M-SERIES FLOW METERS



M-SERIES FLOW METERS

MECHANICAL FLOW METERS

The Mechanical Flow Meters range is the original meter range from Macnaught. They are available with reliable mechanical displays offer a measurement option for unpowered or remote sites. All Macnaught Flow Meters are supplied with an individual Test Report.

EXPLODED DIAGRAM



PRODUCT IDENTIFICATION SYSTEM

012

5

F012-1S3

	MATERIALS OF CONSTRUCTION					
	CATEGORY (METER/ROTOR/SEAL)	MODELS				
-	AL/PPS/FKM	F012 - 050				
	AL/AL/FKM	F075 -100				
М	SS/PPS/FEP	M012 - 050				
6	AL/SS/FEP	S025				
5	AL/AL/FEP	S040 - 100				

	PORT SIZE
012	1/2"
025	1"
040	1 1/2"
050	2"
075	3"
100	4"

	PORT CONNECTION	MODELS
1	G (Litres Display)	
2	NPT (US Gallons Display)	
3	NPT (Litres Display)	All Models
4	BSP Rc (Litres Display)	

	ROTOR	MODELS
S	Standard Rotors	Category F and M
T*	High Temperature	Category M and S025
v	High Viscosity	PPS material for F012-F050 AL material for F075-F100, S040-S100 SS material for M025-M050

*T type rotors are offered in Aluminium for category S040 to S100

	OUTPUT	MODELS
3	Standard Mechanical	012-050
4	Heavy Duty Mechanical	All Models

M-SERIES FLOW METERS

PULSE FLOW METERS (STANDARD)

The Macnaught Pulse Flow Meter range are the original meter range from Macnaught. They offer a compact and robust metal body, manufactured from high quality grades of cast aluminium and stainless steel. For highly corrosive chemical applications, BR42B grade PPS material is used to deliver superior stability*.

EXPLODED DIAGRAM



PRODUCT IDENTIFICATION SYSTEM

006

S

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F006-1SA

	MATERIALS OF CONSTRUCTION					
	CATEGORY (BODY/ROTOR/SEAL)	MODELS				
F	AL/SS/FKM	All Models				
М	SS/SS/FFKM	M006/M009				
S	AL/SS/FFKM	S006/S009				
CP	PPS/PPS/FFKM	CR006 and CR009				
CR	PPS/PPS/FEP	CR025				

	PORT SIZE	MODELS
006	1/4"	All models
009	1/4"	All models
025	1"	Category CR only

	PORT CONNECTION	MODELS
1	G	Category F, M and S only
2	NPT	All models
4	Rc	All models

	ROTOR TYPE	MODELS
S	Standard	F and CR category only
Т	High Temp. Pulse	M and S category only
v	High Viscosity	009 only; Not available for CR

	OUTPUT TYPE	MODELS
1	Reed/Hall	Flying lead for 006/009 User connection for CR025
2	Reed/Reed	006/009 Single reed ONLY
Α	Reed/Hall DIN connection	Not Available for CD005
В	Reed/Reed DIN connection	NOT AVAILABLE TOF CRU25

M-SERIES FLOW METERS

PULSE FLOW METERS (HIGH PRESSURE)

Macnaught High Pressure Flow Meters are manufactured from robust stainless steel body utilizing high quality billet suitable for use in the harshest environments. Designed to withstand pressures from 3000psi to 8000psi, the Macnaught High Pressure Flow Meters fit virtually any high pressure liquid measurement requirements. All Macnaught Flow Meters are supplied with an individual Test Report.

EXPLODED DIAGRAM





PRODUCT IDENTIFICATION SYSTEM



M-SERIES FLOW METERS

PULSE FLOW METERS (CUSTODY TRANSFER)

The Macnaught Custody Transfer meter range are the original meter range from Macnaught. They offer a compact and robust body manufactured from high quality grades of cast Aluminium and Stainless steel. Macnaught Custody Transfer meters are certified and approved by the National Measurement Institute (NMI) and supplied with an individual Test Report.

EXPLODED DIAGRAM





M-SERIES FLOW METERS

M1 – ¹/₄" PULSE FLOW METERS

SUITABLE FOR FLOW RANGE 0.5-100L/HR





F006-1S1 Aluminium body with flying lead CR006-1SA PPS body with DIN variation

Macnaught $\frac{1}{4}$ " Pulse Flow Meters are a small capacity meter in the M-SERIES range. Differentiated by its flow rate capabilities. Suitable for flows between 0.5-100L/hr. The $\frac{1}{4}$ " Pulse Flow Meters have an accuracy of +/- 0.5% and provides exceptional levels of reliability and durability.

SPECIFICATIONS

	F006		S006		M006		CR	006	
Materials of Construction Meter Body	Aluminium		Aluminium		Stainless Steel		PPS		
Rotor	Stainless Steel		Stainless Steel		Stainless Steel	Stainless Steel		PPS	
Seals	Fluorocarbon (I	FKM)	Perfluoroelasto	mer (FFKM)	Perfluoroelasto	omer (FFKM)	Perfluoroelasto	mer (FFKM)	
Design Specifications Process Connections	¹ /4" G ¹ /4" NPT		1/4" G 1/4" NPT		1⁄4" G 1⁄4" NPT		1/4" BSP (Rc) 1/4" NPT		
Technical Specifications Flow rate	<5cP 2-100L/hr 0.5-26USG/hr	>5cP 0.5-100L/hr 0.13-26USG/hr	<5cP 2-100L/hr 0.5-26USG/hr	>5cP 0.5-100L/hr 0.13-26USG/hr	<5cP 2-100L/hr 0.5-26USG/hr	>5cP 0.5-100L/hr 0.13-26USG/hr	<5cP 2-100L/hr 0.5-26USG/hr	>5cP 0.5-100L/hr 0.13-26USG/hr	
Non-lubricating fluids		6-100L/hr 1.58-26USG/hr		6-100L/hr 1.58-26USG/hr		6-100L/hr 1.58-26USG/hr		6-100L/hr 1.58-26USG/hr	
Operating Temperature Range*	-40 - 80°C -40 - 176°F		-40 - 120°C -40 - 248°F		-40 - 120°C -40 - 248°F		-40 - 80°C -40 - 176°F		
Max. Operating Pressure	800 psi 55 bar		800 psi 55 bar		800 psi 55 bar		75 psi 5 bar		
Accuracy	+/- 0.5%		+/- 0.5%		+/- 0.5%		+/- 0.5%		
Repeatability	lity +/- 0.03%		+/- 0.03%		+/- 0.03%		+/- 0.03%		
Nominal K-Factor	1000 Pulses/L		1000 Pulses/L		1000 Pulses/L	-	1000 Pulses/L		

