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Solenoid valves and pressure regulators for the railway industry



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Parker Fluid Control Division Europe - FCDE

About Us

The Fluid Control Division Europe (FCDE) is a division of Parker Hannifin, a leader in the movement and control technologies sector.

The basic skills in the FCDE division are the development and manufacture of a range of products for controlling fluids, comprising solenoid valves and pressure regulators.

Where To Find Us

Our head office is in Geneva along with R&D, marketing, application support, and product management.

FCDE products are mainly manufactured in Carouge (Geneva, Switzerland) and Gessate (Milan, Italy).

Parker Sales Companies and their extensive sales and service network provide support throughout Europe.

History

For more than 60 years, Parker FCDE has been a leader in the manufacture and development of solenoid valve technologies. Through its continuous research and development, the company has been able to offer innovative solutions to the market and introduce, for example, the use of synthetic ruby for critical applications with water or the reliability and unequalled accuracy of our pressure regulators. The know-how acquired and developed over the years has resulted in FCDE's solutions being of the highest quality.

Markets served

Our products and solutions are typically designed for the following business sectors: industrial equipment, industrial automation, mobile systems, transportation, life sciences, beverage dispensers, and the control of fluids and processes.

Benefits

The modular design of our products integrating solenoid valves and separate electrical parts provides customers with greater flexibility by allowing them to use a variety of combinations. This increased flexibility allows distributors to reduce their stock of valves to a greater extent while continuing to offer the widest range. Parker also benefits from unrivalled experience in the development of custom products to the strictest technical, environmental, energy, and endurance requirements.



PARKER FCDE - GENEVA - SWITZERLAND



PARKER FCDE - MILAN - ITALY

Contents

Solenoid valves and pressure regulators for controlling fluids in the railway industry.....	04
A range of solenoid valves for fluid control applications in the railway industry	05
Solenoid Valves: Applications	06
Solenoid Valves: General specifications table.....	10
Solenoid Valves: Technical characteristics table.....	11
Coils for solenoid valves.....	12
Solenoid Valves: Dimensional drawings.....	14
Pressure Regulators: Applications	16
EPP3 pressure regulators: Technical characteristics table.....	17
EPP3 pressure regulators: Dimensional drawings.....	18



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Solenoid valves and pressure regulators for controlling fluids in the railway industry

Parker is the world leader in fluid movement and control technology. We provide solutions designed for the rail transport industry with products which are extremely reliable, even under the most demanding environmental conditions. In spite of extreme weather phenomena, high levels of vibration, the presence of dust and aggressive contamination, the railway industry seeks to become ever more competitive, so our technical knowledge and customer service skills will always be a guarantee of results.

Our solenoid valves and pressure regulators used for controlling fluids in the railway industry are fully suited to handling these difficult conditions, maximizing reliability for the customer by reducing rolling stock operating costs.

So, by working with a recognized world leader in fluids control and technology, you will be assured of the best service with a technology that meets all your requirements.

Collaboration... Creating solutions

Our world is much more than manufacturing standard components adapted for unique needs. Working together with you, we will produce solutions that not only meet your requirements but which also offer commercial and environmental advantages.

Our team of Parker engineers and technical support personnel aim to meet specifications and rigorous functional requirements to ensure the development of components and systems solutions that meet railway standards and meet application needs.

At Parker, we are committed to excellence, by encouraging transparency, creative interaction between professionals, and discussions on best practice.

We believe that the sharing of knowledge, skills, and experience provides the key to obtaining the most technically efficient and commercially viable results. Thus, from design to production, an open dialogue is always ensured.

