



# ***PD Series***

## ***Axial Piston Pumps***

### ***Variable Displacement***

*Catalog HY28-2663-01/NA,EU*



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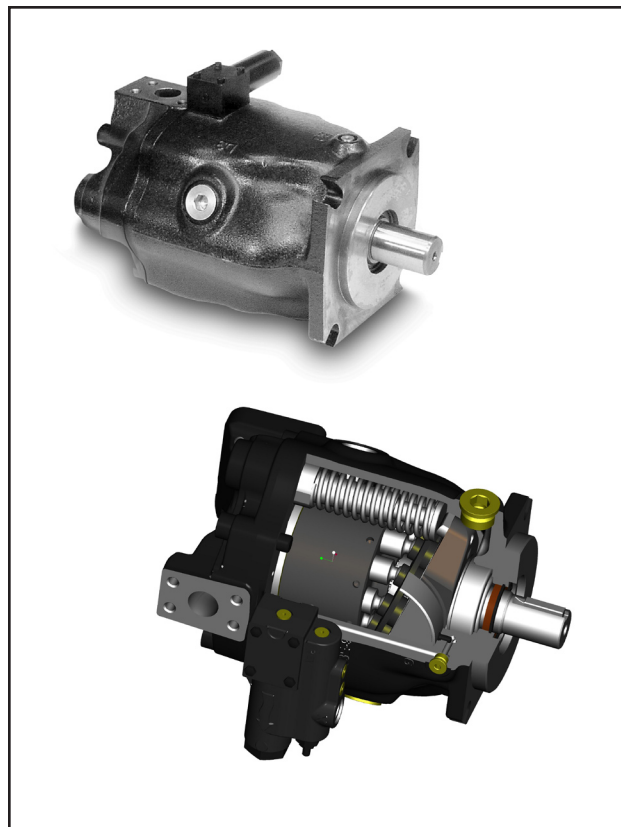
**Parker Hannifin Corporation**  
Hydraulic Pump Division  
Marysville, Ohio USA

**General Information****Description**

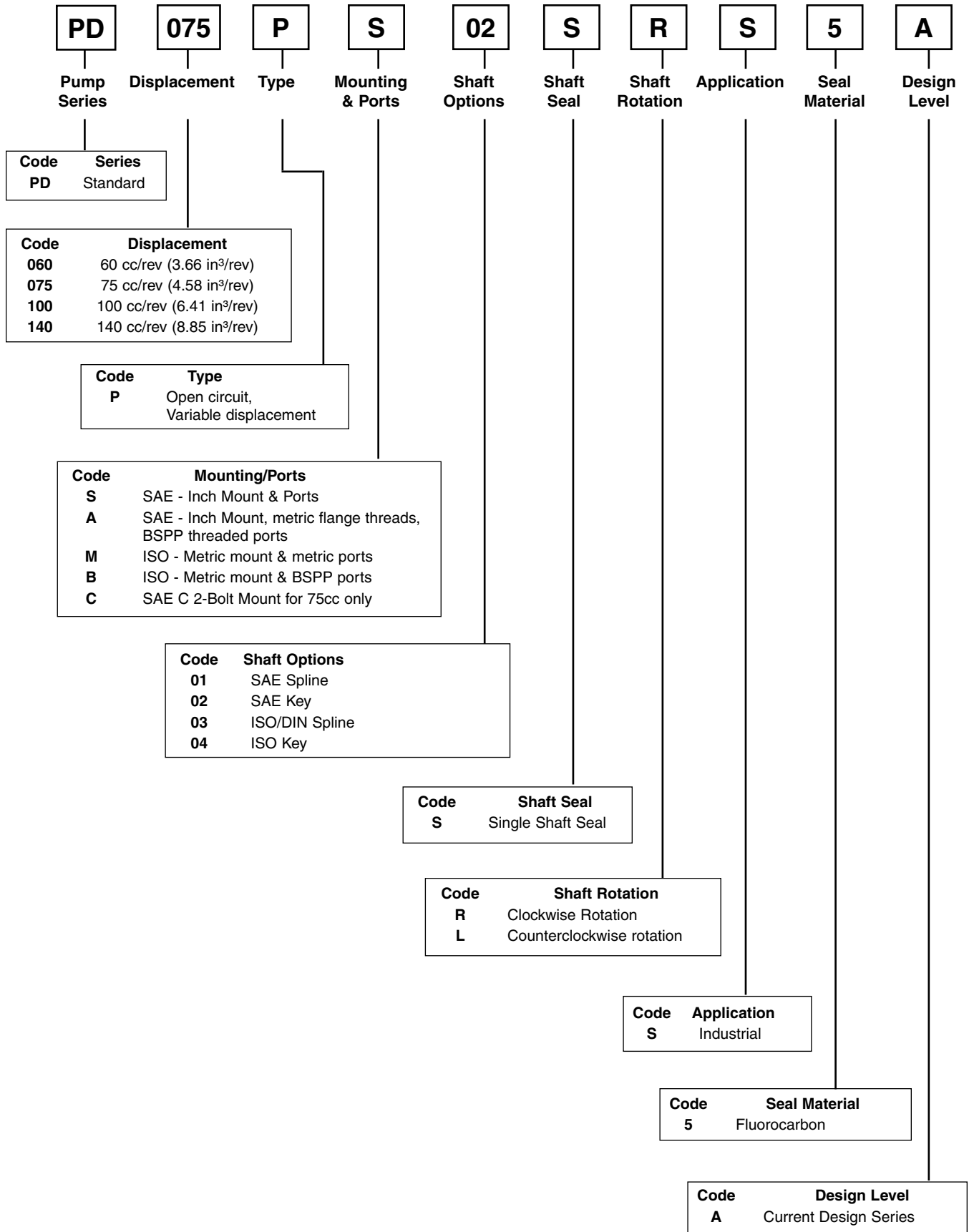
- Variable displacement, axial piston pump for open-circuit applications
- Medium pressure, continuous operation at pressures up to 280 bar
- Low noise models for industrial markets
- Quiet and efficient control capability

**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

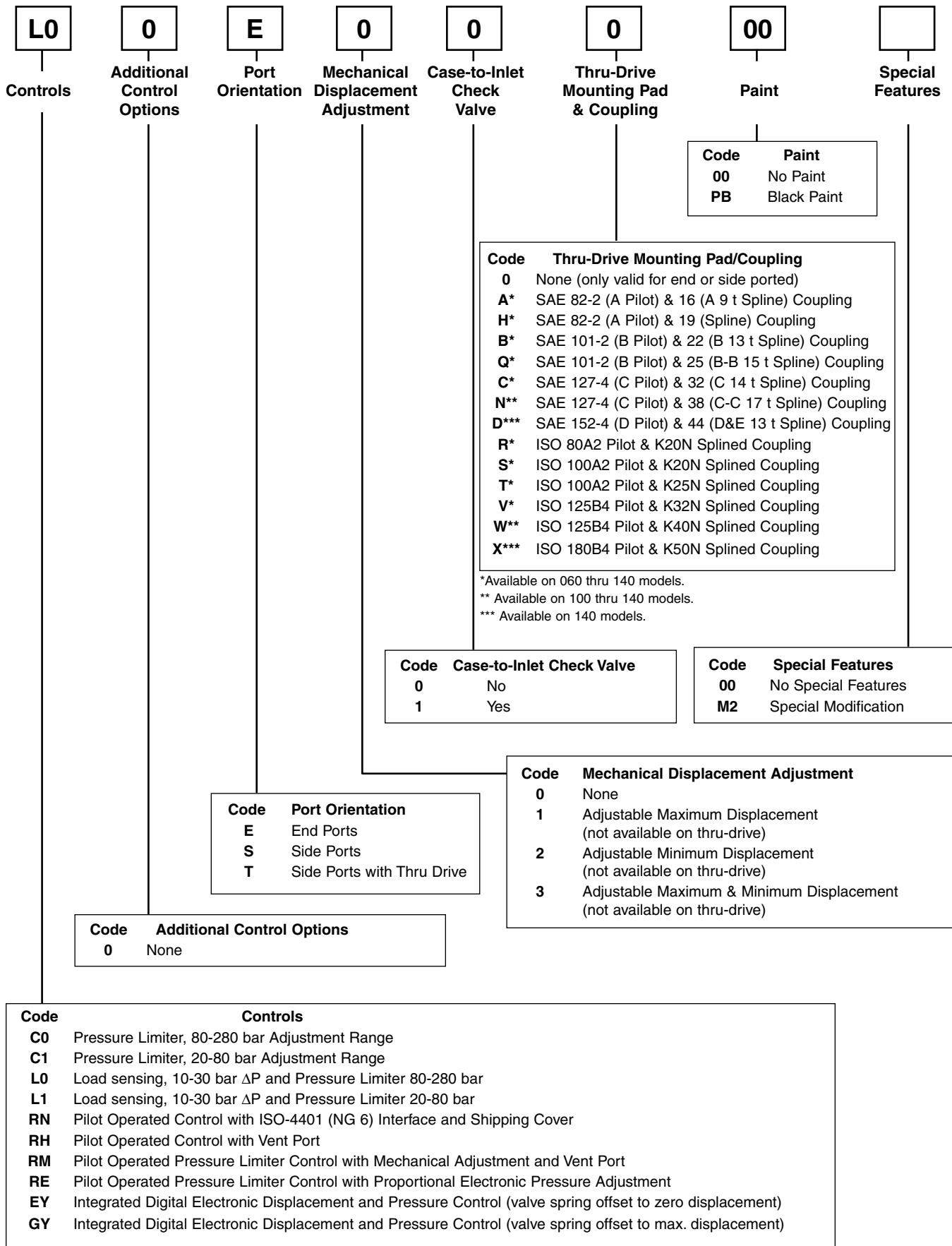


Ordering Information





Ordering Information



**Technical Data**

Model	PD060	PD075	PD100	PD140
Maximum Displacement, cm <sup>3</sup> /rev cu. in./rev	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			
Maximum Speed (1.0 bar abs inlet), rpm (0.8 bar abs inlet), rpm	1800			
Minimum Speed, rpm	1800	1800	1800	1500
Inlet Pressure – Maximum, bar psi	10 145			
Rated, bar	1.0 absolute (0.0 gage)			
Minimum, bar	0.8 absolute (-0.2 gage)			
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 Max. Intermittent, cSt Min. Intermittent, cSt	6 to 160 5000 (for cold starting) 5			
Fluid Contamination – Rated, ISO Maximum, ISO	20/18/14 21/19/16			
SAE Mounting – Flange, SAE	127-4 (C)		152-4 (D)	152-4 (D)
Key Shaft, SAE	32-1 (C)		38-1 (C-C)	44-1 (D)
Spline Shaft, SAE	14T-12/24P		17T-12/24P	13T-8/16P
Weight – End Port, kg lb	29 64	30 66	51 112	66 145
Side Port, kg lb	30 6	31 68	53 117	67 147
Thru-Drive, kg lb	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)			
		060	075	100	140
"C" Pressure Limiter	Maximum Displacement to Zero	37	21	26	30
	Zero Displacement to Maximum	119	89	108	125
"L" Load Sensing	Maximum Displacement to Zero	54	40	43	45
	Zero Displacement to Maximum	186	97	189	280
"R" Pilot Operated Control	Maximum Displacement to Zero	43	37	39	40
	Zero Displacement to Maximum	125	115	123	130

\* Based on NFPA testing standards

**For max volume stops:**

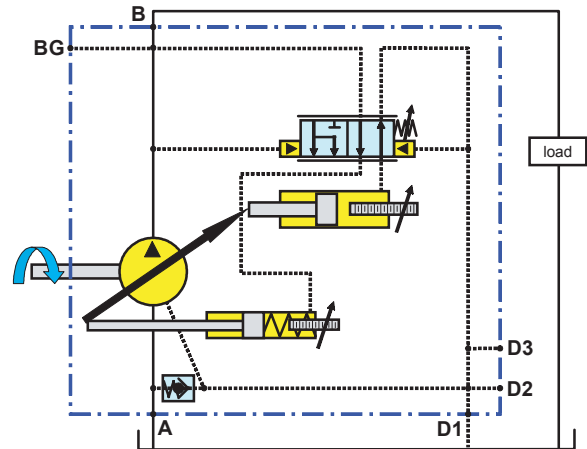
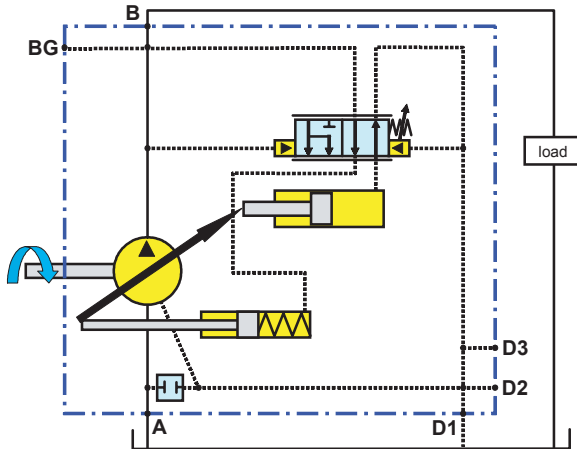
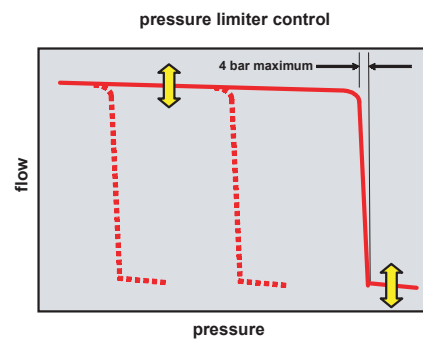
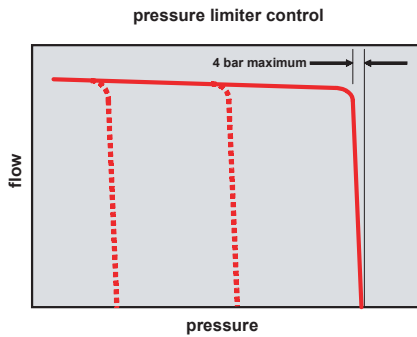
Pump Size	% Stroke reduction per turn
P*060	6.76
P*075	6.2
P*100	5.5
P*140	4.8

**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

**Control Option "C"  
 Pressure Limiter Control**

The pressure limiter control is used to limit the maximum system pressure. The control acts such that full pump displacement is achieved unless the system valve restricts the output flow or the load pressure reaches the maximum setting of the control. If pump flow is restricted by the system valve, the pump will provide only the flow demanded, but at the maximum pressure setting of the compensator control. If the outlet flow is completely blocked, the pump will destroke to zero displacement and maintain the pressure at the setting of the compensator spring.



**Pressure Limiter Control**

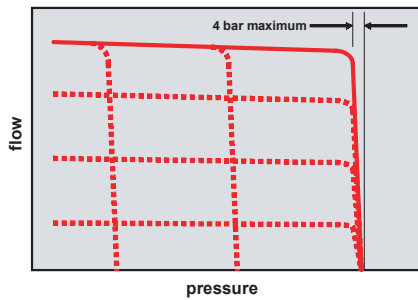
**Pressure Limiter Control  
 with Optional Maximum & Minimum  
 Displacement Adjustments and  
 Case-to-Inlet Check Valve**  
 (A minimum displacement stop requires  
 the use of a system relief valve.)

Refer to page 4 for typical control characteristics.

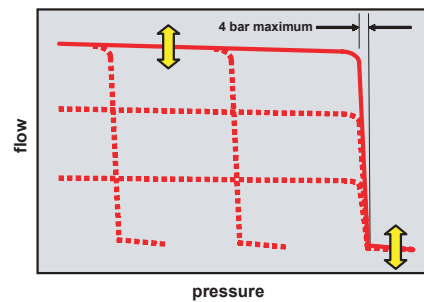
**Control Option “L”  
 Load Sensing and Pressure Limiter Control**

These controls feature load sensing and maximum pressure compensation. Load sense controls are used to match pump flow and pressure to system demands, thus minimizing losses due to wasted horsepower. The pump automatically adjusts for changes in drive speed and load pressures to match the pump output flow to the load requirement. Since the pump load sense control will maintain a constant pressure drop across the main system throttling valve, the flow rate will remain constant, independent of changes in load pressure and pump shaft speed.

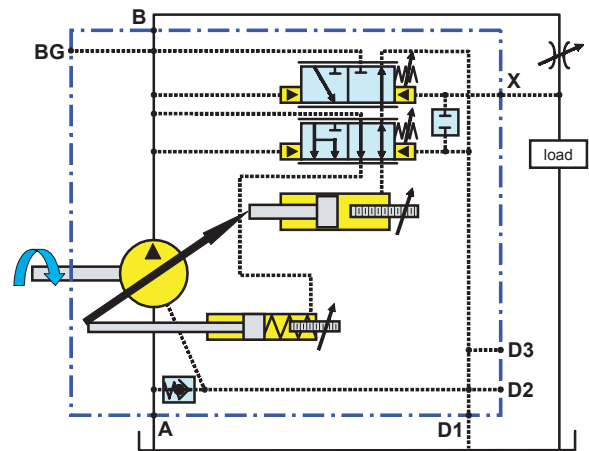
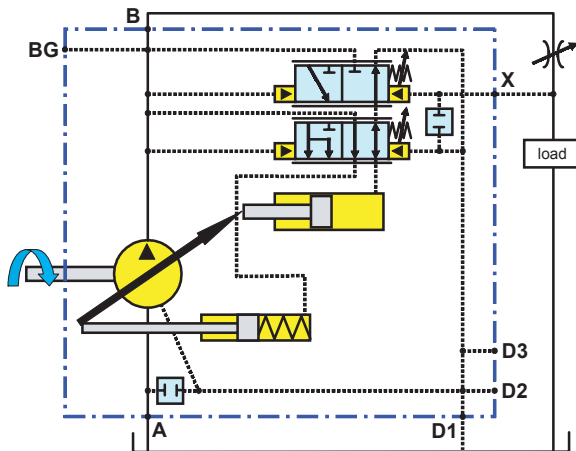
load sensing and pressure limiter control



load sensing and pressure limiter control



schematic diagram



**Load Sensing and  
 Pressure Limiter Control**

**Load Sensing and  
 Pressure Limiter Control  
 with Optional Minimum & Maximum  
 Displacement Adjustments and  
 Case-to-Inlet Check Valve**

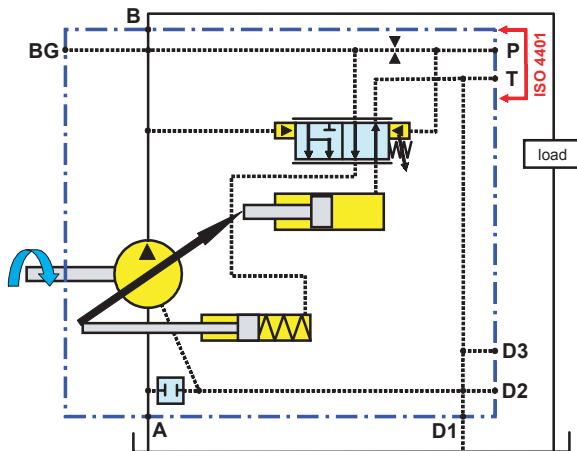
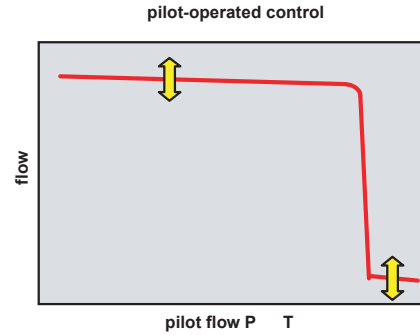
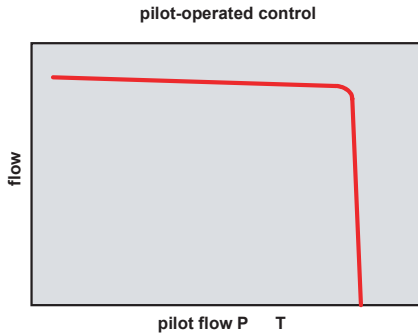
(A minimum displacement stop requires the use of a system relief valve.)

