



## Submittal Data

**NP SERIES** Multi Circuit Non-pressurized Flow Center

Variable Speed or Constant Speed Pumping for 2 to 5 Heat Pumps w/ No Header option



Project Name:	Representative:	
Contractor:	Engineer:	
Ref/P.O.#:	Date:	
Submitted by:	Date:	
Qty:	Part #:	Description

## Technical Data

Pump(s):	Variable Speed: Grundfos Magna3 or UPMXL 25-124 Constant Speed : UPS26-99 (3 speed) or UP26-116 (single speed)
Cabinet:	Powder coated galvanized steel
Tank:	High density polyethylene
Insulation:	CFC-free polyurethane foam
Gournd Loop	
Connections:	3" ANSI 4-bolt flange, 2" HDPE fusion, or 2" PVC glue
Headers:	Sch 80 PVC and/or HDPE, SDR 11
Circuit Valves:	1" full port, brass
Isolation Valves:	2" full port, union, Sch 80 PVC
Check Valves:	Acetal body, stainless steel spring

Max. fluid temp.: 140°F [60°C]  
Min. fluid temp.: 20°F [-7°C]  
Max. static press.: 13 psig [89.6 kPa]  
Max. ambient air temp.: 104°F [40°C]

## Approved Antifreeze

Propylene Glycol  
Methanol  
Ethanol

## Electrical Data

Pump Model	Speed	Nominal HP	Voltage / Frequency (single phase)	Amps* (Min. - Max.)	Watts* (Min. - Max.)	Capacitor	Pump Housing (Volute)
40-120	Variable	Note 3	208-230/50-60	0.19 - 1.95	16 - 440	N/A	Cast Iron
40-180	Variable		208-230/50-60	0.18 - 2.68	16 - 607		
UPS26-99	High	1/6	208-230/60	0.9	196	5µF/400V	Cast Iron
	Medium			0.8	179		
	Low			0.7	150		
UP26-116	--	1/6	208-230/60	1.8	385	2.5µF/380V	Cast Iron
UPMXL 25-124	Variable	N/A	208-230	0.04-1.5	3-180	N/A	Cast Iron

\*All data is per pump. Amps and Watts are at 230V.

### Notes:

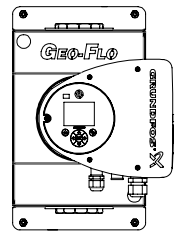
- All pump motors include thermal overload protection.
- Approvals:  
Magna3: ETL and FCC W\_RADIAL. Enclosure class Type 2, IEC 34-5: X4D; Insul. class Type F, IEC 85: F.  
UPS26-99 & UP26-116: UL and CSA approved; Insulation class Type F.
- Magna3 insulated pumps use ECM motor technology. Therefore, horsepower is not shown on the submittal, as it is not pertinent to pump performance, as compared to standard pumps with variable frequency drives. Contact Geo-Flo for more information.

## Mounting

Flow center is designed for indoor installation only.

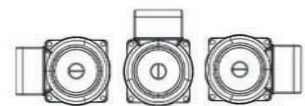
Flow center must be installed in an upright position.

The pump terminal box must be located in one of the following orientations:

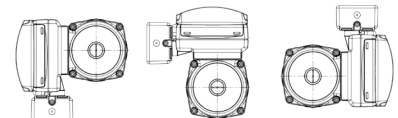


Magna 3

UP(S)26



UPMXL



**GEO-FLO CORPORATION**

905 Williams Park Drive  
Bedford, IN 47421 U.S.A.

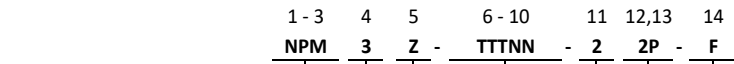
PH: 812-275-8513; FAX: 812-275-8523

www.geo-flo.com

# Functions and Features

- **Multiple Heat Pump Piping:** Factory assembled headers/manifolds for three, four, or five heat pumps. Significant labor savings for up to 25-30 ton systems.
- **Variable Speed Central Pump or Constant Speed Distributed Pumping:** Premium (most efficient) option utilizes central variable speed pumping (Magna3) and a zone valve for each heat pump; alternate design provides one, two, or three (UPS26-99 or UP26-116) pumps for each heat pump with check valves and isolation valves.
- **Choice of Variable Speed Central Pump Options:** Single insulated pump, two pumps in series, or two pumps in parallel (primary/backup -- wireless communication), plus two pump sizes.
- **Choice of Zone Valves:** Taco Sentry, Belimo, or remote (provided by others) zone valve options.
- **Loop Expansion/Air Separation:** Non-pressurized design operates as a “built in” expansion tank and air separator. Pressure/vacuum relief is standard on all NP Series flow centers.
- **Online Calculator:** A comprehensive design tool is available on the Geo-Flo website. From pressure drop calculation to pump sizing to model number generation, the Calculator is an essential design tool for multi unit applications.

## Model Nomenclature



### NP Multi

### Number of Heat Pumps

- 2 = 2 Circuits
- 3 = 3 Circuits
- 4 = 4 Circuits
- 5 = 5 Circuits
- N = No Header (NPMNZ only)

### System Type

- P = Circulator(s) for each heat pump
- Z = Zone valve for ea. heat pump (central variable speed pumping)

### System Configuration

- Digit 6 = Heat Pump #1
  - Digit 7 = Heat Pump #2
  - Digit 8 = Heat Pump #3
  - Digit 9 = Heat Pump #4
  - Digit 10 = Heat Pump #5
- See Central Pumping or Distributed Pumping, below.

### Central Variable Speed Pumping -- digit 5 = Z

- Use one of the following choices for digits 6 to 10:
- T = 1" Taco Sentry zone valve (Cv = 8.9)
- B = 1" Belimo zone valve (Cv = 30)
- R = Remote valve at heat pump (header with isolation valves)
- N = This circuit not used
- NOTE:** Circuit field connections are 1" FPT.

