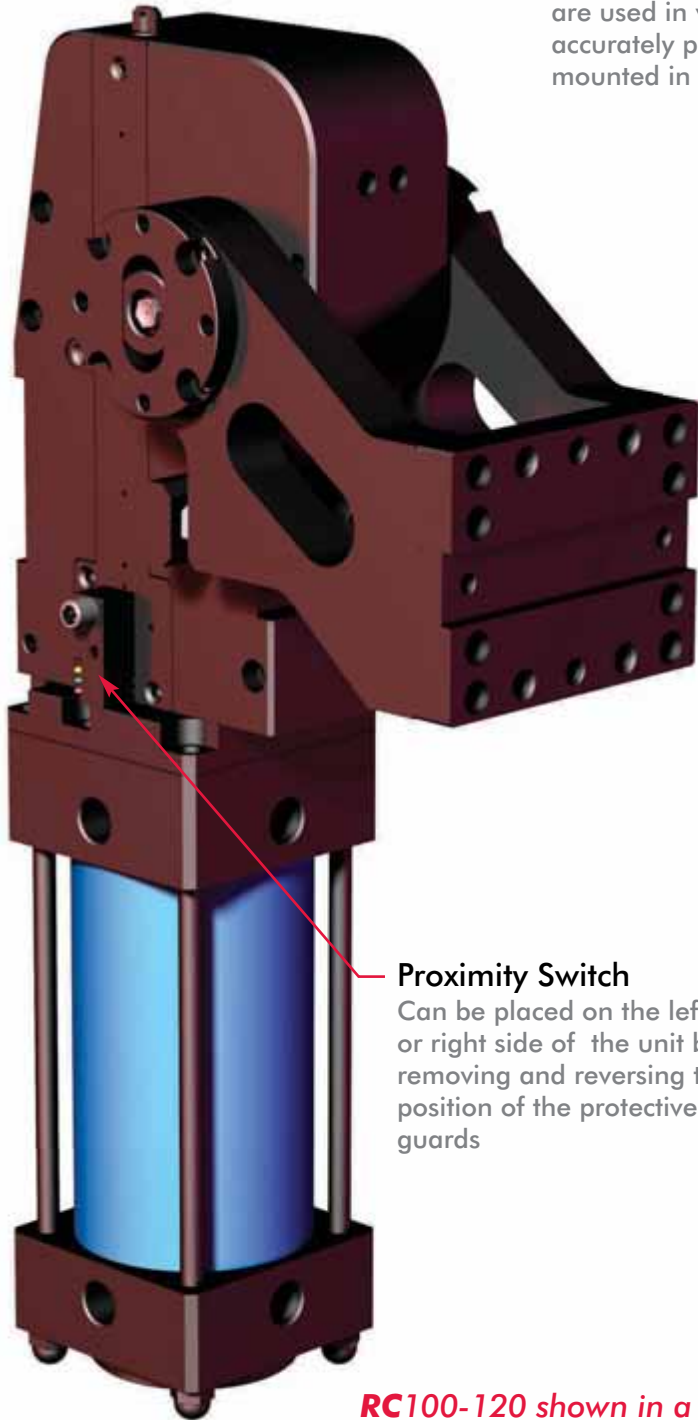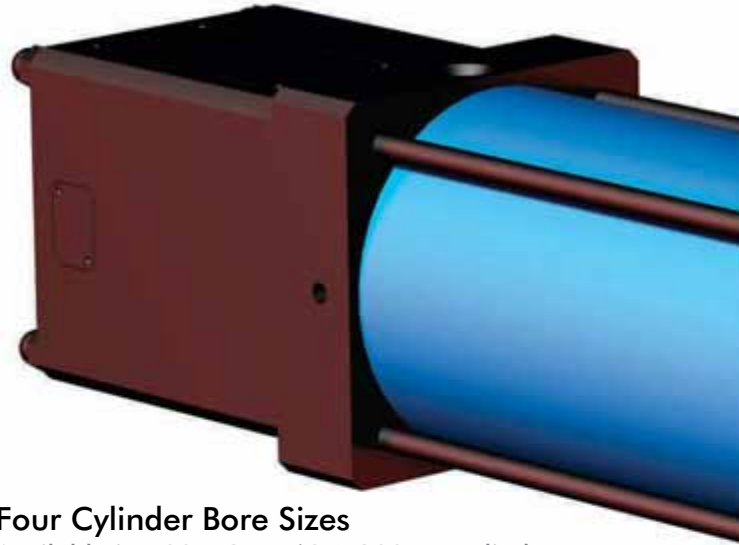## GR and RC Series Medium Duty Pivot Units

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.

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

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

Cut Off Valve (GR Series Only)
Stops movement when air pressure is lost.

RC100-120 shown in a vertical "V" orientation

CLAMPING TECHNOLOGY

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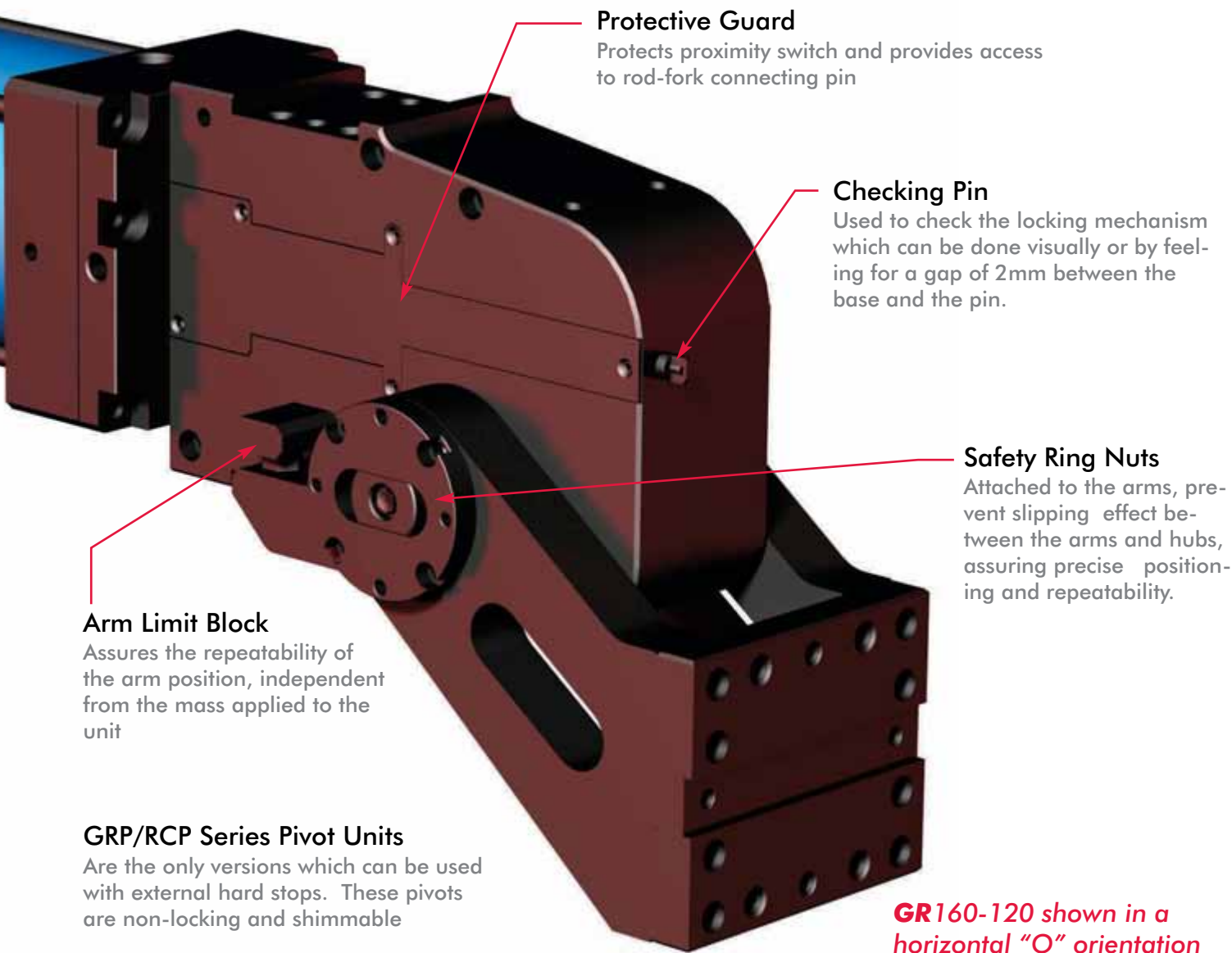
Protective Guard
Protects proximity switch and provides access to rod-fork connecting pin

