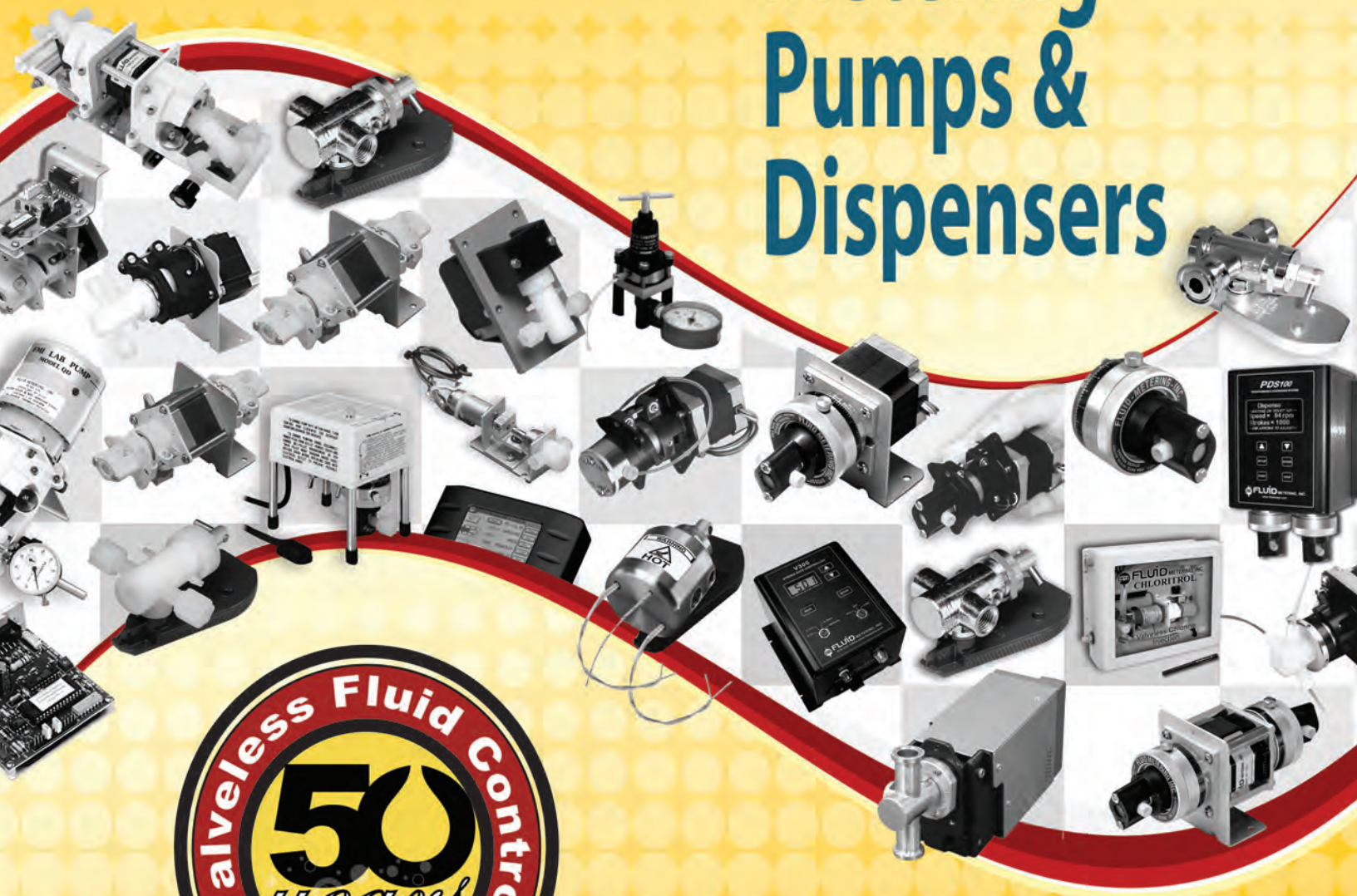




FLUID METERING, INC.

ISO 9001

Valveless Metering Pumps & Dispensers



50 Years of Precision Fluid Control

www.fmipump.com

2009 Catalog



“V” Variable Speed

Ideal For Automated Process Control

- Adjustable from 90 to 1800 strokes per minute for the QV, and 5 to 50 strokes per minute for the QVG50.
- Q2V Ratio-Matic® duplex for proportional metering using a single drive.
- Q2V Ratio-Matic® duplex reduces pulsation by 50%
- Quick connect to V300 Controller (included).

*Best Value!
Most Versatile!*



QV/QVG50

QV
Motor Electrical: 1800 RPM, TENV.

Dimensions:
10" x 4 5/8" x 4 7/8" wide
(254 x 117 x 124 mm)
Shipping weight:
QV : 10 lb (4.5 kg)
V300: 5 lb (2.25 kg)

QVG50
Motor Electrical: 50 RPM, TENV.

Dimensions:
11" x 5" x 5 3/4" wide
(279 x 127 x 146 mm)

Shipping weight:
15 lb (6.75 kg)



RHV

Dimensions:
7 1/8" x 3" x 3" wide
(181 x 76 x 76 mm)
Shipping weight :
7 lb (3.15 kg)
V300: 5 lb (2.25 kg)

Electrical:
1800 RPM, TENV.

Drive + Pump Head = Complete Pump
Example: QVG50 + Q3CKC =

QV/QVG50/Q2V PDM (Includes V300)

MAX. Flow/Pressure				PDM	Piston Code	Price V300
ML/MIN	GAL/HR	PSIG	BAR			
1.25	.019	100	6.90	QVG50	RH00	
2.50	.039				RH0	
4.00	.063				Q0	
5.00	.079				RH1	
16.00	.252				Q1	
36.00	.568	Q2				
64.00	.998	25	1.72	Q3		
45.00	.71	100	6.90	QV	RH00	
90.00	1.4				RH0	
144	2.2				Q0	
180	2.8				RH1	
576*	9.1				Q1	
1296*	20.4	50	3.45	Q2V	Q2	
2304*	35.9	25	1.72		Q3	



Drive Options
Dial Indicator (pg.22) Part Number: - Q485 Price:
Mounting Base (pg.14) Part Number: -MB Price:

*See Page 27 for General Specification notes

Call Us. We Have The Answers.

“RHV” Low Flow (0-180 ml/min max)

- No Valves to clog, hang up or service.
- Ceramic and PVDF standard wetted materials - Tefzel available.
- One moving part - piston.
- Accuracy of better than ± 1 % = Drift Free Operation.
- Drift-free flow ranges up to 180 ml/min, pressures from -10 to 100 psig.
- Easy grip flow control ring graduated in 450 divisions.
- Instant adjustment of flow while running.
- Adjustable from 90 to 1800 strokes per minute.
- Quick connect to V300 Controller (included).

RHV Pumps (Includes V300)

MAX. Flow/Pressure			Complete Pump	Wetted Parts	MAX. Temp	Price V300
ML/MIN	PSIG	BAR				
45	100	6.90	RHV00SKY	316 SS/PVDF/Carbon	140° F	
90			RHV0CKC			
180			RHV1CKC	Ceramic / PVDF	212° F	
45			RHV00CTC			
90			RHV0CTC			
180			RHV1CTC	Ceramic / Tefzel	212° F	



Variable Speed "V"

Variable Flow Rate to 2300 ml/min



"V300" Automatic Rate Control/System

QV, QVG50, RHV and Q2V Pump Drive Modules

- Selectable 4-20 mA, 0-5 VDC, & 0-10 VDC input for automatic control.
- Membrane Switches for manual Flow Rate Settings and Start / Stop functions.
- Start, Stop & Reverse Flow while maintaining flow settings.
- Large 3 Digit LCD Flow Display.
- Universal Power Input accepts 100-240 VAC 50/60 Hz.
- Rugged, anodized aluminum enclosure designed for both bench-top & wall mounting.

Dimensions: 7 1/4" x 5 1/8" x 6 1/4" wide
182 mm x 128 x 159 mm



V300



Selectable 4-20 mA, 0-5 VDC, & 0-10 VDC input for automatic control. QV, QVG50, RHV & Q2V Pump Drive Modules.



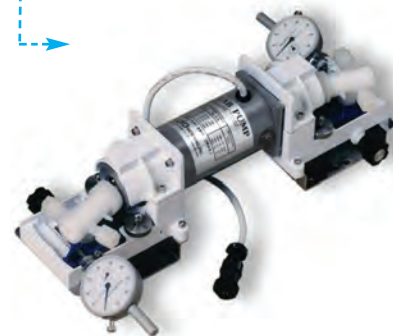
Digital LCD Flow Display

PHM (PUMP HEAD MODULE)

Piston Size Code	Materials of Construction								
	CKC	CKY	CSC	CSY	SAN	SKY	SSY	STY	CTC
RH00									
RH0									
RH1									
Q0									
Q1									
Q2									
Q3									
Wetted Parts	Ceramic PVDF	Ceramic PVDF Carbon	Ceramic 316 SS	Ceramic 316 SS Carbon	Ceramic Teflon	316 SS PVDF Carbon	316 SS Carbon	316 SS Tefzel Carbon	Ceramic Tefzel
MAX.Temp	212° F	212° F	350° F	350° F	350° F	140° F	140° F	140° F	212° F
Options	(add Option Code & cost to Pump Module for complete price and part number)								
LF (pg.20)	N/C	N/C				N/C		N/C	N/C
W (pg.20)									
WT (pg.20)									
TC (pg.30)									
R479 (Pg.22)									
S ("Q" Only)									

RATIO:MATIC[®]

Proportional Dual Head Pump Drive Module



Q2V

Dimensions :
15" x 4 7/8" x 5 1/8" wide
(381 x 124 x 130 mm)
Shipping weight:
15 lb (6.75 kg)
V300: 5 lb (2.25 kg)

*See page 28 "Pump Head Materials Configuration" for additional information.





OEM Dispensers/Pumps

High Precision Step Motor Pumps for OEM Applications



- No Valves to clog, hang up or service.
- One Moving Part - Piston.
- Drift-Free accuracy better than $\pm 1\%$.
- Precision - CV of 0.5% or better.
- Ceramic and fluorocarbon fluid path.
- Displacement of 0 to 1280 microliters (1.28 ml) per revolution.
- 1.8° stepper motors with opto sensors.
- Excellent chemical resistance.
- 6 standard models and custom models.
- Special OEM pricing available upon request.

STH

Low Flow "STH"

Dimensions:

4 5/8" x 3 1/8" x 2 1/8" wide
(117 x 79 x 53 mm)

Shipping weight :

2 lb. (0.9 kg)



STH Pumps

MAX. Dispense Rates	Complete Pump Assembly	Wetted Parts	Price
Microliters / Revolution			
0 - 25 μ l	STH00CKCLF	Ceramic PVDF	
0 - 50 μ l	STH0CKCLF		
0 - 100 μ l	STH1CKCLF		

23 Frame Stepper 8 wire motor std.

*Picture shown with optional 17 size motor

STQ

High Flow "STQ"

STQ Pumps

MAX. Dispense Rates	Complete Pump Assembly	Wetted Parts	Price
Milliliters/Revolution			
0 - .32 ml	STQ1CKC	Ceramic PVDF	
0 - .72 ml	STQ2CKC		
0 - 1.28 ml	STQ3CKC		

*Standard 23 frame stepper motor shown

Dimensions:

6 1/2" x 3 5/8" x 3 1/4" wide
(166 x 91 x 82 mm)

Shipping weight :

3 lb. (1.35 kg)



Economical Fluid Control "RO"

- Economical, fixed displacement
- Reciprocating, Oscillating Ceramic Piston
- Valveless, Reversible, Self Priming
- Transfer, Wash, Aspirate, Flush

RO

Want Something Special-- Ask us!



Programmable Dispensing "PDS100"

Valveless, Programmable, Dispensing & Metering System



New



The PDS100 uses precision stepper motors to control a variety of FMI's patented valveless piston pumps.

- All models feature FMI's Patented CeramPump® No-Valve Fluid Control Technology.
- Pump heads are integrally mounted to control unit, which includes precision stepper motors, drivers and programmable electronics housed in a rugged anodized aluminum enclosure.
- Intuitive menu driven programming uses front panel membrane switches with 2.75" x 1.5" LCD display.
- Available in single and dual pump head configurations in all FMI pump head sizes.
- Dual pump head configurations can be programmed for independent pump control.
- Universal Power Input accepts 100-240 VAC 50/60 Hz.

PDS100

Dimensions:
7 1/4" x 5 1/8" x 6 1/4" wide
182 mm x 128 x 159 mm

Electrical:
RS485, 4-20mA, 0-10V, 0-5V interface for connection to process sensors, PLC and PC controllers
Shipping weight :
7.5 lb. (3.41 kg)



Selectable RS485 4-20 mA, 0-5 VDC, & 0-10 VDC input for automatic control.



LCD Menu Display

Piston Size Code	Displacement ml's / Rev.		Flow per Minute		Pressure (psig) Maximum
	Minimum	Maximum	Minimum ¹	Maximum ²	
RH00	1.25 µl	0.025 ml	7.5 µl	18.75 ml	100
RH0	2.5 µl	0.05 ml	15 µl	37.5 ml	100
Q0	4.0 µl	0.08 ml	24 µl	48 ml	40
RH1	5.0 µl	0.1 ml	30 µl	75 ml	100
Q1	16.00 µl	0.32 ml	96 µl	192 ml	40
Q2	36.00 µl	0.72 ml	216 µl	432 ml	20
Q3	64.00 µl	1.28 ml	384 µl	768 ml	10

1) Minimum Flow Rates for RH and Q Pump Heads calculated at 6 RPM.
2) Maximum Flow Rates for RH Pump Heads calculated at 750 RPM.
Maximum Flow Rates for Q Pump Heads calculated at 600 RPM.

