

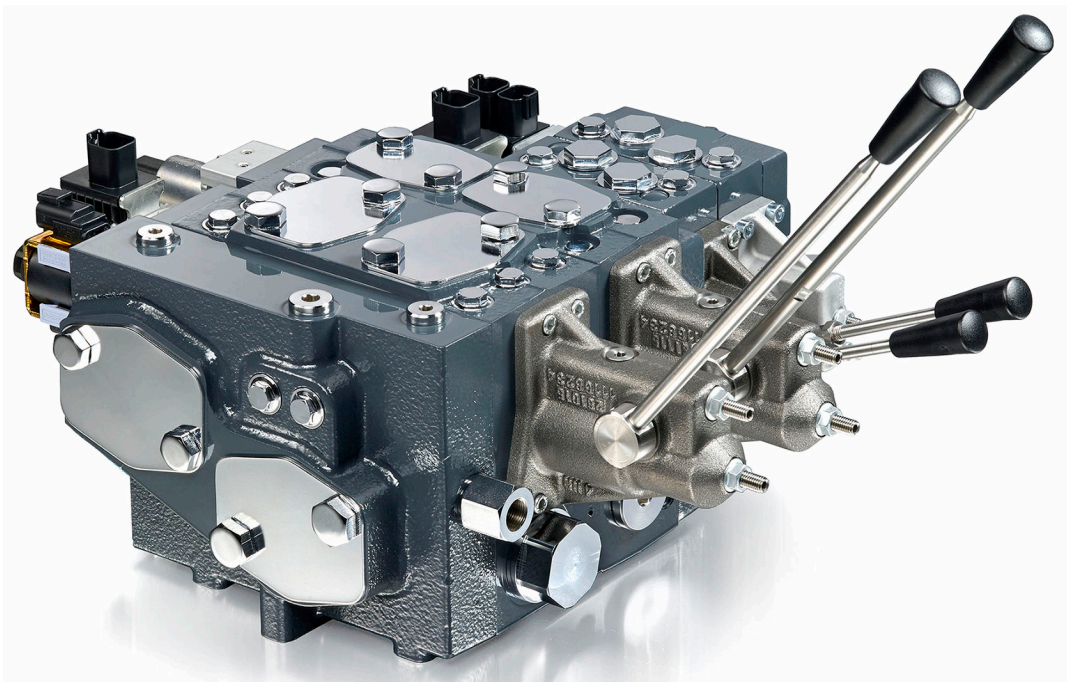
ENGINEERING  
TOMORROW



Technical Information

# PVG 128/256

## Proportional Valve Group



## Revision history

*Table of revisions*

<b>Date</b>	<b>Changed</b>	<b>Rev</b>
March 2021	Corrected PVSI with P and T port dimensions	0509
May 2020	Minor revision - data corrections throughout, updated version number to match online catalogue.	0508
	Changed document number from 'BC00000380' to 'BC220686485279'	XX
June 2019	Minor changes throughout document, new images added.	0407
September 2018	Safety topic added.	0406
August 2018	Layout changes, minor edits	0405
June 2018	Table for dimensions page 90 update.	0404
March 2018	Minor edits	0403
January 2018	correction to part number pg 54	0402
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March 2017	Corrected PVAS equation	0203
March 2017	Updated PVAS tables	0202
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## General Information

### 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.

#### **⚠ 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:

*Aerial lift*

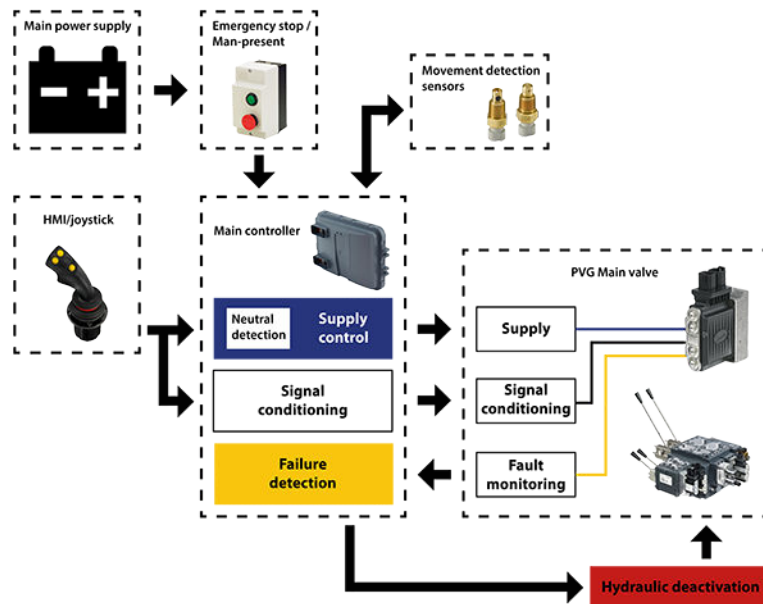


This example breaks down the control system into smaller bits explaining the architecture in depth. Even though many Danfoss components are used in the PVG control system.

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.

**General Information**

*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.

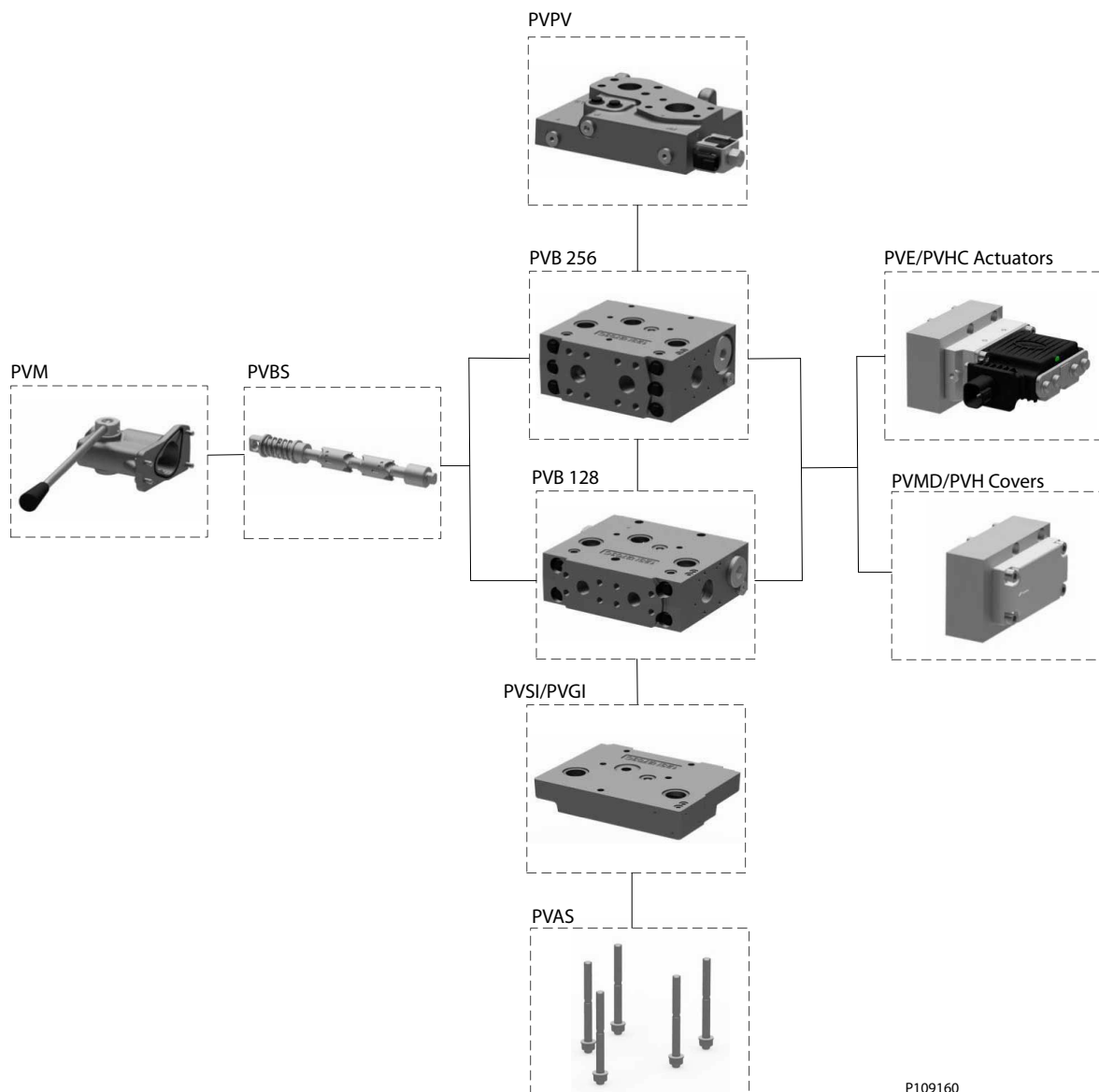
**Caution**

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.

**General Information**

**PVG 128/256 Proportional Valve Group**



P109160

**Navigation**

<a href="#">PVPV</a>	<a href="#">PVB 256</a>	<a href="#">PVB 128</a>
<a href="#">PVBS Main Spool on page 49</a>	<a href="#">PVM</a>	<a href="#">PVE Series 7 Electrical Actuator on page 62/PVHC</a>
<a href="#">PVMD/PVH Covers</a>	<a href="#">PVS1/PVGI End and Interface Plates on page 82</a>	<a href="#">PVAS</a>

## General Information

### PVG general description

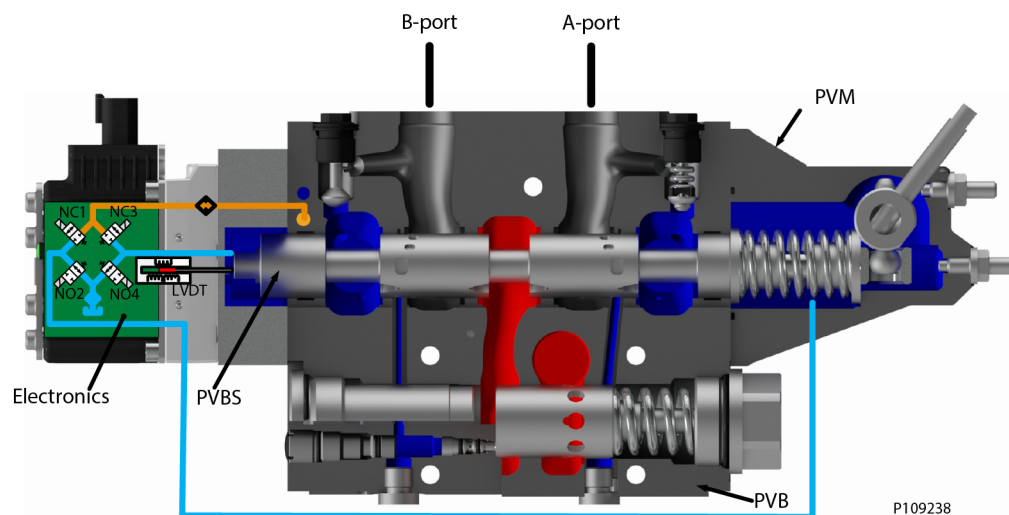
PVG is a hydraulic, load-sensing proportional valve, designed for optimal machine performance and maximum design flexibility.

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 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 PVS/PVGI





## 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.

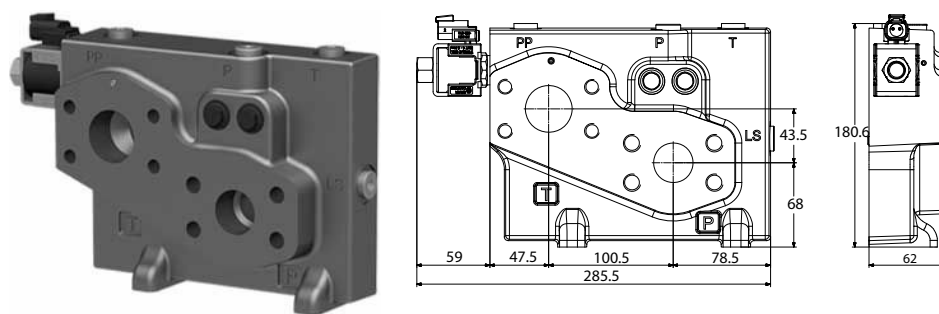
PVLPs are for pressure peak protection in the system and pump.

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

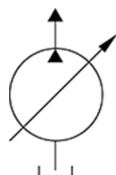
PVPV inlet module dimensions (mm)



Weight 10 kg [22 lbs]

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.

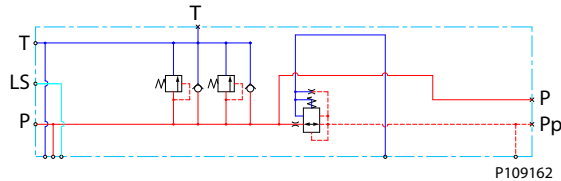
Optional feature: PVPP Electrical Pilot Shut-Off Valve - Closed center inlet module for variable displacement pumps.

## PVPV Inlet Modules

### 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*

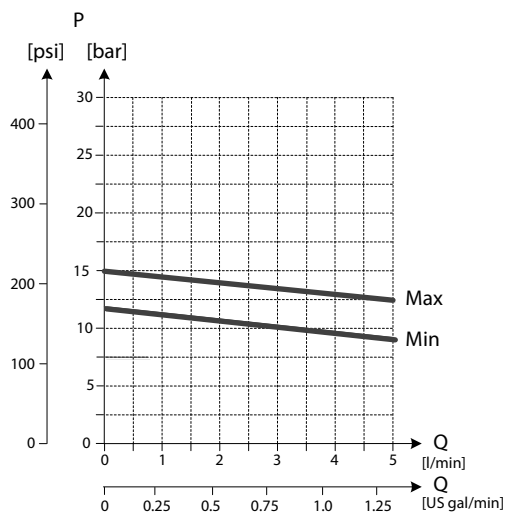
Max. rated pressure	P-port continuous	350 bar	[5076 psi]
	P-port intermittent	400 bar	[5800 psi]
	T-port static/dynamic	25/40 bar	[363/580 psi]
Rated Port P (PVPV/PVSI)	P-port	600/600 l/min	[159/159 US gal/min]
Oil temperature	Recommended	30 to 60°C	[86 to 140°F]
	Minimum	-30°C	[-22°F]
	Maximum	90°	[194°F]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

### 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- and Pp 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

**PVPV Inlet Modules**

*Pilot Pressure Reduction Valve Performance*



P109211

*Accessory module for PVPV 256*

Ordering information	12 V	24 V
PVPP Pilot shut off valve	11160318	11160319

## PVPV Inlet Modules

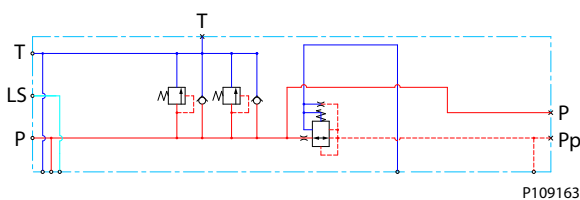
### PPRV for PVH/PVHC Activation and/or Mechanical

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*

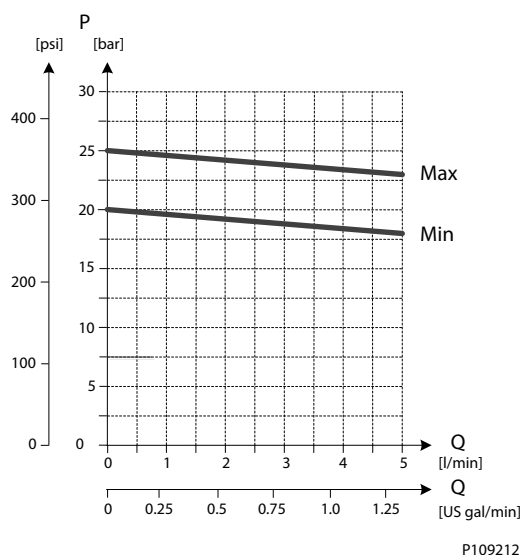
Max. rated pressure	P-port continuous	350 bar	[5076 psi]
	P-port intermittent	400 bar	[5800 psi]
	T-port static/dynamic	25/40 bar	[363/580 psi]
Rated Port P (PVPV/PVSI)	P-port	600/600 l/min	[159/159 US gal/min]
Oil temperature	Recommended	30 to 60°C	[86 to 140°F]
	Minimum	-30°C	[-22°F]
	Maximum	90°	[194°F]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

### Part numbers for Closed Center PVPV with PPRV for PVH/PVHC

Part number	PPRV	P-port	T-port	LS-port Gauge-port	M-port Gauge-port	T- and Pp Gauge-port	Mounting feet
11178095	PVH/PVHC	Metric Flange 1-1/4"	Metric Flange 1-1/2"	G3/8"BSP	G3/8"BSP	G1/4"BSP	M12
11178098	PVH/PVHC	Thread Ports G1-1/2" BSP	Thread Ports G1-1/2" BSP	G3/8"BSP	G3/8"BSP	G1/4"BSP	M12
11178117	PVH/PVHC	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/PVHC	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

**PVPV Inlet Modules**

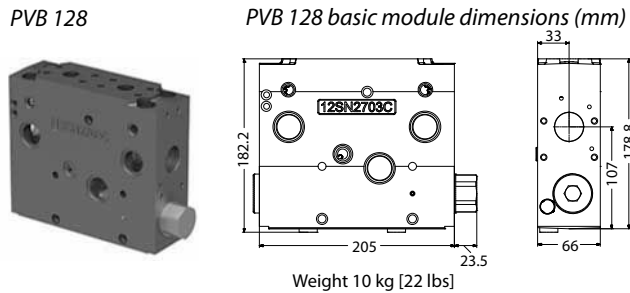
*Pilot Pressure Reduction Valve Performance*



*Accessory module for PVPV 256*

Ordering information	12 V	24 V
PVPP Pilot shut off valve	11160318	11160319

**PVB 128 Variant Overview**



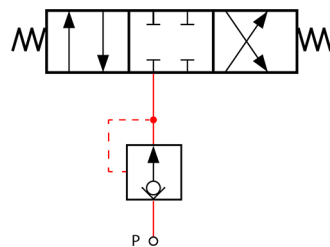
Weight 10 kg [22 lbs]

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*



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.

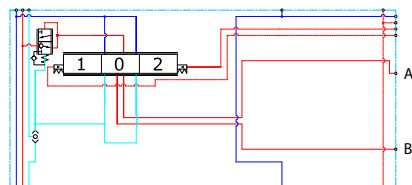
## PVB 128 Variant Overview

### 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	250 l/min	[66 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 <sup>2</sup> /s	[65 to 347 SUS]
	Minimum	4 mm <sup>2</sup> /s	[39 SUS]
	Maximum	460 mm <sup>2</sup> /s	[2128 SUS]
Oil contamination according to ISO 4406	Maximum	23/19/16	
Max. internal leakage at 100 bar [1450 psi] and 21 mm <sup>2</sup> /s [102 SUS]	A/B→T without shock valve	70 cm <sup>3</sup> /min	[4.27 in <sup>3</sup> /min]
	A/B→T with shock valve	80 cm <sup>3</sup> /min	[4.88 in <sup>3</sup> /min]

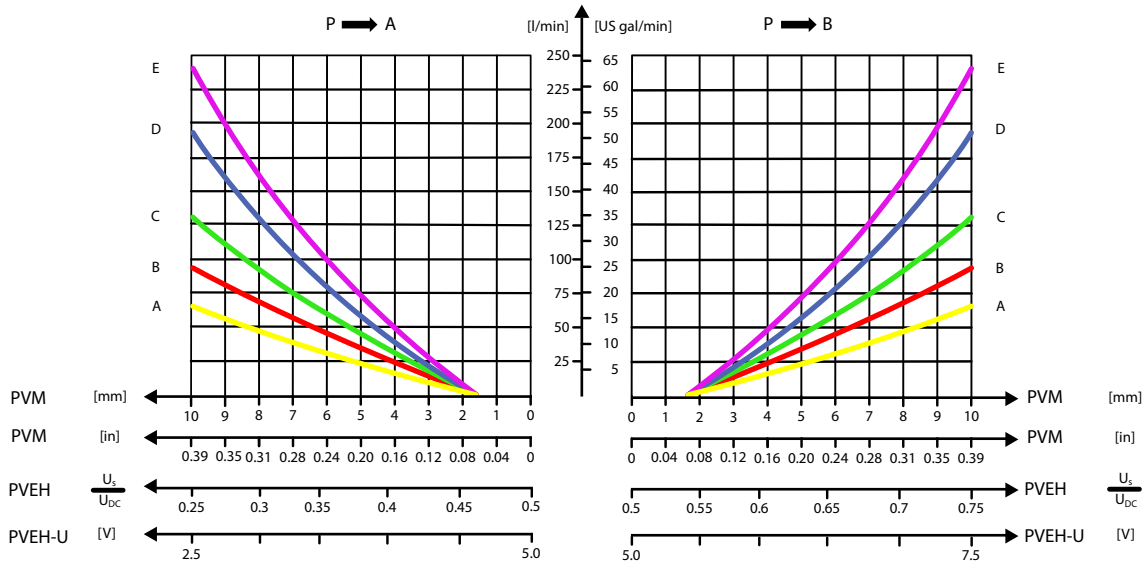
\* Rated flow at 15 bar margin pressure

#### Part numbers for Compensated PVB 128

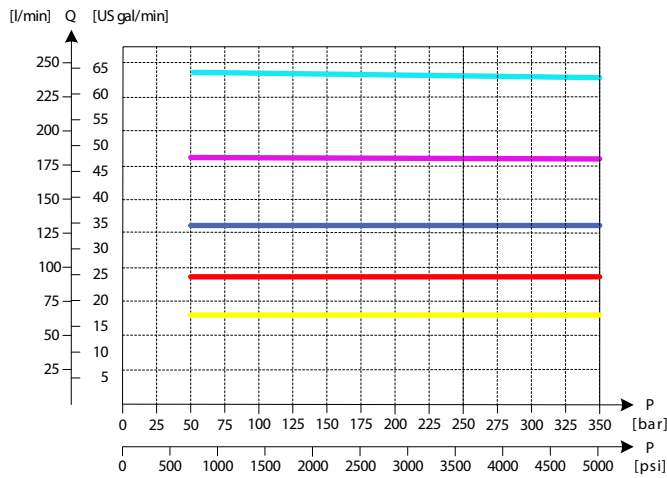
Part number	A/B-port	PVLP/PVLA	LS A/B-port
11170522	Metric Flange 3/4"	-	-
11170528	G 1" BSP	-	-
11170524	SAE Flange 3/4" UNC	-	-
11170526	Thread Ports 1 5/16 UNC	-	-

**PVB 128 Variant Overview**

*Oil flow as function of spool travel*



*Load Independent Oil Flow, Pressure Compensated*



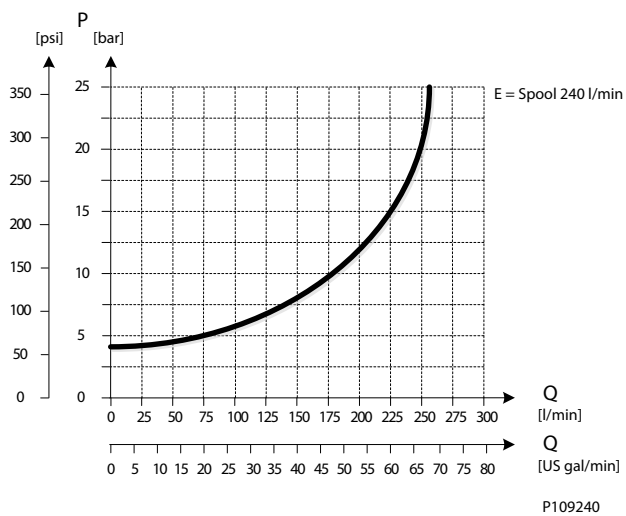
P109213



**PVB 128 Variant Overview**

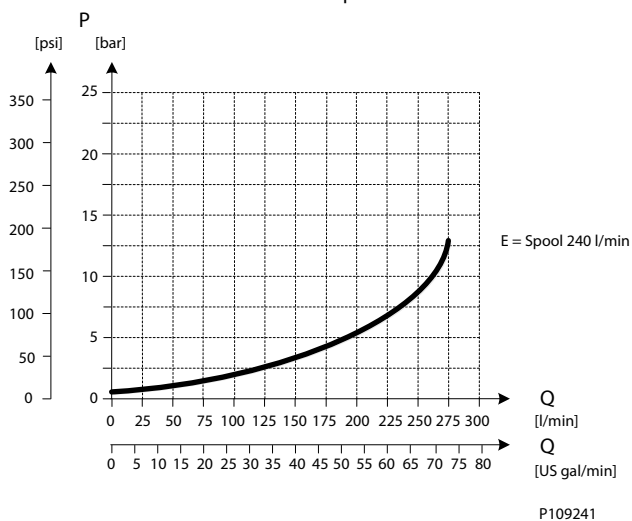
*PVB 128 Upstream Performance*

Port P to Port A/B at full spool stroke



*PVB 128 Downstream Performance*

Port A/B to Tank at full spool stroke



## PVB 128 Variant Overview

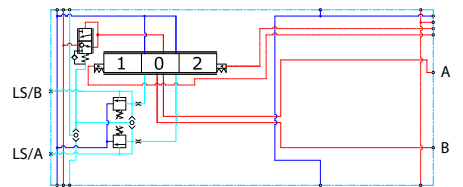
### PVB 128 3-way Compensator with LS A/B

