



# Pressure Tanks

Pressure Tanks

Pump Catalog - January 2019

MORE THAN A BRAND. WE'RE A FAMILY.

# How to Order DuraMAC™ Tanks

Order by Model Number - Example: 16002-V3M

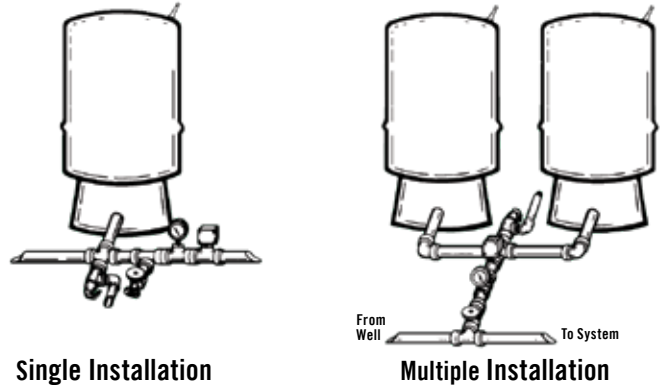
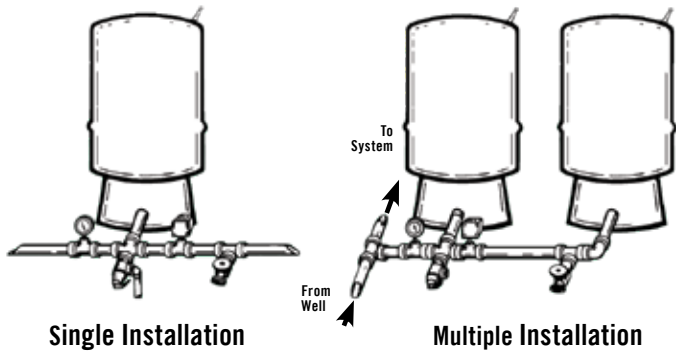
<b>16</b>	<b>002</b>	<b>-</b>	<b>V</b>	<b>3</b>	<b>M</b>	<b>PI</b>	<b>X</b>
<b>Class #</b>	<b>Gallons</b>	<b>Base</b>	<b>Position</b>	<b>Connection Size</b>	<b>Male or Female</b>	<b>Expansion Tanks Only</b>	<b>Expansion Tanks Only</b>
	2, 5, 7, 20, 32, 36, 52, 86, 96, 119	M = Metal - = No Base	V = Vertical H = Horizontal	3 = 3/4" 4 = 1" 5 = 1 1/4"	M = Male F = Female	PI = Potable H = Hydronic	X = Five Year Limited Warranty



**No "X" on Expansion Tanks Only have One Year Limited Warranty**

## Installations of Water Well Tanks

DuraMAC™ Free-Standing Series



The standard rear-entry installation. Gauge, relief valve, and pressure switch are installed in rear of tank. The piping is run behind the tank and the connection is made to standard tee.

The standard front-entry installation. Gauge, relief valve, and pressure switch are installed in front of tank.

# Tank Sizing

The charts below allow you to easily select the right DuraMAC™ Series tank for standard-size pumps between 2 1/2 and 30 gallons in capacity, and for 20-40 PSI, 30-50 PSI and 40-60 PSI pressure ranges. Minimum run times shown (from start-up) are one minute, one and a half minutes and two minutes. For example, for a system that delivers ten gpm at 30-50 PSI, with a minimum run time of one minute, Chart 1 indicates that the proper tank is the 16036MV4F.

**Chart 1 | DuraMAC™ Series Free-Standing Tank Selection Chart**

Pump GPM	System Pressure Ranges-PSI								
	20-40			30-50			40-60		
	Minimum Run Times (Minutes)								
	1	1 1/2	2	1	1 1/2	2	1	1 1/2	2
2.5	16020MV4F	16020MV4F	16020MV4F	16020MV4F	16020MV4F	16020MV4F	16020MV4F	16020MV4F	16020MV4F
5	16020MV4F	16020MV4F	16036MV4F	16020MV4F	16036MV4F	16036MV4F	16020MV4F	16036MV4F	16052MV5F
7	16020MV4F	16036MV4F	16052MV5F	16036MV4F	16036MV4F	16052MV5F	16036MV4F	16052MV5F	16086MV5F
10	16036MV4F	16052MV5F	16086MV5F	16036MV4F	16052MV5F	16086MV5F	16052MV5F	16086MV5F	16086MV5F
12	16036MV4F	16052MV5F	16086MV5F	16052MV5F	16086MV5F	16086MV5F	16052MV5F	16086MV5F	16096MV5F
15	16052MV5F	16086MV5F	16086MV5F	16052MV5F	16086MV5F	16119MV5F	16086MV5F	16096MV5F	16119MV5F
20	16086MV5F	16086MV5F	16119MV5F	16086MV5F	16119MV5F	(2)16086MV5F	16086MV5F	16119MV5F	(2)16086MV5F
25	16086MV5F	16119MV5F	(2)16086MV5F	16086MV5F	(2)16086MV5F	(2)16086MV5F	16096MV5F	(2)16086MV5F	(2)16096MV5F
30	16086MV5F	(2)16086MV5F	(2)16086MV5F	16119MV5F	(2)16086MV5F	(2)16119MV5F	16119MV5F	(2)16096MV5F	(2)16119MV5F

