

**AMG
PNEUMATIC
ACTUATORS
BR16**

**TYPE SAD BR16
DOUBLE-ACTING**

**TYPE SAF BR16
SINGLE-ACTING**

AMG-PESCH®



an **ERIKS** company

QUALITY IS OUR DRIVE

AMG-PESCH



an **ERIKS** company

Under the names PESCH, AMG and ABK, we are manufacturers and suppliers of complete solutions for valves, pneumatic actuators and controls.

We are active world wide, supported by a network of sales representatives and distributors, supported by our own subsidiaries and group companies.

Our activities comprise the design, manufacturing and sales of high quality pneumatic rack and pinion actuators and related control equipment. These are combined with standard valves from recognised brands or, in case of "ABK", with customised, tailor made solutions, of our own production.

The compact design, high performance valves and actuators of AMG - PESCH are specified where fluids are to be safely and efficiently transmitted in all fields of flow technology and automation.

In addition to the company headquarters in Cologne, another site is operated in Merseburg (Germany).

AMG - Pesch is supported by a reliable team of around 80 employees with a wide-range of expertise, many years of experience and Know-how, a mature and extensive product range and the latest technology in the field of flow technology and automation.

These factors have made the company one of Germany's leading providers to this industry.

The acquisition of the main assets and commercial activities of AMG-Pesch by ERIKS in 2011 will allow us to continue completing and developing our product range and to further increase customer satisfaction. Please contact us- we would be happy to provide you with more details and help in choosing your ideal combination. In addition, being part of ERIKS, we can offer you a wide range portfolio of technical products (www.eriks.com).

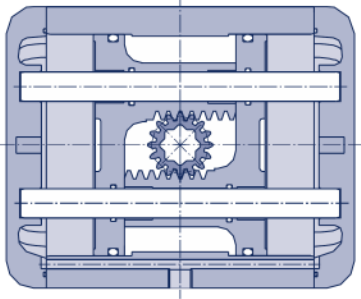
Quality is our drive



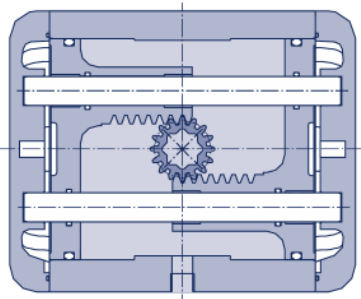
DOUBLE-PISTON QUARTER TURN ACTUATORS

TYPE SAD/SAF BR16

FUNCTION TYPE SAD (DOUBLE-ACTING)



The ventilation of the external chambers via **port 4** causes a Clockwise rotation of the pinion shaft (valve closes).

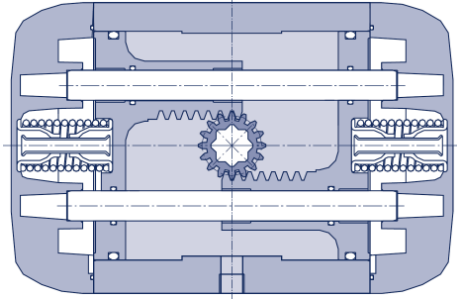


The ventilation of the internal chamber via **port 2** causes a Counter Clockwise rotation of the pinion shaft (valve opens).

Motion by compressed air

Double-acting actuators are provided with two chambers which are alternately pressurised. The generated force causes the pistons to move into opposite directions, this results in rotation of the pinion shaft which in turn operates the valve.

FUNCTION TYPE SAF (SINGLE-ACTING)



The ventilation of the internal chamber via **port 2** results in a Counter Clockwise rotation of the pinion shaft (valve opens). When venting of the interior chamber, the pinion rotates in the Clockwise (valve closes).

Motion by compressed air and spring force

When applying single-acting actuators only the internal chamber is pressurised. The generated force moves the pistons which in turn activate the valve. At the same time the encapsulated springs are loaded.

In the event of loss of air supply the compressed safety springs turn the valve into the **safety position (close or open)**.

Although the actuator types 05 and 07, as well as the SADT/SADF series are technically not identical to the SAD/SAF series, they are described here due to their comparable performance. For further information please go to our website: www.amg-pesch.com



PORT 4

PORT 2

DOUBLE-PISTON QUARTER TURN ACTUATORS

ADVANTAGES OF AMG-ACTUATORS BR16

THE SAFE, RELIABLE AND LONG SERVICE LIFE OF AMG ACTUATORS IS GUARANTEED BY THE ROD GUIDED PISTONS:

- Tilting free motion of the pistons
- Prevents O-ring wear
- Smooth and uniform rotary motion
- Prevents stick-slip effects at low operating pressure and slow motion
- Fixed rotary angle 0° and 90°
- Precise end positions, by machined travel stops
- Unintended change of end positions during operation excluded
- 500.000 cycles guaranteed (open and close)

APPLIED REGULATIONS, APPROVALS

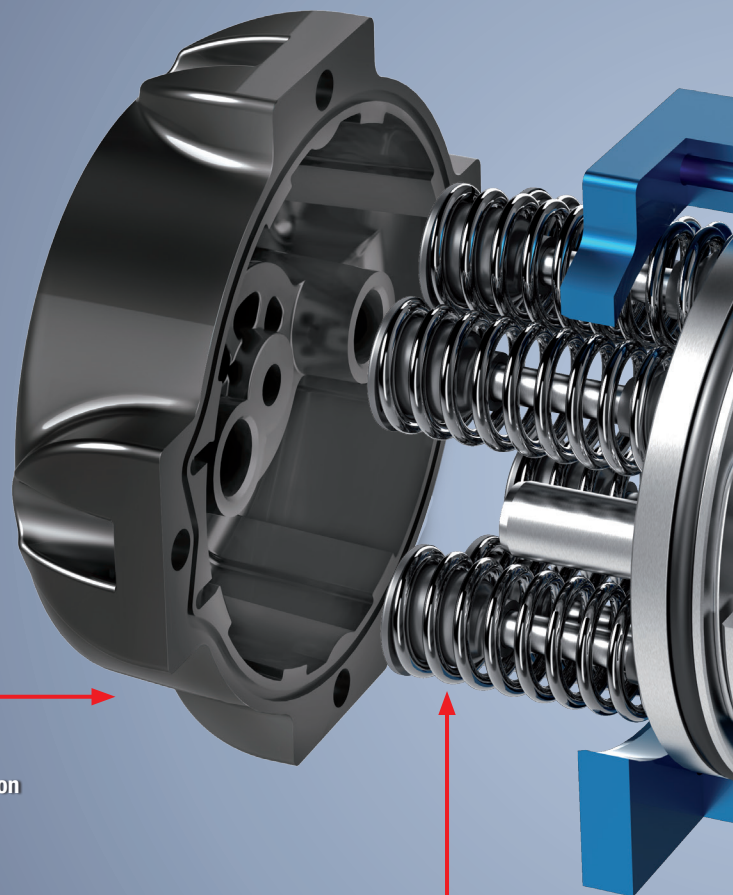
- ATEX acc. to guideline 2014/34/EU, Zone 1 (Gas) und 21 (Dust)
- SIL 3 acc. IEC 61508
- DIN EN ISO 5211
- VDI / VDE 3845
- DIN EN 15714 - 3

