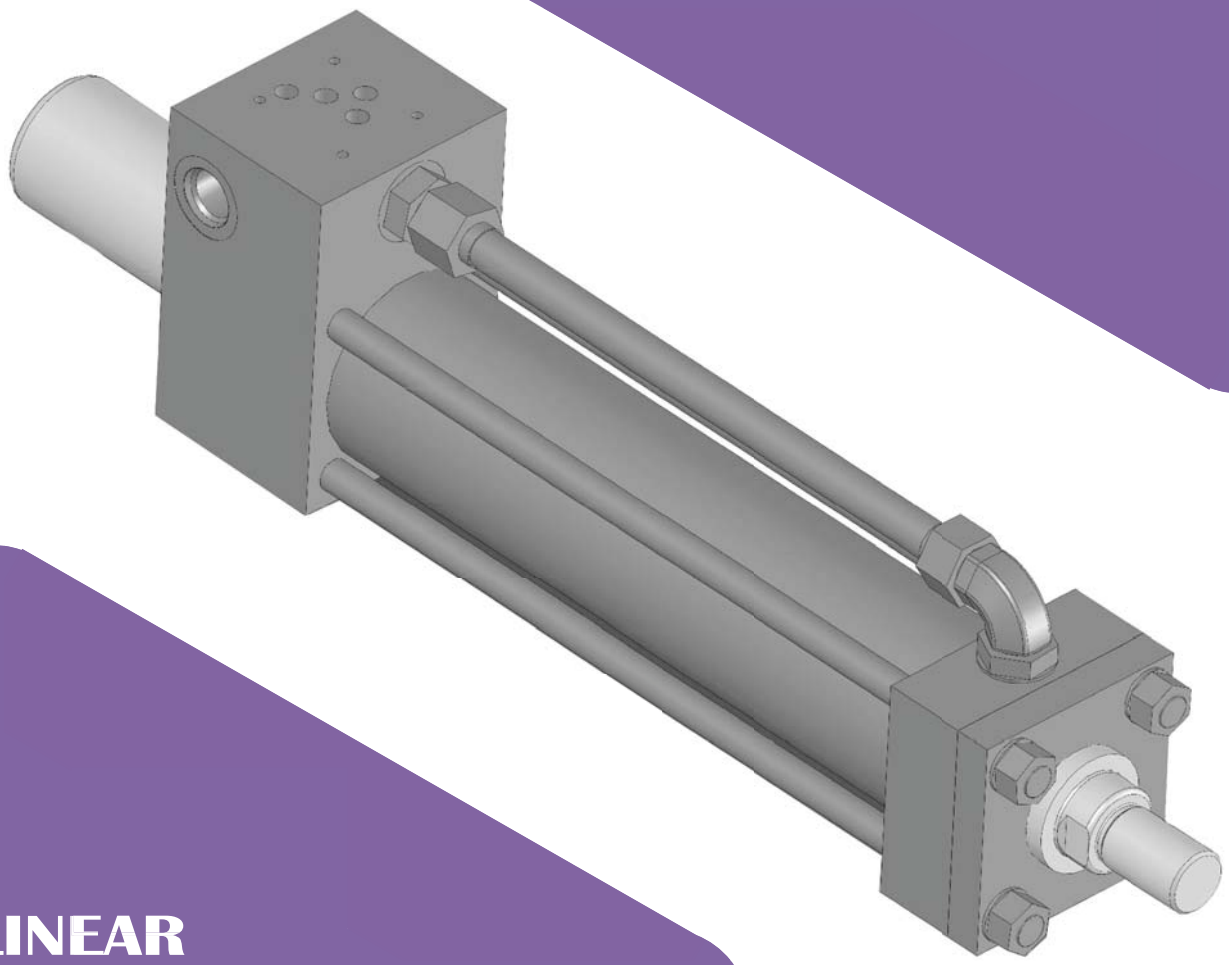
PURAKAL

CYLINDERS, INC

SERIES 3050

3000 PSI
5000 PSI NON SHOCK



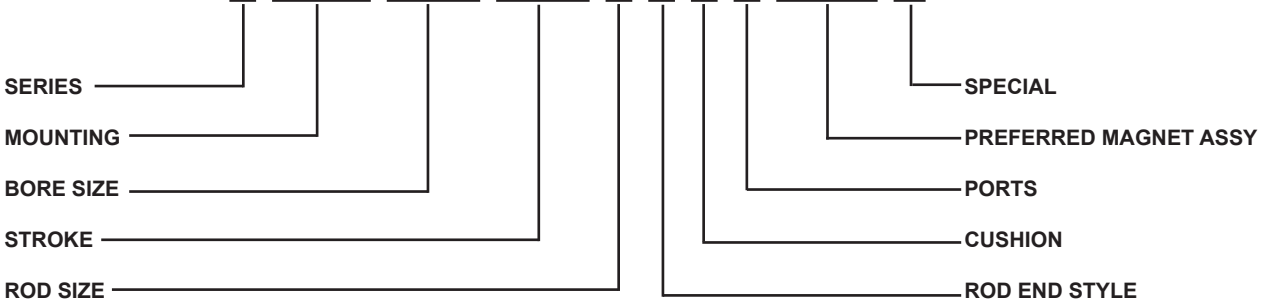
LINEAR POSITIONING CYLINDER

PURAKAL CYLINDERS, INC
P.O. Box 22038
1017 S. Danebo Ave.
Eugene, OR 97402-0414
Phone (541) 345-4199
FAX (541) 345-6522
www.purakal.com

ORDER INFORMATION

The example that follows illustrates the basic order code system. Use this code system for accurate and efficient processing of your cylinder order.

4-MP3-5.00-6.00-2-1-3-3-MTS-S



SERIES

1 = 100 (Air and low pressure hydraulic)
2 = 2500 (Welded hydraulic)
3 = 3000 (Hydraulic)
4 = 3050 (Sensor positioning)
5 = 3500 (Extra heavy duty hydraulic)

MOUNTING

MS2	MPU3
MS4	MT1
MX0	MT4
MX3	MF1
MP1	MF5
MP3	

BORE SIZE (INCHES)

2.00	4.00
2.50	5.00
3.25	

(Contact factory for other Bore Sizes)

STROKE (INCHES)

XXX.XX

ROD SIZE

1 = Standard #1 (smallest standard)
2 = Standard #2
3 = Oversized

ROD END STYLE

1 = Standard male thread (KK)
2 = Oversized male thread (CC)
3 = Female thread (KK)
4 = Special thread size
5 = Safety coupler

CUSHIONING

0 = Non cushioned
1 = Cushioned on rod end only
2 = Cushioned on blind end only
3 = Cushioned on both ends

PORTS

1 = NPT
2 = SAE
3 = Standard proportional valve
4 = Special

PREFERRED MAGNET ASSY

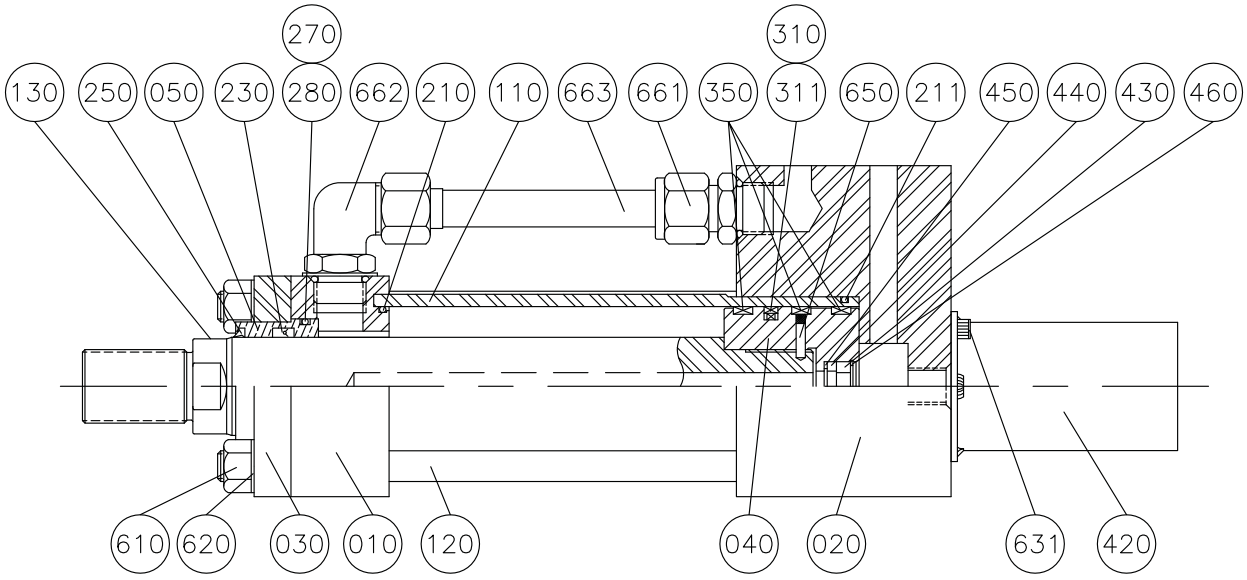
BALLUFF, GEMCO, MTS, Etc...

SPECIAL

Specify any special features. A sketch may be submitted to facilitate your order.

PURAKAL SERIES 3050
TABLE OF CONTENTS

PURAKAL SERIES 3050
PARTS LIST



REPAIR KIT CONTENTS:
ITEMS 050 210 211 230 250 270 280 310 311 350

SEAL KIT CONTENTS:
ITEMS 210 211 230 250 270 280 310 311 350

To insure the proper components and to speed your order please specify:

1. Serial number of cylinder.
2. Part number or drawing number of cylinder (if applicable).
3. Model (series and mounting style).
4. Bore of cylinder.
5. Stroke of cylinder.
6. Piston rod diameter.
7. Operating medium.

010 Rod Head
020 Servo Head
030 Retainer Plate
040 Piston
050 Rod Bearing
110 Barrel
120 Tie Rod
130 Piston Rod

210 Barrel Seal, Rod End ('O' Ring)
211 Barrel Seal, Blind End ('O' Ring)
230 Rod Seal (Deep Cup)
250 Rod Wiper
270 Bearing O.D. Seal ('O' Ring)
280 Bearing O.D. Seal (Backup)
310 Piston O.D. Seal
311 Piston Seal Expander
350 Piston Wear Ring

420 Transducer Cover
430 Magnet
440 Spacer
450 Wave Spring
460 Snap Ring
610 Tie Rod Nut
620 Hardened Washer
631 Cover Cap Screw
650 Piston Lock
661 Straight Fitting
662 Elbow Fitting
663 Port Tube

860 Seal Kit
870 Repair Kit
862 Rod Bearing With Seals
864 Rod Seal Kit
866 Piston Seal Kit

PURAKAL SERIES 3050
DESCRIPTION AND FEATURES

PURAKAL Series 3050 cylinders are used in conjunction with a magnetostrictive linear displacement transducer and a servo-solenoid valve to form a closed loop positioning system. Cylinders may be purchased as complete units including valve and transducer - assembled, flushed, and tested.

ADJUSTABLE CUSHION VALVE: This infinite adjustment feature can be obtained at an additional cost for all bores and rod sizes that are not fixed cushions. Standard position is #2

BALL CHECK ASSEMBLY: Ball check assemblies are supplied as standard for most cushioned cylinders. Standard position is #4

BARREL: Standard material is cold drawn seamless honed steel tubing.

CUSHIONS: All cylinders are supplied as non-cushioned unless otherwise requested. Certain 2", and 2.5" bore cylinders are limited to fixed, non adjustable cushions. For longer cushions, check with the factory.

FLUID: Series 3050 cylinders are designed for operation with mineral based hydraulic fluid. Specify any special fluids or lubricant if required.

MOUNTINGS: Most popular NFPA mounts are available.

PISTON: The piston is extra long to accommodate multiple low friction wear rings. It is threaded and positively locked to the piston rod. A single bi-directional teflon ring seal assures smooth low friction operation and long life.

PISTON ROD: Piston rods are hard chrome plated with a 90,000 psi or better tensile strength. Rods are precision gun drilled for a displacement transducer. All commonly used rod end styles are available.

PORTING: SAE 'O' ring ports connect to the servo valve "P" and "T" ports. The valve's "B" port is plumbed to the retract side of the cylinder with high pressure hydraulic tubing and forged steel fittings. The "A" port is connected directly to the cylinder extend side. The valve can be plumbed in the conventional manner or can be configured as a regenerative circuit. Contact factory for dimensional information when mounting the valve remotely.

PRESSURE: Series 3050 cylinders are rated for 3,000 PSI and 5,000 PSI non-shock service.

ROD BEARINGS: The 3050 cylinder uses the SAE 660 rod bearing from our Heavy Duty Series 3000 series cylinder, with the same urethane rod wiper and "Deep" style cup seal.

COVER: The transducer body is protected with a rugged steel cover.

