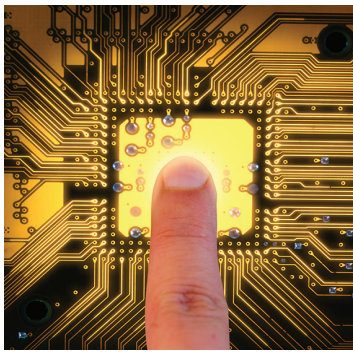
IQAN-LSL Input Devices

Electronic Control Systems



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Application

The IQAN-LSL is a 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 on the armrest or 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 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 the dashboard, panel or armrest.

The IQAN-LSL has an IP65 rating above the flange and the cable has 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 at the top of the handle can be used to detect operator presence. For different application needs, there are two options for the locking force of the electrical detent function. The higher locking force detent version has a stronger pre-feeling resistance for operator detection of the lever stroke condition.

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 lever fits into the IQAN platform and is designed to meet typical environmental stresses in mobile hydraulic applications.

EN 13849-1

Failure mode distribution are available on request.

General

Weight	0.22 Kg
Rated power supply (V_S)	5 Vdc
Load resistive (min.)	4.5K Ω
Load capacitive (max.)	1 µF
Current consumption	16 mA

Mechanical

Angle of movement	±20°
Expected life (operations)	5 million
Detented versions (Lx)	2 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	<2 mV

Digital output option

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

Other options

No handle	U0 variant
Mechanical detent	Neutral only
Solenoid detents	V_{BAT} (+24V only)
Detent index force	
L1/L2	9 N @ 100 mm
L4/L5	13 N @ 100 mm

Connectors

D	Deutsch DT

Ordering part numbers

IQAN-LSL-E0-//-//-D	20014069
IQAN-LSL-E0-DN-//-D	20085157
IQAN-LSL-E0-//-L1-D	20077789
IQAN-LSL-E0-//-L2-D	20070174
IQAN-LSL-E0-//-L3-D	20085158
IQAN-LSL-E0-//-L4-D	20077714
IQAN-LSL-E0-//-L5-D	20077715
IQAN-LSL-E1-//-//-D	20077749
IQAN-LSL-E1-DN-//-D	20085159
IQAN-LSL-E1-//-L1-D	20076217
IQAN-LSL-E1-//-L2-D	20076218
IQAN-LSL-E1-//-L3-D	20076219
IQAN-LSL-E1-//-L4-D	20077706
IQAN-LSL-E1-//-L5-D	20077707
IQAN-LSL-U0-//-L4-D	20077769
IQAN-LSL-U0-//-L5-D	20077770

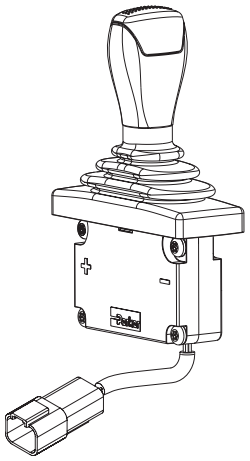
MTTFd

Output A	3676 [year]
Output B	3676 [year]

Descriptions

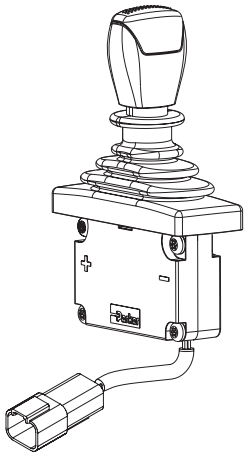
IQAN - LSL - E0 - / / - / / - /

The basic version of the LSL has a single cable with a 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.



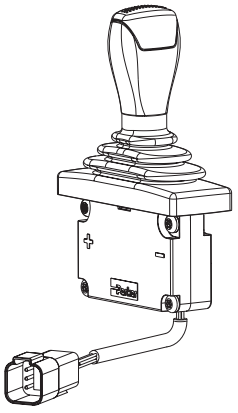
IQAN - LSL - E0 - DN - / / - /

This version of the LSL has a single cable with a 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 - /

Two versions of locking force for the electrical detent function are offered for this version. The range for Output A is 0.5 to 4.5Vdc and the range for Output B is 4.5 to 0.5Vdc. The electrical detent supply is from V_{BAT} (option offered in 24V only). The cable has a 6-position connector.



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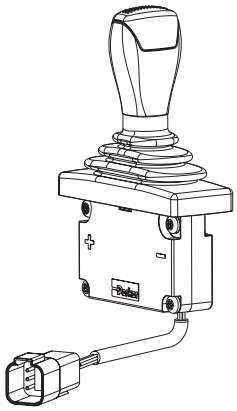
Mölnlycke, Sweden

Descriptions

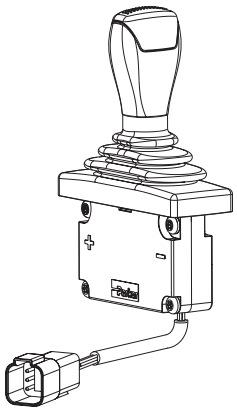
IQAN - LSL - E1 - / / - / / - /

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 cable has a 6-position connector.



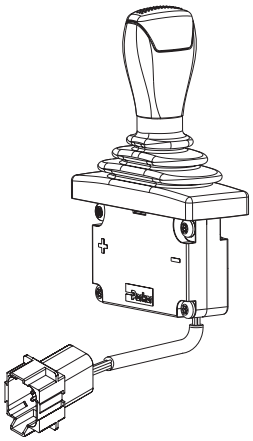
IQAN - LSL - E1 - DN - / / - /

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 cable has a 6-position connector.



