DBR Automation

The Drive & Control Company

Rexroth Bosch Group

The New AES Fieldbus System: A Rexroth Pneumatics Innovation

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Link structure AES

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Valve systems
Series AV03

Interview

Interview with Theo Paulus from Bosch Rexroth AG, Laatzen

Press release

Electric Drives and Controls | Hydraulics | Linear Motion and Assembly Technologies | Pneumatics | Service

Rexroth
Bosch Group

Field bus connections → Link structure AES

Link structure AES

Brochure

Field bus connections → Link structure AES

Link structure AES

Bus coupler

Field bus connection with I/O functionality
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► for AES — **5**

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Spring clamp element
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Part numbers marked in bold are available from the central warehouse in Germany, see the shopping basket for more detailed information
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Field bus connection with I/O functionality

► Bus coupler ► Field bus protocol: PROFIBUS DP / ProfiNet IO / EtherCAT ► for AV series valves, for AES series I/O modules

16456

Ambient temperature min./max.	-10 °C / +60 °C
Protection class, with plug	IP 65
Operational voltage electronics	24 V DC
Electronics voltage tolerance	-25% / +25%
Power consumption electronics	0.1 A
Operational voltage valves	24 V DC
Number of solenoid coils	128
Number of valve positions	64
I/O extension possible, Max.	10
Generic emission standard in accordance with norm	EN 61000-6-4
Generic immunity standard in accordance with norm	EN 61000-6-2
Materials:	
Housing	Polyamide, fiber-glass reinforced

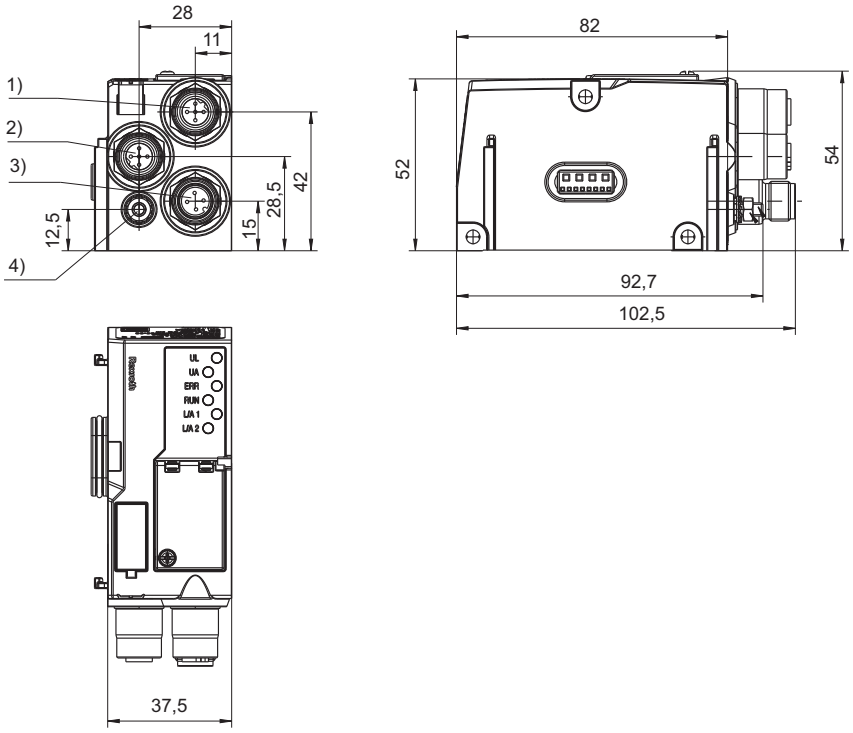
Technical Remarks
■ You will find assignment schemes for the product in the operating instructions, or contact the nearest Bosch Rexroth sales office.

Field bus protocol	Communication port Bus IN	Communication port Bus OUT	power supply	Number of inputs	Number of outputs	Weight	Part No.
						[kg]	
PROFIBUS DP	Plug (male), M12, 5-pin, B-coded	Socket (female), M12, 5-pin, B-coded	Plug (male), M12, 4-pin, A-coded	512 bit	512 bit	0.16	R412018218
ProfiNet IO	Socket (female), M12, 4-pin, D-coded	Socket (female), M12, 4-pin, D-coded	Plug (male), M12, 4-pin, A-coded	512 bit	512 bit	0.175	R412018223
EtherCAT	Socket (female), M12, 4-pin, D-coded	Socket (female), M12, 4-pin, D-coded	Plug (male), M12, 4-pin, A-coded	512 bit	512 bit	0.175	R412018225
Scope of delivery: Incl. mounting screws 3x							

Field bus connection with I/O functionality

► Bus coupler ► Field bus protocol: PROFIBUS DP / ProfiNet IO / EtherCAT ► for AV series valves, for AES series I/O modules

Dimensions



1) Bus IN 2) Bus OUT 3) Power supply 4) Ground

End plate left

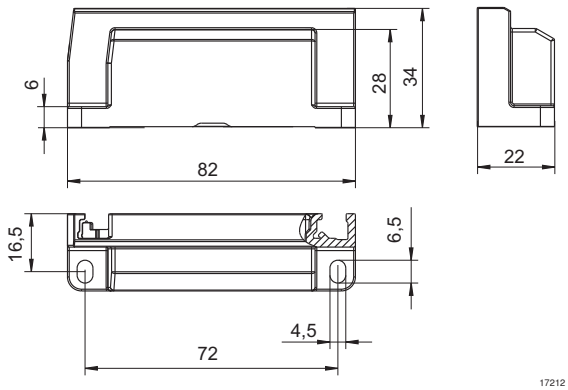
► for AES

19092

Ambient temperature min./max.	-10 °C / +60 °C
Materials:	
Subbase	Polyamide, fiber-glass reinforced

Type	Weight	Part No.
	[kg]	
End plate left	0.033	R412015398
Delivery contents: incl. 2 spring clamp elements		

Dimensions



17212

Data final plug (male), Series CN2

► **Plug, M12x1, 4-pin, B-coded**

00120228

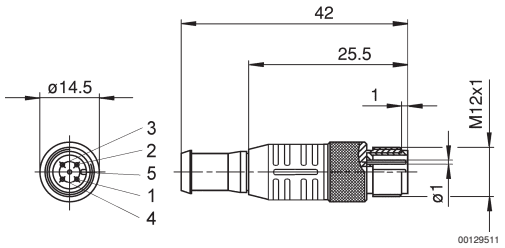
Ambient temperature min./max.	-25 °C / +80 °C
Protection class	IP 67
Materials:	
Housing	Thermoplastic elastomer

Technical Remarks

- The specified protection class is valid only in assembled and tested state.

Operating voltage	Max. current	Cable exit	suitable cable-Ø min./max	Housing color	Weight	Part No.
AC						
[V]	[A]		[mm]		[kg]	
60	4	straight 180°	5 / 6	Black	0.013	**8941054064**

Dimensions



M12x1 plug (male), Series CN2

► Plug, M12x1, 5-pin, B-coded ► screened

00120241

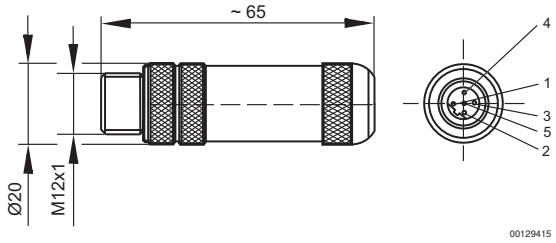
Ambient temperature min./max.	-25°C / +90°C
Protection class	IP 67
Materials:	
Housing	Brass, nickel-plated
Seals	fluorocarbon caoutchouc

Technical Remarks

- The specified protection class is valid only in assembled and tested state.

Operating voltage	Max. current	Cable exit	suitable cable-Ø min./max	Housing color	Weight	Part No.
AC						
[V]	[A]		[mm]		[kg]	
120	4	straight 180°	4 / 9	silver	0.06	**8941054054**

Dimensions



00129415

M12x1 socket (female), Series CN2

► Socket, M12x1, 5-pin, B-coded ► screened

00120227

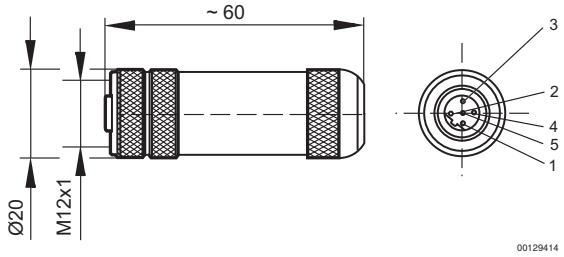
Ambient temperature min./max.	-25 °C / +90 °C
Protection class	IP 67
Materials:	
Housing	Brass, nickel-plated
Seals	fluorocarbon caoutchouc

Technical Remarks

- The specified protection class is valid only in assembled and tested state.

Operating voltage	Max. current	Cable exit	suitable cable-Ø min./max	Housing color	Weight	Part No.
AC						
[V]	[A]		[mm]		[kg]	
120	4	straight 180°	4 / 9	silver	0.06	**8941054044**

Dimensions



00129414

M12x1 socket (female), Series CN2

► **Socket, M12x1, 4-pin, A-coded**

00129412

Ambient temperature min./max.	-25 °C / +90 °C
Protection class	IP 67
Materials:	
Housing	Polybutyleneterephthalate
Seals	fluorocarbon caoutchouc

Technical Remarks
■ The specified protection class is valid only in assembled and tested state.

Operating voltage	Max. current	Cable exit	suitable cable-Ø min./max	Housing color	Weight	Fig.	Part No.
AC							
[V]	[A]		[mm]		[kg]		
240	4	straight 180° angled 90°	4 / 8	Black	0.028 0.027	Fig. 1 Fig. 2	**8941054324** **8941054424**

Fig. 1

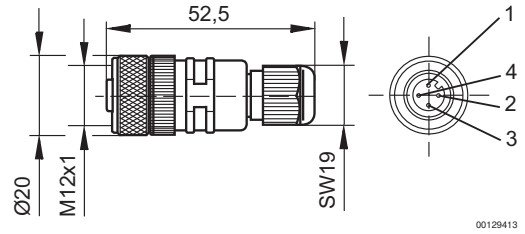
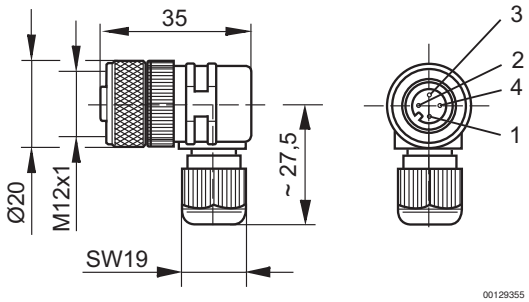


Fig. 2



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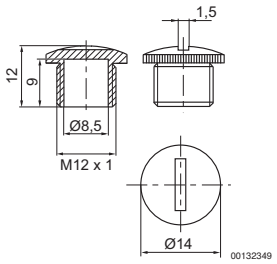
Protective cap

► **M12x1**

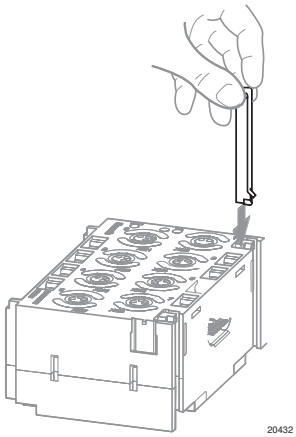


Part No.	Type	Material	Weight [kg]	Delivery quantity [Piece]			
1823312001	M12x1	Polyamide	0.001	50			

Spring clamp element

► for AES, For connecting field bus components

19094



20432

Part No.	Type	Delivery quantity [Piece]							
R412015400	Spring clamp element	10							

