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pneumatics  
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sealing & shielding



# Electronic Control Systems Components

Catalog HY33-1800/US  
North American Product Offering



ENGINEERING YOUR SUCCESS.

**Task oriented controller, valve driver module**

IQAN-TOC2..... 1

**Input devices, analog levers**

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**SAFETY**

For safety information, see Safety Guide at [www.parker.com/safety](http://www.parker.com/safety) or call 1-800-CParker.



**General**

Weight	0.2 Kg
Operating temperature	-40 to +70 °C
Protection	outdoor use
Voltage supply	9 - 34 VDC
Current consumption (idle)	60 mA (28 VDC) 40 mA (14 VDC)
Data interface	mechanical encoder or RS232 (using IQANdevelop)
VREF output	4.9 - 5.1 VDC 30 mA (28 VDC)

**Outputs**

Current / PWM outputs	
Number	2 double
Type current mode	current - closed loop
PWM mode	voltage - open loop
Min. threshold	50 mA
Max. load	3000 mA
Dither frequency	25 - 333 Hz
Resolution	1 mA

**Inputs**

Voltage inputs	
Number	2
Signal range	0 - 5 VDC
Resolution	5 mV
Digital inputs	
Number	2
Signal high	4 VDC - V <sub>BAT</sub>
Signal low	0 - 1 VDC

**Application**

The IQAN-TOC2 is a simple task oriented controller in the IQAN product group. This unit is designed for ease of setup, weather resistance, and safety.

The TOC2 is a general purpose unit that can control two bi-directional valve sections or two cartridge solenoids simultaneously. The IQAN-TOC2 communicates with a variety of input and output devices. It has current mode (current closed-loop) or PWM mode (voltage open-loop) output for valve control. The analog inputs accept signals from joysticks or potentiometers. Two digital inputs can be used to read switches.

The IQAN-TOC2 has a simple mechanical interface for calibration. With a preloaded personality from the factory, setup can be easily performed on the machine using a screwdriver. Adjustments possible include threshold, maximum output and slopes. The TOC2 may also be connected to a PC and programmed using IQANdevelop software to change the functionality of the controller. This advanced feature allows the TOC2 to be used in more demanding applications.

The housing is designed to be rugged, but light and has a sealed, automotive AMP junior-power timer connector. The IQAN-TOC2 has a membrane to prevent condensation inside the housing. This controller is designed for the outdoor environment.

The TOC2 is made using selected components and conforms to strict international requirements.

Diagnostics: If an error is detected an LED on the top of the controller flashes a sequence to indicate the nature of the error.

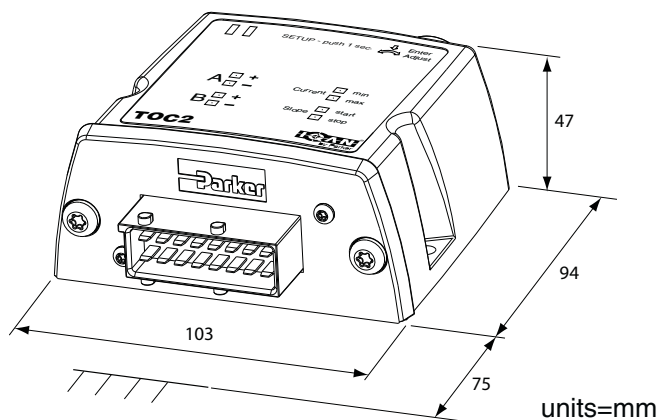
**Description**

IQAN-TOC2 (100 hz)

Consult pricelist for other TOC2 factory preloaded personalities and their ordering part numbers.

**Ordering PN**

5010028





**General**

Weight	0.22 Kg
Rated power supply (V <sub>S</sub> )	5 Vdc
Load resistive (min.)	4.5 kΩ
Load capacitive (max.)	1 μF
Current consumption	16 mA

**Mechanical**

Angle of movement	±20°
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 <sub>S</sub>
Resolution	<2mV

**Digital output option**

Handle switch, top	V <sub>BAT</sub> (+12V, +24V)
Max load current, DOUT	200 mA

**Other options**

Mechanical detent	Neutral only
Solenoid detents	V <sub>BAT</sub> (+24V only)

**Connectors**

-S	Saab (AMP/Tyco JPT)
-D	Deutsch DT04

**Application**

The IQAN-LSL is an analog 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 doubleacting 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 the minus direction or both plus and 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.

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

The standard 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.

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.

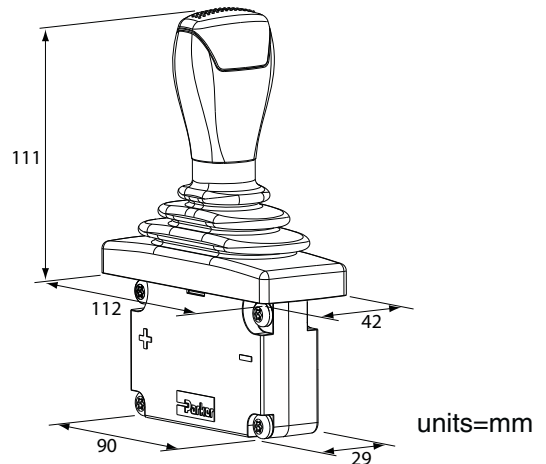
**Description**

IQAN-LSL-E0-//--S  
 IQAN-LSL-E0-//--D

**Ordering PN**

20011365  
 20014069

Consult datasheet and pricelist for IQAN-LSL detent and connector options and their ordering part numbers.





**General**

Weight	0.04 Kg
Rated power supply (V <sub>s</sub> )	5 Vdc
Load resistive (min.)	4.5 kΩ
Load capacitive (max.)	1 μF
Current consumption	16 mA

**Mechanical**

Angle of movement	±30°
Expected life (operations)	5 million

**Environment**

Operating temperature	-40° to 70 °C
Sealing	IP66

**Analog outputs**

Active range (Vdc out)	10%-90% VS
Resolution	<2mV

**Connectors**

-S	Saab (AMP/Tyco JPT)
-D	Deutsch DT04

**Application**

The IQAN-LST is a paddle style, analog mini-lever in the IQAN product group. This lever focuses on compact design, weather resistance and safety.

The LST is a small single-axis joystick 0.5 - 4.5 Vdc, intended for the proportional control of one doubleacting hydraulic function. The combination of a minilever and armrest can provide substantial ergonomic benefits. The LST can be mounted in the armrest or on the dashboard in mobile vehicles. It is easily actuated with a fingertip for good ergonomics.

The IQAN-LST is lightweight with small installation dimensions. The LST also has low, well-adapted forces designed in for ease of operation in close quarters.

