

Biffi Pneumatic Booster

Low Pressure Pneumatic Component



Revision Details

Rev.	Date	Description	Prepared	Approved
1	March 2022	Added EAC logo		
0	December 2021	General update (Migration to new template)		

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Section 1: Introduction

According to the continuous improvement process of the Biffi product range, the decision has been made that the Biffi Volume Booster Ver2020 will be obsoleted and will be replaced with the new version 2021.

Biffi Volume Booster is a low-pressure pneumatic component that converts a low volume pressure signal into a 1:1 ratio high volume output. It is specifically designed for both modulating and “on - off” pilot pressure signals and provide fast response and stability to the control system.

1.1 Main Technical Differences from the Previous Version

The new version is engineered to better fit to our customer needs with a unique design which allows optimized features and extended capabilities.

- Introduction of new sizes for performance optimization (3/8” instead of 1/4”, 3/4” instead of 1/2”).
- New shutter design to allow more precise regulation capability for air inlet and exhaust. The shutter for inlet or exhaust function have now different design.
- New regulator screw for air inlet and exhaust.
- Addition of a second inlet hole in the body to grant a reverse installation capability and reduce the tube length and bend.
- In order to grant the compatibility with the new sizes 3/8” and 3/4” with the control panel components sizes 1/4” and 1/2”, the new booster sold as spare part will be equipped with reduction fittings.

Figure 1 Old Version

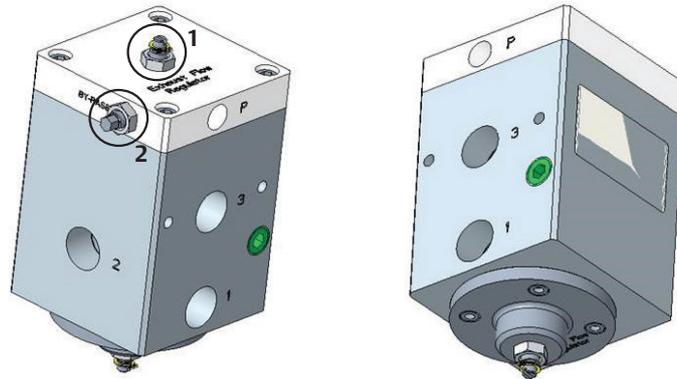
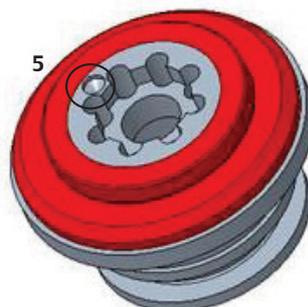


Figure 2 New Version



1. The flow regulation screw is now available with visual indication lines.
2. Bypass screw is now on the Booster top for better accessibility and prevent accidental complete unscrewing.
3. Additional holes on the bottom for the installation with optional bracket.
4. Additional hole on the front to grant reverse installation.
5. The shutters (supplied in the spare kit) now have different design for inlet or exhaust function. Exhaust shutter has a spot indication on board to clearly recognize it.

Figure 3



1.2 Old and New Version Codes Cross-check

Table 1 shows the correspondence between the old codes and the new codes of the complete booster spare unit.

Table 1.