Field bus connection with I/O functionality, D-design

► I/O module, active ► for AES series bus couplers

18457

Ambient temperature min./max.	-10 °C / +60 °C
Protection class, with plug	IP 65
Operational voltage electronics	24 V DC
Electronics voltage tolerance	-25% / +25%
Generic emission standard in accordance with norm	EN 61000-6-4
Generic immunity standard in accordance with norm	EN 61000-6-2
Materials:	
Housing	Polyamide, fiber-glass reinforced

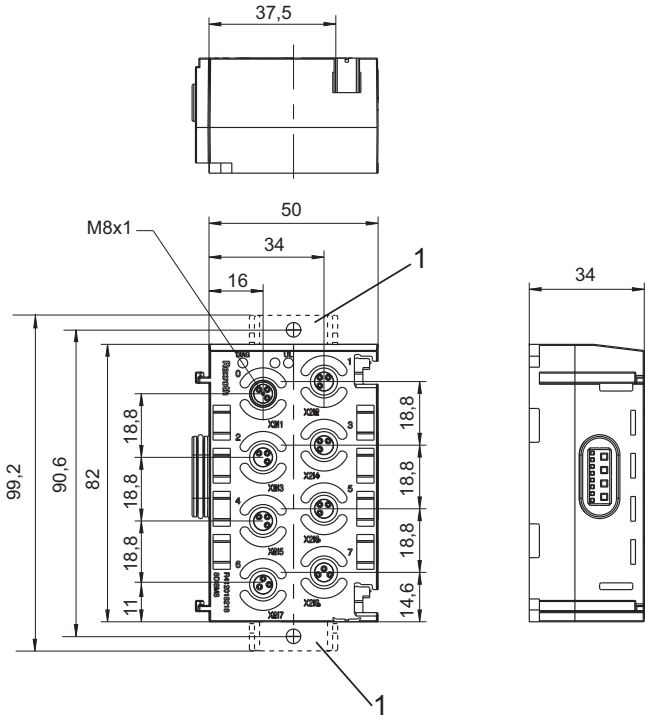
Technical Remarks
■ You will find assignment schemes for the product in the operating instructions, or contact the nearest Bosch Rexroth sales office.

Communication port Bus IN	power supply	Number of inputs	Number of outputs	I/O module version	Weight	Part No.
					[kg]	
Socket (female), M8, 3-pin	Through the bus coupler via the backplane	8	-	Digital inputs	0.11	R412018233
Socket (female), M8, 3-pin	Through the bus coupler via the backplane	-	8	Digital outputs	0.11	R412018248
Delivery contents: incl. 2 spring clamp elements						

Field bus connection with I/O functionality, D-design

► I/O module, active ► for AES series bus couplers

Dimensions

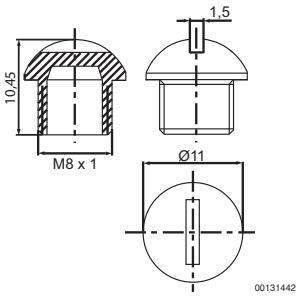


1) Retaining bracket (optional)

Part numbers marked in bold are available from the central warehouse in Germany, see the shopping basket for more detailed information

Protective cap

► **M8x1**



Part No.	Type	Material	Weight [kg]	Delivery quantity [Piece]			
R412003493	Protective cap M8x1	Polyamide	0.014	25			

Part numbers marked in bold are available from the central warehouse in Germany, see the shopping basket for more detailed information
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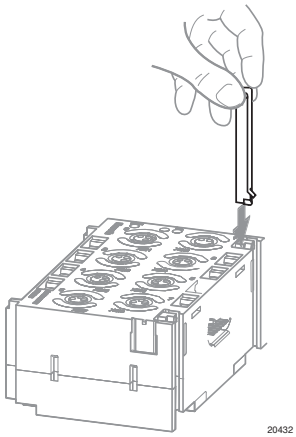
Spring clamp element

► for AES, For connecting field bus components

19094



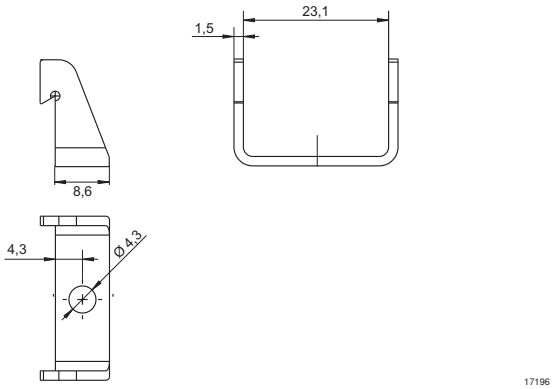
20432

Part No.	Type	Delivery quantity [Piece]							
R412015400	Spring clamp element	10							

Retaining bracket for intermediate mounting

► **for AES, AV03**

19093



17196

Part No.	Type	Material	Delivery quantity [Piece]				
R412018339	Retaining brackets	Stainless steel	10				
After three I/O modules or 8 valves, mount a retaining bracket (R412018339) to fasten the entire unit to the mounting surface. An appropriate number of retaining brackets are included in the initial configuration. The max. permissible space between the retaining brackets is 150 mm.							

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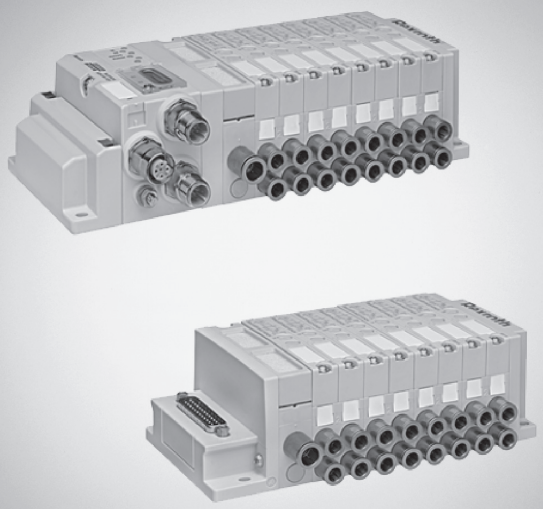
Valve systems → Valve systems

Series AV03

Brochure



Valve systems → Valve systems

Series AV03

Valve systems

Single valves

Accessories

Field Bus Modules

Other accessories

Part numbers marked in bold are available from the central warehouse in Germany, see the shopping basket for more detailed information

Valve systems → Valve systems

Series AV03

	Multipole plug (44-pin) ► Socket, D-Sub, 44-pin ► for series AV03	**25**
	Blanking plate ► Base plate principle, multiple ► Reversed pressure supply permissible ► With collective pilot air exhaust ► for AV03	**27**
	End plate left ► for AV03	**28**
	End plate right ► for AV03	**30**
	Retaining bracket for intermediate mounting ► for AES, AV03	**32**

Part numbers marked in bold are available from the central warehouse in Germany, see the shopping basket for more detailed information

Valve systems → Valve systems

Valve system, Series AV03

► Qn Max. = 300 l/min ► Multipole ► Electr. connection: D-Sub plug, 25-pin, top / D-Sub plug, 44-pin, top

18204

Blocking principle	Combination of double and triple base plate principles
Working pressure min./max.	-0.9 bar / 10 bar
Control pressure min./max.	3 bar / 8 bar
Ambient temperature min./max.	-10 °C / +60 °C
Medium temperature min./max.	-10 °C / +60 °C
Medium	Compressed air
Max. particle size	40 µm
Oil content of compressed air	0 mg/m³ - 5 mg/m³
Protection class with electrical connector/plug	IP 65
Protection class without electrical connector	IP 54
Number of valve positions	24 / 36
Number of solenoid coils	24 / 40
DC operating voltage	24 V
Voltage tolerance DC	-10% / +10%
Materials:	
End plate	Aluminum; Polyamide
Base plate	Polyamide

An example configuration is illustrated. The delivered product may thus deviate from the illustration.

Technical Remarks

- The pressure dew point must be at least 15 °C under ambient and medium temperature and may not exceed 3 °C.
- The oil content of air pressure must remain constant during the life cycle.
- Use only the approved oils from Bosch Rexroth, see chapter „Technical information“.
- The combination of double and triple base plates allows a configuration in increments of 1.
- See the following pages on the series for technical data on individual components.
- Here you can find more information on D-Sub connection pin assignments (version A and version B).

Configurable product

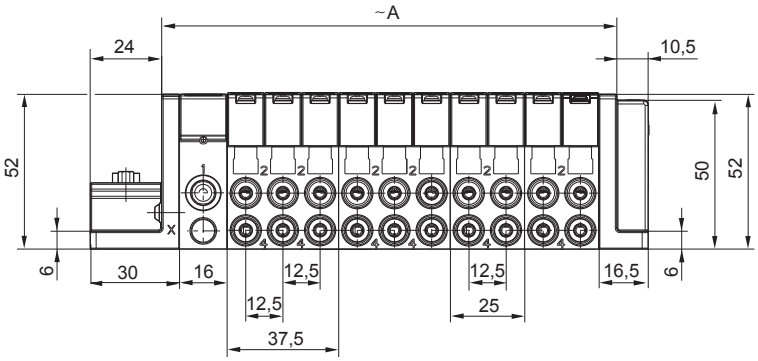
This product is configurable. Please use our Internet configurator at www.boschrexroth.com/pneumatics or contact the nearest Bosch Rexroth sales office.

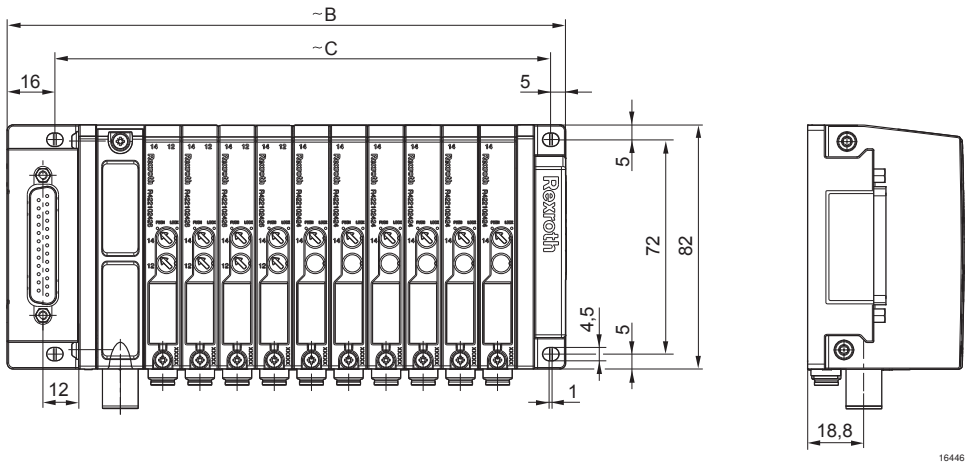
Valve systems → Valve systems

Valve system, Series AV03

► Qn Max. = 300 l/min ► Multipole ► Electr. connection: D-Sub plug, 25-pin, top / D-Sub plug, 44-pin, top

Dimensions





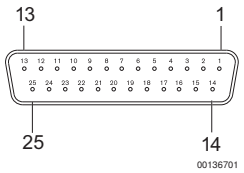
A = number of valve positions x 12.5 mm + number of supply plates x 16 mm + 12 mm
B = number of valve positions x 12.5 mm + number of supply plates x 16 mm + 46.5 mm
C = number of valve positions x 12.5 mm + number of supply plates x 16 mm + 25.5 mm
The supply plate in front of the first valve must be taken into consideration in the dimensions.
1 = push-in fitting Ø 4 mm, Ø 6 mm and Ø 8 mm. Connection angle 1: straight and 90° (exchangeable fittings)
2 and 4 = push-in fitting Ø 3 mm. Connection angle: 90°
2 and 4 = push-in fitting Ø 4 mm and Ø 8 mm. Connection angle: straight and 90° (exchangeable fittings)
3 and 5 = push-in fitting Ø 8 mm. Connection angle: straight
R = restricted pilot exhaust air, push-in fitting Ø 4 mm. Connection angle: straight
X = external pilot, push-in fitting Ø 4 mm. Connection angle: straight
An example configuration is shown. You can calculate the dimensions for your configuration using the formula or read them directly in the configurator.

