

VBX-160 Gripper Assembly

Summary:

The VBX-160 Gripper Assembly is used to pick and place VersaBuilt Multi-Grip Soft Jaws. The Gripper Assembly is composed of 2 Actuators:

- 1) QTY: 1, Gripper
- 2) QTY: 2, Cylinder

The Gripper is used to clamp soft jaws and parts. It is actuated via air pressure up to 120 psi, with a solenoid valve with 3 positions:

- 1) Gripper Open
- 2) Gripper Closed
- 3) Gripper Float (valve center position, exhausting air to atmosphere)

The Cylinder is used to locate and retain soft jaws. It is actuated via air pressure up to 120 psi, with a solenoid valve with 3 positions:

- 1) Cylinder Extended
- 2) Cylinder Retracted
- 3) Cylinder Float (valve center position, exhausting air to atmosphere)

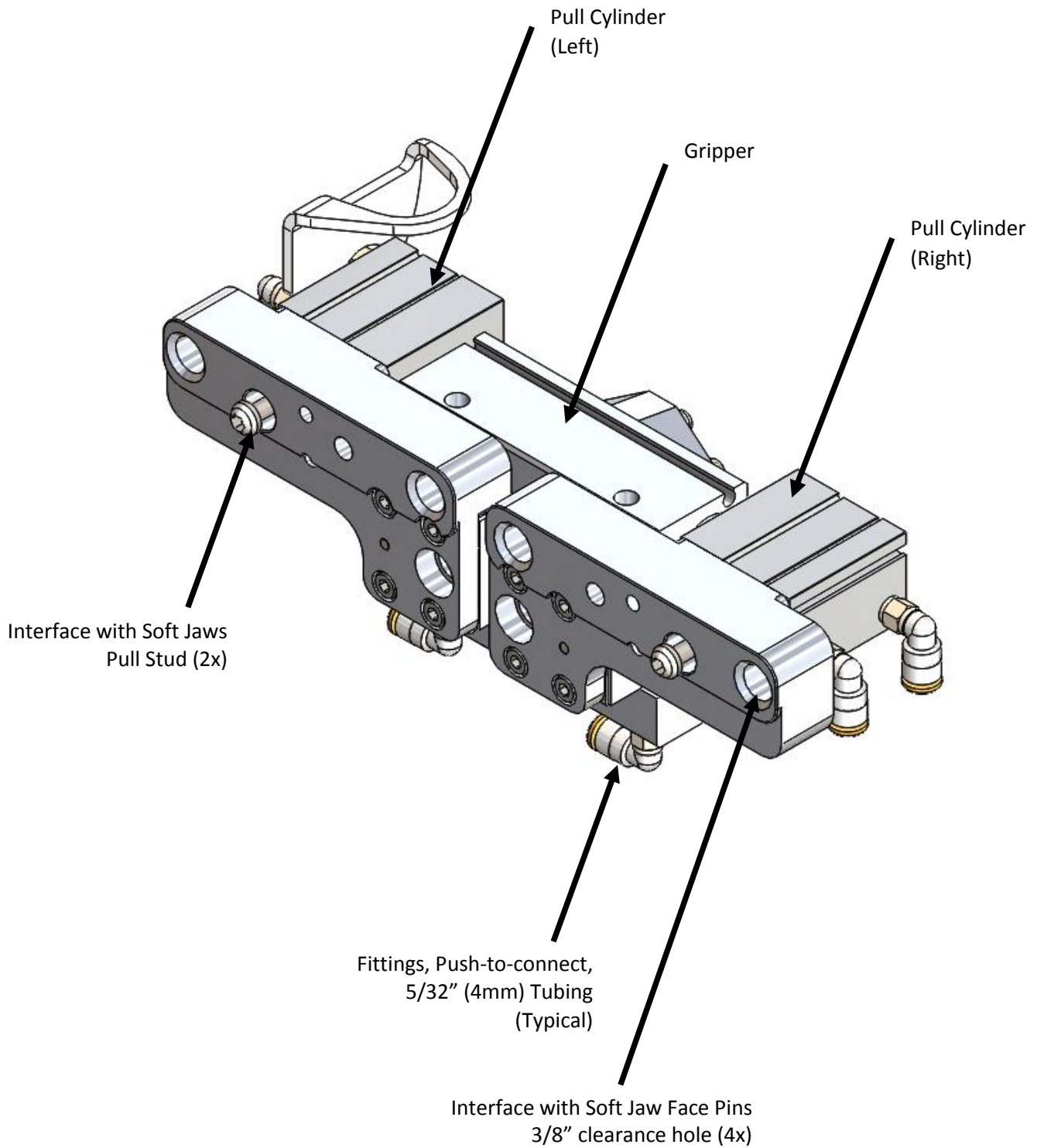
Nominal Gripping Force = 48 lbf @ 100 psi

