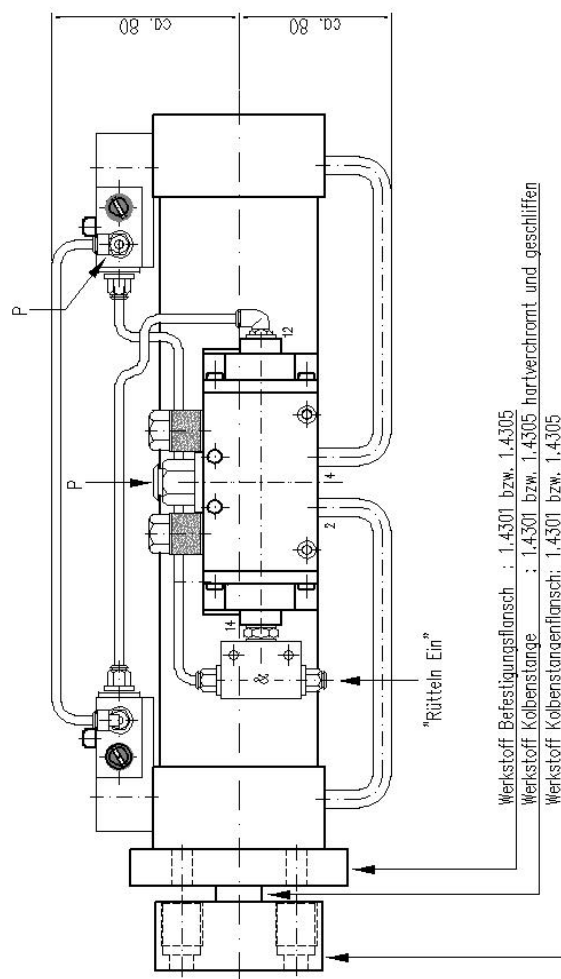
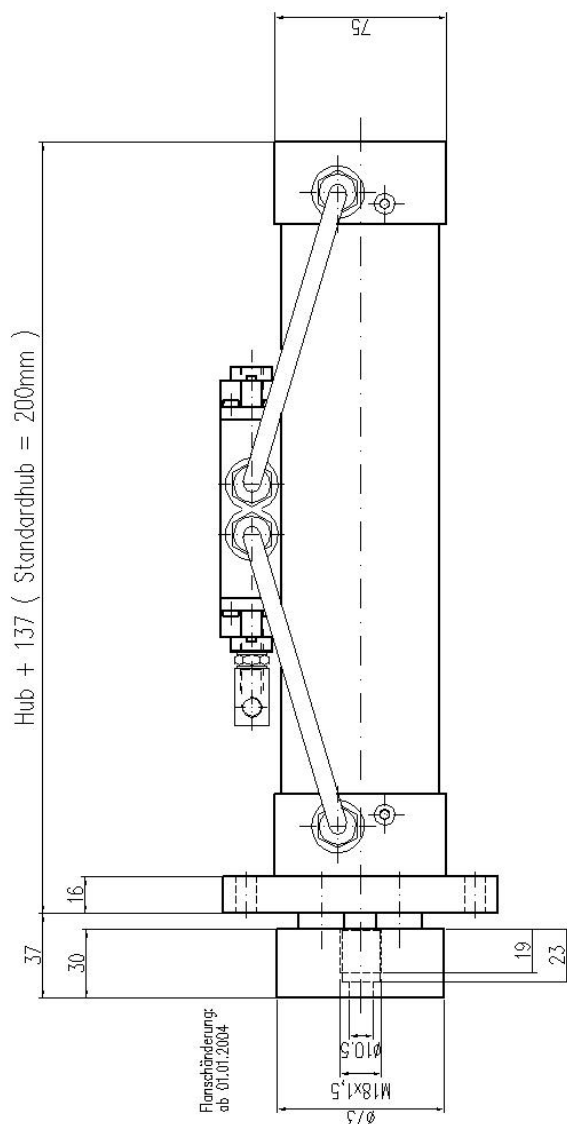
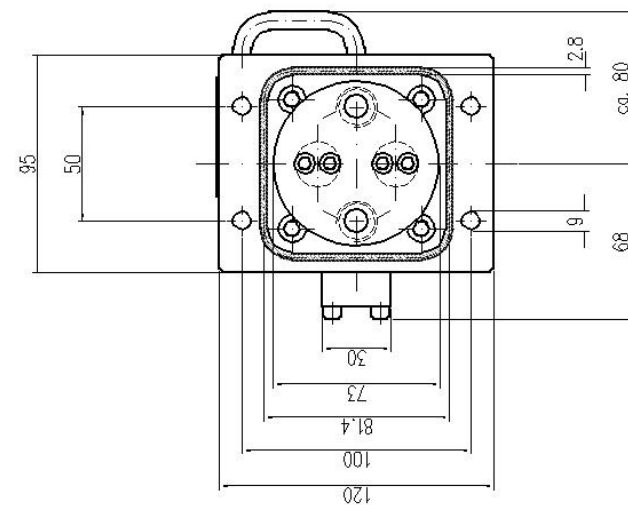


Characteristics according to VDI guide line 3294 (or equivalent ASME code)							
	Symbol	Unit					
General							
Name			Pneumatic cylinder				
Type			FSD (Ø) / (Stroke) /# 8560				
Construction			With parallel piston rods for anti-rotating Double acting, with bothside, adjustable travel end buffering, Pneumatic limit switches at both end positions				
Fastening			see dimensional drawings				
Connections			Thread				
Ambient temperature range	ϑ _{min}	°C / °F	+10 / 50	Note: When using below freezing point (0°C/ 32°F) or above max. operating temperature please ask your for supplier for advice!			
	ϑ _{max}	°C / °F	+60 / 140				
Medium temperature range	ϑ _{min}	°C / °F	+10 / 50				
	ϑ _{max}	°C / °F	+60 / 140				
Fitting position			Any radial loading on piston rod have to be avoided				
Medium			Filtered and oiled or filtered and unoiled compressed air				
Material: Cylinder housing and cylinder tube			Aluminium (anodized)				
Fastening flange			AISI 316L (1.4404, 1.4435 or 1.4460)				
Piston rod			AISI 316L (1.4404) hard chrome plated and plained				
Piston rod flange			AISI 316L (1.4404, 1.4435 or 1.4460) (other materials upon request)				
Pneumatic Characteristics:							
Nominal pressure	p _n	bar	5,5				
Operating pressure range	p _{min} p _{max}	bar bar	2 6,3				
Type:			FSD-3 6/...	FSD-3 8/...	FSD 3-10/...	FSD-3 12...	
Piston Ø		mm	63	80	100	125	
Connections			G3/8"	G3/8"	G1/2"	G1/2"	
Piston area (extending)	A _{Ka}	cm ²	31,17	50,27	78,54	122,72	
Piston area (descending)	A _{Ke}	cm ²	24,89	40,45	68,72	106,63	
Pushing force (6bar)	F _s	N	1800	2900	4550	7300	
Shearing force (6bar)	F _z	N	1420	2520	4170	6330	
Piston speed	v _{max.}	m/s	0,6	0,6	0,6	0,6	
Standard strokes		mm	200, 250				
Transverse- and torque loadings			See dimensional drawing				

