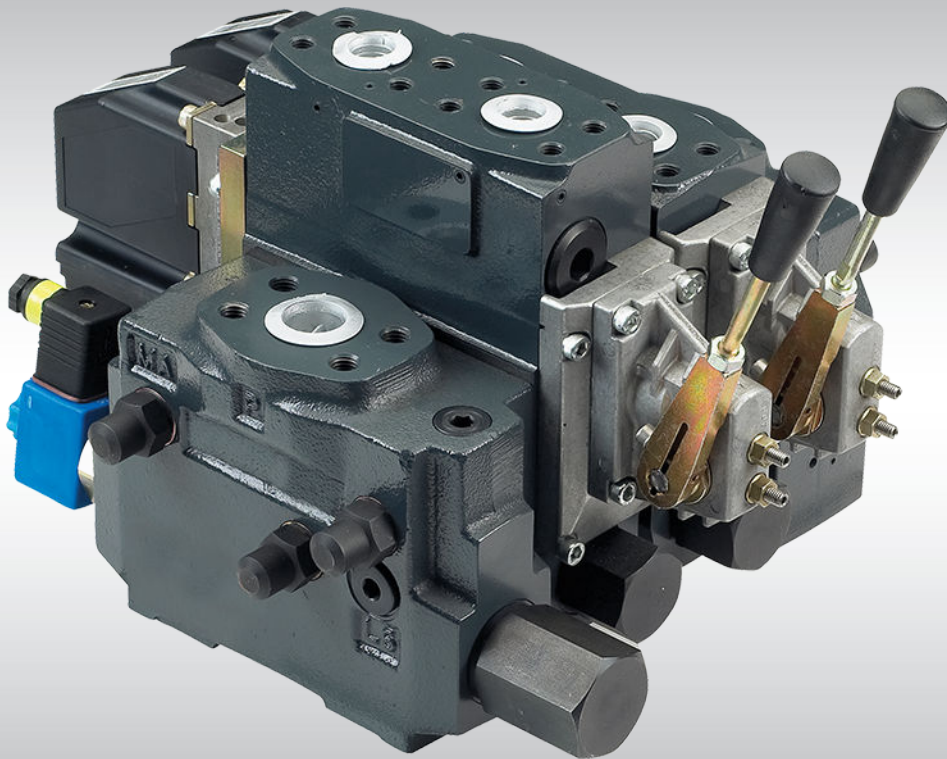




Service Manual
Proportional Valve Group
PVG 120



Revision history*Table of revisions*

Date	Changed	Rev
May 2014	Converted to Danfoss layout – DITA CMS, major revision	JA
Jan 2012	Pos. 3 change	ID
Feb 2011	Table on page 35 changed, layout changes - all pages	IC
Feb 2010	Handles on drawings	IA
Jan 2010	Japan location	HC

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PVG 120 sectional view
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Order specification

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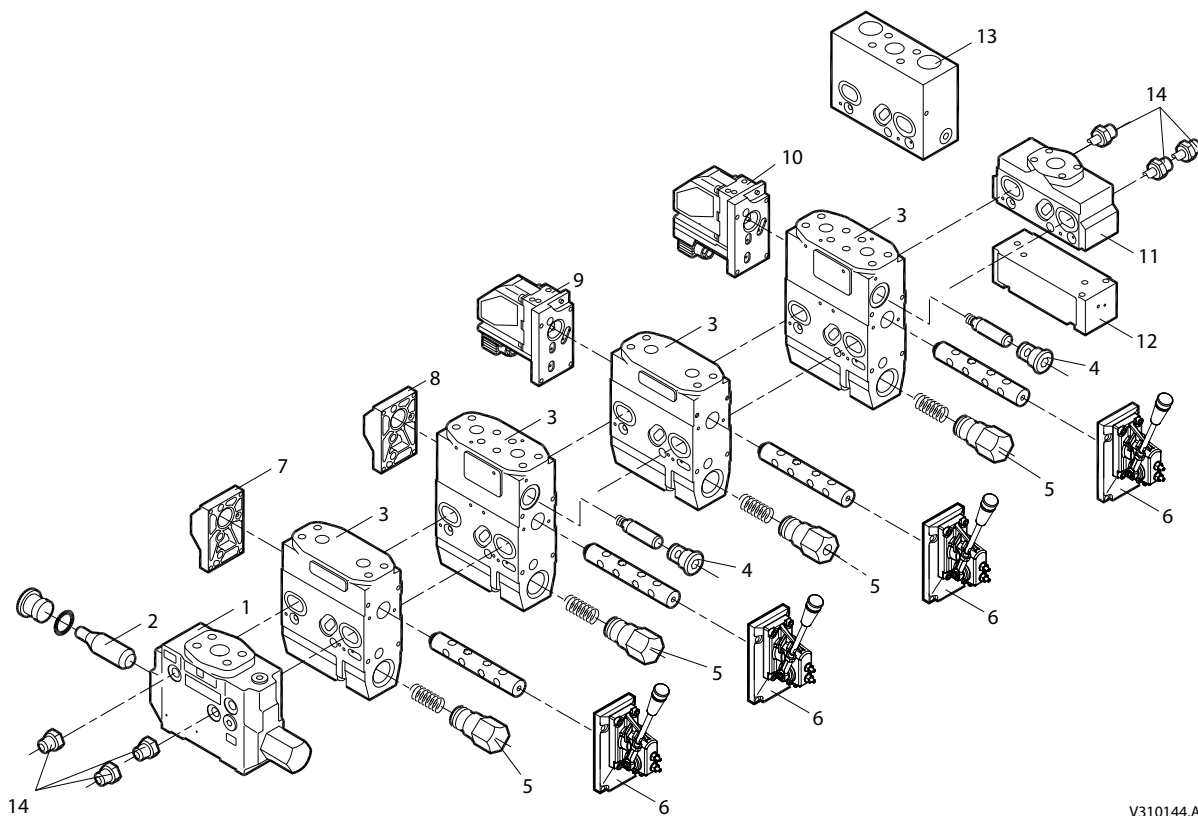
Ordering of modules for oil flow exceeding 180 l/min [47.6 US gal/min].....48

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PVG 120 service parts exploded view

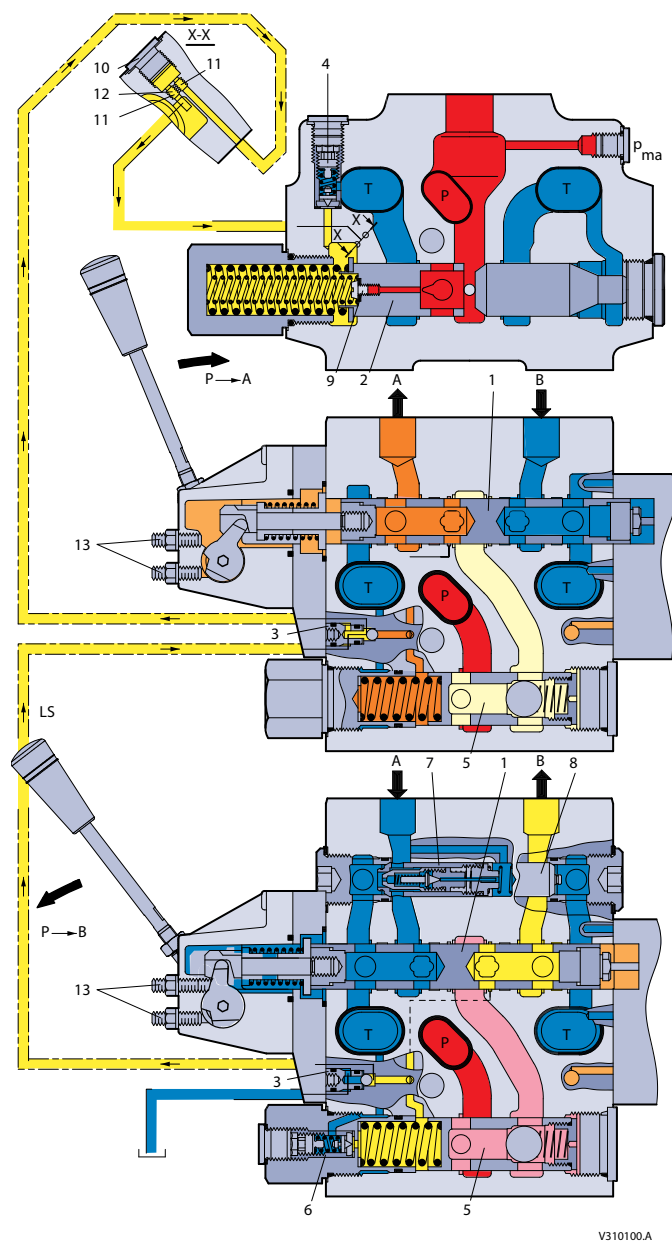
PVG 120 service parts exploded view



V310144.A

PVG 120 sectional view

PVG 120 sectional view



V310100.A

Legend:

- | | |
|--------------------------------------|---|
| 1 – Main spool | 7 – Shock and suction valve PVL P |
| 2 – Pressure adjustment spool in PVP | 8 – Suction valve PVLA |
| 3 – Shuttle valve | 9 – Orifice, closed center PVP; Plug, open center PVP |
| 4 – Pressure relief valve in PVP | 10 – LS connection |
| 5 – Pressure compensator in PVB | 11 – Orifice, open center PVP |
| 6 – LS pressure relief valve in PVB | 12 – Plug, closed center PVP |

Safety in application

All makes and all types of control valves (incl. proportional valves) can fail, thus the necessary protection against the serious consequences of function failure should always be built into the system. For each application an assessment should be made for the consequences of pressure failure and uncontrolled or blocked movements.

To determine the degree of protection that is required to be built into the application, system tools such as FMEA (Failure Mode and Effect Analysis) and Hazard and Risk Analysis can be used.

FMEA – IEC EN 61508

FMEA (Failure Mode and Effect Analysis) is a tool used for analyzing potential risks. This analytical technique is utilized to define, identify, and prioritize the elimination or reduction of known and/or potential failures from a given system before it is released for production. Please refer to IEC FMEA Standard 61508.

Hazard and risk analysis ISO 12100-1 / 14121

This analysis is a tool used in new applications as it will indicate whether there are special safety considerations to be met according to the machine directives EN 13849. Dependent on the determined levels conformity this analysis will determine if any extra requirements for the product design, development process, production process or maintenance, i.e. the complete product life cycle.

Warning

All makes/brands and types of directional control valves – inclusive proportional valves – can fail and cause serious damage. It is therefore important to analyze all aspects of the application.

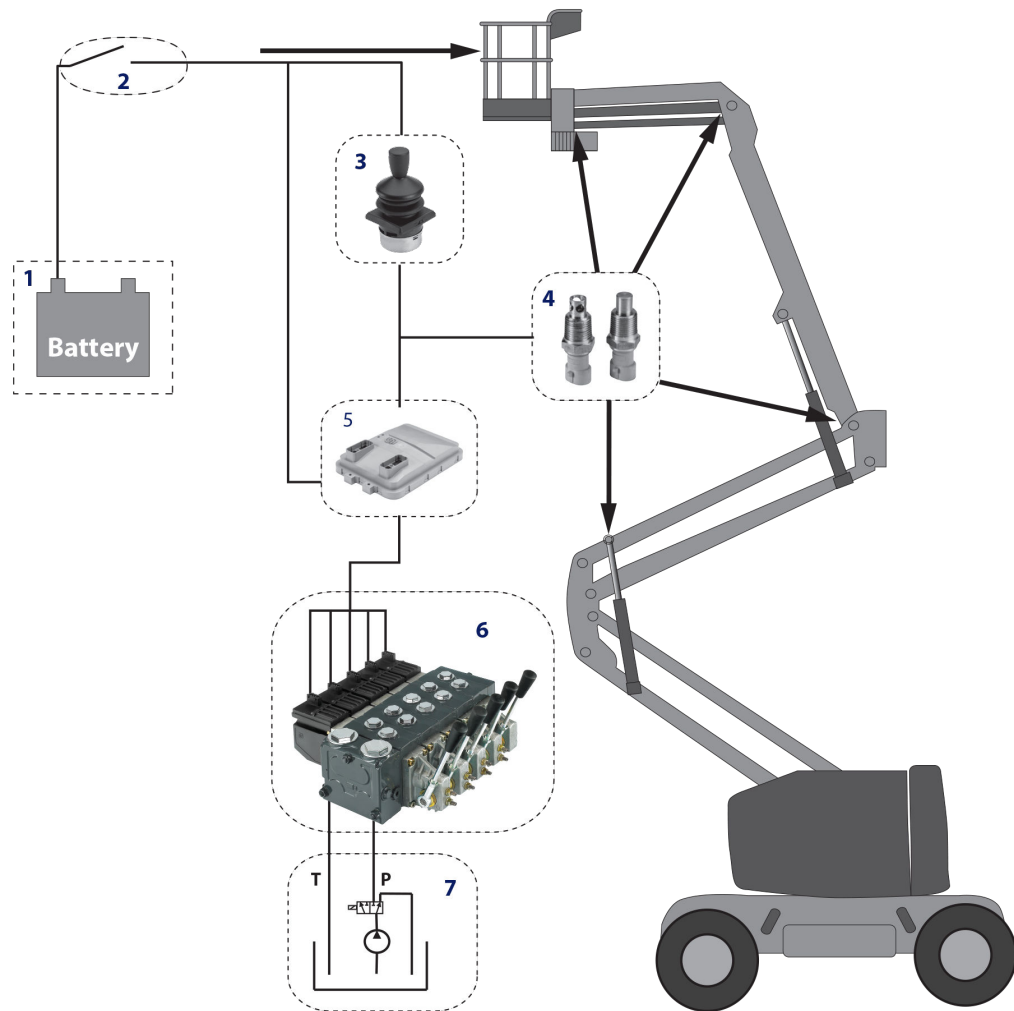
Because the proportional valves are used in many different operation conditions and applications, the manufacturer of the application is alone responsible for making the final selection of the products – and assuring that all performance, safety and warning requirements of the application are met.

