



## DECLARATION OF COMPLIANCE (ROHS)

European Directive 2002/95/EC - RoHS (**R**estriction of use **o**f certain **H**azardous **S**ubstances in electrical and electronic equipment), restricts the use of the 6 substances below in the manufacture of specified electrical equipment.

Substance	Concentration
<b>LEAD:</b>	Product containing lead and its compounds (except for application of lead as an alloying element by weight in steel up to 0.35%, in aluminum up to 0.4% and in copper alloys up to 4% and in Circuit Board solder) must not exceed 0.1% by weight.
<b>MERCURY:</b>	The concentration level must not exceed 0.1% by weight.
<b>CADMIUM:</b>	The concentration level must not exceed 0.01% by weight.
<b>HEXAVALENT CHROMIUM:</b>	This is a corrosive protective finish used on our product line. Were this finish is utilized the Chromate solution is Hexavalent (Chrome 6) free.
<b>POLYBROMINATED BIPHENYLS (PBB):</b>	The concentration level must not exceed 0.1% by weight. This substance is not known to be in any of our products.
<b>POLYBROMINATED DIPHENYL ETHERS (PBDE):</b>	The concentration level must not exceed 0.1% by weight. This substance is not known to be in any of our products.

This information applies to product sold on or after 1<sup>st</sup> July, 2006

### **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.

The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

### **Offer of Sale**

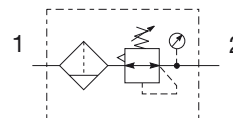
The items described in this document are hereby offered for sale by Parker Hannifin Corporation, its subsidiaries or its authorized distributors. This offer and its acceptance are governed by the provisions stated on the separate page of this document entitled "Offer of Sale".

**Global Air Preparation System**

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## Mini Filter / Regulator - P31

## Symbols



- Integral 1/4" ports (NPT, BSPP & BSPT)
  - High efficiency 5 micron element as standard
  - Excellent water removal efficiency
  - Robust but lightweight aluminum construction
  - Positive bayonet latch to ensure correct & safe fitting
- Secondary pressure ranges 0-2 bar (0-30 psig), 0-4 bar, (0-60 psig), 0-8 bar (0-125 psig)
- Secondary aspiration plus balanced poppet provides quick response and accurate pressure regulation

## Options:

<b>P 3 1</b>	<b>E A</b>			<b>E</b>				<b>N</b>		<b>P</b>
<b>Thread type</b>		<b>Drain type</b>		<b>Relief</b>		<b>Adjustment range</b>		<b>Mounting</b>		
BSPP	<b>1</b>	Pulse drain	<b>B</b>	Relieving	<b>B</b>	<b>With square gauge</b>		Plastic panel	<b>P</b>	
BSPT	<b>2</b>	Manual drain	<b>M</b>	Non relieving	<b>N</b>	psig	bar	mount nut		
NPT	<b>9</b>					30* = <b>1</b>	2* = <b>V</b>			
<b>Port size</b>						60 = <b>3</b>	4 = <b>S</b>			
1/4	<b>2</b>					125 = <b>5</b>	8 = <b>T</b>			
<b>Element</b>						<b>Without gauge</b>				
5µ Element	<b>E</b>					psig	bar			
<b>Bowl type</b>						30 = <b>Y</b>	2 = <b>Y</b>			
Poly bowl with bowl guard	<b>G</b>					60 = <b>L</b>	4 = <b>L</b>			
Metal bowl without sight gauge	<b>M</b>					125 = <b>N</b>	8 = <b>N</b>			

\* Unit comes with 0-4 bar, 0-60 psig gauge respectively

Port size	Description	Order Code†	Flow dm <sup>3</sup> /s (scfm)	Max. bar (psig)	Height mm (inches)	Width mm (inches)	Depth mm (inches)
1/4"	8 bar (125 psig) Relieving - Poly bowl - Manual drain	<b>P31EA92EGMBN5P</b>	14 (30)	10 (150)	164.1 (6.46)	40 (1.58)	64 (2.53)
1/4"	8 bar (125 psig) Relieving - Poly bowl - Pulse drain	<b>P31EA92EGBBN5P</b>	14 (30)	10 (150)	164.1 (6.46)	40 (1.58)	64 (2.53)
1/4"	8 bar (125 psig) Relieving - Metal bowl - Manual drain	<b>P31EA92EMMBN5P</b>	14 (30)	17 (250)	164.1 (6.46)	40 (1.58)	64 (2.53)
1/4"	8 bar (125 psig) Relieving - Metal bowl - Pulse drain	<b>P31EA92EMB5P</b>	14 (30)	17 (250)	164.1 (6.46)	40 (1.58)	64 (2.53)

\* flow with 10 bar (145 psig) inlet pressure, 6.3 bar (91.3 psig) set pressure and 1 bar (14.5 psig) pressure drop.

