

COUPLING ELEMENTS ND 3/5/8/12



Ninefold coupling plate for a planet circular table. Coupling elements as a pressure oil interface are used between a circular table and changeable fixture paletts.



General information

Couplings are used to prevent leakage when transmitting liquid or gaseous mediums. The coupling elements are special mounting parts, which are built directly into an accommodation housing.

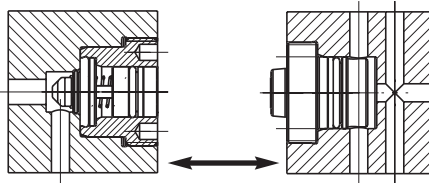
The system seal (axial seal) between coupling mechanism and coupling nipple acts axially and is placed in the coupling mechanism.

This designing makes it possible to have positioning tolerances and both coupling elements are compact.

HYDROKOMP supplies two kinds of coupling elements for pressurized coupling and for depressurized coupling. The materials are stainless and able to transfer air, liquids and vacuum. Special materials are available for aggressive liquids. The coupling mechanism is always combined with a coupling nipple. Various design possibilities are available.

We would appreciate our experience to you.

Installation situation



Before the coupling procedure coupling nipple and coupling mechanism are situated coaxially opposite each other. The base plates of both parts have to be brought into approx. 2-3 mm distance from the contact of the face seal area. The radial positioning tolerance must not be exceeded. The coupling force between coupling nipple and coupling mechanism resulting from hydraulic pressure according to the formula has to be compensated positively from the outside. The axially acting face seal areas of the coupling elements have

to be protected against contamination. The System seal (axial seal) between coupling mechanism and coupling nipple acts axially and is placed in the coupling mechanism.

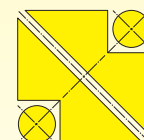
It is possible to change the axial sealing with a special mounting tool (see page 4).

Due to the coupling elements' plain and smooth face contours the danger of contamination is reduced and the possibility for the customer to clean the seal areas before coupling is improved.

Good results can be achieved by rinsing and following blowing-off with compressed air. The sealing of the coupling mechanism is done in the bore bottom of the mounting hole. The required surface quality has to be kept and the area has to be in angle to the screw-in thread.

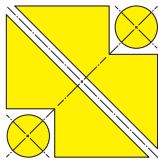
General Technical Data

Nominal Diameter	ND 3	ND 5	ND 8	ND 12
Max. operating pressure	350 bar	350 bar	250 bar	250 bar
Max. flow	133 cm ³ /s (8 l/min)	200 cm ³ /s (12 l/min)	416 cm ³ /s (25 l/min)	832 cm ³ /s (50 l/min)
Opening stroke	4,5 mm	4,5 mm	7 mm	10 mm
Min. coupling force in depressurized mode	94 N	98 N	98 N	169 N
Axial coupling force under pressure, per coupl. pos.	$F [N] = 9,4 \times p [bar]$	$F [N] = 15,4 \times p [bar]$	$F [N] = 31,4 \times p [bar]$	$F [N] = 70,7 \times p [bar]$
Axial positioning tolerance	+ 0,5 mm	+ 0,5 mm	+ 0,5 mm	+ 0,5 mm
Radial positioning tolerance	± 0,3 mm	± 0,2 mm	± 0,3 mm	± 0,5 mm
Operating mode	1) (for) pressurized coupling 2) (for) depressurized coupling			