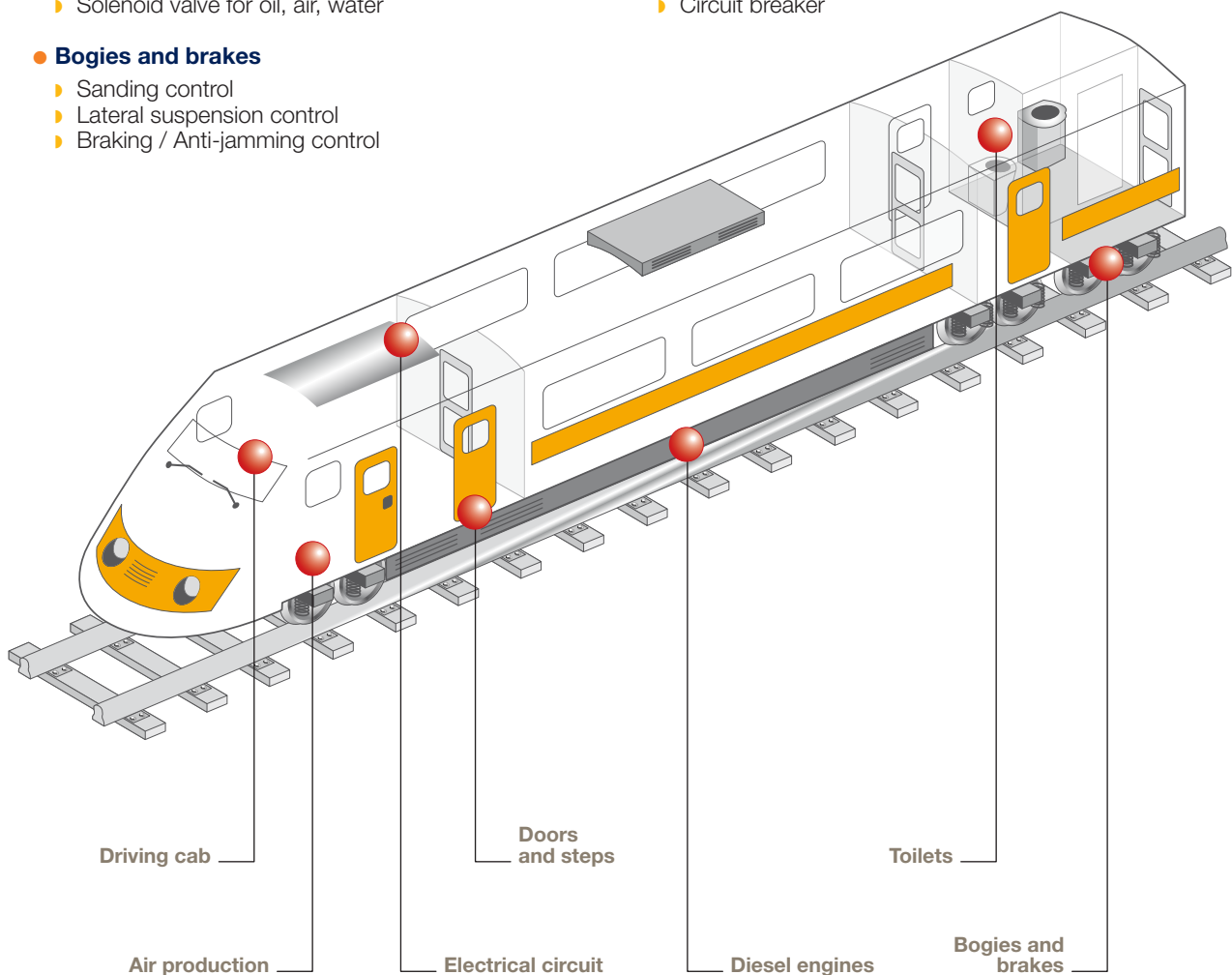


A range of solenoid valves for fluid control applications in the railway industry

The Parker FCDE range for the railway industry includes normally closed, normally open, or bi-stable 2/2 direct control solenoid valves; normally closed, normally open, or universal 3/2 direct control solenoid valves, and also pressure regulators for all fluids present in on-board equipment: air, oil, water, etc.

Here are some standard application examples for using solenoid valves and pressure regulators.

- **Driving cab**
 - ▶ Windscreen wiper control
 - ▶ Audible warning control
 - ▶ Cab heating control
- **Air production**
 - ▶ Condensate drain
- **Diesel engines**
 - ▶ Solenoid valve for oil, air, water
- **Bogies and brakes**
 - ▶ Sanding control
 - ▶ Lateral suspension control
 - ▶ Braking / Anti-jamming control
- **Toilets**
 - ▶ Drinking water supply
 - ▶ Toilet water supply
- **Doors and steps**
 - ▶ Outer door control
 - ▶ Step control
- **Electrical circuit**
 - ▶ Circuit breaker



Solenoid Valves

Applications

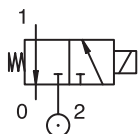
Driving cab



> Windscreen wiper control

Fluid: Air

Valve reference: E131K04



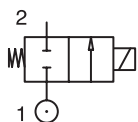
Benefits: Reduced dimensions, easy installation, good internal sealing.



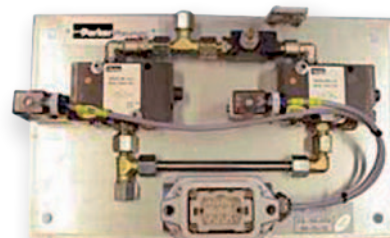
> Warning horn

Fluid: Air

Valve reference: E121K07



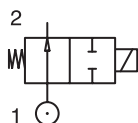
Benefits: Reduced dimensions, easy installation, long-life check valve.



> Cabin heating

Fluid: Hot water

Valve reference: Normally open 122KS4074A



Benefits: High flow rate, zero pressure difference.



Solenoid Valves

Applications

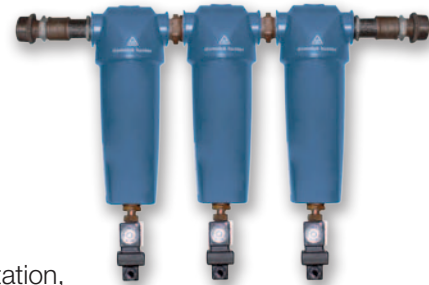
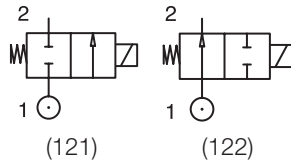
Air production



> Purge solenoid valve

Fluid: Air

Valve references: Normally closed E121K63-E121K0402-E121K04
Normally open 122K8406-122K8306-122K8311

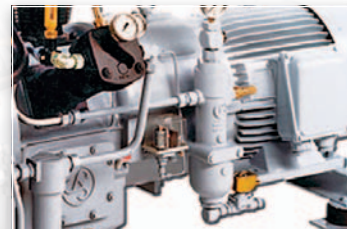
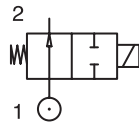


Benefits: Compact valves, limited power (9 W when hot), any orientation, great reliability, pilot can be delivered on its own (valve without body).

