aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding

Solenoid valves and pressure regulators for the railway industry

Parker

ENGINEERING YOUR SUCCESS.

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, drink 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

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.

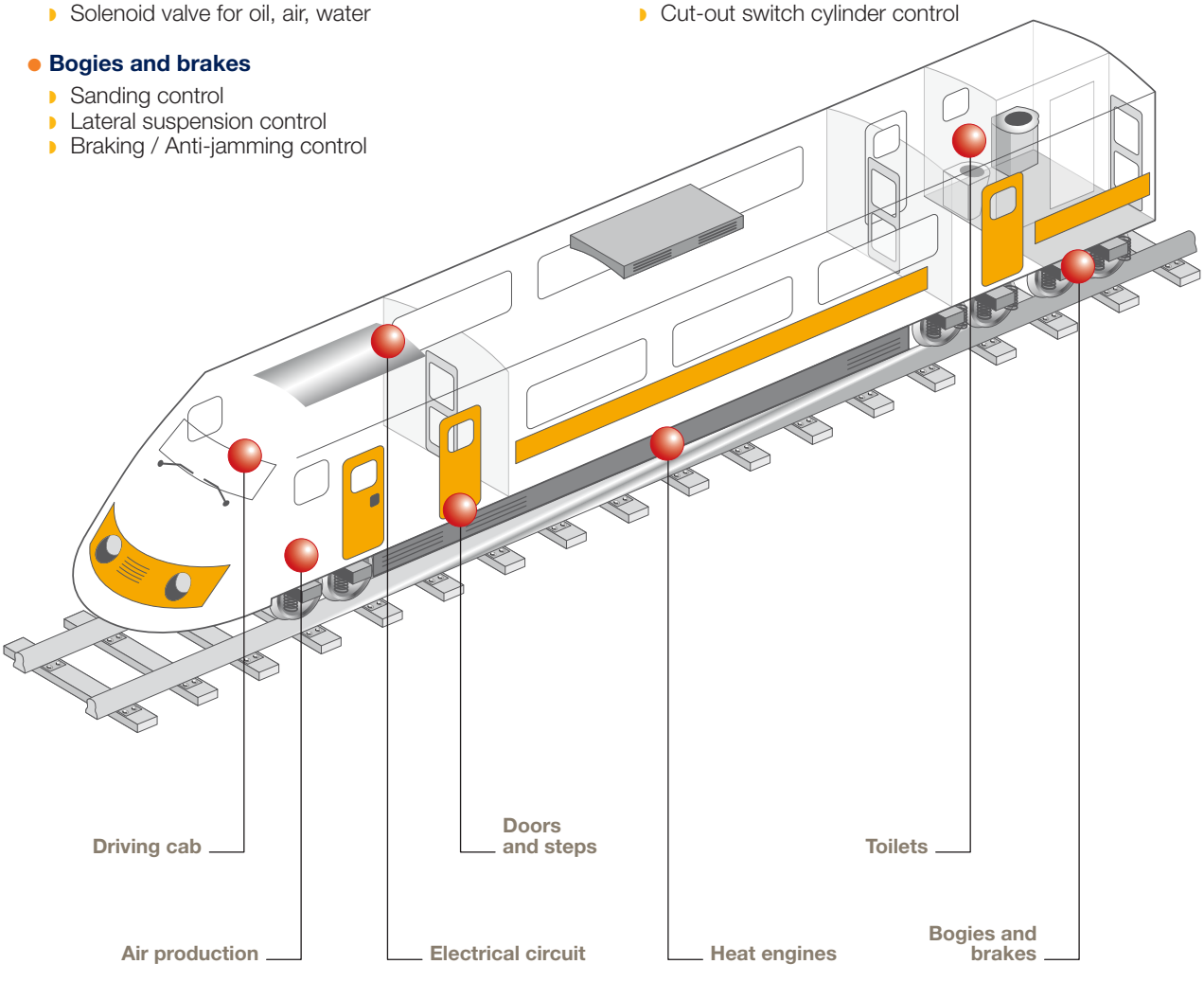
We believe that the sharing of knowledge, skills, and experience provides the key to obtaining the most technically efficient and commercially viable results. Thus, from design to production, an open dialogue is always ensured.

