

ECON HYDRAULIC HELICAL ACTUATOR

Fig. 21201 Spring Return Actuator, type ESH



Fig. 21204 Double Acting Actuator, type EDH



**Installation & Operation Manual for Hydraulic Actuator:
Fig. 21201, 21204**

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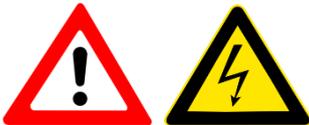
1 INTRODUCTION

1.1 Purpose

The purpose of this manual is to introduce and explain the installation, operation and maintenance of the ESH / EDH Hydraulic Helical Actuators.

1.2 Safety Notices

This manual contains safety notices and precautions the user must take to reduce the risk of personal injury and damage to the equipment. The user(s) must read these instructions before the installation, operation or maintenance of the ESH / EDH Hydraulic Helical Actuators.



DANGER: Refers to personal safety and alerts the user for danger and/or injury.
Hazardous or unsafe practice may result in severe injury or death.



WARNING: Refers to personal safety. Alerts the user for potential danger.
Not following warning notices could result in personal injury or death.



CAUTION: Directs the user's attention to general precautions that, if not followed, could result in personal injury and/or equipment damage.

Note: Information in this manual is critical to the user's understanding of the actuator's installation and operation.

2 PRODUCT IDENTIFICATION

2.1 Product Identification

The product name plate is located on the side of the actuator. The name plate contains the following:

2.1.1 Marking



- ECON logo (trademark)
- Figure number
- Serial number
- Actuator type
- Standard Hydraulic working pressure

2.1.2 Applied Standards

- ISO 5211

2.2 Initial Inspection

Upon the receipt of the actuator, the user should inspect the condition of the product and ensure that the product specification stated on the name plate matches with the order sheet.

- Remove the packing wrap or wooden box carefully. Inspect the product for any physical damage that may have occurred during shipment.
- Check the product specification of the received product. If a wrong product has been supplied, please immediately report this to the distributing company.

2.3 Storage

Actuators must be stored in a clean, cool and dry area. The unit should be stored with the top cover installed and the connection ports plugged. Storage must be off the floor, covered with a sealed dust protector.

3 GENERAL INFORMATION AND FEATURES

3.1 General Information

ECON Helical actuators are equipped with a standardised connecting flange for direct mounting of Hydraulic Accessories and with ¼ inch threaded connection ports for BSP Hydraulic couplers.

- Fig. 21201 – Single acting Hydraulic actuator
- Fig. 21204 – Double acting Hydraulic actuator

3.1.1 Standard Technical Data

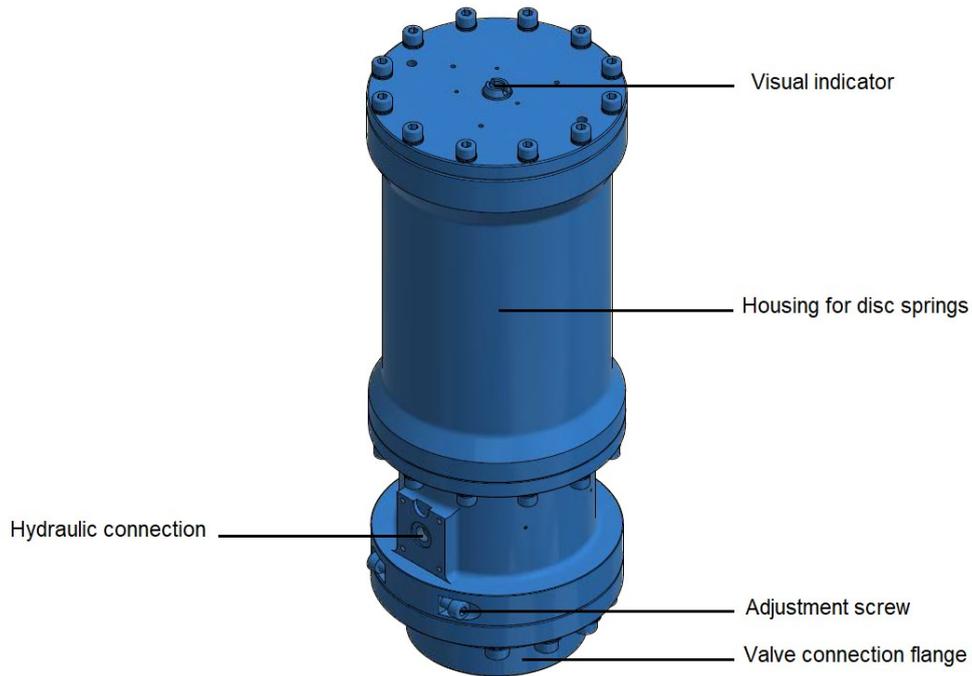
Standard working pressure	135 bar
Test pressure	210 bar
Torque output	125 Nm up to 16200 Nm
Valve connection	According ISO 5211
Indication	Standard visual indicator for open/closed position indication, optional limit switches or Potentiometer available
Local Control	Minimess quick connection couplers, type SMK20 M16x2 (on control block)
Hydraulic connections	¼ inch BSP
Ambient Temperature	-20°C (-4°F) up to +80°C (176°F)
External Coating	2 component Epoxy coating system, RAL5015

3.1.2 Actuator Versions

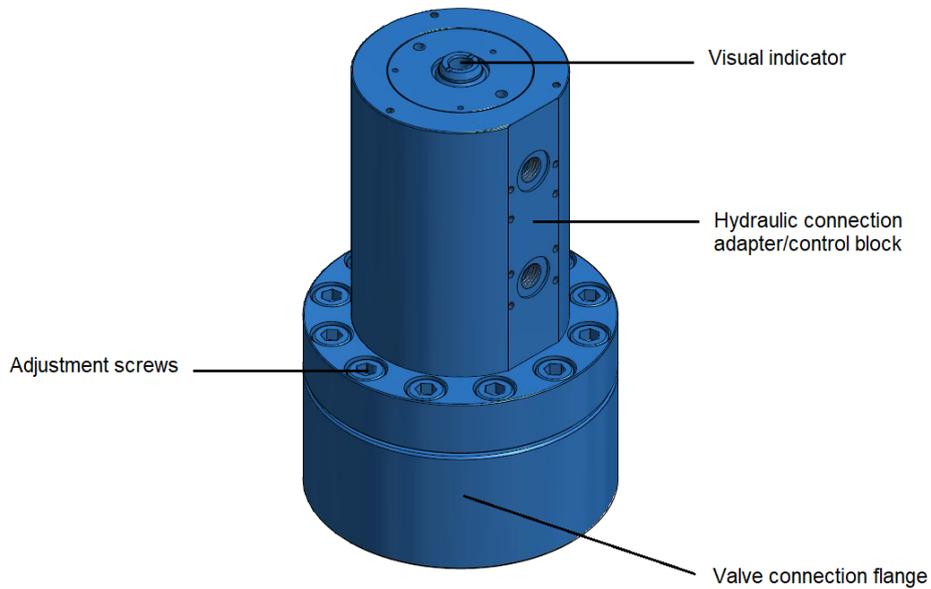
Actuator type	Torque output in Nm		Displacement volume in liter		Weight in kg	
	ESH*	EDH	ESH	EDH	ESH	EDH
ESH-1 / EDH-1	125	125	0.150	0.032	22	10
ESH-2 / EDH-2	280	280	0.260	0.069	42	13
ESH-3 / EDH-3	525	525	0.470	0.127	73	21
ESH-4 / EDH-4	1.090	1.090	0.900	0.263	134	32
ESH-5 / EDH-5	1.980	1.980	-	0.470	-	55
ESH-6 / EDH-6	4.050	4.050	-	1.042	-	115
ESH-7 / EDH-7	8.100	8.100	-	2.032	-	156
ESH-8 / EDH-8	16.200	16.200	-	3.824	-	300