5 END CAPS

- Protected by a high grade cathodic electrodeposition coating, inside / outside, to prevent corrosion
- Spray tests acc. to DIN EN 9227 (former DIN 50021)
- Cross-cut tests acc. to DIN EN ISO 2409
- Screws of high grade stainless steel (A4- 70)

4 SAFETY SPRING CARTRIDGES

- Captured spring cartridges, free of non-ferrous materials
- Easy and safe assembly / disassembly
- One spring is equivalent to 0,5 bar air pressure
- Corrosion protected by delta tone / delta seal coating

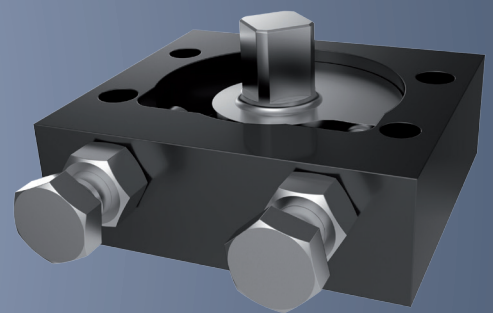
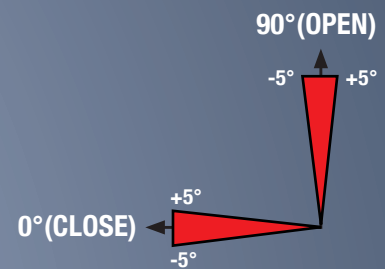


1 HOUSING

- Extruded aluminium
- Precise CNC machining
- Corrosion and wear protected by multi-layer anodising with embedded colour pigments
- Interface actuator / valve acc. to DIN EN ISO 5211
- Interface for signal transmitters and pilot valves according to VDI / VDE 3845 (NAMUR)
- Optional centering ring allows immediate construct
- Double flange connection acc. to DIN EN ISO 5211
- Port for stroke limit module

2 PINION SHAFT

- High strength stainless steel (1.4021)
- Corrosion resistant
- Inner square on 45° and 90° position
- High quality self lubricating shaft bearing material
- Maintenance free
- Spacer ring stainless steel

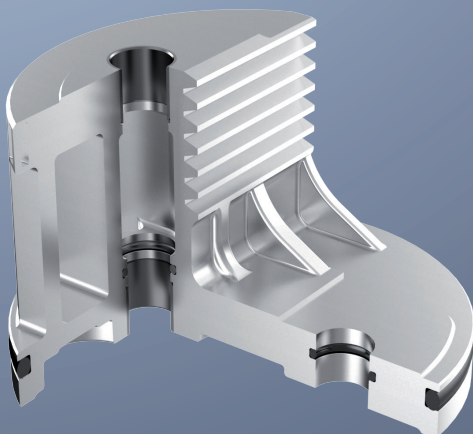


OPTION

- Adjustable travel stop module
0°+/-5° to 90°+/-5°
- Outside pressurised housing
- Shaft of stainless steel (1.4021),
with own bearing
- Suitable for heavy duty applications
(high dynamic forces)
- More information in HBM catalogue

3 PISTON & GUIDE RODS

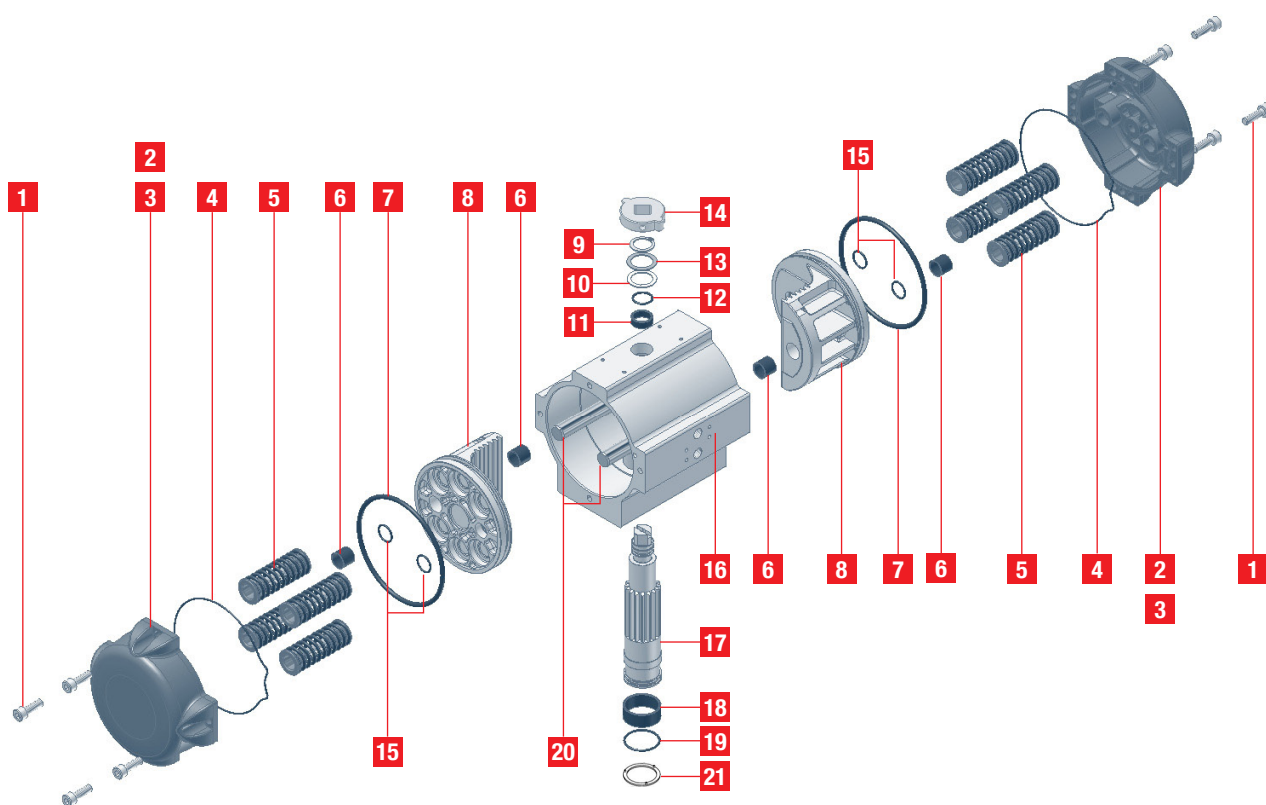
- Long life due to rod guided pistons
- Wide toothing width for high load capacity
- Maintenance free sliding bearing guides
- Machined toothing
- Machined travel stops
- Optimum piston guidance via long
and pressure resistant slide bearings
- Polished rods, made of stainless steel (1.4021)



