

Proportional Valve Group

PVG 16



The PVG 16 is a new member of the PVG family of valves. The PVG portfolio now comprises PVG 16, 32, 100 and 120 – providing flow up to 240 l/min.

A common feature is the modular build concept. This enables engineers to combine stacks of flexible slice-sections across the entire PVG family, making it possible to build up a valve group that meets precise requirements.

Furthermore, the compact external dimensions of the valve remain unchanged, no matter what combination is specified.

The PVG 16 is also designed as a load-sensing directional control valve, which helps improve application efficiency – reducing both cooling requirements and fuel expenses.

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Features

- 40 mm [1.575 in] PVB module width
- PVB with BSP and UNF threads
- Compensated basic modules
- Uncompensated basic modules
- P-channel check valve
- Shock valves
- PVM with or w/o adjustment screws
- PVH, hydraulic actuation
- PVEO and PVEA
- Combination with PVG 32, 100 and 120

Available spools

- Closed or open neutral position
- Float
- Assymetrical flow options
- Electrical/mechanical or hydraulic actuation
- 5, 10, 25, 40 or 60 l/min [1.32, 2.64, 6.60, 10.57 or 15.85 US gal/min]

Technical data

Maximum pressure	Port P continuous	350 bar ¹	[5075 psi]	
	Port P intermittent	400 bar	[5800 psi]	
	Port A/B continuous	380 bar	[5510 psi]	
	Port A/B intermittent	420 bar	[6090 psi]	
	Port T, static/dynamic	25/40 bar	[365/580 psi]	
Oil flow rated	Port P	140/230 l/min	[37/61 US gal/min]	
	Port A/B	60 l/min	[16 US gal/min]	
Spool travel	Deadband	± 1.5 mm	[± 0.06 in]	
	Proportional range	± 5 mm	[± 0.2 in]	
	Float position	± 7.5 mm	[± 0.3 in]	
Maximum internal leakage at 100 bar [1450 psi] and 21 mm ² /s [102 SUS]	A/B → T without shock valve	20 cm ³ /min	[1.85 in ³ /min]	
	A/B → T with shock valve (system setting 30 bar [435 psi])	25 cm ³ /min	[2.15 in ³ /min]	
Ambient temperature		-30 → 60 °C	[-22 → 140 °F]	
Oil viscosity	Operating range	12 - 75 mm ² /s	[65 - 347 SUS]	
	Minimum viscosity	4 mm ² /s	[39 SUS]	
	Maximum viscosity	460 mm ² /s	[2128 SUS]	
Filtration	Maximum contamination (ISO 4406)	23/19/16		
PVM regulating range	Proportional	13.9°		
	Float position	22.3°		
PVM operating force	PVM + PVMD	Neutral position	2.2 ± 0.2 N·m	[5.0 ± 1.8 lbf·in]
		Maximum stroke	2.8 ± 0.2 N·m	[6.3 ± 1.8 lbf·in]
	PVM + PVE ²	Neutral position	2.2 ± 0.2 N·m	[5.0 ± 1.8 lbf·in]
		Maximum stroke	2.8 ± 0.2 N·m	[6.3 ± 1.8 lbf·in]
	PVM + PVH	Neutral position	2.7 ± 0.2 N·m	[23.9 ± 1.8 lbf·in]
		Maximum stroke	7.1 ± 0.2 N·m	[62.8 ± 1.8 lbf·in]
PVH pressure	Regulating range	5 – 15 bar	[75 – 220 psi]	
	Maximum pilot pressure	30 bar	[435 psi]	
	Maximum pressure on T-port	10 bar	[145 psi]	
PVE input voltage ³	Supply	11 – 32 V _{DC}		
	Regulating range	25 – 75% of supply voltage		
PVE SP pin output voltage ³	Float	0,5 V _{DC}		
	Flow to B-port	1.25 – 2.5 V _{DC}		
	Neutral	2.5 V _{DC}		
	Flow to A-port	2.5 – 3.75 V _{DC}		
	Error	5 V _{DC}		

¹ With PVSI end plate. Using PVS end plate maximum 300 bar [4351 psi].