### Distributed Pumping (circulator for heat pump) -- digit 5 = P (Notes 1,3,4)

- 1 = One UPS26-99
- 2 = Two UPS26-99
- 3 = Three UPS26-99 (Note 2)
- 4 = One UP26-116
- 5 = Two UP26-116
- 6 = Three UP26-116 (Note 2)
- A = One UPMXL 25-124
- B = UPMXL 25-124 + UPS26-99
- C = Two UPMXL 25-124
- D = One UPMXL 25-124 INV PWM
- E = UPMXL 25-124 INV + UPS26-99
- N = This circuit not used (use in digit 8, 9 and/or 10 for NPM2, NPM3, or NPM4)

### Ground Loop Connections

- P = 2" Pipe connection\* -- with flush valves
- F = 3" ANSI 150# 4-bolt flange -- with flush valves
- \* Includes adapters for 2" HDPE pipe & 2" PVC glue

### Central Variable Speed Pump

- NN = N/A (when digit 5 = P)
- 1S = Single insulated pump
- 2P = Two insulated pumps in parallel
- 2S = Two insulated pumps in series

### Central Variable Speed Pump Model

- N = N/A (when digit 5 = P)
- 1 = Magna3 40-120 variable speed insulated pump (up to 33 ft. of hd. @ 30 gpm; up to 23 ft. of hd. @ 60 gpm)
- 2 = Magna 3 40-180 variable speed insulated pump (up to 50 ft. of hd. @ 30 gpm; up to 32 ft. of hd. @ 60 gpm)

### Series/Parallel Combinations (Magna3)

2 - 40-120 in parallel	up to 33 ft. of hd. @ 60 gpm
2 - 40-180 in parallel	up to 50 ft. of hd. @ 60 gpm
2 - 40-120 in series	up to 66 ft. of hd. @ 30 gpm up to 46 ft. of hd. @ 60 gpm
2 - 40-180 in series	up to 100 ft. of hd. @ 30 gpm up to 64 ft. of hd. @ 60 gpm

### NOTES:

1. Arrange circuits from the the largest to smallest number of pumps in series. For example, use two pumps in series for circuit one, two pumps in series for circuit two, and one pump on circuit three.
2. If any circuit has 3 pumps in series, all other circuits must have at least two pumps in series.
3. You cannot mix UP26-99s and UP26-116s on the same NPM
4. Var. spd. pumps (options A to E) include PWM cable.
5. VS pump (UPMXL) options are limited to three consecutive circuits due to the powerhead/terminal box design. If you need more than (3) circuits with UPMXL pumps consult factory.

# Pump Performance Curves -- Magna3 40-120 (Variable Speed)

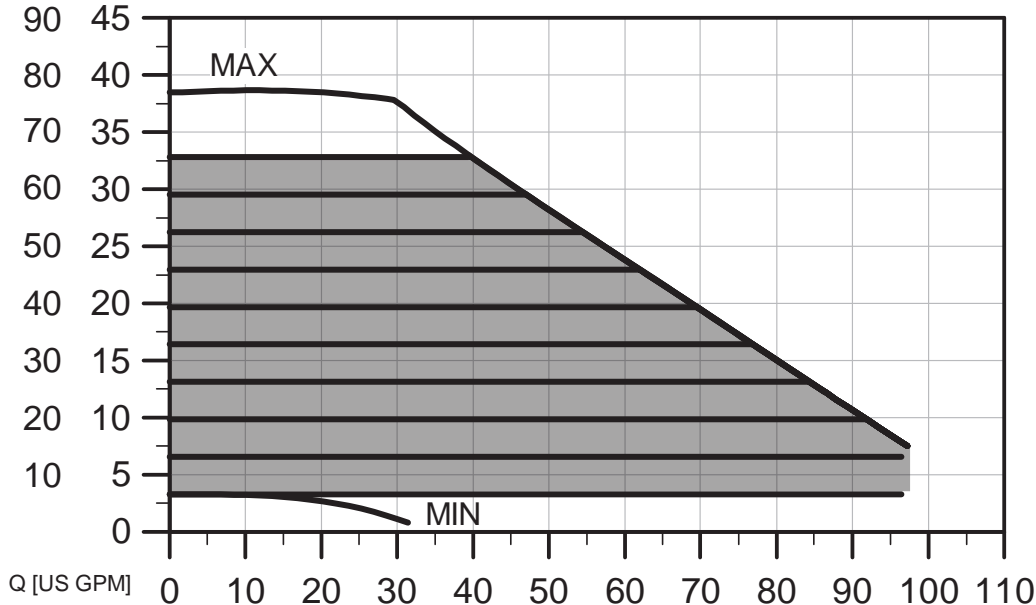
**DESIGN NOTES:**

1. The multi circuit variable speed flow center includes a zone valve for each heat pump. The central pump is controlled based upon differential pressure (constant or proportional pressure in pump menu). As the zone valves open and close based upon the operation of the heat pump (on/off or modulating), the system pressure changes, causing the pump to adjust speed to attain the water flow needed for the number of heat pumps running.
2. When sizing pumps for a multi circuit flow center, a pressure drop calculation should be done for the entire system when all heat pumps are running. Use the online NP Multi Calculator at [www.geo-flo.com](http://www.geo-flo.com) to calculate pressure drop and size the pump(s), or manually select pump(s), using the curves below.

Head (ft)

