

Axial Piston Pump

PV016 - PV360
Variable Displacement

aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding

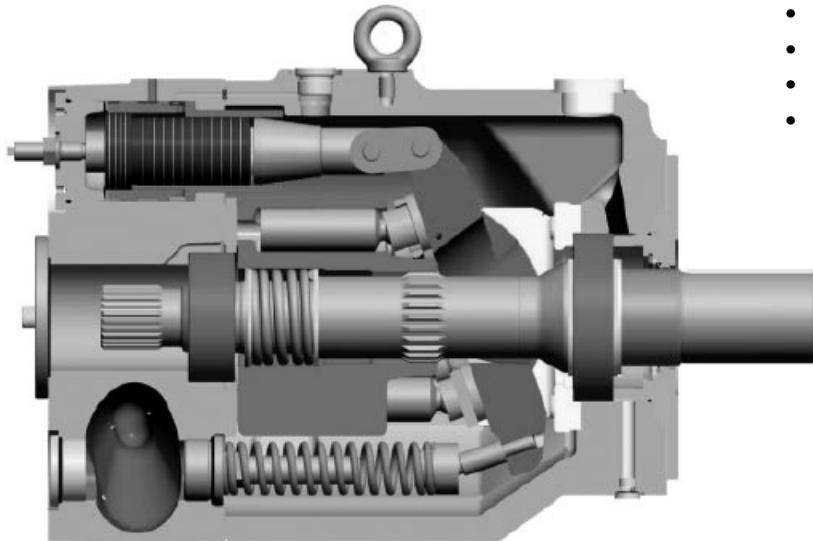


ENGINEERING YOUR SUCCESS.

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With thru drive for single and multiple pumps

Swash plate type for open circuit

**General Information****Fluid recommendations**

Premium quality hydraulic mineral fluid is recommended, like HLP oils to DIN 51524, part 2. Brugger- value has to be 30 N/mm² minimum for general application and 50 N/mm² for heavily loaded hydraulic equipment and fast cycling machines and/or high dynamic loads, measured in accordance with DIN 51 347-2. See also Document HY30-3248/UK Parker Hydraulic Fluids.

Viscosity

The normal operating viscosity should range between 16 and 100 mm²/s (cSt). Max. start-up viscosity is 800 mm²/s (cSt).

Filtration

For maximum pump and system component functionality and life, the system should be protected from contamination by effective filtration.

Technical Features

- Low noise level
- Fast response
- Service-friendly
- High self-priming speed
- Compact design
- Thru drive for 100% nominal torque

Fluid cleanliness should be in accordance with ISO classification ISO 4406:1999. The quality of filter elements should be in accordance with ISO standards. General hydraulic systems for satisfactory operation: Class 20/18/15, according to ISO 4406:1999 Recommended cleanliness for maximum component life and functionality: Class 18/16/13, according to ISO 4406:1999

Seals

Check hydraulic fluid specification for chemical resistance of seal material.

Check temperature range of seal material and compare with max. system and ambient temperature.

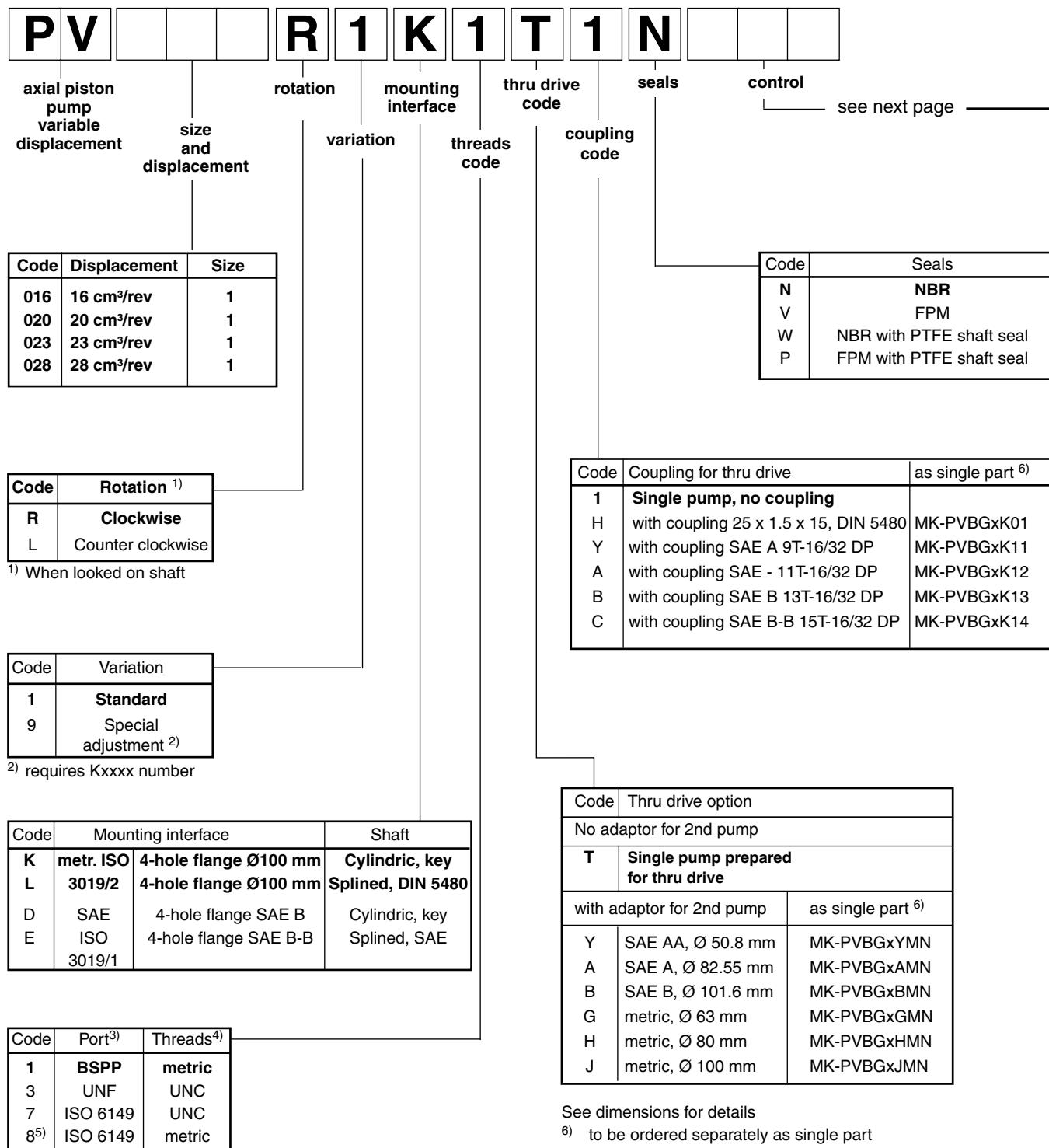
N - Nitrile -40 ... +90 °C

Note: The highest fluid temperature will be at the drain port of the pump, up to 25 °C higher than in the reservoir.

		PV016	PV020	PV023	PV028	PV032	PV040	PV046
Frame size		1	1	1	1	2	2	2
Max. Displacement	[cm ³ /rev.]	16	20	23	28	32	40	46
Output flow at 1500 rpm	[l/min]	24	30	34,5	42	48	60	69
Nominal pressure pN	[bar]	350	350	350	350	350	350	350
Max. pressure pmax at 20% working cycle ¹⁾	[bar]	420	420	420	420	420	420	420
Case drain pressure, continuous	[bar]	0.5	0.5	0.5	0.5	0.5	0.5	0.55
Case drain pressure, max. peak	[bar]	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Min. Inlet pressure, abs.	[bar]	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Max. Inlet pressure	[bar]	16	16	16	16	16	16	16
Input power at 1500 rpm and 350 bar	[kW]	15.5	19.5	22.5	27.5	31	39	45
Max speed at 1 bar, abs, inlet pressure	[rpm]	3000	3000	3000	3000	2800	2800	2800
Moment of inertia	[kgm ²]	0.0017	0.0017	0.0017	0.0017	0.0043	0.0043	0.0043
Weight	[kg]	19	19	19	19	30	30	30

		PV063	PV080	PV092	PV140	PV180	PV270	PV360
Frame size		3	3	3	4	4	5	5
Max. Displacement	[cm ³ /rev.]	63	80	92	140	180	270	360
Output flow at 1500 rpm	[l/min]	94.5	120	138	270	405	405	540
Nominal pressure pN	[bar]	350	350	350	350	350	350	350
Max. pressure pmax at 20% working cycle ¹⁾	[bar]	420	420	420	420	420	420	420
Case drain pressure, continuous	[bar]	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Case drain pressure, max. peak	[bar]	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Min. Inlet pressure, abs.	[bar]	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Max. Inlet pressure	[bar]	16	16	16	16	16	16	16
Input power at 1500 rpm and 350 bar	[kW]	61.5	78	89.5	136	175	263	350
Max speed at 1 bar, abs, inlet pressure	[rpm]	2800	2500	2300	2400	2200	1800	1750
Moment of inertia	[kgm ²]	0.018	0.018	0.018	0.030	0.030	0.098	0.103
Weight	[kg]	59	59	59	90	90	172	180

1) Special control options required.



³⁾ Drain, gauge and flushing ports

⁴⁾ All mounting and connecting threads

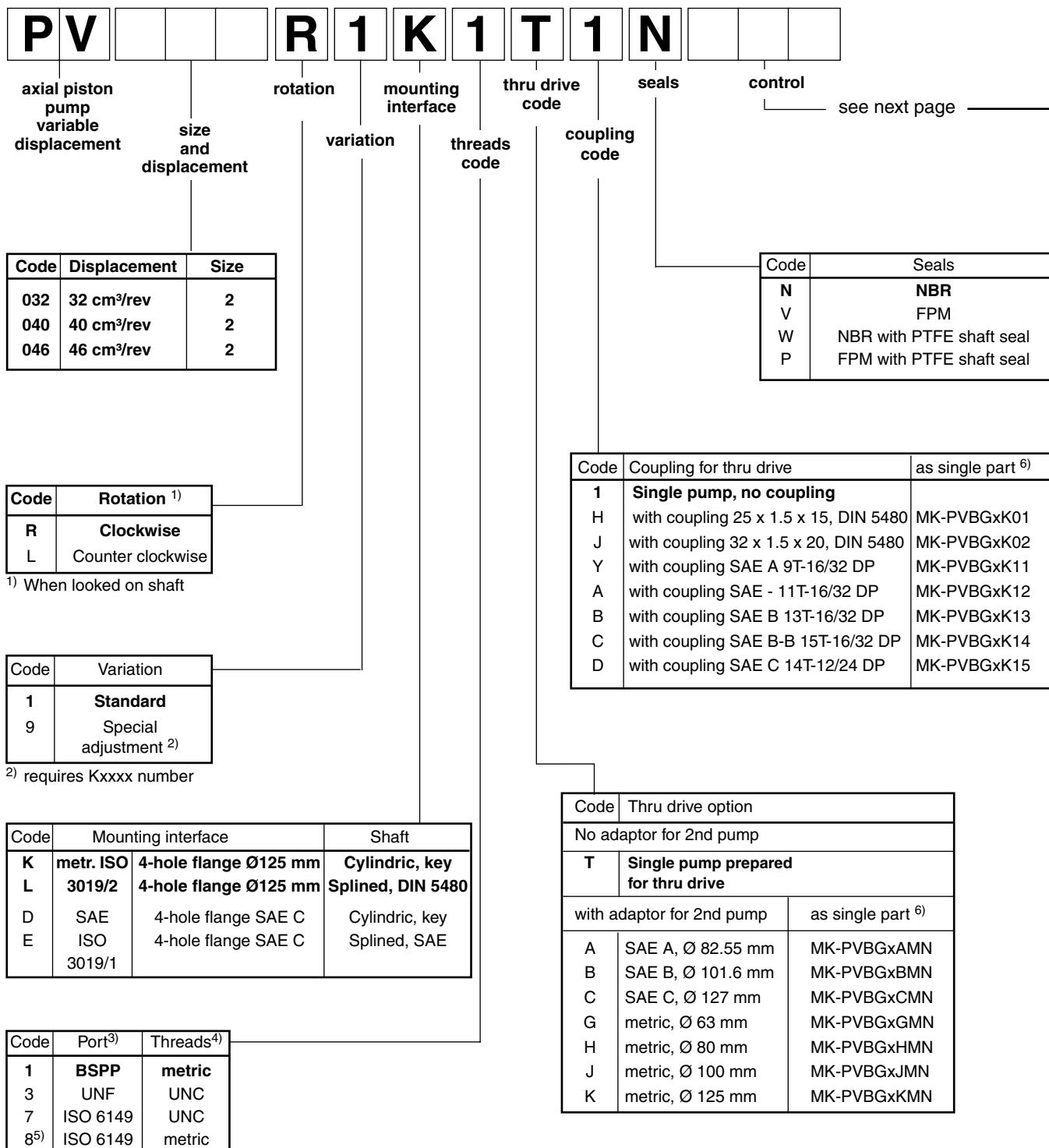
⁵⁾ Mounting interface, code K and L only

Code			Control options			
0	0	1	No control			
1	0	0	With cover plate, no control function			
M	M		Standard pressure control, integrated pilot valve			
M	R		Remote pressure control, integrated pilot valve			
M	F		Load Sensing (flow) control, integrated pilot valve			
M	T		Two spool LS control			
Control variation						
	C		Standard version ¹⁾			
	1		NG6 interface top side for pilot valves			
	W		With unloading function, 24VDC solenoid ¹⁾			
	K		Prop.-pilot valve type PVACRE..35 mounted			
	Z		Without integrated pilot valve, NG6 interface, for mounting of accessory code PVAC*			
	P		MT1 with mounted pilot valve PVAC1P ²⁾			

1) not for MT
 2) only for MT

Horse power / Torque control						
Displacem.			Code			
016	028			Nominal HP at 1.500 rpm		
			B		3 kW	20 Nm
			C		4 kW	25 Nm
			D		5.5 kW	35 Nm
			E		7.5 kW	50 Nm
			G		11 kW	71 Nm
			H		15 kW	97 Nm
			K		18.5 kW	120 Nm
Function						
			L		Horse power control with pressure control	
			C		Horse power control with load sensing (single spool)	
Control variation						
			C		Standard version	
			1		NG 6 interface top side	
			W		With unloading function, 24 VDC solenoid	
			K		Prop.-pilot valve type PVACRE..35 mounted	
			Z		Without integrated pilot valve, NG6 interface, for mounting of accessory code PVAC*	

Code			Control option	
electro hydraulic control				
F	P	V	Proportional displacement control, no pressure compensation	
U	P		Proportional displacement control, with pressure compensation	
Control variation				
		R	pilot operated pressure control, open NG6 interface	
		K	pilot operated pressure control, proportional pilot valve type PVACRE..35 mounted	
		M	pilot operated pressure control, pressure sensor and proportional pilot valve type PVACRE..35 mounted for pressure control and/or power control	



³⁾ Drain, gauge and flushing ports

⁴⁾ All mounting and connecting threads

⁵⁾ Mounting interface, code K and L only

Code	Seals
N	NBR
V	FPM
W	NBR with PTFE shaft seal
P	FPM with PTFE shaft seal

Code	Coupling for thru drive	as single part ⁶⁾
1	Single pump, no coupling	
H	with coupling 25 x 1.5 x 15, DIN 5480	MK-PVBGxK01
J	with coupling 32 x 1.5 x 20, DIN 5480	MK-PVBGxK02
Y	with coupling SAE A 9T-16/32 DP	MK-PVBGxK11
A	with coupling SAE - 11T-16/32 DP	MK-PVBGxK12
B	with coupling SAE B 13T-16/32 DP	MK-PVBGxK13
C	with coupling SAE B-B 15T-16/32 DP	MK-PVBGxK14
D	with coupling SAE C 14T-12/24 DP	MK-PVBGxK15

Code	Thru drive option
No adaptor for 2nd pump	
T	Single pump prepared for thru drive
	with adaptor for 2nd pump as single part ⁶⁾
A	SAE A, Ø 82.55 mm MK-PVBGxAMN
B	SAE B, Ø 101.6 mm MK-PVBGxBMN
C	SAE C, Ø 127 mm MK-PVBGxCMN
G	metric, Ø 63 mm MK-PVBGxGMN
H	metric, Ø 80 mm MK-PVBGxHMN
J	metric, Ø 100 mm MK-PVBGxJMN
K	metric, Ø 125 mm MK-PVBGxKMN

See dimensions for details

⁶⁾ to be ordered separately as single part
x= Frame size, see displacement.

Code			Control options		
0	0	1	No control		
1	0	0	With cover plate, no control function		
M	M		Standard pressure control, integrated pilot valve		
M	R		Remote pressure control, integrated pilot valve		
M	F		Load Sensing (flow) control, integrated pilot valve		
M	T		Two spool LS control		
Control variation					
	C		Standard version ¹⁾		
	1		NG6 interface top side for pilot valves		
	W		With unloading function, 24VDC solenoid ¹⁾		
	K		Prop.-pilot valve type PVACRE..35 mounted		
	Z		Without integrated pilot valve, NG6 interface, for mounting of accessory code PVAC*		
	P		MT1 with mounted pilot valve PVAC1P ²⁾		

1) not for MT
 2) only for MT

Horse power / Torque control					
Displacem.			Code		
032	046			Nominal HP at 1.500 rpm	Nominal torque
			D	5.5 kW	35 Nm
			E	7.5 kW	50 Nm
			G	11 kW	71 Nm
			H	15 kW	97 Nm
			K	18.5 kW	120 Nm
			M	22 kW	142 Nm
			S	30 kW	195 Nm
Function					
			L	Horse power control with pressure control	
			C	Horse power control with load sensing (single spool)	
Control variation					
			C	Standard version	
			1	NG 6 interface top side	
			W	With unloading function, 24 VDC solenoid	
			K	Prop.-pilot valve type PVACRE..35 mounted	
			Z	Without integrated pilot valve, NG6 interface, for mounting of accessory code PVAC*	

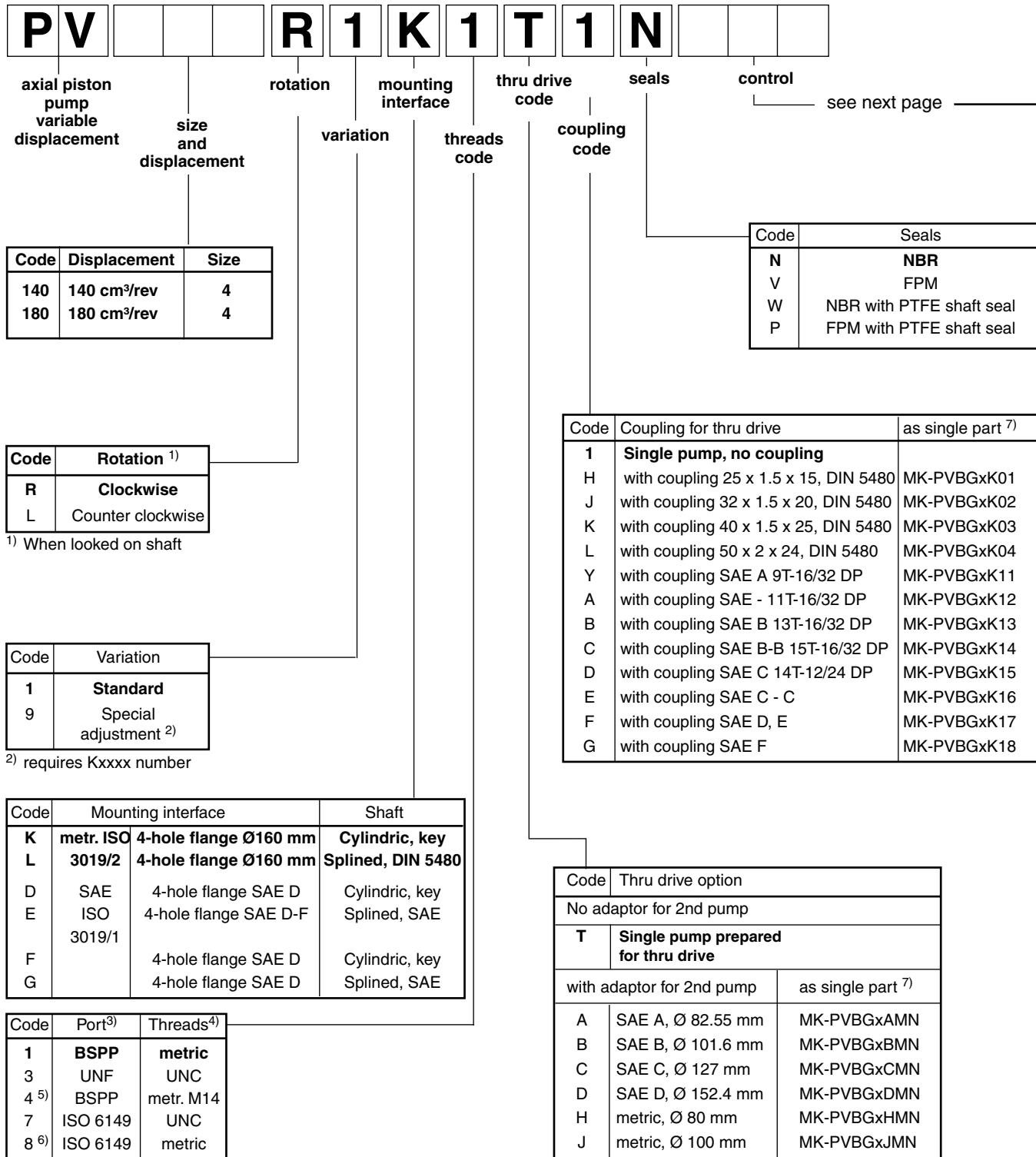
Code				Control option
electro hydraulic control				
F	P	V		Proportional displacement control, no pressure compensation
U	P			Proportional displacement control, with pressure compensation
Control variation				
		R	pilot operated pressure control, open NG6 interface	
		K	pilot operated pressure control, proportional pilot valve type PVACRE..35 mounted	
		M	pilot operated pressure control, pressure sensor and proportional pilot valve type PVACRE..35 mounted for pressure control and/or power control	

Code			Control options		
0	0	1	No control		
1	0	0	With cover plate, no control function		
M	M		Standard pressure control, integrated pilot valve		
M	R		Remote pressure control, integrated pilot valve		
M	F		Load Sensing (flow) control, integrated pilot valve		
M	T		Two spool LS control		
Control variation					
	C		Standard version ¹⁾		
	1		NG6 interface top side for pilot valves		
	W		With unloading function, 24VDC solenoid ¹⁾		
	K		Prop.-pilot valve type PVACRE..35 mounted		
	Z		Without integrated pilot valve, NG6 interface, for mounting of accessory code PVAC*		
	P		MT1 with mounted pilot valve PVAC1P ²⁾		

1) not for MT
 2) only for MT

Horse power / Torque control					
Displacem.			Code		
063	092			Nominal HP at 1.500 rpm	
			G	11 kW	
			H	15 kW	
			K	18.5 kW	
			M	22kW	
			S	30 kW	
			T	37 kW	
			U	45 kW	
			W	55 kW	
Function					
			L	Horse power control with pressure control	
			C	Horse power control with load sensing (single spool)	
Control variation					
			C	Standard version	
			1	NG 6 interface top side	
			W	With unloading function, 24 VDC solenoid	
			K	Prop.-pilot valve type PVACRE..35 mounted	
			Z	Without integrated pilot valve, NG6 interface, for mounting of accessory code PVAC*	

Code			Control option
electro hydraulic control			
F	P	V	Proportional displacement control, no pressure compensation
U	P		Proportional displacement control, with pressure compensation
Control variation			
	R		pilot operated pressure control, open NG6 interface
	K		pilot operated pressure control, proportional pilot valve type PVACRE..35 mounted
	M		pilot operated pressure control, pressure sensor and proportional pilot valve type PVACRE..35 mounted for pressure control and/or power control



³⁾ Drain, gauge and flushing ports

⁴⁾ All mounting and connecting threads

⁵⁾ Pressure port 1 1/4" with 4 x M14 instead of 4 x M12

⁶⁾ Mounting interface, code K and L only

See dimensions for details

⁷⁾ to be ordered separately as single part
x= Frame size, see displacement.

Code			Control options			
0	0	1	No control			
1	0	0	With cover plate, no control function			
M	M		Standard pressure control, integrated pilot valve			
M	R		Remote pressure control, integrated pilot valve			
M	F		Load Sensing (flow) control, integrated pilot valve			
M	T		Two spool LS control			
Control variation						
	C		Standard version ¹⁾			
	1		NG6 interface top side for pilot valves			
	W		With unloading function, 24VDC solenoid ¹⁾			
	K		Prop.-pilot valve type PVACRE..35 mounted			
	Z		Without integrated pilot valve, NG6 interface, for mounting of accessory code PVAC*			
	P		MT1 with mounted pilot valve PVAC1P ²⁾			

1) not for MT
2) only for MT

Horse power / Torque control						
Displacem.				Code		
140	180					Nominal HP at 1.500 rpm
				K		18.5 kW
				M		22 kW
				S		30 kW
				T		37 kW
				U		45 kW
				W		55 kW
				Y		75 kW
				Z		90 kW
			2			110 kW
Nominal torque						
						120 Nm
						142 Nm
						195 Nm
						240 Nm
						290 Nm
						355 Nm
						485 Nm
						585 Nm
						715 Nm
Function						
			L			Horse power control with pressure control
			C			Horse power control with load sensing (single spool)
Control variation						
			C			Standard version
			1			NG 6 interface top side
			W			With unloading function, 24 VDC solenoid
			K			Prop.-pilot valve type PVACRE..35 mounted
			Z			Without integrated pilot valve, NG6 interface, for mounting of accessory code PVAC*

Code			Control option	
electro hydraulic control				
F	P	V	Proportional displacement control, no pressure compensation	
U	P		Proportional displacement control, with pressure compensation	
Control variation				
		R	pilot operated pressure control, open NG6 interface	
		K	pilot operated pressure control, proportional pilot valve type PVACRE..35 mounted	
		M	pilot operated pressure control, pressure sensor and proportional pilot valve type PVACRE..35 mounted for pressure control and/or power control	

P	V			R	1	K	1	T	1	N			
axial piston pump variable displacement high pressure version	size and displacement	rotation	mounting interface	thru drive code	seals	compensator							
			variation	threads code	coupling code								
						see next page							
Code	Displacement	Size					Code	Seals					
270	270 cm³/rev	5					N	NBR					
							V	FPM					
							W	NBR with PTFE shaft seal					
							P	FPM with PTFE shaft seal					
Code	Rotation ¹⁾						Code	Coupling for thru drive	as single part ⁶⁾				
R	Clockwise						1	Single pump, no coupling					
L	Counter clockwise						H	with coupling 25 x 1.5 x 15, DIN 5480	MK-PVBGxK01				
							J	with coupling 32 x 1.5 x 20, DIN 5480	MK-PVBGxK02				
							K	with coupling 40 x 1.5 x 25, DIN 5480	MK-PVBGxK03				
							L	with coupling 50 x 2 x 24, DIN 5480	MK-PVBGxK04				
							M	with coupling 60 x 2 x 28, DIN 5480	MK-PVBGxK05				
							Y	with coupling SAE A 9T-16/32 DP	MK-PVBGxK11				
							A	with coupling SAE - 11T-16/32 DP	MK-PVBGxK12				
							B	with coupling SAE B 13T-16/32 DP	MK-PVBGxK13				
							C	with coupling SAE B-B 15T-16/32 DP	MK-PVBGxK14				
							D	with coupling SAE C 14T-12/24 DP	MK-PVBGxK15				
							E	with coupling SAE C - C	MK-PVBGxK16				
							F	with coupling SAE D, E	MK-PVBGxK17				
Code	Variation						Code	Thru drive option					
1	Standard						No adaptor for 2nd pump						
9	special adjustment ²⁾						T	Single pump prepared for thru drive					
							with adaptor for 2nd pump	as single part ⁶⁾					
Code	Mounting interface	Shaft					A	SAE A, Ø 82.55 mm	MK-PVBGxAMN				
K	metr. ISO 3019/2	4-hole flange Ø200 mm	Cylindric, key				B	SAE B, Ø 101.6 mm	MK-PVBGxBMN				
L		4-hole flange Ø200 mm	Splined, DIN 5480				C	SAE C, Ø 127 mm	MK-PVBGxCMN				
D	SAE	4-hole flange SAE E	Cylindric, key				D	SAE D, Ø 152,4 mm	MK-PVBGxDMN				
E	ISO 3019/1	4-hole flange SAE E-F	Splined, SAE				E	SAE E, Ø 165,1 mm	MK-PVBGxEMN				
Code	Port ⁴⁾	Threads ⁵⁾					H	metric, Ø 80 mm	MK-PVBGxHMN				
1	BSPP	metric					J	metric, Ø 100 mm	MK-PVBGxJMN				
3	UNF	UNC					K	metric, Ø 125 mm	MK-PVBGxKMN				
7	ISO 6149	UNC					L	metric, Ø 160 mm	MK-PVBGxLMN				
8	ISO 6149	metric					M	metric, Ø 200 mm	MK-PVBGxMMN				
Code	Port ⁴⁾	Threads ⁵⁾											
1	BSPP	metric											
3	UNF	UNC											
7	ISO 6149	UNC											
8	ISO 6149	metric											

4) Drain, gauge and flushing ports

5) All mounting and connecting threads

See dimensions for details

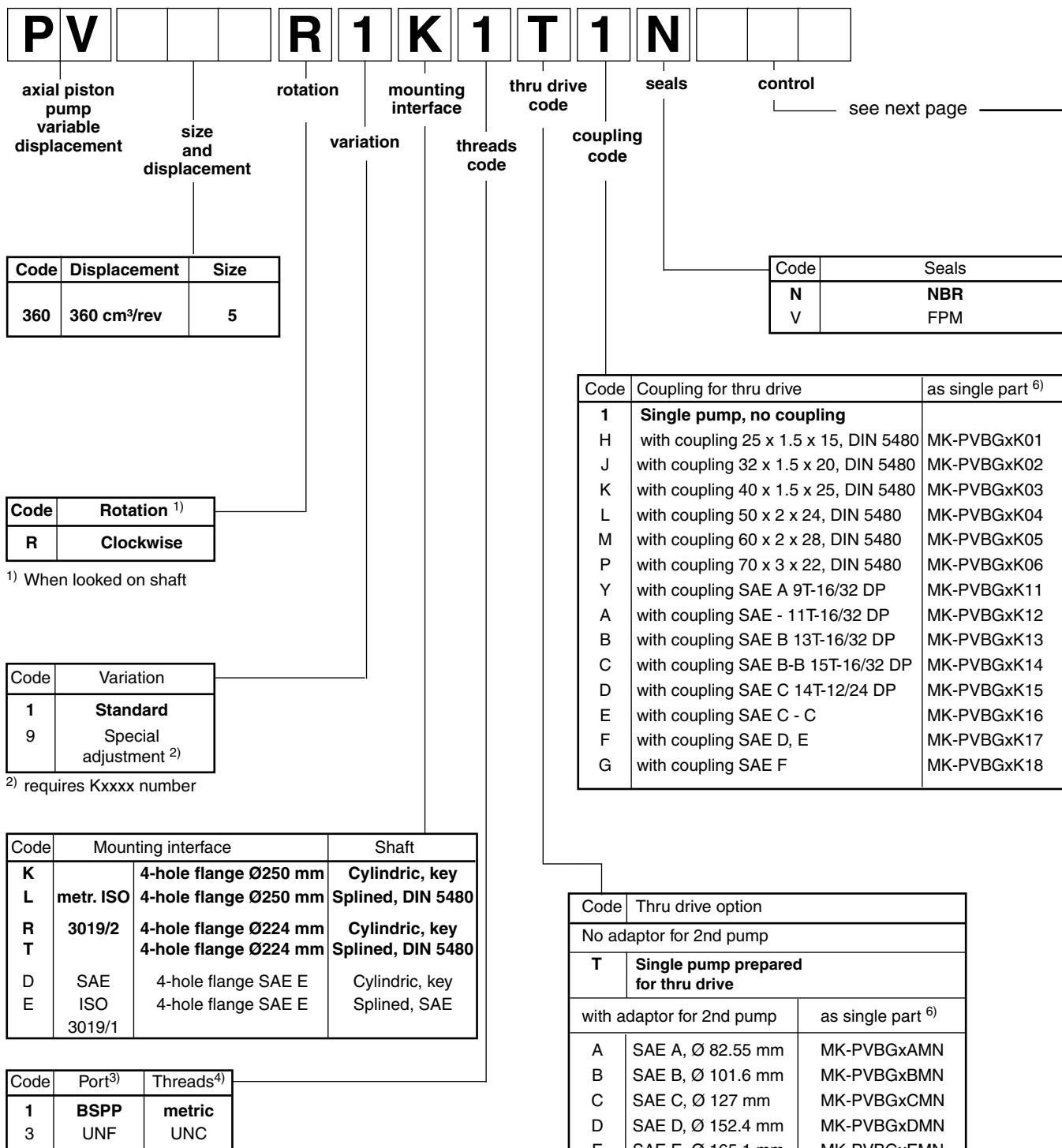
6) to be ordered separately as single part
x= Frame size, see displacement.

