Air Preparation Units
Parker-Watts QIX Series
Filters, Regulators, Lubricators
Catalog 0306
## Catalog 0306

**QIX Air Preparation Units**

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**CAUTION:**

Polycarbonate bowls and sight dome, being transparent and tough, are ideal for use with Filters and Lubricators. They are suitable for use in normal industrial environments, but should not be located in areas where they could be subjected to direct sunlight, an impact blow, nor temperatures outside of the rated range. As with most plastics, some chemicals can cause damage. Polycarbonate bowls and sight dome should not be exposed to chlorinated hydro-carbons, ketones, esters and certain alcohols. They should not be used in air systems where compressors are lubricated with fire-resistant fluids such as phosphate ester and di-ester types.

Metal bowls are recommended where ambient and/or media conditions are not compatible with polycarbonate bowls. Metal bowls resist the action of most such solvents, but should not be used where strong acids or bases are present or in salt laden atmospheres. Consult the factory for specific recommendations where these conditions exist.

**TO CLEAN POLYCARBONATE BOWLS USE MILD SOAP AND WATER ONLY!** DO NOT use cleansing agents such as acetone, benzene, carbon tetrachloride, gasoline, toluene, etc., which are damaging to this plastic.

**Metal bowl guards are recommended for all applications.**

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**WARNING**

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

This document and other information from Parker Hannifin Corporation, its subsidiaries and authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application including consequences of any failure, and review the information concerning the product or system in the current product catalog. Due to the variety of operating conditions and applications for these products or systems, the user, through its own analysis and testing, is solely responsible for making the final selection of the products and systems and assuring that all performance, safety and warning requirements of the application are met.

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QIX is the Premium FRL System for the Demanding, High Performance Manufacturer

Addressing the needs of the production-oriented plant more than a decade ago, WATTS FluidAir pioneered a breakthrough in FRL technology. The QIX Series of high flow, generously sized filters, regulators lubricators and accessories.

Designed around the parameters of one inch pipe, every QIX component is manufactured with wide open internal porting for maximum efficiency and optimum performance at flow rates up to 250 SCFM.

QIX Means Less Downtime
Qix is short for “Quick Insert eXchange”. By means of removable connector -inserts, any QIX unit easily adapts to a variety of pipe sizes ranging from 1” down to 1/4”. Each time you change pipe size or units, you change only the insert - not the filter, regulator, or lubricator. Pull two pins with a pair of pliers and your change is made in seconds.

QIX Means Less Inventory Plus Simplified Specification, Ordering and Service
The QIX concept enables you to stock one basic size filter, regulator or lubricator module along with an assortment of economical insert kits. You save as much as 50% on inventory. Working with fewer part numbers, you simplify engineering specs, lessen purchasing efforts and improve overall service.

Durable Textured Finish
All QIX components are powder coated to ensure a hard, durable finish.

Particulate Filters (F20)
Deflector plate insures maximum water removal while 40 micron element eliminates damaging particulate matter. Oil-removing coalescing filters (F21) are also available.

One-piece rugged metal bowls with sight gauge and bright liquid level indicating float are standard on all filters and lubricators.

Regulators (R20)
Accurate high-flow regulators are equipped with positive snap lock, push / pull adjusting knobs for easy operation. Bayonet style spring cage is removed with only the push of a button. Piston and o-ring is replaceable in seconds, using standard pliers.

Lubricators (L20)
Bypass valve system provides consistent lubrication under variable flow conditions. Removable adjusting knob renders the lubricator tamperproof (standard). QIX lubricators are fillable under pressure.

Inserts
All QIX components connect using inserts, o-rings and pins. Pins are easily removed using standard pliers. No special tools are required. Threaded end inserts, 1/4” through 1”, make it easy to replace a complete FRL in seconds without breaking pipe connections. Also allows you to stock only one FRL for all your 1/4” through 1” plant needs.

Shut-Off Valves (IK20V)

Automatic Float Drain
Optional automatic float drain removes condensate as required. Manual drain is standard.

Pressure Switch
Low cost miniature pressure switch easily integrates into your QIX system via a porting block. The switch provides an electric signal when set pressure is achieved.

Porting Block
Insert style porting blocks are available with 1/4” NPT branch lines. They allow the mounting of a pressure switch or branching off a non-lubricated line.
F20 & F21 QIX Particulate & Coalescing Filters

Features

- Unique Interchangeable QIX Inserts Allow One Module to Accommodate 5 Port Sizes 1/4", 3/8", 1/2", 3/4", 1"
- For Heavy Duty Applications with Minimum Pressure Drop Requirement
- Excellent Water Removal Efficiency
- Available in Both Particulate (F20) and Coalescing (F21) Configurations
- Metal Bowl with Sightgauge Standard
- High Flow - 180 SCFM for 3/4" & 1" Sizes (F20) 20 SCFM (F21 Coalescing)

Ordering Information

<table>
<thead>
<tr>
<th>Filter Types</th>
<th>Port Threads</th>
<th>Port Size</th>
<th>Elements</th>
<th>Optional Drain</th>
<th>Engineering Change Designator</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 Particulate</td>
<td>NPT</td>
<td>00 No Port Inserts</td>
<td>J F20 40 Micron G F20 5 Micron</td>
<td>R Internal Auto Float Drain</td>
<td>Will be entered at factory.</td>
</tr>
<tr>
<td>21 Coalescing</td>
<td>G&quot; BSPP</td>
<td>02 1/4 Inch</td>
<td>J* F21 .01 Micron Coalescing</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>03 3/8 Inch</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>04 1/2 Inch</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>06 3/4 Inch</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>08 1 Inch</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

F20 & F21 Filter Dimensions

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D*</th>
<th>D**</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.90</td>
<td>6.82</td>
<td>.75</td>
<td>3.50</td>
<td>4.50</td>
<td>7.58</td>
<td>1.77</td>
</tr>
<tr>
<td>(74)</td>
<td>(173)</td>
<td>(19)</td>
<td>(89)</td>
<td>(114)</td>
<td>(192)</td>
<td>(45)</td>
</tr>
</tbody>
</table>

inches (mm)