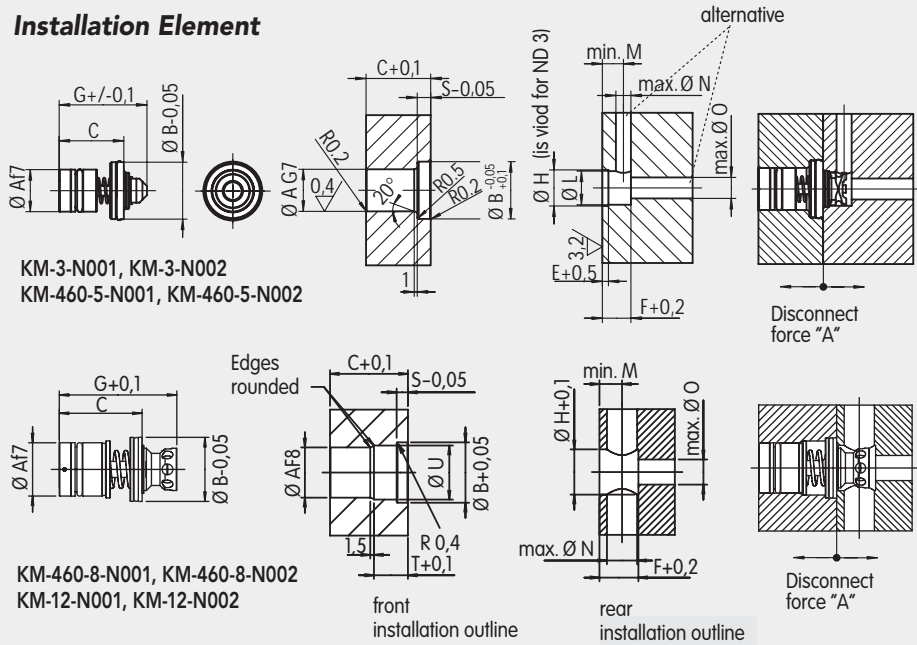
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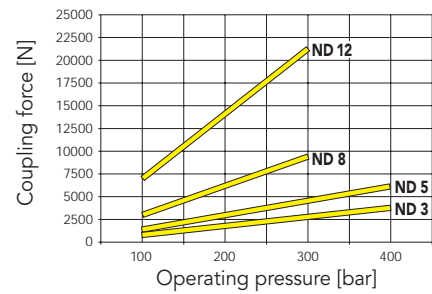


COUPLING MECHANISM

Installation Element

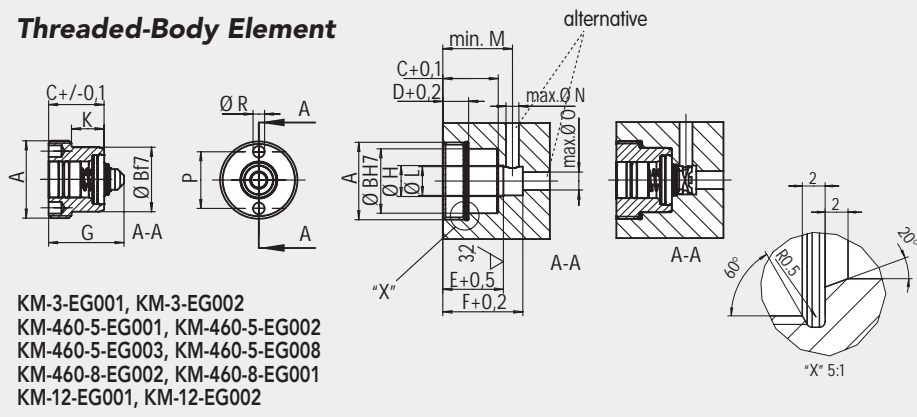


Coupling force

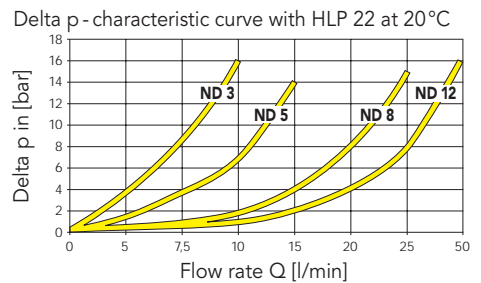


$$\begin{aligned}
 \text{ND 3} &= F \text{ [N]} = 9,4 \times p \text{ [bar]} \\
 \text{ND 5} &= F \text{ [N]} = 15,4 \times p \text{ [bar]} \\
 \text{ND 8} &= F \text{ [N]} = 31,4 \times p \text{ [bar]} \\
 \text{ND 12} &= F \text{ [N]} = 70,7 \times p \text{ [bar]}
 \end{aligned}$$

