



**Keeping the World Flowing
for Future Generations**

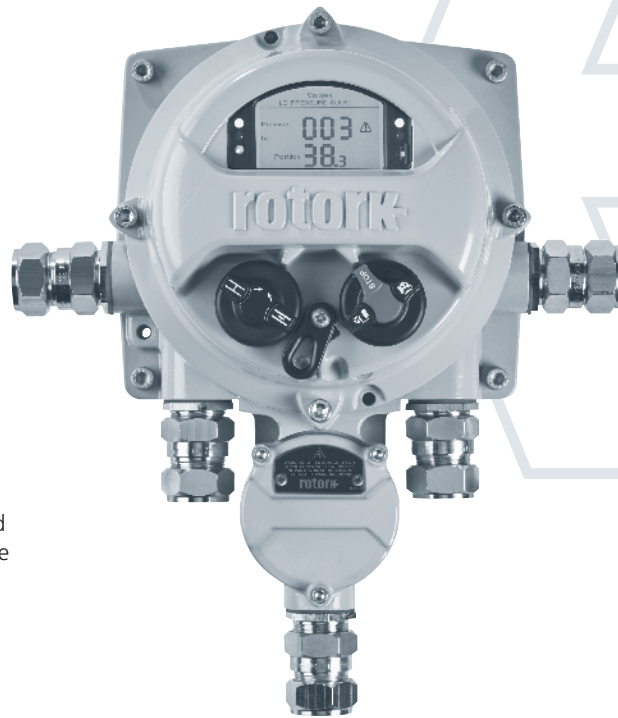
ELB Product Specification

Rotork's ELB (Electronic Line Break) is a robust self-contained electronic pipeline monitoring system designed for use in the gas industry. It will continuously monitor pipeline pressure to provide early detection of pipeline breaks and initiate automatic movement of the valve actuator to a user-defined position. The powerful and versatile system can also collect detailed operational data useful for optimising performance and enhancing pipeline safety.

The ELB system is designed to monitor the pipeline with the capability of sensing both upstream and downstream pressure. It provides valve actuator control based on rate-of-drop (RoD) and rate-of-rise (RoR) as well as high, low and differential pressure limits. The ELB can also provide an array of programmable alarm and alert indications and has an extensive feature set that can be configured to meet each end user's particular requirements.

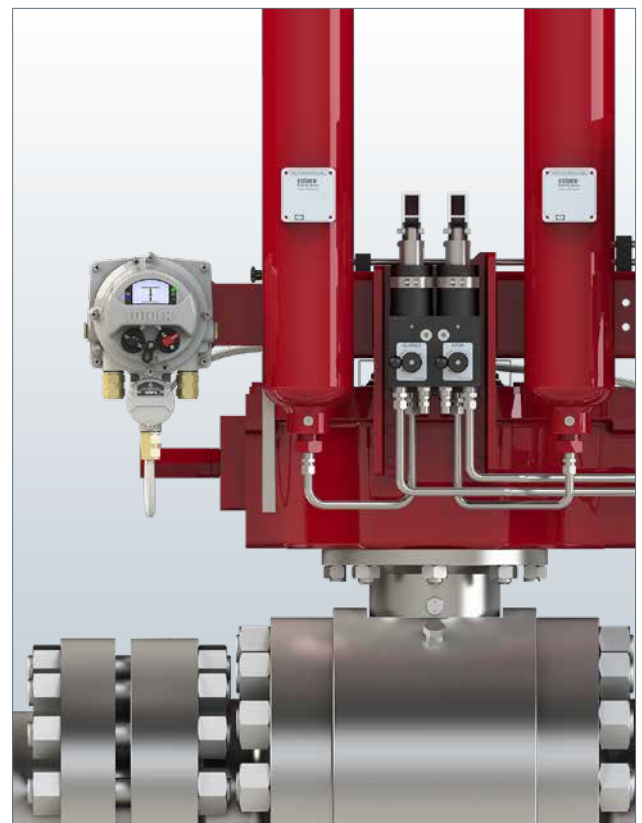
Design Features

- Intuitive user interface featuring an advanced backlit display and Chinese language option
- Configuration and data retrieval via Rotork Bluetooth® Setting Tool or PC (using Rotork Insight 2 software)
- Comprehensive data logging in non-volatile memory with real-time clock
- Pressure monitoring with RoD and RoR calculation
- Configurable Process Shutdown (PSD) position to Open, Close, or Stay-in-place
- Manual reset option to maintain PSD position until human intervention allows a return to normal operation
- Will operate on 9-28 VDC supply voltage
- Local controls: Open, Close, Local/Remote/Stop
- Remote control available via either hard-wired connections or Modbus® serial communication protocol
- Provision for up to six remote inputs
- Partial stroke testing available
- Optional position sensor input
- Up to four configurable solenoid outputs
- Rotork designed hazardous area enclosure
- Compatible with a variety of actuator types
- Can be mounted either on the actuator or remotely



ELB Detection System

**for Pipeline Monitoring
and Valve Control**



General Operation

The ELB has two distinct modes of operation:

Basic Mode

The actuator will be driven to the open or closed position by using either the local controls or the PSD input when the actuator is controlled remotely.