TEMPERATURES: Series 3050 cylinders operate continuously at -10 degrees F to 165 degrees F. For special temperature or medium, contact our engineering department.

SIZES: NFPA standard bore sizes 2 inch through 5 inch with a choice of standard or oversize rods.

TOLERANCES: All dimensions are in inches with tolerances of ± 1/32". There will be an additional cost for closer tolerances

PURAKAL SERIES 3050
CYLINDER SELECTION

SELECT THE BORE SIZE

Use the table below to select the cylinder bore size that provides the required force at the desired working pressure. As a general guideline, select a cylinder that provides about 10% more force than the minimum requirement.

After selecting the proper size cylinder for the job use the envelope and mounting dimension charts to determine cylinder dimensions.

CYL BORE DIA	PISTON ROD DIA	PRESSURE RATING HEAVY DUTY SERVICE	PRESSURE RATING 4:1 SAFETY FACTOR	CYL WORK ACTION	WORK AREA SQ IN	WORKING PRESSURE PSI 250	500	750	1000	1250	1500	1750	2000	2500	3000	FLUID REQUIRED PER INCH OF STROKE GAL	CU FT
1 1/2	5/8	3000	1800	PUSH	1.767	442	884	1325	1767	2209	2651	3093	3534	4418	5301	.0077	.00102
	1			PULL	1.460	365	730	1095	1460	1825	2191	2556	2921	3651	4381	.0063	.00084
				PULL	0.982	245	491	736	982	1227	1473	1718	1963	2454	2945	.0043	.00057
2	1	3000	3400	PUSH	3.141	785	1571	2356	3142	3927	4712	5498	6283	7854	9425	.0136	.00182
	1 3/8			PULL	2.356	589	1178	1767	2356	2945	3534	4123	4712	5890	7069	.0102	.00136
				PULL	1.656	414	828	1243	1657	2071	2485	2899	3313	4142	4970	.0072	.00096
2 1/2	1	3000	2000	PUSH	4.909	1227	2454	3682	4909	6136	7363	8590	9817	12272	14726	.0213	.00284
	1 3/8			PULL	4.124	1031	2062	3093	4123	5154	6185	7216	8247	10308	12370	.0179	.00239
	1 3/4			PULL	3.424	856	1712	2568	3424	4280	5136	5992	6848	8560	10272	.0148	.00198
				PULL	2.504	626	1252	1878	2503	3129	3755	4381	5007	6259	7510	.0108	.00145
3 1/4	1 3/8	3000	2200	PUSH	8.296	2074	4148	6222	8296	10370	12444	14518	16592	20739	24887	.0359	.00480
	1 3/4			PULL	6.811	1703	3405	5108	6811	8514	10216	11919	13622	17027	20433	.0295	.00394
	2			PULL	5.891	1473	2945	4418	5890	7363	8836	10308	11781	14726	17671	.0255	.00341
				PULL	5.154	1289	2577	3866	5154	6443	7731	9020	10308	12885	15463	.0223	.00298
4	1 3/4	3000	2300	PUSH	12.566	3142	6283	9425	12566	15708	18850	21991	25133	31416	37699	.0544	.00727
	2			PULL	10.161	2540	5081	7621	10161	12701	15242	17782	20322	25403	30483	.0440	.00588
	2 1/2			PULL	9.424	2356	4712	7069	9425	11781	14137	16493	18850	23562	28274	.0408	.00545
				PULL	7.657	1914	3829	5743	7658	9572	11486	13401	15315	19144	22973	.0331	.00443
5	2	3000	2500	PUSH	19.635	4909	9817	14726	19635	24544	29452	34361	39270	49087	58905	.0850	.01136
	2 1/2			PULL	16.492	4123	8247	12370	16493	20617	24740	28863	32987	41233	49480	.0714	.00954
	3 1/2			PULL	14.726	3682	7363	11045	14726	18408	22089	25771	29452	36816	44179	.0637	.00852
				PULL	10.014	2503	5007	7510	10014	12517	15021	17524	20028	25035	30041	.0433	.00580
6	2 1/2	3000	2300	PUSH	28.274	7069	14137	21206	28274	35343	42411	49480	56549	70686	84823	.1224	.01636
	3			PULL	23.365	5841	11683	17524	23366	29207	35048	40890	46731	58414	70097	.1011	.01352
	4			PULL	21.205	5301	10603	15904	21206	26507	31809	37110	42411	53014	63617	.0918	.01227
				PULL	15.708	3927	7854	11781	15708	19635	23562	27489	31416	39270	47124	.0680	.00909
8	3 1/2	3000	2300	PUSH	50.265	12566	25133	37699	50265	62832	75398	87965	100531	125664	150796	.2176	.02909
	4			PULL	40.644	10161	20322	30483	40644	50805	60966	71128	81289	101611	121933	.1759	.02352
	5 1/2			PULL	37.699	9425	18850	28274	37699	47124	56549	65973	75398	94248	113097	.1632	.02182
				PULL	26.507	6627	13254	19880	26507	33134	39761	46388	53014	66268	79521	.1147	.01534
10	4 1/2	3000	2700	PUSH	78.540	19635	39270	58905	78540	98175	117810	137445	157080	196349	235619	.3400	.04545
	5 1/2			PULL	62.636	15659	31318	46977	62635	78294	93953	109612	125271	156589	187906	.2717	.03625
	7			PULL	54.782	13695	27391	41086	54781	68477	82172	95868	109563	136954	164344	.2372	.03170
				PULL	40.055	10014	20028	30041	40055	50069	60083	70097	80111	100138	120166	.1740	.02319
12	5 1/2	3000	3300	PUSH	113.100	28274	56549	84823	113097	141372	169646	197920	226194	282743	339292	.4896	.06545
	7			PULL	89.339	22335	44669	67004	89339	111674	134008	156343	178678	223347	268017	.3868	.05170
	8			PULL	74.613	18653	37306	55960	74613	93266	111919	130572	149226	186532	223838	.3230	.04333
				PULL	62.830	15708	31416	47124	62832	78540	94248	109956	125664	157080	188495	.2719	.03636

SELECT THE PISTON ROD SIZE

For most tension applications, the smallest standard rod diameter is adequate. For a push application, determine the proper rod size using the following procedure.

Determine the maximum load that will be imposed on the rod.

Identify the mounting style and the corresponding "L" dimension from the Mounting Style illustration on the following page.

Determine the stop tube length, if required, from the discussion at right. For mounting styles B, C, D, and J, add the stop tube length to the "L" dimension to obtain the basic column length.

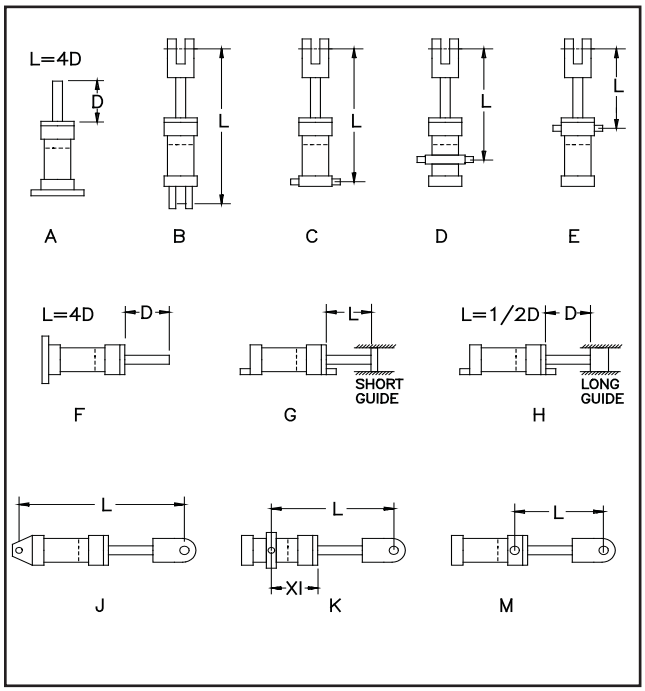
Refer to the Allowable Column Load table on page 5 and select the line with a thrust load greater than or equal to your requirement.

Scan to the right until a length greater than or equal to your basic column length is encountered.

Read the required piston rod diameter at the top of the column.

PURAKAL SERIES 3050
PISTON ROD SIZES

MOUNTING STYLES



STOP TUBE LENGTH

Stop tubes are spacers which increase the distance between the piston and rod head, maintaining alignment of the piston rod and cylinder bore. This reduces the eccentricity in the column, resulting in lower bending stress in the rod. The increased span also reduces the bearing stress on the piston and rod bearings.

Stop tubes are advisable for long stroke push cylinders mounted as styes A, B, C, D, J, and K. When the value of "L" exceeds 50 inches, use one whole inch of stop tube for each 10 inches of length in excess of 50 inches.

For a horizontally mounted cylinder with piston rod unsupported and no weight added to the rod (style F), use one whole inch of stop tube for every 10 inches of length in excess of 50 inches.

For horizontally mounted styles J, K, and M, it is advisable to calculate the bearing loads with the rod fully extended. The bearing loads should be limited to 200 psi for smooth operation and long life and not more than 350 psi under any condition.

For style K (center trunnion cylinder), the most favorable rod bearing load is obtained with the XI dimension equal to about 1/3 the total collapsed cylinder length.

ALLOWABLE COLUMN LOAD

THRUST	PISTON ROD DIAMETER												
(LBS)	5/8	1	1 3/8	1 3/4	2	2 1/2	3	3 1/2	4	4 1/2	5 1/2	7	8
50	62												
100	55	112											
200	47	99											
300	44	88	142										
500	38	75	130	180									
750	28	70	122	170	198	272							
1,000	25	60	103	156	191	258	332						
1,250	21	52	94	140	183	251	316	400					
1,500	19	50	92	136	168	240	300	390					
2,000	15	43	81	113	150	229	291	360	430	500			
4,000	12	31	62	96	120	170	252	309	380	445			
6,000		25	52	80	100	160	197	262	346	407			
8,000		22	45	75	99	134	189	230	310	372			
10,000		21	40	67	89	121	173	210	268	334	480		
20,000			27	48	63	104	142	171	216	275	375		
30,000				40	51	81	115	155	204	233	320		
40,000				30	45	70	99	135	176	225	292	420	
50,000					35	62	90	121	162	198	260	407	
60,000						56	82	110	144	181	254	382	
70,000						48	74	103	133	168	246	366	
80,000						43	70	96	125	157	234	352	400
90,000						37	66	90	119	149	225	340	387
100,000							60	84	112	141	212	330	373
125,000							48	76	100	125	190	308	344
150,000								64	91	115	174	288	320
200,000								55	69	100	150	259	281
250,000										80	134	233	254
300,000											121	212	232
350,000											105	196	217
400,000											85	180	200
450,000												163	187
500,000													172

PURAKAL SERIES 3050
CYLINDER INSTALLATION

WARNING: Hydraulic systems may contain large levels of stored energy. Do not attempt to connect, disconnect, test, or repair a hydraulic device unless properly trained. Always exhaust the pressure from a system before performing any service work. Make certain all ports are properly connected or vented before pressurizing a cylinder. Disregarding this warning could result in serious, possibly fatal, injury.

General Recommendations

Before plumbing the cylinder, all lines in the system should be flushed to remove any contamination. The shipping plugs on the cylinder should not be removed until immediately before the lines are connected. Clean fluid is essential for long life and satisfactory operation of not only cylinders but pumps and valves as well. Keep oil tanks covered and provide proper filtration.

The most important consideration in mounting your cylinder is proper alignment that does not induce excessive side loads. Side loads or off-center thrust will result in accelerated wear of the rod bearing and seals and can cause chatter and binding. Forcing the mounting bolts or clevis pins into position indicates improper alignment.

The piston should not be allowed to bottom out against the cylinder head at the end of stroke. Either provide external stops or use a cushioned cylinder which will stop the piston just before it reaches the end of its stroke. (Cushions are not a substitute for speed controls or deceleration valves. Standard cushions will not handle large inertial loads.)

Flush Mounts (MS-2, MS-4)

These cylinders should be pinned or keyed to prevent shifting from load application. Keys should be bolted or welded against the cylinder heads in maximum pressure or shock applications. Pins or keys must be large enough to withstand the full force developed by the cylinder. Always use top quality, high strength bolts to fasten the cylinder.

Flange Mounts (MF-1, MF-2, MF-5, MF-6, ME-5, ME-6)

The rod bearing can be used for precise alignment of the cylinder. After centering, the flange should be pinned to the mounting surface to prevent shifting under load.

Trunnion Mounts (MT-1, MT-2, MT-4)

Trunnion mounted cylinders swivel in one direction only with trunnion pins designed to carry shear loads only. The pins must fit the pillow block bearings closely and pillow blocks must be rigid and accurately aligned.