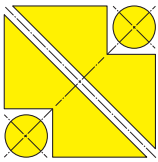
Threaded-Body Element



Flow resistance

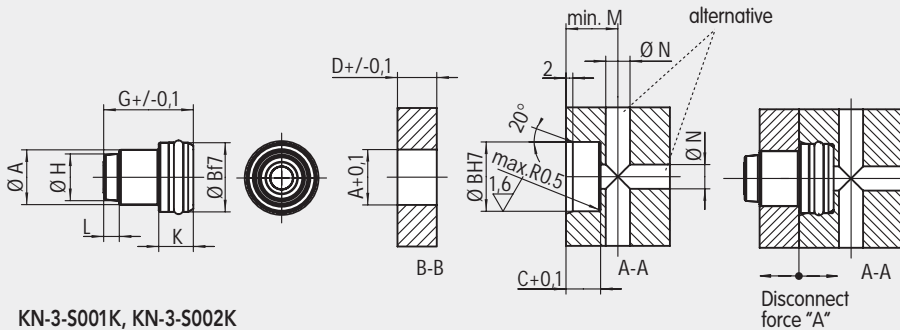


Design	Coupling mechanism									
	thraeded body	(for) mounting	thraeded body	thraeded body	(for) mounting	thraeded body	(for) mounting	thraeded body	(for) mounting	
ND	3	3	5	5	5	8	8	12	12	
A [mm]	M20x1,5	11	M30x1,5	M24x1,5	14	M36x1,5	20	M45x1,5	30	
B [mm]	18	14	25	22	19	30	24	40	34,7	
C [mm]	21,5	21,5	21,5	21,5	21,5	31	31	41	41	
D [mm]	10	-	10	10	-	13	-	18	-	
E [mm]	23,5	-	23,5	23,5	2	31	-	49,5	8,5	
F [mm]	31	9,5	31	31	9,5	46,5	15,5	57,5	16,5	
G [mm]	29	29	29	29	29	44	44	53,1	53,1	
H+0,1 [mm]	12	12	12	12	12	-	18	22	22	
K [mm]	12,5	-	12,5	12,5	-	19,5	-	24,6	-	
L+0,1 [mm]	11,2	11,2	11,2	11,2	11,2	18	-	20	-	
M [mm]	28	7	28	28	7	40	9	50	9	
N [mm]	5	5	5	5	5	12	12	12	12	
O [mm]	7	7	7	7	7	10	10	12	12	
P [mm]	15,5	-	22	18,5	-	28	-	37	-	
R [mm]	2x2,6	-	2x4,5	4x2,8	-	2x4,5	-	2x4,5	-	
S [mm]	-	4,5	-	-	4,5	-	4,5	-	6	
T [mm]	-	-	-	-	-	-	13,5	-	18,5	
U [mm]	-	-	-	-	-	-	21,5	-	31,5	
Part-no.	KM-									
(for) pressurized coupling	3-EG002	3-N002	460-5-EG003	460-5-EG002	460-5-N002	460-8-EG002	460-8-N002	12-EG002	12-N002	
(for) depressurized coupling	3-EG001	3-N001	460-5-EG001	460-5-EG008	460-5-N001	460-8-EG001	460-8-N001	12-EG001	12-N001	
Disconnect force "A" [N]	-	20,1 x p [bar]	-	-	28,4 x p [bar]	-	45,2 x p [bar]	-	96,2 x p [bar]	



