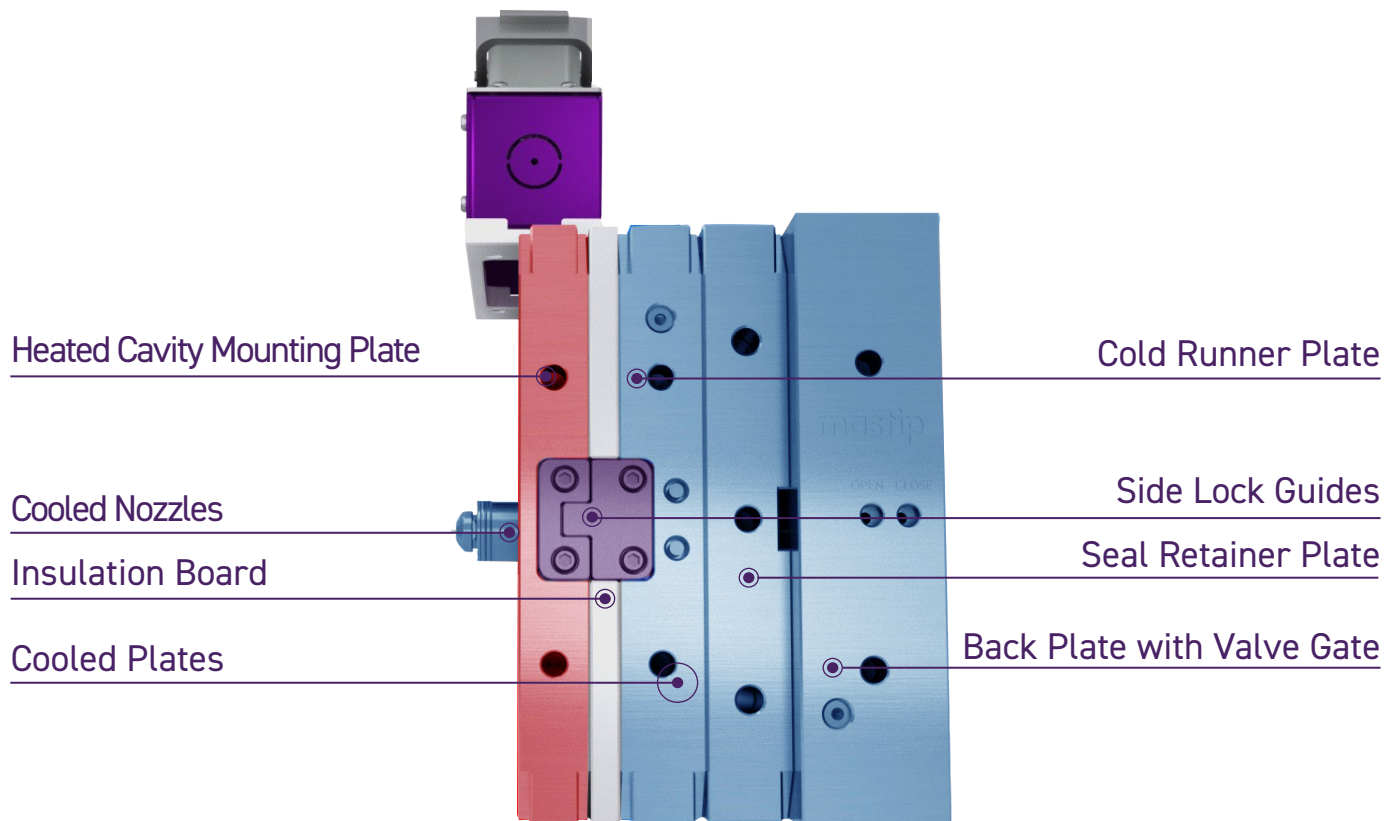


AQUILO[™]
LSR Cold Deck
Technical Guide

Assembly Overview

Mastip provides a customised Liquid Silicone Rubber (LSR) cold deck valve gated solution with proven cooling and heating technology. Mastip cold decks are optimised to shorten cycle times while producing high quality parts.

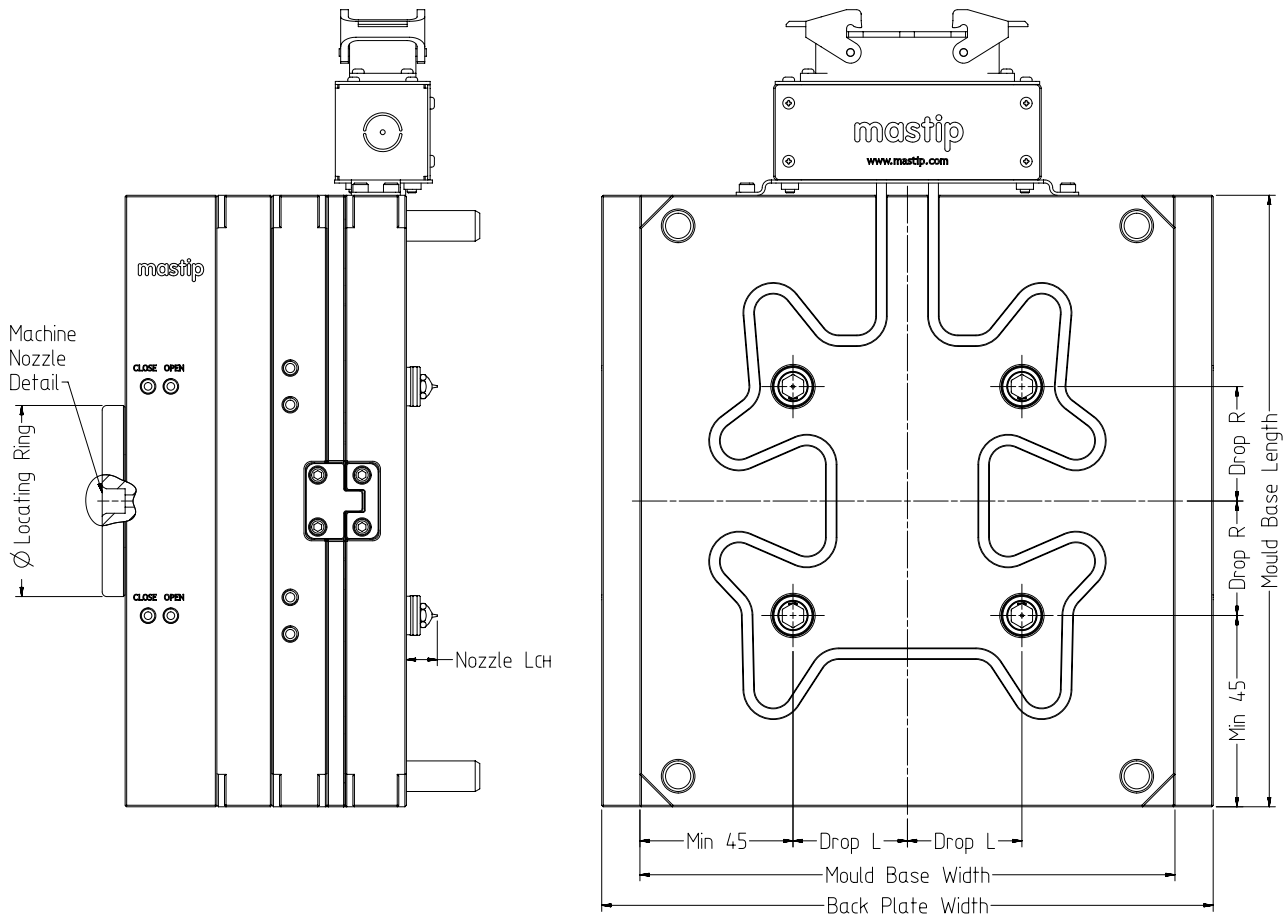


Key Features

- Cooled plates ensure silicone remains liquid
- Cooling channels in the nozzle for delivery of material in optimum condition
- Cavity mounting plate heated with Mastip's proven heater technology
- Insulation board to thermally insulate the cooled plates from heated plates
- Hardened side lock guides to control the thermal expansion between the heated and cooled plates
- Valve gate technology to precisely control the liquid silicone at the gate
- Thermally insulated electrical terminal mounting box for heated plates
- Sequential control available for optimum balancing

AQUILO™ System Quote Information

Note: To ensure that Mastip are able to supply system approval drawings in a timely and accurate manner, please complete the required AQUILO™ System Quoting Information and supply to Mastip along with the **CAD model with cavity mounting locations**.



