



Swivel Unit

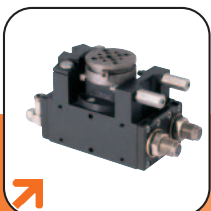
pneumatic

SOMMER
automatic

Flat Swivel **Units** *with 2 positions*



Order no.	Swivel angle [°]	Torque [Nm]	Page
Product Information			10
SEF19	90 oder 180	1,2	14
SEF19S	90 oder 180	1,2	14
SEF30	90 oder 180	3,5	16
SEF30S	90 oder 180	3,5	16



Order no.	Swivel angle [°]	Torque [Nm]	Page
Product Information			20
SF42-90N	90	1,4	24
SF42-90I4	90	0,8	24
SF42-180N	180	1,4	26
SF42-180I4	180	0,8	26



Order no.	Swivel angle [°]	Torque [Nm]	Page
Product Information			30
SF50-90N	90	2,4	34
SF50-180N	180	2,4	34
SF50-90ND4	90	1,5	36
SF50-180ND4	180	1,5	36
SF74-90N	90	7,3	38
SF74-180N	180	7,3	38
SF74-90ND4	90	5,5	40
SF74-180ND4	180	5,5	40
SF74-90ND6	90	5,5	42
SF74-180ND6	180	5,5	42
SF100-90N	90	20	44
SF100-180N	180	20	44
SF100-90ND4	90	15	46
SF100-180ND4	180	15	46
SF100-90ND6	90	15	48
SF100-180ND6	180	15	48



Order no.	Swivel angle [°]	Torque [Nm]	Page
Product Information			52
SF125-90N-B	90	38	56
SF125-90I4-B	90	34	58
SF125-90I8-B	90	32	60
SF125-180N-B	180	38	56
SF125-180I4-B	180	34	58
SF125-180I8-B	180	32	60
SF155-90N	90	62	62
SF155-90I4	90	58	64
SF155-90I8	90	54	66
SF155-180N	180	62	62
SF155-180I4	180	58	64
SF155-180I8	180	54	66
SF195-90N	90	130	68
SF195-90I4	90	125	70
SF195-90I8	90	120	72
SF195-180N	180	130	68
SF195-180I4	180	125	70
SF195-180I8	180	120	72



Order no.	Swivel angle [°]	Torque [Nm]	Page
Product information			76
SF150-90S	90	46	80
SF150-180S	180	46	80
SF190-90S	90	115	82
SF190-180S	180	115	82
Swivel Unit Formulas			84



Flat Swivel Units *with 3 positions*



Order no.	Swivel angle [°]	Torque [Nm]	Page
Product Information			90
SF74ML	+90/0/-90	6	94
SF74MLD4	+90/0/-90	4,5	96
SF74MLD6	+90/0/-90	4,5	98
SF125ML-B	+90/0/-90	38	100
SF125MLI4-B	+90/0/-90	34	102
SF125MLI8-B	+90/0/-90	32	104



Order no.	Swivel angle [°]	Torque [Nm]	Page
Product Information			108
SF74M-B	+90/0/-90	6	112
SF74MD4-B	+90/0/-90	4,5	114
SF74MD6-B	+90/0/-90	4,5	116
SF100M-B	+90/0/-90	20	118
SF100MD4-B	+90/0/-90	15	120
SF100MD6-B	+90/0/-90	15	122



Order no.	Swivel angle [°]	Torque [Nm]	Page
Product Information			126
SF155M	+90/0/-90	62	130
SF155MI4	+90/0/-90	58	132
SF155MI8	+90/0/-90	54	134
SF195M	+90/0/-90	130	136
SF195MI4	+90/0/-90	125	138
SF195MI8	+90/0/-90	120	140
SF150SM	+90/0/-90	46	142
SF190SM	+90/0/-90	115	144
Function			146
Swivel Unit Formulas			150



Table of contents Angled Swivel Unit

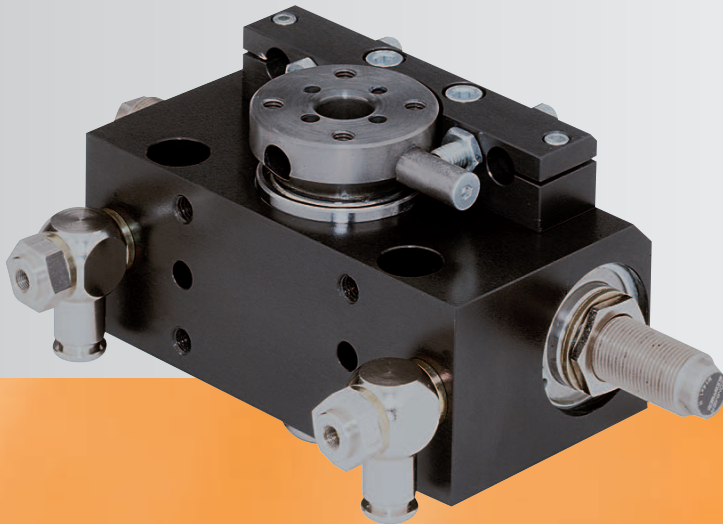
Order no.	Swivel angle [°]	Torque [Nm]	Page
Product Information			156
SW50D4	180	1,5	160
SW74D4	180	5,5	162
SW100D4	180	15	164
SW150D4	180	46	166
SW190D8	180	110	168
Angled Swivel Unit Formulas			170





Flat Swivel Units

pneumatic



SEF-Series

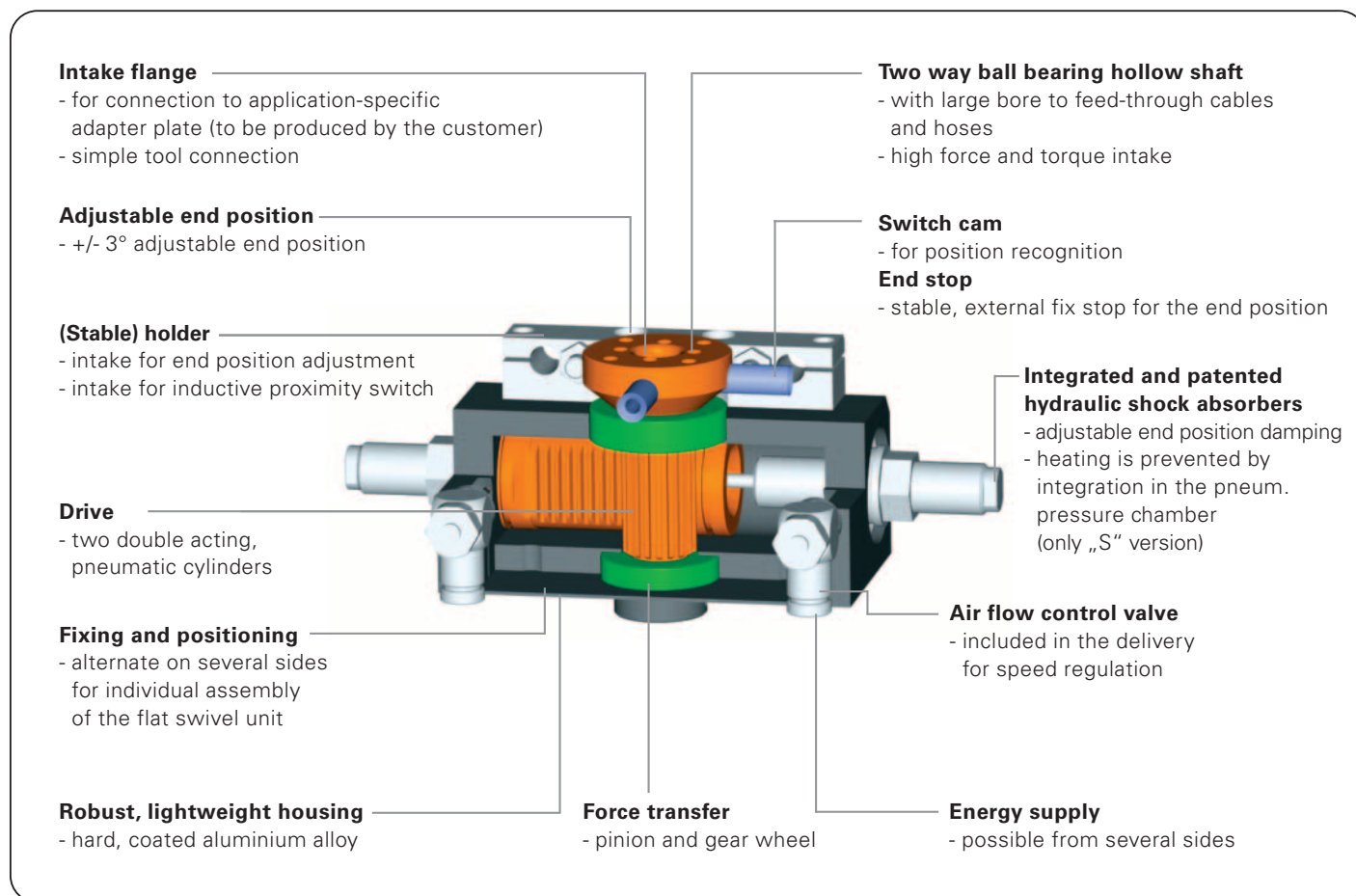
SOMMER
automatic

Flat Swivel Unit

➤ Features

- Small compact swivel unit in two sizes, with one of torque up to 3,5 Nm
- Optimally suited to low mass workpieces. Available with or without hydraulic shock absorbers
- Dual ball bearing shaft, with large central bore up to 12 mm diameter
- Quick convertible from 90° - 180° swivel angle
- Without end position damping available for sooth swivel movements

Functional diagram



Terms

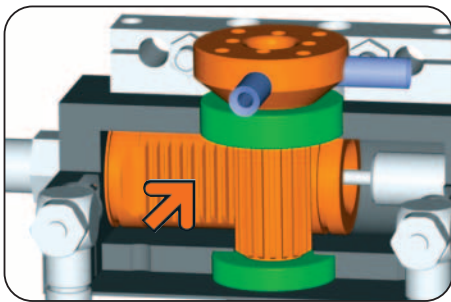
Torque:	force moment occurring on the edge of the swivel unit
Swivel time:	time required to cover a 0/90° or 0/180° swivel movement
Repeatability:	dispersion of stop positions at 100 consecutive swivel cycles
Cycle:	distance covered by the piston in one 0/90/0° or 0/180/0° swivel movement
Maintenance:	<p>maintenance free up to 10 Mio. swivel cycles (please see the owner's manual for conditions, download from www.sommer-automatic.com)</p> <ul style="list-style-type: none"> • long maintenance intervals keep costs down • long durability

Model

S:	Integrated shock absorber
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Order no.	Swivel angle	Torque	Center through bore
SEF19	90° oder 180°	1,2 Nm	Ø 9 mm
SEF19S	90° oder 180°	1,2 Nm	Ø 9 mm
SEF30	90° oder 180°	3,5 Nm	Ø 12 mm
SEF30S	90° oder 180°	3,5 Nm	Ø 12 mm

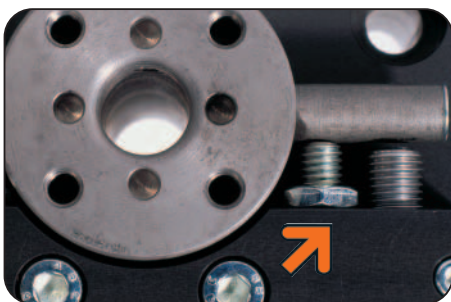
Flat Swivel Unit



Drive

Double acting pneumatic cylinder

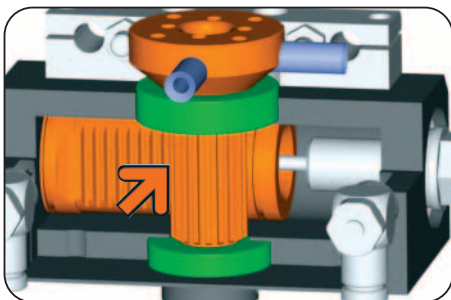
- Maximum torque in both rotation directions
- Torque up to 3,5 Nm



Swivel angle 90° or 180°

external end stop $\pm 3^\circ$

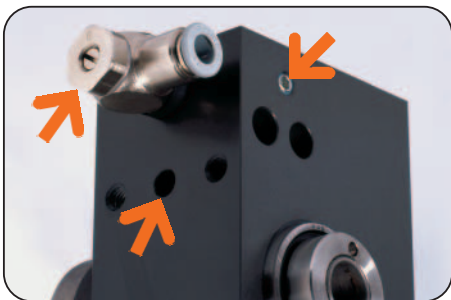
- External fixed stop to absorb the force over housing prevents overload of pinion and gear wheel



Force transfer

Via pinion and gear wheel

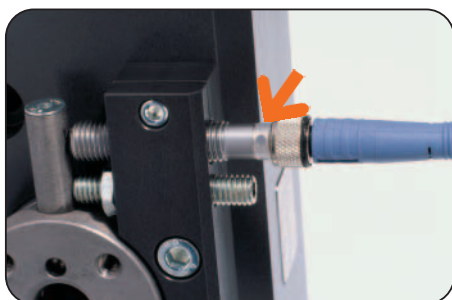
- Optimum steering of drive force in torque
- High repeatability
- Two way ball bearings for high torque intake



Machine connection

Energy supply, attachment and positioning-possibilities on several sides

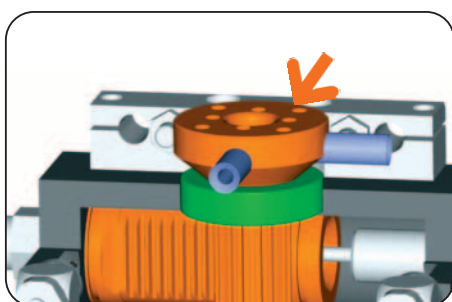
- Optimum integration into the workroom through individual mounting-situation
- Hoseless direct connection possible, no additional interference contours
- Exhaust air flow control valve for speed regulation (included in the delivery)



Position sensing

for inductive proximity switch with 8 mm diameter

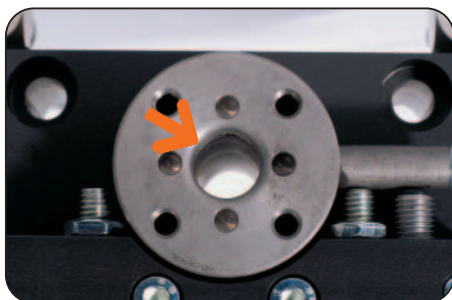
- Process safe
- Low interference contour
- Compact



Intake flange

for individual connecting plate intake

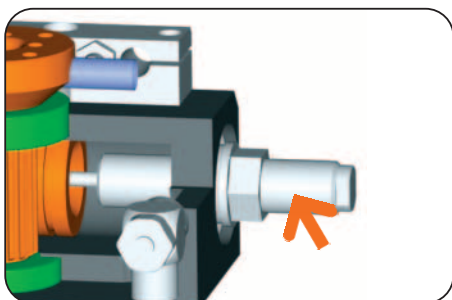
- Stable thread and pin holes
- Low design effort
- Simple connection



Central bore

For cable feed-through

- Up to Ø 12 mm
- Central
- Low torsion on feed-through supply lines



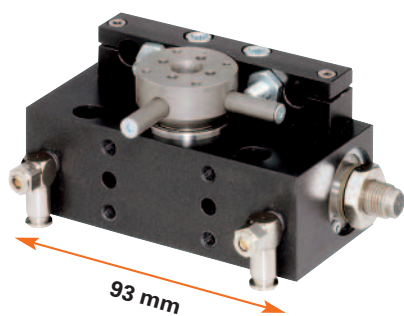
Hydraulic shock absorber

with spiral groove technology

End position damping (only „S“ version)

- Low wear approach to end position
- Constant damping behavior along the total stroke of the shock absorber

Flat Swivel Unit

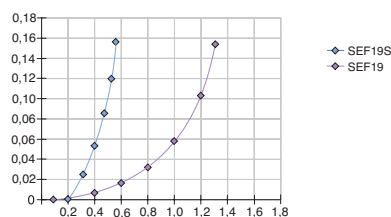


Picture shows SEF19S

Moment of inertia

Shows the expected swivel time against the calculated moment of inertia

Moment of inertia in [kg m²]



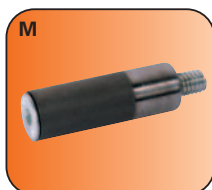
Swivel time in [sec]

Data measured at 6 bar and horizontal mounting position

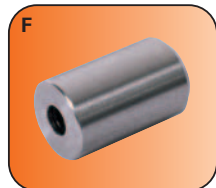
Included in the delivery



Pneumatic fittings
Order no. DRVM5x4

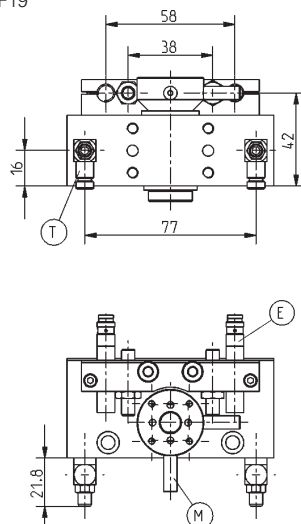


Stop 90° + screw
Order no. ANS0004

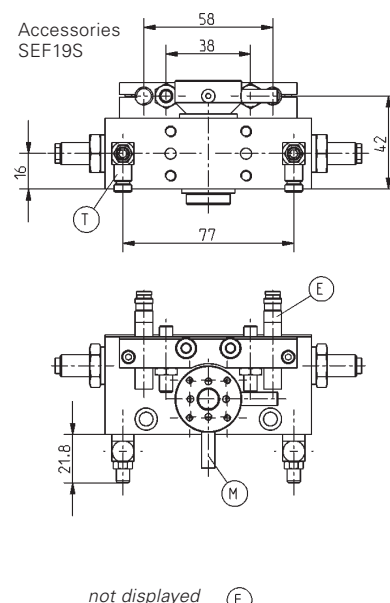


Distance for the shock
absorber piston
90° swivel angle
Order no. BDST19230

Accessories
SEF19



Accessories
SEF19S

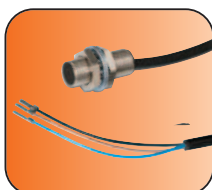


Subject to change without prior notice

Accessory list



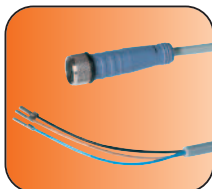
Proximity switch
Order no. NJ8-E2S



Proximity switch
Order no. NJ8-E2



Cable angled plug
Order no. KAW500



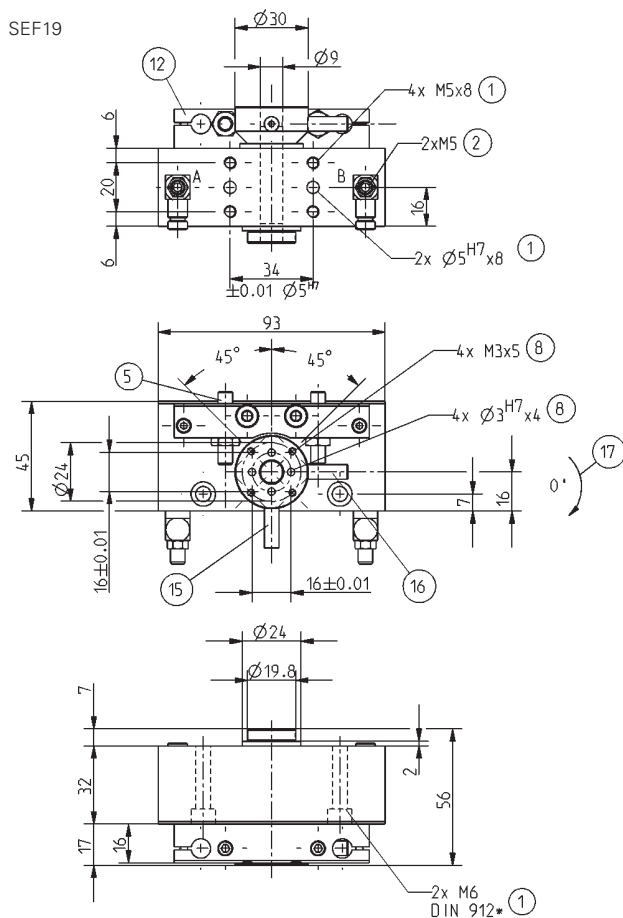
Cable straight plug
Order no. KAG500



Plug 3-pole
Order no. S12-G-3

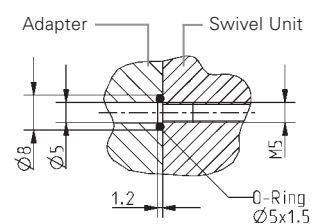
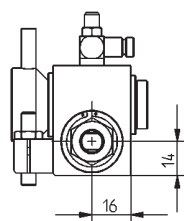
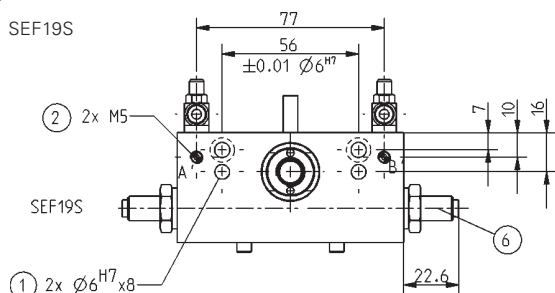
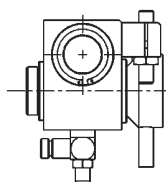
Order no.:	SEF19	SEF19S
Swivel angle [°]:	90/180	90/180
Torque [Nm]:	1,2	1,2
Swivel angle 90°/180° adjustable +/- [°]:	3	3
Repeatability +/- [°]:	0,01	0,01
Passage bore Ø [mm]:	9	9
Axial bearing load [N]:	500	500
Radial bearing load [Nm]:	35	35
Min./max. operating pressure [bar]:	3/8	3/8
Min./max. operating temperature [°C]:	5/80	5/80
Air volume per cycle 90°/180° [cm³]:	6/8	6/8
Weight [g]:	520	580

All data measured at 6 bar



- ① Fixing swivel unit
- ② Energy supply
- ⑤ Adjusting screw
- ⑥ Shock absorbers
- ⑧ Fixing tool side
- ⑫ Holder for proximity switch and fix stop
- ⑮ Fix stop 90°
- ⑯ Fix stop 180°
- ⑰ Swivel direction
- Ⓐ Air connection swivel to 90° or 180°
- Ⓑ Air connection swivel to 0°
- Ⓐ Air connection swivel to 90° or 180°
(alternate)
- Ⓑ Air connection swivel to 0°
(alternate)

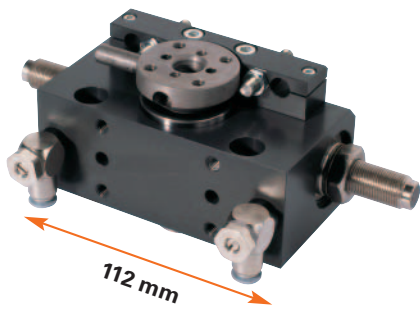
* replaced by DIN EN ISO 4762



Hoseless energy connection (maschine side)

Subject to change without prior notice

Flat Swivel Unit

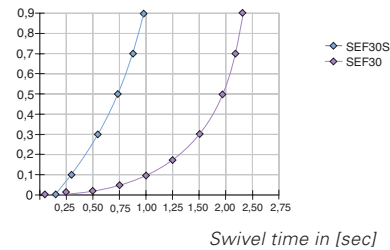


Picture shows SEF30S

Moment of inertia

Shows the expected swivel time against the calculated moment of inertia

Moment of inertia in $[kg\ m^2]$

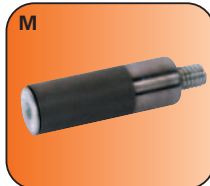


Data measured at 6 bar and horizontal mounting position

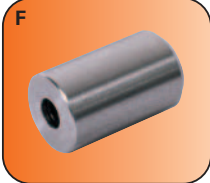
Included in the delivery



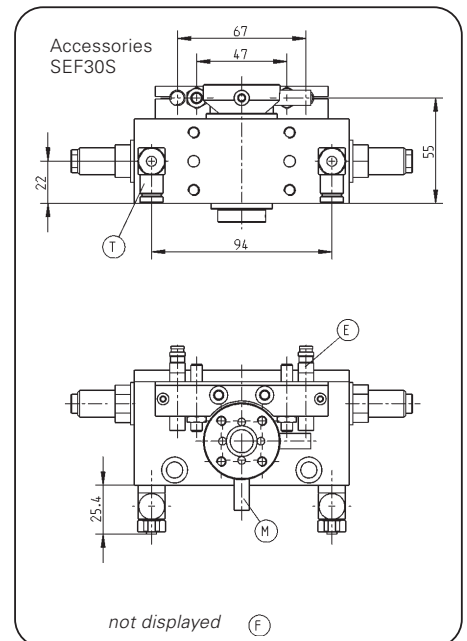
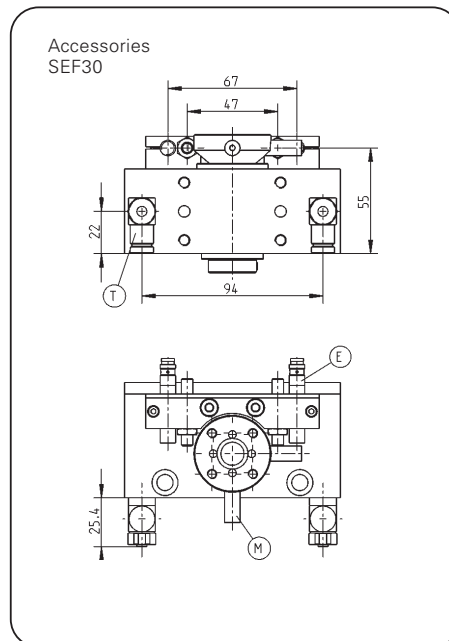
Pneumatic fittings
Order no. DRV1/8x6



Stop 90° + screw
Order no. ANS0005



Distance for the shock absorber piston
90° swivel angle
Order no. BDST03050

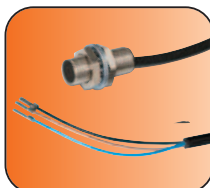


Subject to change without prior notice

Accessory list



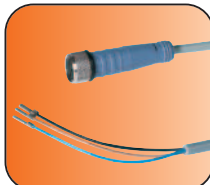
Proximity switch
Order no. NJ8-E2S



Proximity switch
Order no. NJ8-E2



Cable angled plug
Order no. KAW500



Cable straight plug
Order no. KAG500



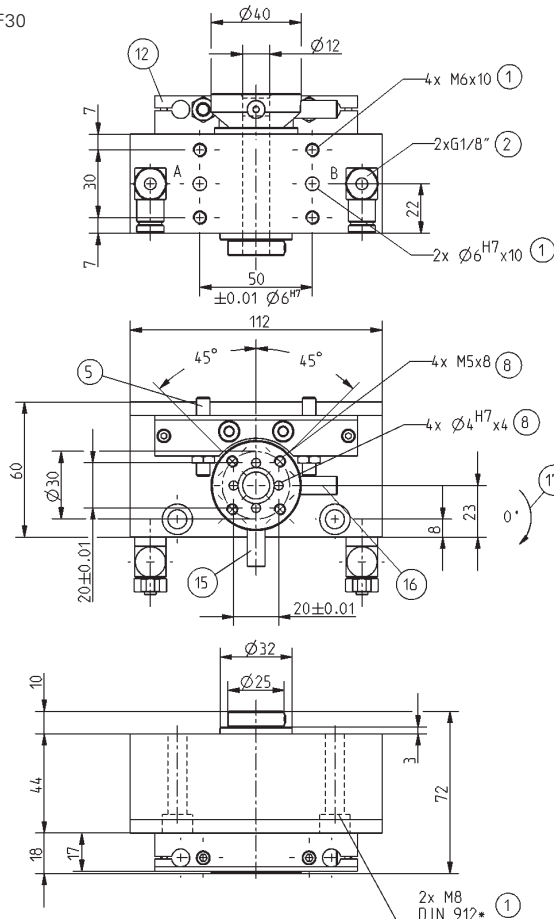
Plug 3-pole
Order no. S12-G-3



Order no.:	SEF30	SEF30S
Swivel angle [°]:	90/180	90/180
Torque [Nm]:	3,5	3,5
Swivel angle 90°/180° adjustable +/- [°]:	3	3
Repeatability +/- [°]:	0,01	0,01
Passage bore Ø [mm]:	12	12
Axial bearing load [N]:	1000	1000
Radial bearing load [Nm]:	75	75
Min./max. operating pressure [bar]:	3/8	3/8
Min./max. operating temperature [°C]:	5/80	5/80
Air volume per cycle 90°/180° [cm³]:	16/21	16/21
Weight [kg]:	1,2	1,3

All data measured at 6 bar

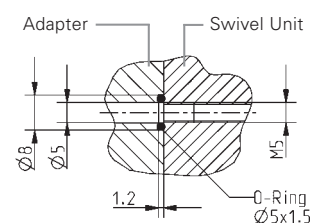
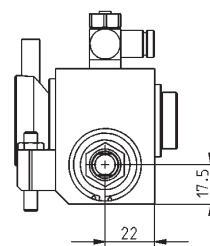
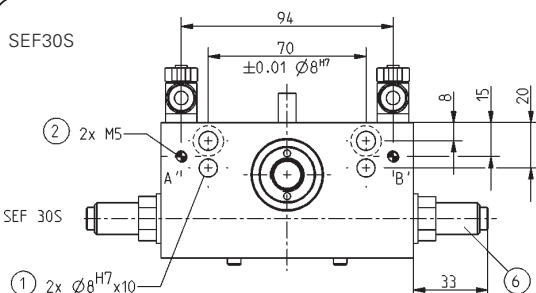
SEF30



- ① Fixing swivel unit
- ② Energy supply
- ⑤ Adjusting screw
- ⑥ Shock absorbers
- ⑧ Fixing tool side
- ⑫ Holder for proximity switch and Fix stop
- ⑮ Fix stop 90°
- ⑯ Fix stop 180°
- ⑰ Swivel direction
- A Air connection swivel to 90° or 180°
- B Air connection swivel to 0°
- A' Air connection swivel to 90° or 180° (alternate)
- B' Air connection swivel to 0° (alternate)

* replaced by DIN EN ISO 4762

SEF30S



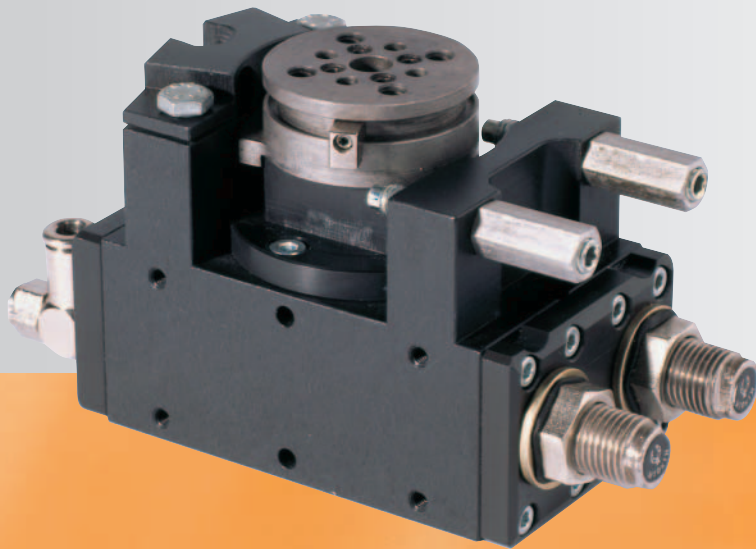
Hoseless energy connection (maschine side)

Subject to change without prior notice



Flat Swivel Units

pneumatic



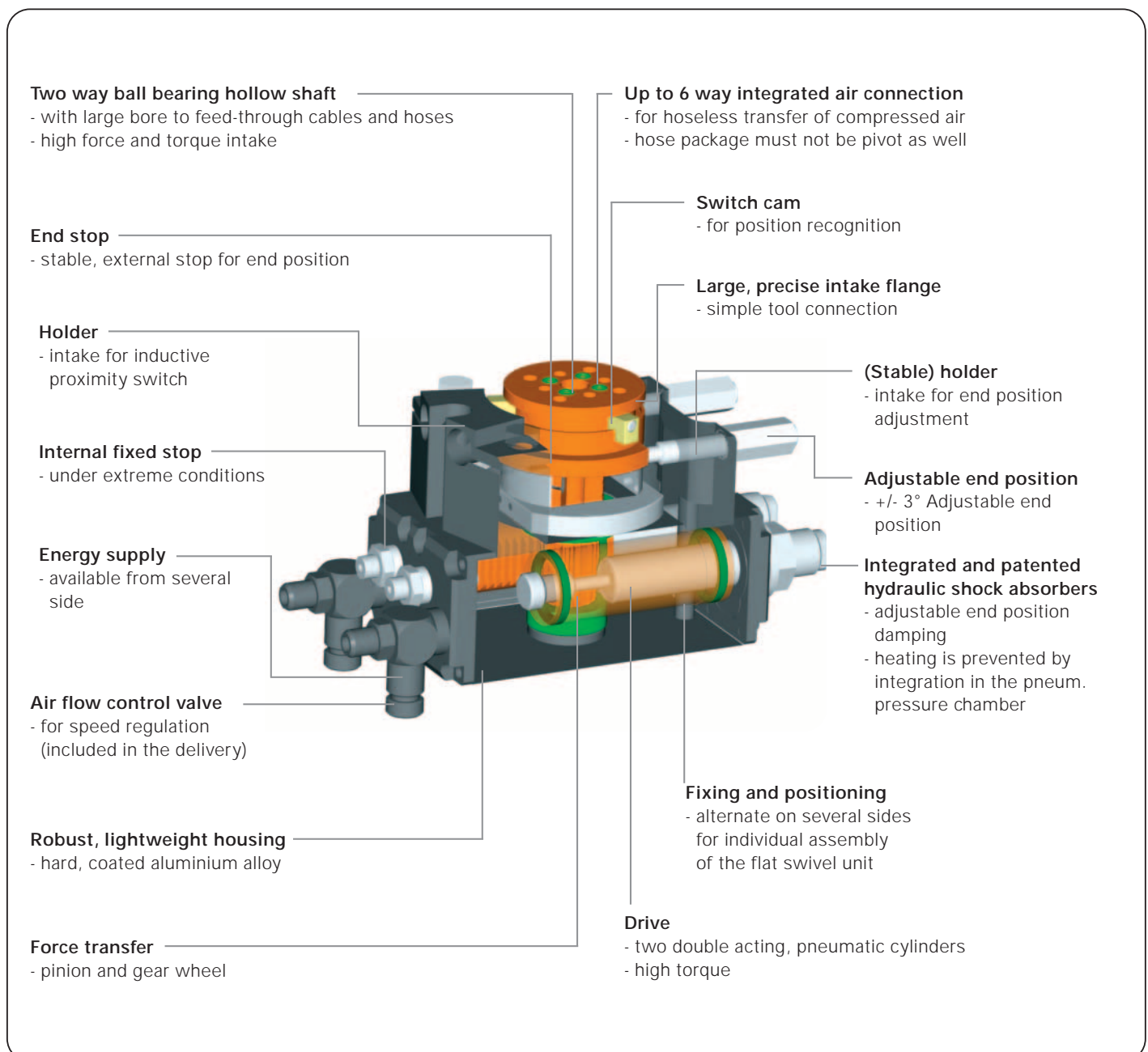
SF42

Flat Swivel Unit

Features

- Compact structure and high torque up to 1.4 Nm
- With integrated and patented hydraulic shock absorbers, built into the pressure chamber, cooled due to permanent air flow and therefore constant in damping behavior
- With large drive flange for easy connection, dual ball bearings for a high moment intake, large central bore up to 6 mm diameter, torque up to 1,4 Nm
- Also available as a design with integrated pneumatic rotary distributor with up to 4 way hoseless air transfer

Functional diagram



Terms

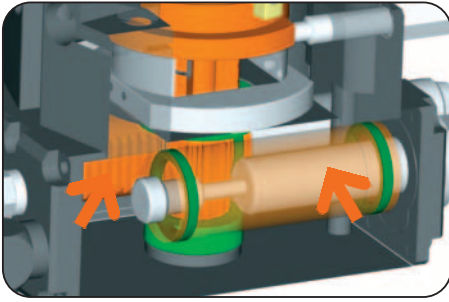
Torque:	force moment occurring on the edge of the swivel unit
Swivel time:	time required to cover a 0/90° or 0/180° swivel movement
Repeatability:	dispersion of stop positions at 100 consecutive swivel cycles
Cycle:	distance covered by the piston in one 0/90/0° or 0/180/0° swivel movement
Maintenance:	<p>maintenance free up to 10 Mio. swivel cycles (please see the owner's manual for conditions, download from www.sommer-automatic.com)</p> <ul style="list-style-type: none"> • long maintenance intervals keep costs down • long durability

Model

N:	Two double acting pneumatic cylinders
I4:	Two double acting pneumatic cylinders, hoseless pneumatic 4 way rotary distributor

Ordner no.	Swivel angle	Torque	Center through-bore	Air feed-through
SF42-90N	90°	1,4 Nm	Ø 6 mm	-
SF42-90I4	90°	0,8 Nm	Ø 6 mm	4
SF42-180N	180°	1,4 Nm	Ø 6 mm	-
SF42-180I4	180°	0,8 Nm	Ø 6 mm	4

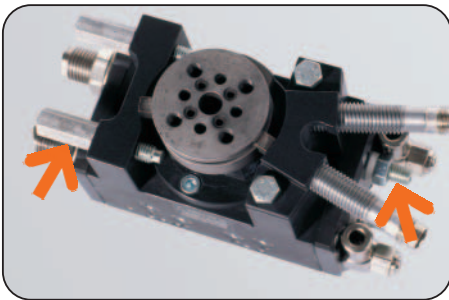
Flat **Swivel Unit**



Drive

Two dual effect pneumatic cylinders

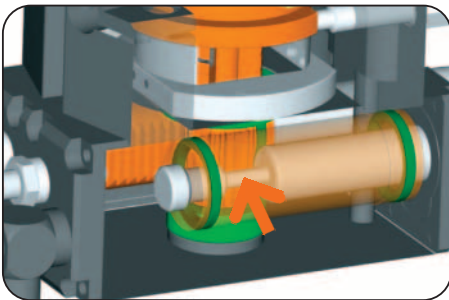
- Maximum torque in both rotation directions
- Torque up to 1.4 Nm



Swivel angle 90° or 180°

End stop adjustable via adjustment screw +/-3°

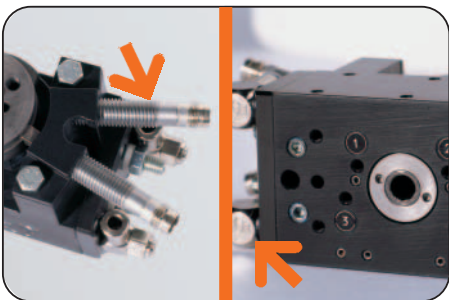
- External fixed stop absorb the force line over housing prevents overload of pinion and gear wheel
- Internal fixed stop, recommended under extreme conditions



Force transfer

Via pinion and gear wheel

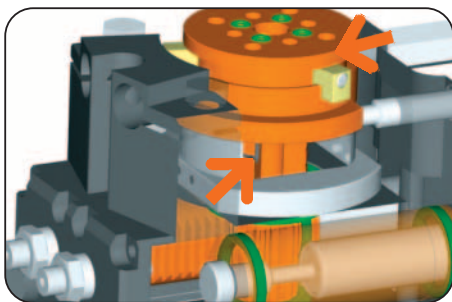
- Optimum steering of drive force in torque
- High repeat accuracy
- Two way ball bearings for high torque intake



Machine connection

Position sensing, energy supply, attachment and positioning-possibilities on several sides

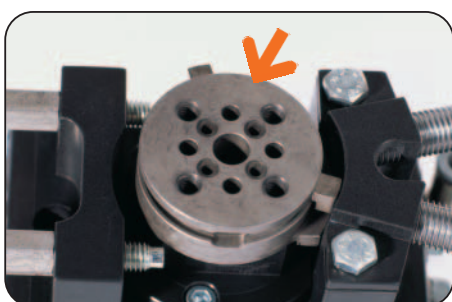
- For inductive proximity switches
- Optimum integration into the workroom through individual mounting-situation
- Hoseless direct connection possible, no additional interference contours
- Exhaust air control valve for speed regulation (included in the delivery)
- Machine side without projection, thus lower design and production effort for the adapter plate



Air transfer

hoseless, up to 4 pneumatic feed-through

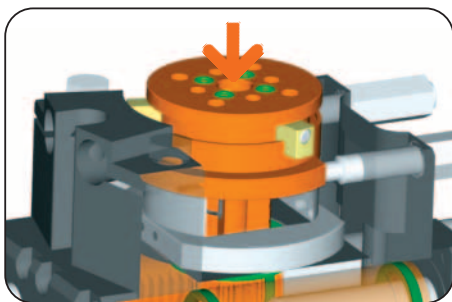
- Reduces interference contour, hose package must not pivot as well
- Smooth rotary distributor due to special rotation seals
- Compact external dimensions due to direct screwing on the housing



Intake flange

For simple connection

- Low design and extension effort for connection of following tool connection
- Air transfer direct possible by the adapter plate
- External, stable fix stop, prevents damage from overload



Central bore

For cable feed- through

- Ø 6 mm
- Central
- Low torsion on feed-through supply lines

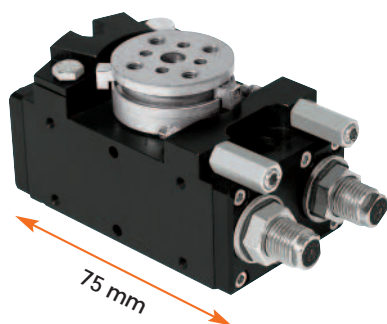


End position damping

Hydraulic shock absorber with spiral groove technology

- Low wear approach to end position, gentle energy absorption due to profiled spiral groove
- The damping characteristics can be individually adjusted by the screw depth
- Built into the pressure chamber, cooled by permanent air flow, constant damping behavior

Flat Swivel Unit

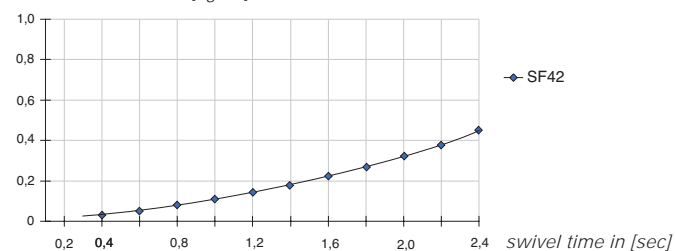


Picture shows SF42-180I4

Moment of inertia

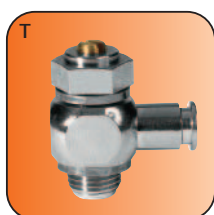
Shows the expected swivel time against the calculated moment of inertia

Moment of inertia in $[kg \cdot m^2]$



Data measured at 6 bar and horizontal mounting position

Included in the delivery

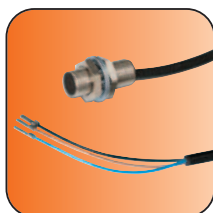


Pneumatic fittings
Order no. DRVM5x4

Accessory list



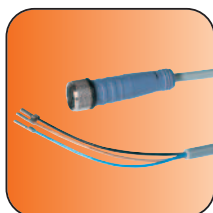
Proximity switch
Order no. NJ8-E2S



Proximity switch
Order no. NJ8-E2



Cable angled plug
Order no. KAW500

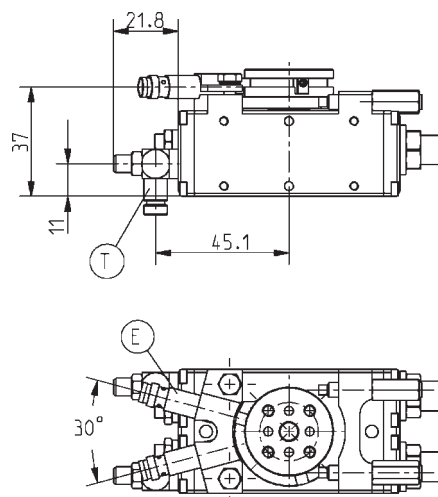


Cable straight plug
Order no. KAG500



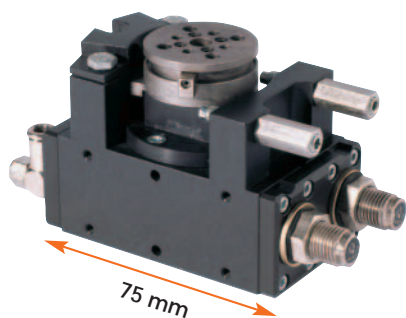
Plug 3-pole
Order no. S12-G-3

Accessories



Subject to change without prior notice

Flat Swivel Unit

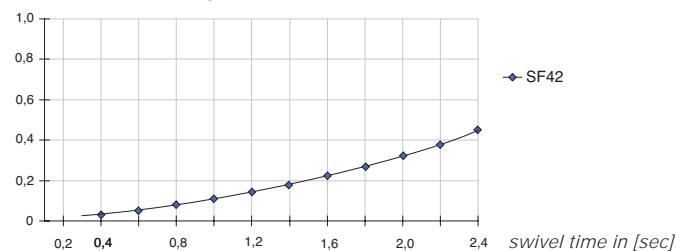


Picture shows SF42-180I4

Moment of inertia

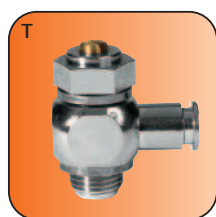
Shows the expected swivel time against the calculated moment of inertia

Moment of inertia in $[kg\ m^2]$

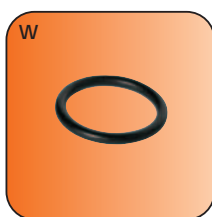


Data measured at 6 bar and horizontal mounting position

Included in the delivery



Pneumatic fittings
Order no. DRVM5x4

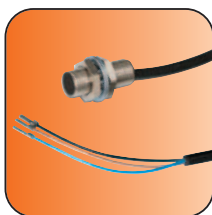


O-Ring
Order no. COR0020070

Accessory list



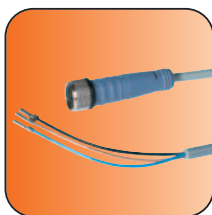
Proximity switch
Order no. NJ8-E2S



Proximity switch
Order no. NJ8-E2



Cable angled plug
Order no. KAW500

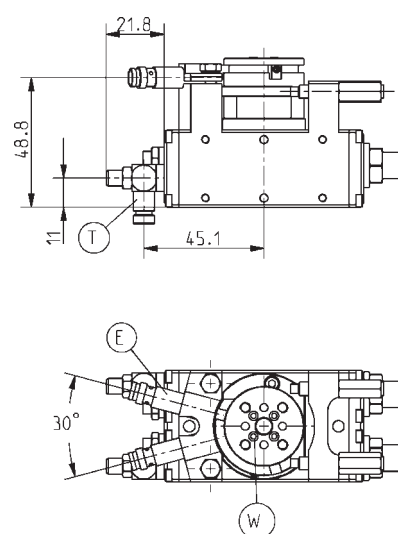


Cable straight plug
Order no. KAG500



Plug 3-pole
Order no. S12-G-3

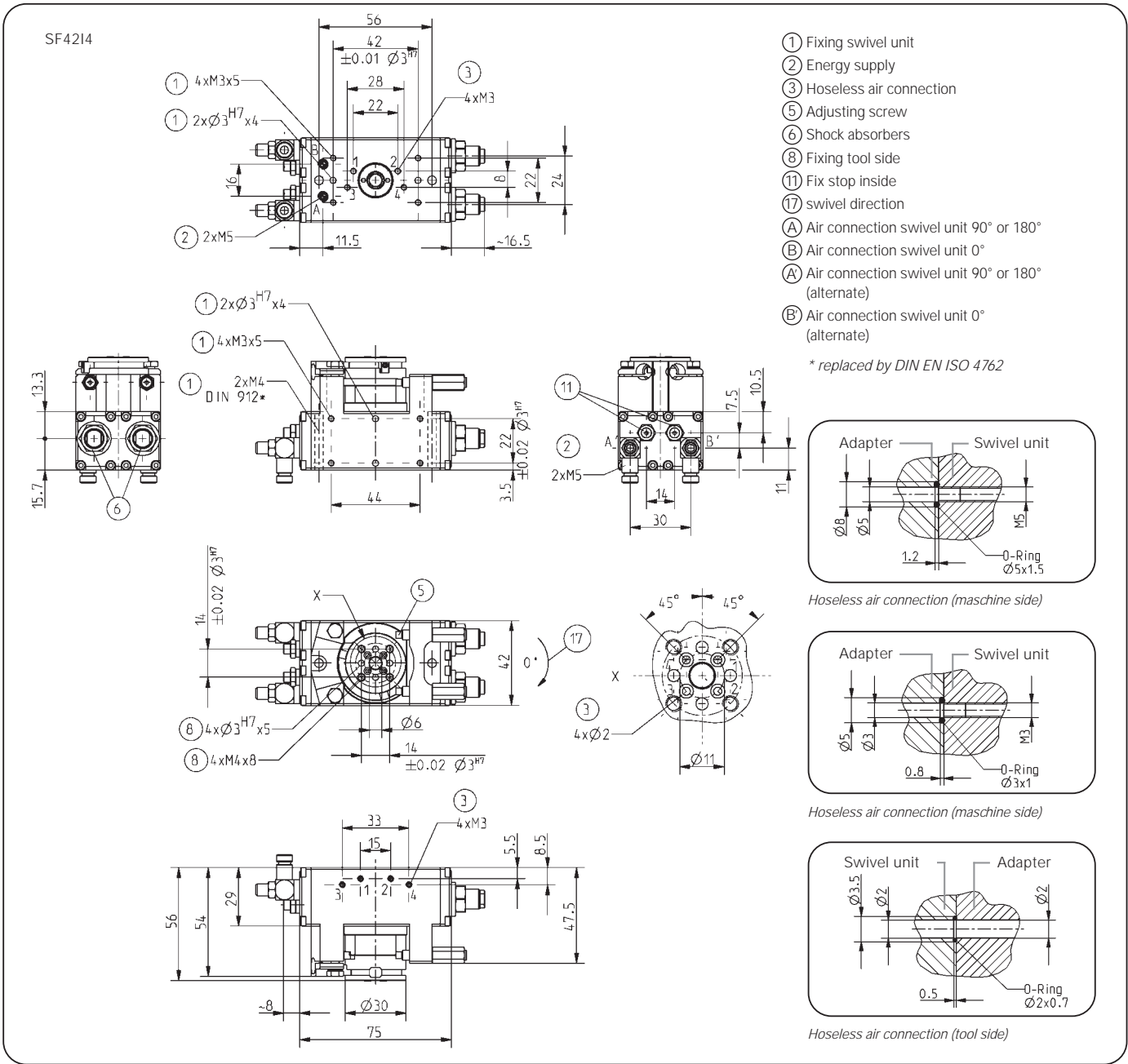
Accessories



Subject to change without prior notice

Order no.:	SF42-90I4	SF42-180I4
Swivel angle [°]:	90	180
Torque [Nm]:	0,8	0,8
Swivel angle 90° or 180° adjustable +/- [°]:	3	3
Repeatability +/- [°]:	0,01	0,01
Passage bore Ø [mm]:	6	6
Air feed-through [quantity]:	4	4
Axial bearing load [N]:	250	250
Radial bearing load [Nm]:	14	14
Min./max. operating pressure [bar]:	4/8	4/8
Air volume per cycle [cm³]:	7	14
Min./max. operating temperature [°C]:	5/80	5/80
Weight [g]:	500	500

All data measured at 6 bar

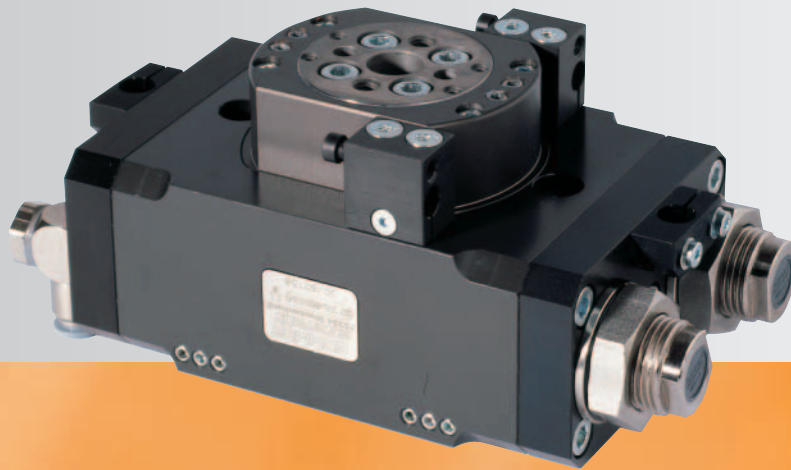


Subject to change without prior notice



Flat Swivel Units

pneumatic



SF50
SF74
SF100

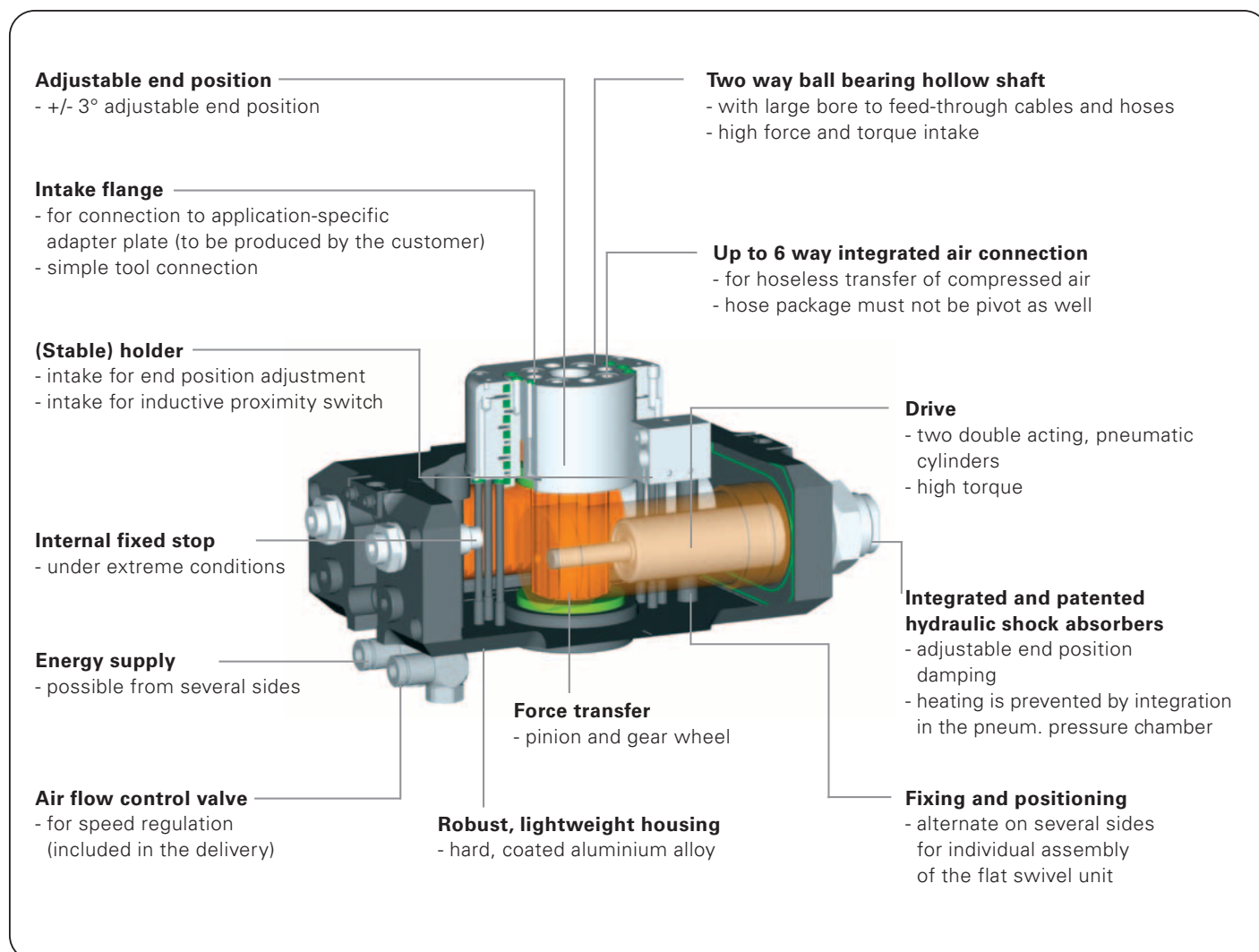
SOMMER
automatic

Flat Swivel Unit

Features

- High torque up to 20 Nm in conjunction with a compact design
- With integrated and patented hydraulic shock absorbers, built into the pressure chamber, cooled due to permanent air flow and therefore constant in damping behavior
- Two way ball bearing drive shaft for high moment intake, with large central hole up to 15 mm diameter
- Also available as a version with integrated pneumatic rotary distributor, with up to 6 way hoseless air transfer

Functional diagram



Terms

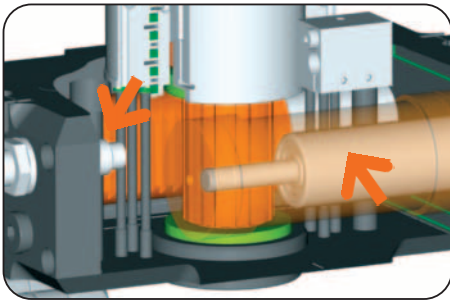
Torque:	force moment occurring on the edge of the swivel unit
Swivel time:	time required to cover a 0/90° or 0/180° swivel movement
Repeatability:	dispersion of stop positions at 100 consecutive swivel cycles
Cycle:	distance covered by the piston in one 0/90/0° or 0/180/0° swivel movement
Maintenance:	<p>maintenance free up to 10 Mio. swivel cycles (please see the owner's manual for conditions, download from www.sommer-automatic.com)</p> <ul style="list-style-type: none"> • long maintenance intervals keep costs down • long durability

Model

N:	Two double acting pneumatic cylinders
D4:	Two double acting pneumatic cylinders, hoseless pneumatic 4 way rotary distributor
D6:	Two double acting pneumatic cylinders, hoseless pneumatic 6 way rotary distributor

Order no.	Swivel angle	Torque	Center through-bore	Air feed-through
SF50-90N	90°	2,4 Nm	Ø 9 mm	-
SF50-180N	180°	2,4 Nm	Ø 9 mm	-
SF50-90ND4	90°	1,5 Nm	Ø 9 mm	4
SF50-180ND4	180°	1,5 Nm	Ø 9 mm	4
SF74-90N	90°	7,3 Nm	Ø 12 mm	-
SF74-180N	180°	7,3 Nm	Ø 12 mm	-
SF74-90ND4	90°	5,5 Nm	Ø 12 mm	4
SF74-180ND4	180°	5,5 Nm	Ø 12 mm	4
SF74-90ND6	90°	5,5 Nm	Ø 12 mm	6
SF74-180ND6	180°	5,5 Nm	Ø 12 mm	6
SF100-90N	90°	20 Nm	Ø 15 mm	-
SF100-180N	180°	20 Nm	Ø 15 mm	-
SF100-90ND4	90°	15 Nm	Ø 15 mm	4
SF100-180ND4	180°	15 Nm	Ø 15 mm	4
SF100-90ND6	90°	15 Nm	Ø 15 mm	6
SF100-180ND6	180°	15 Nm	Ø 15 mm	6

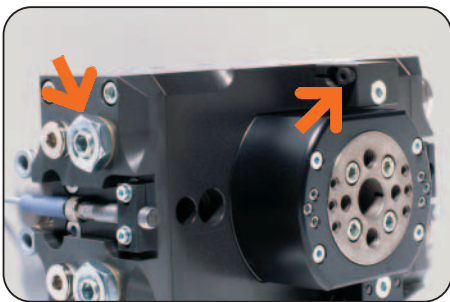
Flat Swivel Unit



Drive

Two double acting pneumatic cylinders

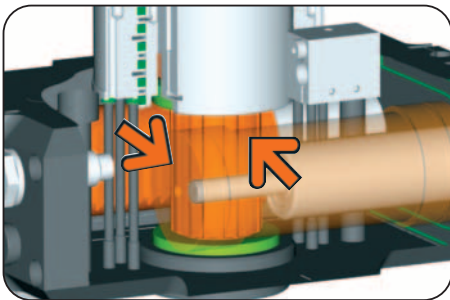
- Maximum torque in both rotation directions
- Torque up to 20 Nm



Swivel angle 90° or 180°

End stop adjustable via adjustment screw +/- 3°

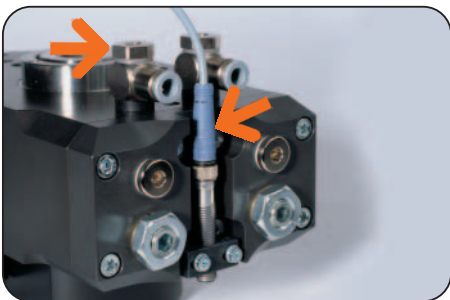
- Internal fixed stop, recommended under extreme conditions
- External fixed stop to absorb the force over housing prevents overload of pinion and gear wheel (Stop bolts not included in the delivery)



Force transfer

Via pinion and gear wheel

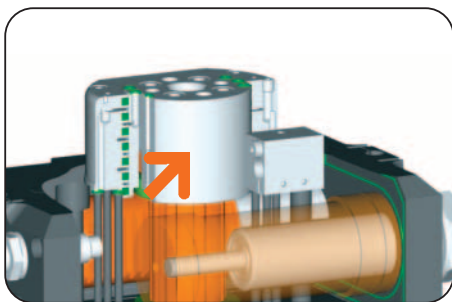
- Optimum steering of drive force in torque
- High repeatability
- Two way ball bearings for high torque intake



Machine connection

Position sensing, energy supply, attachment and positioning possibilities on several sides

- For inductive proximity switches
- Optimum integration into the workroom through individual mounting-situation
- Hoseless direct connection possible, no additional interference contours
- Exhaust air flow control valve for speed regulation (included in the delivery)



Air transfer

Hoseless up to 6 pneumatic feed-through

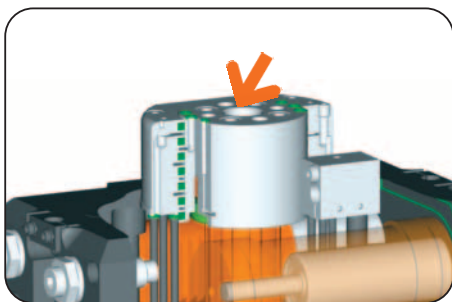
- Reduces interference contour, hose package does not pivot as well
- Smooth rotary distributor due to o-ring with Teflon support ring
- Compact external dimensions due to direct screwing on the housing



Intake flange

Direct screwing onto the working flange

- Stable thread and pin holes
- Low design effort
- Simple connection
- Standard adapter available as accessory



Central bore

For cable feed-through

- Up to Ø 15 mm
- Central
- Low torsion on feed-through supply lines

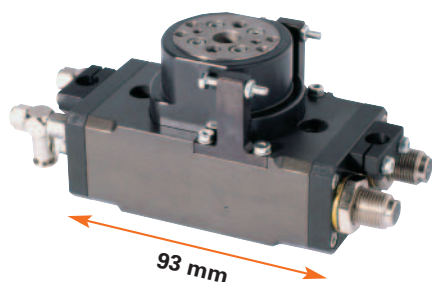


End position damping

Hydraulic shock absorber with spiral groove technology

- Low wear approach to end position, gentle energy absorption due to profiled spiral groove
- The absorber characteristics can be individually adjusted by the screw depth
- Built into the pressure chamber, cooled by permanent air flow, constant damping behaviour

Flat Swivel Unit

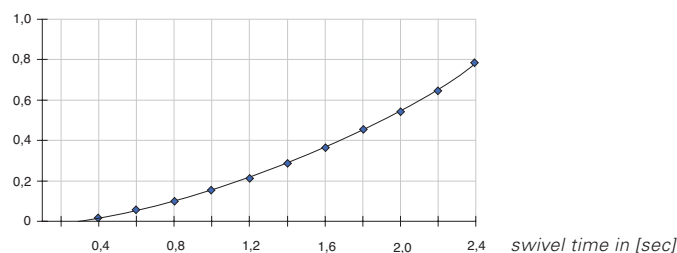


Picture shows SF50-180ND4

Moment of inertia

Shows the expected swivel time against the calculated moment of inertia.

