



HYDRAULIC PART-TURN ACTUATOR

Fittings, flaps and ball valves

We turn the world for you

For more than 40 years

We have developed the rotary actuators presented here, which have proven their worth through many years of use, especially for fittings, butterfly valves and ball valves.

The highest safety and quality demands as well as longevity and precision are typical features of HKS rotary actuators. Our strengths also include ATEX, DIN standards or special customised solutions.

Complete systems

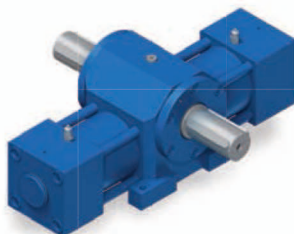


Electro-hydraulic
Fitting-Part-turn actuator

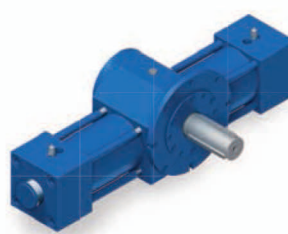


PowerPack

Rack and Pinion (Solo)



▶ DEK



▶ DEK1



▶ DZK

Solo Part-turn actuator (Helical principle)



▶ SA-H1



▶ SA-H2



▶ AFR

Typical features

Features

- » Small dimensions
- » All sliding surfaces are hardened machine-ground and polished
- » Identical torque in both directions
- » Interchangeable types of mounting
- » No Internal leakage so that intermediate positions can be exactly maintained
- » Variable positioning of the drive shaft
- » Interchangeability of all components
- » Suitable for almost all pressure media
- » Endposition cushioning for all movement is possible

- » Sealing material from reputable manufacturers
- » High-quality and high-tensile materials are used
- » Piston end position can be indicated by proximity switches
- » Various auxiliary attachments available
- » Angle of rotation can be indicated by digital or analog angle sensor
- » Special requests to your satisfaction
- » Short delivery periods
- » Favourable price-performance ratio

Applications



Water works
Sewage works
Steel constructions for hydraulic engineering
Drinking water distribution



Exploration, offshore facilities
Refineries
Pipelines
Tank farms



Chemicals and pharmaceuticals industry
HVAC industry
Shipbuilding
Steel mills
Food industry



Geothermal power plants
Solar thermal power plants
Biogas power plants
Power plants (water, coal, gas, oil, atomic)

Part-turn actuator

Fittings, flaps and ball valves

Electro-hydraulic

Product and technical data



Certification: ATEX - Ex II2G EEx d IIB T4

Protection cat: IP 65

Temperature range: -25 to +55°C

Position accuracy: <2% of full scale

Power-up time: ≤S3-10%

Funktionen:

OPEN / CLOSE

Positioning

Fail Safe hydraulically (Speicher)

Fail Safe mechanically (Feder)

INDUSTRIAL AUTOMATION MEANS EFFICIENCY.

The newly developed electrohydraulic actuators for fittings satisfy these high requirements on flexible, automated industrial fittings. The sturdy, compact and modular design offers ideal solutions for special requirements

- Oil and gas
- Chemicals and petrochemicals
- Energy and water industry

YOUR CUSTOMER BENEFITS:

- » Compact design
- » Integrated safety functions
- » Low installation and operating costs

An installation with no piping, the use of top-quality components and a 100% functional test vouch for the operational safety and reliability of these systems. The pressure-resistant encapsulation of all electrical components in one housing also allows their use in potentially explosive areas (ATEX) and at the same time guarantees a high degree of protection under extreme working conditions:

- » Explosion protection
- » High reliability

Rotary lift combination

Fittings, flaps and ball valves

Plug valves / Electro-hydraulic

Product and
technical data



	up to 210 bar
	up to 250,000 Nm
	up to 90° ±1
	Lift up to 1,200mm
	Lifting power up to 360,000 N
	Tensile force up to 180,000 N
	Higher lifting power and tensile force on request

DHK-H-ZV



In the series with the linear unit in front of the rotary actuator (DHK-H-ZV) the lifting cylinder and rotary actuator are connected by flanges.

The spline tothing on the drive shaft of the rotary actuator interlocks with the bore of the lifting cylinder's piston rod.

The spline and bore are manufactured with a corresponding length or depth depending on the length of stroke. The drive shaft with two opposite feather keys is located at the end of the piston rod.

The lifting and turning movements can be carried out synchronously or separately. An exact positioning of the movements can be achieved with accessory parts.

Powerpack

Fittings, flaps and ball valves

Electro-hydraulical

Product and technical data



From SA-H 55 to SA-H 140
Torque up to 7.000 Nm
Protection cat: IP 68
Aggregat: ZB 1632, compl. version for double and single acting actuators
Power-up time: S3 10 %
Delivery volume: 0.4 l/min
Absorption: 400 cm ³
Electromotor: 230 VA C one phase with operation condenser
Emergency operation
E Box
Electronically / hydraulically controlled

Functions:

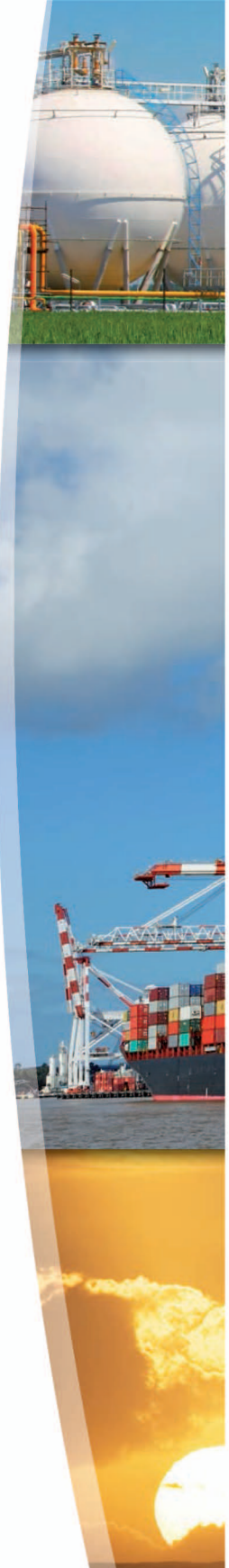
Open/close
Positioning

Hand pump

Product and technical data



Type GL290-25
Tank capacity: 2.2 l (optional with 4 l)
Delivery: 25 cm ³
Working pressure up to: 180 bar
Weight: 7,5 kg
Material: Aluminium pump head, casted aluminium tank