3.2 External Parts for Single & Double acting actuator

3.2.1 ESH



3.2.2 EDH

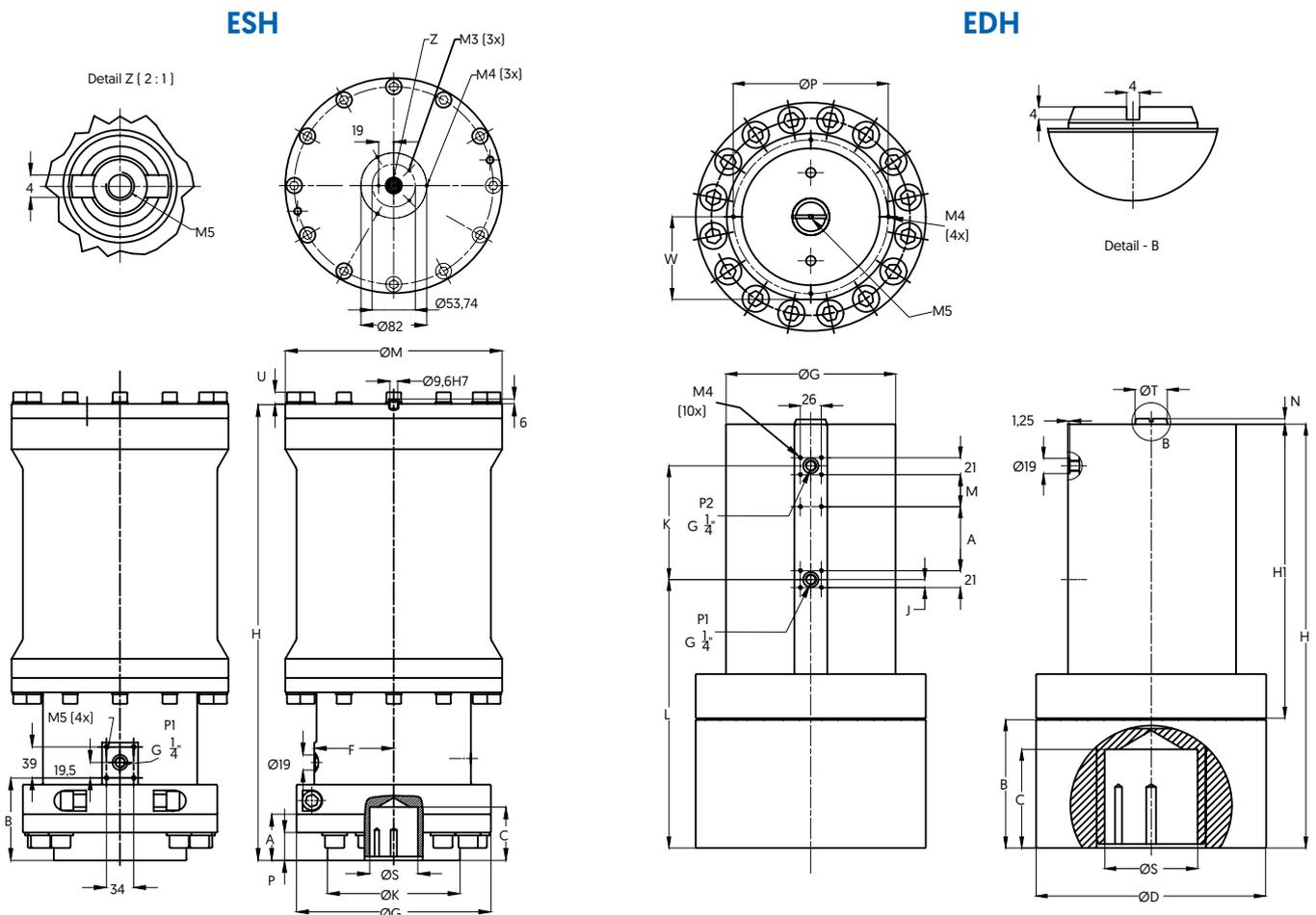


Dimensions Fig. 21201 ESH actuator

Actuator	A	B	C	F	ØG	H	ØK	ØM	P	ØS	U
Type	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
ESH 1	53	81,5	30	58	145	327	84	140	37	30	8
ESH 2	58	89,5	40	71	167	435	120	172	40	40	11
ESH 3	58	93,5	45	82	198	492	146	217	39	50	13
ESH 4	58	103,5	67	99	242	573	165	270	35	60	15

Dimensions Fig. 21204 EDH actuator

Actuator	A	B	C	ØD	ØG	H1	H	J	K	L	M	N	ØP	ØS	ØT	W
Type	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
EDH 1	22	49	30	115	80	137	188	10	44	110	20	6	57	30	16	37
EDH 2	28	57	40	130	90	149	208	10	54	124	15	6	82	40	18	42,5
EDH 3	42	65	45	145	105	198	265	10	75	155	35	6	82	50	25	50
EDH 4	40	92	67	165	122	216	310	10	82	191	40	6	108	60	32	59
EDH 5	77	95	67	210	147	255	352	10	99	213	19	6	128	80	32	71
EDH 6	93	151	113	285	187	292	445	10	115	282	19	6	170	95	40	92
EDH 7	80	160	123	285	210	367	529	10	142	335	40	6	192	115	40	103
EDH 8	83	215	163	365	250	427	644	10	165	420	60	6	232	153	40	124

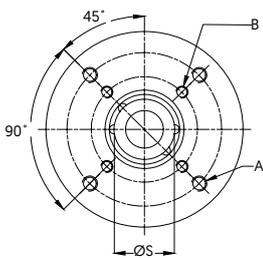




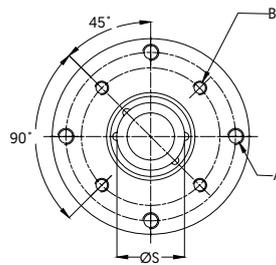
ISO 5211 details ESH/EDH actuator

Actuator	Actuator ISO 5211 details in mm				
	ØS	A	M-A	B	M-B
ESH-1 / EDH-1	30	F07	M8	F05	M6
ESH-2 / EDH-2	40	F10	M10	F07	M8
ESH-3 / EDH-3	50	F12	M12	F10	M10
ESH-4 / EDH-4	60	F14	M16	F12	M12
EDH-5	80	F16	M20	F14	M16
EDH-6	95	F25	M16	F16	M20
EDH-7	115	F25	M16	F16	M20
EDH-8	153	F30	M20	F25	M16

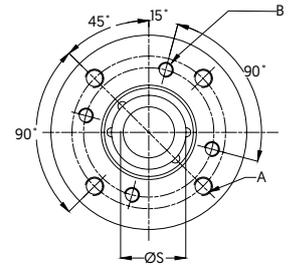
ESH 1 & 2, EDH 1 & 2



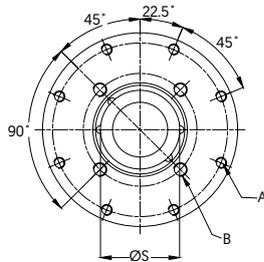
ESH 3 & 4, EDH 3 & 4



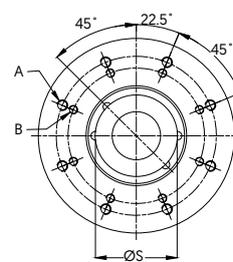
EDH 5



EDH 6 & 7



EDH 8



ESH/EDH Material specifications

Body:	Carbon Steel
Base ring:	Carbon Steel
Drive shaft:	Carbon Steel
Piston:	Ductile Iron
Annular gear:	Ductile Iron
Top flange:	Steel
Bolts:	Galvanised Steel
Washers:	Galvanised Steel
Internal seals:	NBR

Coating

2 component Epoxy coating system, high corrosion resistance. Thickness: 200 µm, Colour: RAL 5015

4 INSTALLATION & HYDRAULIC REQUIREMENTS

4.1 Pre-installation

Note: *Prior to mounting, actuator assembly must be checked for any damage. Damaged parts must be replaced by original spare parts.*

Verify the actuator's nameplate to ensure that actuator type, model number, torque output are correct before installation or use.

