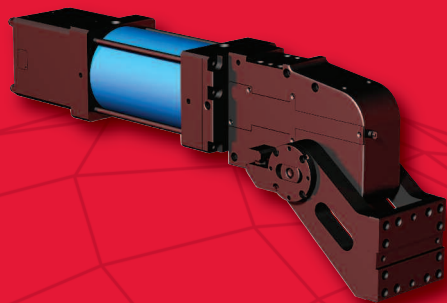




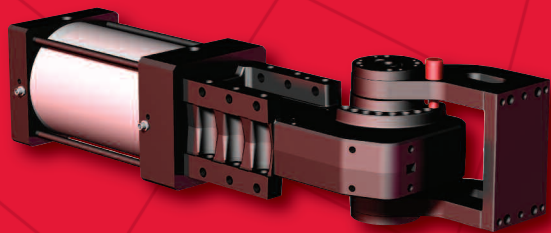
ALUMINUM

# PNEUMATIC PIVOT UNITS

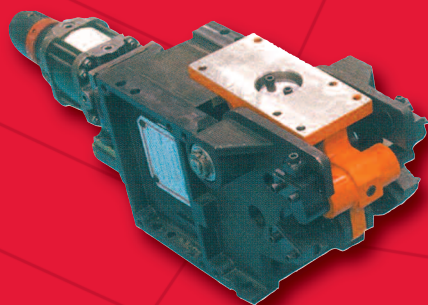
JUNE 2009



**GR & RC SERIES**



**RU SERIES**



**PM SERIES**

[www.destaco.com](http://www.destaco.com)



**CAD FILES  
AVAILABLE  
ONLINE**

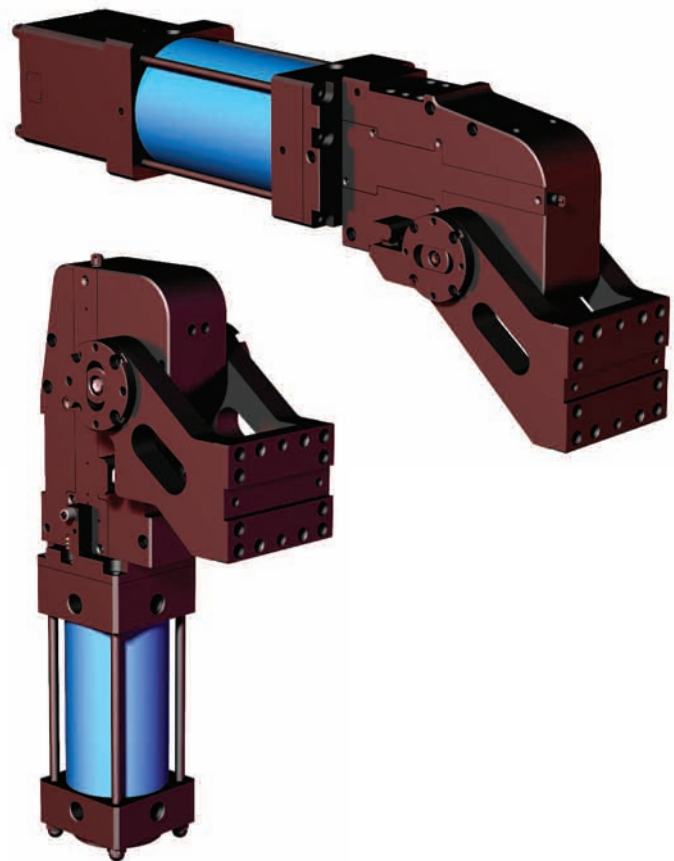


**DE-STA-CO Pivot Units**

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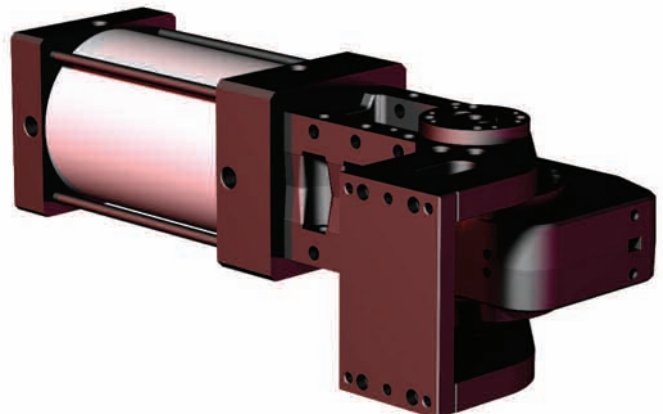
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**RU Series Heavy Duty Pivot Units**

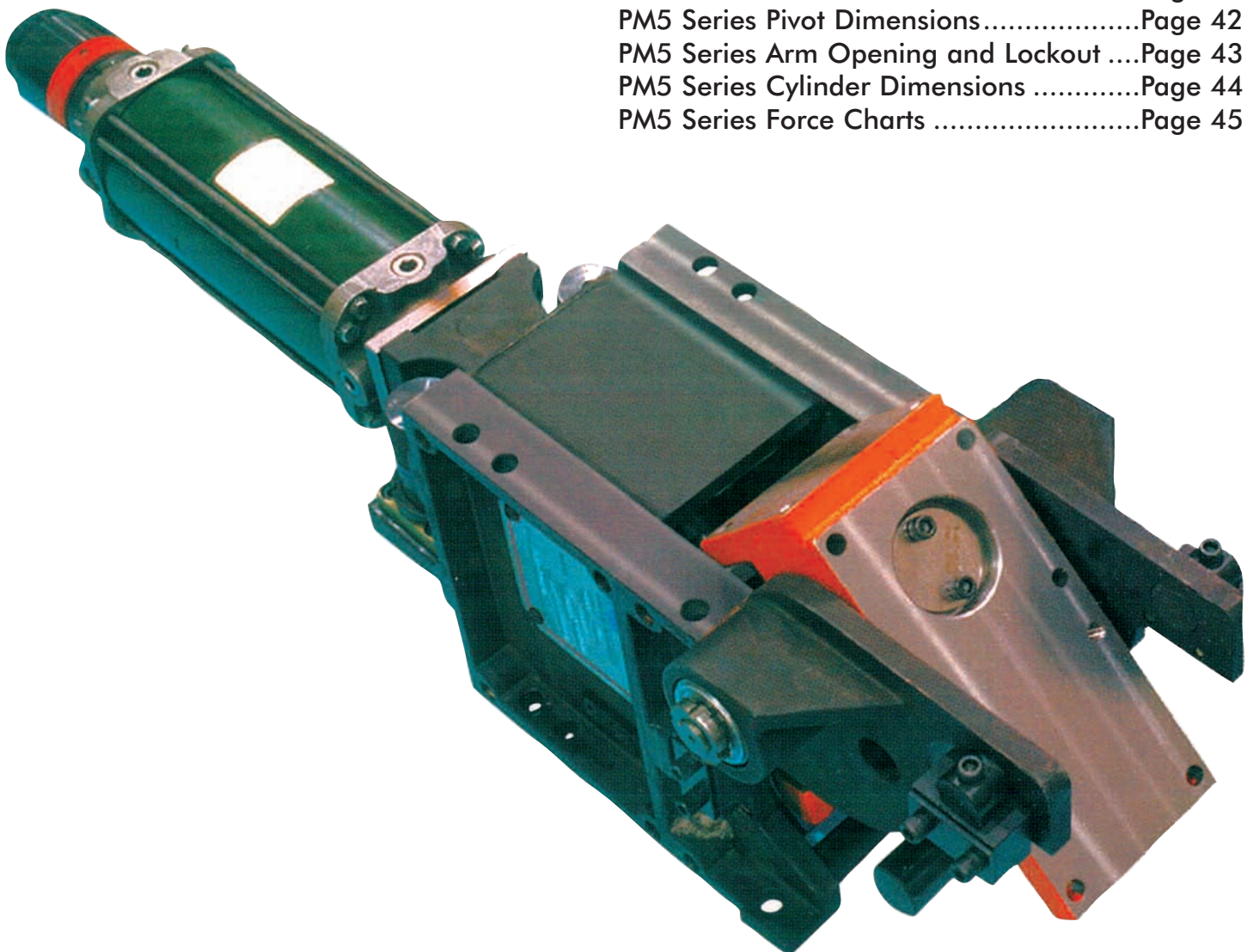
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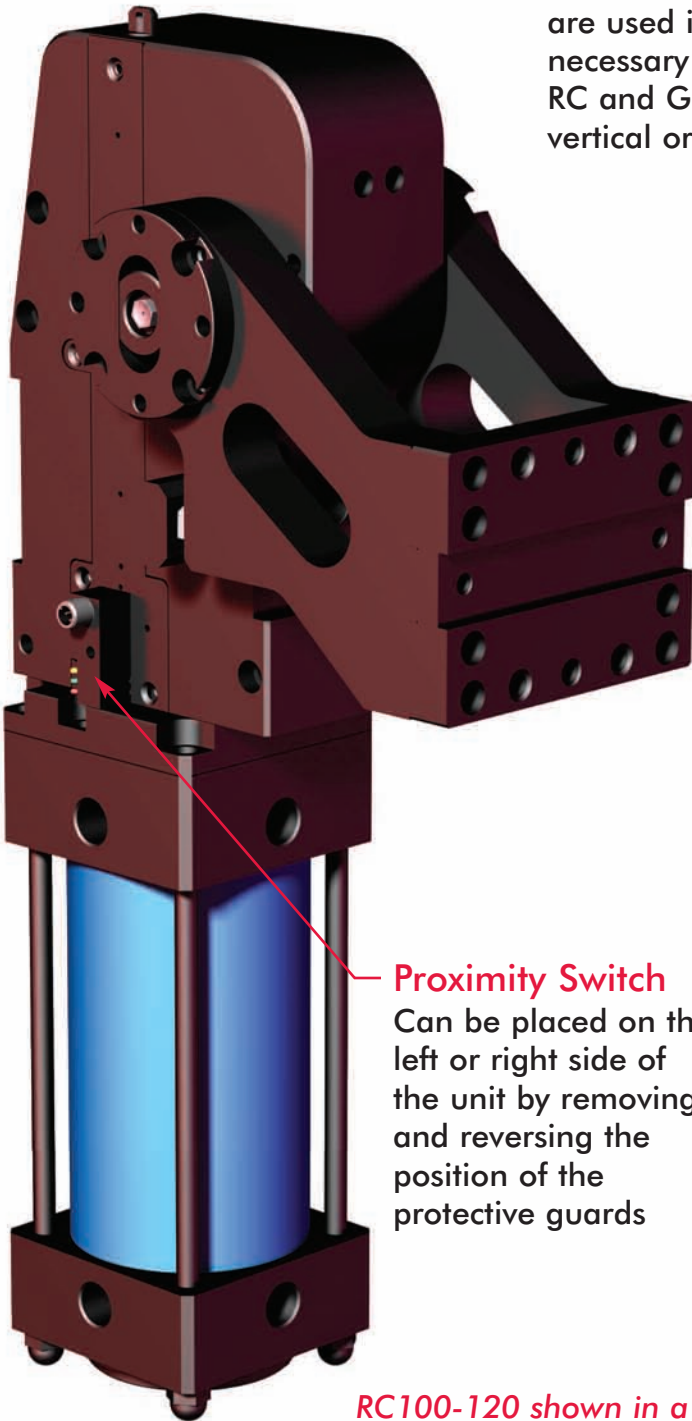


## GR and RC Series Medium Duty Pivot Units

### Features and Benefits

#### GR and RC Series Pneumatic Pivot Units

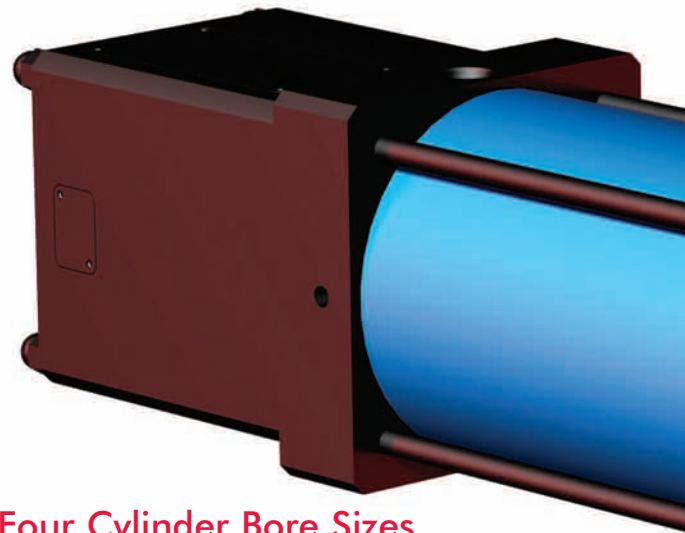
are used in welding applications or anywhere it is necessary to accurately position tooling. Both the RC and GR series can be mounted in an upright vertical or horizontal position.



#### Proximity Switch

Can be placed on the left or right side of the unit by removing and reversing the position of the protective guards

*RC100-120 shown in a vertical "V" orientation*



#### Four Cylinder Bore Sizes

Available in 100, 125, 160 & 200mm cylinder bore sizes. Cylinders are offered with NPT or ISO G ports



#### Cut Off Valve (GR Series Only)

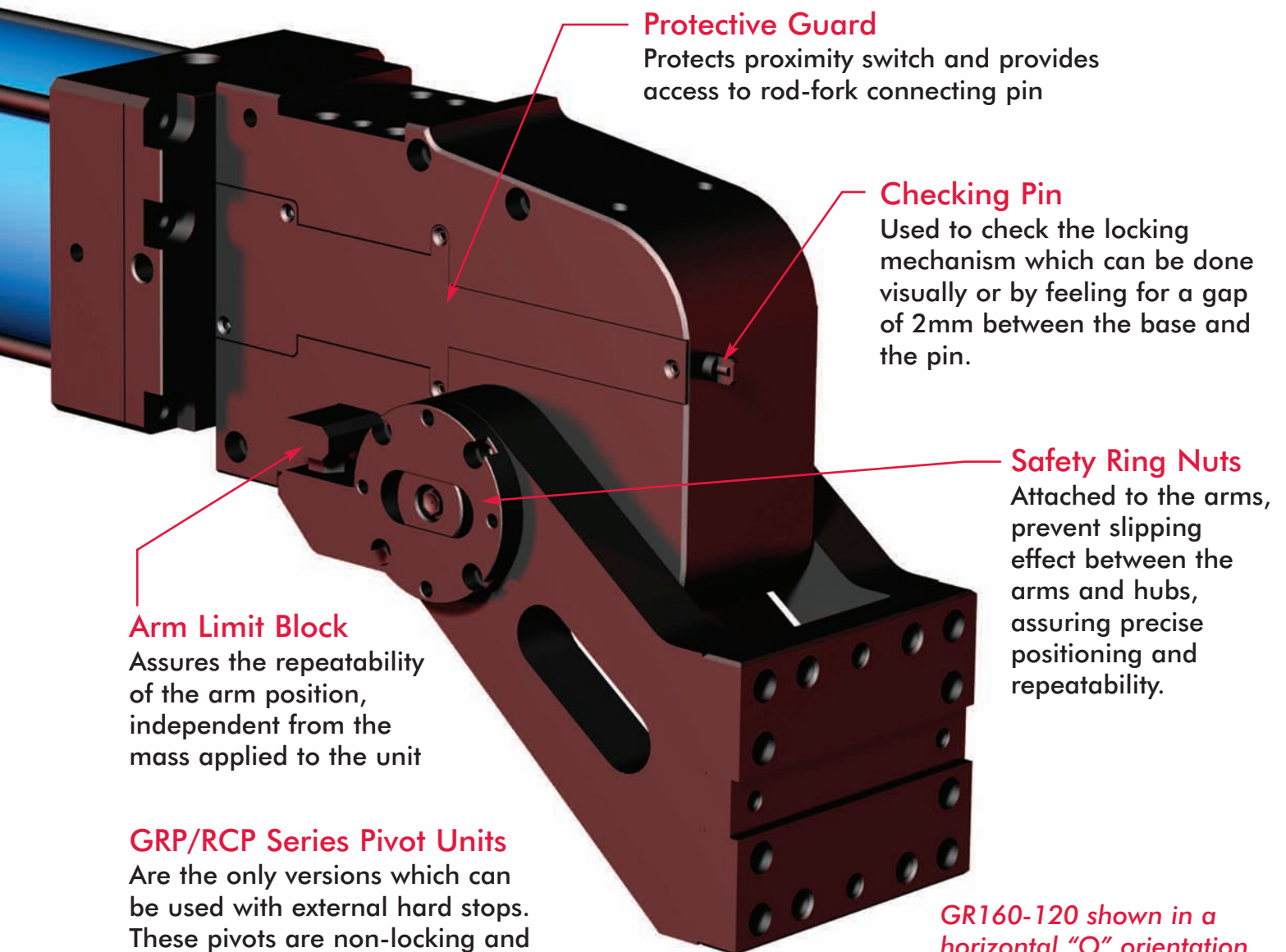
Stops movement when air pressure is lost.

## GR and RC Series Medium Duty Pivot Units

Features and Benefits

### Available in three different arm opening angles

45°, 90° and 120° arm opening angles are available in both the horizontal and vertical mount orientation. Both mounting orientations can also be ordered with an inverted mounting bracket.



#### Protective Guard

Protects proximity switch and provides access to rod-fork connecting pin

#### Checking Pin

Used to check the locking mechanism which can be done visually or by feeling for a gap of 2mm between the base and the pin.

#### Safety Ring Nuts

Attached to the arms, prevent slipping effect between the arms and hubs, assuring precise positioning and repeatability.

#### Arm Limit Block

Assures the repeatability of the arm position, independent from the mass applied to the unit

### GRP/RCP Series Pivot Units

Are the only versions which can be used with external hard stops. These pivots are non-locking and shimmable

*GR160-120 shown in a horizontal "O" orientation*

GR and RC Series Medium Duty Pivot Units  
Ordering Information

**GR**

**160**

**120**

**V**

**PNEUMATIC PIVOT MODEL**

**GR** = GR SERIES PIVOT UNITS  
(HYDRAULIC MOTION CONTROL  
WITH BRAKING FEATURE)

**\*GRP** = GR SERIES PIVOT UNITS  
**NON LOCKING VERSION**  
(HYDRAULIC MOTION CONTROL  
WITH BRAKING FEATURE)

**RC** = RC SERIES PIVOT UNITS  
(HYDRAULIC MOTION CONTROL  
WITHOUT BRAKING FEATURE)

**\*RCP** = RC SERIES PIVOT UNITS  
**NON LOCKING VERSION**  
(HYDRAULIC MOTION CONTROL  
WITHOUT BRAKING FEATURE)

**CYLINDER OPTIONS**

**100** = 100MM BORE CYLINDER

**125** = 125MM BORE CYLINDER

**160** = 160MM BORE CYLINDER

**200** = 200MM BORE CYLINDER

**OPENING ANGLE**

**45** = 45°

**90** = 90°

**120** = 120°

**ORIENTATION**

**O** = HORIZONTAL

**V** = VERTICAL

**O/LS** = INVERTED HORIZONTAL

**V/LS** = INVERTED VERTICAL

**\*ONLY RCP AND GRP PIVOT UNITS  
CAN BE USED WITH EXTERNAL HARD  
STOPS AND SHIMMING**

GR and RC Series Medium Duty Pivot Units  
Ordering Information

**PX**

**0**

**N**

**X**

**CYLINDER POSITION**  
(SEE BELOW)

- X** = CYLINDER POSITION X
- Y** = CYLINDER POSITION Y
- W** = CYLINDER POSITION W
- Z** = CYLINDER POSITION Z

**PORT TYPE**

- N** = NPT PORTS
- G** = G PORT

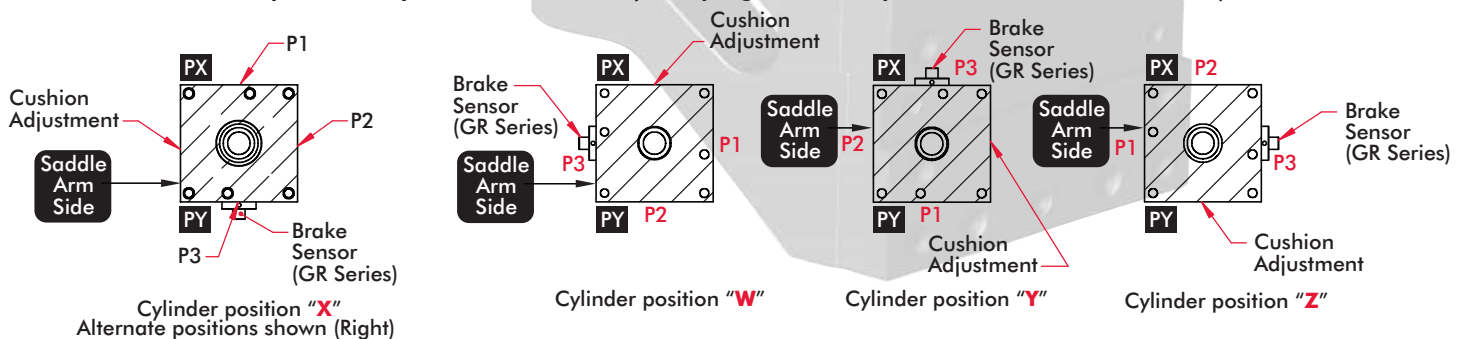
**PROXIMITY SWITCH TYPE**

- 0** = NO PROXIMITY SWITCH
- T** = TURCK PROXIMITY SWITCH

**PROXIMITY SWITCH LOCATION (SEE BELOW)**

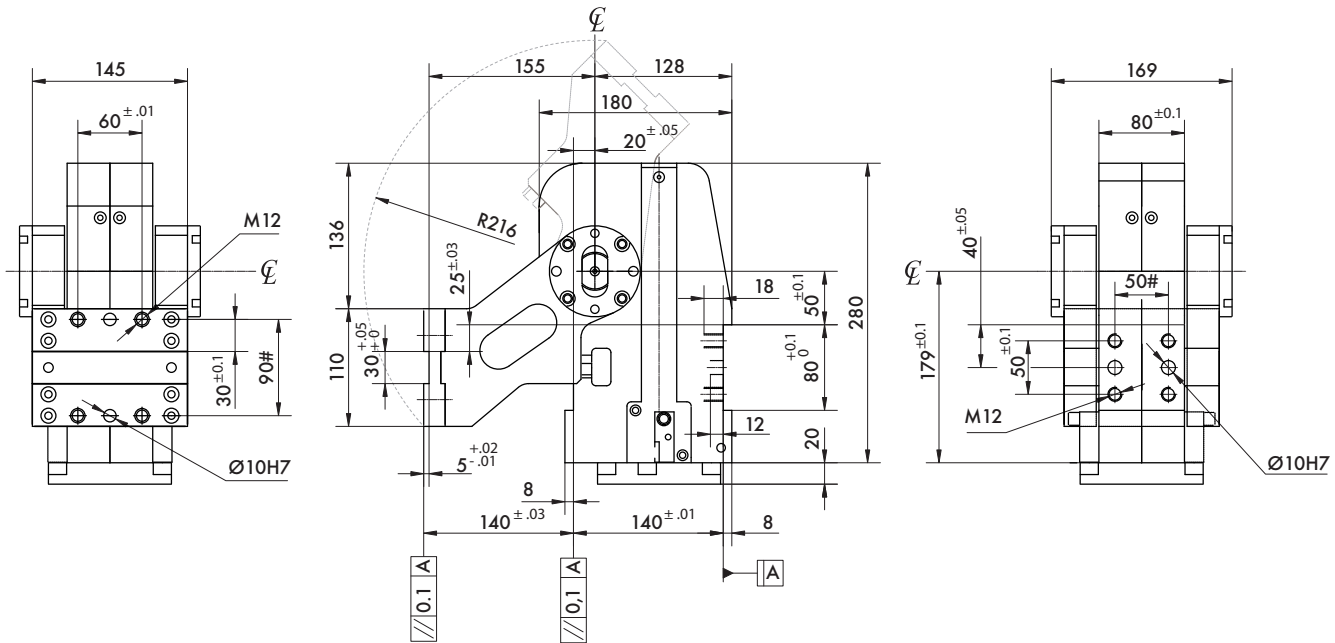
- P0** = NO PROXIMITY SWITCH
- PX** = PROXIMITY SWITCH ON THE X SIDE
- PY** = PROXIMITY SWITCH ON THE Y SIDE

GR & RC Series Optional Cylinder Position (See page 12 for port sizes and locations)