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	250 l/min	[66 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 <sup>2</sup> /s	[65 to 347 SUS]
	Minimum	4 mm <sup>2</sup> /s	[39 SUS]
	Maximum	460 mm <sup>2</sup> /s	[2128 SUS]
Oil contamination according to ISO 4406	Maximum	23/19/16	
Max. internal leakage at 100 bar [1450 psi] and 21 mm <sup>2</sup> /s [102 SUS]	A/B→T without shock valve	70 cm <sup>3</sup> /min	[4.27 in <sup>3</sup> /min]
	A/B→T with shock valve	80 cm <sup>3</sup> /min	[4.88 in <sup>3</sup> /min]

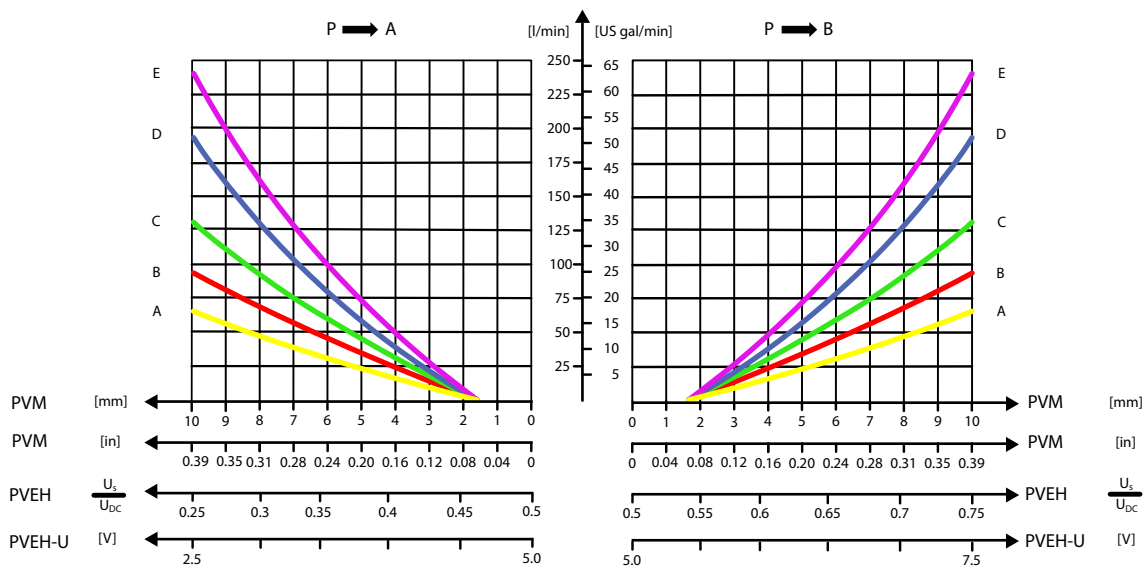
\* Rated flow at 15 bar margin pressure

#### Part numbers for Compensated PVB with LS A/B

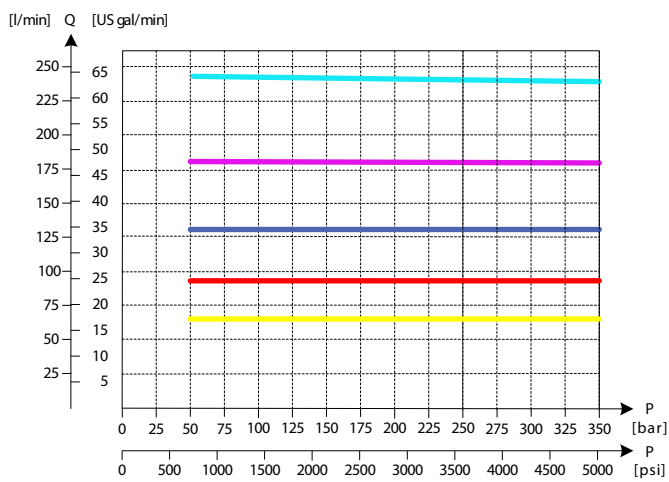
Part number	A/B-port	PVLP/PVLA	LS A/B-port
11176915	Metric Flange 3/4"	-	G1/4"BSP
11176918	G 1" BSP	-	G1/4"BSP
11176916	SAE Flange 3/4" UNC	-	7/16-20 UNC
11176917	Thread Ports 1 5/16 UNC	-	7/16-20 UNC

**PVB 128 Variant Overview**

*Oil flow as function of spool travel*



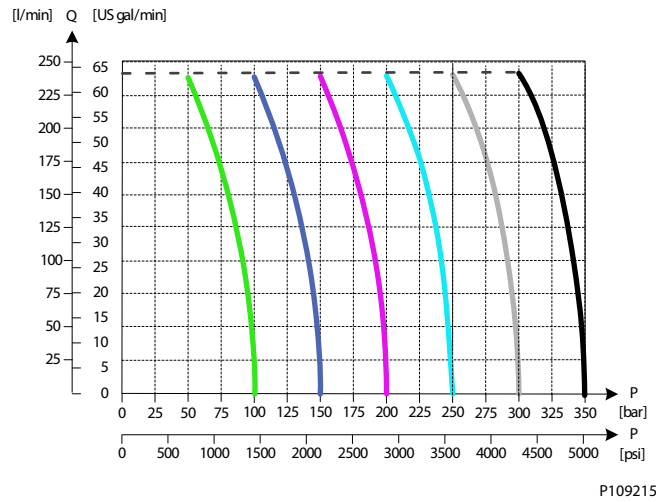
*Load Independent Oil Flow, Pressure Compensated*



P109213

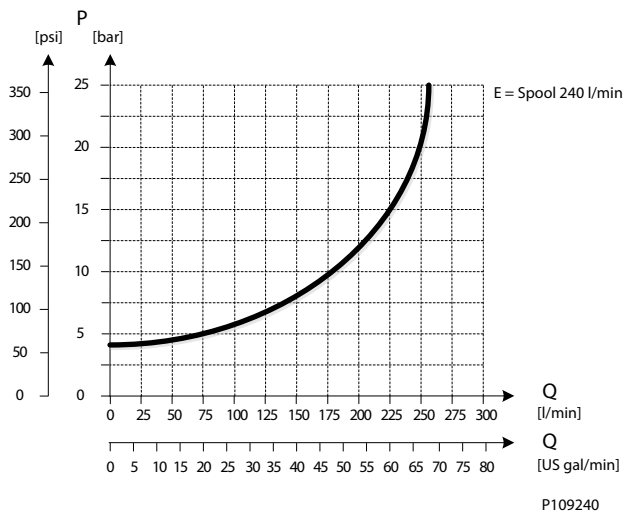
**PVB 128 Variant Overview**

*LS A/B Pressure Relief Valve*



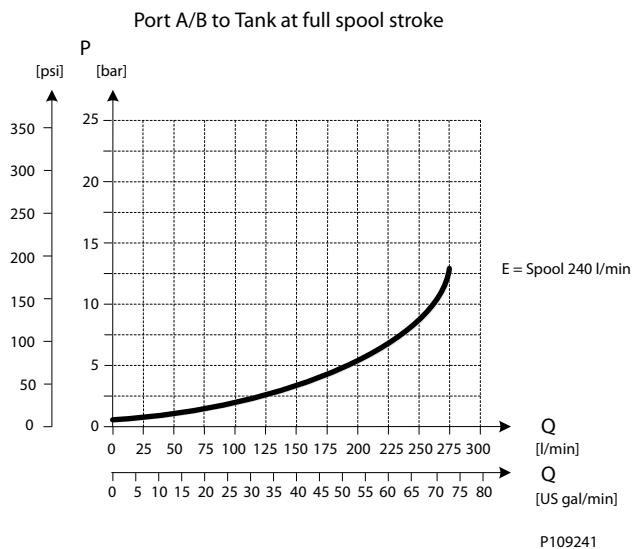
*PVB 128 Upstream Performance*

Port P to Port A/B at full spool stroke



**PVB 128 Variant Overview**

*PVB 128 Downstream Performance*



## PVB 128 Variant Overview

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

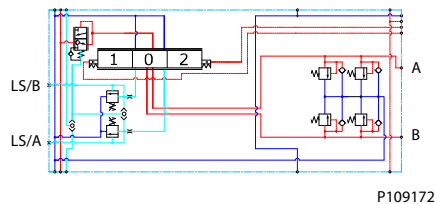
The compensated PVB is intended for controlling a work function where the function behavior in terms of flow and pressures requires independency on the load pressure of other functions used simultaneously.

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



#### 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	250 l/min	[66 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 <sup>2</sup> /s	[65 to 347 SUS]
	Minimum	4 mm <sup>2</sup> /s	[39 SUS]
	Maximum	460 mm <sup>2</sup> /s	[2128 SUS]
Oil contamination according to ISO 4406	Maximum	23/19/16	
Max. internal leakage at 100 bar [1450 psi] and 21 mm <sup>2</sup> /s [102 SUS]	A/B→T without shock valve	70 cm <sup>3</sup> /min	[4.27 in <sup>3</sup> /min]
	A/B→T with shock valve	80 cm <sup>3</sup> /min	[4.88 in <sup>3</sup> /min]

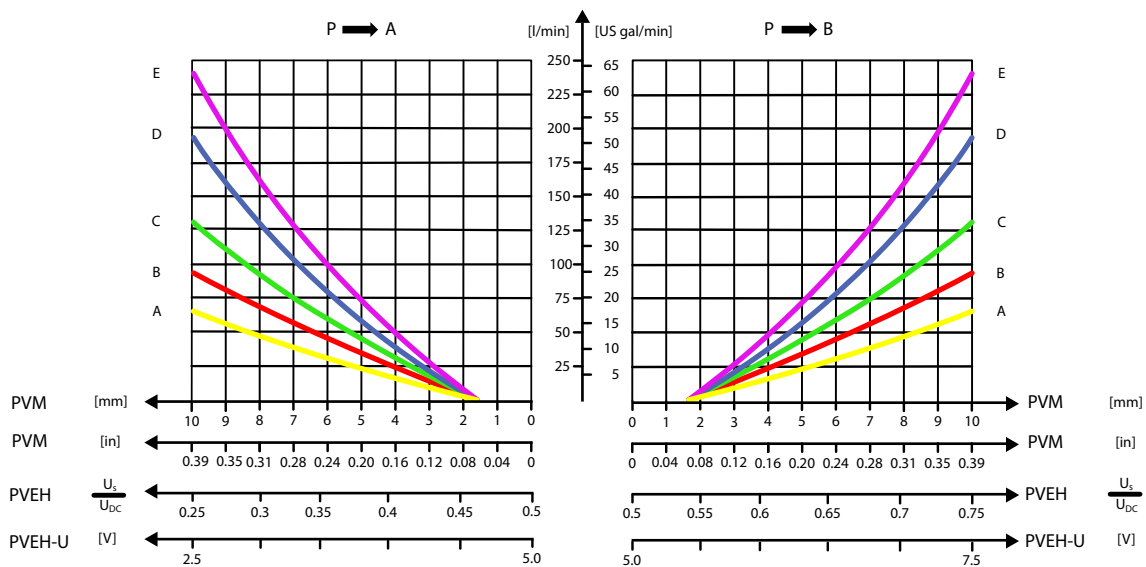
\* Rated flow at 15 bar margin pressure

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

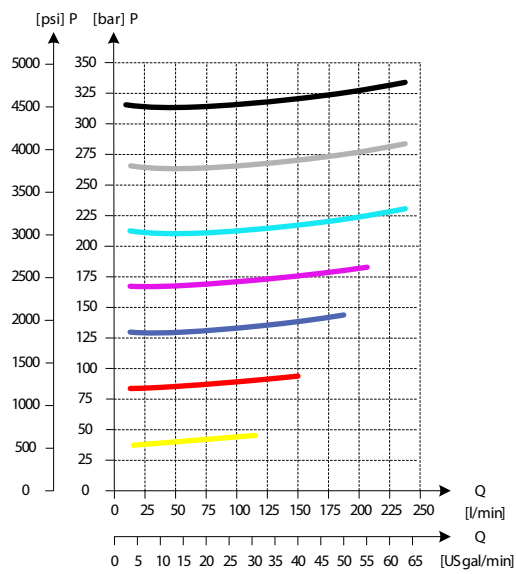
Part number	A/B-port	PVLP/PVLA	LS A/B-port
11165621	Metric Flange 3/4"	2 PVLP/PVLA	G1/4"BSP
11170527	G 1" BSP	2 PVLP/PVLA	G1/4"BSP
11170523	SAE Flange 3/4" UNC	2 PVLP/PVLA	7/16-20 UNC
11170525	Thread Ports 1 5/16 UNC	2 PVLP/PVLA	7/16-20 UNC

### PVB 128 Variant Overview

Oil flow as function of spool travel



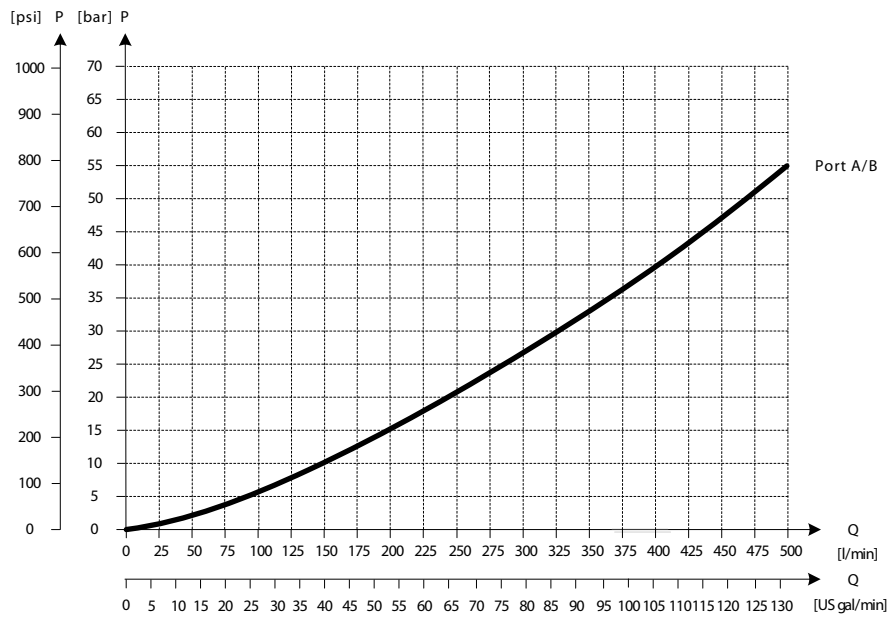
### 2xPVLP Shock Valve



P109216

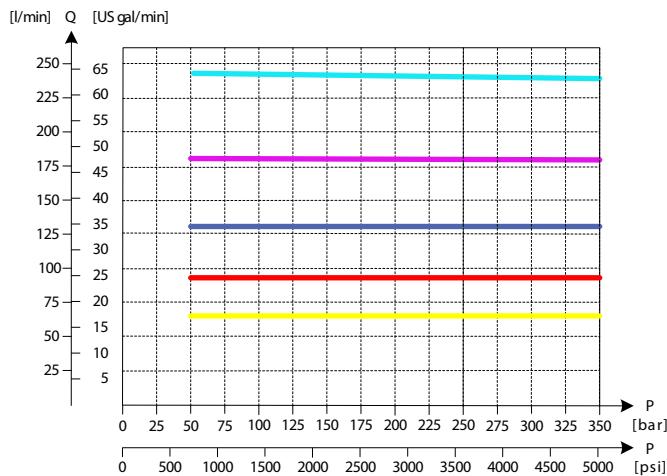
**PVB 128 Variant Overview**

*2xPVLA Suction Valve*



P109217

*Load Independent Oil Flow, Pressure Compensated*

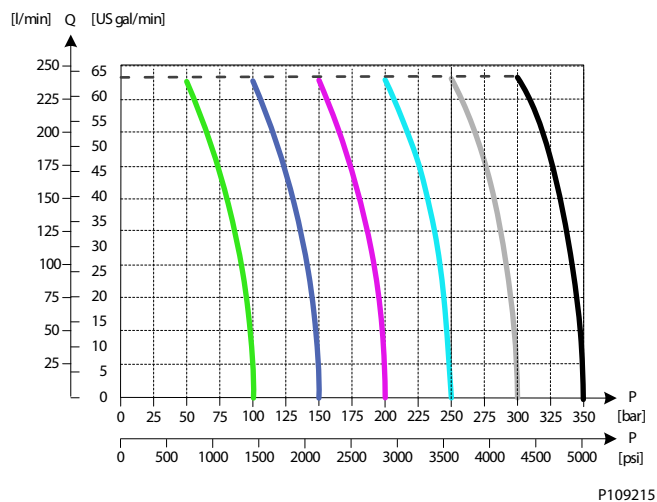


P109213



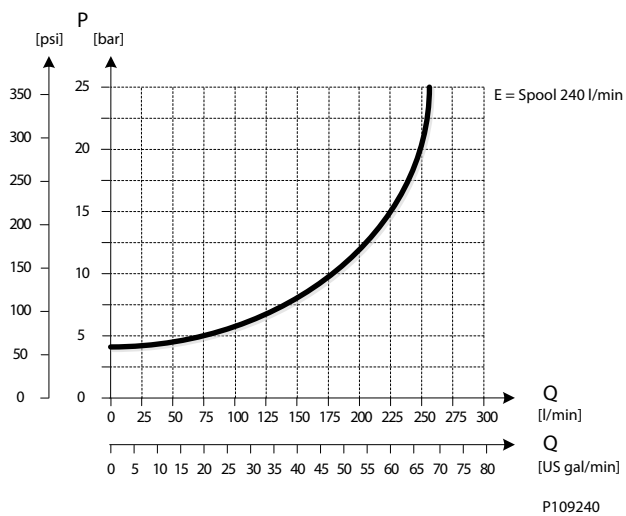
**PVB 128 Variant Overview**

*LS A/B Pressure Relief Valve*



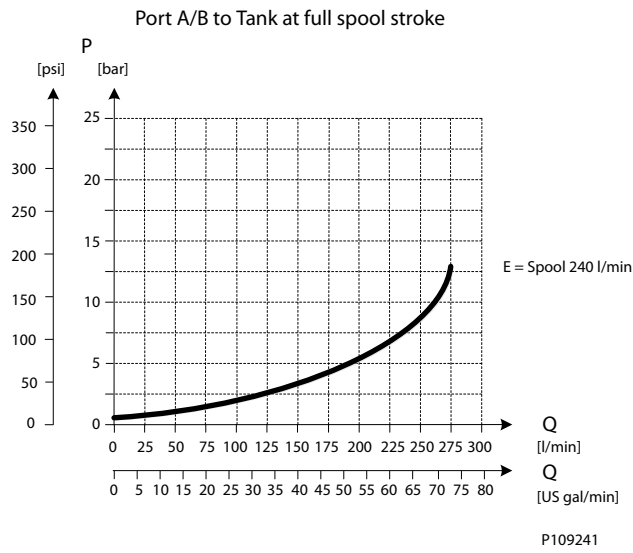
*PVB 128 Upstream Performance*

Port P to Port A/B at full spool stroke



**PVB 128 Variant Overview**

*PVB 128 Downstream Performance*

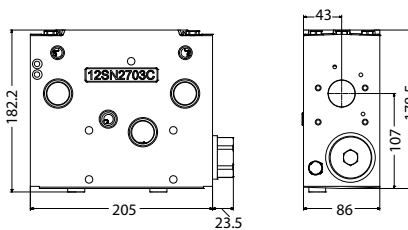


## PVB 256 Variant Overview

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.

[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.

## PVB 256 Variant Overview

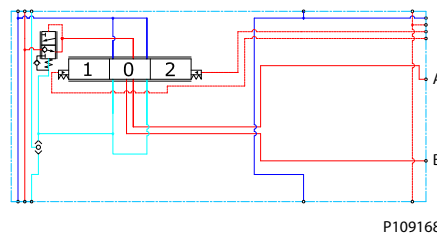
### PVB 256 3-way Compensator

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*



*Technical data*

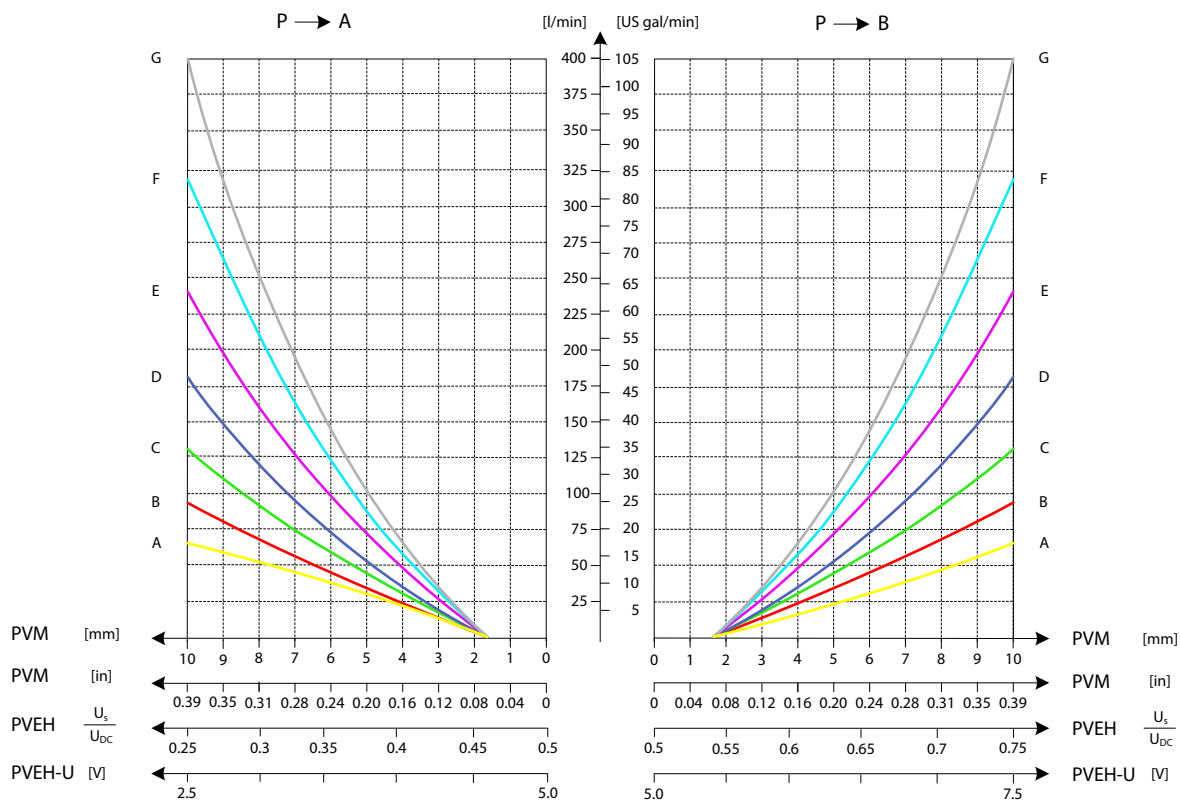
Max. rated pressure	A/B port continuous	350 bar	[5076 psi]
	A/B port intermittent	400 bar	[5800 psi]
Max. rated flow	A/B port	450 l/min	[119 US gal/min]
Oil temperature	Recommended	30 to 60°C	[86 to 140°F]
	Minimum	-30°C	[-22°F]
	Maximum	90°	[194°F]
Ambient temperature	Recommended	-30 to 60°C	[-22 to 140°F]
Oil viscosity	Operating range	12 to 75 mm <sup>2</sup> /s	[65 to 347 SUS]
	Minimum	4 mm <sup>2</sup> /s	[39 SUS]
	Maximum	460 mm <sup>2</sup> /s	[2128 SUS]
Oil contamination according to ISO 4406	Maximum	23/19/16	
Max. internal leakage at 100 bar [1450 psi] and 21 mm <sup>2</sup> /s [102 SUS]	A/B→T without shock valve	70 cm <sup>3</sup> /min	[4.27 in <sup>3</sup> /min]
	A/B→T with shock valve	85 cm <sup>3</sup> /min	[5.19 in <sup>3</sup> /min]

### Part numbers for Compensated PVB 256

Part number	A/B port	PVLP/PVLA	LS A/B port
11169244	Metric Flange 1"	-	-
11169252	G1 BSP	-	-
11169248	SAE Flange 1" UNC	-	-
11177020	Thread Ports 1-5/16-12 UNC	-	-