Check if the hydraulic control pressure corresponds with your system specification and the information on the actuator type plate.

4.1.1 Actuator application

ECON hydraulic actuators are used for operation of quarter turn valves. The actuators are designed for severe operating conditions. For use in extreme conditions e.g. aggressive, corrosive environments it is recommended to mention this at the ordering stage, in order to verify if the actuator is suitable. The installation designer is responsible for the hydraulic actuator selection and must determine if the actuator is suitable for the working conditions.

ECON hydraulic actuators are also available for submerged application up to 50 mt depth. For submerged application a gasket should always be placed in between the actuator and valve table to avoid water from penetrating the assembly.

4.1.2 Actuator orientation

The actuator can be installed in any position on to the valve, make sure that both the actuator and valve are; in the same position, open or closed. The normal performance of the actuators is to close clockwise and to open counter clockwise. However, this may be inverted under request.

When the actuator does not have an Electric Hydraulic Powerpack the valve assembly can be mounted in any position; horizontal, vertical, level and upside down. When the actuator has an Electric Hydraulic Powerpack there can be restrictions in installing the assembly. Check the Powerpack specifications before installing.

4.1.3 Actuator Installation

The handling and transportation of actuators must be carried out with extreme precaution and using the necessary and adequate means depending on their size and weight in order to avoid risks to the operators handling them.

When mounting the actuator on to the valve, check for proper alignment between the valve and actuator. The coupling bolts, whether the actuator connects directly to the valve or uses a bracket, must be tightened proportionally, distributing the stress, before tightening them completely.

ECON hydraulic actuators are provided with travel adjustment. The standard rotation is adjustable at $90^\circ + / - 2^\circ$ on close stroke end, fixed at 92° on open stroke end. This Travel angle adjustment can be done best on a work bench when can be determined if the closed position of the valve is in the right angle.

Actuators should be installed in such a way that they are easy to access in order to do the periodic inspections and corresponding maintenance operations necessary to guarantee the performance qualities that they have been designed for.

4.2 Recommended Oil Quality

The use of clean oil increases the lifetime of the actuators, as well as the lifetime of their accessories, solenoids and other hydraulic accessories

Any type of mineral oil can be used, the HLP type (DIN 51524-2) is recommended.

Also many fire-resistant fluids (as HFC) or polyglycole can be used.

Viscosity Range: 15 , 200 mm²/sec (Oil ISO VG 46 mm²/sec DIN 51519 is recommended)

4.2.1 Hydraulic System flushing

The actuators are supplied cleaned and plugged; **before to start up, the connection piping and the hydraulic system have to be flushed according to ISO 4406 16/13 (NAS 1638/7) or better.**

5 OPERATION

5.1 General Operation

The EDH standard connection flange includes two hydraulic ports, threaded for 1/4" BSP couplings. The ESH connection flange has one hydraulic port, threaded for 1/4" BSP coupling. When hydraulic pressure is supplied to these ports the cylinder slides through the housing in a linear movement. While the cylinder is moving up and down the helical shaped internal thread converts in to a rotation movement. The actuator shaft connects to the valve spindle and transfers the quarter turn rotation of the actuator into an opening and closing of the valve.

5.1.1 Double Acting actuator

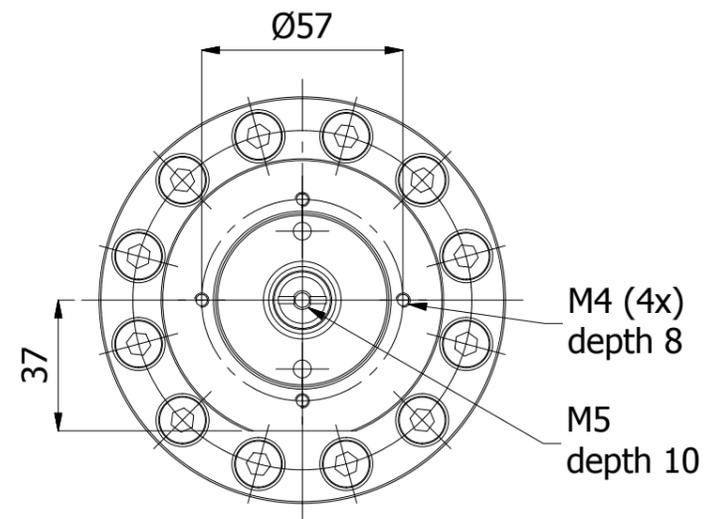
When the oil is supplied to port P1 the actuator will make counter clockwise rotation (opening), when oil is supplied to port P2 will cause clockwise rotation (closing).

5.1.2 Single Acting actuator

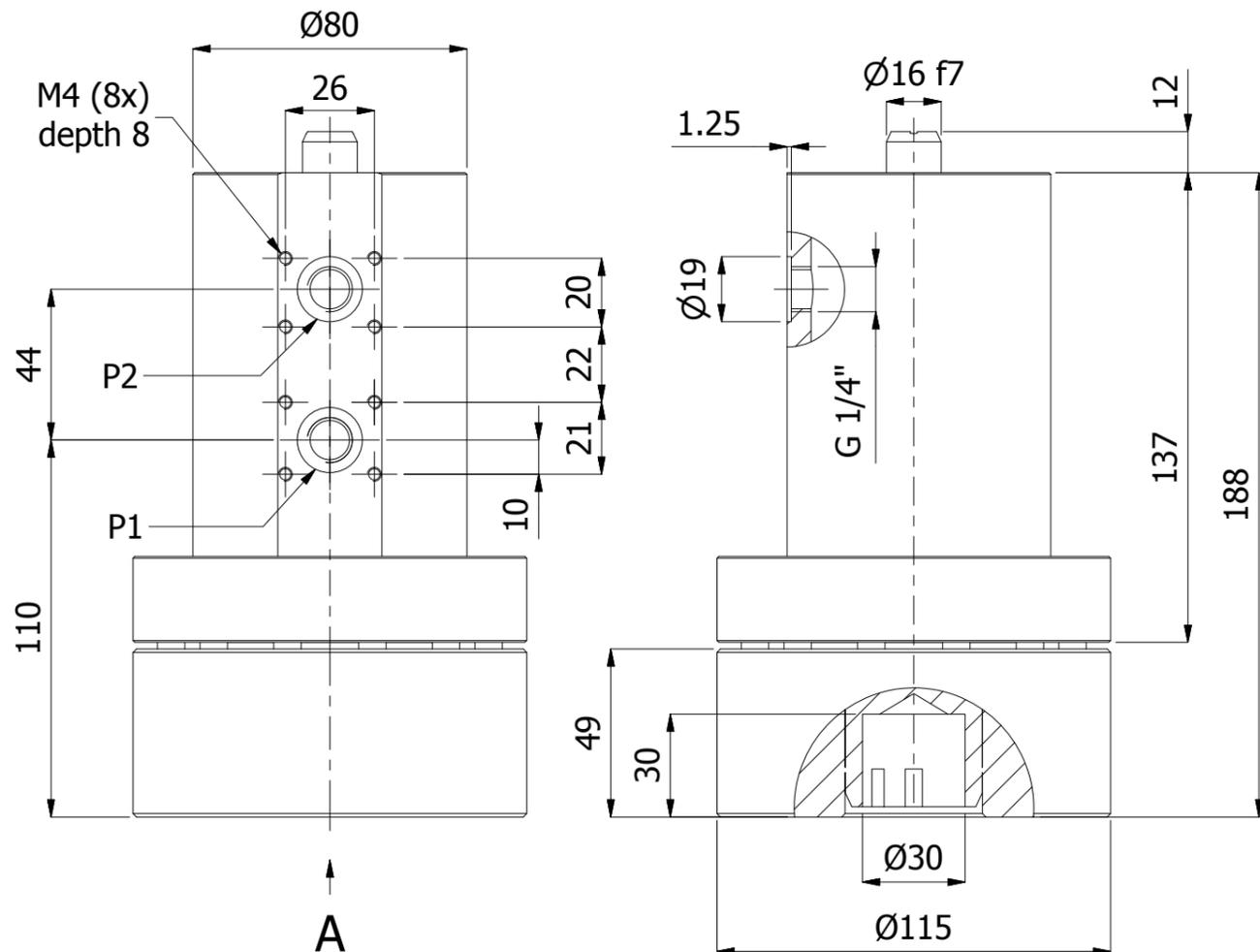
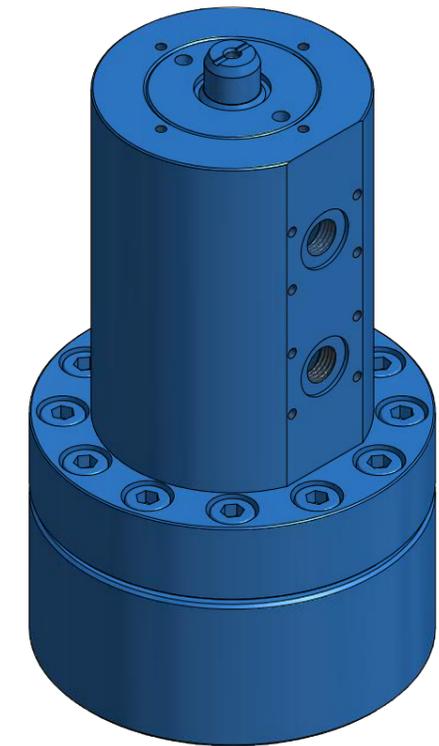
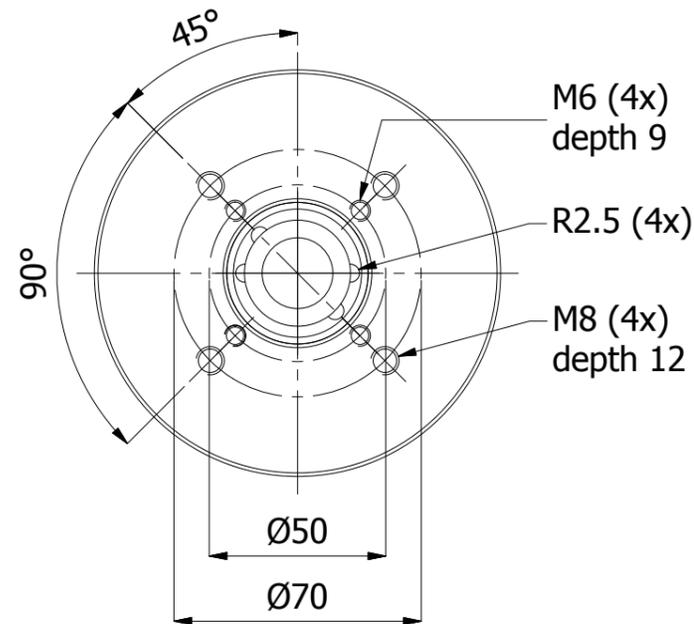
On a single acting actuator the movement (opening) is done by hydraulic pressure and the other movement (closing) is done by a spring. Therefore there is only one connection port on the actuator.

