mastip™
hot runner solutions

Cylix Actuation Technical Guide

www.mastip.com

Assembly Overview

IMPORTANT!!

Air quality: Filtered to 40 µM and lubricated

Minimum air: pressure 4 Bar

Maximum air: pressure 10 Bar

The Cylix Actuators are bolted to the manifold and must be protected from overheating to ensure long seal life. During system start-up, operation and shut-down the cooling water supply to the actuators must continue flowing to ensure the seals are thermally separated from the hot manifold and excessive heat does not cause premature failure of the components.

Cooling Water Medium

1. Water quality and PH levels must be maintained to ensure it is clean and free of particulates and biological growth
2. Cooling water temperature must not exceed 80°C
3. Cooling water pressure should not exceed 8 bar
4. Cooling water flow rate should be a minimum of 2 l /min. per unit
5. A maximum of 2 Cylix actuators may be connected in series for cooling

Actuator Start-up Procedure

1. Turn on all water chillers/cooling and ensure temperatures are below 80°C
2. Turn on water cooling connections to actuators and check cooling flow is operating correctly
3. Continue with normal hot runner mould start-up procedure

Actuator Shut-down Procedure

Use normal hot runner mould shut-down procedures, ensuring all water cooling continues flowing to the actuators until the hot runner is below 150°C.

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Assembly Overview

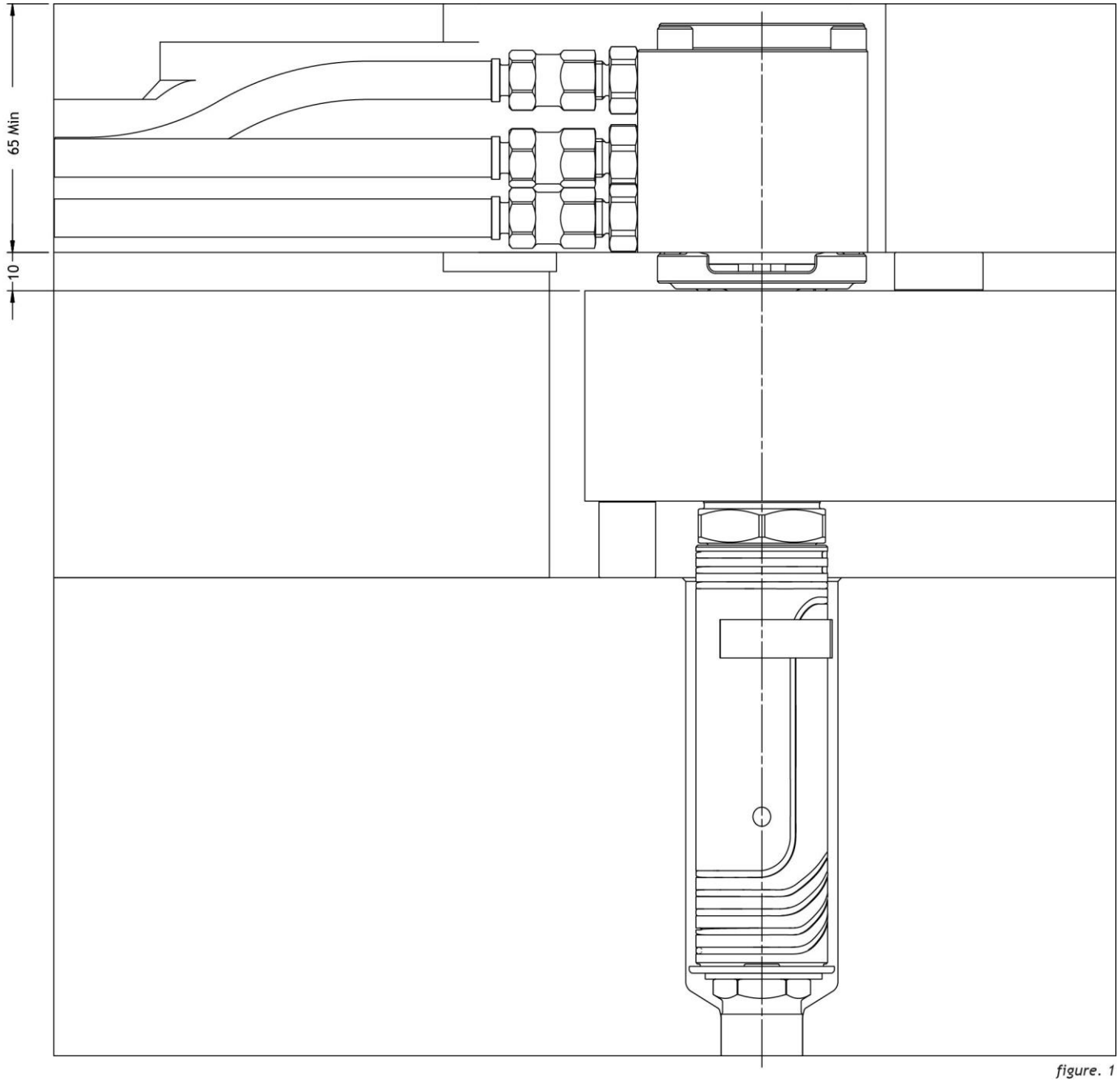

figure. 1

Key Features

- Conical or Cylindrical shut off
- From Ø2.0mm to Ø5.0mm pin
- Air actuated

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Minimum Spacing Layout

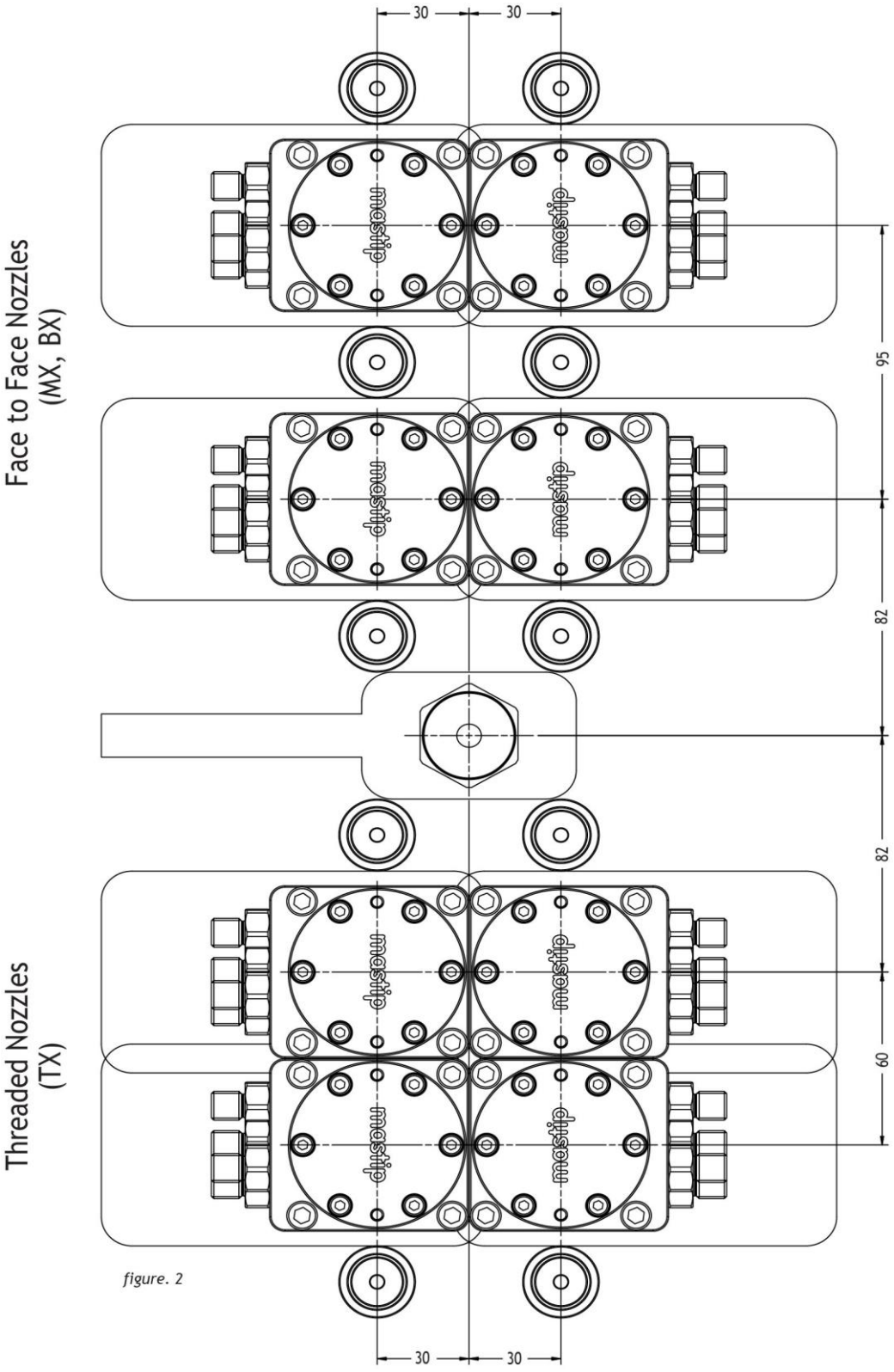

figure. 2

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Cylix Actuation Overall Dimensions

Note: Pins are supplied in standard length and must be cut to required length before installation.

