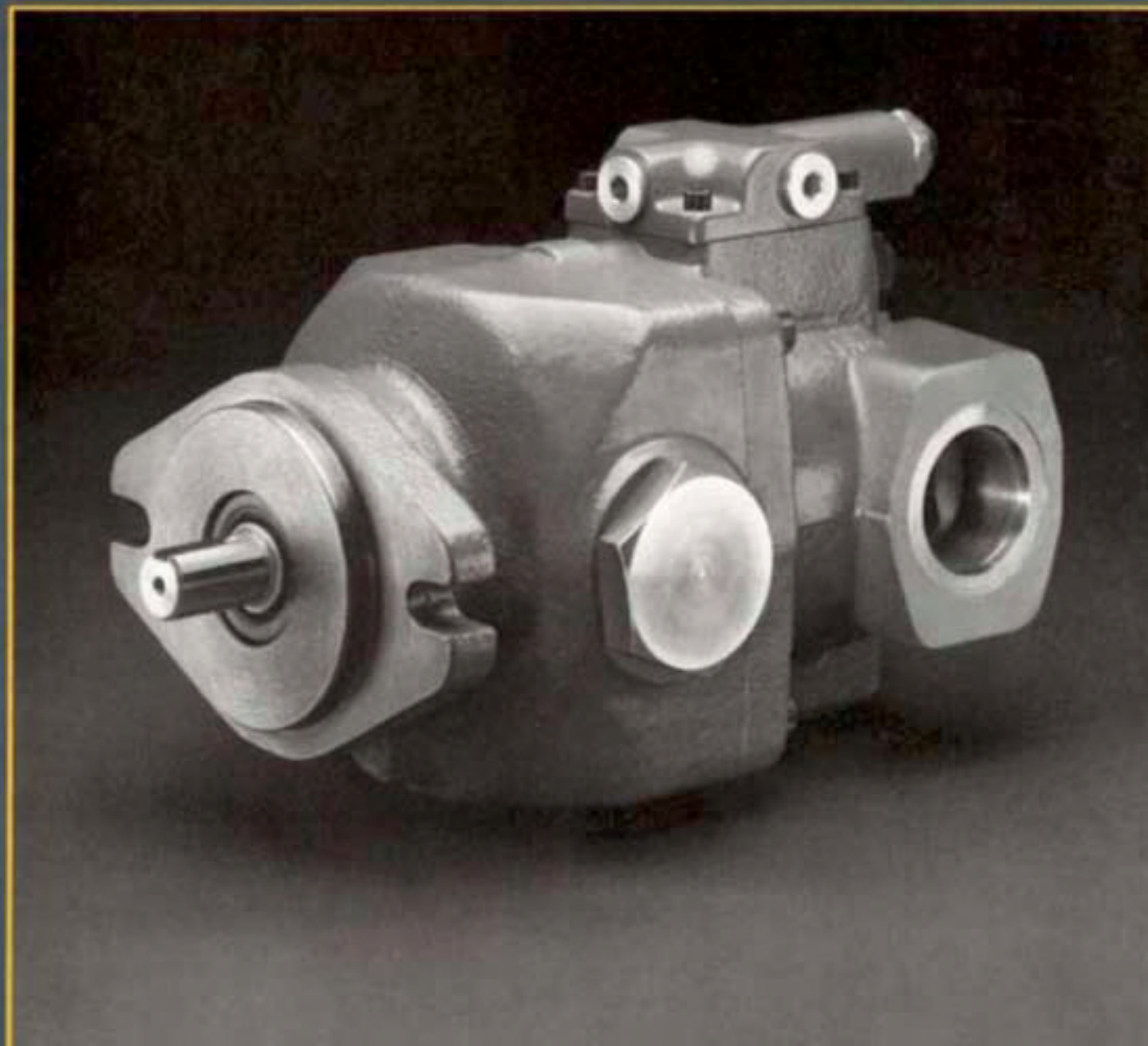
HARTMANN

PUMPS - MOTORS - CONTROLS

PVC SERIES 34/43

ATMOSPHERIC INLET AXIAL PISTON PUMPS



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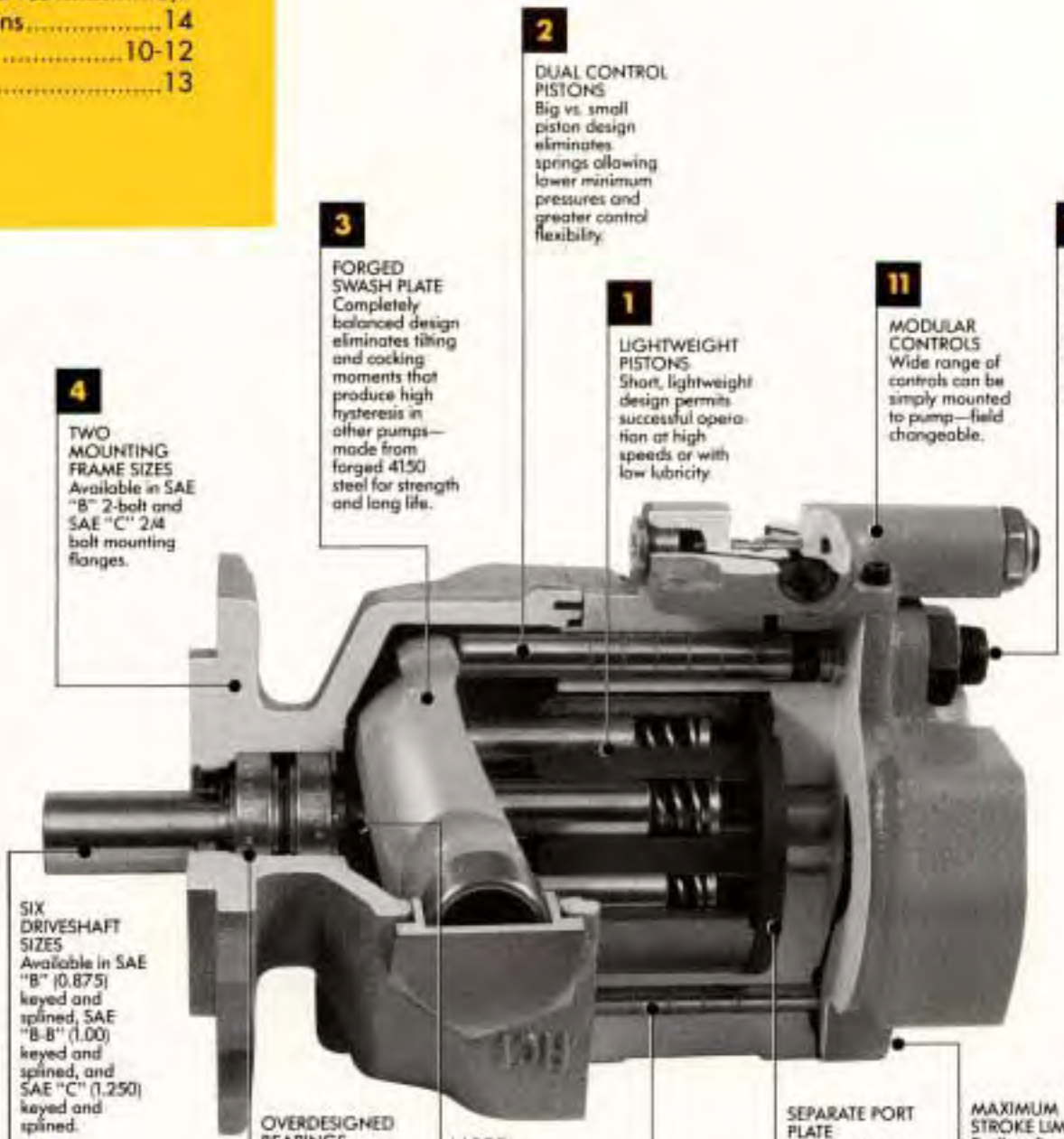
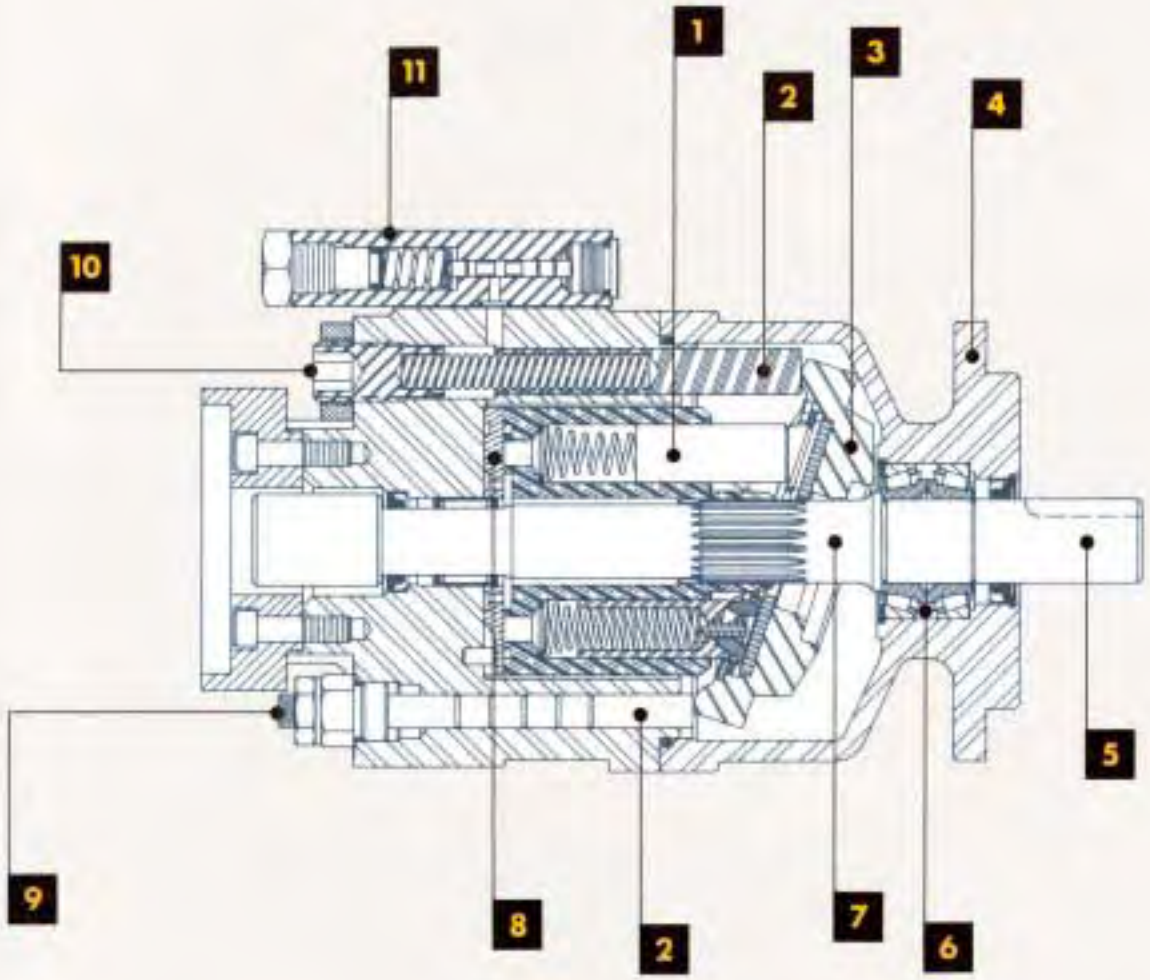


Each pump is shipped with a corporate commitment to make the unit perform as specified. A total dedication to performance is based upon experience gained since 1964 in matching axial piston pumps to a wide range of fluid power applications.

Our commitment does not stop with the shipment of an individually tested product. Rather, it guarantees that Hartmann engineers and our long proven representatives will be there—when needed— to make sure your application runs smoothly and correctly—now and in the future.