5.2 Manual (emergency) operation

Besides operation through the main system the actuator can also be operated through a handpump. For this the actuator need to be equipped with an adapter and control block. The adapter block is an actuator(size) specific item and is needed to mount a control block. Besides hand pump connectors a control block can have several hydraulic functions, see our product brochure for more information.



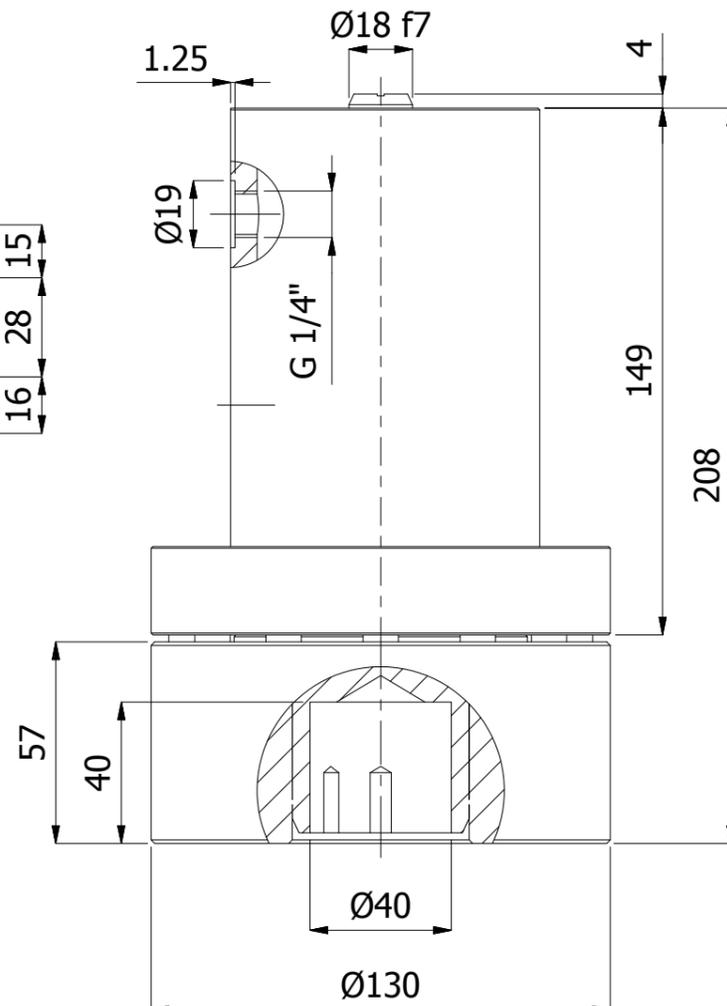
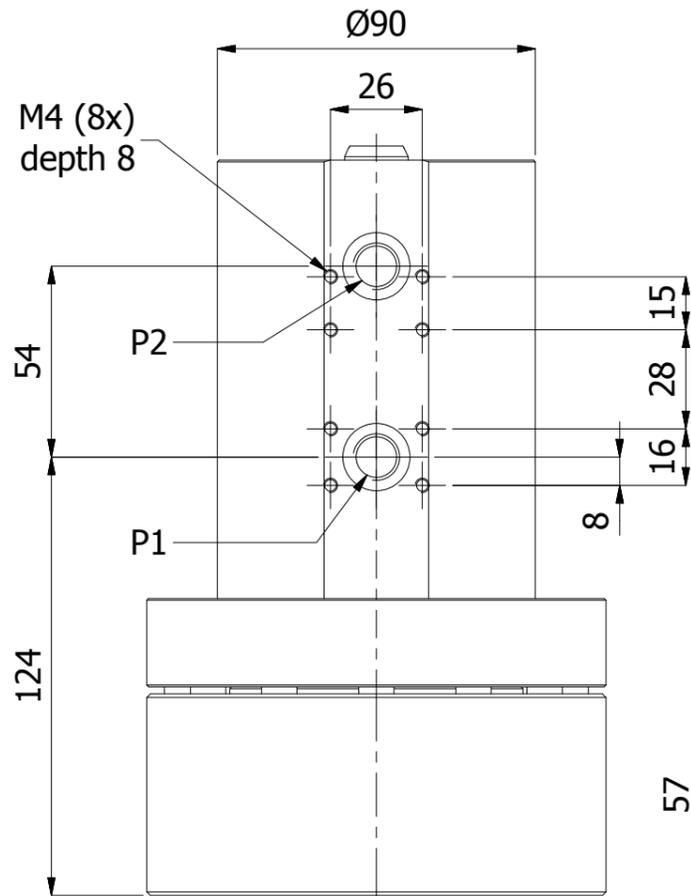
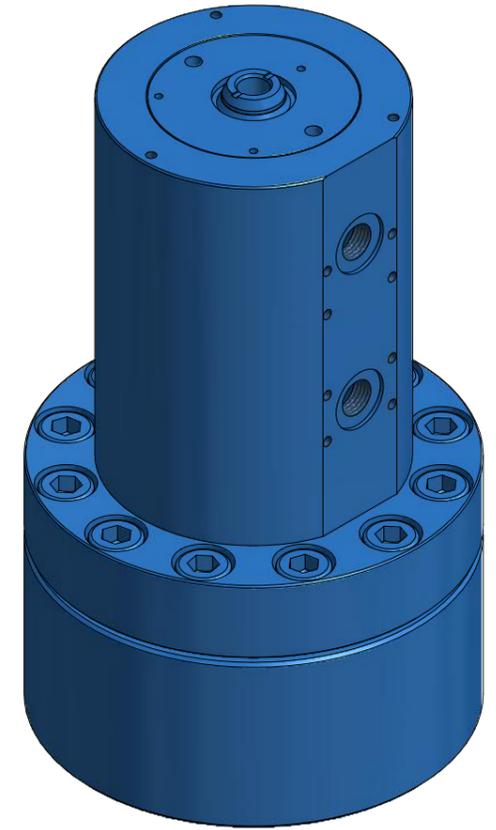
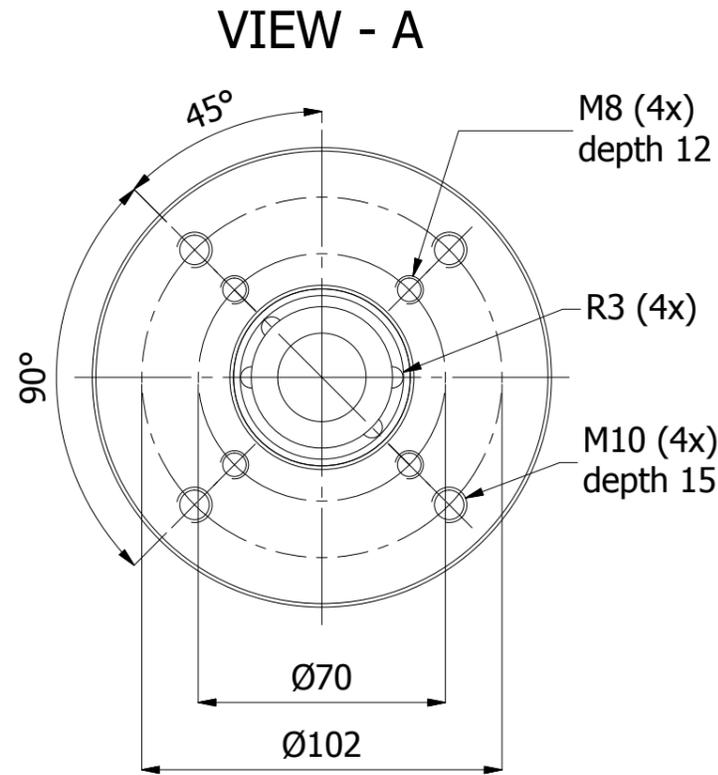
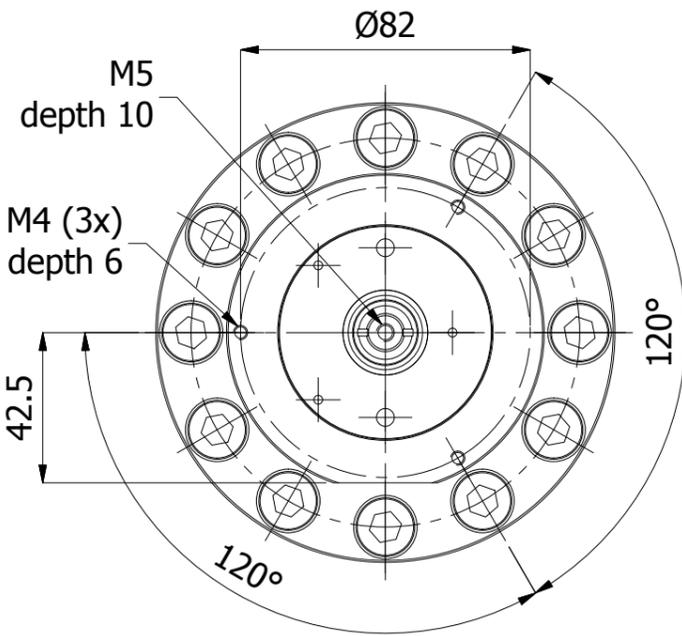
VIEW - A