* 1/4 thru 3/4 Inch Port Insert Size
** 1 Inch Port Insert Size

BOLD ITEMS ARE MOST POPULAR.
QIX F20 & F21 Kits & Accessories

Drains –
- Automatic Float Drain .................................................. SA602MD
- Automatic Pulse Drain ..................................................... 4212
- Semi-Automatic "Overnight" Drain ..................................... SA602A7
  (Drains automatically under zero pressure)

Bowl Kit ................................................................. BKF21WA
Bowl Sightgauge Repair Kit .................................................. RKB605WB
Combination Connector ............................................... IK20CC
  (Connects 2 QIX units together)
Combination Porting Block ........................................... IK20CP
  (same as IK20CC, except with 1/8" top branch outlet)
Element Kits –
- Particulate (F20) 40 micron ........................................... EKF20A
- Particulate (F20) 5 micron .............................................. EKF20VA
- Coalescing (F21) .01 micron ............................................ EKF601J
Mounting brackets (pair) ............................................... MK20-0100
  (Mounts directly to port inserts)
Port Insert Kits (includes o-rings & pins) NPT –
- 1/4" Port Size .............................................................. IK20Y
- 3/8" Port Size .............................................................. IK20X
- 1/2" Port Size .............................................................. IK20A
- 3/4" Port Size .............................................................. IK20B
- 1" Port Size ............................................................... IK20C
Shut-off Valve w/lockout (for inlet) .................................. IK20V

Specifications
- Bowl Capacity ................................................................. 10 oz.

Filter Element Rating –
- "J" (F20 particulate) ......................................................... 40 micron
- "G" (F20 particulate) ......................................................... 5 Micron
- "J" (F21 coalescing) ........................................................ 01 Micron

Maximum Pressure .........................................................
- 250 PSIG
- 175 PSIG

Port Threads / Inserts –
- 00 ................. No Port Inserts
- 02 ................................................................. 1/4"
- 03 ................................................................. 3/8"
- 04 ................................................................. 1/2"
- 06 ................................................................. 3/4"
- 08 ................................................................. 1"

Temperature Range ................................................. 40°F to 150°F (4.4°C to 65.6°C)
  With Auto Drain ............................................. 40°F to 125°F (4.4°C to 52°C)

Weight ........................................................................ 2.1 lb
  (For total weight add .1 lb for port inserts)

Materials of Construction
- Body ................................................................. Zinc
- Bowl ................................................................. Zinc
- Drain ................................................................. Brass
- Filter Element –
  - Particulate .................................................. Polypropylene
  - Coalescing ................................................. Borosilicate Fibers
- Thread Inserts ............................................................ Zinc
- Seals .................................................................. Buna-N
- Sightgauge ............................................................... Nylon
R20 & R21 QIX Regulators

Features
- Unique Interchangeable QIX Inserts Allow One Module to Accommodate 5 Port Sizes 1/4", 3/8", 1/2", 3/4", 1"
- Piston Operated for High Flow Performance
- Secondary Aspiration Plus Balanced Poppet Provides Quick Response and Accurate Pressure Regulation
- Panel Mountable
- High Flow: 250 SCFM for 3/4" & 1" Port Sizes

R20 Features
- Push-to-Lock, Pull-to-Adjust, Remove-for-Tamper-Resistant Knob Feature

R21 Features
- Heavy Duty Tee Handle Adjustment

R20 / R21 Regulator Dimensions

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D*</th>
<th>D**</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>R20</td>
<td>3.03</td>
<td>.75</td>
<td>4.70</td>
<td>3.50</td>
<td>4.50</td>
<td>6.10</td>
</tr>
<tr>
<td></td>
<td>(77)</td>
<td>(86)</td>
<td>(119)</td>
<td>(89)</td>
<td>(114)</td>
<td>(155)</td>
</tr>
<tr>
<td>R21</td>
<td>3.03</td>
<td>.75</td>
<td>5.58</td>
<td>3.50</td>
<td>4.50</td>
<td>6.33</td>
</tr>
<tr>
<td></td>
<td>(77)</td>
<td>(86)</td>
<td>(142)</td>
<td>(89)</td>
<td>(114)</td>
<td>(161)</td>
</tr>
</tbody>
</table>

inches (mm)  
* 1/4 thru 3/4 Inch Port Insert Size  
** 1 Inch Port Insert Size

Ordering Information

R 20 00 C /**

Adjustment Type
- 20 Knob
- 21 Tee-Handle

Port Threads
- NPT
- G* BSPP
* If ordering BSPP Port Inserts Separately Order “G00” Unit

Port Size
- 00 No Port Inserts
- 02 1/4 Inch
- 03 3/8 Inch
- 04 1/2 Inch
- 06 3/4 Inch
- 08 1 Inch

Reduced Pressure
- B 0-60 PSIG
- C 0-120 PSIG
- D 0-250 PSIG

Options
- P Panel Mount Nut (Plastic)
- G Gauge
- K Non-Relieving

Engineering Change Designator
- Will be entered at factory.

BOLD ITEMS ARE MOST POPULAR.
Technical Information

**WARNING**

Product rupture can cause serious injury.
Do not connect regulator to bottled gas.
Do not exceed maximum primary pressure rating.

