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P1/PD Series
Medium Duty Axial Piston Pumps

Variable Displacement
Catalog HY28-2665-01/P1/EN
Effective: March 15, 2010

Parker

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General Information

Description

- Variable displacement, axial piston pump for open-circuit applications
- Medium pressure, continuous operation at pressures up to 280 bar
- High drive speed models for mobile markets and low noise models for industrial markets
- Quiet and efficient control capability

Benefits

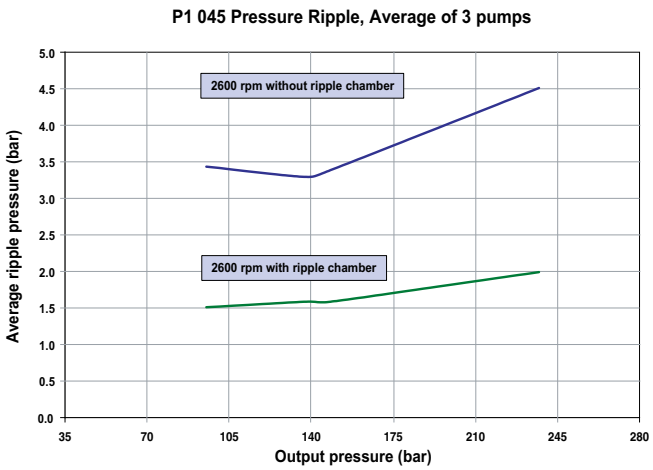
- Compact overall package size
- Quiet operation
- Low flow ripple to further reduce noise
- Elastomer seals that eliminate gaskets and external leakage
- High operating efficiency for lower power consumption and reduced heat generation
- Simple hydraulic controls with “no-leak” adjustments
- SAE and ISO standard mounting flanges and ports
- Long life, tapered-roller shaft bearings
- Long life, low friction, hydrostatically balanced swash plate saddle bearings
- Full power through-drive capability
- End or side inlet and outlet ports
- Case drain ports for horizontal or vertical, shaft-up mounting
- Optional minimum and maximum displacement adjustments
- Optional case-to-inlet check valve to extend shaft seal life
- Easy to service

P1 Series

PD Series

Ripple Chamber Technology

The chart refers to the “Ripple Chamber “ technology engineered into the P1/PD 18, 28 and 45 Series, side ported pumps. The ripple chamber reduces pressure pulsations (called ripple) at the outlet of the pump by 40-60%. This leads to a significant reduction in overall system noise, without the added expense of noise dampening components.



Ordering Information - 18cc, 28cc, 45cc

Pump Series | Displacement | Type | Mounting & Ports | Shaft Options | Shaft Seal | Shaft Rotation | Application | Seal Material | Design Level | Control Options | Additional Control Options | Port Orientation | Displacement Adjustment | Case-to-Inlet Check Valve | Thru-Drive Mounting Pad & Coupling | Paint | Special Features

Code	Series
P1	Mobile
PD	Industrial

Code	Displacement
018	18 cc/rev (1.10 in³/rev)
028	28 cc/rev (1.71 in³/rev)
045	45 cc/rev (2.75 in³/rev)

Code	Type
P	Open circuit, variable displacement

Code	Design Level
A	Current Design Series

Code	Seal Material
5	Fluorocarbon

Code	Application
M	Mobile (P1)
S	Industrial (PD)
U*	Universal

* Available on 45 cc , "S" Mounting & Port Option Pumps only.

Code	Shaft Rotation
R	Clockwise
L	Counterclockwise

Code	Shaft Seal
S	Single Shaft Seal

Code	Paint
00	No Paint
PB	Black Paint

Code	Special Features
00	No Special Features
M2	Special Modification

Code	Thru-Drive Mounting Pad/ Coupling*
0	No Thru-Drive
A*	SAE 82-1 (A) Pilot & SAE A 9T Coupling
H*	SAE 82-2 (A) Pilot & SAE A 11T Coupling
B*	SAE 101-2 (B) Pilot & SAE B 13T Coupling
Q**	SAE 101-2 (B) Pilot & SAE B-B 15T Coupling

