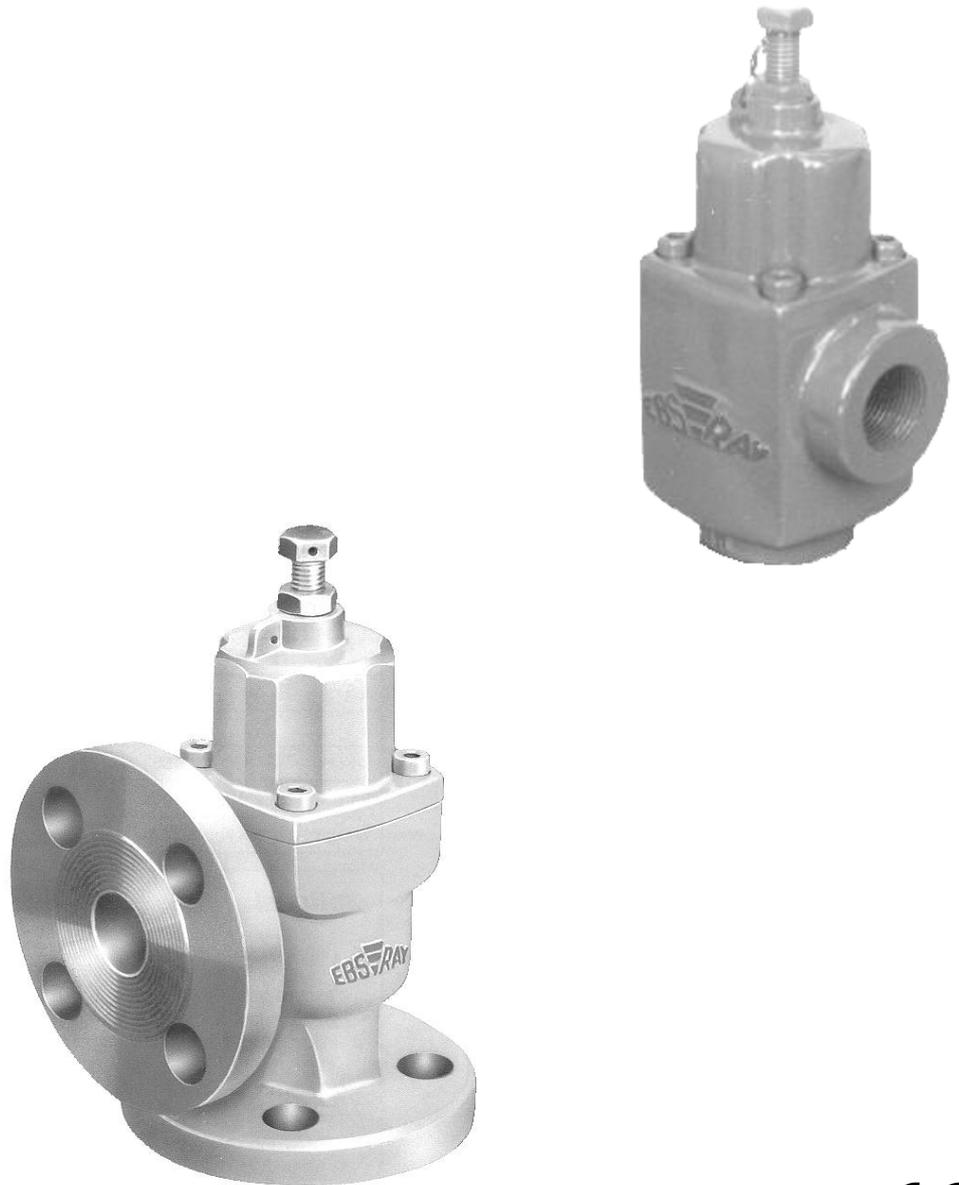


# EBSRAY PUMPS

## INSTALLATION, OPERATION & MAINTENANCE INSTRUCTIONS



CE

### ***RV SERIES*** ***Bypass Valves*** ***MODELS RV18 & RV19***

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## IMPORTANT NOTES

1. This Publication is **TYPICAL ONLY** and only relates to the specifications of the minimum equipment required to ensure the optimum performance, maximum life and trouble-free operation of the Ebsray RV18 and RV19 Bypass Valves.
2. Products with the mandatory European CE mark affixed indicate conformity to the essential health and safety requirements via their applicable EU Directives (e.g. ATEX 94/09/EC, Machinery 98/37/EC etc).  
As certain specific products/equipment outlined in this Publication may or may not be CE marked (meaning the equipment has been assessed and supplied in conformity to those Directives), **STRICT ADHERENCE** with **ALL** the instructions and recommendations forms an essential part in maintaining the product/equipment's conformity.  
**Failure to comply with the instructions and recommendations contained in this Publication may void CE conformity.**
3. This Publication does **NOT** depict:
  - a) Ancillary required equipment related to the fabrication, installation and operation of the Bypass Valve e.g. miscellaneous flanges, fittings etc.
  - b) Required equipment unrelated to the Bypass Valve e.g. tank fill lines, vapour return lines, emergency shutdown systems etc.
  - c) The materials and method of fabrication of any required sub-systems.
4. It is the responsibility of the designer, fabricator and the installer of each required sub-system to ensure that:
  - a) The Ebsray specifications within this Publication and any other relevant Ebsray documents are **STRICTLY** adhered to.
  - b) Any variation (including use of equipment deemed "Equivalent") or addition to the Ebsray Specifications, as related to the Bypass Valve and Pumping System in general, meet Ebsray's minimum requirements.
  - c) All design, fabrication and installation of the tank and sub-systems is **STRICTLY** in accordance with all relevant National, State and Local Directives, Standards, Codes and Regulations.
5. Ebsray reserves the right to:
  - a) Withdraw or alter any or all of the Ebsray specifications within this Publication and any other relevant Ebsray documents without notification.
  - b) Determine the validity of any Warranty claims for Ebsray equipment based on the proper application of Ebsray supplied equipment by the way of adherence to the Ebsray specifications within this Publication and any other relevant Ebsray documents

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## Terms used in this publication requiring special attention



**DANGER**

1. *Non-compliance with requirements under this heading could create circumstances which may lead to serious personal injury or death or substantial property damage.*



**WARNING**

2. *Non-compliance with requirements under this heading could create circumstances which may lead to personal injury and/or which may cause damage to the Bypass Valve and/or ancillary equipment.*



**CAUTION**

3. *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 Bypass Valve and ancillary equipment.*