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**

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
P = PEPPERL+FUCHS PROXIMITY SWITCH
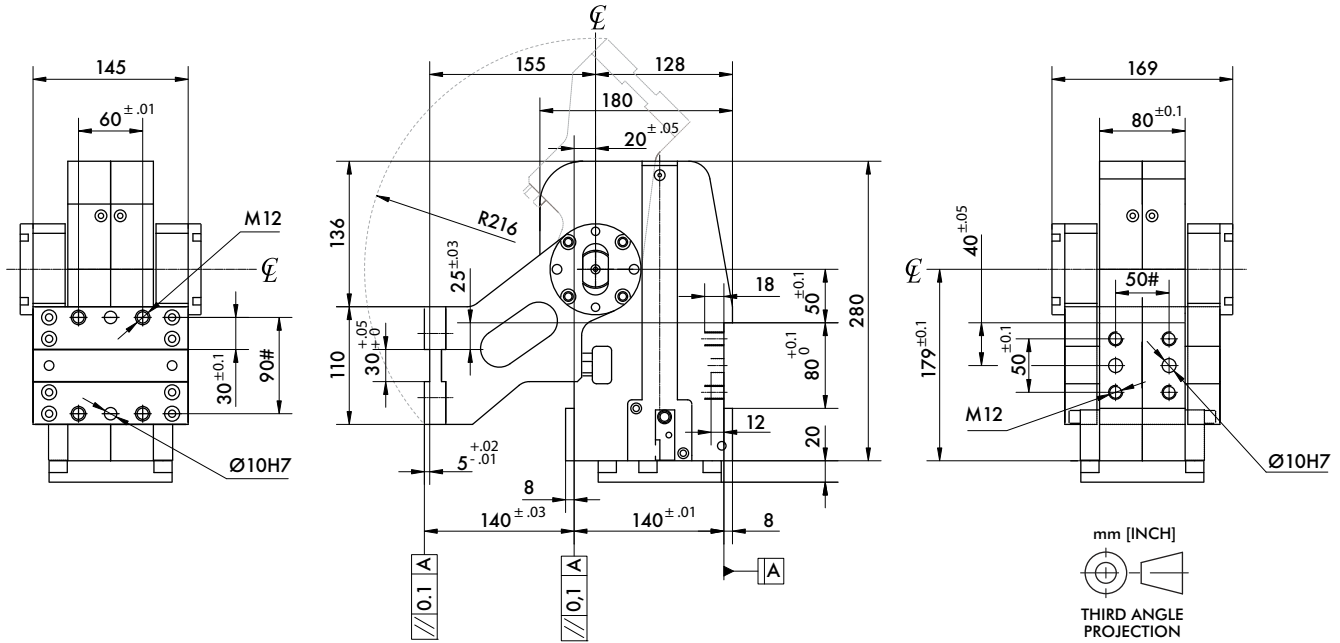**PM** = PEPPERL+FUCHS PROXIMITY SWITCH (WHITE LED)

PROXIMITY SWITCH LOCATION (SEE BELOW)
P0 = NO PROXIMIY SWITCH
PX = PROXIMITY SWITCH ON THE X SIDE
PY = PROXIMITY SWITCH ON THE Y SIDE

GR & RC Series Optional Cylinder Position (See page 9 for port sizes and locations)
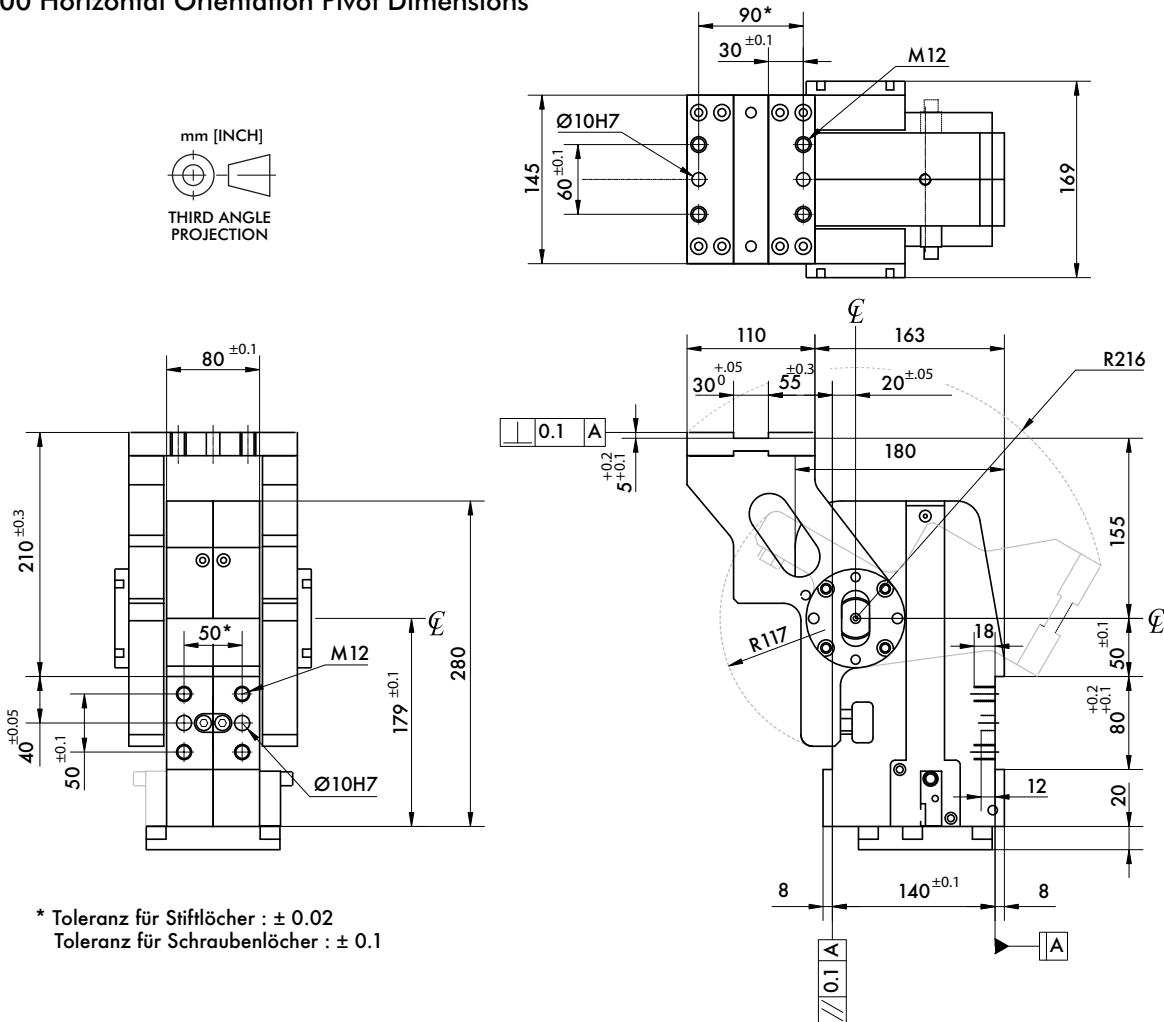
Cylinder position "**X**"
Alternate positions shown (Right)

Cylinder position "**W**"

Cylinder position "**Y**"