Pins can be supplied by Mastip finished ready to use

→ Refer to page PVB40-8 Pin Calculations section to calculate required final pin lengths

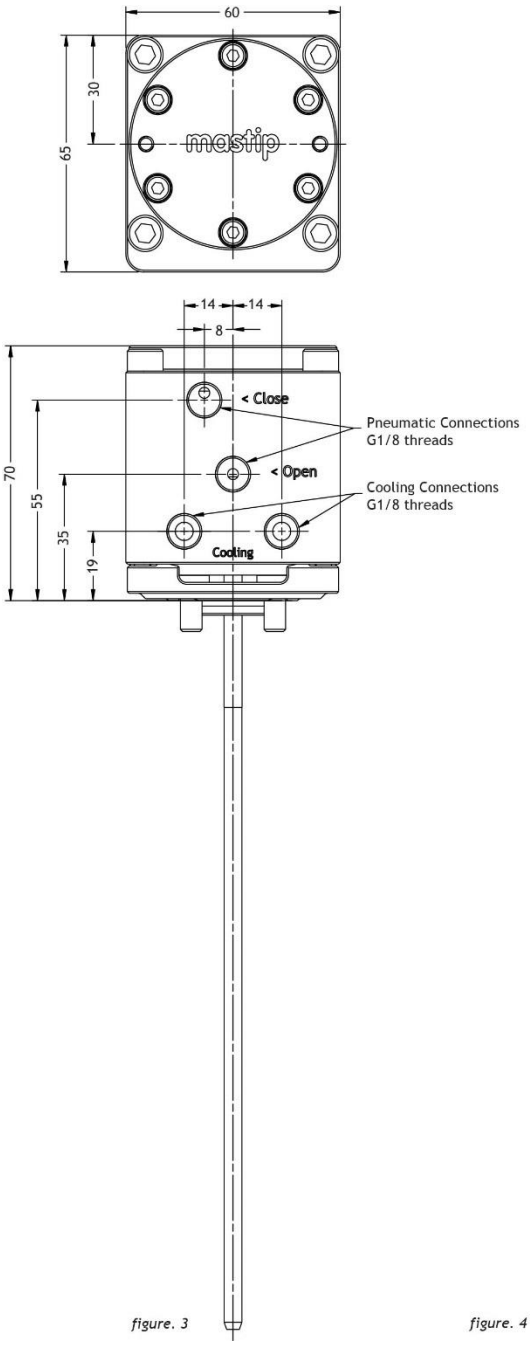

figure. 3

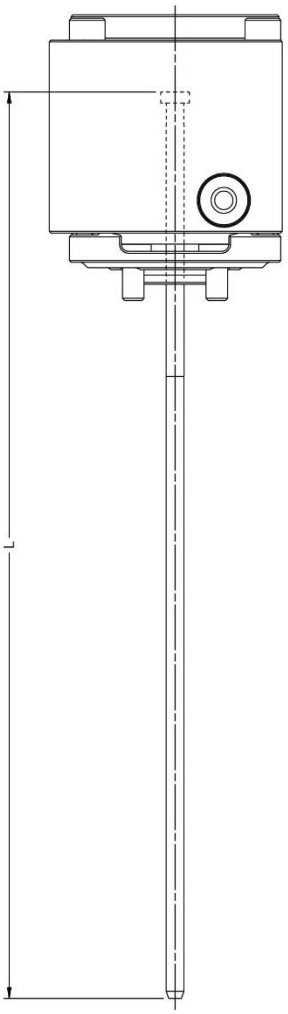

figure. 4

Nozzle Compatibility			
Description	Nozzle	Tip	Supplied Pin Size
PVB40-P1 Headed Pin	MX13 / BX13	OV	Ø2.0
PVB40-P1 Headed Pin	MX16 / BX16 / TX16	OV / TV	Ø2.5
PVB40-P1 Headed Pin	MX19 / BX19 / TX19	OV / TV	Ø3.0
PVB40-P1 Headed Pin	BX27 / TX27	OV / TV	Ø5.0

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Plate Details – Straight Exit