† Standard part numbers shown in bold. For other models refer to Options chart above.

## Global Air Preparation System

## Specifications

Flow Capacity*	1/4	14 dm <sup>3</sup> /s (30.0 scfm)
Max. Operating Temperature	Plastic Bowl	52°C (125°F)
	Metal Bowl	65.5°C (150°F)
Max. Supply Pressure	Plastic Bowl	10 bar (150 psig)
	Metal Bowl	17 bar (250 psig)
Standard Filtration	5 Micron	
Useful Retention	12 cm <sup>3</sup> (0.4 US oz.)	
Adjusting Range	0-2 bar (30 psig)	
Pressure	0-4 bar (60 psig)	
	0-8 bar (125 psig)	
Port Size	BSPP / BSPT / NPT	1/4
Gauge Port (2 ea.)**	BSPP / BSPT / NPT	1/8
Weight	0.19 kg (0.42 lbs)	

\* Inlet pressure 10 bar (145 psig). Secondary pressure 6.3 bar (91.3 psig).

\*\* Non-gauge option only.

## Air quality:

Within ISO 8573-1: 1991 Class 3 (Particulates)

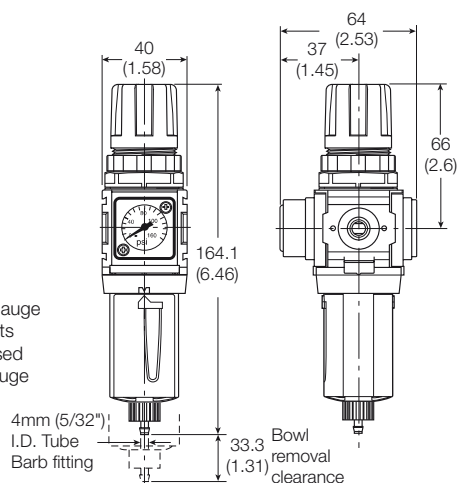
Within ISO 8573-1: 2001 Class 6 (Particulates)

## Materials of Construction

Body	Aluminum	
Adjustment Knob	Acetal	
Body Cap	ABS	
Bonnet	PBT	
Bowl	Plastic Bowl	Polycarbonate
	Metal Bowl	Aluminum
Bowl Guard	Nylon	
Filter Element	Polyethylene	
Seals	Plastic Bowl	Nitrile
	Metal Bowl	Nitrile
Springs	Steel	
Valve Assembly	Brass / Nitrile	
Diaphragm Assembly	Brass / Nitrile	
Panel Nut	Acetal	

For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

## Dimensions mm (inches)



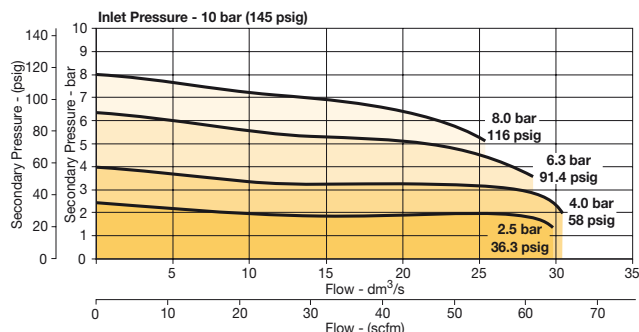
**Note:**  
Flush-mounted gauge kits will not fit units originally purchased with threaded gauge ports.

**WARNING**

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

## Flow Charts

## 1/4 Filter/Regulator



## Repair and Service Kits

Plastic bowl / Bowl guard manual drain	<b>P31KA00BGM</b>
Metal bowl / w/o sight gauge manual drain	<b>P31KA00BMM</b>
Plastic bowl / Bowl guard pulse drain	<b>P31KA00BGB</b>
Metal bowl / w/o sight gauge pulse drain	<b>P31KA00BMB</b>
5µ particle filter element	<b>P31KA00ESE</b>
Regulator repair kit - Relieving	<b>P31KA00RB</b>
Regulator repair kit - Non-relieving	<b>P31KA00RC</b>
Panel mount nut - Aluminum	<b>P31KA00MM</b>
Panel mount nut - Plastic	<b>P31KA00MP</b>
Angle Bracket (uses panel mount threads)	<b>P31KA00MR</b>
C-Bracket (fits to body)	<b>P31KA00MW</b>
T-Bracket with body connector	<b>P31KA00MT</b>
Body connector	<b>P31KA00CB</b>