*Temperature based on standard pulse output - subject to change dependant on rotor and output type, contact Macnaught technical support for further investigations



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OUTPUTS

PREFIX	OUTPUT	SWITCH TYPE	F006	S 006	M006	CR006
1	Pulse output	Reed/Hall Flying Lead	•	•	•	•
2	Pulse output	Reed Flying Lead	•	•	•	•
Α	Pulse output	Reed/Hall DIN Connection	•	•	•	•
В	Pulse output	Reed/Reed DIN Connection	•	•	•	•

• Available X Not Available

DIMENSIONS



M1 – 1/4" HIGH PRESSURE FLOW METERS

SUITABLE FOR FLOW RANGE 0.5-100L/HR



Also available as optional accessories:



DR LCD Display (12mm)



DRA LCD Display (12mm) with outputs

MH006-1T1 Stainless steel body with pulser cap

Macnaught ¼" High Pressure Flow Meters are a small capacity meter in the M-SERIES range. Suitable for flows between 0.5-100L/hr. The ¼" High Pressure Flow Meters are manufactured from high quality billet for enhanced material reliability with pressure ratings of up to 8000psi and have an accuracy of +/- 0.5% to provide exceptional levels of reliability and durability.

SPECIFICATIONS

	мн	006
Materials of Construction		
Meter Body	Stainless Steel	
Rotor	Stainless Steel	
Seals	Perfluoroelastomer (FFKM)	
Design Specifications Process Connections	14" G 14" NPT	
Technical Specifications Flow rate	<5cP 2-100L/hr 0.5-26USG/hr	>5cP 0.5-100L/hr 0.13-26USG/hr
Non-lubricating fluids	6-100L/hr 1.58-26USG/hr	
Operating Temperature Range*	-40 - 120°C -40 - 248°F	
Pressure	8000 psi 557 bar	
A	+/- 0.5%	
Accuracy	+/- 0.03%	
Repeatability	1000 Pulses/L	
Nominal K-Factor		
Pulse Output Options Pulser Pulser	Single Hall Effect Single Reed Switch	
Local Display Options Type DR	LCD display (12mm)	No Outputs
Type DRA	LCD display (12mm)	Outputs: Scaled Pulse, 4-20mA and Hi/Lo Flow Alarm

*Temperature based on standard pulse output - subject to change dependant on rotor and output type, contact Macnaught technical support for further investigations



MH006





ISOMETRIC VIEW





MH006 with DR Display



Ø100



ISOMETRIC VIEW





M2 – 1/4" PULSE FLOW METERS

SUITABLE FOR FLOW RANGE 15-500L/HR





F009-1S1 Aluminium body with flying lead CR009-1SA PPS body with DIN variation

Macnaught $\frac{1}{4}$ " Pulse Flow Meters are a small capacity meter in the M-SERIES range. Differentiated by its flow rate capabilities. Suitable for flows between 15-500L/hr. The $\frac{1}{4}$ " Pulse Flow Meters have an accuracy of +/- 0.5% and provides exceptional levels of reliability and durability.

SPECIFICATIONS

	FO	09	S 0	S009		M009		009
Materials of Construction Meter Body	Aluminium		Aluminium		Stainless Steel		PPS	
Rotor	Stainless Steel		Stainless Steel		Stainless Steel		PPS	
Seals	Fluorocarbon (Fl	KM)	Perfluoroelastor	ner (FFKM)	Perfluoroelastor	ner (FFKM)	Perfluoroelaston	ner (FFKM)
Design Specifications Process Connections	1/4" G 1/4" NPT		1/4" G 1/4" NPT		1/4" G 1/4" NPT		1/4" BSP (Rc) 1/4" NPT	
Technical Specifications Flow rate	<5cP 25-500L/hr 6.6-132USG/hr	>5cP 15-500L/hr 4-132USG/hr	<5cP 25-500L/hr 6.6-132USG/hr	>5cP 15-500L/hr 4-132USG/hr	<5cP 25-500L/hr 6.6-132USG/hr	>5cP 15-500L/hr 4-132USG/hr	<5cP 25-500L/hr 6.6-132USG/hr	>5cP 15-500L/hr 4-132USG/hr
Operating Temperature Range*	-40 - 80°C -40 - 176°F		-40 - 120°C -40 - 248°F		-40 - 120°C -40 - 248°F		-40 - 80°C -40 - 176°F	
Max. Operating Pressure	800 psi 55 bar		800 psi 55 bar		800 psi 55 bar		75 psi 5 bar	
Accuracy	+/- 0.5%		+/- 0.5%		+/- 0.5%		+/- 1.0%	
Repeatability	+/- 0.03%		+/- 0.03%		+/- 0.03%		+/- 0.03%	
Nominal K-Factor	400 Pulses/L		400 Pulses/L		400 Pulses/L		400 Pulses/L	

*Temperature based on standard pulse output - subject to change dependant on rotor and output type, contact Macnaught technical support for further investigations



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OUTPUTS

PREFIX	OUTPUT	SWITCH TYPE	F009	S 009	M009	CR009
1	Pulse output	Reed/Hall Flying Lead	•	•	•	•
2	Pulse output	Reed Flying Lead	•	•	•	•
Α	Pulse output	Reed/Hall DIN Connection	•	•	•	•
В	Pulse output	Reed/Reed DIN Connection	•	•	•	•

Available X Not Available

DIMENSIONS



M2 – 1/4" HIGH PRESSURE FLOW METERS

SUITABLE FOR FLOW RANGE 15-500L/HR



Also available as optional accessories:



DR LCD Display (12mm)



DRA LCD Display (12mm) with outputs

MH009-1T1 Stainless steel body with pulser cap

Macnaught ¼" High Pressure Flow Meters are a small capacity meter in the M-SERIES range. Suitable for flows between 25-500L/hr. The ¼" High Pressure Flow Meters are manufactured from high quality billet for enhanced material reliability with pressure ratings of up to 8000psi and have an accuracy of +/- 0.5% to provide exceptional levels of reliability and durability.

