

# Rack and Pinion Actuators



Single piston actuator



Dual piston rotary actuator



## HKS Group

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Certified to  
DIN EN ISO 9001:2000

# Rack and pinion actuators



## DZK-H and DEK-H series ( rack and pinion principle )

### Applications:

Our rotary actuators may be used throughout industry, e.g. in construction machines, machine tools, bending machines, mould carriers, foundry, mining, agricultural and packaging machines, transfer lines, handling technology, fittings, ship construction, automotive and ventilation technology, power station valves etc..

### HKS DZK-H and DEK-H rotary actuators are characterised by the following standards:

- 10 sizes up to 190,000 Nm
- angle of rotation ranges of up to 360°
- drive shafts with fitting keys or DIN 5480 splined shaft profile
- flange or foot attachment

### Additional devices:

- limit position damping on both sides
- rotation angle adjustment
- control shaft
- hollow shaft with profile according to DIN 5463, DIN 5480 or DIN 6885

### Special designs:

- drive shaft with second drive pins
- drive shaft and fastening flange designed according to customer's requirements
- rotation angle adjustment throughout the swivel range
- limit switch device
- direct valve connection
- all intermediate rotation are available*
- rotation range over 360°
- resistant to seawater
- other special designs are possible
- working pressures of up to 250 bar, torque of up to 350,000 Nm and over are available to order

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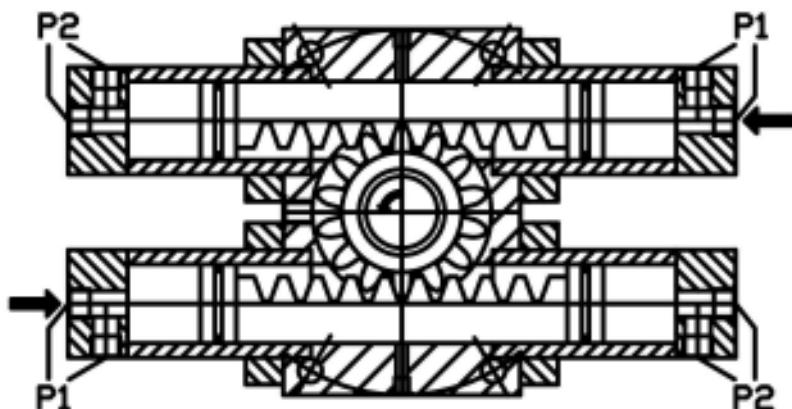


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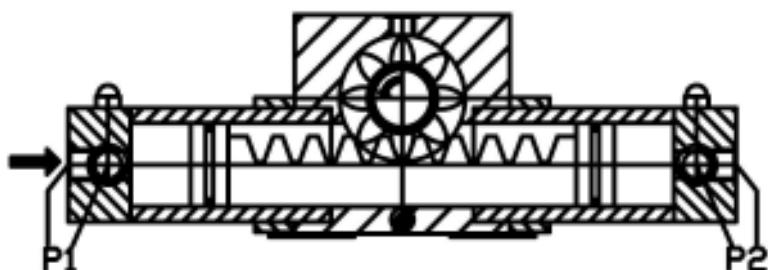
# Rack and pinion drives



## DZK-H dual piston rotary actuator



## DEK-H single piston rotary actuator



## Functional description:

The oil pressure supplied by connections P1 and P2 causes the displacement of the rack (2 racks). In this case the linear movement of the rack (2 racks) is converted to a rotary movement of the pinion due to toothing

## Direction of rotation

The admission of pressure to P1 displaces the rack from the initial position to the right and the pinion is then rotated to the left (anticlockwise).

## Lubrication:

The rotary actuators can operate with immersion or pressure lubrication. To achieve maximum efficiency and service life we recommend the use of pressure lubrication.