Note: All Flow Rates based on single pump head.

LIVE ONLINE HELP

>> Chat live online with an application expert.

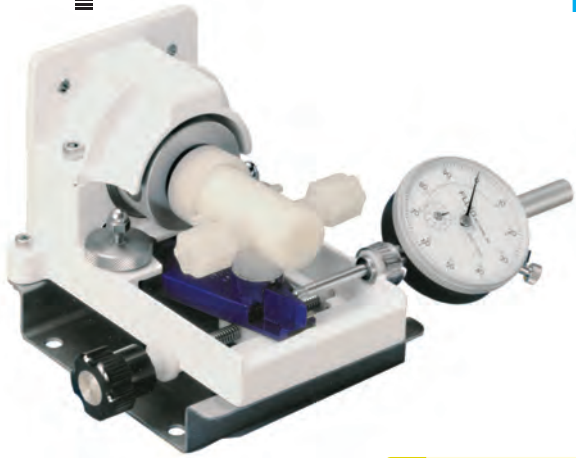
Have questions?
Chat live with an FMI application specialist at www.fmipump.com





“QP” Motorless Pedestal

High Flow - Rugged Duty



- No Valves to clog, hang up or service.
- One Moving Part - Piston.
- Drift-Free accuracy of better than $\pm 1\%$.
- Ideal for OEM applications up to 1800 RPM.
- Used extensively in laboratory, industrial, and OEM applications for both dispensing & metering up to 2300 ml/min continuous flow.
- Typically driven by belt, chain or shaft coupling connected to your special motor drive, e.g. air, hydraulic, stepper, etc.
- Minimal torque requirement of 35 inch ounces.

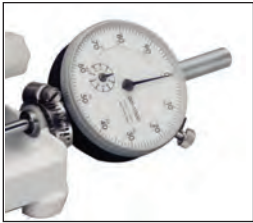
QP

Model QP with CKC PHM

Dimensions:
6 3/8" x 4 3/8 x 5 1/8"
(162 x 111 x 130 mm)

Shaft extension:
5/16" dia. x 1 3/16"
(8 mm dia. x 30 mm)

Shipping weight:
5 lb. (2.25 kg)



Q485 Dial Indicator for ultra fine flow adjustment (pg 22 for more info)



Rotational Sensors
See (pg 20 for more info)

LIVE ONLINE HELP

>> Chat live online with an application expert.



FMI FLUID METERING, INC.

Have questions?
Chat live with an FMI application specialist at
www.fmipump.com

Example: Drive + Pump Head = Complete Pump
QP + Q1CKC =

QP PDM (PUMP DRIVE MODULE)

MAX. Flow/Pressure			PDM	Piston Code	Drive Price
ML/Rev.	PSIG	BAR			
.025	100	6.90	QP	RH00	
.05				RH0	
.08				Q0	
.10				RH1	
.32				Q1	
.72	Q2				
1.28	25	1.72	Q3		



Drive Options

Dial Indicator (pg. 22)

Part Number: - Q485

Price:

P56C Face Adapter (pg. 19)

Part Number: - P56C

Price:

Masterflex Adapter (pg. 20)

Part Number: - QP/M

Price:

PHM (PUMP HEAD MODULE)

Piston Size Code	Materials of Construction								
	CKC	CKY	CSC	CSY	SAN	SKY	SSY	STY	CTC
RH00									
RH0									
RH1									
Q0									
Q1									
Q2									
Q3									
Wetted Parts	Ceramic PVDF	Ceramic PVDF Carbon	Ceramic 316 SS	Ceramic 316 SS Carbon	Ceramic Teflon	316 SS PVDF Carbon	316 SS Carbon	316 SS Tefzel Carbon	Ceramic Tefzel
MAX.Temp	212° F	212° F	350° F	350° F	350° F	140° F	140° F	140° F	212° F
Options	(add Option Code & cost to Pump Module for complete price and part number)								
LF (pg.20)	N/C	N/C				N/C		N/C	N/C
W (pg.20)									
WT (pg.20)									
TC (pg.30)									
R479 (Pg.22)									
S ("Q" Only)									

*See page 28 "Pump Head Materials Configuration" for additional information.



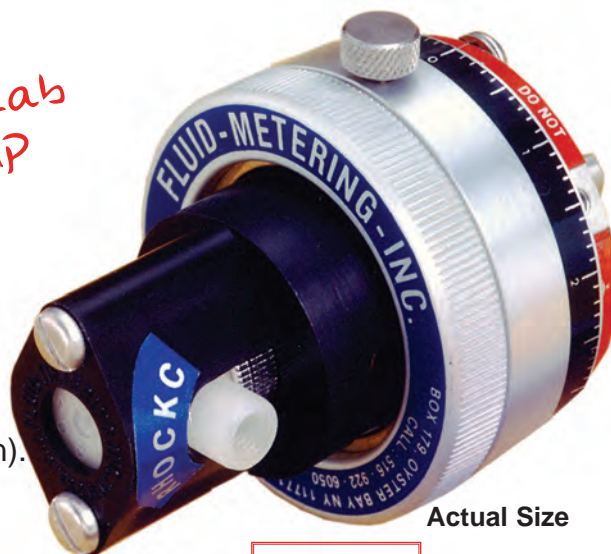
Miniature Motorless "RH"

For Low Flow - High Precision



- Ceramic and PVDF standard wetted materials - also available in Tefzel.
- 0 to 100 microliters per stroke.
- Precision stroke to stroke = 0.5% or better.
- Pressures from -10 to 100 psig.
- Needs only 17 inch ounces of torque.
- Requires only 2 1/4" panel space.
- Standard 1/4" O.D. tubing or 1/4-28 female.
- Adjustable while running or at rest.
- 0 to 100% stroke length adjustment for maximum flow rate flexibility.
- Easy grip flow control ring graduated in 450 divisions.
- Linear speed vs. flow rate from 0 to 3600 RPM (360 ml/min).
- Standard and low flow configurations.

FMI Lab Pump Jr



Actual Size

RH-LF

RH-LF features integrally molded 1/4-28 female low dead volume ports. This allows for quick connections to 1/16" & 1/8" O.D. micro bore tubing and fittings (FMI Q661 pg. 21).

Dimensions:
2 1/4" O.D. x 3 1/2"
(57 O.D. x 89 mm)

Shaft Extension:
5/16" dia. x 3/4" long
(8 mm dia. x 19 mm long)

Shipping weight:
2 lb (0.9 kg)

RH Pumps

MAX. Flow/Pressure			Complete Pump Assembly	Wetted Parts	Price
µl / Stroke	PSIG	BAR			
0 - 25 µl	100	6.90	RH00SKY	316 SS/PVDF/Carbon	
0 - 25 µl			RH00STY	316 SS Tefzel Carbon	
0 - 25 µl			RH00CTC	Ceramic Tefzel	
0 - 50 µl			RH0CKC	Ceramic / PVDF	
0 - 100 µl			RH1CKC	Ceramic / PVDF	



Drive Options

Low Dead Volume Pump Head (pg. 20)

Part Number: - LF

Price: N/C

Adapter for Q (PDM) (pg. 22)

Part Number: - RH/Q

Price:

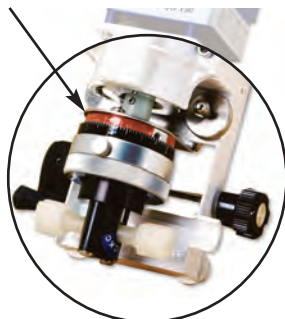
Masterflex Adapter (pg. 20)

Part Number: - RH/M

Price:

See page 28 for pump head codes, material of construction

"RH/Q" Adapter See page 22



OEM version



RH

Actual Size





"IVSP" Industrial Variable Speed Pump



IVSP

Dimensions:
17 3/4" x 6 7/8" x 8 1/2" wide
(451 x 175 x 216mm)

Shipping weight:
43 lb (19.35 kg)

Electrical:
Controller:

Input 115 VAC, 1Ø, 50/60 Hz.
Output: 230 VAC, 3Ø 50/60 Hz

Speed adjustment
0 to 20 mA
4 to 20 mA
0 to 10 VDC

Motor:

230 VAC, 3Ø, 50/60 Hz.
Variable Speed, 1800 RPM max.

- Flow Rates from 0 to 2300 mL/min ±1%.
- FMI's Patented CeramPump® Valveless Piston Design - One Moving Part in fluid path.
- Rugged, 1/4 HP, 3 phase High Torque Motor, ideal for viscous fluids.
- Space-Saving, DIN Mount Controller ideal for process control panels.
- Local Keyboard & Remote Control.
- Remote Speed Control: 0-20 mA, 4-20 mA, 0-10 VDC.
- Multi-function I/O connector for forward, reverse, jog, emergency stop, & reset.
- Complete System includes drive motor, pump head, variable speed controller, & cables.
- All electronic components



"X" Hazardous-Duty

QDX PDM (PUMP DRIVE MODULE)

MAX. Flow/Pressure			PDM	Piston Code	Drive Price
ML/MIN	PSIG	BAR			
43.13	100	6.90	QDX	RH00	
86.25				RH0	
138				Q0	
172.50				RH1	
552*				Q1	
1242*				Q2	
2208*	25	1.72		Q3	

Drive Options
Dial Indicator (pg.22)
Part Number: - Q485
Price:



*See Page 27 for General Specification



QDX

Fixed Speed
The QDX High Flow Hazardous-Duty Class I, Group D; Class II, Group E, F, G

Dimensions:
17 3/4" x 6 7/8" x 8 1/2" wide
(451 x 175 x 216mm)

Shipping weight:
43 lb (19.35 kg)

Electrical:
115/230 VAC, 60 Hz, 1Ø, 1/3 hp, ball bearing UL listed motor, 1725 RPM, pigtail leads for conduit connection. Motor is totally enclosed fan cooled. 6.6 amps @ 115 VAC and 3.3 amps @ 230 VAC.

PHM (PUMP HEAD MODULE)

Piston Size Code	Materials of Construction									
	CKC	CKY	CSC	CSY	SAN	SKY	SSY	STY	CTC	
RH00										
RH0										
RH1										
Q0										
Q1										
Q2										
Q3										
Wetted Parts	Ceramic PVDF	Ceramic PVDF Carbon	Ceramic 316 SS	Ceramic 316 SS Carbon	Ceramic Teflon	316 SS PVDF Carbon	316 SS Carbon	316 SS Tefzel Carbon	Ceramic Tefzel	
MAX.Temp	212° F	212° F	350° F	350° F	350° F	140° F	140° F	140° F	212° F	
Options	(add Option Code & cost to Pump Module for complete price and part number)									
LF (pg.20)	N/C	N/C				N/C		N/C	N/C	
W (pg.20)										
WT (pg.20)										
TC (pg.30)										
R479 (Pg.22)										
S ("Q" Only)										

*See page 28 "Pump Head Materials Configuration" for additional information.



Smooth-flo PDS100

Valveless, Pulse-Free Dispensing & Metering System

The Smooth-flo PDS100 is a unique valveless dispensing and metering system which utilizes dual FMI pumps, precisely synchronized, to eliminate pulsation typically present in other piston pump designs.

- Pulse-Free fluid delivery down to 5 uL/min continuous flow.
- Precision dual stepper control, factory calibrated for your flow range.
- RS485, 4-20 mA, 0-5 V, 0-10 V electronic control interface for connection to process sensors, PLC and PC control systems.
- Rugged, anodized aluminum enclosure is suitable for wall mounting or bench top installations.
- Includes tubing, fittings, and configuration instructions for Smooth-flo operation.
- Universal Power Input accepts 100-240 VAC 50/60 Hz.

VMP OEM Electronic Variable Displacement & Variable Speed Dispense System

- Independently control both stroke rate and displacement volume.
- Forward, Reverse, Suck-back, & Quick Prime all adjustable.
- Up to 100 customer designed programs let you change setups on the fly for different applications.
- 3 different pump head sizes dispense volumes of 0.01 to 0.320 ml/disp, 0.05 to 0.720 ml/disp or 0.10 to 1.28 ml/disp @ dispense speeds from 1 to 400 dispenses/min are achievable.
- Touch Screen Interface (TSI) provides intuitive setup of all fluid control parameters and communicates with up to 16 pump drives simultaneously.
- RS232 and RS485 interface enables simultaneous computer or PLC control of up to 128 pump modules FMI's Patented CeramPump® No-Valve Design.

TSI Touch Screen Interface

Provides quick and easy programming of VMP products and can control up to 16 individual VMP Pump drives. It is capable of programming volume, speed, dwell, number of dispenses and provides up to 100 customer designed programs /pump system.



PDS100 SFSTH

Dimensions:

7 1/4" x 5 1/8" x 6 1/4" wide
182 mm x 128 x 159 mm

Electrical:

RS485, 4-20mA, 0-10V, 0-5V
interface for connection to
process sensors, PLC and
PC controllers



VMP OEM

Dimensions:

8.97" x 3.0" x 4.44"
(228 x 76 x 113 mm)

Shipping weight : 4 lbs



TSI





Lab-OEM-Production

Ideal for Prototyping



STRH

Precision Adjustment Stepper “STRH”

- Meter, Dispense, Aspirate, Flush.
- Precision RH adjustable pump with stepper motor.
- Valveless, Reversible, Self priming.
- Ceramic and fluoro-carbon, low dead-volume fluid path.
- Ideal for Prototyping.
- Optical Sensor.

