ENGINEERING
TOMORROW

Technical Information

Proportional Valve Group
PVG-EX 32/128/256

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Revision history

Table of revisions

Date	Changed	Rev
November 2022	Updated certificates	0401
January 2022	Updated EU Declaration of Conformity	0301
November 2020	Added PVG 128/256, new EU Declaration of Conformity	0201
June 2019	New EU Declaration of Conformity	0103
May 2019	Updated EU Declaration of Conformity, and minor changes	0102
May 2019	First edition	0101

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PVG-EX Introduction

The Danfoss PVG-EX program is an explosion-proof PVG designed to be used in Ex hazardous areas like mining and oil and gas industries.

Product certification

The PVG-EX is developed according to and in compliance with:

EU Directive 2014/34/EU Equipment for explosive atmosphere - ATEX

- EN 60079-0:2018 Electrical apparatus for explosive gas atmospheres-part 0
- EN 80079-36:2016 Non-electrical equipment for explosive atmospheres – Basic method and requirements
- EN 80079-37:2016 Non-electrical equipment for explosive atmospheres – Non-electrical type of protection constructional safety “c”, control of ignition sources “b”, liquid immersion “k”
- EN 80079-38:2016 Equipment and components in explosive atmospheres in underground mines

PVG-EX 32/128/256 Safety in Systems

All types and brands of control valves, including proportional valves, can fail. Therefore, the necessary protection against the serious consequences of a functional failure should always be built into the system.

General safety considerations

For each application an assessment should be made for the consequences of the system in case of pressure failure and uncontrolled or blocked movements.

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Warning

Because the proportional valve is used in many different applications and under different operating conditions, it is the sole responsibility of the manufacturer to ensure that all performance, safety and warning requirements of the application is met in his selection of products and complies with relevant machine specific and generic standards.

Control system example

An example of a control system using an aerial lift is shown below:

PVG-EX Introduction

Aerial lift

This example breaks down the control system into smaller bits explaining the architecture in depth. Even though many Danfoss components are used in the PVG control system.

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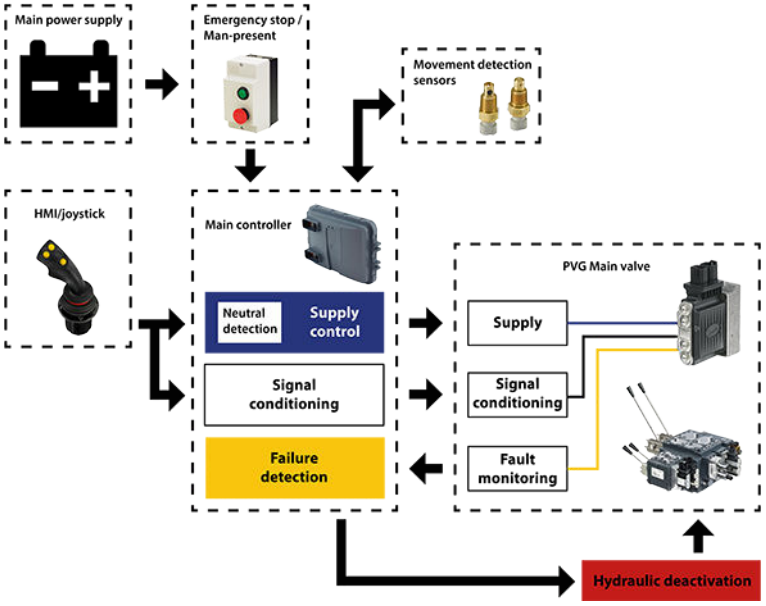
The function of the control system is to use the output from the PVE together other external sensors to ensure the PLUS+1 main controllers correct function of the aerial lift.

Electrical block diagram



Warning

It is the responsibility of the equipment manufacturer that the control system incorporated in the machine is declared as being in conformity with the relevant machine directives.

PVG-EX Introduction

Caution

A mix of electrical actuation and hydraulic actuation on the same valve stack is not safe. PVE and PVH are designed for different pilot pressure.

Cost-free repairs, as mentioned in Danfoss General Conditions of Sale, are carried out only at Danfoss or at service shops authorized by Danfoss.

Warnings

Warning

All brands and all types of directional control or proportional valves, which are used in many different operation conditions and applications, can fail and cause serious damage.

Analyze all aspects of the application. The machine builder/system integrator alone is responsible for making the final selection of the products and assuring that all performance, safety and warning requirements of the application are met.

The process of choosing the control system and safety levels is governed by Machinery Directive 2006-42-EC, and harmonized standard EN 13849 (Safety related requirements for control systems).

Warning

All national safety regulations must be fulfilled in connection with installation, start-up and operation of Danfoss PVG-EX.

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Furthermore, the requirements of the Declaration of Conformity and national regulations for installations in potentially explosive atmospheres applies as well. Disregarding such regulations involves a risk of serious personal injury or extensive material damage.

Warning

Work in connection with the valve group must be performed only by professionals and qualified persons.

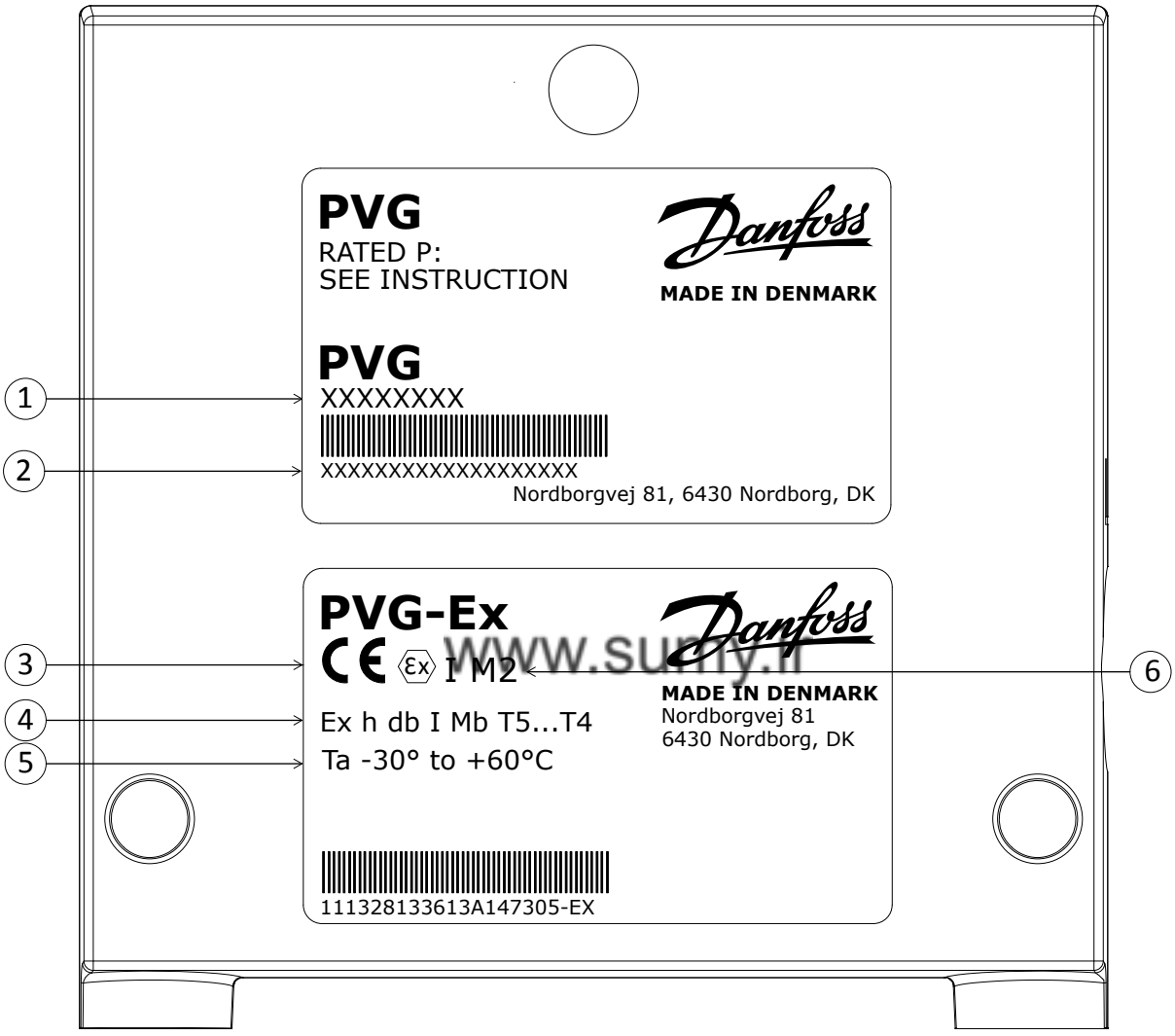
Warning

PVG with non-conductive coating must have preventive protection against electrostatic charge by an earthed metal connection.

PVG-EX Introduction

Nameplate description example

Nameplate key



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Nameplate legend

Number	Description	
1	PVG Valve Group code number	
2	Code number, production date, and serial number	*Example:* 42 12 C xxxxxx Week: 42, Year: 2012, Day: C=Wednesday (A=Monday), Serial number
3	CE Conformity marking	
4	EU marking (per 80079) - Standard part	
5	Ambient temperature range	
6	EU marking (per 2014/34/EU) - Directive part	

PVG-EX Introduction

T-category with ambient temperature at 65°C [149°F]

Oil inlet temperature	T-category
≤ 79°C [174°F]	T5
79 - 90°C [174 - 194°F]	T4

Description of the EX code h version

Ex marking (EN 80079-36 standard part)

Description	EU Marking
Protection principle	h
Explosion protection marking	
Equipment group	I / II
Equipment protection level (EPL)	Mb / Gb
T-class	T5...T4

Ex marking (EU Directive part)

Description	EU Marking
CE conformity marking	CE
Explosion protection marking	
Equipment Group	I / II
Equipment Category	M2 / 2G

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EPL/Equipment category

EPL/Equipment category

Definition	Level of protection	Typical zone of application	IEC		EU	
			EPL	Group	Category	Group
Mines	Very high	N/A	Ma	I	M1	I
	High		Mb		M2	
Gas atmosphere	Very high	0	Ga	II	1G	II
	High	1	Gb		2G	
	Enhanced	2	Gc		3G	

PVG-EX 32

General information

General description

PVG 32 is a hydraulic load sensing (LS) valve designed to give maximum flexibility. From a simple load sensing directional valve, to an advanced electrically controlled load-independent proportional valve.

The PVG 32 modular system makes it possible to build up a valve group to meet the different functional requirements precisely.

The compact external dimensions of the valve remain unchanged whatever combination is specified.

The PVG 32 interfaces to other valve families like PVG 128/256 enabling all machine functions being controlled from one single valve stack.

Features

Features of the PVG 32 include:

- 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
- Good regulation characteristics
- Energy-saving
- Up to 12 basic modules per valve group
- Several types of connection threads
- Low weight
- Compact design and installation

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Inlets

The 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

Our work section housing includes:

- 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

PVG-EX 32

Actuation methods

Our actuation methods include:

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

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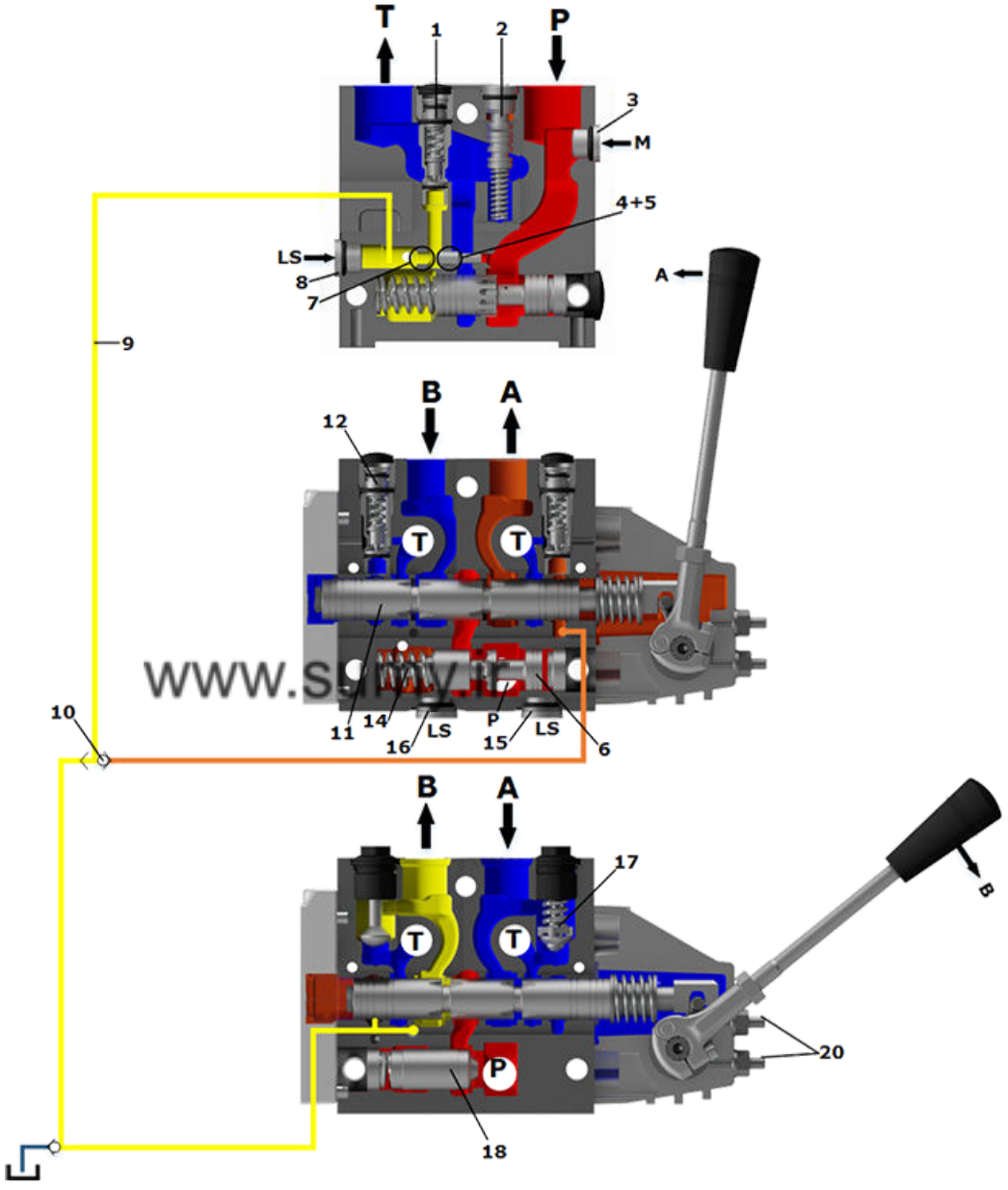
PVG-EX 32

Sectional view

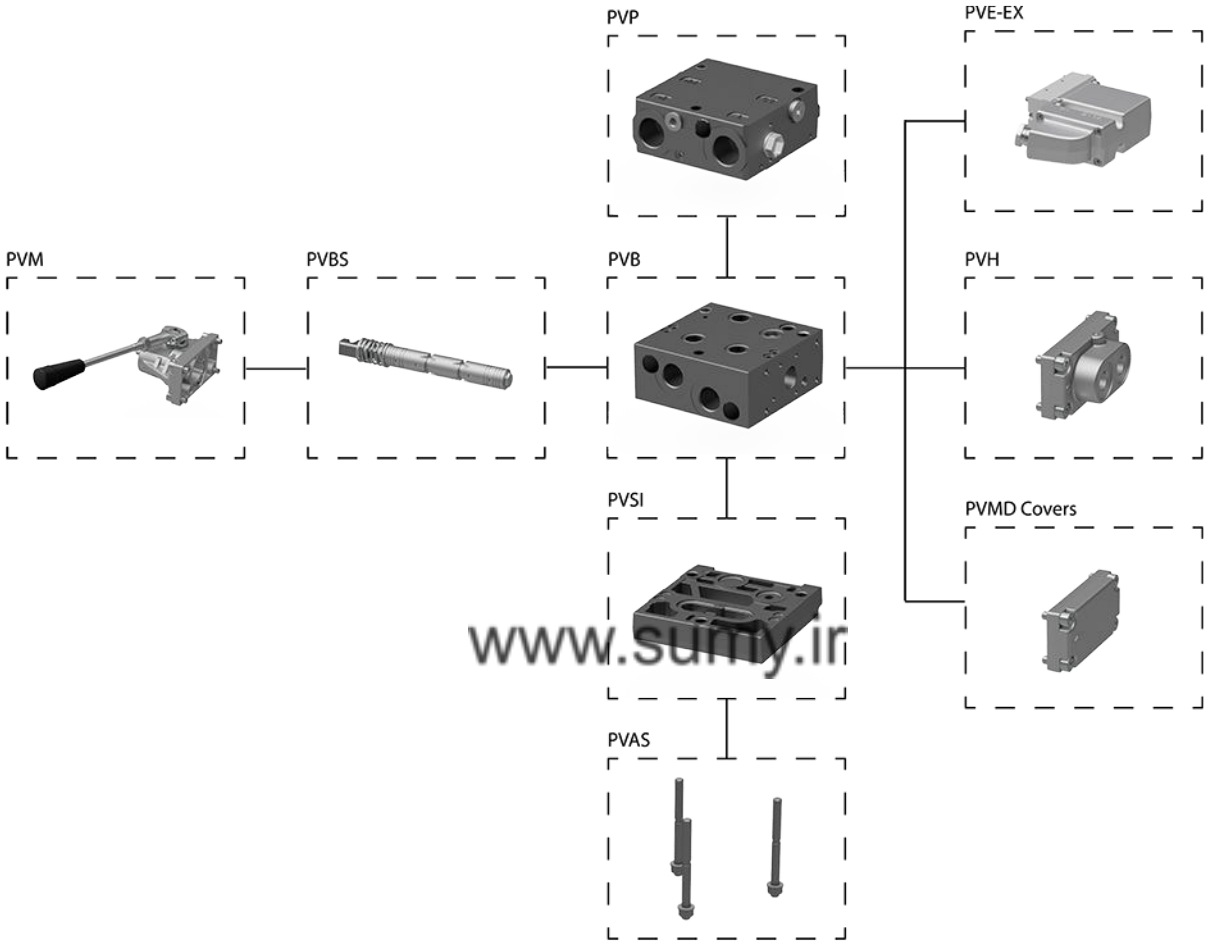


1.	Pressure relief valve	11.	Main spool
2.	Pressure reduction valve for pilot oil supply	12.	LS pressure limiting valve
3.	Pressure gauge connection	13.	Shock and suction valve, PVLP
4.	Plug, open center	14.	Pressure compensator
5.	Orifice, closed center	15.	LS connection, port A
6.	Pressure adjustment spool	16.	LS connection, port B
7.	Plug, closed center	17.	Suction valve, PVLA
8.	LS connection	18.	Load drop check valve
9.	LS signal	19.	Pilot oil supply for PVE
10.	Shuttle valve	20.	Maximum oil flow adjustment screws for A/B ports

PVG-EX 32

PVG-EX modules overview

PVG-EX 32 modules exploded view



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PVG modules navigation

- *PVP Inlet Modules* on page 15
- *PVB Basic Modules* on page 42
- *PVBS Main Spools* on page 80
- *PVSKM Full Flow Cut Off Modules* on page 130
- *PVAS Stay Bolts* on page 134

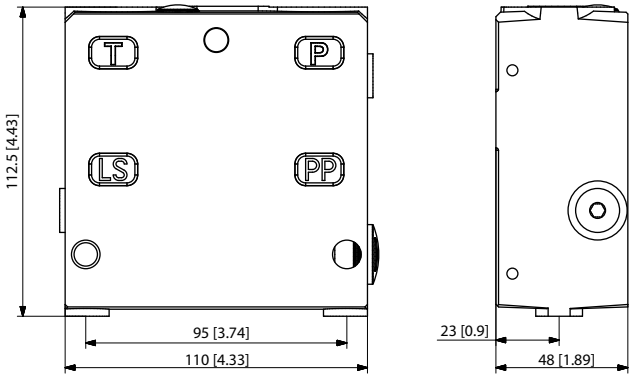
PVG-EX 32

PVP Inlet Modules

The PVG-EX 32 PVP inlet modules, also referred to as pump side modules, act as an interface between the PVG-EX 32 proportional valve group and the hydraulic pump and tank reservoir.

PVP Inlet Module

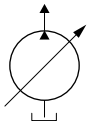
PVP inlet module dimensions



Weight: 3.1 kg [6.9 lb]

Fixed displacement pump symbol

Variable displacement pump symbol



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The PVP inlet module variants are based on a generic platform with a selection of additional features, enabling you to tailor the PVP to suit the demands of any hydraulic system:

- *Open Center PVP* on page 16 (for fixed displacement pumps)
- *Open Center PVP with PPRV* on page 19 (for fixed displacement pumps)
- *Open center PVP with HPCO and PVE PPRV* on page 22 (for fixed displacement pumps)
- *Closed Center PVP* on page 25 (for variable displacement pumps)
- *Closed Center PVP with PPRV* on page 27 (for variable displacement pumps)
- *Closed center PVPV with PPRV* on page 30 (for variable displacement pumps)
- *Closed center PVPVM with PPRV* on page 32 (for variable displacement pumps)
- *Open/Closed center PVP with PPRV* on page 34
- *Open/Closed center PVPM* on page 37

PVG-EX 32

Open Center PVP

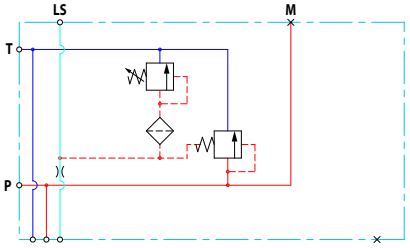
The basic Open Center PVP inlet module is intended for use with fixed displacement pumps in applications, where a valve group with mechanically controlled work sections is desired, or where the pilot pressure to the valve group is supplied externally.

The Open Center PVP features:

- Integrated LS pressure relief valve
- Threaded ports for P/T/LS and M measuring gauge
- Optional T0 facility and external T0 port

All modules can be manually activated with the PVM actuation.

Open center PVP schematic



Technical specification for PVP

Max. P-port continuous	Max. P-port intermittent	Max. T-port static/ dynamic	Max. rated flow
350 [5076 psi]	400 bar [5800 psi]	25/40 bar [365/580 psi]	140 l/min [37 US gal/min]

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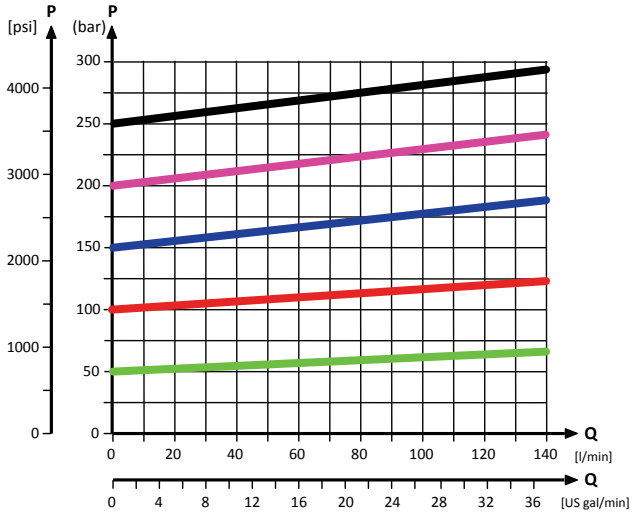
Technical specification

Parameter	Minimum	Recommended range	Maximum
Fluid temperature	-30°C [-22°F]	30 to 60°C [86 to 140°F]	90° [194°F]
Fluid viscosity	4 mm^2/s [39 SUS]	12 to 75 mm^2/s [65 to 347 SUS]	460 mm^2/s [2128 SUS]
Fluid cleanliness (mechanical activation)	23/19/16 (according to ISO 4406)		
Fluid cleanliness (PVE activation)	18/16/13 (according to ISO 4406)		
Operating temperature	Ambient: -30 to 60°C [-22 to 140°F]		

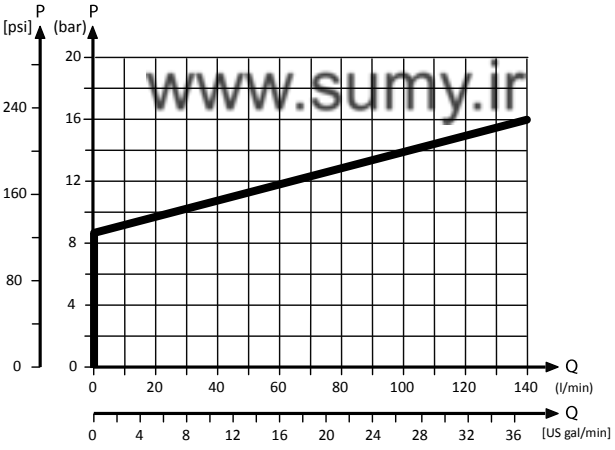
PVG-EX 32

Theoretical Performance Graphs

Integrated LS pressure relief valve characteristics



Neutral by-pass pressure drop characteristics



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Part numbers for Open Center PVP

Part number	P-port	T-port	LS-, M-port (LS1*)	T0-port	Mounting
157B5000	G1/2″	G3/4″	G1/4″	-	M8
157B5100	G3/4″			–	
157B5200	7/8-14 UNF	1 1/16-12 UNF	1/2-20 UNF	-	5/16-18 UNC
157B5300	1-1/16 UN			-	
11008852[1]	G1/2	G3/4	G1/4 (G1/8)	-	M8
11030545	G3/4	G3/4	G1/4 (G1/4)	G1/4	M8
11053974	G3/4	G3/4	G1/4 (G1/4)	G1/4	M8
11151852	1 1/16-12 UNF	1 1/16-12 UNF	9/16-18 UNF	9/16-18 UNF	M8
157B5908	1 1/16-12 UNF	1 1/16-12 UNF	1/2-20 UNF	-	M8
157B5921	JIS 1/2	JIS 3/4	JIS 1/4	-	M8
157B5925	JIS 1/2	JIS 3/4	JIS 1/4	-	M8

PVG-EX 32

Part numbers for Open Center PVP (continued)

Part number	P-port	T-port	LS-, M-port (LS1*)	T0-port	Mounting
157B5945	G1/2	G3/4	G1/4 (G1/8)	-	M8
157B5990[2]	1 1/16-12 UNF	1 1/16-12 UNF	-	-	M8

* LS1 is an extra LS-port.

[1] Dampened LS response

[2] No relief valve

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PVG-EX 32

Open Center PVP with PPRV

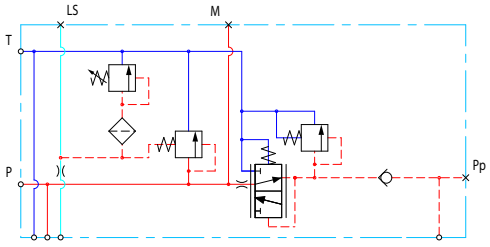
The Open Center PVP inlet with integrated pilot pressure reduction valve (PPRV) is intended for use with fixed displacement pumps in applications, where a valve group with electro-hydraulically or hydraulically controlled work sections is desired (PVE or PVH/PVHC).

The Open Center PVP with PPRV features:

- Integrated LS pressure relief valve
- Threaded ports for P/T/LS and M measuring gauge
- Integrated pilot pressure reducing valve (PPRV) for PVE or PVH/PVHC
- Optional T0 facility and external T0 port
- Optional external pilot pressure port (Pp)

All modules can be manually activated with the PVM actuation.

Open center PVP with PPRV schematic



Technical specification for PVP

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Max. P-port continuous	Max. P-port intermittent	Max. T-port static/ dynamic	Max. rated flow
350 [5076 psi]	400 bar [5800 psi]	25/40 bar [365/580 psi]	140 l/min [37 US gal/min]

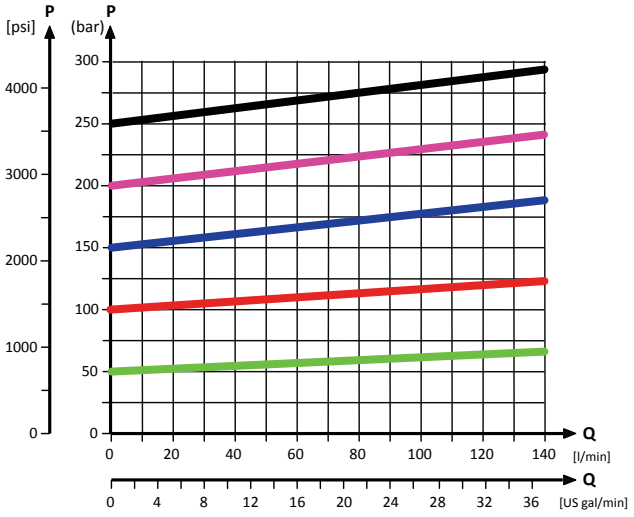
Technical specification

Parameter	Minimum	Recommended range	Maximum
Fluid temperature	-30°C [-22°F]	30 to 60°C [86 to 140°F]	90° [194°F]
Fluid viscosity	4 mm^2/s [39 SUS]	12 to 75 mm^2/s [65 to 347 SUS]	460 mm^2/s [2128 SUS]
Fluid cleanliness (mechanical activation)	23/19/16 (according to ISO 4406)		
Fluid cleanliness (PVE activation)	18/16/13 (according to ISO 4406)		
Operating temperature	Ambient: -30 to 60°C [-22 to 140°F]		

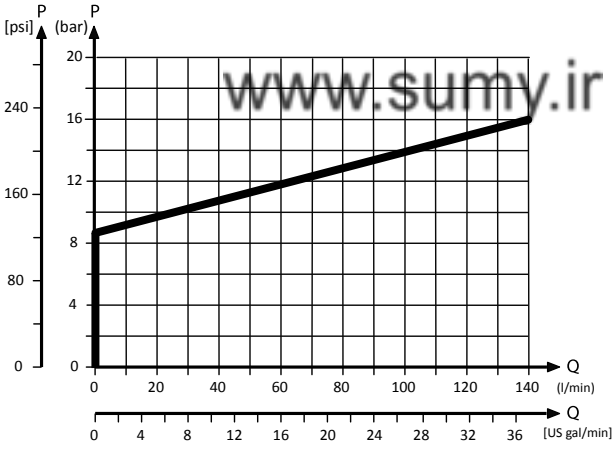
PVG-EX 32

Theoretical Performance Graphs

Integrated LS pressure relief valve characteristics



Neutral by-pass pressure drop characteristics



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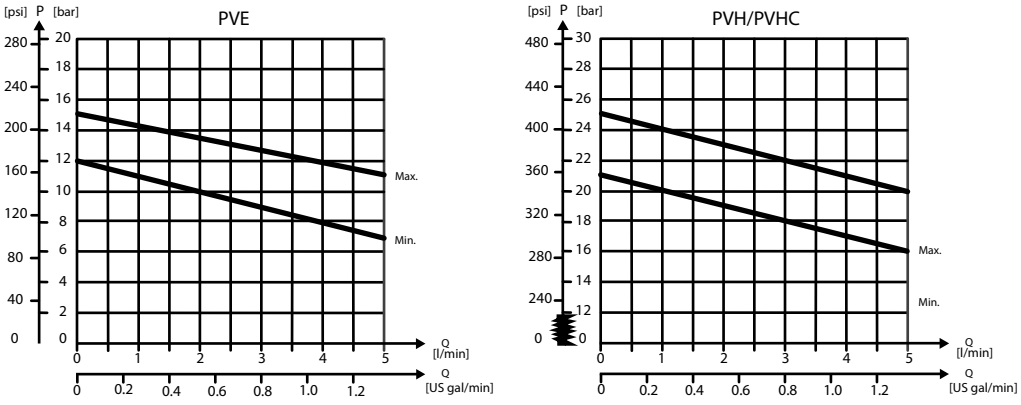
Pilot pressure reduction valve characteristics



PVG-EX 32

Part numbers for Open Center PVP with PPRV

Part number	Actuation	P-port	T-port	LS-port	M-port	Pp-port	T0-port	Mounting
11008849[1]	PVE	G3/4″	G3/4″	G1/4″	G1/4″	-	-	M8
11008851[1]	PVH/PVHC	G3/4″	G3/4″	G1/4″	G1/4″	G1/4″	-	M8
11072195	PVE	M27x2	M27x2	M14x1.5	M14x1.5	-	M14x1.5	M8
157B5010	PVE	G1/2″	G3/4″	G1/4″	G1/4″	-	-	M8
157B5110	PVE	G3/4″	G3/4″	G1/4″	G1/4″	-	-	M8
157B5130	PVE	G3/4″	G3/4″	G1/4″	G1/4″	G1/4″	G1/4″	M8
157B5180	PVE	G3/4″	G3/4″	G1/4″	G1/4″	G1/4″	-	M8
157B5190	PVH/PVHC	G3/4″	G3/4″	G1/4″	G1/4″	G1/4″	-	M8
157B5210	PVE	7/8-14 UNF	1 1/16-12 UNF	1/2-20 UNF	1/2-20 UNF	-	-	5/16-18 UNC
157B5310	PVE	1 1/16-12 UNF	1 1/16-12 UNF	1/2-20 UNF	1/2-20 UNF	-	-	5/16-18 UNC
157B5312	PVE	1 1/16-12 UNF	1 1/16-12 UNF	1/2-20 UNF	1/2-20 UNF	-	-	5/16-18 UNC
157B5330	PVE	1 1/16-12 UNF	1 1/16-12 UNF	1/2-20 UNF	1/2-20 UNF	1/2-20 UNF	-	5/16-18 UNC
157B5380	PVE	1 1/16-12 UNF	1 1/16-12 UNF	9/16-18 UNF	9/16-18 UNF	9/16-18 UNF	-	5/16-18 UNC
157B5390	PVH/PVHC	1 1/16-12 UNF	1 1/16-12 UNF	9/16-18 UNF	9/16-18 UNF	9/16-18 UNF	-	5/16-18 UNC
11101194	PVE	M22x1.5 M16x1.5 (P2)	M22x1.5	M12x1.5	M10x1	-	M16x1.5	M8
11013317[1]	PVE	G3/4	G3/4	G1/4	G1/4	G1/4	G1/4	M8
11020964	PVE	1 1/16-12 UNF	1 1/16-12 UNF	1/2-20 UNF	1/2-20 UNF	-	-	M8
11087590[1]	PVH/PVHC	G3/4	G3/4	G1/4	G1/4	G1/4	-	M8
11090453	PVE	JIS 3/4	JIS 3/4	JIS 1/4	JIS 1/4	JIS 1/4	JIS 1/4	M8
11119429[2]	PVE	G3/4	G3/4	G1/4	G1/4	G1/4	-	M8
11124966	PVH/PVHC	G3/4	G3/4	G1/4	G1/4	G1/4	-	M8
11130941[2]	PVE	1 1/16-12 UNF	1 1/16-12 UNF	9/16-18 UNF	9/16-18 UNF	9/16-18 UNF	-	5/16-18 UNC
11196947	PVE	G3/4	G3/4	G1/4	G1/4	-	G1/4	M8
11225941	PVE	1 1/16-12 UNF	1 1/16-12 UNF	9/16-18 UNF	9/16-18 UNF	9/16-18 UNF	9/16-18 UNF	5/16-18 UNC
157B5135[3]	PVE	G3/4	G3/4	G1/4	G1/4	G1/4	G1/4	M8
157B5904[2]	PVE	G3/4	G3/4	G1/4	G1/4	G1/4	-	M8
157B5923	PVE	JIS 1/2	JIS 3/4	JIS 1/4	JIS 1/4	-	-	M8
157B5926	PVE	JIS 3/4	JIS 3/4	JIS 1/4	JIS 1/4	-	-	M8
157B5934	PVE	G3/4	G3/4	G1/4	G1/4	-	-	M8
157B5943[2]	PVH/PVHC	G3/4	G3/4	G1/4	G1/4	G1/4	-	M8
157B5954	PVE	G3/4	G3/4	G1/4	G1/4	G1/4	-	M8
157B5960	PVE	1 1/16-12 UNF	1 1/16-12 UNF	9/16-18 UNF	9/16-18 UNF	-	9/16-18 UNF	5/16-18 UNF
157B5977[1,4]	PVE	G3/4	G3/4	G1/4	G1/4	-	-	M8
11101194	PVE	M22 x 1.5	M22 x 1.5	M12 x 1.5	M10 x 1	-	M16 x 1.5	M8

[1] Dampened LS response

[2] Pressure adjustment spool with check valve

[3] Internal T0 connection

[4] Low flow pressure adjustment spool

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PVG-EX 32

Open center PVP with HPCO and PVE PPRV

The Open Center PVP inlet with integrated High Pressure Carry Over (HPCO) functionality is intended for use with fixed displacement pumps in applications where one pump supply for multiple hydraulic subsystems is desired.

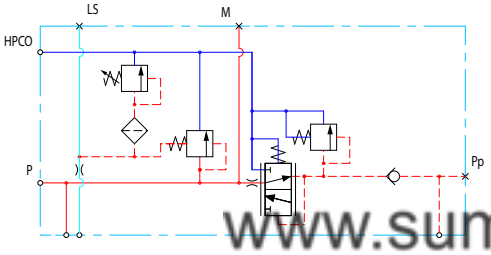
The integrated HPCO functionality guides the excess flow of the PVG-EX 32 valve group to the external hydraulic subsystem(s), giving priority to the PVG-EX 32 work functions.

The Open Center PVP with HPCO and PVE PPRV features:

- Integrated LS pressure relief valve
- Threaded ports for P/T/LS/HPCO and M measuring gauge
- Integrated pilot pressure reducing valve (PPRV) for PVE
- Optional T0 facility and external T0 port
- Optional external pilot pressure port (Pp)

Only applicable with PVST end plates with separate T-port due to blocked T-lines for HPCO functionality.

Open Center PVP with HPCO, PVE PPRV schematic



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Technical specification for PVP

Max. P-port continuous	Max. P-port intermittent	Max. T-port static/ dynamic	Max. rated flow
350 [5076 psi]	400 bar [5800 psi]	25/40 bar [365/580 psi]	140 l/min [37 US gal/min]

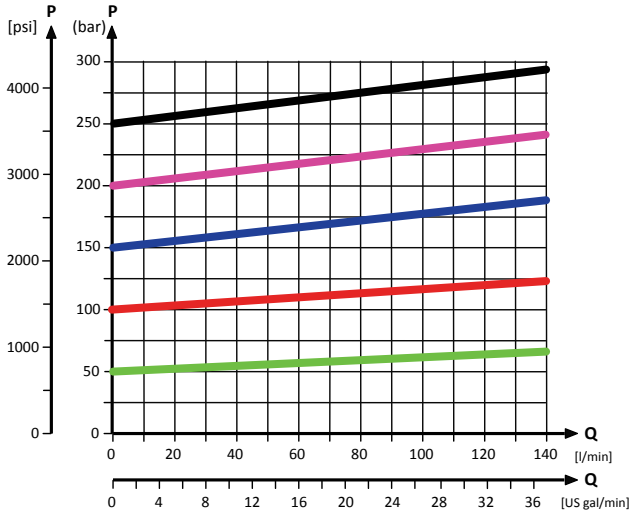
Technical specification

Parameter	Minimum	Recommended range	Maximum
Fluid temperature	-30°C [-22°F]	30 to 60°C [86 to 140°F]	90° [194°F]
Fluid viscosity	4 mm^2/s [39 SUS]	12 to 75 mm^2/s [65 to 347 SUS]	460 mm^2/s [2128 SUS]
Fluid cleanliness (mechanical activation)	23/19/16 (according to ISO 4406)		
Fluid cleanliness (PVE activation)	18/16/13 (according to ISO 4406)		
Operating temperature	Ambient: -30 to 60°C [-22 to 140°F]		

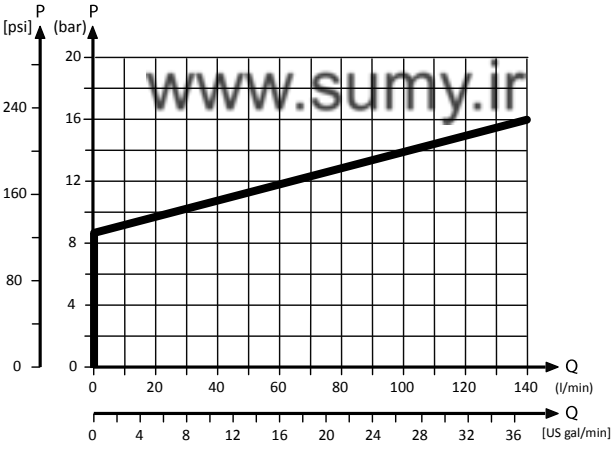
PVG-EX 32

Theoretical Performance Graphs

Integrated LS pressure relief valve characteristics



Neutral by-pass pressure drop characteristics



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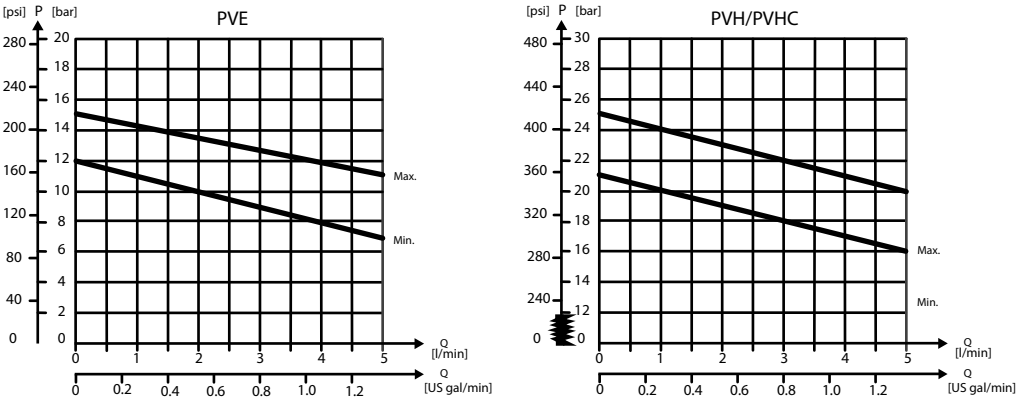
Pilot pressure reduction valve characteristics



PVG-EX 32

Part numbers for OC PVP (HPCO and PPRV)

Part number	P-port	HPCO-port	LS-port	M-port	Pp-port	T0-port	Mounting
157B5140	G3/4″	G3/4"	G1/4″	G1/4″	G1/4″	G1/4″	M8
157B5340	1 1/16-12 UNF	1 1/16-12 UNF	1/2-20 UNF	1/2-20 UNF	1/2-20 UNF	1/2-20 UNF	5/16-18 UNC
157B5961	M27x2	M27x2	M14x1.5	M14x1.5	–	M14x1.5	M8
11101195	M22x1.5 M16x1.5 (P2)	M22x1.5	M12x1.5	M10x1	–	M16x1.5	M8

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PVG-EX 32

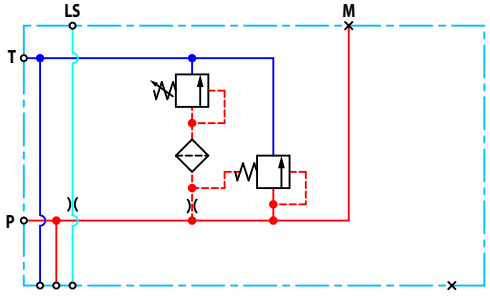
Closed Center PVP

The basic Closed Center PVP inlet is intended for use with variable displacement pumps in applications where a valve group with mechanically controlled work sections is desired, or where the pilot pressure to the valve group is supplied externally.

The Closed Center PVP features:

- Integrated LS pressure relief valve
- Threaded ports for P/T/LS and M measuring gauge
- Optional T0 facility and external T0 port

Closed center PVP schematic



Technical specification for PVP

Max. P-port continuous	Max. P-port intermittent	Max. T-port static/ dynamic	Max. rated flow
350 [5076 psi]	400 bar [5800 psi]	25/40 bar [365/580 psi]	140 l/min [37 US gal/min]

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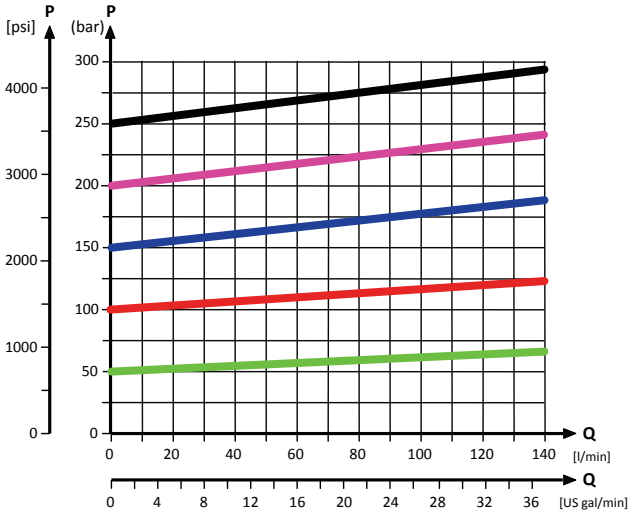
Technical specification

Parameter	Minimum	Recommended range	Maximum
Fluid temperature	-30°C [-22°F]	30 to 60°C [86 to 140°F]	90° [194°F]
Fluid viscosity	4 mm^2/s [39 SUS]	12 to 75 mm^2/s [65 to 347 SUS]	460 mm^2/s [2128 SUS]
Fluid cleanliness (mechanical activation)	23/19/16 (according to ISO 4406)		
Fluid cleanliness (PVE activation)	18/16/13 (according to ISO 4406)		
Operating temperature	Ambient: -30 to 60°C [-22 to 140°F]		

PVG-EX 32

Theoretical Performance Graphs

Integrated LS pressure relief valve characteristics



Part numbers for Closed Center PVP

Part number	P-port	T-port	LS-port (LS1**)	M-port	T0-port	Mounting
11030683	G3/4	G3/4	G1/4 (G1/4)	G1/4	G1/4	M8
157B5001	G1/2	G3/4	G1/4	G1/4	-	M8
157B5101	G3/4	G3/4	G1/4	G1/4	-	M8
157B5201	7/8-14 UNF	1 1/16-12 UNF	1/2-20 UNF	1/2-20 UNF	--	5/16-18 UNC
157B5301	1 1/16-12 UNF	1 1/16-12 UNF	1/2-20 UNF	1/2-20 UNF	-	5/16-18 UNC
15B5907	1 1/16-12 UNF	1 1/16-12 UNF	1/2-20 UNF	1/2-20 UNF	-	M8
157B5922	JIS 1/2	JIS 3/4	JIS 1/4	JIS 1/4	-	M8
157B5927	JIS 3/4	JIS 3/4	JIS 1/4	JIS 1/4	-	M8
157B5946	G1/2	G3/4	G1/4 (G1/8)	G1/4	-	M8

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** LS1 is an extra LS-port

PVG-EX 32

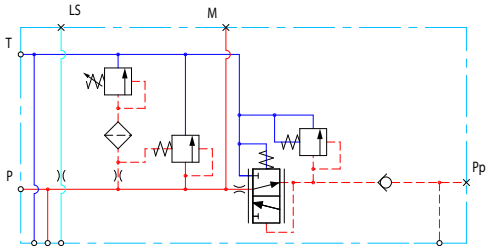
Closed Center PVP with PPRV

The Closed Center PVP inlet with integrated pilot pressure reduction valve (PPRV) is intended for use with variable displacement pumps in applications where a valve group with electro-hydraulic or hydraulically controlled work sections is desired.

The Closed Center PVP with PPRV features:

- Integrated LS pressure relief valve
- Threaded ports for P/T/LS and M measuring gauge
- Integrated pilot pressure reducing valve (PPRV) for PVE or PVH/PVHC
- Optional T0 facility and external T0 port

Closed center PVP with PPRV schematic



Technical specification for PVP

Max. P-port continuous	Max. P-port intermittent	Max. T-port static/ dynamic	Max. rated flow
350 [5076 psi]	400 bar [5800 psi]	25/40 bar [365/580 psi]	140 l/min [37 US gal/min]

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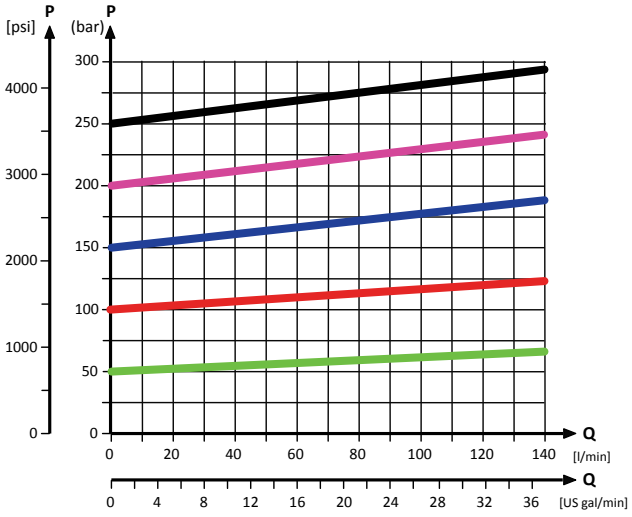
Technical specification

Parameter	Minimum	Recommended range	Maximum
Fluid temperature	-30°C [-22°F]	30 to 60°C [86 to 140°F]	90° [194°F]
Fluid viscosity	4 mm^2/s [39 SUS]	12 to 75 mm^2/s [65 to 347 SUS]	460 mm^2/s [2128 SUS]
Fluid cleanliness (mechanical activation)	23/19/16 (according to ISO 4406)		
Fluid cleanliness (PVE activation)	18/16/13 (according to ISO 4406)		
Operating temperature	Ambient: -30 to 60°C [-22 to 140°F]		

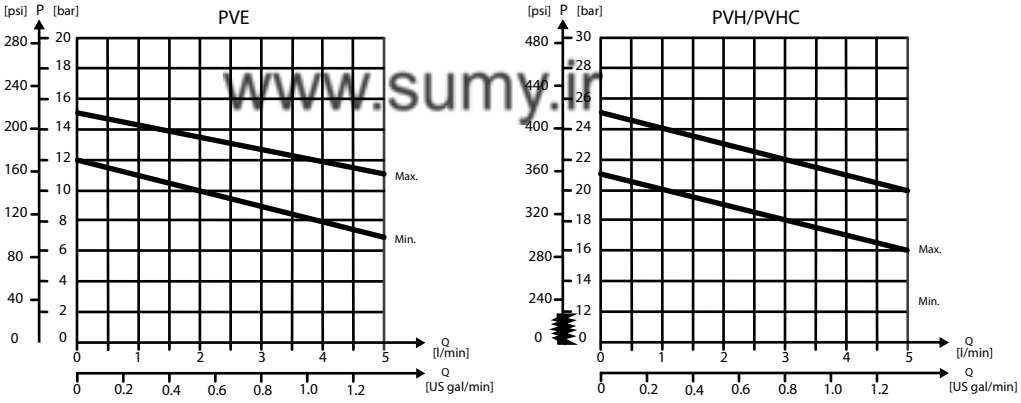
PVG-EX 32

Theoretical Performance Graphs

Integrated LS pressure relief valve characteristics



Pilot pressure reduction valve characteristics



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Part numbers for Closed Center PVP with PPRV

Part number	Actuation	P-port	T-port	LS-port (LS1**)	M-port	Pp-port	T0-port	Mounting
11051802	PVH/PVHC	1 1/16-12 UNF	1 1/16-12 UNF	1/2-20 UNF	1/2-20 UNF	1/2-20 UNF	1/2-20 UNF	5/16-18 UNC
157B5011	PVE	G1/2″	G3/4″	G1/4″	G1/4″	-	-	M8
157B5111	PVE	G3/4″	G3/4″	G1/4″	G1/4″	-	-	M8
157B5131	PVE	G3/4″	G3/4″	G1/4″	G1/4″	G1/4″	G1/4″	M8
157B5181	PVE	G3/4″	G3/4″	G1/4″	G1/4″	G1/4″	-	M8
157B5191	PVH/PVHC	G3/4″	G3/4″	G1/4″	G1/4″	G1/4″	-	M8
157B5211	PVE	7/8-14 UNF	1 1/16-12 UNF	1/2-20 UNF	1/2-20 UNF	-	-	5/16-18 UNC
157B5311	PVE	1 1/16-12 UNF	1 1/16-12 UNF	1/2-20 UNF	1/2-20 UNF	-	-	5/16-18 UNC
157B5331	PVE	1 1/16-12 UNF	1 1/16-12 UNF	1/2-20 UNF	1/2-20 UNF	1/2-20 UNF	1/2-20 UNF	5/16-18 UNC
157B5381	PVE	1 1/16-12 UNF	1 1/16-12 UNF	9/16-18 UNF	9/16-18 UNF	9/16-18 UNF	-	5/16-18 UNC
157B5391	PVH/PVHC	1 1/16-12 UNF	1 1/16-12 UNF	9/16-18 UNF	9/16-18 UNF	9/16-18 UNF	-	5/16-18 UNC

** LS1 is an extra LS-port

PVG-EX 32

All modules can be manually activated with the PVM actuation.

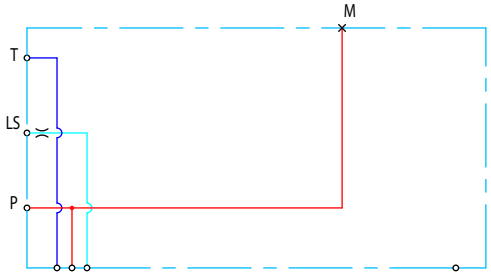
Closed center PVPV

The Closed Center PVPV inlet is intended for use with variable displacement pumps in applications where a valve group with mechanical controlled work sections is desired.

The Closed center PVPV features:

- Optional T0 facility and port
- Threaded ports for P/T/LS and M measuring gauge
- Optional additional threaded ports for P2, T2, and T02

PVPV Schematic



Technical specification for PVP

Max. P-port continuous	Max. P-port intermittent	Max. T-port static/ dynamic	Max. rated flow
350 [5076 psi]	400 bar [5800 psi]	25/40 bar [365/580 psi]	140 l/min [37 US gal/min]

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Technical specification

Parameter	Minimum	Recommended range	Maximum
Fluid temperature	-30°C [-22°F]	30 to 60°C [86 to 140°F]	90° [194°F]
Fluid viscosity	4 mm^2/s [39 SUS]	12 to 75 mm^2/s [65 to 347 SUS]	460 mm^2/s [2128 SUS]
Fluid cleanliness (mechanical activation)	23/19/16 (according to ISO 4406)		
Fluid cleanliness (PVE activation)	18/16/13 (according to ISO 4406)		
Operating temperature	Ambient: -30 to 60°C [-22 to 140°F]		

Part numbers for Closed Center PVPV

Part number	P-port (P2)	T-port (T2)	LS-port	M-port	T0-port (T02)	Mounting
11055758	M27x2.0 (M27x2.0)	M27x2.0 (M14x1.5)	M14x1.5	M14x1.5	M14x1.5 (M14x1.5)	M8
11067570	M27x2.0	M33x2.0	M14x1.5	M14x1.5	-	M8

PVG-EX 32

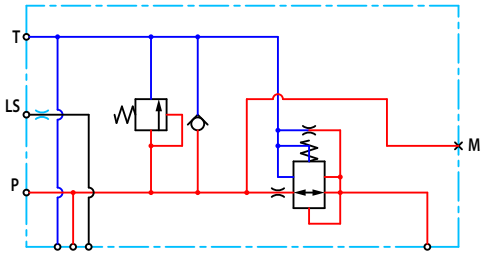
Closed center PVPV with PPRV

The Closed Center PVPV inlet with integrated pilot pressure reduction valve (PPRV) is intended for use with variable displacement pumps in applications where a valve group with electro-hydraulic or hydraulically controlled work sections is desired.