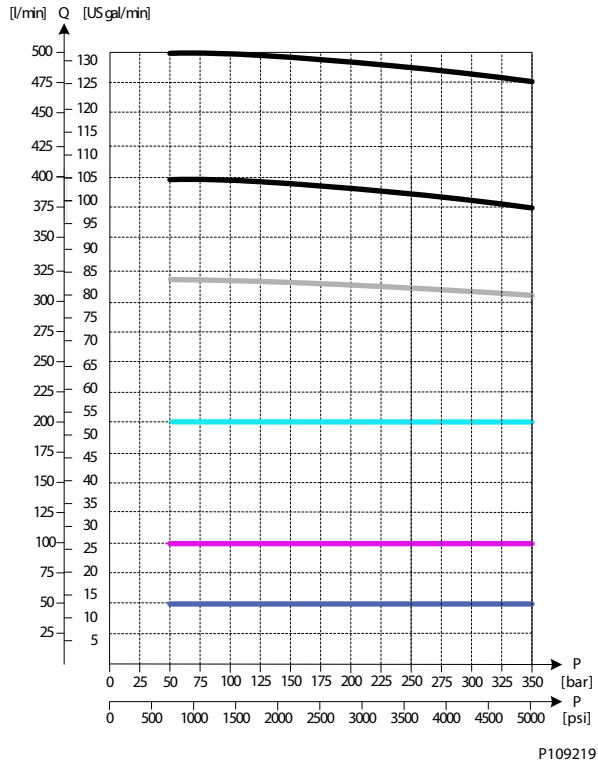
### PVB 256 Variant Overview

#### Oil Flow as Function of Spool Travel

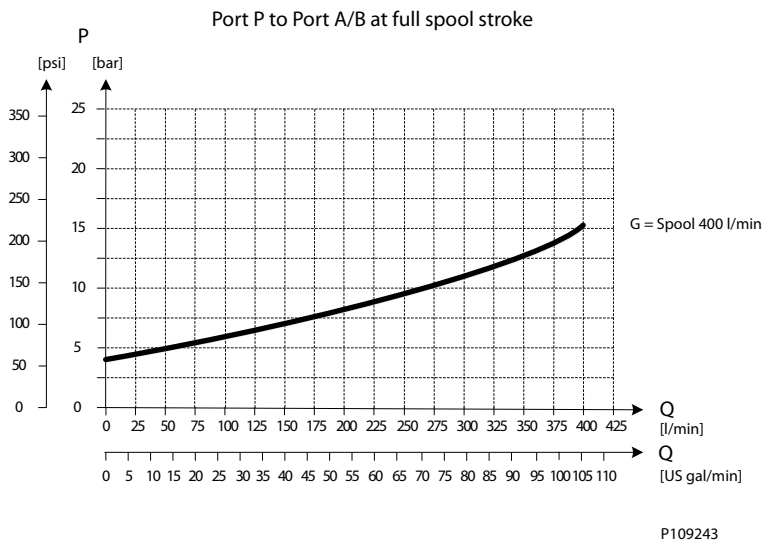


**PVB 256 Variant Overview**

*Load Independent Oil Flow, Pressure Compensated*

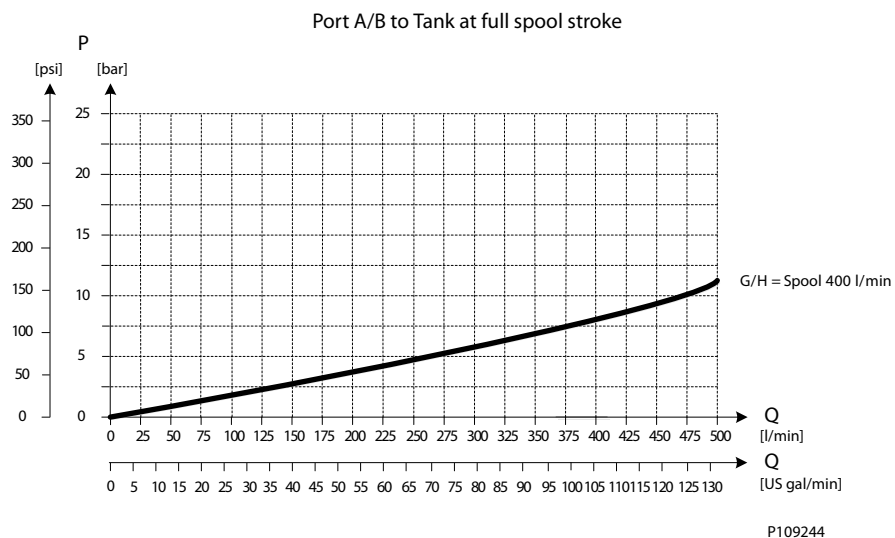


*PVB 256 Upstream Performance*



**PVB 256 Variant Overview**

*PVB 256 Downstream Performance*



## PVB 256 Variant Overview

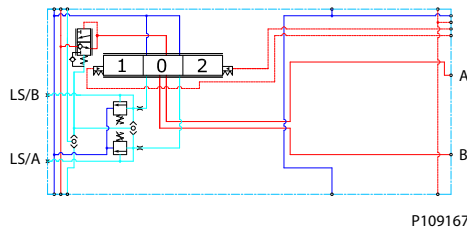
### PVB 256 3-way Compensator with LS A/B

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



#### 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	450 l/min	[119 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 <sup>2</sup> /s	[65 to 347 SUS]
	Minimum	4 mm <sup>2</sup> /s	[39 SUS]
	Maximum	460 mm <sup>2</sup> /s	[2128 SUS]
Oil contamination according to ISO 4406	Maximum	23/19/16	
Max. internal leakage at 100 bar [1450 psi] and 21 mm <sup>2</sup> /s [102 SUS]	A/B→T without shock valve	70 cm <sup>3</sup> /min	[4.27 in <sup>3</sup> /min]
	A/B→T with shock valve	85 cm <sup>3</sup> /min	[5.19 in <sup>3</sup> /min]

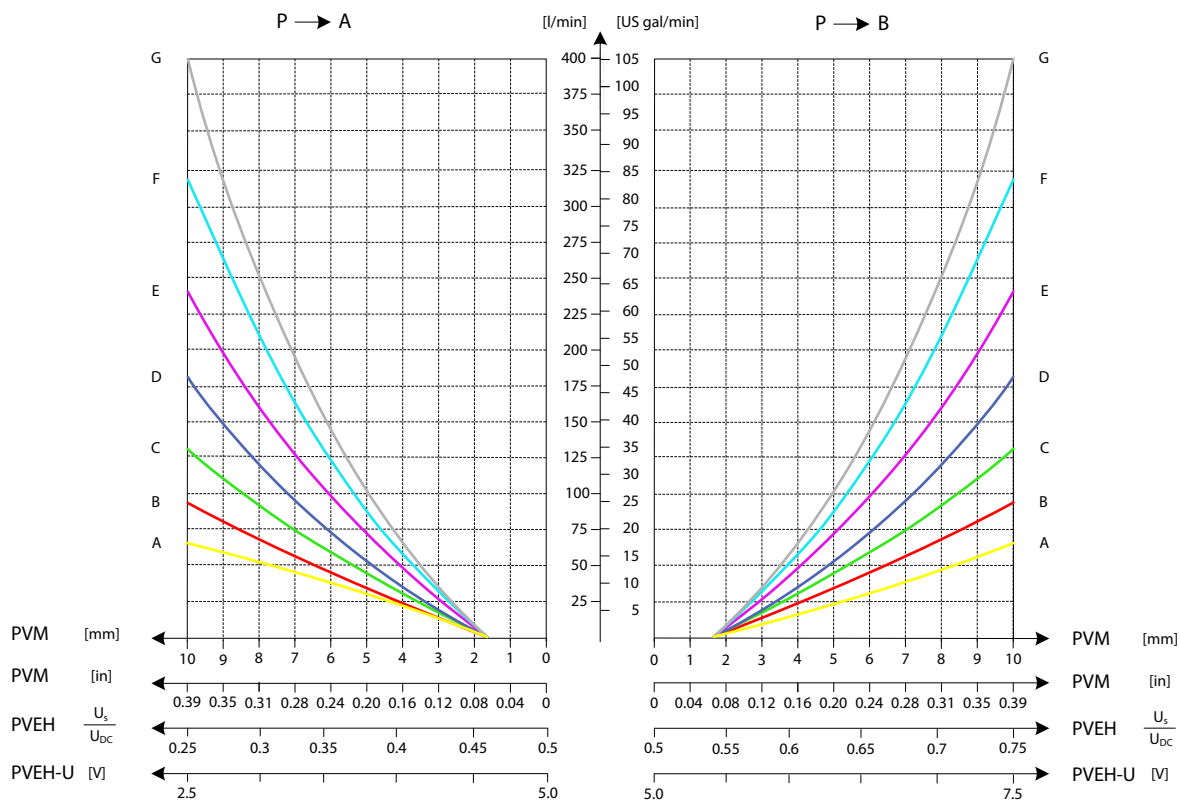
#### Part numbers for Compensated PVB 256 with LSA/B

Part number	A/B-port	PVLP/PVLA	LS A/B-port
11177015	Metric Flange 1"	-	G1/4"BSP
11177017	G1 BSP	-	G1/4"BSP
11177016	SAE Flange 1" UNC	-	7/16-20 UNC
11177019	Thread Ports 1-5/16-12 UNC	-	7/16-20 UNC



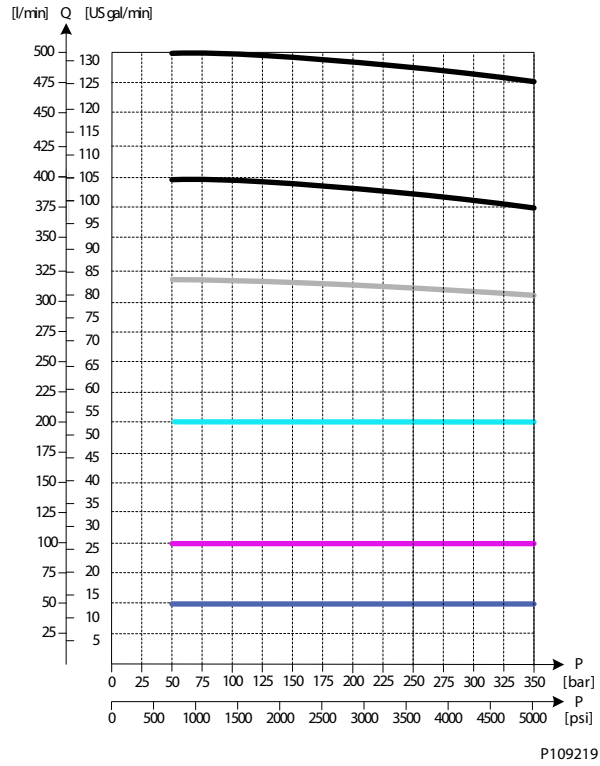
**PVB 256 Variant Overview**

*Oil Flow as Function of Spool Travel*

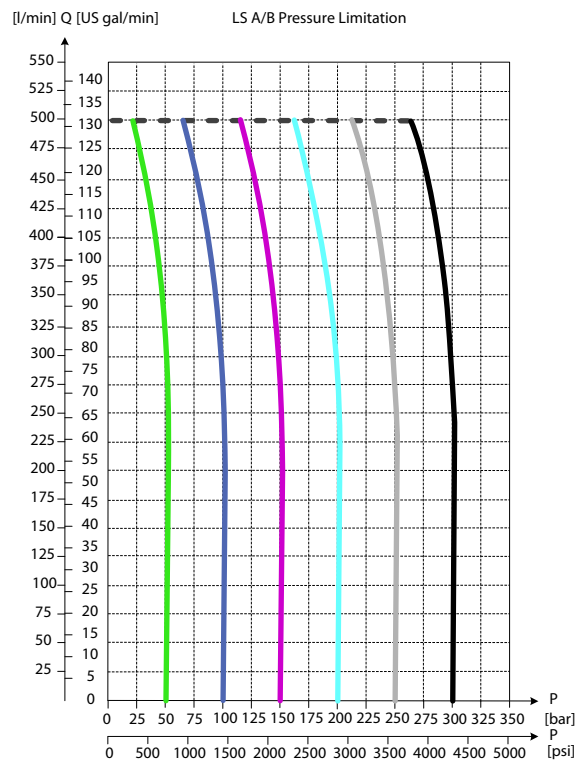


**PVB 256 Variant Overview**

*Load Independent Oil Flow, Pressure Compensated*

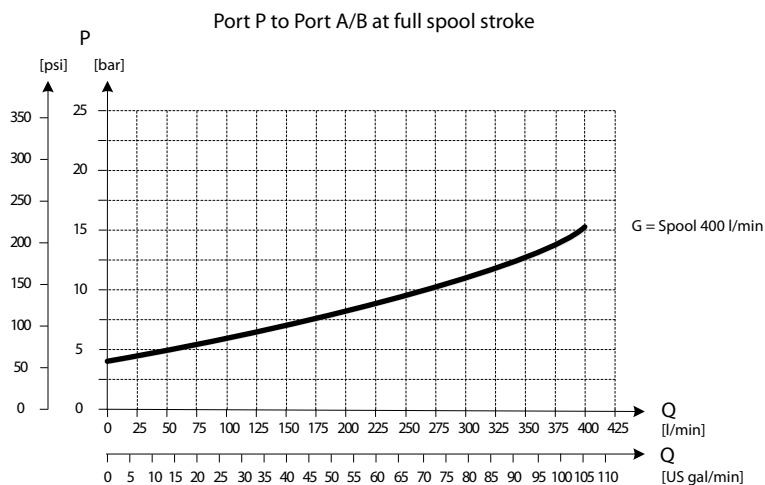


*LS A/B Pressure Limitation*



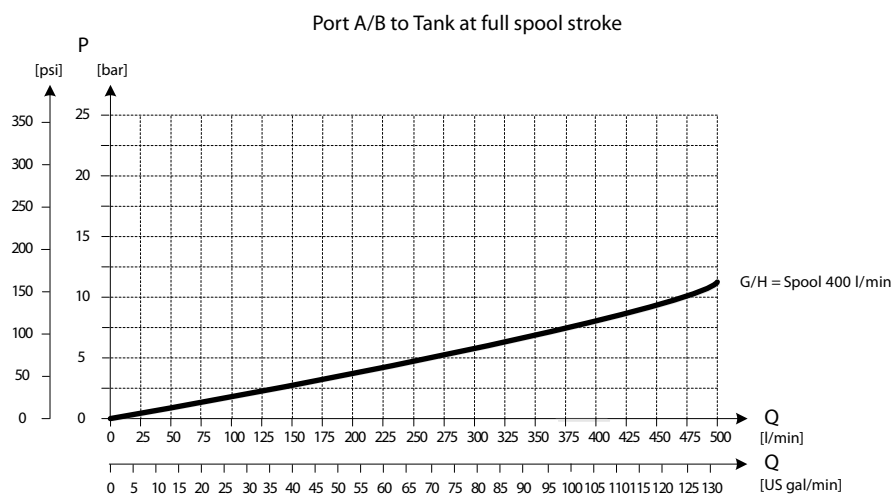
**PVB 256 Variant Overview**

*PVB 256 Upstream Performance*



P109243

*PVB 256 Downstream Performance*



P109244

## PVB 256 Variant Overview

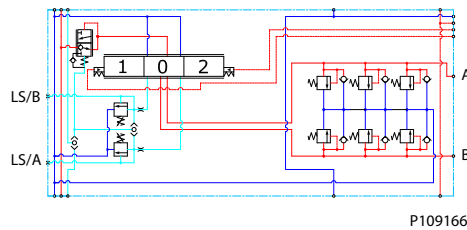
### PVB 256 3-way Compensator with LSA/B and PVL

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 3xPVL 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.



### Technical data

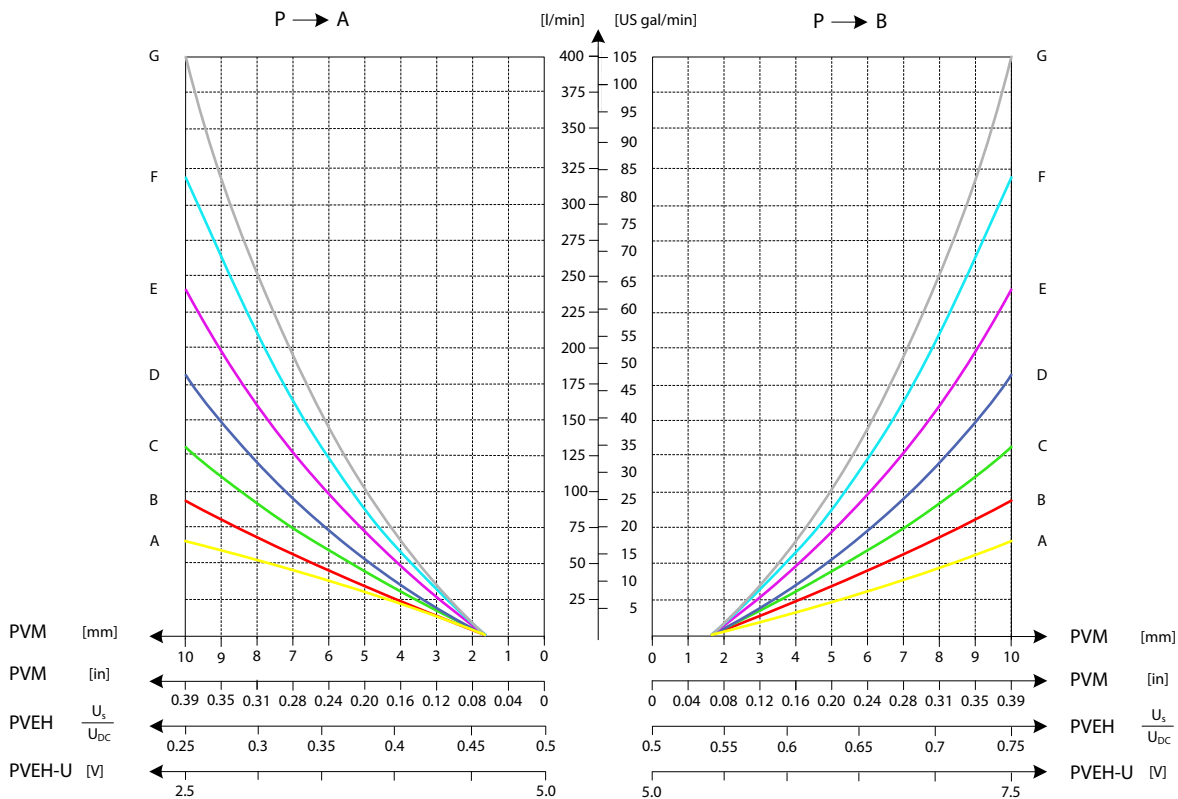
Max. rated pressure	A/B port continuous	350 bar	[5076 psi]
	A/B port intermittent	400 bar	[5800 psi]
Max. rated flow	A/B port	450 l/min	[119 US gal/min]
Oil temperature	Recommended	30 to 60°C	[86 to 140°F]
	Minimum	-30°C	[-22°F]
	Maximum	90°	[194°F]
Ambient temperature	Recommended	-30 to 60°C	[-22 to 140°F]
Oil viscosity	Operating range	12 to 75 mm <sup>2</sup> /s	[65 to 347 SUS]
	Minimum	4 mm <sup>2</sup> /s	[39 SUS]
	Maximum	460 mm <sup>2</sup> /s	[2128 SUS]
Oil contamination according to ISO 4406	Maximum	23/19/16	
Max. internal leakage at 100 bar [1450 psi] and 21 mm <sup>2</sup> /s [102 SUS]	A/B→T without shock valve	70 cm <sup>3</sup> /min	[4.27 in <sup>3</sup> /min]
	A/B→T with shock valve	85 cm <sup>3</sup> /min	[5.19 in <sup>3</sup> /min]

### Part numbers for Compensated PVB 256 with LSA/B and PVL

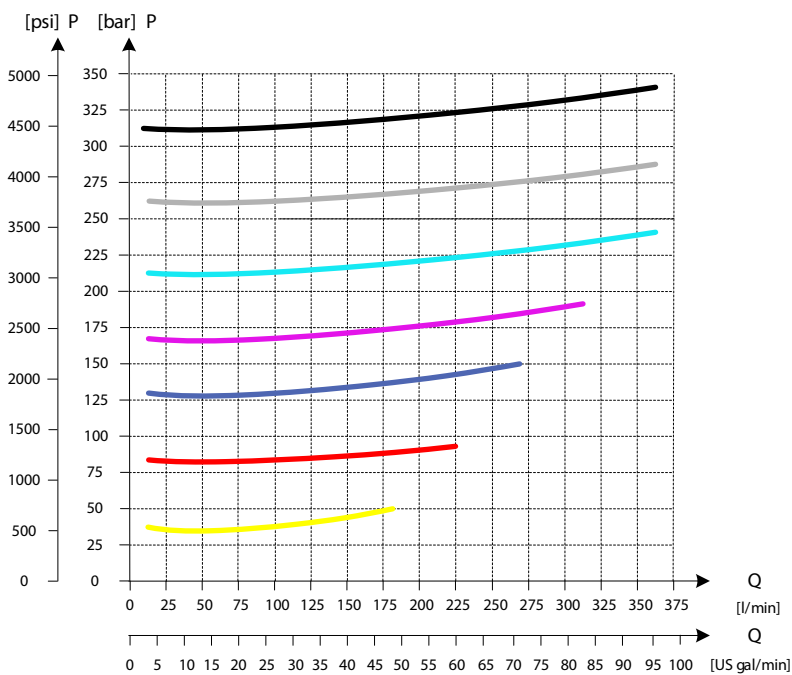
Part number	A/B port	PVLP/PVLA	LS A/B port
11169243	Metric Flange 1"	3 PVLP/PVLA	G1/4"BSP
11169251	G1 BSP	3 PVLP/PVLA	G1/4"BSP
11169247	SAE Flange 1" UNC	3 PVLP/PVLA	7/16-20 UNC
11177018	Thread Ports 1-5/16-12 UNC	3 PVLP/PVLA	7/16-20 UNC