Old code	New code	Old code	New code
2P27101500	4P271X2502	2P271055S1	2P271X55R1
2P27101501	4P271X2501	2P271055S2	2P271X55R2
2P27101502	4P271X2502	2P271A1500	4P271B2502
2P271015M2	4P271X25R2	2P271A1501	4P271B2501
2P271015R1	4P271X25R1	2P271A1502	4P271B2502
2P271015R2	4P271X25R2	2P271A15M1	4P271B25R1
2P271015RZ	4P271X25R2	2P271A15M2	4P271B25R2
2P271015S1	4P271X25R1	2P271A15R1	4P271B25R1
2P271015S2	4P271X25R2	2P271A15R2	4P271B25R2
2P27103500	4P271X4502	2P271A15S2	4P271B25R2
2P27103501	4P271X4501	2P271A3500	4P271B4502
2P27103502	4P271X4502	2P271A3501	4P271B4501
2P271035M2	4P271X45R2	2P271A3502	4P271B4502
2P271035R1	4P271X45R1	2P271A35M1	4P271B45R1
2P271035R2	4P271X45R2	2P271A35M2	4P271B45R2
2P271035S1	4P271X45R1	2P271A35R1	4P271B45R1
2P271035S2	4P271X45R2	2P271A35R2	4P271B45R2
2P27105500	2P271X5502	2P271A35S1	4P271B45R1
2P27105501	2P271X5501	2P271A35S2	4P271B45R2
2P27105502	2P271X5502	2P271A5500	2P271B5502
2P271055M2	2P271X55R2	2P271A5501	2P271B5501
2P271055R1	2P271X55R1	2P271A5502	2P271B5502
2P271055R2	2P271X55R2	2P271A55M2	2P271B55R2
2P271055RZ	2P271X55R2	2P271A55R1	2P271B55R1
2P271055S1	2P271X55R1	2P271A55R2	2P271B55R2
2P271055S2	2P271X55R2	2P271A55S1	2P271B55R1
2P271A1500	4P271B2502	2P271A55S2	2P271B55R2
2P271A1501	4P271B2501		
2P271A1502	4P271B2502		

Table 2 shows the correspondence between the old codes and the new codes of the the spare part kits.

Table 2.

Old code	New code
G02P271A1502	G02P27101502
G02P271A15R1	G02P271015R1
G02P271015S1	G02P271015R1
G02P271015M2	G02P271015R2
G02P271A15M2	G02P271015R2
G02P271015RZ	G02P271015R2
G02P271A15R2	G02P271015R2
G02P271015S2	G02P271015R2
G02P271A15S2	G02P271015R2
G02P271A3502	G02P27103502
G02P271035S1	G02P271035R1
G02P271A35S1	G02P271035R1
G02P271035M2	G02P271035R2
G02P271A35M2	G02P271035R2
G02P271A35R2	G02P271035R2
G02P271035S2	G02P271035R2
G02P271A35S2	G02P271035R2
G02P271A5502	G02P27105502
G02P271A55R1	G02P271055R1
G02P271055S1	G02P271055R1
G02P271A55S1	G02P271055R1
G02P271055M2	G02P271055R2
G02P271A55M2	G02P271055R2
G02P271055RZ	G02P271055R2
G02P271A55R2	G02P271055R2
G02P271055S2	G02P271055R2
G02P271A55S2	G02P271055R2

Section 2: References

- IEC 61508
- Machinery Directive 2006/42/EC
- PED Directive 2014/68/EU
- ATEX Directive 2014/34/UE
- CU TR 012/2011 certification for the safety of the equipment in explosionproof environment
- CU TR 010/2011 certification for the safety of machinery



Section 3: Biffi Pneumatic Booster

The high capacity, fast response, and stability you need are important characteristics of Biffi volume boosters. A wide range of signal to output pressure ratios, pipe sizes from 3/8" to 1" NPT, and flow capacities from 1 l/s to 30 l/s provide a versatile selection. Simplicity, reliability, and economy are at the top of the list of design parameters. Supply pressure is maximum of 12 barg, accepting air, nitrogen, or sweet gas. Supported standard ambient temperature ranges from -60 °C to +100 °C, special versions are available to accommodate Biffi Booster outside this temperature envelope.