**NOTE:**

4. *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 the Bypass Valve and ancillary equipment.*

## SECTION 1 – GENERAL

### 1.1 INTRODUCTION

This publication is intended to assist those involved with the installation, operation and maintenance of Ebsray Model RV18 & RV19 Inline Bypass Valves.



**DANGER**

*Before starting any work, this publication should be completely read/reviewed by all persons involved with the work. If any part of this publication is unclear, obtain clarification before proceeding with any work.*



**DANGER**

*If designated for pumping LPG: - As LPG (Propane and Butane) is regarded as a flammable liquid, extreme caution must be taken to ensure total compliance with all relevant Directives, Standards, Codes and Regulations is fully understood and exercised in the installation, operation and maintenance of Ebsray RV18 & RV19 Inline Bypass Valves.*

*These instructions are intended to assist correct Bypass Valve installation, operation and maintenance requirements. They are additional to, and do not supersede or override any applicable statutory, legal or regulatory requirements.*

The design, materials and workmanship incorporated in the manufacture of Ebsray Bypass Valves make them capable of reliable operation over a long working life. Correct installation and operation is essential. Service life is enhanced by periodic inspection and careful maintenance.



**CAUTION**

*Installation and servicing of this equipment should be performed by qualified competent personnel in accordance with relevant Directives, Standards, Codes, Regulations and site restrictions, in conjunction with these instructions.*



**WARNING**

*The Bypass Valves must be operated within the original selected design parameters of pumped product (Use only LPG of internationally accepted (ISO) quality and specification), flow, pressure, temperature. Should any change be contemplated, please confer with Ebsray in order to verify the suitability of such a change*

### 1.2 TRANSPORTATION, PACKING & STORAGE

Standard domestic packing is suitable for shipment in covered transports. Ports must be sealed to exclude ingress of condensation, moisture or foreign material. When received on site the Bypass Valve must be stored in a dry covered area.

**NOTE:** *If Bypass Valve is not installed and commissioned immediately, special preservative techniques will be required. (Refer to Ebsray). e.g. If the Bypass Valve is installed, but not commissioned, low pressure nitrogen can be used to purge, seal and protect the Bypass Valve from the effects of condensation and atmospheric corrosion.*



**WARNING**

***NEVER** allow water or any corrosive product to enter the Bypass Valve (e.g. for hydrostatic testing of pipework). Severe internal damage may result and will void the Warranty*

### 1.3 RECEIVING INSPECTION

**SHORTAGES and/or DAMAGE:** 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. A claim should be made immediately on the transport company. Also advise Ebsray or their Appointed Representative. Should a shortage be evident on receipt, notify Ebsray immediately giving full details and packing note number.

### 1.4 HANDLING

**Do not drop Bypass Valve!** Care should be taken in moving/handling Bypass Valves in order to minimise stress on the internal components.

