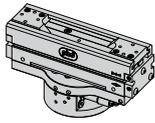
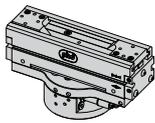
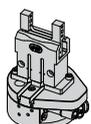
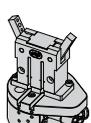
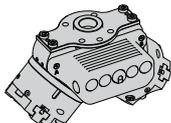
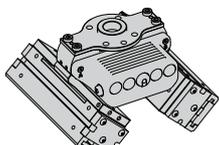
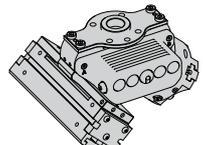


ORDERING DATA: PNEU-CONNECT® KITS

	KIT INCLUDES	KIT NUMBER
SINGLE GRIPPER	 <ul style="list-style-type: none"> • Pneu-Connect • GRH12-5-12x75-L11-UB99 gripper • gripper mounting plate • mounting kit • 2 integrated discrete switches for sensing gripper open and close • URCap integration software 	89387-01-012-0001
	 <ul style="list-style-type: none"> • Pneu-Connect • GRT532-1-0001 gripper • gripper mounting plate • mounting kit • URCap integration software 	89387-02-050-0001
	 <ul style="list-style-type: none"> • Pneu-Connect • GRH12-5-12x75-L11-UB99-E3 gripper • gripper mounting plate • mounting kit • 1 integrated analog sensor for jaw position feedback • URCap integration software 	89387-03-012-0001
	 <ul style="list-style-type: none"> • Pneu-Connect • GRA-5-20x13-L11-UB99-GR9 gripper • gripper mounting plate • mounting kit • 2 integrated discrete switches for sensing gripper open and close • URCap integration software 	89387-04-020-0001
	 <ul style="list-style-type: none"> • Pneu-Connect • GRV-5-20x40-L11-UB99-GR9 gripper • gripper mounting plate • mounting kit • 2 integrated discrete switches for sensing gripper open and close • URCap integration software 	89387-05-020-0001
	 <ul style="list-style-type: none"> • Pneu-Connect • GRL12-5-16x26-L11-UB99 gripper • gripper mounting plate • mounting kit • URCap integration software 	89387-06-016-0001
X2 - DUAL GRIPPERS	 <ul style="list-style-type: none"> • Pneu-Connect • 2 GRT532-1-0001 grippers • 2 gripper mounting plates • mounting kit • URCap integration software • Freedrive 	89921-0101-5050-0001
	 <ul style="list-style-type: none"> • Pneu-Connect • 2 GRH12-5-12x75-L11-UB99-E3 grippers • 2 gripper mounting plates • mounting kit • 2 integrated analog sensors for jaw position feedback • URCap integration software • Freedrive 	89921-0202-1212-0001
	 <ul style="list-style-type: none"> • Pneu-Connect • GRT532-1-0001 gripper • GRH12-5-12x75-L11-UB99-E3 gripper • 2 gripper mounting plates • mounting kit • 1 integrated analog sensor for jaw position feedback on GRH Gripper • URCap integration software • Freedrive 	89921-0102-5012-0001