Cylinder position "**Z**"
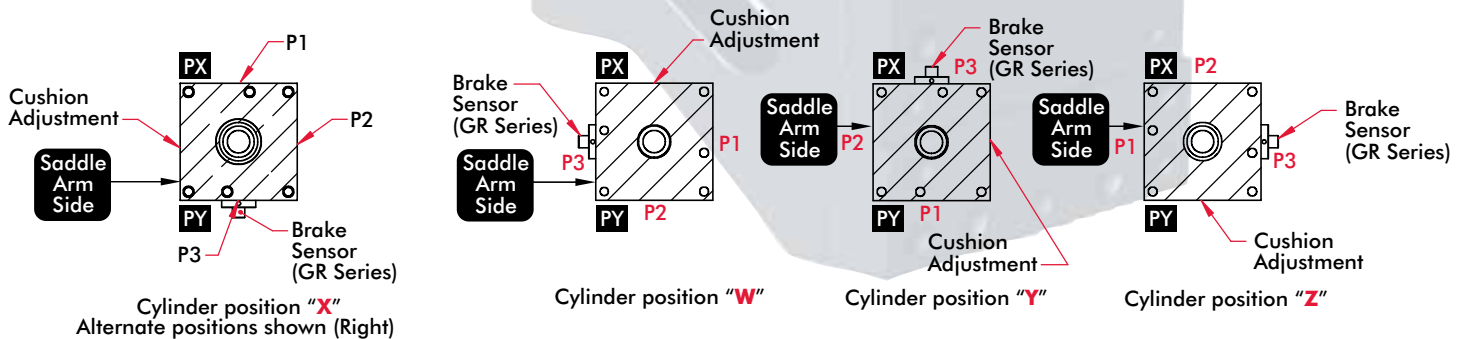
GR and RC Series Medium Duty Pivot Units

GR-RC 100 Vertical Orientation Pivot Dimensions

mm [INCH]

THIRD ANGLE
PROJECTION

GR-RC 100 Horizontal Orientation Pivot Dimensions

mm [INCH]

THIRD ANGLE
PROJECTION

* Toleranz für Stiftlöcher : ± 0.02
  Toleranz für Schraubenlöcher : ± 0.1

Dimensions and technical information are subject to change without notice

CLAMPING TECHNOLOGY

GR and RC Series Medium Duty Pivot Units

GR-RC 125-160-200 Vertical Orientation Pivot Dimensions

mm [INCH]

THIRD ANGLE
PROJECTION

* Toleranz für Stiftlöcher : ± 0.02
  Toleranz für Schraubenlöcher : ± 0.1
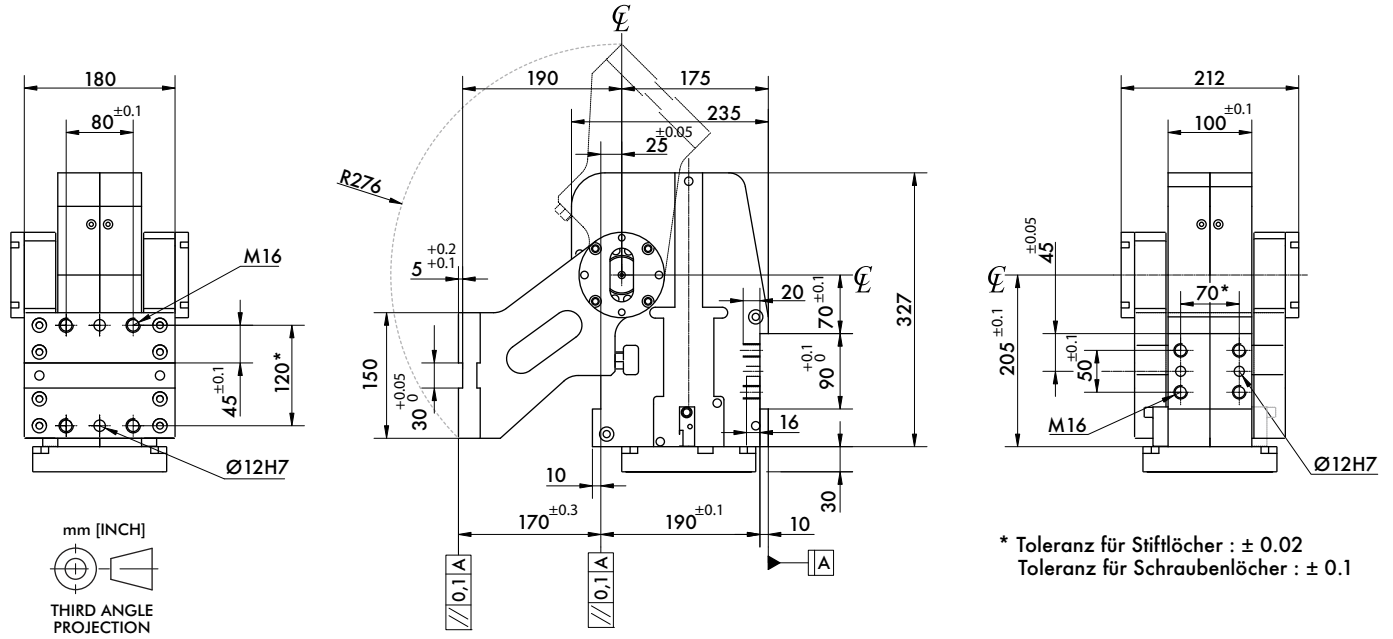
GR-RC 125-160-200 Horizontal Orientation Pivot Dimensions

* Toleranz für Stiftlöcher : ± 0.02
  Toleranz für Schraubenlöcher : ± 0.1

mm [INCH]

THIRD ANGLE
PROJECTION
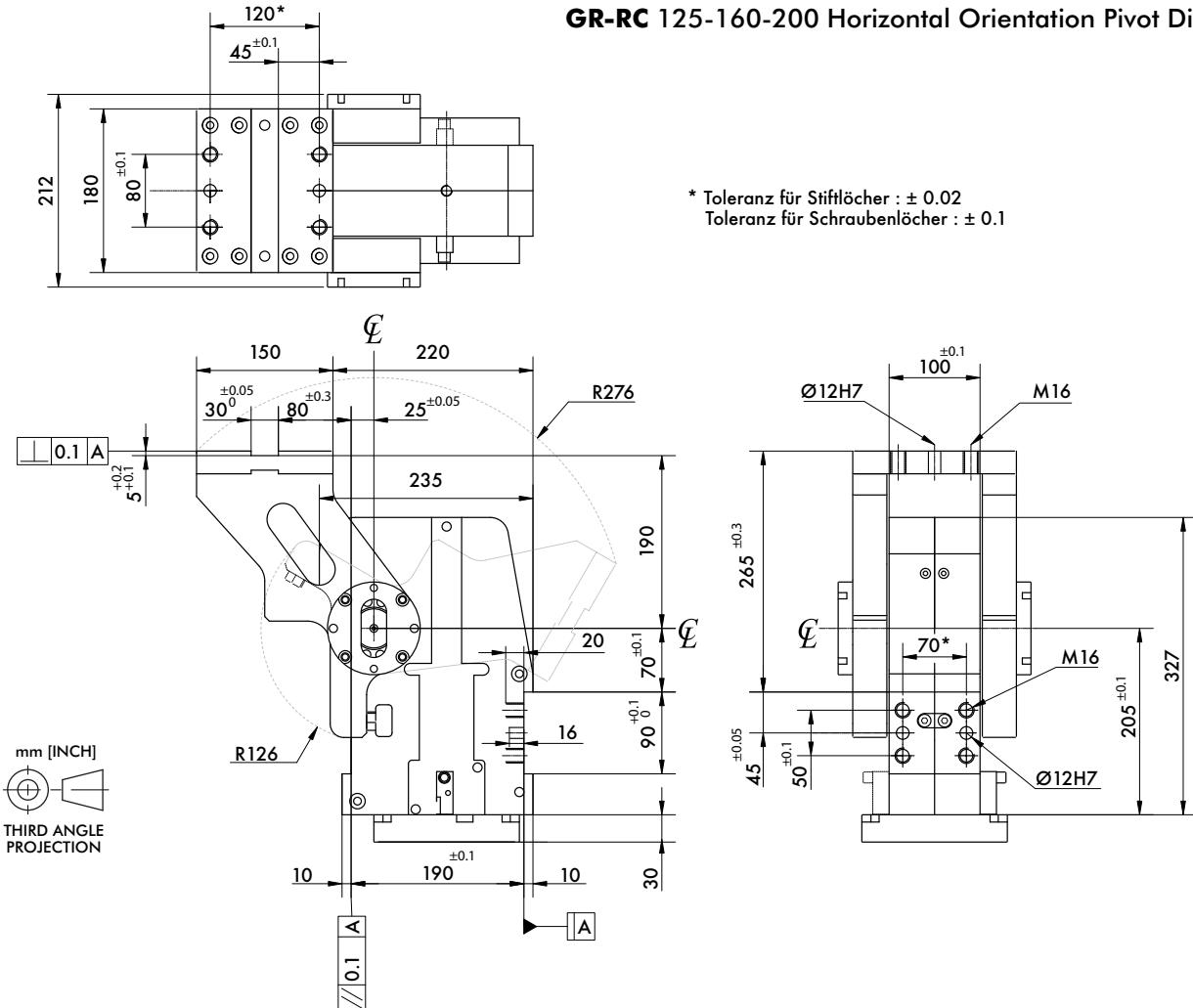
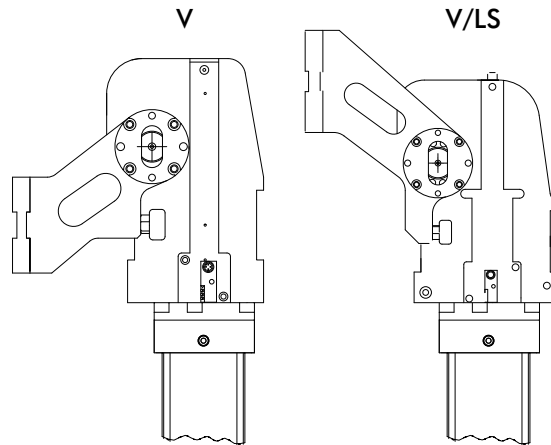**GR** and **RC** Series Medium Duty Pivot Units-Movement

