



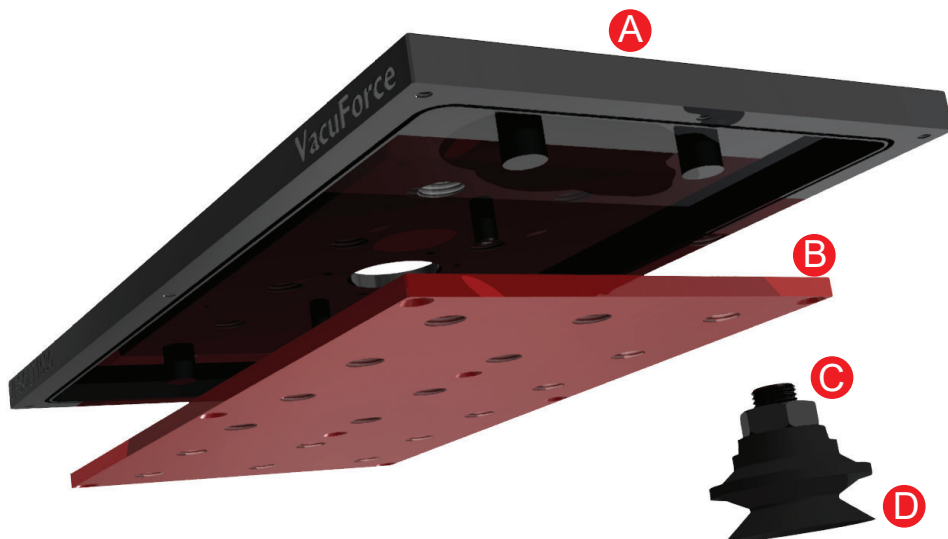
UNIVERSAL VACUUM TOOL TECHNOLOGY

patent pending





The Squid has been developed to offer the vacuum user a universal end of arm vacuum tool. The Squid utilizes different “end effectors” such as vacuum cups, foam, orifice fittings and self closing valves. The choice of Squid is dependent on the application and user preference. Please contact Vacuforce to discuss the application.

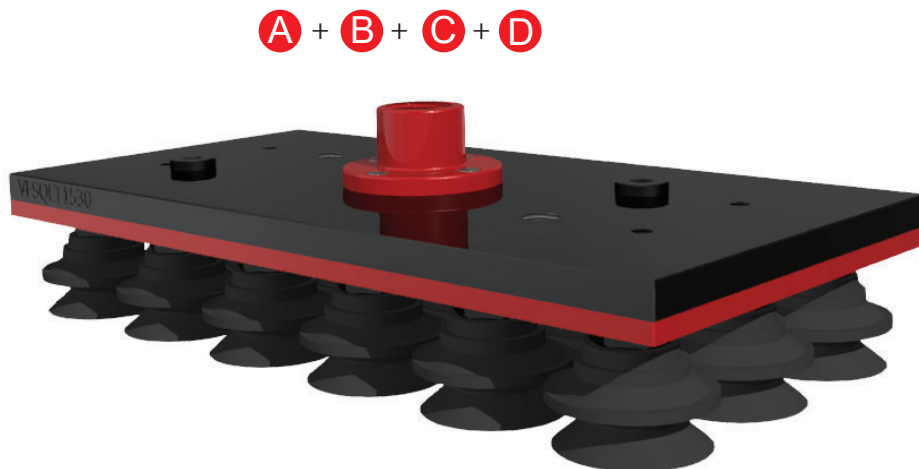


Assembly

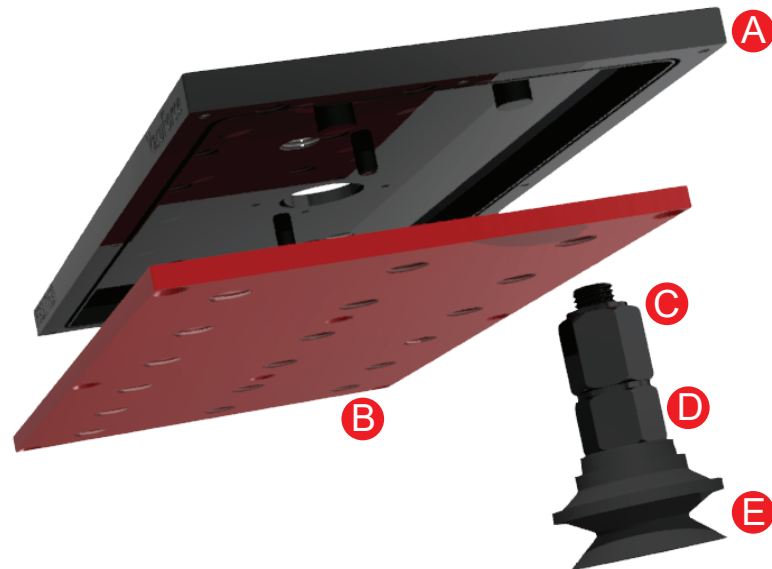
Every Squid requires a Base Box **A**. This is the top of the Squid system which mounts to the robot or lifting device. The cup plate **B** connects to the underside of the Squid with an airtight seal.

Orifice Version

The Squid assembly above shows a vacuum cup fitting **C** which has a small orifice in the vacuum channel. This orifice restricts leakage if the vacuum cup **D** is not sealed correctly against the load being gripped by the Squid system. The orifice system is a very simple and effective way of handling parts of varying sizes where the vacuum source such a vacuum pump or compressed air powered venturi can compensate for the leakage in the system.



The Squid has been developed to offer the vacuum user a universal end of arm vacuum tool. The Squid utilizes different “end effectors” such as vacuum cups, foam, orifice fittings and self closing valves. The choice of Squid is dependent on the application and user preference. Please contact Vacuforce to discuss the application.



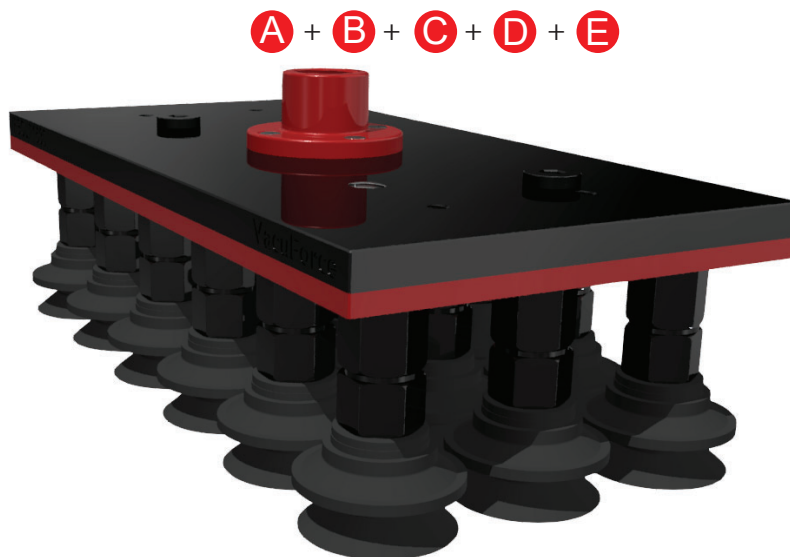
Assembly

Every Squid requires a Base Box **A**. This is the top of the Squid system which mounts to the robot or lifting device. The cup plate **B** connects to the underside of the Squid with an airtight seal.

