Publication #2480-08

EBSRAY PUMPS

R Series

Model RX33 Submersible (50Hz)

...for LPG Applications

EBSRAY AUSTRALIA

CE

Submersible Pumpset Model RX33

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 - LCIE 03 ATEX 6390 (Ex II 2 G EEx 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.

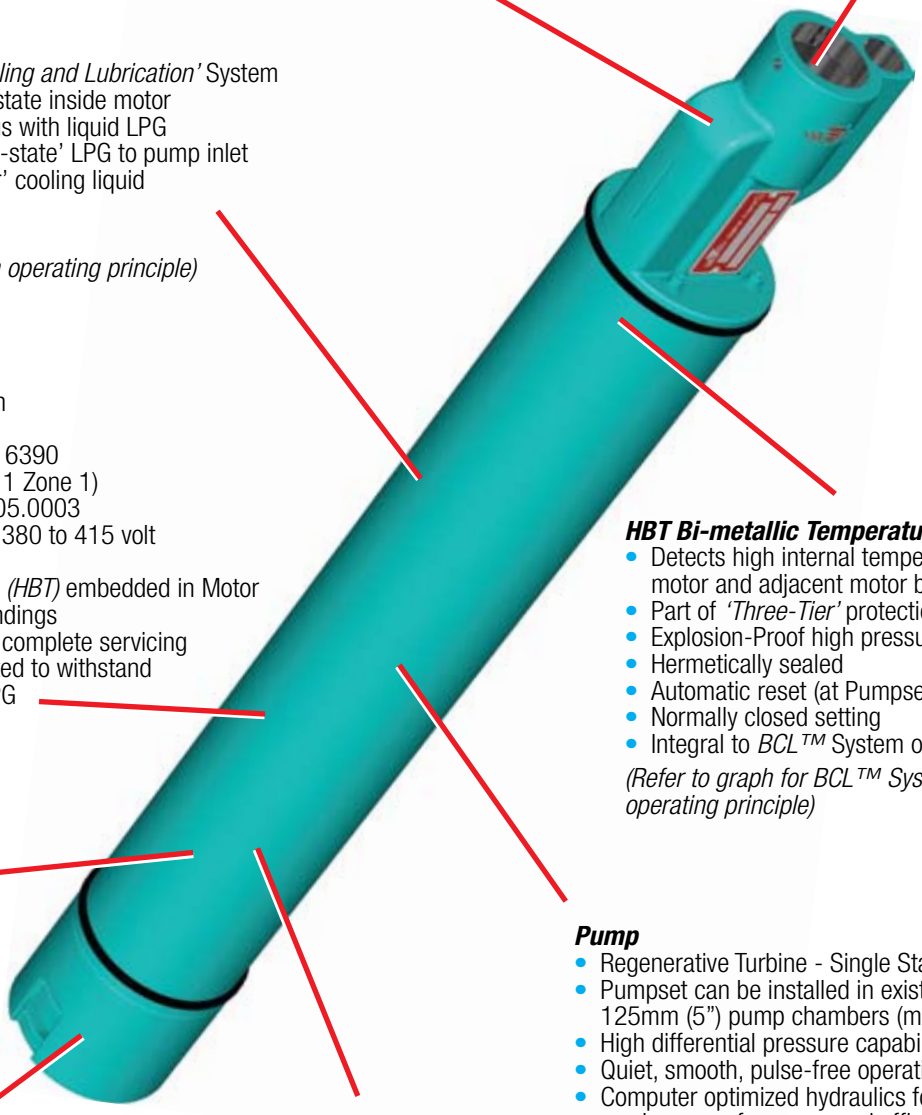
Pumpset Features

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

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

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
- CE marked, ATEX compliant
- EU Certification - LCIE 03 ATEX 6390 (Ex II 2 G EEx 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

Pump
- Regenerative Turbine - Single Stage
- Pumpset can be installed in existing 125mm (5") pump chambers (manifolds)
- High differential pressure capability
- Quiet, smooth, pulse-free operation
- Computer optimized hydraulics for maximum performance and efficiency
- Unique anti-cavitation shrouded inlet (suction) port. Low NPSH design
- Operates efficiently and quietly to LPG liquid levels as low as pump inlet port, ensuring maximum LPG withdrawal from tank
- Vertically slotted inlet port design facilitates bottom LPG entry
- Gunmetal Impeller – axially located
- Robust Ductile Iron casing to ASTM A395

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

Allied Ancillary Equipment

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 △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.

