

# Standard Symbols – Pipeline Accessories

## Scope

Symbols for valves and ancillary equipment connected to pipework systems. These may be for heating, cooling or domestic water systems.

## Basic geometry

Dimensions refer to size as shown on a drawing when printed full size. Equipment shown on general arrangements will be sized according to the proposed size of the equipment divided by the scale of the drawing.

## Ancillary Equipment

### General

Ancillary equipment shall include all pipeline components that are not end of line or primary pieces of equipment.

Ancillary equipment is generally attached to one pipework system to provide services such as pressurisation (including motive force to a fluid), fluid filtration, addition of chemicals (dosing) or fluid control (valves).

Equipment attached to a single system shall inherit the colouration of that system.

### Pumps

Pumps shall be shown consistently, irrespective of actual unit size or duty (see geometry diagram below). The arrow in the centre of the symbol shall point in the direction of fluid flow. The arrow shall be filled in with colour generally, unless the pump is a dedicated standby unit (which is less common nowadays), whereupon it shall be an empty triangle.

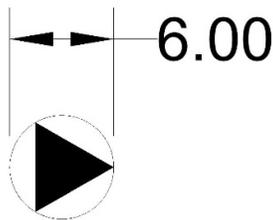


Figure 1 - Pump Geometry

### Expansion and Buffer vessels

Expansion tanks and Buffer vessels perform different tasks in pipelines, they are, however, both tanks containing fluids, hence the symbols for them are related. The Expansion tank symbol is differentiated by the inclusion of a representation of a pressurising diaphragm, this is not necessarily indicative of the method of pressurisation in the final selected product, that detail should be covered by either a schedule or specification.

Symbols are provided at a size suitable for general use, there may, however, be circumstances where a much larger vessel is being represented. In this instance it may be suitable to enlarge the symbol to denote the larger capacity, or to rotate the symbol 90° to denote a sideways mounted vessel.

#### Dosing

Dosing pots are generally smaller than Expansion tanks or Buffer vessels, hence the symbol is smaller than for those product types.

As the vast majority of dosing pots will be supplied with a tundish for pouring chemicals into the pot, this component is included in the symbol.

Other common parts are not included, such as isolation valves, drain cocks or air valves, as these may or may not be included in the purchased item and it provides greater connection flexibility to the modeller (pipework may be connected from either side, irrespective of the actual connection locations).

#### Pressurisation units

Pressurisation units maintain water pressure in sealed systems and may include a facility to add water to the system if required.

Exact specifications of pressurisation unit will vary dependent upon the nature of the fluid being pressurised, be that heating water (LTHW), chilled water (ChW) or solar water (SHW). These variations may be indicated by applying the primary system colour to the symbol, no symbolic differentiations are therefore required.

Pressurisation units usually have one or two pumps, no symbolic differentiation is made for the number of pumps included in a unit, this may be expressed through schedule or specification.

Pressurisation units may also have a buffer vessel included, this may be denoted by the inclusion of a buffer vessel symbol within the pressurisation unit symbol, or by specification or schedule, an example symbol with buffer vessel is provided.

#### Booster sets

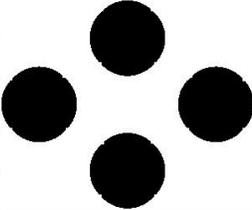
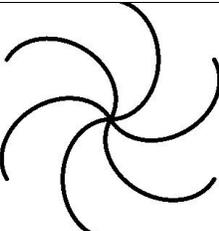
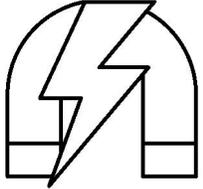
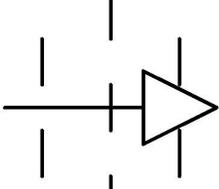
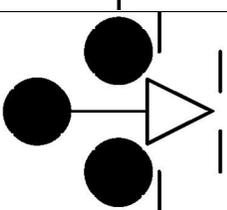
Booster sets increase flow water pressure to overcome head losses in domestic water (non-sealed) systems.

Booster sets are mainly comprised of one or more pump units and may have one or more buffer vessels included. No symbolic differentiation is made for the number of pumps or booster sets included in a unit, this may be expressed through schedule or specification.

#### Filtration

Filtration accessories are generally inline equipment to remove particulate matter from fluid flows. This removal may be achieved through a number of different methods and remove a number of different particulate types from the fluid.

The symbols provided here cover the most common methods and particulate types covering both mechanical and public health pipework types.

Filtration method	Symbol
Carbon	
Cyclone	
Electro-magnet	
Membrane	
Reverse Osmosis	
UV	<b>UV</b>

## Valves

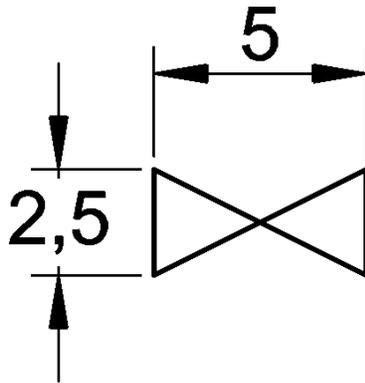
### General

Valves shall include all components for the control, isolation and measurement of a fluid contained within a pipework system.

