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TECH. DATA SHEET	PAGE	EQUIPMENT	DATE
1100	1	SERIES 1100 PR/PL VALVES	12/06/2013

INTRODUCTION

The 1100 Series valves have been designed specifically for the dosing industry to meet the needs of dosing pump manufacturers, dosing system builders, and end users in terms of reliable operation, flexibility, safety, and optional features. The valves are available to match all types of connections and pipework standards with the size and capacity ranges available providing adequate flexibility to match virtually any pump or system throughput whilst retaining uniformity of design, operational familiarity, and - when required - spares. The 1100 series valves operate on the spring loaded diaphragm principle and although designed initially for use within dosing systems they are equally suited to installation on any other pressure relief or loading duty consistent with their type and design..

APPLICATIONS

Pressure relief of dosing lines.
Pressure sustaining (loading) for dosing pumps.
Flow checking (where supply pressure is higher than pumped discharge pressure).
Anti-syphoning.
Combination back pressure & check valve.
Backpressure valving.
Pump re-cycle bypass relief.
Thermal expansion relief.

OPERATING PRESSURE RANGES

A clear benefit of the valve design is their dual range capability - the same valve can be used in pressure relief or in pressure loading (sustaining) mode merely by selecting the relevant inlet port. The standard 1100 series valves provide pressure relief between the ranges of 1 - 10 BarG when using the PR inlet (this is identified as the port having the central vent visible inside), or pressure loading (sustaining) duty between the ranges 0.5 - 3.0 BarG. when using the opposite inlet port. The ports are clearly identified by external labelling. The operating pressure range of the standard 1100 series valves can be extended by the use of high range loading springs - refer to the specific sections below.

PRESSURE RELIEF

The 1100 series valves used in PR mode can be adjusted between approx. 1 and 10 BarG. Adjustment is made in situ simply by screwing in or out the large adjuster screw which is exposed by removal of the bonnet cap. It should be borne in mind that if PTFE coated diaphragms are used on low pressure PR applications (approx. 2.5 BarG) then the harder PTFE facing prevents a good positive seal from being made and some slight weeping should be expected. In these situations an elastomeric diaphragm i.e. Viton should be selected to ensure a bubble-tight seal. Alternately, the 0 - 3 BarG inlet can be used if circumstances permit - see below. As a safety feature the valve cannot be completely shut off even when the adjuster screw is fully down. This helps prevent

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personnel hazards or system damage caused by inadvertent or unauthorised over-adjustment. **Positive locks** can be fitted to prevent unauthorised adjustment - refer to the **options** section later for details. The majority of chemical treatment dosing systems utilising plastic piping material operate in this pressure area and so are covered by the 1100 PR pressure range. For those applications demanding higher operating pressures the 1100 Series up to $1^{1}/_{2}^{''}$ size can be fitted with a high range spring which extends the PR range to 14 - 16 BarG. In this configuration the valve is designated '1100HP' and is generally of metallic construction. Refer to **model designation** section later for specifics. The 1100 valves are not bellows sealed or balanced and are therefore effected by back pressures applied to the valve discharge during operation. Generally a back pressure will reduce the set point of the valve so it will tend to 'fail safe'. It is possible to set 1100 series valves to operate with an applied back pressure and details are available from PROCHEM on how to accommodate this condition. **Alarm contacts, Manual override,** and **'gagging'** facilities are available on the valves - refer to **options** section later.

PRESSURE LOADING (SUSTAINING)

The majority of dosing pumps require a loading pressure of between 1 and 3 BarG. on their discharge to enable the inlet and outlet check valve incorporated in the pump head to operate correctly and produce the high degree of volumetric delivery accuracy frequently required. The 1100 Series valves are ideal for this application when the 0.5 - 3.0 BarG. inlet port is used. As with the valves in PR mode, the standard loading spring can be replaced with a higher range version to extend the operating range to 0.5 - 5.0 BarG. when the installation duty demands this. Again the designation changes to '1100HP'. A similar range of options is available for the valves in PL and PR mode. For low range pressure relief situations it is sometimes advantageous to use the lower pressure 'pressure loading' inlet as this provides more adjustment sensitivity. If PTFE coated diaphragms are used on very low pressure PR duties, a complete seal may not be achieved (see above) and an elastomeric diaphragm i.e. Viton should be considered - this phenomena rarely causes problems in pressure loading situations however.