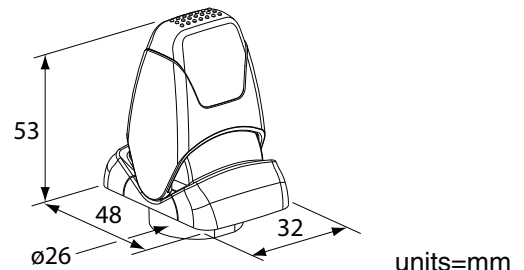
The lever is covered with friction rubber on either side, to prevent the fingers from slipping and to provide a comfortable feel. Mounting screws are installed from underneath for a clean appearance of the dashboard, panel or armrest.

The IQAN-LST is designed for the outdoor environment. The electronics are potted and the cable has a choice of either a Saab sealed AMP junior-power timer connector or a Deutsch DT series transportation connector. These features combine to give the LST an IP66 rating.

The IQAN-LST is a spring centered, dual sensor device. 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. It is well suited as an input device for a variety of valve drivers.

**Description Ordering PN**

IQAN-LST-S	20011381
IQAN-LST-D	20014070







**General (Lever base)**

Weight	0.37 kg
Rated power supply ( $V_s$ )	5 VDC
Load resistive (min.)	4.5 k $\Omega$
Load capacitive (max.)	1 $\mu$ F
Current consumption	16 mA (5Vdc)

**Mechanical (Lever base)**

Angle of movement	$\pm 18^\circ$
Expected life (full stroke cycles)	5 million
Lever force in neutral, XY	0.6 Nm
Full actuated, XY direction	1.4 Nm
One time loading (max.)	100 Nm

**Environmental (Lever base)**

Temperature range	
Operating, ambient	-40 to +85° C
Storage, ambient	-40 to +100° C
Sealing, above flange	IP65 (with sealed handle and bellow)

**Electrical (Lever base)**

Over voltage range	11Vdc @ 10 minutes
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**Connection (Lever base)**

Electrical connection	Deutsch DTM, 6 pos.
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**Analog outputs**

Active range ( $V_{dc}$ out)	10%-90% $V_s$
Resolution	<2 mV

**Application**

The IQAN-LC5-X05 is a large, coordinate joystick that incorporates ruggedness, functionality, light weight with high flexibility for mobile market applications. The unit is extremely robust, able to withstand aggressive conditions during outdoor use and in outdoor installations, including EMI, vibrations and a wide temperature range. The IQAN-LC5-X05 features a compact ergonomic design making it ideal for armrest and panel installations in mobile equipment. Fourth generation ICL4 type joysticks with N or G handles are easily replaced with the IQAN-LC5-X05.

The joystick base has an integrated Deutsch transportation connector. The handle cable may be routed completely through the non-corrosive housing. This makes field mounting of new handles, or replacing a bellow, very easy to accomplish.

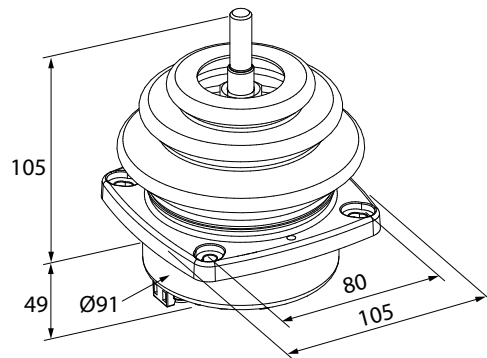
All proportional output signals are of contactless Hall effect type with dual sensors to provide redundancy for high safety and reliability. The primary signal for each axis is 10%-90% of supply voltage. The corresponding secondary signal is 90%-10% of supply voltage.

**Description**

**Ordering PN**

IQAN-LC5-X05-U1	20076317
IQAN-LC5-X05-U2	20076318
IQAN-LC5-X05-N2	20077692
IQAN-LC5-X05-N2T	20077695
IQAN-LC5-X05-N4	20077699
IQAN-LC5-X05-N4T	20077694
IQAN-LC5-X05-G	20077753

Consult datasheet and pricelist for other IQAN-LC5-X05 options and ordering part numbers.



units=mm

**-MP handle for IQAN-LC5-X05**

Input devices, analog joystick  
**Components**

**General (handle)**

Weight .25 kg  
Temperature range -40 to +85° C  
Sealing outdoor use

**Buttons/Trigger**

Expected life (electrical) 0.5 million  
Expected life (mechanical) 1 million  
Travel 1.5 mm  
Actuating force 2 - 5 Nm  
Switching current (max) 400 mA, 32 VAC, resistive load

**Thumb wheel**

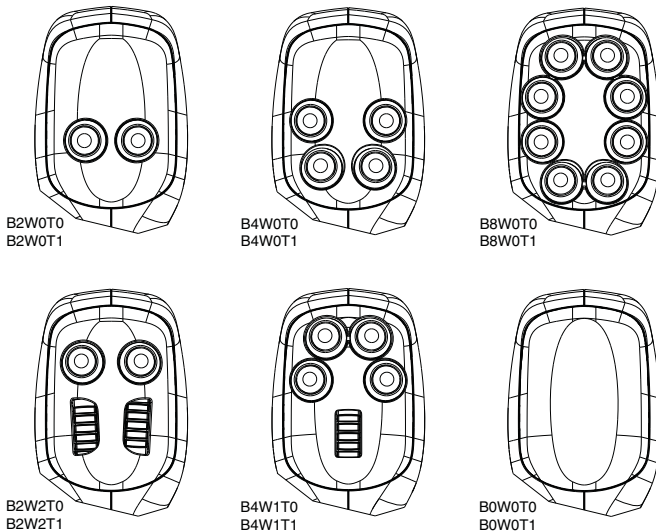
Rated power supply (Vs) 5 Vdc  
Load resistive (min) 4.5 kΩ  
Load capacitive (max) 1 uF  
Current consumption (typ) 16 mA  
Analog output active range 10%-90% Vs  
Resolution < 2 mV  
Angle of movement ± 25 degrees  
Expected life (operations) 5 million

**Connection**

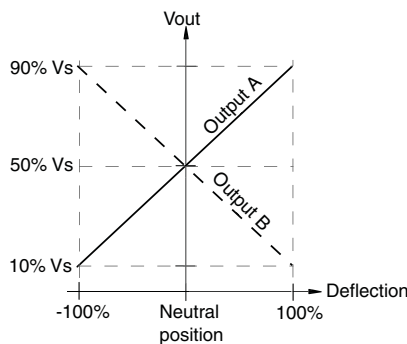
B0W0T1 / B2W0T0 / B2W0T1 / B4W0T0 Deutsch DTM, 6 p.

B4W0T1 / B4W1Tx / B2W2Tx / B8W0Tx Deutsch DTM, 12 p.

