

EBSRAY PUMPS

INSTALLATION, OPERATION & MAINTENANCE
INSTRUCTIONS



RV Series Bypass Valve Model RV26



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SECTION 1- GENERAL

WARNING NON-COMPLIANCE WITH REQUIREMENTS UNDER THIS HEADING COULD CREATE CIRCUMSTANCES WHICH MAY LEAD TO PERSONAL INJURY AND/OR WHICH MAY CAUSE DAMAGE TO THE PUMPSET AND OR ANCILLARY EQUIPMENT

CAUTION ITEMS UNDER THIS HEADING DRAW ATTENTION TO LEGAL AND/OR STATUTORY REQUIREMENTS WHICH CONTROL THE INSTALLATION AND USE OF THIS TYPE OF EQUIPMENT. NON-COMPLIANCE WITH THESE REQUIREMENTS MAY CREATE A DANGEROUS SITUATION AND/OR RESULT IN DAMAGE TO THE PUMPSET AND ANCILLARY EQUIPMENT.

NOTE

Items under this heading are to draw attention to assembly procedures, techniques and methods of operation etc. which are important to ensure correct installation and operation of equipment and which, if not followed, may result in damage, failure or poor performance of pumpset and ancillary equipment.

1.1 - **CAUTION**

INSTALLATION AND SERVICING OF THESE VALVES SHOULD BE CARRIED OUT BY QUALIFIED, COMPETENT PERSONNEL IN ACCORDANCE WITH RELEVANT STATUTORY REGULATIONS OR CODES, IN CONJUNCTION WITH THESE INSTRUCTIONS.

1.2 - **WARNING**

THESE VALVES MUST BE OPERATED WITHIN THE ORIGINAL SELECTED DESIGN PARAMETERS OF PRESSURE, TEMPERATURE, FLOW AND VISCOSITY. SHOULD ANY CHANGE BE CONTEMPLATED, PLEASE CONFER WITH EBSRAY IN ORDER TO VERIFY THE SUITABILITY OF SUCH A CHANGE.

1.3 TRANSPORTATION AND PACKING

Standard domestic packing is suitable for shipment in covered transports. Ports must be sealed to exclude ingress of solids. When received on site the valve should be stored in a dry covered area.

1.4 INSPECTION ON RECEIPT

On receipt of equipment, check all items against the dispatch documents and inspect for damage. Any damage or shortage incurred during transit should be noted on the packing note and on both your own and the carrier's copy of the consignment note and a claim should be made immediately on the transport company. Should a shortage be evident on receipt, notify EBSRAY immediately giving full details and packing note number.

1.5 STORAGE

If storage is required for other than a short period prior to installation, special preservatives and protective wrappings will be required.

SECTION 2- INSTALLATION

Ensure pipework is clean before installation. Bypass Valve must only be installed in accurately aligned pipework to ensure that pipe stresses are not transferred to valve housing. The port which is opposite the Adjusting Screw is the inlet port and the other port is the outlet port.

The preferred installation orientation is with the adjusting screw up however the valve may be mounted in any position as required by the installation and available space. Ensure that the adjusting screw is accessible



WARNING

NEVER ALLOW WATER OR ANY CORROSIVE PRODUCT TO ENTER THE VALVE AS THIS MAY DAMAGE THE VALVE AND WILL VOID THE WARRANTY.

SECTION 3 - OPERATION

The EBSRAY Model RV26 BYPASS VALVE is a spring actuated pump and system protection device that by design cannot be positively shut-off. With the VRS option, It also provides for controlled and rapid 'bleed-off' of vapour. This enhances the self priming capabilities of the pump. The valve is installed in the pump discharge system and normally returns flow to the supply vessel.

The RV26 Valve is available in various configurations including 'O'Ring sealed or Gasket sealed versions, with or without the 'VRS' (Vapour Removal System) option.

On commissioning, the bypass valve must be set in accordance with the required/specified pump differential pressure, ensuring that total system pressure does not exceed regulatory codes or requirements of equipment installed.

SECTION 4 - MAINTENANCE

PRIOR TO ANY DISASSEMBLY OR SERVICE, VERIFY THAT ALL REQUIREMENTS OF STATUTORY REGULATIONS OR CODES ARE MET AND THAT SPECIFIC SITE REQUIREMENTS ETC ARE SATISFIED.

Apart from Housing replacement, other maintenance tasks and inspections can be carried out with the valve 'in line', so long as complete isolation, depressurising and purging have been completed.

4.1 SPARE PARTS

1. When ordering spare parts, to ensure correct replacement to original specification, always quote valve Serial Number, which is located on the nameplate of the valve. Please advise if valve has been upgraded with VRS option original supply from EBSRAY.
2. Advise the name, item number and quantity required. Refer to Drg CMP112.
3. Advise complete delivery instructions, transportation, etc.

4.2 PREPARATION FOR DISASSEMBLY

1. Obtain the appropriate Work Permit if required.
2. Isolate valve from liquids/vapour in suction and discharge lines, depressurise and purge out any toxic, flammable, corrosive or air hardening liquid/vapour.
3. Ensure the associated pump motor power supply has been isolated, before proceeding with the valve disassembly.