**PVB 256 Variant Overview**

*Oil Flow as Function of Spool Travel*



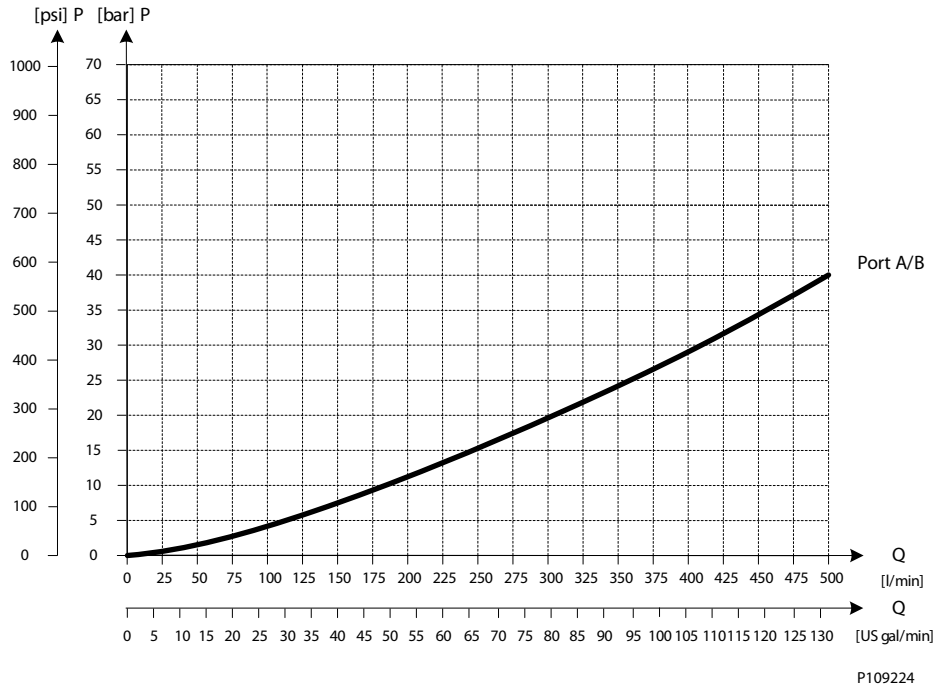
*3xPVL Shock Valve*



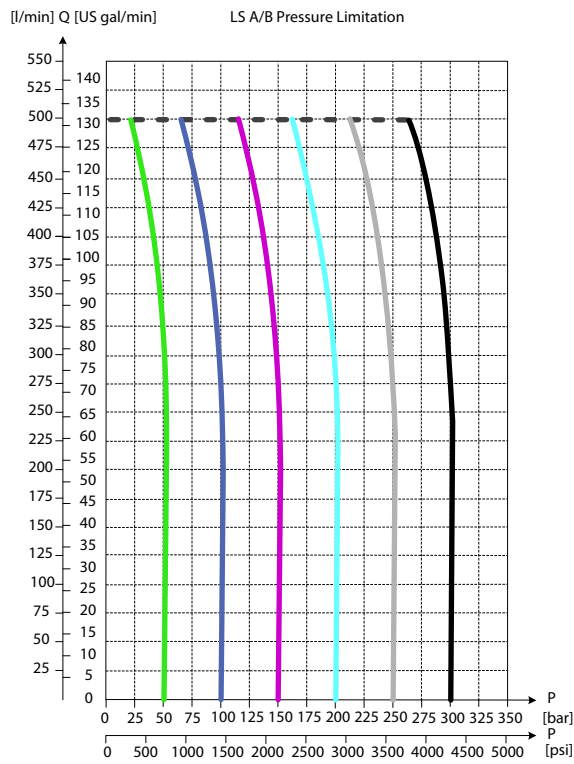
P109221

**PVB 256 Variant Overview**

*3xPVLA Suction Valve*

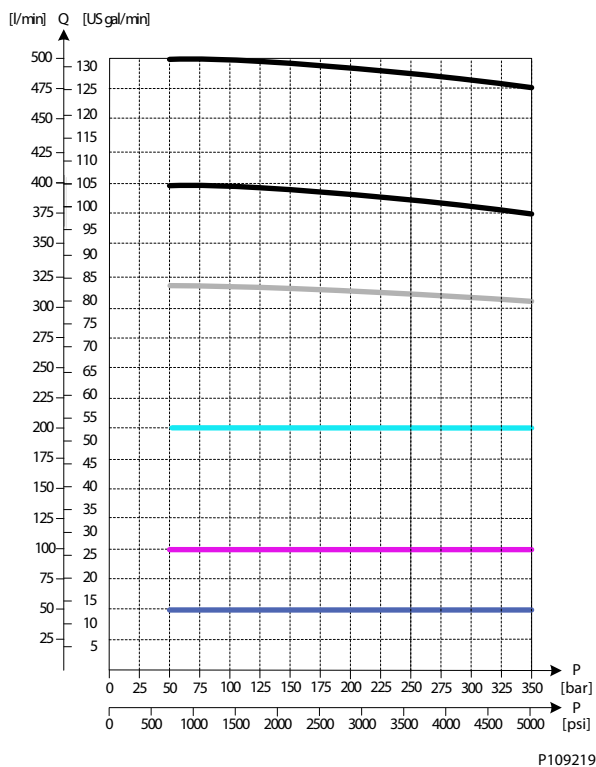


*LS A/B Pressure Limitation*

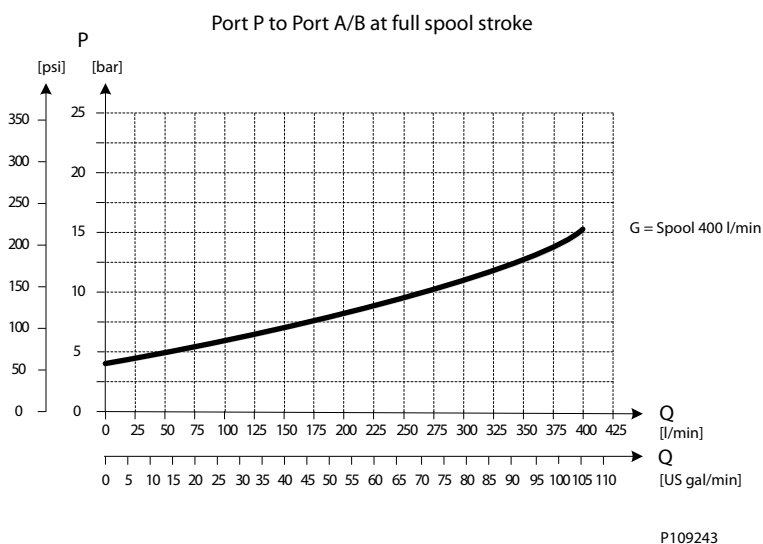


**PVB 256 Variant Overview**

*Load Independent Oil Flow, Pressure Compensated*

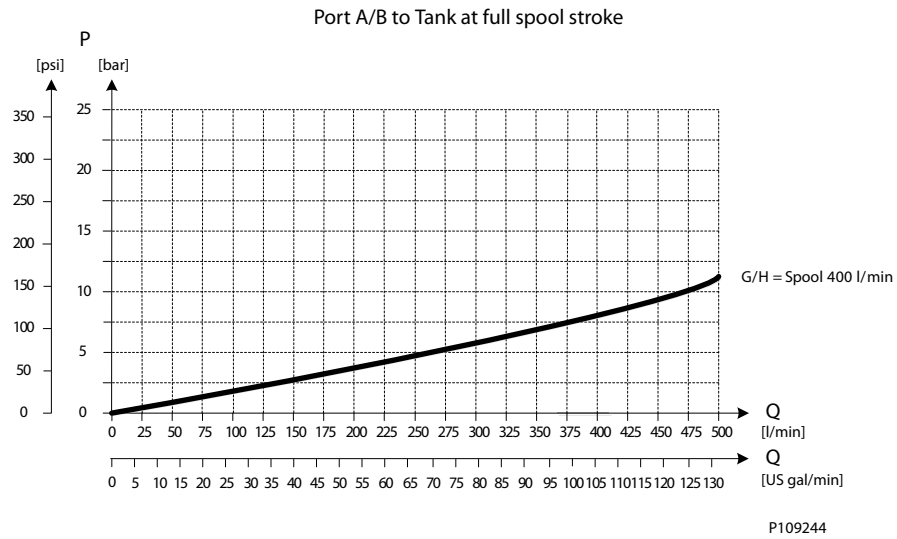


*PVB 256 Upstream Performance*



**PVB 256 Variant Overview**

*PVB 256 Downstream Performance*





## PVB 256 Variant Overview

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

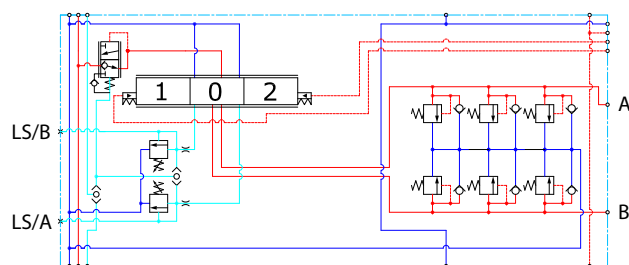
The compensated PVB is intended for controlling a work function where the function behavior in terms of flow and pressures requires independency on the load pressure of other functions used simultaneously.

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

#### Technical data

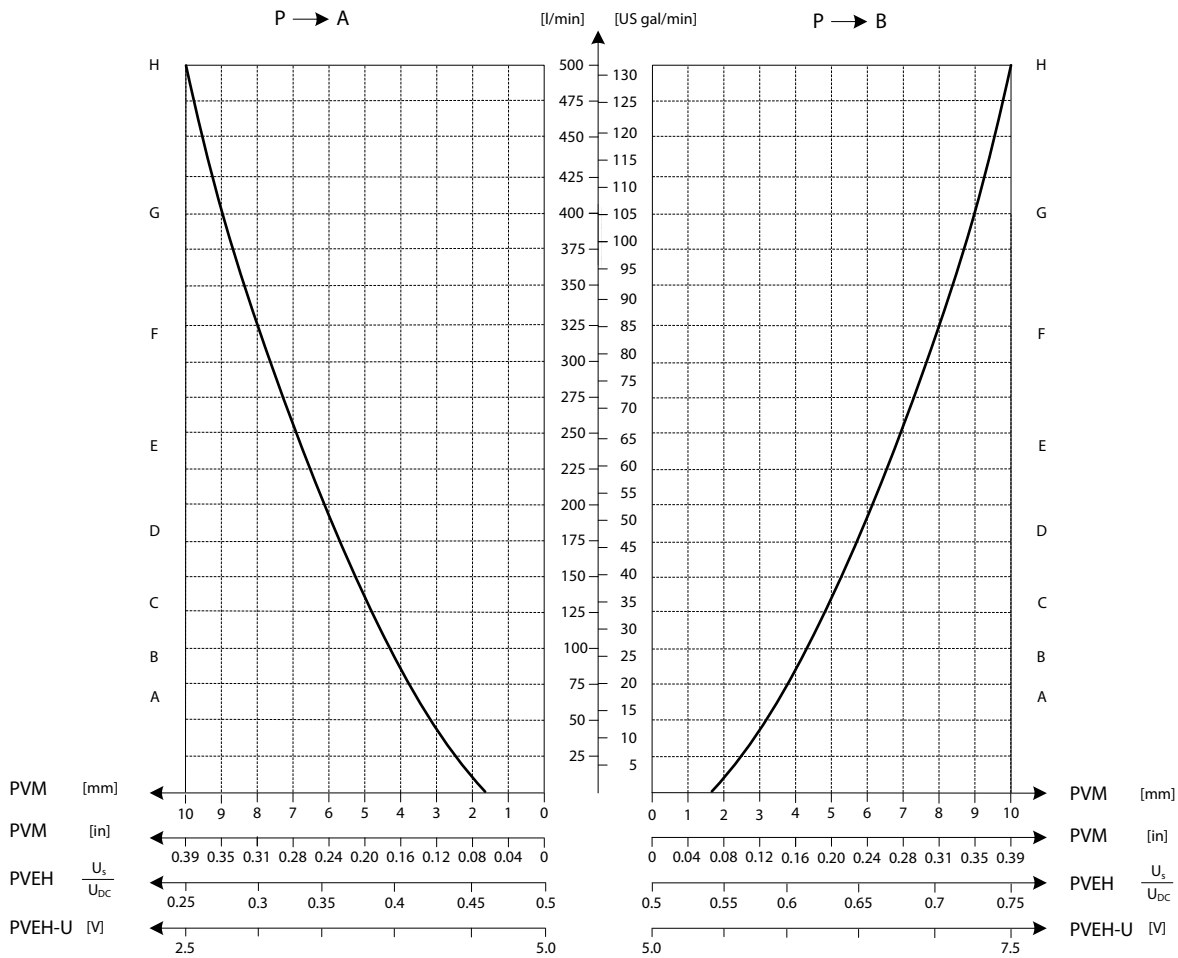
Max. rated pressure	A/B port continuous	350 bar	[5076 psi]
	A/B port intermittent	400 bar	[5800 psi]
Max. rated flow	A/B port	500 l/min	[132 US gal/min]
Oil temperature	Recommended	30 to 60°C	[86 to 140°F]
	Minimum	-30°C	[-22°F]
	Maximum	90°	[194°F]
Ambient temperature	Recommended	-30 to 60°C	[-22 to 140°F]
Oil viscosity	Operating range	12 to 75 mm <sup>2</sup> /s	[65 to 347 SUS]
	Minimum	4 mm <sup>2</sup> /s	[39 SUS]
	Maximum	460 mm <sup>2</sup> /s	[2128 SUS]
Oil contamination according to ISO 4406	Maximum	23/19/16	
Max. internal leakage at 100 bar [1450 psi] and 21 mm <sup>2</sup> /s [102 SUS]	A/B→T without shock valve	70 cm <sup>3</sup> /min	[4.27 in <sup>3</sup> /min]
	A/B→T with shock valve	85 cm <sup>3</sup> /min	[5.19 in <sup>3</sup> /min]

#### 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 BSP	3 PVLP/PVLA	G1/4"BSP
11183404	SAE Flange 1" UNC	3 PVLP/PVLA	7/16-20 UNC
11183402	Thread Ports 1-5/16-1 UNC	3 PVLP/PVLA	7/16-20 UNC

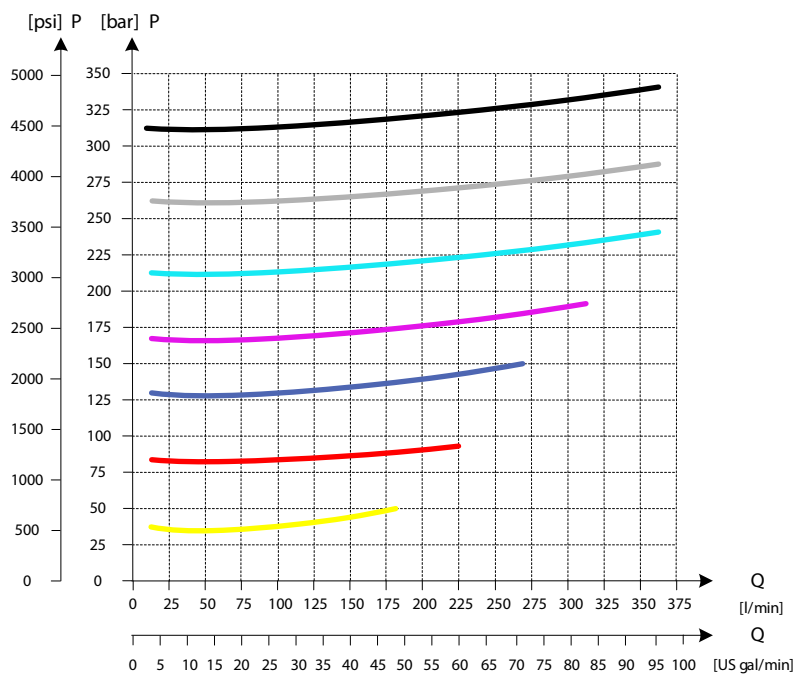
**PVB 256 Variant Overview**

*Oil Flow as Function of Spool Travel*



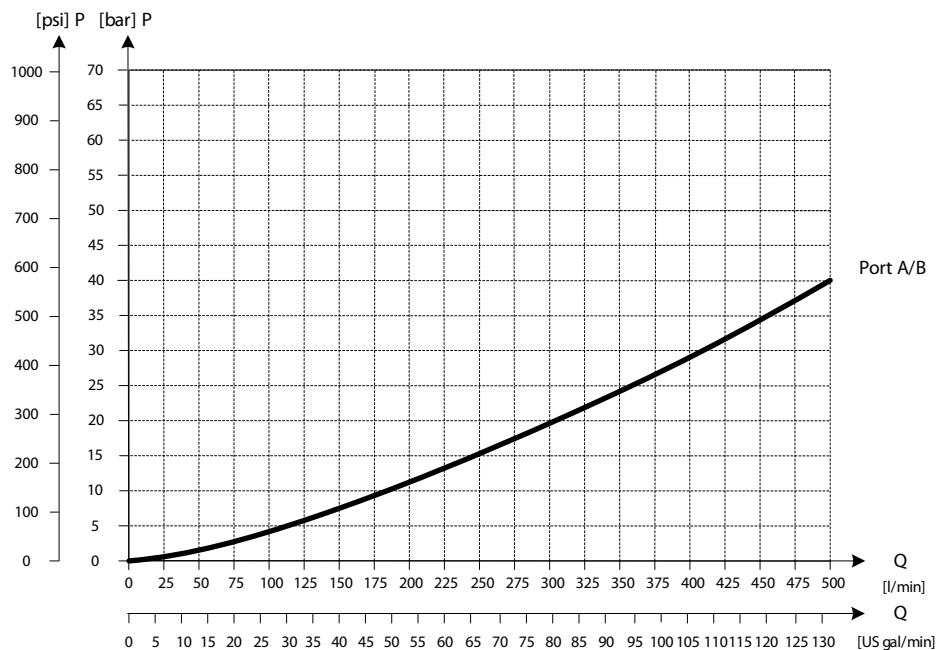
**PVB 256 Variant Overview**

*3xPVLP Shock Valve*



P109221

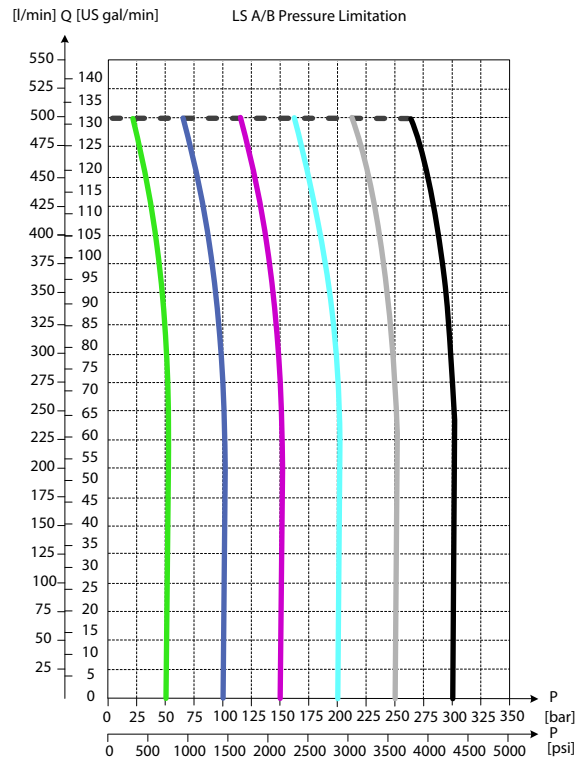
*3xPVLA Suction Valve*



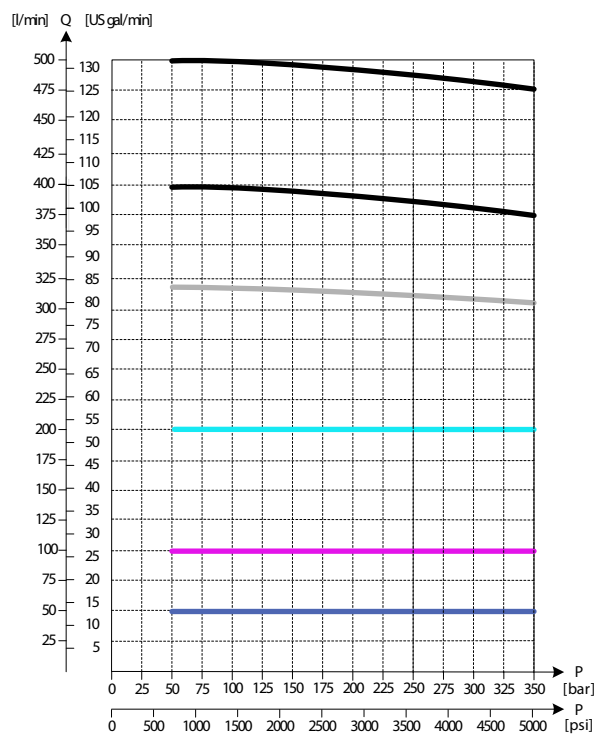
P109224

**PVB 256 Variant Overview**

*LS A/B Pressure Limitation*



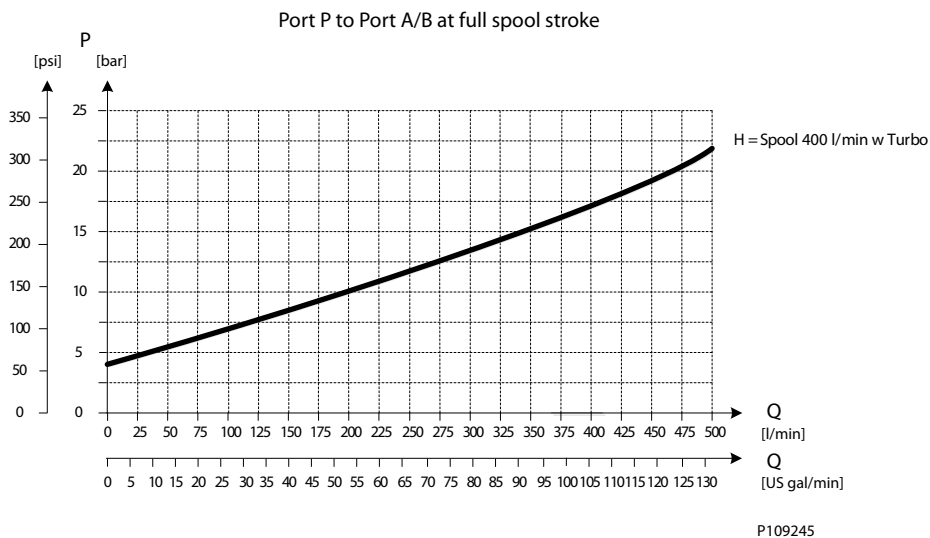
*Load Independent Oil Flow, Pressure Compensated*



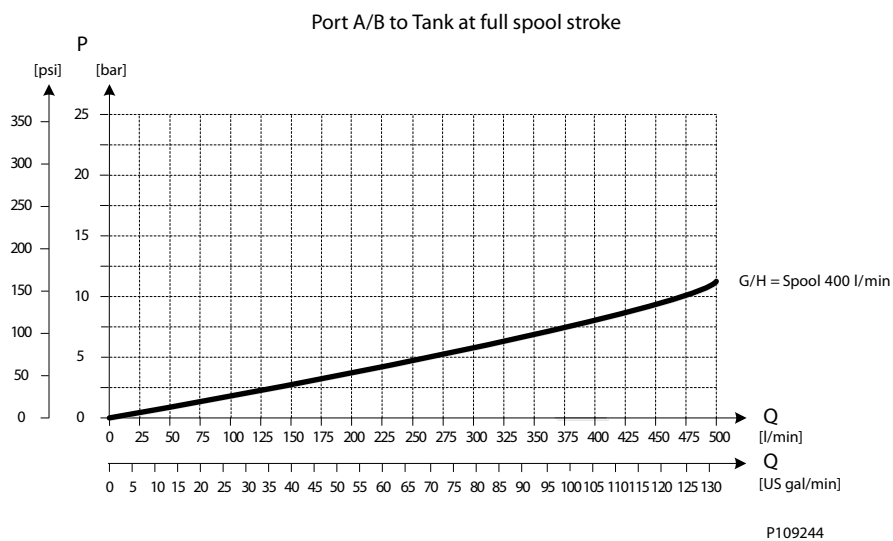
P109219

**PVB 256 Variant Overview**

*PVB 256 Turbo Upstream Performance*



*PVB 256 Downstream Performance*



## PVLP Shock and PVLA Suction Valves

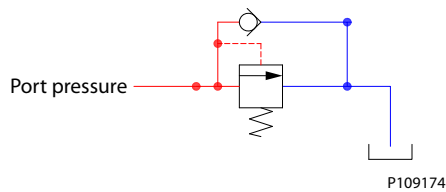
### PVLP Overview

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

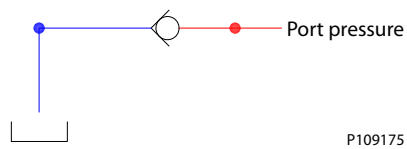
The shock valve PVLP is designed to absorb shock effects. Consequently, it should not be used as a pressure relief valve.

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*



### 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 <sup>2</sup> /s	[65 to 347 SUS]
	Minimum	4 mm <sup>2</sup> /s	[39 SUS]
	Maximum	460 mm <sup>2</sup> /s	[2128 SUS]
Oil contamination according to ISO 4406	Maximum	23/19/16	

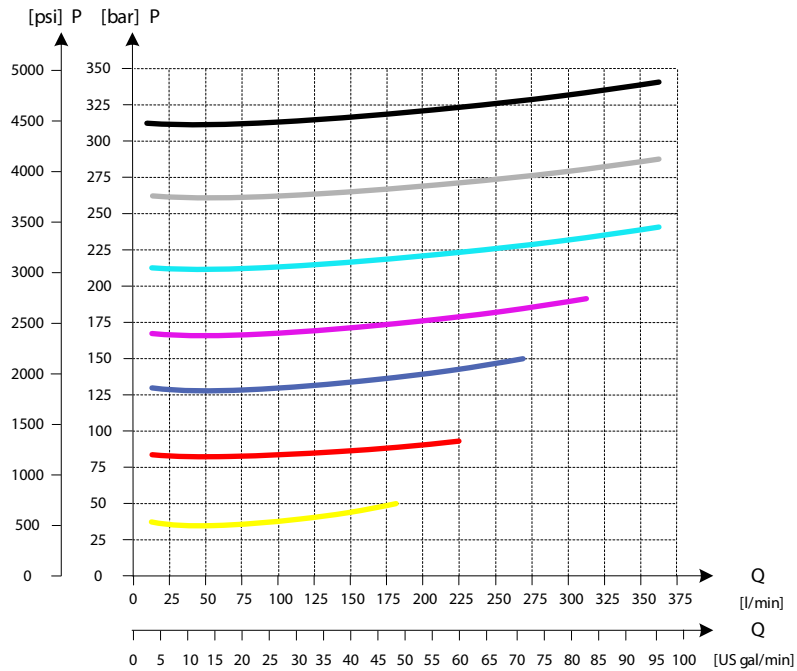
**PVLP Shock and PVLA Suction Valves**

**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

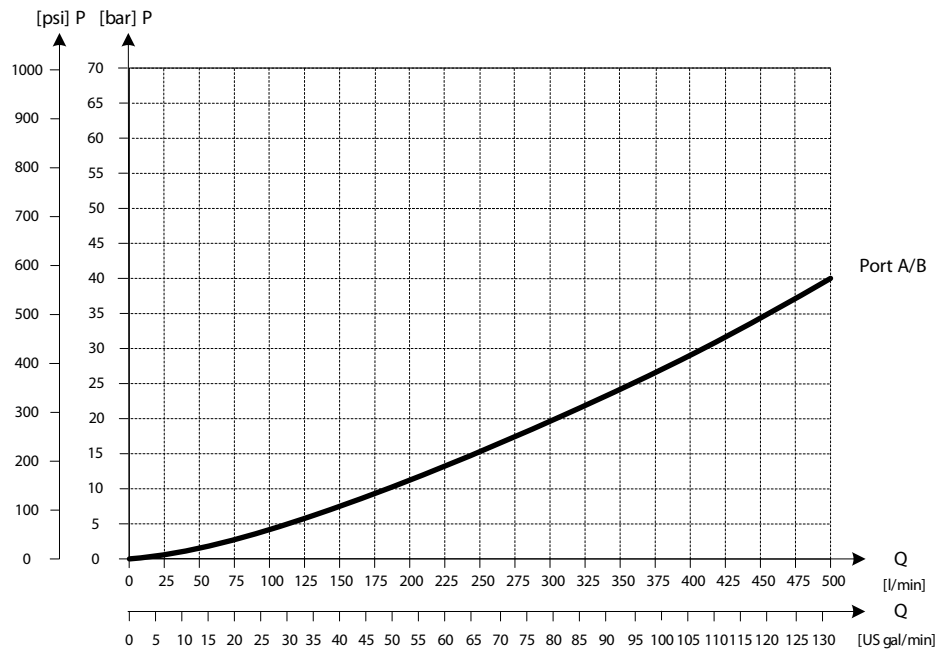
**PVLP Shock and PVLA Suction Valves**

*3xPVLP Shock Valve*



P109221

*3xPVLA Suction Valve*



P109224



## PVBS Main Spool

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

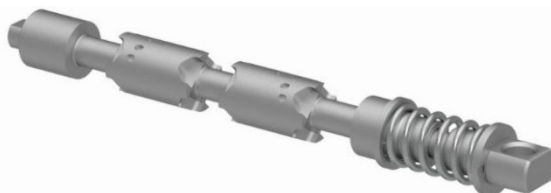
The PVBS main spool variants are based on a generic platform with a wide selection of additional features, enabling you to tailor the PVBS to suit the demands of any hydraulic system and any function.

