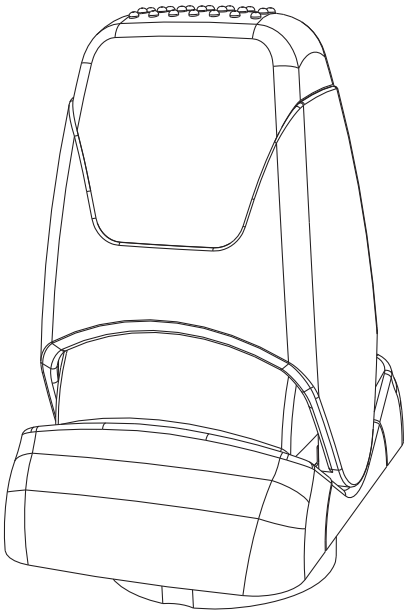
IQAN-LST
Instruction book

Publ no HY33-8303-IB/UK
Edition 2012-01-17



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1 Introduction

These instructions are to be used as a reference tool for the vehicle manufacturer's design, production, and service personnel.

The user of these instructions should have basic knowledge in the handling of electronic equipment.

Safety symbols

Sections regarding safety, marked with a symbol in the left margin, must be read and understood by everyone using the system, carrying out service work or making changes to hardware and software.

The different safety levels used in this manual are defined below.

WARNING

Sections labeled *WARNING* with a caution symbol in the left margin, indicate that a hazardous situation exists. If precautions are not taken, this could result in death, injury, or property damage.

NOTICE

Sections labeled *NOTICE* with a notice symbol in the left margin, indicate there is important information about the product. Ignoring this could result in less than optimal performance, or damage to the product.

Contact the manufacturer if there is anything you are not sure about or if you have any questions regarding the product and its handling or maintenance.

The term "manufacturer" refers to Parker Hannifin Corporation.

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2 Precautions

General safety regulations

Work on the hydraulics control electronics may only be carried out by trained personnel who are well-acquainted with the control system, the machine and its safety regulations.

WARNING

Mounting, modification, repair and maintenance must be carried out in accordance with the manufacturer's regulations. The manufacturer has no responsibility for any accidents caused by incorrectly mounted or incorrectly maintained equipment. The manufacturer does not assume any responsibility for the system being incorrectly applied, or the system being programmed in a manner that jeopardizes safety.

WARNING

Damaged product may not be used. If the control system shows error functions or if electronic modules, cabling or connectors are damaged, the system shall not be used.

WARNING

Electronic control systems in an inappropriate installation and in combination with strong electromagnetic interference fields can, in extreme cases, cause an unintentional change of speed of the output function.

NOTICE

As much as possible of the welding work on the chassis should be done before the installation of the system. If welding has to be done afterwards, the electrical connections on the system must be disconnected from other equipment. The negative cable must always be disconnected from the battery before disconnecting the positive cable. The ground wire of the welder shall be positioned as close as possible to the place of the welding. The cables on the welding unit shall never be placed near the electrical wires of the control system.

Construction regulations

WARNING

The vehicle must be equipped with an emergency stop which disconnects the supply voltage to the control system's electrical units. The emergency stop must be easily accessible to the operator. The machine must be built if possible, so that the supply voltage to the control system's electrical units is disconnected when the operator leaves the operator’s station.

Safety during installation

WARNING

Incorrectly positioned or mounted cabling can be influenced by radio signals which can interfere with the functions of the system.

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Safety during start-up

WARNING

The machine's engine must not be started before the control system is mounted and its electrical functions have been verified.

Ensure that no one is in front, behind or nearby the machine when first starting up the machine.

Follow the instructions for function control in the Start-up section.

Safety during maintenance and fault diagnosis

WARNING

Ensure that the following requirements are fulfilled before any work is carried out on the hydraulics control electronics.

- The machine cannot start moving.
- Functions are positioned safely.
- The machine is turned off.
- The hydraulic system is relieved from any pressure.
- Supply voltage to the control electronics is disconnected.

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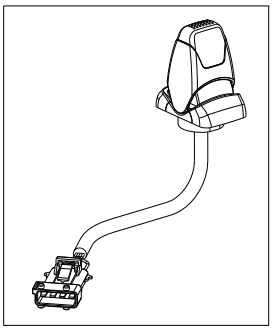
3 Product description

IQAN-LST

The IQAN-LST is one of several single axis joysticks designed for controlling hydraulic functions in vehicles and machinery, using 0,5-4,5Vdc outputs.