Self Closing Valve Version

The Squid assembly above shows a self closing valve **C** which acts like an air velocity fuse. More details of this valve can be found on page 10.12. If the valve senses too much air flow when vacuum is turned on to the Squid, this valve will close isolating the attached vacuum cup from the rest of the system. Therefore, maximum system vacuum level is now available to the remaining vacuum cups that are sealed against the load being handled. The self closing valve system is the preferred choice when handling varying size loads with the same Squid particularly if the loads being handled vary greatly in surface area on the pick up face. The cup fitting **D** and vacuum cup **E** attach directly to the self closing valve.

It should be noted that the self closing valves are adjustable to allow for successful handling of low quality cardboard cartons or other porous type products.



VFSQLT1530 Squid Assembly



The VFSQLT1530 Squid assembly measures 144mm x 288mm (approximately 6" x 12") and is a standard size model. There is one vacuum port on this model utilizing the VFSQFIT3/4 thread port adapter. This model is supplied assembled as shown.

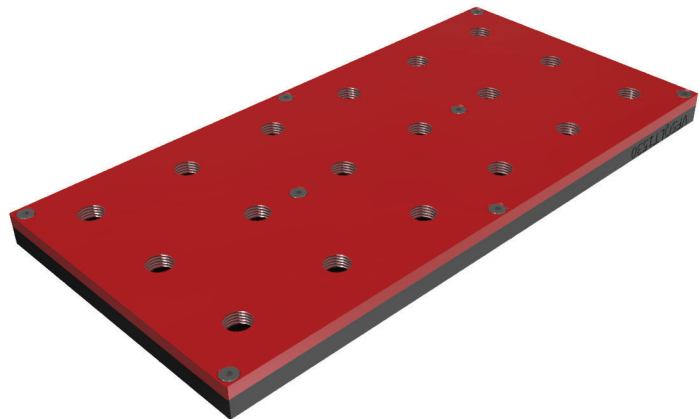
For general dimensions please refer to the technical drawing at the end of this product section.

Assembly Weight as shown 1.25kg / 2.8lbs 

Top Side



Under Side



Assembly Components	Description	Qty Required
VFSQLT1530	Squid Body	1
VFSQP481530	Cup Plate	1
VFSQFIT3/4	Vacuum Port	1

Typical Vacuum Cup Components

Model Number	Description	Qty Required	Lifting Force*
VFCF40-U02*	Vacuum Cup Fitting	18	170kg/374lbs
VFB40ST*	Typical Single Bellows Ø40mm Vacuum Cup	18	
VFSC3/8	Optional Self Closing Valve	18	

*The lifting force is based upon the recommended vacuum cups and associated cup fittings as shown in the above table. The lifting force is also based upon a working vacuum of -80kPa / 24"Hg on a non porous rigid surface with a Ø40mm diameter vacuum cup. Other types of cups can be used based on the application. Please contact Vacuforce for assistance for correct selection.

The VFSQLT1540 Squid assembly measures 144mm x 384mm (approximately 6" x 15") and is a standard size model. There are three potential vacuum ports on this model. The model below shows two of these ports utilizing the VFSQFIT3/4 threaded port adaptor and the other utilizing a VFBP3/4 blanking plates. This model is supplied assembled as shown.

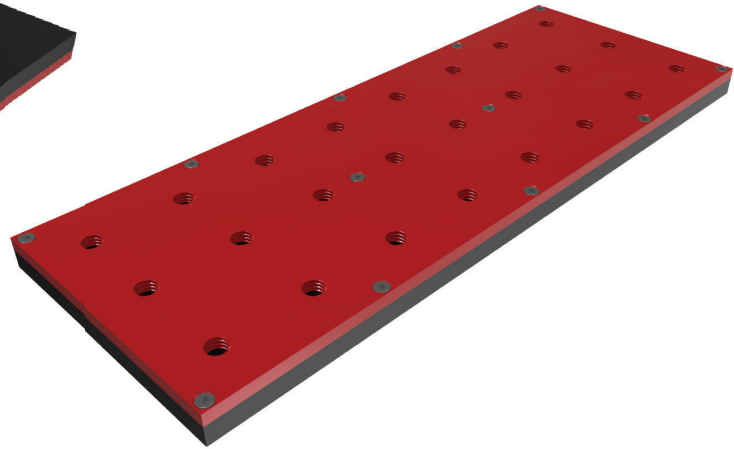
For general dimensions please refer to the technical drawing at the end of this product section.

Assembly Weight as shown 1.7kg / 3.8lbs 

Top Side



Under Side



Assembly Components	Description	Qty Required
VFSQLT1540	Squid Body	1
VFSQP481540	Cup Plate	1
VFSQFIT3/4	Vacuum Port	2
VFSQBP3/4	Vacuum Blanking Port	1

Typical Vacuum Cup Components

Model Number	Description	Qty Required	Lifting Force*
VFCF40-U02*	Vacuum Cup Fitting	24	225kg / 495lbs
VFB40ST*	Typical Single Bellows Ø40mm Vacuum Cup	24	
VFSC3/8	Optional Self Closing Valve	24	

*The lifting force is based upon the recommended vacuum cups and associated cup fittings as shown in the above table. The lifting force is also based upon a working vacuum of -80kPa / 24"Hg on a non porous rigid surface with a Ø40mm diameter vacuum cup. Other types of cups can be used based on the application. Please contact Vacuforce for assistance for correct selection.

VFSQLT1560 Squid Assembly



The following Squid assembly measures 144mm x 576mm (approximately 6" x 24") and is a standard size model. There are three potential vacuum ports on this model. The model below shows one of these ports covered by the VFSQBP3/4 blanking plate with the two vacuum ports utilizing the VFSQFIT3/4 thread port adapter. This model is supplied assembled as shown.

For general dimensions please refer to the technical drawing at the end of this product section.