Valve systems → Valve systems

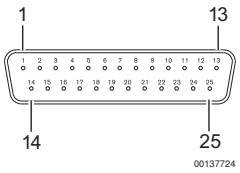
Valve system, Series AV03

► Qn Max. = 300 l/min ► Multipole ► Electr. connection: D-Sub plug, 25-pin, top / D-Sub plug, 44-pin, top

Multipole plug (25-pin), PIN assignment and cable colors, cable identification as per DIN 47100



Socket (female)

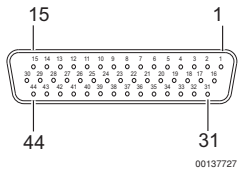


Plug (male)

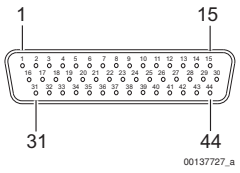
Pin	1	2	3	4	5	6	7	8	9	10	11	12	13
Color	white	brown	green	yellow	gray	pink	blue	red	black	violet	gray/ pink	red/blue	white/ green

Pin	14	15	16	17	18	19	20	21	22	23	24	25
Color	brown/ green	white/ yellow	yellow/ brown	white/ gray	gray/ brown	white/ pink	pink/ brown	white/ blue	brown/ blue	white/red	brown/ red	white/ black

Multipole plug (44-pin), PIN assignment and cable colors, cable identification as per DIN 47100



Socket (female)



Plug (male)

Pin	1	2	3	4	5	6	7	8	9	10	11	12	13
Color	white	brown	green	yellow	gray	pink	blue	red	black	violet	gray/ pink	red/blue	white/ green

Pin	14	15	16	17	18	19	20	21	22	23	24	25
Color	brown/ green	white/ yellow	yellow/ brown	white/ gray	gray/ brown	white/ pink	pink/ brown	white/ blue	brown/ blue	white/red	brown/ red	white/ black

Pin	38	39	40	41	42	43	44
Color	pink/blue	gray/red	pink/red	gray/black	pink/black	blue/black	red/black

Part numbers marked in bold are available from the central warehouse in Germany, see the shopping basket for more detailed information
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Valve system, Series AV03

► Qn Max. = 300 l/min ► Multipole ► Electr. connection: D-Sub plug, 25-pin, on the side / D-Sub plug, 44-pin, on the side

18205

Blocking principle	Combination of double and triple base plate principles
Working pressure min./max.	-0.9 bar / 10 bar
Control pressure min./max.	3 bar / 8 bar
Ambient temperature min./max.	-10 °C / +60 °C
Medium temperature min./max.	-10 °C / +60 °C
Medium	Compressed air
Max. particle size	40 µm
Oil content of compressed air	0 mg/m³ - 5 mg/m³
Protection class with electrical connector/plug	IP 65
Protection class without electrical connector	IP 54
Number of valve positions	24 / 36
Number of solenoid coils	24 / 40
DC operating voltage	24 V
Voltage tolerance DC	-10% / +10%
Materials:	
End plate	Aluminum; Polyamide
Base plate	Polyamide

An example configuration is illustrated. The delivered product may thus deviate from the illustration.

Technical Remarks

- The pressure dew point must be at least 15 °C under ambient and medium temperature and may not exceed 3 °C.
- The oil content of air pressure must remain constant during the life cycle.
- Use only the approved oils from Bosch Rexroth, see chapter „Technical information“.
- The combination of double and triple base plates allows a configuration in increments of 1.
- See the following pages on the series for technical data on individual components.
- Here you can find more information on D-Sub connection pin assignments (version A and version B).

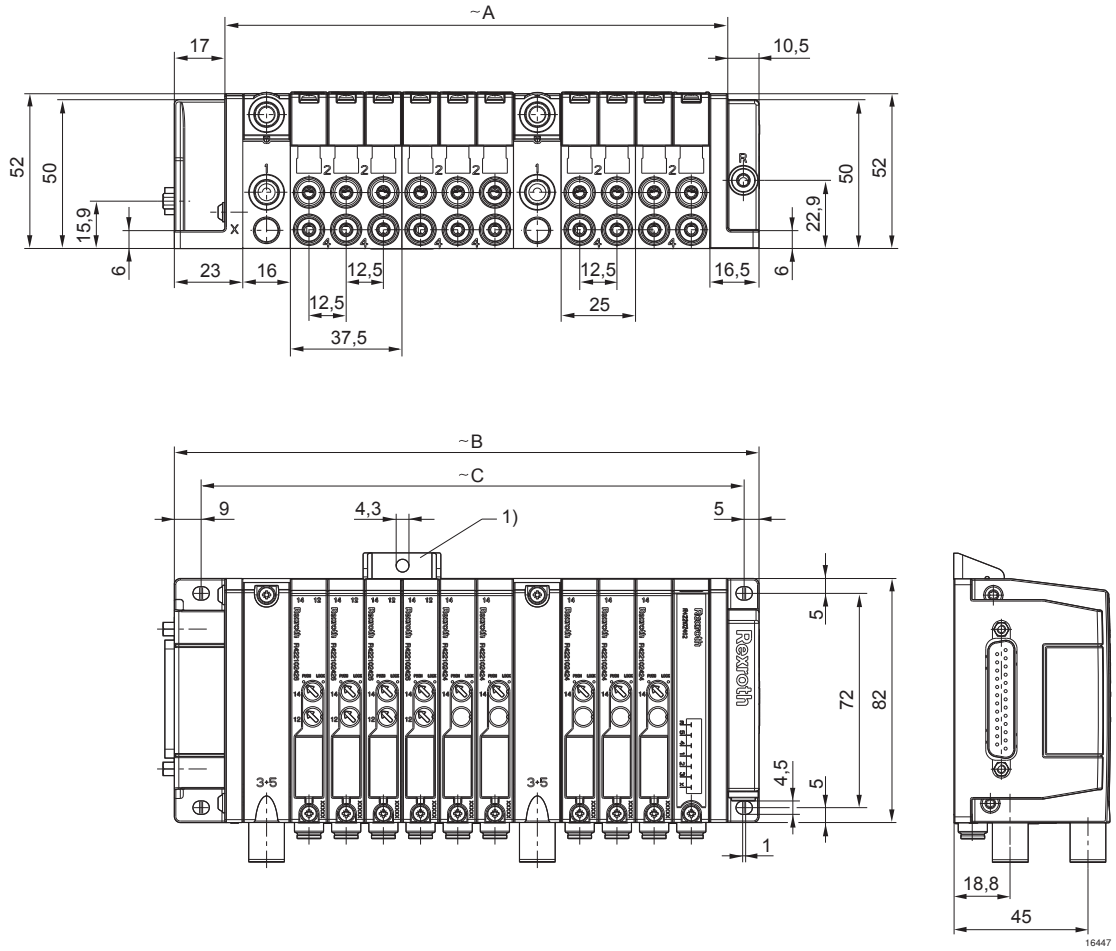
Configurable product

This product is configurable. Please use our Internet configurator at www.boschrexroth.com/pneumatics or contact the nearest Bosch Rexroth sales office.

Valve system, Series AV03

► Qn Max. = 300 l/min ► Multipole ► Electr. connection: D-Sub plug, 25-pin, on the side / D-Sub plug, 44-pin, on the side

Dimensions

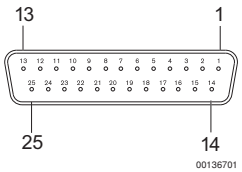


1) Retaining bracket (optional)
A = number of valve positions x 12.5 mm + number of supply plates x 16 mm + 12 mm
B = number of valve positions x 12.5 mm + number of supply plates x 16 mm + 39.5 mm
C = number of valve positions x 12.5 mm + number of supply plates x 16 mm + 25.5 mm
The supply plate in front of the first valve must be taken into consideration in the dimensions.
1 = push-in fitting Ø 4 mm, Ø 6 mm and Ø 8 mm. Connection angle 1: straight and 90° (exchangeable fittings)
2 and 4 = push-in fitting Ø 3 mm. Connection angle: 90°
2 and 4 = push-in fitting Ø 4 mm and Ø 8 mm. Connection angle: straight and 90° (exchangeable fittings)
3 and 5 = push-in fitting Ø 8 mm. Connection angle: straight
R = restricted pilot exhaust air, push-in fitting Ø 4 mm. Connection angle: straight
X = external pilot, push-in fitting Ø 4 mm. Connection angle: straight
An example configuration is shown. You can calculate the dimensions for your configuration using the formula or read them directly in the configurator.

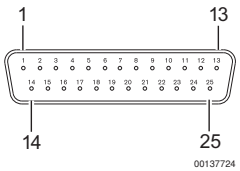
Valve system, Series AV03

► Qn Max. = 300 l/min ► Multipole ► Electr. connection: D-Sub plug, 25-pin, on the side / D-Sub plug, 44-pin, on the side

Multipole plug (25-pin), PIN assignment and cable colors, cable identification as per DIN 47100



Socket (female)



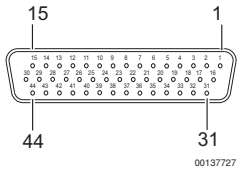
Plug (male)

Pin	1	2	3	4	5	6	7	8	9	10	11	12	13
Color	white	brown	green	yellow	gray	pink	blue	red	black	violet	gray/ pink	red/blue	white/ green

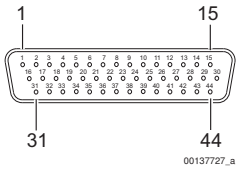
cable identification as per DIN 47100

Pin	14	15	16	17	18	19	20	21	22	23	24	25
Color	brown/ green	white/ yellow	yellow/ brown	white/ gray	gray/ brown	white/ pink	pink/ brown	white/ blue	brown/ blue	white/red	brown/ red	white/ black

Multipole plug (44-pin), PIN assignment and cable colors, cable identification as per DIN 47100



Socket (female)



Plug (male)

Pin	1	2	3	4	5	6	7	8	9	10	11	12	13
Color	white	brown	green	yellow	gray	pink	blue	red	black	violet	gray/ pink	red/blue	white/ green

Pin	14	15	16	17	18	19	20	21	22	23	24	25
Color	brown/ green	white/ yellow	yellow/ brown	white/ gray	gray/ brown	white/ pink	pink/ brown	white/ blue	brown/ blue	white/red	brown/ red	white/ black

Pin	26	27	28	29	30	31	32	33	34	35	36	37
Color	brown/ black	gray/ green	yellow/ gray	pink/ green	yellow/ pink	green/ blue	yellow/ blue	green/ red	yellow/ red	green/ black	yellow/ black	gray/ blue

Pin	38	39	40	41	42	43	44
Color	pink/blue	gray/red	pink/red	gray/black	pink/black	blue/black	red/black

Valve systems → Valve systems

Valve system, Series AV03

► Qn Max. = 300 l/min ► Field bus connection with I/O functionality (AES)

18455

Version	Link structure AES
Blocking principle	Combination of double and triple base plate principles
Working pressure min./max.	-0.9 bar / 8 bar
Control pressure min./max.	3 bar / 10 bar
Ambient temperature min./max.	-10 °C / +60 °C
Medium temperature min./max.	-10 °C / +60 °C
Medium	Compressed air
Max. particle size	40 µm
Oil content of compressed air	0 mg/m³ - 5 mg/m³
Protection class, with plug	IP 65
Number of valve positions	4 / 64
Number of solenoid coils	4 / 128
Supported field bus protocols:	ProfiNet IO EtherCAT PROFIBUS DP
Operational voltage electronics	24 V DC
Electronics voltage tolerance	-25% / +25%
Operational voltage valves	24 V DC
Valve voltage tolerance	-10% / +10%
Power supply connection	M12, A-coded, 4-pin
Materials:	
End plate	Aluminum
Subbase	Polyamide

An example configuration is illustrated. The delivered product may thus deviate from the illustration.