---

**QIX R20 & R21 Kits & Accessories**

<table>
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<tr>
<th>Combination Connector</th>
<th>IK20CC</th>
<th>Connects 2 QIX units together</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combination Porting Block</td>
<td>IK20CP</td>
<td>(same as IK20CC, except with 1/8&quot; top branch outlet)</td>
</tr>
<tr>
<td>Mounting brackets (pair)</td>
<td>MK20-0100</td>
<td>(Mounts directly to port inserts)</td>
</tr>
<tr>
<td>Wall Mounting Bracket</td>
<td>SAR10A57</td>
<td>(Uses panel mount threads - includes plastic panel mount nut)</td>
</tr>
<tr>
<td>Panel Mount Nut – Plastic</td>
<td>R10X51-P</td>
<td></td>
</tr>
<tr>
<td>Panel Mount Nut – Aluminum</td>
<td>R10X51-A</td>
<td></td>
</tr>
<tr>
<td>Port Insert Kits (includes o-rings &amp; pins) NPT –</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/4&quot; Port Size</td>
<td>IK20Y</td>
<td></td>
</tr>
<tr>
<td>3/8&quot; Port Size</td>
<td>IK20X</td>
<td></td>
</tr>
<tr>
<td>1/2&quot; Port Size</td>
<td>IK20A</td>
<td></td>
</tr>
<tr>
<td>3/4&quot; Port Size</td>
<td>IK20B</td>
<td></td>
</tr>
<tr>
<td>1&quot; Port Size</td>
<td>IK20C</td>
<td></td>
</tr>
<tr>
<td>Repair Kit - Internal Parts (Piston, Innervalue, Seals)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relieving</td>
<td>RKR20A</td>
<td></td>
</tr>
<tr>
<td>Non-Relieving (K)</td>
<td>RKR20KA</td>
<td></td>
</tr>
<tr>
<td>Spring Cage Kit –</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R20</td>
<td>CKR20A</td>
<td></td>
</tr>
<tr>
<td>R21</td>
<td>CKR21Y</td>
<td></td>
</tr>
<tr>
<td>Shut-off Valve w/lockout (for inlet)</td>
<td>IK20V</td>
<td></td>
</tr>
</tbody>
</table>

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**Specifications**

| Gauge Ports | (2) 1/4" |
| Maximum Pressure | 300 PSIG |

---

**Flow Characteristics**

<table>
<thead>
<tr>
<th>R20 / R21</th>
<th>Supply Pressure 100 PSI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow - SCFM</td>
<td>20 40 60 80 100 120</td>
</tr>
<tr>
<td>Flow - dm³/s</td>
<td>0.1 0.2 0.3 0.4 0.5 0.6</td>
</tr>
<tr>
<td>Secondary Pressure - bar</td>
<td>0 0.1 0.2 0.3 0.4</td>
</tr>
<tr>
<td>Secondary Pressure - PSIG</td>
<td>0 10 20 30 40 50</td>
</tr>
</tbody>
</table>

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**Technical Specifications – R20, R21**

- **Port Threads / Inserts**
  - 00: No Port Inserts
  - 02: 1/4" (R/B 20) Acetal
  - 03: 1/4" (R/B 20) Steel
  - 04: 1/2" (R/B 20) Zinc
  - 06: 3/4" & 1" (R/B 20) Buna-N
  - 08: 1" (R/B 20) Brass

- **Reduced Pressure Range**
  - "B": 0-60 PSIG
  - "C": 0-120 PSIG
  - "D": 0-250 PSIG

- **Temperature Range**
  - 40°F to 150°F

- **Weight**
  - 2.6 lb
  (For total weight add .1 lb for port inserts)

---

**Materials of Construction**

- **Adjusting Knob**
  - (R/B 20) Acetal

- **Adjusting Screw (all)**
  - Steel

- **Body**
  - Zinc

- **Bottom Plug**
  - Brass

- **Innervalue**
  - Brass

- **Piston**
  - Nylon

- **Seals**
  - Buna-N

- **Spring Cage**
  - Zinc

- **Springs**
  - Steel

- **Thread Inserts**
  - Zinc

---

**CAUTION:**

**REGULATOR PRESSURE ADJUSTMENT** – The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.
L20 QIX Lubricators

**Features**
- Unique Interchangeable QIX Inserts Allow One Module to Accommodate 5 Port Sizes 1/4", 3/8", 1/2", 3/4", 1"
- High Flow Venturi and By-pass Valve to Minimize Pressure Drop and Ensure Consistant Lubrication at All Rated Flows
- Excellent Water Removal Efficiency
- Tamper Resistant Removable Drip Control Knob
- Manual Drain Standard
- High Flow: 250 SCFM for 3/4" & 1" Port Sizes

**L20 Filter Dimensions**

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D*</th>
<th>D**</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3.13</td>
<td>6.82</td>
<td>2.04</td>
<td>3.50</td>
<td>4.50</td>
<td>8.86</td>
<td>1.77</td>
</tr>
<tr>
<td>(in)</td>
<td>(173)</td>
<td>(52)</td>
<td>(89)</td>
<td>(114)</td>
<td>(228)</td>
<td>(45)</td>
<td></td>
</tr>
</tbody>
</table>

* 1/4 thru 3/4 Inch Port Insert Size
** 1 Inch Port Insert Size

**Options**
- H Button Head Fill Fitting

**Ordering Information**

L 20 — 00 W /**

**Port Threads**
- NPT
- G* BSPP

*If ordering BSPP Port Inserts Separately, order "-00" Unit

**Port Size**
00 No Port Inserts
02 1/4 Inch
03 3/8 Inch
04 1/2 Inch
06 3/4 Inch
08 1 Inch

**Engineering Change Designator**
Will be entered at factory.
QIX L20 Kits & Accessories

Port Threads / Inserts –
00 ........................................ No Port Inserts
02 ........................................ 1/4"
03 ........................................ 3/8"
04 ........................................ 1/2"
06 ........................................ 3/4"
08 ........................................ 1"

Temperature Range .................................. 40°F to 150°F

Weight .................................................. 3.3 lb
(For total weight add .1 lb for port inserts)

Materials of Construction
Body .............................................. Zinc
Bowl .............................................. Zinc
Drain .......................................... Brass
Drip Control .................................. Polyurethane
Seals .......................................... Buna-N
Sightgauge .................................... Nylon
Thread Inserts ................................. Zinc