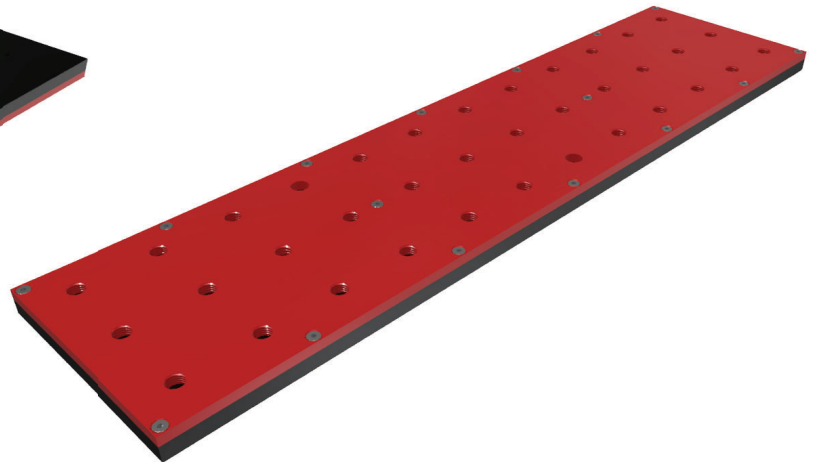
Assembly Weight as shown 2.5kg / 5.5lbs



Top Side



Under Side



Assembly Components	Description	Qty Required
VFSQLT1560	Squid Body	1
VFSQP481560	Cup Plate	1
VFSQFIT3/4	Vacuum Port	1
VFSQBP3/4	Vacuum Blanking Port	2

Typical Vacuum Cup Components

Assembly Components	Description	Qty Required	Lifting Force*
VFCF40-U02*	Vacuum Cup Fitting	36	340kg / 748lbs
VFB40ST*	Typical Single Bellows Ø40mm Vacuum Cup	36	
VFSC3/8	Optional Self Closing Valve	36	

*The lifting force is based upon the recommended vacuum cups and associated cup fittings as shown in the above table. The lifting force is also based upon a working vacuum of -80kPa / 24"Hg on a non porous rigid surface with a Ø40mm diameter vacuum cup. Other types of cups can be used based on the application. Please contact Vacuforce for assistance for correct selection.

The following Squid assembly measures 288mm x 288mm (approximately 12" x 12") and is a standard size model. There are three potential vacuum ports on this model. The model below shows one of these ports covered by the VFSQBP3/4 blanking plate with the two vacuum ports utilizing the VFSQFIT3/4 thread port adapter. This model is supplied assembled as shown.

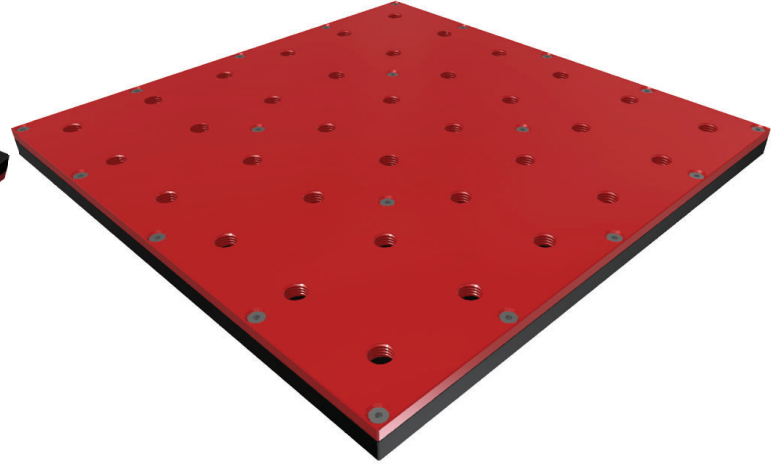
For general dimensions please refer to the technical drawing at the end of this product section.

Assembly Weight as shown 2.5kg / 5.5lbs 

Top Side



Under Side



Assembly Components	Description	Qty Required
VFSQLT3030	Squid Body	1
VFSQP483030	Cup Plate	1
VFSQFIT3/4	Vacuum Port	2
VFSQBP3/4	Vacuum Blanking Port	1

Typical Vacuum Cup Components

Assembly Components	Description	Qty Required	Lifting Force*
VFCF40-U02*	Vacuum Cup Fitting	36	340kg / 748lbs
VFB40ST*	Typical Single Bellows Ø40mm Vacuum Cup	36	
VFSC3/8	Optional Self Closing Valve	36	

*The lifting force is based upon the recommended vacuum cups and associated cup fittings as shown in the above table. The lifting force is also based upon a working vacuum of -80kPa / 24"Hg on a non porous rigid surface with a Ø40mm diameter vacuum cup. Other types of cups can be used based on the application. Please contact Vacuforce for assistance for correct selection.

VFSQLT3040 Squid Assembly



The following Squid assembly measures 288mm x 384mm (approximately 12" x 15") and is a standard size model. There are three potential vacuum ports on this model. The model below shows one of these ports covered by the VFSQBP3/4 blanking plate with the two vacuum ports utilizing the VFSQFIT3/4 thread port adapter. This model is supplied assembled as shown.

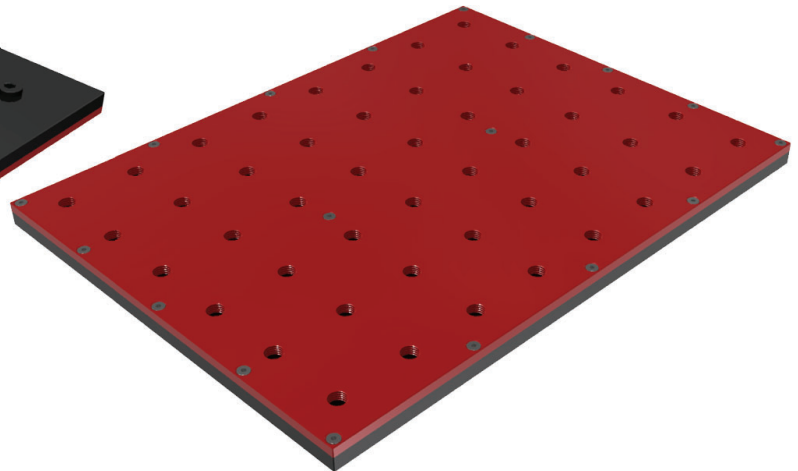
For general dimensions please refer to the technical drawing at the end of this product section.

Assembly Weight as shown 3.25kg / 7.2lbs 

Top Side



Under Side



Assembly Components	Description	Qty Required
VFSQLT3040	Squid Body	1
VFSQP483040	Cup Plate	1
VFSQFIT3/4	Vacuum Port	2
VFSQBP3/4	Vacuum Blanking Port	1

Assembly Components	Description	Qty Required	Lifting Force*
VFCF40-U02*	Vacuum Cup Fitting	48	450kg / 990lbs
VFB40ST*	Typical Single Bellows Ø40mm Vacuum Cup	48	
VFSC3/8	Optional Self Closing Valve	48	

**The lifting force is based upon the recommended vacuum cups and associated cup fittings as shown in the above table. The lifting force is also based upon a working vacuum of -80kPa / 24"Hg on a non porous rigid surface with a Ø40mm diameter vacuum cup. Other types of cups can be used based on the application. Please contact Vacuforce for assistance for correct selection.*

The following Squid assembly measures 288mm x 576mm (approximately 12" x 24") and is a standard size model. There are three potential vacuum ports on this model. The model below shows the three vacuum ports utilizing the VFSQFIT3/4 thread port adapter. This model is supplied assembled as shown.