The process of choosing the control system – and safety levels – is governed by the machine directives EN 13849 (Safety related requirements for control systems).

Safety in application

Control system example

Example of a control system for manlift using PVE Fault monitoring input signals and signals from external sensors to ensure the PLUS+1® main controllers correct function of the manlift.

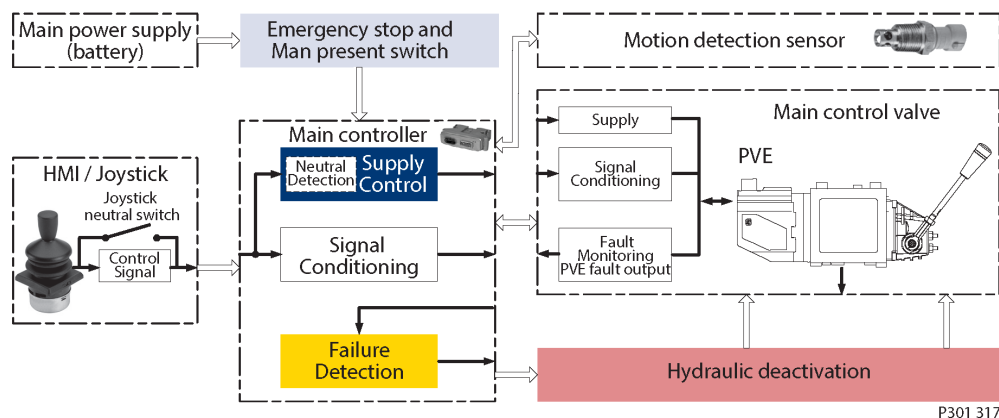


Legend:

- 1 – Main power supply
- 2 – Emergency stop/man present switch
- 3 – HMI/Joystick control
- 4 – Movement detection sensors
- 5 – Main controller
- 6 – PVG control valve
- 7 – Hydraulic deactivation

Safety in application

Electrical block diagram for the above illustration



Warning

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

PVG 32 – mainly used in system with fixed displacement pumps:

- PVSK, commonly used in crane application - full flow dump
- PVPX, LS dump to tank

PVG 100 – alternative LS dump or pilot supply disconnect:

- PVPP, pilot oil supply shut off
- External cartridge valve connecting LS pressure or main pressure to tank

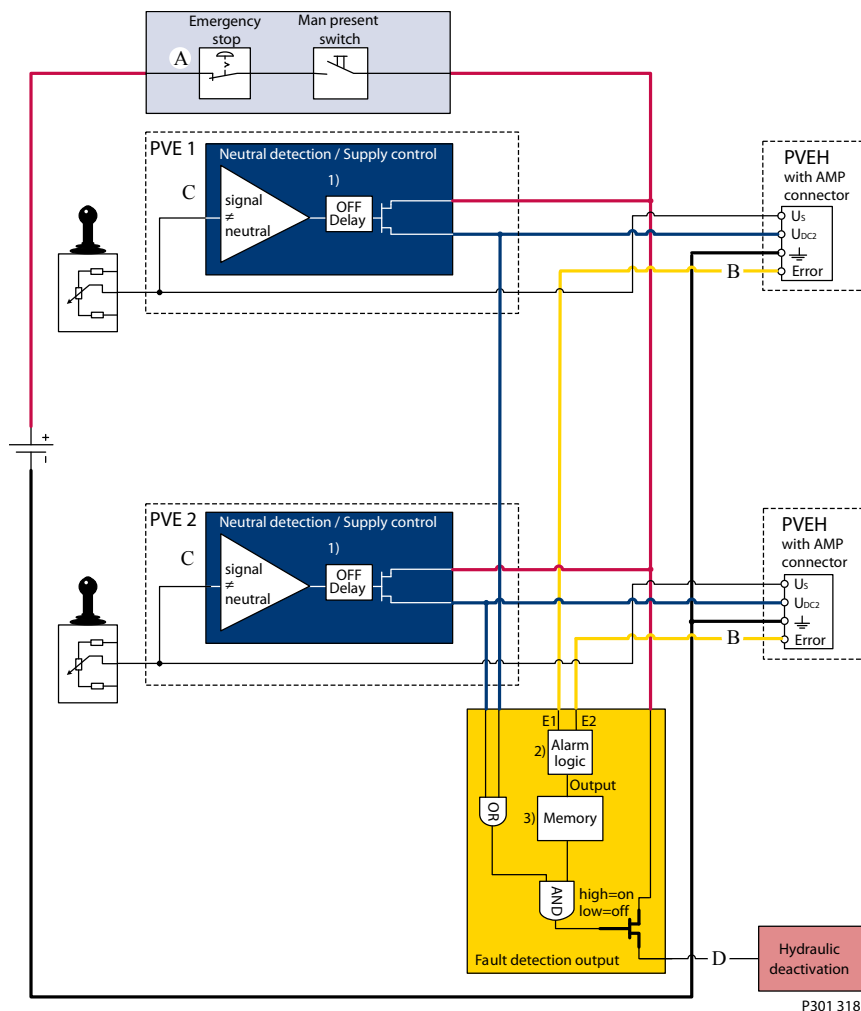
PVG 120 – pump disconnect / block for variable pumps:

- PVPE, full flow dump for the PVG 120
- External cartridge valve connecting LS pressure to tank

Safety in application

Examples of wiring block diagram

Example of a typical wiring block diagram using PVEH with neutral power off switch and fault monitoring output for hydraulic deactivation.



P301 318

A– Emergency stop / man present switch

B– PVE Fault monitoring signals

C– Neutral signal detection.

D– Hydraulic deactivation

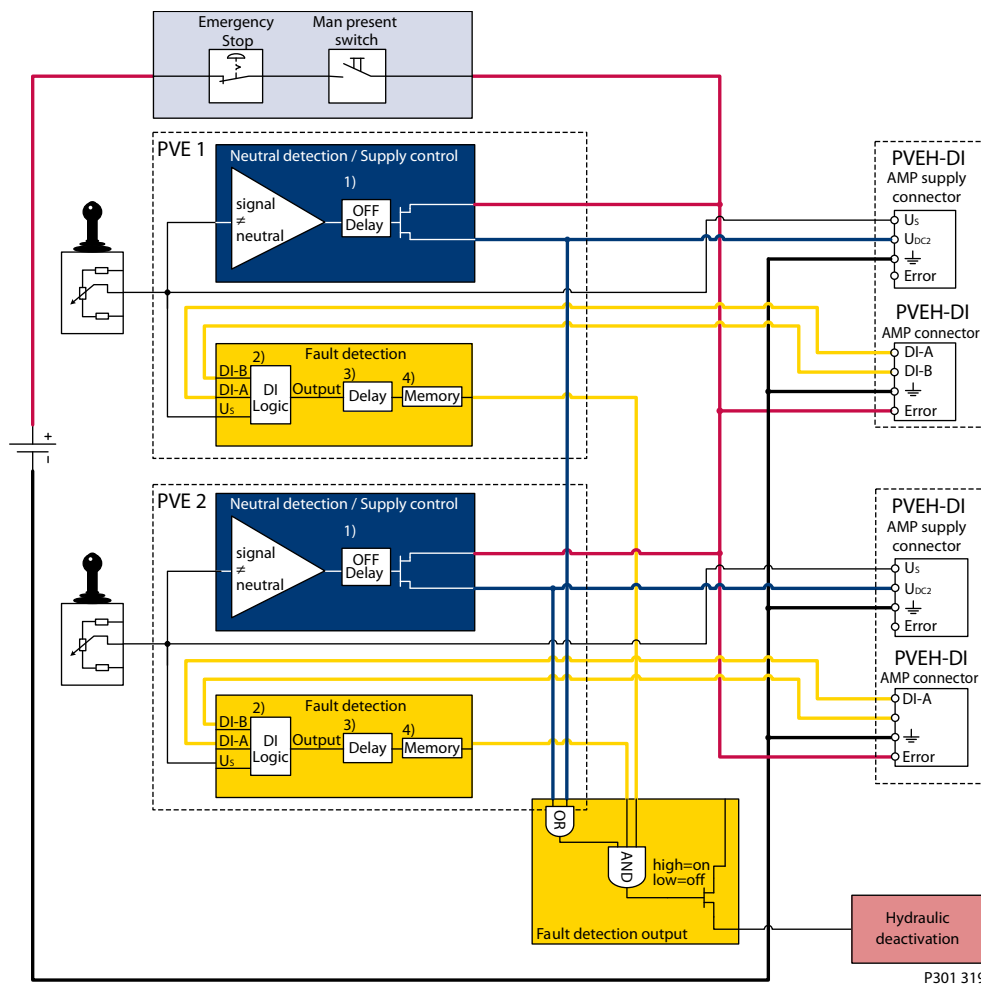
System Control Logic e.g. PLUS+1® for signal monitoring and triggering signal for deactivation of the hydraulic system.

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.

Safety in application

Example of fault monitoring for deactivation of the hydraulic system with extra fault inputs using the PVE's with DI (Direction Indication) function.



P301 319

System Control Logic e.g. PLUS+1® for signal monitoring and triggering signal for deactivation of the hydraulic system.

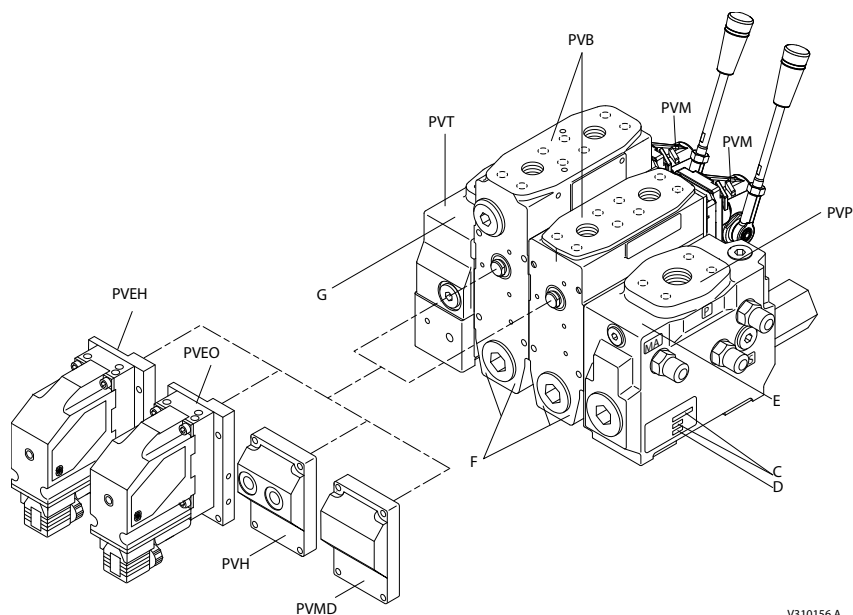
Warning

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.

Identification

Identification

PVG 120 Identification



V310156.A

C: PVG – number, week and year of installation

D: PVP – pressure setting

E: PVP – number, week, year and day manufacturing, issue and series No.

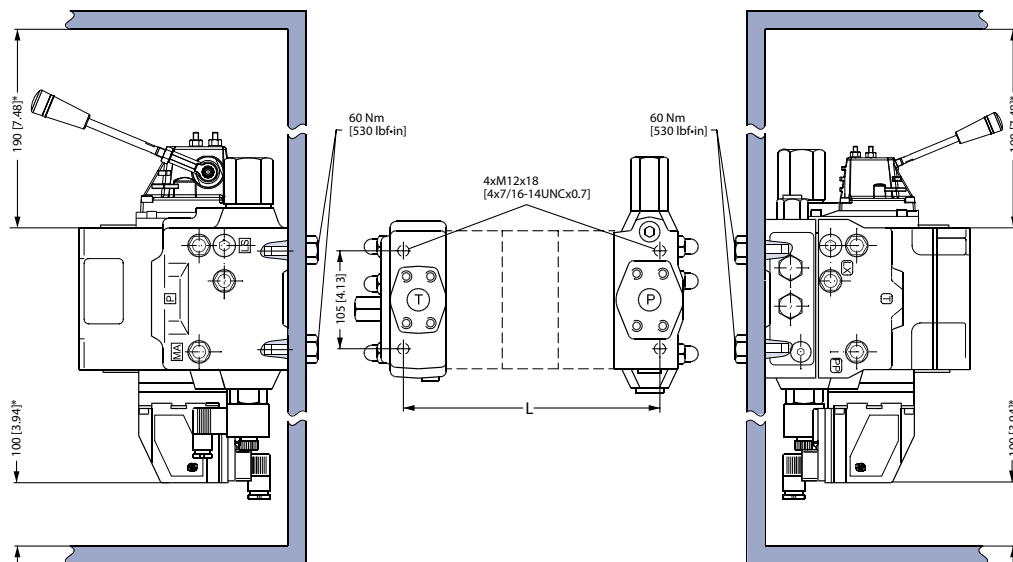
F: PVB – A-Port, number, week, year and day manufacturing, issue and series No.