> Compressor vent solenoid valve

Fluid: Air

Valve references: Normally open 122K8408 -122K8406 - 122K8306 - 122K8311



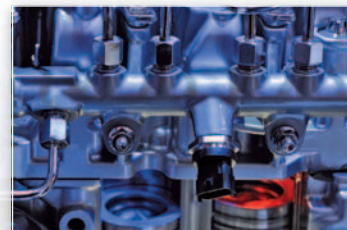
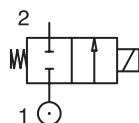
Benefits: Compact valves, limited power (9 W when hot), any orientation, great reliability, pilot can be delivered on its own (valve without body).

Diesel engine

> Water, air, or oil solenoid supply valve (lubrication system)

Fluid: Water, air, oil

Valve reference: E121K45



Benefits: Compact high flow rate valve (air 2,500 l/min, oil 20 l/min), limited power (9 W when hot).

Solenoid Valves

Applications

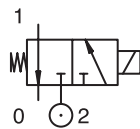
Bogies and brakes



> Sanding control

Fluid: Air

Valve references: 131M74 - 131M75



Benefits: Low power (2.5 W), simplified fitting plan, reduced dimensions.

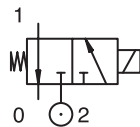


Electrical circuit

> Circuit breaker

Fluid: Air

Solenoid control valve with pneumatic actuator: 131FS9366



Benefits: Usable at low temperature (-40°C), manual control, easy installation.



Solenoid Valves

Applications

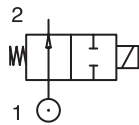
Doors and steps



> Door control

Fluid: Air

Valve references:
Normally open
122K8306 - 122K8406

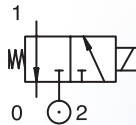


Benefits: Safety valves (open circuit in the event of a supply fault).

> Step control

Fluid: Air

Valve references:
E131F4350 - 131F4650



Benefits: Compact valves, easy installation, manual control.



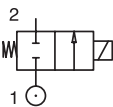
Toilets



> Drinking water supply

Fluid: Water

Valve ref.: 121V5163

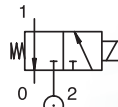


Benefits: Stainless steel 303, ruby check valve, compatible with drinking water, direct control, high flow rate valve.

> Toilet water supply

Fluid: Air

Valve ref.: 131T21



Benefits: Compact valve (3 connections integrated into the valve body).



Solenoid Valves

General specifications table

Function	2/2 NF & NO 3/2 NF & NO & Universal
Technology	Direct control
Fluid	All fluids (air, water, oils, etc.)
Max. pressure differential	Between 0 and 40 bar (depending on orifice)
Connection	¼"G - ½"G - Flanged and specials
Manual control	"Quarter turn" type - Available according to reference
Seat seal	FKM, EPDM, Ruby, PCTFE, PUR
Material - Body	Brass or stainless steel 303
Material - Control	Stainless Steel
Material - Electrical part	PBT (polybutylene terephthalate) Class F or PPS (phenylene polysulfide) Class H
Protection	IP65 with DIN 43650A connector
Power Supply	12, 24, 48, 72, 90, 96, 110 VDC & 220-230/50 VAC
Electrical voltage range *	-25% to +30%
Electrical power	9 W under 100% ED (12.5 W under 0% ED) 2.5 W under 100% ED (3 W under 0% ED) 5 W under 100% ED (6.5 W under 0% ED)
Ambient temperature*	-40°C to +50°C with 100% ED permanent engagement with Class F coil -40°C to +70°C with 100% ED permanent engagement with Class H coil
Fluid temperature*	-40°C to +100°C
Storage temperature	-40°C to +80°C
Service life	> 1 million operations
Vibration resistance	Test conducted on request
Impact resistance	Test conducted on request
Internal leakage rate*	≤2 Ncm ³ /min for elastomer check valve down to -15°C
Electromagnetic compatibility	DIN EN 61000-6-3 compatibility and DIN EN 61000-6-2 immunity
RoHS	In accordance with current standard
Fire/smoke standard	Product not submitted due to the bulk of the materials concerned in accordance with NF F16-101 / 102 / 103

* For extreme combined conditions, please contact the factory.

Solenoid Valves

Technical characteristics table

2-way valves

Reference	Function	Connection	Body material	Orifice (mm)	Qn (l/min)	Pressure range (bar)	Seat seal	Weight of solenoid valve (g)	Drawing
121F67	2/2 NF	Flanged	Brass	1.5	80	0-25	Ruby	280	A
121F4606	2/2 NF	Flanged	Brass	2	140	0-10	FKM	280	A
121F63	2/2 NF	Flanged	Brass	2.5	220	0-10	Ruby	280	A
121F64	2/2 NF	Flanged	Brass	3	320	0-7	Ruby	280	A
E121K0402	2/2 NF	¼"G	Brass	1.5	80	0-20	FKM	320	B
E121K04	2/2 NF	¼"G	Brass	1.5	80	0-25	PCTFE	320	B
121K0605	2/2 NF	¼"G	Brass	2	140	0-10	FKM	320	B
E121K07	2/2 NF	¼"G	Brass	2.5	220	1-10	PCTFE	320	B
E121K63	2/2 NF	¼"G	Brass	2.5	220	0-10	Ruby	280	B
121K0302	2/2 NF	¼"G	Brass	3	320	0-7	FKM	280	B
E121K45	2/2 NF	½"G	Brass	11	2,500	0-0.3	FKM	430	C
121V5163	2/2 NF	¼"G	Stainless steel	5	(kV 10)	0-2	Ruby	410	D
122K8406	2/2 NO	¼"G	Brass	1.5	80	0-20	FKM	320	B
122K8408	2/2 NO	¼"G	Brass	1.5	80	0-40	Ruby	320	B
122K8306	2/2 NO	¼"G	Brass	2.5	200	0-12	FKM	320	B
122K8311	2/2 NO	Pilot	-	2.5	200	0-12	FKM	320	B
122KS4074A	2/2 NO	20 mm dia.	Brass	18	(kV 50)	0-2	FKM	930	-