DOUBLE-PISTON QUARTER TURN ACTUATORS

TYPE SAD/SAF BR16

PARTS LIST



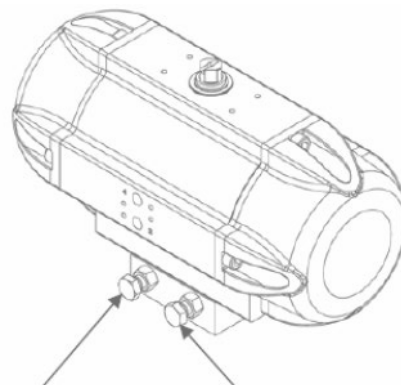
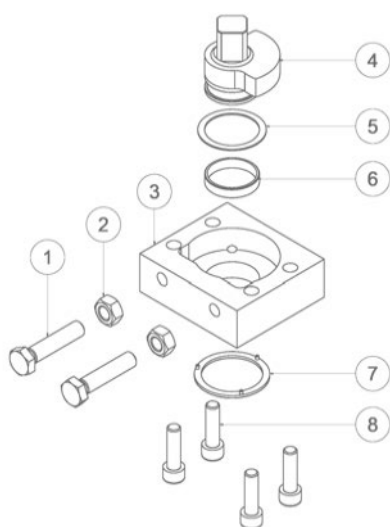
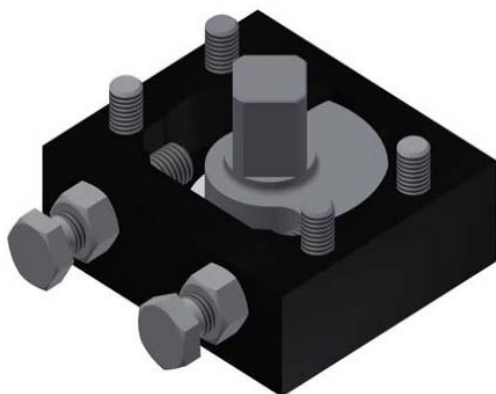
Position	Piece		Component	Designation	Material
	SAD	SAF			
1	8-12	8-12		Screw	Stainless steel A4-70
2	2			End cap (double acting)	Aluminum alloy, coated
3		2		End cap (single acting)	Aluminum alloy, coated
4	2	2	X	O-ring	NBR *
5		4-14		Safety spring package	Spring steel, coated
6	4	4		Guide bush	Bearing material
7	2	2	X	Piston sealing ring	NBR *
8	2	2		Piston	Aluminum alloy
9	1	1	X	Circlip	Stainless steel 1.4532
10	1	1	X	Axial thrust bearing	Bearing material
11	1	1		Guide ring, top	Bearing material
12	1	1	X	Shaft sealing ring, top	NBR *
13	1	1	X	Spacer ring	Stainless steel
14	1	1		Position indicator	Plastic
15	4	4	X	Rod sealing ring	NBR *
16	1	1		Housing	Aluminum alloy, anodised
17	1	1		Pinion shaft	Stainless steel
18	1	1		Guide ring, bottom	Bearing material
19	1	1	X	Shaft sealing ring, bottom	NBR *
20	2	2		Guide rod	Stainless steel
21	1	1		Centering ring	Plastic

* alternative elastomer qualities on request

DOUBLE-PISTON QUARTER TURN ACTUATORS

TYPE SAD/SAF BR16

STROKE LIMIT MODULE BR16



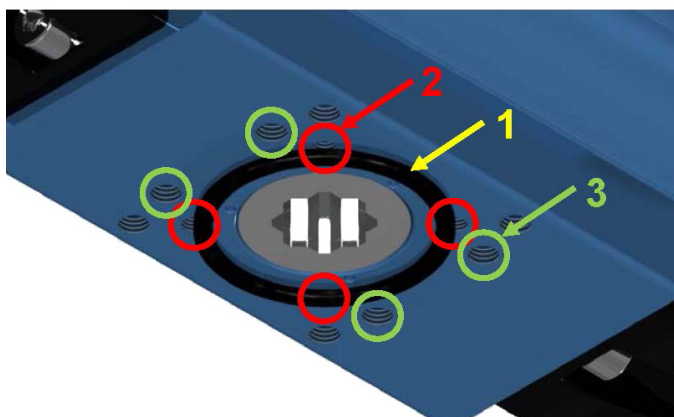
Limitation of the
OPEN position

Limitation of the
CLOSE position

Design type	Stroke Limit Module		
Position	Qty	Designation	Material
1	2x	Stop bolt	galvanised steel *
2	2x	Lock Nut	galvanised steel *
3	1x	Body	anodised aluminium
4	1x	Stop Shaft	Stainless Steel
5	1x	Bearing Plate	slide bearing material
6	1x	Plain Bearing	slide bearing material
7	1x	Bearing Plate	slide bearing material
8	4x /8x	Fastening Screws	galvanised steel *

* Alternative Materials upon request.