SPECIFICATIONS

	MF	1009
Materials of Construction Meter Body	Stainless Steel	
Potor	Stainless Steel	
Seela		
Process Connections	1/4" G 1/4" NPT	
Technical Specifications Flow rate	<5cP 25-500L/hr 6.6-132USG/hr	> 5cP 15-500L/hr 4-132USG/hr
Operating Temperature Range*	-40 - 120°C -40 - 248°F	
Max. Operating Pressure	8000 psi 557 bar	
Accuracy	+/- 0.5%	
Repeatability	+/- 0.03%	
Nominal K-Factor	400 Pulses/L	
Pulse Output Options Pulser Pulser	Single Hall Effect Single Reed Switch	
Local Display Options Type DR	LCD display (12mm)	No Outputs
Type DRA	LCD display (12mm)	Outputs: Scaled Pulse, 4-20mA and Hi/Lo Flow Alarm

*Temperature based on standard pulse output - subject to change dependant on rotor and output type, contact Macnaught technical support for further investigations



MH009





ISOMETRIC VIEW





MH009 with DR Display



Ø100



ISOMETRIC VIEW





M4 – 1/2" HIGH PRESSURE FLOW METERS

SUITABLE FOR FLOW RANGE 2-30L/MIN



Also available as optional accessories:



DR LCD Display (12mm)



DRA LCD Display (12mm) with outputs

MH012-1T1 Stainless steel body with pulser cap

Macnaught ½" High Pressure Flow Meters are suitable for low to medium flow range of 2-30L/min. The ½" High Pressure Flow Meters are manufactured from high quality billet for enhanced material reliability with pressure ratings of up to 3000psi and have an accuracy of +/- 0.5% to provide exceptional levels of reliability and durability.

SPECIFICATIONS

	Mł	1012
Materials of Construction Meter Body	Stainless Steel	
Rotor	Stainless Steel PPS option	
Seals	PTFE encapsulated (FEP)	
Design Specifications Process Connections	Threaded ½" G ½" NPT	
Technical Specifications Flow rate	<5cP 3-25L/min 0.6-6.6USG/min	>5cP 2-30L/min 0.5-8USG/min
Operating Temperature Range*	-40 - 120°C -40 - 248°F	
Pressure	3000psi 207 Bar	
Accuracy Repeatability Nominal K-Factor	+/- 1.0% +/- 0.03 112 Pulses/L	
Pulse Output Options Pulser Pulser	Dual Reed/Hall Dual Reed Switch	
Local Display Options Type DR	LCD display (12mm)	No Outputs
Type DRA	LCD display (12mm)	Outputs: Scaled Pulse, 4-20mA and Hi/Lo Flow Alarm

*Temperature based on standard pulse output - subject to change dependant on rotor and output type, contact Macnaught technical support for further investigations



MH012





ISOMETRIC VIEW





MH012 with DR Display





ISOMETRIC VIEW





M4 – 1/2" MECHANICAL METERS

SUITABLE FOR FLOW RANGE 2-30L/MIN



Output variations:



Standard Mechanical Display



Type 4 Heavy Duty Mechanical Display

F012-1S3

Aluminium body with standard mechanical display

Designed and built to suit a broad range of industrial applications, the Macnaught ½" Mechanical Meters are suitable for flows between 2-30L/min. The ½" Mechanical Meters have an accuracy of +/- 1.0% and provides exceptional levels of reliability and durability. These meters are an ideal solution for remote sites or where ease of installation, accuracy and reliability are the priority.

SPECIFICATIONS

	F0	12	M012		
Materials of Construction Meter Body	Cast Aluminium		Cast Stainless Steel		
Rotor	PPS		PPS Stainless Steel		
Seals	Fluorocarbon (FKM)		PTFE encapsulated (FEP)		
Design Specifications Process Connections	Threaded ½" G ½" NPT		Threaded ½" G ½" NPT		
Technical Specifications Flow rate	<5cP 3-25L/min 0.6-6.6USG/min	>5cP 2-30L/min 0.5-8USG/min	<5cP 3-25L/min 0.6-6.6USG/min	> 5cP 2-30L/min 0.5-8USG/min	
Max. Operating Temperature*	-40 - 80°C -40 - 176°F		-40 - 80°C -40 - 176°F		
Max. Operating Pressure	500 psi 35 bar		500psi 35 bar		
Accuracy	+/- 1.0%		+/- 1.0%		
Repeatability	+/- 0.03%		+/-0.03%		
Mechanical Display Type 3 - Standard	Polypropylene (IP56)		Polypropylene (IP56)		
Type 4 - Heavy Duty	Aluminium (IP67)		Aluminium (IP67)		

*Temperature based on standard pulse output - subject to change dependant on rotor and output type, contact Macnaught technical support for further investigations



F012 M012





DISPLAY HEIGHT - A

TYPE 3 MECHANICAL REGISTER - STANDARD







TYPE 4

MECHANICAL REGISTER - HEAVY DUTY



M7 – 1" PULSE FLOW METERS

SUITABLE FOR FLOW RANGE 3-80L/MIN



Also available as optional accessories:



DR LCD Display (12mm) DRA LCD Display (12mm) with outputs



ER LCD Display (17mm) ERA LCD Display (17mm) with outputs ERB

LCD Display (17mm) with batch control output

CR025-2S1 PPS body with pulser cap

The Macnaught 1" Pulse Flow Meters are specialised meters suitable for aggressive chemicals and water based products. Suitable for flows between 3-80L/min. The 1" Pulse Flow Meters have an accuracy of +/-0.5% and provides exceptional levels of reliability and durability.

