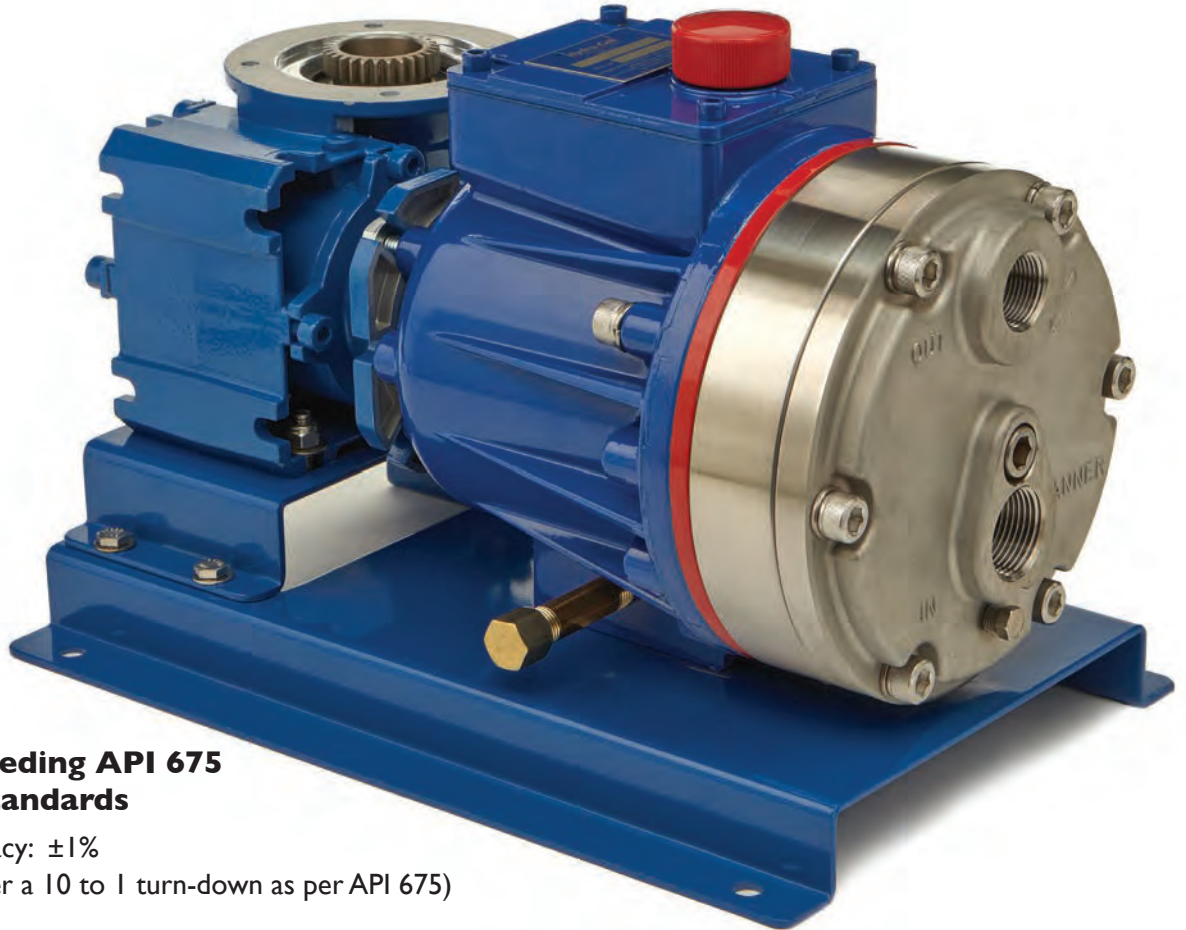


## P400 Series Electronic Precision Metering Pumps

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

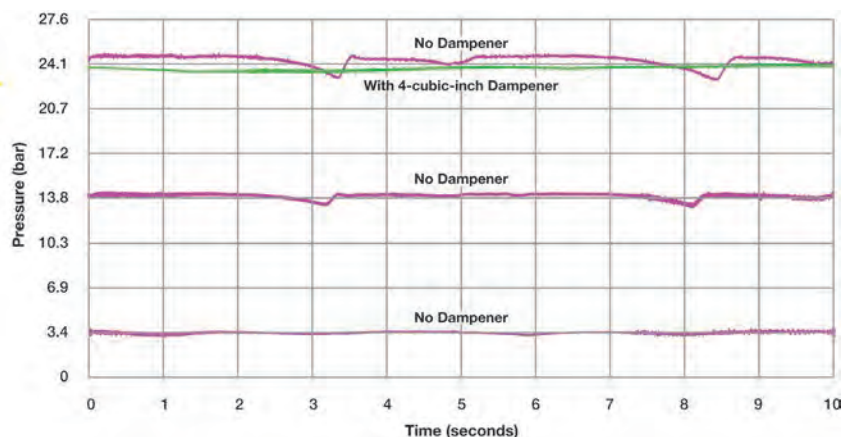
- Steady State Accuracy:  $\pm 1\%$
- Linearity:  $\pm 3\%$  (over a 10 to 1 turn-down as per API 675)
- Repeatability:  $\pm 3\%$
- Infinite turn-down achievable