**Severe internal Bypass Valve damage may result if correct handling and due care is not taken.**

### 1.5 WARRANTY

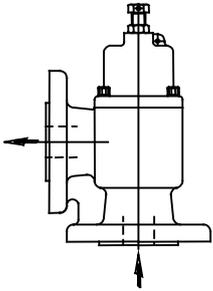
All Ebsray manufactured equipment is warranted as standard for one (1) year against faulty workmanship and/or materials. Refer to Ebsray Pumps 'Standard Conditions of Sale and Warranty' publication for details.

## SECTION 2 – INSTALLATION

**CAUTION** Installation and removal of this equipment should be performed by suitably qualified competent personnel in accordance with relevant Directives, Standards, Codes, Regulations and site restrictions - in conjunction with these instructions.

**DANGER** Never loosen or remove fittings, flanges, etc. while under pressure (vapour pressure of LPG may be very high), always isolate components or pipework and depressurise prior to work.

### 2.1 LOCATION



Maximum service life is attained if the bypass valve is installed with the adjusting screw in the 12 O'clock (up) position. Mounting the valve horizontally may cause increased wear on the spool valve depending on operating conditions. Flow must be into the port marked "IN".

### 2.2 BYPASS VALVE PIPING CONNECTIONS

Remove pipe scale and other foreign material such as PTFE tape residue from the connecting pipelines. If valve has screwed ports, apply a suitable pipe thread sealant to the male threads before fitting.

**NOTE:** Never draw piping into place by use of force at the port connections of the Bypass Valve.

All piping should be supported independently and line up accurately with the Bypass Valve ports.

## SECTION 3 – OPERATION

### 3.1 DESCRIPTION

The EBSRAY Models RV18 and RV19 Bypass Valves are intended to enable control and setting of pump and system differential pressures only. They are spring actuated devices that by design cannot be positively shut-off. There are three configuration options available:

1. Constant Bleed System (CBS) option which provides for controlled 'bleed-off' of vapour enhancing self priming and vapour clearing capabilities of the pump.
2. Vapour Removal System (VRS) option which provides rapid flow-through of vapour until liquid reaches the valve and then closes off the vapour orifice for maximum pump efficiency. i.e. fulfils an excess-flow valve type of function.
3. Non Return Valve (NRV) option which is soft seated and eliminates flow of either liquid or vapour in both directions when closed. I.e. acts like a soft-seated back check valve

All the above options provide pump and system differential pressure control. The valves are installed in the discharge system and:

- a) Normally return vapour/liquid to the supply tank, or
- b) Return vapour/liquid to pump inlet (suction) pipework when system design criteria dictates.

On commissioning, these bypass valves should be set in accordance with the required/specified pump differential pressure.

**NOTE:** Ensure that total system discharge pressure does not exceed regulatory codes or system requirements.

### 3.2 LUBRICATION

No 'in service' lubrication is required on Ebsray Model RV18 or RV19 Inline Bypass Valves.

Model Types	Spool Valve Options		
	CBS	NRV	VRS
RV18	CBS2 CBS3	NRV	VRS10 VRS14 VRS19
RV19	CBS		VRS06
<b>Options:</b> Casing material, elastomers and differential pressure range			

### 3.3 ADJUSTMENT

**NB:** Final differential pressure setting is carried out after the Valve is installed or reassembled 'in-line'.

**NB:** Differential pressure settings outside the range of adjustment requires a different spring to be fitted.

1. For increased bypass pressure, rotate Adjusting Screw in clockwise direction (i.e. screw in). DO NOT exceed system design pressure.
2. For decreased bypass pressure, rotate Adjusting Screw anti-clockwise (i.e. screw out).
3. Lock Adjusting Screw Lock Nut against Valve Cover immediately after any adjustment is made.
4. After setting is completed wire and seal Adjusting Screw, utilising holes provided for passing wire through head of Adjusting Screw and lug on Valve Cover.

**NB:** Bypass Valves characteristically exhibit two distinct pressures during their operation :

- a) The setting or cracking pressure which occurs when, initial bypassing begins against the preset spring load.
- b) Maximum pressure, which occurs when the full flow of the bypassed product passes through the Bypass Valve.

It is important to ensure both these above characteristics are understood fully in order to correctly apply the Bypass Valve.

### 3.3 OPERATIONAL CHECKS

Inspect Bypass Valve frequently during the first few hours of operation for such conditions as leaks, excessive heating, vibration or unusual noises etc.