Nominal Cylinder Force (pulling on Soft Jaws) = 36 lbf @ 100 psi

***For information regarding Gripper Sensors, refer to the "Gripper Sensor" document.**

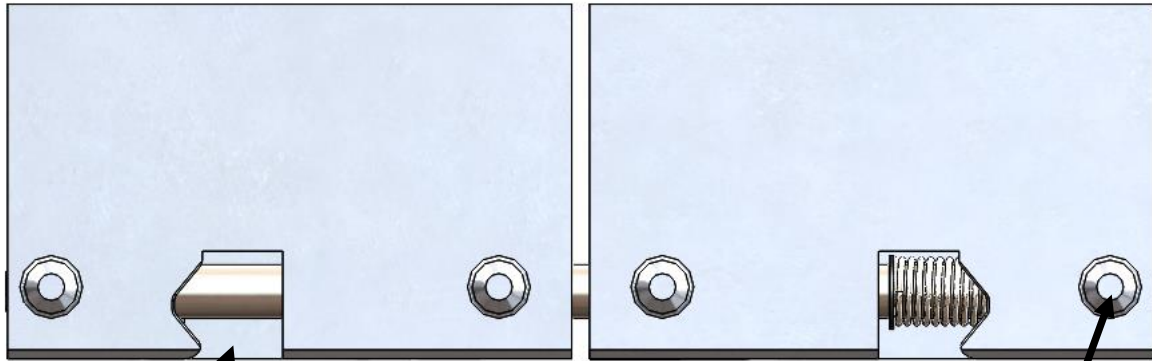
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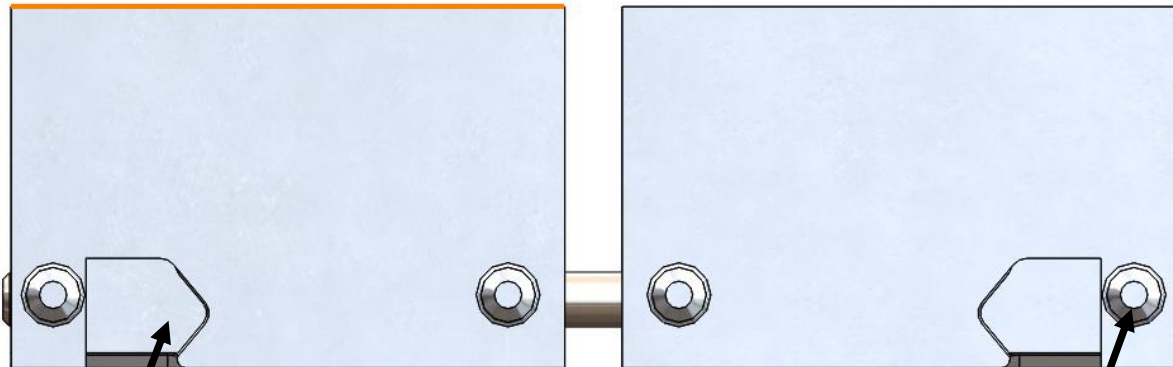
OD Jaws:



Pull Stud Engagement Window (2x)

Soft Jaw Face Pins
Ø 0.375" (4x)

ID Jaws:



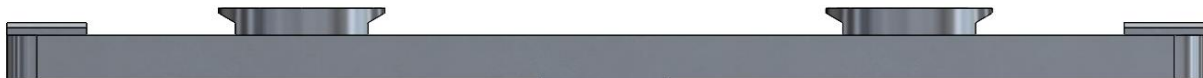
Pull Stud Engagement Window (2x)

Soft Jaw Face Pins
Ø 0.375" (4x)