MAX. Dispense Rates	Complete Pump Assembly	Wetted Parts	Price
Microliters / Revolution			
0 - 25 µl	STRH00CKCLF	Ceramic PVDF	
0 - 50 µl	STRH0CKCLF		
0 - 100 µl	STRH1CKCLF		



SMTRH

Sub-Microliter “SMTRH”

- 500 nL to 25 µl per dispense.
- Meter, Dispense, Aspirate.
- Valveless, Reversible, Self Priming.
- Ceramic and fluoro-carbon, low dead-volume fluid path.
- Optical Sensor.



SCST-01

FMI Stepper Control Kit “SCST-01”

- Quick start control for all FMI stepper pumps
- Stroke rate to 1200 RPM maximum
- 7 dispense modes
- 0 - 5 VDC input control
- Automatic current reduction
- Stall detection & restart
- Easy hook-up
- Small size (board only 3 1/2” x 3 1/4” x 1 1/4” high)
- Forward / reverse, dispense/aspirate function.

KIT SCST-01 includes:
Power supply, cables and controller.

Intelligent Stepper Development Kit “ICST01”

- Ideal for R&D and Prototyping.
- Complete Development Kit provides the ultimate in programming flexibility.
- Four "Pic-n-Run" ready-to-go programs or create your own.
- Control forward, reverse, speed, purge, suck-back, ramp up/down, profile, inputs, outputs and more.



ICST01



Lab-OEM-Production

STQP & ST2 Duplex Pumps



Adjustable High Flow Stepper Pump “STQP”

- Precision, variable displacement “Q” Pump with integral stepper motor.
- Accommodates all “Q” style pump heads and RH pump heads (with RH/Q adaptor).
- Ideal for OEM applications where accurate & frequent displacement changes are expected.
- Available in ST2QP Duplex Ratio:Matic® configurations.
- Ideal for prototyping.
- Can be driven by FMI’s SCST-01, ICST01, or a variety of commercially available stepper driver boards.



STQP

Low Flow Ratio:Matic® Duplex Stepper Pumps “ST2RH”

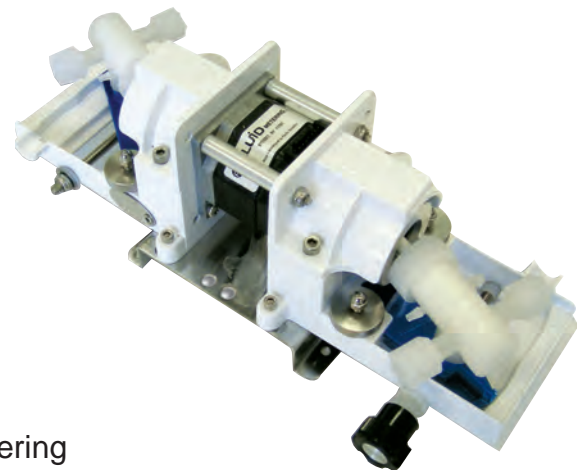
- Dual, variable displacement RH pumps with integral stepper motor.
- Each pump head is independently variable using an easy-grip flow ring graduated in 450 divisions.
- Ideal for proportional or dual channel dispensing & metering applications which require frequent and accurate displacement changes.
- Accommodates all RH low flow pump head sizes.
- Can be driven by FMI’s SCST-01, ICST01, or a variety of commercially available stepper driver boards.
- For dispenses down to 2 ul per dispense up to 100 ml/min continuous metering.



ST2RH

High Flow Ratio:Matic® Duplex Stepper Pumps “ST2QP”

- Dual, STQ high flow pump heads for proportional metering using a single stepper motor.
- Each pump head displacement is independently adjustable.
- Ideal for proportional, as well as dual channel dispensing and metering.
- Accommodates all combinations of “Q” pump sizes.
- Can be driven by FMI’s SCST-01, ICST01, or a variety of commercially available stepper driver boards.
- For single shot dispensing up to 1.28 mL and continuous metering up to 1.5 L/min or double this capacity by combining both pump heads.



ST2QP





“PiP” Precision Dispensers

For Pipetting, Syringing and Diluting



- Ideal for repetitive and volumetric dispensing of acids, solvents and aqueous solutions.
- Features FMI’s unique low dead-volume pump heads, and synchronous motor drives.
- Can act as a single shot dispenser using the hand/foot switch or as a single metering pump in the continuous mode.
- Using a combination of forward and reverse modes, dilutions can easily be accomplished.

PiP

Dimensions:

5" x 5" x 4" wide
(127 x 127 x 102mm)

Shipping weight:

5 lb (2.25 kg)

Electrical:

115 VAC, 60 Hz, 1Ø, .08 amps,
150, 300, 600 RPM with 3 prong
power cord.

PiP Pumps micro π-petter®

MAX. Dispense Rates	Complete Pump Assembly	Price
Microliters / Revolution		
0 - 25 µl	PIP00SKY	
0 - 50 µl	PIP0CKC	
0 - 100 µl	PIP1CKC	



Pump Options
Low Dead-Volume Pump Head (pg 20)
Part Number: -LF
Price:

“IDS” Industrial Dispensers

For Industrial Process Environments

- No Valves to clog, hang up or service.
- Drift-Free accuracy better than ± 1 %.
- Dispense or continuous metering.
- Fixed or variable speed.
- PLC compatible.
- Dispense volume: 0.002 to 1.28 cc/shot up to 7 shots/dispense at 0.5% precision.
- Rugged, stainless steel, splash-proof wall mount design.
- Quick Run Module ready-to-use interface for IDS2000 Series, (not CE)
- For OEM Dispensers (See page 4 for more info)



Drive	+	Pump Head	=	Complete Pump
Example: IDS2000A	+	Q3CKC	=	

IDS2000

IDS 2000 shown with the Quick Run Module

Dimensions:

11.4" x 5.2" x 4.3"
(290 x 132 x 109 mm)

Shipping weight:

10 lb (4.5 kg)

Electrical: Power Input: 24-32 VDC, 2+ amps Drive Speed (RPM). Field selectable presets from 10 to 1200 RPM Analog 0-5 VDC input control from 6 - 1200 RPM Protection: Internal 2.5 Amp replaceable plug in fuse. Connection: 6 ft. shielded cable with connector.

IDS PDM (PUMP DRIVE MODULE)

MAX. Flow Pressure	Pump Drive Module	Piston Size Code	* Complete Pump
ml /Revolution			
.025 ml	IDS2000ARH	RH00	
.05 ml		RH0	
.10 ml		RH1	
.08 ml	IDS2000A	Q0	
.32 ml		Q1	
.72 ml		Q2	
1.28 ml		Q3	

*TC, WT & SMTRH pump heads are not included

Quick Run Module Foot Switch, Power Supply on/off - Dispense/ Continuous Control for IDS2000

Part Number# 400438



CHLORITROL™ “CL”

Valveless Chlorine Injection Pump System



New

New Patented Technology

The Pump that Never Loses Prime!

The Chloritrol™ is the solution for Sodium Hypochlorite injection. Totally new patented technology and field tested, perfect for high and low demand situations

- No valves to service.
- No loss of prime from out-gassing.
- Ability to prime against line pressure.
- Months of “no touch” service = fast payback.

Unique Valveless Duplex pump design—a high pressure pump for Sodium Hypochlorite injection and special RO (Rotating Oscillating) pump for gas/vapor removal, eliminates “Airlock” and prime loss. Provides long term, drift free chlorine control without priming issues, gaslock, valve problems or short life of tubing pumps.

Flow rate is controlled by FMI’s Model V300 Variable Flow Controller:

The V300 Controller provides an ideal user interface for both manual and electronic flow control of the Chloritrol™. For additional information regarding the features of the V300, see page 3.

- Flow Range from 0 to 9 GPH
- Manual 4-20mA, 0-5 VDC, 0-10 VDC input control
- Universal 100-240 VAC power input



Chloritrol™ CL1

Dimensions:
15 1/2" x 13 3/8" x 6 3/4"
(mm x mm x mm)

Shipping weight:
18.6 lbs. (8.4 kg.)

Electrical:
0-90 VDC source from the V300 or customer supplied voltage controller.

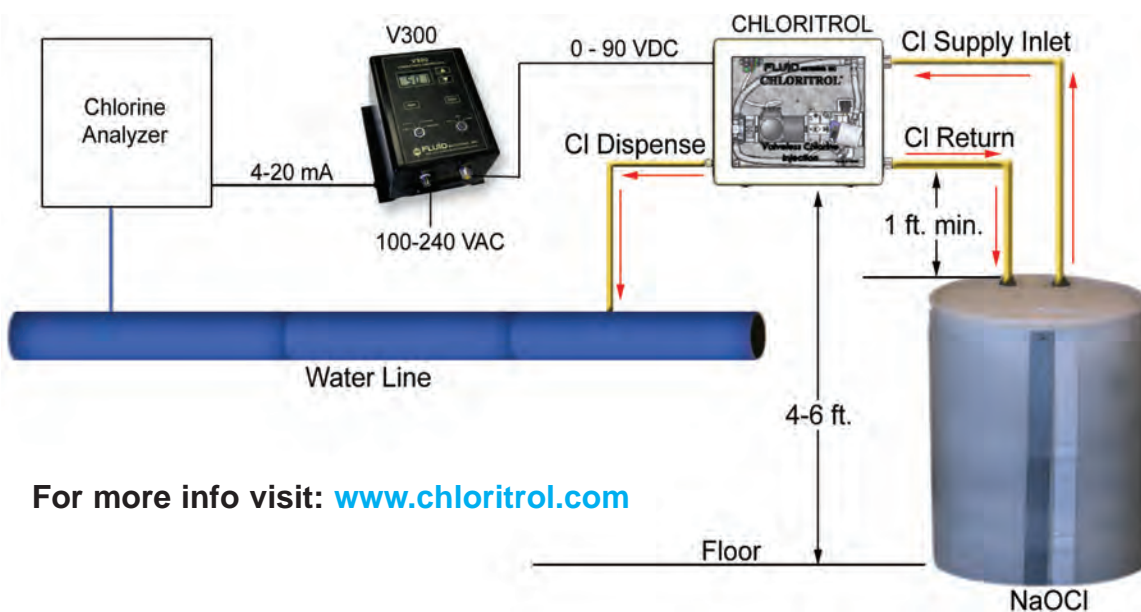
Electrical supply wiring should be 3 conductor, minimum 22 AWG.

Enclosure: NEMA 4X
Fiberglass with view window.



V300

Typical Instalation



LIVE ONLINE HELP

>> Chat live online with an application expert.

FLUID METERING, INC.

Have questions?
Chat live with an FMI application specialist at www.fmipump.com

For more info visit: www.chloritrol.com





“QD” High Speed - High Flows

For General Lab and Industrial Use



QD



- No Valves to clog, hang up or service.
- Ceramic and fluorocarbon standard wetted materials.
- One Moving Part - Piston.
- Drift-Free accuracy better than $\pm 1\%$.
- Flow rate infinitely adjustable from 0 to 2208 ml/min in either direction.
- Convenient multi-position tilt stand for wall or counter mounting.
- Rugged, long life, fan cooled, thermally protected, ball bearing motor.

Example: Drive QD + Pump Head Q3CKC = Complete Pump

QD PDM (PUMP DRIVE MODULE)

MAX. Flow/Pressure				PDM	Piston Code	Drive Price
ML/MIN	GAL/HR	PSIG	BAR			
43.13	0.681			QD	RH00	
86.25	1.3				RH0	
138.0	2.1				Q0	
172.50	2.7	100	6.9		RH1	
552	8.6				Q1	
1242*	18.9	50	3.45		Q2	
2208*	30.0	25	1.72	Q3		

*See General Specifications note (pg 27)

Drive Options

230 VAC (50 Hz)*

Part Number: -2

Price:

Mounting Base (pg.14)

Part Number: -MB

Price:

Dial Indicator (pg.22)

Part Number: -Q485

Price:

Hazardous Duty (pg.8)

Part Number: QDX

Price:

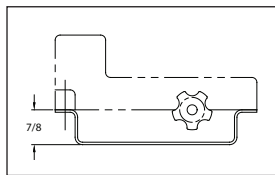
Dimensions:
9 3/4" x 4 3/4" x 5 3/8"
(248 x 121 x 137mm)

Shipping weight:
10 lb (4.5 kg)

Electrical:
115 VAC, 60Hz, 1Ø, 1.25 amps, 1/25 Hp, 1725 RPM, shaded 4 pole, TEFC, sparkless, thermally protected with 3 prong power cord. CE
"Motor is UL recognized"



Q485 Dial Indicator for ultra fine flow adjustment see (pg 22) for more info



“Q” FIXED MOUNTING BASE KIT MB

Sturdy mounting base accessory for “Q” Line metering pumps. Allows pumps to be firmly bolted to surface in horizontal or vertical operating position. Hardware for attaching base to pump and instructions included.