Clevis/Pivot Mounts (MP-1, MP-3, MPU-3)

The pin and/or clevis centerlines of the cylinder and the attached linkage must all be held parallel to each other. Use an MPU-3 universal clevis mount if this alignment cannot be guaranteed. An MPU-3 automatically compensates for 5 to 10 degrees of misalignment in any direction.

Cushion Adjustment

A noncushioned cylinder requires no further adjustment after it has been installed and properly aligned. A cushioned cylinder, after installation and alignment, must be adjusted to obtain the degree of cushioning required. An adjustment is provided by a screw-type needle valve in either or both ends of the cylinder. This valve controls the rate at which trapped fluid is allowed to meter from the end of the cylinder when the piston is near the end of its stroke. Turn the needle valve clockwise to increase the amount of cushioning and counter-clockwise to decrease cushioning. The recommended starting point is with the adjuster backed off 1/4 turn from the fully closed position. The normal operating range is from zero to 1/2 turn. Under no circumstances should the valve be adjusted more than 1 1/2 turns from the fully closed position. To obtain the most effective cushioning, final adjustments must be made while the cylinder is operating under normal condititions at normal operating pressure.

PURAKAL SERIES 3050
CYLINDER MAINTENANCE

General Recommendations

Cylinders should be visually inspected at frequent intervals for damage, wear and leakage, and if problems are observed the cylinder must be removed for repair. Fluid leakage due to seal wear is the most common problem, however seal life depends on many factors and is difficult to predict. As a guideline, two years or one million cycles of operation should be considered the maximum interval between overhauls.

Disassembly and Repair

Obtain the appropriate Purakal seal kit before beginning the job. Refer to page 2 for ordering information.

Always exhaust the pressure from a system before performing any service work. Disconnect the lines from both ports of the cylinder. Disassemble the cylinder using the assembly view on page 2 as a guide. The rod assembly normally does not require disassembly. No special tools are required.

Clean the metal parts with an appropriate solvent and blow dry with low pressure air. Examine each part carefully for signs of wear or damage. Look for score marks on the rod, piston, rod bearing, and barrel and replace any component with a sharp edge that would damage seals. Minor scratches or superficial roughness may be smoothed with 400 grit emory cloth and/or "ScotchBright" pads. Take care not to rub through the chrome plating on the piston rod. Particular attention should be given to the rod bearing since cylinder leakage can result from a worn bearing. A scored or rough rod bearing must be replaced before it damages the piston rod and, subsequently, the rod seal.

Reassembly

1. Use new seals, freely lubricated with system hydraulic fluid. Install in the grooves, using extreme caution to avoid damaging a seal. Even a tiny nick can cause leakage.

2. Install the barrel on the base end head, taking care not to damage the barrel seal.

3. Lubricate the piston and cylinder bore with system hydraulic fluid. Carefully insert the piston in the cylinder barrel, then install the rod end head.

4. For bore size 5" and smaller, install the rod bearing and retainer plate. (Larger sizes use a retainer cap; bearing and cap are installed later.) Use caution not to nick the rod seal as you slide the bearing over the rod end thread.

5. Install the tie rods and torque to the appropriate value in the table on the inside back cover page. Tie rod nuts should be lubricated in order to produce the expected preload at the specified torque. Tighten the nuts in a crossing pattern, using locking pliers to prevent the tie rods from twisting.

7. For bore sizes 6 inch and larger, the final step is installation of the rod bearing, retained with a cap secured with socket head cap screws. The screws should be installed using LocTite 242 or a comparable thread locking compound (no lubricant). The torque for these cap screws is found on the inside back cover page.

Test Procedure

The refurbished cylinder should be tested for leakage and cycled to check for smooth operation and to assure proper operation of cushions, if applicable.

1. For cushioned cylinders, turn the adjusting screw(s) clockwise until seated, then back off 1/4 turn.

2. Remove the line from the rod end port and cap the open line from the valve. Apply supply pressure to the blind head port. The rod should extend smoothly without chatter or binding. For cushioned cylinders, there should be a noticable deceleration at the end of stroke. To obtain the most effective cushioning, final adjustments must be made while the cylinder is operating under normal condititions at normal operating pressure.

3. Leave the rod stalled in the extended position while maintaining pressure on the base end. Make certain no fluid is leaking by the piston (as evidenced by fluid escaping the open rod port).

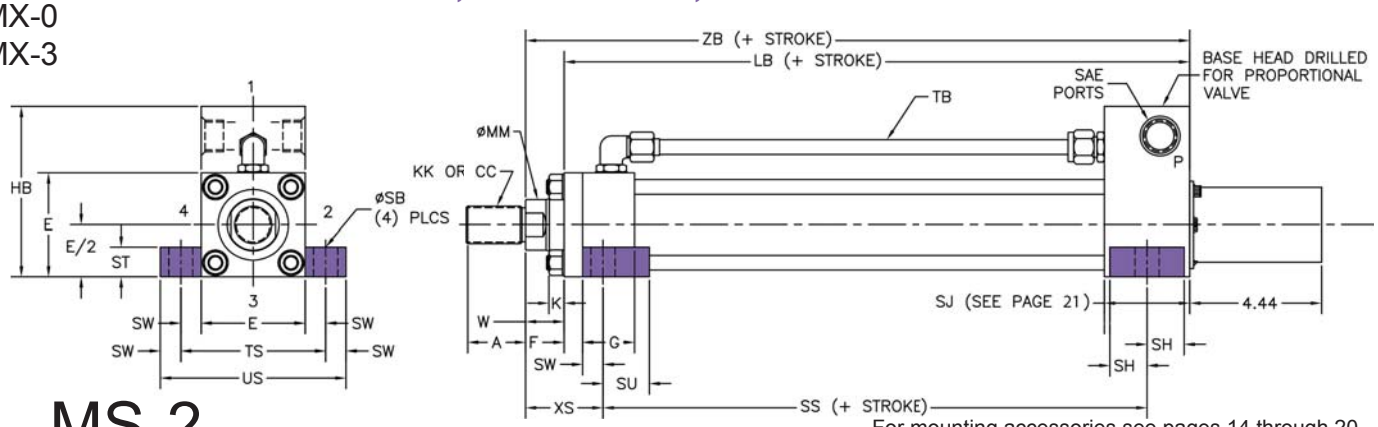
4. Measure the extended length to verify that the cylinder has reached full stroke + .03".

5. Reconnect the supply line to the rod end port and connect the base end port to the tank. Apply supply pressure to the rod end port. The rod should retract smoothly, and for cushioned cylinders there should be noticable deceleration near the end of stroke.

6. Maintain pressure long enough to verify no leakage at the rod seal or piston seal.

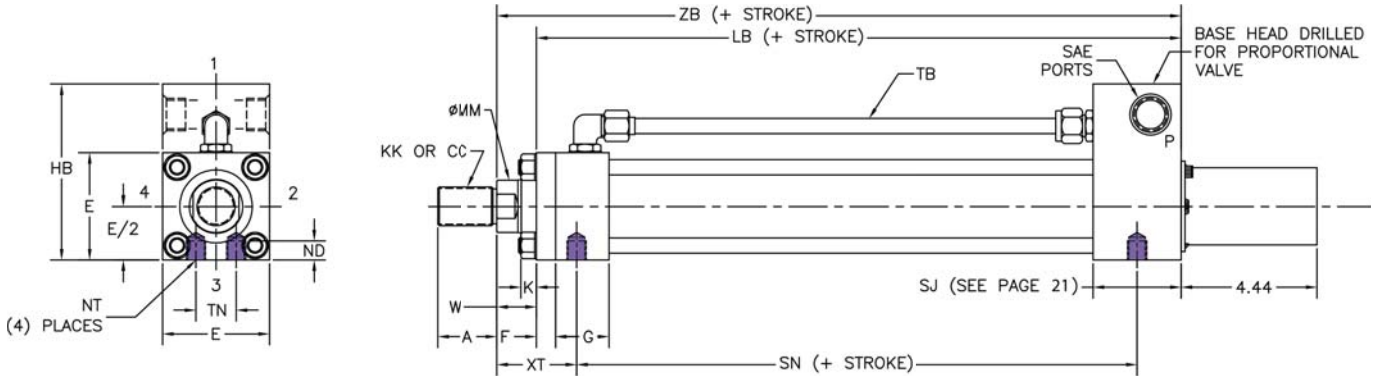
MS-2
MS-4
MX-0
MX-3

PURAKAL SERIES 3050
SIDE LUG, SIDE TAPPED, TIE ROD MOUNTINGS



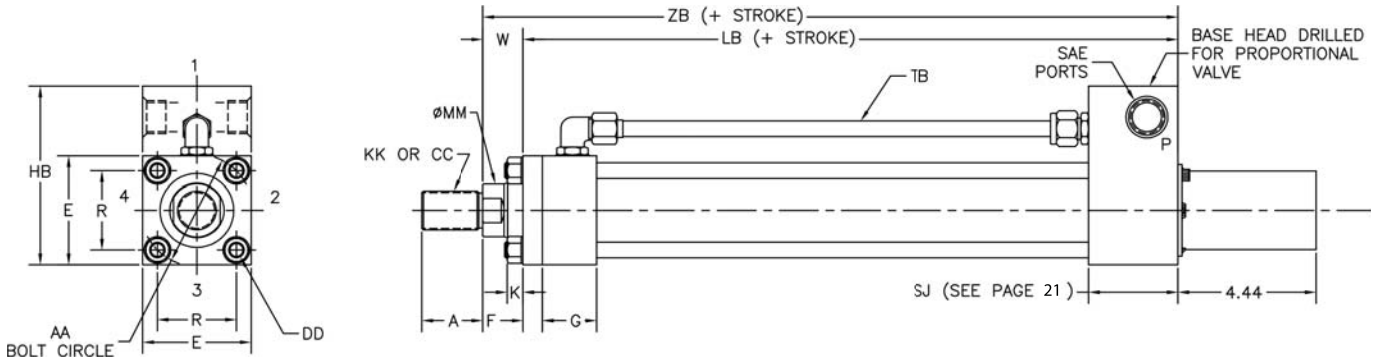
MS-2

For mounting accessories see pages 14 through 20.



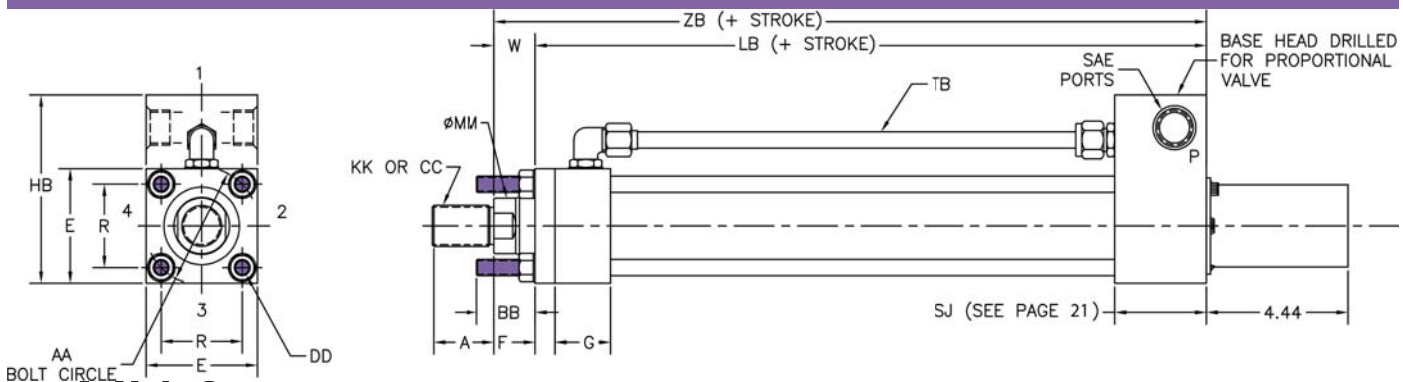
MS-4

For mounting accessories see pages 14 through 20.



MX-0

For mounting accessories see pages 14 through 20.



MX-3

For mounting accessories see pages 14 through 20.