3-way valves

Reference	Function	Connection	Body material	Orifice (mm) (1) (2)	Qn (l/min)	Pressure range (bar)	Seat seal	Weight of solenoid valve (g)	Drawing
131FS9366*	3/2 NF	Flanged	Brass	1.5 / 1.5	80 / 80	2-10	PUR	280	E
E131F44	3/2 NF	Flanged	Brass	1.5 / 1.5	80 / 80	0-15	FKM	280	E
131F46	3/2 NF	Flanged	Brass	2 / 2.5	140 / 220	0-10	FKM	280	E
131F4650*	3/2 NF	Flanged	Brass	2 / 2.5	140 / 220	0-10	FKM	280	E
E131F43	3/2 NF	Flanged	Brass	2.5 / 2.5	220 / 220	0-7	FKM	280	E
E131F4350*	3/2 NF	Flanged	Brass	2.5 / 2.5	220 / 220	0-7	FKM	280	E
E131K04	3/2 NF	¼"G	Brass	1.5 / 1.5	80 / 80	0-16	FKM	320	F
E131K06	3/2 NF	¼"G	Brass	2 / 2.5	140 / 220	0-10	FKM	320	F
E131K03	3/2 NF	¼"G	Brass	2.5 / 2.5	220 / 220	0-7	FKM	320	F
131M74	3/2 NF	Flanged	Brass	1.5 / 1.5	70 / 70	0-7	FKM	120	G
131M75	3/2 NF	Flanged	Brass	1.2 / 1.5	50 / 70	0-10	FKM	120	G
131T21	3/2 NF	¼"G	Brass	4.5 / 6	500 / 750	0-2	FKM	400	H
132F44	3/2 NO	Flanged	Brass	1.5 / 1.5	80 / 80	0-16	FKM	280	E
132F46	3/2 NO	Flanged	Brass	2 / 2	125 / 125	0-10	FKM	280	E
132F4301	3/2 NO	Flanged	Brass	2.5 / 2.5	160 / 160	0-9	PUR	280	E
132K04	3/2 NO	¼"G	Brass	1.5 / 1.5	80 / 80	0-16	FKM	320	F
133F46	3/2 Universal	Flanged	Brass	2 / 2	140 / 140	0-7	FKM	280	E

* With manual control.

Coils for solenoid valves

Coils for connecting to DIN plugs



> 32 mm coils

These coils may be fitted on all Parker solenoid valves from this catalogue (Except for 131M74 and 131M75 use coil on page 13).

Encapsulated assembly comprising a coil, a magnetic circuit, and a plug-in connector.

The synthetic casing material (PBT or PPS) protects the compact assembly against the penetration of foreign bodies e.g. : dust, oil, water, etc.).

Easy to fit in confined spaces.

Protection against impacts and corrosion.

Coils comply with the European "low voltage" directive.



Features		Standard			High temperature				
References (without DIN plug)		481865			492453				
References (with DIN plug)		482725			492726				
Protection index		IP65 as per IEC/EN 60529 standards							
Insulation class		F 155°C			H 180°C				
Electrical connection		The coil is connected using a 2P+E plug as per EN 175301-803, type A.							
Ambient temperature		between -40°C and +50°C The application is also limited by the valve temperature range.							
Power Supply	DC	Pn (hot)	9 W			9 W			
		P (cold) 20°C	12 W			12 W			
	AC	Pn (holding)	8 W			8 W			
		Attraction (cold)	26VA (9 W)			26VA (9 W)			
Weight		130 g (without plug)							
"Un" voltages		VAC/Hz	Code	VDC	Code	VAC/Hz	Code	VDC	Code
between -10% and +10% of Un		220-230/50	3D	12	C1	220-230/50	3D	12	C1
				24	C2			24	C2
				48	C4			48	C4
				72	ON			110	C5
				90	M8				
				96	1T				
110	C5								

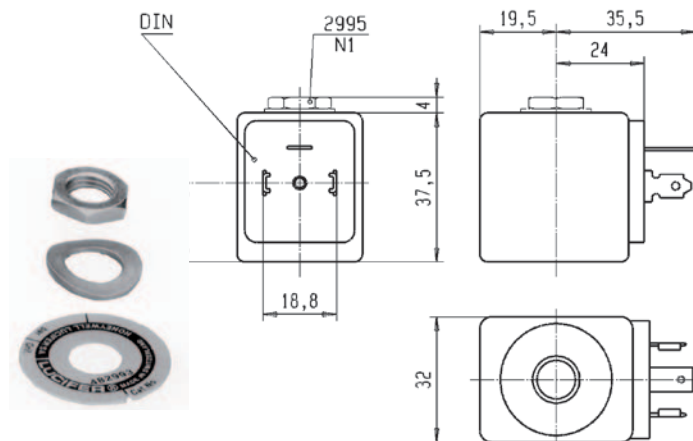
To order a coil, choose ref. coil + the voltage code, for example: 481865 for 24VDC = 481865C2

These coils must be used with suitable housings.