M3H\* M3S\*\*

Performance



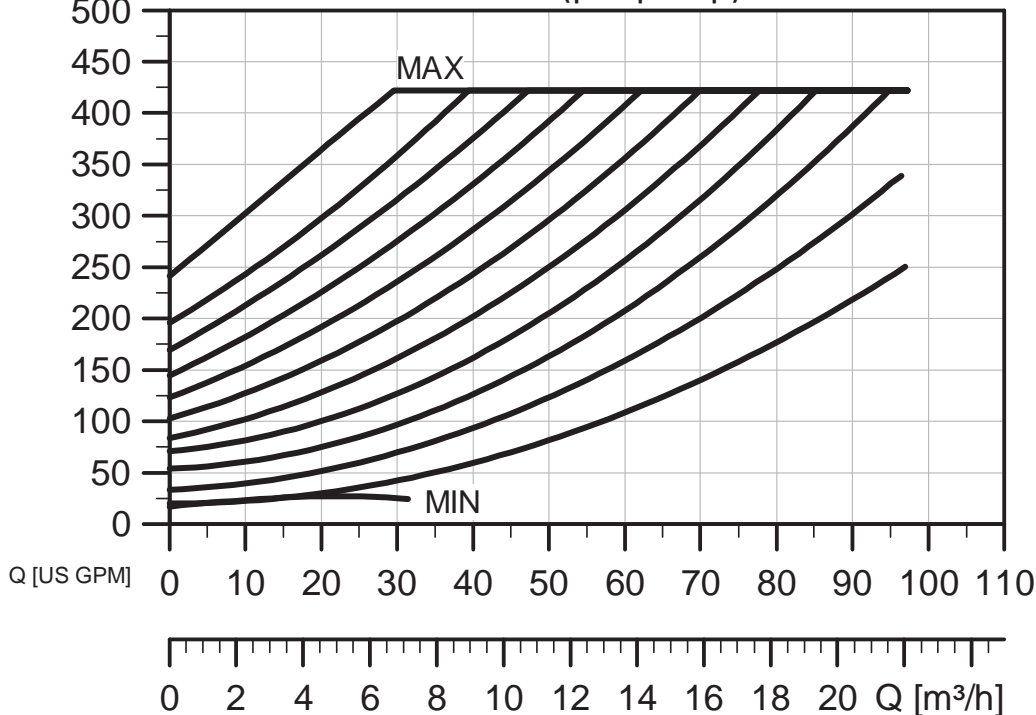
**Pump Curve Usage:**

1. In Constant Pressure (Differential Pressure) mode, pump operating range is the gray shaded area.
2. In Constant Curve mode, pump operates between the MIN and MAX curves.

\*Two pumps in series  
 \*\*Single pump or two pumps in parallel. Note: For two parallel pumps, double the flow rate for each head value.

P1 [W]

Power (per pump)



Curves are manufacturer's reported averages using water at 68°F [20°C].

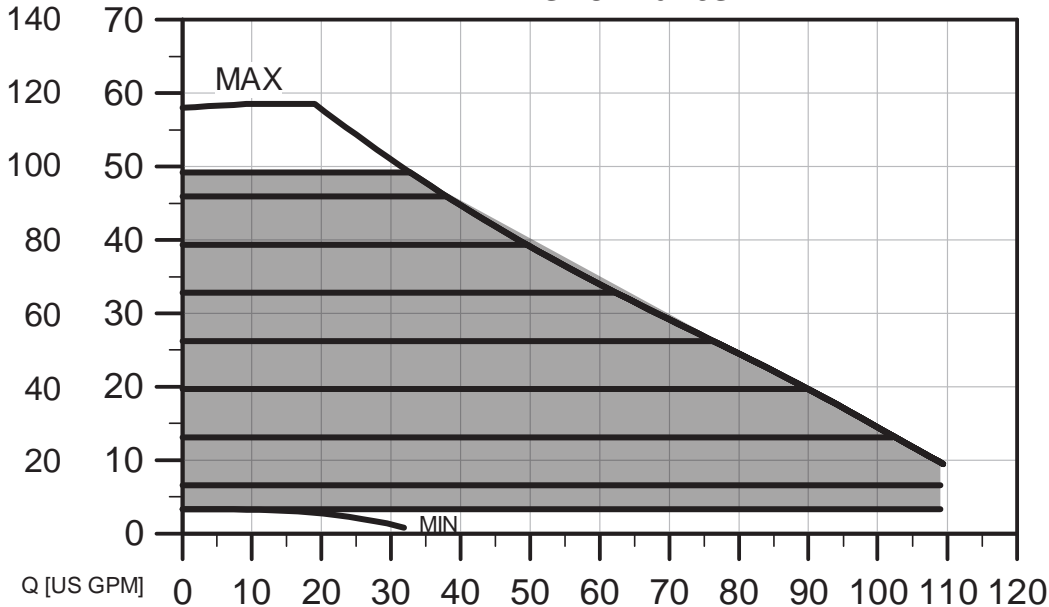
# Pump Performance Curves -- Magna3 40-180 (Variable Speed)

**DESIGN NOTES:**

1. The multi circuit variable speed flow center includes a zone valve for each heat pump. The central pump is controlled based upon differential pressure (constant or proportional pressure in pump menu). As the zone valves open and close based upon the operation of the heat pump (on/off or modulating), the system pressure changes, causing the pump to adjust speed to attain the water flow needed for the number of heat pumps running.
2. When sizing pumps for a multi circuit flow center, a pressure drop calculation should be done for the entire system when all heat pumps are running. Use the online NP Multi Calculator at [www.geo-flo.com](http://www.geo-flo.com) to calculate pressure drop and size the pump(s), or manually select pump(s), using the curves below.

Head (ft)  
M3H\* M3S\*\*

## Performance

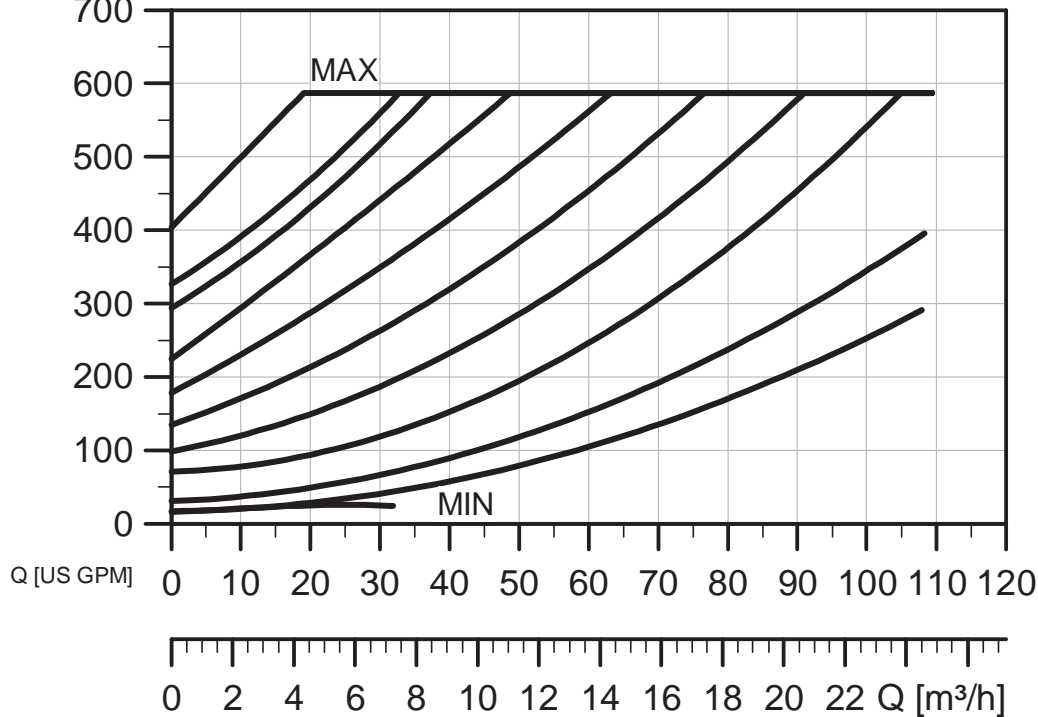


Pump Curve Usage:

1. In Constant Pressure (Differential Pressure) mode, pump operating range is the gray shaded area.
2. In Constant Curve mode, pump operates between the MIN and MAX curves.