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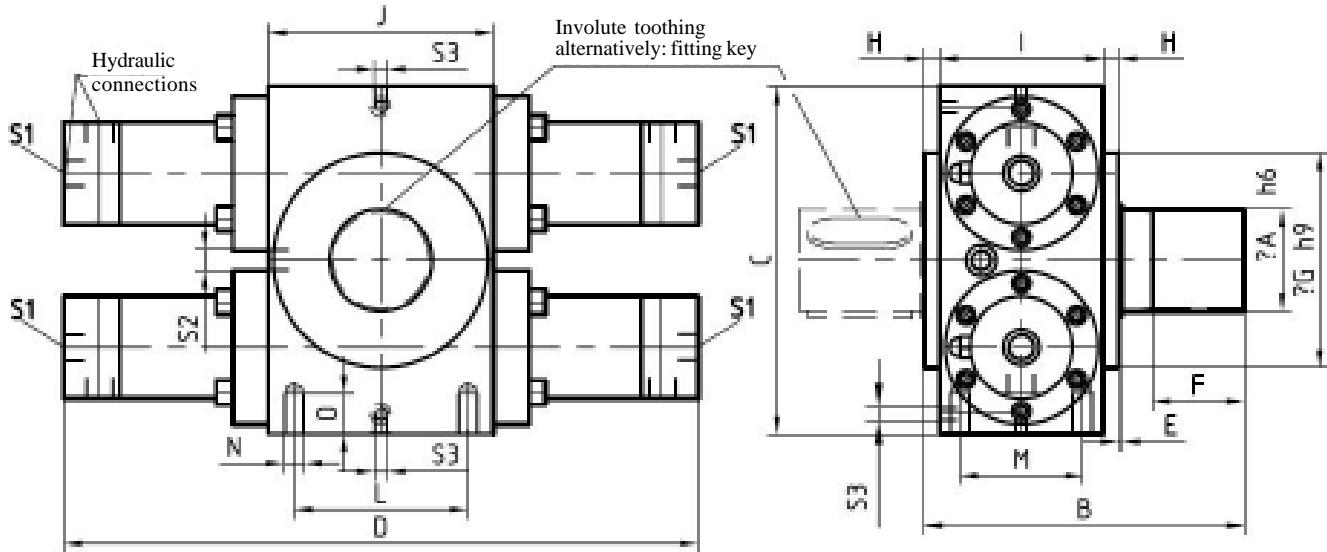
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# Rack and pinion actuators

## Dual piston standard version



## Technical data type: DZK-H 40 to DZK-H 200

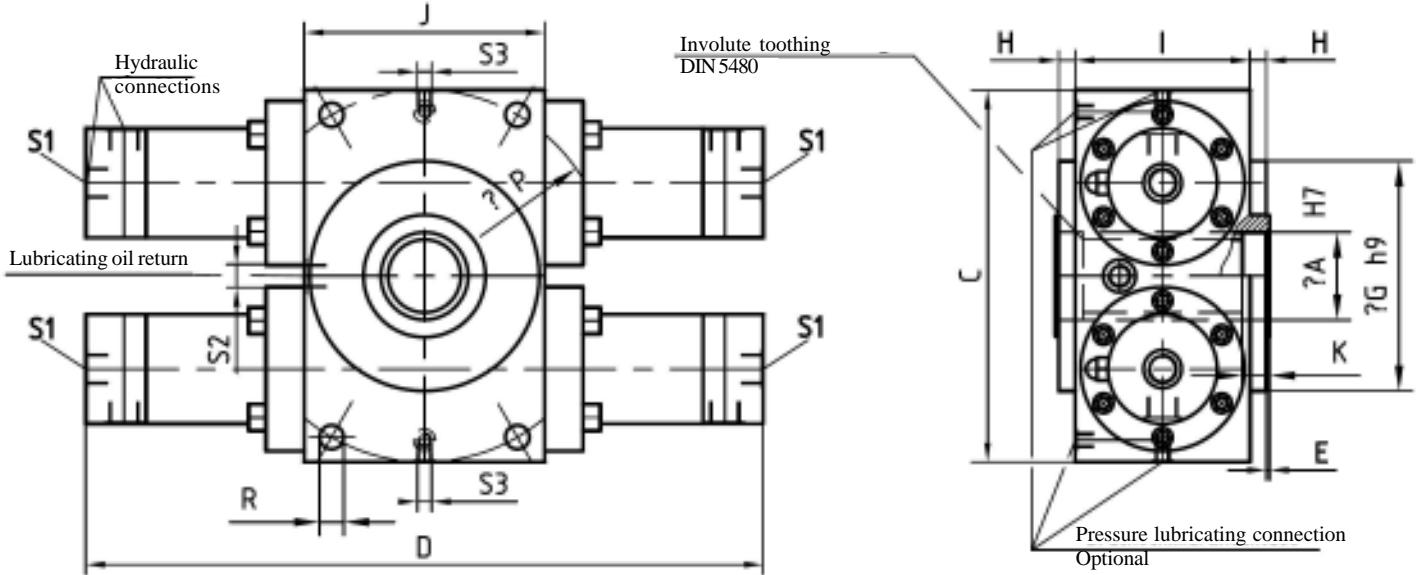
Typ	DZK-40	DZK-50	DZK-63	DZK-80	DZK-100	DZK-125	DZK-140	DZK-160	DZK-180	DZK-200
Torque at 180 bar	1600	3200	6300	12600	25600	49500	69800	101000	141500	190000
Working pressure max. bar	200	200	200	200	200	200	200	200	200	200
Absorption volume -V 360°	0,6	1,15	2,2	4,4	8,9	17,9	24,5	35,5	49,5	66,5
Swivel time min. Sec. /360 °	1,1	1,1	1,5	2,5	3,5	5	5	8	10	12
Shaft load radial = N	1000	1600	3000	5000	6000	12000	16000	20000	24000	30000
Shaft load axial = N	500	800	1500	2500	3000	6000	8000	10000	12000	15000
Weight at 0° = kg	25	45	75	110	220	500	580	850	1100	1500
Weight increase per 10° = kg	0,2	0,45	0,9	1,7	4	8	10	15	25	30