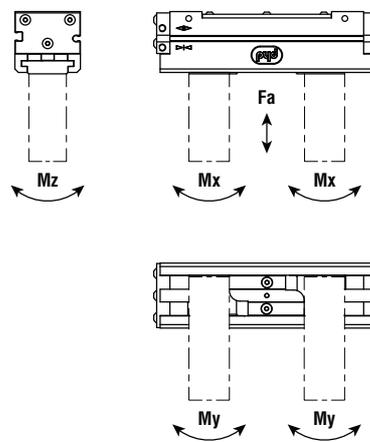
ENGINEERING DATA: LONG JAW TRAVEL PARALLEL GRIPPER - SERIES GRH

SPECIFICATIONS	GRH12-5-12
OPERATING PRESSURE	1.4 bar min to 6.9 bar max [20 psi min to 100 psi max] air
OPERATING TEMPERATURE	-28 to +82°C [-20 to +180°F]
GRIP REPEATABILITY	±0.05 mm [±0.002 in] of original position
RATED LIFE	5 million cycles
LUBRICATION	Factory lubricated for rated life
MINIMUM TOTAL JAW TRAVEL	75 mm [2.953 in]
TOTAL GRIP FORCE AT 6 bar [87 psi]	120 N [27 lb]
GRIPPER WEIGHT	0.79 kg [1.75 lb]
ONE DIRECTION DISPLACEMENT	10.47 cm³ [0.639 in³]
CLOSE OR OPEN TIME AT 6 bar [87 psi]	0.215 sec
MAX TOOLING LENGTH	100 mm [3.94 in]
GRIP FORCE FACTOR (Gf)	20.0 [0.31]

MODEL NO.	AXIAL FORCE		MAXIMUM INDIVIDUAL MOMENTS					
	N	lb	Nm	in-lb	Nm	in-lb	Nm	in-lb
GRH12-5-12	222	50	11	95	7	65	7	65

- Fa: Total for both jaws
- Mx: Maximum allowable moment per jaw, relative to the reference plane
- My: Maximum allowable moment per jaw, relative to the geometric center of the jaw finger
- Mz: Maximum allowable moment per jaw, relative to the reference plane

When calculating the value for Fa, include the tooling weight, part weight, external forces, and accelerations. When calculating values for Mx, My, and Mz, include the grip force per jaw, tooling weight, part weight, external forces, and accelerations as applicable.



TOOLING LENGTH FACTOR

As the tool center point is moved away from the jaw surface the grip force is reduced due to additional friction generated by the grip induced moment. The tooling length factor allows calculation of the grip force at any tool center point. The graph also indicates the maximum tooling length.

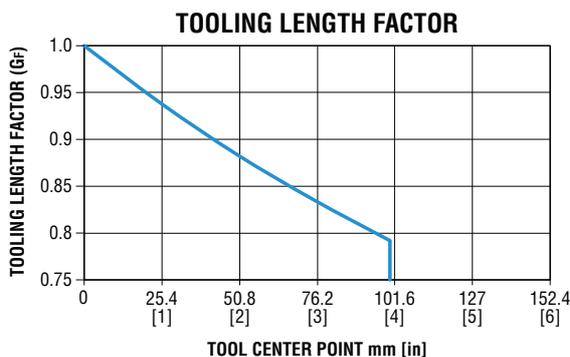
GRIP FORCE CALCULATION EQUATIONS:

METRIC:

Total Grip Force (N) = (Pressure [bar] x Gf) x Tooling Length Factor

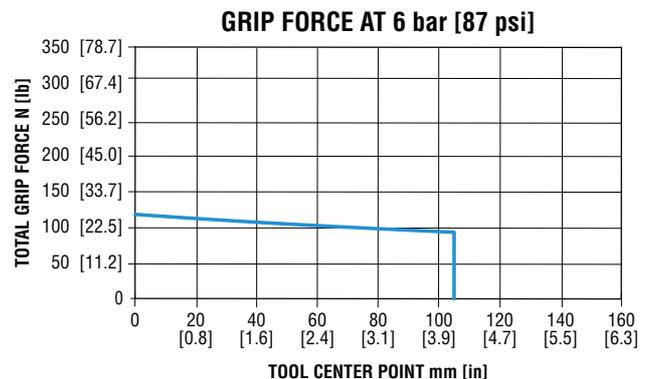
IMPERIAL:

Total Grip Force (lb) = (Pressure [psi] x Gf) x Tooling Length Factor



GRIP FORCE

Total gripping force relative to tooling length is shown below at 6 bar [87 psi] pressure. Grip force per jaw equals the total grip force divided by two. The graphs also indicate the maximum tooling length.