² PVE without voltage.

³ Voltage is measured between spool output pin and ground (GND).

PVG 16 Technical Information	L1214235
PVE-CI Technical Information	L1505234

PVG 32

Proportional Valve Group



PVG is a hydraulic, load-sensing proportional valve, designed for optimal machine performance and maximum design flexibility. The PVG valve design is based on a modular concept that enables machine designers to specify a valve solution suitable for multiple market segments across multiple applications.

The PVG 32 is a member of the PVG product platform and interfaces to other valve families enabling all machine functions being controlled from one single valve stack.

PVG 32 controls work port flow up to 125 l/min [33 US gal/ min] l/min and up to 420 bar [6090 psi] bar work port pressure.

The load independent proportional control valve and high performance actuator technology combined with a low pressure drop design improves the machine



PVG 32 Features

PVG load-sensing proportional valves features and benefits summarized in bullets below:

- Load-independent flow control:
 - Oil flow to an individual function is independent of the load pressure of this function
 - Oil flow to one function is independent of the load pressure of other functions
- Possible combination with the rest of the PVG family, when using an interface module
- Up to 12 basic modules per PVG 32 valve group
- Reliable regulation characteristics across the entire flow range
- Load sense relief valves for A and B port enables reduced energy loss at target pressure
- Several options for connection threads and flange mount
- Compact design, easy installation and serviceability
- Energy-saving
- Low weight

Other technical features

Inlets, work section housing, and actuation methods features are listed below:

Inlets include:

- Built-in pressure relief valve
- Pressure gauge connection
- Versions for different pump types
 - Open center systems with fixed displacement pumps
 - Closed center systems with variable displacement pumps
- Integrated pilot oil supply Work section housing include:
 - Interchangeable spools
 - Pressure gauge connection
 - Versions for different application needs:
 - Built-in compensator for load independent flow
 - Built-in load holding check valve in P-channel
 - Integrated shock/suction valve
 - Integrated local pressure relief valve

General Information

Actuation methods include:

- Manual control – with lever
 - with friction detent
- Hydraulic control
- Electro-hydraulic
 - ON/OFF control –
 - Ratiometric proportional control
 - CAN bus proportional control
 - PWM proportional control



PVG 32 Valve Group

The technical data for PVG 32 and PVPX are typical measured results. For the hydraulic system a mineral based hydraulic oil with a viscosity of 21 mm²/s [102 SUS] and a temperature of 50°C [122°F] was used.

Max. pressure	Port P continuous	350 bar ¹⁾	[5075 psi]
	Port A/B	350 bar	[5075 psi]
	Port T, static/dynamic	25 / 40 bar	[365/580 psi]
Oil flow rated (See characteristics page 31 - 36)	Port P	140/230 l/min ^{3) 4)}	[37/61 US gal/min] ^{3) 4)}
	Port A/B, with press.comp.	100 l/min ²⁾	[26.4 US gal/min] ²⁾
	Port A/B without press.comp.	125 l/min	[33 US gal/min]
Spool travel, standard		± 7 mm	[± 0.28 in]
Spool travel, float position, spool	Proportional range	± 4.8 mm	± 0.19 in]
	Float position	± 8 mm	[± 0.32 in]
Dead band, flow control spools	Standard	± 1.5 mm	[± 0.06 in]
	Linear characteristic	± 0.8 mm	[± 0.03 in]
Max. internal leakage at 100 bar [2175 psi] and 21 mm ² /s [102 SUS]	A/B → T without shock valve λ ε σ	20 cm ³ /min	[1.85 in ³ /min]
	A/B → T with shock valve	25 cm ³ /min	[2.15 in ³ /min]
Oil temperature (inlet temperature)	Recommended temperature	30 → 60 °XC	[86 → 140°F]
	Min. temperature	-30°C	[-22°F]
	Max. temperature	+90°C	[194°F]
Ambient temperature		-30 → 60 °XC	[-22 → 140°F]
Oil viscosity	Operating range	12 - 75 mm ² /s	[65 - 347 SUS]
	Min. viscosity	4 mm ² /s	[39 SUS]
	Max. viscosity	460 mm ² /s	[2128 SUS]
Filtration (See page 55)	Max. contamination (ISO 4406)	23/19/16	23/19/16
Oil consumption in pilot oil pressure reduction valve		1 l/min	[0.25 US gal/min]

1) With PVS1 end plate. With PVS end plate max. 300 bar [4351 psi].