\*Two pumps in series  
\*\*Single pump or two pumps in parallel. Note: For two parallel pumps, double the flow rate for each head value.

P1 [W]  
Power (per pump)



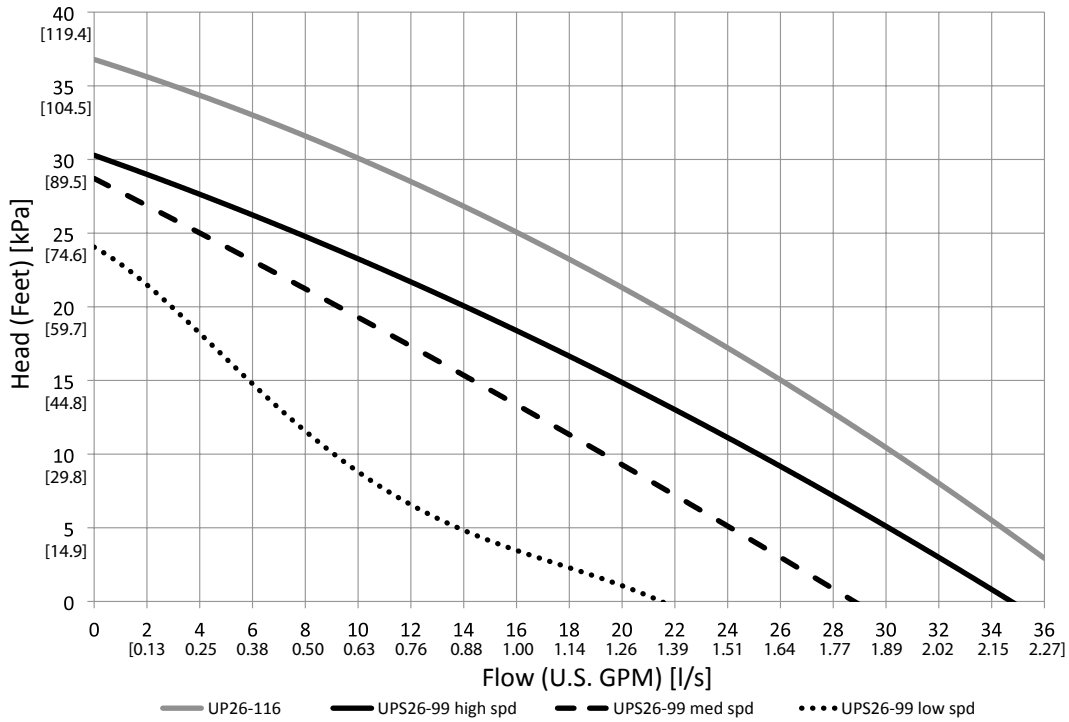
Curves are manufacturer's reported averages using water at 68°F [20°C].

# Pump Performance Curves -- Constant Speed

**DESIGN NOTES:**

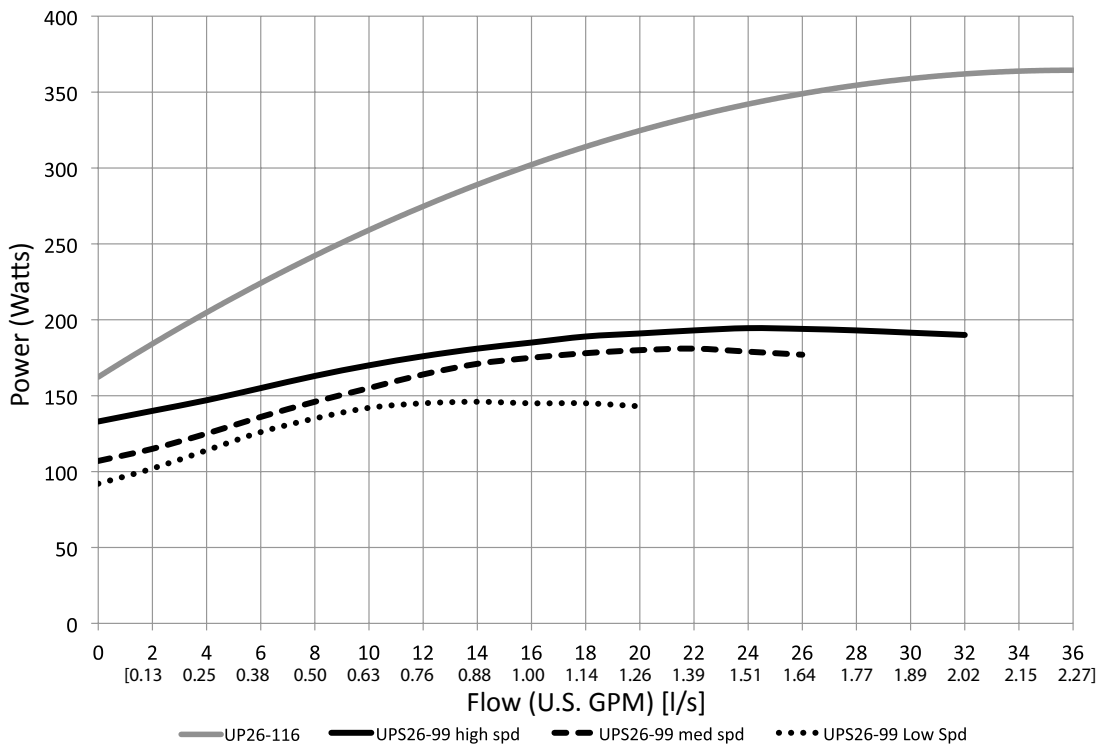
1. The multi circuit constant speed flow center includes one, two or three pumps for each heat pump. Each heat pump controls the pump(s) for that particular circuit.
2. When sizing pumps for a multi circuit flow center, a pressure drop calculation should be done for the entire system when all heat pumps are running. Use the online NP Multi Calculator at [www.geo-flo.com](http://www.geo-flo.com) to calculate pressure drop and size the pumps, or manually select pumps using the curves below. The pump(s) selected for each circuit must be able to overcome the head loss through the circuit (heat pump and unit piping), and the combined/shared piping (inside and outside/ground loop) when all units are running.