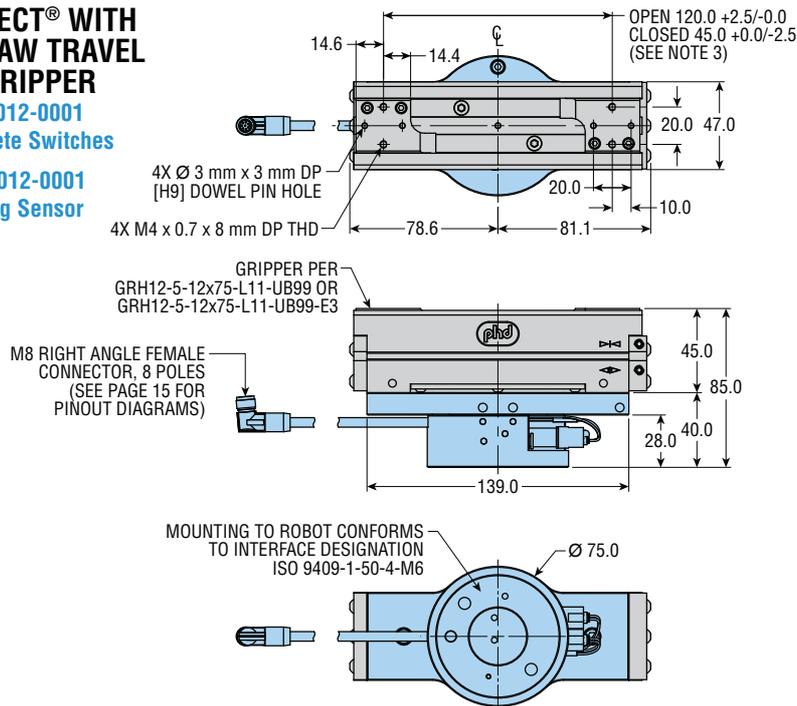
DIMENSIONS: LONG JAW TRAVEL PARALLEL GRIPPER - SERIES GRH