PURAKAL SERIES 3050
SIDE LUG, SIDE TAPPED, TIE ROD MOUNTINGS

MS-2
MS-4
MX-0
MX-3

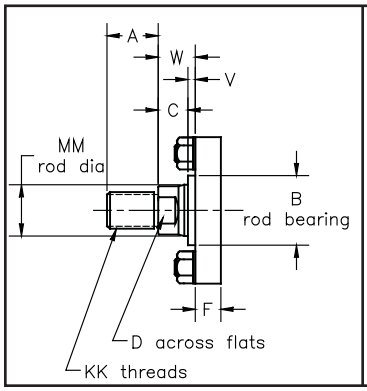
ENVELOPE AND MOUNTING DIMENSIONS AFFECTED BY ROD SIZE

CYL BORE	ROD DIA												ADD STROKE
	MM	A	B	C	CC	D	K	KK	V	W	WA	XS	XT	ZB
2	1	1 1/8	1 1/2	1/2	7/8-14	7/8	1/2	3/4-16	1/4	3/4	7/8	1 7/8	2 3/8	7 3/8
	1 3/8	1 5/8	2	5/8	1 1/4-12	1 1/8	3/4	1-14	3/8	1	1 1/2	2 1/8	2 5/8	7 5/8
2 1/2	1	1 1/8	1 1/2	1/2	7/8-14	7/8	1/2	3/4-16	1/4	3/4	7/8	2 1/16	2 3/8	7 1/2
	1 3/8	1 5/8	2	5/8	1 1/4-12	1 1/8	1/2	1-14	3/8	1	1 1/2	2 5/16	2 5/8	7 3/4
	1 3/4	2	2 3/8	3/4	1 1/2-12	1 1/2	1/2	1 1/4-12	1/2	1 1/4	1 3/4	2 9/16	2 7/8	8
3 1/4	1 3/8	1 5/8	2	5/8	1 1/4-12	1 1/8	5/8	1-14	1/4	7/8	7/8	2 5/16	2 3/4	8 1/4
	1 3/4	2	2 3/8	3/4	1 1/2-12	1 1/2	5/8	1 1/4-12	3/8	1 1/8	1 1/8	2 9/16	3	8 1/2
	2	2 1/4	2 5/8	7/8	1 3/4-12	1 11/16	5/8	1 1/2-12	3/8	1 1/4	1 1/2	2 11/16	3 1/8	8 5/8
4	1 3/4	2	2 3/8	3/4	1 1/2-12	1 1/2	5/8	1 1/4-12	1/4	1	1	2 3/4	3	8 5/8
	2	2 1/4	2 5/8	7/8	1 3/4-12	1 11/16	5/8	1 1/2-12	1/4	1 1/8	1 1/4	2 7/8	3 1/8	8 3/4
	2 1/2	3	3 1/8	1	2 1/4-12	2 1/16	5/8	1 7/8-12	3/8	1 3/8	2 1/8	3 1/8	3 3/8	9
5	2	2 1/4	2 5/8	7/8	1 3/4-12	1 11/16	13/16	1 1/2-12	1/4	1 1/8	1 3/8	2 7/8	3 1/8	8 5/8
	2 1/2	3	3 1/8	1	2 1/4-12	2 1/16	13/16	1 7/8-12	3/8	1 3/8	2 1/4	3 1/8	3 3/8	8 7/8
	3 1/2	3 1/2	4 1/4	1	3 1/4-12	3	13/16	2 1/2-12	3/8	1 3/8	2 7/8	3 1/8	3 3/8	8 7/8

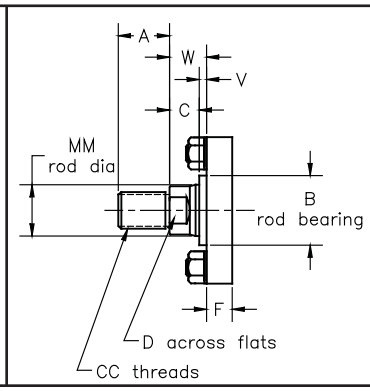
ENVELOPE AND MOUNTING DIMENSIONS

CYL BORE					With Valve Pattern	Without Valve Pattern				ADD STROKE						ADD STROKE	ADD STROKE							
	AA	BB	DD	E	SAE	SAE	F	G	HB	LB	ND	NT	R	SB	SH	SN	SS	ST	SU	SW	TB	TN	TS	US
2	2.9	1 13/16	1/2-20	3	#8	#8	5/8	1 3/4	4 7/8	5 5/8	7/16	1/2-13	2.05	9/16	7/8	3 7/16	3 5/8	3/4	1 1/4	1/2	1/2	15/16	4	5
2 1/2	3.6	1 13/16	1/2-20	3 1/2	#12	#8	5/8	1 3/4	5 3/8	6 3/4	5/8	5/8-11	2.55	13/16	1 1/8	3 11/16	3 3/8	1	1 9/16	11/16	11/16	1 5/16	4 7/8	6 1/4
3 1/4	4.6	2 5/16	5/8-18	4 1/2	#12	#12	3/4	2	6 3/4	7 3/8	3/4	3/4-10	3.25	13/16	1 1/8	4 1/8	4 1/8	1	1 9/16	11/16	11/16	1 1/2	5 7/8	7 1/4
4	5.4	2 5/16	5/8-18	5	#12	#12	7/8	2	7 1/4	7 5/8	1	1-8	3.82	1 1/16	1 7/16	4 3/8	4	1 1/4	2	7/8	7/8	2 1/16	6 3/4	8 1/2
5	7	3 3/16	7/8-14	6 1/2	#16	#12	7/8	2 1/8	8 3/4	7 1/2	1	1-8	4.95	1 1/16	1 7/16	3 7/8	4 1/2	1 1/4	2	7/8	7/8	2 15/16	8 1/4	10

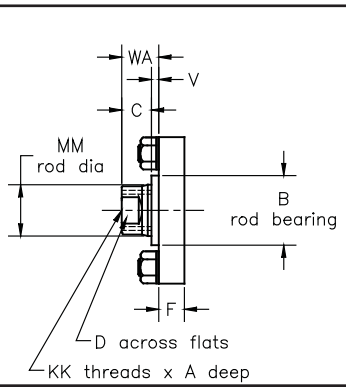
STYLE 1 ROD END



STYLE 2 ROD END



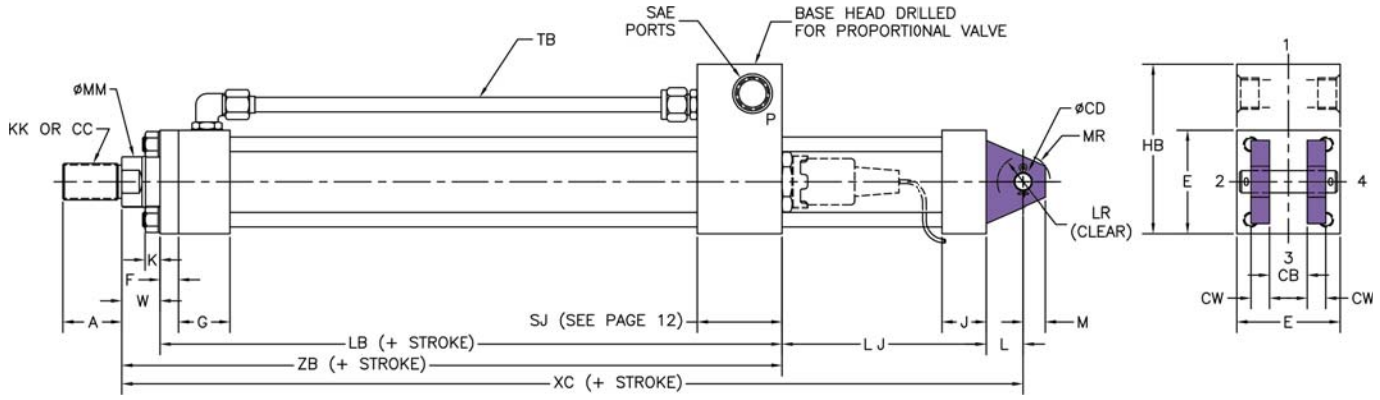
STYLE 3 ROD END



STYLE 4 ROD END

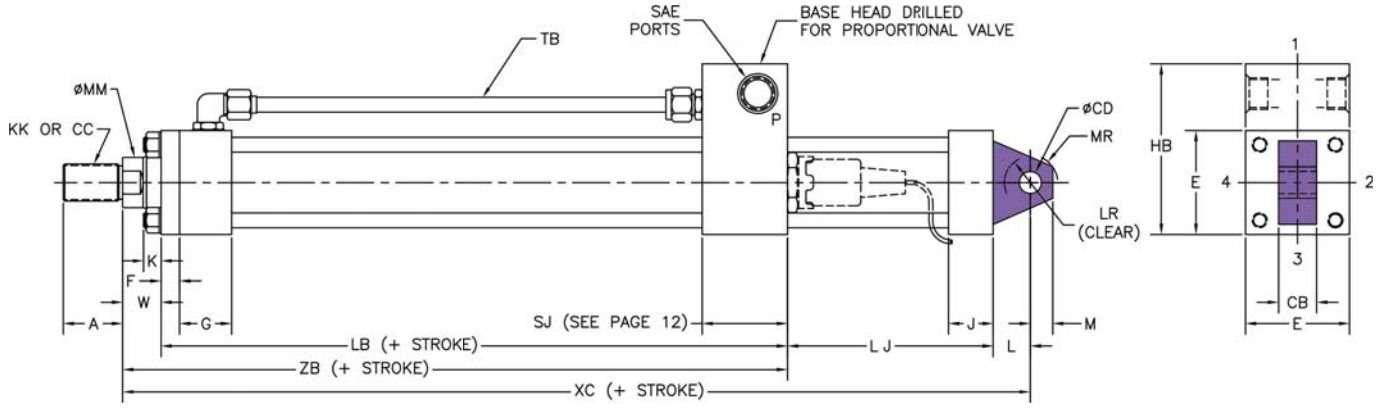
Special rod end : special thread, extensions, tube eye, plain end, etc. Specify style #4 when ordering and the desired dimensions for KK or CC, A or W, or that which is special. A sketch with the changes may be submitted to facilitate your order.

PURAKAL SERIES 3050
CLEVIS, EYE, SPHERICAL EYE MOUNTINGS



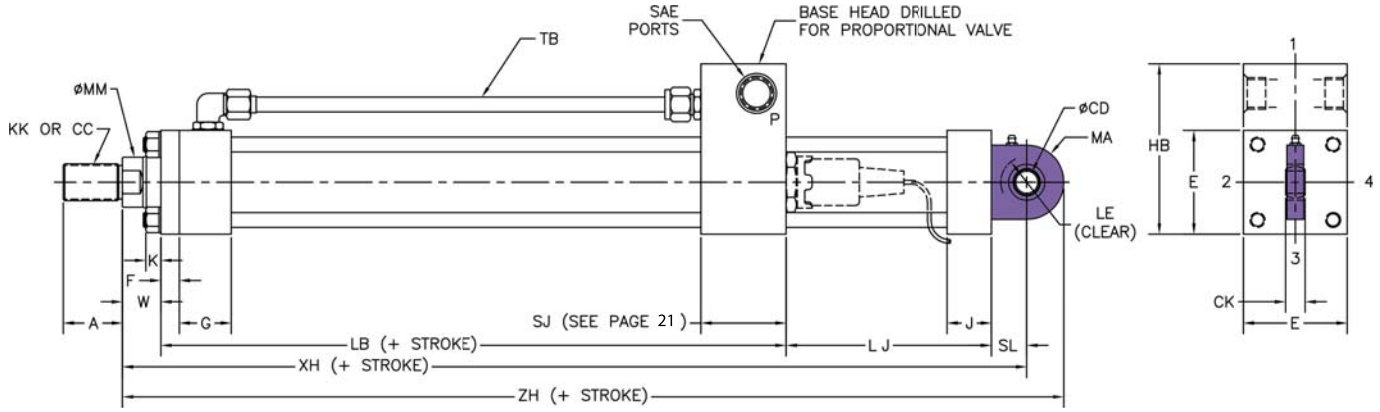
MP-1

For mounting accessories see pages 14 through 20



MP-3

For mounting accessories see pages 14 through 20.



MPU-3

For mounting accessories see pages 14 through 20.