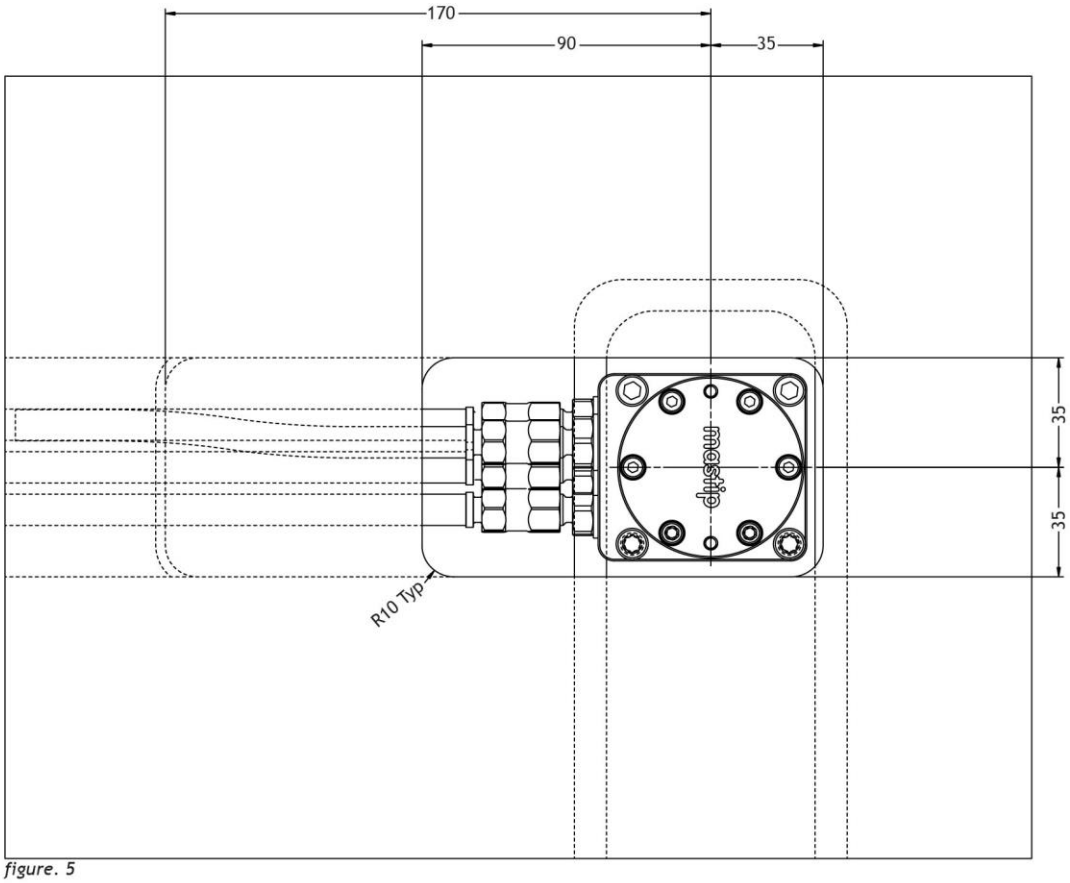

figure. 5

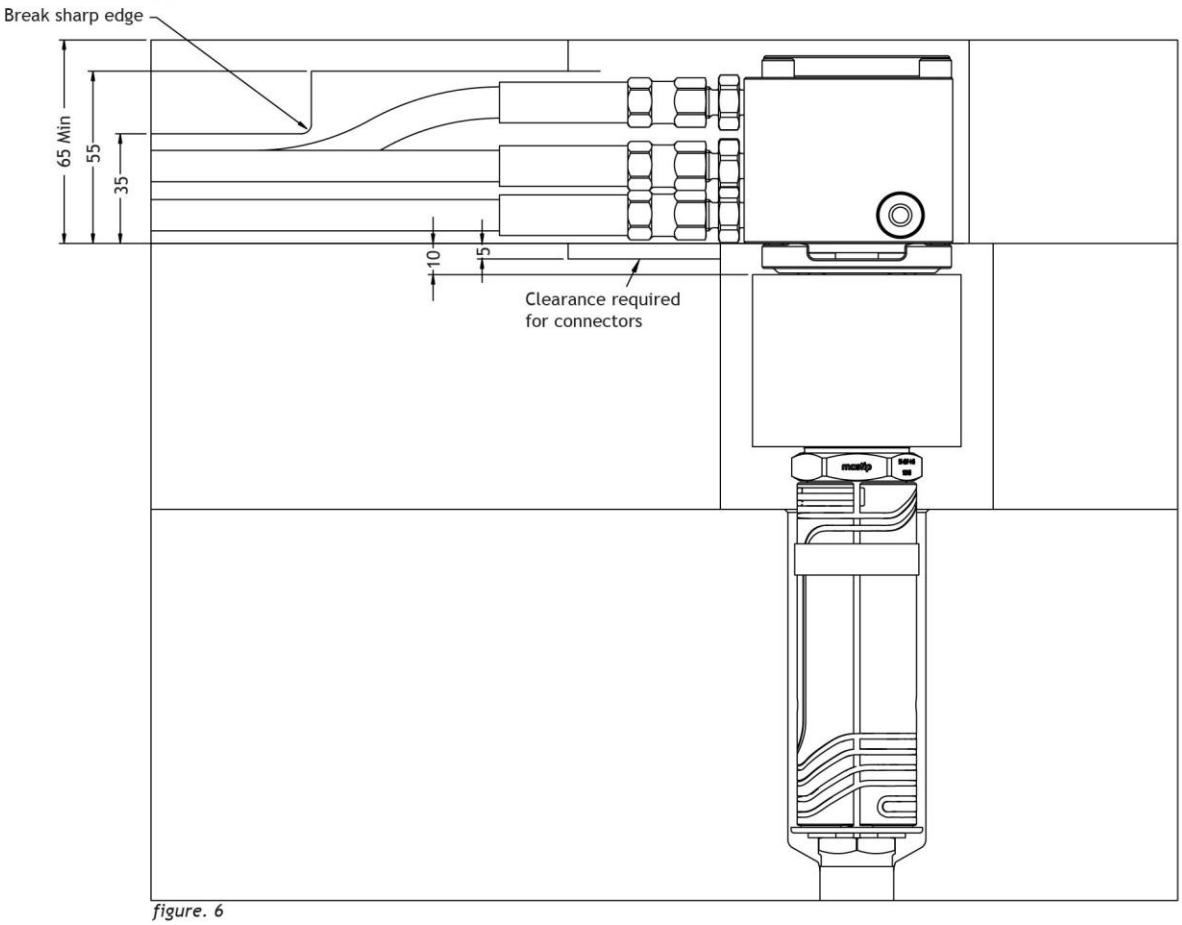

figure. 6

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Plate Details - 90° Bend Exit