The Closed Center PVPV with PPRV features:

- Optional shock/anti-cavitation valve facility (PVLP)
- Threaded ports for P/T/LS and M measuring gauge
- Integrated pilot pressure reducing valve (PPRV) for PVE or PVH/PVHC

Hydraulic schematic



Technical specification for PVP

Max. P-port continuous	Max. P-port intermittent	Max. T-port static/ dynamic	Max. rated flow
350 [5076 psi]	400 bar [5800 psi]	25/40 bar [365/580 psi]	140 l/min [37 US gal/min]

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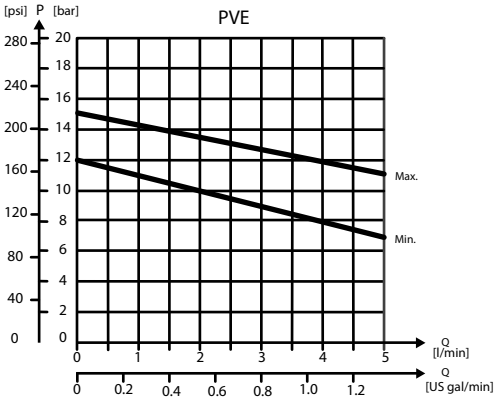
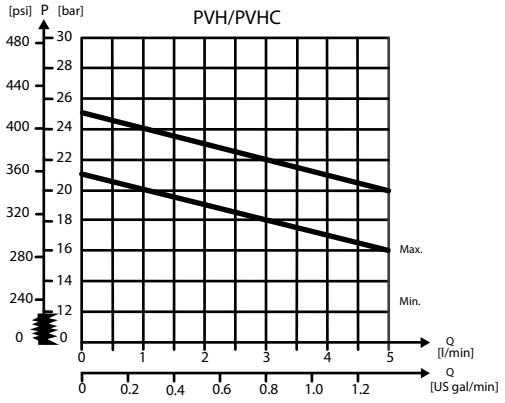
Technical specification

Parameter	Minimum	Recommended range	Maximum
Fluid temperature	-30°C [-22°F]	30 to 60°C [86 to 140°F]	90° [194°F]
Fluid viscosity	4 mm^2/s [39 SUS]	12 to 75 mm^2/s [65 to 347 SUS]	460 mm^2/s [2128 SUS]
Fluid cleanliness (mechanical activation)	23/19/16 (according to ISO 4406)		
Fluid cleanliness (PVE activation)	18/16/13 (according to ISO 4406)		
Operating temperature	Ambient: -30 to 60°C [-22 to 140°F]		

Pilot pressure reduction valve characteristics





PVG-EX 32

Part numbers for Closed Center PVPV with PPRV

Part number	Actuator	P-port	T-port (T2)	LS-port	M-port	Pp-port	T0-port (T02)	Mounting	PVLP
11012350[1]	PVE	M27x2.0	M33x2.0	M14x1.5	M14x1.5	G1/4	-	M8	-
11003806		M27x2.0	M27x2.0 (M14x1.5)	M14x1.5	M14x1.5	G1/4	M14x1.5 (M14x1.5)	M8	-
11008854[2]		G1	G1	G1/4	G1/4	G1/4	-	M8	Yes
11124107		1 5/16-12	1 1/16-12	9/16-18	9/16-18	G1/4	-	M8	Yes
11196949		G1	G1	-	-	-	-	M8	Yes
157B5911		1 5/16-12	1 5/16-12	9/16-18	9/16-18	G1/4	-	5/16-18	-
157B5913		1 5/16-12	1 5/16-12	9/16-18	9/16-18	G1/4	-	5/16-18	Yes
157B5938		G1	G1	G1/4	G1/4	G1/4	-	M8	-
157B5941		G1	G1	G1/4	G1/4	G1/4	-	M8	Yes
157B5948[3]		G1	G1	G1/4	G1/4	G1/4	-	M8	Yes
157B5973[4]		G1	G1	G1/4	G1/4	G1/4	-	M8	Yes
157B5978		M27x2.0	M33x2.0	M14x1.5	M14x1.5	G1/4	-	M8	-
11008856	PVH/PVHC	G1	G1	G1/4	G1/4	G1/4	-	M8	Yes
11051803		1 5/16-12	1 5/16-12	9/16-18	9/16-18	G1/4	-	5/16-18	Yes
157B5916		1 5/16-12	1 5/16-12	9/16-18	9/16-18	G1/4	-	5/16-18	-
157B5963		1 1/16-12	1 1/16-12	7/16-20	-	M18x1.5	9/16-18	M8	-

[1] No LS-orifice

[2] Internal T0 connection

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[3] 0.4 mm hole in the pilot reduction cone (standard 0.8 mm)

[4] HPCO-facility

All modules can be manually activated with the PVM actuation.

PVG-EX 32

Closed center PVPVM with PPRV

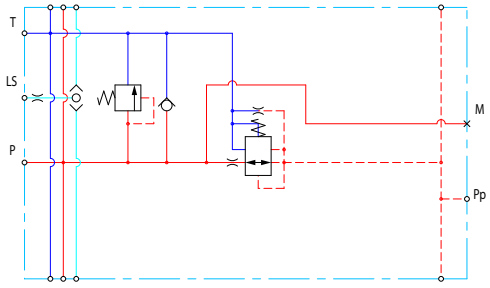
The Closed Center PVPVM mid-inlet module with integrated pilot pressure reduction valve (PPRV) is intended for use with variable displacement pumps in applications where a valve group with electro-hydraulic or hydraulically controlled work sections is desired.

Using a PVPVM module in a valve group requires a 180° degree rotation of the PVG work sections on one side.

The Closed Center PVPVM with PPRV features:

- Optional shock/anti-cavitation valve facility (PVLP)
- Threaded ports for P/T/LS and M measuring gauge
- Integrated pilot pressure reducing valve (PPRV) for PVE or PVH/PVHC

Hydraulic schematic



Technical specification for PVP

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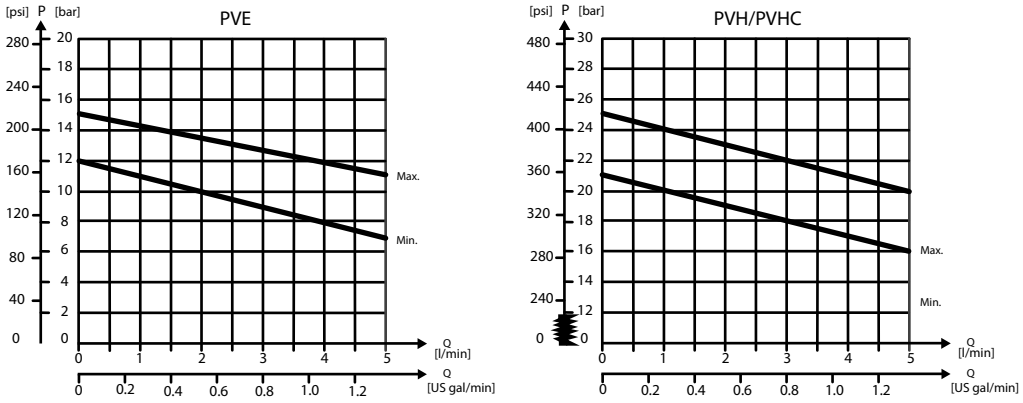
Max. P-port continuous	Max. P-port intermittent	Max. T-port static/ dynamic	Max. rated flow
350 [5076 psi]	400 bar [5800 psi]	25/40 bar [365/580 psi]	230 l/min [61 US gal/min]

Technical specification

Parameter	Minimum	Recommended range	Maximum
Fluid temperature	-30°C [-22°F]	30 to 60°C [86 to 140°F]	90° [194°F]
Fluid viscosity	4 mm^2/s [39 SUS]	12 to 75 mm^2/s [65 to 347 SUS]	460 mm^2/s [2128 SUS]
Fluid cleanliness (mechanical activation)	23/19/16 (according to ISO 4406)		
Fluid cleanliness (PVE activation)	18/16/13 (according to ISO 4406)		
Operating temperature	Ambient: -30 to 60°C [-22 to 140°F]		

PVG-EX 32

Pilot pressure reduction valve characteristics



Part numbers for Closed Center PVPVM with PPRV

Part number	Actuator	P-port	T-port	LS-port	M-port	Pp-port	Mounting	PVLP
157B5914	PVE	1 5/16-12 UNF	1 5/16-12 UNF	9/16-18 UNF	9/16-18 UNF	G1/4	5/16-18 UNC	Yes
157B5937		G1	G1	G1/4	G1/4	G1/4	M8	-
157B5940		G1	G1	G1/4	G1/4	G1/4	M8	Yes
11083156	PVH/PVHC	1 1/16-12 UNF	1 1/16-12 UNF	9/16-18 UNF	9/16-18 UNF	G1/4	5/16-18 UNC	Yes
157B5912		1 5/16-12 UNF	1 5/16-12 UNF	9/16-18 UNF	9/16-18 UNF	G1/4	5/16-18 UNC	-
157B5986		G1	G1	G1/4	G1/4	G1/4	M8	Yes

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All modules can be manually activated with the PVM actuation.

PVG-EX 32

Open/Closed center PVP with PPRV

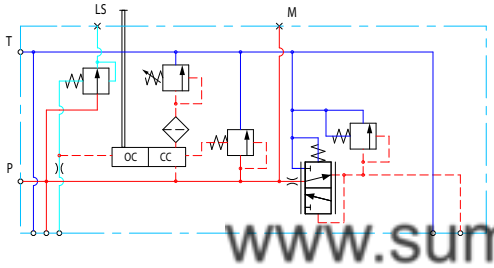
The Open Center/Closed Center PVP with integrated pilot pressure reduction valve (PPRV) is intended for use with fixed or variable displacement pumps in applications where the application manufacturer does not determine the pump type.

The modules allow an easy switch between Open Center and Closed Center configuration by means of an external hexagon selector key. Variants also feature an LS boost functionality, increasing the LS pressure to the pump LS regulator with a constant 6 bar, compensating for potential LS bleed-off and leakage.

The Open/closed center PVPV with PPRV features:

- Integrated OC/CC selector
- Integrated LS pressure relief valve
- Threaded ports for P/T/LS and M measuring gauge
- Integrated pilot pressure reducing valve (PPRV) for PVE or PVH/PVHC
- Optional LS boost functionality

Hydraulic schematic



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Technical specification for PVP

Max. P-port continuous	Max. P-port intermittent	Max. T-port static/ dynamic	Max. rated flow
350 [5076 psi]	400 bar [5800 psi]	25/40 bar [365/580 psi]	140 l/min [37 US gal/min]

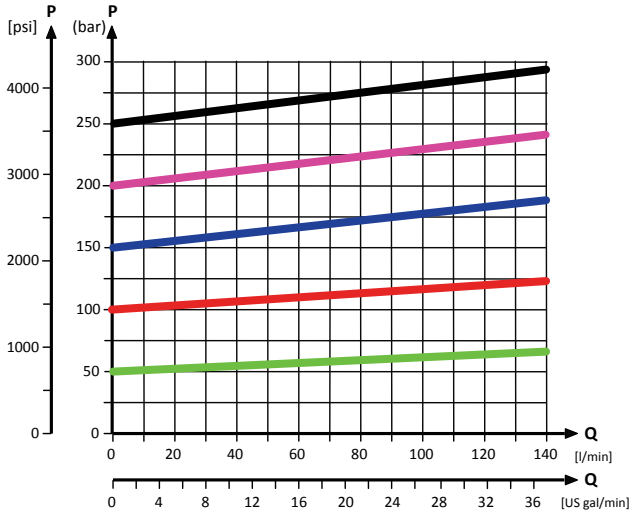
Technical specification

Parameter	Minimum	Recommended range	Maximum
Fluid temperature	-30°C [-22°F]	30 to 60°C [86 to 140°F]	90° [194°F]
Fluid viscosity	4 mm^2/s [39 SUS]	12 to 75 mm^2/s [65 to 347 SUS]	460 mm^2/s [2128 SUS]
Fluid cleanliness (mechanical activation)	23/19/16 (according to ISO 4406)		
Fluid cleanliness (PVE activation)	18/16/13 (according to ISO 4406)		
Operating temperature	Ambient: -30 to 60°C [-22 to 140°F]		

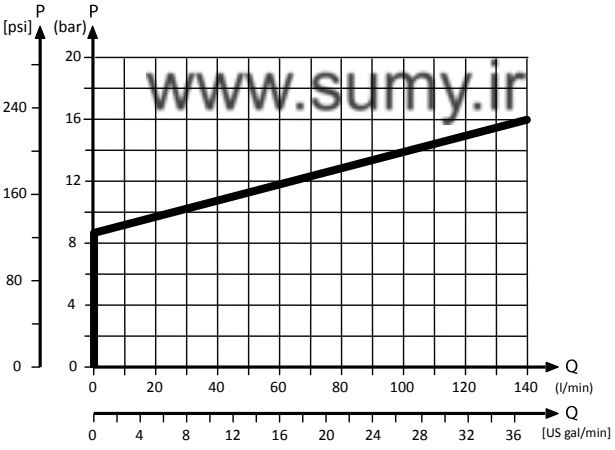
PVG-EX 32

Theoretical Performance Graphs

Integrated LS pressure relief valve characteristics



Neutral by-pass pressure drop characteristics



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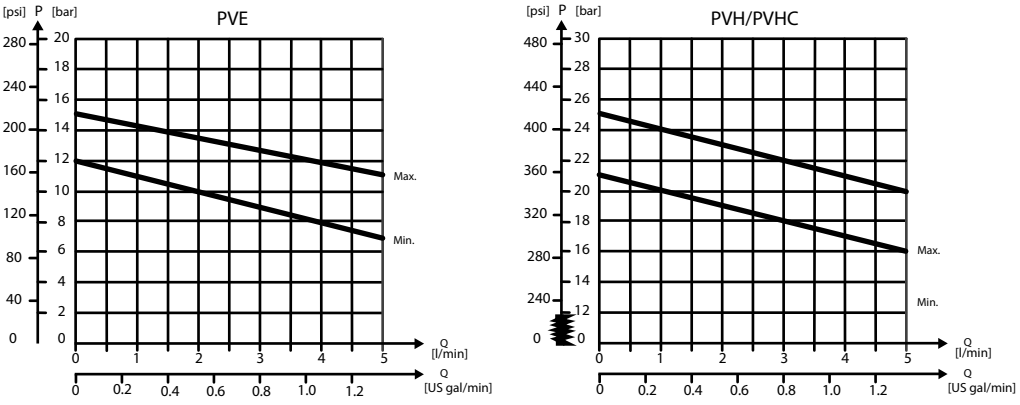
Pilot pressure reduction valve characteristics



PVG-EX 32

Part numbers for Open/Closed Center PVP with PPRV

Part number	Actuation	P-port	T-port	LS-port (LS1**)	M-port	T0-port	Mounting	LS Boost
11093273	PVE	G3/4	G3/4	-	G1/4	-	M8	Yes
11119094	PVE	G3/4	G3/4	-	G1/4	-	M8	-
11119095	PVE	1 1/16-12 UNF	1 1/16-12 UNF	1/2-20 UNF	1/2-20 UNF	-	M8	-
11131344	PVH/PVHC	G3/4	G3/4	-	G1/4	-	M8	Yes
11168608[1]	PVE	G3/4	G3/4	-	G1/4	-	M8	Yes

** LS1 is an extra LS-port

[1] Dampened LS response

All modules can be manually activated with the PVM actuation.

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PVG-EX 32

Open/Closed center PVPM

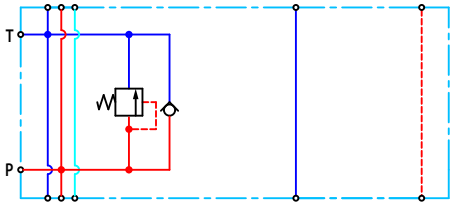
The Open Center/Closed Center PVPM mid-inlet acts as a simple manifold and is intended for use with fixed or variable displacement pumps. The PVPM features no logic other than a PVLP shock/anti-cavitation valve facility for pressure peak protection and anti-cavitation prevention.

The PVPM module must be configured together with an Open Center PVP module for **fixed displacement pumps** and for **variable displacement pumps** can be configured together with a PVSI start plate or a Closed Center PVP/PVPV module.

The Open center/closed center PVPM features:

- Integrated shock/anti-cavitation valve facility (PVLP)
- Threaded ports for P/T
- Pilot pressure and T0 lines through module

Hydraulic schematic



Technical specification for PVP

Max. P-port continuous	Max. P-port intermittent	Max. T-port static/ dynamic	Max. rated flow
350 [5076 psi]	400 bar [5800 psi]	25/40 bar [365/580 psi]	230 l/min [61 US gal/min]

www.sunny.ir

Technical specification

Parameter	Minimum	Recommended range	Maximum
Fluid temperature	-30°C [-22°F]	30 to 60°C [86 to 140°F]	90° [194°F]
Fluid viscosity	4 mm^2/s [39 SUS]	12 to 75 mm^2/s [65 to 347 SUS]	460 mm^2/s [2128 SUS]
Fluid cleanliness (mechanical activation)	23/19/16 (according to ISO 4406)		
Fluid cleanliness (PVE activation)	18/16/13 (according to ISO 4406)		
Operating temperature	Ambient: -30 to 60°C [-22 to 140°F]		

Part numbers for Open Center/Closed Center PVPM

Part number	P-, T-port	Mounting	PVLP
11093682	1 5/16-12 UN	5/16-18 UNC	Yes
11093684	G1″	M8	Yes

PVG-EX 32

PVP Inlet Module Accessories

The generic PVP inlet module accessory platform includes the PVPX Electrical LS pressure unloading valve, External pilot pressure adapters PVPC with or without check valve for all Open Center PVP with PPRV.

- *PVPC without Check Valve* on page 39
- *PVPC with Check Valve* on page 41

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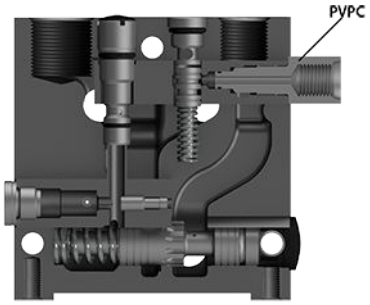
PVG-EX 32

PVPC without Check Valve

The PVPC external pilot pressure adapter without check valve is an accessory in the M-port available for PVP inlet modules with integrated pilot pressure reduction valve (PPRV).

The PVPC without check valve cuts off the integrated PPRV to the PVE or PVH/PVHC in the valve group and enables an external pilot pressure supply through the PVPC adapter.

PVPC without Check Valve



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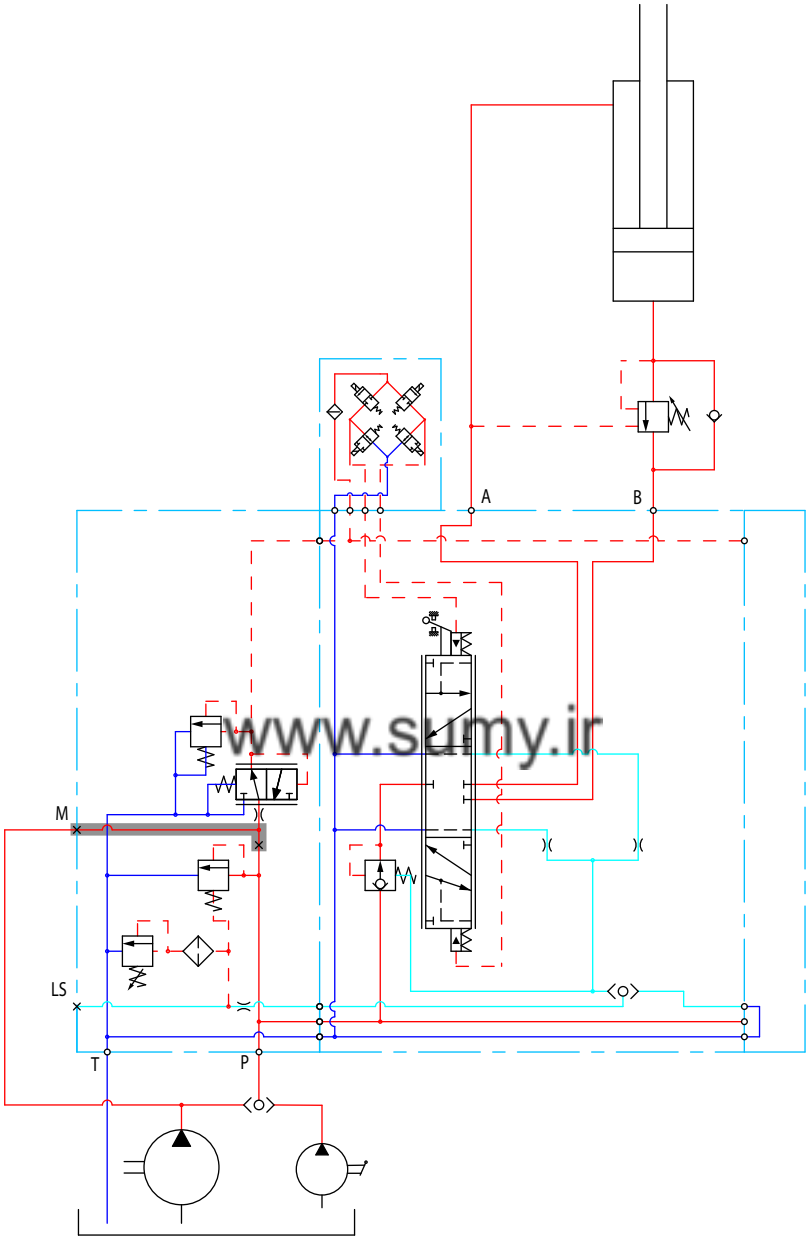
PVP with PVPC without check valve schematic



www.sumy.ir

One application example for the PVPC without check valve is where it is a wanted feature to supply the valve group with oil from a manually operated emergency pump without directing oil flow to the PPRV.

When the main pump is running in its normal operation mode, the oil is directed through the PVPC adapter via the PPRV to the PVE electrical actuators.

When the main pump flow fails, the external shuttle valve ensures that the oil flow from the manually operated emergency pump is used to pilot open the over-center valve and lower the load. The load is only possible to lower when using the mechanical operating lever of the PVG work sections.

Part numbers for Open Center/Closed Center PVPM

Part number	**157B5400**	**158X1000**
Thread	G1/2"	1/2-20 UNF

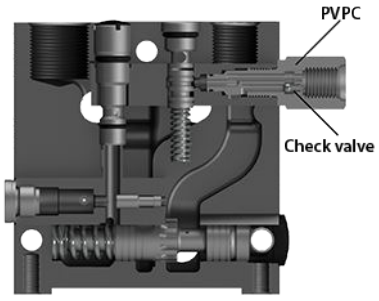
PVG-EX 32

PVPC with Check Valve

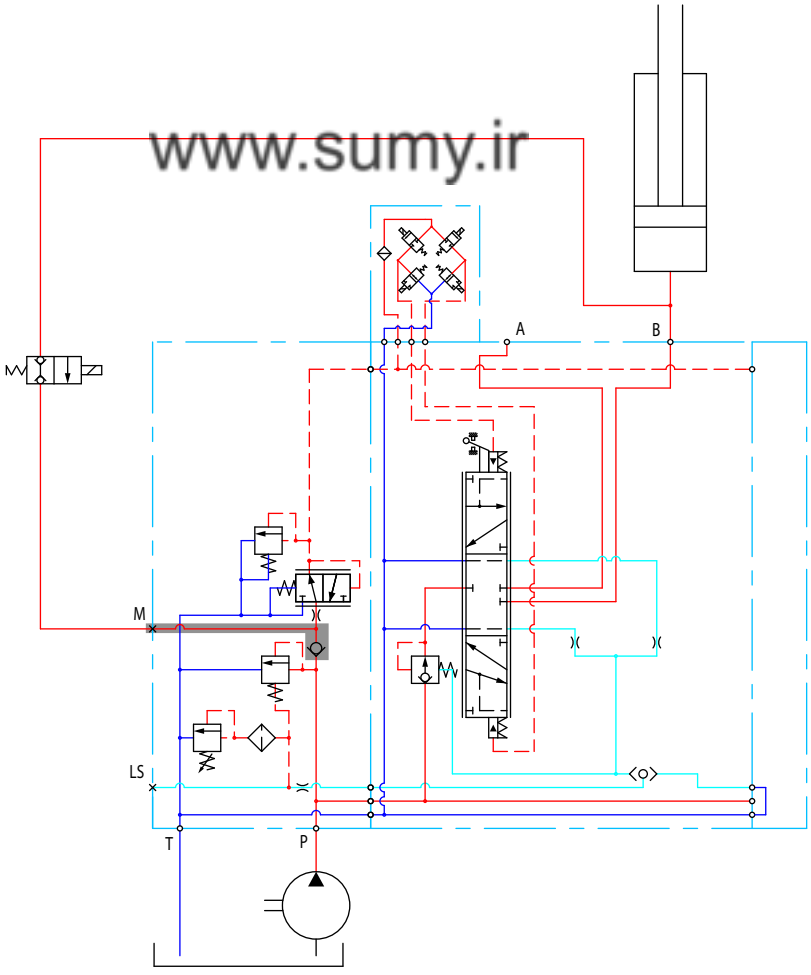
The PVPC external pilot pressure adapter with check valve is an accessory in the M-port available for PVP inlet modules with integrated pilot pressure reduction valve (PPRV).

The PVPC with check valve enables an external pilot pressure supply through the PVPC adapter and the PPRV, while also allowing the main pump to supply the PPRV through the P-gallery as a standard Open Center PVP with PPRV.

PVPC with Check Valve



PVP with PVPC with check valve schematic



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One application example for the PVPC with check valve is where it is a wanted feature to operate the valve group by means of the PVE electrical actuators without pump flow.

PVG-EX 32

When the external solenoid valve is opened, oil from the pressure side of the cylinder is fed via the PVPC through the PPRV to act as the pilot supply for the PVE electrical actuators. This means that it is possible to lower a load by means of the PVE electrical actuators without starting the pump.

The built-in check valve prevents the oil from flowing via the pressure adjustment spool to tank. With the pump functioning normally the external solenoid valve is closed to ensure that the load is not lowered due to the pilot supply oil flow requirement of approximately 1 l/min [0.25 US gal/min].

With a Closed Center PVP the external pilot oil supply can be connected to the pressure gauge connection without the use of a PVPC plug.

Part numbers for Open Center/Closed Center PVPM

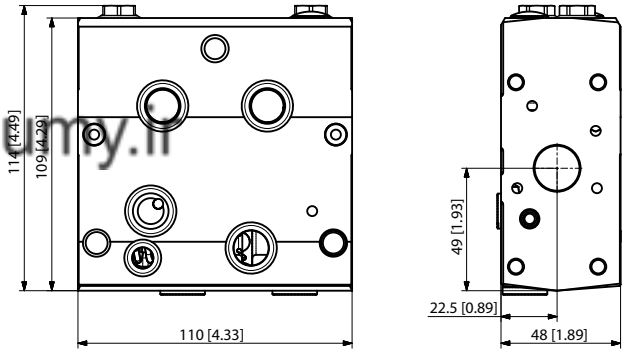
Part number	**157B5600**	**157B5700**
Thread	G1/2"	1/2-20 UNF

PVB Basic Modules

The PVG-EX 32 PVB basic modules, also referred to as work sections, are the interface between the PVG-EX 32 proportional valve group and the work function such as a cylinder or a motor.

PVB Basic Module

PVB 32 dimensions



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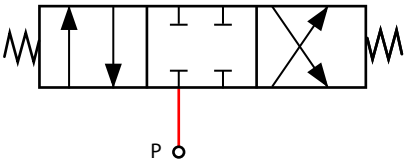
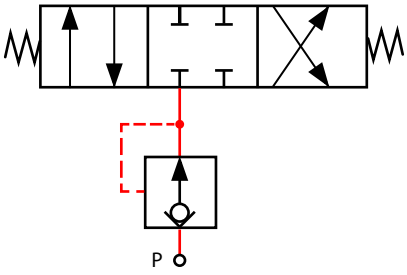
Weight: 3.05 kg [6.73 lb]

Uncompensated PVB schematic symbol



Compensated PVB schematic symbol



The PVB basic module variants are based on a generic platform with a selection of additional features, enabling you to tailor the PVB to suit the demands of any hydraulic system. The generic PVB basic module platform includes the following main variants:

- *Uncompensated PVB* on page 44
- *Uncompensated PVB with load drop check valve* on page 47
- *Uncompensated PVBZ with POC* on page 50
- *Compensated PVB* on page 51

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PVG-EX 32

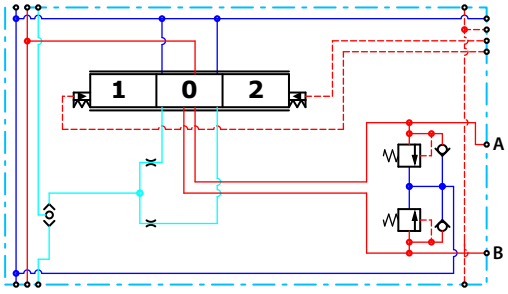
Uncompensated PVB

The uncompensated PVB is intended for controlling a work function where the function behavior in terms of flow and pressures requires independence on the load pressure of other functions used simultaneously.

The Uncompensated PVB features:

- Integrated LS shuttle network
- Optional shock/anti-cavitation valve facility (PVLP)
- Optional $LS_{A/B}$ shuttle valve facility for float spool use
- Optional T0 facility

Schematic



Technical specification for A/B-port

Max. continuous pressure	Max. intermittent pressure	Max. rated flow
350 bar [5076 psi]*	420 bar [6090 psi]**	125 l/min [33 US gal/min]

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* With PVSI end plate. With PVS end plate max. 300 [4351 psi]

** Intermittent pressure at max. 250,000 cycles of full PVG life time cycles, with PVSI end plate. The maximum intermittent pressure at max. 250,000 cycles stresses the need to confirm application duty cycle before proceeding with specification. For further information contact Danfoss Product Application Engineering.

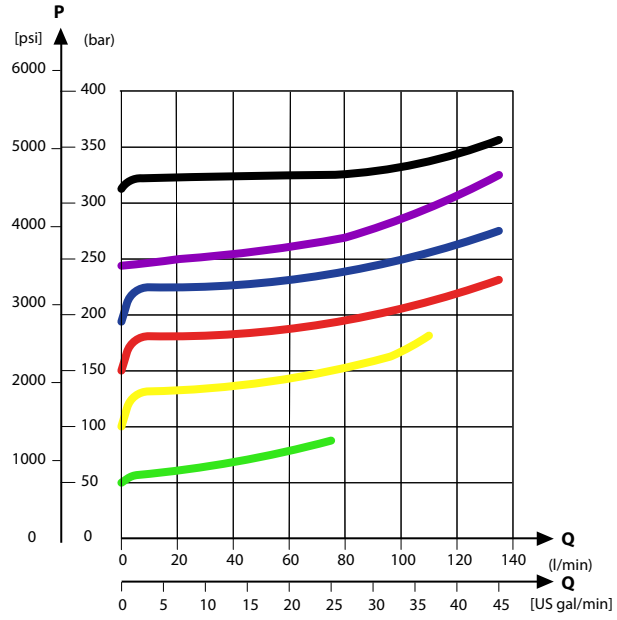
Technical specification

Parameter	Minimum	Recommended range	Maximum
Fluid temperature	-30°C [-22°F]	30 to 60°C [86 to 140°F]	90° [194°F]
Fluid viscosity	4 mm^2/s [39 SUS]	12 to 75 mm^2/s [65 to 347 SUS]	460 mm^2/s [2128 SUS]
Fluid cleanliness (mechanical activation)	23/19/16 (according to ISO 4406)		
Fluid cleanliness (PVE activation)	18/16/13 (according to ISO 4406)		
Operating temperature	Ambient: -30 to 60°C [-22 to 140°F]		

PVG-EX 32

Performance graphs (Theoretical)

PVLP shock valve characteristics



PVLP/PVLA suction valve characteristics

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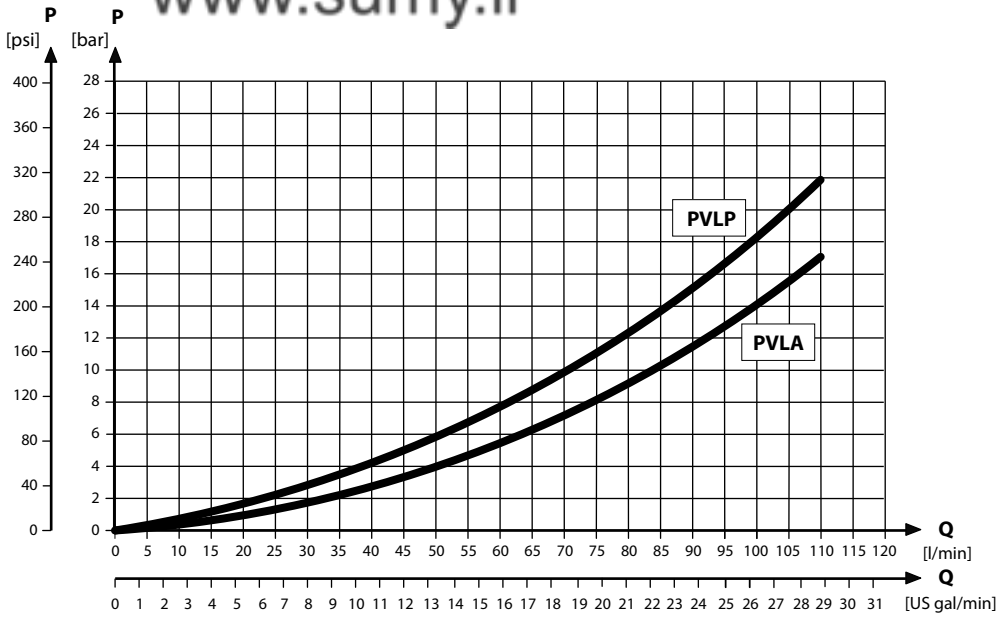

Part numbers for uncompensated PVB

Part number	A/B-port	PVLP/PVLA	LS A/B shuttle	T0 facility
157B6000	G1/2"	—	—	—
157B6010		—	—	Yes
157B6030		Yes	—	—
11071832		Yes	Yes	—

PVG-EX 32

Part numbers for uncompensated PVB (continued)

Part number	A/B-port	PVLP/PVLA	LS A/B shuttle	T0 facility
157B6400	7/8–14 UNF	—	—	—
157B6410		—	—	Yes
157B6430		Yes	—	—

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PVG-EX 32

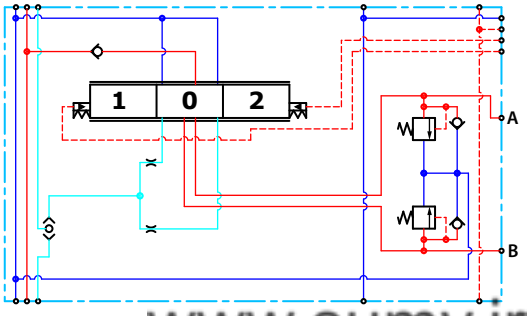
Uncompensated PVB with load drop check valve

The uncompensated PVB is intended for controlling a work function where the function behavior in terms of flow and pressures allows dependency on the load pressure of other functions used simultaneously. The integrated load drop check valve prevents flow back from work ports influencing other functions.

The Uncompensated PVB with load drop check valve features:

- Integrated LS shuttle network
- Load drop check valve
- Optional shock/anti-cavitation valve facility (PVLP)
- Optional $LS_{A/B}$ shuttle valve facility for float spool use
- Optional T0 facility

Schematic



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Technical specification for A/B-port

Max. continuous pressure	Max. intermittent pressure	Max. rated flow
350 bar [5076 psi]	420 bar [6090 psi]	125 l/min [33 US gal/min]

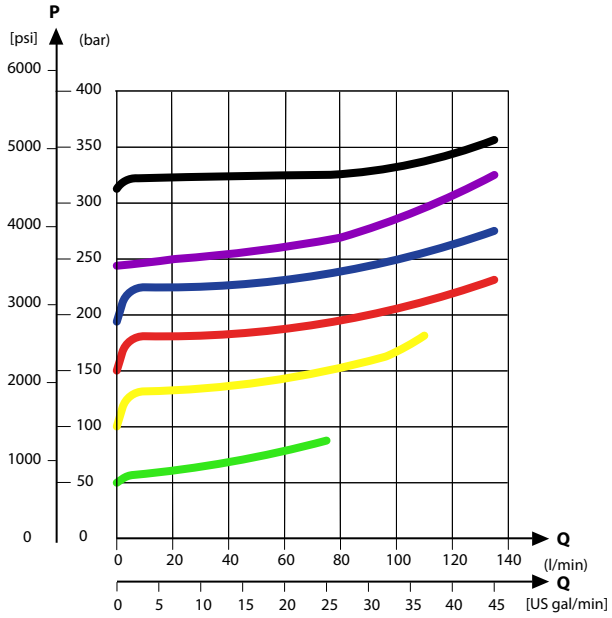
Technical specification

Parameter	Minimum	Recommended range	Maximum
Fluid temperature	-30°C [-22°F]	30 to 60°C [86 to 140°F]	90° [194°F]
Fluid viscosity	4 mm^2/s [39 SUS]	12 to 75 mm^2/s [65 to 347 SUS]	460 mm^2/s [2128 SUS]
Fluid cleanliness (mechanical activation)	23/19/16 (according to ISO 4406)		
Fluid cleanliness (PVE activation)	18/16/13 (according to ISO 4406)		
Operating temperature	Ambient: -30 to 60°C [-22 to 140°F]		

PVG-EX 32

Performance graphs (Theoretical)

PVLP shock valve characteristics



PVLP/PVLA suction valve characteristics

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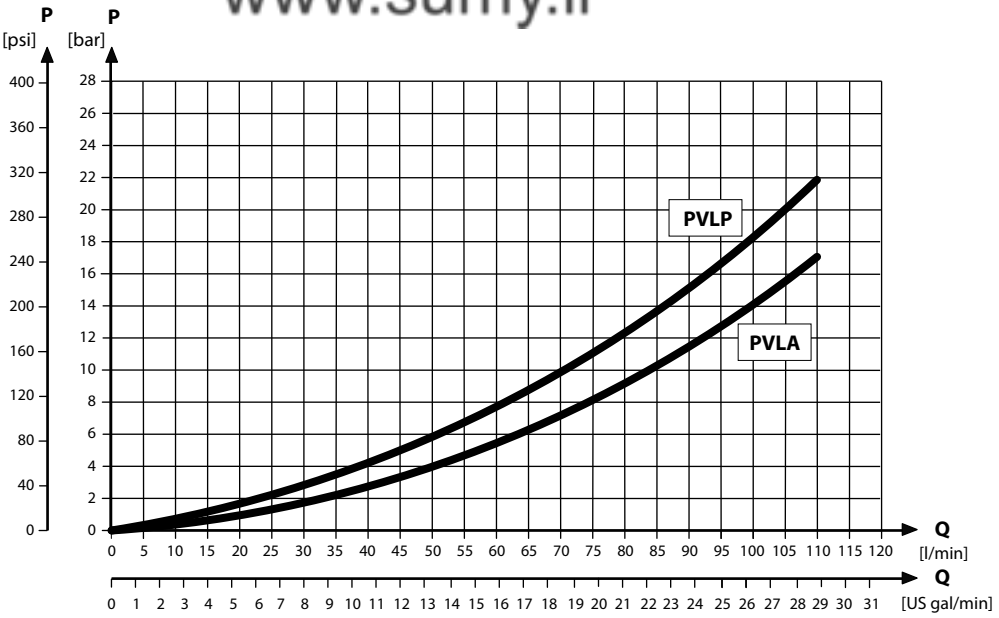

Part numbers for Uncomp. PVB with load drop check valve

Part number	A/B-port	PVLP/PVLA	LS A/B shuttle	T0 facility
157B6100	G1/2"	—	—	—
157B6500	7/8–14 UNF	—	—	—
157B6110	G1/2"	—	—	Yes
157B6909	7/8–14 UNF	—	—	Yes

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Part numbers for Uncomp. PVB with load drop check valve (continued)

Part number	A/B-port	PVLP/PVLA	LS A/B shuttle	T0 facility
157B6130	G1/2"	Yes	—	—
157B6530	7/8–14 UNF	Yes	—	—
157B6140	G1/2"	Yes	—	Yes
157B6904	7/8–14 UNF	Yes	—	Yes
157B6136	G1/2"	Yes	Yes	—
157B6536	7/8–14 UNF	Yes	Yes	—

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PVG-EX 32

Uncompensated PVBZ with POC

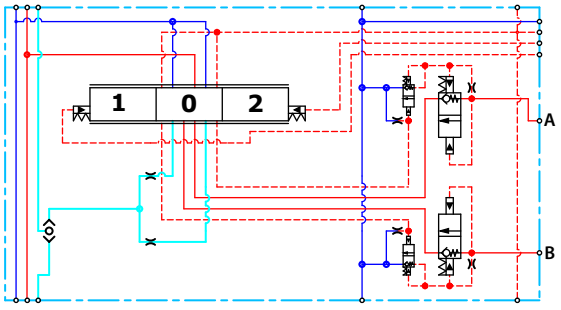
The uncompensated PVBZ is intended for controlling a work function where the function behavior in terms of flow and pressures allows dependency on the load pressure of other functions used simultaneously.

The Pilot Operated Check valve giving very low leakage will prevent cylinder creep.

The Uncompensated PVBZ with POC features:

- Integrated LS shuttle network
- Integrated POC
- Optional T0 facility

Schematic



Technical specification for A/B-port

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Max. continuous pressure	Max. intermittent pressure	Max. rated flow
350 bar [5076 psi]	420 bar [6090 psi]	125 l/min [33 US gal/min]

Technical specification

Parameter	Minimum	Recommended range	Maximum
Fluid temperature	-30°C [-22°F]	30 to 60°C [86 to 140°F]	90° [194°F]
Fluid viscosity	4 mm^2/s [39 SUS]	12 to 75 mm^2/s [65 to 347 SUS]	460 mm^2/s [2128 SUS]
Fluid cleanliness (mechanical activation)	23/19/16 (according to ISO 4406)		
Fluid cleanliness (PVE activation)	18/16/13 (according to ISO 4406)		
Operating temperature	Ambient: -30 to 60°C [-22 to 140°F]		

Part numbers for uncompensated PVBZ with POC

Part number	A/B-port	POC
157B6051	G½"	B-port
157B6052		A/B-port
157B6451	7/8–14 UNF	B-port
157B6452		A/B-port
157B6969	None – machined top	A-port

PVG-EX 32

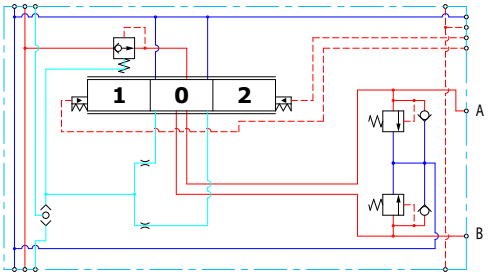
Compensated PVB

The compensated PVB is intended for controlling a work function where the function behavior in terms of flow and pressures requires independence on the load pressure of other functions used simultaneously.

The Compensated PVB features:

- Integrated LS shuttle network
- Integrated compensator
- Optional shock/anti-cavitation valve facility (PVLP)
- Optional T0 facility and external T0 port

Compensated PVB schematic



Technical specification for A/B-port

Max. continuous pressure	Max. intermittent pressure	Max. rated flow *
350 bar [5067 psi]	420 bar [6090 psi]	125 l/min [33 US gal/min]

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* With turbo function spool @ max rated flow of 130 l/min is possible

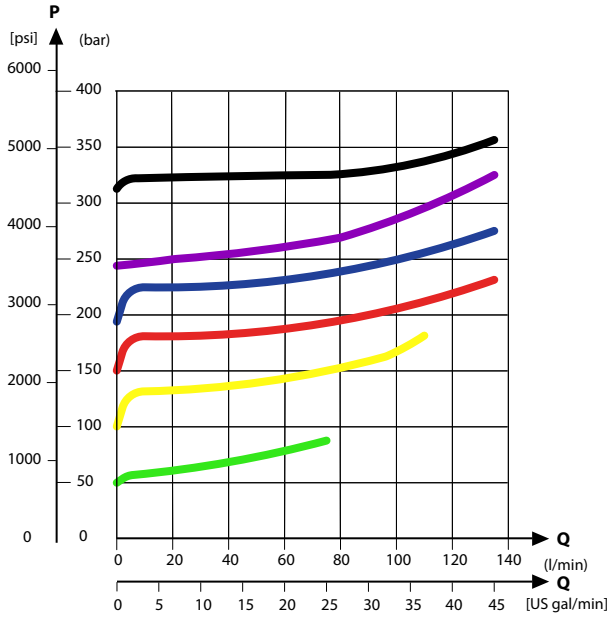
Technical specification

Parameter	Minimum	Recommended range	Maximum
Fluid temperature	-30°C [-22°F]	30 to 60°C [86 to 140°F]	90° [194°F]
Fluid viscosity	4 mm^2/s [39 SUS]	12 to 75 mm^2/s [65 to 347 SUS]	460 mm^2/s [2128 SUS]
Fluid cleanliness (mechanical activation)	23/19/16 (according to ISO 4406)		
Fluid cleanliness (PVE activation)	18/16/13 (according to ISO 4406)		
Operating temperature	Ambient: -30 to 60°C [-22 to 140°F]		

PVG-EX 32

Performance graphs (Theoretical)

PVLP shock valve characteristics



Load Independent Fluid Flow – Pressure Compensated PVB

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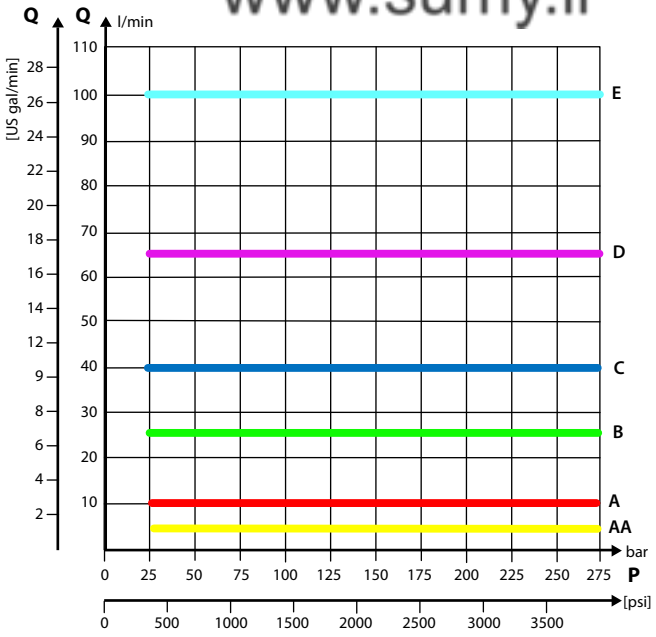
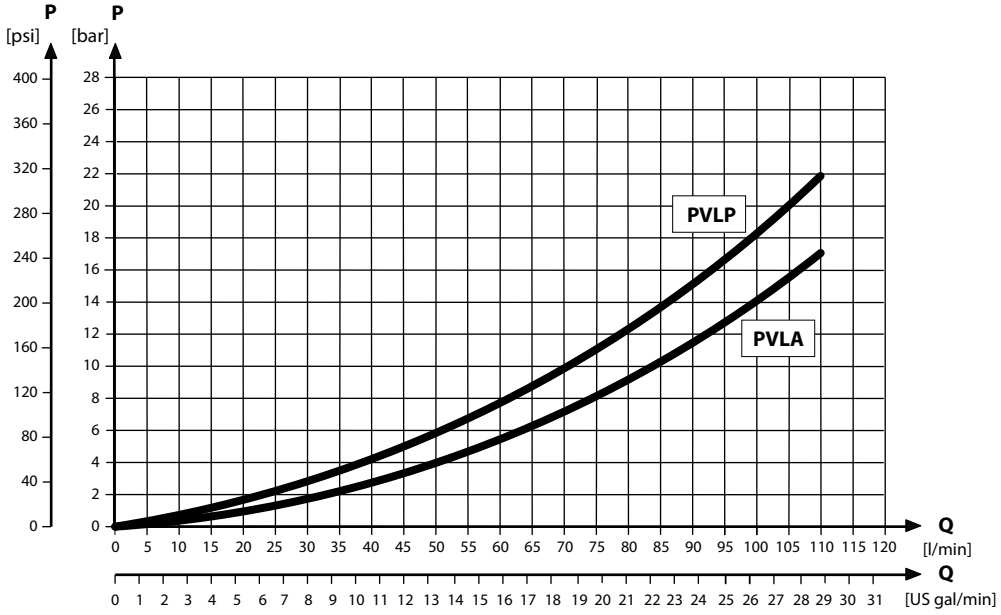


PVG-EX 32

PVLP/PVLA suction valve characteristics



Part numbers for compensated PVB

Part number	A/B-port	PVLP/PVLA	T0
157B6200	G1/2"	–	–
157B6210		–	Yes
157B6230		Yes	–
157B6240		Yes	Yes
157B6600	7/8–14 UNF	–	–
157B6922		–	Yes
157B6630		Yes	–
157B6906		Yes	Yes
157B6850	M22x1.5	Yes	Yes
157B6849	None*	–	–

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* Machined top, prepared for mounting of a PVBD diverter.

PVG-EX 32

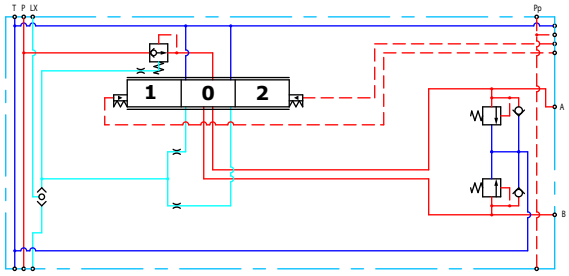
Dampened Compensated PVB

The compensated PVB is intended for controlling a work function where the function behavior in terms of flow and pressures requires independence on the load pressure of other functions used simultaneously. The dampening of the compensator reaction will slow down the system thereby removing instability.

The dampened compensated PVB features:

- Integrated LS shuttle network
- Integrated compensator
- Optional shock/anti-cavitation valve facility (PVLP)

Compensated PVB schematic



Technical specification for A/B-port

Max. continuous pressure	Max. intermittent pressure	Max. rated flow*
350 bar [5076 psi]	420 bar [6090 psi]	125 l/min [33 US gal/min]

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* With turbo function spool @ max rated flow of 130 l/min is possible

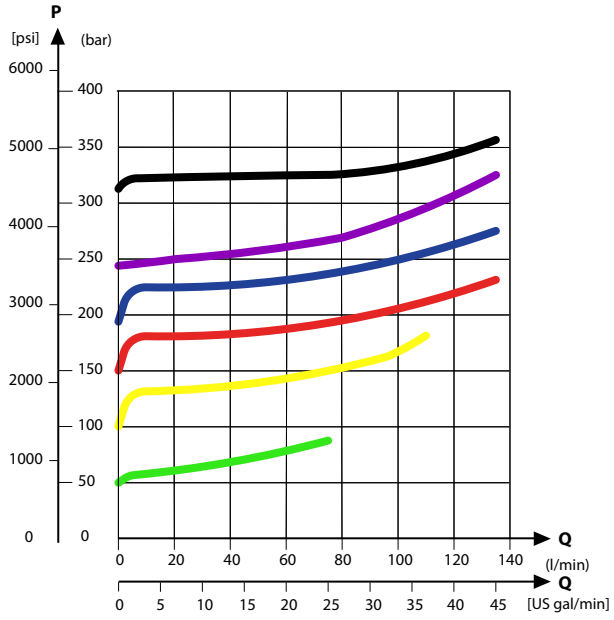
Technical specification

Parameter	Minimum	Recommended range	Maximum
Fluid temperature	-30°C [-22°F]	30 to 60°C [86 to 140°F]	90° [194°F]
Fluid viscosity	4 mm^2/s [39 SUS]	12 to 75 mm^2/s [65 to 347 SUS]	460 mm^2/s [2128 SUS]
Fluid cleanliness (mechanical activation)	23/19/16 (according to ISO 4406)		
Fluid cleanliness (PVE activation)	18/16/13 (according to ISO 4406)		
Operating temperature	Ambient: -30 to 60°C [-22 to 140°F]		

PVG-EX 32

Performance graphs (Theoretical)

PVLP shock valve characteristics



Load Independent Fluid Flow – Pressure Compensated PVB

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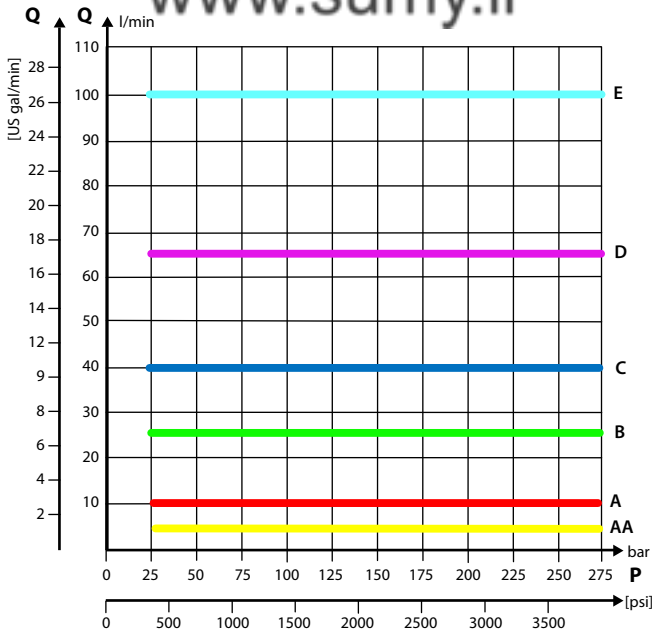
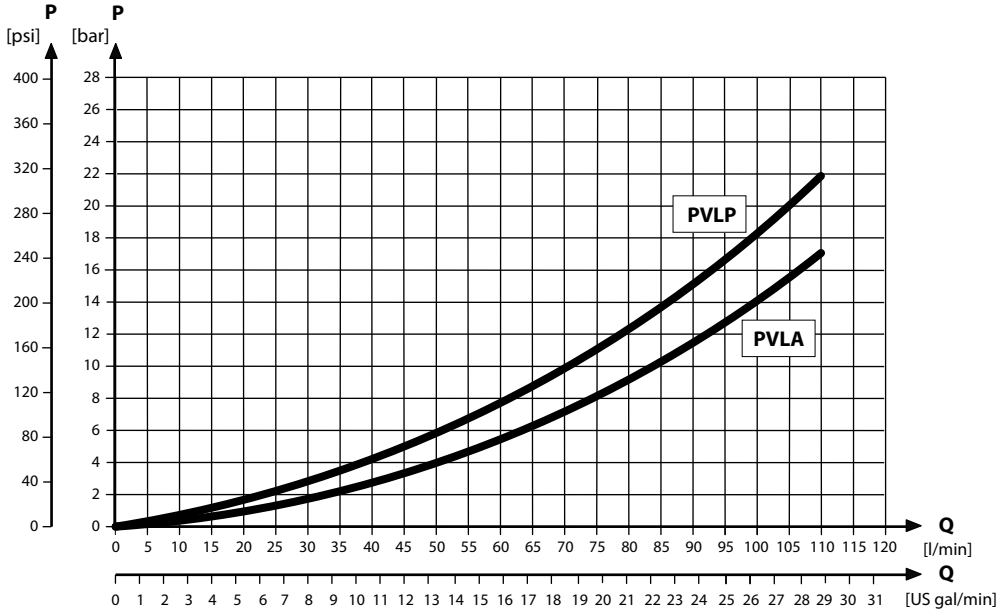


PVG-EX 32

PVLP/PVLA suction valve characteristics



Part numbers for damp. compensated PVB

Part number	A/B-port	PVLP/PVLA
157B6206	G1/2"	–
157B6236		Yes
11036629	7/8–14 UNF	–
11036630		Yes

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PVG-EX 32

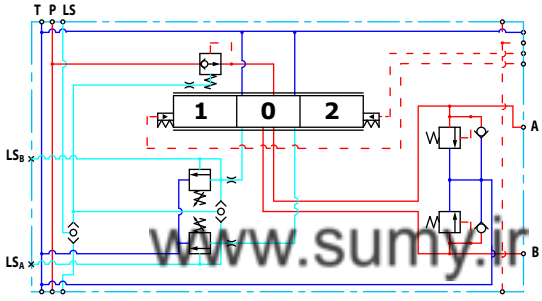
Dampened compensated PVB with LS A/B

The compensated PVB is intended for controlling a work function where the function behavior in terms of flow and pressures requires independence on the load pressure of other functions used simultaneously. The dampening of the compensator reaction will slow down the system thereby removing instability. The integrated $LS_{A/B}$ relief valve is used to limit the maximum work port build-up on the A/B-ports individually.