See examples below:

The coil assembly kit with reference 2995 corresponds to the numbering system for housing (valve - housing - coil - voltage).

It comprises a name plate with information on the type of valve with its main specifications, a washer, and a nut for fixing the 32 mm coil on the valve.



Coils for solenoid valves

Coils for connecting to DIN plugs



> 22 mm coils

These coils may be fitted on Parker solenoid valves models 131M74, 131M75.

This coil was designed for valves fitted with a set of miniature tubes (series 2000 valves).

Encapsulated assembly comprising a coil, a magnetic circuit and a plug-in connector.

The synthetic casing material protects the compact assembly against the penetration of foreign bodies e.g. : dust, oil, water, etc.). Easy to fit in confined spaces - Protection against impacts and corrosion. This coil meets IEC/CENELEC safety standards and also the European "low voltage" directive.



Features		Low power			High power				
References (without DIN plug)		488980			481180				
References (with DIN plug)		481045			481530				
Protection index		IP65 as per IEC/EN 60529 standards (with DIN plug).							
Insulation class		F 155 C							
Electrical connection		The coil is connected using a 2P+E plug as per EN 175301-803, type B.							
Ambient temperature		between -40°C and +50°C The application is also limited by the valve temperature range.							
Power Supply	DC	Pn (hot)	2.5 W			5 W			
		P (cold) 20°C	3 W			6.5 W			
	AC	Pn (holding)	2 W			4 W			
		Attraction (cold)	5.7 VA (2.5 W)			8.9 VA (5 W)			
Weight		100 g with DIN plug							
"Un" voltages		VAC/Hz	Code	VDC	Code	VAC/Hz	Code	VDC	Code
between -10% and +10% of Un		220-230/50	3D	12 24 48 110	C1 C2 C4 C5	220-230/50	3D	12 24 110	C1 C2 C5

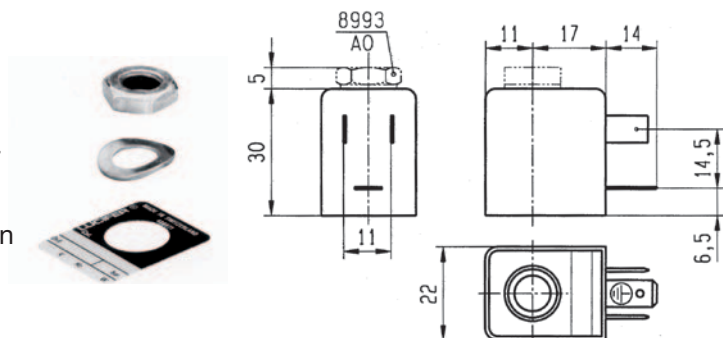
To order a coil, choose ref. coil + the voltage code, for example: 488980 for 24V dc = 488980C2
Other possible voltages can be found in the voltage codes table at the end of the coils section.

These coils must be used with suitable housings.

See examples below:

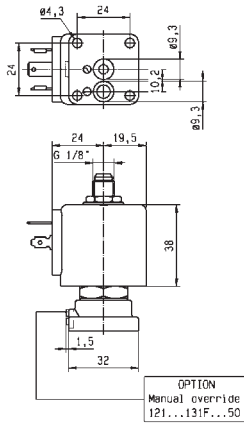
The coil assembly kit with reference **8993** corresponds to the numbering system for housing (valve - housing - coil - voltage).

It comprises a name plate with information on the type of valve with its main specifications, a washer and a nut for fixing the 22 mm coil on the valve.

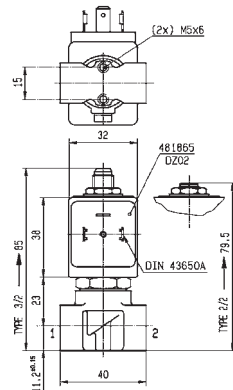
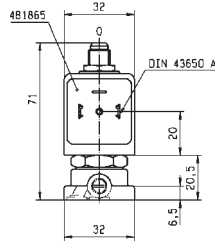


2-way solenoid valves

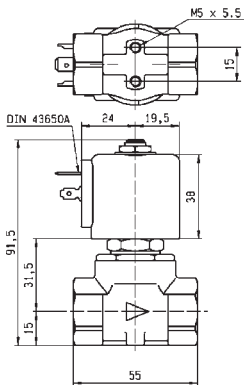
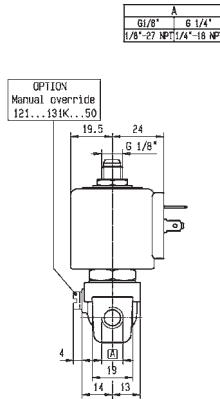
Dimensional drawings



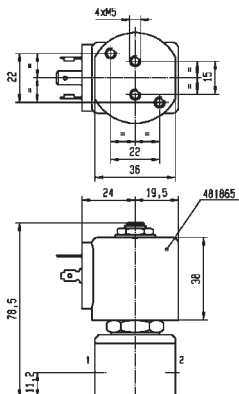
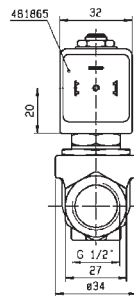
Drawing A



Drawing B

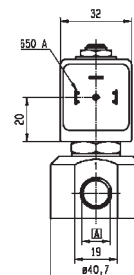


Drawing C



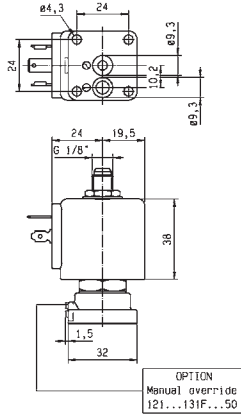
Drawing D

A	
G 1/8"	6 1/4"
G 1/8"	6 1/4"