SPECIFICATIONS

	CR	025
Materials of Construction Meter Body	PPS	
Rotor	PPS	
Seals	PTFE encapsulated (FEP)	
Design Specifications Process Connections	Threaded 1" BSP (Rc) 1" NPT	
Technical Specifications Flow rate	<5cP 8-70L/min 2-18.5 USG/min	>5cP 3-80L/min 0.8-21 USG/min
Operating Temperature Range*	-40 - 80°C -40-176°F	
Max. Operating Pressure	150 psi 10 Bar	
Accuracy	+/- 0.5%	
Repeatability	+/- 0.03%	
Nominal K-Factor	52 Pulses/L	
Pulse Output Options Pulser Pulser Pulser	Reed/Hall Effect Reed/Reed Switch Dual Hall	
Local Display Options Type DR	LCD display (12mm)	No Outputs
Type DRA	LCD display (12mm)	Outputs: Scaled Pulse, 4-20mA and Hi/Lo Flow Alarm

*Temperature based on standard pulse output - subject to change dependant on rotor and output type, contact Macnaught technical support for further investigations



CR025







ISOMETRIC VIEW



CR025 with ER Display







ISOMETRIC VIEW



CR025 with DR Display









M7 – 1" CUSTODY TRANSFER METERS

SUITABLE FOR FLOW RANGE 14-70L/MIN



WM7RRP-1 PPS body with pulser cap

The Macnaught 1" Custody Transfer meters are specialised meters suitable for aggressive chemicals and water based products. Suitable for flows between 14-70L/min. The 1" Pulse Flow Meters are NMI approved and have an accuracy of +/- 0.5% and provides exceptional levels of reliability and durability.

SPECIFICATIONS



*Temperature based on standard pulse output - subject to change dependant on rotor and output type, contact Macnaught technical support for further investigations



WM7





ISOMETRIC VIEW





M10 - 1" MECHANICAL METERS

SUITABLE FOR FLOW RANGE 6-120L/MIN



Output variations:



Standard Mechanical Display



Type 4 Heavy Duty Mechanical Display

F025-1S3

Aluminium body with standard mechanical display

Designed and built to suit a broad range of industrial applications, the Macnaught 1" Mechanical Meters are suitable for flows between 6-120L/min. The 1" mechanical meters have an accuracy of +/- 1.0% and provides exceptional levels of reliability and durability. These meters are an ideal solution for remote sites or where ease of installation, accuracy and reliability are the priority.

SPECIFICATIONS

	F0	25	M	M025		25
Materials of Construction Meter Body	Cast Aluminium		Cast Stainless Steel		Cast Aluminium	
Rotor	PPS		PPS Stainless Steel		Stainless Steel	
Seals	Fluorocarbon (FKM)		PTFE encapsulated ((FEP)	PTFE encapsulated ((FEP)
Design Specifications Process Connections	Threaded 1" G 1" NPT	Flange ANSI CLASS 150 DIN PN16 JIS 10k	Threaded 1" G 1" NPT	Flange ANSI CLASS 150 DIN PN16 JIS 10k	Threaded 1" G 1" NPT	Flange ANSI CLASS 150 DIN PN16 JIS 10k
Technical Specifications Flow rate	<5cP 10-100L/min 2.6-26USG/min	> 5cP 6-120L/min 1.6-32USG/min	<5cP 10-100L/min 2.6-26USG/min	>5cP 6-120L/min 1.6-32USG/min	<5cP 10-100L/min 2.6-26USG/min	>5cP 6-120L/min 1.6-32USG/min
Operating Temperature Range*	-40 - 80°C -40 - 176°F		-40 - 80°C -40 - 176°F		-40 - 120°C -40 - 248°F	
Max. Operating Pressure**	500 psi 35 Bar		500 psi 35 Bar		500 psi 35 Bar	
Accuracy	+/- 1.0%		+/- 1.0%		+/- 1.0%	
Repeatability	+/- 0.03%		+/- 0.03%		+/- 0.03%	
Mechanical Display Type 3 - Standard	Polypropylene (IP56)		Polypropylene (IP56))	Polypropylene (IP56)	
Type 4 - Heavy Duty	Aluminium (IP67)		Aluminium (IP67)		Aluminium (IP67)	

*Temperature based on standard pulse output - subject to change dependant on rotor and output type, contact Macnaught technical support for further investigations **Pressure subject to change as per flange rating



284mm

DIMENSIONS









DISPLAY HEIGHT - A

TYPE 3 MECHANICAL REGISTER - STANDARD

TYPE 4 MECHANICAL REGISTER - HEAVY DUTY









M10 - 1" CUSTODY TRANSFER METERS

SUITABLE FOR FLOW RANGE 24-120L/MIN





The 1" Custody Transfer Meters are the medium capacity meter in the M-SERIES range. Suitable for flows between 24-120L/min. The 1" Custody Transfer Meters are NMI approved and have an accuracy of +/- 0.5% and provides exceptional levels of reliability and durability. It has ability to handle a wide range of fluid viscosities with exceptional levels of repeatability and durability.