Moment of inertia in $[kg\ m^2]$

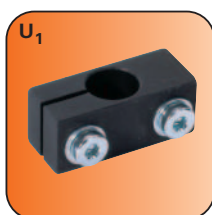


Data measured at 6 bar and horizontal mounting position

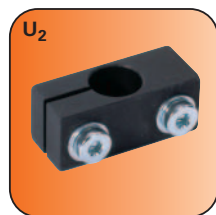
Included in the delivery



Pneumatic fittings
Order no. DRVM5x4



Mounting block
Order no. KB8-36

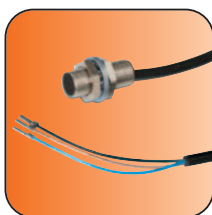


Mounting block
Order no. KB8-35

Accessory list



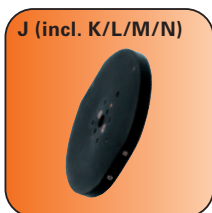
Proximity switch
Order no. NJ8-E2S



Proximity switch
Order no. NJ8-E2

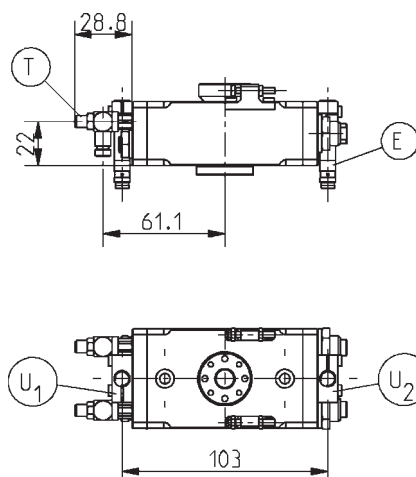


Cable angled plug
Order no. KAW500

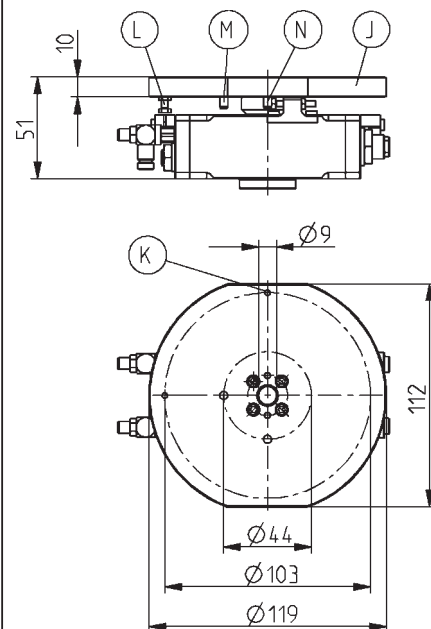


Adapter plate
Order no. SFP50N

Accessories

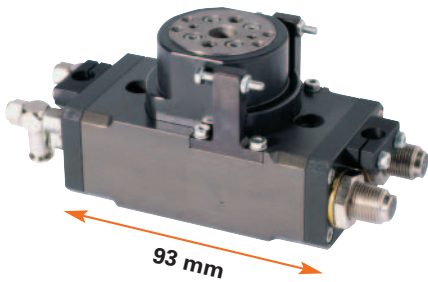


Adapter plate



Subject to change without prior notice

Flat Swivel Unit

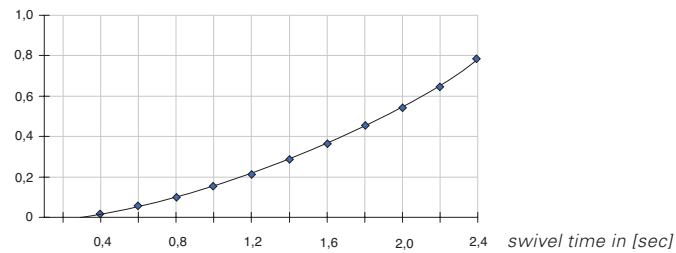


Picture shows SF50-180ND4

Moment of inertia

Shows the expected swivel time against the calculated moment of inertia.

Moment of inertia in $[kg \cdot m^2]$

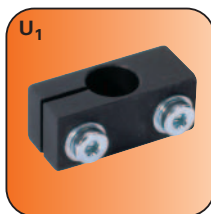


Data measured at 6 bar and horizontal mounting position

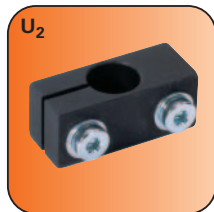
Included in the delivery



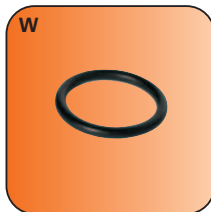
Pneumatic fittings
Order no. DRVM5x4



Mounting block
Order no. KB8-36



Mounting block
Order no. KB8-35

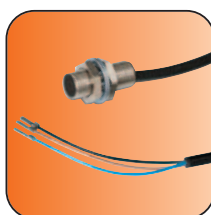


O-Ring
Order no. COR0020100

Accessory list



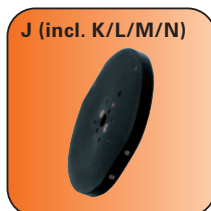
Proximity switch
Order no. NJ8-E2S



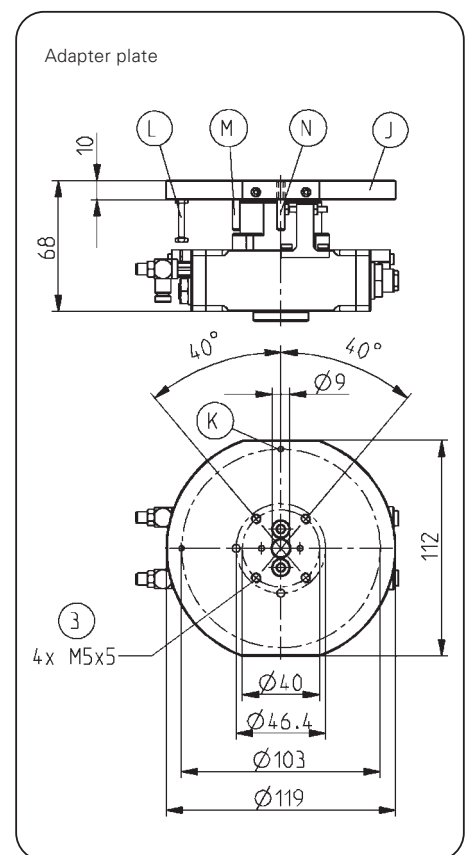
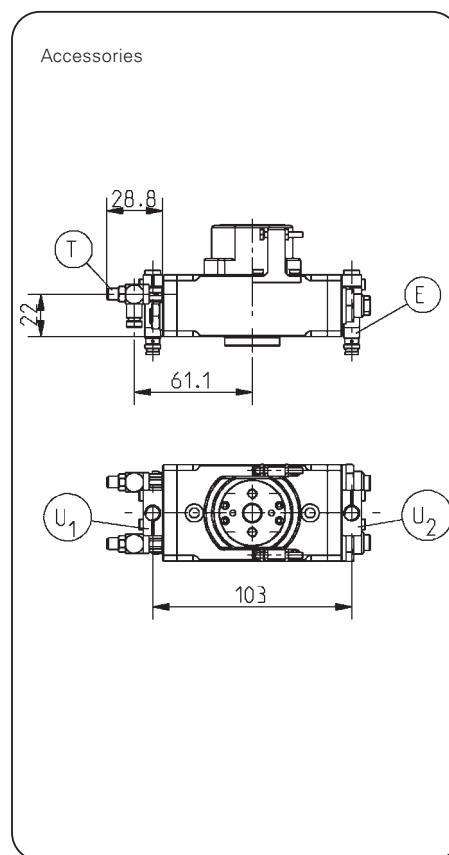
Proximity switch
Order no. NJ8-E2



Cable angled plug
Order no. KAW500



Adapter plate
Order no. SFP50D

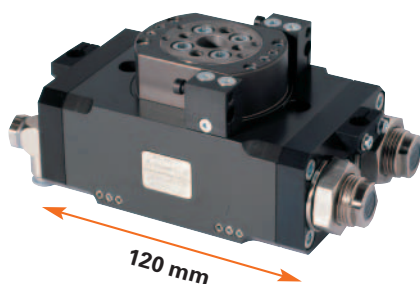


Subject to change without prior notice

All data measured at 6 bar



Flat Swivel Unit

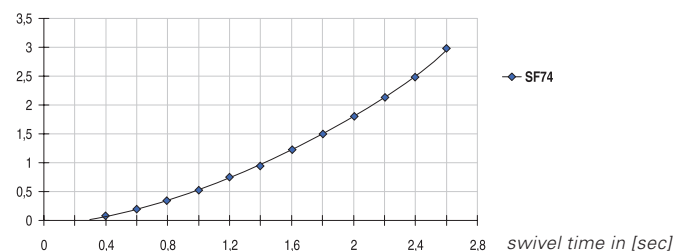


Picture shows SF74-180ND4

Moment of inertia

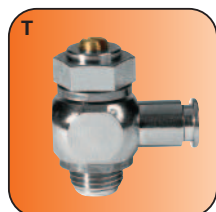
Shows the expected swivel time against the calculated moment of inertia.

Moment of inertia in $[kg\ m^2]$



Data measured at 6 bar and horizontal mounting position

Included in the delivery



Pneumatic fittings
Order no. DRV1/8x6

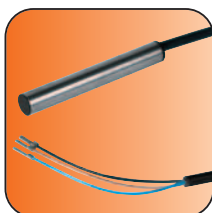


Mounting block
Order no. KB8-37

Accessory list



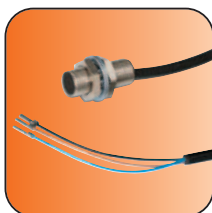
Proximity switch
Order no. NJ6.5-E2S



Proximity switch
Order no. NJ6.5-E2



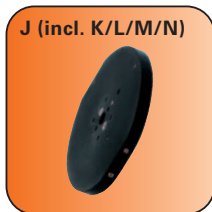
Proximity switch
Order no. NJ8-E2S



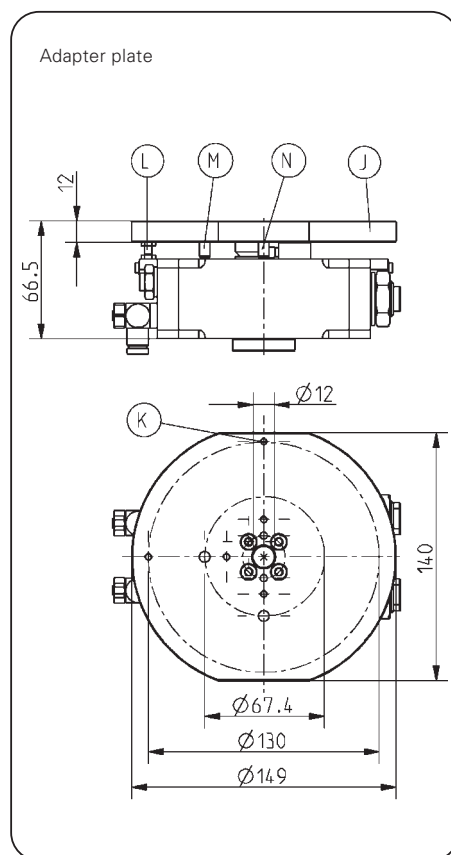
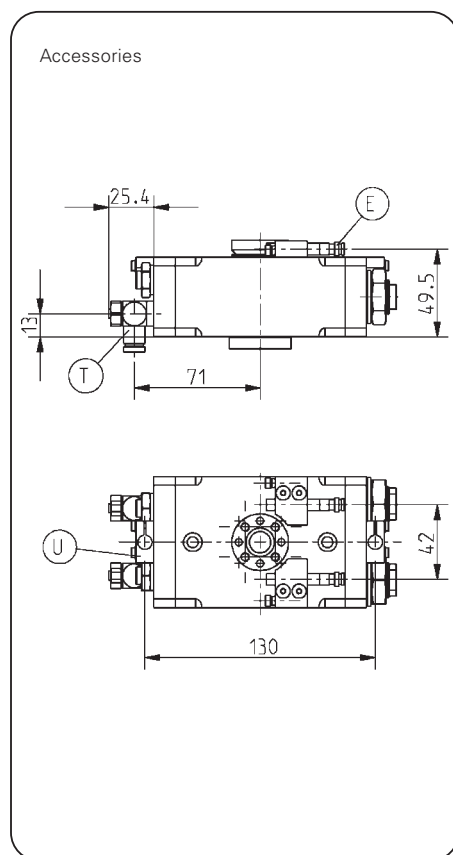
Proximity switch
Order no. NJ8-E2



Cable angled plug
Order no. KAW500



Adapter plate
Order no. SFP74N

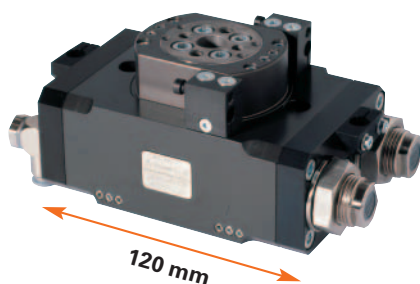


Subject to change without prior notice

All data measured at 6 bar



Flat Swivel Unit

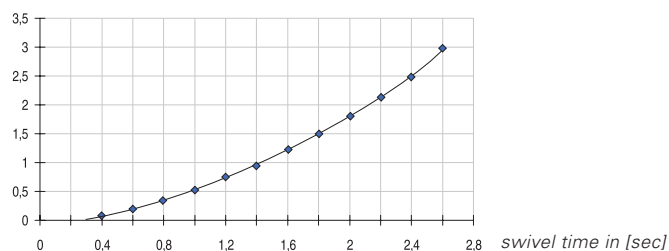


Picture shows SF74-180ND4

Moment of inertia

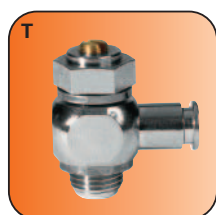
Shows the expected swivel time against the calculated moment of inertia.

Moment of inertia in $[kg\ m^2]$

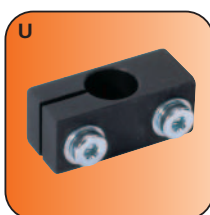


Data measured at 6 bar and horizontal mounting position

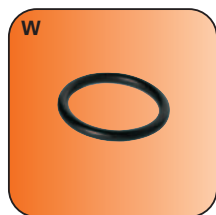
Included in the delivery



Pneumatic fittings
Order no. DRV1/8x6



Mounting block
Order no. KB8-37



O-Ring
Order no. COR0020100

Accessory list



Proximity switch
Order no. NJ6.5-E2S



Proximity switch
Order no. NJ8-E2S



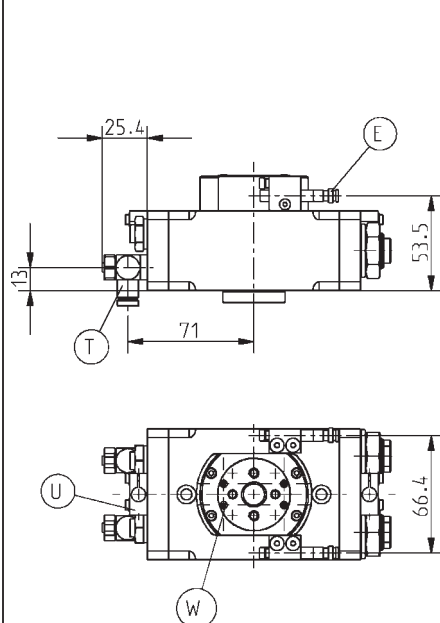
Cable angled plug
Order no. KAW500



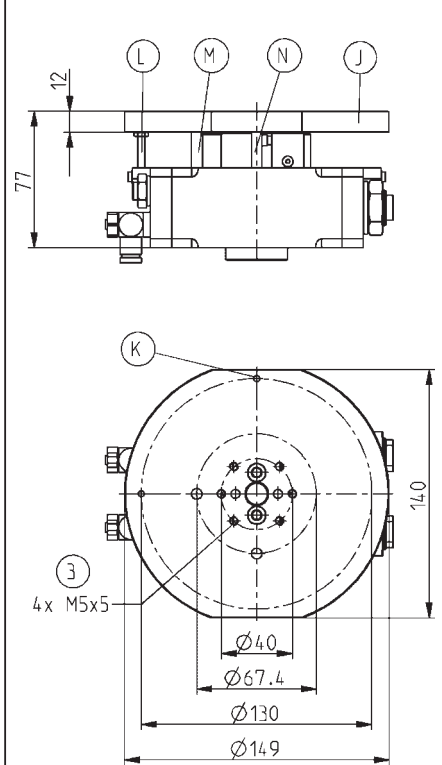
J (incl. K/L/M/N)

Adapter plate
Order no. SFP74D

Accessories



Adapter plate

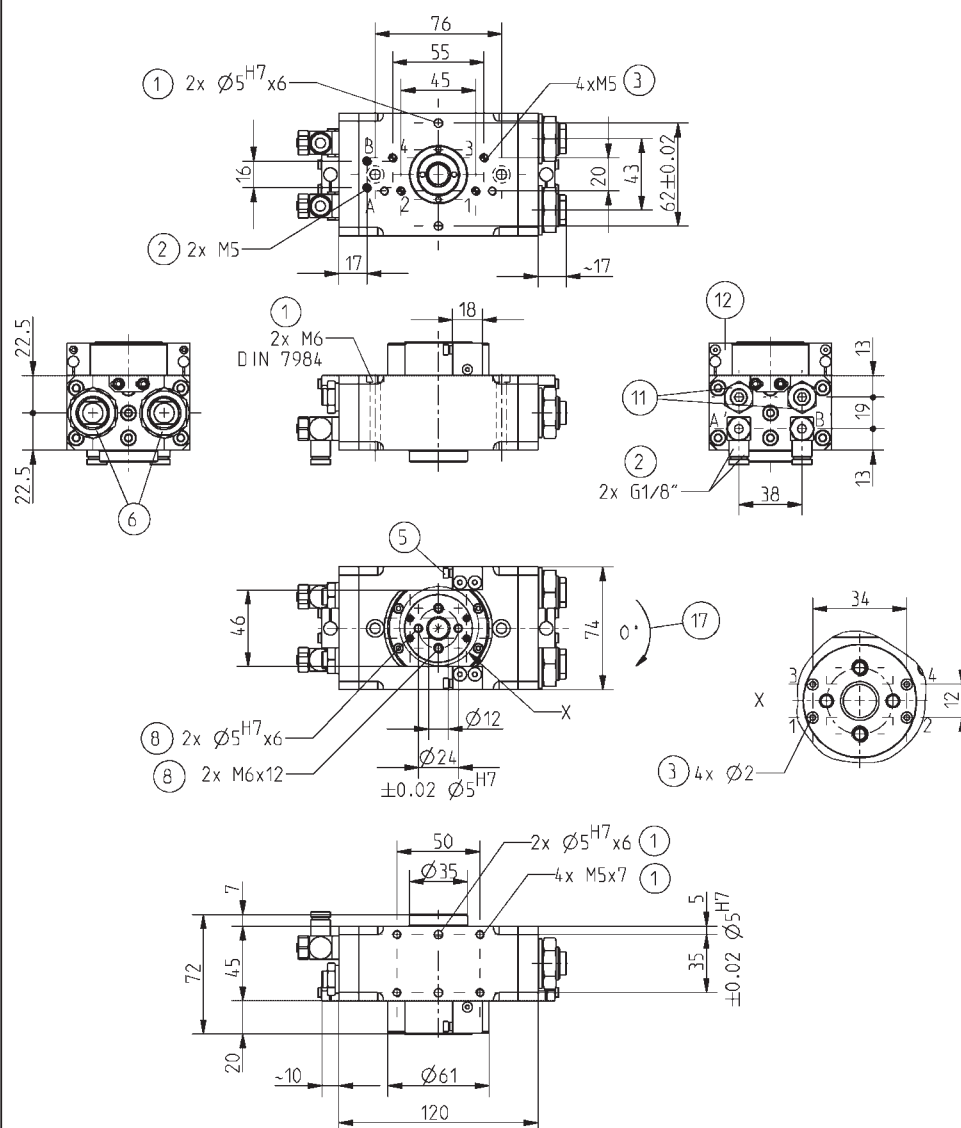


Subject to change without prior notice

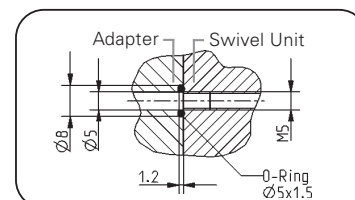
Order no.:	SF74-90ND4	SF74-180ND4
Swivel angle [°]:	90	180
Torque [Nm]:	5,5	5,5
Swivel angle 90° or 180° adjustable +/- [°]:	3	3
Repeatability +/- [°]:	0,01	0,01
Passage bore Ø [mm]:	12	12
Air feed-through [quantity]:	4	4
Axial bearing load [N]:	1000	1000
Radial bearing load [Nm]:	75	75
Min./max. operating pressure [bar]:	4/8	4/8
Min./max. operating temperature [°C]:	5/80	5/80
Air volume per cycle [cm³]:	32	42
Weight [kg]:	1,8	1,8

All data measured at 6 bar

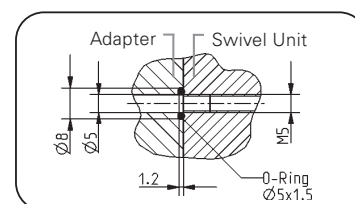
SF74ND4



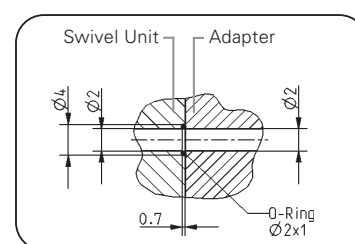
- ① Fixing swivel unit
- ② Energy supply
- ③ Hoseless air connection
- ⑤ Adjusting screw
- ⑥ Shock absorbers
- ⑧ Fixing tool side
- ⑪ Fix stop inside
- ⑫ Holder for proximity switch and fix stop
- ⑬ Swivel direction
- Ⓐ Air connection swivel to 90° or 180°
- Ⓑ Air connection swivel to 0°
- Ⓐ Air connection swivel to 90° or 180°
(alternate)
- Ⓑ Air connection swivel to 0°
(alternate)



Hoseless energy connection (maschine side)



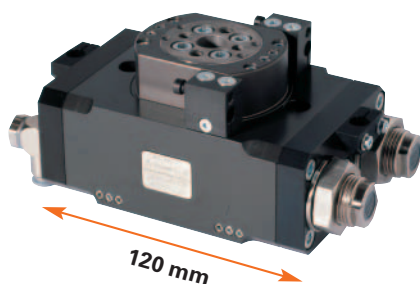
Hoseless air connection (maschine side)



Hoseless air connection (tool side)

Subject to change without prior notice

Flat Swivel Unit

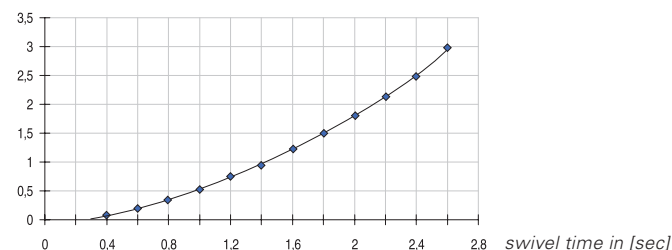


Picture shows SF74-180ND4

Moment of inertia

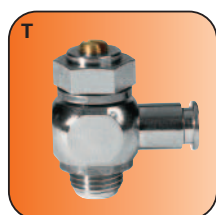
Shows the expected swivel time against the calculated moment of inertia.

Moment of inertia in [kg m²]

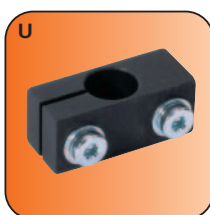


Data measured at 6 bar and horizontal mounting position

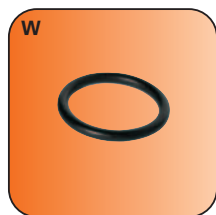
Included in the delivery



Pneumatic fittings
Order no. DRV1/8x6



Mounting block
Order no. KB8-37



O-Ring
Order no. COR0020100

Accessory list



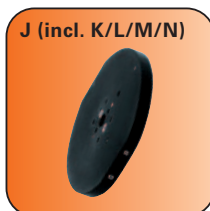
Proximity switch
Order no. NJ6.5-E2S



Proximity switch
Order no. NJ8-E2S



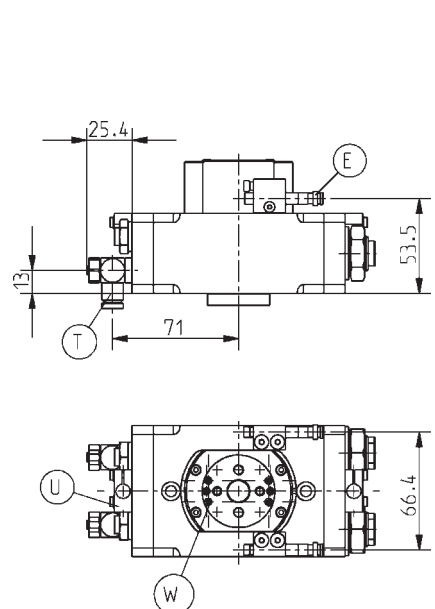
Cable angled plug
Order no. KAW500



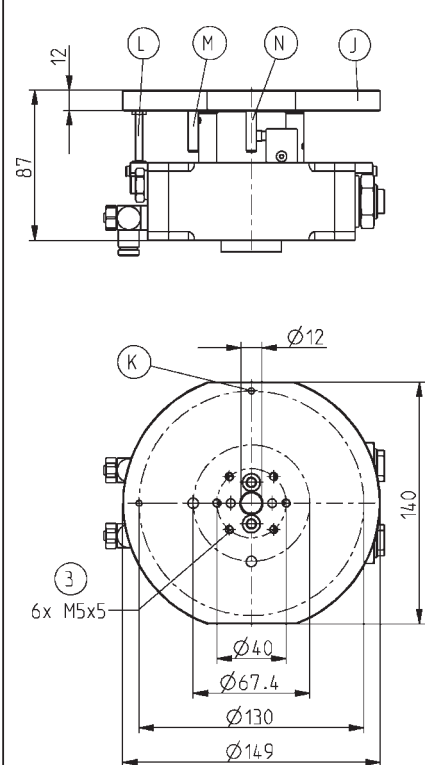
J (incl. K/L/M/N)

Adapter plate
Order no. SFP74D

Accessories



Adapter plate



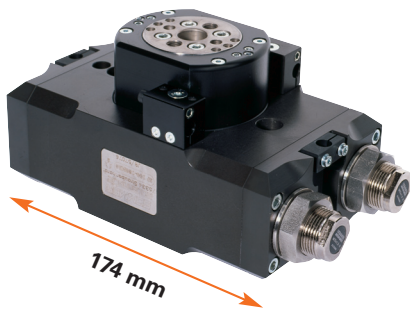
Subject to change without prior notice

All data measured at 6 bar



SOMMER
automatic

Flat Swivel Unit

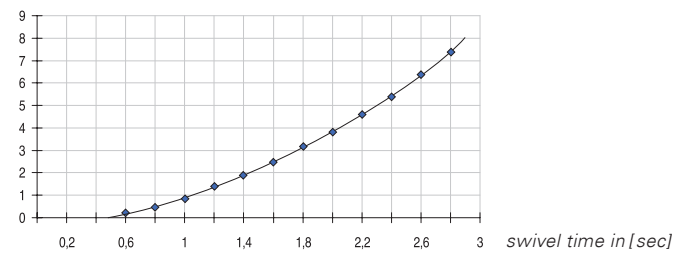


Picture shows SF100-180ND4

Moment of inertia

Shows the expected swivel time against the calculated moment of inertia.

Moment of inertia in $[kg \cdot m^2]$



Data measured at 6 bar and horizontal mounting position

Included in the delivery



Pneumatic fittings
Order no. DRV1/8x6

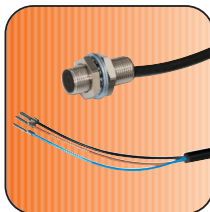


Mounting block
Order no. KB8-38

Accessory list



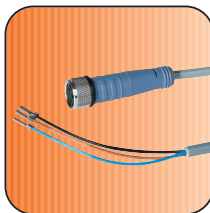
Proximity switch
Order no. NJ8-E2S



Proximity switch
Order no. NJ8-E2



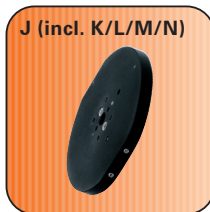
Cable angled plug
Order no. KAW500



Cable straight plug gerade
Order no. KAG500

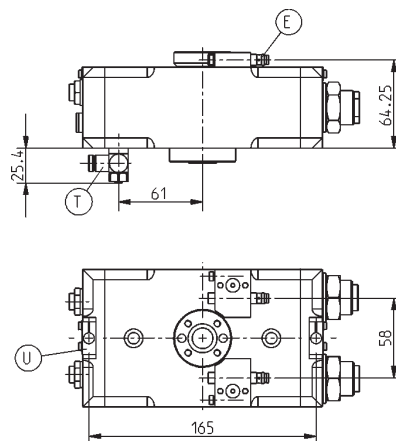


Plug 3-pole
Order no. S12-G-3

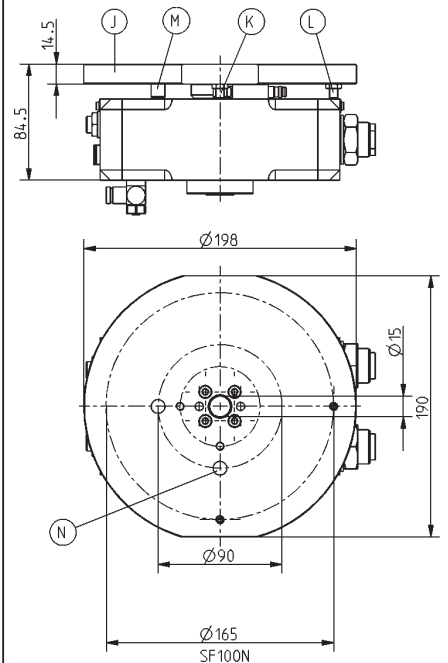


Adapter plate
Order no. SFP100N

Accessories



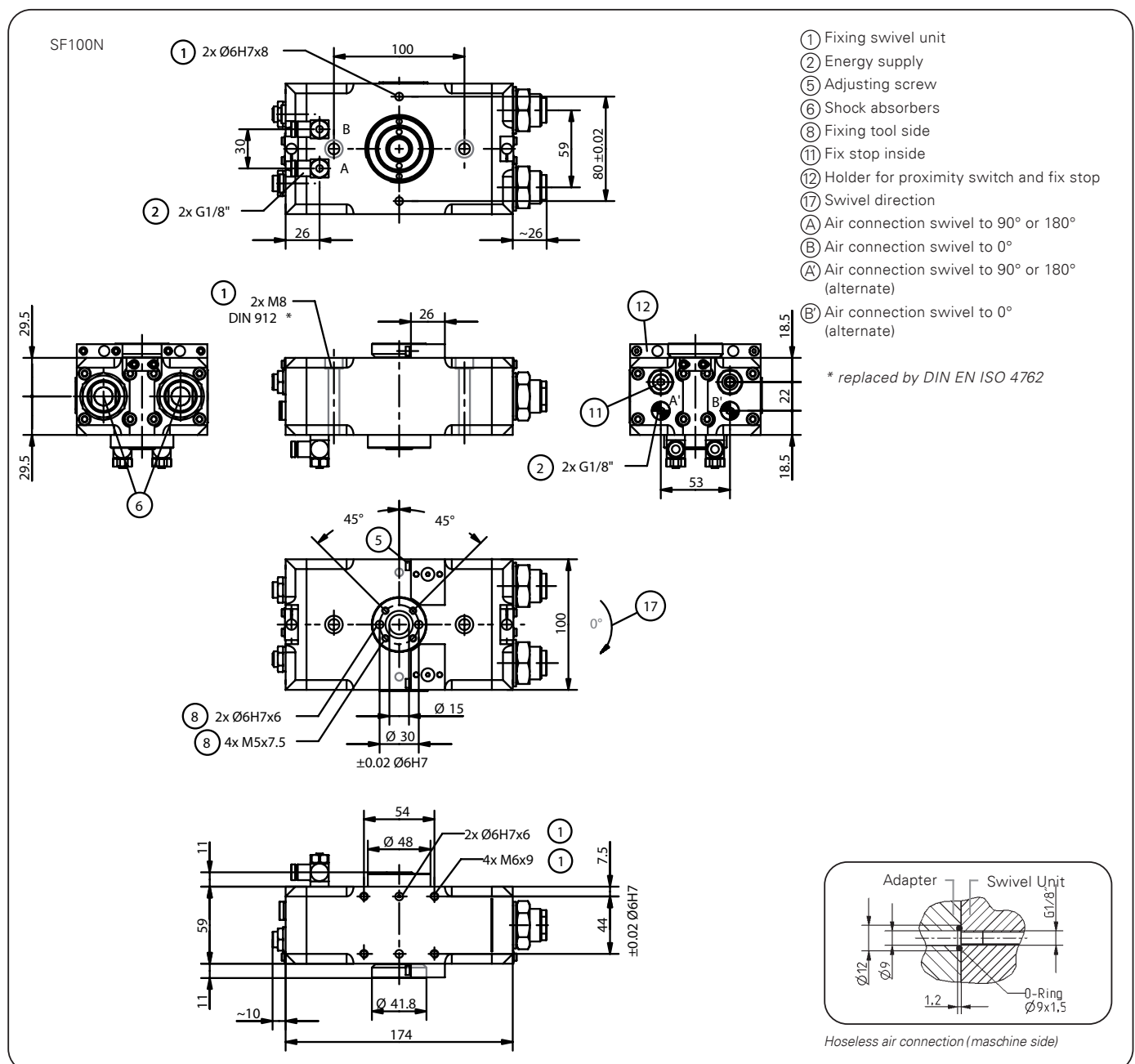
Adapter plate



Subject to change without prior notice

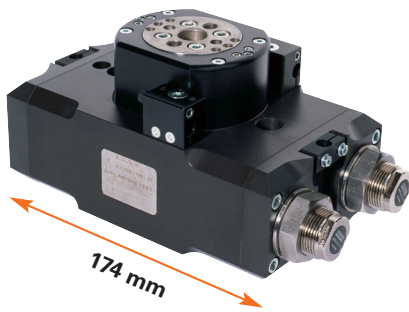
Order no.:	SF100-90N	SF100-180N
Swivel angle [°]:	90	180
Torque [Nm]:	20	20
Swivel angle 90° or 180° adjustable +/- [°]:	3	3
Repeatability +/- [°]:	0,01	0,01
Passage bore Ø [mm]:	15	15
Air feed-through [quantity]:	-	-
Axial bearing load [N]:	2500	2500
Radial bearing load [Nm]:	150	150
Min./max. operating pressure [bar]:	3/8	3/8
Min./max. operating temperature [°C]:	5/80	5/80
Air volume per cycle [cm³]:	81	108
Weight [kg]:	3,7	3,7

All data measured at 6 bar



Subject to change without prior notice

Flat Swivel Unit

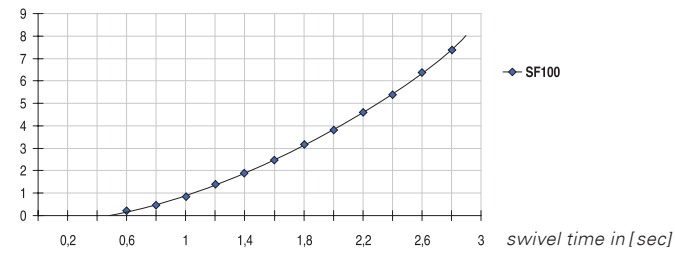


Picture shows SF100-180ND4

Moment of inertia

Shows the expected swivel time against the calculated moment of inertia.

Moment of inertia in $[kg \cdot m^2]$



Data measured at 6 bar and horizontal mounting position

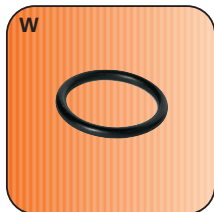
Included in the delivery



Pneumatic fittings
Order no. DRV1/8x6



Mounting block
Order no. KB8-38

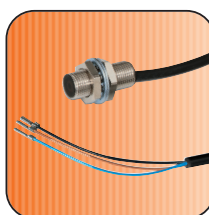


O-Ring
Order no. COR0030100

Accessory list



Proximity switch
Order no. NJ8-E2S



Proximity switch
Order no. NJ8-E2

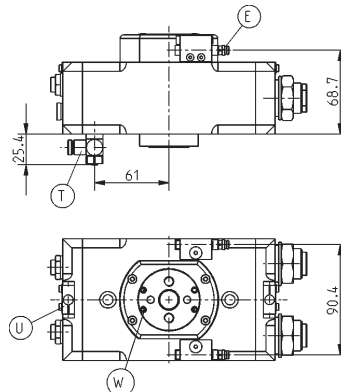


Cable angled plug
Order no. KAW500

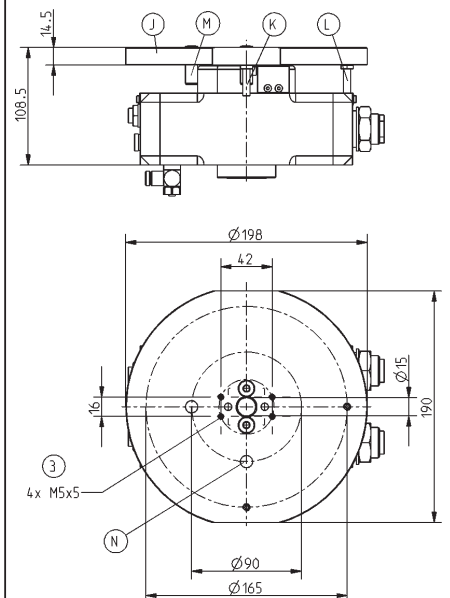


J (incl. K/L/M/N)
Adapter plate
Order no. SFP100D

Accessories

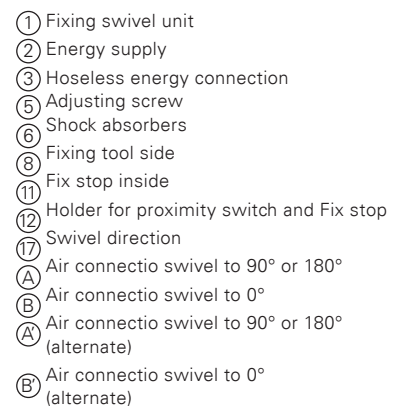


Adapter plate

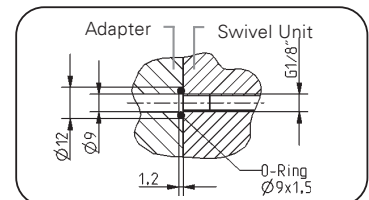


Subject to change without prior notice

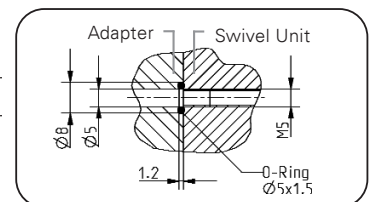
All data measured at 6 bar



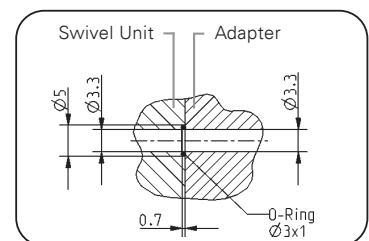
* replaced by DIN EN ISO 4762



Hoseless energy connection (maschine side)



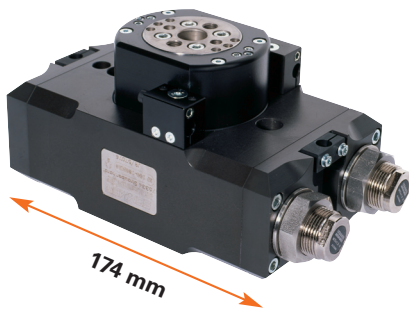
Hoseless air connection (maschine side)



Hoseless air connection (tool side)

SOMMER
automatic

Flat Swivel Unit

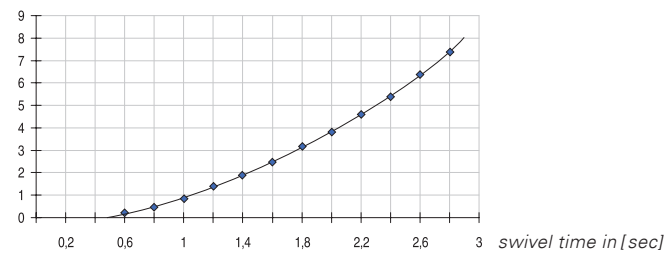


Picture shows SF100-180ND4

Moment of inertia

Shows the expected swivel time against the calculated moment of inertia.

Moment of inertia in $[kg \cdot m^2]$



Data measured at 6 bar and horizontal mounting position

Included in the delivery



Pneumatic fittings
Order no. DRV1/8x6



Mounting block
Order no. KB8-38

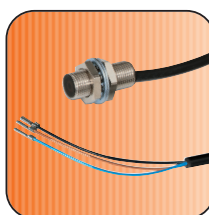


O-Ring
Order no. COR0030100

Accessory list



Proximity switch
Order no. NJ8-E2S



Proximity switch
Order no. NJ8-E2

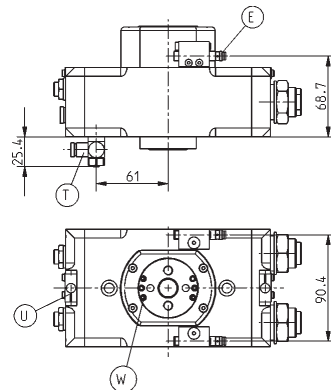


Cable angled plug
Order no. KAW500

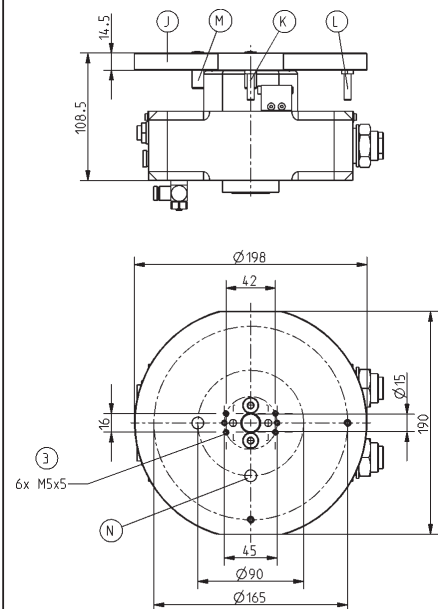


Adapter plate
Order no. SFP100D

Accessories

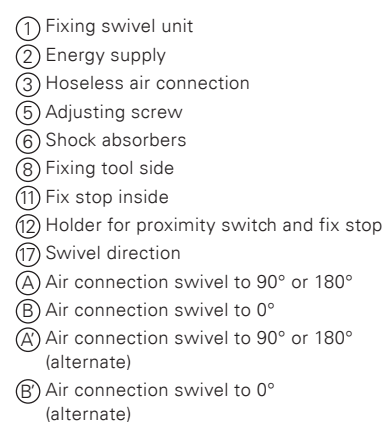


Adapter plate

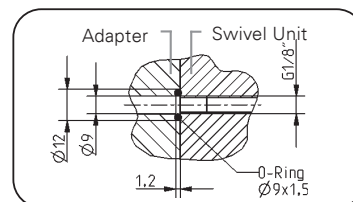


Subject to change without prior notice

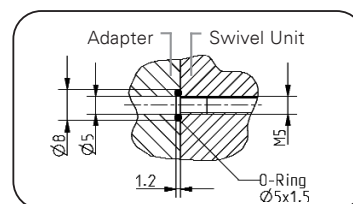
All data measured at 6 bar



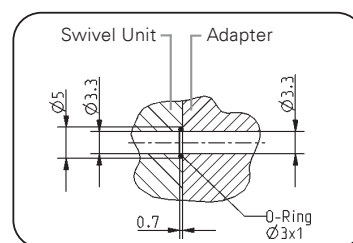
* replaced by DIN EN ISO 4762



Hoseless energy connection (maschine side)



Hoseless air connection (maschine side)



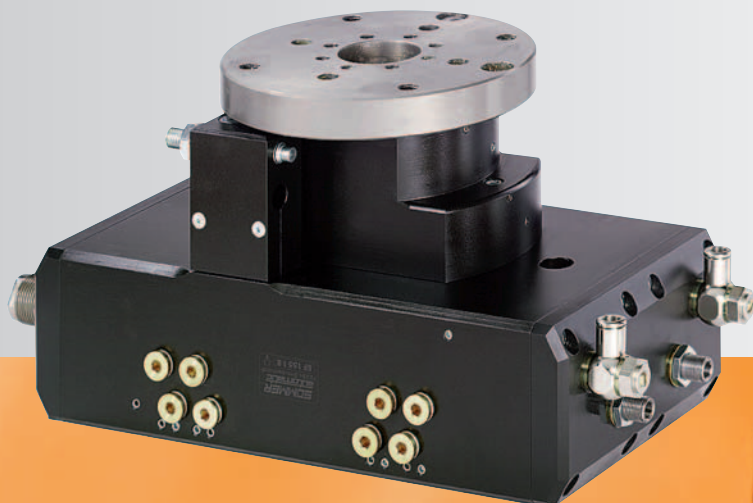
Hoseless air connection (tool side)

SOMMER
automatic



Flat Swivel Units

pneumatic



SF125-B

SF155

SF195

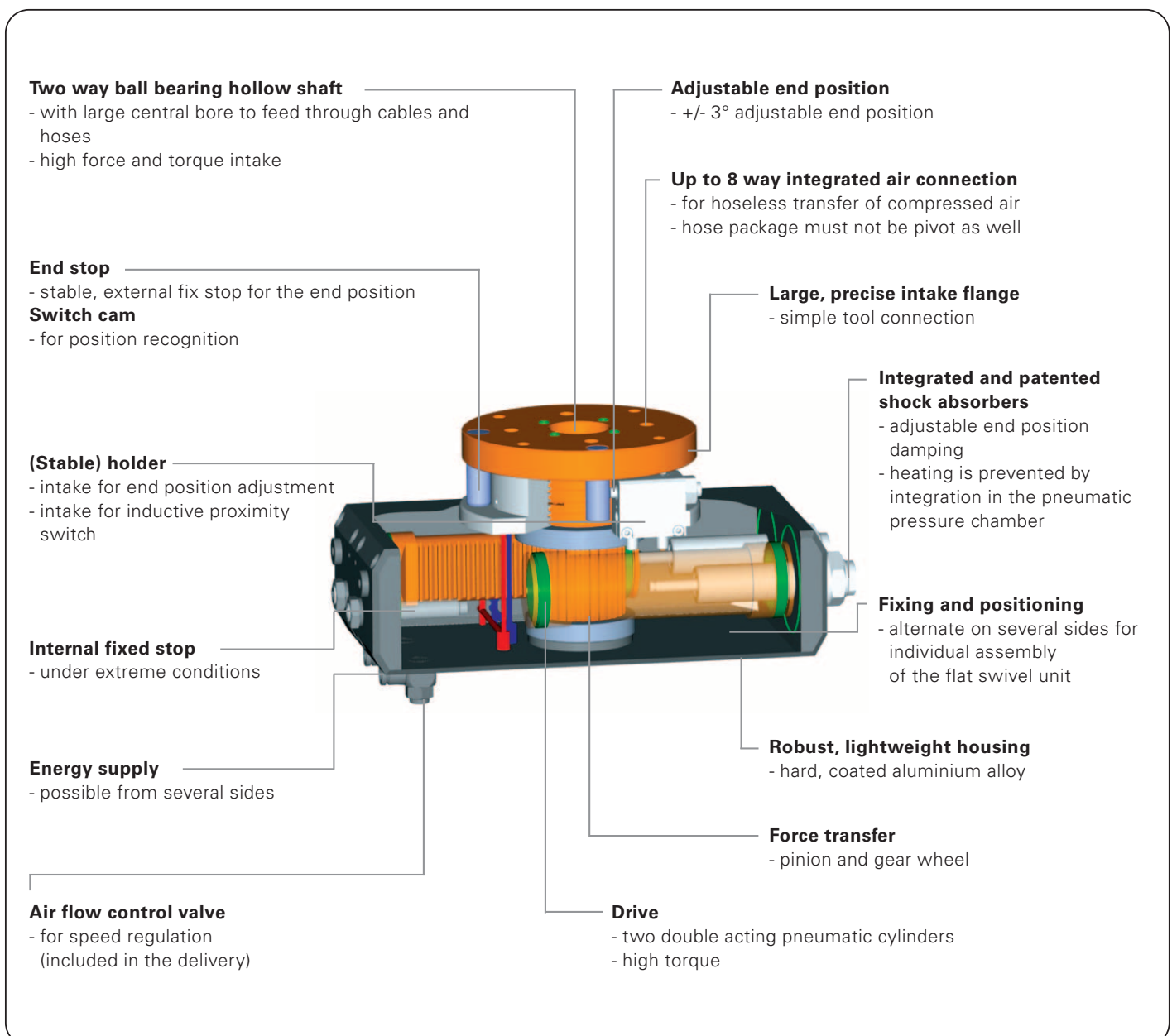
SOMMER
automatic

Flat Swivel Unit

Features

- With integrated and patented hydraulic shock absorbers, built into the pressure chamber, cooled due to permanent air flow and therefore constant in damping behavior
- With large, precise intake flange for easy connection, two way ball bearing for high moment intake, large central hole up to 40mm diameter, torque up to 130 Nm
- Also available as a design with integrated pneumatic rotary distributor, with up to 8 way hoseless air transfer

Functional diagram





Terms

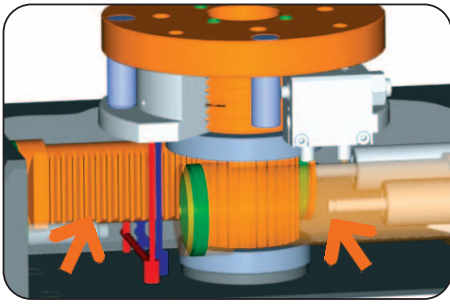
Torque:	force moment occurring on the edge of the swivel unit
Swivel time:	time required to cover a 0/90° or 0/180° swivel movement
Repeatability:	dispersion of stop positions at 100 consecutive swivel cycles
Cycle:	distance covered by the piston in one 0/90/0° or 0/180/0° swivel movement
Maintenance:	<p>maintenance free up to 10 Mio. swivel cycles (please see the owner's manual for conditions, download from www.sommer-automatic.com)</p> <ul style="list-style-type: none"> • long maintenance intervals keep costs down • long durability

Model

N:	Two double acting pneumatic cylinders
I4:	Two double acting pneumatic cylinders, hoseless pneumatic 4 way rotary distributor
I8:	Two double acting pneumatic cylinders, hoseless pneumatic 8 way rotary distributor

Order no.	Swivel angle	Torque	Center through-bore	Air feed-through
SF125-90N	90°	38 Nm	Ø 26 mm	-
SF125-90I4	90°	34 Nm	Ø 26 mm	4
SF125-90I8	90°	32 Nm	Ø 26 mm	8
SF125-180N	180°	38 Nm	Ø 26 mm	-
SF125-180I4	180°	34 Nm	Ø 26 mm	4
SF125-180I8	180°	32 Nm	Ø 26 mm	8
SF155-90N	90°	62 Nm	Ø 40 mm	-
SF155-90I4	90°	58 Nm	Ø 40 mm	4
SF155-90I8	90°	54 Nm	Ø 40 mm	8
SF155-180N	180°	62 Nm	Ø 40 mm	-
SF155-180I4	180°	58 Nm	Ø 40 mm	4
SF155-180I8	180°	54 Nm	Ø 40 mm	8
SF195-90N	90°	130 Nm	Ø 40 mm	-
SF195-90I4	90°	125 Nm	Ø 40 mm	4
SF195-90I8	90°	120 Nm	Ø 40 mm	8
SF195-180N	180°	130 Nm	Ø 40 mm	-
SF195-180I4	180°	125 Nm	Ø 40 mm	4
SF195-180I8	180°	120 Nm	Ø 40 mm	8

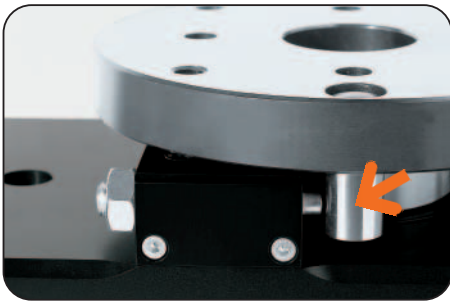
Flat Swivel Unit



Drive

Two double acting pneumatic cylinders

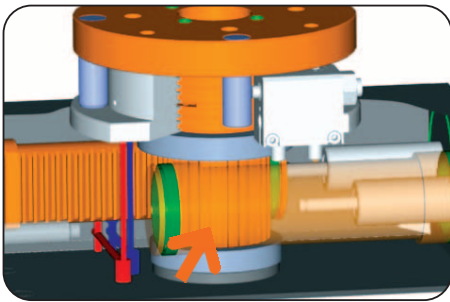
- Maximum torque in both rotation directions
- Torque up to 130 Nm



Swivel angle 90° or 180°

End stop adjustable via adjustment screw +/- 3°

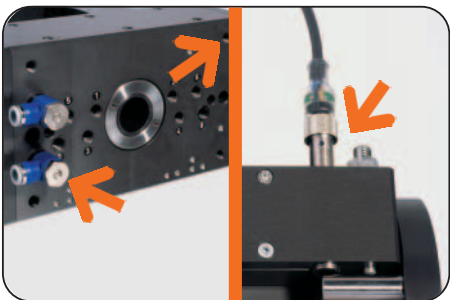
- External fixed stop to absorb the force over housing prevents overload of pinion and gear wheel
- Internal fixed stop, recommended under extreme conditions, limits the piston stroke



Force transfer

Via pinion and gear wheel

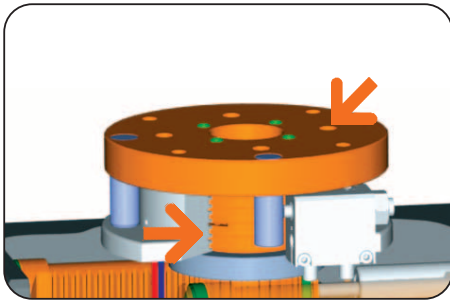
- Optimum steering of drive force in torque
- High repeatability
- Two way ball bearings for high torque intake



Machine connection

Position sensing, energy supply, attachment and positioning- possibilities on several sides

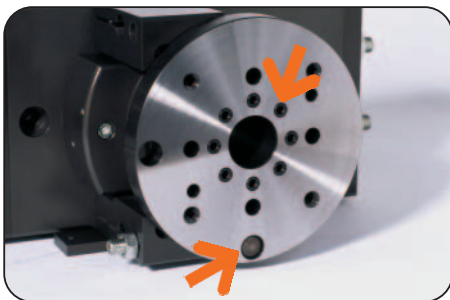
- For inductive proximity switches
- Optimum integration into the workroom through individual mounting situation
- Hoseless direct connection possible, no additional interference contours
- Exhaust air flow control valve for speed regulation (included in the delivery)
- Machine side without projection, thus lower design and production effort for the adapter plate



Air transfer

hoseless, up to 8 pneumatic feed-through

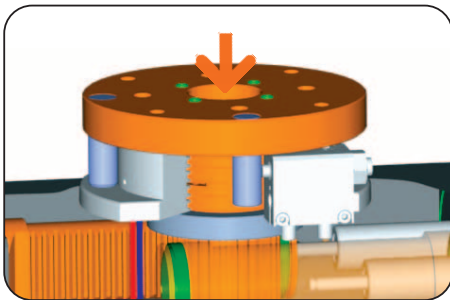
- Reduces interference contour, hose package must not pivot as well
- Smooth rotary distributor due to o-ring with Teflon support ring
- Compact external dimensions due to direct screwing on the housing



Intake flange

For simple connection

- Low design and extension effort for connection of following tool connection
- Simplest connection of an adapter plate adapted to the application
- Generous size end stop prevents damage from overload



Central bore

e.g. for cable feed-through

- Up to Ø 40 mm
- Central
- Low torsion on feed-through supply lines

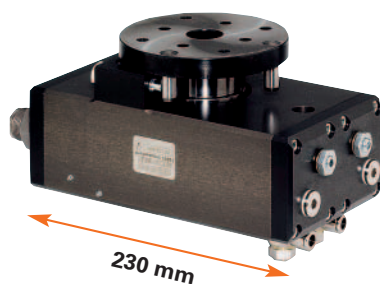


End position damping

Hydraulic shock absorber with spiral groove technology

- Low wear approach to end position, gentle energy absorption due to profiled spiral groove
- The damping characteristics can be individually adjusted by the screw depth
- Built into the pressure chamber, cooled by permanent air flow, constant damping behavior

Flat Swivel Unit

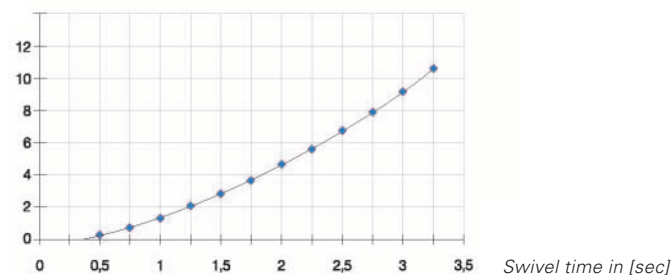


Picture shows SF125-90N-B

Moment of inertia

Shows the expected swivel time against the calculated moment of inertia.

Moment of inertia in $[kg\ m^2]$

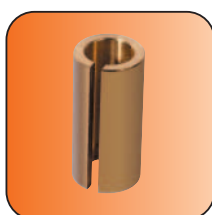


Data measured at 6 bar and horizontal mounting position

Included in the delivery



Pneumatic fittings
Order no. DRV1/4x8

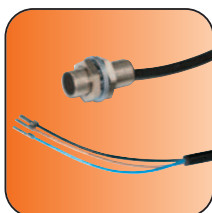


Reducing bush
($\varnothing\ 12 - \varnothing\ 8\ mm$)
Order no. BDMS15500

Accessory list



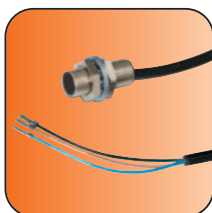
Proximity switch
Order no. NJ8-E2S-14



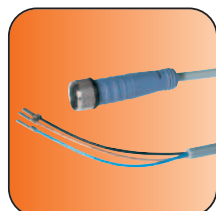
Proximity switch
Order no. NJ8-E2



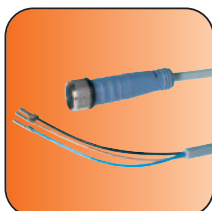
Proximity switch
Order no. NJ12-E2S-02



Proximity switch
Order no. NJ12-E2-01

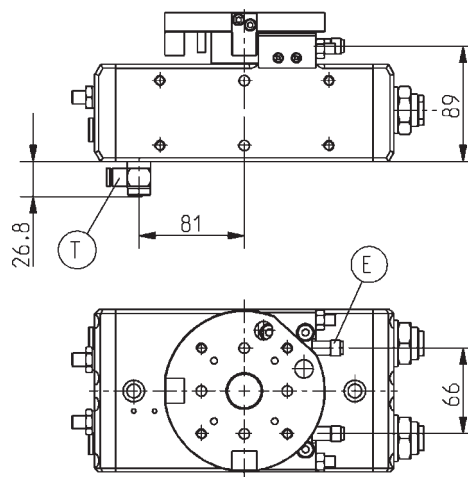


Cable straight plug
Order no. KAG500
Connection NJ8



Cable straight plug
Order no. KAG500-02
Connection NJ12

Accessories

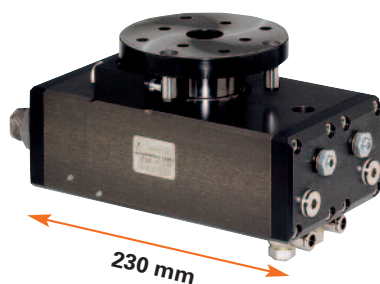


Subject to change without prior notice

All data measured at 6 bar



Flat Swivel Unit

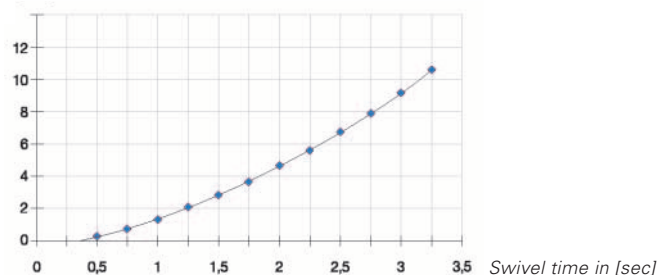


Picture shows SF125-90N

Moment of inertia

Shows the expected swivel time against the calculated moment of inertia.