**MP standard faceplate configurations**



**-MP thumbwheel Deflection vs. output diagram**



**Application**

The MP handle option provides a variety of control interfaces in an ergonomic, multi-function handle that comfortably fits your hand. The handle is a robust design, able to withstand heavy use in outdoor installations, including exposure to a wide range of automotive chemicals. The handle has the capability to have a maximum of 8 buttons or 2 proportional thumb wheels in the faceplate. Combinations of buttons, thumb wheels, and trigger are also possible. The MP handle will be assembled to the IQAN-LC5-X05 base, and the cables are routed through the base. The push buttons and thumb wheel are easily connected to the vehicle wire harness by a Deutsch DTM connector.

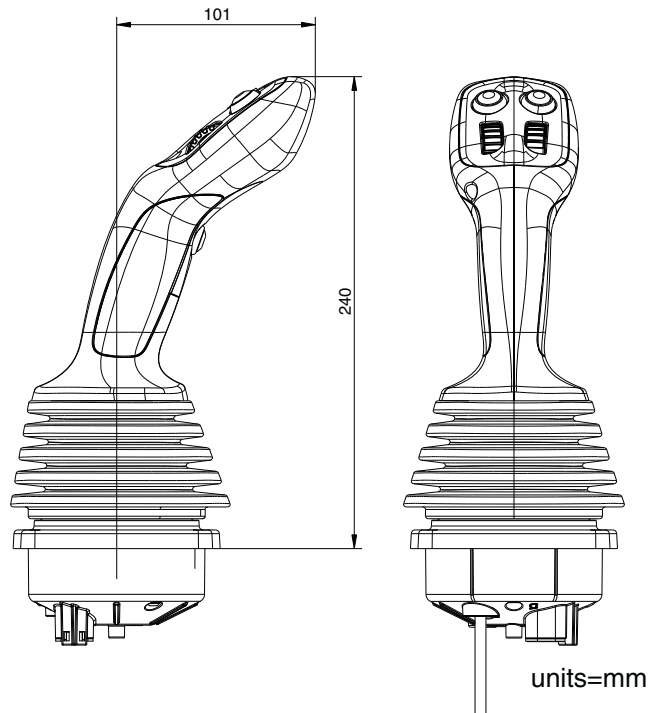
The MP handle is made to fit either the right or left hand, reducing inventory part numbers. The buttons are large, and have a nice tactile feel. The proportional thumb wheel has dual sensors providing 2 crossed outputs that may be compared in IQAN modules for safe operation.

**Description**

Description	Ordering PN
IQAN-LC5-X05-MPB2W0T0	20076320
IQAN-LC5-X05-MPB2W0T1	20076321
IQAN-LC5-X05-MPB2W2T1	20076323
IQAN-LC5-X05-MPB4W0T0	20076324
IQAN-LC5-X05-MPB4W0T1	20076325
IQAN-LC5-X05-MPB4W1T1	20076327
IQAN-LC5-X05-MPB8W0T1	20076329

Consult datasheet and pricelist for other IQAN-LC5-X05-MP options and ordering part numbers.

**Ordering PN**





**General (joystick and handle)**

Weight	0.40 kg (base)
Weight (handle)	0.75 kg (base + handle)
Power supply (Vs)	4.5 to 5.5 Vdc
Current (base)	Max 65 mA (@ 5Vdc)
Current (rocker+knob)	Max 65 mA (@ 5Vdc)
CE marking	2004/108/EC

**Mechanical**

Angle of movement	
Base	20°
Rocker	20°
Knob	20°
Expected life	5 million cycles

**Environmental**

Temperature	
Operating,	-40 to +70° C
Storage,	-40 to +85° C
Electronics sealing	IP67 <sup>1</sup>

**Analog outputs**

Analog output range	10%-90% Vs
Resolution	<2 mV)

**Connection**

LC6-X05-U0	Molex MicroFit 3.0
LC6-X05-H1-R1K0	Molex MicroFit 3.0
LC6-X05-H1-R1K1	Molex MicroFit 3.0

1) Depending on connector

**Application**

The IQAN-LC6-X05 is a mini-coordinate joystick that incorporates ergonomic design with ruggedness, functionality, light weight and high flexibility for mobile market applications. The unit is designed to withstand aggressive conditions in different types of mobile equipment. The LC6 has a compact ergonomic design and small dimensions that make it ideal for armrest and panel mounting. The IQAN-LC6-X05 is designed for outdoor use. The housing and handle have potted electronics and are rated up to IP67.

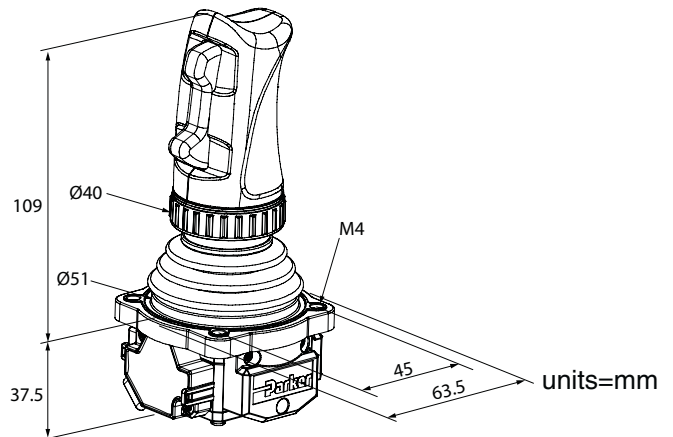
The ergonomic handle has a unique, patent pending, rotary knob function that adds a fourth proportional function integrated in the handle. The design gives the user a benefit to control all joystick proportional functions without changing their grip on the handle, and makes the LC6 ideal for repetitive, precise motion control during extended periods in mobile applications. The 4th axis default fitted ring has a small diameter, however, if needed, the operator can attach a larger sized ring to provide a different grip feeling.

All proportional output signals in joystick, rocker and knob are of contactless Hall effect type with dual sensors to provide redundancy for safety and reliability. A magnet shielding technology is used to protect the joystick from external magnetic fields.

IQAN-LC6-X05 joystick redundant signals allow error checking to make it easy for the application designer to meet high safety requirements by using IQAN software. The primary signal for each axis is 10%-90% of supply voltage. The corresponding secondary signal is 90%-10% of supply voltage.

**Description Ordering PN**

IQAN-LC6-X05-U0	20077757
IQAN-LC6-X05-H1R1K0	20077758
IQAN-LC5-X05-H1R1K1	20077759







**General**

Weight	0.06 kg
Operating temperature	-40 °C to 125 °C
Storage temperature	-40 °C to 140 °C
Pressure range	
SP035	0 - 35 bar
SP500	0 - 500 bar
Over pressure	
SP035	Max 100 bar
SP500	Max 1050 bar
Burst pressure	
SP035	Min 150 bar
SP500	Min 1500 bar
Total error (-40°C to 105°C) <sup>1)</sup>	Max 4.0 % FS
Total error ( 40°C to 80°C) <sup>1)</sup>	Max 1.0 % FS
Response time <sup>2)</sup>	5.0 msec

1) Total accuracy includes non- linearity, hysteresis, repeatability and temperature effects.  
 2) Measured from initial value to output at 90%.