PNEU-CONNECT® WITH ONE LONG JAW TRAVEL PARALLEL GRIPPER

KITS: 89387-01-012-0001
with Discrete Switches

89387-03-012-0001
with Analog Sensor

Total Weight:
1.31 kg [2.88 lb]
IP Rating: IP40



two discrete switches



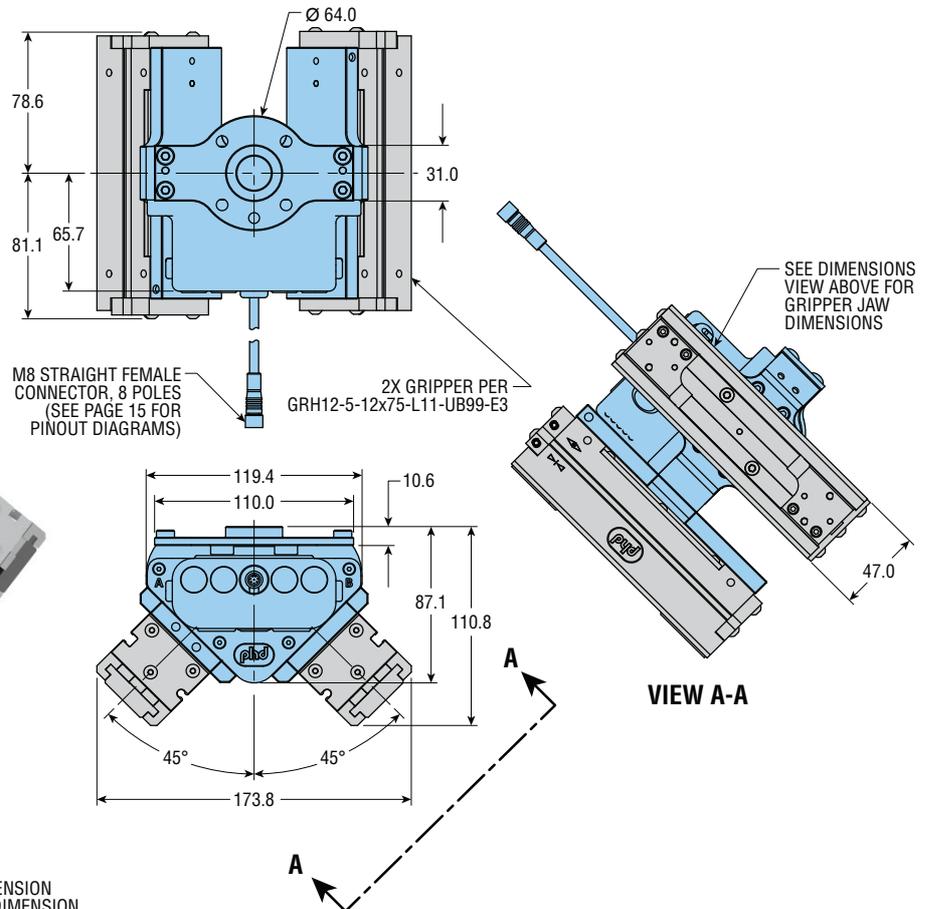
one analog sensor

PNEU-CONNECT® X2 WITH TWO LONG JAW TRAVEL PARALLEL GRIPPERS

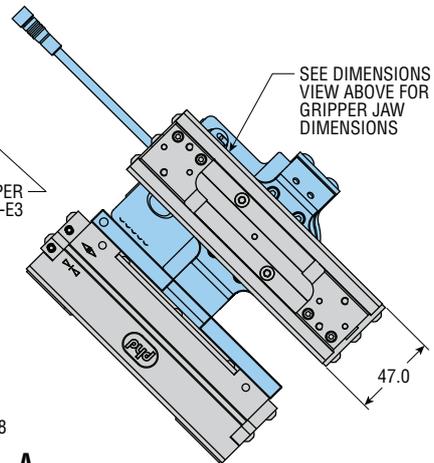
KIT: 89921-0202-1212-0001
with two Analog Sensors

Total Weight: 2.40 kg [5.30 lb]

IP Rating: IP50



two analog sensors



VIEW A-A

NOTES:

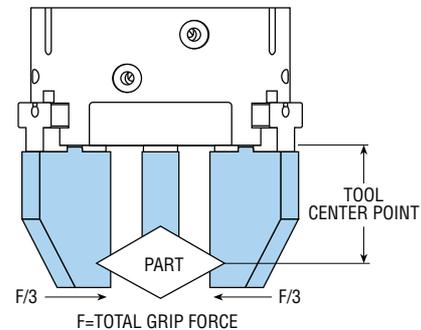
- 1) ALL DIMENSIONS ARE mm
- 2) DESIGNATED ϕ IS CENTERLINE OF UNIT
- 3) OPEN REFLECTS SMALLEST POSSIBLE OPEN DIMENSION
CLOSED REFLECTS LARGEST POSSIBLE CLOSED DIMENSION

All dimensions are reference only unless specifically tolerated.

ENGINEERING DATA: 3-JAW PARALLEL CONCENTRIC GRIPPER - SERIES GRT

SPECIFICATIONS	GRT532
OPERATING PRESSURE	2 bar min to 7 bar max [30 psi min to 100 psi max] air
OPERATING TEMPERATURE	-28° to +82°C [-20° to +180°F]
RATED LIFE	10 million cycles minimum with standard seals
GRIP REPEATABILITY	Within ±0.05 mm [±0.002 in] of original centered position
CLOSE OR OPEN TIME 6 bar [87 psi]	0.04 sec
LUBRICATION	Factory lubricated for rated life
MAINTENANCE	Field repairable
TOTAL DIAMETRAL JAW TRAVEL	12 mm [0.472 in]
TOTAL CLOSE GRIP FORCE AT 6 bar [87 psi]	747 N [168 lb]
GRIPPER WEIGHT	0.43 kg [0.95 lb]
DISPLACEMENT	12 cm ³ [0.72 in ³]
GRIP FORCE FACTOR (G _F)	
EXTERNAL GRIP	125 [1.93]
INTERNAL GRIP	136 [2.10]