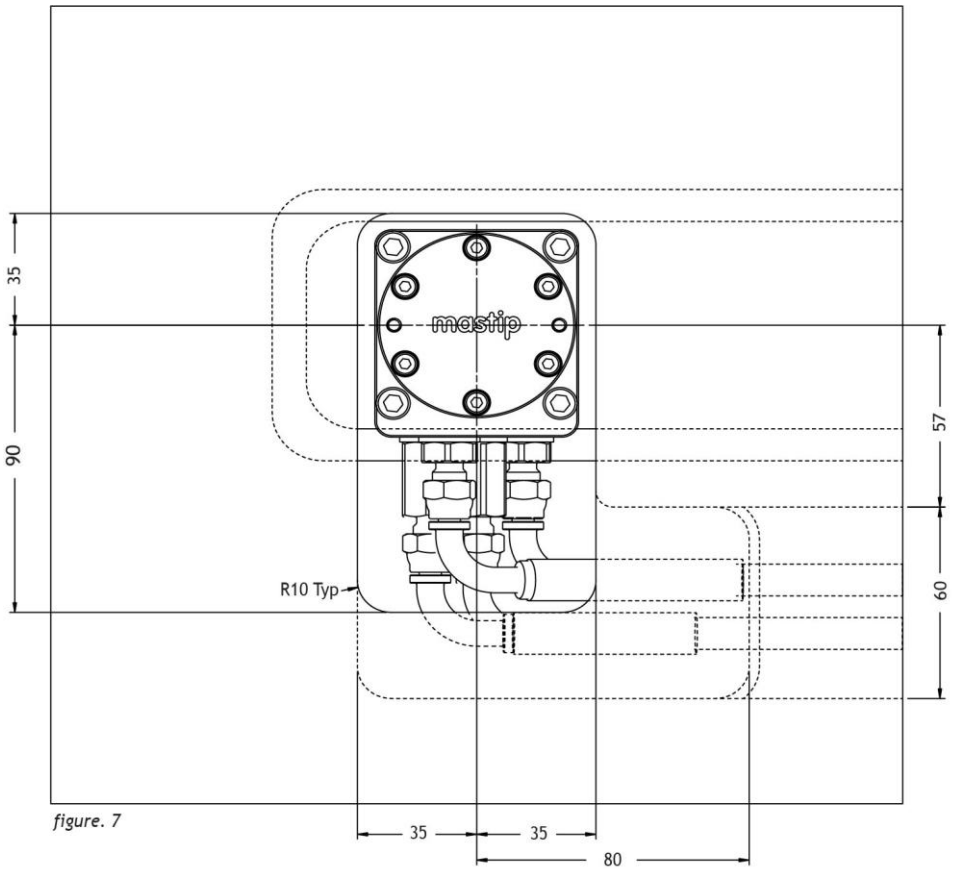

figure. 7

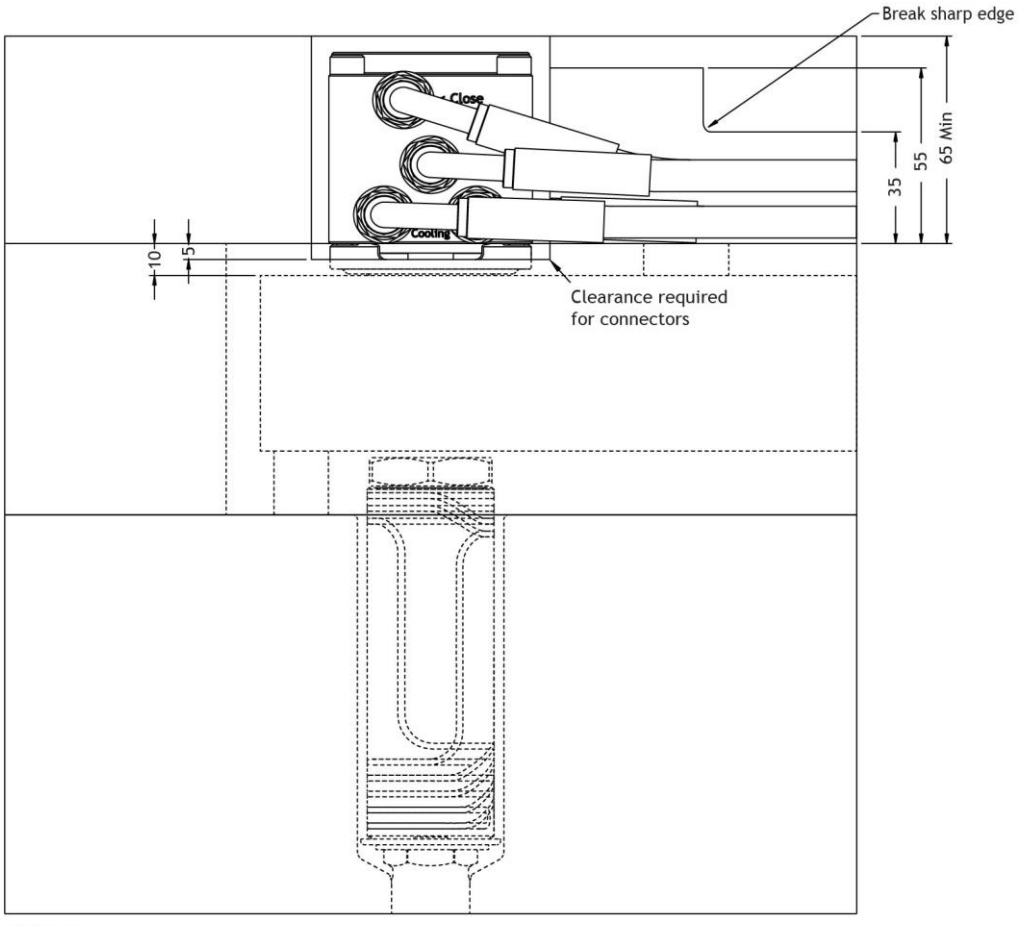

figure. 8

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Pin Details

To calculate final pin length, use the following equation:

PVB40-P1 – D2.0
PVB40-P1 – D2.5
PVB40-P1 – D3.0

Pin Length = (Y=28.75) + 10.0 + X + L4 + L + 0.1

PVB40-P1 – D5.0

Pin Length = (Y=29.00) + 10.0 + X + L4 + L + 0.1

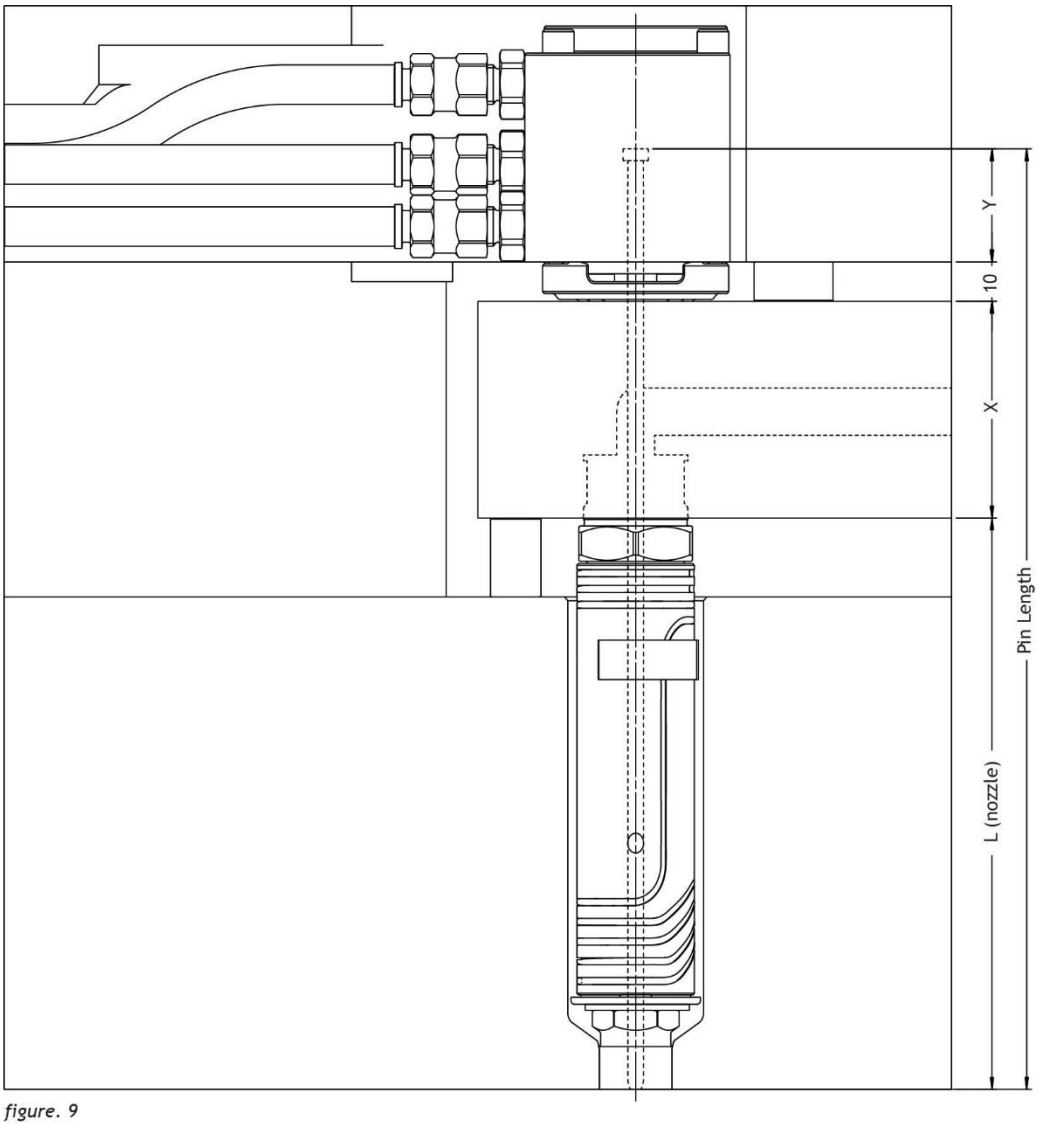

figure. 9

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Conical and Cylindrical Valve Gate Recommendations

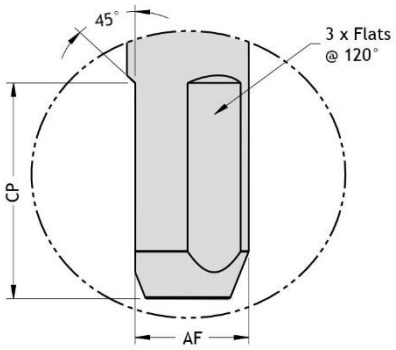
	Conical Valve Gate	Cylindrical Valve Gate
Gate Quality	***	***
Pin Cooling	***	*
Filled Materials	*	***
Material with Small Moulding Window	*	***
Ease of Pin Setup	*	***
Ease of Gate Manufacture	***	**
Gate Life	***	*

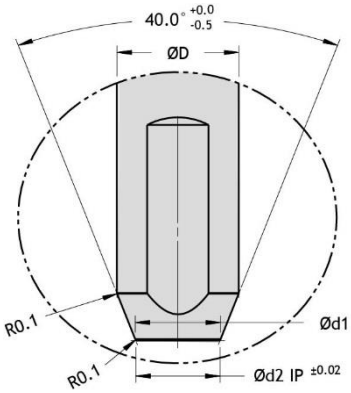
Key	Value
*	Lowest Rating
***	Highest Rating

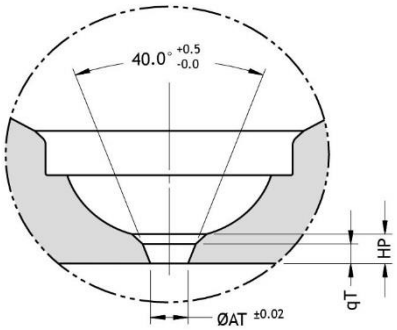
VG1 - Conical Valve Gate

D	d1	d2	AF	CP	AT	qT	HT
2.0	1.3	1.25	1.80	8	1.30	0.8	1.0
2.5	1.8	1.75	2.30	8	1.80	1.0	2.0
3.0	2.2	2.15	2.75	8	2.20	1.2	2.5
5.0	3.5	3.45	4.65	10	3.50	2.0	3.0

The pin will form a 0.1mm deep dimple on the part.
Pin and gate to be lapped to ensure clean shutoff.
Recommended for amorphous polymers



