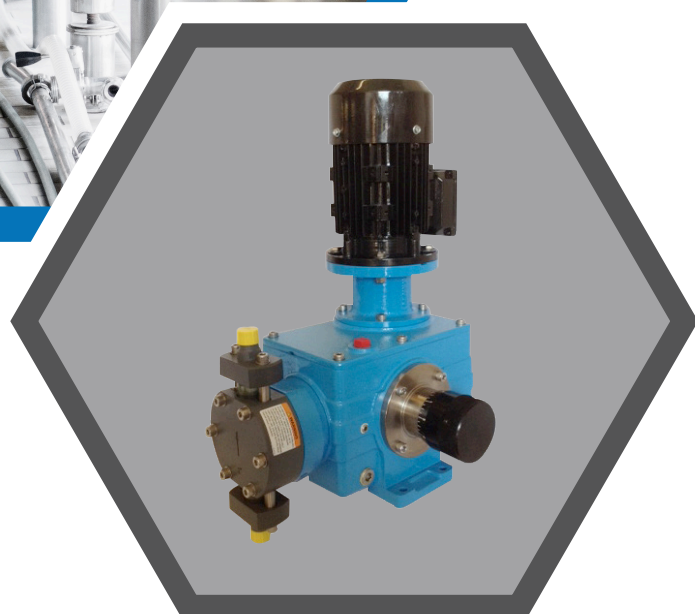


WATER PROCESS SOLUTIONS

Metering/Dosing Pump
Accessories And Installation
Guidelines



Pump Installation Guidelines

These guidelines are intended for those planning metering pump installations. They do not replace the instruction manual which should be read and understood before installation and commissioning.

Location

Site pump with protection from elements, preferably in a building. It should be on a level plinth or floor close to the supply tank with an adequate space for maintenance, especially dismantling of the pump head. A containment bund should be provided with a capacity at least 110% of the volume of the tank. In extreme climatic conditions a hood or cover should be considered for the pump and associated pipework and fittings. Mounting the pump above the containment flood level will minimize damage in the event of a chemical leak.

Pipework General

- Suction and discharge pipework should be short and direct
- Avoid use of short elbow fittings, unnecessary bends and loops
- Pipework must not impose strain on pump connections
- Always flush pipework to remove dirt etc. before initial start-up
- All pipework must be of adequate size, long runs may require larger bores

Suction

For accurate results, variations in suction conditions should be kept to a minimum. Where possible use solution vessels having a larger diameter and minimum change in contents level. Termination should always be 100-200mm (4-8") from the bottom to prevent sediment being drawn into the pump. Filters should be sized to have an area of at least five times that of the cross section of the pipe they are protecting. Diaphragm valves should be avoided. Flooded suction is preferable to suction lift, but up to 1 meter (3' 3") of lift is acceptable for free flowing liquids on pumps of adequate capacity. Where conditions demand, use suction demand valve or pulse dampener (see overleaf).

Discharge

Ensure that the difference between delivery and suction pressure is not less than 0.7 bar (10 psi). If normal conditions would not produce this, use a back pressure valve (see sketch overleaf). Discharge lines must never be closed during operation. Where a blockage in the pipework is a possibility (e.g. a closed valve), a relief valve should be installed with the relief pipework connected back to the Chemical Supply Tank. Motor overload cutouts on larger pumps can give additional protection whilst a flow switch will allow remote indication/alarm on pump failure. Pulsation Dampeners or accumulators, fitted close to the pump discharge will smooth line pulsations.

Slurry Heading

Size pipework to give a velocity between 0.2 and 2.0m/s (0.65 and 6.5ft/s). Avoid sharp bends and restrictions. Use of transparent flexible pipe will help in getting a smooth run and also assist in removing blockages should they occur. A flushing water line should be installed just downstream of the valve adjacent to the solution container so that on shutdown slurry particles can be washed out. Automatic flushing should be considered for unmanned or automatic sites.

Volatile Liquids

Extra care must be taken to provide sufficient net positive suction head (NPSH) to prevent vaporisation. As a general guide, provide 3m (9' 9") head above vapour pressure.