List of compatibility

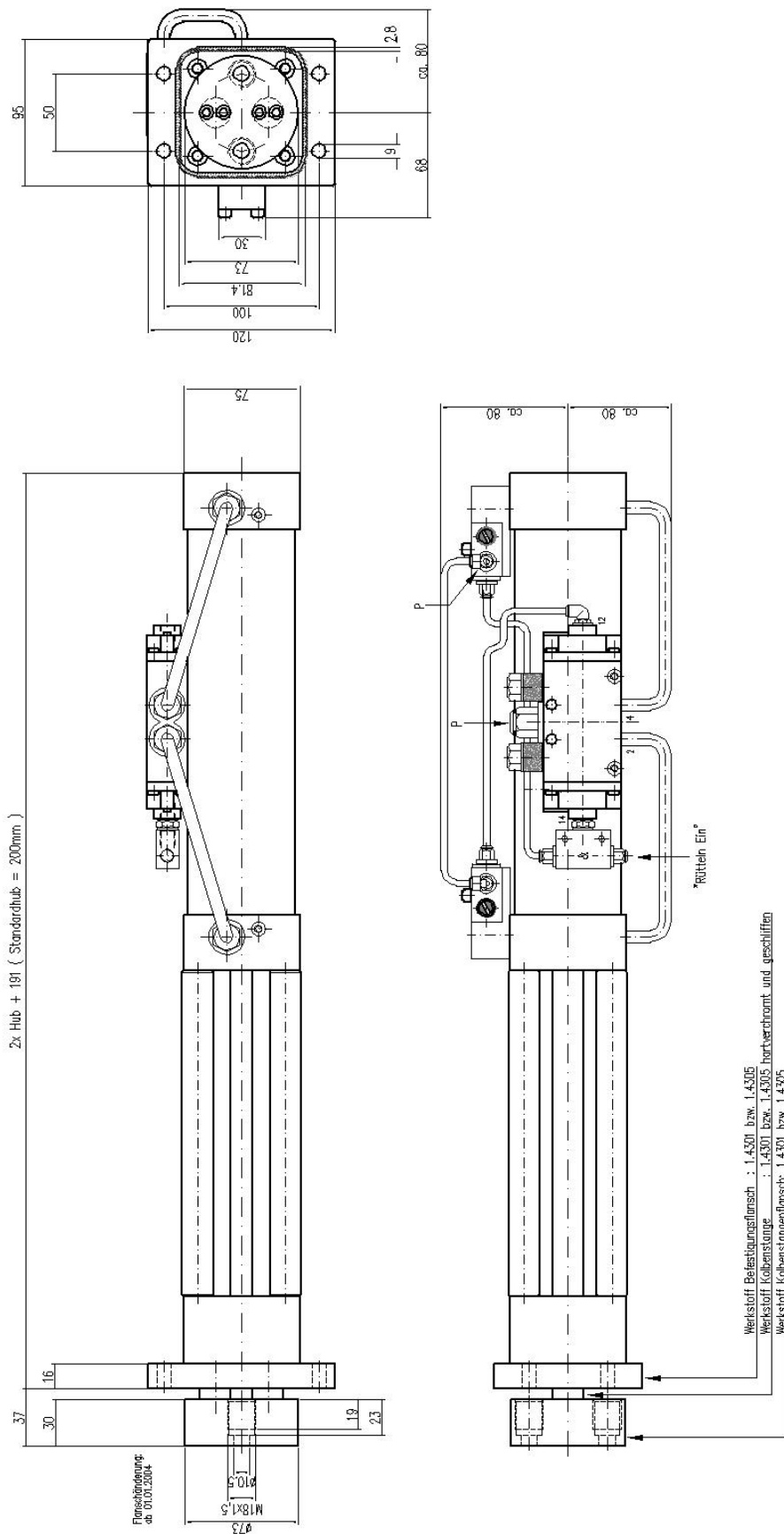
	New cylinder model	Fits also for former types and models
Nominal piston Ø		
63	FSD-3 6/... /# 8560 FSD-3 6/... -E /# 8560 FSD-3 6/... -L /# 8560 FSD-3 6/... -EL /# 8560	PZ 3/20 FV 63/... HM/ VM /# 630 PRE 63/ ... -M /# 5000 & # 5001 PZ 3/20 FV 63/... HE/ VE /# 798 PRE 63/ ... -E /# 5000 & # 5001 PZ 3/20 FV 63/... HML/ VML /# 640 PRE 63/ ... -M -L /# 5000 & # 5001 PZ 3/20 FV 63/... HEL/ VEL /# 820-63 PRE 63/ ... -E -L /# 5000 & # 5001
80	FSD-3 8/... FSD-3 8/... -E FSD-3 8/... -L FSD-3 8/... -EL	PZ 3/25 FV 80/... HM/ VM /# 599 PRE 80/ ... -M /# 5000 & # 5001 PZ 3/25 FV 80/... HE/ VE /# 800 PRE 80/ ... -E /# 5000 & # 5001 PZ 3/25 FV 80/... HML/ VML /# 610 PRE 80/ ... -M -L /# 5000 & # 5001 PZ 3/25 FV 80/... HEL/ VEL /# 820-80 PRE 80/ ... -E -L /# 5000 & # 5001
100	FSD-3 10/... FSD-3 10/... -E FSD-3 10/... -L FSD-3 10/... -EL	PZ 3/25 FV 100/... HM/ VM /# 592 PRE 100/ ... -M /# 5000 & # 5001 PZ 3/25 FV 100/... HE/ VE /# 801 PRE 100/ ... -E /# 5000 & # 5001 PZ 3/25 FV 100/... HML/ VML /# 605 PRE 100/ ... -M -L /# 5000 & # 5001 PZ 3/25 FV 100/... HEL/ VEL /# 820-100 PRE 100/ ... -E -L /# 5000 & # 5001
125	FSD-3 12/... FSD-3 12/... -E FSD-3 12/... -L FSD-3 12/... -EL	PZ 3/32 FV 125/... HM/ VM /# PRE 125/ ... -M /# 5000 & # 5001 PZ 3/32 FV 125/... HE/ VE /# 800 PRE 125/ ... -E /# 5000 & # 5001 PZ 3/32 FV 125/... HML/ VML /# 610 PRE 125/ ... -M -L /# 5000 & # 5001 PZ 3/32 FV 125/... HEL/ VEL /# 820-80 PRE 125/ ... -E -L /# 5000 & # 5001

Dimensions FSD-3 6/... (Ø63mm)

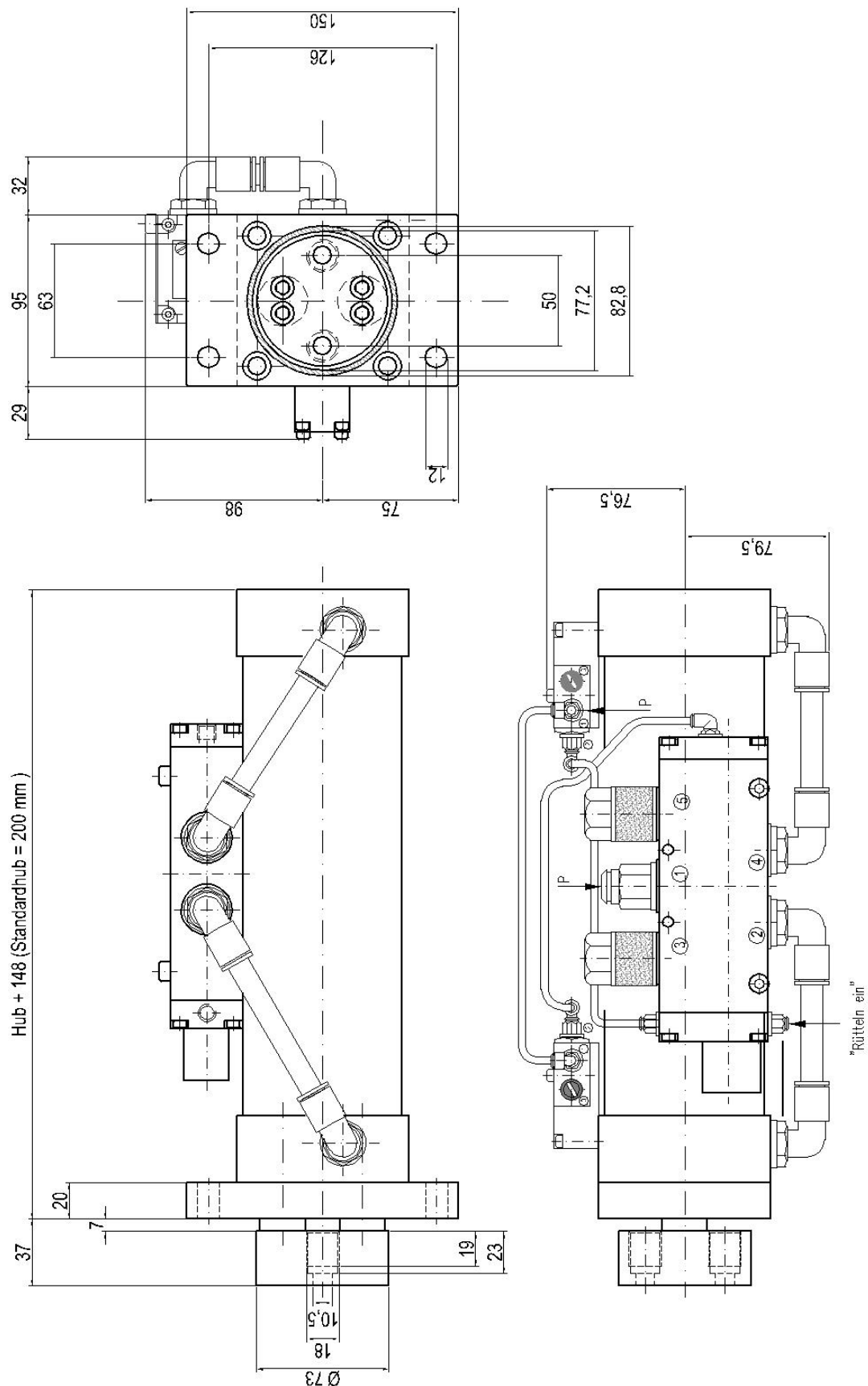


Werkstoff Befestigungsflansch : 1.4301 bzw. 1.4305
Werkstoff Kolbenstange : 1.4301 bzw. 1.4305 hartverchromt und geschliffen
Werkstoff Kolbenstangenflansch: 1.4301 bzw. 1.4305

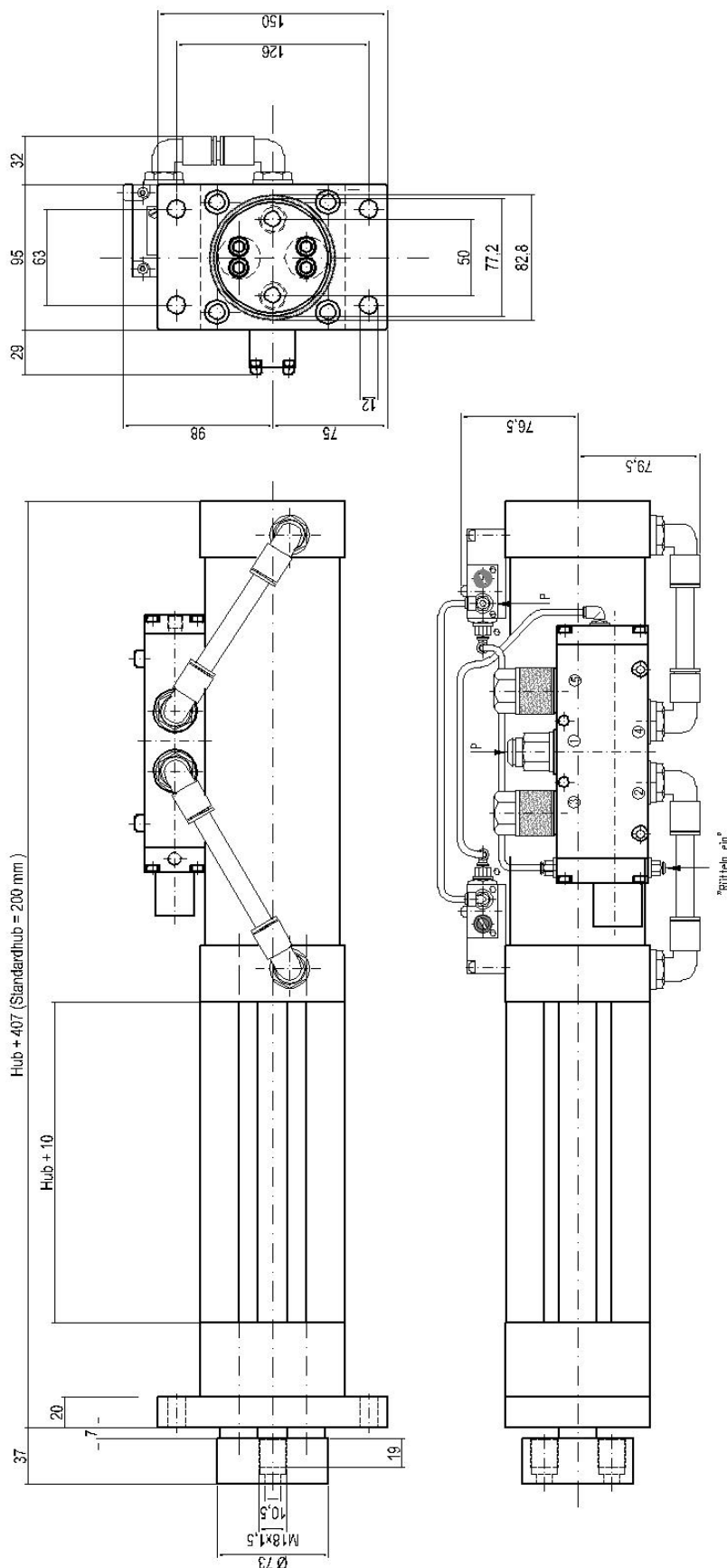
Dimensions FSD-3 6/... -L (Ø63mm with extension „-L“)