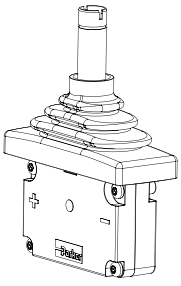
IQAN - LSL - E1 - / / - Lx - D

The range for Output A is 0.5 to 4.5Vdc and the range for Output B is 4.5 to 0.5Vdc. Two versions of locking force for the electrical detent function are offered. The switch supply is from V_{BAT} and the electrical detent supply is from V_{BAT} (option offered in 24V only). The cable has a 8-position connector. 4 positions are used for the lever power supply and outputs. The other 4 positions are for the switch and electrical detent options. The switch and the detent each use 2 positions in the connector.



IQAN - LSL - U0 - / / - / / - /

This type of LSL is supplied without a handle. The no handle variant can have any of the connector and detent options listed in the previous descriptions. The models that are available for ordering are listed in the 'Ordering part numbers' table. The customer is responsible for a mating handle design that properly fits the bellow and is sealed.



Model code

Code	Description
E0	standard handle
E1	handle w/ button
U0	no handle

Code	Description
DN	Detent, neutral
/ /	no option

Code	Description
D	Deutsch DT

Code	Description
L1	1 solenoid detent, (-) direction std. index force*
L2	2 solenoid detents, (+) and (-) std. index force
L3	1 solenoid detent, (-) direction, 75%, no index
L4	1 solenoid detent, (-) direction high index force
L5	2 solenoid detents, (+) and (-) high index force
/ /	no option

*-The term index force refers to the increased force or 'pre-feeling' at the end of stroke just before the detent engages.

Note:

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

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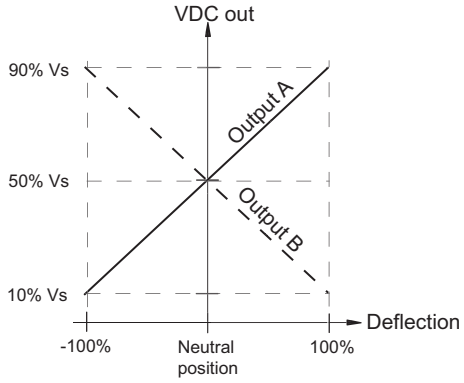
Mölnlycke, Sweden

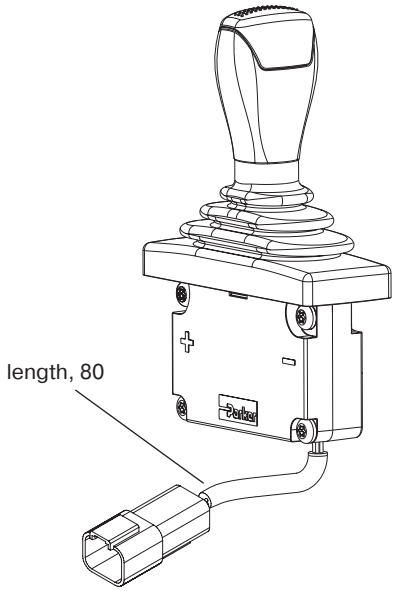
Outputs

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





unit = mm

Environmental Protection

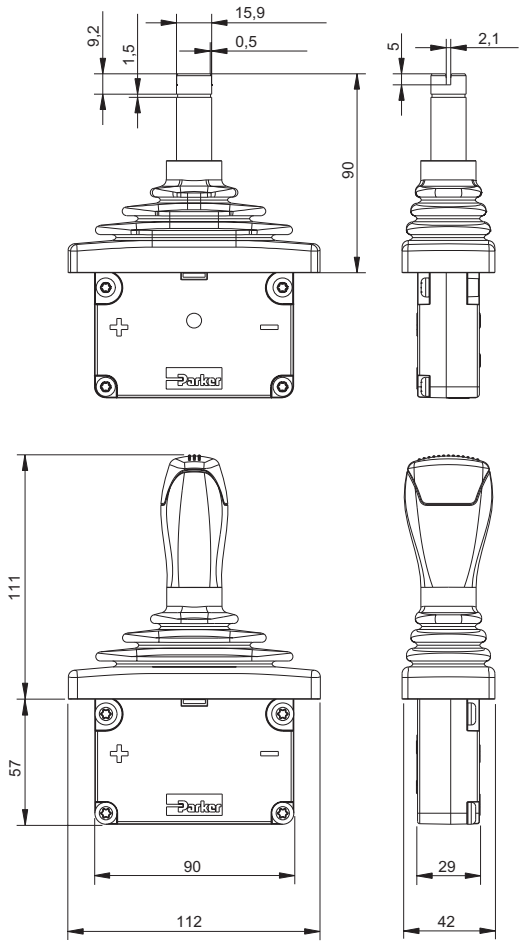
EMI
ISO 14982:1998, Radiated emission
EN 55022:2003, Conducted emission
ISO 11452-2:1995, Radiated Susceptibility
ISO 11452-4:2001, Conducted Susceptibility
ISO7637-3:1995, Conducted transient susceptibility
EN 61000-4-8:, Magnetic immunity

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, IEC60529, IP65
IEC 60068-2-30:1985 Db, damp heat, cyclic

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



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