## Gauges

## Square flush mount gauge

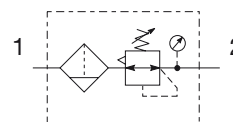
0-4 bar	<b>K4511SCR04B</b>
0-10 bar	<b>K4511SCR11B</b>
0-60 psig	<b>K4511SCR060</b>
0-150 psig	<b>K4511SCR150</b>

For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

## Global Air Preparation System

## Compact Filter / Regulator - P32

## Symbols



- Integral 1/4", 3/8" or 1/2" ports (NPT, BSPP & BSPT)
- High efficiency 5 micron element as standard
- Excellent water removal efficiency
- Robust but lightweight aluminum construction
- Positive bayonet latch to ensure correct & safe fitting
- Secondary pressure ranges 0-2 bar (0-30 psig), 0-4 bar, (0-60 psig), 0-8 bar (0-125 psig), 0-17 bar (0-250 psig)
- Secondary aspiration plus balanced poppet provides quick response and accurate pressure regulation

## Options:

<b>P 3 2</b>	<b>E A</b>			<b>E</b>				<b>N</b>		<b>P</b>	
<b>Thread type</b>		<b>Port size</b>		<b>Drain type</b>		<b>Mounting</b>					
BSPP	<b>1</b>	1/4	<b>2</b>	Manual drain	<b>M</b>					Plastic panel mount nut	<b>P</b>
BSPT	<b>2</b>	3/8	<b>3</b>	Auto drain	<b>A</b>						
NPT	<b>9</b>	1/2	<b>4</b>			<b>Adjustment range</b>					
				<b>Element</b>		<b>Relief</b>		<b>With round gauge</b>			
				5µ Element	<b>E</b>	Relieving	<b>B</b>	2 bar; 30 psig; 0.2 MPa		<b>Z</b>	
						Non relieving	<b>N</b>	4 bar; 60 psig; 0.4 MPa		<b>M</b>	
								8 bar; 125 psig; 0.8 MPa		<b>G</b>	
								17 bar; 250 psig; 1.7 MPa		<b>J</b>	
								<b>Without gauge</b>			
								2 bar; 30 psig; 0.2 MPa		<b>Y</b>	
								4 bar; 60 psig; 0.4 MPa		<b>L</b>	
								8 bar; 125 psig; 0.8 MPa		<b>N</b>	
								17 bar; 250 psig; 1.7 MPa		<b>H</b>	
<b>Bowl type</b>											
Poly bowl with bowl guard										<b>G</b>	
Metal bowl without sight gauge										<b>M</b>	
Metal bowl with sight gauge										<b>S</b>	

Port size	Description	Order Code†	Flow dm³/s (scfm)	Max. bar (psig)	Height mm (inches)	Width mm (inches)	Depth mm (inches)
1/4"	8 bar (125 psig) Relieving - Poly bowl - Manual drain	<b>P32EA92EGMBNGP</b>	42 (89)	10 (150)	254 (10.0)	60 (2.36)	60 (2.36)
1/4"	8 bar (125 psig) Relieving - Poly bowl - Auto drain	<b>P32EA92EGABNGP</b>	42 (89)	10 (150)	248 (9.76)	60 (2.36)	60 (2.36)
1/4"	8 bar (125 psig) Relieving - Metal bowl - Manual drain	<b>P32EA92ESMBNGP</b>	42 (89)	17 (250)	245 (9.66)	60 (2.36)	60 (2.36)
1/4"	8 bar (125 psig) Relieving - Metal bowl - Auto drain	<b>P32EA92ESABNGP</b>	42 (89)	17 (250)	254 (10.0)	60 (2.36)	95 (3.74)
3/8"	8 bar (125 psig) Relieving - Poly bowl - Manual drain	<b>P32EA93EGMBNGP</b>	58 (123)	10 (150)	254 (10.0)	60 (2.36)	60 (2.36)
3/8"	8 bar (125 psig) Relieving - Poly bowl - Auto drain	<b>P32EA93EGABNGP</b>	58 (123)	10 (150)	248 (9.76)	60 (2.36)	60 (2.36)
3/8"	8 bar (125 psig) Relieving - Metal bowl - Manual drain	<b>P32EA93ESMBNGP</b>	58 (123)	17 (250)	245 (9.66)	60 (2.36)	60 (2.36)
3/8"	8 bar (125 psig) Relieving - Metal bowl - Auto drain	<b>P32EA93ESABNGP</b>	58 (123)	17 (250)	254 (10.0)	60 (2.36)	95 (3.74)
1/2"	8 bar (125 psig) Relieving - Poly bowl - Manual drain	<b>P32EA94EGMBNGP</b>	64 (136)	10 (150)	245 (9.66)	60 (2.36)	95 (3.74)
1/2"	8 bar (125 psig) Relieving - Poly bowl - Auto drain	<b>P32EA94EGABNGP</b>	64 (136)	10 (150)	248 (9.76)	60 (2.36)	95 (3.74)
1/2"	8 bar (125 psig) Relieving - Metal bowl - Manual drain	<b>P32EA94ESMBNGP</b>	64 (136)	17 (250)	245 (9.66)	60 (2.36)	60 (2.36)
1/2"	8 bar (125 psig) Relieving - Metal bowl - Auto drain	<b>P32EA94ESABNGP</b>	64 (136)	17 (250)	254 (10.0)	60 (2.36)	60 (2.36)