Adjustment of fittings



Steering adjustment

Facts:

- Extremely durable
- Low maintenance and very few servicing cycles



Adjustment of fittings



Valve control

Part-turn actuator

Fittings, flaps and ball valves

SA-H1

SA-H2

Product and technical data



Helical principle

	up to 210 bar
	up to 250.000 Nm
	up to 90° ±1
Temperature range: -10°C to 75°C	
Protection cat: IP 65 / IP 68	

	up to 125 bar
	up to 10.000 Nm
	up to 90° ±1
Temperature range: -10°C to 75°C	
Protection cat: IP 65 / IP 68	
Face mounting	

More features

ISO 5211 Flange and additional standard and special flanges possible

Certification: ATEX, SIL2

Emergency operation

Seals: PU / NBR / Viton

Special angle possible

Power-up time: S1 100 %

Ability to position precisely

Hydraulic fluid: HLP DIN 51524 HFC and HFD possible on request

Safe, stable and compact housing design in nodular graphite iron

low maintenance

Floating time fail-safe open/closed: <1 sec. (depending on the size of the actuator)

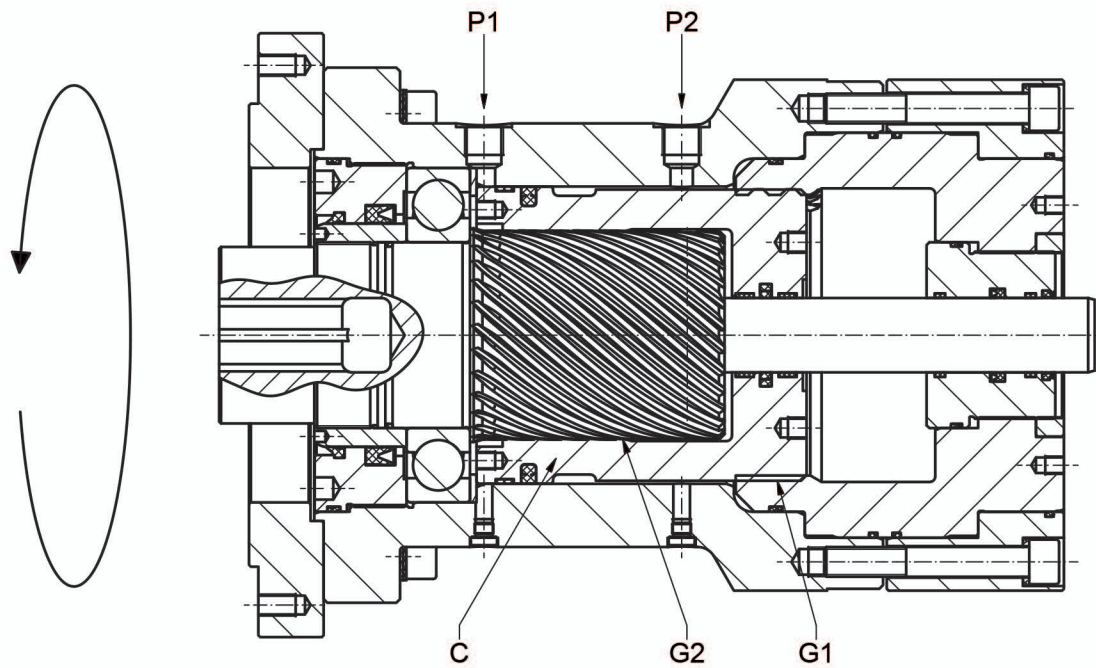
Materials: steel, nodular graphite iron, stainless steel on request

Functional description

The oil pressure which is supplied through connections P1 and P2 causes a rotary movement on the actuator shaft. The linear movement of the piston C is converted into a rotary movement by means of multiple gears. (Sectional representation as from the series SA-H 125)

Rotation direction

With pressure at P1 the actuator shaft rotates, from the basic position to the left (anti clockwise). Changes in the direction can be especially made to order.



Part-turn actuator

with spring return

AFR

Product and technical data



	up to 350 bar
	up to 38,000 Nm
	Spring reset single-acting
	Opening moment up to 38,000 Nm
	Closing moment up to 7,000 Nm
	Safety function through spring reset

You can still obtain our part-turn actuators provided with a spring return. These have been designed for operation in a one-sided hydraulic system. The part-turn actuator normally opens the closed armature by hydraulic pressure and it closes with a spring return. The opposite is achieved with appropriate assembly. Depending on the assembly the 'open' or 'closed' position can be maintained. Specific customer requirements are taken into account here.

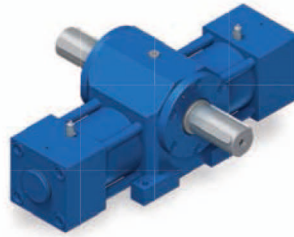


Steel and power production

Power stations, steel industry, tyre industry, ship building

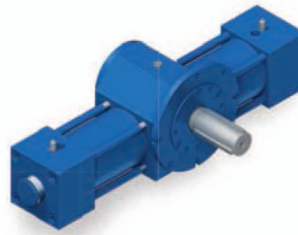
DEK

Product series



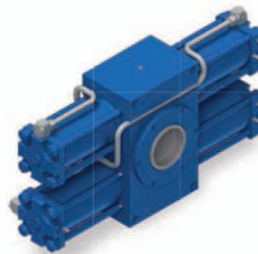
	up to 210 bar
	up to 40,000 Nm
	up to 720°
Flange or foot fixing	

DEK1



	up to 250 bar
	up to 60,000 Nm
	up to 360°
Flange or foot fixing	

DZK



	up to 250 bar
	up to 350,000 Nm
	up to 360° (bigger on request)
Flange or foot fixing	