G: PVT – week and year of manufacturing

Installation

Installation and plug orientation

Installation Dimensions

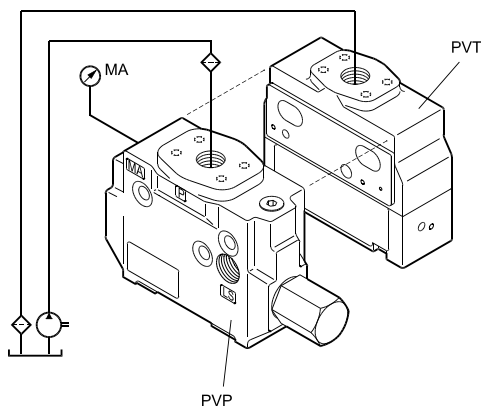


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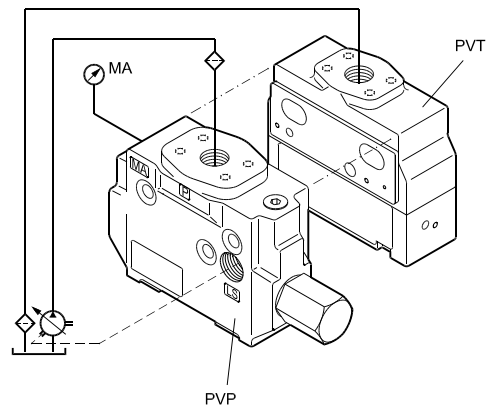
* Room for dismantling

Module of PVB	1	2	3	4	5	6	7	8
L mm	168	235	302	369	436	503	570	637
L in	6.61	9.25	11.88	14.53	17.17	19.80	22.44	25.08

Connection, PVP, Pump Side Module



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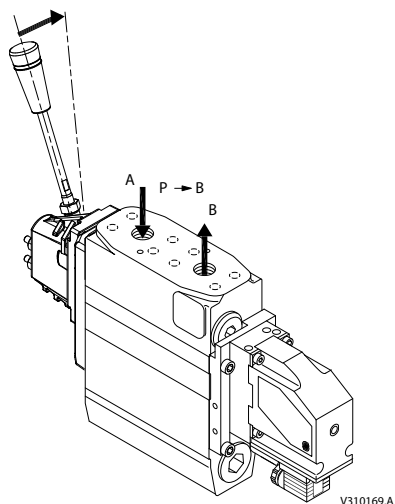


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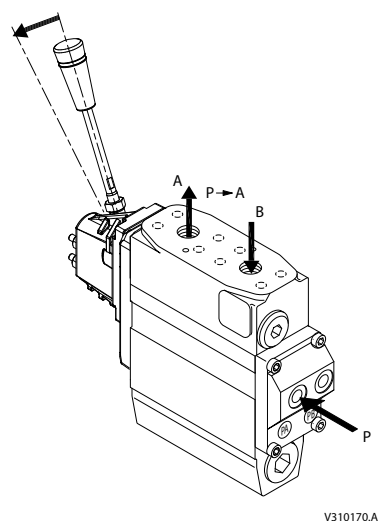
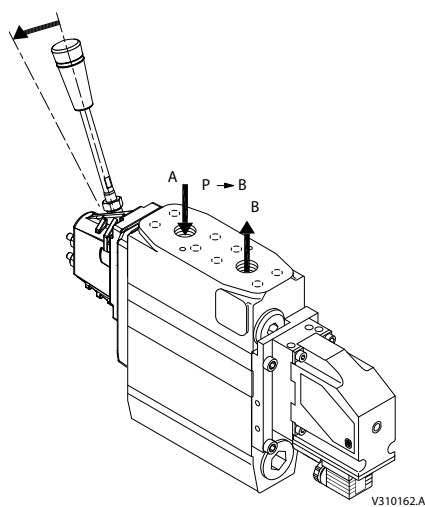
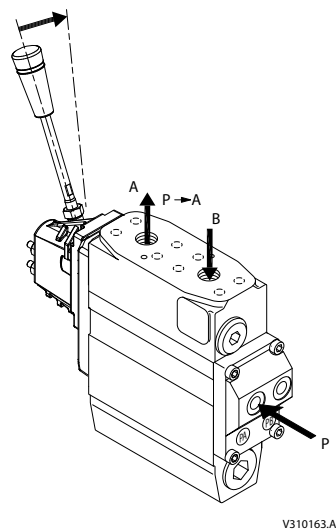
Installation

Oil flow direction

Mechanical / electrical actuation



Mechanical / hydraulic actuation



Tightening Torques

Max. tightening torques – Connection Threads Type G (ISO 228/1)

Ports	Max. tightening torques		
	PA, PB	MA	LS, LX, PP
Sealing thread	G 1/4	G 1/4	G 3/8
With steel washer	35 N•m [310 lbf•in]	40 N•m [350 lbf•in]	60 N•m [530 lbf•in]
With cooper washer	30 N•m [270 lbf•in]	20 N•m [180 lbf•in]	35 N•m [310 lbf•in]
With aluminium washer	30 N•m [270 lbf•in]	30 N•m [270 lbf•in]	40 N•m [350 lbf•in]
With cutting edge	35 N•m [310 lbf•in]	40 N•m [350 lbf•in]	60 N•m [530 lbf•in]

Installation

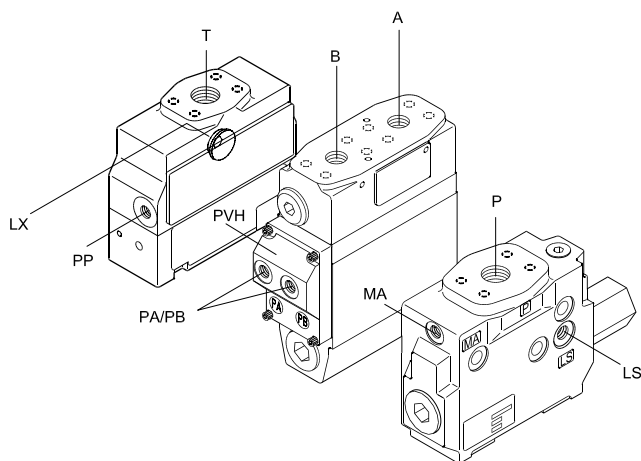
Max. tightening torques – Mounting Threads in SAE J 518c Flanges

Port	Size	Threads	Tightening torque
P	1 in	M12, 18 deep	68 N•m
		7/16 - 14 UNC 0.7" deep	[600 lbf•in]
A/B	3/4 in	M10, 17 deep	45 N•m
		3/8 - 16 UNC 0.7" deep	[400 lbf•in]
T	1 in	M10, 17 deep	45 N•m
		3/8 - 16 UNC 0.7" deep	[400 lbf•in]

Max. tightening torques – UN and UNF Connection Threads – O-ring Boss Port

Max. tightening torques						
Ports	P	A/B	T	PA/PB	MA	LS, LX, PP
Sealing /Thread	1 5/16 in-12 UN	1 1/16 in-12 UN	1 5/16 in-12 UN	½ in-20 UNF	½ in-20 UNF	¾ in-20 UNF
O-ring	160 N•m	120 N•m	160 N•m	30 N•m	30 N•m	60 N•m
	[1410 in•lbs]	[1060 in•lbs]	[1410 in•lbs]	[270 in•lbs]	[270 in•lbs]	[530 in•lbs]

Ports identification

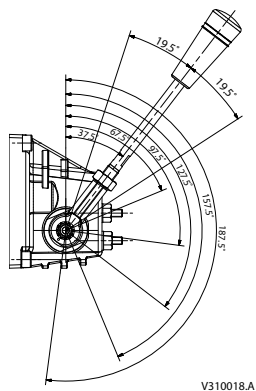


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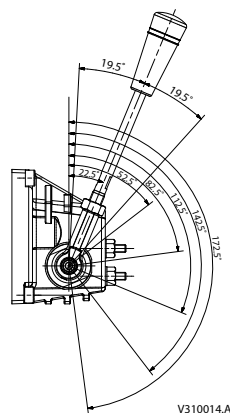
Installation