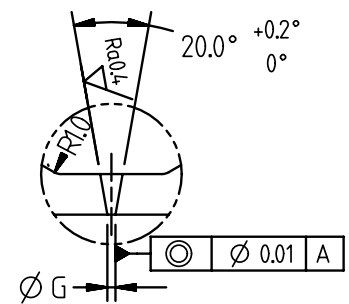
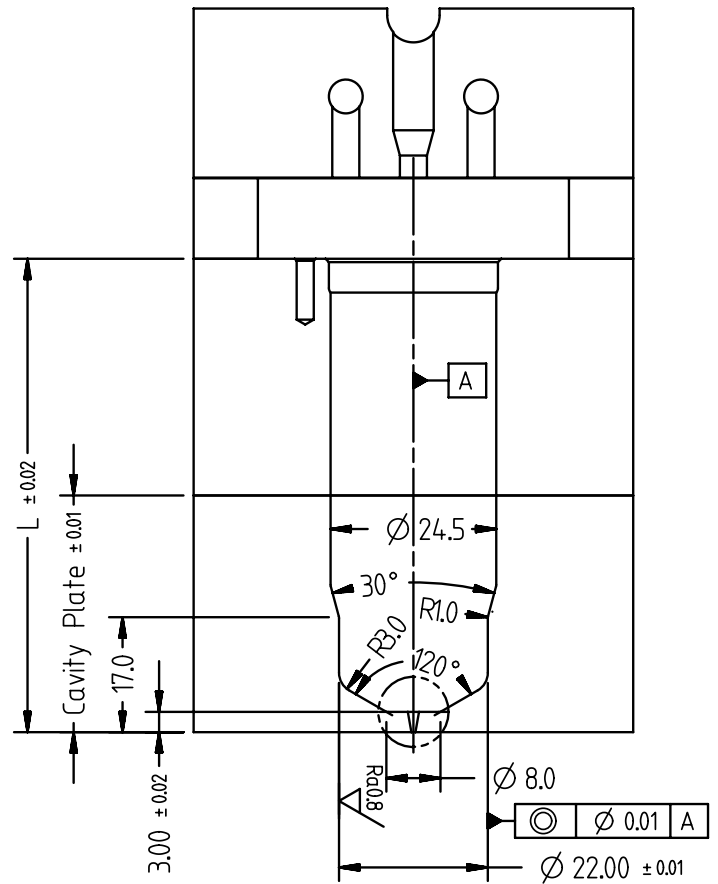
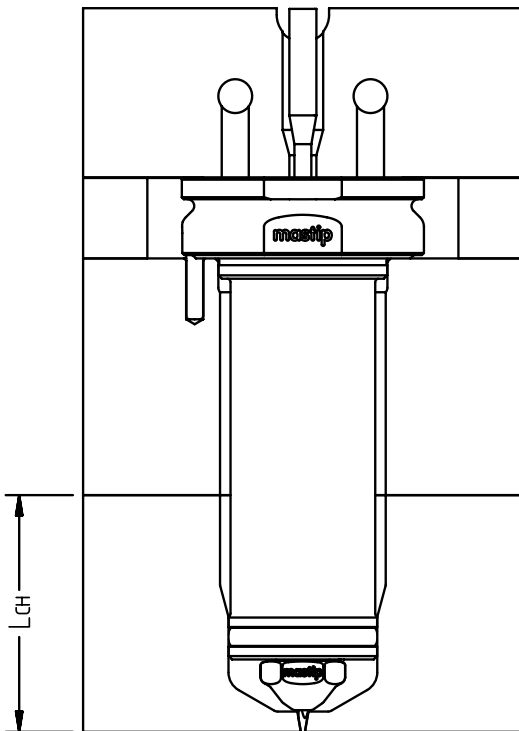
Description	Value
Drop Quantity	
Drop L (Outermost Positions)	
Drop R (Outermost Positions)	
Mold Material (P20 / SS)	
Mould Base Width	
Back Plate Width	
Mould Base Length	
Nozzle LCH (To Cavity)	
∅ Locating Ring	
Machine Nozzle Detail	
Sequential Valve Gate (Y / N)	
Part / Shot Weight (including runner)	
Nominal Wall Thickness	

Notes:

1. Details shown required for quoting, additional information and CAD details required to complete order
2. Please supply CAD model with cavity mounting locations

Cold Deck Nozzle Range Series and Lengths

Standard Nozzle Dimensions*			
Series	Flow Bore	Length L	Gate ϕ
CR04	$\phi 4$	50, 70, 90	0.4, 0.6, 0.8

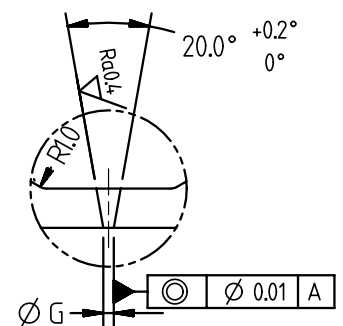
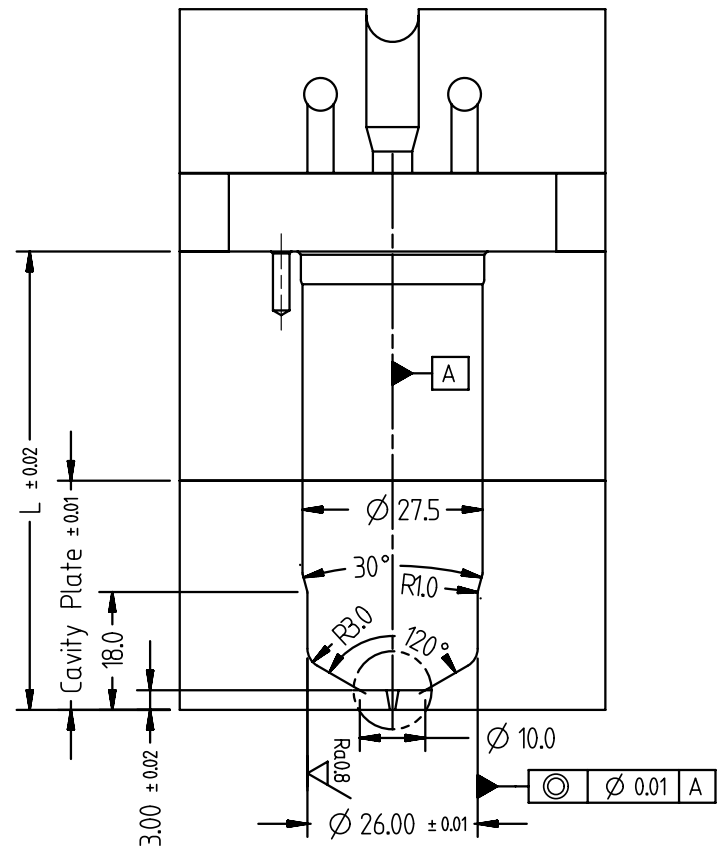
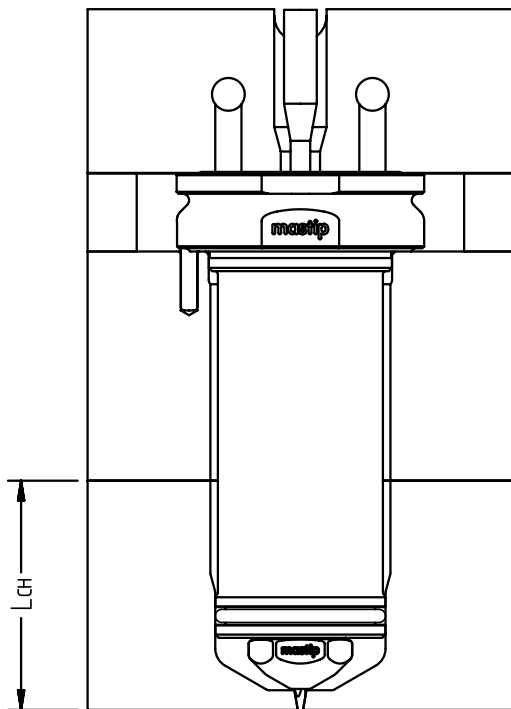


Note:

*Custom lengths available on request

Cold Deck Nozzle Range Series and Lengths

Standard Nozzle Dimensions*			
Series	Flow Bore	Length L	Gate \varnothing
CR06	$\varnothing 6$	50, 70, 90	0.6, 0.8, 1.0



Note:

*Custom lengths available on request

Cold Deck Requirements

Pneumatic Supply

Air quality: Filtered to 40 µM and lubricated

Minimum air: pressure 4 Bar

Maximum air: pressure 10 Bar

System Cooling

During system start-up, operation and shut-down the cooling water supply to the cold deck must continue flowing to ensure the material does not cure prematurely inside the cold deck.

