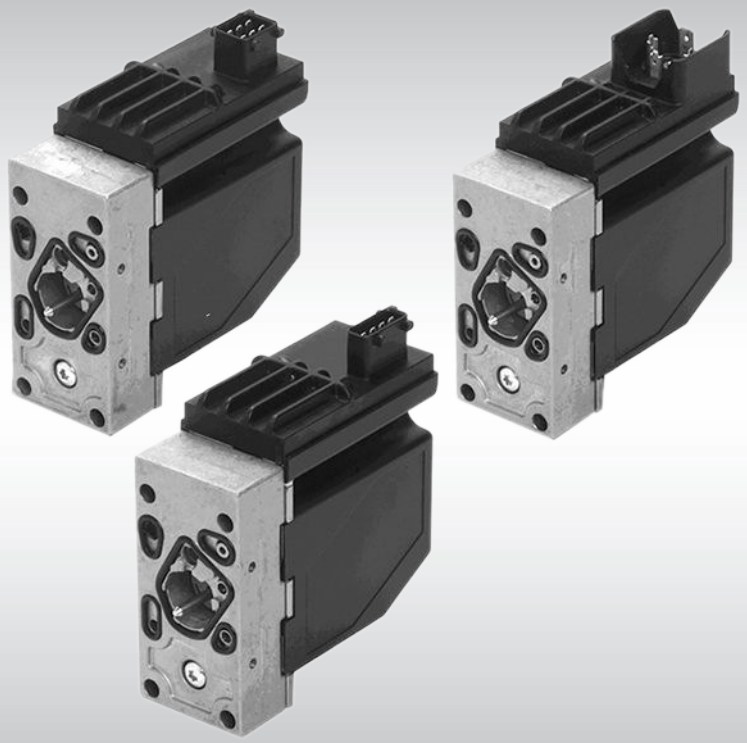
MAKING MODERN LIVING POSSIBLE

Electrical Installation

Electrohydraulic Actuators

PVEA/H/S



Revision history

Table of revisions

Date	Changed	Rev
September 2015	Minor layout revision	CB
August 2014	Converted to Danfoss layout	CA
February 2010	Proportional valve body drawing updated	BA
April 2007	First edition	AA

Contents

Literature references

Literature references

References

Literature ID number	Title	Description
520L0344	*PVG 32 Proportional Valves Technical Information*	Complete product electrical and mechanical specifications
520L0720	*PVG 100 Proportional Valves Technical Information*	
520L0356	*PVG 120 Proportional Valves Technical Information*	
520L0553	*PVE Series 4 for PVG 32, PVG 100 and PVG 120 Technical Information*	
520L0619	*Instructions for PVG Series 4 for PVG32/100*	
520L0651	*Instructions for PVG Series 4 for PVG120*	
11020635	*PLUS+1® Compliant PVEA/H/S Function Block User Manual*	Compliant function blocks set-up information

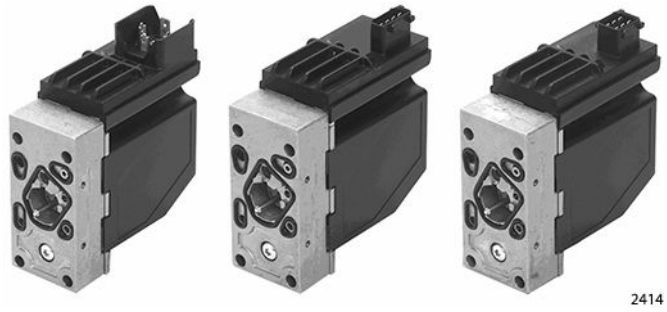
Latest version of technical literature

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

Product overview

Product image

PVEA/H/S electrohydraulic actuator



Code/ part numbers

PVG 32/100

PVEA/H/S proportional actuation code number 157B....

Description		Hirschmann® Connector 11 to 32 Vdc	AMP® Connector 11 to 32 Vdc	Deutsch® Connector 11 to 32 Vdc
PVEA	Standard, active fault monitoring	Not available	4734	4792
	Standard, passive fault monitoring	Not available	4735, 4775*	Not available
PVEH	Standard, active fault monitoring	4032	4034, 4074*	4092
	Standard, passive fault monitoring	4033, 4073*	4035, 4075*	4093
PVES	0% hysteresis, active fault monitoring	4832	4834	4892
	0% hysteresis, passive fault monitoring	4833	4835, 4865	Not available

* Anodized version.