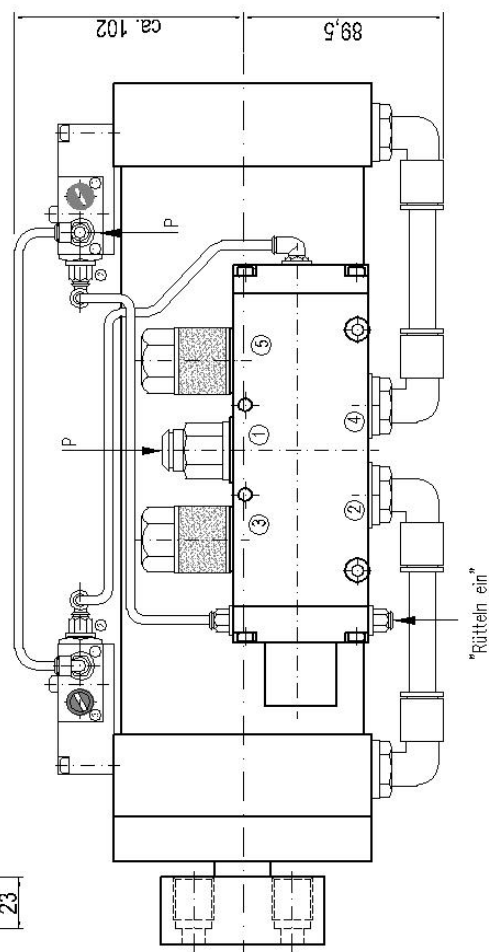


Dimensions FSD-3 8/... (Ø 80mm)

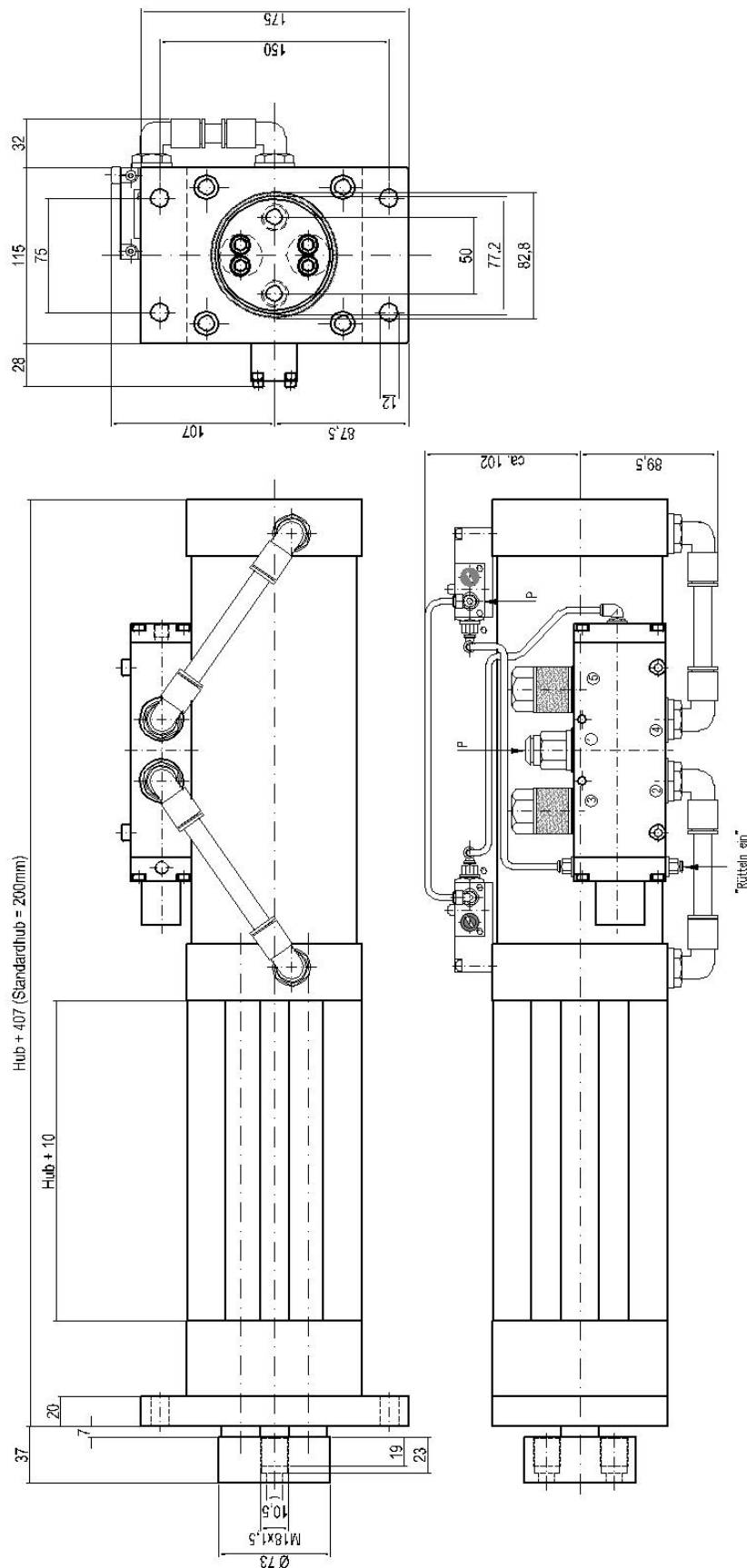


Dimensions FSD-3 8/... (Ø 80mm with extension „-L“)

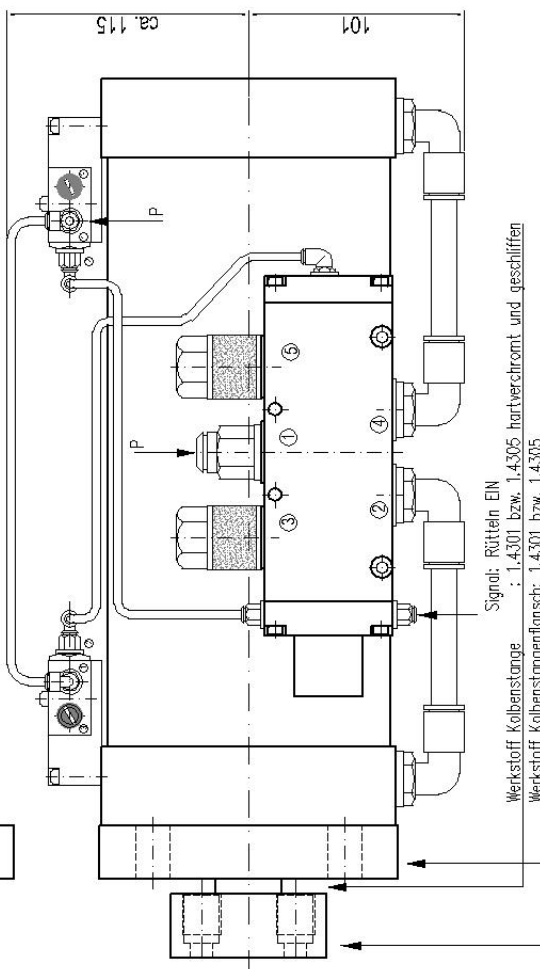
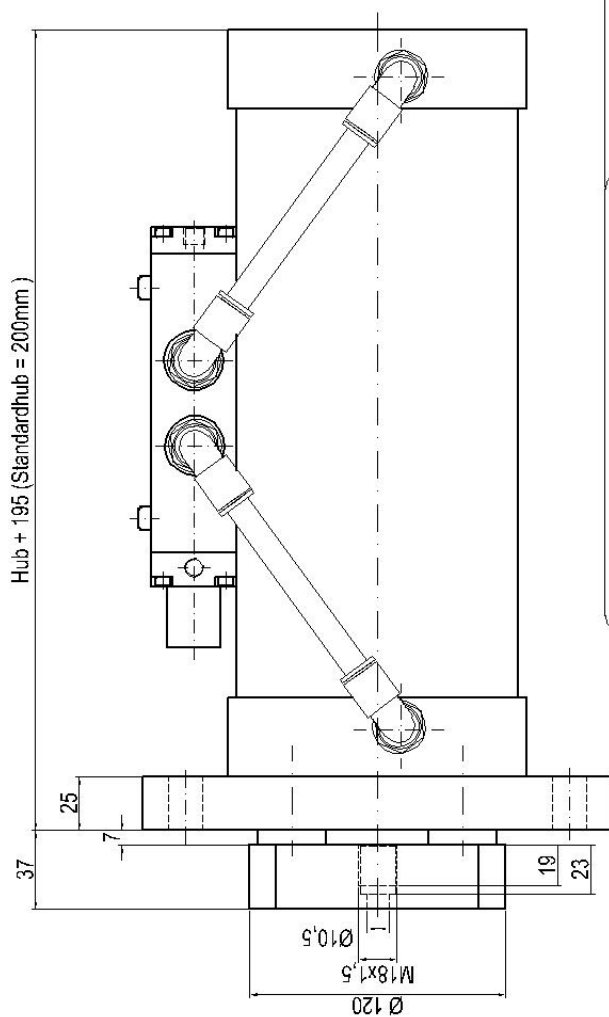
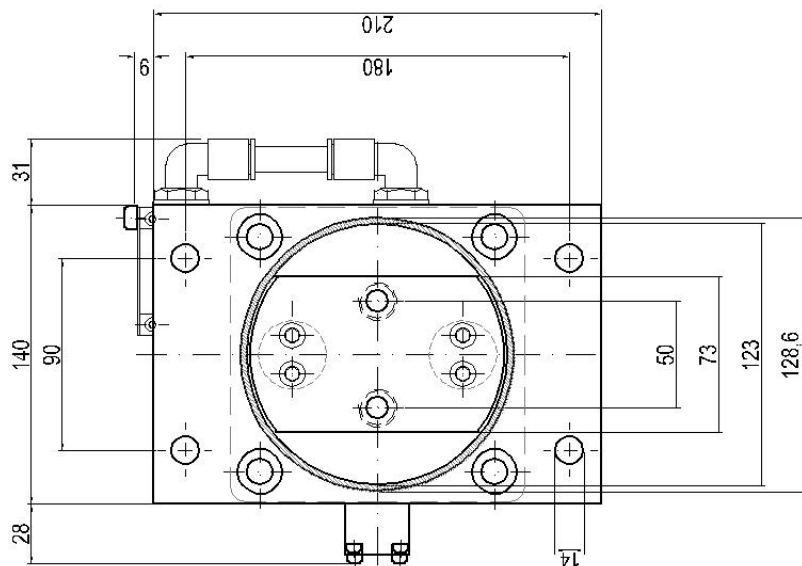