PVM, Lever Positions

Base with an angle of 37.5°

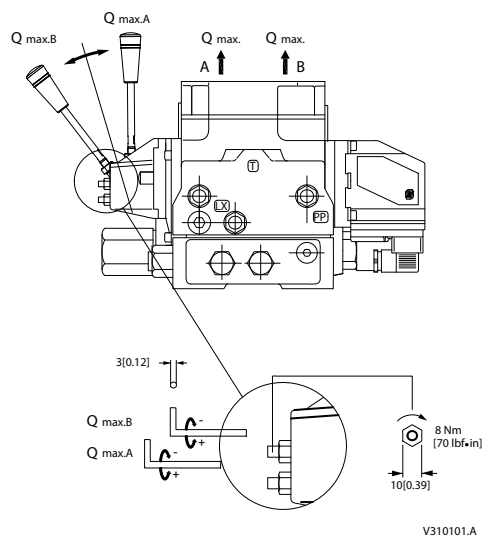


Base with an angle of 22.5°



Setting of max. flow

Setting of Max. Flow

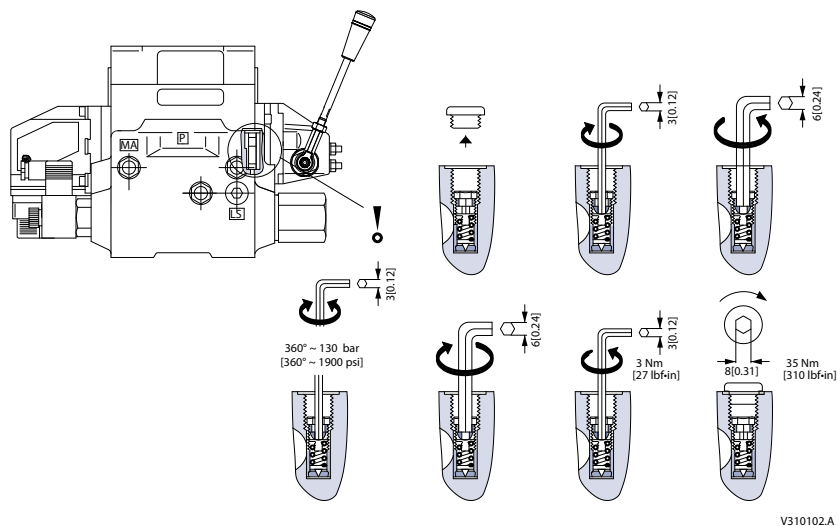


Installation

Pressure Setting

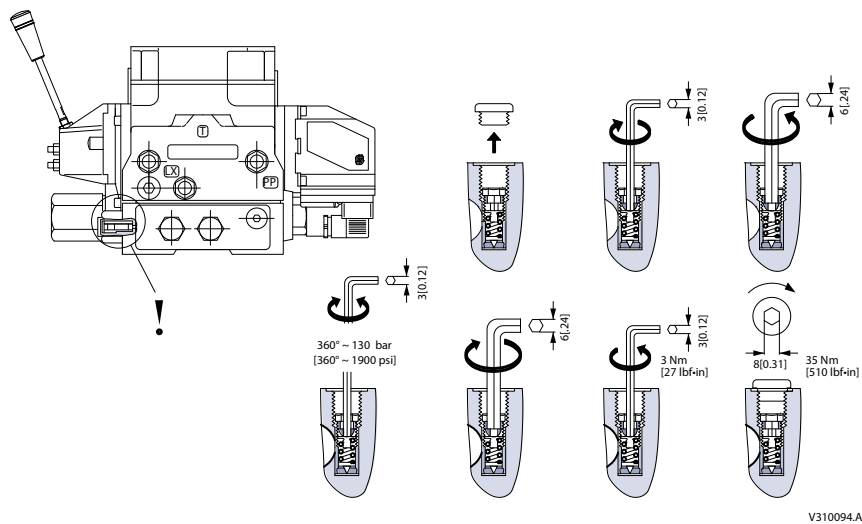
PVP, LS Relief Valve Pressure Setting

PVP, LS Relief Valve Setting



PVB, LS Relief Valve Pressure Setting

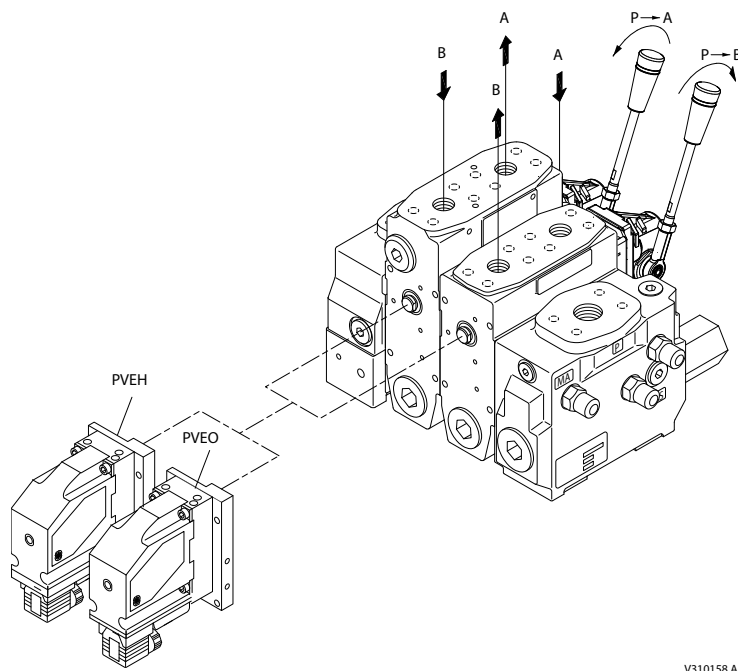
PVB, LS Relief Valve Setting



Installation

Option, Oil Flow Direction and Setting of max Flow

Oil flow direction



Installation of PVE

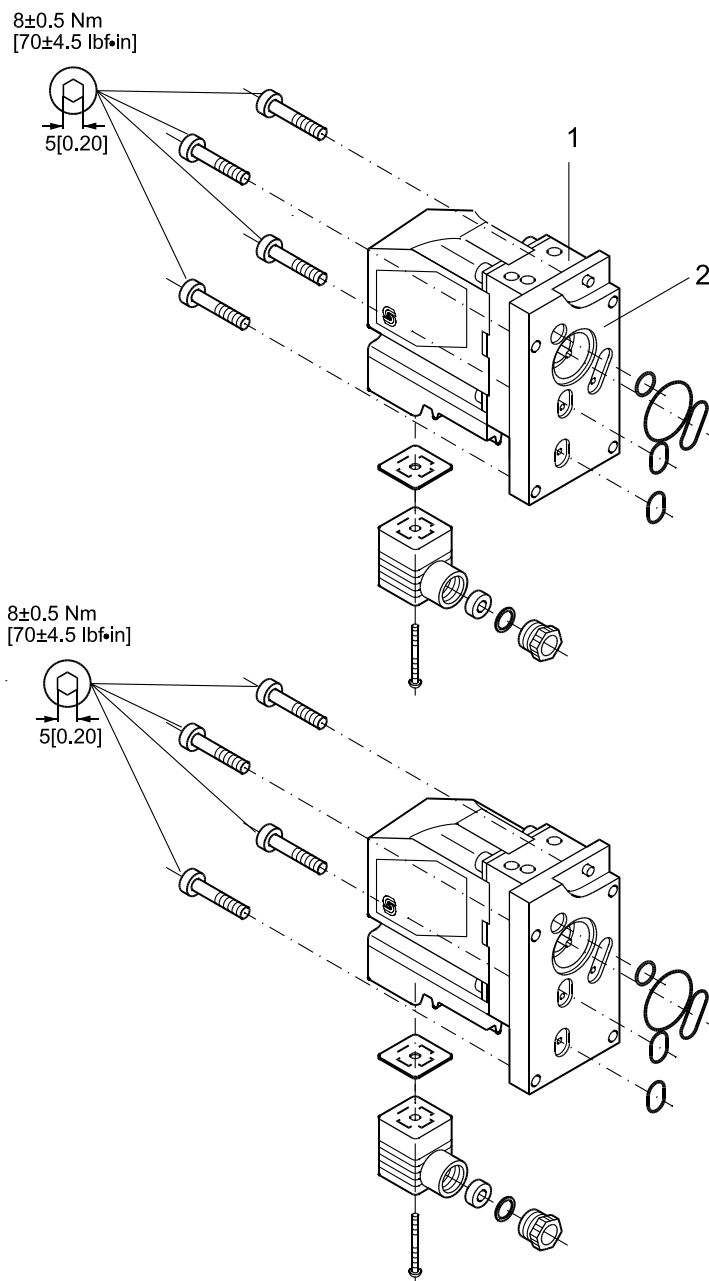
For security reasons, any replacement of O-rings between valve block 1 and intermediate plate 2 may only be effected at service shops authorized by Danfoss.

Caution

Mixing up PVE series 2 for PVG 120 may lead to self-actuation.

Installation

PVEH, PVEO

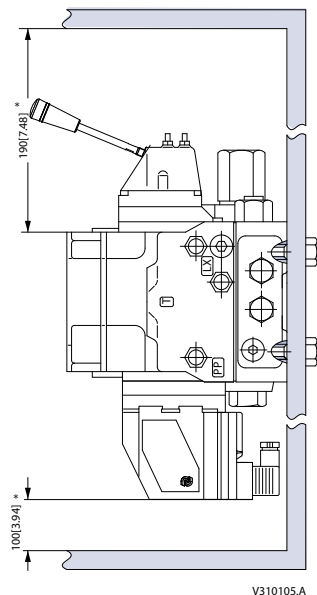


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Installation

Bleeding

PVG 120 installed vertically



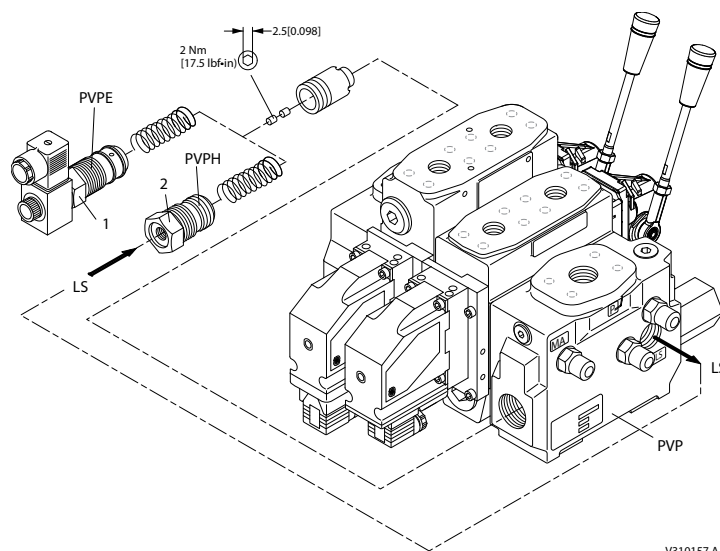
If the group is installed vertically, it is recommended to bleed it at the adjusting screws.

PVPE/PVH relief valves

Max. tightening torque for PVPE/PVH

Position	Across flats	Max. tightening torque
1	22 mm [0.87 in]	5 N·m [45 lbf·in]
2	36 mm [1.42 in]	85 N·m [750 lbf·in]
3	36 mm [1.42 in]	85 N·m [750 lbf·in]

Tightening PVPE/PVH



Installation

PVPH and LS connections

Max. tightening torque for PVPH and LS

Sealing	Threads, DS/ISO 228/1	Max. tightening torque
Steel washer	PVPH: G ¼	40 Nm [350 lbf-in]
	LS: G ¾	60 Nm [530 lbf-in]
Copper washer	PVPH: G ¼	20 Nm [180 lbf-in]
	LS: G ¾	35 N•m [310 lbf-in]
Aluminium washer	PVPH: G ¼	30 N•m [270 lbf-in]
	LS: G ¾	40 Nm [350 lbf-in]
Cutting edge	PVPH: G ¼	40 Nm [350 lbf-in]
	LS: G ¾	60 Nm [530 lbf-in]

PVPE technical data

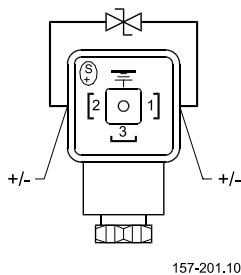
PVPE technical data

Max. operation pressure		350 bar [5085 psi]	
Max. pressure drop at a flow of 0.20 l/min. [0.053 US gal/min]		1.2 bar [17 psi]	
Oil temperature (inlet temperature)	Recommended temperature	30 to 60°C [86 to 140°F]	
	Min. temperature	-30°C [-22°F]	
	Max. temperature	90°C [194°F]	
Max. coil surface temperature		155°C [311°F]	
Ambient temperature		-30 to 60°C [-22 to 140°F]	
Oil viscosity	Operating range	12 to 75 mm²/s [65 to 347 SUS]	
	Min. viscosity	4 mm²/s [39 SUS]	
	Max. viscosity	460 mm²/s [2128 SUS]	
Response time for pressure relief to tank		600 ms	
Enclosure to. IEC 529		IP 65	
Rated voltage		12 V	24 V
Max. permissible deviation from rated supply voltage		± 10 %	± 10 %
Current consumption at rated voltage	at 22°C [72°F] coil temperature	1.55 A	0.78 A
	at 85°C [230°F] coil temperature	1 A	0.5 A
	at 22°C [72°F] coil temperature	19 W	19 W
	at 85°C [230°F] coil temperature	12 W	12 W

Installation

Connection PVPE

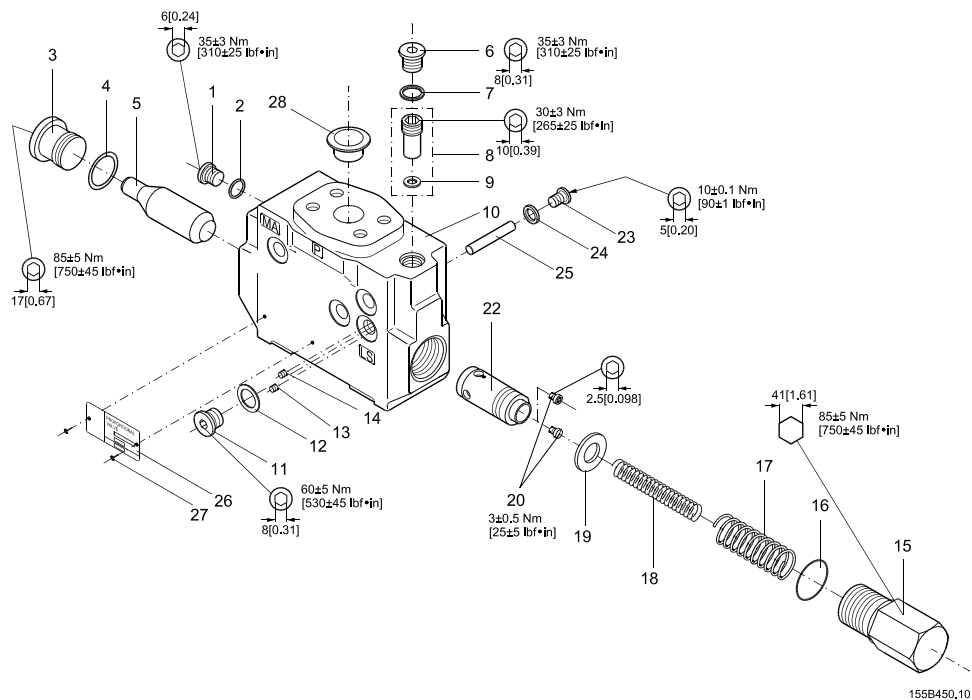
Installing the wire



When installing the wire remember to connect the built-in diode to the plug pins.