Technical Remarks

- The pressure dew point must be at least 15 °C under ambient and medium temperature and may not exceed 3 °C.
- The oil content of air pressure must remain constant during the life cycle.
- Use only the approved oils from Bosch Rexroth, see chapter „Technical information“.
- The combination of double and triple base plates allows a configuration in increments of 1.
- See the following pages on the series for technical data on individual components.
- For technical data for electronics (link structures), see the Chapter “Field bus connections”.

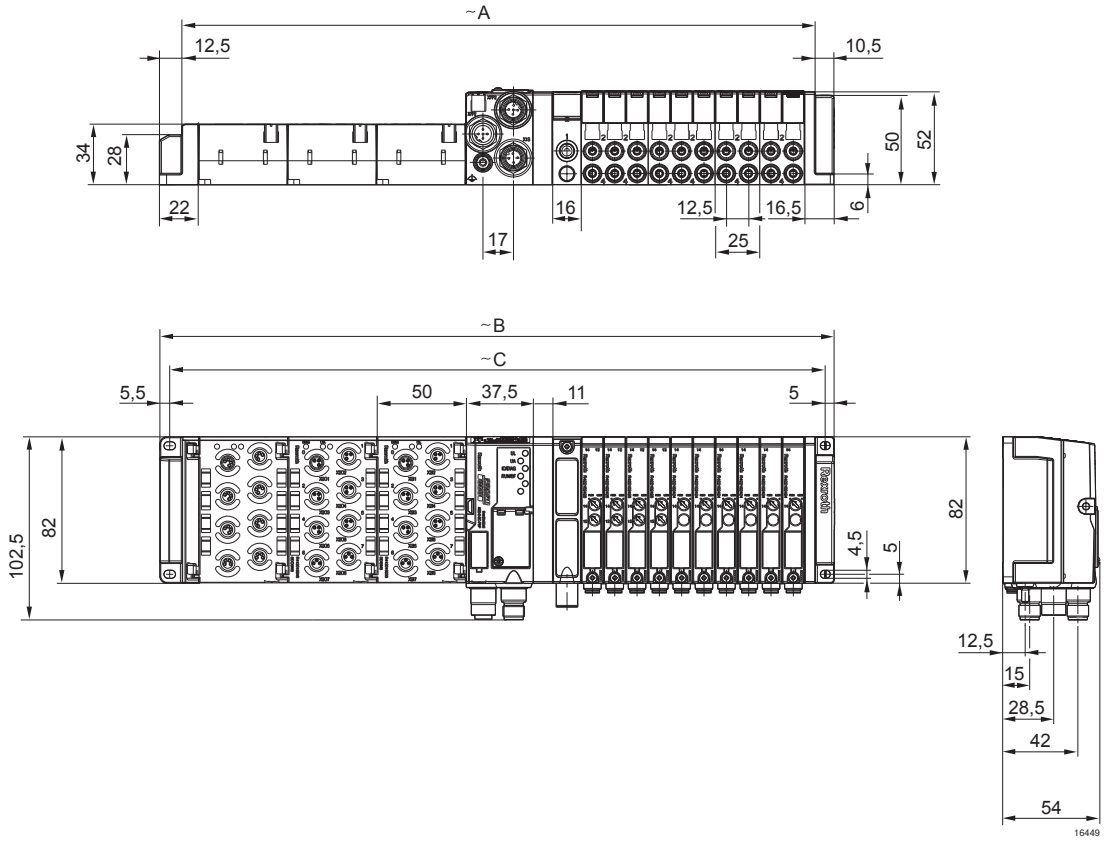
Configurable product

This product is configurable. Please use our Internet configurator at www.boschrexroth.com/pneumatics or contact the nearest Bosch Rexroth sales office.

Valve system, Series AV03

► Qn Max. = 300 l/min ► Field bus connection with I/O functionality (AES)

Dimensions, Field bus connection with I/O functionality (AES)



A = number of valve positions x 12.5 mm + number of supply plates x 16 mm + number of I/O x 50 mm + 64 mm
B = number of valve positions x 12.5 mm + number of supply plates x 16 mm + number of I/O x 50 mm + 87 mm
C = number of valve positions x 12.5 mm + number of supply plates x 16 mm + number of I/O x 50 mm + 76.5 mm
The supply plate in front of the first valve must be taken into consideration in the dimensions.
1 = push-in fitting Ø 4 mm, Ø 6 mm and Ø 8 mm. Connection angle 1: straight and 90° (exchangeable fittings)
2 and 4 = push-in fitting Ø 3 mm. Connection angle: 90°
2 and 4 = push-in fitting Ø 4 mm and Ø 8 mm. Connection angle: straight and 90° (exchangeable fittings)
3 and 5 = push-in fitting Ø 8 mm. Connection angle: straight
R = restricted pilot exhaust air, push-in fitting Ø 4 mm. Connection angle: straight
X = external pilot, push-in fitting Ø 4 mm. Connection angle: straight
An example configuration is shown. You can calculate the dimensions for your configuration using the formula or read them directly in the configurator.

Valve systems → Valve systems

2x3/2-way valve, Series AV03

► Qn = 250 - 300 l/min ► plate connection ► Manual override: with detent, without detent ► double solenoid

18437

Version	Spool valve, zero overlap
Pilot	external
Sealing principle	soft sealing
Blocking principle	Base plate principle, multiple
Working pressure min./max.	-0.9 bar / 10 bar
Control pressure min./max.	-- / 8 bar
Ambient temperature min./max.	-10 °C / +60 °C
Medium temperature min./max.	-10 °C / +60 °C
Medium	Compressed air
Max. particle size	40 µm
Oil content of compressed air	0 mg/m³ - 5 mg/m³
	with directional pilot air exhaust
Degree of protectionwith electrical connector/plug	IP 65
Protective circuit	Z-diode
	Protected against polarity reversal
Status display LED	Yellow
Duty cycle	100 %
Switch-on time	16 ms
Switch-off time	20 ms
Mounting screw	Hexalobular socket (TORX) ISO 10664-8
mounting screw tightening torque	0.7 Nm
Materials:	
Housing	Polyamide, fiber-glass reinforced
Seals	Acrylonitrile Butadiene Rubber; Hydrogenated acrylonitrile butadiene rubber
Front plate	Polyamide, fiber-glass reinforced
End plate	Polyamide

Technical Remarks

- The pressure dew point must be at least 15 °C under ambient and medium temperature and may not exceed 3 °C.
- The oil content of air pressure must remain constant during the life cycle.
- Use only the approved oils from Bosch Rexroth, see chapter „Technical information“.

Operating voltage	Voltage tolerance	Power consumption
DC	DC	DC
		W
24 V	-10% / +10%	0.55

Part numbers marked in bold are available from the central warehouse in Germany, see the shopping basket for more detailed information
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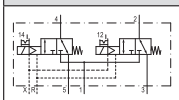
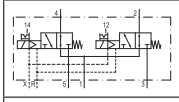
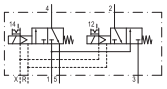
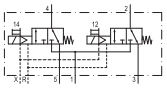
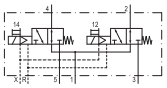
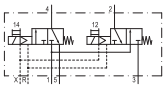
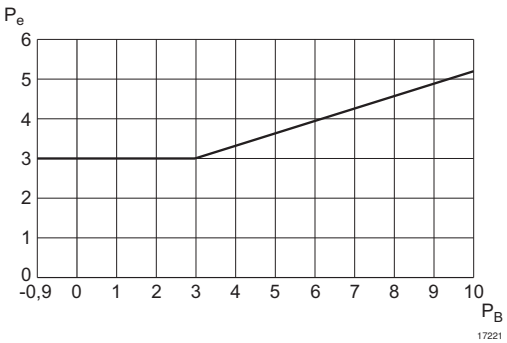
2x3/2-way valve, Series AV03

► Qn = 250 - 300 l/min ► plate connection ► Manual override: with detent, without detent ► double solenoid

		MO	Operating voltage	Flow conductance		Flow rate value	Weight	Part No.
			DC	b	C	Qn		
					[l/(s*bar)]	[l/min]	[kg]	
	NC/NC		24 V	0.29	1.17	300	0.05	**R422102430**
	NO/NO		24 V	0.38	0.92	250	0.049	**R422102432**
	NC/NO		24 V	0.38	0.92	250	0.05	**R422102434**
	NC/NC		24 V	0.29	1.17	300	0.05	**R422102431**
	NO/NO		24 V	0.38	0.92	250	0.049	**R422102433**
	NC/NO		24 V	0.38	0.92	250	0.05	**R422102435**

MO = Manual override
Basic valve with pilot valve
Nominal flow Qn at 6 bar and Δp = 1 bar

Control pressure: see diagram for min., max. 8 bar



P_B = Working pressure
Pe = External control pressure, min.

Part numbers marked in bold are available from the central warehouse in Germany, see the shopping basket for more detailed information
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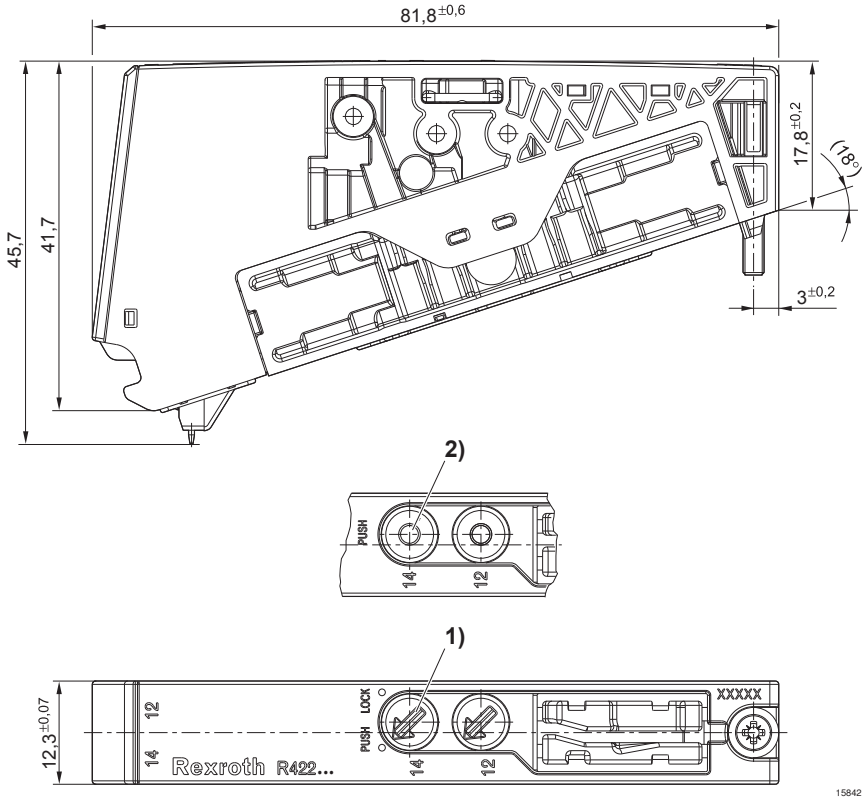
2x3/2-way valve, Series AV03

► Qn = 250 - 300 l/min ► plate connection ► Manual override: with detent, without detent ► double solenoid

Dimensions



1) with detent
2) without detent

Part numbers marked in bold are available from the central warehouse in Germany, see the shopping basket for more detailed information

5/2-way valve, Series AV03

► Qn = 300 l/min ► plate connection ► Manual override: with detent, without detent ► double solenoid, single solenoid

18434

Version	Spool valve, zero overlap
Pilot	external
Sealing principle	soft sealing
Blocking principle	Base plate principle, multiple
Working pressure min./max.	-0.9 bar / 10 bar
Control pressure min./max.	3 bar / 8 bar
Ambient temperature min./max.	-10 °C / +60 °C
Medium temperature min./max.	-10 °C / +60 °C
Medium	Compressed air
Max. particle size	40 µm
Oil content of compressed air	0 mg/m³ - 5 mg/m³
	with directional pilot air exhaust
Degree of protectionwith electrical connector/plug	IP 65
Protective circuit	Z-diode
	Protected against polarity reversal
Status display LED	Yellow
Duty cycle	100 %
Mounting screw	Hexalobular socket (TORX) ISO 10664-8
mounting screw tightening torque	0.7 Nm
Materials:	
Housing	Polyamide, fiber-glass reinforced
Seals	Acrylonitrile Butadiene Rubber; Hydrogenated acrylonitrile butadiene rubber
Front plate	Polyamide, fiber-glass reinforced
End plate	Polyamide

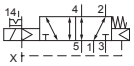
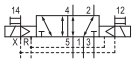
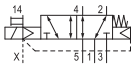
Technical Remarks

- The pressure dew point must be at least 15 °C under ambient and medium temperature and may not exceed 3 °C.
- The oil content of air pressure must remain constant during the life cycle.
- Use only the approved oils from Bosch Rexroth, see chapter „Technical information“.
- The pilot type (external/internal) is not implemented in the valve, but in the end plate of the valve system.