**Electrical specifications**

Output at FS <sup>3)</sup>	4.5 VDC
Zero output <sup>3)</sup>	0.5 VDC
Supply Voltage(Vs)	5.0 ±10% VDC <sup>4)</sup>
Current supply	Max 12.5 mA
Load resistor	Min 5k ohm
Load capacitor	Max 0.1 µF

3) The output is ratiometric to supply voltage (Vs)  
 4) The max supply voltage with sensor operating is 6 Volt. (switch off app. 6.2 Volt)

**Threaded interface**

with integral face seal G1/4 BSP

**Connector**

Integral to sensor AMP JPT

**Application**

The IQAN-SP pressure transducers belong to the family of IQAN accessories developed to complement IQAN control systems. IQAN-SP is a range of 0-5V pressure transducers for mobile hydraulic applications. These transducers are available in two pressure ranges; 35 bar (507 psi) and 500 bar (7250 psi). To make the sensors suitable for mobile equipment, we have focused upon properties such as reliability, electromagnetic immunity and ease of installation.

**Reliability**

The IQAN-SP has stainless steel construction for strength. The sensor cells use thin film technology with no internal o-rings or fluid. The high pressure capability makes the sensor very robust and able to withstand vibration.

**Electromagnetic immunity**

The design of the IQAN-SP has an EMI cap that separates the sensor electronics from the connector. This ensures a high level of EMI protection.

**Installation**

The IQAN-SP is well designed for the mobile hydraulics industry. The 3 pin connector is a sealed AMP Junior Power Timer (Bosch Jetronic) type designed for automotive use. This connector gives the sensor IP65 protection for exposed outdoor applications.

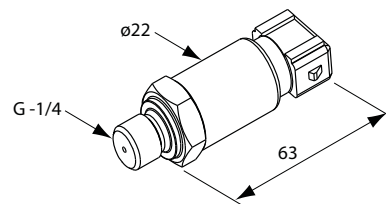
The hex of the G1/4 BSP threaded transducer has an integrated face seal to eliminate sealing washers. These features provide for easy installation and removal, even in field conditions.

**Description**

IQAN-SP035	5020026
IQAN-SP500	5020027

**Ordering PN**

For IQAN compatible pressure sensors with Deutsch connectors and SAE threads, and their ordering part numbers, consult the SCP datasheet and pricelist.



units=mm



**General**

Weight	50 g
Operating temperature	-50 to 150°C
Protection	outdoor use
Pressure rating	
G (1/4 BSP)	Max 700 bar
M (M10)	Max 350 bar
U (SAE 6)	Max 1000 bar
Electrical	
Voltage supply VS	5±0.5 Vdc
Max 6 Vdc	
Current consumption	5.0 µA
	Max 7.5 µA
Total error (25°C)	1%
Total error (-40 to 150°C)	4%

**Output**

FS (150°C)	4.75 Vdc
Zero (-50°C)	0.25 Vdc
Span	4.50 Vdc
Ratiometricity	1%
Linearity	1% FS

**Threaded interfaces**

-G	G1/4 DIN 3852-E with integral FKM face seal
-M	M10 x 1, with integral face seal
-U	9/16"-18 UNF, SAE 6 with NBR o-ring seal

**Connectors**

-B	Bosch (AMP Junior Timer)
-D	Deutsch DT04-4P

**Application**

The IQAN-ST temperature transducer belongs to the family of IQAN accessories developed to complement IQAN control systems. IQAN-ST is a 0-5V output temperature transducer for mobile hydraulic applications. This transducer is available in three interface types; G1/4 BSP, M10 and 9/16"-18 UNF SAE 6. The G1/4 BSP and M10 sensors have an integral Bosch automotive connector. The SAE 6 sensor has a short cable-mounted Deutsch connector.

The IQAN-ST has stainless steel construction for strength. The PT100 sensor uses thin film technology with internal amplification. All versions of the sensor have high pressure capability. The IQAN-ST is very robust and able to withstand heavy vibrations.

The design of the IQAN-ST has an EMI cap that separates the sensor electronics from the connector. This ensures a high level of EMI protection.

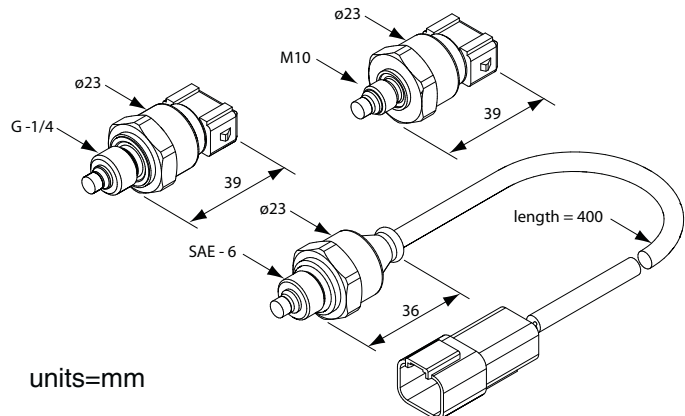
The IQAN-ST is well designed for the mobile hydraulics industry. The 3 pin integral connector is a sealed AMP Junior Power Timer (Bosch Jetronic) type. The Deutsch connector is the DT04 type. Both connectors are designed for automotive use. These connectors give the sensor IP65 protection for exposed outdoor applications. The hex of the G1/4 BSP and M10 versions of the transducer have integrated face seals to eliminate loose sealing washers. The SAE 6 sensor type has a factory installed o-ring. These features provide for easy installation and removal, even in field conditions.

**Description**

IQAN-ST-G-B
IQAN-ST-M-B
IQAN-ST-U-D

**Ordering PN**

20073657
20073659
20073658



**Proximity sensors**

**01695**

FP2000 sensor is a normally open, ferrous proximity sensor with max. .20" air gap, sense zone on side.  
cable: 12 inches, connector: Deutsch DTM04-2P

**01038**

FP2000 same as above except: sense zone on top.  
cable: 8 inches, connector: flying leads

**01699**

FP3000 sensor is a normally open, ferrous proximity sensor with max. .40" air gap.  
cable: 12 inches, connector: Deutsch DTM04-2P

**01062**

FP3000 same as above except: normally closed,  
cable: 10.5 inches, connector: Deutsch DT04-4P

**01778**

same as FP3000 sensor 01699 except with a vertical, adjustable mounting style case.  
cable: 12 inches, connector: Deutsch DTM04-2P

**01703**

FP4000 sensor is a NO/NC, high power, ferrous proximity sensor with max. .25" air gap.  
cable: 12 inches, connector: Deutsch DTM04-4P

