R Series
Model RX33 Submersible
(50Hz)
...for LPG Applications
EBSRAY MODEL RX33 REGENERATIVE TURBINE SUBMERSIBLE PUMPSETS are specifically designed and precision built for efficient, high pressure pumping of LPG, Autogas, Propane and Butane from underground or aboveground storage tanks.

Features
- Single Stage Regenerative Turbine pumping element
- Quiet, smooth, pulse-free operation
- Pumpset can be installed in existing 125mm (5") pump chambers
- Submersible concept guarantees rapid priming and pressure generation
- CE marked, ATEX compliant
- Certified Explosion-proof design Submersible Electric Motor
- EU Certification - LQIE 03 ATEX 6390
  (II 2 G Ex d IIA T4 for Class 1 Zone 1)
- IECEx Certification - IECEx LCI 05.0003
- Materials of construction selected to withstand abnormal sulphur content in LPG
- Internal BCL™ ‘Bearing Cooling and Lubrication’ System for ultimate pumpset reliability
- EBSRAY ‘Three-Tier’ Protection System for Pump, Motor and pumping system
- High Differential Pressure capability
- Robust design, Heavy Duty construction
- Pumpset is designed to enable complete servicing

Typical Services
Underground or Aboveground Submersible LPG installations for:
- Autogas Driveway Dispensing for single or 2-hose sites
- Forklift Refueling
- Aerosol Industries
- Agricultural Industries
- Marine Dispensing
- Cylinder Filling
- Direct Burner / Vaporiser feed

Allied Ancillary Equipment
Manufactured and/or supplied by EBSRAY for the RX33 Pumpsets:
- Bypass Valves
- PPV™ Valves
- Differential Pressure Switches
- Pump Controllers, Drives and System Protection Equipment

Assured Quality and Performance
EBSRAY’s ISO 9001:2000 Quality Management System assures compliance with the high safety and quality standards demanded by the LPG Industry.

All EBSRAY RX33 pumpsets are manufactured and individually test-run under strict guidelines. Mandatory quality checks and electrical compliance tests during production guarantee pump and motor integrity and pumping performance – all in accordance with the specifications.

All EBSRAY LPG Pumps and Bypass Valves are designed and manufactured in Australia and comply with the requirements of International Standards, Codes and Directives including ATEX 94/9/EC, Australian Standard AS/NZS 1596 and other recognized Ex Certifications schemes.
**Pumpset Features**

**Discharge Head / Connector Housing**
- Material - Ductile Iron to ASTM A395
- Robust design for ultimate strength and leak-proof integrity
- NPT threaded LPG discharge riser connection
- Dual NPT electrical connections enables either coaxial or parallel conduit entry
- Ability to leave ‘in-situ’ for pumpset replacement and maintaining correct inlet port orientation
- Leak tested to ensure ultimate safety and integrity
- Motor and Pump Certification and Serial No tag location

**BCL™ System**
- EBSRAY’S proven ‘Bearing Cooling and Lubrication’ System
- Ensures LPG remains in liquid state inside motor
- Cools and lubricates all bearings with liquid LPG
- Returns internally cooled ‘liquid-state’ LPG to pump inlet
- Explosion-Proof breathers “filter” cooling liquid
- Enhances pumpset operation
- Extends pumpset service life

(Refer to graph for BCL™ System operating principle)

**Motor**
- Certified Explosion-Proof design
- Ex marked, ATEX compliant
- EU Certification - LCIE 03 ATEX 6390
  (Ex II 2 G Ex d IIA T4 for Class 1 Zone 1)
- IECEx Certification - IECEx LCI 05.0003
- 2.2kW, 2-pole, 3-phase, 50Hz, 380 to 415 volt
- Temperature Rating T4
- Bi-metallic Temperature Switch (HBT) embedded in Motor
- Encapsulated, sealed stator windings
- Pumpset is designed to enable complete servicing
- Materials of construction selected to withstand abnormal sulphur content in LPG

**HBT Bi-metallic Temperature Switch**
- Detects high internal temperatures in motor and adjacent motor bearing
- Part of ‘Three-Tier’ protection system
- Explosion-Proof high pressure design
- Hermetically sealed
- Automatic reset (at Pumpset)
- Normally closed setting
- Integral to BCL™ System operation

(Refer to graph for BCL™ System operating principle)

**Thrust Bearing**
- Kingsbury/Michelle type
- For Axial Thrust and location of Rotor, Shaft and Impeller
- Extra Heavy Duty design
- Proven Performance

**Shaft**
- Single piece, rugged design
- Hardened bearing journals
- Extra large diameter
- Precision ground
- Alloy steel

**Pump and Motor Bearings**
- Engineered carbon composite material specifically for LPG duty
- Forced ‘liquid-state’ LPG Cooling and Lubrication
- Robust – extra large diameter
- Hardened shaft journals
- Spiral grooved bearings to induce extra flow
- Long service life

**Electrical Connection**
- Double O-Ring sealed against LPG leakage
- Proven heavy duty, high quality lead connector
- Double insulated, colour coded, hydrocarbon-resistant, UL Listed, stranded cables
**Pump with ‘Three-Tier’ Protection System**

The EBSRAY ‘Three-Tier’ Protection System forms an integral and fundamental part of the complete pumping system; ensuring proper pumpset performance and protection against operation outside the specified duty points of Temperature, Differential Pressure and Motor Current parameters.