Operating voltage	Voltage tolerance	Power consumption
DC	DC	DC
		W
24 V	-10% / +10%	0.55

5/2-way valve, Series AV03

► Qn = 300 l/min ► plate connection ► Manual override: with detent, without detent ► double solenoid, single solenoid

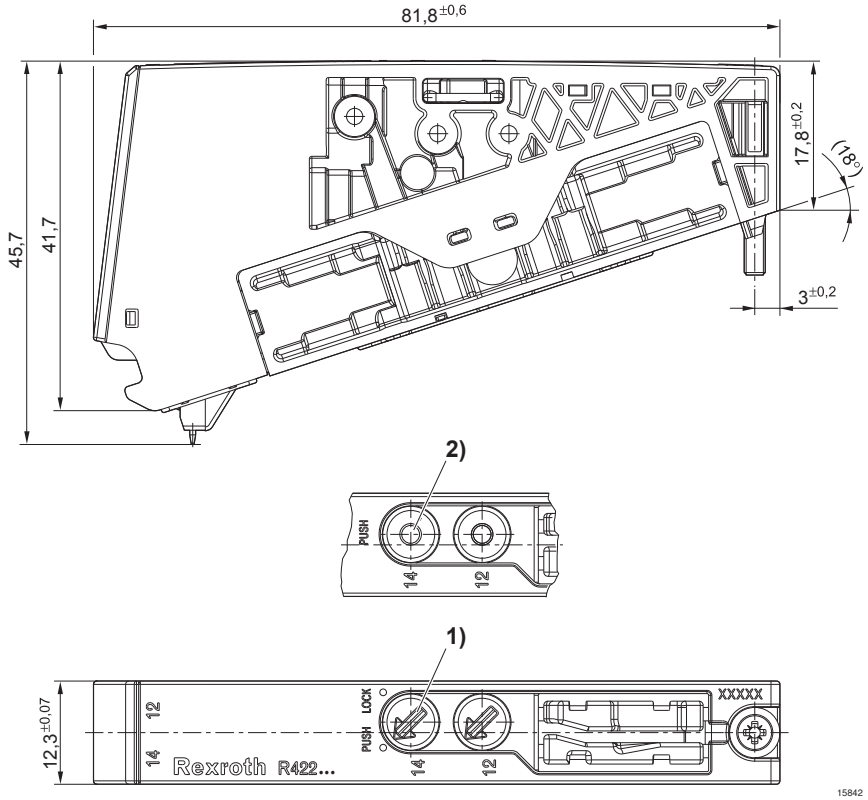
	MO	Operating voltage	Flow conductance		Flow rate value	Switch-on time	Switch-off time	Weight	Part No.
		DC	b	C	Qn				
				[l/(s*bar)]	[l/min]	[ms]	[ms]	[kg]	
		24 V	0.29	1.17	300	8	8	0.048	**R422102426**
		24 V	0.29	1.17	300	12	17	0.043	**R422102424**
		24 V	0.29	1.17	300	8	8	0.048	**R422102427**
		24 V	0.29	1.17	300	12	17	0.043	**R422102425**

MO = Manual override
Basic valve with pilot valve
Nominal flow Qn at 6 bar and Δp = 1 bar

5/2-way valve, Series AV03

► Qn = 300 l/min ► plate connection ► Manual override: with detent, without detent ► double solenoid, single solenoid

Dimensions

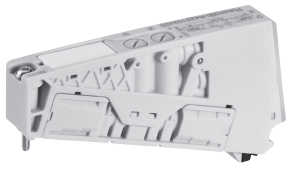


1) with detent
2) without detent

Part numbers marked in bold are available from the central warehouse in Germany, see the shopping basket for more detailed information

5/3-way valve, Series AV03

► Qn = 285 l/min ► plate connection ► Manual override: with detent, without detent ► double solenoid



18436

Version	Spool valve, zero overlap
Pilot	external
Sealing principle	soft sealing
Blocking principle	Base plate principle, multiple
Working pressure min./max.	-0.9 bar / 10 bar
Control pressure min./max.	3 bar / 8 bar
Ambient temperature min./max.	-10 °C / +60 °C
Medium temperature min./max.	-10 °C / +60 °C
Medium	Compressed air
Max. particle size	40 µm
Oil content of compressed air	0 mg/m³ - 5 mg/m³
	with directional pilot air exhaust
Degree of protectionwith electrical connector/plug	IP 65
Protective circuit	Z-diode
	Protected against polarity reversal
Status display LED	Yellow
Duty cycle	100 %
Switch-on time	12 ms
Switch-off time	12 ms
Mounting screw	Hexalobular socket (TORX) ISO 10664-8
mounting screw tightening torque	0.7 Nm
Materials:	
Housing	Polyamide, fiber-glass reinforced
Seals	Acrylonitrile Butadiene Rubber; Hydrogenated acrylonitrile butadiene rubber
Front plate	Polyamide, fiber-glass reinforced
End plate	Polyamide

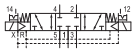
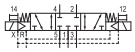
Technical Remarks

- The pressure dew point must be at least 15 °C under ambient and medium temperature and may not exceed 3 °C.
- The oil content of air pressure must remain constant during the life cycle.
- Use only the approved oils from Bosch Rexroth, see chapter „Technical information“.
- The pilot type (external/internal) is not implemented in the valve, but in the end plate of the valve system.

Operating voltage	Voltage tolerance	Power consumption
DC	DC	DC
		W
24 V	-10% / +10%	0.55

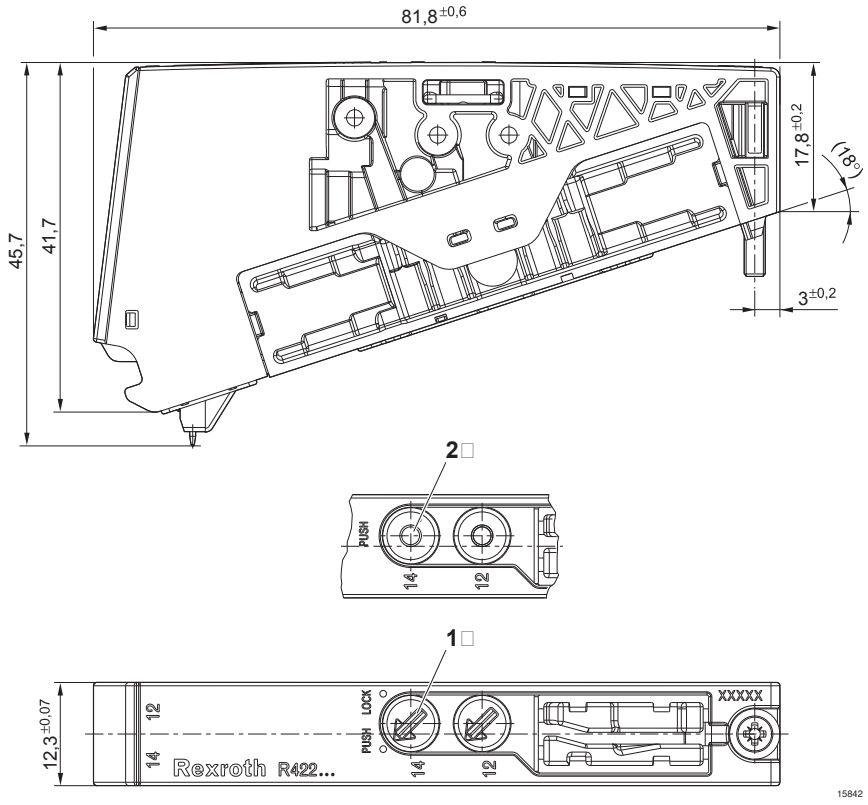
5/3-way valve, Series AV03

► Qn = 285 l/min ► plate connection ► Manual override: with detent, without detent ► double solenoid

	MO	Operating voltage	Flow conductance		Flow rate value	Weight	Part No.
		DC	b	C	Qn		
				[l/(s*bar)]	[l/min]	[kg]	
		24 V	0.28	1.1	285	0.046	**R422102428**
		24 V	0.28	1.1	285	0.046	**R422102429**

MO = Manual override
Basic valve with pilot valve
Nominal flow Qn at 6 bar and Δp = 1 bar

Dimensions



1) with detent
2) without detent

Part numbers marked in bold are available from the central warehouse in Germany, see the shopping basket for more detailed information
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Series AV03
Accessories

Field bus connection with I/O functionality
► Bus coupler ► Field bus protocol: PROFIBUS DP / ProfiNet IO / EtherCAT ► for AV series valves, for AES series I/O modules


16456

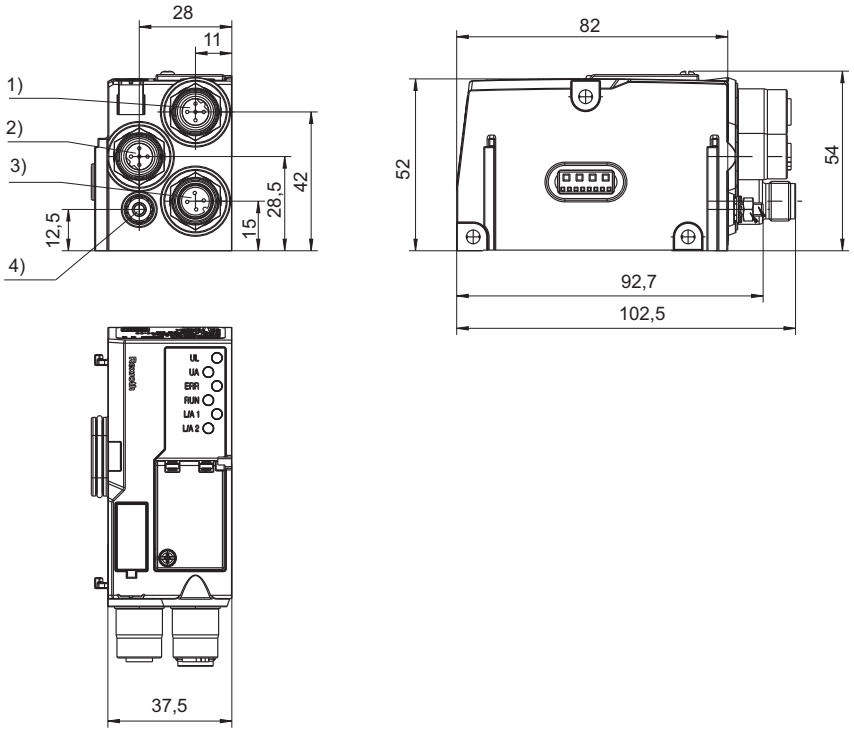
Ambient temperature min./max.	-10 °C / +60 °C
Protection class, with plug	IP 65
Operational voltage electronics	24 V DC
Electronics voltage tolerance	-25% / +25%
Power consumption electronics	0.1 A
Operational voltage valves	24 V DC
Number of solenoid coils	128
Number of valve positions	64
I/O extension possible, Max.	10
Generic emission standard in accordance with norm	EN 61000-6-4
Generic immunity standard in accordance with norm	EN 61000-6-2
Materials:	
Housing	Polyamide, fiber-glass reinforced

Technical Remarks
■ You will find assignment schemes for the product in the operating instructions, or contact the nearest Bosch Rexroth sales office.

