



## Technical Information

## IQAN-LSL Input Devices

### Model code

IQAN - LSL - E0 - // - // - /

| Code | Description      |
|------|------------------|
| E0   | standard handle  |
| E1   | handle w/ button |

| Code | Description     |
|------|-----------------|
| DN   | Detent, neutral |
| //   | no option       |

| Code | Description         |
|------|---------------------|
| S    | Saab (AMP/Tyco JPT) |
| D    | Deutsch DT          |

### Note:

Not all option combinations are supported with ordering part numbers. The most commonly requested models are available for ordering.

| Code | Description                                |
|------|--|
| L1   | 1 solenoid detent, (-) direction lever     |
| L2   | 2 solenoid detents, (+) and (-) directions |
| L3   | 1 solenoid detent, (-) direction, 75%      |
| //   | no option                                  |

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### Application

The IQAN-LSL is a new lever in the IQAN product group. This lever focuses on compact design, weather resistance and safety.

The LSL is a single-axis joystick, 0.5 - 4.5 Vdc, intended for the proportional control of one double-acting hydraulic function. The lever has several options including a manual neutral detent and a switch in the top of the handle. For 24V systems there are solenoid detent options at full stroke in either the B (minus) direction or both A (plus) and B (minus) directions. A solenoid detent at 75% in the B (minus) direction is also available. The LSL can be mounted in the armrest or on the dashboard in mobile vehicles. It has a comfortable grip and is easily actuated for good ergonomics.

### Design and function

The IQAN-LSL is lightweight with small installation dimensions. The ergonomic design gives a good support to the arms and wrists and assures a comfortable grip from several angles. Mounting screws are installed from underneath for a clean appearance of dashboard, panel or armrest.

The IQAN-LSL has an IP65 rating above the flange and the cable has a choice of either a Saab sealed AMP junior-power timer connector or a Deutsch DT series transportation connector. This unit is designed for the outdoor environment.

The IQAN-LSL is a spring centered, dual sensor device. The optional switch in the top of the handle can be used to detect operator presence. The dual sensors provide 0.5 - 4.5 Vdc and 4.5 - 0.5 Vdc outputs which allows error checking to meet high safety requirements. All inputs and outputs are protected against short circuit to ground. The LSL is well suited as a control unit for a variety of valve drivers. The LSL fits to the IQAN platform and is designed to meet typical environmental stresses in mobile hydraulic applications.

### General

|                              |             |
|------------------------------|-------------|
| Weight                       | 0.22 Kg     |
| Rated power supply ( $V_s$ ) | 5 Vdc       |
| Load resistive (min.)        | 1K $\Omega$ |
| Load capacitive (max.)       | 1 $\mu$ F   |
| Current consumption          | 16 mA       |

### Mechanical

|                            |                |
|----------------------------|----------------|
| Angle of movement          | $\pm 20^\circ$ |
| Expected life (operations) | 5 million      |

### Environment

|                          |               |
|--------------------------|---------------|
| Operating temperature    | -40° to 70 °C |
| Sealing above the flange | IP65          |
| Sealing with DN option   | IP44          |

### Analog outputs

|                        |               |
|------------------------|---------------|
| Active range (VDC out) | 10%-90% $V_s$ |
| Resolution             | <2mV          |

### Digital output option

|                        |                        |
|------------------------|------------------------|
| Handle switch, top     | $V_{BAT}$ (+12V, +24V) |
| Max load current, DOUT | 200 mA                 |

### Other options

|                   |                       |
|-------------------|-----------------------|
| Mechanical detent | Neutral only          |
| Solenoid detents  | $V_{BAT}$ (+24V only) |

### Connectors

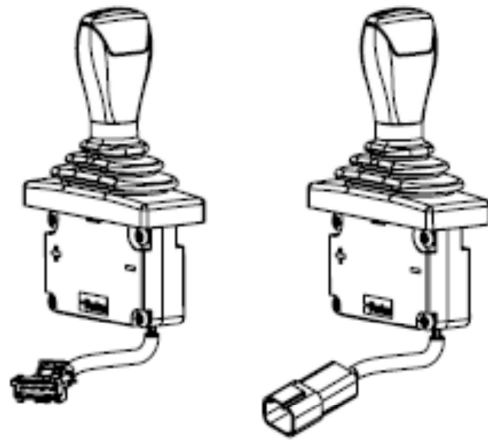
|   |                     |
|---|---------------------|
| S | Saab (AMP/Tyco JPT) |
| D | Deutsch DT          |