## Type code

DZK-H	40	180°	F	HE	D	WV	SW
Dual piston rotary actuator-Hydraulic							
Overall size	40						
Angle of rotation							
Attachment type: F-Flange attachment; B-Foot attachment							
Shaft type: H-Hollow shaft; Z-Splind shaft E-Involute toothed; P-Fitting key (keyways)							
Damping: adjustable from size 63							
Angle adjustment							
Control shaft							

# Rack and pinion actuator

## Dual piston standard version



## Overall dimensions type DZK-H 40 bis DZK-H 200

Type	DZK-40	DZK-50	DZK-63	DZK-80	DZK-100	DZK-125	DZK-140	DZK-160	DZK-180	DZK-200
Ø A k6	50	55	70	100	110	140	150	180	200	220
Ø A H7	40	50	62	80	100	120	140	150	180	200
B	193	223	268	343	398	483	548	613	675	735
C	190	240	280	340	440	510	580	680	740	810
D = stroke 0° +	240	290	350	400	500	580	650	700	850	900
Increase per 10°	15	20	25	30	35	45	50	55	60	65
E	3	3	3	3	3	3	3	3	5	5
F	60	65	85	120	130	165	180	215	240	260
Ø G H9	125	150	170	210	260	310	350	400	420	460
H	12,5	12,5	15	15	20	20	25	25	25	25
I	90	110	130	160	190	230	270	290	320	350
J	130	160	180	220	270	320	360	420	460	520
K	12	15	20	25	30	35	45	45	55	60
L	100	120	140	170	220	250	300	350	380	420
M	55	60	100	120	140	170	200	220	240	250
N	M 12	M 16	M 16	M 20	M 24	M 24	M 30	M 30	M 36	M 42
O	25	35	35	40	50	50	60	60	75	90
Ø P	190	235	280	340	440	510	580	680	740	820
R	14	16	18	22	26	26	32	32	38	45
S 1	G 1/2	G 3/4	G 3/4	G 1	G 1	G 1 1/4	G 1 1/2	G 1 1/2	G 1 1/2	G 1 1/2
S 2	G 1/4	G 1/2	G 1/2	G 1/2	G 1/2	G 1/2	G 1/2	G 1/2	G 1/2	G 1/2
S 3	G 1/8	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4
Poss. DIN5480 r	1,25	1,25 u. 2	2	2 u. 3	3	3	3	3 u. 5	5	5

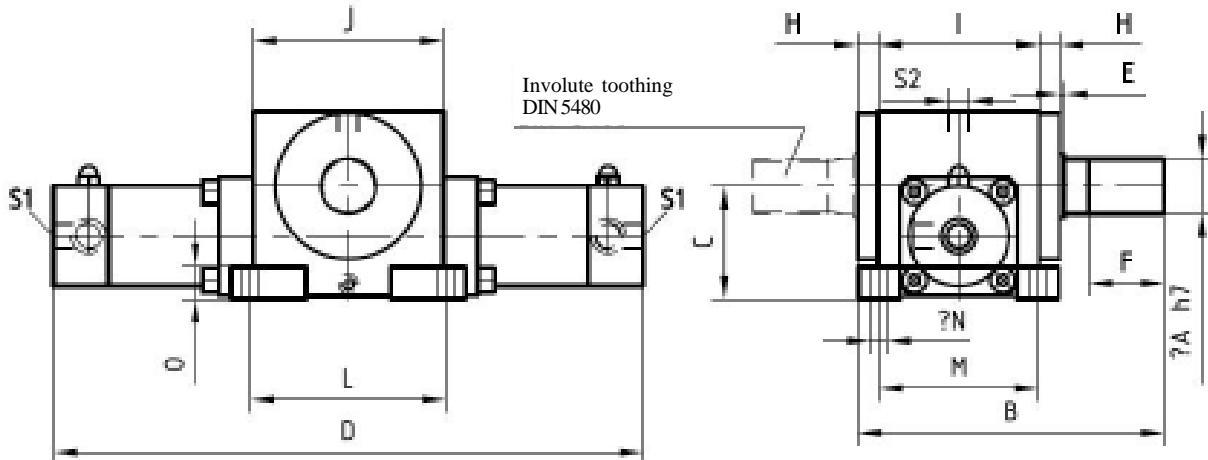
## Special rotary actuators available at the customer's request:

with deviating installation dimensions, hydraulic connections, attachments, e.g. rotary potentiometers, valves, etc.  
 Suitable for different operating media, e.g. hydraulic oil, water emulsion and other difficultly flammable liquids.  
 For temperature ranges from -50°C to +200°C.

# Rack and pinion actuators



## Single piston standard version



## Technical data type: DEK-H 40 to DEK-H 200

Type	DEK-40	DEK-50	DEK-63	DEK-80	DEK-100	DEK-125	DEK-140	DEK-160	DEK-180	DEK-200
Torque at 180 bar	490	910	1790	3250	5650	10600	15510	21710	29310	40710
Working pressure max. -bar	200	200	200	200	200	200	200	200	200	200
Absorption volume -l/ 360°	0,2	0,4	0,6	1,2	2	3,7	5,5	7	10,5	14,5
Swivel time min. Sec / 360 °	0,8	0,8	1,2	1,2	2,2	2,5	3,5	3,5	4,5	4,5
Shaft load radial = N	1000	1600	3000	5000	6000	12000	16000	20000	24000	30000
Shaft load axial = N	500	800	1500	2500	3000	6000	8000	10000	12000	15000
Weight at 0° = kg	18	25	40	110	100	160	220	300	420	550
Weight increase per 10° = kg	0,1	0,45	0,2	0,25	0,45	0,8	1,5	2	3	4

## Type code

DEK-H 40 180° F HE D WV SW

Dual piston rotary actuator-Hydraulic

Overall size

Angle of rotation

Attachment type: F-Flange attachment; B-Foot attachment

Shaft type: H-Hollow shaft; Z-Splind shaft

E-Involute toothing; P-Fitting key (keyways)