Refer to page 4 for typical control characteristics.

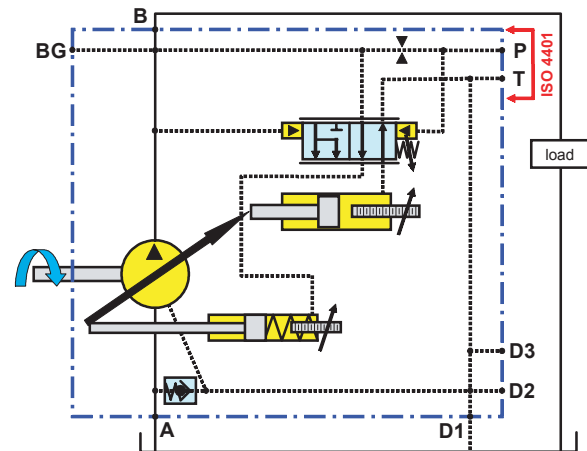
**Control Options “RN”**  
**Pilot Operated Control with ISO 4401**  
**NG6 Interface**

This control allows the pump pressure compensator setting to be adjusted from a remote relief valve. The control acts such that full pump displacement is achieved unless the system valve restricts the output flow or the load pressure reaches the maximum setting of the control. If pump flow is restricted by the system valve, the pump will provide only the flow demanded, but at the maximum pressure setting of the compensator control. If the outlet flow is completely blocked, the pump will destroke to zero displacement and maintain the pressure at the setting of the remote relief valve.

Note: Non-functioning control, provides ISO 4401 interface.



**“RN”**  
**Pilot Operated Control**  
**with ISO 4401 NG6 Interface**



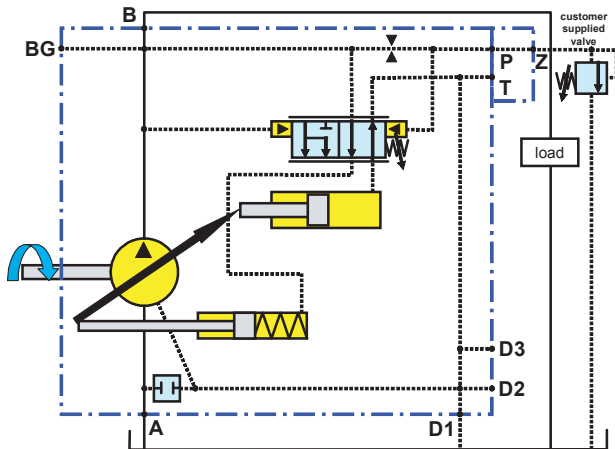
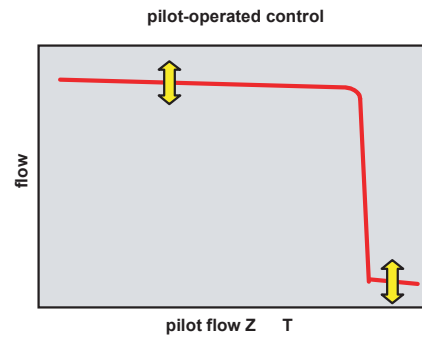
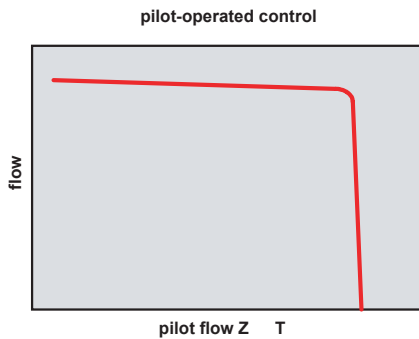
**“RN”**  
**with Optional Minimum & Maximum**  
**Displacement Adjustments and**  
**Case-to-Inlet Check Valve**  
 (A minimum displacement stop requires  
 the use of a system relief valve.)

Refer to page 4 for typical control characteristics.

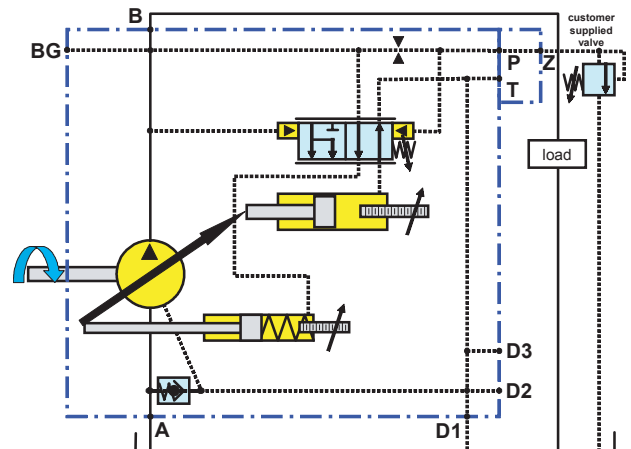
**Control Options “RH”**  
**Pilot Operated Control**  
**with Remote Control Port Z**

This control allows the pump pressure compensator setting to be adjusted from a remote relief valve. The control acts such that full pump displacement is achieved unless the system valve restricts the output flow or the load pressure reaches the maximum setting of the control. If pump flow is restricted by the system valve, the pump will provide only the flow demanded, but at the maximum pressure setting of the compensator control. If the outlet flow is completely blocked, the pump will destroke to zero displacement and maintain the pressure at the setting of the remote relief valve.

Note: If control port "Z" is plugged, the pump will remain fixed at maximum displacement and not compensate.



**“RH”**  
**Pilot Operated**



**“RH”**  
**with Optional Minimum & Maximum Displacement Adjustments and Case-to-Inlet Check Valve**  
 (A minimum displacement stop requires the use of a system relief valve.)

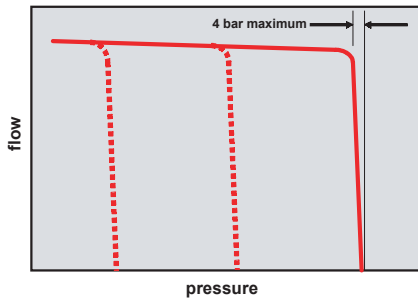
Refer to page 4 for typical control characteristics.



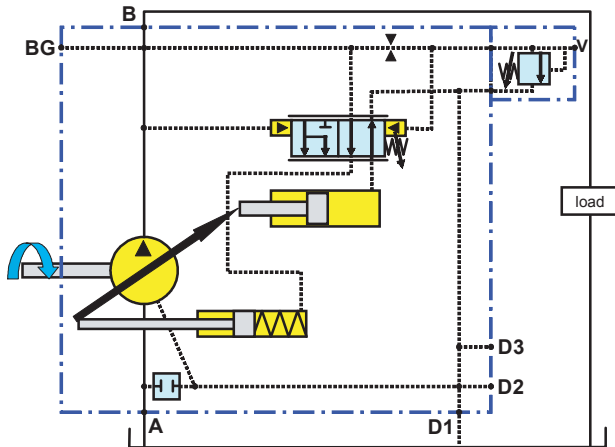
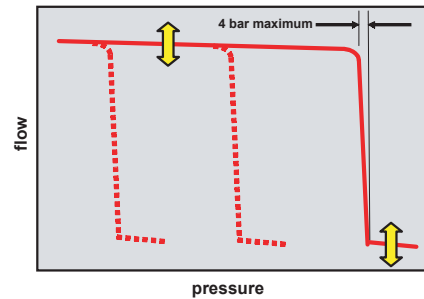
**Control Options “RM”**  
**Pilot Operated Pressure Limiter Control**  
**with Vent Port V**

This control allows the pump pressure compensator setting to be adjusted from a remote relief valve. The control acts such that full pump displacement is achieved unless the system valve restricts the output flow or the load pressure reaches the maximum setting of the control. If pump flow is restricted by the system valve, the pump will provide only the flow demanded, but at the maximum pressure setting of the compensator control. If the outlet flow is completely blocked, the pump will destroke to zero displacement and maintain the pressure at the setting of the remote relief valve.

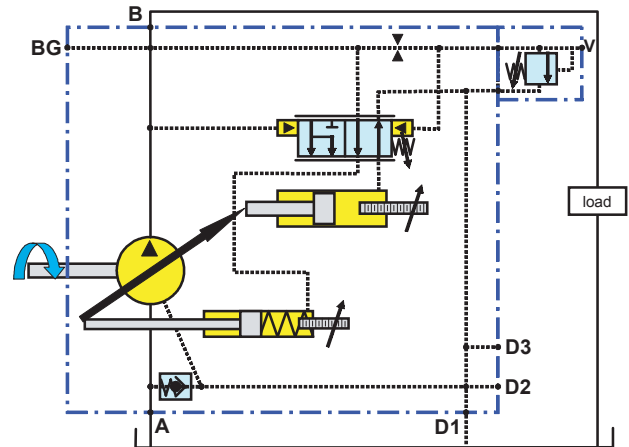
pilot-operated pressure limiter control



pilot-operated pressure limiter control



**“RM”**  
**Pilot Operated Pressure Control**



**“RM”**  
**with Optional Minimum & Maximum**  
**Displacement Adjustments and**  
**Case-to-Inlet Check Valve**  
 (A minimum displacement stop requires  
 the use of a system relief valve.)

Refer to page 4 for typical control characteristics.

**Control Options “RE”**

**Pilot Operated Pressure Limiter Control with Proportional Electronic Adjustment**

This control allows the pump pressure compensator setting to be adjusted by an on-board 4VP01 proportional electronic remote relief valve. The control acts such that full pump displacement is achieved unless the system valve restricts the output flow or the load pressure reaches the maximum setting of the control. If pump flow is restricted by the system valve, the pump will provide only the flow demanded, but at the maximum pressure setting of the compensator control. If the outlet flow is completely blocked, the pump will destroke to zero displacement and maintain the pressure at the setting of the remote relief valve.

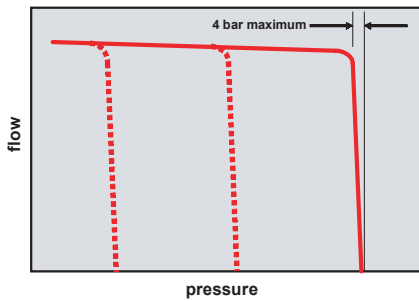
The information below is required for the RE control.

**The following are recommended to drive the 4VP01 valve on the RE pump:**

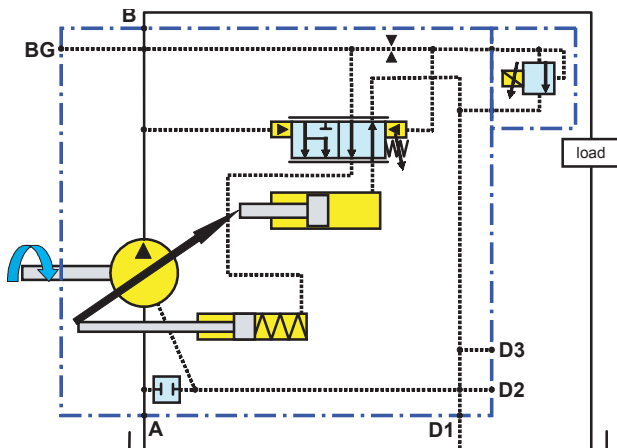
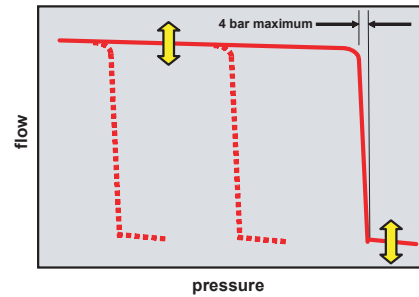
Parker Denison Part#	Description
701-00600-8	Proportional Amplifier
701-00007-8	Card Holder
701-00023-8	Power Supply
701-00066-8	Card Holder
701-00013-8	Potentiometer

Reference catalogs 3-EN2200-B and 9-EN601-A for setup.

pilot-operated pressure limiter control

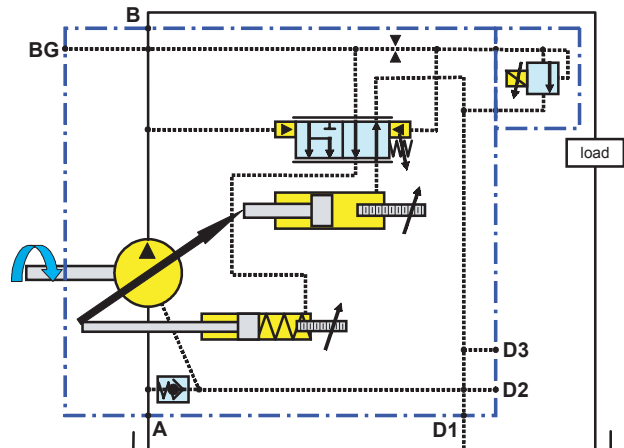


pilot-operated pressure limiter control



**“RE”**

**Pilot Operated Pressure Limiter Control with Proportional Electronic Adjustment**



**“RE”**

**with Optional Minimum & Maximum Displacement Adjustments and Case-to-Inlet Check Valve**

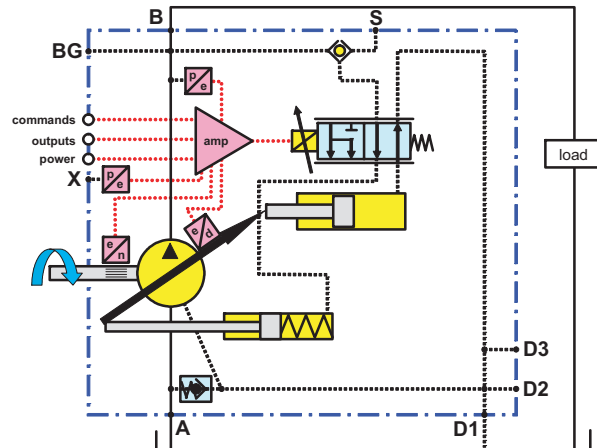
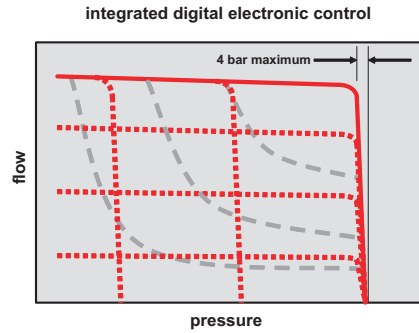
(A minimum displacement stop requires the use of a system relief valve.)

Refer to page 4 for typical control characteristics.

**Control Options "EY"  
 Integrated Digital Electronic Control  
 Shown with Case-to-Inlet Check Valve**

Initially available on the PD-075. This control will allow the user to select various control functions such as proportional pressure and proportional displacement, electronic torque limiting, anti stall and constant flow. All functions can be factory preset, analog driven or adjusted thru Windows based software.

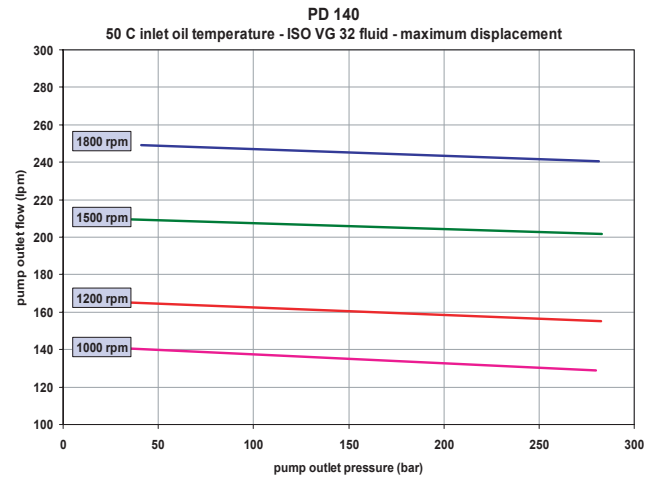
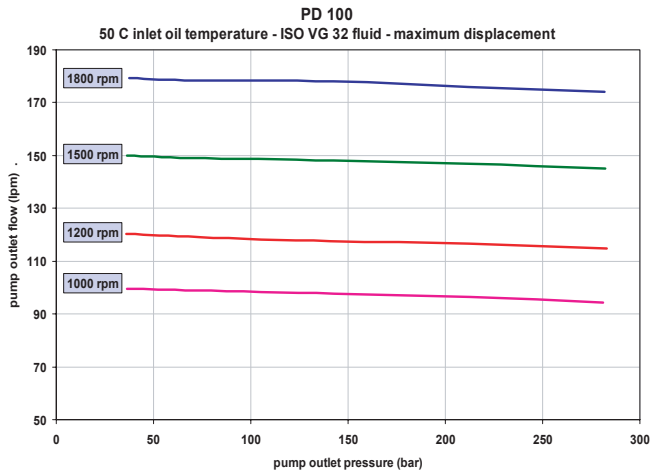
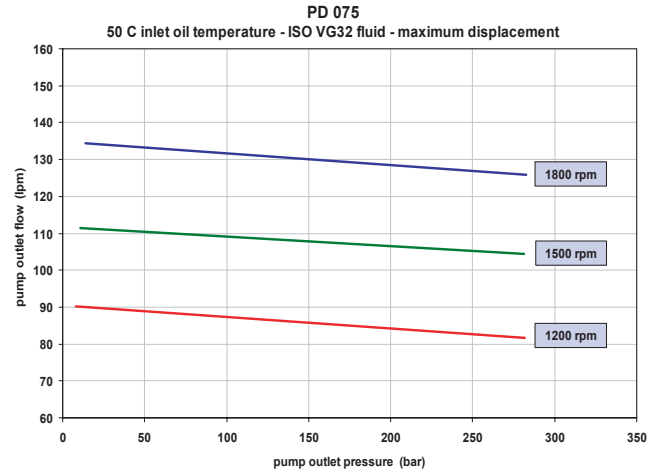
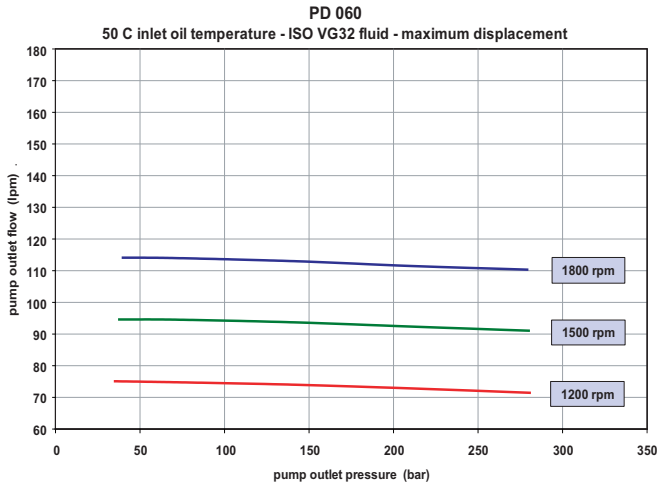
The control is integral to the pump and has no external wires or plumbing other than the signal wire which commands the flow and pressure output. The pump features internal sensors for pressure, speed and displacement, which are used with the control software to provide the desired pressure and flow output, even with varying parameters such as speed, temperature, viscosity and load pressure. The sensors also provide the user with hydraulic system monitoring capability for onboard diagnostics.