Arm Opening Angle and Saddle Movement
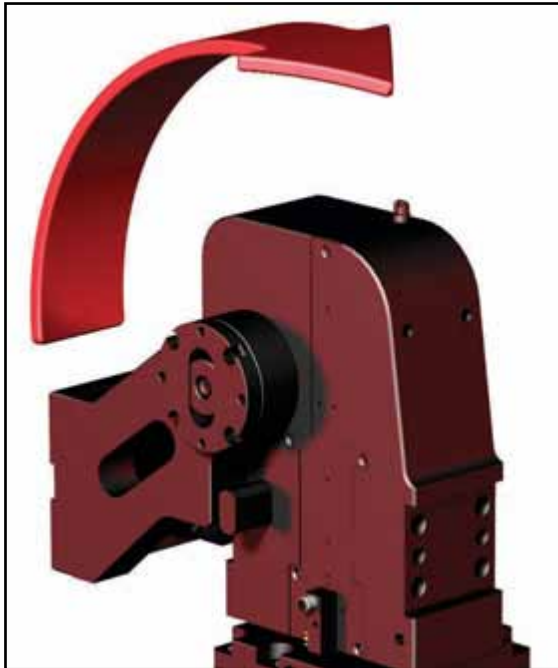
Vertical Saddle Orientation
Arm opening angles offered:
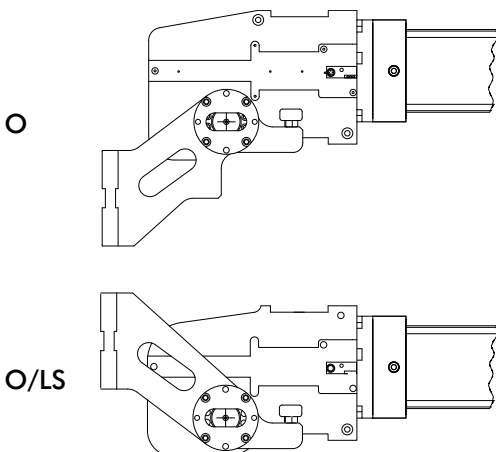45° Arm Opening Angle
90° Arm Opening Angle
120° Arm Opening Angle

Swivel Arm Position

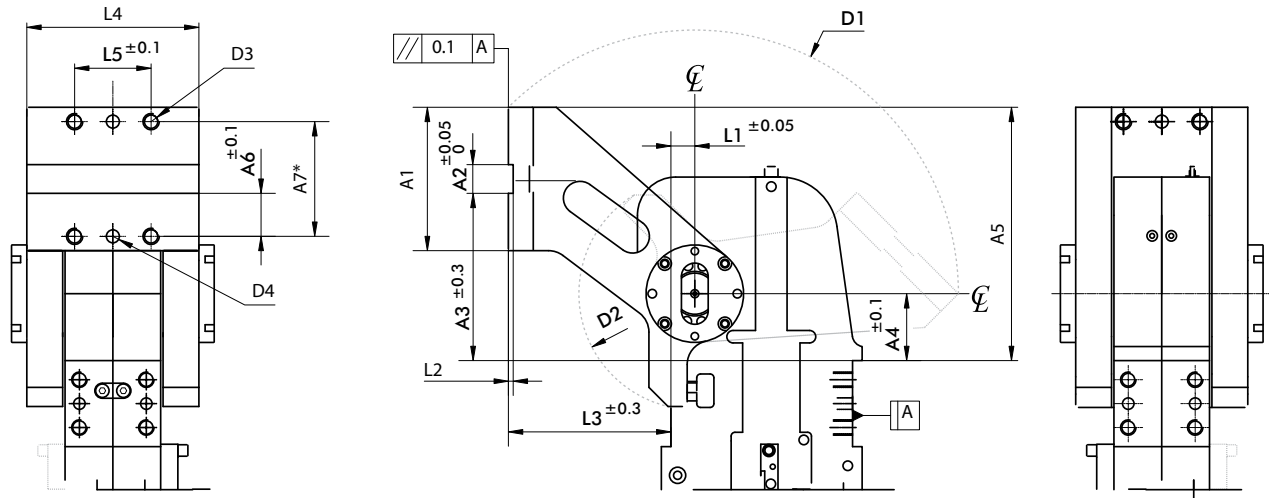V   V/LS

Horizontal Saddle Orientation
Arm opening angles offered:
45° Arm Opening Angle
90° Arm Opening Angle
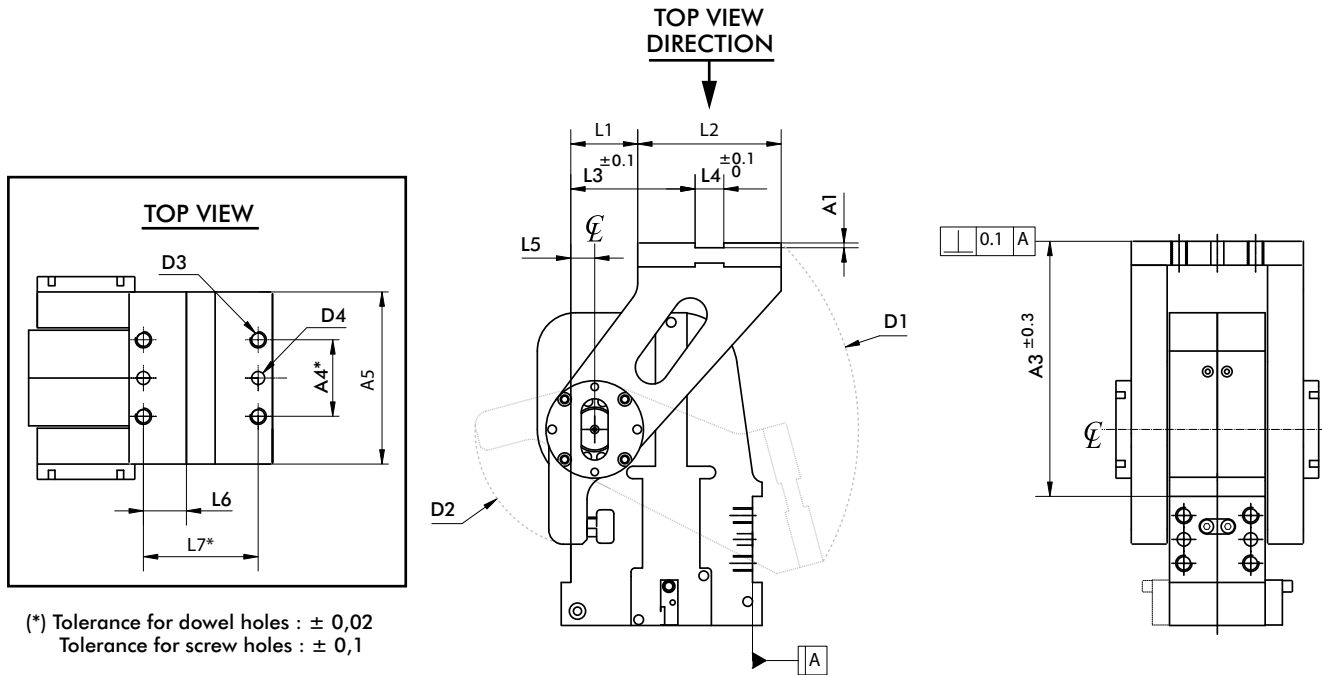120° Arm Opening Angle