Code			Control options		
0	0	1	No control		
1	0	0	With cover plate, no control function		
M	M		Standard pressure control, integrated pilot valve		
M	R		Remote pressure control, integrated pilot valve		
M	F		Load Sensing (flow) control, integrated pilot valve		
M	T		Two spool LS control		
Control variation					
	C		Standard version ¹⁾		
	1		NG6 interface top side for pilot valves		
	W		With unloading function, 24VDC solenoid ¹⁾		
	K		Prop.-pilot valve type PVACRE..35 mounted		
	Z		Without integrated pilot valve, NG6 interface, for mounting of accessory code PVAC*		
	P		MT1 with mounted pilot valve PVAC1P ²⁾		

1) not for MT
 2) only for MT

Horse power / Torque control					
Displacem.			Code		
270				Nominal HP at 1.500 rpm	Nominal torque
			T	37 kW	240 Nm
			U	45 kW	290 Nm
			W	55 kW	350 Nm
			Y	75 kW	480 Nm
			Z	90 kW	580 Nm
			2	110 kW	700 Nm
			3	132 kW	840 Nm
Function					
			L	Horse power control with pressure control	
			C	Horse power control with load sensing (single spool)	
Control variation					
			C	Standard version	
			1	NG 6 interface top side	
			W	With unloading function, 24 VDC solenoid	
			K	Prop.-pilot valve type PVACRE..35 mounted	
			Z	Without integrated pilot valve, NG6 interface, for mounting of accessory code PVAC*	

Code			Control option
electro hydraulic control			
F	P	V	Proportional displacement control, no pressure compensation
U	P		Proportional displacement control, with pressure compensation
Control variation			
		R	pilot operated pressure control, open NG6 interface
		K	pilot operated pressure control, proportional pilot valve type PVACRE..35 mounted
		M	pilot operated pressure control, pressure sensor and proportional pilot valve type PVACRE..35 mounted for pressure control and/or power control

³⁾ Drain, gauge and flushing ports⁴⁾ All mounting and connecting threads

Code	Coupling for thru drive	as single part ⁶⁾
1	Single pump, no coupling	
H	with coupling 25 x 1.5 x 15, DIN 5480	MK-PVBGxK01
J	with coupling 32 x 1.5 x 20, DIN 5480	MK-PVBGxK02
K	with coupling 40 x 1.5 x 25, DIN 5480	MK-PVBGxK03
L	with coupling 50 x 2 x 24, DIN 5480	MK-PVBGxK04
M	with coupling 60 x 2 x 28, DIN 5480	MK-PVBGxK05
P	with coupling 70 x 3 x 22, DIN 5480	MK-PVBGxK06
Y	with coupling SAE A 9T-16/32 DP	MK-PVBGxK11
A	with coupling SAE - 11T-16/32 DP	MK-PVBGxK12
B	with coupling SAE B 13T-16/32 DP	MK-PVBGxK13
C	with coupling SAE B-B 15T-16/32 DP	MK-PVBGxK14
D	with coupling SAE C 14T-12/24 DP	MK-PVBGxK15
E	with coupling SAE C - C	MK-PVBGxK16
F	with coupling SAE D, E	MK-PVBGxK17
G	with coupling SAE F	MK-PVBGxK18

Code	Thru drive option	
No adaptor for 2nd pump		
T	Single pump prepared for thru drive	
with adaptor for 2nd pump		as single part ⁶⁾
A	SAE A, Ø 82.55 mm	MK-PVBGxAMN
B	SAE B, Ø 101.6 mm	MK-PVBGxBMN
C	SAE C, Ø 127 mm	MK-PVBGxCMN
D	SAE D, Ø 152.4 mm	MK-PVBGxDMN
E	SAE E, Ø 165.1 mm	MK-PVBGxEVN
H	metric, Ø 80 mm	MK-PVBGxHMN
J	metric, Ø 100 mm	MK-PVBGxJMN
K	metric, Ø 125 mm	MK-PVBGxKMN
L	metric, Ø 160 mm	MK-PVBGxLMN
M	metric, Ø 200 mm	MK-PVBGxMMN

See dimensions for details

⁶⁾ to be ordered separately as single part
x= Frame size, see displacement.

Code			Control options		
0	0	1	No control		
1	0	0	With cover plate, no control function		
M	M		Standard pressure control, integrated pilot valve		
M	R		Remote pressure control, integrated pilot valve		
M	F		Load Sensing (flow) control, integrated pilot valve		
M	T		Two spool LS control		
Control variation					
	C		Standard version ¹⁾		
	1		NG6 interface top side for pilot valves		
	W		With unloading function, 24VDC solenoid ¹⁾		
	K		Prop.-pilot valve type PVACRE..35 mounted		
	Z		Without integrated pilot valve, NG6 interface, for mounting of accessory code PVAC*		
	P		MT1 with mounted pilot valve PVAC1P ²⁾		

1) not for MT
 2) only for MT

Horse power / Torque control					
Displacem.			Code		
360				Nominal HP at 1.500 rpm	Nominal torque
			U	45 kW	290 Nm
			W	55 kW	350 Nm
			Y	75 kW	480 Nm
			Z	90 kW	580 Nm
			2	110 kW	700 Nm
			3	132 kW	840 Nm
			4	160 kW	1020 Nm
			5	180 kW	1150 Nm
			6	200 kW	1280 Nm
Function					
			L	Horse power control with pressure control	
			C	Horse power control with load sensing (single spool)	
Control variation					
			C	Standard version	
			1	NG 6 interface top side	
			W	With unloading function, 24 VDC solenoid	
			K	Prop.-pilot valve type PVACRE..35 mounted	
			Z	Without integrated pilot valve, NG6 interface, for mounting of accessory code PVAC*	

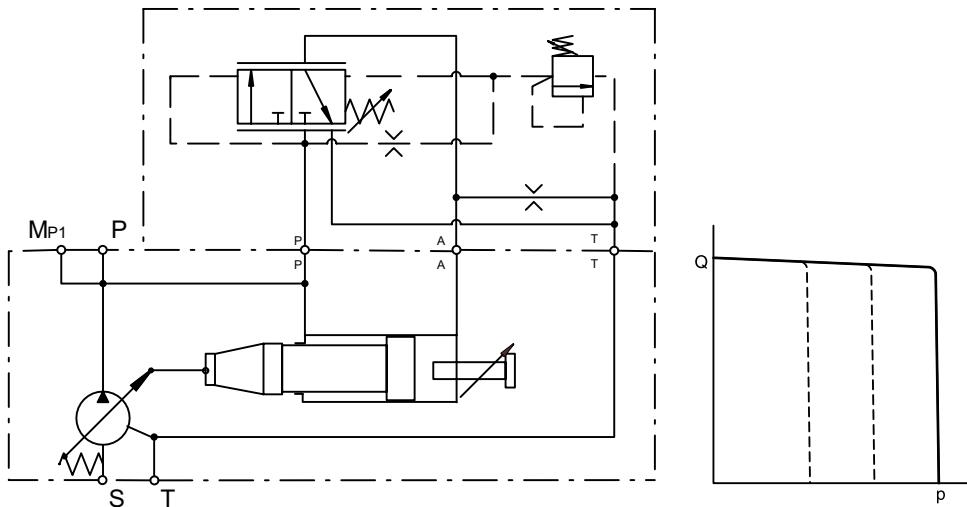
Code			Control option
electro hydraulic control			
F	P	V	Proportional displacement control, no pressure compensation
U	P		Proportional displacement control, with pressure compensation
Control variation			
		R	pilot operated pressure control, open NG6 interface
		K	pilot operated pressure control, proportional pilot valve type PVACRE..35 mounted
		M	pilot operated pressure control, pressure sensor and proportional pilot valve type PVACRE..35 mounted for pressure control and/or power control

Standard Pressure Control

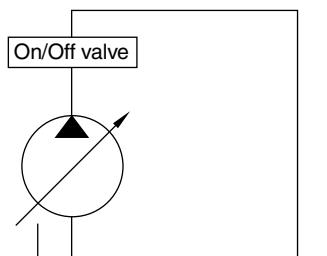
Control option MMC

The standard pressure control adjusts the pump displacement according to the actual need of flow in the system in order to keep the pressure constant.

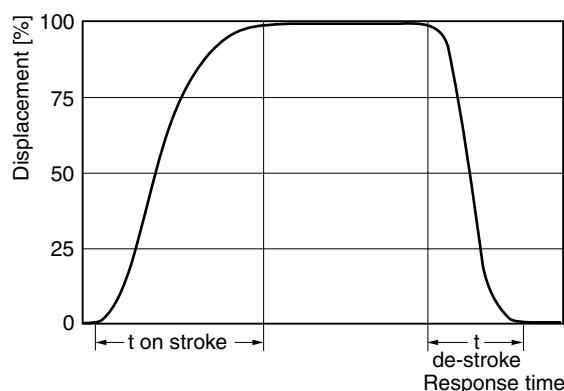
Control schematics



Response times of the pump are collected from a circuit as below by measuring the pumps swash angle movement at different pressures.



Dynamic characteristic of flow control *



	Time on-stroke [ms]		Time de-stroke [ms]	
	against 50 bar	against 350 bar	zero stroke 50 bar	zero stroke 350 bar
PV360	520	180	120	82

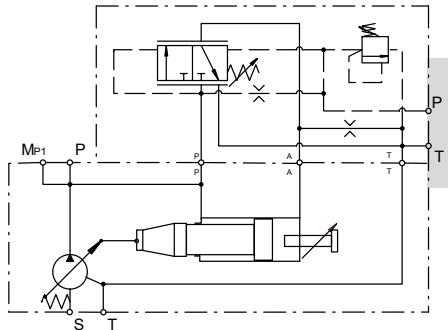
Pressure adjustment range	15 to 350 bar
Factory setting pressure	50 bar
Differential pressure adjustment range	10 to 40 bar
Factory setting differential pressure	15 bar
Control oil consumption	Max 8.0 l/min

Standard Pressure Control with NG6 Interface

Control option MM1

With code MM1 the standard pressure control has a valve interface size NG 6 DIN 24340 (CETOP 03 acc. RP35H, NFPA D03) on the top side.

This interface allows the mounting of accessories like multiple pressure selectors without the need of external piping and valve mounting.

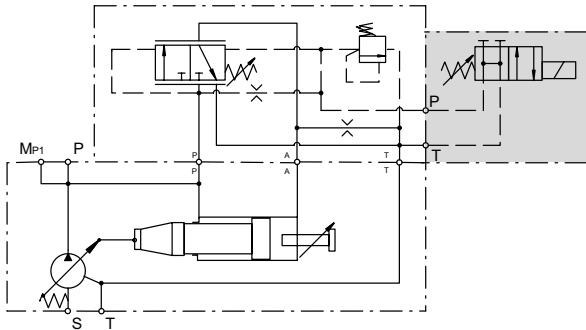


Standard Pressure Control with Electrical Unloading

Control option MMW

With code MMW a solenoid operated directional control valve (D1VW002KNJW) for electrical unloading is mounted on the control top side.

When the solenoid is de-energised, the pump compensates at a stand-by pressure of typically 15 bar. When the solenoid is energised, the pump compensates at the pressure adjusted on the integrated pilot valve.

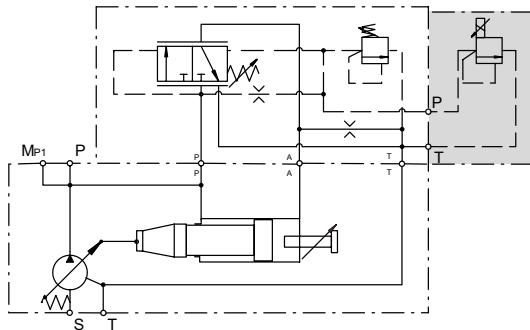


Standard Pressure Control with Proportional Pilot Valve

Control option MMK

With code MMK a proportional pilot valve of type PVACRE..35 (see page 35) is mounted on the top side interface.

This allows a variation of the pump compensating pressure between 20 and 350 bar by an electrical signal.

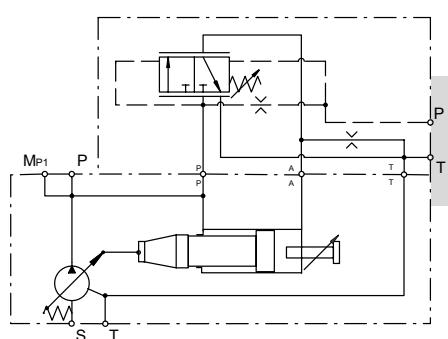


Standard Pressure Control with Accessory

Control option MMZ

Control MMZ has no integrated pilot valve but a valve interface NG6 DIN 24340 on the top.

This version is recommended for valve accessories.

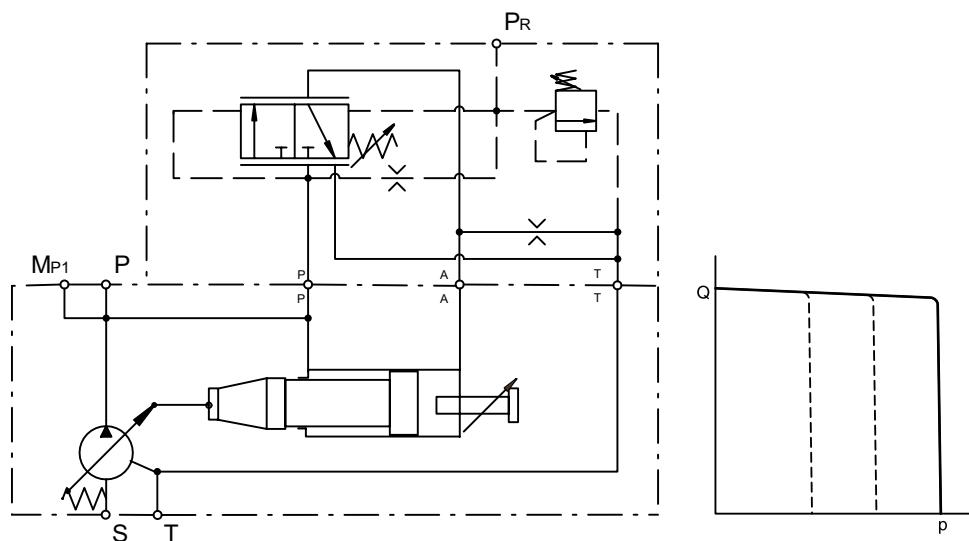


Remote Pressure Control

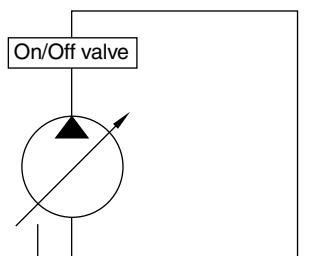
Control option MRC

The remote pressure control adjusts the pump displacement according to the actual need of flow in the system in order to keep the pressure constant at a level given by a remotely installed pilot valve.

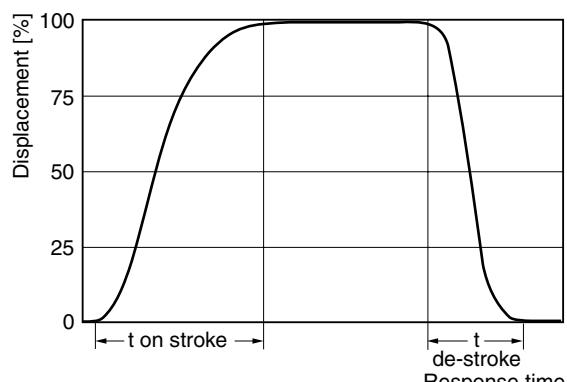
Control schematics



Response times of the pump are collected from a circuit as below by measuring the pumps swash angle movement at different pressures.



Dynamic characteristic of flow control *



* Curve shown exaggerated

	Time on-stroke [ms]		Time de-stroke [ms]	
	against 50 bar	against 350 bar	zero stroke 50 bar	zero stroke 350 bar
PV360	520	180	120	82

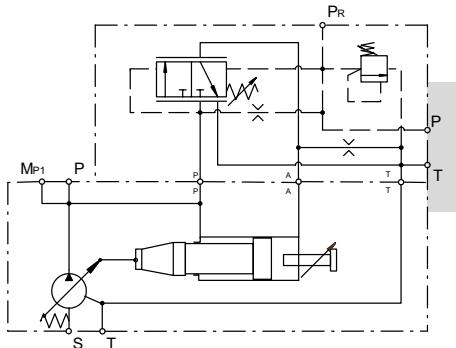
Pressure adjustment range	15 to 350 bar
Factory setting pressure	50 bar
Differential pressure adjustment range	10 to 40 bar
Factory setting differential pressure	15 bar
Control oil consumption	Max 8.0 l/min

Remote Pressure Control with NG6 Interface

Control option MR1

With code MR1 the remote pressure control has a valve interface size NG 6 DIN 24340 (CETOP 03 acc. RP35H, NFPA D03) on the top side.

This interface allows the mounting of accessories like multiple pressure selectors without the need of external piping and valve mounting.

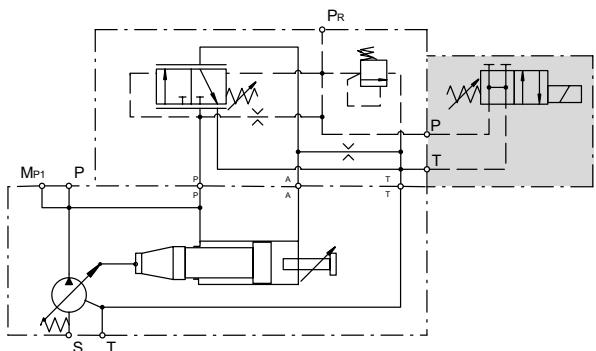


Remote Pressure Control with Electrical Unloading

Control option MRW

With code MRW a solenoid operated directional control valve (D1VW002KNJW) for electrical unloading is mounted on the control top side.

When the solenoid is de-energised, the pump compensates at a stand-by pressure of typically 15 bar. When the solenoid is energised, the pump compensates at the pressure adjusted on the integrated pilot valve.

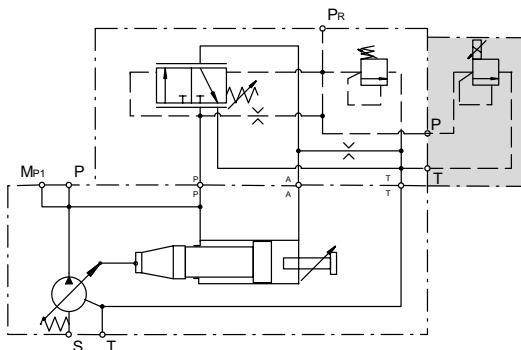


Remote Pressure Control with Proportional Pilot Valve

Control option MRK

With code MRK a proportional pilot valve of type PVACRE..35 (see page 35) is mounted on the top side interface.

This allows a variation of the pump compensating pressure between 20 and 350 bar by an electrical signal.

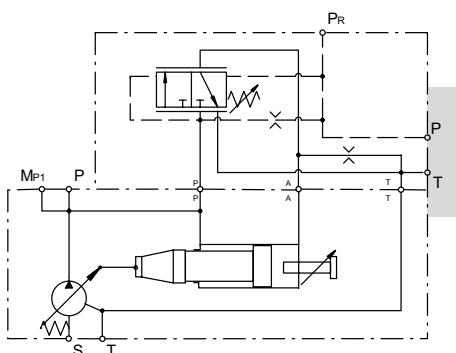


Remote Pressure Control with Accessory

Control option MRZ

Control MRZ has no integrated pilot valve but a valve interface NG6 DIN 24340 on the top.

This version is recommended for valve accessories.

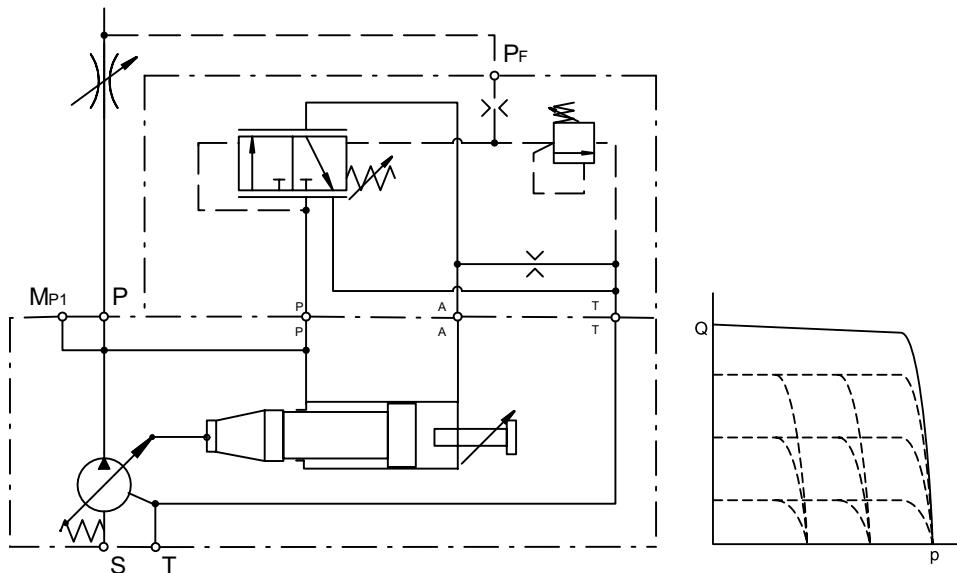


Load Sensing Control

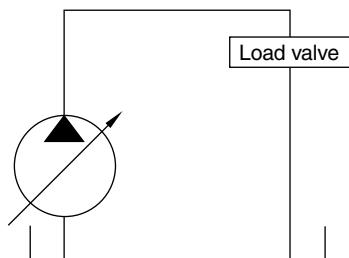
Control option MFC

The pilot pressure of the load sensing control is taken from a load sensing port in the hydraulic system. It is used to match pump flow to system demands.

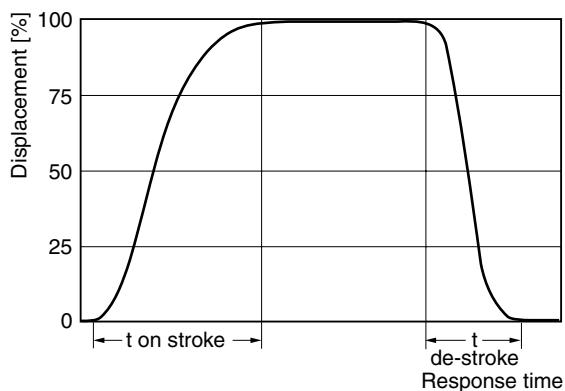
Control schematics



Response times of the pump are collected from a circuit as below by measuring the pumps swash angle movement at different pressures.



Dynamic characteristic of flow control *



* Curve shown exaggerated

	Time on-stroke [ms]		Time de-stroke [ms]	
	stand-by to 50 bar	stand-by to 350 bar	50 bar to stand-by	350 bar to stand-by
PV360	500	690	830	50

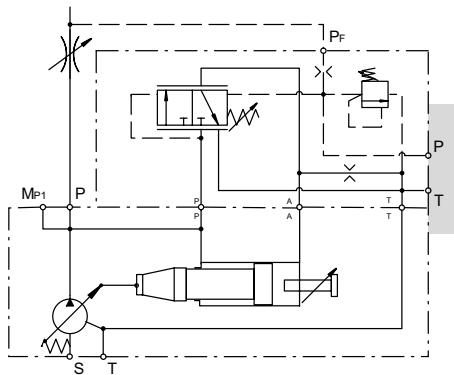
Pressure adjustment range	15 to 350 bar
Factory setting pressure	50 bar
Differential pressure adjustment range	10 to 40 bar
Factory setting differential pressure	10 bar
Control oil consumption	Max 8.0 l/min

Load Sensing Control with NG6 Interface

Control option MF1

With code MF1 the remote pressure control has a valve interface size NG 6 DIN 24340 (CETOP 03 acc. RP35H, NFPA D03) on the top side.

This interface allows the mounting of accessories like multiple pressure selectors without the need of external piping and valve mounting.

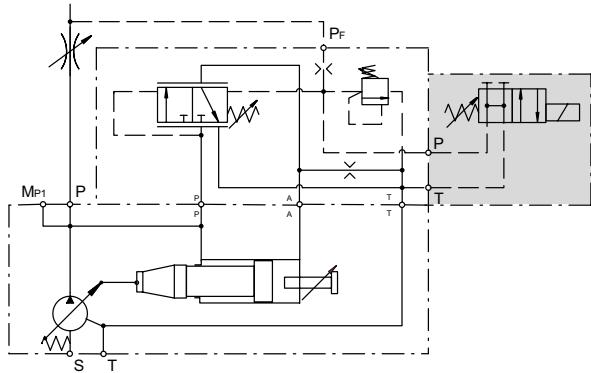


Load Sensing Control with Electrical Unloading

Control option MFW

With code MFW a solenoid operated directional control valve (D1VW002KNJW) for electrical unloading is mounted on the control top side.

When the solenoid is de-energised, the pump compensates at a stand-by pressure of typically 15 bar. When the solenoid is energised, the pump compensates at the pressure adjusted on the integrated pilot valve.

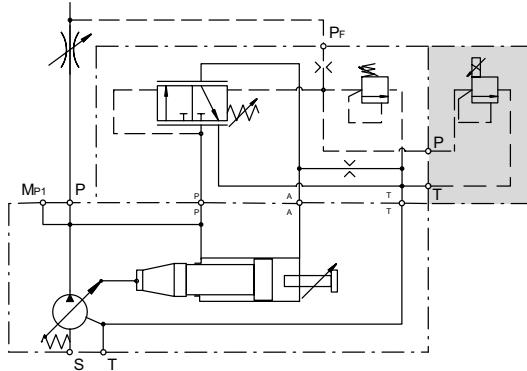


Load Sensing Control with Proportional Pilot Valve

Control option MFK

With code MFK a proportional pilot valve of type PVACRE..35 (see page 35) is mounted on the top side interface.

This allows a variation of the pump compensating pressure between 20 and 350 bar by an electrical signal.

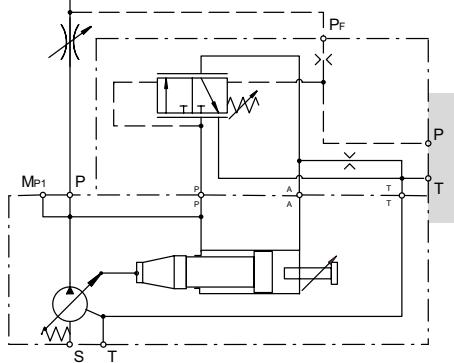


Load Sensing Control with Accessory

Control option MFZ

Control MFZ has no integrated pilot valve but a valve interface NG6 DIN 24340 on the top.

This version is recommended for valve accessories.

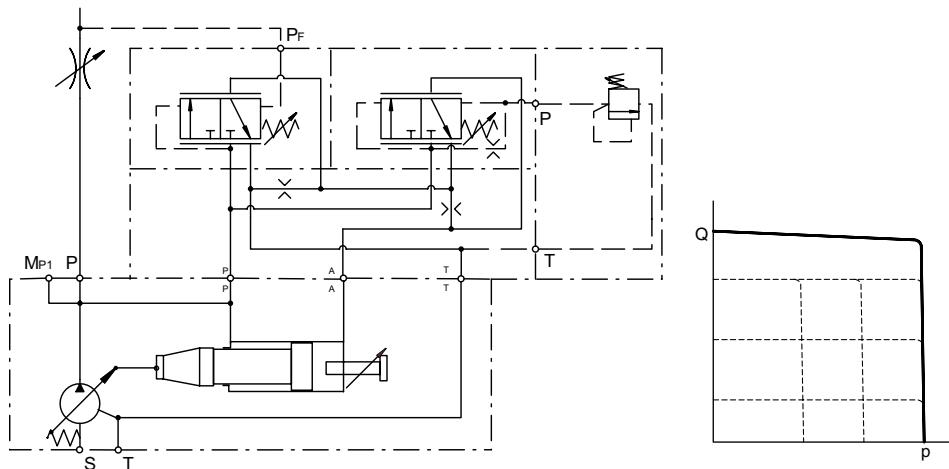


2 Spool Load Sensing Control

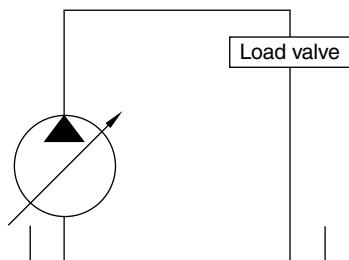
Control option MTP

The pilot pressure of the load sensing control is taken from a load sensing port in the hydraulic system. It is used to match pump flow to system demands. With the 2 spool control the interaction of the two control functions is avoided by using two separate control valves for flow and pressure compensation.