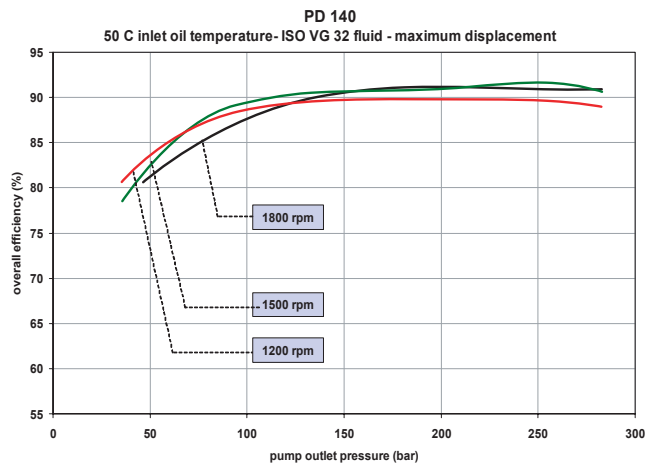
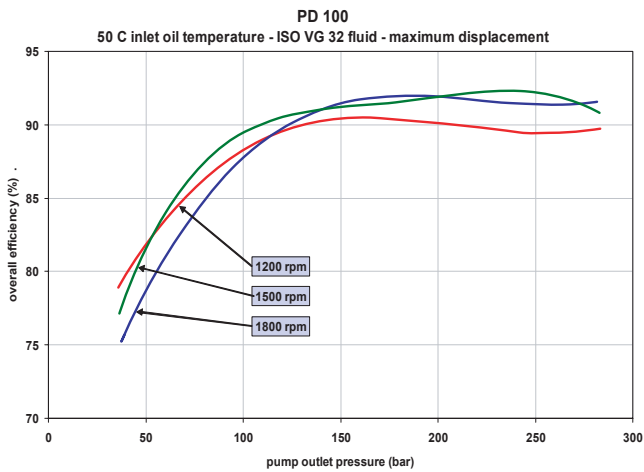
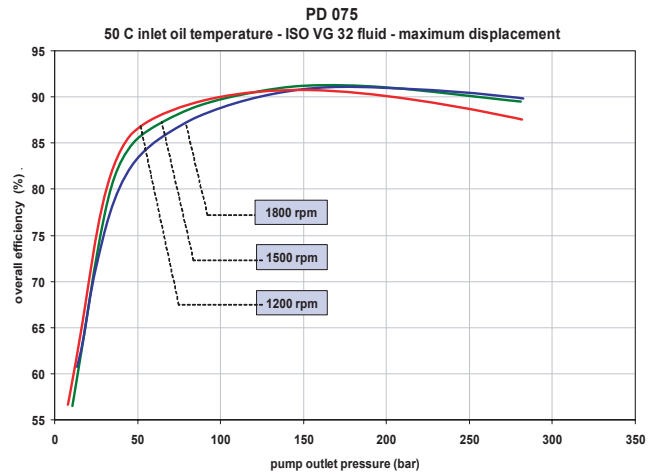
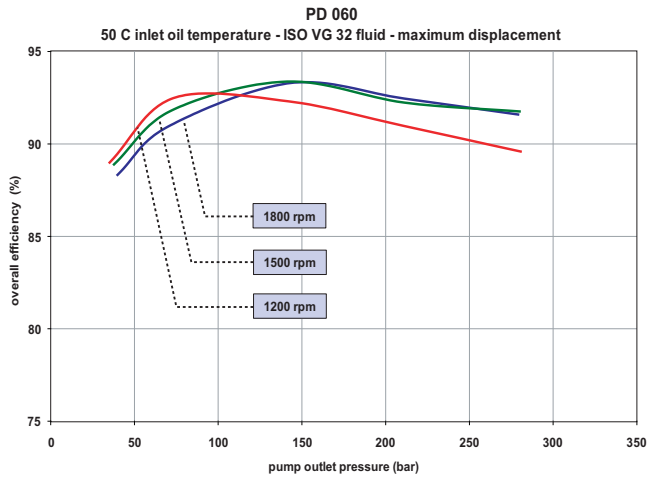
**"EY" Integrated Digital Electronic Control Specifications**

Description	Specifications	Comments
Power Supply Voltage	9 to 36 VDC	DC power supply (<5% ripple) (SAE J1455)
Power Supply Current	2.2 A maximum	1.1 A quiescent current ± 1.1A
Input Connector	19 pin MS threaded connector	Mating connector provided by Parker
Onboard Power Supply	±10 VDC ± 10 mA maximum	Conditioned supply to power input command device
Input Commands	0 to 10 VDC or 4 to 20 mA or 0 to 20 mA	Displacement command, pressure limiter setting, and torque limiter setting
Analog Output Signal	0 to 10 VDC 20 mA maximum	Actual operating pump displacement or outlet pressure or speed or signal pressure – PC user interface selects output signal parameter
"enable" digital input	9 to 36 VDC (supply voltage)	Input enables the operation of the pump control – remove this input to disable the pump control
"ready" digital output	0 or 10 VDC 5 mA maximum	Indicates the pump is ready for operation – control error exists if ready signal is not present
Ramp	0 to 90 seconds	PC user interface enables and sets the ramp
Hysteresis	<2% or maximum displacement	
Repeatability	<1% of maximum displacement	
Operating Temperature	-40 to +95°C	Pump inlet temperature
Serial Communication Port	RS-232	DB9 connector – Windows© PC connection to the user interface
Optional Serial Bus Connector	CAN compatible	4-pin
EMI and RFI susceptioibity	10 V/m maximum	CE mark
Environmental Protection Class	IP65	

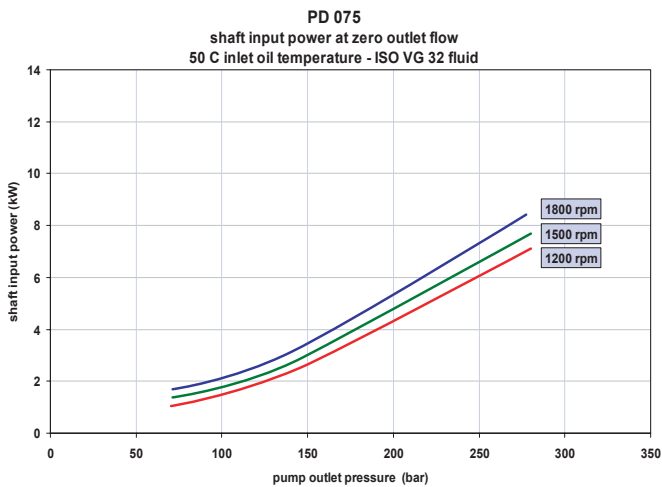
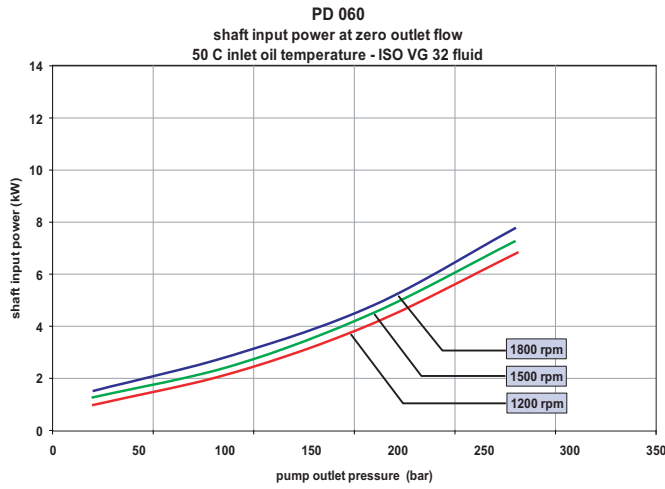
**PD Series Pump Outlet Flow**



**PD Series Overall Efficiency**

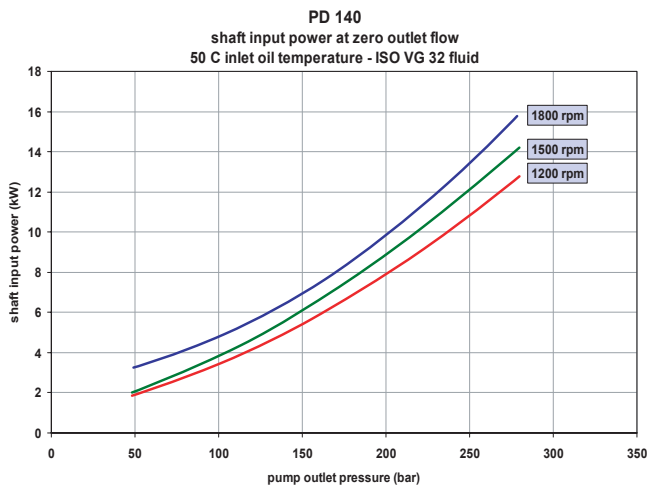
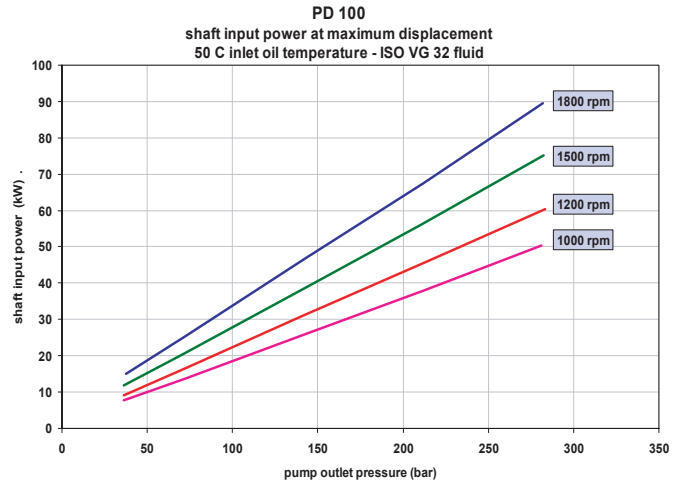
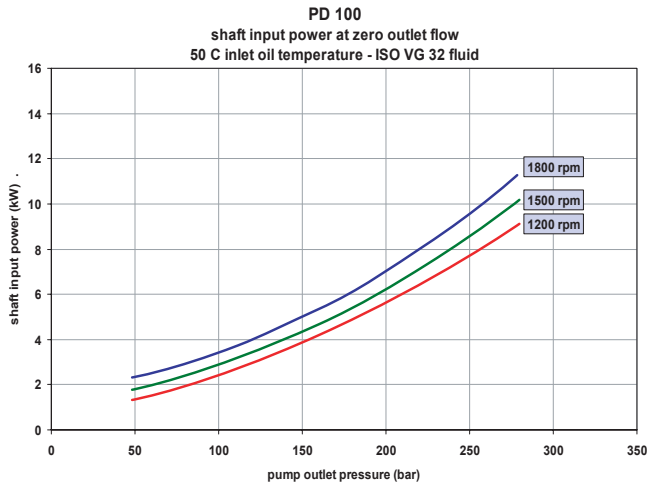


**PD Series Shaft Input Power**

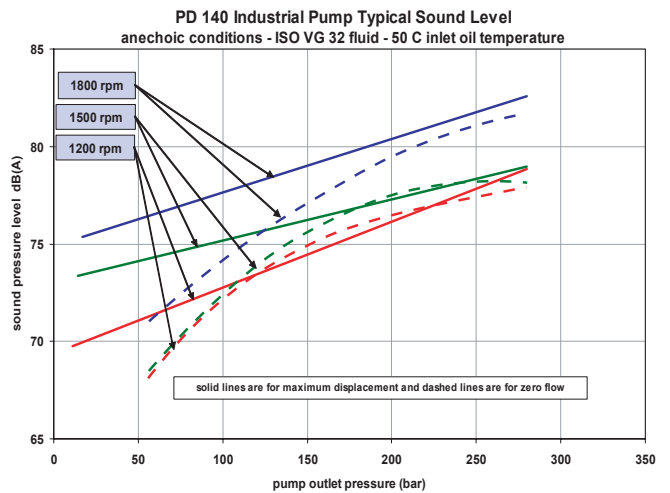
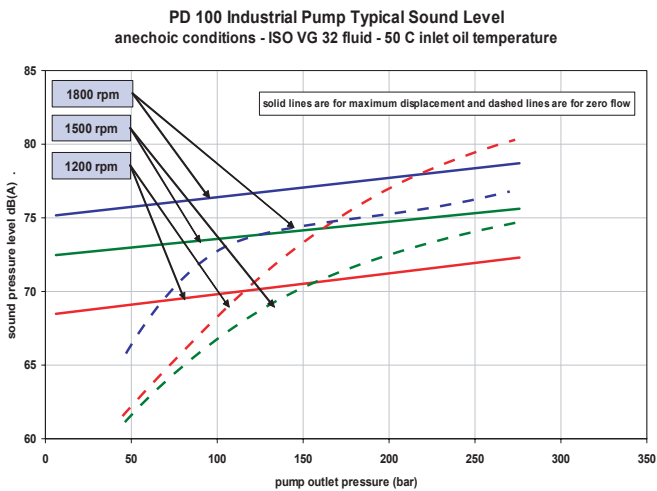
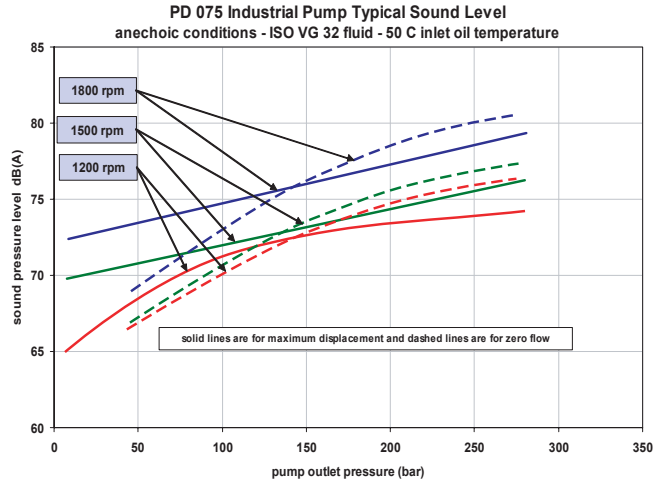
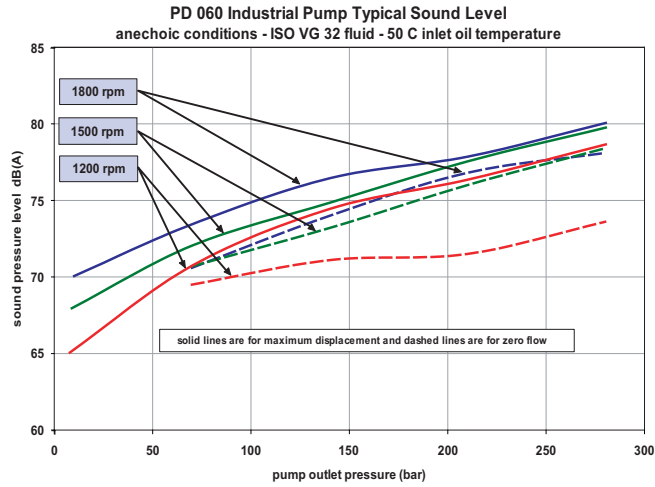




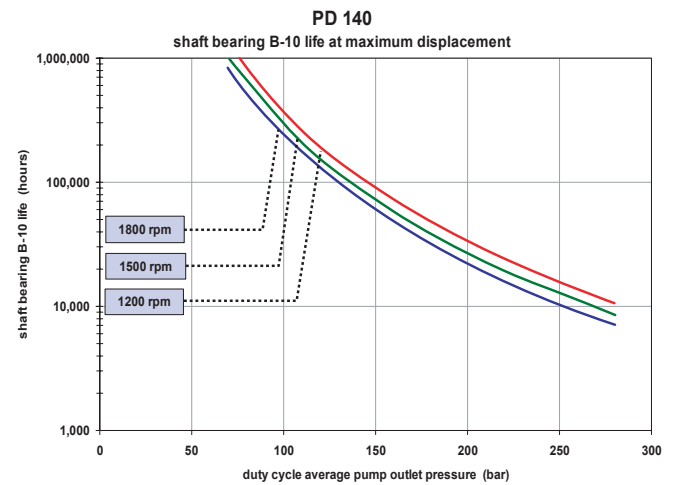
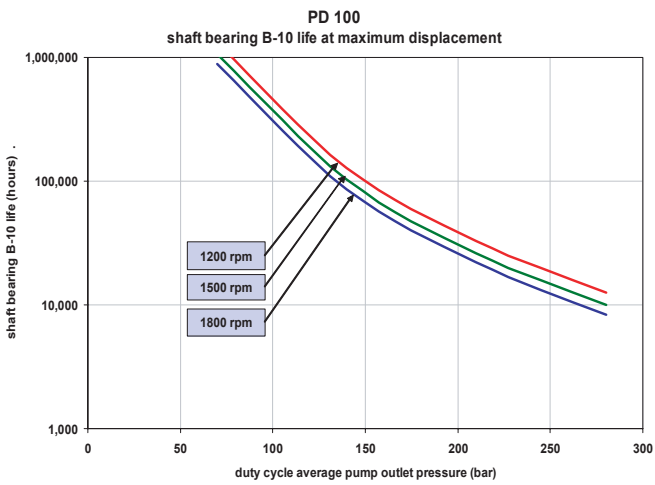
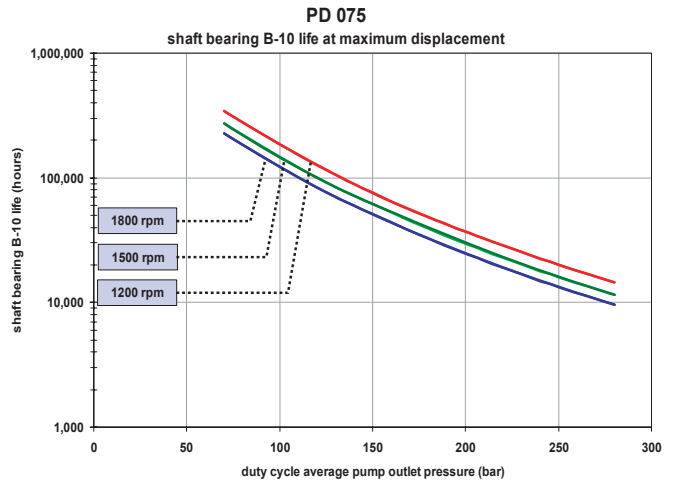
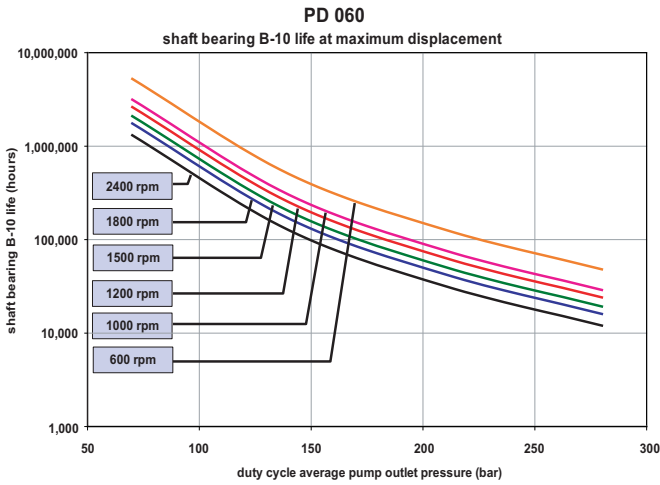
**PD Series Shaft Input Power**



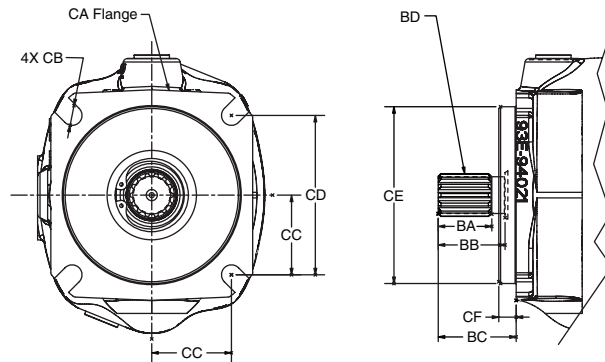
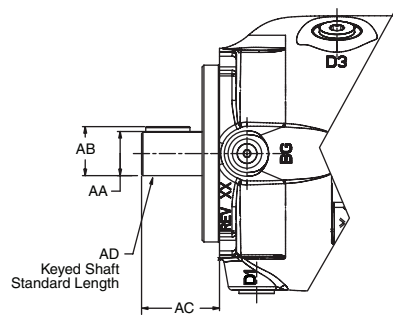
**PD Series Typical Noise Characteristics**  
 (These are anechoic sound pressure readings.)