**154482**

PS65 sensor is a normally closed, magnetic proximity sensor with max. .50" air gap.  
cable: 6 inches, connector: Deutsch DTM04-2P

**01143**

A magnet target compatible with PS65  
thread: 1/4"-20 UNC

**Linear sensors**

**01710**

ADS50 sensor is a 25mm [1.0"] travel, lever actuated, 0.5-4.5Vdc linear output, non-contact, analog sensor. Supply: 5V, cable: 12 inches, connector: Deutsch DTM04-3P

**Liquid level sensors**

**149318**

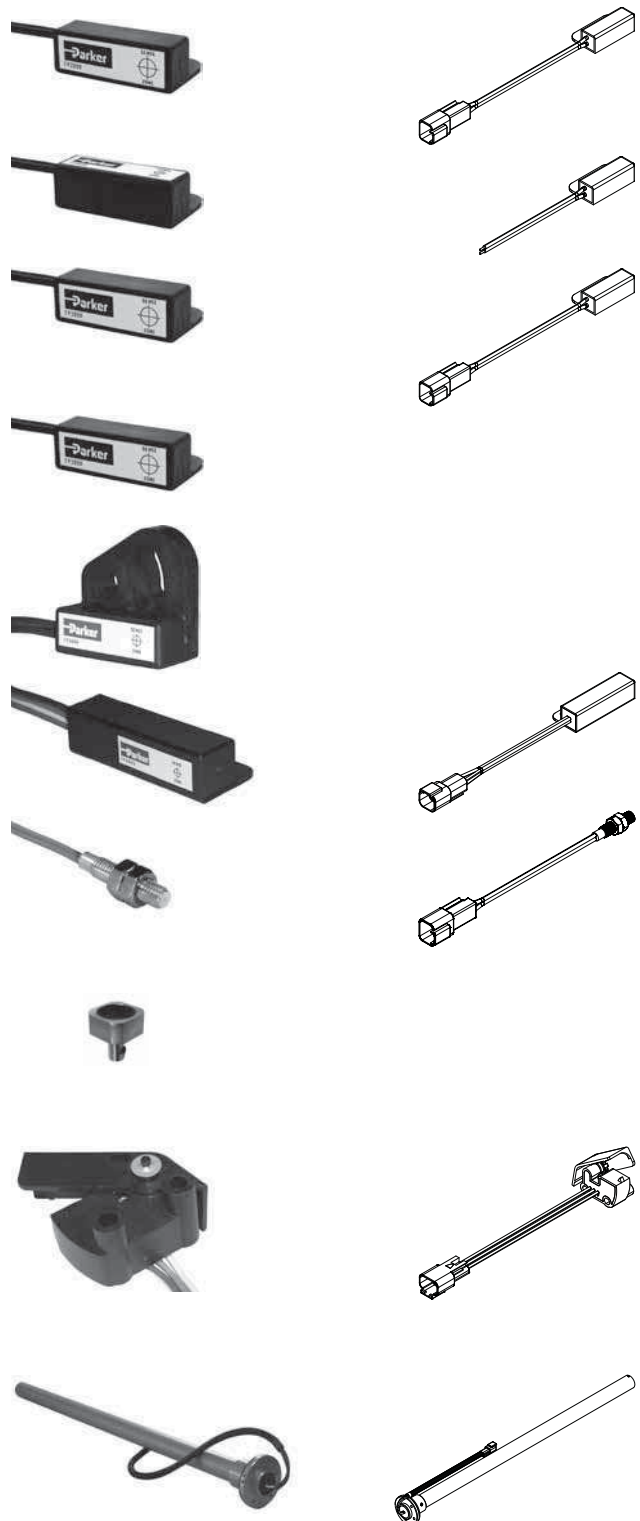
LF700 fuel level sensor is a 700mm length, variable resistance output, non-contact, float sensor.  
cable: 12 inches, connector: AMP Superseal 2 pos.

**149320**

LF750 fuel level sensor is same as above with 750mm length.

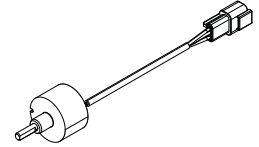
**149321**

LF800 fuel level sensor is same as above with 800mm length.

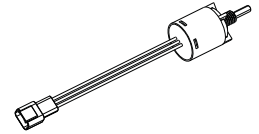


**Rotary sensors****01705**

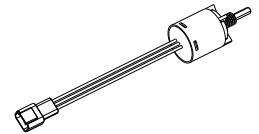
RF50 rotary friction sensor is a 0.5-4.5Vdc output, Ø1/4" shaft, non-contact, friction lock rotary control. Supply: 5V, cable: 12 inches, connector: Deutsch DTM04-3P

**153880**

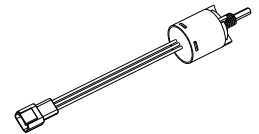
RF55 rotary friction sensor is a 0.5-4.5Vdc output, Ø1/4" shaft, non-contact, 90° friction lock rotary control. Supply: 12V, cable: 12 inches, connector: Deutsch DTM04-3P

**153881**

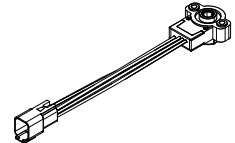
RF55 rotary friction sensor is a 0.5-4.5Vdc dual output, plastic body, Ø1/4" shaft, non-contact, 3 detent, rotary control. Supply: 5V, cable: 12 inches, connector: Deutsch DTM04-6P

**153882**

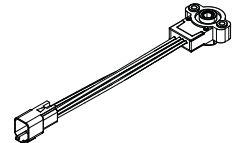
RF55 rotary friction sensor is a 0.5-4.5Vdc output, Ø1/4" shaft, non-contact, 360° continuous rotary control. Supply: 5V, cable: 12 inches, connector: Deutsch DTM04-3P

**01707**

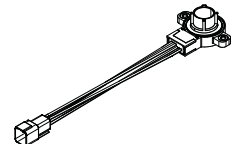
RS70 rotary sensor is a 0.5-4.5Vdc, dual output, 5/16" hex coupling, non-contact, 170° rotary sensor. Supply: 5V, cable: 12 inches, connector: Deutsch DTM04-6P

**141453**

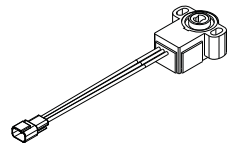
RS70 rotary sensor is a 0.5-4.5Vdc, dual output, 5/16" hex coupling, non-contact, 100° rotary sensor. Supply: 5V, cable: 12 inches, connector: Deutsch DTM04-6P

**01708**

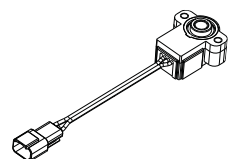
RS60 rotary sensor is a 0.5-4.5Vdc, dual output, Ø7/8" through hole coupling, non-contact, 120° rotary sensor. Supply: 5V, cable: 12 inches, connector: Deutsch DTM04-6P