### 3.4 PERIODIC INSPECTION

Periodic Inspection of the Bypass Valve, Pump System and Ancillary Equipment is required to maintain safety, conformity, operational functionality and reliability. Ebsray recommends a maximum interval of three months or 500 hours operation between routine periodic maintenance

## SECTION 4 – MAINTENANCE



**CAUTION** *Prior to any system disassembly or service, verify that all requirements of statutory Directives, Standards, Codes and Regulations 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 PREPARATION FOR DISASSEMBLY

1. Obtain the appropriate Work Permit if required.
2. Isolate Bypass Valve from liquids/vapour in inlet 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 disassembly.

### 4.2 DISASSEMBLY

Refer to the Parts Designation drawings in Section 5

1. Unlock Adjusting Screw Locknut.
2. Release Spring pressure by rotating Adjusting Screw anti-clockwise.
3. Unscrew four Setscrews, holding Valve Cover onto Housing.  
**NB:** There will be a slight spring pre-compression remaining.
4. Remove the Valve Cover and O-Ring, together with the Spring Cap and its O-Ring.
5. Remove Spring Cap and O-Ring from Valve Cover.
6. Remove Spring and Valve from Housing.
7. **OPTIONAL VRS ONLY:** Carefully remove Circlip from inside Valve, then remove Ball and Spring.
8. **OPTIONAL NRV ONLY:** Remove O-Ring from Valve.

### 4.3 INSPECTION

1. Inspect Housing and valve bore for damage or wear. If required, remove Housing and replace.
2. Check Valve for damage or wear. If required, replace valve.
3. Inspect Spring - Bypass, replace if broken or damaged.
4. It is advised that O-Rings be replaced at every overhaul.

inspections (More frequent inspections may be necessary dependent upon usage, site conditions, operation etc).

If any abnormal condition is discovered, cease operation of pump system immediately and take action to rectify the problem.

For safe operation, the following items should be included in the routine periodic inspection:

- a. Inspect the Bypass Valve for leaks, vibration, abnormal noises, signs of overheating, discolouration, etc.
- b. Check Bypass Valve differential pressure

5. Check Valve Cover, Spring Cap, Adjusting Screw and Locknut for damage. Replace as required.

6. **OPTIONAL VRS ONLY:** Check condition of Ball, Spring - Vent and Circlip. Replace as required.

### 4.4 SPARE PARTS

1. When ordering spare parts, to ensure a minimum of delay and correct replacement to original (or current) specification, ALWAYS quote the Bypass Valve Serial Number located on the nameplate of the Bypass Valve.
2. Advise the name, Cat # and quantity required. Refer Section 5 – Parts Designation.
3. Advise complete delivery instructions, transportation, etc.

**NOTE:** *Substitute or so-called 'equivalent' item/spare parts are not recommended for use.*

**Compliance, safe operation and Bypass Valve performance may be severely compromised if incorrect or substitute spare parts – including Fasteners, O-Rings, etc – are used.**

**Only use genuine Ebsray spare parts.**

### 4.5 REASSEMBLY

(Refer Section 5 – Parts Designation)

<b>Fastener Torque settings:</b>	<b>RV18</b>	<b>RV19</b>
<b>Valve Cover to Housing</b>	<b>22Nm</b>	<b>44Nm</b>

**NB:** Lightly smear all O-Rings with a compatible good quality detergent free, light oil before assembly.

1. **OPTIONAL VRS ONLY:** Insert Spring - Vent into Valve with large end seating in Valve, insert Ball after Spring - Vent and retain in place with Circlip, ensuring Circlip locates correctly in groove.
2. **OPTIONAL NRV ONLY:** Fit O-Ring to Valve.
3. Fit Valve into Housing, ensuring freedom of movement.
4. Fit Spring - Bypass on to top of Valve.
5. Fit O-Ring to Valve Cover.
6. Fit O-Ring to Spring Cap and insert into Valve Cover with spring location boss facing out.
7. Fasten Valve Cover to Housing using four Setscrews.
8. After recommissioning, adjust differential pressure as per Sect 3.3

**SECTION 5 – PARTS DESIGNATION**

**MODELS: RV18 & RV19 Inline Bypass Valves.**

Note: Reference to drawing below enables parts identification for all models (flanged or screwed ports) including valves fitted with CBS, NRV & VRS options.

Cat#	Description	Qty	Cat#	Description	Qty
1	Housing (flanged/screwed)	1	9	Set Screw	4
2	Valve Cover	1	10	Lock Nut	1
3	Valve	1	11	Plug	1
4	Spring Cap	1	12	Ball	1
5	Spring – Bypass	1	13	Spring - Vent	1
6	O-Ring – Spring Cap	1	14	Circlip	1
7	O-Ring – Housing	1	15	O-Ring - Valve	1
8	Adjusting Screw	1			