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UNIT SIZE	DISPLACEMENT		CONTINUOUS PRESSURE RATING		PEAK PRESSURE RATING		MINIMUM PRESSURE RATING	
	in^3/rev	cm^3/rev	lb/in^2	bar	lb/in^2	bar	lb/in^2	bar
34	3.4	56.0	4000	275	5000	345	80	5.5
43	4.3	71.0	3000	205	4000	275	80	5.5

UNIT SIZE	THEORETICAL Q @ 1800 R.P.M.		MAXIMUM SPEED		MINIMUM SPEED
	gal/min	l/min	$12.5\ lb/in^2$ abs	$14.7\ lb/in^2$ abs	
			0.92 bar abs	1.0 bar abs	
34	26.4	100	1800'	2800*	250
43	33.5	127	1800'	2500*	250

'With standard port end housing and port plate configurations.
*With high speed port end housing and port plate configurations.

INPUT AND THRUSHAFT TORQUE RATINGS

SHAFT SIZE	RECOMMENDED TORQUE LIMIT	
	in-lb	N · M
SAE A[1]	517	58.2
SAE B[1 & 2]	1852	208.4
SAE B-B[1 & 2]	2987	336.1
SAE C[2]	5677	638.7

[1]Available at thrushaft.
[2]Available at input shaft.

PUMP INPUT TORQUE AT RATED PRESSURE

UNIT SIZE	RATED PRESSURE		TORQUE @ RATED PRESSURE	
	lb/in^2	bar	in-lb	N · M
34	4000	275	2165	244
43	3000	205	2053	231

- Care must be taken so that a shaft will not receive an excess torque load in multiple pump applications.
- Since multiple pump applications up to four (4) have been done, various points could receive higher loads than they can transmit.
- To check for an overload all the torques at actual load must be:
  1. Compared to the load rating of each input shaft.
  2. The sum of all units must not exceed the first pump's torque rating.
- To calculate the actual input torque use the following formula where T_A = Actual Torque & T_R = Torque @ Rated Pressure:

$$T_A = T_R \times \frac{\text{Actual Pressure}}{\text{Rated Pressure}} \times \frac{\%\ \text{Stroke}}{100\%}$$

Modularity is designed into Hartmann pumps so that maximum flexibility is given to the machine designer in their difficult task of matching a pump or multiple pumps to a given space. Modularity can be also important when commonality of parts is considered in multiple pump or multiple machine situations.

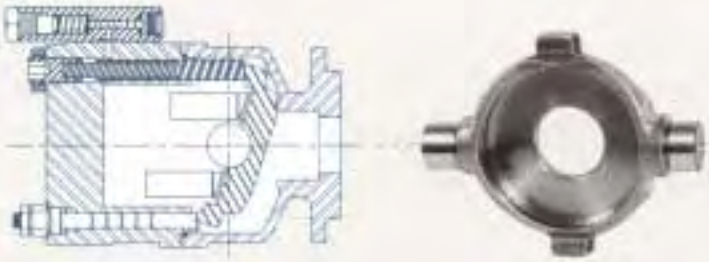
- Housing modularity is used to provide different mounting frames (SAE B and SAE C), different porting (rear port, side port, or a combination), and different shafts (SAE B, SAE B-B, SAE C).

- Thrushaft design is used so that multiple pumps can be "modualized" together producing an elaborate hydraulic system with a single drive input.

- A separate port plate is retained in the Hartmann design as part of the modular system providing the possibility of CCW, CW, low speed, high speed, low noise, or motor operation from the same housings. Most of these changes can be done in the field if necessary.

- All of the wide variety of Hartmann controls are designed to manifold mount to the port end housing. Not only does this feature provide field changeability, but, it provides for dual functions combining the typical hydraulic controls with solenoid and proportional controls.

HARTMANN

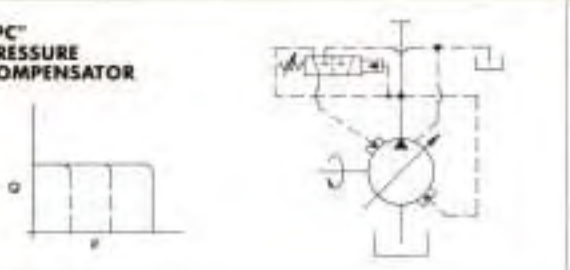


BALANCED TWO PISTON DESIGN AND COMPLETE MODULARITY

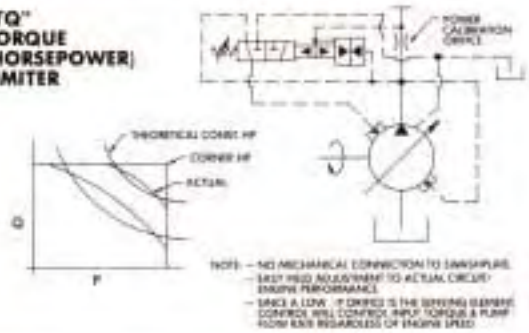
As can be seen on the drawings to the left, the control is completely balanced with the force locations on an axis perpendicular to the pivot axis and located midway between the pivot points. This design eliminates the strong binding, cocking, and sticking forces present in other designs. The resulting benefits are decreased hysteresis, better stability, and lower minimum pressures (i.e. minimum compensating pressure can be as low as 80 p.s.i.).