**PD Series Shaft Bearing Life**

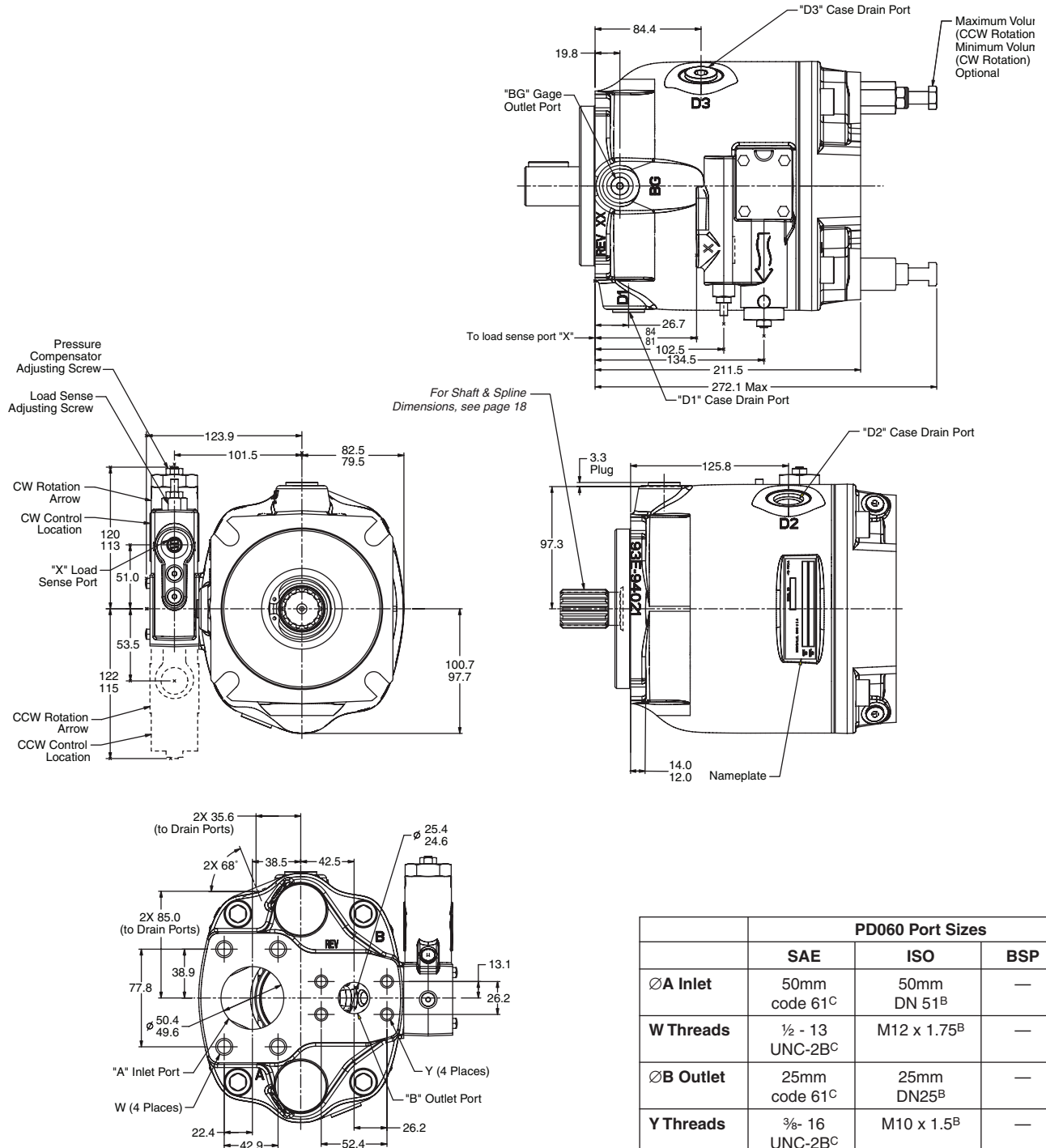


**Pump Installation - PD060  
Input Shaft Dimensions**



PD075	ISO	SAE
AA	32.021/32.002	31.75/31.70
AB	35.00/34.71	35.33/35.02
AC	68.8/67.2	56.8/55.2
AD	ISO E32N	SAE J744 32.1 C
BA	22.0	38.0
BB	36	48
BC	47.0/46.0	56.8/55.2
BD	SPLINE: ISO 3019/202991-P32N (REF DIN 5480) INVOLUTE SPLINE DATA FLAT ROOT SIDE FIT NUMBER OF TEETH - 14 MODULE - M2 PRESSURE ANGLE - 30 MAJOR DIAMETER - 32 TOOTH THICKNESS - 9e	SPLINE: SAE J744 SAE 32-4C INVOLUTE SPLINE DATA CLASS 2 FLAT ROOT SIDE FIT NUMBER OF TEETH - 14 PITCH - 12/24 PRESSURE ANGLE - 30 MAJOR DIAMETER - 1.2268 IN PITCH DIAMETER - 1.1666
CA	ISO 3019/202991 125B4SW	SAE J744 JUN96 127-4 C
CB	13.77/13.50	14.4 DIA.
CC	56.6	57.2
CD	113.2 SQUARE	114.5 SQUARE
CE	125.00/124.94 ISO 3019/2	127.00/126.95 SAE J744
CF	9.5/9.0	12.7/12.2

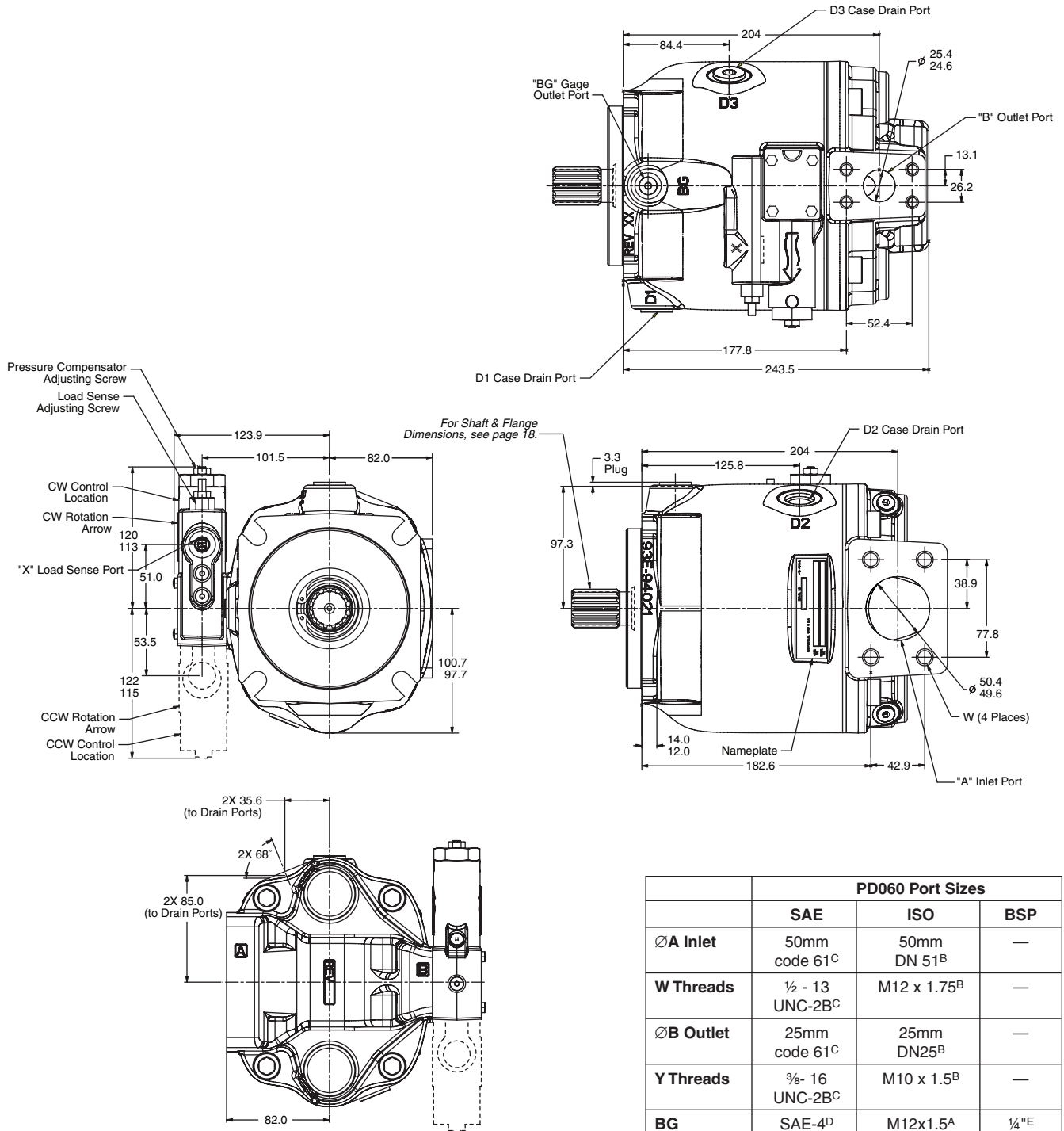
**Pump Installation - PD060  
End Port  
"L" Control Option**



	PD060 Port Sizes		
	SAE	ISO	BSP
ØA Inlet	50mm code 61 <sup>C</sup>	50mm DN 51 <sup>B</sup>	—
W Threads	½ - 13 UNC-2B <sup>C</sup>	M12 x 1.75 <sup>B</sup>	—
ØB Outlet	25mm code 61 <sup>C</sup>	25mm DN25 <sup>B</sup>	—
Y Threads	¾ - 16 UNC-2B <sup>C</sup>	M10 x 1.5 <sup>B</sup>	—
BG	SAE-4 <sup>D</sup>	M12x1.5 <sup>A</sup>	¼" <sup>E</sup>
D1 D2 D3	SAE-10 <sup>D</sup>	M22x1.5 <sup>A</sup>	¾" <sup>E</sup>
X	SAE-4 <sup>D</sup>	M12x1.5 <sup>A</sup>	¼" <sup>E</sup>

Note A: Metric o-ring boss port conform to ISO 6149-1  
 Note B: Metric 4-bolt flange port conforms to ISO 6162  
 Note C: Inch 4-bolt flange port conforms to SAE J518  
 Note D: Inch o-ring boss port conforms to SAE J514  
 Note E: BSP boss port conforms to ISO 228-1

**Pump Installation - PD060  
Side Port  
"L" Control Option**

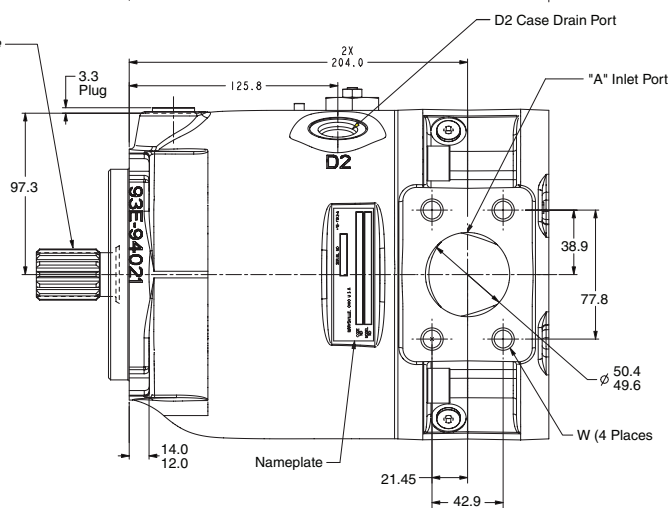
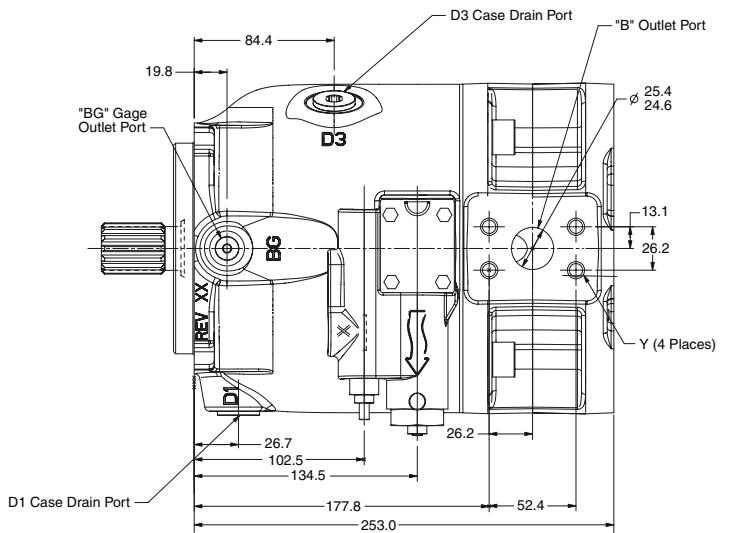
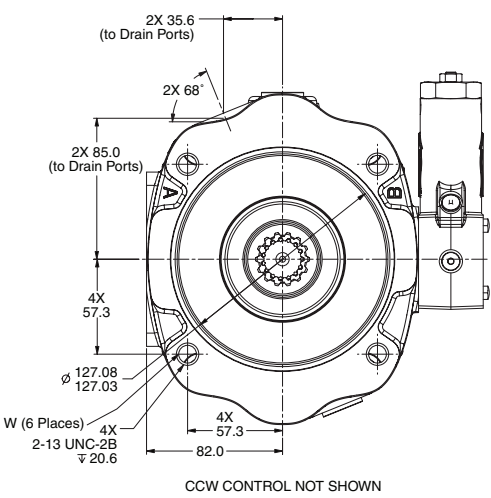
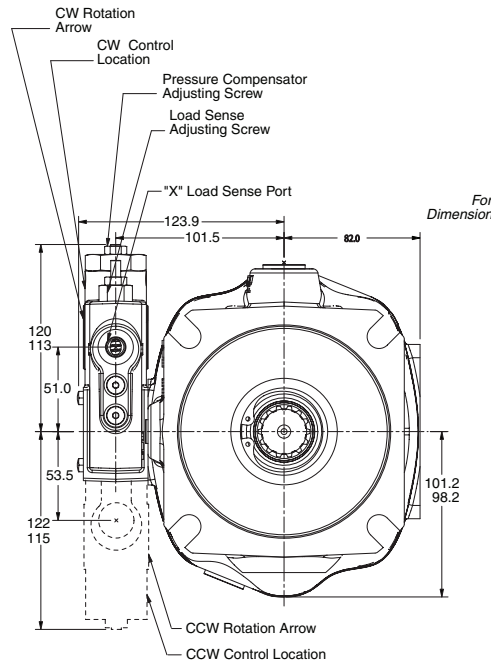


	PD060 Port Sizes		
	SAE	ISO	BSP
∅A Inlet	50mm code 61 <sup>C</sup>	50mm DN 51 <sup>B</sup>	—
W Threads	½ - 13 UNC-2B <sup>C</sup>	M12 x 1.75 <sup>B</sup>	—
∅B Outlet	25mm code 61 <sup>C</sup>	25mm DN25 <sup>B</sup>	—
Y Threads	¾ - 16 UNC-2B <sup>C</sup>	M10 x 1.5 <sup>B</sup>	—
BG	SAE-4 <sup>D</sup>	M12x1.5 <sup>A</sup>	¼" <sup>E</sup>
D1 D2 D3	SAE-10 <sup>D</sup>	M22x1.5 <sup>A</sup>	¾" <sup>E</sup>
X	SAE-4 <sup>D</sup>	M12x1.5 <sup>A</sup>	¼" <sup>E</sup>

Note A: Metric o-ring boss port conform to ISO 6149-1  
 Note B: Metric 4-bolt flange port conforms to ISO 6162  
 Note C: Inch 4-bolt flange port conforms to SAE J518  
 Note D: Inch o-ring boss port conforms to SAE J514  
 Note E: BSP boss port conforms to ISO 228-1



**Pump Installation - PD060  
Side Ports with Thru-Drive  
“L” Control Option**



For Shaft & Flange Dimensions, see page 18.