### Ordering part numbers

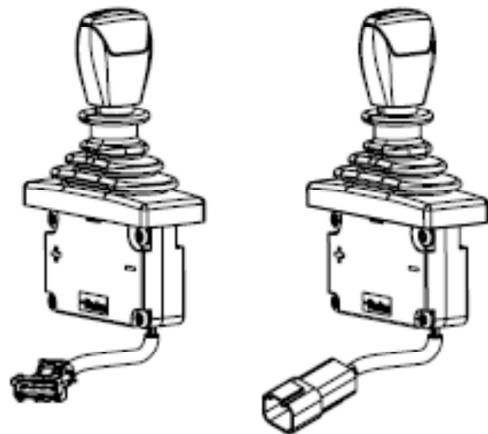
|                    |          |
|--------------------|----------|
| IQAN-LSL-E0-//--S  | 20011365 |
| IQAN-LSL-E0-DN-//S | 20011366 |
| IQAN-LSL-E0-//L1-S | 20011367 |
| IQAN-LSL-E0-//L2-S | 20011368 |
| IQAN-LSL-E0-//L3-S | 20011369 |
| IQAN-LSL-E1-//--S  | 20011370 |
| IQAN-LSL-E1-DN-//S | 20011371 |
| IQAN-LSL-E1-//L1-D | 20076217 |
| IQAN-LSL-E1-//L2-D | 20076218 |
| IQAN-LSL-E1-//L3-D | 20076219 |
| IQAN-LSL-E0-//--D  | 20014069 |

**Technical Information****IQAN-LSL Input Devices****Descriptions****IQAN - LSL - E0 - / / - / / - /**

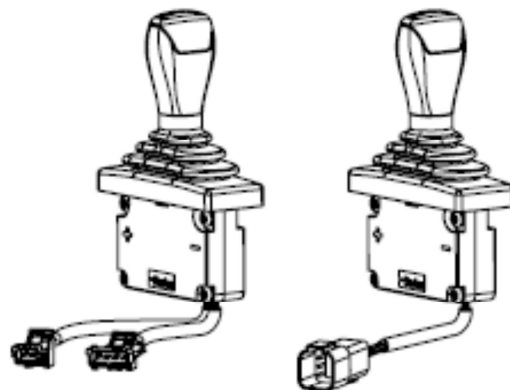
The basic version of the LSL has a single cable with a sealed 4 position connector. The range for Output A is 0.5 to 4.5Vdc and the range for Output B is 4.5 to 0.5Vdc.

**IQAN - LSL - E0 - DN - / / - /**

This version of the LSL has a single cable with a sealed 4 position connector. The range for Output A is 0.5 to 4.5Vdc and the range for Output B is 4.5 to 0.5Vdc. There is a spring loaded manual detent that must be disengaged to move the handle away from the center (neutral) position.

**IQAN - LSL - E0 - / / - Lx - /**

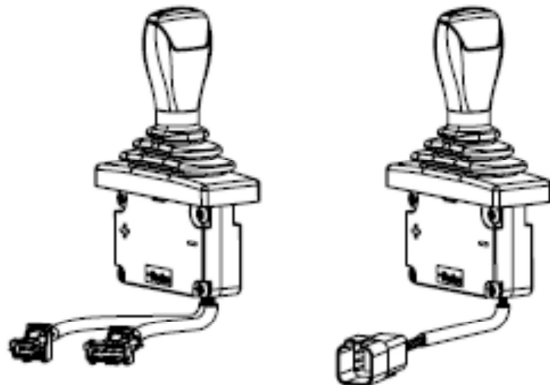
The -S version of this LSL has two cables. The main cable has a sealed Saab (AMP/Tyco JPT) 4 position connector. The second cable is for the solenoid detent option and has a sealed Saab (AMP/Tyco JPT) 2 position connector. The range for Output A is 0.5 to 4.5Vdc and the range for Output B is 4.5 to 0.5Vdc. The solenoid supply is from  $V_{BAT}$  (option offered in 24V only). The -D version has a single 6 position Deutsch DT connector.



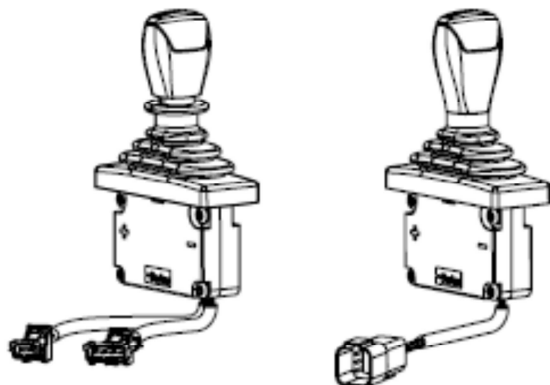


**Technical Information****IQAN-LSL Input Devices****Descriptions****IQAN - LSL - E1 - /// - /// - /**

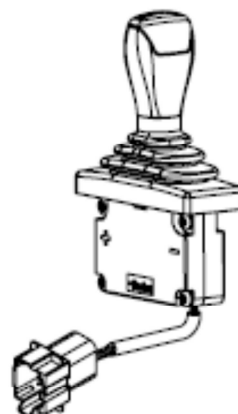
The -S version of this LSL has two cables. The main cable has a sealed Saab (AMP/Tyco JPT) 4 position connector. The second cable is for the switch option and has a sealed Saab (AMP/Tyco JPT) 2 position connector. The range for Output A is 0.5 to 4.5Vdc and the range for Output B is 4.5 to 0.5Vdc. The switch supply is from  $V_{BAT}$ . The -D version has a single 6 position Deutsch DT connector.