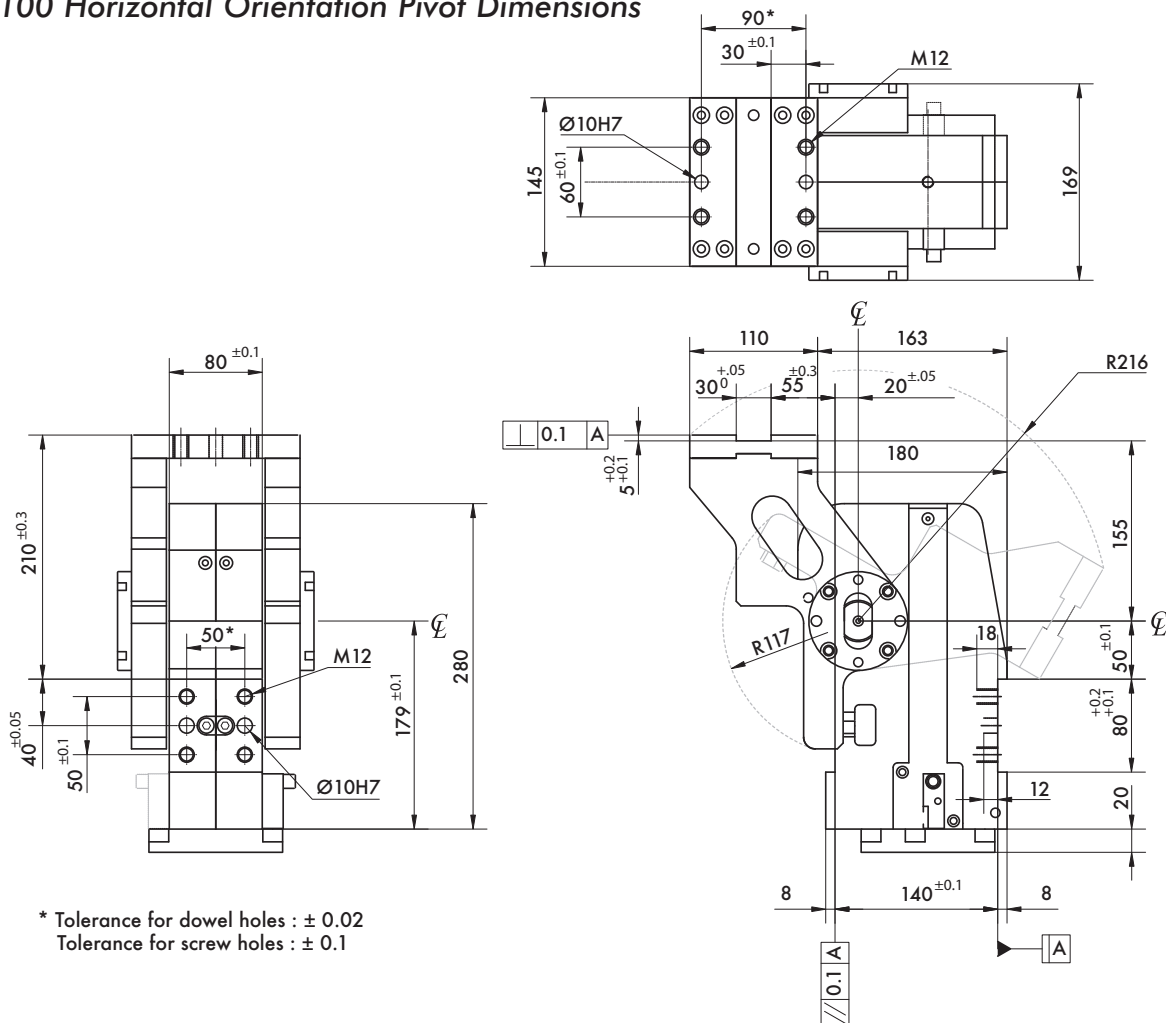


## GR and RC Series Medium Duty Pivot Units

### GR-RC 100 Vertical Orientation Pivot Dimensions



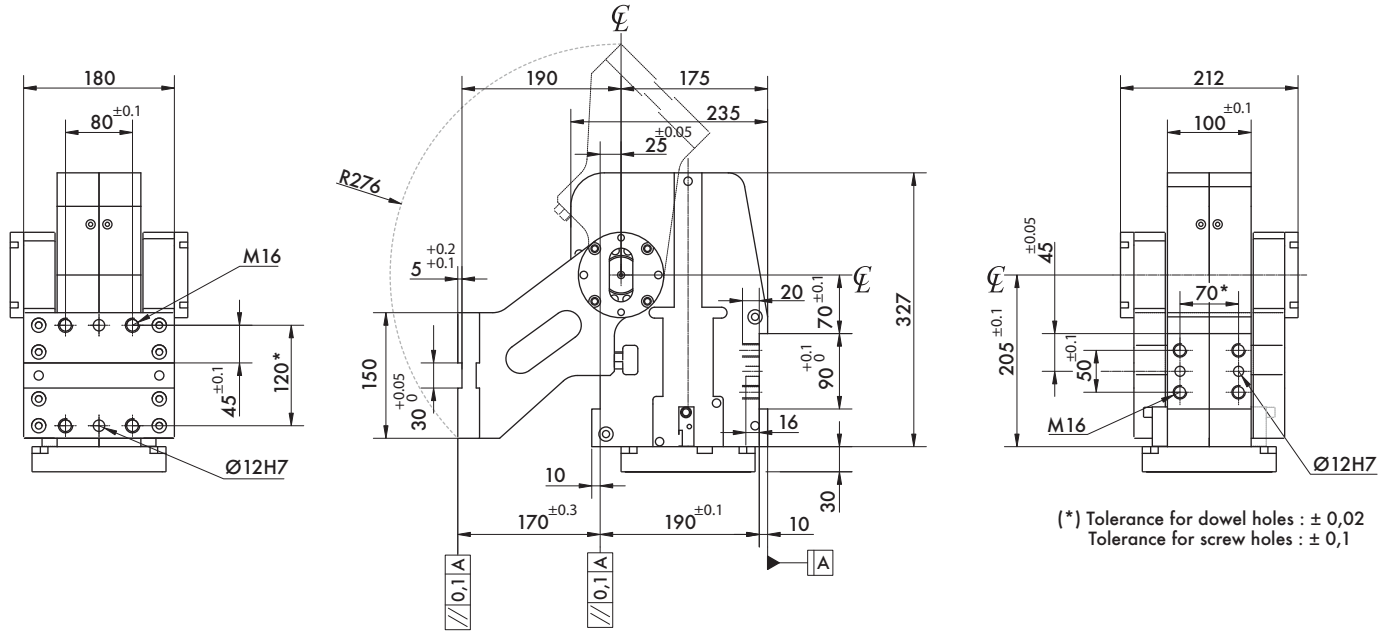
### GR-RC 100 Horizontal Orientation Pivot Dimensions



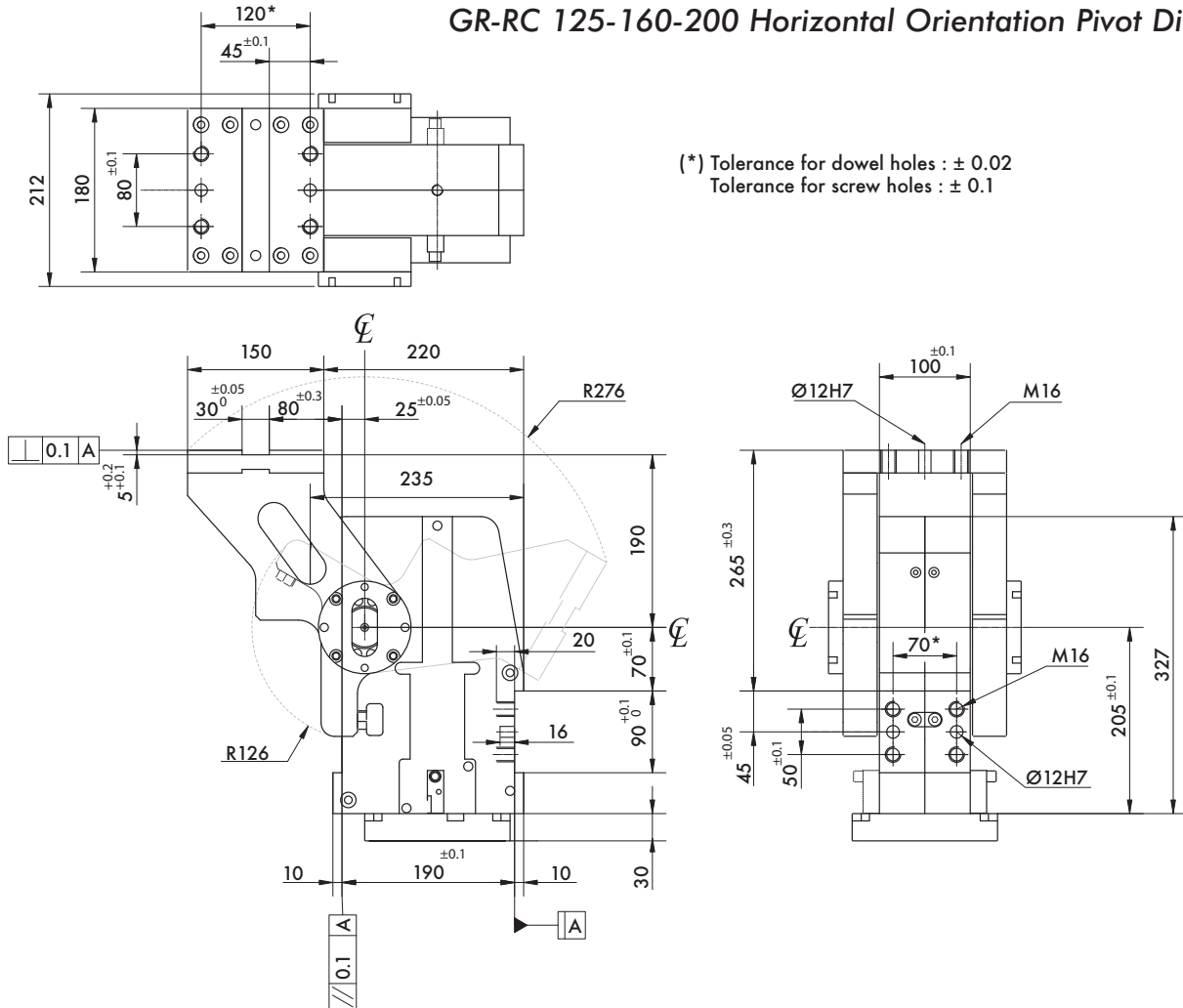
\* Tolerance for dowel holes :  $\pm 0.02$   
Tolerance for screw holes :  $\pm 0.1$



**GR and RC Series Medium Duty Pivot Units**  
**GR-RC 125-160-200 Vertical Orientation Pivot Dimensions**

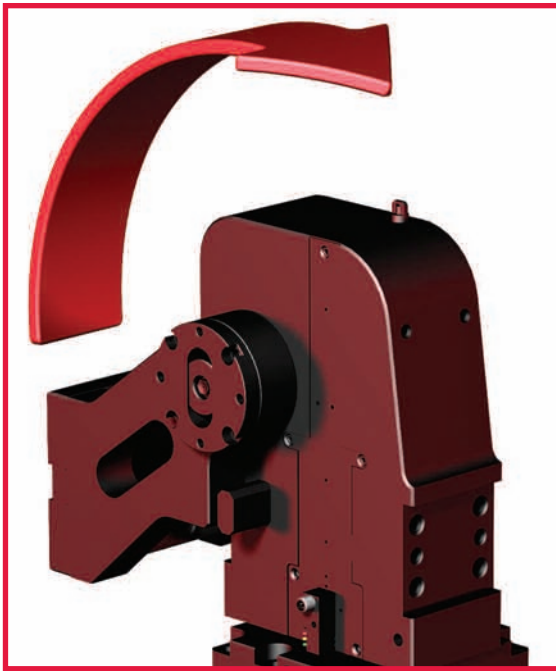


**GR-RC 125-160-200 Horizontal Orientation Pivot Dimensions**



## GR and RC Series Medium Duty Pivot Units

### Arm Opening Angle and Saddle Movement



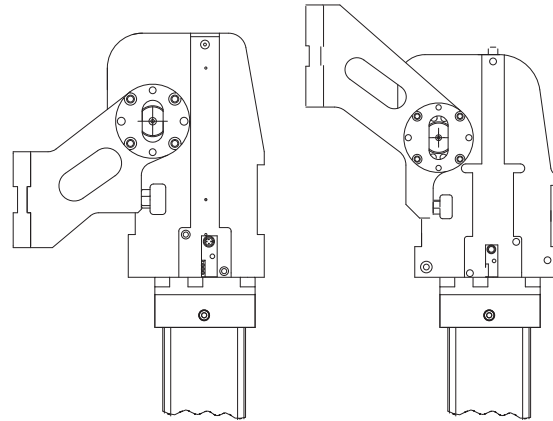
### Vertical Saddle Orientation

Arm opening angles offered:

45° Arm Opening Angle

90° Arm Opening Angle

120° Arm Opening Angle



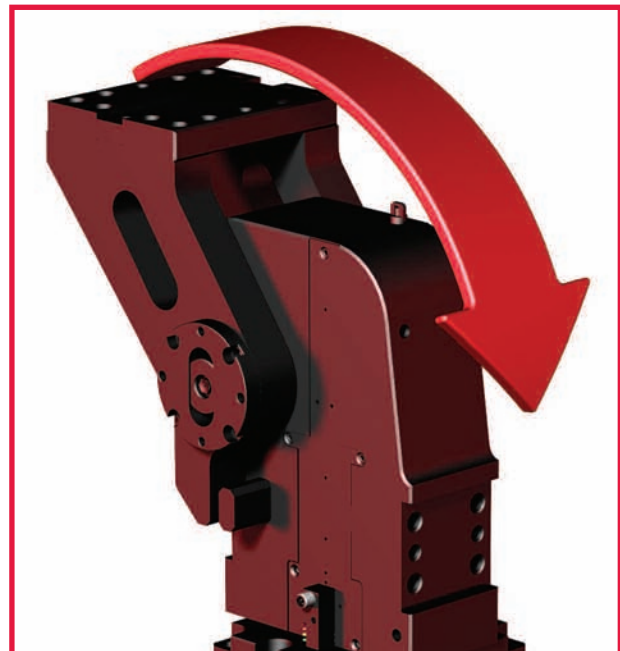
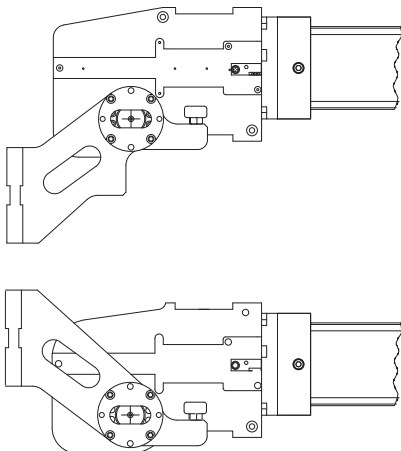
### Horizontal Saddle Orientation

Arm opening angles offered:

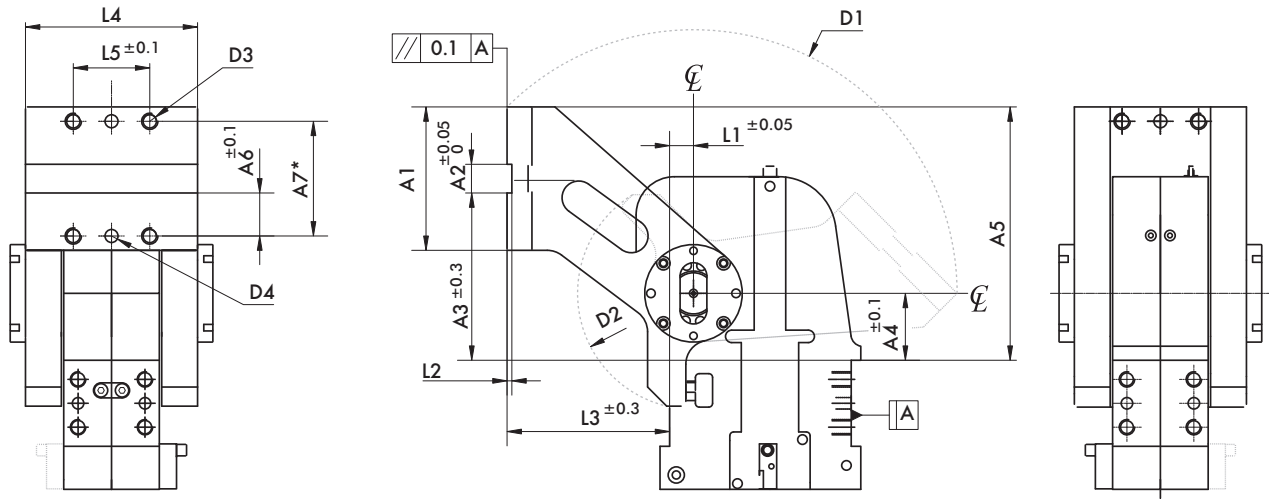
45° Arm Opening Angle

90° Arm Opening Angle

120° Arm Opening Angle

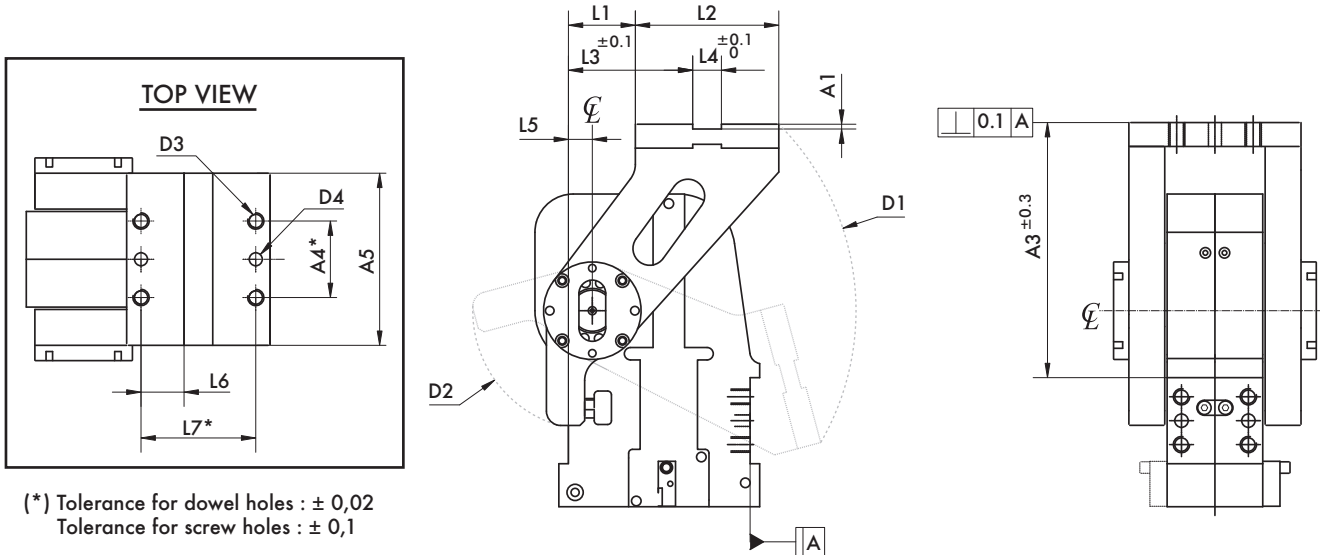


GR and RC Series Medium Duty Pivot Units  
Type "LS" Vertical Orientation Dimensions



MODEL	A1	A2	A3	A4	A5	A6	A7	L1	L2	L3	L4	L5	D1	D2	D3	D4 H7	Max. opening angle
GR/RC100...V/LS	110	30	125	50	195	30	90	20	5	140	145	60	~	~	M12	Ø10	120°
GR/RC125...V/LS																	
GR/RC160...V/LS	150	30	175	70	265	45	120	25	5	170	180	80	276	126	M16	Ø12	
GR/RC200...V/LS																	

TOP VIEW DIRECTION Type "LS" Horizontal Orientation Dimensions

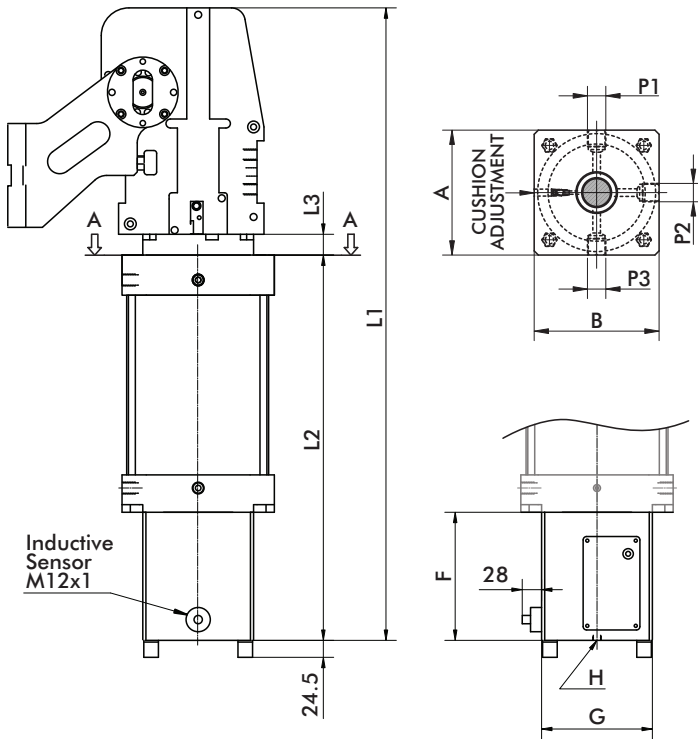


(\*) Tolerance for dowel holes : ± 0,02  
Tolerance for screw holes : ± 0,1

MODEL	A1	A2	A3	A4	A5	L1	L2	L3	L4	L5	L6	L7	D1	D2	D3	D4 H7	Max. opening angle
GR/RC100...O/LS	5	50	210	60	145	55	110	95	30	20	30	90	216	117	M12	Ø10	90°
GR/RC125...O/LS																	80°
GR/RC160...O/LS	5	70	265	80	180	70	150	130	30	25	45	120	276	126	M16	Ø12	
GR/RC200...O/LS																	

## GR and RC Series Medium Duty Pivot Units

### GR Series Cylinder Dimensions

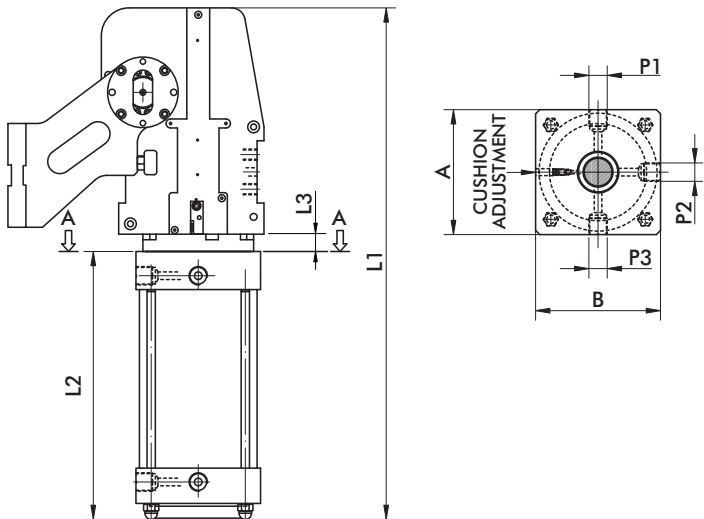


GR MODEL	L1	L2	L3	A - B	P3	P1 - P2	Weight
GR100-45°	683.5	383.5	20	115	1/2" G	1/2" G or 1/2" NPT	36 kg [80 lb]
GR100-90°	728.5	428.5					
GR100-120°	758.0	458.0	25	160	1/2" G	1/2" G or 1/2" NPT	80 kg [176 lb]
GR125-45°	818.0	466.0					
GR125-90°	867.0	515.0	28	180	3/4" G	3/4" G or 3/4" NPT	95 kg [209 lb]
GR125-120°	895.0	543.0					
GR160-45°	827.0	472.0					
GR160-90°	876.0	521.0	30	220	3/4" G	3/4" G or 3/4" NPT	103 kg [226 lb]
GR160-120°	804.0	547.0					
GR200-45°	835.0	478.0					
GR200-90°	884.0	527.0					
GR200-120°	912.0	555.0					

NOTE: "P1-P2" DEPENDANT ON ORDERING CODE

GR MODEL	F	G	H
GR100	136	115 SQ	1/4"
GR125	185	160 SQ	1/4"
GR160	185	160 SQ	1/4"
GR200	185	160 SQ	1/4"

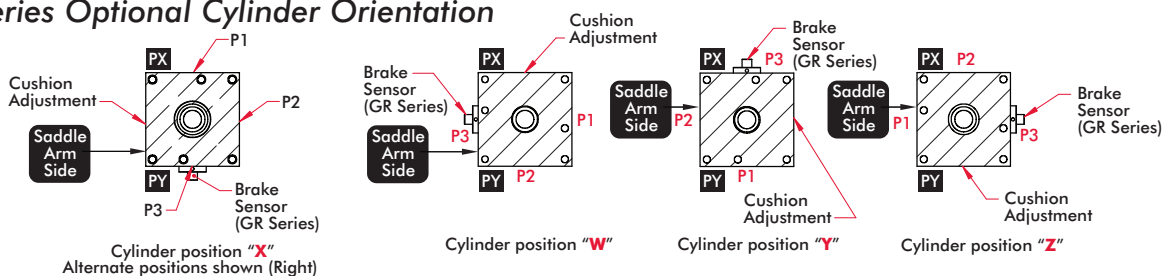
### RC Series Cylinder Dimensions



RC MODEL	L1	L2	L3	A - B	P3	P1 - P2	Weight
RC100-45°	566.5	266.5	20	115	1/2" G	1/2" G or 1/2" NPT	29 kg [64 lb]
RC100-90°	611.5	311.5					
RC100-120°	641.0	341.0	25	160	1/2" G	1/2" G or 1/2" NPT	62 kg [137 lb]
RC125-45°	656.0	304.0					
RC125-90°	705.0	353.0	28	180	3/4" G	3/4" G or 3/4" NPT	77 kg [170 lb]
RC125-120°	733.0	381.0					
RC160-45°	665.0	310.0					
RC160-90°	714.0	359.0	30	220	3/4" G	3/4" G or 3/4" NPT	85 kg [187 lb]
RC160-120°	742.0	387.0					
RC200-45°	670.0	313.0					
RC200-90°	719.0	362.0					
RC200-120°	746.5	389.5					

NOTE: "P1-P2" DEPENDANT ON ORDERING CODE

### GR & RC Series Optional Cylinder Orientation



## GR and RC Series Medium Pivot Units

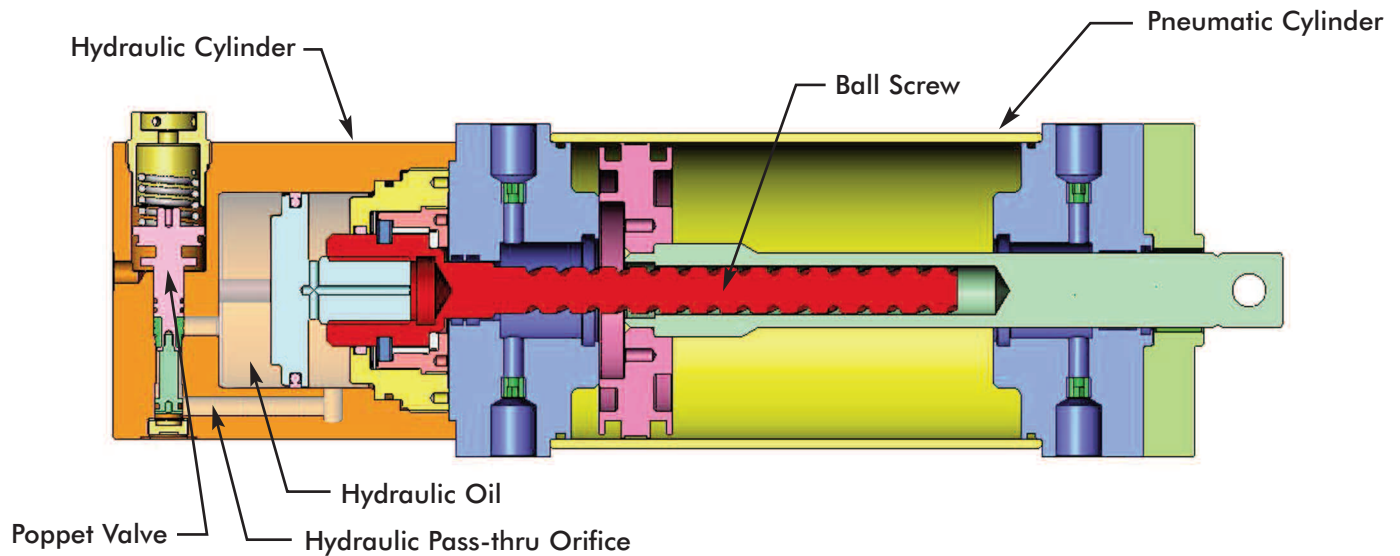
### GR Series Hydraulic-Pneumatic Cylinder - Operating Principle

The GR Series uses a system which is divided into two cylinders; a pneumatic and a hydraulic cylinder. The pneumatic cylinder controls actuation of the pivot and the hydraulic cylinder controls motion and braking.