Specifications
Bowl Capacity ..................................... 10 oz.
Maximum Pressure ............................ 250 PSIG
B20 & B21 QIX Filter / Regulators

Features
- Unique Interchangeable QIX Inserts
  Allow One Module to Accommodate
  5 Port Sizes 1/4", 3/8", 1/2", 3/4", 1"
- Piston Operated Regulator for High
  Flow Performance
- Excellent Water Removal Efficiency
- Secondary Aspiration Plus
  Balanced Poppet Provides Quick
  Response and Accurate Pressure
  Regulatorion
- Excellent Water Removal Efficiency
- Manual Drain Standard
- Automatic Drain Optional
- Panel Mountable
- High Flow: 250 SCFM for 3/4" & 1"
  Port Sizes

B20 Features
- Push-to-Lock, Pull-to-Adjust,
  Remove-for-Tamper Resistant
  Knob Feature

B21 Features
- Heavy Duty Tee Handle Adjustment

Ordering Information

<table>
<thead>
<tr>
<th>B</th>
<th>20</th>
<th>—</th>
<th>00</th>
<th>W</th>
<th>J</th>
<th>C</th>
<th>/**</th>
</tr>
</thead>
</table>

**Adjustment Type**
- 20 Knob
- 21 Tee Handle

**Port Threads**
- NPT
- G* BSPP
  * If ordering BSPP
  Port Inserts
  Separately -
  Order “G00” Unit

**Port Size**
- 00 No Port
- 02 1/4 Inch
- 03 3/8 Inch
- 04 1/2 Inch
- 06 3/4 Inch
- 08 1 Inch

**Elements**
- G 5 Micron
- J 40 Micron

**Reduced Pressure Range**
- B 0-60 PSIG
- C 0-125 PSIG
- D 0-250 PSIG

**Drains and Options**
- G Gauge
- K Non-Relieving
- P Panel Mount Nut
  (Plastic)
- R Internal Auto
  Float Drain

**Engineering Change Designator**
- Will be entered at
  factory.

* BOLD ITEMS ARE MOST POPULAR.*
QIX B20 & B21 Kits & Accessories

Drains –
- Automatic Float Drain .......................................................... SA602MD
- Automatic Pulse Drain ............................................................ 4212
- Semi-Automatic “Overnight” Drain ......................................... SA602A7
  (Drains automatically under zero pressure)

Bowl Kit .......................................................... BKF21WA
Bowl Sightgauge Repair Kit .................................................. RKB605WB
Combination Connector ......................................................... IK20CC
  (Connects 2 QIX units together)
Combination Porting Block .................................................... IK20CP
  (same as IK20CC, except with 1/8" top branch outlet)

Element Kits –
- Particulate (F20) 40 micron ............................................. EKF20A
- Particulate (F20) ................................................................. 5 micron EKF20VA

Mounting Brackets (pair) ..................................................... MK20-0100
Panel Mount Nut –
- Plastic ................................................................................. R10X51-P
- Aluminum ............................................................................. R10X51-A

Port Insert Kits (includes o-rings & pins) NPT –
- 1/4" Port Size ....................................................................... IK20Y
- 3/8" Port Size ....................................................................... IK20X
- 1/2" Port Size ........................................................................ IK20A
- 3/4" Port Size ........................................................................ IK20B
- 1" Port Size ............................................................................ IK20C

Repair kit - internal parts (piston, inner valve, seals) –
- Relieving .............................................................................. RKR20A
- Non-Relieving (K) ................................................................. RKR20KA

Spring Cage Kit –
- R20 ..................................................................................... CKR20A
- R21 ..................................................................................... CKR21Y

Wall Mounting Bracket .......................................................... SAR 20A57
  (uses panel mount threads - includes plastic panel mount nut)

Specifications

Bowl Capacity .......................................................... 10 oz.
Filter Element Rating –
- “J” (particulate) ................................................................. 40 micron
- “G” (particulate) ................................................................. 5 Micron

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**WARNING**

Product rupture can cause serious injury.
Do not connect regulator to bottled gas.
Do not exceed maximum primary pressure rating.

---

**CAUTION:**

REGULATOR PRESSURE ADJUSTMENT – The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design.
For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

---

**Gauge Ports (2)................................. 1/4”**

Maximum Pressure ........................................ 250 PSIG
With Auto Drain ........................................ 175 PSIG

**Port Threads / Inserts –**

<table>
<thead>
<tr>
<th>Port Size</th>
<th>Insert Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>No Port Inserts</td>
</tr>
<tr>
<td>02</td>
<td>1/4&quot;</td>
</tr>
<tr>
<td>04</td>
<td>3/8&quot;</td>
</tr>
<tr>
<td>06</td>
<td>1/2&quot;</td>
</tr>
<tr>
<td>08</td>
<td>3/4&quot;</td>
</tr>
<tr>
<td>08</td>
<td>1&quot;</td>
</tr>
</tbody>
</table>

**Reduced Pressure Range –**

- “B” .............................................................................. 0-60 PSIG
- “C” .............................................................................. 0-120 PSIG
- “D” .............................................................................. 0-250 PSIG

**Temperature Range**

- 40°F to 150°F (4.4°C to 65.6°C)
- 40°F to 125°F (4.4°C to 52°C)

**Weight** ................................................................. 4.5 lb
  (For total weight add .1 lb for port inserts)

**Materials of Construction**

- Adjusting Knob (R/B 20) .............................................. Acetal
- Adjusting Screw (all) ............................................................ Steel
- Body ................................................................................ Zinc
- Bottom Plug ................................................................. Brass
- Bowl ................................................................. Zinc
- Drain ................................................................. Brass
- Filter Element (particulate) ............................................ Polypropylene
- Inner Valve ................................................................. Brass
- Piston ................................................................. Nylon
- Seals .............................................................................. Buna-N
- Sightgauge ................................................................. Nylon
- Spring Cage ................................................................. Zinc
- Springs ................................................................. Steel
- Thread Inserts ............................................................... Zinc
QIX Combinations – C20 / C21 Series

- See individual component pages for details.
- Gauges included on combinations.