**Chart 2 | Drawdown Volume Multiplier (Approximate)**

Pump Shut-Off Pressure-PSI	Pump Start-Up Pressure-PSI							
	10	20	30	40	50	60	70	80
20	0.26							
30	0.41	0.22						
40		0.37	0.18					
50		0.46	0.31	0.15				
60			0.40	0.27	0.13			
70			0.47	0.35	0.24	0.12		
80				0.42	0.32	0.21	0.11	
90				0.48	0.38	0.29	0.19	0.10
100					0.44	0.35	0.26	0.17

Pressure above those listed, exceed maximum tank acceptance volumes.

If proper tank selection cannot be made using Chart 1, follow this procedure. First, find the “drawdown multiplier” by matching the pump start-up and shut-off pressures on Chart 2. For example, the multiplier for a 30-50 PSI pressure range is .31.

Next, insert the pump GPM capacity and desired minimum run time into this formula:

$$\frac{\text{PUMP GPM} \times \text{Min. Run Time}}{\text{Multiplier}} = \text{Minimum Tank Volume Required}$$

To assume dependable drawdown volumes, and in keeping with present industry practice, drawdowns are based on Boyle’s Law.

**Chart 3 | Drawdown in Gallons**

Model No.	Vol. in Gals.	20-40	30-50	40-60
16002-H3M	2.0	0.7	0.6	–
16005-H3M	4.6	1.7	1.4	–
16007-H3M	7.3	2.7	2.3	–
16020MV4F	20.0	7.4	6.2	5.4
16032MV4F	32.0	11.5	9.6	8.4
16036MV4F	36.0	13.3	11.2	9.7
16052MV5F	52.0	19.2	16.1	14.0
16086MV5F	86.0	31.8	26.7	23.2
16096MV5F	96.0	35.5	29.8	25.9
16119MV5F	119.5	44.2	37.0	32.3

Horizontal Series has the same drawdown as the In-Line Series.

For example, using a 10 GPM pump, a one-minute minimum run time, and a 30-50 PSI pressure range, the formula is as follows:

$$\frac{10 \times 1}{.31} = 32.26 \text{ Minimum Tank Volume}$$

Then, using Chart 3, select the tank that has a minimum volume that meets or exceed your minimum volume requirement, and supplies adequate drawdown at the required pressure range. Minimum drawdown equals Pump GPM X Minimum Run Time. Therefore, in the above example, select the 16036MV4F 36-gallon tank. It provides adequate drawdown at 30-50 PSI.

For questions about proper tank sizing, contact the Factory.

## Features & Benefits

When pump and tank are in different locations, the pressure switch should be at the tank location. Or, compensating adjustment must be made for pressure loss due to head of water. For example, one PSI for every two feet of elevation.

### FEATURES

- ◆ Free Standing and In-line Models
- ◆ Diaphragm Pump Tanks
- ◆ Sizes 2 thru 119 gallons
- ◆ Pressure to 100 PSI

### AIR CHARGE VALVE

- ◆ Conveniently-located for easy pressure adjustment
- ◆ Metal in metal bases
- ◆ Flexible rubber in plastic bases (replaceable on plastic)

### DESIGNER FINISH

- ◆ An attractive addition to any home
- ◆ Provides positive protection against corrosion
- ◆ Two-part electrostatic finish
- ◆ Ideal for outside use

### INSIDE FINISH

- ◆ Two-layer epoxy coating inside to protect against corrosion

### DURABLE BUTYL DIAPHRAGM

- ◆ Strong and flexible, for smooth operation and long life

### PLASTIC LINING

- ◆ Permanently bonded to the shell in two coat base on epoxy lining
- ◆ Proven protection against internal rust or corrosion

### TANK CONSTRUCTION

- ◆ Pre-pressurized @ 38 PSI
- ◆ Lightweight drawn-steel construction
- ◆ Maximum working pressure 100 PSI
- ◆ Slotted and notched for air flow, reduces condensation build-up



## How McDonald Diaphragm Tanks Operate



Start-Up Cycle

With water chamber empty, diaphragm is pressed against bottom of chamber.