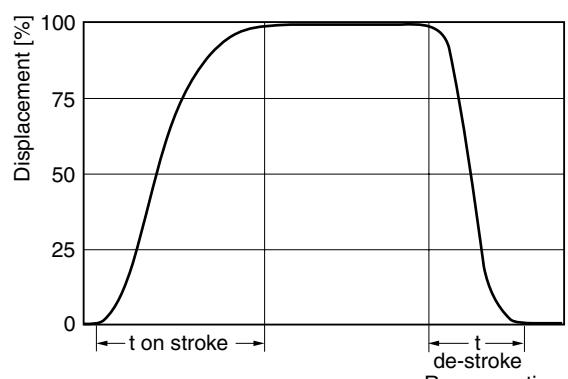
Control schematics



Response times of the pump are collected from a circuit as below by measuring the pumps swash angle movement at different pressures.



Dynamic characteristic of flow control *



* Curve shown exaggerated

	Time on-stroke [ms]		Time de-stroke [ms]	
	stand-by to 50 bar	stand-by to 350 bar	50 bar to stand-by	350 bar to stand-by
PV360	920	670	1000	170

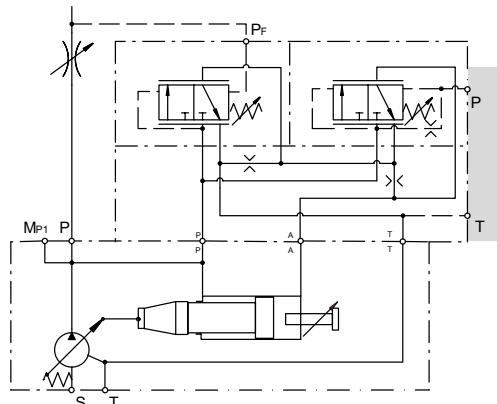
Pressure adjustment range	15 to 350 bar
Factory setting pressure	50 bar
Differential pressure adjustment range	10 to 40 bar
Factory setting differential pressure load sensing	10 bar
Factory setting differential pressure, pressure control	15 bar
Control oil consumption	Max 8.0 l/min

2 Spool Load Sensing Control with NG6 Interface

Control option MT1

With code MT1 the remote pressure control has a valve interface size NG 6 DIN 24340 (CETOP 03 acc. RP35H, NFPA D03) on the top side.

This interface allows the mounting of accessories like multiple pressure selectors without the need of external piping and valve mounting.

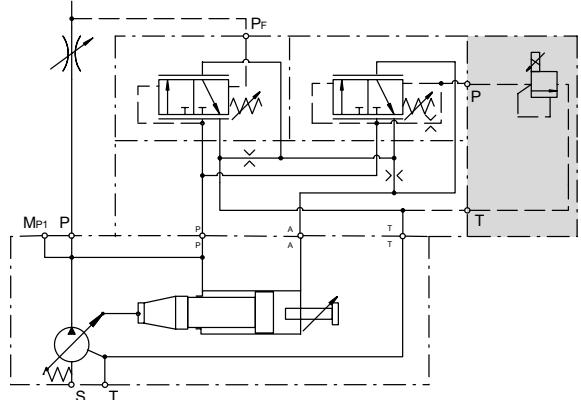


2 Spool Load Sensing Control with Proportional Pilot Valve

Control option MTK

With code MTK a proportional pilot valve of type PVACRE..35 (see page 35) is mounted on the top side interface.

This allows a variation of the pump compensating pressure between 20 and 350 bar by an electrical signal.

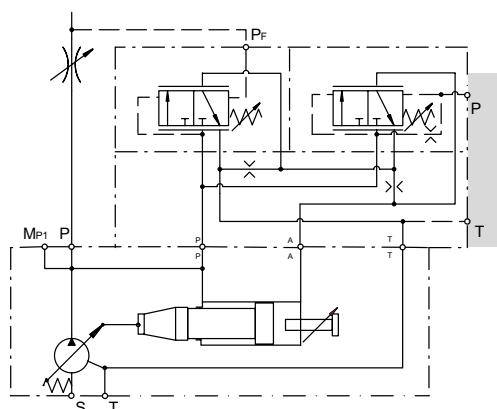


2 Spool Load Sensing Control with Accessory

Control option MTZ

Control MTZ has a valve accessory factory mounted on the NG6 interface.

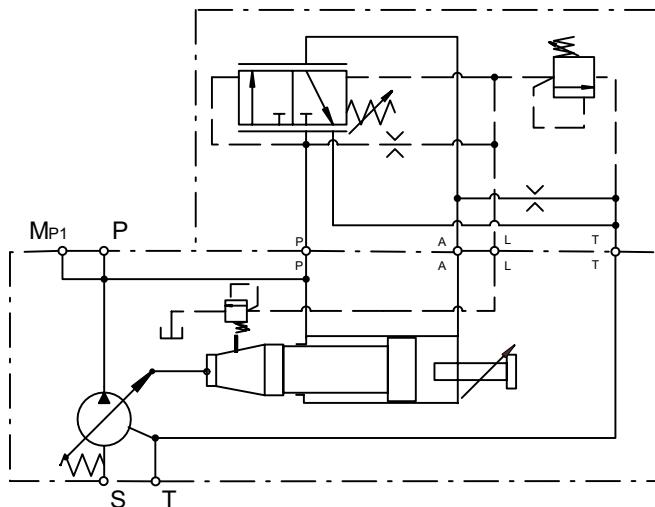
Available valve accessory can be seen on page 33.
Specify the accessory with full ordering code.



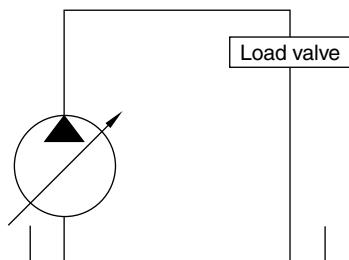
Horse Power/Torque Controls with Pressure Control Control option *LC

The horse power control type *L* provides the benefit of the pressure control, plus the ability to limit the input power the pump will draw. These controls are beneficial when the power available from the prime mover for the hydraulics is limited or the application power demand has both high flow/low pressure and low flow/high pressure duty cycles.

Control schematics



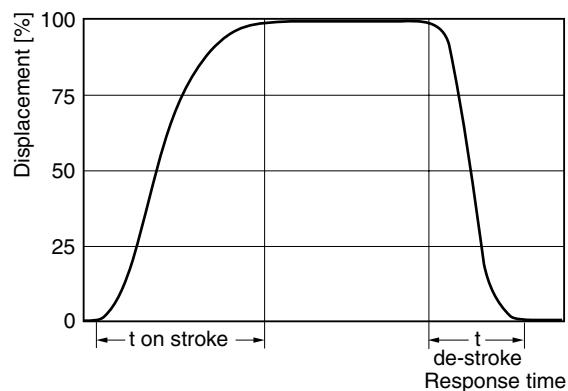
Response times of the pump are collected from a circuit as below by measuring the pumps swash angle movement at different pressures.



	Time on-stroke [ms]		Time de-stroke [ms]	
	against 50 bar	against 350 bar	zero stroke 50 bar	zero stroke 350 bar
PV360	90	90	100	100

Pressure adjustment range	15 to 350 bar
Factory setting pressure	350 bar
Differential pressure adjustment range	10 to 40 bar
Factory setting differential pressure	15 bar
Control oil consumption	Max 8.0 l/min

Dynamic characteristic of flow control *



* Curve shown exaggerated

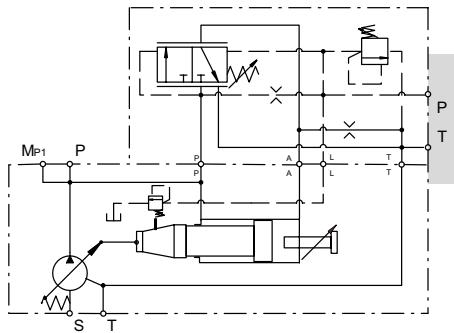
See Horse Power characteristic curves on page 24

Horse Power/Torque Control with NG6 Interface

Control option *L1

With code *L1 the remote pressure control has a valve interface size NG 6 DIN 24340 (CETOP 03 acc. RP35H, NFPA D03) on the top side.

This interface allows the mounting of accessories like multiple pressure selectors without the need of external piping and valve mounting.

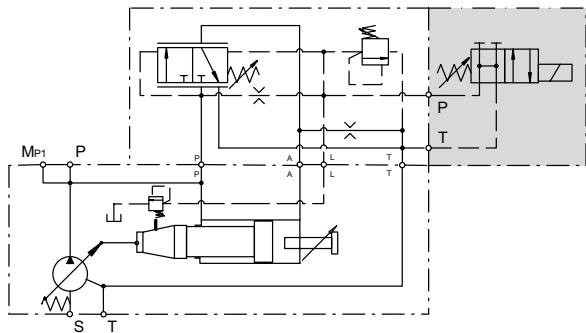


Horse Power/Torque Control with Electrical Unloading

Control option *LW

With code *LW a solenoid operated directional control valve (D1VW002KNJW) for electrical unloading is mounted on the control top side.

When the solenoid is de-energised, the pump compensates at a stand-by pressure of typically 15 bar. When the solenoid is energised, the pump compensates at the pressure adjusted on the integrated pilot valve.

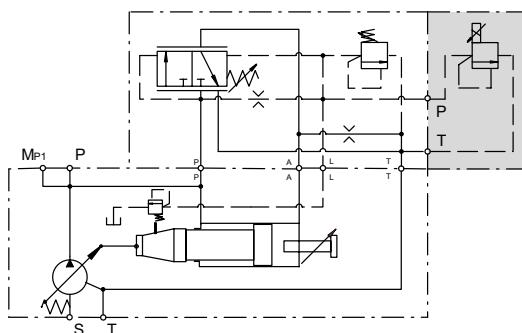


Horse Power/Torque Control with Proportional Pilot Valve

Control option *LK

With code *LK a proportional pilot valve of type PVACRE..35 (see page 35) is mounted on the top side interface.

This allows a variation of the pump compensating pressure between 20 and 350 bar by an electrical signal.

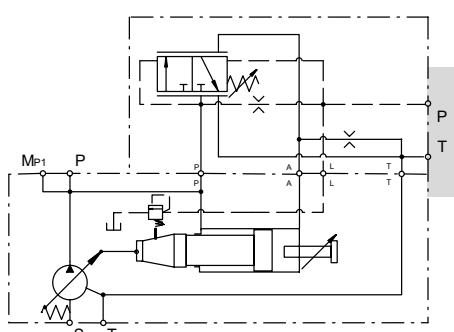


Horse Power/Torque Control with Accessory

Control option *LZ

Control *LZ has no integrated pilot valve but a valve interface NG6 DIN 24340 on the top.

This version is recommended for valve accessories.

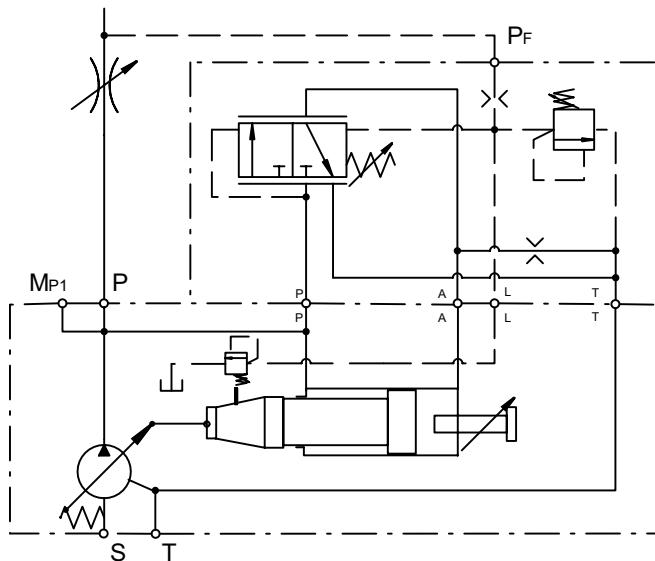


Horse Power/Torque Controls with Load Sensing

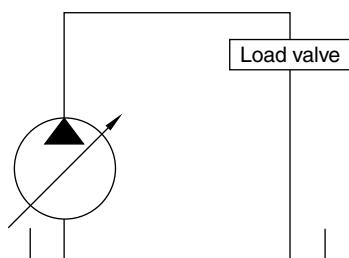
Control option *CC

The horse power control type *C* provides the benefit of the load sensing control, plus the ability to limit the input power the pump will draw. These controls are beneficial when the power available from the prime mover for the hydraulics is limited or the application power demand has both high flow/low pressure and low flow/high pressure duty cycles.

Control schematics



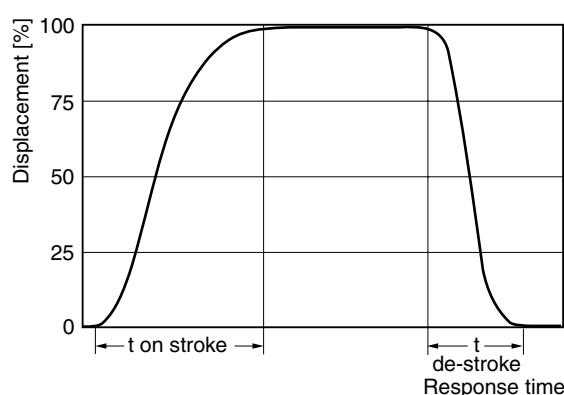
Response times of the pump are collected from a circuit as below by measuring the pumps swash angle movement at different pressures.



	Time on-stroke [ms]		Time de-stroke [ms]	
	stand-by to 50 bar	stand-by to 350 bar	50 bar to stand-by	350 bar to stand-by
PV360	90	90	100	100

Pressure adjustment range	15 to 350 bar
Factory setting pressure	350 bar
Differential pressure adjustment range	10 to 40 bar
Factory setting differential pressure	15 bar
Control oil consumption	Max 8.0 l/min

Dynamic characteristic of flow control *



* Curve shown exaggerated

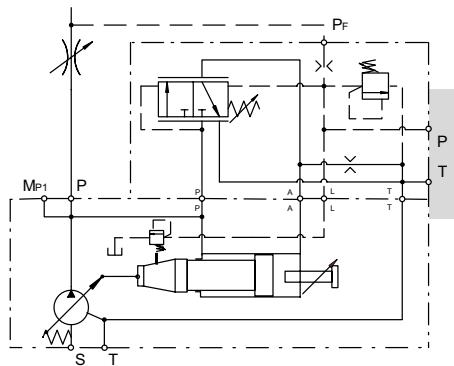
See Horse Power characteristic curves on page 24

Horse Power/Torque Control with NG6 Interface

Control option *C1

With code *C1 the remote pressure control has a valve interface size NG 6 DIN 24340 (CETOP 03 acc. RP35H, NFPA D03) on the top side.

This interface allows the mounting of accessories like multiple pressure selectors without the need of external piping and valve mounting.

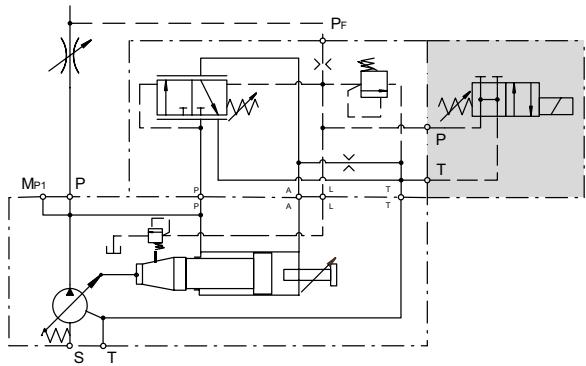


Horse Power/Torque Control with Electrical Unloading

Control option *CW

With code *CW a solenoid operated directional control valve (D1VW002KNJW) for electrical unloading is mounted on the control top side.

When the solenoid is de-energised, the pump compensates at a stand-by pressure of typically 15 bar. When the solenoid is energised, the pump compensates at the pressure adjusted on the integrated pilot valve.

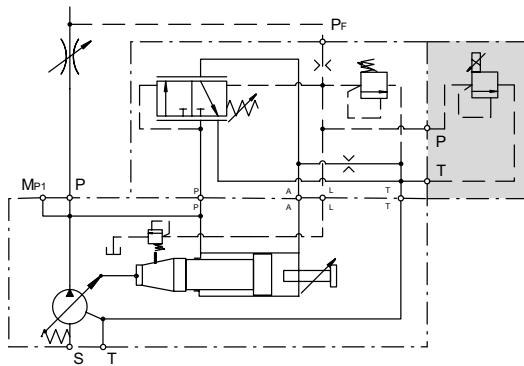


Horse Power/Torque Control with Proportional Pilot Valve

Control option *CK

With code *CK a proportional pilot valve of type PVACRE..35 (see page 35) is mounted on the top side interface.

This allows a variation of the pump compensating pressure between 20 and 350 bar by an electrical signal.

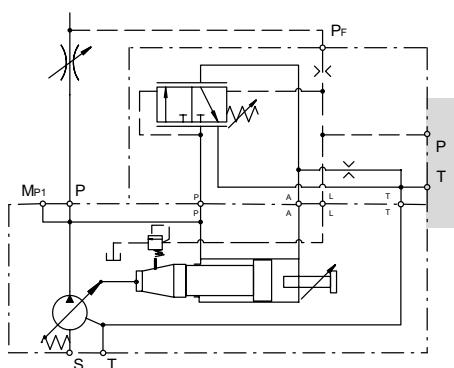


Horse Power/Torque Control with Accessory

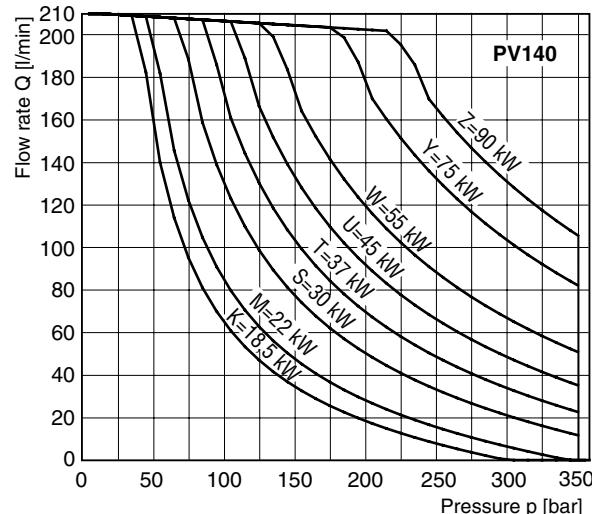
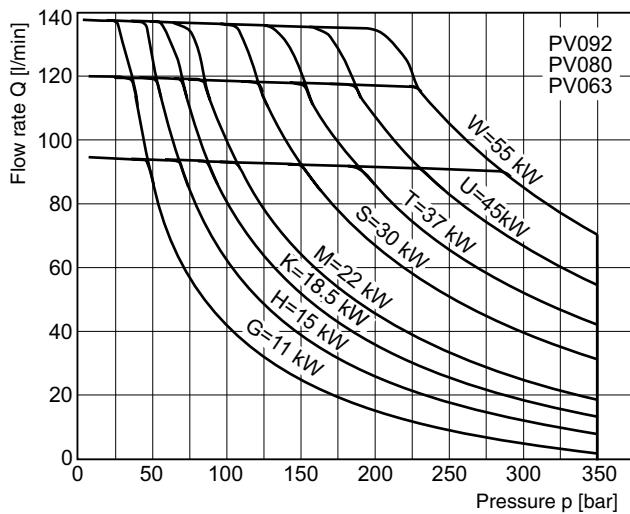
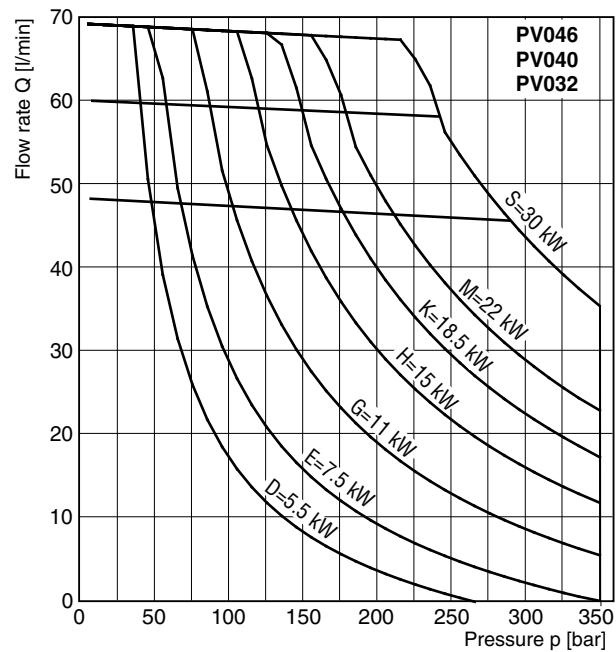
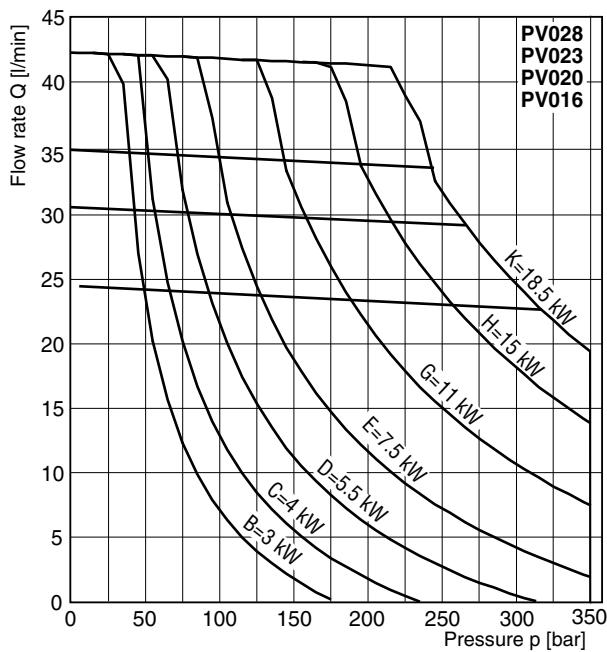
Control option *CZ

Control *CZ has no integrated pilot valve but a valve interface NG6 DIN 24340 on the top.

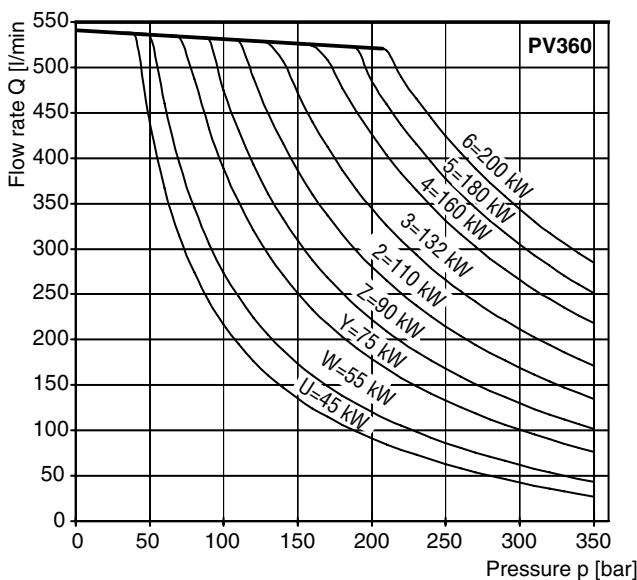
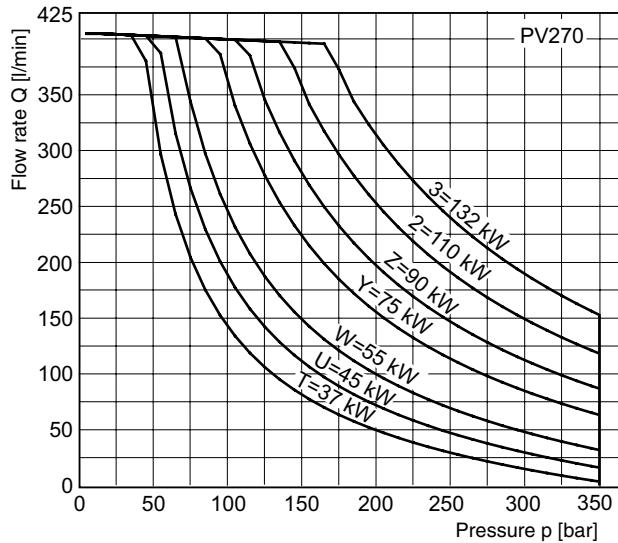
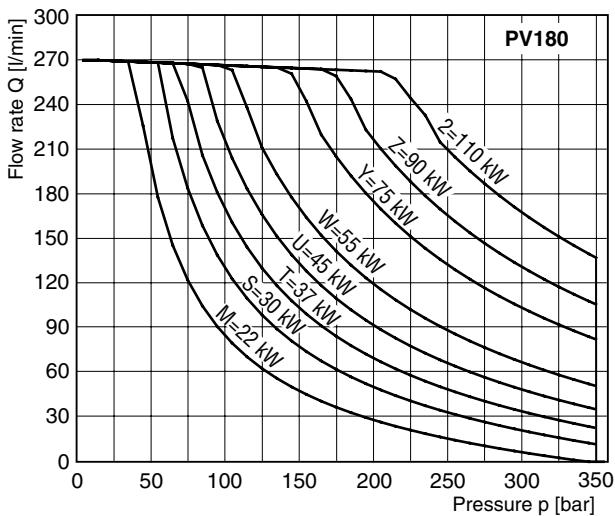
This version is recommended for valve accessories.



Typical Horse Power/Torque Control Characteristics



Typical Horse Power/Torque Control Characteristics



Speed : $n = 1500$ rev/min
 Temperature : $t = 50^\circ\text{C}$
 Fluid : HLP, ISO VG46
 Viscosity : $\nu = 46 \text{ mm}^2/\text{s}$ at 40°C
 Pressure : Maximum 350 bar, depending on HP level

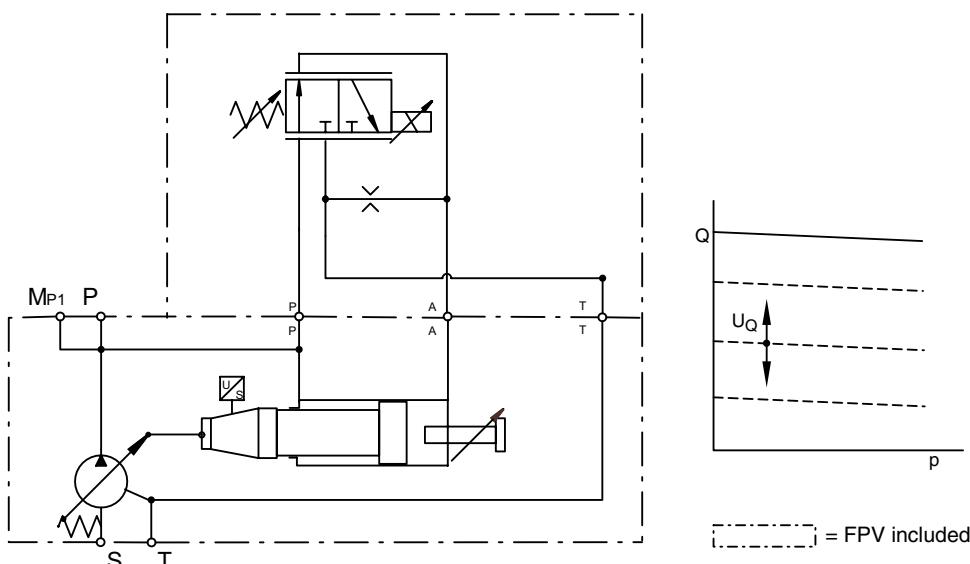
Proportional Displacement Control

Control option FPV

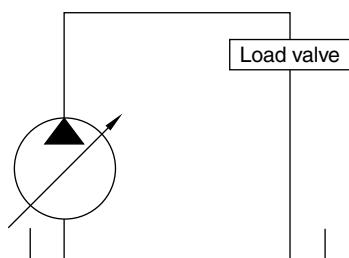
The proportional displacement control allows the adjustment of the pumps output flow with an electrical input signal. The actual displacement of the pump is monitored by an LVDT and compared with the commanded displacement in an electronic control module PQDXXA-Z00. The command is given as an electrical input signal (0 - 10 V) from the supervising machine control or a potentiometer.

Version FPV of the proportional control does not provide a pressure compensation. The hydraulic circuit must be protected by a pressure relief valve.

Control schematics

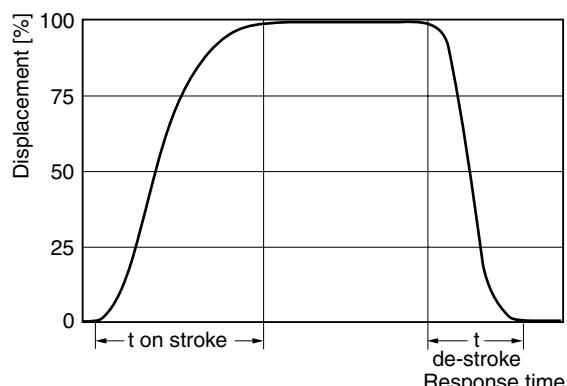


Response times of the pump are collected from a circuit as below by measuring the pumps swash angle movement at different pressures.



	Time on-stroke [ms]		Time de-stroke [ms]	
	stand-by to 50 bar	stand-by to 350 bar	50 bar to stand-by	350 bar to stand-by
PV360	180	100	330	240

Dynamic characteristic of flow control *



* Curve shown exaggerated

Pressure adjustment range *	25 to 350 bar
Factory setting pressure *	50 bar
Differential pressure adjustment range *	10 to 40 bar
Factory setting differential pressure *	15 bar
Control oil consumption	Max 8.0 l/min

Internal pilot pressure required to control the pump	
FPV	15 bar
UPR	25 bar
UPK	25 bar
UPM	25 bar

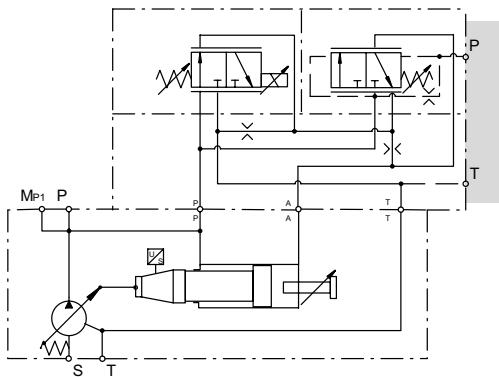
* Data valid for UP* version

Proportional Displacement Control with Overriding Pressure Control

Control option UPR

Control version UPR provides electro-hydraulic displacement control and pressure stage mounted on an elbow manifold.