Advanced Mode

The following inputs, outputs and features can be utilised in Advanced Mode if independent limits switches are connected for open, closed and partial stroke position, (if required):

- Limit switch inputs
- Sensor 3 input (actuator position or pressure)
- Remote Open, Close, Maintain and Manual reset.
- Inhibit Open/Close
- Partial Stroke Testing (PST)
- Stall detection

Display

The advanced dual stacked display is clear and offers a wide viewing angle making it easily legible from a distance. In normal mode the LCD display indicates pipeline pressure down to -50 °C (-58 °F).

The matrix layer provides high resolution screens for settings menus, status and alarms along with graphical datalog screens such as pressure/position profiles. Position indication lights (red, yellow and green) are duplicated each side of the display. All display elements are protected by a 13mm toughened glass window with an optional shield for protection against abrasive media such as sand and UV light.

Local Controls

Local Open/Close and lockable Local/Stop/Remote selectors are coupled magnetically to the designated switches and therefore do not penetrate the electrical cover.

Rotork Bluetooth® Setting Tool Pro

The dual Bluetooth and IR secure and intrinsically safe setting tool is suitable for use in hazardous environments. The setting tool can be used to download data wirelessly and to remotely configure multiple devices, (individually).

Process Shutdown (PSD)

The PSD command can be configured so that its action overrides all other commands and alarms. It can also be re-mapped to provide a 2nd Open/Close command which can act as an AND/OR function. The PSD action can be set to the following:

- De-energise all solenoid valves
- Open
- Close
- Open Inhibit
- Close Inhibit
- Stop
- Do Nothing
- PSD (specific solenoid valve output)

The PSD can be initiated by a remote hardwired input or a network card.



Manual Reset

The device can be configured to either automatically clear an alarm when its source is no longer present or keep the condition active until manually reset by the user. This is managed via the local controls, a remote hardwired input or through a network card.

If an alarm is tripped and the device goes into manual reset then it will not accept any new commands. For new commands to be accepted the alarm condition needs to be removed before the device can be manually reset.

Partial Stroke Testing (PST)

Partial Stroke Testing is a function used in two position, critical applications, where the process valve is infrequently operated. PST allows the operator to test the final elements such as solenoid valve(s), actuator drive and the process valve for possible failure. The test can be performed without the need to physically close the valve and thereby maintain the process operation.

The open or close limit needs to be selected for the test to start from along with the allowable time to move to the partial stroke position (set by a separate limit switch) and the allowable time to move back to the start position. A pass will be issued if the test is carried out within the allowable times and a fail will be issued if the test is outside these times. If a fail is issued then the device will drive the actuator back to the start position.

The PST can be initiated by a remote hardwired input, a network card or locally with the Rotork Bluetooth® Setting Tool Pro.

Pipeline Monitoring

The ELB has five different pressure conditions that can be monitored; any combination of the five can be utilised depending on the application. These are as follows:

- Rate of Drop (RoD)
- Rate of Rise (RoR)
- High Pressure
- Low Pressure
- Differential Pressure (across the valve)

Each of the five pressure conditions has adjustable limits allowing the ELB to indicate an alert condition when close to the alarm limit. Once the alarm limit is reached the configured action will be performed.

Each alarm action can also be set with a Delay to Action time and a Delay to Reset time. These are adjustable from 0-1800 seconds.

Alarm actions can be set to the following:

- De-energise all solenoid valves
- Open
- Close
- Open Inhibit
- Close Inhibit
- Stop
- Do Nothing
- PSD (specific solenoid valve output)

Alarm Reset actions can be set to the following:

- Disabled (alarm not raised)
- Set (alarm active whilst source is present)
- Set and Latch (alarm active until manually reset)