The dampened compensated PVB with LS A/B features:

- Integrated LS shuttle network
- Integrated compensator
- Integrated adjustable $LS_{A/B}$ pressure relief valves
- External $LS_{A/B}$ port connection
- Optional shock/anti-cavitation valve facility (PVLP)

Dampened compensated PVB with LS A/B schematic



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Technical specification for A/B-port

Max. continuous pressure	Max. intermittent pressure	Max. rated flow*
350 bar [5076 psi]	420 bar [6090 psi]	125 l/min [33 US gal/min]

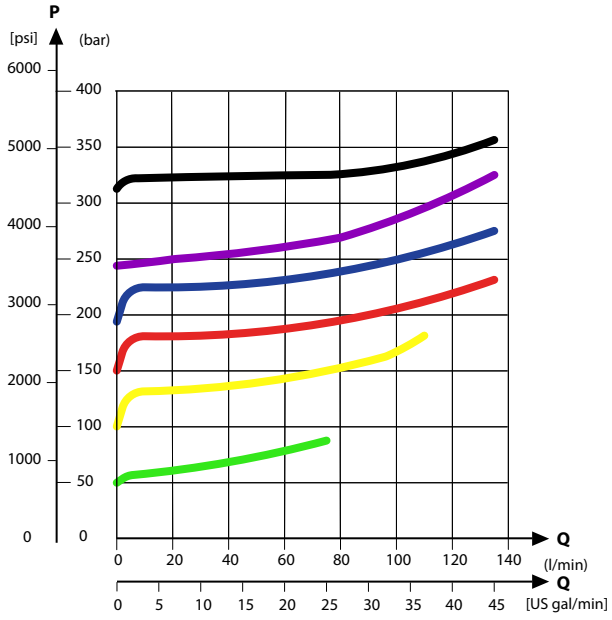
* With turbo function spool @ max rated flow of 130 l/min is possible

Parameter	Minimum	Recommended range	Maximum
Fluid temperature	-30°C [-22°F]	30 to 60°C [86 to 40°F]	90°C [194°F]
Fluid viscosity	4 mm2/s [39 SUS]	12 to 75 mm2/s [65 to 347 SUS]	460 mm2/s [2128 SUS]
Fluid cleanliness	23/19/16 (according to ISO 4406)		
Operating temperature	Ambient: -30 to 60°C [-22 to 140°F]		

PVG-EX 32

Performance graphs (Theoretical)

PVLP shock valve characteristics



Load Independent Fluid Flow – Pressure Compensated PVB

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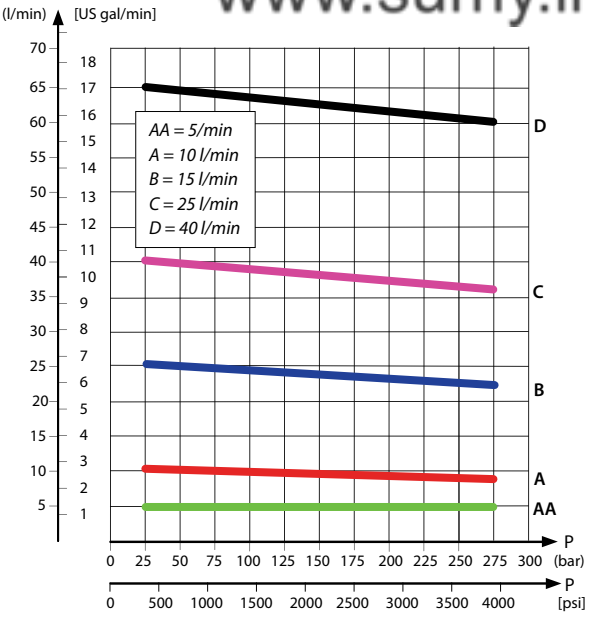
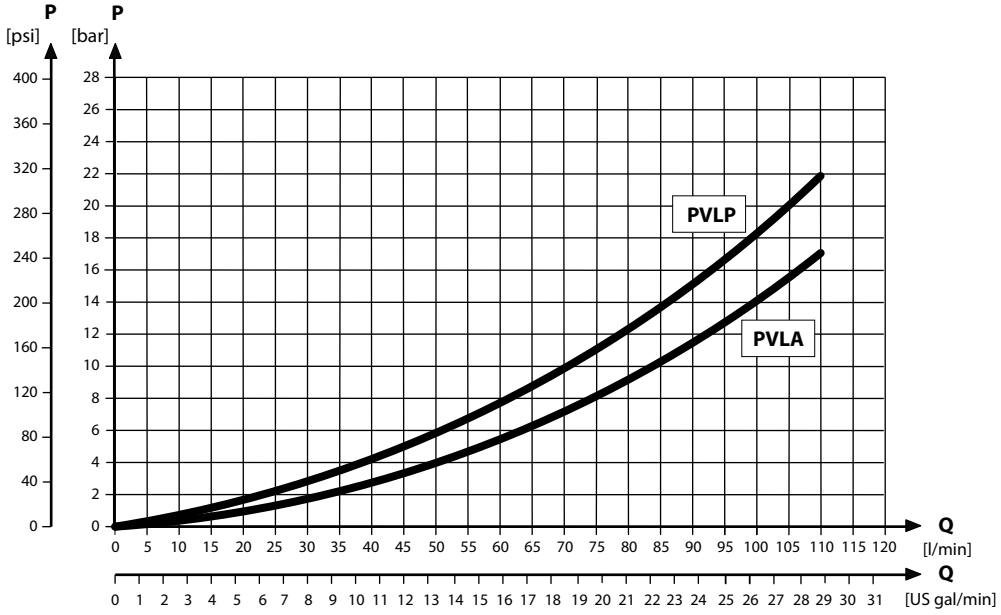
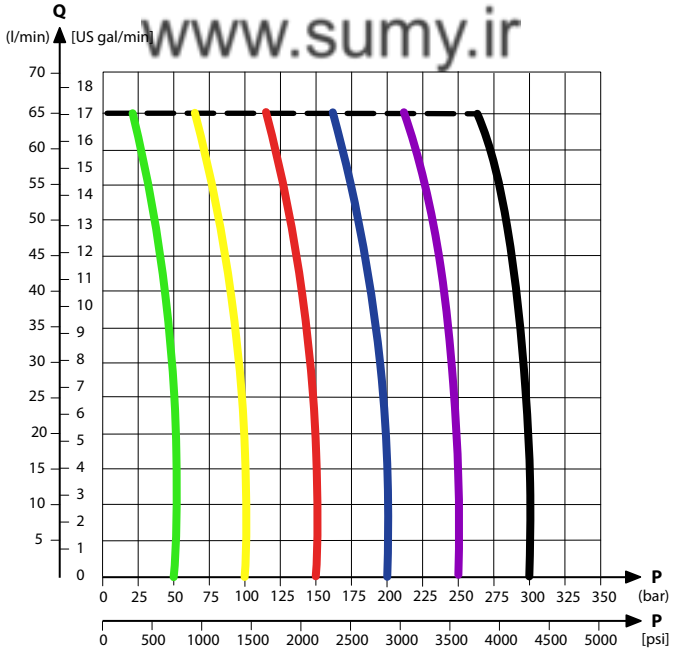


PVG-EX 32

PVLP/PVLA suction valve characteristics



PVB pressure compensated for LS A/B characteristics



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Part number	A/B-port	LS-port	PVLP/PVLA
157B6208	G1/2	G1/4	-
157B6238			Yes

PVG-EX 32

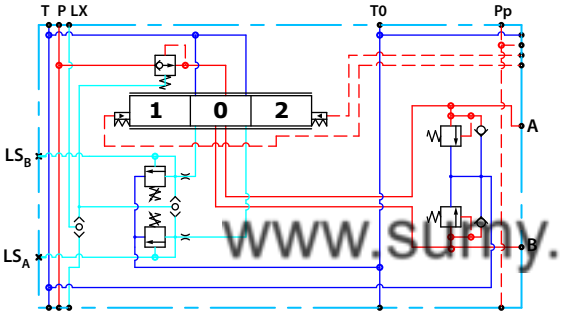
Compensated PVB with LS A/B

The compensated PVB is intended for controlling a work function where the function behavior in terms of flow and pressures requires independency on the load pressure of other functions used simultaneously. The integrated $LS_{A/B}$ relief valve is used to limit the maximum work port build-up on the A/B-ports individually.

The compensated PVB with $LS_{A/B}$ features:

- Integrated LS shuttle network
- Integrated compensator
- Integrated adjustable $LS_{A/B}$ pressure relief valves
- External $LS_{A/B}$ port connection
- Integrated $LS_{A/B}$ shuttle valve for float spool usage
- Optional shock/anti-cavitation valve facility (PVLP)
- Optional T0 facility

Compensated PVB with LS schematic



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Technical specification for A/B-port

Max. continuous pressure	Max. intermittent pressure	Max. rated flow*
350 bar [5076 psi]	420 bar [6090 psi]	125 l/min [33 US gal/min]

* With turbo function spool @ max rated flow of 130 l/min is possible

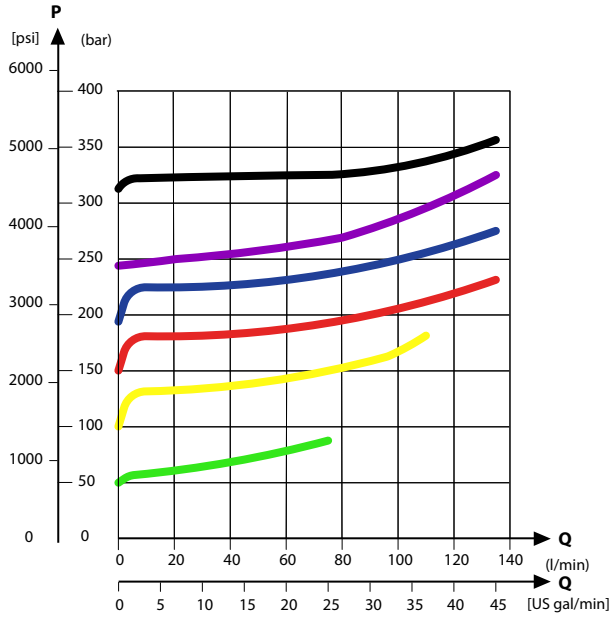
Technical specification

Parameter	Minimum	Recommended range	Maximum
Fluid temperature	-30°C [-22°F]	30 to 60°C [86 to 140°F]	90° [194°F]
Fluid viscosity	4 mm^2/s [39 SUS]	12 to 75 mm^2/s [65 to 347 SUS]	460 mm^2/s [2128 SUS]
Fluid cleanliness (mechanical activation)	23/19/16 (according to ISO 4406)		
Fluid cleanliness (PVE activation)	18/16/13 (according to ISO 4406)		
Operating temperature	Ambient: -30 to 60°C [-22 to 140°F]		

PVG-EX 32

Performance graphs (Theoretical)

PVLP shock valve characteristics



Load Independent Fluid Flow – Pressure Compensated PVB

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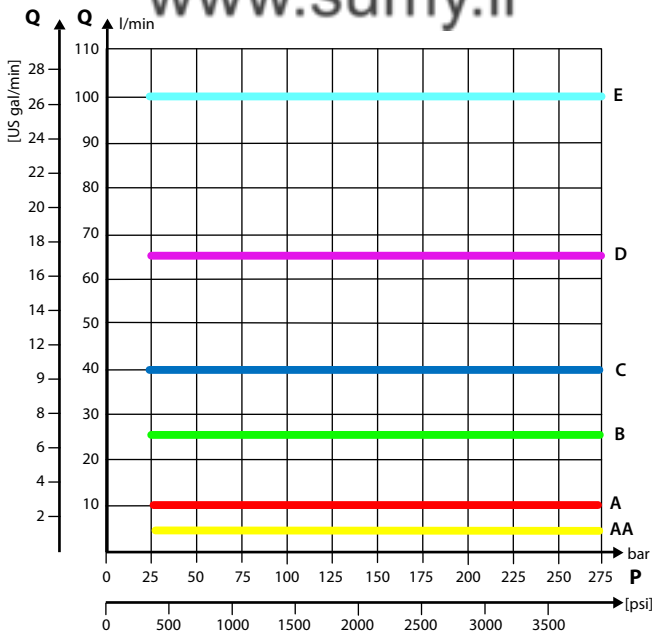
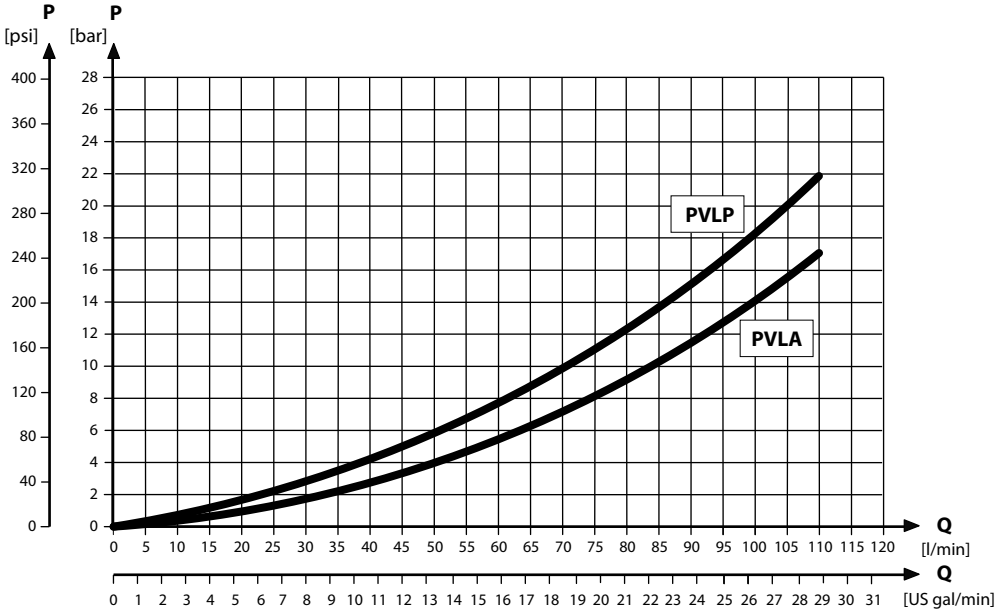
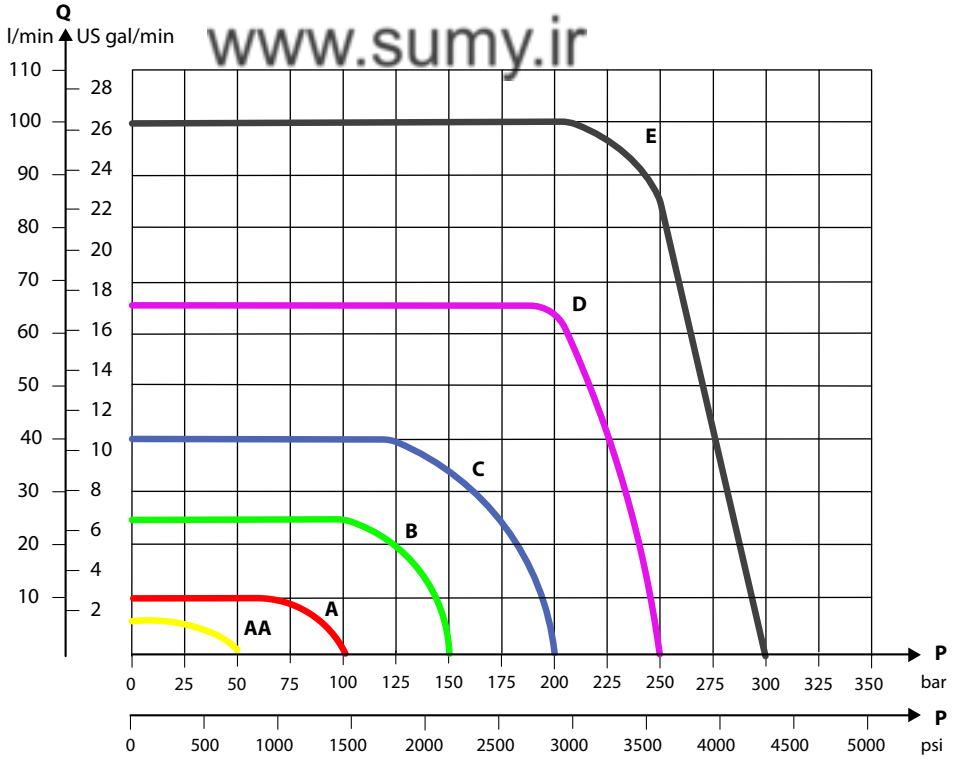


PVG-EX 32

PVLP/PVLA suction valve characteristics



PVB pressure compensated for LS A/B characteristics



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PVG-EX 32

Part numbers for compensated PVB with LS A/B (all with shuttle)

Part number	A/B-port	LS–port	PVLP/PVLA	T0
157B6203	G1/2"	G1/4"	–	–
157B6213			–	Yes
157B6233			Yes	–
157B6243			Yes	Yes
157B6603	7/8–14 UNF	1/2–20 UNF	–	–
157B6613			–	Yes
157B6633			Yes	–
157B6643			Yes	Yes

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PVG-EX 32

Compensated high flow PVB

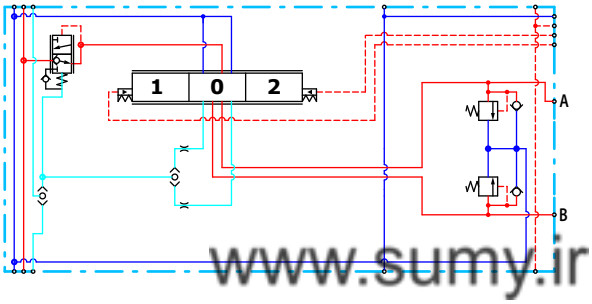
The compensated PVB is intended for controlling a work function where the function behavior in terms of flow and pressures requires independence on the load pressure of other functions used simultaneously.

The bleed-off will prevent pressure build-up on the work ports in neutral.

Features

- Integrated LS shuttle network
- Integrated high flow compensator with bleed-off
- Integrated adjustable $LS_{A/B}$ pressure relief valves
- Optional shock/anti-cavitation valve facility (PVLP)
- Optional T0 facility

Compensated high flow PVB schematic



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Technical specification for A/B-port

Max. continuous pressure	Max. intermittent pressure	Max. rated flow
350 bar [5076 psi]	420 bar [6090 psi]	130 l/min [34 US gal/min]

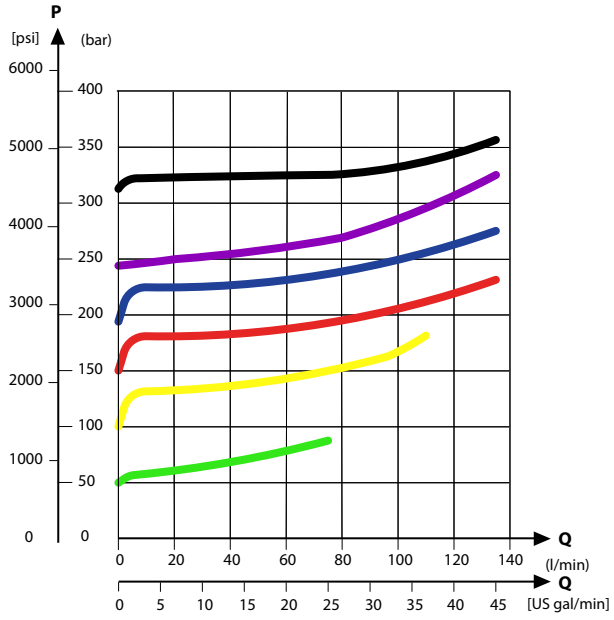
Technical specification

Parameter	Minimum	Recommended range	Maximum
Fluid temperature	-30°C [-22°F]	30 to 60°C [86 to 140°F]	90° [194°F]
Fluid viscosity	4 mm^2/s [39 SUS]	12 to 75 mm^2/s [65 to 347 SUS]	460 mm^2/s [2128 SUS]
Fluid cleanliness (mechanical activation)	23/19/16 (according to ISO 4406)		
Fluid cleanliness (PVE activation)	18/16/13 (according to ISO 4406)		
Operating temperature	Ambient: -30 to 60°C [-22 to 140°F]		

PVG-EX 32

Performance graphs (Theoretical)

PVLP shock valve characteristics



Load Independent Fluid Flow – Pressure Compensated PVB

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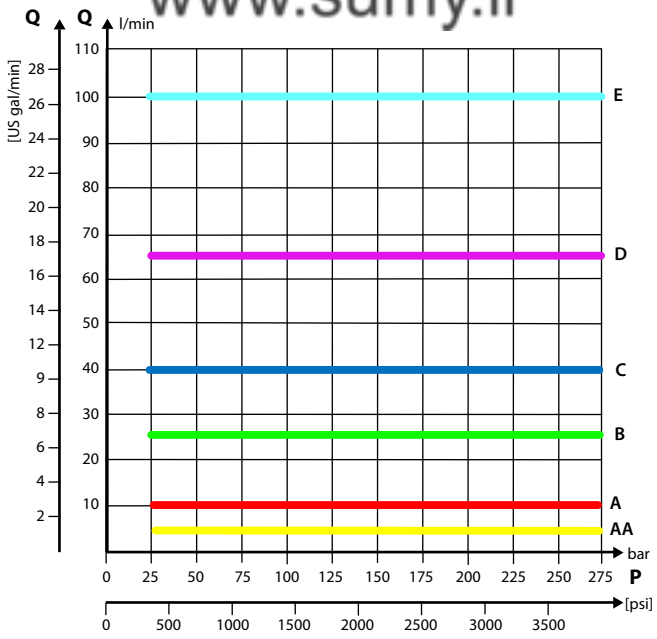
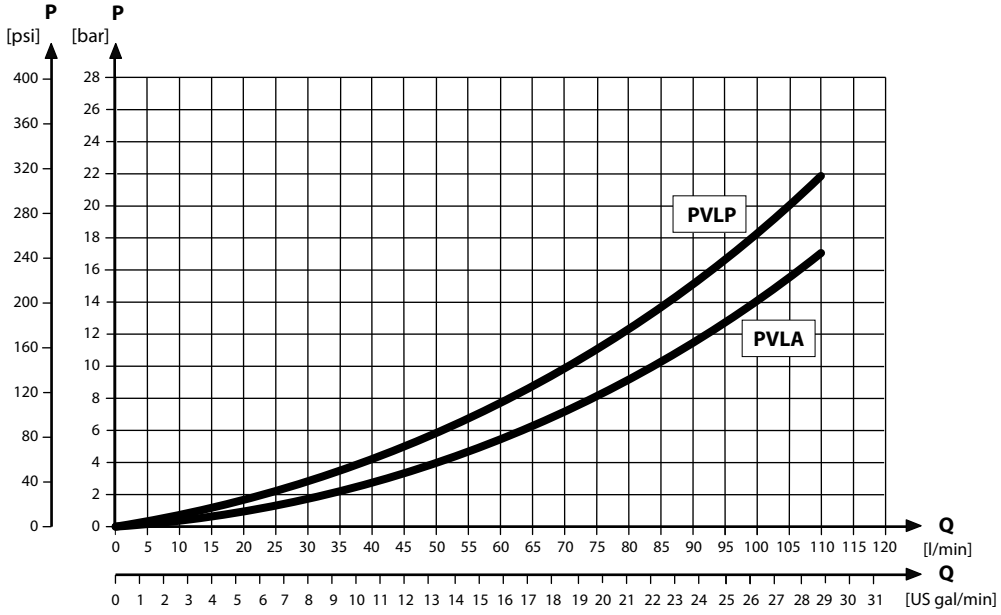


PVG-EX 32

PVLP/PVLA suction valve characteristics



Part numbers for compensated high flow PVB

Part number	A/B-port	PVLP/PVLA	LS A/B shuttle	T0 facility
11126962	7/8–14 UNF	—	—	Yes
157B6938		Yes	—	—
157B6852	G½"	Yes	—	—
157B6853		—	—	—

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PVG-EX 32

Compensated high flow PVB with LS A/B

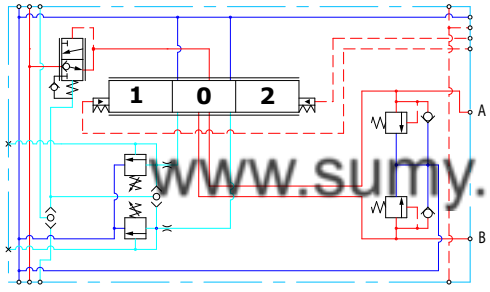
The compensated PVB is intended for controlling a work function where the function behavior in terms of flow and pressures requires independence on the load pressure of other functions used simultaneously. The integrated $LS_{A/B}$ relief valve is used to limit the maximum work port build-up on the A/B-ports individually.

The bleed-off will prevent pressure build-up on the work ports in neutral.

Features

- Integrated LS shuttle network
- Integrated high flow compensator with bleed-off
- Integrated adjustable $LS_{A/B}$ pressure relief valves
- Integrated $LS_{A/B}$ shuttle valve for float spool usage
- External $LS_{A/B}$ port connection
- Optional shock/anti-cavitation valve facility (PVLP)
- Optional T0 facility

Compensated high flow PVB with LS A/B schematic



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Technical specification for A/B-port

Max. continuous pressure	Max. intermittent pressure	Max. rated flow
350 bar [5076 psi]	420 bar [6090 psi]	130 l/min [34 US gal/min]

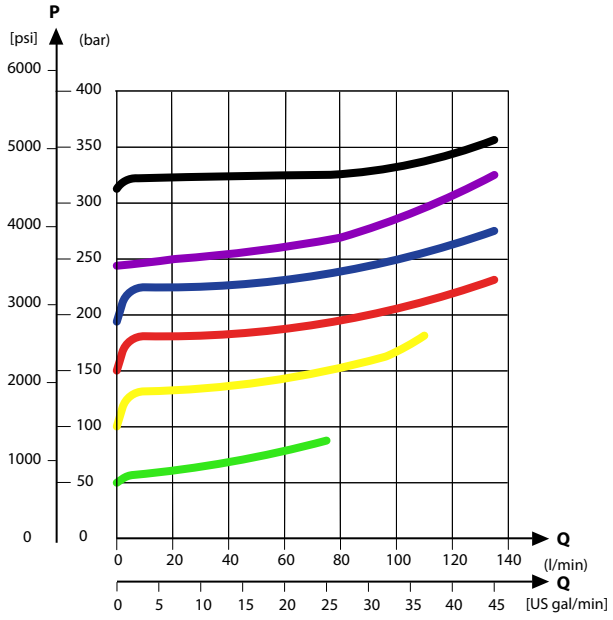
Technical specification

Parameter	Minimum	Recommended range	Maximum
Fluid temperature	-30°C [-22°F]	30 to 60°C [86 to 140°F]	90° [194°F]
Fluid viscosity	4 mm^2/s [39 SUS]	12 to 75 mm^2/s [65 to 347 SUS]	460 mm^2/s [2128 SUS]
Fluid cleanliness (mechanical activation)	23/19/16 (according to ISO 4406)		
Fluid cleanliness (PVE activation)	18/16/13 (according to ISO 4406)		
Operating temperature	Ambient: -30 to 60°C [-22 to 140°F]		

PVG-EX 32

Performance graphs (Theoretical)

PVLP shock valve characteristics



Load Independent Fluid Flow – Pressure Compensated PVB

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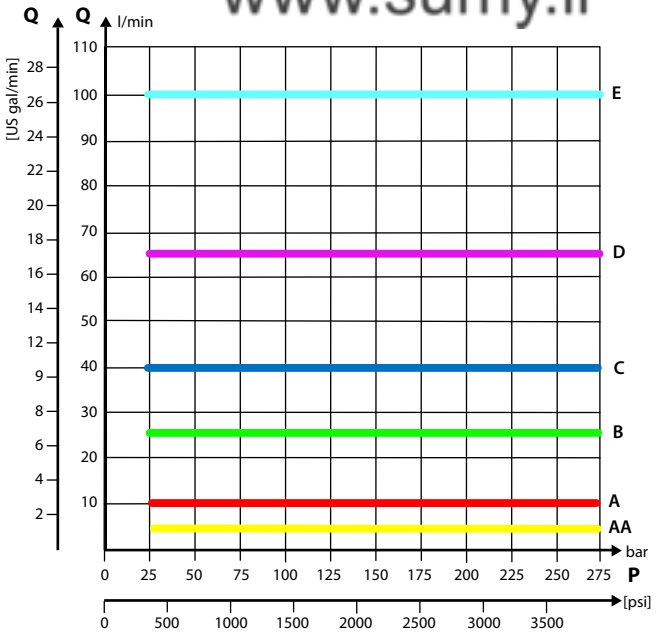
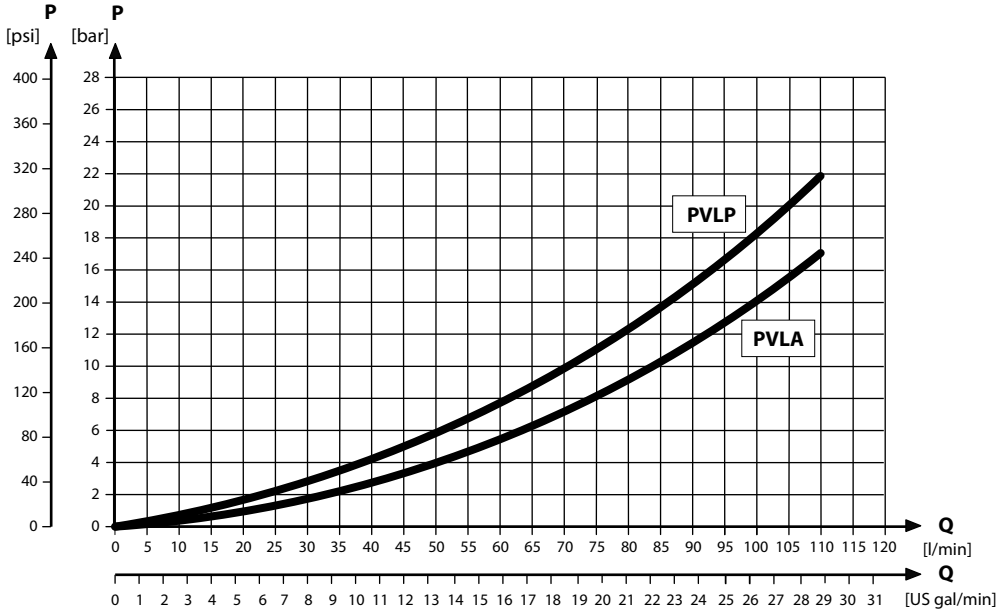
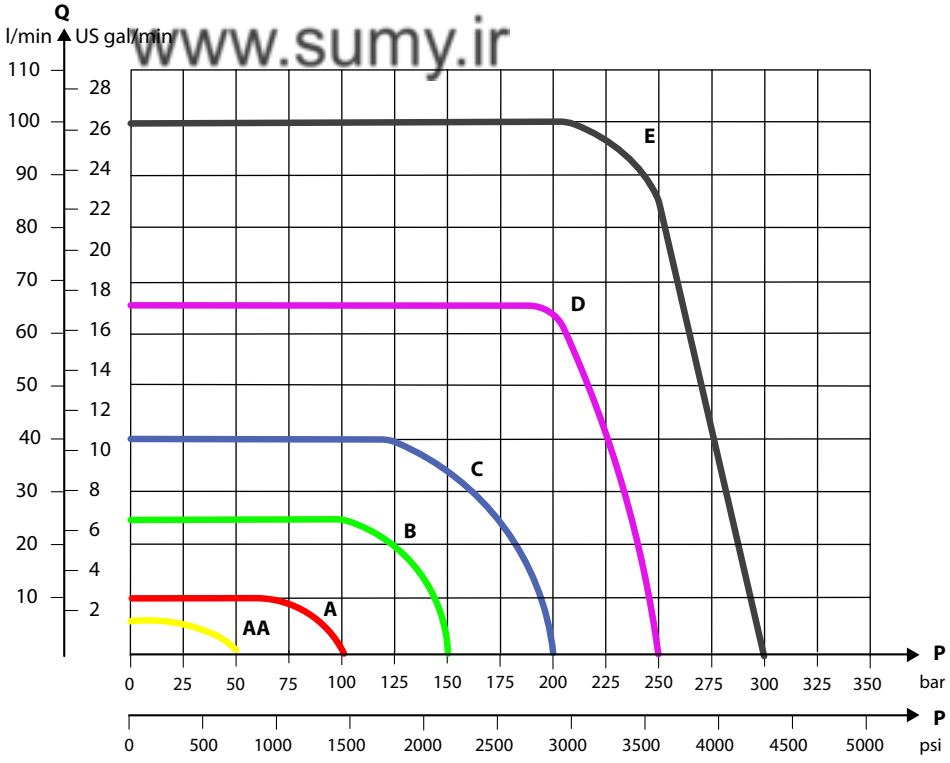


PVG-EX 32

PVLP/PVLA suction valve characteristics



PVB pressure compensated for LS A/B characteristics



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PVG-EX 32

Part numbers for comp. high flow PVB with LS

Part number	A/B-port	$LS_{A/B}$ port	PVLP/PVLA	$LS_{A/B}$ shuttle	T0 facility
157B6855	G½"	G¼"	—	Yes	—
11059838			—		Yes
157B6854			Yes		—
11126963	7/8–14 UNF	½-20 UNF	—		Yes
11126964			Yes		Yes

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PVG-EX 32

Compensated PVBZ with POC

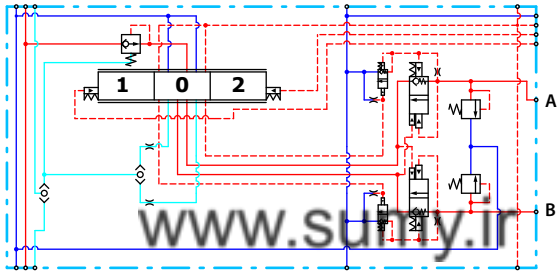
The compensated PVB is intended for controlling a work function where the function behavior in terms of flow and pressures requires independence on the load pressure of other functions used simultaneously.

The bleed-off will prevent pressure build-up on the work ports in neutral.

Features

- Integrated LS shuttle network
- Integrated compensator
- Integrated POC
- T0 facility
- Optional $LS_{A/B}$ shuttle valve facility for float spool use
- Optional thermo-relief valve

Schematic



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Technical specification for A/B-port

Max. continuous pressure	Max. intermittent pressure	Max. rated flow
350 bar [5076 psi]	420 bar [6090 psi]	100 l/min [26 US gal/min]

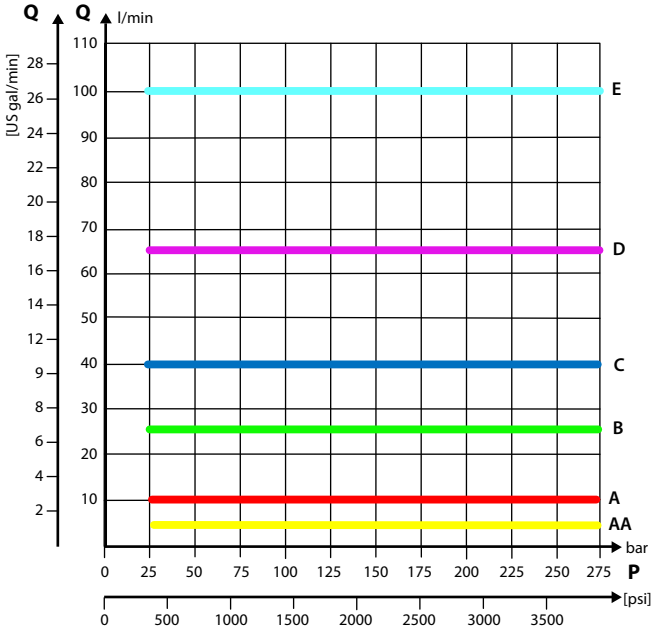
Technical specification

Parameter	Minimum	Recommended range	Maximum
Fluid temperature	-30°C [-22°F]	30 to 60°C [86 to 140°F]	90° [194°F]
Fluid viscosity	4 mm^2/s [39 SUS]	12 to 75 mm^2/s [65 to 347 SUS]	460 mm^2/s [2128 SUS]
Fluid cleanliness (mechanical activation)	23/19/16 (according to ISO 4406)		
Fluid cleanliness (PVE activation)	18/16/13 (according to ISO 4406)		
Operating temperature	Ambient: -30 to 60°C [-22 to 140°F]		

PVG-EX 32

Performance graphs (Theoretical)

Load Independent Fluid Flow – Pressure Compensated PVB



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Part numbers for compensated PVBZ with POC

Part number	A/B-port	POC	$LS_{A/B}$ shuttle	Thermo relief
157B6251	G1/2"	B-port	—	—
157B6252		A/B-port	—	—
157B6261		B-port	—	Yes
157B6262		A/B-port	—	Yes
157B6266		A/B-port	Yes	Yes
157B6960		A-port		—
157B6651	7/8–14 UNF	B-port	—	—
157B6652		A/B-port	—	—
157B6661		A/B-port	—	Yes
157B6662		A/B-port	—	Yes
157B6666		A/B-port	Yes	Yes
157B6954	M22x1.5 mm	A/B-port	Yes	Yes
157B6952	None – machined top	A/B-port	Yes	Yes
157B6958	None – machined top	A/B-port	Yes	Yes
11157082	None – machined top	A-port	—	—

PVG-EX 32

Compensated high flow PVBZ with POC

The compensated high flow PVBZ with POC is intended for controlling a work function where the function behavior in terms of flow and pressures requires independence on the load pressure of other functions used simultaneously.

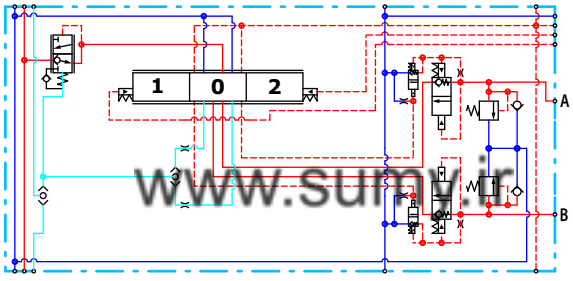
The bleed-off will prevent pressure build-up on the work ports in neutral.

The Pilot Operated Check valve giving very low leakage will prevent cylinder creep.

Features

- Integrated LS shuttle network
- Integrated high flow compensator with bleed-off
- Integrated POC
- T0 facility
- Optional $LS_{A/B}$ shuttle valve facility for float spool use
- Optional shock/anti-cavitation valve facility (PVLP)

Schematic



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Technical specification for A/B-port

Max. continuous pressure	Max. intermittent pressure	Max. rated flow
350 bar [5076 psi]	420 bar [6090 psi]	125 l/min [33 US gal/min]

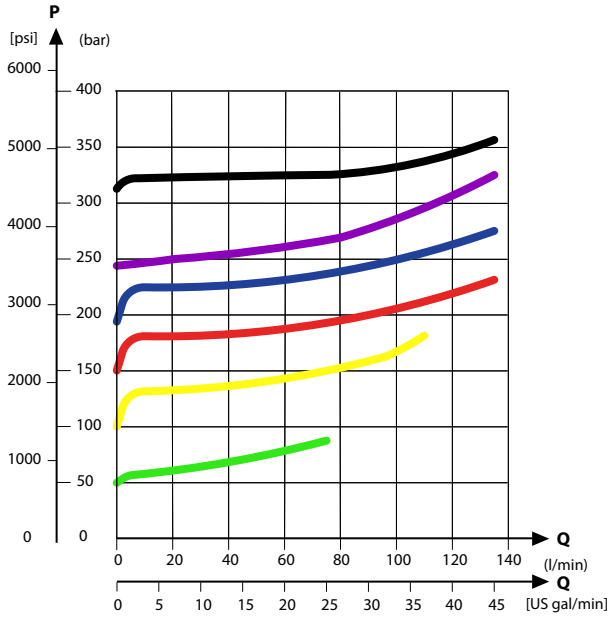
Technical specification

Parameter	Minimum	Recommended range	Maximum
Fluid temperature	-30°C [-22°F]	30 to 60°C [86 to 140°F]	90° [194°F]
Fluid viscosity	4 mm^2/s [39 SUS]	12 to 75 mm^2/s [65 to 347 SUS]	460 mm^2/s [2128 SUS]
Fluid cleanliness (mechanical activation)	23/19/16 (according to ISO 4406)		
Fluid cleanliness (PVE activation)	18/16/13 (according to ISO 4406)		
Operating temperature	Ambient: -30 to 60°C [-22 to 140°F]		

PVG-EX 32

Performance graphs (Theoretical)

PVLP shock valve characteristics



Load Independent Fluid Flow – Pressure Compensated PVB

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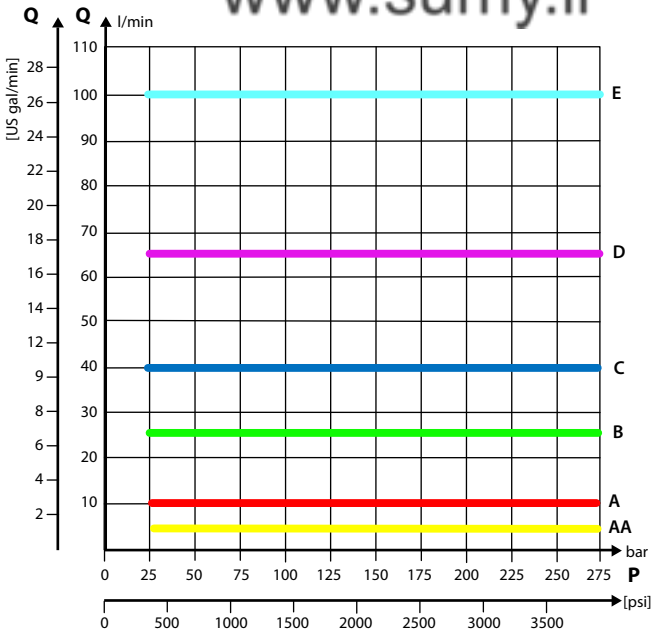


Part numbers for high flow PVBZ with POC

Part number	A/B-port	PVLP/PVLA	LS $_{A/B}$ shuttle	T0 facility
11119463	7/8–14 UNF	—	—	Yes
11126962		—	—	Yes
157B6938		Yes	—	—
157B6852	G½"	Yes	—	—

PVG-EX 32

Compensated high flow PVBZ with POC and manifold interface

The compensated PVB is intended for controlling a work function where the function behavior in terms of flow and pressures requires independence on the load pressure of other functions used simultaneously.

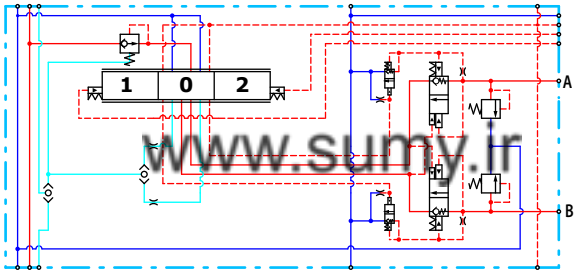
The integrated $LS_{A/B}$ relief valve is used to limit the maximum work port build-up on the A/B-ports individually.

The bleed-off will prevent pressure build-up on the work ports in neutral.

Features

- Integrated LS shuttle network
- Integrated high flow compensator with bleed-off
- Integrated POC
- T0 facility
- Integrated adjustable $LS_{A/B}$ pressure relief valves
- Optional thermo relief valve

Schematic



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Technical specification for A/B-port

Max. continuous pressure	Max. intermittent pressure	Max. rated flow
350 bar [5076 psi]	420 bar [6090 psi]	125 l/min [33 US gal/min]

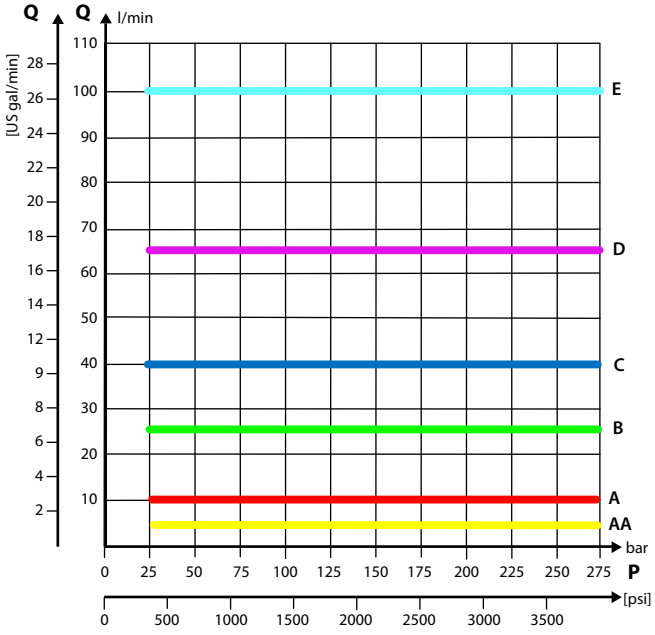
Technical specification

Parameter	Minimum	Recommended range	Maximum
Fluid temperature	-30°C [-22°F]	30 to 60°C [86 to 140°F]	90° [194°F]
Fluid viscosity	4 mm^2/s [39 SUS]	12 to 75 mm^2/s [65 to 347 SUS]	460 mm^2/s [2128 SUS]
Fluid cleanliness (mechanical activation)	23/19/16 (according to ISO 4406)		
Fluid cleanliness (PVE activation)	18/16/13 (according to ISO 4406)		
Operating temperature	Ambient: -30 to 60°C [-22 to 140°F]		

PVG-EX 32

Performance graphs (Theoretical)

Load Independent Fluid Flow – Pressure Compensated PVB



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Part numbers for PVBZ - POC, manifold interface

Part number	POC
157B6958	A/B-port
11005475	A/B-port
11032961	A/B-port

PVB Basic Modules Accessories

The generic PVB module accessory platform include the PVLP shock and anti-cavitation valve and PVLA suction valve.

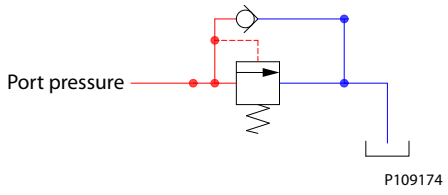
- *PVLP Shock and Anti-Cavitation Valve* on page 76
- *PVLA Suction Valve* on page 79

PVLP Shock and Anti-Cavitation Valve

The PVLP shock and anti-cavitation valve will relieve a pressure peak to the internal tank galleries and will furthermore suck oil from the tank to the work port to prevent cavitation. Pressure settings range: 32–400 bar [460–5801 psi].

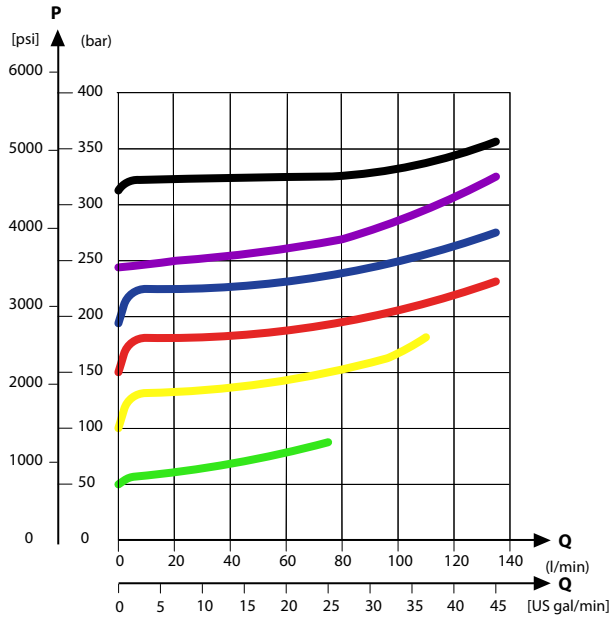
The pressure setting of the PVLP must always be 20 bar [290 psi] higher than $LS_{A/B}$ setting in the same module.

PVLP schematic

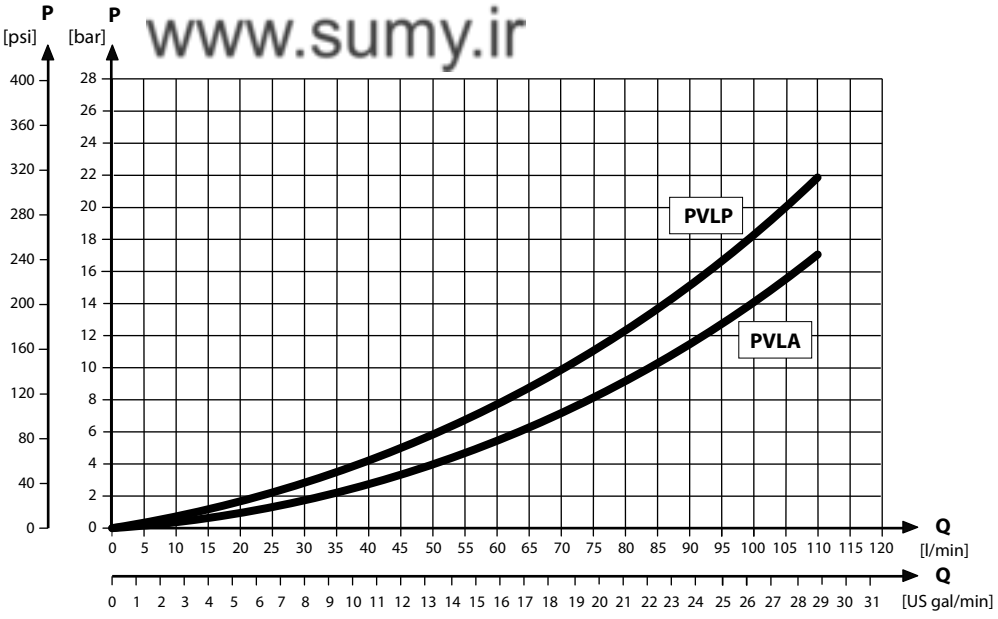


PVG-EX 32

PVLP shock valve characteristics



PVLP/PVLA suction valve characteristics



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Technical specification

Parameter	Minimum	Recommended range	Maximum
Fluid temperature	-30°C [-22°F]	30 to 60°C [86 to 140°F]	90° [194°F]
Fluid viscosity	4 mm^2/s [39 SUS]	12 to 75 mm^2/s [65 to 347 SUS]	460 mm^2/s [2128 SUS]
Fluid cleanliness (mechanical activation)	23/19/16 (according to ISO 4406)		

PVG-EX 32

Technical specification (continued)

Parameter	Minimum	Recommended range	Maximum
Fluid cleanliness (PVE activation)	18/16/13 (according to ISO 4406)		
Operating temperature	Ambient: -30 to 60°C [-22 to 140°F]		

Part numbers for PVLP according to pressure settings

Part number	Pressure in bar [psi]	Part number	Pressure in bar [psi]
157B2032	32 [464]	**157B2210**	210 [3045]
157B2050	50 [725]	**157B2230**	230 [3335]
157B2063	63 [913]	**157B2240**	240 [3480]
157B2080	80 [1160]	**157B2250**	250 [3626]
157B2100	100 [1450]	**157B2265**	265 [3844]
157B2125	125 [1813]	**157B2280**	280 [4061]
157B2140	140 [2031]	**157B2300**	300 [4351]
157B2150	150 [2176]	**157B2320**	320 [4641]
157B2160	160 [2321]	**157B2350**	350 [5076]
157B2175	175 [2538]	**157B2380**	380 [5511]
157B2190	190 [2756]	—	

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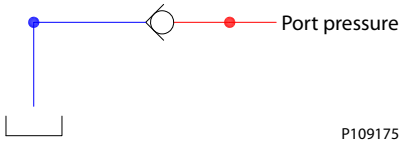
PVG-EX 32

PVLA Suction Valve

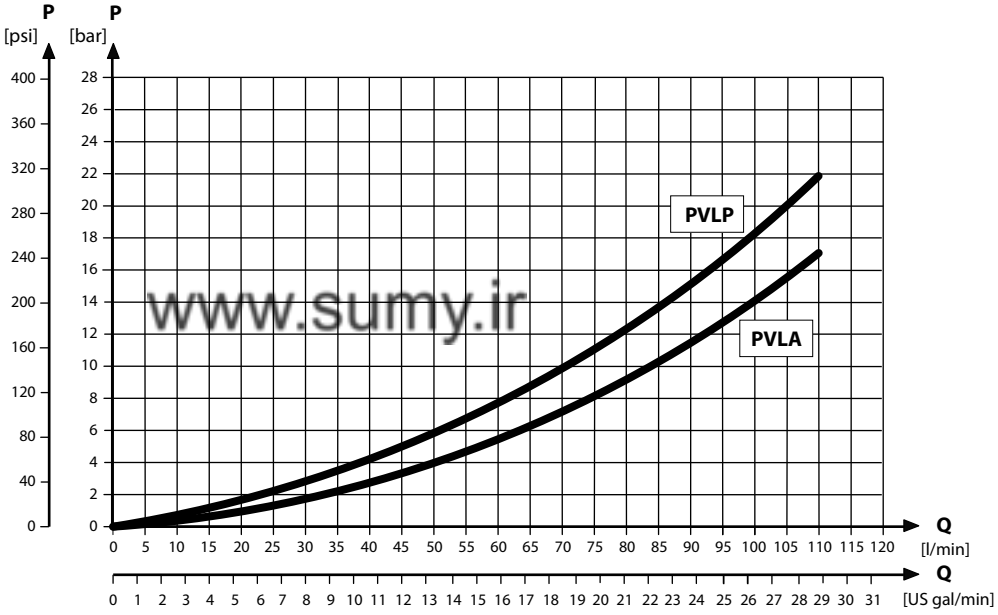
The PVLA valve is an accessory available for PVB basic modules.

The PVLA will suck fluid from the tank to the work port to prevent cavitation by the 0.5 bar spring. The plug will ensure that when using a single acting spool, all flow returning through the work port is led to tank.

PVLA schematic



PVLP/PVLA suction valve characteristics



Technical specification

Parameter	Minimum	Recommended range	Maximum
Fluid temperature	-30°C [-22°F]	30 to 60°C [86 to 140°F]	90° [194°F]
Fluid viscosity	4 mm^2/s [39 SUS]	12 to 75 mm^2/s [65 to 347 SUS]	460 mm^2/s [2128 SUS]
Fluid cleanliness (mechanical activation)	23/19/16 (according to ISO 4406)		
Fluid cleanliness (PVE activation)	18/16/13 (according to ISO 4406)		
Operating temperature	Ambient: -30 to 60°C [-22 to 140°F]		

PVLA suction valve part number

PVLA suction valve	Plug
157B2001	157B2002

PVG-EX 32

PVBS Main Spools

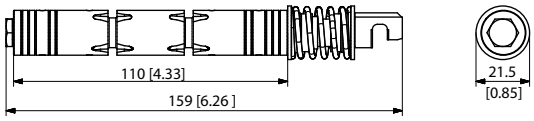
The main spools (PVBS) determine the flow out of the work section or the pressure build up, and are based on a generic platform with a wide selection of additional features, enabling you to tailor the PVBS to suit the demands of any hydraulic system and any function.

The PVBS main spool can be activated in three different ways:

- Mechanically by a PVM lever
- Electrically by a PVE/PVHC actuator
- Hydraulically by a PVH actuator

PVBS main spool

PVBS main spool dimensions



Weight: 0.25 kg [0.55 lb]

Technical specification

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Parameter	Minimum	Recommended range	Maximum
Fluid temperature	-30°C [-22°F]	30 to 60°C [86 to 140°F]	90° [194°F]
Fluid viscosity	4 mm^2/s [39 SUS]	12 to 75 mm^2/s [65 to 347 SUS]	460 mm^2/s [2128 SUS]
Fluid cleanliness (mechanical activation)	23/19/16 (according to ISO 4406)		
Fluid cleanliness (PVE activation)	18/16/13 (according to ISO 4406)		
Operating temperature	Ambient: -30 to 60°C [-22 to 140°F]		

Flow Control Spools (FC)	Flow control spools are for work sections where you want to control the speed (flow) of the work port
Pressure Control Spools (PC)	Pressure control spools are for work sections where you want to control the power (pressure) of the work port

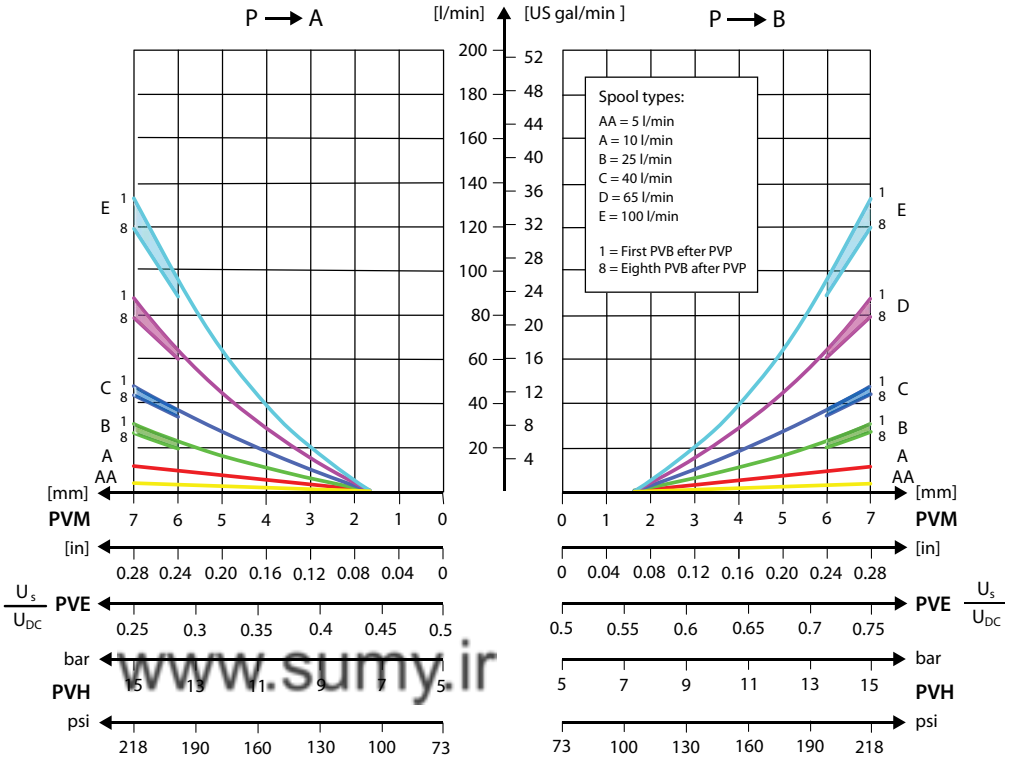
For more information on where to use flow control or pressure control spools see application guide **AB224686484921** - *"Using flow or pressure control spools"*

Closed neutral position	In neutral position and inside of the deadband area the connection to tank is closed
Throttled open neutral position	In neutral position and inside of the deadband area the connection to tank is 10 % of the full flow function
Open/closed neutral position (drain)	In total neutral position the connection to tank is less than 10 % of the full flow function. But when moving the spool out of neutral position but still within dead band area the connection will close.