Rack and pinion principle

General instructions

- » Maximum torque
- » Short axial overall length
- » Very short angle play
- » Extremely sturdy

Technical data

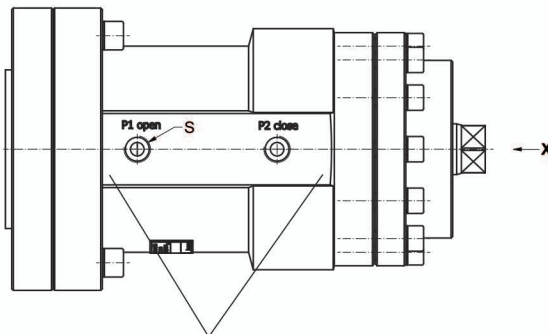
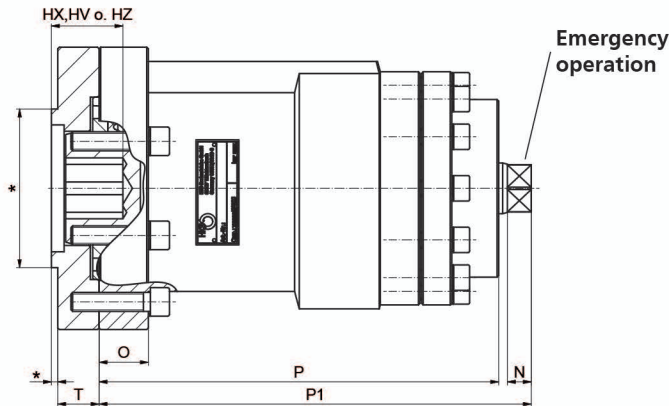
of the series SA-H 30 to SA-H 300

Typ SA-H P _{max} =210bar		30	42	55	63	80	100	125	140	160	180	200	225	225S	250	280	300
M _{nom} /P _{working} Nm/bar		0,3	0,95	2,1	3,0	7,2	14,7	22	30	50	71	100	142	175	200	275	350
absorption volume	cdm	0,009	0,022	0,038	0,081	0,164	0,366	0,484	0,719	1,099	1,626	2,179	3,271	4,039	4,532	6,268	7,843
weight	kg	5,6	6,9	8,2	12,0	20,6	27,7	47,0	74,0	114	150	194	354	462	551	764	1100
B	mm	70	114	124	128	150	178	222	250	278	298	325	385	385	450	490	555
O	mm	11	18	18	25	25	31	37	40	43	45	54	64	64	90	100	110
P	mm	99	137	159	187	216	252	285	304	365	435	440	570	690	710	790	840
P ₁	mm	114	157	179	208	236	272	305	324	385	455	460	590	710	730	810	860
S	"	G1/8	G1/8	G1/4	G1/4	G3/8	G3/8	G3/8	G3/8	G3/8	G1/2	G1/2	G3/4	G3/4	G1	G1	G1
T	mm	10	15	20	25	25	25	25	25	25	25	30	40	45	50	50	50
N	mm	10	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
I	mm	6	12	17	17	22	22	22	22	22	22	22	22	22	22	22	22
HWP X1 ^{H7} (max.)	mm	12	18	20	22	30	42	55	60	75	75	95	100	100	110	120	140
	mm*	12	18	18	22	28	42	50	60	72	72	80	98				
X2	mm	4	6	6	6	8	12	16	18	20	20	25	28	28	28	32	36
X3	mm	7,8	11,8	12,8	12,8	18,3	24,3	31,8	34,4	42,4	42,4	52,9	56,4	56,4	61,4	67,4	78,4
HX	mm	31	39	45	45	75	100	120	120	150	150	175	175	175	175	200	200
	mm	30	35	45	45	65	80	110	110	130	130	180	180				
HWV SW V (max.)	mm	12	17	18	22	27	36	50	50	67	75	82	82	82	95	104	120
	mm*	11	17	17	22	27	36	46	46	55	75	75	75				
HV	mm	34	34	45	45	50	50	50	57	60	60	77	77	75	85	90	100
	mm	16	19	24	29	38	48	48	57	57	57	77	77				
HWZ SW Z (max.)	mm	10	12	14	17	22	30	36	41	55	55	65	75	70	80	85	95
	mm*	9	11	14	17	22	27	36	36	55	55	55	75				
Z1	mm	17	24	25	25	36	50	71	71	95	95	116	116	116	135	138	170
HZ	mm	34	34	45	48	50	64	64	64	64	82	82	82	75	85	90	100
	mm*	19	30	34	48	48	64	64	64	64	82	82	82				

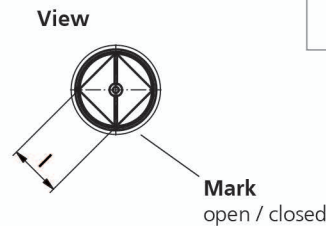
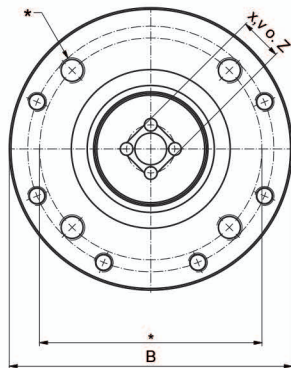
*) Dimensions acc. DIN ISO 5211

Assembly drawing

of the series SA-H 30 to SA-H 300

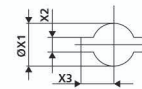


Hole pattern for valve assembly. Adapter plate or direct assembly on request.