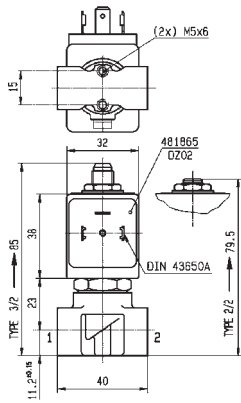
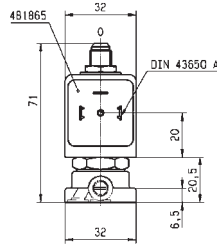


3-way solenoid valves

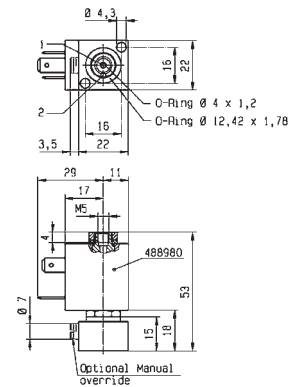
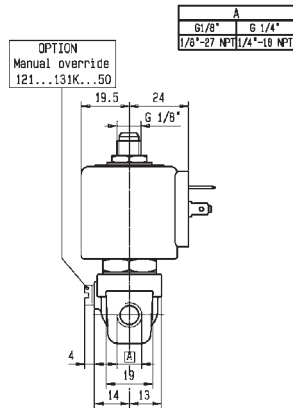
Dimensional drawings



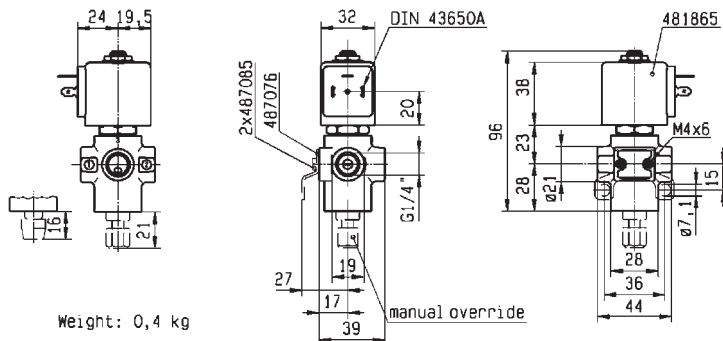
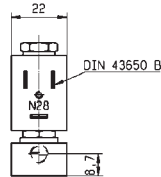
Drawing E



Drawing F



Drawing G



Drawing H

Weight: 0,4 kg



Pressure regulators

Applications

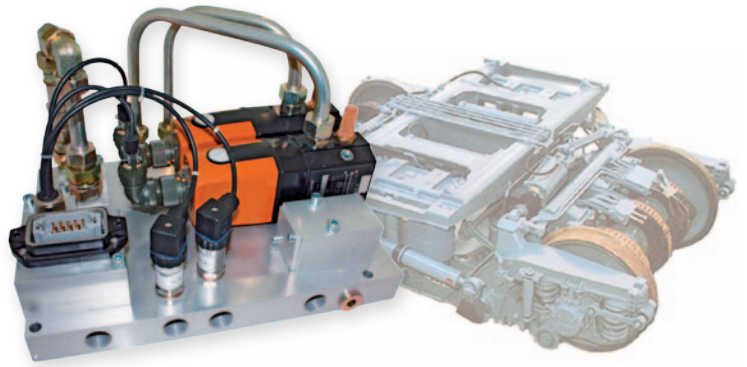
Bogies and brakes



> Lateral suspension control

Pressure regulator mounted on a "Pendolino" type train. The pressure regulator ensures that the train is re-centered in relation to the track, counter-balancing the centrifugal force created when negotiating bends.

Pressure regulator references: EPP3BC41I10410
EPP3BC41I12810A - EPP3BC41I17510 EPP3BC41I17610



> Braking / Anti-skidding control

Pressure regulator references: EPP3BF41I10410 / EPP3BF41U10410



> Benefits

- Low consumption (3.5 W)
- Long service life (more than 300 million cycles)
- Integrated discharge valve
- Low temperature operation (down to -40°C)
- Product flanged as per ISO 3 (for EPP3 BF, etc.)
- Easy to install
- Meets EN50121.3.2, EN50155, EN61373
- Service kit and maintenance kit available