PHM (PUMP HEAD MODULE)

Piston Size Code	Materials of Construction								
	CKC	CKY	CSC	CSY	SAN	SKY	SSY	STY	CTC
RH00									
RH0									
RH1									
Q0									
Q1									
Q2									
Q3									
Wetted Parts	Ceramic PVDF	Ceramic PVDF Carbon	Ceramic 316 SS	Ceramic 316 SS Carbon	Ceramic Teflon	316 SS PVDF Carbon	316 SS Carbon	316 SS Tefzel Carbon	Ceramic Tefzel
MAX.Temp	212° F	212° F	350° F	350° F	350° F	140° F	140° F	140° F	212° F
Options	(add Option Code & cost to Pump Module for complete price and part number)								
LF (pg.20)	N/C	N/C				N/C		N/C	N/C
W (pg.20)									
WT (pg.20)									
TC (pg.30)									
R479 (Pg.22)									
S (“Q” Only)									

*See page 28 "Pump Head Materials Configuration" for additional information.



Direct Current “RHB” Instrumentation Pumps



- 12, 24, 90 VDC motors with close-coupled RH Pump Heads.
- Widely used to inject discrete quantities of additive fluids into main discharge lines of tank trucks and pest control vehicles.
- Ideal for environmental sampling & injection.
- Offers the advantage of mechanical adjustment of stroke length, plus electrical control of stroke rate by voltage variation.
- Extended motor shaft accepts FMI HES/PRS Rotational Sensor or user supplied rotational sensor (see page 20 for more info).



RHB Pumps

MAX. Flow/Pressure			Complete Pump Assembly	Wetted Parts	MAX. Temp	Price
ML/MIN	PSIG	BAR				
65	100	6.90	RHB00SKY	316 SS/PVDF/Carbon	140° F	
130			RHB0CKC	Ceramic / PVDF	212° F	
260			RHB1CKC			

RHB

Dimensions:
8" x 3" x 3" wide
(203 x 76 x 76 mm)

Shipping weight:
7 lb (3.15 kg)

Electrical:
12 VDC, 4 amps, 2600 RPM, totally enclosed, with 6" pigtail leads. Shaft extension: 5/16" dia. x 1" long with flat.

Drive Options
24 VDC (3 amps) for RHB Part Number: -4 Price:

90 VDC (0.41 amps) for RHB
Part Number: -5
Price:

Direct Current “QB” For Mobile, and Remote Applications

- No Valves to clog, hang up or service.
- One Moving Part - Piston.
- Drift Free accuracy better than $\pm 1\%$.
- Offers the advantage of mechanical adjustment of stroke length, plus electrical control of stroke rate by voltage variation.
- Extended motor shaft accepts FMI HES/PRS Rotational Sensor or user supplied rotational sensor (see page 20 for more info).



QB

QB PUMPS: Rated at 1800 RPM (or approximately 8 volts for 12 VDC models.)

Dimensions:
10 1/2" x 5" x 4 1/2" wide
(267 x 127 x 114 mm)
Shipping weight: 8 lb (3.6kg)

Electrical:
12 VDC, 4 amps; 24 VDC, 3 amps
90 VDC, 0.41 amps, totally enclosed with 6" pigtail leads. Shaft extension: 5/16" dia. x 1" long with flat.

Example: Drive QB + Pump Head Q1CKC = Complete Pump

QB PDM (PUMP DRIVE MODULE)

MAX. Flow/Pressure			PDM	Piston Code	Drive Price
ML/MIN	PSIG	BAR			
45	100	6.90	QB	RH00	
90				RH0	
144				Q0	
180	RH1				
576*	70	4.38		Q1	
1296*	30	2.07		Q2	
2304*	25	1.72	Q3		



Drive Options

Dial Indicator (pg.22)

Part Number: -Q485

Price:

Mounting Base (pg.14)

Part Number: -MB

Price:

90 VDC (0.41 amps)

Part Number: -5

Price:

*See Page 27 for General Specification notes





“QG” Low Speed - Low Flows

For General Lab and Industrial Use

- No Valves to clog, hang up or service.
- One Moving Part - Piston.
- Drift-Free accuracy better than $\pm 1\%$.
- Can be combined with all RH and Q Pump Head Modules.
- Flow rate infinitely adjustable from 0 to maximum in either direction.



QG6,20



Dimensions:
10 3/4" x 4 7/8" x 5 3/4" wide
(273 x 124 x 146 mm)
Shipping weight:
10 lb (4.5kg)

Electrical:
115 VAC, 60 Hz, 1Ø, 1 amp,
6, 20 RPM,
shaded 2 pole, enclosed
ventilated, thermally
protected, with 3 prong
power cord - UL, CE.



Q485 Dial Indicator for
ultra fine flow adjustment
(see pg 22) for more info



Rotational Sensors
(see pg 20 for more info)

LIVE ONLINE HELP

>> Chat live online with an application expert.

Have questions?
Chat live with an FMI
application specialist at
www.fmipump.com

	Drive	+	Pump Head	=	Complete Pump
Example:	QG6	+	Q1CSC	=	

QG PDM (PUMP DRIVE MODULE)

MAX. Flow/Pressure				PDM	Piston Code	Drive Price
ML/MIN	GAL/HR	PSIG	BAR			
0.15	.002	100	6.90	QG6	RH00	
0.30	.004	100	6.90		RH0	
0.48	.007	20	1.38		Q0	
0.60	.009	100	6.90		RH1	
1.92	.030	75	5.17		Q1	
4.32	.068	50	3.45		Q2	
7.68	.119	25	1.72	Q3		
0.50	.007	100	6.90	QG20	RH00	
1.00	.015	100	6.90		RH0	
1.60	.025	20	1.38		Q0	
2.00	.031	100	6.90		RH1	
6.40	.101	50	3.45		Q1	
14.40	.227	40	2.76		Q2	
25.60	.399	25	1.72		Q3	



Drive Options
230 VAC (50/60 Hz)* Part Number: -2 Price:
24 VAC (50/60 Hz)* Part Number: -3 Consult Factory
Mounting Base (pg.14) Part Number: -MB Price:
Dial Indicator (pg.22) Part Number: -Q485 Price:

*Flow Rates are reduced approximately 18% when operating on a 50 Hz electrical supply.

PHM (PUMP HEAD MODULE)

Piston Size	Materials of Construction									
	Code	CKC	CKY	CSC	CSY	SAN	SKY	SSY	STY	CTC
RH00										
RH0										
RH1										
Q0										
Q1										
Q2										
Q3										
Wetted Parts	Ceramic PVDF	Ceramic PVDF Carbon	Ceramic 316 SS	Ceramic 316 SS Carbon	Ceramic Teflon	316 SS PVDF Carbon	316 SS Carbon	316 SS Tefzel Carbon	Ceramic Tefzel	
MAX.Temp	212° F	212° F	350° F	350° F	350° F	140° F	140° F	140° F	212° F	
Options	(add Option Code & cost to Pump Module for complete price and part number)									
LF (pg.20)	N/C	N/C				N/C		N/C	N/C	
W (pg.20)										
WT (pg.20)										
TC (pg.30)										
R479 (Pg.22)										
S ("Q" Only)										

*See page 28 "Pump Head Materials Configuration" for additional information.



Low Speed - Low Flows "QG"

For General Lab and Industrial Use



- A choice of five different drive speeds.
- Ceramic and fluorocarbon standard wetted materials.
- Long-life, fan cooled, thermally protected, ball bearing gear motors.
- Convenient multi-position tilt stand for wall or counter mounting.

QG PDM (PUMP DRIVE MODULE)

MAX. Flow/Pressure				PDM	Piston Code	Drive Price
ML/MIN	GAL/HR	PSIG	BAR			
1.25	.019	100	6.90	QG50	RH00	
2.50	.039				RH0	
4.00	.063				Q0	
5.00	.079				RH1	
16.00	.252				Q1	
36.00	.568	25	1.72	QG150	Q2	
64.00	.998				Q3	
3.75	.059				RH00	
7.50	.118				RH0	
12.00	.189				Q0	
15.00	.237	100	6.90	QG400	RH1	
48.00	.758				Q1	
108.00	1.706				Q2	
192.00	2.995				Q3	
10.00	.158				RH00	
20.00	.316	RH0				
32.00	.505	Q0				
40.00	.632	100	6.90	QG400	RH1	
128.00	2.022				Q1	
288.00*	4.550				Q2	
512.00*	7.987				Q3	



Drive Options

230 VAC (50/60 Hz)*

Part Number: -2

Price:

24 VAC (50/60 Hz)*

Part Number: -3

Price:

Mounting Base (pg.14)

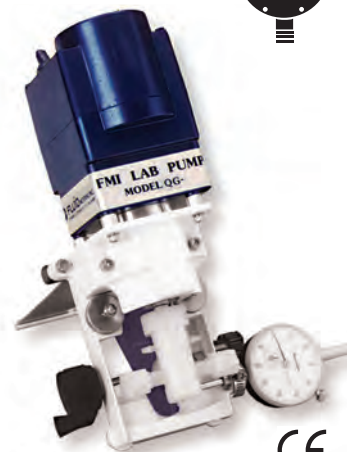
Part Number: -MB

Price:

Dial Indicator (pg.22)

Part Number: -Q485

Price:



QG50,150,400

Dimensions:

10 3/4" x 4 7/8" x 5 3/4" wide
(273 x 124 x 146 mm)

Shipping weight:

10 lb (4.5 kg)

Electrical:

115 VAC, 60 Hz, 1Ø, 1 amp,
50, 150, 400 RPM, shaded 2
pole, enclosed ventilated,
thermally protected, with 3
prong power cord - UL, CE.

*See Page 27 for General Specification notes

PHM (PUMP HEAD MODULE)

Piston Size Code	Materials of Construction								
	CKC	CKY	CSC	CSY	SAN	SKY	SSY	STY	CTC
RH00									
RH0									
RH1									
Q0									
Q1									
Q2									
Q3									
Wetted Parts	Ceramic PVDF	Ceramic PVDF Carbon	Ceramic 316 SS	Ceramic 316 SS Carbon	Ceramic Teflon	316 SS PVDF Carbon	316 SS Carbon	316 SS Tefzel Carbon	Ceramic Tefzel
MAX.Temp	212° F	212° F	350° F	350° F	350° F	140° F	140° F	140° F	212° F
Options	(add Option Code & cost to Pump Module for complete price and part number)								
LF (pg.20)	N/C	N/C				N/C		N/C	N/C
W (pg.20)									
WT (pg.20)									
TC (pg.30)									
R479 (Pg.22)									
S ("Q" Only)									

*See page 28 "Pump Head Materials Configuration" for additional information.



PD-60-LF

Pulse Damper Accessory
(see pg 22) for more info.

LIVE ONLINE HELP

>> Chat live online with an application expert.



FMI FLUID METERING, INC.

Have questions?
Chat live with an FMI
application specialist at
www.fmipump.com





“QBG” Low Current DC

Ideal for extended 12/24 volt battery operation in remote locations. They are rated 60 RPM at 12 VDC and 120 RPM at 24 VDC.



QBG

Dimensions:
9 3/4" x 5 1/4" x 6 3/4" wide
(246 x 135 x 171 mm)

Shipping weight:
7 lb (3.15kg)

Electrical:
12/24 VDC, 60-120 mA
(depending on load), with 6" pigtail leads.

Example: Drive QBG + Pump Head Q1CKC = Complete Pump

QBG PDM (PUMP DRIVE MODULE)

MAX. Flow/Pressure			PDM	Piston Code	Drive Price
ML/MIN	PSIG	BAR			
1.5	60	4.1	QBG	RH00	
3.0				RH0	
4.8				Q0	
6.0	RH1				
19.2	30	2.07		Q1	
43.2	20	1.38		Q2	
76.8	10	0.70		Q3	

Drive Options
Dial Indicator (pg. 22) Part Number: -Q485 Price:
Mounting Base (pg. 14) Part Number: -MB Price:

Note: Flow rates shown for QBG are based on 12 VDC, 60 RPM operation.

“RHSY” Synchronous Pumps

The Ultimate in Low Flow Metering Accuracy

- Drift-Free accuracy better than ± 1 % independent of load variations or fluctuations in line voltage.
- Compact design “RH” pump with synchronous motor assembly.
- Micrometer-like fine adjustment using an easy grip flow control ring graduated in 450 divisions.
- Choice of 150, 300, and 600 RPM through a simple and safe belt arrangement change.
- Forward-Off-Reverse switch for instant flow direction control.
- Available with low dead volume pump head and low flow tubing kit.



RHSY CE

Dimensions:
5" x 5" x 4" wide
(127 x 127 x 102 mm)

Shipping weight:
4 lb (1.8kg)

Electrical:
115 VAC, 60 Hz, 1Ø, .08 amps,
with 3 prong power cord, CE.

RHSY Pumps

MAX. Flow/Pressure			Complete Pump Assembly	Wetted Parts	MAX. Temp	Price
@150 RPM ml/min	@300 RPM ml/min	@600 RPM ml/min				
3.75	7.5	15	RHSY00SKY	316 SS / PVDF / Carbon	140° F	
7.5	15.	30	RHSY0CKC	Ceramic / PVDF	212° F	
15.	30.	60	RHSY1CKC			

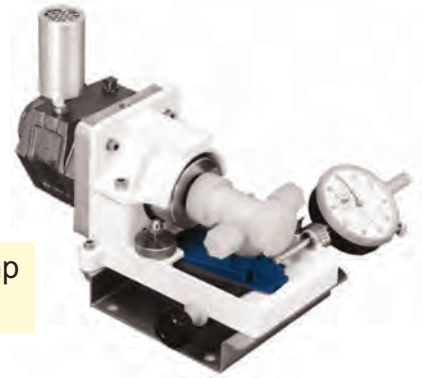
Drive Options
230 VAC (50Hz.,.04 amp) * Part Number: -2 Price:

*Flow Rates are reduced approximately 18% when Pump Drive Module is operating on a 50 Hz electrical supply.