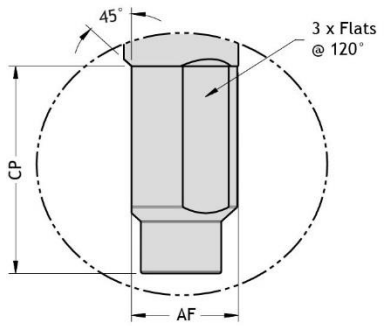


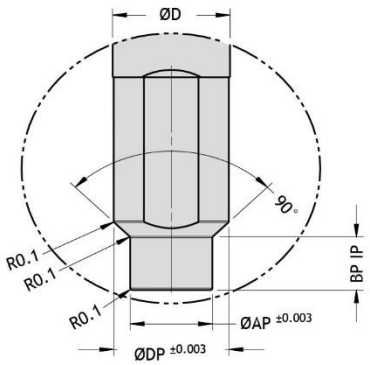


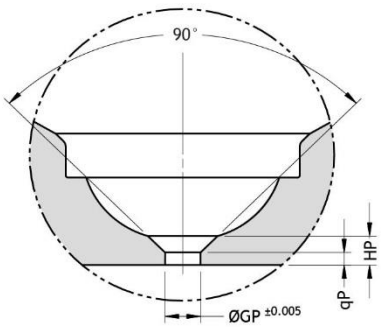
VG2 - Cylindrical Valve Gate

D	AP	BP	CP	DP	AF	GP	qP	HP
2.0	1.292	2.0	8	1.892	1.70	1.305	0.5	1.0
2.5	1.792	2.0	8	2.392	2.20	1.805	0.7	2.0
3.0	2.192	2.0	8	2.892	2.65	2.205	0.8	2.5
5.0	3.492	2.5	10	4.892	4.55	3.505	1.3	3.0

The pin will form a 0.1mm deep dimple on the part.
Recommended for semi-crystalline and filled polymers.







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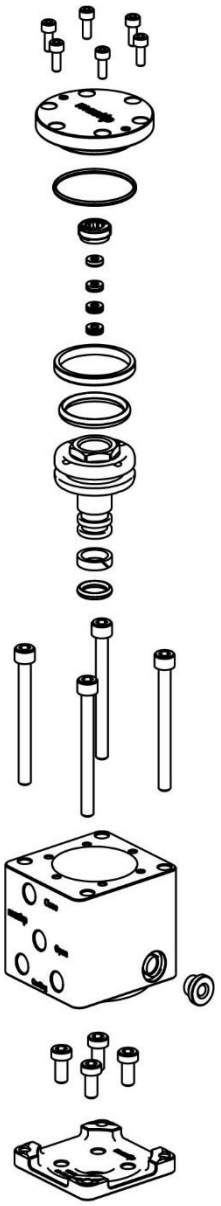
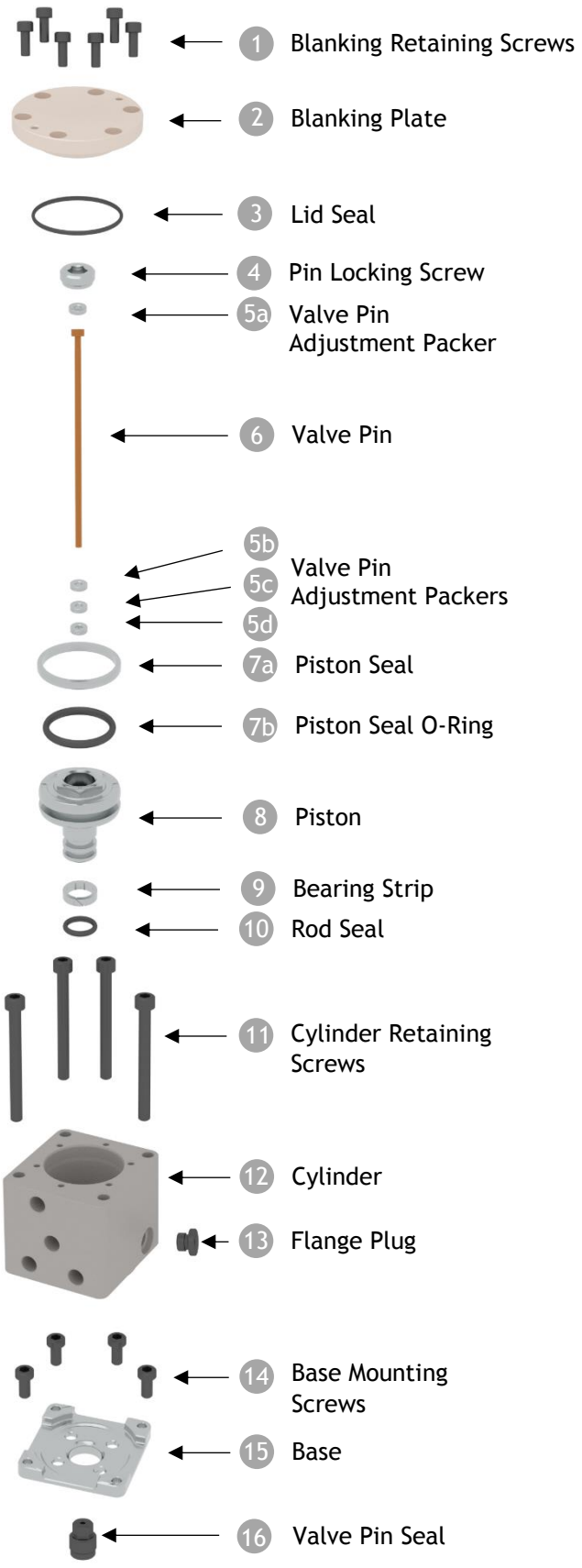
As Supplied

A PVB40 CYLINDER ASSEMBLY



B PVB40 VALVE PIN + SEAL

Exploded Diagram



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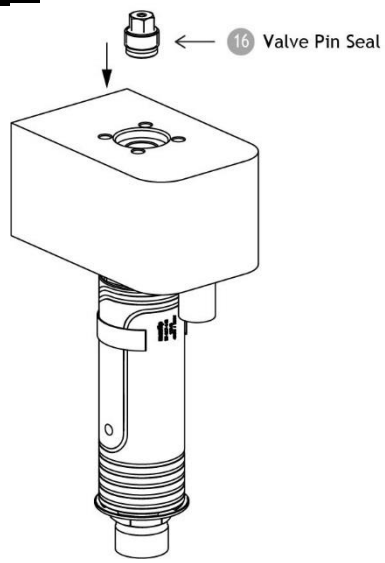
Installation and Pin Adjustment Guide

PRE-INSTALLATION

1. Verify the actuator pockets and hose channels are machined in the back plate as shown in figure 7.
2. Ensure there are no sharp edges or burrs.
3. Cut pins to length and profile end to conical or cylindrical (refer nozzle approval drawing).
4. Pin and seal are a matched set and must remain paired.

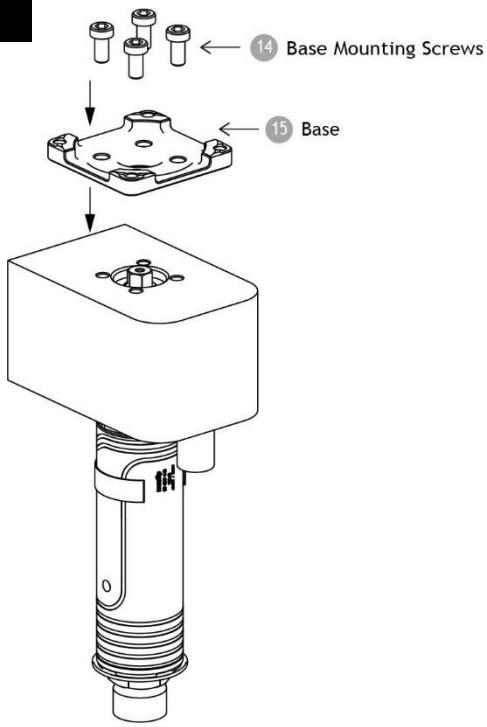
VALVE CYLINDER ASSEMBLY

ONE



Apply heat resistant nickel based anti-seize grease to the thread of the **Valve Pin Seal 16** and screw into the manifold and tighten to 20Nm.
Ensure pins slide smoothly through the pin seal after tightening.

TWO



Mount the **Base 15** onto the manifold and secure in place with the **Base Mounting Screws 14** and tighten to 14Nm.