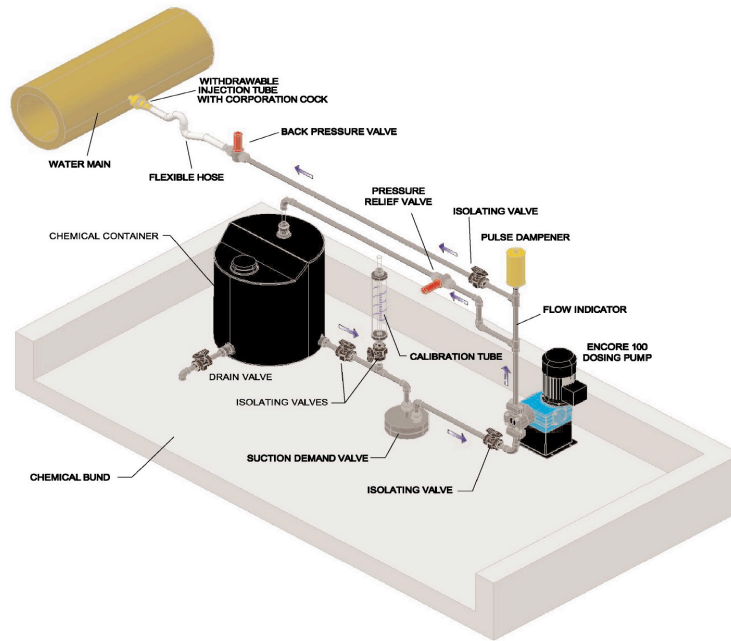
Temperature

The effect of temperature on construction materials and liquids should be assessed during system planning. Where ambient or process liquid temperatures below 5°C (41°F) or above 50°C (122°F) are expected, Siemens Water Technologies should be consulted.

Sodium Hypochlorite

Special consideration should be given to sodium hypochlorite metering installations, please refer to WT.010.055.000.IE.AG or contact your local Siemens Water Technologies office for further information.

Typical installation



Pump Accessories

Pump accessories are required for two main reasons:-

1. To alleviate problems which might occur when site conditions prevent an ideal installation.
2. Where additional facilities are required over and above a basic dosing pump installation.

In this product sheet we set out the benefits of each accessory and indicate under what conditions they should be employed. An effective dosing pump system is reliant on correct selection of appropriate accessories.

Suction Demand Valve (SDV)

Benefits:

1. Minimizes effect of variation in liquid level in the storage tank to produce better accuracy and repeatability.
2. Prevents contents of storage tank passing the SDV when pump is not running thus removing a potential leak hazard.
3. Simplifies installation - eliminates need for a breaktank.

Use When:

1. There is a difference between the maximum and minimum liquid levels in the storage tank of more than 1.5m (4' 9") for standard pumping systems and more than 3m (9' 9") where the dosing pump forms part of a closed loop control system.
2. Hazardous liquid is involved. Materials of Construction: RPVC, PTFE, Viton & glass or tungsten.

Note:

1. When an SDV is employed, a back pressure/antisiphon valve is not required provided there is about 1m (3' 3") head of pressure on the discharge side of the pump.
2. Recommended maximum storage tank head on the SDV is 15m (50').
3. When calibration chamber is installed, SDV must be on the upstream side.
4. Output reduced by an average of 12% when SDV is used.

Calibration Chamber

Benefits:

Provides means of precise site calibration and checking of pump output.

Use when:

Greater accuracy and long term repeatability are essential.

Note:

Allow minimum of 11/2 minutes for operation e.g. 30 liter (8 US gal) chamber for flows up to 120l/h (32 US gal/h). Associated valves are provided.

Pulsation Dampener

Benefits:

Smooths out the pulsating output of reciprocating pumps.

Use When:

1. A smoother flow pattern is essential at the injection point.
2. It would enhance the operation of an inline device in the discharge pipework (e.g. flowmeter or relief valve).
3. Pipe runs are abnormally long or hydraulic shock is likely.

Materials of Construction:

RPVC and various (according to manufacture).