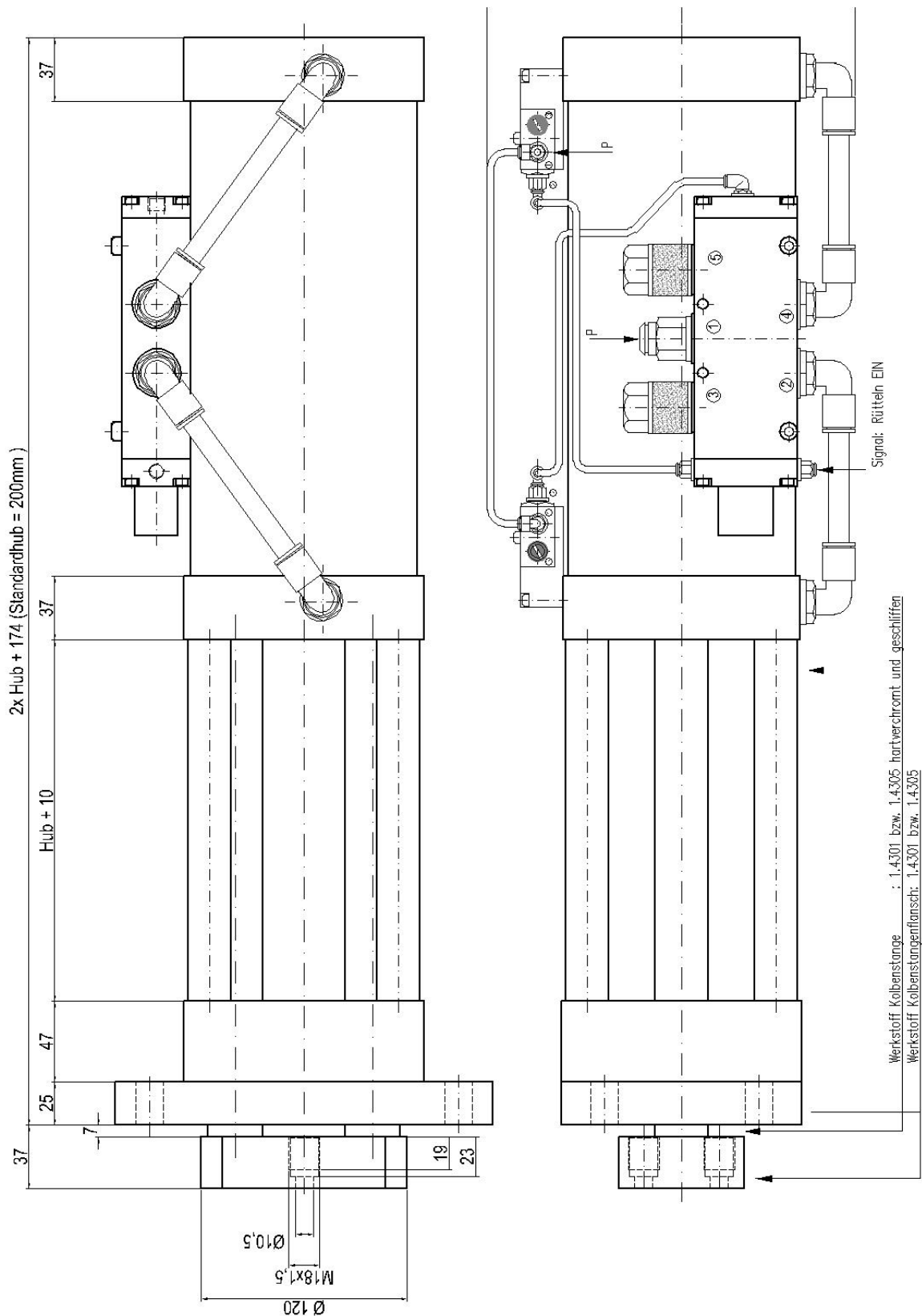
Dimension FSD-3 8/... (Ø 100mm with extension „-L“)



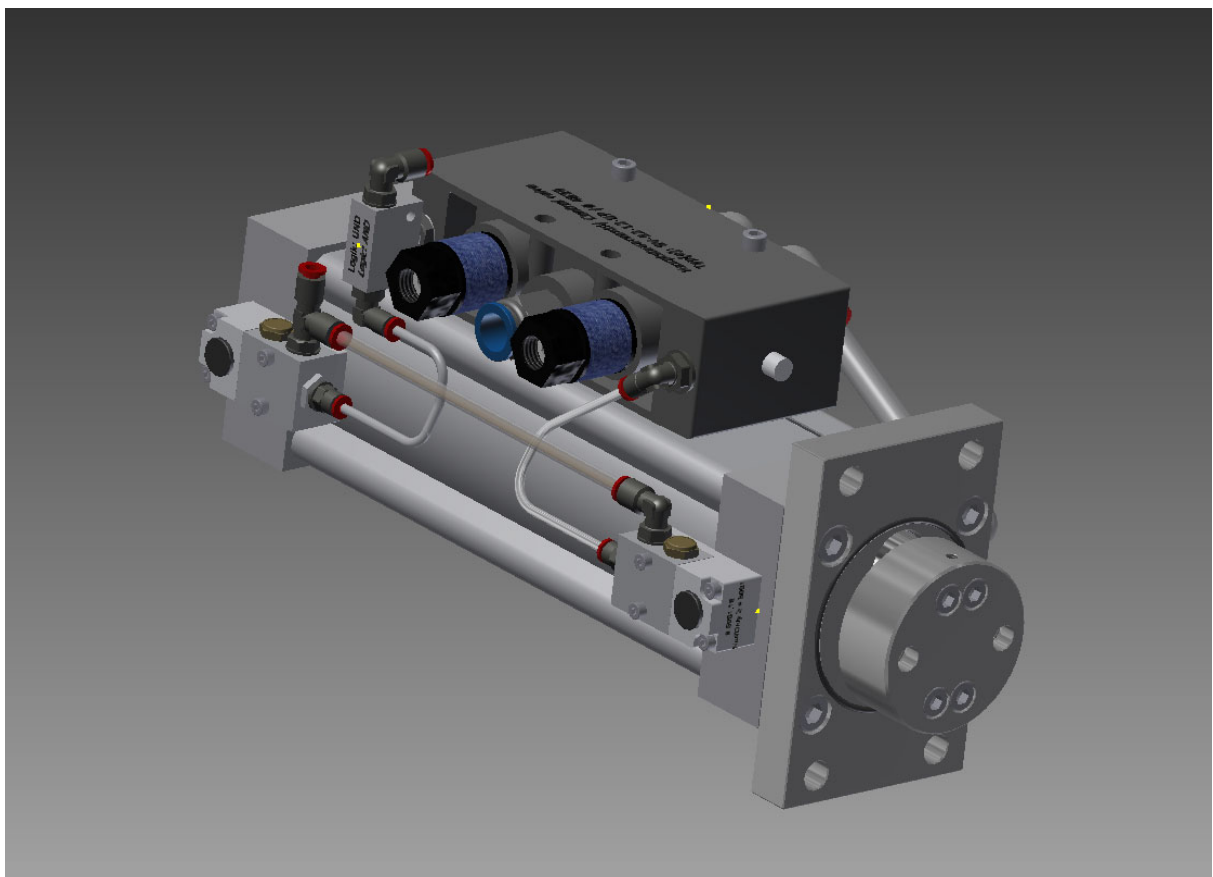
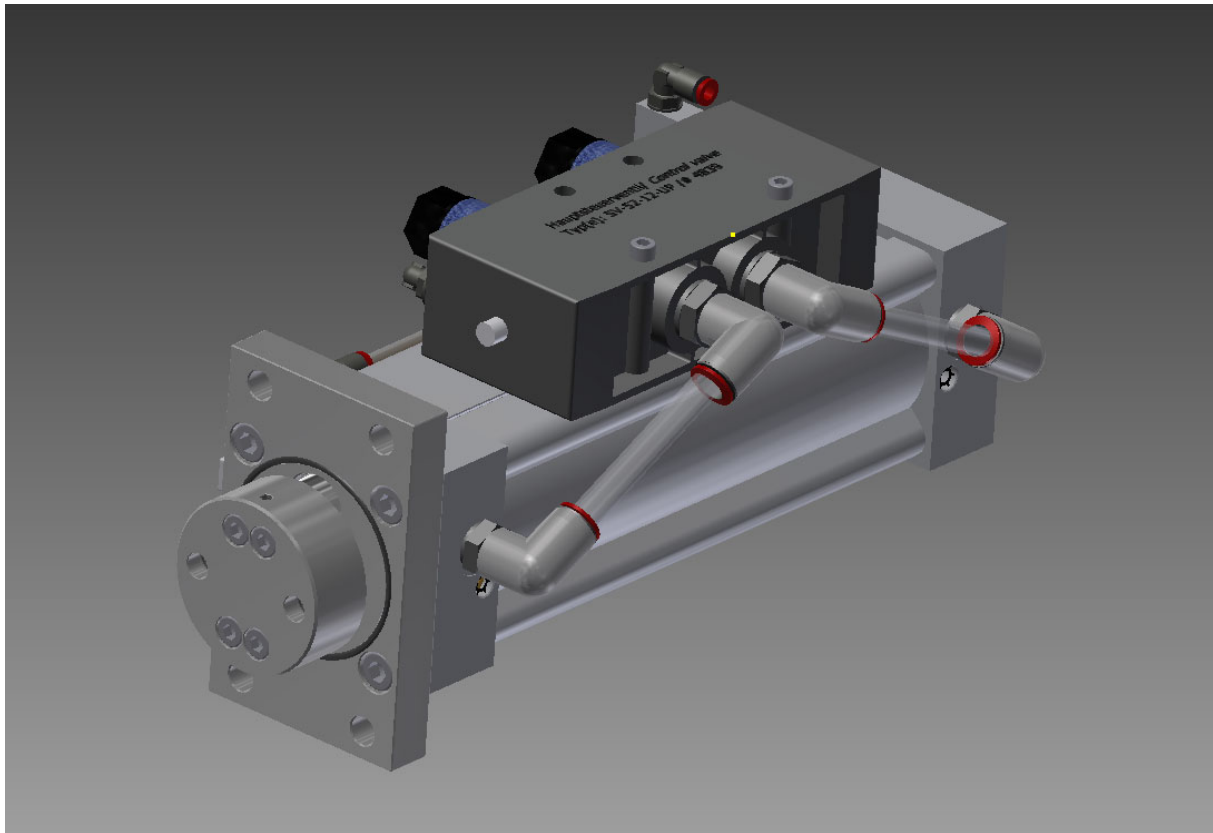
Dimensions FSD-3 12/... (Ø 125mm)