Swivel Arm Position

O

O/LS

GR and **RC** Series Medium Duty Pivot Units-Dimensions

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
								mm									
GR/RC100-...V/LS	110	30	125	50	195	30	90	20	5	140	145	60	216	117	M12	Ø10	
GR/RC125-...V/LS																	120°
GR/RC160-...V/LS	150	30	175	70	265	45	120	25	5	170	180	80	276	126	M16	Ø12	
GR/RC200-...V/LS																	

## Type "LS" Horizontal Orientation Dimensions

TOP VIEW

(*) 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
						mm											
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																	
GR/RC160-...O/LS	5	70	265	80	180	70	150	130	30	25	45	120	276	126	M16	Ø12	80°
GR/RC200-...O/LS																	

## GR and RC Series Medium Duty Pivot Units

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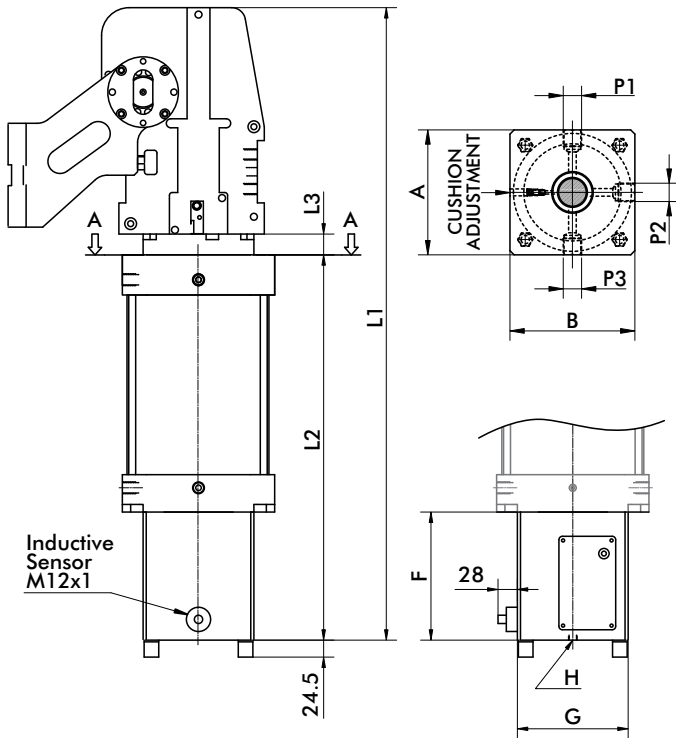
GR MODEL	L1	L2	L3	A - B	P3	P1 - P2	Weight
			mm				
GR100-45°	683.5	383.5		115	1/2" G	1/2" G or 1/2" NPT	36 kg [80 lb]
GR100-90°	728.5	428.5	20				
GR100-120°	758.0	458.0					
GR125-45°	818.0	466.0		160	1/2" G	1/2" G or 1/2" NPT	80 kg [176 lb]
GR125-90°	867.0	515.0	25				
GR125-120°	895.0	543.0					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

NOTE: "P1-P2" DEPENDANT ON ORDERING CODE

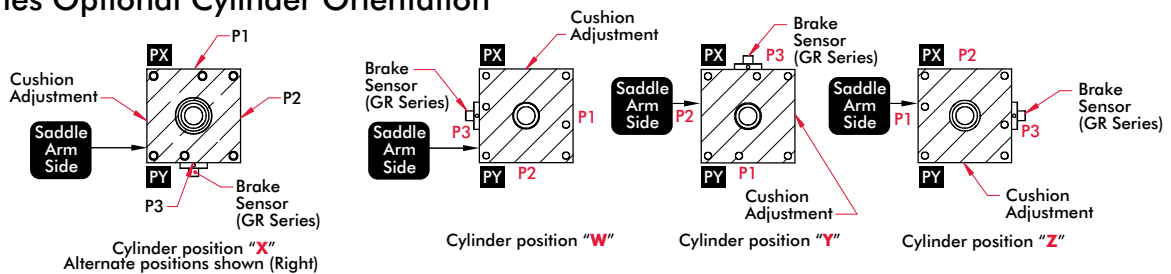| GR MODEL	F	G	H
		mm	
GR100	136	115 SQ	1/4"
GR125	185	160 SQ	1/4"
GR160	185	160 SQ	1/4"
GR200	185	160 SQ	1/4"

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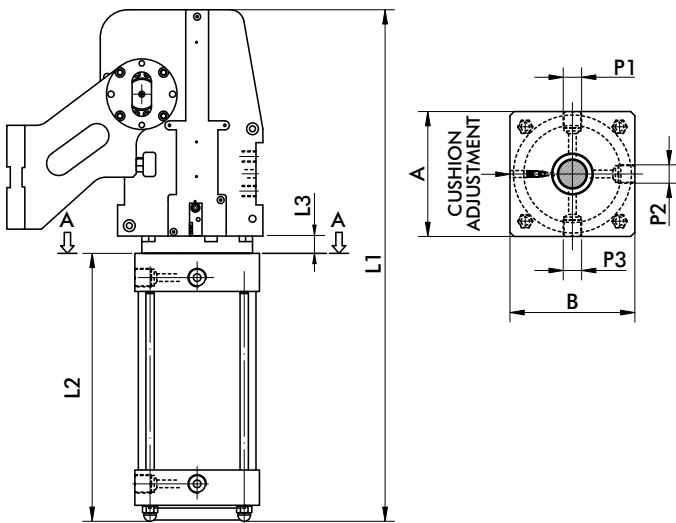
RC MODEL	L1	L2	L3	A - B	P3	P1 - P2	Weight
			mm				
RC100-45°	566.5	266.5		115	1/2" G	1/2" G or 1/2" NPT	29 kg [64 lb]
RC100-90°	611.5	311.5	20				
RC100-120°	641.0	341.0					
RC125-45°	656.0	304.0		160	1/2" G	1/2" G or 1/2" NPT	62 kg [137 lb]
RC125-90°	705.0	353.0	25				
RC125-120°	733.0	381.0					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

NOTE: "P1-P2" DEPENDANT ON ORDERING CODE

GR & RC Series Optional Cylinder Orientation

Cylinder position "X" Alternate positions shown (Right)

Cylinder position "W"

Cylinder position "Y"

Cylinder position "Z"

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 pnuematic 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 popet valve is engaged to allow oil to flow from one side of the piston to the other, If the popet 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.