SPECIFICATIONS

M-SERIES FLOW METERS

	WM	10AR	WM10SS		
Materials of Construction Meter Body	Cast Aluminium		Cast Stainless Steel		
Rotor	PPS		Stainless Steel		
Seals	Fluorocarbon (FKM)		PTFE encapsulated (FEP)		
Design Specifications Process Connections	Threaded 1" G 1" NPT	Flange ANSI CLASS 150	Threaded 1" G 1" NPT	Flange ANSI CLASS 150	
Technical Specifications Flow rate	24-120L/min 6.3-31.7USG/min		24-120L/min 6.3-31.7USG/min		
Operating Temperature Range*	-40 - 80°C -40 - 176°F		-40 - 120°C -40 - 248°F		
Max. Operating Pressure**	1000 psi 69 Bar		1200 psi 83 Bar		
Accuracy	+/- 0.5%		+/- 0.5%		
Repeatability	+/- 0.03%		+/- 0.03%		
Nominal K-Factor	36 Pulses/L		36 Pulses/L		
Pulse Output Options* Pulser	Dual Reed switch Dual Hall switch		Dual Reed switch Dual Hall switch		

*Temperature based on standard pulse output - subject to change dependant on rotor and output type, contact Macnaught technical support for further investigations **Pressure subject to change as per flange rating

*Additional output options also available as accessories. Contact Macnaught Technical Support Team for more information



WM10AR









WM10SS









M40 – 1¹/₂" MECHANICAL METERS

SUITABLE FOR FLOW RANGE 10-250L/MIN







Standard Mechanical Display



Type 4 Heavy Duty Mechanical Display

F040-1S3

Aluminium body with standard mechanical display

Designed and built to suit a broad range of industrial applications, the Macnaught $1\frac{1}{2}$ " Mechanical Meters are suitable for flows between 10-250L/min. The $1\frac{1}{2}$ " Mechanical Meters have an accuracy of +/- 1.0% and provides exceptional levels of reliability and durability. These meters are an ideal solution for remote sites or where ease of installation, accuracy and reliability are the priority.

SPECIFICATIONS

	F0	40	M	M040		40	
Materials of Construction Meter Body	Cast Aluminium		Cast Stainless Steel		Cast Aluminium		
Rotor	PPS		PPS Stainless Steel		Aluminium Stainless Steel		
Seals	Fluorocarbon (FKM)		PTFE encapsulated ((FEP)	PTFE encapsulated (FEP)	
Design Specifications Process Connections	Threaded 11⁄2" G 11⁄2" NPT	Flange ANSI CLASS 150 DIN PN16 JIS 10k	Threaded 11/2" G 11/2" NPT	Flange ANSI CLASS 150 DIN PN16 JIS 10k	Threaded 1½" G 1½" NPT	Flange ANSI CLASS 150 DIN PN16 JIS 10k	
Technical Specifications Flow rate	<5cP 15-235L/min 4-62USG/min	>5cP 10-250L/min 2.6-66 USG/min	<5cP 15-235L/min 4-62USG/min	>5cP 10-250L/min 2.6-66 USG/min	<5cP 15-235L/min 4-62USG/min	>5cP 10-250L/min 2.6-66 USG/min	
Operating Temperature Range*	-40 - 80°C -40 - 176°F		-40 - 80°C -40 - 176°F		-40 - 120°C -40 - 248°F		
Max. Operating Pressure**	500 psi 35 Bar		500 psi 35 Bar		500 psi 35 Bar		
Accuracy	+/- 1.0%		+/- 1.0%		+/- 1.0%		
Repeatability	+/- 0.03%		+/- 0.03%		+/- 0.03%		
Mechanical Display Type 3 - Standard	Polypropylene (IP56)		Polypropylene (IP56))	Polypropylene (IP56)		
Type 4 - Heavy Duty	Aluminium (IP67)		Aluminium (IP67)		Aluminium (IP67)		

*Temperature based on standard pulse output - subject to change dependant on rotor and output type, contact Macnaught technical support for further investigations **Pressure subject to change as per flange rating







TYPE 3 MECHANICAL REGISTER - STANDARD





TYPE 4 MECHANICAL REGISTER - HEAVY DUTY





M40 – 11/2" CUSTODY TRANSFER METERS

SUITABLE FOR FLOW RANGE 50-250L/MIN





WM40AR Aluminium body with pulser cap WM40SS Stainless steel body with pulser cap

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The $1\frac{1}{2}$ " Custody Transfer Meters are the medium to large capacity meter in the M-SERIES range. Suitable for flows between 50-250L/min. The $1\frac{1}{2}$ " Custody Transfer Meters are NMI approved and have an accuracy of +/- 0.5% and provides exceptional levels of reliability and durability. It has ability to handle a wide range of fluid viscosities with exceptional levels of repeatability and durability.

SPECIFICATIONS

	WM4	IOAR	WM40SS		
Materials of Construction Meter Body	Cast Aluminium		Cast Stainless Steel		
Rotor	PPS		Stainless Steel		
Seals	Fluorocarbon (FKM)		PTFE encapsulated (FEP)		
Design Specifications Process Connections	Threaded 1½" G 1½" NPT	Flange ANSI CLASS 150	Threaded 11/2" G 11/2" NPT	Flange ANSI CLASS 150	
Technical Specifications Flow rate	50-250L/min 13-66USG/min		50-250L/min 13-66USG/min		
Operating Temperature Range*	-40 - 80°C -40 - 176°F		-40 - 120°C -40 - 248°F		
Max. Operating Pressure**	800 psi 55 Bar		1000 psi 69 Bar		
Accuracy	+/- 0.5%		+/- 0.5%		
Repeatability	+/- 0.03%		+/- 0.03%		
Nominal K-Factor	14.5 Pulses/L		14.5 Pulses/L		
Pulse Output Options Pulser Pulser Pulser	Dual Reed switch Dual Hall Switch		Dual Reed switch Dual Hall Switch		

*Temperature based on standard pulse output - subject to change dependant on rotor and output type, contact Macnaught technical support for further investigations **Pressure subject to change as per flange rating

*Additional output options also available as accessories. Contact Macnaught Technical Support Team for more information



WM40AR WM40SS









M-SERIES FLOW METERS

M50 – 2" MECHANICAL METERS

SUITABLE FOR FLOW RANGE 15-500L/MIN







Standard Mechanical Display



Type 4 Heavy Duty Mechanical Display

F050-1S3

Aluminium body with standard mechanical display and BSP thread adaptors

Designed and built to suit a broad range of industrial applications, the Macnaught 2" Mechanical Meters are suitable for flows between 15-500L/min. The 2" Mechanical Meters have an accuracy of +/- 1.0% and provides exceptional levels of reliability and durability. These meters are an ideal solution for remote sites or where ease of installation, accuracy and reliability are the priority.