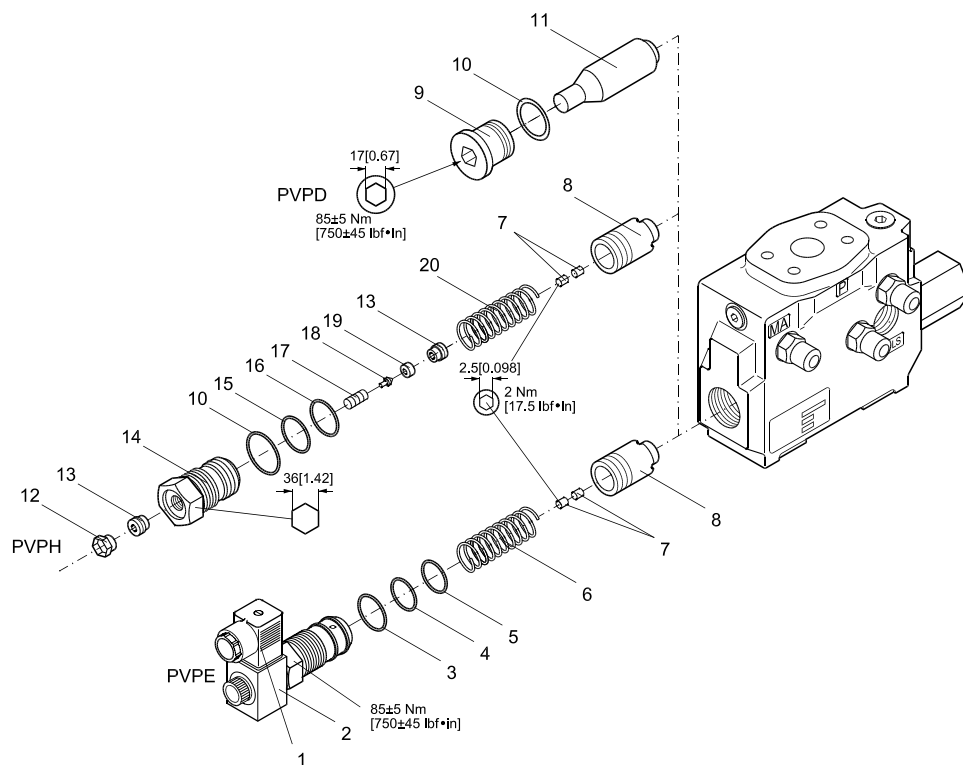
PVP

PVP, Pump Side Module



PVP

PVPD, PVPH, PVPE, Accessories for PVP



155B451.11

PVP

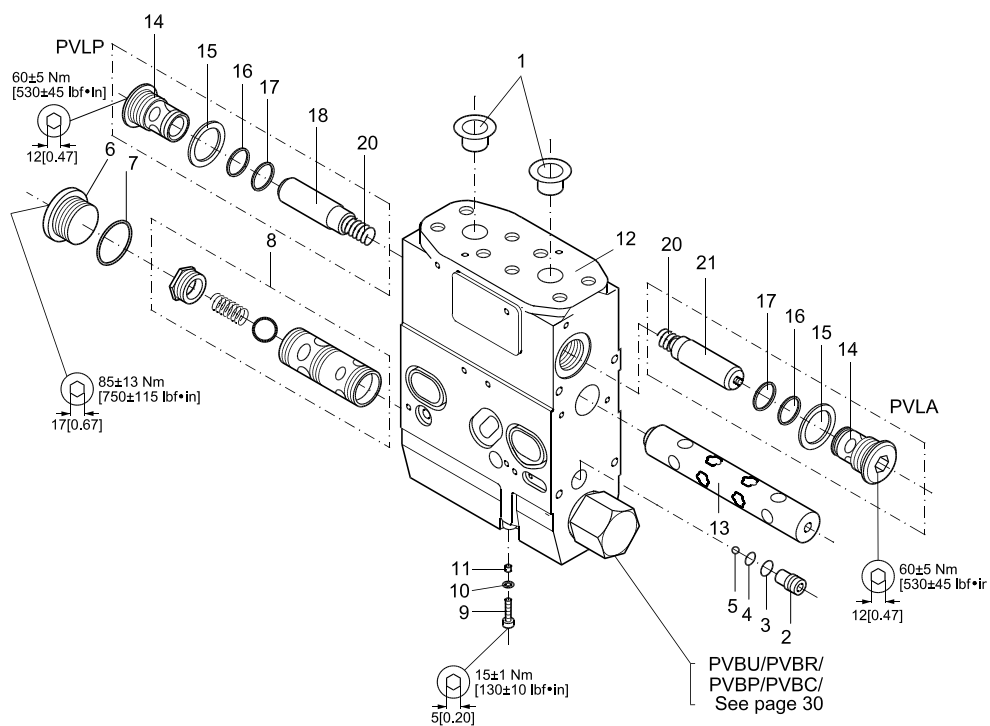
Additional Module for PVP Open Center

Type	Code No.
PVPE – extra electrical relief valve	155G5052
12 V	155G5054
24 V	155G5041
PVPD – Plug	155G5061
PVPH – extra hydraulic relief valve	155G5061

Item	Description	Code No.				
1	Electrical plug	155G5451			1	1
2	Electrical relief valve incl. item 3, 4, 5	155G5013				1
		155G5025			1	
3*	O-ring 29.82 · 2.62 [1.18 · 0.10 in]	633B0069			1	1
4*	Back-up ring 27.0 · 2.0 [1.06 · 0.08 in]	633B0068			1	1
5*	O-ring 26.7 · 1.78 [1.05 · 0.07 in]	633B0070			1	1
6	Spring	155G5332			1	1
7	Orifice M5 · Ø0.5 [0.2 · 0.02 in]	155G5318	2		2	2
8	Spool	155G5311	1		1	1
9	Plug	631X2040		1		
10*	O-ring 30 · 3 · 2.4 [1.18 · 0.09 in]	633B1441	1	1		
11	Insert incl. item 9, 10	155G5041		1		
12	Plastic plug	633X7018				
13	Nut	155G5404	2			
14	Bushing	155G5403	1			
15*	Back-up ring	155G2316	1			
16*	O-ring 25.3 · 2.4 [1.0 · 0.09 in]	633B1440	1			
17	Spool	155G5405	1			
18	Cone	155G5406	1			
19	Seat	155B4478	1			
20	Spring	155G3317	1			
*	Set of seals	155G8527			1	1
		155G8526	1			

PVLP / PVLA

PVLP / PVLA, Shock and Suction Valve Port A/B



155B452.10

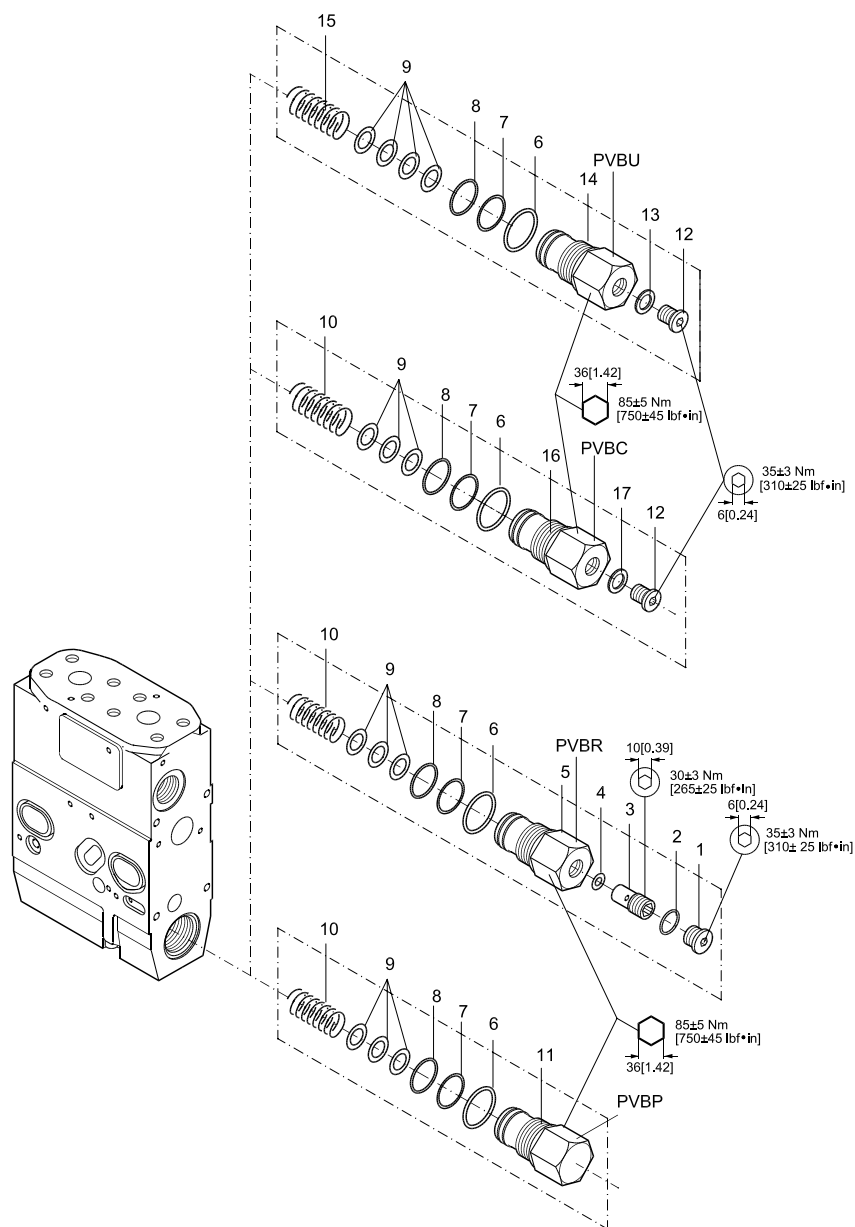
PVLP / PVLA

Type		Code No.	
PVLP, pressure setting: 50, 75, 100, 125, 175, 200, 225, 250, 275, 300, 325, 350, 375, 400 bar [725, 1087, 1450, 1813, 2538, 2900, 3263, 3625, 3988, 4351, 4713, 5076, 5438, 5801 psi]		155G0...	
PVLA		155G1065	

Item	Description	Code No.		
14	Plug	155G1386	1	1
15*	Back-up ring	633B0014	1	1
16*	Back-up ring	633B0016	1	1
17*	O-ring 20.35 x 1.78 [0.80 · 0.07 in]	633B0015	1	1
18	PVLP 50 bar [725 psi]	155G0051		1
	PVLP 75 bar [1087 psi]	155G0076		1
	PVLP 100 bar [1450 psi]	155G0101		1
	PVLP 125 bar [1813 psi]	155G0126		1
	PVLP 150 bar [2175 psi]	155G0151		1
	PVLP 175 bar [2538 psi]	155G0176		1
	PVLP 200 bar [2900 psi]	155G0201		1
	PVLP 225 bar [3263 psi]	155G0226		1
	PVLP 250 bar [3625 psi]	155G0251		1
	PVLP 275 bar [3988 psi]	155G0276		1
	PVLP 300 bar [4351 psi]	155G0301		1
	PVLP 325 bar [4713 psi]	155G0326		1
	PVLP 350 bar [5076 psi]	155G0351		1
	PVLP 375 bar [5438 psi]	155G0376		1
	PVLP 400 bar [5801 psi]	155G0401		1
19	Plastic plug to protect cartridge	633X0053		1
20	Spring	155G1387	1	1
21	PVLA	155G1066	1	
*	Set of seals	155G8525	1	1

PVBP, PVBR, PVBC, PVBU

PVBP, PVBR, PVBC, PVBU Accessories for PVB



155B453.11

PVBP, PVBR, PVBC, PVBU

Type	Code No.				
PVBU - uprating kit for PVB	155G6035				
PVBR - LSA/B relief valve	155G6080				
PVBP - plug	155G6081				
PVBC - connection for external LS-signal	155G6082				

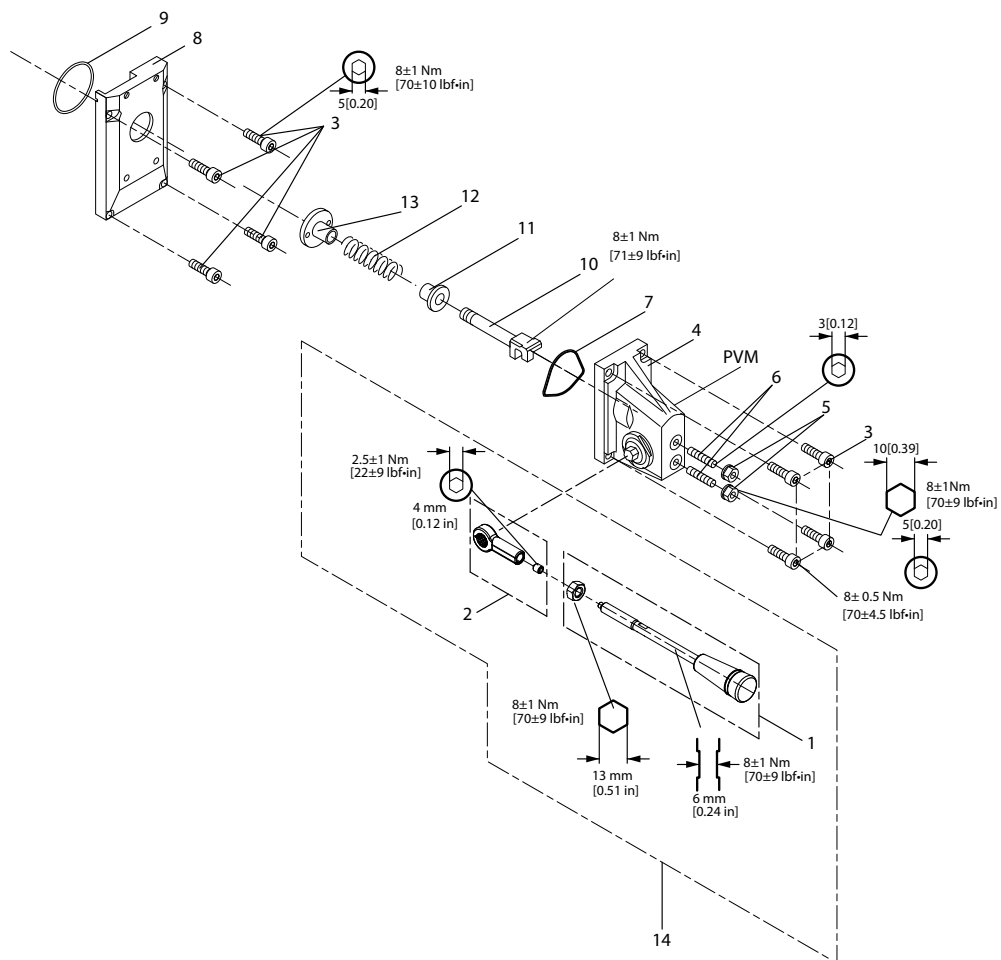
Item	Description	Code No.				
1	Plug	155G5325			1	
2*	O-ring 13.3 × 2.4 [0.52 × 0.09 in]	633B1462			1	
3	Relief valve incl. item 4	155G8561			1	
4*	Washer 7.0 × 14.0 × 1.5 [0.28 × 0.55 × 0.06 in]	684X2367			1	
5	Plug	155G2313			1	
6*	O-ring 30.3 × 2.4 [1.19 × 0.09 in]	633B1441	1	1	1	1
7*	Back-up ring	155G2316	1	1	1	1
8*	O-ring 25.3 × 2.4 [1.0 × 0.09 in]	633B1440	1	1	1	1
9**	Adjustment disc.	155G2315	4	4	4	4
10	Spring	155G2317	1	1	1	
11	Plug	155G2322		1		
12	Plug	631X2036	1			1
13	Bonded seal 14.7 × 1,5 [0.58 × 0.06 in]	633B9017				1
14	Plug	155G2323				1
15	Spring	155G2324				1
16	Plug	155G2319	1			
17	Washer 13.5 × 17.5 × 1.5 [0.53 × 0.69 × 0.06 in]	684X2120	1			
*	Set of seals	155G8502	1	1	1	1

** To increase flow capacity up to 8 shims can be used. Flow will increase 2.5 - 5% Pr. added shim.

Critical flow applications require work port load pressures above 30 bar and should be qualified prior to group installation.