MATERIALS OF CONSTRUCTION

The design of the 1100 series valves allows an almost limitless choice of constructional materials to be used - there being only two main valve components in contact with the fluid handled thus minimising the problems normally associated with handling corrosive chemicals. Below are some of the more common materials of construction.

BODY

PVC, POLYPROPYLENE, PVDF, PTFE, 316SS, MONEL, HAST 'C' & 'B', TITANIUM, ALLOY 20, ALUM, BRONZE.

DIAPHRAGM & SEALS

EPDM*, VITON, PTFE COATED EPDM, PTFE COATED VITON.

Note: EPDM diaphragms carry WRc. approval. Other construction materials are available to order for specific applications.

FOR MATERIAL DESIGNATION CODES SEE VALVE DESIGNATION DATA.

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SIZES & CAPACITIES

METRIC O.D.	METRIC DN.	IMPERIAL N.B.	CAPACITY Lt/HR.
16	10	3/8"	400
20	15	1/2"	750
25	20	3/4"	1250
32	25	1"	2000
40	32	1 1/4"	3000
50	40	1 1/2"	4000
63	50	2"	6000
63 DUPLEX	50 DUPLEX	2" DUPLEX	12000

NOTES 1) DUPLEX VALVES HAVE TWO IDENTICAL LOADING DIAPHRAGM HEADS ON A COMMON BODY.
2) CAPACITIES BASED UPON STEADY DAMPED PULSE FREE FLOW IF IF NOT DAMPED DIVIDE BY 2

CONNECTIONS

The 1100 Series valves are available with connection types to suit all pipework standards. The actual type of connection is generally dependant upon what is possible with the materials of construction selected. The more accepted connections and corresponding construction materials are as follows:

PVC.
Solvent weld, screwed, solvent weld union, stub flanged, and wafer pattern*.

POLYPROPYLENE & PVDF.
Fusion weld, screwed, fusion weld union, stub flanged, and wafer pattern*.

PTFE
Screwed, and wafer pattern*.

316 & EXOTIC METALS.
Screwed, butt weld, socket weld, union, hygienic, & flanged.

WAFER PATTERN*
It is not normally recommended to bolt plastic valves into metallic or lined steel pipework as this often results in broken flange connections - the wafer pattern enables this to be done safely as the flange bolting passes through the valve taking most of the pipework stresses from the plastic body - see drgs. later.

NOTE:
Solvent weld, fusion weld, & socket weld connections are available in both Metric and Imperial sizes.
Flanged connections & wafer pattern valves are available to all flange standards. On standard plastic valves the flanges are lap-stub type with galvanised steel backing flanges. On standard 316 valves the flanges are integrally welded. On exotic metal valves the flanges are normally lap-stub type with 304 plate type backing flanges.
Hygienic connections are available in both BS & DIN standards.

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OPTIONS

The following options are available on most variants of the 1100 series valves. Some types of construction variations or applications may preclude the use of certain options - check with PROCHEM.

MANUAL LIFT. This option allows the loading spring pressure to be overridden to assist in C.I.P. systems, line flushing, pump priming, or system venting. **The lift action can be supplied pneumatically operated for automated sequential flush systems (as in lime dosing).**

ELECTRIC CONTACTS.* This option provides a signal when the valve vents thus allowing remote alarm systems to be initiated. The system **monitors diaphragm movement** and requires a minimum of 20% rated valve capacity for satisfactory operation.

SECURITY LOCK. This allows securing the valve from unauthorised tampering and consists of a locking bar preventing access to the adjuster screw.

PRESSURE SWITCH CONTACTS.* A diaphragm sealed pressure switch assembly is mounted into the valve body to **monitor the pressure** at the valve inlet and allows contacts to be activated when a pre-set pressure is reached. This system has no minimum flow requirement but cannot easily be used where the product handled tends to 'drop out' and settle i.e. lime slurry.