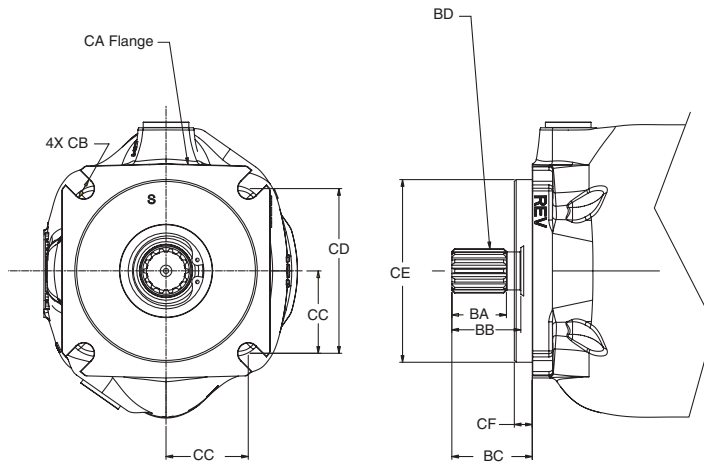
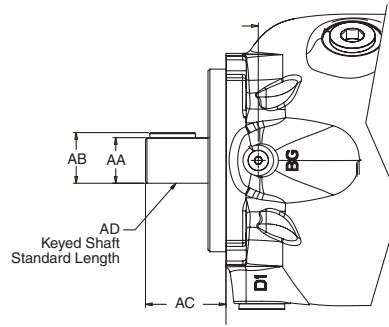
Shaft Location	PD060 Shaft Size & Type	Shaft Torque Capacity (Nm)
Input End	SAE C 32-1 Key	562
	SAE C 14T Spline	732
	ISO E32N Key	576
	ISO 14T Spline	732
Thru-Drive End	Spline Coupling	366

	PD060 Port Sizes		
	SAE	ISO	BSP
ØA Inlet	50mm code 61 <sup>C</sup>	50mm DN 51 <sup>B</sup>	—
W Threads	½ - 13 UNC-2B <sup>C</sup>	M12 x 1.75 <sup>B</sup>	—
ØB Outlet	25mm code 61 <sup>C</sup>	25mm DN25 <sup>B</sup>	—
Y Threads	¾ - 16 UNC-2B <sup>C</sup>	M10 x 1.5 <sup>B</sup>	—
BG	SAE-4 <sup>D</sup>	M12x1.5 <sup>A</sup>	¼" <sup>E</sup>
D1 D2 D3	SAE-10 <sup>D</sup>	M22x1.5 <sup>A</sup>	¾" <sup>E</sup>
X	SAE-4 <sup>D</sup>	M12x1.5 <sup>A</sup>	¼" <sup>E</sup>

Note A: Metric o-ring boss port conform to ISO 6149-1  
 Note B: Metric 4-bolt flange port conforms to ISO 6162  
 Note C: Inch 4-bolt flange port conforms to SAE J518  
 Note D: Inch o-ring boss port conforms to SAE J514  
 Note E: BSP boss port conforms to ISO 228-1

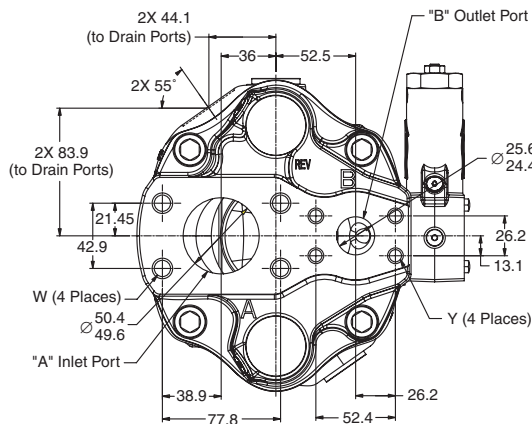
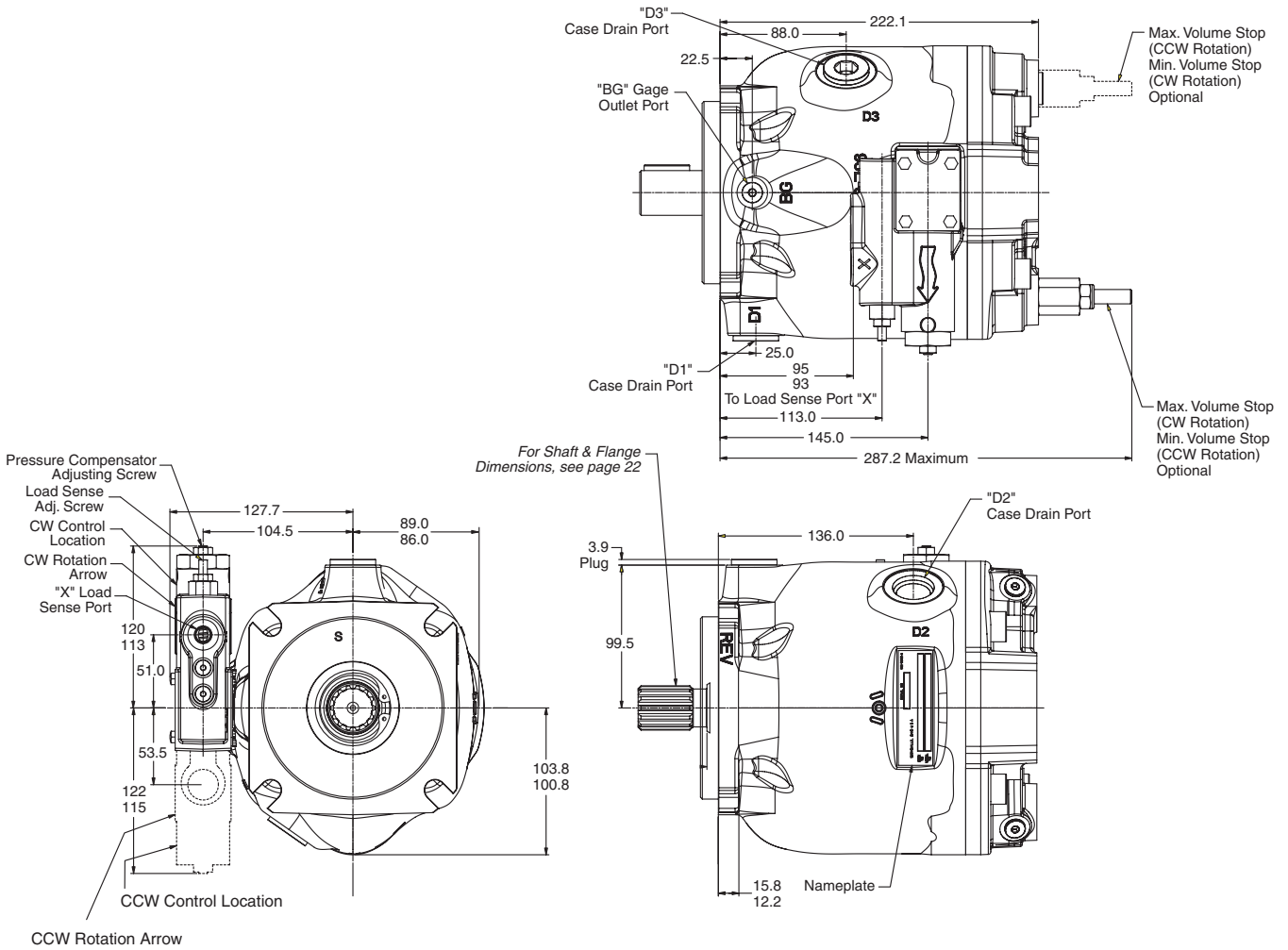


**Pump Installation - PD075  
Input Shaft Dimensions**



PD075	ISO	SAE
AA	32.021/32.002	31.75/31.70
AB	35.00/34.71	35.33/35.02
AC	68.8/67.2	56.8/55.2
AD	ISO E32N	SAE J744 32.1 C
BA	22.0	38.0
BB	36	48
BC	47.0/46.0	56.8/55.2
BD	SPLINE: ISO 3019/202991-P32N (REF DIN 5480) INVOLUTE SPLINE DATA FLAT ROOT SIDE FIT NUMBER OF TEETH - 14 MODULE - M2 PRESSURE ANGLE - 30 MAJOR DIAMETER - 32 TOOTH THICKNESS - 9e	SPLINE: SAE J744 SAE 32-4C INVOLUTE SPLINE DATA CLASS 2 FLAT ROOT SIDE FIT NUMBER OF TEETH - 14 PITCH - 12/24 PRESSURE ANGLE - 30 MAJOR DIAMETER - 1.2268 IN PITCH DIAMETER - 1.1666
CA	ISO 3019/202991 125B4SW	SAE J744 JUN96 127-4 C
CB	13.77/13.50	14.4 DIA.
CC	56.6	57.2
CD	113.2 SQUARE	114.5 SQUARE
CE	125.00/124.94 ISO 3019/2	127.00/126.95 SAE J744
CF	9.5/9.0	12.7/12.2

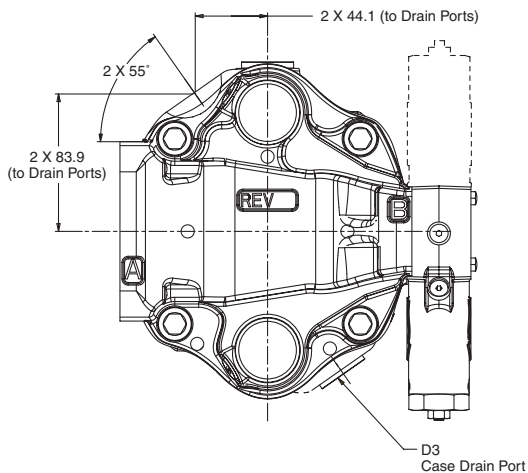
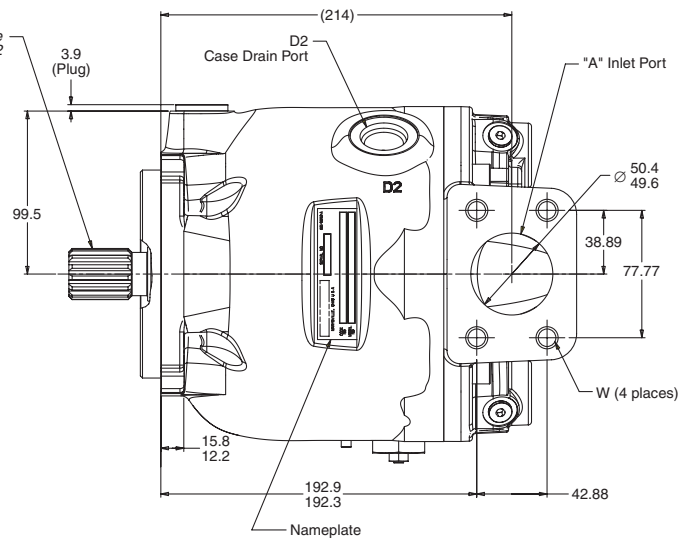
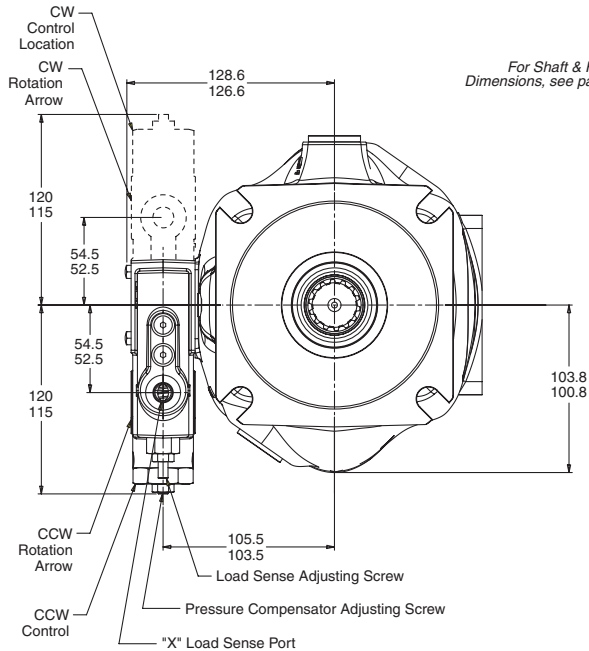
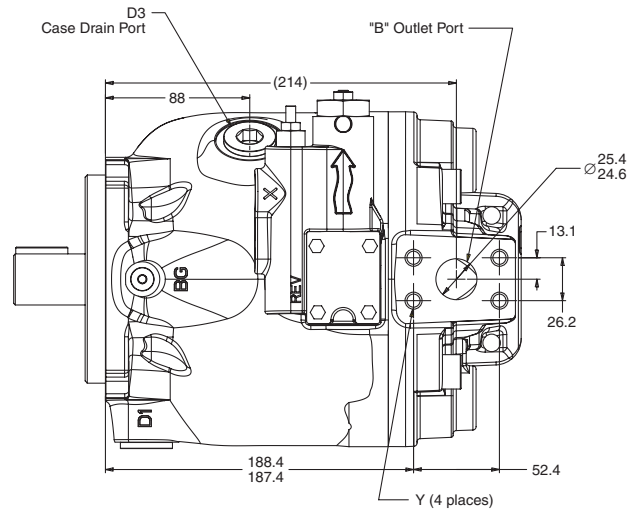
**Pump Installation - PD075  
End Port  
"L" Control Option**



	PD075 Port Sizes		
	SAE	ISO	BSP
∅A Inlet	50mm code 61 <sup>C</sup>	50mm DN 51 <sup>B</sup>	—
W Threads	½ - 13 UNC-2B <sup>C</sup>	M12 x 1.75 <sup>B</sup>	—
∅B Outlet	25mm code 61 <sup>C</sup>	25mm DN25 <sup>B</sup>	—
Y Threads	¾ - 16 UNC-2B <sup>C</sup>	M10 x 1.5 <sup>B</sup>	—
BG	SAE-4 <sup>D</sup>	M12x1.5 <sup>A</sup>	¼" <sup>E</sup>
D1 D2 D3	SAE-12 <sup>D</sup>	M27x2 <sup>A</sup>	¾" <sup>E</sup>
X	SAE-4 <sup>D</sup>	M12x1.5 <sup>A</sup>	¼" <sup>E</sup>

Note A: Metric o-ring boss port conform to ISO 6149-1  
 Note B: Metric 4-bolt flange port conforms to ISO 6162  
 Note C: Inch 4-bolt flange port conforms to SAE J518  
 Note D: Inch o-ring boss port conforms to SAE J514  
 Note E: BSP boss port conforms to ISO 228-1

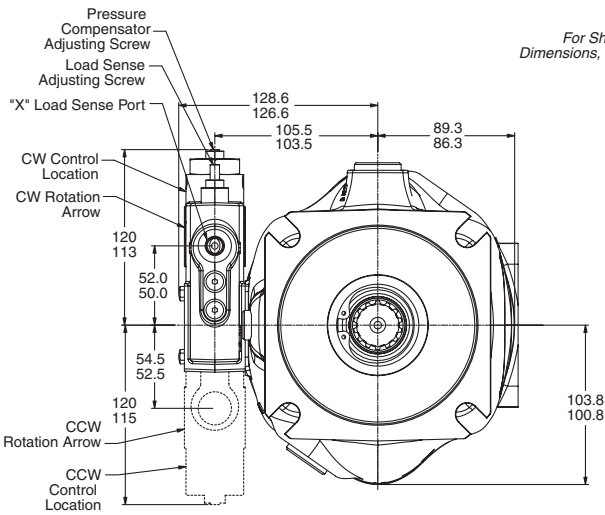
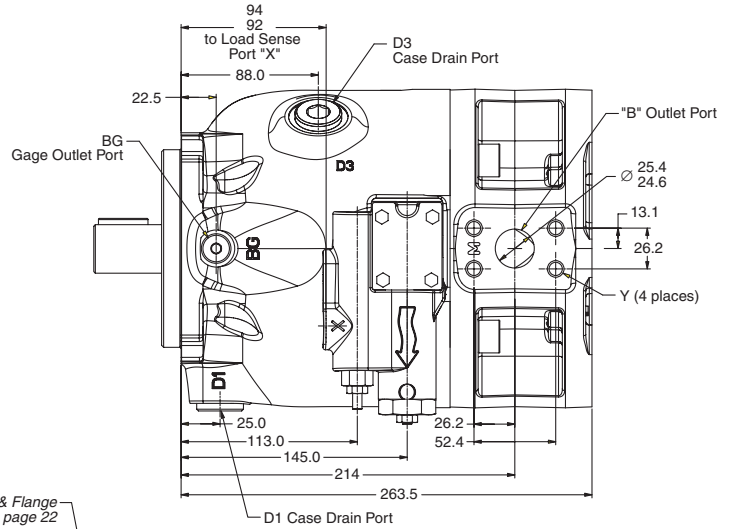
**Pump Installation - PD075  
Side Port  
"L" Control Option**



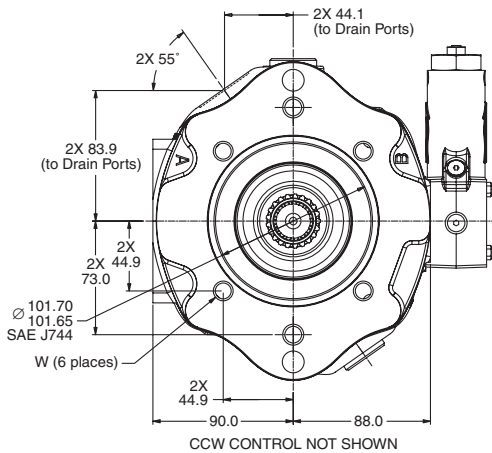
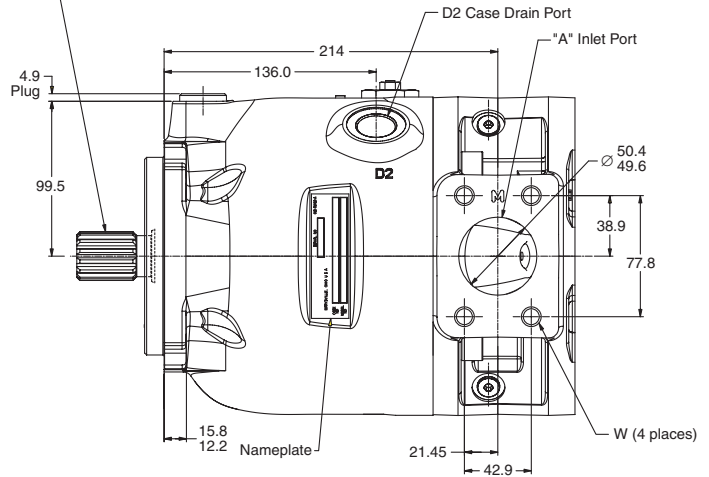
	PD075 Port Sizes		
	SAE	ISO	BSP
∅A Inlet	50mm code 61 <sup>C</sup>	50mm DN 51 <sup>B</sup>	—
W Threads	½ - 13 UNC-2B <sup>C</sup>	M12 x 1.75 <sup>B</sup>	—
∅B Outlet	25mm code 61 <sup>C</sup>	25mm DN25 <sup>B</sup>	—
Y Threads	¾ - 16 UNC-2B <sup>C</sup>	M10 x 1.5 <sup>B</sup>	—
BG	SAE-4 <sup>D</sup>	M12x1.5 <sup>A</sup>	¼" <sup>E</sup>
D1 D2 D3	SAE-12 <sup>D</sup>	M27x2 <sup>A</sup>	¾" <sup>E</sup>
X	SAE-4 <sup>D</sup>	M12x1.5 <sup>A</sup>	¼" <sup>E</sup>

Note A: Metric o-ring boss port conform to ISO 6149-1  
 Note B: Metric 4-bolt flange port conforms to ISO 6162  
 Note C: Inch 4-bolt flange port conforms to SAE J518  
 Note D: Inch o-ring boss port conforms to SAE J514  
 Note E: BSP boss port conforms to ISO 228-1

**Pump Installation - PD075  
Side Ports with Thru-Drive  
“L” Control Option**



For Shaft & Flange Dimensions, see page 22

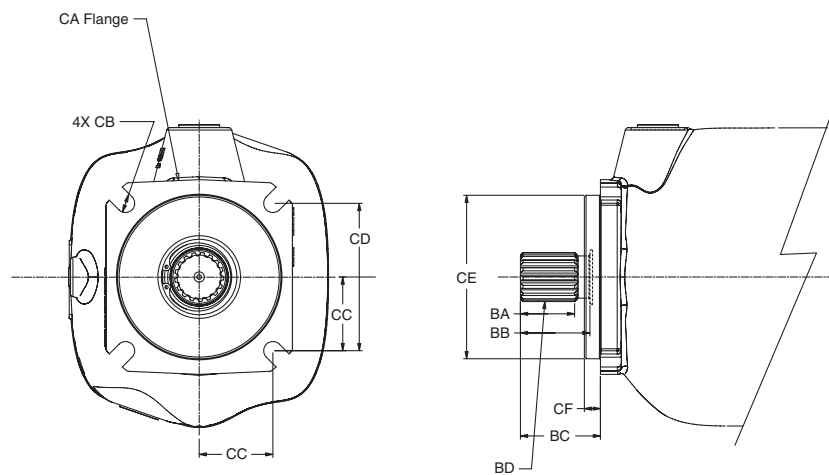
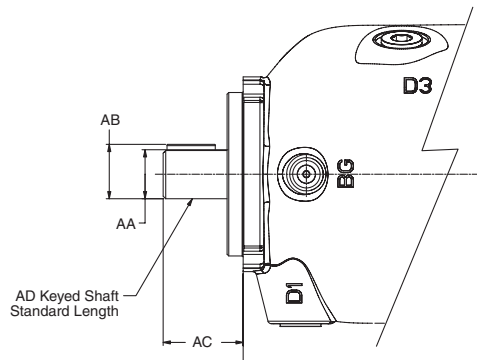