PVG-EX 32

PVBS fluid flow characteristics—Theoretical performance

Fluid flow at different spool travel + 10 bar margin (uncompensated PVB)



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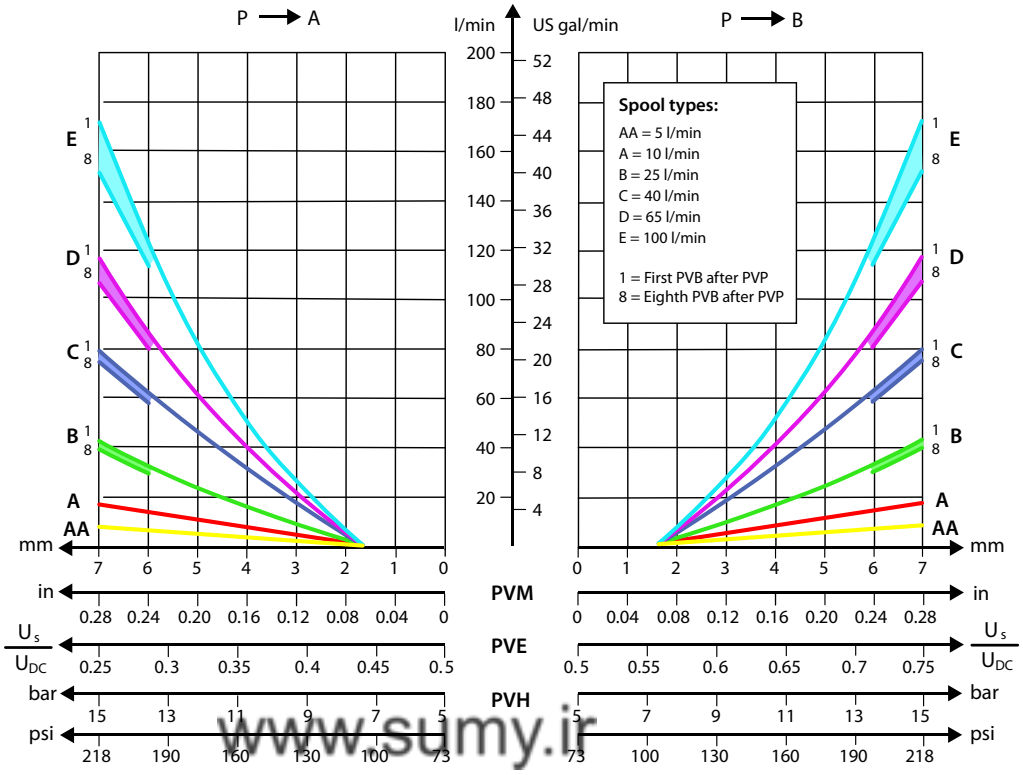
Fluid flow at different spool travel + 20 bar margin (uncompensated PVB)



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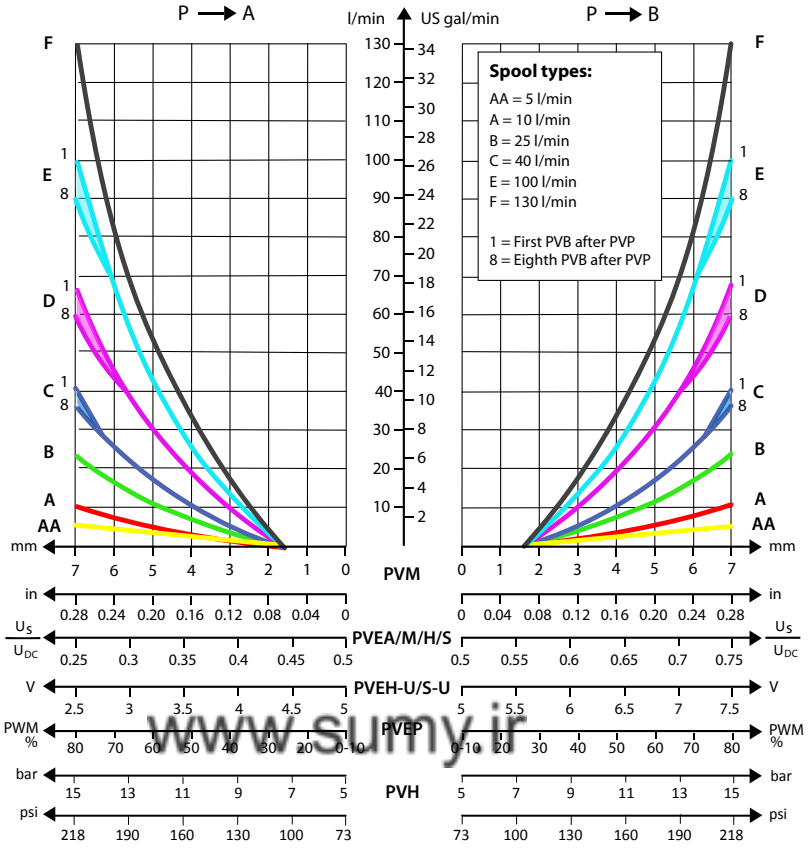
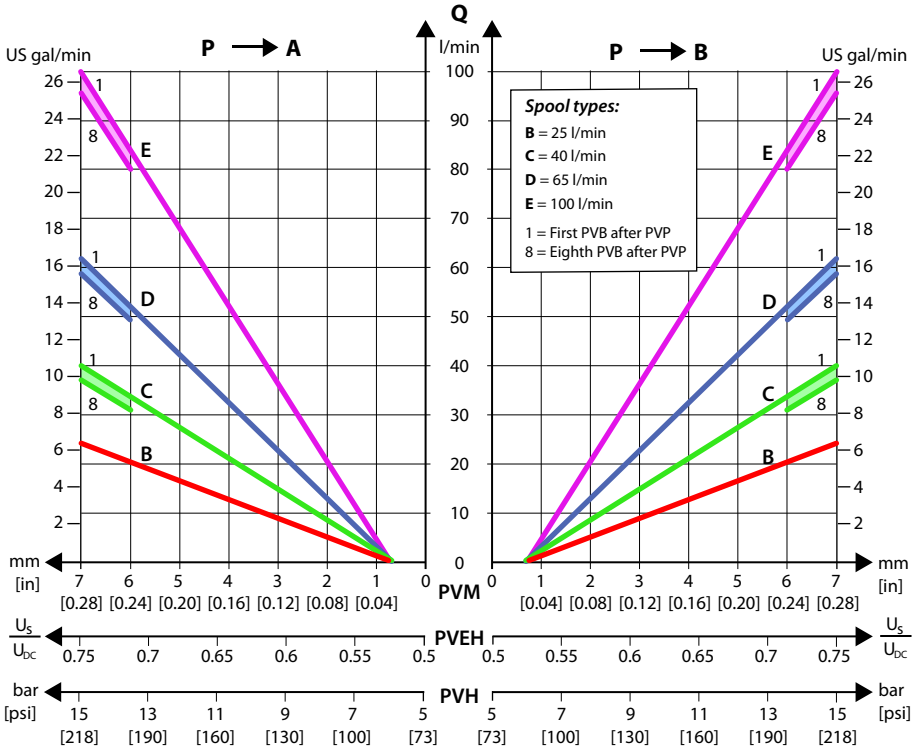
Progressive fluid flow characteristic depending on spool type



Linear fluid flow characteristic depending on spool type



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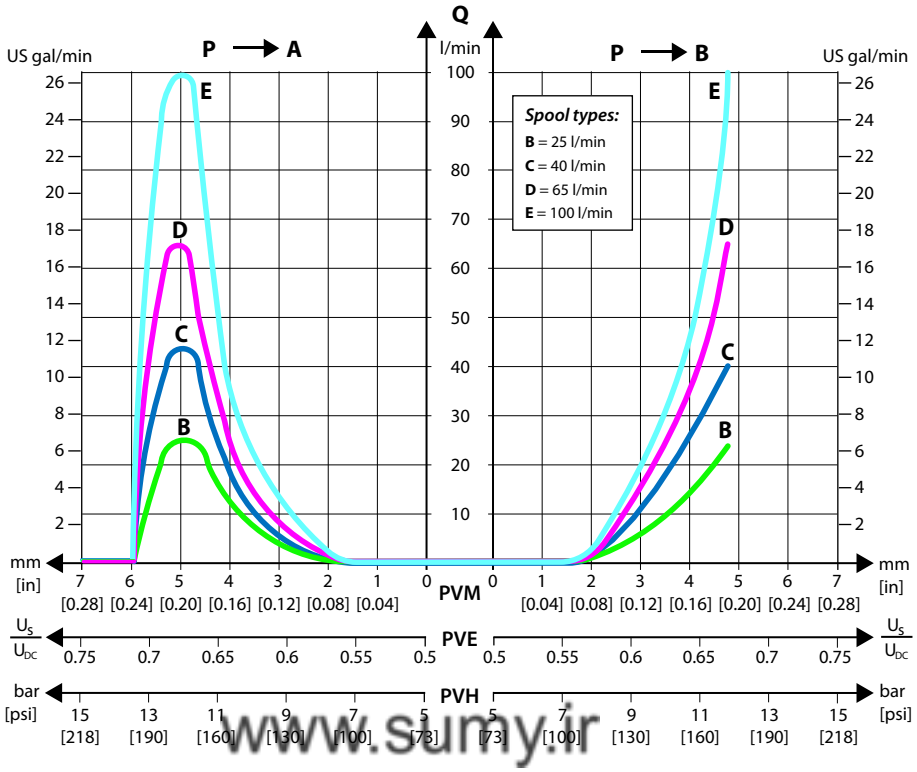
Progressive fluid flow characteristic of spool with A-float



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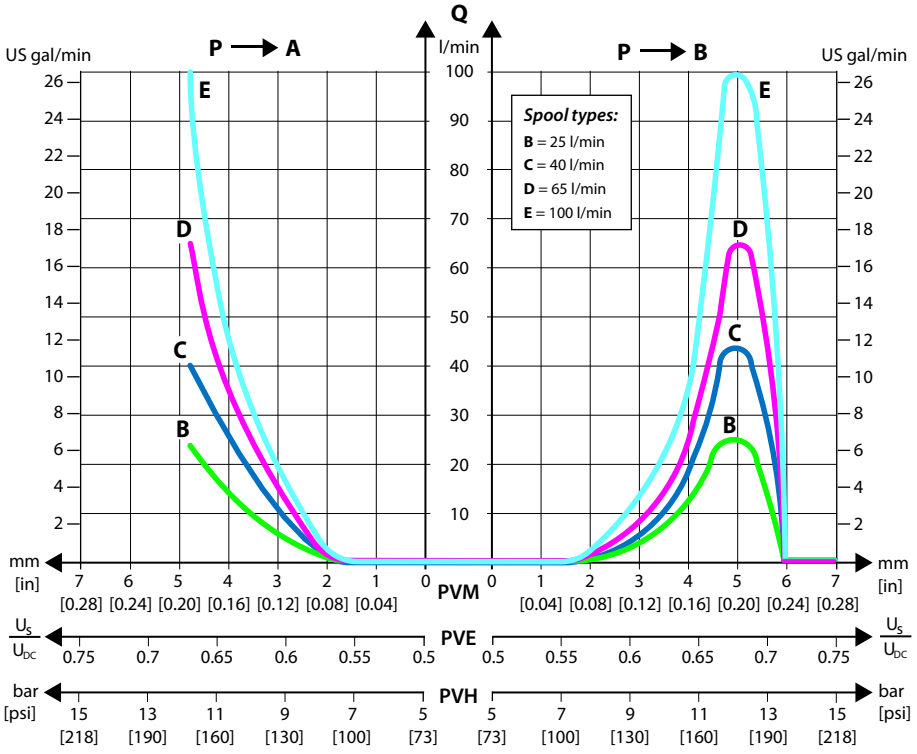
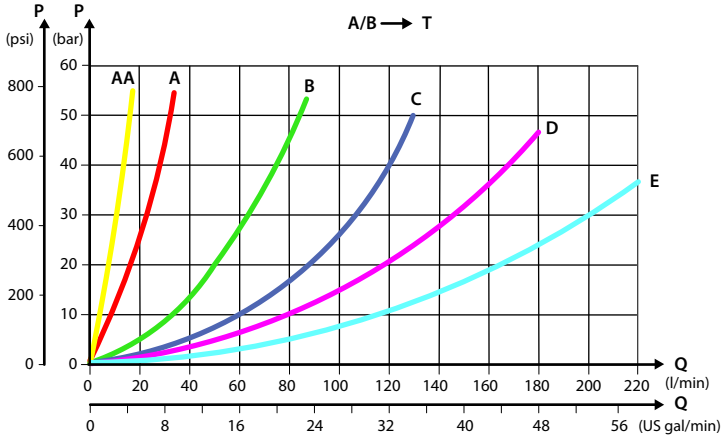
Progressive fluid flow characteristic of spool with B-float

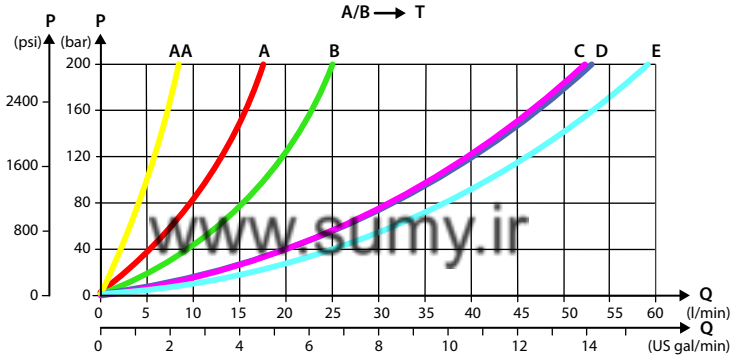


PVG-EX 32

Pressure drop at maximum spool travel position



Pressure drop for open spool in neutral position



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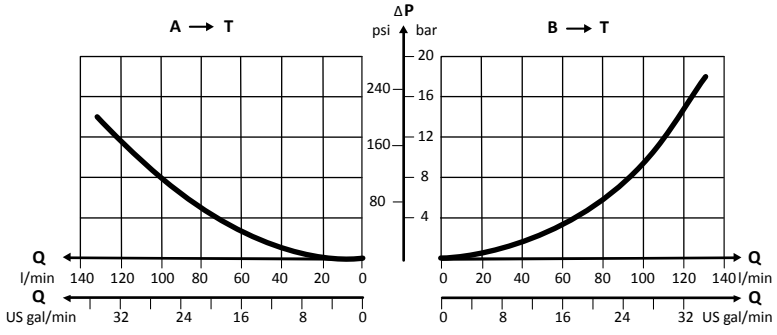
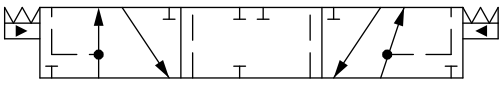
Pressure drop A/B to T in float position



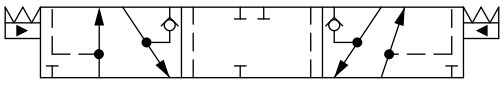
PVBS Main Spools Part Numbers

Flow Control Spools—Closed Neutral Position

Schematic for PVBS without shuttle valve



Schematic for PVBS with shuttle valve



PVG-EX 32

Part numbers for Symmetric Flow Control Spools

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B9672	PVE	-	1 [0,26]	1 [0,26]	1 [0,26]	1 [0,26]
157B7005	PVE	-	5 [1,3]	5 [1,3]	5 [1,3]	5 [1,3]
157B9543	PVE	-	10 [2,6]	5 [1,3]	5 [1,3]	10 [2,6]
157B7000	PVE	-	10 [2,6]	10 [2,6]	10 [2,6]	10 [2,6]
157B9509	PVE	-	15 [4,0]	15 [4,0]	15 [4,0]	15 [4,0]
157B7001	PVE	-	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
157B7002	PVE	-	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B9903	PVE	-	50 [13,2]	50 [13,2]	50 [13,2]	50 [13,2]
157B7003	PVE	-	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
157B9920	PVE	-	75 [19,8]	75 [19,8]	75 [19,8]	130 [34,3]
157B7004	PVE	-	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]
157B9977	PVE	-	100 [26,4]	100 [26,4]	100 [26,4]	130 [34,3]
11140830	PVE	-	100 [26,4]	100 [26,4]	100 [26,4]	130 [34,3]
157B9674	PVE	-	130 [34,3]	100 [26,4]	100 [26,4]	100 [26,4]
157B9503	PVE	-	[2)]	100 [26,4]	100 [26,4]	100 [26,4]
157B7006[1)]	PVE	-	130 [34,3]	130 [34,3]	130 [34,3]	130 [34,3]
11137391	PVE	Yes	1 [0,26]	1 [0,26]	1 [0,26]	1 [0,26]
157B7025	PVE	Yes	5 [1,3]	5 [1,3]	5 [1,3]	5 [1,3]
157B7020	PVE	Yes	10 [2,6]	10 [2,6]	10 [2,6]	10 [2,6]
11225588	PVE	Yes	15 [4,0]	15 [4,0]	15 [4,0]	15 [4,0]
157B7021	PVE	Yes	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
157B7022	PVE	Yes	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B7023	PVE	Yes	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
11223875	PVE	Yes	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
11212900	PVE	Yes	80 [21.1]	80 [21.1]	80 [21.1]	80 [21.1]
157B7024	PVE	Yes	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]
157B7026[1)]	PVE	Yes	130 [34,3]	130 [34,3]	130 [34,3]	130 [34,3]
11201284	PVE	Yes	130 [34,3]	130 [34,3]	130 [34,3]	130 [34,3]
157B9005	PVH/PVHC	-	5 [1,3]	5 [1,3]	5 [1,3]	5 [1,3]
157B9000	PVH/PVHC	-	10 [2,6]	10 [2,6]	10 [2,6]	10 [2,6]
11225674	PVH/PVHC	-	15 [4,0]	15 [4,0]	15 [4,0]	15 [4,0]
157B9001	PVH/PVHC	-	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
157B9002	PVH/PVHC	-	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B9003	PVH/PVHC	-	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
157B9816	PVH/PVHC	-	75 [19,8]	75 [19,8]	75 [19,8]	130 [34,3]
157B9004	PVH/PVHC	-	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]
157B9006[1)]	PVH/PVHC	-	130 [34,3]	130 [34,3]	130 [34,3]	130 [34,3]
157B9025	PVH/PVHC	Yes	5 [1,3]	5 [1,3]	5 [1,3]	5 [1,3]

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Part numbers for Symmetric Flow Control Spools (continued)

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B9020	PVH/PVHC	Yes	10 [2,6]	10 [2,6]	10 [2,6]	10 [2,6]
11122055	PVH/PVHC	Yes	15 [4,0]	15 [4,0]	15 [4,0]	15 [4,0]
157B9021	PVH/PVHC	Yes	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
157B9022	PVH/PVHC	Yes	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B9023	PVH/PVHC	Yes	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
11196171	PVH/PVHC	Yes	*	90 [23,8]	90 [23,8]	*
157B9024	PVH/PVHC	Yes	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]
157B9026[1)]	PVH/PVHC	Yes	130 [34,3]	130 [34,3]	130 [34,3]	130 [34,3]

[2)] Fully opened, no flow restriction notch.

[1)] Turbo on A-port.

Part numbers for Asymmetric Flow Control Spools

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B9524	PVE	-	5 [1,3]	5 [1,3]	10 [2,6]	10 [2,6]
11004213	PVE	-	5 [1,3]	5 [1,3]	65 [17,2]	65 [17,2]
157B9092	PVE	-	10 [2,6]	10 [2,6]	5 [1,3]	5 [1,3]
157B9514	PVE	-	10 [2,6]	10 [2,6]	15 [4,0]	15 [4,0]
157B9579	PVE	-	10 [2,6]	10 [2,6]	65 [17,2]	65 [17,2]
157B9579	PVE	-	65 [17,2]	10 [2,6]	65 [17,2]	65 [17,2]
157B9856	PVE	-	15 [4,0]	15 [4,0]	10 [2,6]	10 [2,6]
157B9516	PVE	-	15 [4,0]	15 [4,0]	10 [2,6]	10 [2,6]
11137748	PVE	-	20 [5,3]	20 [5,3]	15 [4,0]	15 [4,0]
157B9515	PVE	-	20 [5,3]	20 [5,3]	25 [6,6]	25 [6,6]
157B9950	PVE	-	25 [6,6]	25 [6,6]	10 [2,6]	10 [2,6]
11130056	PVE	-	25 [6,6]	25 [6,6]	15 [4,0]	15 [4,0]
157B9975	PVE	-	100 [26,4]	25 [6,6]	100 [26,4]	100 [26,4]
11119792	PVE	-	40 [10,6]	40 [10,6]	25 [6,6]	25 [6,6]
11022810	PVE	-	65 [17,2]	65 [17,2]	40 [10,6]	40 [10,6]
157B9566	PVE	-	65 [17,2]	65 [17,2]	10 [2,6]	10 [2,6]
11119557	PVE	-	75 [19,8]	75 [19,8]	65 [17,2]	65 [17,2]
157B9947	PVE	Yes	5 [1,3]	5 [1,3]	25 [6,6]	25 [6,6]
157B9555	PVE	Yes	7 [1,8]	7 [1,8]	10 [2,6]	10 [2,6]
11212898	PVE	Yes	10 [2,6]	10 [2,6]	5 [1,3]	5 [1,3]
157B9915	PVE	Yes	15 [4,0]	15 [4,0]	35 [9,2]	35 [9,2]
11088763	PVE	Yes	25 [6,6]	25 [6,6]	40 [10,6]	40 [10,6]
11078499	PVE	Yes	40 [10,6]	25 [6,6]	40 [10,6]	40 [10,6]
157B9810	PVE	Yes	30 [7,9]	30 [7,9]	20 [5,3]	20 [5,3]

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PVG-EX 32

Part numbers for Asymmetric Flow Control Spools (continued)

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
11015763	PVE	Yes	40 [10,6]	40 [10,6]	25 [6,6]	25 [6,6]
11229294	PVE	A-port	40 [10,6]	40 [10,6]	25 [6,6]	25 [6,6]
11015765	PVE	Yes	40 [10,6]	40 [10,6]	65 [17,2]	65 [17,2]
11216150	PVE	Yes	40 [10,6]	40 [10,6]	65 [17,2]	65 [17,2]
157B9907	PVE	Yes	50 [13,2]	50 [13,2]	5 [1,3]	5 [1,3]
157B9828	PVE	Yes	65 [17,2]	65 [17,2]	40 [10,6]	40 [10,6]
11021888	PVE	Yes	65 [17,2]	65 [17,2]	40 [10,6]	65 [17,2]
11216162	PVE	Yes	65 [17,2]	65 [17,2]	100 [26,4]	100 [26,4]
11036502	PVE	Yes	100 [26,4]	100 [26,4]	65 [17,2]	65 [17,2]
157B9857[1)]	PVE	Yes	130 [34,3]	130 [34,3]	65 [17,2]	65 [17,2]
11119552	PVH/PVHC	-	15 [4,0]	15 [4,0]	10 [2,6]	10 [2,6]
11066371	PVH/PVHC	-	20 [5,3]	20 [5,3]	15 [4,0]	15 [4,0]
11130928	PVH/PVHC	-	25 [6,6]	25 [6,6]	15 [4,0]	15 [4,0]
11130924	PVH/PVHC	-	40 [10,6]	40 [10,6]	25 [6,6]	25 [6,6]
11130831	PVH/PVHC	-	75 [19,8]	75 [19,8]	65 [17,2]	65 [17,2]
11094986	PVH/PVHC	-	[2)]	100 [26,4]	100 [26,4]	[2)]
11219179	PVH/PVHC	Yes	40 [10,6]	40 [10,6]	25 [6,6]	25 [6,6]
157B9084	PVH/PVHC	Yes	50 [13,2]	50 [13,2]	5 [1,3]	5 [1,3]
11145741[1)]	PVH/PVHC	Yes	130 [34,3]	130 [34,3]	65 [17,2]	65 [17,2]
11145955	PVH/PVHC	Yes	150 [39,6]	60 [15,9]	90 [23,8]	150 [39,6]

[1)] Turbo on A-port.

[2)] Fully open, no flow restriction notch.

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Part numbers for Back pressure Flow Control Spools (A/B->T flow track smaller than P->A/B)

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
11124636	PVE	-	40 [10,6]	65 [17,2]	65 [17,2]	40 [10,6]
11084778	PVE	-	2 [0,53]	10 [2,6]	10 [2,6]	5 [1,3]
11104114	PVE	-	3 [0,79]	10 [2,6]	15 [4,0]	5 [1,3]
11075794	PVE	-	5 [1,3]	10 [2,6]	5 [1,3]	10 [2,6]
11098883	PVE	-	5 [1,3]	10 [2,6]	10 [2,6]	2 [0,53]
11104452	PVE	-	5 [1,3]	15 [4,0]	10 [2,6]	3 [0,79]
157B9633	PVE	-	5 [1,3]	25 [6,6]	25 [6,6]	5 [1,3]
11098881	PVE	-	5 [1,3]	25 [6,6]	25 [6,6]	25 [6,6]
11126414	PVE	-	10 [2,6]	25 [6,6]	25 [6,6]	25 [6,6]
11129522	PVE	-	10 [2,6]	25 [6,6]	50 [13,2]	25 [6,6]
157B9952	PVE	-	25 [6,6]	38 [10,0]	38 [10,0]	25 [6,6]
157B9635	PVE	-	10 [2,6]	40 [10,6]	40 [10,6]	25 [6,6]

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Part numbers for Back pressure Flow Control Spools (A/B->T flow track smaller than P->A/B) (continued)

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
11129523	PVE	-	10 [2,6]	40 [10,6]	50 [13,2]	40 [10,6]
157B9638	PVE	-	25 [6,6]	40 [10,6]	40 [10,6]	25 [6,6]
157B9818	PVE	-	40 [10,6]	55 [14,5]	55 [14,5]	40 [10,6]
11022164	PVE	-	10 [2,6]	65 [17,2]	65 [17,2]	10 [2,6]
157B9634	PVE	-	25 [6,6]	65 [17,2]	65 [17,2]	25 [6,6]
157B9931	PVE	-	40 [10,6]	65 [17,2]	65 [17,2]	65 [17,2]
157B9551	PVE	-	65 [17,2]	65 [17,2]	65 [17,2]	10 [2,6]
157B9978	PVE	-	100 [26,4]	65 [17,2]	100 [26,4]	40 [10,6]
157B9976	PVE	-	40 [10,6]	100 [26,4]	65 [17,2]	100 [26,4]
157B9541	PVE	-	40 [10,6]	100 [26,4]	65 [17,2]	*
157B9949	PVE	-	40 [10,6]	100 [26,4]	100 [26,4]	100 [26,4]
157B9932	PVE	-	100 [26,4]	100 [26,4]	100 [26,4]	40 [10,6]
11129528	PVE	Yes	5 [1,3]	15 [4,0]	20 [5,3]	10 [2,6]
157B9827	PVE	Yes	10 [2,6]	20 [5,3]	20 [5,3]	10 [2,6]
157B9863	PVE	Yes	5 [1,3]	25 [6,6]	25 [6,6]	5 [1,3]
11100489	PVE	Yes	5 [1,3]	25 [6,6]	40 [10,6]	20 [5,3]
157B9946	PVE	Yes	25 [6,6]	25 [6,6]	10 [2,6]	10 [2,6]
157B9858	PVE	Yes	10 [2,6]	40 [10,6]	40 [10,6]	10 [2,6]
157B9639	PVE	Yes	25 [6,6]	40 [10,6]	40 [10,6]	25 [6,6]
157B9906	PVE	Yes	30 [7,9]	40 [10,6]	15 [4,0]	20 [5,3]
157B9632	PVE	Yes	25 [6,6]	65 [17,2]	65 [17,2]	25 [6,6]
157B9640	PVE	Yes	40 [10,6]	100 [26,4]	65 [17,2]	65 [17,2]
157B9839	PVH/PVHC	-	5 [1,3]	25 [6,6]	25 [6,6]	5 [1,3]
11104487	PVH/PVHC	-	5 [1,3]	25 [6,6]	25 [6,6]	25 [6,6]
11111729	PVH/PVHC	-	25 [6,6]	40 [10,6]	40 [10,6]	25 [6,6]
11074169	PVH/PVHC	-	100 [26,4]	100 [26,4]	100 [26,4]	40 [10,6]
11218880	PVH/PVHC	Yes	5 [1,3]	25 [6,6]	25 [6,6]	5 [1,3]
11119474	PVH/PVHC	Yes	25 [6,6]	40 [10,6]	40 [10,6]	25 [6,6]
11145741	PVH/PVHC	Yes	150 [39,6]	150 [39,6]	150 [39,6]	65 [17,2]

* Fully opened, no flow restriction notch.

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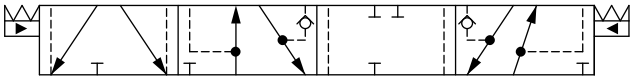
PVG-EX 32

Flow Control Spools—Closed Neutral Position with A-float

Schematic for PVBS with shuttle valve



Part numbers for Asymmetric Flow Control Spools

Part Number	Actuation	PVB with shuttle valve	Flow - l/min [US gal/min]			
			A → T	P → A	P → B	B → T
11020293	PVE	Yes	*	100 [26,4]	65 [17,2]	*

* Fully opened, no flow restriction notch

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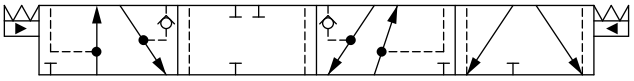
PVG-EX 32

Flow Control Spools—Closed Neutral Position with B-float

Schematic for PVBS with shuttle valve



Part numbers for Symmetric Flow Control Spools

Part Number	Actuation	PVB with shuttle valve	Flow - l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B7620	PVE	Yes	10 [2,6]	10 [2,6]	10 [2,6]	10 [2,6]
157B7621	PVE	Yes	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
157B7622	PVE	Yes	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B7623	PVE	Yes	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
157B7624[1]	PVE	Yes	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]
157B9620	PVH/PVHC	Yes	10 [2,6]	10 [2,6]	10 [2,6]	10 [2,6]
157B9636	PVH/PVHC	Yes	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
11051805	PVH/PVHC	Yes	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
11085501[1]	PVH/PVHC	Yes	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]

[1] Turbo on A and B port.

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Part numbers for Asymmetric Flow Control Spools

Part Number	Actuation	PVB with shuttle valve	Flow - l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B9911	PVE	Yes	30 [7,9]	30 [7,9]	65 [17,2]	65 [17,2]
157B9518[1]	PVE	Yes	100 [26,4]	100 [26,4]	65 [17,2]	100 [26,4]

[1] Turbo on A port.

Part numbers for Back pressure Flow Control Spools (A/B->T flow track smaller than P->A/B)

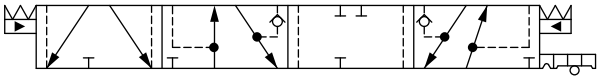
Part Number	Actuation	PVB with shuttle valve	Flow - l/min [US gal/min]			
			A → T	P → A	P → B	B → T
11129529	PVE	Yes	3 [0,8]	10 [2,6]	13 [3,4]	5 [1,3]
157B9691	PVE	Yes	15 [4,0]	30 [7,9]	30 [7,9]	15 [4,0]
157B9692	PVE	Yes	25 [6,6]	50 [13,2]	65 [17,2]	65 [17,2]
157B9941[1]	PVE	Yes	100 [26,4]	130 [34,3]	130 [34,3]	130 [34,3]
157B9691	PVH/PVHC	Yes	15 [4,0]	30 [7,9]	30 [7,9]	15 [4,0]
157B9692	PVH/PVHC	Yes	25 [6,6]	50 [13,2]	65 [17,2]	65 [17,2]

[1] Turbo on A and B port.

PVG-EX 32

Flow Control Spools—Closed Neutral Position with A-float for PVMF

Schematic for PVBS with shuttle valve



Part numbers for Symmetric Flow Control Spools

Part Number	Actuation	PVB with shuttle valve	Flow - l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B9825	PVE	Yes	5 [1,3]	5 [1,3]	5 [1,3]	5 [1,3]
157B9820	PVE	Yes	10 [2,6]	10 [2,6]	10 [2,6]	10 [2,6]
157B9821	PVE	Yes	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
157B9822	PVE	Yes	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B9823	PVE	Yes	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
157B9824[1)]	PVE	Yes	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]

[1)] Turbo on A and B port.

Flow Control Spools—Closed Neutral Position with B-float for PVMF

Schematic for PVBS with shuttle valve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Part numbers for Symmetric Flow Control Spools

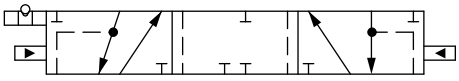
Part Number	Actuation	PVB with shuttle valve	Flow - l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B9821	PVE	Yes	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
157B9822	PVE	Yes	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B9823	PVE	Yes	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
157B9824[1)]	PVE	Yes	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]

[1)] Turbo on A and B port.

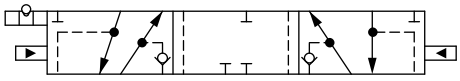
PVG-EX 32

Flow Control Spools—Closed Neutral Position for PVMR

Schematic for PVBS without shuttle valve



Schematic for PVBS with shuttle valve



Part numbers for Symmetric Flow Control Spools

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B9705	PVE	-	5 [1,3]	5 [1,3]	5 [1,3]	5 [1,3]
157B9700	PVE	-	10 [2,6]	10 [2,6]	10 [2,6]	10 [2,6]
11095634	PVE	-	15 [4,0]	15 [4,0]	15 [4,0]	15 [4,0]
157B9701	PVE	-	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
157B9702	PVE	-	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B9703	PVE	-	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
157B9704	PVE	-	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]
157B9725	PVE	Yes	5 [1,3]	5 [1,3]	5 [1,3]	5 [1,3]
157B9720	PVE	Yes	10 [2,6]	10 [2,6]	10 [2,6]	10 [2,6]
157B9721	PVE	Yes	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
157B9722	PVE	Yes	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B9723	PVE	Yes	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
157B9724	PVE	Yes	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]

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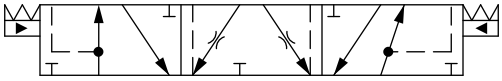
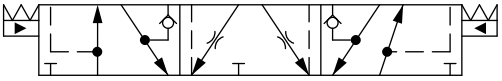
PVG-EX 32

Flow Control Spools—Open/Closed Neutral Position

Schematic for PVBS without shuttle valve



Schematic for PVBS with shuttle valve



Part numbers for Symmetric Flow Control Spools

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B7101	PVE	-	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
157B9537	PVE	-	40 [10,6]	40 [10,6]	40 [10,6]	65 [10,6]
157B7103	PVE	-	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
11100878	PVE	Yes	35 [9,2]	35 [9,2]	35 [9,2]	35 [9,2]
11027254	PVE	Yes	75 [19,8]	75 [19,8]	75 [19,8]	75 [19,8]

Part numbers for Asymmetric Flow Control Spools

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B9698	PVE	Yes	15 [4,0]	15 [4,0]	10 [2,6]	10 [2,6]
11055532	PVE	Yes	35 [9,2]	35 [9,2]	65 [17,2]	65 [17,2]
11025812	PVE	Yes	50 [13,2]	50 [13,2]	75 [19,8]	75 [19,8]

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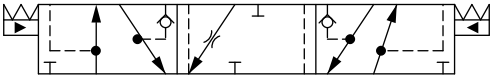
Back pressure Flow Control Spools (A/B->T flow track smaller than P->A/B)

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
11094317	PVE	Yes	2 [0,5]	5 [1,3]	5 [1,3]	2 [0,5]
11051992	PVE	Yes	5 [1,3]	18 [4,8]	18 [4,8]	5 [1,3]
11027284	PVE	Yes	6 [1,6]	25 [6,6]	25 [6,6]	6 [1,6]
11117573	PVE	Yes	25 [6,6]	35 [9,2]	65 [17,2]	65 [17,2]
11025212	PVE	Yes	35 [9,2]	35 [9,2]	18 [4,8]	12 [3,2]
11137744	PVE	Yes	35 [9,2]	50 [13,2]	75 [19,8]	75 [19,8]
11027911	PVE	Yes	65 [17,2]	65 [17,2]	35 [9,2]	25 [6,6]
11027922	PVE	Yes	75 [19,8]	75 [19,8]	50 [13,2]	35 [9,2]

Flow Control Spools—Open/Closed A and Closed B Position

Schematic for PVBS with shuttle valve



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Part numbers for Symmetric Flow Control Spools

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
11213583	PVE	Yes	100 [26.4]	100 [26.4]	100 [26.4]	100 [26.4]

Part numbers for Asymmetric Flow Control Spools

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
11201798	PVE	Yes	100 [26.4]	100 [26.4]	65 [17.2]	65 [17.2]

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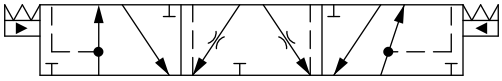
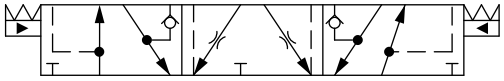
PVG-EX 32

Flow Control Spools—Throttled Open Neutral Position

Schematic for PVBS without shuttle valve



Schematic for PVBS with shuttle valve



Part numbers for Symmetric Flow Control Spools

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B9697	PVE	-	1 [0,26]	1 [0,26]	1 [0,26]	1 [0,26]
157B7105	PVE	-	5 [1,3]	5 [1,3]	5 [1,3]	5 [1,3]
157B7100	PVE	-	10 [2,6]	10 [2,6]	10 [2,6]	10 [2,6]
157B7101	PVE	-	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
157B9534	PVE	-	25 [6,6]	25 [6,6]	25 [6,6]	40 [6,6]
157B7102	PVE	-	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B9537	PVE	-	40 [10,6]	40 [10,6]	40 [10,6]	65 [10,6]
11091340	PVE	-	[3]	40 [10,6]	40 [10,6]	[3]
157B9521	PVE	-	[3]	40 [10,6]	40 [10,6]	[3]
157B9677	PVE	-	50 [13,2]	50 [13,2]	50 [13,2]	50 [13,2]
157B7103	PVE	-	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
11007176	PVE	-	[3]	65 [17,2]	65 [17,2]	[3]
11122809	PVE	-	75 [19,8]	75 [19,8]	75 [19,8]	75 [19,8]
157B7104	PVE	-	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]
11144269	PVE	-	100 [26,4]	100 [26,4]	100 [26,4]	[3]
157B9098[2]	PVE	-	130 [34,3]	130 [34,3]	130 [34,3]	130 [34,3]
157B7106[1]	PVE	-	130 [34,3]	130 [34,3]	130 [34,3]	130 [34,3]
157B9675	PVE	Yes	3 [0,8]	3 [0,8]	3 [0,8]	3 [0,8]
157B7125	PVE	Yes	5 [1,3]	5 [1,3]	5 [1,3]	5 [1,3]
157B7120	PVE	Yes	10 [2,6]	10 [2,6]	10 [2,6]	10 [2,6]
157B9647	PVE	Yes	15 [4,0]	15 [4,0]	15 [4,0]	15 [4,0]
157B9594	PVE	Yes	20 [5,3]	20 [5,3]	20 [5,3]	20 [5,3]
157B7121	PVE	Yes	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
11029379	PVE	Yes	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
11153790	PVE	Yes	[3]	25 [6,6]	25 [6,6]	[3]
157B7122	PVE	Yes	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B9538	PVE	Yes	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
11121691	PVE	Yes	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
11108808	PVE	Yes	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]
157B9649	PVE	Yes	55 [14,5]	55 [14,5]	55 [14,5]	55 [14,5]
157B7123	PVE	Yes	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
157B9650	PVE	Yes	75 [19,8]	75 [19,8]	75 [19,8]	75 [19,8]
11217660	PVE	Yes	*	90	90	*

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Part numbers for Symmetric Flow Control Spools (continued)

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B9930[2]	PVE	Yes	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]
157B7124	PVE	Yes	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]
11122118	PVE	Yes	[3]	100 [26,4]	100 [26,4]	[3]
11142634[2]	PVE	Yes	130 [34,3]	130 [34,3]	130 [34,3]	130 [34,3]
157B7126[1]	PVE	Yes	130 [34,3]	130 [34,3]	130 [34,3]	130 [34,3]
157B9854[1]	PVE	Yes	130 [34,3]	130 [34,3]	130 [34,3]	[3]
157B9105	PVH/PVHC	-	5 [1,3]	5 [1,3]	5 [1,3]	5 [1,3]
157B9100	PVH/PVHC	-	10 [2,6]	10 [2,6]	10 [2,6]	10 [2,6]
157B9101	PVH/PVHC	-	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
157B9102	PVH/PVHC	-	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B9103	PVH/PVHC	-	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
157B9104	PVH/PVHC	-	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]
157B9106[1]	PVH/PVHC	-	130 [34,3]	130 [34,3]	130 [34,3]	130 [34,3]
157B9125	PVH/PVHC	Yes	5 [1,3]	5 [1,3]	5 [1,3]	5 [1,3]
157B9120	PVH/PVHC	Yes	10 [2,6]	10 [2,6]	10 [2,6]	10 [2,6]
157B9121	PVH/PVHC	Yes	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
157B9122	PVH/PVHC	Yes	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B9123	PVH/PVHC	Yes	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
157B9124[2]	PVH/PVHC	Yes	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]
157B9126[1]	PVH/PVHC	Yes	130 [34,3]	130 [34,3]	130 [34,3]	130 [34,3]
11201697	PVH/PVHC	Yes	40	40	40	40

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[3] Fully opened, no flow restriction notch

[2] Dead band 0.8 mm [0.03 in]

[1] Turbo on A and B port

Part numbers for Asymmetric Flow Control Spools

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
11004389	PVE	-	5 [1,3]	5 [1,3]	65 [17,2]	65 [17,2]
157B9094	PVE	-	15 [4,0]	15 [4,0]	30 [7,9]	30 [7,9]
157B9544	PVE	-	100 [26,4]	15 [4,0]	25 [6,6]	40 [10,6]
157B9526	PVE	-	30 [7,9]	30 [7,9]	15 [4,0]	15 [4,0]
157B9815	PVE	-	30 [7,9]	30 [7,9]	20 [5,3]	20 [5,3]
157B9545	PVE	-	40 [10,6]	40 [10,6]	15 [4,0]	40 [10,6]
11093116	PVE	-	40 [10,6]	40 [10,6]	20 [5,3]	20 [5,3]
11005204	PVE	-	40 [10,6]	40 [10,6]	65 [17,2]	65 [17,2]
157B9595	PVE	-	40 [10,6]	40 [10,6]	100 [26,4]	100 [26,4]
157B9860	PVE	-	50 [13,2]	50 [13,2]	20 [5,3]	20 [5,3]

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Part numbers for Asymmetric Flow Control Spools (continued)

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
11091575	PVE	-	55 [14,5]	55 [14,5]	30 [7,9]	30 [7,9]
157B9696	PVE	-	65 [17,2]	65 [17,2]	10 [2,6]	10 [2,6]
157B9506	PVE	-	65 [17,2]	65 [17,2]	40 [10,6]	40 [10,6]
157B9586	PVE	-	65 [17,2]	65 [17,2]	100 [26,4]	100 [26,4]
11137895	PVE	-	*	65 [17,2]	40 [10,6]	*
11122941	PVE	Yes	15 [4,0]	15 [4,0]	100 [26,4]	100 [26,4]
157B9830	PVE	Yes	25 [6,6]	25 [6,6]	40 [10,6]	40 [10,6]
11070681	PVE	Yes	25 [6,6]	25 [6,6]	50 [13,2]	50 [13,2]
11217665	PVE	Yes	25 [6,6]	25 [6,6]	100 [26,4]	100 [26,4]
157B9547	PVE	Yes	40 [10,6]	25 [6,6]	20 [5,3]	40 [10,6]
157B9558	PVE	Yes	30 [7,9]	30 [7,9]	10 [2,6]	10 [2,6]
157B9833	PVE	Yes	30 [7,9]	30 [7,9]	20 [5,3]	20 [5,3]
157B9813	PVE	Yes	30 [7,9]	30 [7,9]	55 [14,5]	55 [14,5]
11100875	PVE	Yes	*	35 [9,2]	18 [4,8]	*
11100881	PVE	Yes	*	35 [9,2]	50 [13,2]	*
157B9567	PVE	Yes	40 [10,6]	40 [10,6]	20 [5,3]	20 [5,3]
157B9865	PVE	Yes	40 [10,6]	40 [10,6]	25 [6,6]	25 [6,6]
11125125	PVE	Yes	40 [10,6]	40 [10,6]	65 [17,2]	65 [17,2]
157B9505	PVE	Yes	40 [10,6]	40 [10,6]	100 [26,4]	100 [26,4]
11096423	PVE	Yes	50 [13,2]	50 [13,2]	65 [17,2]	65 [17,2]
157B9681	PVE	Yes	55 [14,5]	55 [14,5]	30 [7,9]	30 [7,9]
157B9814	PVE	Yes	65 [17,2]	65 [17,2]	40 [10,6]	40 [10,6]
11217660	PVE	Yes	[1]	80 [21,1]	80 [21,1]	[1]
11202615	PVH/PVHC	-	25 [6,6]	25 [6,6]	25 [6,6]	40 [10,6]
157B9847	PVH/PVHC	-	30 [7,9]	30 [7,9]	20 [5,3]	20 [5,3]
157B9546	PVH/PVHC	-	40 [10,6]	25 [6,6]	20 [5,3]	40 [10,6]
157B9686	PVH/PVHC	-	40 [10,6]	30 [7,9]	25 [6,6]	40 [10,6]
157B9685	PVH/PVHC	-	40 [10,6]	40 [10,6]	35 [9,2]	40 [10,6]
157B9498	PVH/PVHC	-	65 [17,2]	65 [17,2]	40 [10,6]	40 [10,6]
11140120	PVH/PVHC	-	*	65 [17,2]	65 [17,2]	*
157B9688	PVH/PVHC	-	100 [26,4]	20 [5,3]	30 [7,9]	40 [10,6]
11079579	PVH/PVHC	Yes	25 [6,6]	25 [6,6]	50 [13,2]	50 [13,2]
11218879	PVH/PVHC	Yes	40 [10,6]	40 [10,6]	15 [4.0]	15 [4.0]
157B9689	PVH/PVHC	Yes	40 [10,6]	30 [7,9]	30 [7,9]	40 [10,6]
11200936	PVH/PVHC	Yes	40 [10,6]	40 [10,6]	25 [6,6]	25 [6,6]
11092123	PVH/PVHC	Yes	40 [10,6]	40 [10,6]	100 [26,4]	100 [26,4]
11147574	PVH/PVHC	Yes	*	65 [17,2]	65 [17,2]	*

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PVG-EX 32

Part numbers for Asymmetric Flow Control Spools (continued)

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
11200922	PVH/PVHC	Yes	65 [17,2]	65 [17,2]	40 [10,6]	40 [10,6]
11153474	PVH/PVHC	Yes	80 [21,1]	80 [21,1]	65 [17,2]	65 [17,2]

[*] Fully opened, no flow restriction notch

[1] Fully open, no flow restriction notch

Back pressure Flow Control Spools (A/B->T flow track smaller than P->A/B)

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
11034321	PVE	-	3 [0,79]	3 [0,79]	10 [2,6]	1 [0,26]
11074918	PVE	-	5 [1,3]	10 [2,6]	5 [1,3]	10 [2,6]
11006879	PVE	-	25 [6,6]	25 [6,6]	65 [17,2]	25 [6,6]
11097891	PVE	Yes	40 [10,6]	100 [26,4]	40 [10,6]	40 [10,6]
157B9684	PVH/PVHC	-	25 [6,6]	30 [7,9]	30 [7,9]	25 [6,6]
157B9687	PVH/PVHC	-	25 [6,6]	35 [9,2]	35 [9,2]	25 [6,6]

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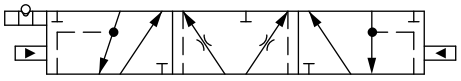
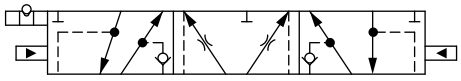
PVG-EX 32

Flow Control Spools—Throttled Open Neutral Position for PVMR

Schematic for PVBS without shuttle valve



Schematic for PVBS with shuttle valve



Part numbers for Symmetric Flow Control Spools

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B9715	PVE	-	5 [1,3]	5 [1,3]	5 [1,3]	5 [1,3]
157B9710	PVE	-	10 [2,6]	10 [2,6]	10 [2,6]	10 [2,6]
157B9711	PVE	-	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
157B9712	PVE	-	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B9678	PVE	-	50 [13,2]	50 [13,2]	50 [13,2]	50 [13,2]
157B9713	PVE	-	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
11128430	PVE	-	80 [21,1]	80 [21,1]	80 [21,1]	80 [21,1]
157B9714	PVE	-	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]
157B9716[1)]	PVE	-	130 [34,3]	130 [34,3]	130 [34,3]	130 [34,3]
157B9735	PVE	Yes	5 [1,3]	5 [1,3]	5 [1,3]	5 [1,3]
157B9730	PVE	Yes	10 [2,6]	10 [2,6]	10 [2,6]	10 [2,6]
157B9731	PVE	Yes	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
157B9732	PVE	Yes	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B9733	PVE	Yes	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
157B9734	PVE	Yes	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]

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[1)] Turbo on A and B port

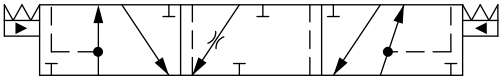
Part numbers for Asymmetric Flow Control Spools

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
11107125	PVE	-	5 [1,3]	5 [1,3]	65 [17,2]	65 [17,2]
11119504	PVE	-	40 [10,6]	40 [10,6]	65 [17,2]	65 [17,2]
11071543	PVE	Yes	30 [7,9]	30 [7,9]	10 [2,6]	10 [2,6]

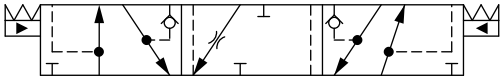
PVG-EX 32

Flow Control Spools—Throttled A to T Neutral Position

Schematic for PVBS without shuttle valve



Schematic for PVBS with shuttle valve



Part numbers for Symmetric Flow Control Spools

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B9504	PVE	-	15 [4,0]	15 [4,0]	15 [4,0]	15 [4,0]
157B7401	PVE	-	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
157B7402	PVE	-	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B7403	PVE	-	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
157B7404	PVE	-	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]
157B7406[1)]	PVE	-	130 [34,3]	130 [34,3]	130 [34,3]	130 [34,3]
157B9846	PVE	-	[2)]	130 [34,3]	130 [34,3]	130 [34,3]
157B9527	PVE	Yes	15 [4,0]	15 [4,0]	15 [4,0]	15 [4,0]
157B7421	PVE	Yes	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
157B7422	PVE	Yes	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B7423	PVE	Yes	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
157B7424	PVE	Yes	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]
157B7404	PVH/PVHC	-	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]
157B7424	PVH/PVHC	Yes	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]

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[1)] Turbo on A and B port.

[2)] Fully opened, no flow restriction notch.

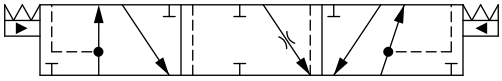
Part numbers for Asymmetric Flow Control Spools

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
11022518	PVE	-	25 [6,6]	25 [6,6]	40 [10,6]	40 [10,6]
157B9834	PVE	-	30 [7,9]	30 [7,9]	20 [5,3]	20 [5,3]
11202228	PVE	-	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]
11201797	PVE	Yes	150 [39.6]	150 [39.6]	100 [26,4]	100 [26,4]

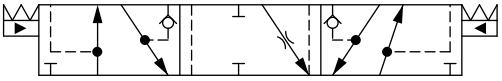
PVG-EX 32

Flow Control Spools—Throttled B to T Neutral Position

Schematic for PVBS without shuttle valve



Schematic for PVBS with shuttle valve



Part numbers for Symmetric Flow Control Spools

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B7500	PVE	-	10 [2,6]	10 [2,6]	10 [2,6]	10 [2,6]
157B7501	PVE	-	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
157B7502	PVE	-	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B7503	PVE	-	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
157B7504	PVE	-	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]
11064144[1)]	PVE	-	130 [34,3]	130 [34,3]	130 [34,3]	130 [34,3]
157B7520	PVE	Yes	10 [2,6]	10 [2,6]	10 [2,6]	10 [2,6]
157B7521	PVE	Yes	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
157B7522	PVE	Yes	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B7523	PVE	Yes	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
157B7524	PVE	Yes	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]
11202731	PVH/PVHC	Yes	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]

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[1)] Turbo on A and B port.

Part numbers for Asymmetric Flow Control Spools

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B9948	PVE	Yes	25 [6,6]	25 [6,6]	10 [2,6]	10 [2,6]
11008038	PVE	Yes	40 [10,6]	40 [10,6]	25 [6,6]	25 [6,6]
11037198	PVE	Yes	100 [26,4]	40 [10,6]	40 [10,6]	40 [10,6]
11126490	PVE	Yes	65 [17,2]	65 [17,2]	40 [10,6]	40 [10,6]

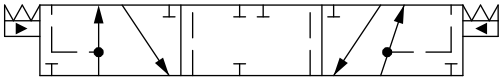
Part numbers for Full open B → T

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
11131447	PVE	-	10 [2.6]	10 [2.6]	10 [2.6]	10 [2.6]

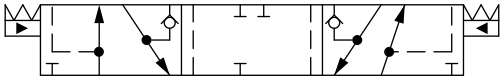
PVG-EX 32

Linear Flow Control Spools—Closed Neutral Position

Schematic for PVBS without shuttle valve



Schematic for PVBS with shuttle valve



Part numbers for Symmetric Flow Control Spools

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
11231130	PVE	-	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
157B9770	PVE	Yes	10 [2,6]	10 [2,6]	10 [2,6]	10 [2,6]
157B9771	PVE	Yes	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
157B9511[1)]	PVE	Yes	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
157B9772	PVE	Yes	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B9773	PVE	Yes	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
157B9655[1)]	PVE	Yes	85 [17,2]	85 [17,2]	85 [17,2]	85 [17,2]
11073991	PVH/PVHC	-	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
11051903	PVH/PVHC	-	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]
11107159	PVH/PVHC	Yes	10 [2,6]	10 [2,6]	10 [2,6]	10 [2,6]
11107222	PVH/PVHC	Yes	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B9080	PVH/PVHC	Yes	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
11083650	PVH/PVHC	Yes	[2)]	85 [17,2]	85 [17,2]	[2)]

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[1)] Dead band 1,1 mm [0,04 in].

[2)] Fully opened, no flow restriction notch.

Part numbers for Asymmetric Flow Control Spools

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B9086	PVH/PVHC	-	65 [17,2]	65 [17,2]	100 [26,4]	100 [26,4]

Dead band 1,5 mm [0,06 in].

Part number for Back pressure Flow Control Spools (A/B->T flow track smaller than P->A/B)

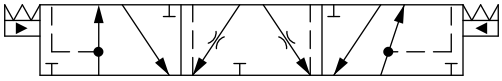
Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
11151485	PVE	Yes	30 [7.9]	85 [22.5]	110 [29,1]	35 [9.2]

Dead band 0.8 mm [0,03 in].

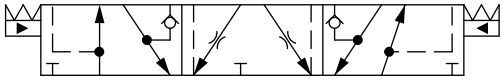
PVG-EX 32

Linear Flow Control Spools—Throttled Open Neutral Position

Schematic for PVBS without shuttle valve



Schematic for PVBS with shuttle valve



Part numbers for Symmetric Flow Control Spools

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
11140460	PVE	Yes	5 [1,3]	5 [1,3]	5 [1,3]	5 [1,3]
157B9780	PVE	Yes	10 [2,6]	10 [2,6]	10 [2,6]	10 [2,6]
157B9781	PVE	Yes	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
157B9782	PVE	Yes	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
11076654	PVE	Yes	50 [13,2]	50 [13,2]	50 [13,2]	50 [13,2]
157B9783	PVE	Yes	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
157B9784	PVE	Yes	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]
157B9577*	PVE	Yes	130 [34,3]	130 [34,3]	130 [34,3]	130 [34,3]
157B9807	PVH/PVHC	-	10 [2,6]	10 [2,6]	10 [2,6]	10 [2,6]
157B9805	PVH/PVHC	-	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
11046738	PVH/PVHC	-	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
11080984	PVH/PVHC	-	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
11153567	PVH/PVHC	-	100 [26,4]	40 [10,6]	40 [10,6]	100 [26,4]
11218248[1)]	PVH/PVHC	-	130 [34,3]	130 [34,3]	130 [34,3]	130 [34,3]
157B9806	PVH/PVHC	Yes	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
157B9079	PVH/PVHC	Yes	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B9081	PVH/PVHC	Yes	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
157B9082	PVH/PVHC	Yes	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]
11140180	PVH/PVHC	Yes	[2)]	100 [26,4]	100 [26,4]	[2)]
11231448	PVE	-	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
11216148	PVE	-	*	55 [14,5]	55 [14,5]	*
11231449	PVE	-	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]

* Turbo on A and B port

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Part numbers for Assymmetric Flow Control Spools

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
11201830[1)]	PVH/PVHC	-	[2)]	65 [17,2]	65 [17,2]	[2)]

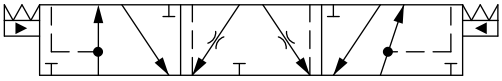
1) Dead band 0.8 mm [0,03 in].

2) Fully opened, no flow restriction notch

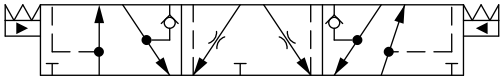
PVG-EX 32

Linear Flow Control Spools—Open/Closed Neutral Position

Schematic for PVBS without shuttle valve



Schematic for PVBS with shuttle valve



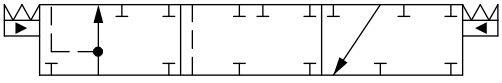
Part numbers for Back pressure Flow Control Spools (A/B->T flow track smaller than P->A/B)

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
11146795	PVE	Yes	15 [4.0]	40 [10.6]	65 [17.2]	15 [4.0]
11146797	PVE	Yes	15 [4.0]	65 [17.2]	40 [10.6]	10 [2.6]
11151486*	PVE	Yes	20 [5.3]	80 [21.1]	110 [29,1]	40 [10.6]

* Dead band 0.8 mm [0,03 in].