- Biffi Booster Code:

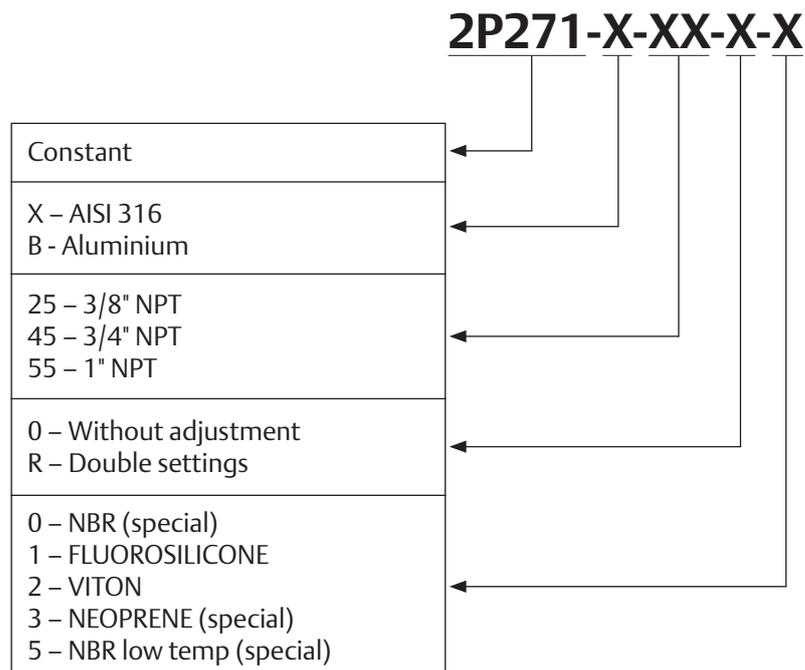


Figure 4 Pneumatic Booster Assembly

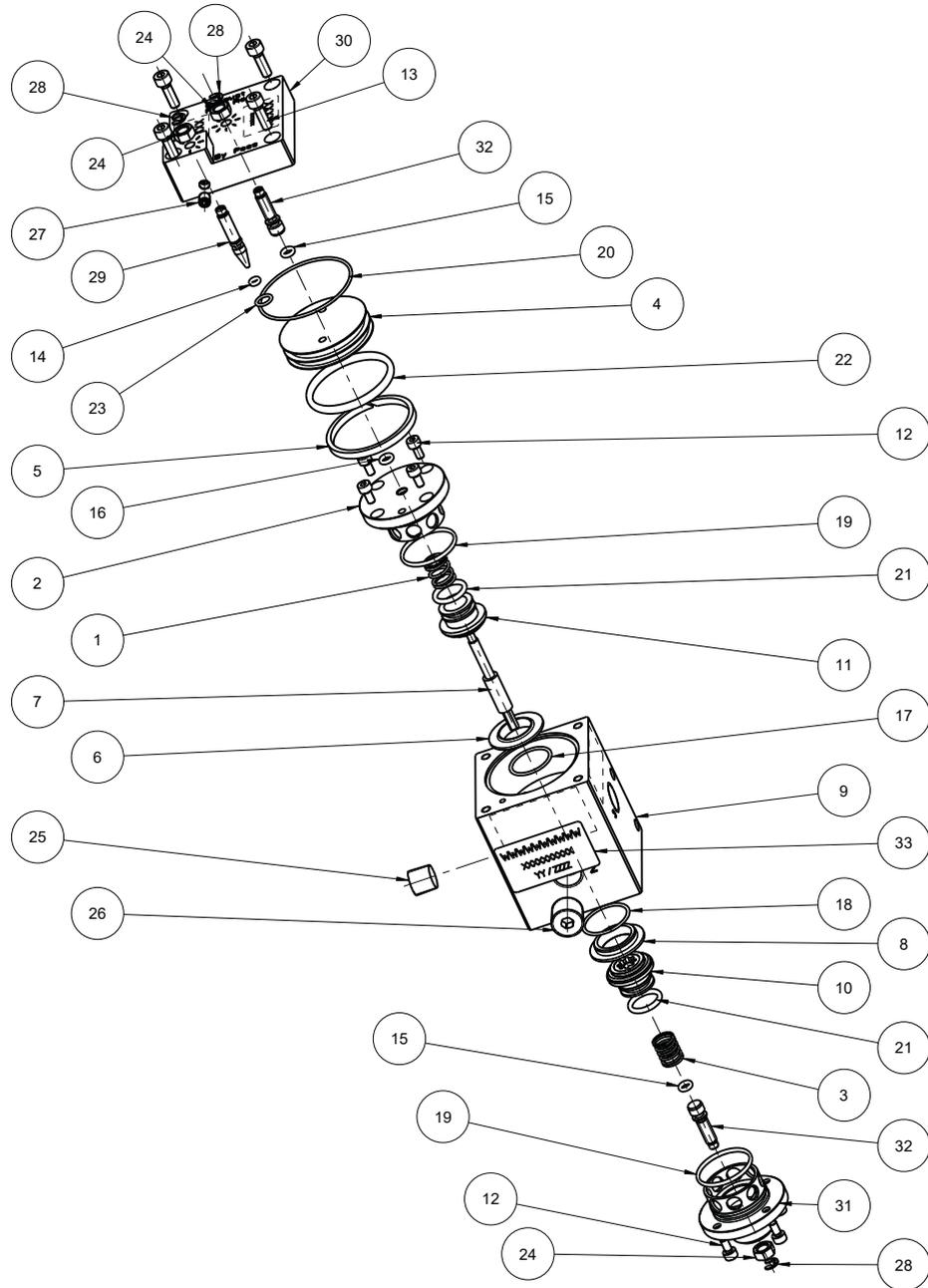


Table 3. Parts List

Item	Qty	Description	Material	Other Materials Available	Spare
1	1	Spring	Carbon steel	N/A	-
2	1	Flange	Stainless steel	N/A	-
3	1	Spring	Carbon steel	N/A	-
4	1	Piston	Stainless steel	N/A	-
5	1	Skat	Turcite	N/A	-
6	1	Seat holded	Stainless steel	N/A	-
7	1	Rod	Stainless steel	N/A	-
8	1	Seat holded	Stainless steel	N/A	-
9	1	Body	Stainless steel	Aluminum (others special available)	-
10	1	ASS.PIST.BOOST.ING	SS316+Viton	SS316+FLR (others special available)	X
11	1	ASS.PIST. BOOST.OUT	SS316+Viton	SS316+FLR (others special available)	X
12	8	Screw	Stainless steel	N/A	-
13	4	Screw	Stainless steel	N/A	-
14	1	O-ring	Viton	FLR (others special available)	X
15	2	O-ring	Viton	FLR (others special available)	X
16	1	O-ring	Viton	FLR (others special available)	X
17	1	O-ring	Viton	FLR (others special available)	X
18	1	O-ring	Viton	FLR (others special available)	X
19	2	O-ring	Viton	FLR (others special available)	X
20	1	O-ring	Viton	FLR (others special available)	X
21	2	O-ring	Viton	FLR (others special available)	X