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

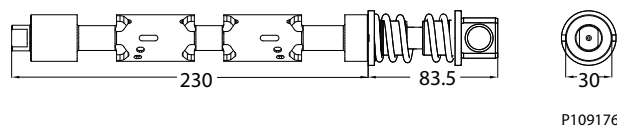
- Mechanically by a PVM lever
- Electrically by either a PVE or a PVHC actuator
- Hydraulically by a PVH actuator

All spools can be mechanically activated.

*PVBS Main Spool*



*PVBS Main Spool dimensions*



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## PVBS Main Spools variant overview

### 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

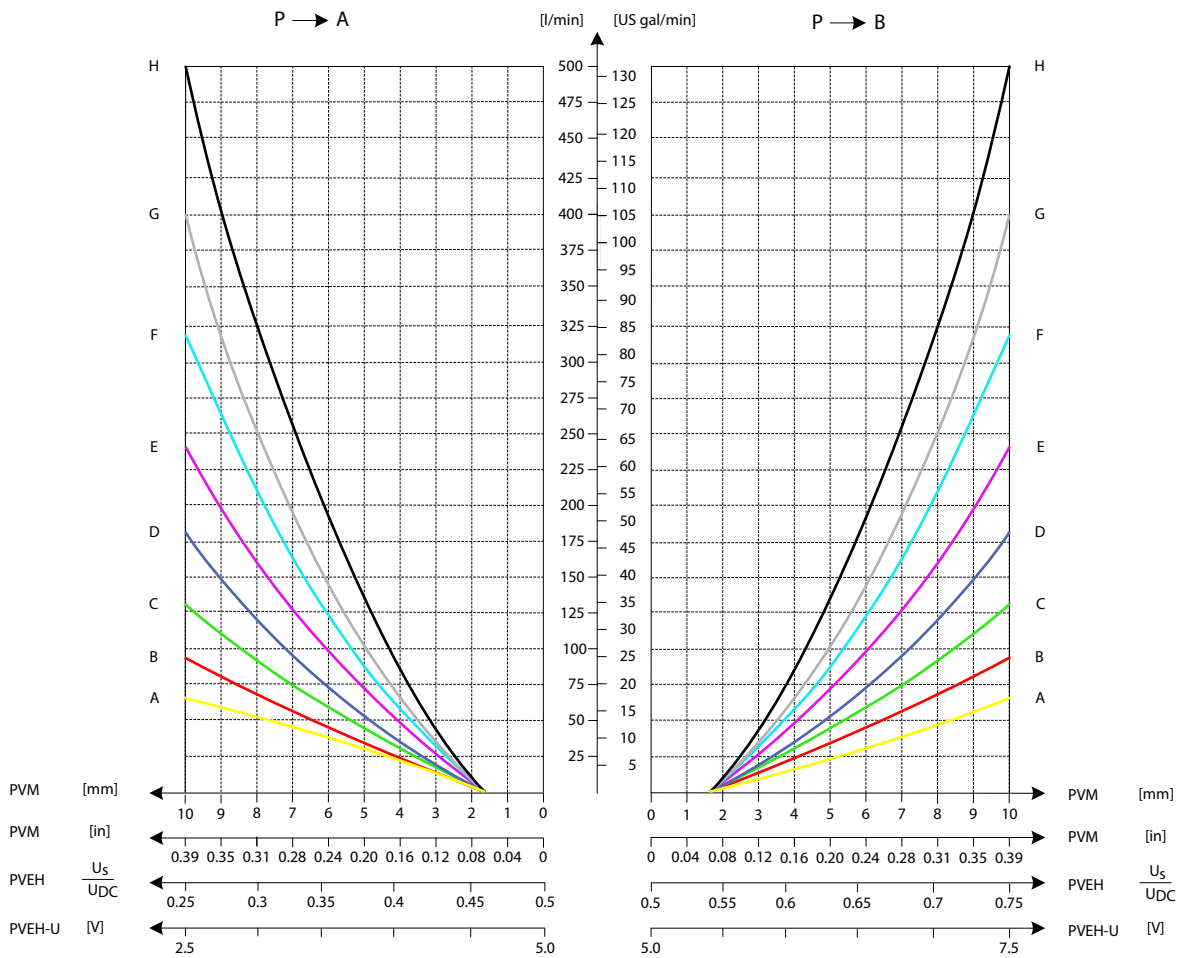
## PVBS main spools product details

### 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 <sup>2</sup> /s	[65 to 347 SUS]
	Minimum	4 mm <sup>2</sup> /s	[39 SUS]
	Maximum	460 mm <sup>2</sup> /s	[2128 SUS]
Oil contamination according to ISO 4406	Maximum	23/19/16	

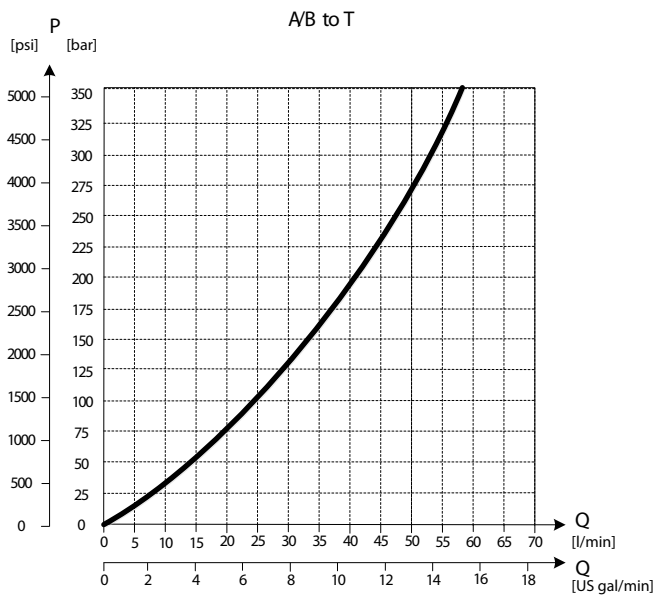
**PVBS Main Spool**

*Progressive Oil Flow as Function of Spool Travel*



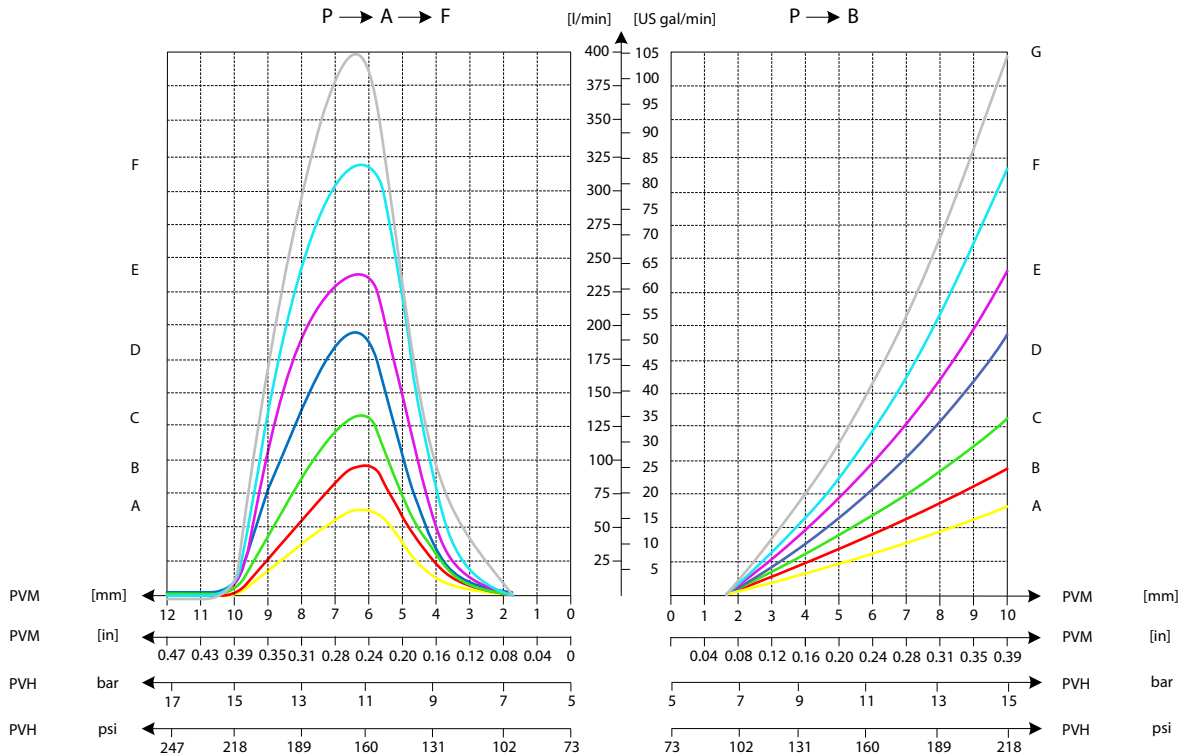
**PVBS Main Spool**

*Pressure drop for open spool in neutral position*



P109253

*Progressive oil flow characteristic of spool with A-float*



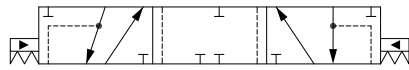
**PVS Main spools part numbers**

**PVBS Main Spool**

**Flow control spools**

**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]

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

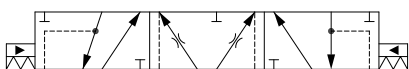
**Asymmetric spools**

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.

**Flow control spool throttled open neutral position**

Schematic



P109178

**PVBS Main Spool**

*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 <sup>2</sup>	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]

<sup>1</sup> Please contact your Danfoss Power Solutions representative if one of these variants is needed.

<sup>2</sup> Up to 500 l/min in combination with PVB 256 3-way Turbo Compensator feature

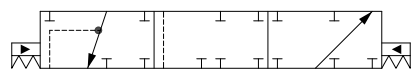
*Asymmetric flow control spools*

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.

**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) <sup>2</sup>	PVE	-	-	400 [105.67]	400 [105.67]

**PVBS Main Spool**

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]

<sup>1</sup> Please contact your Danfoss Power Solutions representative if one of these variants is needed.

<sup>2</sup> Up to 500 l/min in combination with PVB 256 3-way Turbo Compensator feature

**Flow control spool closed neutral position with A-float**

Schematic



P109180

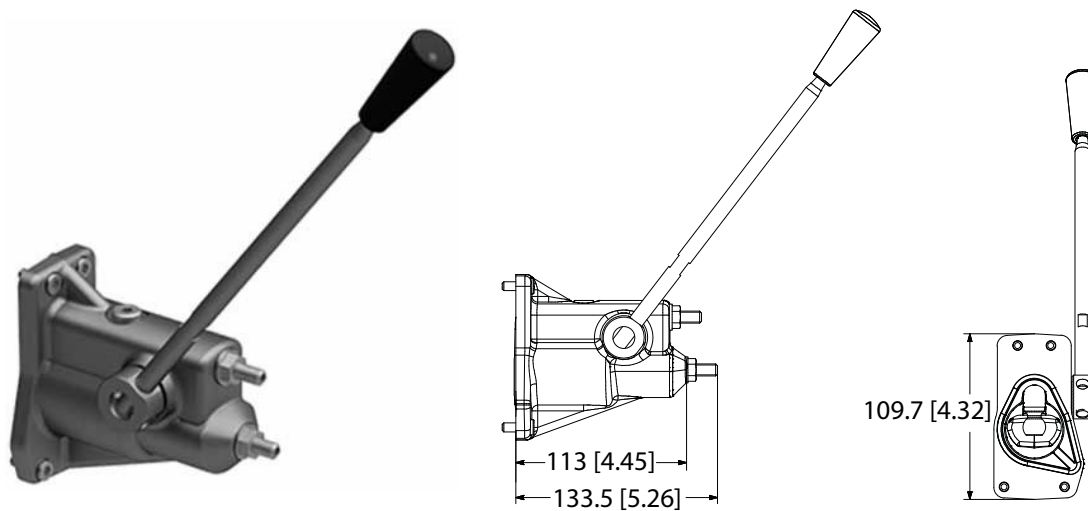
**Symmetric flow control spools**

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

<sup>1</sup> Please contact your Danfoss Power Solutions representative if one of these variants is needed.

### PVM Manual Activation

#### *PVM Lever dimensions*



Weight: 1.5 kg [3.3 lbs]

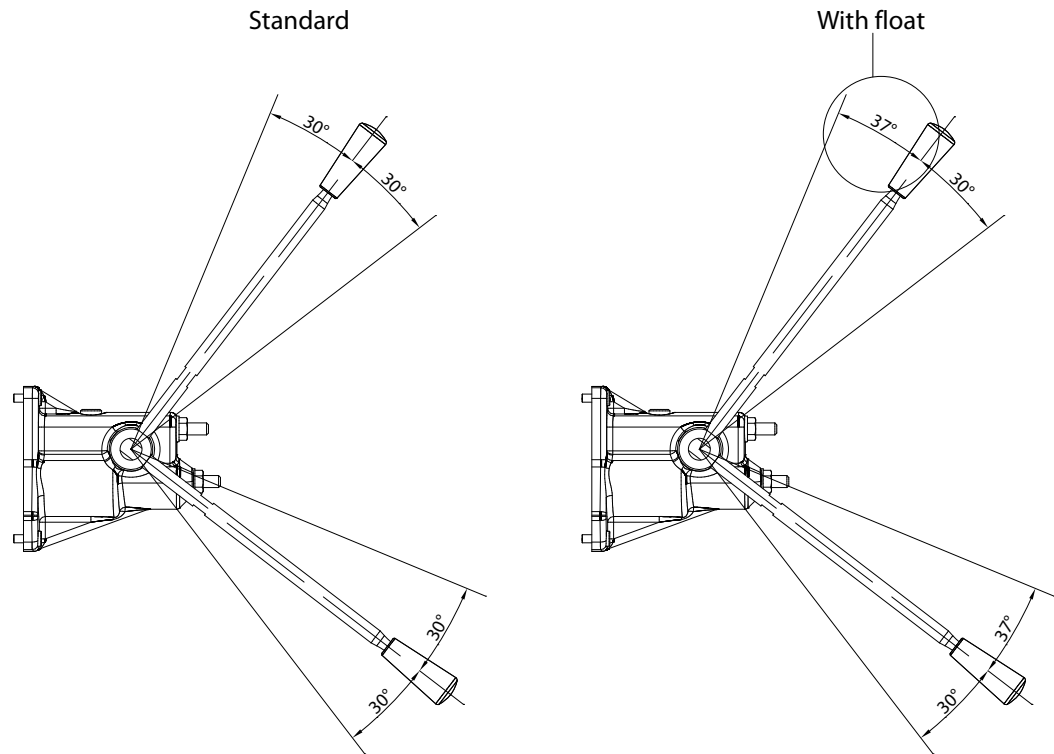
The PVM manual activation cover is intended for use on any work section where the operator has to have the ability to interact with the spool manually.

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

**PVM Manual Activation**

**PVM Technical Data**

*Handle Installation*



*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°	

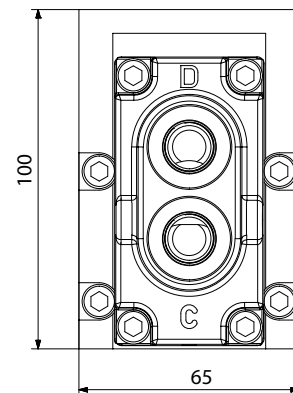
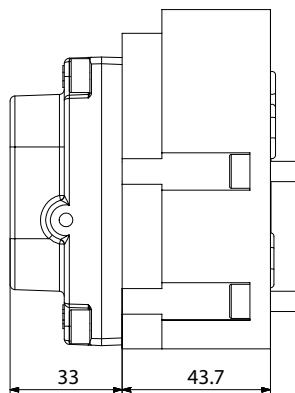
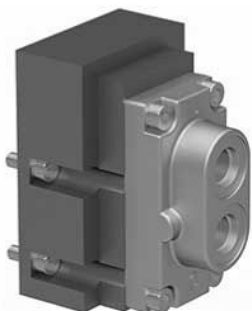
**Part numbers for PVM Manual Activation**

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



**PVH Hydraulic Actuation**

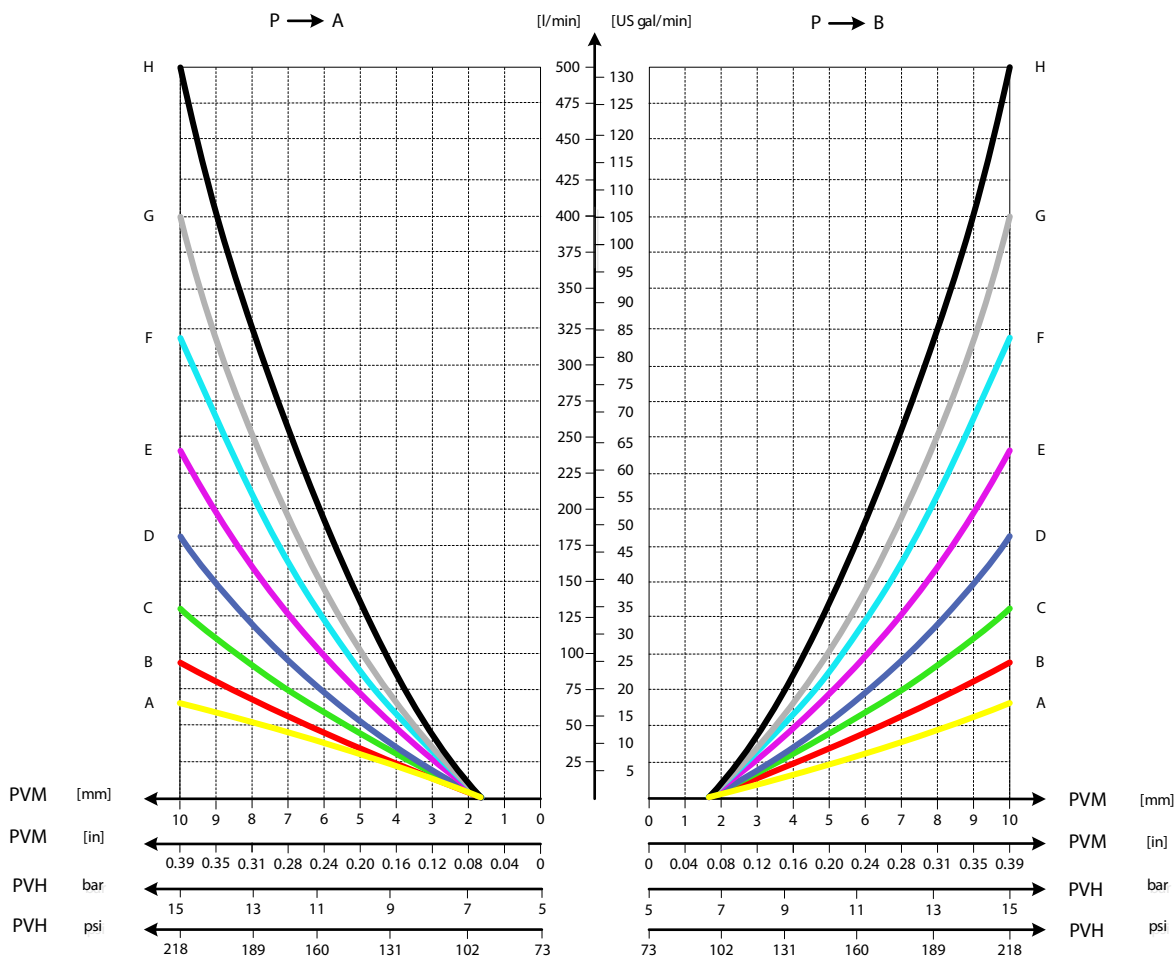
*PVH dimensions*



Weight: 1.9 kg [4.2 lbs]

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.



P109247

## **PVH Hydraulic Actuation**

### **PVH Technical Data**

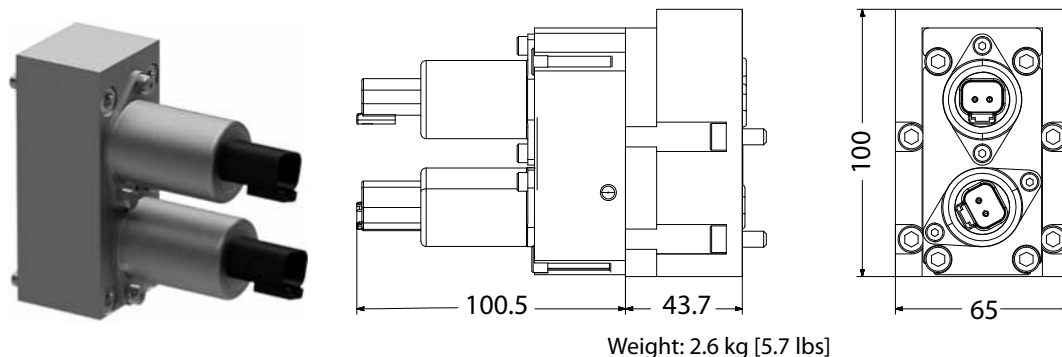
#### *Technical data*

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]

#### **Part numbers for PVH Hydraulic Actuation**

<b>Part number</b>	<b>Material</b>	<b>Connection</b>
11187777	Aluminum	G1/4" BSP
11187776	Aluminum	9/16"-18 UNF

**PVHC Electro-Hydraulic Actuator type**



The PVHC is an electrical actuator module for main spool control.

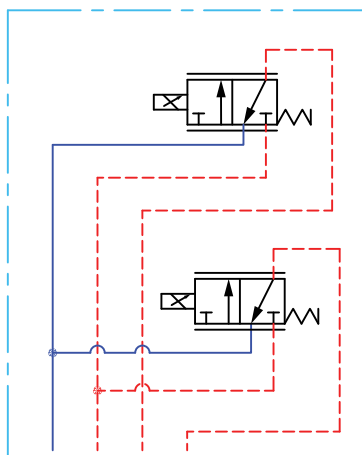
The PVHC control is done by dual Pulse Width Modulated (PWM) high current supply 100-400 Hz PWM control signals.

The hysteresis is affected by viscosity, friction, flow forces, dither frequency and modulation frequency. The spool position will shift when conditions are changed such as temperature change.

Inlet with Hydraulic Pilot Pressure is needed.