MODIFICATIONS BODY BR16



MODIFICATIONS AND ADVANTAGES

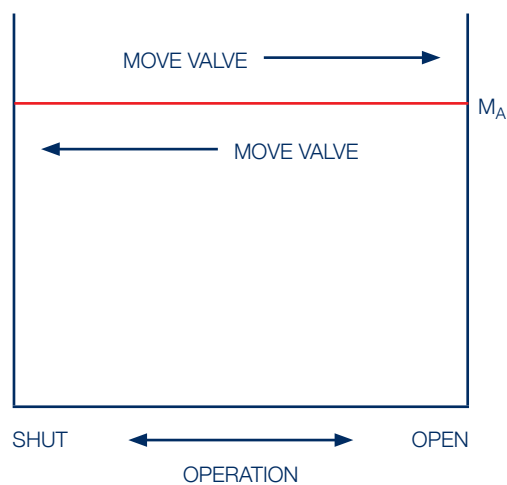
- No more fixed centering ring, centering ring is now done by a plug-in optional centering ring (1)
- The centering ring (1) corresponds to the sizes of centering BR03 and BR03C according to DIN EN ISO 5211
- In sizes 10 to 42, an additional flange pattern (2) according to DIN EN ISO 5211 was introduced for an extended area of application and direct connections
- The mounting threads (3) for mounting the stroke limit module are integrated directly in the new actuator housing

TORQUE [Nm] RATINGS OF TYPE SAD BR16 DOUBLE ACTING ACTUATORS

Type	Torque M_A at air supply pressure p_e												
SAD BR16	2 bar	2,5 bar	3 bar	3,5 bar	4 bar	4,5 bar	5 bar	5,5 bar	6 bar	6,5 bar	7 bar	7,5 bar	8 bar
10	10	13	16	19	22	25	27	30	33	36	39	42	45
15	23	29	36	42	49	55	62	68	75	82	88	94	101
20	32	42	51	61	70	80	89	98	108	118	127	136	145
25	61	79	98	115	133	151	169	187	205	223	240	257	275
30	91	117	144	170	196	223	249	276	302	329	355	380	405
33	166	215	264	312	360	410	458	506	555	605	651	698	744
35	221	286	350	413	478	543	607	671	736	801	863	925	986
40	336	435	534	629	727	827	924	1022	1121	1220	1314	1408	1502
42	536	694	852	1005	1161	1321	1475	1631	1789	1948	2098	2248	2398
43	715	926	1136	1340	1548	1761	1967	2175	2385	2598	2798	2998	3197
45	893	1156	1419	1674	1934	2199	2457	2717	2980	3245	3495	3744	3994
50	1576	2039	2503	2952	3411	3879	4333	4792	5256	5724	6164	6604	7045

M_A = effective torque in Nm

TORQUE CHARACTERISTIC OF TYPE SAD BR16 DOUBLE-ACTING ACTUATORS



The indicated torques are constant over
the complete movement

DOUBLE-PISTON QUARTER TURN ACTUATORS

TYPE SAD/SAF BR16

TORQUE [Nm] RATINGS OF TYPE SAF BR16 SINGLE ACTING ACTUATORS

Air supply pressure p_e	2 bar		2,5 bar		3 bar		3,5 bar		4 bar		4,5 bar		5 bar		5,5 bar		6 bar		7 bar *	
Number of springs n	4		5		6		7		8		9		10		11		12		14	
Type	Spring torque $M_S \cong$ Air torque M_A [Nm]**																			
SAF BR16	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
10	3,9	6,5	4,9	8,1	5,9	9,8	6,8	11,4	7,8	13,0	8,8	14,6	9,8	16,3	10,7	17,9	11,7	19,5	13,7	22,8
15	8,8	14,7	11,0	18,4	13,3	22,0	15,5	25,7	17,7	29,4	19,9	33,0	22,1	36,7	24,3	40,4	26,5	44,0	30,9	51,4
20	12,7	21,1	15,9	26,4	19,1	31,7	22,2	36,9	25,4	42,2	28,6	47,5	31,8	52,8	35,0	58,0	38,1	63,3	44,5	73,9
25	24,2	40,2	30,2	50,2	36,3	60,2	42,3	70,3	48,3	80,3	54,4	90,4	60,4	100,4	66,5	110,8	72,5	120,5	84,6	141
30	36	59	45	74	54	89	62	104	71	118	80	133	89	148	98	163	107	178	125	207
33	66	109	82	136	98	163	115	190	131	217	148	244	164	271	180	299	197	326	230	380
35	87	144	109	180	131	216	152	252	174	288	196	324	218	360	239	396	261	432	305	504
40	133	222	166	277	199	333	232	388	266	443	299	499	332	554	365	610	398	665	465	776
42	212	352	265	440	318	528	371	615	424	703	477	791	530	879	583	967	636	1055	742	1231
43	298	456	372	570	447	684	521	798	596	912	670	1026	744	1140	819	1254	893	1368	1042	1596
45	352	585	440	732	528	878	616	1025	705	1171	793	1317	881	1464	969	1610	1057	1756	1233	2049
50	622	1033	777	1291	933	1550	1088	1808	1244	2066	1399	2324	1555	2583	1710	2841	1866	3099	2177	3616

* maximum number of springs $n = 14$ (special design)

** Air and spring torque are identical at given „ p_e “ and corresponding „ n “
(Detailed list of air moments can be found in the dimension sheets of the individual sizes)

Example for choosing the right actuator:

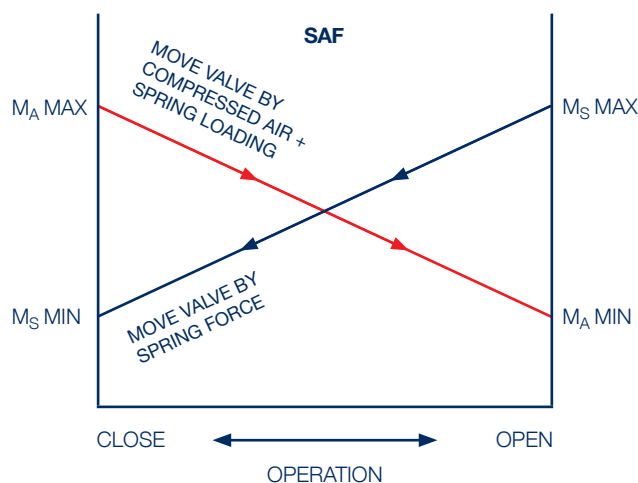
Fact: air pressure p_e 4 bar

Required: SAF with a minimim spring torque (M_S MIN) of 70 Nm

Result: SAF 30, $n=8$

Torques: Spring / Air min = **71 Nm** - Spring / Air max = **118 Nm**

TORQUE CHARACTERISTIC OF TYPE SAF BR16 SINGLE ACTING ACTUATORS

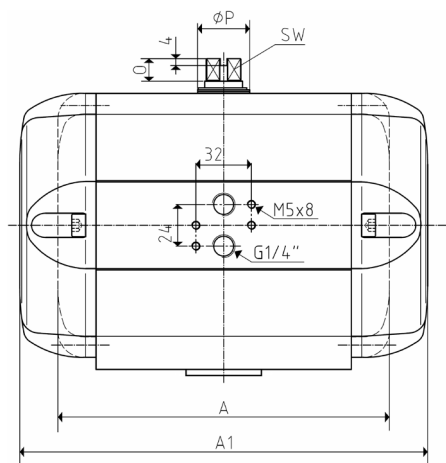


DOUBLE-PISTON QUARTER TURN ACTUATORS

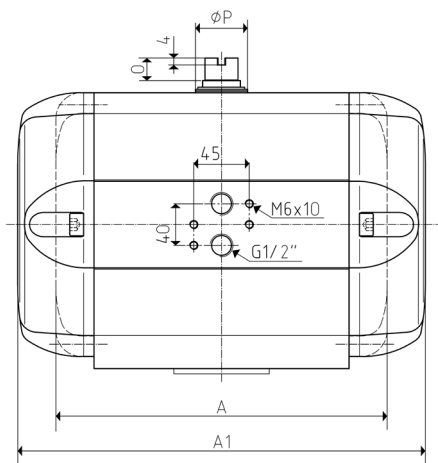
TYPE SAD/SAF BR16

DIMENSION DRAWING SAD/SAF BR16

FRONT VIEW

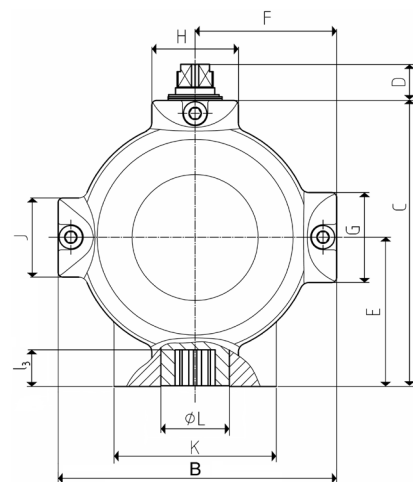


SAD/SAF 10-42



SAD/SAF 43-50

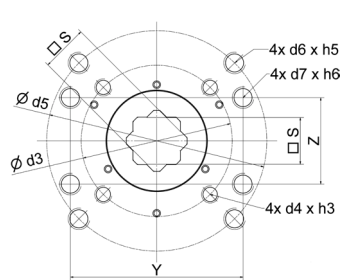
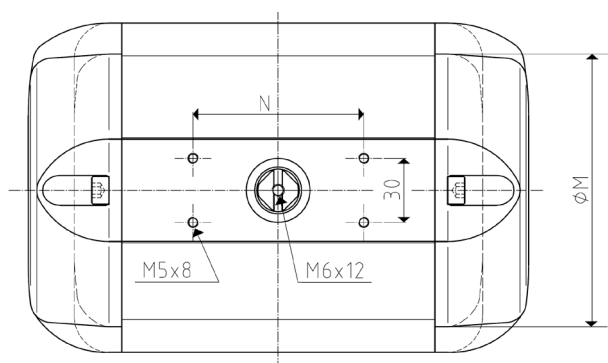
SIDE VIEW