**Three-Unit Combo**

**Ordering Information**

<table>
<thead>
<tr>
<th>C</th>
<th>20</th>
<th>—</th>
<th>02</th>
<th>FRL</th>
<th>W</th>
<th>J</th>
<th>C</th>
<th>W</th>
<th>/**</th>
</tr>
</thead>
</table>

**Adjustment Type**
- 20 Knob
- 21 Tee Handle

**Port Threads**
- NPT
- BSPP

**Port Size**
- 02 1/4 Inch
- 03 3/8 Inch
- 04 1/2 Inch
- 06 3/4 Inch
- 08 1 Inch

**Combination**
- BL 2-Unit
- FRL 3-Unit

**Regulator Reduced Pressure Range**
- B 0-60 PSIG
- C 0-125 PSIG
- D 0-250 PSIG

**Elements**
- G 5 Micron
- J 40 Micron

**Drains and Options**
- K Non-Relieving
- R Internal Auto
- Float Drain

**CAUTION:**

**REGULATOR PRESSURE ADJUSTMENT** – The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

**BOLD ITEMS ARE MOST POPULAR.**
QIX Accessories

QIX Port Insert Kits & Accessories
Port Insert Kits (includes o-rings & pins) NPT BSPP

<table>
<thead>
<tr>
<th>Port Size</th>
<th>NPT</th>
<th>BSPP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4&quot;</td>
<td>IK20Y</td>
<td>IK20YG</td>
</tr>
<tr>
<td>3/8&quot;</td>
<td>IK20X</td>
<td>IK20XG</td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>IK20A</td>
<td>IK20AG</td>
</tr>
<tr>
<td>3/4&quot;</td>
<td>IK20B</td>
<td>IK20BG</td>
</tr>
<tr>
<td>1&quot;</td>
<td>IK20C</td>
<td>IK20CG</td>
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</table>

Combination Connector
(connects 2 QIX units together)

<table>
<thead>
<tr>
<th>Port Size</th>
<th>NPT</th>
<th>BSPP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IK20CC</td>
<td>IK20CC</td>
</tr>
</tbody>
</table>

Combination Porting Block
(same as IK20CC, except with 1/4" top branch outlet)

<table>
<thead>
<tr>
<th>Port Size</th>
<th>NPT</th>
<th>BSPP</th>
</tr>
</thead>
<tbody>
<tr>
<td>IK20CP</td>
<td>IK20GCP</td>
<td></td>
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</table>

IK20CP Porting Block and 1908 Pressure Switch

<table>
<thead>
<tr>
<th>Port Size</th>
<th>NPT</th>
<th>BSPP</th>
</tr>
</thead>
<tbody>
<tr>
<td>PST20</td>
<td>—</td>
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</tr>
</tbody>
</table>

QIX MK20 Mounting Brackets
Part Number: MK20-0100
Kit contains 2 brackets and 4 screws

QIX IK20V Shut-Off Valve
This modular, 3-way ball valve attaches between the port insert and the inlet side of any QIX component. This valve shuts off the air pressure and vents the downstream pressure through a 1/8" NPTF port in the bottom of the valve. The valve comes standard with a “lockout” feature as required by OSHA Standard 1910.147. Valve adds 1.4" to width of system.
Inline Bronze Filters

Features

- All Bronze Unit
- Designed for Applications where Fine Straining of Air is Required
- Porous Bronze Element Strains Out Particles Larger than 90 Microns (0.0035 Inch)

Port Size | 90 Micron Element* | No Drain | With Manual Petcock Drain
----------|---------------------|----------|--------------------------
1/4"      | 137-02              |          | 137-02A                  |
3/8"      | 137-03              |          | 137-03A                  |
1/2"      | 137-04              |          | 137-04A                  |

* Add "V" Suffix for 5 Micron Element.

In-Line Bronze Filters

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.63</td>
<td>2.38</td>
<td>1.41</td>
<td>1.16</td>
</tr>
<tr>
<td>(66.7)</td>
<td>(60)</td>
<td>(35.7)</td>
<td>(29.4)</td>
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</tbody>
</table>

With Manual Twist Drain

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.63</td>
<td>3.19</td>
<td>184</td>
<td>1.16</td>
</tr>
<tr>
<td>(66.7)</td>
<td>(81)</td>
<td>(46.8)</td>
<td>(29.4)</td>
</tr>
</tbody>
</table>

Replacement Elements

- 5 Micron
  - 137AY77-5
- 20 Micron
  - 137AY77-20
- 90 Micron
  - RK137Y

Specifications

- Maximum Pressure: 300 PSIG
- Performance – Pressure Drop (PSIG) at Various Conditions
  - Flow
    - Supply Pressure 100 PSIG: .05 .15 .06 1.20 1.70
    - Supply Pressure 150 PSIG: .02 .10 .30 .70 1.00
- Weight –
  - 1/4" & 3/8": 9 lb. (0.41 kg) / Unit
  - 1/2": 1.1 lb. (0.49 kg) / Unit

Materials of Construction

- Body: Bronze
- Element –
  - Standard: 90 Micron Porous Bronze
  - Optional: 5 Micron Porous Bronze
- Seals: Buna N

Pneumatic Division
Richland, Michigan
www.parker.com/watts
### D11-04 Tank Drain

**Features**

- Metal Bowl without Sight Glass
- Port Size – 1/2 Inch NPTF
- Minimum Supply Pressure – 30 PSIG
- Maximum Supply Pressure – 175 PSIG
- Max. Operating Temperature – 125° F (52° C)
- Body – Zinc
- Bowl – Zinc
- Seals – Buna-N
- Bowl Capacity – 4 oz.
- Weight per Unit – 1 lb.
- Master Pack Quantity – 24
- Master Pack Weight – 25 lbs.