Technical Data of ECON Helical Hydraulic Actuator type EDH-1:

Design Pressure: 135 bar
 Nominal Torque: 125 Nm @ 135 bar
 Connection: Flange F05 + F07 (DIN-EN-ISO 5211)
 Insert Diameter Ø30
 Starting Position Actuator: Valve closed
 P1: Open (Rotation counter clockwise seen from above)
 P2: Close
 Rotation Angle: 90° ± 1°
 HPPI (Hydraulic Positive Position Indication)
 Oil Displacement @ 90°: 0.032 dm³
 Temperature Range: -20°C - +75°C
 Weight: 9.39 kg
 Mineral Oils according to the group HLP DIN 51524/Part 2 and VDMA Sheet 24318 have to be used. Care must be taken to ensure their viscosity is between 15 mm²/s (cSt.) and 250 mm² (cSt.). These conditions are suitable for oil between HLP16 and HLP46, depending on the temperature.

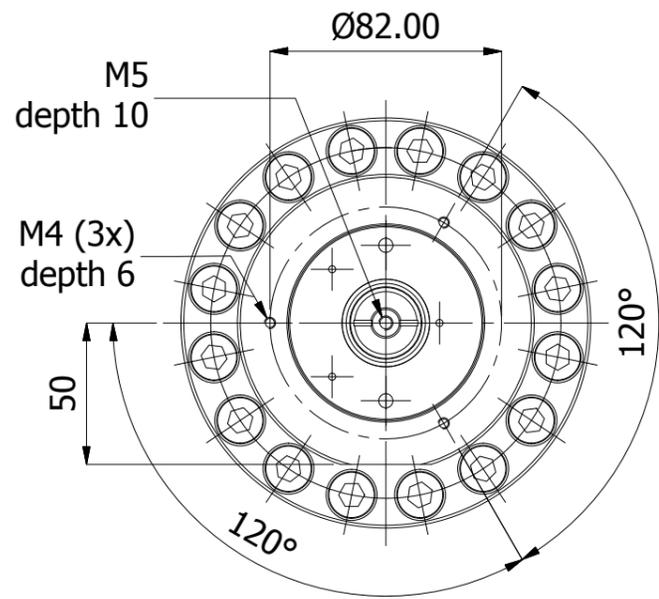
DRAWING	PART	QTY	DESCRIPTION	MATERIAL	DIMENSION	REMARKS
1	1	1	Hydraulic Actuator EDH-1	F05,F07,HPPI	Part No.: 250409006262	
SURFACE FINISH Ra IN µm ACC. TO ISO 1302 INDICATION OF DIMENSIONS AND TOLERANCES ACC. TO ISO 129-1 FORM AND POSITIONAL TOLERANCES ACC. TO ISO 1101			Scale: 1 : 2	Date: 8-7-2015		
TOLERANCES FOR LINEAR AND ANGULAR DIMENSIONS WITHOUT INDIVIDUAL TOLERANCE INDICATIONS acc. to ISO 2768-m			Drawn by: RdK	Approved by:		
REVISION DATE: DESCR.:			Figure No.: 21202	Size: EDH-1	Drawing No.:	REV.:
				Connection: F05 + F07	C-36794	