PVM

PVM, Mechanical Activating Module



V310171.A

PVM

Type		Code No.		
PVM with PVMD or PVE	22.5° / 37.5°	155G3040	↓	↓
PVM with PVH	22.5° / 37.5°	155G3050		

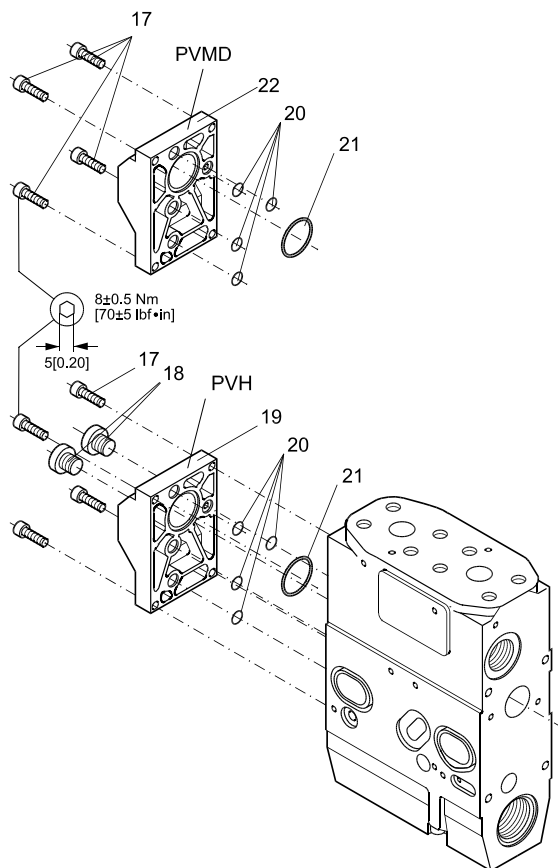
Item	Description	Code No.		
1	Handle, black knob, including nut		1	1
2	Base, including set screw	22.5° / 37.5°	1	1
3	Screw M6 · 20 [0.24 · 0.78 in]	681X9266	8	8
4	PVM housing	155L3431	1	1
5	Seal nut M6	681X8270	2	2
6	Threaded pin M6 · 25 [0.80 · 0.07 in]	681X0323	2	2
7*	Profile O-ring	155L3430	1	1
8	Intermediate plate	155G3301	1	1
9*	O-ring 42.0 · 2.0 [1.65 · 0.08 in]	633B1005	1	1
10	Spool control pin	155G3313	1	1
11	Stop	155G3314	1	1
12	Spring	155G3317		1
		155G3318	1	
13	Stop	155G3315	1	1

Spare Part, Kits Available

Item	Description	Code no.
14	Lever, with black knob handle and base	11046724
*	Set of seals	155G8518
	Lever, with red knob handle and base	11064640
1	Handle, black knob, including nut	11077262
2	Base, including set screw	11064641

PVMD and PVH

PVMD, Cover for PVM and PVH, Hydraulic Activation



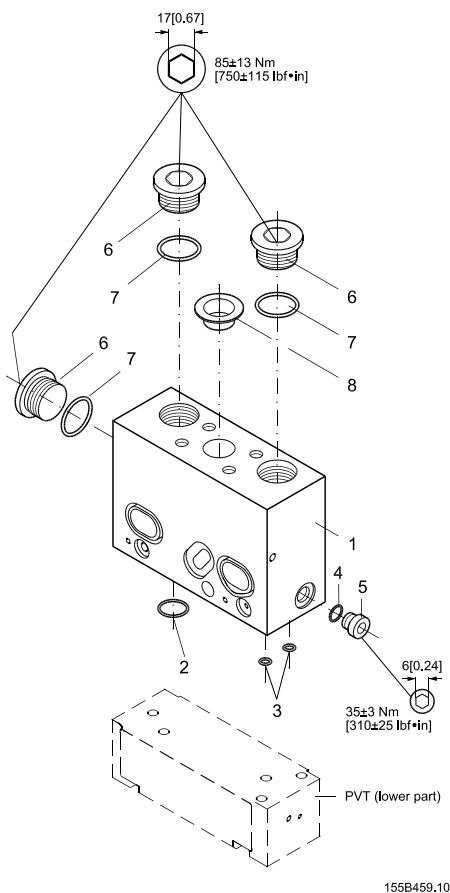
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Type	Code No.
PVM + PVH assy - UNF	155G4021
PVH assy - BSP.F - thread	155G4022
PVMD assy	155G4061

Item	Description	Code No.			
17	Screw M6 · 25 [0.80 · 0.07 in]	681X1198	4	4	4
18	Plastic plug	633X7018		2	
		633X0018			2
19	Cover	155G4301		1	
		155G4201			1
20*	O-ring 6.0 · 2.0 [0.24 · 0.78 in]	633B1460	4	4	4
21*	O-ring 27.0 · 2.0 [1.06 · 0.78 in]	633B0407	1	1	1
22	Cover	155G4402	1		
*	Set of seals	155G8505	1	1	1

PVGI

PVGI, Interface for PVG 120 and PVG 32



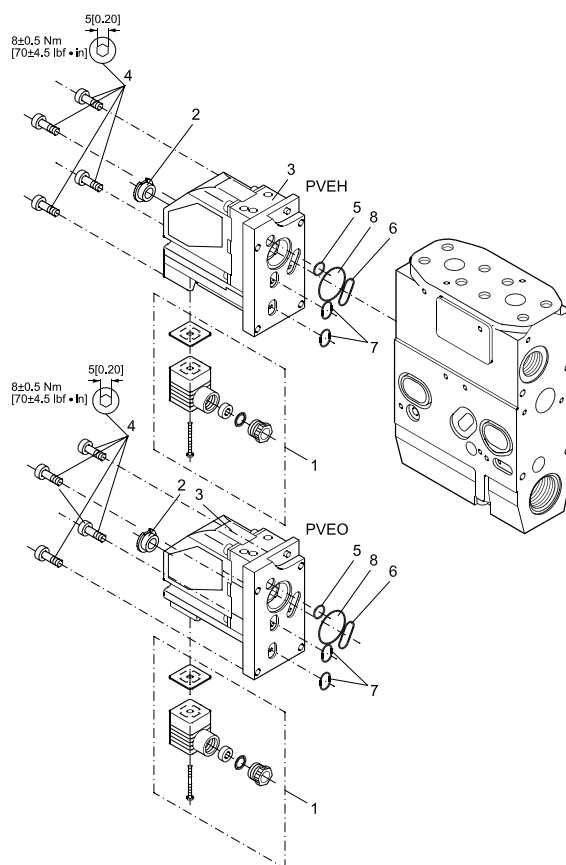
Type	Code No.
PVGI assy 1" SAE flange, M10	155G7033
PVGI sddy 1 5/16 in - 12 UN	155G7031
PVGI assy 1" SAE flange, 3/8 in - 16 UNC	155G7032

Item	Description	Code No.			
1	Combination module	—	1	1	1
2	O-ring 24.0 · 2.0 [0.94 · 0.08 in]	633B1428	1	1	1
3	O-ring 10.0 · 2.0 [0.39 · 0.08 in]	633B1461	2	2	2
4	Bonded seal 14.7 · 1.5 [0.58 · 0.06 in]	633B9017	1	1	1
5	Plug	G 1/4			1
		1/2 - 20 UNF	1	1	
6	Plug	631X2040	3	3	3
7	O-ring 30.3 · 2.4 [1.19 · 0.08 in]	633B1441	3	3	3
8	Plastic plug	633X1028	1		1
		633X0019		1	

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PVEH and PVEO

PVEH and PVEO, Electrical Activating Module, ON-OFF



155B520,10

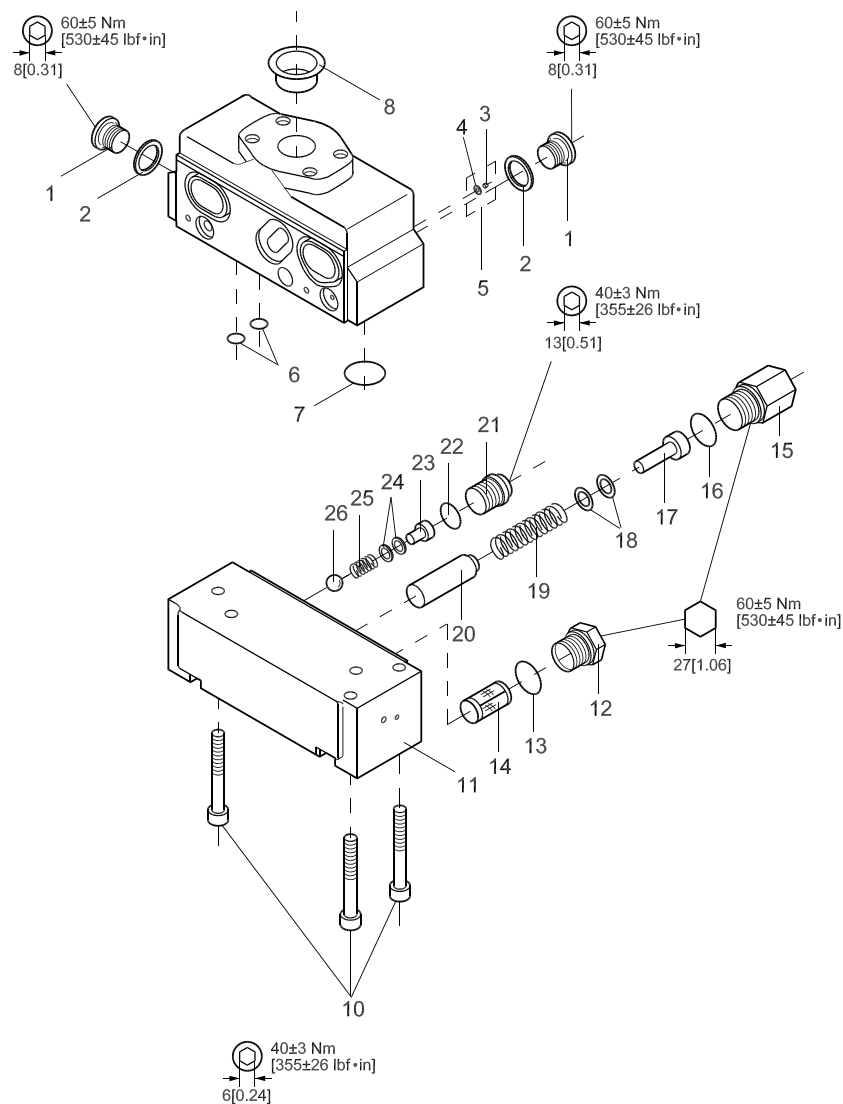
PVEH and PVEO

Type		Connector	Code No.
PVEH	Fault monitoring active, 11-32V	Hirschman	155G4092
		AMP	155G4094
	Fault monitoring passive, 11-32V	Hirschman	155G4093
		AMP	155G4095
PVEO	12V	Hirschman	155G4272
	24V		155G4274
	12V	AMP	155G4282
	24V		155G4284

Item	Description	Code No.	155G4284	155G4282	155G4274	155G4272	155G4095	155G4093	155G4094	155G4092
1	El. plug DIN 43650 Black PG 9	984L3156			1	1		1		1
2	Plastic plug	155U2779	1	1	1	1	1	1	1	1
3	PVEH assy	-							1	1
	PVEH assy. with passive fault monitoring	-					1	1		
	PVEO assy	-	1	1	1	1				
4	Screw M6; l = 15 [0.24 in]	681X9266	4	4	4	4	4	4	4	4
5*	O-ring 7 × 2 [0.28 × 0.78 in]	633B1148	1	1	1	1	1	1	1	1
6*	O-ring 15 × 2 [0.59 × 0.78 in]	633B1030	1	1	1	1	1	1	1	1
7*	O-ring 10 × 2 [0.39 × 0.78 in]	633B1267	2	2	2	2	2	2	2	2
8*	O-ring 27 × 2 [1.06 × 0.78 in]	633B0407	1	1	1	1	1	1	1	1
*	Set of seals	155G8519	1	1	1	1	1	1	1	1