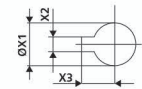


Various connection

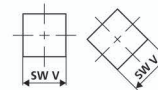
HWP
with 2 feather key slots DIN 6885



HWP 1
with 1 feather key slot DIN 6685



HWV
ISO-Square DIN 475T1

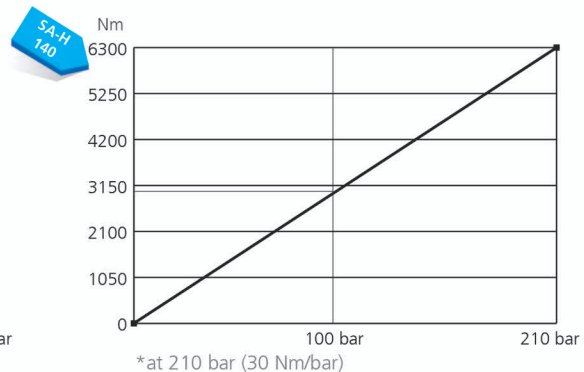
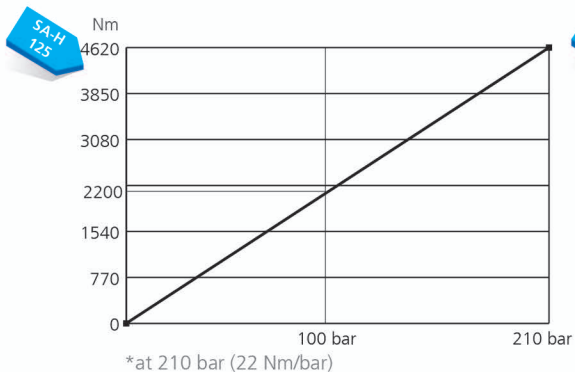
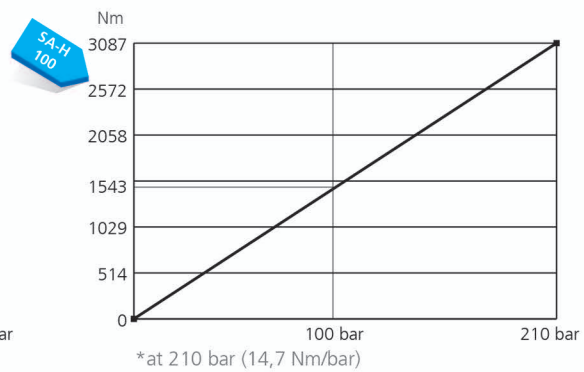
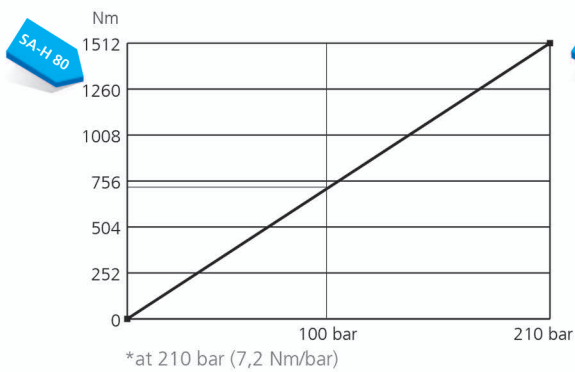
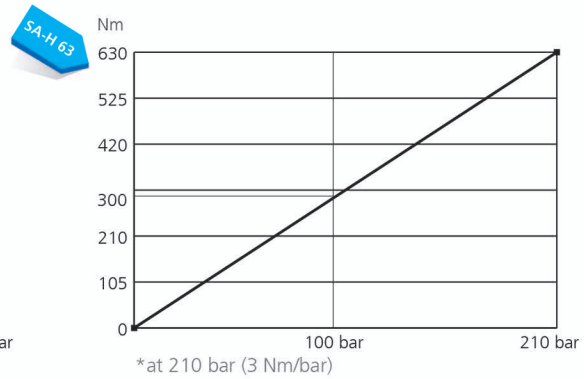
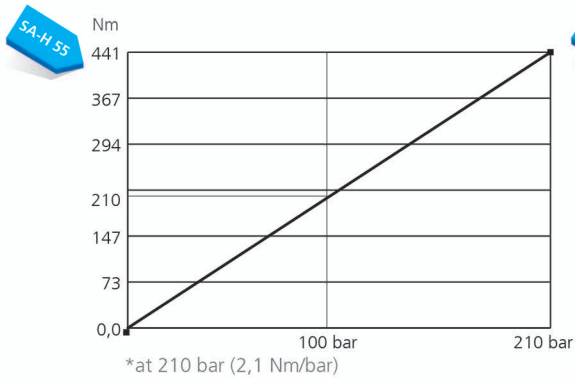
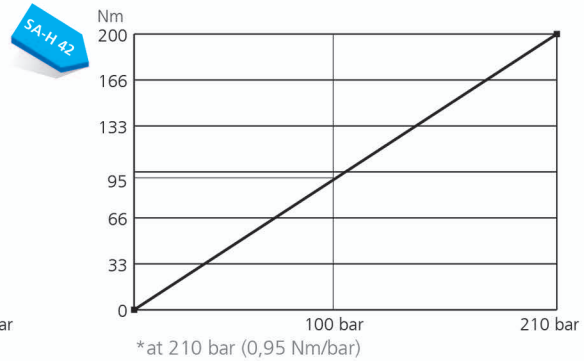
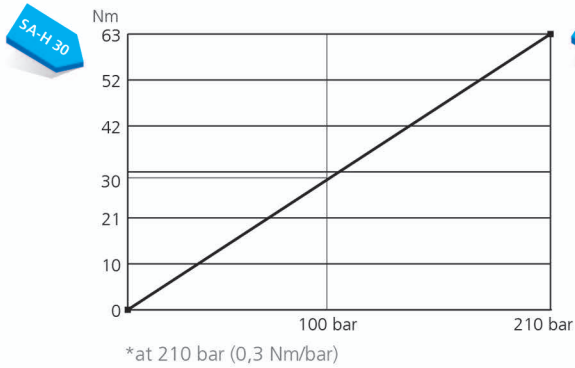