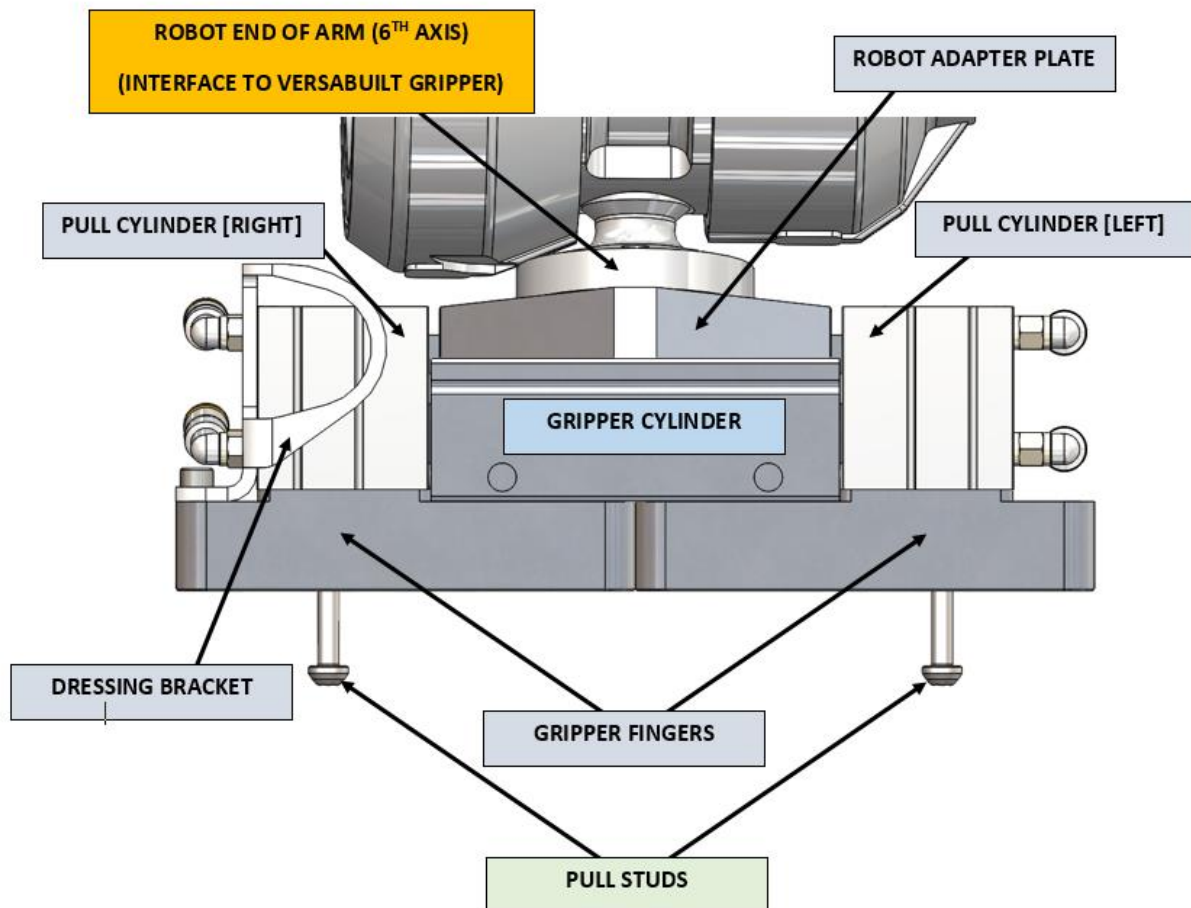
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Dovetail Plate:

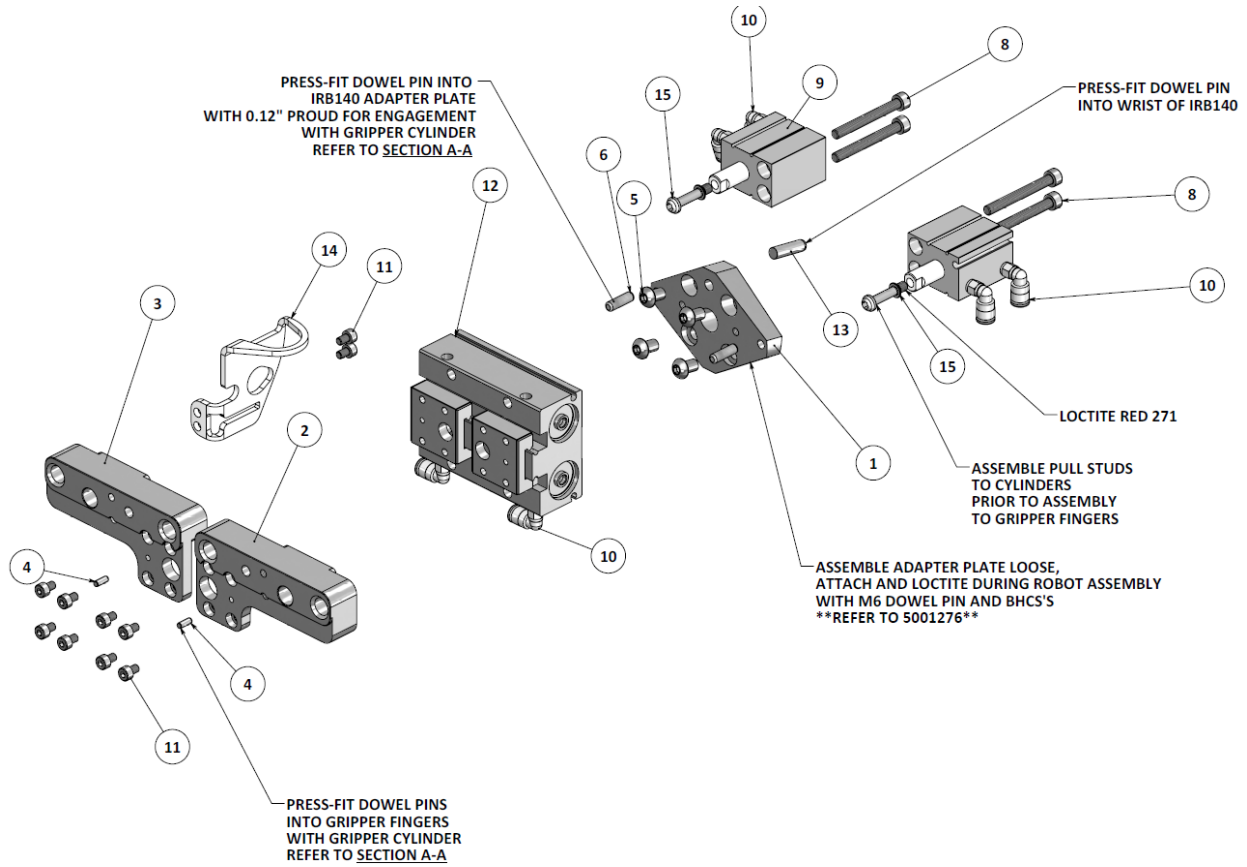
For Jaw Storage and Transfer Station inside VBX-160 cell



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For Assembly Documentation, refer to VersaBuilt drawing # 5000502