MODEL NO.	TOOL CENTER POINT		TOOLING WEIGHT MAX. PER JAW	
	mm	in	kg	lb
GRT532	65	2.56	0.33	0.72



TOOLING LENGTH FACTOR

Tooling should be designed so that the tool center point is as close to the body surface as possible. When the tool center point moves away, jaw friction increases, which decreases grip force. The G_F information given to the right is for zero tooling length (body surface). The graph shows how force decreases as the grip point moves away from the body surface.

GRIP FORCE CALCULATION EQUATIONS:

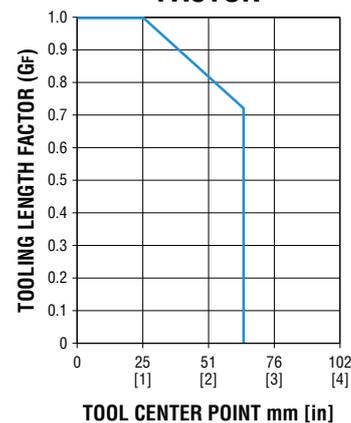
METRIC:

Total Grip Force (N) = (Pressure [bar] x G_F) x Tooling Length Factor

IMPERIAL:

Total Grip Force (lb) = (Pressure [psi] x G_F) x Tooling Length Factor

TOOLING LENGTH FACTOR



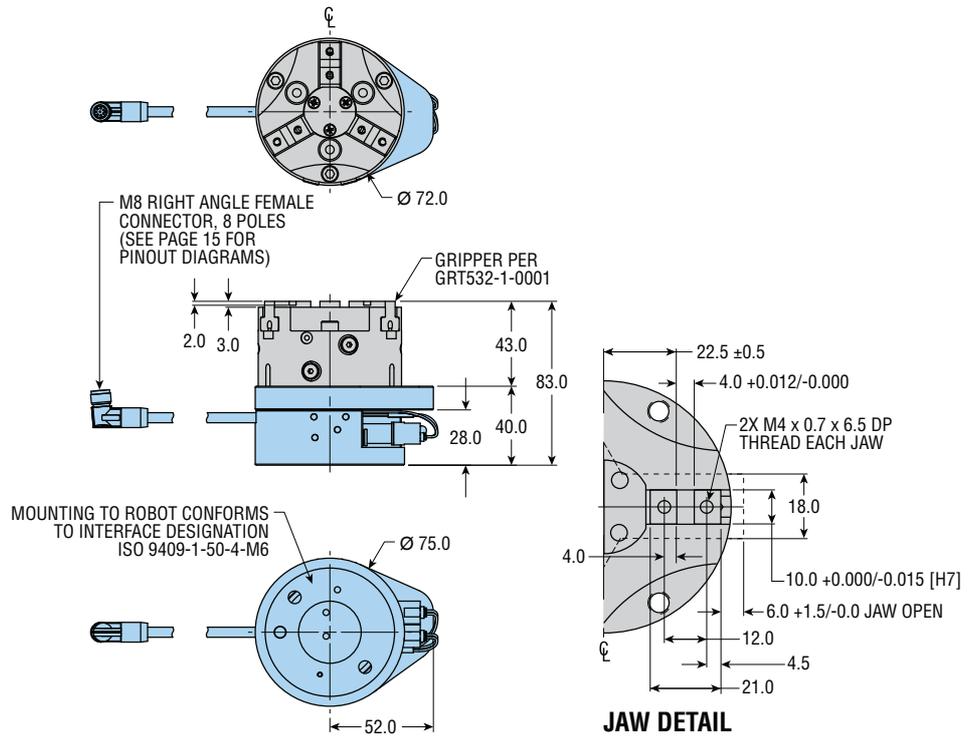
DIMENSIONS: 3-JAW PARALLEL CONCENTRIC GRIPPER - SERIES GRT