### D11-04W Tank Drain

**Features**

- Metal Bowl with Sight Glass
- Port Size – 1/2 Inch NPTF
- Minimum Supply Pressure – 30 PSIG
- Maximum Supply Pressure – 175 PSIG
- Max. Operating Temperature – 125° F (52° C)
- Body – Zinc
- Bowl – Zinc
- Seals – Buna-N
- Bowl Capacity – 4 oz.
- Weight per Unit – 1 lb.
- Master Pack Quantity – 24
- Master Pack Weight – 25 lbs.

### 608-04D Tank Drain

**Features**

- Polycarbonate Bowl with Polyethylene Bowl Guard
- Port Size – 1/2 Inch NPTF
- Minimum Supply Pressure – 30 PSIG
- Maximum Supply Pressure – 150 PSIG
- Max. Operating Temperature – 125° F (52° C)
- Body – Aluminum
- Bowl – Polycarbonate
- Seals – Buna-N
- Bowl Capacity – 8 oz.
- Weight per Unit – 2 lb.
- Master Pack Quantity – 8
- Master Pack Weight – 17 lbs.

### 608-04DW Tank Drain

**Features**

- Metal Bowl with Sight Glass
- Port Size – 1/2 Inch NPTF
- Minimum Supply Pressure – 30 PSIG
- Maximum Supply Pressure – 255 PSIG
- Max. Operating Temperature – 125° F (52° C)
- Body – Aluminum
- Bowl – Zinc
- Seals – Buna-N
- Bowl Capacity – 8 oz.
- Weight per Unit – 2 lb.
- Master Pack Quantity – 8
- Master Pack Weight – 17 lbs.
Safety Guide For Selecting And Using Pneumatic Division Products And Related Accessories

⚠️ WARNING:

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF PNEUMATIC DIVISION PRODUCTS, ASSEMBLIES OR RELATED ITEMS (“PRODUCTS”) CAN CAUSE DEATH, PERSONAL INJURY, AND PROPERTY DAMAGE. POSSIBLE CONSEQUENCES OF FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THESE PRODUCTS INCLUDE BUT ARE NOT LIMITED TO:

- Unintended or mistimed cycling or motion of machine members or failure to cycle
- Work pieces or component parts being thrown off at high speeds.
- Failure of a device to function properly for example, failure to clamp or unclamp an associated item or device.
- Explosion
- Suddenly moving or falling objects.
- Release of toxic or otherwise injurious liquids or gasses.

Before selecting or using any of these Products, it is important that you read and follow the instructions below.

1. GENERAL INSTRUCTIONS

1.1. Scope: This safety guide is designed to cover general guidelines on the installation, use, and maintenance of Pneumatic Division Valves, FRLs (Filters, Pressure Regulators, and Lubricators), Vacuum products and related accessory components.

1.2. Fail-Safe: Valves, FRLs, Vacuum products and their related components can and do fail without warning for many reasons. Design all systems and equipment in a fail-safe mode, so that failure of associated valves, FRLs or Vacuum products will not endanger persons or property.


1.4. Distribution: Provide a copy of this safety guide to each person that is responsible for selection, installation, or use of Valves, FRLs or Vacuum products. Do not select, or use Parker valves, FRLs or vacuum products without thoroughly reading and understanding this safety guide as well as the specific Parker publications for the products considered or selected.

1.5. User Responsibility: Due to the wide variety of operating conditions and applications for valves, FRLs, and vacuum products Parker and its distributors do not represent or warrant that any particular valve, FRL or vacuum product is suitable for any specific end use system. This safety guide does not analyze all technical parameters that must be considered in selecting a product. The user, through its own analysis and testing, is solely responsible for:

- Making the final selection of the appropriate valve, FRL, Vacuum component, or accessory.
- Assuring that all user’s performance, endurance, maintenance, safety, and warning requirements are met and that the application presents no health or safety hazards.
- Complying with all existing warning labels and / or providing all appropriate health and safety warnings on the equipment on which the valves, FRLs or Vacuum products are used; and,
- Assuring compliance with all applicable government and industry standards.

1.6. Safety Devices: Safety devices should not be removed, or defeated.

1.7. Warning Labels: Warning labels should not be removed, painted over or otherwise obscured.

1.8. Additional Questions: Call the appropriate Parker technical service department if you have any questions or require any additional information. See the Parker publication for the product being considered or used, or call 1-800-CPARKER, or go to www.parker.com, for telephone numbers of the appropriate technical service department.

2. PRODUCT SELECTION INSTRUCTIONS

2.1. Flow Rate: The flow rate requirements of a system are frequently the primary consideration when designing any pneumatic system. System components need to be able to provide adequate flow and pressure for the desired application.

2.2. Pressure Rating: Never exceed the rated pressure of a product. Consult product labeling, Pneumatic Division catalogs or the instruction sheets supplied for maximum pressure ratings.

2.3. Temperature Rating: Never exceed the temperature rating of a product. Excessive heat can shorten the life expectancy of a product and result in complete product failure.

2.4. Environment: Many environmental conditions can affect the integrity and suitability of a product for a given application. Pneumatic Division products are designed for use in general purpose industrial applications. If these products are to be used in unusual circumstances such as direct sunlight and/or corrosive or caustic environments, such use can shorten the useful life and lead to premature failure of a product.

2.5. Lubrication and Compressor Carryover: Some modern synthetic oils can and will attack nitrile seals. If there is any possibility of synthetic oils or greases migrating into the pneumatic components check for compatibility with the seal materials used. Consult the factory or product literature for materials of construction.