PURAKAL SERIES 3050
CLEVIS, EYE, SPHERICAL EYE MOUNTINGS

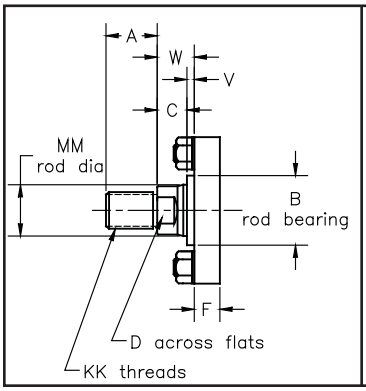
ENVELOPE AND MOUNTING DIMENSIONS AFFECTED BY ROD SIZE

CYL BORE	ROD DIA											ADD STROKE	ADD STROKE	ADD STROKE	ADD STROKE
	MM	A	B	C	CC	D	K	KK	V	W	WA	XC	XH	ZC	ZH
2	1	1 1 /8	1.499	1/2	7/8-14	7/8	1/2	3/4-16	1/4	3/4	7/8	15 5/8	15 9/16	16 3/8	16 13/16
	1 3/8	1 5/8	1.999	5/8	1 1/4-12	1 1/8	3/4	1-14	3/8	1	1 1/2	15 7/8	15 13/16	16 5/8	17 1/16
2 1/2	1	1 1/8	1.499	1/2	7/8-14	7/8	1/2	3/4-16	1/4	3/4	7/8	15 3/4	15 11/16	16 1/2	16 13/16
	1 3/8	1 5/8	1.999	5/8	1 1/4-12	1 1/8	1/2	1-14	3/8	1	1 1/2	16	15 15/16	16 3/4	17 3/16
	1 3/4	2	2.375	3/4	1 1/2-12	1 1/2	1/2	1 1/4-12	1/2	1 1/4	1 3/4	16 1/4	16 3/16	17	17 7/16
3 1/4	1 3/8	1 5/8	1.999	5/8	1 1/4-12	1 1/8	5/8	1-14	1/4	7/8	7/8	17	17 1/16	18	18 7/16
	1 3/4	2	2.374	3/4	1 1/2-12	1 1/2	5/8	1 1/4-12	3/8	1 1/8	1 1/8	17 1/4	17 5/16	18 1/4	18 11/16
	2	2 1/4	2.624	7/8	1 3/4-12	1 11/16	5/8	1 1/2-12	3/8	1 1/4	1 1/2	17 3/8	17 7/16	18 3/8	18 13/16
4	1 3/4	2	2.374	3/4	1 1/2-12	1 1/2	5/8	1 1/4-12	1/4	1	1	18	17 13/16	19 3/8	19 9/16
	2	2 1/4	2.624	7/8	1 3/4-12	1 11/16	5/8	1 1/2-12	1/4	1 1/8	1 1/4	18 1/8	17 15/16	19 1/2	19 11/16
	2 1/2	3	3.124	1	2 1/4-12	2 1/16	5/8	1 7/8-12	3/8	1 3/8	2 1/8	18 3/8	18 3/16	19 3/4	19 15/16
5	2	2 1/4	2.624	7/8	1 3/4-12	1 11/16	13/16	1 1/2-12	1/4	1 1/8	1 3/8	18 1/4	18 7/16	20	20 11/16
	2 1/2	3	3.124	1	2 1/4-12	2 1/16	13/16	1 7/8-12	3/8	1 3/8	2 1/4	18 1/2	18 11/16	20 1/4	20 15/16
	3 1/2	3 1/2	4.249	1	3 1/4-12	3	13/16	2 1/2-12	3/8	1 3/8	2 7/8	18 1/2	18 11/16	20 1/4	20 15/16

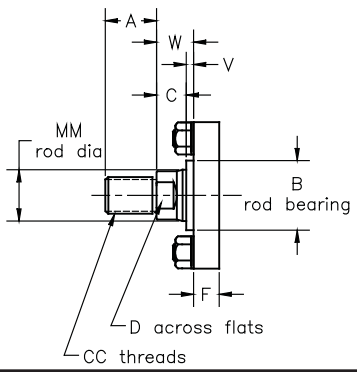
ENVELOPE AND MOUNTING DIMENSIONS

CYL BORE						With Valve Pattern	Without Valve Pattern						ADD STROKE								
	CB	CD	CK	CW	E	SAE	SAE	F	G	HB	J	L	LB	LE	LJ	LR	M	MA	MR	SL	TB
2	1 1/4	3/4	21/32	5/8	3	#8	#8	5/8	1 3/4	4 7/8	1 1/2	1 1/4	6 5/8	7/8	7	15/16	3/4	1 1/4	15/16	1 3/16	1/2
2 1/2	1 1/4	3/4	21/32	5/8	3 1/2	#12	#8	5/8	1 3/4	5 3/8	1 1/2	1 1/4	6 3/4	7/8	7	15/16	3/4	1 1/4	15/16	1 3/16	1/2
3 1/4	1 1/2	1	7/8	3/4	4 1/2	#12	#12	3/4	2	6 3/4	1 3/4	1 1/2	7 3/8	1 1/8	7 1/4	1 3/16	1	1 3/8	1 3/16	1 9/16	3/4
4	2	1 3/8	1 3/16	1	5	#12	#12	7/8	2	7 1/4	1 3/4	2 1/8	7 5/8	1 1/2	7 1/4	1 3/4	1 3/8	1 3/4	1 11/16	1 15/16	3/4
5	2 1/2	1 3/4	1 17/32	1 1/4	6 1/2	#16	#12	7/8	2 1/8	8 3/4	1 7/8	2 1/4	7 1/2	1 15/16	7 3/8	1 13/16	1 3/4	2 1/4	2 1/8	2 7/16	3/4

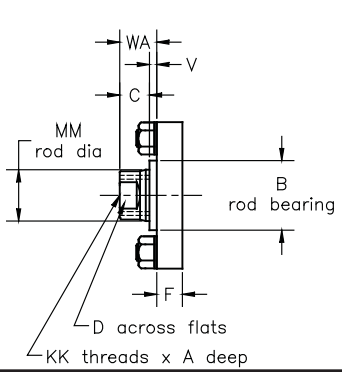
STYLE 1 ROD END



STYLE 2 ROD END



STYLE 3 ROD END

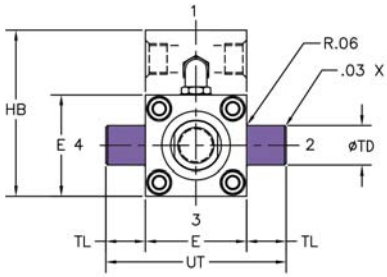


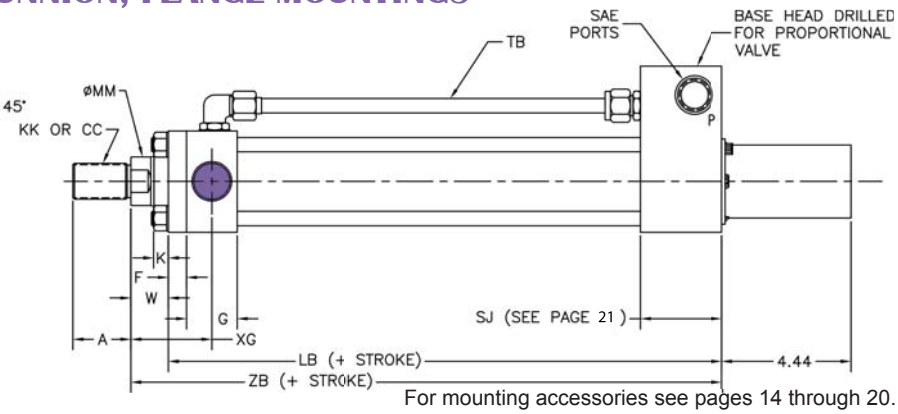
STYLE 4 ROD END

Special rod end : special thread, extensions, tube eye, plain end, etc. Specify style #4 when ordering and the desired dimensions for KK or CC, A or W, or that which is special. A sketch with the changes may be submitted to facilitate your order.

MT-1
MT-4
MF-1
MF-5

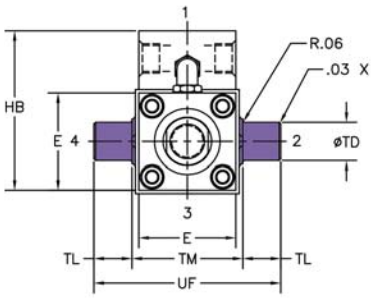
PURAKAL SERIES 3050
TRUNNION, FLANGE MOUNTINGS

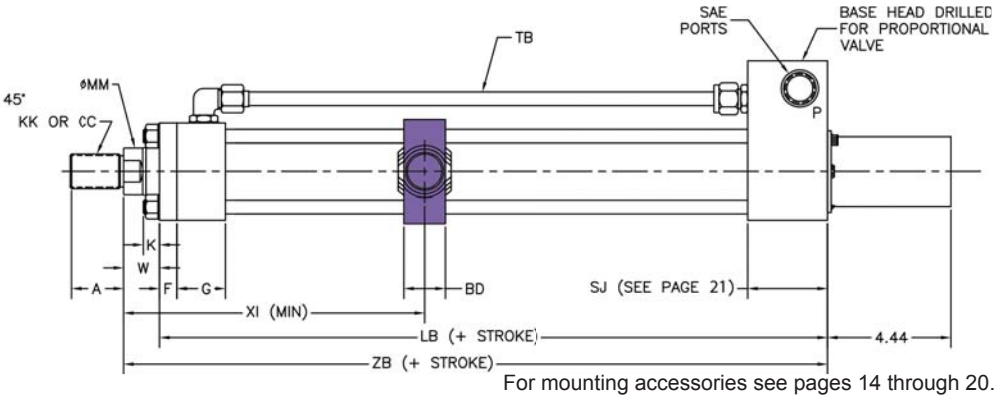




MT-1

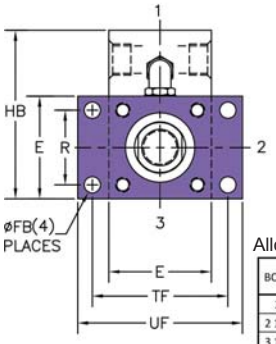
For mounting accessories see pages 14 through 20.





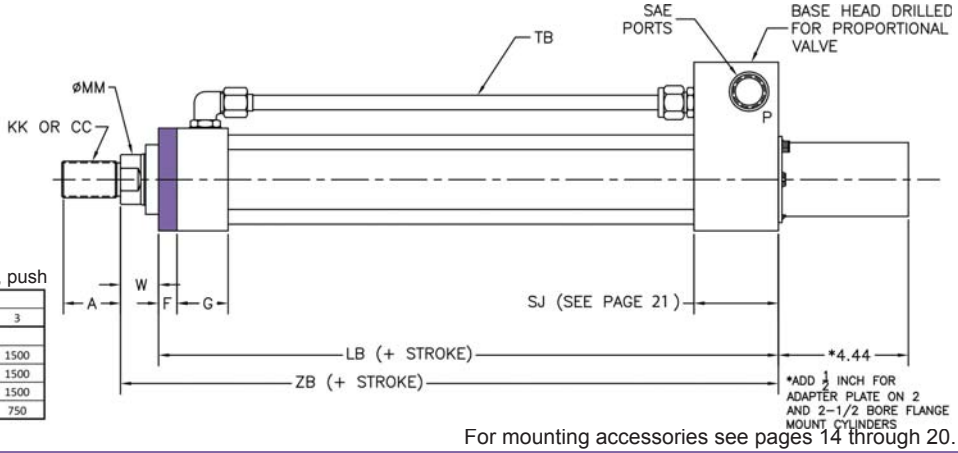
MT-4

For mounting accessories see pages 14 through 20.



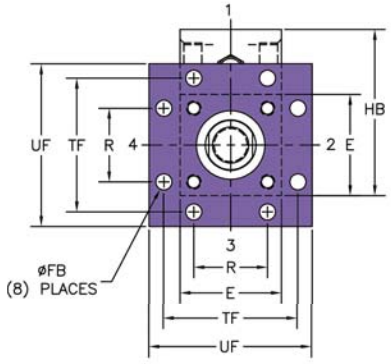
Allowable Pressure, push

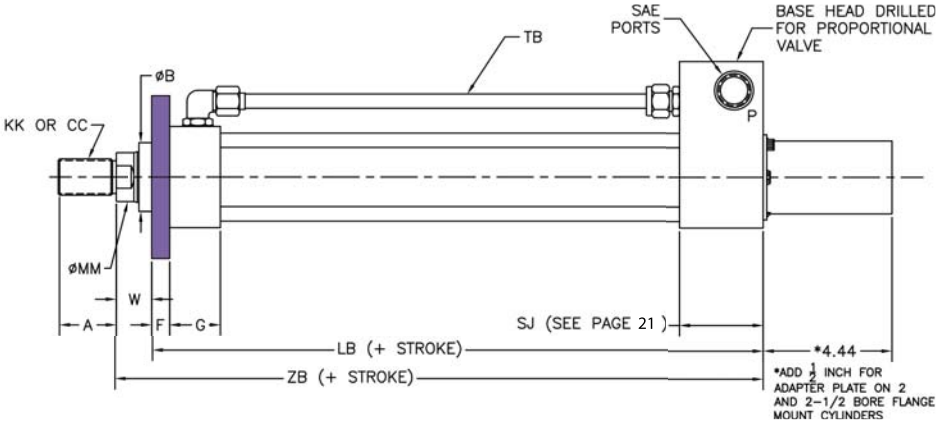
BORE	ROD SIZE		
	1	2	3
2	2500	1500	
2 1/2	2500	1900	1500
3 1/4	2500	2100	1500
4	2500	1800	1500
5	2200	1650	750



MF-1

For mounting accessories see pages 14 through 20.





MF-5

For mounting accessories see pages 14 through 20.