PNEU-CONNECT® WITH ONE 3-JAW PARALLEL CONCENTRIC GRIPPER

KIT: 89387-02-050-0001

Total Weight: 0.85 kg [1.88 lb]

IP Rating: IP40

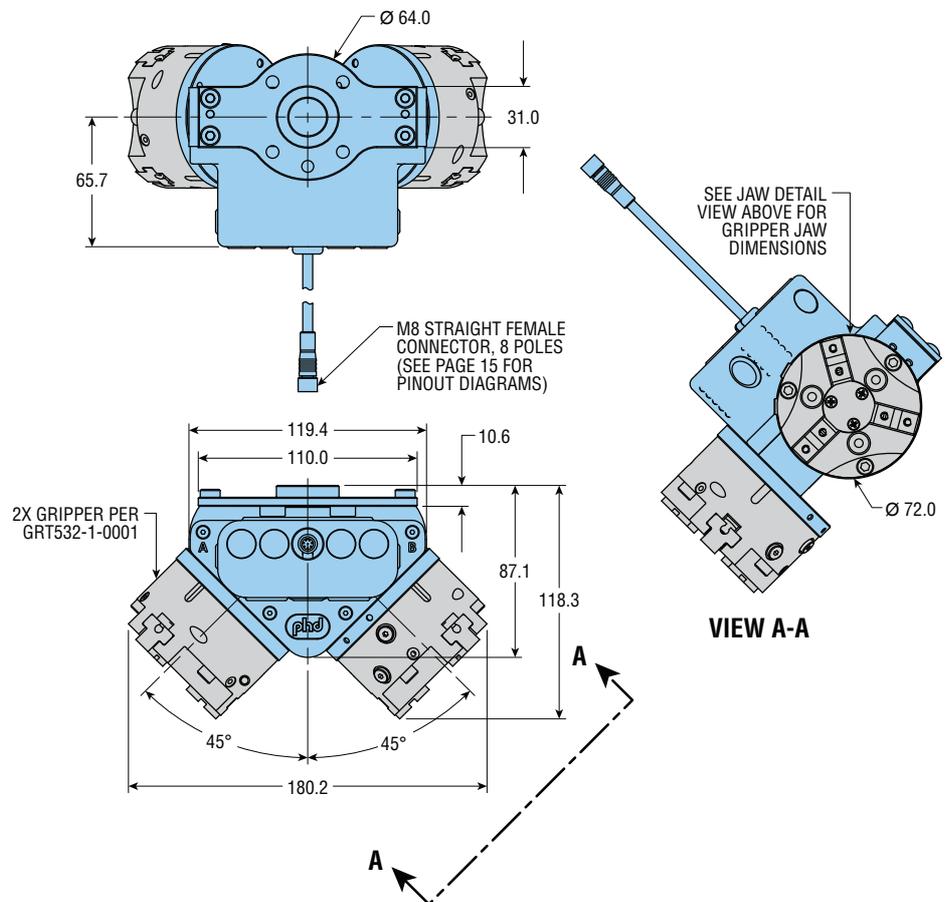


PNEU-CONNECT® X2 WITH TWO 3-JAW PARALLEL CONCENTRIC GRIPPERS

KIT: 89921-0101-5050-0001

Total Weight: 1.68 kg [3.70 lb]

IP Rating: IP50



NOTES:

- 1) ALL DIMENSIONS ARE mm
- 2) DESIGNATED \varnothing IS CENTERLINE OF UNIT

All dimensions are reference only unless specifically toleranced.