They shall be shown symbolically at the same size (see diagram below) irrespective of the actual size of the valve or pipework system in which it is hosted.

Valve symbols shall be comprised of several symbol parts that denote the function of the valve and, for more detailed valve symbols, the mechanism by which that function is enacted. For example, an isolation valve will have a symbol denoting the isolation function, a more detailed symbol will show the isolation function with the method by which isolation is achieved, e.g. Ball Valve.

#### *General Valve Geometry*



#### Isolating

Valves for shutting off supply of the fluid through a pipe.

#### Control

Valves for the control of flow volume through a pipe. The control may be achieved through manual, pneumatic or motorised mechanisms and be actuated by a variety of factors, such as building controls or thermostatic measurements.

Control may also be the ability to prevent flow in a given direction, such as in a non-return valve.

#### Safety

Valves to relieve pipework in certain situations, such as over pressure.

#### Other

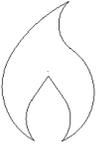
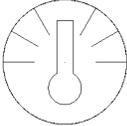
Other valves include pressure reducing or inline strainers.

#### Meters

Meter symbols are provided to denote devices for the accrued measurement of a medium passing through.

No differentiation is made between statutory authority metering and more general building (e.g. landlord and tenant) metering. This may be demonstrated through annotation or scheduling.

Traditionally meters have been designated with a signifying letter in the symbol, these symbols are provided with this set, also, where language may be an issue, an alternative set is provided with a symbol part denoting the medium being measured.

Measured medium	Symbol
Electricity	
Flow	
Gas	
Heat	
Water	

### Pipe Ancillaries

Methods of guiding and anchoring of pipework may be shown on drawings or in models. Symbols for their inclusion, generally in plans and not schematics, are included here.

#### Anchors and guides

Anchors and guides perform similar tasks, they restrict the movement of a pipe. A guide allows movement in one direction, an anchor prevents movement in all directions.

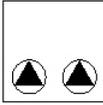
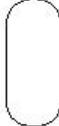
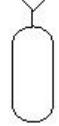
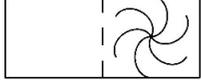
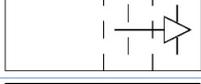
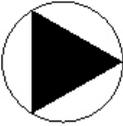
#### Joints

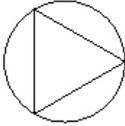
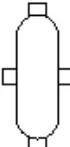
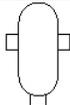
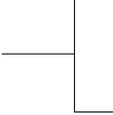
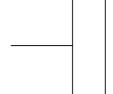
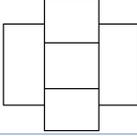
Methods of joining pipes may be shown on plans or schematics. It is useful to be able to specify a joining method when it is critical to the overall performance of the pipe system. Several methods have symbolic representations included in this set.

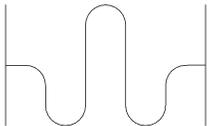
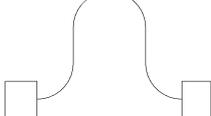
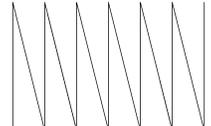
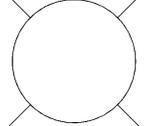
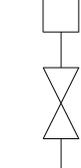
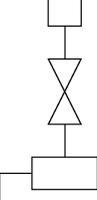
### Controls and Sensors

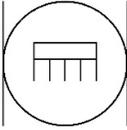
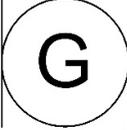
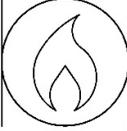
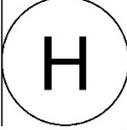
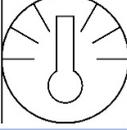
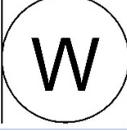
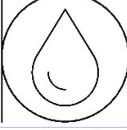
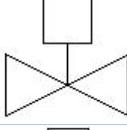
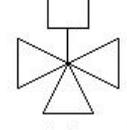
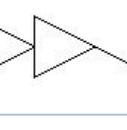
These are covered by the Controls and Sensors set of symbols.

