

# Maric Flow Control Valves for Glandwater Flow Control

## Product Manual



AUSTRALIA

[www.maric.com.au](http://www.maric.com.au)

Maric Glandwater Manual V3, Sept 2011

# Contents

page	
3	Introduction - Controlling glandwater flow rate using Maric flow control valves <ul style="list-style-type: none"><li>• Assumptions</li></ul>
4	<ul style="list-style-type: none"><li>• What the Maric flow control valve does</li><li>• What the Maric flow control valve does not do</li><li>• Benefits, &amp; Why use the Maric flow control valve</li><li>• Recommended for the alumina industry</li><li>• How the conventional Maric flow control valve works</li></ul>
5	Product Data - Screwed valves, Stainless steel, BSP & NPT
6	Product Data - No 15 Flow control check (FCC) valves, BSP & NPT
7	Product Data - No 25 Flow control check (FCC) valves, BSP & NPT
8	Product Data - Wafer type valves
9	How to specify Maric flow control valves and establish part numbers
10	Performance curves
11	Determining Maric valve pressure differential range and correct glandwater pressure <ul style="list-style-type: none"><li>• Introduction</li><li>• Minimum glandwater pressure required</li><li>• Maximum glandwater pressure permissible</li></ul>
12	<ul style="list-style-type: none"><li>• Example calculations</li></ul>
13	Centrifugal pumps plumbed in series
14	Installation Instructions
15	Operating Instructions <ul style="list-style-type: none"><li>• Maintenance</li><li>• Spare Parts</li><li>• Troubleshooting Guide</li><li>• Valve Identification</li><li>• Noise</li><li>• Life Expectancy</li><li>• After Sales Service</li></ul>

All images remain the property of Maric Flow Control Australia and our affiliates, and are not to be reproduced without permission.

[www.maric.com.au](http://www.maric.com.au)

Telephone:

08 8431 2281

(Int'l 61 8 8431 2281)

Facsimile:

08 8431 2025



**DISCLAIMER:** Whilst Maric Flow Control Australia quote conditions that the valves will accurately operate within, it is possible that individual on-site conditions may result in the valves not performing as expected. No responsibility shall be taken by Maric for the subsequent failure of an installation as a result of relying solely on the information contained herein. It is therefore recommended that prior to commissioning, the pump or gland-packing supplier or manufacturer examine the installation and specifications of the flow control valve selected for its suitability.

## Introduction

This booklet is designed to provide information on how Maric Flow Control valves can compliment centrifugal and centrifugal slurry pumping installations by ensuring a constant glandwater flow rate.

It also provides valve suppliers and engineers with the necessary information to establish full and precise Maric Flow Control valve specifications, and part numbers for the purpose of ensuring the desired outcome will actually be achieved.

The term **Glandwater**, used throughout this document, refers to the sealing or packing water supplied to the glands of centrifugal pumps fitted with conventional gland-packing type sealing arrangements.

Maric flow controllers are also suitable for controlling flow rate of “flushing” or “quench” water to mechanical seals.

## Assumptions

This document assumes that the user of the Maric flow control valves is aware of;

- the desired maximum gland-water flow rate,
- the normal and maximum discharge pressure of the centrifugal pump, ie: The maximum pressure the gland is sealing against, and
- the recommended glandwater pressure differential desired across the gland.

This document assumes that the preferred Maric valve body material is stainless steel. It therefore includes product data on stainless steel valve bodies only.

This document also assumes for the alumina industry, that EPDM type rubber control rings are required due to this materials ability to handle both caustic and high temperature environments.



# For Constant Flow Rate Regardless of Pressure



[www.maric.com.au](http://www.maric.com.au)

Telephone:

08 8431 2281

(Int'l 61 8 8431 2281)

Facsimile:

08 8431 2025



**What the Maric Valve DOES** The Maric flow control valve is designed to deliver a fixed, pre-set, constant (maximum) flow of water, irrespective of pressure differential across it, (within a given range).

In the case of glandwater, this means constant flow rate, irrespective of fluctuating glandwater supply pressure, gland condition, or centrifugal pump discharge pressures.

Maric "Flow Control Check" valves, (FCC valves), also offer a reliable backflow prevention feature.

**What the Maric Valve DOES NOT DO** The flow controller is not designed to control pressure.

The flow controller will not allow a flow rate greater than the gland will permit. ie; if the gland is too restrictive, or has been over-tightened.

**Benefits & Why Use a Maric Valve?** Maric Flow Control valves are used to; –

**Protect centrifugal pump glands,** through;

- A constant supply of glandwater to the gland, ensures the life of expensive pump seals are maximized.
- Prevents one centrifugal pump from robbing all the available glandwater in the event of its failure, which could result in the simultaneous failure of all other glands supplied from the same water supply.

**Prevent unnecessary dilution of slurry,** (or liquor in the alumina refining industry) by ensuring that glands cannot receive more than a pre-determined flow rate. A lower than set rated flow is not a particular concern here, as the condition of the gland will ultimately determine flow rate, up to the pre-set maximum permitted by the flow controller. Full rated flow of the flow controller will only result when gland is sufficiently loose enough or worn to enable it.

**Minimize wastage of available packing water supplies.**

## Recommended for Alumina Industry

Stainless steel flow controllers, fitted with EPDM type control rubber rings are vital for use in alumina refineries due to their caustic and/or high temperature environments.

Maric Flow Control Check valves are particularly recommended for the alumina industry, due to the benefit provided by the reliable non-return feature.

## How the Conventional Maric Flow Control Valve Works

The flow control valves utilize a flexible rubber control ring, with an orifice diameter that responds instantly to fluctuations in water pressure. As pressure differential increases, the orifice diameter reduces to maintain the pre-set flow rate.

Likewise, as pressure reduces, the orifice opens up to maintain the pre-set flow rate.

These valves are particularly suitable for use on poor water quality, because the flow controlling element is a rubber material, and flexes under normal operation. This minimizes the risk of blockage, and eliminates the build-up of scale.