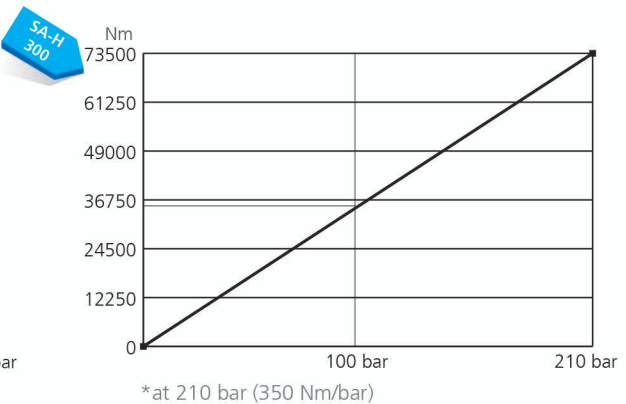
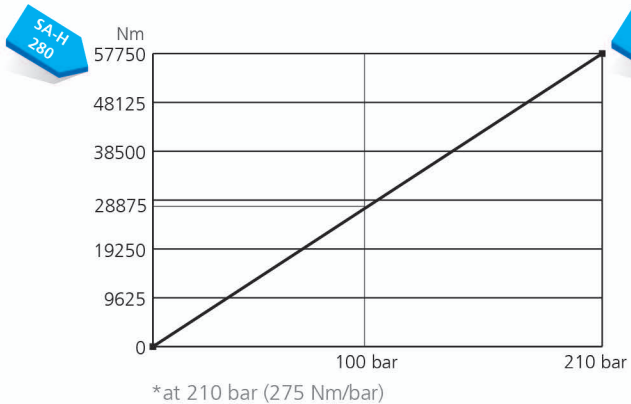
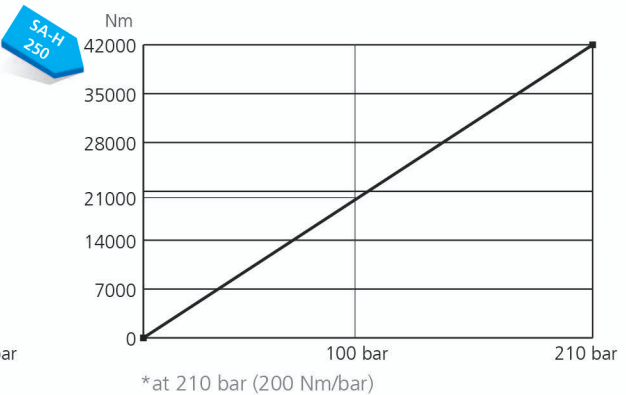
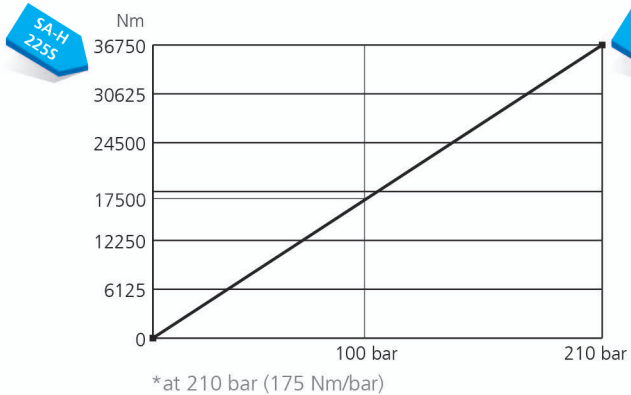
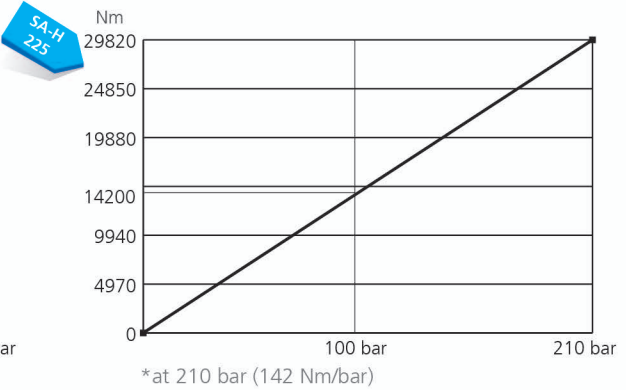
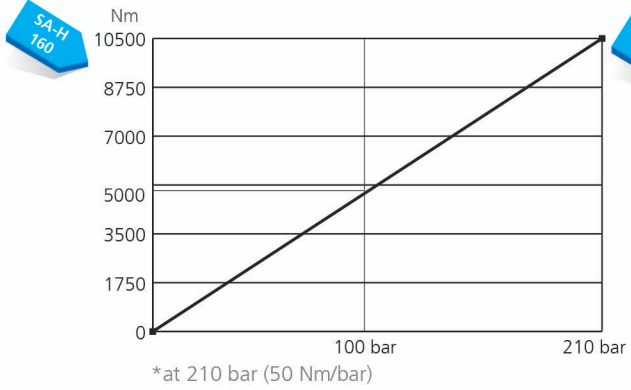
HWZ
ISO-Double DIN 475T1



*) Dimensions acc. DIN ISO 5211 S.16

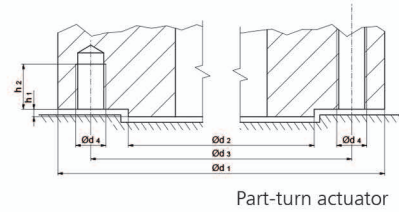
Nom. torque to working pressure of the series SA-H 30 to SA-H 300





