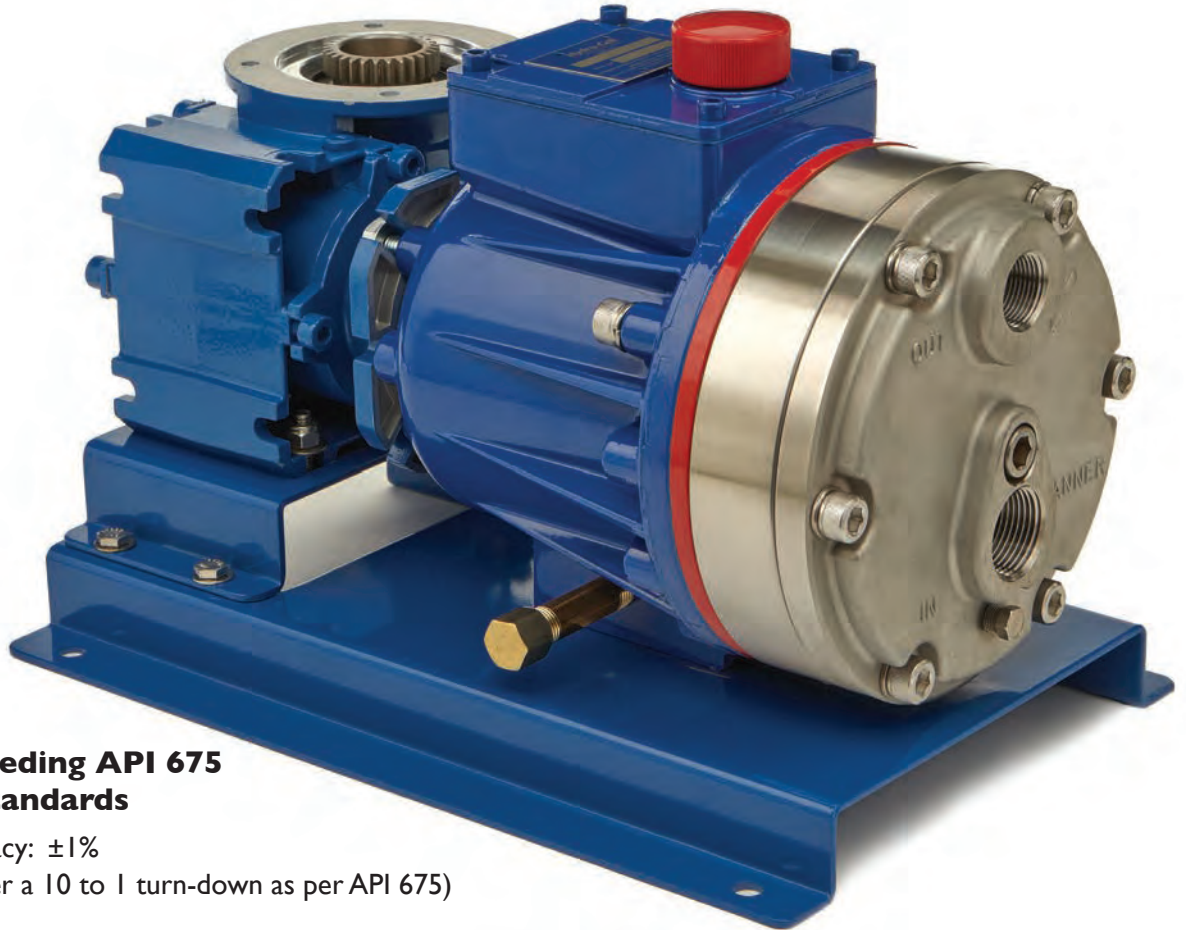


P400 Series Electronic Precision Metering Pumps

Maximum Flow Rate: 766 L/hr
Maximum Pressure: 69 bar for Metallic Pump Heads
24 bar for Non-metallic Pump Heads