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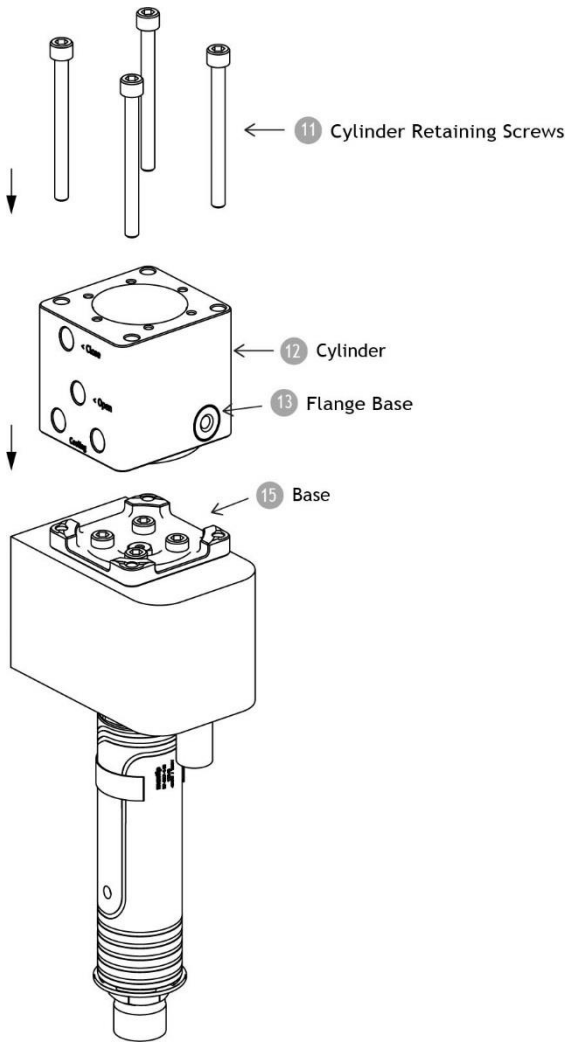
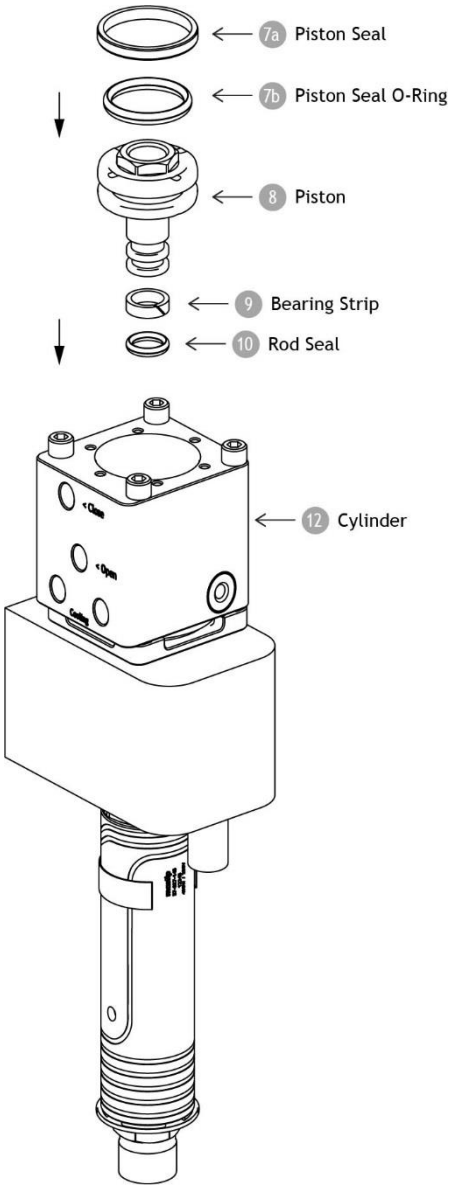
VALVE CYLINDER ASSEMBLY CONT…

THREE



Mount the **Cylinder** **12** to the **Base** **15**, orientate the **Cylinder** **12** so the connections are facing the correct direction. Secure in place with **Cylinder Retaining Screws** **11** and tighten to 16Nm.
Ensure the **Flange Plug** **13** is tightly sealed in place in the cooling circuit.

FOUR



Fit the **Piston Seals** **7a** & **7b**, **Bearing Strip** **9** and **Rod Seal** **10** to the **Piston** **8**. Apply high temperature silicon grease to the cylinder bore, **Piston Seals** **7a** & **7b**, **Bearing Strip** **9** and **Rod Seal** **10**.

Fit the **Piston** **8** to the **Cylinder** **12**.

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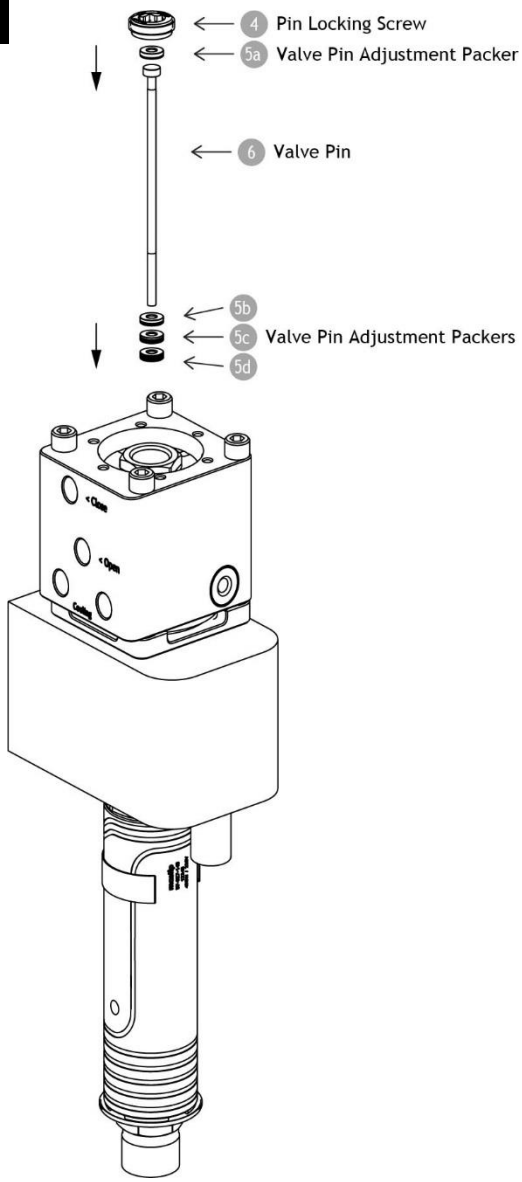
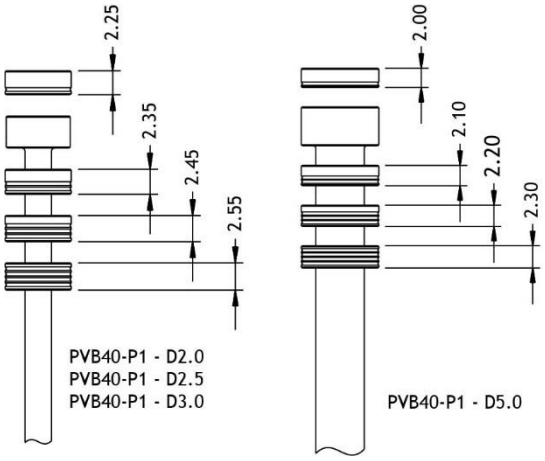
VALVE CYLINDER ASSEMBLY CONT…

FIVE





Insert the **Valve Pin Adjustment Packers** **5b**, **5c** & **5d** onto the **Valve Pin** **6**. Ensure the correct packer thickness is in the correct position. (Recommend starting with the thinnest packer above the pin head, then adjust to suit if necessary). Fit the **Valve Pin** **6** to the **Piston** **8**.

Fit the remaining **Valve Pin Adjustment Spacer** **5a**, above the **Valve Pin** **6** head.
Fit the **Pin Locking Screw** **4** to the **Piston** **8** and tighten to 40Nm.