22	1	O-ring	Viton	FLR (others special available)	X
23	1	O-ring	Viton	FLR (others special available)	X
24	3	Nut	Stainless steel	N/A	-
25	1	Plug	Stainless steel	N/A	-
26	1	Plug	Stainless steel	N/A	-
27	1	Plug	Stainless steel	N/A	-
28	3	Ring	Stainless steel	N/A	-
29	1	Shutter	Stainless steel	N/A	-
30	1	Cover	Stainless steel	Aluminum	-
31	1	Flange	Stainless steel	N/A	-
32	2	Stopper	Stainless steel	N/A	-
33	1	Tag	PVC sticker	N/A	-
34	1	Tag	PVC sticker	N/A	-

NOTES:

X- Recommended spare parts.
Spare parts kit code: See Figure 4.

3.1 Biffi Booster Set-up

Pneumatic Booster with Bypass is an air piloted pressure regulator with high flow rate. Booster compares pilot pressure to the cylinder chamber pressure and if the pilot pressure is higher than cylinder pressure, the supply shutter valve opens and the cylinder pressure increases up to pilot pressure. While, when the cylinder chamber pressure exceeds the pilot pressure, the exhaust shutter valve opens and the cylinder chamber pressure decreases up to pilot pressure.

Bypass puts in communication the air cylinder port with the pilot port. Bypass regulates pressure balancing speed between the two ports.