Meeting & Exceeding API 675 Performance Standards

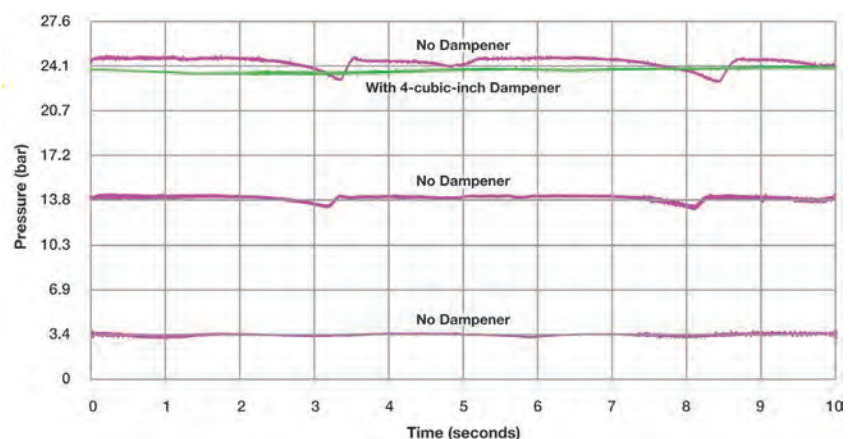
- Steady State Accuracy: $\pm 1\%$
- Linearity: $\pm 3\%$ (over a 10 to 1 turn-down as per API 675)
- Repeatability: $\pm 3\%$
- Infinite turn-down achievable

Unique Multiple Diaphragm Design for Linear, Pulse-free Flow

Hydra-Cell Metering Solutions P400 pumps feature three diaphragms in one pump head. This unique design enables Hydra-Cell to provide virtually “pulse-free” flow without the need to buy expensive pulsation dampeners.

- Minimises pipe strain and other maintenance; enhances operator safety
- Reduces acceleration/friction losses in the suction line
- Provides accurate metering with linear, constant flow

Hydra-Cell P400 Pressure Trace



Hydra-Cell can eliminate the need for expensive pulsation dampeners because, as the graph shows, it provides virtually pulse-less flow.

Performance - Flow Capacities and Pressure Ratings

For Synchronous Speed, Self-cooled Motors
L/hr Maximum Flow at Designated Pressure

L/hr All Pumps		L/hr Metallic Pump Heads Only		Pump RPM	Gear Ratio	Motor RPM
7 Bar	17 Bar	34 Bar	69 Bar			
30.4	29.3	26.8	20.4	25	60:1	1500
36.8	35.6	33.0	26.1	30	50:1	
46.2	45.1	42.2	35.4	37.5	40:1	
62.2	60.9	57.7	50.3	50	30:1	
75.0	73.6	70.1	62.3	60	25:1	
94.2	92.6	88.8	80.3	75	20:1	
126.2	124.2	119.9	110.2	100	15:1	
190.2	187.5	182.0	170.1	150	10:1	
254.2	250.8	244.2	230.0	200	7.5:1	
382.1	377.4	368.5	349.7	300	5:1	
510.0	503.9	492.8	469.5	400	7.5:1	3000
765.9	757.1	741.4	709.0	600	5:1	

Required Motor kW

0.18	0.37	0.55	0.75	1.1
1.5	2.2			

Notes:

- The motor kW are based on ambient temperature conditions up to 40°C. For ambient temperatures above 40°C, please contact Wanner International.
- Capacity data is shown for pumps with elastomeric diaphragms. Contact factory for performance characteristics of pumps with PTFE diaphragms.
- Contact factory for performance specifications.
- Based on using IE2 motors.
- For intermittent or reduced pressure duties, please contact Wanner International.

For 10:1 Turndown, Self-cooled Motors
L/hr Maximum Flow at Designated Pressure

L/hr All Pumps		L/hr Metallic Pump Heads Only		Pump RPM	Gear Ratio	Motor RPM
7 Bar	17 Bar	34 Bar	69 Bar			
30.4	29.3	26.8	20.4	25	60:1	1500
36.8	35.6	33.0	26.1	30	50:1	
46.2	45.1	42.2	35.4	37.5	40:1	
62.2	60.9	57.7	50.3	50	30:1	
75.0	73.6	70.1	62.3	60	25:1	
94.2	92.6	88.8	80.3	75	20:1	
126.2	124.2	119.9	110.2	100	15:1	
190.2	187.5	182.0	170.1	150	10:1	
254.2	250.8	244.2	230.0	200	7.5:1	
382.1	377.4	368.5	349.7	300	5:1	
510.0	503.9	492.8	469.5	400	7.5:1	3000
765.9	757.1	741.4	709.0	600	5:1	