4.3 DISASSEMBLY

1. Remove Adjusting Screw Cap (18) (Gasket sealed version only)
2. Unlock Adjusting Screw Locknut (10).
3. Release all spring pressure by rotating Adjusting Screw (8) anti-clockwise.
4. Remove Valve Cover (2) from Housing (1).
5. Remove components from Valve cover (2) and Housing (1).

6. **OPTIONAL VRS ONLY:** If disassembly is necessary, the Ball (12) and Spring (13) will have to be replaced as heat is required to break the bond between the Spring Retainer (16) and the Valve (3).

To disassemble:

- a. Screw a bolt or setscrew (M12) into Spring Retainer (16) and lock in position with a locknut (10).
- b. Apply heat to the Valve (3) until the Spring Retainer (16) can be unscrewed from the Valve (3).
- c. Remove the Spring Retainer (16), Spring (13) and Ball (12) from the Valve (3).

4.4 INSPECTION

1. Inspect Housing and Valve seat for damage or wear. If required, remove Housing and replace.
2. Check all components for for damage or deposits, clean thoroughly, replace if broken or damaged.
3. It is advised that 'O'rings and Gaskets be replaced at every overhaul.

4.5 REASSEMBLY

(Refer drawing No CMP112).

NOTE: Lightly smear all 'O' rings with a compatible good quality lubricant before assembly.

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1. OPTIONAL VRS ONLY:

- NOTE:** To facilitate assembly, screw a bolt or setscrew (M12) into Spring Retainer and lock in position with a locknut.
- a. Insert Ball (12) into Valve (3).
 - b. Position Spring (13) on Ball (12).

- c, Apply loctite 620 (High temperature retaining compound) or equivalent to Spring Retainer thread.
 - d, Carefully screw in Spring Retainer (16) ensuring that Spring (13) enters the bore of the Spring Retainer (16).
 - e, Loosen locknut (10) and unscrew bolt or setscrew from Valve assembly.
2. Fit Locknut (10) to Adjusting Screw (8) and partially screw Adjusting Screw (8) into Valve Cover (2). For Gasket sealed versions, screw Adjusting Screw (8) in to Valve Cover(2) far enough to allow engagement with Spring Cap 4) during assembly.
 3. Fit Valve (3) into Housing (1), ensuring freedom of movement.
 4. Fit Spring (5) on to top of Valve (3).
 5. Fit 'O'Ring (7) or Gasket (17) to Valve Cover (2).
 6. **'O'RING SEALED VERSIONS ONLY:** Fit 'O'Ring (6) to Spring Cap (4) and fit Spring Cap (4) onto Valve Cover (2).

7. **GASKET SEALED VERSIONS ONLY:** Place Spring Cap (4) on Spring(5).
8. With a new 'O'ring or gasket in place, fit Valve Cover (2).

4.6 SETTING

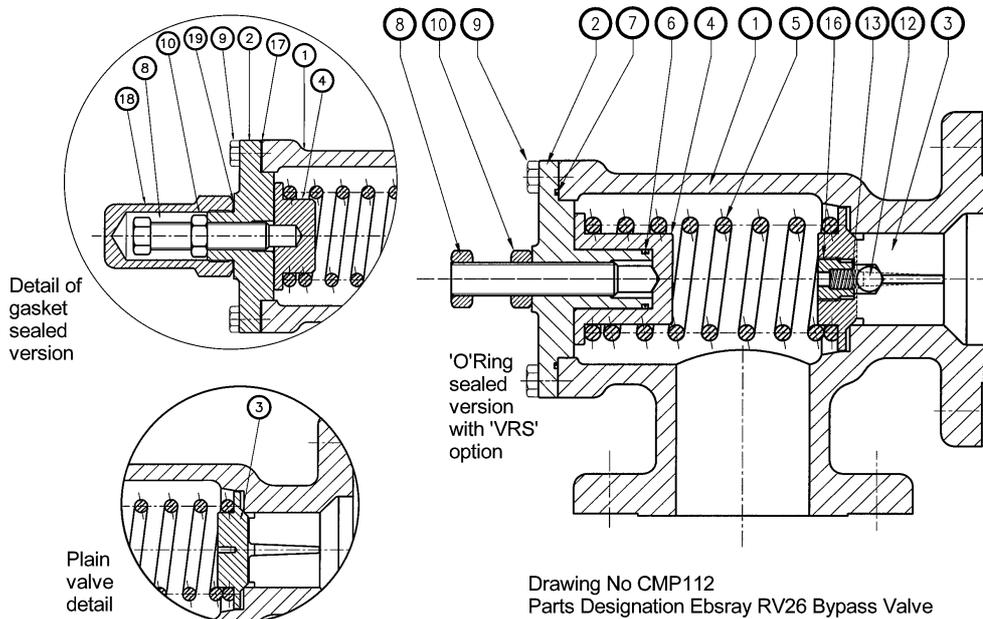
NOTE: Final pressure setting is carried out after the valve is installed or reassembled 'in line'. Refer to Section 6 for notes on Bypass Valve setting and operation.