	PD075 Port Sizes		
	SAE	ISO	BSP
∅A Inlet	50mm code 61 <sup>C</sup>	50mm DN 51 <sup>B</sup>	—
W Threads	½ - 13 UNC-2B <sup>C</sup>	M12 x 1.75 <sup>B</sup>	—
∅B Outlet	25mm code 61 <sup>C</sup>	25mm DN25 <sup>B</sup>	—
Y Threads	¾ - 16 UNC-2B <sup>C</sup>	M10 x 1.5 <sup>B</sup>	—
BG	SAE-4 <sup>D</sup>	M12x1.5 <sup>A</sup>	¼" <sup>E</sup>
D1 D2 D3	SAE-12 <sup>D</sup>	M27x2 <sup>A</sup>	¾" <sup>E</sup>
X	SAE-4 <sup>D</sup>	M12x1.5 <sup>A</sup>	¼" <sup>E</sup>

Note A: Metric o-ring boss port conform to ISO 6149-1  
 Note B: Metric 4-bolt flange port conforms to ISO 6162  
 Note C: Inch 4-bolt flange port conforms to SAE J518  
 Note D: Inch o-ring boss port conforms to SAE J514  
 Note E: BSP boss port conforms to ISO 228-1

Shaft Location	PD075 Shaft Size & Type	Shaft Torque Capacity (Nm)
Input End	SAE C 32-1 Key	562
	SAE C 14T Spline	915
	ISO E32N Key	576
	ISO 14T Spline	915
Thru-Drive End	Spline Coupling	458

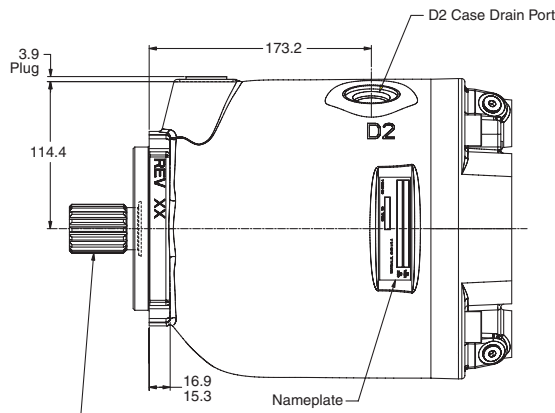
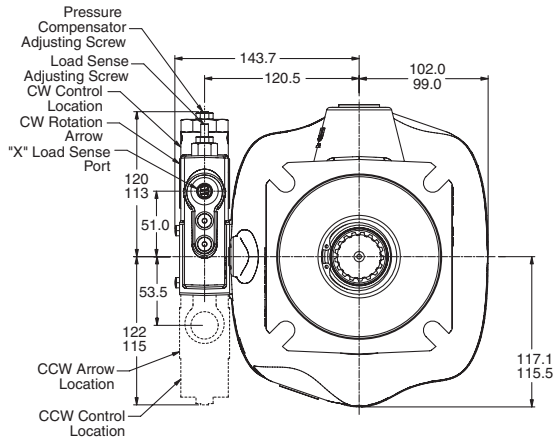
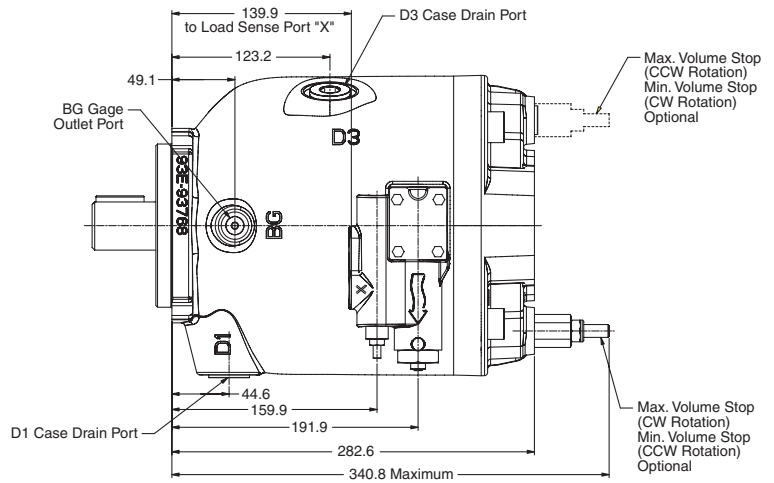
**Pump Installation - PD100  
Input Shafts**



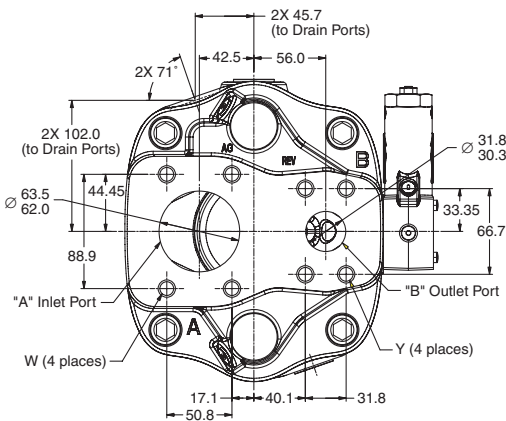
PD100	ISO	SAE
AA	40.021/40.002	38.10/38.05
AB	43.00/42.71	42.35/42.17
AC	92.8/91.2	62.8/61.2
AD	ISO E40N	SAE J744 38.1(C-C)
BA	20.0	42.1
BB	45.0	54.0
BC	56.0/55.0	62.8/61.2
BD	SPLINE: ISO 3019/2-2001-P40N (REF DIN 5480) INVOLUTE SPLINE DATA FLAT ROOT SIDE FIT NUMBER OF TEETH - 18 MODULE - M2 PRESSURE ANGLE - 30 MAJOR DIAMETER - 39.60 TOOTH THICKNESS - 9e	SPLINE: SAE ASA-B 1960 SAE 38-4(C-C) INVOLUTE SPLINE DATA CLASS 2 FLAT ROOT SIDE FIT NUMBER OF TEETH - 17 PITCH - 12/24 PRESSURE ANGLE - 30 MAJOR DIAMETER - 1.4793/1.4763 IN PITCH DIAMETER - 1.4167
CA	ISO 3019/2-2001 125B2SW	SAE J744 JUN96 127-4 C
CB	13.77/13.50	14.4 DIA.
CC	56.6	57.2
CD	113.2 SQUARE	114.5 SQUARE
CE	125.00/124.94 ISO 3019/2	127.00/126.95 SAE J744
CF	9.5/9.0	12.7/12.2



**Pump Installation - PD100  
End Ports  
“L” Control Option**



For Shaft & Flange Dimensions, see page 26

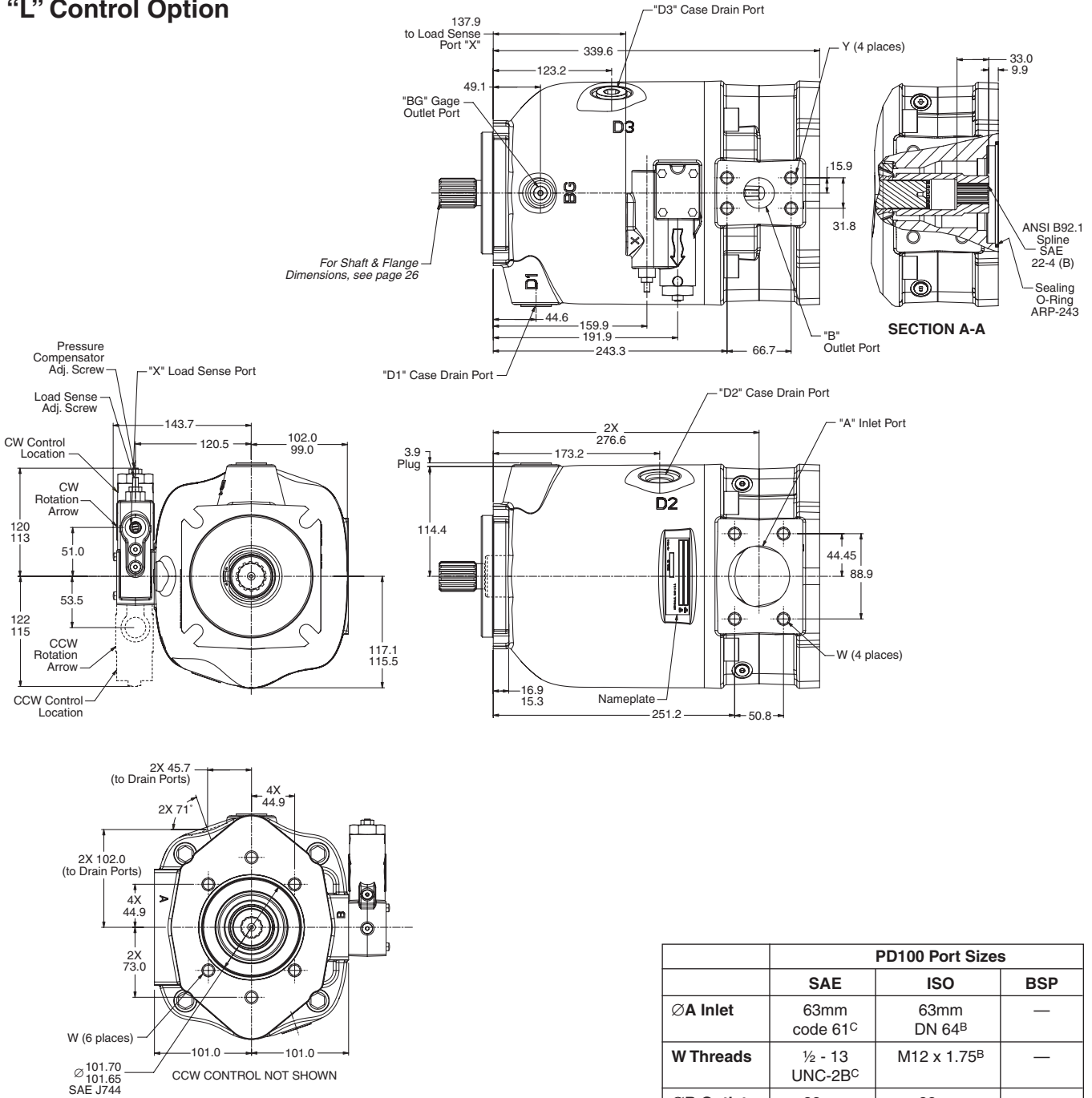


	PD100 Port Sizes		
	SAE	ISO	BSP
ØA Inlet	63mm code 61 <sup>C</sup>	63mm DN 64 <sup>B</sup>	—
W Threads	½ - 13 UNC-2B <sup>C</sup>	M12 x 1.75 <sup>B</sup>	—
ØB Outlet	32mm code 62 <sup>C</sup>	32mm DN 32 <sup>B</sup>	—
Y Threads	½ - 13 UNC-2B <sup>C</sup>	M12 x 1.75 <sup>B</sup>	—
BG	SAE-4 <sup>D</sup>	M12x1.5 <sup>A</sup>	¼" <sup>E</sup>
D1 D2 D3	SAE-12 <sup>D</sup>	M27x2 <sup>A</sup>	¾" <sup>E</sup>
X	SAE-4 <sup>D</sup>	M12x1.5 <sup>A</sup>	¼" <sup>E</sup>

Note A: Metric o-ring boss port conform to ISO 6149-1  
 Note B: Metric 4-bolt flange port conforms to ISO 6162  
 Note C: Inch 4-bolt flange port conforms to SAE J518  
 Note D: Inch o-ring boss port conforms to SAE J514  
 Note E: BSP boss port conforms to ISO 228-1



**Pump Installation - PD100  
Side Ports with Thru-Drive  
“L” Control Option**

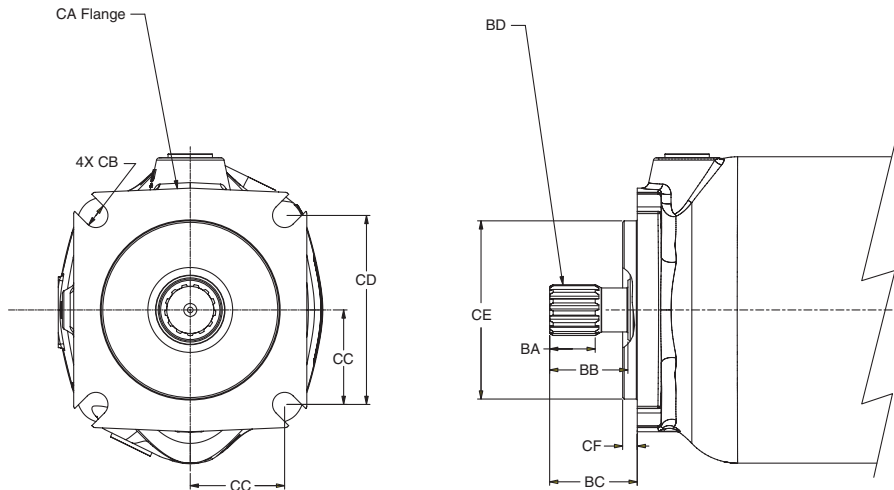
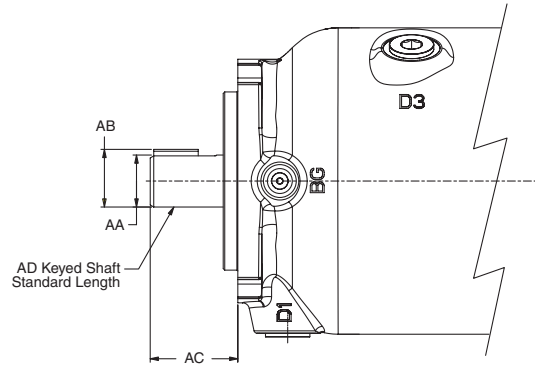


Shaft Location	PD100 Shaft Size & Type	Shaft Torque Capacity (Nm)
Input End	SAE C-C 38-1 Key	980
	SAE C-C 17T Spline	1220
	ISO E40N Key	1157
	ISO 18T Spline	1220
Thru-Drive End	Spline Coupling	610

	PD100 Port Sizes		
	SAE	ISO	BSP
∅A Inlet	63mm code 61 <sup>C</sup>	63mm DN 64 <sup>B</sup>	—
W Threads	½ - 13 UNC-2B <sup>C</sup>	M12 x 1.75 <sup>B</sup>	—
∅B Outlet	32mm code 62 <sup>C</sup>	32mm DN 32 <sup>B</sup>	—
Y Threads	½ - 13 UNC-2B <sup>C</sup>	M12 x 1.75 <sup>B</sup>	—
BG	SAE-4 <sup>D</sup>	M12x1.5 <sup>A</sup>	¼" <sup>E</sup>
D1 D2 D3	SAE-12 <sup>D</sup>	M27x2 <sup>A</sup>	¾" <sup>E</sup>
X	SAE-4 <sup>D</sup>	M12x1.5 <sup>A</sup>	¼" <sup>E</sup>

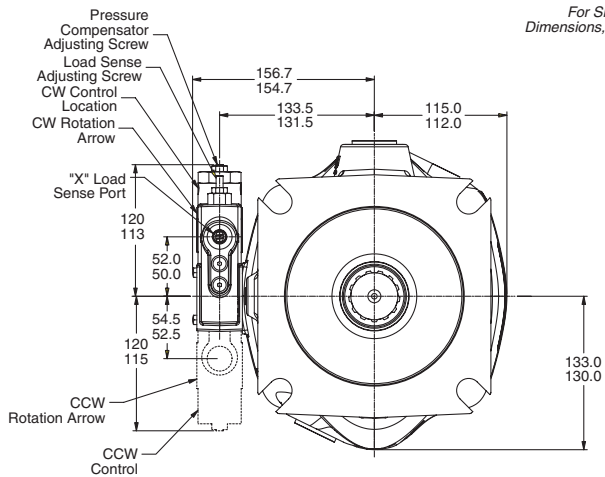
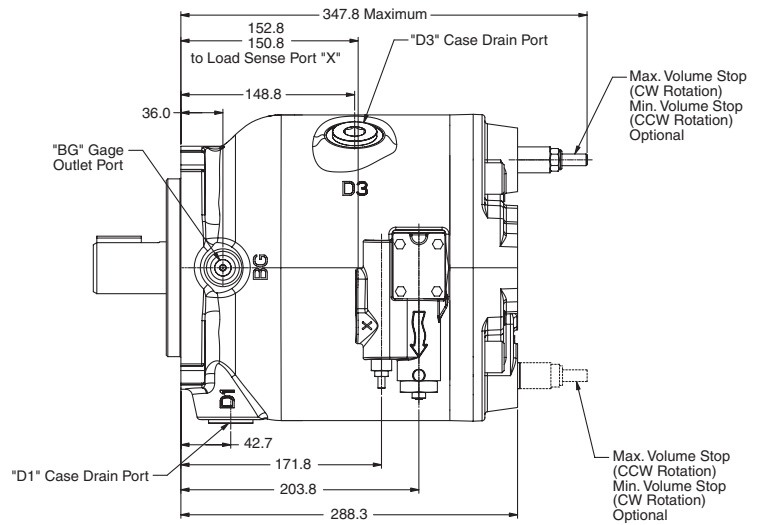
Note A: Metric o-ring boss port conform to ISO 6149-1  
 Note B: Metric 4-bolt flange port conforms to ISO 6162  
 Note C: Inch 4-bolt flange port conforms to SAE J518  
 Note D: Inch o-ring boss port conforms to SAE J514  
 Note E: BSP boss port conforms to ISO 228-1

**Pump Installation - PD140  
Input Shafts**

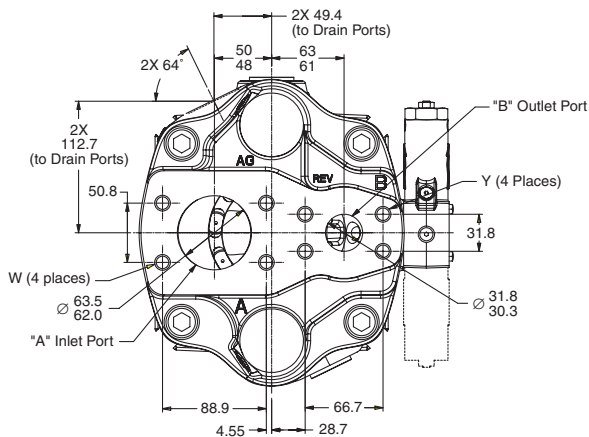
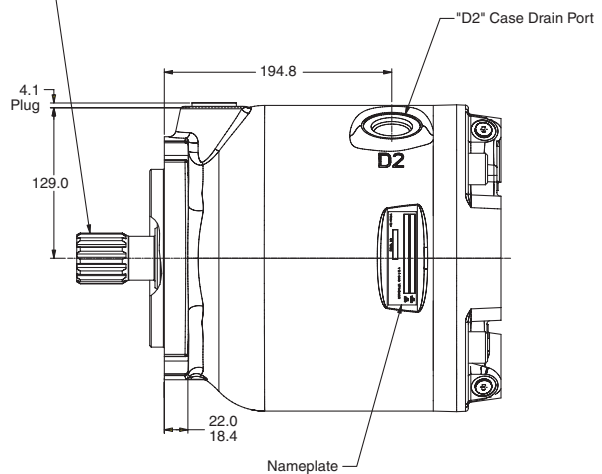


PD140	ISO	SAE
∅AA	50.027/50.002	44.45/44.40
AB	53.50/53.21	49.43/49.17
AC	92.8/91.2	75.8/74.2
AD	ISO E50N	SAE J744 44-1(D)
BA	41.0	39.0
BB	55.0	67.0
BC	66.0/65.0	75.8/74.2
BD	SPLINE: ISO 3019/2-2001-P50N (REF DIN 5480) INVOLUTE SPLINE DATA FLAT ROOT SIDE FIT NUMBER OF TEETH - 24 MODULE - M2 PRESSURE ANGLE - 30 MAJOR DIAMETER - 49.60 TOOTH THICKNESS TOLERANCE - 9g	SPLINE: SAE J498-B 1969 SAE 44-4(D) INVOLUTE SPLINE DATA CLASS 1 FLAT ROOT SIDE FIT NUMBER OF TEETH - 13 PITCH - 8/16 PRESSURE ANGLE - 30 MAJOR DIAMETER - 1.7210/1.7160 IN PITCH DIAMETER - 1.6250
CA	ISO 3019/2-2001 180B4SW	SAE J744 JUN96 152-4(D)
CB	18.20/17.80	20.9/20.5 DIA.
CC	79.2	80.8
CD	158.4 SQUARE	161.6 SQUARE
CE	180.00/179.95 ISO 3019/2	152.40/152.35 SAE J744
CF	9.5/9.0	12.7/12.2