Grundfos Pump Performance Curves (Single Pump)



Curves are manufacturer's reported averages using water at 68°F [20°C].

Grundfos Power Curves (Single Pump)

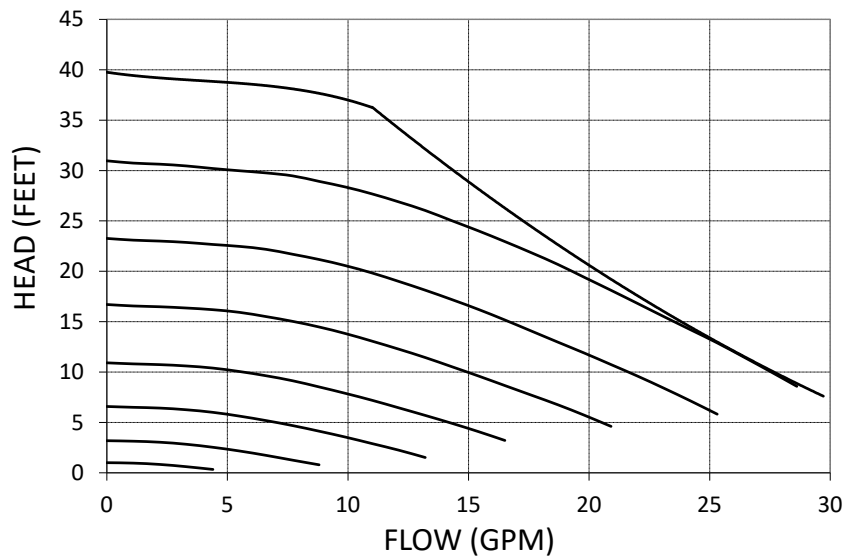


## Pump Performance Curves -- UPMXL 25-124 (Variable Speed)

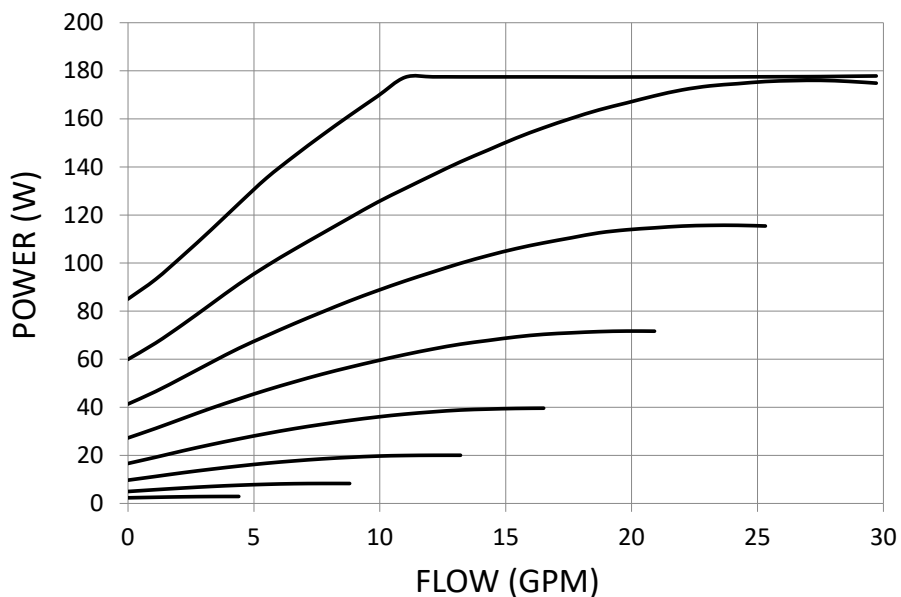
### DESIGN NOTES:

1. The NPM\_P model flow center includes one, two, or three pumps for each heat pump. Each heat pump controls the pump(s) for that circuit.
2. When sizing pumps for a multi circuit flow center, a pressure drop calculation should be done for the entire system when all heat pumps are running. Use the online NP Multi Calculator at [www.geo-flo.com](http://www.geo-flo.com) to calculate pressure drop and size the pumps, or manually select pumps using the curves below. The pump(s) selected for each circuit must be able to overcome the head loss through the circuit (heat pump and unit piping), and the combined/shared piping (inside and outside/ground loop) when all units are running. GPM. For higher flow rates, the Belimo valve is recommended.
3. NPM\_P versions that include the UPMXL VS pump can only have three consecutive circuits that include the UPMXL pumps due to the powerhead/ terminal box design. If you need more that 3 circuits with UPMXL pumps, consult the factory.
4. UPMXL VS pumps must have an external controller to vary the speed of the pump. UPMXL pumps should not be cycled with the heat pump contactor (high voltage-208/230V) unless the contactor is rated for high inrush current.

### UPMXL 25-124 PERFORMANCE CURVES



### UPMXL 25-124 POWER CURVES



Curves are manufacturer's reported averages using water at 68°F [20°C].

## Zone Valves (Variable Speed)

### DESIGN NOTES:

1. The multi circuit variable speed flow center includes a zone valve for each heat pump on select models. The central pump is controlled based upon differential pressure (constant or proportional pressure in pump menu). As the zone valves open and close based upon the operation of the heat pump (on/off or modulating), the system pressure changes, causing the pump to adjust speed to attain the water flow needed for the number of heat pumps running.
2. When selecting zone valves, choose a zone valve that will not adversely affect the system pressure drop. A higher Cv (flow coefficient) results in lower pressure drop. Good design practice is to limit zone valve pressure drop to no more than 25% to 50% of the circuit pressure drop. For a typical heat pump heat exchanger pressure drop, 2.5 to 5.0 ft. of head should be the maximum pressure drop for the zone valve. The Taco Sentry zone valve is typically used for systems up to about 12 U.S. GPM. For higher flow rates, the Belimo valve is recommended.
3. If neither of the zone valves listed below are suited to the application, the heat pump header may be configured with isolation ball valves, and the remote (supplied by others) zone valves may be field installed at the header or at the heat pump.