* For 028 and 045 only
** For 045 only

Code	Mounting & Ports See Catalog Table for Complete Information									
	018 Mount	018 Threaded	018 Aux Ports	028 Mount	028 Threaded	028 Aux Ports	045 Mount	045 Threaded	045 4 Bolt Flange	045 Aux Ports
S	82-2 SAE A	SAE 16/12	SAE 4/6	101-2 SAE B	SAE 20/12	SAE 4/8	101-2 SAE B	SAE 24/16	38/25mm Code 61	SAE 4/10
A	82-2 SAE A	M33/27	BSPP 1/4,3/8"	101-2 SAE B	M42x2 M27x2	BSPP 1/4",1/2"	101-2 SAE B	M48x2 M33x2	38/25mm DIN51/25	BSPP 1/4",1/2"
M	ISO	M33/27	M12x1.5, M16x1.5	ISO	M42x2, M27x2	M12x1.5, M22x1.5	ISO	M48x2, M33x2	38/25mm DN51/25	M12x1.5, M22x1.5
B	ISO	M33/27	BSPP 1/4,3/8"	ISO	M42x2, M27x2	BSPP 1/4", 1/2"	ISO	M48x2, M33x2	38/25mm DN51/25	BSPP 1/4", 1/2"

Code	Case-to-Inlet Check Valve/Port Type
0*	4 Bolt Flange / No Case Check
1*	4 Bolt Flange / With Case Check
2	Threaded Ports / No Case Check
3	Threaded Ports / With Case Check

* For 045 only

Code	018 Shaft Options	028 Shaft Option	045 Shaft Option
01	SAE A 11T Spline	SAE B-B 15T Spline	SAE B-B 15T Spline
02	SAE 19-1 Key .75" Dia.	SAE Key 1" Dia. B-B	SAE Key 1" Dia. B-B
04	ISO/DIN Key 20mm Dia.	ISO/DIN Key 25mm Dia.	ISO/DIN Key 25mm Dia.
06	SAE A 9T Spline	—	—
08	—	SAE B 13T Spline	SAE B 13T Spline

Code	Displacement Adjustment
0	None
1*	Adjustable Maximum Displacement
2*	Adjustable Minimum Displacement
3*	Adjustable Max & Min Displacement

* Displacement adjustment not available on thru-drive.

Code	Control Options
C0	Pressure Limiter, 80-280 bar Adjustment Range
C1	Pressure Limiter, 20-80 bar Adjustment Range
L0	Load sensing, 10-30 bar ΔP and Pressure Limiter 80-280 bar
L2	Load sensing, 10-30 bar ΔP and Pressure Limiter 80-280 bar with bleed orifice
AE	Pilot Operated Pressure Limiter Control with Proportional Electronic Adjustment (12V)
AF	Pilot Operated Pressure Limiter Control with Proportional Electronic Adjustment (24V)
AG	Fan Drive Pressure Limiter with Proportional Electronic Adjustment (24 V)
AH	Fan Drive Pressure Limiter with Proportional Electronic Adjustment (12 V)
AN*	Pilot Operated Control with ISO-4401 (NG6) Interface and Shipping Cover
AM	Pilot Operated Pressure Limiter Control with Mechanical Adjustment and Vent Port
AL	Load Sense and Pressure Limiter (P'045 Torque Limiter only)

* Not a functional control as shipped . See control description on page 7.

Code	Port Orientation
E	End Ports
R	Side Ports with Ripple Chamber
T*	Side Ports with Thru-Drive

* For 028 and 045 only

Code	Additional Control Options
0	None
T	Torque Limiter 45cc ALT, AMT only
4	Max System Pressure, 210 Bar. For AG & AH Controls Only
5	Max System Pressure, 250 Bar. For AG & AH Controls Only
7	Max System Pressure, 280 Bar. For AG & AH Controls Only

Ordering Information - 60cc, 75cc, 100cc, 140cc

Pump Series | Displacement | Type | Mounting & Ports | Shaft Options | Shaft Seal | Shaft Rotation | Application | Seal Material | Design Level | Control Options | Additional Control Options | Port Orientation | Mechanical Displacement Adjustment | Case-to-Inlet Check Valve | Thru-Drive Mounting Pad & Coupling | Paint | Special Features

Code	Series
P1	Mobile
PD	Industrial

Code	Displacement
060	60 cc/rev (3.66 in³/rev)
075	75 cc/rev (4.58 in³/rev)
100	100 cc/rev (6.41 in³/rev)
140	140 cc/rev (8.85 in³/rev)

Code	Type
P	Open circuit, variable displacement

Code	Shaft Rotation
R	Clockwise
L	Counterclockwise

Code	Shaft Seal
S	Single Shaft Seal

Code	Application
M	Mobile (P1)
S	Industrial (PD)
U*	Universal

* Available on "S" Mounting & Port Option Pumps only.