The elbow manifold provides NG6/D03 interface on top to mount a pressure pilot valve (not included in UPR).

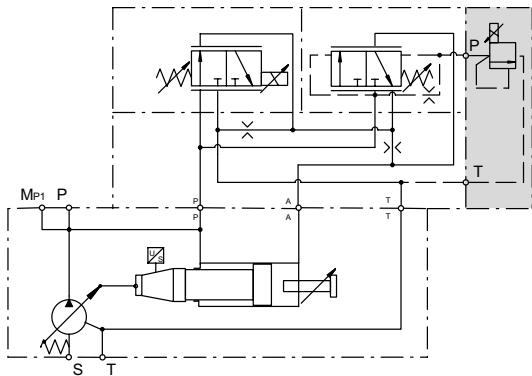


Proportional Displacement Control with Proportional Pressure Control

Control option UPK

When using a proportional pressure pilot valve an electro-hydraulic p/Q control can be realized. The proportional pressure pilot valve PVACRE..35 is included in control version UPK.

By using the digital module PQDXXA-Z00 it is possible to control the displacement proportionally with overriding open loop proportional pressure control.

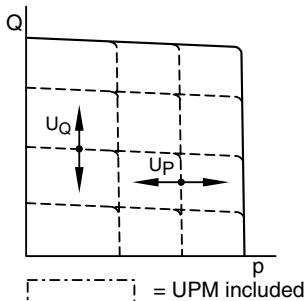
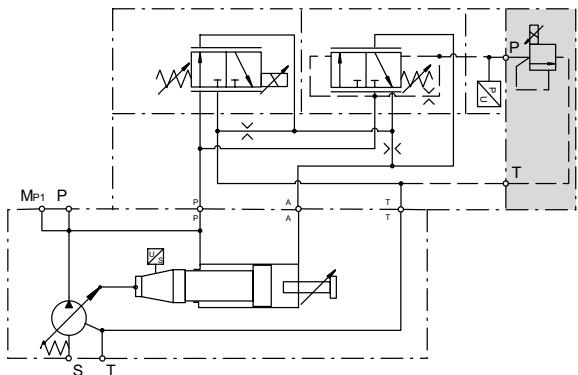


Proportional Displacement Control with Closed Loop Pressure Control

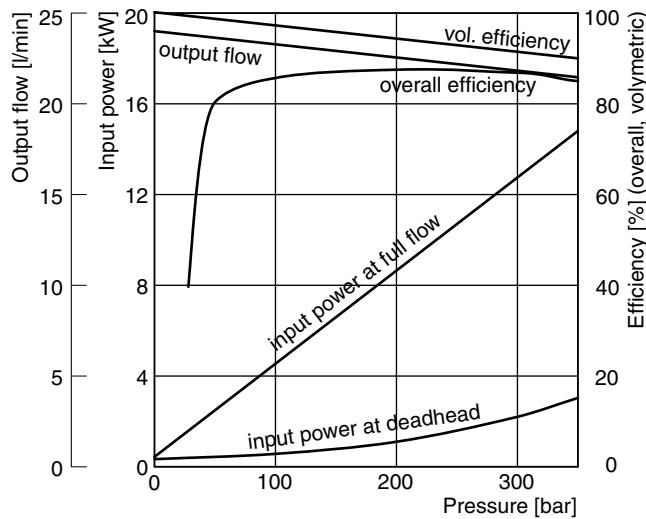
Control option UPM

Control version UPM is completed by a pressure transducer Parker SCP 8181 CE. In combination with control module PQDXXA-Z00 a closed loop pressure control of pump outlet pressure is available.

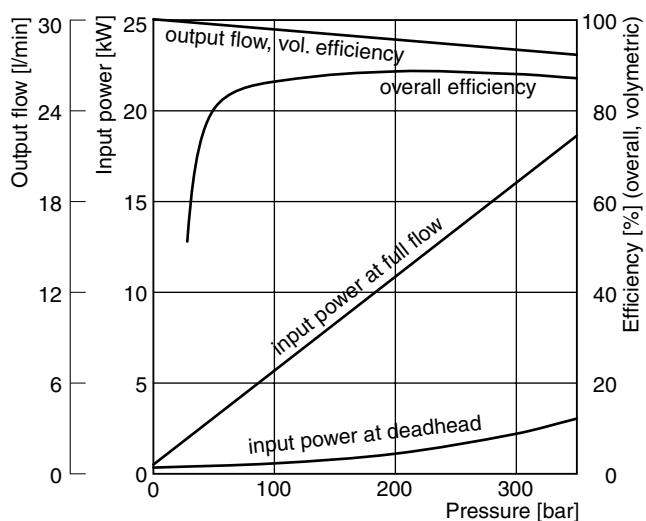
The control module also offers an electronic power limiter in addition to closed loop pressure control with this control option.



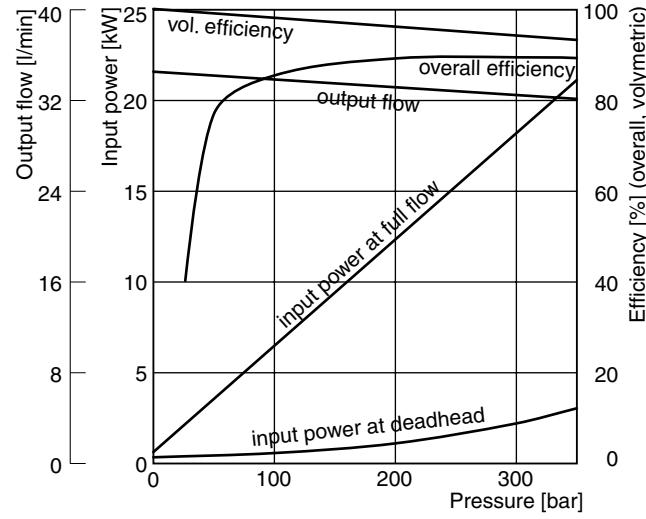
**Efficiency, power consumption
PV016**



PV020



PV023



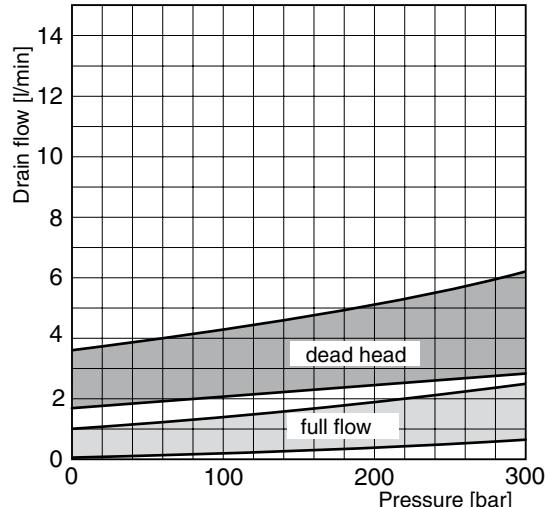
Efficiency and case drain flows PV016, PV020, PV023 and PV028

The efficiency and power graphs are measured at an input speed of $n = 1500$ rpm, a temperature of 50°C and a fluid viscosity of $30 \text{ mm}^2/\text{s}$.

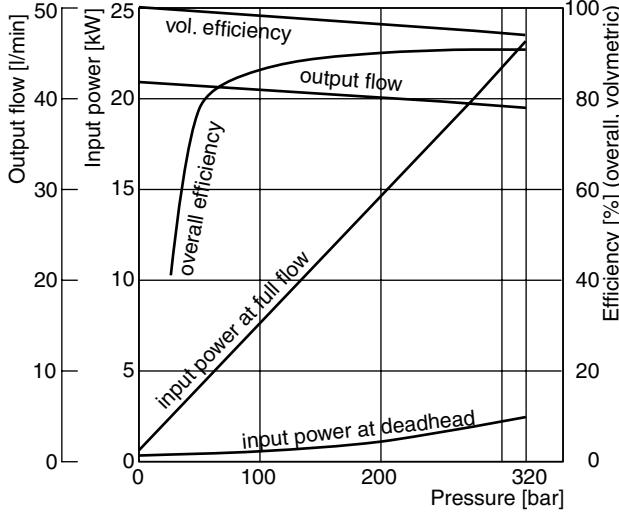
Case drain flow and compensator control flow leave via the drain port of the pump. To the values shown are to be added 1 to 1.2 l/min, if at pilot operated compensators the control flow of the pressure pilot valve also goes through the pump.

Please note: The values shown below are only valid for static operation. Under dynamic conditions and at rapid compensation of the pump the volume displaced by the servo piston also leaves the case drain port. This dynamic control flow can reach up to 40 l/min! Therefore the case drain line is to lead to the reservoir at full size and without restrictions as short and direct as possible.

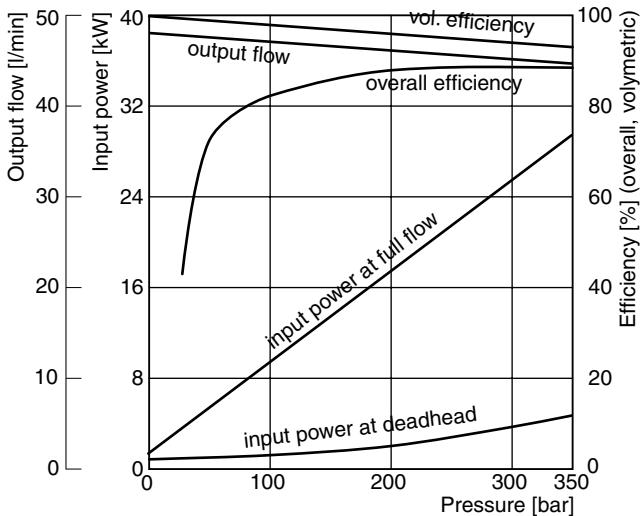
Case drain flow PV016-028 with pressure compensator (MMC)



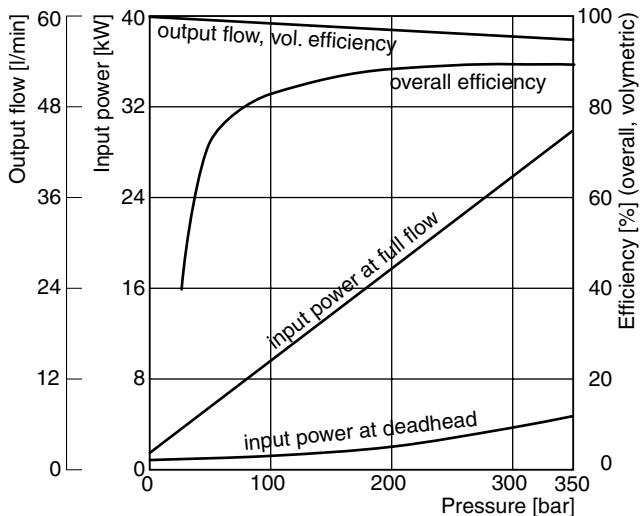
PV028



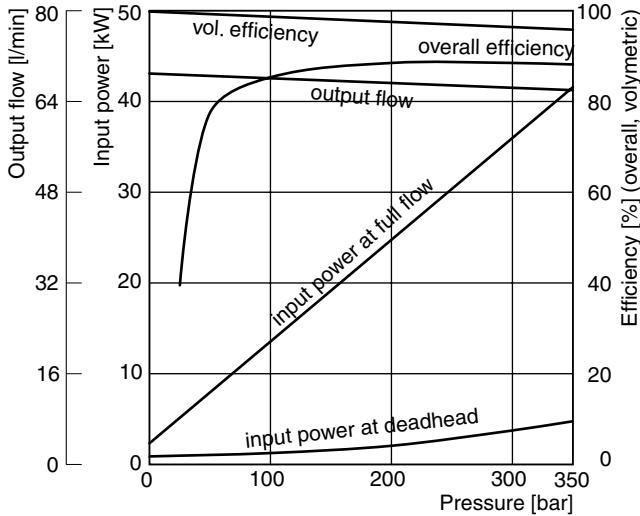
**Efficiency, power consumption
PV032**



PV040



PV046



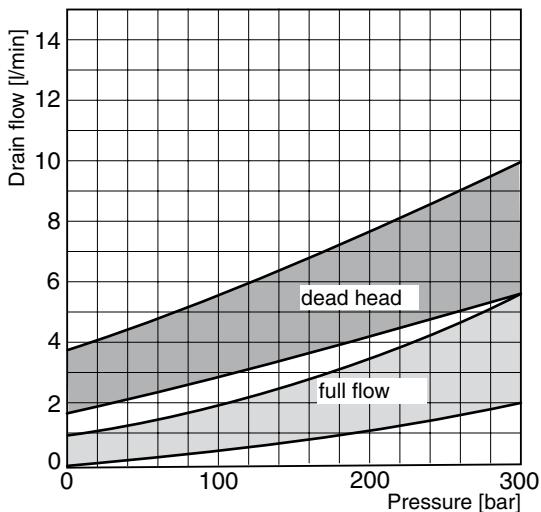
Efficiency and case drain flows PV032 to PV046

The efficiency and power graphs are measured at an input speed of $n = 1500$ rpm, a temperature of 50°C and a fluid viscosity of $30 \text{ mm}^2/\text{s}$.

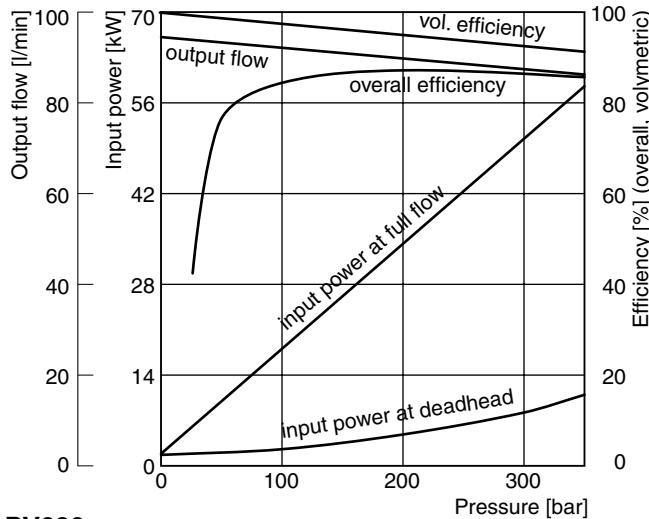
Case drain flow and compensator control flow leave via the drain port of the pump. To the values shown are to be added 1 to $1.2 \text{ l}/\text{min}$, if at pilot operated compensators the control flow of the pressure pilot valve also goes through the pump.

Please note: The values shown below are only valid for static operation. Under dynamic conditions and at rapid compensation of the pump the volume displaced by the servo piston also leaves the case drain port. This dynamic control flow can reach up to $60 \text{ l}/\text{min}$! Therefore the case drain line is to lead to the reservoir at full size and without restrictions as short and direct as possible.

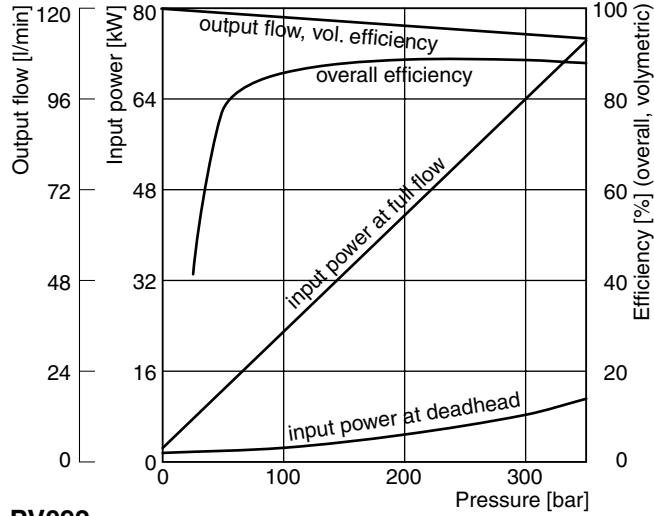
Case drain flow PV032-046 with pressure compensator (MMC)



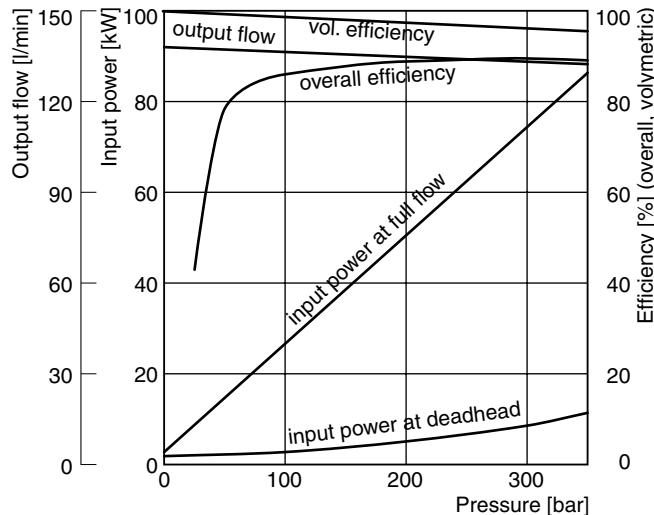
**Efficiency, power consumption
PV063**



PV080



PV092



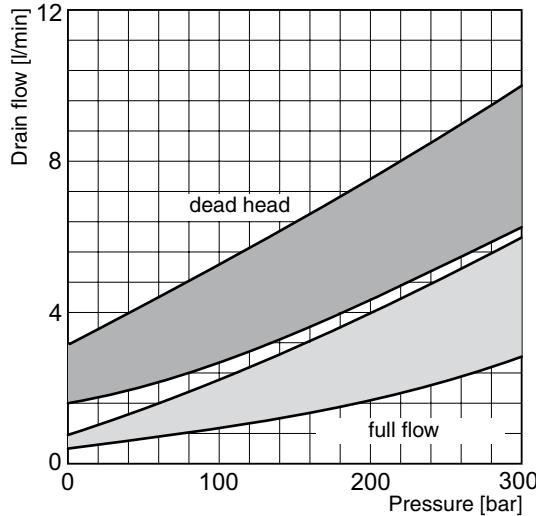
Efficiency and case drain flows PV063, PV080, PV092

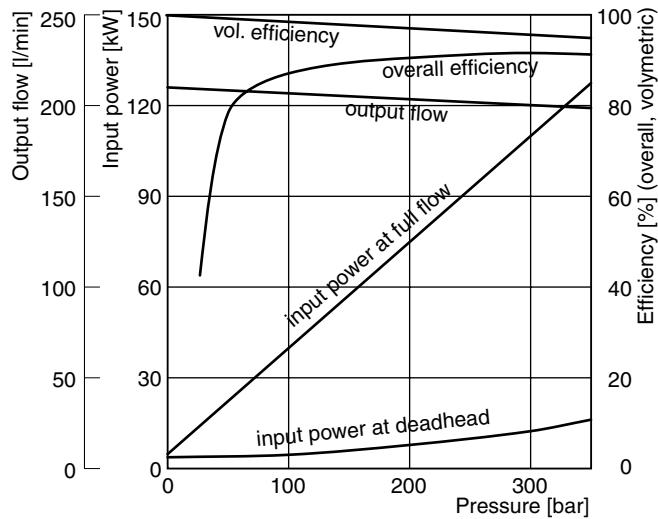
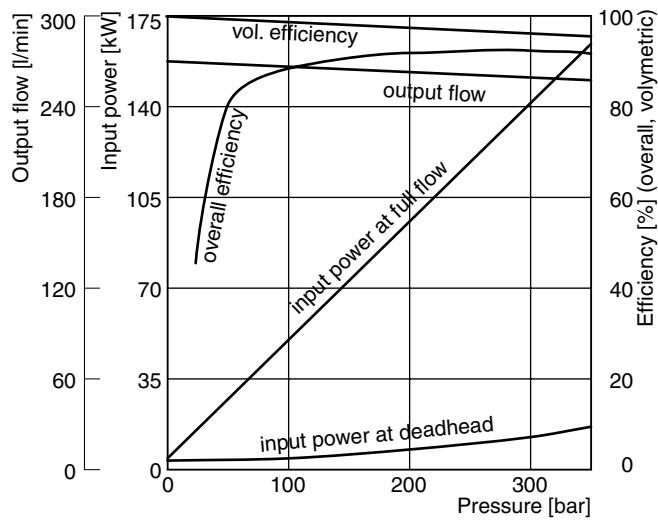
The efficiency and power graphs are measured at an input speed of $n = 1500$ rpm, a temperature of 50°C and a fluid viscosity of $30 \text{ mm}^2/\text{s}$.

Case drain flow and compensator control flow leave via the drain port of the pump. To the values shown are to be added 1 to 1.2 l/min, if at pilot operated compensators (codes FR*, FF*, FT*, power compensator and p-Q-control) the control flow of the pressure pilot valve also goes through the pump.

Please note: The values shown below are only valid for static operation. Under dynamic conditions and at rapid compensation of the pump the volume displaced by the servo piston also leaves the case drain port. This dynamic control flow can reach up to 80 l/min! Therefore the case drain line is to lead to the reservoir at full size and without restrictions as short and direct as possible.

Case drain flows PV063-092

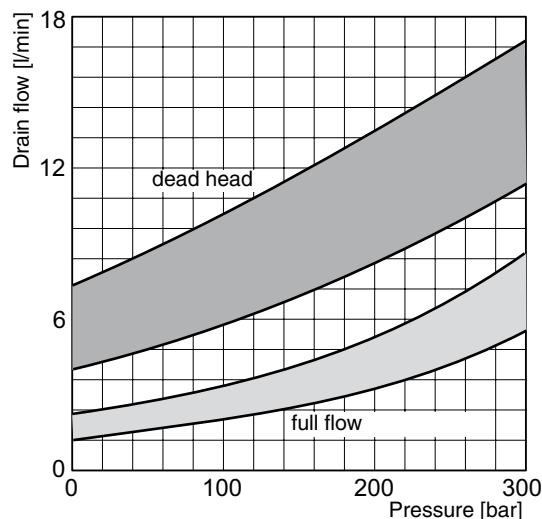


Efficiency, power consumption**PV140****PV180****Efficiency and case drain flows PV140, PV180**

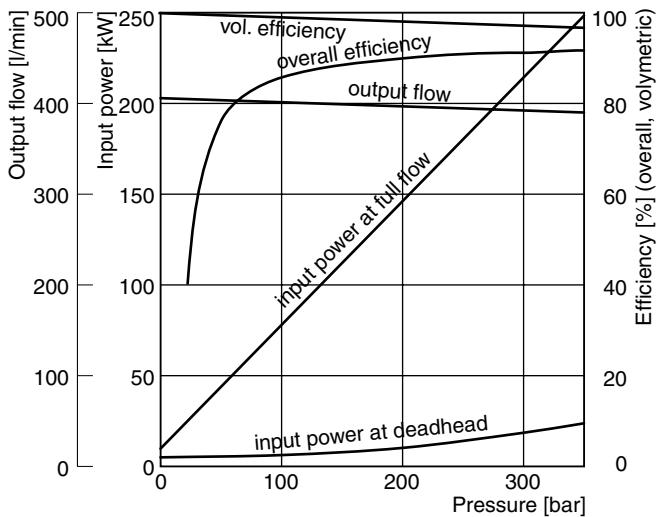
The efficiency and power graphs are measured at an input speed of $n = 1500$ rpm, a temperature of 50°C and a fluid viscosity of $30 \text{ mm}^2/\text{s}$.

Case drain flow and compensator control flow leave via the drain port of the pump. To the values shown are to be added 1 to 1.2 l/min, if at pilot operated compensators the control flow of the pressure pilot valve also goes through the pump.

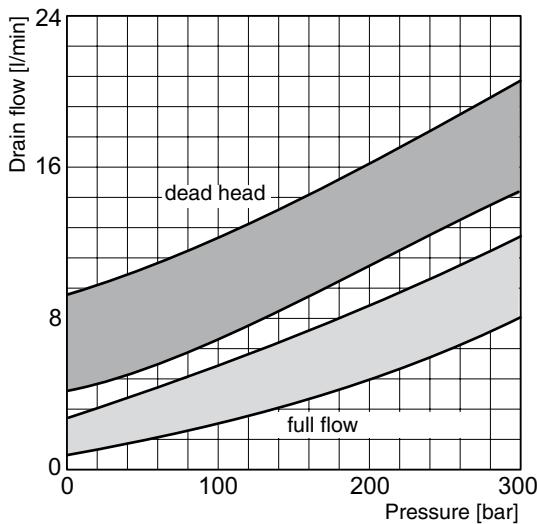
Please note: The values shown below are only valid for static operation. Under dynamic conditions and at rapid compensation of the pump the volume displaced by the servo piston also leaves the case drain port. This dynamic control flow can reach up to 120 l/min! Therefore the case drain line is to lead to the reservoir at full size and without restrictions as short and direct as possible.

Case drain flows PV140-180

**Efficiency, power consumption
PV270**



Case drain flows PV270



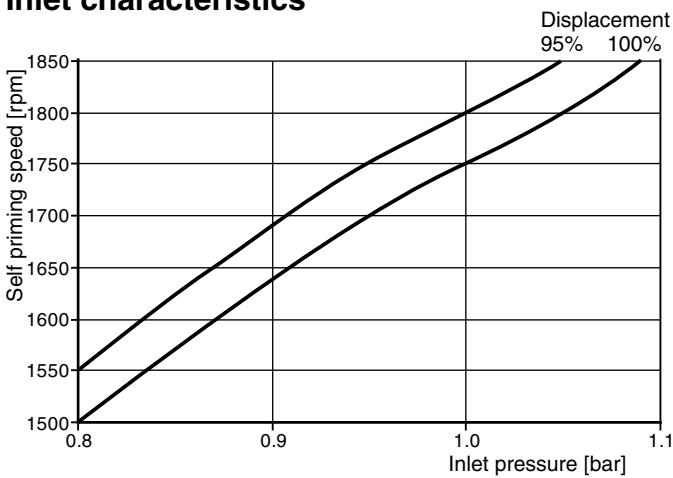
Efficiency and case drain flows PV270

The efficiency and power graphs are measured at an input speed of $n = 1500$ rpm, a temperature of 50°C and a fluid viscosity of $30 \text{ mm}^2/\text{s}$.

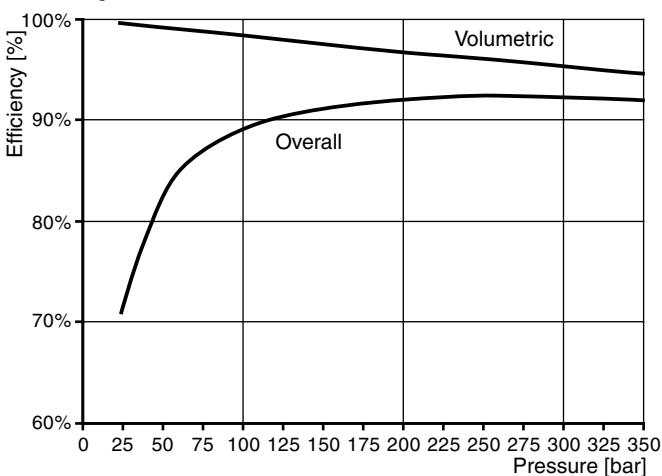
Case drain flow and compensator control flow leave via the drain port of the pump. To the values shown are to be added 1 to 1.2 l/min, if at pilot operated compensators (codes FR*, FF*, FT*, power compensator and p-Q-control) the control flow of the pressure pilot valve also goes through the pump.

Please note: The values shown below are only valid for static operation. Under dynamic conditions and at rapid compensation of the pump the volume displaced by the servo piston also leaves the case drain port. This dynamic control flow can reach up to 120 l/min! Therefore the case drain line is to lead to the reservoir at full size and without restrictions as short and direct as possible.