Field bus protocol	Communication port Bus IN	Communication port Bus OUT	power supply	Number of inputs	Number of outputs	Weight	Part No.
						[kg]	
PROFIBUS DP	Plug (male), M12, 5-pin, B-coded	Socket (female), M12, 5-pin, B-coded	Plug (male), M12, 4-pin, A-coded	512 bit	512 bit	0.16	R412018218
ProfiNet IO	Socket (female), M12, 4-pin, D-coded	Socket (female), M12, 4-pin, D-coded	Plug (male), M12, 4-pin, A-coded	512 bit	512 bit	0.175	R412018223
EtherCAT	Socket (female), M12, 4-pin, D-coded	Socket (female), M12, 4-pin, D-coded	Plug (male), M12, 4-pin, A-coded	512 bit	512 bit	0.175	R412018225
Scope of delivery: Incl. mounting screws 3x							

Series AV03
Accessories

Dimensions



1) Bus IN 2) Bus OUT 3) Power supply 4) Ground

Field bus connection with I/O functionality, D-design
► I/O module, active ► for AES series bus couplers

Ambient temperature min./max.	-10 °C / +60 °C
Protection class, with plug	IP 65
Operational voltage electronics	24 V DC
Electronics voltage tolerance	-25% / +25%
Generic emission standard in accordance with norm	EN 61000-6-4
Generic immunity standard in accordance with norm	EN 61000-6-2
Materials:	
Housing	Polyamide, fiber-glass reinforced

Technical Remarks

- You will find assignment schemes for the product in the operating instructions, or contact the nearest Bosch Rexroth sales office.

Part numbers marked in bold are available from the central warehouse in Germany, see the shopping basket for more detailed information
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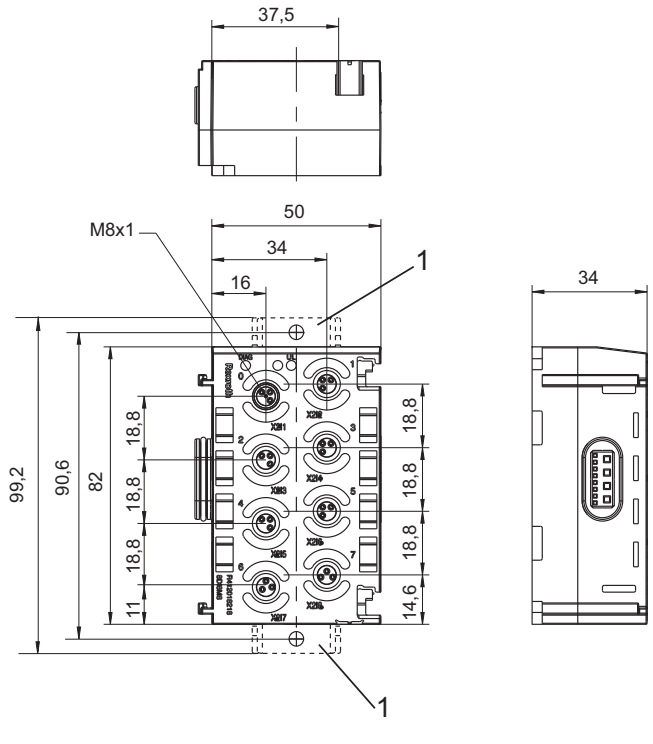
Series AV03
Accessories

Communication port Bus IN	power supply	Number of inputs	Number of outputs	I/O module version	Weight	Part No.
					[kg]	
Socket (female), M8, 3-pin	Through the bus coupler via the backplane	8	-	Digital inputs	0.11	R412018233
Socket (female), M8, 3-pin	Through the bus coupler via the backplane	-	8	Digital outputs	0.11	R412018248
Delivery contents: incl. 2 spring clamp elements						

Dimensions



1) Retaining bracket (optional)

Series AV03
Accessories

Multipole plug D-Sub (25-pin)
► Socket, D-Sub, 25-pin ► for series AV03

15845

Ambient temperature min./max.	-20 °C / +80 °C
Protection class	IP 65
Operating voltage DC max.	24 V
Wire cross-section	0.22 mm²
Materials:	
Housing	Thermoplastic elastomer
Housing color	Black
Cable color	Black

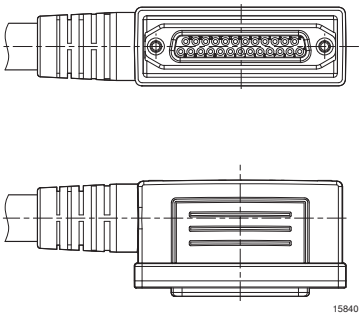
Technical Remarks

- The specified protection class is valid only in assembled and tested state.
- The increased wire cross-section of pin 25 is 0.82 mm².

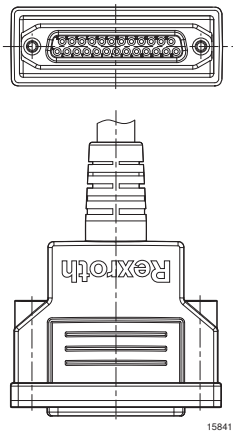
Electrical interface	Cable exit	Cable sheath	Cable-Ø	Cable length L		Part No.
[Port 1]			[mm]	[m]		
Socket, D-Sub, 25-pin	straight 180°	Polyvinyl chloride	8.5	3	-	**R419500454**
Socket, D-Sub, 25-pin	straight 180°	Polyvinyl chloride	8.5	5	-	**R419500455**
Socket, D-Sub, 25-pin	straight 180°	Polyvinyl chloride	8.5	10	-	**R419500456**
Socket, D-Sub, 25-pin	straight 180°	Polyurethane	10.5	3	suitable for dynamic laying	**R419500457**
Socket, D-Sub, 25-pin	straight 180°	Polyurethane	10.5	5	suitable for dynamic laying	**R419500458**
Socket, D-Sub, 25-pin	straight 180°	Polyurethane	10.5	10	suitable for dynamic laying	**R419500459**
Socket, D-Sub, 25-pin	angled 90°	Polyvinyl chloride	8.5	3	-	**R419500460**
Socket, D-Sub, 25-pin	angled 90°	Polyvinyl chloride	8.5	5	-	**R419500461**
Socket, D-Sub, 25-pin	angled 90°	Polyvinyl chloride	8.5	10	-	**R419500462**
Socket, D-Sub, 25-pin	angled 90°	Polyurethane	10.5	3	suitable for dynamic laying	**R419500463**
Socket, D-Sub, 25-pin	angled 90°	Polyurethane	10.5	5	suitable for dynamic laying	**R419500464**
Socket, D-Sub, 25-pin	angled 90°	Polyurethane	10.5	10	suitable for dynamic laying	**R419500465**

Series AV03
Accessories

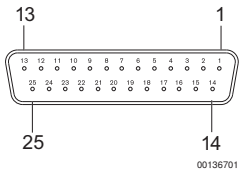
angled



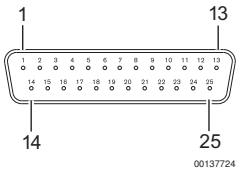
straight



Multipole plug (25-pin), PIN assignment and cable colors, cable identification as per DIN 47100



Socket (female)



Plug (male)

Pin	1	2	3	4	5	6	7	8	9	10	11	12	13
Color	white	brown	green	yellow	gray	pink	blue	red	black	violet	gray/ pink	red/blue	white/ green

Pin	14	15	16	17	18	19	20	21	22	23	24	25
Color	brown/ green	white/ yellow	yellow/ brown	white/ gray	gray/ brown	white/ pink	pink/ brown	white/ blue	brown/ blue	white/red	brown/ red	white/ black

Valve systems → Valve systems

Series AV03
Accessories

Multipole plug (44-pin)
► Socket, D-Sub, 44-pin ► for series AV03

15845

Ambient temperature min./max.	-20 °C / +80 °C
Protection class	IP 65
Operating voltage DC max.	24 V
Wire cross-section	0.22 cm²
Materials:	
Housing	Thermoplastic elastomer
Housing color	Black
Cable color	Black

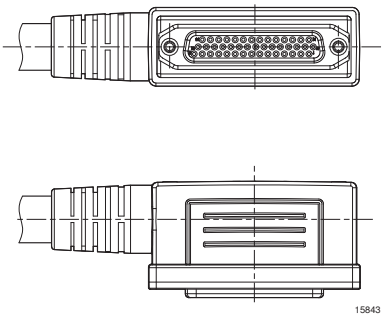
Technical Remarks

- The specified protection class is valid only in assembled and tested state.

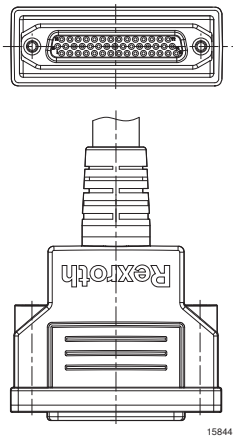
Electrical interface	Cable exit	Cable sheath	Cable-Ø	Cable length L		Part No.
[Port 1]			[mm]	[m]		
Socket, D-Sub, 44-pin	straight 180°	Polyvinyl chloride	10.7	3	-	**R419500466**
Socket, D-Sub, 44-pin	straight 180°	Polyvinyl chloride	10.7	5	-	**R419500467**
Socket, D-Sub, 44-pin	straight 180°	Polyvinyl chloride	10.7	10	-	**R419500468**
Socket, D-Sub, 44-pin	straight 180°	Polyurethane	13	3	suitable for dynamic laying	**R419500469**
Socket, D-Sub, 44-pin	straight 180°	Polyurethane	13	5	suitable for dynamic laying	**R419500470**
Socket, D-Sub, 44-pin	straight 180°	Polyurethane	13	10	suitable for dynamic laying	**R419500471**
Socket, D-Sub, 44-pin	angled 90°	Polyvinyl chloride	10.7	3	-	**R419500472**
Socket, D-Sub, 44-pin	angled 90°	Polyvinyl chloride	10.7	5	-	**R419500473**
Socket, D-Sub, 44-pin	angled 90°	Polyvinyl chloride	10.7	10	-	**R419500474**
Socket, D-Sub, 44-pin	angled 90°	Polyurethane	13	3	suitable for dynamic laying	**R419500475**
Socket, D-Sub, 44-pin	angled 90°	Polyurethane	13	5	suitable for dynamic laying	**R419500476**
Socket, D-Sub, 44-pin	angled 90°	Polyurethane	13	10	suitable for dynamic laying	**R419500477**

Series AV03
Accessories

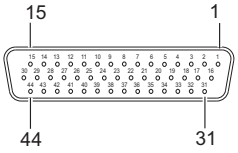
angled



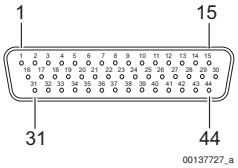
straight



Multipole plug (44-pin), PIN assignment and cable colors, cable identification as per DIN 47100



Socket (female)



Plug (male)

Pin	1	2	3	4	5	6	7	8	9	10	11	12	13
Color	white	brown	green	yellow	gray	pink	blue	red	black	violet	gray/ pink	red/blue	white/ green

Pin	14	15	16	17	18	19	20	21	22	23	24	25
Color	brown/ green	white/ yellow	yellow/ brown	white/ gray	gray/ brown	white/ pink	pink/ brown	white/ blue	brown/ blue	white/red	brown/ red	white/ black

Pin	26	27	28	29	30	31	32	33	34	35	36	37
Color	brown/ black	gray/ green	yellow/ gray	pink/ green	yellow/ pink	green/ blue	yellow/ blue	green/ red	yellow/ red	gray/ black	yellow/ black	gray/ blue

Pin	38	39	40	41	42	43	44
Color	pink/blue	gray/red	pink/red	gray/black	pink/black	blue/black	red/black

Part numbers marked in bold are available from the central warehouse in Germany, see the shopping basket for more detailed information