SPECIFICATIONS

	F0	50	M)50	SO	50
Materials of Construction Meter Body	Cast Aluminium		Cast Stainless Steel	Cast Stainless Steel		
Rotor	PPS		PPS Stainless Steel		Stainless Steel Aluminium	
Seals	Fluorocarbon (FKM)		PTFE encapsulated ((FEP)	PTFE encapsulated ((FEP)
Design Specifications Process Connections	Threaded 2" G 2 " NPT	Flange ANSI CLASS 150 DIN PN16 JIS 10k	Threaded 2" G 2 " NPT	Flange ANSI CLASS 150 DIN PN16 JIS 10k	Threaded 2" G 2 " NPT	Flange ANSI CLASS 150 DIN PN16 JIS 10k
Technical Specifications Flow rate	<5cP 15-500L/min 4-130USG/min	>5cP 15-500L/min 4-130USG/min	<5cP 15-500L/min 4-130USG/min	>5cP 15-500L/min 4-130USG/min	<5cP 15-500L/min 4-130USG/min	>5cP 15-500L/min 4-130USG/min
Operating Temperature Range*	-40 - 80°C -40 - 176°F		-40 - 80°C -40 - 176°F		-40 - 120°C -40 - 248°F	
Max. Operating Pressure**	500psi 35 Bar		500psi 35 Bar		500psi 35 Bar	
Accuracy	+/- 1.0%		+/- 1.0%		+/- 1.0%	
Repeatability	+/- 0.03%		+/- 0.03%		+/- 0.03%	
Mechanical Display Type 3 - Standard	Polypropylene (IP56)		Polypropylene (IP56))	Polypropylene (IP56)	
Type 4 - Heavy Duty	Aluminium (IP67)		Aluminium (IP67)		Aluminium (IP67)	

*Temperature based on standard pulse output - subject to change dependant on rotor and output type, contact Macnaught technical support for further investigations **Pressure subject to change as per flange rating



F050 M050 S050







ANSI/DIN/JIS



G/NPT

DISPLAY HEIGHT - A

TYPE 3 MECHANICAL REGISTER - STANDARD





TYPE 4 MECHANICAL REGISTER - HEAVY DUTY





M50 – 2" CUSTODY TRANSFER METERS

SUITABLE FOR FLOW RANGE 70-350L/MIN





WM50AR Aluminium body with pulser cap and BSP thread adaptors WM50SS Stainless steel body with pulser cap and ANSI flanges

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The 2" Custody Transfer Meters are the large capacity meter in the M-SERIES range. Suitable for flows between 70-350L/min. The 2" Custody Transfer Meters are NMI approved and have an accuracy of +/- 0.5% and provides exceptional levels of reliability and durability. It has ability to handle a wide range of fluid viscosities with exceptional levels of repeatability and durability.

SPECIFICATIONS

	WM	50AR	WM50SS			
Materials of Construction Meter Body	Cast Aluminium		Cast Stainless Steel			
Rotor	PPS		Stainless Steel			
Seals	Fluorocarbon (FKM)		PTFE encapsulated (FEP)			
Design Specifications Process Connections	Threaded 2" G 2" NPT	Flange ANSI CLASS 150	Threaded 2" G 2" NPT	Flange ANSI CLASS 150		
Technical Specifications Flow rate	70-350L/min 18-92.4USG/min		70-350L/min 18-92.4USG/min			
Operating Temperature Range*	-40 - 80°C -40 - 176°F		-40 - 120°C -40 - 248°F			
Max. Operating Pressure**	800 psi 55 Bar		800 psi 55 Bar			
Accuracy	+/- 0.5%		+/- 0.5%			
Repeatability	+/- 0.03%		+/- 0.03%			
Nominal K-Factor	6.68 Pulses/L		6.68 Pulses/L			
Pulse Output Options* Pulser Pulsar Pulser	Dual Reed Switch Dual Hall Switch Encoder		Dual Reed Switch Dual Hall Switch Encoder			

*Temperature based on standard pulse output - subject to change dependant on rotor and output type, contact Macnaught technical support for further investigations **Pressure subject to change as per flange rating

*Additional output options also available as accessories. Contact Macnaught Technical Support Team for more information





60mm







0

0

6

0



1

120

Flange Connections





G/NPT

M80 - 3" MECHANICAL METERS

SUITABLE FOR FLOW RANGE 20-733L/MIN







Type 4 Heavy Duty Mechanical Display

F075-1S4

Aluminium body with heavy duty mechanical display and ANSI flanges

Designed and built to suit a broad range of industrial applications, the Macnaught 3" Mechanical Meters are suitable for flows between 20-733L/min. The 3" Mechanical Meters have an accuracy of +/- 1.0% and provides exceptional levels of reliability and durability. These meters are an ideal solution for remote sites or where ease of installation, accuracy and reliability are the priority.

SPECIFICATIONS

	F0	75	S075			
Materials of Construction Meter Body	Cast Aluminium		Cast Aluminium			
Rotor	Aluminium		Aluminium			
Seals	Fluorocarbon (FKM)		PTFE encapsulated (FEP)			
Design Specifications Process Connections	Threaded 3" G 3" NPT	Flange ANSI CLASS 150 DIN PN16 JIS 10k	Threaded 3" G 3" NPT	Flange ANSI CLASS 150 DIN PN16 JIS 10k		
Technical Specifications Flow rate	<5cP 60-600L/min 17-170USG/min	>5cP 20-733L/min 5-194USG/min	<5cP 60-600L/min 17-170USG/min	>5cP 20-733L∕min 5-194USG∕min		
Operating Temperature Range*	-40 - 120°C -40 - 248°F		-40 - 120°C -40 - 248°F			
Max. Operating Pressure**	175 psi 12 Bar		175 psi 12 Bar			
Accuracy	+/- 1.0%		+/- 1.0%			
Repeatability	+/- 0.03%		+/- 0.03%			
Pulse Output Options Type 4 - Heavy Duty	Aluminium (IP67)		Aluminium (IP67)			