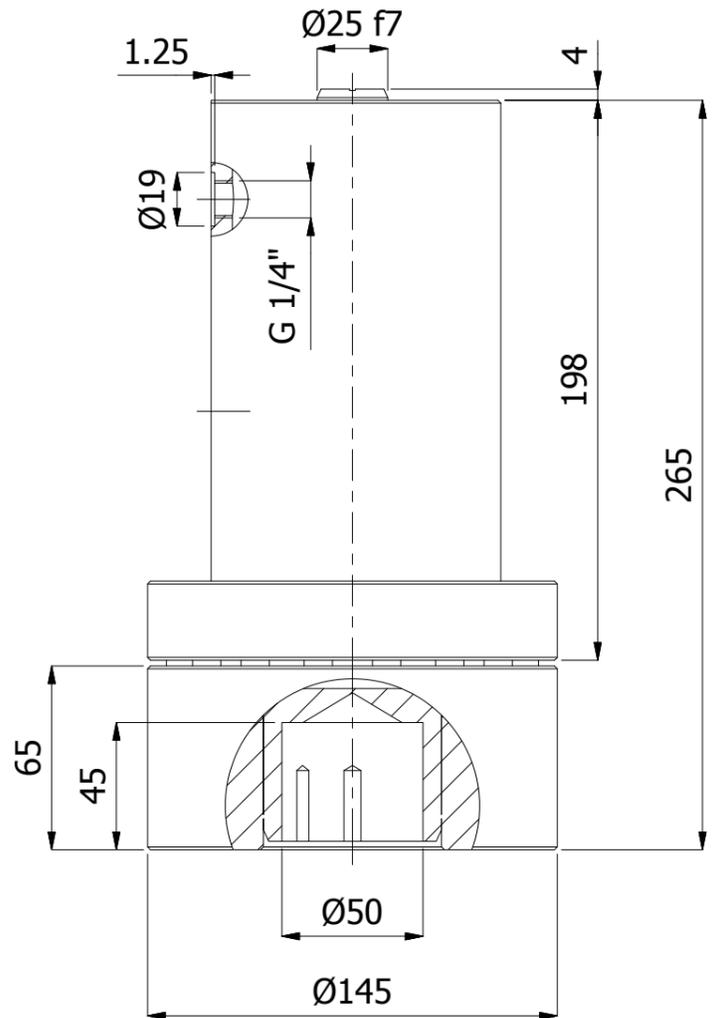
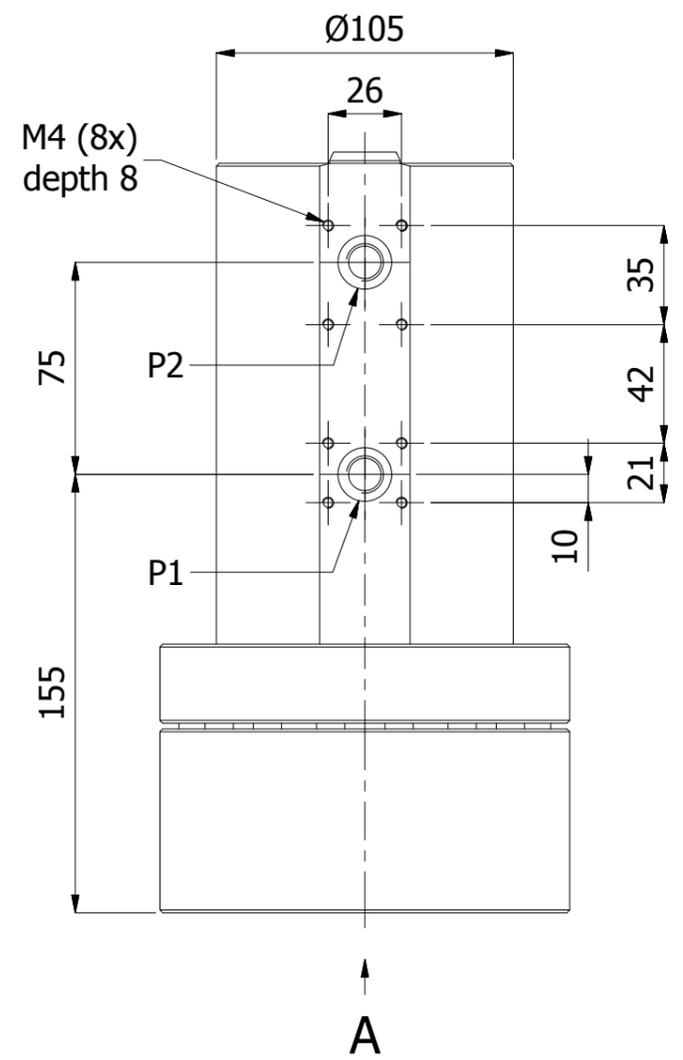
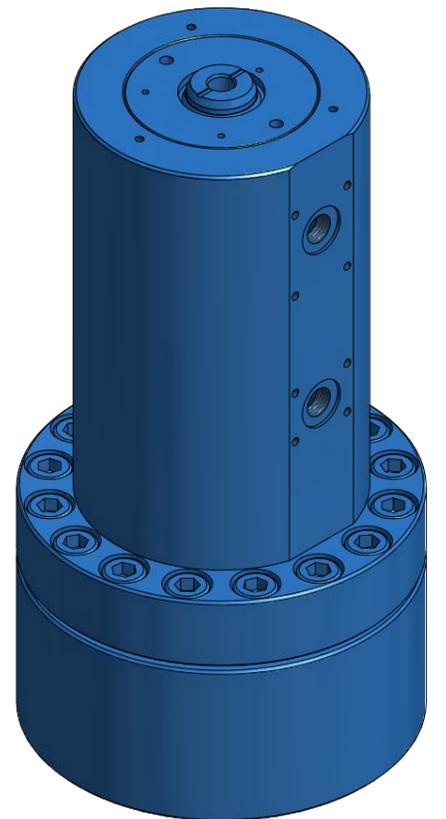
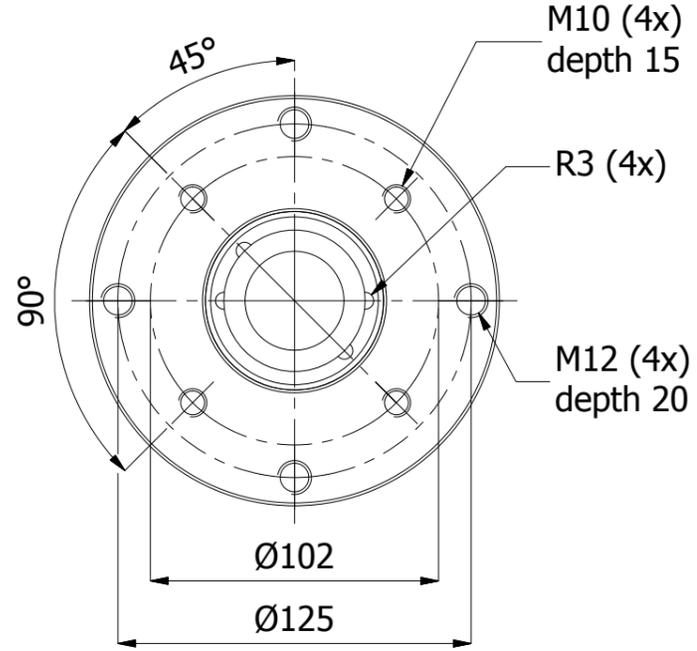
Technical Data of ECON Helical Hydraulic Actuator type EDH-2:

Design Pressure: 135 bar
 Nominal Torque: 290 Nm @ 135 bar
 Connection: Flange F07 + F10 (DIN-EN-ISO 5211)
 Insert Diameter $\varnothing 40$
 Starting Position Actuator: Valve closed
 P1: Open (Rotation counter clockwise seen from above)
 P2: Close
 Rotation Angle: $90^\circ \pm 1^\circ$
 HPPI (Hydraulic Positive Position Indication)
 Oil Displacement @ 90° : 0.069 dm^3
 Temperature Range: $-20^\circ\text{C} - +75^\circ\text{C}$
 Weight: 12.84 kg
 Mineral Oils according to the group HLP DIN 51524/Part 2 and VDMA Sheet 24318 have to be used. Care must be taken to ensure their viscosity is between $15 \text{ mm}^2/\text{s}$ (cSt.) and 250 mm^2 (cSt.). These conditions are suitable for oil between HLP16 and HLP46, depending on the temperature.