[www.maric.com.au](http://www.maric.com.au)

Telephone:

08 8431 2281

(Int'l 61 8 8431 2281)

Facsimile:

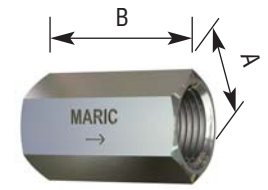
08 8431 2025



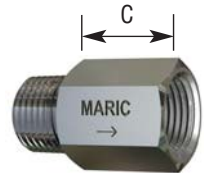
## PRODUCT DATA

### Specifications – Valve bodies

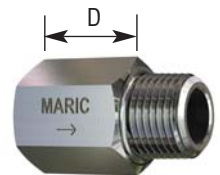
Body Sizes	BSP Configurations <i>First letter specifies inlet</i>	NPT Configurations <i>First letter specifies inlet</i>	Flow Rate Availability <i>See all Available Flow Rates below</i>
6x3mm (1/4" x 1/8")	F&M	-	from 0.4 to 9 l/m
6mm (1/4")	F&F, F&M	F&F	from 0.4 to 9 l/m
10mm	M&F	F&F	from 0.4 to 9 l/m
15mm	F&F, M&F, F&M	F&F	from 0.4 to 23 l/m
20mm	F&F	F&F	from 0.4 to 54 l/m
25mm	F&F, M&F, F&M	F&F	from 0.4 to 114 l/m
32mm	F&F	F&F	from 0.4 to 233 l/m
40mm	F&F	F&F	from 0.4 to 233 l/m
50mm	F&F	F&F	from 0.4 to 233 l/m



F&F



M&F



F&M

### Dimensions & Weights

Nominal size	1/4" x 1/8"	1/4"	10	15	20	25	32	40	50
A/F Dimension "A"	18.0	18.0	22.0	25.4	31.8	40.0	57.0	57.0	70.0
FF Body Length "B"	-	32.0	33.1	41.8	47.9	58.0	66.2	66.2	74.8
MF Body Length "C"	-	-	15.0	23.2	-	39.7	-	-	-
FM Body Length "D"	18.6	18.6	-	23.2	-	36.4	-	-	-
NPT (F&F only)	-	32.8	-	42.0	43.1	57.0	61.6	61.6	62.4
Approx Weight Kg	0.03	0.04	0.05	0.1	0.18	0.22	0.83	0.7	1.0

### Standard Performance

Unless otherwise specified, **standard** Nitrile "Precision" type control rubbers are fitted giving the valve the following standard performance; (Refer also to available; Product Data – Control Rubbers – Precision)

**Pressure Differential Range**

140 – 1000 kPa

**Headloss**

140 kPa at rated flow. ( At lower than rated flows headloss reduces significantly. )

**Flow Rate Accuracy**

+/- 10%

**Available Flow Rates**

.4 / .45 / .5 / .55 / .63 / .7 / .8 / .9 / 1.0 / 1.1 / 1.2 / 1.3 / 1.5 / 1.6 / 1.8 / 2.0 / 2.3 / 2.5 / 2.8 / 3.2 / 3.5 / 4.0 / 4.5 / 5.0 / 5.5 / 6.3 / 7.0 / 8.0 / 9.0 / 10 / 11 / 12 / 13 / 15 / 16 / 18 / 20 / 23 / 25 / 28 / 32 / 36 / 41 / 45 / 49 / 54 / 59 / 66 / 73 / 82 / 91 / 102 / 114 / 125 / 138 / 150 / 162 / 180 / 199 / 216 / 233 lpm

(litres/min)

### Materials

#### Body

316 Stainless Steel to ASTM484/A276

#### Threads, BSPT

BSPT to AS ISO 7.1-2008 Male Series R, Female RP (Standard)

#### Threads, NPT

NPSC to ANSI/ASME B1.20.1

### Max Pressure Differential

2000 kPa or limited by Control Rubber type

### Max Hydrostatic Pressure

6000 kPa

### Max Temperature

60°C for Nitrile control rubbers, 100°C for EPDM, 200°C for Viton

### Compatible Control Rubbers

P, LP, N6, N7, EP, E7, V, HF

[www.maric.com.au](http://www.maric.com.au)

Telephone:

08 8431 2281

(Int'l 61 8 8431 2281)

Facsimile:

08 8431 2025

### Specifying valves

*When ordering these valves, please be sure to specify;*

- Body size • (NPT if applicable) • Thread configuration • Body material
- Control rubber material and pressure differential range - if other than Precision
- Flow Rate



# Flow Control Check Valve – 15mm BSP & NPT

## PRODUCT DATA

### Application

For providing the centrifugal pumping industry with a constant glandwater flow rate to pump glands, - with backflow prevention. A constant pre-set maximum flow rate to centrifugal pump glands can be achieved irrespective of fluctuating gland-water supply pressure, gland condition, or centrifugal pump discharge pressure.

### Benefits

- A constant supply of glandwater to the gland, ensures the life of expensive pump seals are maximised.
- Can ensure that the slurry will not be unnecessarily diluted.
- Prevents one centrifugal pump from robbing all the available gland water in the event of its failure, which could result in the simultaneous failure of all other glands supplied from the same water supply.
- Minimise wastage of available water supplies

### Features

- Constant glandwater flow rate
- Back-flow prevention
- High pressure and high temperature handling
- Corrosion and scale resistant assembly



**Non-Return Feature.** The maintenance free design of the Maric valve uses the flow control rubber as the flexible sealing component in the non-return mechanism. The flexing of the control rubber under normal operating conditions prevents scale build-up on the rubbers surface, which ensures a reliable seal, even after extended periods of no reverse pressure.