Moment of inertia in $[kg\ m^2]$

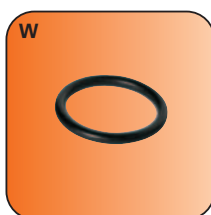


Data measured at 6 bar and horizontal mounting position

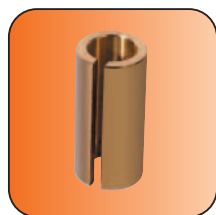
Included in the delivery



Pneumatic fittings
Order no. DRV1/4x8



O-Ring
Order no. COR0040150



Reducing bush
($\varnothing 12 - \varnothing 8\ mm$)
Order no. BDMS15500

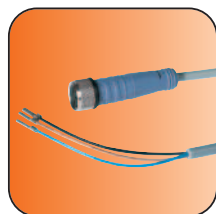
Accessory list



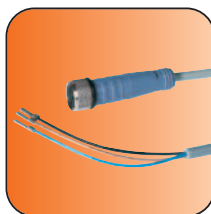
Proximity switch
Order no. NJ8-E2S-14



Proximity switch
Order no. NJ12-E2S-02

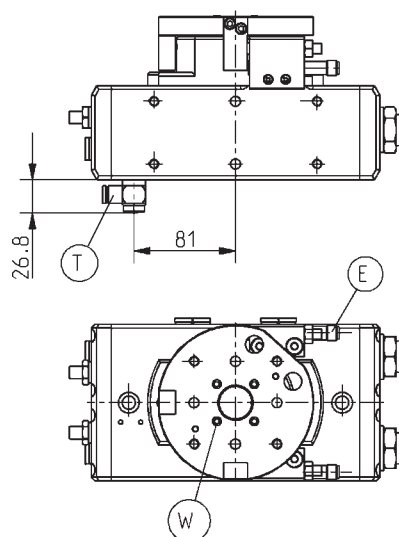


Cable straight plug
Order no. KAG500
Connection NJ8



Cable straight plug
Order no. KAG500/02
Connection NJ12

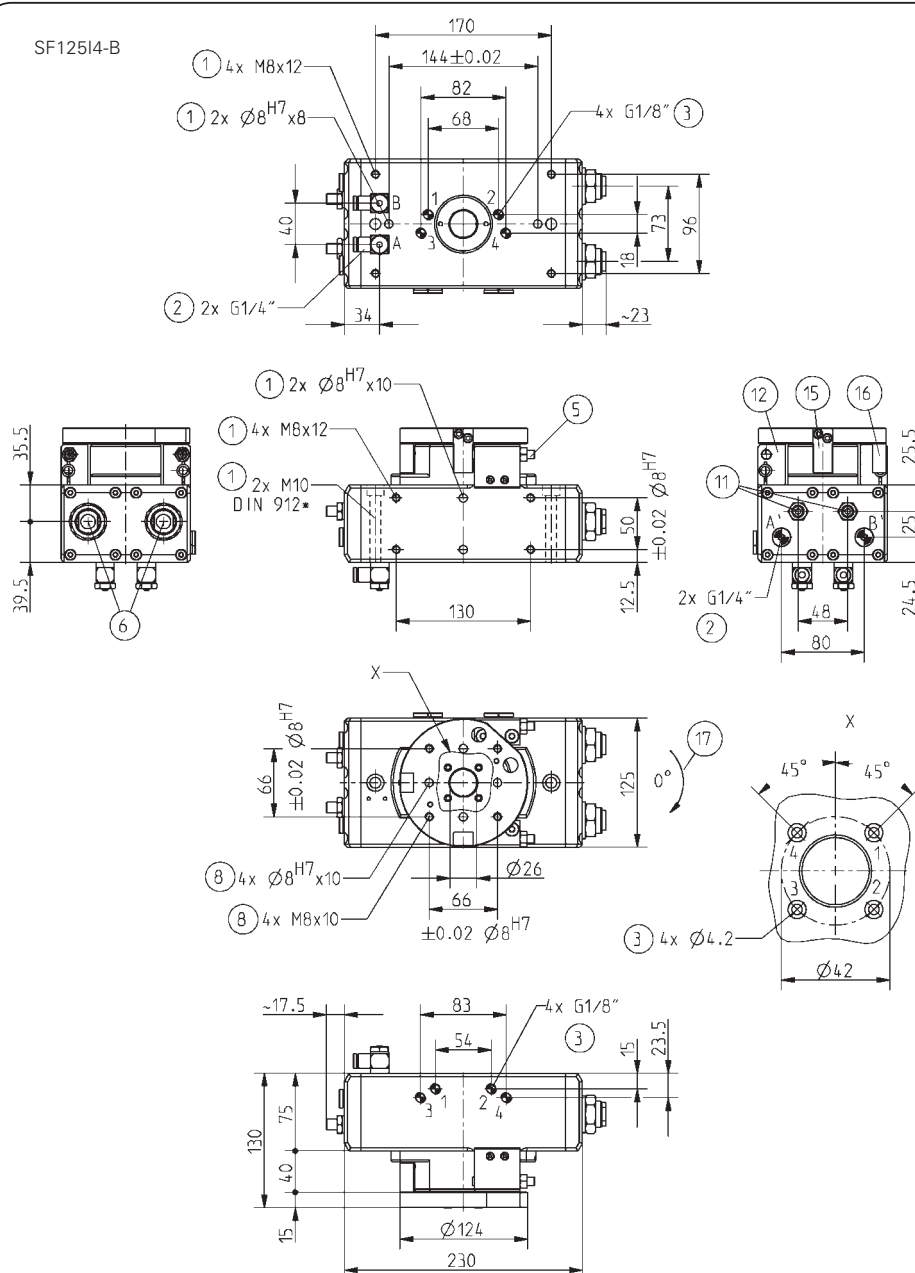
Accessories



Subject to change without prior notice

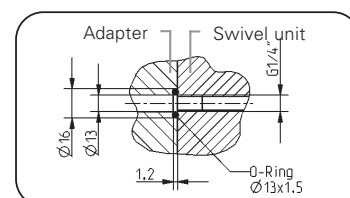
Order no.:	SF125-90I4-B	SF125-180I4-B
Swivel angle [°]:	90	180
Torque [Nm]:	34	34
Swivel angle 90° or 180° adjustable +/- [°]:	3	3
Repeatability +/- [°]:	0,01	0,01
Passage bore Ø [mm]:	26	26
Air feed-through [quantity]:	4	4
Axial bearing load [N]:	3000	3000
Radial bearing load [Nm]:	400	400
Min./max. operating pressure [bar]:	4/8	4/8
Min./max. operating temperature [°C]:	5/80	5/80
Air volume per cycle [cm³]:	220	440
Weight [kg]:	9,5	9,5

All data measured at 6 bar

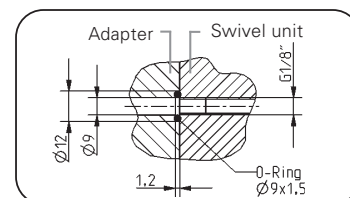


- ① Fixing swivel unit
- ② Energy supply
- ③ Hoseless feed-through
- ⑤ Adjusting screw
- ⑥ Shock absorbers
- ⑧ Fixing tool side
- ⑪ Fix stop inside
- ⑫ Holder for proximity switch and fix stop
- ⑮ Fix stop and Switch cam 90°
- ⑯ Fix stop and Switch cam 180°
- ⑰ Swivel direction
- Ⓐ Air connection swivel to 90° or 180°
- Ⓑ Air connection swivel to 0°
- Ⓐ Air connection swivel to 90° or 180°
(alternate)
- Ⓑ Air connection swivel to 0°
(alternate)

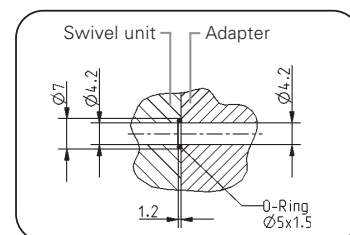
* replaced by DIN EN ISO 4762



Hoseless energy connection (maschine side)



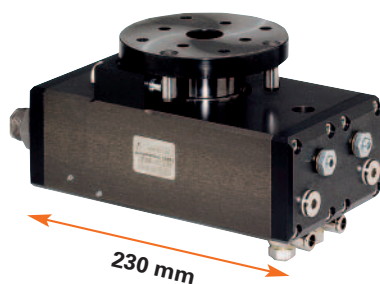
Hoseless air connection (maschine side)



Hoseless air connection (tool side)

Subject to change without prior notice

Flat Swivel Unit

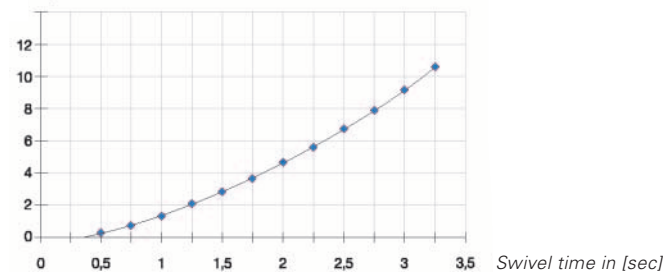


Picture shows SF125-90N

Moment of inertia

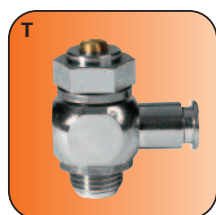
Shows the expected swivel time against the calculated moment of inertia.

Moment of inertia in $[kg\ m^2]$

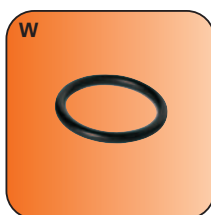


Data measured at 6 bar and horizontal mounting position

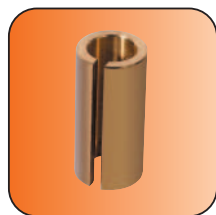
Included in the delivery



Pneumatic fittings
Order no. DRV1/4x8



O-Ring
Order no. COR0040150



Reducing bush
($\varnothing 12 - \varnothing 8\ mm$)
Order no. BDMS15500

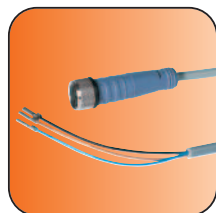
Accessory list



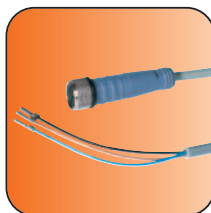
Proximity switch
Order no. NJ8-E2S-14



Proximity switch
Order no. NJ12-E2S-02

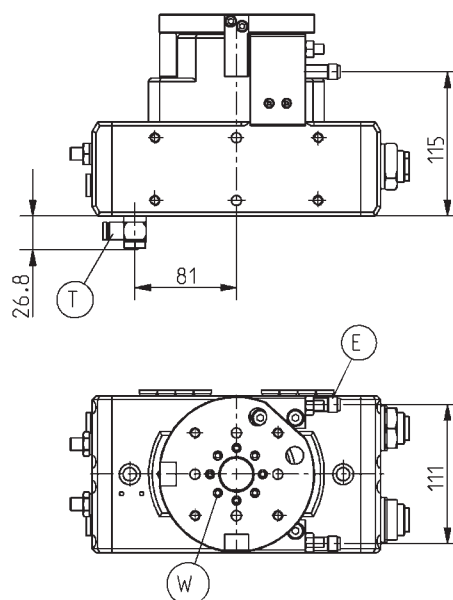


Cable straight plug
Order no. KAG500
Connection NJ8



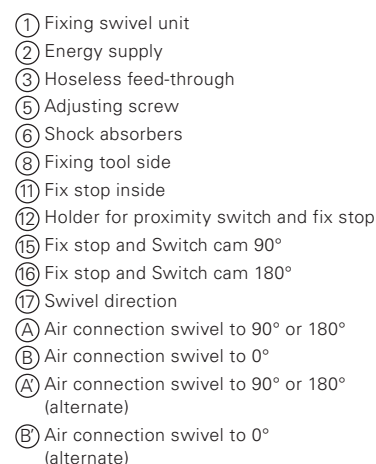
Cable straight plug
Order no. KAG500/02
Connection NJ12

Accessories

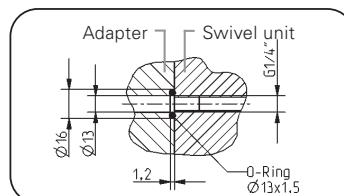


Subject to change without prior notice

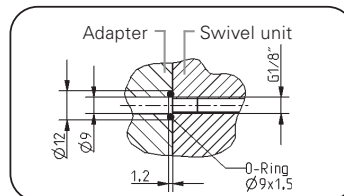
All data measured at 6 bar



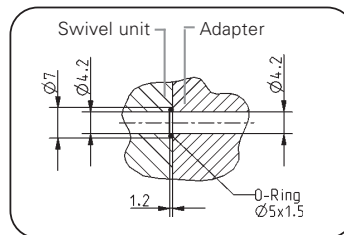
* replaced by DIN EN ISO 4762



Hoseless energy connection (maschine side)



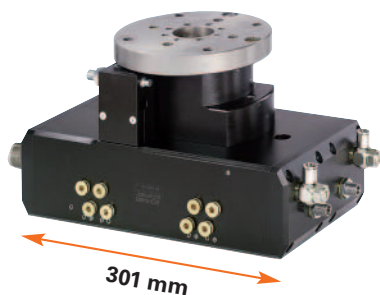
Hoseless air connection (maschine side)



Hoseless air connection (tool side)

SOMMER
automatic

Flat Swivel Unit

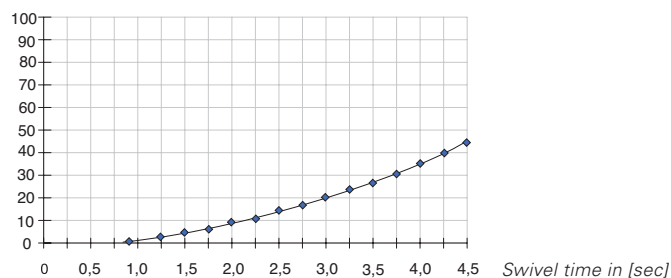


Picture shows SF155-180I8

Moment of inertia

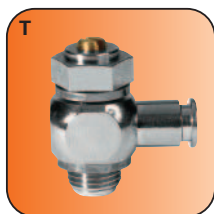
Shows the expected swivel time against the calculated moment of inertia.

Moment of inertia in $[kg\ m^2]$

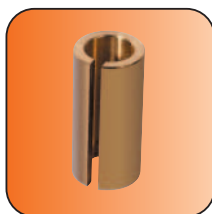


Data measured at 6 bar and horizontal mounting position

Included in the delivery



Pneumatic fittings
Order no. DRV1/4x8

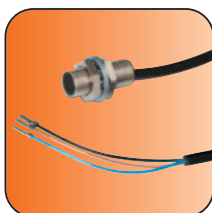


Reducing bush
($\varnothing\ 12 - \varnothing\ 8\ mm$)
Order no. BDMS15500

Accessory list



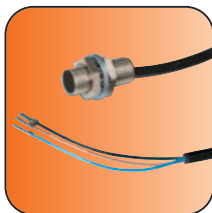
Proximity switch
Order no. NJ8-E2S-14



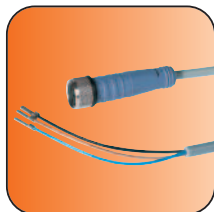
Proximity switch
Order no. NJ8-E2



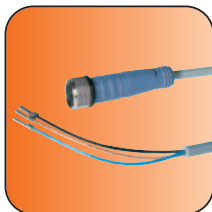
Proximity switch
Order no. NJ12-E2S-02



Proximity switch
Order no. NJ12-E2-01

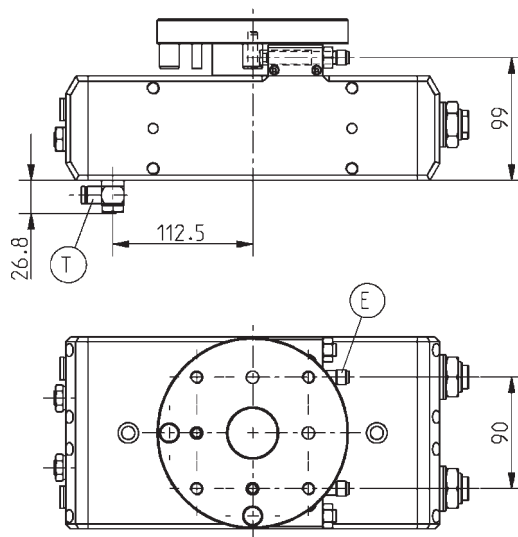


Cable straight plug
Order no. KAG500
Connection NJ8



Cable straight plug
Order no. KAG500/02
Connection NJ12

Accessories



Subject to change without prior notice

All data measured at 6 bar



SOMMER
automatic

Flat Swivel Unit

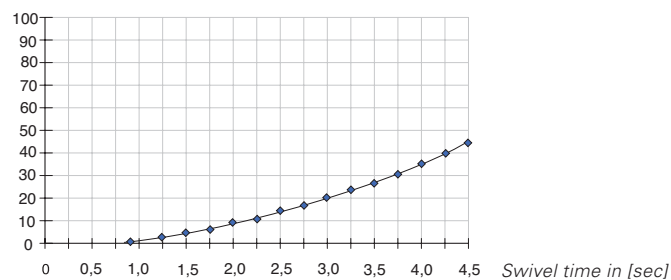


Picture shows SF155-180I8

Moment of inertia

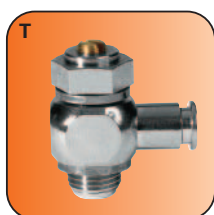
Shows the expected swivel time against the calculated moment of inertia.

Moment of inertia in $[kg\ m^2]$

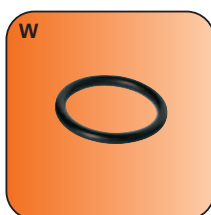


Data measured at 6 bar and horizontal mounting position

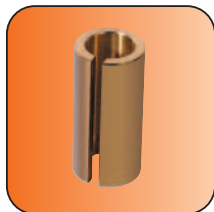
Included in the delivery



Pneumatic fittings
Order no. DRV1/4x8



O-Ring
Order no. COR0040150



Reducing bush
($\varnothing 12 - \varnothing 8\ mm$)
Order no. BDMS15500

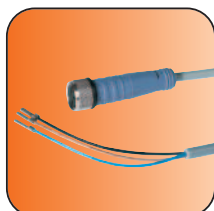
Accessory list



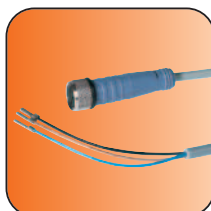
Proximity switch
Order no. NJ8-E2S-14



Proximity switch
Order no. NJ12-E2S-02

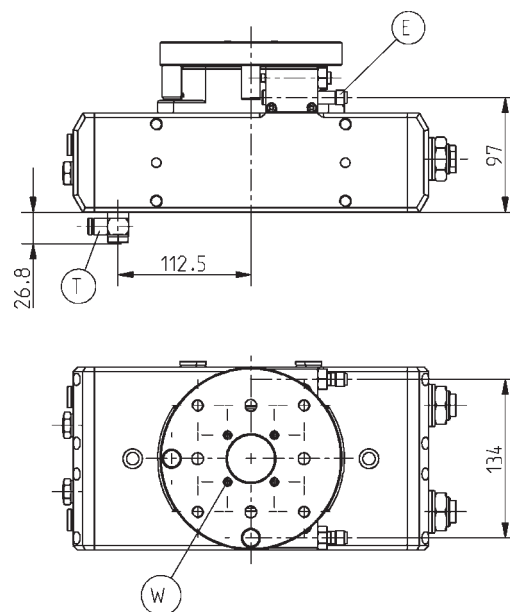


Cable straight plug
Order no. KAG500
Connection NJ8



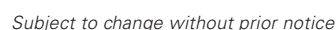
Cable straight plug
Order no. KAG500/02
connection NJ12

Accessories



Subject to change without prior notice

All data measured at 6 bar



Flat Swivel Unit

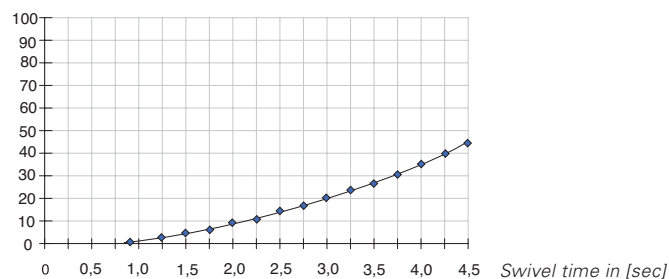


Picture shows SF155-180I8

Moment of inertia

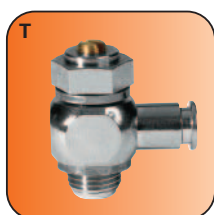
Shows the expected swivel time against the calculated moment of inertia.

Moment of inertia in $[kg\ m^2]$

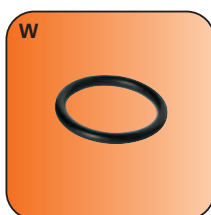


Data measured at 6 bar and horizontal mounting position

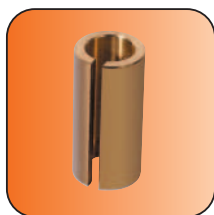
Included in the delivery



Pneumatic fittings
Order no. DRV1/4x8



O-Ring
Order no. COR0040150



Reducing bush
($\varnothing 12 - \varnothing 8\ mm$)
Order no. BDMS15500

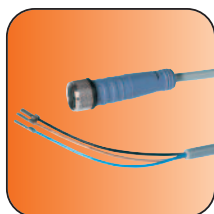
Accessory list



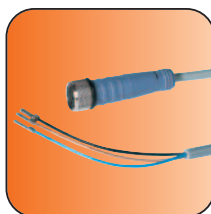
Proximity switch
Order no. NJ8-E2S-14



Proximity switch
Order no. NJ12-E2S-02

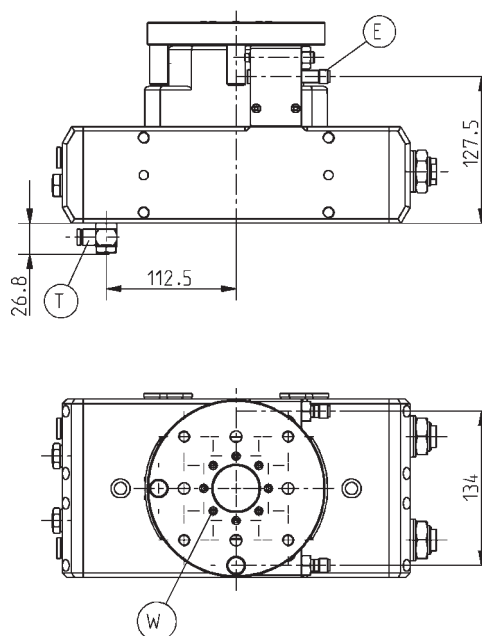


Cable straight plug
Order no. KAG500
Connection NJ8



Cable straight plug
Order no. KAG500/02
Connection NJ12

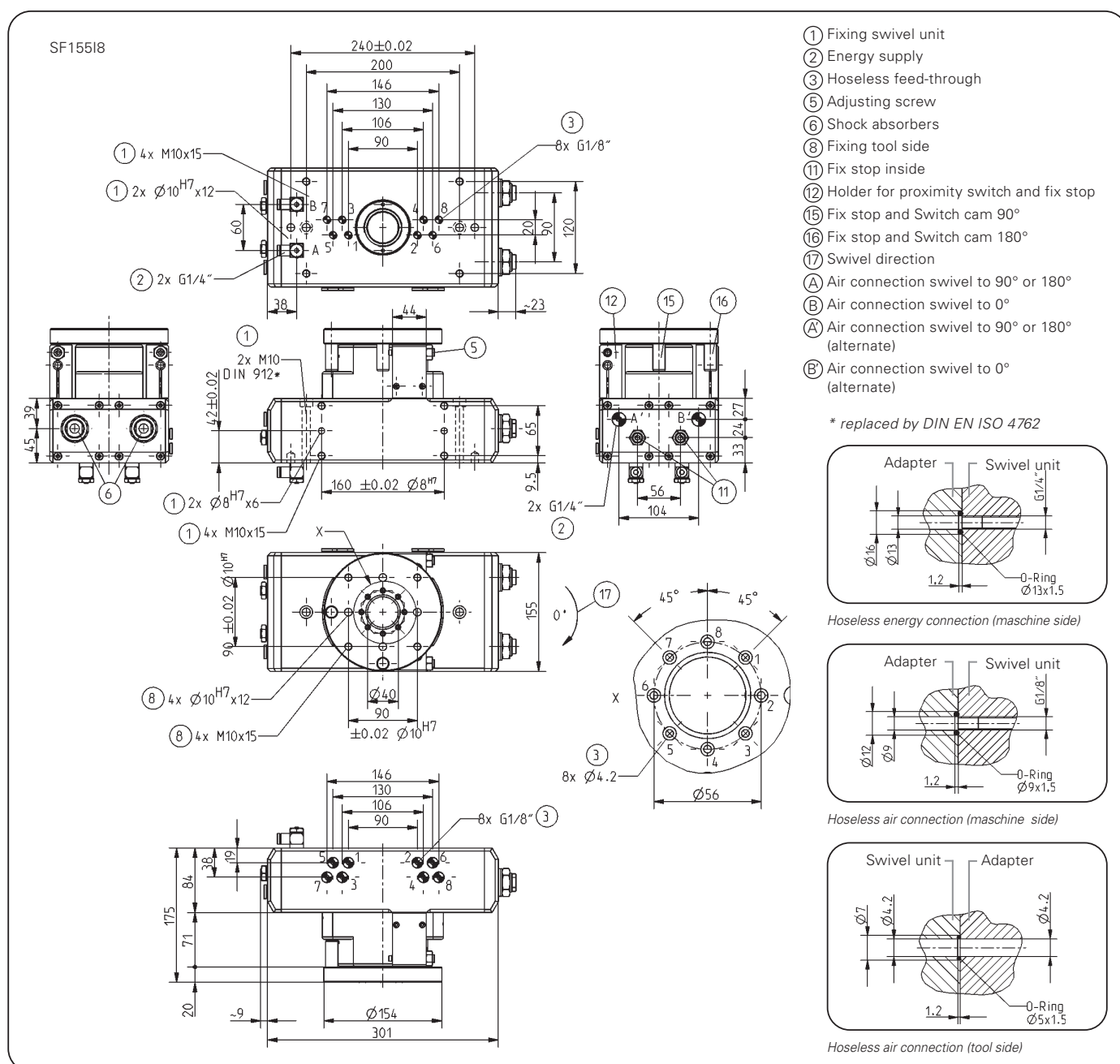
Accessories



Subject to change without prior notice

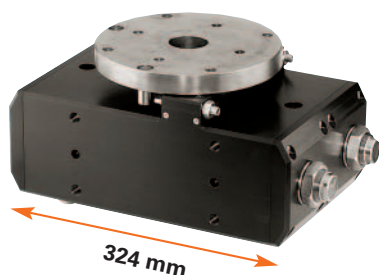
Order no.:	SF155-90I8	SF155-180I8
Swivel angle [°]:	90	180
Torque [Nm]:	54	54
Swivel angle 90° or 180° adjustable +/- [°]:	3	3
Repeatability +/- [°]:	0,01	0,01
Passage bore Ø [mm]:	40	40
Air feed-through [quantity]:	8	8
Axial bearing load [N]:	6000	6000
Radial bearing load [Nm]:	600	600
Min./max. operating pressure. [bar]:	4/8	4/8
Min./max. operating temperature [°C]:	5/80	5/80
Air volume per cycle [cm³]:	540	730
Weight [kg]:	17,5	17,5

All data measured at 6 bar



Subject to change without prior notice

Flat Swivel Unit

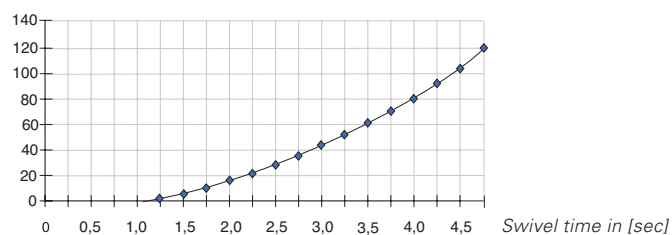


Picture shows SF195-180N

Moment of inertia

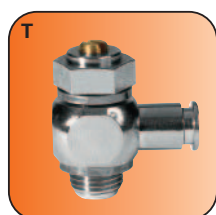
Shows the expected swivel time against the calculated moment of inertia.

Moment of inertia in $[kg \cdot m^2]$

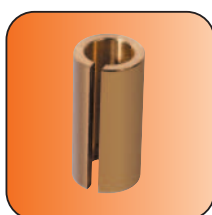


Data measured at 6 bar and horizontal mounting position

Included in the delivery



Pneumatic fittings
Order no. DRV1/4x8

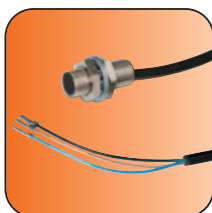


Reducing bush
($\varnothing 12 - \varnothing 8 \text{ mm}$)
Order no. BDMS15500

Accessory list



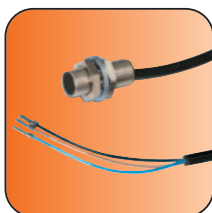
Proximity switch
Order no. NJ8-E2S-14



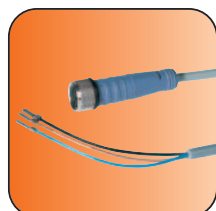
Proximity switch
Order no. NJ8-E2



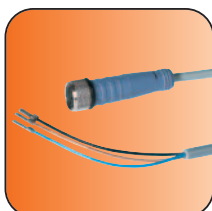
Proximity switch
Order no. NJ12-E2S-02



Proximity switch
Order no. NJ12-E2-01

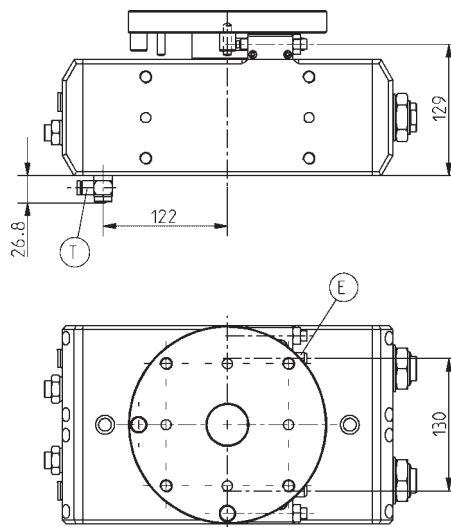


Cable straight plug
Order no. KAG500
Connection NJ8



Cable straight plug
Order no. KAG500/02
Connection NJ12

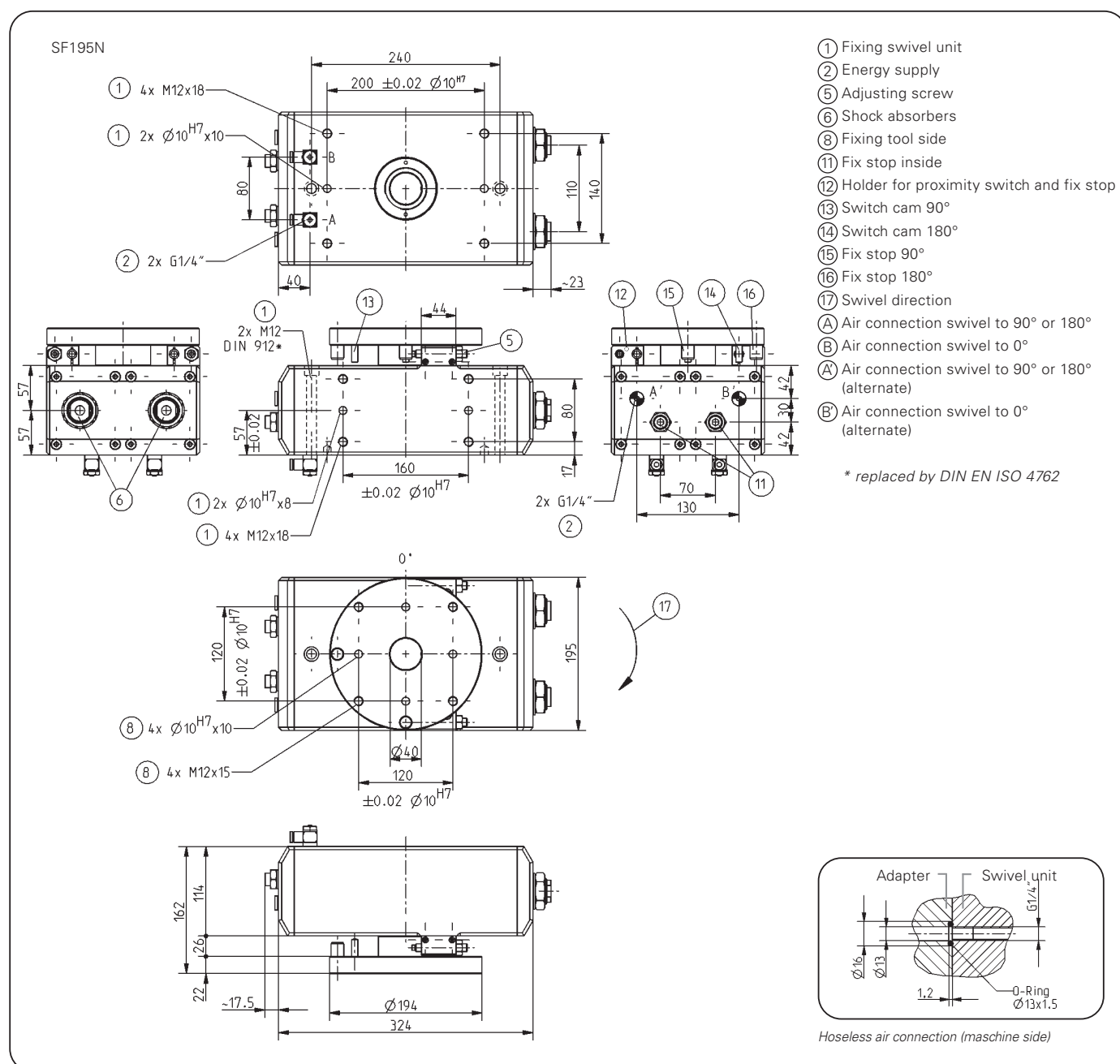
Accessories



Subject to change without prior notice

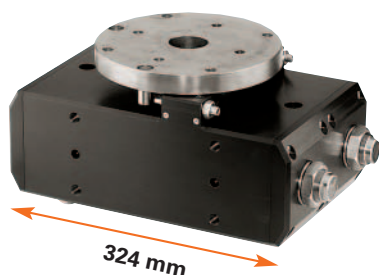
Order no.:	SF195-90N	SF195-180N
Swivel angle [°]:	90	180
Torque [Nm]:	130	130
Swivel angle 90° or 180° adjustable +/- [°]:	3	3
Repeatability +/- [°]:	0,01	0,01
Passage bore Ø [mm]:	40	40
Air feed-through [quantity]:	-	-
Axial bearing load [N]:	6500	6500
Radial bearing load [Nm]:	1150	1150
Min./max. operating pressure [bar]:	3/8	3/8
Min./max. operating temperature [°C]:	5/80	5/80
Air volume per cycle [cm³]:	1140	1520
Weight [kg]:	27,5	27,5

All data measured at 6 bar



Subject to change without prior notice

Flat Swivel Unit

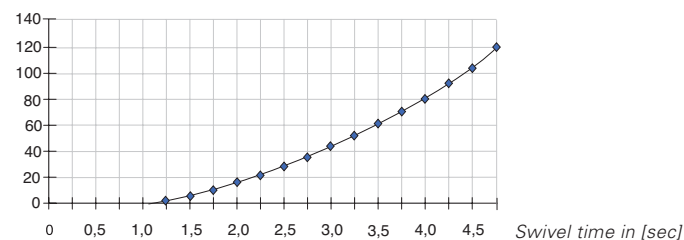


Picture shows SF195-180N

Moment of inertia

Shows the expected swivel time against the calculated moment of inertia.

Moment of inertia in $[kg \cdot m^2]$

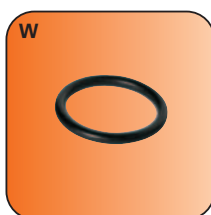


Data measured at 6 bar and horizontal mounting position

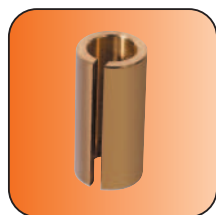
Included in the delivery



Pneumatic fittings
Order no. DRV1/4x8



O-Ring
Order no. COR0050150



Reducing bush
($\varnothing 12 - \varnothing 8 \text{ mm}$)
Order no. BDMS15500

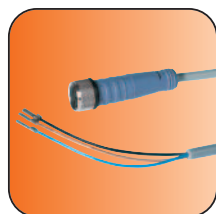
Accessory list



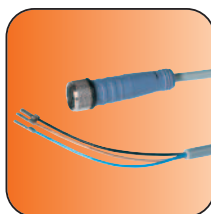
Proximity switch
Order no. NJ8-E2S-14



Proximity switch
Order no. NJ12-E2S-02

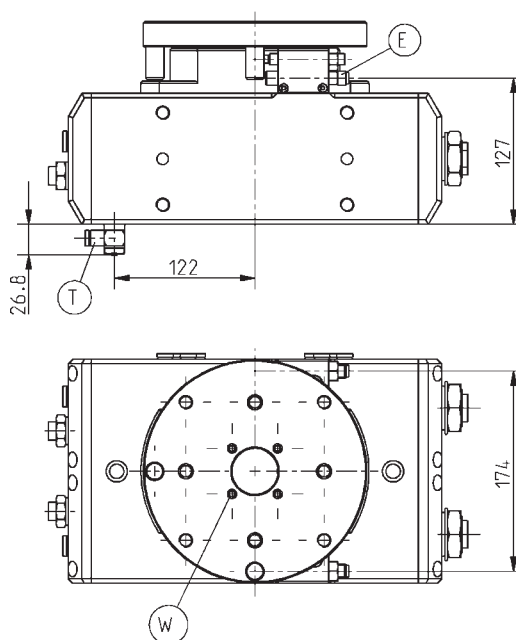


Cable straight plug
Order no. KAG500
Connection NJ8



Cable straight plug
Order no. KAG500/02
Connection NJ12

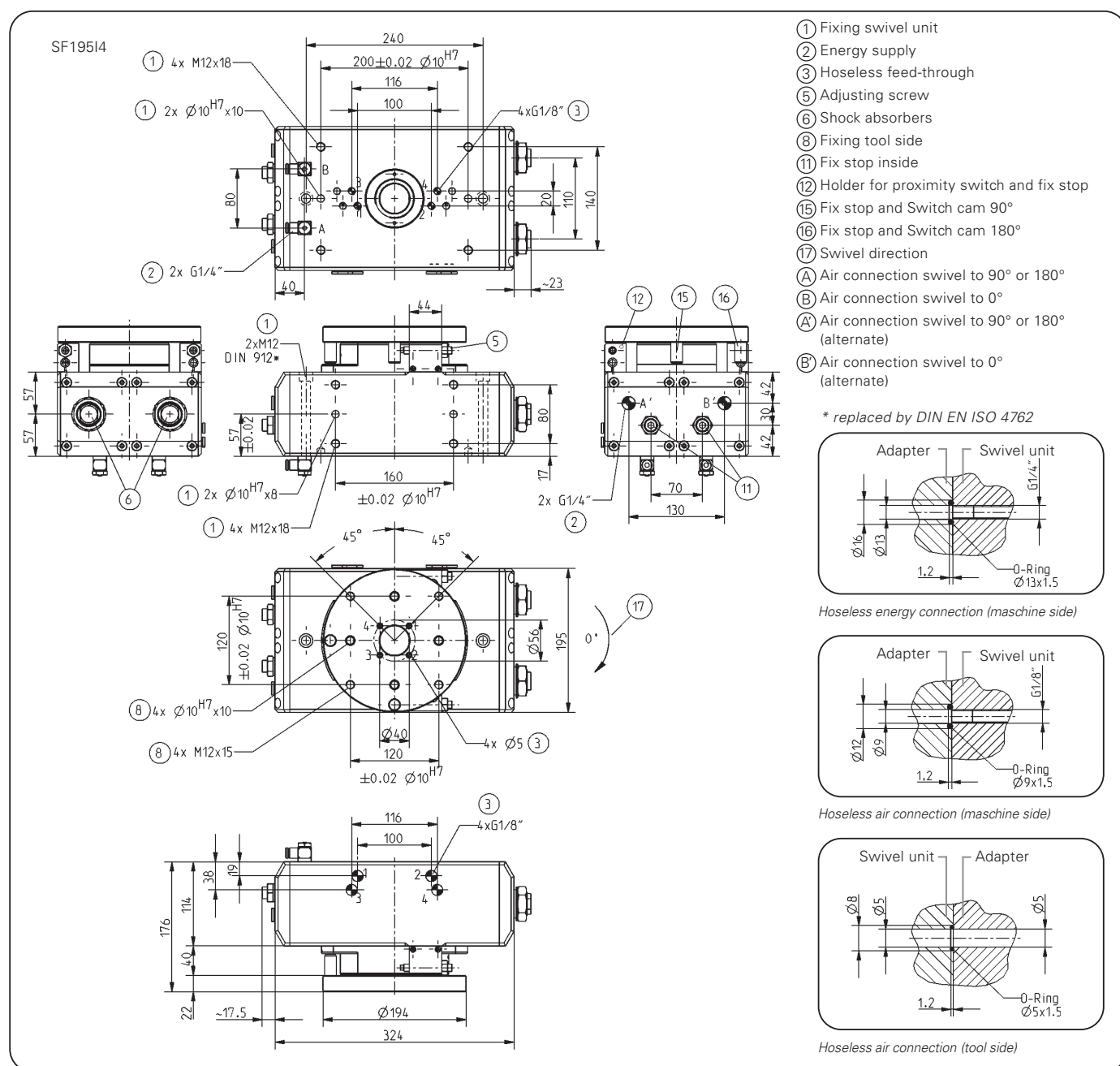
Accessories



Subject to change without prior notice

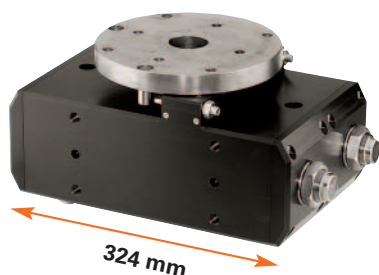
Order no.:	SF195-9014	SF195-18014
Swivel angle [°]:	90	180
Torque [Nm]:	125	125
Swivel angle 90° or 180° adjustable +/- [°]:	3	3
Repeatability +/- [°]:	0,01	0,01
Passage bore Ø [mm]:	40	40
Air feed-through [quantity]:	4	4
Axial bearing load [N]:	6500	6500
Radial bearing load [Nm]:	1150	1150
Min./max. operating pressure [bar]:	4/8	4/8
Min./max. operating temperature [°C]:	5/80	5/80
Air volume per cycle [cm³]:	1140	1520
Weight [kg]:	29,0	29,0

All data measured at 6 bar



Subject to change without prior notice

Flat Swivel Unit

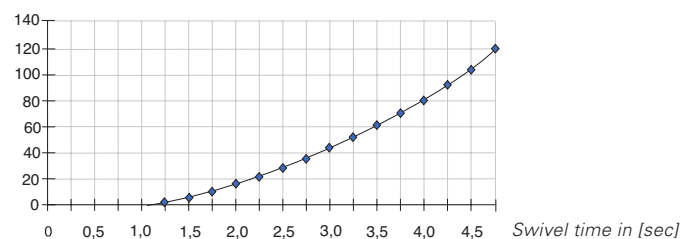


Picture shows SF195

Moment of inertia

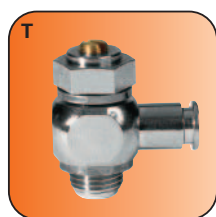
Shows the expected swivel time against the calculated moment of inertia.

Moment of inertia in [kg m²]

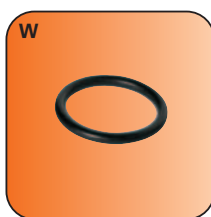


Data measured at 6 bar and horizontal mounting position

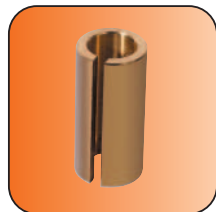
Included in the delivery



Pneumatic fittings
Order no. DRV1/4x8



O-Ring
Order no. COR0050150

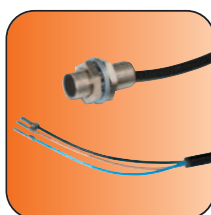


Reducing bush
(ø 12 - ø 8 mm)
Order no. BDMS15500

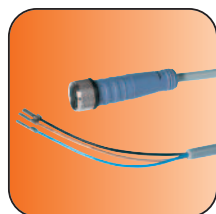
Accessory list



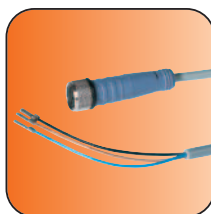
Proximity switch
Order no. NJ8-E2S-14



Proximity switch
Order no. NJ8-E2

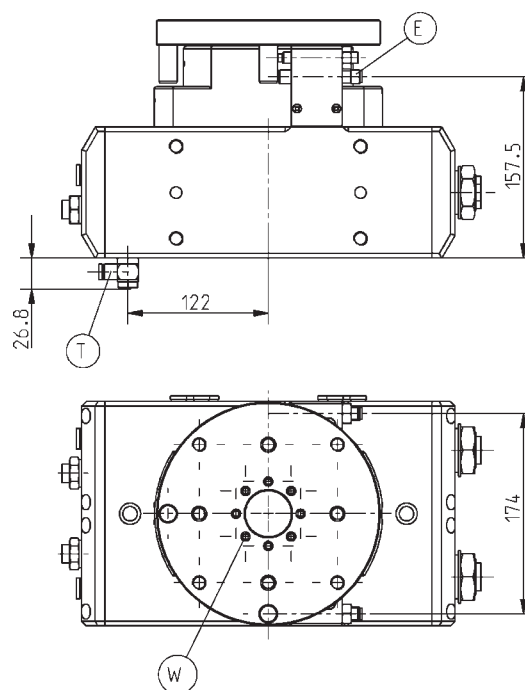


Cable straight plug
Order no. KAG500
Connection NJ8



Cable straight plug
Order no. KAG500/02
Connection NJ12

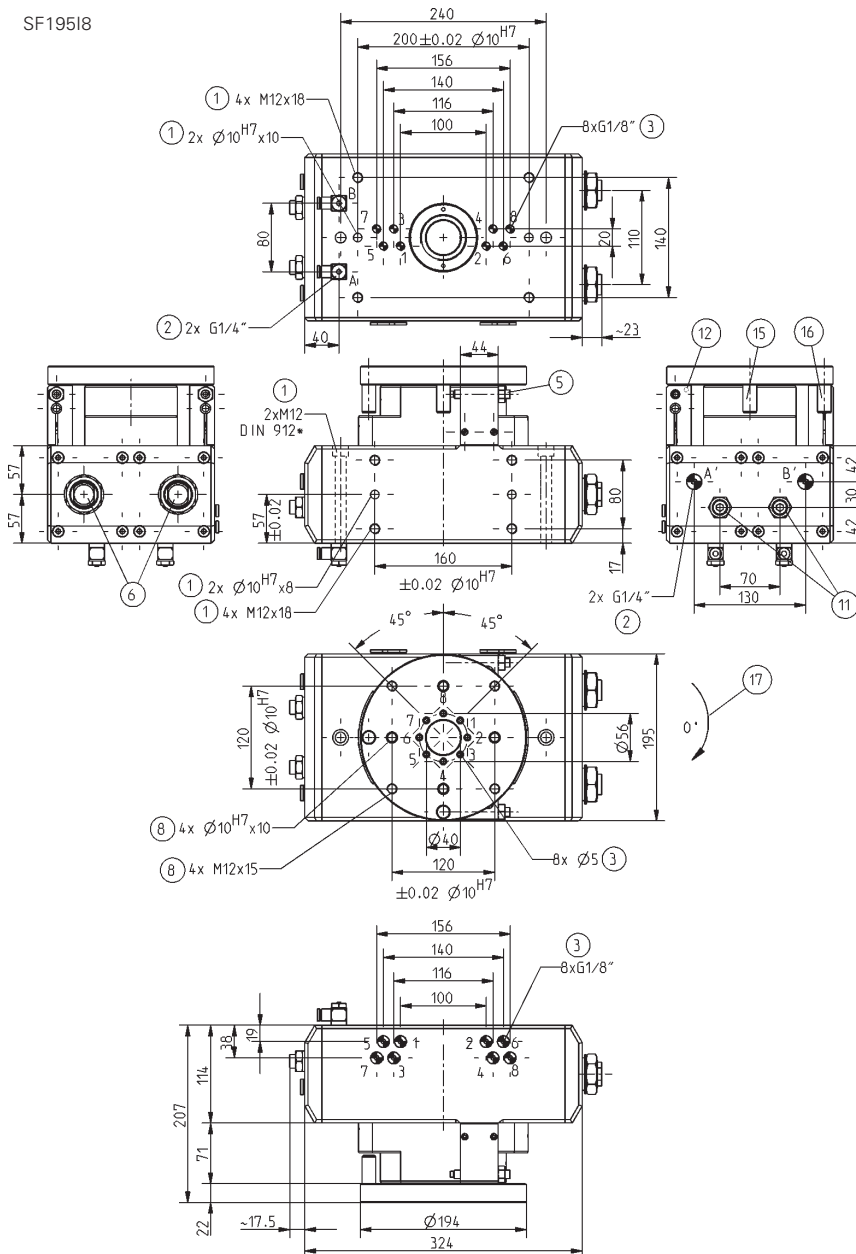
Accessories



Subject to change without prior notice

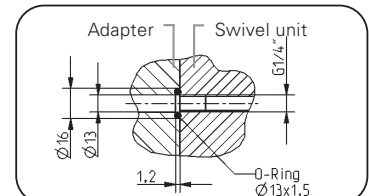
Order no.:	SF195-90I8	SF195-180I8
Swivel angle [°]:	90	180
Torque [Nm]:	120	120
Swivel angle 90° or 180° adjustable +/- [°]:	3	3
Repeatability +/- [°]:	0,01	0,01
Passage bore Ø [mm]:	40	40
Air feed-through [quantity]:	8	8
Axial bearing load [N]:	6500	6500
Radial bearing load [Nm]:	1150	1150
Min./max. operating pressure [bar]:	4/8	4/8
Min./max. operating temperature [°C]:	5/80	5/80
Air volume per cycle [cm³]:	1140	1520
Weight [kg]:	31,5	31,5

All data measured at 6 bar

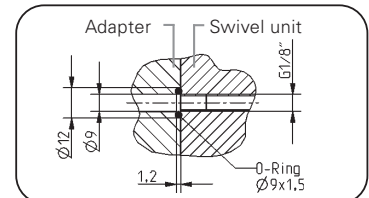


- ① Fixing swivel unit
- ② Energy supply
- ③ Hoseless feed-through
- ⑤ Adjusting screw
- ⑥ Shock absorbers
- ⑧ Fixing tool side
- ⑪ Fix stop inside
- ⑫ Holder for proximity switch and fix stop
- ⑮ Fix stop and Switch cam 90°
- ⑯ Fix stop and Switch cam 180°
- ⑰ Swivel direction
- Ⓐ Air connection swivel to 90° or 180°
- Ⓑ Air connection swivel to 0°
- Ⓐ Air connection swivel to 90° or 180°
(alternate)
- Ⓑ Air connection swivel to 0°
(alternate)

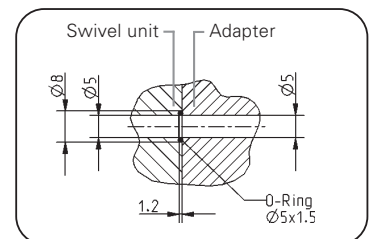
* replaced by DIN EN ISO 4762



Hoseless energy connection (maschine side)



Hoseless air connection (maschine side)



Hoseless air connection (tool side)

Subject to change without prior notice



Flat Swivel Units

pneumatic



SF150
SF190

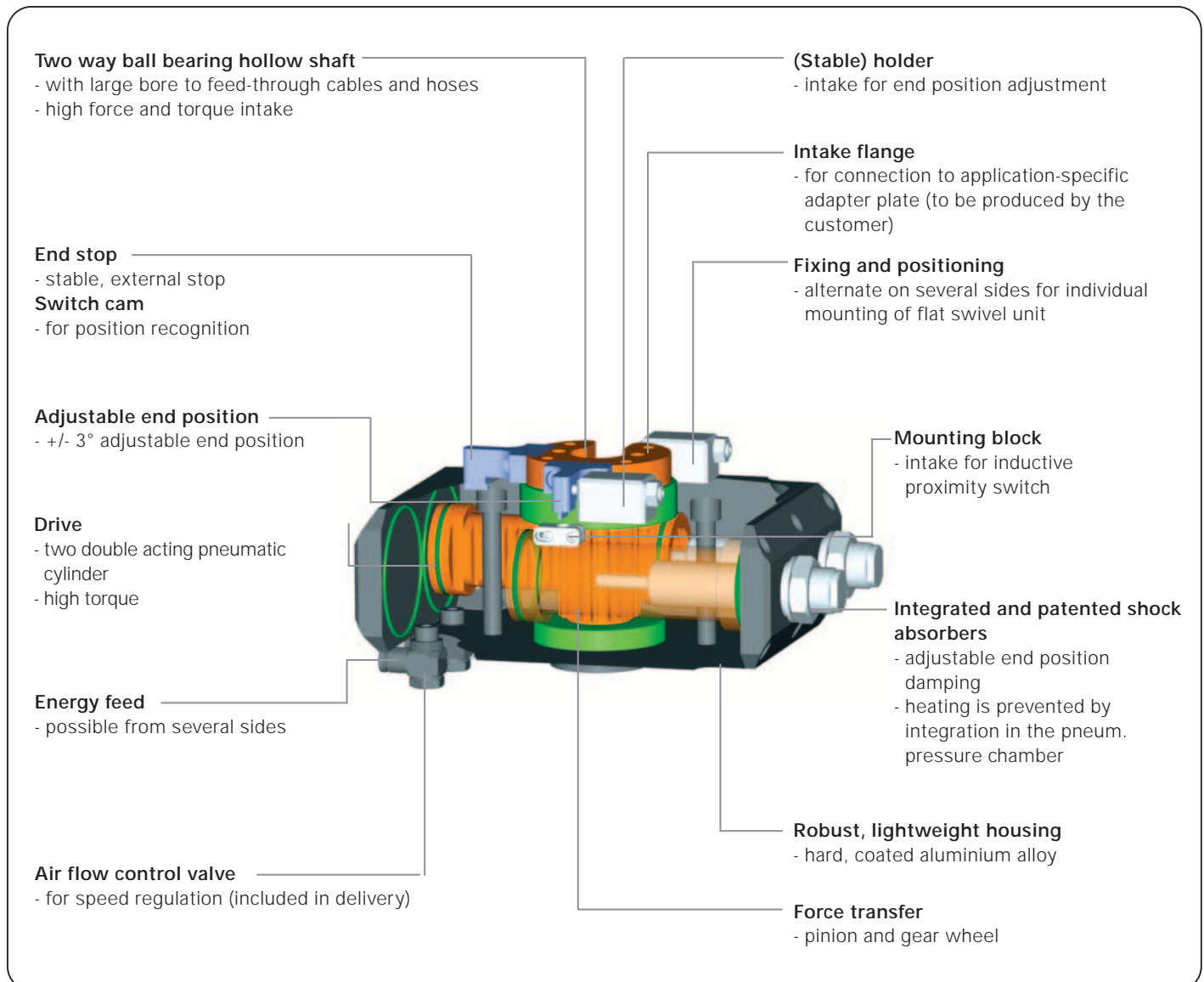
SOMMER
automatic

Flat Swivel Unit

Features

- With integrated and patented hydraulic shock absorbers, built into the pressure chamber, cooled due to permanent air flow and therefore constant in damping behavior
- Two way ball bearing drive shaft for high moment intake, with large central bore up to 34 mm diameter
- Compact and light flange swivel units for high torque up to 115 Nm at a reasonable price

Functional diagram



Terms

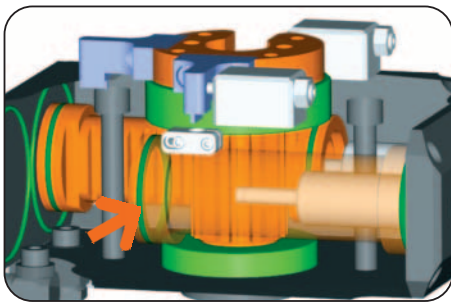
- Torque:** force moment occurring on the edge of the swivel unit
- Swivel time:** time required to cover a 0/90° or 0/180° swivel movement
- Repeatability:** dispersion of stop positions at 100 consecutive swivel cycles
- Cycle:** distance covered by the piston in one 0/90/0° or 0/180/0° swivel movement
- Maintenance:**
 - maintenance free up to 10 Mio. swivel cycles (please see the owner's manual for conditions, download from www.sommer-automatic.com)
 - long maintenance intervals keep costs down
 - long durability

Model

- S:** integrated shock absorber

Order no.	Swivel angle	Torque	Center through-bore
SF150-90S	90°	46 Nm	Ø 28 mm
SF150-180S	180°	46 Nm	Ø 28 mm
SF190-90S	90°	115 Nm	Ø 34 mm
SF190-180S	180°	115 Nm	Ø 34 mm

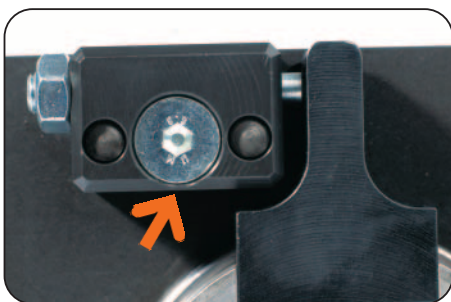
Flat **Swivel Unit**



Drive

Two double acting pneumatic cylinders

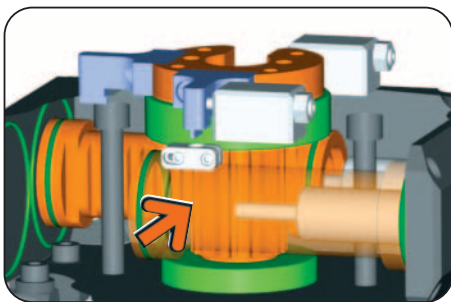
- Maximum torque in both rotation directions
- Torque up to 115 Nm



Swivel angle 90° or 180°

End stop adjustable via adjustment screw $\pm 3^\circ$

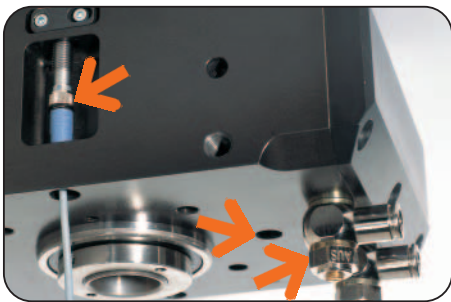
- External fixed stop to absorb the force over housing prevents overload of pinion and gear wheel



Force transfer

Via pinion and gear wheel

- Optimum steering of drive force in torque
- High repeatability
- Two way ball bearings for high torque intake



Machine connection

Energy supply, attachment and positioning possibilities on several sides

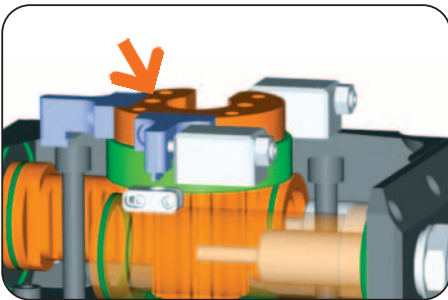
- For inductive proximity switches
- Optimum integration into the workroom through individual
- Hoseless direct connection possible, no additional interference contours
- Exhaust air flow control valve for speed regulation (included in the delivery)



Central bore

For cable feed-through

- Up to Ø 34 mm
- Central
- Low torsion on feed-through supply lines



Individual connecting plate intake

Direct screwing onto the working flange

- Stable thread and pin holes
- Low design effort
- Simple connection



End position damping

Hydraulic shock absorber with spiral groove technology

- Low wear approach to end position, gentle energy absorption due to profiled spiral groove
- The absorber characteristics can be individually adjusted by the screw depth
- Built into the pressure chamber, cooled by permanent air flow, constant damping behaviour

Flat Swivel Unit

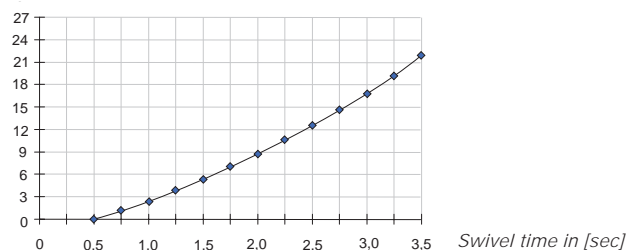


Picture shows SF150-90S

Moment of inertia

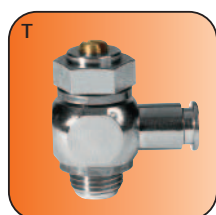
Shows the expected swivel time against the calculated moment of inertia

Moment of inertia in $[kg\ m^2]$

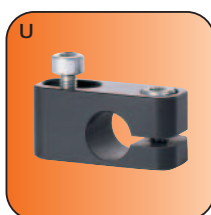


Data measured at 6 bar and horizontal mounting position

Included in the delivery



Pneumatic fittings
Order no. DRV1/4x8

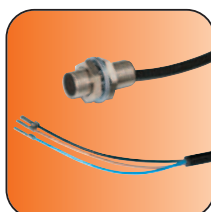


Mounting block
Order no. KB8-40

Accessory list



Proximity switch
Order no. NJ8-E2S



Proximity switch
Order no. NJ8-E2



Cable angled plug
Order no. KAW500



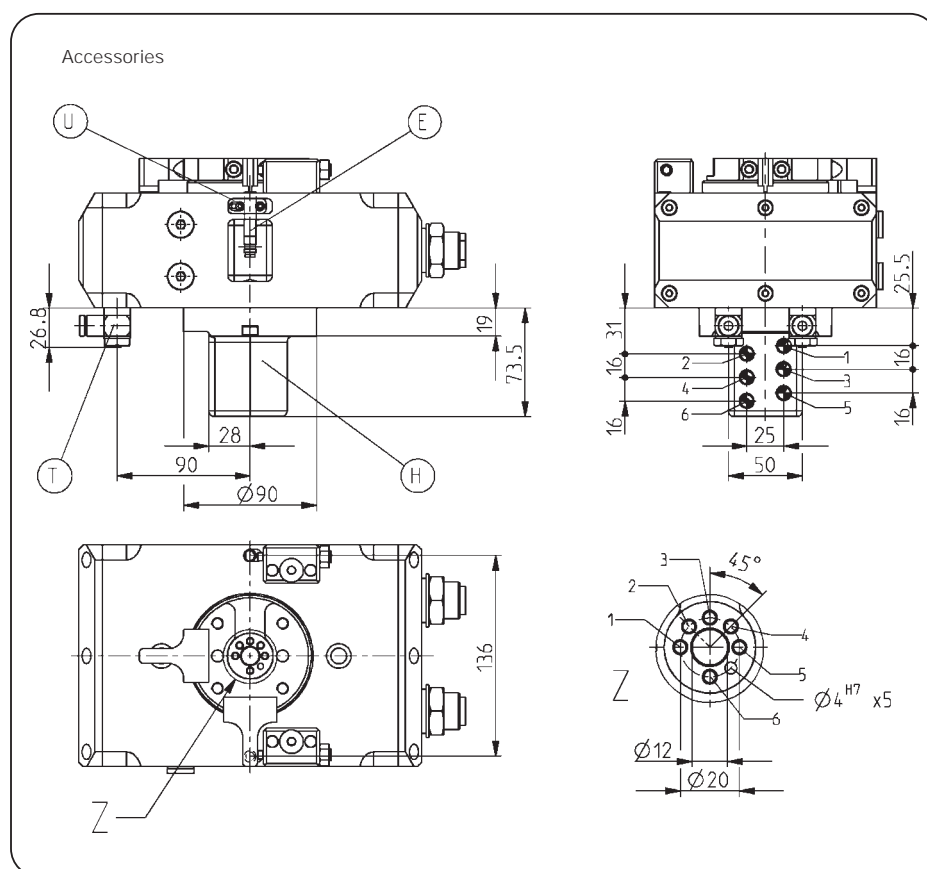
Plug 3-pole
Order no. S12-G-3



Integrated air feed-through 4 way
Order no. IL150-4

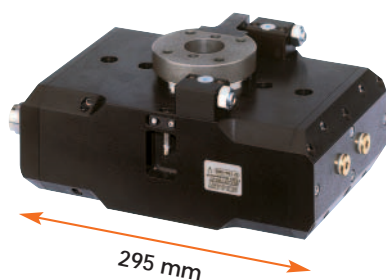


Integrated air feed-through 6 way
Order no. IL150-6



Subject to change without prior notice

Flat Swivel Unit

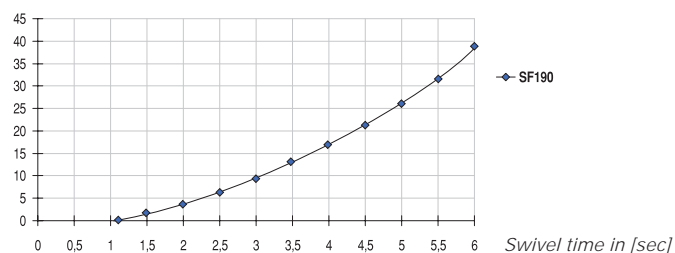


Picture shows SF190-180S

Moment of inertia

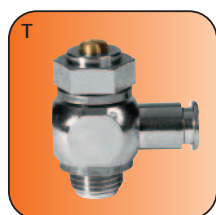
Shows the expected swivel time against the calculated moment of inertia

Moment of inertia in [kg m²]

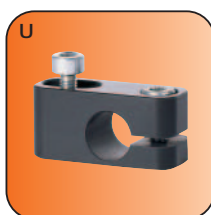


Data measured at 6 bar and horizontal mounting position

Included in the delivery



Pneumatic fittings
Order no. DRV1/4x8

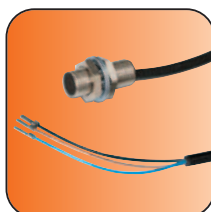


Mounting block
Order no. KB8-40

Accessory list



Proximity switch
Order no. NJ8-E2S



Proximity switch
Order no. NJ8-E2



Cable angled plug
Order no. KAW500



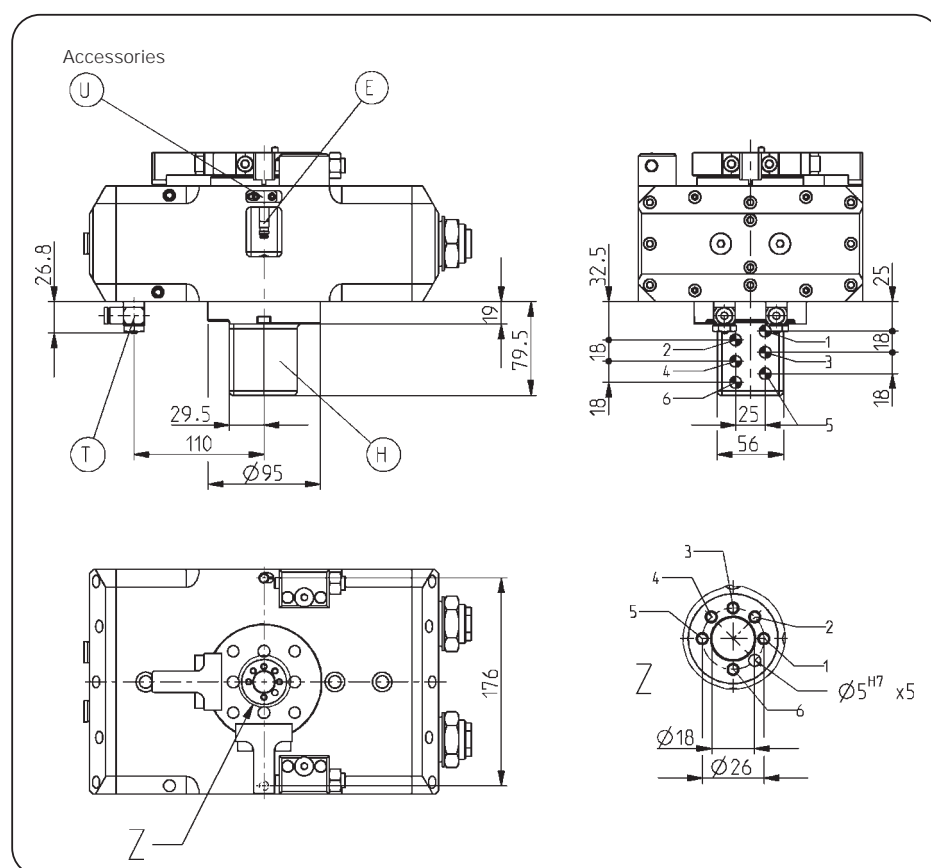
Plug 3-pole
Order no. S12-G-3



Integrated air feed-through 4 way
Order no. IL190-4



Integrated air feed-through 6 way
Order no. IL190-6



Subject to change without prior notice

Swivel Unit **Formulas**

1. Torque Calculation

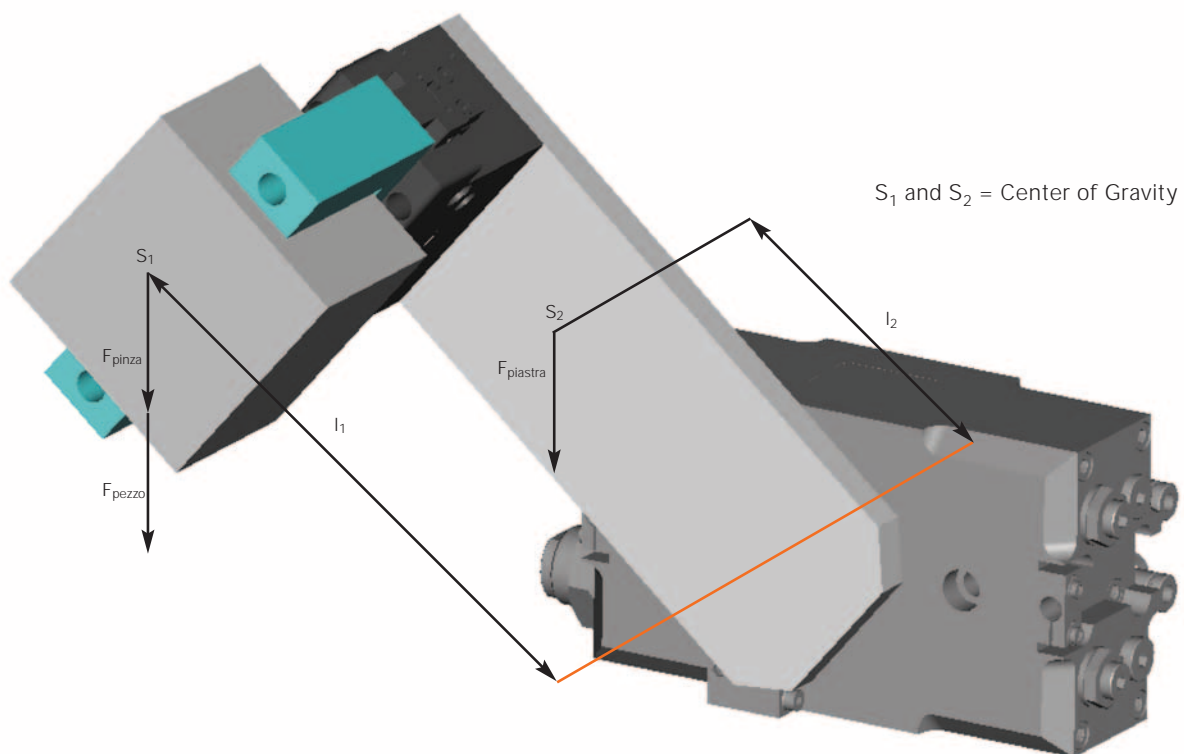
In the technical tables, the "Force" of the swivel-units is declared in Nm. This value declares a torque, produced by the swivel unit, when a pressure of 6 bar is supplied.