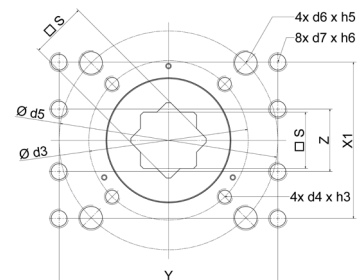
SAD/SAF 10-50

INTERFACE CONNECTION DIN EN ISO 5211

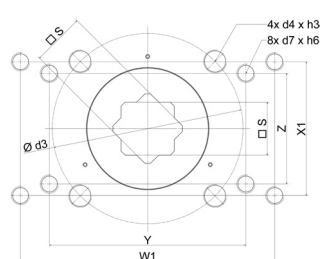
TOP VIEW



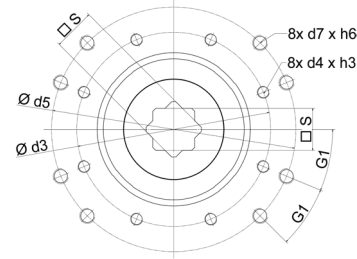
SAD/SAF 10-35



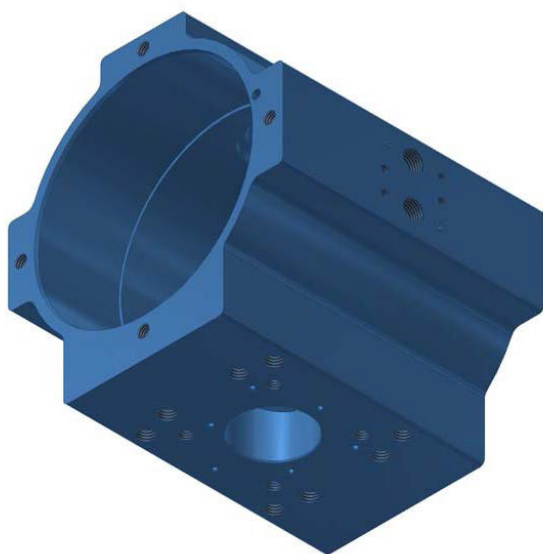
SAD/SAF 40-42



SAD/SAF 43-45



SAD/SAF 50



DOUBLE-PISTON QUARTER TURN ACTUATORS

TYPE SAD/SAF BR16

SIZE TABLE

SAD/SAF BR16												
Size	10	15	20	25	30	33	35	40	42	43	45	50
A (SAD BR16)	138	150	175,5	191	230	253	284	318	362	463	475	567
A1 (SAF BR16)	138	198	207,5	235	346	365	382	430	550	659	695	817
B	96	116	134	154,5	174	204	218	268	288	288	330	390
C	94,5	111	132,5	159	174	202	217	266	296	296	337	389
D	20	20	20	20	20	20	20	20	20	20	30	30
E	49,5	56	68,5	83	89	103	112	136	146	146	175	197
F	51	61	70	78,5	87	102	109	134	144	144	165	195
G	50	50	50	50	50	50	50	60	60	60	84	84
H	40	40	48	48	64	90	90	108	108	108	125	150
K	64	64	64	90	90	108	108	125	150	150	150	265
Ø L	26	28	35	38	47	56	62	62	80	106	106	132
J	44	44	44	44	50	50	50	60	60	60	84	84
Ø M	74	93	111	130	145	175	192	236	258	258	292	345
N	80	80	80	80	80	80	80	80	80	80	130	130
O	12	12	12	12	12	12	12	12	12	12	18	18
Ø P	20	22	25	30	36	45	50	50	63	63	90	110
Y	64	64	75	80	80	138	138	140	140	170	170	-
Z	34	34	40	40	30	76	76	40	40	96	96	-
W1	-	-	-	-	-	-	-	-	-	220	220	-
X1	-	-	-	-	-	-	-	100	100	116	116	-
X	G1/4"	G1/4"	G1/4"	G1/4"	G1/4"	G1/4"	G1/4"	G1/4"	G1/4"	G1/2"	G1/2"	G1/2"
SW	12	12	14	17	17	22	30	30	30	30	46	46
Connection DIN 5211	F05/F07	F05/F07	F07/F05	F07/F10	F10/F07	F12/F10	F12/F10	F14/F10	F14/F10	F16	F16	F25
Ø d ₂	35/55	35/55	55/-	55/70	70/-	85/70	85/70	100/-	100/-	130	130	200
Ø d ₃	50	50	50	70	70	102	102	102	102	165	165	254
Ø d ₅	70	70	70	102	102	125	125	140	140	-	-	320
4(8)xd4xh3	4xM6x10	4xM6x10	4xM6x10	4xM8x13	4xM8x13	4xM10x16	4xM10x16	4xM10x16	4xM10x16	4xM20x32	4xM20x32	8xM16x25
4xd6xh5	4xM8x13	4xM8x13	4xM8x13	4xM10x16	4xM10x16	4xM12x20	4xM12x20	4xM16x25	4xM16x25	-	-	-
4(8)xd7xh6	4xM6x10	4xM6x10	4xM8x13	4xM10x16	4xM10x16	4xM16x19	4xM16x19	8xM12x18	8xM12x18	8xM16x24	8xM16x24	8xM20x31
G1	-	-	-	-	-	-	-	-	-	-	-	8x 22,5°
h ₄	2,5/2,5	2,5/2,5	2,5/-	2,5/2,5	2,5/-	2,5/2,5	2,5/2,5	3/-	3/-	3	3	5
l ₃	16	16	20	20	25	30	30	40	40	50	50	60
s	14	14	17	17	22	27	27	36	36	46	46	55

WEIGHTS – STROKE VOLUME – OPERATING TIMES

Size	10	15	20	25	30	33	35	40	42	43	45	50
Weight [kg]												
Type SAD BR16	1,8	2,8	4,0	6,0	12,0	13,5	18,5	24,0	34,0	58,0	75,0	126
Type SAF BR16	1,9	3,5	5,0	8,5	13,5	18,5	26,0	37,5	48,5	86,0	102	190
Stroke volume [dm³]												
Type SAD BR16	0,3	0,7	1,0	2,0	2,8	5,1	6,8	10,6	16,4	20,5	25,6	43,8
Type SAF BR16	0,2	0,4	0,5	1,0	1,5	3,0	3,9	6,1	9,5	11,5	14,7	25,0
Operating times [sec]*												
Type SAD BR16 AUF	0,1	0,2	0,4	0,4	0,5	0,8	1,0	1,5	2,5	3,3	4,0	7,0
Type SAD BR16 ZU	0,1	0,2	0,4	0,4	0,5	0,8	1,0	1,5	2,5	3,3	4,0	7,0
Type SAF BR16** AUF	0,1	0,2	0,4	0,4	0,5	1,0	2,0	3,0	5,0	6,0	7,0	11,0
Type SAF BR16** ZU	0,1	0,1	0,2	0,2	0,3	0,5	1,0	1,5	2,0	3,0	3,0	5,0

* Operating times at 4,5 bar air pressure supply and without load (standard values, OP. = Open / CL. = Close).