### Standard Performance

Unless otherwise specified, **EP type EPDM** control rubbers are fitted giving the valve the following standard performance;

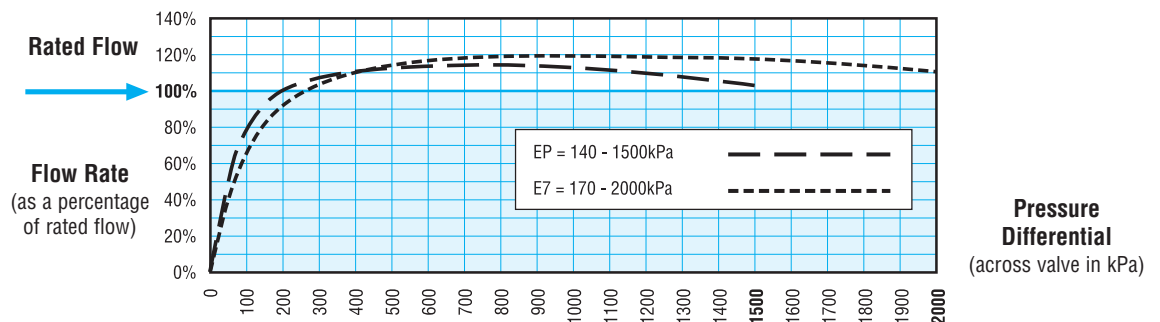
<b>Pressure Differential Range</b>	140 – 1500 kPa
<b>Headloss</b>	140 kPa at rated flow. ( At lower than rated flows headloss reduces significantly. )
<b>Flow Rate Accuracy</b>	+/- 20%
<b>Available Flow Rates</b> (litres/min)	.4 / .45 / .5 / .55 / .63 / .7 / .8 / .9 / 1.0 / 1.1 / 1.2 / 1.3 / 1.5 / 1.6 / 1.8 / 2.0 / 2.3 / 2.5 / 2.8 / 3.2 / 3.5 / 4.0 / 4.5 / 5.0 / 5.5 / 6.3 / 7.0 / 8.0 / 9.0 / 10 / 11 / 12 / 13 / 15 / 16 / 18 lpm
<b>Check Valve Operation</b>	Closed when reverse pressure of 70 kPa exists
<b>Body Material</b>	303 Stainless Steel to ASTM484/A582
<b>Thread Configuration</b>	F&M, Female inlet (parallel), Male outlet,(tapered)
<b>Threads, BSPT</b>	15mm (1/2") BSPT to AS1722.1 Male Series R, Female Series RP
<b>Threads, NPT</b> (non-standard)	15mm (1/2") NPT to ANSI/ASME B1.20.1, Male NPT, Female NPSC
<b>Max Hydrostatic Pressure</b>	6000 kPa
<b>Temperature Range</b>	0- 100 degrees C.

### Non-Standard Specifications

High pressure 2, "E7", 170 – 2000 kPa. is also available.

### Performance Curve Options – Maric, No 15 Flow Control Check Valve

EP = 140 - 1500kPa, High Pressure 2 (E7) = 170 - 2000 kPa



www.maric.com.au

Telephone:

08 8431 2281

(+61 8 8431 2281)

Facsimile:

08 8431 2025



**Please Specify When Ordering:**

Options / Description	<b>Body Size</b> 15mm	<b>Configuration</b> F&M	<b>Body Material</b> Stainless	<b>Control Rubber</b> EP (or E7)	<b>Check</b> C	<b>Flow Rate</b> 0.4 to 18 lpm
-----------------------	--------------------------	-----------------------------	-----------------------------------	-------------------------------------	-------------------	-----------------------------------

Example Part Number for 18 lpm;

**15 FM S EP C 18**

(Add **N** here for NPT if required)

# Flow Control Check Valve – 25mm BSP & NPT

## PRODUCT DATA

### Application

For providing the centrifugal pumping industry with a constant glandwater flow rate to pump glands, with backflow prevention. A constant pre-set maximum flow rate to centrifugal pump glands can be achieved irrespective of fluctuating gland-water supply pressure, gland condition, or centrifugal pump discharge pressure.

### Benefits

- A constant supply of glandwater to the gland, ensures the life of expensive pump seals are maximised.
- Can ensure that the slurry will not be unnecessarily diluted.
- Prevents one centrifugal pump from robbing all the available gland water in the event of its failure, which could result in the simultaneous failure of all other glands supplied from the same water supply.
- Minimise wastage of available water supplies

### Features

- Constant glandwater flow rate
- Back-flow prevention
- High pressure and high temperature handling
- Corrosion and scale resistant assembly



**Non-Return Feature.** The maintenance free design of the Maric valve uses the flow control rubber as the flexible sealing component in the non-return mechanism. The flexing of the control rubber under normal operating conditions prevents scale build-up on the rubbers surface, which ensures a reliable seal, even after extended periods of no reverse pressure.

### Standard Performance

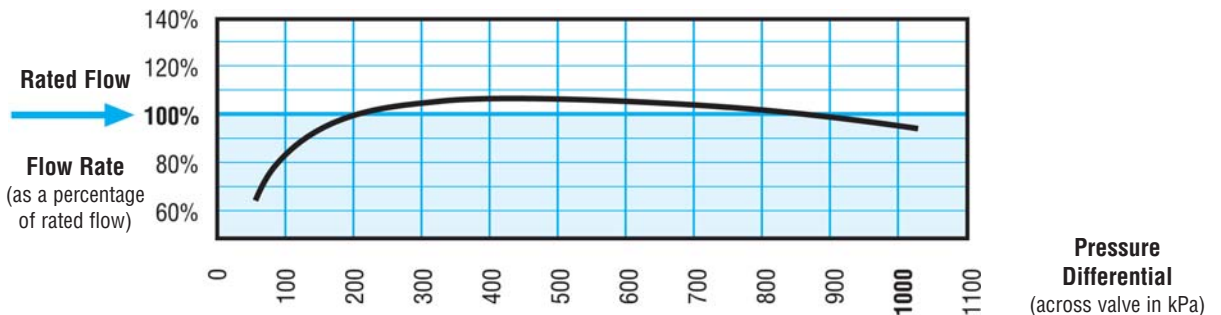
Unless otherwise specified, **standard** Nitrile “**Precision**” type control rubbers are fitted giving the valve the following standard performance;

<b>Pressure Differential Range</b>	140 – 1000 kPa
<b>Headloss</b>	140 kPa at rated flow. ( At lower than rated flows headloss reduces significantly. )
<b>Flow Rate Accuracy</b>	+/- 10%
<b>Available Flow Rates</b> (litres/min)	15 / 16 / 18 / 20 / 23 / 25 / 28 / 32 / 36 / 41 / 45 / 49 / 54 / 59 / 66 lpm
<b>Check Valve Operation</b>	Closed when reverse pressure of 70 kPa exists
<b>Body Material</b>	316 Stainless Steel to ASTM484/A276
<b>Thread Configuration</b>	F&M, Female inlet (parallel), Male outlet,(tapered)
<b>Threads, BSPT</b>	25mm (1”) BSPT to AS1722.1 Male Series R, Female Series RP
<b>Threads, NPT</b> (non-standard)	25mm (1”) NPT to ANSI/ASME B1.20.1 Male NPT, Female NPSC
<b>Max Hydrostatic Pressure</b>	6000 kPa
<b>Temperature Range</b>	0 - 60 degrees C. (100°C for non-standard EPDM control rubbers)