Note:

Pulsation dampeners cover a variety of types (known by various names e.g. air vessel, accumulator, alleviator), from the simple reservoir chamber with a small volume of air to absorb the discharge stroke energy to a rather more complex cylinder with a gas liquid separation system. Under certain conditions a pulsation dampener should be installed on the suction side of the pump. Consult Siemens Water Technologies for recommendation on most suitable pulsation dampener for any application. Any pulsation dampener should be located within 1 meter (3' 3") of pump.

Pressure Relief Valve (PRV)

Benefits:

Relieves excess pressure in the pump discharge line, thus protecting the pumphead and pipework and reducing the chances of leakage.

Use when:

1. Possibility of discharge pipework blockage.
2. Handling hazardous liquid.

Back Pressure Valve (BPV)

Benefits:

Produces a positive head on discharge of pump to assist accurate metering.

Use When:

Pressure differential between suction and discharge side of pump is less than 0.7 bar (10 psi). Sizes available: To suit pump range.

Materials of Construction:

RPVC or 316 stainless steel, Viton or PTFE filmed diaphragm.

Note:

1. Back pressure valve not normally required if suction demand valve is employed.
2. For slurry applications a special air operated pinch valve is employed.

Injection Fittings

To provide the means of connecting the pump discharge pipe/hose into the flow stream in an enclosed main and promote chemical mixing. Withdrawable and non-withdrawable types are available. The advantage of the withdrawable type is that it can be disconnected from a main under pressure without allowing the contents of the main to discharge.

Hose

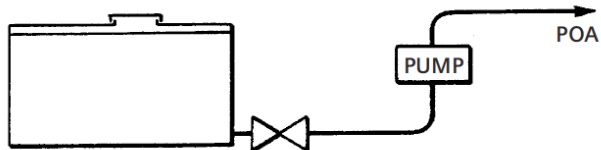
A variety of flexible hoses are available to suit most applications. When ordering please specify the length required. Rigid pipework is normally supplied and installed by the client.

Miscellaneous

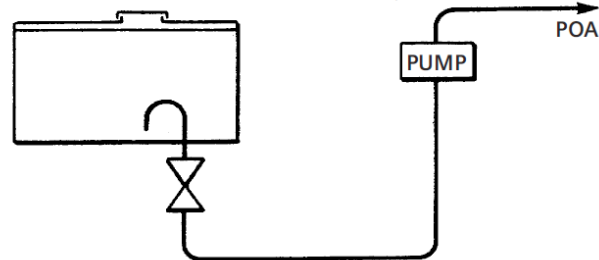
1. Foot valves and strainer for use with pumps mounted above the tank.
2. Sight glasses to give visual indication of pump operation.
3. Packaged pump units: mounted on polyethylene tanks of capacities 100, 200 and 500 liters (26, 53 and 132 US gal).
4. Duty/standby change-over panel to effect automatic changeover from duty to standby pump on a signal from external source e.g. timer, controller etc.
5. Chemical dilution systems, both straightforward fixed ratio systems and highly accurate arrangements for specialist application.
6. Prefabricated plastic containments.
7. Complete chemical metering packages, both open frame and fully enclosed.

Typical Suction Pipework

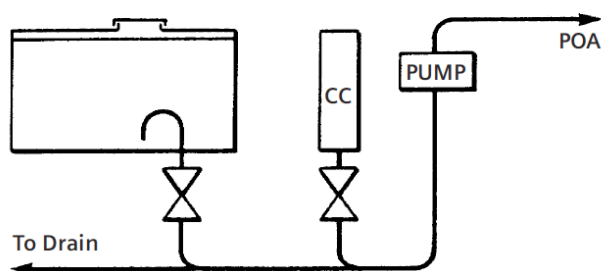
1. Side outlet



2. Bottom outlet (not suitable for slurry)



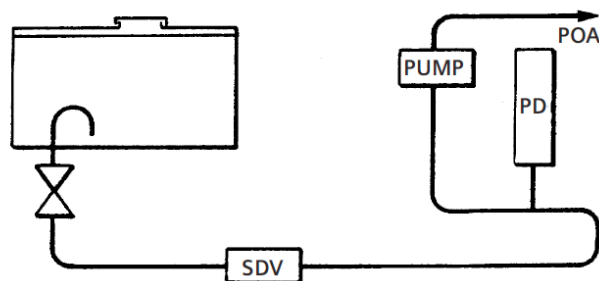
3. Bottom outlet with connection for calibration chamber (CC). For best results the chamber should be within level limits of solution container.