** Type SAF with 9 springs

APPLIED STANDARDS

- In accordance with the practicable standards, for example DIN EN ISO 5211, DIN EN 15714 - 3, VDI / VDE 3845

MAINTENANCE

AMG ACTUATORS ARE FREE OF MAINTENANCE

Provided that:

- The actuator is properly mounted
- The operating medium used is clean and non-aggressive
- The actuator is operated under normal ambient conditions
- Usage according to regulations

OPTIONS

- Extended angle of rotation 120°, 135°, 180°, 270°
- Adjustable inner / outer travel stops +/-5°
- Ambient temperature up to +100°C
- Ambient temperature down to -40°C
- Sealing elements made of FKM (Viton) or alternatively fluorosilicone
- Tailor made mounting kits and dimensioning acc. to customer requirements
- Variable cycle times (fast / slow)
- Variable sens of rotation (clockwise / counterclockwise)
- Coating options:
 - HARD-COAT
 - Chemical nickelplating
 - Plastic-coating
 - Silicone-free lacquer
 - Special lacquer
- Special housing : stainless steel

DOUBLE-PISTON QUARTER TURN ACTUATORS

TYPE SAD/SAF BR16

TYPE OF DESIGN, TECHNICAL DATA

DESIGN

- Pneumatic double-piston quarter turn actuator

DESIGN FEATURES

- Rack-and-pinion system, piston guidance via guide rods

DEGREE OF ROTATION

- 90°

PRESSURE RANGE

- SAD/SAF series: min. 2 bar, max. 10 bar

OPERATING MEDIUM

- Dry and filtered compressed air.
Other, non-aggressive gaseous media upon request

AMBIENT TEMPERATURE

- -25°C to +80°C

MOUNTING POSITION

- Any

RESISTANCE TO CORROSION

- Industrial atmosphere

LUBRICATION

- Permanent lubrication with grease ISO 51825-K2K-30

WERKSTOFFE

- Housing Aluminum alloy, anodised
- End cap Aluminum alloy, coated
- Piston Aluminum alloy
- Piston bearing Bearing material
- Guide rods Stainless steel
- Pinion shaft Stainless steel
- Pinion shaft bearing Bearing material
- Safety springs VD Si Cr,
delta tone / delta seal coating
- Sealings O-ring, NBR, 70 shore

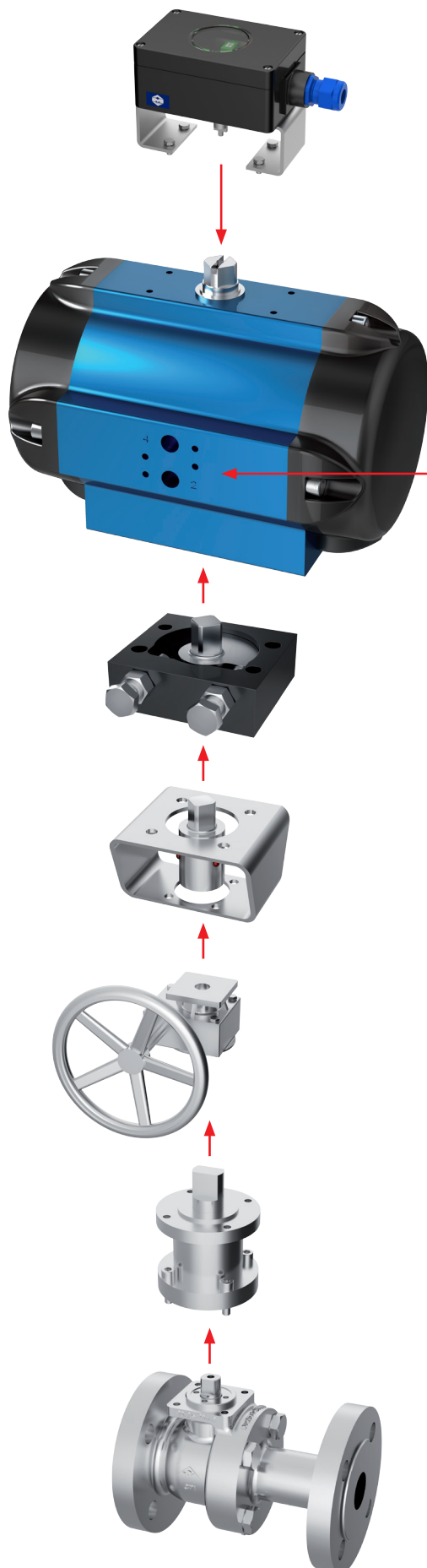
TORQUES

- see torque chart page 8 and 9

DOUBLE-PISTON QUARTER TURN ACTUATORS

TYPE SAD/SAF BR16

CONNECTING OPTIONS FOR ACCESSORIES



LIMIT SWITCH BOX

for signaling of end position

SOLENOID VALVE

for quarter turn actuator control

TRAVEL STOP MODULE

Adjustable travel stop module

0°+/-5° bzw. 90°+/-5°

COUPLING & BRACKET

to connect valve and actuator

MANUAL EMERGENCY GEAR

for manual operation of the actuator

PINION SHAFT EXTENSION

to keep away extreme process temperatures from the actuator, to implement a leaking advice, monitoring of functionality and tightness