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
- **Heat 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**
  - Cut-out switch cylinder control



Solenoid Valves

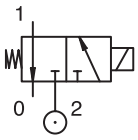
Applications

Driving cab

> Windscreen wiper control

Fluid: Air

Valve reference: E131K04

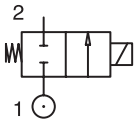


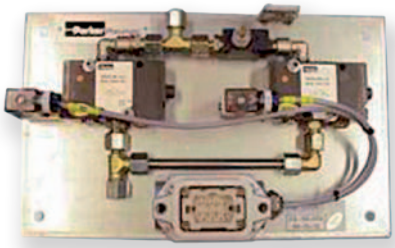
Benefits: Reduced dimensions, easy installation, good internal sealing.

> Audible warning control

Fluid: Air

Valve reference: E121K07



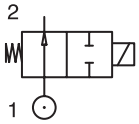


Benefits: Reduced dimensions, easy installation, long-life check valve.

> Heating the driving cab

Fluid: Hot water

Valve reference: Normally open 122KS4074A



Benefits: High flow rate, zero pressure difference.

Solenoid Valves

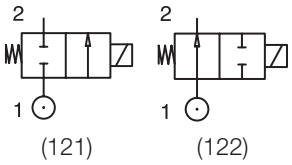
Applications

Air production

> Condensate drain solenoid valve

Fluid: Air

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

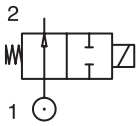


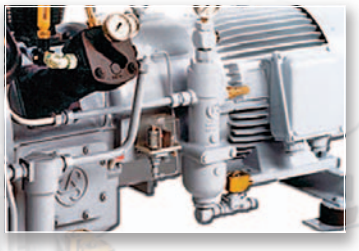
Benefits: Compact valves, limited power (9 W when hot), any orientation, great reliability, pilot can be delivered on its own (valve without body).

> Compressor vent solenoid valve

Fluid: Air

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





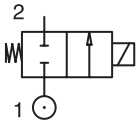
Benefits: Compact valves, limited power (9 W when hot),
any orientation, great reliability, pilot can be delivered on its own (valve without body).

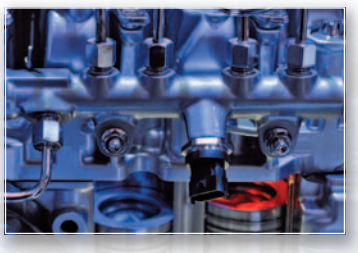
Heat engine

> 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

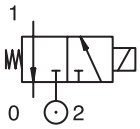
Applications

Bogies and brakes

> Sanding control

Fluid: Air

Valve references: 131M74 - 131M75



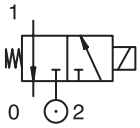
Benefits: Low power (2.5 W), simplified fitting plan, reduced dimensions.

Electrical circuit

> Electrical circuit isolator

Fluid: Air

Solenoid control valve with pneumatic actuator: 131FS9366



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

Solenoid Valves

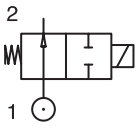
Applications

Doors and steps

> Outer door control

Fluid: Air

Valve references:
Normally open
122K8306 - 122K8406

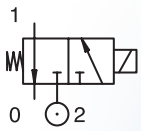


Benefits: Safety valves (open circuit in the event of a supply fault).

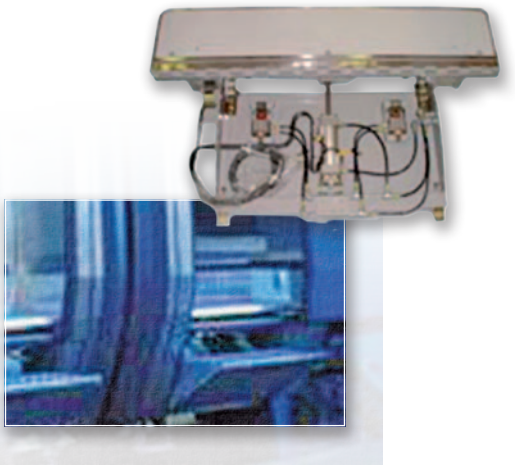
> Step control

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: Water

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 the flow-though port)
Connection	¼"G - ½"G - Flanged and specials
Manual control	"Quarter turn" type - Available according to reference
Type of check valves	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% (-10% to +10% under all operating conditions)
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	Port (mm)	Qn (l/min)	Pressure range (bar)	Check valve	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	Port (mm) (1) (2)	Qn (l/min)	Pressure range (bar)	Check valve	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 in the specific electrical group.