There is a 1:4 differential between the stroke of the pneumatic cylinder and the stroke of the hydraulic cylinder. The pitch of the threaded rod on the hydraulic side is less than the pitch on the ball screw on the pneumatic side. As the pneumatic cylinder is actuated, a non-rotating piston forces this ball screw to rotate and engages the movement of the hydraulic piston. The hydraulic piston cannot move until a poppet valve is engaged to allow oil to flow from one side of the piston to the other. If the poppet valve is not released, the brake is engaged.

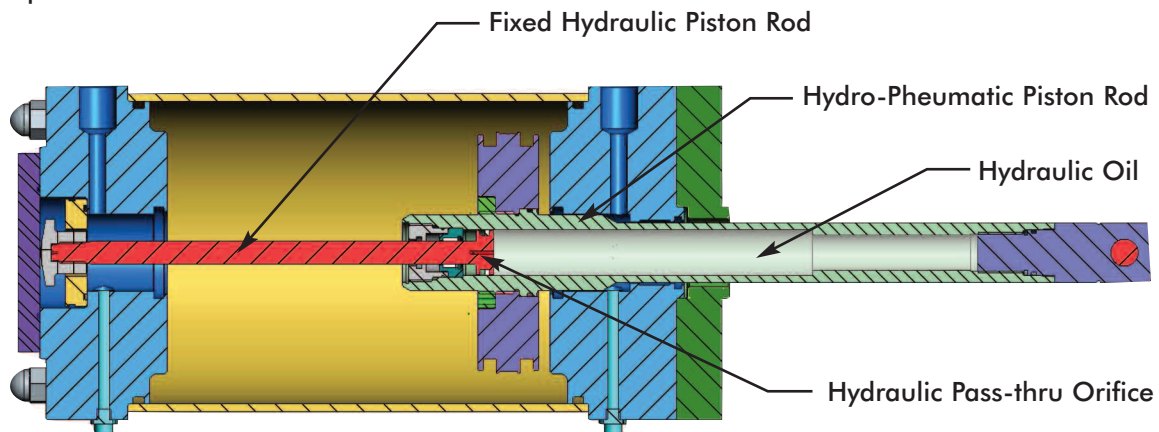
The flow of oil from one side to the other is also controlled by an adjustable orifice. This orifice provides a dampening effect on the movement of the hydraulic piston and, in turn, the pneumatic actuator.

Please Note: The brake is not intended to be engaged on every cycle. It should be piped to remain open during normal operation and engaged only when air pressure to the cell has been interrupted.



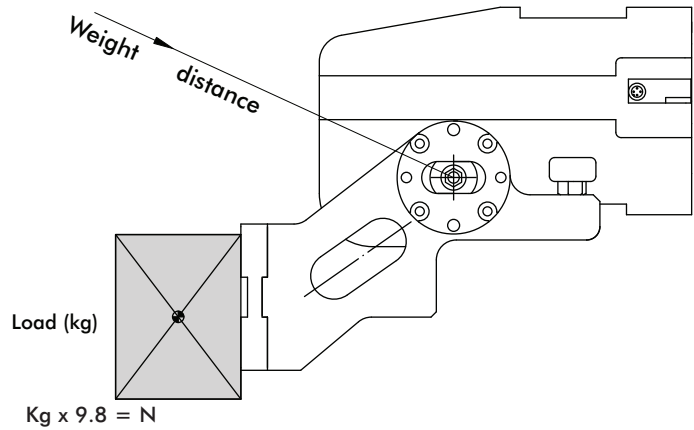
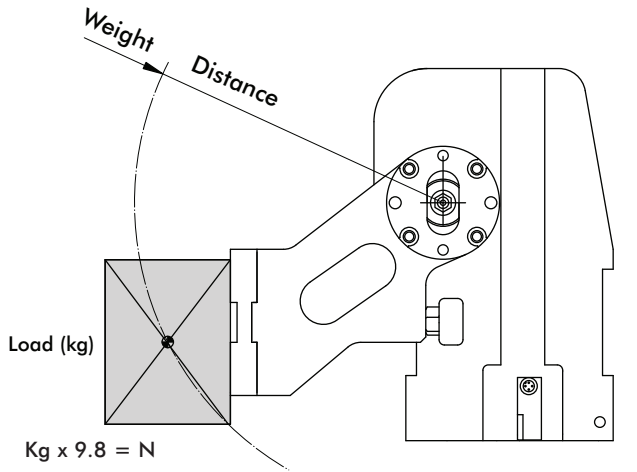
### RC Series Hydraulic-Pneumatic Cylinder - Operating Principle

The RC Series pivot unit utilizes a hydraulic rod system completely contained within the pneumatic cylinder rod to control the mass moved by the pivot unit. The system works with hydraulic oil passing through an orifice in the fixed hydraulic piston rod between chambers within the hydro-pneumatic piston rod. The system has a fixed orifice and does not need adjustment. This system provides constant speed, eliminating sudden movement and abrupt impacts at the end of stroke.



## GR and RC Series Medium Duty Pivot Units

### Maximum Torque for Weight



Model	Maximum Torque for Weight - $\leq 90^\circ$ opening					
	58psi / 4 Bar		72psi / 5 Bar		87psi / 6 Bar	
	lbf*in	N*m	lbf*in	N*m	lbf*in	N*m
GR/RC100	1062	120	1328	150	1682	190
GR/RC125	1563	180	2124	240	2567	290
GR/RC160	2832	320	3629	410	4425	500
GR/RC200	4514	510	5841	660	7081	800

Model	Maximum Torque for Weight - $> 90^\circ$ opening					
	58psi / 4 Bar		72psi / 5 Bar		87psi / 6 Bar	
	lbf*in	N*m	lbf*in	N*m	lbf*in	N*m
GR/RC100	620	70	797	90	1062	120
GR/RC125	1239	140	1593	180	2036	230
GR/RC160	2124	240	2744	310	3540	400
GR/RC200	3629	410	4602	520	5488	620

Model	Maximum Torque with Side Load for Weight					
	58psi / 4 Bar		72psi / 5 Bar		87psi / 6 Bar	
	lbf*in	N*m	lbf*in	N*m	lbf*in	N*m
GR/RC100	708	80	708	80	708	80
GR/RC125	1770	200	1770	200	1770	200
GR/RC160	1770	200	1770	200	1770	200
GR/RC200	1770	200	1770	200	1770	200

Center of Gravity to Pivot (distance in Meters [Inches]) X Tooling Weight (N [lb]) = Torque for weight (N\*m [lbf\*in])  
Distance from Center of Gravity to pivot is measured parallel to the floor

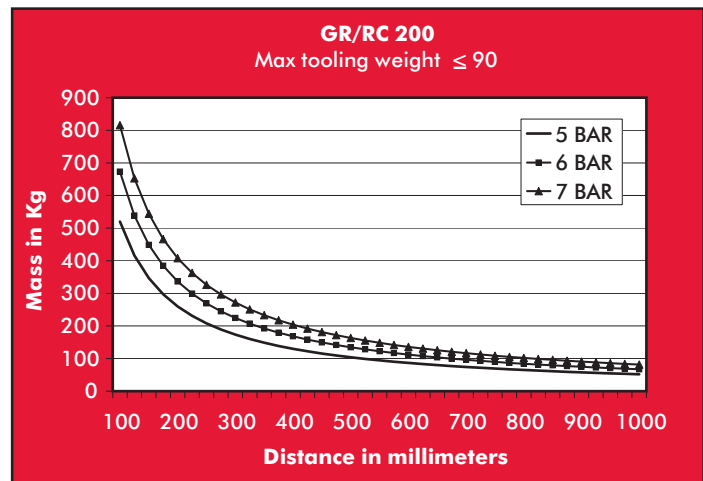
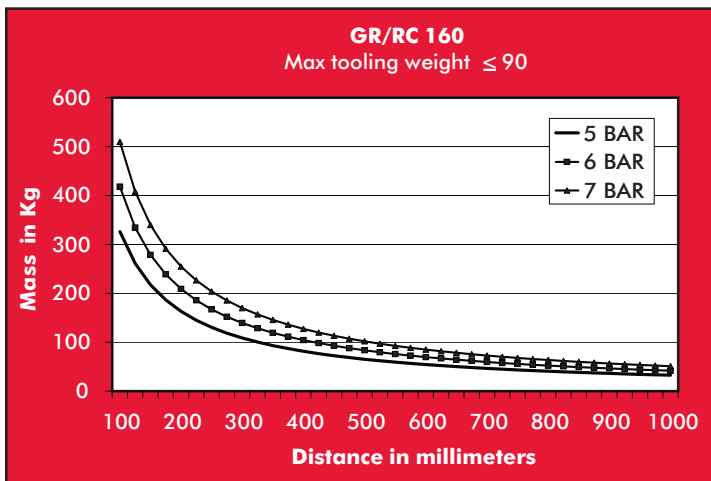
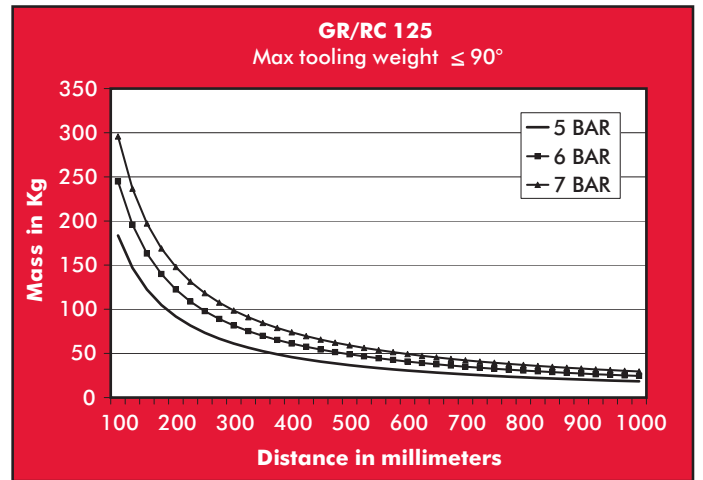
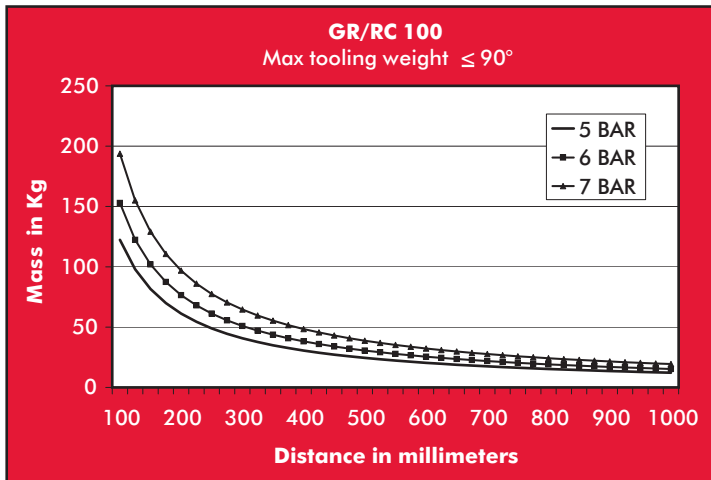
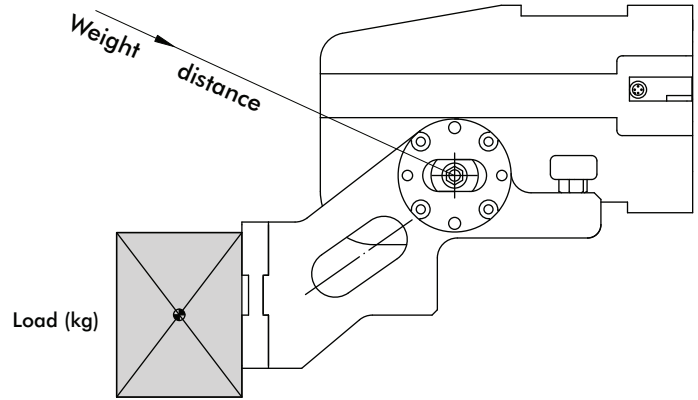
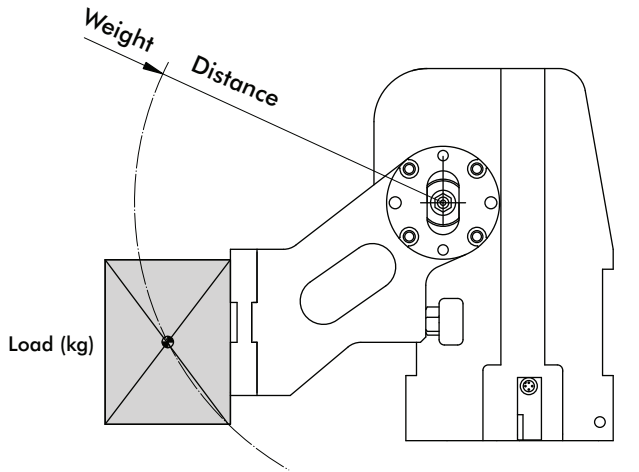
### Notes

The total torque for the application must be less than the Maximum Torque for a given PSI in the Maximum Torque for Weight charts above. For applications with a total torque greater than the Maximum Torque shown, please see RU Series Pivot Units.

Based on cycle time of 2-3 seconds. Flow controls must be used to provide this cycle time. Cushions must also be adjusted to provide deceleration to the load. Failure to control movement will severely damage unit and cause premature failure.

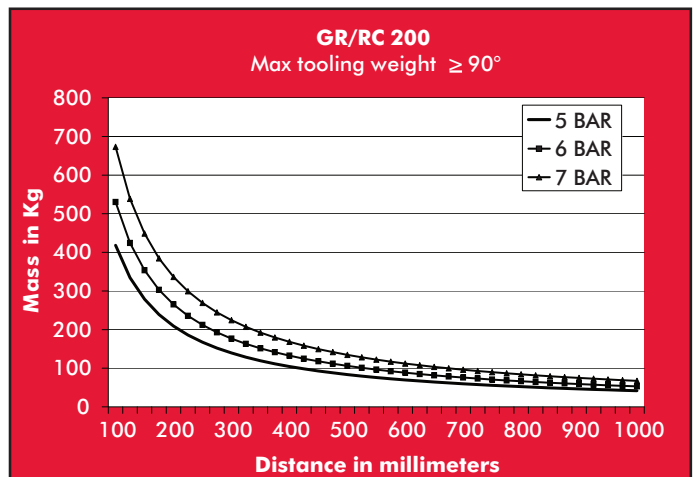
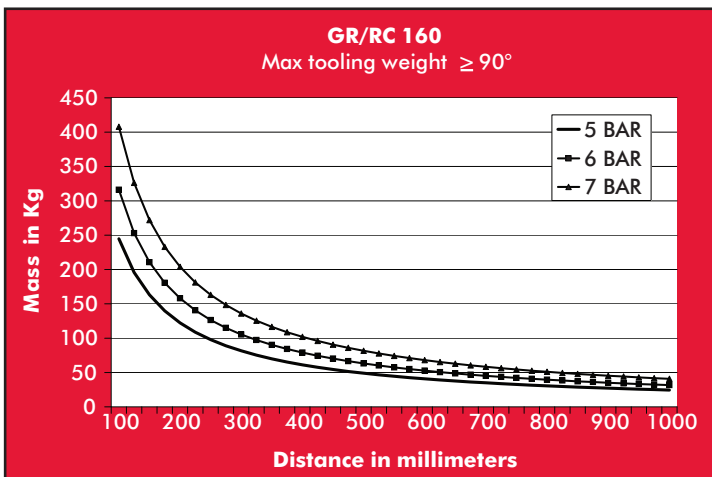
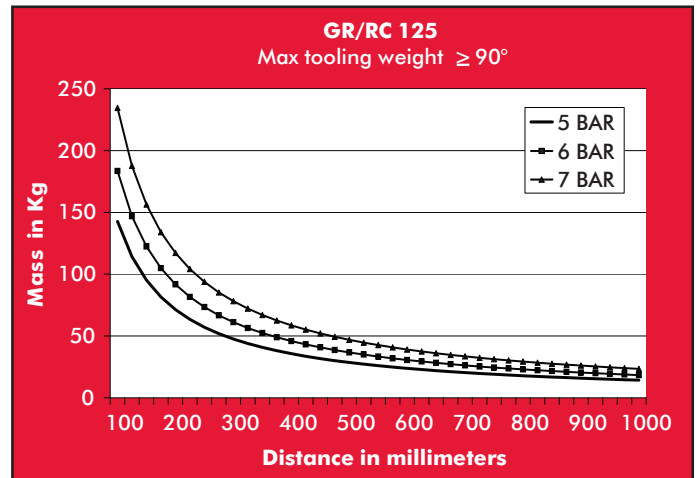
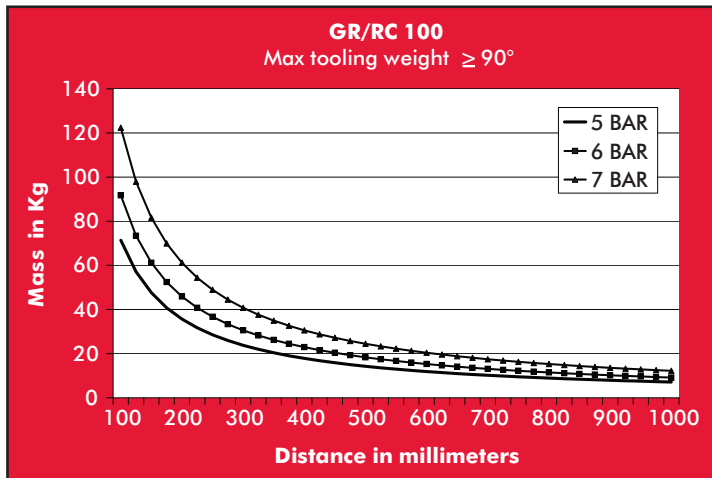
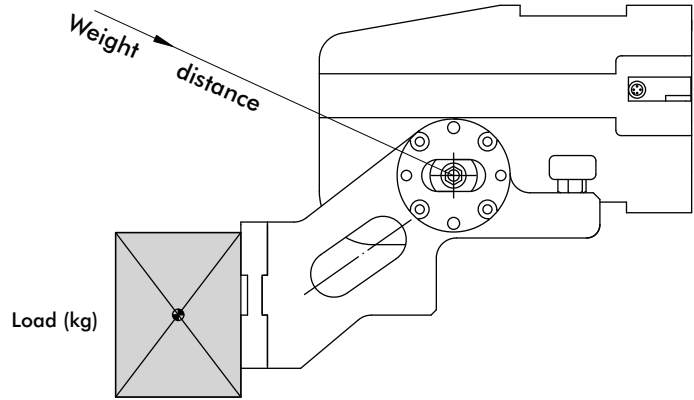
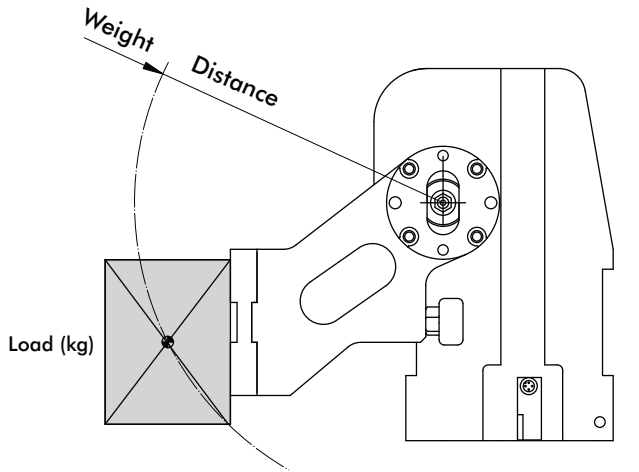
Use the following graphs to determine the maximum amount of tooling weight that is allowed. The tooling load should be placed as close to the center line of the unit as possible.

**GR and RC Series Medium Duty Pivot Units**  
 Maximum Added Tooling Weight less than 90°



## GR and RC Series Medium Duty Pivot Units

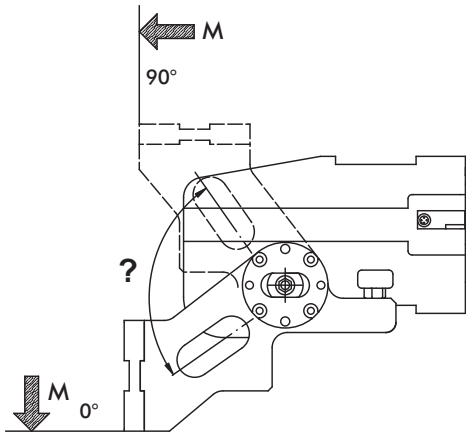
Maximum Added Tooling Weight Greater than 90°





## GR and RC Series Medium Duty Pivot Units

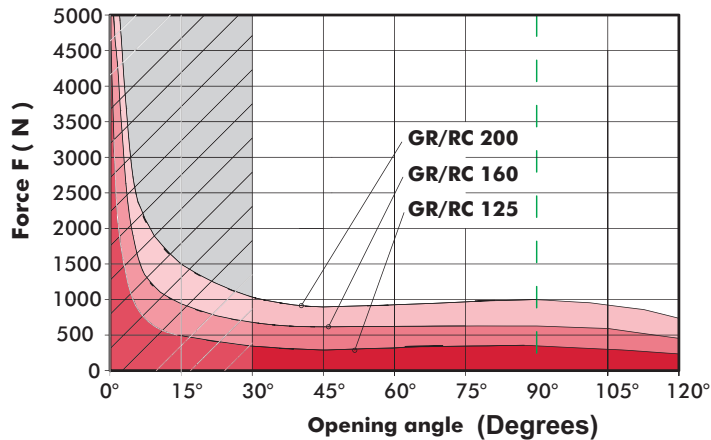
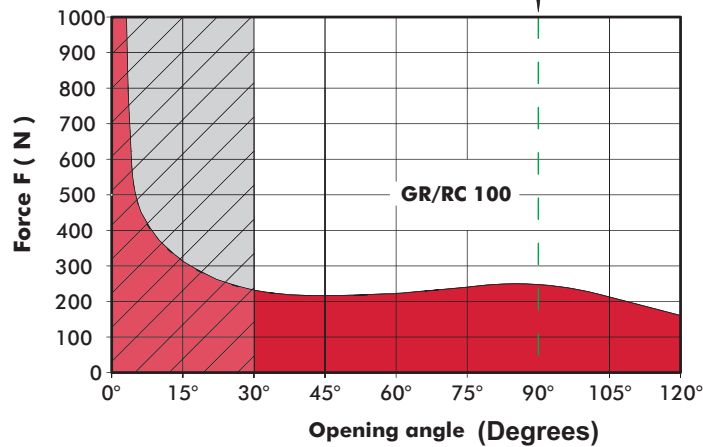
### Force Charts for Opening Angles



(Values calculated at 1 m from center of rotation)

MODEL	TORQUE WITH ARM AT 90°
GR/RC 100	240 Nm
GR/RC 125	370 Nm
GR/RC 160	630 Nm
GR/RC 200	1000 Nm

**NOTE: Values at 6 bar**



**WARNING:** Make sure that the tilting device runs a complete working cycle and reaches the angle position at 0°. (Any interference in the highlighted angle area may seriously damage both the tooling and the tilting device, as the result of the very high forces developed, as shown in the chart).

**Do not use external stops with GR/RC Series Pivot Units!**

## RU Series Heavy Duty Pivot Units

### Features and Benefits

RU Series Pivot Units are toggle-locking pivot units which can be used in horizontal, vertical, or side mounted applications

#### Hydraulic-Pneumatic Cylinder System

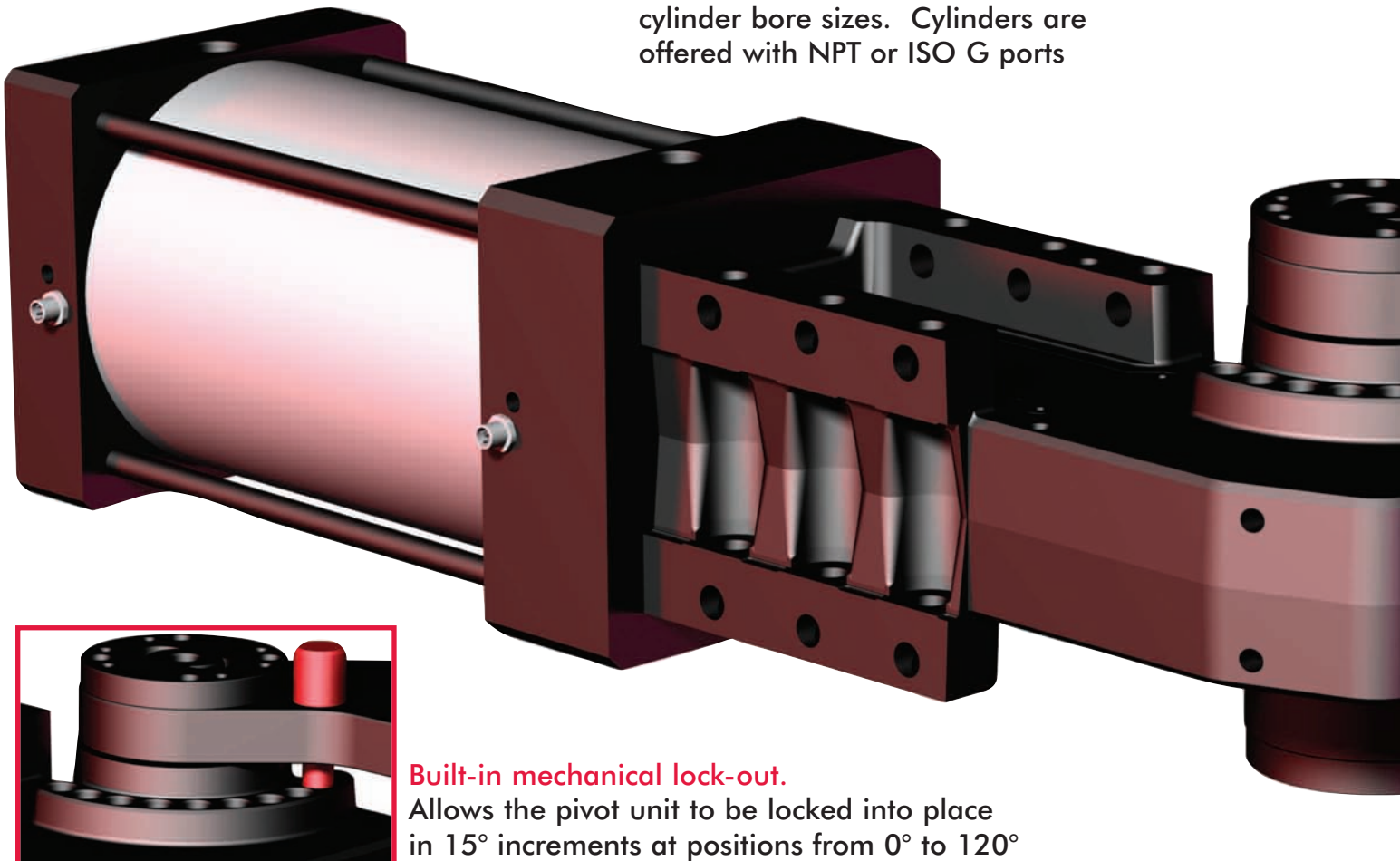
Operates in the same manner as a typical cylinder. The piston rod in the cylinder, however, utilizes a hydraulic rod system which provides smooth operation throughout the stroke of the cylinder.