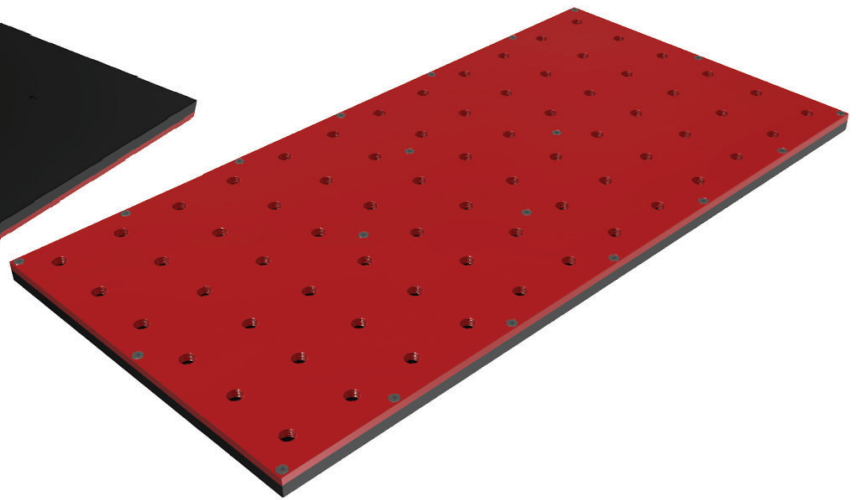
For general dimensions please refer to the technical drawing at the end of this product section.

Assembly Weight as shown 4.8kg / 10.5lb 

Top Side



Under Side



Assembly Components	Description	Qty Required
VFSQLT3060	Squid Body	1
VFSQP483060	Cup Plate	1
VFSQFIT3/4	Vacuum Port	3