**01709**

RS52 rotary sensor is a 0.5-4.5Vdc, single output, non-contact, 90° rotary sensor. Supply: 5V, cable: 12 inches, connector: Deutsch DTM04-3P

**01825**

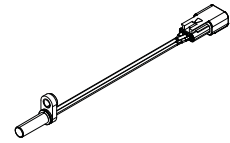
RS53 rotary sensor is a 0.5-4.5Vdc, single output, non-contact, 360° continuous rotary sensor. Supply: 5V, cable: 6 inches, connector: Deutsch DTM04-3P



**Speed sensors**

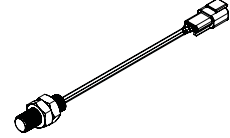
**01711**

GS50 geartooth sensor is a digital output, non-contact, flange mount, ferrous sensor.  
cable: 12 inches, connector: Deutsch DTM04-3P



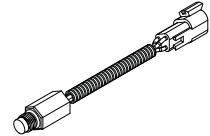
**01712**

GS60 geartooth sensor is a digital output, non-contact, threaded barrel mount, ferrous sensor.  
cable: 12 inches, connector: Deutsch DTM04-3P



**154877**

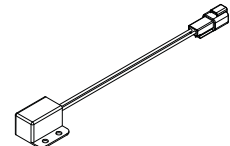
GS70 geartooth sensor is a digital output, non-contact, threaded mount, ferrous sensor.  
cable: 6 inches, connector: Deutsch DT04-3P



**Tilt sensors**

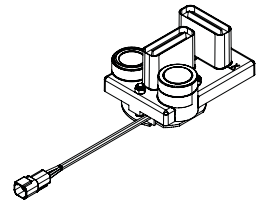
**01715**

RM50 rolling magnet switch is a one axis tilt switch.  
sensitivity:  $\pm 10$  degrees  
cable: 12 inches, connector: Deutsch DTM04-2P



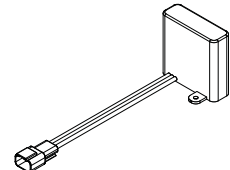
**01716**

ATS90 dual axis sensor is a two axis, 0.5-4.5Vdc, non-contact, Hall effect angle/tilt sensor.  
Supply: 12V, range:  $\pm 10$  degrees each axis,  
cable: 12 inches, connector: Deutsch DTM04-4P



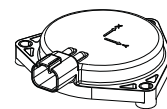
**01759**

ATS50 single axis sensor is a one axis, 0.5-4.5Vdc, non-contact, Hall effect angle/tilt sensor.  
Supply: 5V, range:  $\pm 10$  degrees, cable: 12 inches,  
connector: Deutsch DTM04-3P



**151938**

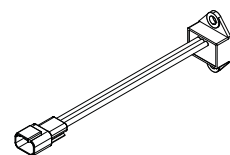
UTS universal tilt sensor is a two axis, CANbus (J1939), non-contact, MEMS angle/tilt sensor.  
Supply: 6.5-36Vdc, range:  $\pm 10$  degrees each axis,  
connector: Deutsch DTM04-4P



**Acceleration/tilt sensors**

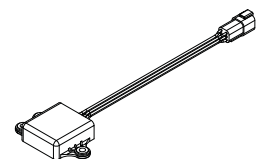
**01767**

ACC50 acceleration sensor is a 0.5-4.5 Vdc output accelerometer used to sense vibration, impact, tilt and motion. Supply: 5V, sensitivity:  $\pm 1.5g$ ,  
cable: 12 inches, connector: Deutsch DTM04-3P



**155471**

ACC100 acceleration sensor is a 1.675-3.192 Vdc dual output accelerometer used to sense tilt and motion. Supply: 5V, sensitivity:  $\pm 40^\circ$ ,  
cable: 12 inches, connector: Deutsch DTM04-6P





**Tools**

**5031061**

Medium duty service kit  
 contents: 3 crimping tools  
           1 5031057 pin box  
           1 5035003 extractor set  
*crimping tools not sold separately*



**5031057**

Pin box, JPT and MT parts  
 contents: qty      AMP/Tyco PN  
           100        962945-2  
           100        963531-1  
           100        963530-1  
           100        963711-2  
           50         927779-1  
           25         927777-1  
           25         828922-1  
           25         929938-1  
           50         929940-1  
           25         2-963745-1  
           50         828904-1  
           25         828905-1



*AMP parts not sold separately*

**5035003**

Set of 3 extraction tools, stamped  
 contents: 1 JPT extractor (yellow)  
           1 MT extractor (blue)  
           1 pin extractor (red)  
*stamped tools not sold separately*



**12000199**

Extraction tool, hardened alloy  
 contents: 1 MT extractor



**12003099**

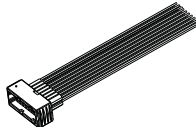
Extraction tool, hardened alloy  
 contents: 1 JPT extractor



**Prototype installation cables**

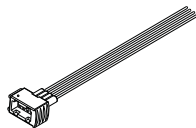
**5030090**

C1-cable, with seals  
 length: 2,5 meters  
 use with: IQAN-TOC2



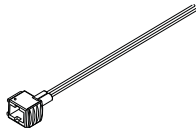
**5030094**

C1-cable, with seals  
 length: 2,5 meters  
 use with: IQAN-LST, -LSL (-S)



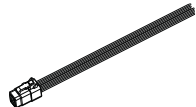
**5030095**

C2-cable, with seals  
 length: 2,5 meters  
 use with: IQAN-LSL-E1 (-S)



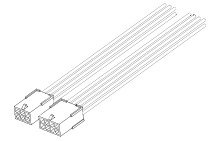
**5030127**

C1-cable, Deutsch DTM  
 length: 2,5 meters  
 use with: IQAN-LC5



**20077763**

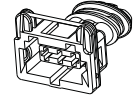
C1&C2-cables, MicroFit 3.0  
 length: 2,5 meters  
 use with: IQAN-LC6



**Connector kits**

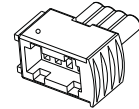
**5031086**

C1-connector, 3 position  
 use with: IQAN-SP, -ST (-B)



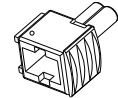
**5031097**

C1-connector, 4 position  
 use with: IQAN-LST, -LSL (-S)



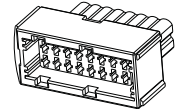
**5031098**

C2-connector, 2 position  
 use with: IQAN-LSL-E1 (-S)



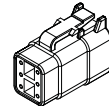
**5031105**

C1-connector, 16 position  
 use with: IQAN-TOC2



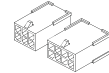
**20072408**

C1-connector, DTM 6 position  
 including 6 sealing pins  
 use with: IQAN-LC5



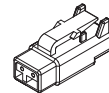
**20077764**

C1&C2-connector, MicroFit 3.0  
 use with: IQAN-LC6



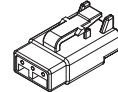
**01786 (same as 5035010)**

DTM connector, 2 position  
 use with: sensors



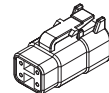
**01787 (same as 5035011)**

DTM connector, 3 position  
 use with: sensors



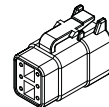
**01788**

DTM connector, 4 position  
 use with: sensors



**01789**

DTM connector, 6 position  
 does not include sealing pins  
 use with: sensors



Consult "IQAN accessories" datasheet and pricelist for other accessory items and ordering part numbers.