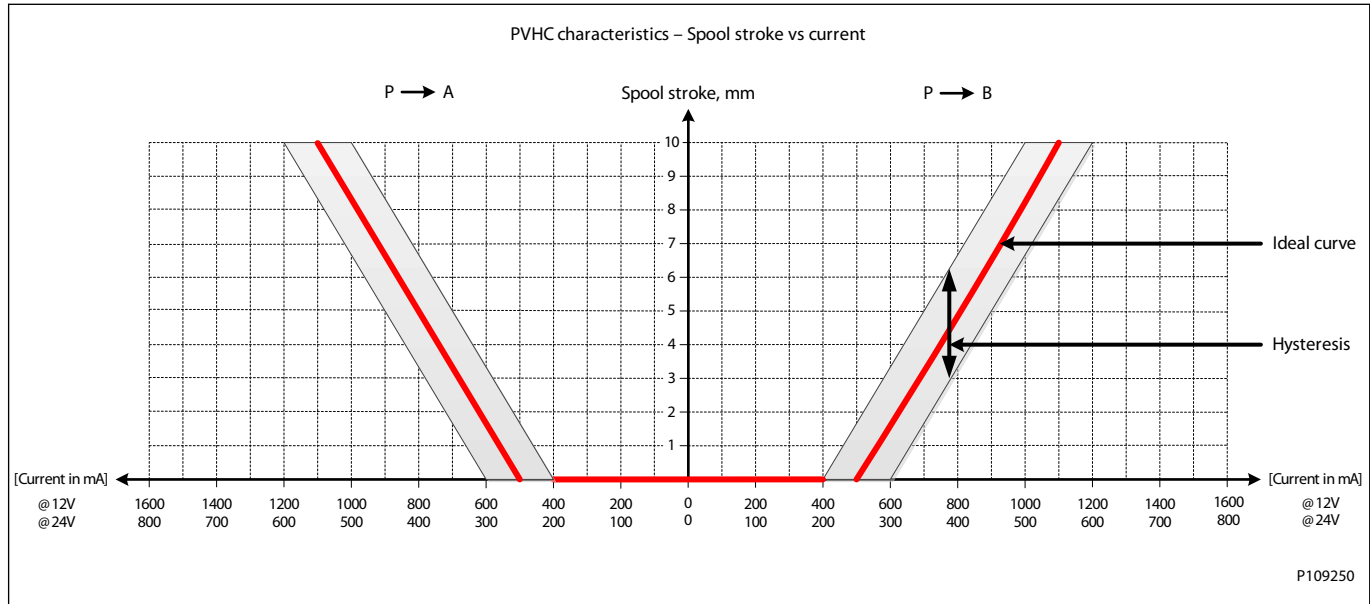
Dither frequency with a certain amplitude is needed for optimal application performance.

*Schematic*



P109249

**PVHC Electro-Hydraulic Actuator type**



**PVHC Technical Data**

*Technical data*

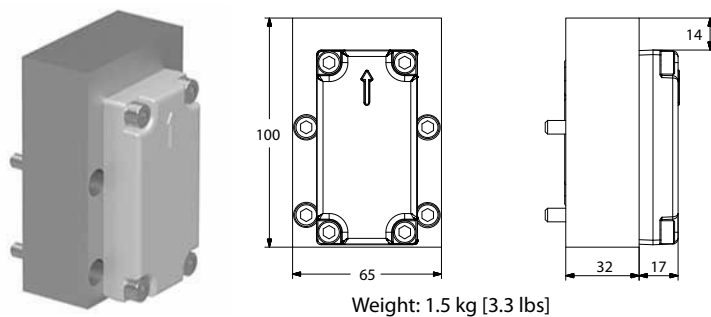
Main Spool Spring control pressure range	5-15 bar	[73-218 psi]
Pilot oil pressure range between 20 and 25 bar	20-25 bar	[290-362 psi]
Max. pressure on port T	10 bar	[145 psi]
PVHC 12 Volt Current Input	0-1500 mA	
PVHC 24 Volt Current Input	0-750 mA	
Ambient Temperature Range	-30°C to 80°C	[-22 °F to 176°F]
Medium Temperature Range	-20°C to 80°C	[-4 °F to 176°F]
Oil contamination according to ISO 4406 Maximum	23/19/16	

**Part numbers for PVHC Electro-Hydraulic Actuator types**

Part number	Power supply	Connector type
11187757	12V	AMP
11187772	12V	DEUTSCH
11187774	24V	AMP
11187775	24V	DEUTSCH

**PVMD Cover Manual Actuation Only**

*PVMD dimensions*



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

**PVMD Part Numbers**

**Part numbers for PVMD Covers**

Part number	Material
11187779	Aluminum

## PVE Electrical Actuator

### PVE Series 7 Electrical Actuator

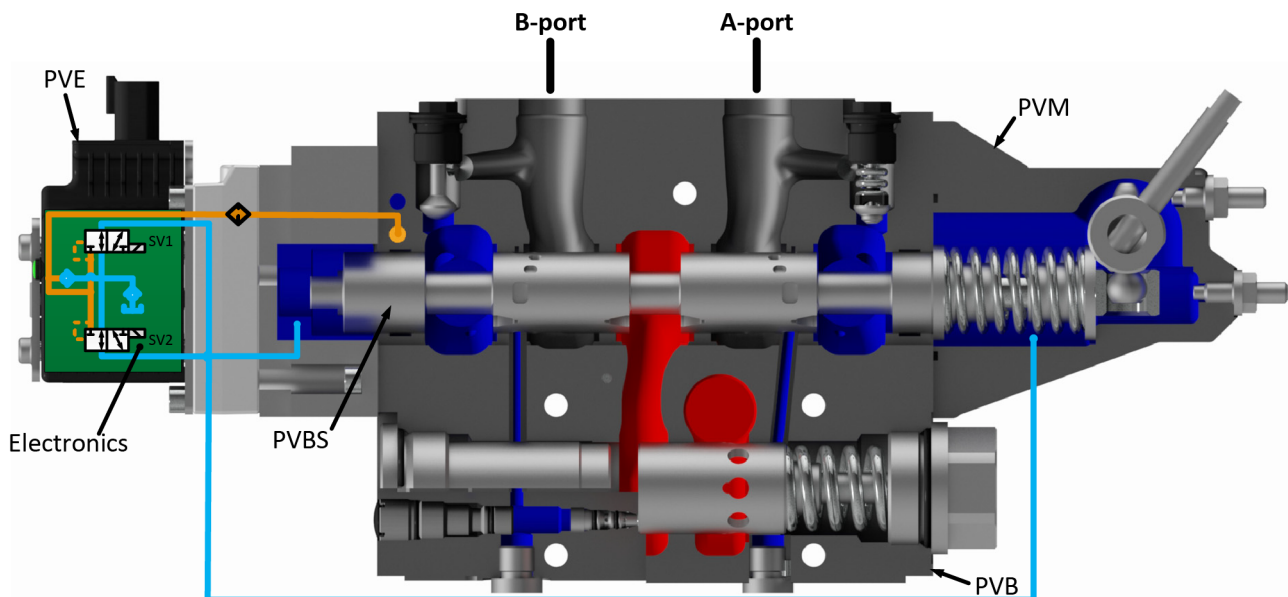
The analog PVE Series 7 is an electro-hydraulic actuator used to control a single work section of a PVG proportional valve group. The PVE Series 7 actuator program includes variants with different performance levels and features for PVG 128/256.

The actuator positions the main spool in a PVG work section in order to control either the flow or the pressure of the oil distributed to/from the work function. The control signal to the actuator is an analog voltage signal, enabling the user to operate the work function remotely by means of a joystick, a controller or the similar.

The electro-hydraulic solenoid valve bridge of the actuator is available in different designs utilizing different regulation principles, depending on performance variant. The actuator positions the main spool by distributing pilot oil pressure to either side of it, pressurizing one side by pilot pressure while relieving the opposite side to tank and vice versa, as illustrated below. All proportional actuators feature a closed-loop spool control and continuous fault monitoring.

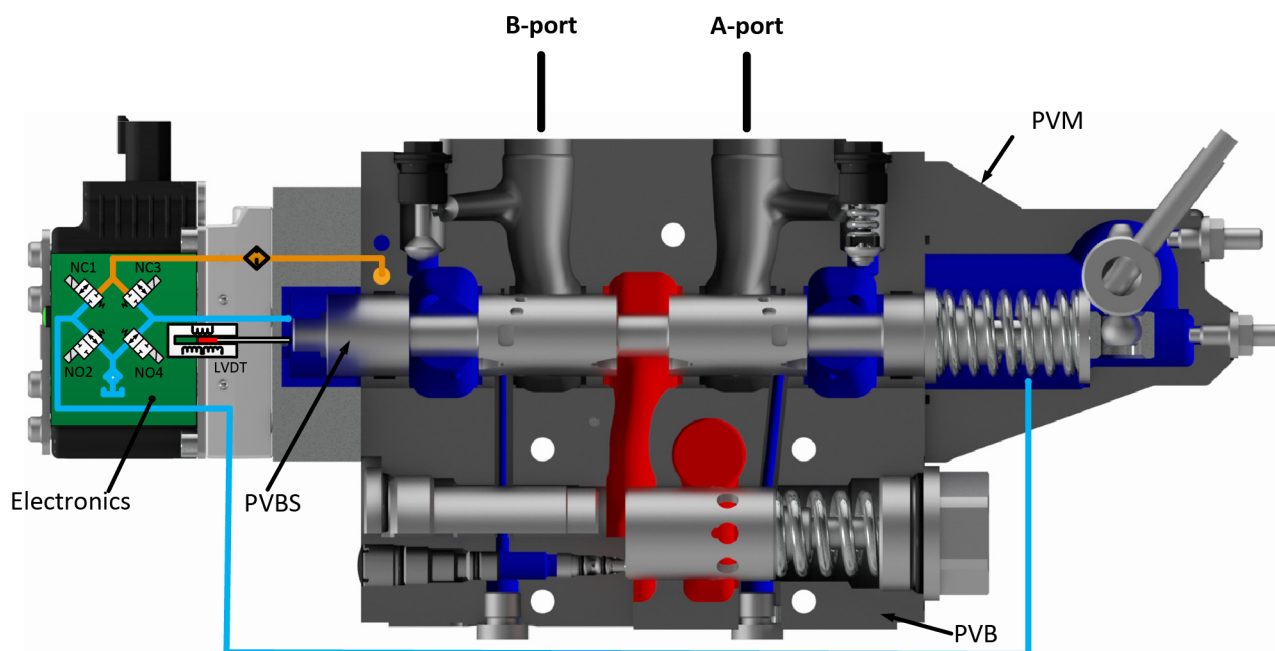
The analog PVE Series 7 actuator program for PVG 128/256 features two different main hydraulic principle variants (PVEO and PVEH). The different hydraulic principles combined with the different solenoid valve regulation principles determine whether the actuator controls the spool proportionally according to a demand signal or ON/OFF according to a voltage signal. The voltage control characteristic of the PVE Series 7 actuators is shown in the figure below to the left.

PVG 256 with PVEO



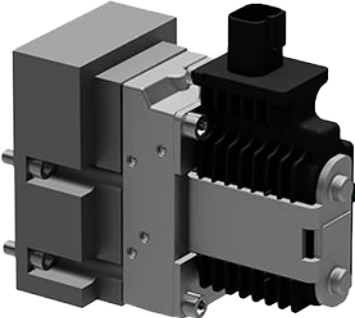
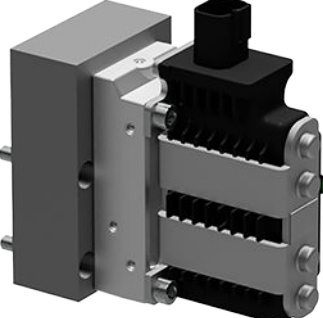
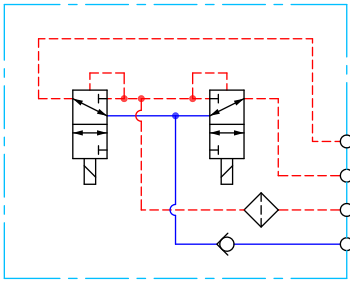
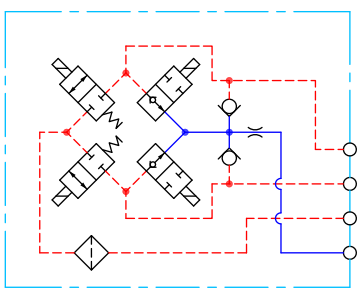
### PVE Electrical Actuator

*PVG 256 with PVEH*



**PVE Variant Overview**

**PVE Variant Overview**

PVEO Series 7	PVEH Series 7
	
Symbol	Description
 <p style="text-align: right;">P109195</p>	<p><b>PVEO</b>  ON/OFF voltage control for non-proportional functions.</p> <ul style="list-style-type: none"> <li>• Neutral position or max. spool stroke according to control signal</li> <li>• Variants available with 12 V dc or 24 Vdc supply voltage</li> <li>• Variants available with DEUTSCH or DIN/Hirschmann connectors</li> <li>• To be used with standard PVE pilot oil pressure of 13.5 bar</li> <li>• LED only indicating Power ON or Power OFF</li> </ul>
 <p style="text-align: right;">P109198</p>	<p><b>PVEH</b>  Proportional spool control for functions with high performance and reaction demands.</p> <ul style="list-style-type: none"> <li>• All variants with 11-32 Vdc multi-voltage power supply</li> <li>• Variants available with DEUTSCH or DIN/Hirschmann connectors</li> <li>• To be used with standard PVE pilot oil pressure of 13.5 bar</li> <li>• All variants with LED indicating error state and active or passive fault monitoring</li> <li>• Variants available with Float (-F) or 0-10 V dc control signal (-U) functionality</li> </ul>

**PVEO**

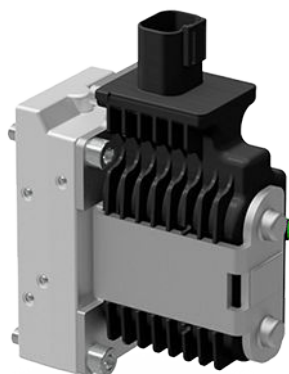


## PVE Variant Overview

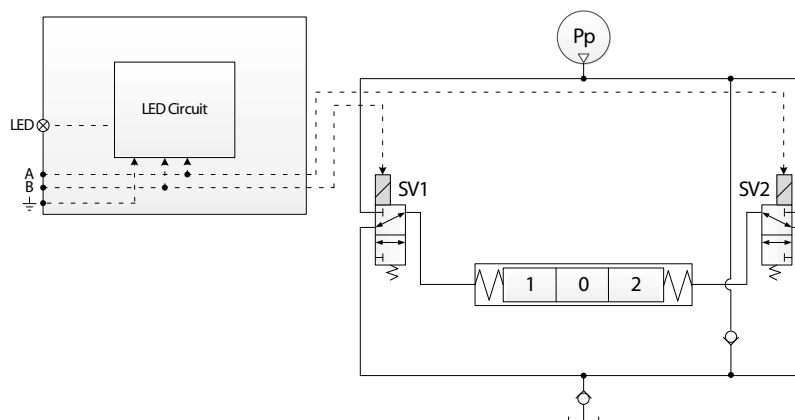
### PVEO

The PVEO actuator is a non-proportional ON/OFF control actuator with open-loop spool control primarily used to control simple ON/OFF work functions where a proportional control of speed or oil flow is not a requirement

#### PVEO



#### PVEO functionality



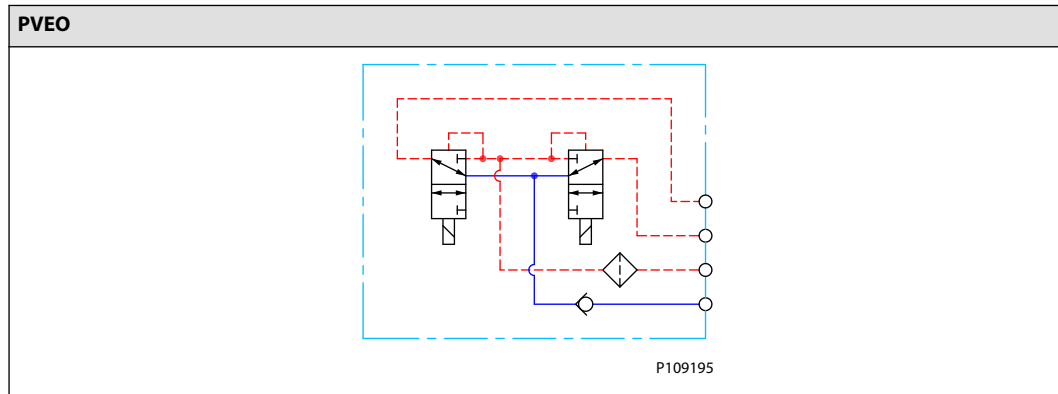
The standard PVEO functionality includes the simplest electric circuit of the PVG 128/256 actuator program, using a fixed 12 Vdc or 24 Vdc supply voltage or signal voltage and a simple LED circuit to control the LED light indicating Power ON/OFF.

An energization of solenoid valve SV1 and a simultaneous de-energization of SV2 will cause the main spool to move to the right direction and vice versa. If both SV1 and SV2 are energized or de-energized simultaneously, the main spool stays locked in its neutral position.

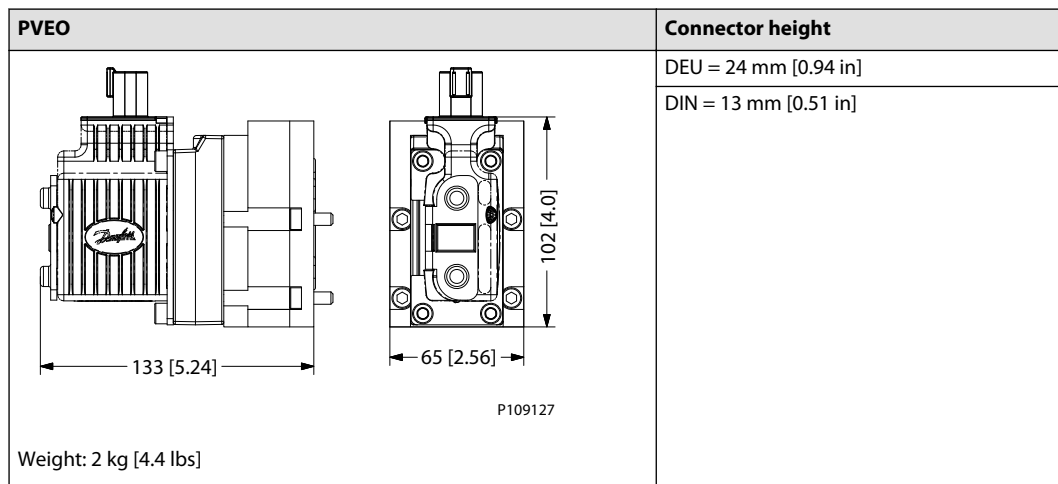
**PVE Variant Overview**

***PVEO Schematics and Dimensions***

*PVEO schematics*



*Dimensions*



***PVEO Technical Data***

*Control Specification*

Description	Type	Value	
Supply Voltage (Udc)	Rated	12 Vdc	24 Vdc
	Range	11 to 15 Vdc	
	Max. ripple	5%	
Current Consumption	Typical	708 mA	361 mA
	Minimum	430 mA	220 mA
	Maximum	944 mA	482 mA

*Operating Conditions*

Description	Type	Value	
Pilot Pressure	Nominal	13.5 bar	[196 psi]
	Minimum	10.0 bar	[145 psi]
	Maximum	15.0 bar	[218 psi]

## PVE Variant Overview

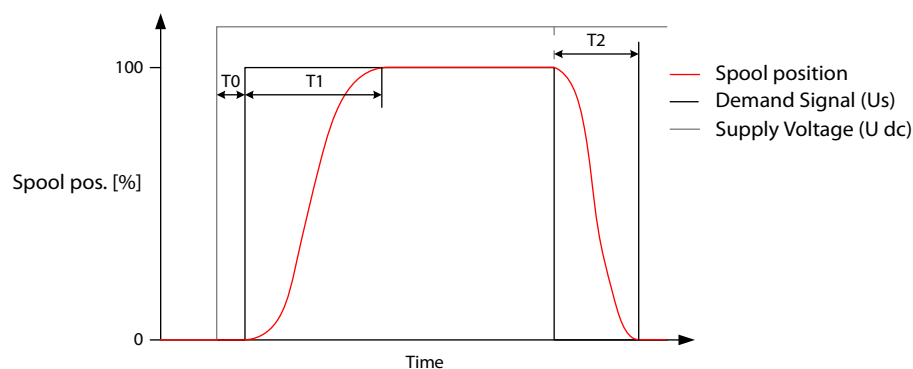
### Operating Conditions (continued)

Description	Type	Value	
Oil Consumption	Neutral	0.0 l/min	[0.0 gal/min]
	Locked position	0.0 l/min	[0.0 gal/min]
	Actuating	0.9 l/min	[0.24 gal/min]
Max T-port pressure	Static	25 bar	[365 psi]
Max T-port pressure	Intermittent	40 bar	[580 psi]
Storage Temperature	Ambient	-50 to +90°C	[-58 to +194°F]
Operating Temperature	Ambient	-40 to +90°C	[-40 to +194°F]
Oil Viscosity	Operating range	12 to 75 cSt	[65 to 347 SUS]
	Minimum	4 cSt	[39 SUS]
	Maximum	460 cSt	[2128 SUS]
Oil Cleanliness	Maximum	18/16/13 (according to ISO 4406)	

### LED characteristic

Color	LED characteristic	Description
Green constant		Power ON

### PVEO 128/256 Reaction Times



P109128

### PVEO

Reaction	PVG128	PVG 256
T1 A-port – Neutral to maximum spool stroke @ Constant Udc	375 ms	375 ms
T1 B-port – Neutral to maximum spool stroke @ Constant Udc	520 ms	520 ms
T2 A-port – Maximum spool stroke to neutral @ Constant Udc	350 ms	350 ms
T2 B-port – Maximum spool stroke to neutral @ Constant Udc	600 ms	600 ms

### PVEO Variants for PVG

#### PVG 128/256 Variants

Part number	Type	Connector	IP	Udc	Functionality
11186328	PVEO	1x4 DEU	67	12 Vdc	Standard
11186330	PVEO	1x4 DEU	67	24 Vdc	Standard

## PVE Variant Overview

*PVG 128/256 Variants (continued)*

Part number	Type	Connector	IP	Udc	Functionality
11186331	PVEO	1x4 DIN	65	12 Vdc	Standard
11186342	PVEO	1x4 DIN	65	24 Vdc	Standard

## PVEH

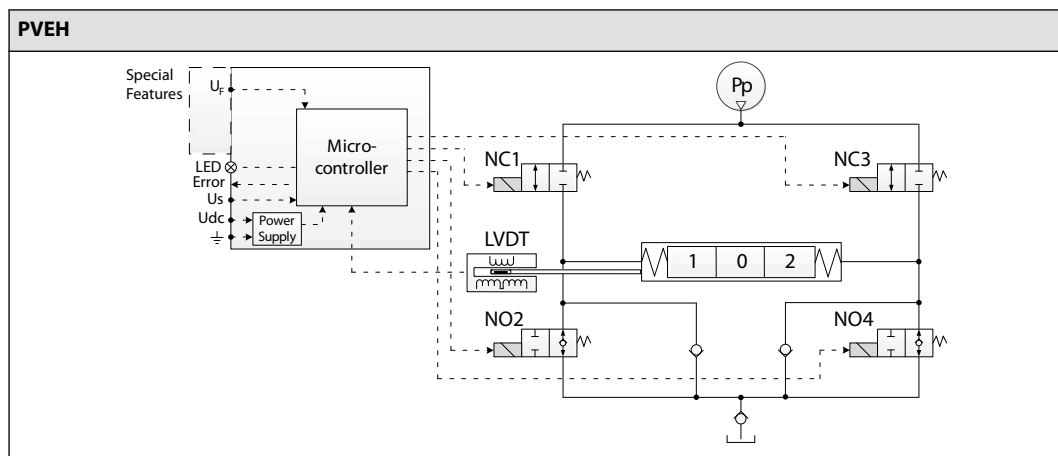
### PVEH Overview

The PVEH actuator is a proportional control actuator with closed-loop spool control primarily used to control work functions with high performance requirements.

The PVEH functionality includes an electric circuit with a closed-loop logic. An embedded microcontroller processes the signal voltage and the LVDT feedback signal and regulates the solenoid valves accordingly. Features such as active or passive fault monitoring, LED indicating fault state, error output pin and Power Save are all default PVEH features.

A continuous modulation of solenoid valves NC1 and NO4 together, with a simultaneous energization of NO2 and de-energization of NC3, causes the main spool to move to the right direction and vice versa. When the main spool is stroked to the far right, a simultaneous energization of both NO2 and NO4 and de-energization of both NC1 and NC3 locks the main spool in its stroked position. An emergency stop activated when the spool is stroked will cause all solenoid valves to de-energize causing the main spool to move back to its neutral position by means of the main spool neutral spring and the hydraulic principle.