Dimensions FSD-3 12/... (Ø 125mm with extension „-L“)



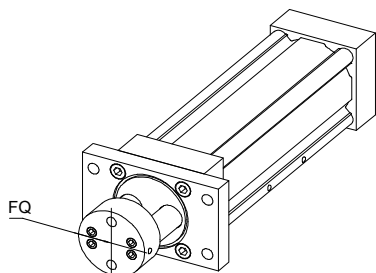
Assembling and control



Schematic

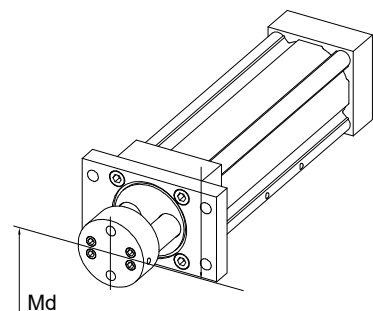
Type „...M“ und „...M-L“	Type „... -UO“, former type „... c“
Type „...-UU“	

Maximum loading of piston rod flange



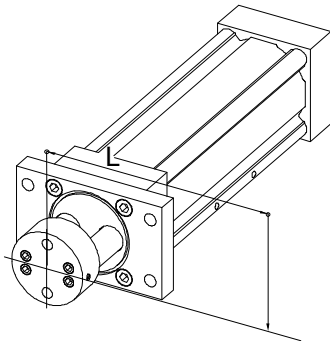
Querbelastung FQ [N]										Hub [mm]
Typ	50	80	100	125	160	200	250	300	400	500
FSD-3 6/...	116	91	82	71	58	50	42	36	28	23
FSD-3 8/...	184	138	127	109	103	78	64	56	43	35
FSD-3 10/...	184	138	127	109	103	78	64	56	43	35
FSD-3 12/...	423	317	292	250	237	179	147	129	99	81

Maximum torque loading



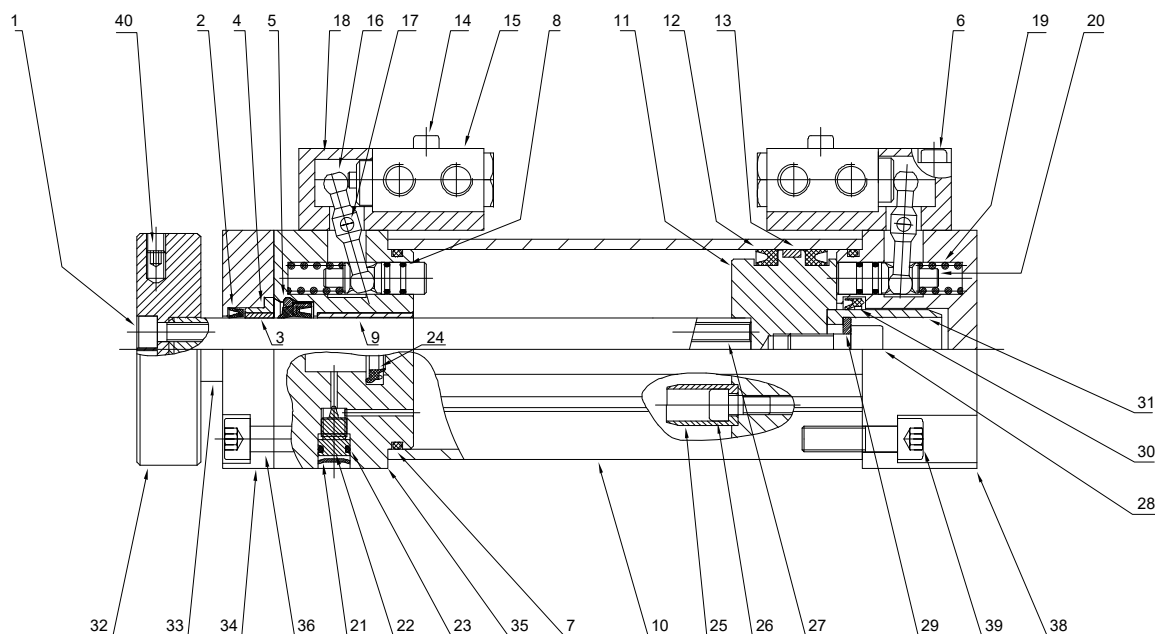
Torque loading Md [Nm]										Stroke [mm]
Typ	50	80	100	125	160	200	250	300	400	500
FSD-3 6/...	7,6	5,5	4,8	4	3,3	2,7	2,2	1,9	1,4	1,3
FSD-3 8/...	16,2	11,7	10,1	8,7	7,1	5,9	4,9	4,1	3,2	2,6
FSD-3 10/...	16,2	11,7	10,1	8,7	7,1	5,9	4,9	4,1	3,2	2,6
FSD-3 12/...	37	27	23	20	16	13,5	11,3	9,4	7,4	6

Maximum Tranverse- and torque loading



Transverse- and torque loading FQ [N]										Stroke [mm]
Typ	50	80	100	125	160	200	250	300	400	L
FSD-3 6/...	85	60	57	48,5	44	41	29	25	19,5	50
FSD-3 8/...	144	115	103	87,5	74,5	61	51,5	44,5	35	50
FSD-3 10/...	144	115	103	87,5	74,5	61	51,5	44,5	35	50
FSD-3 12/...	330	264	236	200	170	140	118	102	80	50

Spare parts list



Description of parts					
Item	Quantity	R/K	R/K US - type	Description	Material
01	4			Screw	
02	2	*	*	PTFE seal	PTFE white, FDA-conform
03	2		*	Guide bushing	Plastic-PTFE-compound
04	2			Fastening to guide bushing	
05	2	*	*	Seal	Polyurethane PU
06	4			Screw	
07	2	*	*	O-Ring	NBR
08	4	*	*	O-Ring	NBR
09	2		*	Guide bushing	Plastic-PTFE-compound
10	1			Cylinder tube	
11	1			Piston	
12	2	*	*	Grooved ring	NBR
13	1	*	*	Guide ring	Plastic-PTFE-compound
14	4			Screw	
15	2			Valve / Limit switch	
16	2			Lever	
17	2			Pin	
18	2			Valve cap	
19	2		*	Spring	Spring steel
20	2			Piston	
21	2		*	Safety ring	Spring steel
22	2			Buffer screw with safety ring	