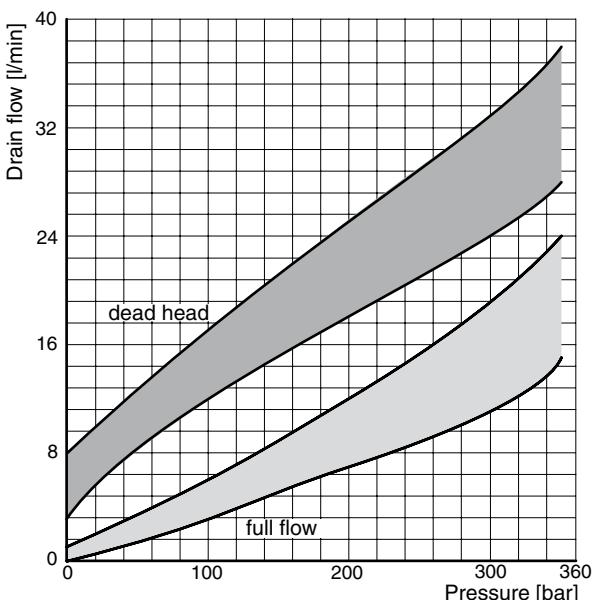
Typical inlet characteristics vs. speed at various percentage displacements
Inlet characteristics



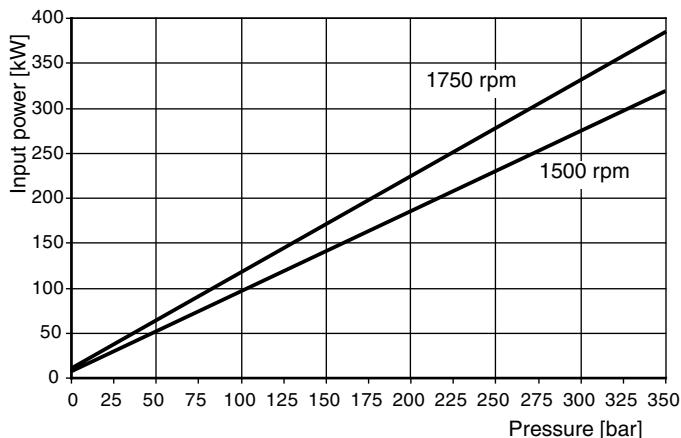
Typical efficiency at full displacement and 1500 rpm



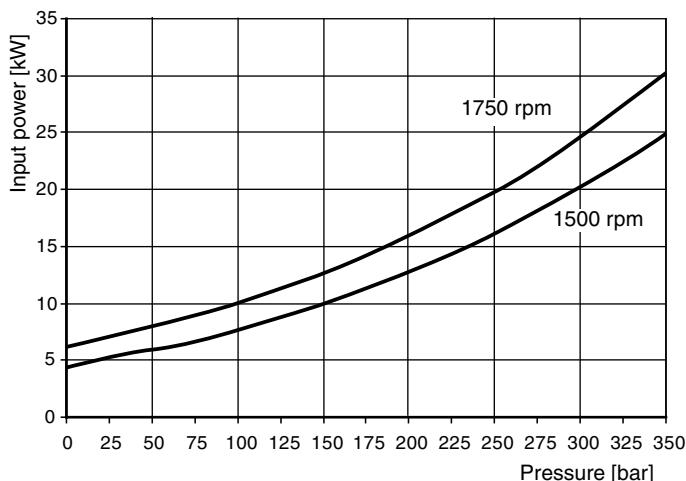
Case drain flows



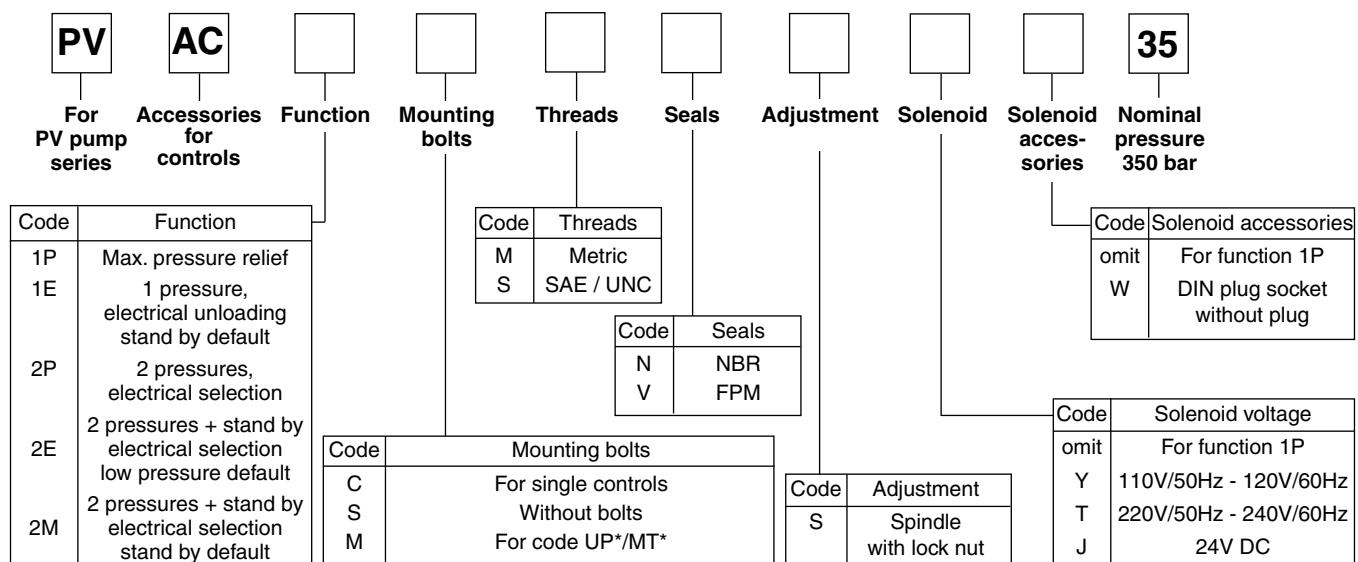
Typical drive power at full displacement
Input power – full stroke



Typical compensated power
Input power – zero stroke

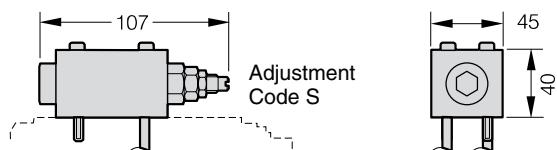


The curves show typical characteristics measured under following conditions:
Fluid: Mineral oil ISO VG 22 at 32 °C
Inlet pressure 1,0 bar (absolute), measured at inlet port.

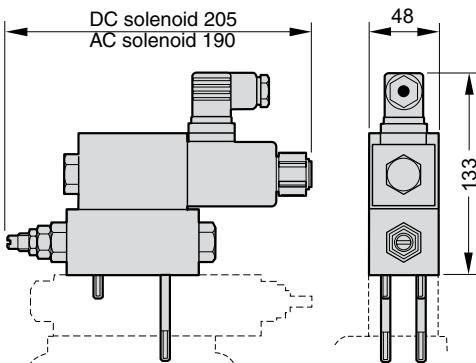


Dimensions

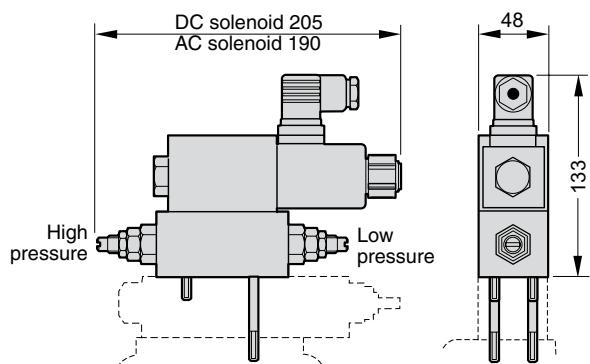
PVAC1P*



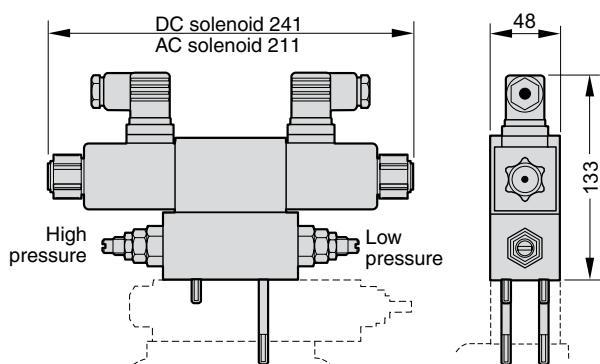
PVAC1E*



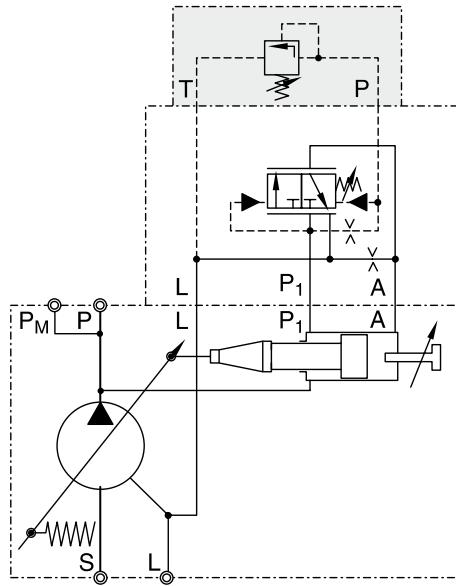
PVAC2P*



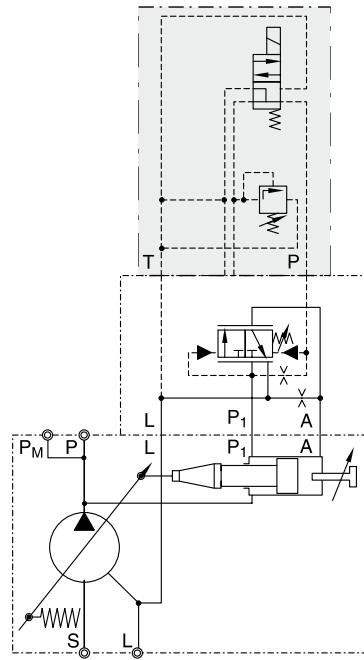
PVAC2M*/PVAC2E*



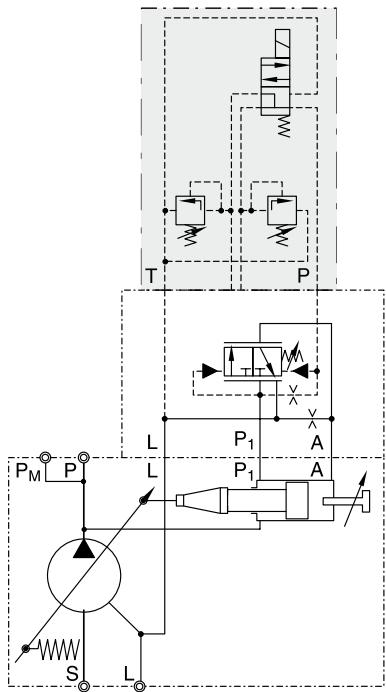
Schematics PVAC1P*



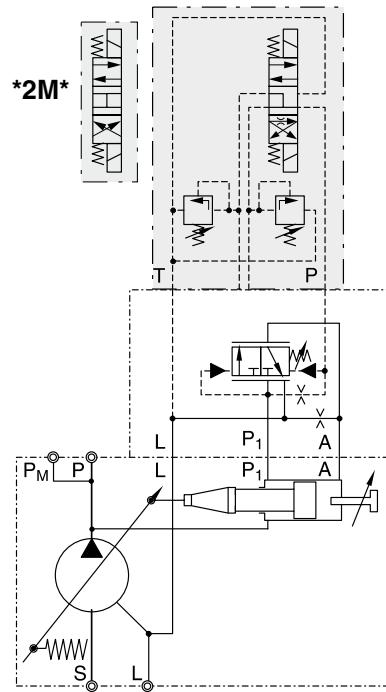
Schematics PVAC1E*



Schematics PVAC2P*



Schematics PVAC2M*/PVAC2E*

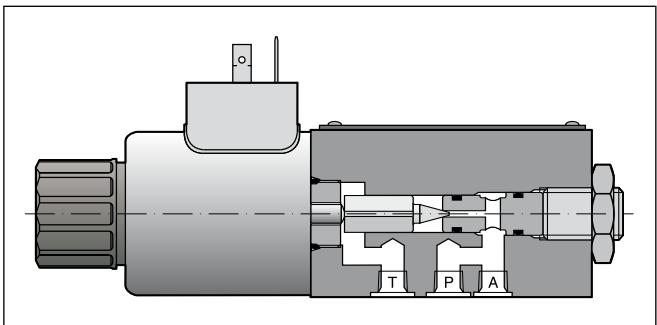
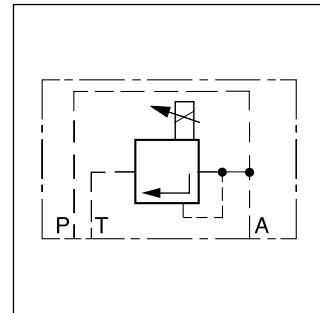


Proportional pressure relief valve PVACRE*

Function

When the pressure in port P exceeds the pressure setting at the solenoid, the poppet opens to port T and limits the pressure in port P to the adjusted level.

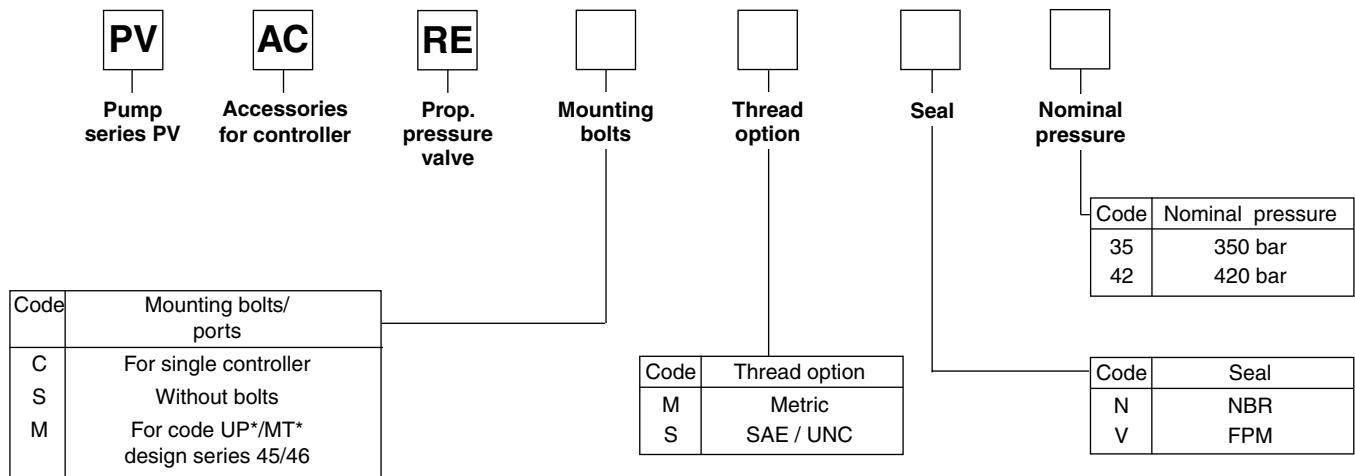
The optimum performance can be achieved in combination with the digital amplifier module PCD00A-400 (see catalogue HY11-3500 for reference).



Technical data

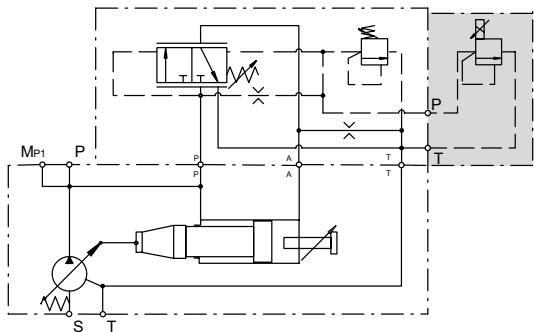
General			
Nominal size		DIN NG06 / CETOP03 / NFPA D03	
Mounting position		as desired, horizontal mounting preferred	
Ambient temperature	[°C]	-20 ... +70	
Weight	[kg]	1.8	
Hydraulic			
Max. operating pressure	[bar]	Ports P and A up to 420; port T depressurized	
Pressure stages	[bar]	350, 420	
Fluid		Hydraulic oil as per DIN 51524 ... 525	
Viscosity, recommended permitted	[cSt] / [mm²/s]	30 ... 80	
	[cSt] / [mm²/s]	12 ... 380	
Fluid temperature	[°C]	-20 ... +60	
Filtration		ISO 4406 (1999), 18/16/13	
Linearity	[%]	±2.8	
Repeatability	[%]	<±1	
Hysteresis	[%]	±1.5 of p _{max}	
Electrical			
Duty ratio	[%]	100 ED	
Protection class		IP 65 in accordance with EN 60529 (plugged and mounted)	
Nominal voltage	[V]	16 (1.3 A max. current)	
Coil resistance	[Ohm]	4 at 20°C	
Solenoid connection		Connector as per EN 175301-803	
Power amplifier, recommended		PCD00A-400	

Ordering code proportional pressure relief valve

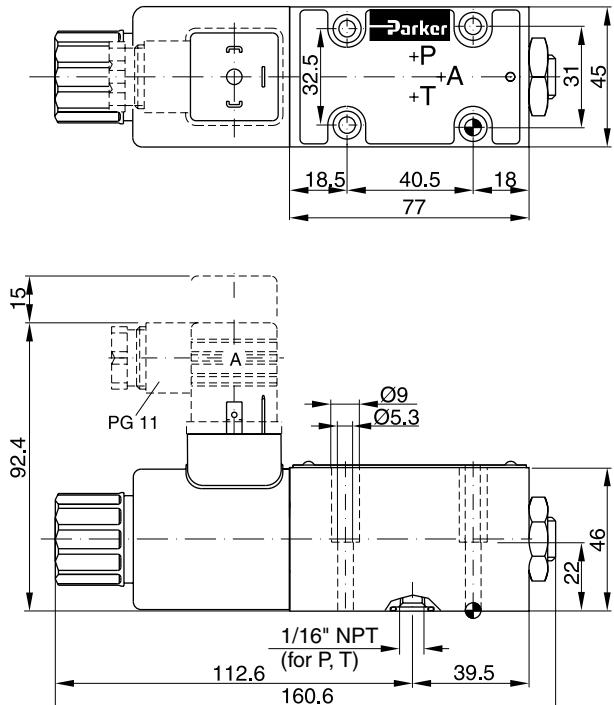


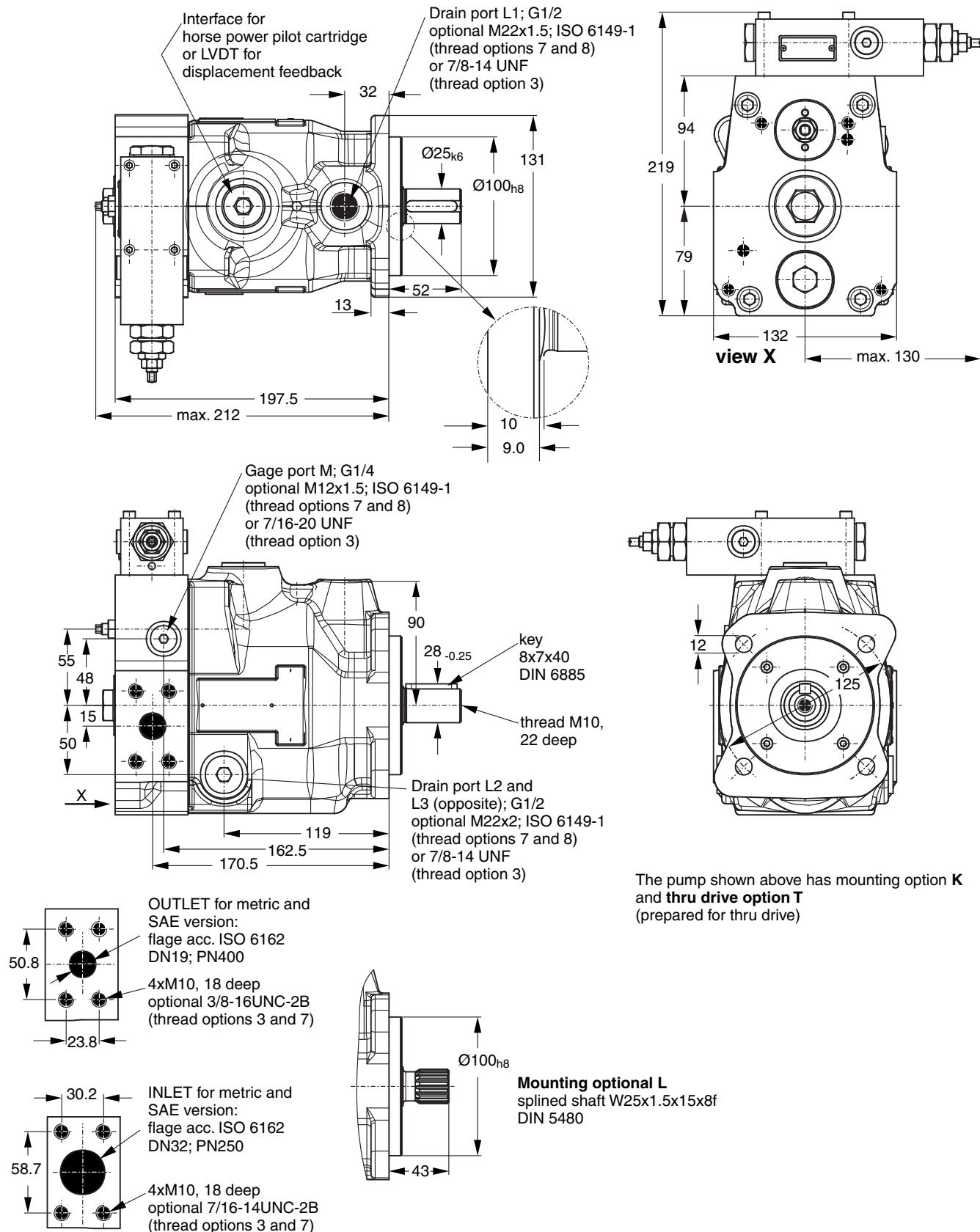
Schematic PVACRE*

Example for PVACRE* mounted



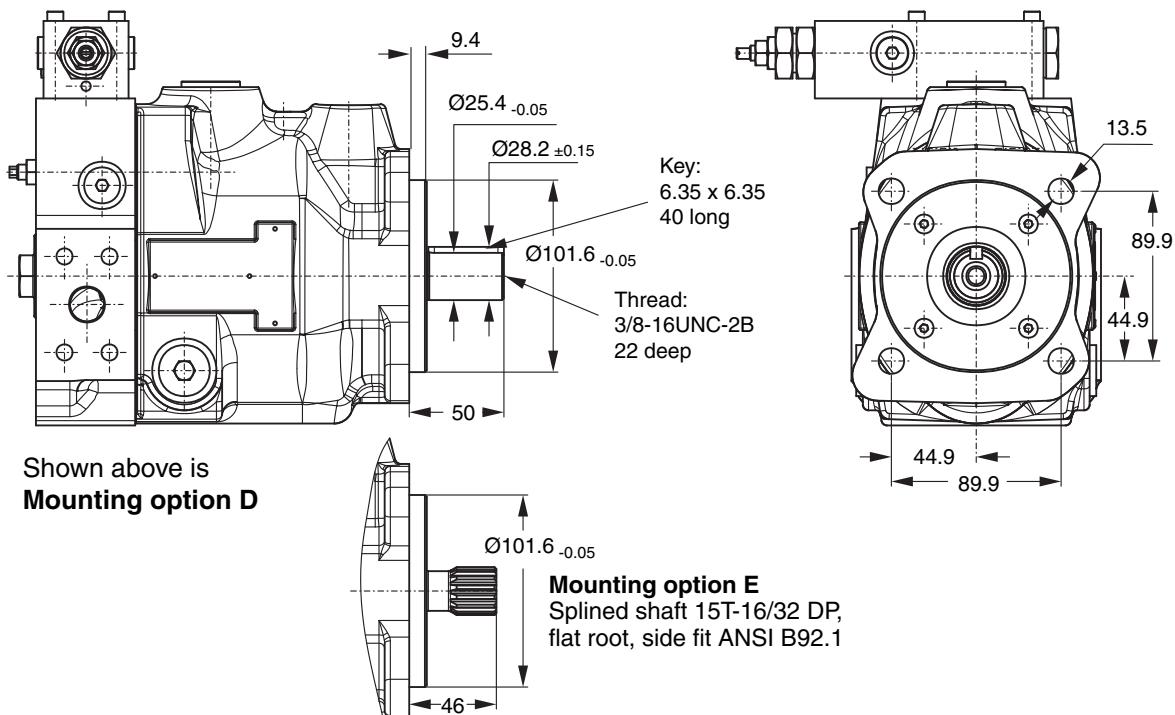
Dimensions PVACRE*



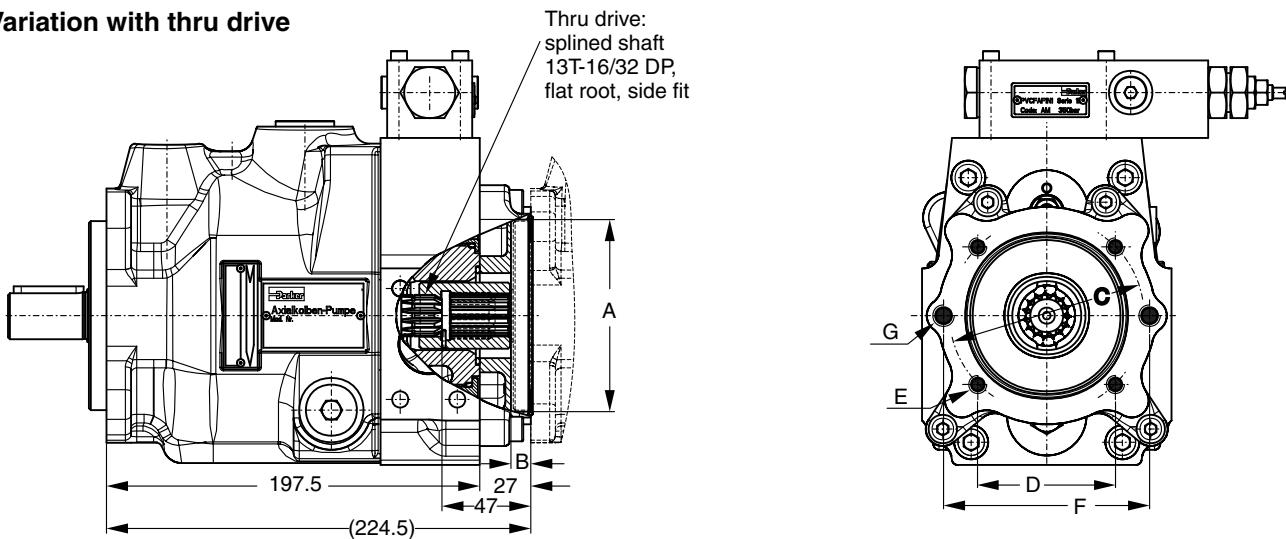
PV016 - 028, metric version

Shown is a clockwise rotating pump with standard pressure compensator.
Counter clockwise rotating pumps have inlet, outlet and gauge port reversed.

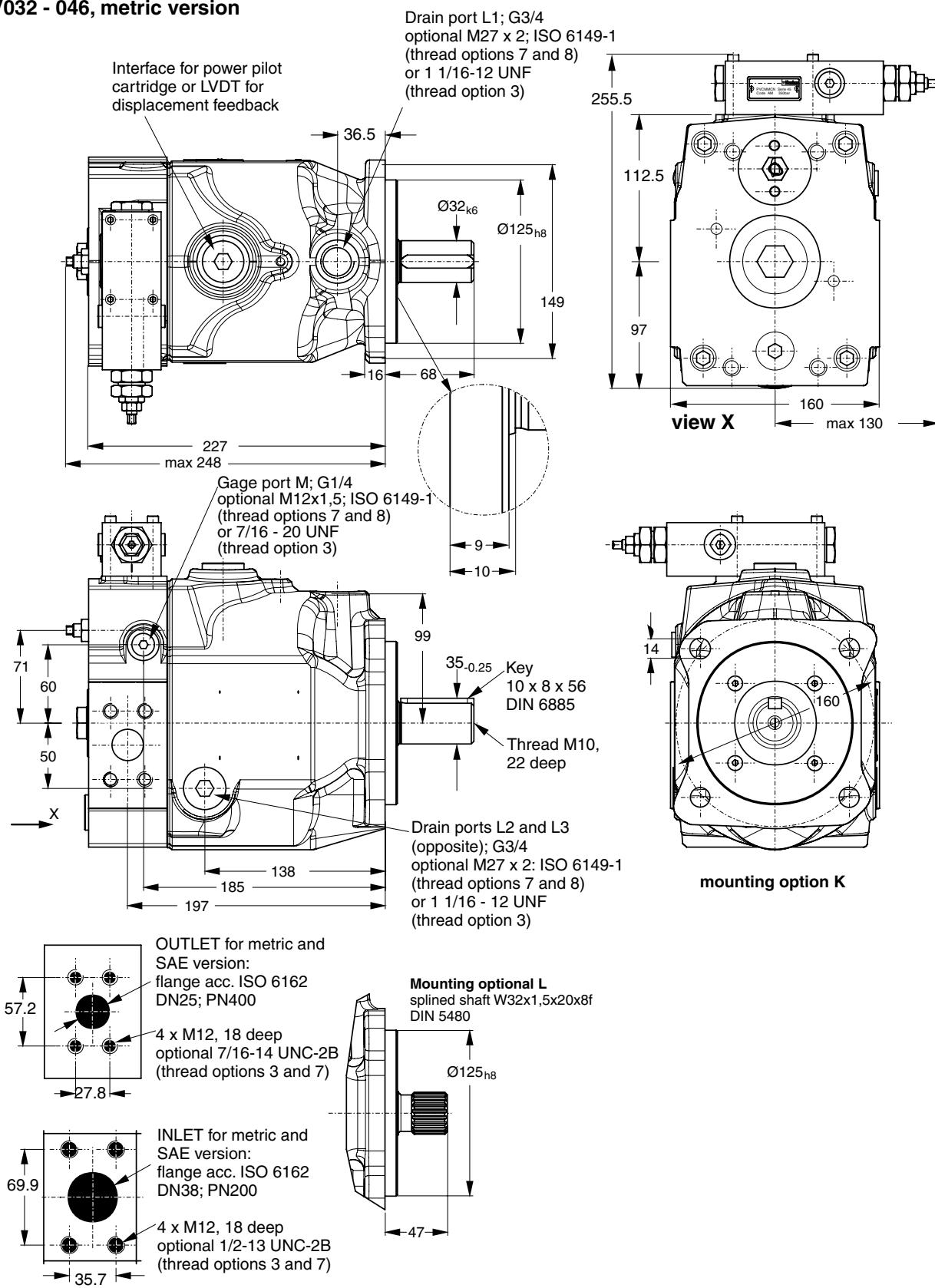
PV016 - 028, SAE version



Variation with thru drive

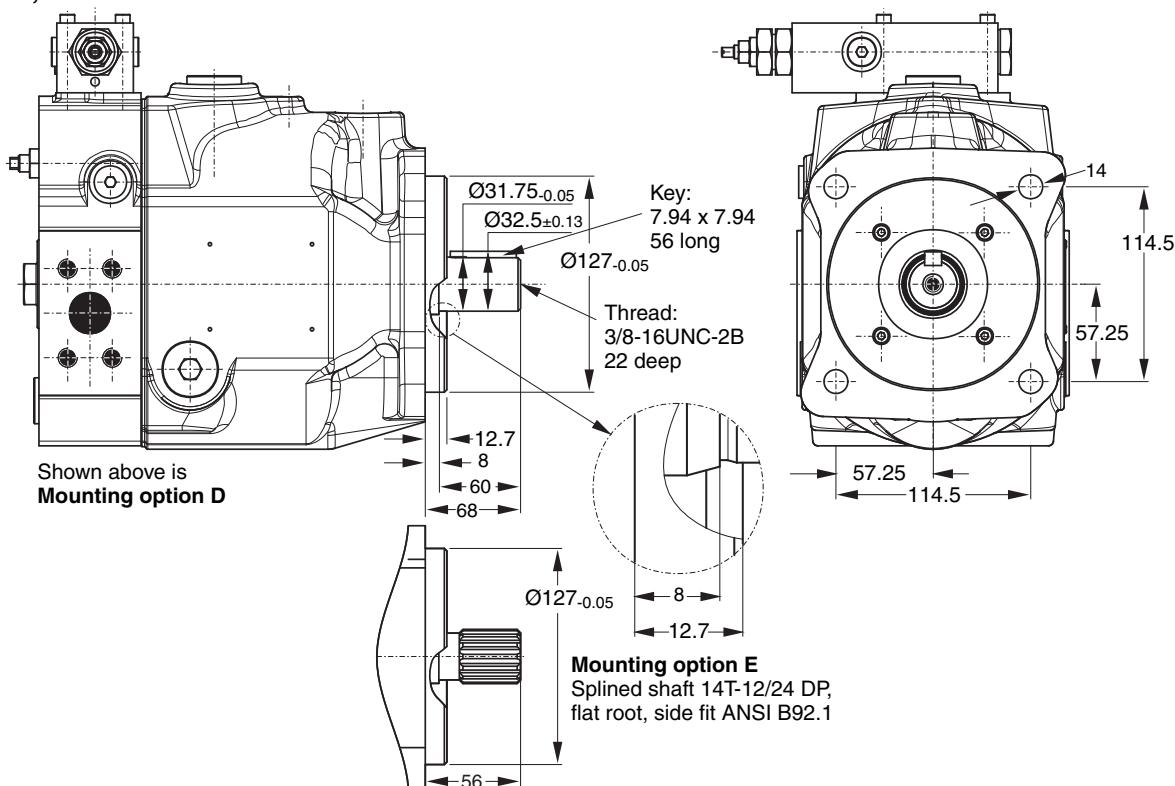


Thru drive adaptors are available with the following dimensions										
Drawing Dimension	A	B	C	D	E		F	G		Remark
					Metr	UNC		Metr	UNC	
Thru drive option Y	50.8	8	-	-	-	-	82	M8	5/16"-18	SAE AA 2-Bolt
A	82.55	8	-	-	-	-	106	M10	3/8"-16	SAE A 2-Bolt
B	101.6	10.5	127	89.8	M12	1/2"-13	-	-	-	SAE B 4-Bolt
G	63	8.5	85	60.1	M8	5/16"-18	100	M8	5/16"-18	2/4-Bolt
H	80	8.5	103	72.8	M8	5/16"-18	109	M10	3/8"-16	2/4-Bolt
J	100	10.5	125	88.4	M10	3/8"-16	-	-	-	4-Bolt

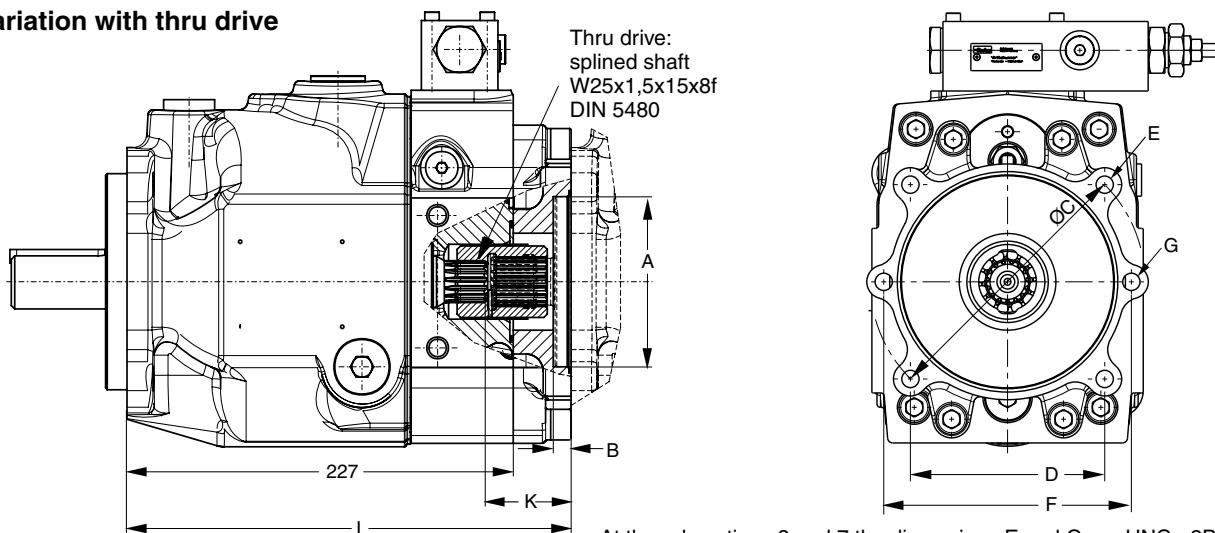
PV032 - 046, metric version

Shown is a clockwise rotating pump with standard pressure compensator.
Counter clockwise rotating pumps have inlet, outlet and gauge port reversed.