Single Acting Cylinder Flow Control Spools—Neutral A-port Position

Schematic for PVBS without shuttle valve



Symmetric flow control spools

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Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
11077423	PVE	-	5 [1,3]	5 [1,3]	-	-
157B7200	PVE	-	10 [2,6]	10 [2,6]	-	-
157B7201	PVE	-	25 [6,6]	25 [6,6]	-	-
157B7202	PVE	-	40 [10,6]	40 [10,6]	-	-
157B7203	PVE	-	65 [17,2]	65 [17,2]	-	-
157B7204	PVE	-	100 [26,4]	100 [26,4]	-	-
11015830	PVE	-	130 [34,3]	130 [34,3]	-	-
157B9200	PVH/PVHC	-	10 [2,6]	10 [2,6]	-	-
157B9201	PVH/PVHC	-	25 [6,6]	25 [6,6]	-	-
157B9202	PVH/PVHC	-	40 [10,6]	40 [10,6]	-	-
157B9203	PVH/PVHC	-	65 [17,2]	65 [17,2]	-	-
157B9204	PVH/PVHC	-	100 [26,4]	100 [26,4]	-	-
11085447	PVH/PVHC	-	130 [34,3]	130 [34,3]	-	-

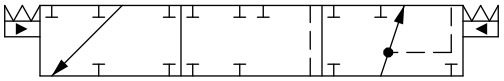
Back pressure Flow Control Spool (A/B->T flow track smaller than P->A/B)

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B9905	PVE	-	25 [6.6]	65 [17.2]	-	-

PVG-EX 32

Single Acting Cylinder Flow Control Spools—Neutral B-port Position

Schematic for PVBS without shuttle valve



Symmetric flow control spools

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B7300	PVE	-	-	-	10 [2,6]	10 [2,6]
157B7301	PVE	-	-	-	25 [6,6]	25 [6,6]
157B7302	PVE	-	-	-	40 [10,6]	40 [10,6]
157B7303	PVE	-	-	-	65 [17,2]	65 [17,2]
157B7304	PVE	-	-	-	100 [26,4]	100 [26,4]
157B9301	PVH/PVHC	-	-	-	25 [6,6]	25 [6,6]

Back pressure Flow Control Spool (A/B->T flow track smaller than P->A/B)

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B9912	PVE	-	-	-	65 [17,2]	25 [6,6]
11098878	PVE	-	-	-	25 [6,6]	5 [1,3]
11104486	PVH/PVHC	-	-	-	25 [6,6]	5 [1,3]

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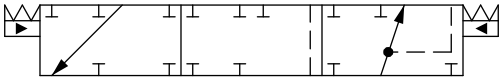
Single Acting Cylinder Linear Flow Control Spools—Neutral B-port Position

Schematic for PVBS without shuttle valve



Back pressure Flow Control Spool (A/B->T flow track smaller than P->A/B)

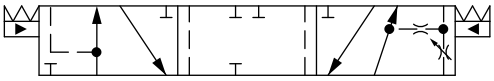
Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B9668	PVE	-	-	-	65 [17,2]	40 [10,6]

PVG-EX 32

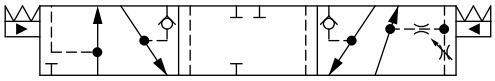
Flow/Pressure Control Spools—Closed Neutral Position

All spools have flow control on port A, pressure control on port B and a dead band on 1,5 mm [0,06 in].

Schematic for PVBS without shuttle valve



Schematic for PVBS with shuttle valve



Part numbers for Symmetric FC/PC Spools

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B7050	PVE	-	10 [2,6]	10 [2,6]	10 [2,6]	10 [2,6]
157B7051	PVE	-	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
157B7052	PVE	-	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B7053	PVE	-	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
157B7071	PVE	Yes	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
157B7072	PVE	Yes	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B7073	PVE	Yes	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
157B7074	PVE	Yes	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]
157B9052	PVH/PVHC	-	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B9053	PVH/PVHC	-	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
157B9054	PVH/PVHC	-	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]
157B9072	PVH/PVHC	Yes	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B9073	PVH/PVHC	Yes	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
157B9074	PVH/PVHC	Yes	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]

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Part numbers for Asymmetric FC/PC Spools

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B9529	PVE	Yes	65 [17,2]	65 [17,2]	40 [10,6]	65 [17,2]

Back pressure FC/PC Spools (A/B->T flow track smaller than P->A/B)

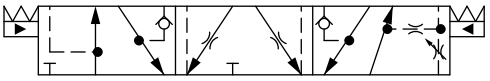
Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B9533	PVE	Yes	10 [2,6]	25 [6,6]	5 [1,3]	25 [6,6]
11120728	PVE	Yes	10 [2,6]	40 [10,6]	25 [6,6]	25 [6,6]
157B9536	PVE	Yes	25 [6,6]	40 [10,6]	10 [2,6]	40 [10,6]

PVG-EX 32

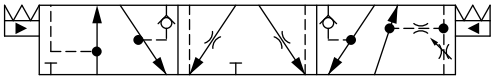
Flow/Pressure Control Spools—Throttled Open Neutral Position

All spools have flow control on port A, pressure control on port B and a dead band on 1,5 mm [0,06 in].

Schematic for PVBS without shuttle valve



Schematic for PVBS with shuttle valve



Part numbers for Symmetric FC/PC Control Spools

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B7150	PVE	-	10 [2,6]	10 [2,6]	10 [2,6]	10 [2,6]
157B7151	PVE	-	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
157B7152	PVE	-	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B7153	PVE	-	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
157B7154	PVE	-	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]
11067130	PVE	Yes	10 [2,6]	10 [2,6]	10 [2,6]	10 [2,6]
157B7171	PVE	Yes	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
157B9556	PVE	Yes	30 [7,9]	30 [7,9]	30 [7,9]	30 [7,9]
157B7172	PVE	Yes	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B7173	PVE	Yes	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
157B7174	PVE	Yes	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]
11107242	PVH/PVHC	Yes	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B9173	PVH/PVHC	Yes	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]

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Part numbers for Asymmetric FC/PC Control Spools

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B9592	PVE	Yes	40 [10,6]	40 [10,6]	15 [4,0]	15 [4,0]
11051961	PVE	Yes	100 [26,4]	100 [26,4]	65 [17,2]	65 [17,2]
11139550	PVE	Yes	115 [30,4]	115 [30,4]	65 [17,2]	65 [17,2]

Part number for Back pressure, FC/PC Spools (A/B->T flow track smaller than P->A/B)

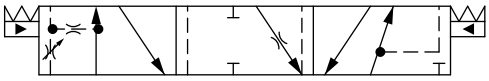
Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B9548	PVE	Yes	25 [6.6]	25 [6.6]	25 [6.6]	5 [1.3]

PVG-EX 32

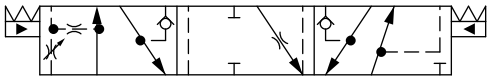
Flow/Pressure Control Spools—Throttled Open B to T in Neutral Position

All spools have pressure control on port A, flow control on port B and a dead band on 1,5 mm [0,06 in].

Schematic for PVBS without shuttle valve



Schematic for PVBS with shuttle valve



Part numbers for Symmetric FC/PC Control Spools

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B7150	PVE	-	10 [2,6]	10 [2,6]	10 [2,6]	10 [2,6]
157B7151	PVE	-	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
157B7152	PVE	-	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B7153	PVE	-	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
11122525	PVE	Yes	10 [2,6]	10 [2,6]	10 [2,6]	10 [2,6]
157B7562	PVE	Yes	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B7563	PVE	Yes	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]

Part numbers for Asymmetric FC/PC Control Spools

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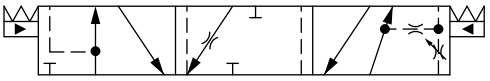
Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B9198	PVE	Yes	10 [2.6]	10 [2.6]	40 [10.6]	40 [10.6]

PVG-EX 32

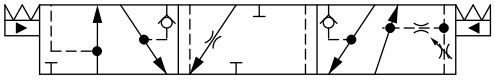
Flow/Pressure Control Spools—Throttled Open A to T in Neutral Position

All spools have flow control on port A, pressure control on port B and a dead band on 1,5 mm [0,06 in].

Schematic for PVBS without shuttle valve



Schematic for PVBS with shuttle valve



Part numbers for Symmetric FC/PC Control Spools

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B7450	PVE	-	10 [2,6]	10 [2,6]	10 [2,6]	10 [2,6]
157B7451	PVE	-	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
157B7452	PVE	-	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B7453	PVE	-	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
157B7470	PVE	Yes	10 [2,6]	10 [2,6]	10 [2,6]	10 [2,6]
157B7471	PVE	Yes	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
157B7472	PVE	Yes	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B7473	PVE	Yes	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
157B9083	PVH/PVHC	Yes	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]

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Part numbers for Asymmetric FC/PC Control Spools

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B9660	PVE	Yes	40 [10.6]	40 [10.6]	25 [6.6]	40 [10.6]

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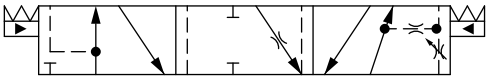
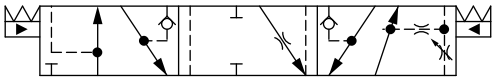
Flow/Pressure Control Spools—Throttled Open B to T in Neutral Position

All spools have flow control on port A, pressure control on port B and a dead band on 1,5 mm [0,06 in].

Schematic for PVBS without shuttle valve



Schematic for PVBS with shuttle valve



Part numbers for Asymmetric FC/PC Control Spools

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B9591	PVE	-	40 [10,6]	40 [10,6]	25 [6,6]	40 [10,6]
157B9641	PVE	-	50 [13,2]	50 [13,2]	10 [2,6]	10 [2,6]
157B9660	PVE	Yes	50 [13,2]	50 [13,2]	10 [2,6]	10 [2,6]
157B9832	PVE	Yes	55 [14,5]	55 [14,5]	25 [6,6]	25 [6,6]

Flow/Pressure Control Spools—Open/Closed in Neutral Position

All spools have flow control on port A, pressure control on port B and a dead band on 1,0 mm [0,04 in].

Schematic for PVBS without shuttle valve

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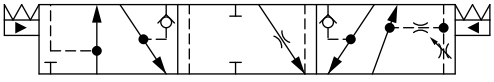
Part number for Back pressure FC/PC Spools (A/B->T flow track smaller than P->A/B)

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
11067514	PVE	—	40 [10.6]	40 [10.6]	25 [6.6]	25 [6.6]

Flow/Pressure Control Spools—Closed A and Open/Closed B Position

Schematic for PVBS with shuttle valve



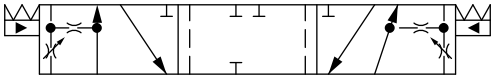
Part numbers for Symmetric FC/PC Flow Control Spools

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
11213570	PVE	Yes	40 [10.6]	40 [10.6]	40 [10.6]	40 [10.6]

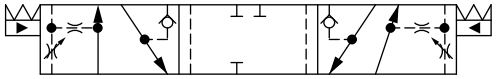
PVG-EX 32

Pressure Control Spools—Closed Neutral Position

Schematic for PVBS without shuttle valve



Schematic for PVBS with shuttle valve



Part numbers for Symmetric Pressure Control Spools

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B7015	PVE	-	5 [1,3]	5 [1,3]	5 [1,3]	5 [1,3]
157B7010	PVE	-	10 [2,6]	10 [2,6]	10 [2,6]	10 [2,6]
157B9540	PVE	-	18 [4,8]	18 [4,8]	18 [4,8]	18 [4,8]
157B7011	PVE	-	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
157B7012	PVE	-	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B7013	PVE	-	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
157B7035	PVE	Yes	5 [1,3]	5 [1,3]	5 [1,3]	5 [1,3]
157B7030	PVE	Yes	10 [2,6]	10 [2,6]	10 [2,6]	10 [2,6]
11081829	PVE	Yes	18 [4,8]	18 [4,8]	18 [4,8]	18 [4,8]
157B7031	PVE	Yes	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
157B7032	PVE	Yes	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B7033	PVE	Yes	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
157B9683	PVE	Yes	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]
157B9015	PVH/PVHC	-	5 [1,3]	5 [1,3]	5 [1,3]	5 [1,3]
157B9010	PVH/PVHC	-	10 [2,6]	10 [2,6]	10 [2,6]	10 [2,6]
157B9540	PVH/PVHC	-	18 [4,8]	18 [4,8]	18 [4,8]	18 [4,8]
157B9011	PVH/PVHC	-	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
157B9012	PVH/PVHC	-	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B9013	PVH/PVHC	-	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]

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Back pressure Pressure Control Spools (A/B->T flow track smaller than P->A/B)

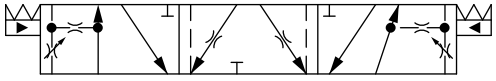
Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
11177945	PVE	-	40 [10,6]	65 [17,2]	65 [17,2]	65 [17,2]

PVG-EX 32

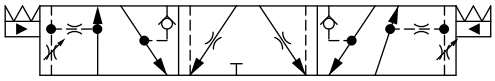
Pressure Control Spools—Throttled Open Neutral Position

All spools have pressure control on port A and B and a dead band on 1,5 mm [0,06 in].

Schematic for PVBS without shuttle valve



Schematic for PVBS with shuttle valve



Part numbers for Symmetric Pressure Control Spools

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B7115	PVE	-	5 [1,3]	5 [1,3]	5 [1,3]	5 [1,3]
157B7110	PVE	-	10 [2,6]	10 [2,6]	10 [2,6]	10 [2,6]
157B7111	PVE	-	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
157B7112	PVE	-	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B7113	PVE	-	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
157B9853	PVE	Yes	3 [0,8]	3 [0,8]	3 [0,8]	3 [0,8]
157B7135	PVE	Yes	5 [1,3]	5 [1,3]	5 [1,3]	5 [1,3]
157B7130	PVE	Yes	10 [2,6]	10 [2,6]	10 [2,6]	10 [2,6]
157B7131	PVE	Yes	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
157B7132	PVE	Yes	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B7133	PVE	Yes	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
157B7134	PVE	Yes	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]
11057575	PVH/PVHC	-	5 [1,3]	5 [1,3]	5 [1,3]	5 [1,3]
157B9110	PVH/PVHC	-	10 [2,6]	10 [2,6]	10 [2,6]	10 [2,6]
157B9112	PVH/PVHC	-	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B9113	PVH/PVHC	-	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
11057314	PVH/PVHC	Yes	5 [1,3]	5 [1,3]	5 [1,3]	5 [1,3]
157B9130	PVH/PVHC	Yes	10 [2,6]	10 [2,6]	10 [2,6]	10 [2,6]
157B9131	PVH/PVHC	Yes	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]

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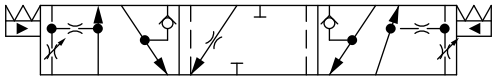
Part numbers for Asymmetric Pressure Control Spools

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B9525	PVE	-	20 [5,3]	20 [5,3]	10 [2,6]	10 [2,6]
11041330	PVE	-	40 [10,6]	40 [10,6]	20 [5,3]	20 [5,3]
157B9634	PVH/PVHC	Yes	10 [2,6]	10 [2,6]	5 [1,3]	5 [1,3]

PVG-EX 32

Pressure Control Spools—Throttled A to T in Neutral Position

Schematic for PVBS with shuttle valve



Part numbers for Pressure Control Spools Throttled A to T in Neutral Position

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B9646	PVE	Yes	15 [4]	15 [4]	15 [4]	15 [4]
157B9199	PVE	Yes	10 [2.6]	10 [2.6]	40 [10.6]	40 [10.6]

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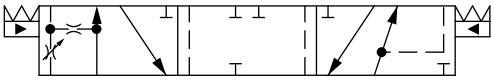
PVG-EX 32

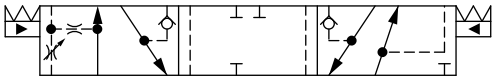
Pressure/Flow Control Spools—Closed Neutral Position

All spools have pressure control on port A, flow control on port B and a dead band on 1,5 mm [0,06 in].

Schematic for PVBS without shuttle valve



Schematic for PVBS with shuttle valve



Part numbers for Symmetric PC/FC Spools

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B7040	PVE	-	10 [2,6]	10 [2,6]	10 [2,6]	10 [2,6]
157B7041	PVE	-	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
157B7042	PVE	-	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B7043	PVE	-	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
157B7044	PVE	-	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]
157B7061	PVE	Yes	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
157B7062	PVE	Yes	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B7063	PVE	Yes	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
157B7064	PVE	Yes	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]
157B9040	PVH/PVHC	-	10 [2,6]	10 [2,6]	10 [2,6]	10 [2,6]
157B9041	PVH/PVHC	-	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
157B9042	PVH/PVHC	-	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B9043	PVH/PVHC	-	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
157B9044	PVH/PVHC	-	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]
157B9062	PVH/PVHC	Yes	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B9063	PVH/PVHC	Yes	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]

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Part numbers for Asymmetric PC/FC Spools

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B9589	PVE	Yes	25 [6.6]	25 [6.6]	40 [10,6]	40 [10,6]
157B9528	PVE	Yes	65 [17,2]	40 [10,6]	65 [17,2]	65 [17,2]
11223873	PVE	Yes	65 [17,2]	40 [10,6]	65 [17,2]	40 [10,6]

Back pressure PC/FC Spools (A/B->T flow track smaller than P->A/B)

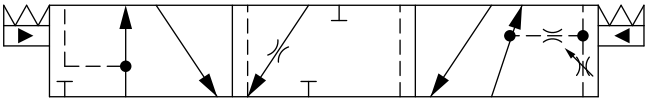
Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B9532	PVE	Yes	25 [6,6]	65 [17,2]	25 [6,6]	10 [2,6]
11051179	PVE	Yes	25 [6,6]	10 [2,6]	25 [6,6]	5 [1,3]
157B9535	PVE	Yes	40 [10,6]	10 [2,6]	40 [10,6]	25 [6,6]
11051177	PVE	Yes	25 [6,6]	25 [6,6]	40 [10,6]	10 [2,6]

PVG-EX 32

Pressure/Flow Control Spools—Closed Neutral Position with B-float

All spools have pressure control on port A, flow control on port B and a dead band on 1,5 mm [0,06 in].

Schematic for PVBS without shuttle valve



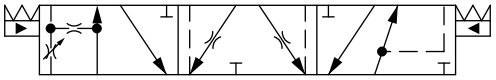
Part number for Symmetric PC/FC Spools

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B9637	PVE	—	10 [2.6]	10 [2.6]	10 [2.6]	10 [2.6]

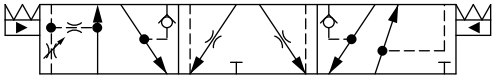
Pressure/Flow Control Spools—Throttled Open Neutral Position

All spools have pressure control on port A, flow control on port B and a dead band on 1,5 mm [0,06 in].

Schematic for PVBS without shuttle valve



Schematic for PVBS with shuttle valve



Part numbers for Symmetric PC/FC Control Spools

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Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
11122564	PVE	-	10 [2,6]	10 [2,6]	10 [2,6]	10 [2,6]
157B7141	PVE	-	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
157B7142	PVE	-	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B7143	PVE	-	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
157B7144	PVE	-	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]
157B7161	PVE	Yes	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
157B7162	PVE	Yes	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B7163	PVE	Yes	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
157B7164	PVE	Yes	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]
157B9163	PVH/PVHC	Yes	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]

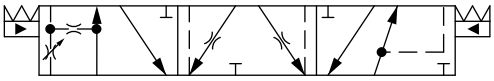
Part numbers for Asymmetric PC/FC Control Spools

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B9811	PVE	Yes	10 [2,6]	10 [2,6]	40 [10,6]	65 [17,2]
157B9988	PVE	Yes	25 [6,6]	10 [2,6]	25 [6,6]	25 [6,6]

PVG-EX 32

Pressure/Flow Control Spools—Open/Closed Neutral Position

Schematic for PVBS without shuttle valve

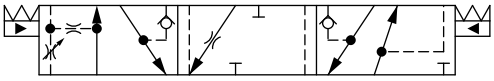


Part number for PC/FC Spool Open/Closed in Neutral Position

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
11104931	PVE	—	40 [10.6]	40 [10.6]	40 [10.6]	40 [10.6]

Pressure/Flow Control Spools—Open/Closed A and Closed B Position

Schematic for PVBS with shuttle valve



Part numbers for Symmetric PC/FC Control Spools

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
11213571	PVE	Yes	40 [10.6]	40 [10.6]	40 [10.6]	40 [10.6]
11198095	PVE	Yes	65 [17.2]	65 [17.2]	65 [17.2]	65 [17.2]

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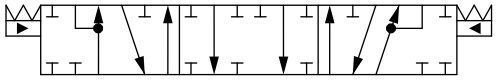
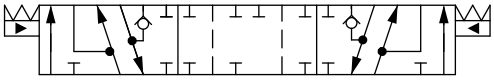
PVBS for PVBZ Main Spools Part Numbers

PVBZ Flow Control Spools—Closed Neutral Position

Schematic for PVBZ without shuttle valve



Schematic for PVBZ with shuttle valve



Part numbers for Symmetric Flow Control Spools

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B9405	PVE	-	5 [1,3]	5 [1,3]	5 [1,3]	5 [1,3]
157B9400	PVE	-	10 [2,6]	10 [2,6]	10 [2,6]	10 [2,6]
157B9401	PVE	-	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
157B9402	PVE	-	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B9403	PVE	-	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
157B9404	PVE	-	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]
11051945	PVE	Yes	5 [1,3]	5 [1,3]	5 [1,3]	5 [1,3]
11019630	PVE	Yes	10 [2,6]	10 [2,6]	10 [2,6]	10 [2,6]
11019631	PVE	Yes	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
11019633	PVE	Yes	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]

PVG-EX 32

Part numbers for Symmetric Flow Control Spools (continued)

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
11019634	PVE	Yes	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
11019635	PVE	Yes	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]
11105665	PVH/PVHC	-	5 [1,3]	5 [1,3]	5 [1,3]	5 [1,3]
11105445	PVH/PVHC	-	10 [2,6]	10 [2,6]	10 [2,6]	10 [2,6]
11105446	PVH/PVHC	-	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
11125900	PVH/PVHC	-	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]
11140563	PVH/PVHC	Yes	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
11140564	PVH/PVHC	Yes	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]

Part numbers for Back pressure Flow Control Spools (A/B->T flow track smaller than P->A/B)

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B9573*	PVH/PVHC	-	38 [10,0]	25 [6,6]	65 [17,2]	15 [4,0]
157B9651	PVE	-	38 [10,0]	25 [6,6]	65 [17,2]	15 [4,0]
11084227	PVE	Yes	5 [1,3]	25 [6,6]	25 [6,6]	25 [6,6]
11129527	PVE	Yes	40 [10,6]	10 [2,6]	40 [10,6]	10 [2,6]
11085297	PVE	Yes	20 [5,2]	40 [10,6]	40 [10,6]	10 [2,6]

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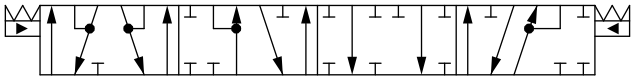
* Deadband 1,5 mm [0,06].

PVG-EX 32

PVBZ Flow Control Spools—Closed Neutral Position with A-float

Schematic for PVBZ with shuttle valve



Part numbers for Symmetric Flow Control Spools

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B9415	PVE	Yes	5 [1,3]	5 [1,3]	5 [1,3]	5 [1,3]
157B9410	PVE	Yes	10 [2,6]	10 [2,6]	10 [2,6]	10 [2,6]
157B9411	PVE	Yes	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
157B9412	PVE	Yes	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B9413	PVE	Yes	65 [17,2]	65 [17,2]	65 [17,2]	65 [17,2]
157B9414	PVE	Yes	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]
11027130	PVH/PVHC	Yes	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
11124250	PVH/PVHC	Yes	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]

Part numbers for Back pressure Flow Control Spools (A/B->T flow track smaller than P->A/B)

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
11085128	PVE	Yes	2 [0,5]	10 [2,6]	10 [2,6]	5 [1,3]

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Part number Flow Control Spools for PVML

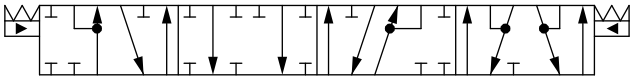
Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
11128843	PVE	Yes	40 [10,6]	40 [10,6]	40 [10,6]	40 [10,6]
157B9596	PVE	Yes	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]
157B9631	PVE	Yes	100 [26,4]	100 [26,4]	100 [26,4]	100 [26,4]
11017592	PVE	Yes	120 [31,7]	120 [31,7]	120 [31,7]	120 [31,7]
157B9434[1)]	PVE	Yes	120 [31,7]	120 [31,7]	120 [31,7]	120 [31,7]

[1)] Dead band 0,8 mm [0,03 in].

PVG-EX 32

PVBZ Flow Control Spools—Closed Neutral Position with B-float

Schematic for PVBZ with shuttle valve



Part numbers for Symmetric Flow Control Spools

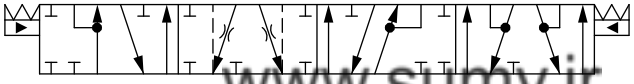
Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
11147069	PVE	Yes	100 [26.4]	100 [26.4]	100 [26.4]	100 [26.4]

Part number Flow Control Spools for PVML

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
11146502	PVE	Yes	100 [26.4]	100 [26.4]	100 [26.4]	100 [26.4]

PVBZ Flow Control Spools—Throttled Open Neutral Position with B-float

Schematic for PVBZ with shuttle valve



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Part number for Symmetric Flow Control Spools

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B9690	PVE	Yes	15 [4]	15 [4]	15 [4]	15 [4]

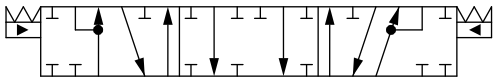
Part number Flow Control Spools for PVML

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
11146502	PVE	Yes	100 [26.4]	100 [26.4]	100 [26.4]	100 [26.4]

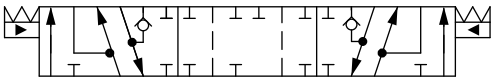
PVG-EX 32

PVBZ Linear Flow Control Spools—Closed Neutral Position

Schematic for PVBZ without shuttle valve



Schematic for PVBZ with shuttle valve



Part numbers for Symmetric Flow Control Spools

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B9664	PVE	-	25 [6,6]	25 [6,6]	25 [6,6]	25 [6,6]
157B9809	PVE	-	80 [21,1]	80 [21,1]	80 [21,1]	80 [21,1]

Part numbers for Asymmetric Flow Control Spools

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
11130939	PVE	Yes	25 [6,6]	40 [10,6]	40 [10,6]	25 [6,6]

Part numbers for Flow Control Spools for PVML

Part Number	Actuation	PVB with shuttle valve	Flow - l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B9866	PVE	Yes	25 [6,6]	40 [10,6]	40 [10,6]	25 [6,6]

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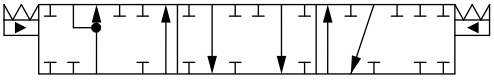
PVBZ Single Acting Cylinder Flow Control Spools—Closed Neutral A-port Position

Schematic for PVBS without shuttle valve



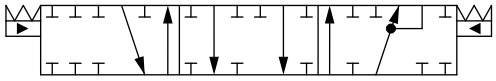
Symmetric flow control spools

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B9859	PVE	-	25 [6.6]	25 [6.6]	-	-

PVG-EX 32

PVBZ Single Acting Cylinder Flow Control Spools—Closed Neutral B-port Position

Schematic for PVBS without shuttle valve

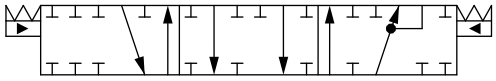


Symmetric flow control spools

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
11149444	PVE	-	-	-	140 [37]	140 [37]

PVBZ Single Acting Cylinder Linear Flow Control Spools—Closed Neutral B-port Position

Schematic for PVBS without shuttle valve



Symmetric flow control spools

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B9859	PVE	-	25 [6.6]	25 [6.6]	-	-

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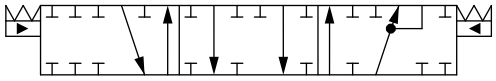
PVBZ–HS Single Acting Cylinder Flow Control Spools—Closed Neutral Position

Schematic for PVBS with or without shuttle valve



Back pressure Flow Control Spools (B->T flow track smaller than P->B)

Part Number	Actuation	PVB with shuttle valve	Flow – l/min [US gal/min]			
			A → T	P → A	P → B	B → T
157B9912	PVE	Yes	-	-	40 [10,6]	25 [6,6]
11098878	PVE	Yes	-	-	100 [26,4]	65 [17,2]

PVG-EX 32 Actuation

PVG 32 actuation can be done manually, hydraulically, and electrically.

PVG 32 actuation overview:

- *PVM Manual actuation* on page 124
- *PVMD detention covers* on page 126
- *PVH Hydraulic Actuation* on page 127

For information, description and part numbers on electrical EX-actuators please see the following documents:

- AN212686484914: PVE-EX Installation Guide eb mb version, Group II
- AN216686485434: PVE-EX Installation Guide db version, Group I & II
- AN249186480855: PVE-EX Installation Guide Aex d version
- BC248086480848: PVE-EX Technical Information db version + eb mb version

PVG-EX 32

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PVG-EX 32

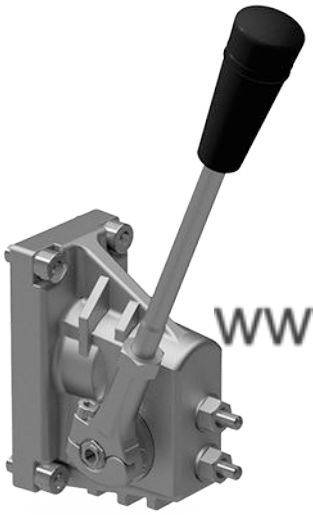
PVM Manual actuation

The PVM variants are based on a generic platform with a selection of additional features, enabling you to tailor the PVM to suit the demands of any hydraulic system, which includes the following main variants:

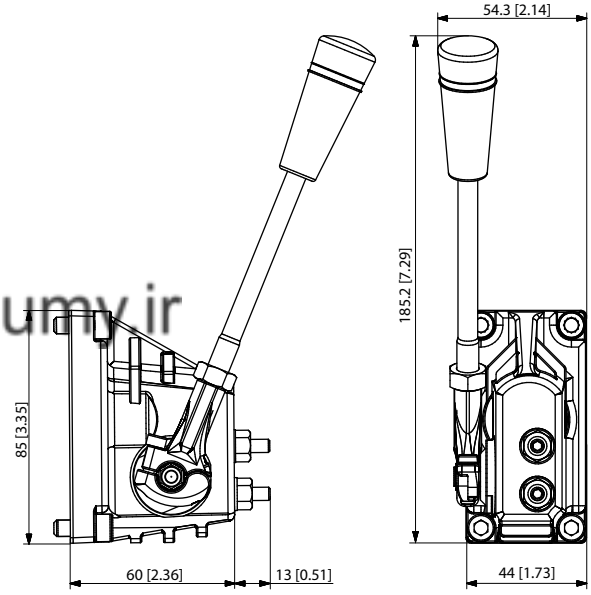
- PVM manual actuation or override of a function
- Spring centering cover without manual override (PVML)
  - Optional with lever base
  - Optional with lever base and lever
  - Optional flow adjustment screws

The adjustment screws are intended for limiting the spool travel and thereby the maximum achievable flow.

PVM cover



PVM dimensions



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Control lever data

No lever position	Standard control range	Control lever range	Control lever range + float position
2 x 6	± 13.4°	± 19.5°	22.3°

PVM versions torque data

Spool displacement	PVM+PVMD PVM+PVE	PVM+PVH	PVM+PVMR	PVM+PVMF
From neutral position	2.2 ±0.2 N•m [19.5 ±1.8 lb•in]	2.5 ±0.2 N•m [22.1 ± 1.8 lb•in]	17 N•m [3.8 lb•in]	22 N•m [5.0 lb•in]
Max. spool travel	2.8 ±0.2 N•m [24.8 ±1.8 lb•in]	6.9 ±0.2 N•m [61.0 ±1.8 lb•in]	–	–
Into float position	–	–	–	60 N•m [13.5 lb•in]
Away from float position	–	–	–	28 N•m [6.3 lb•in]
From any other position	–	–	8.5 N•m [73.3 lb•in]	–

PVG-EX 32

Part number	Material	Adjustment screws	Lever base	Lever base and lever	Weight
157B3161	Cast iron	Yes	—	Yes	0,4 kg [0,88 lb]

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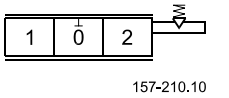
PVG-EX 32

PVMD detention covers

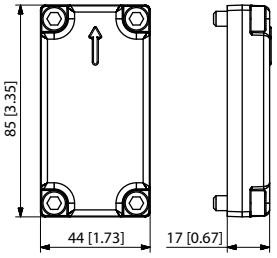
The PVMD cover, also referred to as detention cover, is intended for manually activated PVB sections.

PVMD symbol



PVMD detention cover

Dimensions, mm [in]



PVMD Detention Covers detailed information

Technical data

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Spool displacement		Torque (dependent on spool)	
From neutral position	PVM+PVMD	2,2±0,2 N·m	[19,5±1,8 lbf·in]
Max. spool travel	PVM+PVMD	2,8±0,2 N·m	[24,8±1,8 lbf·in]

Part numbers for PVMD/F/R covers

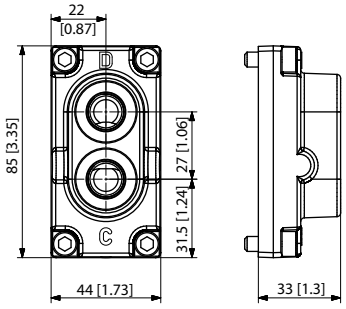
Part number	Type	Material
157B0021	PVMD	Cast iron

PVG-EX 32

PVH Hydraulic Actuation

PVH cover

PVH 32 cover dimensions



The hydraulic remote control lever should be connected directly to the tank.

Technical data

Max pilot pressure	30 bar	435 psi
Proportional control pressure range	5 - 15 bar	75 – 220 psi
Operating torque from neutral	2,5±0,2 N·m	[22,1±1,8 lbf·in]
Operating torque max spool position	6,9±0,2 N·m	[61,0±1,8 lbf·in]

Part numbers for PVH Hydraulic Actuation

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Part number	Material	Weight
157B0014	Cast iron	9/16-18 UNF
157B0016	Cast iron	G1/4"

PVSI End Plates

The PVG 32 PVSI end plates close off the valve stack section placed between them by placing them at the end. Furthermore, the end plate is ensuring Load Sense (LS) is relieved to tank pressure when the valve is not operated.

The PVSI end plate variants are based on a generic platform with a wide selection of additional features, enabling you to tailor the PVSI to suit the demands of any hydraulic system.

The generic PVSI end plate platform includes the following main variants.

- **PVSI** - Cast iron
- **PVSI with LX-connection** - Cast iron

PVSI

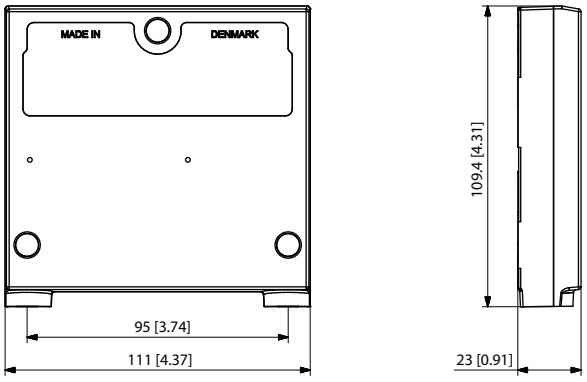
The PVSI Start Plates features:

- Integrated LS pressure relief valve to tank
- Optional integrated thermal orifice
- Optional version without seals

PVG-EX 32

PVSI module

PVSI dimensions



Weight: 0.47 kg [1.05 lb]

PVSI schematic

See part number table for details on maximum pressure capacity

Technical data

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Max. rated pressure	P-port continuous	300 / 350 bar	[4351/5075 psi]
	P-port intermittent	400 bar	[5800 psi]
	T-port static/dynamic	25/40 bar	[365/580 psi]
Oil temperature	Recommended	30 60°C	[86 140°F]
	Minimum	-30°C	[-22°F]
	Maximum	90°	[194°F]
Ambient temperature	Recommended	-30 60°C	[-22 140°F]
Oil viscosity	Operating range	12 75 mm2/s	[65 347 SUS]
	Minimum	4 mm2/s	[39 SUS]
	Maximum	460 mm2/s	[2128 SUS]
Oil contamination acc. to ISO 4406	Maximum	23/19/16	

Part numbers for PVSI End Plate

Part number	Maximum pressure		Material	Weight kg [lbs]	Seals	Thermal orifice	Mounting
157B2004	350 bar	5076 psi	Cast iron	1.745 [3.85]	Yes	-	5/16-18 UNC
157B2008	350 bar	5076 psi	Cast iron	1.745 [3.85]	no*	-	M8
157B2018	350 bar	5076 psi	Cast iron	1.745 [3.85]	no*	-	M8
157B2014	350 bar	5076 psi	Cast iron	1.745 [3.85]	Yes	-	M8
157B2902	350 bar	5076 psi	Cast iron	1.745 [3.85]	Yes	Yes (0.8mm)	M8

* For use when using a mid-inlet

PVG-EX 32

PVSI with LX-connection

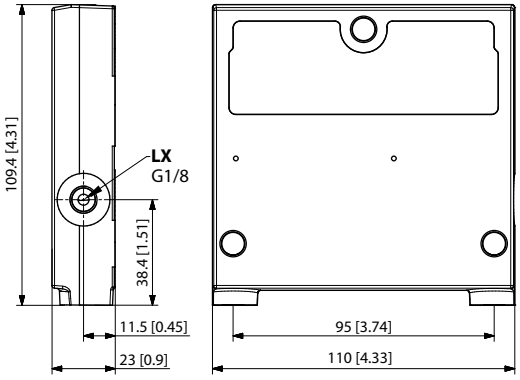
The PVSI type end plates are made of aluminum while the PVSI types are made of cast iron thereby being able to withstand a higher pressure.

The PVSI with LX-port connection features:

- Integrated LS pressure relief valve to tank
- Threaded LX port for connecting another valve to LS network

PVSI with LX-connection

PVSI with LX-connection dimensions



PVSI with LX-connection schematic

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See part number table for details on maximum pressure capacity

Technical data

Max. rated pressure	P-port continuous	300 / 350 bar	[4351/5075 psi]
	P-port intermittent	400 bar	[5800 psi]
	T-port static/dynamic	25/40 bar	[365/580 psi]
Oil temperature	Recommended	30 60°C	[86 140°F]
	Minimum	-30°C	[-22°F]
	Maximum	90°	[194°F]
Ambient temperature	Recommended	-30 60°C	[-22 140°F]
Oil viscosity	Operating range	12 75 mm2/s	[65 347 SUS]
	Minimum	4 mm2/s	[39 SUS]
	Maximum	460 mm2/s	[2128 SUS]
Oil contamination acc. to ISO 4406	Maximum	23/19/16	

Part numbers for PVSI with LS-connection End Plate

Part number	Maximum pressure		Material	Weight kg [lbs]	LX port	Mounting
157B2015	350 bar	5076 psi	Cast iron	1.695 [3.74]	G1/4"	M8
157B2910	350 bar	5076 psi	Cast iron	1.695 [3.74]	M12x1.5 ISO 6149	M8
157B2005	350 bar	5076 psi	Cast iron	1.695 [3.74]	1/2-20 UNF	5/16-18 UNC

PVG-EX 32

PVSKM Full Flow Cut Off Modules

The PVG-EX 32 PVSKM inline full flow cut-off module, also referred to as full flow cut-off modules, enables an integrated full flow cut-off and High Pressure Carry Over (HPCO) functionality by means of the integrated PVSKM spool, controlled either manually, hydraulically or electrohydraulically.

The PVG-EX 32 PVSKM modules, also referred to as full flow cut-off modules, inline full flow cut-off of flow or as an HPCO, High Pressure Carry Over port.

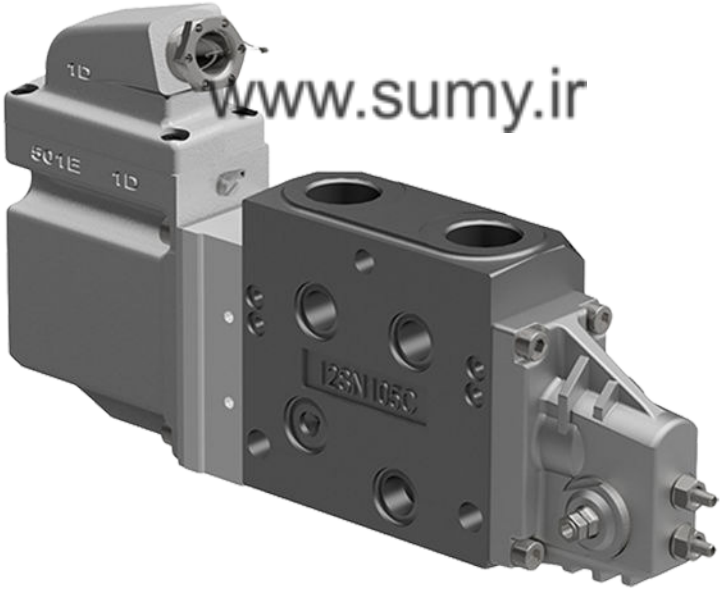
The PVSKM module allows a position anywhere in the PVG-EX 32 valve group, similar to a standard PVG-EX 32 basic module. The freedom of position of the PVSKM module in the PVG-EX 32 valve group enables a full flow cut-off, of the entire valve group, by placing the PVSKM right after the PVP inlet module, or only a part of the valve group, by placing the PVSKM elsewhere in the valve group.

The PVSKM module variants are based on a generic platform with a wide selection of additional features, enabling you to tailor the valve stack to comply with Category 2 or 3 safety systems according to ISO 13849.

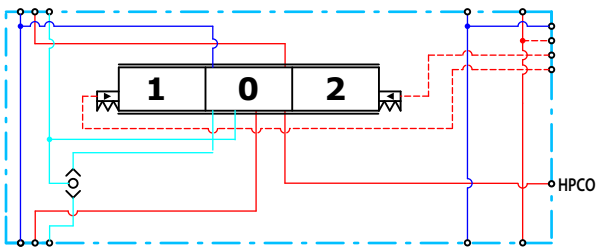
The PVSKM Full Flow Cut-Off Module features:

- Threaded port for HPCO port
- Optional T0 facility and external T0 port
- Different PVSKM spool types depending on requested HPCO flow capacity

PVSKM Full Flow Cut Off module



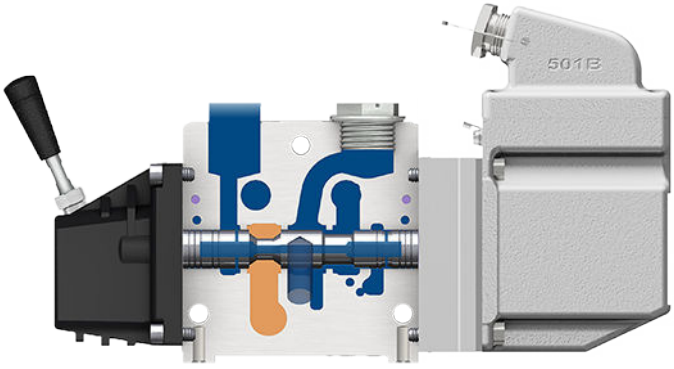
PVSKM schematic



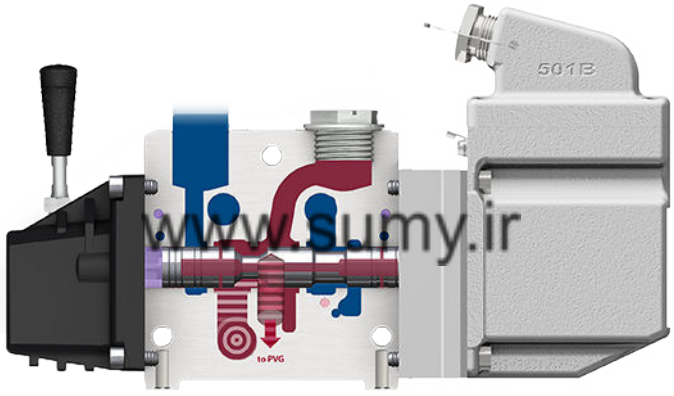
PVG-EX 32

PVSKM Functionality

Neutral mode



PVG mode



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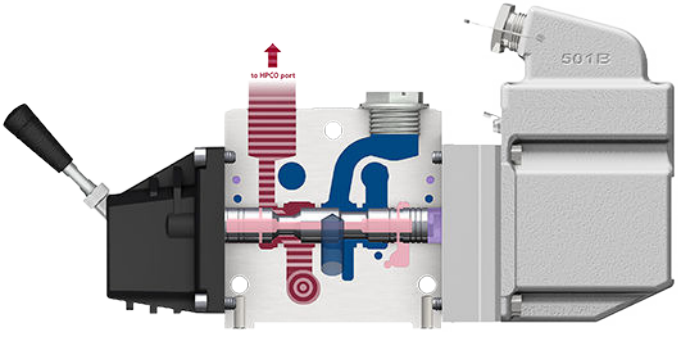
HPCO mode



Maximum pressure for P- and T-port

Max. P-port continuous	Max. P-port intermittent	Max. T-port static/dynamic
210 bar [3045 psi]	400 bar [5800 psi]	25/40 bar [365/580 psi]

Technical specification

Parameter	Minimum	Recommended range	Maximum
Fluid temperature	-30°C [-22°F]	30 to 60°C [86 to 140°F]	90° [194°F]
Fluid viscosity	4 mm^2/s [39 SUS]	12 to 75 mm^2/s [65 to 347 SUS]	460 mm^2/s [2128 SUS]

PVG-EX 32

Technical specification (continued)

Parameter	Minimum	Recommended range	Maximum
Fluid cleanliness (mechanical activation)	23/19/16 (according to ISO 4406)		
Fluid cleanliness (PVE activation)	18/16/13 (according to ISO 4406)		
Operating temperature	Ambient: -30 to 60°C [-22 to 140°F]		

Part number for PVSKM module

Part number	P-port/HPCO-port	T0 Facility	Mounting
11099469	G3/4"	yes	M8
11107369	1 1/16-12 UN	yes	
11117252	G3/4"	-	

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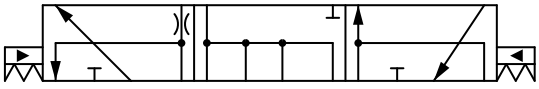
PVG-EX 32

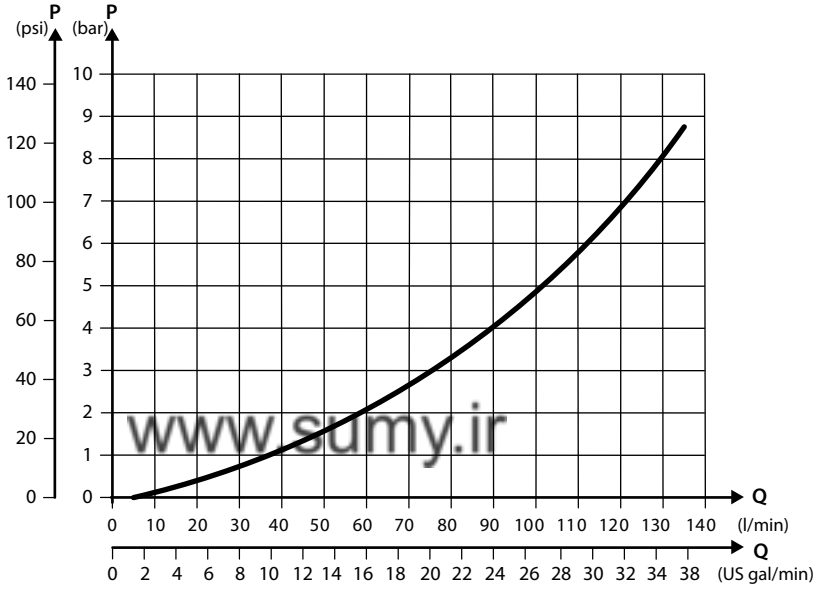
PVSKM Spool

PVSKM Spool schematic



Theoretical Performance

Pressure drop P to P characteristic



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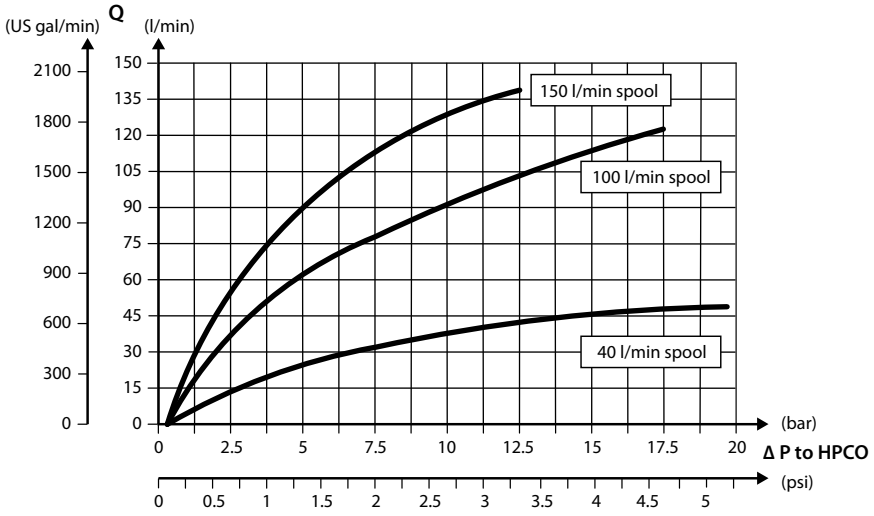
Pressure drop from P to HPCO characteristics



PVG-EX 32

Part number for PVSKM spool

Part number	HPCO flow	Actuation method
11100036	150 l/min [39.6 US gal/min]	PVE
11116733	40 l/min [10.6 US gal/min]	
11116734	100 l/min [26.4 US gal/min]	
11111293	150 l/min [39.6 US gal/min]	PVH/PVHC

PVAS Stay Bolts

PVAS Stay Bolts kit for various PVG combinations consist of three tie rods, six washers, six nuts and O-ring. Use the guide and reference tables how to choose PVAS kit.

The tie rods are inserted through the entire length of the PVG valve stack. The nuts are tightened at the pump side and at the end plate.

To find the PVAS kit that fits your PVG-EX 32 valve stack, you need to go to the table *PVG-EX 32 modules total length* on page 135 and find the length. Then go to the table *PVAS Part Numbers* on page 135 and find the matching part number.

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PVG-EX 32

PVAS Part Numbers

PVAS part numbers according to accumulated length interval PVG-EX 32.

PVAS part numbers

Length, mm [in]	Part number	Length, mm [in]	Part number
20 – 48 [0.79 – 1.89]	**11188219**	361 – 372 [14.21 – 14.65]	**11188205**
49 – 60 [1.93 – 2.36]	**11188218**	373 – 384 [14.69 – 15.12]	**157B8026**
61 – 72 [2.40 – 2.83]	**157B8000**	385 – 396 [15.16 – 15.59]	**11188204**
73 – 84 [2.87 – 3.31]	**11188217**	397 – 408 [15.63 – 16.06]	**157B8007**
85 – 96 [3.35 – 3.78]	**157B8031**	409 – 420 [16.10 – 16.54]	**11188203**
97 – 108 [3.82 – 4.25]	**11188216**	421 – 432 [16.58 – 17.01]	**157B8027**
109 – 120 [4.29 – 4.72]	**157B8001**	433 – 444 [17.05 – 17.48]	**11188202**
121 – 132 [4.76 – 5.20]	**11188215**	445 – 456 [17.52 – 17.95]	**157B8008**
133 – 144 [5.24 – 5.67]	**157B8021**	457 – 468 [17.99 – 18.43]	**11188201**
145 – 156 [5.71 – 6.14]	**11188214**	469 – 480 [18.47 – 18.90]	**157B8028**
157 – 168 [6.18 – 6.61]	**157B8002**	481 - 492 [18.94 – 19.37]	**11188200**
169 – 180 [6.65 – 7.09]	**11188213**	493 – 504 [19.41 – 19.84]	**157B8009**
181 – 192 [7.13 – 7.56]	**157B8022**	505 – 516 [19.88 – 20.31]	**11188199**
193 – 204 [7.60 – 8.03]	**11188212**	517 – 528 [20.35 – 20.79]	**157B8029**
205 – 216 [8.07 – 8.50]	**157B8003**	529 – 540 [20.83 – 21.26]	**11188198**
217 – 228 [8.54 – 8.98]	**11188211**	541 – 552 [21.30 – 21.73]	**157B8010**
229 – 240 [9.02 – 9.45]	**157B8023**	553 – 564 [21.77 - 22.20]	**11188197**
241 – 252 [9.49 – 9.92]	**11188210**	565 – 576 [22.24 – 22.68]	**157B8030**
253 – 264 [9.96 – 10.39]	**157B8004**	577 – 588 [22.72 – 23.15]	**11188196**
265 – 276 [10.43 – 10.87]	**11188209**	589 – 600 [23.19 – 23.62]	**157B8061**
277 – 288 [10.91 – 11.34]	**157B8024**	601 – 612 [23.66 – 24.09]	**11188195**
289 – 300 [11.38 – 11.81]	**11188208**	613 – 624 [24.13 – 24.57]	**157B8081**
301 – 312 [11.85 – 12.28]	**157B8005**	625 – 636 [24.61 – 25.04]	**11188194**
313 – 324 [12.32 – 12.76]	**11188207**	637 – 648 [25.08 – 25.51]	**157B8062**
325 – 336 [12.80 – 13.23]	**157B8025**	649 – 660 [25.55 – 25.98]	**11188189**
337 – 348 [13.27 – 13.70]	**11188206**	661 - 672 [26.02 – 26.46]	**157B8082**
349 – 360 [13.74 – 14.17]	**157B8006**		

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PVG-EX 32 modules total length

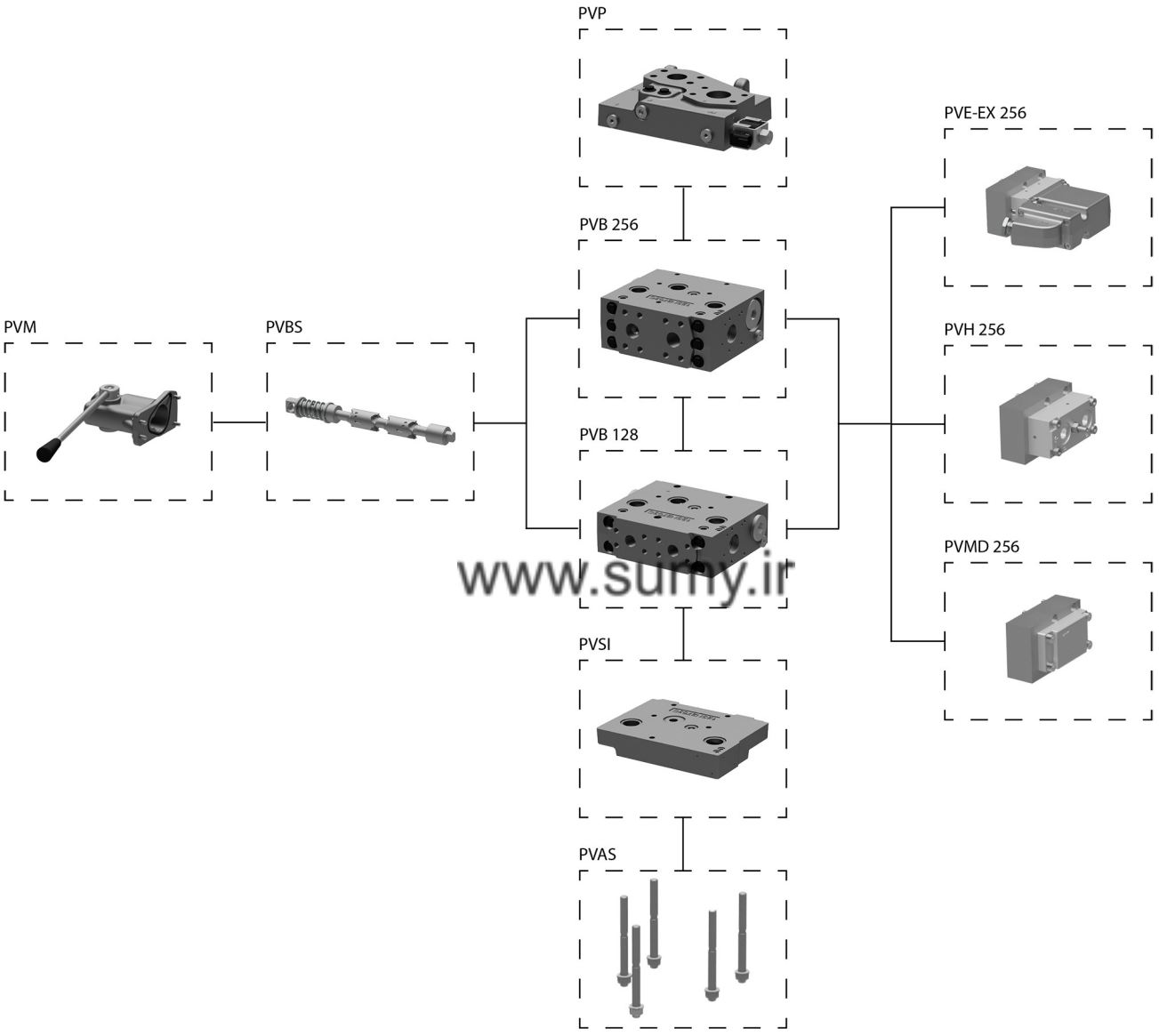
Table with total length of the PVG 32 depending on the number of PVB modules.