### Non-Standard Specifications

Control rubber material EPDM for higher temp and / or caustic handling  
 Pressure differential ranges 140 - 1500 kPa., & 170 - 2000 kPa. In EPDM or Nitrile - Refer to “How to Specify Maric Valves”

### Performance Graph Typical of all PRECISION valves irrespective of body size or flow rate



www.maric.com.au

Telephone:

08 8431 2281

(+61 8 8431 2281

Facsimile:

08 8431 2025



**Please Specify When Ordering:** Body Size **25mm** Configuration **F&M** Body Material **Stainless** Control Rubber **Precision (or other)** Check **C** Flow Rate **18 to 66 lpm**

Options / Description Example Part Number for 66 lpm;

**25 FM S P C 66**

(Add **N** here for NPT if required)

# 316 Stainless Steel Wafer type valves

## PRODUCT DATA

### Standard Specifications – Valve bodies

Designed for mounting between Table “D” pipe flanges.

Sizes	flow rate ranges avail.	standard no. of control rubbers
20mm	from 0.4 to 114 l/m	1
25mm	from 0.4 to 233 l/m	1
32mm	from 0.4 to 233 l/m	1
40mm	from 0.4 to 233 l/m	1
50mm	from 0.4 to 342 l/m	1 – 3
65mm	from 0.4 to 456 l/m	4
80mm	from 0.4 to 699 l/m	3
100mm	from 0.4 to 1279 l/m	6
150mm	from 0.4 to 2320 l/m	12
200mm	from 125 to 4427 l/m	19
250mm	from 25 to 6058 l/m	26
300mm	from 125 to 8854 l/m	38



### Dimensions & Weights

Nominal size	20	25	32	40	50	65	80	100	150	200	250	300
Diameter	61.0	71.0	75.0	86.0	98.0	111.0	130.0	162.0	219.0	276.0	336.0	386.0
Thickness	22.0	22.0	22.0	22.0	22.0	22.0	22.0	24.0	24.0	28.0	32.0	40.0
Approx Weight Kg	0.45	0.6	0.7	0.9	1.2	1.2	1.6	2.7	5.0	11.0	19.0	31.0

### Standard Performance

**Pressure Differential Range**  
**Flow Rate Accuracy**  
**Headloss**  
**Available Flow Rates**

Unless otherwise specified, **standard** Nitrile “**Precision**” type control rubbers are fitted giving the valve the following standard performance; (Refer also to available; Product Data – Control Rubbers – Precision)

140 – 1000 kPa  
 +/- 10%

140 kPa at rated flow. ( At lower than rated flows headloss reduces significantly. )

.4 / .45 / .5 / .55 / .63 / .7 / .8 / .9 / 1.0 / 1.1 / 1.2 / 1.3 / 1.5 / 1.6 / 1.8 / 2.0 / 2.3 / 2.5 / 2.8 / 3.2 / 3.5 / 4.0 / 4.5 / 5.0 / 5.5 / 6.3 / 7.0 / 8.0 / 9.0 / 10 / 11 / 12 / 13 / 15 / 16 / 18 / 20 / 23 / 25 / 28 / 32 / 36 / 41 / 45 / 49 / 54 / 59 / 66 / 73 / 82 / 91 / 102 / 114 / 125 / 138 / 150 / 162 / 180 / 199 / 216 / 233 lpm up to 342 lpm

### Materials

**Body**  
**Sealing O’Rings**

316 Stainless Steel to ASTM484/A276

Nitrile, potable water approved to AS4020 or EPDM or Viton if applicable

### Flange Specification

Suits standard table “D” flanges to AS2129 and AS4087 Class 14

Alternative specs are available - *Refer to Valve Selection Guide for additional info.*

Standard Wafers are not full flange type i.e. flange bolts locate wafer concentrically and remain visible when viewing assembly. PVC and Poly Stub Flanges note; Due to smaller I.D. of these flanges/pipes, Optional spacers are often required to prevent restriction. Please contact a Maric rep

### Max Pressure Differential

1000 kPa or limited by Control Rubber type

### Max Hydrostatic Pressure

3000 kPa

### Max Temperature

50°C

### Compatible Control Rubbers

P, LP, EP, K, V, HF

[www.maric.com.au](http://www.maric.com.au)

Telephone:

08 8431 2281

(Int'l 61 8 8431 2281)

Facsimile:

08 8431 2025



### Specifying valves

*When ordering these valves, please be sure to specify;*

- Body size
- Flange specification (if other than Table D)
- Body material
- Control rubber material and pressure differential range (if other than Precision)
- Flow Rate

# How to Specify Maric Flow Control Valves and

## Establish Part Numbers (Stainless Steel valves only)

- When purchasing a Maric valve, please specify each of the components below. The full description (specification) then condenses into an appropriate part number as illustrated below.

### Screwed Type Valves – your 7 step specifying guide

**Important:**  
Refer to the Product Data section through-out this process

<h1>1.</h1> <p><b>Body Size</b></p> <p>6, 10, 15 20, 25, 32 40, 50</p>	<h1>2.</h1> <p>(if applic.)</p> <p><b>Thread Spec</b> standard BSP No character required</p> <p>If Non-Standard NPT required insert N here</p>	<h1>3.</h1> <p><b>Configuration</b></p> <p>MF, FM, or FF First letter specifies inlet.</p>	<h1>4.</h1> <p><b>Body Material</b></p> <p>Brass, PVC Stainless Steel</p>	<h1>5.</h1> <p><b>Control Rubber</b></p> <p>Precision = P Low Pressure = LP High Pressure 1 = N6 High Pressure 2 = N7 EPDM = EP EPDM High Pressure 2 = E7 Viton = V Kwyflo = K Hi Flow = HF</p>	<h1>6.</h1> <p>(optional)</p> <p><b>Check Valve</b> (if applic) Only avail. in 15 &amp; 25mm, F&amp;M, Stainless Steel If required insert C here Check Valve = C</p>	<h1>7.</h1> <p><b>Flow Rate</b></p> <p>In litres per minute</p>
--	--	--	---	---	--	---