**Pump Installation - PD140  
End Ports  
"L" Control Option**



For Shaft & Flange Dimensions, see page 30



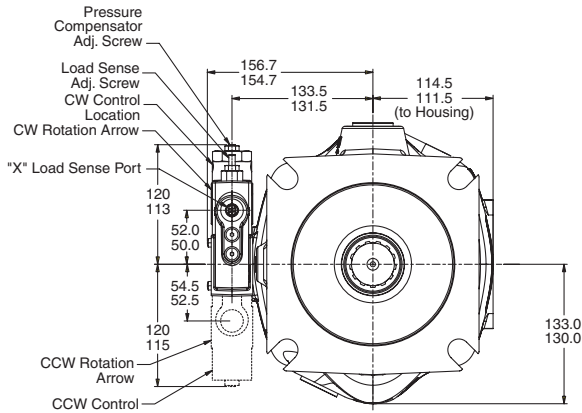
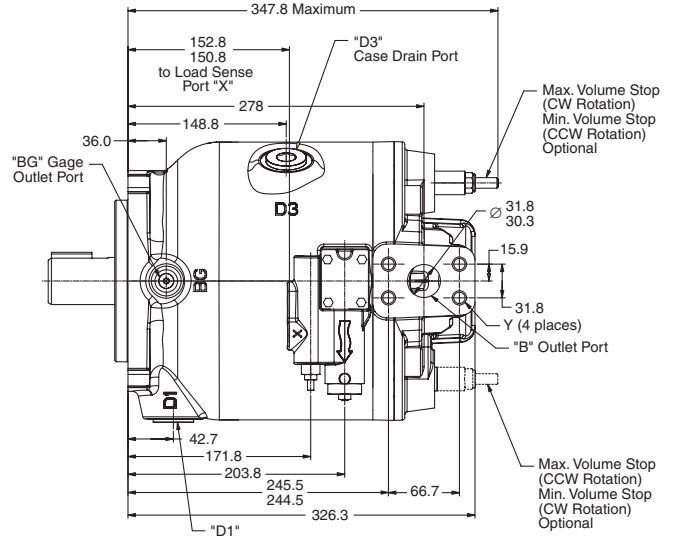
	PD140 Port Sizes		
	SAE	ISO	BSP
ØA Inlet	63mm code 61 <sup>C</sup>	63mm DN 64 <sup>B</sup>	—
W Threads	½ - 13 UNC-2B <sup>C</sup>	M12 x 1.75 <sup>B</sup>	—
ØB Outlet	32mm code 62 <sup>C</sup>	32mm DN 32 <sup>B</sup>	—
Y Threads	½ - 13 UNC-2B <sup>C</sup>	M12 x 1.75 <sup>B</sup>	—
BG	SAE-4 <sup>D</sup>	M12x1.5 <sup>A</sup>	¼" <sup>E</sup>
D1 D2 D3	SAE-16 <sup>D</sup>	M33x2 <sup>A</sup>	1" <sup>E</sup>
X	SAE-4 <sup>D</sup>	M12x1.5 <sup>A</sup>	¼" <sup>E</sup>

Note A: Metric o-ring boss port conform to ISO 6149-1  
 Note B: Metric 4-bolt flange port conforms to ISO 6162  
 Note C: Inch 4-bolt flange port conforms to SAE J518  
 Note D: Inch o-ring boss port conforms to SAE J514  
 Note E: BSP boss port conforms to ISO 228-1

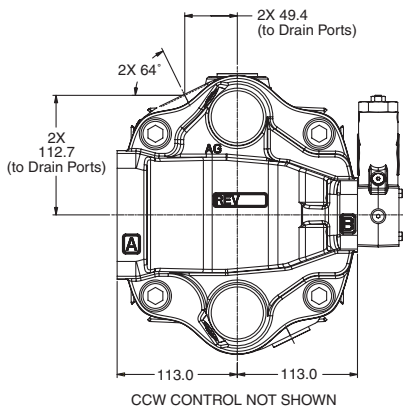
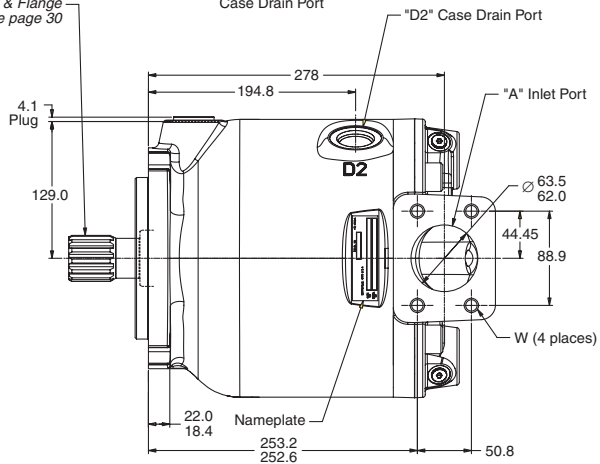
**Pump Installation - PD140**

**Side Ports**

**"L" Control Option**



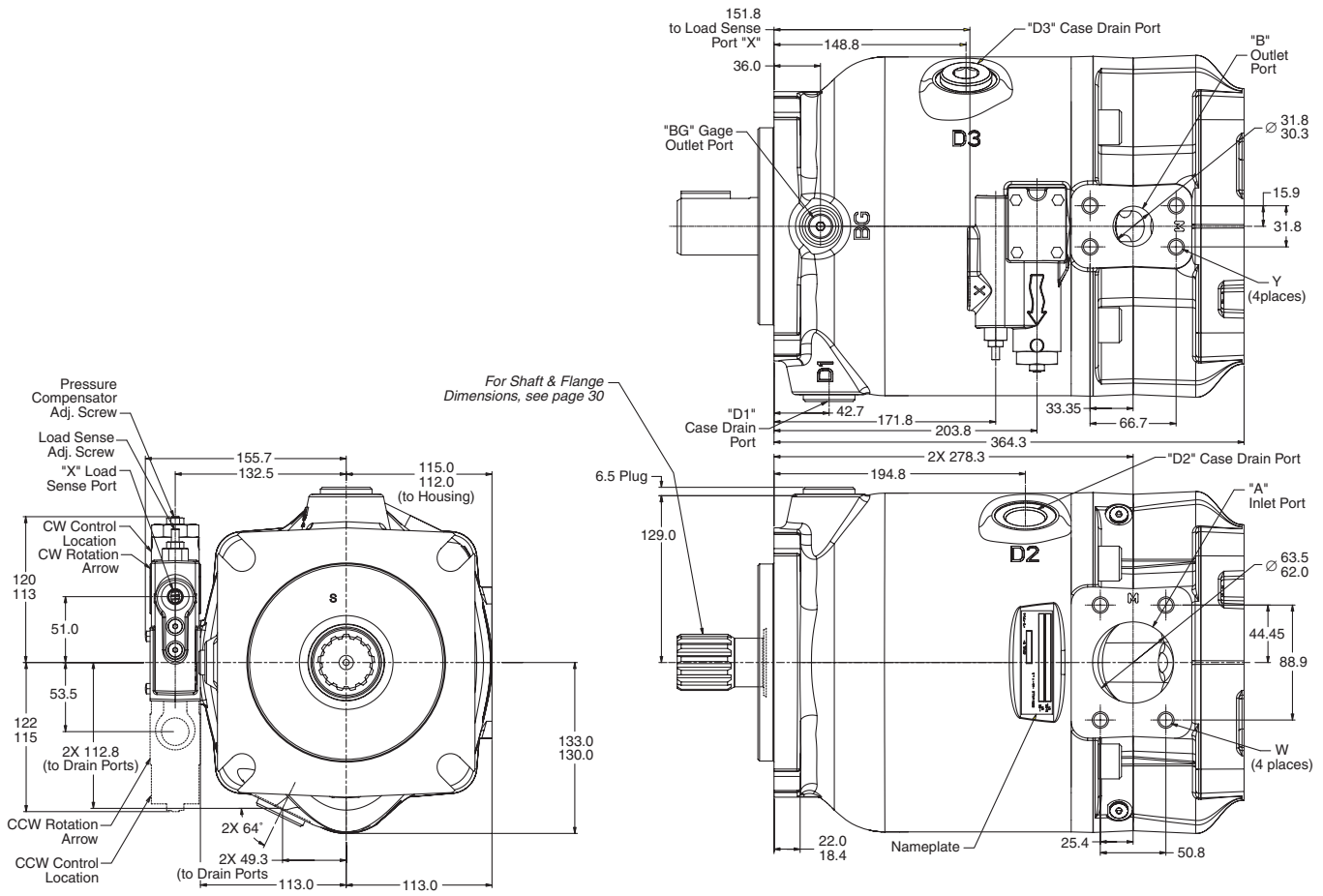
For Shaft & Flange Dimensions, see page 30



	PD140 Port Sizes		
	SAE	ISO	BSP
∅A Inlet	63mm code 61 <sup>C</sup>	63mm DN 64 <sup>B</sup>	—
W Threads	½ - 13 UNC-2B <sup>C</sup>	M12 x 1.75 <sup>B</sup>	—
∅B Outlet	32mm code 62 <sup>C</sup>	32mm DN 32 <sup>B</sup>	—
Y Threads	½ - 13 UNC-2B <sup>C</sup>	M12 x 1.75 <sup>B</sup>	—
BG	SAE-4 <sup>D</sup>	M12x1.5 <sup>A</sup>	¼" <sup>E</sup>
D1 D2 D3	SAE-16 <sup>D</sup>	M33x2 <sup>A</sup>	1" <sup>E</sup>
X	SAE-4 <sup>D</sup>	M12x1.5 <sup>A</sup>	¼" <sup>E</sup>

Note A: Metric o-ring boss port conform to ISO 6149-1  
 Note B: Metric 4-bolt flange port conforms to ISO 6162  
 Note C: Inch 4-bolt flange port conforms to SAE J518  
 Note D: Inch o-ring boss port conforms to SAE J514  
 Note E: BSP boss port conforms to ISO 228-1

**Pump Installation - PD140  
Side Ports with Thru-Drive  
"L" Control Option**

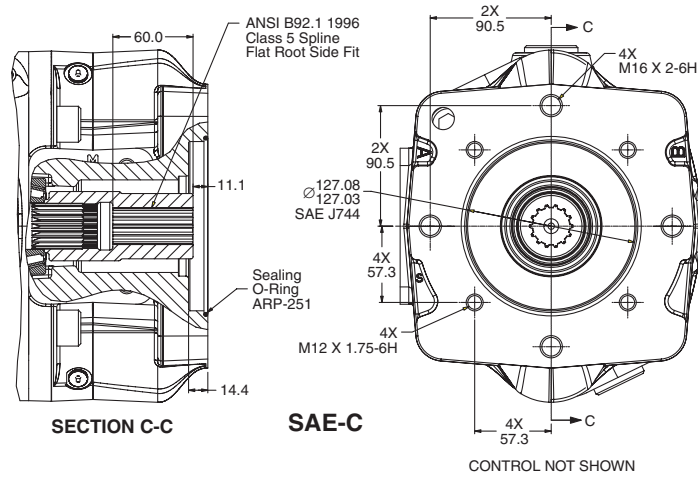
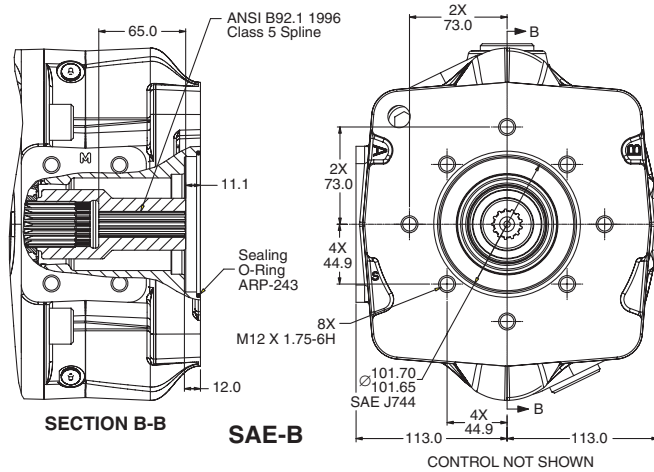


Shaft Location	PD140 Shaft Size & Type	Shaft Torque Capacity (Nm)
Input End	SAE D 44-1 Key	1708
	SAE D 13T Spline	1708
	ISO E50N Key	1708
	ISO 24T Spline	1708
Thru-Drive End	Spline Coupling	854

	PD140 Port Sizes		
	SAE	ISO	BSP
ØA Inlet	63mm code 61 <sup>C</sup>	63mm DN 64 <sup>B</sup>	—
W Threads	½ - 13 UNC-2B <sup>C</sup>	M12 x 1.75 <sup>B</sup>	—
ØB Outlet	32mm code 62 <sup>C</sup>	32mm DN 32 <sup>B</sup>	—
Y Threads	½ - 13 UNC-2B <sup>C</sup>	M12 x 1.75 <sup>B</sup>	—
BG	SAE-4 <sup>D</sup>	M12x1.5 <sup>A</sup>	¼" <sup>E</sup>
D1 D2 D3	SAE-16 <sup>D</sup>	M33x2 <sup>A</sup>	1" <sup>E</sup>
X	SAE-4 <sup>D</sup>	M12x1.5 <sup>A</sup>	¼" <sup>E</sup>

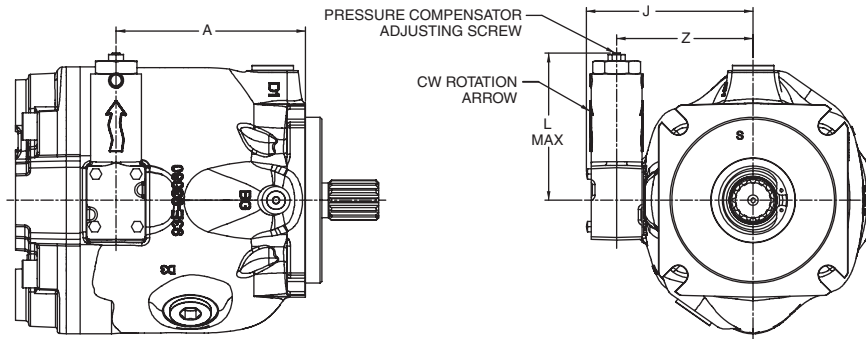
Note A: Metric o-ring boss port conform to ISO 6149-1  
 Note B: Metric 4-bolt flange port conforms to ISO 6162  
 Note C: Inch 4-bolt flange port conforms to SAE J518  
 Note D: Inch o-ring boss port conforms to SAE J514  
 Note E: BSP boss port conforms to ISO 228-1

**Pump Installation - PD140  
Side Ports with Thru-Drive  
Mounting Options**





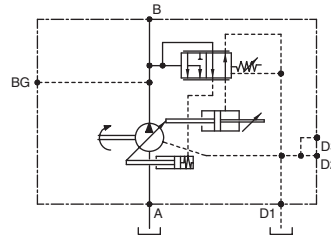
**C\*\* Control  
Pressure Limiter**



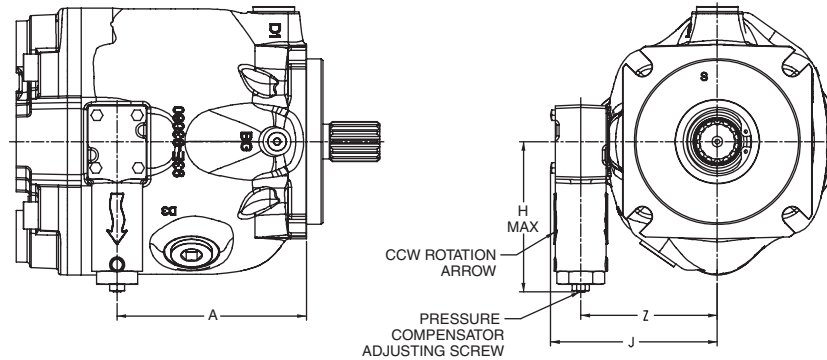
**CW ORIENTATION**  
P\*075 Shown

**C\*\* CONTROL**

ADJUSTMENT SENSITIVITY	
C00	40 Bar per Turn
C10	18.6 Bar per Turn



**CCW ORIENTATION**  
P\*075 Shown

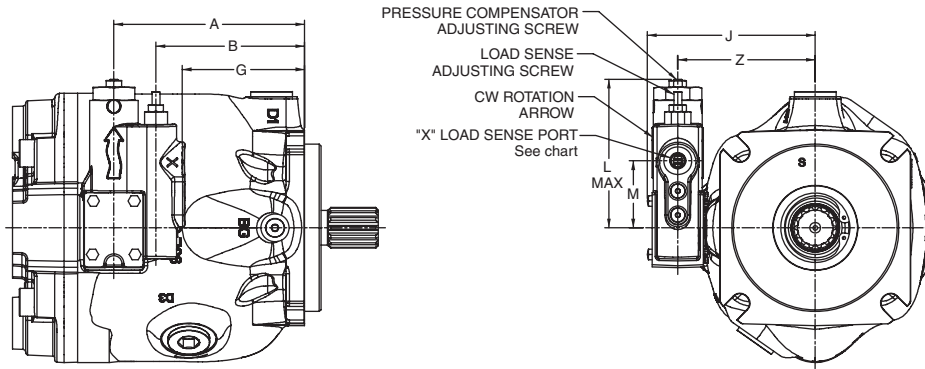


**Dimensions**

Model	A	H Max	J	L Max	Z
P*060	134.5	122	124.7	120	101.5
P*075	145.0	122	127.7	120	104.5
P*100	191.9	122	143.7	120	120.5
P*140	203.8	122	155.7	120	132.5

**L\*\* Control**

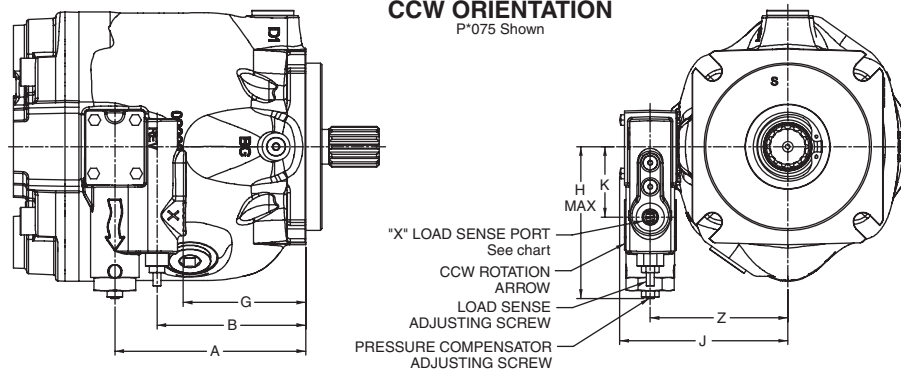
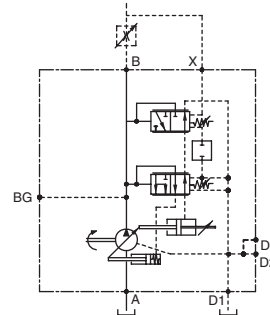
**Load Sensing with Pressure Limiter**