In order to size a swivel-unit correctly, one requires different basic data such as workpiece-weight and lever-length to center of gravity. For increased application-safety, a factor of safety may be inserted into the calculation.

In the following example calculation (1.1.) a Swivel unit application with one GP410NC-B gripper and a given swing-angle of 90° is shown as an example.

Example Calculation 1.1.

Sketch



Given:	Weight of Workpiece	=	$F_{Wst.}$	=	$3 \text{ kg} \times 9,81 \text{ m/s}^2$	=	29,43 N
	Gripper Weight	=	$F_{Gr.}$	=	$1 \text{ kg} \times 9,81 \text{ m/s}^2$	=	9,81 N
	Weight of Plate	=	$F_{Pl.}$	=	$2 \text{ kg} \times 9,81 \text{ m/s}^2$	=	19,62 N
	Length of Lever (to Gripper and Workpiece Center of Gravity) Gr. und Wst. =		l_1	=	0,2 m		
	Length of Lever (to Plate Center of Gravity) Pl.	=	l_2	=	0,1 m		
	Safety Factor	=	ν	=	2		

Find: Torque = M

Calculation:

$$M = ((F_{Wst.} + F_{Gr.}) \times l_1 + F_{Pl.} \times l_2) \times \nu$$

$$M = ((29,43 \text{ N} + 9,81 \text{ N}) \times 0,2 \text{ m} + 19,62 \text{ N} \times 0,1 \text{ m}) \times 2$$

$$\underline{M = 19,62 \text{ Nm}}$$

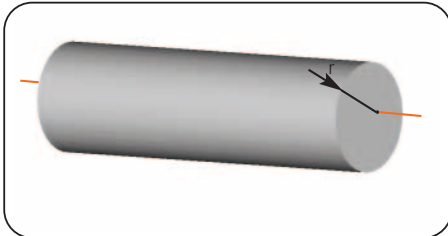
Result: On the basis of the torque, the selection falls to the SF100-90N, with a torque of 20 Nm at 6 bar.

2. Moment of Inertia Calculation

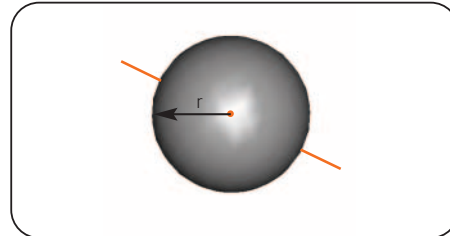
The sample calculation (2.2, page 86) shows the selection of a swivel-unit by means of the moment of inertia. The moment of inertia describes the inertia of a body during a rotational movement. This unit is required to determine about the swivel-time of the respective swivel-unit.

For this calculation, the grippers GP410NC-B, are simplified as parallelogram and are mounted to SF100-90N swivel symmetrically. Should the workpiece or the gripper have a shape other than that of a parallelogram, the corresponding formulas (2.1) must be used to calculate the moment of inertia (J).

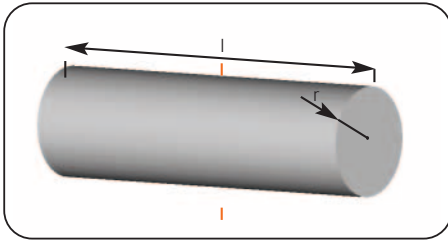
Formeln 2.1



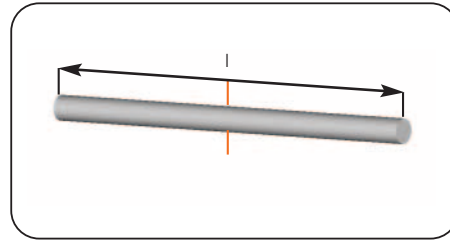
Full Cylinder:
Rotating around its body axis
 $J = \frac{1}{2} m \times r^2$



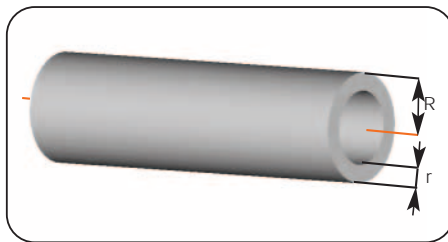
Massive sphere:
Rotating around its center of gravity
 $J = \frac{2}{5} m \times r^2$



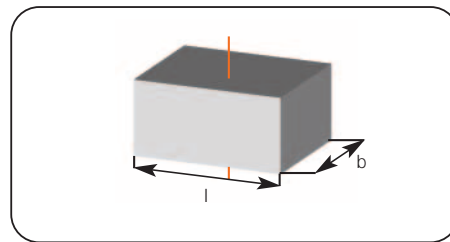
Full Cylinder:
Rotating around the center of gravity perpendicular to its body axis
 $J = \frac{1}{4} m \times r^2 + \frac{1}{12} m \times l^2$



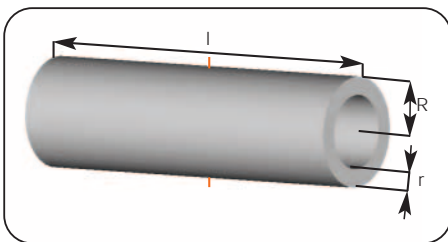
Small Diameter Rod:
Rotating around the center of gravity perpendicular to its body axis
 $J = \frac{1}{12} m \times l^2$



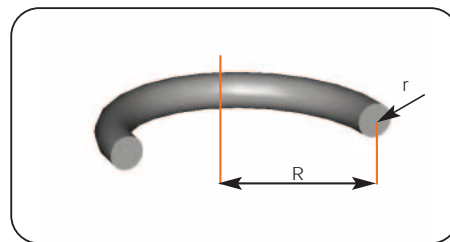
Hollow cylinder:
Rotating around its body axis
 $J = \frac{1}{2} m (R^2 + r^2)$
 R =Radius of cylinder, r = wall thickness



Rectangular parallelepiped:
Rotating around its center of gravity
 $J = \frac{1}{12} m (b^2 + l^2)$



Hollow Cylinder:
Rotating around the center of gravity perpendicular to its body axis
 $J = \frac{1}{4} m (R^2 + r^2) + \frac{1}{3} m l^2$
 R =Radius of cylinder, r = wall thickness

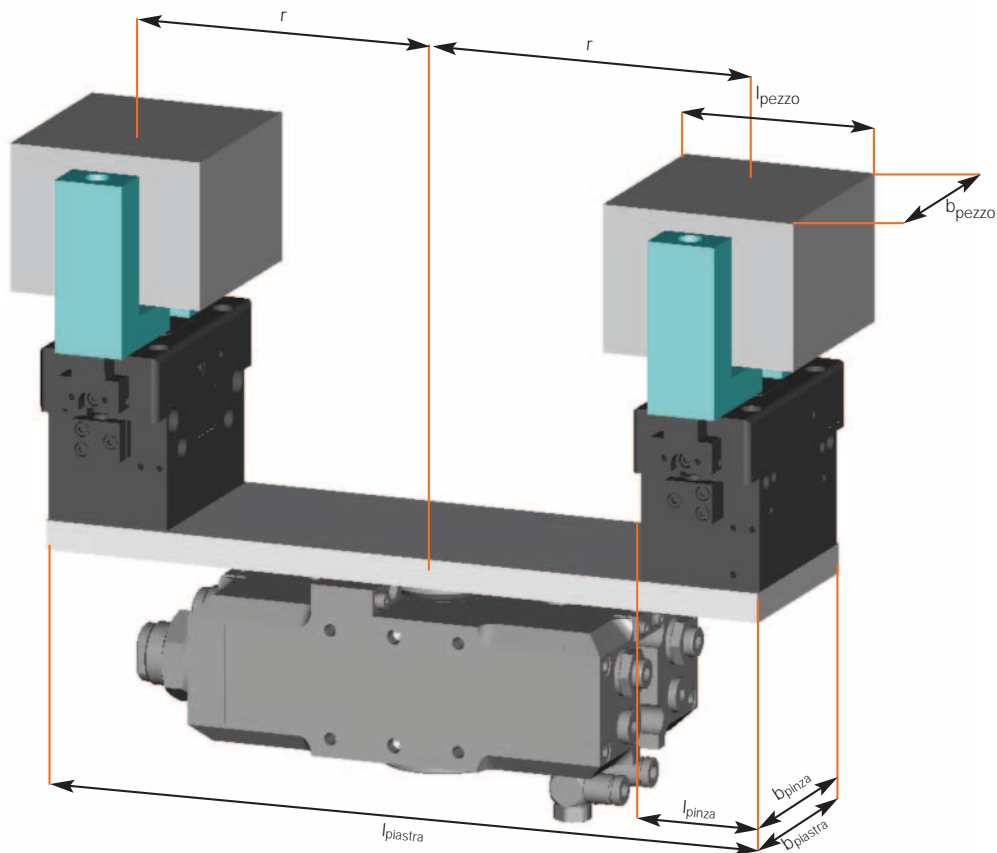


Ring:
Rotating around its body axis
 $J = m (R^2 + \frac{3}{4} r^2)$

Swivel Unit **Formulas**

Example Calculation 2.2.

Sketch:



General: Longitudinal-dimensions in **meters**, mass in **kilogram** yields moment of inertia into **kgm²**

Given:	Weight of workpiece	=	$m_{Wst.}$	=	4 kg
	Gripper Weight	=	$m_{Gr.}$	=	1 kg
	Weight of Plate	=	$m_{Pl.}$	=	4 kg
	Length of Lever (to Gripper and Workpiece Center of Gravity) Wst. und Gr.	=	r	=	0,12 m
	Length of workpiece	=	$l_{Wst.}$	=	0,09 m
	Depth of Gripper	=	$b_{Wst.}$	=	0,09 m
	Length of Gripper	=	$l_{Gr.}$	=	0,08 m
	Depth of Gripper	=	$b_{Gr.}$	=	0,05 m
	Length of Gripper	=	$l_{Pl.}$	=	0,29 m
	Depth of Gripper	=	$b_{Pl.}$	=	0,08 m

Find:	Moment of inertia of Workpiece	=	$J_{Wst. (right)}$	=	$J_{Wst. (left)}$
	Moment of inertia of Gripper	=	$J_{Gr. (right)}$	=	$J_{Gr. (left)}$
	Moment of inertia of Plate	=	$J_{Pl.}$		
	Total Moment of inertia	=	J_{total}		

Calculations:

$$J_{\text{total}} = J_{\text{Wst. (right)}} + J_{\text{Wst. (left)}} + J_{\text{Gr. (right)}} + J_{\text{Gr. (left)}} + J_{\text{Pl.}}$$

$$J_{\text{Wst. (right)}} = \frac{1}{12} m_{\text{Wst.}} \times (b_{\text{Wst.}}^2 + l_{\text{Wst.}}^2) + m_{\text{Wst.}} \times r^2$$

$$J_{\text{Wst. (right)}} = \frac{1}{12} 4 \text{ kg} \times ((0,09 \text{ m})^2 + (0,09 \text{ m})^2) + 4 \text{ kg} \times (0,12 \text{ m})^2$$

$$J_{\text{Wst. (right)}} = \underline{0,063 \text{ kgm}^2}$$

$$J_{\text{Wst. (left)}} = J_{\text{Wst. (right)}}$$

$$J_{\text{Wst. (left)}} = \underline{0,063 \text{ kgm}^2}$$

$$J_{\text{Gr. (right)}} = \frac{1}{12} m_{\text{Gr.}} \times (b_{\text{Gr.}}^2 + l_{\text{Gr.}}^2) + m_{\text{Gr.}} \times r^2$$

$$J_{\text{Gr. (right)}} = \frac{1}{12} 1 \text{ kg} \times ((0,05 \text{ m})^2 + (0,08 \text{ m})^2) + 1 \text{ kg} \times (0,12 \text{ m})^2$$

$$J_{\text{Gr. (right)}} = \underline{0,015 \text{ kgm}^2}$$

$$J_{\text{Gr. (left)}} = J_{\text{Gr. (right)}}$$

$$J_{\text{Gr. (left)}} = \underline{0,015 \text{ kgm}^2}$$

$$J_{\text{Pl.}} = \frac{1}{12} m_{\text{Pl.}} \times (b_{\text{Pl.}}^2 + l_{\text{Pl.}}^2)$$

$$J_{\text{Pl.}} = \frac{1}{12} 4 \text{ kg} \times ((0,08 \text{ m})^2 + (0,29 \text{ m})^2)$$

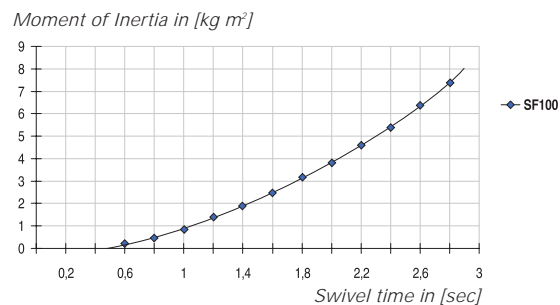
$$J_{\text{Pl.}} = \underline{0,03 \text{ kgm}^2}$$

$$J_{\text{ges.}} = 0,063 \text{ kgm}^2 + 0,063 \text{ kgm}^2 + 0,015 \text{ kgm}^2 + 0,015 \text{ kgm}^2 + 0,03 \text{ kgm}^2$$

$$J_{\text{ges.}} = \underline{0,186 \text{ kgm}^2}$$

Result: By inserting the arbitrated value into the Diagram (2.3) which shows the moment of inertia in relation to time, one gets the swivel time.
The diagram (2.3) appears on the upper half of the first product page of each swivel-unit.

Diagramm 2.3



With the SF100-90N, that is used in this application example, one gets a value of approximately **0.6 seconds**.

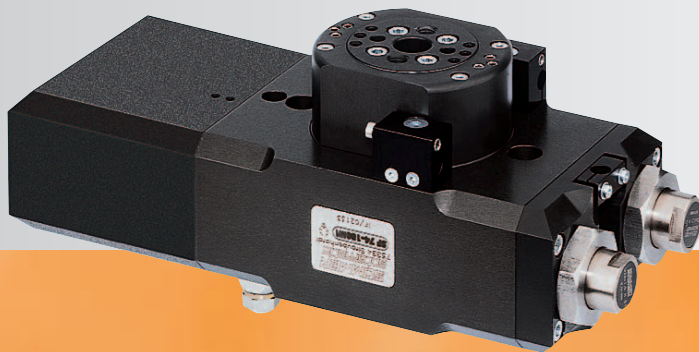
Attention: With this result, one must take into account, that this swivel-time is only realized with an correctly installed swivel-unit supplied with 6 bar air pressure and calculated without factor of safety.

For more information regarding the proper sizing of swivel-units, please go to our website, www.sommer-automatic.com.



Flat Swivel Units

with 3-positions
pneumatic



SF74ML
SF125ML-B

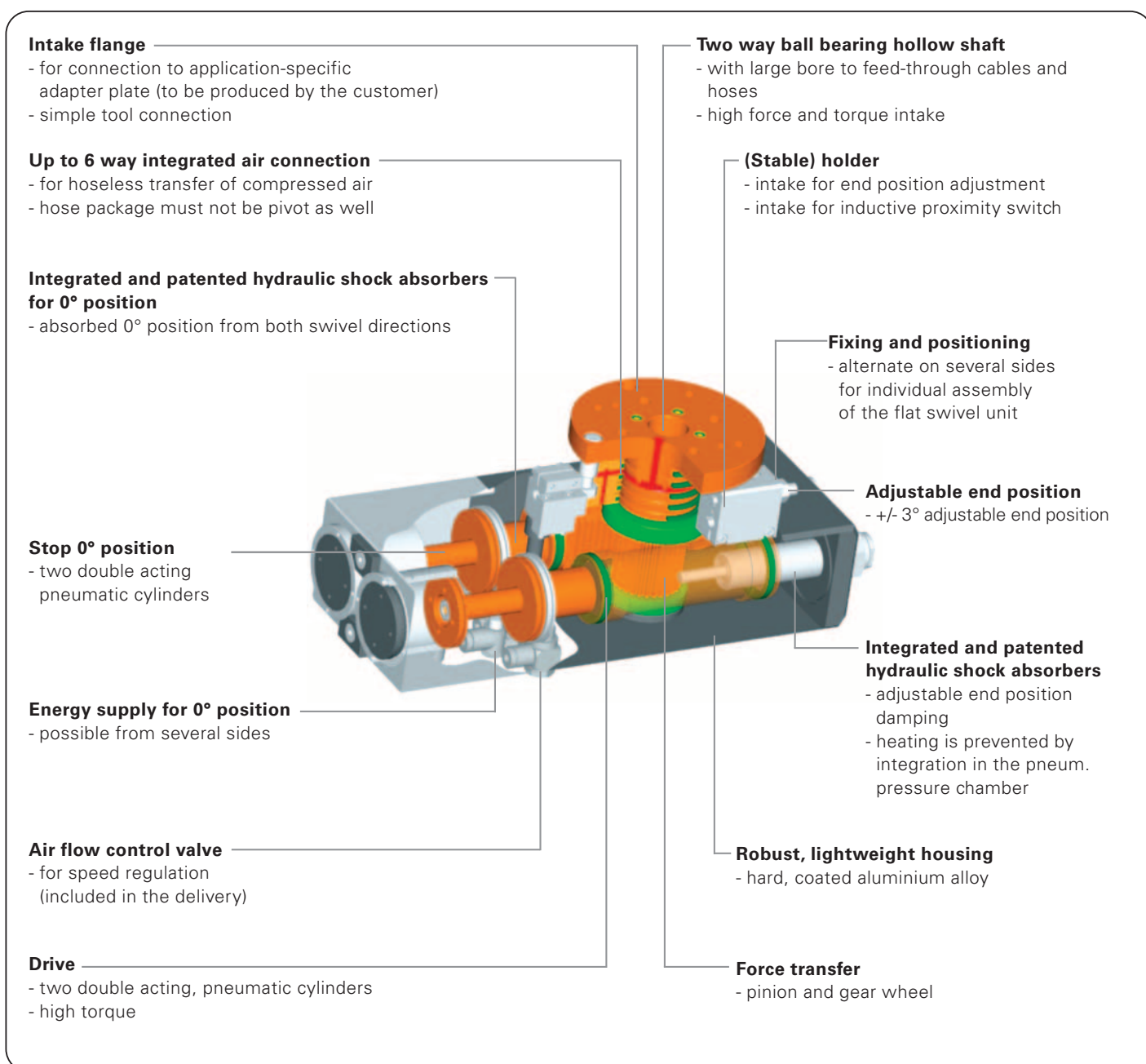
SOMMER
automatic

Flat Swivel Unit *with 3 position*

Features

- Compact flat swivel unit with 3 positions (+90°/0°/-90°) and a torque up to 38 Nm
- Middle position achieved by stop pistons for simplified control, specially for horizontal applications
- Also available as a design with integrated pneumatic rotary distributor, with up to 6 way hoseless air transfer

Functional diagram





Terms

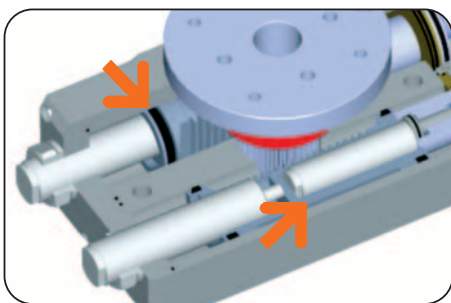
Torque:	force moment occurring on the edge of the swivel unit
Swivel time:	time required to cover a +90°/0°/-90° swivel movement
Repeatability:	dispersion of stop positions at 100 consecutive swivel cycles
Cycle:	distance covered by the piston in one +90°/0°/-90°/0°/+90° swivel movement
Maintenance:	<p>maintenance free up to 10 Mio. swivel cycles (please see the owner's manual for conditions, download from www.sommer-automatic.com)</p> <ul style="list-style-type: none"> • long maintenance intervals keep costs down • long durability

Model

ML:	Middle position, no mechanical locking in the 0° position
D4:	Two double acting pneumatic cylinders, hoseless pneumatic 4 way rotary distributor
D6:	Two double acting pneumatic cylinders, hoseless pneumatic 6 way rotary distributor
I4:	Two double acting pneumatic cylinders, hoseless pneumatic 4 way rotary distributor
I8:	Two double acting pneumatic cylinders, hoseless pneumatic 8 way rotary distributor

Order no.	Swivel angle	Torque	Center through-bore	Air feed-through
SF74ML	+90°/0°/-90°	6 Nm	Ø 12 mm	-
SF74MLD4	+90°/0°/-90°	4,5 Nm	Ø 12 mm	4
SF74MLD6	+90°/0°/-90°	4,5 Nm	Ø 12 mm	6
SF125ML-B	+90°/0°/-90°	38 Nm	Ø 26 mm	-
SF125MLI4-B	+90°/0°/-90°	34 Nm	Ø 26 mm	4
SF125MLI8-B	+90°/0°/-90°	32 Nm	Ø 26 mm	8

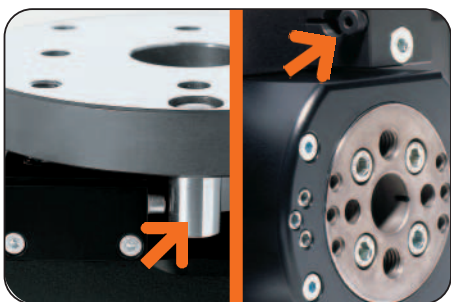
Flat Swivel Unit *with 3 position*



Drive (180°)

Two double acting pneumatic cylinders

- Maximum torque in both rotation directions
- Torque up to 38 Nm



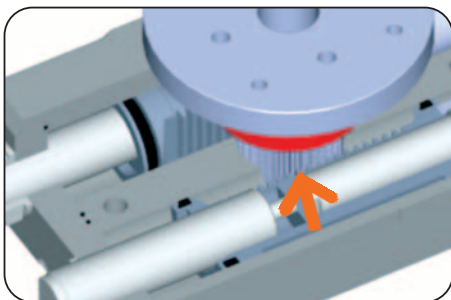
SF125

SF100

Swivel angle +90° / 0° / -90°

End stop (+90° / -90°) adjustable via adjustment screw +/-3°

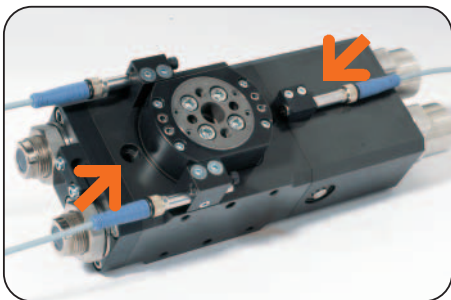
- External fixed stop to absorb the force over housing prevents overload of pinion and gear wheel (stop pin for SF74ML/D4/D6 not included in delivery)
- 0° position preset ex works



Force transfer

Via pinion and gear wheel

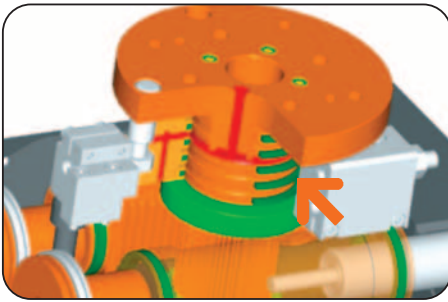
- Optimum steering of drive force in torque
- High repeatability
- Two way ball bearings for high torque intake



Machine connection

Position sensing, energy supply, attachment and positioning-possibilities on several sides

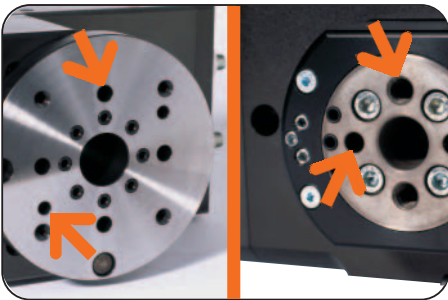
- For inductive proximity switches
- Optimum integration into the workroom through individual mounting position
- Hoseless direct connection possible, no additional interference contours
- exhaust air flow control valve for speed regulation (included in the delivery)



Air transfer

Hoseless, up to 8 pneumatic feed-through

- Reduces interference contour, hose package must not pivot as well
- Smooth rotary distributor due to o-ring with Teflon support ring
- Compact external dimensions due to direct screwing on the housing



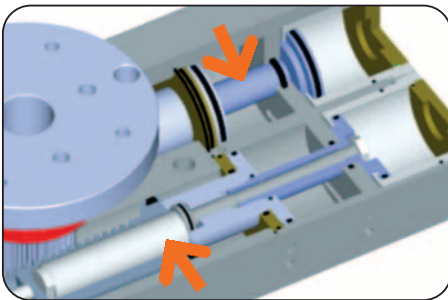
SF125ML

SF74ML

Intake flange

Direct screwing onto the working flange

- Stable thread and pin holes
- Low design effort
- Simple connection
- Standard adapter available as accessory (SF74ML/D4/D6)



0° intermediate position

Shock absorbed, achieved via stopper pistons

- Easy control
- For horizontal use
- $\pm 3^\circ$ adjustable

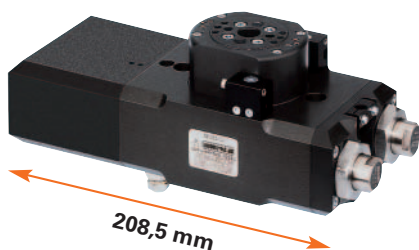


Damping

Hydraulic shock absorber with spiral groove technology

- Low wear approach to end position, gentle energy absorption due to profiled spiral groove
- The damping characteristics can be individually adjusted by the screw depth
- Built into the pressure chamber, cooled by permanent air flow, constant damping behavior

Flat Swivel Unit *with 3 position*

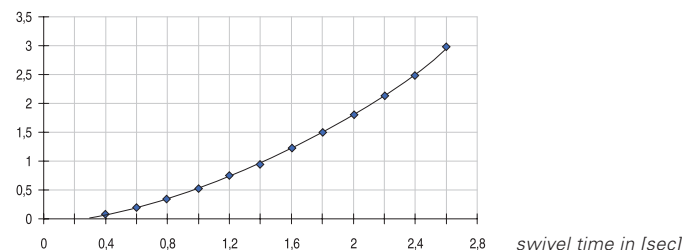


Picture shows SF74MLD6

Moment of inertia

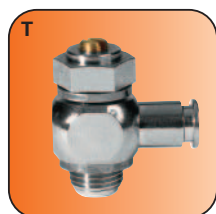
Shows the expected swivel time against the calculated moment of inertia

Moment of inertia in [kg m²]



Data measured at 6 bar and horizontal mounting position

Included in the delivery



Pneumatic fittings
Order no. DRVM5x4

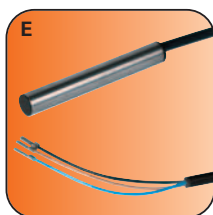


Mounting block 0° Position
Order no. KB6.5-01

Accessory list



Pneumatic fittings
Order no. WVM5



Proximity switch
Order no. NJ6.5-E2

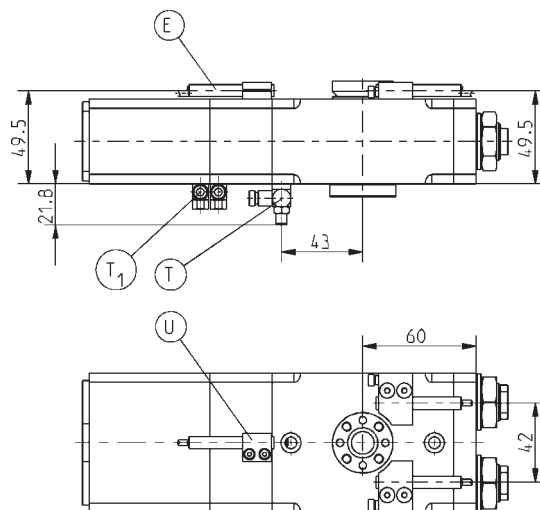


Plug 3-pole
Order no. S12-G-3



Adapter plate
Order no. SFP74N
see SF74N, page 38

Accessories

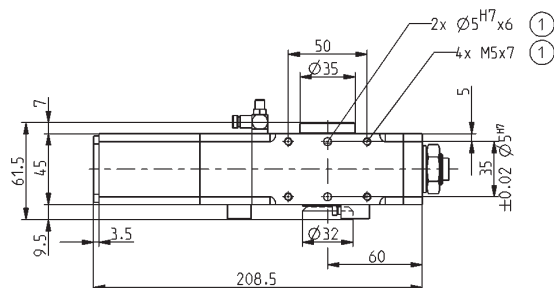
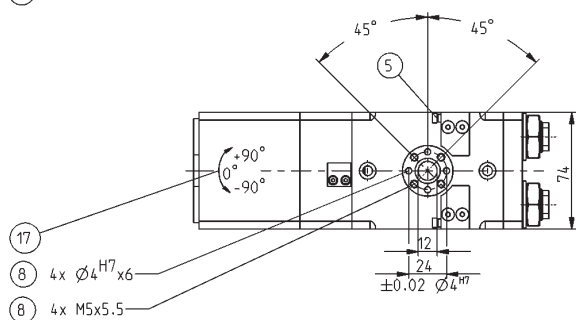
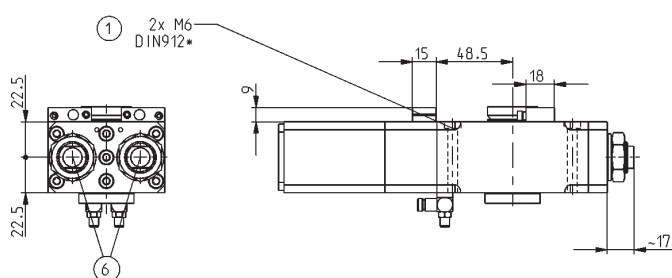
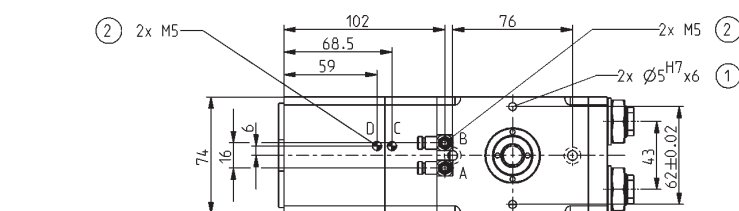


Subject to change without prior notice

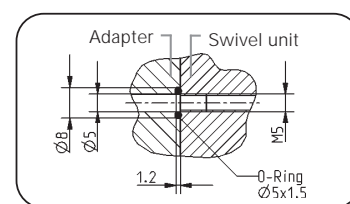
Order no.:	SF74ML
Swivel angle [°]:	-90/0/+90
Torque [Nm]:	6
Swivel angle -90°/+90° adjustable +/- [°]:	3
Repetition accuracy -90°/+90° position +/- [°]:	0,01
Repetition accuracy 0° position +/- [°]:	0,1
Passage bore Ø [mm]:	12
Air feed-through [quantity]:	-
Axial bearing load [N]:	1000
Radial bearing load [Nm]:	75
Min./max. operating pressure [bar]:	4/8
Min./max. operating temperature [°C]:	5/80
Air volume per cycle [cm³]:	66
Weight [kg]:	2,6

All data measured at 6 bar

SF74ML



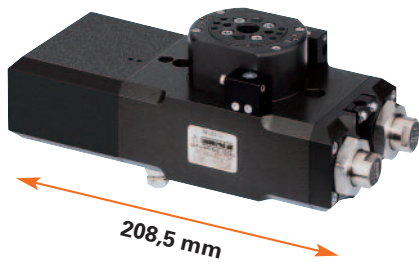
- ① Fixing swivel unit
 - ② Energy supply
 - ⑤ Adjusting screw
 - ⑥ Shock absorbers
 - ⑧ Fixing tool side
 - ⑪ Swivel direction
 - ⑫ Clamping plate
 - ⑫ Cover for shock absorbers
 - ⑫ Set sleeve 0° position
 - ⑫ Air connection swivel to +90°
 - ⑫ Air connection swivel to -90°
 - ⑫ See control diagram middle position
- * replaced by DIN EN ISO 4762



Hoseless air connection (maschine side)

Subject to change without prior notice

Flat Swivel Unit *with 3 position*

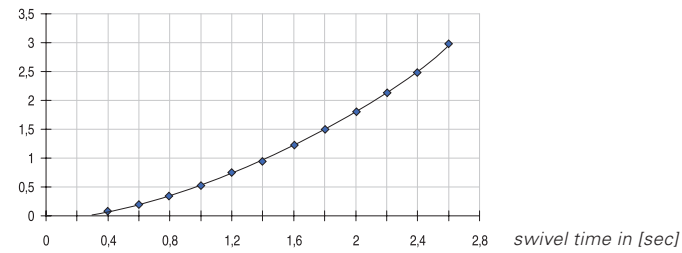


Picture shows SF74MLD6

Moment of inertia

Shows the expected swivel time against the calculated moment of inertia

Moment of inertia in $[kg \cdot m^2]$



Data measured at 6 bar and horizontal mounting position

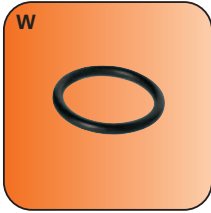
Included in the delivery



Pneumatic fittings
Order no. DRVM5x4



Mounting block 0° Position
Order no. KB6.5-01

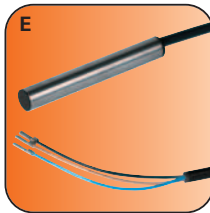


O-Ring
Order no. COR0020100

Accessory list



Pneumatic fittings
Order no. WVM5



Proximity switch
Order no. NJ6.5-E2

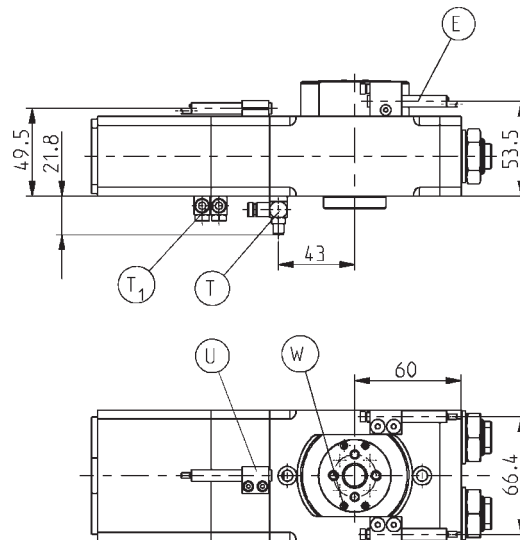


Plug 3-pole
Order no. S12-G-3



Adapter plate
Order no. SFP74D
see SF74ND4, page 40

Accessories

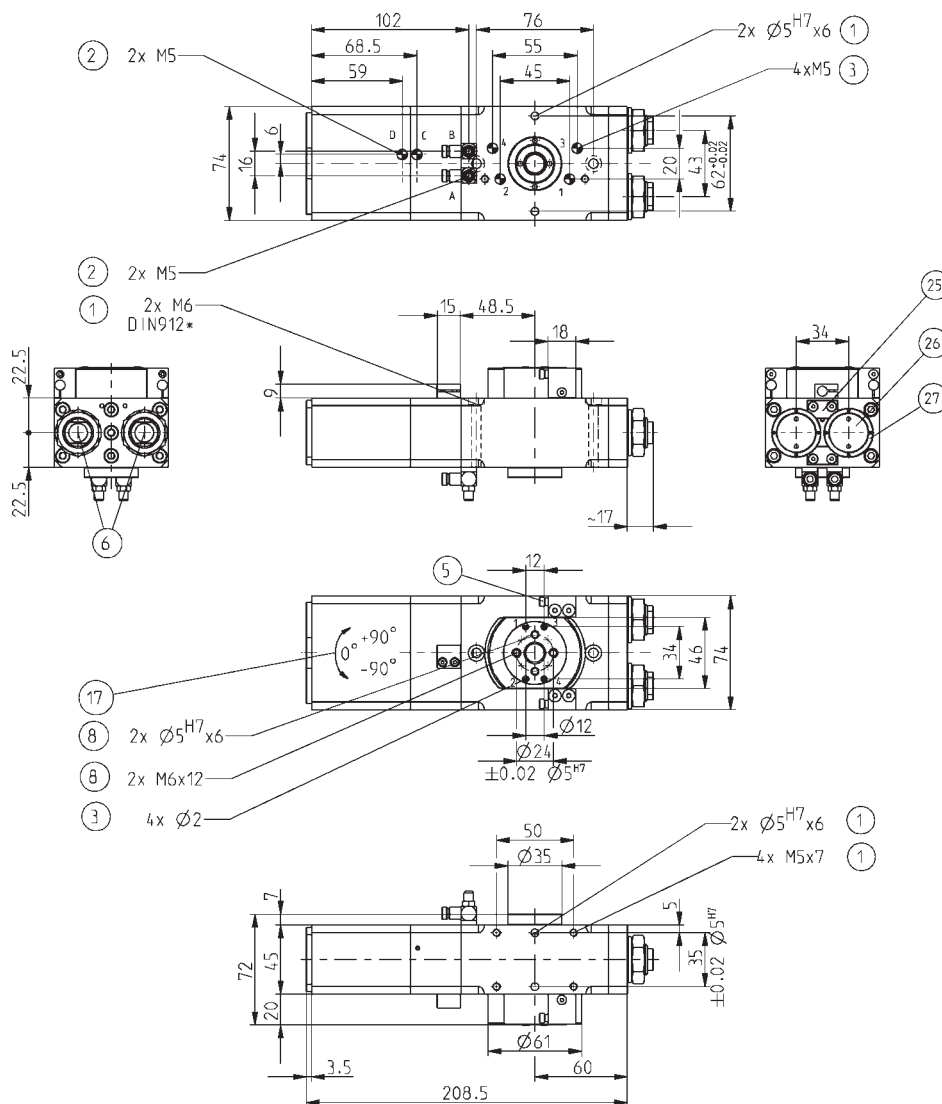


Subject to change without prior notice

Order no.:	SF74MLD4
Swivel angle [°]:	-90/0/+90
Torque [Nm]:	4,5
Swivel angle -90°/+90° adjustable +/- [°]:	3
Repetition accuracy -90°/+90° position +/- [°]:	0,01
Repetition accuracy 0° position +/- [°]:	0,1
Passage bore Ø [mm]:	12
Air feed-through [quantity]:	4
Axial bearing load [N]:	1000
Radial bearing load [Nm]:	75
Min./max. operating pressure [bar]:	4/8
Min./max. operating temperature [°C]:	5/80
Air volume per cycle [cm³]:	66
Weight [kg]:	2,8

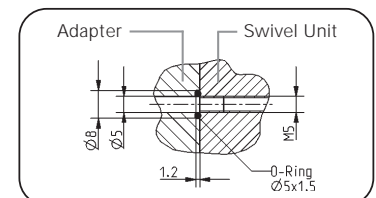
All data measured at 6 bar

SF74MLD4

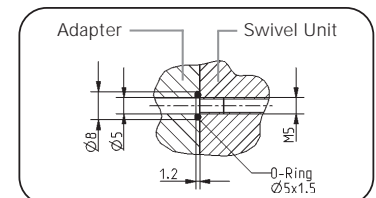


- ① Fixing swivel unit
- ② Energy supply
- ③ Hoseless air connection
- ⑤ Adjusting screw
- ⑥ Shock absorbers
- ⑧ Fixing tool side
- ⑪ Swivel direction
- ⑫ Clamping plate
- ⑬ Cover for shock absorbers
- ⑭ Set sleeve 0° position
- ⑮ Air connection swivel to +90°
- ⑯ Air connection swivel to -90°
- ⑰ See control diagram middle position

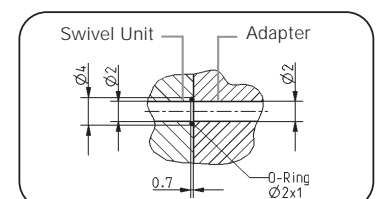
* replaced by DIN EN ISO 4762



Hoseless energy connection (maschine side)



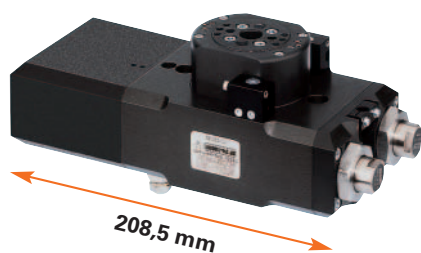
Hoseless air connection (maschine side)



Hoseless air connection (tool side)

Subject to change without prior notice

Flat Swivel Unit *with 3 position*

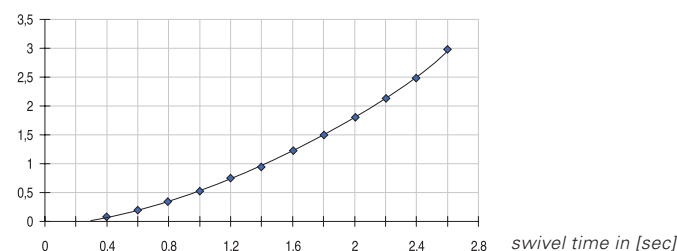


Picture shows SF74MLD6

Moment of inertia

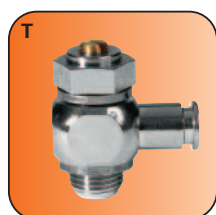
Shows the expected swivel time against the calculated moment of inertia

Moment of inertia in [kg m²]



Data measured at 6 bar and horizontal mounting position

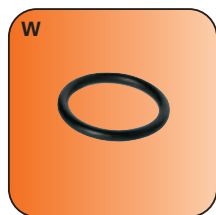
Included in the delivery



Pneumatic fittings
Order no. DRVM5x4



Mounting block 0° Position
Order no. KB6.5-01

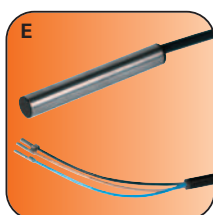


O-Ring
Order no. COR0020100

Accessory list



Pneumatic fittings
Order no. WVM5



Proximity switch
Order no. NJ6.5-E2

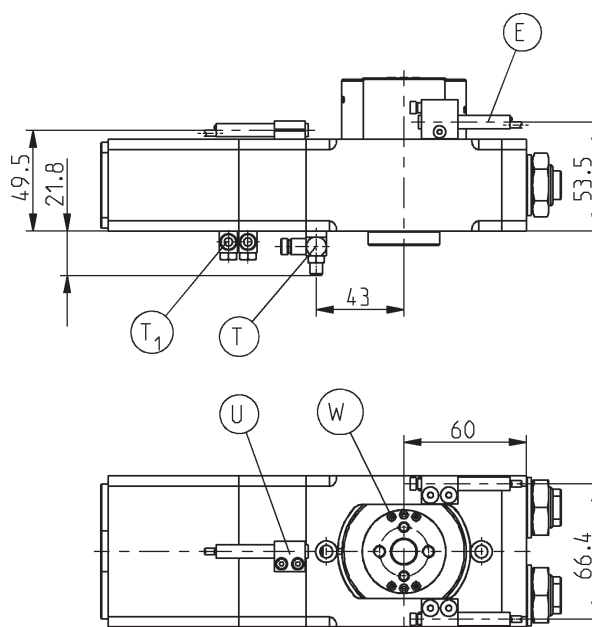


Plug 3-pole
Order no. S12-G-3



Adapter plate
Order no. SFP74D
see SF74ND6, page 42

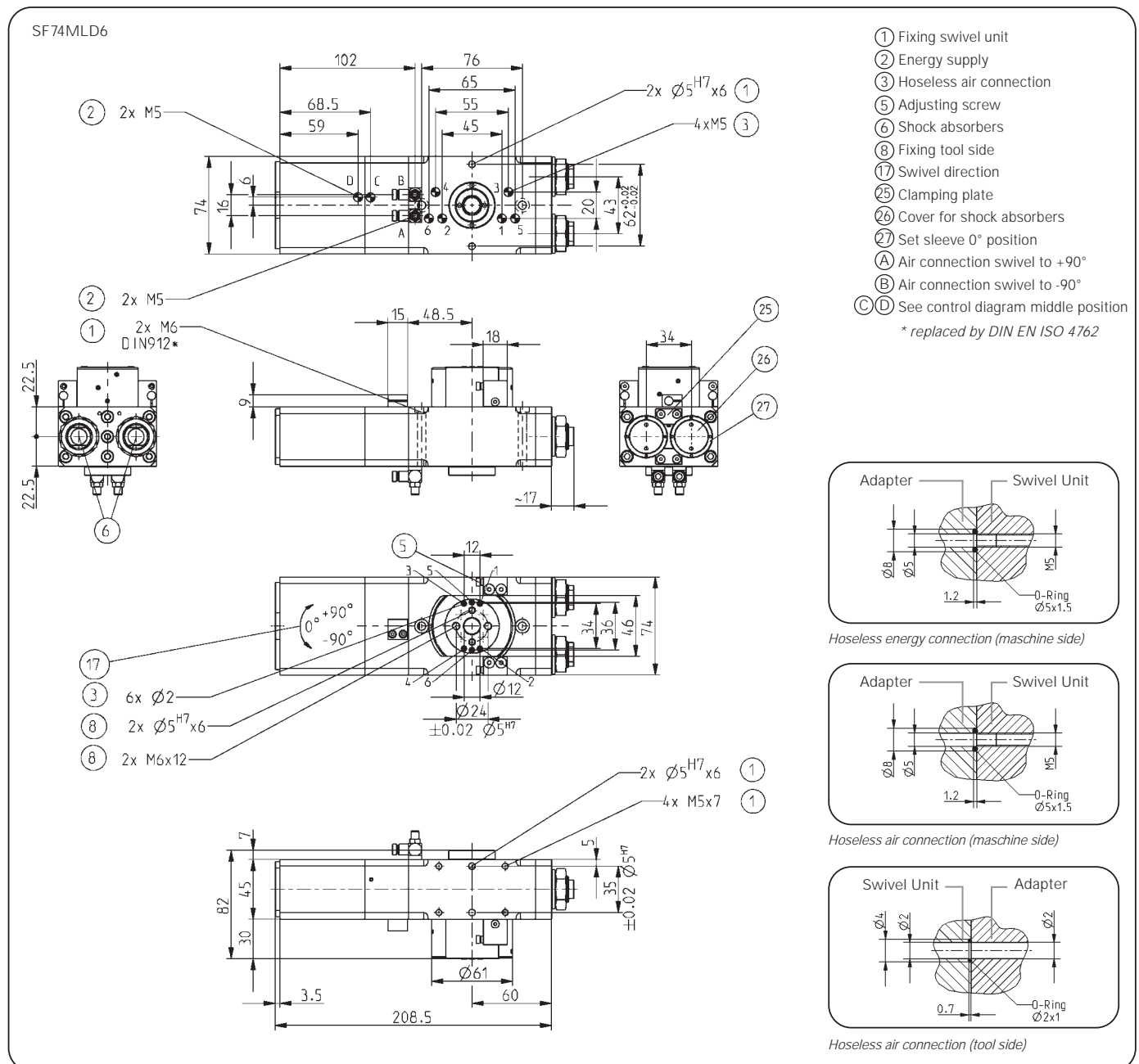
Accessories



Subject to change without prior notice

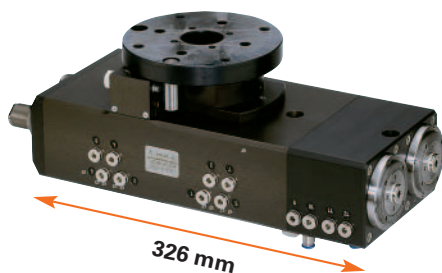
Order no.:	SF74MLD6
Swivel angle[°]:	-90/0/+90
Torque [Nm]:	4,5
Swivel angle -90°/+90° adjustable +/- [°]:	3
Repetition accuracy -90°/0°/+90° position +/- [°]:	0,01
Repetition accuracy 0° position +/- [°]:	0,1
Passage bore Ø [mm]:	12
Air feed-through [quantity]:	6
Axial bearing load [N]:	1000
Radial bearing load [Nm]:	75
Min./max. operating pressure [bar]:	4/8
Min./max. operating temperature [°C]:	5/80
Air volume per cycle [cm³]:	66
Weight [kg]:	2,8

All data measured at 6 bar



Subject to change without prior notice

Flat Swivel Unit *with 3 position*

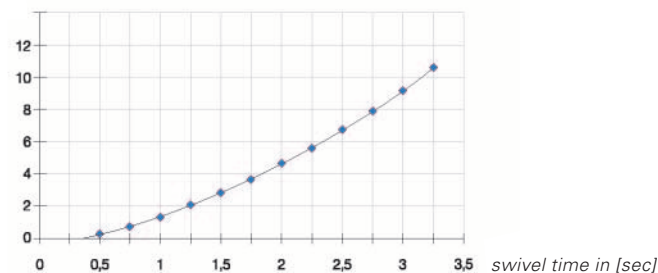


Picture shows SF155M

Moment of inertia

Shows the expected swivel time against the calculated moment of inertia

Moment of inertia in [kg m²]

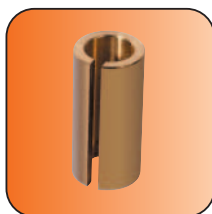


Data measured at 6 bar and horizontal mounting position

Included in the delivery



Pneumatic fittings
Order no. DRV1/4x8



Reduction sleeve
(ø 12 - ø 8 mm)
Order no. BDMS15500

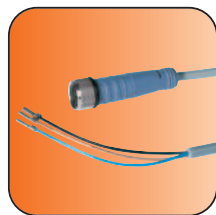
Accessory list



Pneumatic fittings
Order no. WV1/8x6



Proximity switch
Order no. NJ8-E2S-14
Order no. NJ12-E2S-02

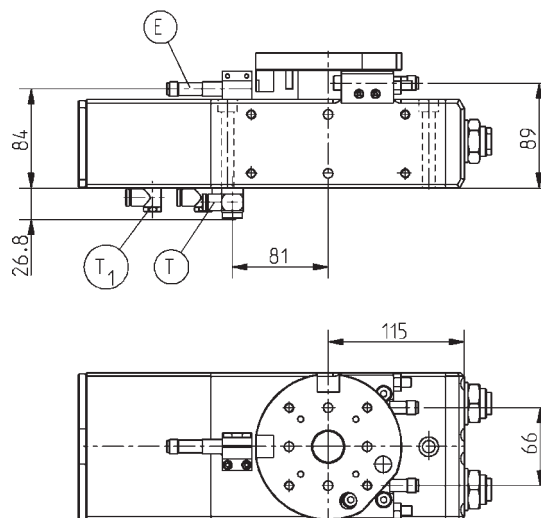


Cable straight plug
Order no. KAG500 *
Order no. KAG500-02 **



Plug 3-pole
Order no. S12-G-3

Accessories



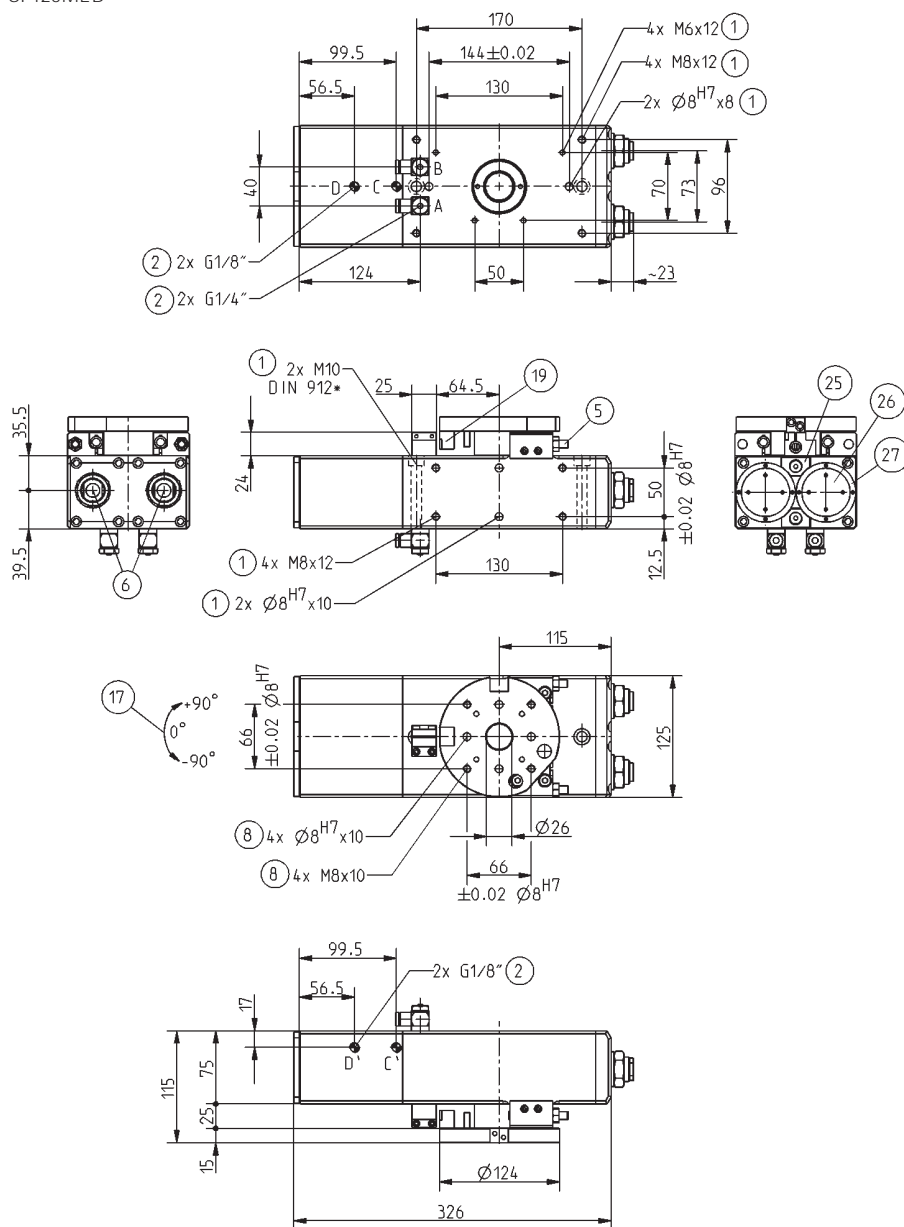
Subject to change without prior notice

* Connection NJ8
** Connection NJ12

Order no.:	SF125ML-B
Swivel angle [°]:	90
Torque [Nm]:	38
Swivel angle -90°/+90° adjustable +/- [°]:	3
Repetition accuracy -90°/+90° position +/- [°]:	0,01
Repetition accuracy 0° position +/- [°]:	0,1
Passage bore Ø [mm]:	26
Air feed-through [quantity]:	-
Axial bearing load [N]:	3000
Radial bearing load [Nm]:	400
Min./max. operating pressure [bar]:	4/8
Min./max. operating temperature [°C]:	5/80
Air volume per cycle [cm³]:	1040
Weight [kg]:	14,0