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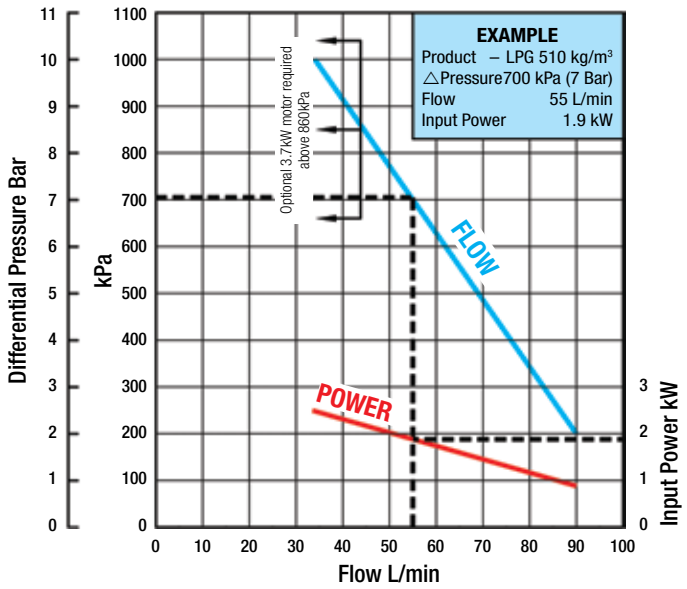
Specifications

Performance - RX33 - 50Hz Supply



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

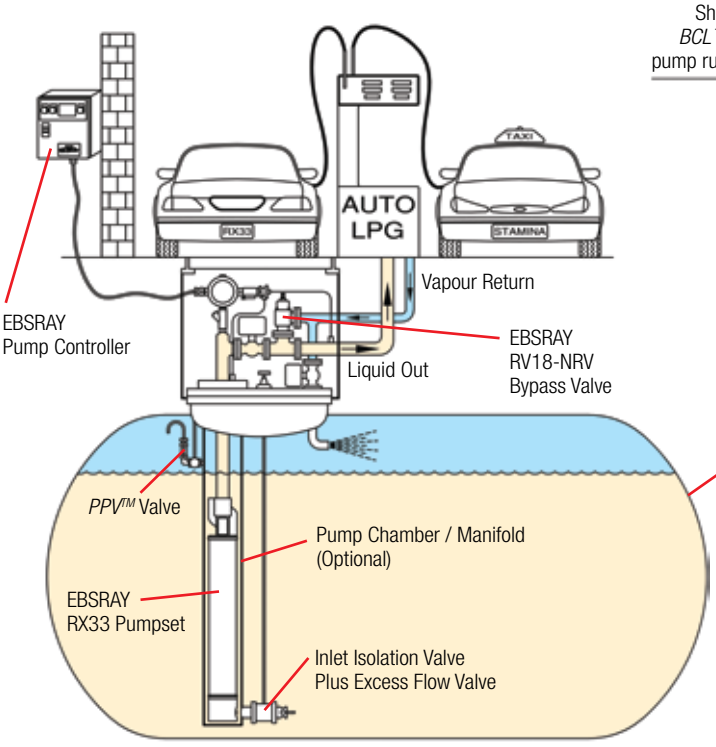
Materials ..... Body, Cover, Discharge Head: Ductile Iron (ASTM A395)
Impeller: Gunmetal
Casing: Steel
Bearings: Carbon Composite
Elastomers: Viton

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

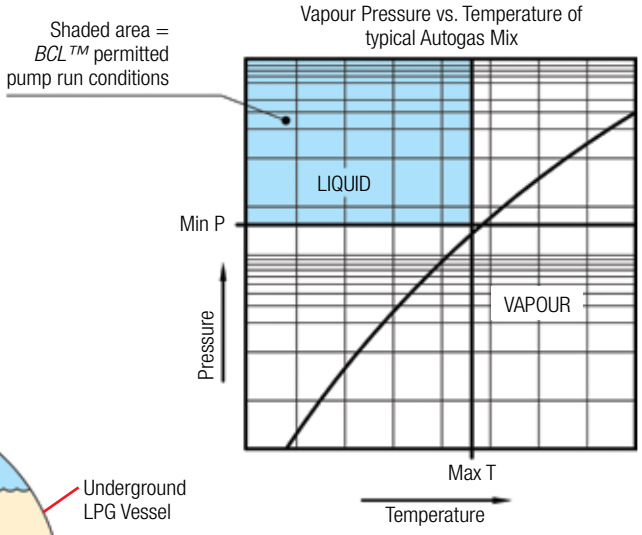
Certification ..... LCIE 03 ATEX 6390
IECEx LCI 05.0003