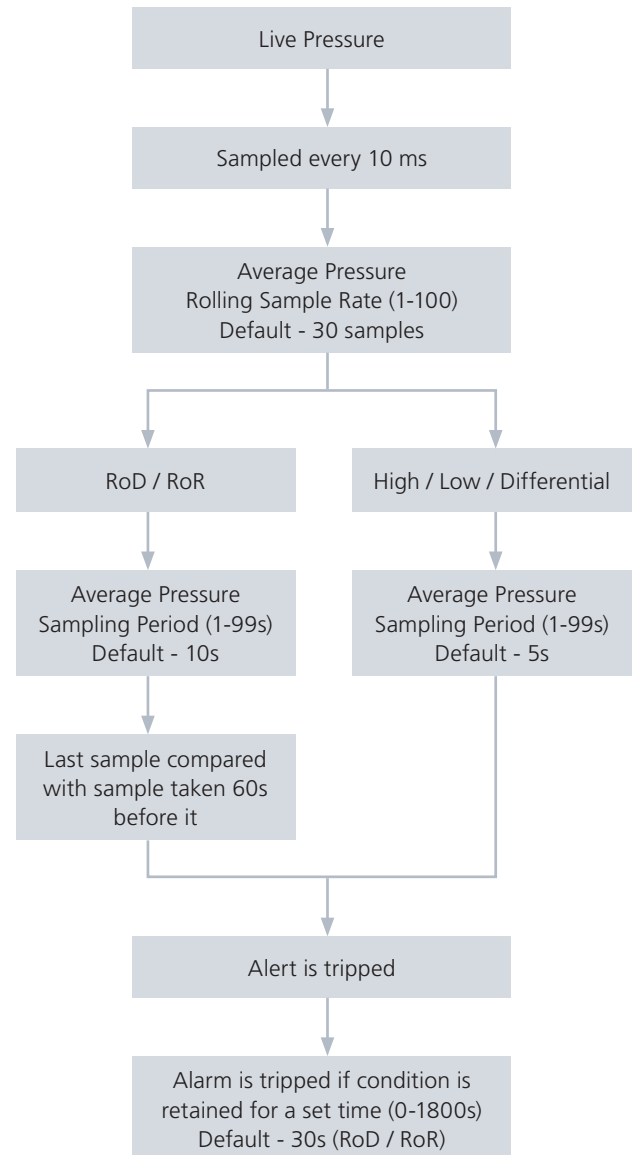
The pressure is sampled every 10 milliseconds (fixed) for each sensor.

The pressure is then averaged over a number of rolling samples (1-100). The default is 30 samples.

For RoD and RoR, the average pressure value is then sampled again every 10 seconds (default). This is then compared to the value sampled 60 seconds before it. The sample period can be adjusted from 1-99 seconds.

The rate of change is adjustable from 0.2 to 20 bar/min (0.02 to 2.0 MPa/min) for both the alarm and alert.

For Low, High and Differential alarms and alerts, the averaged pressure value is sampled every 5 seconds (default) with the range being 1-99 seconds.

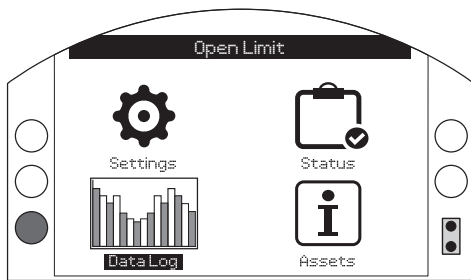


Asset Management

Asset management data regarding the device and the valve can be stored including build data, tag numbers and valve information along with operational and service information.

Data logger

The data logger stores the configuration set-up, events, trends, status and alarms with up to 1000 events held in the memory. The position and various pressure values can also be continuously monitored and stored (if appropriate sensors are connected).



The data can be viewed locally on the dot matrix display from pressure and position graphs through to statistical operational data. All data held is secure and can be downloaded using the Rotork Bluetooth® Setting Tool *Pro* for viewing on a PC with Rotork Insight 2 software.

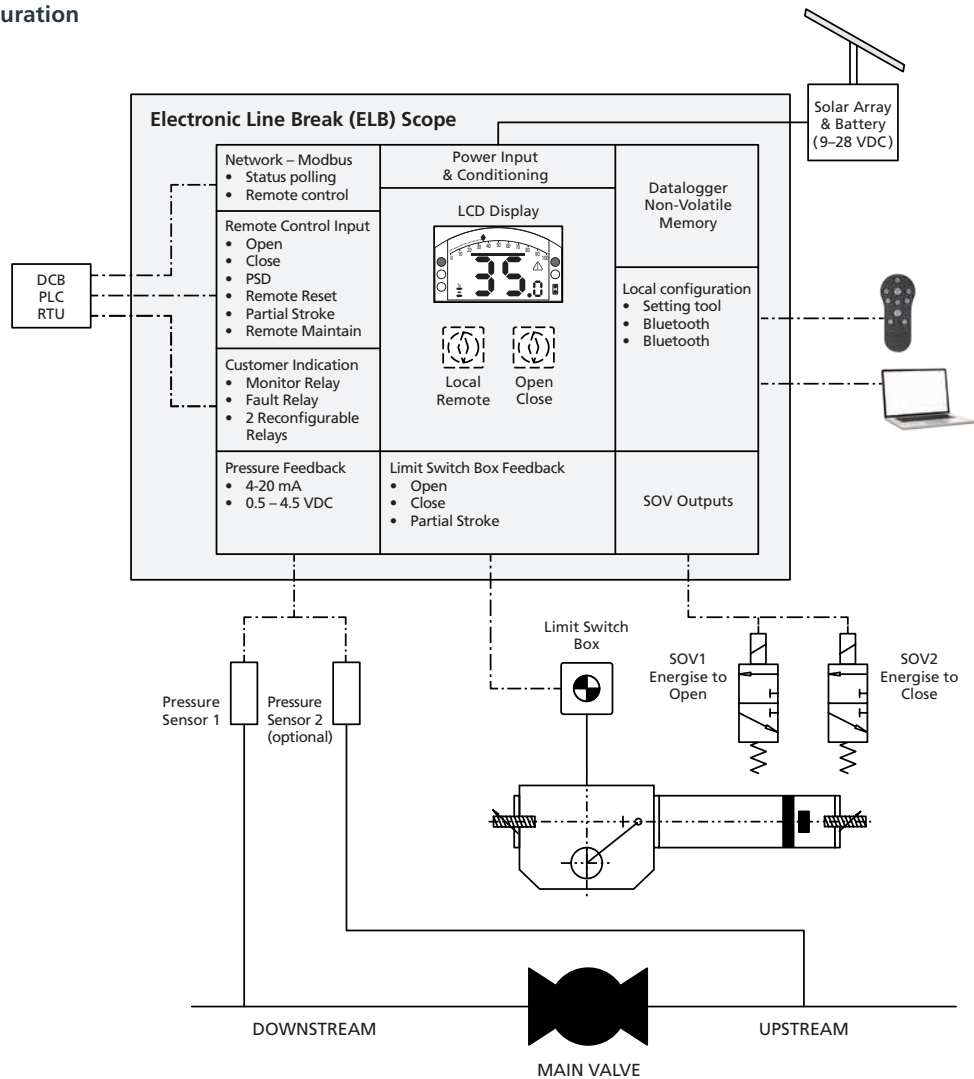
All configuration and data log files are stored in non-volatile EEPROM memory, which means all settings are safe when the power is removed. An internal super capacitor is provided to maintain the real time clock (used to maintain the data logger time) when the device is not powered for periods up to two weeks.