2) For 130 l/min contact technical Sales Organization for Sauer-Danfoss

3) In open circuit systems with short P-hoses/tubes, attention should be paid to pressure peaks at flows >100 l/min. [26.4 US gal/min]

4) For system with Mid inlet PVPVM

Load Independent Proportional Valve PVG 100



PVG 100 is a load independent proportional valve with flow up to 180 l/min [48 gpm] and pressures up to 350 bar [5076 psi]. It offers equitable flow sharing for precise control of multiple machine functions under varying load conditions and pressure requirements.

Building on the modular, flexible, and proven Danfoss load-sensing proportional valve concept, PVG 100 offers easy, fast configuration, thereby helping vehicle designers meet tight time-to-market deadlines. The new valve is positioned between the existing Danfoss PVG 32 and PVG 120 with flows up to 130 l/min [34.4 gal/min] and 240 l/min [63.4 gal/min] respectively.

PVG 100 optimizes system design for engineers who must incorporate new emissions restrictions by providing a more efficient hydraulic system that maximizes power and conserves energy. Typical applications include backhoes, telehandlers, wheel loaders, forklifts, and forestry equipment.



Features

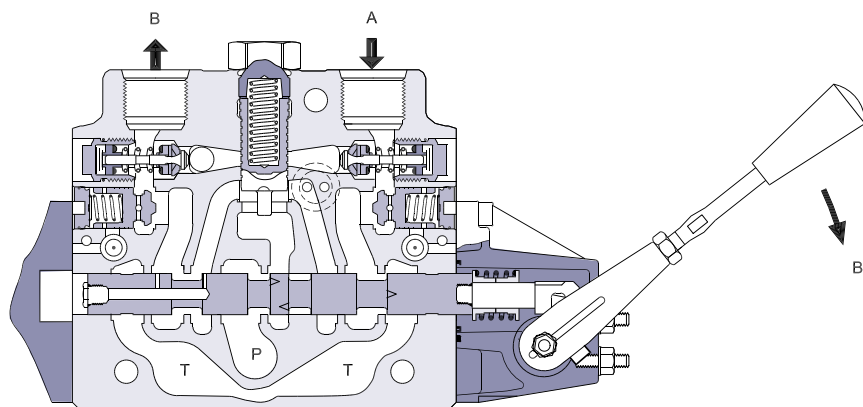
- Flow sharing for maximum controllability and safety. All sections will continue to function regardless of load differences and pump flow.
- Load-independent flow control for smooth operation and improved productivity.
- Load-sensing technology for higher efficiency, safety, reduced energy consumption, and longer system lifetime.
- Configurable as advanced electrically controlled proportional valve as well as load-sensing directional control valve.
- Modular design providing a wide range of configuration possibilities.
- Up to eight different sections per valve group. Maximum flow per section: 180 l/min [48 gpm].
- Can be configured in combination with our range of HIC hybrid modules and/or PVG 32 for maximum flexibility.
- Mechanical, hydraulic, and electrical actuation options.

SAMER has become a preferred Hydraulic Supplier with many Manufacturers because offers the best of what really matters: the hardware at the internal core of the Machine Application.