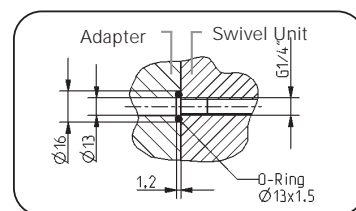
All data measured at 6 bar

SF125ML-B



- ① Fixing swivel unit
- ② Energy supply
- ⑤ Adjusting screw
- ⑥ Shock absorbers
- ⑧ Fixing tool side
- ⑪ Swivel direction
- ⑪ Switch cam -90°/0°/+90°
- ⑪ Clamping plate
- ⑪ Cover for shock absorbers
- ⑪ Set sleeve 0° position
- A Air connection swivel to +90°
- B Air connection swivel to -90°
- C See control diagram middle position
- C See control diagram middle position (alternate)

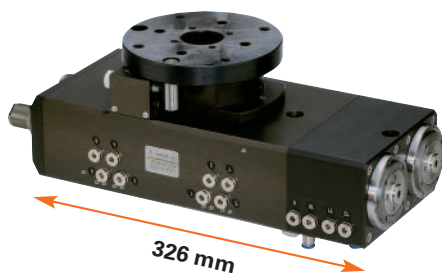
* replaced by DIN EN ISO 4762



Hoseless air connection (maschine side)

Subject to change without prior notice

Flat Swivel Unit *with 3 position*

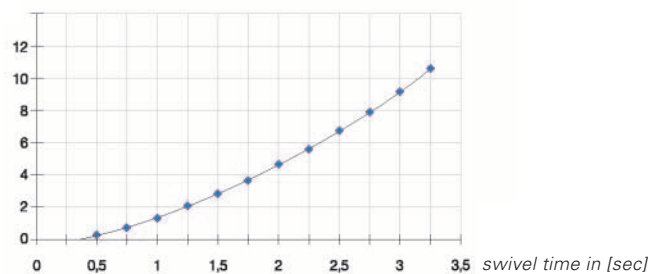


Picture shows SF155M

Moment of inertia

Shows the expected swivel time against the calculated moment of inertia

Moment of inertia in [kg m²]

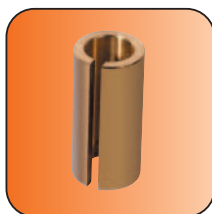


Data measured at 6 bar and horizontal mounting position

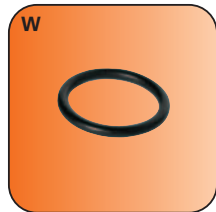
Included in the delivery



Pneumatic fittings
Order no. DRV1/4x8



Reduction sleeve
(ø 12 - ø 8 mm)
Order no. BDMS15500



O-Ring
Order no. COR0040150

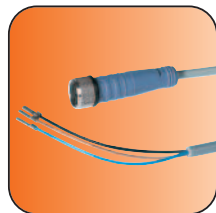
Accessory list



Pneumatic fittings
Order no. WV1/8x6



Proximity switch
Order no. NJ8-E2S-14
Order no. NJ12-E2S-02

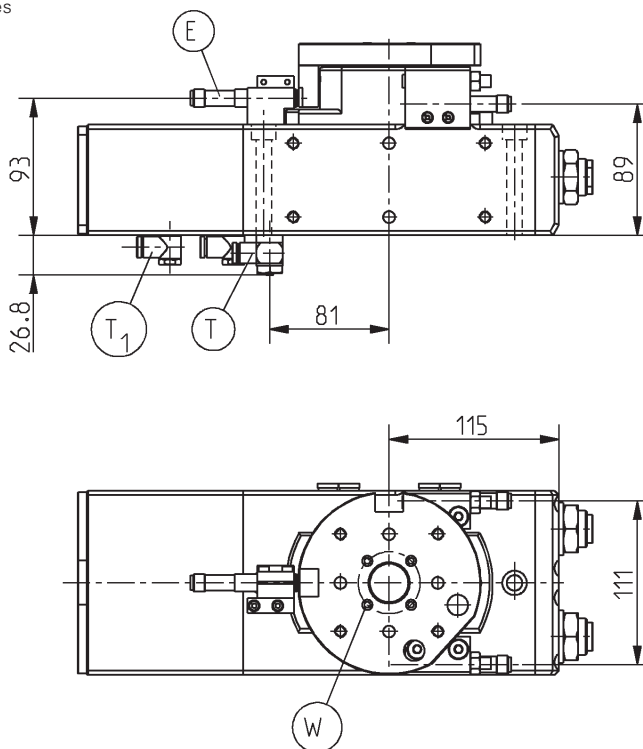


Cable straight plug
Order no. KAG500 *
Order no. KAG500-02 **



Plug 3-pole
Order no. S12-G-3

Accessories



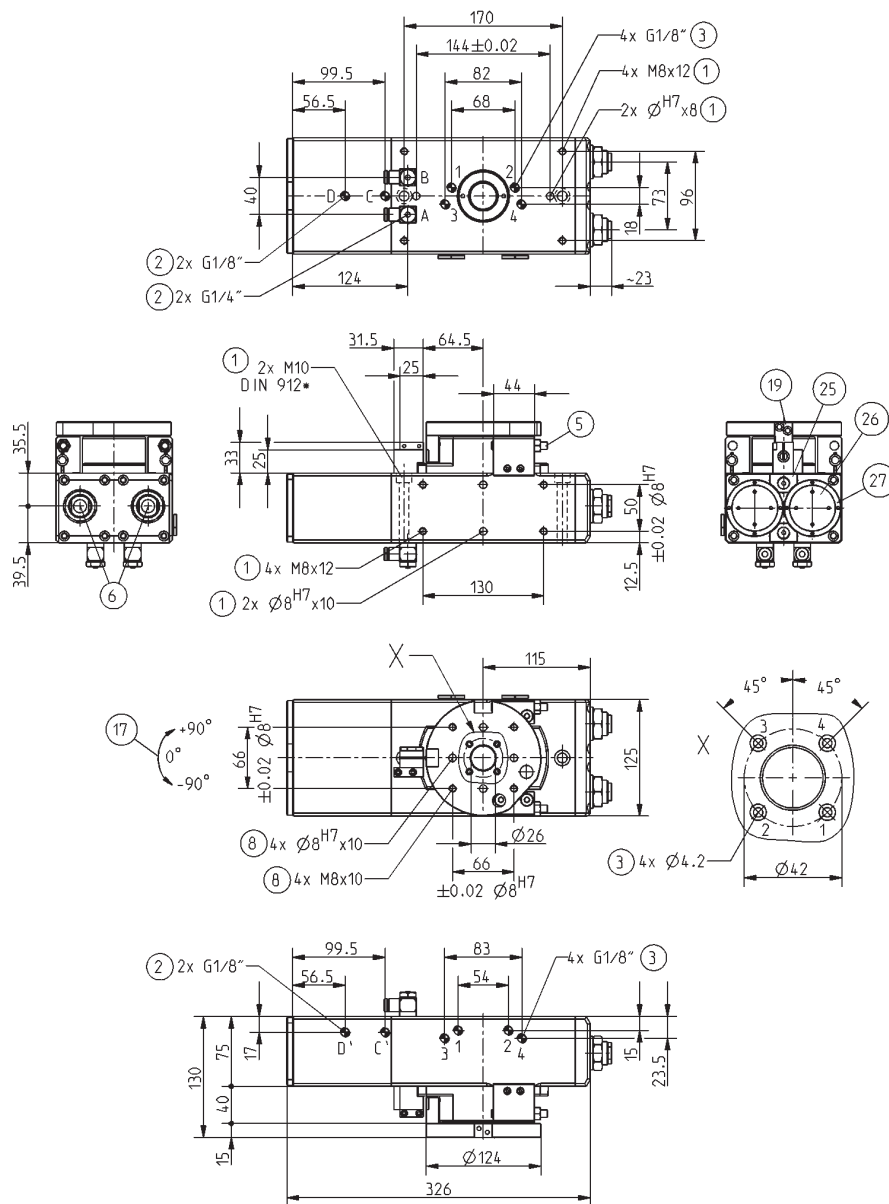
Subject to change without prior notice

* Connection NJ8
** Connection NJ12

Order no.:	SF125MLI4-B
Swivel angle [°]:	-90/0/+90
Torque [Nm]:	34
Swivel angle -90°/+90° adjustable +/- [°]:	3
Repetition accuracy -90°/+90° position +/- [°]:	0,01
Repetition accuracy 0° position +/- [°]:	0,1
Passage bore Ø [mm]:	26
Air feed-through [quantity]:	-
Axial bearing load [N]:	3000
Radial bearing load [Nm]:	400
Min./max. operating pressure [bar]:	4/8
Min./max. operating temperature [°C]:	5/80
Air volume per cycle [cm³]:	1040
Weight [kg]:	15,0

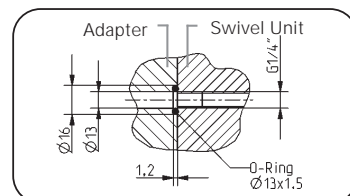
All data measured at 6 bar

SF125MLI4-B

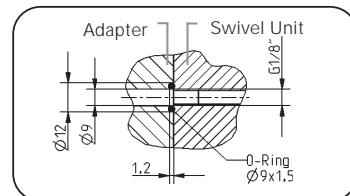


- ① Fixing swivel unit
- ② Energy supply
- ③ Hoseless air connection
- ⑤ Adjusting screw
- ⑥ Shock absorbers
- ⑧ Fixing tool side
- ⑪ Swivel direction
- ⑪ Switch cam -90°/0°/+90°
- ⑪ Clamping plate
- ⑪ Cover for shock absorbers
- ⑪ Set sleeve 0° position
- ⑪ Air connection swivel to +90°
- ⑪ Air connection swivel to -90°
- ⑪ See control diagram middle position
- ⑪ See control diagram middle position (alternate)

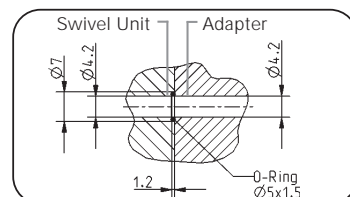
* replaced by DIN EN ISO 4762



Hoseless energy connection (maschine side)



Hoseless air connection (maschine side)



Hoseless air connection (tool side)

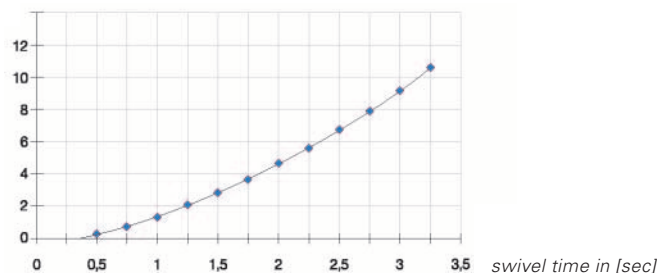
Subject to change without prior notice

Flat Swivel Unit *with 3 position*

Moment of inertia

Shows the expected swivel time against the calculated moment of inertia

Moment of inertia in [kg m²]

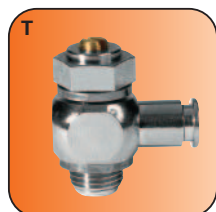


Data measured at 6 bar and horizontal mounting position

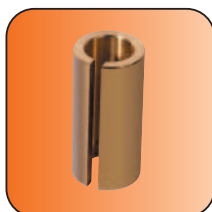


Picture shows SF155M

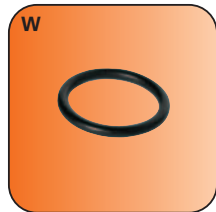
Included in the delivery



Pneumatic fittings
Order no. DRV1/4x8



Reduction sleeve
(ø 12 - ø 8 mm)
Order no. BDMS15500



O-Ring
Order no. COR0040150

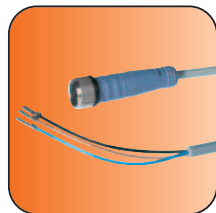
Accessory list



Pneumatic fittings
Order no. WV1/8x6



Proximity switch
Order no. NJ8-E2S-14
Order no. NJ12-E2S-02

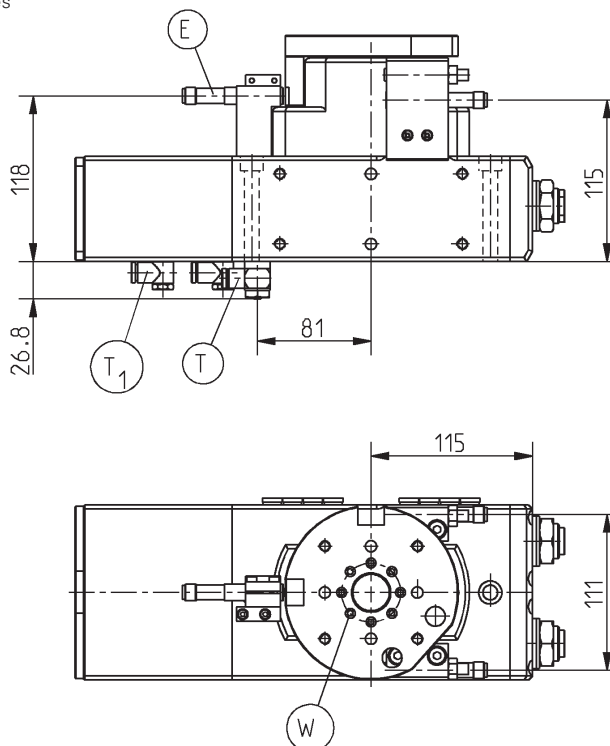


Cable straight plug
Order no. KAG500 *
Order no. KAG500-02 **



Plug 3-pole
Order no. S12-G-3

Accessories



Subject to change without prior notice

* Connection NJ8
** Connection NJ12

All data measured at 6 bar



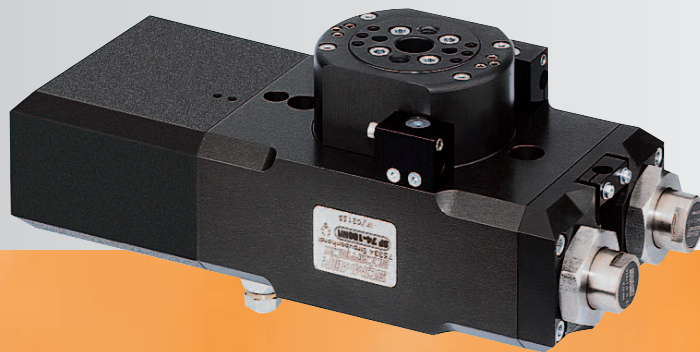
105



*Flat **Swivel Units***

*with **3 positions***

pneumatic



*SF74M-B
SF100M-B*

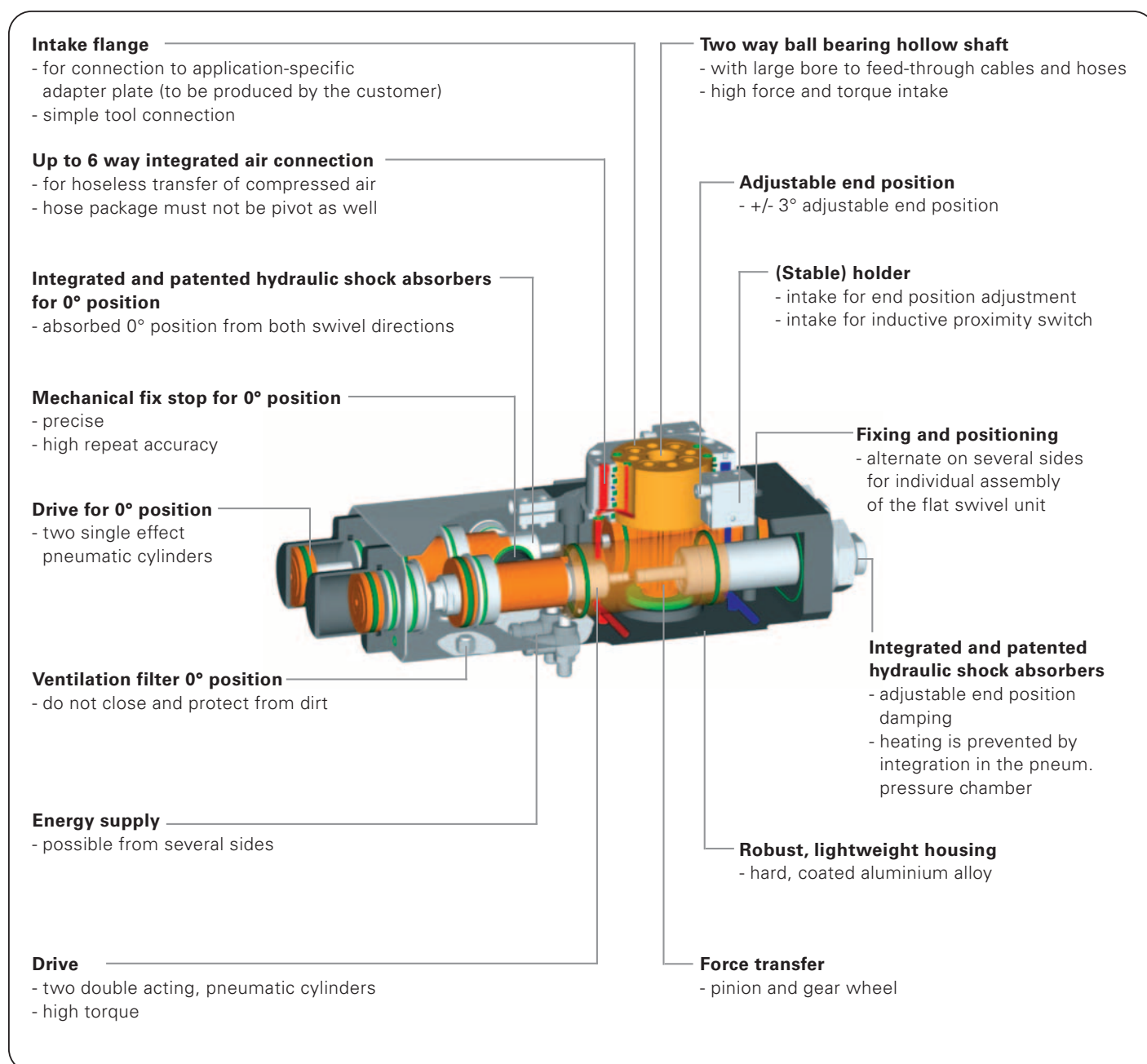
SOMMER
automatic

Flat Swivel Unit *with 3 positions*

Features

- Compact flat swivel unit with 3 positions (+90°/0°/-90°) and a torque up to 20 Nm
- All three positions with mechanical fixed stop and antishock for high repetition accuracy and low wear end position hitting
- Also available as a design with integrated pneumatic rotor distributor with up to 6 way hoseless air transfer

Functional diagram





Terms

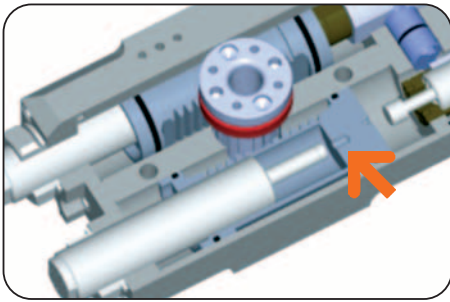
Torque:	force moment occurring on the edge of the swivel unit
Swivel time:	time required to cover a +90°/0°/-90° swivel movement
Repeatability:	dispersion of stop positions at 100 consecutive swivel cycles
Cycle:	distance covered by the piston in one +90°/0°/-90°/0°/+90° swivel movement
Maintenance:	<p>maintenance free up to 10 Mio. swivel cycles (please see the owner's manual for conditions, download from www.sommer-automatic.com)</p> <ul style="list-style-type: none"> • long maintenance intervals keep costs down • long durability

Model

M:	Middle position, 0° position mechanically locked
D4:	Two double acting pneumatic cylinders, hoseless pneumatic 4 way rotary distributor
D6:	Two double acting pneumatic cylinders, hoseless pneumatic 6 way rotary distributor

Order no.	Swivel angle	Torque	Center through-bore	Air feed-through
SF74M-B	+90°/0°/-90°	6 Nm	Ø 12 mm	-
SF74MD4-B	+90°/0°/-90°	4,5 Nm	Ø 12 mm	4
SF74MD6-B	+90°/0°/-90°	4,5 Nm	Ø 12 mm	6
SF100M-B	+90°/0°/-90°	20 Nm	Ø 15 mm	-
SF100MD4-B	+90°/0°/-90°	15 Nm	Ø 15 mm	4
SF100MD6-B	+90°/0°/-90°	15 Nm	Ø 15 mm	6

Flat Swivel Unit *with 3 positions*



Drive (180°)

Two double acting pneumatic cylinders

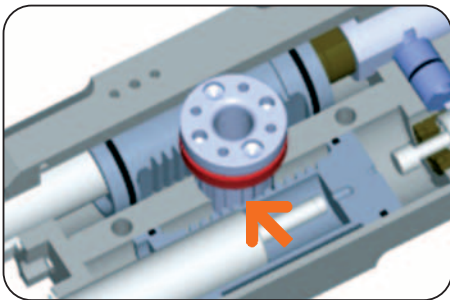
- Maximum torque in both rotation directions
- Torque up to 20 Nm



Swivel angle +90° / 0° / -90°

End stop (+90° / -90°) can be aligned via adjustment screw +/- 3°

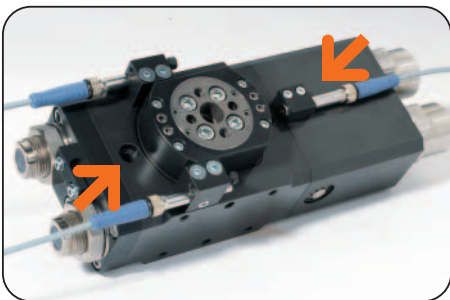
- External fixed stop to absorb the force over housing prevents overload of pinion and gear wheel
- 0° position preset ex works



Force transfer

Via pinion and gear wheel

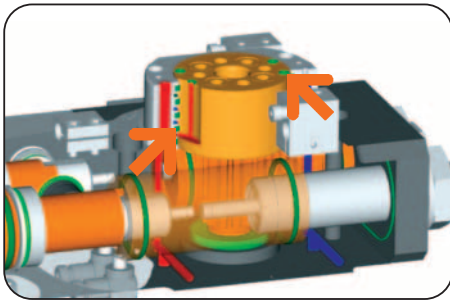
- Optimum steering of drive force in torque
- High repeatability
- Two way ball bearings for high torque intake



Machine connection

Position sensing, energy supply, attachment and positioning-possibilities on several sides

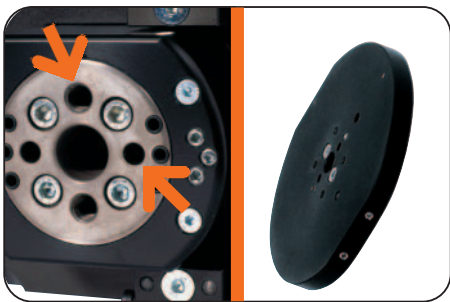
- For inductive proximity switches
- Optimum integration into the workroom through individual mounting -position
- Hoseless direct connection possible, no additional interference contours
- Exhaust air flow control valve for speed regulation (included in the delivery)



Air transfer

Hoses, up to 8 pneumatic feed-through

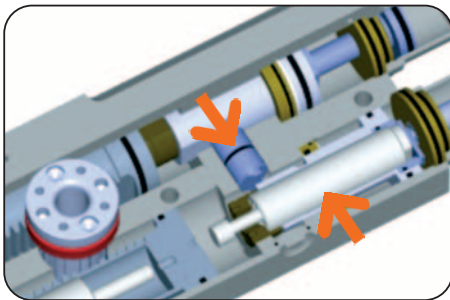
- Reduces interference contour, hose package must not pivot as well
- Smooth rotary distributor due to O-ring with Teflon support ring
- Compact external dimensions due to direct screwing on the housing



Individual connecting plate intake

Direct screwing onto the working flange

- Stable thread and pin holes
- Low design effort
- Simple connection
- Standard adapter available as accessory



0° intermediate position

Shock absorbed and mechanically locked via positive drive

- Very high repetition accuracy
- Exact and low wear approach to 0° position
- No crossing of intermediate position at high loads

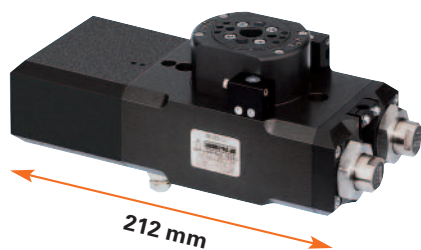


Damping

Hydraulic shock absorber with spiral groove technology

- Low wear approach to end position, gentle energy absorption due to profiled spiral groove
- The damping characteristics can be individually adjusted by the screw depth
- Built into the pressure chamber, cooled by permanent air flow, constant damping behavior

Flat Swivel Unit *with 3 positions*

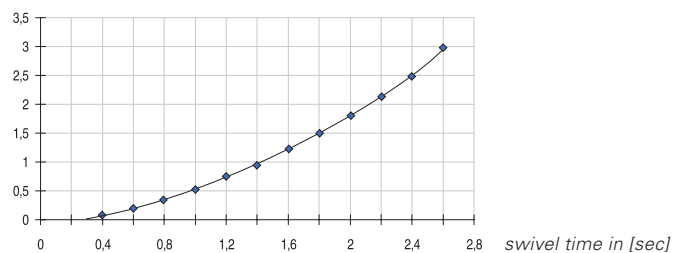


Picture shows SF74MD6L

Moment of inertia

Shows the expected swivel time against the calculated moment of inertia.

Moment of inertia in [kg m²]

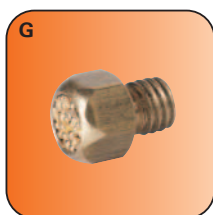


Data measured at 6 bar and horizontal mounting position

Included in the delivery



Mounting block 0° position
Order no. KB6.5-01

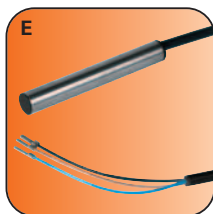


Ventilation filter
Order no. CBF001

Accessory list



Pneumatic fittings
Order no. WVM5



Proximity switch
Order no. NJ6.5-E2

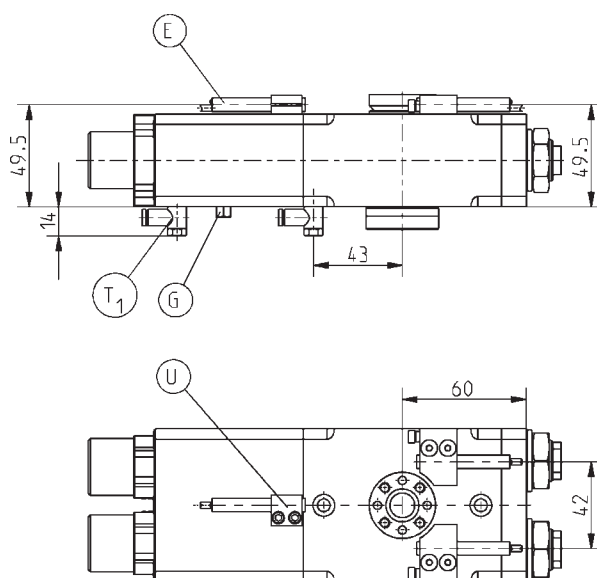


Plug 3-pole
Order no. S12-G-3



Adapter plate
Order no. SFP74N
see SF74N, page 38

Accessories SF74M-B



Subject to change without prior notice

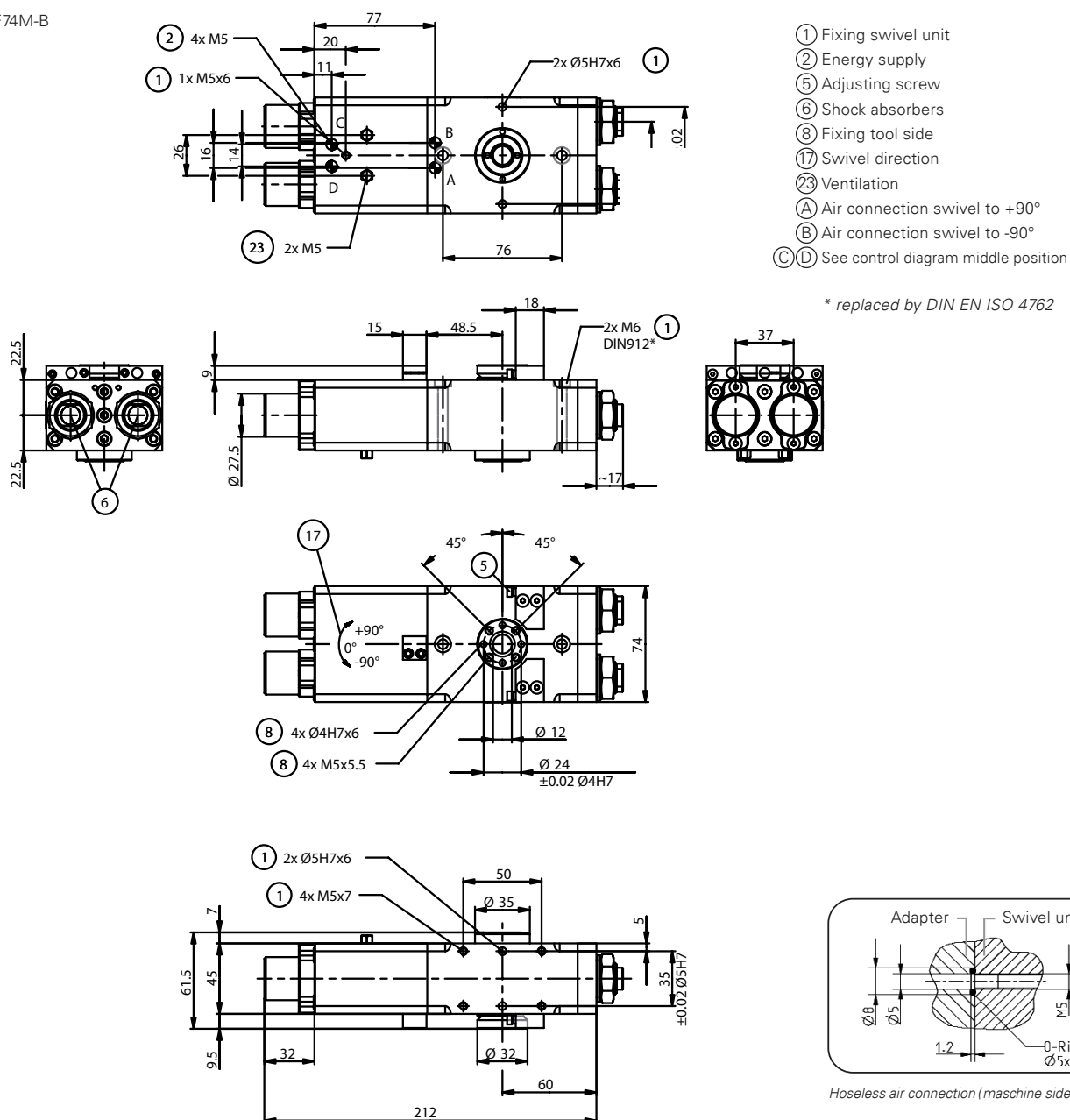


Order no.:	SF74M-B
Swivel angle [°]:	-90/0/+90
Torque [Nm]:	6
Swivel angle -90°/+90° adjustable +/- [°]*:	3
Repeatability -90°/+90°-position +/- [°]:	0,01
Repetition accuracy 0° position +/- [°]:	0,1
Passage bore Ø [mm]:	12
Air feed-through [quantity]:	-
Axial bearing load [N]:	1000
Radial bearing load [Nm]:	75
Min./max. operating pressure [bar]:	4/8
Min./max. operating temperature [°C]:	5/80
Air volume per cycle [cm³]:	66
Weight [kg]:	2,5

All data measured at 6 bar

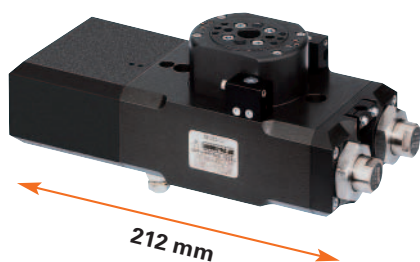
* 0°-position preset ex works, not adjustable

SF74M-B



Subject to change without prior notice

Flat Swivel Unit *with 3 positions*

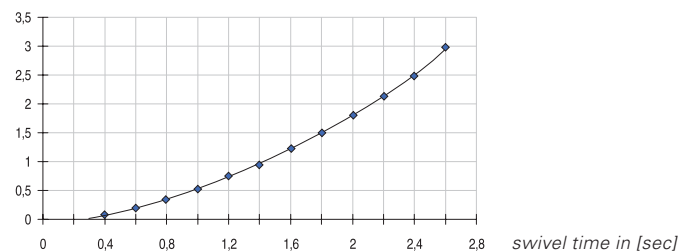


Picture shows SF74MD6L

Moment of inertia

Shows the expected swivel time against the calculated moment of inertia.

Moment of inertia in $[kg\ m^2]$

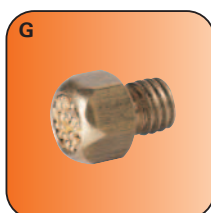


Data measured at 6 bar and horizontal mounting position

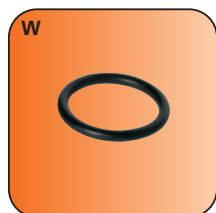
Included in the delivery



Mounting block 0° position
Order no. KB6.5-01



Ventilation filter
Order no. CBF001



O-Ring
Order no. COR0020100

Accessory list



Pneumatic fittings
Order no. WVM5



Proximity switch
Order no. NJ6.5-E2

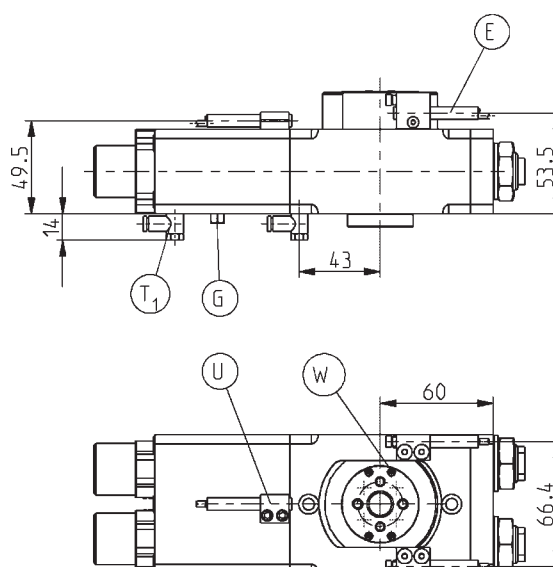


Plug 3-pole
Order no. S12-G-3



Adapter plate
Order no. SFP74D
see SF74ND4, page 40

Accessories SF74MD4-B



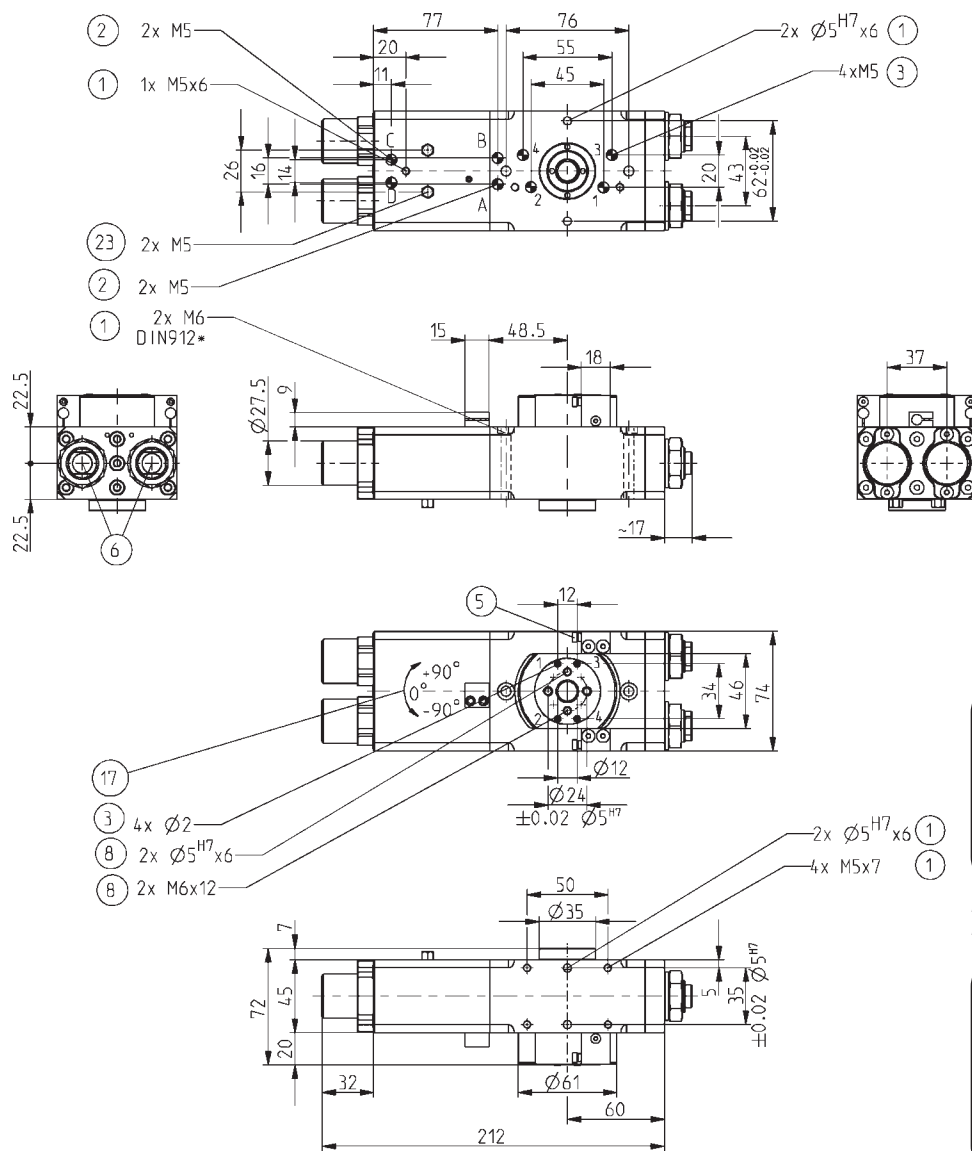
Subject to change without prior notice

Order no.:	SF74MD4-B
Swivel angle [°]:	-90/0/+90
Torque [Nm]:	4,5
Swivel angle -90°/+90° adjustable +/- [°]*:	3
Repeatability -90°/+90°-position +/- [°]:	0,01
Repetition accuracy 0° position +/- [°]:	0,1
Passage bore Ø [mm]:	12
Air feed-through [quantity]:	4
Axial bearing load [N]:	1000
Radial bearing load [Nm]:	75
Min./max. operating pressure [bar]:	4/8
Min./max. operating temperature [°C]:	5/80
Air volume per cycle [cm³]:	66
Weight [kg]:	2,6

All data measured at 6 bar

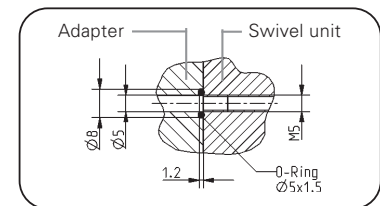
* 0°-position preset ex works, not adjustable

SF74MD4-B

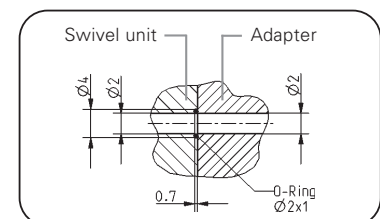


- ① Fixing swivel unit
- ② Energy supply
- ③ Hoseless air connection
- ⑤ Adjusting screw
- ⑥ Shock absorbers
- ⑧ Fixing tool side
- ①7 Swivel direction
- ②3 Ventilation
- Ⓐ Air connection swivel to +90°
- Ⓑ Air connection swivel to -90°
- Ⓒ Ⓓ See control diagram middle position

* replaced by DIN EN ISO 4762



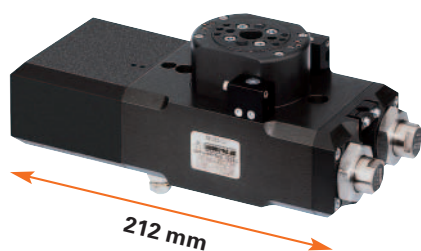
Hoseless air connection (maschine side)
Hoseless energy connection (maschine side)



Hoseless air connection (tool side)

Subject to change without prior notice

Flat Swivel Unit *with 3 positions*

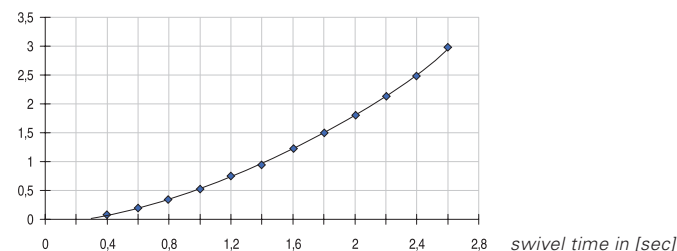


Picture shows SF74MD6L

Moment of inertia

Shows the expected swivel time against the calculated moment of inertia.

Moment of inertia in $[kg\ m^2]$

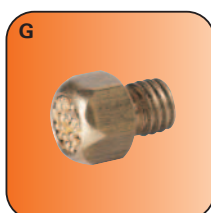


Data measured at 6 bar and horizontal mounting position

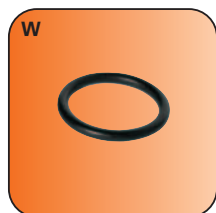
Included in the delivery



Mounting block 0° position
Order no. KB6.5-01



Ventilation filter
Order no. CBF001

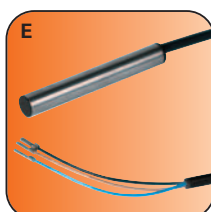


O-Ring
Order no. COR0020100

Accessory list



Pneumatic fittings
Order no. WVM5



Proximity switch
Order no. NJ6.5-E2

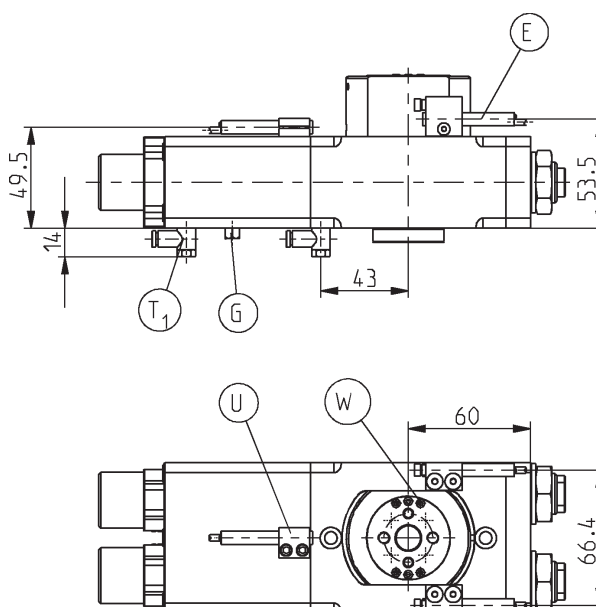


Plug 3-pole
Order no. S12-G-3



Adapter plate
Order no. SFP74D
see SF74ND6, page 42

Accessories SF74MD6-B



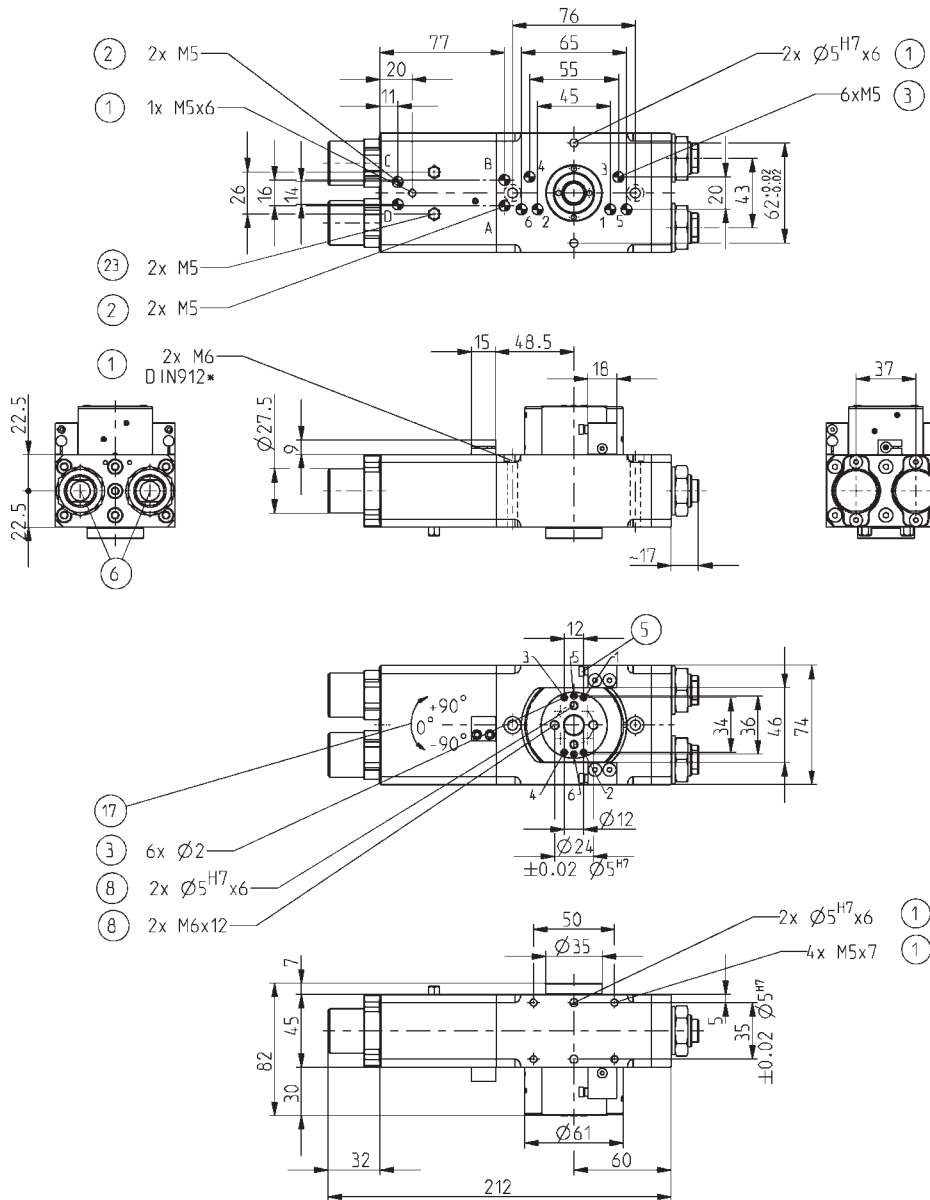
Subject to change without prior notice

Order no.:	SF74MD6-B
Swivel angle [°]:	-90/0/+90
Torque [Nm]:	4,5
Swivel angle -90°/+90° adjustable +/- [°]*:	3
Repeatability -90°/+90°-position +/- [°]:	0,01
Repetition accuracy 0° position +/- [°]:	0,1
Passage bore Ø [mm]:	12
Air feed-through [quantity]:	6
Axial bearing load [N]:	1000
Radial bearing load [Nm]:	75
Min./max. operating pressure [bar]:	4/8
Min./max. operating temperature [°C]:	5/80
Air volume per cycle [cm³]:	66
Weight [kg]:	2,8

All data measured at 6 bar

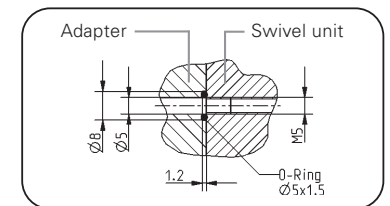
* 0°-position preset ex works, not adjustable

SF74MD6-B

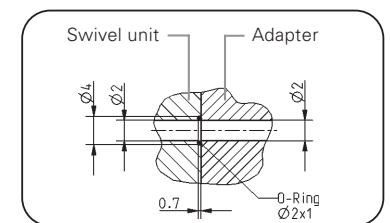


- ① Fixing swivel unit
- ② Energy supply
- ③ Hoseless air connection
- ⑤ Adjusting screw
- ⑥ Shock absorbers
- ⑧ Fixing tool side
- ⑪ Swivel direction
- ⑬ Ventilation
- ⑭ Air connection swivel to +90°
- ⑮ Air connection swivel to -90°
- ⑯ See control diagram middle position

* replaced by DIN EN ISO 4762



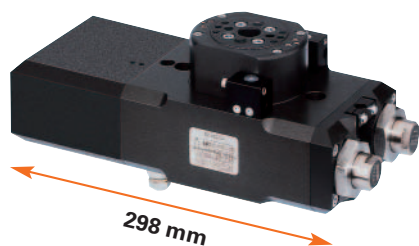
Hoseless air connection (maschine side)
Hoseless energy connection (maschine side)



Hoseless air connection (tool side)

Subject to change without prior notice

Flat Swivel Unit *with 3 positions*

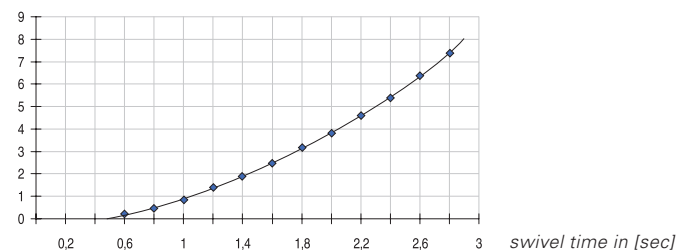


Picture shows SF74MD6L

Moment of inertia

Shows the expected swivel time against the calculated moment of inertia.

Moment of inertia in $[kg \cdot m^2]$

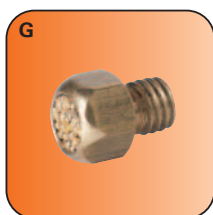


Data measured at 6 bar and horizontal mounting position

Included in the delivery



Mounting block
Order no. KB8-21



Ventilation filter
Order no. CBF001

Accessory list



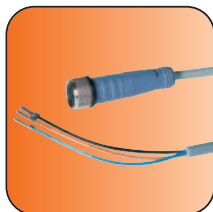
Pneumatic fittings
Order no. WVM5



Pneumatic fittings
Order no. WV1/8x6



Proximity switch
Order no. NJ8-E2S



Cable straight plug
Order no. KAG500

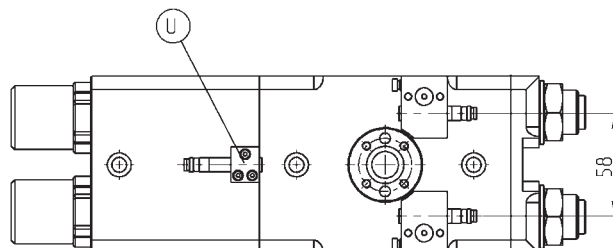
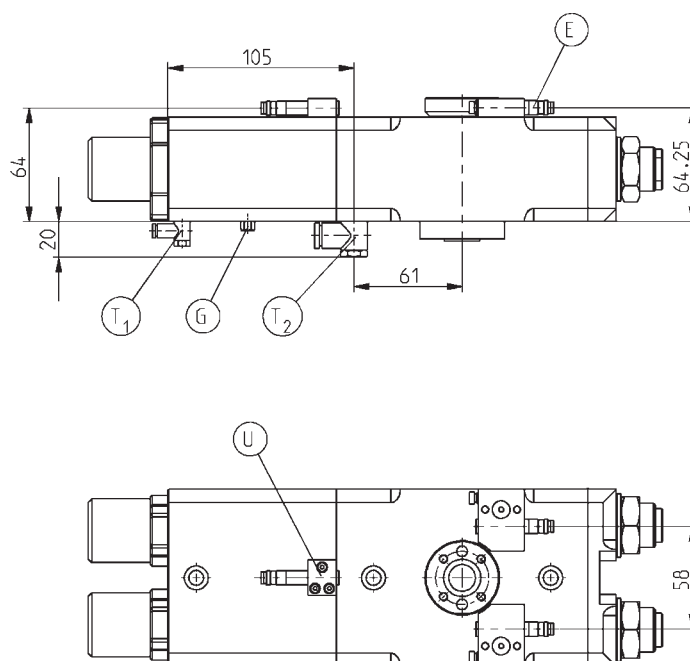


Plug 3-pole
Order no. S12-G-3



Adapter plate
Order no. SFP100N
see SF100N, page 44

Accessories



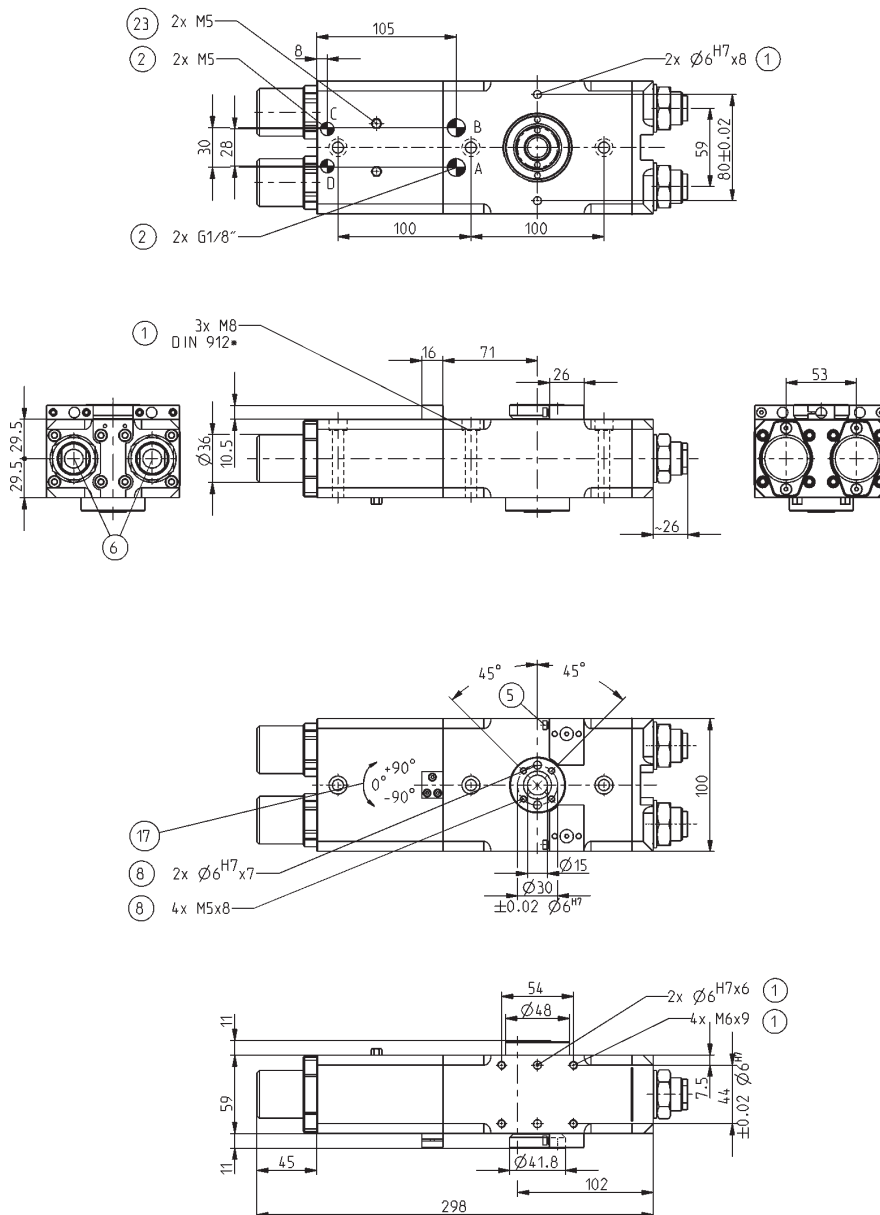
Subject to change without prior notice

Order no.:	SF100M-B
Swivel angle [°]:	-90/0/+90
Torque [Nm]:	20
Swivel angle -90°/+90° adjustable +/- [°]*:	3
Repeatability -90°/+90°-position +/- [°]:	0,01
Repetition accuracy 0° position +/- [°]:	0,1
Passage bore Ø [mm]:	15
Air feed-through [quantity]:	-
Axial bearing load [N]:	2500
Radial bearing load [Nm]:	150
Min./max. operating pressure [bar]:	4/8
Min./max. operating temperature [°C]:	5/80
Air volume per cycle [cm³]:	200
Weight [kg]:	5,8

All data measured at 6 bar

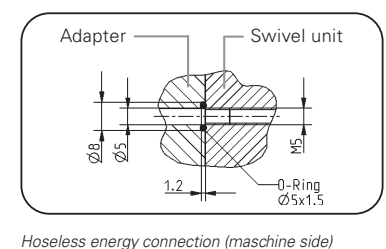
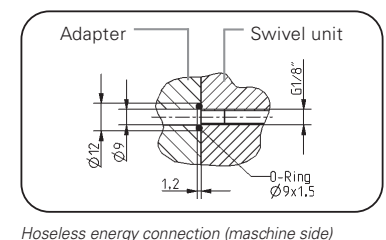
* 0°-position preset ex works, not adjustable

SF100M-B



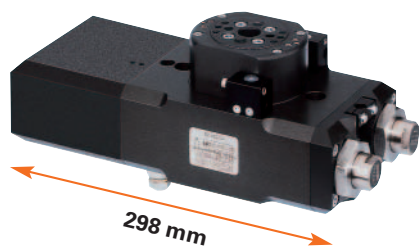
- ① Fixing swivel unit
- ② Energy supply
- ⑤ Adjusting screw
- ⑥ Shock absorbers
- ⑧ Fixing tool side
- ⑪ Swivel direction
- ⑬ Ventilation
- ⑭ Air connection swivel to +90°
- ⑮ Air connection swivel to -90°
- ⑯ See control diagram middle position

* replaced by DIN EN ISO 4762



Subject to change without prior notice

Flat Swivel Unit *with 3 positions*

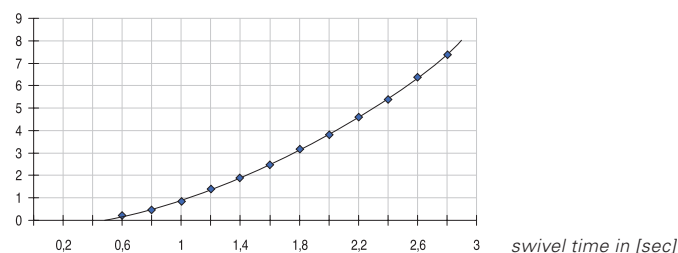


Picture shows SF74MD6L

Moment of inertia

Shows the expected swivel time against the calculated moment of inertia.