PVG 120

PVEH proportional actuation code number 155G....

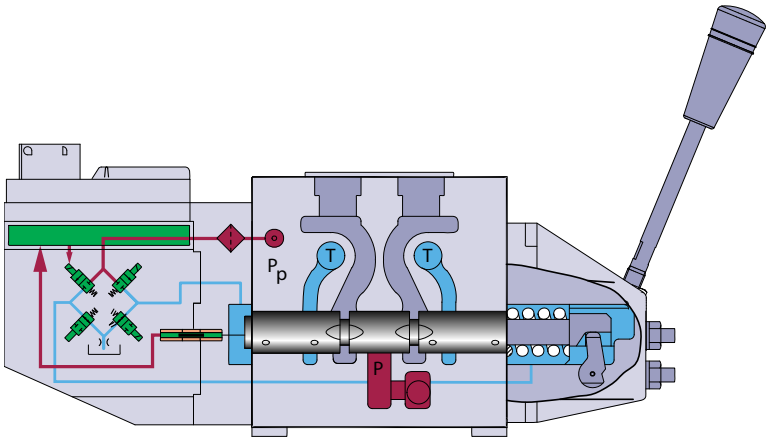
Description		Hirschmann® Connector 11 to 32 Vdc	AMP® Connector 11 to 32 Vdc	Deutsch® Connector 11 to 32 Vdc
PVEH	Standard, active fault monitoring	4092	4094	Not available
	Standard, passive fault monitoring	4093	4095	Not available

Description/theory of operation

The PVE elecrohydraulic actuator integrates electronics, sensors, and actuators into a single unit. This unit interfaces directly to the proportional valve body.

Product overview

Proportional valve body

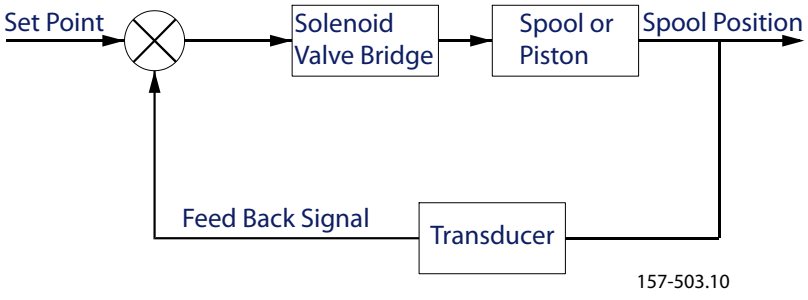


V310134.A

Closed loop control

All the proportional actuators feature an integrated feedback transducer that measures spool movement in relation to the input signal, and by means of a solenoid valve bridge, controls the direction, velocity and position of the main spool of the valve. The integrated electronics compensate for flow forces on the spool, internal leakage, changes in oil viscosity, pilot pressure, etc. This results in lower hysteresis and better resolution. Furthermore the electronics enable built in safety like fault monitoring, directional indication and LED light indication.

Closed loop control schematic

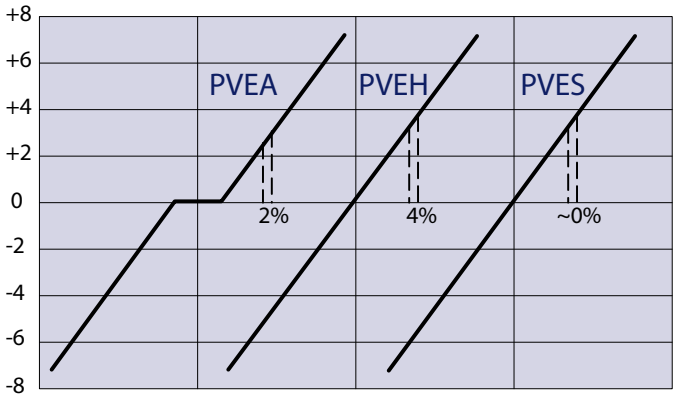


157-503.10

The PVEA/H/S versions are recommended where requirements include fault monitoring, low hysteresis, and high resolutuion, but the reaction time is not critical.