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 the material manufacturers recommendation, typically less than 25°C
3. Cooling water pressure should not exceed 8 bar
4. Cooling water flow rate should be a minimum of 15 l /min
5. All cooling circuits should be independently supplied by separate cooling feeds

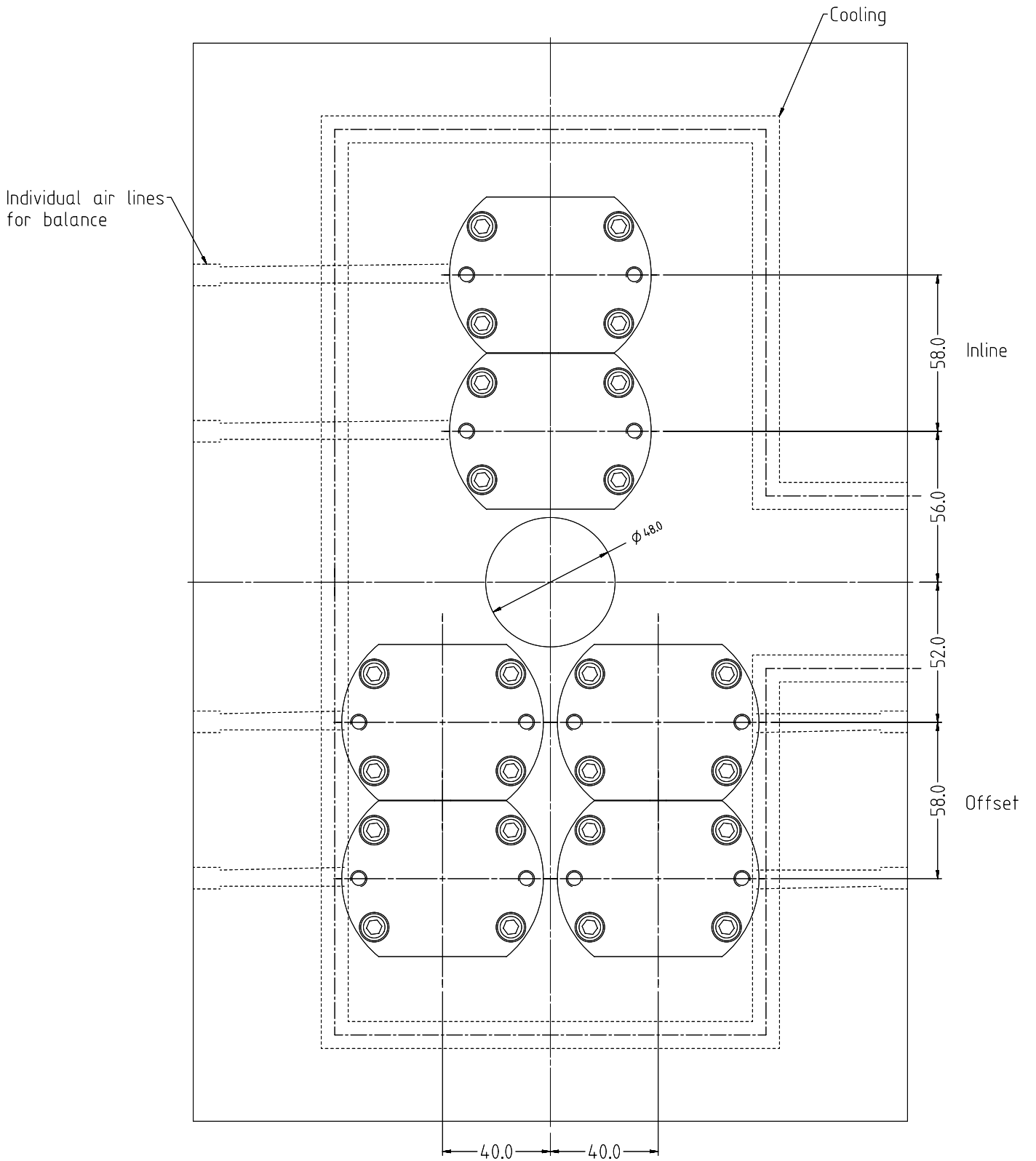
Start-up Procedure

1. Turn on all water chillers/cooling and ensure temperatures are at or below the conditions mentioned above
2. Turn on water cooling connections to the cold deck and check cooling flow is operating correctly
3. Continue with normal cavity heating start-up procedure

Shut-down Procedure

Switch off all mould heaters, ensuring all water cooling continues flowing to the cold deck until the heated plates are at room temperature

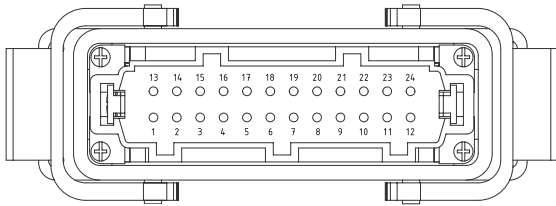
Spacing Layout



Combination Power and Thermocouple Mould Connector Assignments for 6 Zone - Option 1

6 Zone Mould Connector - 24 Pin Male Connector

Option 1 - 24 Pin Female TC, 24 Pin Male Power



Zone #	TC Terminals	Power Terminals
1	3 (+) - 4 (-)	1 - 2
2	7 (+) - 8 (-)	5 - 6
3	11 (+) - 12 (-)	9 - 10
4	15 (+) - 16 (-)	13 - 14
5	19 (+) - 20 (-)	17 - 18
6	23 (+) - 24 (-)	21 - 22

Suitable for up to 6 zones

Tick required option

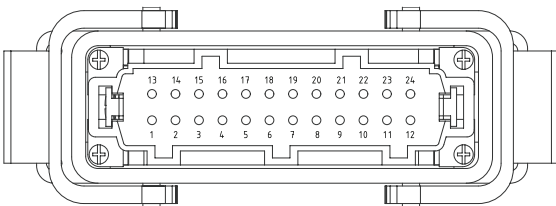
Single Latch

Dual Latch

Combination Power and Thermocouple Mould Connector Assignments for 6 Zone - Option 2

6 Zone Mould Connector - 24 Pin Male Connector

Option 2 - 24 Pin Female TC, 24 Pin Male Power



Zone #	TC Terminals	Power Terminals
1	13 (+) - 14 (-)	1 - 2
2	15 (+) - 16 (-)	3 - 4
3	17 (+) - 18 (-)	5 - 6
4	19 (+) - 20 (-)	7 - 8
5	21 (+) - 22 (-)	9 - 10
6	23 (+) - 24 (-)	11 - 12

Suitable for up to 6 zones

Tick required option

Single Latch

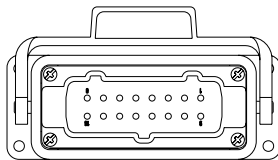
Dual Latch

Power and Thermocouple Mould Connector Assignments for 8 Zone - Option 3

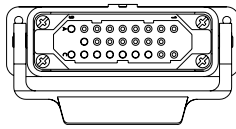
8 Zone Mould Connector - 25 Pin Male Connector

Default options for Mould Side Plug Combinations

Option 3 - 16 Pin Female TC, 25 Pin Male Power



SINGLE LATCH PICTURED



Zone #	TC Terminals	Power Terminals
1	1(+) - 9(-)	"A" 1 - 2
2	2(+) - 10(-)	"A" 3 - 4
3	3(+) - 11(-)	"A" 5 - 6
4	4(+) - 12(-)	"A" 7 - 8
5	5(+) - 13(-)	"B" 2 - 3
6	6(+) - 14(-)	"B" 4 - 5
7	7(+) - 15(-)	"B" 6 - 7
8	8(+) - 16(-)	"C" 1 - 2

Tick required option

Single Latch

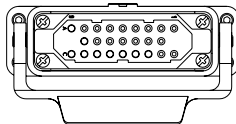
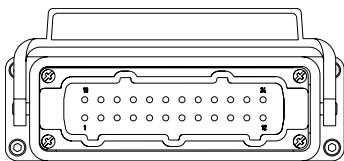
Dual Latch

Suitable for up to 8 zones

Power and Thermocouple Mould Connector Assignments for 12 Zone - Option 4

12 Zone Mould Connector - 24 Pin Male Connector

Option 4 - 24 Pin Female TC, 24 Pin Male Power



Suitable for up to 12 zones

Zone #	TC Terminals	Power Terminals
1	1(+) - 13(-)	"A" 1 - 2
2	2(+) - 14(-)	"A" 3 - 4
3	3(+) - 15(-)	"A" 5 - 6
4	4(+) - 16(-)	"A" 7 - 8
5	5(+) - 17(-)	"B" 2 - 3
6	6(+) - 18(-)	"B" 4 - 5
7	7(+) - 19(-)	"B" 6 - 7
8	8(+) - 20(-)	"C" 1 - 2
9	9(+) - 21(-)	"C" 3 - 4
10	10(+) - 22(-)	"C" 5 - 6
11	11(+) - 23(-)	"C" 7 - 8
12	12(+) - 24(-)	"A" 9 - "C" 9