PVT

PVT, Tank Side Module – Upper Part



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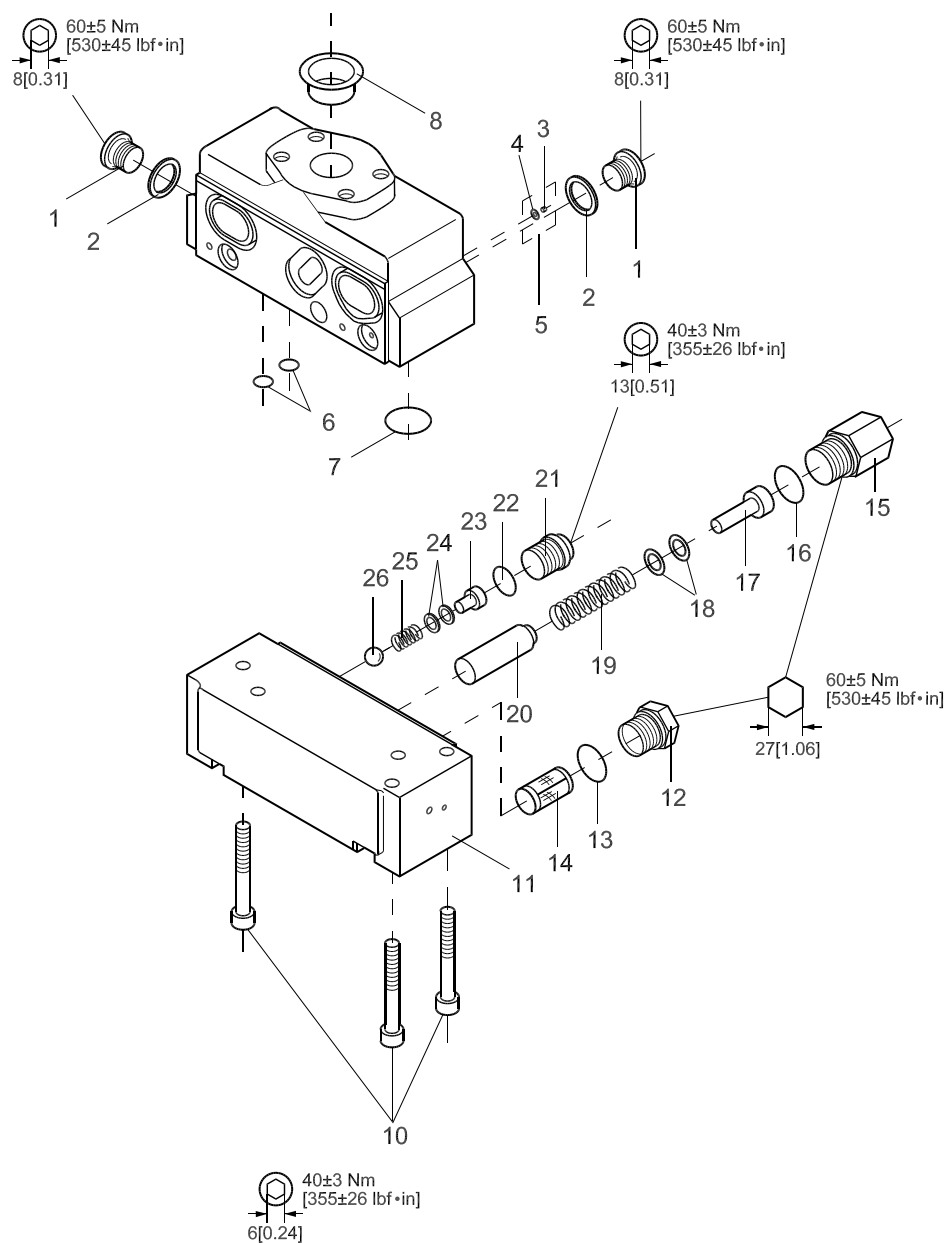
PVT

With LX-connection		Code No.
PVT, SAE UNF, mounting thread $\frac{3}{8}$ in - 16 UNC		155G7025
PVT, Boss port connection $1\frac{5}{16}$ in - 12 UN		155G7024
PVT, SAE flange, mounting thread M10 · 23 deep		155G7023
Without LX-connection		Code No.
PVT, SAE UNF, mounting thread $\frac{3}{8}$ in - 16 UNC		155G7022
PVT, Boss port connection $1\frac{5}{16}$ in - 12 UN		155G7021
PVT, SAE flange, mounting thread M10 · 23 deep		155G7020

Item	Description	Code No.							
1	Plug	631X2038	2			2			
		631X9716		2	2		2	2	
2*	Bonded seal 17.4 x 1.5 [0.69 · 0.06 in]	633B9018	2			2			
	O-ring 16.36 x 2.21 [0.64 · 0.09 in]	633B0046		2	2		2	2	
3**	Screw M5; l = 6 [0.2 in]	681X1925					1	1	1
4**	Bonded seal 5.7 x 1.0 [0.22 · 0.04 in]	633B9029					1	1	1
5**	Plug (item 3 and 4)	155G8555							
6*	O-ring 10.0 x 2.0 [0.39 · 0.08 in]	633B1461	2	2	2	2	2	2	2
7*	O-ring 24.0 x 2.0 [0.94 · 0.08 in]	633B1428	1	1	1	1	1	1	1
8	Plastic plug	633X1028	1			1	1		1
		633X0064		1				1	
9	Tank part assy	-	1	1	1	1	1	1	1
*	Set of seals	155G8507	1	1	1	1	1	1	1
**	Used only when load signal is carried to LX-port	155G8555	1	1	1	1	1	1	1

PVT

PVT, Tank Side Module – Lower Part



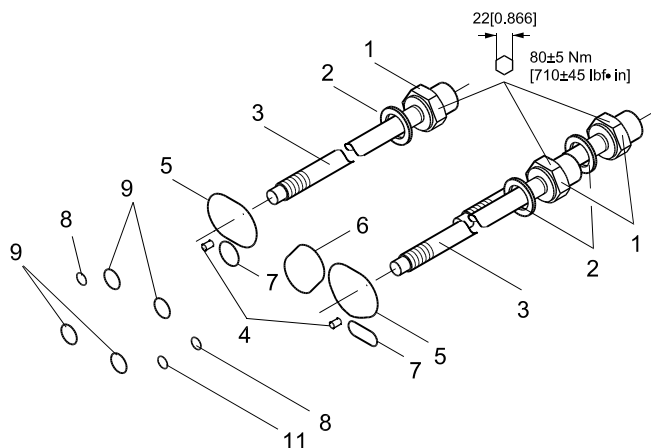
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PVT

UNC		Code No.				
PVT with pilot supply for PVE		155G7042				
PVT without pilot supply for PVE		155G7062				
BSP.F. thread		Code No.				
PVT with pilot supply for PVE		155G7040				
PVT without pilot supply for PVE		155G7060				
Item	Description	Code No.				
10	Screw M8 x 60 [0.31 · 2.36 in]	681X1146	3	3	3	3
11	Tank part assy	-	1	1	1	1
12	Plug	155G7372		1		1
13*	O-ring 17.5 x 2.4 [0.69 · 0.09 in]	633B1335		1		1
14*	Filter	155B4056		1		1
15	Plug	155G7373		1		1
16*	O-ring 19.3 x 1.5 [0.76 · 0.06 in]	633B1136		1		1
17	Stop	155G7376		1		1
18	Washer 10.0 x 16.0 x 0.5 [0.39 · 0.63 · 0.02 in]	684X2094		2		2
19	Spring	155G7375		1		1
20	Spool	155G7374		1		1
21	Plug	155L1373		1		1
22*	O-ring 16.0 x 1.5 [0.63 · 0.06 in]	633B1813		1		1
23	Stop	155G7382		1		1
24	Washer 7.4 x 11.5 x 1.0 [0.29 · 0.45 · 0.04 in]	684X2547		2		2
25	Spring	155G7381		1		1
26	Ball	689X1040		1		1
*	Set of seals	155G8524		1		1
	Kit for hydraulic activation	155G7041		1		1

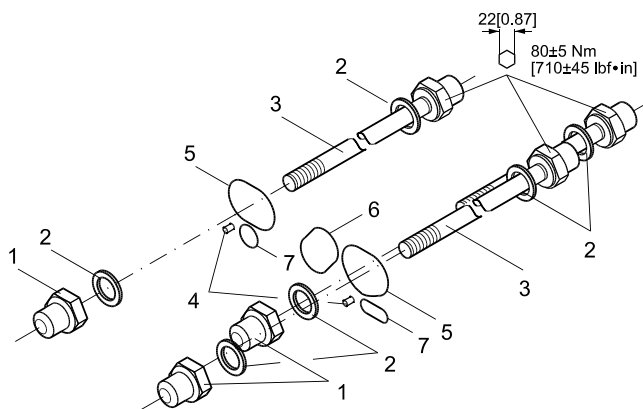
PVAS and PVGI

PVGI, Assembly Kit



155B474.10

PVAS, Assembly Kit



155B460.10

Assembly sequence

1. Mount nut on short thread and torque 10 N•m
2. Mount seal
3. Assemble PVG
4. Mount seal and nut on long thread and torque 10 N•m
5. When all three stay bolts are mounted, torque full to 80 N•m

Warning

Do not reuse stay bolts or loosen torque. The stay bolts are not designed as motor bolts and do not keep strength when remounted.

PVAS and PVGI

PVGI, Assembly Kit (continued)

Type	Code No.
PVGI for 0 basic module	155G8040
PVGI for 1 basic module	155G8041
PVGI for 2 basic module	155G8042
PVGI for 3 basic module	155G8043
PVGI for 4 basic module	155G8044

PVAS, Assembly Kit (continued)

Type	Code No.
PVAS for 1 basic module	155G8031
PVAS for 2 basic module	155G8032
PVAS for 3 basic module	155G8033
PVAS for 4 basic module	155G8034
PVAS for 5 basic module	155G8035
PVAS for 6 basic module	155G8036
PVAS for 7 basic module	155G8037
PVAS for 8 basic module	155G8038

Item	Description	Code No.	1	2	3	4	5	6	7	8	9	10	11	12
1	Nut	155G8312	3	3	3	3	3	3	3	3	3	3	3	3
2* / 2**	Bonded seal 17.4 x 1.5 [0.69 · 0.06 in]	633B9018	6	6	6	6	6	6	6	6	6	6	6	6
3	Stay bolt M12 [0.47]; l = 234 [9.21 in]	155G8201								3				
	Stay bolt M12 [0.47]; l = 302 [11.89 in]	155G8202							3					
	Stay bolt M12 [0.47]; l = 369 [14.53 in]	155G8203							3					
	Stay bolt M12 [0.47]; l = 436 [17.17 in]	155G8204						3						
	Stay bolt M12 [0.47]; l = 503 [19.80 in]	155G8205				3								
	Stay bolt M12 [0.47]; l = 571 [22.48 in]	155G8206			3									
	Stay bolt M12 [0.47]; l = 638 [25.12 in]	155G8207		3										
	Stay bolt M12 [0.47]; l = 705 [27.76 in]	155G8208	3											
	Stay bolt M12 [0.47]; l = 124.5 [4.90 in]	155G8330												3
	Stay bolt M12 [0.47]; l = 192.5 [7.58 in] PVGI	155G8331												3
	Stay bolt M12 [0.47]; l = 260.5 [10.24 in] PVGI	155G8332											3	
	Stay bolt M12 [0.47]; l = 328.5 [12.93 in] PVGI	155G8333										3		
	Stay bolt M12 [0.47]; l = 396.5 [15.61 in] PVGI	155G8334									3			
4* / 4**	Pin	682L2006	18	16	14	12	10	8	6	4	10	8	6	4
5* / 5**	O-ring 33.3 x 2.4 [1.31 · 0.09 in]	633B1029	18	16	14	12	10	8	6	4	10	8	6	4
6* / 6**	O-ring 28.24 x 2.62 [1.118 · 0.10 in]	633B1956	9	8	7	6	5	4	3	2	5	4	3	2
7* / 7**	O-ring 11.91 x 2.62 [0.47 · 0.10 in]	633B1955	18	16	14	12	10	8	6	4	10	8	6	4
8	O-ring 5.0 x 2.0 [0.20 · 0.08 in]	633B1809									2	2	2	2
9	O-ring 16.0 x 2.5 [0.63 · 0.10 in]	633B1817									4	4	4	4
11	O-ring 10.0 x 2.5 [0.39 · 0.10 in]	633B0120									1	1	1	1
*	Set of seals first PVG section	155G8522	1	1	1	1	1	1	1	1	1	1	1	1
**	Set of seals for additional sections	155G8523	7	6	5	4	3	2	1		3	2	1	