Required Motor kW

0.18	0.25	0.37	0.55	0.75	1.1
1.5	2.2	3.0			

Notes:

- The motor kW are based on ambient temperature conditions up to 25°C. For ambient temperatures above 25°C, Force-cooled Motors may be required. Please contact Wanner International.
 - Capacity data is shown for pumps with elastomeric diaphragms. Contact factory for performance characteristics of pumps with PTFE diaphragms.
 - Contact factory for performance specifications.
 - Based on using IE2 motors.
 - For intermittent or reduced pressure duties, please contact Wanner International.
- See Page 6 for **Electronic Flow Rate Controller**.

Mechanical Adjustment Controller for ATEX/Explosive Areas

All Min/Max flow rates in litres/hour

7 bar		17 bar		34 bar		69 bar		Pump rpm	Gearbox Ratio	Model Number	Required Motor Size & Frame
Min	Max	Min	Max	Min	Max	Min	Max				
4.7	28.8	3.5	27.6	1.2	24.7	0	17.6	5 - 24	25:1	MEC5 - 71B14	0.37kW / IEC 71 / 4-Pole
	36.5		35.1		32.1		24.5	5 - 30	20:1		
	49.1		47.8		44.4		36.4	5 - 40	15:1		
	74.7		73.1		69.3		60.4	5 - 60	10:1	MEC5 - 80B14	0.55kW / IEC 80 / 4-Pole
	100.3		98.4		94.1		84.4	5 - 80	7.5:1		
	151.5		149.0		143.9		132.3	5 - 120	5:1		
	202.6		199.7		193.6		180.2	5 - 160	7.5:1		
	305.0		300.9		293.0		276.0	5 - 240	5:1	MEC5 - 90B14	1.5kW / IEC 90 / 2-Pole

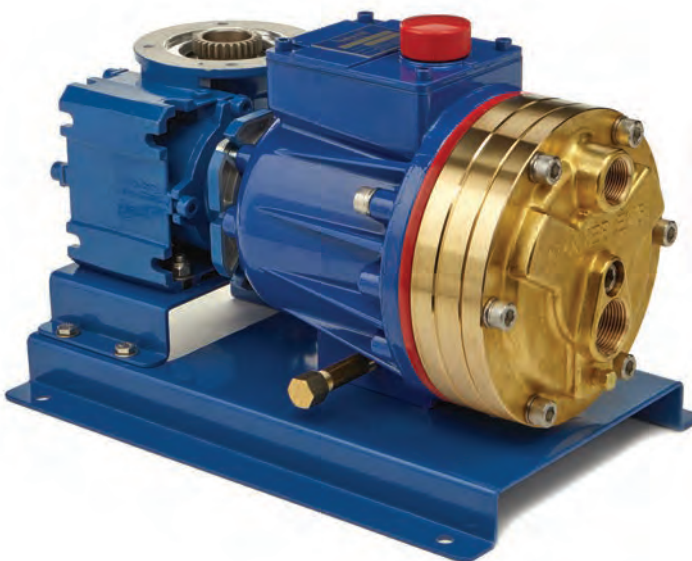
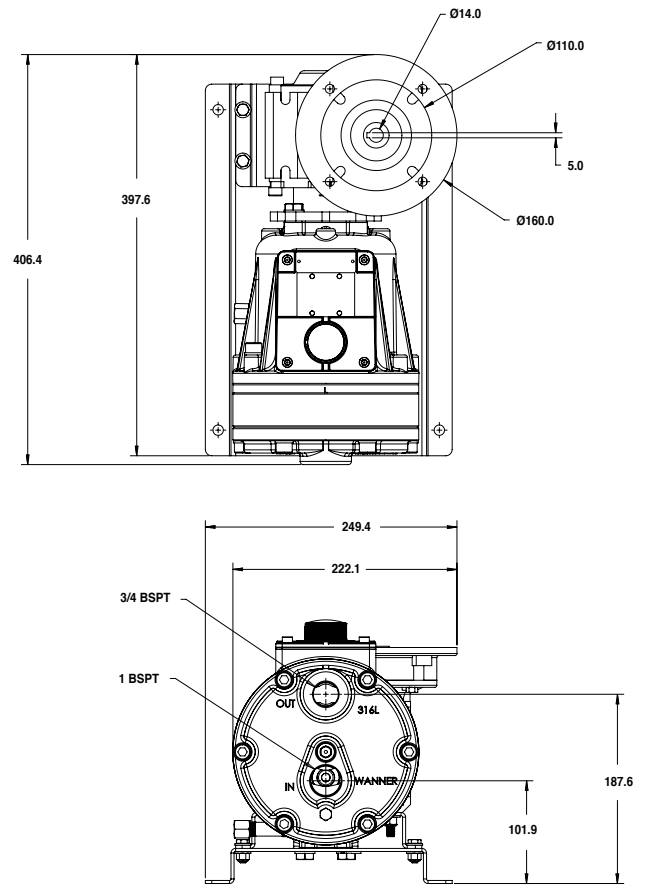
P400 Series