Pneumatic "PD" For Non-Electric Operation

- Provides a compact, variable speed, air powered drive.
- Ideal power alternative when electrical power source not available.
- SPD** up to 1800 RPM.
- GPD** up to 400 RPM.



Example: Drive + Pump Head = Complete Pump
SPD + Q1CKC =

SPD PDM (PUMP DRIVE MODULE)

MAX. Flow/Pressure			PDM	Piston Code	Drive Price
ML/MIN	PSIG	BAR			
45	100	6.90	SPD	RH00	
90					
144					
180					
576	70	3.45		RH1	
1296	50			Q1	
2304	25		1.72	Q2	
			Q3		



Drive Options
Dial Indicator (pg. 22) Part Number: -Q485
Price:
FMI Pulse Dampener (pg. 21) Part Number: "58003"
Price:

SPD
GPD

Dimensions:
8" x 3" x 3" wide
(203 x 76 x 76 mm)

Specification:
SPD: Air requirements
9-10 CFM at 40 psig.
Air Inlet size: 1/8" (F) NPT.

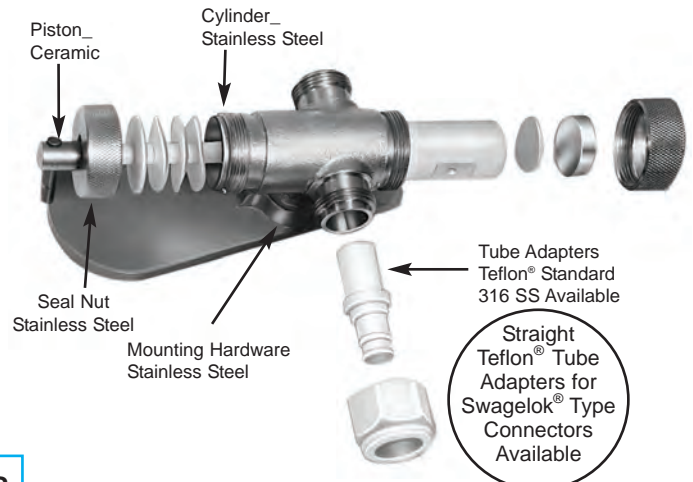
GPD: Heavy-duty gear box
Air requirements:
14-16 CFM at 40 psig.
Air Inlet size: 1/8" (F) NPT
Shipping weight: 9 lb (4.05 kg).

*See Page 27 for General Specification

Options

Sanitary Pump Heads "SAN"

- Ideal for accurate and dependable handling of discrete fluid streams in sanitary applications.
- No internal threads or blind holes to harbor bacterial growth.
- Easily dismantles for scrubbing, brushing, & sterilization
- 316 SS and Teflon® fluid surfaces highly resistant to chemical & biological attack.
- Ideal for Food, Dairy, Brewery, Pharmaceutical, & Biotech applications.



ALL STAINLESS STEEL VERSION AVAILABLE WITH SS PORT NUTS, TUBE ADAPTERS & CARRIER -"SAN-S"

SAN-S

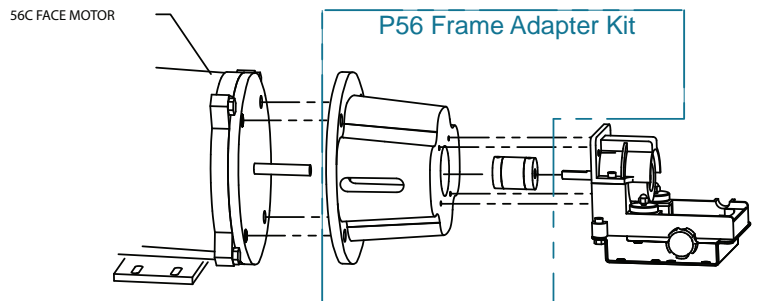
DESIGNED FOR QUICK DISASSEMBLY FOR MAXIMUM CLEANING

Adapter Kit "P56C"

- Adapter Kit for easy hook-up to your NEMA 56C FACE Foot Mount motor.
- Requires Pump Drive Module QP
- Kit includes adapter, coupling and hardware

Shipping Weight: 4 lb (1.80 kg)

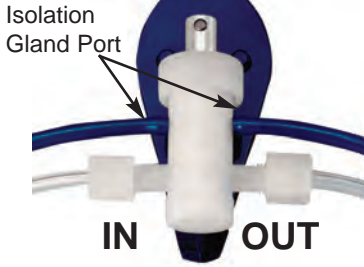
P56C





Options

“W”, “WT” Isolation Gland Pump Head Modules



- For saline, slurries, abrasives, particulates, anaerobics, and crystal forming fluids.
- Isolates main pumped fluid from seal area and atmosphere.
- 2 extra ports for Gland “Barrier” liquid or gas.
- For Q1/Q2CKC, Q3CKC, CKC-LF, & CSC Pump Head Modules.

CKCW

Pump Heads “LF”



- For low flow (under 50 ml/min), and Zero Dead Volume Applications.
- Direct connection to 1/4-28 low flow fittings.
- RH-LF & Q-LF* pump heads feature integrally molded 1/4-28 female low dead volume ports. This allows for quick connections to 1/16” or 1/8” O.D. micro bore tubing and fittings such as FMI Q661 (pg 21).
- Add suffix “LF” after Pump Head configuration.

Q-LF

RH-LF

* polypropylene case

Hall Effect Sensor



Proximity Type Rotational Sensor

PART NO.	FORM	CONTACT RATING	MAX RPM
PRS-1	SPST-N.O.	10 Watts, Max.	1000

Life: 50 Million Operations at 5 VDC, 10 mA

PRS-1

Hall Effect Electrical Specification

PART NO.	Supply Voltage (VDC)	Supply Current (mA max.)	Output Type	Output Voltage (V)	Output Current (Max.)	6" Leadwires
HES-6	4.5 TO 24	10.0	Sink	0.4	40mA	22 gauge teflon insulated

Life: Indefinite

HES-6

Accessories

FMI Masterflex® Kits **QP/M** & **RH/M**

Enhance your Existing Masterflex Pump Drives

- Move to state-of-the-art valveless piston technology.
- Extend operating pressure to 100 psig.
- Improve your long term accuracy to better than $\pm 1\%$.
- Add precise mechanical flow adjustment to your L/S™ drives.
- Ceramic and fluorocarbon standard wetted materials.
- Installs in minutes to your L/S™ standard pump head, L/S™ EASYLOAD™ pump head, or directly to any L/S™ drive
- Flow rates from microliters to 768 ml/min.

QP/M

Masterflex - Reg TM of Cole-Parmer Instrument Co.
L/S - Reg TM of Cole-Parmer Instrument Co.
EASY-LOAD - Reg TM of Cole-Parmer Instrument Co.

KIT # QP/M



Accessories



“Q661” Small Bore Tubing Kit

1/4-28 Fittings and 1/16”, 1/8” O.D. Teflon Tubing

Designed for all LF Pump Heads and to complement the FMI R479, R412-5K, and PD-60-LF, the Small Bore Tubing Kit has a flangeless design that eliminates the need for special tools and assures leak-free, zero dead-volume connections. They provide Tefzel® and Teflon® wetted surfaces.



Q661

Kit Q661 - 1/16” & 1/8”

Contains Both Q661A and Q661B

Kit Q661A - 1/16”

10’ - 1/16”O.D. x 1/32” I.D. TFE Tubing
10 - Delrin Nuts (Black)
10 - Tefzel Ferrules (Blue)

Kit Q661B - 1/8”

10’ - 1/8”O.D. x 1/16” I.D. TFE Tubing
10 - Delrin Nuts (Green)
10 - Tefzel Ferrules (Yellow)

Kit Q661C - 1/8”

10’ - 1/8”O.D. x 1/16” I.D. TFE Tubing
10 - Teflon Nuts (White)
10 - Tefzel Ferrules (Yellow)

Low Flow Barb Adapters for 1/16” and 1/8” I.D. Tubing

Threaded 1/4-28 UNF Fitting to Kynar Barb Bottom sealing, rotating adapters consisting of a white nylon 1/4-28 fitting with 5/16” hex nut and Kynar (fluid path) insert barb.



#110873A for use with 1/8” (3.2 mm) I.D. tubing. Pkg. of 10



#110874A for use with 1/16” (1.6 mm) I.D. tubing. Pkg. of 10

“PD-HF” In-Line Pulse Suppressor

(For High Flow Applications)

New InLine Pulse Suppressor for high flow systems of 50 ml/min or greater and stroke rates higher than 150 against head pressures of 10 to 65 psig. Unique encapsulated polyethylene bellows design that eliminates tubing vibrations and cavitation problems. Easy to connect 1/4” compression fittings. Best results achieved when installed on both suction and discharge lines.



Model PD-HF

PD-HF

Corrugated Teflon® Tubing Pulse Suppressor

(For High Flow Applications)

Highly flexible no kink tubing for high flow, 50 ml/min or greater, high pressure (100 psig) applications. Eliminates cavitation and mechanical stress. Best results when used on both suction and discharge lines. Slips over 3/8” barbed fitting. 3/8”I.D.x12” long

#58003



Tubing Adapters

(For Plastic Case Pump Heads)

The integrally molded port fittings on the standard FMI Type K pump heads accept all 1/4” O.D. tubing. For other tubing arrangements, special port adapters are required.

#R412-0K	Adaptor for 1/8” I.D. Tubes
#R412-1K	Adaptor for 1/4” I.D. Tubes
#R412-2K	Adaptor for 3/8” I.D. Tubes
#R412-6K	Adaptor for 1/2” I.D. Tubes
#R412-5K	Adaptor for 1/4-28 ferrule fittings
#H476K	Adaptor for 1/8” O.D. Tubes
#110949	Adaptor for 6 mm O.D. Tubing





Accessories

“R479” Low Flow Isolation Kit



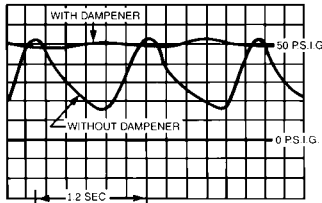
- Low flow adapter for stainless steel "Q" pump heads (except SAN).
- Isolates stainless steel cylinder case from process fluid for maximum chemical inertness.
- 1/4-28 female thread provides minimal system dead volume.
- Typically used with FMI "Q661" Small Bore Tubing Kit.
- Ideal for chromatography applications when used with "PD-60-LF" Pulse Dampener.
- For flows up to 50 ml/min and pressures to 100 psig.

R479

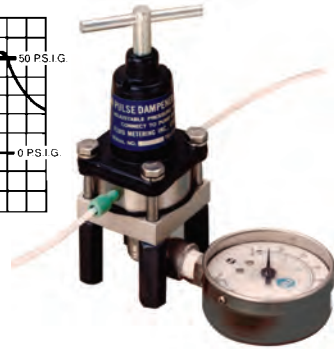
R479 Kit for LOW FLOW APPLICATIONS (Replaces R412, when used)

#R478 Consists of ten spare ferrules

Kit #R479 Consisting of four ferrules, two adapters & assembly/removal tools



Actual Recorded Pulse Pattern of an FMI LAB PUMP with and without the PD-60-LF



“PD-60-LF” Pulse Dampener

- Provides pulseless flow for low flow metering applications
- Suppresses approximately 90% of pulse magnitude.
- Corrosion resistant 316 SS and Teflon® wetted surfaces.
- Excellent reduction of baseline drift & noise in feeding low pressure LC systems.
- For flows up to 50 ml/min & stroke rates up to 150 RPM against head pressures of 10 to 65 psig.
- Accepts standard 1/4-28 low flow tubing accessories.
- Includes isolated pressure gauge.

PD-60-LF

PD-60-LF

“RH/Q” Adapter



“RH/Q” Adapter

- Adds versatility to your RH pump head by adapting it to any "Q" pump drive.
- Simple installation of adapter to RH pump head using only 3 screws.
- Pump assembly can easily be slipped onto the Drive Module in seconds without tools.

RH/Q

Kit #RH/Q

“Q485” Dial Indicator Kit



- Ultra-precise flow adjustment for "Q" pumps.
- Responds to the slightest adjustment of the "Q" pump adjusting knob.
- Each increment on direct reading dial represents 1/1000 of maximum flow.
- Easily attaches to all "Q" Pump bases.
- Can be ordered with pump or separately.