The data logger provides comprehensive data capture and analysis for planned maintenance and troubleshooting issues with the valve and processes. This includes, but is not limited to the following:

- **Event Log**
 - Alarms and Alerts
 - PSD status
 - PST results
 - Local and Remote commands
 - Faults
- **Alarm Log**
 - One log per Alarm
 - Alarms logged are RoR, RoD, High, Low and Differential Pressure
- **Trend Logs**
 - Pipeline Pressure
 - Mains Supply
 - Temperature
 - Vibration
- **Partial Stroke Result Log**
 - Last 10 results
- **Operational logs**
 - Opening and closing time
 - Last Open and Close limits
 - Max. and min. temperature
 - Max. and min. mains supply voltage

Asset Management

Typical Configuration



Design Specification

Design Life

The expected design life of the electronics is at least 10 years across the full operating temperature range if the requirements of this specification are met. This will be extended where the operating temperature is consistently below +60 °C (+140 °F).

Vibration, Shock and Noise

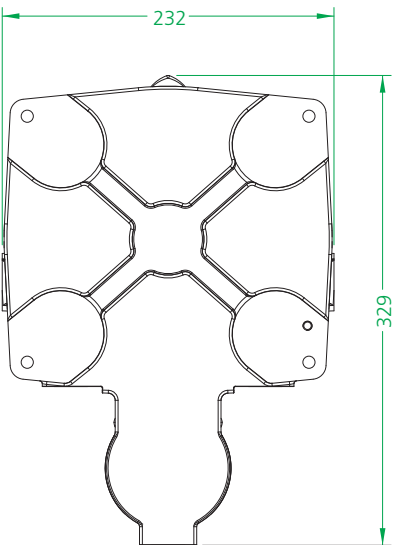
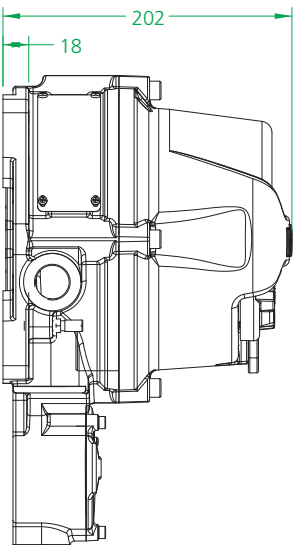
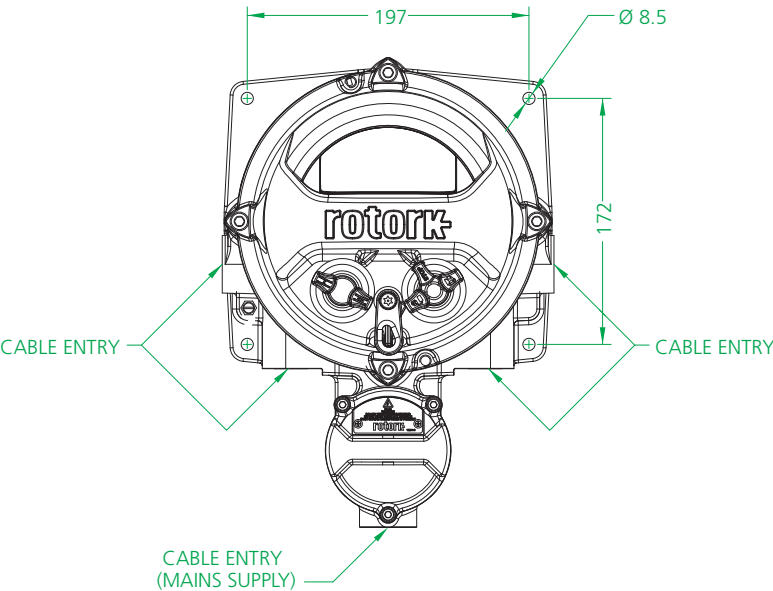
The ELB is suitable for applications where vibration and shock severity do not exceed the following:

Levels quoted are those present at the actuator mounting interface. It should be noted that the effects of vibration are cumulative and therefore a device subjected to significant levels may have a reduced lifespan. Where excessive plant induced vibration is anticipated, mounting the device remote from the valve may provide a satisfactory solution.

Mounting Interface

Maximum weight is 9 kg.

Type	Level
Plant induced vibration	1g RMS total for all vibration within the frequency range of 10 to 1,000 Hz
Shock	5g peak acceleration
Seismic	2g acceleration over a frequency range of 1 to 50 Hz if it is to operate during and after the event
Emitted noise	Tests have shown that at 1m generated noise does not exceed 70 db (A)



Certification

Non-Hazardous & Hazardous areas Certification

The ELB is watertight to IP66/IP68/NEMA type 4 & 6. Through the use of non-intrusive commissioning, using the Rotork Bluetooth® Setting Tool *Pro*, covers do not need removed.

In addition, the Rotork Bluetooth® Setting Tool *Pro* is certified Intrinsically Safe permitting power-on commissioning in hazardous areas.

Devices are available with the following enclosure types for which the ambient working temperature ranges are stated.

Where option temperatures are indicated, changes to some actuator components are required and therefore the temperature requirement must be specified. Hazardous area approvals for other country standards are available; please contact Rotork.

The ELB is available in accordance with the following standards:

Non-Hazardous Area (Watertight)

Standard	Rating	Standard	Option 1
BS EN 60529 (1992)	IP66 / IP68 (7m for 72Hrs)	-20 to +60 °C (-4 to +140 °F)	-50 to +60 °C (-58 to +140 °F)
IEC 60529 (1989-11)	IP66 / IP68 (7m for 72Hrs)		

Hazardous Area

ATEX (Europe)

Code	Enclosure Code	Standard	Option 1
ATEX II 2G c	Ex db IIB T4	-20 to +60 °C (-4 to +140 °F)	-50 to +60 °C (-58 to +140 °F)
ATEX II 2G c	Ex db IIC T4		

IECEx (International)

Code	Enclosure Code	Standard	Option 1
IECEx	Ex db IIB T4	-20 to +60 °C (-4 to +140 °F)	-50 to +60 °C (-58 to +140 °F)
IECEx	Ex db IIC T4		

cCSAus – (Canada & USA)*

Code	Enclosure Code	Standard	Option 1
Class 1 / Zone 1	(A) Ex d IIB T4	-20 to +60 °C (-4 to +140 °F)	-50 to +60 °C (-58 to +140 °F)
Class 1 / Zone 1	(A) Ex d IIC T4		

*The approvals above are pending and subject to change.

Rotork Bluetooth® Setting Tool *Pro*

Region	Directive/Standard	Rating	Temperature
Europe	ATEX II 1 G	Ex ia IIC T4	-30 to +50 °C (-22 to +122 °F)
International	IECEx		
United States	FM3610		
Canada	CSA C22.2 No.157-92	Intrinsically Safe - Class I, Div. 1 Groups A, B ,C & D: T4	

Regulatory Standards

Compliance with the following European Union Directives permits the ELB to be CE marked under the provision of the Machinery Directive.

Directive	Applicable to	Reference
Electro-magnetic Compatibility (EMC)	Immunity to/emissions of electromagnetic energy	2004/108/EC
Low Voltage (LVD)	Electrical Safety	2006/95/EC
Machinery*	Product Safety	Actuators follow the provision of the Machinery Directive 2006/42/EC. They must not be put into service until the equipment into which it is being incorporated has been declared to be in conformity with the provisions of the European Community Machinery Directive 2006/42/EC.
Waste Electrical & Electronic Equipment (WEEE)	Exempt under the scope of the directive	
Restriction of the Use of Certain Hazardous Substances (RoHS) in Electrical and Electronic Equipment Directive	Restriction of the use of certain hazardous substances in electrical and electronic equipment	2011/65/EU
Radio Equipment Directive (RED)	Bluetooth modules - actuator and Rotork Bluetooth® Setting Tool <i>Pro</i>	2014/53/EU

*This device is not classified as a machine within the scope of the machinery directive.
Contact Rotork for a copy of our Declaration of Conformity and Incorporation

Non-European Union Directives

Directive	Applicable to	Reference
Federal Communications Commission	Bluetooth modules - actuator and Rotork Bluetooth® Setting Tool <i>Pro</i>	Contains FCC certified transmitter module. Refer to PUB002-039 for FCC ID.