EPP3 pressure regulators

Technical characteristics table

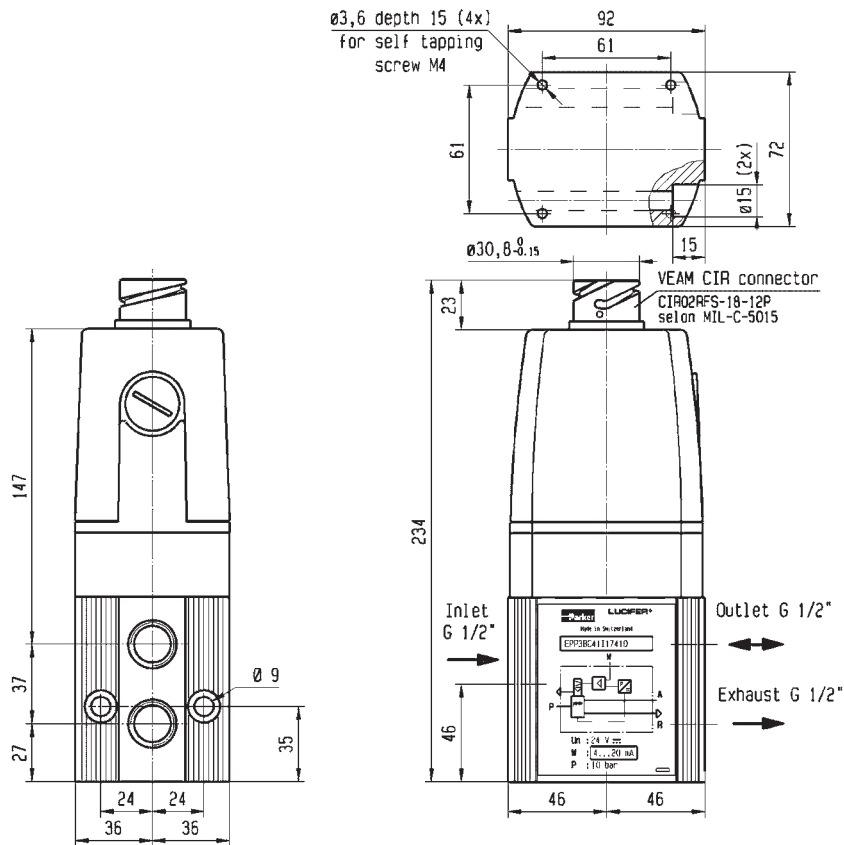
Pressure regulators

Regulator reference	Connection	Pressure range (bar)	Control signal	Operating range	Connector type	Electrical output	Weight (kg)
EPP3BC41110410	½"G	0.2-10 bar	4-20 ma	-40°C +70°C	VEAM	Upper	2.1
EPP3BC41112810A	½"G	0.2-10 bar	4-20 ma	-30°C +70°C	VEAM	Upper	2.1
EPP3BC41117510	½"G	0.2-10 bar	4-20 ma	-30°C +70°C	VEAM	Lateral	2.1
EPP3BC41117610	½"G	0.2-10 bar	4-20 ma	-40°C +70°C	VEAM	Lateral	2.1
EPP3BF41110410	Flanged ISO 3	0.2-10 bar	4-20 ma	-40°C +70°C	VEAM	Upper	2.1
EPP3BF41U10410	Flanged ISO 3	0.2-10 bar	0-10 V	-40°C +70°C	VEAM	Upper	2.1

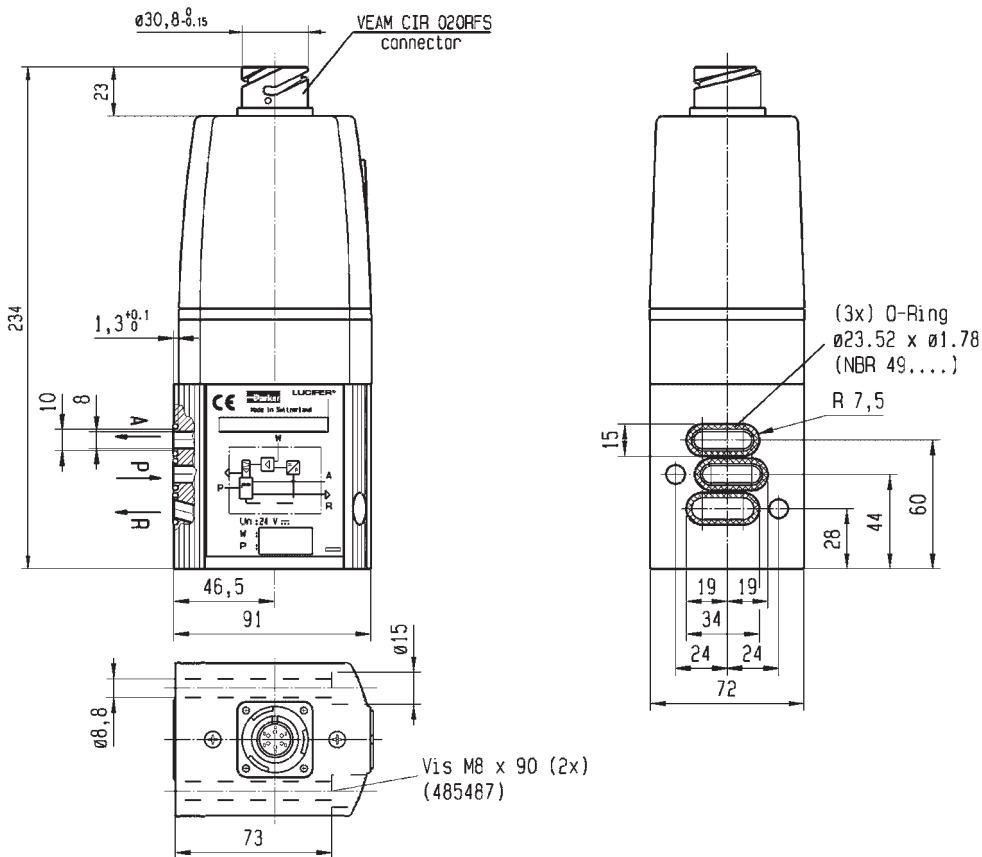


EPP3 pressure regulators

Dimensional drawings



EPP3 with 1/2" G connection



EPP3 with ISO 3 flange connection





Parker's Motion & Control Technologies

At Parker, we're guided by a relentless drive to help our customers become more productive and achieve higher levels of profitability by engineering the best systems for their requirements. It means looking at customer applications from many angles to find new ways to create value. Whatever the motion and control technology need, Parker has the experience, breadth of product and global reach to consistently deliver. No company knows more about motion and control technology than Parker. For further info call 00800 27 27 5374