- continue -

- Fortsetzung Ersatzteilliste -

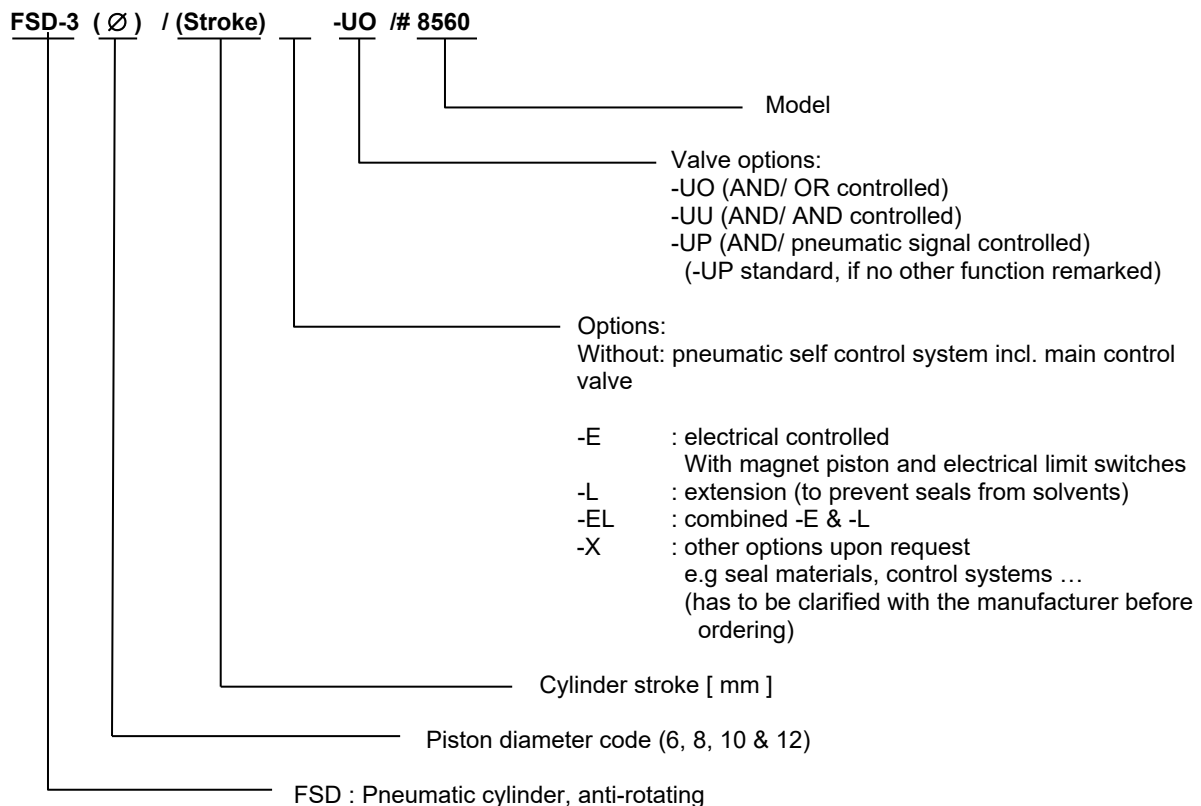
23	2	*	*	O-Ring	NBR
24	1	*	*	Sealing ring	Polyurethane PU
25	1		*	Buffer bushing	Brass
26	1			Screw	
27	4			Screw	
28	1			Screw	
29	1			Washer	
30	1	*	*	Sealing ring	Polyurethane PU
31	1		*	Buffer bushing	Brass
32	1			Piston rod flange	
33	2			Piston rod	
34	1			Fastening flange	
35	1			Cylinder head	
36	4			Screw	
37	1			5/2-way-main control valve (see control scheme)	
38	1			Cylinder bottom	
39	4			Screw	
40	2			Screw	

All parts marked with an „*“ are included in the respective rebuilding kit !

We preserve the right to vary the seals, especially the seal colours, delivered for the rebuilding kits, and guarantee the same quality.

Bestellschlüssel für Pneumatik-Rüttелеlemente

Bestellangabe:



Special features have to be clarified with your supplier and added to the order !

Art no.			
		with extension	Rebuilding kit
Piston-Ø			
63	8560-63/ (Stroke)	8560-63/ (Stroke) -L	8560-63-VTS
80	8560-80/ (Stroke)	8560-80/ (Stroke) -L	8560-80-VTS
100	8560-100/ (Stroke)	8560-100/ (Stroke) -L	8560-100-VTS
125	8560-125/ (Stroke)	8560-125/ (Stroke) -L	8560-125-VTS

Please replace „(Stroke)“ by the respective cylinder stroke.

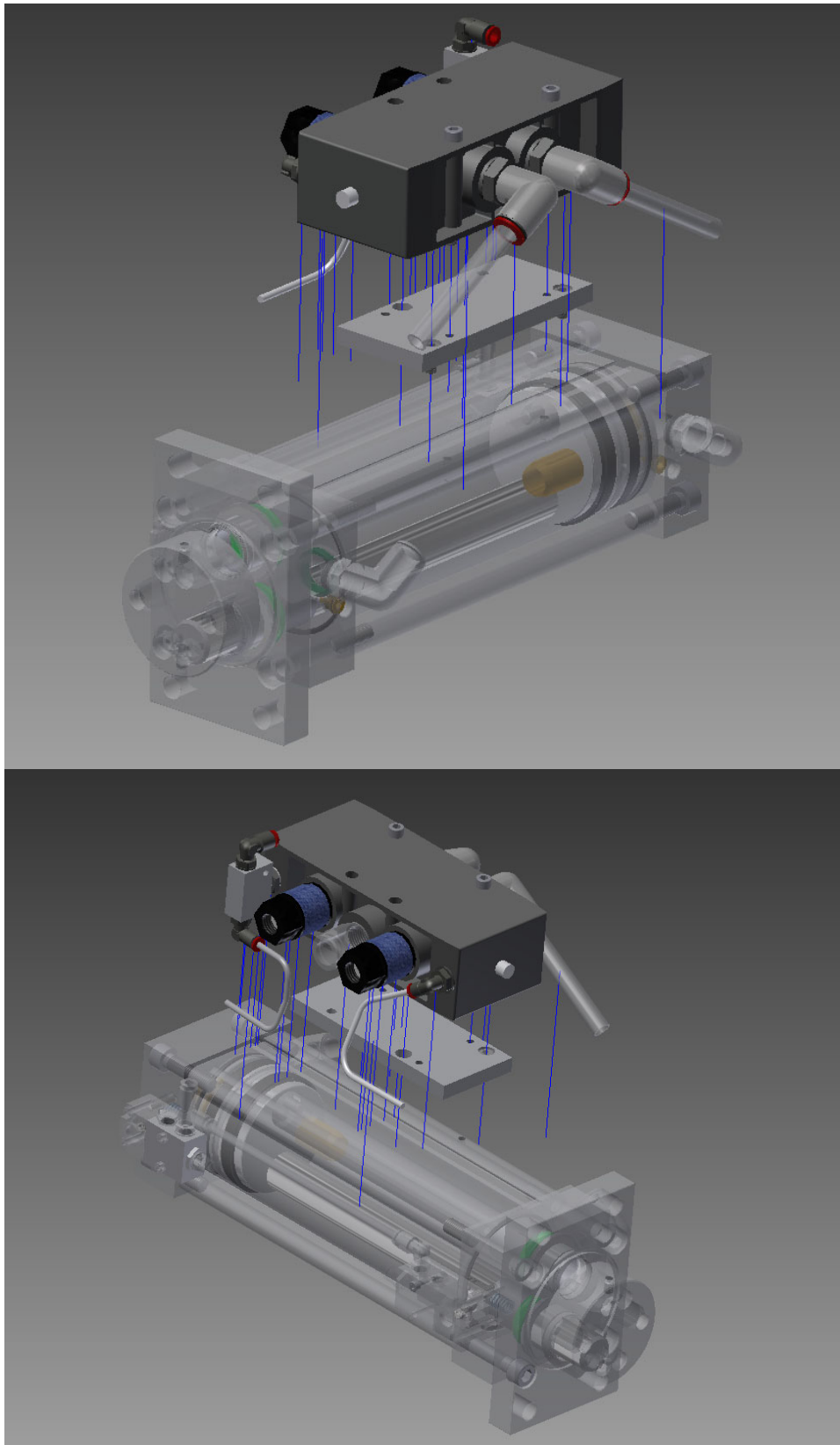
- 8560-63VTS:
Rebuilding kit, standard edition

Standard stroke = 200mm,
 Further standard strokes, see page 1
 Special strokes by step 1mm are available