\* flow with 10 bar (145 psig) inlet pressure, 6.3 bar (91.3 psig) set pressure and 1 bar (14.5 psig) pressure drop.

† Standard part numbers shown in bold. For other models refer to Options chart above.

## Specifications

Flow Capacity*	1/4	42 dm <sup>3</sup> /s (89 scfm)
	3/8	58 dm <sup>3</sup> /s (123 scfm)
	1/2	64 dm <sup>3</sup> /s (136 scfm)
Max. Operating Temperature	Plastic Bowl	52°C (125°F)
	Metal Bowl	65.5°C (150°F)
Max. Supply Pressure	Plastic Bowl	10 bar (150 psig)
	Metal Bowl	17 bar (250 psig)
Standard Filtration	5 Micron	
Useful Retention†	51 cm <sup>3</sup> (1.7 US oz.)	
Adjusting Range Pressure	0-2 bar (30 psig)	
	0-4 bar (60 psig)	
	0-8 bar (125 psig)	
	0-17 bar (250 psig)	

Port Size	BSPP / BSPT / NPT	1/4, 3/8, 1/2
Gauge Port (2 ea.)	BSPP / BSPT / NPT	1/4
Weight	0.53 kg (1.17 lbs)	

\* Inlet pressure 10 bar (145 psig). Secondary pressure 6.3 bar (91.3 psig).

† Useful retention refers to volume below the quiet zone baffle.

### Air quality:

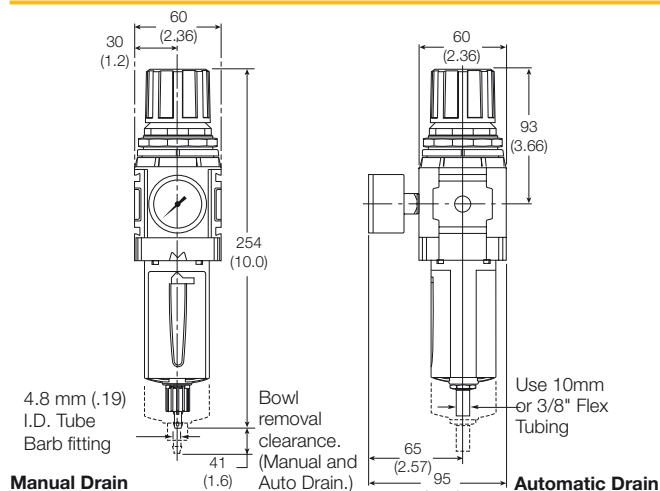
Within ISO 8573-1: 1991 Class 3 (Particulates)

Within ISO 8573-1: 2001 Class 6 (Particulates)

## Materials of Construction

Body	Aluminum	
Adjustment Knob	Acetal	
Body Cap	ABS	
Element Retainer / Baffle	Acetal	
Bowl	Plastic Bowl	Polycarbonate
	Metal Bowl	Zinc
Bowl Guard	Nylon	
Filter Element	Sintered Polyethylene	
Seals	Plastic Bowl	Nitrile
	Metal Bowl	Nitrile
Springs	Main Regulating / Valve	Steel / S.S.
Valve Assembly	Brass / Nitrile	
Diaphragm Assembly	Nitrile / Zinc	
Panel Nut	Acetal	
Sight Gauge	Metal Bowl	Polycarbonate