Description: No 15 - F&M Brass Precision - 9 lpm

Applicable part number: 15FMBP9

**Other examples;**

- |   |            |
|---|------------|
| No.15 F&F PVC Precision 9 lpm                   | 15FFPP9    |
| No.20 F&F S/steel EPDM 36 lpm                   | 20FFSEP36  |
| No.15 F&M S/steel EPDM FC Check 12 lpm          | 15FMSEPC12 |
| No.25 NPT F&M S/steel Precision FC Check 45 lpm | 25NFMSPC45 |

### Wafer Type Valves – your 5 step specifying guide

<h1>1.</h1> <p><b>Body Size</b></p> <p>20, 25, 32, 40, 50, 65, 80, 100, 150, 200, 250, 300mm</p>	<h1>2.</h1> <p>(if applic.)</p> <p><b>Flange Spec</b></p> <p>Australian - for table D no character req'd. Table C, E, F, H, J Class#14 = C14 Class#21 = C21 American ANSI ANSI300 = A3 British BS4504 PN16 = B16 Japanese JIS2220 PN16 = J16</p> <p>Class#16 = C16 Class#32 = C32 ANSI150 = A1 ANSI600 = A6 PN14 = B14 PN25 = B25 PN10 = J10 PN25 = J25</p>	<h1>W</h1> <p>Specifies Wafer</p>	<h1>3.</h1> <p><b>Body Material</b></p> <p>Brass, PVC Stainless Steel Gunmetal</p>	<h1>4.</h1> <p><b>Control Rubber</b></p> <p>Precision = P Low Pressure = LP High Pressure 1 = N6 High Pressure 2 = N7 EPDM = EP EPDM High Pressure 2 = E7 Viton = V Kwyflo = K High Flow = HF</p>	<h1>5.</h1> <p><b>Flow Rate</b></p> <p>In litres per minute</p>
--	---	-----------------------------------	--	---	---

Description: No 80 - Wafer PVC Precision 658 lpm

Applicable part number: 80WPP658

**Other examples;**

- |  |             |
|--|-------------|
| 50mm Wafer Brass Precision 342 lpm             | 50WBP342    |
| 100mm Wafer PVC Low Pressure 750 lpm           | 100WPLP750  |
| 200mm (Table E) Wafer Gunmetal Kwyflo 2345 lpm | 200EWGK2345 |
| 40mm (ANSI150) Wafer S/steel EPDM 59 lpm       | 40A1WSEP59  |

www.maric.com.au

Telephone:  
08 8431 2281  
(+61 8 8431 2281)  
Facsimile:  
08 8431 2025



### Insert Type Valves – contact your nearest Maric Representative

# How to Specify Maric Flow Control Valves and

## Establish Part Numbers (Stainless Steel valves only)

### Control Rubber Material and Pressure Differential Range Options

Pressure Differential Range	Maric Name	Control Rubber Material	Abbreviation	Flow Rate Accuracy
140 – 1000 kPa	Precision	Nitrile	“P”	+/- 10%
140 – 1500 kPa	High Pressure 1 (HP1)	Nitrile	“N6”	+/- 20%
140 – 1500 kPa	Epdm Standard	EPDM	“EP”	+/- 20%
170 – 2000 kPa	High Pressure 2 (HP2)	Nitrile	“N7”	+/- 20%
170 – 2000 kPa	Epdm High Pressure 2	EPDM	“E7”	+/- 20%

**Important** The “abbreviation” characters above specify both the control rubber material and the pressure differential range.

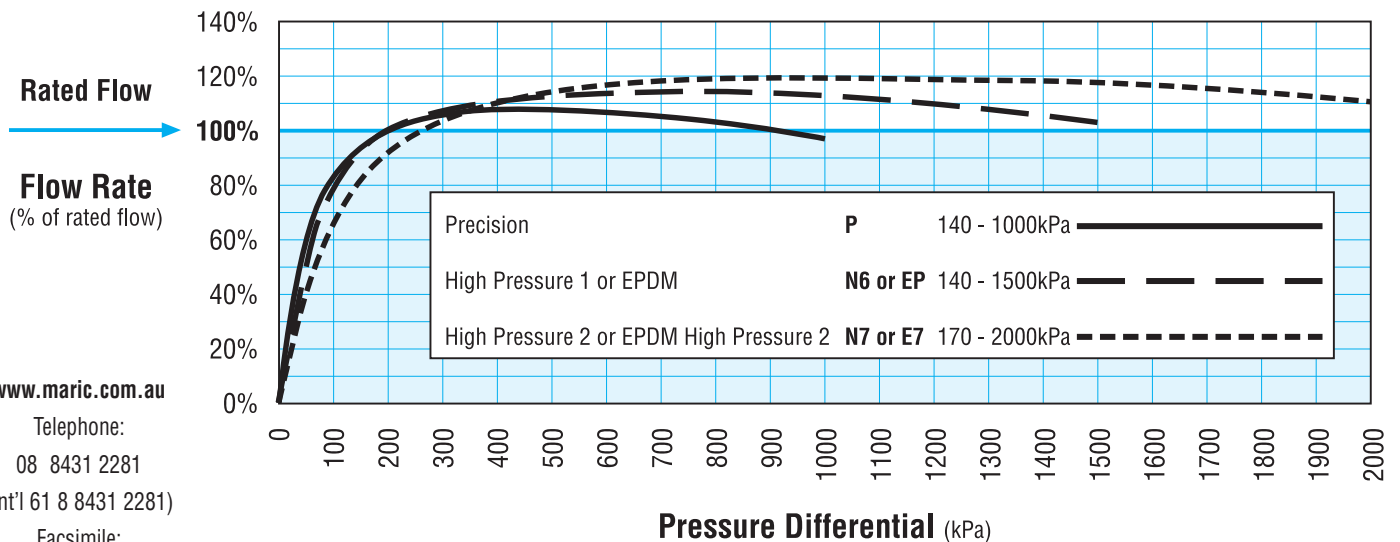
**Nitrile** - is the standard general purpose control rubber material used in conventional flow control valves.