2.6. Polycarbonate Bowls and Sight Glasses: To avoid potential polycarbonate bowl failures:

- Do not locate polycarbonate bowls or sight glasses in areas where they could be subject to direct sunlight, impact blow, or temperatures outside of the rated range.
- Do not expose or clean polycarbonate bowls with detergents, chlorinated hydro-carbons, keytones, esters or certain alcohols.
- Do not use polycarbonate bowls or sight glasses in air systems where compressors are lubricated with fire resistant fluids such as phosphate ester and di-ester lubricants.
2.7. Chemical Compatibility: For more information on plastic component chemical compatibility see Pneumatic Division technical bulletins Tec-3, Tec-4, and Tec-5

2.8. Product Rupture: Product rupture can cause death, serious personal injury, and property damage. 
   - Do not connect pressure regulators or other Pneumatic Division products to bottled gas cylinders.
   - Do not exceed the maximum primary pressure rating of any pressure regulator or any system component.
   - Consult product labeling or product literature for pressure rating limitations.

3. PRODUCT ASSEMBLY AND INSTALLATION INSTRUCTIONS

3.1. Component Inspection: Prior to assembly or installation a careful examination of the valves, FRLs or vacuum products must be performed. All components must be checked for correct style, size, and catalog number. DO NOT use any component that displays any signs of nonconformance.

3.2. Installation Instructions: Parker published Installation Instructions must be followed for installation of Parker valves, FRLs and vacuum components. These instructions are provided with every Parker valve or FRL sold, or by calling 1-800-CPARKER, or at www.parker.com.

3.3. Air Supply: The air supply or control medium supplied to Valves, FRLs and Vacuum components must be moisture-free if ambient temperature can drop below freezing

4. VALVE AND FRL MAINTENANCE AND REPLACEMENT INSTRUCTIONS

4.1. Maintenance: Even with proper selection and installation, valve, FRL and vacuum products service life may be significantly reduced without a continuing maintenance program. The severity of the application, risk potential from a component failure, and experience with any known failures in the application or in similar applications should determine the frequency of inspections and the servicing or replacement of Pneumatic Division products so that products are replaced before any failure occurs. A maintenance program must be established and followed by the user and, at minimum, must include instructions 4.2 through 4.10.

4.2. Installation and Service Instructions: Before attempting to service or replace any worn or damaged parts consult the appropriate Service Bulletin for the valve or FRL in question for the appropriate practices to service the unit in question. These Service and Installation Instructions are provided with every Parker valve and FRL sold, or are available by calling 1-800-CPARKER, or by accessing the Parker web site at www.parker.com.


4.4. Visual Inspection: Any of the following conditions requires immediate system shut down and replacement of worn or damaged components:
   - Air leakage: Look and listen to see if there are any signs of visual damage to any of the components in the system. Leakage is an indication of worn or damaged components.
   - Damaged or degraded components: Look to see if there are any visible signs of wear or component degradation.
   - Kinked, crushed, or damaged hoses. Kinked hoses can result in restricted air flow and lead to unpredictable system behavior.
   - Any observed improper system or component function: Immediately shut down the system and correct malfunction.
   - Excessive dirt build-up: Dirt and clutter can mask potentially hazardous situations.

Caution: Leak detection solutions should be rinsed off after use.

4.5. Routine Maintenance Issues:
   - Remove excessive dirt, grime and clutter from work areas.
   - Make sure all required guards and shields are in place.

4.6. Functional Test: Before initiating automatic operation, operate the system manually to make sure all required functions operate properly and safely.

4.7. Service or Replacement Intervals: It is the user’s responsibility to establish appropriate service intervals. Valves, FRLs and vacuum products contain components that age, harden, wear, and otherwise deteriorate over time. Environmental conditions can significantly accelerate this process. Valves, FRLs and vacuum components need to be serviced or replaced on routine intervals. Service intervals need to be established based on:
   - Previous performance experiences.
   - Government and / or industrial standards.
   - When failures could result in unacceptable down time, equipment damage or personal injury risk.

4.8. Servicing or Replacing of any Worn or Damaged Parts: To avoid unpredictable system behavior that can cause death, personal injury and property damage:
   - Disconnect electrical supply (when necessary) before installation, servicing, or conversion.
   - Disconnect air supply and depressurize all air lines connected to system and Pneumatic Division products before installation, service, or conversion.
   - Installation, servicing, and / or conversion of these products must be performed by knowledgeable personnel who understand how pneumatic products are to be applied.
   - After installation, servicing, or conversions air and electrical supplies (when necessary) should be connected and the product tested for proper function and leakage. If audible leakage is present, or if the product does not operate properly, do not put product or system into use.
   - Warnings and specifications on the product should not be covered or painted over. If masking is not possible, contact your local representative for replacement labels.

4.9. Putting Serviced System Back into Operation: Follow the guidelines above and all relevant Installation and Maintenance Instructions supplied with the valve FRL or vacuum component to insure proper function of the system.
The items described in this document and other documents and descriptions provided by Parker Hannifin Corporation, its subsidiaries and its authorized distributors ("Seller") are hereby offered for sale at prices to be established by Seller. This offer and its acceptance by any customer ("Buyer") shall be governed by all of the following Terms and Conditions. This order for any products described in this document, when communicated to Seller verbally, or in writing, shall constitute acceptance of this offer. All goods or work described will be referred to as "Products".

1. Terms and Conditions. Seller’s willingness to offer Products, or accept an order for Products, or to from Buyer is subject to these Terms and Conditions or any newer version of the terms and conditions found on-line at www.parker.com/saleterms/. Seller objects to any additional terms or conditions of Buyer’s order or any other document issued by Buyer.

2. Price Adjustments; Payments. Prices stated on Seller’s quote or other documentation offered by Seller are valid for 30 days, and do not include any sales, use, or other taxes, levies or charges imposed by any governmental authority or agency. Unless otherwise specified by Seller or Seller’s facility (INCO TERMS 2010), Payment is subject to credit approval and is due 30 days from the date of invoice or such other term as required by Seller’s Credit Department. Buyer shall pay interest on any unpaid invoices at the rate of 1.5% per month or the maximum allowable rate under applicable law.