Q485

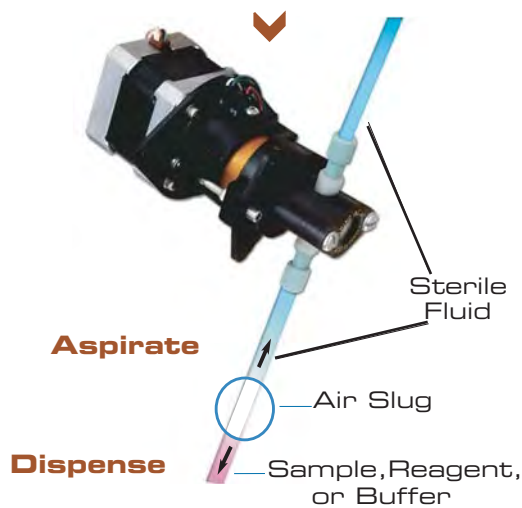
Kit #Q485



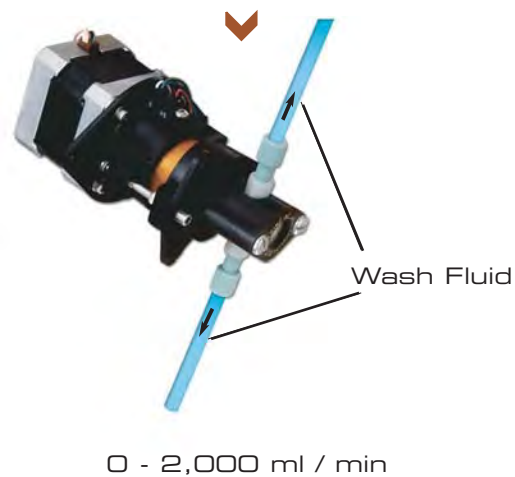
One Dispenser / Pump For all your Applications



Valveless Syringing Aspirate & Dispense



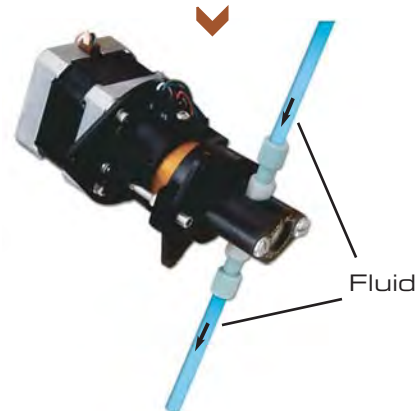
Fast Prime Flush & Wash



Continuous Dispensing



Continuous Metering



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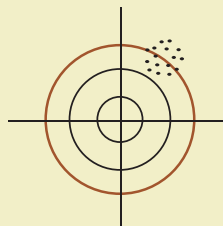
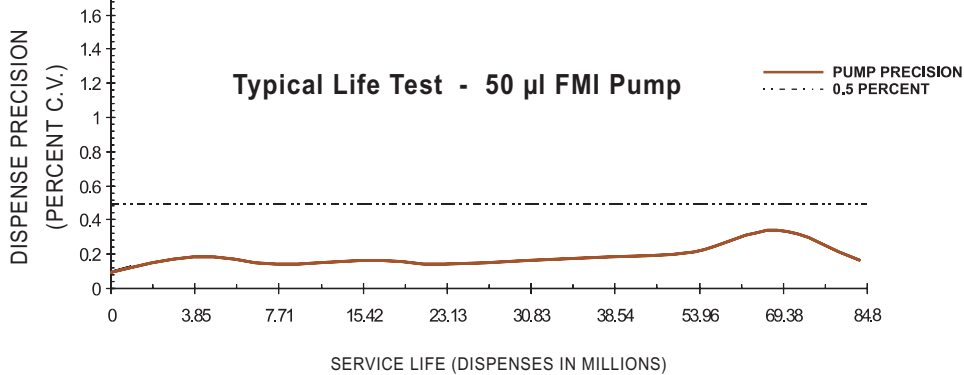
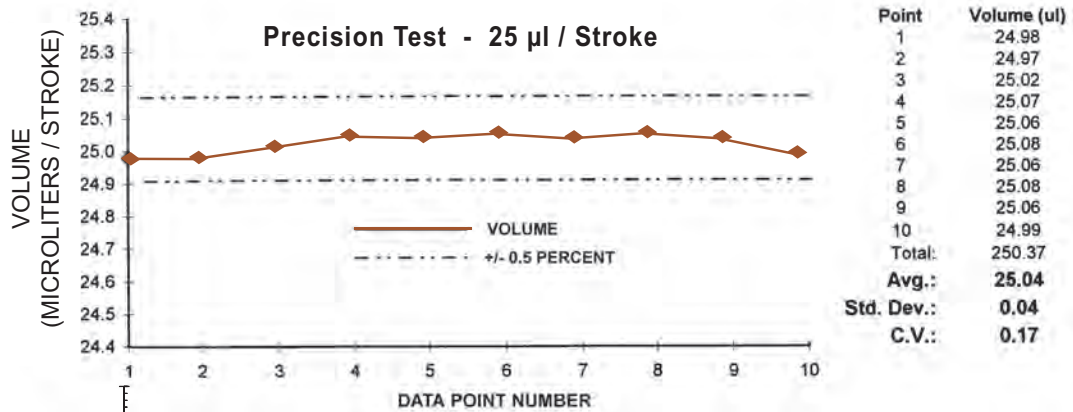
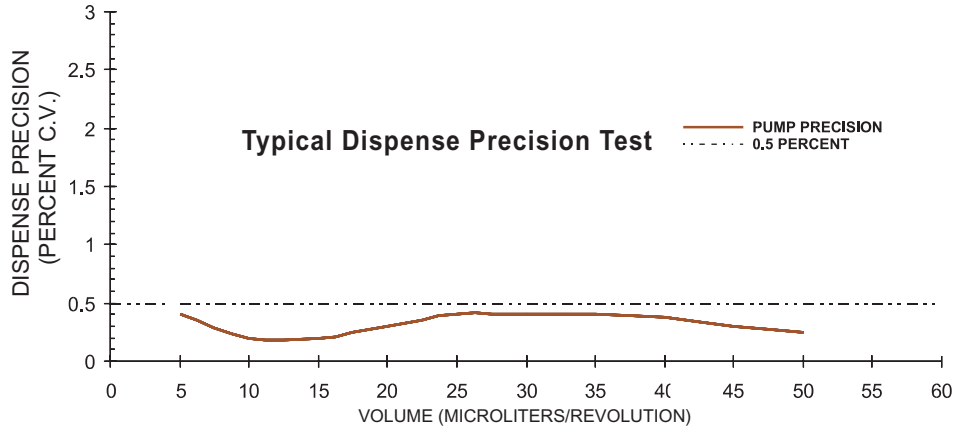
FMI FLUID METERING, INC.

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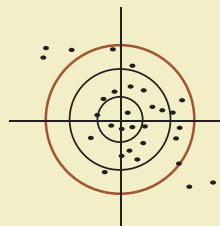




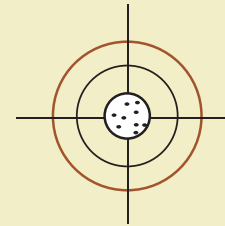
"H" Style Pump Typical Flow Data



Precision
Repeatability and degree of variation of a set of values



Accuracy
How close the average value is to the true value



FMI Pumps
Accuracy: 1%
Precision: 0.5% (% C.V.)

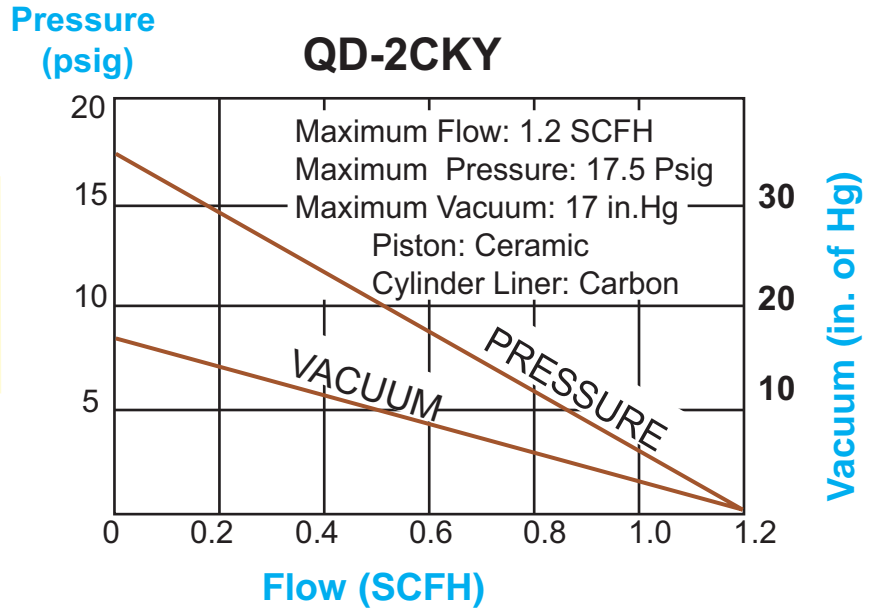


“Q” Typical Performance Curves

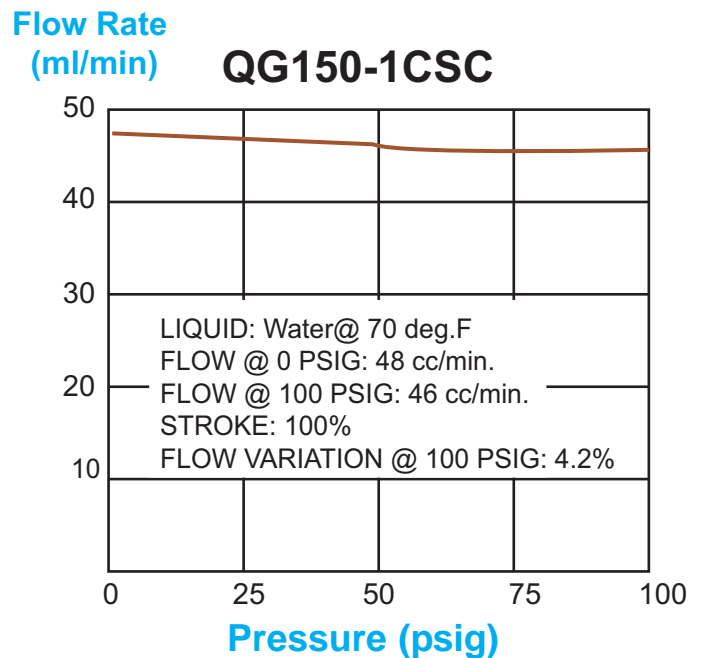
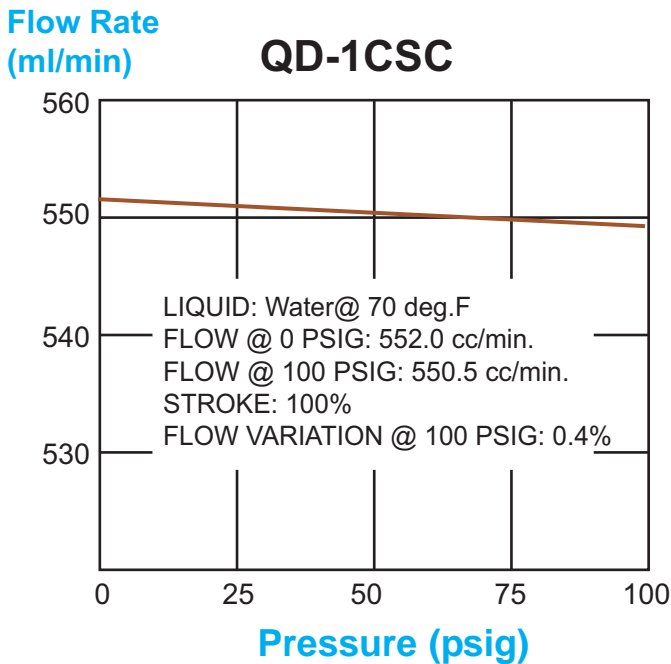


Performance curves shown below are applicable to the new “Q” line of metering pumps.

Performance Curve shown represents a test run on an FMI LAB PUMP handling ambient air at 70F with CKY Pump Head Module.



PERFORMANCE FLOW CURVES: Typical flow “curves” for FMI LAB PUMPS with “CSC” pump heads handling water at a pump setting of 100% full stroke. Internal fluid slip (decrease in flow with increased pressure) is least at 100% and increases as stroke displacement is decreased. Always select a pump with maximum output nearest your actual requirement.



*Celebrating 50 years of pump and dispensing knowledge.
 Tell us your needs- we have the answers.*





Valveless Ceramic Dispensers & Metering Pumps Since 1959!

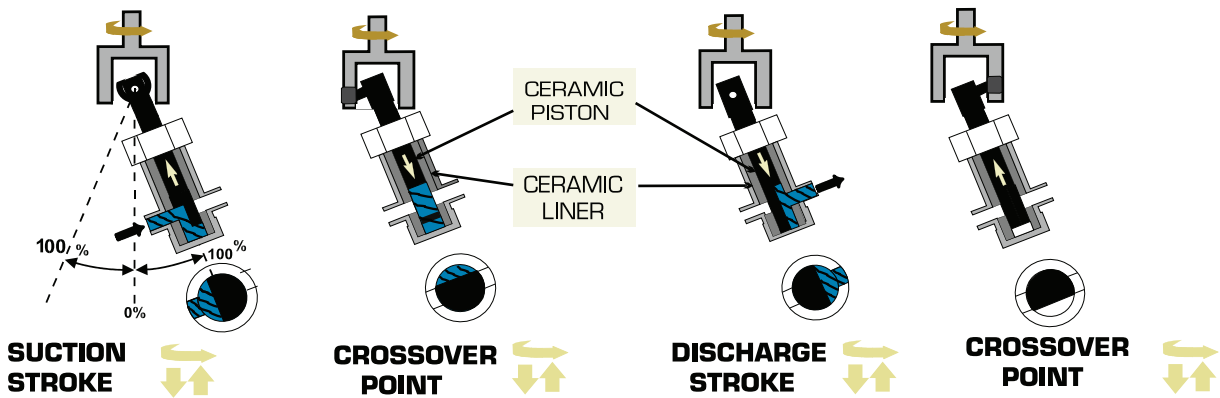
- No Valves, Drift-Free Operation.
- One moving part.
- Accuracy better than $\pm 1\%$.
- Precision Dispensing - CV of 0.5% or better..
- Flow rates from microliters to 4600 ml/min.
- Positive Displacement up to 200 psig.
- Viscosity Independent - Unaffected by viscosity of fluids.
- Millions of Maintenance-Free Cycles.
- Inert, corrosion resistant fluid path - ceramic & fluorocarbon standard.
- Self-priming to 15 feet, vertical lift.
- Instant Reversibility - While running.
- Large Selection of Drives - Fixed, variable, pneumatic, stepper, hazardous duty and OEM.
- Delivery from Stock - No waiting time.