DRAWING	PART	QTY	DESCRIPTION	MATERIAL	DIMENSION	REMARKS
	1	1	Hydraulic Actuator EDH-2		F07,F10,HPPI	Part No.: 250509006279
SURFACE FINISH Ra IN μm ACC. TO ISO 1302 INDICATION OF DIMENSIONS AND TOLERANCES ACC. TO ISO 129-1 FORM AND POSITIONAL TOLERANCES ACC. TO ISO 1101			Scale: 1 : 2	Date: 8-7-2015		
TOLERANCES FOR LINEAR AND ANGULAR DIMENSIONS WITHOUT INDIVIDUAL TOLERANCE INDICATIONS acc. to ISO 2768-m			Drawn by: RdK	Approved by:		
REVISION DATE: DESCR.:			Figure No.: 21202	Size: EDH-2	Drawing No.:	REV.:
				Connection: F07 + F10	C-36795	



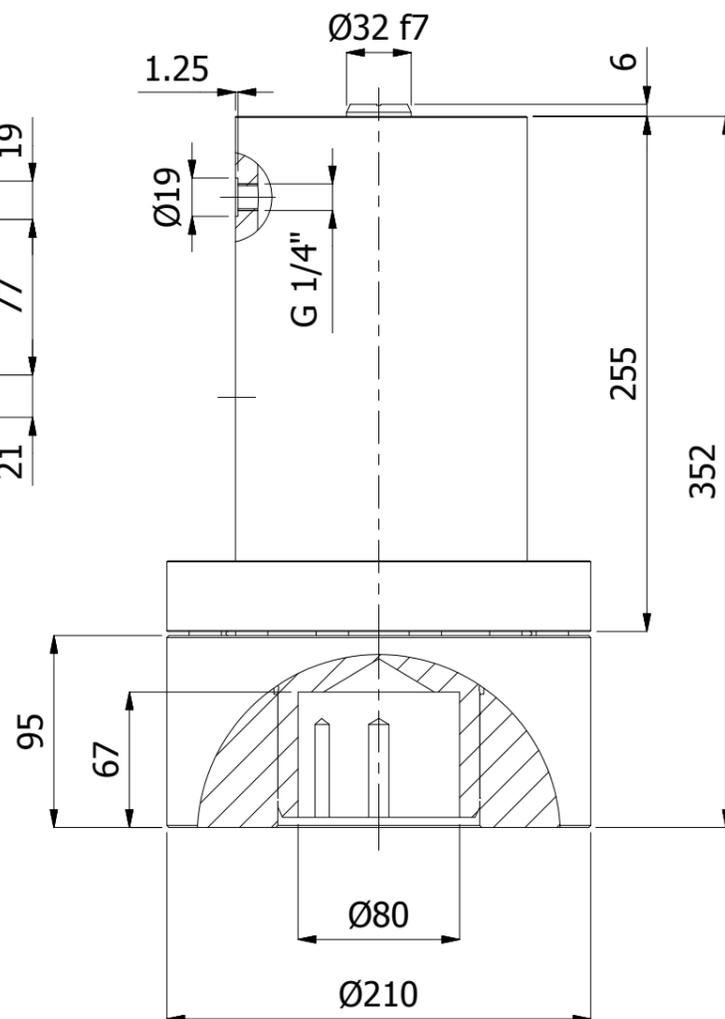
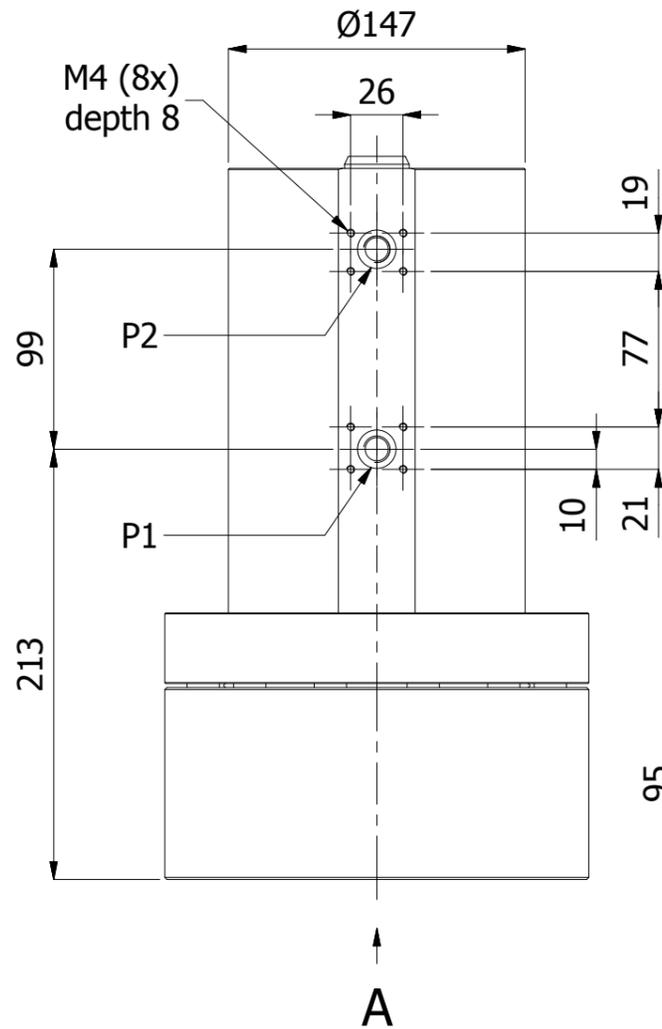
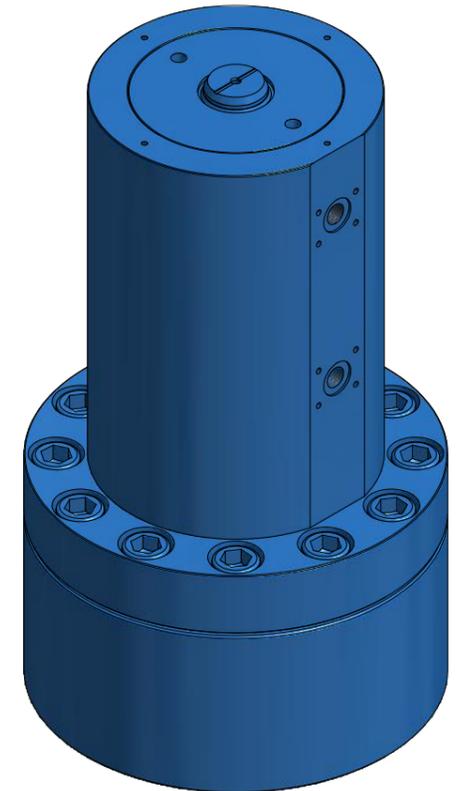
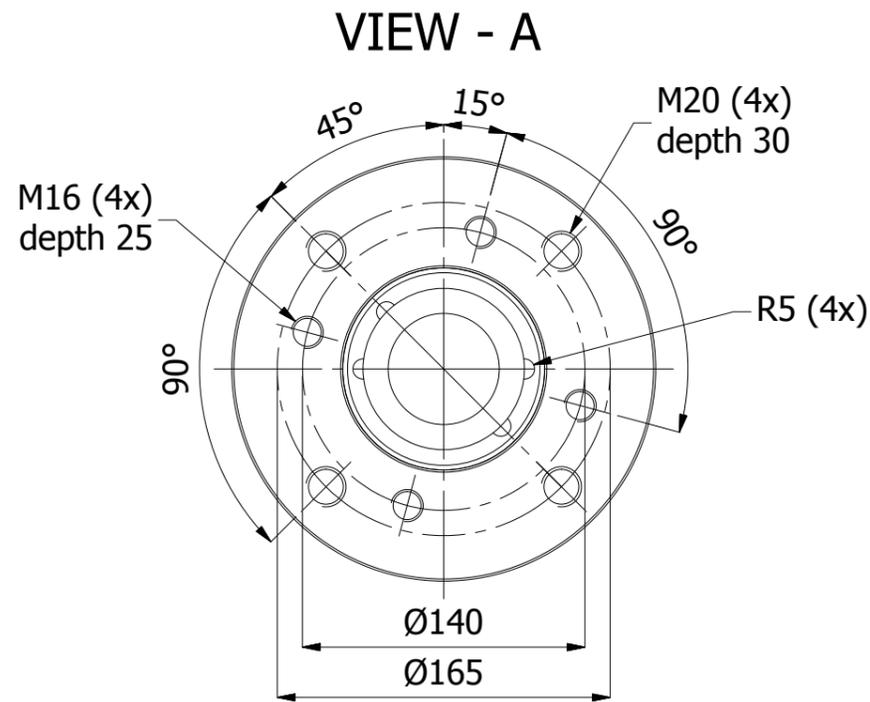
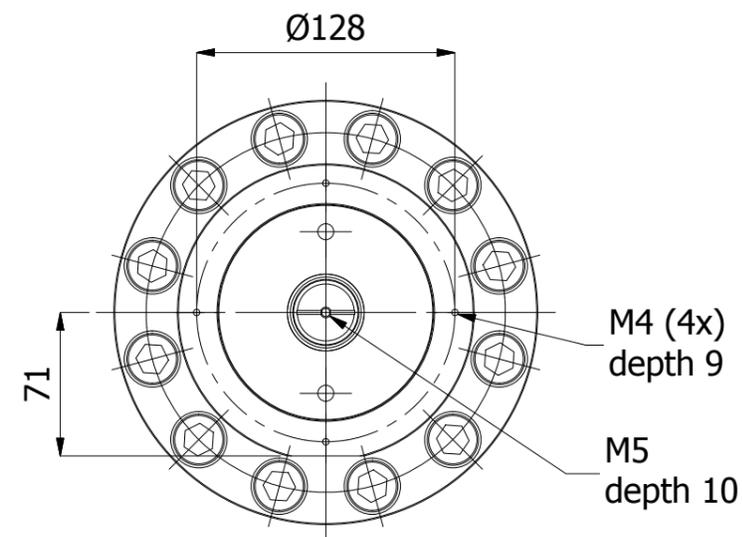
VIEW - A