POA = Point of Application

4. Unavoidable adverse suction conditions

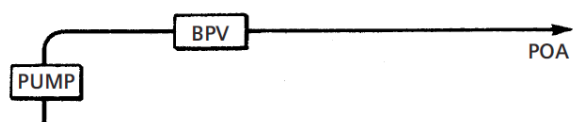
- (a) When liquid level in the container varies by more than 1.5 meters (4' 9"), use a suction demand valve (SDV).
- (b) When the pipework distance between container and pump is more than about 6 meters (19' 6"), use a pulse dampener (PD) close to the pump.



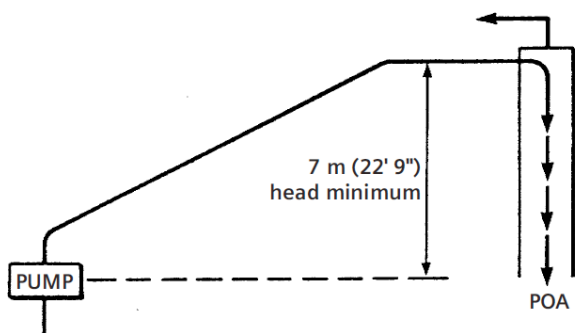
Typical Delivery Pipework

1. Differential pressure across pumps

POA pressure must exceed suction pressure by at least 0.7 bar (10 psi) (7m (22' 9") head). If this is not naturally available fit a back pressure valve (BPV)* close to the pump.

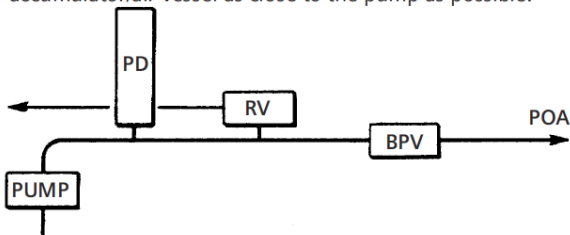


3. Alternative to 1 above (for open applications)
Top vent to be fitted to prevent siphonic action.



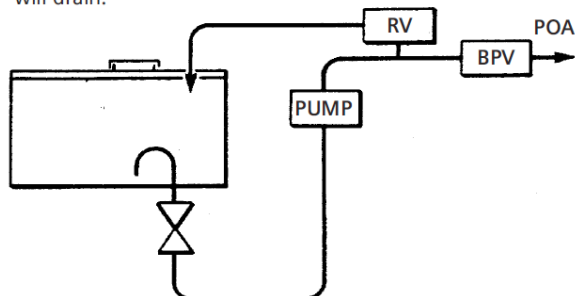
2. Pulse dampener

To reduce discharge pulsations, fit a pulse dampener/ accumulator/air vessel as close to the pump as possible.



4. Relief valve (recommended for pump protection)

Return the relief valve (RV) discharge to solution container. Keep RV above liquid level of container so that discharge line will drain.



*Also called pressure sustaining valve, anti-syphon valve or constant load valve. (NOT a leak tight shut-off valve).



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The information provided in this brochure contains merely general descriptions of characteristics of performance which in case of actual use do not always apply as described or which may change as a result of further development of the products. An obligation to provide the respective characteristics shall only exist if expressly agreed in the terms of contract.

www.waterprocesssolutions.com
enquiries@waterprocesssolutions.com

 Water-Process-Solutions

 @waterwps

Water Process Solutions Ltd
Unit 10,
Mill Hall Business Estate,
Aylesford,
Kent, ME20 7JZ

 **WATER PROCESS
SOLUTIONS**