TYPICAL CONTROLS AND COMBINATIONS

"PC"
PRESSURE COMPENSATOR

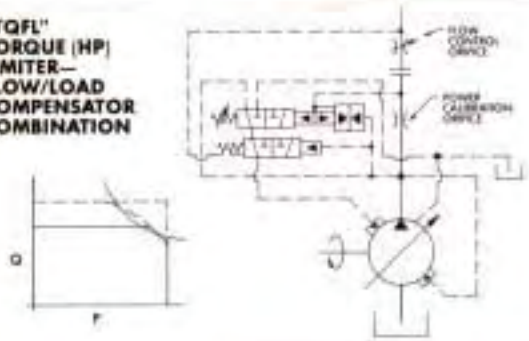


"TQ"
TORQUE (HORSEPOWER) LIMITER

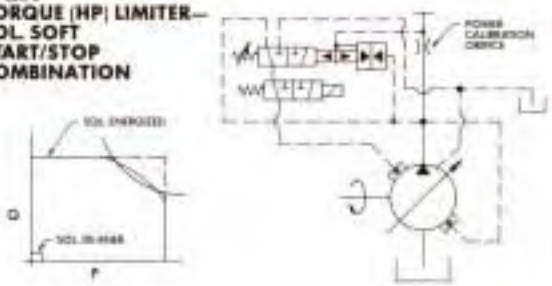


NOTE: — NO MECHANICAL CONNECTION TO SWASHPLATE. EASY FIELD ADJUSTMENT TO ACTUAL CIRCUIT/ ENGINE PERFORMANCE.
— SINCE A LOW ΔP ORIFICE IS THE SENSING ELEMENT CONTROL WILL CONTROL INPUT TORQUE & PUMP FLOW RATE REGARDLESS OF ENGINE SPEED

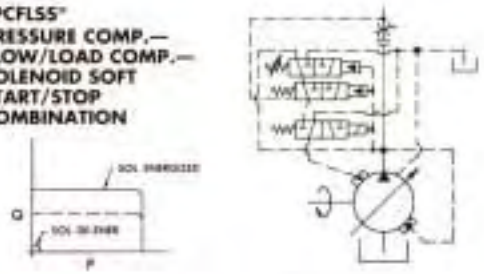
"TQFL"
TORQUE (HP) LIMITER— FLOW/LOAD COMPENSATOR COMBINATION



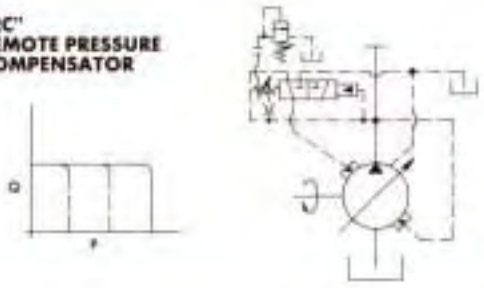
"TQSS"
TORQUE (HP) LIMITER— SOL. SOFT START/STOP COMBINATION



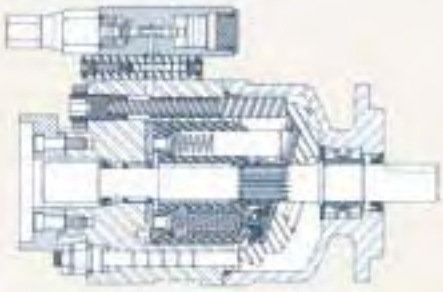
"PCFLSS"
PRESSURE COMP.— FLOW/LOAD COMP.— SOLENOID SOFT START/STOP COMBINATION

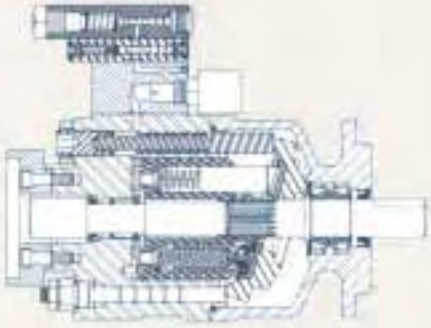


"RC"
REMOTE PRESSURE COMPENSATOR

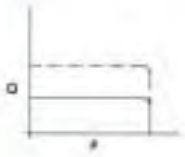


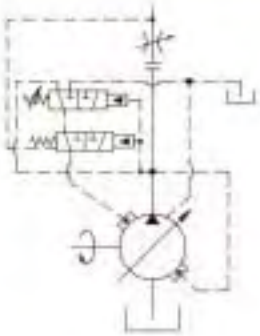
As can be seen on the drawings to the right, the controls are mounted with a simple manifold design with the connections to the two control pistons, H.P. port and tank accomplished through drillings in the casting. With this configuration and in conjunction with the inherent stability of the balanced two piston design allows great control flexibility by simply adding manifolded modules. Illustrations are presented below, but, many more combinations are possible.



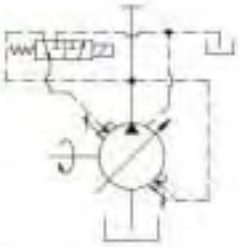


"PCFL"
PRESSURE COMPENSATOR—FLOW/LOAD COMPENSATOR COMBINATION

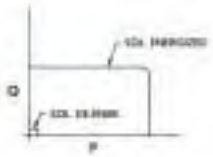


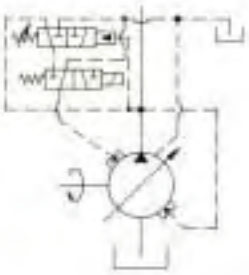


"SO"
SOLENOID ON/OFF CONTROL

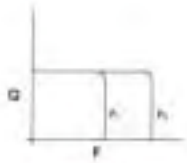


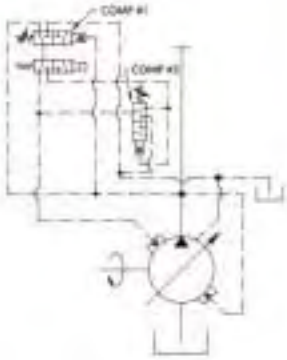
"PC5S"
PRESSURE COMPENSATOR—SOLENOID SOFT START/STOP COMBINATION



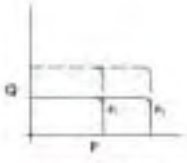


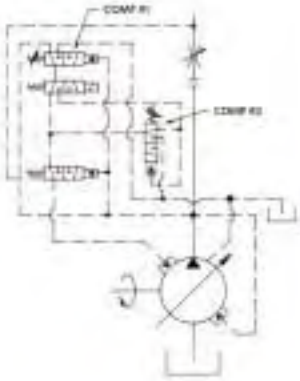
"PC2P"
SOLENOID SELECTED—TWO PRESSURE COMPENSATOR