Power, Control and Indication

Power Supply

The ELB is suitable for operation with the following power supply:

Voltage Type	Voltage
DC	24 VDC - Nominal (Range is 9 – 28 VDC)

The following supply is available for customer use:

24 VDC	10 W rated - device derived supply for remote control circuits and sensors
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Power Consumption (Mains power)

Power (W)	Function
6.1	Standard Unit
5.0	Modbus Card
0.6	Limit Switch (assumes only one limit switch is closed at a time)
0.48	Pressure / Position Sensor (this is worst case value for each sensor connected)
X	Solenoid Valve (X = power rating stated by the manufacturer). Each solenoid valve is pulled in at full power, before going into coil save mode which reduces the power to hold it. See page 13 for further details.

Example

Limit switches connected with two pressure sensors and one solenoid valve (10W each) being powered together with a coil save of 50%.

Pull-in Power = $6.1 + 0.6 + 0.48 + 0.48 + 10 = 17.66W$

Holding Power = $6.1 + 0.6 + 0.48 + 0.48 + (10 \times (50/100)^2) = 10.16W$

Power, Control and Indication

Local Control, Indication and Set-up

Non-intrusive selectors are provided on the electrical cover which also includes an LCD display showing the actuators position, status and alarms.

The cover may be rotated through 360° (90° increments) to suit orientation/operator access. Set-up is over a Bluetooth wireless interface using the supplied Rotork Bluetooth® Setting Tool *Pro*.

Local Controls (Standard)

Operation	Type	Range	Comments
Position	Red, rotary selector	Selects "Local", "Stop" or "Remote" control	Can be padlocked in each position (stop remains available) for site operational protection.
Local Control	Black, rotary selector	Initiates local "Open" and "Close" operation	Spring to centre neutral position. Local control may be user configured for inching action.
Bluetooth®	Rotork Bluetooth® Setting Tool <i>Pro</i>	Initiates local "Open" and "Close" operation	May be user configured for Bluetooth operation over a nominal distance of 10 m (30 ft).

Local Indication (Standard)

Operation	Type	Range	Comments
Position Indication	LCD – large character (25 mm / 1")	Close & Open icon	Position sensor not connected. Back-lit (power on) – operating temperature -50 to +60 °C (-58 to +140 °F).
Position Indication	LCD – large character (25 mm / 1")	Close icon – 1-99% (0.1% increments) – Open icon	Position sensor connected. Back-lit (power on) – operating temperature -50 to +60 °C (-58 to +140 °F).
Position Indication	Coloured indication LEDs	Red (close), Green (open) & Yellow (mid-travel)	LED indication colours can be reversed. Mid-travel LED can be set to flash or indicate an alarm.
Status and Alarm (multi-language)	LCD – status and alarm text	Real time status and alarm text integrated into position display	Alarm icon is also displayed.

Set-up (Standard)

Setting Tool LCD displays	Simple non-intrusive, interactive set-up procedure using supplied Rotork Bluetooth® Setting Tool <i>Pro</i> with read-back from LCD. Settings include limits, indication and control options. Settings may be password protected.
PC	Using the freely available Insight 2 software, devices can be configured / analysed over Bluetooth interface.
Datalogging	Standard on-board datalogger provides operational statistics, event logs and partial stroke test results. Device configuration and manufacturing data also available. Files can be downloaded direct to a PC or to Rotork Bluetooth® Setting Tool <i>Pro</i> (IS certified) for transport to office PC. Freeware Insight 2 for PC is available to download at www.rotork.com

Options

Vandal resistant	Lockable cover protects standard selectors and window
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Power, Control and Indication

Remote Control and Indication

The ELB enables remote control and status indication of Gas over Oil, Hydraulic and Pneumatic actuators. The following actuator control and indication options are available to meet the requirements of various site control systems from

simple manual push-button control, process shutdown (PSD) through to Distributed Control Systems (DCS) using hardwired switched signals or digital “bus” network systems.

Remote Control (Standard)

Operation	Type	Range	Comments
Open Close Maintain Partial Stroke	Positive switched 5 x opto-isolated inputs designed for pulsed or maintained contacts*	20 - 60 VDC 40 - 120 VAC (min. 0.15 W / input)	Device supplied 24 VDC or externally supplied from the control system. Minimum pulsed duration of 30 ms. Limit switches are required for these functions to be available.
Manual Reset			Device supplied 24 VDC or externally supplied from the control system. Minimum pulsed duration of 30 ms.
Process Shutdown (PSD)	1 x opto-isolated input designed for maintained contacts		Device supplied 24 VDC or externally supplied from the control system. This input can be re-mapped as an additional AND/OR Open or Close command.

*Open, close, maintain, partial stroke and manual reset share the same common.