Damping: adjustable from size 63

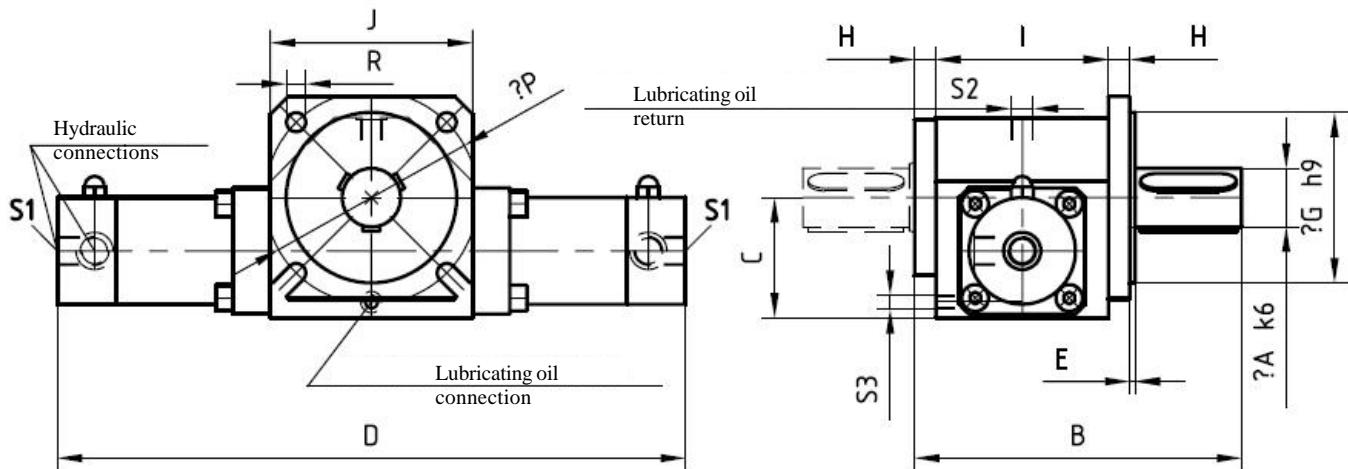
Angle adjustment

Control shaft

# Rack and pinion actuators



## Single piston standard version



## Overall dimensions type DEK-H 40 to DEK-H 200

Type	DEK-40	DEK-50	DEK-63	DEK-80	DEK-100	DEK-125	DEK-140	DEK-160	DEK-180	DEK-200
Ø A k6	28	35	45	55	65	70	75	80	100	110
Ø A H7	28	35	45	55	65	70	75	80	100	110
B	188	203	243	307	335	383	445	505	590	638
C	71	80	95	113	130	160	180	190	225	255
D = stroke 0° +	230	270	290	320	355	420	460	500	510	570
Increase per 10 °	10	12	15	18	20	22	25	25	28	30
E	3	3	3	5	5	5	5	5	10	10
F	30	35	50	65	80	85	95	105	120	130
Ø G H9	100	125	125	160	180	200	220	250	280	315
H	12	15	15	20	20	22	25	30	40	40
I	101	110	130	162	180	214	240	260	300	328
J	118	150	150	190	200	220	250	280	315	355
L	125	150	160	195	220	250	300	320	360	375
M	90	100	120	160	170	200	240	250	300	320
Ø N	11	13	13	17	17	17	17	21	21	32
O	18	21	27	32	32	42	47	47	62	92
Ø P	125	160	160	200	220	250	280	315	355	400
R	11	14	14	18	18	22	22	26	26	32
S 1	G 1/4	G 1/2	G 1/2	G 3/4	G 1	G 1	G 1/4	G 1 1/4	G 1 1/4	G 1 1/2
S 2	G 1/4	G 1/4	G 1/2	G 1/2	G 1/2	G 1/2	G 1/2	G 1/2	G 1/2	G 1/2
S 3	G 1/8	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4
Poss. DIN5480 m =	1,25	1,25	2	2	2	2	2	3	3	3

## Special rotary actuators available at the customer's request:

with deviating installation dimensions, hydraulic connections, attachments, e.g. rotary potentiometers, valves, etc.  
 Suitable for different operating media, e.g. hydraulic oil, water emulsion and other difficultly flammable liquids.  
 For temperature ranges from -50°C to +200°C.

# Hydraulic cylinders



## ZDH-H series, standard version:

Our hydraulic cylinders may be used throughout, e.g. in construction machines, machine tools, bending machines, mould carriers, foundry, mining, agricultural and packaging machines, transfer lines, handling technology, fittings, ship construction, automotive and ventilation technology, power station valves, etc.

### HKS ZD-H hydraulic cylinders are characterised by the following standard:

- 10 sizes-piston diameters from 40 mm to 200 mm
- working pressure up to 250 bar
- different sealing materials
- different methods of attachment

## Special designs according to customer's requirements

- hydraulic cylinders with working pressure of up to 700 bar
- plunger-cylinders
- synchronous cylinders
- single- and double-acting telescopic cylinders
- hydraulic cylinders for mobile hydraulics (lightweight series)

## Hydraulic rotary bushings

- designed according to the customer's requirements
- for different operating media