## Terms of Sale with Warranty Limitations

### Offer of Sale

The goods, services or work (referred to as the "Products") offered by Parker-Hannifin Corporation, its subsidiaries, groups, divisions, and authorized distributors ("Seller") are offered for sale at prices indicated in the offer, or as may be established by Seller. The offer to sell the Products and acceptance of Seller's offer by any customer ("Buyer") is contingent upon, and will be governed by all of the terms and conditions contained in this Offer of Sale. Buyer's order for any Products specified in Buyer's purchase document or Seller's offer, proposal or quote ("Quote") attached to the purchase order, when communicated to Seller verbally, or in writing, shall constitute acceptance of this offer.

1. **Terms and Conditions.** Seller's willingness to offer Products for sale or accept an order for Products is subject to the terms and conditions contained in this Offer of Sale or any newer version of the same, published by Seller electronically at [www.parker.com/saleterms/](http://www.parker.com/saleterms/). Seller objects to any contrary or additional terms or conditions of Buyer's order or any other document or other communication issued by Buyer.

2. **Price; Payment.** Prices stated on Seller's Quote are valid for thirty (30) days, except as explicitly otherwise stated therein, and do not include any sales, use, or other taxes or duties unless specifically stated. Seller reserves the right to modify prices to adjust for any raw material price fluctuations. Unless otherwise specified by Seller, all prices are F.C.A. Seller's facility (INCOTERMS 2010). Payment is subject to credit approval and payment for all purchases is due thirty (30) days from the date of invoice (or such date as may be specified by Seller's Credit Department). Unpaid invoices beyond the specified payment date incur interest at the rate of 1.5% per month or the maximum allowable rate under applicable law.

3. **Shipment; Delivery; Title and Risk of Loss.** All delivery dates are approximate. Seller is not responsible for damages resulting from any delay. Regardless of the manner of shipment, delivery occurs and title and risk of loss or damage pass to Buyer, upon placement of the Products with the shipment carrier at Seller's facility. Unless otherwise stated, Seller may exercise its judgment in choosing the carrier and means of delivery. No deferment of shipment at Buyers' request beyond the respective dates indicated will be made except on terms that will indemnify, defend and hold Seller harmless against all loss and additional expense. Buyer shall be responsible for any additional shipping charges incurred by Seller due to Buyer's acts or omissions.

4. **Warranty.** Seller warrants that the Products sold hereunder shall be free from defects in material or workmanship for a period of twelve (12) months from the date of delivery or 2,000 hours of normal use, whichever occurs first. All prices are based upon the exclusive limited warranty stated above, and upon the following disclaimer: **DISCLAIMER OF WARRANTY: THIS WARRANTY IS THE SOLE AND ENTIRE WARRANTY PERTAINING TO PRODUCTS PROVIDED. SELLER DISCLAIMS ALL OTHER WARRANTIES, EXPRESS AND IMPLIED, INCLUDING DESIGN, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**

5. **Claims; Commencement of Actions.** Buyer shall promptly inspect all Products upon receipt. No claims for shortages will be allowed unless reported to the Seller within ten (10) days of delivery. No other claims against Seller will be allowed unless asserted in writing within thirty (30) days after delivery. Buyer shall notify Seller of any alleged breach of warranty within thirty (30) days after the date the defect is or should have been discovered by Buyer. Any claim or action against Seller based upon breach of contract or any other theory, including tort, negligence, or otherwise must be commenced within twelve (12) months from the date of the alleged breach or other alleged event, without regard to the date of discovery.

6. **LIMITATION OF LIABILITY.** IN THE EVENT OF A BREACH OF WARRANTY, SELLER WILL, AT ITS OPTION, REPAIR OR REPLACE A DEFECTIVE PRODUCT, OR REFUND THE PURCHASE PRICE WITHIN A REASONABLE PERIOD OF TIME. IN NO EVENT IS SELLER LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR AS THE RESULT OF, THE SALE, DELIVERY, NON-DELIVERY, SERVICING, USE OR LOSS OF USE OF THE PRODUCTS OR ANY PART THEREOF, OR FOR ANY CHARGES OR EXPENSES OF ANY NATURE INCURRED WITHOUT SELLER'S WRITTEN CONSENT, WHETHER BASED IN CONTRACT, TORT OR OTHER LEGAL THEORY. IN NO EVENT SHALL SELLER'S LIABILITY UNDER ANY CLAIM MADE BY BUYER EXCEED THE PURCHASE PRICE OF THE PRODUCTS.

7. **User Responsibility.** The user, through its own analysis and testing, is solely responsible for making the final selection of the system and Product and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application and follow applicable industry standards and Product information. If Seller provides Product or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the Products or systems.

8. **Loss to Buyer's Property.** Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished by Buyer or any other items which become Buyer's property, will be considered obsolete and may be destroyed by Seller after two (2) consecutive years have elapsed without Buyer ordering the items manufactured using such property. Seller shall not be responsible for any loss or damage to such property while it is in Seller's possession or control.

9. **Special Tooling.** A tooling charge may be imposed for any special tooling, including without limitation, dies, fixtures, molds and patterns, acquired to manufacture Products. Such special tooling shall be and remain Seller's property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in apparatus belonging to Seller which is utilized in the manufacture of the Products, even if such apparatus has been specially converted or adapted for such manufacture and notwithstanding any charges paid by Buyer. Unless otherwise agreed, Seller has the right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.

10. **Buyer's Obligation; Rights of Seller.** To secure payment of all sums due or otherwise, Seller retains a security interest in all Products delivered to Buyer and this agreement is deemed to be a Security Agreement under the Uniform Commercial Code. Buyer authorizes Seller as its attorney to execute and file on Buyer's behalf all documents Seller deems necessary to perfect its security interest.

11. **Improper Use and Indemnity.** Buyer shall indemnify, defend, and hold Seller harmless from any losses, claims, liabilities, damages, lawsuits, judgments and costs (including attorney fees and defense costs), whether for personal injury, property damage, patent, trademark or copyright

infringement or any other claim, brought by or incurred by Buyer, Buyer's employees, or any other person, arising out of: (a) improper selection, application, design, specification or other misuse of Products purchased by Buyer from Seller; (b) any act or omission, negligent or otherwise, of Buyer; (c) Seller's use of patterns, plans, drawings, or specifications furnished by Buyer to manufacture Products; or (d) Buyer's failure to comply with these terms and conditions. Seller shall not indemnify Buyer under any circumstance except as otherwise provided.