#### Front, back, and side mounting surfaces

Offers the option of mounting the RU Pivot in the front or back so that you can use the pivot unit as a tip or dump unit. The RU Series pivot unit can also be mounted on its side as shown and can be used as a rotate unit.

#### Three different cylinder bore sizes

Available in 125, 160 & 200mm cylinder bore sizes. Cylinders are offered with NPT or ISO G ports



#### Built-in mechanical lock-out.

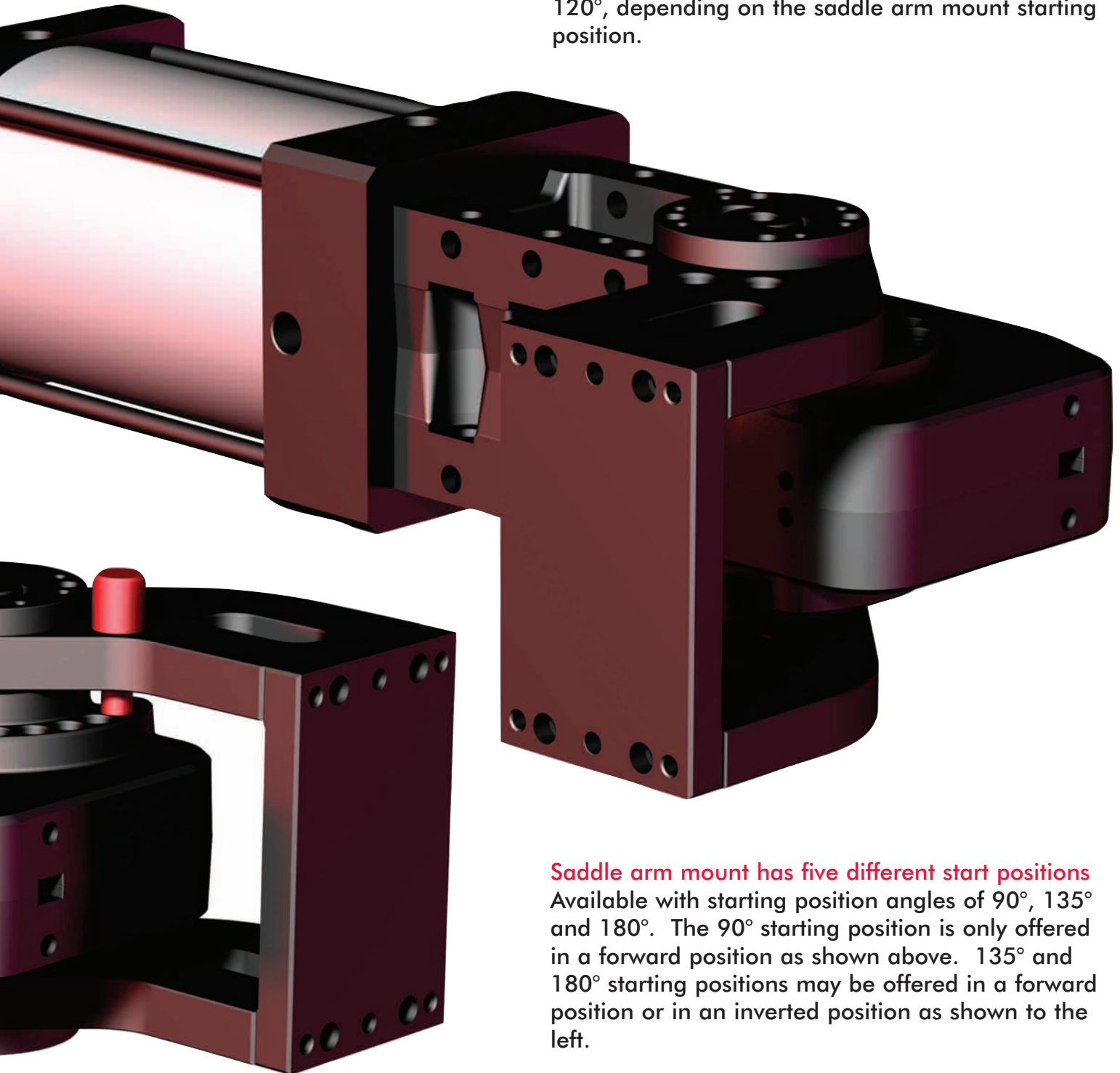
Allows the pivot unit to be locked into place in 15° increments at positions from 0° to 120°

## RU Series Heavy Duty Pivot Units

*Features and Benefits*

### Eight arm opening angles

Available in 15° increments starting from 15° up to 120°, depending on the saddle arm mount starting position.



### Saddle arm mount has five different start positions

Available with starting position angles of 90°, 135° and 180°. The 90° starting position is only offered in a forward position as shown above. 135° and 180° starting positions may be offered in a forward position or in an inverted position as shown to the left.

## RU Series Heavy Duty Pivot Units

### Ordering Information

**RU**

**PNEUMATIC PIVOT MODEL**

**RU** = RU SERIES PIVOT UNITS  
WITH TOGGLE MECHANISM

**RUP** = RU SERIES PIVOT UNITS  
(NON LOCKING VERSION)

**200**

**CYLINDER OPTIONS**

**125** = 125MM BORE CYLINDER

**160** = 160MM BORE CYLINDER

**200** = 200MM BORE CYLINDER

**90**

**OPENING ANGLE**

**15** = 15°

**30** = 30°

**45** = 45°

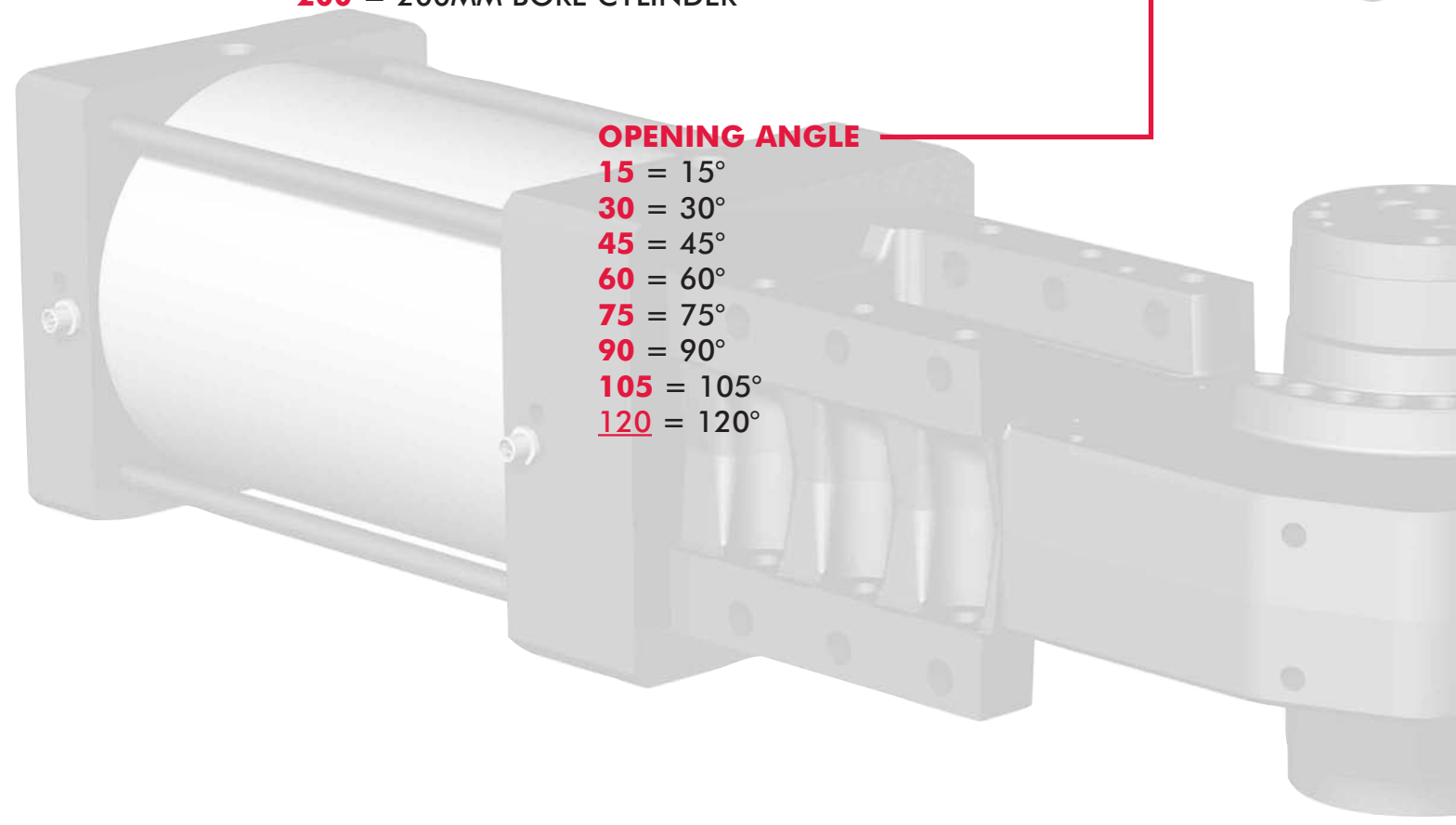
**60** = 60°

**75** = 75°

**90** = 90°

**105** = 105°

**120** = 120°



RU Series Heavy Duty Pivot Units  
Ordering Information

0090

X

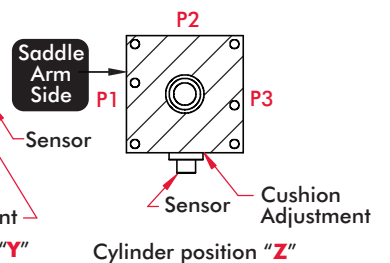
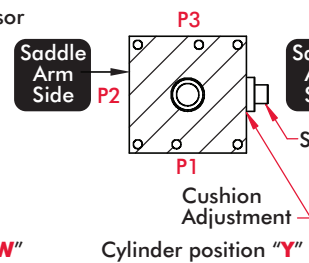
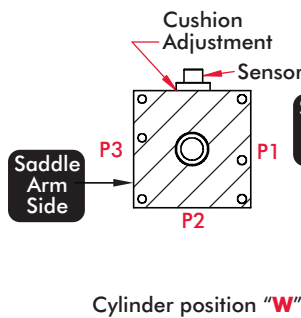
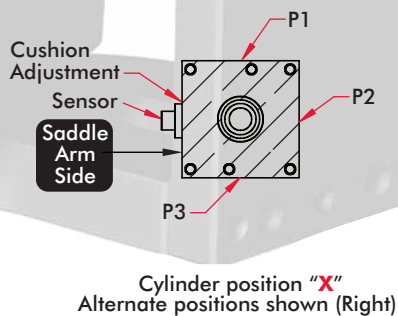
**CYLINDER POSITION**

- X** = CYLINDER POSITION X
- Y** = CYLINDER POSITION Y
- W** = CYLINDER POSITION W
- Z** = CYLINDER POSITION Z

**SADDLE MOUNT BRACKET POSITION**

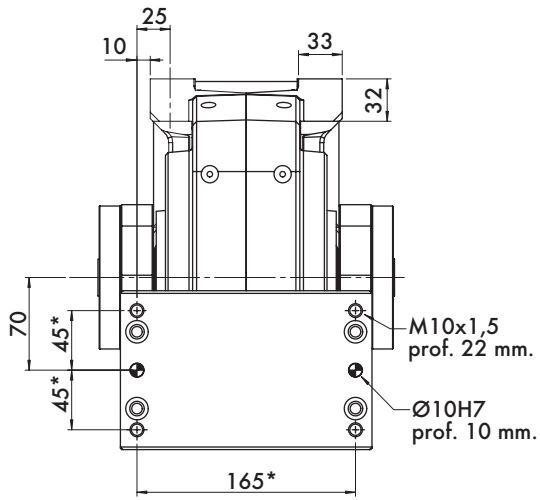
- 0000** = WITHOUT SADDLE MOUNT BRACKET
- 0090** = (120° MAXIMUM ROTATION)
- 135A** = (105° MAXIMUM ROTATION)
- 135B** = (120° MAXIMUM ROTATION)
- 180A** = (60° MAXIMUM ROTATION)
- 180B** = (120° MAXIMUM ROTATION)

RU Series Optional Cylinder Position

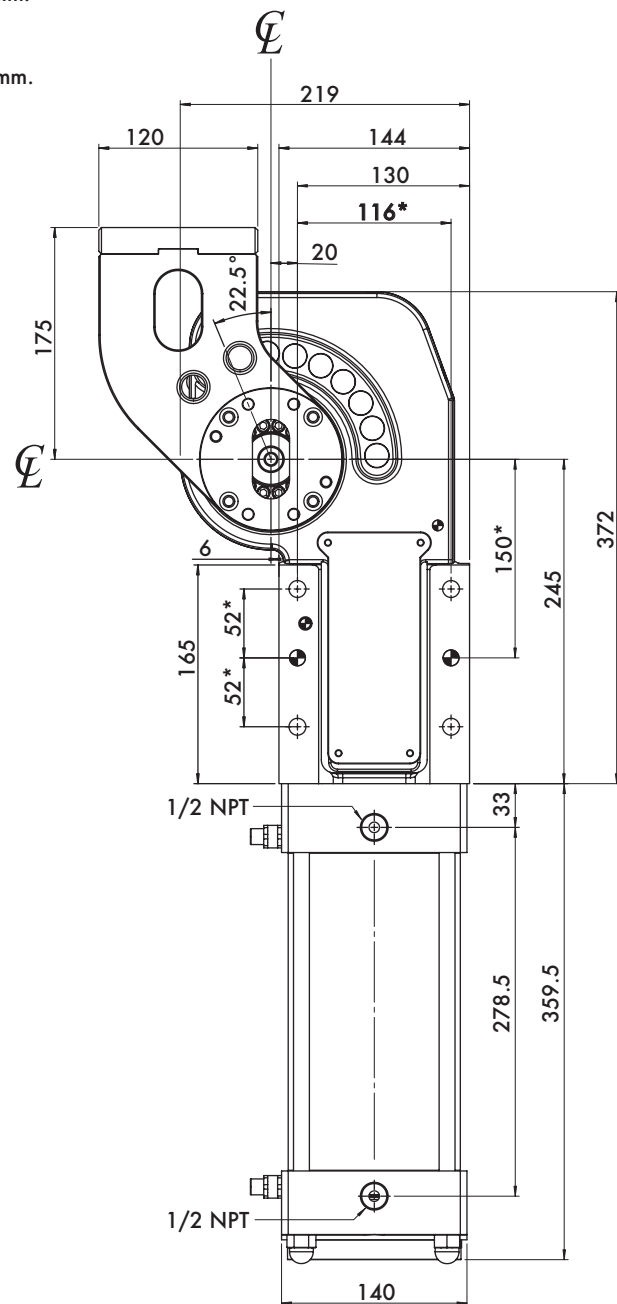
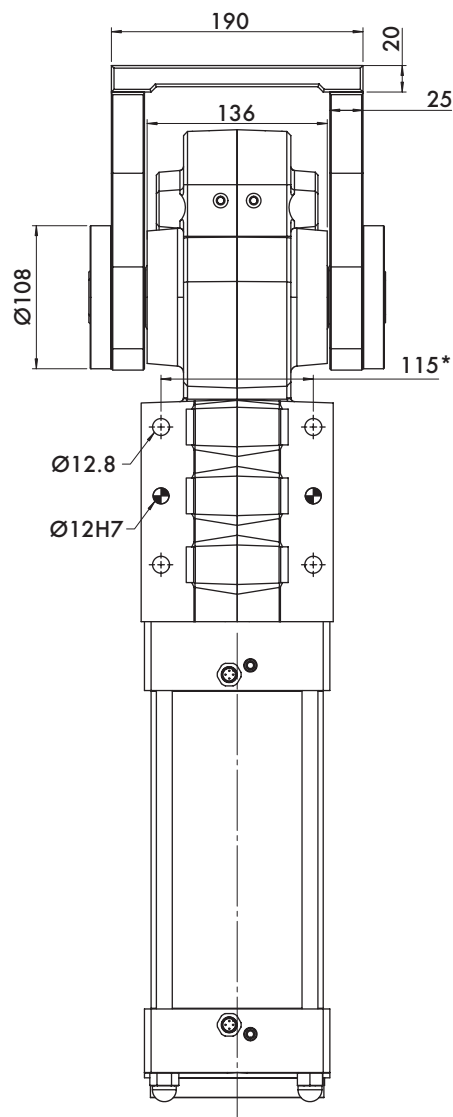


## RU Series Heavy Duty Pivot Units

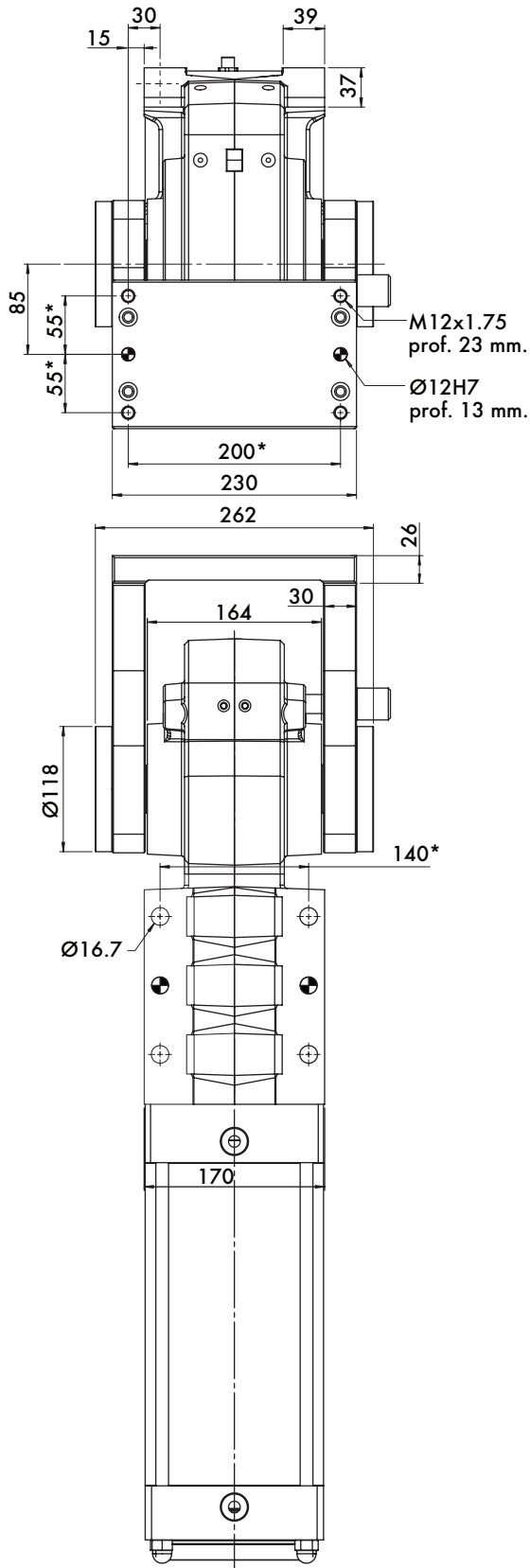
### 125mm Cylinder Bore Pivot Dimensions



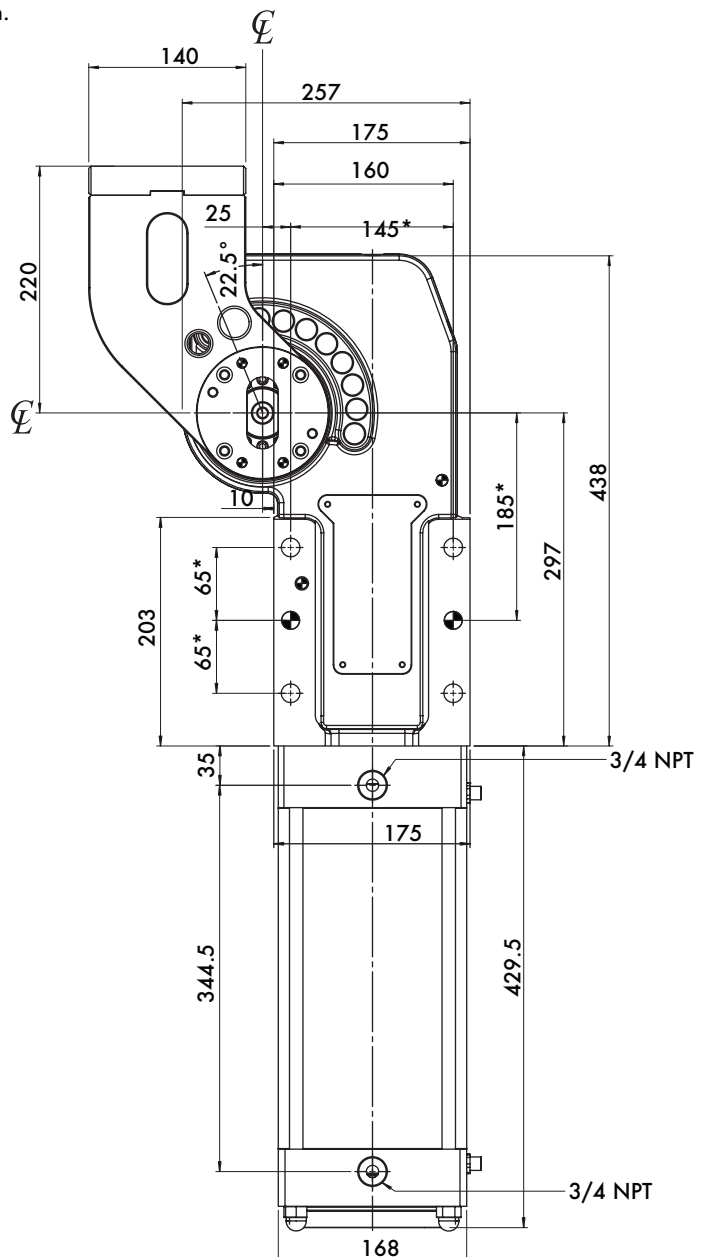
\* Tolerance for dowel holes :  $\pm 0.02$   
Tolerance for screw holes :  $\pm 0.1$



**RU Series Heavy Duty Pivot Units**  
 160mm Cylinder Bore Pivot Dimensions

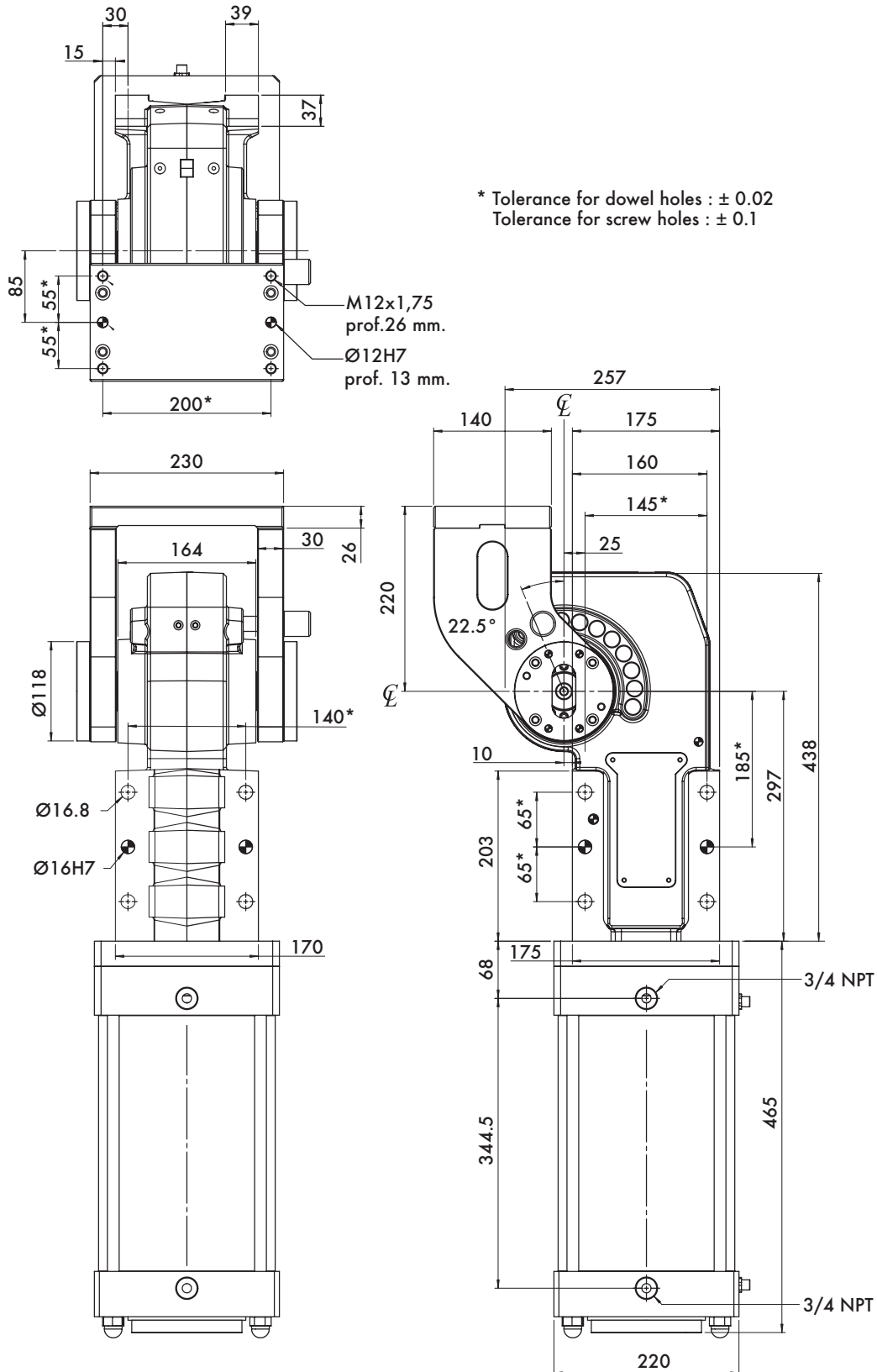


\* Tolerance for dowel holes : ± 0.02  
 Tolerance for screw holes : ± 0.1



## RU Series Heavy Duty Pivot Units

### 200mm Cylinder Bore Pivot Dimensions





**RU Series Heavy Duty Pivot Units**  
*Saddle Arm Mount Bracket Positions*

Saddle Arm Mount has five different start positions Available with starting position angles of 90°, 135° and 180°. The 90° starting position is only offered in a forward position. 135° and 180° starting positions may be offered in a forward position or in an inverted position.