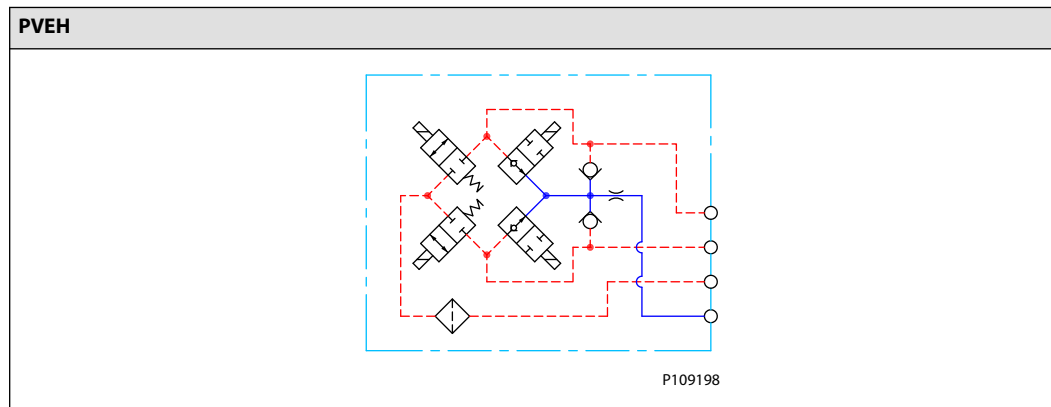
### Functionality



## PVE Variant Overview

### *PVEH Schematics and Dimensions*

#### Schematics



#### Dimensions

PVEH	Connector height
	DEU = 24 mm [0.94 in]
	DIN = 13 mm [0.51 in]
2 kg [4.4]	

### *PVEH Technical Data*

#### Control Specification

Description	Type	Value
Supply Voltage ( $U_{DC}$ )	Rated Range	11 to 32 $V_{DC}$
	Max. ripple	5%
Signal Voltage PWM ( $U_S$ )	Neutral	$U_S = 0.5 U_{DC} = 50\%$ DUT
	Q: P to A	$U_S = (0.5 \text{ to } 0.25) U_{DC} = 50\%$ to 25% DUT
	Q: P to B	$U_S = (0.5 \text{ to } 0.75) U_{DC} = 50\%$ to 75% DUT
Input Impedance	Rated	12 k $\Omega$
Input Capacitance	Rated	1 nF

## PVE Variant Overview

### Current consumption

Description	@ 12 V <sub>DC</sub>	@ 24 V <sub>DC</sub>
PWM Frequency (U <sub>S</sub> ) recommended	> 1000 Hz	> 1000 Hz
Current Consumption	540 mA	270 mA
Power Save	25 mA @ U <sub>DC</sub> = 32 V <sub>DC</sub>	

### Pilot pressure

Minimum	Nominal	Maximum
10.0 bar [145 psi]	13.5 bar [196 psi]	15.0 bar [218 psi]

### Fluid consumption

Neutral	Locked position	Actuating
0.0 l/min	0.0 l/min	0.7 l/min [0.18 US gal/min]

### Technical specification

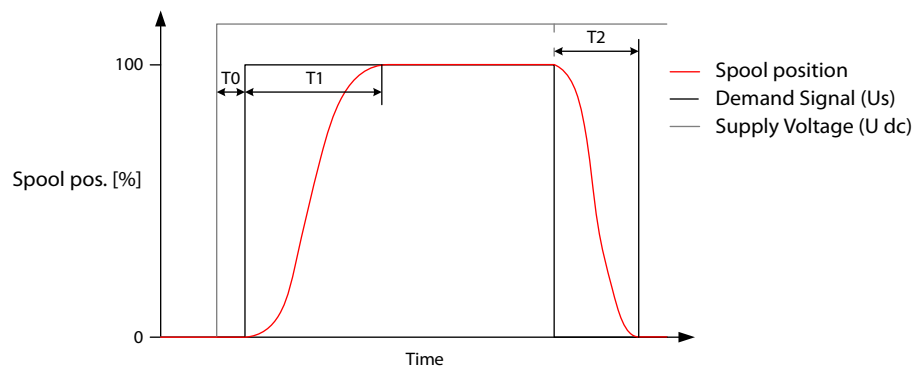
Parameter	Minimum	Recommended range	Maximum
Fluid viscosity	4 mm <sup>2</sup> /s [39 SUS]	12 to 75 mm <sup>2</sup> /s [65 to 347 SUS]	460 mm <sup>2</sup> /s [2128 SUS]
Fluid cleanliness	18/16/13 (according to ISO 4406)		
Storage temperature	Ambient: -50 to 90°C [-58 to 194°F]		
Operating temperature	Ambient: -40 to 90°C [-40 to 194°F]		
Max. T-port pressure static / intermittent	25 / 40 bar [365 / 580 psi]		

### LED Characteristic

Color	LED Characteristic	Description
Green constant		No error – Actuating
Green flashing @ 1.5 Hz		Neutral – Power save
Red constant		Internal error
Red flashing @ 1.5 Hz		External or Float error
Yellow		Disable mode

## PVE Variant Overview

### PVEH for PVG 128/256 Reaction Times



P109128

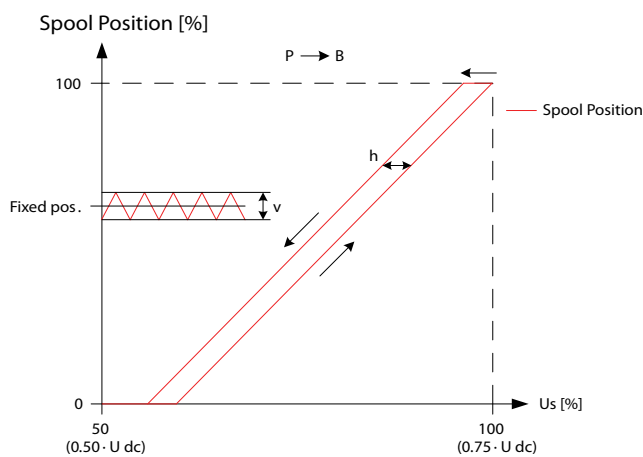
### PVEH

Reaction	PVG 128/256
T0 – Boot up	80 ms
T1 – Neutral to maximum spool stroke @ Power ON	400 ms
T2 – Maximum spool stroke to neutral @ Power OFF	300 ms
T1 – Neutral to maximum spool stroke @ Constant Udc	380 ms
T2 – Maximum spool stroke to neutral @ Constant Udc	270 ms
T0 + Deadband	130 ms

For more information on reaction times, see [Reaction Times](#).

### PVEH Hysteresis and Ripple

Spool position vs. supply (%)



Description	Type	PVEH
Hysteresis (h)	Rated [%]	<2
Steady state ripple @ fixed Us (v)	Rated [mm]	0.0

## PVE Variant Overview

### *PVEH Variants for PVG*

#### *PVG 128/256 variants*

<b>Part number</b>	<b>Type</b>	<b>Connector</b>	<b>IP</b>	<b>Fault monitoring</b>	<b>Functionality</b>
11186325	PVEH	1x4 DEU	67	Passive	Standard
11186326	PVEH	1x4 DEU	67	Active	Standard
11186321	PVEH	1x4 DIN	65	Passive	Standard
11186322	PVEH	1x4 DIN	65	Active	Standard



## Connector Overview

### Connector Overview

#### PVEO 4-pin Connector

Pinout	Pin 1	Pin 2	Pin 3	Pin 4
1x4 DEUTSCH	$U_{DC\_A}$	GND	GND	$U_{DC\_B}$
1x4 DIN	$U_{DC\_A}$	$U_{DC\_B}$	-	GND

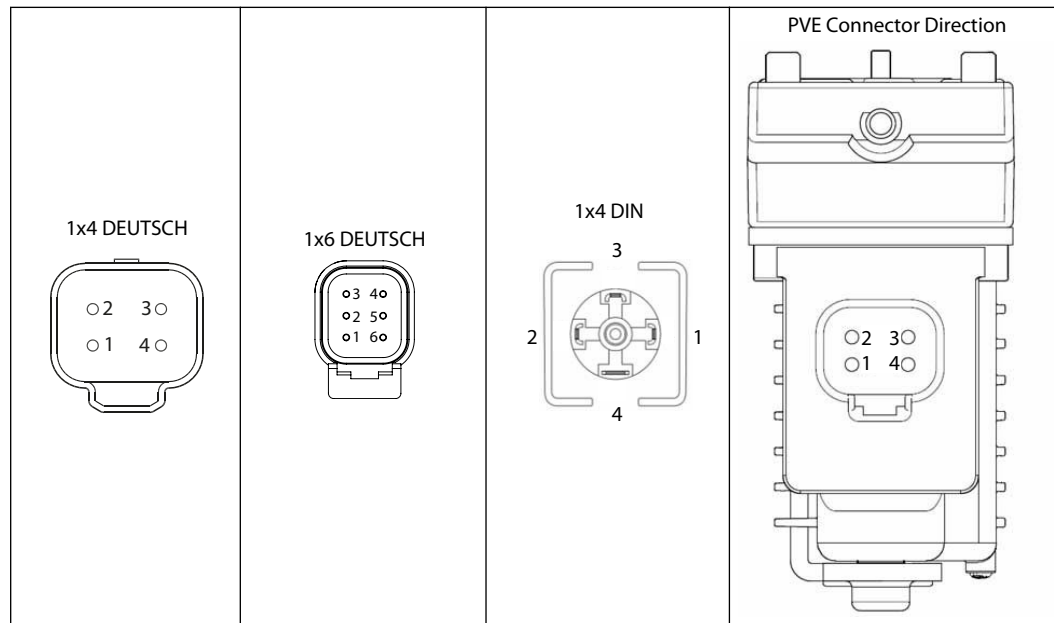
#### PVEH/PVEH-U

Pinout	Pin 1	Pin 2	Pin 3	Pin 4
1x4 DEUTSCH	$U_S$	Error	GND	$U_{DC}$
1x4 DIN	$U_{DC}$	$U_S$	Error	GND

#### PVEH-FLA 6-pin Connector

Pinout	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6
1x6 DEUTSCH	$U_S$	Error	Float	-	GND	$U_{DC}$

#### Connector diagrams



## Fault Monitoring and Reaction

All proportional control PVG 128/256 actuators feature:

- Integrated fault monitoring
- Detecting spool stroke inconsistencies
- Detecting internal hardware defects
- Detecting demand signal inconsistencies
- Fault reaction depending on the type of fault monitoring
  - Generic
  - Specific

Passive and active fault monitoring refers to whether or not the actuator is reacting on the error when it is detected.

### Active fault monitoring

No matter what kind of error is detected, the solenoid valves will be disabled and the operation that the valves/spool controls will stop immediately and spool will go to neutral position. Active fault monitoring keeps a “memory” of the error, even if it is no longer registered. The active fault monitoring does not have Auto Recovery because of this “memory” and a reboot/restart will therefore be required to reactivate the solenoid valves.

With an active fault monitoring the following scenarios will take place when an error is detected/occurs:

- The LED light will switch from green to red and the error pin output will go high
- The solenoid valves will be disabled and the operation that the valves/spool controls will stop immediately
- The active fault monitoring does not have Auto Recovery, so when the error is fixed/no longer is registered a reboot/restart of the PVE is required to reactivate it.

### Passive fault monitoring

Passive fault monitoring does not disable the solenoid valves when an error is detected. It will continue to operate despite that an error was detected. When the error no longer is registered the passive fault monitoring will “forget” the error and continue as if the error was never there.

With a passive fault monitoring the following conditions will happen when an error is detected/occurs:

- The LED light will switch from green to red and the error pin output will go high
- The solenoid valves will continue operating at the set point given at the time of the error
  - Only exception is if the error is caused by the supply voltage ( $U_{DC}$ ) being either above or below the allowed range or if the temperature measured on the internal electronics board is higher than allowed. In these cases, the solenoid valves will be disabled.

## Generic Fault Reaction

All PVE actuators with fault monitoring are triggered by the following main events:

<b>Control Signal Monitoring</b>	The Control signal voltage ( $U_S$ ) is continuously monitored. The permissible range is between 15% and 85% of the supply voltage ( $U_{DC}$ ). Outside this range the PVE will switch into an error state. A disconnected $U_S$ pin (floating) is recognized as a neutral set point.
<b>Transducer/LVDT Supervision</b>	The internal LVDT wires are monitored. If the signals are interrupted or short-circuited, the PVE will switch into an error state.
<b>Supervision of Spool Position</b>	The actual position must always correspond to the demanded position ( $U_S$ ). If the actual spool position is further out from neutral than the demanded spool position or in opposite direction, the PVE will switch into an error state. Spool position closer to neutral and in same direction will not cause an error state – the situation is considered <i>in control</i> .

### Fault Monitoring and Reaction

<b>Float Position Monitoring</b>	Float position must be entered or left within a time limit. A too high delay on the 1x6 pin float PVE will cause an error state – this is relevant for the 1x6 pin PVEH-F actuators only.
<b>Temperature Monitoring</b>	When the temperature is too high the PVE LED will light constant red and solenoid valves will be disabled.

### PVEH Fault Reaction Overview

Description	Monitoring	LED	Solenoid valves	Error pin output	Fault reaction time (ms)
					PVEH
Spool not at setpoint	Active*		Disabled	High	500
	Passive		-	High	250
Unable to reach float position	Active*		Disabled	High	1000
	Passive		-	High	1000
U dc > max.	Active		Disabled	-	-
	Passive		Disabled	-	-
U dc < min.	Active		Disabled	-	-
	Passive		Disabled	-	-
Us out of range	Active*		Disabled	High	500
	Passive		-	High	250
LVDT error	Active*		Disabled	High	500
	Passive		-	High	250
Temp > max.	Active*		Disabled	High	250
	Passive		Disabled	High	250

\* Does not have Auto Recovery

## Functionality Overview

### Standard and Fixed US 0-10 Vdc

All standard proportional actuator variants PVEH can be controlled by an analog signal voltage ( $U_s$ ) or a PWM controlled signal voltage ( $U_s$ ) proportional to the supply voltage ( $U_{dc}$ ).

#### PVEO

Description	Type	Value	
Supply voltage ( $U_{dc}$ )	Rated	12 Vdc	24 Vdc
	Range	11 to 15 Vdc	22 to 30 Vdc
	Max. ripple	5%	

#### PVEH

Description	Type	Value
Supply voltage ( $U_{dc}$ )	Rated	11 to 32 Vdc
	Range	11 to 32 Vdc
	Max. ripple	5%
Signal voltage ( $U_s$ )	Neutral	$U_s = 0.5 \cdot U_{dc}$
	Q: P to A	$U_s = (0.5 \text{ to } 0.25) \cdot U_{dc}$
	Q: P to B	$U_s = (0.5 \text{ to } 0.75) \cdot U_{dc}$

The PVEH-U variants are controlled by a fixed 0-10 Vdc signal voltage ( $U_s$ ), directly compatible with standard PLC control.

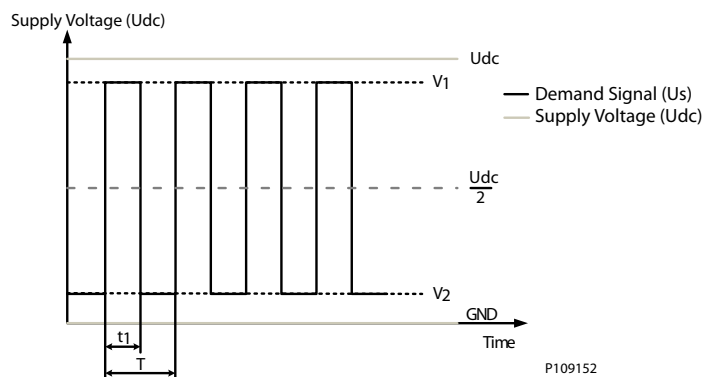
#### PVEH-U

Description	Type	Value
Supply voltage ( $U_{dc}$ )	Rated	11 to 32 Vdc
	Range	11 to 32 Vdc
	Max. ripple	5%
Signal voltage ( $U_s$ )	Neutral	$U_s = 5 \text{ V}$
	Q: P to A	5 V to 2.5 V
	Q: P to B	5 V to 7.5 V

### PWM Voltage Control

The PVEH actuator variants can be controlled by a PWM controlled signal voltage ( $U_s$ ) proportional to the supply voltage ( $U_{dc}$ ).

The  $V_1$  and  $V_2$  must be symmetrical around  $U_{dc}/2$  and  $V_1$  must be equal to or less than  $U_{dc}$ .



P109152

## Functionality Overview

### *PVEH Control specification*

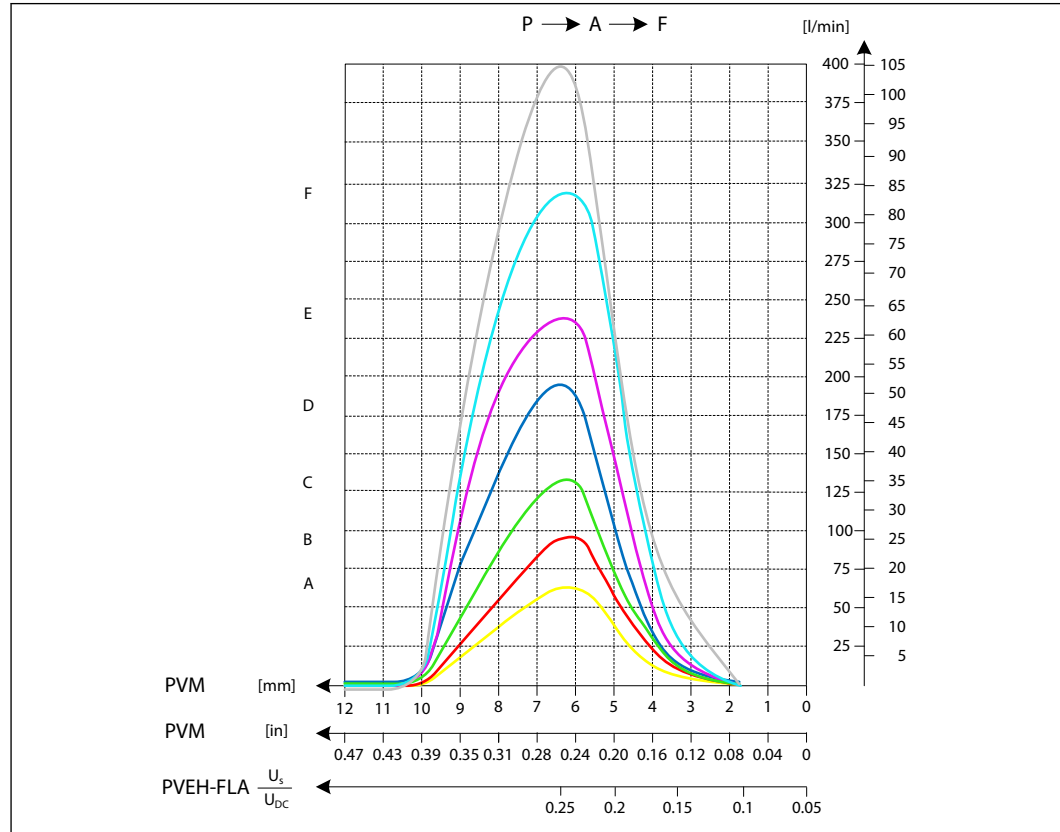
<b>Description</b>	<b>Type</b>	<b>Value</b>
Supply Voltage (Udc)	Rated	11 to 32 Vdc
	Range	11 to 32 Vdc
	Max. ripple	5%
Signal Voltage PWM (Us)	Neutral	Us = 50% DUT
	Q: P to A	Us = 50% to 25% DUT
	Q: P to B	Us = 50% to 75% DUT
PWM Frequency (Us)	Recommended	> 1000 Hz

## Functionality Overview

### Float A-Port (-FLA)

The Float A-Port functionality enables the proportional PVEH-FLA actuator variants to enter the main spool into a float position. The PVE actuators with Float A-Port functionality is compatible with the dedicated main spools with electronic float in A-port.

PVE Type	PVBS Type	Standard Flow Control	Float Control
PVEH-FLA (1x6 pin)	Deadband 1.7 mm	$U_s = (0.25 \rightarrow 0.75) \cdot U_{dc}$	U <sub>dc</sub> to dedicated float pin (UF)
	Max. B-port flow 8.0 mm		



### PVE Power Save

All proportional actuator variants feature a Power Save mode, de-energizing the solenoid valve bridge. The Power Save mode is entered when the signal voltage ( $U_s$ ) and the LVDT spool position has been in neutral for 750 ms. As soon as the signal voltage ( $U_s$ ) or the LVDT spool position is out of neutral the PVE will leave its Power Save mode and re-energize the solenoid valve bridge as usual.

The Power Save mode results in increased power efficiency by reducing the current consumption of the PVE actuators in neutral position. The Power Save mode has no effect on the performance of the PVE actuator.

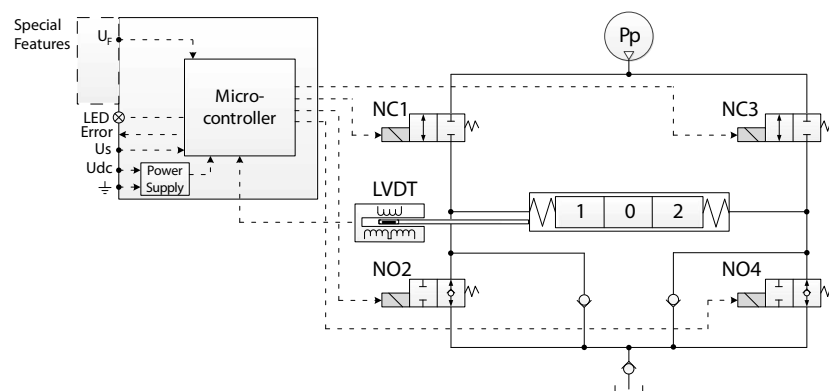
## Special Features

### Dedicated Float Pin (UF)

The Dedicated Float Pin (UF) feature is related to the PVEH-FLA actuator variant enabling the user to move the main spool into its float position by power. The PVEH-FLA uses 1x6 pin AMP or DEUTSCH connectors.

- Normal operation: Low or not connected
- High Float
- Input range:  $U_{DC}$
- Max. voltage: 32  $V_{DC}$

*PVEH-FLA functionality diagram*



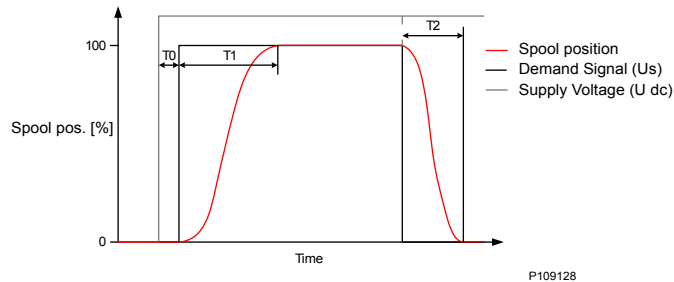
### Disable Mode

The PVEH-U actuator variants controlled by a fixed 0-10  $V_{DC}$  signal voltage ( $U_S$ ), feature the ability to enter a disable mode. This causes the counteracting force on the main spool created by the solenoid valve bridge to deactivate, when using Manual OverRide (MOR).

The disable mode is entered by sending a signal voltage ( $U_S$ ) of 16.2% of 10  $V_{DC}$  when in Power Save.