Typical Installation

(Pictorial only for pumping system)



BCL™ System Operating Principle

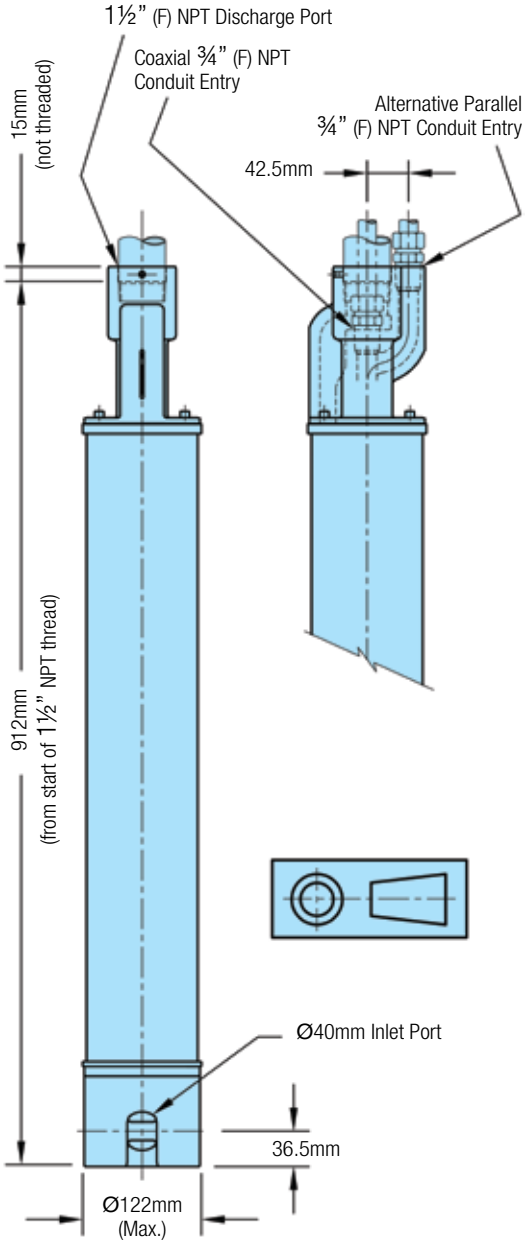


Warranty

All EBSRAY manufactured pumps and equipment are warranted for a full 12 months against faulty workmanship and/or materials.

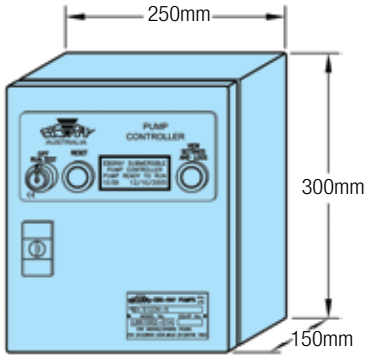
Refer to EBSRAY or appointed Representative for detailed Warranty Conditions

Dimensions



EBSRAY RX33 PUMPSET

Weight 42kg (unpacked)



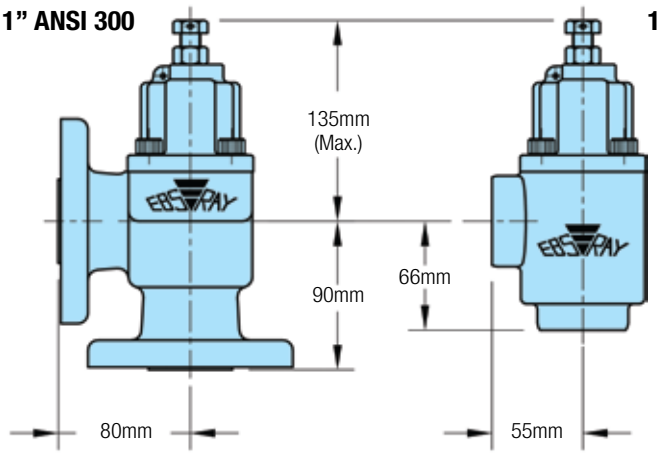
EBSRAY RX33 PUMP CONTROLLER

IP55 Enclosure
Weight 5.6kg (unpacked)

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

Flanged
1" ANSI 300

Threaded
1" NPT



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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