Encased 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.

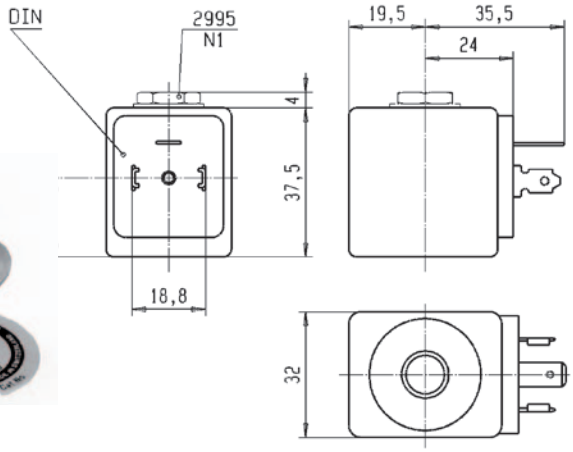
Features			Standard				High temperature			
References (without DIN plug) References (with DIN plug)			481865 482725				492453 492726			
Protection index			**IP65** as per IEC/EN 60529 standards							
Insulation class			F 155°C				H 180°C			
Electrical connection			The coil is connected using a 2P+E 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 24 48 72 90 96 110	C1 C2 C4 ON M8 1T C5	220-230/50	3D	12 24 48 110	C1 C2 C4 C5

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

These coils must be used with suitable enclosures.
See examples below:

The coil assembly kit with reference **Référence 2995** corresponds to the numbering system for Lucifer® valve enclosures (valve - enclosure - 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 all Parker solenoid valves in the specific electrical group.

See the "Electrical group" column on the valve pages. This coil was designed for valves fitted with a set of miniature tubes (series 2000 valves).

Encased 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.

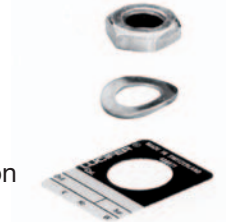
Features			Low power				High power			
References (without DIN plug) References (with DIN plug)			488980 481045				481180 481530			
Protection index			**IP65** as per IEC/EN 60529 standards (with DIN plug).							
Insulation class			F 155 C							
Electrical connection			The coil is connected using a 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

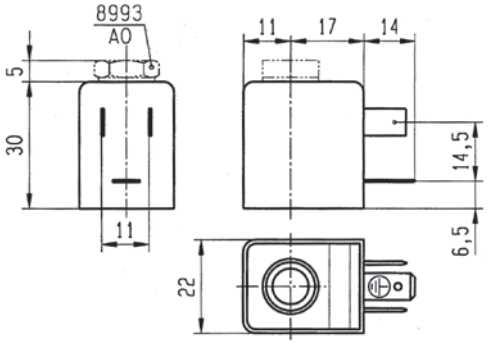
To order a coil, choose ref. coil + the voltage code, for example: **488980** for **24V dc = 488980C2**
Other possible voltages can be found in the voltage codes table at the end of the coils section.

These coils must be used with suitable enclosures.
See examples below:

The coil assembly kit with reference **Référence 8993** corresponds to the numbering system for Lucifer® valve enclosures (valve - enclosure - coil - voltage).

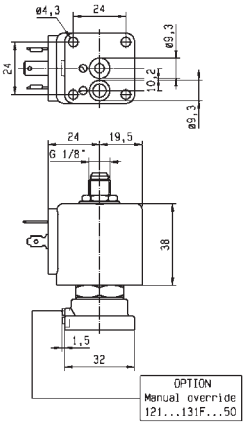
It comprises a name plate with information on the type of valve with its main specifications, a washer and a nut for fixing the 22 mm coil on the valve.