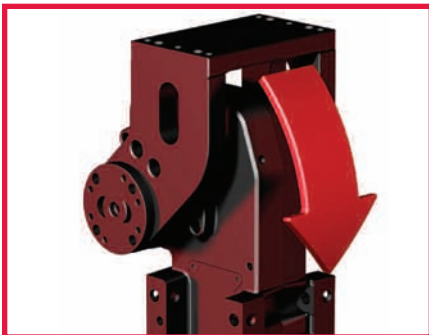
**90 Mount Style**  
*90° Forward Bracket Position*  
*120° Maximum Rotation*



**135A Mount Style**  
*135° Forward Bracket Position*  
*105° Maximum Rotation*



**135B Mount Style**  
*135° Inverted Bracket Position*  
*120° Maximum Rotation*



**180A Mount Style**  
*180° Forward Bracket Position*  
*60° Maximum Rotation*

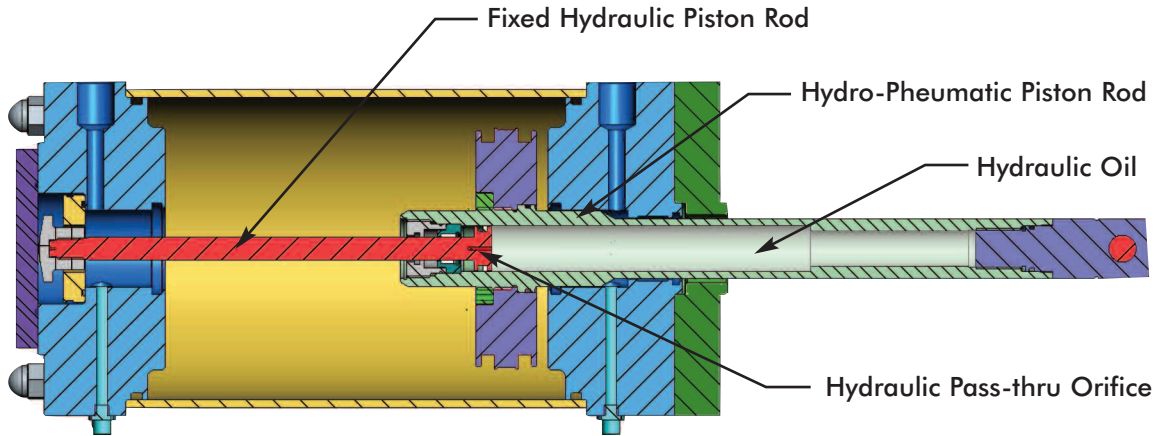


**180B Mount Style**  
*180° Inverted Bracket Position*  
*120° Maximum Rotation*

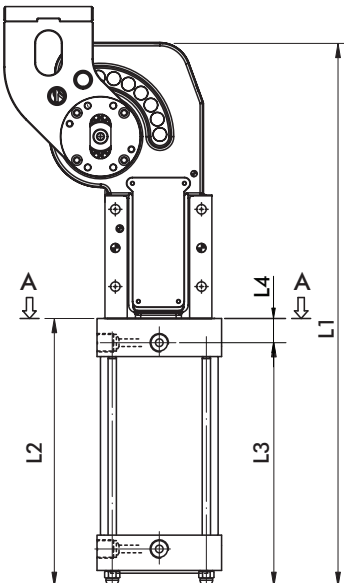
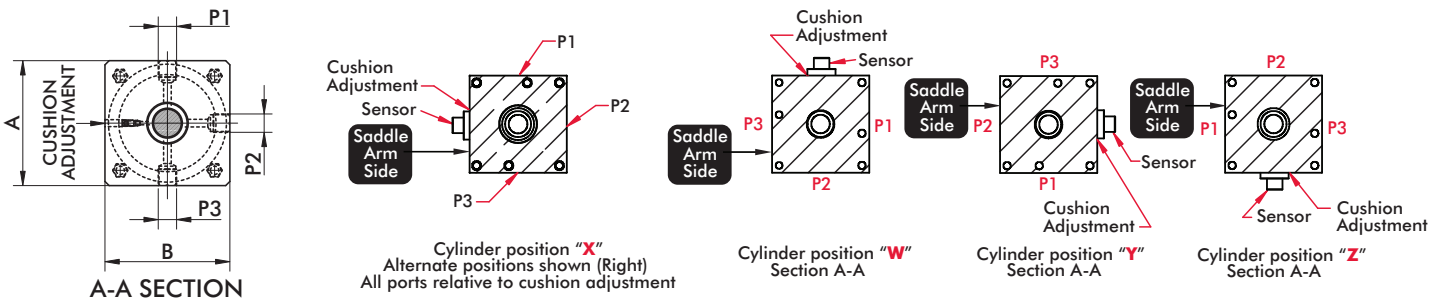
## RU Series Heavy Duty Pivot Units

### Hydraulic-Pneumatic Cylinder - Operating Principle

The RU Series pivot unit utilizes a hydraulic rod system completely contained within the pneumatic cylinder rod to control the mass moved by the pivot unit. The system works with hydraulic oil passing through an orifice in the fixed hydraulic piston rod between chambers within the hydro-pneumatic piston rod. The system has a fixed orifice and does not need adjustment. This system provides constant speed, eliminating sudden movement and abrupt impact at the end of stroke.



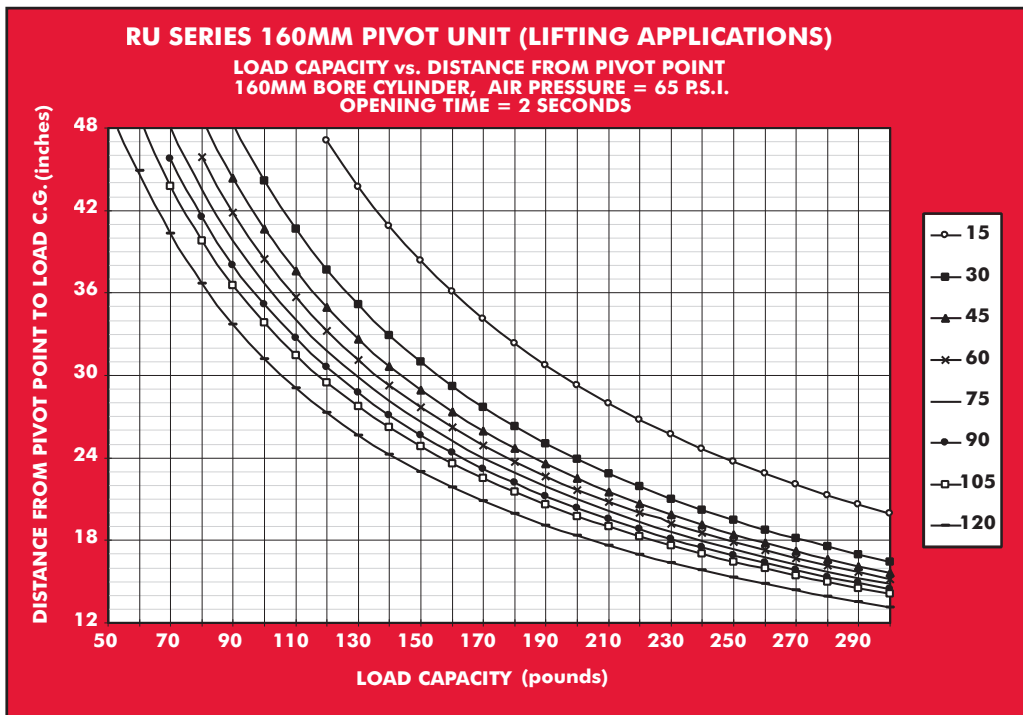
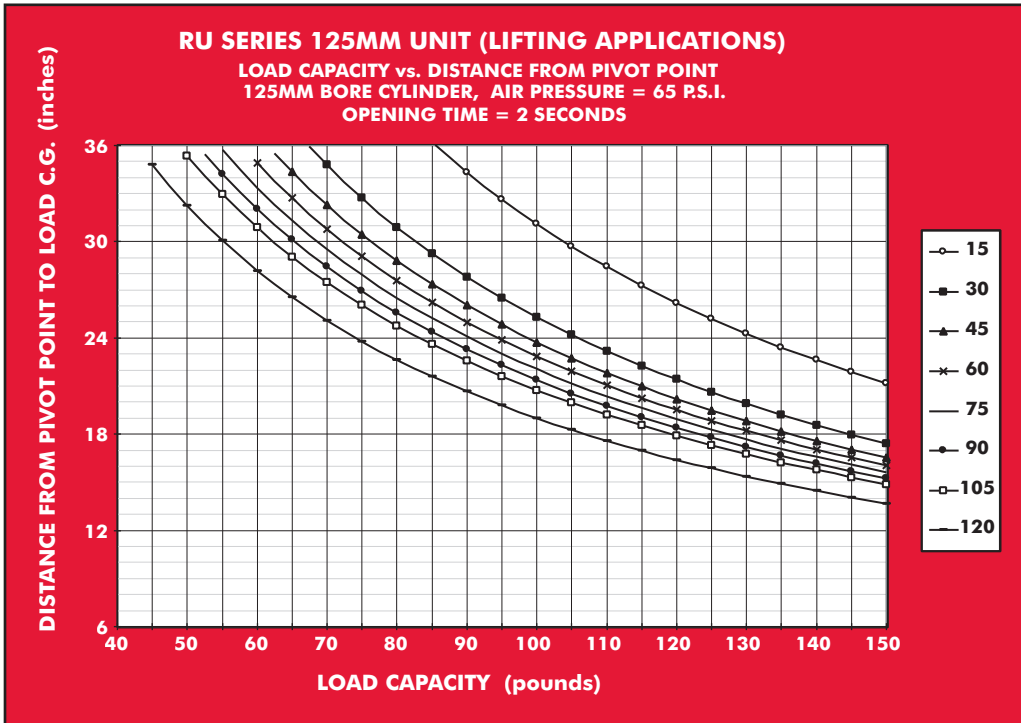
### Hydraulic-Pneumatic Cylinder - Dimensions and Cylinder Orientation



MODEL	ARM POSITION	MAX ARM OPENING	L1	L2	L3	L4	A - B	P1,P2,P3	Weight
RU125	90	120°	731.5	359.5	278.5				
RU125	135A	105°	713.5	341.5	260.5				
RU125	135B	120°	731.5	359.5	278.5	33	140	1/2" NPT	58 kg [128 lb]
RU125	180A	60°	657.5	285.5	204.5				
RU125	180B	120°	731.5	359.5	278.5				
RU160	90	120°	867.5	705	344.5				
RU160	135A	105°	849.5	733	326.5				
RU160	135B	120°	867.5	741	344.5	35	168	3/4" NPT	100 kg [220 lb]
RU160	180A	60°	793.5	665	270.5				
RU160	180B	120°	867.5	714	344.5				
RU200	90	120°	903	465	344.5				
RU200	135A	105°	885	447	326.5				
RU200	135B	120°	903	465	344.5	68	220	3/4" NPT	122 kg [269 lb]
RU200	180A	60°	829	391	270.5				
RU200	180B	120°	903	465	344.5				

**RU Series Heavy Duty Pivot Units**  
*Force Charts for Opening Angles*

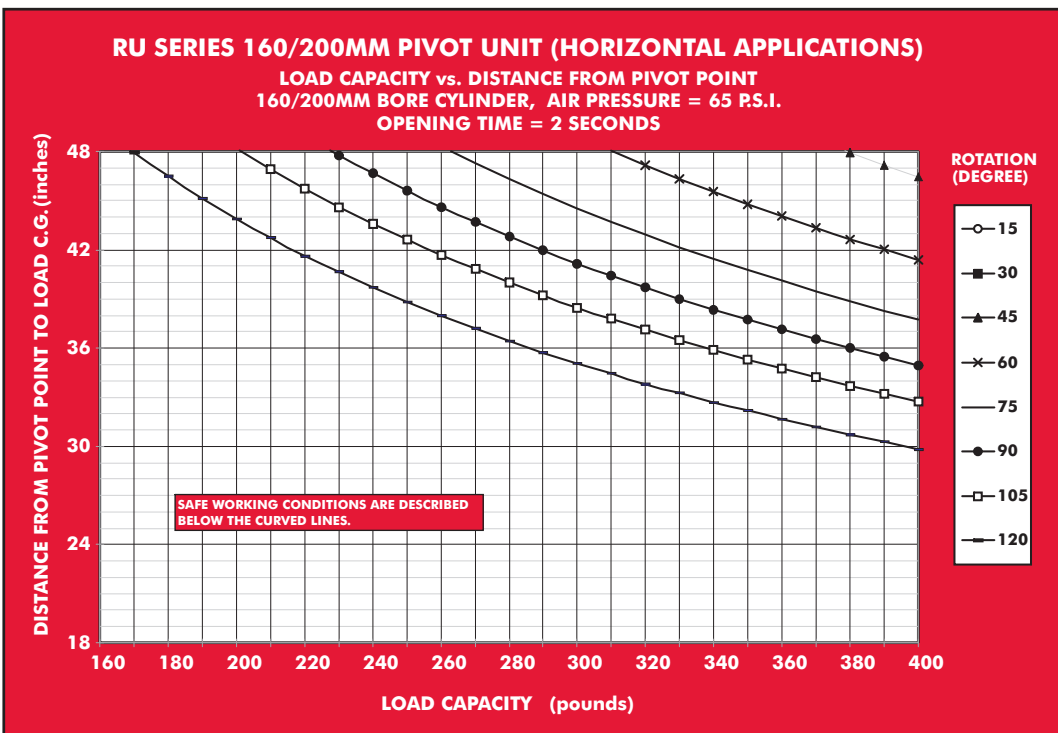
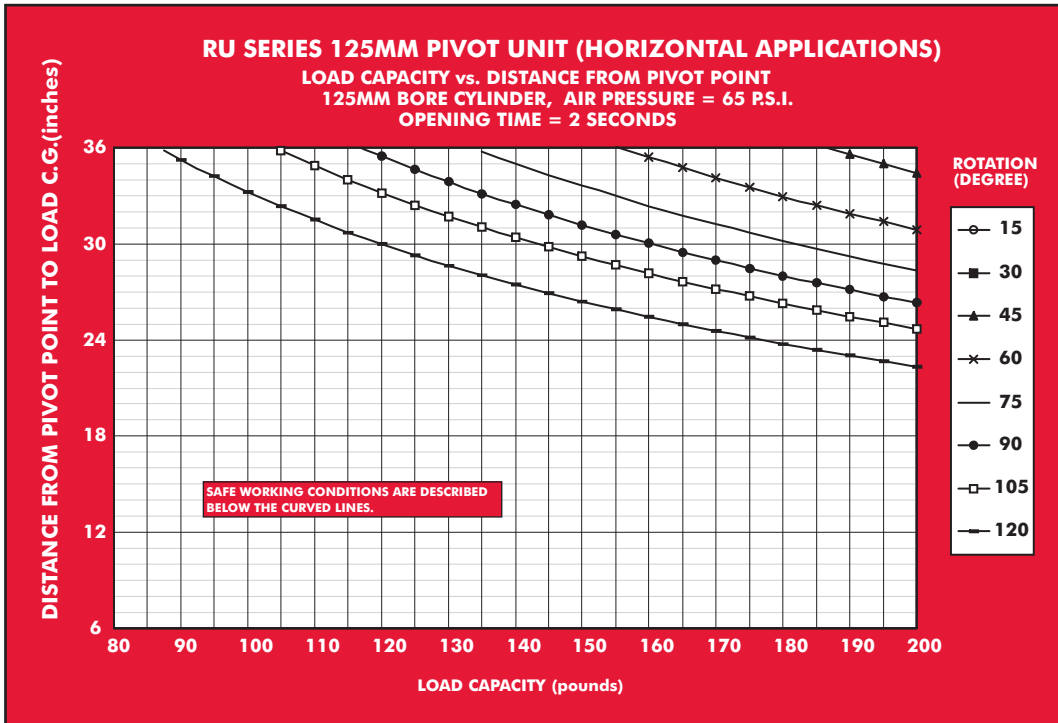
*Lifting Applications*



## RU Series Heavy Duty Pivot Units

### Force Charts for Opening Angles

#### Horizontal/Rotating Applications





## RU Series Heavy Duty Pivot Units

Notes

## PM Series Super-Duty Pivot Units

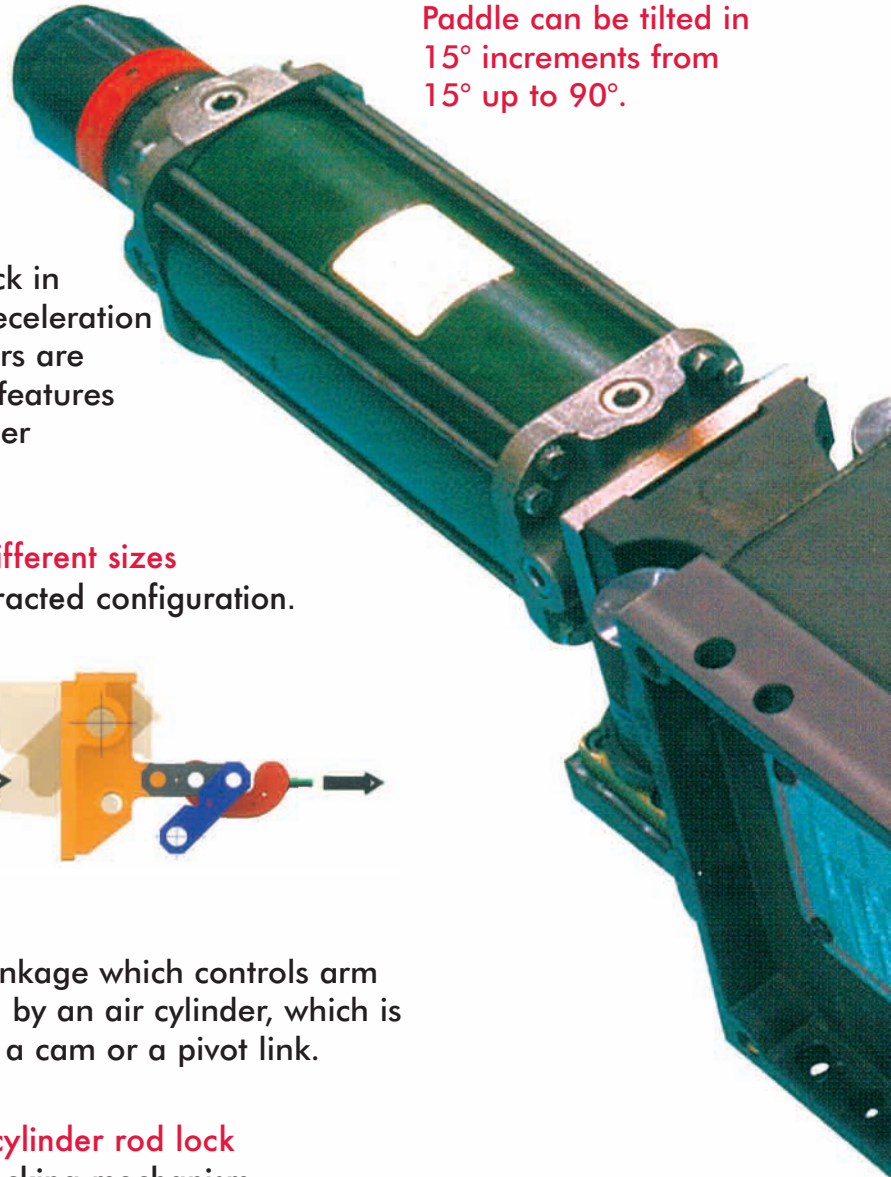
### Features and Benefits

#### Introduction

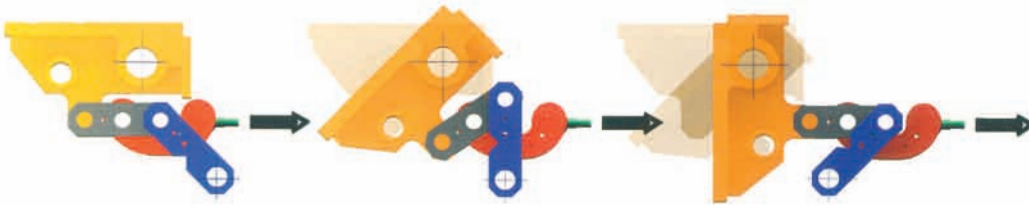
Designed to deliver reliable performance in the most demanding industrial applications, the PM Series super duty pivot units feature sealed, lube-for-life ball and roller bearings, and straight-line cylinder motions for minimal seal wear. Integral shock absorbers at both ends of the cylinder stroke are standard and further improve cylinder life while protecting tooling from shock damage. Optional cyllindicators also are offered to provide control system feedback in applications in which cylinder acceleration/deceleration is programmed. Standard pneumatic cylinders are used to simplify spare parts inventories, and features an easily accessible clevis pin for rapid cylinder replacement.

Paddle widths are 3.25" and 4.25" for PM-3 and PM-4 series pivot units, and 4.5" and 6.5" for the PM-5 series pivot units.

Paddle can be tilted in 15° increments from 15° up to 90°.



PM Series pivot units are available in three different sizes and can function in either an extended or retracted configuration.

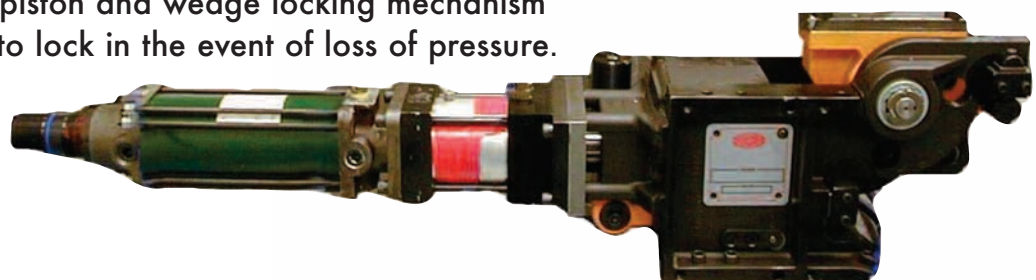


#### Patented modified watts linkage

PM Series Pivot Units uses a modified watts linkage which controls arm movement. The patented linkage is powered by an air cylinder, which is connected to the center of the middle link by a cam or a pivot link.

#### PM Series pivot units can be ordered with a cylinder rod lock

This rod lock is a special piston and wedge locking mechanism which will cause the unit to lock in the event of loss of pressure.



## PM Series Super-Duty Pivot Units Features and Benefits

### Applications

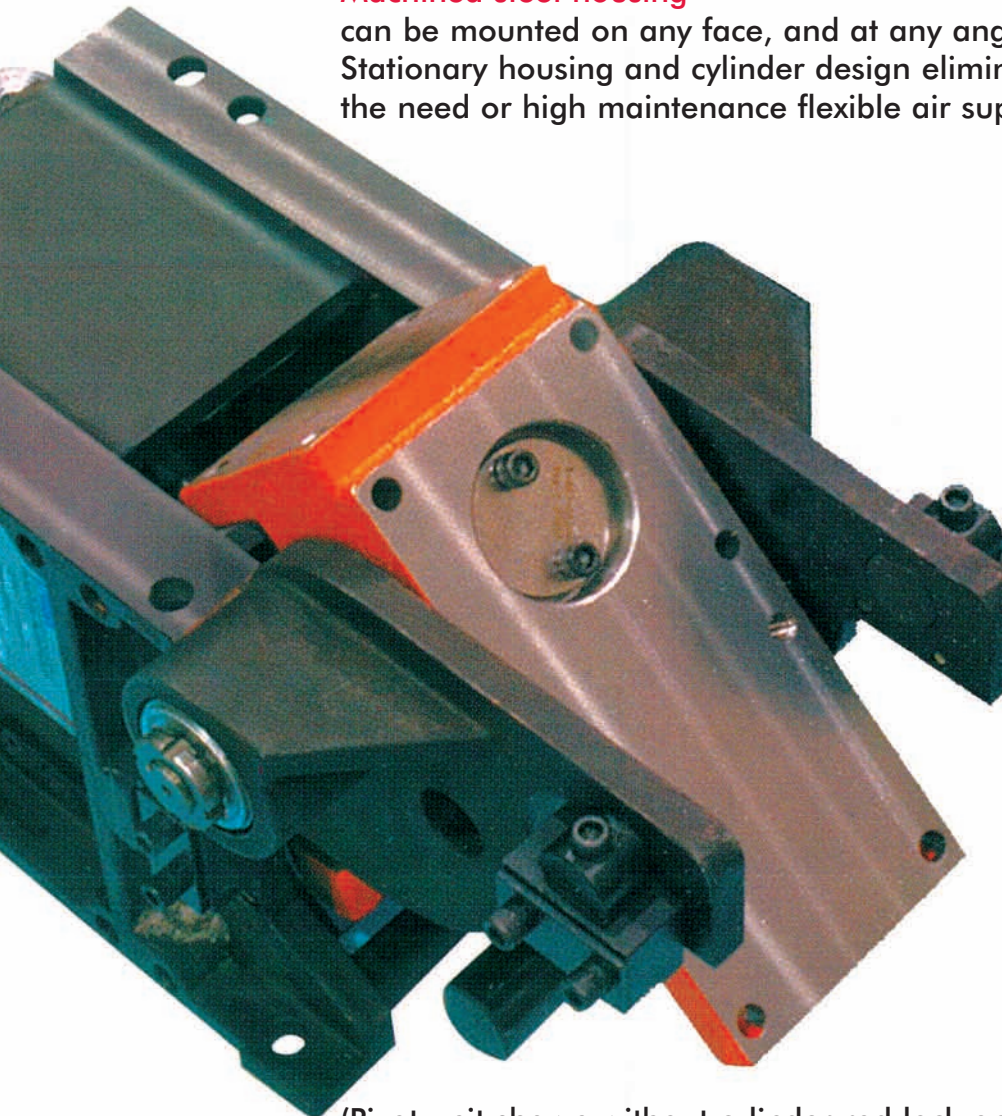
The PM Series Pivot Unit is a proven solution for hundreds of positioning challenges in the body shop and on the production floor.

The PM Series Pivot Units offers a standardized, self-contained alternative to custom engineered "dump" units. It will reduce cost and improve system uptime in a broad range of manufacturing operations including:

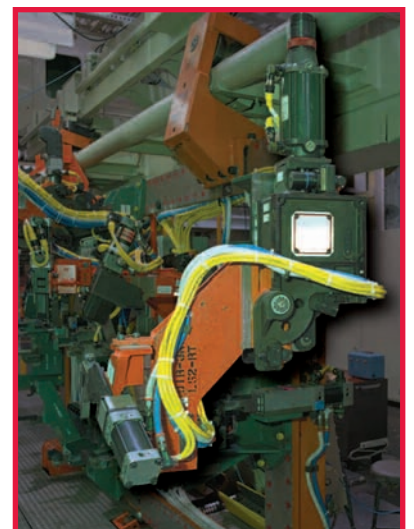
*Framing Systems, Body Side Welding Systems, Quarter Panel Sub-Assembly Fixtures, Door Assembly Systems, Underbody Systems, Appliance Welding and Assembly Systems, Tip Dressing Systems, Pierce Unit Mounting Applications, Component Loading/Unloading, Automatic Assembly and Test Systems.*

### Machined steel housing

can be mounted on any face, and at any angle. Stationary housing and cylinder design eliminates the need or high maintenance flexible air supply.