GAGGING BAR. This prevents the valve from venting at all during hydro-testing or commissioning.
MANY OF THE OPTIONS CAN BE COMBINED ON ONE VALVE - SEE VALVE DESIGNATIONS.

*** SWITCH CONTACTS** - No volt, N.O. or N.C. (as specified), Rating - 100VA at 48V. Spade connectors. Protection: IP00 without rubber boot fitted, IP65 with rubber boot fitted.

SPECIAL FEATURES. The valves can be supplied with special features to suit individual client requirements. In these cases a suffix **'X'** is placed after the total designation and the actual features are specified.

Some typical special features: Different inlet/outlet connection types, PFA coated loading springs, Special material pressure pads/bonnets/adjuster screws, PTFE coated 'O' rings, and wire-tie type bonnet seals.

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VALVE DESIGNATIONS

X - 11 X X - X X

- **X** (DIAPHRAGM MATERIAL)
  - 0 = EPDM
  - 2 = VITON
  - 3 = PTFE COATED
- **X** (BODY MATERIAL)
  - 0 = PVC
  - 1 = POLYPROP
  - 2 = PVDF
  - 3 = 316SS
  - 4 = HASTELLOY 'C'
  - 5 = TITANIUM
  - 6 = OTHER MATL. (SPECIFY)
- **X** (CONNECTION TYPE)
  - 0 = SOLVENT/FUSION/SOCKET WELD
  - 1 = SCREWED
  - 2 = WELD UNION
  - 3 = SCR. UNION
  - 4 = FLANGED (SPECIFY FLG. RATING)*
  - 5 = WAFER TYPE (SPECIFY FLG. RATING)*
- **X** (VALVE OPTIONS)
  - 0 = BASIC VALVE
  - 1 = MANUAL LIFT
  - 3 = MAN. LIFT & PRESSURE SWITCH
  - 4 = SECURITY LOCK
  - 5 = MAN. LIFT & SECURITY LOCK
  - 6 = PRESSURE SWITCH
  - 7 = OTHER COMBINATIONS (SPECIFY)
- **11** (VALVE TYPE) — VALVE TYPE (1100 SERIES)
- **X** (VALVE SIZE) — VALVE SIZE (INCH N.B. OR MM O.D.)

DUPLEX VALVES - Add the letter **'D'** after the valve designation.
SPECIAL CONFIGURATION VALVES - Add suffix**'X'** after total designation and specify features.

EXAMPLES

MODEL $^1/_2$" - 1101 - 00 = $^1/_2$" VALVE IN PVC/EPDM HAVING SCREWED CONNECTIONS.
MODEL 1"- 1114 - 32 - 150 = 1" VALVE IN 316/VITON HAVING ANSI 150LB FLANGES, WITH MANUAL LIFT OPTION.
MODEL 2"- 1102 - 02 D = 2" DUPLEX VALVE IN PVC/EPDM HAVING IMPERIAL SW UNION CONNECTIONS.
MODEL 1" 1164 - 33 - PN16X WITH SCREWED OUTLET = 1" VALVE IN 316/PTFE FITTED WITH PN 16 FLANGED INLET, BSPF OUTLET, AND PRESSURE SWITCH.ALARM.

QUOTATION INFORMATION

In order to provide a quotation for a Series 1100 valve the following information is required:
1) Pumped fluid details and flowrate (dampened or pulsing).
2) Standard valve or special options required?
3) Type of connections required (and size of pipework if existing).
4) Any preferred construction materials.