**EPDM** - is recommended for the alumina industry due to its high temperature and caustic handling.

## Maric Flow Control Valve Performance Curve

### Performance Curve Comparisons

This graph shows typical performance characteristics of each of the three available Pressure Differential Ranges as shown on the [How to specify Maric Flow Control Valves](#) document



www.maric.com.au

Telephone:

08 8431 2281

(Int'l 61 8 8431 2281)

Facsimile:

08 8431 2025



## Introduction

For reliable glandwater flow control, selecting the flow controller of the correct **pressure differential range** is vital, and should be determined in conjunction with calculating the correct glandwater pressure.

The pressure rating of the valve selected must be sufficiently high enough to handle the gland water supply pressure, and the glandwater pressure must be high enough to provide for the minimum pressure differential required across the Maric flow controller. When introducing a Maric Flow Control Valve, it is possible that an existing installations glandwater pressure may need to be increased to allow for the pressure differential required by the flow controller.

Firstly calculate what **apparent** minimum glandwater pressure will be required, by adding up the centrifugal pump discharge pressure, plus the recommended differential required across the gland. Then check that the flow controller will handle that glandwater pressure. If not, then it will be necessary to use a higher pressure rated valve. This may in turn, then require a small increase in glandwater pressure.

## Minimum Glandwater Pressure Required

The **minimum** glandwater pressure required will be the sum of the following three requirements;

- A** • The maximum duty pressure of the centrifugal pump, (not shut head pressure) plus,
- B** • An allowance of 50 to 100 kPa, to overcome restriction of the actual gland itself.  
(Note this may vary from one gland manufacturer to another.)
- C** • The minimum pressure differential required for the flow control valve, ie. 140 or 170kPa

If pressure is set too low, the flow controller will have insufficient differential across it, and flow rate will be proportionally low. See brochure or performance curves for how this affects flow rate.

**Important** - Prior to the centrifugal pump starting, and just after it is stopped, the glandwater system is likely to still be running and delivering glandwater.

During this time, the Maric valve may have little or at pressure on its discharge end, resulting in the pressure *differential* across the valve being the full glandwater pressure.

Therefore, when selecting a flow controller, ensure that its pressure *differential* range is high enough to handle the full glandwater pressure.

## Maximum Glandwater Pressure Permissible

As far as the flow controller is concerned, the maximum gland water pressure permissible can be as high as the maximum pressure tolerated for the particular flow control valve selected.

In general however, it is recommended that this be set just a small amount above the minimum requirement as described above. This is because too high a pressure differential across a gland may result in damage to it.

### If the pressure is set too high, three situations could result;

- flow rate may reduce below specified accuracy, or
- control rubber may jam in the orifice resulting in no flow at all, or
- control rubber may blow completely through orifice allowing uncontrolled high flow.

[www.maric.com.au](http://www.maric.com.au)

Telephone:

08 8431 2281

(Int'l 61 8 8431 2281)

Facsimile:

08 8431 2025

## Recommended Glandwater Pressure

The recommended glandwater pressure supplied to the flow controller should be at least 50 to 100 kPa above the minimum glandwater pressure calculated above. This should be appropriate to allow for system irregularities, and also ensures that the flow controller is not working at the extreme bottom limit of its range.



## Examples

The following examples show installation pressures typically encountered on site, for any flow rate, in increasingly higher pressure scenarios, for the purpose of showing both;

- A, how to calculate the pressure at which the glandwater supply must be set, and therefore;**
- B, determining what Maric valve pressure differential range will be required.**

**Note**, these examples assume that the pre-set constant flow rate is actually desirable, continuously. If the flow controller is being used only to prevent excessive flow in the event of total gland failure, then the allowance for full minimum pressure differential quoted for the particular valve type may not need to be included in the calculations.

### Abbreviations used;

- PD** = Pressure Differential
- GWP** = Gland Water Pressure
- HP1** = High Pressure 1, 140 – 1500 kPa
- HP2** = High Pressure 2, 170 – 2000 kPa

**Special Note:** Centrifugal Pump Pressure (max) must always include any existing suction head pressure to the pump.

### Example 1 Gland requirement; 50 kPa

Max centrifugal pump pressure + suction head; **600 kPa**

Due to relatively low pressures, lets first assume a **Precision valve** may be suitable.  
**Minimum GWP** will be; 600 kPa for the slurry pump + 50 kPa for the gland + 140 kPa for the Maric valve, totalling 790 kPa.  
**Recommended GWP** would be just above this, at approximately 840 kPa.  
**Maximum GWP** will be the maximum pressure a Precision type valve will handle, which is 1000 kPa.  
**Conclusion;** A Precision type valve is suitable.

In this installation, any of the higher pressure rated valves would also be suitable, provided that the minimum GWP provided sufficient pressure to overcome the minimum headloss of these alternative valves. The Maximum GWP could then be higher if preferred.

**Alternative example 1** For the HP1 valve, set the GWP between 790 & 1500 kPa. (790 = 600 + 50 + 140 min for the HP1 valve), and 1500 = max for the HP1 valve. Recommended GWP would be around 840 kPa.

**Alternative example 2** For the HP2 valve, set GWP to between 820 & 2000 kPa. (820 = 600 + 50 + 170 = min for HP2 and 2000 = max. for HP2). Recommended GWP would be around 870 kPa. Note however, the latter two valves will offer an inferior flow rate accuracy of +/- 20%

### Example 2 Gland requirement; 50 kPa

Max centrifugal pump pressure + suction head; **1200 kPa**

In this case a Precision valve will not be suitable, as 1200 exceeds its spec.  
 Let's try a 1500 kPa rated **HP1 valve** and test the theory.  
**Minimum GWP** would be; 1200 + 50 + 140 (for HP1 valve) = 1390 kPa. This is within the range of the HP1 valve  
**Recommended GWP** would be around 1440 kPa.  
**Maximum GWP** would be 1500 as per the HP1 valve max spec.  
**Conclusion;** A HP1 valve will be suitable.