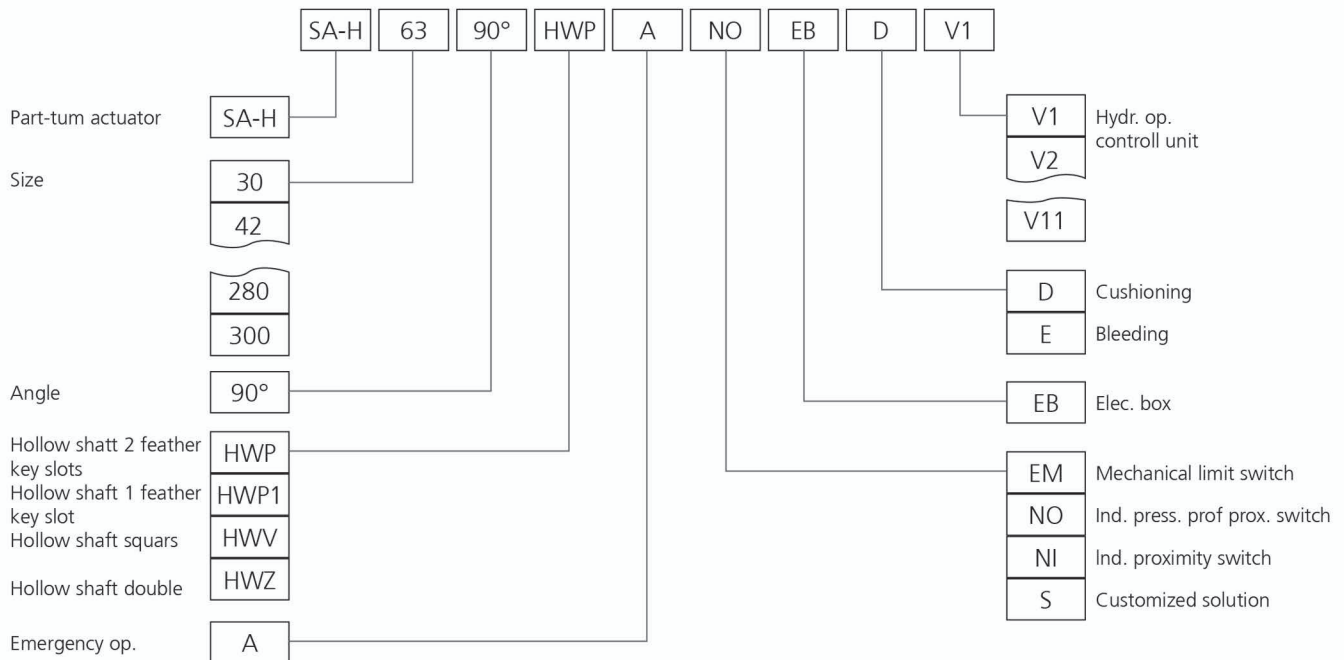
Part-turn valve attachment SA-H and AFR for fittings DIN ISO 5211* (dimensions of flange)

Typ	Ød ₁ [mm]	Ød ₂ f ₈ [mm]	Ød ₃ [mm]	Ød ₄ [mm]	h _{max} [mm]	Torque [Nm]
F03	46	25	36	M 5	2	32
F04	54	30	42	M 5	2	63
F05	65	35	50	M 6	3	125
F07	90	55	70	M 8	3	250
F10	125	70	102	M 10	3	500
F12	150	85	125	M 12	3	1000
F14	175	100	140	M 16	4	2000
F16	210	130	165	M 20	5	4000
F25	300	200	254	M 16	5	8000
F30	350	230	298	M 20	5	16000
F35	415	260	356	M 30	5	32000
F40	475	300	406	M 36	8	63000
F48	560	370	483	M 36	8	125000
F60	686	470	603	M 36	8	250000



The operating pressures may have to be adjusted in accordance with p. 12/13

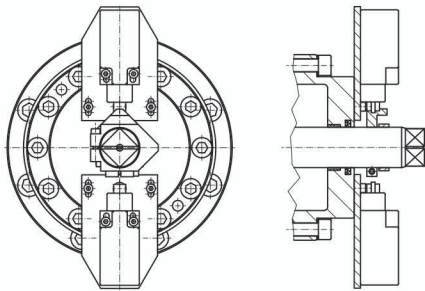
Order code



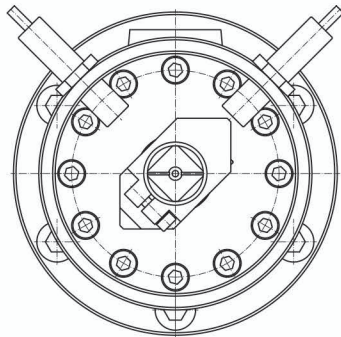
Options for part-turn actuators

for SA-H and AFR

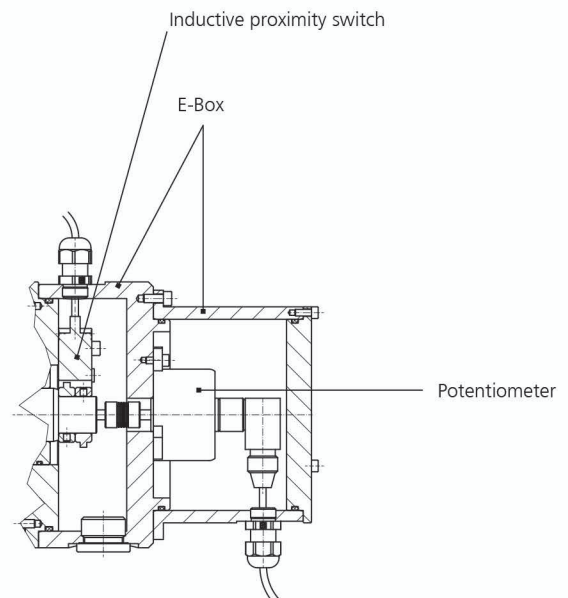
The versions shown are only a few possibilities of the options with which HKS part-turn actuators can be provided. Our engineers will be pleased to advise you.