"PC2PFL"
SOLENOID SELECTED—TWO PRESSURE COMPENSATOR—FLOW/LOAD COMPENSATOR COMBINATION





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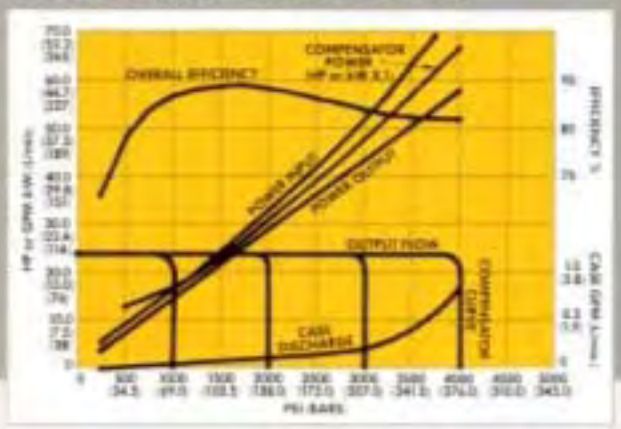
PVC

34

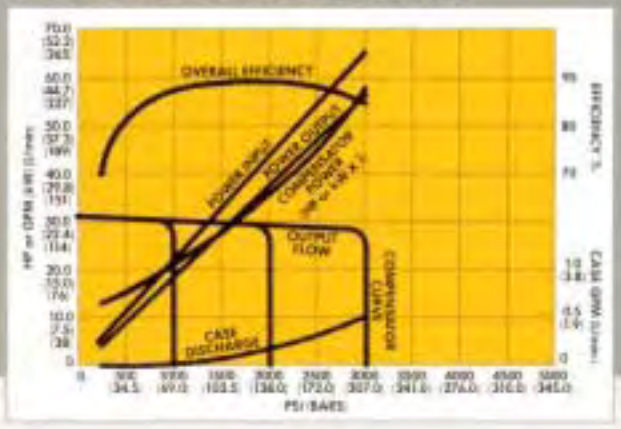
1800 RPM/120° MOBIL DTE 26



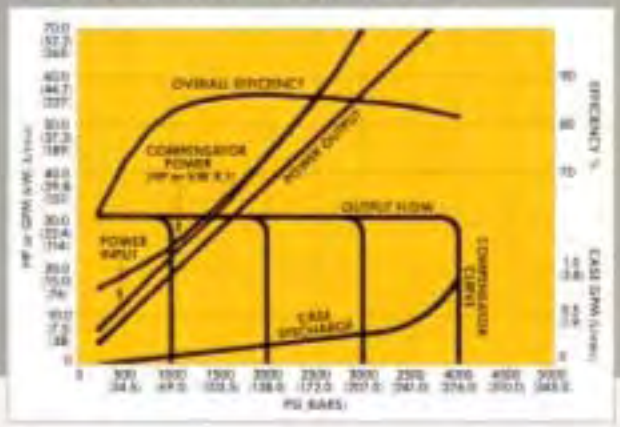
PVC

43

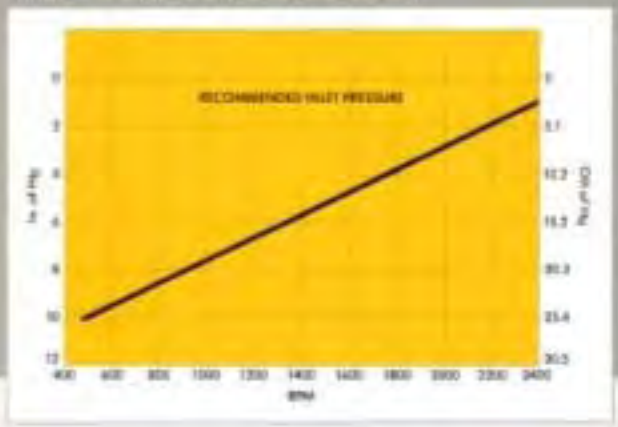
1800 RPM/120° MOBIL DTE 26



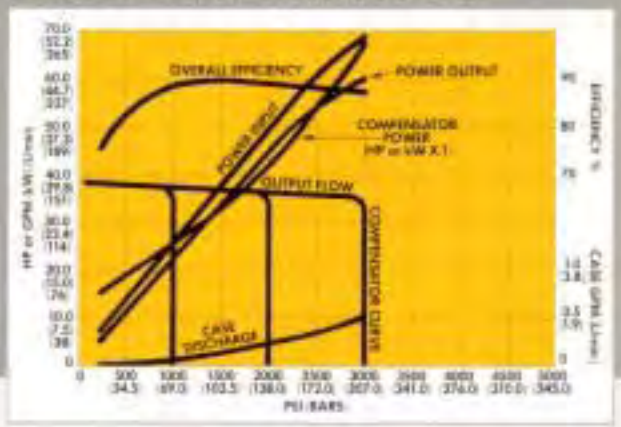
2400 RPM/120° MOBIL DTE 26



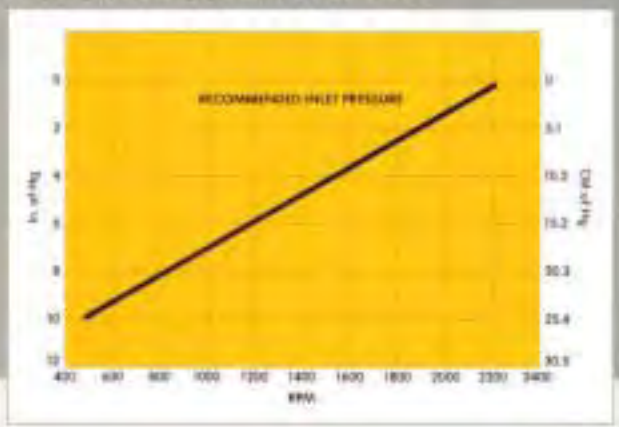
INLET PRESSURE VS. SPEED



2200 RPM/120° MOBIL DTE 26



INLET PRESSURE VS. SPEED



HARTMANN

DRIVESHAFT

SAE B
SPLINE
"**BS**"

SAE B
KEYED
"**BK**"

SAE B-B
SPLINE
"**BB**"