COUPLING NIPPLE

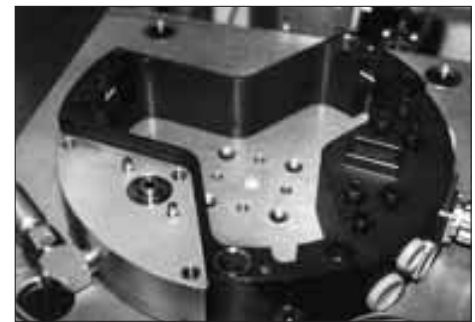
Installation Element



KN-3-S001K, KN-3-S002K
 KN-460-5-S001L, KN-460-5-S003L
 KN-460-5-S001K, KN-460-5-S003K
 KN-460-8-S001, KN-460-8-S002
 KN-12-S001, KN-12-S002



APPLICATION EXAMPLE

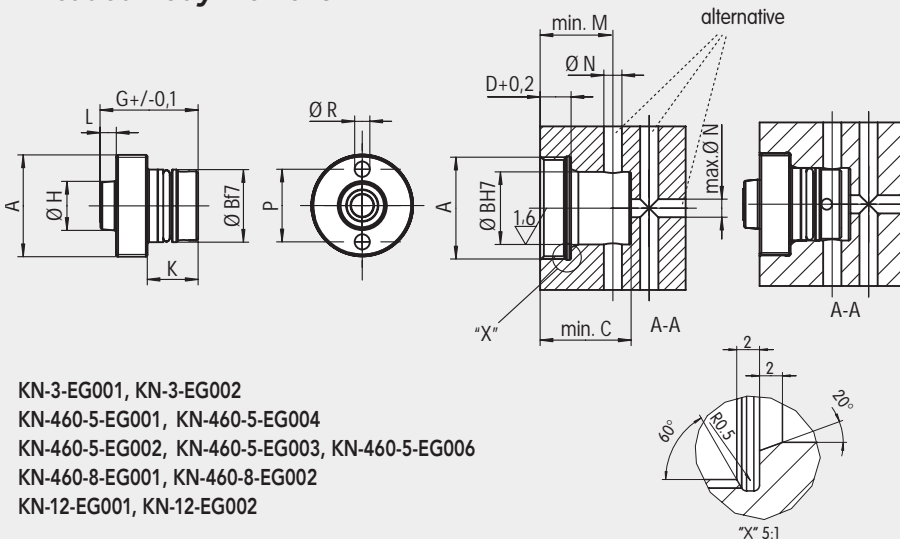


Coupling element as a pressure oil interface for a robot's changing tool.

In total the system consists of three changing tools which are used for non-cutting moulding in the car spare parts production. The hydraulic pressure is 250 bar max. and in every action a tool is pulsed approx. 300 times to its max. operating pressure.

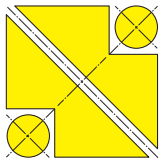
Per shift (2-shift-operation) the tools are changed approx. 60 times. Since the workpieces are painted after being machined, the user puts a main emphasis on a low leakage rate.

Threaded-Body Element



KN-3-EG001, KN-3-EG002
 KN-460-5-EG001, KN-460-5-EG004
 KN-460-5-EG002, KN-460-5-EG003, KN-460-5-EG006
 KN-460-8-EG001, KN-460-8-EG002
 KN-12-EG001, KN-12-EG002