### 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.
- Maximum continuous motor speed is 1800 rpm at full pressure.
- 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.
- Maximum continuous motor speed is 1800 rpm at full pressure.
- 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     |

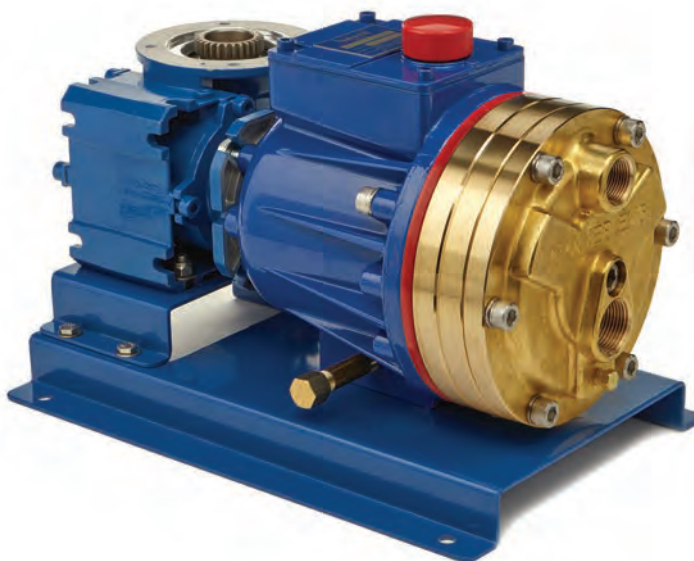
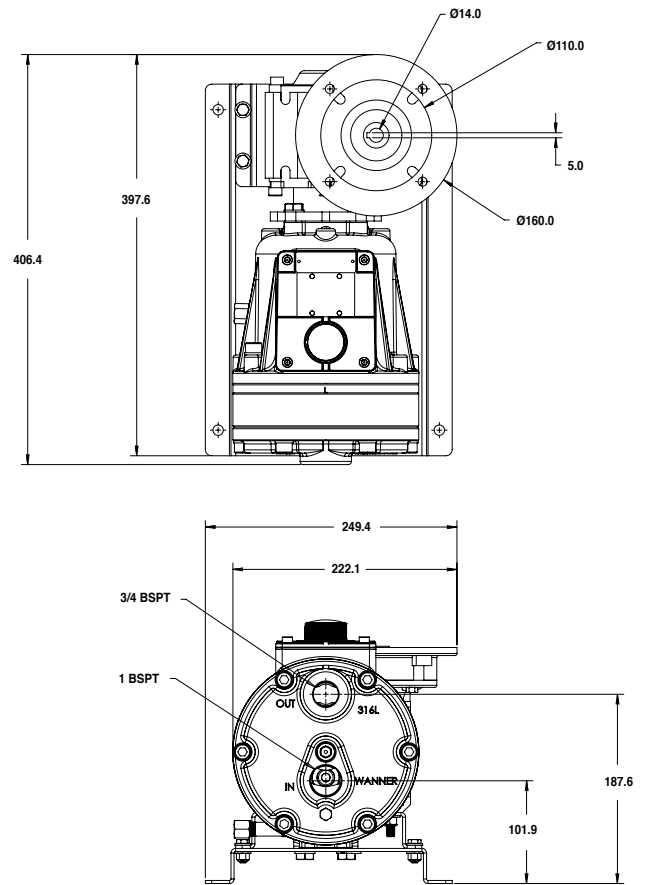
# P400 Series