SAMER offers following services:

- Systems design with pumps and motors in closed and open loop circuits including valves,
- Sale of hydraulic components and electronic devices. --Commissioning and start up on machinery.
- Repair of hydraulic components
- Postsale and service troubleshoot on phone

Sectional Drawing PVB



157-749.10

Technical Data PVG 100

Max. pressure	Port P continuous	350 bar	[5075 psi]
	Port A/B	350 bar	[5075 psi]
	Port T, static / dynamic	25 bar/40 bar	[365/580 psi]
	Port T0, static / dynamic	5 bar/10 bar	[75/145 psi]
Oil flow, rated (See characteristics,	Port P	250 l/min	[66 US gal/min]
	Port A/B, with press. comp.	180 l/min	[47.6 US gal/min]
Spool travel	Standard	± 7 mm	[±0.28 in]
Spool travel, float position spool P→B→F	Proportional range	5.5 mm	[±0.22 in]
	Float position	8 mm	[±0.32 in]
Dead band, flow control spools	Standard	± 1.5 mm	[±0.06 in]
Max. spool leakage at 100 bar [1450 psi] and 21 mm ² /s [102 SUS]	A/B to T, without shock valve	20 cm ³ /min	[1.85 in ³ /min]
	A/B to T, with shock valve	25 cm ³ /min	[2.15 in ³ /min]
Max. internal leakage shock valve pilot operated check valve at 200 bar [2900 psi] and 21 mm ² /s [102 SUS]	A/B to T, without shock valve	1 cm ³ /min	[0.06 in ³ /min]
	A/B to T, with shock valve	6 cm ³ /min	[0.37 in ³ /min]
Oil temperature (inlet temperature)	Recommended temperature	30 to 60°C	30 to 60°C
	Min. temperature	-30°C	[-22°F]
	Max. temperature	+90°C	[194°F]
Ambient temperature		-30 to +60°C	[-22 to +140°F]
Oil viscosity	Operating range	12 - 75 mm ² /s	[65 - 347 SUS]
	Min. viscosity	4 mm ² /s	[39 SUS]
	Max. viscosity	460 mm ² /s	[2128 SUS]
Filtration	Max. contamination (ISO 4406)	23/19/16	23/19/16

Proportional Valve Group

PVG 128 and PVG 256



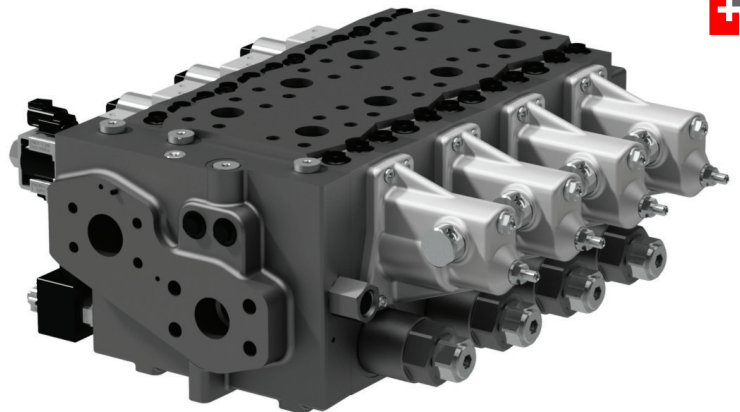
PVG is a hydraulic, load-sensing proportional valve, designed for optimal machine performance and maximum design flexibility.

The PVG 128 and PVG 256 are new members of the PVG product platform.

PVG 128 and PVG 256 providing work port flow up to 500 l/min and up to 420 bar work port pressure.

The PVG valve design includes a modular concept that enables machine designers to specify a valve solution across multiple product lines as a result in optimized and custom valve solutions across multiple applications.

The load independent proportional control valve and high performance actuator technology combined with a low pressure drop design improves the machine performance and efficiency—Increasing productivity and reducing energy consumption.