1. For increased bypass pressure, rotate Adjusting Screw (8) in clockwise direction (i.e. screw in). DO NOT exceed system design pressure.
2. For decreased bypass pressure, rotate Adjusting Screw (8) anti-clockwise (i.e. screw out).
3. Lock Adjusting Screw Locknut (10) against Housing immediately after any adjustment is made.
4. For Gasket sealed versions, replace Adjusting Screw Cap with a new Gasket after setting is completed.

SECTION 5 - PARTS DESIGNATION

Cat #	Description	Qty	Cat #	Description	Qty
1	Housing	1	9	Setscrew	8
2	Valve Cover	1	10	Locknut	1
3	Valve	1	12*	Ball	1
4	Spring Cap	1	13*	Spring - Vent	1
5	Spring	1	16*	Spring Retainer	1
6*	'O'Ring	1	17*	Gasket	1
7*	'O'Ring	1	18	Adjusting Screw Cap	1
8	Adjusting Screw	1	19*	Gasket	1

* Items marked with asterisk are not common to all builds of RV26 valves. Please ensure that parts are identified correctly before ordering.



SECTION 6 - NOTES ON SETTING AND OPERATION

WARNING **SERIOUS INJURY TO PERSONNEL AND/OR DAMAGE TO EQUIPMENT MAY OCCUR IF SYSTEM OR COMPONENT DESIGN PRESSURE IS EXCEEDED. SHOULD THERE BE ANY DOUBT AS TO THE PRESSURES LIKELY TO BE GENERATED IN THE SYSTEM WITH AN INOPERATIVE OR INCORRECTLY SET BYPASS VALVE, PLEASE CONTACT EBSRAY FOR MORE INFORMATION.**

NOTE *In order to set the bypass valve, a throttling valve must be located in the discharge line downstream of the bypass valve. A pressure gauge must be installed in the discharge line between the pump and the throttling valve.*

6.1 ADJUSTMENT PROCEDURE

1. First open the throttling valve and any other valves in the discharge line in order to minimise the discharge pressure as much as possible. Failure to do this could cause excessive and /or dangerous pressures to be generated.
2. Before starting the pump, loosen the locknut on the bypass valve adjusting screw and screw the adjusting screw fully in (clockwise). This increases the tension on the spring and is the maximum pressure setting for the particular spring as fitted. [A number of springs are available to give different pressure ranges]
3. Start the pump and slowly close the throttling valve (ensuring pump/system maximum operating pressure is not exceeded) until the pressure gauge shows expected bypass valve **cracking pressure**. (Also called 'set pressure')

Now turn the adjusting screw out (anticlockwise) until the gauge registers a slight drop in pressure. At this point the bypass valve has begun to open ie. **cracking**. Screw in the adjusting screw one turn (clockwise) and then tighten the locknut. The Bypass Valve is now set

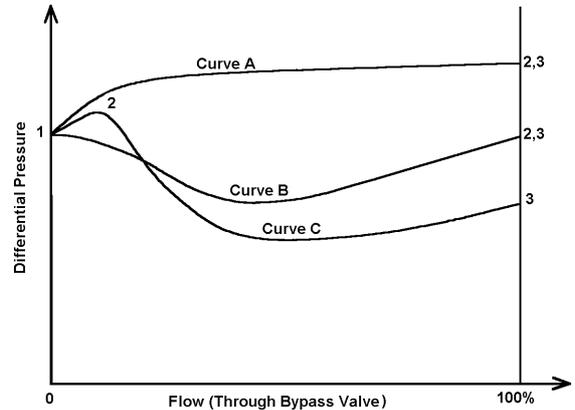
6.2 VERIFICATION OF ADJUSTMENT

Re-open the throttling valve. Stop pump then restart pump. Observe the pressure gauge whilst again slowly and cautiously closing the throttling valve. The gauge should register a levelling off (or reduction) in the characteristic pressure rise once the bypass valve cracking pressure has been reached.

6.3 IMPORTANT NOTES

1. The Bypass Valve is only one item controlling pressure-rise in the bypass system. Other valves, fittings and pipework downstream of the bypass valve also cause system resistance, this may affect maximum system pressure.
2. Bypass valves only control differential pressure - not total system pressure.

Typical Bypass Valve Characteristics



- 1 **Cracking pressure** (set pressure) (Where valve starts to bypass)
- 2 **Maximum pressure** (At the rated operating parameters)
- 3 **Full flow pressure** (bypass) (At the rated operating parameters)

NOTE: Any pressure rise (or fall) after the cracking point may depend upon:

- a. Flow rate through the bypass valve. (Excessive pressure rise may signify restrictions in pipework, fittings etc.)
- b. Viscosity of product at pumping temperature.
- c. Specific bypass valve design and size.

The graph represents three typical bypass valve characteristics. Actual performance during operation will depend on bypass valve design, system design and may also be affected by the parameters (a. b. & c.) as listed above.