Product overview

Main features of pvea/h/s

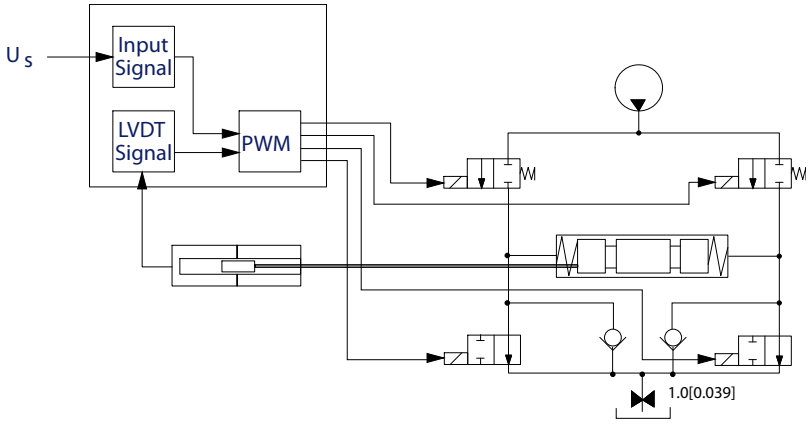


157-777.10

- Inductive transducer
- Integrated pulse width modulation
- Low hysteresis
- Hirshmann, AMP, or Deutsch connector
- As option with directional indicator (DI)
- Fault monitoring with transistor output for signal source
- Low electrical power
- No set-up procedure

Hydraulic schematics

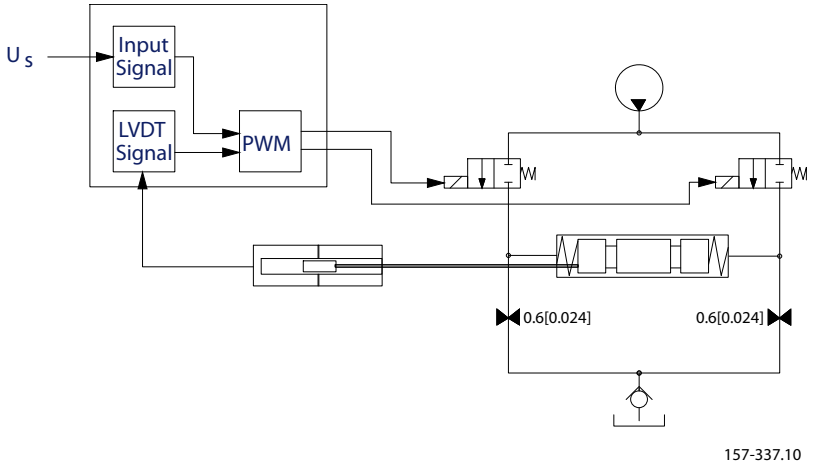
PVEH/ PVES



157-360.10

Product overview

PVEA



Electrical specifications

The following data is for a typical hydraulic system with mineral based hydraulic oil with a viscosity of 21 mm^2/second [102 SUS] and a temperature of 50° C [122° F].

Electrical

Supply voltage U DC rated	11 to 32 Vdc	
Supply voltage U DC range	11 to 32 Vdc	
Supply voltage U DC maximum ripple	5%	
PVEA current consumption at rated voltage	0.33 A at 12 Vdc	0.17 A at 24 Vdc
PVEH/ PVES current consumption at rated voltage	0.57 A at 12 Vdc	0.3 A at 24 Vdc
Signal voltage: Neutral	0.5 . U DC	
Signal voltage: A port B port	0.25 . U DC to 0.75 U DC	
Signal current at rated voltage	0.25 mA to 0.70 mA	
Input impedance in relation to 0.5 . U DC	12 kΩ	
PVEA power consumption	3.5 W	
PVEH/ PVES power consumption	7	

Fault monitoring

It's up to the customer to decide on the required degree of safety for the system.

Product overview

Fault monitoring overview

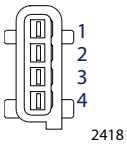
Type	Fault monitoring	Delay before error out	Error mode	Error output status	Error output on PVE*	LED light	Memory (reset needed)
PVEO	No fault monitoring	-	-	-	-	-	-
PVEA PVEH PVES	Active	500 ms (PVEA: 750 ms)	No fault	Low	<2 V	Green	-
			Input signal faults	High	~U DC	Flashing red	Yes
			Transducer (LVDT)			Constant red	
			Close loop fault				
	Passive	250 ms (PVEA: 750 ms)	No fault	Low	<2 V	Green	-
			Input signal faults	High	~U DC	Flashing red	No
			Transducer (LVDT)			Constant red	
			Close loop fault				

* Measurement between fault output pin and ground.