PV032 - 046, SAE version



Variation with thru drive



At threads options 3 and 7 the dimensions E and G are UNC - 2B threads.

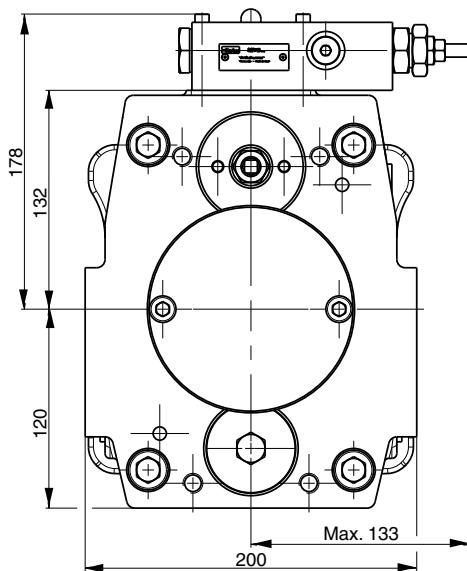
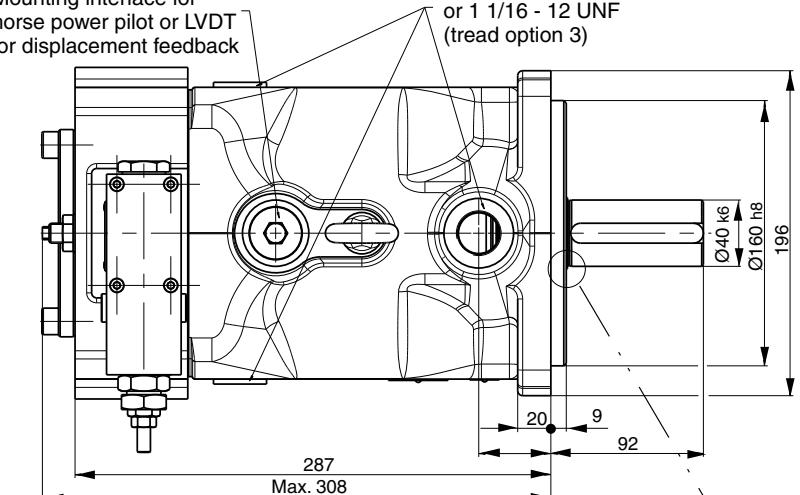
Thru drive adaptors are available with the following dimensions

Drawing Dimension Thru drive option	A	B	C	D	E		F	G		K	L	Remark
					Metr	UNC		Metr	UNC			
A	82.55	8	-	-	-	-	106	M10	3/8"-16	48	261	SAE A 2-Bolt
B	101.6	11	127	89.8	M12	1/2"-13	146	M12	1/2"-13	48	261	SAE B 2/4-Bolt
C	127	13.5	162	114.6	M12	1/2"-13	-	-	-	63	276	SAE C 4-Bolt
G	63	8.5	85	60.1	M8	5/16"-18	100	M8	5/16"-18	48	261	2/4-Bolt
H	80	8.5	103	72.8	M8	5/16"-18	109	M10	3/8"-16	48	261	2/4-Bolt
J	100	10.5	125	88.4	M10	3/8"-16	140	M12	1/2"-13	48	261	2/4-Bolt
K	125	10.5	160	113.1	M12	1/2"-13	-	-	-	48	261	4-Bolt

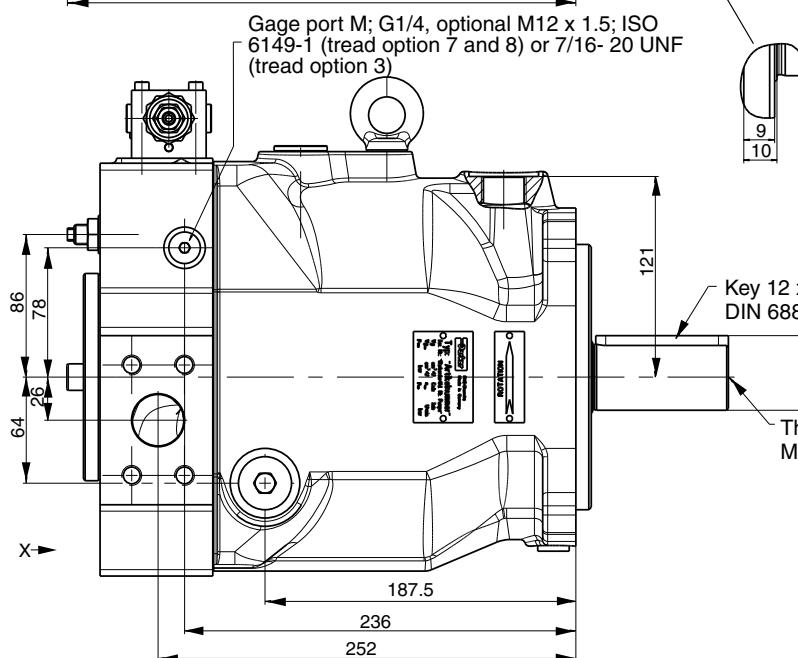
PV 063 - 092 Metric

Mounting interface for
horse power pilot or LVDT
for displacement feedback

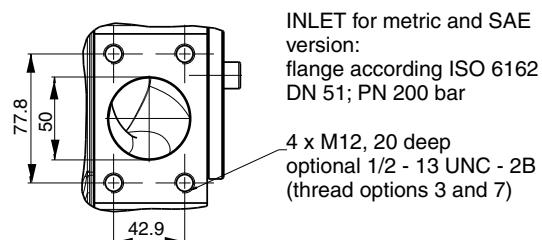
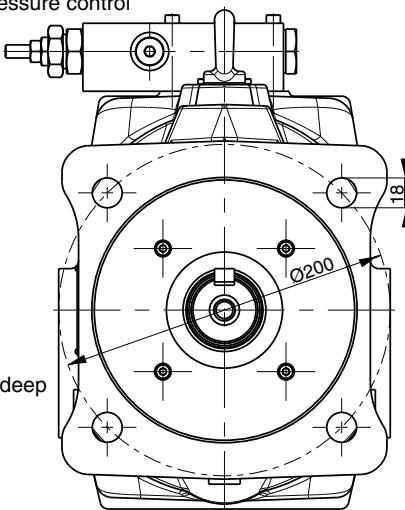
Drain ports L1, L2 and L3; G3/4"
optional M27 x 2; ISO 6149-1
(tread option 7 and 8)
or 1 1/16 - 12 UNF
(tread option 3)



view X

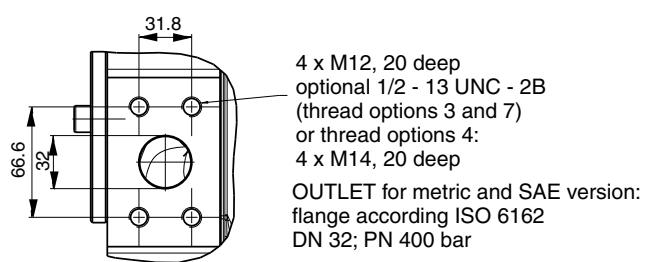


Shown with standard
pressure control



INLET for metric and SAE
version:
flange according ISO 6162
DN 51; PN 200 bar

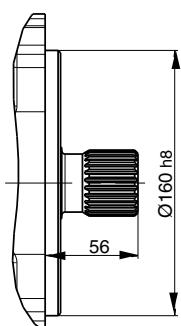
4 x M12, 20 deep
optional 1/2 - 13 UNC - 2B
(thread options 3 and 7)



4 x M12, 20 deep
optional 1/2 - 13 UNC - 2B
(thread options 3 and 7)
or thread options 4:
4 x M14, 20 deep

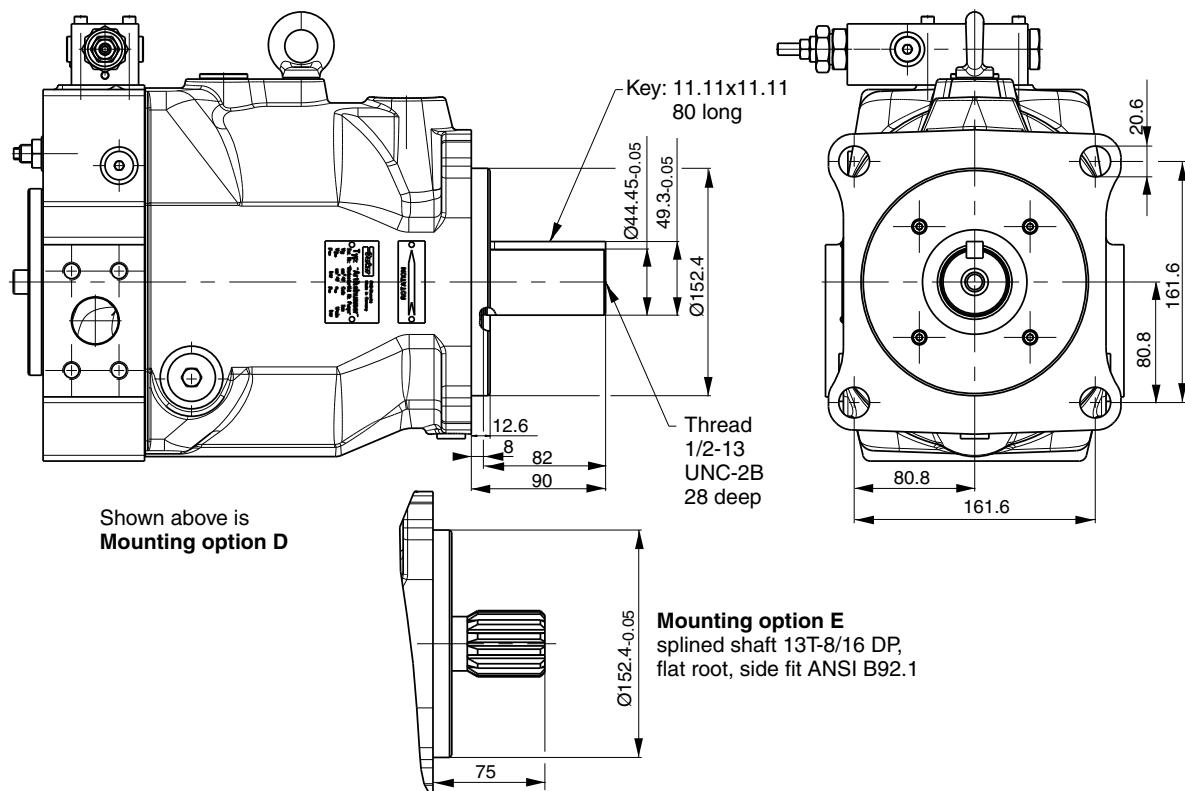
OUTLET for metric and SAE version:
flange according ISO 6162
DN 32; PN 400 bar

The pump shown above has **Mounting option K**
and **through drive variation T**
(prepared for through drive)

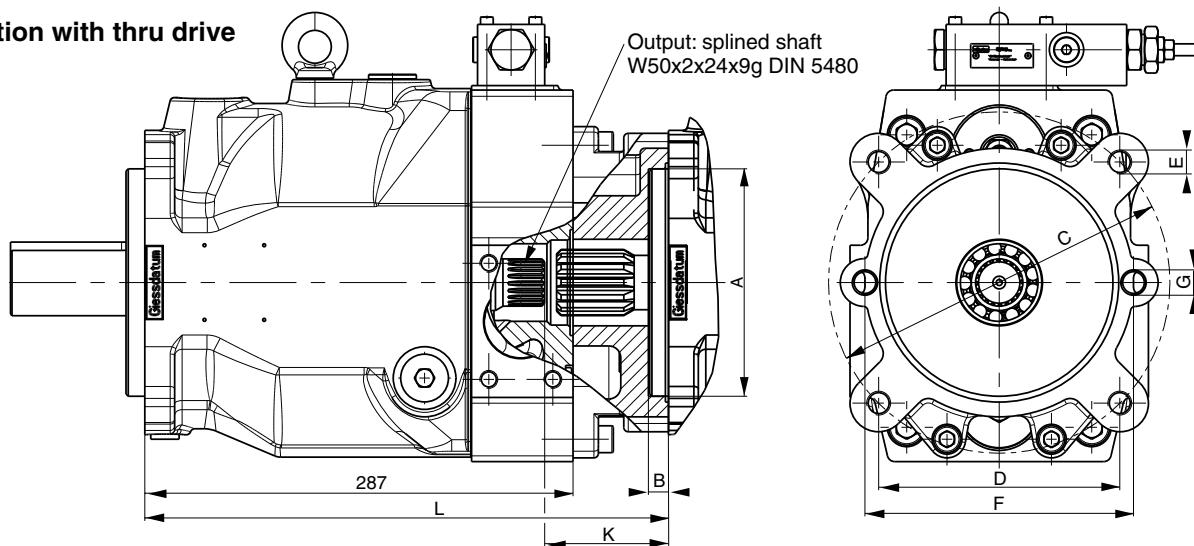


Mounting option L, splined shaft
W40 x 1.5 x 25 x 8f DIN 5480

PV 063 - 092 SAE Version

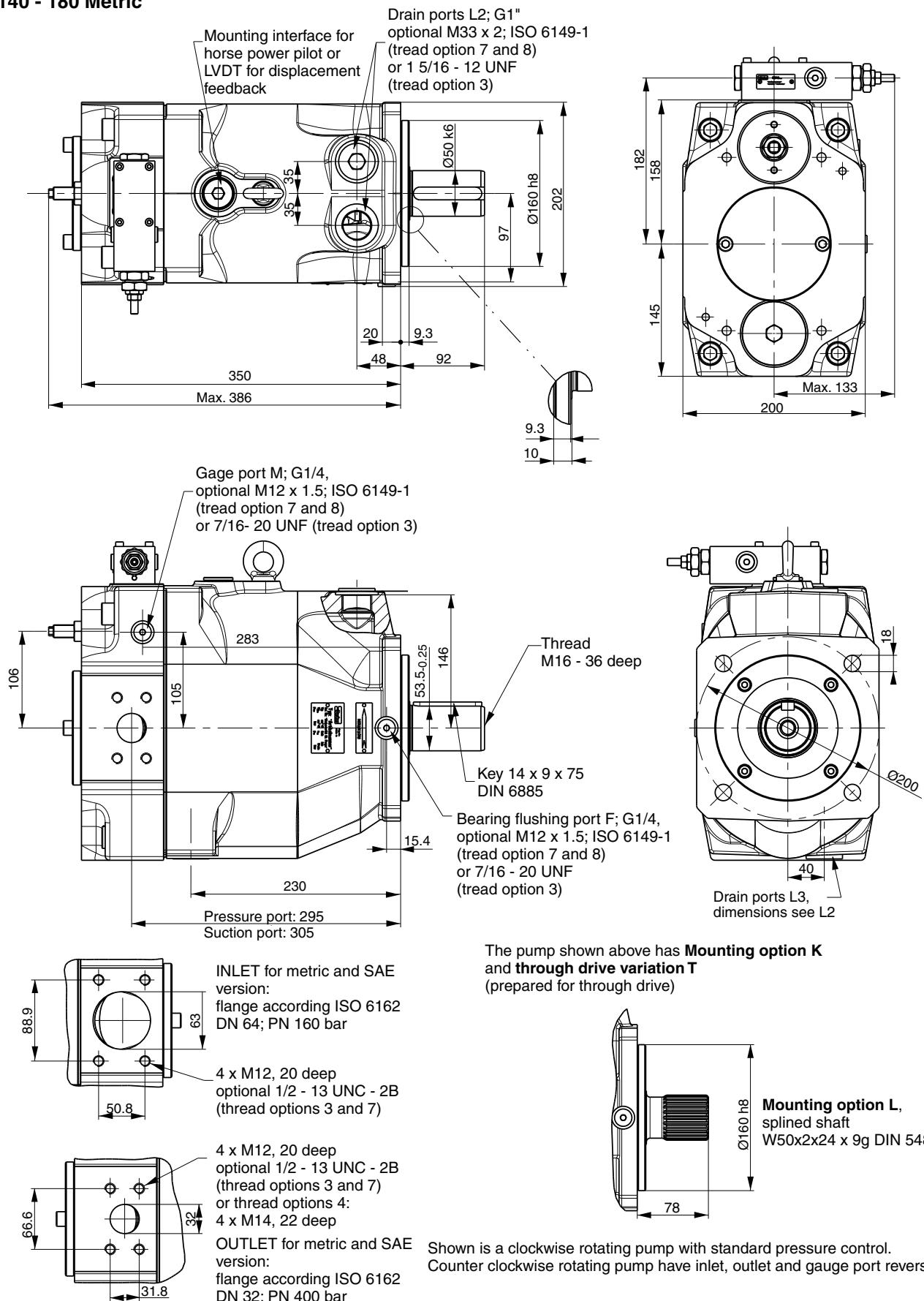


Variation with thru drive

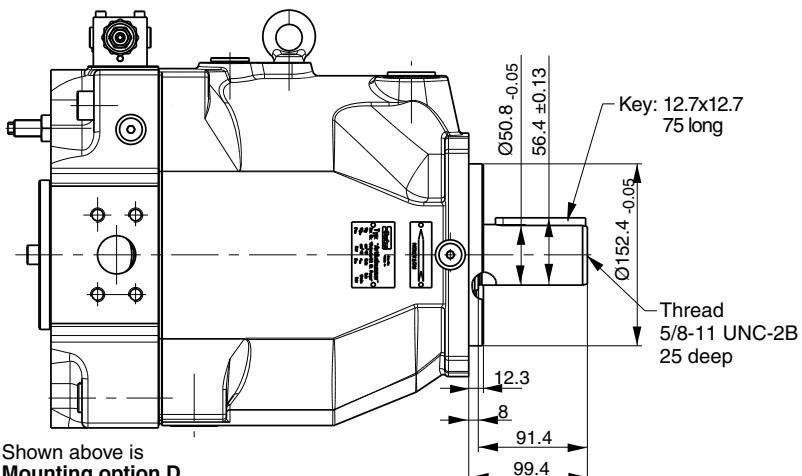


Thru drive adaptors are available with the following dimensions

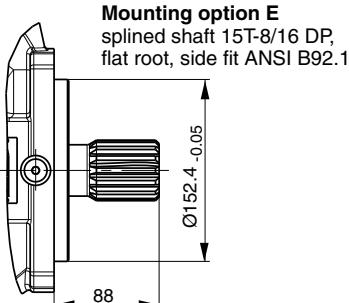
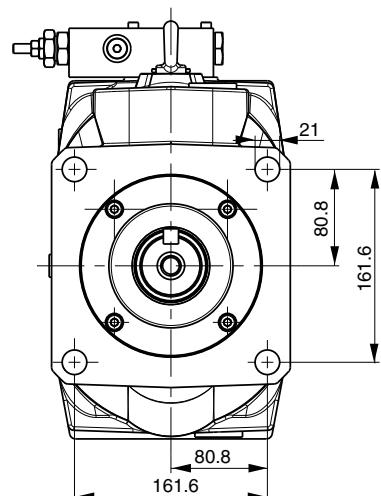
Drawing Dimension	A	B	C	D	E		F	G		K	L	Remark
					Metr	UNC		Metr	UNC			
Thru drive option	82.55	8	-	-	-	-	106	M10	3/8"-16	58	326	SAE A 2-Bolt
A	82.55	8	-	-	-	-	106	M10	3/8"-16	58	326	SAE A 2-Bolt
B	101.6	11	127	89.8	M12	1/2"-13	146	M12	1/2"-13	58	326	SAE B 2/4-Bolt
C	127	13.5	162	114.6	M12	1/2"-13	181	M16	5/8"-11	58	326	SAE C 2/4-Bolt
D	152.4	13.5	228.5	161.6	M16	5/8"-11	-	-	-	83	351	SAE D 4-Bolt
G	63	8.5	85	60.1	M8	5/16"-18	100	M8	5/16"-18	58	326	2/4-Bolt
H	80	8.5	103	72.8	M8	5/16"-18	109	M10	3/8"-16	58	326	2/4-Bolt
J	100	10.5	125	88.4	M10	3/8"-16	140	M12	1/2"-13	58	326	2/4-Bolt
K	125	10.5	160	113.1	M12	1/2"-13	180	M16	5/8"-11	58	326	2/4-Bolt
L	160	13.5	200	141.4	M16	5/8"-11	-	-	-	58	326	4-Bolt

PV 140 - 180 Metric

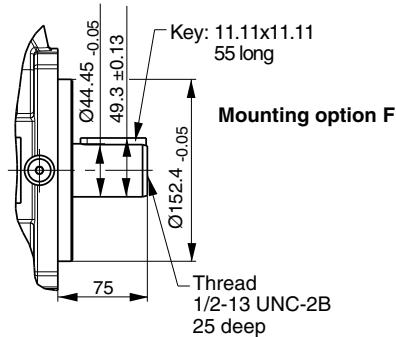
PV 140 - 180 SAE Version



Shown above is
Mounting option D

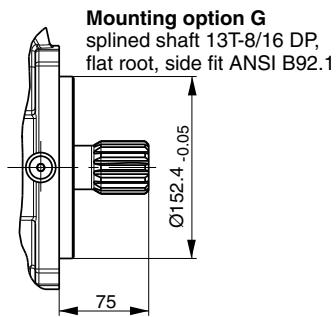


Mounting option E
splined shaft 15T-8/16 DP,
flat root, side fit ANSI B92.1



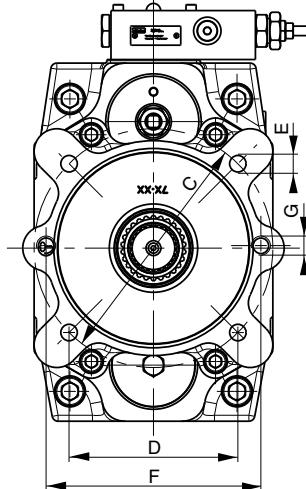
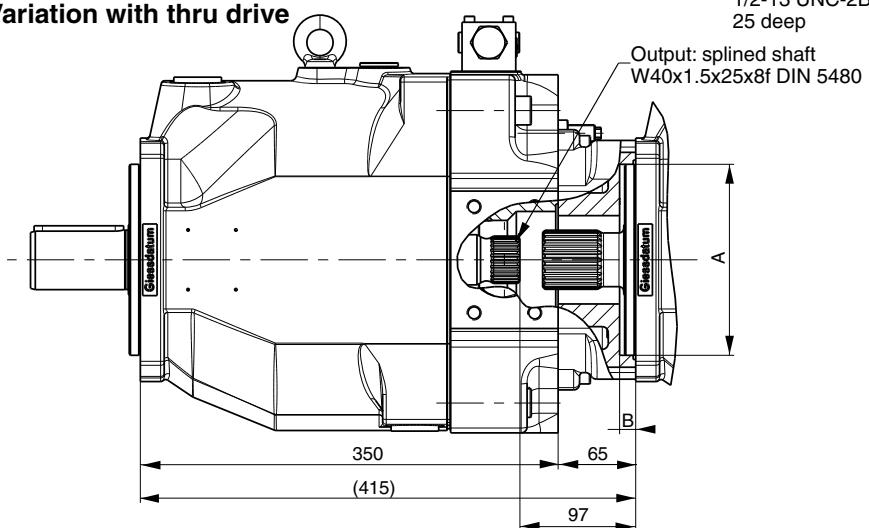
Mounting option F

Thread
1/2-13 UNC-2B
25 deep



Mounting option G
splined shaft 13T-8/16 DP,
flat root, side fit ANSI B92.1

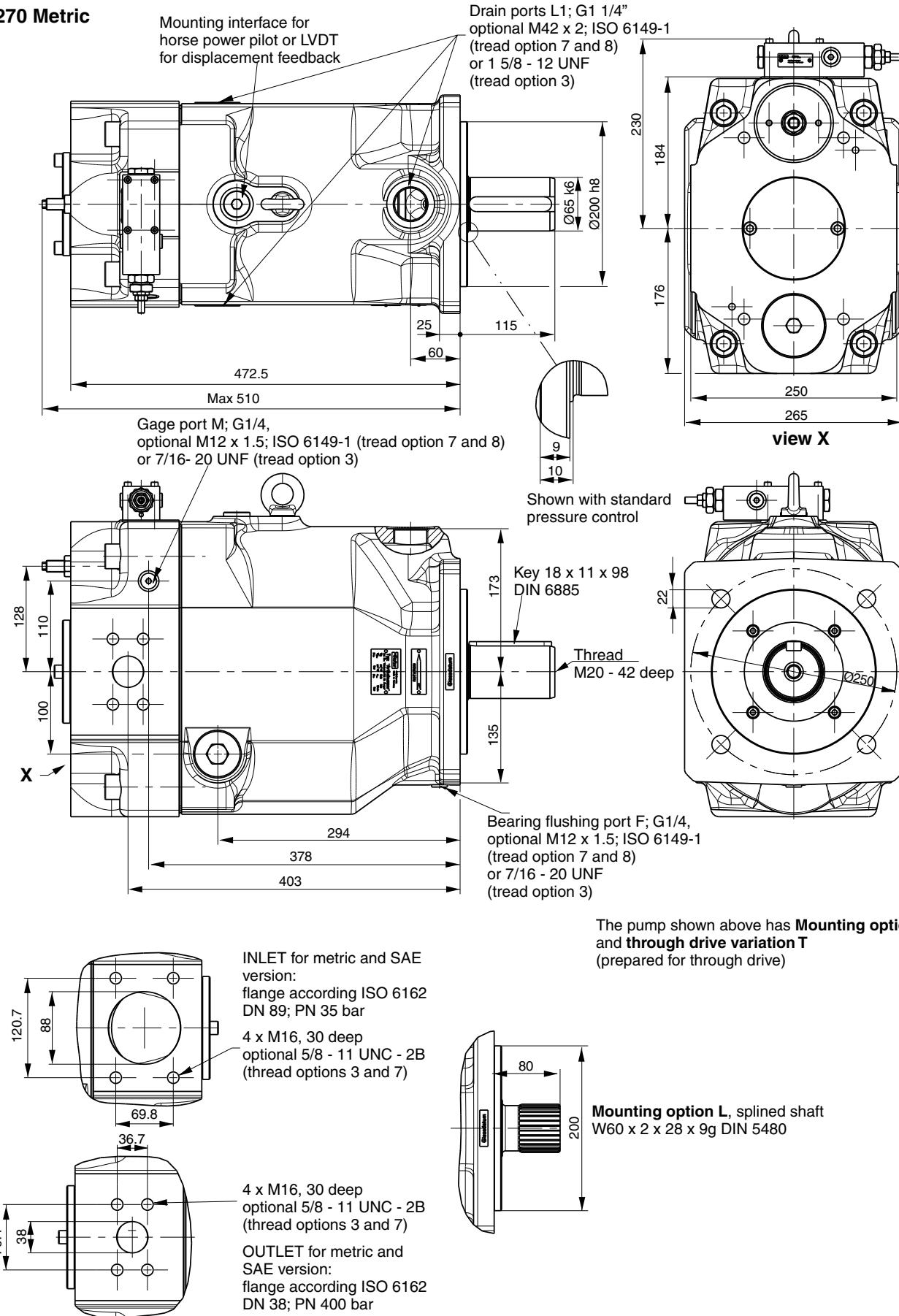
Variation with thru drive



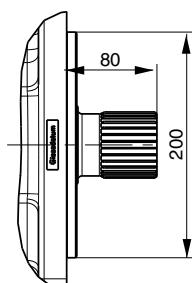
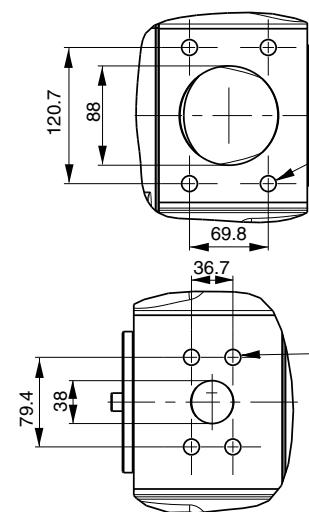
Thru drive adaptors are available with the following dimensions