Specifications

Diaphragms per Liquid End	3
Flow Control	Electronic variable speed drive
Maximum Discharge Pressure	
Metallic Heads:	69 bar
Non-metallic Heads:	17 bar - Polypropylene 24 bar - PVDF
Maximum Inlet Pressure	17 bar
Maximum Liquid Operating Temperature	
Metallic Heads:	121 °C - Consult factory for correct component selection for temperatures greater 71 °C.
Non-metallic Heads:	PVDF to 80 °C Polypropylene to 60 °C
Maximum Solids Size	500 microns
Inlet Port	1 inch BSPT
Discharge Port	3/4 inch BSPT
Shaft Rotation	Reverse (bi-directional)
Oil Capacity	1.05 litres
Weight (less motor)	
Metallic Heads:	29.7 kg
Non-metallic Heads:	23.8 kg
Dimensions (less motor)	
Metallic Heads:	252.4 mm W x 409.4 mm D x 261.3 mm H
Non-metallic Heads:	252.4 mm W x 439.2 mm D x 261.3 mm H
Controllers	
Mechanical Adjustment:	245 mm D x 200 mm H (13.8 kg)

Representative Drawings (mm)

Metallic Pump Heads



P400 with Brass pump head



P400 with Stainless Steel pump head

Pump Ordering Information

A complete pump order number contains 13 digits based on the specified pump materials listed below. Contact your Hydra-Cell sales representative for accompanying motor drive options.

1	2	3	4	5	6	7	8	9	10	11	12	13
P	4	0	0									

Pump Model Size (Digits 1-4)

P400 For all P400 Pumps (Kel-Cell)

Pump Version (Digit 5)

N NPT Ports or ANSI Flanges (NEMA motors only)
M BSPT Ports or ANSI Flanges (IEC motors only)
A ATEX BSPT Ports (IEC motors only)

ATEX reducer must be ordered in conjunction with one of the ATEX Certification Kit Options below.

Category 2, Zone 1

Part Number	Description
ATEX-Z1-G10/P400	Kit-ATEX Category 2, Zone 1 IIB T4 G10/P400

Category 3, Zone 2

Part Number	Description
ATEX-Z2-G10/P400	Kit-ATEX Category 3, Zone 2 IIC T4 G10/P400

Notes:

- All options include Certificate, Oil Level Monitor, Earth Stud & Secondary ATEX Label.
- Extra oil is required to fill the oil bowl during installation of ATEX pumps. This oil is not included and must be ordered separately.