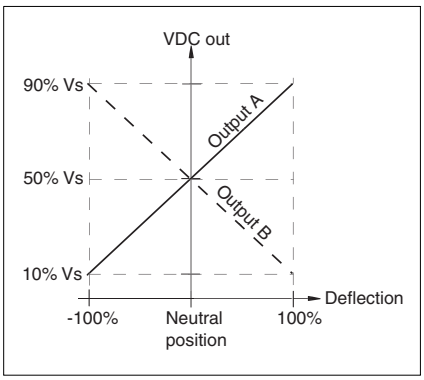
The IQAN-LST lever.

Output

The IQAN-LST has two (2) contactless hall effect sensors that provide mirrored *voltage outputs* for controlling proportional valve drivers.

NOTICE

In order to increase the safety of the LST the opposing 10% - 90% V_S and 90% - 10% V_S outputs can be compared eg. to verify center position. With a 5 Vdc supply the outputs are typically 0,5-4,5Vdc and 4,5-0,5Vdc



Graph showing dual outputs A and B.

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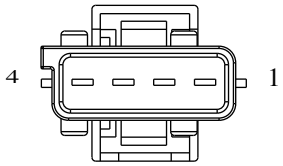
4 Installation

Connector C1

Connector kit	**Parker no. 5031097**
Housing	Amp no. 1-963207-1
Plane sealing, 4 p	Amp no. 963208-1
Pin type	Amp no. 929940-1
Cable	0,75-1,0 mm²
Seals	Amp no. 828904-1
Plugs (empty pos.)	Amp no. 828922
IQAN crimping tool references	Red handle, pos. A use Yellow extraction tool
IQAN tool kit	**Parker no. 5031061**



The IQAN tool kit is found in the 'IQAN accessories' datasheet.

Pos	Signal name
1	GND
2	V_S (+5Vdc)
3	VOUT-A
4	VOUT-B

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Appendix A

IQAN-LST Technical Overview

Absolute maximum ratings

T_A = +25 °C (unless otherwise specified)

Parameter	Limit values			Unit	Remark
	min.	typ.	max.		
Operating ambient temperature, T_A Storage temperature	– 40 – 40		+70 +100	°C	
Voltage supply, V_S	4,5	5,0	5,5	V	
Over voltage			11,0	V	t < 10 min.
Sensor output			11	V	t < 10 min.

Operation

T_A = +25 °C (unless otherwise specified)

Parameter	Limit values			Unit	Remark
	min.	typ.	max.		
Operating ambient temperature, T_A	– 40		+70	°C	
Start-up delay		7,5		ms	
Current consumption	11	16	21	mA	

I/O

T_A = +25 °C (unless otherwise specified)

Parameter	Limit values			Unit	Remark
	min.	typ.	max.		
Signal range low	0,42	0,50	0,58	V	V_S = 5,0V
Signal range center	2,42	2,50	2,58	V	V_S = 5,0V
Signal range high	4,42	4,50	4,58	V	V_S = 5,0V
Linearity error		3		%	
Resolution		4096		steps	(1,25mV)
Response time		6		ms	
Load, resistive	4.5			kΩ	
Load, capacitive			1	µF	

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Mechanical ratings

Parameter	Limit values			Unit	Remark
	min.	typ.	max.		
Breakout force		1,0		N	At top of handle
Operating force		2,5		N	Full deflection, at top of handle
Applied force			100	N	At top of handle
Angle of movement		±30		°	
Expected life		$5x10^6$		cycle	one cycle is: Neutral to full + direction to neutral to full - direction and back to neutral
Weight		40		g	excl. cabling

Environmental ratings, EMI

Parameter	Limit values			Unit	Remark
	min.	typ.	max.		
EMI ISO 14982:1998 EN 55022:1998 ISO 11452-2:1995 ISO 11452-4:1995 ISO7637-3 EN 61000-4-8			 100 150 80 100	 Mhz MhzV/m mA V A/m	 30-1000 Mhz 0.15-30 Mhz 20-1000 Mhz 1-200 Mhz
ESD EN 61000-4-2 (external) ISO TR 10605			 8 15 4	 kV kV kV	 contact air

Environmental ratings, mechanical

Parameter	Limit values			Unit	Remark
	min.	typ.	max.		
Vibration IEC 68-2-64 Fh		0,1		g^2/Hz	10-250 Hz, 30 h
Bump IEC 68-2-29 Eb		40		g	6 ms, 1000 x 3

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Environmental ratings, climate