Series AV03
Accessories

Blanking plate
► Base plate principle, multiple ► Reversed pressure supply permissible ► With collective pilot air exhaust ► for AV03

18435

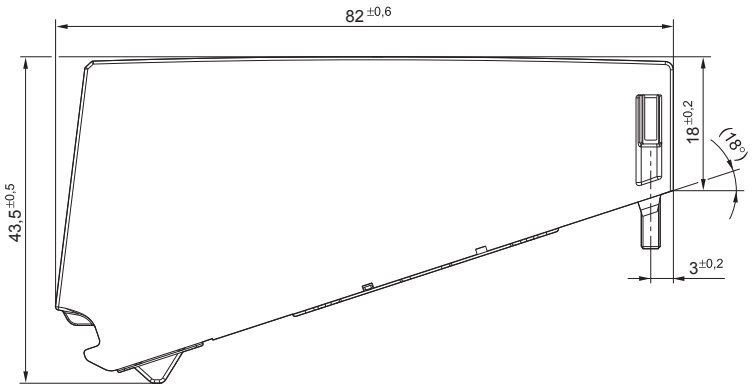
Ambient temperature min./max.	-10 °C / +60 °C
Medium temperature min./max.	-10 °C / +60 °C
Medium	Compressed air
Max. particle size	40 µm
Oil content of compressed air	0 mg/m³ - 5 mg/m³
Working pressure min./max.	-0.9 bar / 10 bar
Protection class	IP 65
Mounting screw	Hexalobular socket (TORX) ISO 10664-8
Tightening torque for mounting screws	0.7 Nm±0,1
Materials:	
Subbase	Polyamide, fiber-glass reinforced
Seals	Nitrile rubber
Screws	Steel, galvanized

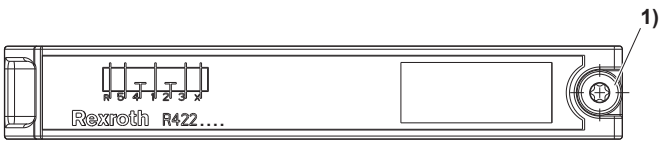
Technical Remarks
■ The pressure dew point must be at least 15 °C under ambient and medium temperature and may not exceed 3 °C.
■ The oil content of air pressure must remain constant during the life cycle.
■ Use only the approved oils from Bosch Rexroth, see chapter „Technical information“.

	Weight [kg]	Part No.
	0.028	R422102462
Delivery includes sealing kit and 1x mounting screw		

Series AV03
Accessories

Dimensions

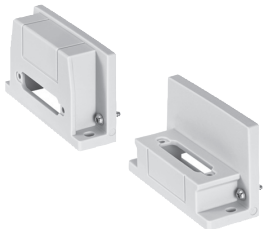




17220

1) Mounting screw

End plate left
► **for AV03**



15851

Ambient temperature min./max.	-10 °C / +50 °C
Medium temperature min./max.	-10 °C / +50 °C
Materials:	
Housing	Polyamide
Screws	Steel

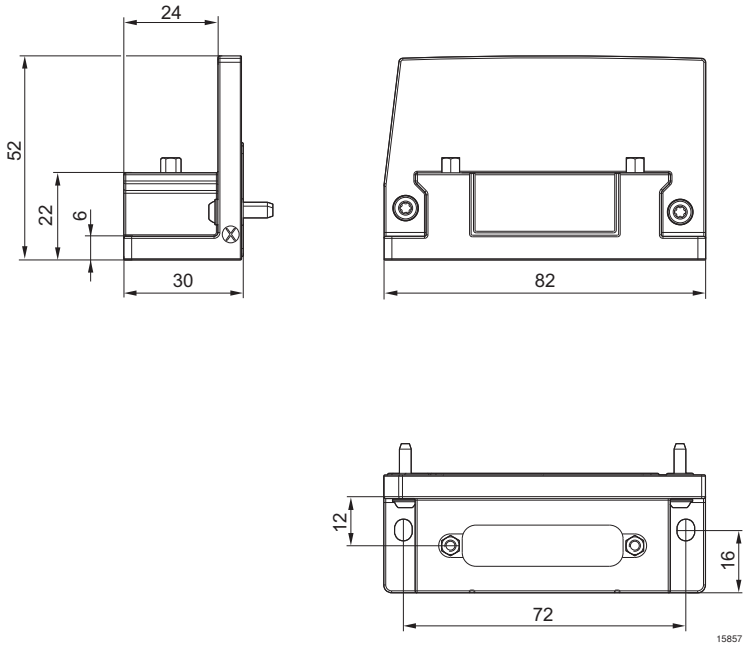
Technical Remarks

- The pressure dew point must be at least 15 °C under ambient and medium temperature and may not exceed 3 °C.
- The oil content of air pressure must remain constant during the life cycle.
- Use only the approved oils from Bosch Rexroth, see chapter „Technical information“.

Series AV03
Accessories

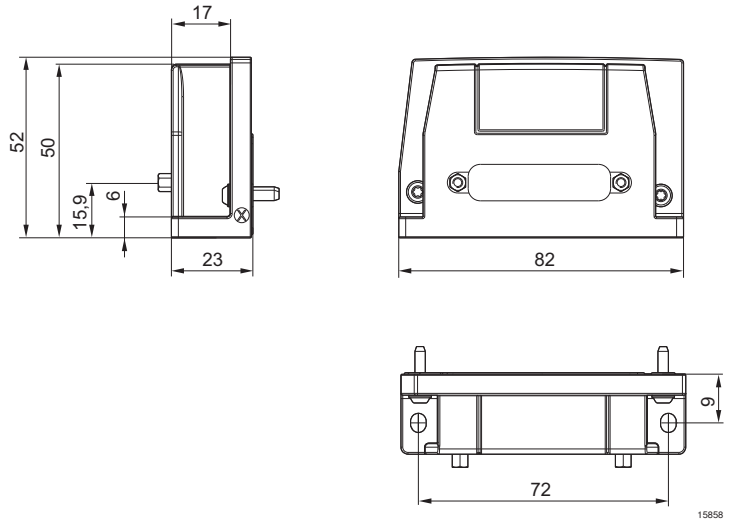
Type	Delivery quantity	Weight [kg]	Fig.	Part No.
Top connection	1	0.045	Fig. 1	R412018334
Side connection	1	0.05	Fig. 2	R412018335
Scope of delivery: incl. 1 seal and 2 mounting screws				

Fig. 1



Series AV03
Accessories

Fig. 2



End plate right
► for AV03

Ambient temperature min./max.	-10 °C / +50 °C
Medium temperature min./max.	-10 °C / +50 °C
Materials:	
Housing	Aluminum
Screws	Steel

Technical Remarks
■ The pressure dew point must be at least 15 °C under ambient and medium temperature and may not exceed 3 °C.
■ The oil content of air pressure must remain constant during the life cycle.
■ Use only the approved oils from Bosch Rexroth, see chapter „Technical information“.

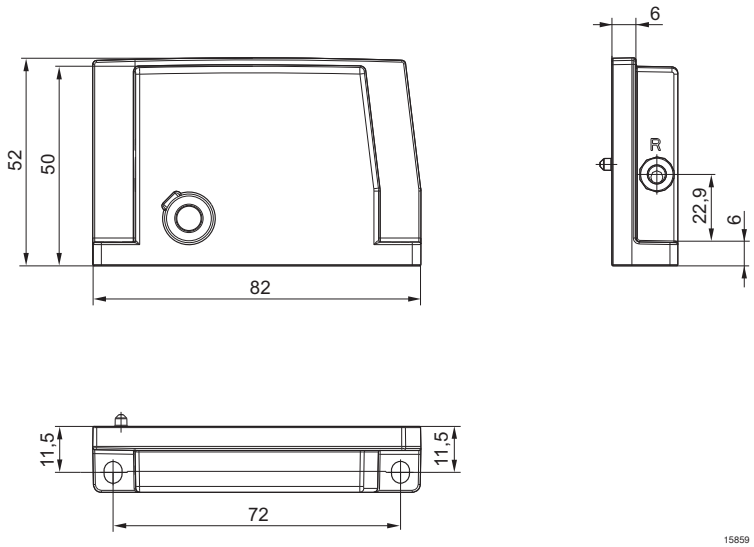
Compressed air connection	Delivery quantity	Weight	Fig.	Part No.
Pilot control exhaust				
[R]		**[kg]**		
Ø 4	1	0.08	Fig. 1	R412018349
Scope of delivery: Incl. mounting screws				

Part numbers marked in bold are available from the central warehouse in Germany, see the shopping basket for more detailed information
Pneumatics catalog, online PDF, as of 2012-10-24, © Bosch Rexroth AG, subject to change

Series AV03
Accessories

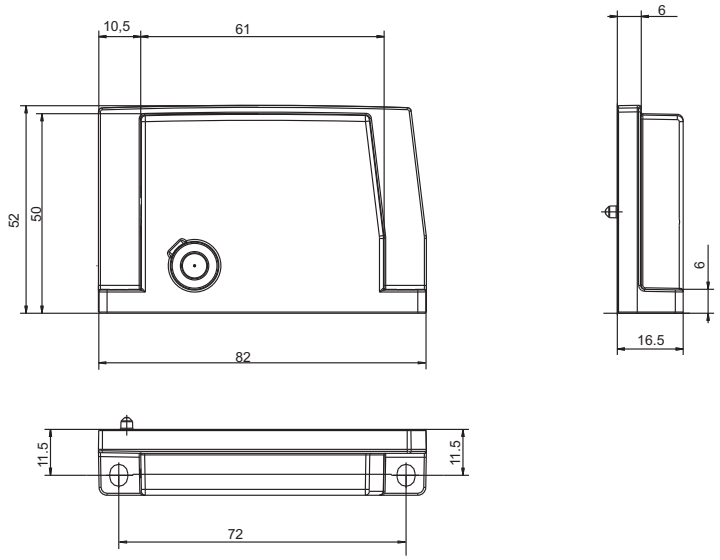
Compressed air connection	Delivery quantity	Weight	Fig.	Part No.
Pilot control exhaust				
[R]		**[kg]**		
-	1	0.08	Fig. 2	R412018350
Scope of delivery: Incl. mounting screws				

Fig. 1

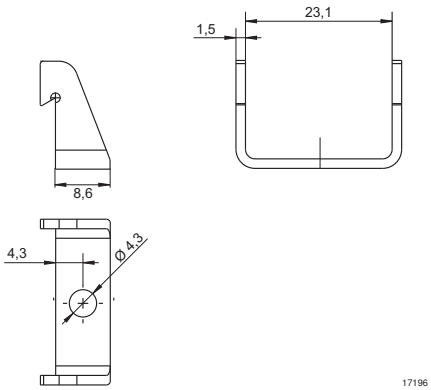


Series AV03
Accessories

Fig. 2



Retaining bracket for intermediate mounting
► for AES, AV03



Part No.	Type	Material	Delivery quantity [Piece]				
R412018339	Retaining brackets	Stainless steel	10				
After three I/O modules or 8 valves, mount a retaining bracket (R412018339) to fasten the entire unit to the mounting surface. An appropriate number of retaining brackets are included in the initial configuration. The max. permissible space between the retaining brackets is 150 mm.							

Rexroth
Bosch Group

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Online-PDF
24-10-2012

Original interview in German language, taken from the o+p journal (issue 6/12)

„Half the Installation Space and Weight, Increased Performance“

Innovation in pneumatics: the newly developed valve series Advanced Valve AV03 from Rexroth radically improves energy efficiency.

With ever shorter product life-cycles and the depletion of “new” physical possibilities, true innovations are becoming more and more of a rarity, also in the field of pneumatics. The Advanced Valve system presented by Bosch Rexroth at the HANNOVER MESSE trade fair truly merits the distinction “innovative”: it reduces compressed air consumption by up to 65% while increasing flow rates by roughly 40% – all with half the weight. The design of the new valve system makes it more energy efficient. We spoke with Theo Paulus, Head of Development and Product Management Pneumatics at Bosch Rexroth in Laatzen, Germany. He explained the considerations behind these impressive figures, as well as how the Pythagorean theorem helped in this endeavor.