## Dimensions mm (inches)

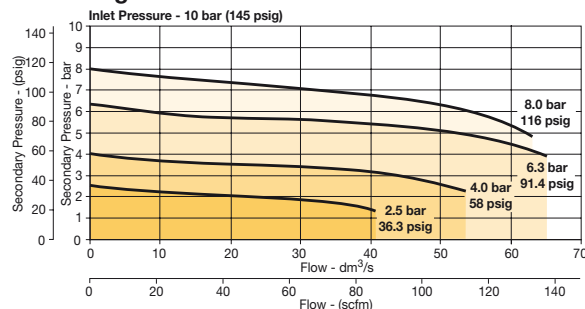


### WARNING

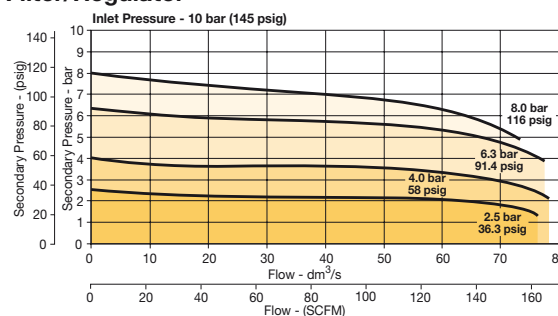
Product rupture can cause serious injury.  
Do not connect regulator to bottled gas.  
Do not exceed Maximum primary pressure rating.

## Flow Charts

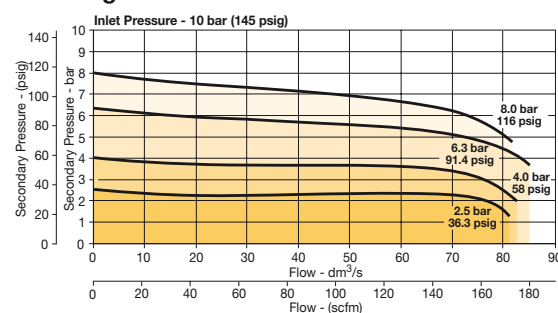
### 1/4 Filter/Regulator



### 3/8 Filter/Regulator



### 1/2 Filter/Regulator



## Repair and Service Kits

Plastic bowl / Bowl guard manual drain	P32KA00BGM
Metal bowl / Sight gauge manual drain	P32KA00BSM
Auto drain	P32KA00DA
5µ particle filter element	P32KA00ESE
Regulator repair kit - Relieving	P32KA00RB
Regulator repair kit - Non-relieving	P32KA00RC
Panel mount nut - Aluminum	P32KA00MM
Panel mount nut - Plastic	P32KA00MP
Angle Bracket (fits to panel mount threads)	P32KA00MR
T-Bracket (fits to body connector)	P32KA00MB
T-Bracket with body connector	P32KA00MT
Body connector	P32KA00CB

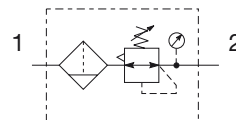
## Gauges

### 50mm (2") Round 1/4" center back mount

0-30 psig / 0-2 bar / 0-0.2 MPa	K4520N14030
0-60 psig / 0-4 bar / 0-0.4 MPa	K4520N14060
0-160 psig / 0-11 bar / 0-1.1 MPa	K4520N14160
0-300 psig / 0-20 bar / 0-2 MPa	K4520N14300

For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

## Symbols



- Integral 1/2" or 3/4" ports (NPT, BSPP & BSPT)
- High efficiency 5 micron element as standard
- Excellent water removal efficiency
- Robust but lightweight aluminum construction
- Positive bayonet latch to ensure correct & safe fitting
- Secondary pressure ranges 0-2 bar (0-30 psig), 0-4 bar, (0-60 psig), 0-8 bar (0-125 psig), 0-17 bar (0-250 psig)
- Secondary aspiration plus balanced poppet provides quick response and accurate pressure regulation

**Options:**

<b>P</b>	<b>3</b>	<b>3</b>	<b>E</b>	<b>A</b>			<b>E</b>					<b>N</b>			<b>P</b>	
<b>Thread type</b>			<b>Port size</b>			<b>Drain type</b>			<b>Adjustment range</b>						<b>Mounting</b>	
BSP	1		1/2	4		Manual drain	M		<b>With round gauge</b>				Plastic panel mount nut		P	
BST	2		3/4	6		Auto drain	A		<b>Without gauge</b>							
NPT	9								<b>Relief</b>							
									Relieving		B					
									Non relieving		N					
									<b>Element</b>							
									5µ Element							E
									<b>Bowl type</b>							
									Poly bowl with bowl guard							G
									Metal bowl without sight gauge							M
									Metal bowl with sight gauge							S
									2 bar; 30 psig; 0.2 MPa							Z
									4 bar; 60 psig; 0.4 MPa							M
									8 bar; 125 psig; 0.8 MPa							G
									17 bar; 250 psig; 1.7 MPa							J
									2 bar; 30 psig; 0.2 MPa							Y
									4 bar; 60 psig; 0.4 MPa							L
									8 bar; 125 psig; 0.8 MPa							N
									17 bar; 250 psig; 1.7 MPa							H