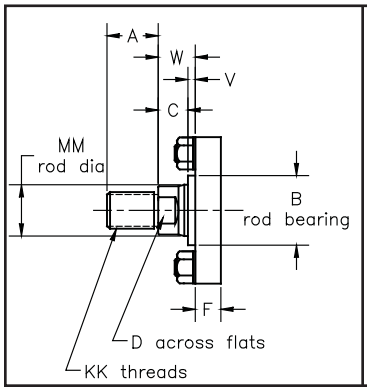
ENVELOPE AND MOUNTING DIMENSIONS AFFECTED BY ROD SIZE

CYL BORE	ROD DIA												ADD STROKE	ADD STROKE
	MM	A	B	C	CC	D	K	KK	V	W	WA	XG	XI Min	ZB
2	1	1 1/8	1 1/2	1/2	7/8-14	7/8	1/2	3/4-16	1/4	3/4	7/8	2 1/4	3 7/8	7 3/8
	1 3/8	1 5/8	2	5/8	1 1/4-12	1 1/8	3/4	1-14	3/8	1	1 1/2	2 1/2	4 1/8	7 5/8
2 1/2	1	1 1/8	1 1/2	1/2	7/8-14	7/8	1/2	3/4-16	1/4	3/4	7/8	2 1/4	3 7/8	7 1/2
	1 3/8	1 5/8	2	5/8	1 1/4-12	1 1/8	1/2	1-14	3/8	1	1 1/2	2 1/2	4 1/8	7 3/4
	1 3/4	2	2 3/8	3/4	1 1/2-12	1 1/2	1/2	1 1/4-12	1/2	1 1/4	1 3/4	2 3/4	4 3/8	8
3 1/4	1 3/8	1 5/8	2	5/8	1 1/4-12	1 1/8	5/8	1-14	1/4	7/8	7/8	2 5/8	4 5/8	8 1/4
	1 3/4	2	2 3/8	3/4	1 1/2-12	1 1/2	5/8	1 1/4-12	3/8	1 1/8	1 1/8	2 7/8	4 7/8	8 1/2
	2	2 1/4	2 5/8	7/8	1 3/4-12	1 11/16	5/8	1 1/2-12	3/8	1 1/4	1 1/2	3	5	8 5/8
4	1 3/4	2	2 3/8	3/4	1 1/2-12	1 1/2	5/8	1 1/4-12	1/4	1	1	2 7/8	5	8 5/8
	2	2 1/4	2 5/8	7/8	1 3/4-12	1 11/16	5/8	1 1/2-12	1/4	1 1/8	1 1/4	3	5 1/8	8 3/4
	2 1/2	3	3 1/8	1	2 1/4-12	2 1/16	5/8	1 7/8-12	3/8	1 3/8	2 1/8	3 1/4	5 3/8	9
5	2	2 1/4	2 5/8	7/8	1 3/4-12	1 11/16	13/16	1 1/2-12	1/4	1 1/8	1 3/8	3	5 1/8	8 5/8
	2 1/2	3	3 1/8	1	2 1/4-12	2 1/16	13/16	1 7/8-12	3/8	1 3/8	2 1/4	3 1/4	5 3/8	8 7/8
	3 1/2	3 1/2	4 1/4	1	3 1/4-12	3	13/16	2 1/2-12	3/8	1 3/8	2 7/8	3/1/4	5 3/8	8 7/8

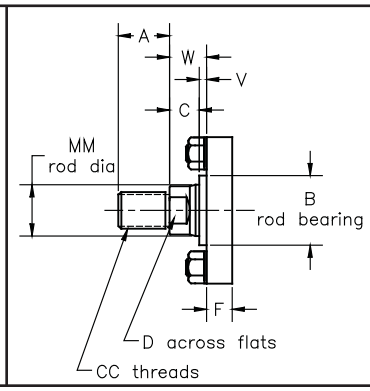
ENVELOPE AND MOUNTING DIMENSIONS

CYL BORE			With Valve Pattern	Without Valve Pattern					ADD STROKE							
	BD	E	SAE	SAE	F	FB	G	HB	LB	TB	TD	TF	TL	TM	TY	UF
2	1 1/2	3	#8	#8	5/8	9/16	1 3/4	4 7/8	6 5/8	1/2	1 3/8	4 1/8	1 3/8	3 1/2	3 1/4	5 1/8
2 1/2	1 1/2	3 1/2	#12	#8	5/8	9/16	1 3/4	5 3/8	6 3/4	1/2	1 3/8	4 5/8	1 3/8	4	3 3/4	5 5/8
3 1/4	2	4 1/2	#12	#12	3/4	11/16	2	6 3/4	7 3/8	3/4	1 3/4	5 7/8	1 3/4	5	4 3/4	7 1/8
4	2	5	#12	#12	7/8	11/16	2	7 1/4	7 5/8	3/4	1 3/4	6 3/8	1 3/4	5 1/2	5 1/4	7 5/8
5	2	6 1/2	#16	#12	7/8	15/16	2 1/8	8 3/4	7 1/2	3/4	1 3/4	8 3/16	1 3/4	7	6 3/4	9 3/4

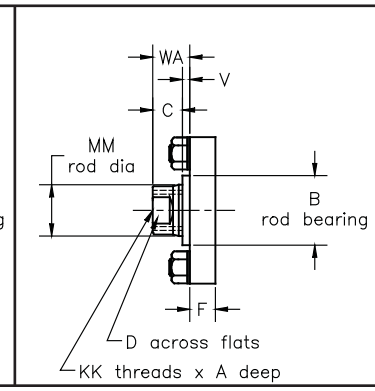
STYLE 1 ROD END



STYLE 2 ROD END



STYLE 3 ROD END

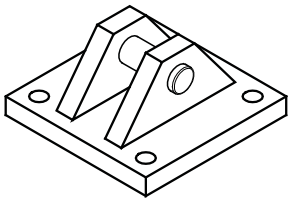


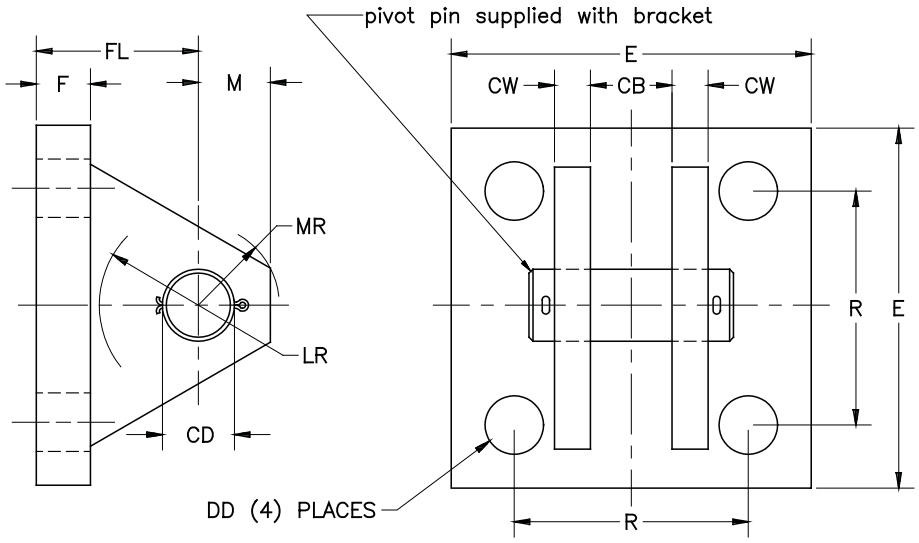
STYLE 4 ROD END

Special rod end : special thread, extensions, tube eye, plain end, etc. Specify style #4 when ordering and the desired dimensions for KK or CC, A or W, or that which is special. A sketch with the changes may be submitted to facilitate your order.

PURAKAL SERIES 3050
MOUNTING ACCESSORIES

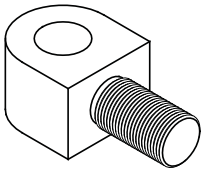
CLEVIS BRACKET

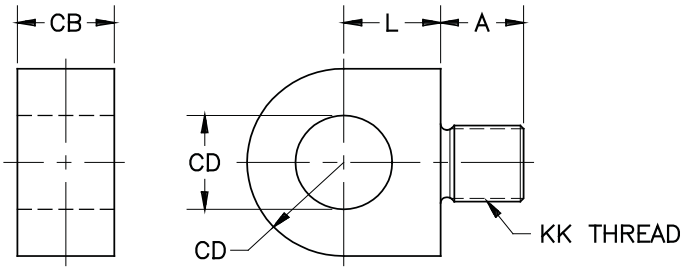




PCB

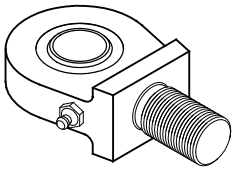
MALE ROD EYE

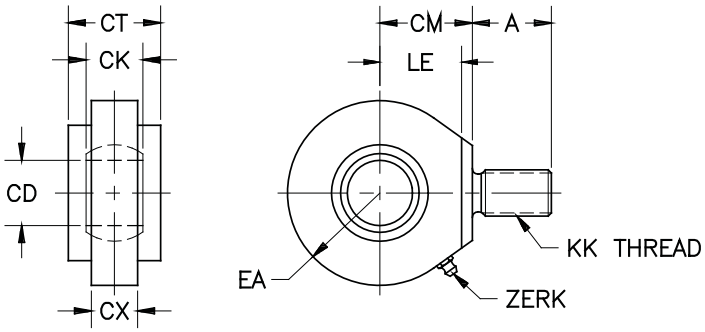




PME

SELF ALIGNING ROD EYE





PSE

PURAKAL SERIES 3050
MOUNTING ACCESSORIES

CLEVIS BRACKET

	PART NUMBER											
	PCB -05	PCB -07	PCB -10	PCB -13	PCB -17	PCB -20	PCB -25	PCB -30	PCB -30-35	PCB -35	PCB -40	PCB -40-45
CB	3/4	1 1/4	1 1/2	2	2 1/2	2 1/2	3	3	3 1/2	4	4 1/2	5
CD	1/2	3/4	1	1 3/8	1 3/4	2	2 1/2	3	3	3 1/2	4	4
CW	1/2	5/8	3/4	1	1 1/4	1 1/2	1 1/2	1 1/2	1 1/2	2	2	2
DD	13/32	17/32	21/32	21/32	29/32	1 1/16	1 3/16	1 5/16	1 5/16	1 13/16	2 1/16	2 1/16
E	3 1/2	5	6 1/2	7 1/2	9 1/2	12 3/4	12 3/4	12 3/4	12 3/4	15 1/2	17 1/2	17 1/2
F	1/2	5/8	3/4	7/8	7/8	1	1	1	1	1 11/16	1 15/16	1 15/16
FL	1 1/2	1 7/8	2 1/4	3	3 5/8	4 1/4	4 1/2	6	6	6 11/16	7 11/16	7 11/16
LR	3/4	1 3/16	1.5	2	2 3/4	3 3/16	3 1/2	4 1/4	4 1/4	5	5 3/4	5 3/4
M	1/2	3/4	1	1 3/8	1 3/4	2	2 1/2	3	3	3 1/2	4	4
MR	5/8	1 1/16	1 1/4	1 3/4	2 7/32	2 3/4	3 1/8	3 5/8	3 5/8	4 1/8	4 7/8	4 7/8
R	2.55	3.82	4.95	5.73	7.50	9.40	9.40	9.40	9.40	12.00	13.75	13.75

MALE ROD EYE

	PART NUMBER															
	PME -05	PME -05-05	PME -07	PME -10-08	PME -10	PME -13	PME -17	PME -20	PME -20-18	PME -25	PME -30	PME -30-27	PME -35	PME -35-35	PME -40	PME -40-45
A	3/4	3/4	1 1/8	1 1/8	1 5/8	2	2 1/4	2 1/4	3	3 1/2	3 1/2	3 1/2	4 1/2	5	5 1/2	5 1/2
CB	3/4	3/4	1 1/4	1 1/2	1 1/2	2	2.5	2 1/2	2.5	3	3	3 1/2	4	4	4 1/2	5
CD	1/2	1/2	3/4	1	1	1 3/8	1 3/4	2	2	2 1/2	3	3	3 1/2	3 1/2	4	4
L	5/8	5/8	7/8	7/8	1 1/8	1 5/8	2	2	2 1/4	2 3/4	4 1/4	4 1/4	5	5	5 3/4	5 3/4
KK	7/16-20	1/2-20	3/4-16	7/8-14	1-14	1 1/4-12	1 1/2-12	1 3/4-12	1 7/8-12	2 1/4-12	2 1/2-12	2 3/4-12	3 1/4-12	3 1/2-12	4-12	4 1/2-12

