

# Automatic coupling systems

ND 5/8, hydraulic pmax. 350/300 bar, pneumatic 3,5 to 10 bar, double-acting

100-6

Issue: 10/2023

## Description:

If there is no coupling stroke required or possible, this coupling system can be coupled separately by a control pressure.

The gap between the coupling mechanism and coupling nipple can be 0.6 - 1.0 mm.

## Operating:

The coupling surfaces of AKN and AKM are frontally flat so that the user can position them in any axial and / or radial positions for coupling in accordance with the positioning tolerance.

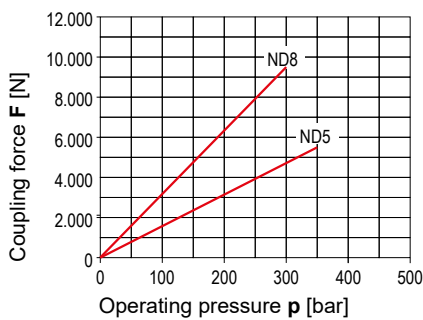
An integrated control piston **A** initiates the clamping stroke. It is possible to control individual couplings specifically. The control pressure **A** is to be supplied with the same pressure as the media pressure **P**.

When the control port **A** is not pressurized, the AKM is set into the basic position. The maximum operating pressure is 350 bar.

The AKM can be operated single-acting (only hydraulically) or double-acting. If the AKM should operate single-acting, the port **B** must be used for housing ventilation. In order to increase the operational safety, the double-acting operation method is preferable.

The coupling force between coupling nipple and coupling mechanism has to be compensated positively from the outside. The axially acting front seal surfaces must be protected from contamination.

## Coupling force:

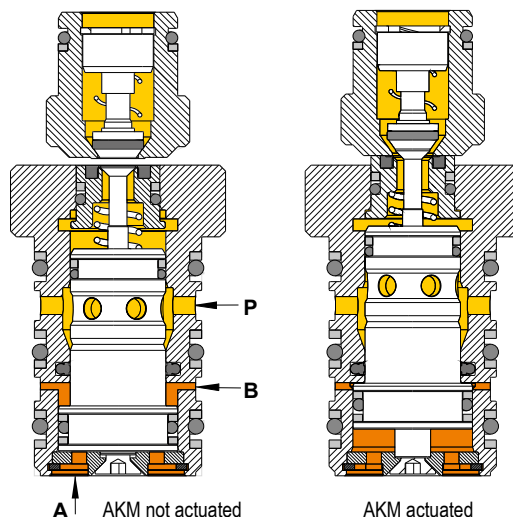


$$ND\ 5 = F [N] = 15,4 \times p [bar]$$

$$ND\ 8 = F [N] = 31,4 \times p [bar]$$

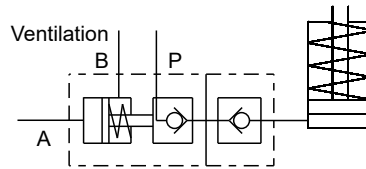
## Functional scheme:

1. Positioning the coupling nipple to the coupling mechanism in accordance with the positioning tolerance
2. Control pressure **A**: the connection to the coupling nipple side is initiated.
3. Operating pressure at port **P**

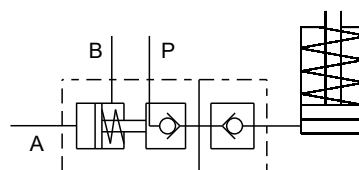


## Application examples:

single-acting, only hydraulically with 1 separate control line **A**



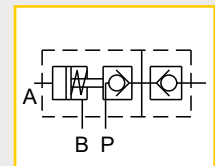
double-acting, hydraulically or pneumatically with 2 separate control lines **A** and **B**



**A**= Control pressure  
**B**= Control pressure  
**P**= Media pressure



Webcode: 010006



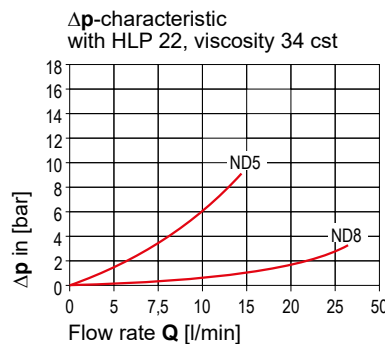
## Designs:

- ☒ - Screw-in system
- ☒ - Plug-in system

## Advantages:

- ☒ no additional stroke required for coupling
- ☒ enable depressurised coupling
- ☒ selective control of individual couplings is possible
- ☒ coupling elements made of stainless materials
- ☒ single-acting only hydraulically

## Flow resistance:



We also design and manufacture customized variants!