SAE B-B
KEYED
"**KB**"

SAE C
SPLINE
"**CS**"

SAE C
KEYED
"**CK**"

DRIVESHAFT END HOUSING

SAE C
2 BOLT/4 BOLT
"**C**"

SAE B
2 BOLT
"**B**"

PORT END HOUSING

REAR PORTS
CW & CCW
"**11**"

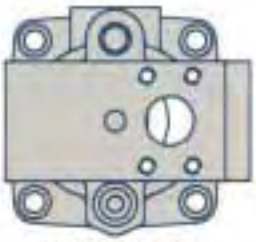
SIDE PORTS
STD OR HI SPEED
CW & CCW
"**21**"▲

REAR PORTS
HI SPEED OPTION
CW ROTATION
"**18**"

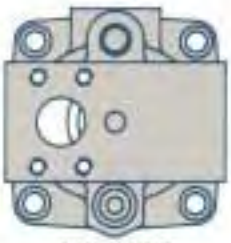
SIDE PORTS
REAR SHAFT
STD OR HI SPEED
CW & CCW
"**22**"▲

REAR PORTS
HI SPEED OPTION
CCW ROTATION
"**19**"

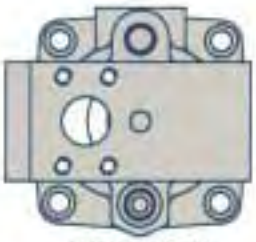
SIDE PORTS
W/REAR SUCTION
CW ROTATION
"**26**"



H.P. SIDE PORT
REAR SUCTION PORT
HI SPEED OPTION
CW ROTATION
"**28**"



SIDE PORTS
W/REAR SUCTION
CCW ROTATION
"**27**"



H.P. SIDE PORT
REAR SUCTION PORT
HI SPEED OPTION
CCW ROTATION
"**29**"

*ONLY VERSION AVAILABLE FOR THRU SHAFT APPLICATIONS
▲PVC21 AVAILABLE IN OPTIONS 21 AND 22 ONLY.

REAR SHAFT ADAPTER OR COVER

SEALED
COVER
"**C**"

SAE A
ADAPTER
"**A**"

SAE B
ADAPTER
"**B**"

USE "**X**" IF
NOT APPLICABLE

REAR SHAFT COUPLING

SAE A SPLINE
"AS"

SAE A KEYED
"AK"

SAE B SPLINE
"BS"

SAE B KEYED
"BK"

SAE B-B SPLINE
"BB"

SAE B-B KEYED
"KB"

USE **"XX"** IF NOT APPLICABLE

ROTATION & PORT PLATE

STANDARD 3.4, 4.3 CCW
"31"

STANDARD 3.4, 4.3 CW
"32"

HI SPEED 3.4, 4.3 CCW
"35"

HI SPEED 3.4, 4.3 CW
"36"

MOTOR 3.4, 4.3 BI-ROTATIONAL
"39"

PORT CONNECTIONS

"FL"—1½" SAE 4-BOLT FLANGE PATTERN 3000 P.S.I. RATING

ST—#24 (1⅜"—12) STRAIGHT THREAD USE FOR PIPING CONVENIENCE OR FOR HIGH PRESSURE APPLICATIONS

GT—#20 (1⅛"—12) STRAIGHT THREAD USE FOR PIPING CONVENIENCE OR FOR HIGH PRESSURE APPLICATIONS

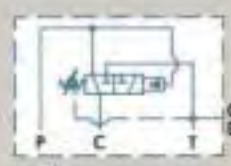
OPTIONAL CASE BLEED PORTS

"Z"—INCLUDES 2 #4 SAE STRAIGHT THREAD PORTS LOCATED ON THE DRIVE-SHAFT END HOUSING

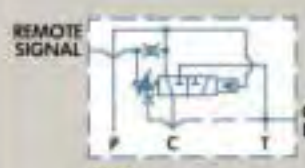
"X"—OMIT

TOP CONTROLS

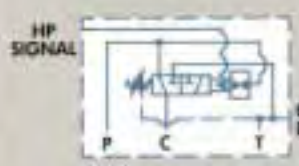
"BP"
BLANKING PLATE



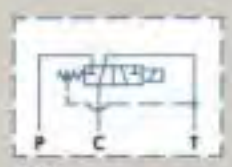
"PC"
PRESSURE COMPENSATOR



"RC"
REMOTE PRESSURE COMPENSATOR



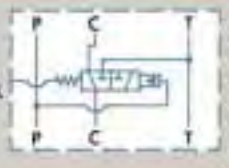
"TQ"
TORQUE (HP) COMPENSATOR



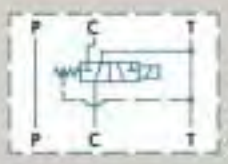
"SO"
SOLENOID ON/OFF STROKE CONTROL

UPPER LOWER

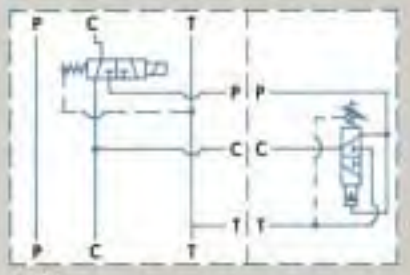
OPTIONAL INTERMEDIATE STACK CONTROLS



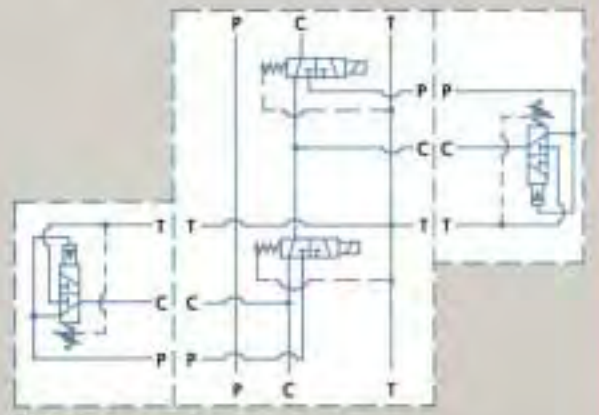
FLOW/LOAD COMPENSATOR
"FL"—100 PSI ΔP
"FH"—200 PSI ΔP
"AL"—ADJ. 100/200
"AH"—ADJ. 200/350
"FB"—100 W/BLEED
"HB"—200 W/BLEED
"AB"—ADJ. 1/200 BL.
"BH"—ADJ. 2/350 BL.