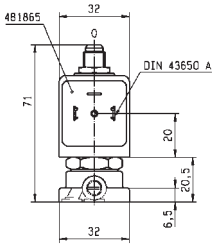




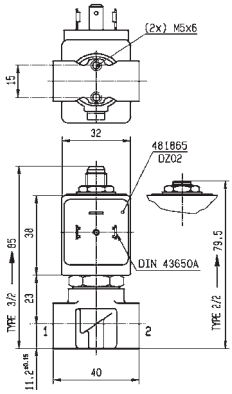
2-way solenoid valves

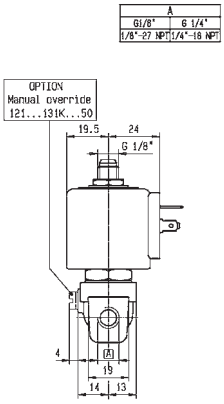
Dimensional drawings



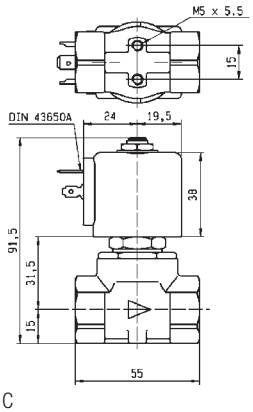


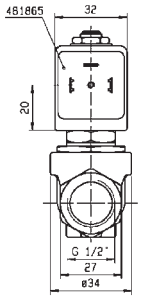
Drawing A



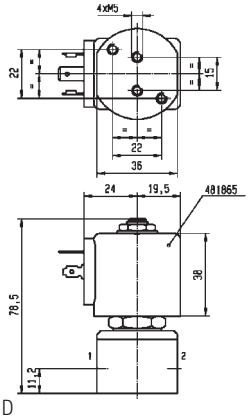


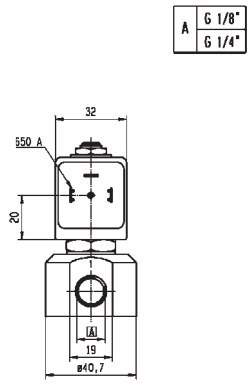
Drawing B





Drawing C

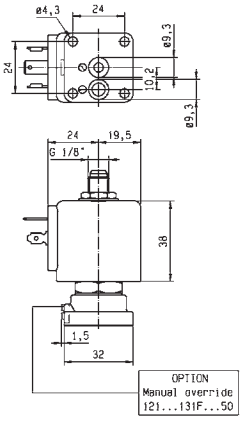


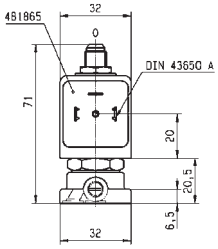


Drawing D

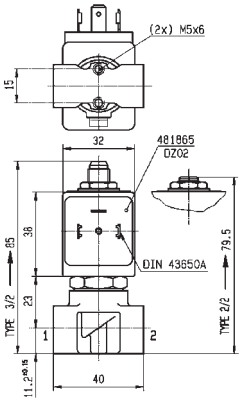
3-way solenoid valves

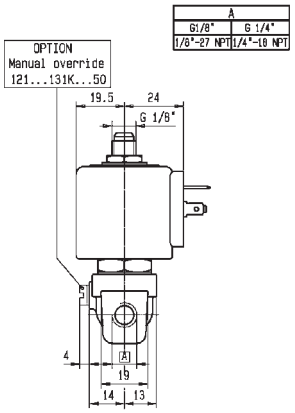
Dimensional drawings



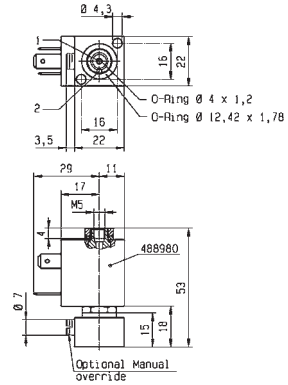


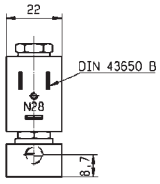
Drawing E