Moment of inertia in $[kg\ m^2]$

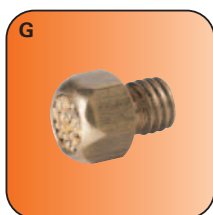


Data measured at 6 bar and horizontal mounting position

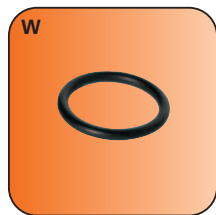
Included in the delivery



Mounting block
Order no. KB8-21



Ventilation filter
Order no. CBF001



O-Ring
Order no. COR0020100

Accessory list



Pneumatic fittings
Order no. WVM5



Pneumatic fittings
Order no. WV1/8x6

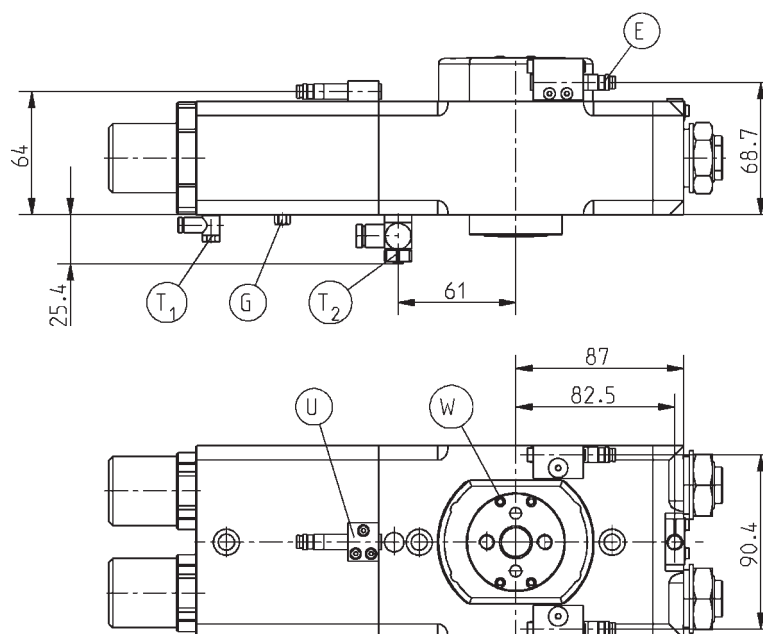


Proximity switch
Order no. NJ8-E2S



Adapter plate
Order no. SFP100D
see SF100ND4, page 46

Accessories

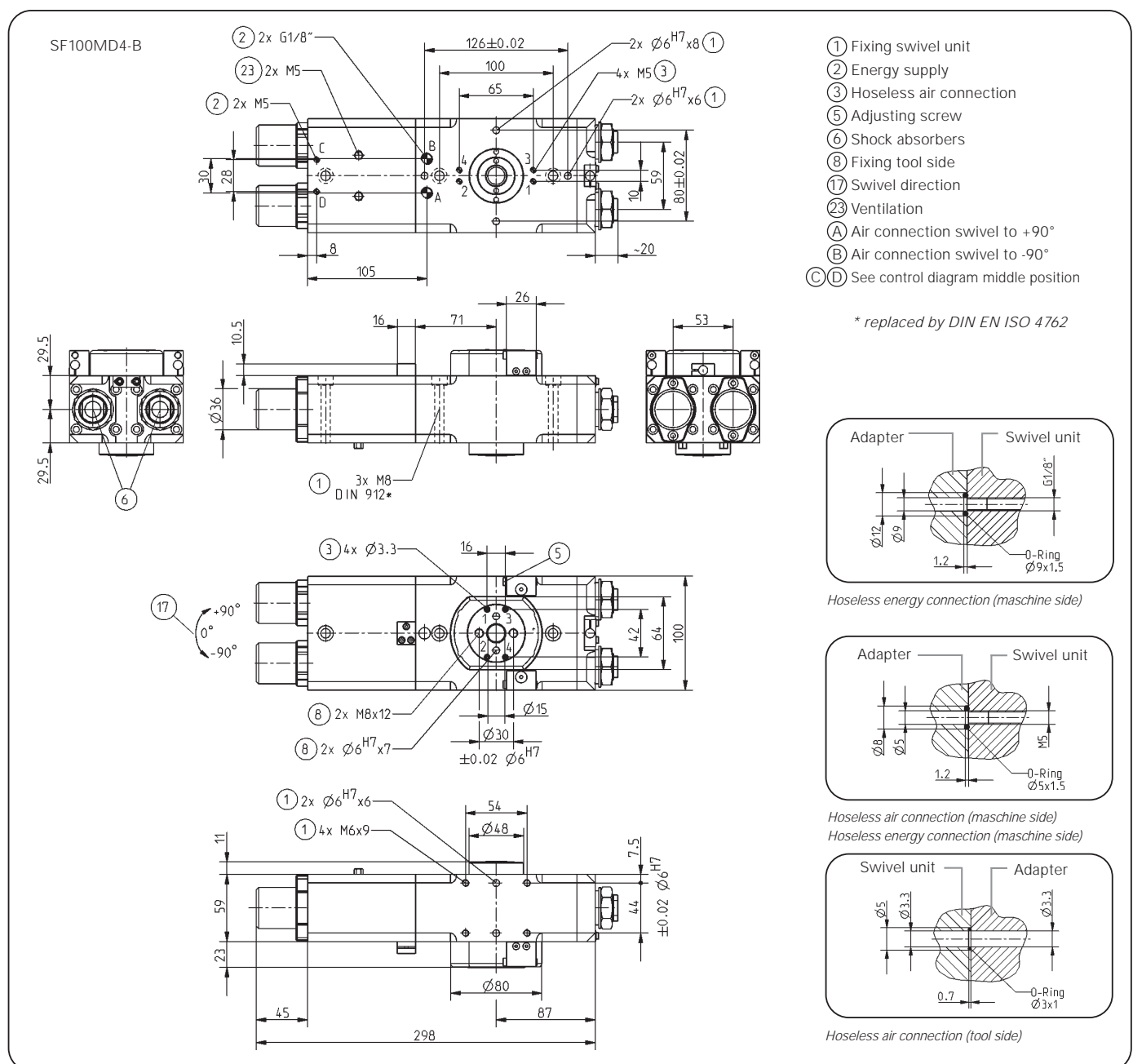


Subject to change without prior notice

Order no.:	SF100MD4-B
Swivel angle [°]:	-90/0/+90
Torque [Nm]:	15
Swivel angle -90°/+90° adjustable +/- [°]*:	3
Repeatability -90°/+90°-Stellung +/- [°]:	0,01
Repetition accuracy 0° position +/- [°]:	0,1
Passage bore Ø [mm]:	15
Air feed-through [quantity]:	4
Axial bearing load [N]:	2500
Radial bearing load [Nm]:	150
Min./max. operating pressure [bar]:	4/8
Min./max. operating temperature [°C]:	5/80
Air volume per cycle [cm³]:	200
Weight [kg]:	6,3

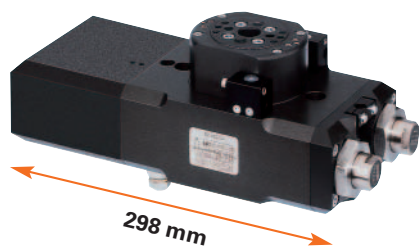
All data measured at 6 bar

* 0°-position preset ex works, not adjustable



Subject to change without prior notice

Flat Swivel Unit *with 3 positions*

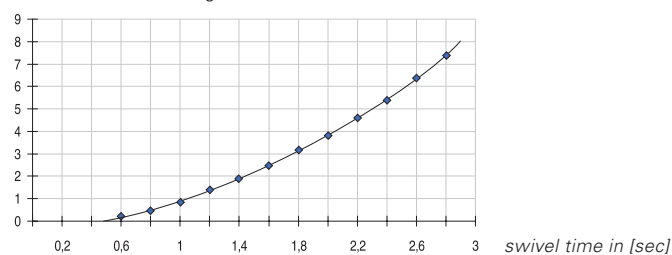


Picture shows SF74MD6L

Moment of inertia

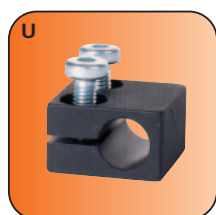
Shows the expected swivel time against the calculated moment of inertia.

Moment of inertia in [kg m²]

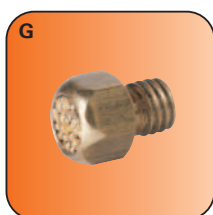


Data measured at 6 bar and horizontal mounting position

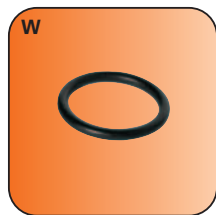
Included in the delivery



Mounting block
Order no. KB8-211



Ventilation filter
Order no. CBF001



O-Ring
Order no. COR0020100

Accessory list



Pneumatic fittings
Order no. WVM5



Pneumatic fittings
Order no. WV1/8x6

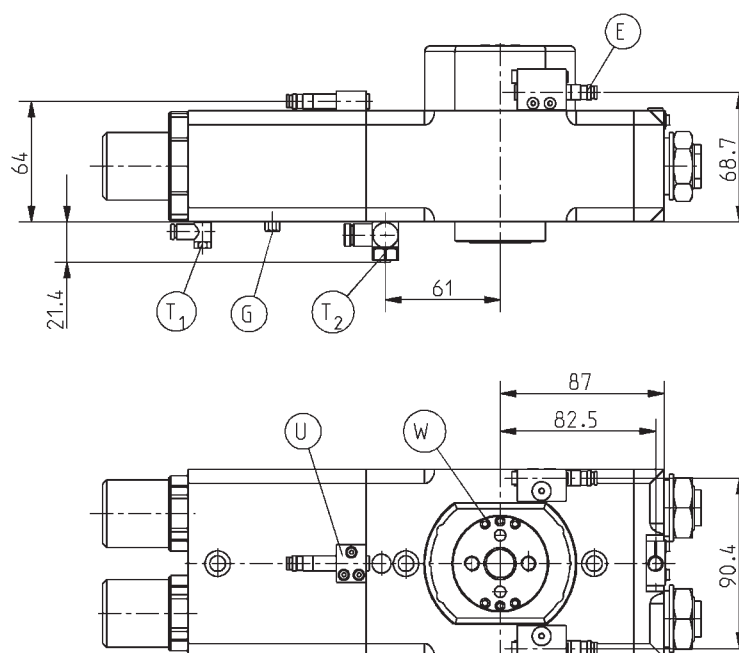


Proximity switch
Order no. NJ8-E2S



Adapter plate
Order no. SFP100D
see SF100ND6, page 38

Accessories



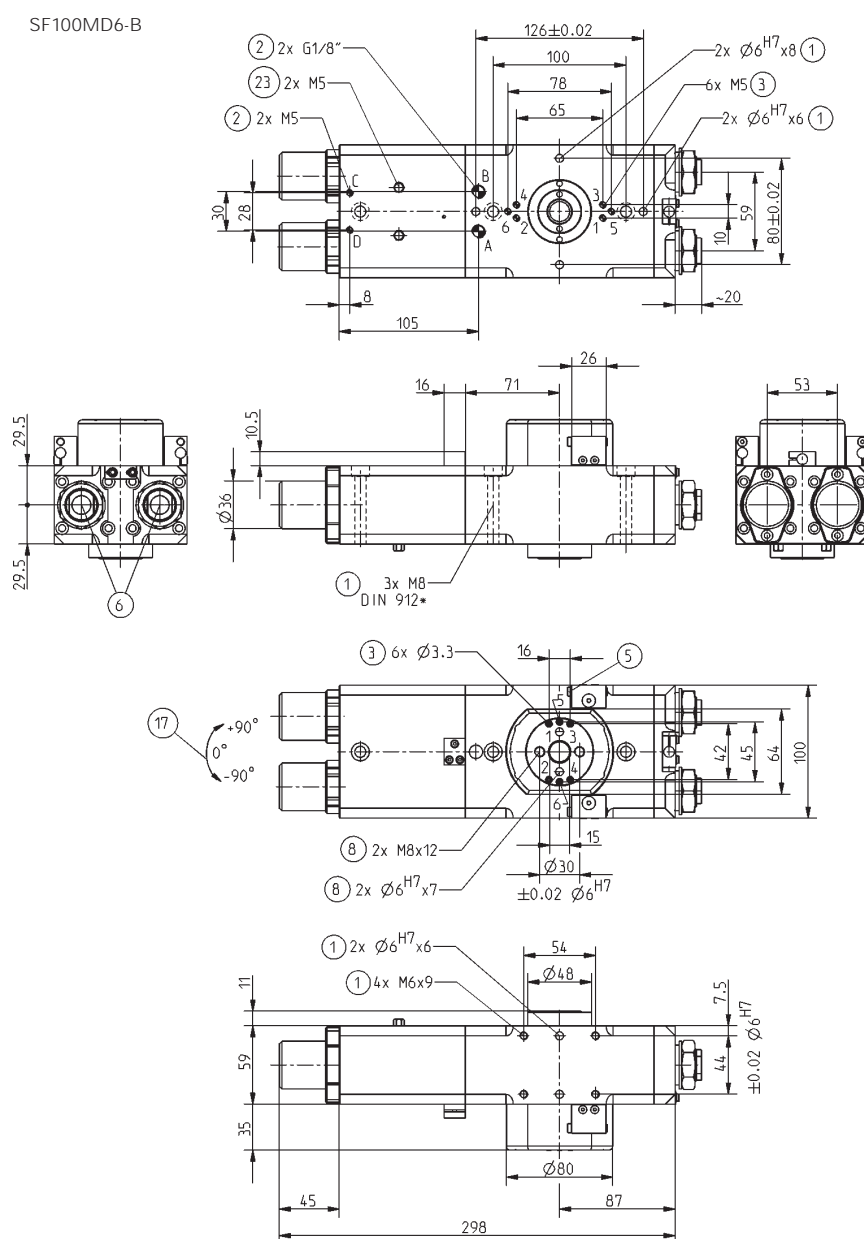
Subject to change without prior notice

SF100MD6-B

Swivel angle [°]:	-90/0/+90
Torque [Nm]:	15
Swivel angle -90°/+90° adjustable +/- [°]*:	3
Repeatability -90°/+90°-Stellung +/- [°]:	0,01
Repetition accuracy 0° position +/- [°]:	0,1
Passage bore Ø [mm]:	15
Air feed-through [quantity]:	6
Axial bearing load [N]:	2500
Radial bearing load [Nm]:	150
Min./max. operating pressure [bar]:	4/8
Min./max. operating temperature [°C]:	5/80
Air volume per cycle [cm³]:	200
Weight [kg]:	6,2

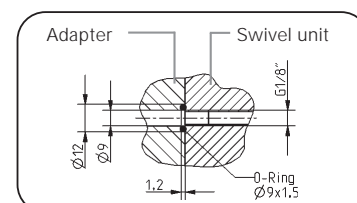
All data measured at 6 bar

* 0°-position preset ex works, not adjustable

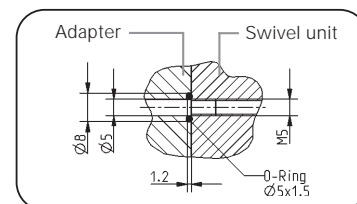


- ① Fixing swivel unit
- ② Energy supply
- ③ Hoseless air connection
- ⑤ Adjusting screw
- ⑥ Shock absorbers
- ⑧ Fixing tool side
- ⑪ Swivel direction
- ⑫ Ventilation
- ⑬ Air connection swivel to +90°
- ⑭ Air connection swivel to -90°
- ⑮ See control diagram middle position

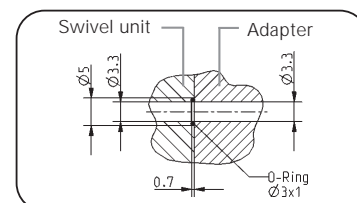
* replaced by DIN EN ISO 4762



Hoseless energy connection (maschine side)



Hoseless air connection (maschine side)
Hoseless energy connection (maschine side)



Hoseless air connection (tool side)

Subject to change without prior notice



Flat Swivel Units

*with 3 positions
pneumatic*



*SF155M
SF195M
SF150SM
SF190SM*

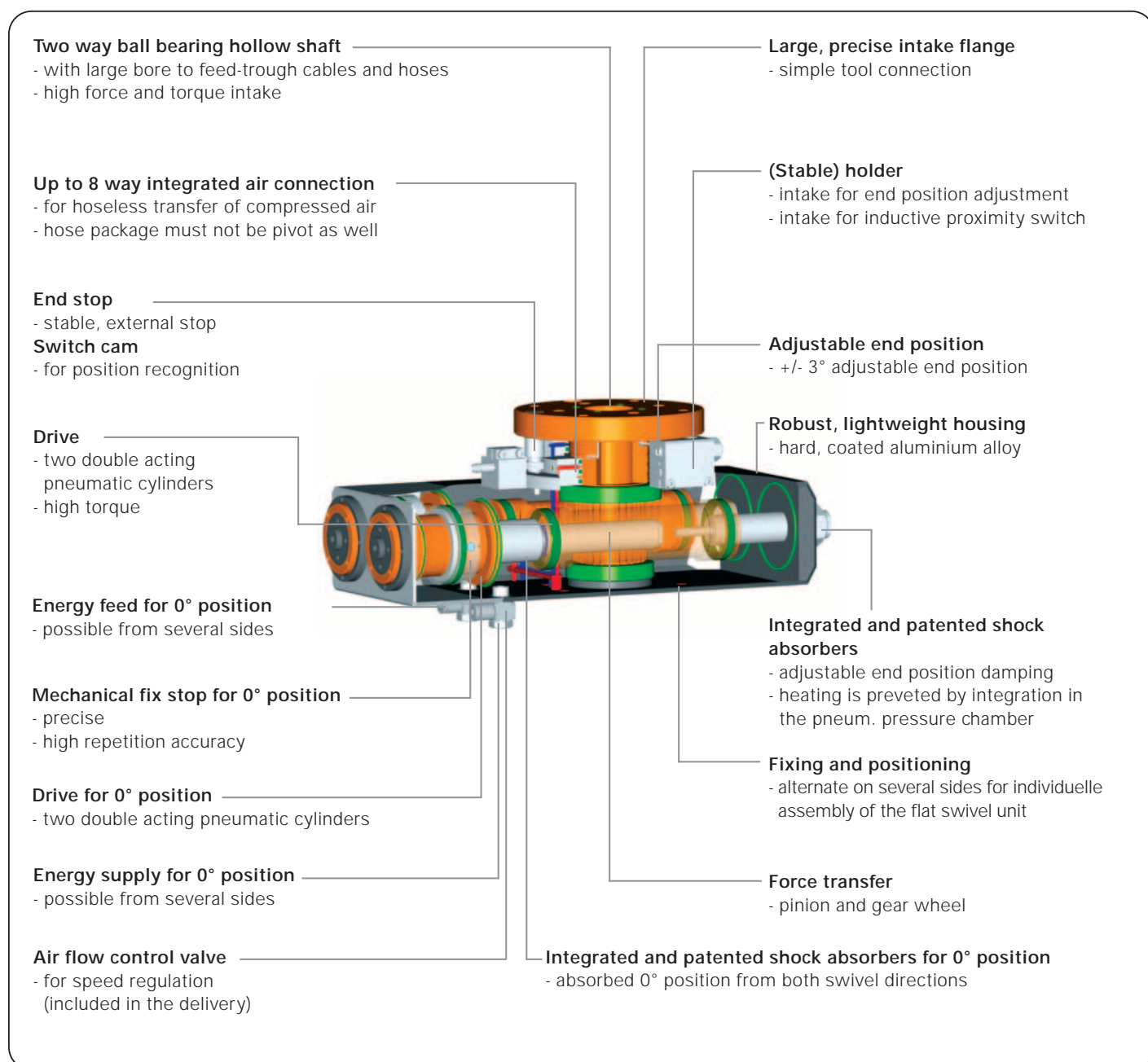
SOMMER
automatic

Flat Swivel Unit *with 3 positions*

➤ Features

- Flat swivel unit with 3 positions (+90°/0°/-90°) and large drive flange, torque up to 130 Nm
- All three positions with mechanical fixed stop and antishock for high repetition accuracy and low wear end position hitting
- Also available as a design with integrated pneumatic rotary distributor with up to 8 way hoseless air transfer

Functional diagram



Terms

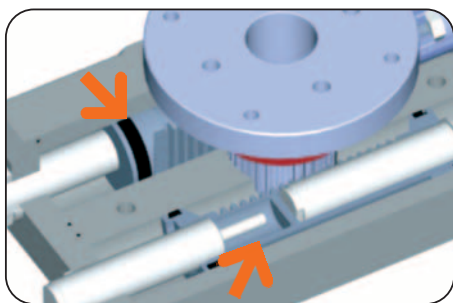
Torque:	force moment occurring on the edge of the swivel unit
Swivel time:	time required to cover a 0/90° or 0/180° swivel movement
Repeatability:	dispersion of stop positions at 100 consecutive swivel cycles
Cycle:	distance covered by the piston in one 0/90/0° or 0/180/0° swivel movement
Maintenance:	<p>maintenance free up to 10 Mio. swivel cycles (please see the owner's manual for conditions, download from www.sommer-automatic.com)</p> <ul style="list-style-type: none"> • long maintenance intervals keep costs down • long durability

Model

M:	Middle position, 0° position mechanically locked
I4:	Two double acting pneumatic cylinders, hoseless pneumatic 4 way rotary distributor
I8:	Two double acting pneumatic cylinders, hoseless pneumatic 8 way rotary distributor

Order no.	Swivel angle	Torque	Center through-bore	Air feed-trough
SF155M	+90°/0°/-90°	62 Nm	Ø 40 mm	-
SF155MI4	+90°/0°/-90°	58 Nm	Ø 40 mm	4
SF155MI8	+90°/0°/-90°	54 Nm	Ø 40 mm	8
SF195M	+90°/0°/-90°	130 Nm	Ø 40 mm	-
SF195MI4	+90°/0°/-90°	125 Nm	Ø 40 mm	4
SF195MI8	+90°/0°/-90°	120 Nm	Ø 40 mm	8
SF150SM	-90°/0°/+90°	46 Nm	Ø 28 mm	-
SF190SM	-90°/0°/+90°	115 Nm	Ø 28 mm	-

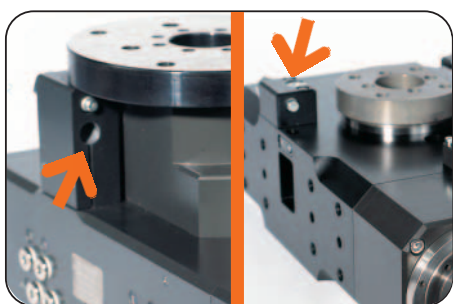
Flat **Swivel Unit** *with 3 positions*



Drive (180°)

Two double acting pneumatic cylinders

- Maximum torque in both rotation directions
- Torque up to 130 Nm



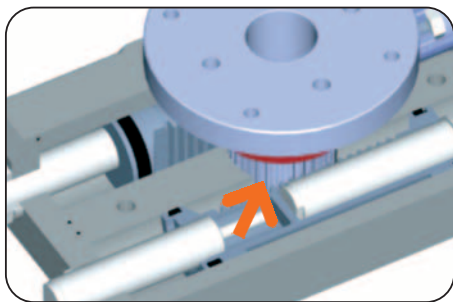
SF155

SF150M

Swivel angle +90° / 0° / -90°

End stop (+90° / -90°) adjustable via adjustment screw +/-3°

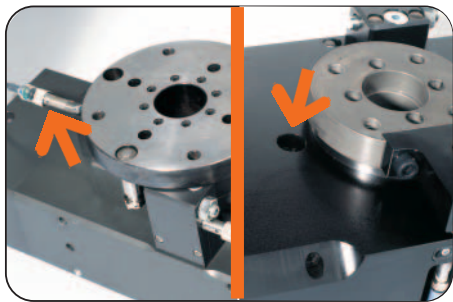
- External fixed stop to absorb the force over housing prevents overload of pinion and gear wheel
- 0° position preset ex works



Force transfer

Via pinion and gear wheel

- Optimum steering of drive force in torque
- High repeatability
- Two way ball bearings for high torque intake



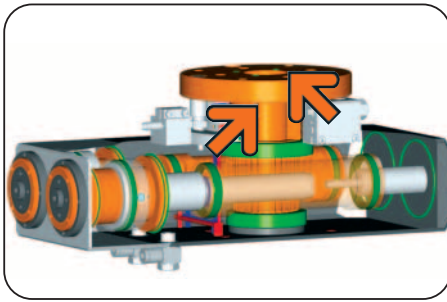
SF155M

SF150SM

Machine connection

Position sensing, energy supply, attachment and positioning-possibilities on several sides

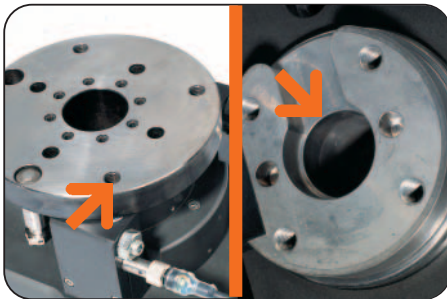
- For inductive proximity switches
- Optimum integration into the workroom through individual mounting-situation
- Hoseless direct connection possible, no additional interference contours
- Exhaust air flow control valve for speed regulation (included in the delivery)



Air transfer

Hoseless, up to 8 pneumatic feed-through

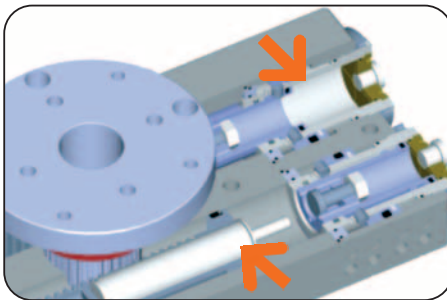
- Reduces interference contour, hose package must not be pivot as well
- Smooth rotary distributor due to O-ring with Teflon support ring
- Compact external dimensions due to direct screwing on the housing
- Available as accessory with SF150SM and SF190SM



Intake flange

Individual connecting plate intake

- Stable thread and pin holes
- Low design effort
- Simple connection
- Large central hole



0° intermediate position

Shock absorbed and mechanically locked via indexing bolts

- Very high repetition accuracy
- Exact and low wear approach to 0° position
- No crossing of intermediate position at high loads
- $\pm 1^\circ$ adjustable
- Adjustable end position absorbency



Damping

Hydraulic shock absorber with spiral groove technology

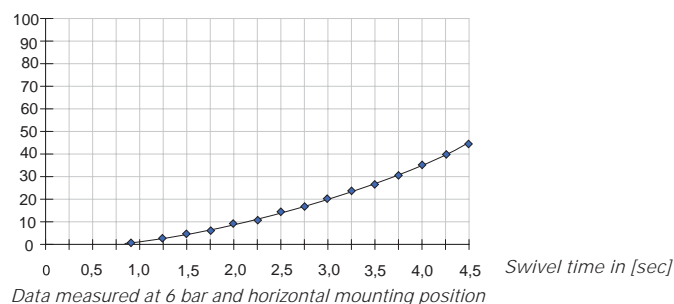
- Low wear approach to end position, gentle energy absorption due to profiled spiral groove
- The damping characteristics can be individually adjusted by the screw depth
- Built into the pressure chamber, cooled by permanent air flow, constant damping behavior

Flat Swivel Unit *with 3 positions*

Moment of inertia

Shows the expected swivel time against the calculated moment of inertia.

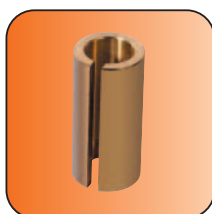
Moment of inertia in [kg m²]



Included in the delivery



Pneumatic fittings
Order no. DRV1/4x8



Reducing bush
(ø 12 - ø 8 mm)
Order no. BDMS15

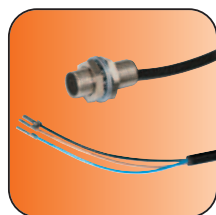
Accessory list



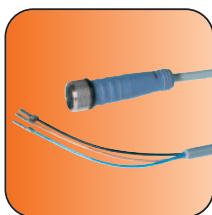
Pneumatic fittings
Order no. WV1/8x6



Proximity switch
Order no. NJ8-E2S-14
Order no. NJ12-E2S-02



Proximity switch
Order no. NJ8-E2
Order no. NJ12-E2-01



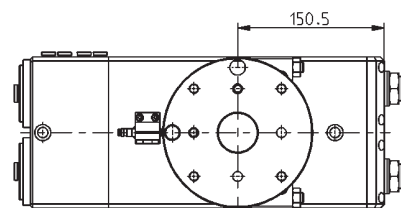
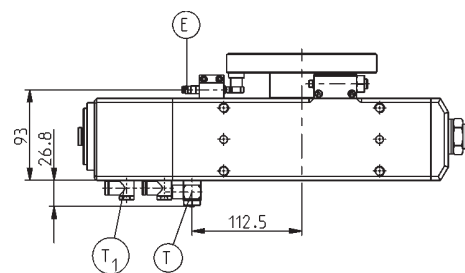
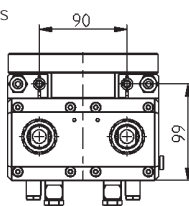
Cable straight plug
Order no. KAG500*
Order no. KAG500-02**



Plug 3-pole
Order no. S12-G-3

* Connection NJ8
** Connection NJ12

Accessories

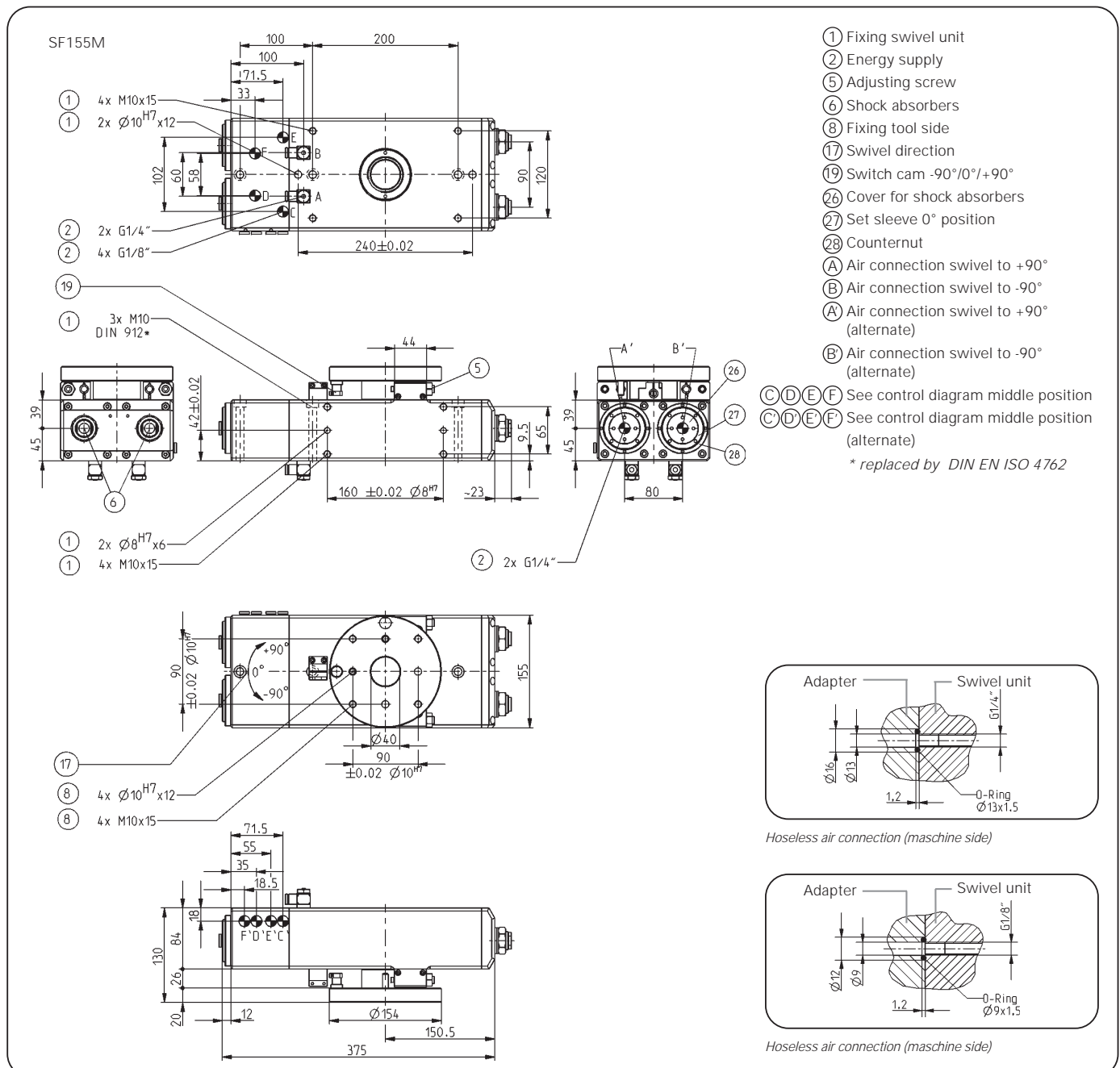


Subject to change without prior notice

Order no.:	SF155M
Swivel angle [°]:	-90/0/+90
Torque [Nm]:	62
Swivel angle -90°/+90° adjustable +/- [°]*:	3
Repeatability -90°/+90° position +/- [°]:	0,01
Repetition accuracy 0° position +/- [°]:	0,05
Passage bore Ø [mm]:	40
Air feed-through [quantity]:	-
Axial bearing load [N]:	6000
Radial bearing load [Nm]:	600
Min./max. operating pressure [bar]:	4/8
Min./max. operating temperature [°C]:	5/80
Air volume per cycle [cm³]:	816
Weight [kg]:	16,0

All data measured at 6 bar

* 0°-position preset ex works, ± 1° adjustable



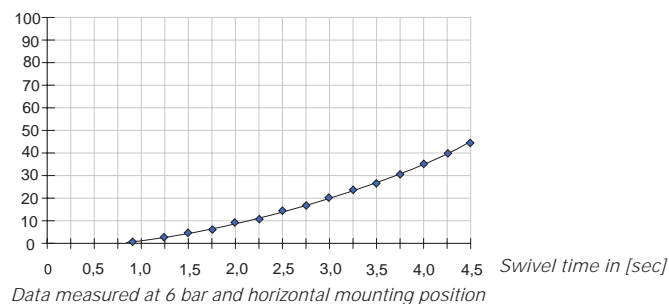
Subject to change without prior notice

Flat Swivel Unit *with 3 positions*

Moment of inertia

Shows the expected swivel time against the calculated moment of inertia.

Moment of inertia in [kg m²]

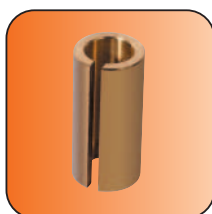


Picture shows SF155M

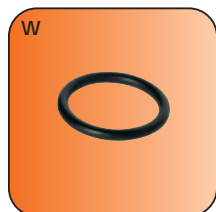
Included in the delivery



Pneumatic fittings
Order no. DRV1/4x8

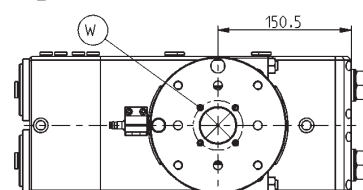
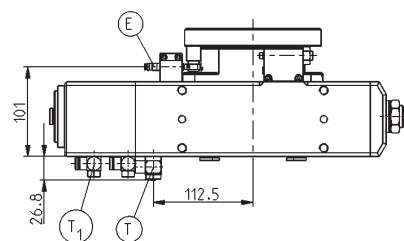
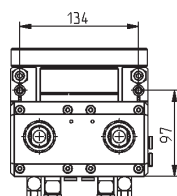


Reducing bush
(ø 12 - ø 8 mm)
Order no. BDMS15500



O-Ring
Order no. COR0040150

Accessories



Subject to change without prior notice

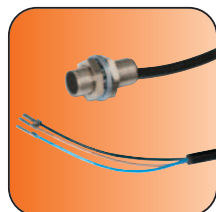
Accessory list



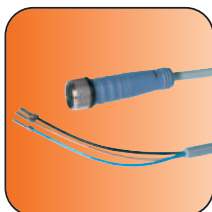
Pneumatic fittings
Order no. WV1/8x6



Proximity switch
Order no. NJ8-E2S-14
Order no. NJ12-E2S-02



Proximity switch
Order no. NJ8-E2
Order no. NJ12-E2-01



Cable straight plug
Order no. KAG500 *
Order no. KAG500-02 **

* Connection NJ8
** Connection NJ12

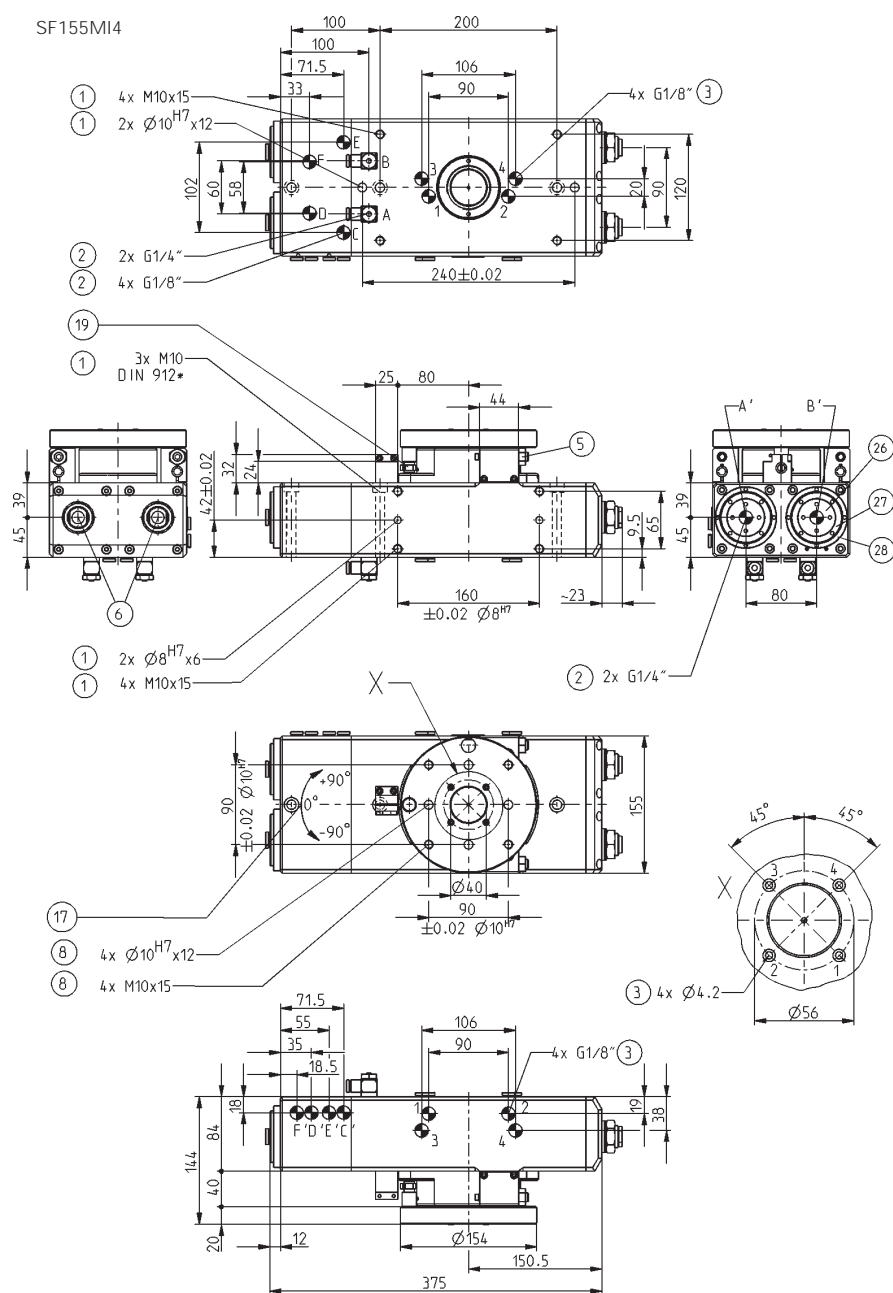


Order no.:	SF155MI4
Swivel angle [°]:	-90/0/+90
Torque [Nm]:	58
Swivel angle -90°/+90° adjustable +/- [°]*:	3
Repeatability -90°/+90° position +/- [°]:	0,01
Repetition accuracy 0° position +/- [°]:	0,05
Passage bore Ø [mm]:	40
Air feed-through [quantity]:	4
Axial bearing load [N]:	6000
Radial bearing load [Nm]:	600
Min./max. operating pressure [bar]:	4/8
Min./max. operating temperature [°C]:	5/80
Air volume per cycle [cm³]:	816
Weight [kg]:	19,0

All data measured at 6 bar

* 0°-position preset ex works, ± 1° adjustable

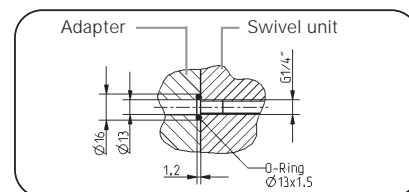
SF155MI4



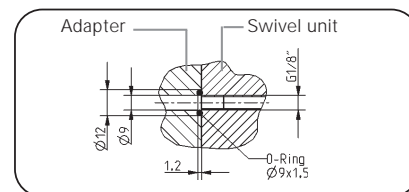
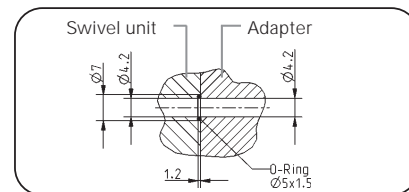
- ① Fixing swivel unit
- ② Energy supply
- ③ Hoseless air connection
- ⑤ Adjusting screw
- ⑥ Shock absorbers
- ⑧ Fixing tool side
- ⑪ Swivel direction
- ⑫ Switch cam -90° or 0° or +90°
- ⑬ Cover for shock absorbers
- ⑭ Set sleeve 0° position
- ⑮ Counternut
- A Air connection swivel to +90°
- B Air connection swivel to -90°
- A' Air connection swivel to +90° (alternate)
- B' Air connection swivel to -90° (alternate)

C D E F See control diagram middle
C' D' E' F' See control diagram middle (alternate)

* replaced by DIN EN ISO 4762



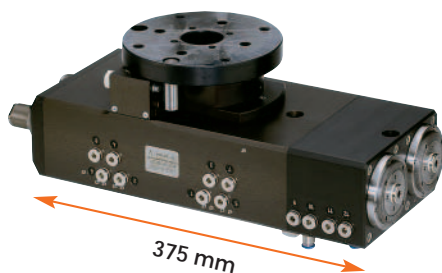
Hoseless energy connection (maschine side)

Hoseless air connection (maschine side)
Hoseless energy connection (maschine side)

Hoseless air connection (tool side)

Subject to change without prior notice

Flat Swivel Unit *with 3 positions*

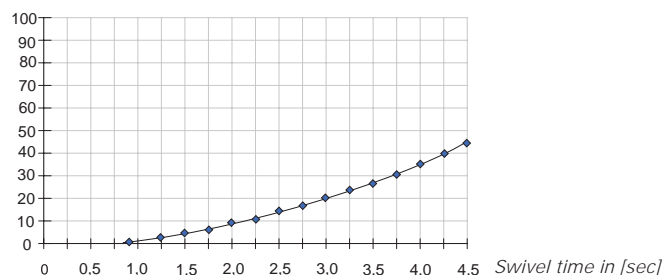


Picture shows SF155M

Moment of inertia

Shows the expected swivel time against the calculated moment of inertia.

Moment of inertia in [kg m²]

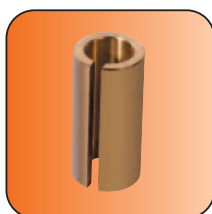


Data measured at 6 bar and horizontal mounting position

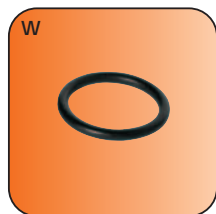
Included in the delivery



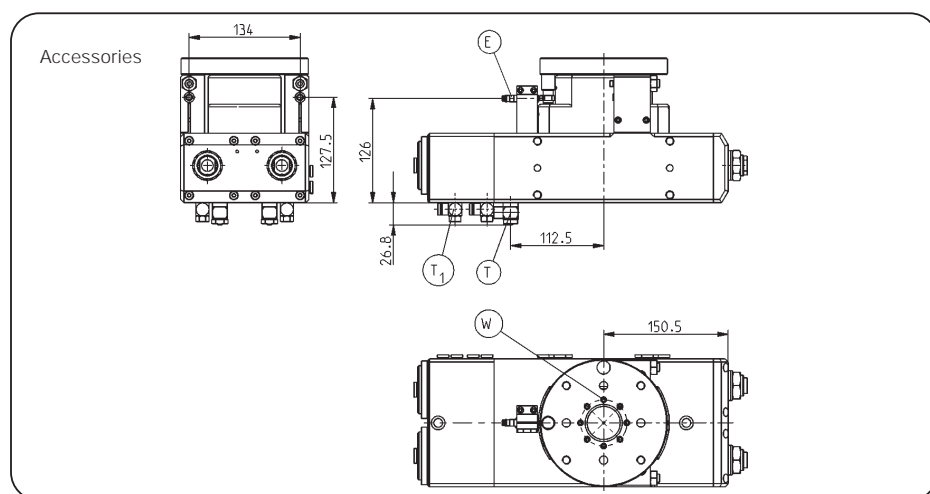
Pneumatic fittings
Order no. DRV1/4x8



Reducing bush
(ø 12 - ø 8 mm)
Order no. BDMS15500



O-Ring
Order no. COR0040150



Subject to change without prior notice

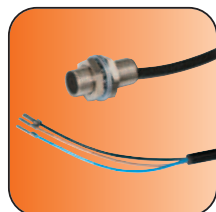
Accessory list



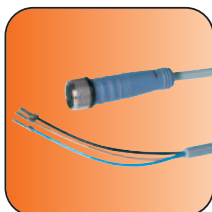
Pneumatic fittings
Order no. WV1/8x6



Proximity switch
Order no. NJ8-E2S-14
Order no. NJ12-E2S-02



Proximity switch
Order no. NJ8-E2
Order no. NJ12-E2-01



Cable straight plug
Order no. KAG500 *
Order no. KAG500-02 **

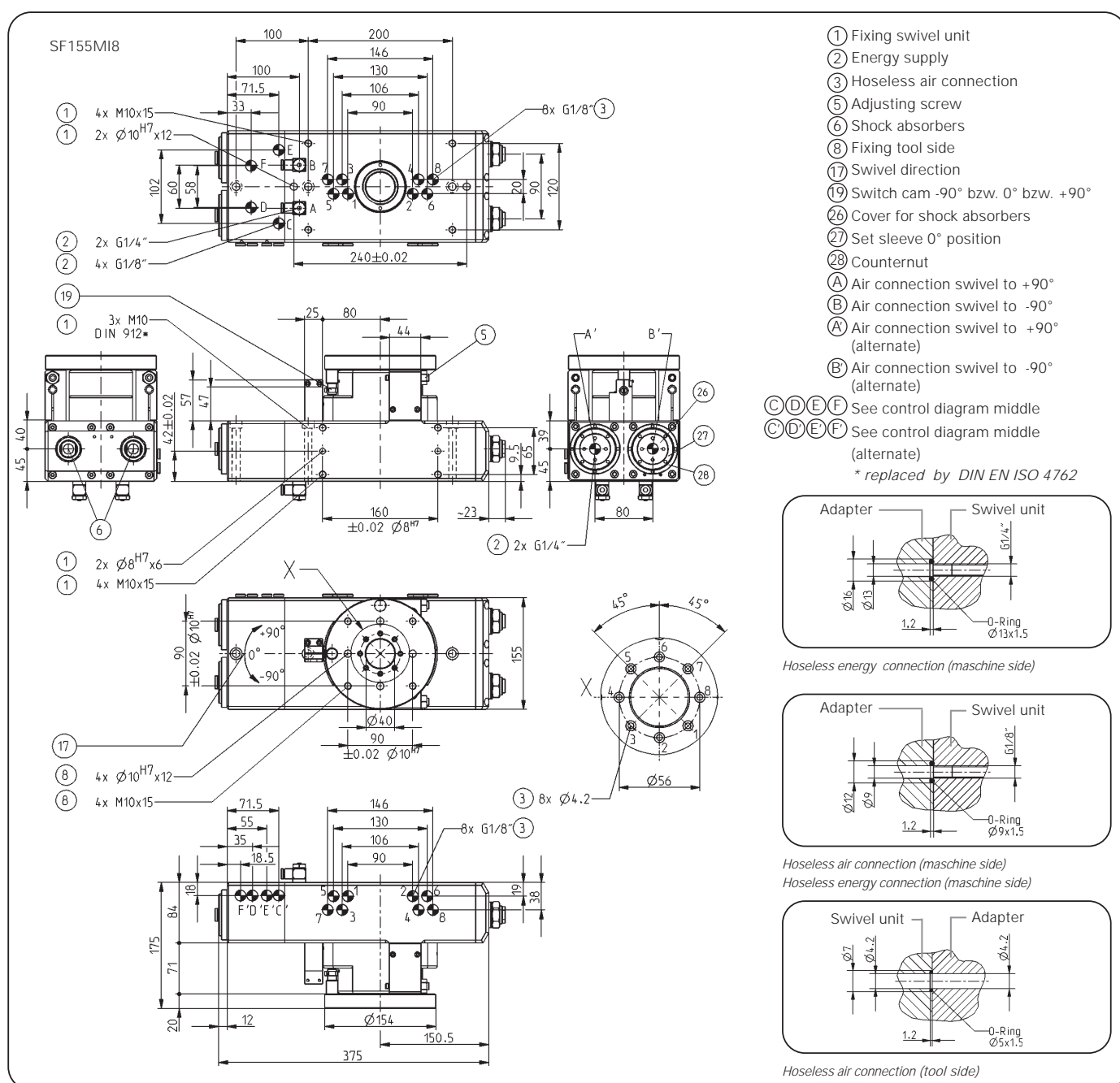
* Connection NJ8
** Connection NJ12



Order no.:	SF155MI8
Swivel angle [°]:	-90/0/+90
Torque [Nm]:	54
Swivel angle -90°/+90° adjustable +/- [°]*:	3
Repeatability -90°/+90° position +/- [°]:	0,01
Repetition accuracy 0° position +/- [°]:	0,05
Passage bore Ø [mm]:	40
Air feed-through [quantity]:	8
Axial bearing load [N]:	6000
Radial bearing load [Nm]:	600
Min./max. operating pressure [bar]:	4/8
Min./max. operating temperature [°C]:	5/80
Air volume per cycle [cm³]:	816
Weight [kg]:	21,5

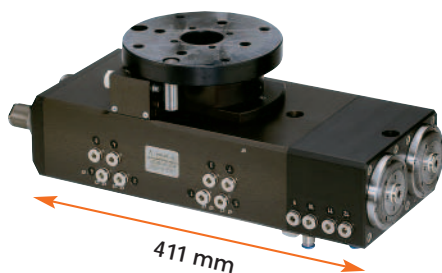
All data measured at 6 bar

* 0°-position preset ex works, ± 1° adjustable



Subject to change without prior notice

Flat Swivel Unit *with 3 positions*

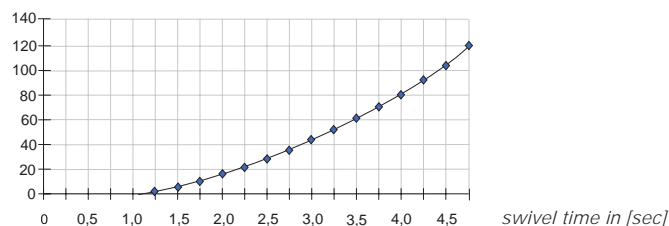


Picture shows SF155M

Moment of inertia

Shows the expected swivel time against the calculated moment of inertia.

Moment of inertia in [kg m²]

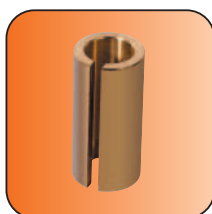


Data measured at 6 bar and horizontal mounting position

Included in the delivery



Pneumatic fittings
Order no. DRV1/4x8



Reducing bush
(ø 12 - ø 8 mm)
Order no. BDMS15500

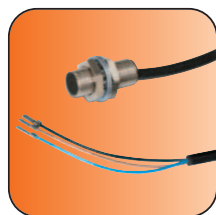
Accessory list



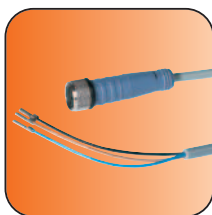
Pneumatic fittings
Order no. WV1/8x6



Proximity switch
Order no. NJ8-E2S-14
Order no. NJ12-E2S-02



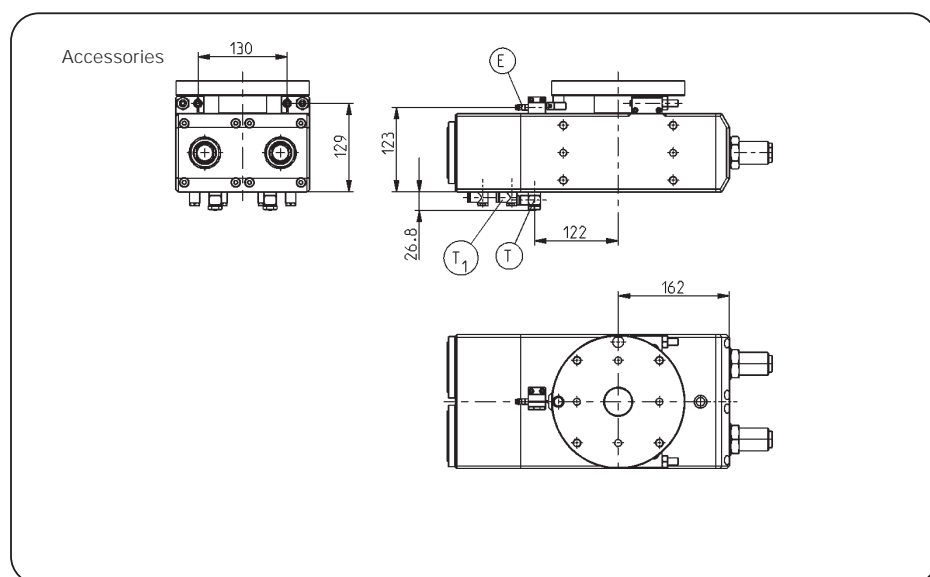
Proximity switch
Order no. NJ8-E2
Order no. NJ12-E2-01



Cable straight plug
Order no. KAG500 *
Order no. KAG500-02 **



Plug 3-pole
Order no. S12-G-3



Subject to change without prior notice

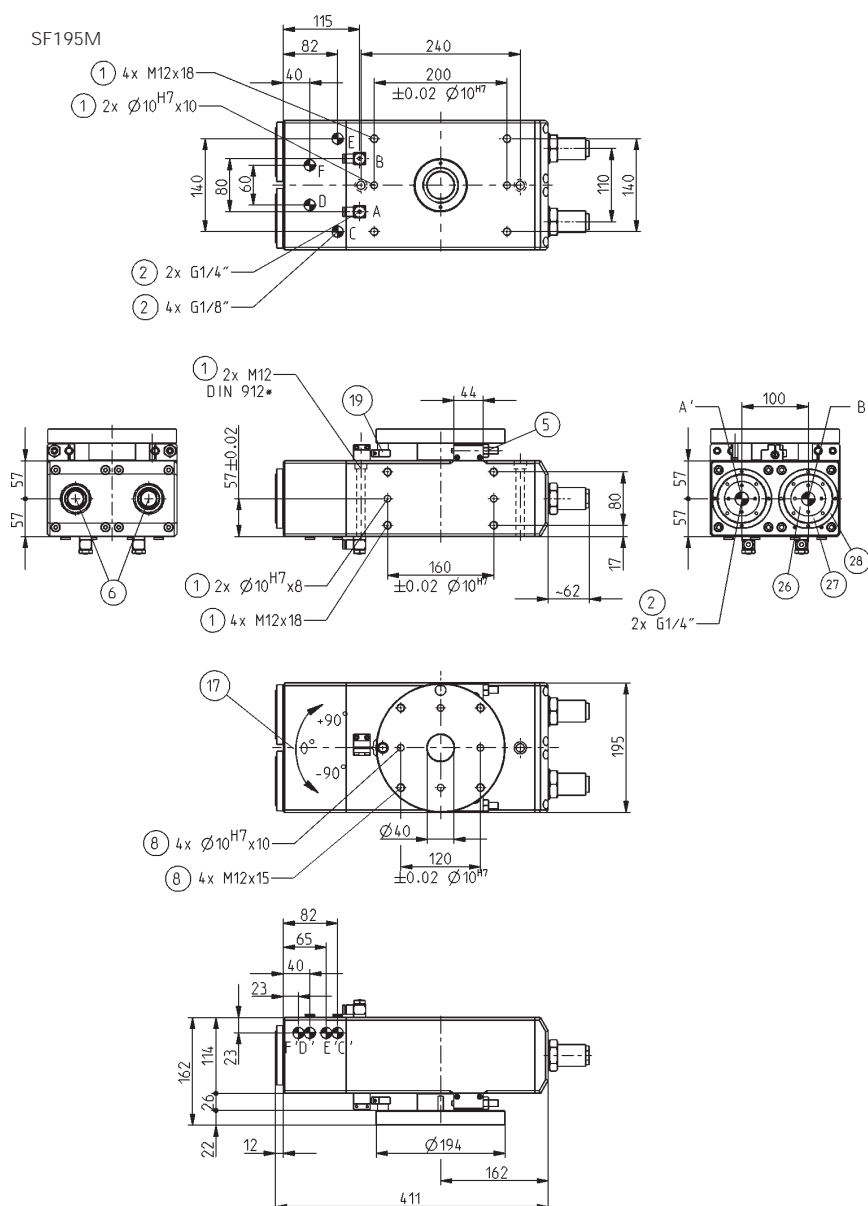
* Connection NJ8
** Connection NJ12



Order no.:	SF195M
Swivel angle [°]:	90
Torque [Nm]:	130
Swivel angle 90° or 180° adjustable +/- [°]*:	3
Repeatability -90°/+90° position +/- [°]:	0,01
Repetition accuracy 0° position +/- [°]:	0,05
Passage bore Ø [mm]:	40
Air feed-through [quantity]:	-
Axial bearing load [N]:	6500
Radial bearing load [Nm]:	1150
Min./max. operating pressure [bar]:	3/8
Min./max. operating temperature [°C]:	5/80
Air volume per cycle [cm³]:	1750
Weight [kg]:	27,5

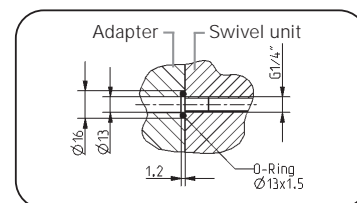
All data measured at 6 bar

* 0°-position preset ex works, ± 1° adjustable



- ① Fixing swivel unit
- ② Energy supply
- ⑤ Adjusting screw
- ⑥ Shock absorbers
- ⑧ Fixing tool side
- ⑪ Swivel direction
- ⑪ Switch cam -90°/0°/+90°
- ⑪ Cover for shock absorbers
- ⑪ Set sleeve
- ⑪ Counternut
- A Air connection swivel to +90°
- B Air connection swivel to -90°
- A Air connection swivel to +90° (alternate)
- B Air connection swivel to -90° (alternate)
- C D E F See control diagram middle
- C' D' E' F' See control diagram middle (alternate)

* replaced by DIN EN ISO 4762



Hoseless air connection (maschine side)

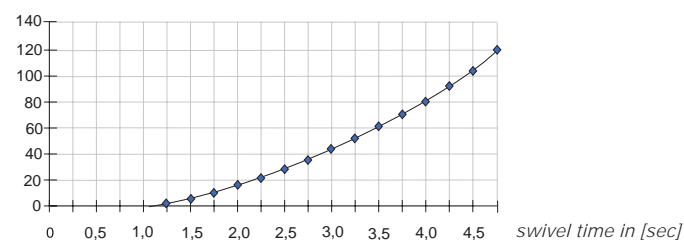
Subject to change without prior notice

Flat Swivel Unit *with 3 positions*

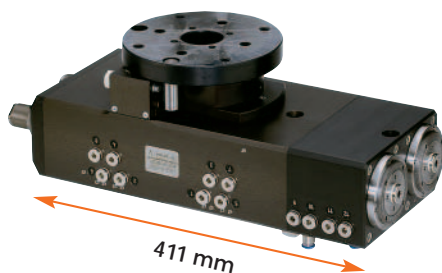
Moment of inertia

Shows the expected swivel time against the calculated moment of inertia.

Moment of inertia in $[kg\ m^2]$



Data measured at 6 bar and horizontal mounting position

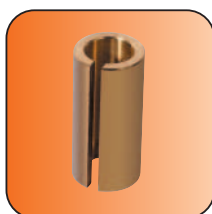


Picture shows SF155M

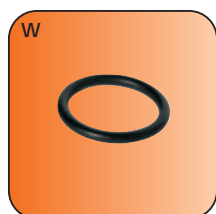
Included in the delivery



Pneumatic fittings
Order no. DRV1/4x8

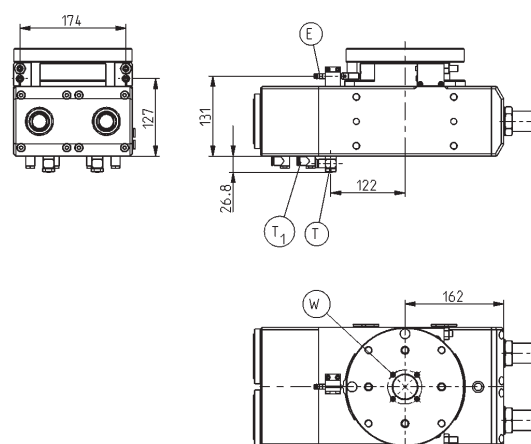


Reducing bush
($\varnothing 12 - \varnothing 8\ mm$)
Order no. BDMS15500



O-Ring
Order no. COR0050150

Accessories

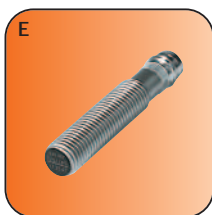


Subject to change without prior notice

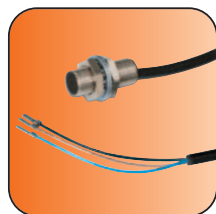
Accessory list



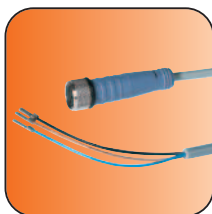
Pneumatic fittings
Order no. WV1/8x6



Proximity switch
Order no. NJ8-E2S-14
Order no. NJ12-E2S-02



Proximity switch
Order no. NJ8-E2
Order no. NJ12-E2-01



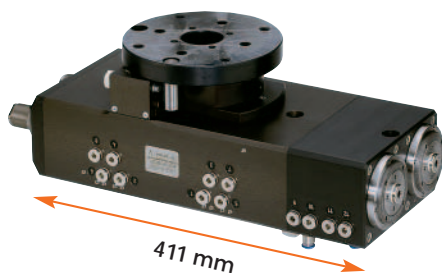
Cable straight plug
Order no. KAG500 *
Order no. KAG500-02 **

* Connection NJ8
** Connection NJ12

* 0°-position preset ex works. $\pm 1^\circ$ adjustable



Flat Swivel Unit *with 3 positions*

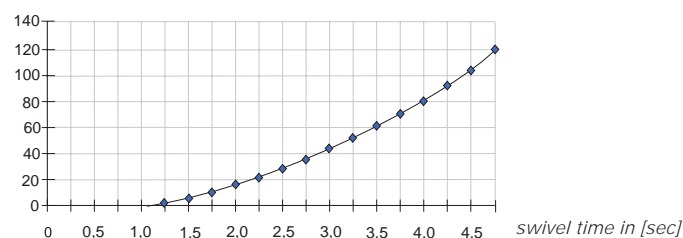


Picture shows SF155M

Moment of inertia

Shows the expected swivel time against the calculated moment of inertia.