Tick required option

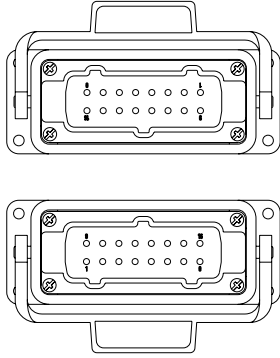
Single Latch

Dual Latch

Power and Thermocouple Mould Connector Assignments for 6 Zone - Option 5

8 Zone Mould Connector - 16 Pin Male Connector

Option 5 - 16 Pin Female TC, 16 Pin Male Power



Suitable for up to 8 zones

Zone #	TC Terminals	Power Terminals
1	1(+) - 9(-)	1 - 9
2	2(+) - 10(-)	2 - 10
3	3(+) - 11(-)	3 - 11
4	4(+) - 12(-)	4 - 12
5	5(+) - 13(-)	5 - 13
6	6(+) - 14(-)	6 - 14
7	7(+) - 15(-)	7 - 15
8	8(+) - 16(-)	8 - 16

Tick required option

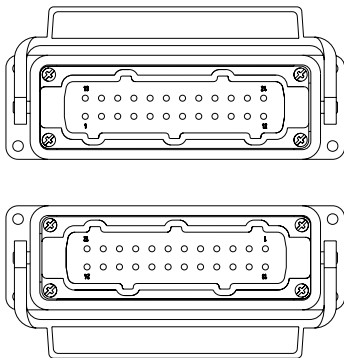
Single Latch

Dual Latch

Power and Thermocouple Mould Connector Assignments for 8 Zone - Option 6

12 Zone Mould Connector - 24 Pin Male Connector

Option 6 - 24 Pin Female TC, 24 Pin Male Power



Suitable for up to 12 zones

Zone #	TC Terminals	Power Terminals
1	1(+) - 13(-)	1 - 13
2	2(+) - 14(-)	2 - 14
3	3(+) - 15(-)	3 - 15
4	4(+) - 16(-)	4 - 16
5	5(+) - 17(-)	5 - 17
6	6(+) - 18(-)	6 - 18
7	7(+) - 19(-)	7 - 19
8	8(+) - 20(-)	8 - 20
9	9(+) - 21(-)	9 - 21
10	10(+) - 22(-)	10 - 22
11	11(+) - 23(-)	11 - 23
12	12(+) - 24(-)	12 - 24

Tick required option

Single Latch

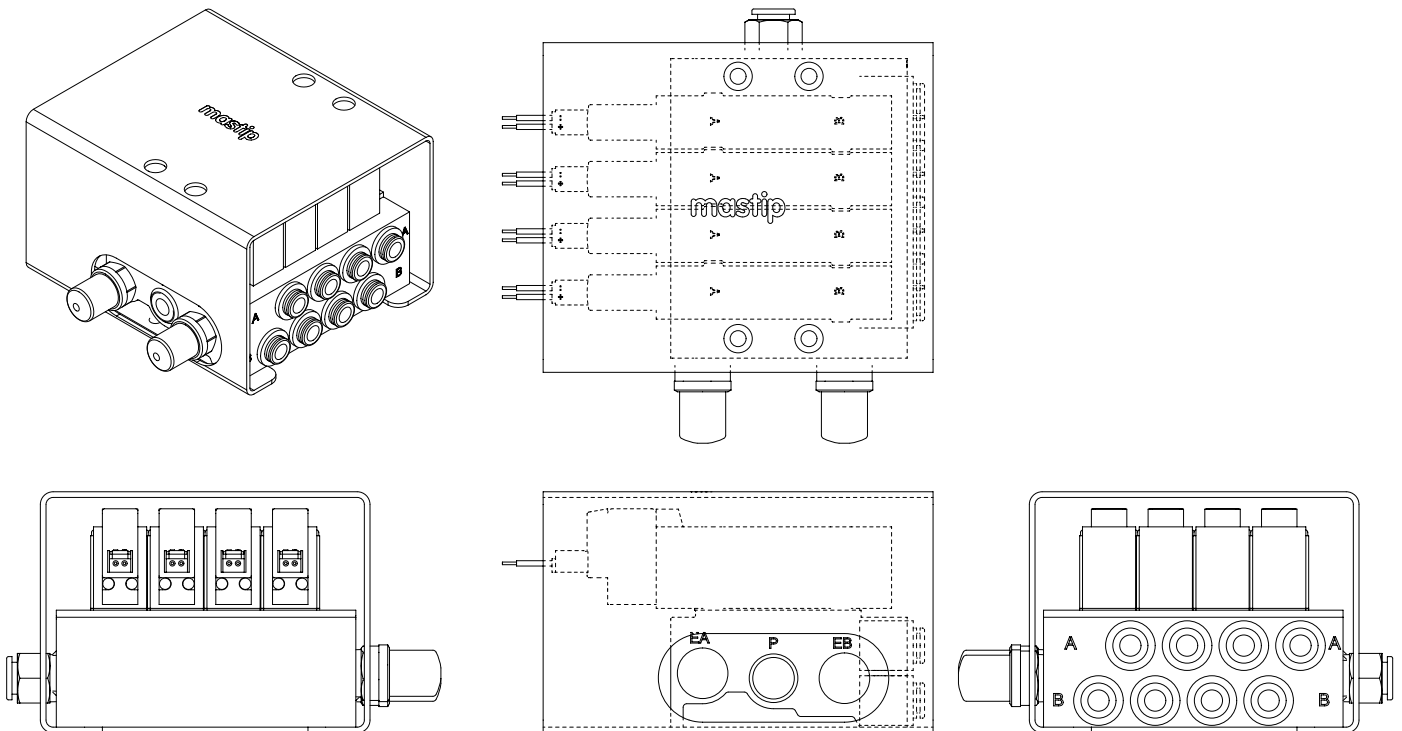
Dual Latch

Sequential Solenoid Timing

Due to the very low viscosity nature of LSR during the injection moulding cycle any filling differences between cavities in multicavity moulds can be accentuated. This places greater demand on the process control available to the moulder. To help overcome this issue and enable you to fine tune your moulding process Mastip recommends using sequential solenoid valves, allowing you to open and close each valve gate independently. Sequential solenoid valve packs and controllers are available from Mastip.

Typical Solenoid Pack

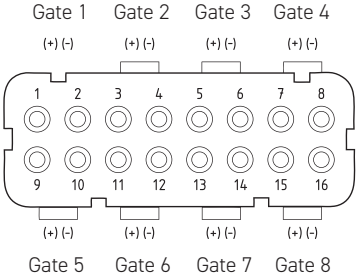
(For final details refer to you System Approval Drawings)



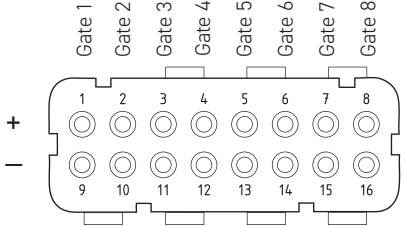
Solenoid Connector Wiring Options

Along with the solenoid wiring options shown below, Mastip can also provide custom connector wiring based on you needs. Please talk to your customer representative about your requirements.