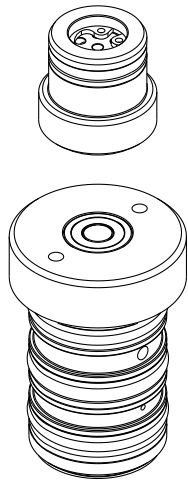
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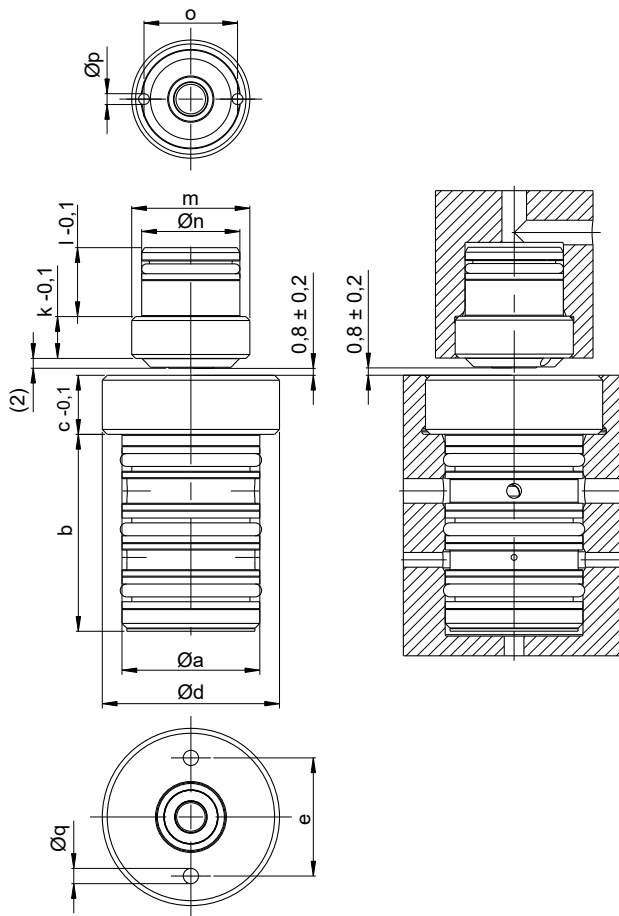
Technology that connects



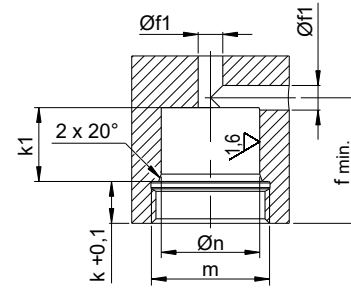
Coupling nipple (AKN)



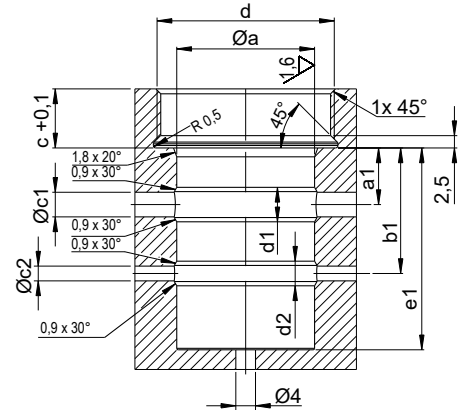
Coupling mechanism (AKM)



Installation contour for AKN



Installation contour for AKM



Dimensions:

N. diameter:	5	8
Øa [mm]	28 H7/f7	42 H7/f7
a1 [mm]	11,5	23
b [mm]	40	65
b1 [mm]	25,5	45
c [mm]	12	15
Øc1 [mm]	5	8
Øc2 [mm]	3	4
d	M36x1,5	M50x2
d1 [mm]	7	11,5
d2 [mm]	5	7,5
e [mm]	24	37
e1 [mm]	> 41	> 66
f min. [mm]	25	30
Øf1 [mm]	5	8
k [mm]	8,5	10
k1 [mm]	15	19
l [mm]	14	17
m	M24x1,5	M32x1,5
n [mm]	20 H7/f7	25 H7/f7
o [mm]	19	24
p [mm]	2,1	3,5
q [mm]	3,1	4,5

Technical data hydraulic:

Nominal diameter:		5	8
Hydraulic operating pressure max.	[bar]	350	300
Flow max./minute	[l/min.]	12	25
Gap nipple/mechanism min.	[mm]	0,6	0,6
Gap nipple/mechanism max.	[mm]	1,0	1,0
Axial coupling force (Pressure spring) coupled	[N]	130	-
Axial coupling force pressurized	[N]	F[N]=15,4 x p[bar]	F[N]=31,4 x p[bar]
Radial positioning tolerance	[mm]	± 0,2	± 0,2

Technical data pneumatic:

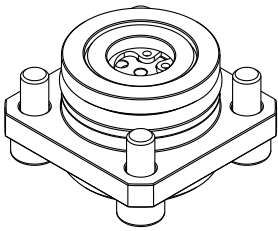
Nominal diameter:		5	8 (on request)
Pneumatic operating pressure min./max.	[bar]	3,5 to 10	-
Flow max./minute	[l/min.]	-	-
Gap nipple/mechanism min.	[mm]	0,6	0,6
Gap nipple/mechanism max.	[mm]	1,0	1,0
Axial coupling force (Pressure spring) coupled	[N]	45	-
Axial coupling force pressurized	[N]	F[N]=15,4 x p[bar]	F[N]=31,4 x p[bar]
Radial positioning tolerance	[mm]	± 0,2	± 0,2

Order number:

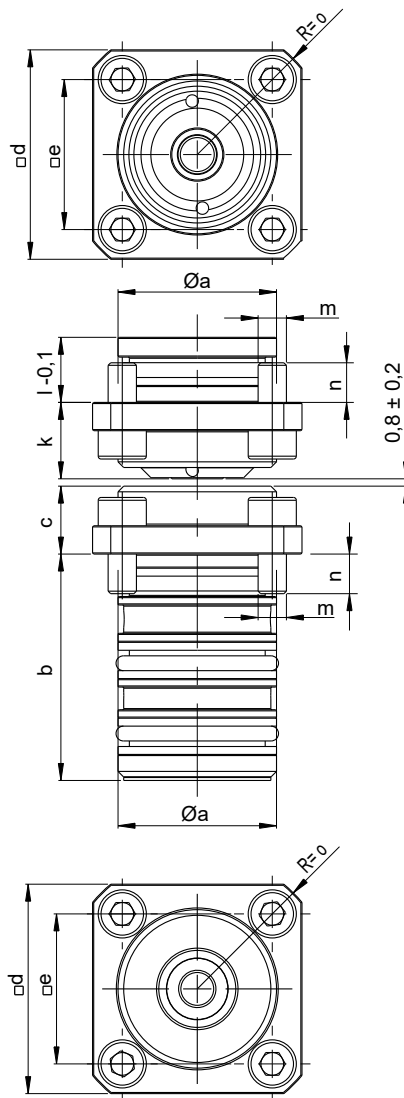
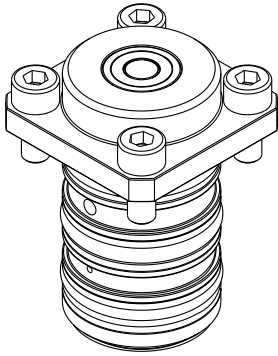
	ND 5	ND 8
Coupling nipple hydraulic (AKN) depressurized coupling	AKN-5-EG001	AKN-8-EG001
Coupling mechanism hydraulic (AKM) depressurized coupling	AKM-5-01-DW-001	AKM-8-01-DW-001
Coupling mechanism (AKM) depressurized coupling, without housing (only available on request)	AKM-5-01-DW-003	AKM-8-01-DW-003
Coupling nipple hydraulic (AKN) pressurized coupling	AKN-5-EG004	AKN-8-EG002
Coupling mechanism hydraulic (AKM) pressurized coupling	AKM-5-01-DW-004	AKM-8-01-DW-004
Coupling mechanism (AKM) pressurized coupling, without housing (only available on request)	AKM-5-01-DW-006	AKM-8-01-DW-006
Coupling nipple pneumatic (AKN) depressurized or pressurized coupling	AKN-5-EG005	-
Coupling mechanism pneumatic (AKM) depressurized or pressurized coupling	AKM-5-01-DW-010	-
Coupling mechanism (AKM) depressurized or pressurized coupling, without housing (only available on request)	AKM-5-01-DW-011	-
Screw-in tool for AKN	9000-199	on request
Screw-in tool for AKM	9000-198	on request