Parameter	Limit values			Unit	Remark
	min.	typ.	max.		
Water IEC 68-2-18 Rb2 (ISO529, IP66)		100		l/min	30kPa, 3 min
Humidity IEC 68-2-30 Db (damp heat, cyclic) IEC 68-2-3 Ca (damp heat, steady)		 72 240		 hrs hrs	 25-55°C, 95%RH 44°C, 93%RH
Temperature IEC 68-2-2 Bb (heat) IEC 68-2-1 Ab (cold) IEC 68-2-14 Nb (temperature change)		 72 16 60	 70	 °C hrs hrs	 70°C -40°C -40 to 70°C in 10 cycles

Environmental ratings, chemical

Parameter	Limit values			Unit	Remark
	min.	typ.	max.		
Chemical IEC 68-2-52 Kb (salt mist, cyclic)		72		hrs	25 - 55°C

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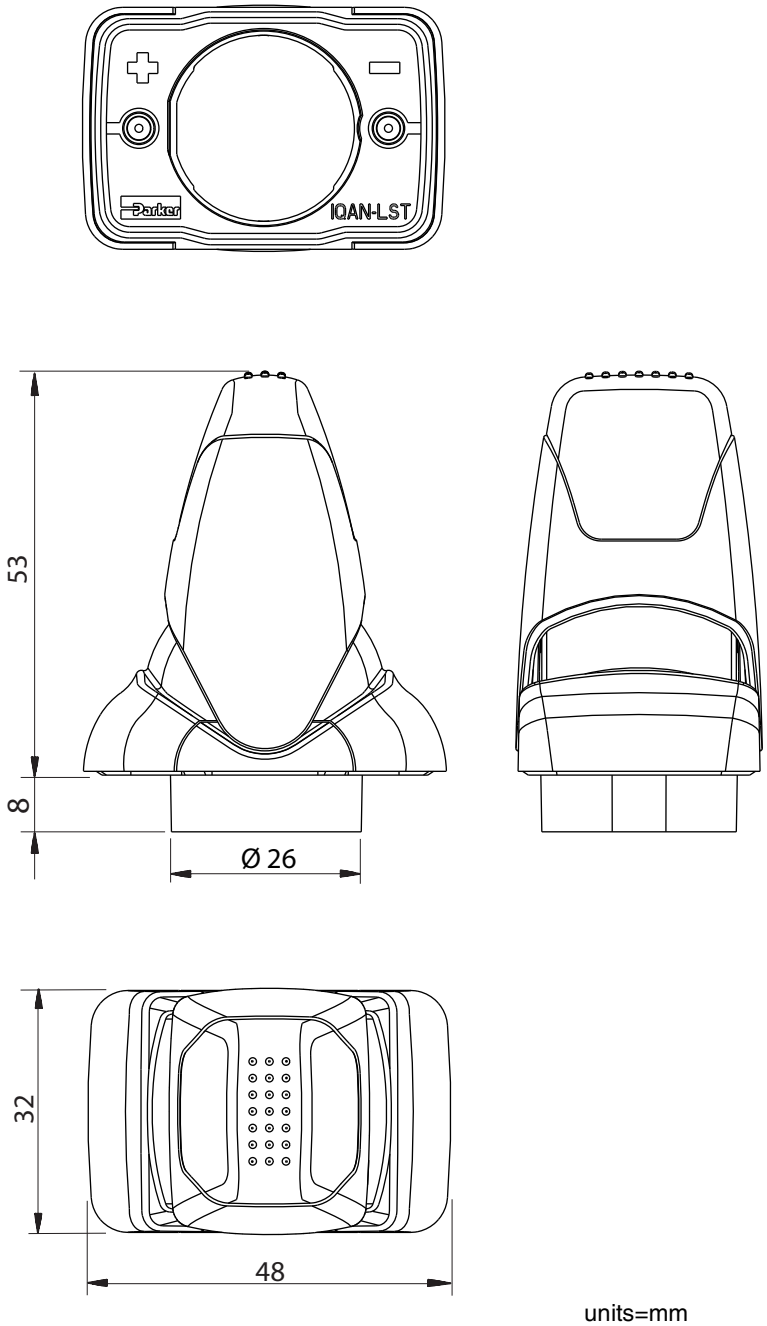
Appendix B

Dimensioning of the IQAN-LST



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Information in this instructionbook is subject to change without notice

Publ no HY33-8303-IB/UK
Edition 2012-01-17

Parker Hannifin
Electronic Controls Division
SE-435 35 Mölnlycke
Sweden
Tel +46 31 750 44 00
Fax +46 31 750 44 21
www.parker.com/ecd

Parker Hannifin
Electronic Controls Division
1651 N. Main Street
Morton, IL 61550
USA
Tel +1 309 266 2200
Fax +1 309 266 6674

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