Wiring Solenoid Input Connector - Option 1

Connector Pin No.		Solenoid Valve No.	Gate Input Connection
+	-		
1	2	No. 1 Solenoid	<p>HAN 16A (250V 16A) MALE P/N:09 20 016 2612 FEMALE P/N:09 20 016 2812</p> 
3	4	No. 2 Solenoid	
5	6	No. 3 Solenoid	
7	8	No. 4 Solenoid	
9	10	No. 5 Solenoid	
11	12	No. 6 Solenoid	
13	14	No. 7 Solenoid	
15	16	No. 8 Solenoid	

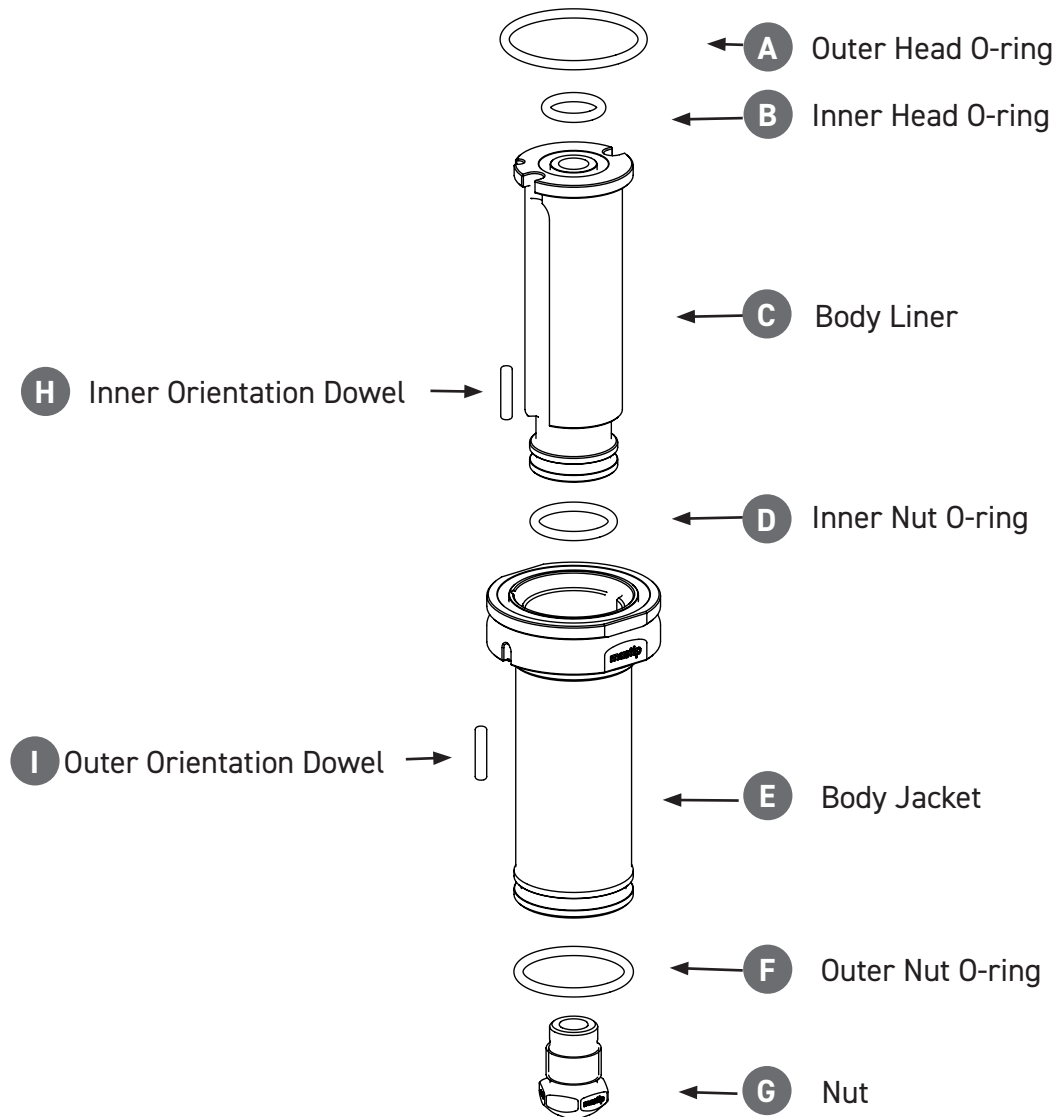
Wiring Solenoid Input Connector - Option 2

Connector Pin No.		Solenoid Valve No.	Gate Input Connection
+	-		
1	9	No. 1 Solenoid	<p>HAN 16A (250V 16A) MALE P/N:09 20 016 2612 FEMALE P/N:09 20 016 2812</p> 
2	10	No. 2 Solenoid	
3	11	No. 3 Solenoid	
4	12	No. 4 Solenoid	
5	13	No. 5 Solenoid	
6	14	No. 6 Solenoid	
7	15	No. 7 Solenoid	
8	16	No. 8 Solenoid	

Maintenance Reassembly Procedure

INSTALLATION

ONE

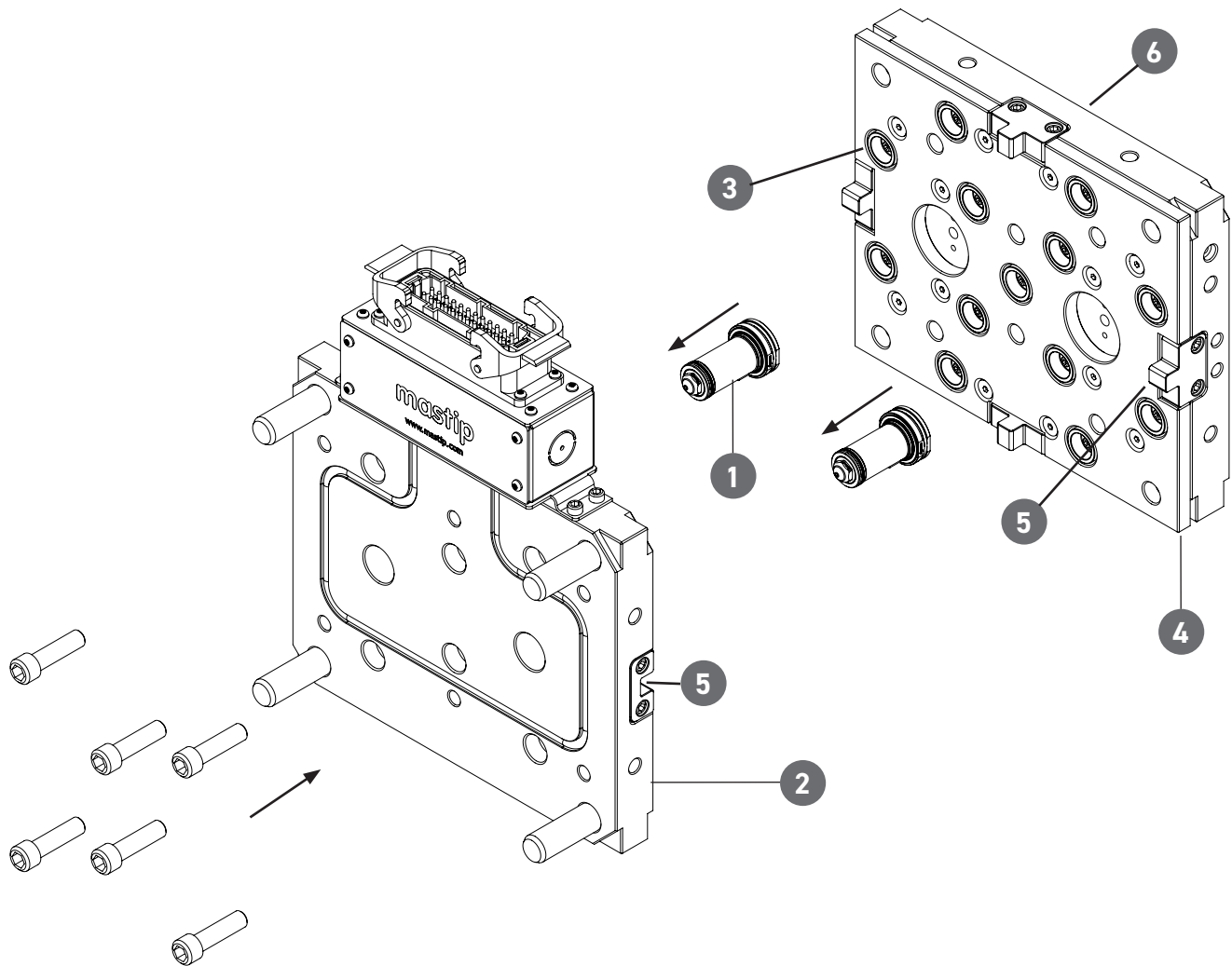


Fit Nut **G** to Body Liner **C** and tighten to 25Nm. Fit Inner Nut O-ring **D** to Body Liner **C** and add silicon grease. Fit Inner Orientation Dowel **H** to Body Jacket **E** and slide Body Liner **C** inside Body Jacket **E** ensuring the orientation dowel is aligned with slot.

Fit Outer Nut O-ring **F**, Outer Head O-ring **A** and Inner Head O-ring **B** to nozzle assembly. Fit Outer Orientation Dowel **I** to Cavity Mounting Plate **2**.

INSTALLATION CONT.....