Aerospace Key Markets

Aftermarket services
Commercial transports
Engines
General & business aviation
Helicopters
Launch vehicles
Military aircraft
Missiles
Power generation
Regional transports
Unmanned aerial vehicles

Key Products

Control systems & actuation products
Engine systems & components
Fluid conveyance systems & components
Fluid metering, delivery & atomization devices
Fuel systems & components
Fuel tank inerting systems
Hydraulic systems & components
Thermal management
Wheels & brakes



Climate Control Key Markets

Agriculture
Air conditioning
Construction Machinery
Food & beverage
Industrial machinery
Life sciences
Oil & gas
Precision cooling
Process
Refrigeration
Transportation

Key Products

Accumulators
Advanced actuators
CO₂ controls
Electronic controllers
Filter driers
Hand shut-off valves
Heat exchangers
Hose & fittings
Pressure regulating valves
Refrigerant distributors
Safety relief valves
Smart pumps
Solenoid valves
Thermostatic expansion valves



Electromechanical Key Markets

Aerospace
Factory automation
Life science & medical
Machine tools
Packaging machinery
Paper machinery
Plastics machinery & converting
Primary metals
Semiconductor & electronics
Textile
Wire & cable

Key Products

AC/DC drives & systems
Electric actuators, gantry robots & slides
Electrohydraulic actuation systems
Electromechanical actuation systems
Human machine interface
Linear motors
Stepper motors, servo motors, drives & controls
Structural extrusions



Filtration Key Markets

Aerospace
Food & beverage
Industrial plant & equipment
Life sciences
Marine
Mobile equipment
Oil & gas
Power generation & renewable energy
Process
Transportation
Water Purification

Key Products

Analytical gas generators
Compressed air filters & dryers
Engine air, coolant, fuel & oil filtration systems
Fluid condition monitoring systems
Hydraulic & lubrication filters
Hydrogen, nitrogen & zero air generators
Instrumentation filters
Membrane & fiber filters
Microfiltration
Sterile air filtration
Water desalination & purification filters & system



Fluid & Gas Handling Key Markets

Aerial lift
Agriculture
Bulk chemical handling
Construction machinery
Food & beverage
Fuel & gas delivery
Industrial machinery
Life sciences
Marine
Mining
Mobile
Oil & gas
Renewable energy
Transportation

Key Products

Check valves
Connectors for low pressure fluid conveyance
Deep sea umbilicals
Diagnostic equipment
Hose couplings
Industrial hose
Mooring systems & power cables
PTFE hose & tubing
Quick couplings
Rubber & thermoplastic hose
Tube fittings & adapters
Tubing & plastic fittings

Hydraulics Key Markets

Aerial lift
Agriculture
Alternative energy
Construction machinery
Forestry
Industrial machinery
Machine tools
Marine
Material handling
Mining
Oil & gas
Power generation
Refuse vehicles
Renewable energy
Truck hydraulics
Turf equipment

Key Products

Accumulators
Cartridge valves
Electrohydraulic actuators
Human machine interfaces
Hybrid drives
Hydraulic cylinders
Hydraulic motors & pumps
Hydraulic systems
Hydraulic valves & controls
Hydrostatic steering
Integrated hydraulic circuits
Power take-offs
Power units
Rotary actuators
Sensors

Pneumatics Key Markets

Aerospace
Conveyor & material handling
Factory automation
Life science & medical
Machine tools
Packaging machinery
Transportation & automotive

Key Products

Air preparation
Brass fittings & valves
Manifolds
Pneumatic accessories
Pneumatic actuators & grippers
Pneumatic valves & controls
Quick disconnects
Rotary actuators
Rubber & thermoplastic hose & couplings
Structural extrusions
Thermoplastic tubing & fittings
Vacuum generators, cups & sensors

Process Control Key Markets

Alternative fuels
Biopharmaceuticals
Chemical & refining
Food & beverage
Marine & shipbuilding
Medical & dental
Microelectronics
Nuclear Power
Offshore oil exploration
Oil & gas
Pharmaceuticals
Power generation
Pulp & paper
Steel
Water/wastewater

Key Products

Analytical Instruments
Analytical sample conditioning products & systems
Chemical injection fittings & valves
Fluoropolymer chemical delivery fittings, valves & pumps
High purity gas delivery fittings, valves, regulators & digital flow controllers
Industrial mass flow meters/ controllers
Permanent no-weld tube fittings
Precision industrial regulators & flow controllers
Process control double block & bleeds
Process control fittings, valves, regulators & manifold valves

Sealing & Shielding Key Markets

Aerospace
Chemical processing
Consumer
Fluid power
General industrial
Information technology
Life sciences
Microelectronics
Military
Oil & gas
Power generation
Renewable energy
Telecommunications
Transportation

Key Products

Dynamic seals
Elastomeric o-rings
Electro-medical instrument design & assembly
EMI shielding
Extruded & precision-cut, fabricated elastomeric seals
High temperature metal seals
Homogeneous & inserted elastomeric shapes
Medical device fabrication & assembly
Metal & plastic retained composite seals
Shielded optical windows
Silicone tubing & extrusions
Thermal management
Vibration dampening

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