Code	Design Level
A	Current Design Series

Code	Seal Material
5	Fluorocarbon

Code	Mounting & Ports See Catalog Table for Complete Information											
	060 Mount	060 Flange Ports mm	060 Aux Ports	075 Mount	075 Flange Ports mm	075 Aux Ports	100 Mount	100 Flange Ports mm	100 Aux Ports	140 Mount	140 Flange Ports mm	140 Aux Ports
S	SAE mounting with SAE ports											
	127-4 (C)	50/25 Code 61	SAE 4/10	127-4 (C)	50/25 Code 61	SAE 4/10	127-4 (C)	63/32 Code 61/62	SAE 4/12	152-4 (D)	63/32 Code 61/62	SAE 4/16
A	SAE mounting with BSPP drain, pilot, & gage ports, and metric 4-bolt inlet/outlet ports											
	127-4 (C)	50/25 Code 61	1/4"-3/4"	127-4 (C)	50/25 Code 61	1/4"-3/4"	127-4 (C)	63/32 Code 61/62	1/4"-3/4"	152-4 (D)	63/32 Code 61/62	1/4"-1"
M	ISO mounting with metric ports											
	ISO	50/25 DN51	M12/ M22	ISO	50/25 DN51	M12/ M22	ISO	63/32 DN64/32	M12/ M27	ISO	63/32 DN64/32	M12/ M33
B	ISO mounting with BSPP ports											
	ISO	50/25 DN51	1/4"-3/4"	ISO	50/25 DN51	1/4"-3/4"	ISO	63/32 DN64/32	1/4"-3/4"	ISO	63/32 DN64/32	1/4"-1"
C*	*SAE C 2 bolt mtg w/ SAE ports											
	127-2 (C)	50/25 Code 61	SAE 4/10	127-2 (C)	50/25 Code 61	SAE 4/10	N/A	N/A	N/A	N/A	N/A	N/A
D*	*SAE C 2 bolt mtg w/ BSPP auxiliary ports											
	127-2 (C)	50/25 Code 61	1/4"-3/4"	127-2 (C)	50/25 Code 61	1/4"-3/4"	N/A	N/A	N/A	N/A	N/A	N/A

* 60cc/r and 75cc/r only

Code	060 Shaft Options	075 Shaft Options	100 Shaft Options	140 Shaft Options
01	SAE C 14T Spline	SAE C 14T Spline	SAE C-C 17T Spline	SAE D 13T Spline
02	SAE C 32-1 Key	SAE C 32-1 Key	SAE C-C 38-1 Key	SAE D 44-1 Key
04	ISO\DIN Key 32mm Dia.	ISO\DIN Key 32mm Dia.	ISO\DIN Key 40mm Dia.	ISO\DIN Key 50mm Dia.
06	—	—	SAE C 14T Spline	—

Code	Control Options
C0	Pressure Limiter, 80-280 bar Adjustment Range
C1	Pressure Limiter, 20-80 bar Adjustment Range
L0	Load sensing, 10-30 bar ΔP and Pressure Limiter 80-280 bar
L2	Load sensing, 10-30 bar ΔP and Pressure Limiter 80-280 bar with bleed orifice
AE	Pilot Operated Pressure Limiter Control with Proportional Electronic Adjustment (12V)
AF	Pilot Operated Pressure Limiter Control with Proportional Electronic Adjustment (24V)
AG	Fan Drive Pressure Limiter with Proportional Electronic Adjustment (24 V)
AH	Fan Drive Pressure Limiter with Proportional Electronic Adjustment (12 V)
AN*	Pilot Operated Control with ISO-4401 (NG6) Interface and Shipping Cover
AM	Pilot Operated Pressure Limiter Control with Mechanical Adjustment and Vent Port
AL	Load Sense and Pressure Limiter (P'060 Torque Limiter Pumps only)

* Not a functional control as shipped . See control description on page 7.

Code	Additional Control Options
0	None
T	Torque limiter used w/ AM, AL (060) & L0 (075-140) Options
4	Max System Pressure, 210 Bar. For AG & AH Controls Only
5	Max System Pressure, 250 Bar. For AG & AH Controls Only
7	Max System Pressure, 280 Bar. For AG & AH Controls Only

Code	Port Orientation
E	End Ports
S	Side Ports
T	Side Ports with Thru-Drive

Code	Mechanical Displacement Adjustment
0	None
1*	Adjustable Maximum Displacement
2*	Adjustable Minimum Displacement
3*	Adjustable Max & Min Displacement

* Displacement adjustment not available on thru-drive.

Code	Case-to-Inlet Check Valve
0	4 Bolt Flange / No Case Check Valve
1	4 Bolt Flange / With Case Check Valve

Code	Thru-Drive Mounting Pad/Coupling	# Teeth
0	None (only valid for end or side ported)	–
A	SAE 82-2 (A) & 16 (A) Coupling	9T
H	SAE 82-2 (A) & 19 (--) Coupling	11T
B	SAE 101-2 (B) & 22 (B) Coupling	13T
Q	SAE 101-2 (B) & 25 (B-B) Coupling	15T
C	SAE 127-4 (C) & 32 (C) Coupling	14T
N*	SAE 127-4 (C) & 38 (C-C) Coupling	17T
D**	SAE 152-4 (D) & 44 (D&E) Coupling	13T
J***	SAE 101-2 (B) rotated 45 degrees, 22 (B) coupling	13T
K***	SAE 101-2 (B) rotated 45 degrees, 25 (B-B) coupling	15T

* Available on 100 thru 140 models.
** Available on 140 models.
*** Available on "S" Mounting & Port Option Pumps only.