(Pivot unit shown without cylinder rod lock option.)



## PM Series Super-Duty Pivot Units

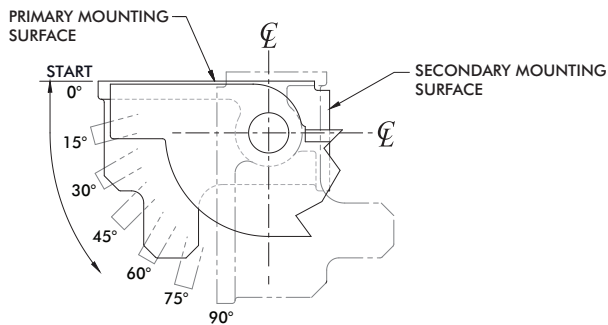
### Ordering Information

**PM** — **4** — **E** — **90** — **3** —

**PNEUMATIC PIVOT MODEL**  
**PM** = METRIC SUPER DUTY PIVOT UNIT

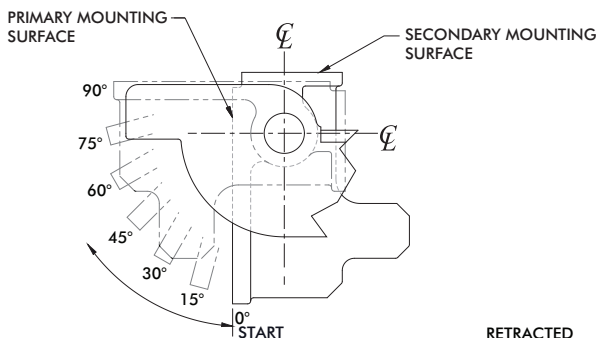
**SERIES**  
**3** = SERIES 3  
**4** = SERIES 4  
**5** = SERIES 5

**MOUNT ARM STYLE**  
**E** = EXTENDED  
**R** = RETRACTED



MOUNTING ARMS START AT ZERO (0°) POSITION AND TRAVEL IN 15° INCREMENTS UP TO 90°.

EXTENDED MOUNTING POSITION

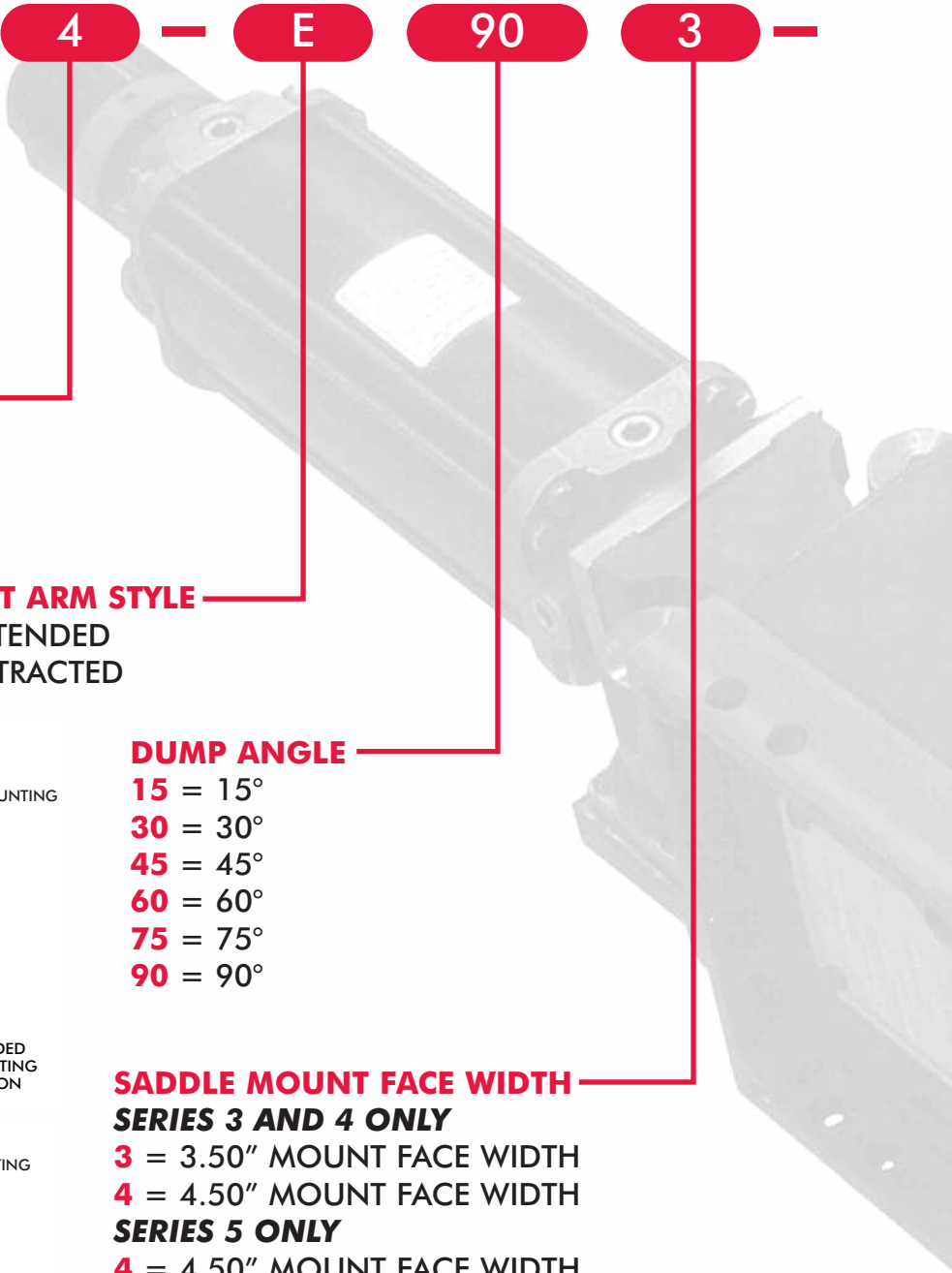


MOUNTING ARMS START AT ZERO (0°) POSITION AND TRAVEL IN 15° INCREMENTS UP TO 90°.

RETRACTED MOUNTING POSITION

**DUMP ANGLE**  
**15** = 15°  
**30** = 30°  
**45** = 45°  
**60** = 60°  
**75** = 75°  
**90** = 90°

**SADDLE MOUNT FACE WIDTH**  
**SERIES 3 AND 4 ONLY**  
**3** = 3.50" MOUNT FACE WIDTH  
**4** = 4.50" MOUNT FACE WIDTH  
**SERIES 5 ONLY**  
**4** = 4.50" MOUNT FACE WIDTH  
**6** = 6.50" MOUNT FACE WIDTH





PM Series Super-Duty Pivot Units  
Ordering Information

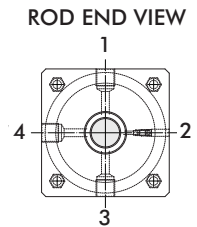


**ROD AND BLIND END PORT/PROX LOCATIONS**

- A** = AIR SUPPLY
- C** = CUSHION POSITION
- M** = MACHINED SURFACE (FOR PROX. SWITCH)

NOTE: ALWAYS LOOK THROUGH ROD END VIEW WHEN REFERENCING END CAP LOCATIONS

ALL SIDES MUST BE LABELED WITH **A**, **C**, OR **M**



**SHOCK OPTION**

- 1** = WITH SHOCK (SEE CYLINDER DWGS)
- 2** = NO SHOCK (WITH CUSHIONS)

**PROXIMITY SWITCH TYPE**

- 0** = NO PROXIMITY SWITCH ORDERED
- 1** = NAMCO LOW PROFILE ROTATABLE (MICRO)
- 2** = NAMCO STANDARD (MINI)
- 3** = TURCK (MINI)
- 4** = TURCK (MICRO)
- 5** = NAMCO LOW PROFILE (MICRO)

**CYLINDER OPTION**

- SERIES 3 ONLY**
- 3** = Ø3.25" (SA9-32-32X8.50-F)
- 4** = Ø4.00" (SA9-40-40X8.50-F)
- SERIES 4 ONLY**
- 4** = Ø4.00" (SA9-40-40X8.50-F)
- 5** = Ø5.00" (SA9-50-50X8.50-F)
- SERIES 5 ONLY**
- 5** = Ø5.00" (SA9-50-50X8.50-F)
- 6** = Ø6.00" (SA9-60-60X8.50-F)

**CYLINDER**

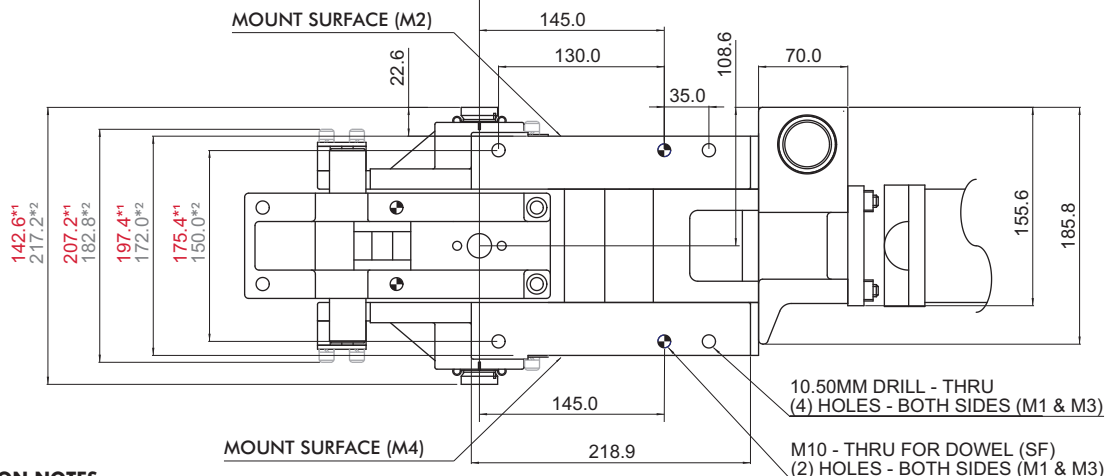
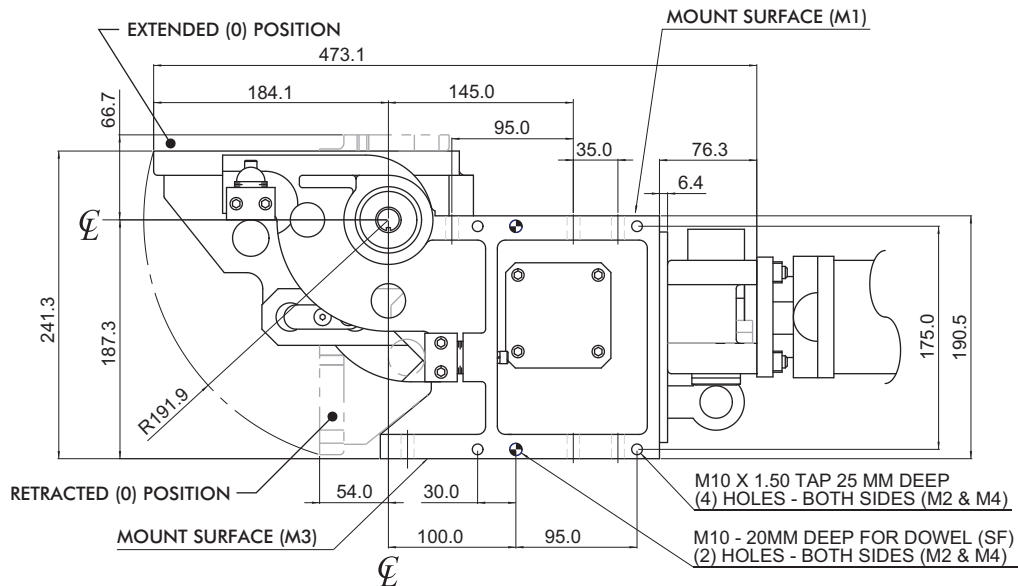
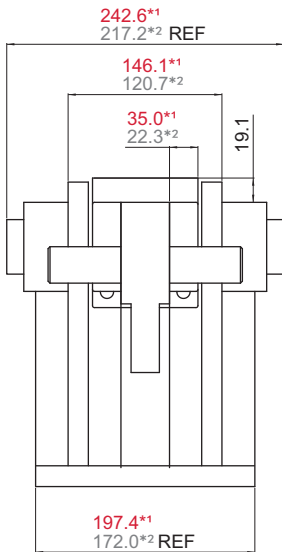
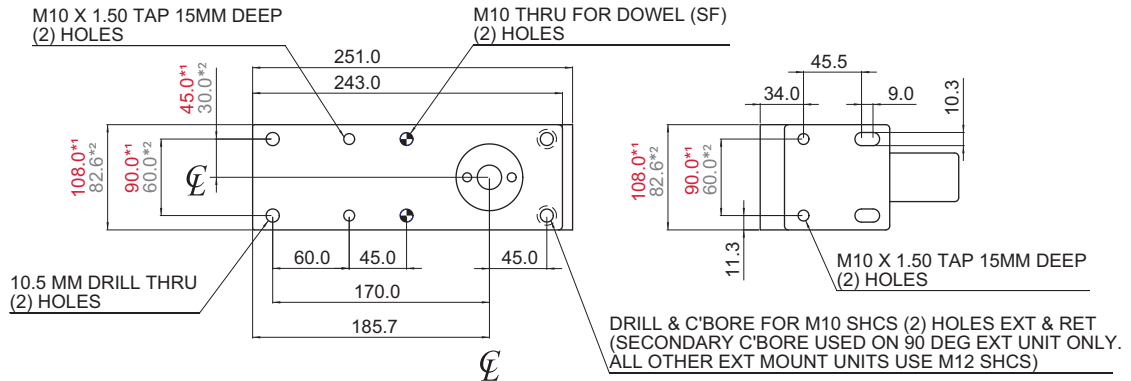
- D** = DE-STA-CO CYLINDER WITH NPT PORTS
- G** = DE-STA-CO CYLINDER WITH BSPP PORTS

**ROD LOCK OPTION**

- R** = WITH ROD LOCK
- N** = NO ROD LOCK

# PM Series Super-Duty Pivot Units

## PM3 Series Pivot Dimensions

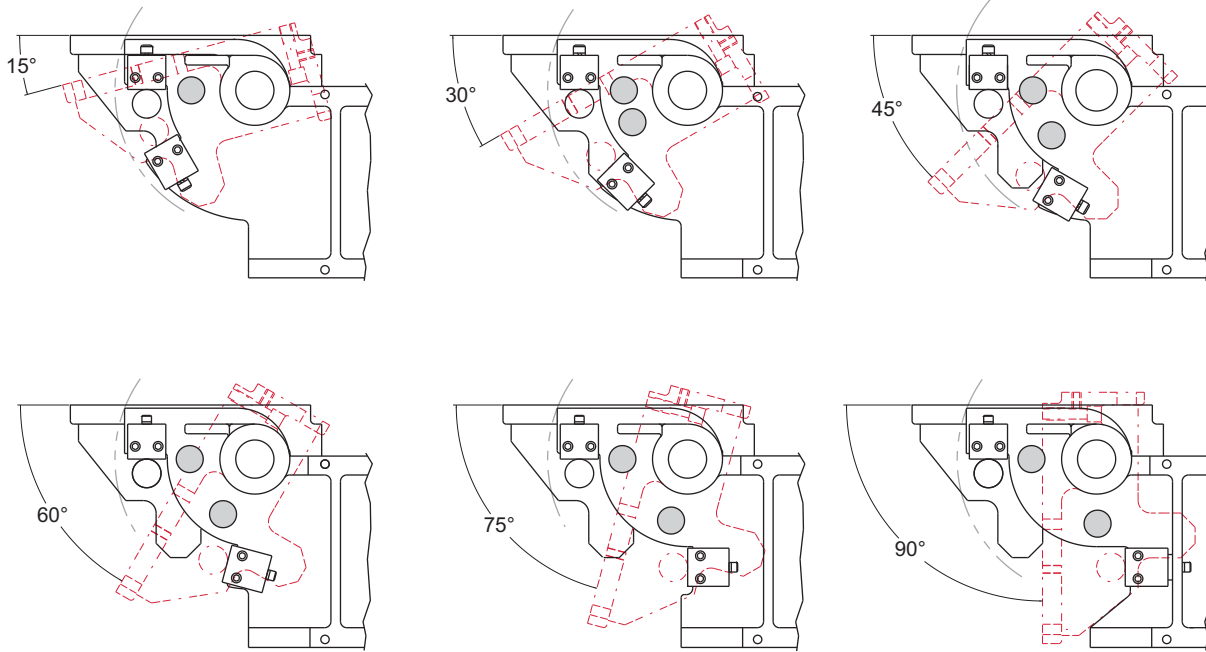


**DIMENSION NOTES**

- 108MM [4.25IN] WIDE MOUNTING ARM "DIM<sub>1</sub>\*1"
- 88MM [3.25IN] WIDE MOUNTING ARM "DIM<sub>2</sub>\*2"
- COMMON DIMENSIONS "DIM<sub>3</sub>"

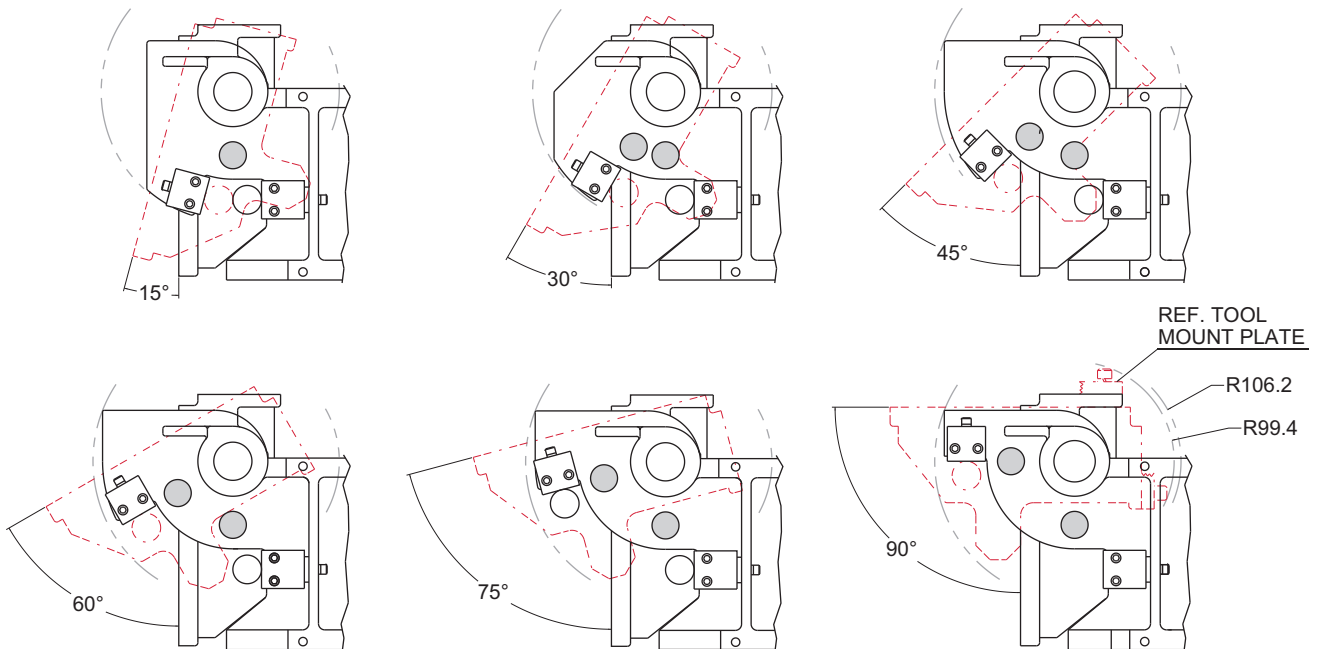
**PM Series Super-Duty Pivot Units**  
**PM3 Series Arm Opening Angle and Lock-Out Positions**

**EXTENDED ARM STYLE**



● LOCK-OUT HOLE POSITIONS FOR Ø25 MM LOCK-OUT PIN

**RETRACTED ARM STYLE**



● LOCK-OUT HOLE POSITIONS FOR Ø25 MM LOCK-OUT PIN

## PM Series Super Duty Pivot Units

### PM3 Series Cylinder Dimensions and Load Capacities

#### MAXIMUM LOAD CAPACITY INFORMATION

CYL. BORE	LINE PRESSURES					
	400 KpA	500 KpA	550 KpA	600 KpA	650 KpA	700 KpA
3.25"	133 N.m	166 N.m	183 N.m	199 N.m	216 N.m	232 N.m
4.00"	196 N.m	245 N.m	269 N.m	294 N.m	318 N.m	343 N.m

WHEN CALCULATING LOAD CAPACITIES, DESIGNER SHOULD CONSIDER ORIENTATION OF TOOL C.G. RELATIVE TO FLOOR AND DUMP PIVOT AND REQUIRED SAFETY FACTOR FOR APPLICATION

#### EXAMPLE:

MASS EQUALS 500 N.  
DISTANCE OF MASS C.G. (CENTER GRAVITY) TO OF PIVOT IS 0.4 M

MASS x C.G. DIST = in lbs  
500 N x 0.4 M = 200 N.m

THIS APPLICATION REQUIRES  
3.25" BORE CYL. WITH 600 KpA LINE PRESS.

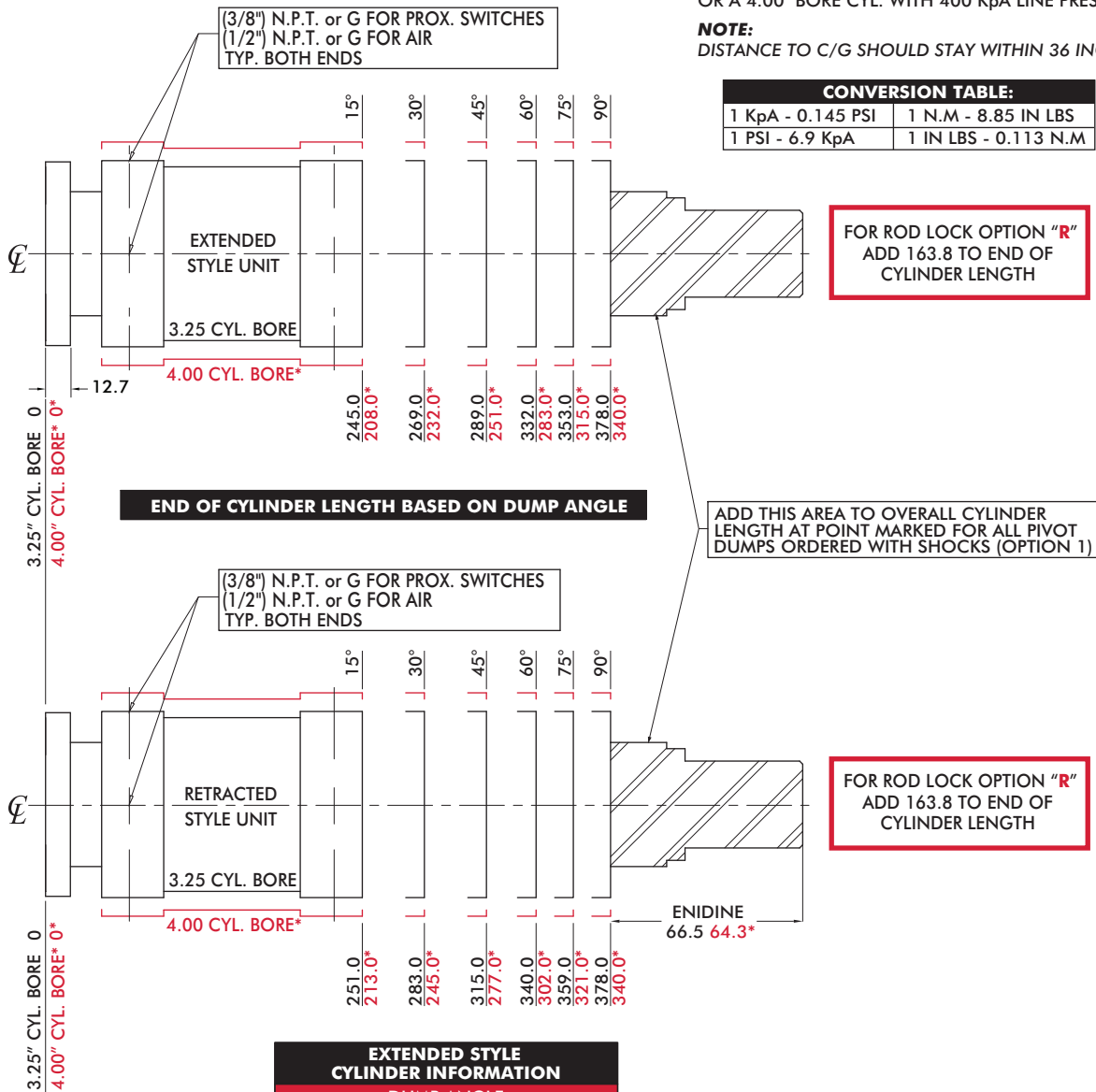
OR A 4.00" BORE CYL. WITH 400 KpA LINE PRESSURE

#### NOTE:

DISTANCE TO C/G SHOULD STAY WITHIN 36 INCHES

#### CONVERSION TABLE:

1 KpA - 0.145 PSI	1 N.M - 8.85 IN LBS
1 PSI - 6.9 KpA	1 IN LBS - 0.113 N.M



END OF CYLINDER LENGTH BASED ON DUMP ANGLE

ADD THIS AREA TO OVERALL CYLINDER LENGTH AT POINT MARKED FOR ALL PIVOT DUMPS ORDERED WITH SHOCKS (OPTION 1)