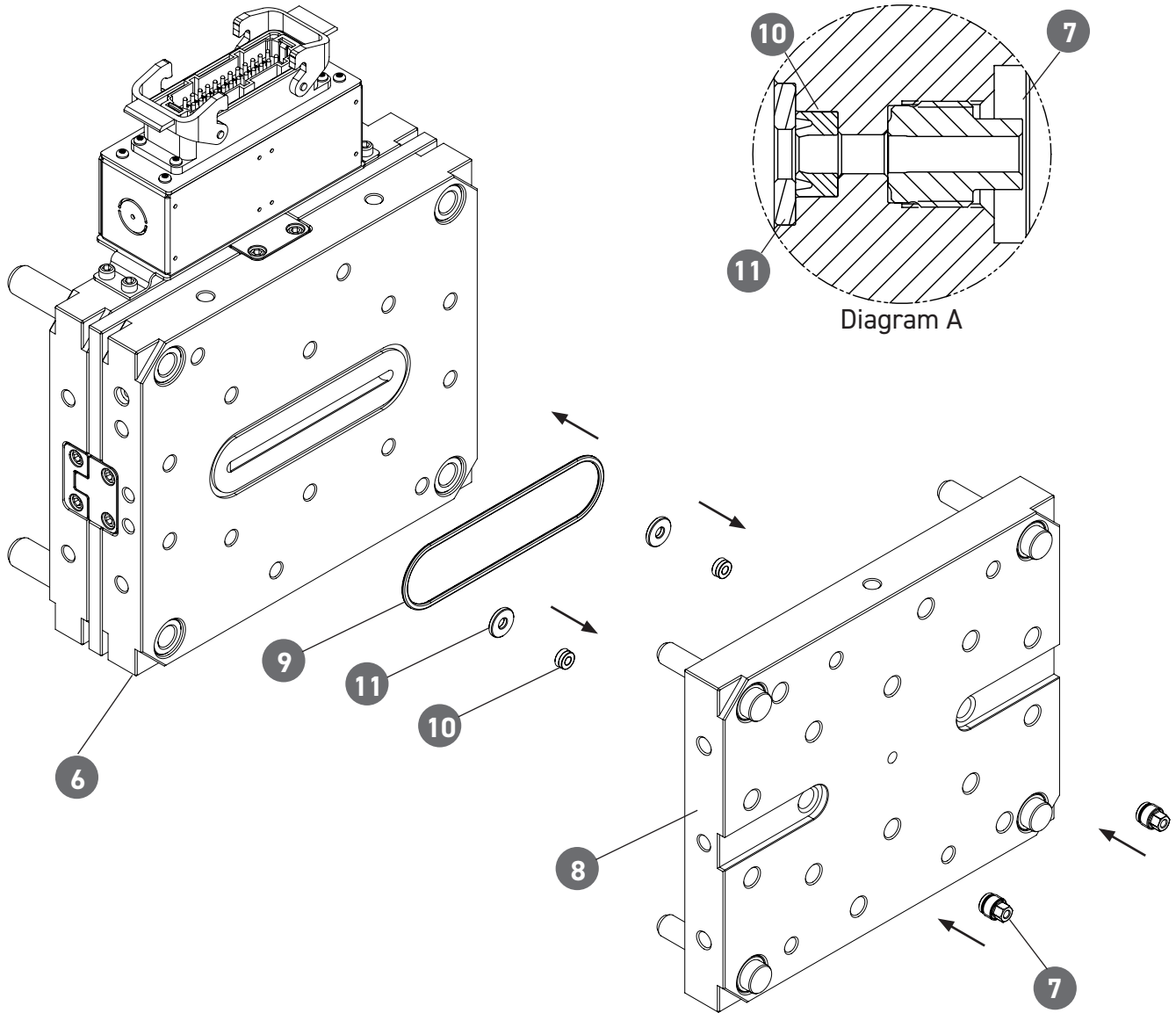
TWO



Fit Nozzles **1** to Cavity Mounting Plate **2** and fit Spacers **3** , Insulation Board **4** , Side Locks **5** to the Manifold Plate **6** . Fasten together with supplied cap head screws

INSTALLATION CONT.....

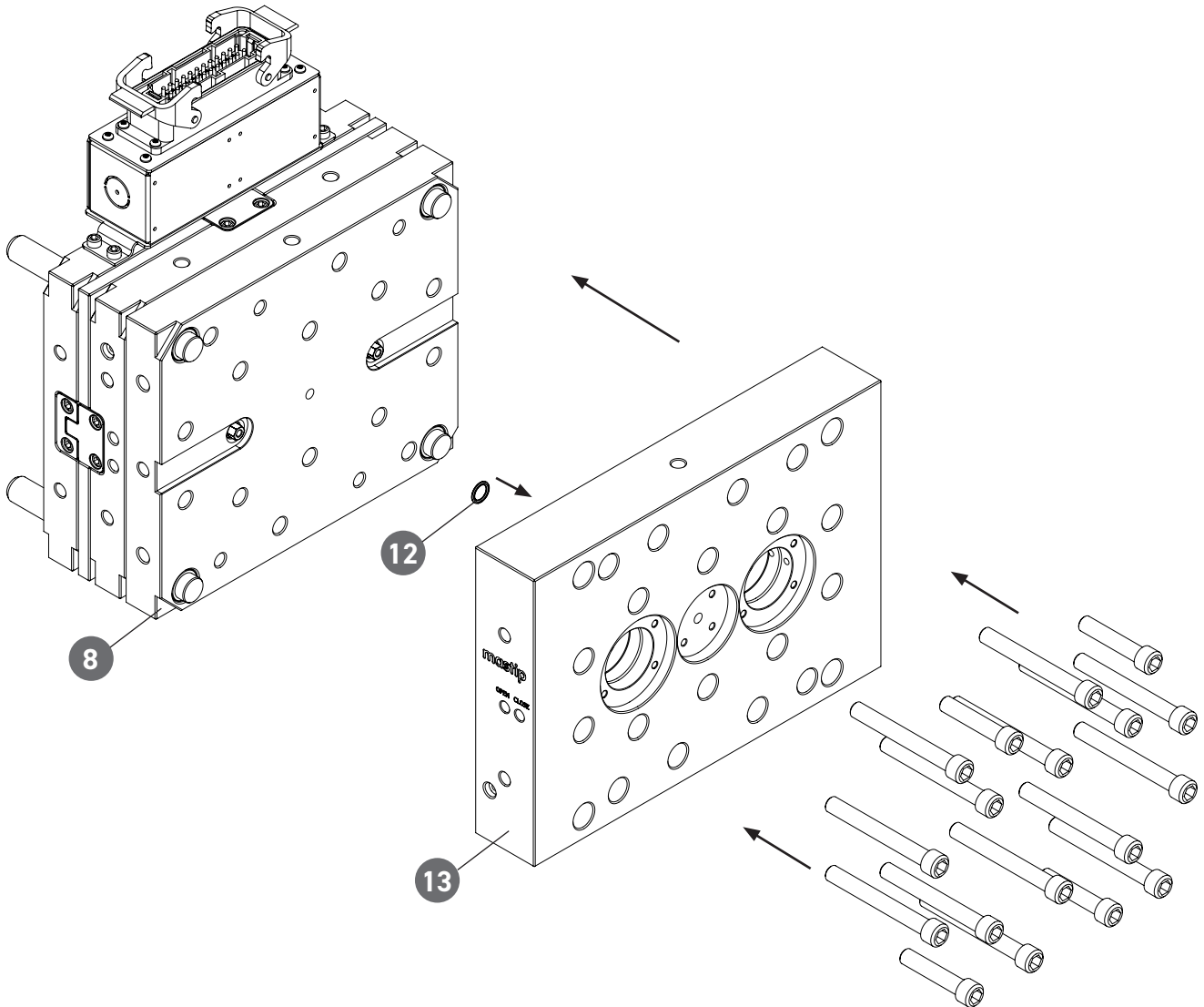
THREE



Fit the Valve Pin Guides **7** to the Seal Plate **8**, and tighten to 20Nm. Fit the Manifold O-Ring **9** to the Manifold Plate **6**. Fit the Valve Pin Seals **10** to the Seal Plate **8** with the groove facing out (Refer to Diagram A), and fit the Seal Retaining Disks **11** over the top of the seal. Assemble the Seal Plate **8** to the Manifold Plate **6**, taking care not to damage the O-Ring **9** or Valve Pin Seals **10**.

INSTALLATION CONT.....