12. **Cancellations and Changes.** Buyer may not cancel or modify or cancel any order for any reason, except with Seller's written consent and upon terms that will indemnify, defend and hold Seller harmless against all direct, incidental and consequential loss or damage. Seller may change Product features, specifications, designs and availability.

13. **Limitation on Assignment.** Buyer may not assign its rights or obligations under this agreement without the prior written consent of Seller.

14. **Force Majeure.** Seller does not assume the risk and is not liable for delay or failure to perform any of Seller's obligations by reason of events or circumstances beyond its reasonable control (hereinafter "Events of Force Majeure"). Events of Force Majeure shall include without limitation: accidents, strikes or labor disputes, acts of any government or government agency, acts of nature, delays or failures in delivery from carriers or suppliers, shortages of materials, or any other cause beyond Seller's reasonable control.

15. **Waiver and Severability.** Failure to enforce any provision of this agreement will not invalidate that provision; nor will any such failure prejudice Seller's right to enforce that provision in the future. Invalidation of any provision of this agreement by legislation or other rule of law shall not invalidate any other provision herein. The remaining provisions of this agreement will remain in full force and effect.

16. **Termination.** Seller may terminate this agreement for any reason and at any time by giving Buyer thirty (30) days prior written notice. Seller may immediately terminate this agreement, in writing, if Buyer: (a) breaches any provision of this agreement (b) appoints a trustee, receiver or custodian for all or any part of Buyer's property (c) files a petition for relief in bankruptcy on its own behalf, or one if filed by a third party (d) makes an assignment for the benefit of creditors; or (e) dissolves its business or liquidates all or a majority of its assets.

17. **Governing Law.** This agreement and the sale and delivery of all Products are deemed to have taken place in, and shall be governed and construed in accordance with, the laws of the State of Ohio, as applicable to contracts executed and wholly performed therein and without regard to conflicts of laws principles. Buyer irrevocably agrees and consents to the exclusive jurisdiction and venue of the courts of Cuyahoga County, Ohio with respect to any dispute, controversy or claim arising out of or relating to this agreement.

18. **Indemnity for Infringement of Intellectual Property Rights.** Seller is not liable for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Section. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets ("Intellectual Property Rights"). Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on an allegation that a Product sold pursuant to this agreement infringes the Intellectual Property Rights of a third party. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If a Product is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using the Product, replace or modify the Product so as to make it noninfringing, or offer to accept return of the Product and refund the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller is not liable for claims of infringement based on information provided by Buyer, or directed to Products delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any Product sold hereunder. The foregoing provisions of this Section constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.

19. **Entire Agreement.** This agreement contains the entire agreement between the Buyer and Seller and constitutes the final, complete and exclusive expression of the terms of sale. All prior or contemporaneous written or oral agreements or negotiations with respect to the subject matter are herein merged. The terms contained herein may not be modified unless in writing and signed by an authorized representative of Seller.

20. **Compliance with Laws.** Buyer agrees to comply with all applicable laws, regulations, and industry and professional standards of care, including those of the United Kingdom, the United States of America, and the country or countries in which Buyer may operate, including without limitation the U. K. Bribery Act, the U.S. Foreign Corrupt Practices Act ("FCPA"), the U.S. Anti-Kickback Act ("Anti-Kickback Act") and the U.S. Food Drug and Cosmetic Act ("FDCA"), each as currently amended, and the rules and regulations promulgated by the U.S. Food and Drug Administration ("FDA"), and agrees to indemnify and hold harmless Seller from the consequences of any violation of such provisions by Buyer, its employees or agents. Buyer acknowledges that it is familiar with the provisions of the U. K. Bribery Act, the FCPA, the FDA, and the Anti-Kickback Act, and certifies that Buyer will adhere to the requirements thereof. In particular, Buyer represents and agrees that Buyer will not make any payment or give anything of value, directly or indirectly to any governmental official, any foreign political party or official thereof, any candidate for foreign political office, or any commercial entity or person, for the purpose of influencing such person to purchase Products or otherwise benefit the business of Seller.

05/14

# Parker Hydraulics International Sales Offices

## North America

### Hydraulics Group Headquarters

6035 Parkland Boulevard  
Cleveland, OH 44124-4141 USA  
Tel: 216-896-3000  
Fax: 216-896-4031

### Parker Canada Division

160 Chisholm Drive Milton  
Ontario Canada L9T 3G9  
Tel: 905-693-3000  
Fax: 905-876-1958

### Parker Hannifin de México

Industrial Hydraulic Sales  
Eje Uno Norte No.100  
Parque Industrial Toluca 2000  
Toluca, Edo, de Mexico CP 50100  
Tel: 52 722 275 4200  
Fax: 52 722 279 9308

### Parker Hannifin de México

Mobile Hydraulic Sales  
Via de FFCC a Matamoraos 730  
Apodaca, NL, de Mexico CP 66600  
Tel: 52 81 8156 6000  
Fax: 52 81 8156 6068

## Europe

### Hydraulics Group Headquarters

La Tuillière 6  
1163 Etoy - Switzerland  
Tel: 41 21 821 8500  
Fax: 41 21 821 8580

## South Africa

### Parker Hannifin Africa Pty Ltd

P.O. Box 1153  
ZA-Kempton Park 1620,  
Republic of South Africa  
Tel: 27 11 961 0700  
Fax: 27 11 392 7213

## Mobile Sales

### Mobile Sales Organization and Global Sales

850 Arthur Avenue  
Elk Grove Village, IL 60007 USA  
Tel: 847-258-6200  
Fax: 847-258-6299

## Industrial Sales

### Central Region

1042 Maple Avenue  
Unit 331  
Lisle, IL 60532 USA  
Tel: 630-964-0796

### Great Lakes Region

6035 Parkland Boulevard  
Cleveland, OH 44124-4141 USA  
Tel: 216-896-2740  
Fax: 866-498-7507

### Gulf Region

20002 Standing Cypress Drive  
Spring, TX 77379 USA  
Tel: 817-473-4431  
Fax: 888-227-9454

### Southwest Region

700 S. 4th Avenue  
Mansfield, TX 76063 USA  
Tel: 817-473-9341  
Fax: 817-473-2680

### Mid Atlantic and Southeast Regions

1225 Old Alpharetta Road  
Suite 290  
Alpharetta, GA 30005 USA  
Tel: 770-619-9767  
Fax: 770-619-9806

### Midwest Region

8145 Lewis Road  
Minneapolis, MN 55427 USA  
Tel: 763-513-3535  
Fax: 763-544-3418

### Northeast Region

P.O. Box 396  
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