Code	Paint
00	No Paint
PB	Black Paint

Code	Special Features
00	No Special Features
M2	Special Modification

Technical Data

Model	P1/PD 018	P1/PD 028	P1/PD 045	P1/PD 060	P1/PD 075	P1/PD 100	P1/PD 140
Maximum Displacement, cm^3/rev cu.in./rev	18 1.10	28 1.71	45 2.75	60 3.66	75 4.58	100 6.01	140 8.54
Outlet Pressure – Continuous, bar psi	280 4000						
Intermittent*, bar psi	320 4500						
Peak, bar psi	350 5000						
P1 Maximum Speed – Boosted Inlet, rpm	3200	3200	3000	2800	2700	2500	2400
P1 (1.0 bar abs inlet), rpm	3200	3200	2600	2500	2300	2100	2000
P1 (0.8 bar abs inlet), rpm	2700	2800	2200	2000	1900	1800	1800
PD Maximum Speed (1.0 bar abs inlet), rpm	1800						
PD (0.8 bar abs inlet), rpm	1800						
Minimum Speed, rpm	600						
Inlet Pressure – Maximum, bar psi	10 (gage) 145						
Rated, bar psia	1.0 absolute (0.0 gage) 14.5						
Minimum, bar psia	0.8 absolute (-0.2 gage) 11.6						
Case Pressure – Peak, bar	4.0 absolute (3.0 gage) and less than 0.5 bar above inlet pressure						
Rated, bar	2.0 absolute (1.0 gage) and less than 0.5 bar above inlet pressure						
Fluid Temperature Range, °C °F	-40 to +95 -40 to +203						
Fluid Viscosity – Rated, cSt	6 to 160						
Max. Intermittent, cSt	5000 (for cold starting)						
Min. Intermittent, cSt	5						
Fluid Contamination – Rated, ISO	20/18/14						
Maximum, ISO	21/19/16						
SAE Mounting – Flange	82-2 (A)	101-2 (B)	101-2 (B)	127-2 (C) or 127-4 (C)		127-4 (C)	152-4 (D)
ISO Mounting - Flange	80 mm	100 mm	100 mm	125 mm	125 mm	125 mm	180 mm
SAE Keyed Shafts	19-1, A	25-1, BB	25-1, BB	32-1, C	32-1, C	38-1, CC	44-1, D
ISO Keyed Shafts	20 mm	25 mm	25 mm	32 mm	32 mm	40 mm	50 mm
SAE Spline Shafts	9T, A 11T, A	13T, B 15T, BB	13T, B 15T, BB	14T, C	14T, C	17T, CC	13T, D
Weight – End Port, kg (lb)	13.4 (29.5)	17.7 (39.0)	23 (50)	29 (64)	30 (66)	51 (112)	66 (145)
Side Port, kg (lb)	14.2 (31.3)	18.1 (40.0)	24 (52)	30 (67)	31 (68)	53 (117)	67 (147)
Thru-Drive, kg (lb)	—	—	27 (59)	34 (75)	35 (77)	55 (121)	82 (180)

*Intermittent pressure is defined as less than 10% of operation time, not exceeding 6 successive seconds.

Typical Control Reponse Times*

Control Description	Pump Operating Condition	Typical Control Response Time (ms)						
		018	028	045	060	075	100	140
”C” Pressure Limiter	Maximum Displacement to Zero	25	25	25	37	21	26	30
	Zero Displacement to Maximum	80	80	106	119	89	108	125
”L” Load Sensing	Maximum Displacement to Zero	40	40	30	54	40	43	45
	Zero Displacement to Maximum	70	70	120	186	97	189	280
”A” Pilot Operated Control	Maximum Displacement to Zero	25	25	46	43	37	39	40
	Zero Displacement to Maximum	80	80	131	125	115	123	130

* Based on NFPA testing standards

For max volume stops:

Pump Size	% Stroke reduction per turn		
P*060	6.76	P*018	9
P*075	6.2	P*028	8.2
P*100	5.5	P*045	7.5
P*140	4.8		

Control Adjustment Sensitivity:

- Load Sense 28 Bar/Turn
- Pressure Compensator 80 to 280 bar range (C0) = 40 Bar/Turn
- Pressure Compensator 20 to 80 bar range (C1) = 18.6 Bar/Turn

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HydraTorque

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