Features

- Inlet flow up to 600 l/min [158 US gal/min]
- Maximum work port flow 400 l/min [105 US gal/min]
- Compact sectional platform solution for easy integration with PVG 16 and PVG 32
- High precision, reliability, and ultimate performance with closed loop actuator technology and CAN bus
- New compensator design for enhanced load independency
- Optimized for lower pressure drop and higher efficiency
- Load sense relief valves for A and B port enables reduced energy loss at target pressure
- External change over between OC and CC systems reducing contamination risk
- Integrated LS amplifier to ensure consistent performance

- Configurable with shock valves or anti cavitation valves
- Load sense auxiliary ports for external adjustment of target pressure
- Port connections available: BSP Flange (Metric), SAE Flange (UNF) and O-ring boss (UNF port threads)

System/application protective features

- Pilot Pressure Shut Off
- Full Flow Dump (PVPE)
- Full Flow Dump (PVPH)
- LS Dump (PVPX)

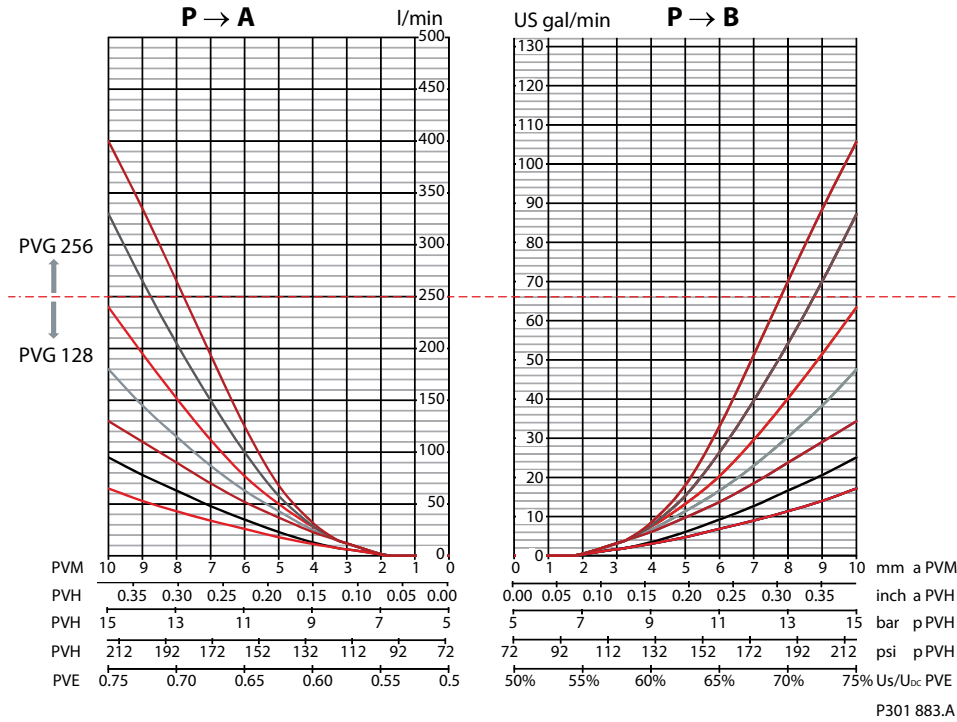
Control options

- PVM, manual control with spool limiting adjustment screws
- PVH for hydraulic actuation
- Electro proportional control options with PVEO, PVEH, PVHC, and PVEH-U