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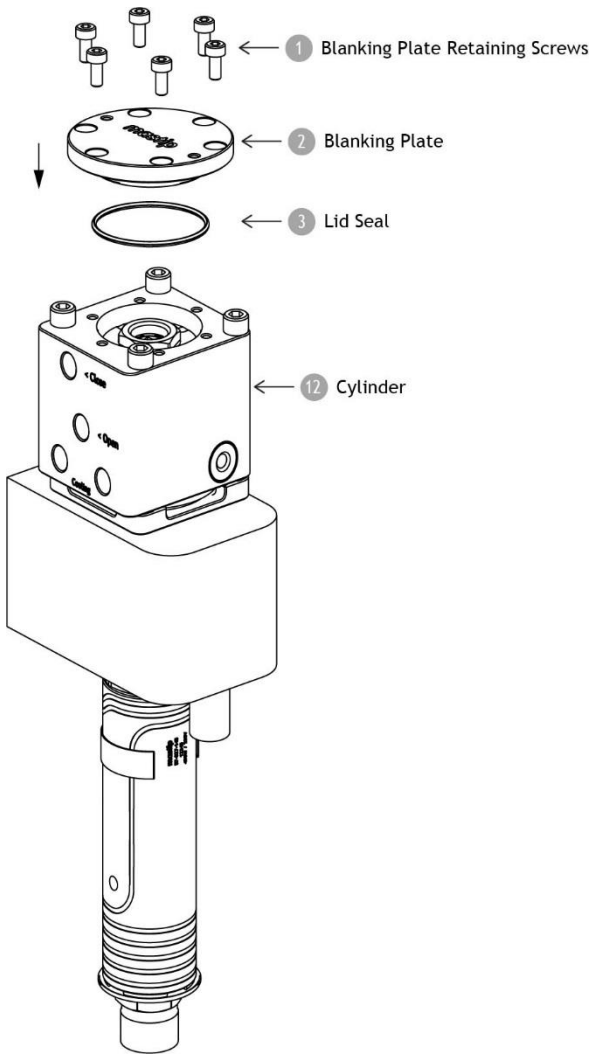
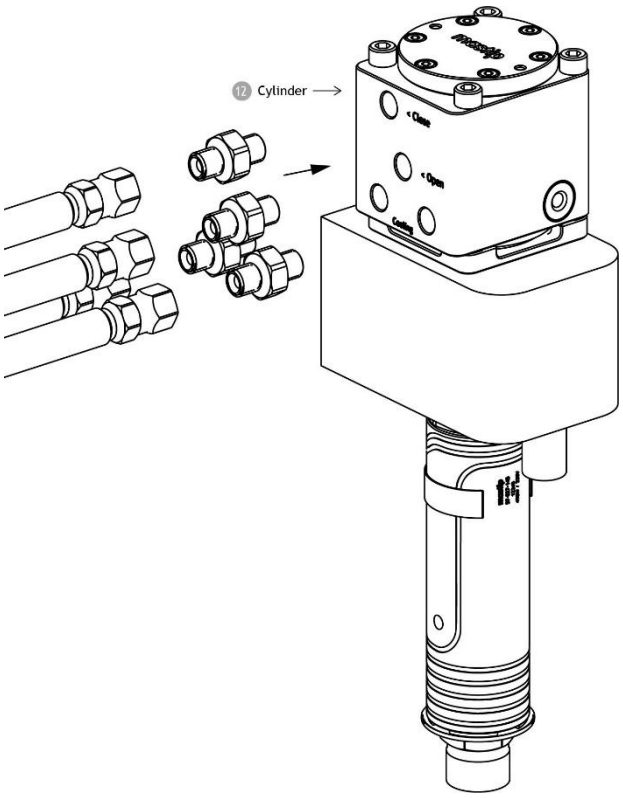
VALVE CYLINDER ASSEMBLY CONT...

SIX



Fit the **Lid Seal** **3** to the **Blanking Plate** **2**. Fit the **Blanking Plate** **2** to the **Cylinder** **12**, secure with **Blanking Plate Retaining Screws** **1** and tighten to 4.5Nm.

SEVEN



Install all pneumatic and cooling fittings and hoses to the **Cylinder** **12** (G1/8 threads) and mould connections, and ensure all connections are correct.

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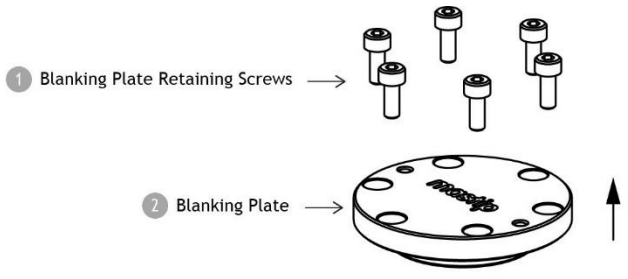
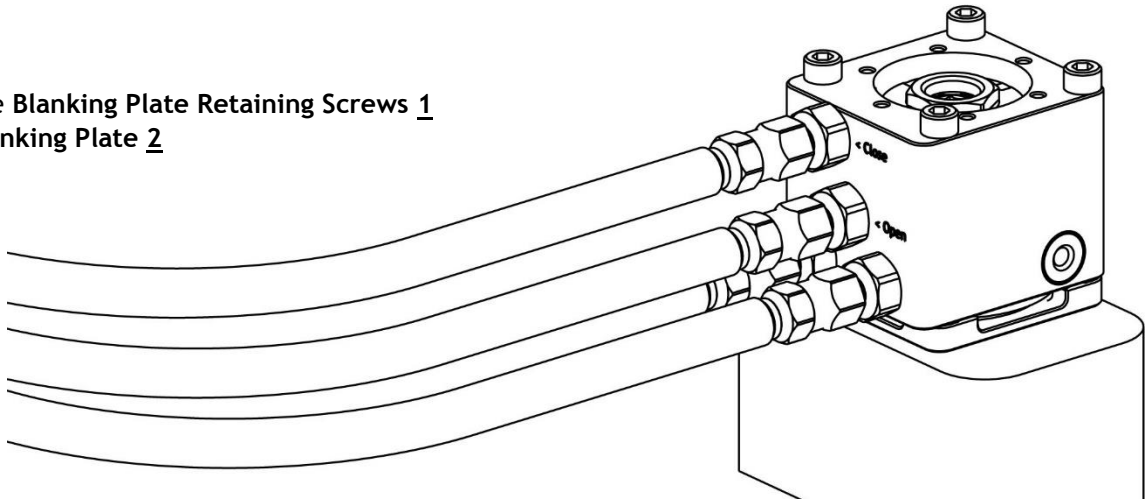
PIN HEIGHT ADJUSTMENT

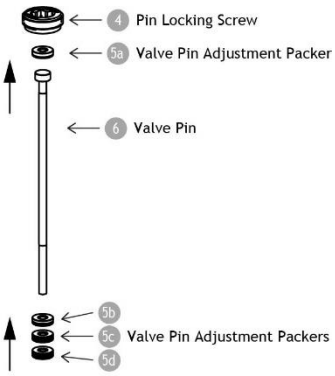
ONE



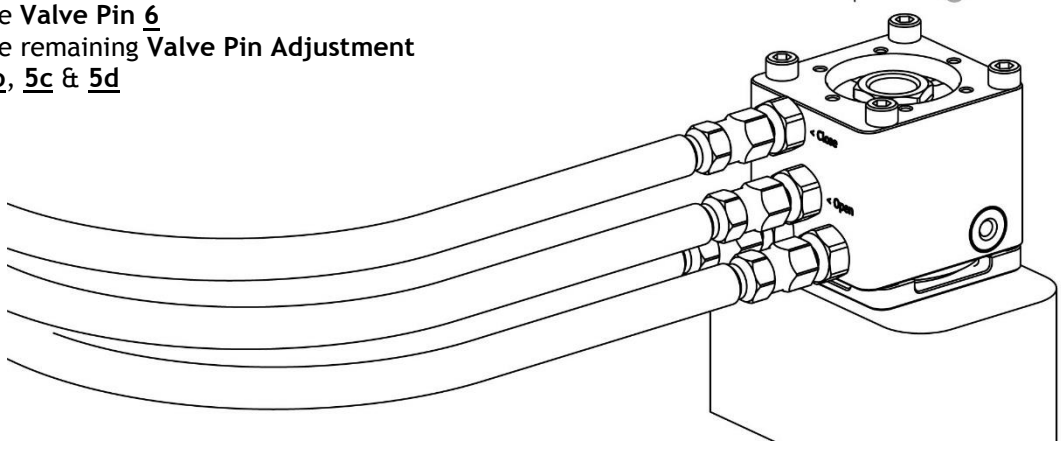
Remove **Blanking Plate Retaining Screws** 1
and **Blanking Plate** 2