Port size	Description	Order Code†	Flow dm <sup>3</sup> /s (scfm)	Max. bar (psig)	Height mm (inches)	Width mm (inches)	Depth mm (inches)
1/2"	8 bar (125 psig) Relieving - Poly bowl - Manual drain	<b>P33EA94EGMBNGP</b>	90 (191)	10 (150)	291 (11.44)	73 (2.9)	73 (2.9)
1/2"	8 bar (125 psig) Relieving - Poly bowl - Auto drain	<b>P33EA94EGABNGP</b>	90 (191)	10 (150)	285 (11.22)	73 (2.9)	73 (2.9)
1/2"	8 bar (125 psig) Relieving - Metal bowl - Manual drain	<b>P33EA94ESMBNGP</b>	90 (191)	17 (250)	282 (11.0)	73 (2.9)	73 (2.9)
1/2"	8 bar (125 psig) Relieving - Metal bowl - Auto drain	<b>P33EA94ESABNGP</b>	90 (191)	17 (250)	291 (11.44)	73 (2.9)	108 (4.27)
3/4"	8 bar (125 psig) Relieving - Poly bowl - Manual drain	<b>P33EA96EGMBNGP</b>	98 (208)	10 (150)	282 (11.0)	73 (2.9)	108 (4.27)
3/4"	8 bar (125 psig) Relieving - Poly bowl - Auto drain	<b>P33EA96EGABNGP</b>	98 (208)	10 (150)	285 (11.22)	73 (2.9)	108 (4.27)
3/4"	8 bar (125 psig) Relieving - Metal bowl - Manual drain	<b>P33EA96ESMBNGP</b>	98 (208)	17 (250)	291 (11.44)	73 (2.9)	73 (2.9)
3/4"	8 bar (125 psig) Relieving - Metal bowl - Auto drain	<b>P33EA96ESABNGP</b>	98 (208)	17 (250)	282 (11.0)	73 (2.9)	73 (2.9)

† Standard part numbers shown in bold. For other models refer to Options chart above.



## Specifications

Flow Capacity*	1/2	90 dm <sup>3</sup> /s (191 scfm)
	3/4	98 dm <sup>3</sup> /s (208 scfm)
Max. Operating Temperature	Plastic Bowl	52°C (125°F)
	Metal Bowl	65.5°C (150°F)
Supply Pressure	Plastic Bowl	10 bar (150 psig)
	Metal Bowl	17 bar (250 psig)
Standard Filtration	5 Micron	
Useful Retention†	85 cm <sup>3</sup> (2.8 US oz.)	
Adjusting Range	0-2 bar (30 psig)	
Pressure	0-4 bar (60 psig)	
	0-8 bar (125 psig)	
	0-17 bar (250 psig)	

Port Size BSPP / BSPT / NPT 1/2, 3/4

Gauge Port (2 ea.) BSPP / BSPT / NPT 1/4

Weight 0.85 kg (1.87 lbs)

\* Inlet pressure 10 bar (145 psig). Secondary pressure 6.3 bar (91.3 psig).

† Useful retention refers to volume below the quiet zone baffle.

### Air quality:

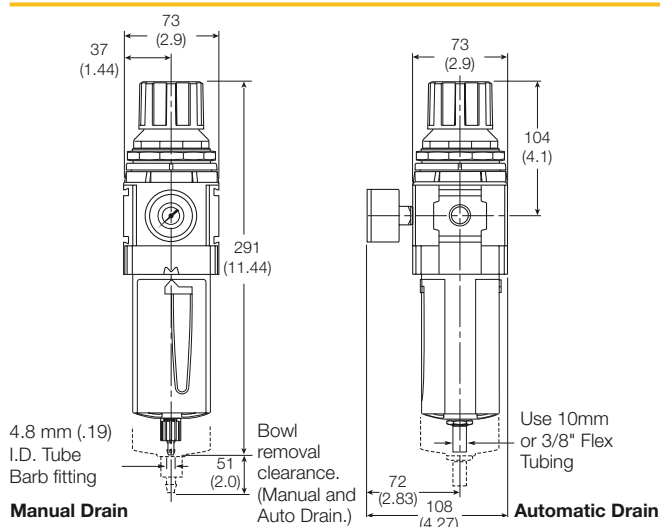
Within ISO 8573-1: 1991 Class 3 (Particulates)

Within ISO 8573-1: 2001 Class 6 (Particulates)

## Materials of Construction

Body	Aluminum	
Adjustment Knob	Acetal	
Body Cap	ABS	
Element Retainer / Baffle	Acetal	
Bowls	Plastic Bowl	Polycarbonate
	Metal Bowl	Aluminum
Filter Element	Sintered Polyethylene	
Seals	Plastic Bowl	Nitrile
	Metal Bowl	Nitrile
Springs	Main Regulating / Valve	Steel / S.S.
Valve Assembly	Brass / Nitrile	
Diaphragm Assembly	Nitrile / Zinc	
Panel Nut	Acetal	
Sight Gauge	Metal Bowl	Polycarbonate