Also includes protection against dry-running/empty tank, closed or blocked discharge, high LPG temperature in tank, rapid cycling etc.

The basic functions of the system are:

1. **‘HBT’** - Operation of the pumpset will be halted if the internal motor temperature exceeds a preset maximum level.
2. **‘DPS’** - Operation of the pumpset will be halted if differential pressure falls below a preset minimum level during operation; or is not developed within a preset time after startup.
3. **‘MOL’** - Operation of the pumpset will be halted if motor current exceeds a preset maximum level.

*Note: If one of the above ‘faults’ occurs, Pumpset operation should only be restarted after assessment and rectification of the ‘fault’.*

**Features**

- PLC controlled, LCD screen
- Visible fault recognition
- Run and fault logs recall
- Protected fault isolation and retention
- Isolation key switch for OFF/RUN/TEST modes
- Adjustable DPS override timer
- Hour run meter
- Tamperproof enclosure
- Pre-wired and pre-tested
- IP55 Enclosure for non-hazardous area installation

*Note: Optional Models available for total LPG pumping ‘System’ control. Refer EBSRAY*

**Bypass Valve – EBSRAY Model RV18-NRV**

**Function/Operation**

The Bypass Valve plays a pivotal role in the overall LPG pumping/dispensing system; it controls the following functions:

- Adjustable for setting system differential pressure for optimum dispensing flow rates
- Maintains the RX33 BCL™ system internal pressure requirements
- Forms part of the overall ‘Three-Tier’ protection system function
- Protects Pumpset against excessive differential pressure
- Soft-seated ‘NRV’ (Non-Return Valve) function prevents LPG drain-back when pumpset is idle
- ATEX compliant

**Differential Pressure Switch (DPS)**

**Function/Operation**

To ensure adequate cooling and lubrication flow through the RX33 pumpset internals, overall pumping system differential pressure must be maintained above a preset minimum level. The DPS signals the Pump Controller if the minimum $\Delta P$:

a) falls below the preset minimum level during operation,

b) is not developed within the preset maximum time after startup

*Ex Certifications to ATEX, ANZEx, UL for Class 1 Zone 1 Hazardous locations*

**EBSRAY PPV™ Valve**

*(Positive Pressure Ventilation Valve)*

Maintains the maximum possible liquid level inside the Pump Chamber / Manifold (if fitted) – thus enabling maximum access to and utilization of the LPG tank’s storage capacity.
Specifications

Performance - RX33 - 50Hz Supply

EXAMPLE

Product – LPG 510 kg/m³
△ Pressure 700 kPa (7 Bar)
Flow 55 L/min
Input Power 1.9 kW

Pumpset

Pump element … Single Stage Regenerative Turbine principle

Porting ………… Inlet 40mm NB
                   Discharge 1½” (F) NPT
                   (Coaxial or parallel with conduit)
                   Conduit entry ¾” (F) NPT

Bearings……….. Sleeve type/Kingsbury type,
                   LPG/Product lubricated

Materials ……….. Body, Cover, Discharge Head:
                   Ductile Iron (ASTM A395)
                   Impeller: Gunmetal
                   Casing: Steel
                   Bearings: Carbon Composite
                   Elastomers: Viton

Motor……………. Certified Explosion-Proof design
                   2.2kW, 2-Pole, EEx d for
                   Class 1 Zone 1, 3 phase, 50Hz,
                   380 to 415V, T4

Certification…….. LCIE 03 ATEX 6390
                   IECEx LCI 05.0003

FLOW

POWER

Optional 3.7kW motor required
above 860kPa

Pumpset

Pump element … Single Stage Regenerative Turbine principle

Porting ………… Inlet 40mm NB
                   Discharge 1½” (F) NPT
                   (Coaxial or parallel with conduit)
                   Conduit entry ¾” (F) NPT

Bearings……….. Sleeve type/Kingsbury type,
                   LPG/Product lubricated

Materials ……….. Body, Cover, Discharge Head:
                   Ductile Iron (ASTM A395)
                   Impeller: Gunmetal
                   Casing: Steel
                   Bearings: Carbon Composite
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Warranty

All EBSRAY manufactured pumps and equipment are warranted for a full 12 months against faulty workmanship and/or materials. Refer to EBSRAY or appointed Representative for detailed Warranty Conditions
Dimensions

EBSRAY RX33 PUMPSET
Weight 42kg (unpacked)

EBSRAY RX33 PUMP CONTROLLER
IP55 Enclosure
Weight 5.6kg (unpacked)

Note: Optional Models available for total LPG 'System' control.
Refer EBSRAY

EBSRAY RV18-NRV BYPASS VALVE
Weights: Flanged 6.2kg
Threaded 4.2kg
(unpacked)

Note: All specifications and illustrations are typical only and are subject to revision without notice. Certified data available upon request

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