**IQAN - LSL - E1 - DN - /// - /**

The -S version of this LSL has two cables. The main cable has a sealed Saab (AMP/Tyco JPT) 4 position connector. The second cable is for the switch option and has a sealed Saab (AMP/Tyco JPT) 2 position connector. The range for Output A is 0.5 to 4.5Vdc and the range for Output B is 4.5 to 0.5Vdc. There is a spring loaded manual detent that must be disengaged to move the handle away from the center (neutral) position. The -D version has a single 6 position Deutsch DT connector.

**IQAN - LSL - E1 - /// - Lx - D**

This type of LSL is only available in the -D version. The cable has a sealed 8 position Deutsch DT connector. 4 positions are used for the lever power supply and outputs. The range for Output A is 0.5 to 4.5Vdc and the range for Output B is 4.5 to 0.5Vdc. The other 4 positions are for the switch and solenoid detent options. Each option uses 2 positions in the connector. The switch supply is from  $V_{BAT}$  and the solenoid supply is from  $V_{BAT}$  (option offered in 24V only).

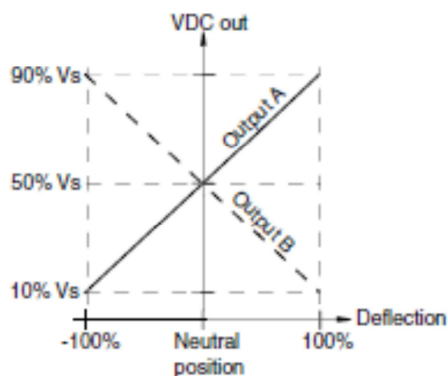


**Technical Information****IQAN-LSL Input Devices****Outputs**

The graph below demonstrates the mirrored voltage outputs. Output A is 10% - 90%  $V_s$  and Output B is 90% - 10%  $V_s$ .

With a nominal 5Vdc supply, the range for Output A is 0.5 to 4.5Vdc and the range for Output B is 4.5 to 0.5Vdc.

**Deflection vs. output diagram**

**Environmental Protection****EMI**

ISO 14982:1998, Radiated emission  
EN 55022:2003, Conducted emission  
ISO 11452-2:1995, Radiated Susceptibility  
ISO 11452-4:2001, Conducted Susceptibility  
ISO 7637-3:1995, Conducted transient susceptibility  
EN 61000-4-8, Magnetic immunity

**ESD**

EN 61000-4-2, external  
ISO TR 10605:2001, ESD

**Mechanical environment**

IEC 60068-2-64:1993 Fh, random  
IEC 60068-2-29:1987 Eb, bump

**Climate environment**

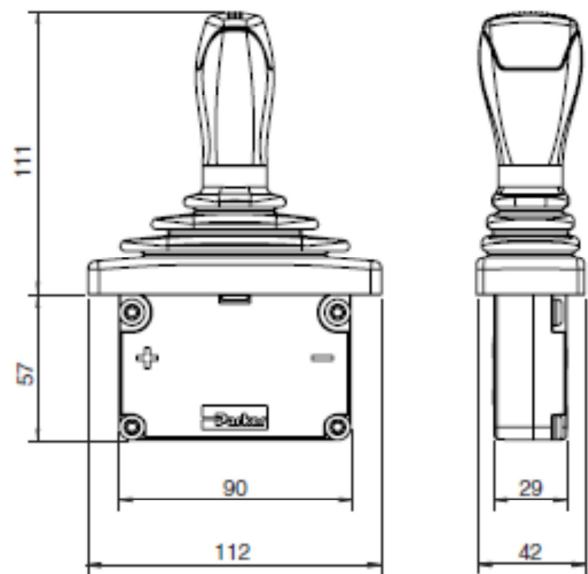
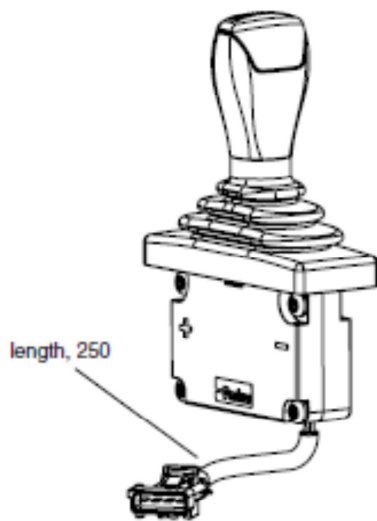
IEC 60068-2-1:1993 Ab, cold  
IEC 60068-2-2:1993-01 Bb, heat  
IEC 60068-2-3 Ca, damp heat, steady  
IEC 60068-2-14:1984 Nb, temperature change  
IEC 60068-2-18 Rb2, ISO529, IP66  
IEC 60068-2-30:1985 Db, damp heat, cyclic

**Chemical environment**

IEC 60068-2-52:1996 Kb salt mist, cyclic

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## IQAN-LSL Input Devices



unit = mm