VALVES

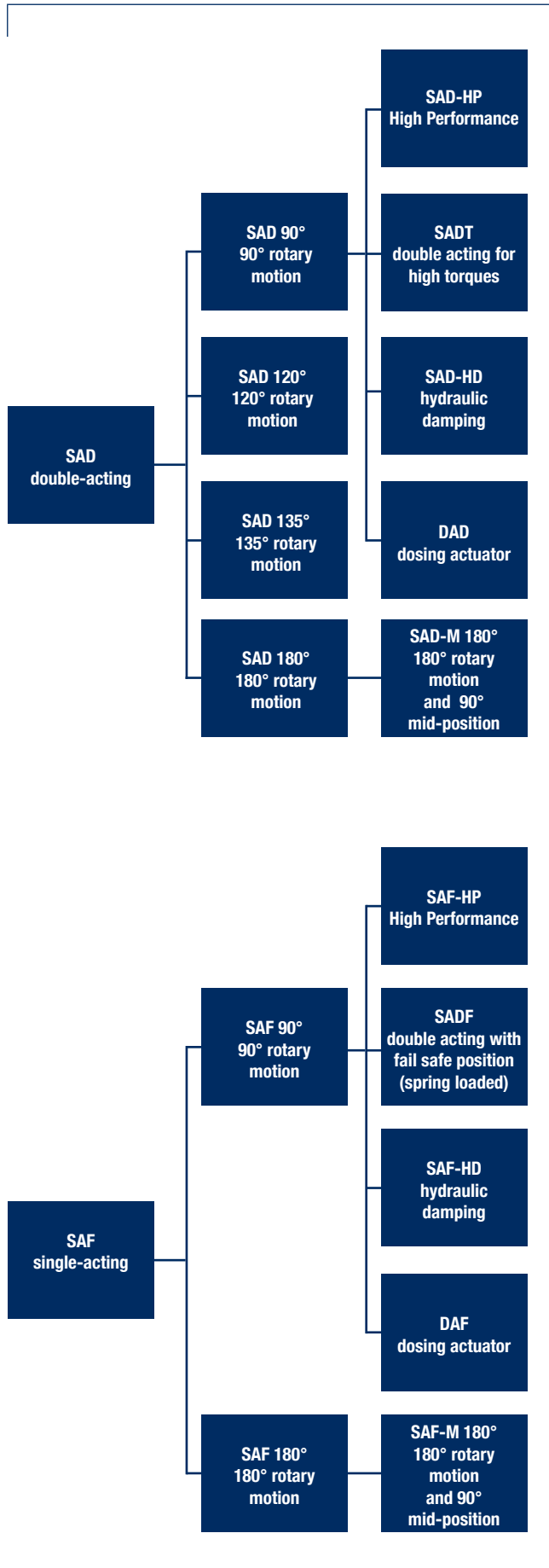
all designs featuring a rotary movement, such as

Ball valves
Plug valves
Butterfly valves
Control valves

DOUBLE-PISTON QUARTER TURN ACTUATORS

TYPE SAD/SAF BR03C

PRODUCT RANGE



SERVICE AND QUALITY MANAGEMENT

SERVICE

- Consulting, performance of training courses
- Assembly and setting- up
- Testing and approval of valves, actuators and complete units according to customer requirements and important international regulations
- After sales and spare parts service
- Repair and overhaul

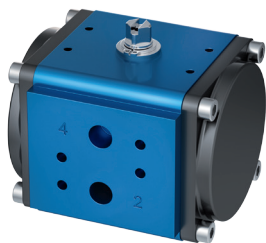
QUALITY MANAGEMENT

Quality Management System according to DIN EN ISO 9001, audited by TÜV-Rheinland Cert GmbH

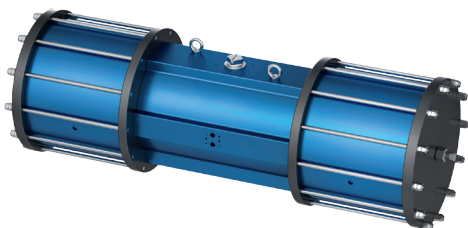
This brochure presents our actuator series BR16.

For more information about our others series, please visit our homepage www.amg-pesch.com or take directly contact with our sales department.

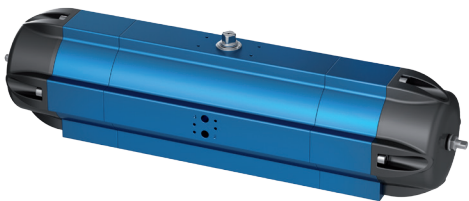
AMG actuators overview



SAD 05



SADF-M 180°



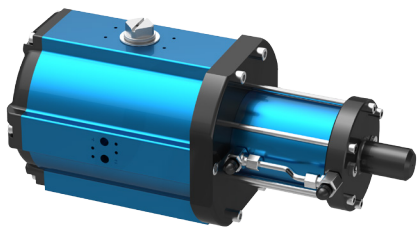
SAF 180°



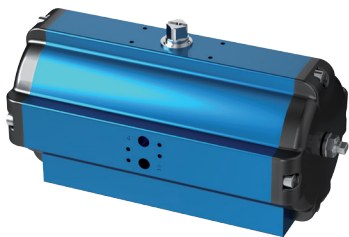
SAD / SAF 90°



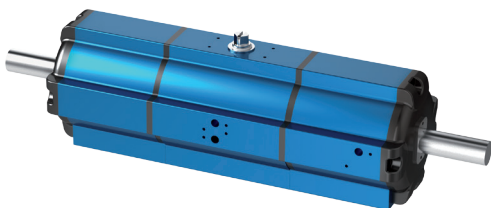
SADT / SADF 90°



SAD / SAF-HD 90°



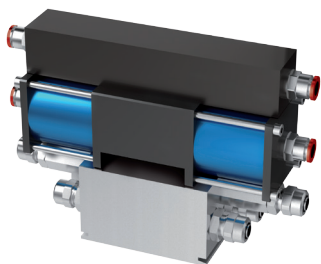
SAD 120° / 135° / 180°



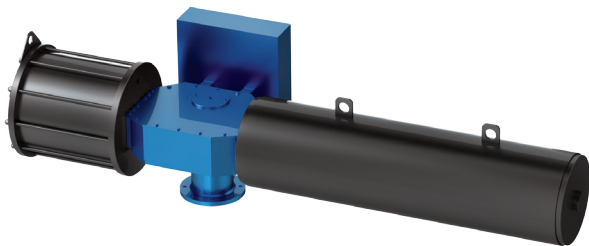
DAD / DAF 90°



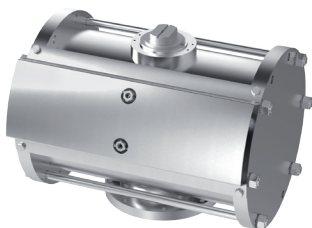
SAD-M 180°



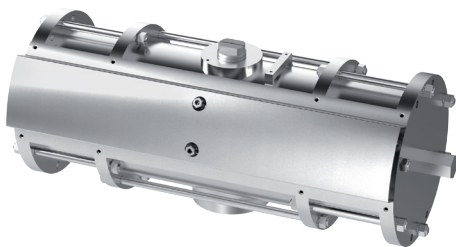
Flutorque (double pinion)



SPD / SPS



Pneumatic rotary actuators
made of stainless steel



Pneumatic rotary actuators
made of stainless steel

STANDORTE



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