## Specifications

|   |  |
|---|--|
| <b>Diaphragms per Liquid End</b>            | 3  |
| <b>Flow Control</b>                         | Electronic variable speed drive  |
| <b>Maximum Discharge Pressure</b>           |  |
| Metallic Heads:                             | 69 bar   |
| Non-metallic Heads:                         | 17 bar - Polypropylene<br>24 bar - PVDF  |
| <b>Maximum Inlet Pressure</b>               | 17 bar   |
| <b>Maximum Liquid Operating Temperature</b> |  |
| Metallic Heads:                             | 121 °C - Consult factory for correct component selection for temperatures greater 71 °C. |
| Non-metallic Heads:                         | PVDF to 80 °C<br>Polypropylene to 60 °C  |
| <b>Maximum Solids Size</b>                  | 500 microns  |
| <b>Inlet Port</b>                           | 1 inch BSPT  |
| <b>Discharge Port</b>                       | 3/4 inch BSPT  |
| <b>Shaft Rotation</b>                       | Reverse (bi-directional)   |
| <b>Oil Capacity</b>                         | 1.05 litres  |
| <b>Weight (less motor)</b>                  |  |
| Metallic Heads:                             | 29.7 kg  |
| Non-metallic Heads:                         | 23.8 kg  |
| <b>Dimensions (less motor)</b>              |  |
| 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   |
| <b>Controllers</b>                          |  |
| 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) |
|--------------|------------------------------|-------------------|---------------------------------|-------------------|--------------------------|
|              |                              |                   |                                 |                   |                          |
| 3/4" (DN 20) | 1135                         | Polypropylene     | 0.7 - 10.3                      | 90                | 111-341-B                |
|              | 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) |
|----------------------------|------------------------------|-------------------|---------------------------------|-------------------|--------------------------|
|                            |                              |                   |                                 |                   |                          |
| 3/4" StdFlo (DN 20)        | 1135                         | Polypropylene     | 0.7 - 10.3                      | 90                | 111-541-B                |
|                            | 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

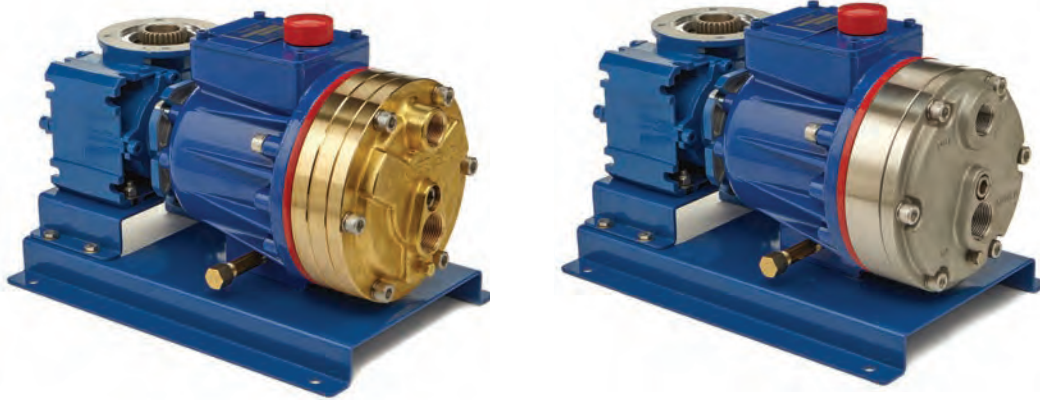


### Control Freak™ for Sophisticated Local Control

- 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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