Fill Cycle

As water is pumped into water chamber, diaphragm is forced upward into air chamber.



Hold Cycle

When pressure in air chamber reaches pump cut-off point, diaphragm is in uppermost position, water chamber is filled to rated capacity.



Delivery Cycle

When water is delivered to system, pump remains shut off. Air pressure in top chamber forces diaphragm downward.



# Water Well Tanks

## DuraMAC™ Free-Standing Series

A.Y. McDonald offers a full line of diaphragm tanks for all your water well needs. Our DuraMAC™ Tanks range in size from 2 gallons up to 119 gallons.

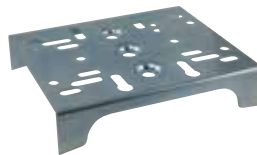


### Universal pump mounting bracket

#### 16000BRKT

Two Pipe

Part No.	Wt.
6127-365	2



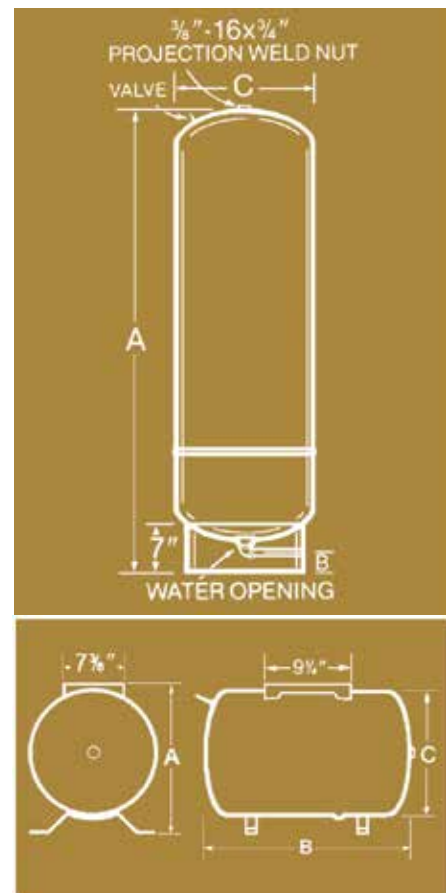
Standard on DuraMAC™ Horizontal models and optional on DuraMAC™ In-Line Series and DuraMAC™ Vertical models.

#### Volume, Dimension and Weight Specifications

Model Number	Volume Gallons	"A" Overall Height (IN.)	"B" to Center of Water Inlet (IN.)	"C" Diameter (IN.)	Weight (LBS.)
<b>DuraMAC™ Series (Free-Standing)</b>					
16020MV4F	20.0	32-3/4	2-1/4	15-3/8	30
16032MV4F	32.0	45-1/2	2-1/4	15-3/8	40
16036MV4F	36.0	32-5/8	2-1/4	20	45
16052MV5F	52.0	38-5/8	2-1/4	23-3/8	77
16086MV5F	86.0	59	2-1/4	23-3/8	105
16096MV5F	96.0	63-3/8	2-1/4	23-3/8	111
16119MV5F	119.5	61-1/4	2-1/4	26	165
<b>DuraMAC™ Series (In-Line) No Base</b>					
16002-V3M	2.0	12-9/16	—	8-3/8	4.5
16005-V3M	4.6	14-11/16	—	11-3/8	7.5
16007-V3M	7.3	21-1/8	—	11-3/8	10.5
<b>DuraMAC™ Series Horizontal</b>					
16014-H4M	14.0	17-3/8	21-3/4	15-3/8	23
16020-H4M	20.0	17-3/8	27-1/8	15-3/8	30

16020-H3M, 16020MV4F, 16032MV4F and 16036MV4F—connection is 1" Female.  
 16052MV5F, 16086MV5F, 16096MV5F, 16119MV5F—connection is 1-1/4" Female.  
 16002-V3M, 16005-V3M, 16007-V3M — connection is 3/4" Male.  
 16014-H4M, 16020-H4M—connection is 1" Male.