OPERATION

The valveless pumping function is accomplished by the synchronous rotation and reciprocation of the ceramic piston in the precisely mated ceramic cylinder liner.

One complete piston revolution is required for each suction /discharge cycle as shown.

The piston always bottoms for maximum fluid and bubble clearing.



The piston rotates and reciprocates. As the piston is pulled back and the piston flat opens to the inlet port, suction is created and fluid fills the pump chamber. As the piston reaches the highest point in the reciprocation cycle, the pump chamber is now at its maximum volume capacity. Continuing the rotation, the inlet port is then sealed

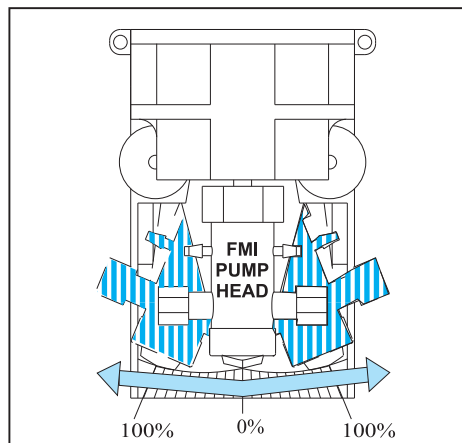
and crossover occurs. As the inlet port is sealed and the pump chamber is full, the outlet port opens up. **Only one port is open at any time and at no time are both ports interconnected.**

Continuing the rotation and reciprocation, the piston is forced down and the piston flat opens to the outlet port. Discharge is created and fluid is pumped out. The piston bottoms for maximum fluid and bubble clearing. Continuing the rotation, the outlet port is then sealed

and crossover occurs. As the outlet port is sealed and the pump chamber is empty, the inlet port opens to start another suction stroke. **Only one port is open at any time and at no time are both ports interconnected.**

EASY FLOW RATE ADJUSTMENT

- Moving the pump head position changes the piston stroke length and, in turn, the flow rate.
- Infinite fine flow adjustments between zero and 100% flow rate.
- Flow rate indicator provides for accurate and simple linear calibration.
- Flow rate can be changed while pump is operating or at rest.



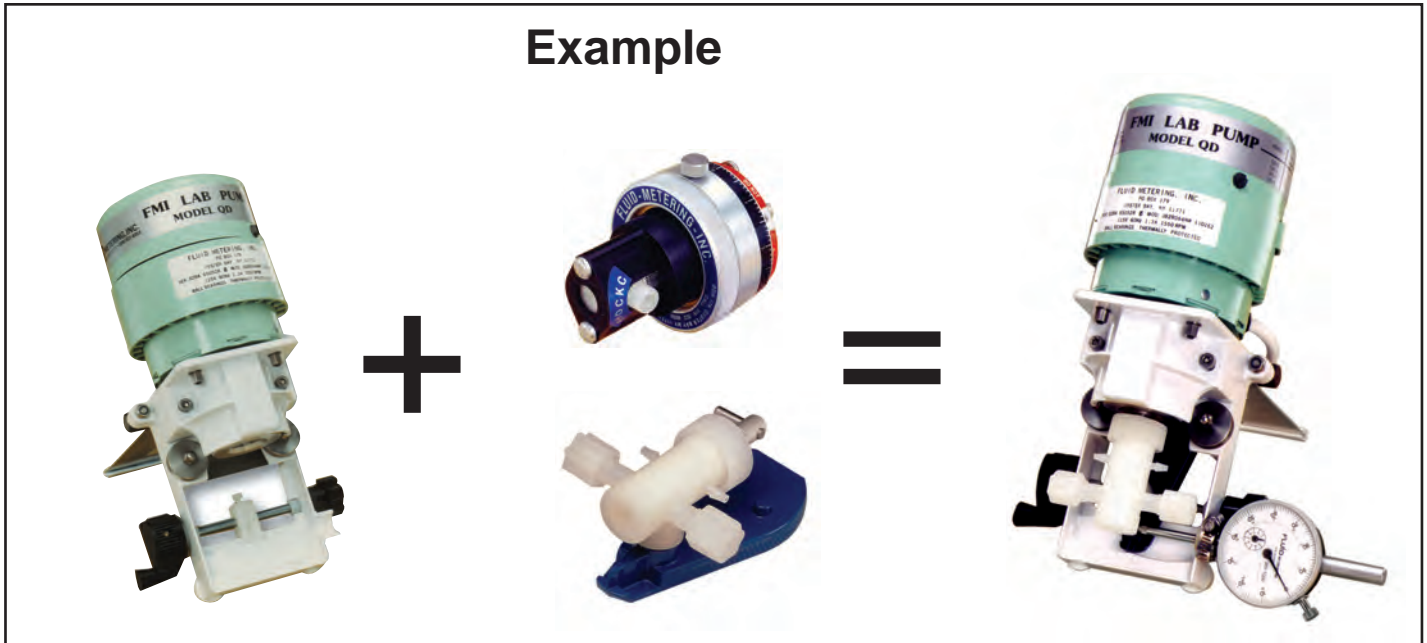
On all FMI pumps, flow rates may be altered when operating or at rest. On the "Q" line this is done by turning the Flow Control Knob which moves the flow rate indicator along a fixed 20 unit scale linearly calibrated "10-0-10". The "10" equals 100% flow rate in that direction, "0" equals zero flow. To improve the fine adjustment of the flow rates on the "Q" line, there is an optional **Dial Indicator Kit Q485** which provides for 1000 discrete settings. The "RH" line flow adjustment is accomplished by turning an easy-grip Flow Control Ring graduated in 450 divisions from 0 to 100% flow.



How To Order



1. Determine your flow rate in ml/min and your pressure requirements in PSIG.
2. Check that the drive power fits your application, i.e. AC, DC, stepper, etc.
3. Check the Piston Size Code for your flow rate and select a Pump Drive Module plus options.
4. Go to page 28 and select a Pump Head Module (PHM) compatible with your fluid and application.



Q PUMP DRIVE MODULE	Q OR RH PUMP HEAD MODULE	COMPLETE PUMP ASSEMBLY
Pump Drive: QD	Pump Head: Q-1CKC	= Total Cost: Pump Drive Modules, Pump Head Modules and options are mounted, tested and shipped as one unit when ordered together.
+Option(s): Q485	Option(s) W	
Cost: _____	Cost: _____	
Pump Drive: _____ \$ _____	Pump Head: _____ \$ _____	
+ Option: _____ \$ _____	+ Option: _____ \$ _____	
Cost: _____ \$ _____	Cost: _____ \$ _____	= Total Cost: \$ _____

Not Sure what you need? Chat with us!

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FLUID METERING, INC.

GENERAL SPECIFICATION NOTES FOR ALL PUMPS*

1. Physical characteristics of your pumped fluid may affect the rating/capacity relationships shown in the performance tables for each FMI unit.
2. The maximum flow rates shown in the tables are for **H₂O** at 2 psig.
3. Flow rates are infinitely variable from zero to maximum capacities shown.
4. Pumping capacities are reduced approximately 18% when the Pump Drive Module is operating on a 50 Hz electrical supply.
5. **Fluorocarbon cylinder cases (Q line only) are rated for a maximum pressure of 60 psig or the lower pressure shown in the charts.**
6. 3/8" I.D. tubing or greater is required for flows higher than 500 ml/min.
7. 1/2" I.D. tubing or greater is required for flows higher than 1200 ml/min.

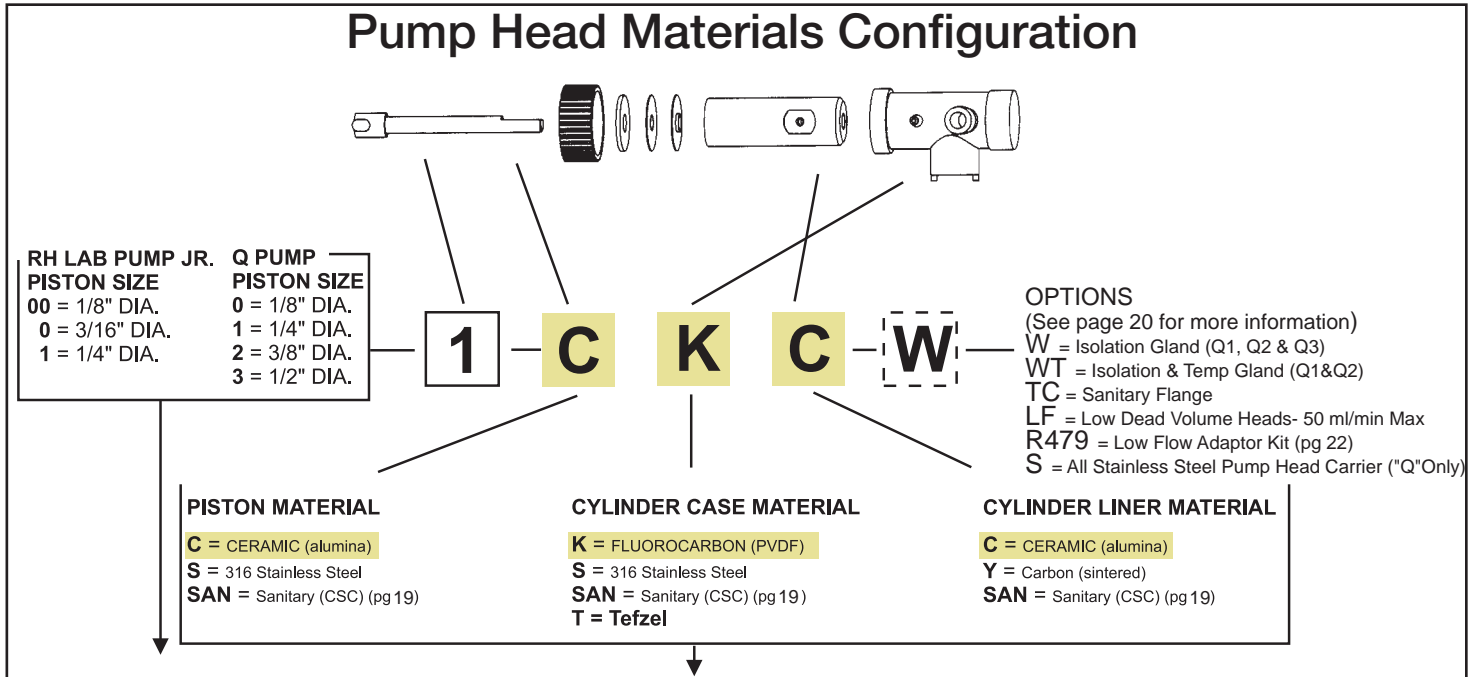




Pump Head Codes & Materials

The table below provides codes for all available Pump Head Modules (PHM). After selecting the appropriate Pump Drive Module (PDM) and Piston Size Code, (refer to Drive Section, pages 2-19) select a PHM and available options below. FMI pump heads are made from various materials of construction for use in most applications. All FMI pumps are modular in design. The Pump Head

Modules can be easily removed for cleaning or replaced with a spare pump head for use with different fluids. Some customers have separate pump heads for use with each fluid handled or flow rate desired. When ordered together, Pump Drive Modules, Pump Head Modules, and options are mounted, tested and shipped as one unit.



PHM (PUMP HEAD MODULE)

Piston Size Code	Materials of Construction								
	CKC	CKY	CSC	CSY	SAN	SKY	SSY	STY	CTC
RH00									
RH0									
RH1									
Q0									
Q1									
Q2									
Q3									
Wetted Parts	Ceramic PVDF	Ceramic PVDF Carbon	Ceramic 316 SS	Ceramic 316 SS Carbon	Ceramic Teflon	316 SS PVDF Carbon	316 SS Carbon	316 SS Tefzel Carbon	Ceramic Tefzel
MAX.Temp	212° F	212° F	350° F	350° F	350° F	140° F	140° F	140° F	212° F
Options	(add Option Code & cost to Pump Module for complete price and part number)								
LF (pg.20)	N/C	N/C				N/C		N/C	N/C
W (pg.20)									
WT (pg.20)									
TC (pg.30)									
R479 (Pg.22)									
S ("Q" Only)									

See Materials of Construction section for more information on wetted parts - pg 29

Let us Help you make a selection

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Materials of Construction

FMI fluid contact components are fabricated of carefully selected materials. Each one has discrete characteristics of physical strength, abrasion resistance, and dimensional stability under varying conditions of pressure, temperature, and resistance to attack by certain chemicals. Since no one material possesses all of the characteristics required to handle all chemicals under all possible conditions, FMI offers a selection of materials of construction for each pump component that fluids contact during the pumping process. These components and materials are identified on page 28 of the catalog by code designation, common usage names and trade names.

General Characteristics are as follows:

C - Ceramic

Ceramic is used in most of the pumps for piston and/or cylinder liners. Ceramic pistons may be used with ceramic and carbon cylinder liners. Ceramic cylinder liners can only be used with ceramic pistons.