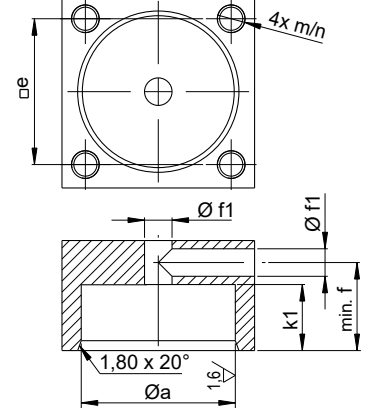
Coupling nipple (AKN)



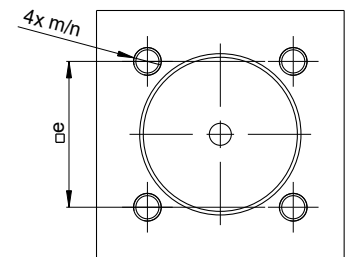
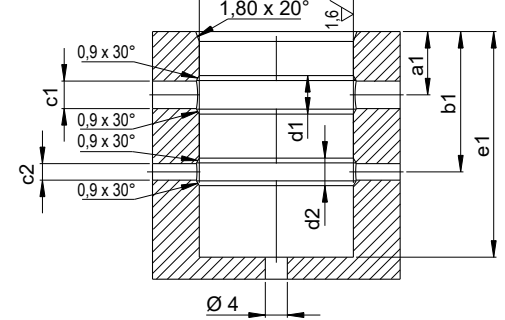
Coupling mechanism (AKM)



Installation contour for AKN



Installation contour for AKM



Dimensions:

N. diameter:	5	8
Øa [mm]	28 H7/f7	42 H7/f7
a1 [mm]	11,5	23
b [mm]	40	65
b1 [mm]	25,5	45
c [mm]	13,5	15
Øc1 [mm]	5	8
Øc2 [mm]	3	4
d [mm]	37	60
d1 [mm]	7	10
d2 [mm]	5	6
e [mm]	26,5	40
e1 [mm]	> 41	>66
f min. [mm]	16	20
Øf1 [mm]	5	8
k [mm]	13,5	17
k1 [mm]	12	13,5
l [mm]	11,5	13
m [mm]	M5	M8
n [mm]	7	13,5
o [mm]	24	37,5

Technical data hydraulic:

Nominal diameter:	5	8
Hydraulic operating pressure max. [bar]	350	300
Flow max./minute [l/min.]	12	25
Gap nipple/mechanism min. [mm]	0,6	0,6
Gap nipple/mechanism max. [mm]	1,0	1,0
Axial coupling force (Pressure spring) coupled [N]	130	-
Axial coupling force pressurized [N]	F[N]=15,4 x p[bar]	F[N]=31,4 x p[bar]
Radial positioning tolerance [mm]	± 0,2	± 0,2

Technical data pneumatic:

Nominal diameter:	5	8 (on request)
Pneumatic operating pressure min./max. [bar]	3,5 to 10	-
Flow max./minute [l/min.]	-	-
Gap nipple/mechanism min. [mm]	0,6	0,6
Gap nipple/mechanism max. [mm]	1,0	1,0
Axial coupling force (Pressure spring) coupled [N]	45	-
Axial coupling force pressurized [N]	F[N]=15,4 x p[bar]	F[N]=31,4 x p[bar]
Radial positioning tolerance [mm]	± 0,2	± 0,2

Order number:	ND 5	ND 8
Coupling nipple hydraulic (AKN) depressurized coupling	AKN-5-S001	AKN-8-S001
Coupling mechanism hydraulic (AKM) depressurized coupling	AKM-5-01-DW-002	AKM-8-01-DW-002
Coupling nipple hydraulic (AKN) pressurized coupling	AKN-5-S004	AKN-8-S002
Coupling mechanism hydraulic (AKM) pressurized coupling	AKM-5-01-DW-005	AKM-8-01-DW-005
Coupling nipple pneumatic (AKN) depressurized or pressurized coupling	AKN-5-S003	-
Coupling mechanism pneumatic (AKM) depressurized or pressurized coupling	AKM-5-01-DW-012	-



### Automatic coupling mechanisms (AKM)

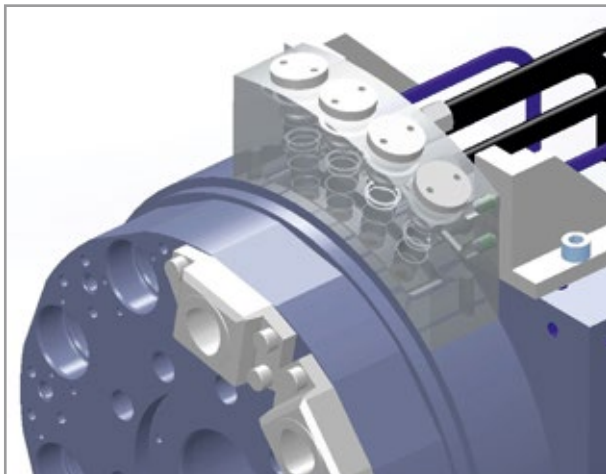
The patented AKM of the system combines the coupling parts or components without additional stroke. The hydraulically activated system spares, for example on rotary tables of tool machines, the otherwise necessary lifting equipment. Changing tables or pallets can be coupled with the rotary table by radial pushing alone.

For the AKM a gap is sufficient between the coupling elements. It allows the desired rotational movement in the decoupled state and can be from 0.6 up to 1.0 millimetres.

Both coupling surfaces are level faced, so that the user can control it from any desired axial and radial positions for coupling. Finally the stroke guides an internal moving piston out by the control pressure **A**. It is possible to control individual couplings specifically. The control pressure **A** is to be supplied with the same pressure as the media pressure **P**. When the control port **A** is not pressurized, the AKM is set into the basic position. The AKM can be operated single-acting or double-acting. If the AKM should operate single-acting, the port **B** must be used for housing ventilation.



Automatic coupling mechanism and coupling nipple, nominal diameter 5, screw-in system, pneumatic.



Application example of a tool changer: Revolver fixture for nine tools with 4 AKM each.

### Tool clamping fixture increases productivity continually

The industrial users confirm useful value of the AKM far above other couplings. Heckert, for example, uses a hydraulic double-acting AKM in a special support of the HED large machining centre 1000 to 1800. It couples the tool axis in standstill, to apply hydraulic fluid on it or the tool. This means that the gap of approx. 1mm safely allows the rotation even during machining.



Fixture block with automatic coupling mechanisms.

Before use of the AKM the experts in Chemnitz laboriously generated the coupling function using an additional moved axis with a stroke of 5 mm. Alternatively they had thought about a multi-channel rotating bush. However, the realisation of this idea was somewhat problematic, firstly, due to the high rotational speed and secondly because the required installation space was not available. Support with the AKM functions reliably according to their test since 2014.



The revolver with a total of 36 coupling nipples.