**Plastic bases, Glass lined, and Galvanized tanks are available in truckload quantities**



# Expansion Tanks - Potable Water

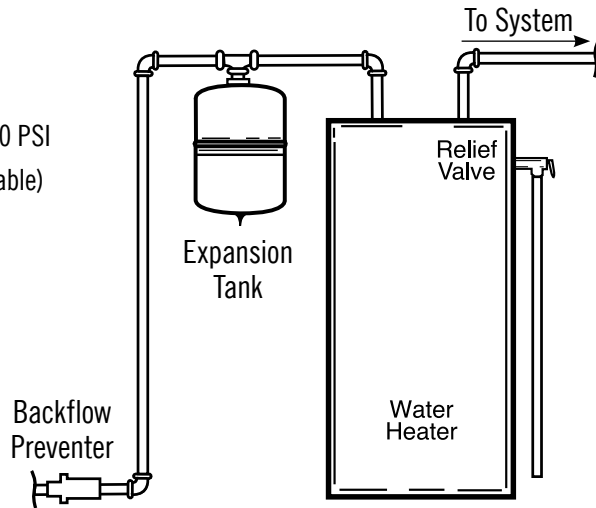
In many of today's potable hot water heating systems, back flow preventers are required by code. Since this seals off the system, an expansion tank is required or the relief valve will discharge on every heating cycle. DuraMAC™ Expansion Tanks eliminate this wasteful and costly practice.

The MPIX and MPI series has all the features of the MH series, but includes a powder coated liner in the water containing area. This unique bonded surface provides positive protection against rust and corrosion and meets today's sanitation requirements. For other conditions, please contact our Pump Department for assistance.

DuraMAC™ Expansion Tanks must be installed on the cold water supply side of the water heater and placed between the water heater and check valve or back flow prevention device.

**Features:**

- Drawn Steel Construction
- Butyl Diaphragm
- Maximum Working Pressure 150 PSI
- 40 PSI Air Charge (field adjustable)



## TANK MODELS WITH 5-YEAR LIMITED WARRANTY Two-Part Powder Coated Liner



Model No.	Max (PSIG) Working Pressure	Tank Volume (Gals)	Max. Accept Volume (Gals)		Conn. MPT Size	Dimensions		Ship Wt. (Lbs.)
			40 PSI	60 PSI		Diameter	Height	
16002-V3MPIX	150	2	1.27	1.03	3/4	8 3/8	12 1/2	5
16005-V3MPIX	150	5	3.05	2.19	3/4	11 3/8	14 3/4	8

## TANK MODELS WITH 1-YEAR LIMITED WARRANTY Two-Part Powder Coated Liner



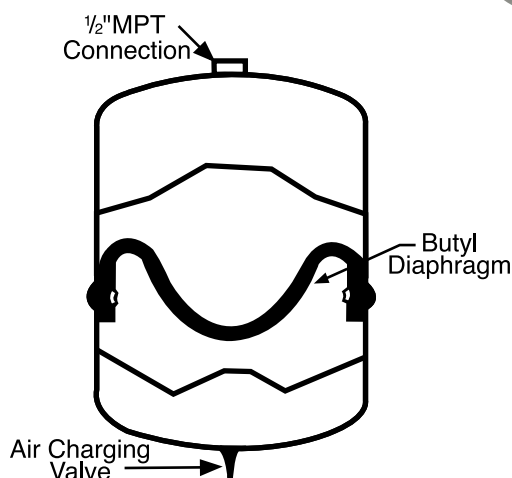
Model No.	Max (PSIG) Working Pressure	Tank Volume (Gals)	Max. Accept Volume (Gals) 20 PSI	Conn. MPT Size	Diameter (IN)	Height (IN)	Ship Wt. (Lbs.)
16005-V3MPI	150	4.4	2.19	3/4	11.0	14	10.0

# Expansion Tanks - Hydronic Residential Space Water Heating Systems

DuraMAC™ Expansion Tanks are designed for the specific purpose of accommodating the natural expansion of water in a Hydronic Heating System. To eliminate the water logging that is troublesome but normal in a plain steel expansion tank, the air and water within the tank is permanently separated by a butyl diaphragm. The in-line series shown on this page are light in weight, easy to install, and afford many years of trouble-free service.

## Features:

- Drawn Steel Construction
- Butyl Diaphragm
- In-line Installation
- Maximum Working Pressure 100 PSI
- Maximum Temperature 240°F
- 12 PSI Air Charge (field adjustable)
- Not for use with Potable Water Heating Systems



## TANK MODELS WITH 1-YEAR LIMITED WARRANTY

Model No.	Max (PSIG) Working Pressure	Tank Volume (Gals)	Max. Accept Volume (Gals) 20 PSI	Conn. MPT Size	Dimensions		Ship Wt. (Lbs.)
					Diameter	Height	
16002-V2MH	100	2	1.53	1/2	8 3/8	12 1/2	5
16005-V2MH	100	5	3.75	1/2	11 3/8	14 3/4	8