Theo Paulus, Head of Development and Product Management Pneumatics at Bosch Rexroth in Laatzen, Germany, shows the valve design during the interview.

Mr. Paulus, what challenges is the field of pneumatics currently facing?
Pneumatics have clear advantages in terms of economy. They are also very simple to use. The integration of fieldbus controls, and especially the use of the new Ethernet-based data transmission protocols in recent years, enable pneumatics to be successfully integrated in a wide variety of equipment automation structures. Improvement potentials primarily exist with regard to energy efficiency – a topic which has recently become extremely important for equipment manufacturers and users.

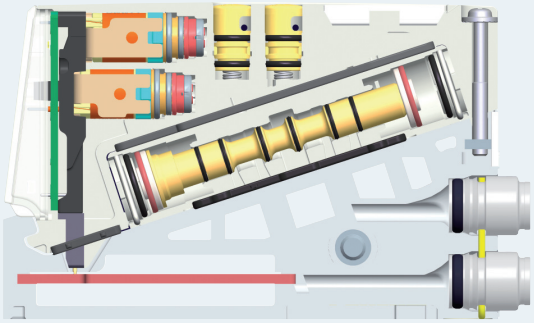
How does the new valve generation from Rexroth contribute to increased energy efficiency?
We use the universal Rexroth 4EE approach (Rexroth for Energy Efficiency) for all of our developments. It begins by increasing component efficiency and also considers subsequent component use in the system. The new Advanced Valve series takes a dual approach: First, we have made significant reductions to internal throttling losses. Second, we were able to minimize installation space and weight by at least 50% compared to conventional valve systems. This opens up new possibilities for design engineers to mount AV valve systems directly onto moving equipment parts near the actuator or compressed air consumers. This reduces tubing lengths and minimizes dead volumes, and thus compressed air consumption.

How were you able to achieve these significant advantages? What is innovative about the new design?
During the early development phase, we questioned all of our familiar design principles. We also consulted professionals from completely different technological fields within the Bosch Group, as well as external experts. We had a set valve design and asked ourselves how we could make its housing as compact as possible. In retrospect, it makes perfect sense that we looked to Pythagoras for inspiration. The result of this highly systematic development approach was the diagonal arrangement of the valve functions.

What is the effect on internal energy efficiency?
With the Advanced Valve series, we have improved the flow rate by about 40% over previous designs – while simultaneously reducing the frame size. For practical purposes, this means that the user can reduce the supply pressure by up to 15% without a loss in performance at the actuators.

How did you achieve this improvement?
Our developers conducted extensive simulations to analyze internal valve flows. The simulations enabled us to improve the geometries inside the AV valve and, for example, to create a smaller deflection angle for the supply and exhaust channels. Additional detailed improvements targeted the inlet and outlet channels on the base plate. We utilized every angle in the valve system and the results are astonishing. All in all, the AV valve system is protected by more than ten patents and proprietary rights applications.

What specific advancements have you made in terms of installation space and weight?
AV valve technology demonstrates the full flexibility of a base plate system with the key difference of needing about 45% less space than normal valves. The valve system is therefore even more compact than the widely used cassette valve systems, which have the additional drawback of limited flexibility. One more plus: the AV valve system weighs around 55% less than conventional valves as we consistently use highly filled engineering polymers. These high-performance plastics have proven themselves in the automotive industry for years. They are resistant against oils, greases, and solvents, as well as refrigerants and lubricants. The combination of a compact design and low weight taps into a significant energy-savings potential: the valve systems are installed decentrally, directly on the machine, even in confined installation spaces or near moving machine functions.

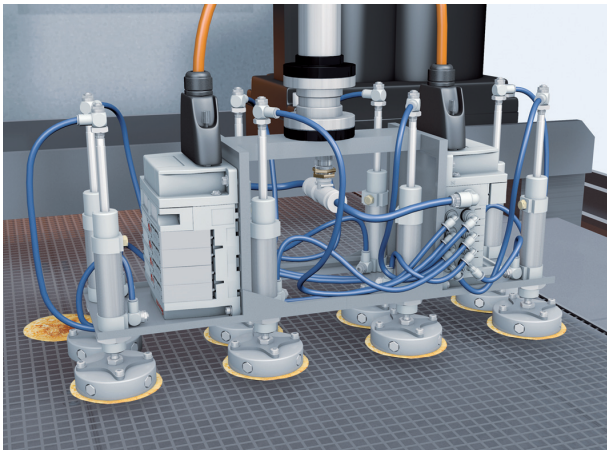


The diagonal interior reduces installation space.

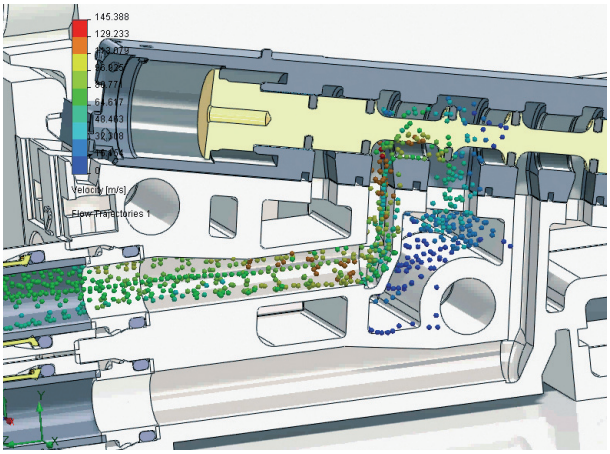
Where can you pinpoint the savings effect?
The air column in the tubing between the valve and actuator is what we refer to as “dead volume.” When the valve opens, the dead volume needs to be compressed before the actuator can move. The longer the tubing, the more air and energy are required. AV valves are situated close to the actuator and reduce the dead volume both in the compressed air supply to the actuator and in the exhaust via the valve system. This equates with compressed air savings of up to 65%. An additional important effect of shorter tubing: it increases the dynamics of pneumatic movements and creates the necessary preconditions for shorter machine cycle times with the same level of air pressure.

Which applications is AV valve technology geared towards?
The AV03 valves are designed to achieve a flow rate of 300 l/min and the protection class IP65. This performance class is often used for handling tasks in general automation settings, but also in the food and packaging industry, as well as in printing presses.

Have you already received feedback from customers?
We worked closely with key customers during development and cooperated in testing prototypes and preproduction samples in the field. Customer feedback was integrated in the end product. We responded to a suggestion from a user to reduce the height in the final AV valve system series by an additional 4 mm compared to the prototypes, for example. This solution allows the customer to create even more compact systems.



▲ **Extremely small and lightweight: The valve system can be efficiently integrated into the system, even directly on the actuator.**



▶ **Rexroth engineers calculated optimum air flows based on extensive simulations.**

To what extent can AV technology be adapted to individual user requirements?
The AV valve series covers all conventional single and double solenoid valve variants. In the bus control version, every base plate can be equipped with up to 64 valves and up to 128 electrically actuated pilot systems. From the second AV valve, the system can be expanded in single increments. Users can implement different pressure zones with supply and partition plates. Valve system versions with fieldbus or Ethernet communication modules enable the direct connection of up to ten digital I/O modules. This is also one of our experiences from the field: when valves are located near the actuator it makes sense to reduce cabling and connect the associated sensors directly to the bus module, which also cuts the potential for error significantly.

Could you give us a brief conclusion: why are you convinced of the success of the new AV valve technology?
It is the first pneumatic valve system that was developed in line with 21st century technology using comprehensive flow analyses and modern high-tech materials. The upshot for the customer is excellent technology paired with increased performance. A 50% reduction in installation space and weight is especially advantageous in compact systems. The energy-related benefits, such as 20% less compressed air thanks to a close proximity to the actuator, provide a convincing argument for all other applications. The integration of electronics in the AV valve system is completely adapted to the design of the mechanical components, meaning that the mechanics and electronics are intertwined in a perfect symbiosis. The AV valve technology thus combines all previous advantages of the pneumatic and electronic components with a considerable increase in energy efficiency. These features will prevail on the market.

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For more information please visit: www.boschrexroth.com/press

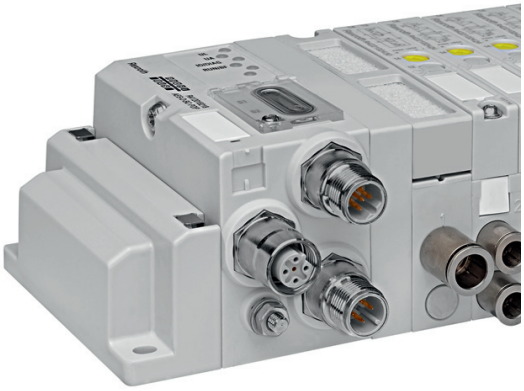
Rexroth
Bosch Group

Press release

Quick and Flexible Handling

Decentralized fieldbus connection AES for Rexroth's pneumatic AV valve system

PI 081/12
2012-11-27



Controls up to 64 valves: AES for decentralized fieldbus connection

Shorter assembly times, increased modularization, and more flexibility for assembling variants: Rexroth's Advanced Electronic System (AES) meets these requirements for decentrally connecting pneumatic actuators and machine peripheries to the fieldbus. The fieldbus electronics are optimized for use with the compact AV valve system but the system is also suitable as a stand-alone solution.

Rexroth's newly developed AES system is responsible for serial data exchange between the controller and the pneumatic valves, as well as additional inputs or outputs. The machine manufacturers are thus saved the task of individually wiring valves and sensors to the control cabinet. OEMs can place the especially compact and light AV valve systems with AES very close to the pneumatic drives. Installers then connect the sensors and single valves which are mounted close by to the decentralized I/O modules using short sections of cable, enabling them to pre-assemble complete machine modules, including peripheries. During final assembly, the modules only need to be connected to the controller via the fieldbus.

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Rexroth
Bosch Group

Press release

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AES supports common fieldbuses such as Profibus and CANopen, as well as the Ethernet-based protocols ProfiNet, EtherCat and EtherNet/IP. The sercos automation bus, as well as DeviceNet and Powerlink, will follow.

Altogether, each AES fieldbus coupler controls up to ten analog and digital I/O modules as well as up to 64 valves with up to 128 solenoids. The modular design of the AES increases the machine manufacturer's flexibility to quickly implement different variants.

An online configurator makes it easier to configure complete AV valve systems with all the I/O modules required for the application. The user can reorder all I/O modules as catalog products and also connect them without tools later. This allows OEMs to quickly implement customer-specific requests and, for example, integrate additional sensors for process monitoring. Furthermore, the modular AV valve system with AES reduces the complexity of logistics and warehousing: Users can combine existing and newly ordered components as required.

Bosch Rexroth AG is one of the world's leading specialists in the field of drive and control technologies. Under the brand name of Rexroth, the company supplies more than 500,000 customers with tailored solutions for driving, controlling, and moving. Bosch Rexroth is a partner for mobile and machinery applications, engineering, factory automation as well as renewable energies. The company covers the requirements and special needs of each of these markets. As The Drive & Control Company, Bosch Rexroth develops, produces and sells components and systems in more than 80 countries. In 2011, Bosch Rexroth, part of the Bosch Group, achieved sales of around 6.4 billion euros with 38,400 employees.
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The Bosch Group is a leading global supplier of technology and services. In the areas of automotive and industrial technology, consumer goods, and building technology, over 300,000 associates generated sales of 51.5 billion euros in fiscal 2011. The Bosch Group comprises Robert Bosch GmbH and its around 350 subsidiaries and regional companies in over 60 countries. If its sales and service partners are included, then Bosch is represented in roughly 150 countries. This worldwide development, manufacturing, and sales network is the foundation for further growth. In 2011, Bosch spent approximately 4.2 billion euros on research and development and applied for over 4,100 patents. With all its products and services, Bosch enhances the quality of life by providing solutions which are both innovative and beneficial.

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