Electrical installation

Pinout

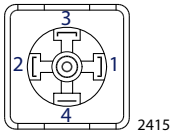
Pin location



Amp® version pinout

Pin	Description
1	U S
2	U DC
3	Ground
4	Error

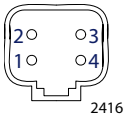
Pin location



Hirschmann® version pinout

Pin	Description
1	U DC
2	U S
3	Error
4	Ground

Pin location



Deutsch version pinout

Pin	Description
1	U S
2	Error
3	Ground
4	U DC

Electrical installation

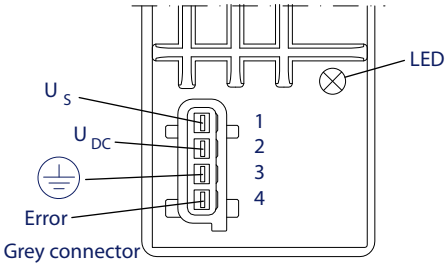
Pin compatibility

PLUS+1® module pin type/ PVEA/H/S pin compatibility

PLUS+1® module pin type	Acceptable use: AMP® connector pin number	Acceptable Use: Hirschmann® connector pin number	Acceptable use: Deutsch® connector pin number
DOUT/PVG Pwr 1-3	2	1	4
PWMOUT/DOUT/PVGOUT 1-3	1	2	1
Power ground -	3	4 (Ground)	3
Dig in	4	3	2

Input/output matrix

PVEA/ PVEH/ PVES

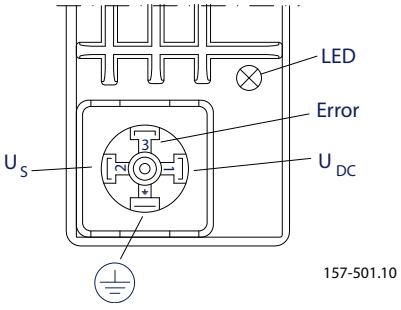


157-500.10

AMP® version proportional

Function	Signal voltage (U_S)
Neutral	U_S (pin 1) = 0.5 U_{DC}
Q: P -> A	U_S (pin 1) = (0.5 -> 0.25) U_{DC}
Q: P -> B	U_S (pin 1) = (0.5 -> 0.75) U_{DC}

PVEH/ PVES



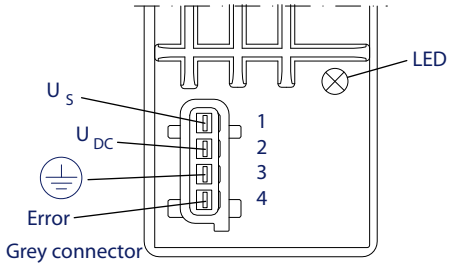
157-501.10

Hirschmann® version proportional

Function	Signal voltage (U_S)
Neutral	U_S (pin 2) = 0.5 U_{DC}
Q: P -> A	U_S (pin 2) = (0.5 -> 0.25) U_{DC}
Q: P -> B	U_S (pin 2) = (0.5 -> 0.75) U_{DC}

Electrical installation

PVEA/ PVEH/ PVES



157-500.10

Deutsch® version proportional

Function	Signal voltage (U_S)
Neutral	U_S (pin 1) = 0.5 U_{DC}
Q: P -> A	U_S (pin 1) = (0.5 -> 0.25) U_{DC}
Q: P -> B	U_S (pin 1) = (0.5 -> 0.75) U_{DC}

Mating connector

AMP® version PVEA/H/S mating connector parts list

Description	Quantity	Ordering number
Wire sealing (Blue)	4	AMP 828904-1
Blind plug (transparent)	1	AMP 828922-1
JPT contact (loose piece)	4	AMP 929930-1
JPT housing keying B (Gray)	1	AMP 2-967059-1
Danfoss mating connector kit	1	157B4994*

* AMP connector with 4m cable.

Hirschmann® version PVEH/S mating connector parts list

Description	Quantity	Ordering number
Connector	1	Hirschmann 931 969-100
Gasket	1	Hirschmann 730 801-002
Danfoss mating connector kit	1	984L3156

Deutsch® version PVEA/H/S mating connector parts list

Description	Quantity	Ordering number
Connector	1	Deutsch DTO6-4S
Wedge lock	1	Deutsch W4S
Socket contact (14 and 16 AWG)	4	Deutsch 0462-209-16141
Danfoss mating connector kit	1	11007498

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