TWO



Remove the **Pin Locking Screw** 4
Remove the **Valve Pin Adjustment Packer** 5a
Remove the **Valve Pin** 6
Remove the remaining **Valve Pin Adjustment Packers** 5b, 5c & 5d



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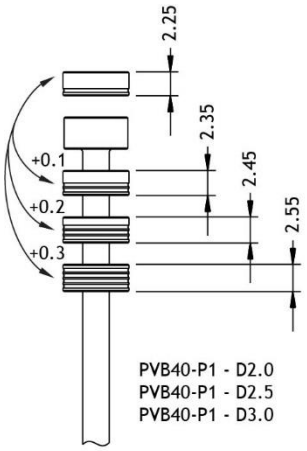
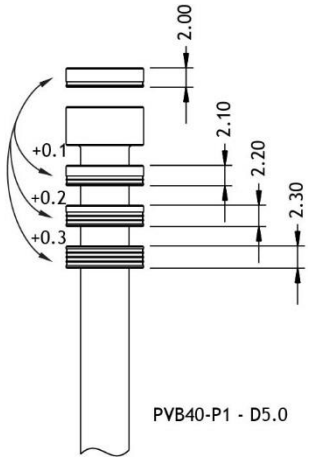
PIN HEIGHT ADJUSTMENT…

THREE

Minor Adjustment



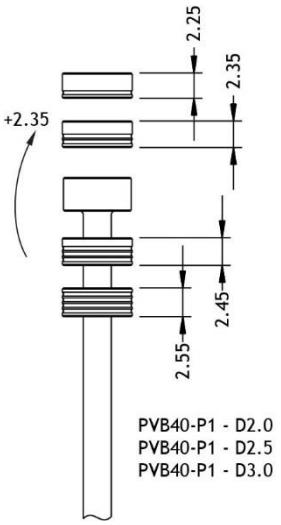


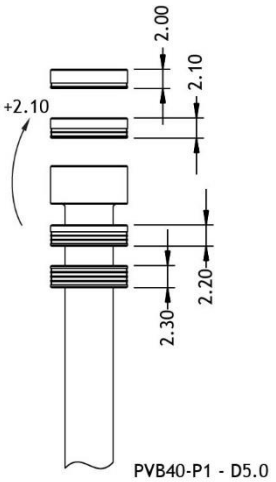
Swap **Valve Pin Adjustment Packers 5a, 5b, 5c & 5d** to achieve small pin adjustments.

(different packer = different height)

FOUR

Major Adjustment





Move one or more **Valve Pin Adjustment Packers 5a, 5b, 5c & 5d** from below the pin head to above the pin head to achieve large pin adjustment

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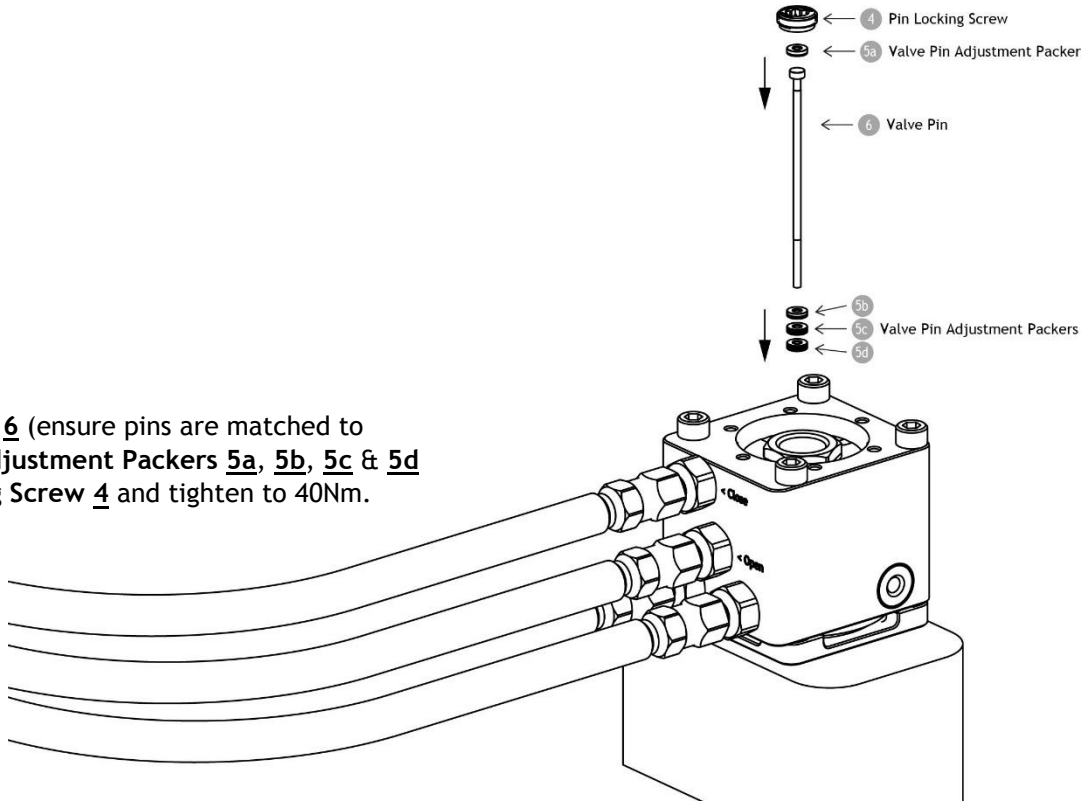
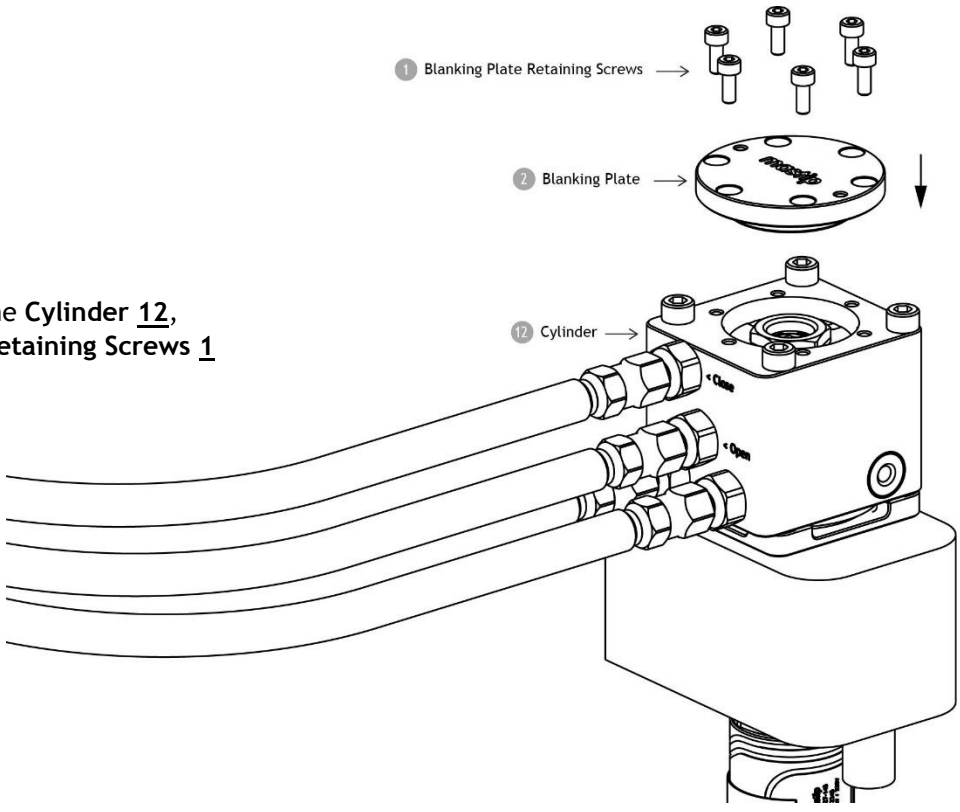
PIN HEIGHT ADJUSTMENT…

FIVE



Assemble **Valve Pin 6** (ensure pins are matched to seals), **Valve Pin Adjustment Packers 5a**, **5b**, **5c** & **5d** and the **Pin Locking Screw 4** and tighten to 40Nm.

SIX



Fit the **Blanking Plate 2** to the **Cylinder 12**, secure with **Blanking Plate Retaining Screws 1** and tighten to 4.5Nm.

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