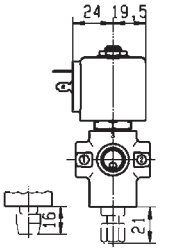


Drawing F

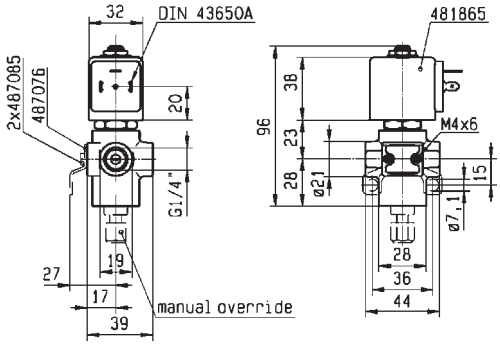




Drawing G



Weight: 0,4 kg



Drawing H

Pressure regulators

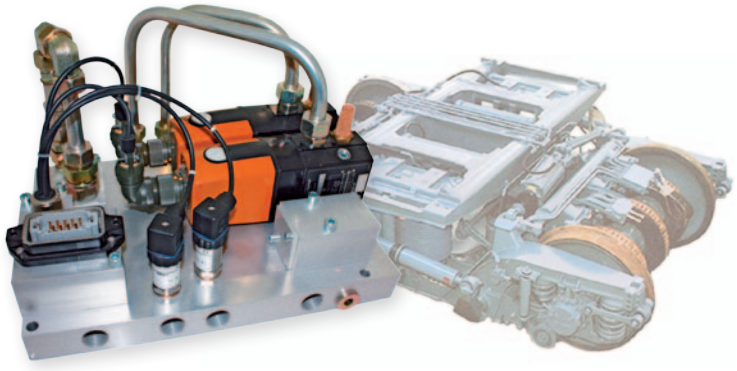
Applications

Bogeys and brakes

> Lateral suspension control

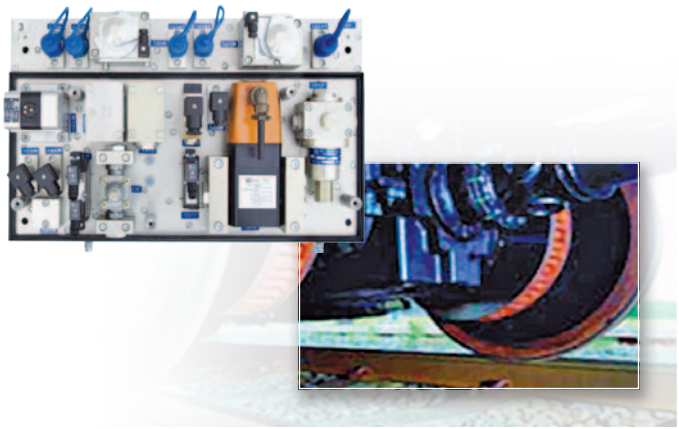
Pressure regulator mounted on a "Pendolino" type train.
The pressure regulator ensures that the train is re-centered in relation to the track, counter-balancing the centrifugal force created when negotiating bends.

Pressure regulator references: EPP3BC41I10410
EPP3BC41I12810A - EPP3BC41I17510 EPP3BC41I17610



> Braking / Anti-jamming 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 possible (kit or maintenance)