Network Control (Optional)

The ELB is available with the following network interface cards to enable remote control and indication using digital “bus” network systems communication to the Distributed Control Systems (DCS).

Network Type	Comments
Modbus®	Modbus modules suitable for single or dual communication highways may be included in the device, to provide Fieldbus communication of all the control functions and feedback data. Data is carried on an RS485 data highway and the communications protocol used is Modbus RTU. System variables such as unit address and data baud rate are programmed over the Bluetooth data link. For more information please refer to PUB091-001.

Power, Control and Indication

Remote Indication (Standard)

Operation	Type	Range	Comments
Indication Relays	2 x configurable volt free non-latching contacts - S1 & S2. Single pole - single throw (SPST), configurable NO or NC	0.7 A @ 24 VDC	Independently configured using the Rotork Bluetooth® Setting Tool <i>Pro</i> or Insight 2 to signal one of the following: Valve Position: closed & open limit (if limit switches are connected). Status: local-stop / local / remote selected, temperature trip & partial stroke active / pass / fail. Control Alarms: PSD active, alarm reset active, voltage supply high / low. Process Alarms / Alerts: rate of pressure rise (ROR) / drop (ROD), high / low pressure, high differential pressure & stall. Device Alarms: loss of customer supply / HMI / Bluetooth. General Alarm / Alert: includes all process alarms / alarms above.
Alarm Relay	1 x volt free non-latching contact. Single pole - double throw (SPDT), configurable NO or NC	0.7 A @ 24 VDC	This relay will be de-energised when the actuator is unavailable for remote control due to any one or more of the following conditions: PSD, process alarms (above) & Internal hardware fault.
Monitor Relay	1 x volt free non-latching contact. Single pole - double throw (SPDT), configurable NO or NC	0.7 A @ 24 VDC	This relay will be de-energised when the actuator is unavailable for remote control due to any one or more of the following conditions: Local control selected, local stop selected, loss of network communication & internal hardware fault.

Protection and Operating Features

Feature	Comments
Set-up	Simple non-intrusive, interactive set-up procedure using supplied Rotork Bluetooth® Setting Tool <i>Pro</i> with LCD display or Insight 2. Settings include sensor calibration, alarm values, indication contacts and control options. Settings may be password protected. Setting tools are provided on a 1 for 10 device ratio, additional setting tools available on request.
Drifting from limit	If the actuator starts to drift away from a limit (limit switch de-activates without any command active), then the ELB will carry out the following action: If in Local or Stop, a Stop command will be issued and the user can then choose to move back to the limit. If in Remote, then an Open or Close command will be issued to move the actuator back to the limit. If the limit switch is not reached in the configured time then a Stall Alarm will be issued along with a Stop command.
Datalogger	Standard onboard datalogger provides hydraulic pressure, position and starts profiles, operational statistics, events log. Actuator configuration & manufacturing data is also available. Files can be downloaded directly to a PC or to the Rotork Bluetooth® Setting Tool <i>Pro</i> (IS certified) for transfer to a remote PC. Freeware Insight 2 for PC is available to download at www.rotork.com Using Insight 2; actuators may be configured and analysed over a Bluetooth interface.
Micro-controller	Provides all control function logic, setup programming and allied system requirements. Software is field upgradeable for future enhancements.
Memory	All configured settings are stored in non-volatile EEPROM memory (does not require power).

Connected Devices

Inputs (Standard)

Input	Type	Range	Comments
Open Limit Switch Close Limit Switch Partial Stroke Limit Switch	3 x non-isolated digital inputs, suitable for NO contacts	N/A	Mechanical limit switches to be housed in a separate switchbox mounted directly to the actuator. If more than one limit switch is active at the same time then an alarm will be raised and its default action is to STOP.
Sensor 1 (Pressure) Sensor 2 (Pressure) Sensor 3 (Position or Pressure)	3 x isolated analogue inputs (2 or 3 wire)	4 - 20 mA 0.5 - 4.5 VDC	Sensor 1 – Monitors downstream pipeline pressure. Sensor 2 – Monitors downstream pipeline pressure to verify Sensor 1 is working correctly (redundancy), or monitors upstream pipeline pressure to enable differential pressure to be calculated. Sensor 3 – Monitors the cylinder pressure or position of the actuator. The 24V supply is rated to 3 W (or customer supply can be used). The 5V supply is rated to 0.5 W.

Outputs (Standard)

Output	Range	Comments
4 x Solenoid Valves	24 VDC $\pm$ 10% Max. Power = 15 W (see table below)	The control logic for the solenoid valves can be configured for open, close, stop and PSD commands. Each solenoid valve can also be configured to switch to a low power mode once energised based on the type used.

The following table is supplied for customers to make solenoid valve selections when the ELB is supplied as a stand alone device.

If the ELB is supplied as a part of a complete Rotork solution, the solenoid valve will be selected by Rotork.