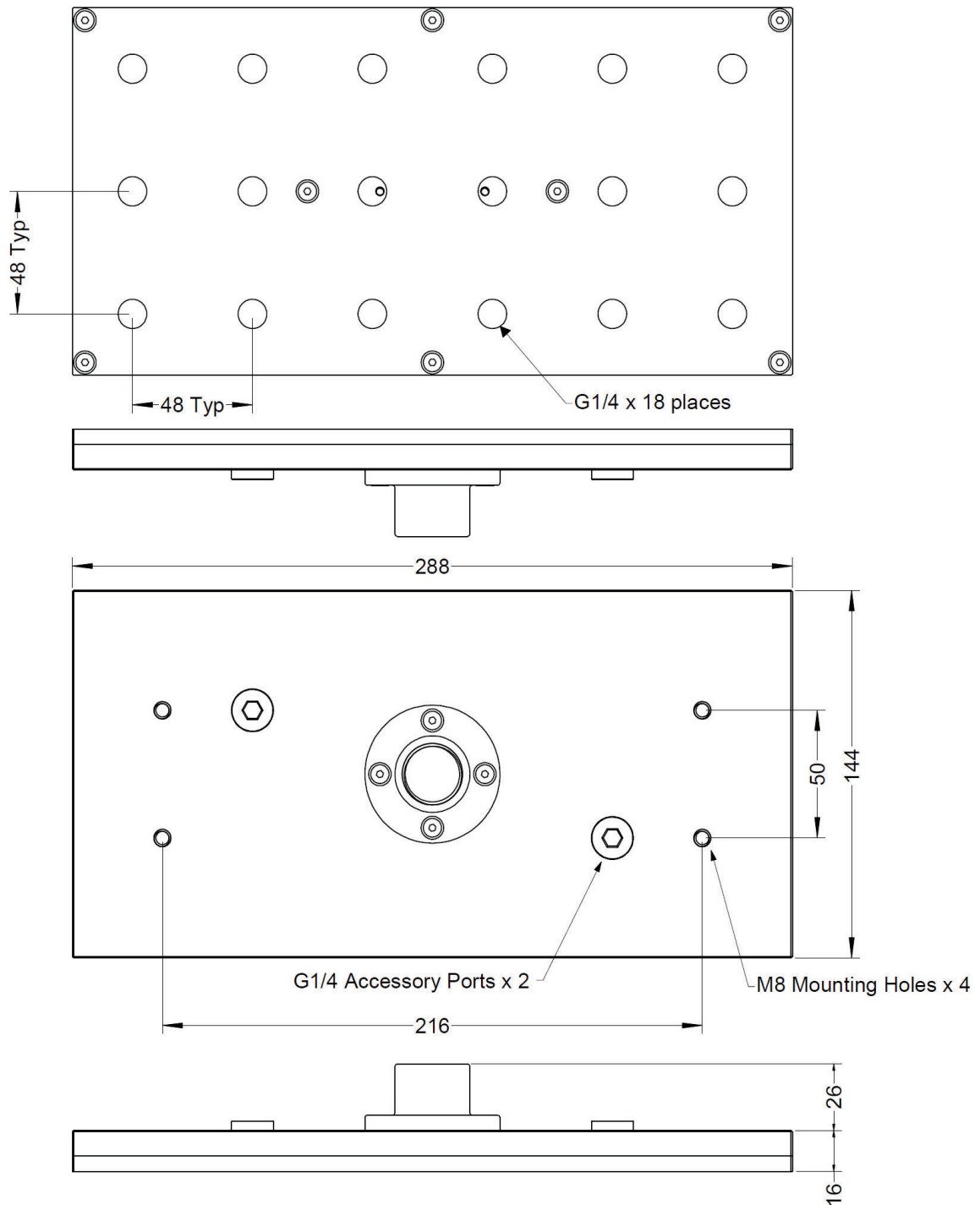
Typical Vacuum Cup Components

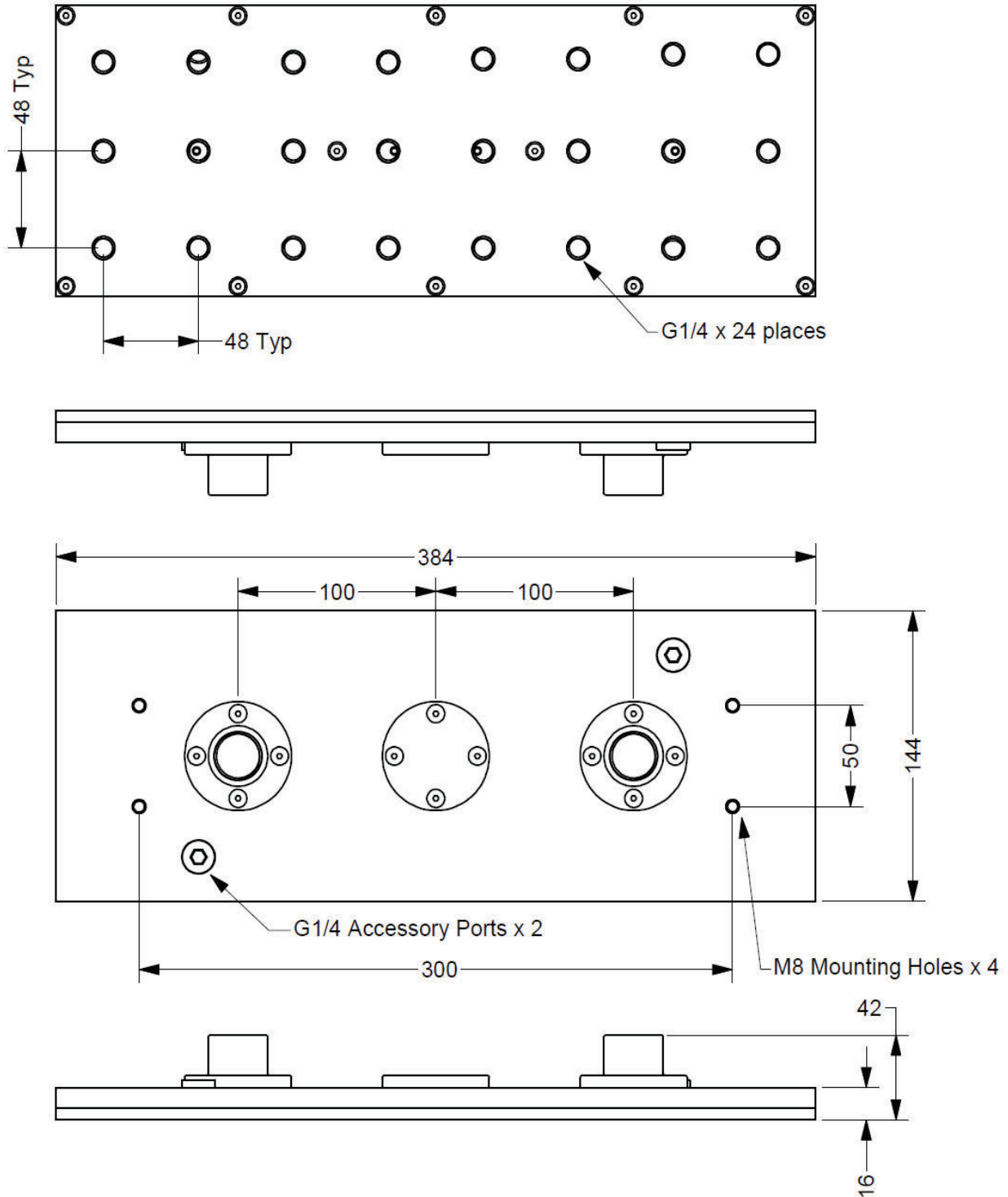
Assembly Components	Description	Qty Required	Lifting Force*
VFCF40-U02*	Vacuum Cup Fitting	72	860kg / 1890lbs
VFB40ST*	Typical Single Bellows Ø40mm Vacuum Cup	72	
VFSC3/8	Optional Self Closing Valve	72	

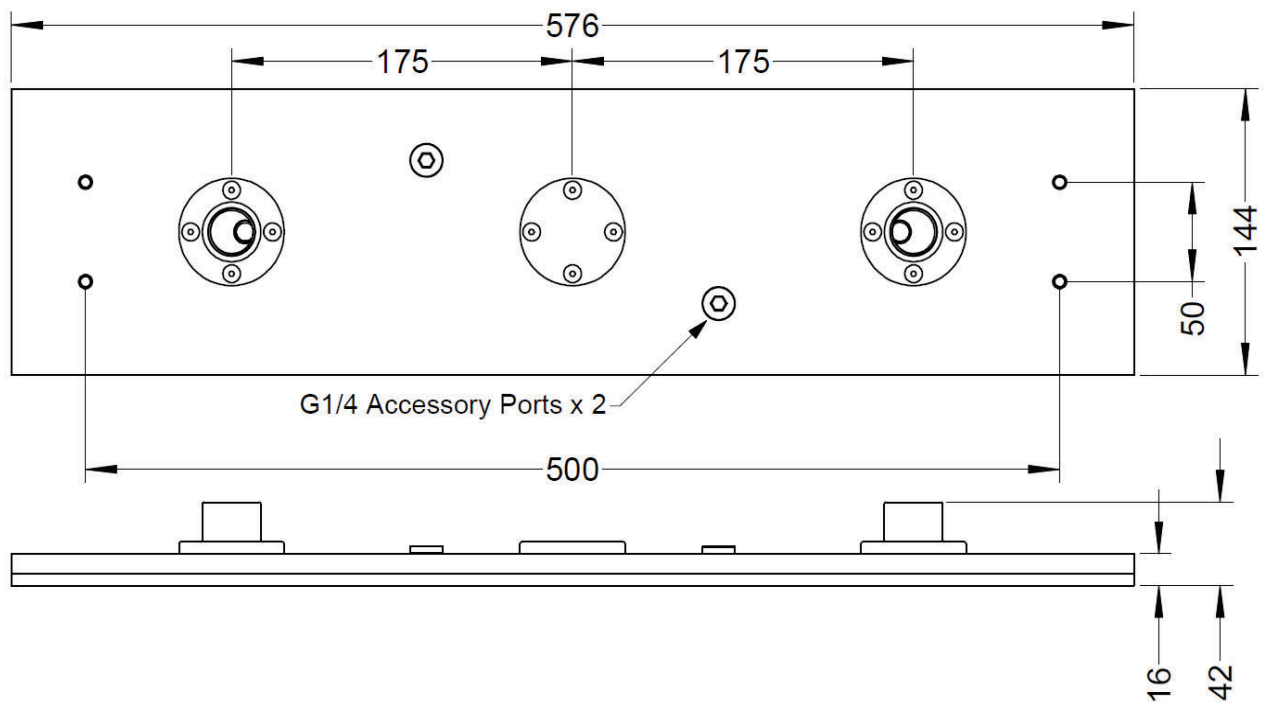
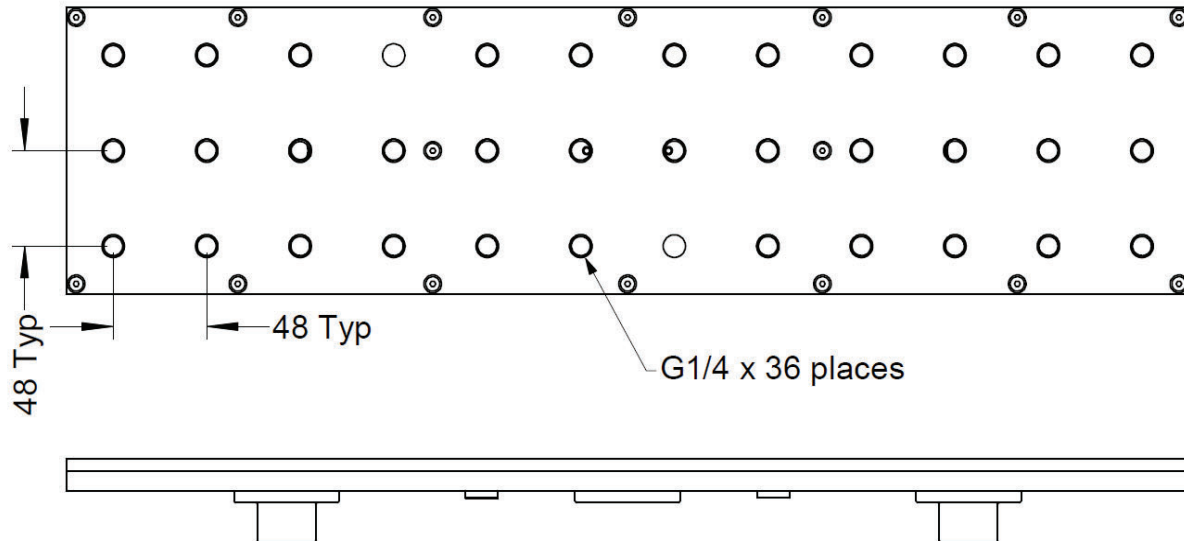
*The lifting force is based upon the recommended vacuum cups and associated cup fittings as shown in the above table. The lifting force is also based upon a working vacuum of -80kPa / 24"Hg on a non porous rigid surface with a Ø40mm diameter vacuum cup. Other types of cups can be used based on the application. Please contact Vacuforce for assistance for correct selection.