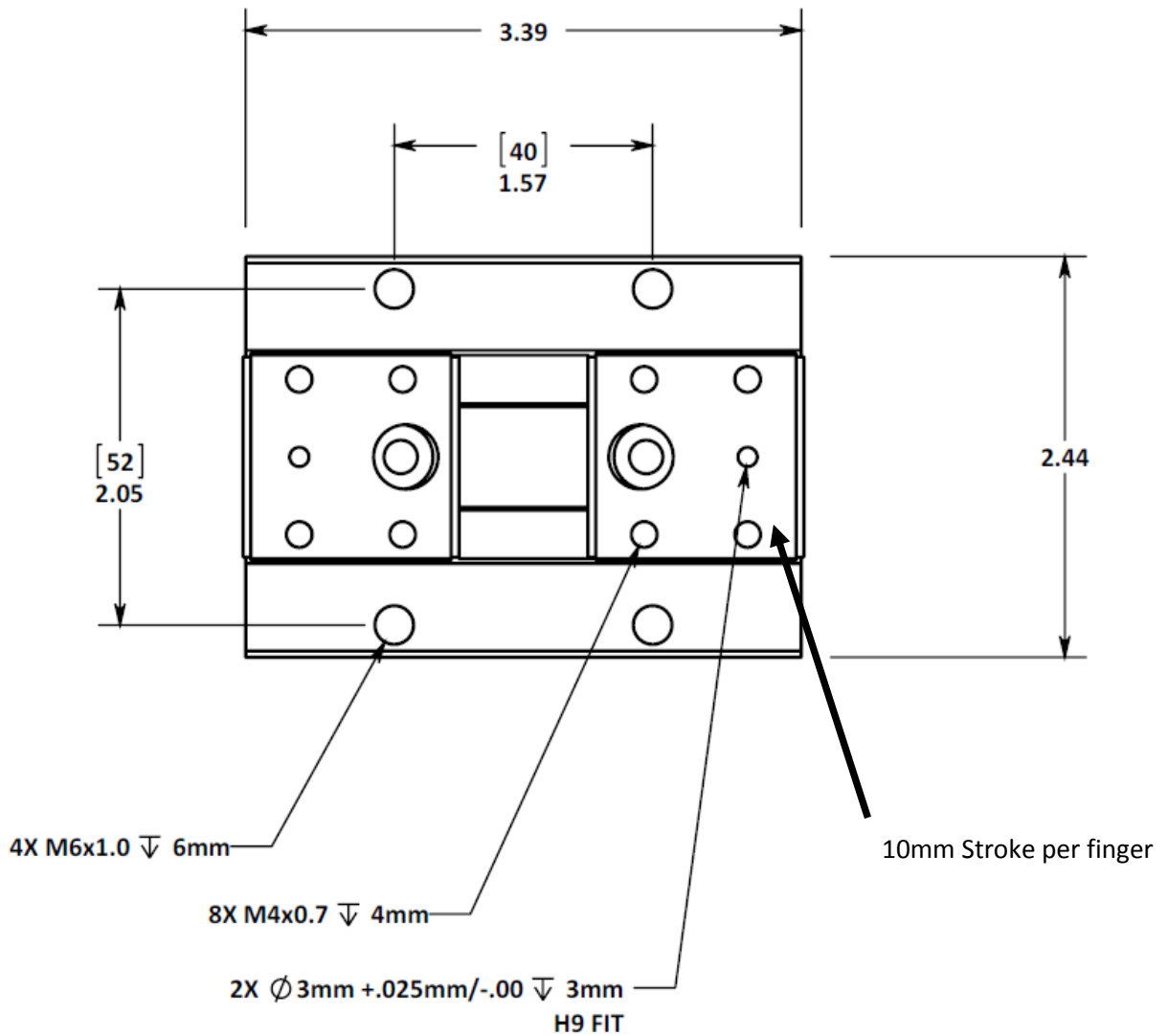
KEY NO.	QTY.	PART NO.	DESCRIPTION	OEM	OEMNumber	REMARKS
1	1	5000419	IRB 140 ADAPTER PLATE	VERSABUILT		FABRICATED
2	1	5000503	GRIPPER FINGER [LEFT]	VERSABUILT		FABRICATED
3	1	5000504	GRIPPER FINGER [RIGHT]			FABRICATED
4	2	5000521	DOWEL PIN 3mm X 8mm	McMASTER-CARR	91595A104	FASTENER
5	4	5000554	M6x1.0 BHCS X 10mm	McMASTER-CARR	92095A224	FASTENER
6	2	5000566	DOWEL PIN 5mm x 16mm	McMASTER-CARR	91595A352	FASTENER
7	2	5000576	SHCS M5-0.8 x 35	McMASTER-CARR	92290A256	FASTENER
8	4	5000577	SHCS M5-0.8 x 45	McMASTER-CARR	91292A195	FASTENER
9	2	5000599	CYLINDER, 20mm x 15mm STK	SMC	CDUJ520-15D	PURCHASE
10	6	5000617	FITTING, L, 5/32" x 10-32UNF	SMC	KQ2L03-32	PURCHASE
11	10	5000635	SHCS M4-0.7 x 6	McMASTER-CARR	90128A208	FASTENER
12	1	5000645	AIR GRIPPER, MHF2-20DR	SMC	MHF2-20DR	PURCHASE
13	1	5001285	M6 DOWEL PIN x 22mm	McMASTER-CARR	91595A458	PURCHASE
14	1	5001344	EOAT DRESSING MOUNT, INSIDE	VERSABUILT	CUT, BEND, PAINT	FABRICATED
15	2	5001365	GRIPPER PULL, 2.0	VERSABUILT		FABRICATED