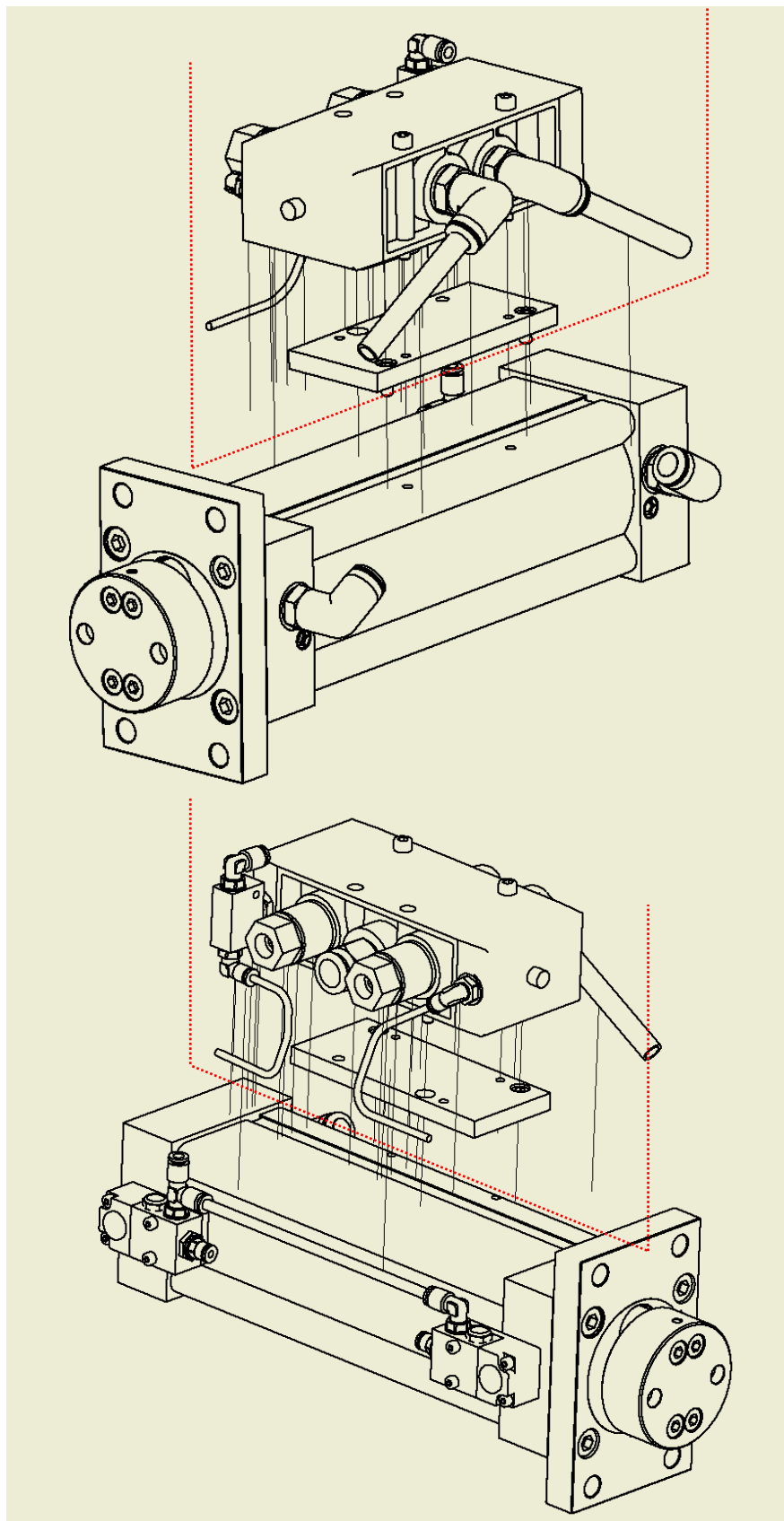
Order code for single spare parts

Art. no. for cylinder parts	
Piston-Ø	Please add the part no. to the cylinder order code
63	# 8560-63/ (Stroke) (-L).spare part no. (see column „item“ at the spare parts list)
80	# 8560-80/ (Stroke) (-L). “ “ “ “ “ “ “
100	# 8560-100/ (Stroke) (-L) “ “ “ “ “ “ “
125	# 8560-125/ (Stroke) (-L) “ “ “ “ “ “ “

Valve retrofit set #4839...



Valve retrofit set #4839... (drawing)



Purchased parts – Description

Retrofit set G1/2“

Type: SV-52.-12-UP-UBS /# 4839

Consisting of:

- Main control valve, Type: SV-52-12-UP /# 4839
- Adapter flange, Type: Bleickert/ Numatics
- 1 set pneumatic tubes in suitable length
(1pc tube D4mm x 500mm and 2pc tube D12 x 140mm length)
- 2 set Screws M6x60 +washer
- 2 set Screw M6x10
- 2 set silencer, adjustable, Type: ALD-R-G1/2”
- 1x Logic element “AND”

All parts are assembled at the main control valve

For nominal cyl. Ø63mm:

a main control valve

Type: SV-52-14-UP-UBS /# 4839

is included.

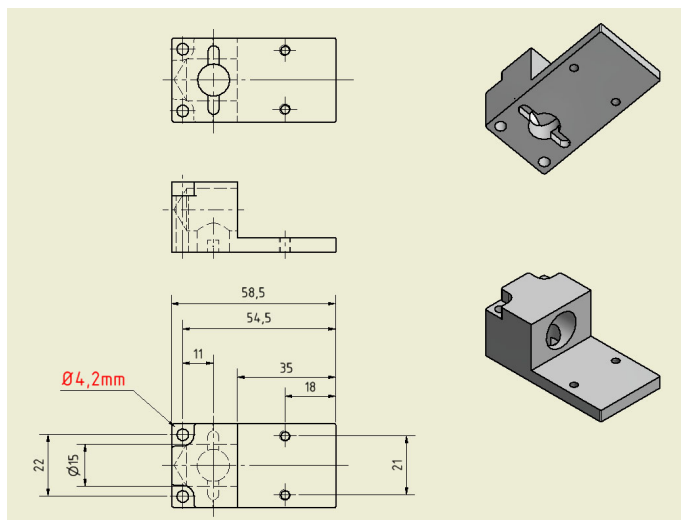
Retrofit set for former Bleickert and Numatics valves.

Modified valve mounting for pneumatic limit switch

Art. no.: # 592.18
Fixing for pneumatic limit switch, Type: K9

Until date of manufacturing: Jan. 2015
Serial no.: 0115

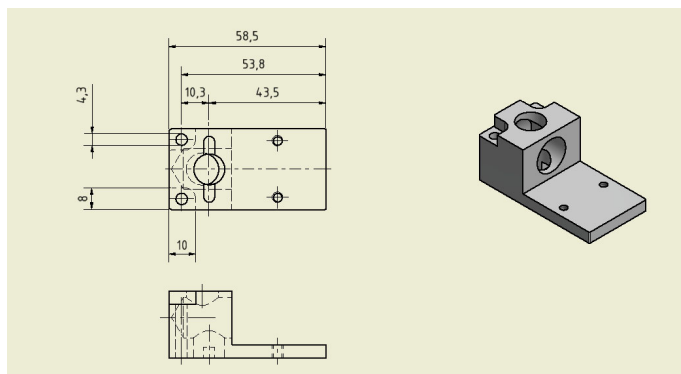
Fixing for limit switch origin design



Art. no.: # 592.18-MOD
Fixing for pneumatic limit switch modified

Modified fixing for limit switch

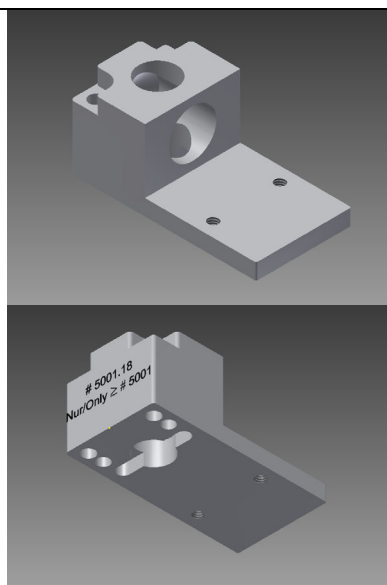
Since date of manuf.: Febr. 2015
Serial no.: 0215



Art. no.: # 5001.18
Fixing for pneumatic limit switch

ONLY for model # 5001

Feature: 2 additional locating pins



Conditions of use

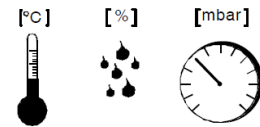


Please note

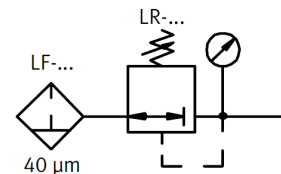
Incorrect handling can result in malfunctions

- Ensure that the specifications in this manual are always observed.
This is the only way to ensure correct and safe operation of the product.

- Observe the maximum limits specified in the catalogue (e.g. for pressures, forces, torques, masses, speeds, temperatures)
- Make sure there is a supply of correct prepared compressed air
- Please observe the prevailing ambient conditions
- Observe also the standards specified in the relevant chapters, as well as national and local laws and technical regulations



- Remove all transport safety measures such as protective wax, foils, caps, cardboard boxes
The individual Materials can be stored in containers for recycling purposes



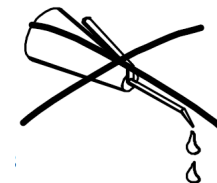
- Use the same medium composition throughout the service life of the product

Example:

Selected: non-lubricated compressed air continue to use: non-lubricated compressed air

- Open connectors must be closed with appropriate screwings, silencers etc.
- (Dis-)assembling of the cylinders only completely depressurized and only by qualified and trained personnel
- Slowly pressurize the complete system

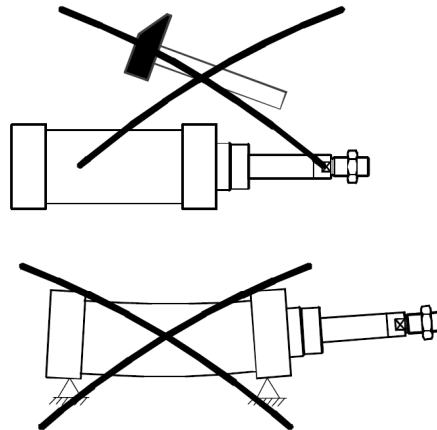
This will prevent uncontrolled movements from occurring



Installation

Mechanical installation

- Check whether the type designation of the cylinder to be fitted is the same as that of the desired cylinder.
- Handle the cylinder with care so that the cylinder barrel and the piston rod are not damaged.
This would reduce operational reliability and the service life.
- Place the cylinder on the support so that the adjusting screws for the end position cushioning are always accessible.
- Make sure that:
 - external guides, if used, are fitted parallel
 - they are not distorted and
 - the maximum permitted loadings are not exceeded
- Observe the maximum tightening torques specified in the catalogue for screws, locking nuts or accessories.



Pneumatic installation

Definition

Moveable mass = work load + piston(rod) mass

- Use suitable one-way flow control valves for setting the speed of the piston
Screw them directly in to the compressed air ports.
Other accessory parts with excessive screw-in length will damage the cushioning piston.
- Check to see if closed-loop controlled non-return valves, e.g. type HGL ... are necessary
You will prevent the moveable mass sliding down if there is a drop in pressure when the product is fitted in a vertical or sloping position.

If an external guide is used:

- . Avoid a mechanical overdetermination of the piston rod by one of the following measures:
 - absolutely exact alignment
 - the use of a self-aligning rod coupling
 - the use of a guide unit

A rigid coupling will impair the service life and the function of the cylinder.