Solenoid Valves Energised Simultaneously	Maximum Coil Power (W)	Maximum Coil Save (%)	Total Power Draw (W)
1	15	100	15.0
2	7.5	100	15.0
2	13	75	14.6
2	20	60	14.4
2	30	50	15.0
3	5	100	15.0
3	8.5	75	14.3
3	13	60	14.0
3	20	50	15.0
4	3.5	100	14.0
4	6.5	75	14.6
4	10	60	14.4
4	15	50	15.0

Consult factory for other combinations.

Components

Details of the major mechanical and electrical components are provided below:

Materials

Component	Material	Grade	Finish
ELB Housing	Aluminium	BS EN 1706 AC-42000 (LM25) ASTM B5 GRADE A360	Painted
Fasteners	Stainless Steel	A4-80 (316)	N/A

Finish

All finishes are tested in accordance with Rotork's 1,000 hour cyclic salt spray test procedure which is the most realistic and arduous test cycle applicable. The test combines cyclic salt spray, drying and humidity at elevated temperatures on complete factory built devices. This tests the finish and the

various substrate materials, fixings and interfaces that make up the ELB. Substrate materials and finishes are selected to provide maximum corrosion resistance combined with good adhesion.

Standard Finish	Two-pack epoxy (90 microns)
Offshore Finish	Two-pack epoxy (350 microns)

Conduit / Cable Entries

The enclosure is machined with conduit/cable entries as indicated below. Alternative adapters are available.

Type	Adapter Material	Thread
Standard	N/A	5 x M25 x 1.5P
Option 1	Nickel Plated Brass	5 x M20 x 1.5 P 5 x M32 x 1.5 P 5 x ½" NPT 5 x ¾" NPT
Option 2	Stainless Steel (316)	5 x 1" NPT 5 x 1-¼" NPT

All devices are dispatched with transit plugs fitted into the conduit entries. It is the responsibility of the installer to ensure the appropriate cable/conduit adapters, cable glands and/or blanking plugs are fitted in order to maintain hazardous area certification and ingress protection levels. Certified adapters and blanking plugs are available as optional extras.

Terminals

The mains supply

The enclosure for the mains supply takes the form of a separately sealed compartment containing a terminal block, which is suitable for fork crimps. Terminal screws and washers are supplied with the device.

All other connections are made within the main enclosure using the supplied removable connectors which accept insulated pin crimps (Ø1.4 mm). Each device is dispatched with a Safe Use and Installation Manual and wiring diagram.

Model Code

ELB Selection ELB – 0 1 – A B D

Table A – Network Cards
Table B – Operating Temperature
Table C – Certification
Table D – Cable Entries
Table E – Accessories

Table A – Network Cards

Code	Description
0	No Network card
2	Modbus Single channel
3	Modbus Dual channel
4	Modbus Single channel + repeater

Table B – Operating Temperature

Code	Description
0	-20 to +60 °C (-4 to +140 °F)
1	-50 to +60 °C (-58 to +140 °F)

Table C – Certification

Code	Description
A	WT - Watertight IP66/68 (7m/72 hours) - NEMA 4, 4X, 6
B1	ATEX - IIB
B2	IECEX - IIB
C1	ATEX - IIC
C2	IECEX - IIC
D	cCSAus - IIB
E	cCSAus - IIC
F	TR TS - IIB (Russia)
G	TR TS - IIC (Russia)

Table D – Cable Entries

Code	Description
A	M25 X 1.5P - No adaptors, only 5 off plastic plugs
B	M20 X 1.5P - 5 off Nickel plated adaptors
C	M20 X 1.5P - 5 off Stainless steel adaptors
D	M32 X 1.5P - 5 off Nickel plated adaptors
E	M32 X 1.5P - 5 off Stainless steel adaptors
F	½" NPT - 5 off Nickel plated adaptors
G	½" NPT - 5 off Stainless steel adaptors
H	¾" NPT - 5 off Nickel plated adaptors
J	¾" NPT - 5 off Stainless steel adaptors
K	1" NPT - 5 off Nickel plated adaptors
L	1" NPT - 5 off Stainless steel adaptors
M	1" - ¼" NPT - 5 off Nickel plated adaptors
N	1" - ¼" NPT - 5 off Stainless steel adaptors

All devices are dispatched with plastic plugs fitted into the conduit entries. Adaptors, if ordered, are shipped loose.

Table E – Accessories

Code	Description
A	No Accessories
B1	M25 Ex Cable entry Plugs - Nickel plated
B2	M25 Ex Cable entry Plugs - Stainless steel
D	Window Protector
E	Vandal Proof Cover
F	Solar Shield
J*	Customer specific paint specification

Standard finish is Grey (BS00A05), 90 microns thickness.

* For Ex d IIC certified devices, maximum paint thickness is 200 microns.



ELB Detection System

for Pipeline Monitoring
and Valve Control

A full listing of the Rotork sales
and service network is available
on our website.

www.rotork.com

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Electric Actuators and Control Systems
Fluid Power Actuators and Control Systems
Gearboxes and Gear Operators
Precision Control and Indication
Projects, Services and Retrofit