#### Taco Sentry™ Motorized Ball Valve Specifications:

Valve Cv: 8.9  
 Valve Body: Brass  
 Stem: Brass  
 Ball: Brass (chrome plated)  
 Seat: Modified Teflon  
 O-rings: EPDM  
 Connections: 1" NPT female  
 Fluid temp. range: 20 to 220°F [-7 to 104°C]  
 Max. VA (charging): 11.5 VA  
 End switch rating : 1 Amp @ 24 VAC



#### Belimo B225 Motorized Ball Valve Specifications:

Valve Cv: 30  
 Valve Body: Brass (nickel plated)  
 Stem: Stainless steel  
 Ball: Stainless steel  
 Seat: PTFE  
 O-rings: EPDM  
 Connections: 1" NPT female  
 Fluid temp. range: 0 to 212°F [-18 to 100°C]  
 Max. VA: 7 VA  
 End switch rating : 6 Amp @ 250 VAC

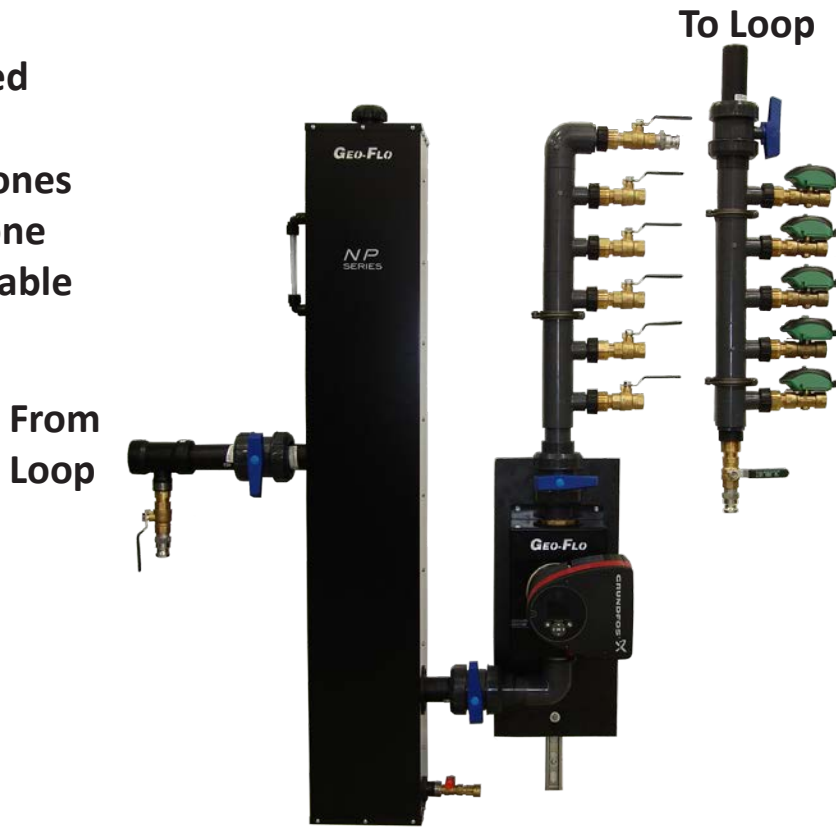
#### Zone Valve Cv Recommendations:

U.S. GPM	Recommended Minimum Cv
3	2 to 3
4.5	3 to 4
6	4 to 6
7.5	6 to 8
9	7 to 9
10	8 to 10
12	9 to 12
15	11 to 15
18	13 to 18