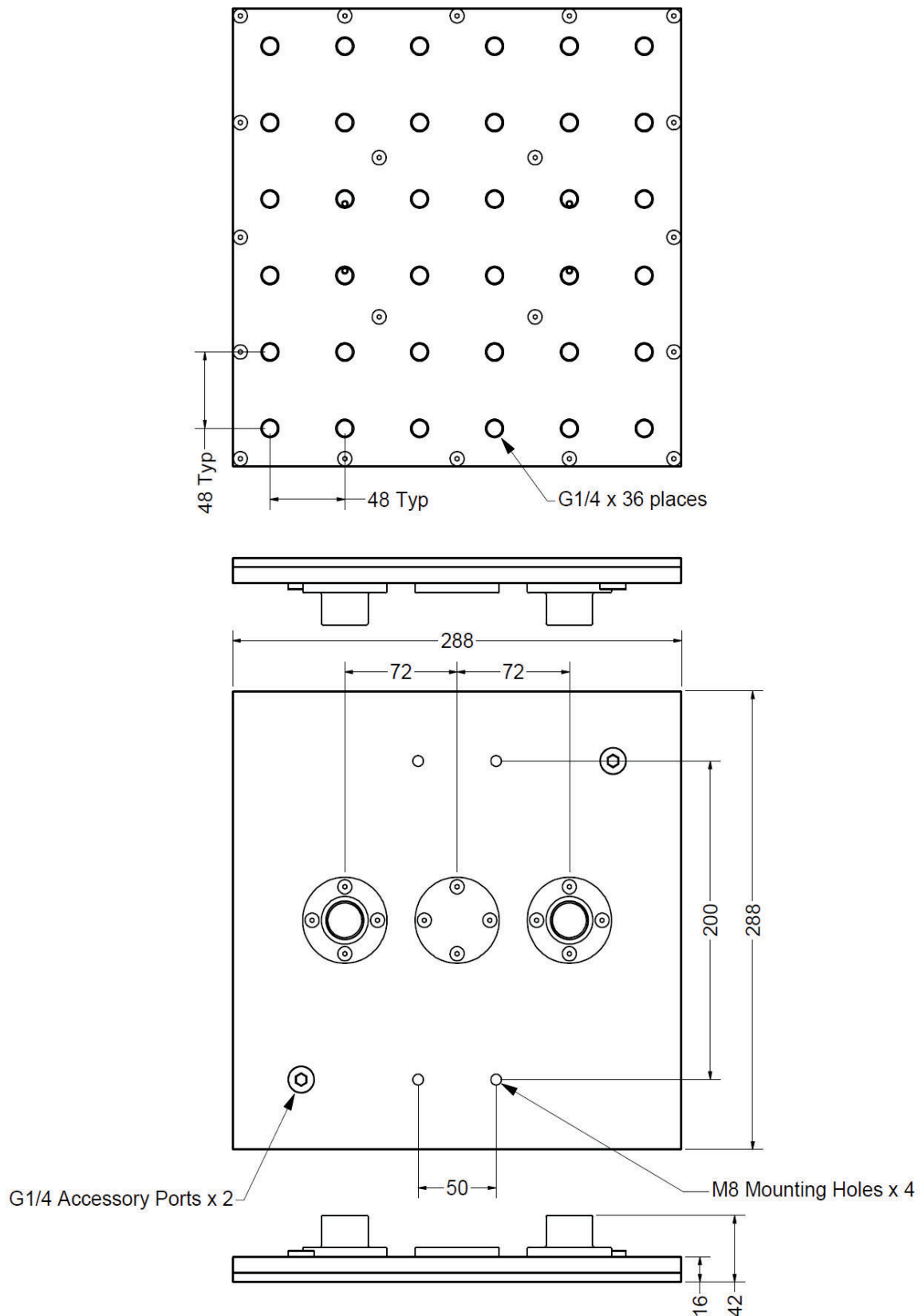
VFSQLT1530

Squid Dimensions



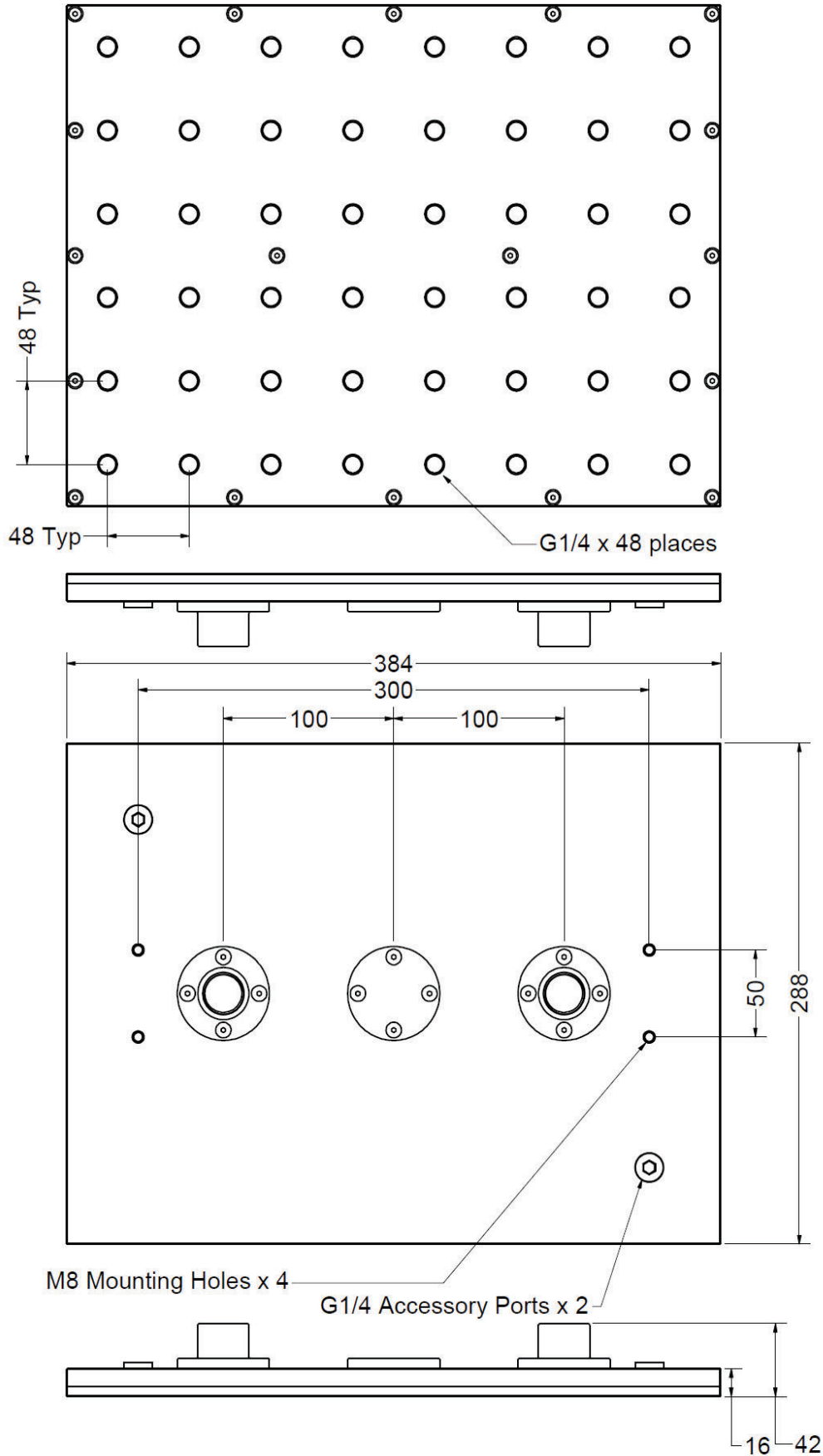


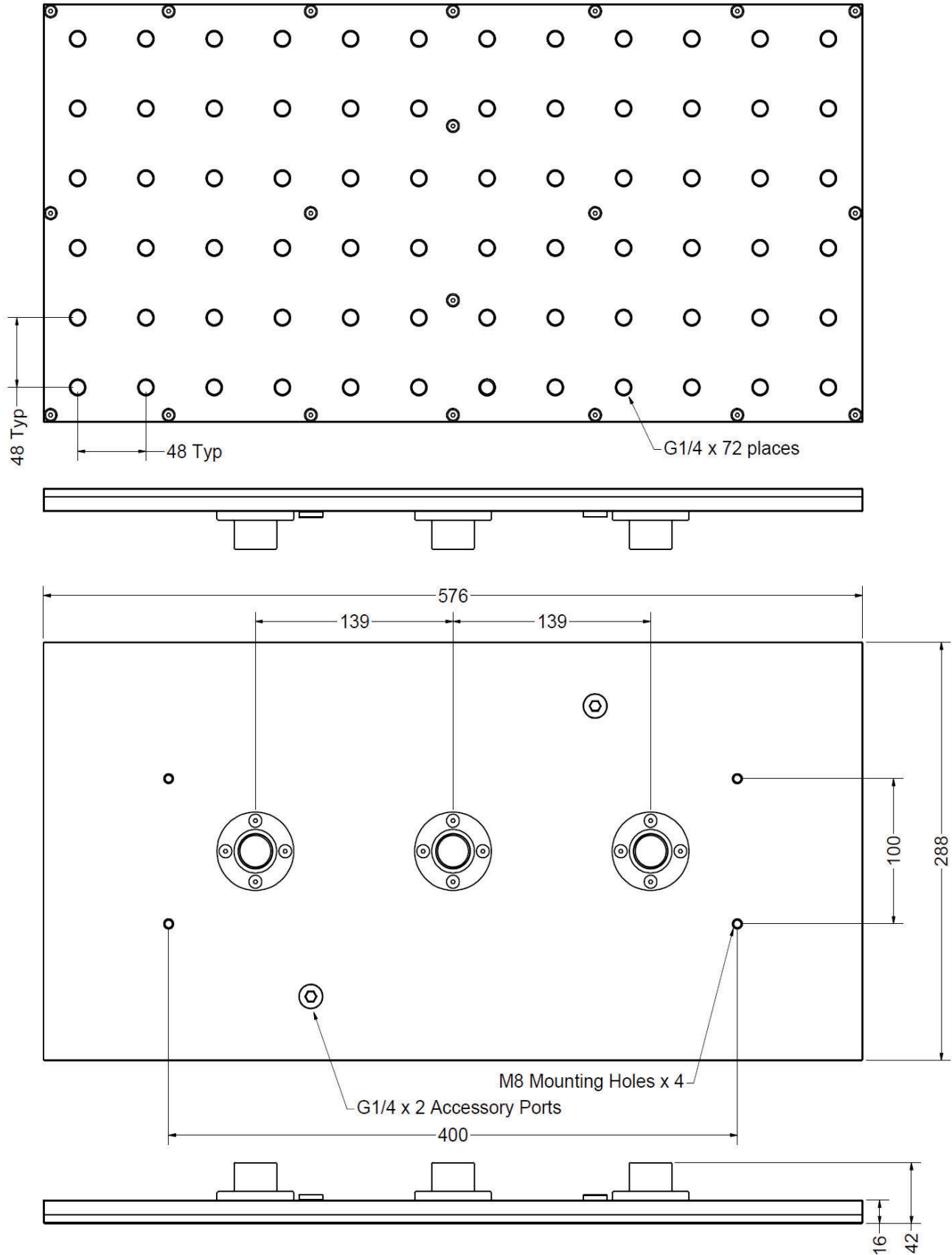




VFSQLT3040

Squid Dimensions





VFSC3/8 Self Closing Valve



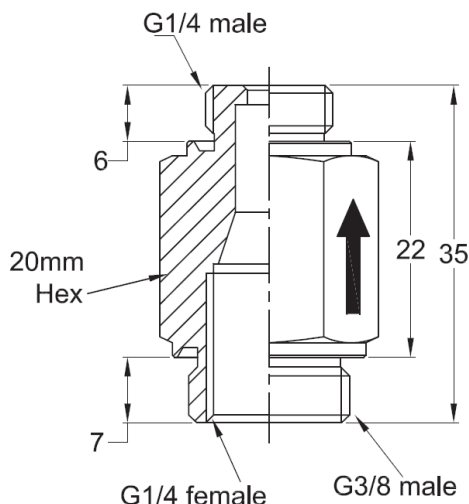
- All Anodized Aluminum Body
- Stainless Steel Spring
- 1/4" Female and 3/8" Male Thread Connection
- Fully Adjustable Based on Application



VFSC	3/8
Series	Male Thread
	3/8

The self closing valve is used on vacuum cup handling systems where multiple cups are utilizing the same vacuum source. The valve is mounted directly onto the vacuum port of the vacuum cup. If that cup is damaged or does not seal against the load being lifted, the induced vacuum air flow closes the valve shut. This ensures that the vacuum level is retained in the rest of the vacuum cups installed on the same circuit. This valve is adjustable and therefore can be used on various size vacuum cups or even on porous surfaces such as cardboard or MDF paneling. The cup mounting can be facilitated using either the G1/4 female or G3/8 male thread. The brass adjustment screw, depending on the cup fitting design, can be adjusted with the vacuum cup installed.