*Temperature based on standard pulse output - subject to change dependant on rotor and output type, contact Macnaught technical support for further investigations **Pressure subject to change as per flange rating



F075 S075





ANSI/DIN/JIS





G/NPT

M80 – 3" CUSTODY TRANSFER METERS

SUITABLE FOR FLOW RANGE 140-700L/MIN



WM80AAP-3

Aluminium body with pulser cap and ANSI flanges

The 3" Custody Transfer Meters are the large capacity meter in the M-SERIES range. Suitable for flows between 140-700L/min. The 3" Custody Transfer Meters are NMI approved and have an accuracy of +/- 0.5% and provides exceptional levels of reliability and durability. It has ability to handle a wide range of fluid viscosities with exceptional levels of repeatability and durability.

SPECIFICATIONS

	WM80AA
Materials of Construction Meter Body	Cast Aluminium
Rotor	Aluminium
Seals	Fluorocarbon (FKM)
Design Specifications Process Connections	Threaded Flange 3" G ANSI CLASS 150 3" NPT ANSI CLASS 150
Technical Specifications Flow rate	140-700L/min 36.9-184.9USG/min
Operating Temperature Range*	-40 - 120°C -40 - 248°F
Max. Operating Pressure**	175psi 12 Bar
Accuracy	+/- 0.5%
Repeatability	+/- 0.03%
Nominal K-Factor	2.58 Pulses/L
Pulse Output Options* Pulser Pulser Pulser Pulsar	Dual Reed switch Dual Hall switch Encoder

*Temperature based on standard pulse output - subject to change dependant on rotor and output type, contact Macnaught technical support for further investigations **Pressure subject to change as per flange rating

*Additional output options also available as accessories. Contact Macnaught Technical Support Team for more information



WM80AAP-3





ANSI







239mm

M100 - 4" MECHANICAL METERS

SUITABLE FOR FLOW RANGE 120-1200L/MIN



Output variations:



Type 4 Heavy Duty Mechanical Display

F100-1S4

Aluminium body with heavy duty mechanical display with ANSI flanges

Designed and built to suit a broad range of industrial applications, the Macnaught 4" Mechanical Meters are suitable for flows between 120-1200L/min. Suitable for fuels, lubricants and non-corrosive fluids of up to a viscosity of 1000cP. The 4" Mechanical Meters have an accuracy of +/- 1.0% and provides exceptional levels of reliability and durability. These meters are an ideal solution for remote sites or where ease of installation, accuracy and reliability are the priority.

SPECIFICATIONS

	F1	00	S100			
Materials of Construction Meter Body	Cast Aluminium		Cast Aluminium			
Rotor	Aluminium		Aluminium			
Seals	Fluorocarbon (FKM)		PTFE encapsulated (FEP)	PTFE encapsulated (FEP)		
Design Specifications Process Connections	Threaded 3" G 3" NPT	Flange 4" ANSI CLASS 150 4" DIN PN16 4' JIS 10k	Threaded 3" G 3" NPT	Flange 4" ANSI CLASS 150 4" DIN PN16 4' JIS 10k		
Technical Specifications Flow rate	<5cP 220-1000L/min 60-250USG/min	>5cP 120-1200L/min 31.7-317USG/min	<5cP 220-1000L/min 60-250USG/min	>5cP 120-1200L/min 31.7-317USG/min		
Operating Temperature Range*	-40 - 120°C -40 - 248°F		-40 - 120°C -40 - 248°F			
Max. Operating Pressure***	175 psi 12 Bar		175 psi 12 Bar			
Accuracy	+/- 1.0%		+/- 1.0%			
Repeatability	+/- 0.03%		+/- 0.03%			
Pulse Output Options Type 4 - Heavy Duty	Aluminium (IP67)		Aluminium (IP67)			

*Temperature based on standard pulse output - subject to change dependant on rotor and output type, contact Macnaught technical support for further investigations **Pressure subject to change as per flange rating



F100-1S4 S100-1S4









G/NPT

M100 – 4" CUSTODY TRANSFER METERS

SUITABLE FOR FLOW RANGE 240-1200L/MIN



WM100AAP-3

Aluminium Body with Pulser Cap with Flanges

The 4" Custody Transfer Meters are the large capacity meter in the M-SERIES range. Suitable for flows between 240-1200L/min. Suitable for fuels, lubricants and corrosive fluids (stainless steel only) of up to a viscosity of 1000cP. The 4" Custody Transfer Meters are NMI approved and have an accuracy of +/- 0.5% and provides exceptional levels of reliability and durability.

SPECIFICATIONS

	WM100AA
Materials of Construction Meter Body	Cast Aluminium
Rotor	Aluminium
Seals	Fluorocarbon (FKM)
Design Specifications Process Connections	Threaded Flange 3" G 4" ANSI CLASS 150 3" NPT 4" ANSI CLASS 150
Technical Specifications Flow rate	240-1200L/min 63.4-317USG/min
Operating Temperature Range*	-40 - 120°C -40-248°F
Max. Operating Pressure**	175 psi 12 Bar
Accuracy	+/- 0.5%
Repeatability	+/- 0.03%
Nominal K-Factor	2.3 Pulses/L
Pulse Output Options Pulser Pulser Pulsar	Dual Reed switch Dual Hall switch Encoder

*Temperature based on standard pulse output - subject to change dependant on rotor and output type, contact Macnaught technical support for further investigations **Pressure subject to change as per flange rating

*Additional output options also available as accessories. Contact Macnaught Technical Support Team for more information

WM100AAP-3









ANSI/DIN/JIS



macnaught flow measurement



corrosive chemical flow meters



macnaught.com.au

macnaught flow measurement

The **CR** range from **Macnaught** are a family of positive displacement oval gear flowmeters that are **optimised for corrosive chemical measurement** applications.