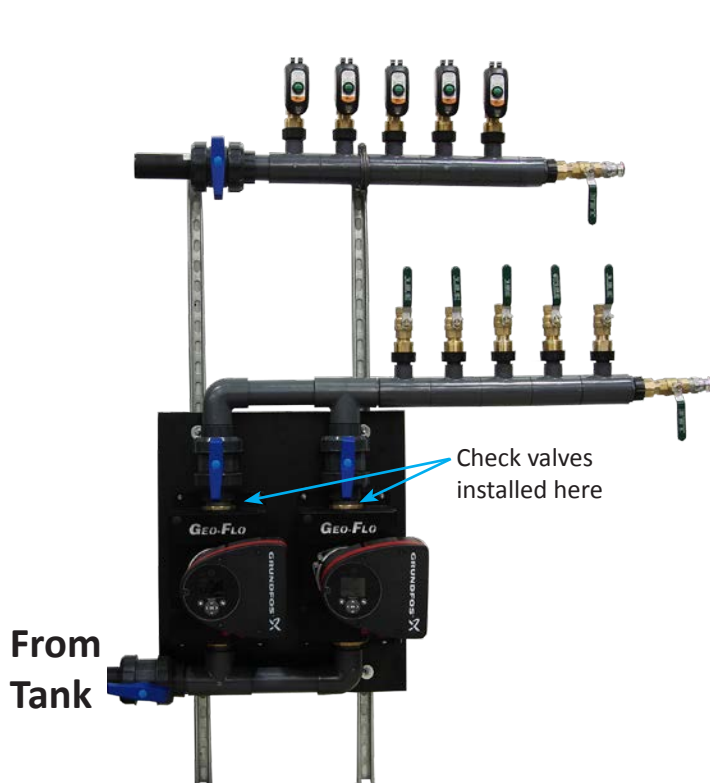


**Product Photos / Configuration Options - Variable Speed**

**Variable Speed  
Single Pump  
Example: 5 Zones  
2, 3, 4, & 5 zone  
systems available**



**Variable Speed  
Two Pumps in Parallel  
Example: 5 Zones  
2, 3, 4, & 5 zone systems available**



**Variable Speed  
Two Pumps in Series  
Example: 5 Zones  
2, 3, 4, & 5 zone systems available**





## Product Photos / Configuration Options - Constant Speed

### Constant Speed

Example: 5 Zones

2, 3, 4, & 5 zone systems available



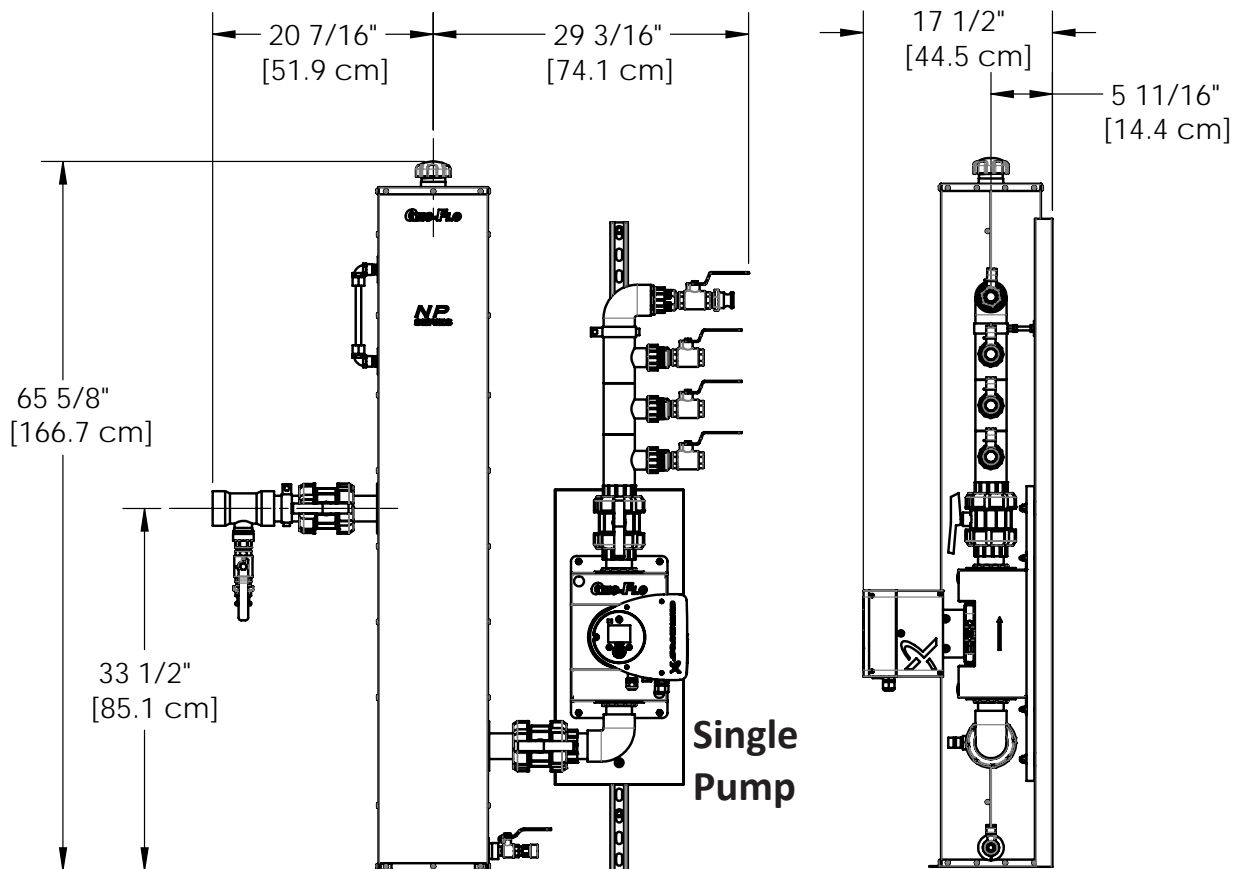
#### Configuration Options:

- 1, 2, or 3 pumps in series per circuit\*
- UPS26-99 3-speed pumps or UP26-116 single speed pumps\*\*
- All circuits include isolation ball valves at the top and bottom of each circuit
- Top ball valves are Flo-Link double O-ring (pump side) x 1" FPT (field connection)
- Bottom ball valves are Flo-Link double O-ring x Flo-Link double O-ring
- Each circuit includes a factory installed check valve in the isolation ball valve at the outlet of the last pump
- Connections between pumps are Flo-Link double O-ring x Flo-Link double O-ring

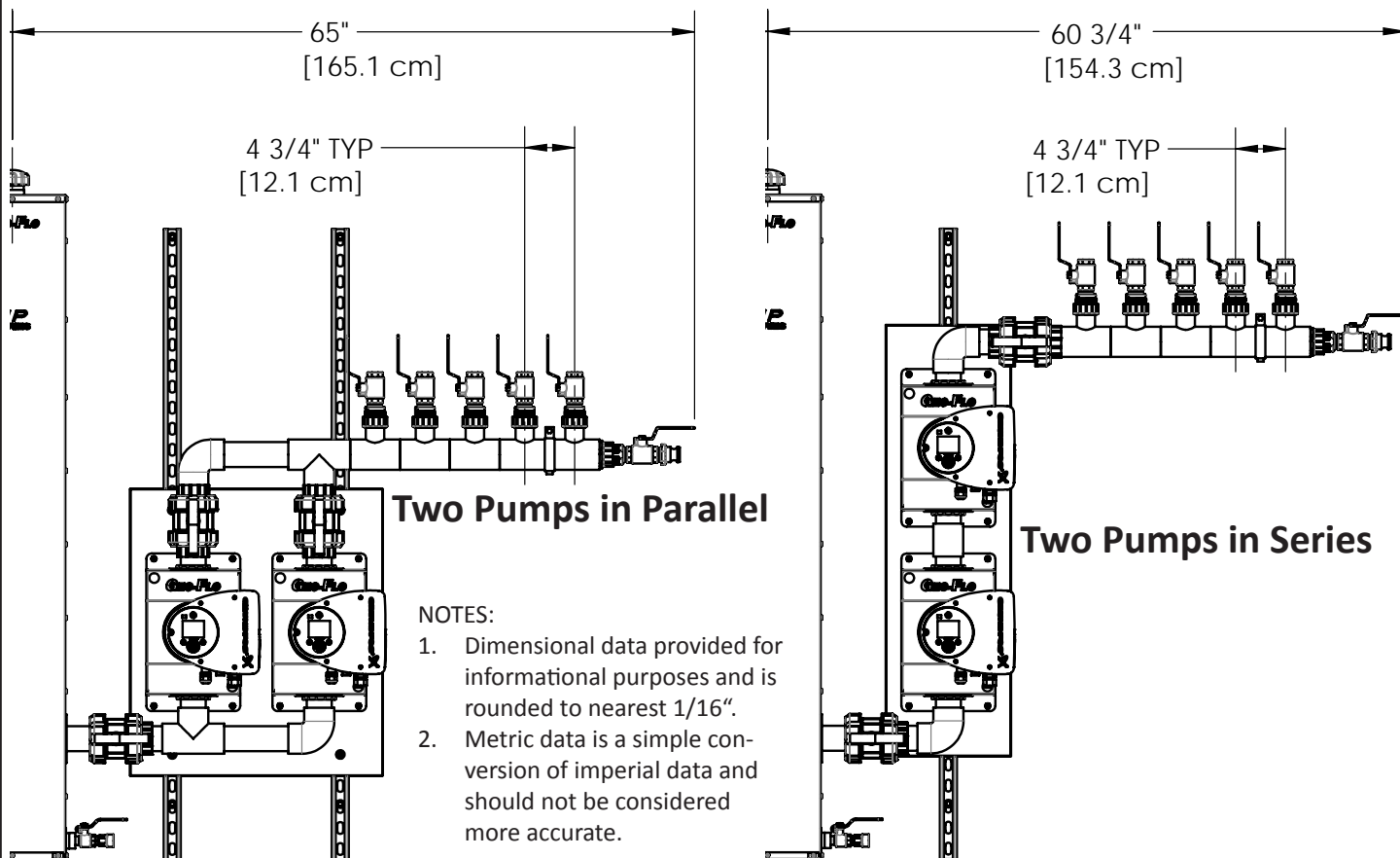
\*If any one circuit has 3 pumps in series, all other circuits must have two or three pumps in series.