Set of seals

Set of Seals

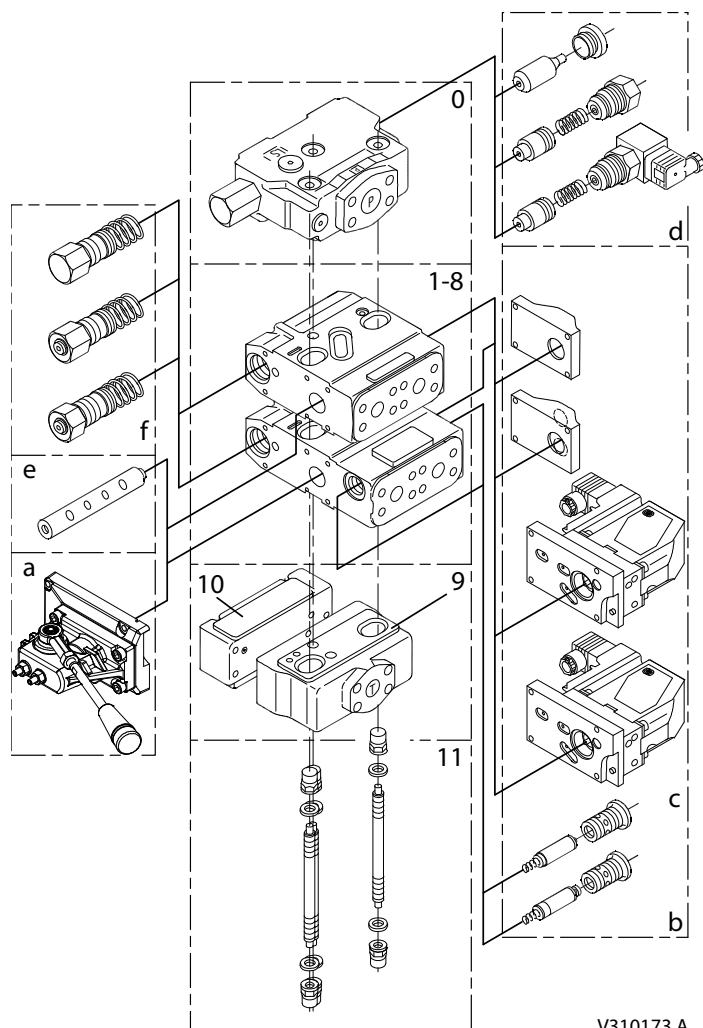
Type	Code No.
PVP	155G8501
PVB / PVB additional module	155G8502
PVPH	155G8526
PVPE	155G8527
PVLP / PVLA	155G8525
PVM	155G8518
PVEH / PVEO	155G8519
PVH / PVMD	155G8505
PVT, Upper part	155G8507
PVT (with pilot supply), Lower part	155G8524
PVAS for first PVG section	155G8522
PVAS for additional sections	155G8523

Item	Description	Code No.
1	O-ring 8.3 x 2.4 [0.33 · 0.09 in]	633B0011
2	O-ring 20.35 x 1.78 [0.80 · 0.07 in]	633B0015
3	O-ring 16.36 x 2.21 [0.64 · 0.09 in]	633B0046
4	O-ring 29.82 x 2.62 [1.17 · 0.10 in]	633B0062
5	O-ring 26.7 x 1.78 [1.05 · 0.07 in]	633B0071
6	O-ring 27.0 x 2.0 [1.06 · 0.08 in]	633B0407
7	O-ring 6.3 x 2.4 [0.25 · 0.09 in]	633B1004
8	O-ring 42.0 x 2.0 [1.65 · 0.08 in]	633B1005
9	O-ring 33.3 x 2.4 [1.37 · 0.09 in]	633B1029
10	O-ring 15.0 x 2.0 [1.59 · 0.08 in]	633B1030
11	O-ring 8.0 x 2.0 [0.31 · 0.08 in]	633B1056
12	O-ring 19.3 x 2.4 [0.76 · 0.09 in]	633B1136
13	O-ring 8.0 x 2.0 [0.31 · 0.08 in]	633B1148
14	O-ring 10.0 x 2.0 [0.39 · 0.08 in]	633B1267
15	O-ring 17.5 x 2.4 [0.69 · 0.09 in]	633B1335
16	O-ring 24.0 x 2.0 [0.94 · 0.08 in]	633B1428
17	O-ring 25.3 x 2.4 [1.00 · 0.09 in]	633B1440
18	O-ring 30.3 x 2.4 [1.19 · 0.09 in]	633B1441
19	O-ring 6.0 x 2.0 [0.24 · 0.08 in]	633B1460
20	O-ring 10.0 x 2.0 [0.39 · 0.08 in]	633B1461
21	O-ring 13.3 x 2.4 [0.52 · 0.09 in]	633B1462
22	O-ring 20.3 x 2.4 [0.78 · 0.09 in]	633B1521
23	O-ring 16.0 x 1.5 [0.63 · 0.06 in]	633B1813
24	O-ring 10.52 x 1.83 [0.41 · 0.07 in]	633B1834
25	O-ring 11.91 x 2.62 [0.47 · 0.10 in]	633B1955
26	O-ring 28.24 x 2.62 [1.11 · 0.10 in]	633B1956
27	Profile O-ring 13.3 x 2.4 [0.52 · 0.09 in]	155L3430
28	Washer 7.0 x 14.0 x 1.5 [0.28 · 0.55 · 0.06 in]	684X2367
29	Washer 16.2 x 19.9 x 1.5 [0.64 · 0.78 · 0.08 in]	684X2565
30	Bonded seal 10.35 x 2.0 [0.41 · 0.08 in]	633B9016
31	Bonded seal 14.7 x 1.5 [0.58 · 0.06 in]	633B9017
32	Bonded seal 17.4 x 1.5 [0.69 · 0.06 in]	633B9018
33	Bonded seal 5.7 x 1.0 [0.22 · 0.04 in]	633B9029
34	Back-up ring	633B0014
35	Back-up ring	633B0016
36	Back-up ring	633B0068
37	Back-up ring	155G2316
38	Filter	155G4710
39	Filter	155B4056
40	Seal nut	681X8270
41	Pin	682L2006

PVG 120 Modules Selection Chart

PVG 120 module selection chart

PVG 120 modules exploded view



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PVB, high basic module

	SAE flange	O-ring Boss	Metric flange	Weight kg [lb]
Facilities for shock valves AB	155G6007	155G6006	155G6005	10.2 [22.5]

PVB, low basic module

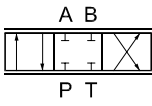
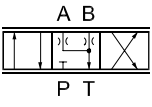
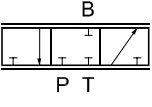
	SAE flange	O-ring Boss	Metric flange	Weight kg [lb]
No facilities for shock valves AB	155G6016	155G6015	155G6014	8.9 [19.6]

PVG 120 Modules Selection Chart

Accessory modules for PVB

	Code number	Weight, kg [lb]
Plug, PVBP	155G6081	0.4 [0.9]
LS _{A/B} press. relief valve, PVBR	155G6080	
External LS connection, PVBC	155G6082	
Module for oil flow > 180 l/min [47.6 US gal/min], PVBU	155G6035	

PVBS, mechanical actuation

Oil flow, l/min [US gal]	A 65 [17.2]	B 95 [25.1]	C 130 [34.3]	D 180 [47.6]
 155B384.10	155G6452	155G6454	155G6456	155G6458
 155B385.10		155G6464	155G6466	155G6468
 155B386.10			155G6476	155G6478
Weight, kg [lb]	0.35 [0.8]			

PVM, mechanical actuation

PVM + PVMD or PVM + PVE	155G3040	22.5°
	155G3041	37.5°
PVM + PVH	155G3050	22.5°
	155G3051	37.5°
Weight	kg [lb]	0.5 [1.1]

PVMD, cover for PVM

Code number	Weight, kg [lb]
155G4061	0.3 [0.7]

PVT, tank side module

Code number	SAE flange	O-ring Boss	Metric flange	Weight kg [lb]
Upper part excl. LX connection	155G7022	155G7021	155G7020	4.6 [10.1]
Upper part incl. LX connection	155G7025	155G7024	155G7023	
Lower part incl. pilot oil supply for PVE	155G7042		155G7040	4.4 [9.7]
Lower part excl. pilot oil supply for PVE	155G7062		155G7060	
Lower part incl. pilot oil supply for PVH	155G7044		155G7043	

PVG 120 Modules Selection Chart

PVP, pump side module

Code number		O-ring Boss	SAE flange	Metric flange	Weight kg [lb]
Open centre	Excl. PVPD, PVPH, PVPE	155G5023	155G5037	155G5021	10.0 [22.1]
	For PVB-oil flow > 180 l/min [47.6 US gal/min] Excl. PVPD, PVPH, PVPE	155G5028	155G5029	155G5027	
Closed centre	Incl. pressure relief valve and plug PVPD	155G5022	155G5038	155G5020	10.2 [22.5]
	Excl. pressure relief valve	155G5031	155G5032	155G5030	11.0 [24.3]

Accessory modules for open centre PVP

Description		Code number	Weight kg [lb]
Plug, PVPD		155G5041	0.4 [0.9]
Hydraulic relief valve, PVH		155G5061	0.5 [1.1]
Electrical relief valve, PVPE	12 V	155G5052	0.7 [1.5]
	24 V	155G5054	

PVH, cover for PVRHH

Port	Code number	Weight, kg [lb]
1/2 in - 20 UNF	155G4021	0.4 [0.9]
G 1/4	155G4022	

PVE, electrical actuation

Connector	PVEH fault monitoring		PVEO voltage	
	Active	Passive	12 V	24 V
Hirschmann	155G4092	155G4093	155G4272	155G4274
AMP	155G4094	155G4095	155G4282	155G4284
Weight, kg [lb]	1.25 [2.76]		1 [2.2]	

PVLA suction valve A/B

Code number	Weight kg [lb]
155G1065	0.2 [0.4]

PVLP, shock and suction valve A/B

Pressure setting		
bar	[psi]	Code number
50	725	155G0050
75	1100	155G0075
100	1450	155G0100
125	1800	155G0125
150	2200	155G0150

PVG 120 Modules Selection Chart

PVLP, shock and suction valve A/B (continued)

Pressure setting		
175	2550	155G0175
200	2900	155G0200
225	3250	155G0225
250	3650	155G0250
275	4000	155G0275
300	4350	155G0300
325	4700	155G0325
350	5100	155G0350
375	5400	155G0375
400	5800	155G0400
Weight, kg [lb]		0.175 [0.386]

PVAS, assembly kit

PVB's	1	2	3	4	5	6	7	8
Code number	155G8031	155G8032	155G8033	155G8034	155G8035	155G8036	155G8037	155G8038
Weight	kg	0.8	1.0	1.1	1.2	1.4	1.7	1.9
	[lb]	[1.8]	[2.2]	[2.4]	[2.6]	[3.1]	[3.7]	[4.6]

Order specification

Ordering of modules for oil flow exceeding 180 l/min [47.6 US gal/min]

Modules for pump with fixed displacement

1. *Ordering:* Order accessory module 155G6035, main spool D, and pump side modules 155G5027 / 155G5028 / 155G5029.
2. *Conversion:* In open center systems a max. oil flow exceeding 180 l/min [47.6 US gal/min] can be achieved by changing the following parts in the pump side and basic modules:
 - Open center pump side module
 - Pressure adjustment spool
 - The springs behind the pressure adjustment spool
 - The plug behind the pressure adjustment spool
 Parts from kit 155G5035 may be used.
 - Closed center pump side module (A closed center pump side module can be changed into an upgraded open center pump side module by means of kit 155G5035.)
 - Basic module
 - Spring behind pressure compensator
 - The plug behind the pressure compensator

Spring and plug with code number 155G6035 (PVBU, accessory module).

Modules for pump with variable displacement

1. *Ordering:* Order accessory module 155G6035 and main spool D.
2. *Conversion:* In closed center systems a max. oil flow exceeding 180 l/min [47.6 US gal/min] can be achieved by changing the following basic module parts:
 - The spring behind the pressure compensator.
 - The plug behind the pressure compensator.

The code number of the spring and plug is 155G6035 (PVBU, accessory module).

Order Form

An order form for PVG 120 hydraulic valve is shown on next page. The form can be obtained from the Danfoss Power Solutions Sales Organisation.

The module selection chart on the next page and the order form are divided into fields.

Each module has its own field:

0: PVP, pump side modules

d: PVPD, PVPH and PVPE, accessory modules

1-8: PVB, basic modules

e: PVBS, main spools

f: PVBP, PVBR, PVBU and PVBC, accessory modules

a: PVM, mechanical actuation

c: PVMD, cover for mechanical operation; PVH, cover for hydraulic operation; PVEO and PVEH, electrical actuations

b: PVLP, shock and suction valve; PVLA, suction valve

9: PVT, tank side module

10: PVAS, assembly kit

Order specification

Please state:

- Code numbers of all modules required
- Required setting (p) for pump side module
- Required setting of LS_{A/B} pressure relief valves, if accessory module PVBR is ordered.

Reordering

The space at the top right-hand corner of the form is for Danfoss to fill in. The code number for the whole of the specified valve group (PVG No.) is entered here. In the event of a repeat order all you have to do is enter the number Danfoss has given on the initial confirmation of order.

If PVG 120 is to be used with phosphate-esters this must be stated on the order form (See *Non-flammable Fluids* for more information).

Order specification


PVG 120
Specification Sheet

Subsidiary / Dealer	PVG No.
Customer	Customer No.
Application	Revision No.

	Function	A-port		B-port
0	Inlet		155G P = bar	155G
1		a 155G b 155G	f 155G LS _A = bar	e 155G LS _B = bar
2		a 155G b 155G	f 155G LS _A = bar	e 155G LS _B = bar
3		a 155G b 155G	f 155G LS _A = bar	e 155G LS _B = bar
4		a 155G b 155G	f 155G LS _A = bar	e 155G LS _B = bar
5		a 155G b 155G	f 155G LS _A = bar	e 155G LS _B = bar
6		a 155G b 155G	f 155G LS _A = bar	e 155G LS _B = bar
7		a 155G b 155G	f 155G LS _A = bar	e 155G LS _B = bar
8		a 155G b 155G	f 155G LS _A = bar	e 155G LS _B = bar
9		a 155G b 155G	f 155G LS _A = bar	e 155G LS _B = bar
10		a 155G b 155G	f 155G LS _A = bar	e 155G LS _B = bar
11	Upper tank module		155G	
12	Lower tank module		155G	
13	PVAS section		155G	

Comments	
Filled in by	Date



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