Design	Coupling nipple										
	threaded body	(for) mounting	threaded body	threaded body	(for) mounting	(for) mounting	with pre-loaded valve threaded body	threaded body	(for) mounting	threaded body	(for) mounting
ND	3	3	5	5	5	5	5	8	8	12	12
A	[mm] M20x1,5	13	M28x1	M24x1,5	16	16	M28x1	M30x1,5	21	M45x15	31
B (H7)	[mm]	16	20	20	20	20	20	25	24	35	35
C	[mm]	23	10	25	25	16,5	10	34	26	9	32
D	[mm]	8,4	11,4	8,5	8,5	17	11,4	8,5	8,5	15	13,4
G	[mm]	25,9	25,9	27	27	38,1	26	37	29,9	31,4	40
H	[mm]	9,8	9,8	13,5	13,5	13,5	13,5	13,5	18,5	18,5	28,5
K	[mm]	13	10	14	14	16,5	10	19,5	14	9	16,6
L	[mm]	4,5	4,5	4,5	4,5	4,5	4,5	4,5	7,4	7,4	10
M	[mm]	19	15	19	19	22	15	19	22,5	15	31
N	[mm]	5	5	5	5	5	5	5	10	10	12
P	[mm]	15	-	20	18,5	-	-	20	24	-	37
R	[mm]	2x2,6	-	2x4,2	4x2,8	-	-	2x4,2	4x3,5	-	2x4,5
Part-no.	KN-										
(for) pressurized coupling	3-EG002	3-S002K	460-5-EG001	460-5-EG002	460-5-S003L	460-5-S003K	-	460-8-EG002	460-8-S002	12-EG002	12-S002
(for) depressurized coupling	3-EG001	3-S001K	460-5-EG004	460-5-EG003	460-5-S001L	460-5-S001K	460-5-EG006	460-8-EG001	460-8-S001	12-EG001	12-S001
Disconnect force "A" [N]	-	20,1x p [bar]	-	-	31,5x p [bar]	31,5x p [bar]	-	-	45,2x p [bar]	-	96,2x p [bar]



MOUNTING TOOL



Mounting tool for axial seals HYDRKOMP coupling elements are designed in a way that the axial seals are exchangeable. HYDRKOMP developed a mounting tool to make it easy to change the axial seal in the coupling mechanism elements.

Just pull out the damaged seal with a scriber. Put the new seal into the mounting tool and place the tool above the coupling element. Now the new seal is inserted by manual pressing in accurately and correct position into the axial groove of the coupling mechanism. After a few minutes the coupling system is again ready for operation.

Denomination		ND 3	ND 5	ND 8
Mounting tool	Part-no.	9000-011	9000-010	9000-013
Spare seal red (10 pieces)	Part-no.	D-3-001	D-460-5-001	D-460-8-001
Spare seal yellow (10 pieces)	Part-no.	D-3-002	D-460-5-002	D-460-8-002

red for depressurized coupling, yellow for pressurized coupling

APPLICATION EXAMPLES

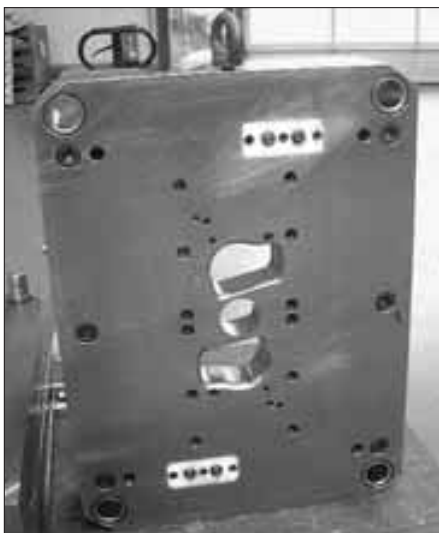


Coupling Connection Blocks for robot-changing devices.

Coupling elements ND 8, max. operating pressure 250 bar, Q_{max} . 25 l/min.

Volume supplied by HYDRKOMP were the complete connection housings from aluminium with mounted and tested coupling elements.

The photos show the coupling nipple resp. the coupling mechanism block.



An application in a two-component plastic injection tool.

To inject a workpiece from two plastic components, the front tool plate is turned by 180° between the two injection processes. In a previously used design hydraulic hoses had been mounted to supply the hydraulic core pullers with pressure oil. These had been destroyed several times during the swivel operation.

Now, the built-in coupling elements part and connect the oil supply in depressurized stage during every swivel action. Besides the improved production process operating safety and reject rate have been optimized.



Threaded-Body Coupling Elements in base plate and changing device for a turbine blade manufacturing.

In several special tool machines approx. 25 different workpieces are clamped with double acting hydraulic cylinders. The positioning and clamping of the changing device is done by a quick changing system. The workpieces are clamped at their ends only. This way the center area of the workpiece is accessible for machining processes.