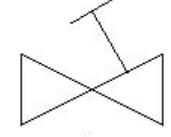
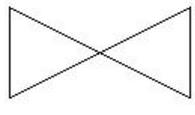
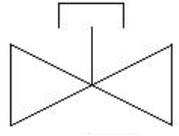
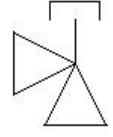
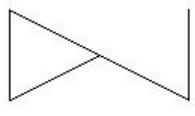
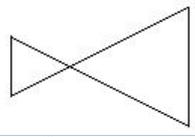
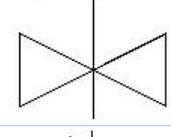
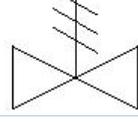
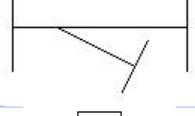
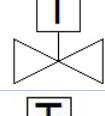
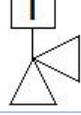
## Symbols and Abbreviations

Pipeline Accessory Symbols		
Product	Abbreviation	Symbol
Equipment – Booster Set	BS	
Equipment – Buffer Vessel	BV	
Equipment – Dosing Pot	DP	
Equipment – Expansion Vessel	EV	
Equipment – Filter – Generic	FI	
Equipment – Filter – Carbon	FI	
Equipment – Filter – Cyclone	FI	
Equipment – Filter – Electro-magnetic	FI	
Equipment – Filter – Membrane	FI	
Equipment – Filter – Reverse Osmosis	FI	
Equipment – Filter – UV	FI	
Equipment – Pressurisation Unit	PU	
Equipment – Pump	P	

Equipment – Pump Standby	P	
Equipment – Separator – Air		
Equipment – Separator – AirDirt		
Equipment – Separator – Dirt		
Fittings – Concentric Reducer		
Fittings – Eccentric Reducer		
Fittings – End Cap		
Fittings – Flange		
Fittings – Flange Blind		
Fitting – Hose		
Fitting – Socket		
Fitting – Union		
Fitting – Weld		

<b>Pipe Ancillaries – Flexible Coupling</b>		
<b>Pipe Ancillaries – Expansion Loop</b>		
<b>Pipe Ancillaries – Expansion Bellows</b>		
<b>Pipe Ancillaries – Anchor Point</b>		
<b>Pipe Ancillaries – Pipe Guide</b>		
<b>Pipe Ancillaries – Intumescent Collar</b>		
<b>Pipe Ancillaries – Air Vent</b>		
<b>Pipe Ancillaries – Air Bottle</b>		
<b>Meter – Electric</b>		
<b>Meter – Electric – alt</b>		
<b>Meter – Flow</b>		

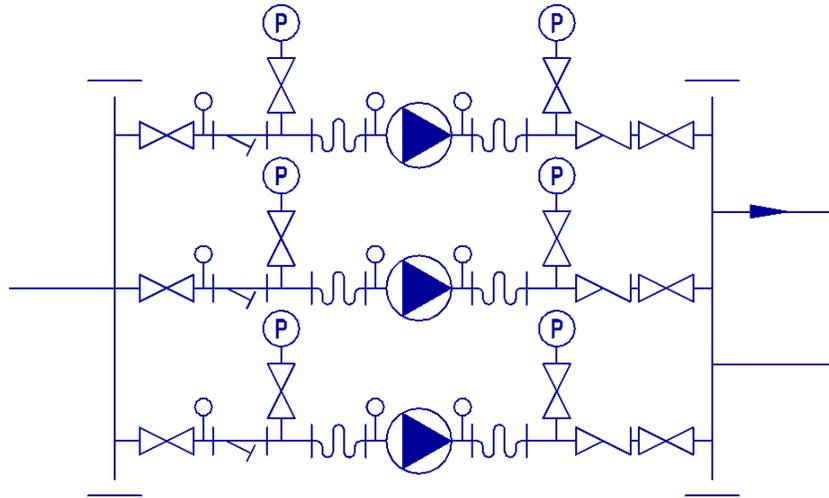
<b>Meter – Flow – alt</b>		
<b>Meter – Gas</b>		
<b>Meter – Gas – alt</b>		
<b>Meter – Heat</b>		
<b>Meter – Heat – alt</b>		
<b>Meter – Water</b>		
<b>Meter – Water – alt</b>		
<b>Valves – Motorised – 2Port</b>	2P	
<b>Valves – Motorised – 3Port</b>	3P	
<b>Valves – Commissioning Set</b>	CS	
<b>Valves – Double Check</b>	DCV	

<b>Valves – Double Regulating</b>	DRV	
<b>Valves – Drain Cock</b>	DC	
<b>Valves – Isolating</b>	IV	
<b>Valves – LockShield</b>	LSV	
<b>Valves – LockShield Angled</b>	LSV	
<b>Valves – Non-Return</b>	NRV	
<b>Valves – Pressure Reducing</b>	PRV	
<b>Valves – Regulating</b>	RV	
<b>Valves – Safety</b>	SV	
<b>Valves – Strainer</b>	Str	
<b>Valves – Thermostatic</b>	TRV	
<b>Valves – Thermostatic – Angled</b>	TRV	

## Use examples

Schematics are simplified to demonstrate symbol usage, they do not imply any engineering principles.

### Boosted Water Pumpset



### Radiator Heating Circuit