**CW ORIENTATION**  
P\*075 Shown

**L\*\* CONTROL**

ADJUSTMENT SENSITIVITY	
Load Sense	28 Bar per Turn
Pressure Compensator L0	40 Bar per Turn
Pressure Compensator L1	18.6 Bar per Turn



**CCW ORIENTATION**  
P\*075 Shown

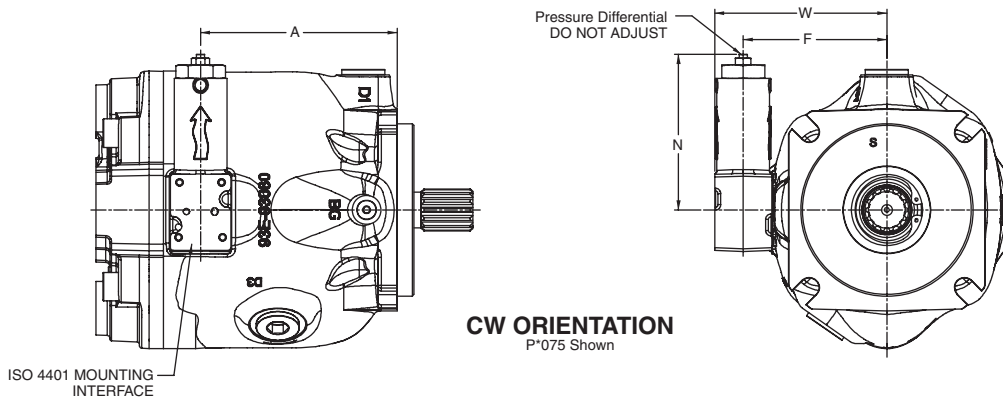
LOAD SENSE PORT "X"	
P****PS	SAE J514 Straight Thread O-Ring Port 7/16-20 UNF-2B (SAE-4)
P****PA	1/4" BSPP per ISO 228-1
P****PB	1/4" BSPP per ISO 228-1
P****PM	M12 x 1.5-6H per ISO 6149-1

**Dimensions**

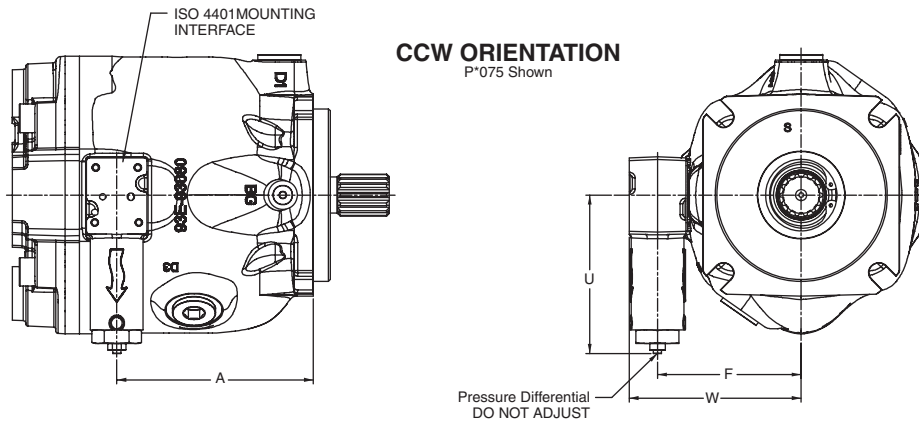
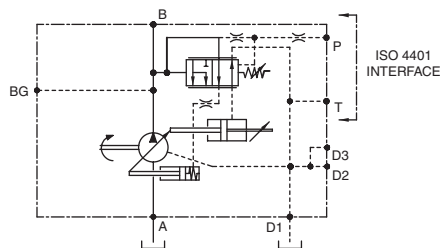
Model	A	B	G	H Max	J	K	L Max	M	Z
P*060	134.5	102.5	82.5	122	124.7	53.5	120	51.0	101.5
P*075	145.0	113.0	93.0	122	127.7	53.5	120	51.0	104.5
P*100	191.9	159.9	139.9	122	143.7	53.5	120	51.0	120.5
P*140	203.8	171.8	151.8	122	155.7	53.5	120	51.0	132.5

**RN Control**

**Control with ISO 4401 Interface and Shipping Cover**



**RN CONTROL**

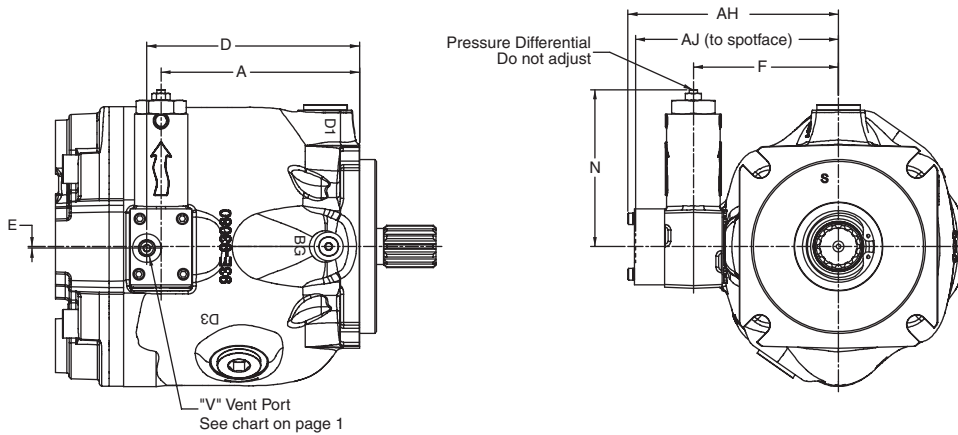


**Dimensions**

Model	A	F	N	U	W
P*060	134.5	103.0	114.6	116.8	124.0
P*075	145.0	106.0	114.6	116.8	127.0
P*100	191.9	122.0	114.6	116.8	143.0
P*140	203.8	134.0	114.6	116.8	155.0

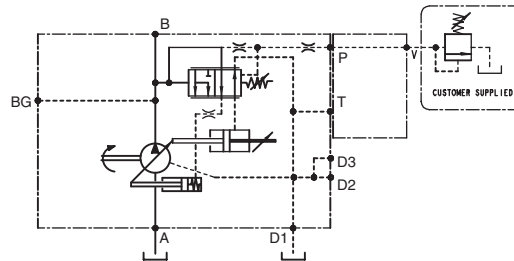
**RH Control**

**Remote Pilot Operated Pressure Limiter**



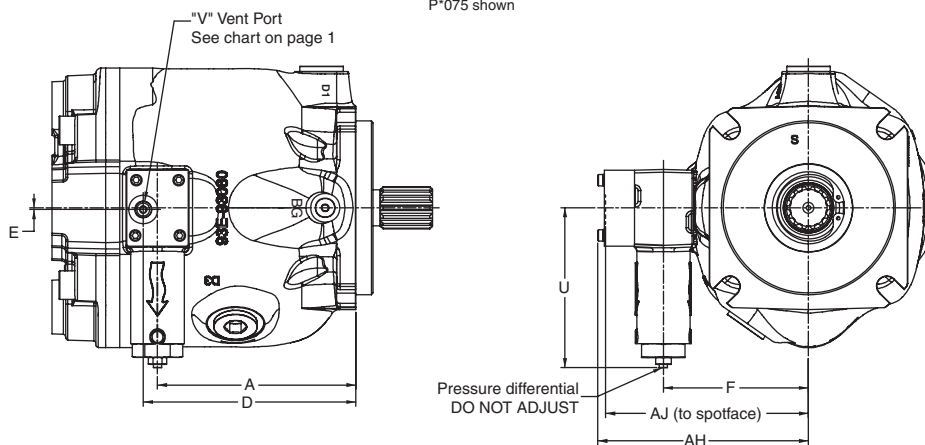
**CW ORIENTATION**

**RH CONTROL**



**CCW ORIENTATION**

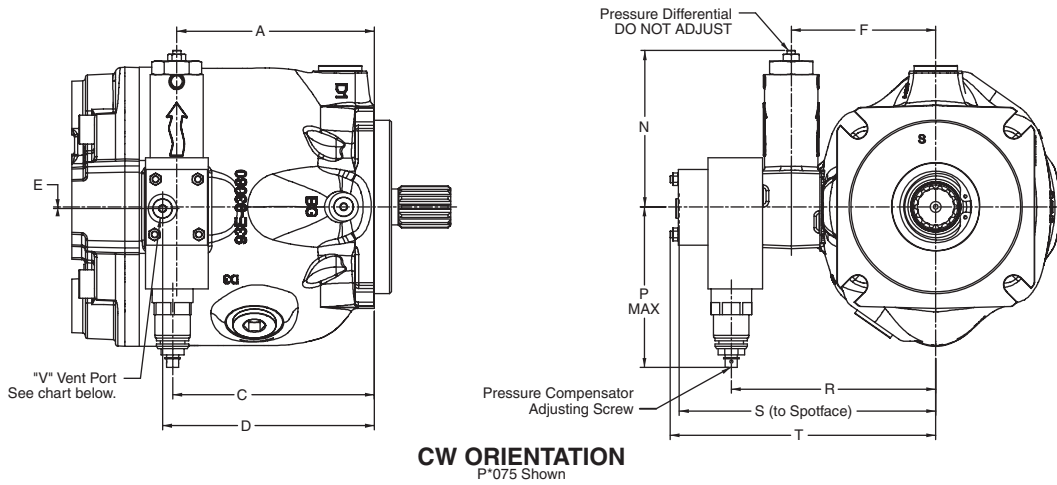
P\*075 shown



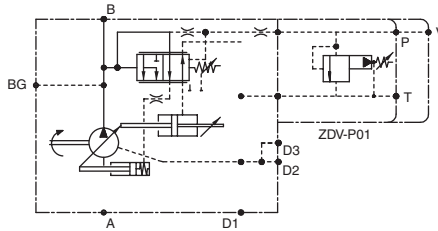
**Dimensions**

Model	A	D	E	F	N	U	AH	AJ
P*060	134.5	144.9	1.3	103.0	114.6	116.8	150.9	145.2
P*075	145.0	155.4	1.3	106.0	114.6	116.8	153.9	148.2
P*100	191.9	202.3	1.3	122.0	114.6	116.8	169.9	164.2
P*140	203.8	214.2	1.3	134.0	114.6	116.8	181.9	176.2

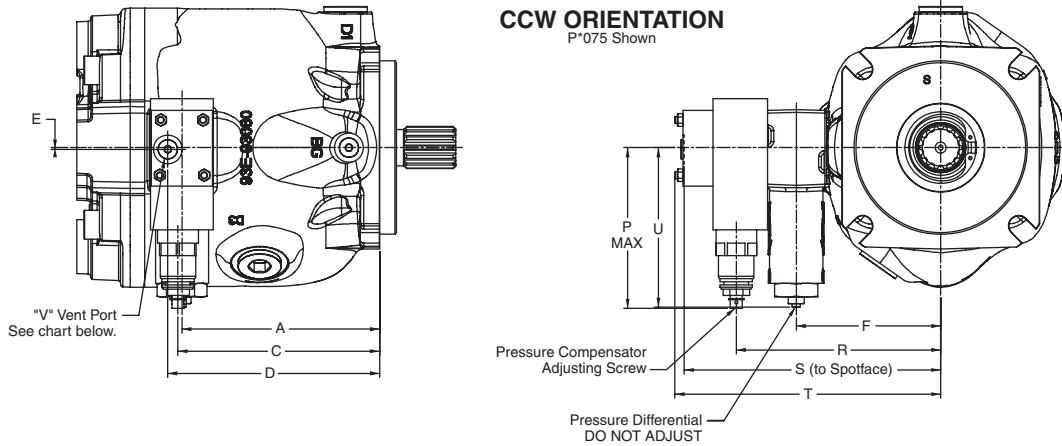
**RM Control  
Pilot Operated Pressure Limiter  
with Mechanical Adjustment and Vent Port**



**RM CONTROL**



**CCW ORIENTATION**  
P\*075 Shown



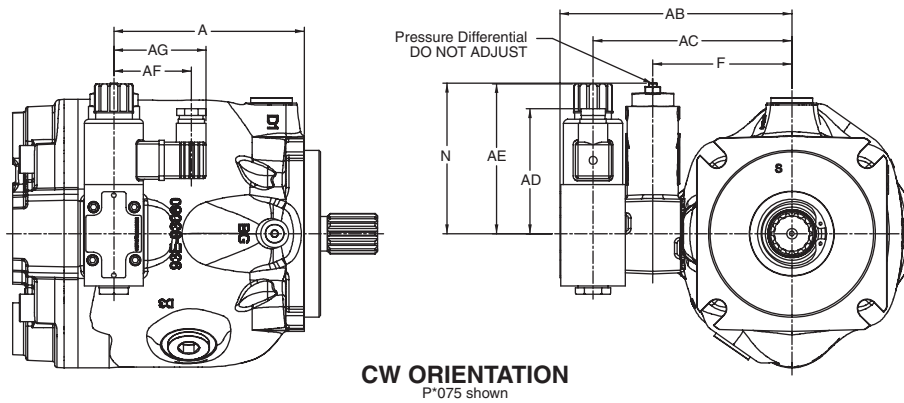
Model	Vent Port "V"
P****PS	SAE J514 Straight Thread O-Ring Port 7/16-20 UNF-2B (SAE-4)
P****PA	1/4" BSPP per ISO 228-1
P****PB	1/4" BSPP per ISO 228-1
P****PM	M12 x 1.5-6H per ISO 6149-1

**Dimensions**

Model	A	C	D	E	F	N	P Max	R	S	T	U
P*060	134.5	137.5	144.9	1.3	103.0	114.6	117.8	147	185.2	192.0	116.8
P*075	145.0	148.0	155.4	1.3	106.0	114.6	117.8	150.0	188.2	195.0	116.8
P*100	191.9	194.9	202.3	1.3	122.0	114.6	117.8	166.0	204.2	211.0	116.8
P*140	203.8	206.8	214.2	1.3	134.0	114.6	117.8	178.0	216.2	223.0	116.8

**RE Control**

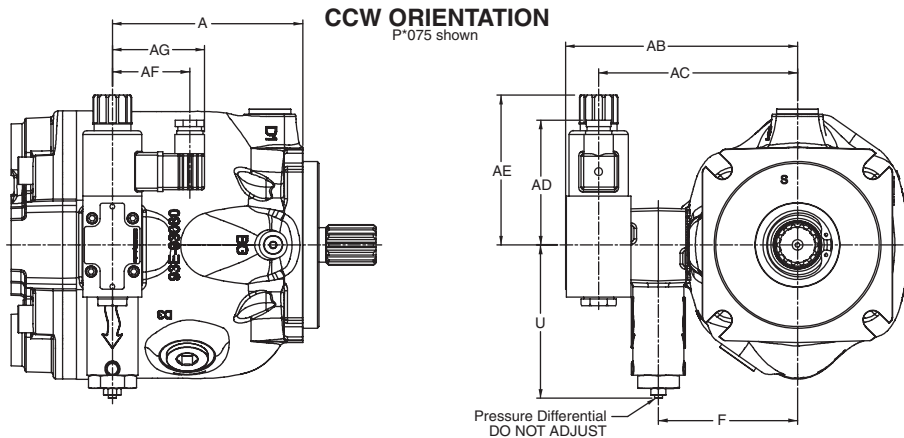
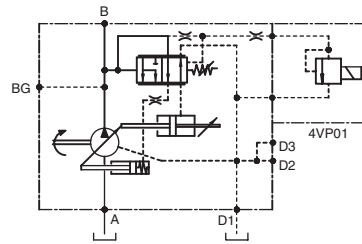
**Pilot Operated Pressure Limiter with Electrical Adjustment**



**THE FOLLOWING ARE RECOMMENDED  
TO DRIVE THE 4VP01 VALVE**

PART NUMBER	DESCRIPTION
701-00600-8	Proportional Amplifier
701-00007-8	Card Holder
701-00023-8	Power Supply
701-00066-8	Card Holder
701-00013-8	Potentiometer
REFERENCE	3-EN 2200-B
REFERENCE	9-EN601-A for Setup

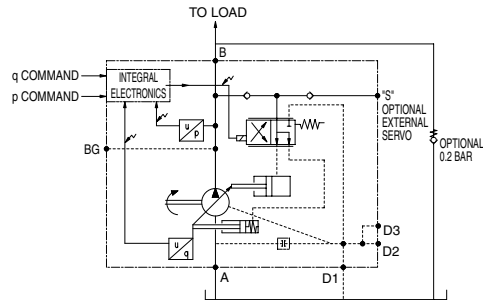
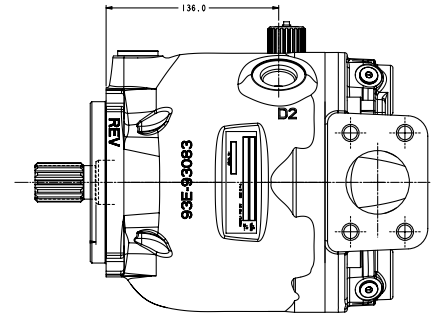
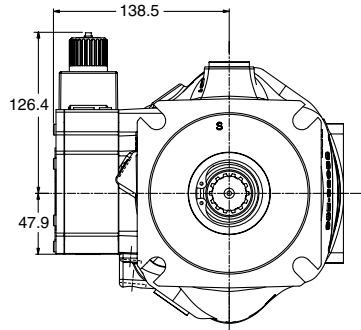
**RE CONTROL**



**Dimensions**

Model	A	F	N	U	Z	AB	AC	AD	AE	AF	AG
P*060	134.5	103.0	114.6	116.8	101.5	173.8	148.5	95.1	114.1	R59.0	R70.2
P*075	145.0	106.0	114.6	116.8	104.5	176.8	151.5	95.1	114.1	R59.0	R70.2
P*100	191.9	122.0	114.6	116.8	120.5	192.8	167.5	95.1	114.1	R59.0	R70.2
P*140	203.8	134.0	114.6	116.8	132.5	204.8	179.5	95.1	114.1	R59.0	R70.2

**EY Control**  
**Integrated Digital Electronic Control**  
**(075 only)**



Shown with Optional Case-to-Inlet Check Valve

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**10. Indemnity For Infringement of Intellectual Property Rights:** Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Part 10. Seller will defend and indemnify Buyer against allegations of infringement of U.S. Patents, U.S. Trademarks, copyrights, trade dress and trade secrets (hereinafter 'Intellectual Property Rights'). Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on an allegation that an item sold pursuant to this contract infringes the Intellectual Property Rights of a third party. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If an item sold hereunder is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using said item, replace or modify said item so as to make it noninfringing, or offer to accept return of said item and return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to items delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any item sold hereunder. The foregoing provisions of this Part 10 shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.

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**11. Force Majeure:** Seller does not assume the risk of and shall not be liable for delay or failure to perform any of Seller's obligations by reason of circumstances beyond the reasonable control of Seller (hereinafter 'Events of Force Majeure'). Events of Force Majeure shall include without limitation, accidents, acts of God, strikes or labor disputes, acts, laws, rules or regulations of any government or government agency, fires, floods, delays or failures in delivery of carriers or suppliers, shortages of materials and any other cause beyond Seller's control.

**12. Entire Agreement/Governing Law:** The terms and conditions set forth herein, together with any amendments, modifications and any different terms or conditions expressly accepted by Seller in writing, shall constitute the entire Agreement concerning the items sold, and there are no oral or other representations or agreements which pertain thereto. This Agreement shall be governed in all respects by the law of the State of Ohio. No actions arising out of the sale of the items sold hereunder or this Agreement may be brought by either party more than two (2) years after the cause of action accrues.

9/91-P



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