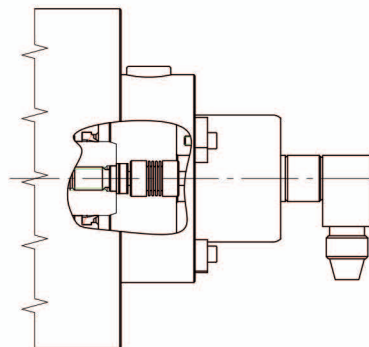
Mechanical limit switch (EM)



Ind. proximity switch (NI)

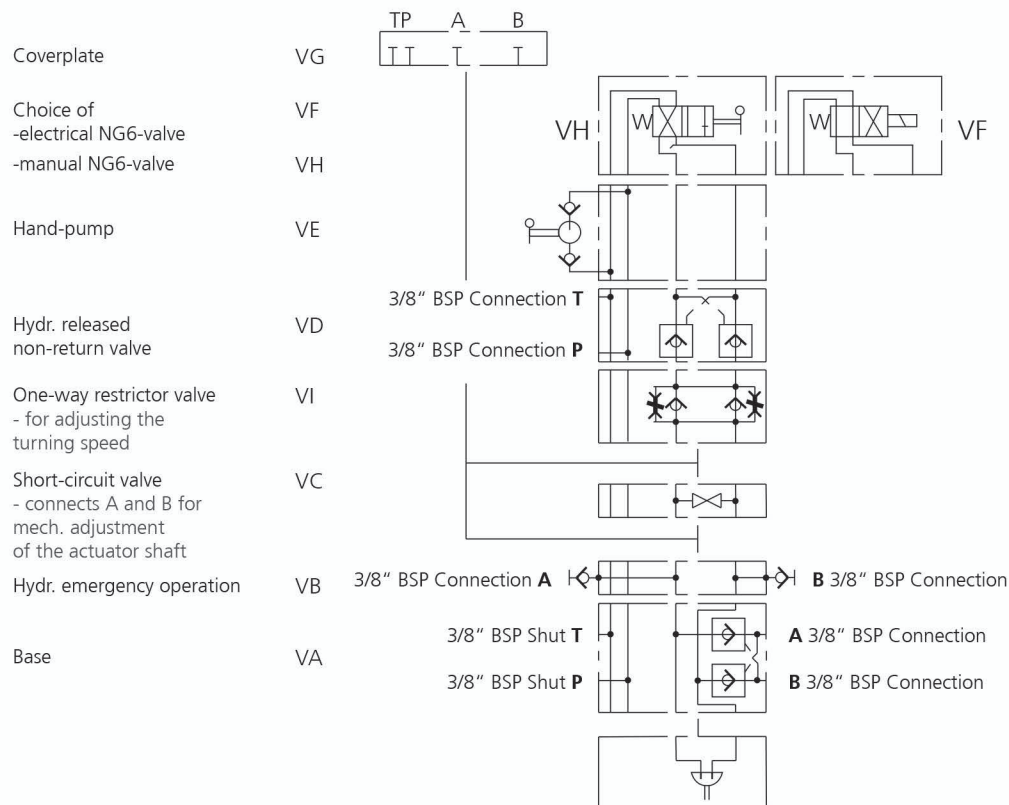
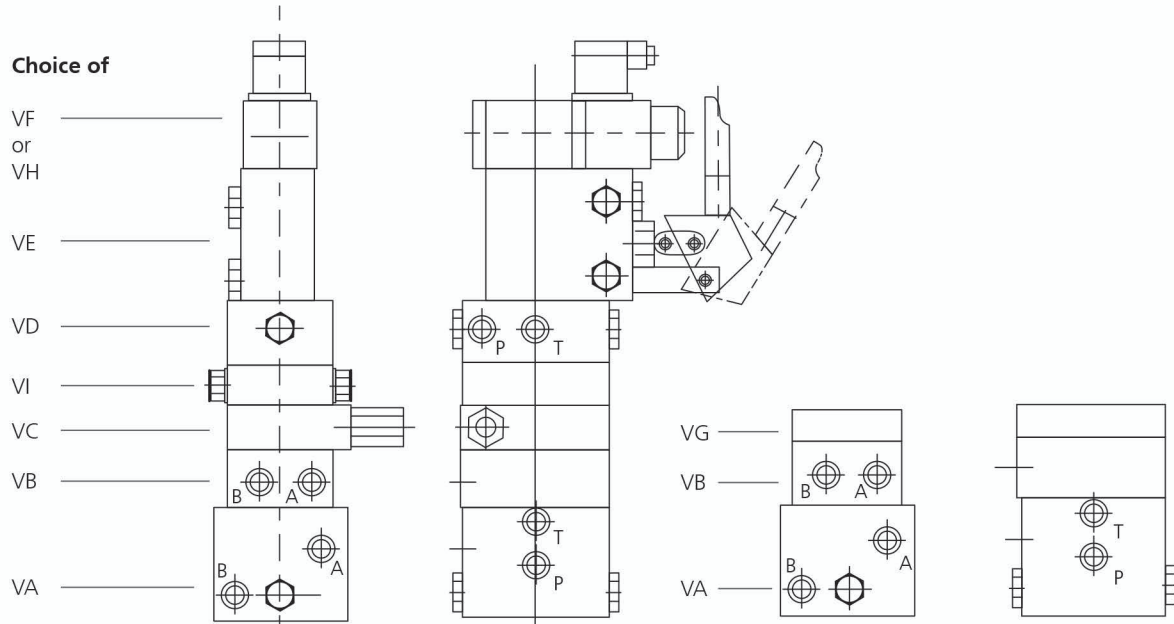


Combination of inductive proximity switch and potentiometer in an E-Box



Potentiometer

Hydraulically operated control unit for HKS part-turn actuators



The part-turn actuators can be operated by an external pump aggregate or a hand-pump. Both of these applications are also possible if the hand pump is intended for emergency operation. By operating through an external aggregate there are two possibilities available.

1. The valves are attached to the aggregate
2. All controls are attached to the part-turn actuator

In case 1, connection of the hydraulic pipes is made by the connections A and B. A causes "turning to the left", B. "turning to the right", when looking

at the shaft spigots. In addition to the base VA, the coverplate VG is required.

In case 2 a ring pipe for P and T from the pump aggregate can supply all actuators, when using several part-turn actuators. Here the pipes for A and B from the aggregate to each part-turn actuator are not required. The connection of the pipes is at P and T in the base VA.

If required the different linked blocks can be combined as a vertical link.

Possibilities of attachment for A and B:

- Hydraulic emergency operation **V1=VA+VB+VG**

An additional external pump can be joined either by a screw or a quick-closing coupling to the part-turn actuator.