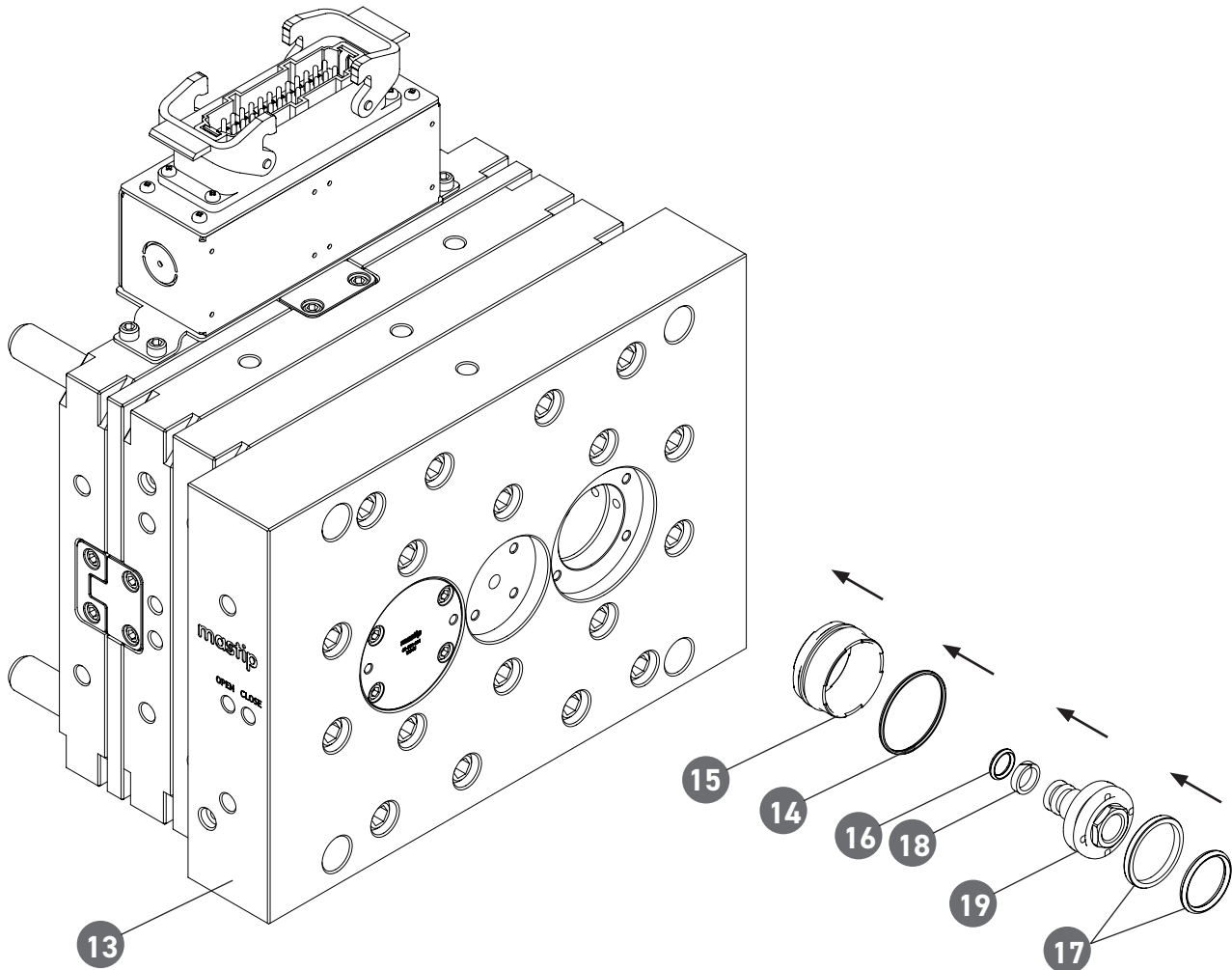
FOUR



Fit the Back Plate Sprue O-ring **12** to the Back Plate **13** and fit the Back Plate **13** to the Seal Plate **8**. Fasten with supplied Cap Head Screws

INSTALLATION CONT.....

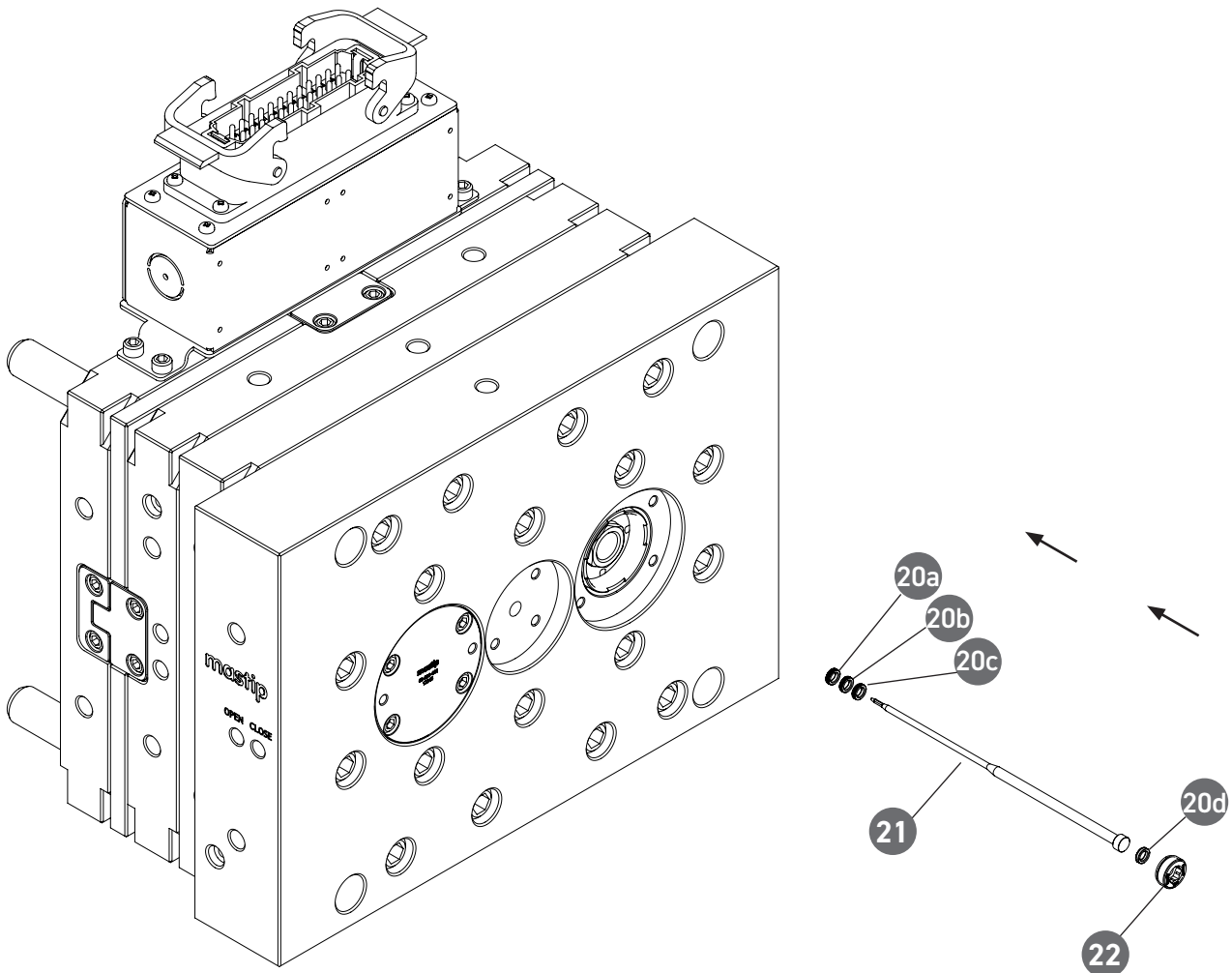
FIVE



Assemble the **Cylinder O-ring 14** to the **Valve Cylinder 15**, apply silicon grease to the **O-ring 14** and fit to the cold deck **Back Plate 13**. Fit the **Piston Seals 17** **Bearing Strip 18** and **Rod Seal 16** to the **Piston 19**. Apply high temperature silicon grease to the cylinder bore, **Piston Seals 17**, **Bearing Strip 18** and **Rod Seal 16**. Fit the **Piston 19** to the **Cylinder 15**.

INSTALLATION CONT.....