"SS"
SOLENOID OPERATED
SOFT START/STOP
CONTROL



"2P"
SOLENOID SELECTED
TWO PRESSURE COMPENSATOR



"3P"
SOLENOID SELECTED
THREE PRESSURE COMPENSATOR

"PP"
PRESSURE PROPORTIONAL
STROKE LIMIT CONTROL

"ES"
ELECTRONIC PROPORTIONAL
STROKE LIMIT CONTROL

"EP"
ELECTRONIC PROPORTIONAL
PRESSURE COMPENSATOR

NOTE: AS THE "PP," "ES," & "EP" ARE MORE COMPLICATED, PLEASE REFER TO SEPARATE APPLICATION SHEETS FOR A COMPLETE DESCRIPTION.

NOTE: TWO STACKABLE CONTROLS CAN SOMETIMES BE USED.

NOTE: USE **"XX"** WHERE STACKABLE CONTROLS ARE NOT TO BE INCLUDED.

MAXIMUM STROKE LIMIT

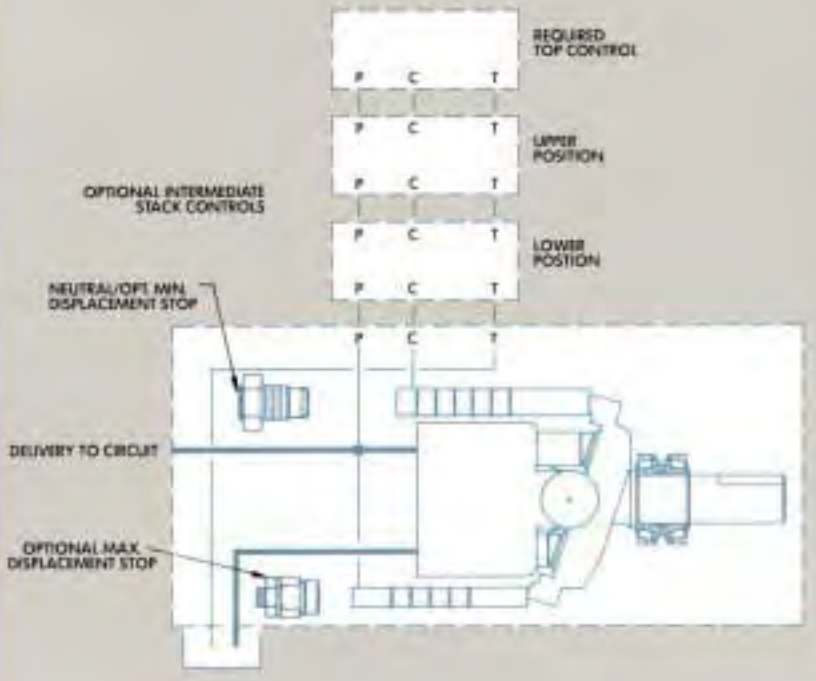
1—FIXED MAX. LIMIT—FULL STROKE (STD)
2—FIXED LIMIT—LESS THAN FULL FLOW
3—ADJUSTABLE MAX LIMIT
4—HANDWHEEL ADJUSTABLE
5—HI/LOW LIMIT—PILOTED

MINIMUM STROKED LIMIT

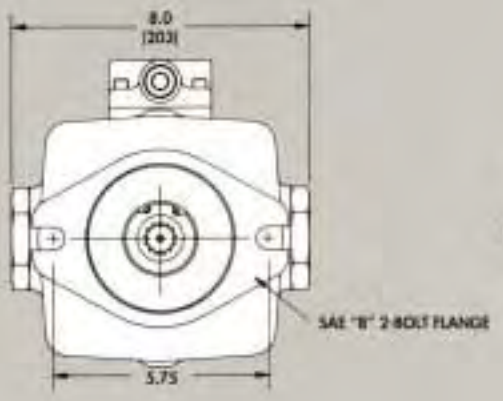
A—NEUTRAL STOP (STD)
B—FIXED MINIMUM LIMIT
C—ADJUSTABLE MINIMUM LIMIT
D—FIXED DISPLACEMENT

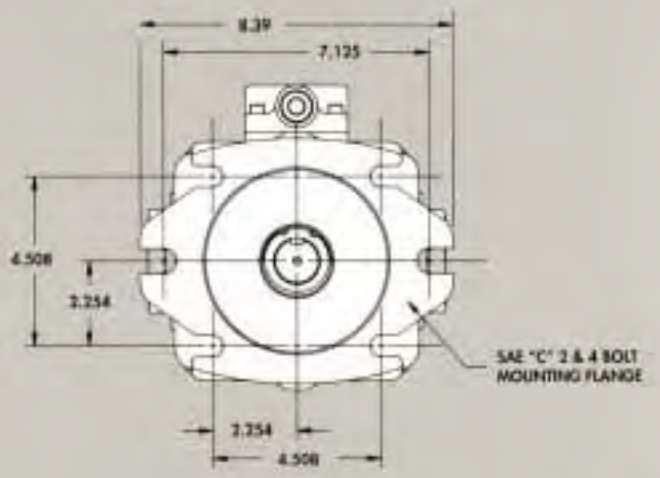
SPECIAL FEATURE SUFFIX

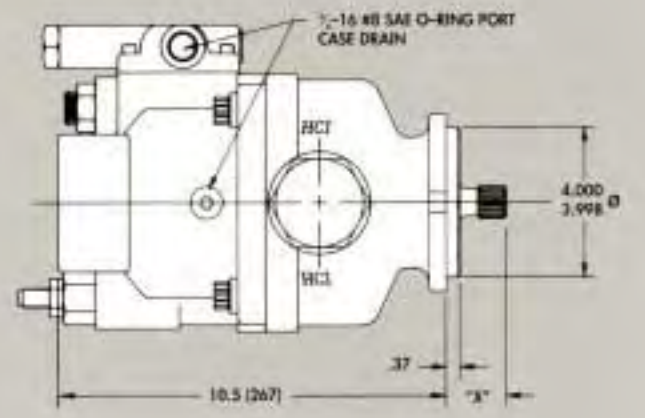
"E" EXTENDED TRUNNION
"R" EPR SEALS
"W" WATER BASE CONSTRUCTION
"V" SPECIAL—CONSULT FACTORY