FOR ROD LOCK OPTION "R"  
ADD 163.8 TO END OF CYLINDER LENGTH

FOR ROD LOCK OPTION "R"  
ADD 163.8 TO END OF CYLINDER LENGTH

#### EXTENDED STYLE CYLINDER INFORMATION

##### DUMP ANGLE

3.25" AND 4" BORE	90°	75°	60°	45°	30°	15°
CYLINDER STROKE	165.0	140.0	108.0	76.0	57.0	32.0

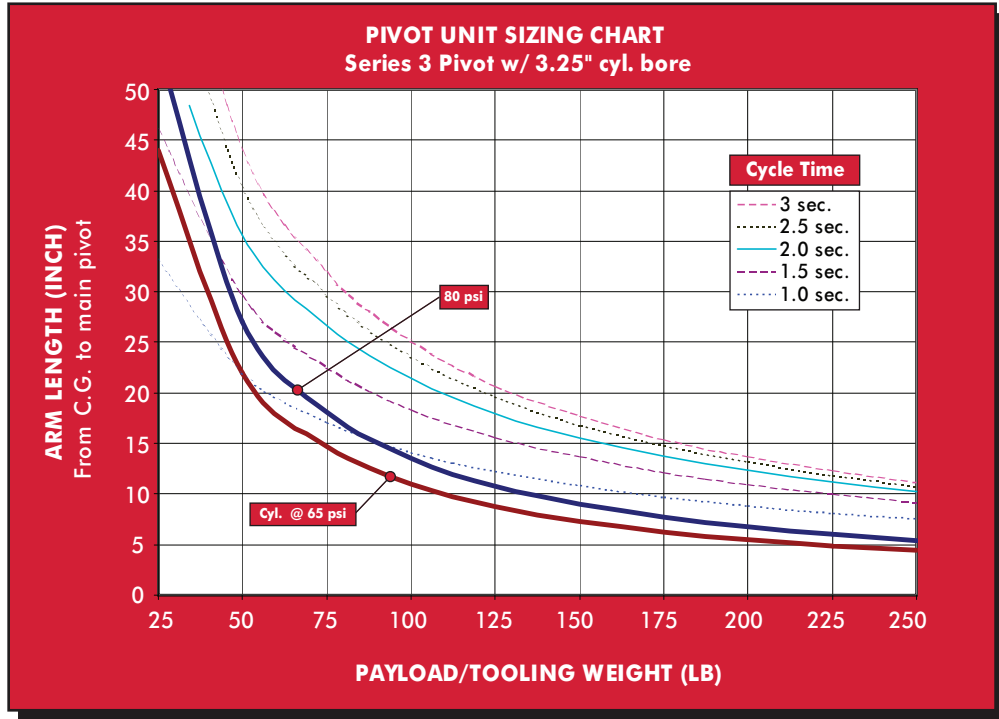
#### RETRACTED STYLE CYLINDER INFORMATION

##### DUMP ANGLE

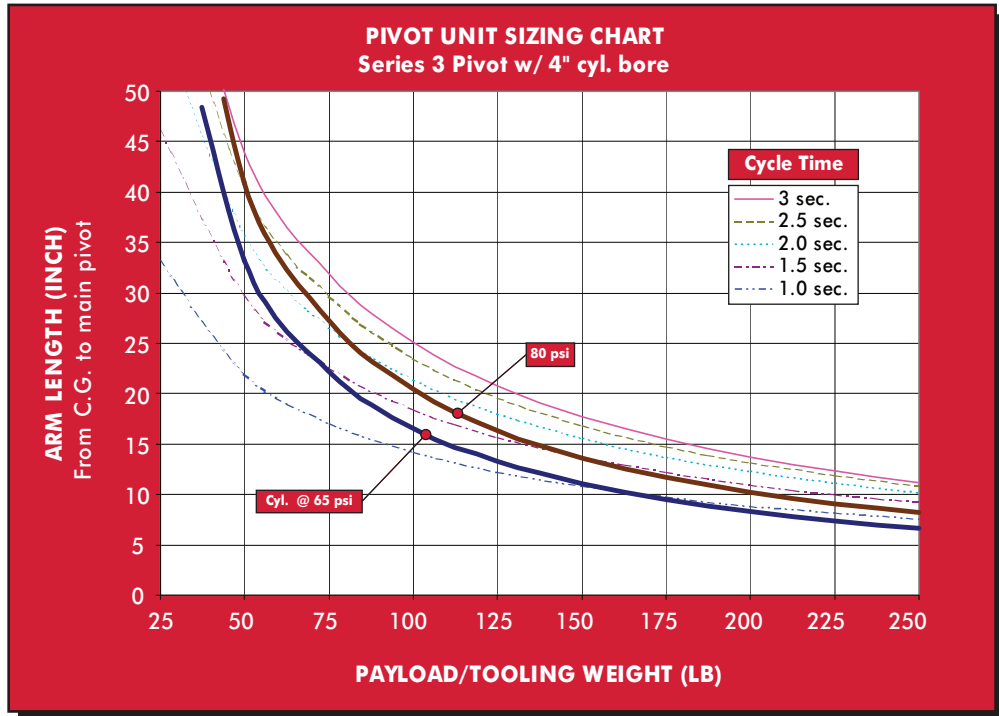
3.25" AND 4" BORE	90°	75°	60°	45°	30°	15°
CYLINDER STROKE	165.0	146.0	127.0	102.0	70.0	38.0

PM Series Super Duty Pivot Units  
PM3 Series Force Charts

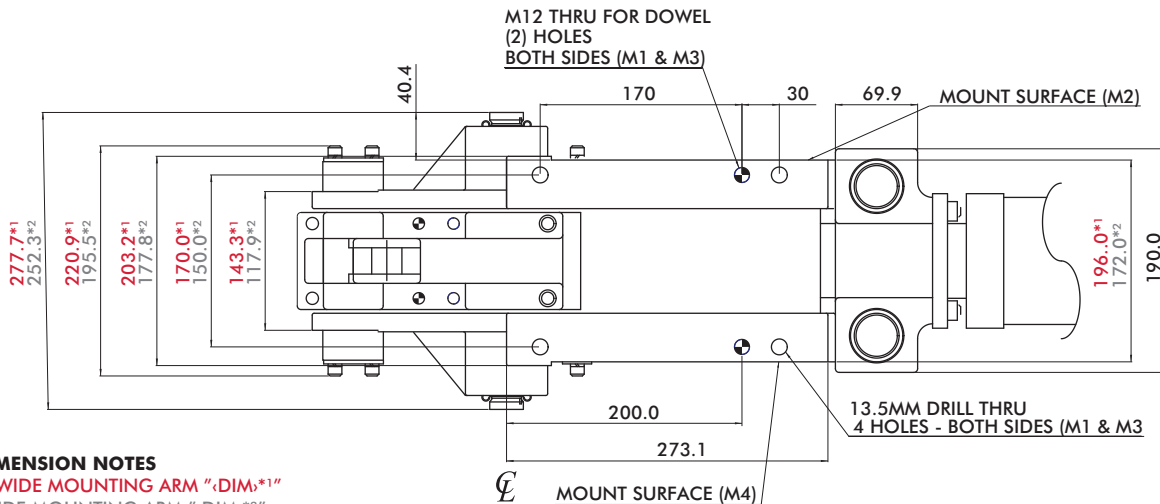
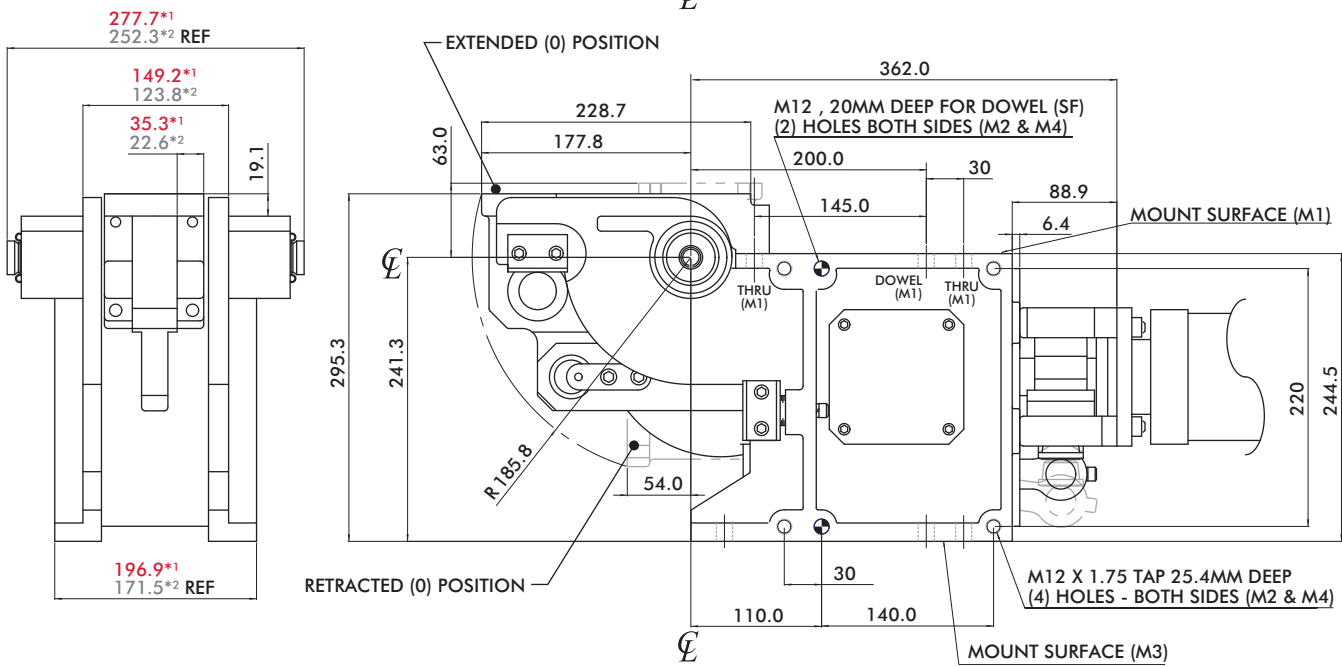
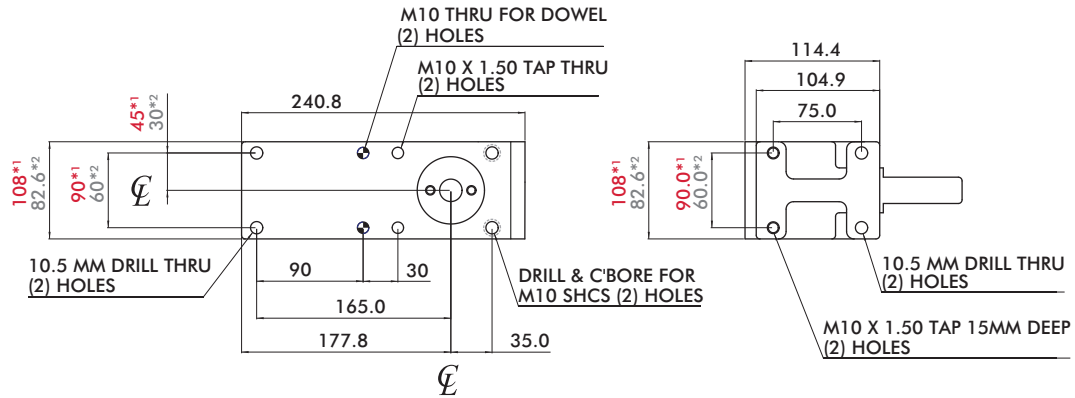
3.25" CYLINDER BORE



4.00" CYLINDER BORE



PM Series Super Duty Pivot Units  
PM4 Series Pivot Dimensions

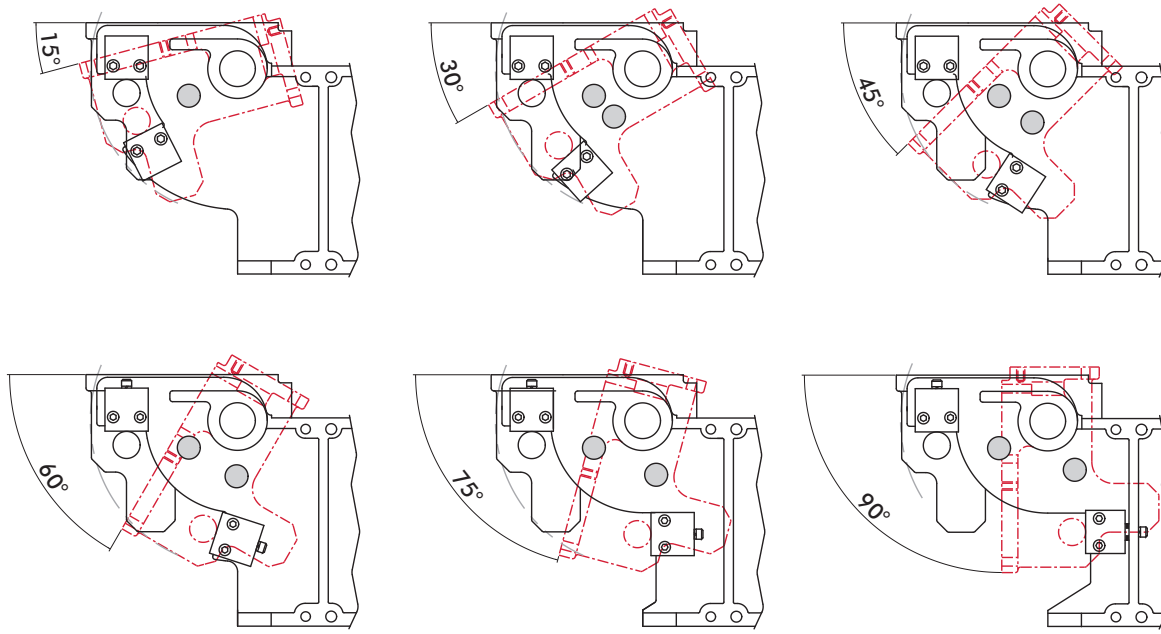


**DIMENSION NOTES**

108MM [4.25IN] WIDE MOUNTING ARM "DIM<sup>#1</sup>"  
88MM [3.25] WIDE MOUNTING ARM "DIM<sup>#2</sup>"  
COMMON DIMENSIONS "DIM<sup>#</sup>"

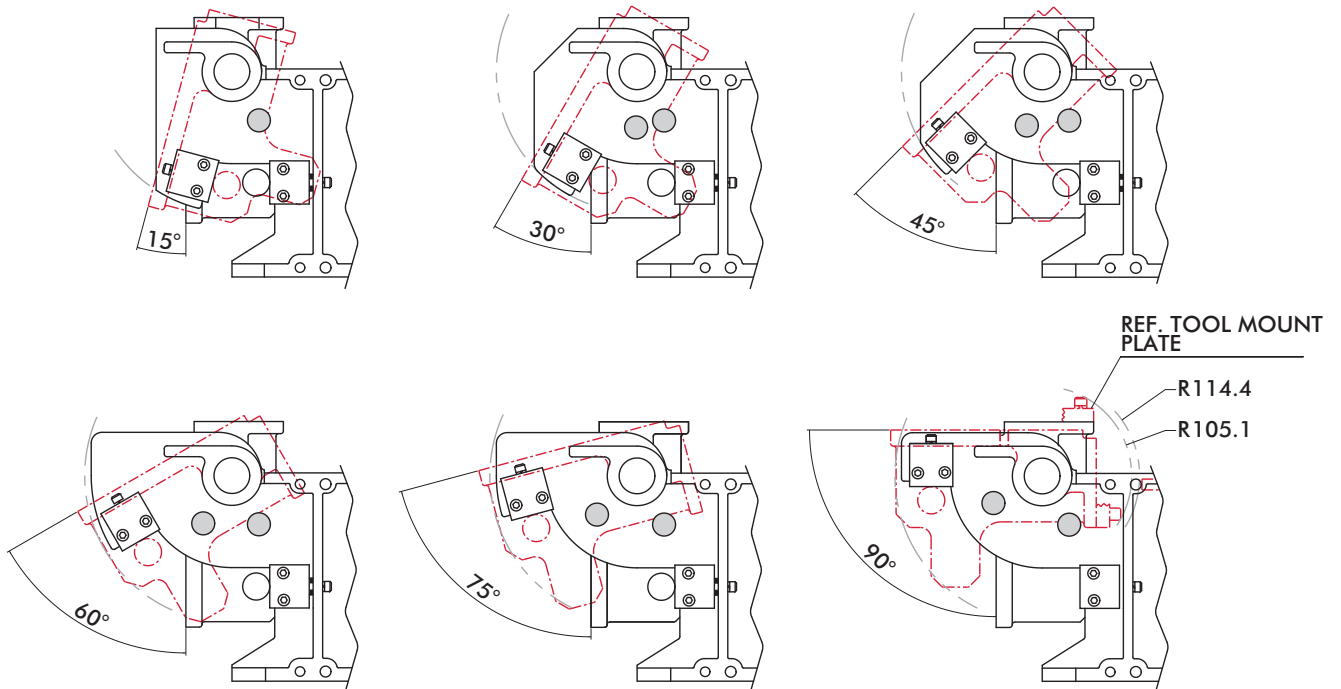
**PM Series Super Duty Pivot Units**  
 PM4 Series Arm Opening Angles and Lock-Out Positions

EXTENDED ARM STYLE



○ LOCK-OUT HOLE POSITIONS FOR Ø25 MM LOCK-OUT PIN

RETRACTED ARM STYLE



○ LOCK-OUT HOLE POSITIONS FOR Ø25 MM LOCK-OUT PIN

## PM Series Super Duty Pivot Units

### PM4 Series Cylinder Dimensions and Load Capacities

#### MAXIMUM LOAD CAPACITY INFORMATION

CYL. BORE	LINE PRESSURES					
	400 KpA	500 KpA	550 KpA	600 KpA	650 KpA	700 KpA
4.00"	261 N.m	326 N.m	359 N.m	392 N.m	424 N.m	457 N.m
5.00"	428 N.m	535 N.m	588 N.m	642 N.m	696 N.m	738 N.m

WHEN CALCULATING LOAD CAPACITIES, DESIGNER SHOULD CONSIDER ORIENTATION OF TOOL C.G. RELATIVE TO FLOOR AND DUMP PIVOT AND REQUIRED SAFETY FACTOR FOR APPLICATION

#### EXAMPLE:

MASS EQUALS 500 N.  
DISTANCE OF MASS C.G. (CENTER GRAVITY) TO OF PIVOT IS 0.5 M

MASS x C.G. DIST = in lbs  
850 N x 0.5 M = 425 N.m

THIS APPLICATION REQUIRES  
4.00" BORE CYL. WITH 400 KpA LINE PRESS.

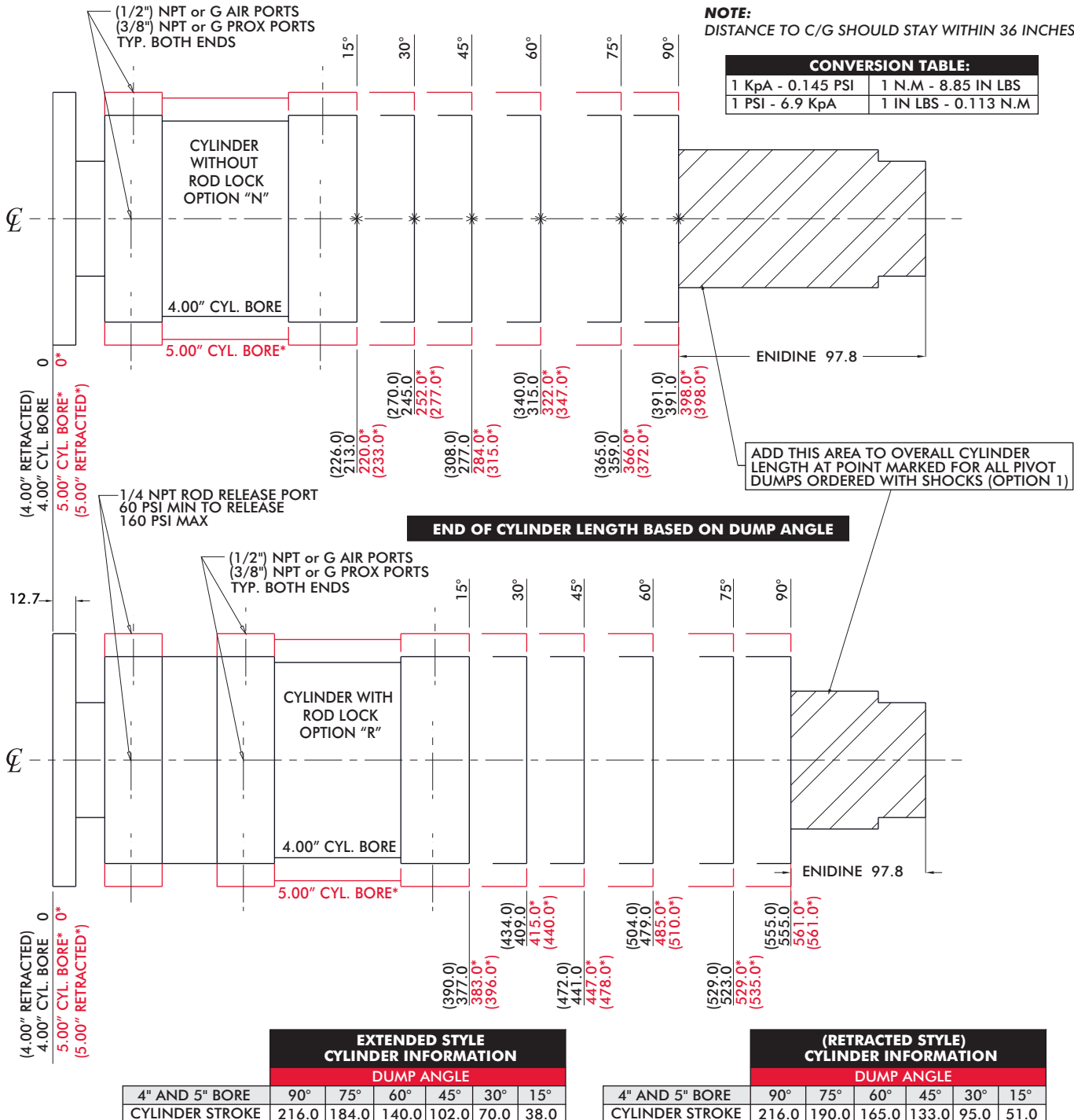
OR A 5.00" BORE CYL. WITH 650 KpA LINE PRESSURE

#### NOTE:

DISTANCE TO C/G SHOULD STAY WITHIN 36 INCHES

#### CONVERSION TABLE:

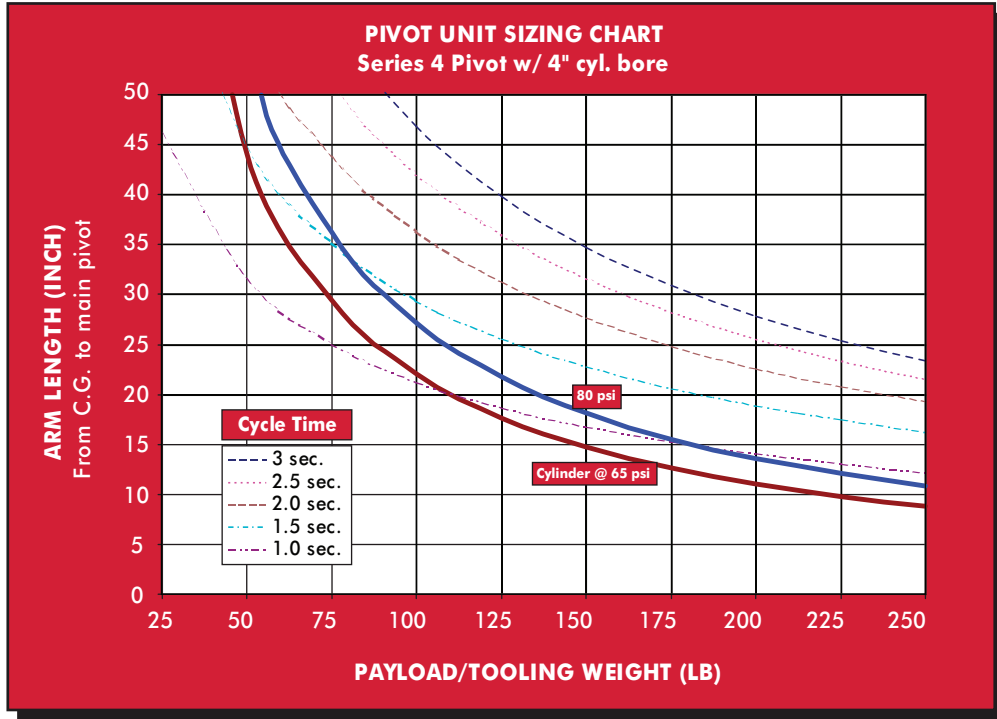
1 KpA - 0.145 PSI	1 N.M - 8.85 IN LBS
1 PSI - 6.9 KpA	1 IN LBS - 0.113 N.M