EPP3 pressure regulators

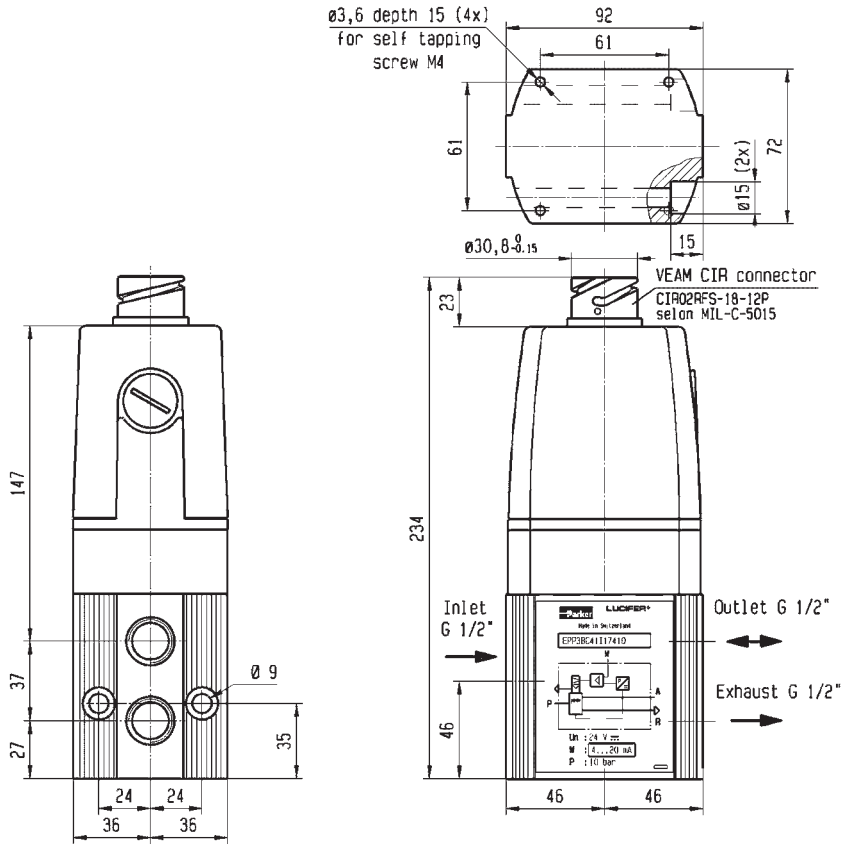
Technical characteristics table

Pressure regulators

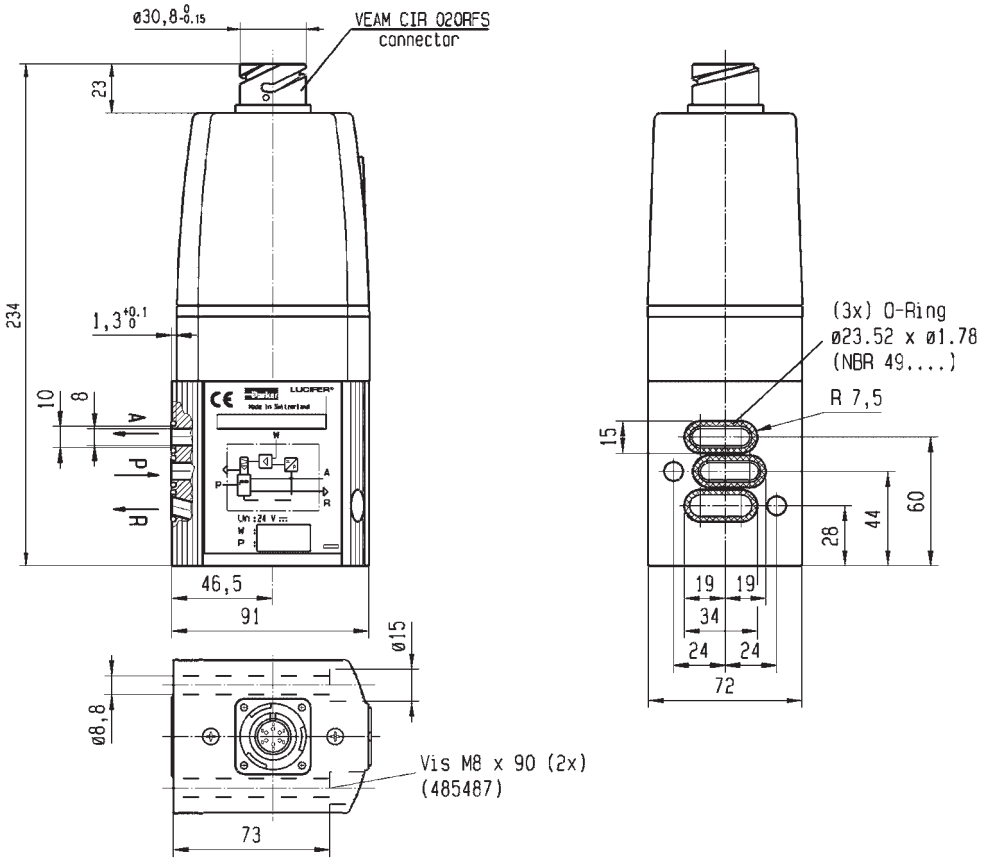
Regulator reference	Connection	Pressure range (bar)	Control signal	Operating range	Connector type	Electrical output	Weight (kg)
EPP3BC41I10410	½"G	0.2-10 bar	4-20 ma	-40°C +70°C	VEAM	Upper	2.1
EPP3BC41I12810A	½"G	0.2-10 bar	4-20 ma	-30°C +70°C	VEAM	Upper	2.1
EPP3BC41I17510	½"G	0.2-10 bar	4-20 ma	-30°C +70°C	VEAM	Lateral	2.1
EPP3BC41I17610	½"G	0.2-10 bar	4-20 ma	-40°C +70°C	VEAM	Lateral	2.1
EPP3BF41I10410	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 ½"G connection



EPP3 with ISO 3 flange connection