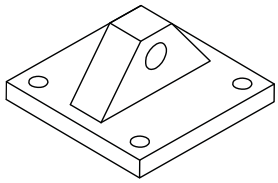
SELF ALIGNING ROD EYE

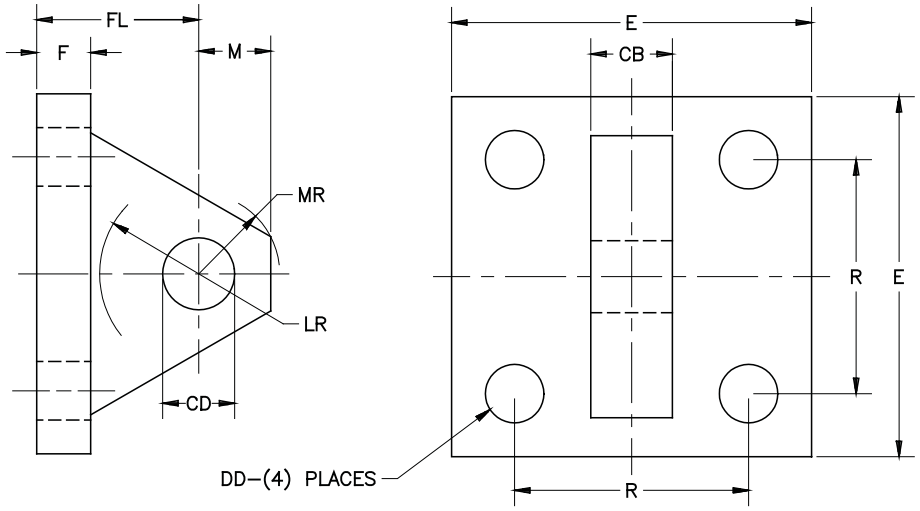
	PART NUMBER					
	PSE-05	PSE-07	PSE-10	PSE-13	PSE-17	PSE-20
A	3/4	1 1/8	1 5/8	2	2 1/4	3
CD	1/2	3/4	1	1 3/8	1 3/4	2
CK	7/16	21/32	7/8	1 3/16	1 17/32	1 3/4
CM	7/8	1 1/4	1 7/8	2 1/8	2 1/2	2 3/4
CT	1/2	7/8	1 1/8	1 1/2	1 3/4	2
CX	3/8	9/16	3/4	1 1/32	1 5/16	1 1/2
EA	7/8	1 1/4	1 3/8	1 13/16	2 13/16	2 1/2
LE	3/4	1 1/16	1 7/16	1 7/8	2 1/4	2 1/2
KK	7/16-20	3/4-16	1-14	1 1/4-12	1 1/2-12	1 7/8-12

PEB
PC
PE

PURAKAL SERIES 3050
MOUNTING ACCESSORIES

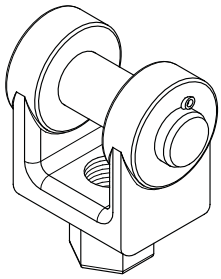
EYE BRACKET

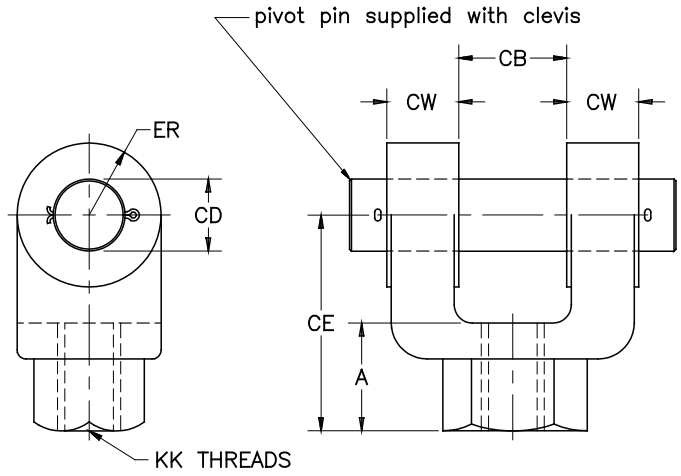




PEB

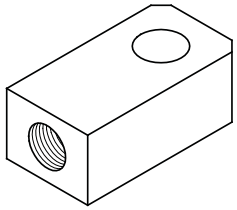
FEMALE ROD CLEVIS

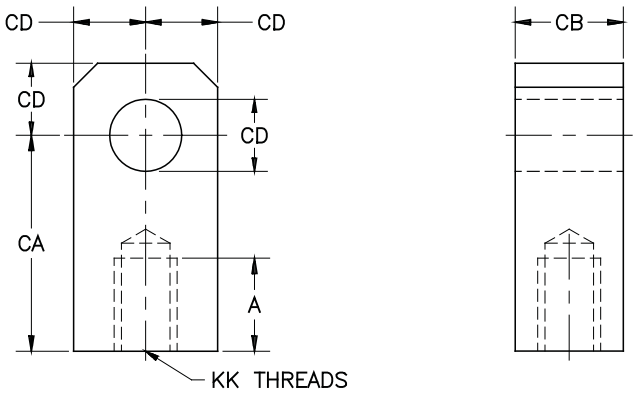




PC

FEMALE ROD EYE





PE

PURAKAL SERIES 3050
MOUNTING ACCESSORIES

EYE BRACKET

	PART NUMBER									
	PEB-05	PEB-07	PEB-10	PEB-13	PEB-17	PEB-20	PEB-25	PEB-30	PEB-35	PEB-40
CB	3/4	1 1/4	1 1/2	2	2 1/2	2 1/2	3	3	4	4 1/2
CD	1/2	3/4	1	1 3/8	1 3/4	2	2 1/2	3	3 1/2	4
DD	13/32	17/32	21/32	21/32	29/32	1 1/16	1 3/16	1 5/16	1 13/16	2 1/16
E	2 1/2	3 1/2	4 1/2	5	6 1/2	7 1/2	8 1/2	9 1/2	12 5/8	14 7/8
F	3/8	5/8	3/4	7/8	7/8	1	1	1	1 11/16	1 15/16
FL	1 1/8	1 7/8	2 1/4	3	3 1/8	3 1/2	4	4 1/4	5 11/16	6 7/16
LR	3/4	1 1/4	1 1/2	2 1/8	2 1/4	2 1/2	3	3 1/4	4	4 1/2
M	1/2	3/4	1	1 3/8	1 3/4	2	2 1/2	2 3/4	3 1/2	4
MR	9/16	7/8	1 1/4	1 5/8	2 1/8	2 7/16	3	3 1/4	4 1/8	5 1/4
R	1.63	2.55	3.25	3.82	4.95	5.73	6.58	7.50	9.62	11.45

FEMALE ROD CLEVIS

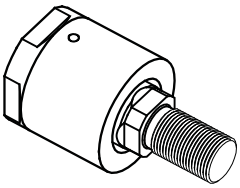
	PART NUMBER													
	PC -05	PC -05-05	PC -07	PC -10-08	PC -10	PC -13	PC -17	PC -20	PC -20-18	PC -25	PC -30	PC -30-27	PC -35	PC -4O-35	PC -40
A	3/4	3/4	1 1/8	1 5/8	1 5/8	2	2 1/4	3	3	3 1/2	3 1/2	3 1/2	4 1/2	5	5 1/2
CB	3/4	3/4	1 1/4	1 1/2	1 1/2	2	2 1/2	2 1/2	2 1/2	3	3	3	4	4 1/2	4 1/2
CD	1/2	1/2	3/4	1	1	1 3/8	1 3/4	2	2	2 1/2	3	3	3 1/2	4	4
CE	1 1/2	1 1/2	2 3/8	3 1/8	3 1/8	4 1/8	4 1/2	5 1/2	5 1/2	6 1/2	6 3/4	6 3/4	8 1/2	9 13/16	10
CW	1/2	1/2	5/8	3/4	3/4	1	1 1/4	1 1/4	1 1/4	1 1/2	1 1/2	1 1/2	2	2 1/4	2 1/4
ER	1/2	1/2	3/4	1	1	1 3/8	1 3/4	2	2	2 1/2	2 3/4	2 3/4	3 1/2	4	4
KK	7/16-20	1/2-20	3/4-16	7/8-14	1-14	1 1/4-12	1 1/2-12	1 7/8-12	1 3/4-12	2 1/4-12	2 1/2-12	2 3/4-12	3 1/2-12	3 1/2-12	4-12

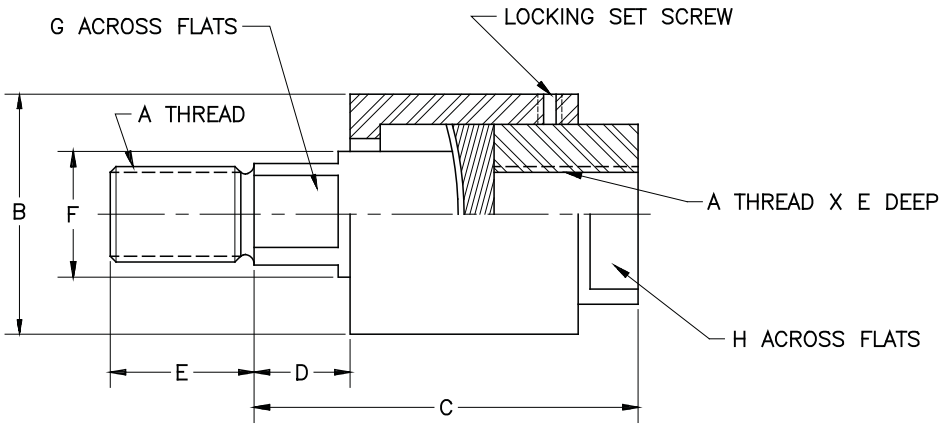
FEMALE ROD EYE

	PART NUMBER														
	PE -05	PE -05-05	PE -07	PE -10-08	PE -10	PE -13	PE -17	PE -20	PE -20-18	PE -25	PE -30	PE -30-27	PE -35	PE -35-35	PE -40	PE -40-45
A	3/4	3/4	1 1/8	1 1/8	1 5/8	2	2 1/4	2 1/4	3	3 1/2	3 1/2	3 5/8	4 1/2	5	5 1/2	5 1/2
CA	1 1/2	1 1/2	2 1/16	2 3/8	2 13/16	3 7/16	4	4 3/8	5	5 13/16	6 1/8	6 1/2	7 5/8	7 5/8	9 1/8	9 1/8
CB	3/4	3/4	1 1/4	1 1/2	1 1/2	2	2 1/2	2 1/2	2 1/2	3	3	3 1/2	4	4	4 1/2	5
CD	1/2	1/2	3/4	1	1	1 3/8	1 3/4	2	2	2 1/2	3	3	3 1/2	3 1/2	4	4
KK	7/16-20	1/2-20	3/4-16	7/8-14	1-14	1 1/4-12	1 1/2-12	1 3/4-12	1 7/8-12	2 1/4-12	2 1/2-12	2 3/4-12	3 1/4-12	3 1/2-12	4-12	4 1/2-12

PURAKAL SERIES 3050
MOUNTING ACCESSORIES

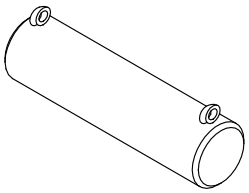
ALIGNMENT COUPLER

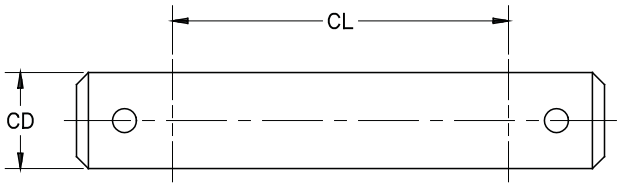




PAC

PIVOT PIN





PP

ALIGNMENT COUPLER

	PART NUMBER									
	PAC-04	PAC-05	PAC-07	PAC-08	PAC-10	PAC-12	PAC-15	PAC-17	PAC-18	PAC-20
A	7/16-20	1/2-20	3/4-16	7/8-14	1-14	1 1/4-12	1 1/2-12	1 3/4-12	1 7/8-12	2-12
B	1 1/4	1 1/4	1 3/4	1 3/4	2 1/2	2 1/2	3 1/4	3 1/4	3 3/4	3 3/4
C	2	2	2 5/16	2 5/16	2 15/16	2 15/16	4 3/8	4 3/8	5 7/16	5 7/16
D	1/2	1/2	1/2	1/2	1/2	1/2	13/16	13/16	7/8	7/8
E	3/4	3/4	1 1/8	1 1/8	1 5/8	1 5/8	2 1/4	2 1/4	3	3
F	5/8	5/8	31/32	31/32	1 3/8	1 3/8	1 3/4	1 3/4	2	2
G	1/2	1/2	13/16	13/16	1 5/32	1 5/32	1 1/2	1 1/2	1 7/8	1 7/8
H	1	1	1 1/2	1 1/2	2 1/4	2 1/4	3	3	3 1/2	3 1/2
MAX PULL	10,000	14,000	34,000	39,000	64,000	78,000	134,000	134,000	240,000	240,000