**Alternative Example** A HP2 (2000 kPa rated) valve would also be suitable, if the GWP was set to between 1420 – 2000 kPa. (1420 = 1200 + 50 + 170), (2000 = max for HP2)

[www.maric.com.au](http://www.maric.com.au)

Telephone:

08 8431 2281

(Int'l 61 8 8431 2281)

Facsimile:

08 8431 2025

### Example 3 Gland requirement; 50 kPa

Max centrifugal pump pressure + suction head; **1400 kPa**

In this case neither a Precision or HP1 valve will be suitable, as we can predict that the GWP will need to exceed 1500 kPa.  
 A **HP2 valve** will be required here.  
 GWP must be set between 1620 & 2000 kPa. 1620 = 1400 + 50 + 170 (for HP2 valve). 2000 = maximum for HP2 valve.  
**Recommended GWP** would be around 1670 kPa.

### Example 4 Gland requirement; 50 kPa

Max centrifugal pump pressure + suction head; **1900 kPa**

Glandwater pressure here would need to be at least 2120 kPa. (2120 = 1900 + 50 + 170). This is higher than the pressure differential rating for the HP2 type valve and an alternative method of protecting glands may need to be sought.  
 The flow controllers however, are generally robust enough to handle a good margin above this pressure. In addition to this, many flow controllers never see the full glandwater pressure as the differential across it.

Please contact a Maric rep for a recommendation.



# Multiple Centrifugal Pumps, Plumbed in Series

It is common for Maric flow control valves to be used in installations where one groundwater system supplies two or more centrifugal pumps connected in series for the purpose of boosting pressure. In determining the pressure differential range of the Maric flow controller, there are two selection strategies to choose from as follows;

**1. Use Precision valves on the lower pressure stages,** with pressure reducing valves before the flow controller to protect it, and use appropriate higher pressure rated valves on higher pressure stages without pressure reducing valves.

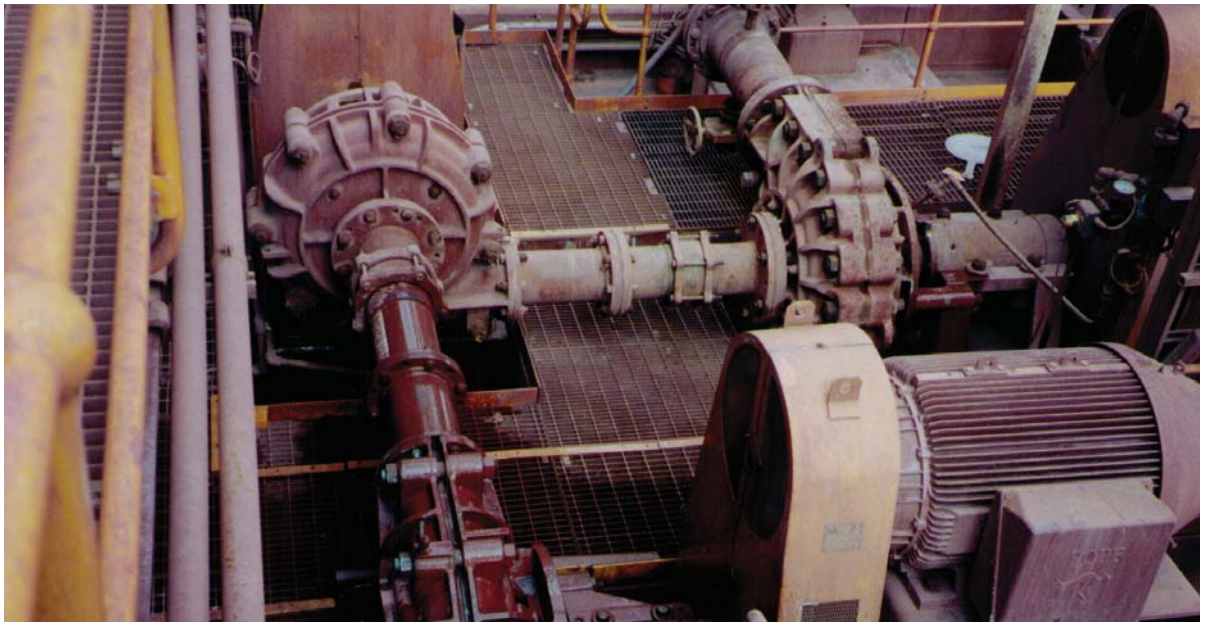
Advantages;           The use of Precision valves provides greater flow rate accuracy.

Disadvantages;       Requires the purchase of additional pressure control valves.

**2. Using valves of all the same pressure differential range.**

Advantages;           Simplicity. One valve type and specification used throughout.

Disadvantages;       Inferior flow accuracy on the first stages, where Precision valves may have been able to be used.



*Maric Flow Control Valves protect these pump glands at  
Olympic Dam Uranium Mine Site, Roxby Downs, South Australia*

[www.maric.com.au](http://www.maric.com.au)

Telephone:

08 8431 2281

(Int'l 61 8 8431 2281)

Facsimile:

08 8431 2025



Photograph of Warman® pump  
reproduced with the permission  
of the copyright owner,  
Weir Minerals Australia Ltd.

# Installation Instructions

## All Valve Types;

Valves must be installed the right way around or immediate valve failure may result. A direction of flow arrow is stamped on the outside diameter of the valve body.

It is recommended to orientate the valves stamped data toward the top, or in such a position to facilitate identification.

Bends or elbows immediately in front of valve will not affect the valves performance, however due to the relative high velocity of the water jets exiting the valve, and possible erosion issues, it is recommended that a straight pipe, the length of approximately the nominal diameter of the fitting, be fitted on valves outlet.

## Use of Sieves;

The installation of a sieve upstream of the Maric valve is recommended where solid particles larger than one third of the valves orifice diameter is likely to be encountered. The mesh aperture should be around one quarter to one third of the valves orifice diameter.

## Screwed Valves;

Refer to direction of flow arrow. Standard threads are BSPT (sealing/tapered) , Male series R, Female RP. The use of thread tape or similar is recommended for a watertight seal.

## Wafer Type Valves;

Wafer type valves are designed for mounting between smooth flat faced pipe flanges.