Pump Head / Retainer Material (Digit 6)

B Brass / Hastelloy C
C Cast Iron / Hastelloy C
M PVDF / PVDF
P Polypropylene / Polypropylene (Hastelloy C followers & screws)
R 316L Stainless Steel with ANSI RF Flanges, Class 150lb x 600lb
S 316L Stainless Steel (NPT or BSPT) / Hastelloy C
- 316L Stainless Steel with Tri-clamp (1-1/2" Inlet & 1" Discharge) Flanges polished to 0.8 Ra ♦
- 316L Stainless Steel with Tri-clamp (1-1/2" Inlet & 1" Discharge) Flanges polished to 0.4 Ra ♦
Tri-clamp options include polishing of Pump Head, Valve Plate, Valves, Valve Seats, Springs & Retainers to 0.8 Ra or 0.4 Ra per above, Sanitary Drain along with TSE, Passivation, Surface Finish & Weld Procedure Certificates
- High-viscosity Manifold, 316L Stainless Steel
T Hastelloy CW12MW / Hastelloy C
 ♦ Selecting this option will result in a Wanner International generated Pump Code, stamped onto the pump.

Diaphragm & O-ring Material / Oil (Digit 7)

A Aflas / PTFE o-ring (Synthetic oil)
E EPDM (EPDM-compatible oil)
G FKM (Standard oil)
S FKM (Food-contact oil)
X FKM (Synthetic oil)
J PTFE (Food-contact oil)
W PTFE (Synthetic oil)
Note: PTFE diaphragms require a minimum suction pressure of 1 bar.
P Neoprene (Standard oil)
R Neoprene (Food-contact oil)
Z Neoprene (Synthetic oil)
T Buna-N (Standard oil)
F Buna-N (Food-contact oil)
Y Buna-N (Synthetic oil)

Check Valve Material (Digits 8-9) (Valve Spring / Valve Seat / Valve)

SS Elgiloy / 316L SST / Nitronic 50
TT Hastelloy C / Hastelloy C / Hastelloy C
SC Elgiloy / Ceramic / Ceramic
TC Hastelloy C / Ceramic / Ceramic
SD Elgiloy / Tungsten Carbide / Tungsten Carbide
TD Hastelloy C / Tungsten Carbide / Tungsten Carbide

Gearbox Ratio (Digits 10-12) IEC Motors

060 60:1 (63 B5 Motor Frame)
050 50:1 (63 B5 Motor Frame)
040 40:1 (63 B5 Motor Frame)
A30 30:1 (71 B5 Motor Frame)
A25 25:1 (71 B5 Motor Frame)
A20 20:1 (71 B5 Motor Frame)
A15 15:1 (71 B5 Motor Frame)
A10 10:1 (71 B5 Motor Frame)
B10 10:1 (80 B5 Motor Frame)
C10 10:1 (90 B5 Motor Frame)
A07 7.5:1 (71 B5 Motor Frame)
B07 7.5:1 (80 B5 Motor Frame)
C07 7.5:1 (90 B5 Motor Frame)
B05 5:1 (80 B5 Motor Frame)
C05 5:1 (90 B5 Motor Frame)

Notes:

- Largest motor rating: 2kW 4-pole motor.
 These are Wanner standard options. Other flange sizes are available upon request.

Base Plate (Digit 13)

C Carbon Steel (Epoxy painted)
S 316L Stainless Steel

Notes:

- Please consult factory for rpm below 6.
- Constant torque drives are required to meet API 675 performance standards.
- Ensure that the motor chosen is capable of delivering the torque and power required over the full range of adjustment. (Consult factory for values.)
- IEC motor size has been calculated assuming IE2 performance as defined by IEC 60034-30.

Calibration Cylinders

Port Size	Cylinder Size (mL)	Cylinder Capacity (L/h)	Maximum Shaft (rpm)	Part Number BSPT Ports	Dimensions - mm	
					Height	Diameter
PVC Cylinders						
1/2"	200	24	75	111-001-B	482.6	38.1
3/4"	1000	120	300	111-003-B	558.8	63.5
1"	2000	240	600	111-004-B	508.0	94.0
2"	10000	1200	--	111-006-B	635.0	176.5.0
Glass Cylinders						
1/4"	30	3.6	36	111-010-B	355.6	35.6
1/2"	200	24	75	111-011-B	533.4	63.5
3/4"	1000	120	300	111-013-B	685.8	88.9
1"	2000	240	600	111-014-B	685.8	127.0



Back Pressure Valves

Port Size	Maximum Flow (L/h) Pulsating	Wetted* Materials	Pressure Adjustment Range (bar)	Maximum Temp (°C)	Part Number (BSPT Ports)
	1135	PVDF	0.7 - 10.3	90	111-343-B
	1135	316 SST	0.7 - 10.3	149	111-346-B
	1135	Hastelloy C	0.7 - 10.3	149	111-350-B

* Diaphragm material is PTFE on all models. Other materials available on request.