DIMENSIONS (mm)



The image below shows the simple construction of this valve consisting of:

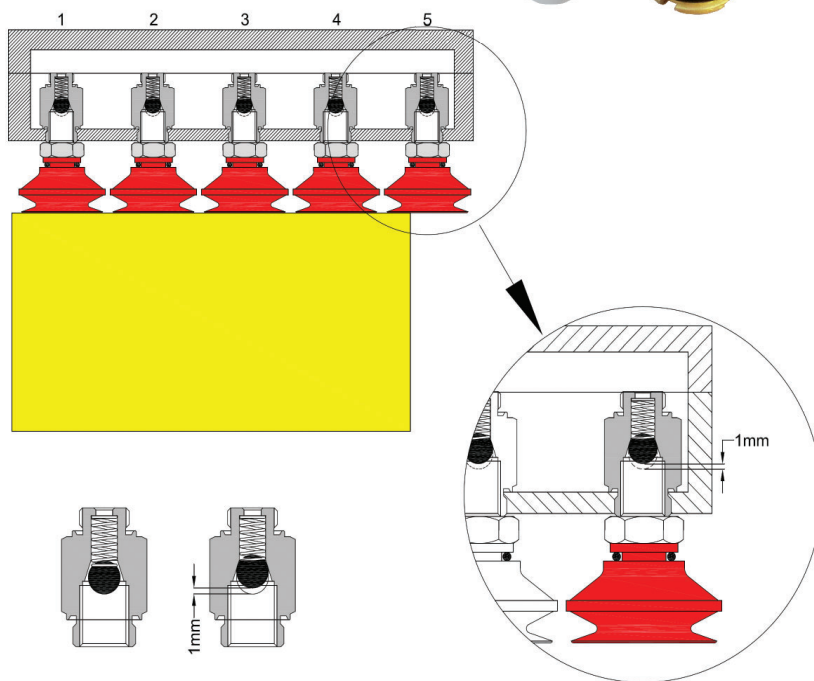
- Valve Body
- Spring
- Acetal Sealing Ball
- Brass Adjustment Screw



Adjustment Instructions

The self closing valve works on the principle of air flow volume. The adjustment of this valve is dependent on the volume of air between the valve and the sealing surface of the cup. Therefore this distance should be minimized to ensure accuracy and repeatability. The brass set screw should be turned inwards in a CW direction to decrease the amount of flow that closes the valve and turned outwards in a CCW direction to increase the amount of flow to close the valve. An approximate guide for use on a 40mm diameter single bellows cup is 1mm of ball movement. If the cup is larger or sealing on a porous surface, this adjustment might need to be increased.

The illustration on the right shows 5 rows of cups but with Row 5 overhanging the load. The inrush of air will close this row or self closing valves.



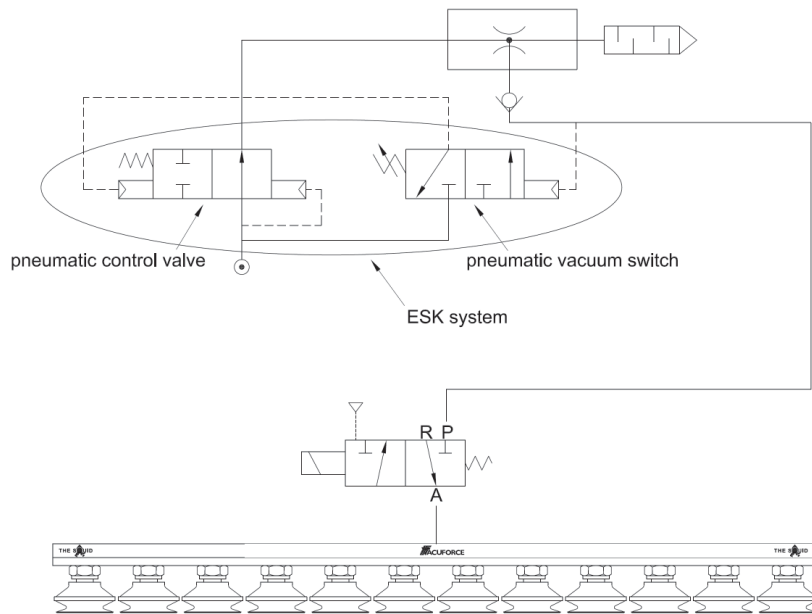
Vacuum generation for The Squid can be a choice of either a vacuum pump or compressed air powered generator.

Vacuum Generators

The AM series of vacuum generators (refer to page 3.20) offer flow rates up to 278m³/hr (162CFM) with maximum vacuum levels in a sealed system of -90kPa (27"Hg).

Regenerative Blowers

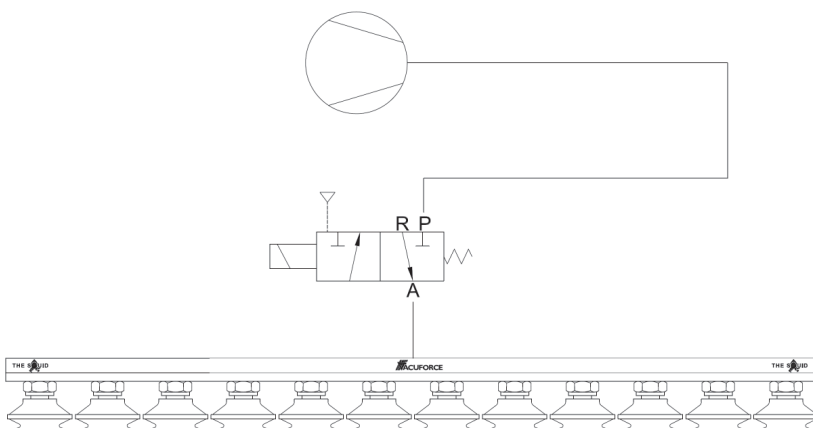
The 4RB series of vacuum regeneration blowers (refer to page 4.6) offer vacuum levels up to -70kPa (21"Hg) with maximum flow rates of 200m³/hr (118CFM).



Vacuum Generator System

The venturi schematic on the left shows a vacuum venturi coupled with an ESK module (refer to page 3.20) which turns the venturi on and off as vacuum demand dictates. This method of controlling the venturi operation independent of machine cycles allows for significant compressed air savings. The JZF vacuum control valve (refer to page 6.3) is shown mounted directly to The Squid which will turn the vacuum on and off as per the machine control.

This schematic is typical of larger installations. However on smaller Squid systems vacuum control is normally achieved by turning off and on the compressed air supply to a directly coupled vacuum generator. Each application is assessed to ensure that the most efficient method is used.



Vacuum Pump System

The schematic on the left shows a vacuum pump such as a regenerative blower or sliding vane pump. The JZF vacuum control valve (refer to page 6.3) is shown mounted directly to The Squid which will turn the vacuum on and off as per the machine control.

This schematic is typical of large installations.

The Squid Pouch Handling



The Squid is typically used for carton handling but in the ever increasing need for fast pick and place of pouch type food packaging, these Squid models have been specifically designed for use on the end of delta robots.

These lightweight Squid units offer the machine builder easy connection and installation utilising the flange as shown on the models on the right.

Of course these flange connections can be supplied to fit various different models of delta robot.

The life expectancy of the silicone vacuum cups (FDA compliant) far exceeds that of foam rubber, which is typically used in these types of pouch cartoning applications.

Contact our offices with your application details.