Wafers are fitted with an o'ring in each face for sealing purposes. Gaskets are therefore not required. If flange faces are rough, or grooved on a diameter close to that on the o'ring of the wafer, then either the flange grooves should be removed by machining, or the wafer o'rings removed, and flange gaskets fitted. Remove the tape holding the o'rings in place prior to assembly. The application of a light smear of grease in the o'ring groove will prevent the o'ring falling out during assembly.

### Standard wafers are orifice plate style,

i.e. they are not *full flange* type, see diagram

Flange bolts will locate the wafer concentrically, and remain visible between the flanges when viewing the assembly.

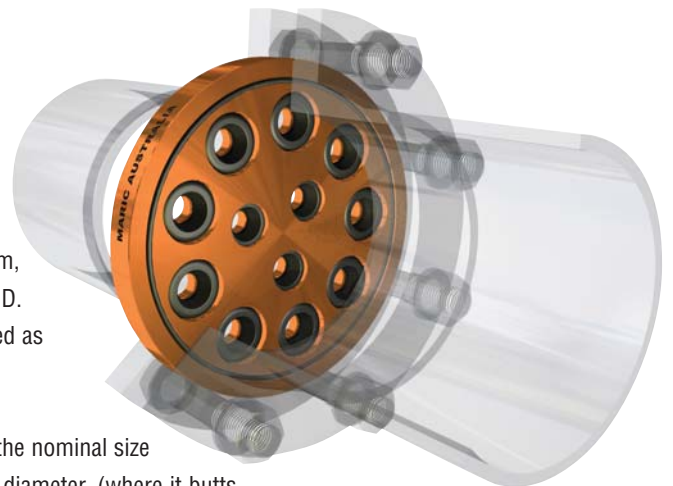
There will be some clearance ( generally around 2 to 3mm, but up to 5 mm on larger wafer sizes ) between wafer O.D. and the bolts. This is normal. The wafer should be located as close as possible to concentric prior to final clamping.

Flanges must have aperture dimensions of no less than the nominal size of the flange. i.e. a 100NB flange, must have an internal diameter, (where it butts up against the wafer valve), of no less than 100.0 mm. If it is less than this, then the flanges will either require machining (chamfering) at an angle of 45 degrees, out to the nominal diameter, or spacers, below, fitted. Otherwise the valves inlet and outlet orifii will be covered more than is permitted and will restrict flow rate to less than the specification of the valve. It is common for a large portion of the outer aperture of the inlet orifii to be covered by the flanges, and up to 3mm of the outlet orifii to be covered by the flanges. This is normal, and will not affect performance.

PVC & Poly stub flanges usually have smaller inside diameters which can restrict valve flow as above. Therefore, optional spacers are usually required. Contact Maric for a recommendation.

## Insert Type Valves;

Installation varies according to application. They must be installed as per the direction of flow arrow.



[www.maric.com.au](http://www.maric.com.au)

Telephone:

08 8431 2281

(Int'l 61 8 8431 2281)

Facsimile:

08 8431 2025

# Operating Instructions

## Operating Instructions;

Maric valves automatically maintain a constant, pre-set, flow rate, irrespective of pressure (within a range), by means of a rubber control ring, whose orifice diameter varies, as the pressure differential across it varies.

The greater the pressure, the smaller the orifice, and vice versa. Therefore constant flow rate.

The valve has no external actuations and requires no adjustments. Provided the valve is supplied with a pressure sufficient to produce a pressure differential across it within its specified range, then the valve will deliver its rated flow within rated flow rate accuracy. Refer also to Installation Instructions for more information.

## Maintenance;

No specific maintenance requirements are pertinent to Maric Flow Control Valves.

## Spare Parts;

Due to the valves unique design and lack of wearing components, spare parts are not available for Maric flow control valves.

## Troubleshooting Guide;

Problem	Cause	Remedy
<b>No flow</b>	Valve is blocked	Remove valve and clear the blockage – Install sieve
	There is no pressure differential across valve	Turn on the supply to the valve
<b>Flow rate is below spec</b>	Pressure differential across valve is below the minimum requirement	Increase pressure to within the pressure differential range of the valve
	Pressure differential across valve is above its maximum limit	Reduce pressure to within the pressure differential range of the valve
	Valve is partly blocked	Clear blockage
	Incompatible environment has attacked control rubber affecting control rubber performance	Replace valve with one fitted with control rubber suitable for the environment
<b>Flow rate is above spec</b>	Control rubber has blown through valve orifice resulting from excessive pressure differential or a high pressure spike	Replace control valve and asses installation for cause of excessive pressure
	Control rubber has blown through orifice due to valve being installed backwards	Replace valve and re-install in accordance with direction of flow arrow stamped on body
	Incompatible environment has caused control rubber to harden	Replace valve with one fitted with control rubber suitable for the environment
<b>Valve is noisy</b>	Valves can be noisy. Noise is often proportional to valve size, and pressure differential across it. If none of the techniques to the right are a practical solution to your issue, please contact a Maric Rep for other possible alternative remedies	<ul style="list-style-type: none"> <li>• Use Kwyflo valves designed for quiet operation</li> <li>• Reduce or increase pressure differential</li> <li>• Relocate valve or bury it underground</li> <li>• Lag the valve and outlet pipe in an acoustic enclosure or material</li> <li>• Alter the valves outlet pipework construction, to alter its resonant characteristics</li> </ul>

[www.maric.com.au](http://www.maric.com.au)

Telephone:

08 8431 2281

(Int'l 61 8 8431 2281)

Facsimile:

08 8431 2025

## Valve Identification;

Valves are stamped with; Maric Australia, WaterMark details if applicable, direction of flow arrow, flow rate, manufacture date and a part number. Comparing the part number with the “Establishing Part Numbers” page in the product catalogue, will enable identification of full valve specifications.

## Noise;

Both flow rate and external factors affect the noise emitted from a maric valve. in most situations the noise level will be between 75 and 85 dB. However in some circumstances may attain 95 dB.

## Life Expectancy;

Approximately 20 years, depending on accuracy required. Flow rate increases generally one half to one percent per year. Therefore in 20 years time, flow rate may be 10% to 20 % higher than when valve was originally supplied.

## After Sales Service;

Your nearest Maric distributor or representative, as listed on our website; [www.maric.com.au](http://www.maric.com.au)