Drawing Dimension Thru drive option	A	B	C	D	E		F	G		Remark
					Metr	UNC		Metr	UNC	
A	82.55	8	-	-	-	-	106	M10	3/8"-16	SAE A 2-Bolt
B	101.6	11	127	89.8	M12	1/2"-13	146	M12	1/2"-13	SAE B 2/4-Bolt
C	127	13.5	162	114.6	M12	1/2"-13	181	M16	5/8"-11	SAE C 2/4-Bolt
D	152.4	13.5	228.5	161.6	M16	5/8"-11	-	-	-	SAE D 4-Bolt
H	80	8.5	103	72.8	M8	5/16"-18	109	M10	3/8"-16	2/4-Bolt
J	100	10.5	125	88.4	M10	3/8"-16	140	M12	1/2"-13	2/4-Bolt
K	125	10.5	160	113.1	M12	1/2"-13	180	M16	5/8"-11	2/4-Bolt
L	160	13.5	200	141.4	M16	5/8"-11	-	-	-	4-Bolt

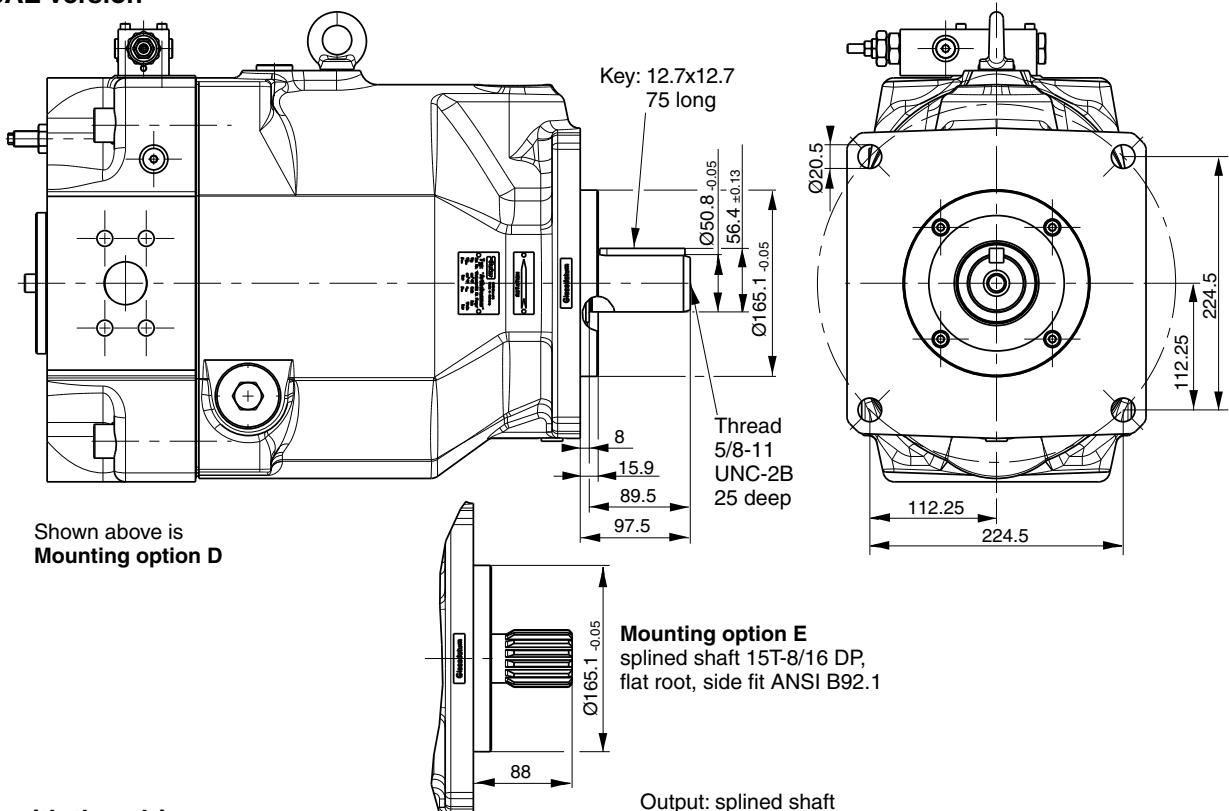
PV 270 Metric



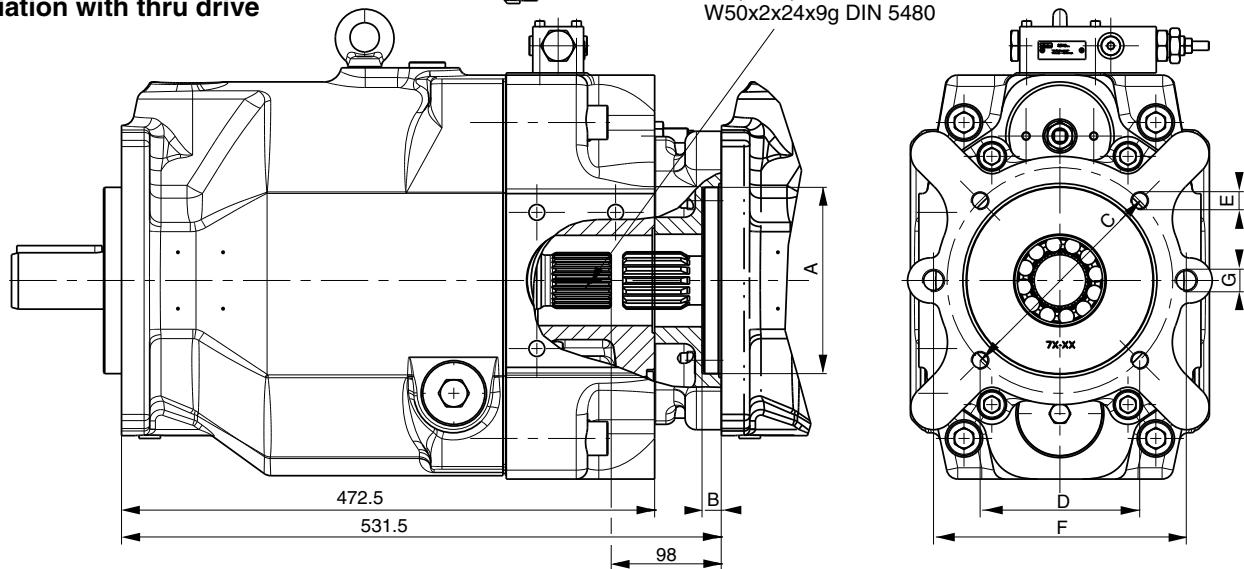
The pump shown above has **Mounting option K** and **through drive variation T** (prepared for through drive)



PV 270 SAE Version



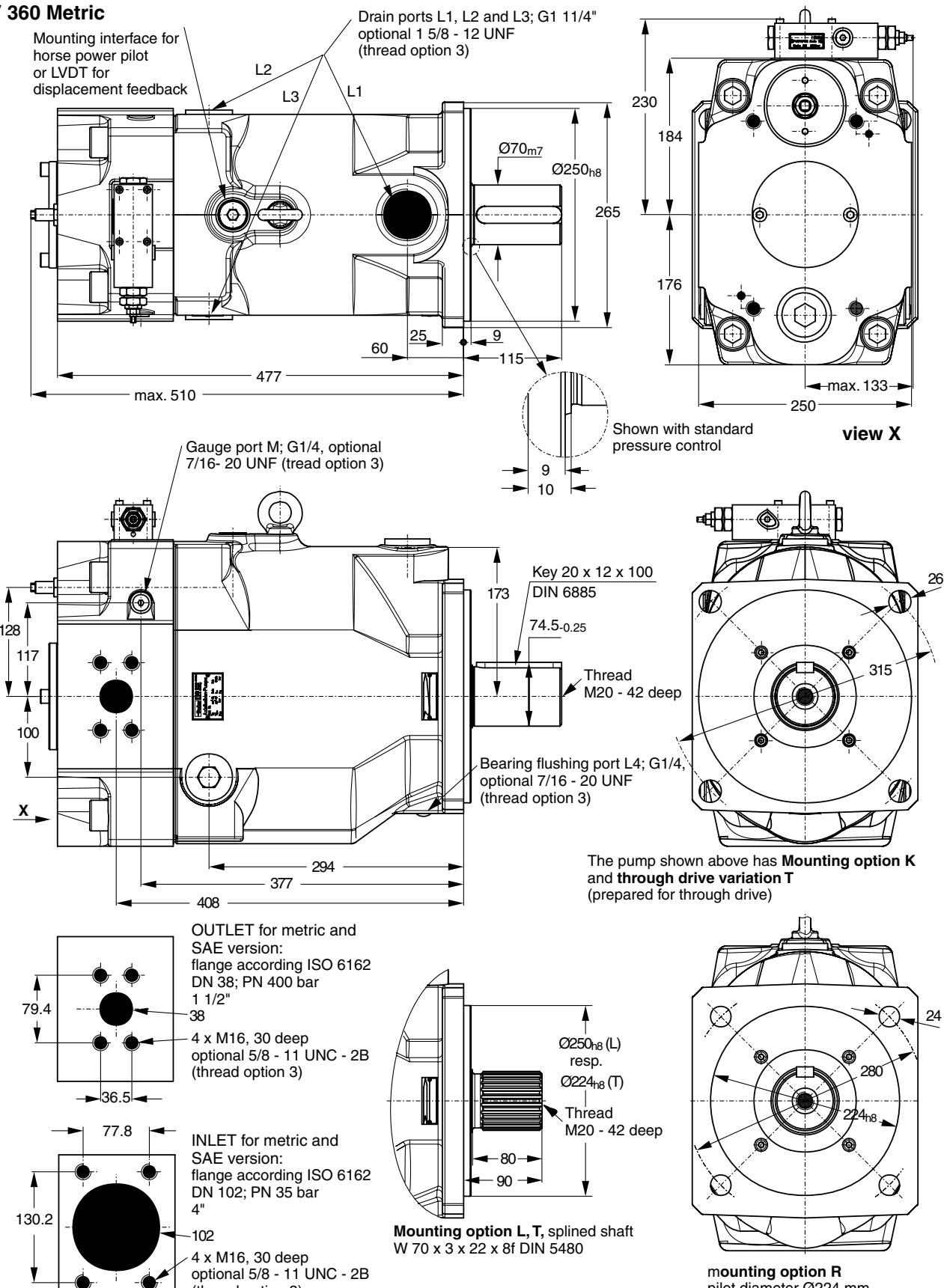
Variation with thru drive



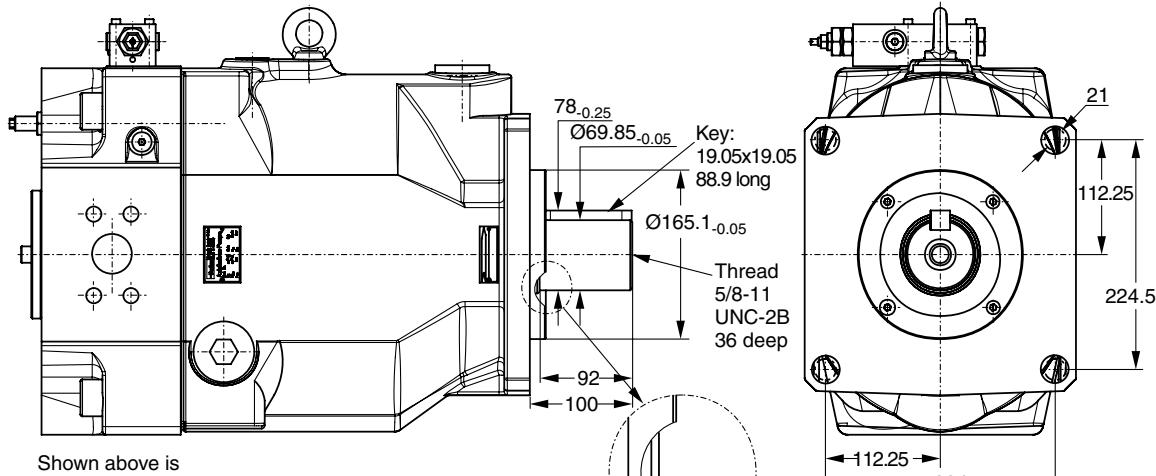
Thru drive adaptors are available with the following dimensions

Drawing Dimension Thru drive option	A	B	C	D	E		F	G		Remark
					Metr	UNC		Metr	UNC	
A	82.55	8	-	-	-	-	106	M10	3/8"-16	SAE A 2-Bolt
B	101.6	11	127	89.8	M12	1/2"-13	146	M12	1/2"-13	SAE B 2/4-Bolt
C	127	13.5	162	114.6	M12	1/2"-13	181	M16	5/8"-11	SAE C 2/4-Bolt
D	152.4	13.5	228.5	161.6	M16	5/8"-11	229	M16	5/8"-11	SAE D 2/4-Bolt
E	165.1	17	317.5	224.5	M20	3/4"-10	-	-	-	SAE E 4-Bolt
H	80	8.5	103	72.8	M8	5/16"-18	109	M10	3/8"-16	2/4-Bolt
J	100	10.5	125	88.4	M10	3/8"-16	140	M12	1/2"-13	2/4-Bolt
K	125	10.5	160	113.1	M12	1/2"-13	180	M16	5/8"-11	2/4-Bolt
L	160	13.5	200	141.4	M16	5/8"-11	224	M20	3/4"-10	2/4-Bolt
M	200	13.5	250	176.8	M20	3/4"-10	-	-	-	4-Bolt

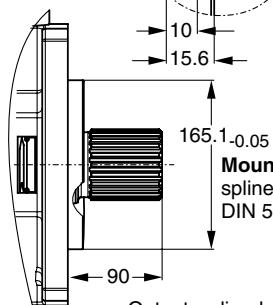
PV 360 Metric



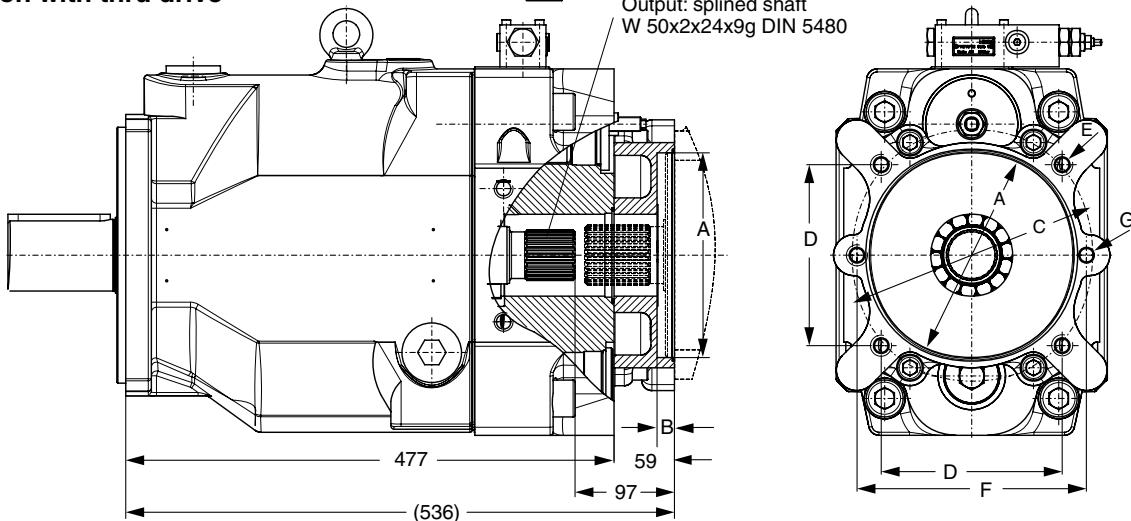
PV 360 SAE Version



Note:
 The dimensions shown conform to ISO 3019/1
 the actual hole dimensions conform to ISO 3019/2
 (pitch Ø315, hole Ø26, see previous page)
 and cover ISO 3019/1 dimensions as well.
 Use washers when assembling pump.



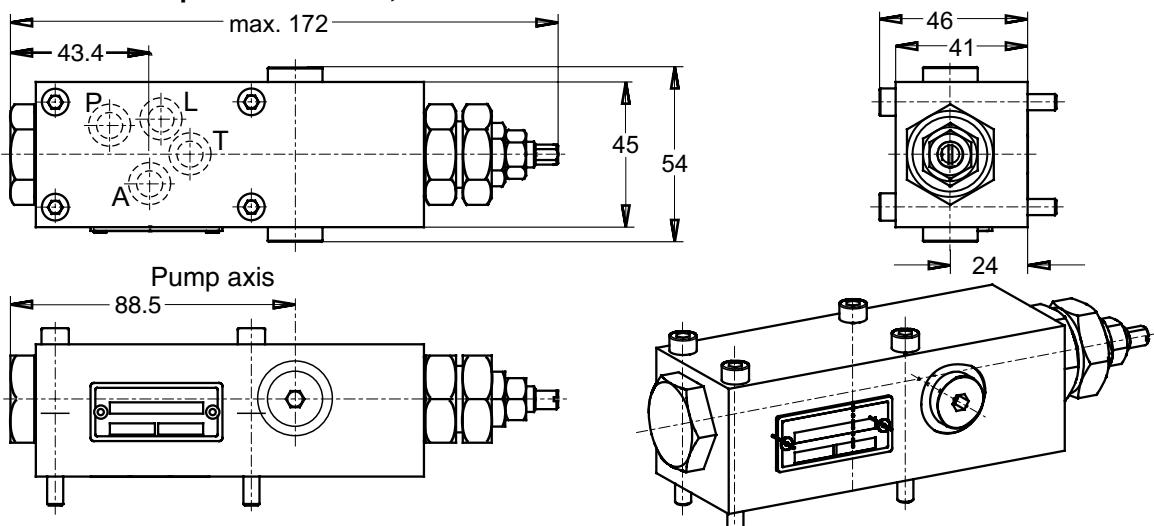
Variation with thru drive



Thru drive adaptors are available with the following dimensions

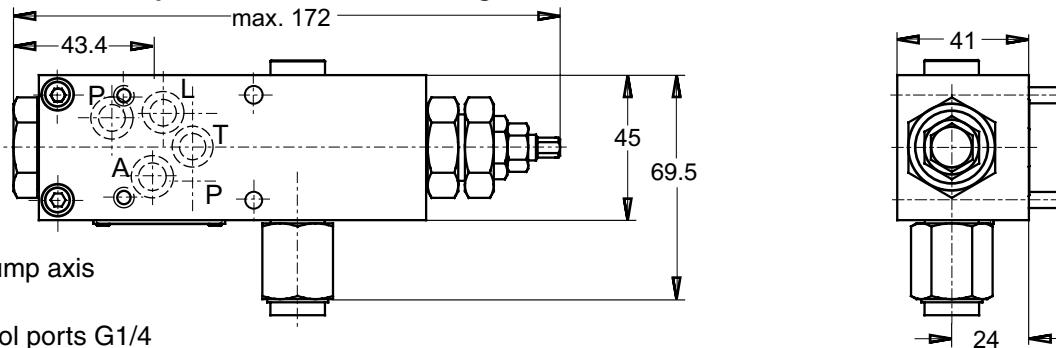
Drawing Dimension Thru drive option	A	B	C	D	E		F	G		Remark
					Metr	UNC		Metr	UNC	
A	82.55	8	-	-	-	-	106	M10	3/8"-16	SAE A 2-Bolt
B	101.6	11	127	89.8	M12	1/2"-13	146	M12	1/2"-13	SAE B 2/4-Bolt
C	127	13.5	162	114.6	M12	1/2"-13	181	M16	5/8"-11	SAE C 2/4-Bolt
D	152.4	13.5	228.5	161.6	M16	5/8"-11	229	M16	5/8"-11	SAE D 2/4-Bolt
E	165.1	17	317.5	224.5	M20	3/4"-10	-	-	-	SAE E 4-Bolt
H	80	8.5	103	72.8	M8	5/16"-18	109	M10	3/8"-16	2/4-Bolt
J	100	10.5	125	88.4	M10	3/8"-16	140	M12	1/2"-13	2/4-Bolt
K	125	10.5	160	113.1	M12	1/2"-13	180	M16	5/8"-11	2/4-Bolt
L	160	13.5	200	141.4	M16	5/8"-11	224	M20	3/4"-10	2/4-Bolt
M	200	13.5	250	176.8	M20	3/4"-10	-	-	-	4-Bolt

Dimensions standard pressure control, code ...MMC



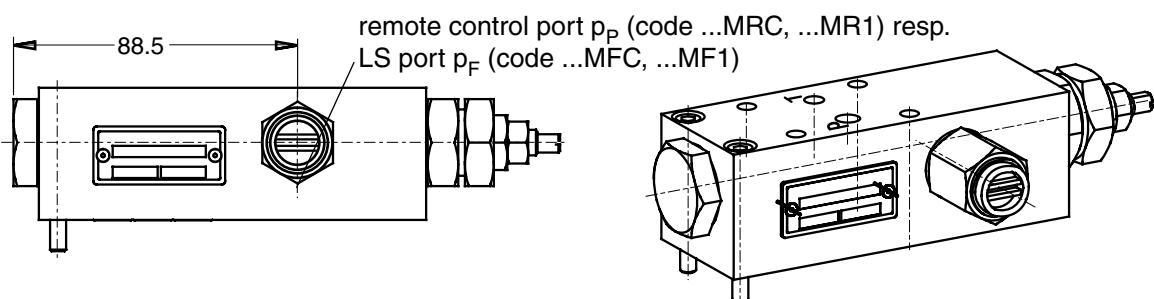
Controls with code ...MM1 have a NG6 / Cetop 3 interface topside (as shown below)

Dimensions remote pressure and load sensing control, codes ...MR1, ...MF1



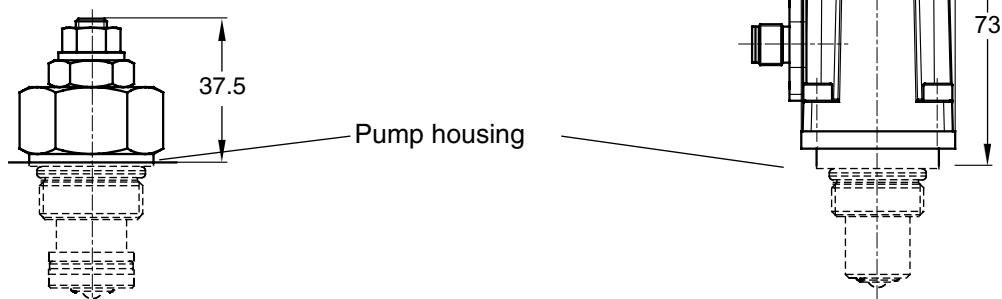
All control ports G1/4

Optional 7/16-20 UNF (option 3)

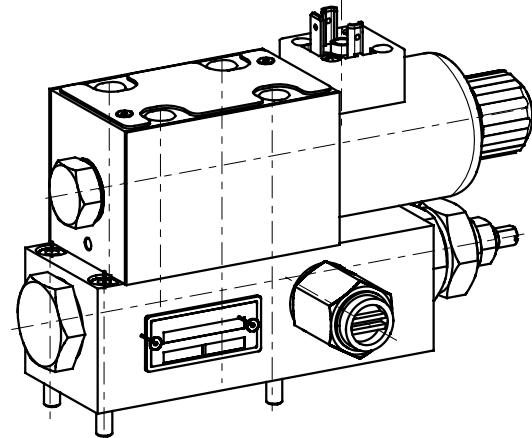
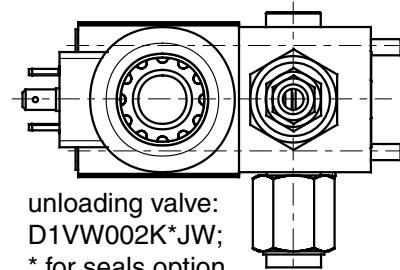
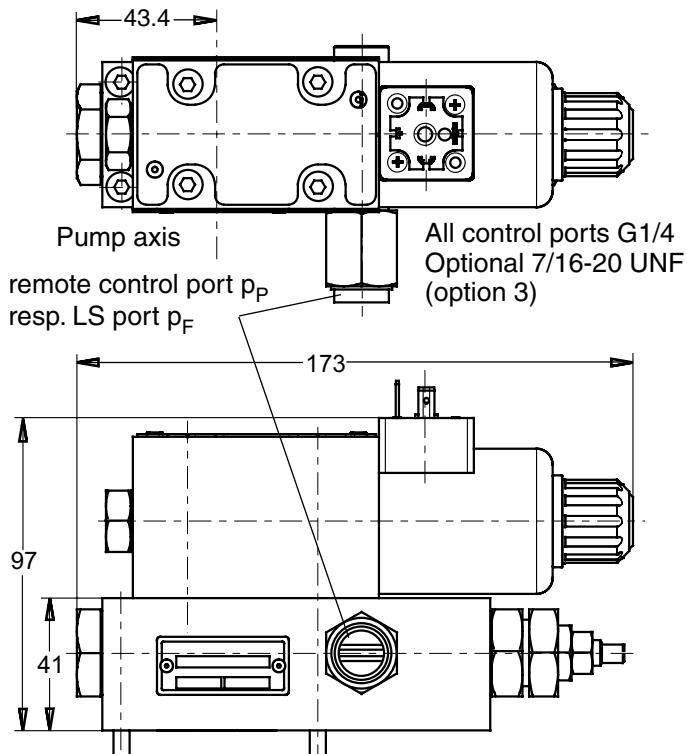


Controls with code ...MRC and MFC have no topside valve interface (as shown above)

Dimensions horse power pilot cartridge, displacement sensor

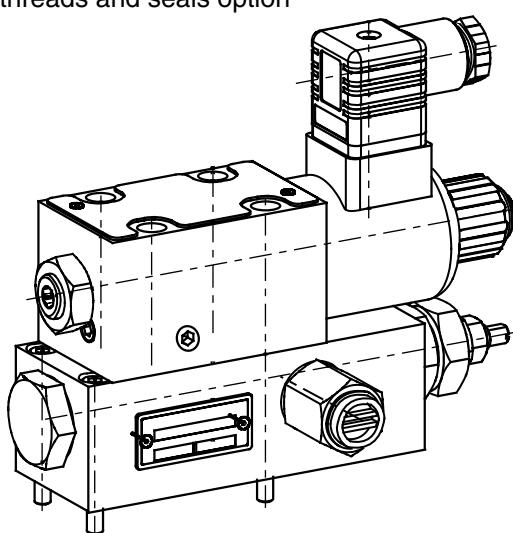
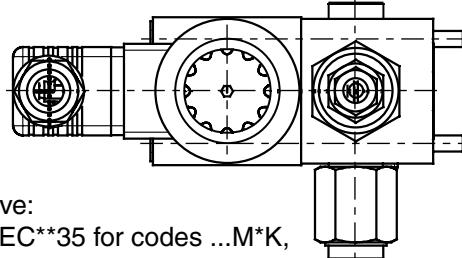
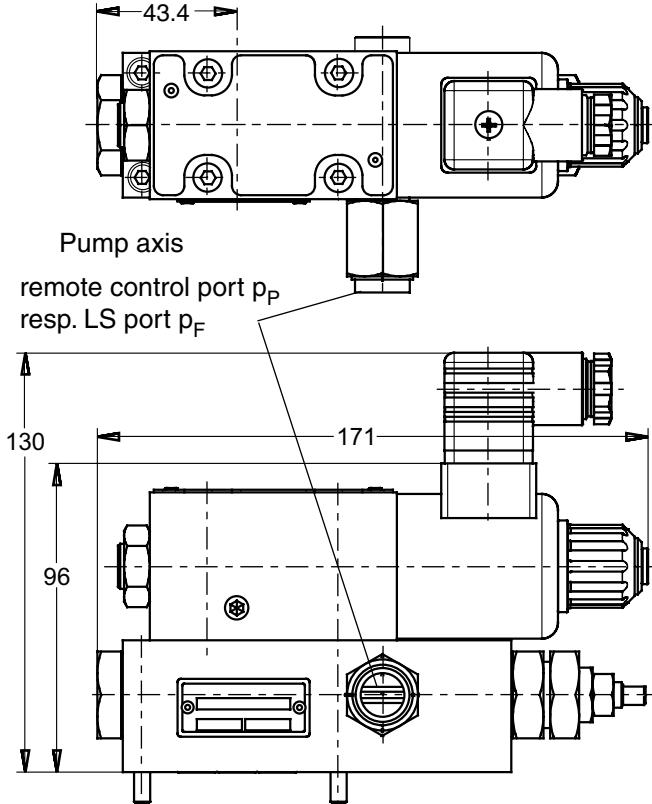


Dimensions for controls with unloading valve, codes ...M*W



Shown in version MRW/MFW, version MMW has no remote control port.