Moment of inertia in [kg m²]

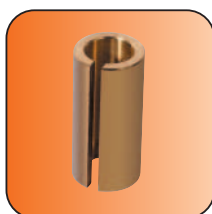


Data measured at 6 bar and horizontal mounting position

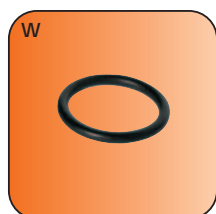
Included in the delivery



Pneumatic fittings
Order no. DRV1/4x8

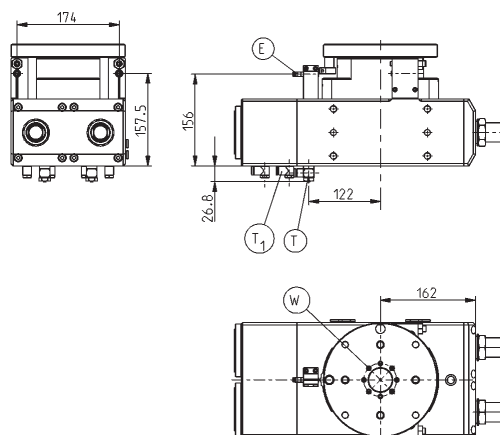


Reducing bush
(ø 12 - ø 8 mm)
Order no. BDMS15500



O-Ring
Order no. COR0050150

Accessories



Subject to change without prior notice

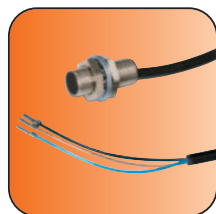
Accessory list



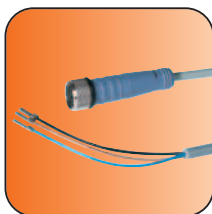
Pneumatic fittings
Order no. WV1/8x6



Proximity switch
Order no. NJ8-E2S-14
Order no. NJ12-E2S-02



Proximity switch
Order no. NJ8-E2
Order no. NJ12-E2-01



Cable straight plug
Order no. KAG500 *
Order no. KAG500-02 **

* Connection NJ8
** Connection NJ12

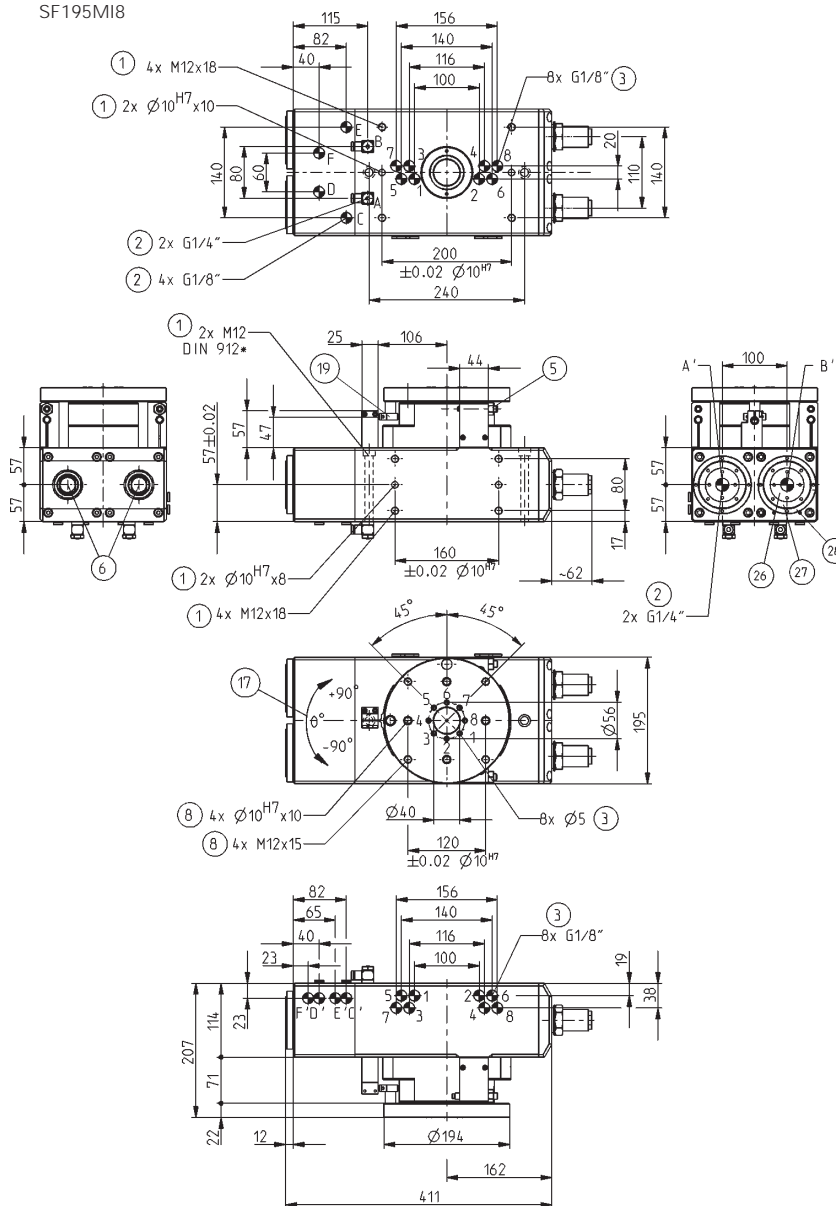


Order no.:	SF195MI8
Swivel angle [°]:	90
Torque [Nm]:	120
Swivel angle 90° or 180° adjustable +/- [°]*:	3
Repeatability -90°/+90° position +/- [°]:	0,01
Repetition accuracy 0° position +/- [°]:	0,05
Passage bore Ø [mm]:	40
Air feed-through [quantity]:	8
Axial bearing load [N]:	6500
Radial bearing load [Nm]:	1250
Min./max. operating pressure [bar]:	3/8
Min./max. operating temperature [°C]:	5/80
Air volume per cycle [cm³]:	1750
Weight [kg]:	40,0

All data measured at 6 bar

* 0°-position preset ex works, ± 1° adjustable

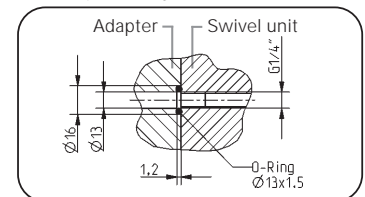
SF195MI8



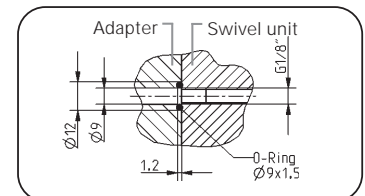
- 1) Fixing swivel unit
- 2) Energy supply
- 3) Hoseless air connection
- 5) Adjusting screw
- 6) Shock absorbers
- 8) Fixing tool side
- 17) Swivel direction
- 19) Switch cam -90°/0°/+90°
- 26) Cover for shock absorbers
- 27) Set sleeve
- 28) Counternut
- A) Air connection swivel to +90°
- B) Air connection swivel to -90°
- A') Air connection swivel to +90° (alternate)
- B') Air connection swivel to -90° (alternate)

C D E F See control diagram middle
C' D' E' F' See control diagram middle (alternate)

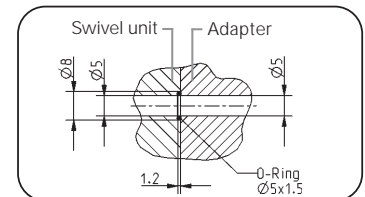
* replaced by DIN EN ISO 4762



Hoseless energy connection (maschine side)



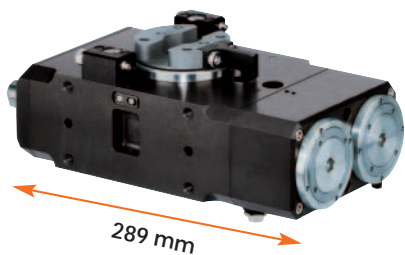
Hoseless air connection (maschine side)
Hoseless energy connection (maschine side)



Hoseless air connection (tool side)

Subject to change without prior notice

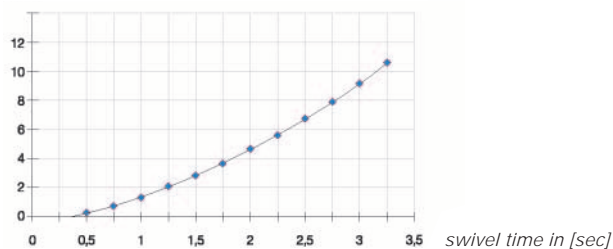
Flat **Swivel Unit** *with 3 positions*



Moment of inertia

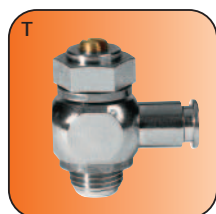
Shows the expected swivel time against the calculated moment of inertia.

Moment of inertia in $[kg\ m^2]$



Data measured at 6 bar and horizontal mounting position

Included in the delivery

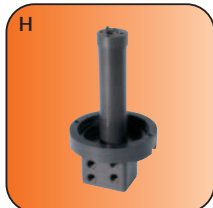


Pneumatic fittings
Order no. DRV1/4x8

Accessory list



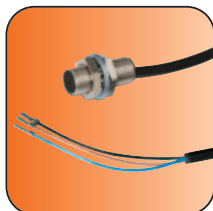
Pneumatic fittings
Order no. WV1/8x6



Integrated air feed-through
Order no. IL150-4 (4 way)
Order no. IL150-6 (6 way)



Proximity switch
Order no. NJ8-E2S



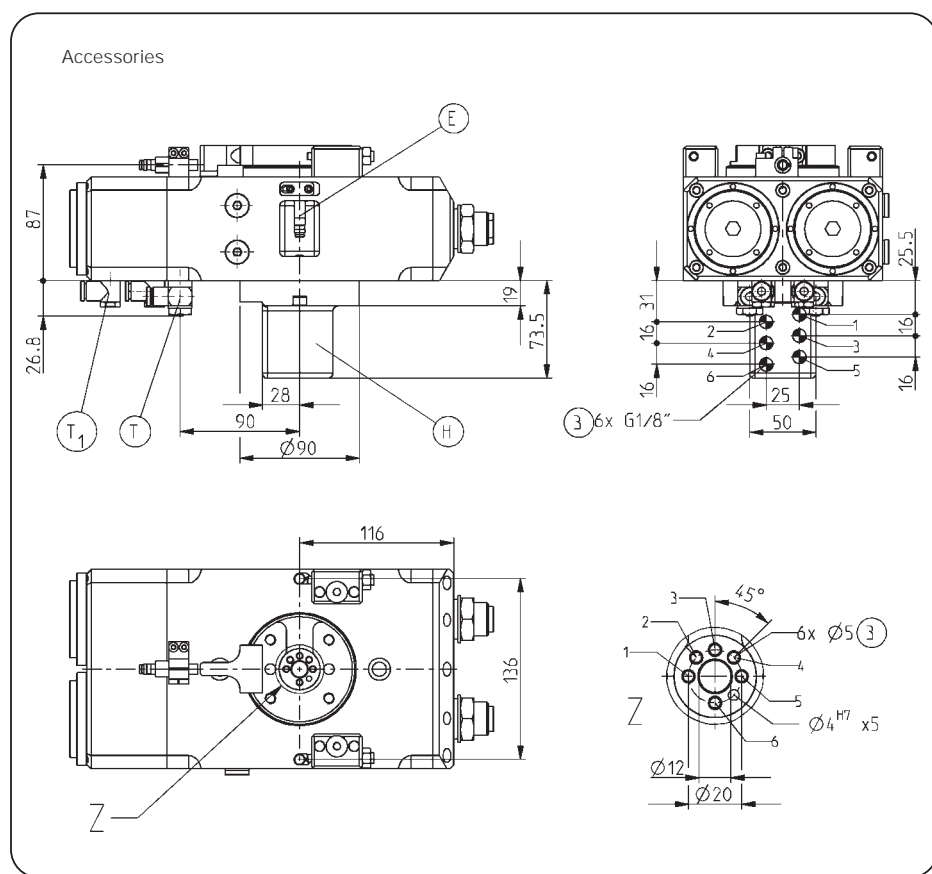
Proximity switch
Order no. NJ8-E2



Cable angled plug
Order no. KAW500



Plug 3-pole
Order no. S12-G-3

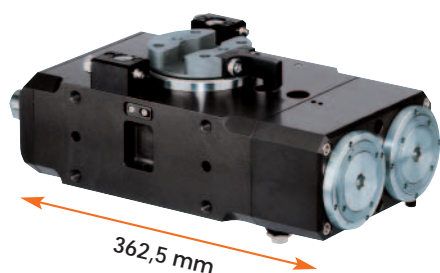


Subject to change without prior notice

* 0°-position preset ex works, $\pm 1^\circ$ adjustable



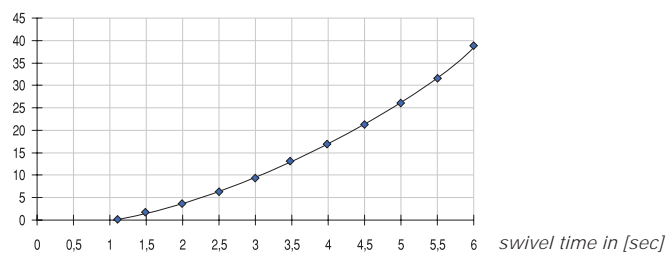
Flat Swivel Unit *with 3 positions*



Moment of inertia

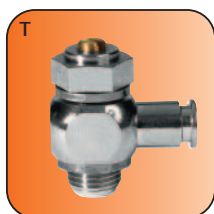
Shows the expected swivel time against the calculated moment of inertia.

Moment of inertia in $[kg\ m^2]$



Data measured at 6 bar and horizontal mounting position

Included in the delivery

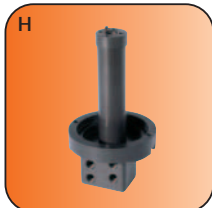


Pneumatic fittings
Order no. DRV1/4x8

Accessory list



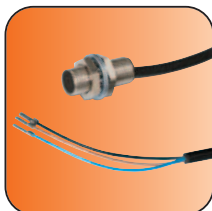
Pneumatic fittings
Order no. WV1/8x6



Integrated air feed-through
Order no. IL190-4 (4 way)
Order no. IL190-6 (6 way)



Proximity switch
Order no. NJ8-E2S



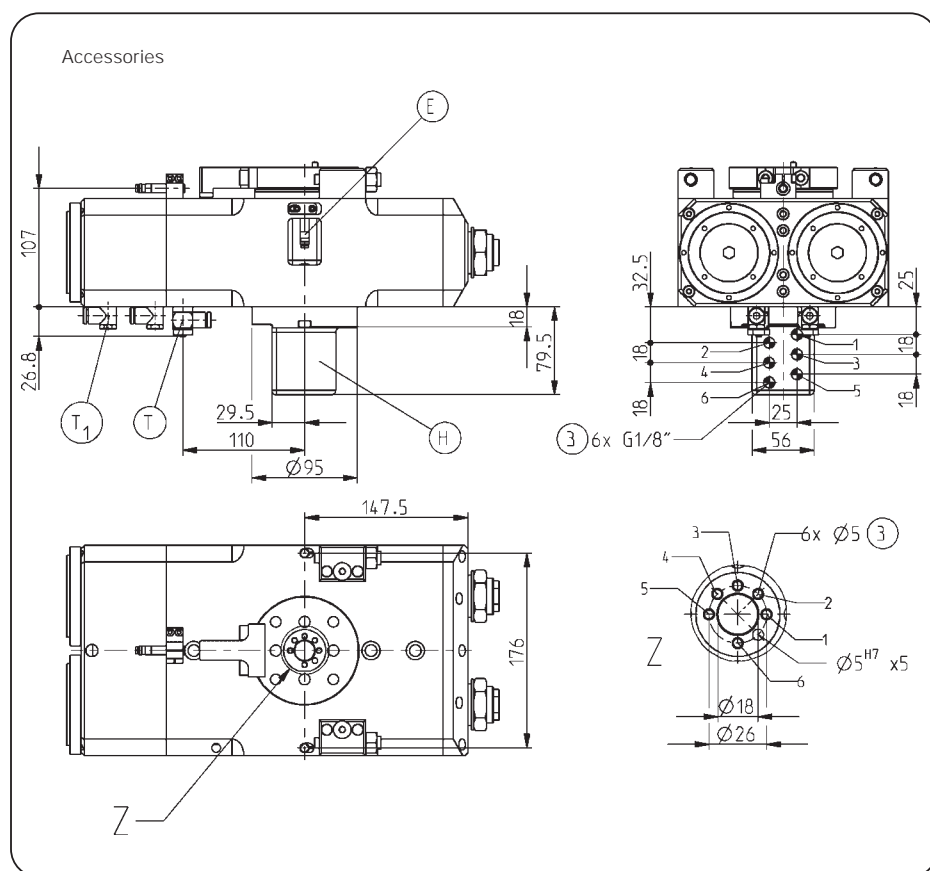
Proximity switch
Order no. NJ8-E2



Cable angled plug
Order no. KAW500



Plug 3-pole
Order no. S12-G-3



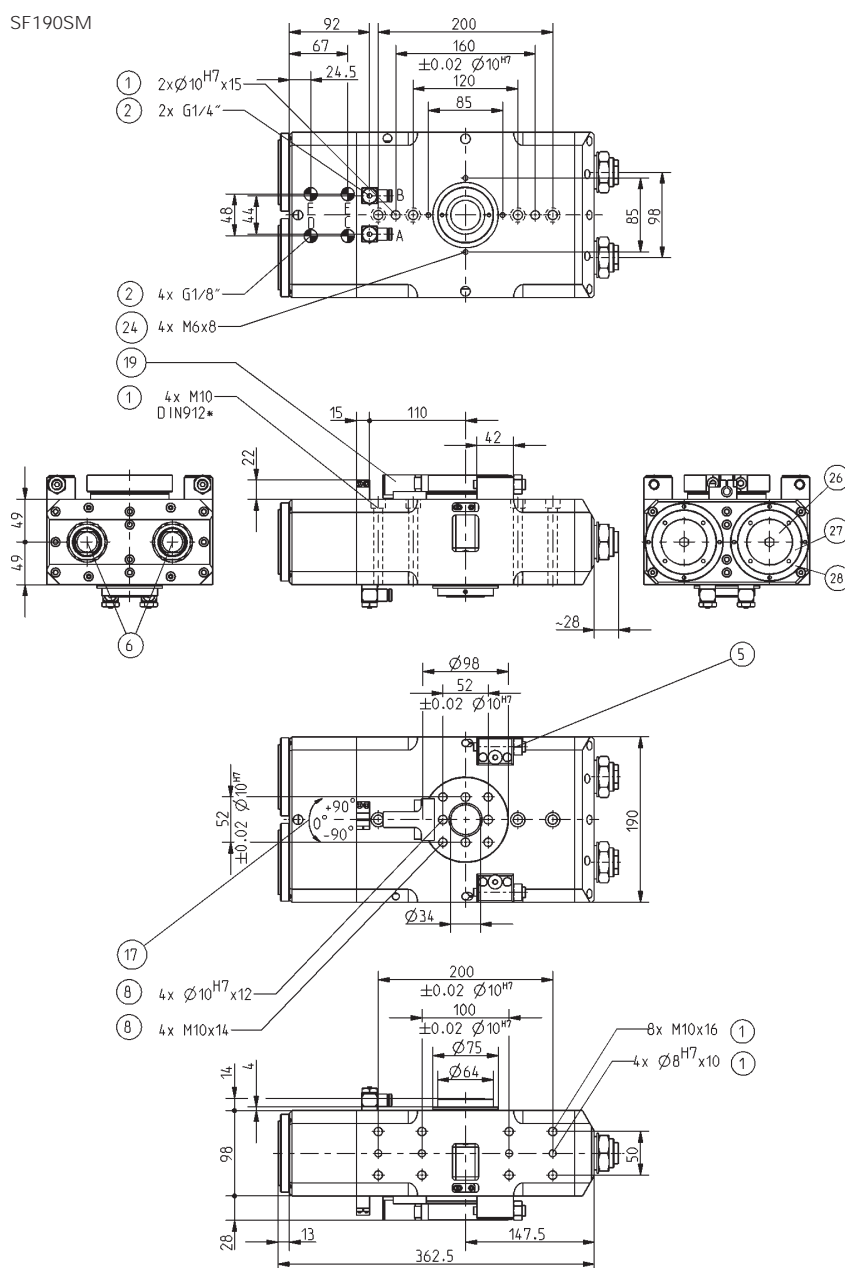
Subject to change without prior notice

Order no.:	SF190SM
Swivel angle [°]:	-90/0/+90
Torque [Nm]:	115
Swivel angle -90°/+90° adjustable +/- [°]*:	3
Repeatability -90°/+90° position +/- [°]:	0,01
Repetition accuracy 0° position +/- [°]:	0,05
Passage bore Ø [mm]:	34
Axial bearing load [N]:	8000
Radial bearing load [Nm]:	1500
Min./max. operating pressure [bar]:	3/8
Min./max. operating temperature [°C]:	5/80
Air volume per cycle [cm³]:	620
Weight [kg]:	24,0

All data measured at 6 bar

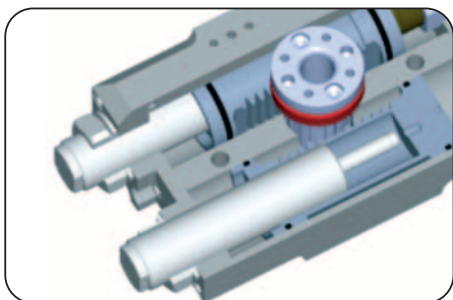
* 0°-position preset ex works, ± 1° adjustable

SF190SM



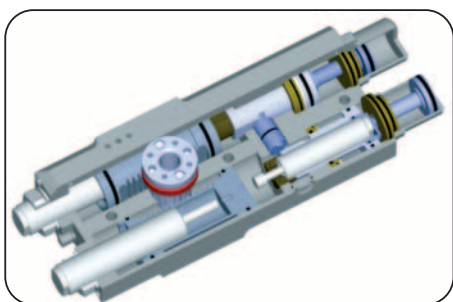
Function

Units with 3 positions



Swivel drive

The swivel action takes place by means of two double-acting cylinders, whose piston rods are act as racks. The racks directly drive the pinion shaft and flange of the swivel unit. Swivel-angles of -90° , 0° and $+90^\circ$ can be achieved with these units.



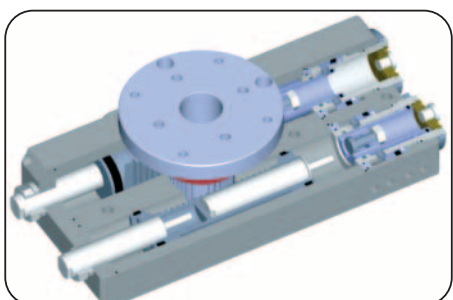
0° Mid positions

M-Versions

SF74M/SF100M

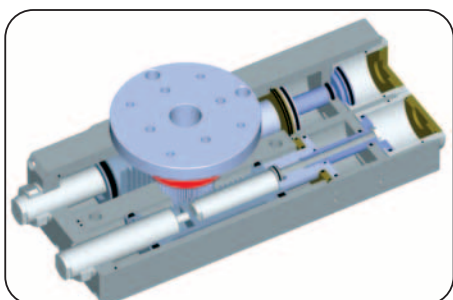
SF74 and SF100 swing-units with M-designation feature a mechanical and shock absorbed hard stops in all three positions. The 0° position is locked by a mechanical sliding bolt and cannot adjustable by the customer.

The hardened slider is compulsory-locked when in the center position, i.e. another adjustment is not possible.



SF155M/SF195M/SF150SM/SF190SM

These units also feature a mechanical and shock-absorbed hard stop in all three positions. The 0° center position is achieved by means of two stop-pistons with integrated shock absorbers. A mechanical hard stop is achieved by stop bolts, that are pushed by the catch-piston into the snap ring-groove of the stop-piston.



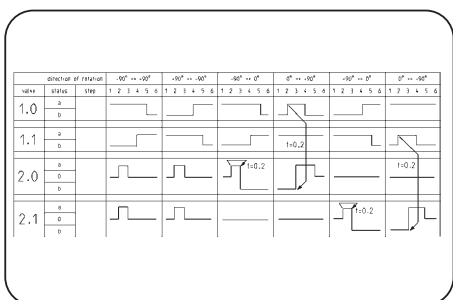
ML-Versions

SF74ML/SF125ML

Mid-position units of the ML-designation possess a mechanical and shock-absorbed hard stop at the -90° and the $+90^\circ$ positions.

The 0° position does not lock, in contrast to the M-designation models.

With these units, the main pistons drive against dominant acting stop-piston, acting as a locked center position which is shock-absorbed and travel together to the endstop position. These units with 3 positions should only be used for horizontal rotation applications or for simple orientation applications.

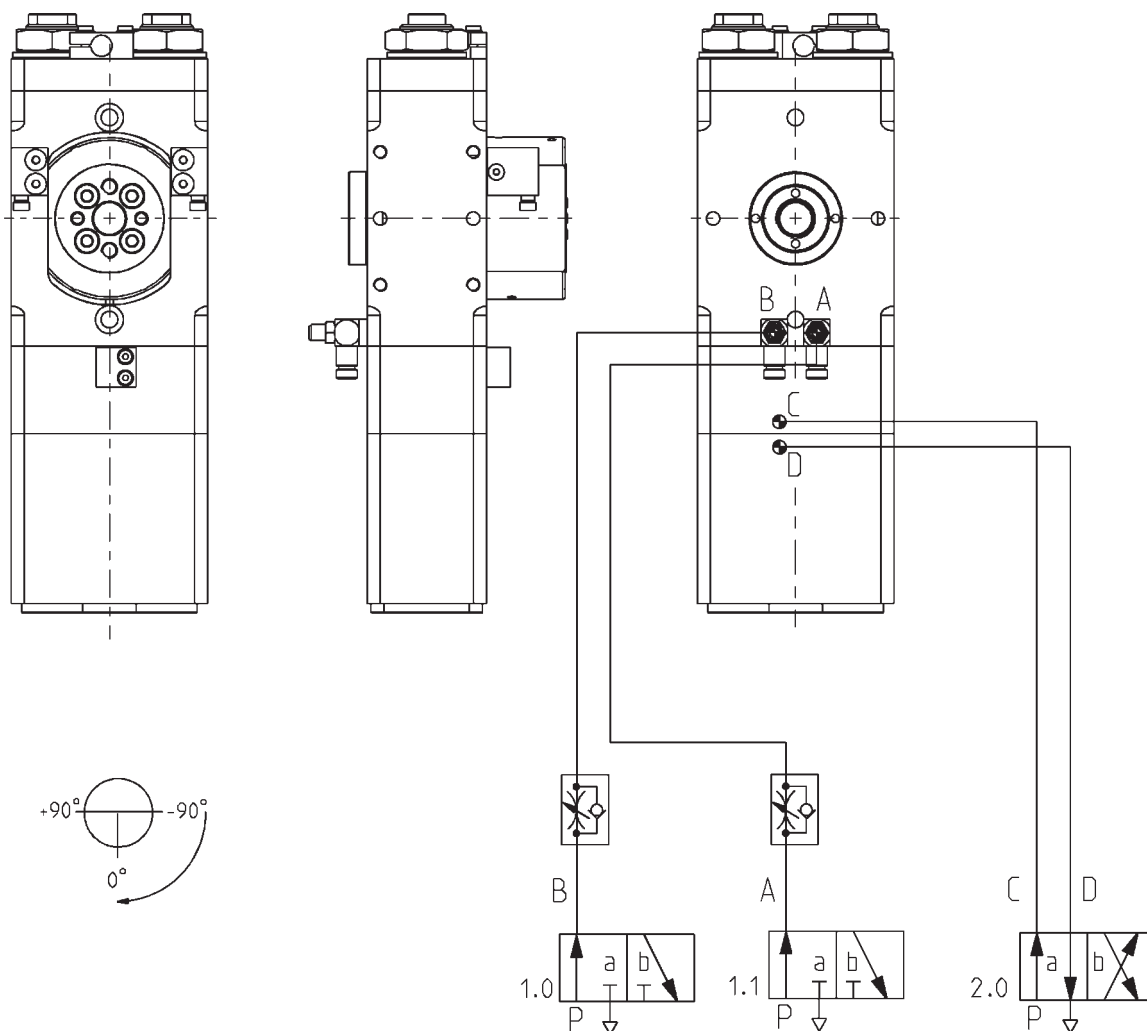


Activation

The sequencing of individual valves, that is required for the activation of swivel-units with 3 positions, is clarified on the following pages with the help of the sequence of events diagrams.

The sequencing of events must be followed in order to ensure a correct operation of the swivel movements.

SF74ML/D4/D6
SF125ML/I4/I8



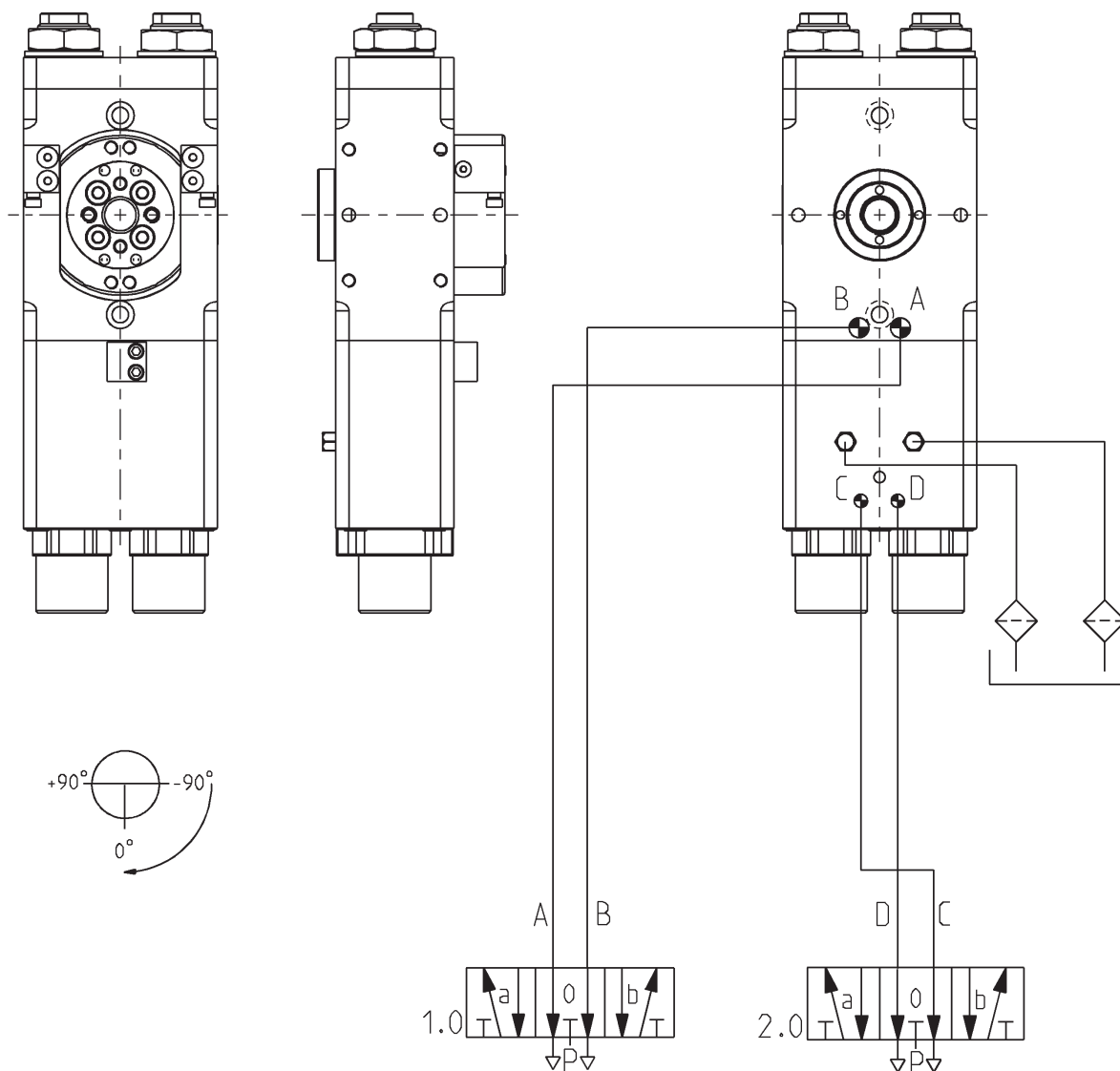
direction of rotation			starting position	-90° => +90°	+90° => -90°	-90° => 0°	0° => +90°	+90° => 0°	0° => -90°
valve	status	step	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
1.0	a		—	—	—	—	—	—	—
	b		—	—	—	—	—	—	—
1.1	a		—	—	—	—	—	—	—
	b		—	—	—	—	—	—	—
2.0	a		—	—	—	—	—	—	—
	b		—	—	—	—	—	—	—

* Ventilation-stage

Subject to change without prior notice

Function

SF74M-B/D4/D6
SF100M-B/D4/D6

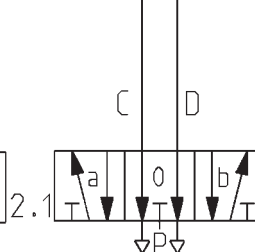
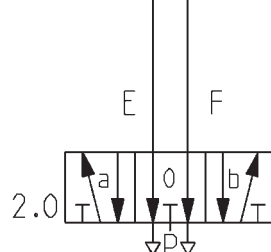
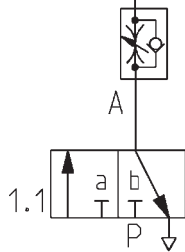
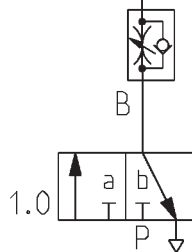
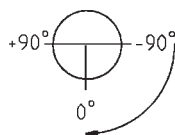
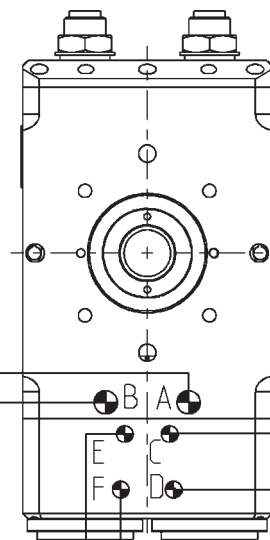
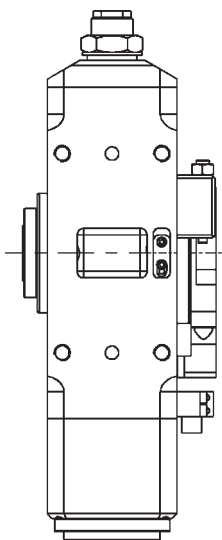
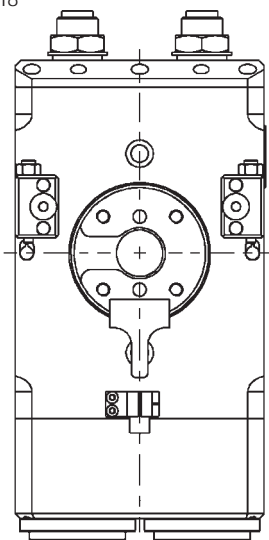


direction of rotation			-90° => +90°						+90° => -90°						-90° => 0°						0° => +90°						+90° => 0°						0° => -90°					
valve	status	step	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
1.0	a																																					
	o																																					
	b																																					
2.0	a																																					
	o																																					
	b																																					

* Ventilation-stage

Subject to change without prior notice

SF155M/MI4/MI8
SF195M/MI4/MI8
SF150SM
SF190SM



direction of rotation			-90° => +90°						+90° => -90°						-90° => 0°						0° => +90°						+90° => 0°						0° => -90°					
valve	status	step	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
1.0	a		[Signal trace]						[Signal trace]						[Signal trace]						[Signal trace]						[Signal trace]						[Signal trace]					
	b		[Signal trace]						[Signal trace]						[Signal trace]						[Signal trace]						[Signal trace]						[Signal trace]					
1.1	a		[Signal trace]						[Signal trace]						[Signal trace]						[Signal trace]						[Signal trace]						[Signal trace]					
	b		[Signal trace]						[Signal trace]						[Signal trace]						[Signal trace]						[Signal trace]						[Signal trace]					
2.0	a		[Signal trace]						[Signal trace]						[Signal trace]						[Signal trace]						[Signal trace]						[Signal trace]					
	0		[Signal trace]						[Signal trace]						[Signal trace]						[Signal trace]						[Signal trace]						[Signal trace]					
	b		[Signal trace]						[Signal trace]						[Signal trace]						[Signal trace]						[Signal trace]						[Signal trace]					
2.1	a		[Signal trace]						[Signal trace]						[Signal trace]						[Signal trace]						[Signal trace]						[Signal trace]					
	0		[Signal trace]						[Signal trace]						[Signal trace]						[Signal trace]						[Signal trace]						[Signal trace]					
	b		[Signal trace]						[Signal trace]						[Signal trace]						[Signal trace]						[Signal trace]						[Signal trace]					

* Ventilation-stage

Subject to change without prior notice

Swivel Unit **Formulas**

1. Moment of Inertia Calculation

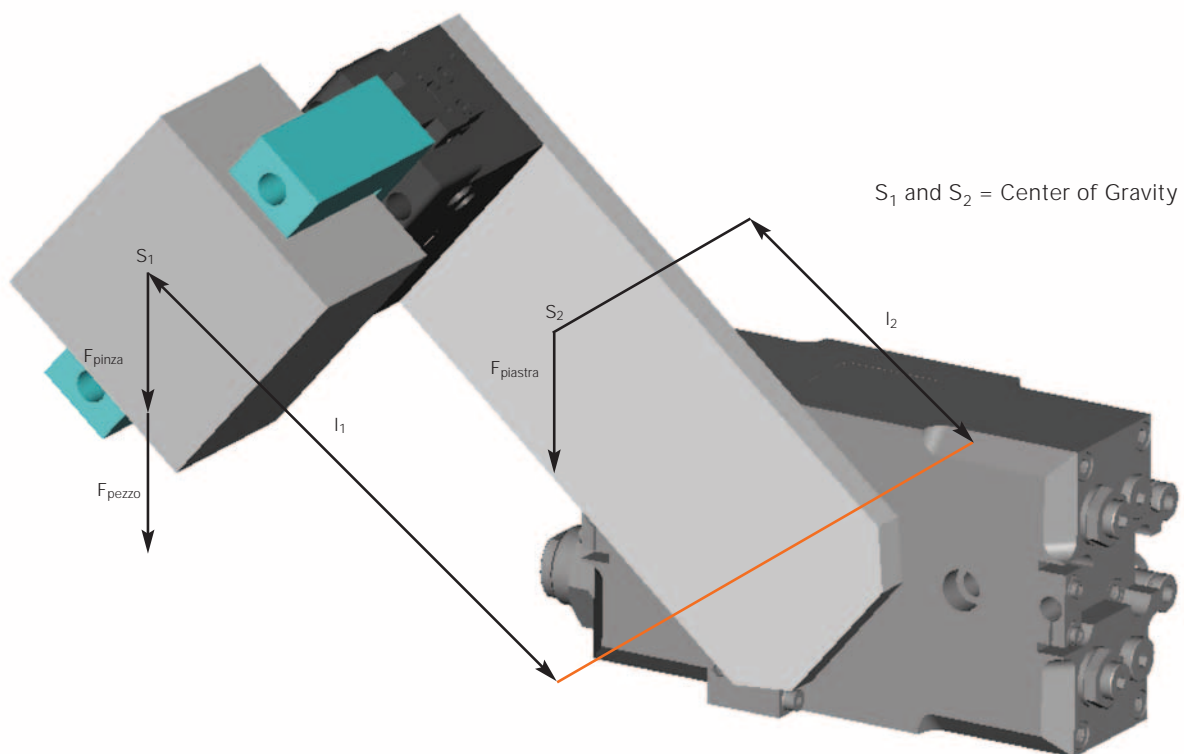
In the technical tables, the "Force" of the swivel-units is declared in Nm. This value declares a torque, produced by the swivel unit, when a pressure of 6 bar is supplied.

In order to size a swivel-unit correctly, one requires different basic data such as workpiece-weight and lever-length to center of gravity. For increased application-safety, a factor of safety may be inserted into the calculation.

In the following example calculation (1.1) a Swivel unit application with one GP410NC-B gripper and a given swing-angle of 90° is shown as an example.

Example Calculation 1.1

Sketch:



Given:	Weight of Workpiece	=	F _{Wst.}	= 3 kg x 9,81 m/s ²	= 29,43 N
	Gripper Weight	=	F _{Gr.}	= 1 kg x 9,81 m/s ²	= 9,81 N
	Weight of Plate	=	F _{Pl.}	= 2 kg x 9,81 m/s ²	= 19,62 N
	Length of Lever (to Gripper and Workpiece Center of Gravity)	=	I ₁	= 0,2 m	
	Length of Lever (to Plate Center of Gravity)	=	I ₂	= 0,1 m	
	Safety Factor	=	ν	= 2	

Find: Torque = M

Calculation:

$$M = ((F_{Wst.} + F_{Gr.}) \times I_1 + F_{Pl.} \times I_2) \times \nu$$
$$M = ((29,43 \text{ N} + 9,81 \text{ N}) \times 0,2 \text{ m} + 19,62 \text{ N} \times 0,1 \text{ m}) \times 2$$
$$\underline{M = 19,62 \text{ Nm}}$$

Result: On the basis of the torque, the selection falls to the SF100-90N, with a torque of 20 Nm at 6 bar.

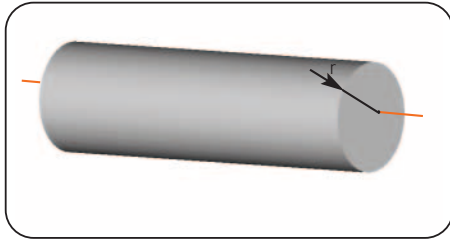


2. Moment of Inertia Calculation

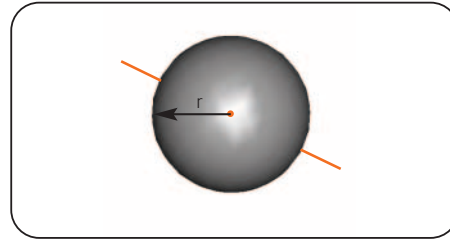
The sample calculation (2.2, page 152) shows the selection of a swivel-unit by means of the moment of inertia. The moment of inertia describes the inertia of a body during a rotational movement. This unit is required to determine about the swivel-time of the respective swivel-unit.

For this calculation, the grippers GP410NC-B, are simplified as parallelogram and are mounted to SF100-90N swivel symmetrically. Should the workpiece or the gripper have a shape other than that of a parallelogram, the corresponding formulas (2.1) must be used to calculate the moment of inertia (J).

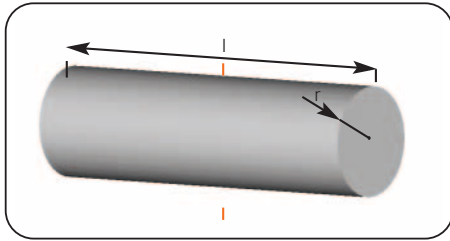
Formulas 2.1



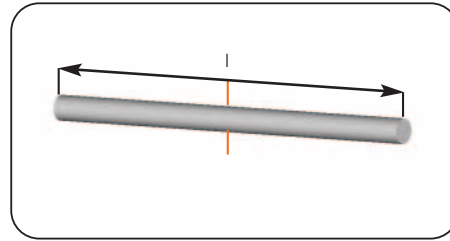
Full Cylinder:
Rotating around its body axis



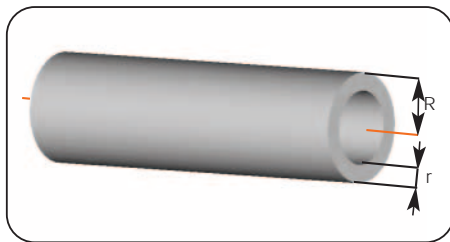
Massive sphere:
Rotating around its center of gravity
 $J = \frac{2}{5} m \times r^2$



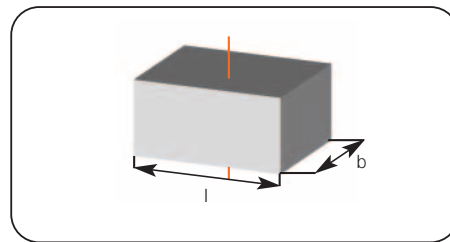
Full Cylinder:
Rotating around the center of gravity perpendicular to its body axis
 $J = \frac{1}{4} m \times r^2 + \frac{1}{12} m \times l^2$



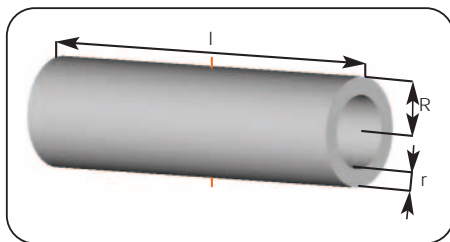
Small Diameter Rod:
Rotating around the center of gravity perpendicular to its body axis
 $J = \frac{1}{12} m \times l^2$



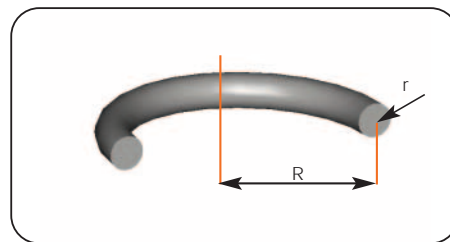
Hollow cylinder:
Rotating around its body axis
 $J = \frac{1}{2} m (R^2 + r^2)$
 R =Radius of cylinder, r = wall thickness



Rectangular parallelogram:
Rotating around its center of gravity
 $J = \frac{1}{12} m (b^2 + l^2)$



Hollow Cylinder:
Rotating around the center of gravity perpendicular to its body axis
 $J = \frac{1}{4} m (R^2 + r^2 + \frac{1}{3} l^2)$
 R =Radius of cylinder, r = wall thickness

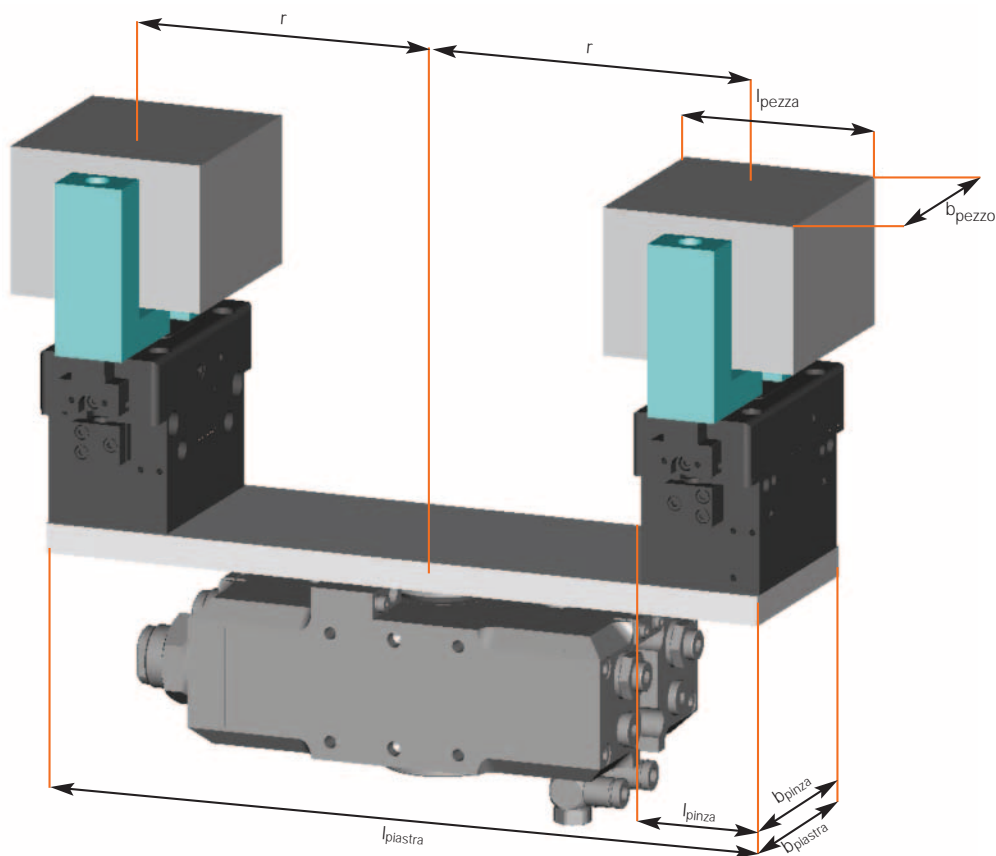


Ring:
Rotating around its body axis
 $J = m (R^2 + \frac{3}{4} r^2)$

Swivel Unit **Formulas**

2.2 Example Calculation

Sketch:



General: Longitudinal-dimensions in **meters**, mass in **kilogram** yields moment of inertia into **kgm²**

Given:	Mass of workpiece	=	$m_{Wst.}$	=	4 kg
	Mass of gripper	=	$m_{Gr.}$	=	1 kg
	Mass of Plate	=	$m_{Pl.}$	=	4 kg
	Radius to center of gravity of workpiece and gripper Wst. and Gr.	=	r	=	0,12 m
	Length of workpiece	=	$l_{Wst.}$	=	0,09 m
	Depth of workpiece	=	$b_{Wst.}$	=	0,09 m
	Length of gripper	=	$l_{Gr.}$	=	0,08 m
	Depth of gripper	=	$b_{Gr.}$	=	0,05 m
	Length of plate	=	$l_{Pl.}$	=	0,29 m
	Depth of plate	=	$b_{Pl.}$	=	0,08 m

Find:	Moment of inertia of workpiece	=	$J_{Wst. (right)}$	=	$J_{Wst. (left)}$
	Moment of inertia of gripper	=	$J_{Gr. (right)}$	=	$J_{Gr. (left)}$
	Moment of inertia of Plate	=	$J_{Pl.}$		
	Total Moment of inertia	=	J_{total}		

Calculations:

$$J_{\text{total}} = J_{\text{Wst. (right)}} + J_{\text{Wst. (left)}} + J_{\text{Gr. (right)}} + J_{\text{Gr. (left)}} + J_{\text{Pl.}}$$

$$J_{\text{Wst. (right)}} = \frac{1}{12} m_{\text{Wst.}} \times (b_{\text{Wst.}}^2 + l_{\text{Wst.}}^2) + m_{\text{Wst.}} \times r^2$$

$$J_{\text{Wst. (right)}} = \frac{1}{12} 4\text{kg} \times ((0,09\text{m})^2 + (0,09\text{m})^2) + 4\text{kg} \times (0,12\text{m})^2$$

$$J_{\text{Wst. (right)}} = \underline{0,063\text{kgm}^2}$$

$$J_{\text{Wst. (left)}} = J_{\text{Wst. (right)}}$$

$$J_{\text{Wst. (left)}} = \underline{0,063\text{kgm}^2}$$

$$J_{\text{Gr. (right)}} = \frac{1}{12} m_{\text{Gr.}} \times (b_{\text{Gr.}}^2 + l_{\text{Gr.}}^2) + m_{\text{Gr.}} \times r^2$$

$$J_{\text{Gr. (right)}} = \frac{1}{12} 1\text{kg} \times ((0,05\text{m})^2 + (0,08\text{m})^2) + 1\text{kg} \times (0,12\text{m})^2$$

$$J_{\text{Gr. (right)}} = \underline{0,015\text{kgm}^2}$$

$$J_{\text{Gr. (left)}} = J_{\text{Gr. (right)}}$$

$$J_{\text{Gr. (left)}} = \underline{0,015\text{kgm}^2}$$

$$J_{\text{Pl.}} = \frac{1}{12} m_{\text{Pl.}} \times (b_{\text{Pl.}}^2 + l_{\text{Pl.}}^2)$$

$$J_{\text{Pl.}} = \frac{1}{12} 4\text{kg} \times ((0,08\text{m})^2 + (0,29\text{m})^2)$$

$$J_{\text{Pl.}} = \underline{0,03\text{kgm}^2}$$

$$J_{\text{total}} = 0,063\text{kgm}^2 + 0,063\text{kgm}^2 + 0,015\text{kgm}^2 + 0,015\text{kgm}^2 + 0,03\text{kgm}^2$$

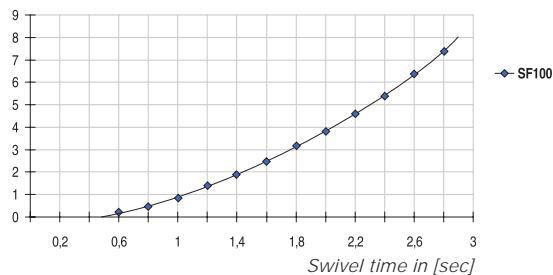
$$J_{\text{total}} = \underline{0,186\text{kgm}^2}$$

Result: By inserting the arbitrated value into the Diagram (2.3) which shows the moment of inertia in relation to time, one gets the swivel time.

The diagram (2.3) appears on the upper half of the first product page of each swivel-unit.

Diagram 2.3

Moment of Inertia in [kg m²]



With the SF100-90N, that is used in this application example, one gets a value of approximately **0.6 seconds**.

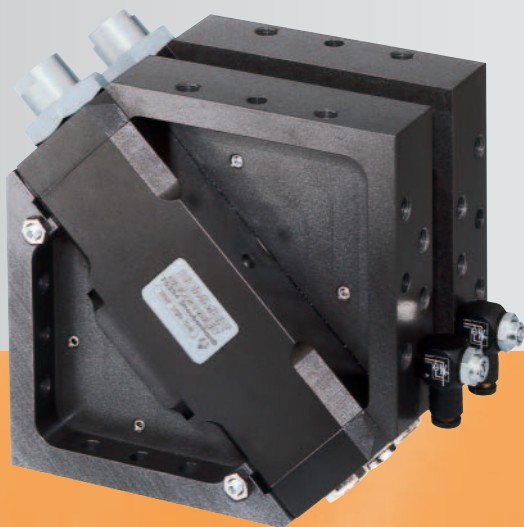
Attention: With this result, one must take into account, that this swivel-time is only realized with an correctly installed swivel-unit supplied with 6 bar air pressure and calculated without factor of safety.

For more information regarding the proper sizing of swivel-units, please go to our website, www.sommer-automatic.com.



Angled Swivel Units

pneumatic



SW50
SW74
SW100
SW150
SW190

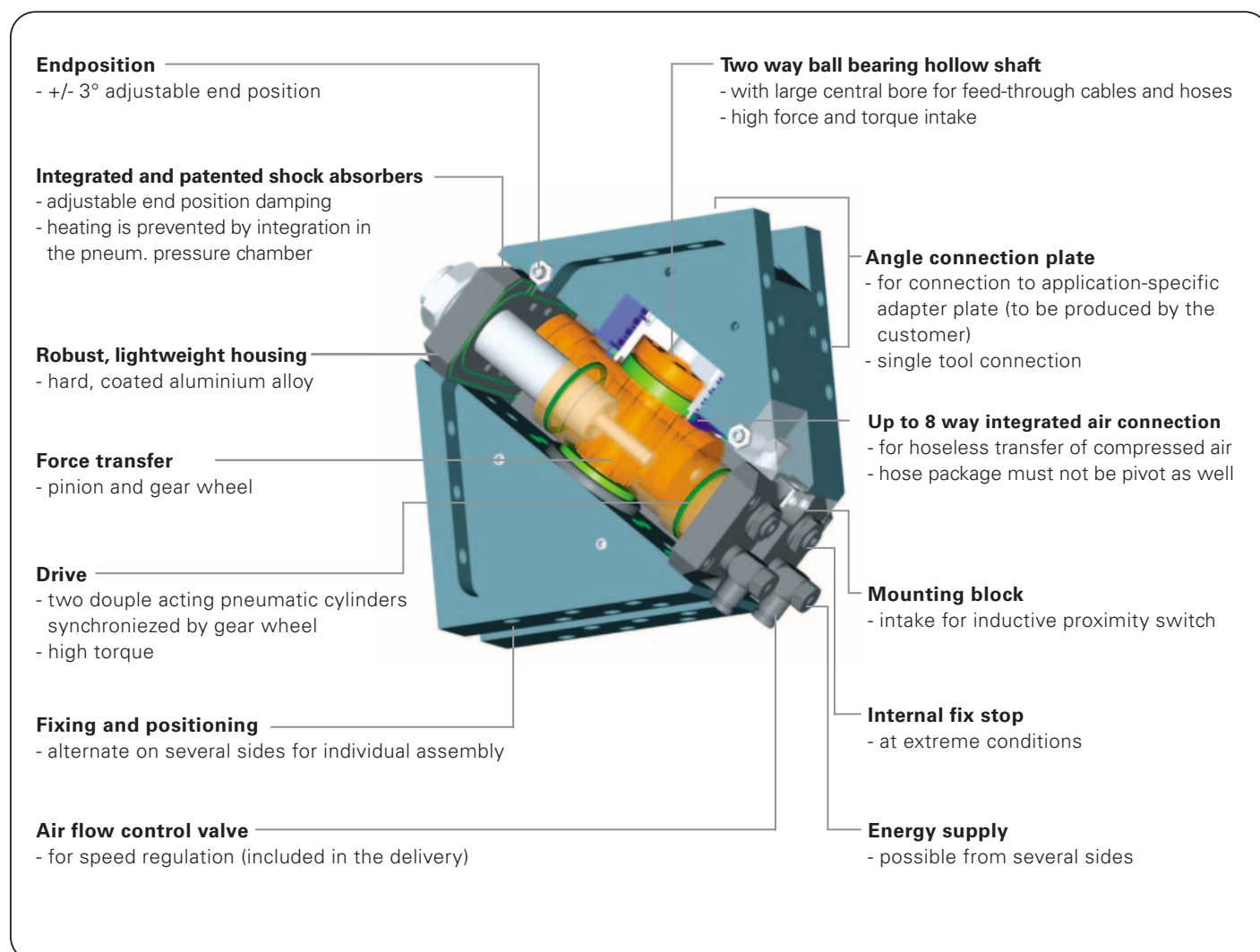
SOMMER
automatic

Angled Swivel Unit

Features

- The angle connecting plates on the machine extension side and on the tool side guarantee simple and space-saving change of workpiece, torque up to 110 Nm
- A solution without large interference contours due to the integrated pneumatic rotary distributor with up to 8 way hoseless air transfer
- With integrated and patented hydraulic shock absorbers, built into the pressure chamber, cooled due to permanent air flow and therefore constant in damping behaviour

Functional diagram



Terms

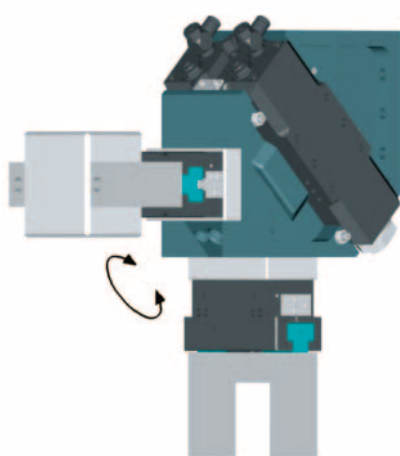
Torque:	force moment occurring on the drive edge of the swivel unit
Swivel time:	time required to cover a 0°/90°/0° or 0°/180°/0° swivel movement
Repeatability:	at end stops after 100 consecutive cycles
Cycle:	distance covered by the piston in one 0°/90°/0° or 0°/180°/0° swivel movement
Maintenance:	<p>maintenance free up to 10 Mio. swivel cycle (please see the owner's manual for conditions, download from www.sommer-automatic.com)</p> <ul style="list-style-type: none"> • long maintenance intervals keep costs down • long durability

Model

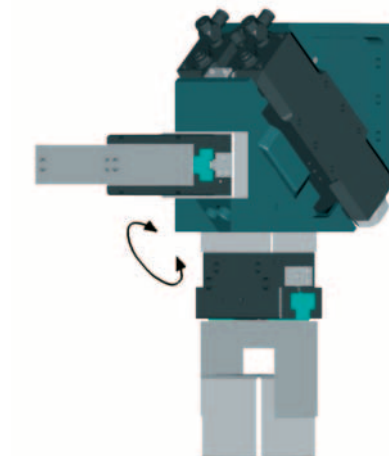
D4:	Two double acting pneumatic cylinders, hoseless pneumatic 4 way rotary distributor
D8:	Two double acting pneumatic cylinders, hoseless pneumatic 8 way rotary distributor

Order no.	Swivel angle	Torque	Center through-bore	Air feed-through
SW50D4	180°	1,5 Nm	Ø 9 mm	4
SW74D4	180°	5,5 Nm	Ø 12 mm	4
SW100D4	180°	15 Nm	Ø 15 mm	4
SW150D4	180°	46 Nm	Ø 12 mm	4
SW190D8	180°	110 Nm	Ø 18 mm	8

Application example

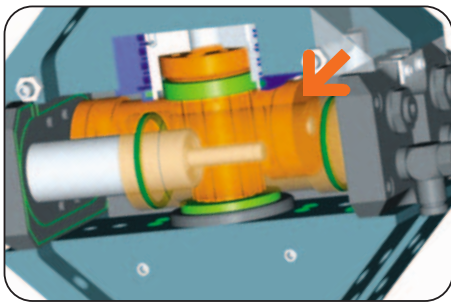


posizione 0°



posizione 180°

Angled Swivel Unit



Drive

Two double acting, synchronized pneumatic cylinders

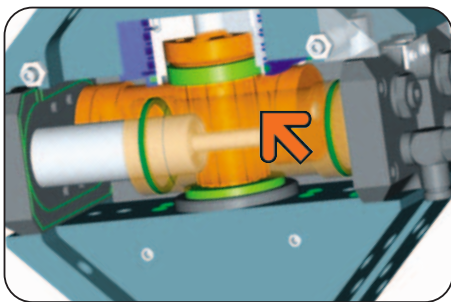
- Maximum torque in both rotation directions
- Torque up to 110 Nm



Swivel angle

End stop adjustable via adjustment screw $\pm 3^\circ$

- External fix stop to absorb the force over the housing, prevents overload of pinion and gear wheel



Force transfer and synchronization

Via pinion and gear wheel

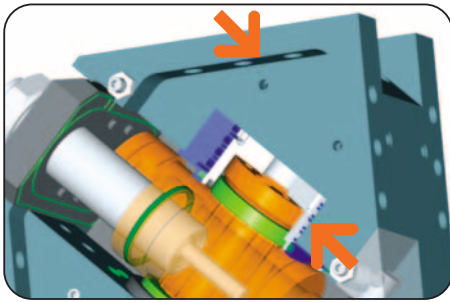
- Optimum steering of drive force in torque
- High repeatability
- Two way ball bearings for high torque intake



Machine connection

Position sensing, energy feed

- For inductive proximity switches
- Hoseless direct connection possible, no additional interference contours
- Optimum integration in the workspace due to individual mounting position
- Exhaust air flow control valve (included in the delivery)



Air transfer

Hoseless up to 8 pneumatic feed-through

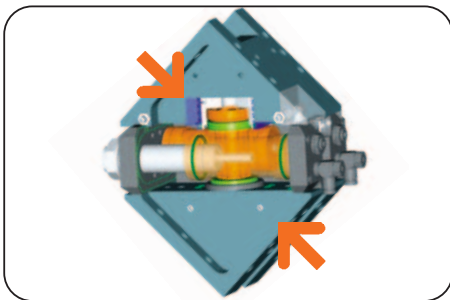
- Reduces interference contour, hose package must not pivot as well
- Smooth rotary distributor due to O-ring with Teflon support ring
- Compact external dimensions due to direct screwing on the housing



Central bore

For cable feed-through

- Up to Ø 18mm
- Central
- Low torsion on feed-through supply lines



Space saving solution

- Workpiece change with low interference contours due to angle connecting plates on the machine extension side and on the tool side
- Integrated pneumatic rotary distributor with up to 8 way hoseless air transfer saves important machine space, it is not necessary to carry the pneumatic supply along

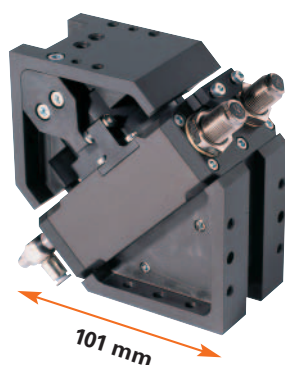


Damping

Hydraulic shock absorber with spiral groove technology

- Low wear approach to end position, gentle energy absorption due to profiled spiral groove
- The damping characteristics can be individually adjusted by the screw depth
- Built into the pressure chamber, cooled by permanent air flow, constant damping behavior