## Dimensions mm (inches)

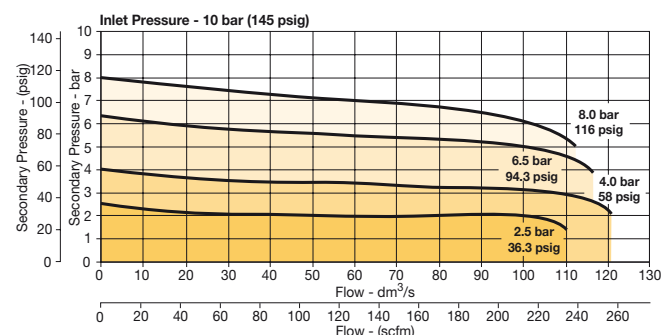


### WARNING

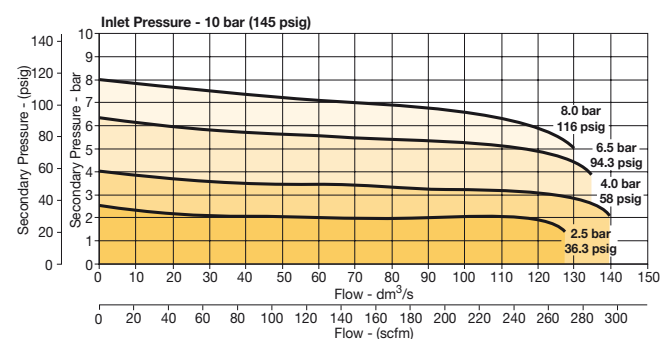
Product rupture can cause serious injury.  
Do not connect regulator to bottled gas.  
Do not exceed Maximum primary pressure rating.

## Flow Charts

### 1/2 Filter/Regulator



### 3/4 Filter/Regulator



## Repair and Service Kits

Plastic bowl / Bowl guard manual drain	<b>P33KA00BGM</b>
Metal bowl / Sight gauge manual drain	<b>P33KA00BSM</b>
Auto drain	<b>P32KA00DA</b>
5µ particle filter element	<b>P33KA00ESE</b>
Regulator repair kit - Relieving	<b>P33KA00RB</b>
Regulator repair kit - Non-relieving	<b>P33KA00RC</b>
Panel mount nut - Aluminum	<b>P33KA00MM</b>
Panel mount nut - Plastic	<b>P33KA00MP</b>
Angle Bracket (fits to panel mount threads)	<b>P33KA00MR</b>
T-Bracket (fits to body connector)	<b>P32KA00MB</b>
T-Bracket with body connector	<b>P32KA00MT</b>
Body connector	<b>P32KA00CB</b>

## Gauges

### 50mm (2") Round 1/4" center back mount

0-30 psig / 0-2 bar / 0-0.2 MPa	<b>K4520N14030</b>
0-60 psig / 0-4 bar / 0-0.4 MPa	<b>K4520N14060</b>
0-160 psig / 0-11 bar / 0-1.1 MPa	<b>K4520N14160</b>
0-300 psig / 0-20 bar / 0-2 MPa	<b>K4520N14300</b>

For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.



## 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.
- 1.3. Relevant International Standards: For a good guide to the application of a broad spectrum of pneumatic fluid power devices see: ISO 4414:1998, Pneumatic Fluid Power – General Rules Relating to Systems. See [www.iso.org](http://www.iso.org) for ordering information.
- 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](http://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 Gauges: To avoid potential polycarbonate bowl failures:
  - Do not locate polycarbonate bowls or sight gauges 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, ketones, esters or certain alcohols.
  - Do not use polycarbonate bowls or sight gauges in air systems where compressors are lubricated with fire resistant fluids such as phosphate ester and di-ester lubricants.

## Global Air Preparation System

- 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](http://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](http://www.parker.com).
  - 4.3. Lockout / Tagout Procedures: Be sure to follow all required lockout and tagout procedures when servicing equipment. For more information see: OSHA Standard – 29 CFR, Part 1910.147, Appendix A, The Control of Hazardous Energy – (Lockout / Tagout)
  - 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:
    - Follow all government, state and local safety and servicing practices prior to service including but not limited to all OSHA Lockout Tagout procedures (OSHA Standard – 29 CFR, Part 1910.147, Appendix A, The Control of Hazardous Energy – Lockout / Tagout).
    - 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.