SIX



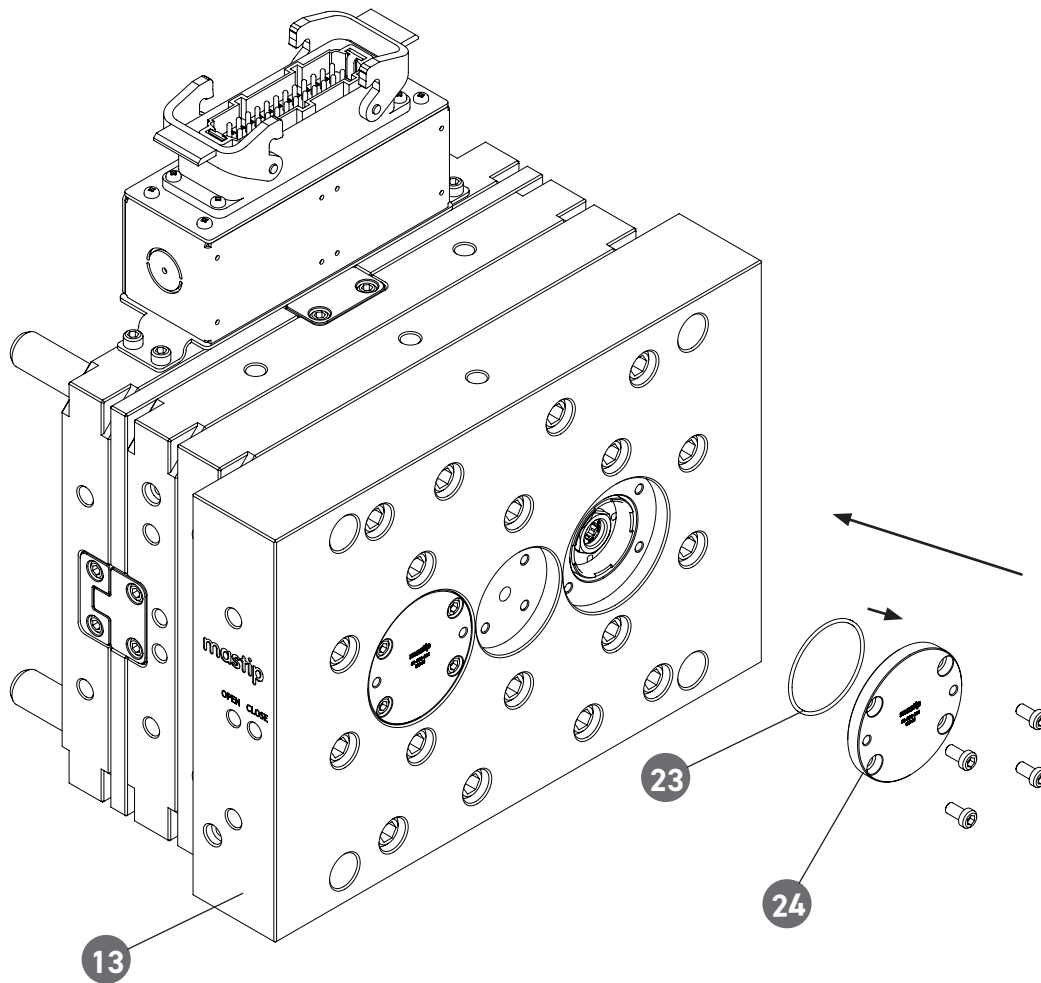
Insert the **Valve Pin Adjustment Packers** 20a, 20b, 20c onto the **Valve Pin** 21. Ensure the correct packer thickness is in the correct position. (Recommend starting with the thinnest packer above the pin head, then adjust to suit if necessary). Fit the **Valve Pin** 21 to the **Piston** 19.

Fit the remaining **Valve Pin Adjustment Spacer** 20d, above the Valve Pin head. Fit the **Pin Locking Screw** 22 to the **Piston** 19 and tighten to 40Nm.

Refer to Page LSR-14 for **Pin Height Adjustment** information.

INSTALLATION CONT.....

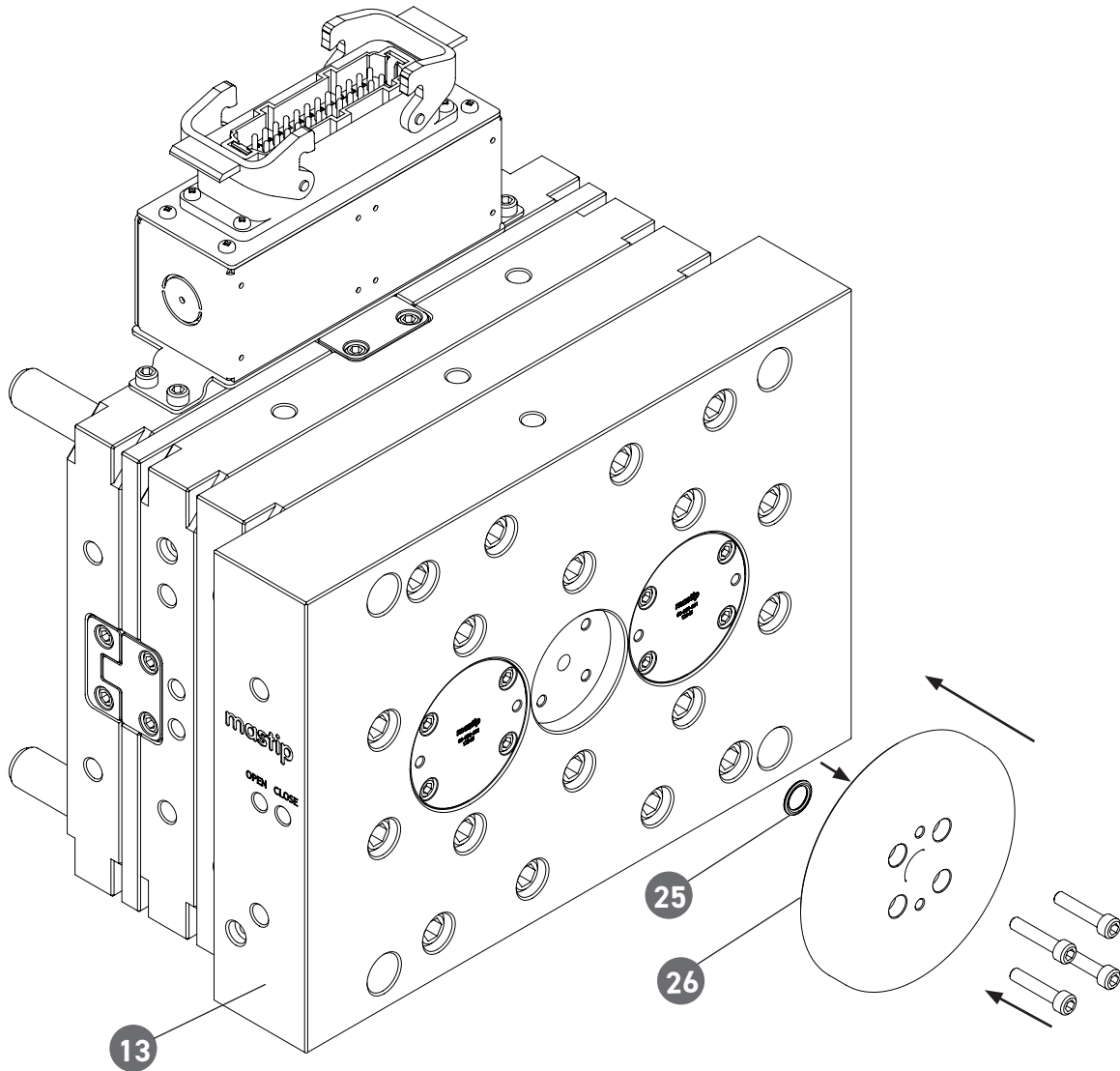
SEVEN



Fit Blanking Plate Seal **23** to Blanking Plate **24**. Fit Blanking Plate **24** to the Backplate **13** and fasten using blanking plate screws

INSTALLATION CONT.....

EIGHT



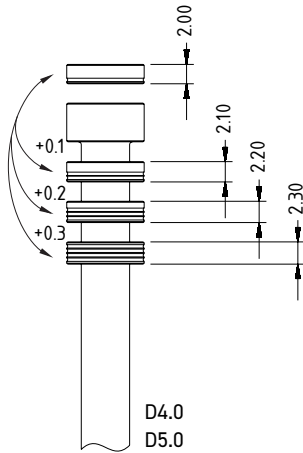
Fit Locating Ring O-ring **25** to Locating Ring **26**. Fit Locating Ring **26** to Backplate **13** and fasten with supplied Caphead Screws.

Note: Disassembly is the opposite of the above assembly procedure

PIN HEIGHT ADJUSTMENT

ONE

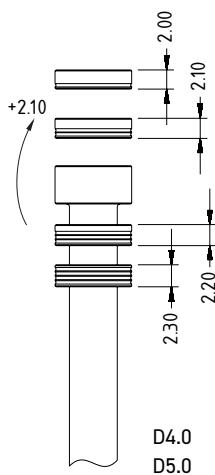
Minor Adjustment



Swap Valve Pin Adjustment Packers 20a, 20b, 20c & 20d to achieve small pin adjustments (different packer = different height)

TWO

Major Adjustment



Move one or more Valve Pin Adjustment Packers 20a, 20b, 20c & 20d from below the pin head to above the pin head to achieve large pin adjustment

Notes



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