Hydraulic Cylinder · Ball Screw · Pneumatic Cylinder · Hydraulic Oil · Poppet Valve · Hydraulic Pass-thru Orifice
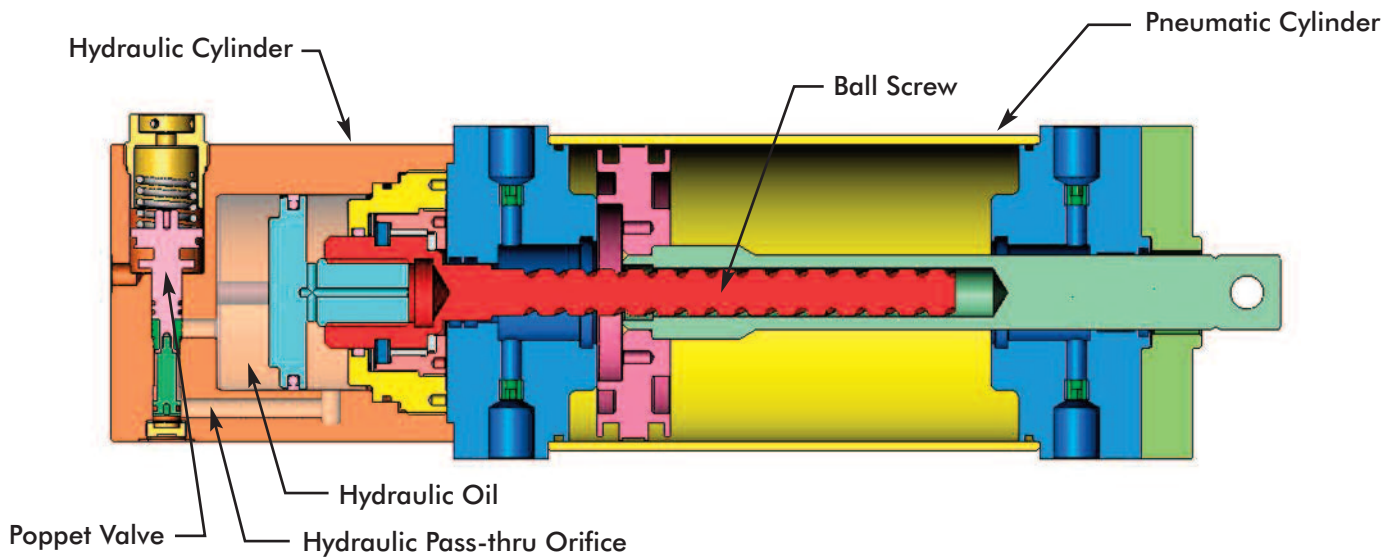
RC Series Hydraulic-Pneumatic Cylinder - Operating Principle

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.

Fixed Hydraulic Piston Rod · Hydro-Pheumatic Piston Rod · Hydraulic Oil · Hydraulic Pass-thru Orifice
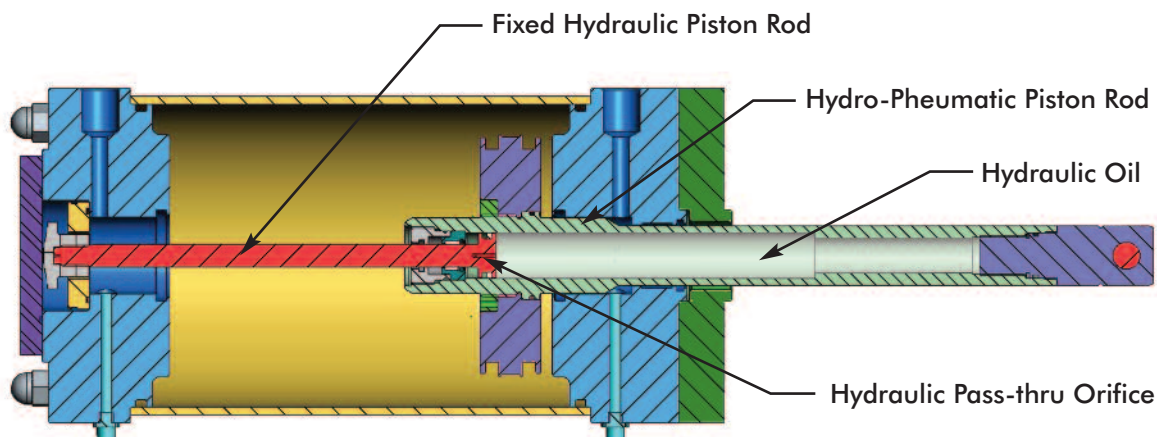
GR and RC Series Medium Duty Pivot Units

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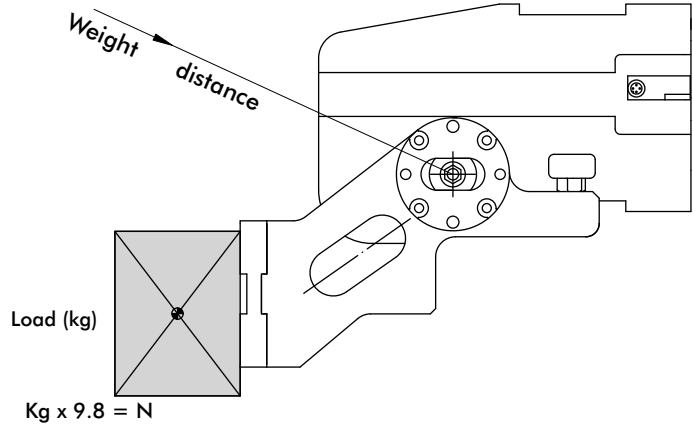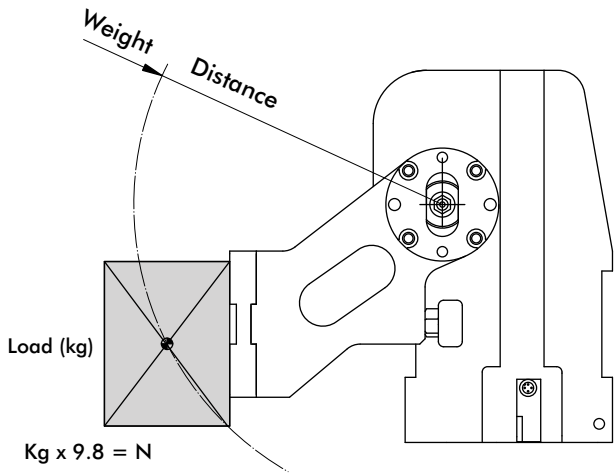
Model	Maximum Torque for Weight - ≤ 90° opening					
	58psi / 4 Bar		**72psi / 5 Bar**		**87psi / 6 Bar**	
	lbf*in	N*m	lbf*in	N*m	lbf*in	N*m
GR/RC100	1062	120	1328	150	1682	190
GR/RC125	1563	180	2124	240	2567	290
GR/RC160	2832	320	3629	410	4425	500
GR/RC200	4514	510	5841	660	7081	800

Model	Maximum Torque for Weight - > 90° 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
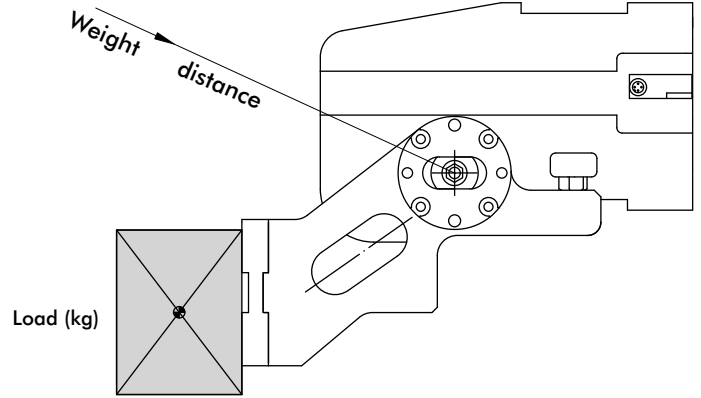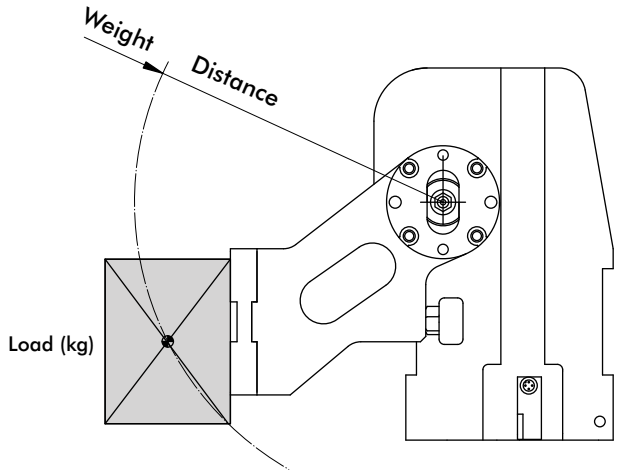
Notes