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Gripper:

SMC P/N: MHF2-20DR

MHF2, AIR GRIPPER, 2 FINGER, LOW PROFILE, PARALLEL GRIPPER, 20mm STROKE, SHORT STROKE, SIDE PORTED

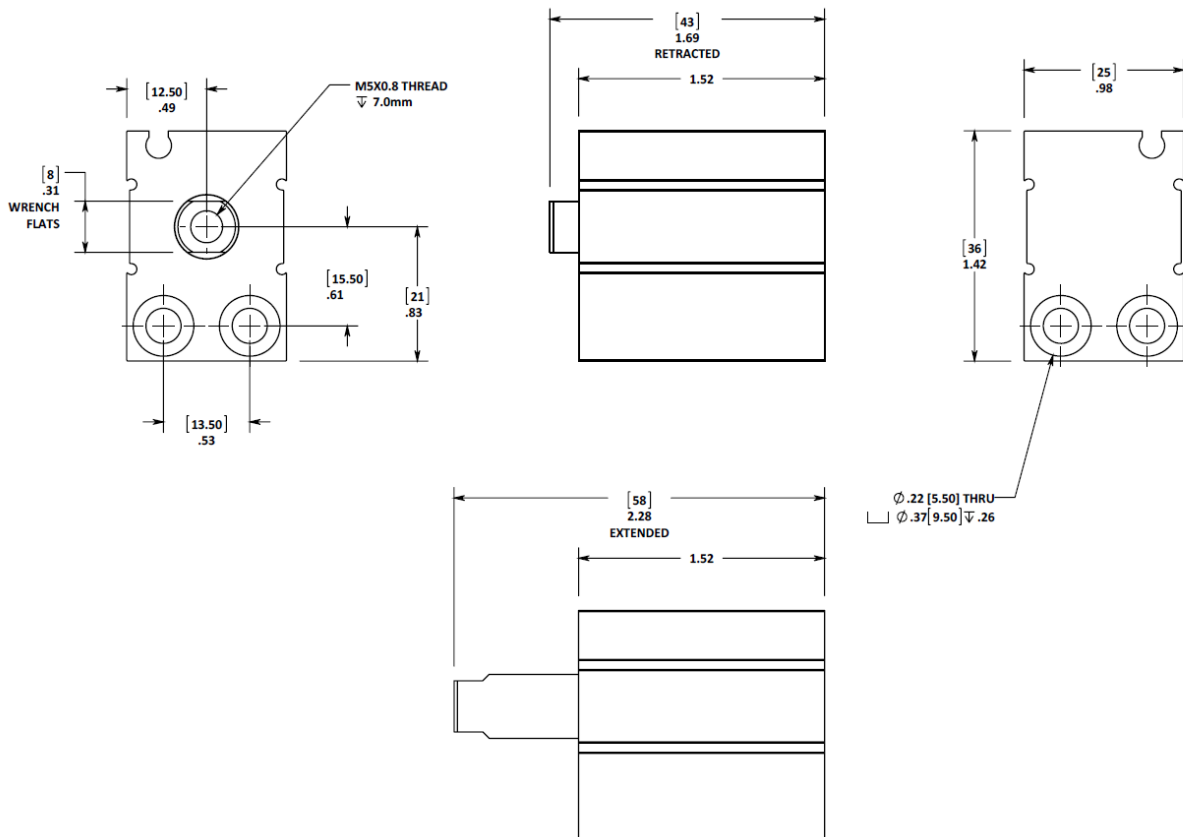


VERSABUILT

Cylinder:

SMC P/N: CDUJS20-15D

C(D)UJ, MINIATURE FREE MOUNT CYLINDER, D - BUILT IN MAGNET, S - AXIAL MOUNTING, 20mm BORE, 15mm STROKE, DOUBLE ACTING, ROD END FEMALE M5X0.8, M5X0.8 [10-32 UNF] PORTS



Sequence of Operations for Pick and Place of Soft Jaws:

- 1) Picking OD Jaws off Dovetail Plates (Soft Jaw fixture inside VBX-160 cell)**
 - a. Gripper Closed
 - b. Pull Stud Cylinder Extended
 - c. Approach Jaws
 - d. Stop approximately 10.5mm away from Engagement Target
 - e. Gripper Open to engage pull stud with Soft Jaw window in proper location
 - f. Pull Stud Cylinder Float
 - g. Gripper Float
 - h. Move to engage position
 - i. Pull Stud Cylinder Retracted
 - j. Gripper Closed
 - k. Move up and away

- 2) Picking ID Jaws off Dovetail Plates (Soft Jaw fixture inside VBX-160 cell)**
 - a. Gripper Open
 - b. Pull Stud Cylinder Extended
 - c. Approach Jaws
 - d. Stop approximately 10.5mm away from Engagement Target
 - e. Gripper Closed to engage pull stud with Soft Jaw window in proper location
 - f. Pull Stud Cylinder Float
 - g. Gripper Float
 - h. Move to engage position
 - i. Pull Stud Cylinder Retracted
 - j. Gripper Open
 - k. Move up and away

3) Placing OD Jaws on Dovetail Plates (Soft Jaw fixture inside VBX-160 cell)

- a. Gripper Closed
- b. Pull Stud Cylinder Retracted
- c. Approach Shelf (above placement height)
- d. Move down to target on dovetail plate
- e. Gripper Open to engage dovetails
- f. Pull Stud Cylinder Float
- g. Gripper Float
- h. Move to exit position approximately 10.5mm away from Engagement Target
- i. Gripper Closed
- j. Pull Stud Cylinder Retracted
- k. Move out and away

4) Placing ID Jaws on Dovetail Plates (Soft Jaw fixture inside VBX-160 cell)

- a. Gripper Closed
- b. Pull Stud Cylinder Retracted
- c. Approach Shelf (above placement height)
- d. Move down to target on dovetail plate
- e. Gripper Closed to engage dovetails
- f. Pull Stud Cylinder Float
- g. Gripper Float
- h. Move to exit position approximately 10.5mm away from Engagement Target
- i. Gripper Open
- j. Pull Stud Cylinder Retracted
- k. Move out and away

5) **Picking OD Jaws off Vise**

- a. Vise Closed (OD clamping on Part or empty Soft Jaws)
- b. Gripper Closed
- c. Pull Stud Cylinder Extended
- d. Approach Jaws
- e. Stop approximately 10.5mm away from Engagement Target
- f. Gripper Open to engage pull stud in proper location
- g. Pull Stud Cylinder Float
- h. Gripper Float
- i. Move to engage position
- j. Pull Stud Cylinder Retracted
- k. Gripper Closed
- l. Vise Open
- m. Move up and away

6) **Picking ID Jaws off Vise**

- a. Vise State:
 - i. Vise Open, if ID clamping on Part
 - ii. Vise Closed, if soft jaws are empty
- b. Gripper Open
- c. Pull Stud Cylinder Extended
- d. Approach Jaws
- e. Stop approximately 10.5mm away from Engagement Target
- f. Gripper Closed to engage pull pin in proper location
- g. Pull Stud Cylinder Float
- h. Gripper Float
- i. Move to engage position
- j. Pull Stud Cylinder Retracted
- k. Gripper Open
- l. Vise Closed
- m. Move up and away

7) Placing OD Jaws on Vise

- a. Vise Open
- b. Gripper Closed
- c. Pull Stud Cylinder Retracted
- d. Approach Vise
- e. Move down to target on intermediate jaw/vise
- f. Vise Closed to engage soft jaw
- g. Pull Stud Cylinder Float
- h. Gripper Float
- i. Move to exit position approximately 10.5mm away from Engagement Target
- j. Gripper Closed
- k. Pull Stud Cylinder Retracted
- l. Move out and away

8) Placing ID Jaws on Vise

- a. Vise Closed
- b. Gripper Open
- c. Pull Stud Cylinder Retracted
- d. Approach Vise
- e. Move down to target on intermediate jaw/vise
- f. Vise Open engage soft jaw
- g. Pull Stud Cylinder Float
- h. Gripper Float
- i. Move to exit position approximately 10.5mm away from Engagement Target
- j. Gripper Open
- k. Pull Stud Cylinder Retracted
- l. Move out and away