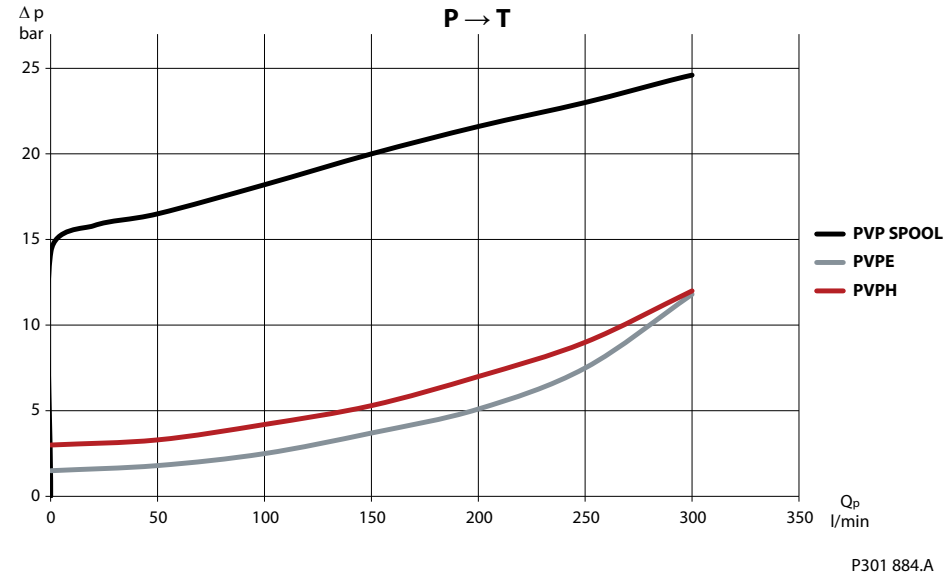
Spool/flow options

- Closed or open in neutral position
- Float - P - A - F
- Electrical/mechanical or hydraulic actuation
- 65, 95, 130, 180, 240, 320 and 400 l/min [17.1, 25.0, 34.2, 47.3, 63.1, 84.2, 105.3 US gal/min]

Flow Performance Graph



PVP, neutral flow pressure in PVP, open centre



Technical data

Maximum pressure	Port P continuous	350 bar	[5075 psi]	
	Port P intermittent	420 bar	[6000 psi]	
	Port A/B continuous	350 bar	[5075 psi]	
	Port A/B intermittent	420 bar	[6000 psi]	
	Port T, static/dynamic	25/40 bar	[360/580 psi]	
Oil flow rated	Port P	600 l/min	[150 US gal/min]	
	Port A/B	250/400 l/min	[68/105 US gal/min]	
Spool travel	Deadband	± 1.5 mm	[± 0.067 in]	
	Proportional control range	± 10 mm	[± 0.39 in]	
	Float position A	± 12 mm	[± 0.47 in]	
Maximum internal leakage at 100 bar [1450 psi] and 21 mm ² /s [102 SUS]	A/B → T without shock valve	82 cm ³ /min	[5 in ³ /min]	
	A/B → T with shock valve (system setting 30 bar [435 psi])	97 cm ³ /min	[5.9 in ³ /min]	
Oil temperature (Inlet temperature)	Recommended Temperature	30 - 60 °C	[86-140 °F]	
	Minimum Temperature	- 30°C	[-22 °F]	
	Maximum Temperature	90°C	[194 °F]	
Ambient temperature		- 30 - 60°C	[-22 - 140 °F]	
Oil viscosity	Nominal Operating range	12 - 75 mm ² /s	[65 - 347 SUS]	
	Minimum viscosity	4 mm ² /s	[39 SUS]	
	Maximum viscosity	460 mm ² /s	[2128 SUS]	
Filtration	Maximum contamination (ISO 4406)	23/19/16		
PVM regulating range	Standard Control Range	30°		
	Control Range + Float in A	37°		
PVM operating force	PVM + PVMD	Neutral position	12 Nm	[106 lbf·in]
		Maximum spool stroke	30 Nm	[265 lbf·in]
	PVM + PVE	Neutral position	12 Nm	[106 lbf·in]
		Maximum spool stroke	30 Nm	[265 lbf·in]
	PVM + PVH	Neutral position	30 Nm	[265 lbf·in]
		Maximum spool stroke	91 Nm	[805 lbf·in]
PVH +PVHC pressure	Regulating range	5 - 15 bar	[75 - 220 psi]	
	Maximum pilot pressure	30 bar	[435 psi]	
	Maximum pressure on T0	10 bar	[145 psi]	
PVE voltage	Supply Voltage	11 - 32 volts		
	Control signal Range	25 - 75% of supply voltage		
	Float Signal (A-port)	Udc (11-32 volts)		
PVEH-U	Supply Voltage	11-32 volts		
	Neutral	5 volts		
	Control signal Range	2.5-7.5 volts		
PVHC control signal range	12 volts	0-1500 mA		
	24 volts	0-750 mA		

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