Macnaught Corrosive Chemical meters are constructed utilising a **PTFE/PPS blend** suitable for use in aggressive chemical environments. We will also soon add a **PVDF version** to provide chemical compatibility in applications where PPS is not suitable.

Our Unique **bearing-less Rotor design** provides **exceptionally low pressure drop** and can even be used in gravity fed applications. This unique rotor design utilises PTFE/PPS blended advanced material, ensuring minimal wear and resulting in many years of reliable service. This approach has proven over time to provide consistently accurate flow measurement that is not affected by variations in temperature, viscosity, or pressure. Another benefit of our unique rotor design is simplicity of repair. With only **2 moving parts**, our meters are simple to repair, require minimal repair parts stock, and can even be repaired inline, resulting in less downtime.

The positive displacement meter technology provides **excellent batch accuracy** (0.03% repeatability) and is **not affected by pulsating flow**, high viscosity, or low conductivity. This technology is also ideal for **dispensing and dosing** at extremely **low flow rates and small batch sizes**.

Oval Gear flowmeters do not require any flow conditioning or straight piping runs before or after the meter, so they **can be installed in tight spaces** without any sacrifice in performance.

With **9 digital display options** to choose from, Macnaught flowmeters are the perfect choice with outputs and displays to suit virtually any application requirement.

Applications

- Laundry Chemicals
- Additive Injection
- Water Treatment
- Corrosive Chemical Dispensing
- Chemical Batching
- Chemical Packaging and Blending



Meter Selection

Step 1 Verify Fluid Compatibility & Application Conditions Determine if your fluid is compatible with the wetted parts of the meter. All Wetted parts are made from: FFKM, PPS, and Hastelloy C. Also determine if the Pressure and Temperature are within the stated limits.

Tips: If you need a mechanical register or have a high pressure application, you may be able to use our 316SS industrial meters, which come in high pressure models and are available with mechanical registers.

Step 2 Choose the model based on your flow rate (See Flow Range Chart)

Tips: If possible, choose a meter model where your expected flow rates fall between 20-80% of the maximum flow range for optimum performance. If you are measuring a high viscosity fluid (over 1000cp), the maximum flow range will be lower. You should consult the factory if you are unsure which model you need.

Step 3 Choose your connection thread type

Tips: For flanged meters, we offer 316SS Industrial meters, which are available with a variety of optional flange adaptors.

Step 4 Choose Pulse Output options

Tips: Choose a pulse output if you want to use a digital display. The Digital displays are listed in the next step and can either be mounted on the meter or remotely. Our standard pulse output comes with both hall effect sensor and reed switch outputs. If you are installing the meter in a hazardous environment, you can choose option "2" which will give you only one reed switch, which classifies the output of the meter as a "simple device".

Step 5 Choose Accessories (See Chart 1)

Tips: All of our digital displays can be mounted either locally on the meter itself, remotely on a wall, on a panel, or nearby on the piping. Just choose the functions you need and the housing type you require.

corrosive chemical flow meters

Part Number Selection

CR	Chemica	Chemical Flow Meters (PPS)						
	Model	Nominal Size	Flow Range	Max Pressure				
	006	1/4"	0.5-100 lph/ 0.13-26.4 gph	5 Bar/75PSI				
	009	1/4"	15-500 lph/ 4-132 gph	5 Bar/75PSI				
	025	1"	3-80 lpm/ 0.8-21 gpm	10 Bar/150PSI				
		Port Type						
		2	NPT					
		4	BSP (Rc)					
			Rotor Type					
			S	Standard				
				Display Type				
				1 Electronic Pulse Meter (Reed & Hall Effect)				
				2 Reed Switch Only- for Hazardous Location Service				
CR	009-	4	S	1 (example part number CR009-4S1)				



Chart 1

	Digital Displays								
Meter Mounted Displays	DR	DRA	ER	ERA	ERB	ERS	ERX	ERAX	ERBX
Total									
Resettable Total									
Flow Rate Display									
Pulse Output									
4-20 mA Output (Passive)									
Alarm Outputs									
Batch Control (Transistor Out)									
Net Use Function									
Intrinsic Safety									
Aluminium Housing IP67									
Plastic Housing									
Digit Size (mm/ in.)	12mm	12mm	17mm						

Flow Range Chart flow rate litres per minute



Technical Specifications

Materials of construction

- Meter Body
- PPS/PTFE Blend (Type CR) Rotor Materials
- PPS/PTFE Blend (Type CR)
- Seal Material
 - Perfluoro Elastomer

Total Flow Range

- 0.008 80 L/min
- 0.002 21 USG/min

Temperature Range

• -40 - 80°C / -40 - 176 °F

Display Options

- 12mm LCD digital display
- 17mm LCD digital display

Outputs options

- 4-20mA
- Transistor
- Pulse Output
- Alarm

Compliance (as applicable)

- Meters
 - CE (Certificate of Conformity)
- Displays
 - ATEX
 - IECEx

Once you have determined the most suitable Flow-meter according to your requirements, please contact macnaught to obtain your detailed 'product specification datasheet'

Trust Macnaught

Established in 1948, Macnaught has a 60 year tradition of excellence in manufacturing. Macnaught began marketing flowmeters in 1965 and has been manufacturing oval gear flowmeters since the early 1990's. Our decades of experience have resulted in a simple, robust, and highly accurate family of flowmeters that are optimised to suit a broad range of applications and markets. Macnaught offers optimised solutions for Fuel and Oil measurement, Bulk Fuel Custody Transfer, Corrosive Chemicals, Solvents, and a wide variety of other industrial liquids.

knowledge that quality and environmental responsibility are at the forefront of every decision at Macnaught.

Trust Macnaught to deliver the performance, value, and reliability required in today's most demanding environments. With distributors in over 60 countries and global sales support, Macnaught has become a global leader in fluid management solutions. Our focus on oval gear flow measurement reflects our commitment to excellence in providing optimised solutions for

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