Sapphire hard, fused crystalline Ceramic Al₂O₃, excellent chemical resistance, thermal stability and mechanically resistant to common abrasives.

Caution: Subject to binding or freezing when stored after improper cleaning - brittle and subject to fracture under sudden impact loading - not suitable for very "dry" fluids such as hexane.

K - Fluorocarbon

Fluorocarbon PVDF, is used for some **cylinder cases and tubing fittings**. Autoclavable @ 240°F maximum. Good chemical tolerance to most fluids.

Caution: Sensitive to degrading effects of some organic solvents, esters, and ketones.

S - Stainless Steel 316

Stainless Steel 316 is used for some **pistons, cylinder cases and/or tube fittings**. Not to be used as piston with ceramic cylinder liner.

Excellent chemical, and physical strength characteristics.

Caution: Subject to attack by some halides, strong acids, and bases - subject to surface abrasion and wear in piston application.

Y - Carbon

Carbon is used for some **cylinder liners**. Suitable for use with stainless steel and ceramic pistons.

Hard crystalline stage, ingot sintered, pure carbon chemically resistant to most commonly used fluids.

Caution: Sensitive to strong oxidants and all abrasive materials.

T - Tefzel, Dupont.

Fluoropolymer E-TFE - Used for **cylinder cases** in some FMI Pump Head Modules. Excellent chemical resistance to most acids, bases and solvents. Autoclavable @ 240°F maximum.

Rulon®AR, Saint-Gobain

Fluorocarbon, filled PTFE - Used for **lip seals** in some FMI pump heads. Excellent chemical resistance, - physically soft, resilient and wear resistant - abrasive to soft metals and should therefore not be used with "S" pistons in high stroke rate applications.

Rulon®J, Saint-Gobain

Fluorocarbon, filled PTFE - Used for **lip seals** in some FMI pump heads. Good chemical resistance, sensitive to some organic solvents, strong acids and bases - physically soft, resilient and non-abrasive.

Teflon®, Dupont Co.

Fluorocarbon PTFE - Used for **seals and fittings** in some FMI pump head modules - excellent chemical resistance characteristics - soft, pliable, easily cut, nonstick surface chemically stable over wide thermal range, dimensionally sensitive to temperature change - not suitable for structural components.

Application Tips

PRESSURE: In most FMI pump models, motor starting torque is the limiting factor in the stated pressure rating. Fluids such as oils, creams and gels that are good lubricants are more easily pumped than aqueous or "dry" fluids and therefore require less motor torque and may be pumped against pressures considerably greater than those given in the rating charts.

All pump head components are designed to withstand backpressures up to 100 psig at room temperatures, though pump heads with fluorocarbon cylinder cases may exhibit some loss of pumping capacity at pressures over 60 psig.

ACCURACY: FMI pump accuracy is based on a simplified positive displacement mechanism. The valveless design provides an accuracy of better than 1% when handling medium viscosity fluids (50 to 500 centipoise). Aqueous solutions and light solvents work well but may exhibit some sensitivity (fluid slip) to variations in discharge head pressure. Gums, gels and non-abrasive semi-solids are handled with a high degree of accuracy... a direct result of the valveless design.

Viscous, tacky solutions, semi-solids and heavy slurries which tend to resist (cavitate) suction flow into a pump head can be handled with ease by selecting an FMI pump employing a relatively slow reciprocation rate.

The principal flow rate deviations of an FMI pump are fluid slip and stroke repetition rate. These two factors in turn are related to load factors such as viscosity, differential pressure, and drive motor voltage. When these two factors are controlled, the FMI pump will handle most fluids with reproducibility of better than 0.5%.

GAS PUMPING: Due to the valveless design of the FMI pump "CKY" and "CSY" pump heads are able to perform accurate gas transfers. With no valves to introduce random compression errors, gas sample flow in bagging, scrubbing and transit operation can be accurately preset based on actual piston displacement.

IMPORTANCE OF CLEAN FLUIDS: While a certain amount of caution must be exercised in the use of abrasive fluids in any metering pump, the "CKC" and "CSC" tend to be more tolerant of suspended solids than other metering pumps. To assure fluid compatibility, consult the Materials of Construction information above.

FOR BEST PUMPING RESULTS: Select an FMI PUMP having a maximum flow rating as near to the desired flow rate as possible.





Selection Guide for FMI's Pump Heads

	<p>QCKC Pump Heads offer excellent chemical resistance with most acids, caustics, and solvents (with the exception of acetone, methyl ethyl ketone (MEK), & methylene chloride). These pump heads are rated to 212 deg F, autoclaved to 240 deg F (non-operating), and for pressures to 60 psig.</p> <p>Fluid Path: Ceramic and PVDF fluorocarbon.</p>
	<p>QCKC-W "Gland" Pump Heads are identical to the above but include an extra pair of ports which provide an "isolation gland" for a barrier liquid or gas to isolate air sensitive, crystal-forming process fluids from atmosphere. Temperature & pressure as above.</p> <p>Fluid Path: Ceramic and PVDF fluorocarbon.</p>
	<p>QCSC Pump Heads offer excellent chemical resistance to almost all solvents. They have an extended temperature & pressure range of 350 deg F and 100 psig.</p> <p>Fluid Path: 316 SS, Ceramic and Teflon standard.</p>
 New	<p>QCSC-W "Gland" Pump Heads are identical to above but include an extra pair of ports which provide an "isolation gland" for a barrier liquid or gas to isolate air sensitive, crystal-forming process fluids from atmosphere. Process fittings are 1/4" NPT female; gland ports are 10-32 female.</p> <p>Fluid Path: 316 SS, Ceramic and Teflon standard.</p>
	<p>QSAN Pump Heads are designed for sanitary applications ideal for food, biotech, & pharmaceutical applications. These pump heads contain no internal threads, are highly resistant to chemical and biological attack, and are easily dismantled for cleaning and sterilizing. (Model QSAN-S shown)</p> <p>Fluid Path: Ceramic and Teflon standard.</p>
 New	<p>QCSC-TC "Tri-Clamp[®]" Pump Heads are designed for sanitary applications, in addition to having no internal threads, these pump heads have standard 3/4" sanitary quick-connect style fluid connections compatible with Tri-Clamp[®] fittings.</p> <p>Fluid Path: 316 SS, Ceramic and Teflon standard.</p>
 New	<p>QCSC-WT "Hi Temp Gland" Pump Heads are designed for applications, which require temperature control of the pump head. These pump heads provide space for two standard 1" x 1/4" cartridge heaters and a 1/8" thermocouple, as well as, an "isolation gland". Pump heads are rated for 350 deg F and 100 psig.</p> <p>Fluid Path: 316 SS, Ceramic and Teflon standard.</p>
	<p>RHLF "Low Flow" Pump Heads feature 1/4-28 female low dead volume ports as well as excellent chemical resistance. Designed for flows to 50 ml/min or dispenses 100 µl or less. RHLF pump heads are rated to 212 deg F, autoclaved up to 240 deg F (non-operating), and can be used in applications up to 100 psig.</p> <p>Flow Path: Ceramic and PVDF fluorocarbon standard - other materials available. RH00SKYLF, RH0CKCLF, H1CKCLF</p>
	<p>RH Pump Heads, 1/4" compression ports, and excellent chemical resistance to most acids, caustic, and solvents with some exceptions including acetone, methyl ethyl ketone (MEK), & methylene chloride. Designed for flows to 360ml/min. RH pump heads are rated to 212 deg F, autoclaved up to 240 deg F (non-operating), and pressure to 100 psig</p> <p>Flow Path: Ceramic and PVDF fluorocarbon standard-other materials available. RH00SKY, RH0CKC, RH1CKC</p>



FMI Terms & Conditions



ONE YEAR LIMITED WARRANTY

FMI LIMITED WARRANTY

FMI products are manufactured to a high level of mechanical precision from materials that are resistant to attack by many corrosive chemicals. These products, however, may be self-destructive when used with non-compatible fluids or when located in physically hostile environments or when operated under non-specification voltage or pressure conditions.

FMI, therefore, warrants only as follows:

Each pump has been test operated with water to rated pressure prior to shipment from the factory. The qualifying performance of each pump is recorded by serial number in a permanent record of the company. If at any time within the first 1 year after any FMI product has been shipped to a customer (user), it fails to perform according to FMI literature, the product, with written explanation of the problem, may be returned, freight prepaid, to the FMI plant for examination, repair or replacement at FMI expense (labor and material). All such returns must have prior FMI customer service authorization before returning. If, upon examination, FMI determines that abusive practices, non-compatible fluids or destructive environment of operation or a combination of these factors is responsible for improper performance of the product, all labor and materials costs involved shall be at the expense of the customer. All such returns shall be redelivered F.O.B. FMI factory.

FMI is not liable for special, indirect or consequential damages that may result from use, failure or malfunction of the product, and any recovery against FMI may not be greater than the purchase price paid for the product.

No person is authorized to change the terms of this warranty.

PRODUCT STANDARDS

FMI products are certified and sold to comply with written FMI specifications. Only the corporation is authorized to modify product claims and specifications. Products are subject to change without notice.

RETURNS FOR CREDIT

Standard FMI catalog products under most circumstances, may be returned to the FMI factory for credit when still in unused condition, packed in original shipping cartons, and meets current product specifications. All such returns, must have prior FMI customer service authorization before returning. A restocking charge of 15% of original invoice price will be made on each to cover related restocking costs.

PRICES

Prices are subject to change without notice.

QUANTITY DISCOUNTS

Quantity discounts on standard catalog products purchased in units of ten or more are available. Contact FMI sales department for details.

QUOTATIONS

Prices quoted in writing will remain in effect for 30 days or any other time period stated in the written quotation.

MINIMUM BILLING

Minimum billing for FMI products is \$25.00 domestic and foreign invoice value per order, net of shipping costs and any applicable discounts regardless of price list value of order.

SHIPMENTS

Shipments are usually made within 24 hours of receipt of order.

FOB SHIPPING POINT

All FMI prices are for delivery FOB shipping Point or Ex Works factory, Syosset, New York, packed for domestic shipment unless otherwise stated in writing.

FREIGHT POLICY

Provisions are made for pick-up, prepay and bill, or freight collect

delivery. All shipping costs other than those normal to FMI domestic product packaging and F.O.B. policy are incurred at customer request and expense. International orders are sent freight collect, unless otherwise specified.

FREIGHT CLAIMS

All claims for damaged merchandise should be made with the delivering carrier.

TERMS OF SALE PAYMENT TERMS

There are no provisions for financing of customer orders. Invoices are considered due and payable when presented.

International sales are cash in advance. All bank charges are the customer's responsibility. Customers may establish an open account status by presenting FMI evidence of prompt payment history including: a) three general credit references, b) one or more bank references, c) Fluid Metering, Inc. reserves the right to obtain a credit report from a national reporting agency.

PROMPT PAYMENT DISCOUNT

1%, 10 days, net 30 for open account
Domestic sales – 2% cash with order

Prices are subject to change for payment terms other than those listed above.

FMI Customer Service Representatives and Technical Support Staff are available Monday through Friday from 8:00 am to 5:30 pm EST. You can also FAX your specifications 24 hours a day to 516-624-8261 or visit our internet site at: www.fmipump.com
WE have EDI at FMI - Give us a call.

We accept Visa, MasterCard, American Express and Discover



Typical Applications

Analytical Instrumentation

TOC Analyzers
 Particle Analyzers
 Viscosity Instrumentation
 Titration Equipment
 Liquid Chromatography
 Water & Wastewater Monitoring
 Stack Gas Monitoring
 Ground Water Monitoring

Medical

Blood Analyzer Sample & Reagent
 Fluid Control
 Contact Lens Mfg. - Monomer
 Dispensing
 Dialysis Systems
 Immunoassays & MicroPlates
 Solvent Welding for Disposable Kits

Electronics

Plating Bath Chemicals
 Semiconductor Chemical Distribution
 Circuit Board Cleaning Systems
 Battery Manufacturing
 CMP & ECP Wafer Processing
 Flux Addition for Wave Soldering
 Wire Coating for Stators & Armatures

Industrial

Agricultural & Pesticide Spraying
 Systems.
 On-Site Petroleum Additive
 Paints, Dyes, Inks, & Pigments
 Lubricant Dispensing
 Ferrofluid dispensing for Speaker Mfg.

Food, Dairy, & Beverage

Aseptic Packaging - Peroxide Dispensing
 Preservative Treatment of Meats & Poultry
 Nutrient & Color Addition
 Brewery additives
 Vitamin Addition for Milk
 Color Addition for Yogurt
 Cottage Cheese Mfg.
 Candy Polishing



FMI 2009 SHOW SCHEDULE

FMI will demonstrate its full line of Metering Pumps, Dispensers and Accessories at the following Trade Shows:

Feb	10 - 12	MD & M West '09	Anaheim	CA	Booth 2479
March	09 - 12	PITTCON '09	Chicago, IL	IL	Booth 4946
March	17 - 19	Interpex '09	New York City	NY	Booth 3005
March	31 - April 2	NJAWWA	Taj Majal	Atlantic City, NJ	Booth 47
April	21 - 23	NYSAWWA	Saratoga Springs	NY	Booth 70
June	14 - 18	ACE09 / AWWA	San Diego	CA	Booth 947
July	21 - 23	AACC	Chicago, IL	IL	TBA
Sep	21 - 24	TIFFT Water Conf.	Verona	NY	TBA
Nov	17 - 19	CHEM Show	New York City	NY	Booth 410

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