Figure 5 Biffi Booster schematic diagram with double regulations

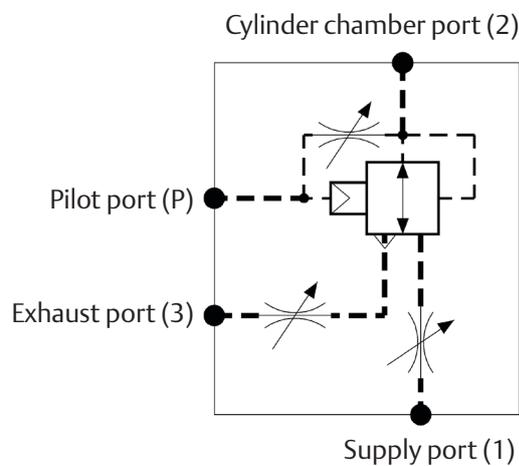
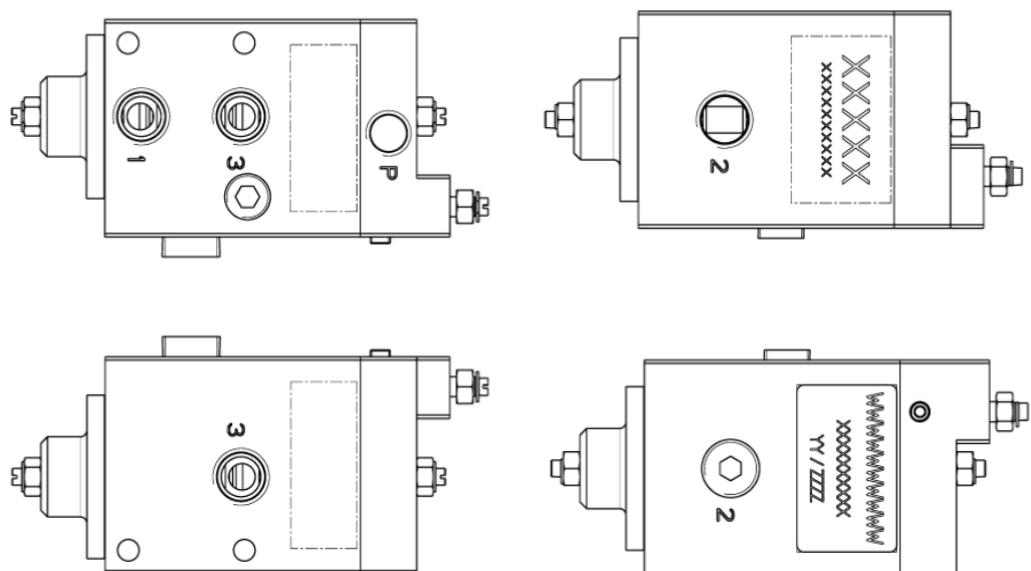
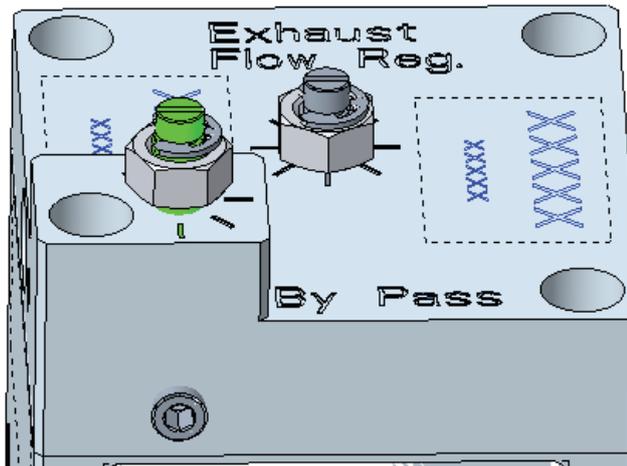