Pressure Relief Valves

Port Size	Maximum Flow (L/h) Pulsating	Wetted* Materials	Pressure Adjustment Range (bar)	Maximum Temp (°C)	Part Number (BSPT Ports)
	1135	PVDF	0.7 - 10.3	90	111-543-B
	1135	316 SST	0.7 - 10.3	149	111-546-B
	1135	Hastelloy C	0.7 - 10.3	149	111-550-B
3/4" HiFlo (DN 20)	2271	Polypropylene	0.7 - 10.3	90	111-641-B
	2271	PVDF	0.7 - 10.3	90	111-643-B
	2271	316 SST	0.7 - 10.3	149	111-646-B
	2271	Hastelloy C	0.7 - 10.3	149	111-650-B
3/4" High Pressure (DN 20)	4542	316 SST	24 - 172	149	111-746-B
	4542	Hastelloy C	24 - 172	149	111-750-B

* Diaphragm material is PTFE on all models. Other materials available on request.

Metering and Dosing Control Options

Electronic Flow Rate Adjustment for Local Control

- Force-cooled Drives supplied as standard
- ATEX Dust Zone 21 (Ex tb III CT I25c Db)
- IP66 Standard
- Various flow rate adjustments options including:
 1. On-board potentiometer(s)
 2. On-board key-pad controller with flow rate display
 3. Removable, hand-held key-pad controller for authorised personnel only
 4. Use the 10:1 Turndown table on Page 2 to select the correct motor kW for ambient temperatures up to 25°C

Maximum Flow at Designated Pressure (see table on Page 2)



On-board keypad control



Hand-held keypad control

Mechanical Flow Rate Adjustment for Local Control

- ATEX Zone I
- Linear fine adjustment scale on hand-wheel
- High reliability due to frictionless design
- Option to fit a mechanical lock to prevent unauthorised flow rate change

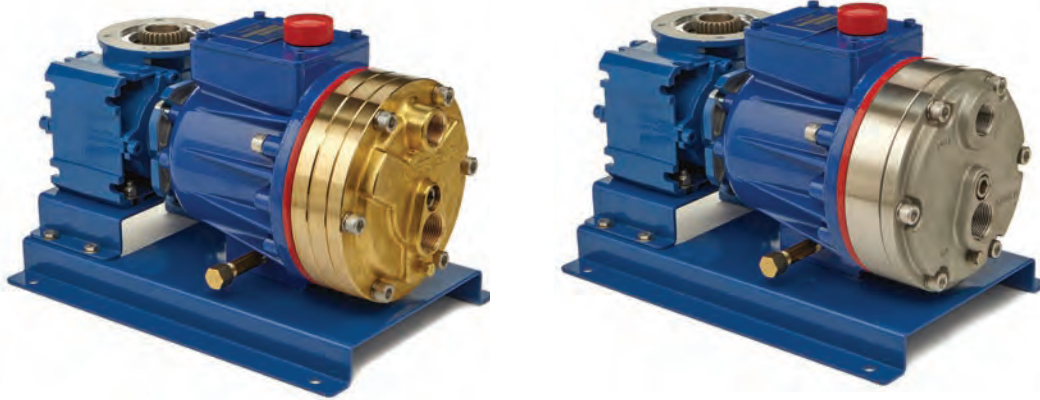


Control Freak™ for Sophisticated Local Control

- Option available to control up to 6 x Hydra-Cell pumps with one Hydra-Cell “Control Freak”
- Multiple Variable Frequency Drive (VFD) options
- Enables programming for flow rate or totalisation
- Allows up to 10 x separate batch sequences
- Built-in Calibration mode



P400 Series



WANNER

Hydra-Cell[®]
Partners in over 70 Countries

Standards Compliance



- API 675 performance testing, both witnessed and non-witnessed available. (Consult your local Wanner office for further details.)

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