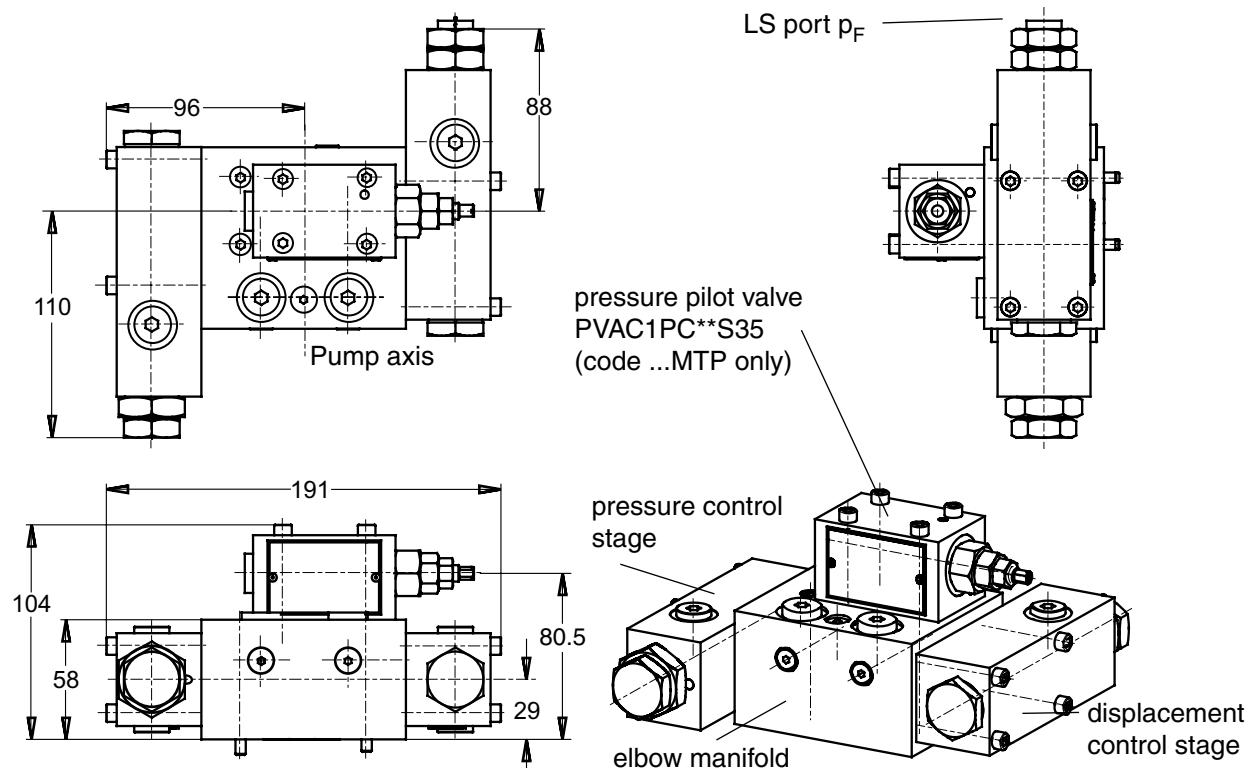
Dimensions for controls with proportional pressure pilot valve, codes ...M*K



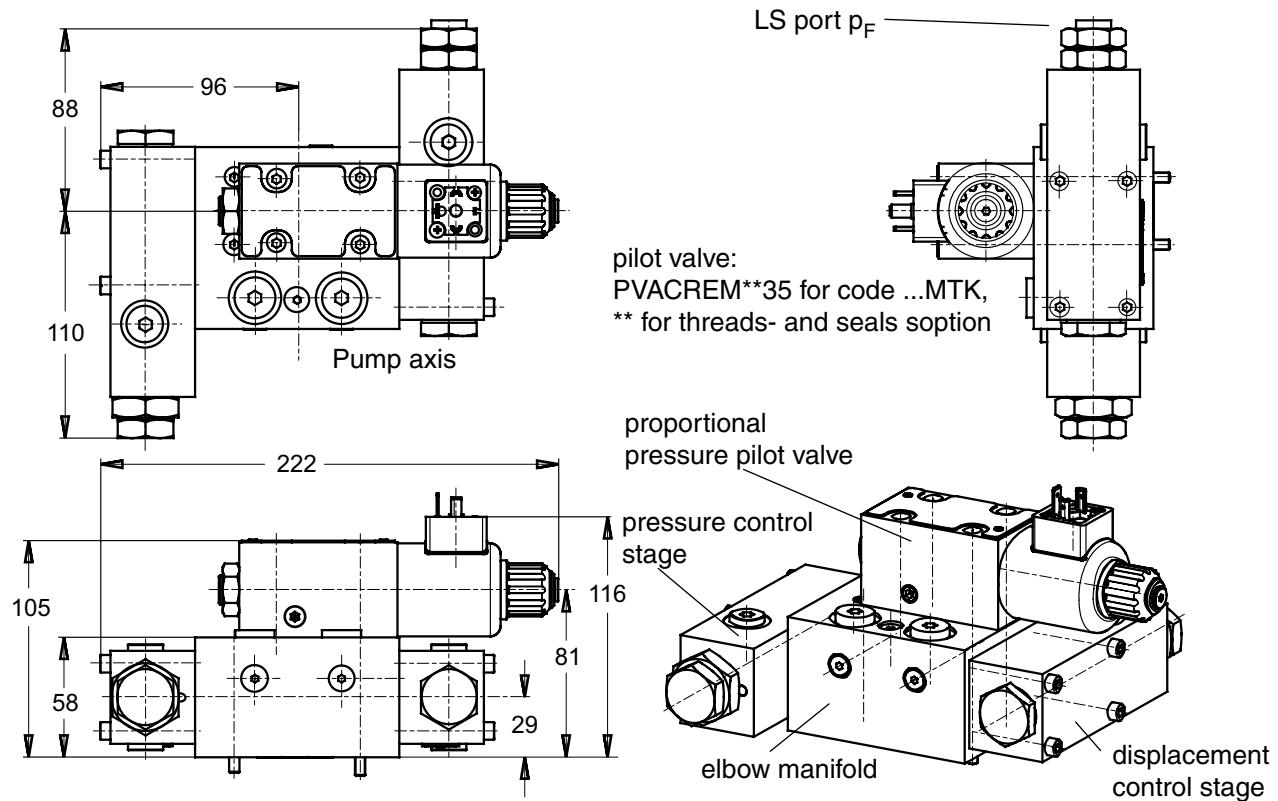
Shown in version MRK/MFK, version MMK has no remote control port.

Dimensions for horse power compensator *L* and *C* are identical to MM* respectively MF*.

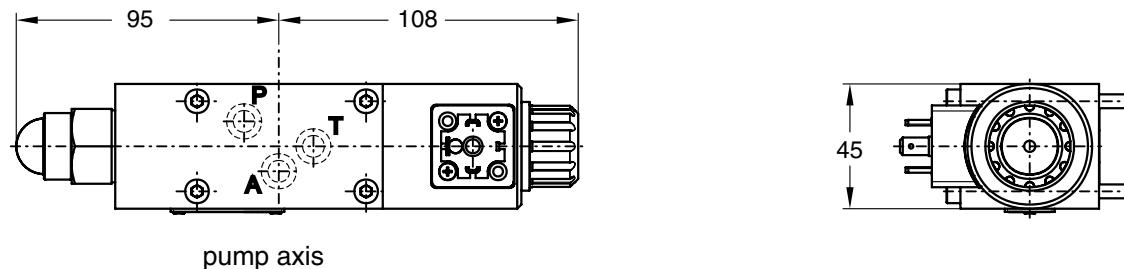
Dimensions two spool load sensing control, code ...MT1, ...MTP



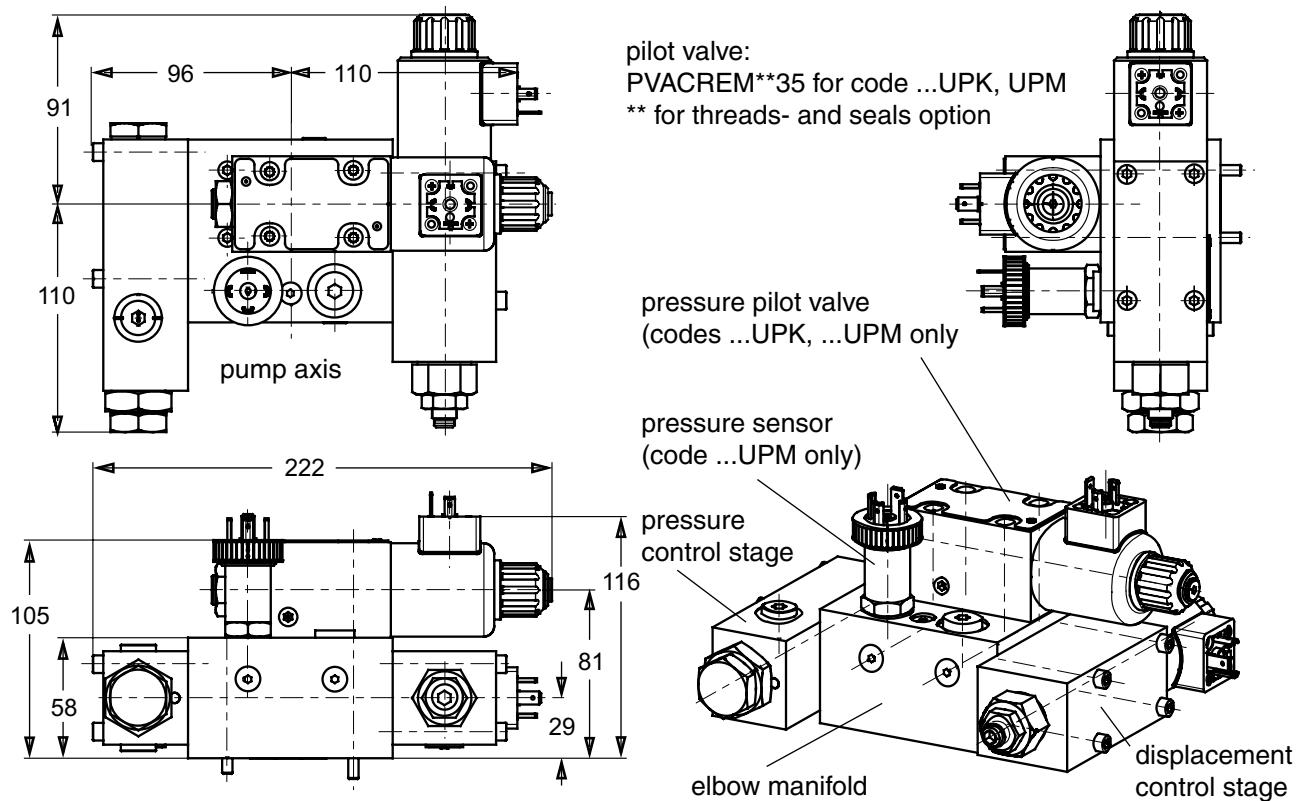
Dimensions two spool load sensing control with proportional pressure pilot valve, code ...MTK



Dimensions proportional displacement control, code ...FPV

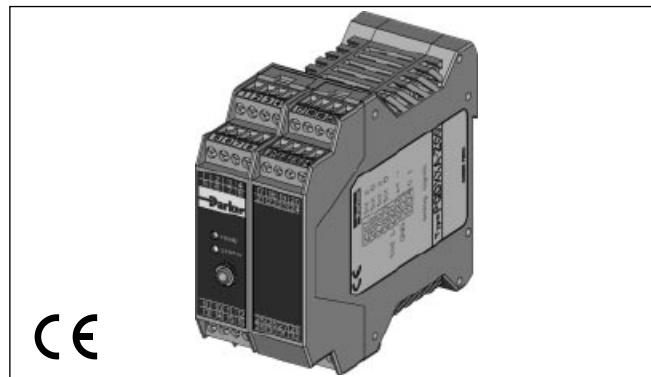


Dimensions proportional p/Q-control, codes ...UPR, ...UPK, ...UPM



Features

- Digital control circuit
- Parameter setting via RS-232 or USB interface
- All settings (ramps, MIN/MAX, control parameters) can be stored digitally and recalled from a PC to duplicate settings to other modules
- Ramp time up to 60 seconds
- Compatible to the relevant european EMC specifications
- Easy to use PC based setup software
- Covers all displacements
- Covers all available functions

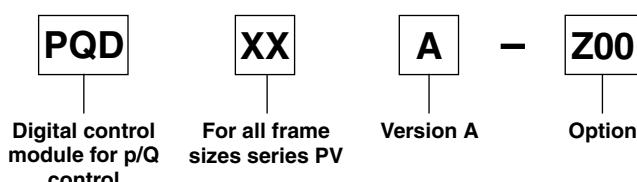


Technical data

Mounting style	Snap-on mounting for EN50022 rail	
Body material	Polycarbonate	
Inflammation class	V2...V0 acc. UL 94	
Mounting position	any	
Env. temperature range	[°C]	-20...+55
Protection class		IP 20 acc. DIN 40 050
Weight	[g]	160
Duty ratio	[%]	100
Supply voltage	[V]	18...30VDC, ripple <5% eff.
Rush in current	[A]	22 for 0.2 ms
Current consumption	[A]	< 4 for p/Q control ; < 2 for Q-control
Resolution	[%]	0.025 (power 0.1)
Interface		RS232C, 9600 baud, 3.5 mm cinch
EMC		EN 50 081-2, EN 50 082-2
Connctors		Screw terminals 0.2...2.5 mm ² , plug in style
Cables	[mm ²]	Supply and solenoid cables; 1,5 mm ² (AWG16) overall braid shield. Sensor and command signals; 0,5 mm ² (AWG20) overall braid shield
Max. cable length	[m]	50

For programming the module via PC, an interface cable is needed,
please order part number PQDXXA-KABEL (RS232) or PQDXXA-KABEL-USB (USB) separately.

Ordering code



Programming software

The programming of the p/Q control module is done in an easy to learn mode. To select the pump model and size and to set the control parameters the program ProPVplus must be started. This program runs under WINDOWS® 95 and higher.

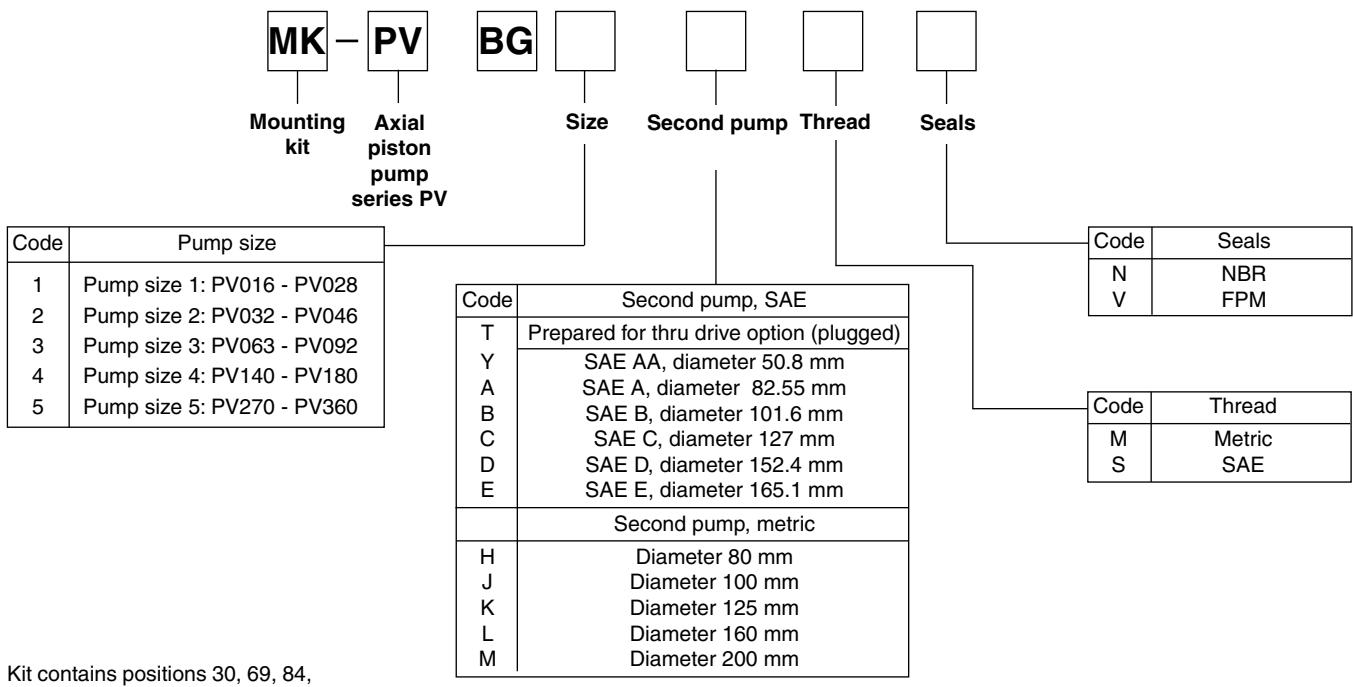
The latest version of this software can be downloaded at the following internet address:

www.parker.com/euro_pmd

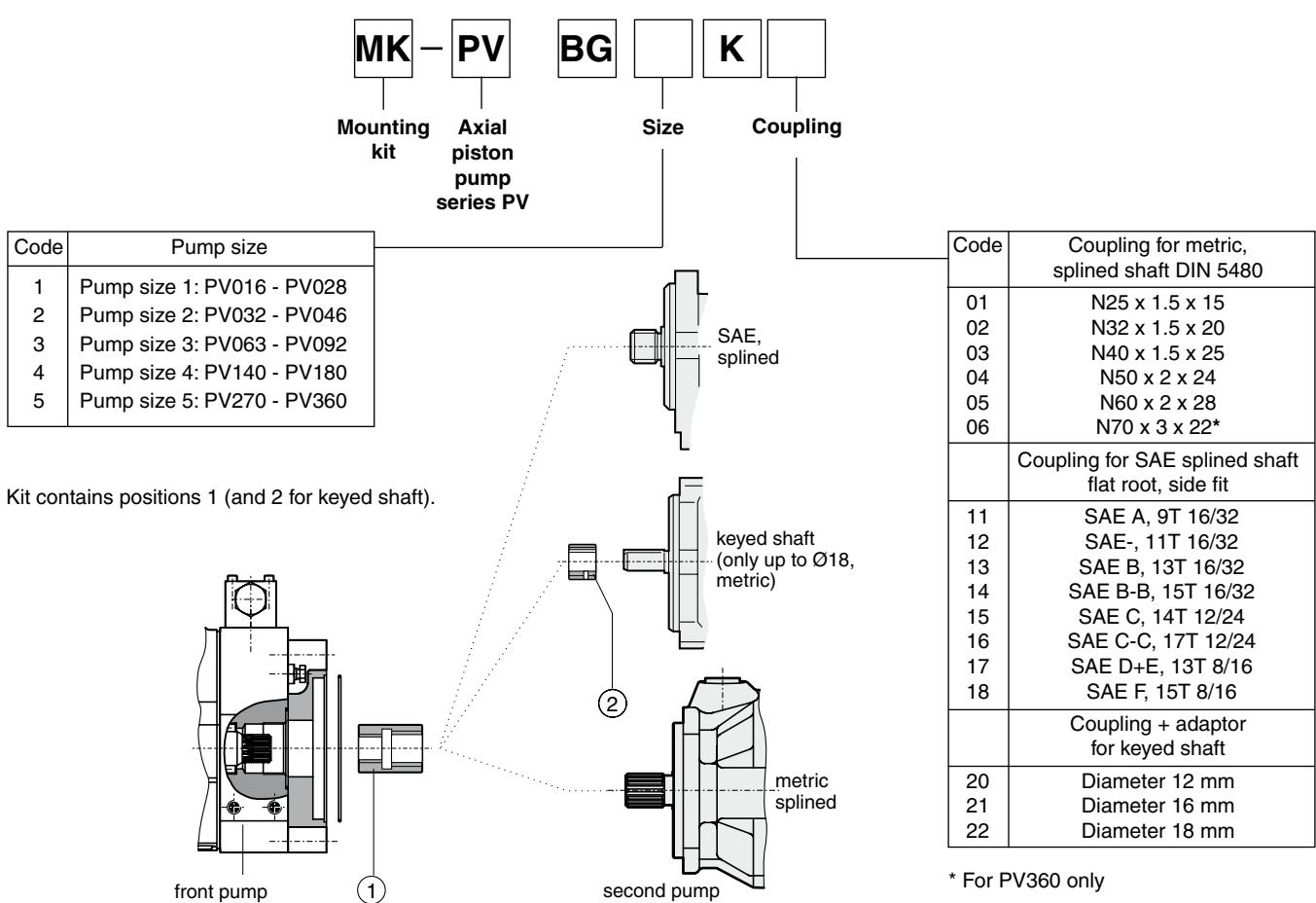
Features

- Display and documentation of parameter sets
- Save and reload of optimized parameter sets
- Offers oscilloscope function for easy performance evaluation and optimization
- Parameter sets for all PVplus pumps are pre-installed in the modules

Mounting kits for multiple pumps, for second pump option



Mounting kits for multiple pumps, couplings

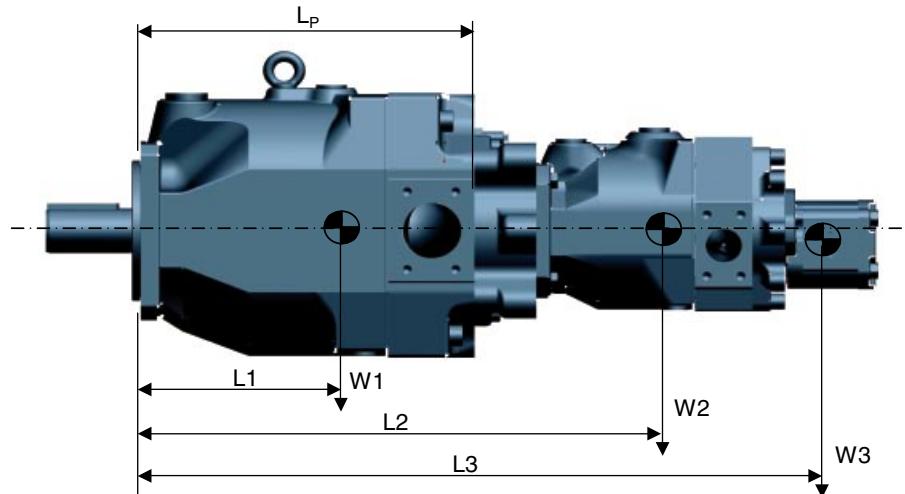


Availability of thru drive flange and coupling please check with ordering code options per each pump size, starting at page 6

Multiple Pump Combinations - Maximum Moment

Combinations of multiple pumps might require additional pump support to avoid a too high stress on the front mounting flange. Combinations of two PVplus pumps in the same frame size generally do not need additional support in an industrial application. For combinations of more pumps support is required.

In case of combinations of a PVplus pump with another type of pump it is recommended to calculate the moment for the combination and compare with the maximum moment in table 1 below.



$$\text{Moment } M = (L_1 \cdot W_1 + L_2 \cdot W_2 + L_3 \cdot W_3 + \dots)$$

Note:

If the calculated moment M exceed the maximum moment in table 1 below, additional pump support is needed

Table 1: Maximum Moment and Pump Dimensions

	PV016-PV028	PV032-PV046	PV063-PV092	PV140-PV180	PV270	PV360
Maximum moment ¹⁾	[Nm]	81	151	401	591	1686
Weight W	[N]	186	294	589	883	1687
Distance L1	[mm to C/G]	106	119	178	184	234
Distance L _p	[mm]	197.5	227	287	350	472.5

1) at dynamic weight acceleration 10g = 98.1 m/sec²

Table 2 Through Drive Adapter Plate Thickness [mm]

Adapter option ²⁾	PV016-PV028	PV032-PV046	PV063-PV092	PV140-PV180	PV270	PV360
Y	27	-	-	-	-	-
A	27	34	39	65	59	59
B	27	34	39	65	59	59
C	-	49	39	65	59	59
D	-	-	39	65	59	59
E	-	-	-	-	59	59
G	27	34	39	-	-	-
H	27	34	39	65	59	59
J	27	34	39	65	59	59
K	-	49	39	65	59	59
L	-	-	39	65	59	59
M	-	-	-	-	59	59

2) See page 6 to 17 for reference per each frame size.

Maximum allowed transferable torque FRONT						
Shaft code	Shaft type	Transferable torque at FRONT shaft end. [Nm]				
		PV016-028	PV032-046	PV063-092	PV140-180	PV270
D	SAE - Key	300	650	1850	2150	2150
E	SAE - Spline	320	630	1700	2750	2800
F	SAE - Key				1200	
G	SAE - Spline				1700	
R	Metric - Key					3750
T	Metric - Spline					8100
K	Metric - Key	280	640	1200	1550	3300
L	Metric - Spline	320	720	1500	3050	5750

Maximum allowed transferable torque REAR						
Max. torque transmission cap. for rear mounted pump	350	520	1100	1550	3150	3250

Important notice

The max. allowable torque of the individual shaft must not be exceeded. For 2-pump combinations there is no problem because PV series offers 100% thru torque. For 3-pump combinations (and more) the limit torque could be reached or exceeded.

Therefore it is necessary to calculate the torque factor and compare it with the allowed torque limit factor in the table.

Required: calculated torque factor
 < torque limit factor

To make the necessary calculations easier and more user friendly it is not required to calculate actual torque requirements in Nm and compare them with the shaft limitations. The table on the right shows limit factors that include material specification, safety factors and conversion factors.

The **total torque factor** is represented by the sum of the individual torque factors of all pumps in the complete pump combination.

Total torque factor of the combination
 = sum of individual torque factors of all pumps

The **torque factor of each individual pump** is calculated by multiplying the max. operating pressure p of the pump (in bar) with the max. displacement V_g of the pump (in cm^3/rev).

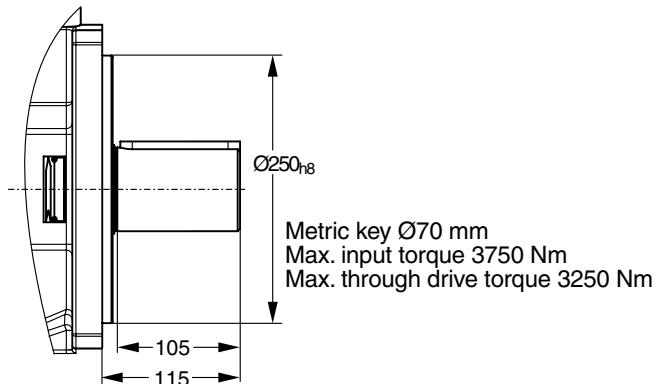
Torque factor of any pump
 $= p \times V_g$

Pump	Shaft	Torque limit factor
PV016-028	D	17700
	E	17700
	K	17700
	L	20130
PV032-046	D	32680
	E	36380
	K	33810
	L	40250
PV063-092	D	77280
	E	72450
	K	67620
	L	83720
PV140-180	D	118400
	E	158760
	F	78750
	G	97650
	K	113400
	L	157500
PV270	D	119000
	E	159700
	K	170100
	L	236250

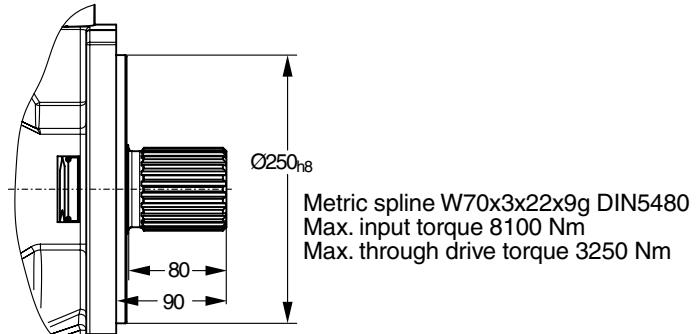
PV360 shaft options

Max. transferable torque in [Nm] for different shaft options

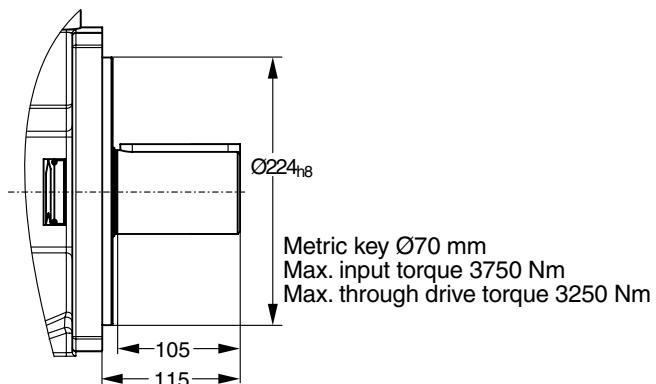
K



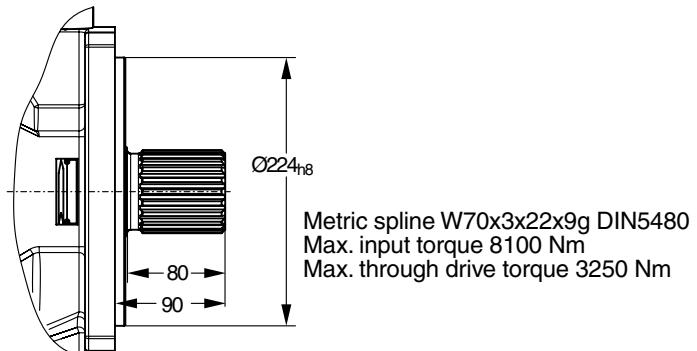
L



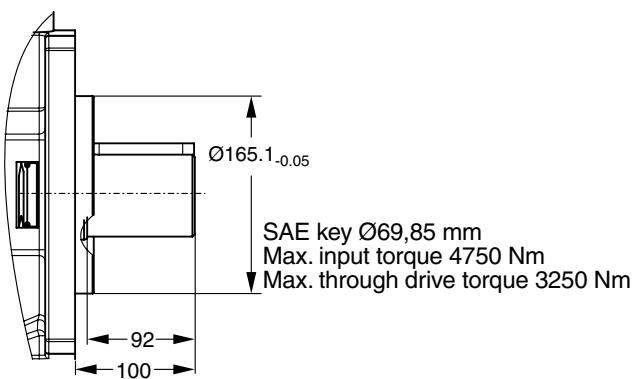
R



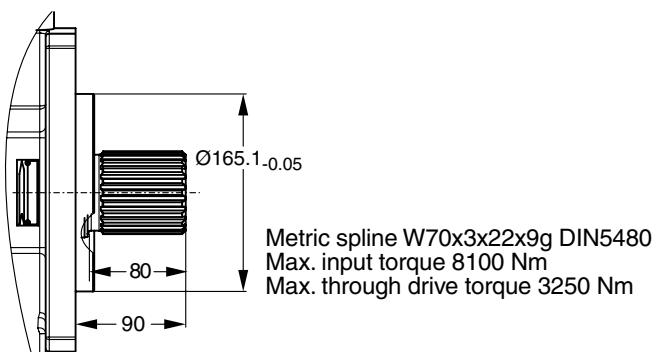
T



D



E





WARNING – USER RESPONSIBILITY

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

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