## Global Air Preparation System

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3. **Delivery:** Unless otherwise provided on the face hereof, delivery shall be made F.O.B. Seller's plant. Regardless of the method of delivery, however, risk of loss shall pass to Buyer upon Seller's delivery to a carrier. Any delivery dates shown are approximate only and Seller shall have no liability for any delays in delivery.

4. **Warranty:** Seller warrants that the items sold hereunder shall be free from defects in material or workmanship for a period of 18 months from date of shipment from Parker Hannifin Corporation. THIS WARRANTY COMPRISES THE SOLE AND ENTIRE WARRANTY PERTAINING TO ITEMS PROVIDED HEREUNDER. SELLER MAKES NO OTHER WARRANTY, GUARANTEE, OR REPRESENTATION OF ANY KIND WHATSOEVER. ALL OTHER WARRANTIES, INCLUDING BUT NOT LIMITED TO, MERCHANTABILITY AND FITNESS FOR PURPOSE, WHETHER EXPRESS, IMPLIED, OR ARISING BY OPERATION OF LAW, TRADE USAGE, OR COURSE OF DEALING ARE HEREBY DISCLAIMED.

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5. **Limitation of Remedy:** SELLER'S LIABILITY ARISING FROM OR IN ANY WAY CONNECTED WITH THE ITEMS SOLD OR THIS CONTRACT SHALL BE LIMITED EXCLUSIVELY TO REPAIR OR REPLACEMENT OF THE ITEMS SOLD OR REFUND OF THE PURCHASE PRICE PAID BY BUYER, AT SELLER'S SOLE OPTION. IN NO EVENT SHALL SELLER BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES OF ANY KIND OR NATURE WHATSOEVER, INCLUDING BUT NOT LIMITED TO LOST PROFITS ARISING FROM OR IN ANY WAY CONNECTED WITH THIS AGREEMENT OR ITEMS SOLD HEREUNDER, WHETHER ALLEGED TO ARISE FROM BREACH OF CONTRACT, EXPRESS OR IMPLIED WARRANTY, OR IN TORT, INCLUDING WITHOUT LIMITATION, NEGLIGENCE, FAILURE TO WARN OR STRICT LIABILITY.

6. **Changes, Reschedules and Cancellations:** Buyer may request to modify the designs or specifications for the items sold hereunder as well as the quantities and delivery dates thereof, or may request to cancel all or part of this order, however, no such requested modification or cancellation shall become part of the contract between Buyer and Seller unless accepted by Seller in a written amendment to this Agreement. Acceptance of any such requested modification or cancellation shall be at Seller's discretion, and shall be upon such terms and conditions as Seller may require.

7. **Special Tooling:** A tooling charge may be imposed for any special tooling, including without limitations, dies, fixtures, molds and patterns, acquired to manufacture items sold pursuant to this contract. 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 items sold hereunder, even if such apparatus has been specially converted or adapted for such manufacture and notwithstanding any charges paid by Buyer. Unless otherwise agreed, Seller shall have the

right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.

8. **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 (2) consecutive years have elapsed without Buyer placing an order for the items which are 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. **Taxes:** Unless otherwise indicated on the face hereof, all prices and charges are exclusive of excise, sales, use, property, occupational or like taxes which may be imposed by any taxing authority upon the manufacture, sale or delivery of the items sold hereunder. If any such taxes must be paid by Seller or if Seller is liable for the collection of such tax, the amount thereof shall be in addition to the amounts for the items sold. Buyer agrees to pay all such taxes or to reimburse Seller therefore upon receipt of its invoice. If Buyer claims exemption from any sales, use or other tax imposed by any taxing authority, Buyer shall save Seller harmless from and against any such tax, together with any interest or penalties thereon which may be assessed if the items are held to be taxable.

10. **Indemnity For Infringement of Intellectual Property Rights:** Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Part 10. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets (hereinafter "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 an item sold pursuant to this contract 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 an item sold hereunder 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 said item, replace or modify said item so as to make it noninfringing, or offer to accept return of said item 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 items 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 item sold hereunder. The foregoing provisions of this Part 10 shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.

If a claim is based on information provided by Buyer or if the design for an item delivered hereunder is specified in whole or in part by Buyer, Buyer shall defend and indemnify Seller for all costs, expenses or judgments resulting from any claim that such item infringes any patent, trademark, copyright, trade dress, trade secret or any similar right.

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

12. **Entire Agreement/Governing Law:** The terms and conditions set forth herein, together with any amendments, modifications and any different terms or conditions expressly accepted by Seller in writing, shall constitute the entire Agreement concerning the items sold, and there are no oral or other representations or agreements which pertain thereto. This Agreement shall be governed in all respects by the law of the State of Ohio. No actions arising out of sale of the items sold hereunder or this Agreement may be brought by either party more than two (2) years after the cause of action accrues.