No. of PVB 32	1	2	3	4	5	6	7	8	9	10	11	12
Length mm [in]	119 [4.69]	167 [6.57]	215 [8.46]	263 [10.35]	311 [12.24]	359 [14.13]	407 [16.02]	455 [17.91]	503 [19.80]	551 [21.69]	599 [23.58]	647 [25.47]

PVG-EX 128/256

General Information

PVG-EX 128/256 Proportional Valve Group



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Navigation

PVPV	*PVB 128*	*PVB 256*
PVLP and PVLA	*PVBS main spools*	*PVM*
PVH	*PVMD*	*PVSI and PVGI*
PVAS		

PVG-EX 128/256

PVG-EX 128/256 general description

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 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 of the PVG-EX 128/256 valve

- Inlet flow up to 1200 l/min [317 US gal/min]
- Compact sectional platform solution for easy integration with PVG 16 and PVG 32
- 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
- Reliable regulation characteristics across the entire flow range
- Load sense relief valves for A and B port enables reduced energy loss at target pressure
- Optimized for lower pressure drop and higher efficiency
- Several options for connection threads and flange mount
- Compact design, easy installation and serviceability
- Static Load sense system when selecting pump control
- Internal T0 connection in all PVSI/PVGI

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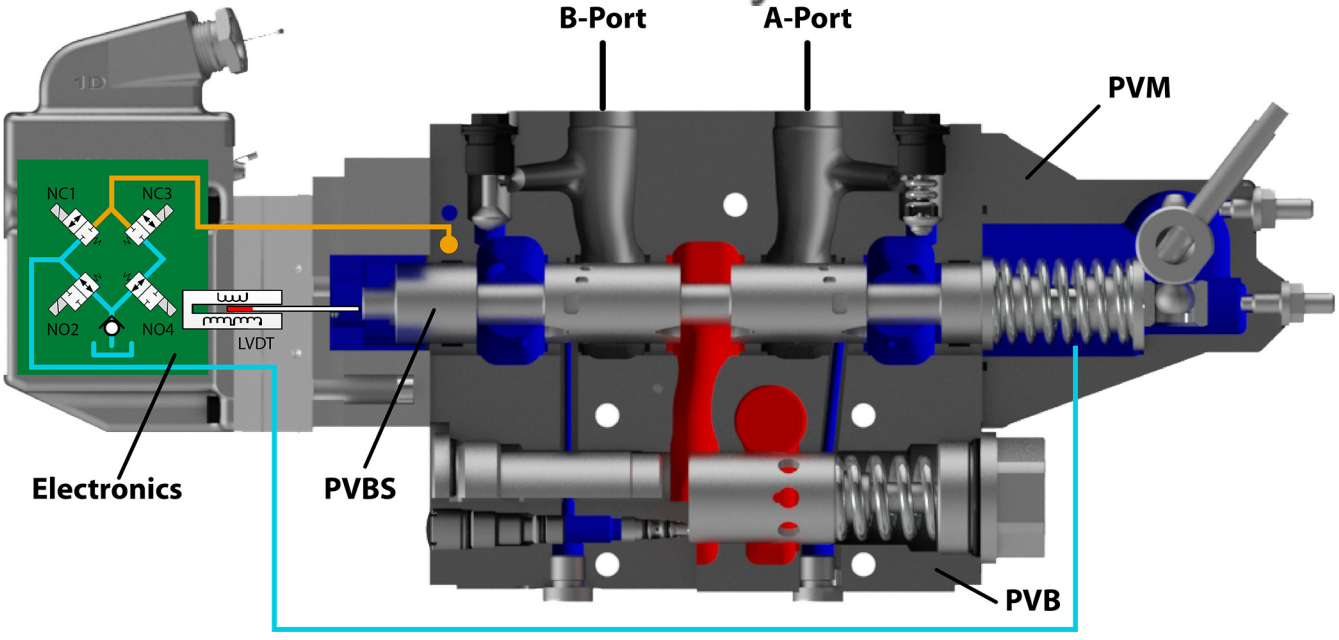


PVG-EX 128/256

PVG-EX 128/256 PVPV Inlet Modules

The Closed Center PVPV inlet with integrated pilot pressure reduction valve (PPRV) for PVE activation is intended for use with variable displacement pumps in applications where a valve group with electro-hydraulic or hydraulically controlled work sections is desired.

All Variants are prepared for 2xPVLP shock/anti-cavitation valves for pressure peak protection and anti-cavitation prevention.

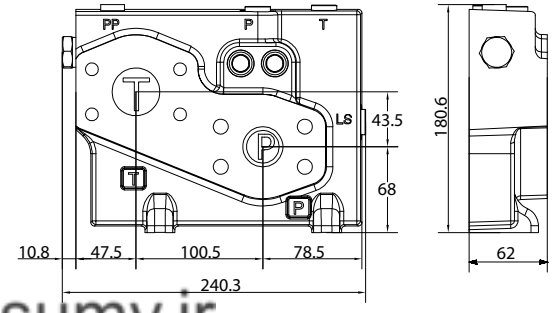
PVLPs are for pressure peak protection in the system and pump.

Optional electrically actuated pilot shut off valve PVPP provides additional functional system safety by removing pilot oil from the electrical actuation or hydraulic actuation system, disabling main spool actuation.

All variants have internal T0 to tank connection in the PVSI and PVGI end plates.

PVPV 256

PVPV inlet module dimensions (mm)



Weight 10 kg [22 lbs]

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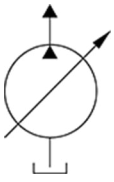
The PVPV 256 inlet module variants are based on a generic platform with a selection of additional features, enabling you to tailor the PVPV inlet to suit the demands of any hydraulic system.

Variable displacement pump symbol



The generic PVPV 256 inlet module platform includes the following main variants:

*Closed Center PVPV with PPRV PVE*Closed center inlet module for variable displacement pumps.

Closed Center PVPV with PPRV for PVH/PVHC Closed center inlet module for variable displacement pumps.

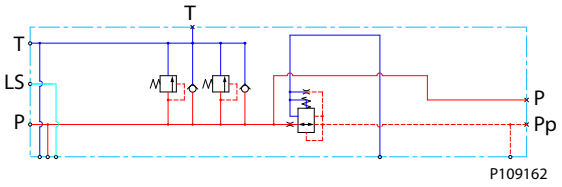
Optional feature: PVPP Electrical Pilot Shut-Off Valve - Closed center inlet module for variable displacement pumps.

PVG-EX 128/256

PVG-EX 128/256 Closed Center PPRV for PVE Activation and/or Mechanical

The PVPV 256 inlet modules, also referred to as pump side modules, act as an interface between the PVG 128/256 proportional valve group and the hydraulic pump and tank reservoir.

Schematic



Technical data

Max. rated pressure	P-port continuous	350 bar	[5076 psi]
	P-port intermittent	400 bar	[5800 psi]
	T-port static/dynamic	25/40 bar	[363/580 psi]
Rated Port P (PVPV/PVSI)	P-port	600/600 l/min	[159/159 US gal/min]
Oil temperature	Recommended	30 to 60°C	[86 to 140°F]
	Minimum	-30°C	[-22°F]
	Maximum	90°	[194°F]
Ambient temperature	Recommended	-30 to 60°C	[-22 to 140°F]
Oil viscosity	Operating range	12 to 75 mm^2/s	[65 to 347 SUS]
	Minimum	4 mm^2/s	[39 SUS]
	Maximum	460 mm^2/s	[2128 SUS]
Oil contamination according to ISO 4406	Maximum	23/19/16	

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Part numbers for Closed Center PVPV with PPRV for PVE

Part number	PPRV	P-port	T-port	LS-port Gauge-port	M-port Gauge-port	T/Pilot Gauge-port	Mounting feet
11173130	PVE	Metric Flange 1-1/4″	Metric Flange 1-1/2″	G3/8"BSP	G3/8"BSP	G1/4"BSP	M12
11176703	PVE	Thread Ports G1-1/2" BSP	Thread Ports G1-1/2" BSP	G3/8"BSP	G3/8"BSP	G1/4"BSP	M12
11176691	PVE	SAE Flange 1-1/4″ UNF	SAE Flange 1-1/2″ UNF	9/16-18 UNF	3/4-16 UNF	7/16-20 UNF	M12
11176702	PVE	Thread Ports 1-7/8″ UNF	Thread Ports 1-7/8″ UNF	9/16-18 UNF	3/4-16 UNF	7/16-20 UNF	M12

PVG-EX 128/256

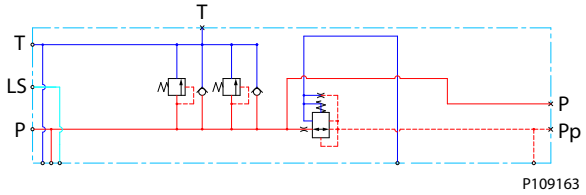
PVG-EX 128/256 PPRV for PVH Activation and/or Mechanical

The Closed Center PVPV inlet with integrated pilot pressure reduction valve (PPRV) for PVH/PVHC activation is intended for use with variable displacement pumps in applications where a valve group with PVH/PVHC controlled work sections is desired.

All Variants are prepared for 2xPVLP shock/anti-cavitation valves for pressure peak protection and anti-cavitation prevention.

Optional electrically actuated pilot shut off valve PVPP provides additional functional system safety by removing pilot oil from the electrical actuation or hydraulic actuation system, disabling main spool actuation.

Schematic



Technical data

Max. rated pressure	P-port continuous	350 bar	[5076 psi]
	P-port intermittent	400 bar	[5800 psi]
	T-port static/dynamic	25/40 bar	[363/580 psi]
Rated Port P (PVPV/PVSI)	P-port	600/600 l/min	[159/159 US gal/min]
Oil temperature	Recommended	30 to 60°C	[86 to 140°F]
	Minimum	-30°C	[-22°F]
	Maximum	90°	[194°F]
Ambient temperature	Recommended	-30 to 60°C	[-22 to 140°F]
Oil viscosity	Operating range	12 to 75 mm^2/s	[65 to 347 SUS]
	Minimum	4 mm^2/s	[39 SUS]
	Maximum	460 mm^2/s	[2128 SUS]
Oil contamination according to ISO 4406	Maximum	23/19/16	

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Part numbers for Closed Center PVPV with PPRV for PVH

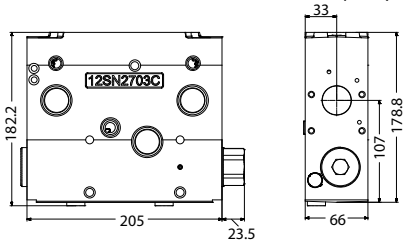
Part number	PPRV	P-port	T-port	LS-port Gauge-port	M-port Gauge-port	T/Pilot Gauge-port	Mounting feet
11178095	PVH	Metric Flange 1-1/4"	Metric Flange 1-1/2"	G3/8"BSP	G3/8"BSP	G1/4"BSP	M12
11178098	PVH	Thread Ports G1-1/2" BSP	Thread Ports G1-1/2" BSP	G3/8"BSP	G3/8"BSP	G1/4"BSP	M12
11178117	PVH	SAE Flange 1-1/4" UNF	SAE Flange 1-1/2" UNF	9/16-18 UNF	3/4-16 UNF	7/16-20 UNF	M12
11178119	PVH	Thread Ports 1-7/8" UNF	Thread Ports 1-7/8" UNF	9/16-18 UNF	3/4-16 UNF	7/16-20 UNF	M12

PVG-EX 128/256

PVG-EX PVB 128 Variant Overview

PVB 128

PVB 128 basic module dimensions (mm)



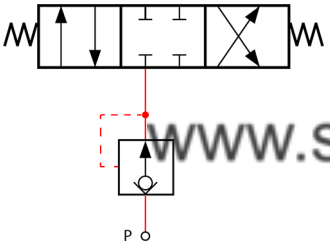
Weight 10 kg [22 lbs]

The PVG 128 Basic modules (PVB), also referred to as work sections, is the interface between the PVG 128 proportional valve group and the work function such as a cylinder or a motor.

The PVB basic module variants are based on a generic platform with a selection of additional features, enabling you to tailor the PVB to suit the demands of any hydraulic system.

The compensator is a 3-way type which include load drop check valve functionality, compensator function and neutral relief which avoid A and B port pressure build up in neutral.

Symbol - compensated PVB



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The generic PVB basic module platform includes the following main variants:

PVB 128 Compensated basic module.

Compensated PVB 128 w LSA/B Compensated basic module with LSA/B relief valve for each work port.

Compensated PVB 128 with LSA/B and PVLP Compensated basic module with LSA/B relief valve for each work port and 2xPVLPs for each work port.

Warning

Risk of leak
The module will leak if the flange mount screws are not properly secured.
Flange mount screws according to ISO 6162-2.

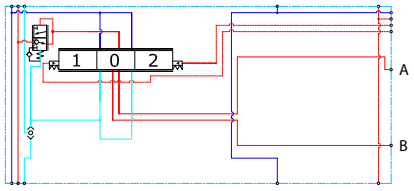
PVG-EX 128/256

PVG-EX PVB 128 3-way Compensator

The compensated PVB is intended for controlling a work function where the function behavior in terms of flow and pressures requires independency on the load pressure of other functions used simultaneously.

The compensator is a 3-way type which include load drop check valve functionality, compensator function and neutral relief which avoid A and B port pressure build up in neutral.

Schematic



P109173

Technical data

Max. rated pressure	A/B port continuous	350 bar	[5076 psi]
	A/B port intermittent	400	[5800 psi]
Max. rated flow*	A/B port	300 l/min	[79 US gal/min]
Oil temperature	Recommended	30 to 60°C	[86 to 140°F]
	Minimum	-30°C	[-22°F]
	Maximum	90°	[194°F]
Ambient temperature	Recommended	-30 to 60°C	[-22 to 140°F]
Oil viscosity	Operating range	12 to 75 mm^2/s	[65 to 347 SUS]
	Minimum	4 mm^2/s	[39 SUS]
	Maximum	460 mm^2/s	[2128 SUS]
Oil contamination according to ISO 4406	Maximum	23/19/16	
Max. internal leakage at 100 bar [1450 psi] and 21 mm^2/s [102 SUS]	A/B→T without shock valve	70 cm^3/min	[4.27 in^3/min]
	A/B→T with shock valve	80 cm^3/min	[4.88 in^3/min

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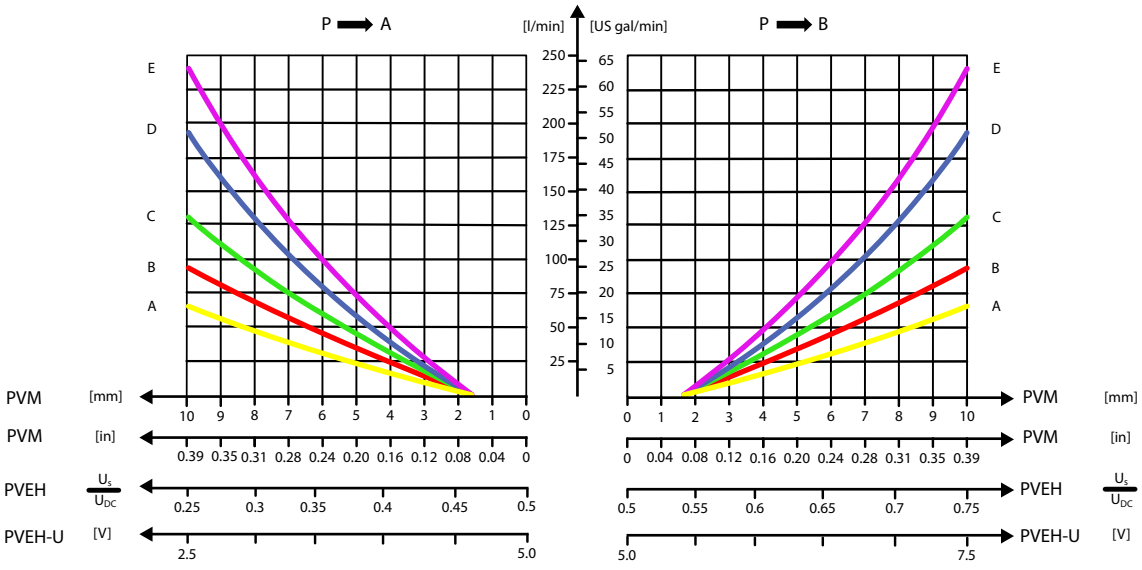
* Rated flow at 15 bar margin pressure

Part numbers for Compensated PVB 128

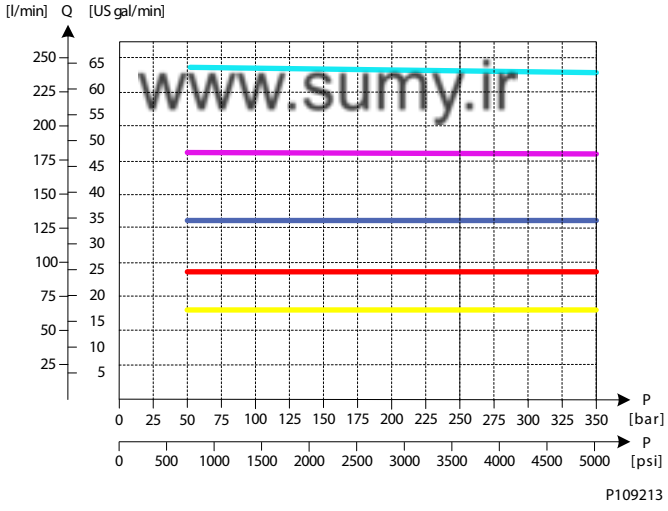
Part number	A/B-port	PVLP/PVLA	LS A/B-port
11170522	Metric Flange 3/4"	-	-
11170528	G 1" BSP	-	-
11170524	SAE Flange 3/4" UNF	-	-
11170526	Thread Ports 1 5/16 UNF	-	-

PVG-EX 128/256

Oil flow as function of spool travel



Load Independent Oil Flow, Pressure Compensated



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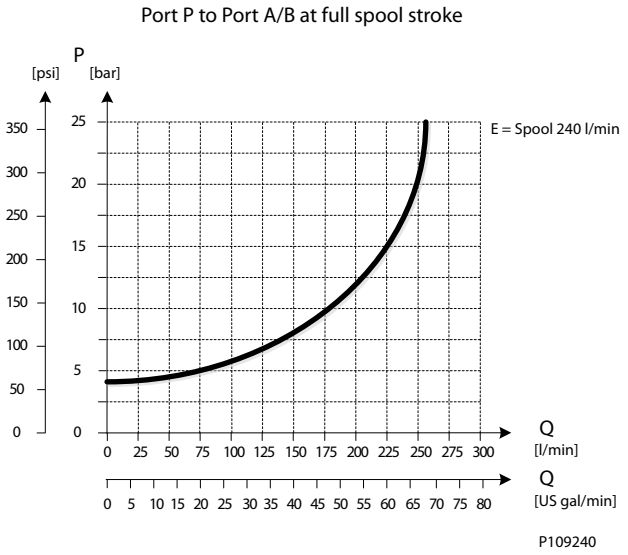
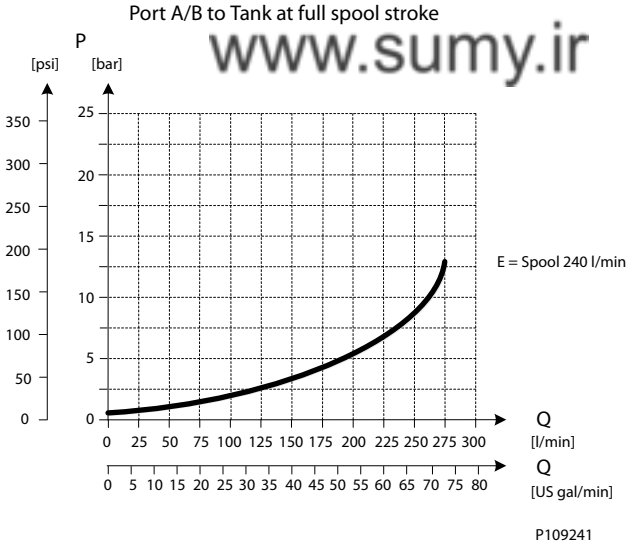
PVG-EX 128/256

PVB 128 Upstream Performance



PVB 128 Downstream Performance



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PVG-EX 128/256

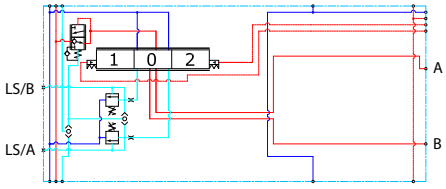
PVG-EX PVB 128 3-way Compensator with LS A/B

The compensated PVB is intended for controlling a work function where the function behavior in terms of flow and pressures requires independency on the load pressure of other functions used simultaneously.

The integrated LSA/B relief valves are used to limit the maximum work port pressure on the A and B-ports individually.

The compensator is a 3-way type which include load drop check valve functionality, compensator function and neutral relief which avoid A and B port pressure build up in neutral.

Schematic



P109186

Technical data

Max. rated pressure	A/B port continuous	350 bar	[5076 psi]
	A/B port intermittent	400	[5800 psi]
Max. rated flow*	A/B port	300 l/min	[79 US gal/min]
Oil temperature	Recommended	30 to 60°C	[86 to 140°F]
	Minimum	-30°C	[-22°F]
	Maximum	90°	[194°F]
Ambient temperature	Recommended	-30 to 60°C	[-22 to 140°F]
Oil viscosity	Operating range	12 to 75 mm^2/s	[65 to 347 SUS]
	Minimum	4 mm^2/s	[39 SUS]
	Maximum	460 mm^2/s	[2128 SUS]
Oil contamination according to ISO 4406	Maximum	23/19/16	
Max. internal leakage at 100 bar [1450 psi] and 21 mm^2/s [102 SUS]	A/B→T without shock valve	70 cm^3/min	[4.27 in^3/min]
	A/B→T with shock valve	80 cm^3/min	[4.88 in^3/min]

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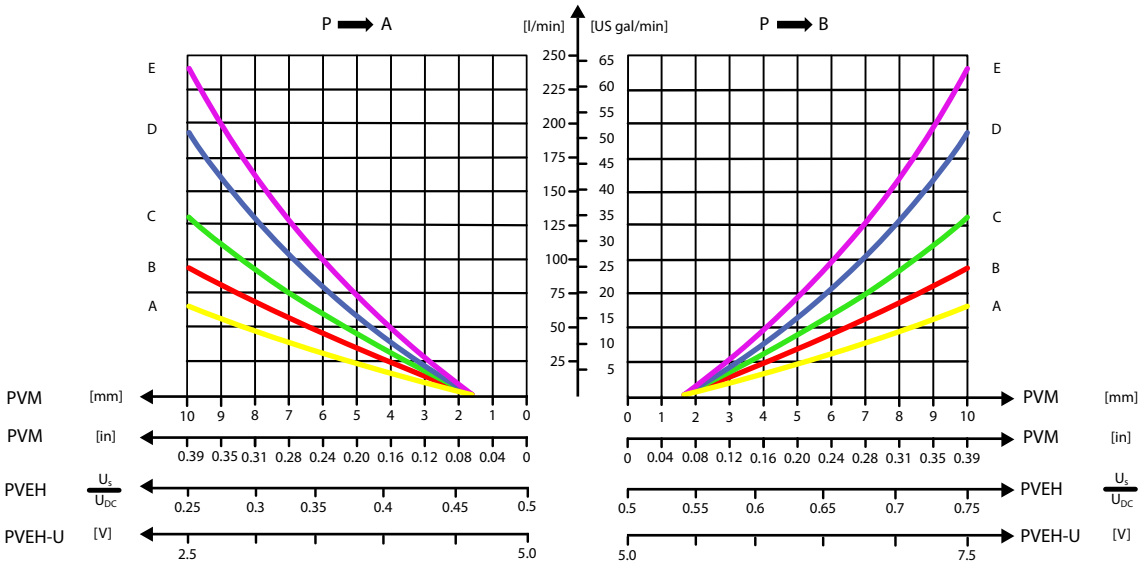
* Rated flow at 15 bar margin pressure

Part numbers for Compensated PVB with LS A/B

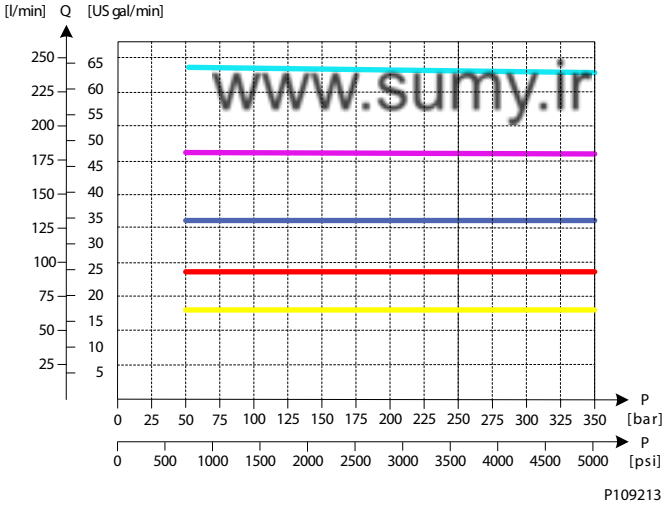
Part number	A/B-port	PVLP/PVLA	LS A/B-port
11176915	Metric Flange 3/4"	-	G1/4"BSP
11176918	G 1" BSP	-	G1/4"BSP
11176916	SAE Flange 3/4" UNF	-	7/16-20 UNF
11176917	Thread Ports 1 5/16 UNF	-	7/16-20 UNF

PVG-EX 128/256

Oil flow as function of spool travel



Load Independent Oil Flow, Pressure Compensated



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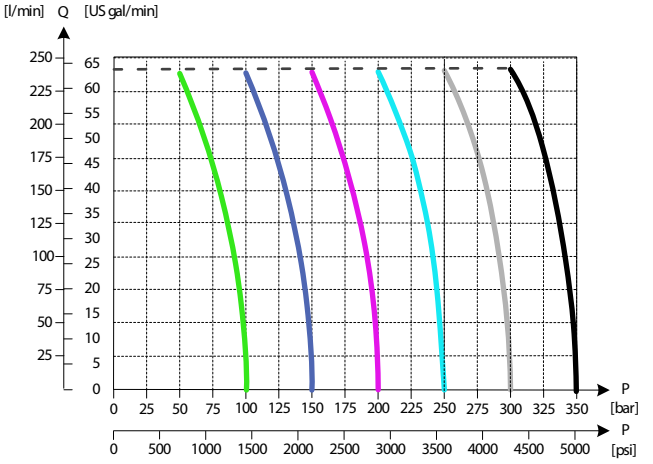
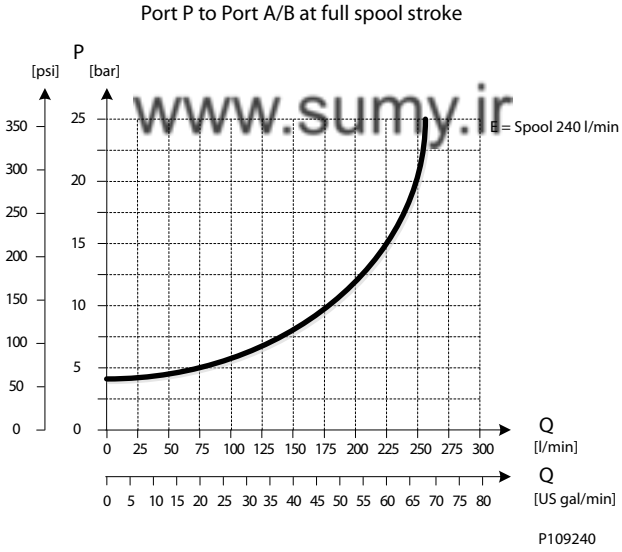
PVG-EX 128/256

LS A/B Pressure Relief Valve



PVB 128 Upstream Performance



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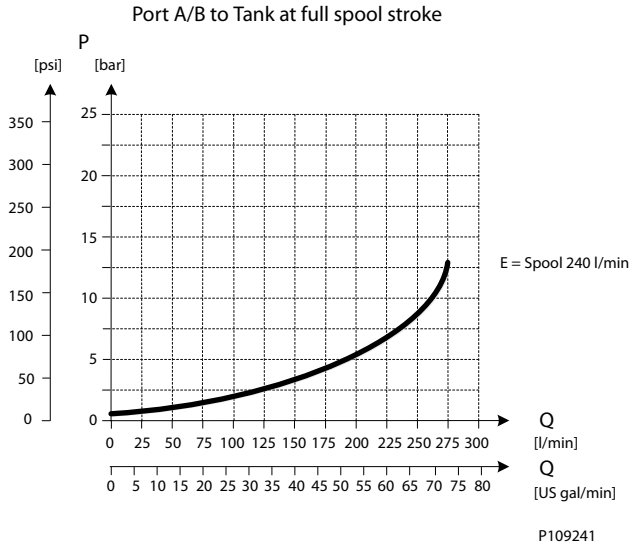
PVG-EX 128/256

PVB 128 Downstream Performance



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PVG-EX 128/256

PVG-EX PVB 128 3-way Compensator with LS A/B and PVLP

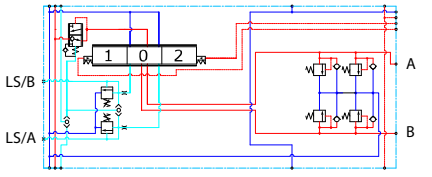
The compensated PVB is intended for controlling a work function where the function behavior in terms of flow and pressures requires independency on the load pressure of other functions used simultaneously.

The integrated LS A/B relief valves are used to limit the maximum work port pressure on the A and B-ports individually.

Featuring 2xPVLP shock/anti-cavitation valves on each work port for pressure peak protection and anti-cavitation prevention

The compensator is a 3-way type which include load drop check valve functionality, compensator function and neutral relief which avoid A and B port pressure build up in neutral.

Schematic



P109172

Technical data

Max. rated pressure	A/B port continuous	350 bar	[5076 psi]
	A/B port intermittent	400	[5800 psi]
Max. rated flow	A/B port	300 l/min	[79 US gal/min]
Oil temperature	Recommended	30 to 60°C	[86 to 140°F]
	Minimum	-30°C	[-22°F]
	Maximum	90°	[194°F]
Ambient temperature	Recommended	-30 to 60°C	[-22 to 140°F]
Oil viscosity	Operating range	12 to 75 mm^2/s	[65 to 347 SUS]
	Minimum	4 mm^2/s	[39 SUS]
	Maximum	460 mm^2/s	[2128 SUS]
Oil contamination according to ISO 4406	Maximum	23/19/16	
Max. internal leakage at 100 bar [1450 psi] and 21 mm^2/s [102 SUS]	A/B→T without shock valve	70 cm^3/min	[4.27 in^3/min]
	A/B→T with shock valve	80 cm^3/min	[4.88 in^3/min

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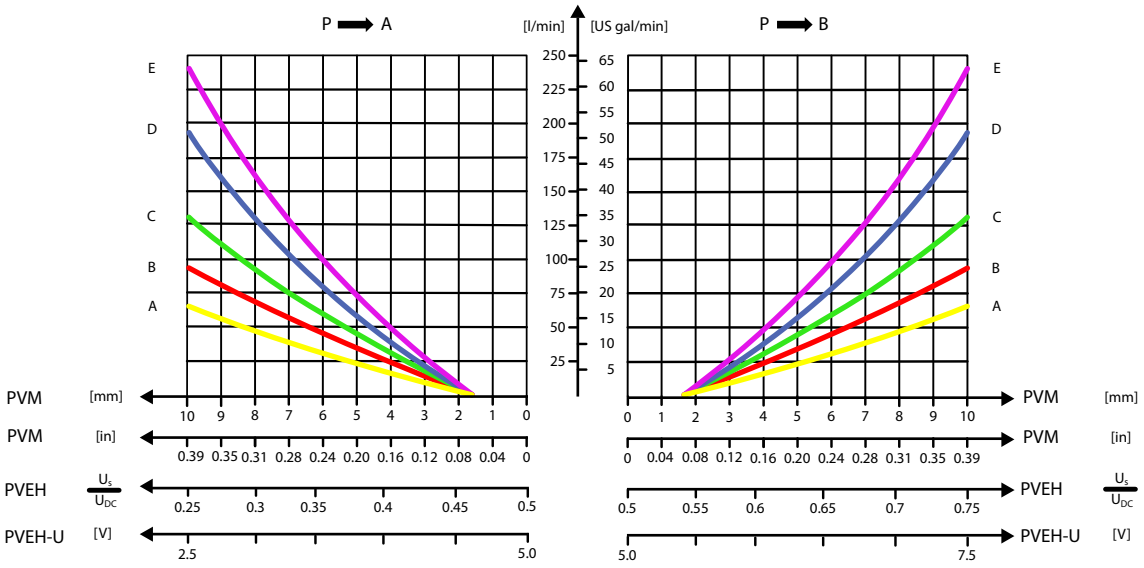
* Rated flow at 15 bar margin pressure

Part numbers for Compensated PVB 128 with LSA/B and PVLP

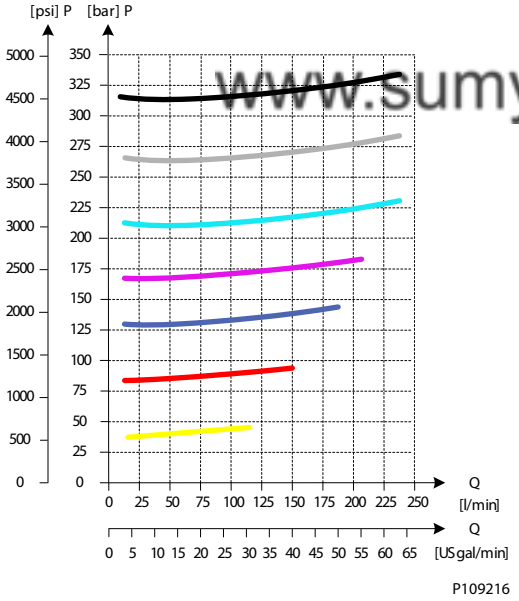
Part number	A/B-port	PVLP/PVLA	LS A/B-port
11165621	Metric Flange 3/4"	2 PVLP/PVLA	G1/4"BSP
11170527	G 1" BSP	2 PVLP/PVLA	G1/4"BSP
11170523	SAE Flange 3/4" UNF	2 PVLP/PVLA	7/16-20 UNF
11170525	Thread Ports 1 5/16 UNF	2 PVLP/PVLA	7/16-20 UNF

PVG-EX 128/256

Oil flow as function of spool travel



2xPVLP Shock Valve



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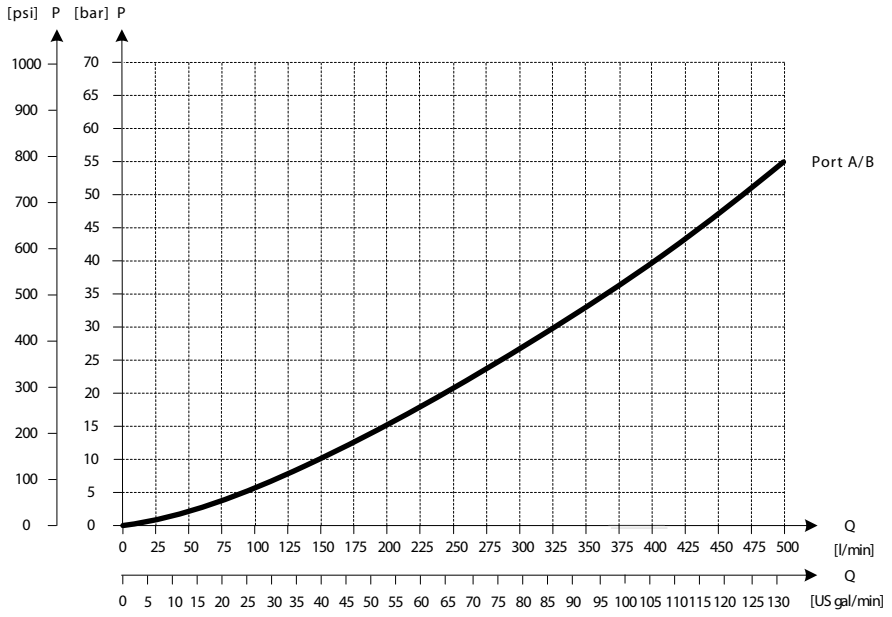
PVG-EX 128/256

2xPVLA Suction Valve



Load Independent Oil Flow, Pressure Compensated

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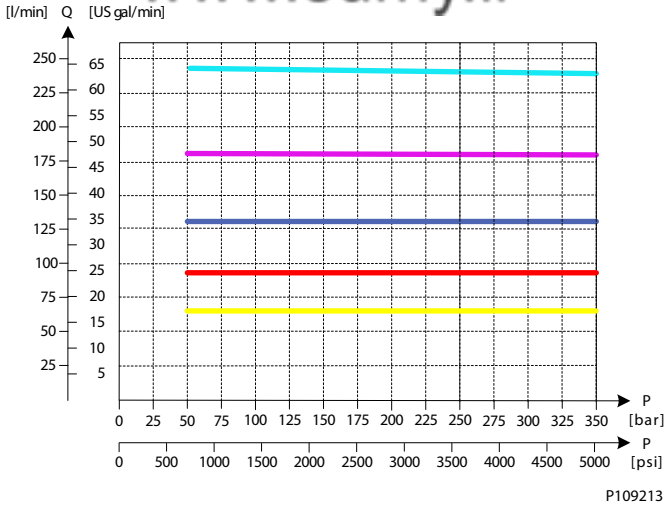
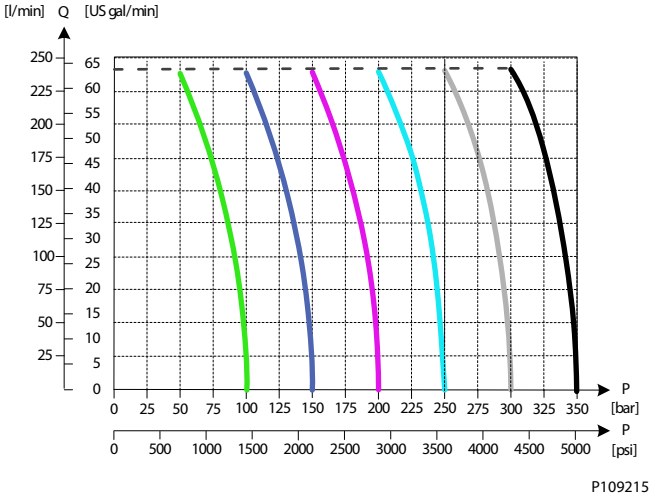
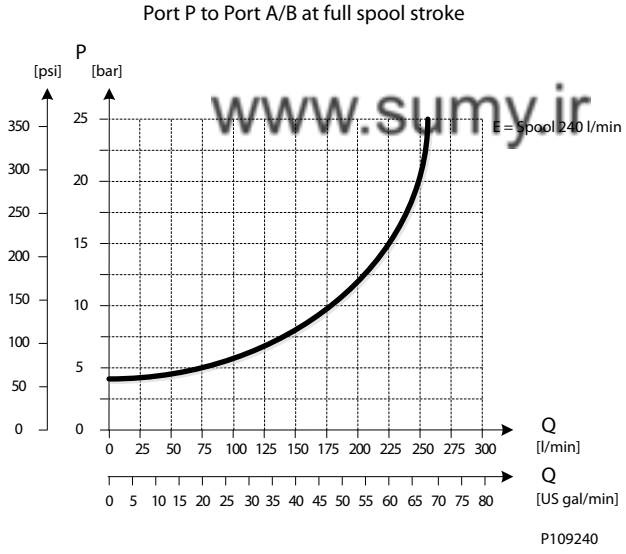


PVG-EX 128/256

LS A/B Pressure Relief Valve



PVB 128 Upstream Performance



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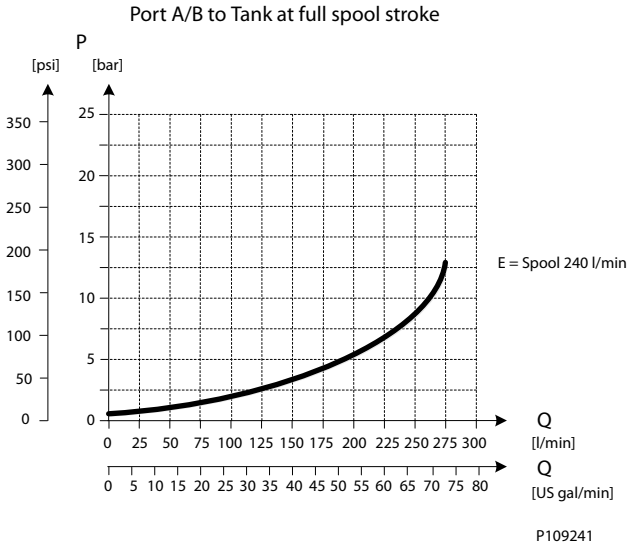
PVG-EX 128/256

PVB 128 Downstream Performance



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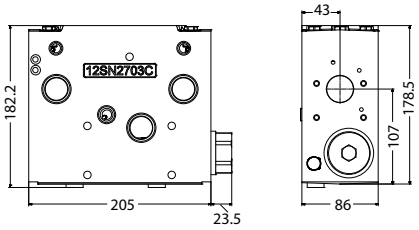
PVG-EX 128/256

PVG-EX PVB 256 Variant Overview

PVB 256

PVB 256 basic module dimensions (mm)



Weight 16 kg [35.3 lbs]

The PVG 256 Basic modules (PVB), also referred to as work sections, is the interface between the PVG 256 proportional valve group and the work function such as a cylinder or a motor.

The PVB basic module variants are based on a generic platform with a selection of additional features, enabling you to tailor the PVB to suit the demands of any hydraulic system.

The compensator is a 3-way type which includes load drop check valve functionality, compensator function and neutral relief which avoid A and B port pressure build up.

The generic PVB basic module platform includes the following main variants.

Compensated PVB 256 Compensated basic module.

Compensated PVB 256 with LS A/B Compensated basic module with LSA/B relief valve for each work port.

Compensated PVB 256 with LS A/B and PVLP Compensated basic module with LSA/B relief valve for each work port and 3xPVLPs for each work port.

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Compensated PVB 256 with Turbo compensator feature Compensated basic module with LS A/B relief valve for each work port and 3xPVLPs for each work port.

PVG-EX 128/256

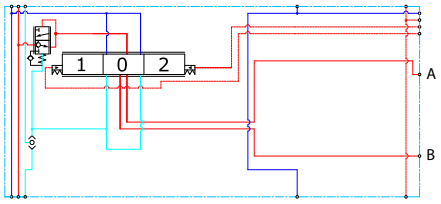
PVG-EX PVB 256 3-way Compensator

The compensated PVB is intended for controlling a work function where the function behavior in terms of flow and pressures requires independency on the load pressure of other functions used simultaneously.

The integrated LS A/B relief valves are used to limit the maximum work port pressure on the A and B-ports individually.

The compensator is a 3-way type which include load drop check valve functionality, compensator function and neutral relief which avoid A and B port pressure build up in neutral.

Schematic



P109168

Technical data

Max. rated pressure	A/B port continuous	350 bar	[5076 psi]
	A/B port intermittent	400 bar	[5800 psi]
Max. rated flow	A/B port	400 l/min	[106 US gal/min]
Oil temperature	Recommended	30 to 60°C	[86 to 140°F]
	Minimum	-30°C	[-22°F]
	Maximum	90°	[194°F]
Ambient temperature	Recommended	-30 to 60°C	[-22 to 140°F]
Oil viscosity	Operating range	12 to 75 mm^2/s	[65 to 347 SUS]
	Minimum	4 mm^2/s	[39 SUS]
	Maximum	460 mm^2/s	[2128 SUS]
Oil contamination according to ISO 4406	Maximum	23/19/16	
Max. internal leakage at 100 bar [1450 psi] and 21 mm^2/s [102 SUS]	A/B→T without shock valve	70 cm^3/min	[4.27 in^3/min]
	A/B→T with shock valve	85 cm^3/min	[5.19 in^3/min]

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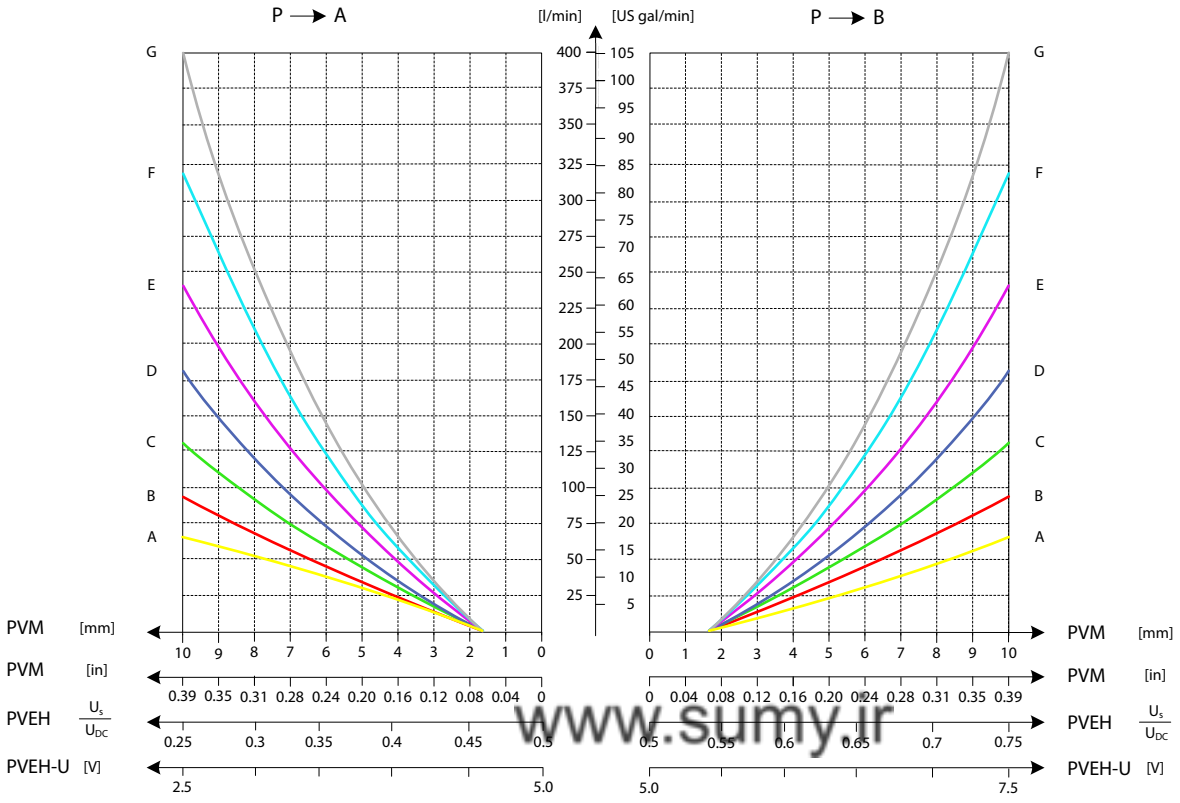
Part numbers for Compensated PVB 256

Part number	A/B port	PVLP/PVLA	LS A/B port
11169244	Metric Flange 1″	-	-
11169252	G1-1/4" BSP	-	-
11169248	SAE Flange 1″ UNF	-	-
11177020	Thread Ports 1-1/4" UNF	-	-

PVG-EX 128/256

Oil Flow as Function of Spool Travel



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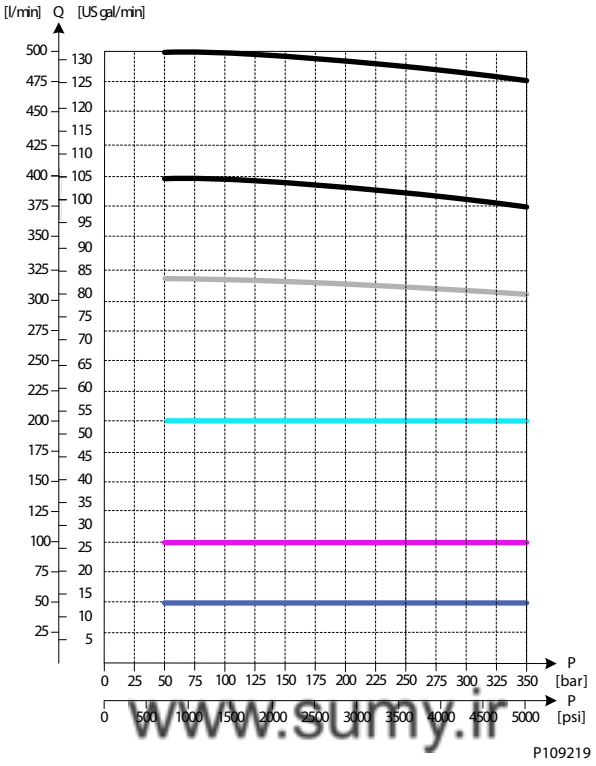
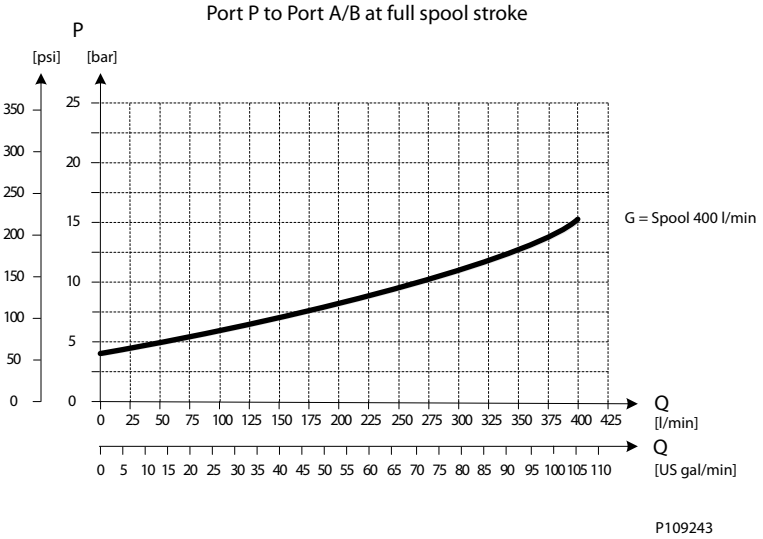
PVG-EX 128/256

Load Independent Oil Flow, Pressure Compensated



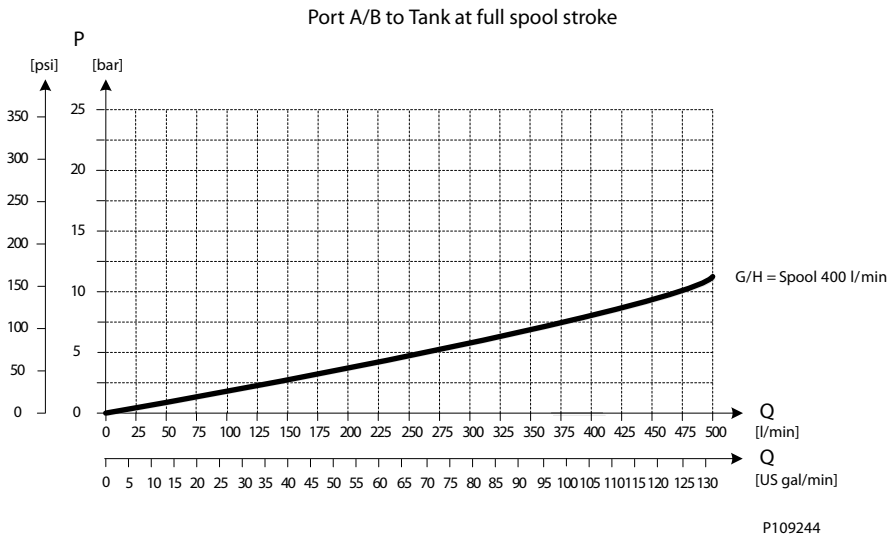
www.sunny.ir

PVB 256 Upstream Performance



PVG-EX 128/256

PVB 256 Downstream Performance



www.sumy.ir

PVG-EX 128/256

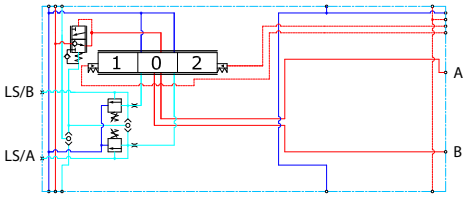
PVG-EX PVB 256 3-way Compensator with LS A/B

The compensated PVB is intended for controlling a work function where the function behavior in terms of flow and pressures requires independency on the load pressure of other functions used simultaneously.

The integrated LS A/B relief valves are used to limit the maximum work port pressure on the A and B-ports individually.

The compensator is a 3-way type which include load drop check valve functionality, compensator function and neutral relief which avoid A and B port pressure build up in neutral.

Schematic



P109167

Technical data

Max. rated pressure	A/B port continuous	350 bar	[5076 psi]
	A/B port intermittent	400	[5800 psi]
Max. rated flow	A/B port	400 l/min	[106 US gal/min]
Oil temperature	Recommended	30 to 60°C	[86 to 140°F]
	Minimum	-30°C	[-22°F]
	Maximum	90°	[194°F]
Ambient temperature	Recommended	-30 to 60°C	[-22 to 140°F]
Oil viscosity	Operating range	12 to 75 mm^2/s	[65 to 347 SUS]
	Minimum	4 mm^2/s	[39 SUS]
	Maximum	460 mm^2/s	[2128 SUS]
Oil contamination according to ISO 4406	Maximum	23/19/16	
Max. internal leakage at 100 bar [1450 psi] and 21 mm^2/s [102 SUS]	A/B→T without shock valve	70 cm^3/min	[4.27 in^3/min]
	A/B→T with shock valve	85 cm^3/min	[5.19 in^3/min]

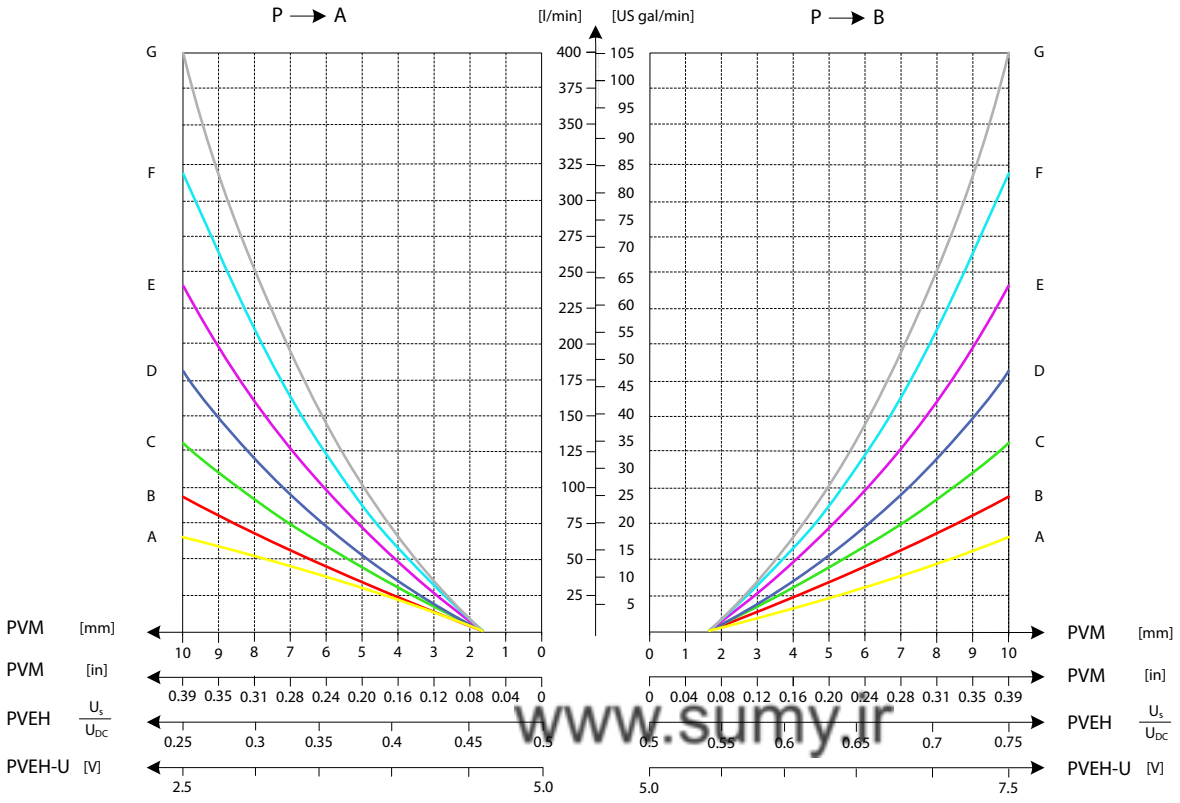
www.sumy.ir

Part numbers for Compensated PVB 256 with LSA/B

Part number	A/B-port	PVLP/PVLA	LS A/B-port
11177015	Metric Flange 1"	-	G1/4"BSP
11177017	G1-1/4" BSP	-	G1/4"BSP
11177016	SAE Flange 1" UNF	-	7/16-20 UNF
11177019	Thread Ports 1-1/4" UNF	-	7/16-20 UNF

PVG-EX 128/256

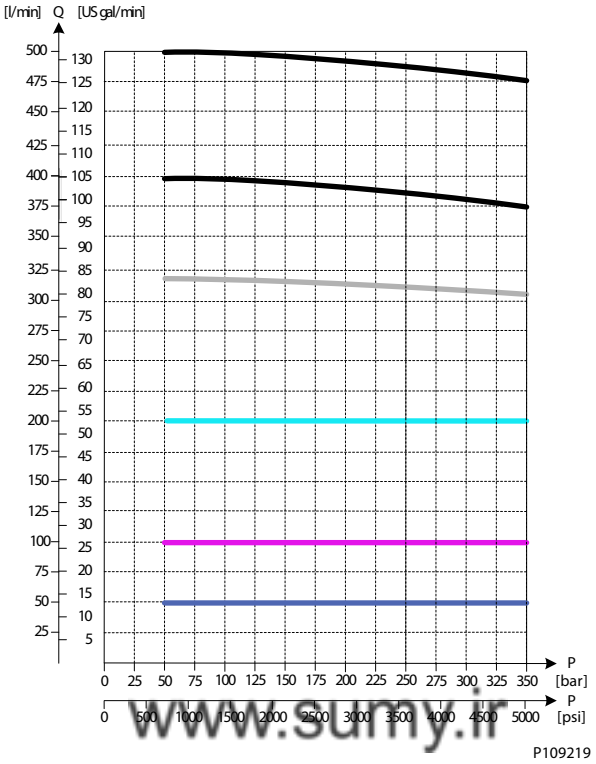
Oil Flow as Function of Spool Travel



www.sumy.ir

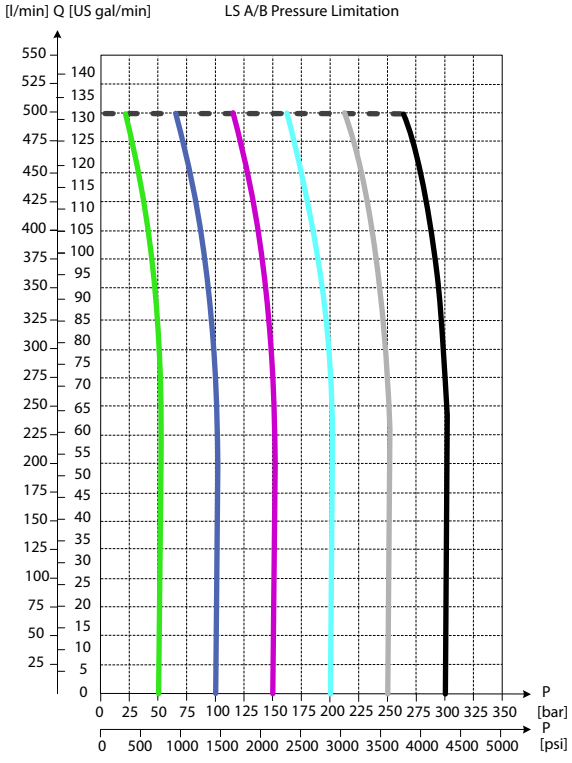
PVG-EX 128/256

Load Independent Oil Flow, Pressure Compensated



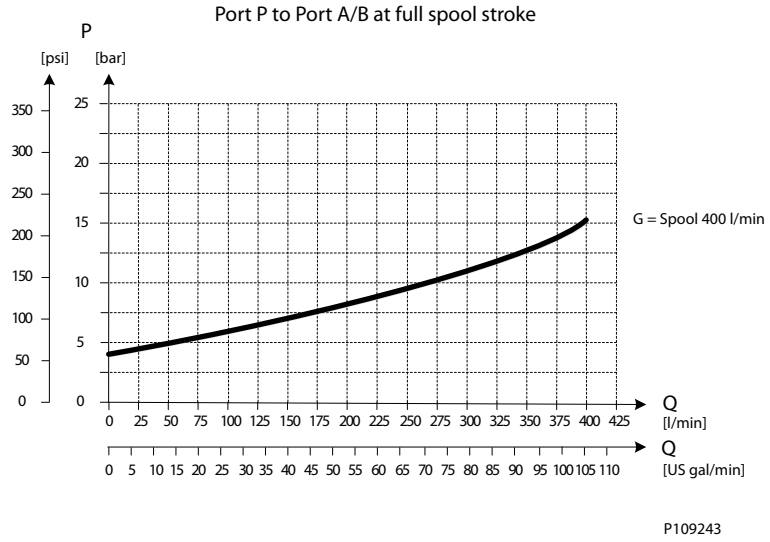
www.sunny.ir

LS A/B Pressure Limitation

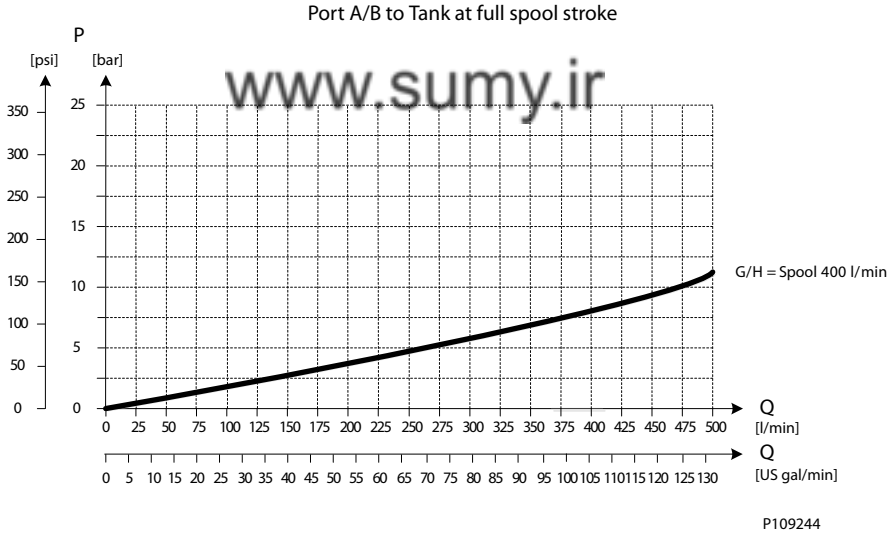


PVG-EX 128/256

PVB 256 Upstream Performance



PVB 256 Downstream Performance



PVG-EX 128/256

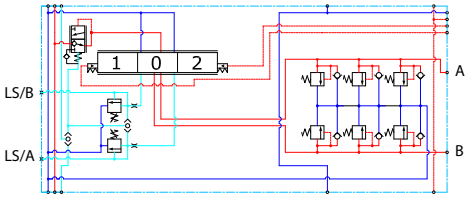
PVG-EX PVB 256 3-way Compensator with LSA/B and PVLP

The compensated PVB is intended for controlling a work function where the function behavior in terms of flow and pressures requires independency on the load pressure of other functions used simultaneously.