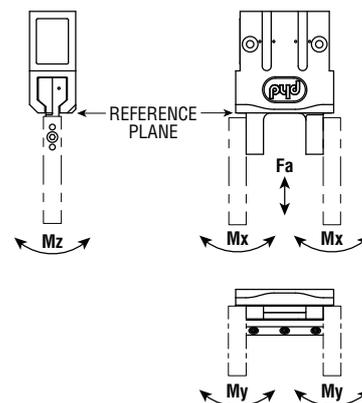
ENGINEERING DATA: PARALLEL MICRO GRIPPER - SERIES GRA

SPECIFICATIONS	GRA-5-20x13
OPERATING AIR PRESSURE	2 bar min to 8.3 bar max [30 psi min to 120 psi max] air
OPERATING TEMPERATURE	-28° to +82°C [-20° to +180°F]
RATED LIFE	10 million cycles minimum with standard seals
GRIP REPEATABILITY	±0.01 mm [±0.0004 in] of original position
LUBRICATION	Factory lubricated for rated life
MINIMUM TOTAL JAW TRAVEL	13.0 mm [0.512 in]
TOTAL CLOSE GRIP FORCE AT 6 bar [87 psi]	123 N [27.7 lb]
GRIPPER WEIGHT	0.28 kg [0.62 lb]
DISPLACEMENT	2.20 cm ³ [0.134 in ³]
CLOSE OR OPEN TIME 6 bar [87 psi]	0.105 sec
MAXIMUM TOOLING LENGTH	100 mm [3.94 in]
GRIP FORCE FACTOR (G _F)	
INTERNAL GRIP	16.4 [0.254]
EXTERNAL GRIP	20.5 [0.318]

- Fa: Total for both jaws
- Mx: Maximum allowable moment per jaw, relative to the reference plane
- My: Maximum allowable moment per jaw, relative to the geometric center of the jaw finger
- Mz: Maximum allowable moment per jaw, relative to the reference plane

When calculating the value for Fa, include the tooling weight, part weight, external forces, and accelerations. When calculating values for Mx, My, and Mz, include the grip force per jaw, tooling weight, part weight, external forces, and accelerations as applicable.

MODEL NO.	AXIAL FORCE		MAXIMUM INDIVIDUAL MOMENTS					
	Fa		Mx	My	Mz			
	lb	N	in-lb	Nm	in-lb	Nm	in-lb	Nm
GRA-5-20x13	40	178	45	5.1	45	5.1	30	3.4



TOOLING LENGTH FACTOR

As the tool center point is moved away from the jaw surface, the grip force is reduced due to additional friction generated by the grip induced moment. The tooling length factor allows calculation of the grip force at any tool center point. The graph also indicates the maximum tooling length.

GRIP FORCE CALCULATION EQUATIONS:

METRIC:

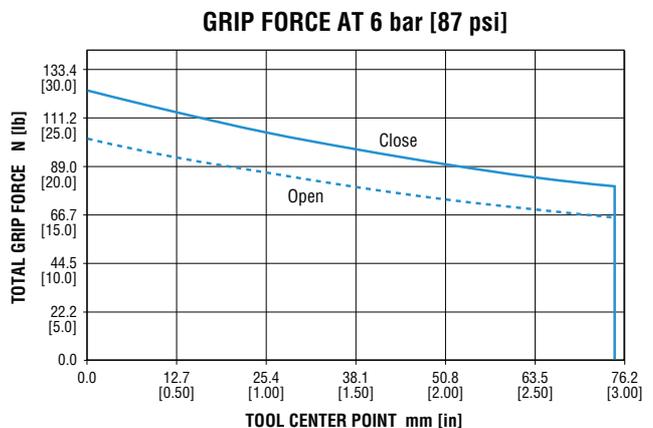
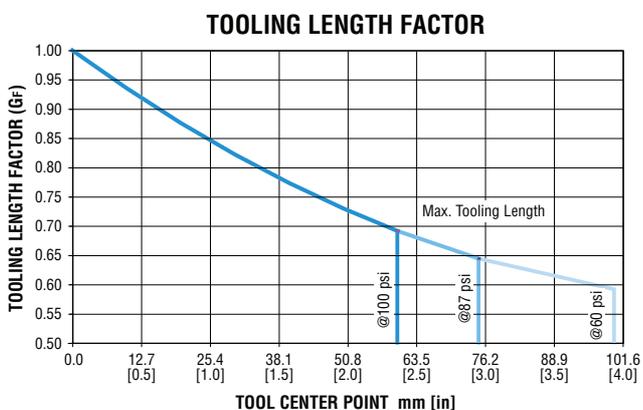
Total Grip Force (N) = (Pressure [bar] x G_F) x Tooling Length Factor