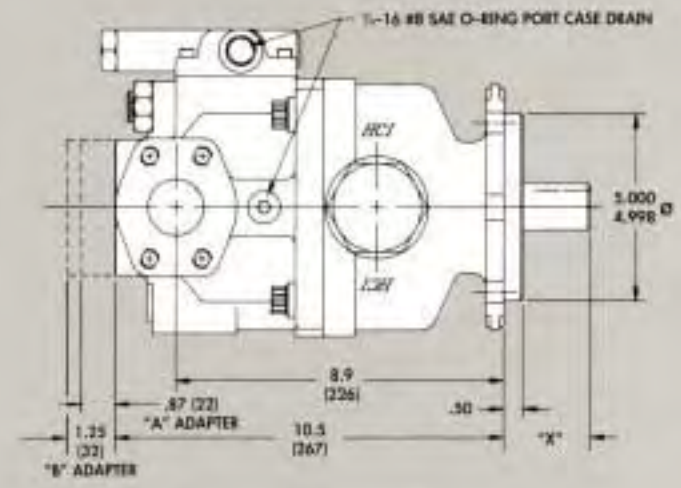


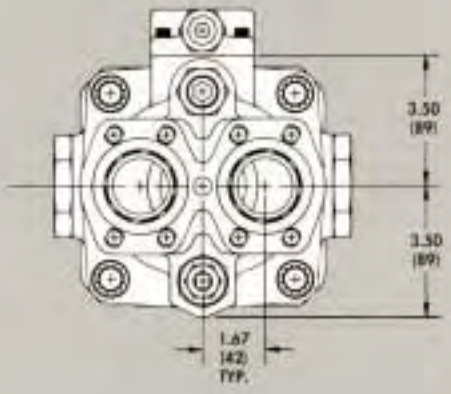
(METRIC DIMENSIONS)

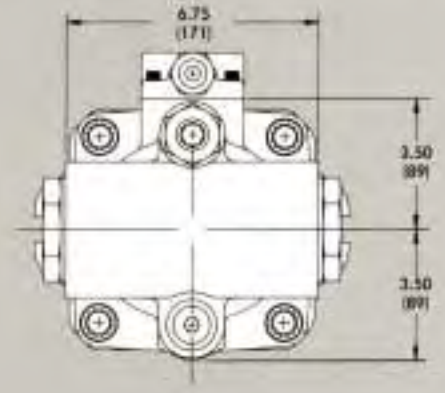












SAE SHAFT	DESCRIPTION	"X"
"B" SPLINE	13 T, ⅛ DP	1.62
"B" KEYED	.875Ø, ¼ SQ. KEY	1.62
"B-B" SPLINE	15 T, ⅛ DP	1.81
"B-B" KEYED	1.000Ø, ¼ SQ. KEY	1.81
"C" SPLINE	14 T, ¼ DP	2.19
"C" KEYED	1.250Ø, ⅜ SQ. KEY	2.19

PUMP SELECTION GUIDE

HARTMANN

PUMPS - MOTORS - CONTROLS

1. SELECT PUMP SIZE FROM SPECIFICATIONS.
2. SELECT DESIGN OPTIONS FROM "PVC SELECTOR SYSTEM CHART."
3. USE TABLE BELOW TO RECORD APPROPRIATE CODE FOR EACH OPTION.

REQUIRED FOR SPECIFIC OPTIONS

1. VOLUME LIMITS NORMALLY INSTALLED ARE MAXIMUM LIMIT "1" AND MINIMUM LIMIT "A".
2. MAXIMUM LIMIT OTHER THAN "1": SPECIFY DESIRED GPM AND DRIVER RPM.
3. MINIMUM LIMIT OTHER THAN "A": SPECIFY DESIRED GPM AND DRIVER RPM.
4. CONTROL OPTION "TQ": SPECIFY MAXIMUM HP AND MAXIMUM SYSTEM PRESSURE.
5. HYDRAULIC MOTOR: SPECIFY VALVE PLATE "39," TOP CONTROL "BP," MAX. FLOW LIMIT "3" AND MIN. FLOW LIMIT "C." ALSO SPECIFY DESIRED RPM AT GPM FLOW IF OTHER THAN FULL DISPLACEMENT. SEE SPECIFICATIONS FOR ALLOWABLE LIMITS.
6. INTERMEDIATE STACK CONTROL OPTIONS "2P" AND "3P": SPECIFY DESIRED PRESSURE SETTING FOR EACH COMPENSATOR.

SERIES		DISPLACEMENT		DRIVESHAFT	DRIVESHAFT HOUSING	PORT HOUSING		ADAPTER	SEAL CPLG.	PORT PLATE		PORT CONN.	NEED PORT	TOP CONTROL		STACK CONTROL	MAX. LIMIT	MIN. LIMIT	APPLICATION
PVC	34	-	CK	C	22	-	B	BB	32	-	FL	X	PC	-	FL/SS	1	A	EXAMPLE
PVC		-				-				-				-				
PVC		-				-				-				-				
PVC		-				-				-				-				
PVC		-				-				-				-				
PVC		-				-				-				-				

WARNING

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

This document and other information from Hartmann Controls, Inc., its subsidiaries and authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application and review the information concerning the product or system in the current product catalog. Due to the variety of operating conditions and applications for these products or systems, the user, through its own analysis and testing, is solely responsible for making the final selection of the products and systems and assuring that all performance, safety and warning requirements of the application are met.

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