Figure 6



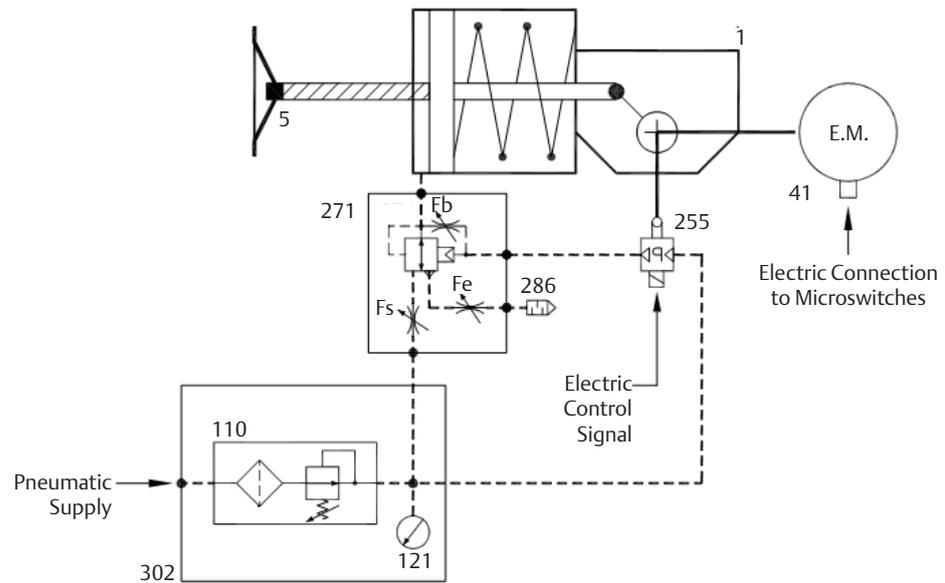
The Bypass function is to avoid hunting on actuator operation: before actuator start-up, it is necessary to set the bypass action. Loosen the locknut and operate with screwdriver to the setting screw, turning it in clockwise or counterclockwise direction until reach the system balancing. Bypass can be excluded (totally screwing the needle valve on booster cover).

Figure 7 Bypass loosening lock-nut and needle for adjustment



3.2 Setting of Actuator's Operating Time by Booster

Figure 8 Example of actuator's operating diagram with pneumatic booster



1	Single acting spring-return pneumatic actuator
5	Manual override
41	Electric microswitches
110	Filter regulator
121	Pressure gauge
255	Single acting electropneumatic positioner
271	Pneumatic booster + bypass
286	Dust excluder
302	Panel
Fe	Exhaust flow regulator (adjustable)
Fs	Supply flow regulator (adjustable)
Fb	Bypass

Regulating Service

- The angular moves the valve up to reach the angular position corresponding to the electric control signal valve.
- The opening time is adjustable by the flow regulator Fe.
- The closing time is adjustable by the flow regulator Fe.

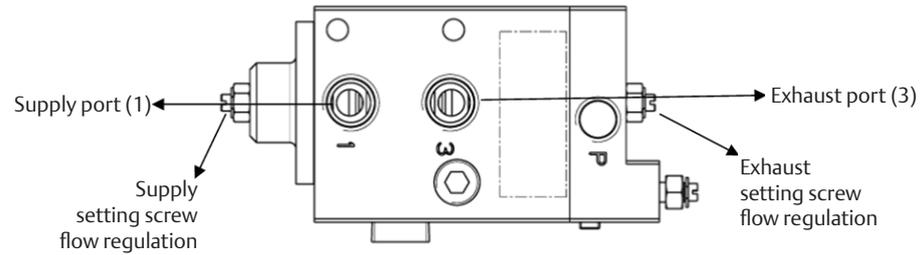
Emergency Manual Operation

- Turn the jackscrew 5 until valve completely closed.

Note: The jackscrew must be completely unscrewed to allow remote control.

The pneumatic booster can be supplied completely with control device for both supply and exhaust flow or without flow regulators.

Figure 9



Loosen the locknut and turn the setting screw clockwise to decrease the flow and consequentially the speed of related actuator operation (on delivery or on discharge).

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