## Repairs

- of hydraulic equipment
- also foreign makes

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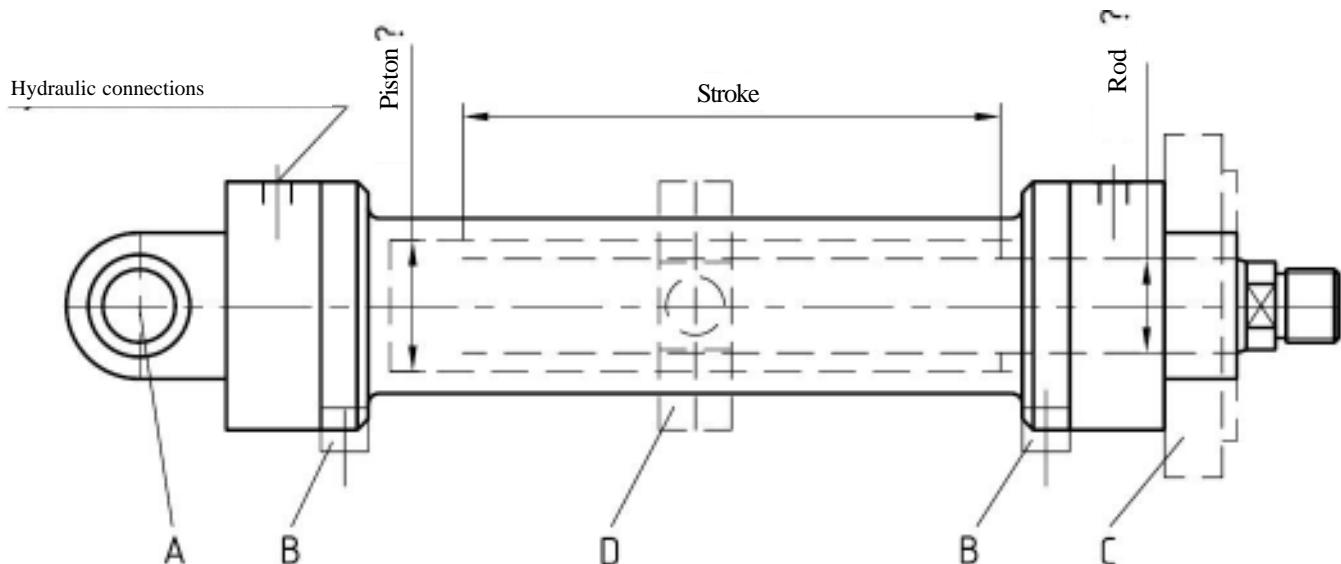
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# Hydraulic cylinders

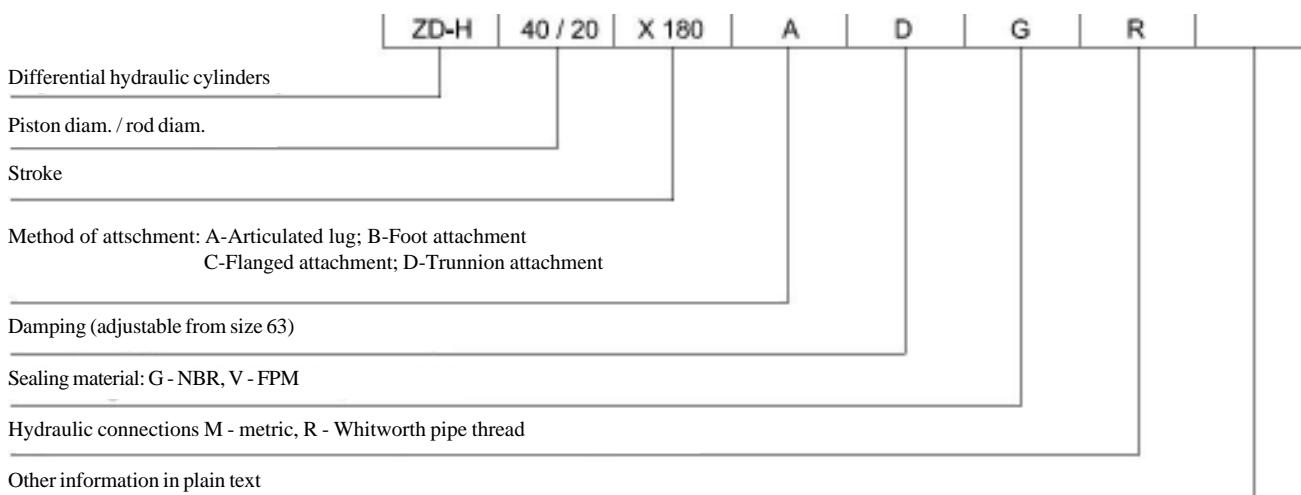
## Standard version



## Technical data type: ZD-H 40 to ZD-H 200

Type	ZD-H 40	ZD-H 50	ZD-H 63	ZD-H 80	ZD-H 100	ZD-H 125	ZD-H 140	ZD-H 160	ZD-H 180	ZD-H 200
Rod diameter mm	20 28	28 36	36 45	45 56	56 70	70 90	90 100	100 110	110 125	125 140
Stroke max. mm	500	700	1000	1300	1500	1800	2000	2300	2800	3000
Working pressure max. bar	250	250	250	250	250	250	250	250	250	250

## Type code



## Special rotary actuators available at the customer's request:

with deviating installation dimensions, hydraulic connections, attachments, e.g. rotary potentiometers, valves, etc.  
Suitable for different operating media, e.g. hydraulic oil, water emulsion and other difficultly flammable liquids.  
For temperature ranges from -50°C to +200°C.