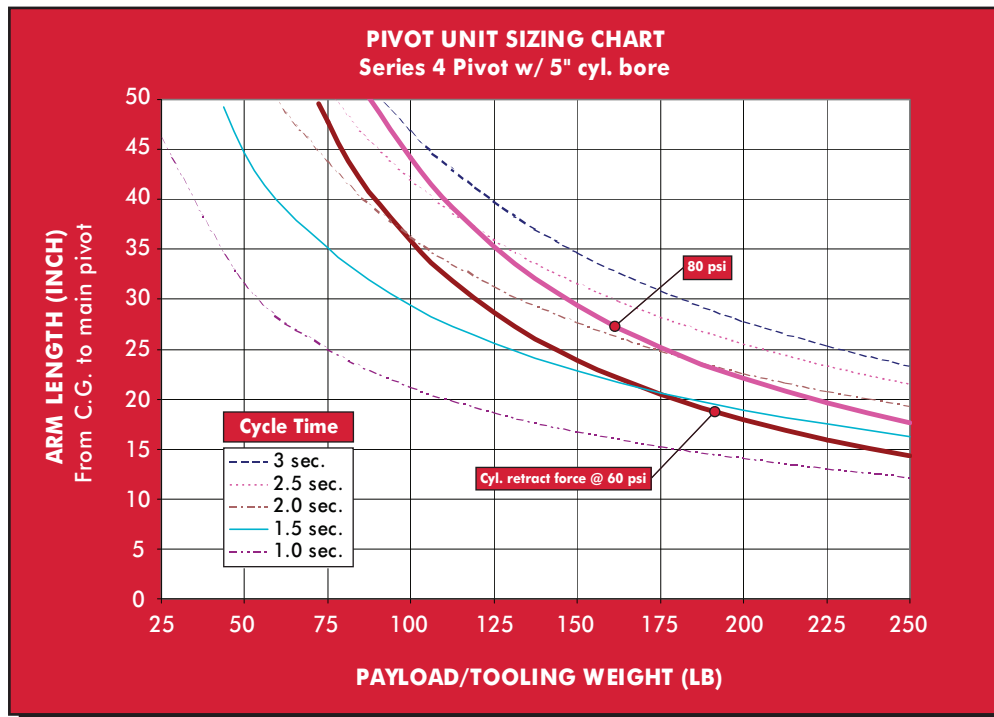


PM Series Super Duty Pivot Units  
PM4 Series Force Charts

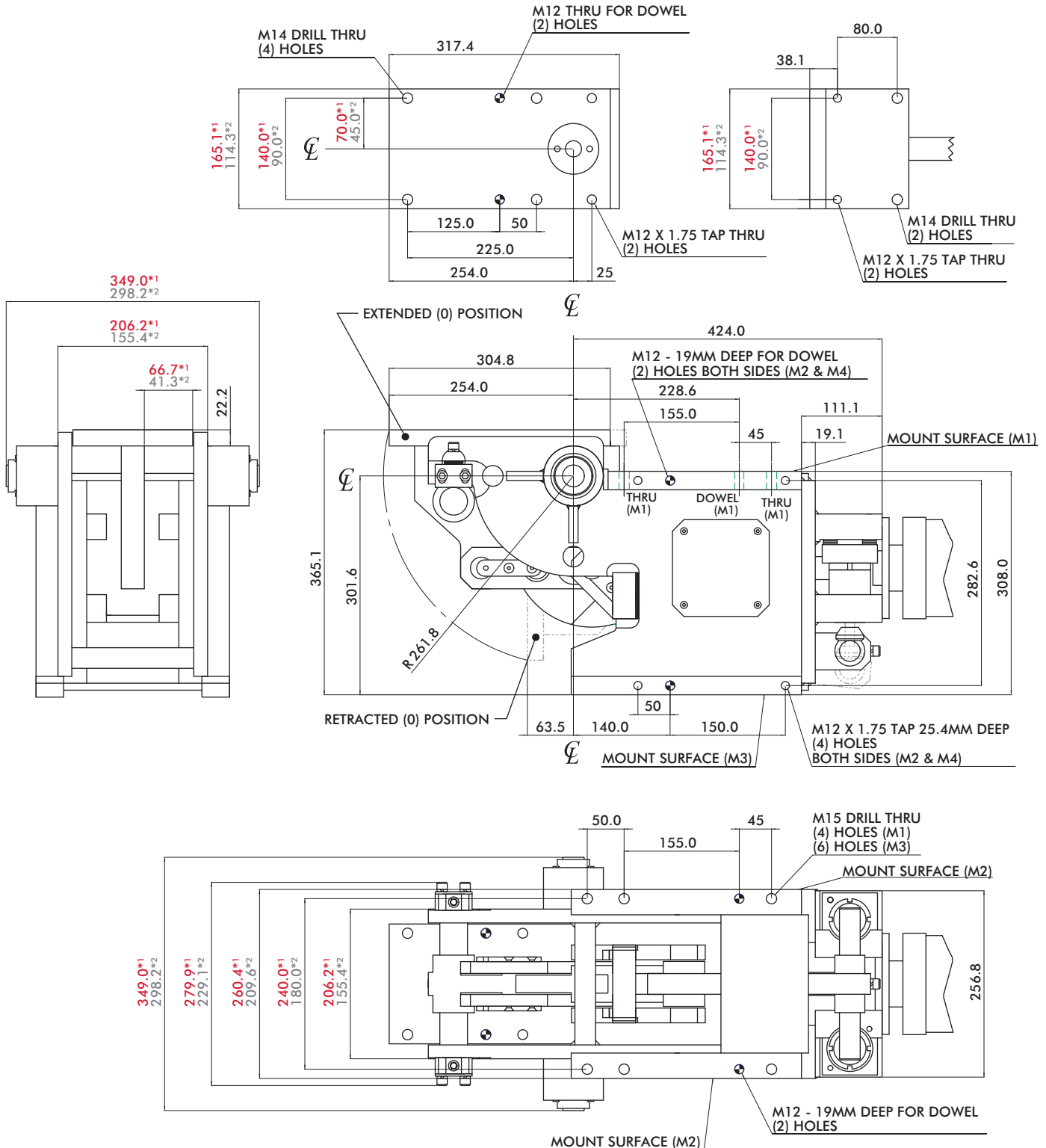
4.00" CYLINDER BORE



5.00" CYLINDER BORE



PM Series Super Duty Pivot Units  
PM5 Series Pivot Dimensions

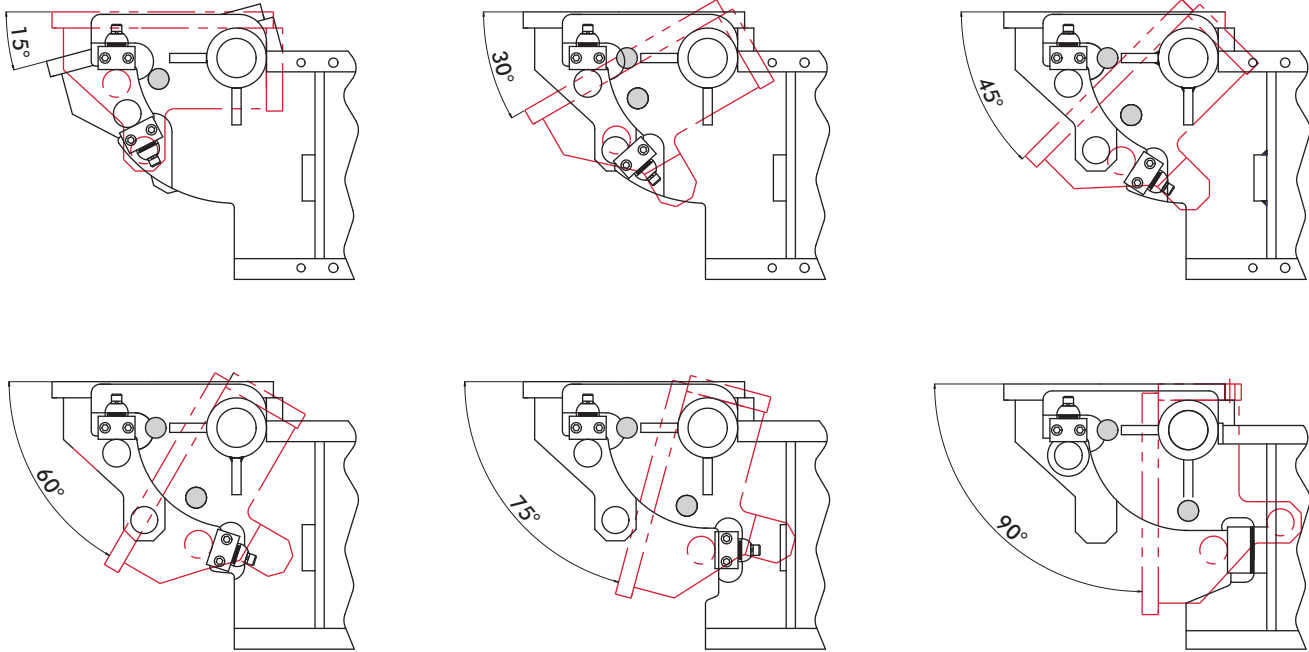


**DIMENSION NOTES**

165.1MM [6.50IN] WIDE MOUNTING ARM "DIM\*1" (SHOWN)  
 114.3MM [4.50IN] WIDE MOUNTING ARM "DIM\*2"  
 COMMON DIMENSIONS "DIM"

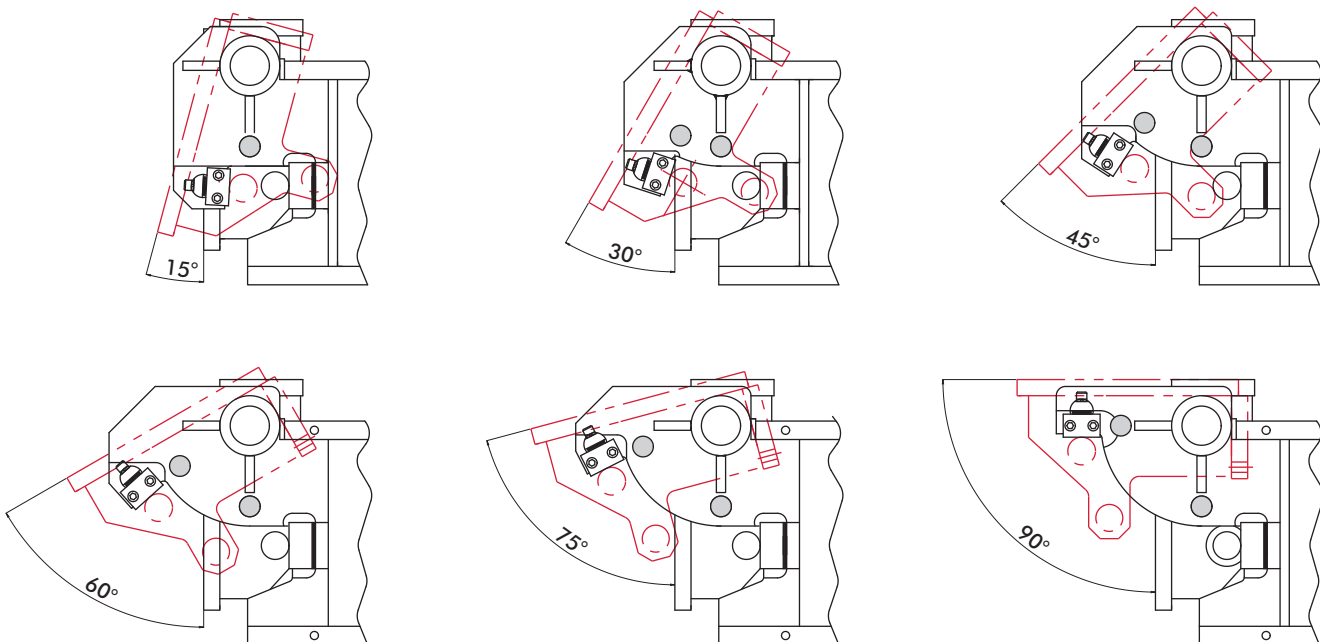
## PM Series Super Duty Pivot Units PM5 Series Arm Opening Angles and Lock-Out Positions

### EXTENDED ARM STYLE



● LOCK-OUT HOLE POSITIONS  
FOR Ø25 MM LOCK-OUT PIN

### RETRACTED ARM STYLE



● LOCK-OUT HOLE POSITIONS  
FOR Ø25 MM LOCK-OUT PIN

## PM Series Super Duty Pivot Units

### PM5 Series Cylinder Dimensions and Load Capacities

#### MAXIMUM LOAD CAPACITY INFORMATION

CYL. BORE	LINE PRESSURES					
	60 PSI	70 PSI	80 PSI	85 PSI	90 PSI	100 PSI
5"	5522 in*lbs	6443 in*lbs	7363 in*lbs	7823 in*lbs	8283 in*lbs	9204 in*lbs
6"	7761 in*lbs	9054 in*lbs	10348 in*lbs	10994 in*lbs	11641 in*lbs	12935 in*lbs

WHEN CALCULATING LOAD CAPACITIES, DESIGNER SHOULD CONSIDER ORIENTATION OF TOOL C.G. RELATIVE TO FLOOR AND DUMP PIVOT AND REQUIRED SAFETY FACTOR FOR APPLICATION

#### EXAMPLE:

MASS EQUALS 400 lbs.  
DISTANCE OF MASS C.G. (CENTER GRAVITY) TO OF PIVOT IS 20"

MASS x C.G. DIST = in lbs  
400 lbs x 20 in = 8000 in lbs

THIS APPLICATION REQUIRES  
5" BORE CYL. WITH 90 psi LINE PRESS.

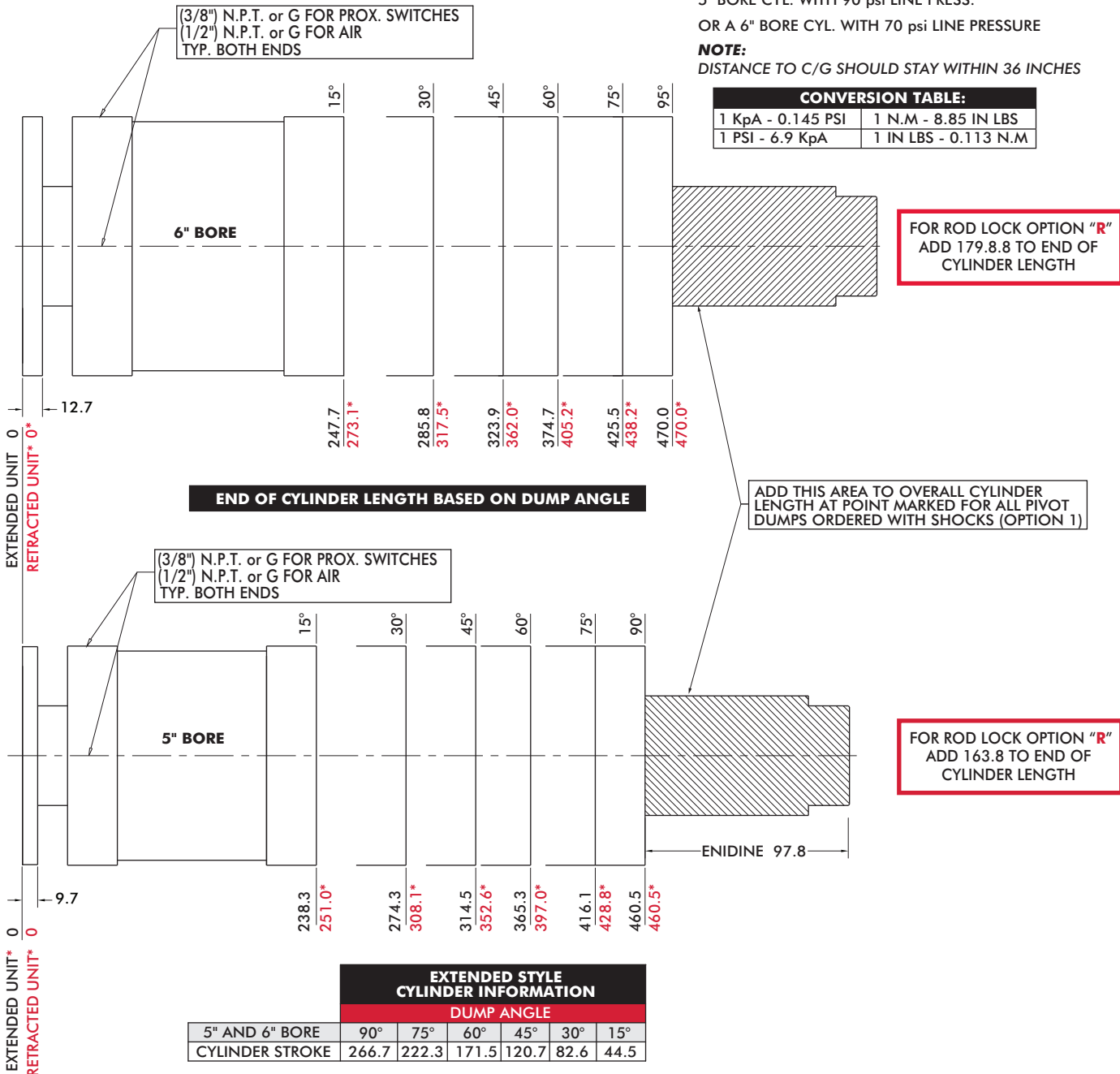
OR A 6" BORE CYL. WITH 70 psi LINE PRESSURE

#### NOTE:

DISTANCE TO C/G SHOULD STAY WITHIN 36 INCHES

#### CONVERSION TABLE:

1 KpA - 0.145 PSI	1 N.M - 8.85 IN LBS
1 PSI - 6.9 KpA	1 IN LBS - 0.113 N.M



#### EXTENDED STYLE CYLINDER INFORMATION

##### DUMP ANGLE

5" AND 6" BORE	90°	75°	60°	45°	30°	15°
CYLINDER STROKE	266.7	222.3	171.5	120.7	82.6	44.5

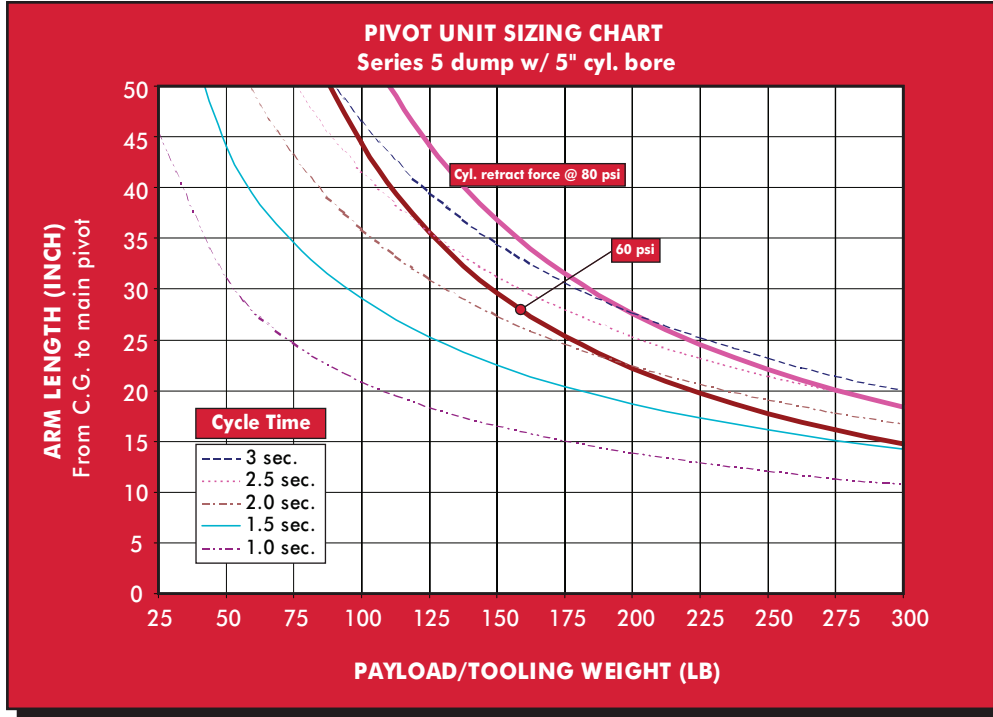
#### RETRACTED STYLE CYLINDER INFORMATION

##### DUMP ANGLE

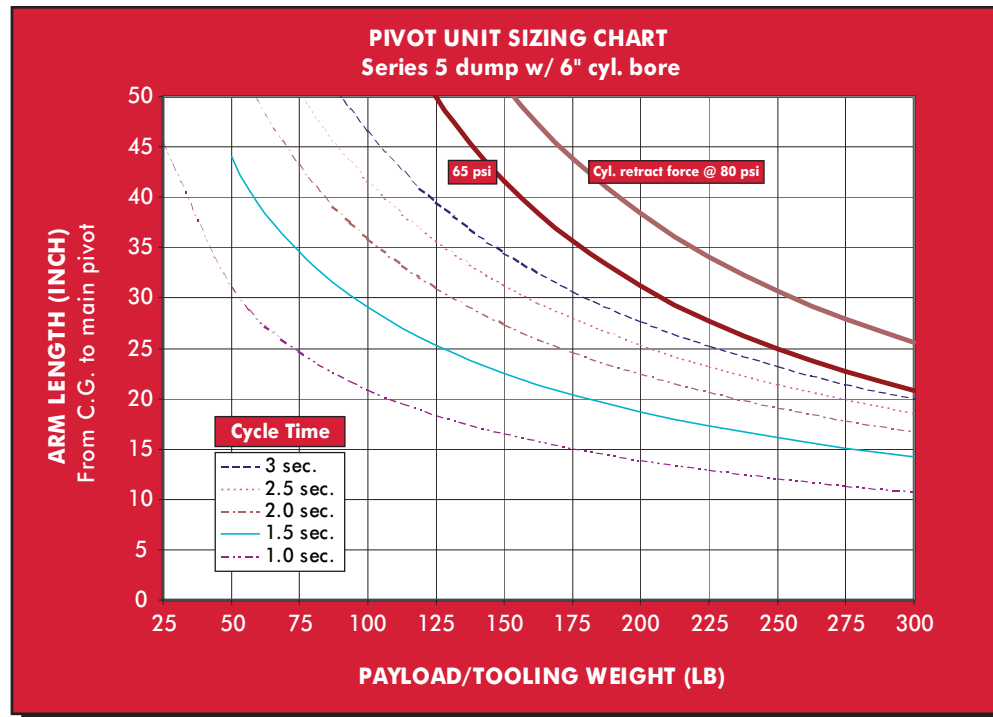
5" AND 6" BORE	90°	75°	60°	45°	30°	15°
CYLINDER STROKE	266.7	235.0	203.2	158.8	114.3	57.6

PM Series Super Duty Pivot Units  
PM5 Series Force Charts

5.00" CYLINDER BORE



6.00" CYLINDER BORE



## DE-STA-CO offers Complete Line of Automotive Solutions

### Pneumatic Modular Grippers

#### GR1 Modular Gripper

- Can be flange or cylinder mounted.
- Offered with several different jaw opening and point options.
- Toggle-Locking Mechanism holds the part if air pressure is lost.

#### GR84 Enclosed Modular Mini-Clamp

- Also offers several different jaw and tip options.
- Can also be flange or cylinder mounted.
- Locking Mechanism holds the part if air pressure is lost
- Protected from contaminants.



### Pneumatic Enclosed Power Clamps

#### 82M Series Clamps

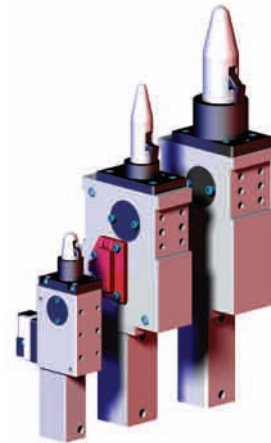
- Offered in two sizes, 50mm and 63mm.
- Available as right, left, or dual drives.
- Angle of arm opening can be adjusted in the field in 15° increments.
- Lightweight - highest weight to power ratio.
- Optional integrated open/closed sensing package will accommodate all major switches.
- Built-in flow controls.
- NAAMS style arms and mounting.
- Sealed roller bearing.
- Toggle-locking mechanism holds the part if air pressure is lost
- Protected from contaminants.



### Pneumatic Locating Pin Clamps

#### 82P Series Pin Clamps

- Optional "Weld-Slag Resistant" offers protection from contamination entering the unit
- Standard rest blocks heights of 25 and 50mm, with others block heights available.
- Hardened and ground precision tool steel locating pin.
- Enclosed aluminum body houses a full toggling mechanism secures part in place even when air is removed from the tool.



### Modular Tool Changer

#### Quick Change 1200 Series

- End effector tooling can be changed quickly and easily to accommodate many different styles of parts on the same robot.



DE-STA-CO offers Complete Line of Automotive Solutions

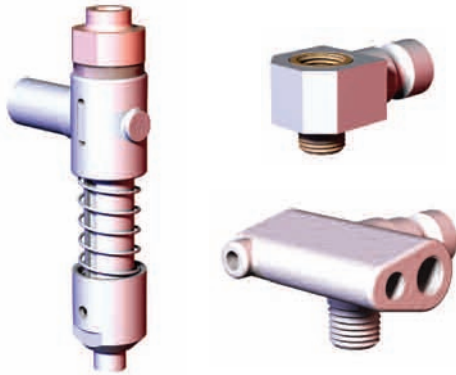
**Pneumatic Modular CAM Grippers**



84A2 and 84A3 Modular CAM Gripper

- Two sensing systems are provided along with interchangeable gripper teeth and pads.
- High speed material movement in restricted spaces.
- High clamping force and fast opening and closing action.
- Roller and cam principal, self-locking at end stop position.
- Multiple mounting and jaw opening options.
- Small size, low weight.

**Vacuum Cup Mounts and Adaptors**



CPI-500 and 750 Series Port Only Adaptors

- Provides an option for integrating swivel arms and vacuum cups with a remote vacuum source.

CPI-VSA 19 and 750 Series Venturi Adaptors

- Generates vacuum at the cup level.
- Available with blow-off and low-profile.

CPI-SCM Series Spring Loaded Cup Mounts

- Available in different porting and travel options.
- Works with CPI-750 Series Venturi Adaptors.

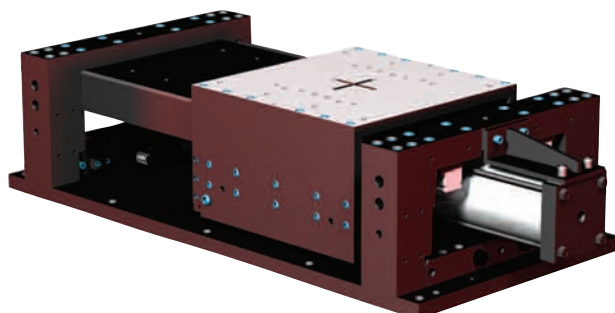
**Pneumatic Actuated Magnets**



CPI-TPLP Series Magnets

- Provides instantaneous pick up and release without electricity, maintaining positive hold even when air pressure is lost.
- Supplied with urethane pad which softens the impact of the magnet and avoids damage to delicate surfaces.

**Pneumatic Weld Slides**



3 sizes with 4 standard maximum stroke lengths each

- Heavy-Duty Structural Frame
- Inverted Design
- (4) Standard Max Strokes from 125 to 500 mm Stroke.
- Actuator Mounted Inside
- Highly Repeatable
- "Open Ended" Design
- Sealed, Self Lubricating Bearing System
- Integrated Shock/Sensor/Stop (WS5)



A DOVER COMPANY

# PRECISELY POSITIONING OUR CUSTOMERS FOR PRODUCTIVITY.

## Workholding

- Widest variety of workholding products
- High durability and reliability
- Flexible solutions for all applications
- Custom products for unique requirements

## Automation

- Broad range of engineered automation products
- Complementary products for modular integration
- Unmatched accuracy, reliability and performance
- Unparalleled global sales, service and engineering support

## DE-STA-CO GLOBAL LOCATIONS

### NORTH AMERICA

DE-STA-CO Headquarters  
 Auburn Hills, Michigan  
 Tel: 1.248.836.6700

Tel: 1.888.DESTACO  
 Customer Service: cs-workholding@destaco.com

Wheeling, Illinois  
 Tel: 1.800.645.5207  
 Customer Service: camco@destaco.com

Monroe, Connecticut  
 Tel: 1.888.DESTACO  
 Customer Service: cs-automation@destaco.com

Charlevoix, Michigan  
 Tel: 1.888.DESTACO  
 Customer Service: cs-automotive@destaco.com

Red Wing, MN (Central Research Laboratories)  
 Tel: 651.385.2142  
 Customer Service: sales@centres.com

### SOUTH AMERICA

Brazil  
 Tel: 0800-124070  
 Customer Service: samerica@destaco.com

### ASIA

Thailand  
 Tel: +66-2-326-0812  
 Customer Service: info@destaco.com

China  
 Tel: +86-21-6081-2888  
 Customer Service: china@destaco.com

India  
 Tel: +91-80-41123421-426  
 Customer Service: india@destaco.com

### EUROPE

Germany  
 Tel: +49-6171-705-0  
 Customer Service: europe@destaco.com

France  
 Tel: +33-1-3996-5000  
 Customer Service: france@destaco.com

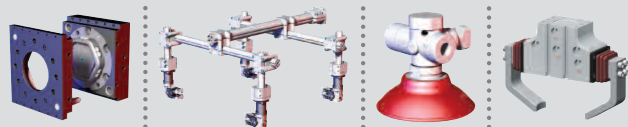
UK  
 Tel: +44-1902-797980  
 Customer Service: uk@destaco.com

Spain  
 Tel: +34-936361680  
 Customer Service: spain@destaco.com

Netherlands  
 Tel: +31-297285332  
 Customer Service: benelux@destaco.com



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1025 Doris Road  
 Auburn Hills, MI 48326  
 Fax: (248) 826-6740  
 Technical Support E-mail:  
 tech-automotive@destaco.com  
 www.destaco.com