The integrated LS A/B relief valves are used to limit the maximum work port pressure on the A and B-ports individually.

Featuring 3xPVLP shock/anti-cavitation valves on each work port for pressure peak protection and anti-cavitation prevention.

The compensator is a 3-way type which include load drop check valve functionality, compensator function and neutral relief which avoid A and B port pressure build up in neutral.



P109166

Technical data

Max. rated pressure	A/B port continuous	350 bar	[5076 psi]
	A/B port intermittent	400 bar	[5800 psi]
Max. rated flow	A/B port	400 l/min	[106 US gal/min]
Oil temperature	Recommended	30 to 60°C	[86 to 140°F]
	Minimum	-30°C	[-22°F]
	Maximum	90°	[194°F]
Ambient temperature	Recommended	-30 to 60°C	[-22 to 140°F]
Oil viscosity	Operating range	12 to 75 mm^2/s	[65 to 347 SUS]
	Minimum	4 mm^2/s	[39 SUS]
	Maximum	460 mm^2/s	[2128 SUS]
Oil contamination according to ISO 4406	Maximum	23/19/16	
Max. internal leakage at 100 bar [1450 psi] and 21 mm^2/s [102 SUS]	A/B→T without shock valve	70 cm^3/min	[4.27 in^3/min]
	A/B→T with shock valve	85 cm^3/min	[5.19 in^3/min]

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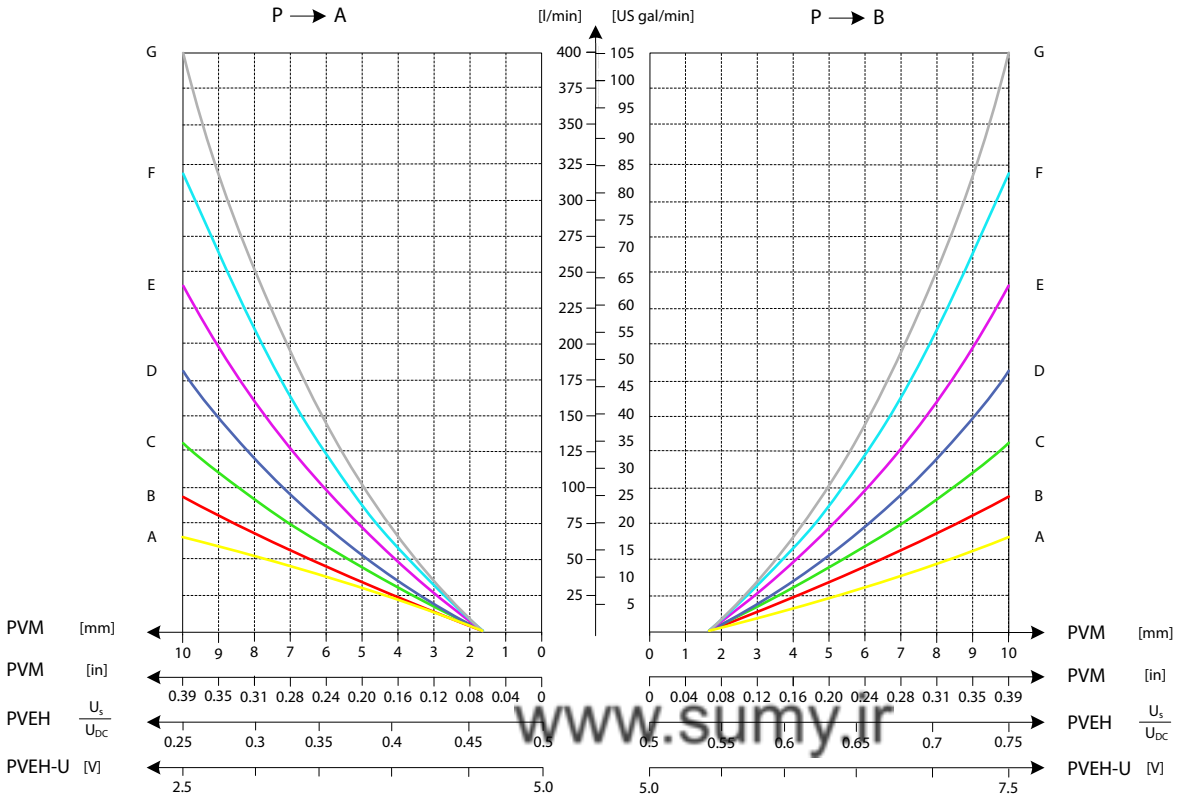
Part numbers for Compensated PVB 256 with LSA/B and PVLP

Part number	A/B port	PVLP/PVLA	LS A/B port
11169243	Metric Flange 1″	3 PVLP/PVLA	G1/4"BSP
11169251	G1-1/4" BSP	3 PVLP/PVLA	G1/4"BSP
11169247	SAE Flange 1″ UNF	3 PVLP/PVLA	7/16-20 UNF
11177018	Thread Ports 1-1/4" UNF	3 PVLP/PVLA	7/16-20 UNF

PVG-EX 128/256

Oil Flow as Function of Spool Travel



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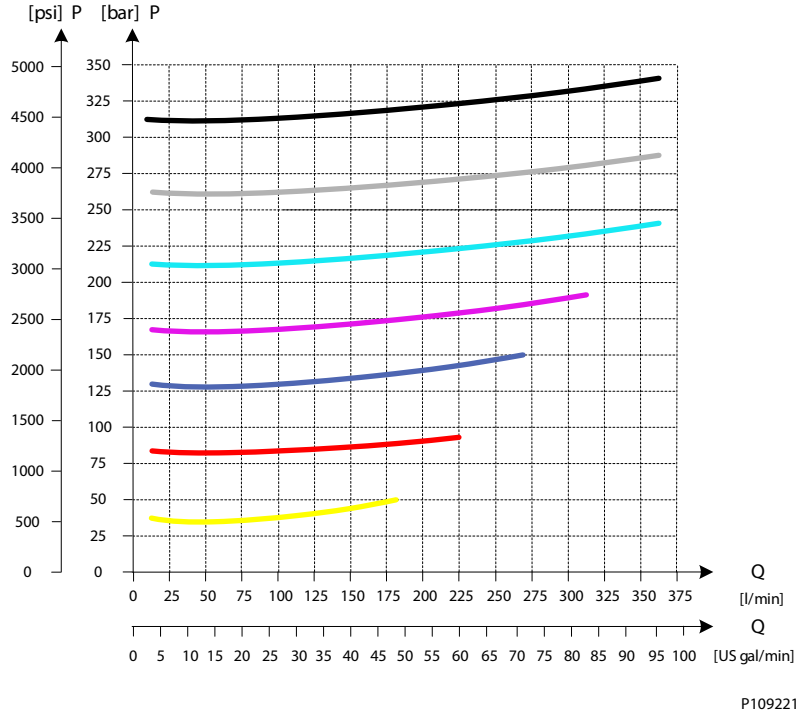
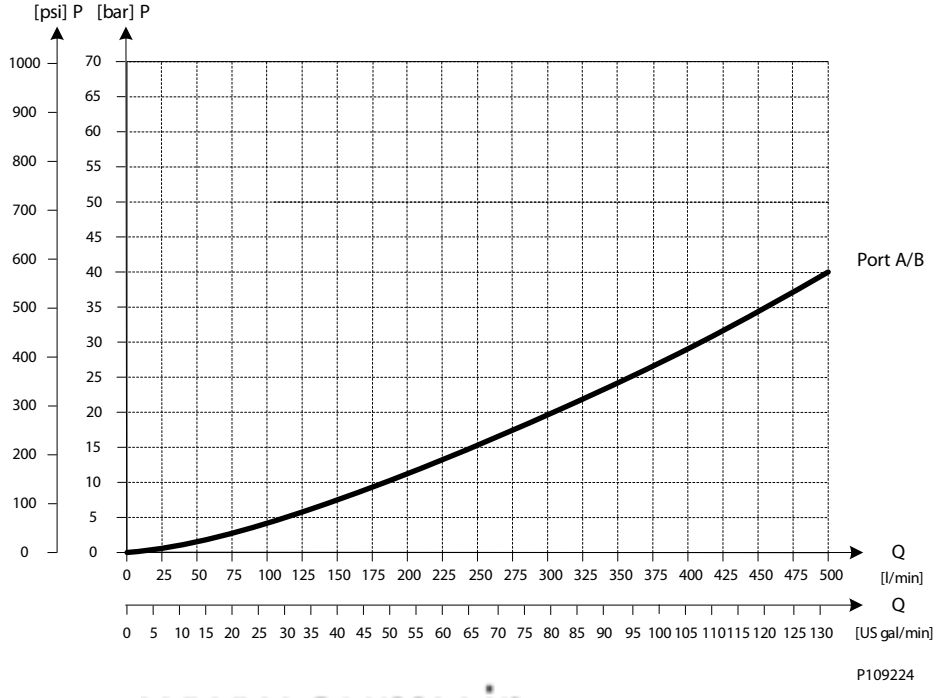
3xPVLP Shock Valve



PVG-EX 128/256

3xPVLA Suction Valve



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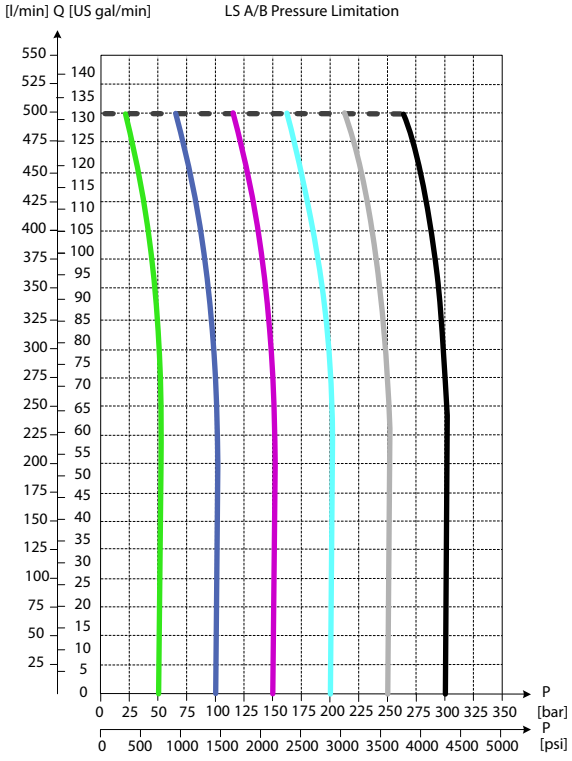
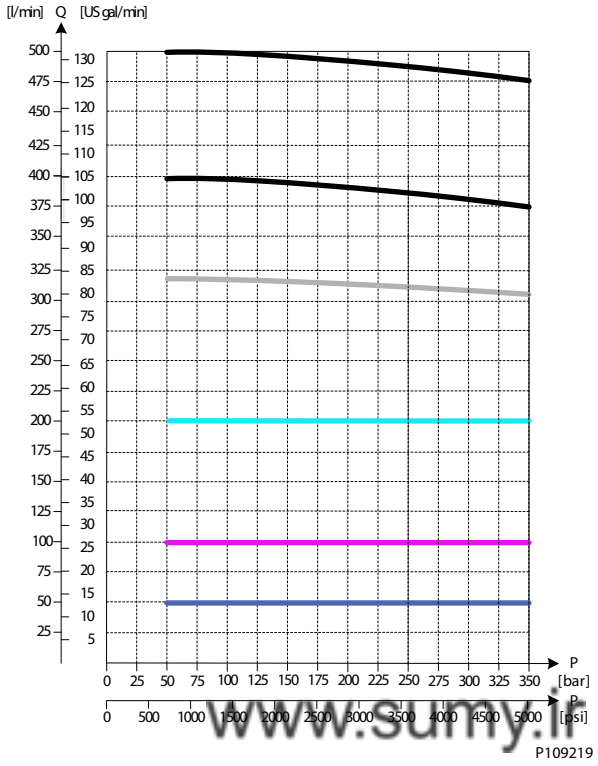
LS A/B Pressure Limitation



PVG-EX 128/256

Load Independent Oil Flow, Pressure Compensated



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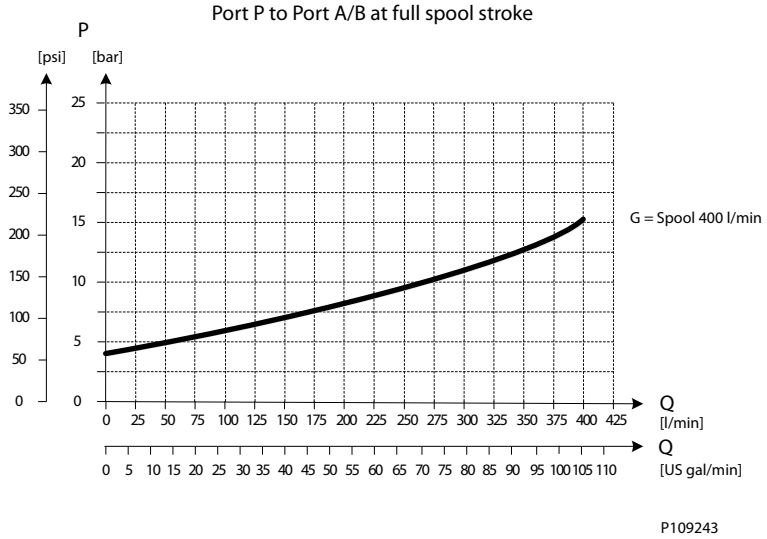
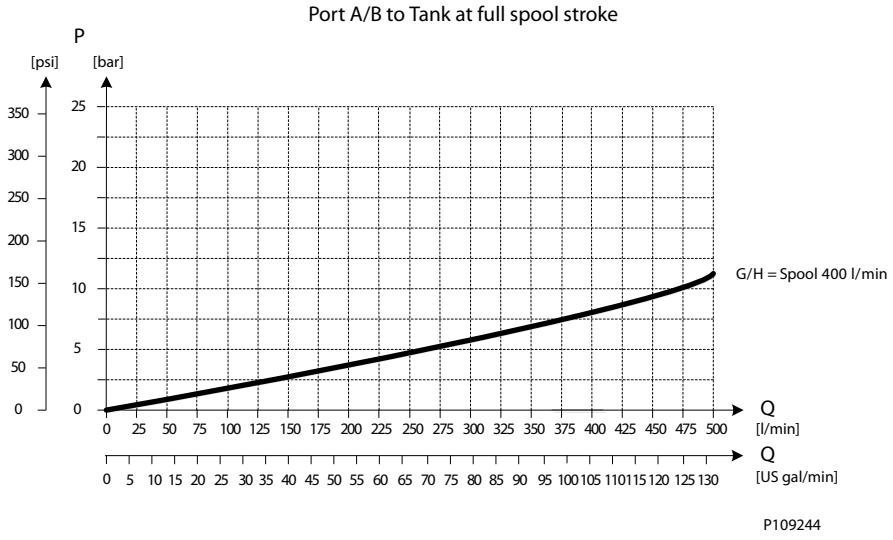
PVB 256 Upstream Performance



PVG-EX 128/256

PVB 256 Downstream Performance



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PVG-EX 128/256

PVG-EX PVB 256 3-way Compensator with LS A/B, PVLP and Turbo

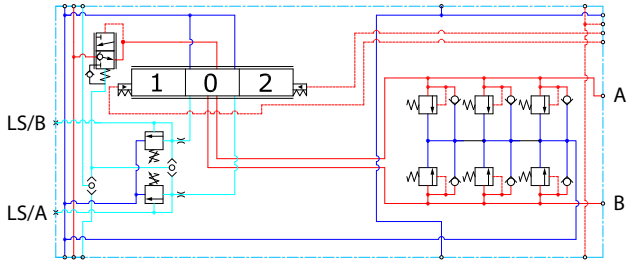
The compensated PVB is intended for controlling a work function where the function behavior in terms of flow and pressures requires independency on the load pressure of other functions used simultaneously.

The integrated LS A/B relief valves are used to limit the maximum work port pressure on the A and B-ports individually.

Featuring 3xPVLP shock/anti-cavitation valves on each work port for pressure peak protection and anti-cavitation prevention.

The compensator is a 3-way type which include load drop check valve functionality, compensator function and neutral relief which avoid A and B port pressure build up in neutral.

Schematic



P109169

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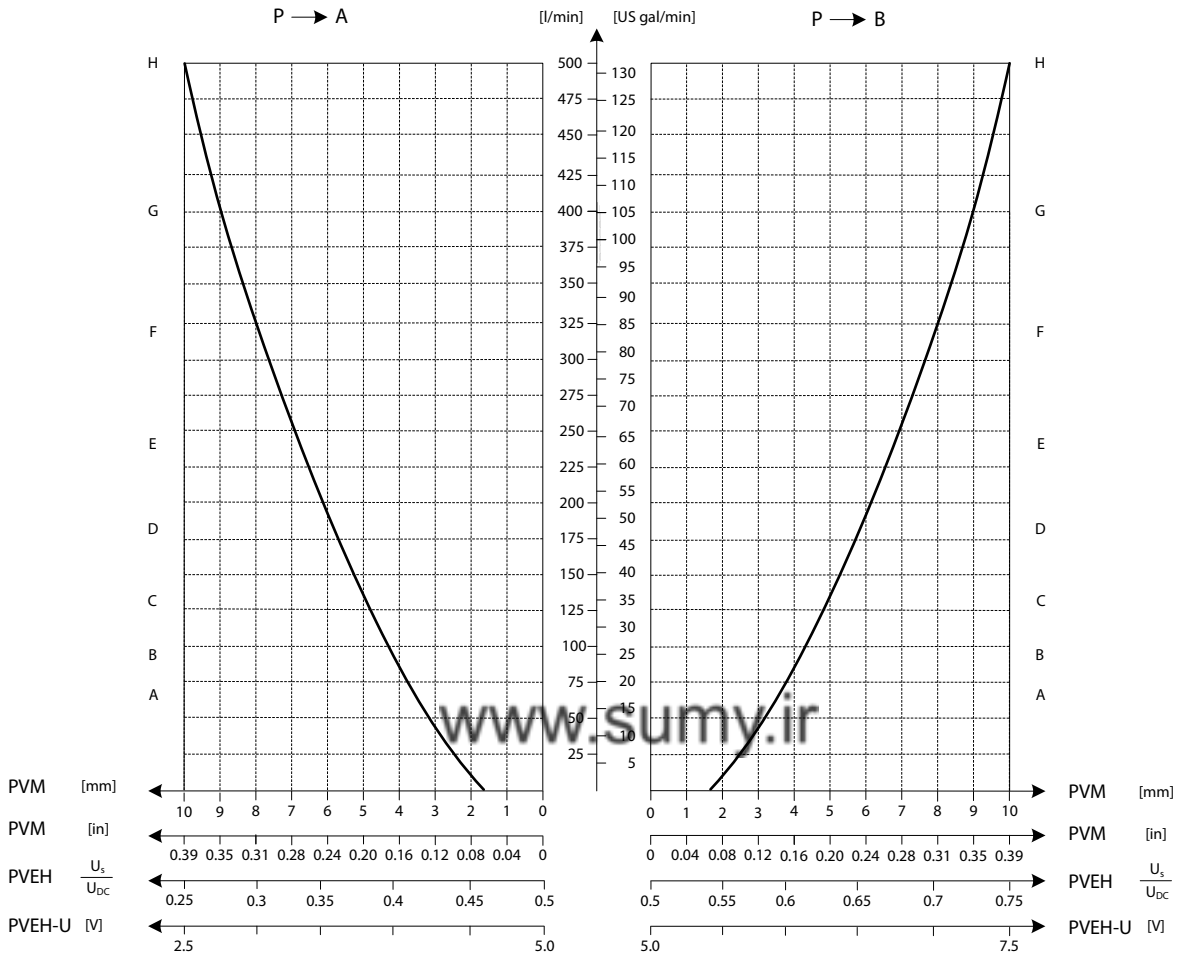
Part numbers for Compensated PVB 256 with LSA/B, PVLP and Turbo

Part number	A/B port	PVLP/PVLA	LS A/B port
11183379	Metric Flange 1″	3 PVLP/PVLA	G1/4"BSP
11183406	G1-1/4" BSP	3 PVLP/PVLA	G1/4"BSP
11183404	SAE Flange 1″ UNF	3 PVLP/PVLA	7/16-20 UNF
11183402	Thread Ports 1-1/4" UNF	3 PVLP/PVLA	7/16-20 UNF

PVG-EX 128/256

Oil Flow as Function of Spool Travel



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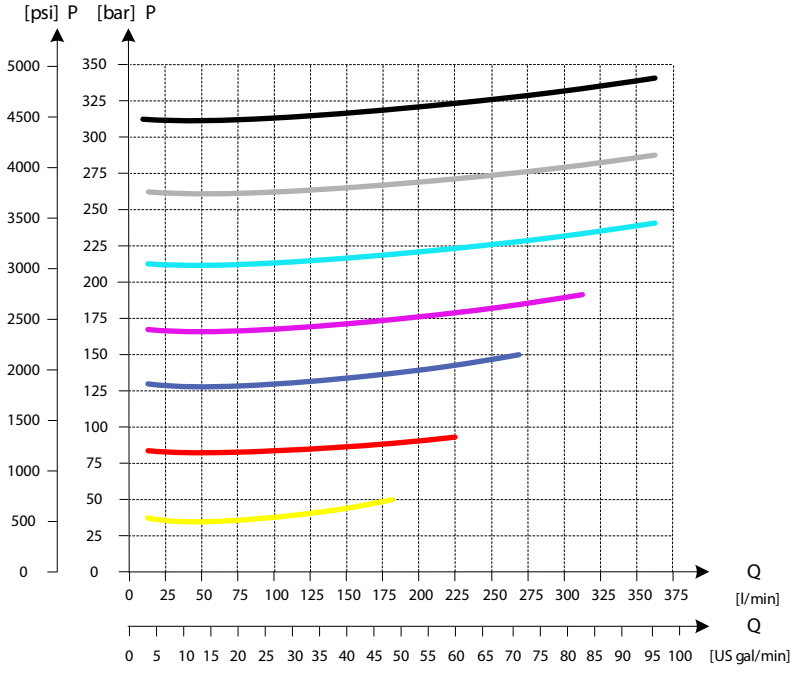
PVG-EX 128/256

3xPVLP Shock Valve



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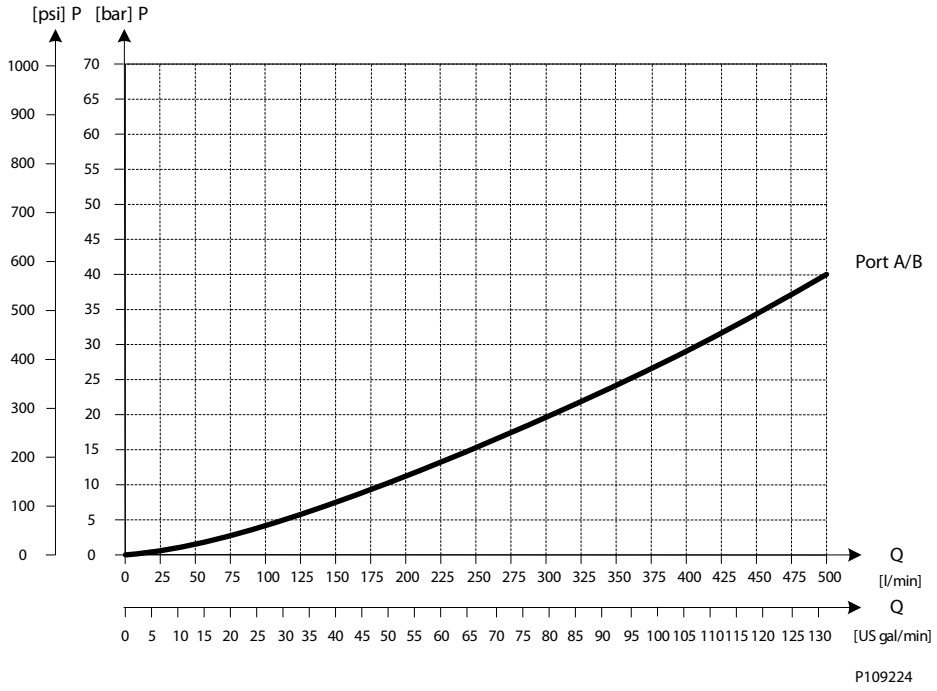
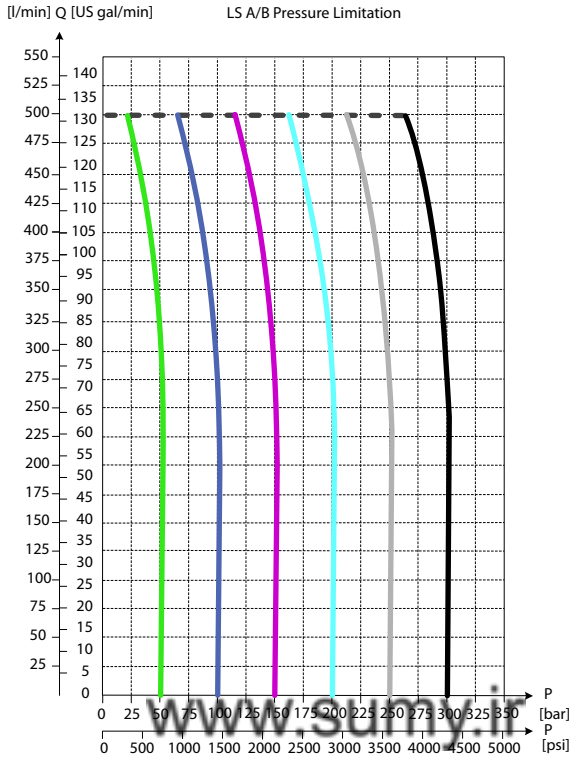
3xPVLA Suction Valve



PVG-EX 128/256

LS A/B Pressure Limitation



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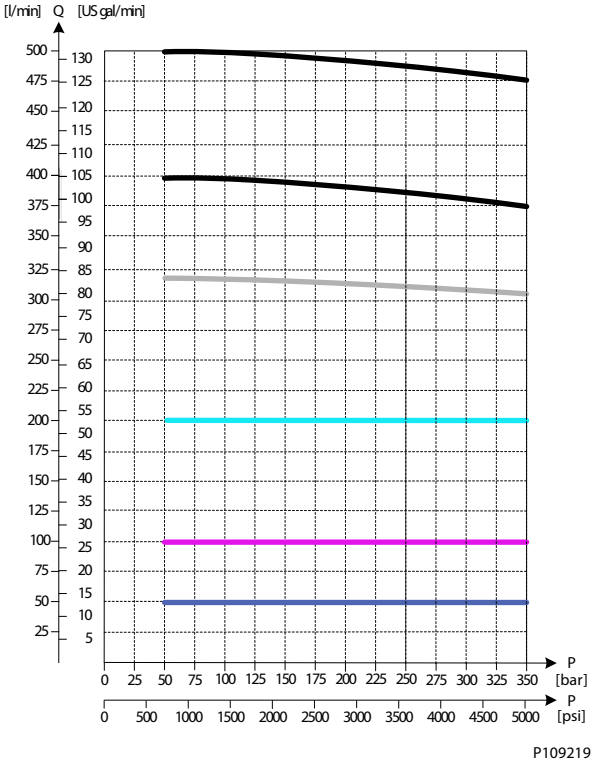
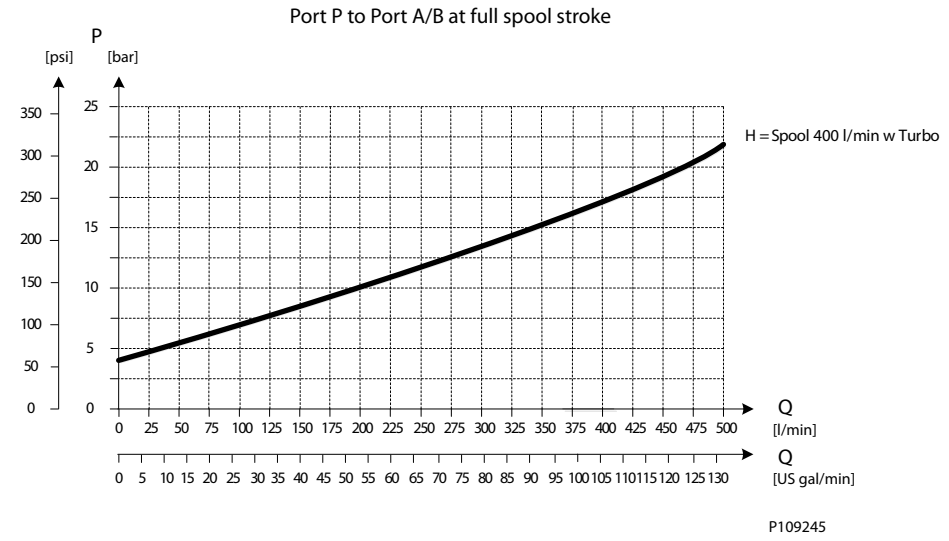
Load Independent Oil Flow, Pressure Compensated

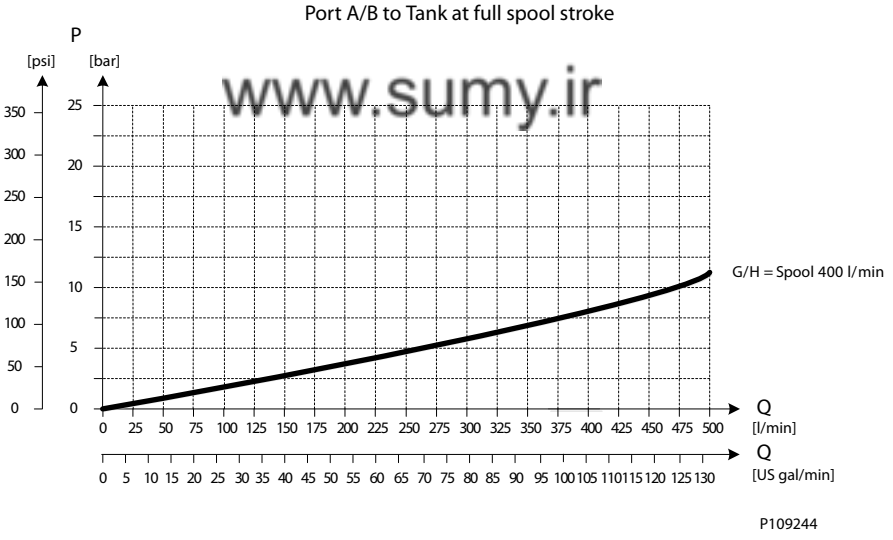


PVG-EX 128/256

PVB 256 Turbo Upstream Performance



PVB 256 Downstream Performance



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PVG-EX 128/256

PVG-EX PVLP Shock and PVLA Suction Valves

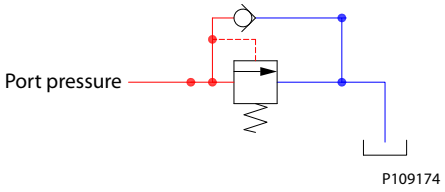
PVG-EX PVLP Overview

PVLP is set at an oil flow of 10 l/min [2.6 US gal/min] per unit.

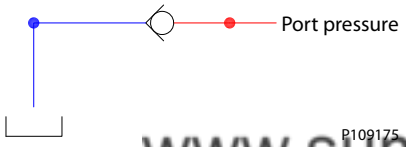
The shock valve PVLP is designed to absorb shock effects. Consequently, it should not be used as a pressure relief valve.

If the working function requires the use of a pressure relief valve, a PVB basic module with built-in LSA/B pressure limiting valve should be used.

PVLP schematic



PVLA schematic



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PVG-EX PVLP Technical Data

Technical data

Oil temperature	Recommended	30 to 60°C	[86 to 140°F]
	Minimum	-30°C	[-22°F]
	Maximum	90°	[194°F]
Ambient temperature	Recommended	-30 to 60°C	[-22 to 140°F]
Oil viscosity	Operating range	12 to 75 mm^2/s	[65 to 347 SUS]
	Minimum	4 mm^2/s	[39 SUS]
	Maximum	460 mm^2/s	[2128 SUS]
Oil contamination according to ISO 4406	Maximum	23/19/16	

PVG-EX 128/256

Part numbers for PVLP Shock and PVLA Suction Valves

Description	Pressure setting in bar	Part number
PVLA	-	157B2001
PVLP	32	157B2032
	50	157B2050
	63	157B2063
	80	157B2080
	100	157B2100
	125	157B2125
	140	157B2140
	150	157B2150
	160	157B2160
	175	157B2175
	190	157B2190
	210	157B2210
	230	157B2230
	240	157B2240
	250	157B2250
	265	157B2265
	280	157B2280
	300	157B2300
	320	157B2320
	350	157B2350
	380	157B2380
PLUG	-	157B2002

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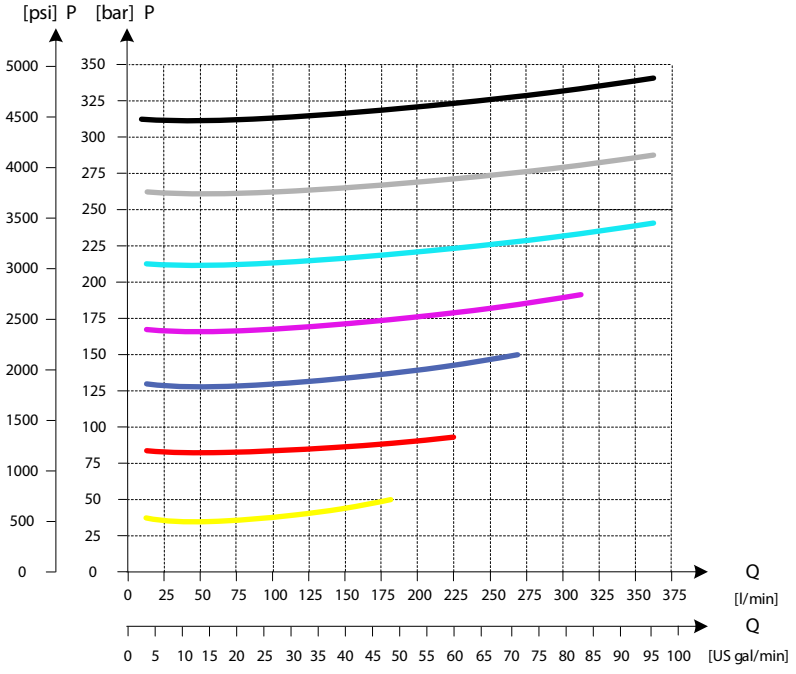
PVG-EX 128/256

3xPVLP Shock Valve



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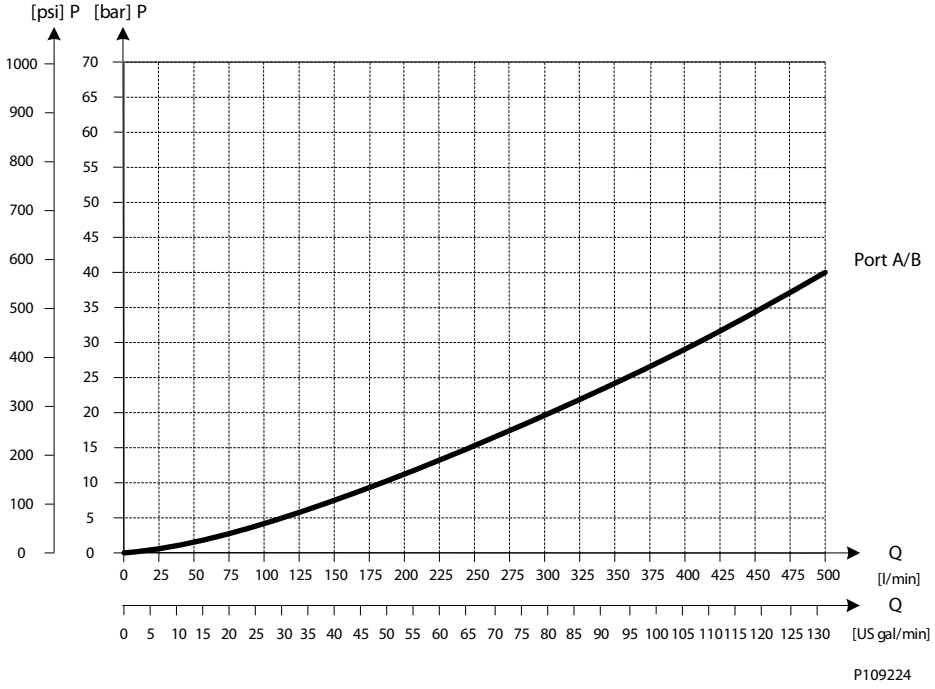
3xPVLA Suction Valve



PVG-EX 128/256

PVG-EX 128/256 PVBS Main Spool

The PVG 128/256 main spools (PVBS) determines the flow out of the work section.

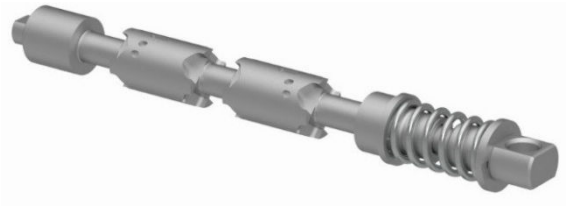
The PVBS main spool variants are based on a generic platform with a wide selection of additional features, enabling you to tailor the PVBS to suit the demands of any hydraulic system and any function.

The PVBS main spool can be activated in three different ways:

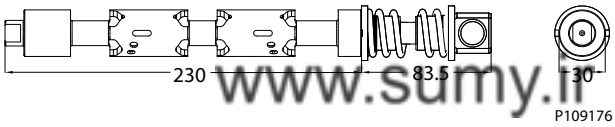
- Mechanically by a PVM lever
- Electrically by either a PVE or a PVHC actuator
- Hydraulically by a PVH actuator

All spools can be mechanically activated.

PVBS Main Spool



PVBS Main Spool dimensions



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PVG-EX PVBS Main Spools variant overview

PVG-EX Flow control spools

- Flow control spool closed neutral position
- Flow control spool throttled open neutral position
- Single acting cylinder flow control spool closed neutral position, flow control B port
- Flow control spool closed neutral position with A-float

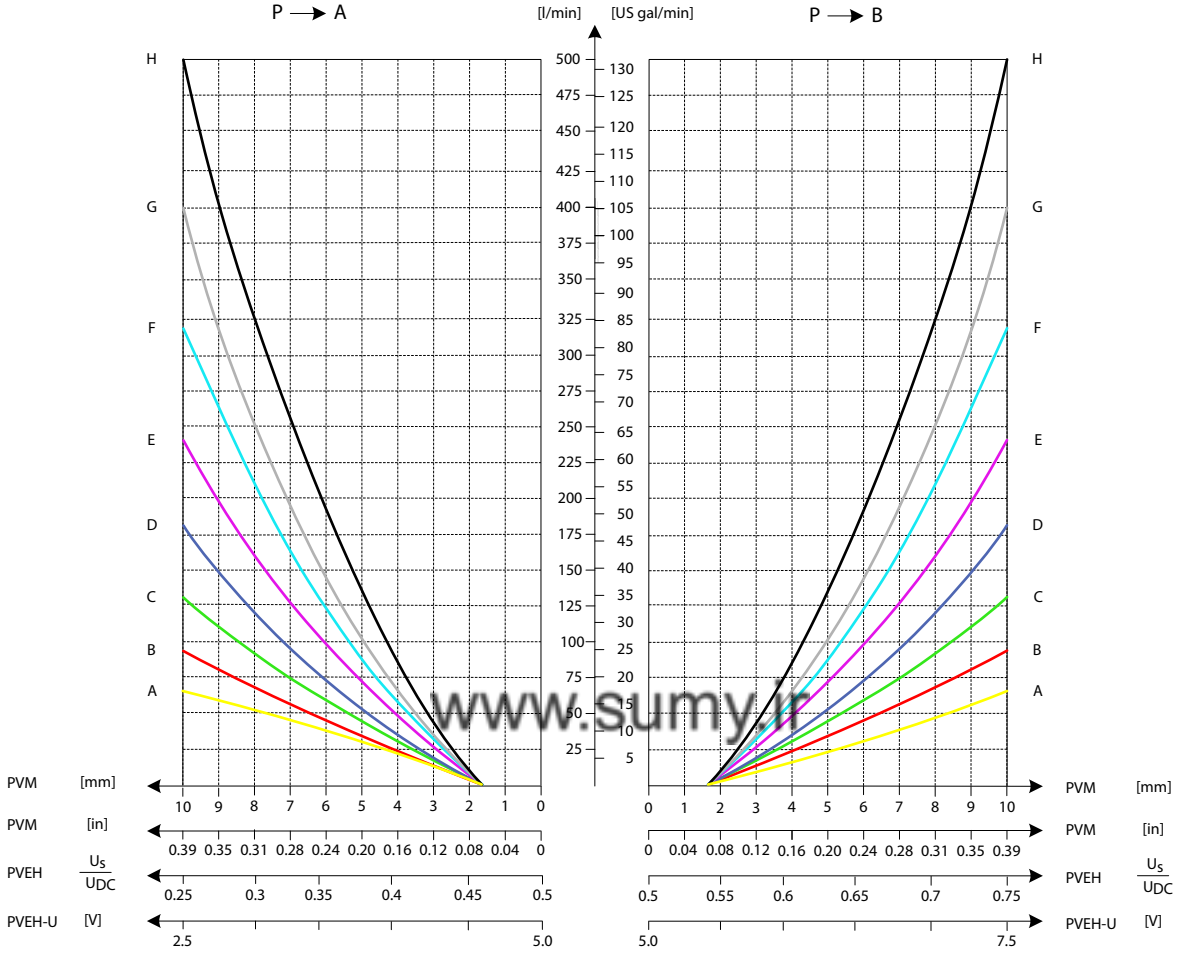
PVG-EX PVBS main spools product details

Technical data

Oil temperature	Recommended	30 to 60°C	[86 to 140°F]
	Minimum	-30°C	[-22°F]
	Maximum	90°	[194°F]
Ambient temperature	Recommended	-30 to 60°C	[-22 to 140°F]
Oil viscosity	Operating range	12 to 75 mm^2/s	[65 to 347 SUS]
	Minimum	4 mm^2/s	[39 SUS]
	Maximum	460 mm^2/s	[2128 SUS]
Oil contamination according to ISO 4406	Maximum	23/19/16	

PVG-EX 128/256

Progressive Oil Flow as Function of Spool Travel



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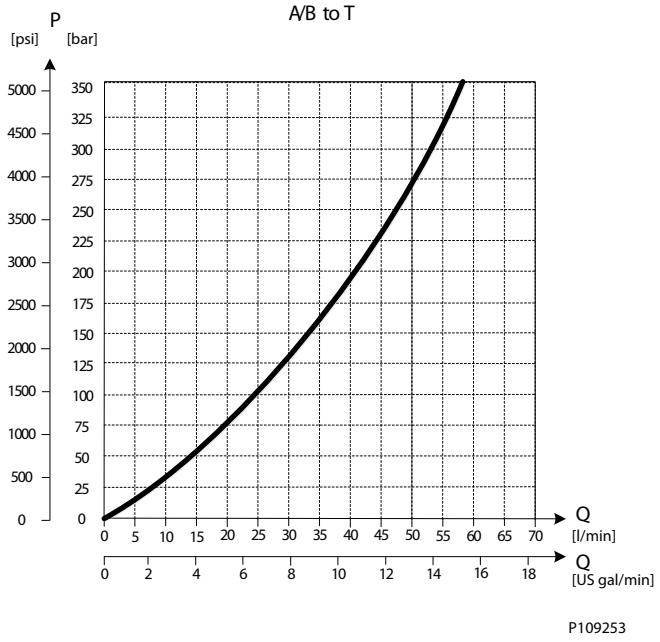
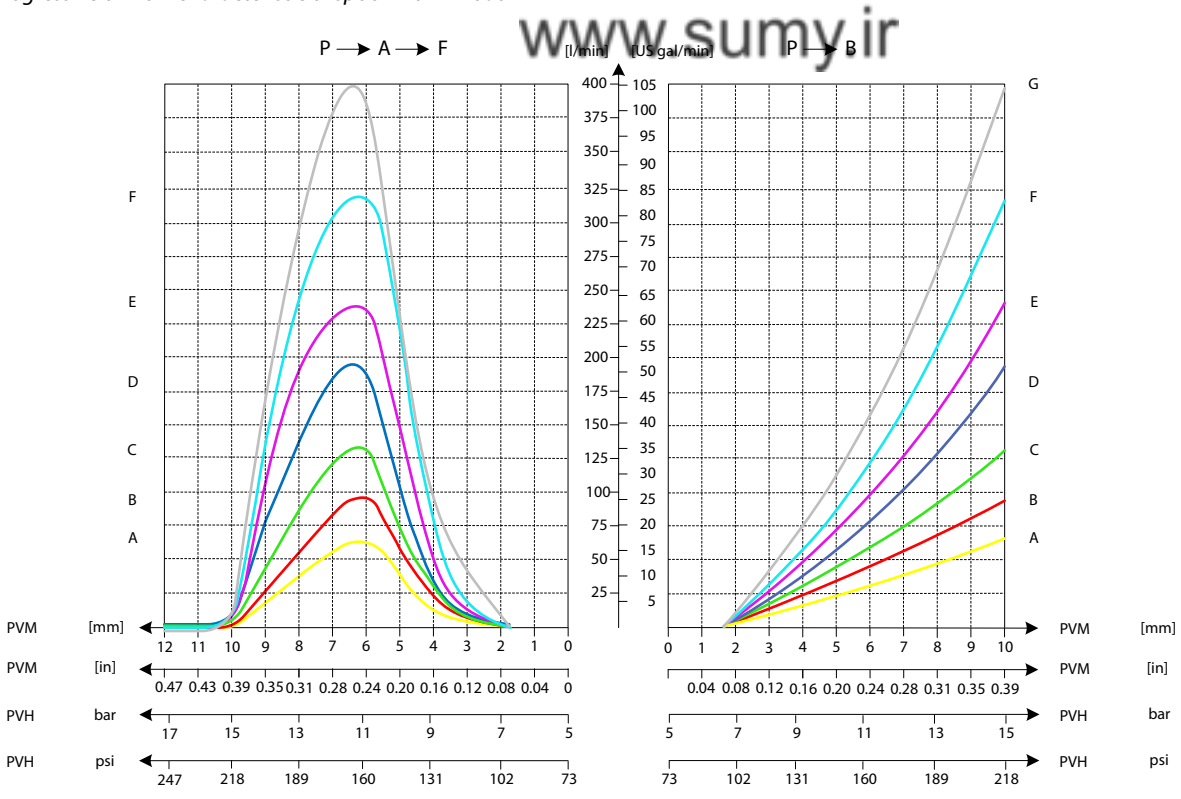
PVG-EX 128/256

Pressure drop for open spool in neutral position



Progressive oil flow characteristic of spool with A-float



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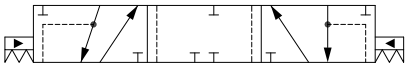
PVG-EX 128/256

PVG-EX PVS Main spools part numbers

PVG-EX Flow control spools

PVG-EX Flow control spool closed neutral position

Schematic



P109177

Symmetric flow control spools

Part number	Actuation	Flow - l/min (US gal/min)			
		A→T	P→A	P→B	B→T
11177686	PVE	65 [17.17]	65 [17.17]	65 [17.17]	65 [17.17]
11177738	PVE	95 [25.10]	95 [25.10]	95 [25.10]	95 [25.10]
11177750	PVE	130 [34.34]	130 [34.34]	130 [34.34]	130 [34.34]
11177448	PVE	180 [47.55]	180 [47.55]	180 [47.55]	180 [47.55]
11177798	PVE	240 [63.40]	240 [63.40]	240 [63.40]	240 [63.40]
11178733	PVE	320 [84.54]	320 [84.54]	320 [84.54]	320 [84.54]
11177058*	PVE	400 [105.67]	400 [105.67]	400 [105.67]	400 [105.67]
11184159	PVH/PVHC	65 [17.17]	65 [17.17]	65 [17.17]	65 [17.17]
11184846	PVH/PVHC	95 [25.10]	95 [25.10]	95 [25.10]	95 [25.10]
11182643	PVH/PVHC	130 [34.34]	130 [34.34]	130 [34.34]	130 [34.34]
11182640	PVH/PVHC	180 [47.55]	180 [47.55]	180 [47.55]	180 [47.55]
11182638	PVH/PVHC	240 [63.40]	240 [63.40]	240 [63.40]	240 [63.40]
11182635	PVH/PVHC	320 [84.54]	320 [84.54]	320 [84.54]	320 [84.54]
11182621*	PVH/PVHC	400 [105.67]	400 [105.67]	400 [105.67]	400 [105.67]

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* Up to 500 l/min in combination with PVB 256 3-way Turbo Compensator feature

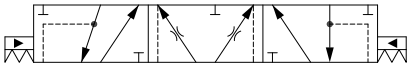
Asymmetric spools

Part number	Actuation	Flow - l/min (US gal/min)			
		A→T	P→A	P→B	B→T
**	PVH/PVHC	65 [17.17]	65 [17.17]	130 [34.34]	130 [34.34]
	PVH/PVHC	95 [25.10]	95 [25.10]	180 [47.55]	180 [47.55]
	PVH/PVHC	130 [34.34]	130 [34.34]	240 [63.40]	240 [63.40]
	PVH/PVHC	180 [47.55]	180 [47.55]	320 [84.54]	320 [84.54]
	PVH/PVHC	240 [63.40]	240 [63.40]	400 [105.67]	400 [105.67]

** Please contact your Danfoss Power Solutions representative if one of these variants is needed.

PVG-EX Flow control spool throttled open neutral position

Schematic



P109178

PVG-EX 128/256

Symmetric flow control spools

Part number	Actuation	Flow - l/min (US gal/min)			
		A→T	P→A	P→B	B→T
[1]	PVE	65 [17.17]	65 [17.17]	65 [17.17]	65 [17.17]
11182537	PVE	95 [25.10]	95 [25.10]	95 [25.10]	95 [25.10]
11178290	PVE	130 [34.34]	130 [34.34]	130 [34.34]	130 [34.34]
11178310	PVE	180 [47.55]	180 [47.55]	180 [47.55]	180 [47.55]
11182619	PVE	240 [63.40]	240 [63.40]	240 [63.40]	240 [63.40]
11182618	PVE	320 [84.54]	320 [84.54]	320 [84.54]	320 [84.54]
11182617[2]	PVE	400 [105.67]	400 [105.67]	400 [105.67]	400 [105.67]
(1)	PVH/PVHC	65 [17.17]	65 [17.17]	65 [17.17]	65 [17.17]
11183604	PVH/PVHC	95 [25.10]	95 [25.10]	95 [25.10]	95 [25.10]
11183602	PVH/PVHC	130 [34.34]	130 [34.34]	130 [34.34]	130 [34.34]
11183441	PVH/PVHC	180 [47.55]	180 [47.55]	180 [47.55]	180 [47.55]
11178318	PVH/PVHC	240 [63.40]	240 [63.40]	240 [63.40]	240 [63.40]
11180718	PVH/PVHC	320 [84.54]	320 [84.54]	320 [84.54]	320 [84.54]
11178984 (2)	PVH/PVHC	400 [105.67]	400 [105.67]	400 [105.67]	400 [105.67]

[1] Please contact your Danfoss Power Solutions representative if one of these variants is needed.