- Mechanical emergency operation **V2=VA+VC+VG**

The shaft can be turned with a square key when the valve is open.

- Hydraulic and mechanical emergency operation **V3=VA+VB+VC+VG**

- Emergency operation with a hand-pump **V4=VA+VB+VC+VG**

- All possibilities **V5=VA+VB+VC+VD+VE+VF+VI / V5A=VA+VB+VC+VD+VE+VH+VI**

Possibilities of connections for P and T:

- Hydraulic emergency operation **V6=VA+VB+VF / V6A=VA+VB+VH**

An additional external pump can be joined by a screw or a quick-closing coupling to the part-turn actuator. (pay attention to the right 4/3 directional valve)

- Mechanical emergency operation **V7=VA+VC+VF / V7A=VA+VC+VH**

The shaft can be turned with a square key when the valve is open.

- Hydraulic and mechanical emergency operation **V8=VA+VB+VC+VF / V8A=VA+VB+VC+VH**

- Emergency operation with a hand-pump **V4=VA+VD+VE+VF / V4A=VA+VD+VE+VH**

- All possibilities **V5=VA+VB+VC+VD+VE+VF+VI / V5A=VA+VB+VC+VD+VE+VH+VI**

Operating instruction

INSTALLATION AND INITIAL OPERATION

The drive shaft is to be aligned properly to the counterpart to avoid exceeding the permissible axial and radial forces. Before initial operation the hydraulic system is to be carefully cleaned and bled.

PRESSURE FLUID

Mineral oils in the group HLP DIN 51524 / Part 2 and VDMA Sheet 24318 are recommended. It must be borne in mind that the viscosity is between 15 mm²/s (cSt.) and 250 mm²/s (cSt.). Hydraulic oils HLP 16 to HLP 46 meet these conditions. Viscosities above and below the required viscosity in the applicable temperature range may result in increased wear.

Flame-resistant hydraulic fluids or bio oils (HFA, HFC and HFD) may only used with our written approval.

FILTRATION

It is recommended that the pressure fluid be filtered between the pump and rotary actuator (pressure pipe). The hydraulic unit must supply the rotary actuator with a guaranteed oil purity according to NAS 1638 – NAS Class 7. Recommendation filter element: 16 VG. Purity class recommendation: ISO 4406: 1999 (22/18/14).

OILCHANGE

A change of hydraulic oil is required and depends on the size of the system. In smaller systems an oil change is required at correspondingly shorter intervals. If the hydraulic fluid is contaminated it must be changed immediately.

OIL REPLACEMENT

In the case of long oil pipes, there should be a guarantee that 50% of the displacement will be replaced for one complete slewing movement.

TEMPERATURE RANGE

-10°C to +75°C

If the thermal load is higher or lower than this range, consult the factory

BEFORE INSTALLATION

Fit the screw connections with the correct tightening torques. Otherwise the loading capacity of the connection will be reduced. If this is the case the connection will loosen.

TIGHTENING TORQUES IN NM FOR CHEESE HEAD SCREWS DIN 912 –12.9 + SCHNORR

Screw	M4	M5	M6	M8	M10	M12	M14	M16	M18	M20	M24	M27	M30	M33	M36
M _n in Nm	4,5	10	17	43	84	148	215	330	460	650	1120	1650	2250	3000	3900

On stainless screws are tightening torques's from the manufacture to inquire.

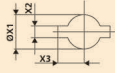
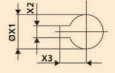
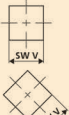

All screws must be lubricated.

Company:		Tel.:	
Name:		Fax.:	
Street:		E-Mail:	
Code / City:		Web:	

Project:	Commission:	Responsible:	Date:
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1 Type of valve Ball valve Flaps Other _____

2 Various connection

<input type="checkbox"/> HWP 	<input type="checkbox"/> HWP 1 	<input type="checkbox"/> HWV 	<input type="checkbox"/> HWZ 
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2.1 Dimensions $\varnothing X1:$ $X2:$ $X3:$ SW V: SW Z: $\varnothing Z1:$

3 ISO-Flange

<input type="checkbox"/> F03	<input type="checkbox"/> F04	<input type="checkbox"/> F05	<input type="checkbox"/> F07	<input type="checkbox"/> F10	<input type="checkbox"/> F12	<input type="checkbox"/> F14	<input type="checkbox"/> F16	<input type="checkbox"/> F25	<input type="checkbox"/> F30	<input type="checkbox"/> F35	<input type="checkbox"/> F40	<input type="checkbox"/> F48	<input type="checkbox"/> F60	with screw: <input type="checkbox"/>
													with through hole: <input type="checkbox"/>	

3.1 Alternative Flange _____ (Please attach a drawing)

4 Required nom. torque	M	Nm
5 Part-turn angle		°
5.1 Part-turn time	t	s
5.2 Cycles	Z	day/week

6 Hydraulic plant	
6.1 Effective working pressure	p1 bar
6.2 Max. perm. system pressure	p2 bar
6.3 Flow rate	Q l/min.
6.4 Plant temperature	TA °C
6.5 Surrounding temperature	TU °C
6.6 Medium used	

7 Special conditions of use	
8 Conditions at working place	
9 Necessary properties of part-turn actuator	

10 Additional equipment required

<input type="checkbox"/> Emergency operation	<input type="checkbox"/> Cushioning
<input type="checkbox"/> Mechanical limit switch	<input type="checkbox"/> Adjustment of the rotation angle
<input type="checkbox"/> Induced pressure proof proximity switch	<input type="checkbox"/> Hydraulically operated control unit
<input type="checkbox"/> Induced proximity switch	<input type="checkbox"/> SIL II
<input type="checkbox"/> Electrical-box	<input type="checkbox"/> ATEX Class: _____
<input type="checkbox"/> Bleeding	<input type="checkbox"/> Other: _____

11 Single action spring return

<input type="checkbox"/> Spring return load	N
<input type="checkbox"/> See 1-10	

12 Recommended actuator _____

tork

valve & automation