3. Delivery Dates; Title and Shipments. All delivery dates are approximate and Seller shall not be responsible for any damages resulting from any delay. Regardless of the manner of shipment, title to any products and risk of loss or damage shall pass to Buyer upon placement of the products with the shipping carrier at Seller’s facility. Unless otherwise stated, Seller may exercise judgment in choosing the carrier and means of delivery. In default of formation of a shipping agreement, the total amount of the invoice will be included in the cost of transportation, which will be credited to any returns made. Any change in the method of shipment shall be made only at the option of Seller. Buyer shall notify Seller of any change in the method of shipment and any change in the shipping address.

4. Warranty. Seller warrants that the Products sold hereunder shall be free from defects in material and workmanship for a period of twelve months from the date of delivery to Buyer or 2,000 hours of normal use, whichever occurs first. The prices charged for Seller’s products are without other warranties or representations and are based upon the above warranty period only. Buyer shall notify Seller of any alleged breach of warranty within 30 days after the date the defect is or should have been discovered by Buyer. Any action based upon breach of this agreement or upon any other claim arising out of the alleged breach of warranty must be brought within 30 days after delivery. Buyer shall notify Seller of any such failure and Buyer’s right to enforce that provision in the future. Invalidation of any provision of this agreement by legislative or other rule of law shall not invalidate any other provision herein. The remaining provisions of the agreement will not be affected.

5. Claims; Commencement of Actions. Buyer shall promptly inspect all Products upon delivery. No claims for shortages will be allowed unless reported to the Seller within 10 days of delivery. No other claims against Seller shall be allowed unless asserted in writing not later than 90 days after delivery. Buyer shall notify Seller of any alleged breach of warranty within 30 days after the date the defect is or should have been discovered by Buyer. Any action based upon breach of this agreement or upon any other claim arising out of an action by Seller for an amount due on any invoice) must be commenced within 12 months from the date of the breach without regard to the date breach is discovered.

6. LIMITATION OF LIABILITY. UPON NOTIFICATION, SELLER WILL, AT ITS OPTION, REPAIR OR REPLACE A DEFECTIVE PRODUCT, OR REFUND THE PURCHASE PRICE. IN NO EVENT SHALL SELLER BE LIABLE TO BUYER FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR AS THE RESULT OF, THE SALE, DELIVERY, NON-DELIVERY, SERVICING, USE OR INABILITY TO USE THE PRODUCTS OR ANY PART THEREOF, OR FOR SPECIAL CHARGES OR EXPENSES OF ANY NATURE INCURRED WITHOUT SELLER’S WRITTEN CONSENT, EVEN IF SELLER HAS BEEN NEGLIGENT, WHETHER IN CONTRACT OR IN TORT. 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 the final selection of the System. If a Product is supplied and remain Seller’s property notwithstanding payment of the purchase price, Buyer shall not be responsible for any loss or damage to such property while it is in Seller’s possession or control.

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, may be considered obsolete and may be destroyed by Seller after two 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 Buyer’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 charges and remain Seller’s property notwithstanding payment of the purchase price 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 change or other lease or otherwise lend or dispose of any such 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 owed by Buyer, Seller shall retain a security interest in the goods delivered and this agreement shall be deemed 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 claim, liability, damages, lawsuits, and costs (including attorney fees), 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, improper application or other misuse of Products purchased by Buyer from Seller; (b) any act or omission, negligent or otherwise, of Buyer; or (c) Buyer’s use of patterns, plans, designs, or specifications furnished by Buyer to manufacture Product; or (d) Buyer’s failure to comply with these terms and conditions. Seller shall not indemnify Buyer under any circumstance except as specifically provided.

12. Cancellations and Changes. Orders shall not be subject to cancellation or change by Buyer 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 damages or losses as a result of change product features, specifications, designs and availability with notice to Buyer.

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 shall not be liable for delay or difficulty which may be caused by causes beyond Seller’s reasonable control, including acts of God, war, riots, strikes, labor disputes, civil disturbances, accidents, 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 constitute a waiver of any rights or provision. Buyer’s failure to enforce the effectiveness of a Product or feature in the future. Invalidation of any provision of this agreement by legislative or other rule of law shall not invalidate any other provision herein. The remaining provisions of the agreement will not be affected.

16. Termination. Seller may terminate this agreement for any reason and at any time by giving Buyer thirty (30) days written notice of termination. Seller may immediately terminate this agreement, in writing, if Buyer: (a) commits a breach of 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 by a third party (d) makes an assignment for the benefit of creditors, or (e) the dissolves or liquidates all or a majority of its assets.

17. Exclusive Selling Line. This agreement and the sale and delivery of all Products hereunder shall be deemed to have taken place in and shall be governed 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. Buyer shall have no liability for infringement of any patents, copyrights, trademarks, 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, 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 the Buyer is contingent upon 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 defense of such claims. Buyer, at its own expense and option, may proceed to defend the Product, 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, 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 return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability 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 shall 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.

20. Compliance with Laws. U.S. and Foreign Corruption Practices Act. Buyer agrees to comply with all applicable laws and regulations, including both those of the United Kingdom and the United States of America, and of the country or countries of the Territory in which the Buyer may operate, including without limitation the Foreign Corrupt Practices Act of 1977, as amended (the “FCPA”), and the Anti-Kickback Act (the “Anti-Kickback Act”), 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 they are familiar with the provisions of the U. K. Bribery Act, the FCPA and the Anti-Kickback Act, and certifies that its products and services will not give rise to any violation of applicable law or regulation which would cause Buyer to lose the status of “full time” and “good standing” with the FCPA and the Anti-Kickback Act, and to indemnify and hold harmless Seller and its subsidiaries from any liability or damage resulting therefrom. In particular, Buyer represents and agrees that Buyer shall not make any payment or give anything of value, directly or indirectly to any governmental official, any foreign political official or political party or any foreign representative of any foreign government in any foreign political or public office, or any commercial entity or person, for the purpose of influencing such person or party to purchase products or otherwise benefit the business of Buyer.