[2] Up to 500 l/min in combination with PVB 256 3-way Turbo Compensator feature

Asymmetric flow control spools

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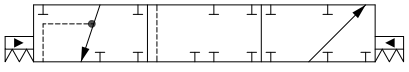
Part number	Actuation	Flow - l/min (US gal/min)			
		A→T	P→A	P→B	B→T
**	-	65 [17.17]	65 [17.17]	130 [34.34]	130 [34.34]
	-	95 [25.10]	95 [25.10]	180 [47.55]	180 [47.55]
	-	130 [34.34]	130 [34.34]	240 [63.40]	240 [63.40]
	-	180 [47.55]	180 [47.55]	320 [84.54]	320 [84.54]
	-	240 [63.40]	240 [63.40]	400 [105.67]	400 [105.67]

** Please contact your Danfoss Power Solutions representative if one of these variants is needed.

PVG-EX Single acting cylinder flow control spool closed neutral position, flow control B port

Schematic



P109179

Part number	Actuation	Flow - l/min (US gal/min)			
		A→T	P→A	P→B	B→T
[1]	PVE	-	-	65 [17.17]	65 [17.17]
(1)	PVE	-	-	95 [25.10]	95 [25.10]
(1)	PVE	-	-	130 [34.34]	130 [34.34]
(1)	PVE	-	-	180 [47.55]	180 [47.55]
(1)	PVE	-	-	240 [63.40]	240 [63.40]
(1)	PVE	-	-	320 [84.54]	320 [84.54]
(1)[2]	PVE	-	-	400 [105.67]	400 [105.67]

PVG-EX 128/256

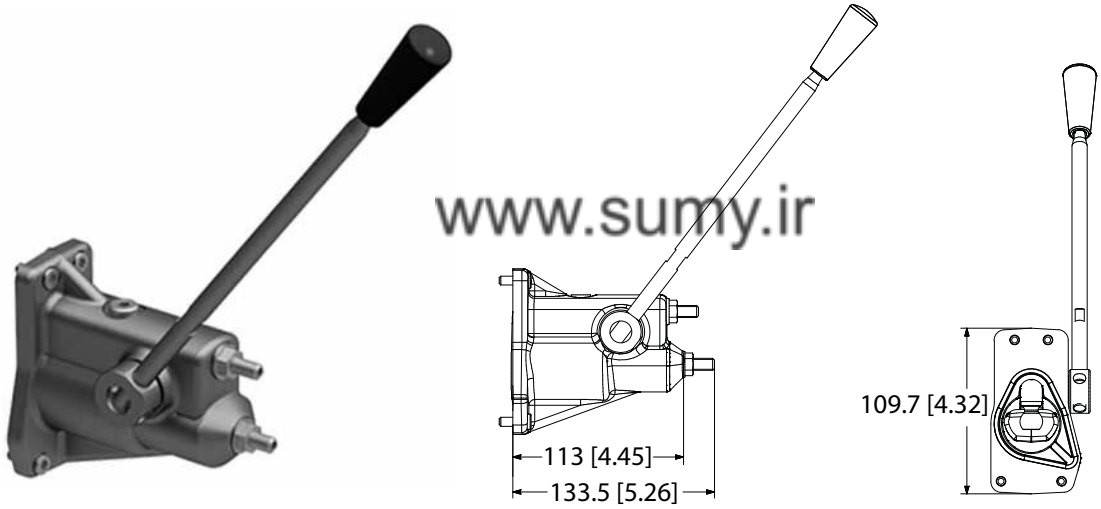
Part number	Actuation	Flow - l/min (US gal/min)			
		A→T	P→A	P→B	B→T
(1)	PVH/PVHC	-	-	65 [17.17]	65 [17.17]
(1)	PVH/PVHC			95 [25.10]	95 [25.10]
(1)	PVH/PVHC	-	-	130 [34.34]	130 [34.34]
(1)	PVH/PVHC	-	-	180 [47.55]	180 [47.55]
(1)	PVH/PVHC	-	-	240 [63.40]	240 [63.40]
(1)	PVH/PVHC	-	-	320 [84.54]	320 [84.54]
(1)(2)	PVH/PVHC	-	-	400 [105.67]	400 [105.67]

[1] Please contact your Danfoss Power Solutions representative if one of these variants is needed.

[2] Up to 500 l/min in combination with PVB 256 3-way Turbo Compensator feature

PVG-EX PVM Manual Activation

PVM Lever dimensions



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Weight: 1.5 kg [3.3 lbs]

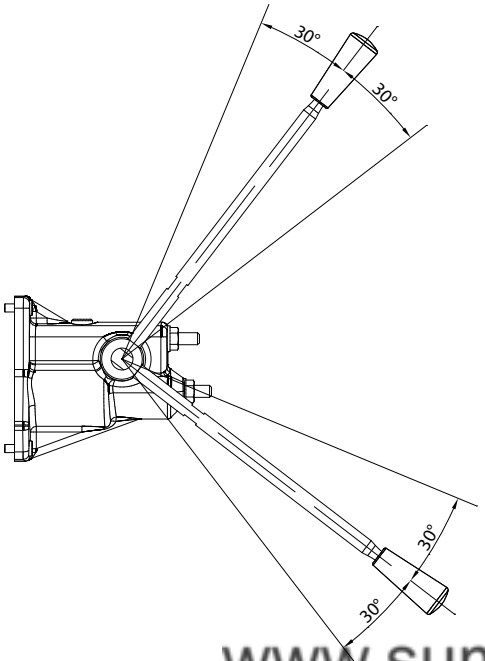
The PVM manual activation cover is intended for use on any work section where the operator has to have the ability to interact with the spool manually.

The adjustment screws are intended for limiting the spool travel and thereby the maximum achievable flow.

PVG-EX 128/256

PVG-EX PVM Technical Data

Handle Installation



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Technical data

Spool displacement		Torque	
From neutral position	PVM+PVMD	12 N·m	106 lb·in
	PVM+PVE	12 N·m	106 lb·in
	PVM+PVH	30 N·m	265 lb·in
Max. spool travel	PVM+PVMD	30 N·m	265 lb·in
	PVM+PVE	30 N·m	265 lb·in
	PVM+PVH	91 N·m	805 lb·in
Standard Control Range		30°	
Control lever range + float position		37°	

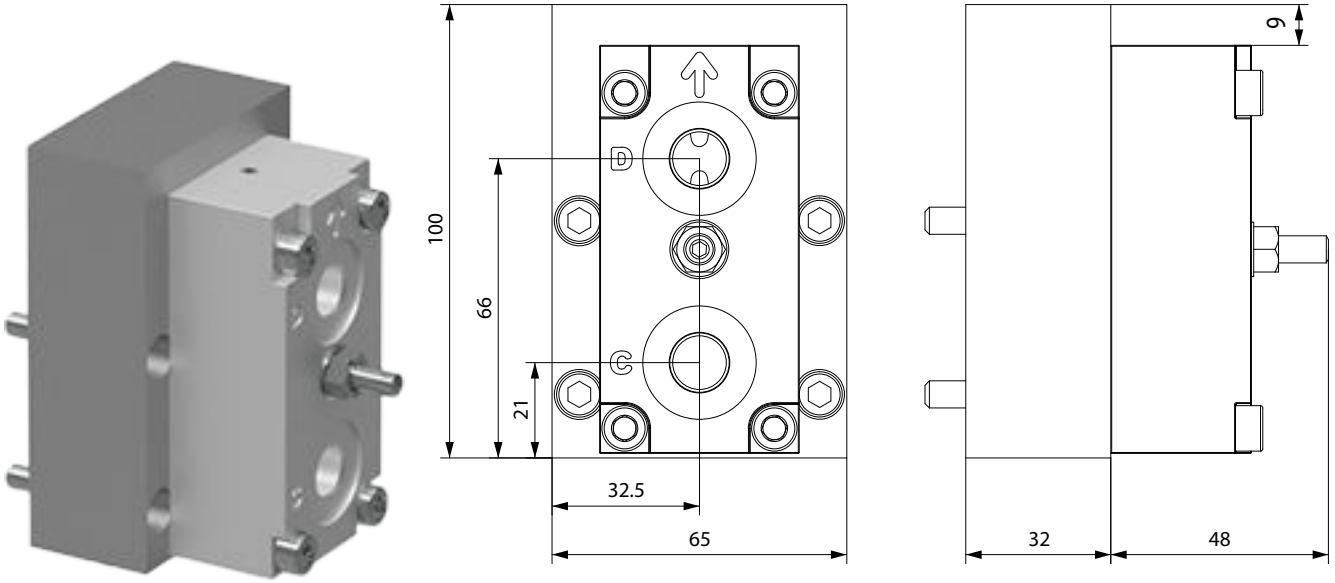
Part numbers for PVM Manual Activation

Part number	Material	Adjustment screws	Lever base and lever	B-port Gauge
11176644	Cast iron	-	Yes	No
11175317	Cast iron	Yes	Yes	G1/8" BSP
11176635	Cast iron	Yes	Yes	3/8"-24 UNF

PVG-EX 128/256

PVG-EX PVH Hydraulic Actuation

PVH dimensions



The PVH hydraulic activation cover is intended for use on any work section where the operator wants to have a possibility to interact with the main spool via a hydraulic joystick.

Inlet with Hydraulic Pilot Pressure is needed.

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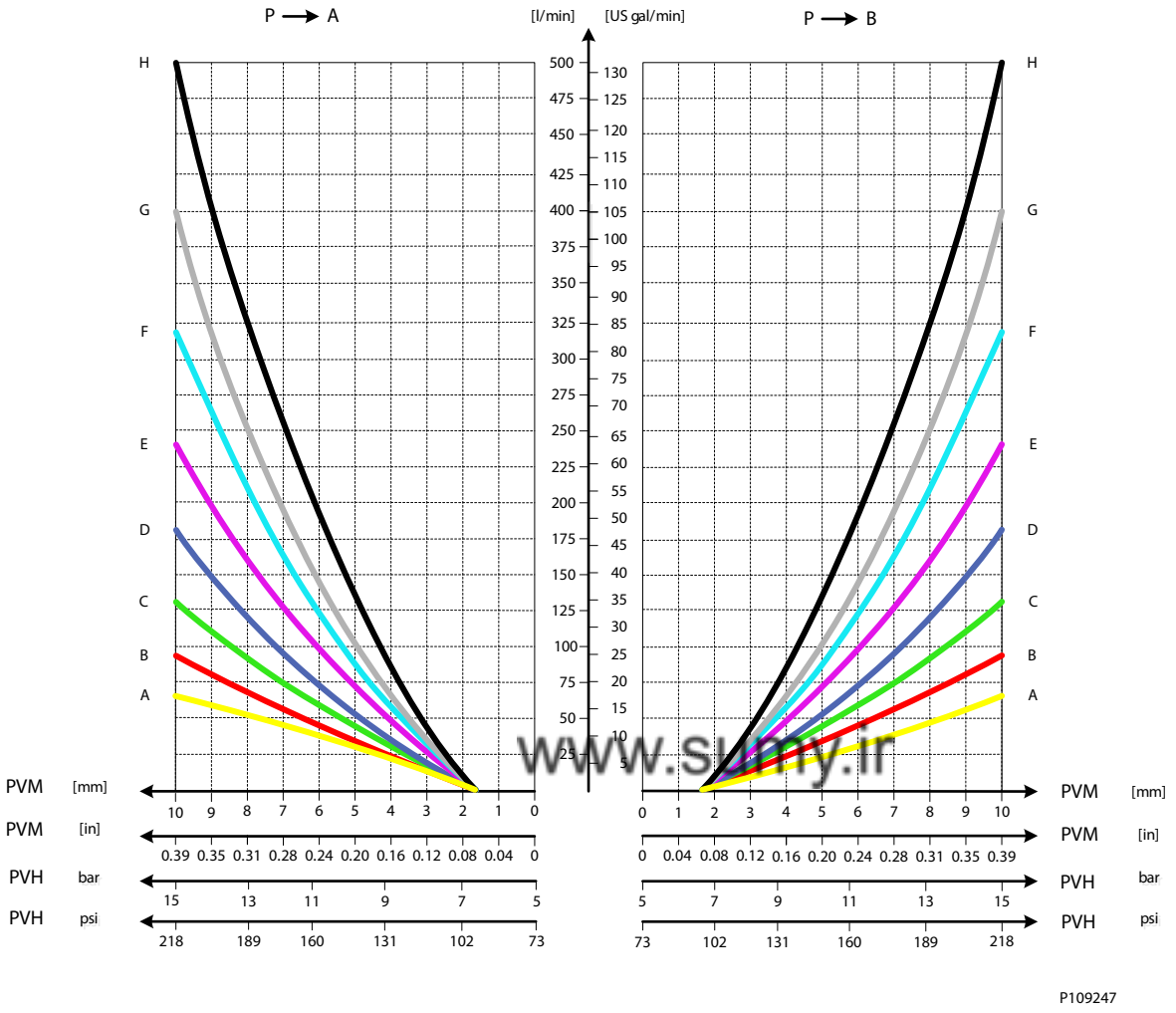
PVG-EX 128/256



www.Sunny.ir

PVG-EX PVH Technical Data

Technical data

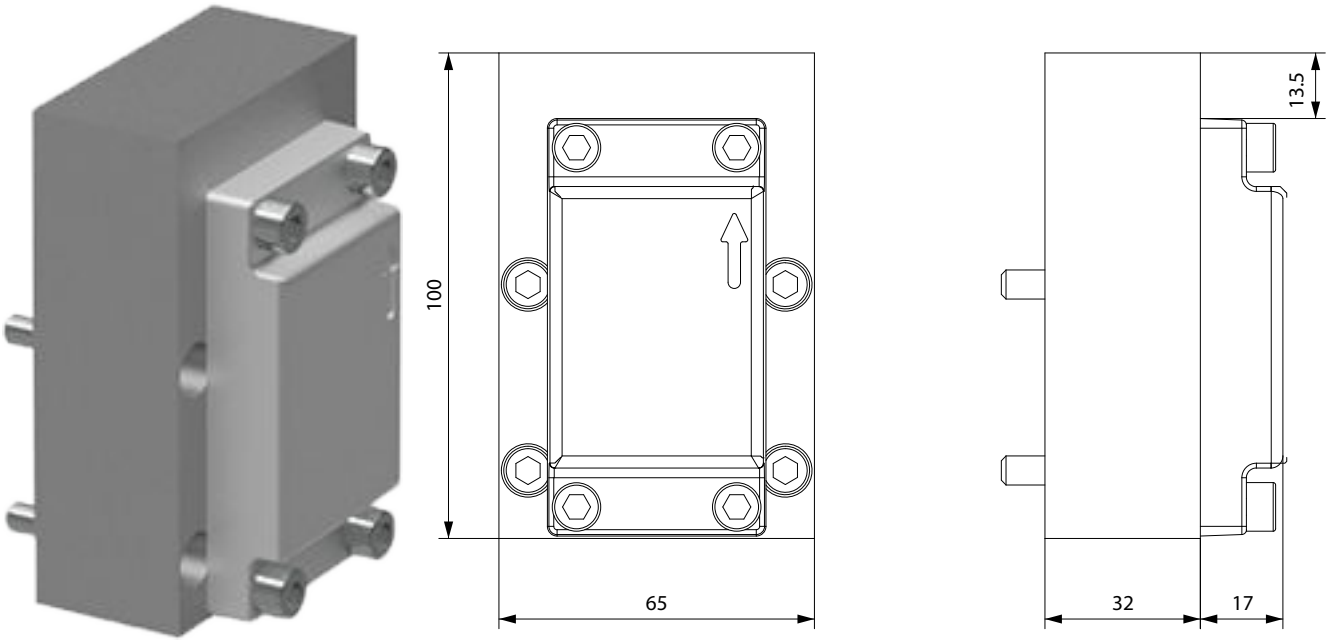
Main Spool Spring control pressure range	5 – 15 bar	[73 – 218 psi]
Pilot oil pressure range between 20 and 25 bar	20 – 25 bar	[290 – 362 psi]
Max. pressure on port T (the hydraulic remote control lever should be connected directly to tank).	10 bar	[145 psi]

For PVH ordering information, please contact a Danfoss Sales Representative.

PVG-EX 128/256

PVG-EX PVMD Cover Manual Actuation Only

PVMD dimensions



The PVMD cover is used when work section is purely mechanical activated.

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PVG-EX PVMD Part Numbers

Part numbers for PVMD Covers

Part number	Material
11258873	Cast iron

PVG-EX 128/256

PVG-EX PVSI/PVGI End and Interface Plates

The PVG PVGI Interface Plate act as an interface between the PVB 256/128 and PVB 32/16 basic modules which enables you to build a combo valve with PVB 256/128/32/16.

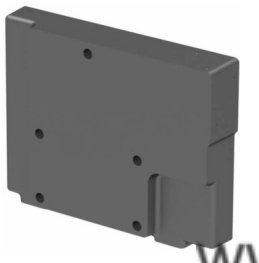
Optional the PVSI End Plate features additional P and T connection to accommodate an additional 600 l/min pump flow.

The PVS end plate variants are based on a generic platform with a selection of additional features, enabling you to tailor the PVSI/PVGI to suit the demands of any hydraulic system. Versions available with LX connection, and P and T connections. PVSI and PVGI are all in cast iron.

The generic PVSI/PVGI End and Interface Plates platform includes the following main variants:

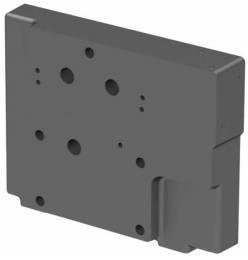
- PVSI with or without LX-connection
- PVSI with P and T connections
- PVSI Interface plate

PVSI with or without LX connection



PVSI with P and T connections

PVGI Interface plate



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Technical data

Max. rated pressure	P-port continuous	350 bar	[5076 psi]
	P-port intermittent	400 bar	[5800 psi]
	T-port static/dynamic	25/40 bar	[363/580 psi]
Oil temperature	Recommended	30 to 60°C	[86 to 140°F]
	Minimum	-30°C	[-22°F]
	Maximum	90°	[194°F]
Ambient temperature	Recommended	-30 to 60°C	[-22 to 140°F]
Oil viscosity	Operating range	12 to 75 mm^2/s	[65 → 347 SUS]
	Minimum	4 mm^2/s	[39 SUS]
	Maximum	460 mm^2/s	23/19/16
Oil contamination according to ISO 4406	Maximum	23/19/16	

For more information about PVSI/PVGI End and Interface Plates, see:

PVG-EX 128/256

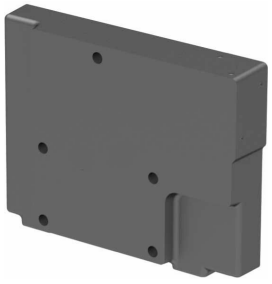
PVG-EX PVSI with or without LX-connection

The PVSI made of Cast Iron work as an End Plate.

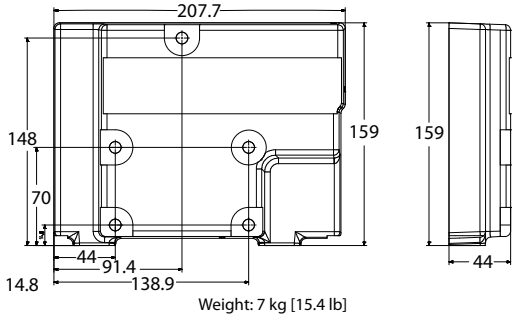
The PVSI with LX connection enables another valves LS pressure to be shuttled to the pump when needed.

The LX port treads are with BSP or UNF tread.

PVSI with or without LX connection



Dimensions



Weight: 7 kg [15.4 lb]

Schematic

P109227

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Technical data

Max. rated pressure	P-port continuous	350 bar	[5076 psi]
	P-port intermittent	400 bar	[5800 psi]
	T-port static/dynamic	25/40 bar	[363/580 psi]
Oil temperature	Recommended	30 to 60°C	[86 to 140°F]
	Minimum	-30°C	[-22°F]
	Maximum	90°	[194°F]
Ambient temperature	Recommended	-30 to 60°C	[-22 to 140°F]
Oil viscosity	Operating range	12 to 75 mm^2/s	[65 → 347 SUS]
	Minimum	4 mm^2/s	[39 SUS]
	Maximum	460 mm^2/s	23/19/16
Oil contamination according to ISO 4406	Maximum	23/19/16	

Part numbers for PVSI End Plate with or without LX connection

Part number	LX-port	Mounting feet
11171419	-	M12
11179950	G1/4"BSP	M12
11179949	7/16-20 UNF	M12

PVG-EX 128/256

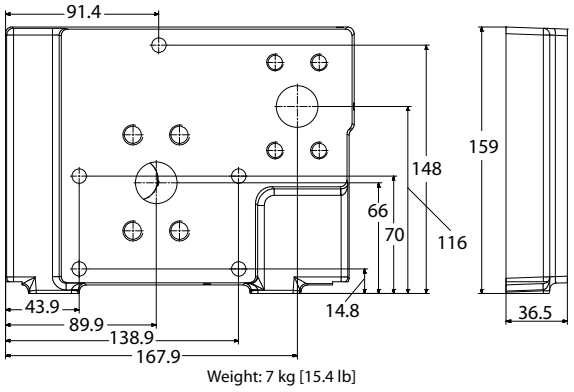
PVG-EX PVSI with P and T port connections

The PVSI with P and T port connections enables an additional 600 l/min pump flow to a PVG 128/256 valve.

Metric and SAE flange connections as well as BSP and UNF treaded ports.

PVSI with P and T port connections

Dimensions



Weight: 7 kg [15.4 lb]

Schematic

P109205

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Technical data

Max. rated pressure	P-port continuous	350 bar	[5076 psi]
	P-port intermittent	400 bar	[5800 psi]
	T-port static/dynamic	25/40 bar	[363/580 psi]
Oil temperature	Recommended	30 to 60°C	[86 to 140°F]
	Minimum	-30°C	[-22°F]
	Maximum	90°	[194°F]
Ambient temperature	Recommended	-30 to 60°C	[-22 to 140°F]
Oil viscosity	Operating range	12 to 75 mm^2/s	[65 → 347 SUS]
	Minimum	4 mm^2/s	[39 SUS]
	Maximum	460 mm^2/s	23/19/16
Oil contamination according to ISO 4406	Maximum	23/19/16	

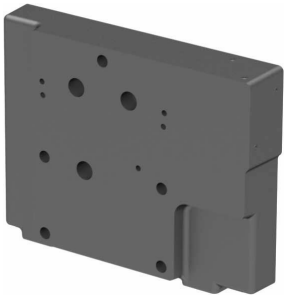
Part number	P-port	T-port	Width	Mounting feet
11171418	Metric Flange 1″	Metric Flange 1-1/4″	37 mm	M12
11179952	Thread Ports G1" BSP	Thread Ports G1-1/4" BSP	44 mm	M12
11171421	SAE Flange 1″ UNF	SAE Flange 1-1/4″ UNF	37 mm	M12
11171416	Thread Ports 1-5/16 UNF	Thread Ports 1-5/8 UNF	44 mm	M12

PVG-EX 128/256

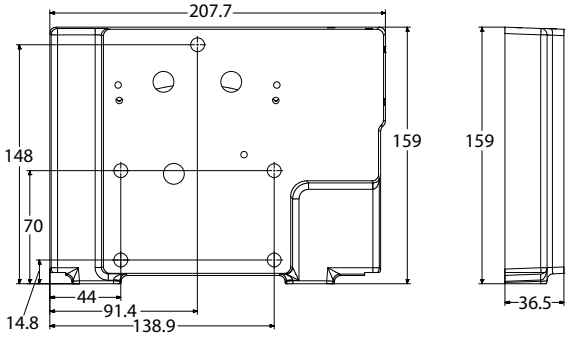
PVG-EX PVGI Interface Plate

The PVGI Interface Plate connects the P-, T-, LS- and Pp-channels in PVB 128/256 to the corresponding channels in PVB 32 and/or 16 modules. T0 variant featured for PVB 32 modules equipped with T0.

PVGI Interface plate



Dimensions



Weight: 7 kg [15.4 lbs]

Schematic

P109184

Technical data

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Max. rated pressure	P-port continuous	350 bar	[5076 psi]
	P-port intermittent	400 bar	[5800 psi]
	T-port static/dynamic	25/40 bar	[363/580 psi]
Oil temperature	Recommended	30 to 60°C	[86 to 140°F]
	Minimum	-30°C	[-22°F]
	Maximum	90°	[194°F]
Ambient temperature	Recommended	-30 to 60°C	[-22 to 140°F]
Oil viscosity	Operating range	12 to 75 mm^2/s	[65 → 347 SUS]
	Minimum	4 mm^2/s	[39 SUS]
	Maximum	460 mm^2/s	23/19/16
Oil contamination according to ISO 4406	Maximum	23/19/16	

Part number	T0	PVGI width	Mounting feet
11171422	No	37 mm	M12
11171423	Yes	37 mm	M12

PVG-EX 128/256

PVG-EX PVAS

Stay Bolts for PVG 128 and 256 consists of 2 different kits:

1. PVAS containing 2 stay bolts – shall be placed in spec sheet under PVAS 1.
2. PVAS containing 3 stay bolts – shall be placed in spec sheet under PVAS 2.

Furthermore, O-rings is a part of the PVAS kits.

The table below shows which 2 PVAS kits required for the specification according to number of PVB 128 and/or PVB 256.

Table 1

		PVB 256							
		0	1	2	3	4	5	6	7
PVB 128	0		11187672+ 11188215	11187673+ 157B8003	11187656+ 11188208	11187675+ 157B8026	11187696+ 157B8028	11187697+ 11188197	11187689+ 157B8062
	1	11187320+ 11188216	11187677+ 157B8022	11187681+ 157B8024	11187658+ 11188205	11187685+ 157B8008	11187687+ 11188198	11187690+ 157B8081	
	2	11187617+ 11188213	11187678+ 157B8004	11187682+ 11188206	11187686+ 157B8027	11187691+ 11188199	11187704+ 11188195		
	3	11187655+ 157B8023	11187679+ 11188207	11187683+ 11188203	11187705+ 157B8009	11187694+ 11188196	11187695+ 157B8082		
	4	11187684+ 157B8005	11187680+ 11188204	11187696+ 157B8028	11187697+ 11188197	11187689+ 157B8062			
	5	11187658+ 11188205	11187699+ 157B8008	11187688+ 157B8010	11187710+ 11188194				
	6	11187693+ 11188202	11187703+ 157B8029	11187704+ 11188195					
	7	11187705+ 157B8009	11187694+ 11188196						
	8	11187692+ 157B8030	11187709+ 11188189						
	9	11187710+ 11188194							

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Ex. For 2 PVB 256 and 1 PVB 128:

PVAS 1 = 11187681

PVAS 2 = 157B8024

For PVG 128/256 in combination with PVG 16/32 please see *PVAS for Combo*.

PVG-EX PVAS for Combo

Stay Bolts for PVG-EX 32/128/256 consists of 2 different kits:

1. PVAS containing 2 stay bolts - please look in *Table 2* and use P/N before + symbol.
2. PVAS containing 3 stay bolts – please look in *Table 2* and write down the length in millimeters after the + symbol.

Furthermore, O-rings is a part of the PVAS kits – no additional P/N needed.

Table 2.

	PVB 256							
	0	1	2	3	4	5	6	7

PVG-EX 128/256

Table 2. (continued)

PVB 128	0	11187676+ 40	11187672+ 126	11187673+ 212	11187656+ 298	11187675+ 384	11187696+ 470	11187697+ 556	11187698+ 642
	1	11187320+ 106	11187677+ 192	**11187681+ 278**	11187658+ 364	11187685+ 450	11187687+ 536	11187690+ 622	
	2	11187617+ 172	11187678+ 258	11187682+ 344	11187686+ 430	11187691+ 516	11187704+ 602		
	3	11187655+ 238	11187679+ 324	11187683+ 410	11187705+ 496	11187694+ 582	11187695+ 668		
	4	11187684+ 304	11187680+ 390	11187696+ 476	11187697+ 562	11187689+ 648			
	5	11187658+ 370	11187699+ 456	11187688+ 542	11187710+ 628				
	6	11187693+ 436	11187703+ 522	11187704+ 608					
	7	11187705+ 502	11187694+ 588						
	8	11187692+ 568	11187709+ 654						
	9	11187710+ 634							

No. of PVB 32	1	2	3	4	5	6	7	8	9	10
Length in mm	72	120	**168**	216	264	312	360	408	456	504

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Example

For 2 PVB 256 and 1 PVB 128 and 3 PVB 32.

PVAS 1 P/N = **11187681** from *Table 2*.

PVAS 2 = **278** mm from *Table 2* + **168** mm from *Table 3* = 278+168 =446 mm which equals **157B8008** in *Table 4*.

PVG-EX PVAS Part Number Overview

Table 4.

Part number	Accumulated module length in mm
157B8082	661-672
11188189	649-660
157B8062	637-648
11188194	625-636
157B8081	613-624
11188195	601-612
157B8061	589-600
11188196	577-588
157B8030	565-576
11188197	553-564
157B8010	541-552
11188198	529-540
157B8029	517-528
11188199	505-516

PVG-EX 128/256

Table 4. (continued)

Part number	Accumulated module length in mm
157B8009	493-504
11188200	481-492
157B8028	469-480
11188201	457-468
157B8008	**445-456**
11188202	433-444
157B8027	421-432
11188203	409-420
157B8007	397-408
11188204	385-396
157B8026	373-384
11188205	361-372
157B8006	349-360
11188206	337-348
157B8025	325-336
11188207	313-324
157B8005	301-312
11188208	289-300
157B8024	277-288
11188209	265-276
157B8004	253-264
11188210	241-252
157B8023	229-240
11188211	217-228
157B8003	205-216
11188212	193-204
157B8022	181-192
11188213	169-180
157B8002	157-168
11188214	145-156
157B8021	133-144
11188215	121-132
157B8001	109-120
11188216	97-108
157B8031	85-96
11188217	73-84
157B8000	61-72
11188218	49-60
11188219	20-48

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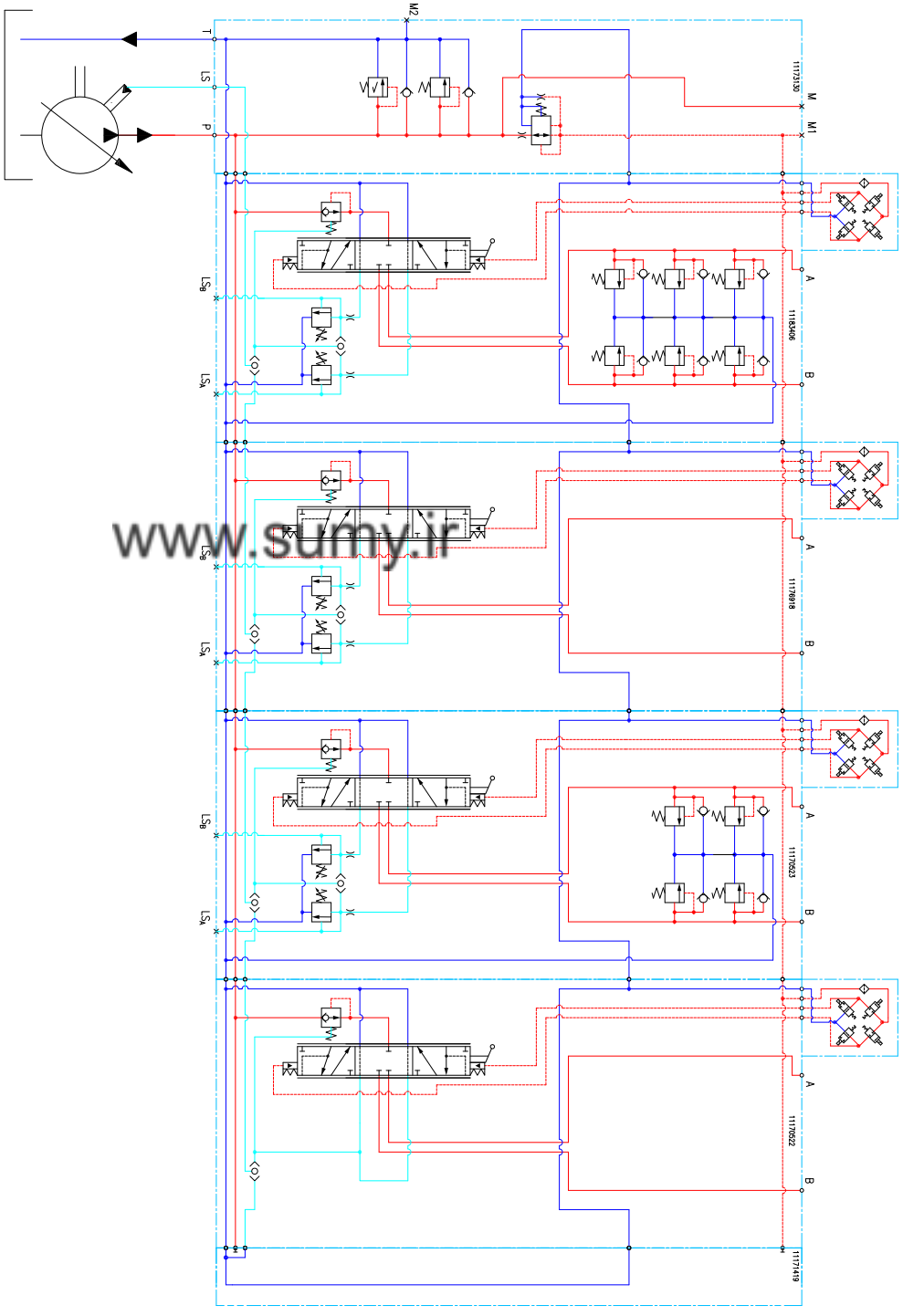
PVG-EX 128/256

PVG-EX 128/256 Valve Schematics

PVG-EX Valve Schematics

PVG 128/256 Schematic with Basic End Plate



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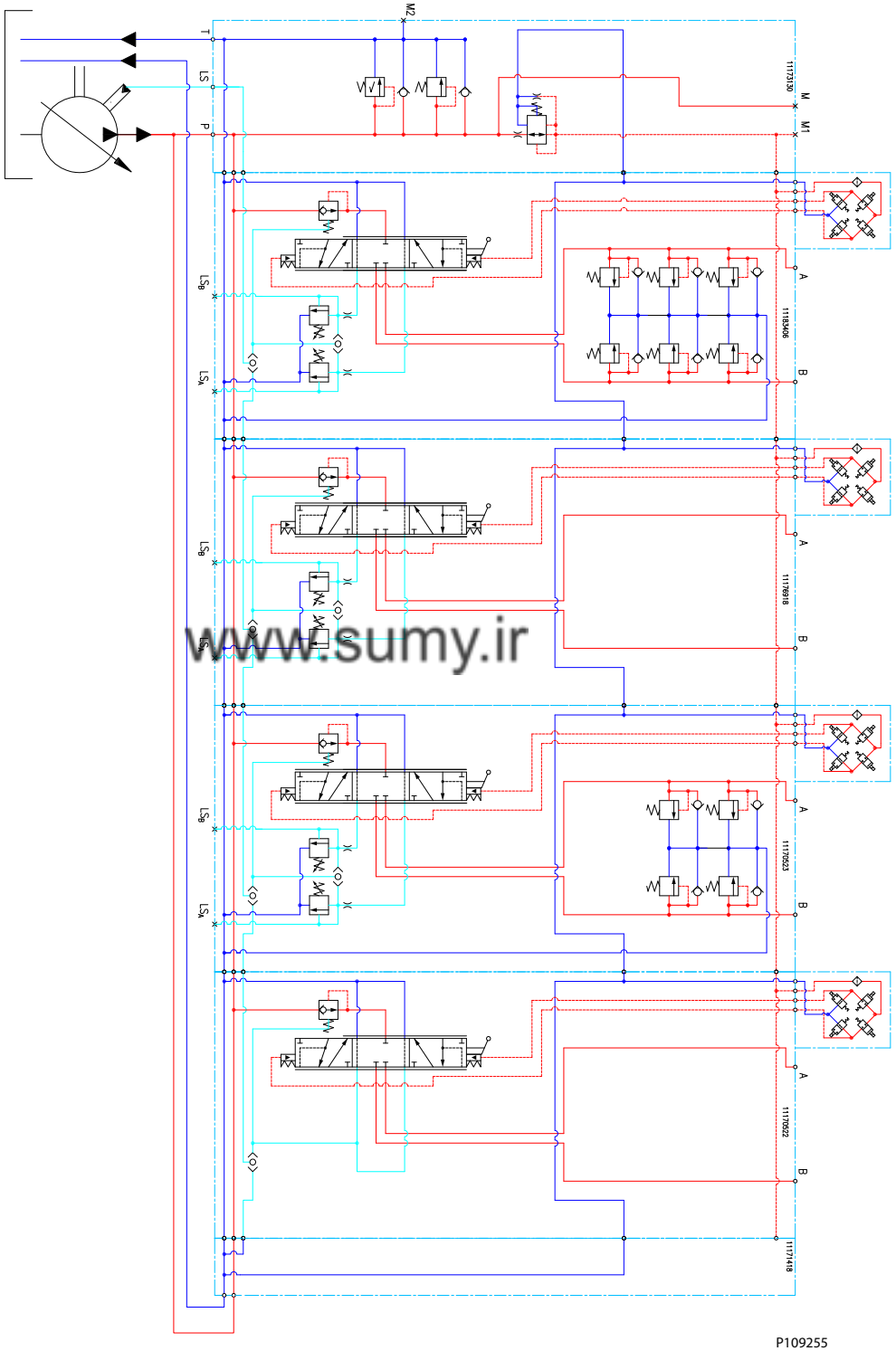
P109254

PVG-EX 128/256

PVG 128/256 with P- and T-connection end plate



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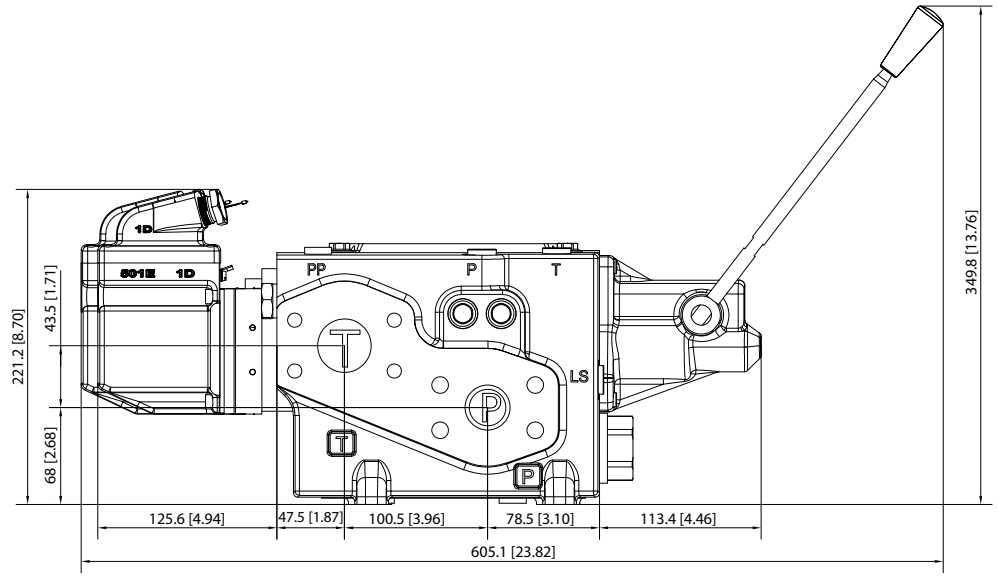
PVG-EX 128/256

Dimensions Overview

Dimension Overview for PVG-EX 128/256

PVG 128/256 Dimensions



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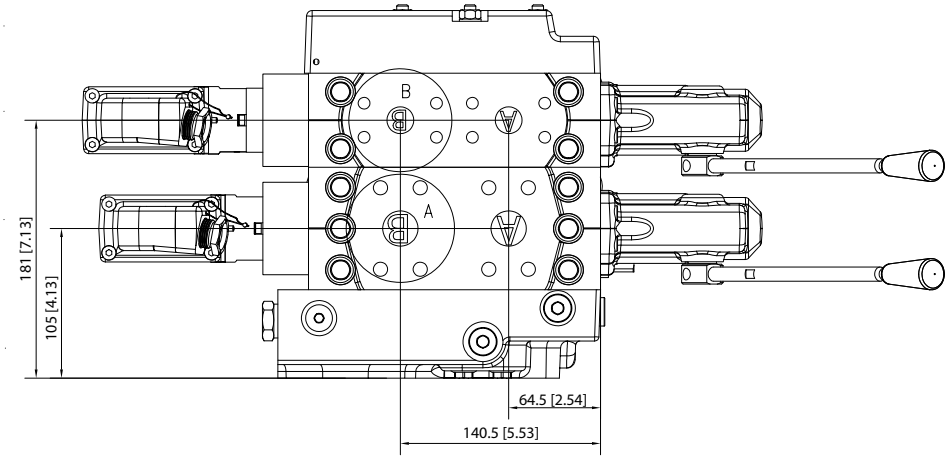

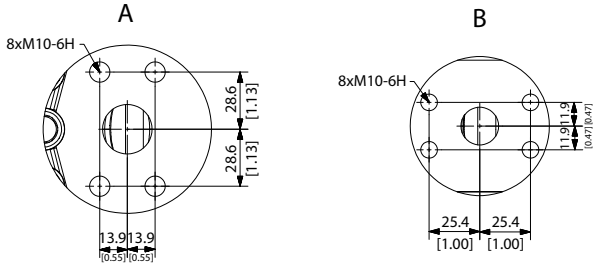

PVG-EX 128/256

Number of PVB 256			Number of PVB 128									
			0	1	2	3	4	5	6	7	8	9
0	L1	mm	-	98.5	164.5	230.5	296.5	362.5	428.5	494.5	560.5	626.5
		[in]	-	[3.88]	[6.48]	[9.07]	[11.67]	[14.27]	[16.87]	[19.47]	[22,07]	[24.67]
	L2	mm	-	176.5	249.5	309.5	382.5	443.5	515.5	576.5	649.5	709.5
		[in]	-	[6.95]	[9.82]	[12.19]	[15.06]	[17.46]	[20.30]	[22.70]	[25.57]	[27.93]
1	L1	mm	118.5	184.5	250.5	316.5	382.5	448.5	514.5	580.5	646.5	-
		[in]	[4.67]	[7.26]	[9.86]	[12.46]	[15.06]	[17.66]	[20.26]	[22.85]	[25.45]	-
	L2	mm	200.5	273.5	334.5	406.5	467.5	540.5	600.5	673.5	734.5	-
		[in]	[7.89]	[10.77]	[13.17]	[16.00]	[18.41]	[21.28]	[26.64]	[26.52]	[28.92]	-
2	L1	mm	204.5	270.5	336.5	402.5	468.5	534.5	600.5	-	-	-
		[in]	[8.05]	[10.65]	[13.25]	[15.85]	[18.44]	[21.04]	[23.64]	-	-	-
	L2	mm	285.5	358.5	418.5	491.5	552.5	625.5	685.5	-	-	-
		[in]	[11.24]	[14.11]	[16.48]	[19.35]	[21.75]	[24.63]	[26.99]	-	-	-
3	L1	mm	290.5	356.5	422.5	488.5	554.5	520.5	-	-	-	-
		[in]	[11.44]	[14.04]	[16.63]	[19.23]	[21.83]	[24.43]	-	-	-	-
	L2	mm	370.5	443.5	503.5	576.5	637.5	709.5	-	-	-	-
		[in]	[14.59]	[17.46]	[19.82]	[22.70]	[25.10]	[27.93]	-	-	-	-
4	L1	mm	376.5	442.5	508.5	574.5	640.5	-	-	-	-	-
		[in]	[14.82]	[17.42]	[20.02]	[22.62]	[25.22]	-	-	-	-	-
	L2	mm	467.5	528.5	600,5	661.5	734.5	-	-	-	-	-
		[in]	[18.40]	[20.81]	[23.64]	[26.04]	[28.92]	-	-	-	-	-
5	L1	mm	462.5	528.5	594.5	660.5	-	-	-	-	-	-
		[in]	[18.21]	[20.81]	[23.41]	[26.00]	-	-	-	-	-	-
	L2	mm	552.5	612.5	685.5	746.5	-	-	-	-	-	-
		[in]	[21.75]	[24.11]	[26.99]	[29.39]	-	-	-	-	-	-
6	L1	mm	548.5	614.5	-	-	-	-	-	-	-	-
		[in]	[21.59]	[24.19]	-	-	-	-	-	-	-	-
	L2	mm	637.5	697.5	-	-	-	-	-	-	-	-
		[in]	[25.10]	[27.46]	-	-	-	-	-	-	-	-
7	L1	mm	634.5	-	-	-	-	-	-	-	-	-
		[in]	[24.98]	-	-	-	-	-	-	-	-	-
	L2	mm	722.5	-	-	-	-	-	-	-	-	-
		[in]	[28.44]	-	-	-	-	-	-	-	-	-

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PVG-EX 128/256

PVG-EX Specifications example

Specification Sheet
Valve type: **PVG 256 Combo**

Subsidiary / Dealer			Danfoss Sold-To Party No.			Customer				
Valve No.			Customer Part No.			Application				
Filled in by			Date		Revision No		EAU			

	Function	A-Port							B-Port	
1					11173130	PVPV256				
		PVLP	157B2380			bar				
		PVLP	157B2380							
2		PVM256	11175317		11169243	PVB256	11177058	PVBS256	11241519	PVES-EX
		PVLP	157B2350	LSA=	100	bar LSB=	315	bar	157B2350	PVLP
		PVLP	157B2350						157B2350	PVLP
		PVLP	157B2350						157B2350	PVLP
3		PVM256	11175317		11165621	PVB128	11178310	PVBS256	11241519	PVES-EX
		PVLP	157B2350	LSA=	315	bar LSB=	315	bar	157B2350	PVLP
		PVLP	157B2350						157B2350	PVLP
4					11171422	PVGI256				
				LSA=		bar LSB=		bar		
5		PVM	157B3171		157B6233	PVB32	157B7122	PVBS32	11156569	PVES-EX
		PVLP	157B2350	LSA=	250	bar LSB=	250	bar	157B2350	PVLP
6					157B2014	PVSI32				
				LSA=		bar LSB=		bar		
7				LSA=		bar LSB=		bar		
8				LSA=		bar LSB=		bar		
18	PVAS	1.	11187677	2.	157B8004	3.			Business Type:	
19	Painting (write **no** if paint not wanted)				no	No paint			New Business	
20	Customer Text on Group Label								PVE Programming:	
21	Customer Text on Packaging Label (Box)								No	
22	Comment:								EX Certification:	
									Ex h eb mb IIB	

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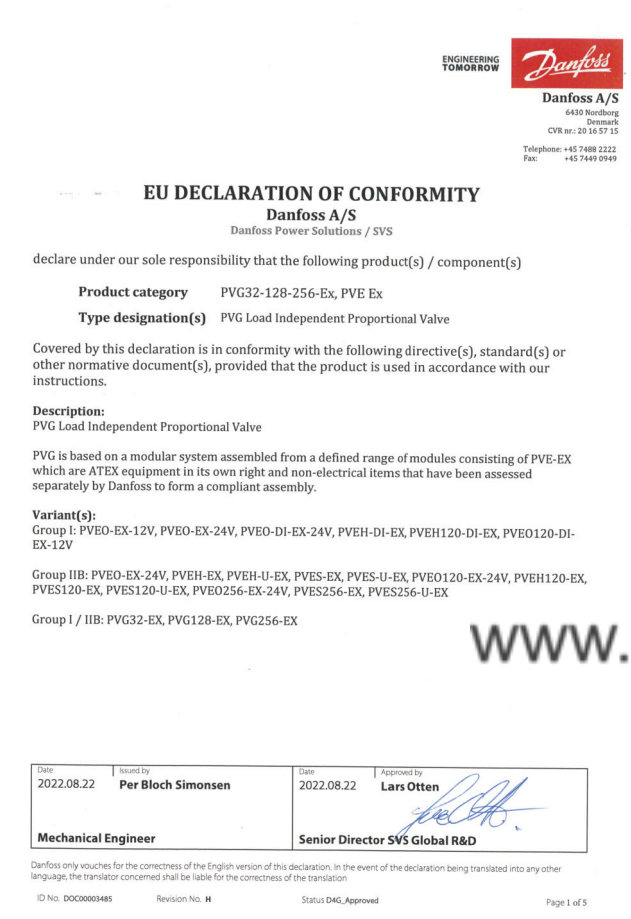

ENGINEERING TOMORROW

Danfoss A/S
6430 Nordborg
Denmark
CVR nr.: 20 16 57 15

Telephone: +45 7488 2222
Fax: +45 7449 0949

EU DECLARATION OF CONFORMITY
Danfoss A/S
Danfoss Power Solutions / SVS

declare under our sole responsibility that the following product(s) / component(s)

Product category PVG32-128-256-Ex, PVE Ex

Type designation(s) PVG Load Independent Proportional Valve

Covered by this declaration is in conformity with the following directive(s), standard(s) or other normative document(s), provided that the product is used in accordance with our instructions.

Description:
PVG Load Independent Proportional Valve

PVG is based on a modular system assembled from a defined range of modules consisting of PVE-EX which are ATEX equipment in its own right and non-electrical items that have been assessed separately by Danfoss to form a compliant assembly.

Variant(s):
Group I: PVEO-EX-12V, PVEO-EX-24V, PVEO-DI-EX-24V, PVEH-DI-EX, PVEH120-DI-EX, PVEO120-DI-EX-12V

Group IIB: PVEO-EX-24V, PVEH-EX, PVEH-U-EX, PVES-EX, PVES-U-EX, PVEO120-EX-24V, PVEH120-EX, PVES120-EX, PVES120-U-EX, PVEO256-EX-24V, PVES256-EX, PVES256-U-EX

Group I / IIB: PVG32-EX, PVG128-EX, PVG256-EX

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Date	Issued by	Date	Approved by
2022.08.22	Per Bloch Simonsen	2022.08.22	Lars Otten
Mechanical Engineer		Senior Director SVS Global R&D	

Danfoss only vouches for the correctness of the English version of this declaration. In the event of the declaration being translated into any other language, the translator concerned shall be liable for the correctness of the translation

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Variant	Part number	Marking	EU Type Examination Certificate		Directive 2014/34/EU Standard / reference number							Directive 2014/30/EU Standard / reference		Inspection
					EN 60079-0:2018	EN 60079-1:2014	EN 60079-7:2015	EN 60079-18:2015	EN 80079-36:2016	EN 80079-37:2016	EN 80079-38:2016/A1:2018	EN 61000-6-4:2007/A1:2011	EN 61000-6-2:2005	Notified Body PQAN
PVEO-EX-24V	11123165	Ex I M2 / Ex db I Mb	Presafe 14 ATEX 5153X	DNV Product Assurance AS Veritasveien 3, 1363 Høvik, Norway, Notified body number 2460	X	X						X	X	Nemko, Gaustad alèen 30, 0314 Oslo, Norway, Notified Body number 0470
PVEH-EX-ACT	11127696				X	X						X	X	
PVEO-DI-EX-24V	11156461				X	X						X	X	
PVEO-EX-12V	11156462				X	X						X	X	
PVEH120-EX-ACT	11166357				X	X						X	X	
PVEO120-EX-12V	11170401				X	X						X	X	
PVEH-32-EX-ACT	11156465	Ex II 2G / Ex db IIB T5 Gb			X	X						X	X	
PVES32-EX-ACT	11156466				X	X						X	X	
PVEO32-EX-24V	11156467				X	X						X	X	
PVEO120-EX-24V	11156468				X	X						X	X	
PVES120-EX-PAS	11156567				X	X						X	X	
PVES120-EX-ACT	11156568				X	X						X	X	
PVEH120-EX-PAS	11161000				X	X						X	X	
PVEH32-EX-PAS	11156463				X	X						X	X	
PVES32-EX-PAS	11156464				X	X						X	X	
PVEO256-EX-24V	11194404				X	X						X	X	
PVES256-EX	11194415				X	X						X	X	
PVEO32-EX-24V	11123166	Ex II 2G / Ex eb mb IIB T4 Gb	Presafe 16 ATEX 8699X		X		X	X				X	X	
PVEH32-EX-PAS	11156608				X		X	X				X	X	
PVES32-EX-PAS	11156609				X		X	X				X	X	
PVEH32-U-EX-ACT	11156610				X		X	X				X	X	
PVES32-U-EX-ACT	11156569				X		X	X				X	X	
PVES120-U-EX-ACT	11156613				X		X	X				X	X	
PVEO120-EX-24V	11156571				X		X	X				X	X	
PVES120-EX-PAS	11156612				X		X	X				X	X	
PVEO256-EX-24V	11241525				X		X	X				X	X	
PVES256-U-EX	11241590				X		X	X				X	X	
PVES256-EX	11241519				X		X	X				X	X	
PVEH120-EX-PAS	11161001				X		X	X				X	X	

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Variant	Part number	Marking	Technical File	Directive 2014/34/EU Standard / reference number							Directive 2014/30/EU Standard / reference number		Inspection
				EN 60079-0:2018	EN 60079-1:2014	EN 60079-7:2015	EN 60079-18:2015	EN 80079-36:2016	EN 80079-37:2016	EN 80079-38:2016 /A1:2018	EN 61000-6-4:2007 /A1:2011	EN 61000-6-2:2005	Internal
PVG32-128-256-EX	Customer specific part number	Ex I M2 / Ex h I Mb Ex II 2G / Ex h IIB T5...T4 Gb	Acknowledgement of Receipt, DNV: C536023	X				X	X	X			Internal production control in accordance with Directive 2014/34/EU Annex VIII Module A.
non-electrical items that can be selected to form a compliant PVG assembly													
PVP/PVPV/ PVPM/PVPVM	Part number must be selected from PVG-Ex Technical Information no. BC290860493426	N/A	Acknowledgement of Receipt., DNV: C536023	X				X	X	X			
PVB/PVBZ				X				X	X	X			
PVBS				X				X	X	X			
PVM				X				X	X	X			
PVH				X				X	X	X			
PVSK/PVSKM				X				X	X	X			
PVSP/PVSPM				X				X	X	X			
PVSI				X				X	X	X			
PVAS				X				X	X	X			
PVLP/A				X				X	X	X			
PVGI				X				X	X	X			

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Marking combination for PVG valve group assemblies:

Variant	Part number	Marking			
		PVE-EX	PVG-EX Non-electrical parts	Combination	Sample: marking for PVG valve group assemblies
PVEO-EX-24V	11123165	Ex I M2 / Ex db I Mb	Ex I M2 / Ex h I Mb Ex II 2G / Ex h IIB T5...T4 Gb	Ex I M2 Ex h db I T5...T4 Mb	PVG-Ex CE Ex I M2 Ex h db I T5...T4 Mb Ta -30° to +60°C 11132813613A147305-EX
PVEH-EX-ACT	11127696				
PVEO-DI-EX-24V	11156461				
PVEO-EX-12V	11156462				
PVEH120-EX-ACT	11166357				
PVEO120-EX-12V	11170401				
PVEH-32-EX-ACT	11156465	Ex II 2G / Ex db IIB T5 Gb		Ex II 2G Ex h db IIB T5...T4 Gb	PVG-Ex CE Ex II 2G Ex h db IIB T5...T4 Gb Ta -30° to +60°C 11132813613A147305-EX
PVES32-EX-ACT	11156466				
PVEO32-EX-24V	11156467				
PVEO120-EX-24V	11156468				
PVES120-EX-PAS	11156567				
PVES120-EX-ACT	11156568				
PVEH120-EX-PAS	11161000				
PVEH32-EX-PAS	11156463				
PVES32-EX-PAS	11156464				
PVEO256-EX-24V	11194404				
PVES256-EX	11194415				
PVEO32-EX-24V	11123166	Ex II 2G / Ex eb mb IIB T4 Gb		Ex II 2G Ex h eb mb IIB T4 Gb	PVG-Ex CE Ex II 2G Ex h eb mb IIB T4 Gb Ta -30° to +60°C 11132813613A147305-EX
PVEH32-EX-PAS	11156608				
PVES32-EX-PAS	11156609				
PVEH32-U-EX-ACT	11156610				
PVES32-U-EX-ACT	11156569				
PVES120-U-EX-ACT	11156613				
PVEO120-EX-24V	11156571				
PVS120-EX-PAS	11156612				
PVEH120-EX-PAS	11161001				
PVEO256-EX-24V	11241525				
PVES256-U-EX	11241590				
PVES256-EX	11241519				

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ENGINEERING TOMORROW

Variant	Part number	Marking			
		PVE-EX	PVG-EX Non-electrical parts	Combination	Sample: marking for PVG valve group assemblies
Without PVE-EX	N/A	N/A	Ex I M2 / Ex h I Mb Ex II 2G / Ex h IIB T5...T4 Gb	N/A	PVG-Ex CE Ex I Mb / II 2G Ex h I Mb Ex h IIB T5...T4 Gb Ta -30° to +60°C 111328133613A147305-EX

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Acknowledgement of Receipt EU

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DNV

ACKNOWLEDGEMENT OF RECEIPT - EU

Acknowledgement Number: C536023 Issue 0

This Acknowledgement consists of 2 pages

This is to confirm that the Technical File for the following product(s):

PVG Load Independent Proportional Valve

With the type designation(s): See page 2

Manufactured by: Danfoss Power Solution Aps
Nordborgvej 81
6430 Nordborg
Denmark

has been received and stored according to the conformity assessment procedure described in Article 13, 1.(b).(ii), the Council Directive 2014/34/EU of 26 February 2014, category 2 non -electrical equipment.

Further details are given overleaf.

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Jurisdiction:
DNV Product Assurance AS is appointed by the Norwegian Directorate for Civil Protection as Notified Body (No. 2460) under the terms of Article 21 of the Council Directive 2014/34/EU of 26 February 2014.

Date of issue:
2022 -04 - 20

Validity end date:
2030 -11 -20

Asle Kaastad
For DNV Product Assurance AS
The document has been digitally signed.
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Page 1 of 2

Acknowledgement of Receipt EU

Acknowledgement of Receipt EU Page 2

Acknowledgement of Receipt - EU, Page 2

DNV

Acknowledgement Number C536023 Issue 0

Product description
The following types are covered by the Acknowledgement:

Product Description	Type Designations	Category	Product Group
PVG Load Independent Proportional Valve	PVG-EX 32/128/256	M2 and 2	Non -electrical Ex equipment

Technical documentation:

The following documentation has been received and stored:

Document No	Document Name
DOC00004829 -A	Technical file for Presafe PVG32
DOC000013912	Technical file for Presafe PVG -Ex
DOC00022923 rev. A;2	Technical file for presafe PVG32 -128 -256 -EX

Terms and conditions
The product liability rests with the manufacturer, his representative or, in the absence of a representative, the importer, in accordance with the General Product Safety Directive 2001/95/E C
The following conditions may render this acknowledgement invalid:

- Changes in the design or construction of the product.
- Changes or amendments to the referenced directive(s).
- Changes or amendments in the standards which form the basis for documenting comp liance with the essential requirements of the directive(s).

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Conformity declaration and marking of product
In order to fully meet with the requirements of the Directive and legally affix the CE mark, the manufacturer must take all measures necessary to ensure that the manufactured product comply with the technical documentation and with the requirements of the Directive and finally draw up an EU D eclaration of C onformity.

Acknowledgement History:

Issue	Description	Issue date
0	Original acknowledgement	2020 -11 -20
1	Updated technical file	2021 -03 -10
0	Updated technical file , C536023 replace 11696 -PA -NA -NOR .	2022 -04 -20

END OF ACKNOWLEDGEMENT

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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
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