**Performance Overview**

**PVG 128/256 Reaction Times**



Reaction
T0 – Boot-up [ms]
T1 – Neutral to max. spool stroke
T2 – Max. spool stroke to neutral
T1 – Neutral to max. spool stroke
T2 – Max. spool stroke to neutral

*PVEO*

Reaction	PVG128	PVG 256
T1 A-port – Neutral to maximum spool stroke @ Constant Udc	375 ms	375 ms
T1 B-port – Neutral to maximum spool stroke @ Constant Udc	520 ms	520 ms
T2 A-port – Maximum spool stroke to neutral @ Constant Udc	350 ms	350 ms
T2 B-port – Maximum spool stroke to neutral @ Constant Udc	600 ms	600 ms

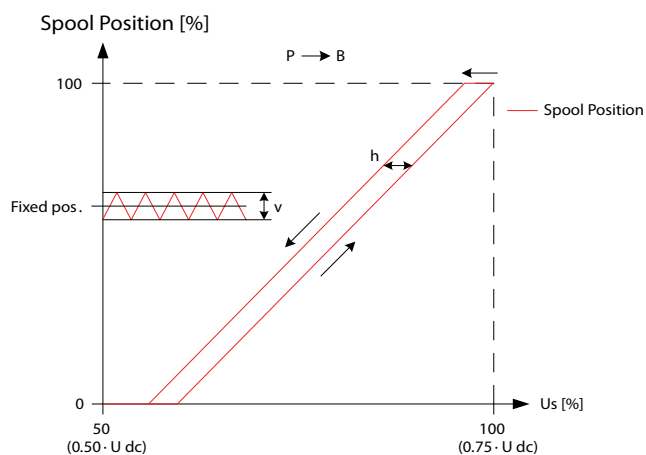
*PVEH*

Reaction	PVG 128	PVG 256
T0 – Boot up	80 ms	80 ms
T1 – Neutral to maximum spool stroke @ Power ON	400 ms	380 ms
T2 – Maximum spool stroke to neutral @ Power OFF	300 ms	270 ms
T1 – Neutral to maximum spool stroke @ Constant Udc	320 ms	320 ms
T2 – Maximum spool stroke to neutral @ Constant Udc	250 ms	250 ms
T0 + Deadband	130 ms	130 ms



## Performance Overview

### Hysteresis and Ripple



Type	Hysteresis (h)	Steady state ripple @ fixed Us (v)
	Rated [%]	Rated [mm]
PVEH 256	1.5	0.0

### Oil Consumption

Type	Neutral	Locked position	Actuating
	[l/min]		
PVEO	0.0	0.0	0.9
PVEH	0.0	0.0	0.7

**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

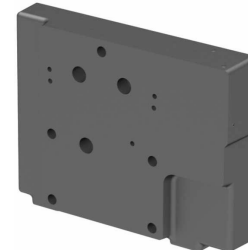
PVSI with or without LX connection



PVSI with P and T connections



PVGI Interface plate


*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 <sup>2</sup> /s	[65 → 347 SUS]
	Minimum	4 mm <sup>2</sup> /s	[39 SUS]
	Maximum	460 mm <sup>2</sup> /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:

[PVSI with or without LX-connection](#) on page 83

[PVSI with P and T port connections](#) on page 84

[PVGI Interface Plate](#) on page 85

## PVSI/PVGI End and Interface Plates

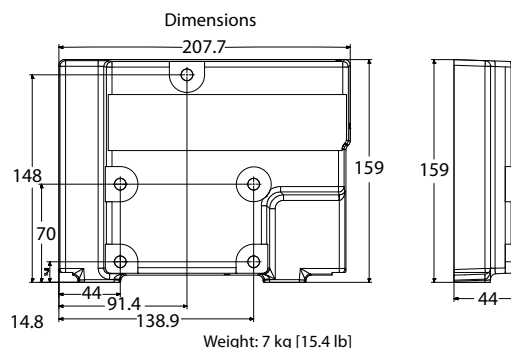
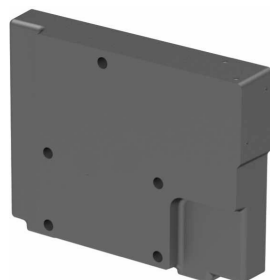
### PVSI with or without LX-connection

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



### Schematic



P109227

### 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 <sup>2</sup> /s	[65 → 347 SUS]
	Minimum	4 mm <sup>2</sup> /s	[39 SUS]
	Maximum	460 mm <sup>2</sup> /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

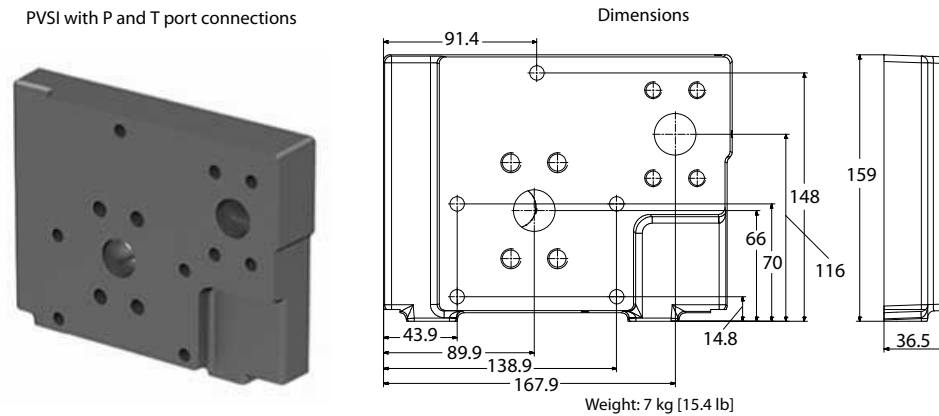
Part number	LX-port	Mounting feet
11171419	-	M12
11179950	G1/4" BSP	M12
11179949	7/16-20 UNF	M12

**PVSI/PVGI End and Interface Plates**

**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 threaded ports.



*Schematic*



*Technical data*

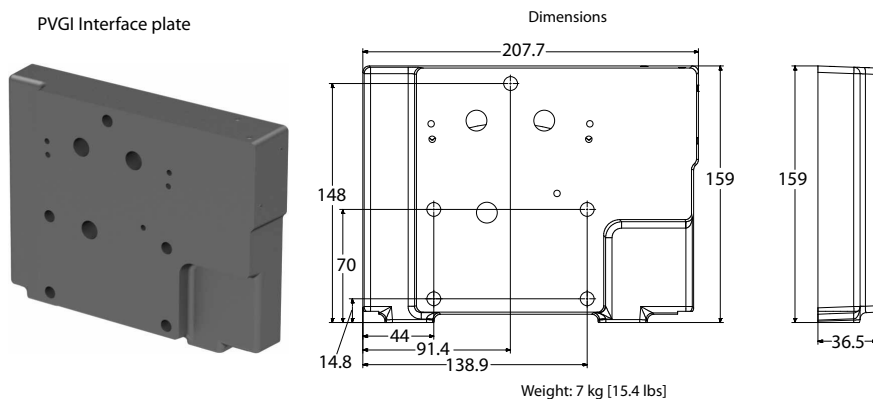
Max. rated pressure	P-port continuous	350 bar	[5076 psi]
	P-port intermittent	400 bar	[5800 psi]
	T-port static/dynamic	25/40 bar	[363/580 psi]
Oil temperature	Recommended	30 to 60°C	[86 to 140°F]
	Minimum	-30°C	[-22°F]
	Maximum	90°	[194°F]
Ambient temperature	Recommended	-30 to 60°C	[-22 to 140°F]
Oil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

## PVSI/PVGI End and Interface Plates

### 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.



#### 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]
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 <sup>2</sup> /s	[65 → 347 SUS]
	Minimum	4 mm <sup>2</sup> /s	[39 SUS]
	Maximum	460 mm <sup>2</sup> /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

**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							

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](#).

**PVAS**

**PVAS for Combo**

Stay Bolts for PVG 128/256/16/32 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
PVB 128	0	11187676+ 40	11187672+ 126	11187673+ 212	11187656+ 298	11187675+ 384	11187696+ 470	11187697+ 556	11187698+ 642
	1	11187320+ 106	11187677+ 192	<b>11187681+ 278</b>	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							

*Table 3.*

		PVB 16										
		0	1	2	3	4	5	6	7	8	9	10
PVB 32	0		64	104	144	184	224	264	304	344	384	424
	1	72	112	<b>152</b>	192	232	272	312	352	392	432	
	2	120	160	200	240	280	320	360	400	440		
	3	168	208	248	288	328	368	408	448			
	4	216	256	296	336	376	416	456				
	5	264	304	344	384	424	464					
	6	312	352	392	432	472						
	7	360	400	440	480							
	8	408	448	488								
	9	456	496									
	10	504										

**Example**

For 2 PVB 256 and 1 PVB 128 and 1 PVB 32 and 2 PVB 16:

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

**PVAS**

PVAS 2 = **278** mm from *Table 2* + **152** mm from *Table 3* = 278+152 =430 mm which equals **157B8027** in *Table 4*.

**PVAS Part Number Overview**

*Table 4.*

<b>Part number</b>	<b>Accumulated module length in mm</b>
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
157B8009	493-504
11188200	481-492
157B8028	469-480
11188201	457-468
157B8008	445-456
11188202	433-444
<b>157B8027</b>	<b>421-432</b>
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



**PVAS**

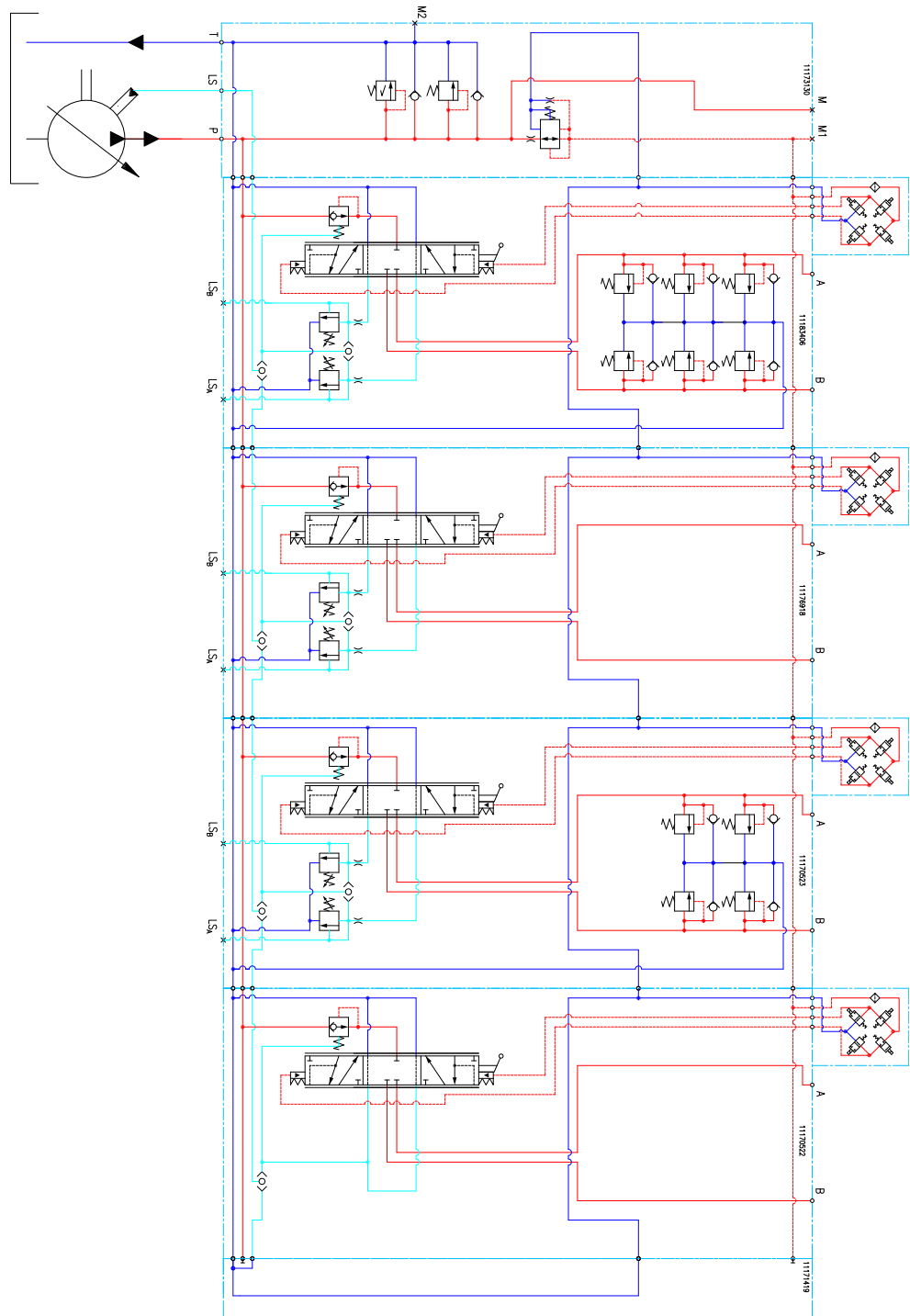
*Table 4. (continued)*

<b>Part number</b>	<b>Accumulated module length in mm</b>
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

### PVG Valve Schematics

#### Valve Schematics

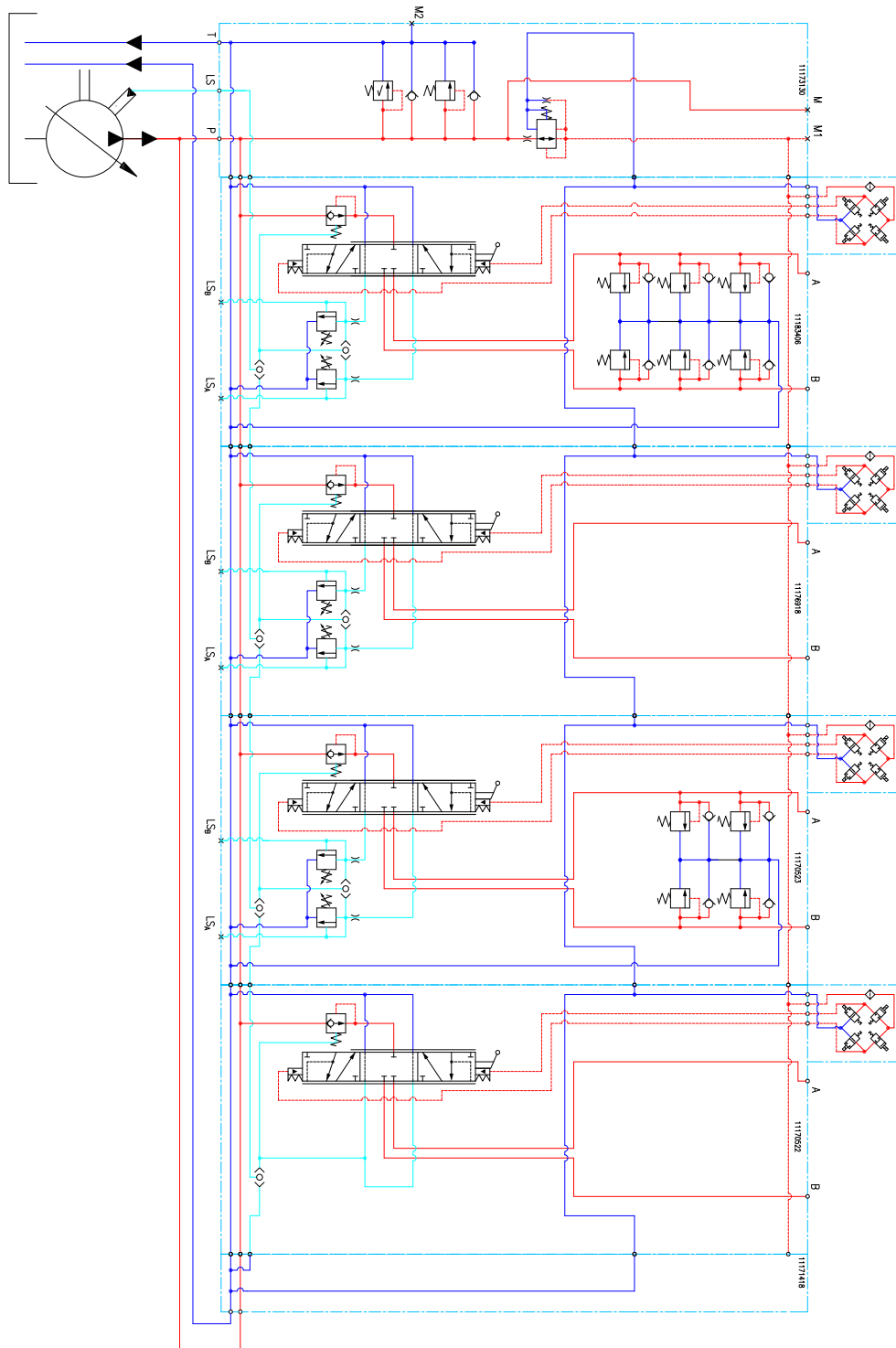
PVG 128/256 Schematic with Basic End Plate



P109254

**PVG Valve Schematics**

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

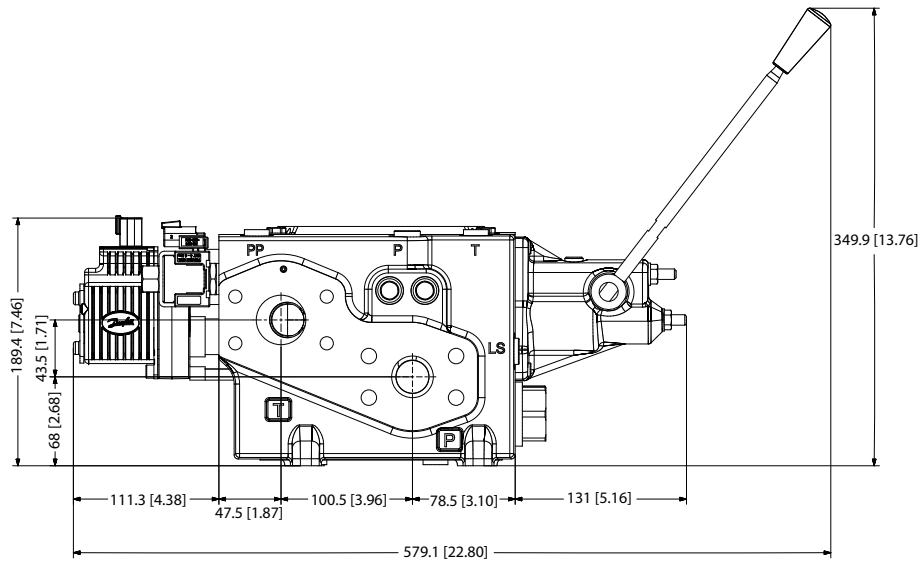


P109255

**Dimension Overview**

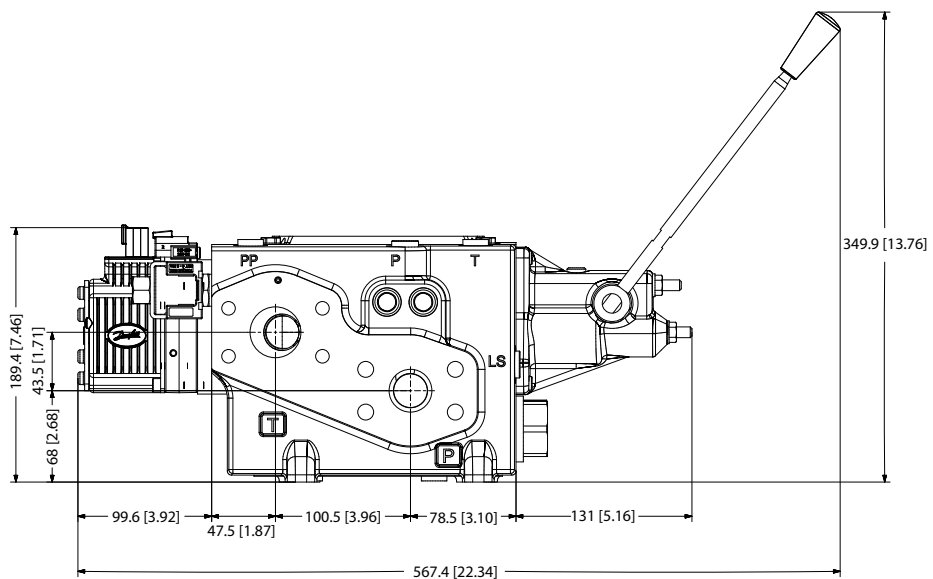
**Dimension Overview for PVG 128/256**

PVEO



P109644

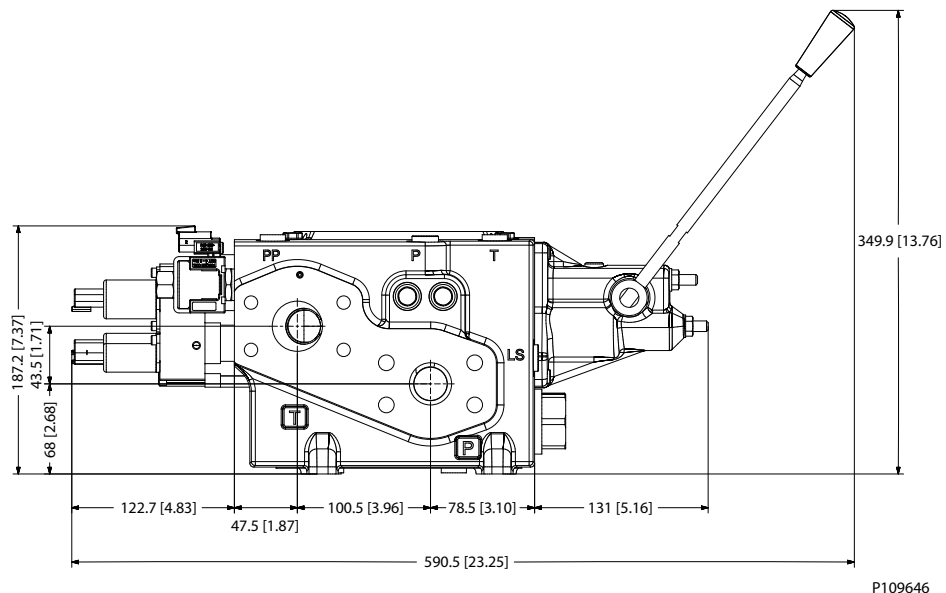
PVEH



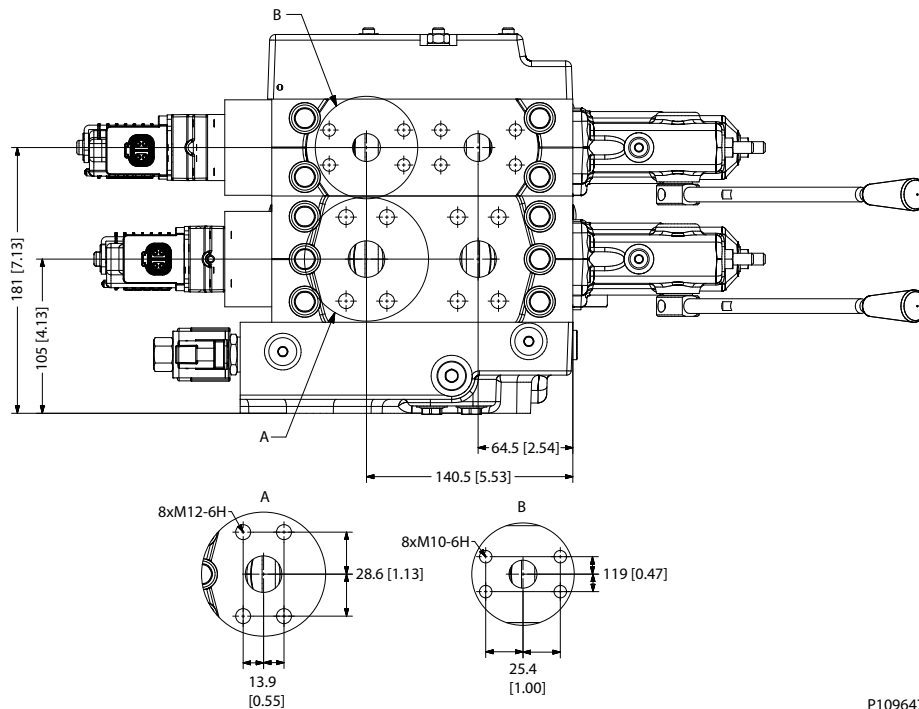
P109645

**Dimension Overview**

PVHC



PVG 128/256 Dimensions



**Dimension Overview**

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]	-	-	-	-	-	-	-	-	-

Technical Information  
**PVG 128/256 Technical Information**

**Dimension Overview**

**Specifications example**

Specification Sheet  
 Valve type:

**PVG 256 Combo**



Subsidiary / Dealer	DPS XXX	Danfoss Sold-To Party No.		Customer	Shark Marine
Valve No.	8xxxxxx	Customer Part No.		Application	Marine Crane
Filled in by	Mr. X	Date	07-04-2017	Revision No	EAU

Function		A-Port			B-Port		
1		PVLP 157B2380	11173130	PVPV 256	11160319	KIT PVPP	
		PVLP 157B2380		bar			
2	Boom up/down	PVM 256 11175317	11169243	PVB 256	11177058	PVBS	11186321 PVEH 256
	400 l/min CN	PVLP 157B2350	LSA= 100	bar	LSB= 315	bar	157B2350 PVLP
		PVLP 157B2350					157B2350 PVLP
		PVLP 157B2350					157B2350 PVLP
3	Winch motor	PVM 256 11175317	11165621	PVB 128	11178310	PVBS	11186321 PVEH 256
	180 l/min ON	PVLP 157B2350	LSA= 315	bar	LSB= 315	bar	157B2350 PVLP
		PVLP 157B2350					157B2350 PVLP
4			11171422	PVGI 256			
			LSA=	bar	LSB=	bar	
5	Boom Swing	PVM 157B3171	157B6233	PVB	157B7122	PVBS	157B4292 PVEO
	40 l/min ON	PVLP 157B2350	LSA= 250	bar	LSB= 250	bar	157B2350 PVLP
6			157B2014	PVS			
			LSA=	bar	LSB=	bar	
7			LSA=	bar	LSB=	bar	
8			LSA=	bar	LSB=	bar	
9			LSA=	bar	LSB=	bar	
10			LSA=	bar	LSB=	bar	
11			LSA=	bar	LSB=	bar	
12			LSA=	bar	LSB=	bar	
13			LSA=	bar	LSB=	bar	
14			LSA=	bar	LSB=	bar	
15			LSA=	bar	LSB=	bar	
18	PVAS	1. 11187677	2. 157B8004	3.			
19	Painting						
20	Customer Text on Group Label						
21	Customer Text on Packaging Label (Box)						

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- Electric machines
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