Commissioning

Complete system

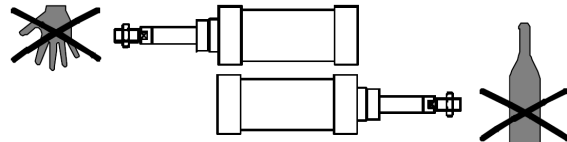
- Slowly pressurize the complete system.
This will prevent uncontrolled movements from occurring.
For slow start-up pressurization use safety start-up valve, type HEL...
- operating conditions and technical characteristics according to VDI guide line 3294 (or equivalent ASME code) have to be strictly observed

Individual unit

Warning

1. Make sure that:

- Nobody can place his/her hands in the positioning range of the moveable mass.
- There are no objects in the positioning range.



2. Close both upstream one-way flow control valves:

- at first completely.
- then loosen approximately one turn.

3. Close the adjusting screws for the end position cushioning:

- at first completely
- then loosen again approximately one turn

4. Note that adjustable end position cushionings may have no effect if used in conjunction with fitted exhaust valves.

This depends on the the flow ratio of the exhaust air.

5. Exhaust the cylinder slowly on one side.

Otherwise excessive loadings will occur during first move, if the piston moves too quickly into an end position.
For slow start-up pressurization use safety start-up valve, type: HEL...

6. Start a test run.

7. During a test run check whether the following settings on the cylinder need to be modified:

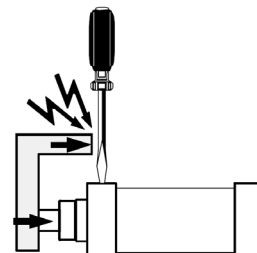
- the end position cushioning
- the speed of the moveable mass

With masses which project longitudinally over the bearing/ end cover:

In case the following screws may only be turned when the cylinder is at a stand:

- the adjusting screws for the one-way flow-control valves-
- the adjusting screws for the end position cushioning

8. Unscrew the one-way flow control valves slowly until the desired piston speed is reached.



9. Open the adjusting screw on both sides as desired for the end position cushioning.

The following applies for the cushioning setting:

With adjustable end position cushioning	With non-adjustable end position cushioning
The piston should reach the end positions safely at the desired cycle times, but not strike hard against them.	The maximum limits for masses, speeds and energy specified in the catalogue must be observed.

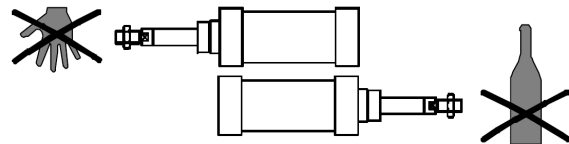
Operation



Warning

Make sure that:

- nobody can place his/her hands in the positioning range of the moveable mass.
- there are no objects in the positioning range.



It must be not possible to touch the cylinder until the mass has come to a complete stand.

With a large work load, high piston speed or when quick exhaust valves are used:

- Use suitable external shock absorbers or external stops.
- Place the proximity switches as follows:

With cylinders with groove	With cylinders without groove
In the integrated groove for proximity switches.	Or with a fastening kit so that the proximity switches lie properly on the cylinder barrel.

- Always use proximity switches at the specified distance.

Care and maintenance

- If the piston rod is dirty, clean it with a soft cloth.

All non-abrasive cleaning agents are permitted.

Otherwise the cylinder do not require maintenance due to their service life lubrication.

Regular removal of the lubricating grease on the surface of the piston rod will reduce the service life.

Dismantling and repairs

With non-roller-burnished cylinders:

Make use of the opportunity to have your cylinder overhauled by the supplier repair service.

Order a suitable rebuilding kit if your cylinder shows the following signs of wear:

- loss of power during operation
- increased air consumption
- (noise emission)

An overview of wearing parts available can be found at the respective documentation.

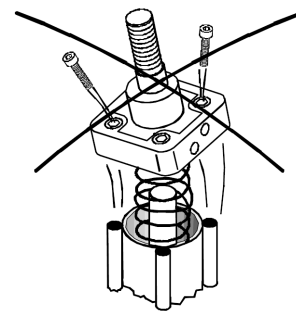
Roller-burnished cylinders cannot be overhauled.

Replace worn parts



Warning

Make sure that the bearing cover cannot suddenly fly off.



Situation	Single-acting cylinders	Tubing with non-return valves
Possible procedure	The spring unbends suddenly	The pressure is released suddenly
Counter measure	Use counter holding device	Remove non-return valves

- Handle the individual parts of the cylinder with care so that the sealing edges and the guide surfaces are not damaged (e.g. by using suitable mounting aids).

Particularly burrs on sealing surfaces can reduce operational reliability.

If the piston rod is distorted:

- Send the piston rod together with the screwed-on piston to your cylinder supplier
- Observe the following points when fitting the cylinder together again:
 - Use a locking agent on all screws
 - Lubricate the moving parts or specified parts with the lubricating grease supplied.
 - The environment must be clean.

Accessories

The necessary accessories for the individual cylinder types can be supplied upon request.

Trouble-shooting

Fault	Possible cause	Remedy
Uneven movement of the piston (cylinder jerks)	Lubrication missing	Lubricate with correct grease (e.g. as per instructions with wearing parts)
	Flow control valves inserted incorrectly	If possible restrict exhaust
	Piston rod dirty	Clean, provide cover (after intensive cleaning or subsequent lubrication)
	Not enough supply air (stick slip)	-Keep the tubing short and select suitable cross-sectional areas -Select correct pressure -Keep pressure constant
	Not enough pressure	Switch volume upstream
	Piston seal or piston rod defective	Send the cylinder to the supplier for repair or Replace wearing parts
	Guide not parallel to the direction of stroke	Use a self-aligning rod-coupling as per "Accessories" (ask your supplier for special specifications)
Piston does not reach the stroke end position	Cylinder barrel is damaged	Replace cylinder
	Adjusting screw of end position cushioning completely closed	Open adjusting screw
	Foreign matter in the cylinder	Remove foreign matter, filter the compressed air
	Cylinder moves to an external end stop	Readjust end stop
Incorrect switching during position recognition	Temperatures too high/low	Observe the permitted temperature range of the proximity switches
	Fault in the proximity switch	See instructions for proximity switch
	Piston without magnet fitted	Use piston with magnet

Technical specifications

Type	
Medium	Filtered compressed air (filter fineness: 40µm), lubricated or non-lubricated
Mounting position	As desired
End-position-cushioning	- Elastic cushioning rings/ plates (P cushioning) - Pneumatic cushioning - Self-adjusting shock-absorber (YSR) - Adjustable shock absorber (YSRJ) -

EG Konformitätserklärung

EC declaration of conformity / Déclaration de conformité CE / Declaración de conformidad CE

Hersteller / Manufacturer / Constructeur / Fabricante:

**Bleickert Automation
Im Kehlhof 43**

D – 79771 Klettgau-Geißlingen

Produktbezeichnung / Product name / Désignation du produit / Designación del producto

Pneumatik-Zylinder / Pneumatic Cylinder / Cylindre pneumatique / Cilindro neumática

Typ / Type / Tipo : FSD .../ ... /# 8560
8560-.../...

Das bezeichnete Produkt stimmt mit den folgenden Richtlinien des Rates zur Angleichung der Rechtsvorschriften der EG-Mitgliedsstaaten überein:

The named product conforms to the following Council Directives on approximation of laws of the EEC Member States:

Le produit sus-mentionné est conforme aux Directives du Conseil concernant le rapprochement des législations des Etats membres CEE:

El producto designado cumple con las Directivas des Consejo relativas a la aproximación de las legislaciones de los Estados Miembros de la CEE:

2006/42/EG	Richtlinie für Maschinen
2006/42/EC	Council Directive for machinery
2006/42/CEE	Directive de Conseil pour les machines
2006/42/CEE	Directivas des Consejo para máquinas

Hinsichtlich der elektrischen Gefahren wurden gemäß Anhang I Nr. 1.5.1 der Maschinenrichtlinie 2006/42/EG die Schutzziele der Niederspannungsrichtlinie 2014/35/EU eingehalten.

With respect to potential electrical hazards as stated in appendix I No. 1.5.1 of the machine guide lines 2006/42/EG all safety protection goals are met according to the low voltage guide lines 2014/35/EU.

Conformément à l'annexe I N° 1.5.1 de la Directive "Machines" (2006/42/CE) les objectifs de sécurité relatifs au matériel électrique de la Directive "Basse Tension" (2014/35/CE) ont été respectés.

Con respect al potencial peligro electro como se indica en el apéndice I No. 1.5.1 des manual de la máquina 2006/42/EU, todos los medios de protección de seguridad se encuentran según la guía de bajo voltaje 2014/35/EU.

Die Übereinstimmung mit den Vorschriften dieser Richtlinien wird nachgewiesen durch die vollständige Einhaltung folgender Normen:

Conformity with the requirements of this Directives is testified by complete adherence to the following standards:

La conformité aux prescriptions de ces Directives est démontrée par la conformité intégrale avec les normes suivantes:

La conformidad con las prescriptions de estas directivas queda justificada por haber cumplido totalmente las siguientes normas:

Harmonisierte Europ. Normen/Harmonised Europ. Standards / Normes Europ. Harmonisées / Normas europ. Armonizadas:

EN ISO 12100-1 EN ISO 12100-2 DIN EN ISO 13849-1 DIN EN ISO 14121-1
DIN EN 60204-1 DIN EN 62079

Die Hinweise in der Betriebsanleitung für den Einbau und die Inbetriebnahme des Pneumatik Zylinders sind zu beachten.

The instructions contained in the operating manual for installation and start up of the pneumatic cylinders have to be followed.

Les indications d'installation / montage et de mise en service de cylindre pneumatique prévues dans l'instruction d'emploi doivent être suivies.

Tenga en cuenta las instrucciones en el manual para la instalación y puesta en marcha de Cilindro neumática.

Bleickert Automation

D-79771 Klettgau, 01.02.2024