The total torque for the application must be less than the Maximum Torque for a given pressure 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 7-8 seconds. Flow controls must be used to provide this cyle time. Cushions must also be adjusted to provide deceleration to the load. Failure to control movement will severely damage unit and cause premature failure.
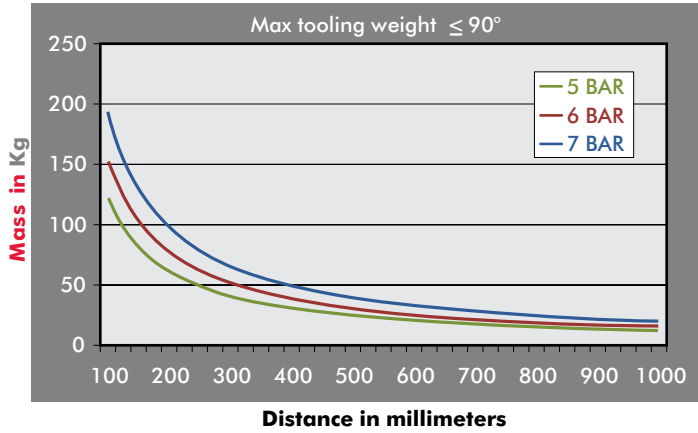
Use the following graphs to determine the maximum amount of tooling weight that is allowed. The tooling load should be placed as close to the center line of the unit as possible.
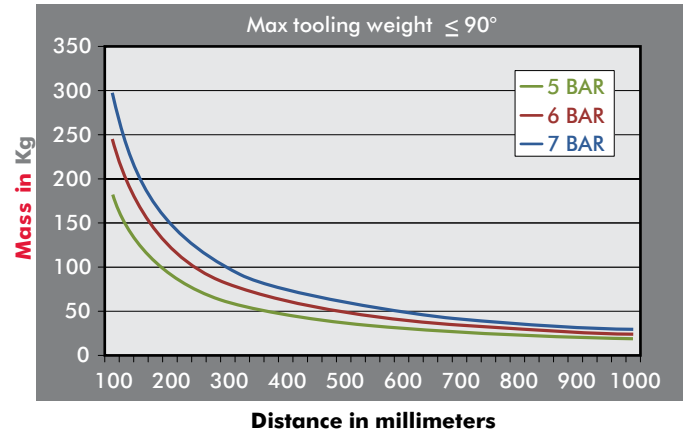
GR and **RC** Series Medium Duty Pivot Units

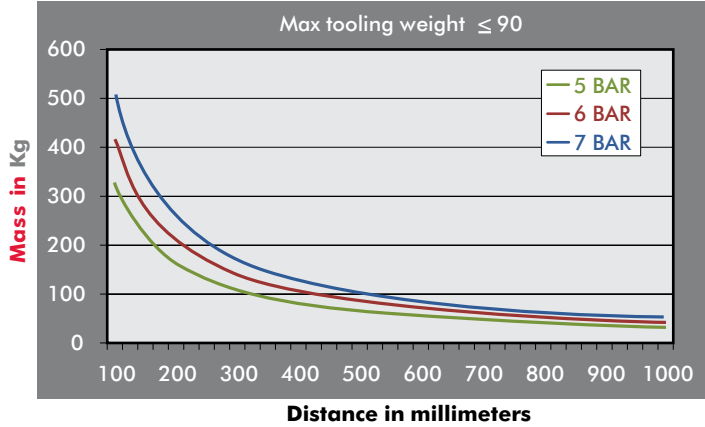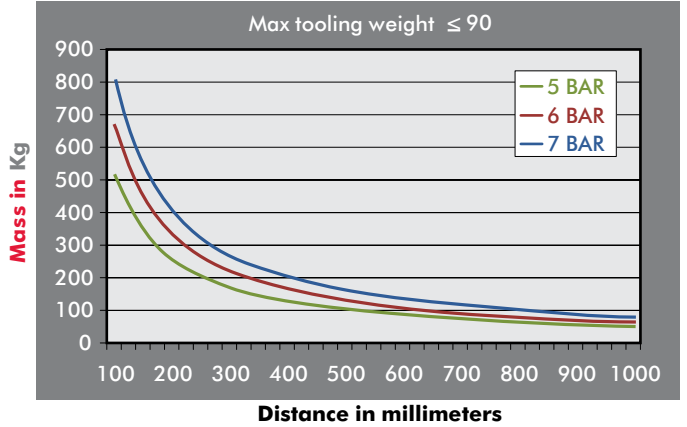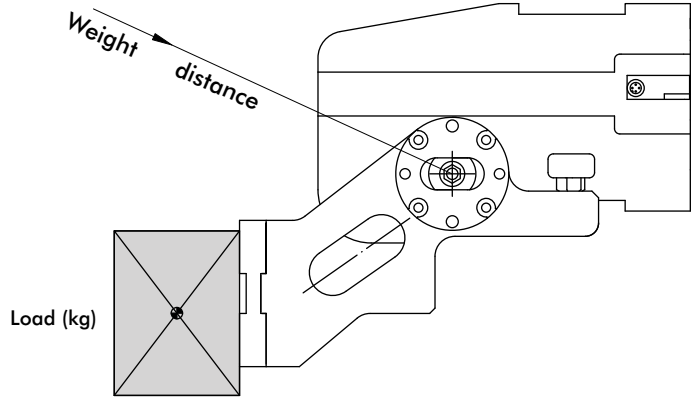## Maximum Added Tooling Weight less than 90°

Weight
Distance
Load (kg)

Weight
distance
Load (kg)