IMPERIAL:

Total Grip Force (lb) = (Pressure [psi] x G_F) x Tooling Length Factor

GRIP FORCE

Total gripping force relative to tool center point is shown below at 6 bar [87 psi] pressure. Grip force per jaw equals the total grip force divided by two. The graphs also indicate the maximum tooling length.



DIMENSIONS: PARALLEL MICRO GRIPPER - SERIES GRA

PNEU-CONNECT® WITH ONE PARALLEL MICRO GRIPPER

KIT: 89387-04-020-0001

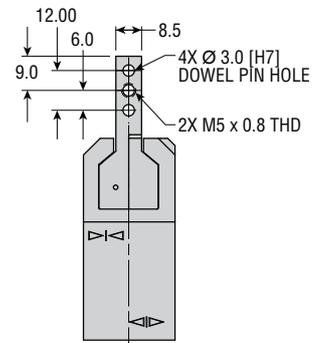
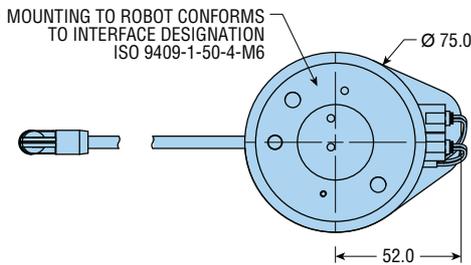
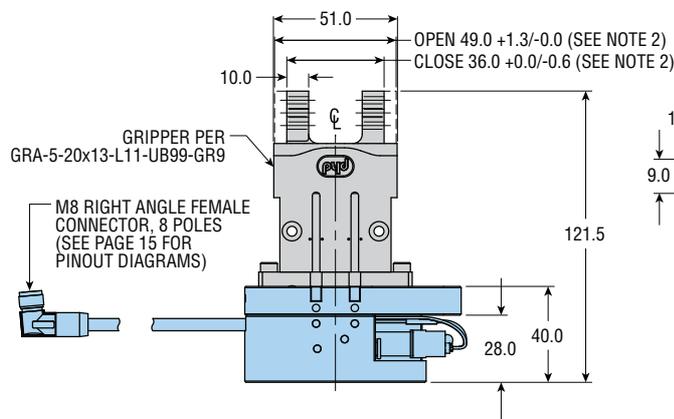
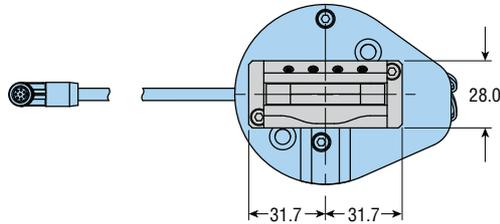
with Discrete Switches

Total Weight: 0.73 kg [1.60 lb]

IP Rating: IP40



two discrete switches



JAW DETAIL

NOTES:

- 1) ALL DIMENSIONS ARE mm
- 2) OPEN REFLECTS SMALLEST POSSIBLE OPEN DIMENSION
CLOSE REFLECTS LARGEST POSSIBLE CLOSED DIMENSION
- 3) DESIGNATED ϕ IS CENTERLINE OF UNIT

All dimensions are reference only unless specifically toleranced.