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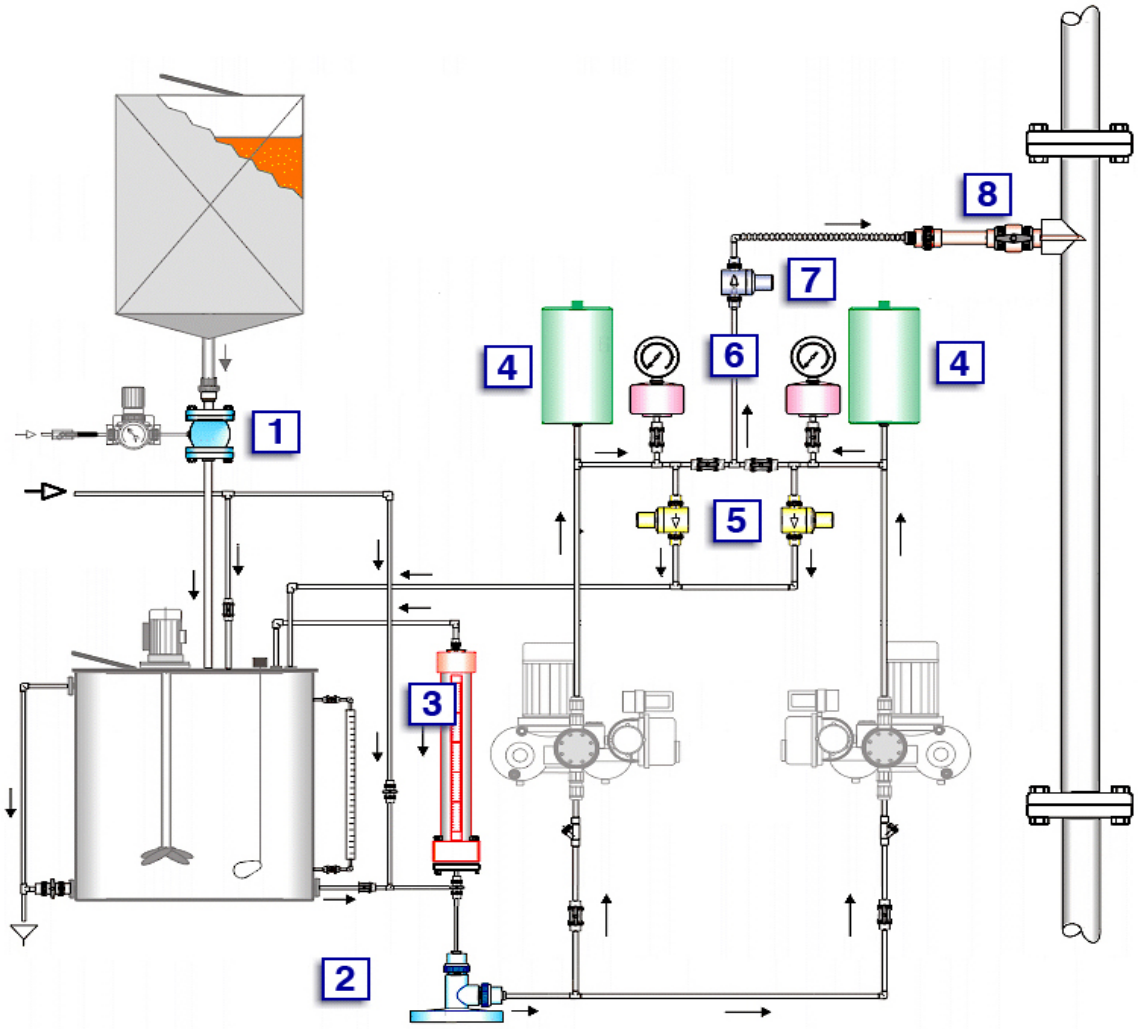
5) Required relief or loading pressure if required for factory setting (no charge).

INSTALLATION

The 1100 series valves are designed for direct mounting in the pipeline and can be mounted in any position although totally inverted mounting is least recommended due to the possibility of air or gas pockets forming in the pipework above the valve and causing erratic operation. If the valves need to be mounted WITH THE PIPELINE AXIS VERTICAL on lime or slurry duties where settling out will occur then the LP inlet port should always be arranged at the bottom. The lines to the valves should be flushed clear of construction debris prior to installation as particles of swarf or grit could damage the valve diaphragm if allowed to become trapped between it and the seat. This is especially true in the case of valves fitted with PTFE coated diaphragms. If debris is anticipated during normal operation then a strainer should be installed upstream.

DOSING SYSTEM SCHEMATIC



1) Pinch Valve. 2) Suction Demand Valve. 3) Calipot. 4) Pulstion Damper. 5) **Pressure Relief Valve.**
6) Diapragm Seal. 7) **Pressure Loading Valve**. 8) Withdrawable Injection Lance.

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