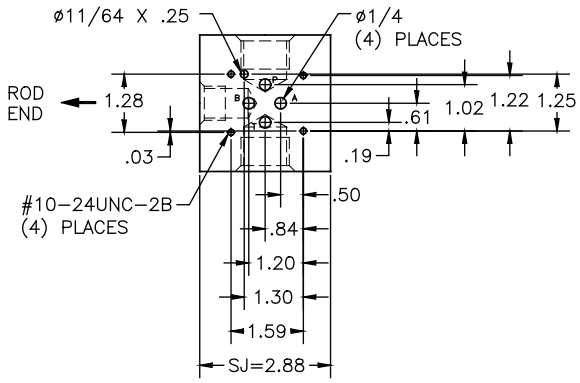
PIVOT PIN

	PART NUMBER												
	PP-05	PP-07	PP-10	PP-13	PP-17	PP-20	PP-20-55	PP-25	PP-30	PP-30-65	PP-35	PP-40-85	PP-40
CD	1/2	3/4	1	1 3/8	1 3/4	2	2	2 1/2	3	3	3 1/2	4	4
CL	1 3/4	2 1/2	3	4	5	5	5 1/2	6	6	6 1/2	8	8 1/2	9

PURAKAL SERIES 3050
ACCESSORY COMPARISON

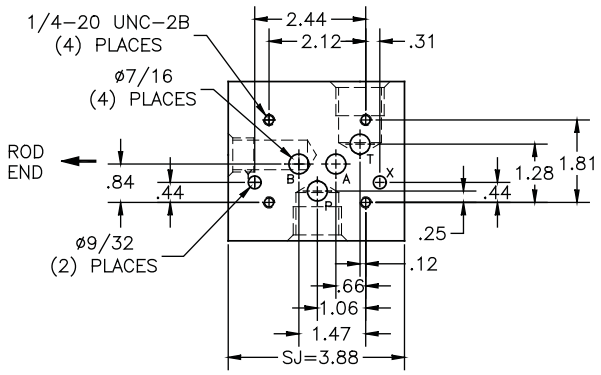
ROD DIA														
KK	CC	THREAD	PIN	CLEVIS	ROD EYE	MALE ROD END	SELF ALIGNING ROD EYE	PIN	EYE BRACKET	CLEVIS BRACKET	SERIES 100	SERIES 2500	SERIES 3000	SERIES 3050
5/8		7/16-20	PP-05	PE-05	PE-05	PME-05	PSE-05	PP-05	PEB-05	PCB-05	1 1/2, 2, 2 1/2	1 1/2	1 1/2	1 1/2
	5/8	1/2-20	PP-05	PE-05-05	PE-05-05			PP-05	PEB-05	PCB-05	1 1/2, 2, 2 1/2	1 1/2	1 1/2	1 1/2
1		3/4-16	PP-07	PC-07	PE-07	PME-07	PSE-07	PP-07	PEB-07	PCB-07	3 1/4, 4, 5	2, 2 1/2	2, 2 1/2	2, 2 1/2
	1	7/8-14	PP-10	PC-10-08	PE-10-08	PME-10-08		PP-10	PEB-10	PCB-10	6, 8	3 1/4	3 1/4	3 1/4
1 3/8		1-14	PP-10	PC-10	PE-10		PSE-10	PP-10	PEB-10	PCB-10	6, 8	3 1/4	3 1/4	3 1/4
1 3/4	1 3/8	1 1/4-12	PP-13	PC-13	PE-13	PME-13	PSE-13	PP-13	PEB-13	PCB-13	10	4	4	4
2	1 3/4	1 1/2-12	PP-17	PC-17	PE-17	PME-17	PSE-17	PP-17	PEB-17	PCB-17	12	5	5	5
	2	1 3/4-12	PP-20	PC-20	PE-20	PME-20		PP-20	PEB-20	PCB-20		6	6	
2 1/2		1 7/8-12	PP-20-18	PC-20-18	PE-20-18	PME-20-18	PSE-20	PP-25	PEB-25	PCB-25		7	7	
3	2 1/2	2 1/4-12	PP-25	PC-25	PE-25	PME-25		PP-30	PEB-30	PCB-30		8	8	
3 1/2		2 1/2-12	PP-30	PC-30	PE-30	PME-30		PP-30	PEB-30	PCB-30		8	8	
	3	2 3/4-12	PP-30	PC-30-27	PE-30-27	PME-30-27								
4		3-12						PP-35	PEB-35	PCB-35		10	10	
4 1/2	3 1/2	3 1/4-12	PP-35	PC-35	PE-35	PME-35		PP-35	PEB-35	PCB-35		10	10	
5		3 1/2-12	PP-35		PE-35-35	PME-35-35		PP-40	PEB-40	PCB-40		12	12	
5		3 1/2-12	PP-40	PC-40-35										
	4	3 3/4-12						PP-40	PEB-40	PCB-40		12	12	
5 1/2, 7		4-12	PP-40	PC-40	PE-40	PME-40								
	4 1/2	4 1/4-12						PP-40	PEB-40	PCB-40		12	12	
8, 8 1/2		4 1/2-12	PP-40		PE-40-45	PME-40-45								
	5	4 3/4-12												
	5 1/2	5 1/4-12												
	7	5 1/2-12												
	8 1/2	6-12												

PURAKAL SERIES 3050
STANDARD VALVE PATTERNS, RECOMMENDED TORQUE



D03 / NG-6

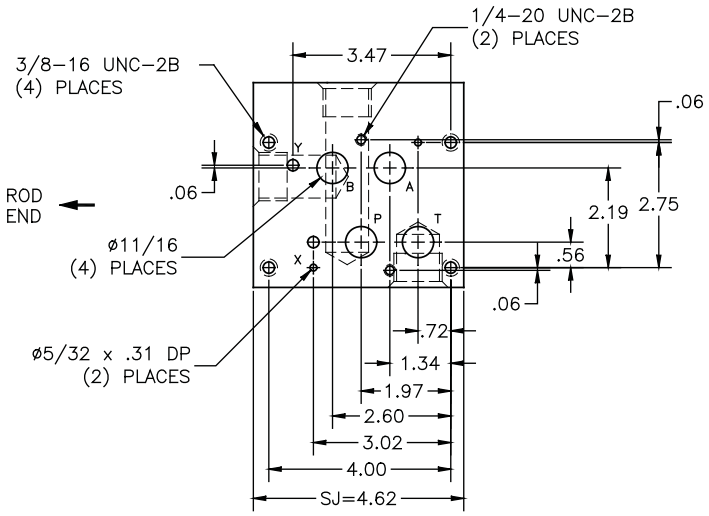
Standard valve pattern for 2 inch bore.
Can be used on all other sizes.



D05 / NG-10

Standard valve pattern for 2 1/2, 3 1/4, 4 inch bore.
Can be used on all other bore sizes.

X and Y ports are provided only on customer request



D07 / NG-16

Standard valve pattern for 5 inch bore.
Can be used on all other bore sizes.

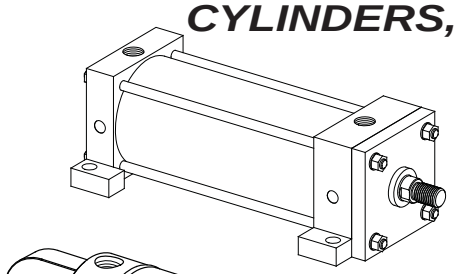
X and Y ports are provided only on customer request

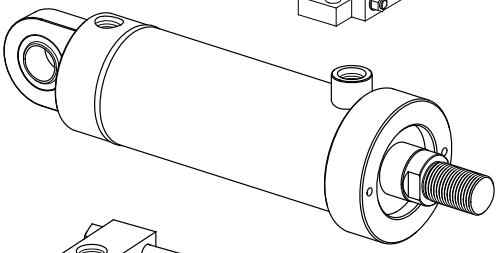
RECOMMENDED TIE ROD TORQUE VALUES FOR 3050 SERIES CYLINDERS

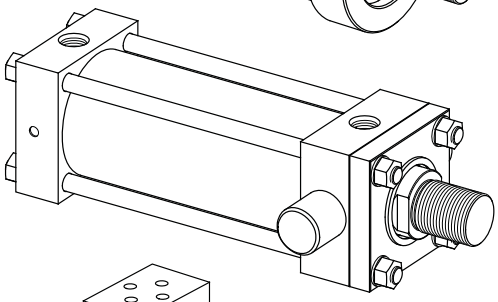
BORE	2	2 1/2	3 1/4	4	5
TIE ROD THREAD	1/2-20	1/2-20	5/8-18	5/8-18	7/8-14
MODELS MF1 MF2 MF5 MF6	45	60	90	115	270
ALL OTHER MODELS	45	60	90	145	310

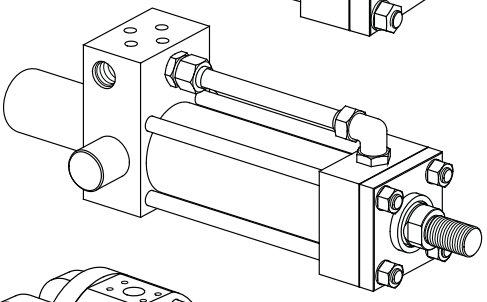
PURAKAL

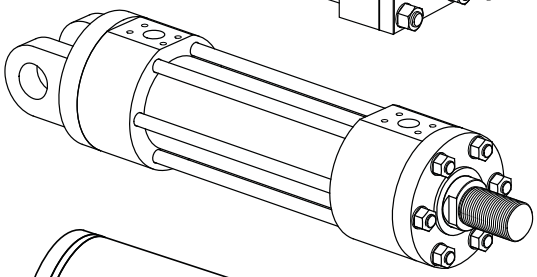
CYLINDERS, INC

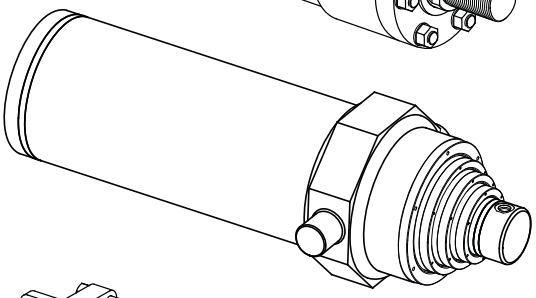


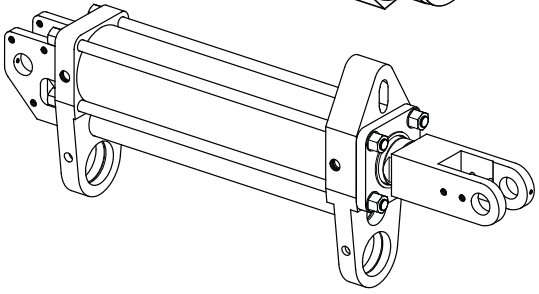












100 SERIES
PNEUMATIC CYLINDER

250 PSI air/750 PSI hydraulic operating pressure — 1 1/2" to 12" Bore

Tie rod cylinder * Ground and polished hard chrome plated piston rod * Honed and chrome plated barrel I.D. * Polyurethane seals * All NFPA mountings available

2500 SERIES
HEAVY DUTY HYDRAULIC CYLINDER

3000 PSI operating pressure — 1 1/2" to 6" Bore

Welded construction * Ground and polished hard chrome plated piston rod * Heavy wall honed barrel I.D. * Polyurethane seals * Clevis, Pin Eye, Single Lug, and Blind End Plate mounts * NFPA interchangeable mounting dimensions

3000 SERIES
HYDRAULIC CYLINDER

3000 PSI operating pressure — 1 1/2" to 12" Bore

Tie rod cylinder * Ground and polished hard chrome plated piston rod * Heavy wall honed barrel I.D. * Polyurethane seals * All NFPA mountings available

3050 SERIES
LINEAR POSITIONING HYDRAULIC CYLINDER

3000 PSI operating pressure — 2" to 5" Bore

Tie rod cylinder * Ground and polished hard chrome plated piston rod * Heavy wall honed barrel I.D. * Low friction seals * Most NFPA mountings available * Direct Servo Valve Mounting * Transducer position sensing * Large bore models available on request

3500 SERIES
SUPER HEAVY DUTY HYDRAULIC CYLINDER

3500 PSI operating pressure — 2 1/2" to 6" Bore

Tie rod cylinder for extreme service requirements* Ground and polished heavy chrome plated piston rod * 4-Bolt Flange ports * Polyurethane seals * Tie rod, Clevis, Single Lug, Trunnion mounts * Heavy duty cushions for high inertial loads

2100 SERIES
TELESCOPIC HYDRAULIC CYLINDER

2000 PSI operating pressure — 3 1/2" to 13 3/4" Bore

Multi-Stage telescopic cylinder for long strokes in a compact package * Double Acting or Single Acting * Ground and polished, hard chrome plated rods * Quick and easy rod seal replacement in the field * Bronze filled teflon piston bearings * Available with trunnion mounts, eye mounts, and other special designs.

SPECIAL DESIGNS

Intensifier cylinders * Accumulators * Multiport swivels * Spring Loaded cylinders* Computer aided design and analysis by an experienced engineering staff

Consult the PURAKAL distributor in your area or call our factory direct to discuss your unique applications.