GR/RC 100

Max tooling weight ≤ 90°

- 5 BAR
- 6 BAR
- 7 BAR

Mass in Kg
Distance in millimeters

GR/RC 125

Max tooling weight ≤ 90°

- 5 BAR
- 6 BAR
- 7 BAR

Mass in Kg
Distance in millimeters

GR/RC 160

Max tooling weight ≤ 90

- 5 BAR
- 6 BAR
- 7 BAR

Mass in Kg
Distance in millimeters

GR/RC 200

Max tooling weight ≤ 90

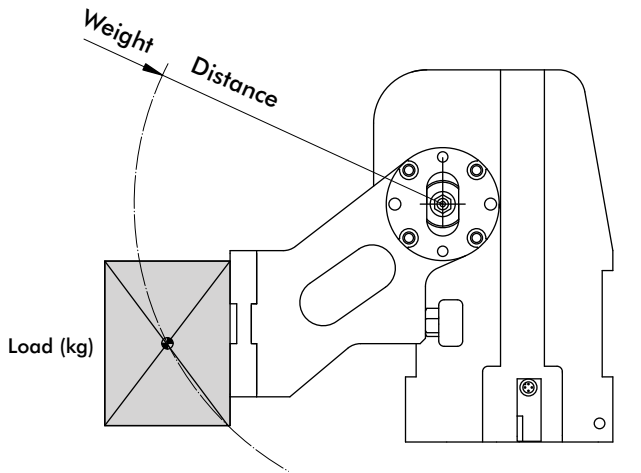- 5 BAR
- 6 BAR
- 7 BAR

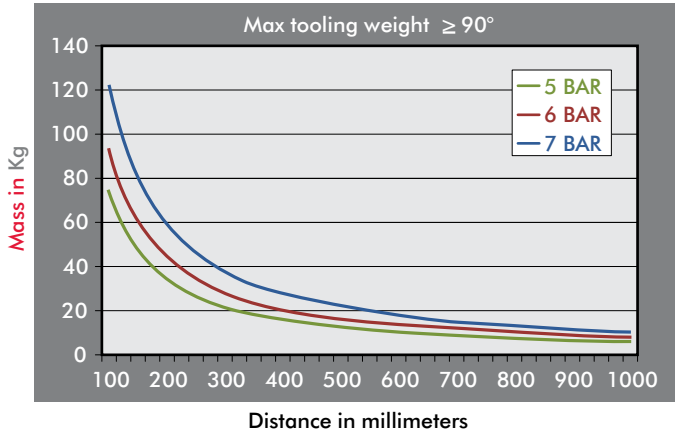Mass in Kg
Distance in millimeters

GR and RC Series Medium Duty Pivot Units

Maximum Added Tooling Weight Greater than 90°

GR/RC 100

Max tooling weight ≥ 90°

Mass in Kg

5 BAR
6 BAR
7 BAR

Distance in millimeters

GR/RC 125

Max tooling weight ≥ 90°

Mass in Kg

5 BAR
6 BAR
7 BAR

Distance in millimeters

GR/RC 160

Max tooling weight ≥ 90

Mass in Kg

5 BAR
6 BAR
7 BAR

Distance in millimeters

GR/RC 200

Max tooling weight ≥ 90°

Mass in Kg

5 BAR
6 BAR
7 BAR

Distance in millimeters

CLAMPING TECHNOLOGY
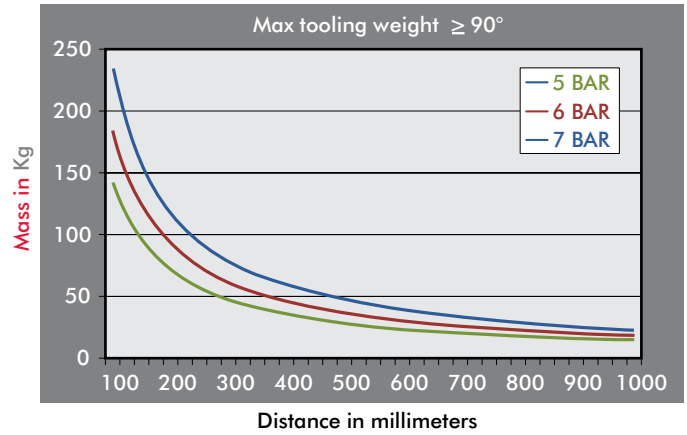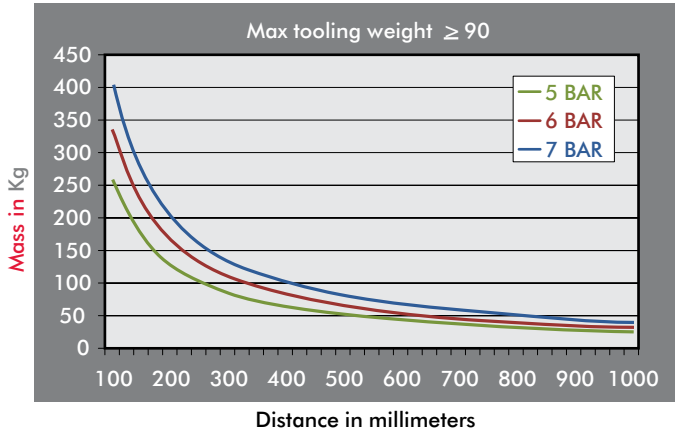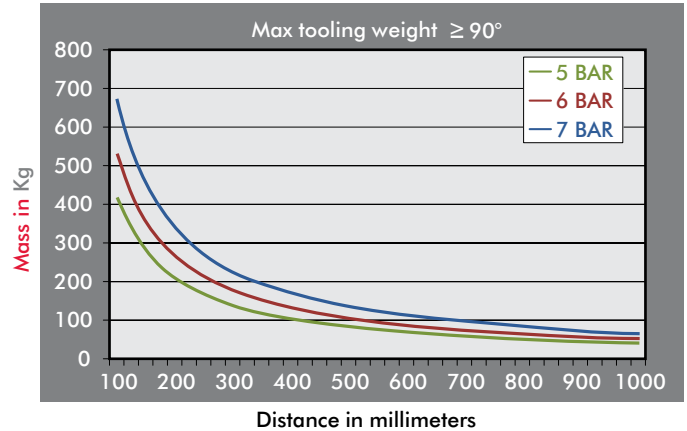
GR and **RC** Series Medium Duty Pivot Units

Force Charts for Opening Angles
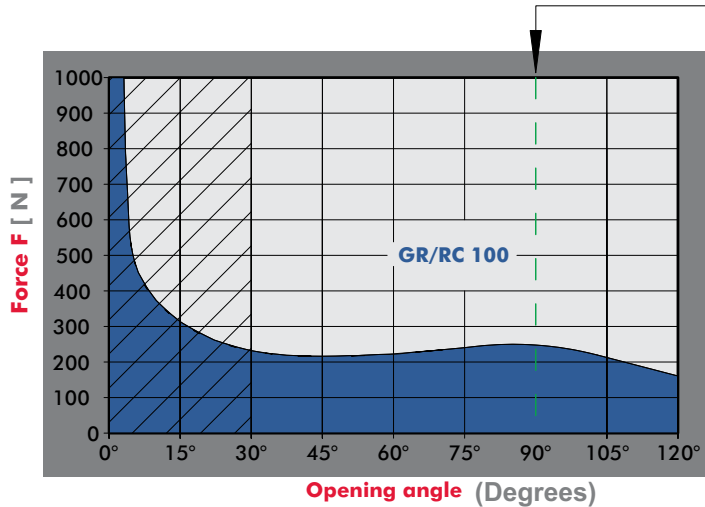

M
90°

α

M 0°
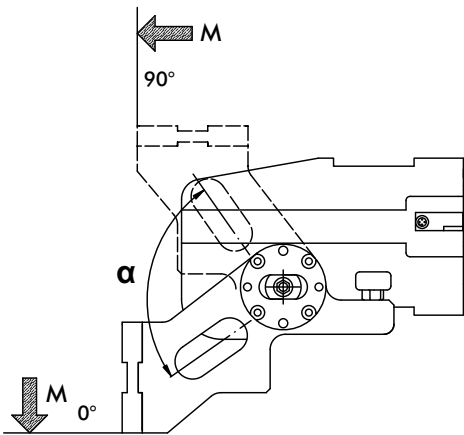
(Values calculated at 1 m from center of rotation)

10°
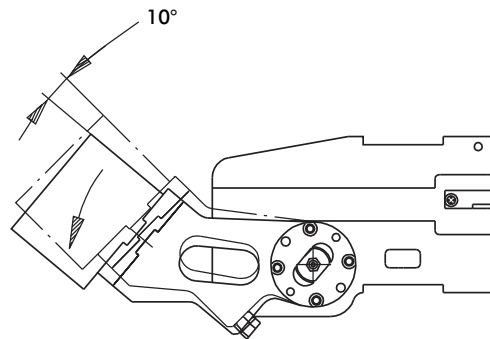
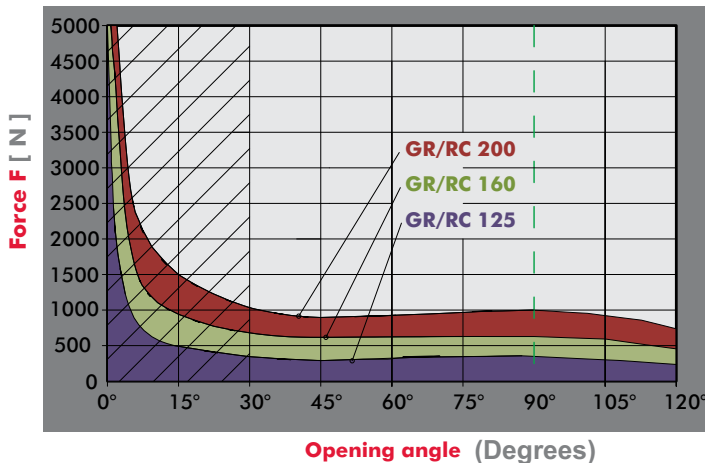**Play of swing arm while closed emergency stop value**

Conditions:

– Emergency stop in operaton
– Cylinder depressurized
– Max. load

Max. play 10°

Force F [N]

GR/RC 100

Opening angle (Degrees)

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

Force F [N]

GR/RC 200
GR/RC 160
GR/RC 125

Opening angle (Degrees)

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!