongest Partner in Mobile Hydraulics.

Go to www.powersolutions.danfoss.com for further product information.

Wherever off-highway vehicles are at work, so is Danfoss. We offer expert worldwide support for our customers, ensuring the best possible solutions for outstanding performance. And with an extensive network of Global Service Partners, we also provide comprehensive global service for all of our components.

Please contact the Danfoss Power Solution representative nearest you.

Comatrol

www.comatrol.com

Schwarzmüller-Inverter

www.schwarzmueller-inverter.com

Turolla

www.turollaocg.com

Hydro-Gear

www.hydro-gear.com

Daikin-Sauer-Danfoss

www.daikin-sauer-danfoss.com

Local address:

Danfoss Power Solutions (US) Company
2800 East 13th Street
Ames, IA 50010, USA
Phone: +1 515 239 6000

Danfoss Power Solutions GmbH & Co. OHG
Krokamp 35
D-24539 Neumünster, Germany
Phone: +49 4321 871 0

Danfoss Power Solutions ApS
Nordborgvej 81
DK-6430 Nordborg, Denmark
Phone: +45 7488 2222

Danfoss Power Solutions Trading (Shanghai) Co., Ltd.
Building #22, No. 1000 Jin Hai Rd
Jin Qiao, Pudong New District
Shanghai, China 201206
Phone: +86 21 3418 5200

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 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.