\*\*All pumps must be the same model.

# Dimensional Information - Variable Speed



**Single Pump**



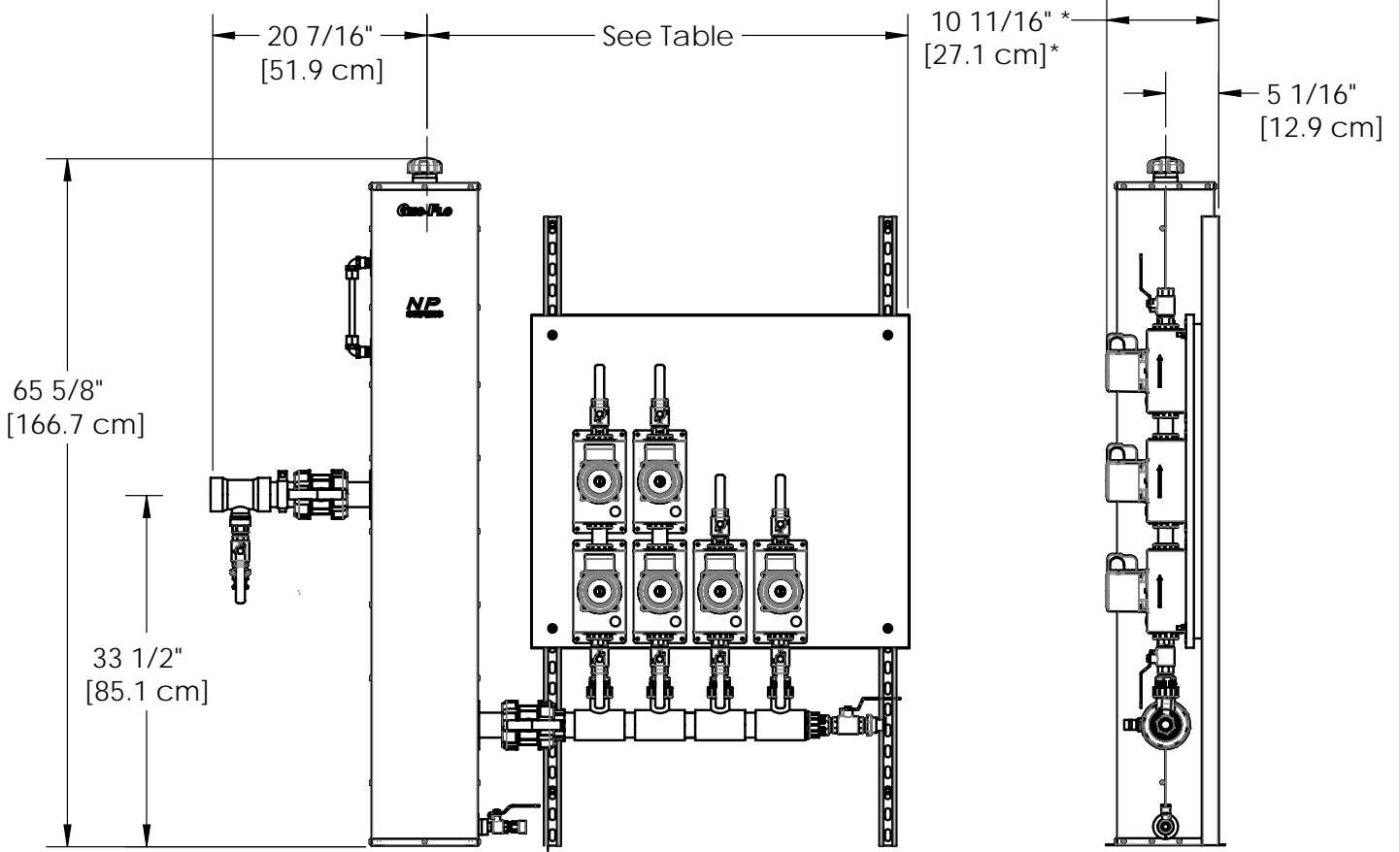
**Two Pumps in Parallel**

**Two Pumps in Series**

**NOTES:**

1. Dimensional data provided for informational purposes and is rounded to nearest 1/16".
2. Metric data is a simple conversion of imperial data and should not be considered more accurate.

# Dimensional Information - Constant Speed



\*Add 1" if Magna GEO pumps.

Width from Center of Cap to Edge of Pump Mounting Board				
Circuits-->	2	3	4	5
Inches	34 1/16	39 5/8	46 3/16	51 1/8
Centimeters	86.5	100.6	117.3	129.9

**NOTES:**

1. Dimensional data provided for informational purposes and is rounded to nearest 1/16".
2. Metric data is a simple conversion of imperial data and should not be considered more accurate.