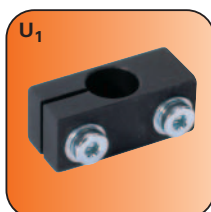
Angled Swivel Unit



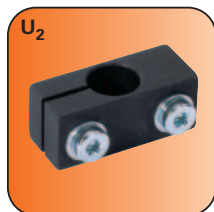
Included in the delivery



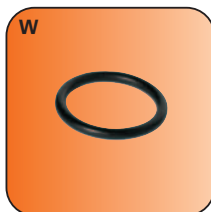
Pneumatic fittings
Order no. DRVM5x4



Mounting block
Order no. KB8-36



Mounting block
Order no. KB8-35

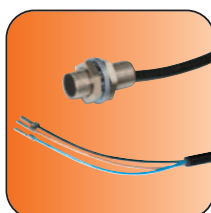


O-Ring
Order no. COR0020100

Accessory list



Proximity switch
Order no. NJ8-E2S



Proximity switch
Order no. NJ8-E2

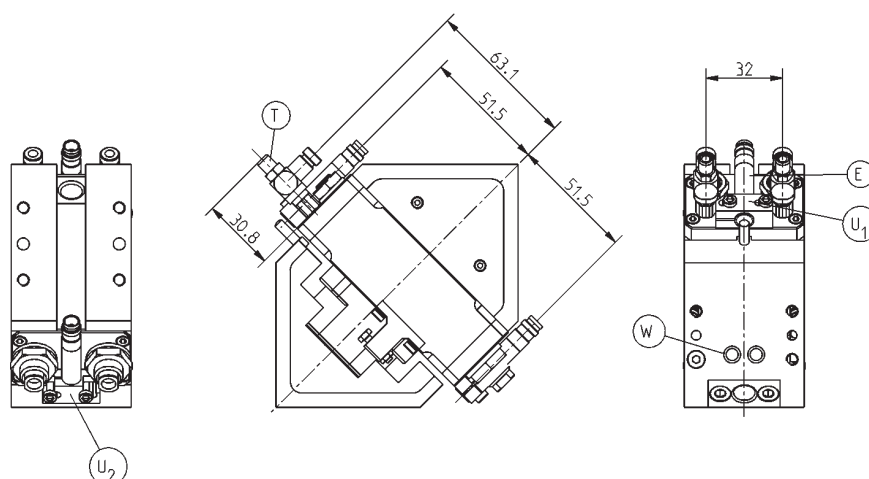


Cable angled plug
Order no. KAW500



Plug 3-pole
Order no. S12-G-3

Accessories



Subject to change without prior notice

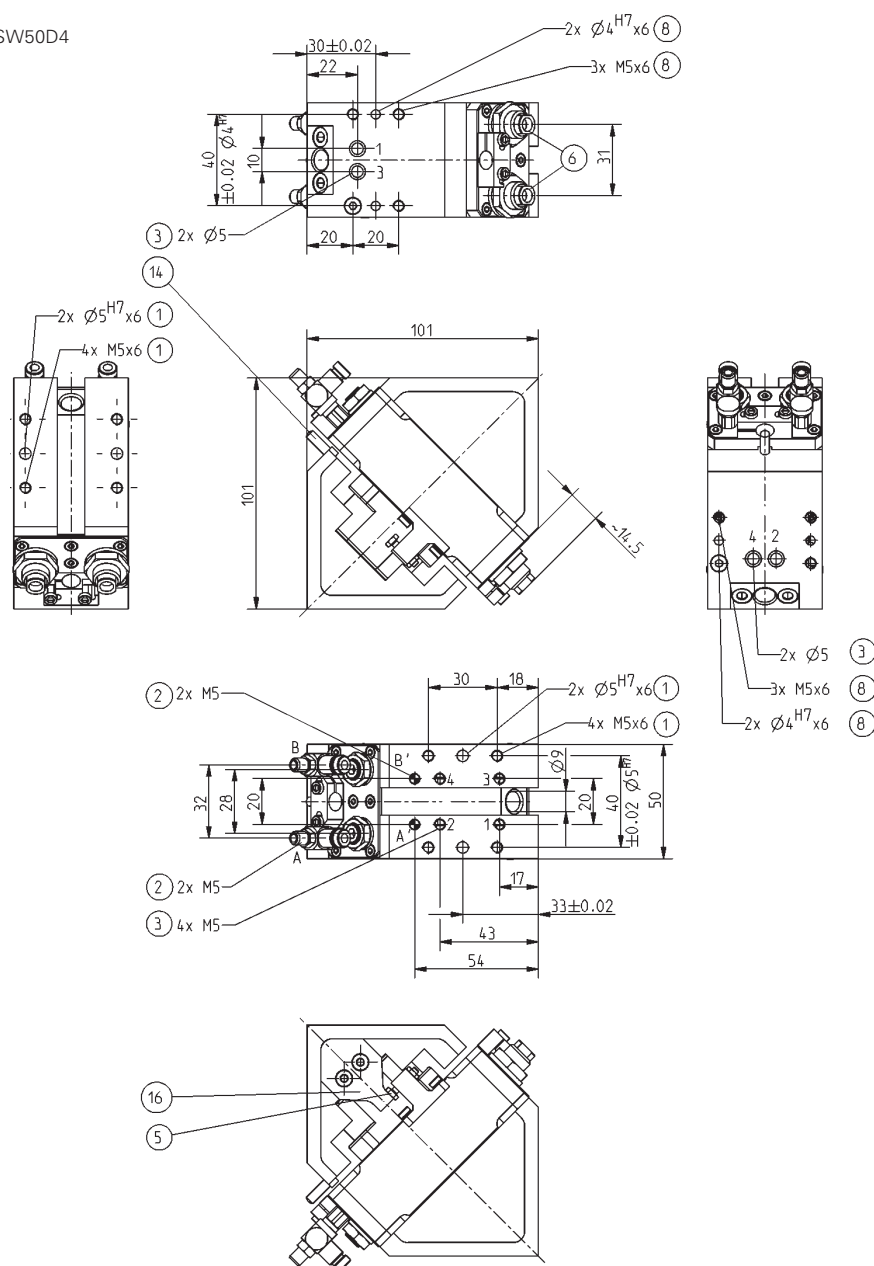


Order no.:	SW50D4
Swivel angle [°]:	180
Torque [Nm]:	1,5
Swivel angle 180° adjustable +/- [°]:	3
Repeatability +/- [°]:	0,01
Swivel time [s]*:	0,3
Passage bore Ø [mm]:	9
Air feed-through [quantity]:	4
Axial bearing load [N]:	700
Radial bearing load [Nm]:	30
Min./max. operating pressure [bar]:	4/8
Air volume per cycle [cm³]:	15
Min./max. operating temperature [°C]:	5/80
Weight [kg]:	1,2

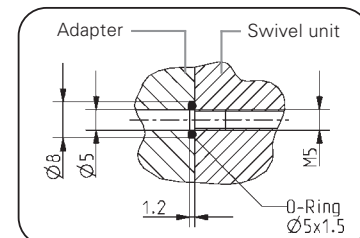
All data measured at 6 bar

* without extension load

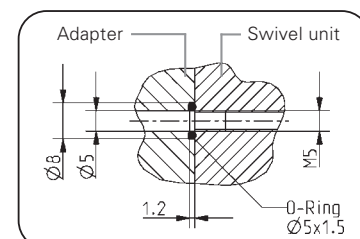
SW50D4



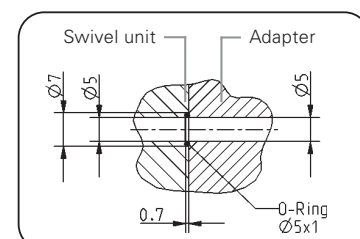
- ① Fixing swivel unit
- ② Energy supply
- ③ Hoseless air connection
- ⑤ Adjusting screw
- ⑥ Shock absorbers
- ⑧ Fixing tool side
- ⑭ Switch cam 180°
- ⑯ Fix stop 180°
- Ⓐ Air connection swivel to 180°
- Ⓑ Air connection swivel to 0°
- Ⓐ Air connection swivel to 180° (alternate)
- Ⓑ Air connection swivel to 0° (alternate)



Hoseless energy connection (machine side)



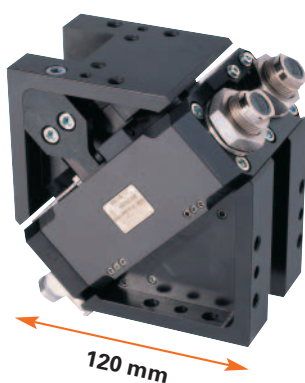
Hoseless air connection (machine side)



Hoseless air connection (tool side)

Subject to change without prior notice

Angled Swivel Unit



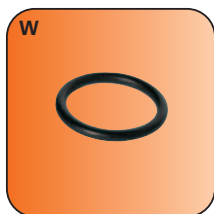
Included in the delivery



Pneumatic fittings
Order no. DRV1/8x6



Mounting block
Order no. KB8-37

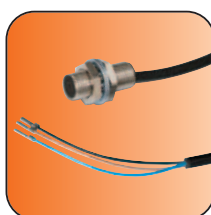


O-Ring
Order no. COR0020100

Accessory list



Proximity switch
Order no. NJ8-E2S



Proximity switch
Order no. NJ8-E2

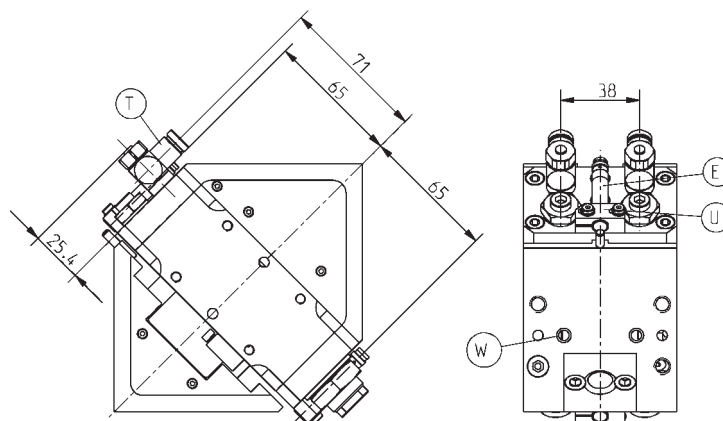


Cable angled plug
Order no. KAW500



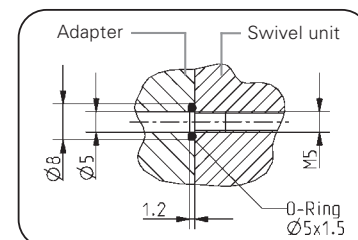
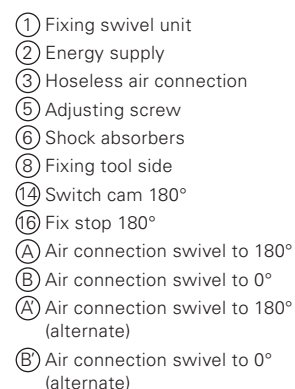
Plug 3-pole
Order no. S12-G-3

Accessories

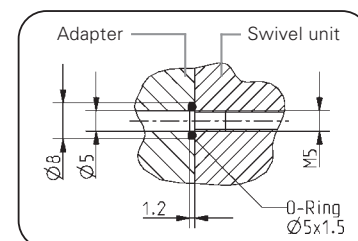


Subject to change without prior notice

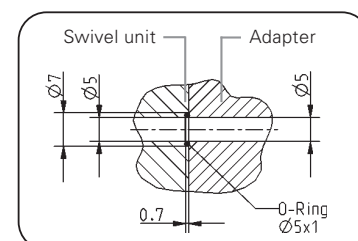
All data measured at 6 bar
* * without extension load



Hoseless energy connection (machine side)



Hoseless air connection (machine side)



Hoseless air connection (tool side)

Subject to change without prior notice

Angled Swivel Unit



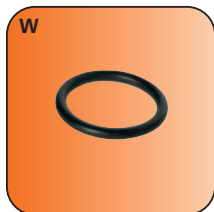
Included in the delivery



Pneumatic fittings
Order no. DRV1/8x6



Mounting block
Order no. KB8-38

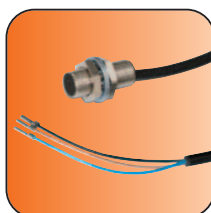


O-Ring
Order no. COR0030100

Accessory list



Proximity switch
Order no. NJ8-E2S



Proximity switch
Order no. NJ8-E2

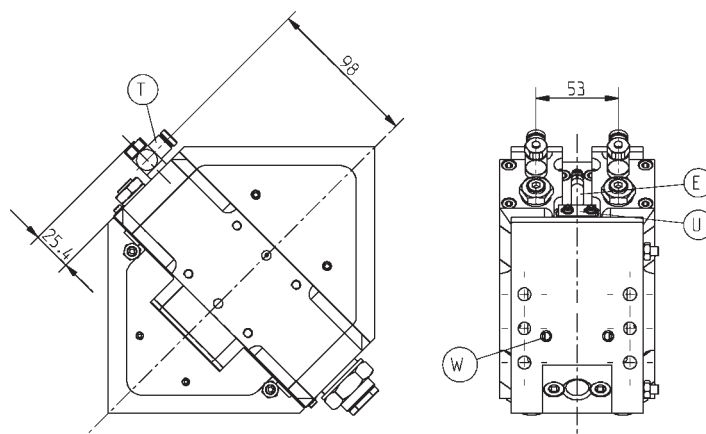


Cable angled plug
Order no. KAW500



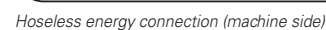
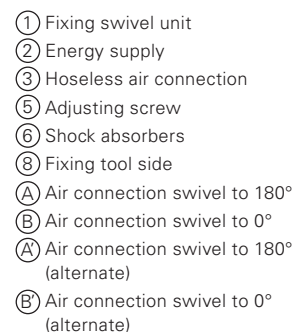
Plug 3-pole
Order no. S12-G-3

Accessories



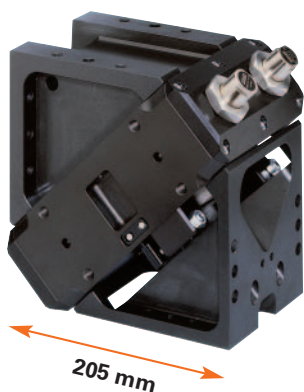
Subject to change without prior notice

All data measured at 6 bar
** * without extension load*



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Angled Swivel Unit



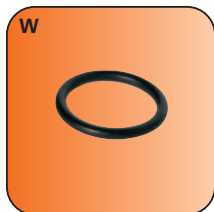
Included in the delivery



Pneumatic fittings
Order no. DRV1/4x8



Mounting block
Order no. KB8-40

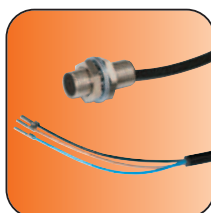


O-Ring
Order no. COR0050100

Accessory list



Proximity switch
Order no. NJ8-E2S



Proximity switch
Order no. NJ8-E2

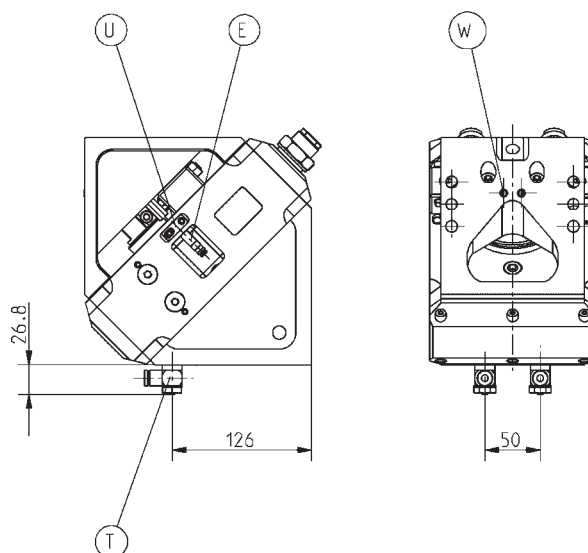


Cable angled plug
Order no. KAW500



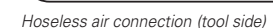
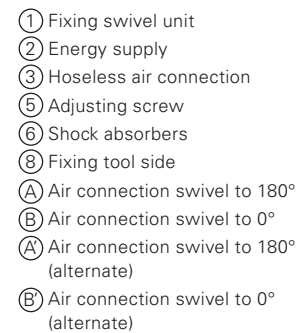
Plug 3-pole
Order no. S12-G-3

Accessories

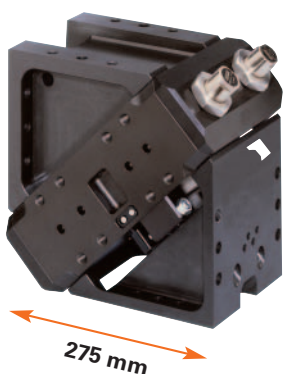


Subject to change without prior notice

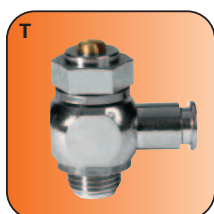
All data measured at 6 bar
** * without extension load*

**SOMMER**
automatic

Angled Swivel Unit



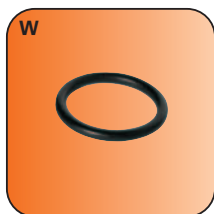
Included in the delivery



Pneumatic fittings
Order no. DRV1/4x8



Mounting block
Order no. KB8-40

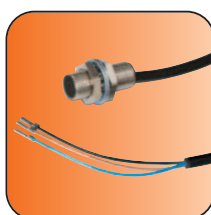


O-Ring
Order no. COR0050100

Accessory list



Proximity switch
Order no. NJ8-E2S



Proximity switch
Order no. NJ8-E2

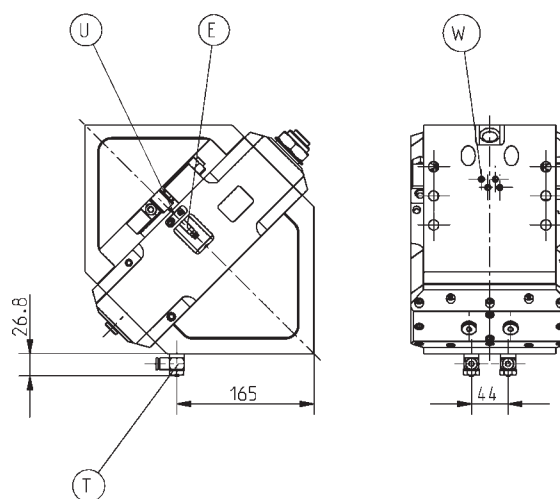


Cable angled plug
Order no. KAW500



Plug 3-pole
Order no. S12-G-3

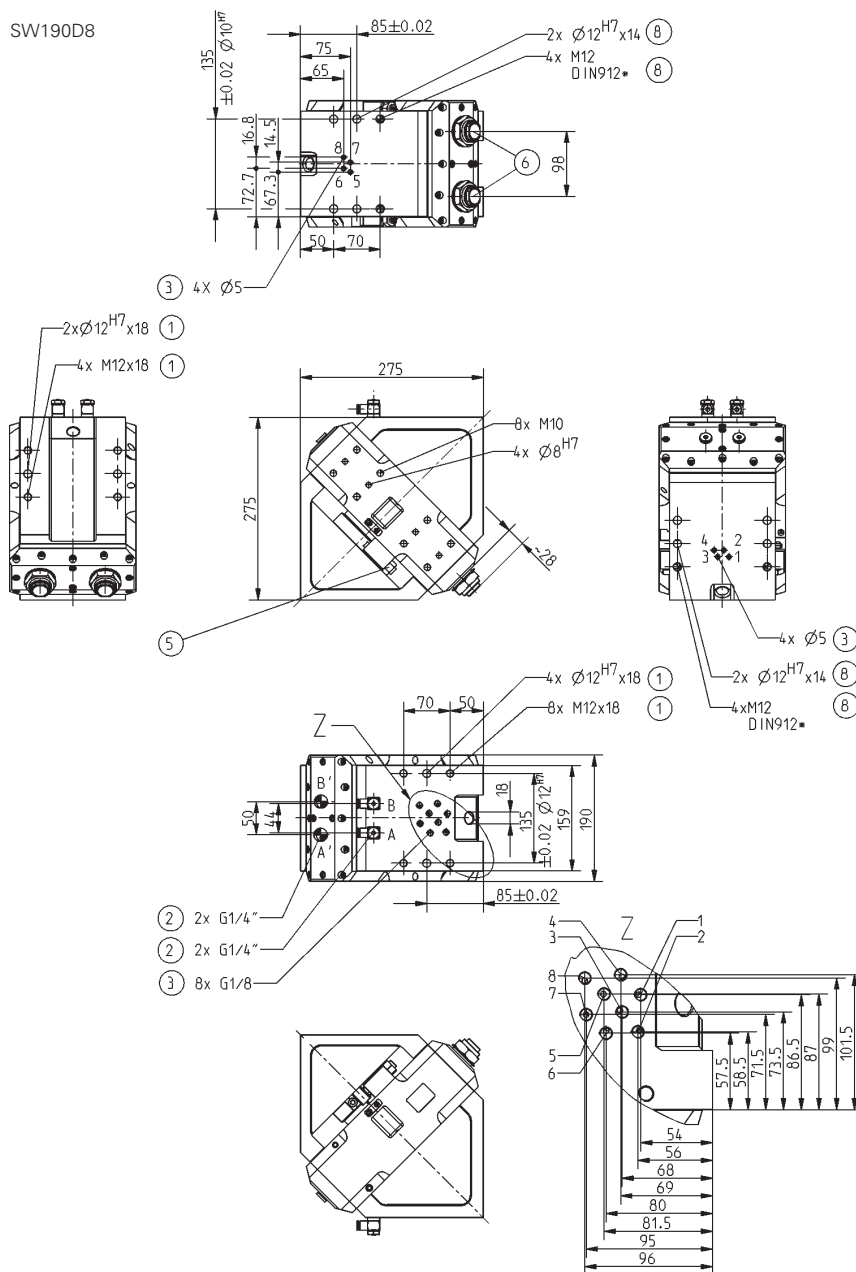
Accessories



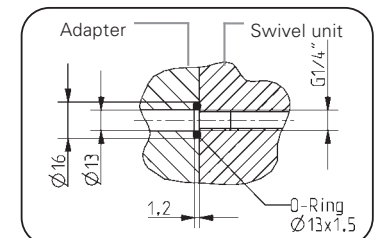
Subject to change without prior notice

Order no.:	SW190D8
Swivel angle [°]:	180
Torque [Nm]:	110
Swivel angle 180° adjustable +/- [°]:	3
Repeatability +/- [°]:	0,01
Swivel time [s]*:	1,1
Passage bore Ø [mm]:	18
Air feed-through [quantity]:	8
Axial bearing load [N]:	8000
Radial bearing load [Nm]:	1500
Min./max. operating pressure [bar]:	4/8
Air volume per cycle [cm³]:	650
Ölvolumen pro cycle [cm³]:	-
Min./max. operating temperature [°C]:	5/80
Weight [kg]:	29,0

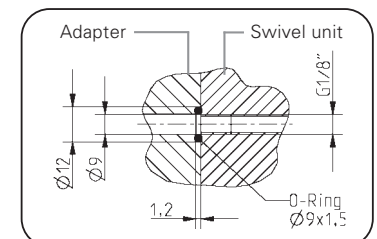
All data measured at 6 bar
* * without extension load



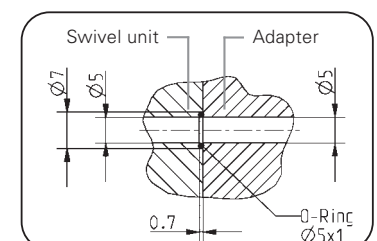
- ① Fixing swivel unit
- ② Energy supply
- ③ Hoseless air connection
- ⑤ Adjusting screw
- ⑥ Shock absorbers
- ⑧ Fixing tool side
- Ⓐ Air connection swivel to 180°
- Ⓑ Air connection swivel to 0°
- Ⓐ Air connection swivel to 180°
(alternate)
- Ⓑ Air connection swivel to 0°
(alternate)



Hoseless energy connection (machine side)



Hoseless air connection (machine side)



Hoseless air connection (tool side)

Subject to change without prior notice

Angled Swivel Unit Formulas

1. Angled Swivel Formulas

In the technical tables, the "Force" of the swivel-units is declared in Nm. This value declares a torque, produced by the swivel unit, when a pressure of 6 bar is supplied.

In order to size a angled swivel-unit correctly, one requires different basic data such as workpiece-weight and lever-length to center of gravity.

For increased application-safety, a factor of safety may be inserted into the calculation.

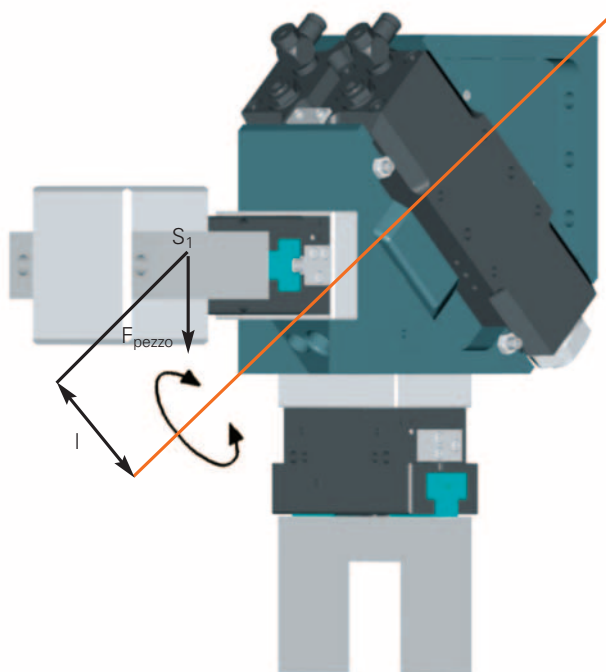
In the following example calculation (1.1) a angled swivel unit application is shown as an example.

Please take into account, the sizing is based on a symmetrical configuration and therefore only the additional weight of the workpiece is going into the calculation.

Calculation example 1.1

Skizze:

S_1 = moment of inertia



Given:	Weight of Workpiece	= $F_{Wst.}$	=	$5,5 \text{ kg} \times 9,81 \text{ m/s}^2 = 53,96 \text{ N}$
	Lenght of lever	= l	=	$0,13 \text{ m}$
	Safety Factor	= n	=	2

Find:	Torque	= M
-------	--------	-------

Calculation:	$M = F_{Wst.} \times l \times n$
	$M = 53,96 \text{ N} \times 0,13 \text{ m} \times 2$
	<u>$M = 14,03 \text{ Nm}$</u>

Result:	On the basis of the torque, the selection falls to the SW100D4 was selected, with a torque of 15 Nm at 6 bar.
---------	---



Series MSF

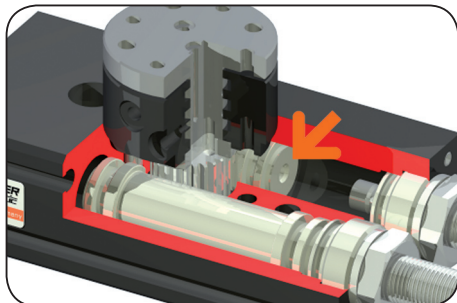
Swivel Units pneumatic



SOMMER
automatic
your application - our focus.

Flat swivel unit

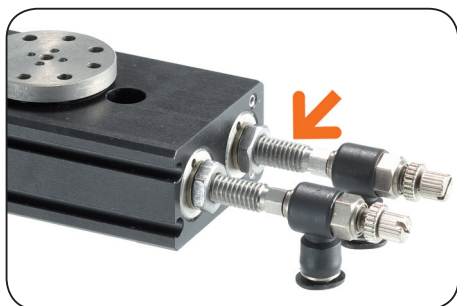
Highlights



Drive

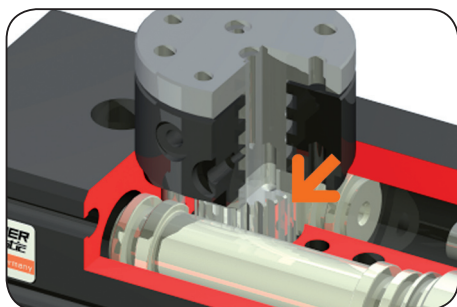
Two double acting pneumatic cylinders

- Maximum torque in both rotating directions
- Torque up to 1.2 Nm



Swivel angle

- high flexibility due to a continuously adjustable swivel angle from 90° (-3°) to 180° (+3°)
- integrated positive stop for high repeatability



Power transmission

via gear rod and pinion

- high efficiency as a result of optimal direction change of driving power into torque
- grinded Functional parts made of ground highest hardened steel ensure precision and a long durability
- two way ball bearings to assure large absorption of vigors and torques



Housing

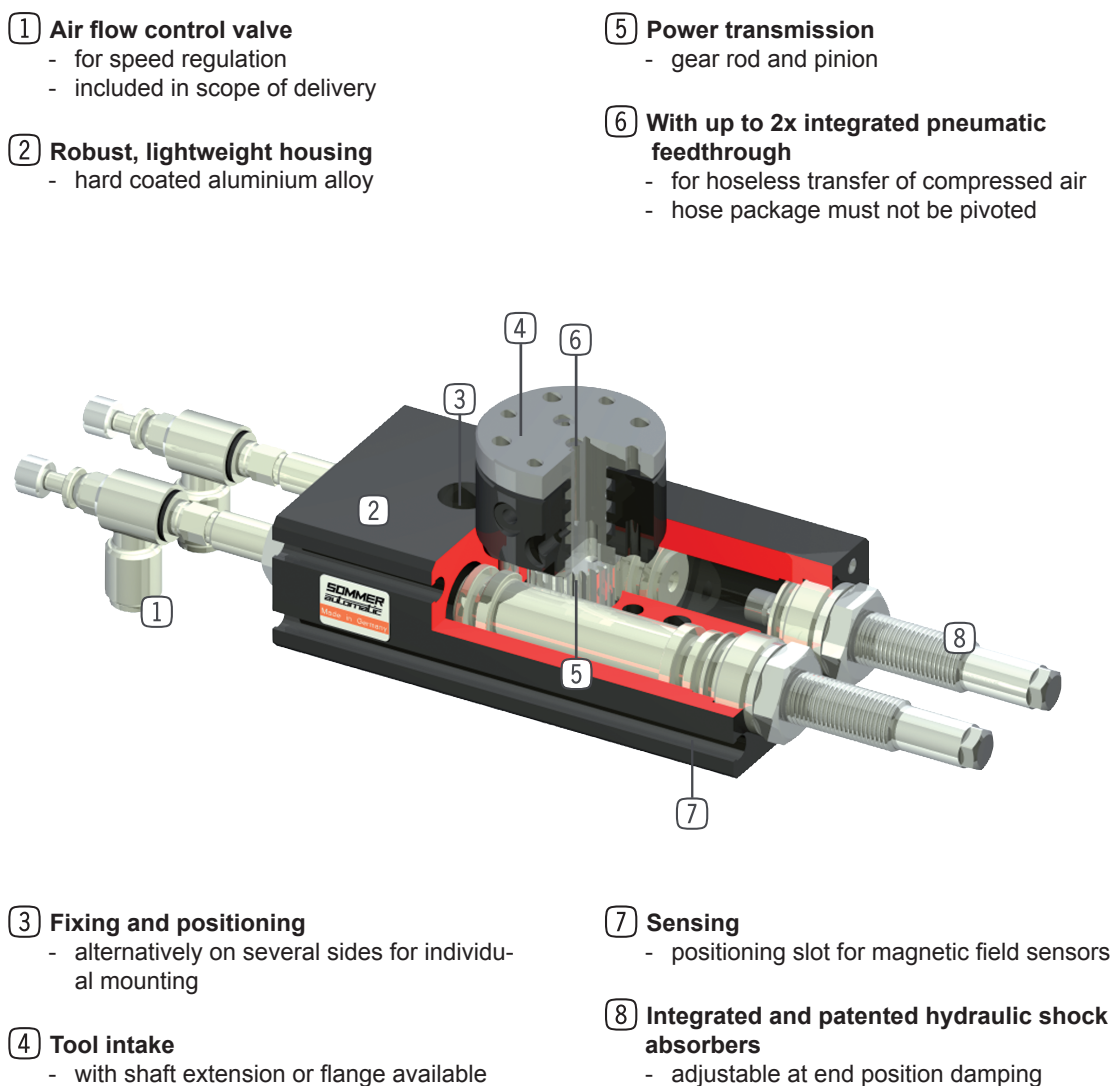
Position sensing, energy supply, fixing- and positioning possibilities integrated

- individual integration into working chamber thank to variable ways of installation
- small complexity in construction and manufacturing of the connecting plate due to a plane tightening surface
- compact design resulting from integrated intake for position sensing to the housing

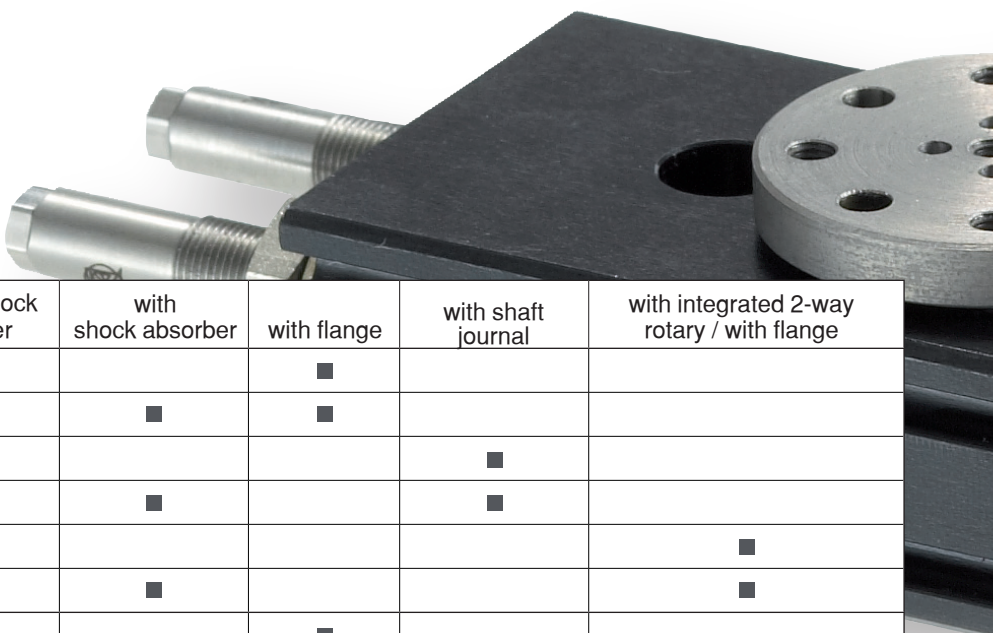
Terms

Torque:	force moment occurring on the output flange of the swivel unit
Swivel time:	time required to complete a 0°/90°/0° or 0°/180°/0° rotation
Repeatability:	dispersion of end positions during 100 consecutive swivel cycles
Cycle:	distance covered by the piston at one 0°/90°/0° or 0°/180°/0° swivel movement
Maintenance:	<p>maintenance free up to 10 Mio. swivel cycles</p> <p>(please see the owner's manual for details, download from www.sommer-automatic.com)</p> <ul style="list-style-type: none"> - long maintenance intervals keep costs low - long durability

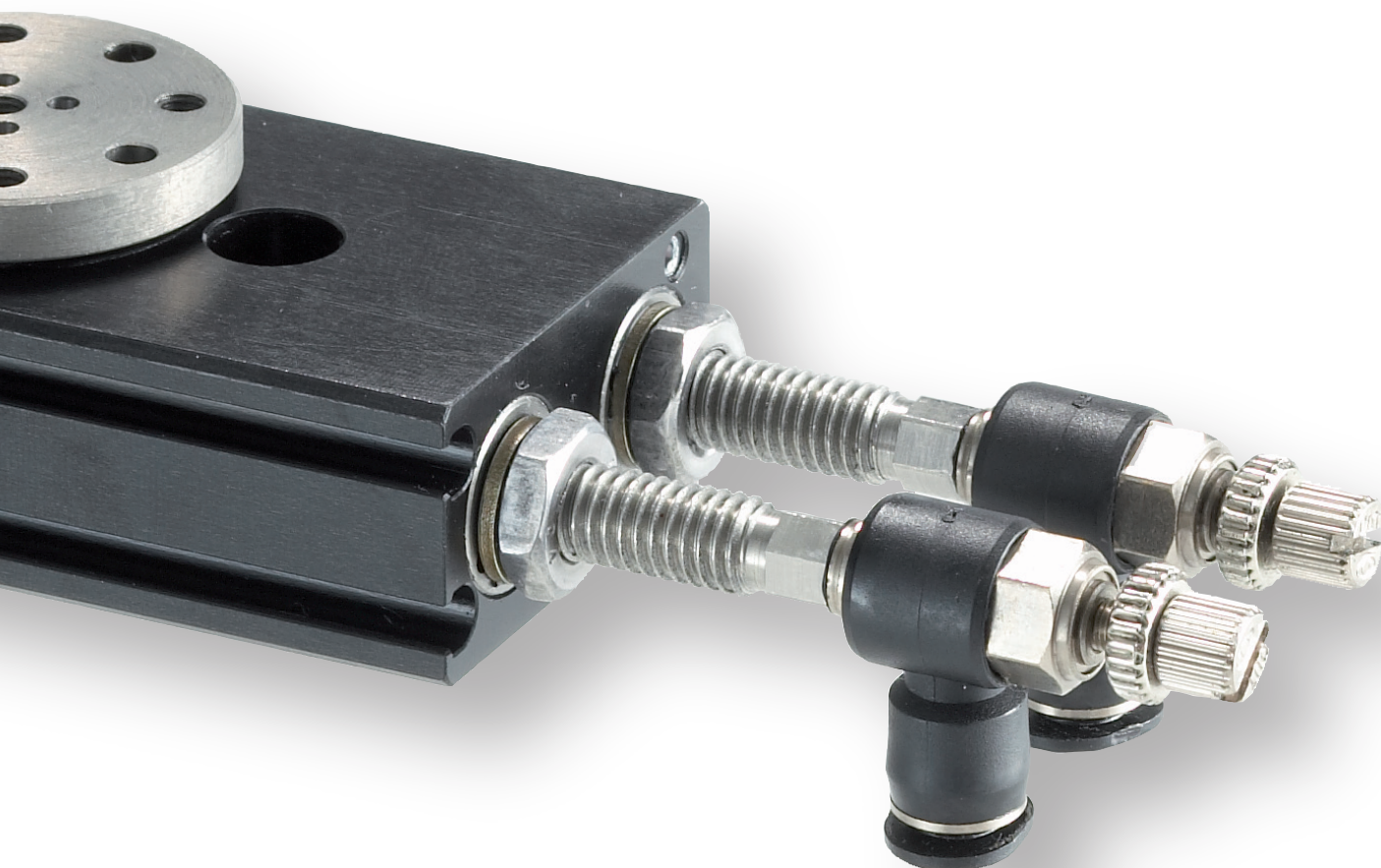
Functional diagram



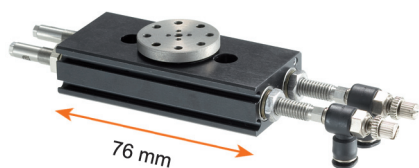
Flatswivel units



Size		Page	without shock absorber	with shock absorber	with flange	with shaft journal	with integrated 2-way rotary / with flange
MSF34	MSF34N-F001	10	■		■		
	MSF34S-F001	10		■	■		
	MSF34N-F002	10	■			■	
	MSF34S-F002	10		■		■	
	MSF34N-D2	10	■				■
	MSF34S-D2	10		■			■
MSF40	MSF40N-F001	12	■		■		
	MSF40S-F001	12		■	■		
	MSF40N-F002	12	■			■	
	MSF40S-F002	12		■		■	
	MSF40N-D2	12	■				■
	MSF40S-D2	12		■			■
MSF44	MSF44N-F001	14	■		■		
	MSF44S-F001	14		■	■		
	MSF44N-F002	14	■			■	
	MSF44S-F002	14		■		■	
	MSF44N-D2	14	■				■
	MSF44S-D2	14		■			■



Flat swivel unit

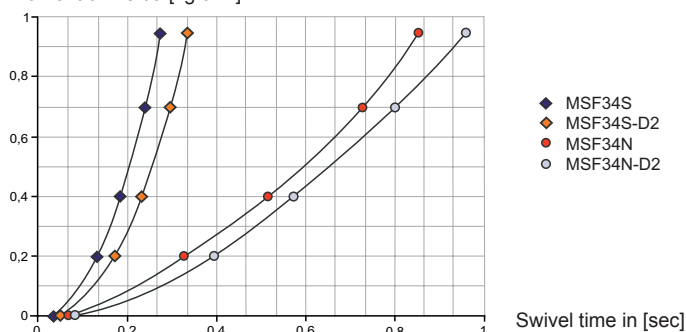


Picture shows MSF34S-F001

Moment of inertia

Shows the expected swivel time against the calculated moment of inertia

Moment of inertia [kg cm²]

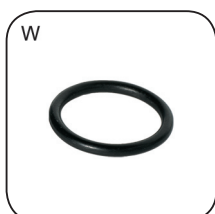


Data measured at 6 bar and horizontal mounting position

Included in scope of delivery



Pneumatic fittings
Order no. DRVM3X4

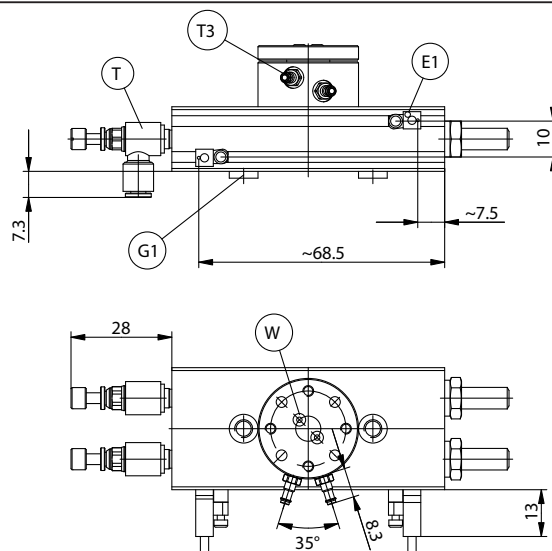


O-Ring
Order no. COR0015100



Centering sleeve
Order no. BDST40800

Accessory

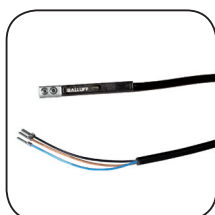


Subject to change without prior notice

Recommended accessories



Proximity switch
Order no. MFS103KHC42



Proximity switch
Order no. MFS303KHC30



Pneumatic fittings
Order no. GVM3



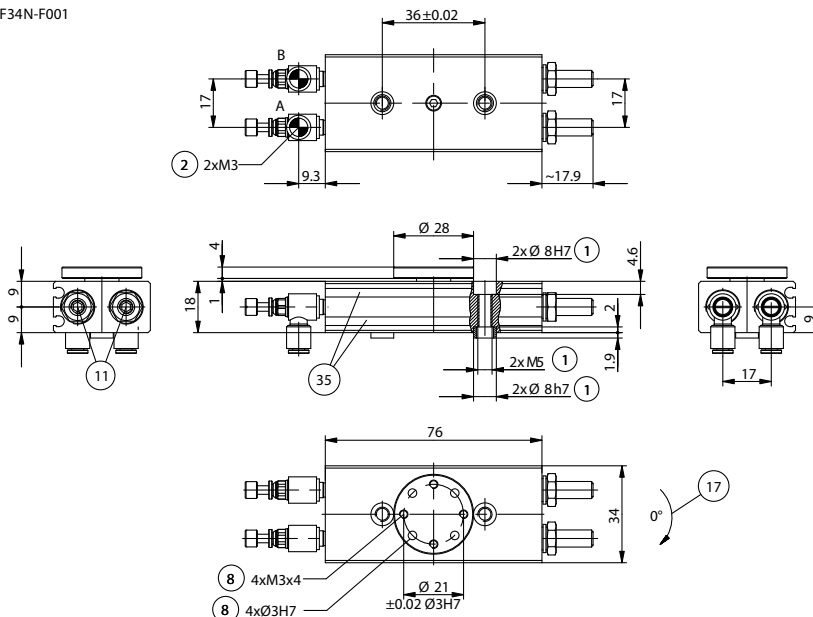
Plug 3 pole
Order no. S12-G-3



Order no:	MSF34N-F001	MSF34S-F001	MSF34N-F002	MSF34S-F002	MSF34N-D2	MSF34S-D2
Swivel angle adjustable [°]:	90-180	90-180	90-180	90-180	90-180	90-180
Torque [Nm]:	0,4	0,4	0,4	0,4	0,3	0,3
Repeatability +/- [°]:	0,07	0,01	0,07	0,01	0,07	0,01
Air feed-through [quantity]:	-	-	-	-	2	2
Axial bearing load [N]:	217,5	217,5	217,5	217,5	217,5	217,5
Radial bearing load [Nm]:	5,4	5,4	5,4	5,4	5,4	5,4
Min. operating pressure [bar]:	3	3	3	3	3	3
Max. operating pressure. [bar]:	8	8	8	8	8	8
Operating temperature min./max. [°C]:	5-80	5-80	5-80	5-80	5-80	5-80
Air volume per cycle 90° [cm³]:	3	3	3	3	3	3
Air volume per cycle 180° [cm³]:	6	6	6	6	6	6
Weight [kg]:	0,17	0,18	0,17	0,19	0,2	0,2

All data measured at 6 bar.

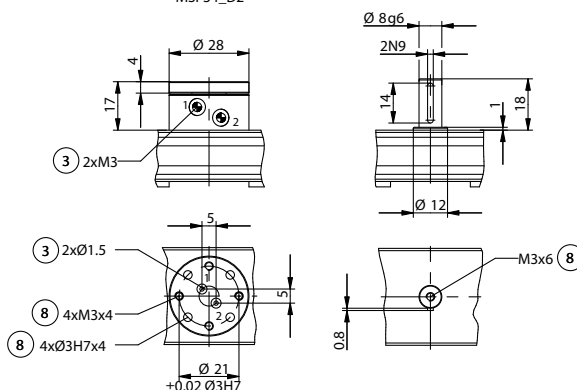
MSF34N-F001



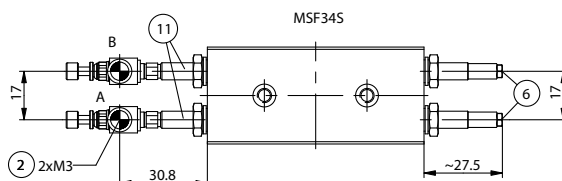
- ① Fixings for swivel unit
- ② Energy supply
- ③ Hoseless air connection / integrated air feed-through
- ⑥ Shock absorbers
- ⑧ Tool fitting / fixing at work piece
- ⑪ Internal positive stop
- ⑰ Swivel direction
- ⑳ Slot for magnetic field sensor
- Ⓐ Air connection swivel to 90° or 180°
- Ⓑ Air connection swivel to 0°

MSF34_D2

MSF34_F002

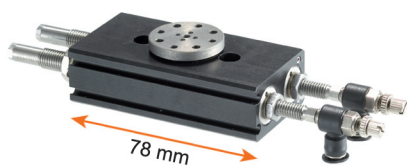


MSF34S



Subject to change without prior notice

Flat swivel unit

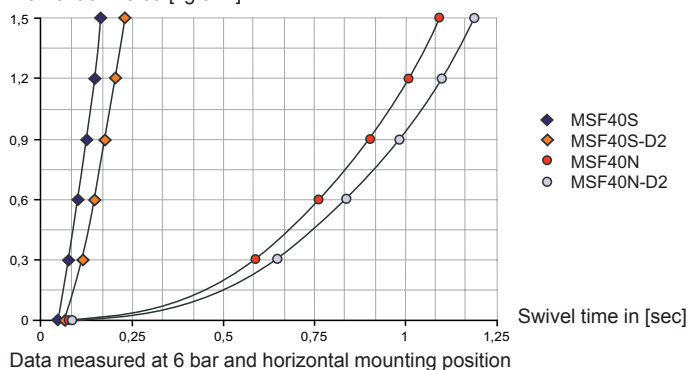


Picture shows MSF40S-F001

Moment of inertia

Shows the expected swivel time against the calculated moment of inertia

Moment of inertia [kg cm²]

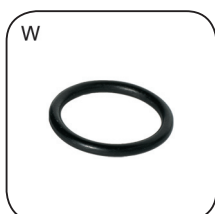


Data measured at 6 bar and horizontal mounting position

Included in scope of delivery



Pneumatic fittings
Order no. DRVM3X4

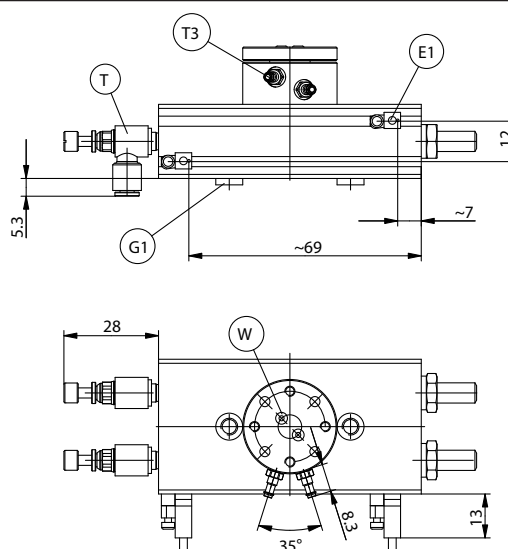


O-Ring
Order no. COR0015100



Centering sleeve
Order no. BDST40800

Accessory



Subject to change without prior notice

Recommended accessories



Proximity switch
Order no. MFS103KHC42



Proximity switch
Order no. MFS303KHC30



Pneumatic fittings
Order no. GVM3



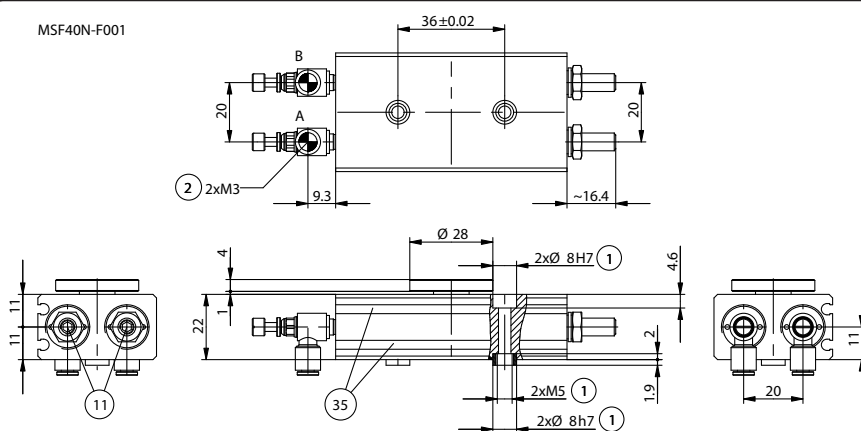
Plug 3 pole
Order no. S12-G-3



Order no:	MSF40N-F001	MSF40S-F001	MSF40N-F002	MSF40S-F002	MSF40N-D2	MSF40S-D2
Swivel angle adjustable [°]:	90-180	90-180	90-180	90-180	90-180	90-180
Torque [Nm]:	0,7	0,7	0,7	0,7	0,6	0,6
Repeatability +/- [°]:	0,07	0,01	0,07	0,01	0,07	0,01
Air feed-through [quantity]:	-	-	-	-	2	2
Axial bearing load [N]:	217,5	217,5	217,5	217,5	217,5	217,5
Radial bearing load [Nm]:	6,9	6,9	6,9	6,9	6,9	6,9
Min. operating pressure [bar]:	3	3	3	3	3	3
Max. operating pressure. [bar]:	8	8	8	8	8	8
Operating temperature min./max. [°C]:	5-80	5-80	5-80	5-80	5-80	5-80
Air volume per cycle 90° [cm³]:	4,3	4,3	4,3	4,3	4,3	4,3
Air volume per cycle 180° [cm³]:	8,6	8,6	8,6	8,6	8,6	8,6
Weight [kg]:	0,26	0,27	0,26	0,27	0,28	0,29

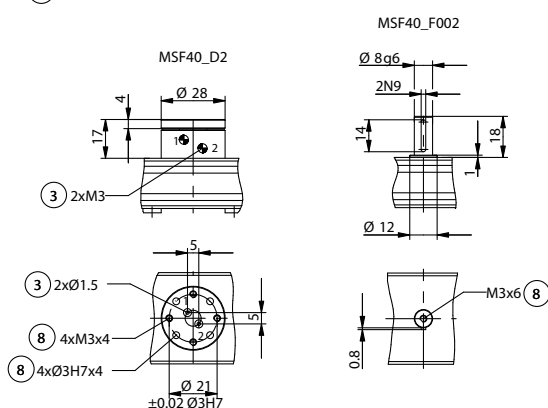
All data measured at 6 bar.

MSF40N-F001

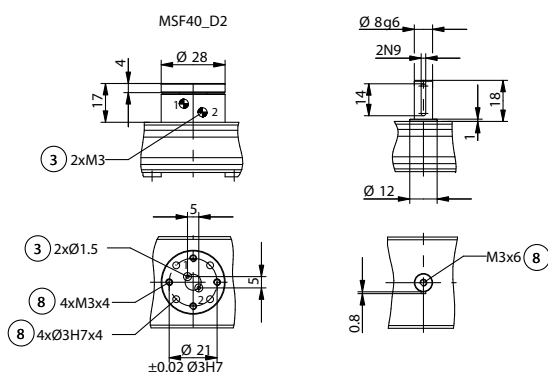


- ① Fixings for swivel unit
- ② Energy supply
- ③ Hoseless air connection / integrated air feed-through
- ⑥ Shock absorbers
- ⑧ Tool fitting / fixing at work piece
- ⑪ Internal positive stop
- ⑰ Swivel direction
- ⑳ Slot for magnetic field sensor
- Ⓐ Air connection swivel to 90° or 180°
- Ⓑ Air connection swivel to 0°

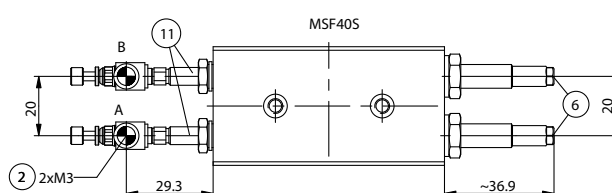
MSF40_F002



MSF40_D2

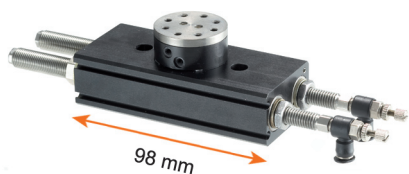


MSF40S



Subject to change without prior notice

Flat swivel unit

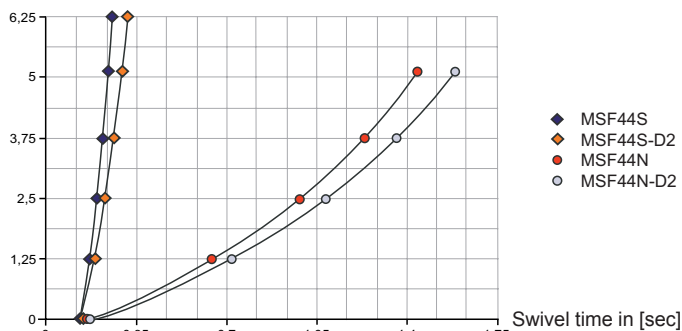


Picture shows MSF44S-D2

Moment of inertia

Shows the expected swivel time against the calculated moment of inertia

Moment of inertia [kg cm²]

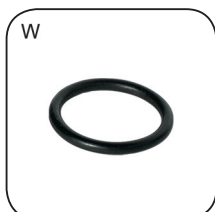


Data measured at 6 bar and horizontal mounting position

Included in scope of delivery



Pneumatic fittings
Order no. DRVM3X4

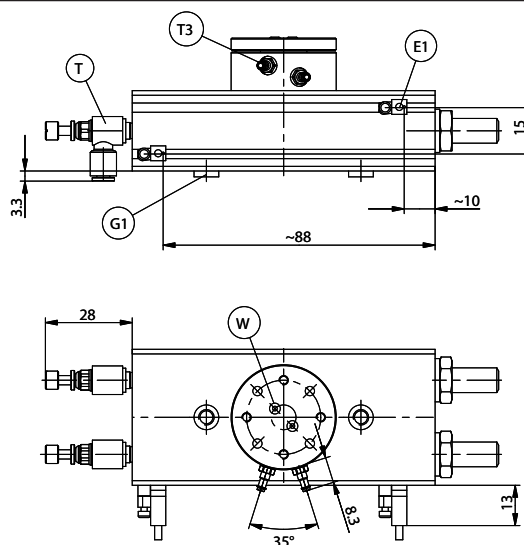


O-Ring
Order no. COR0015100



Centering sleeve
Order no. BDST40800

Accessory

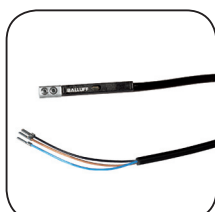


Subject to change without prior notice

Recommended accessories



Proximity switch
Order no. MFS103KHC42



Proximity switch
Order no. MFS303KHC30



Pneumatic fittings
Order no. GVM3

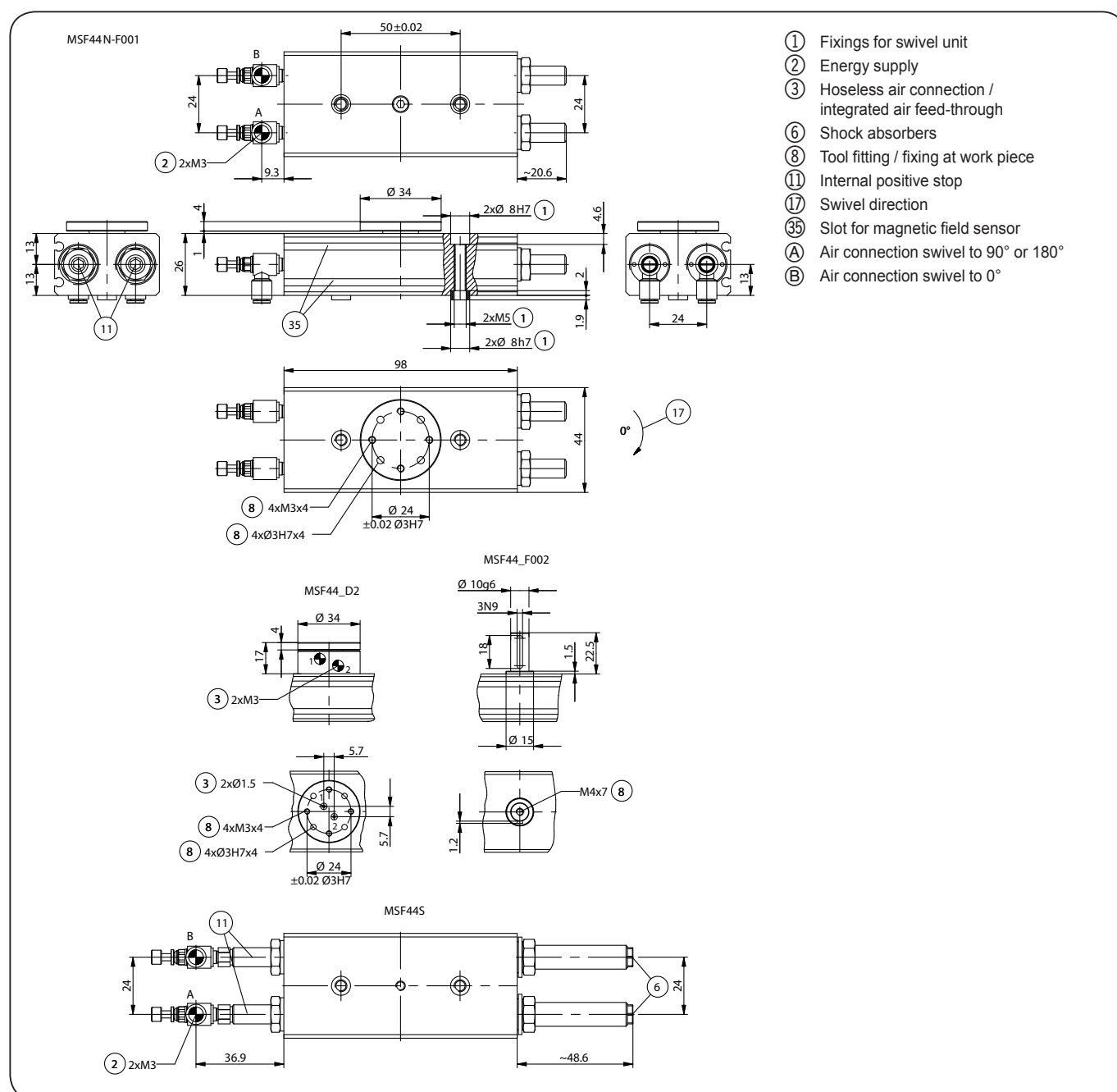


Plug 3 pole
Order no. S12-G-3



Order no:	MSF44N-F001	MSF44S-F001	MSF44N-F002	MSF44S-F002	MSF44N-D2	MSF44S-D2
Swivel angle adjustable [°]:	90-180	90-180	90-180	90-180	90-180	90-180
Torque [Nm]:	1,2	1,2	1,2	1,2	1	1
Repeatability +/- [°]:	0,07	0,01	0,07	0,01	0,07	0,01
Air feed-through [quantity]:	-	-	-	-	2	2
Axial bearing load [N]:	520	520	520	520	520	520
Radial bearing load [Nm]:	19,2	19,2	19,2	19,2	19,2	19,2
Min. operating pressure [bar]:	3	3	3	3	3	3
Max. operating pressure. [bar]:	8	8	8	8	8	8
Operating temperature min./max. [°C]:	5-80	5-80	5-80	5-80	5-80	5-80
Air volume per cycle 90° [cm³]:	7,7	7,7	7,7	7,7	7,7	7,7
Air volume per cycle 180° [cm³]:	15,4	15,4	15,4	15,4	15,4	15,4
Weight [kg]:	0,41	0,42	0,41	0,42	0,45	0,46

All data measured at 6 bar.



Subject to change without prior notice



➤ Grippers <i>pneumatic</i>	01
➤ Grippers <i>electrical</i>	02
➤ Grippers <i>hydraulic</i>	03
➤ Grippers <i>Special</i>	04
➤ Grip & Rotate Modules <i>pneumatic</i>	05
➤ Separators	06
➤ Swivel Units <i>pneumatic</i>	07
➤ Swivel Units <i>electrical</i>	08
➤ Swivel Units <i>hydraulic</i>	09
➤ Rotation Jaws <i>pneumatic</i>	10
➤ Axial Compensation Modules	11
➤ Tool Changers	12
➤ Robotics Accessories	13
➤ Linear Cylinders	14
➤ Shock Absorber	15
➤ Air Vane Motors	16
➤ Rotary Cylinders	17
➤ Vacuum Components	18
➤ Accessorios	19