Technical Data of ECON Helical Hydraulic Actuator type EDH-3:

Design Pressure: 135 bar
 Nominal Torque: 530 Nm @ 135 bar
 Connection: Flange F10 + F12 (DIN-EN-ISO 5211)
 Insert Diameter Ø50
 Starting Position Actuator: Valve closed
 P1: Open (Rotation counter clockwise seen from above)
 P2: Close
 Rotation Angle: 90° ± 1°
 HPPI (Hydraulic Positive Position Indication)
 Oil Displacement @ 90°: 0.127 dm³
 Temperature Range: -20°C - +75°C
 Weight: 20.44 kg
 Mineral Oils according to the group HLP DIN 51524/Part 2 and VDMA Sheet 24318 have to be used. Care must be taken to ensure their viscosity is between 15 mm²/s (cSt.) and 250 mm² (cSt.). These conditions are suitable for oil between HLP16 and HLP46, depending on the temperature.

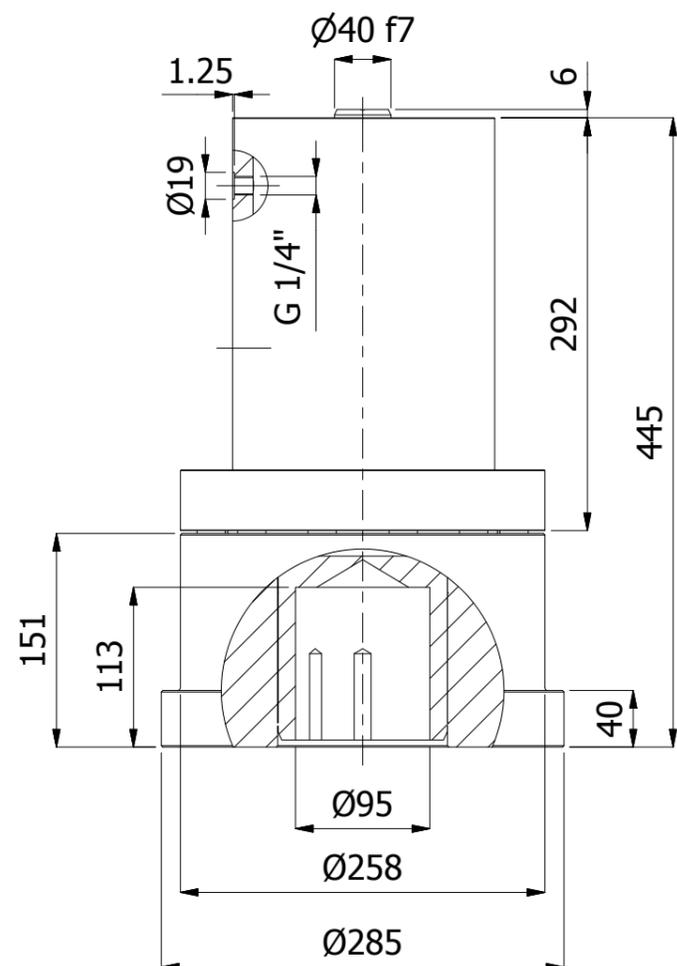
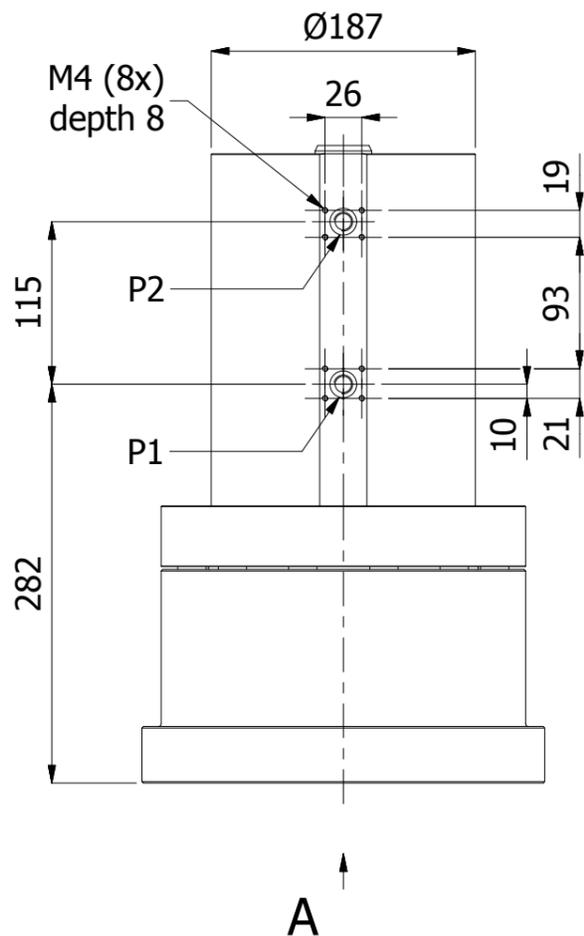
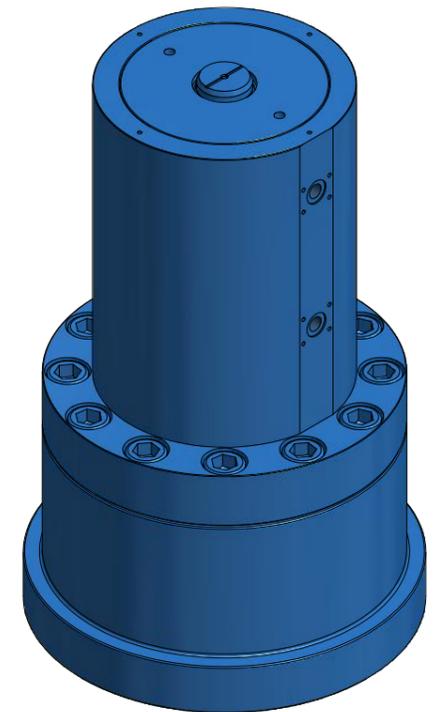
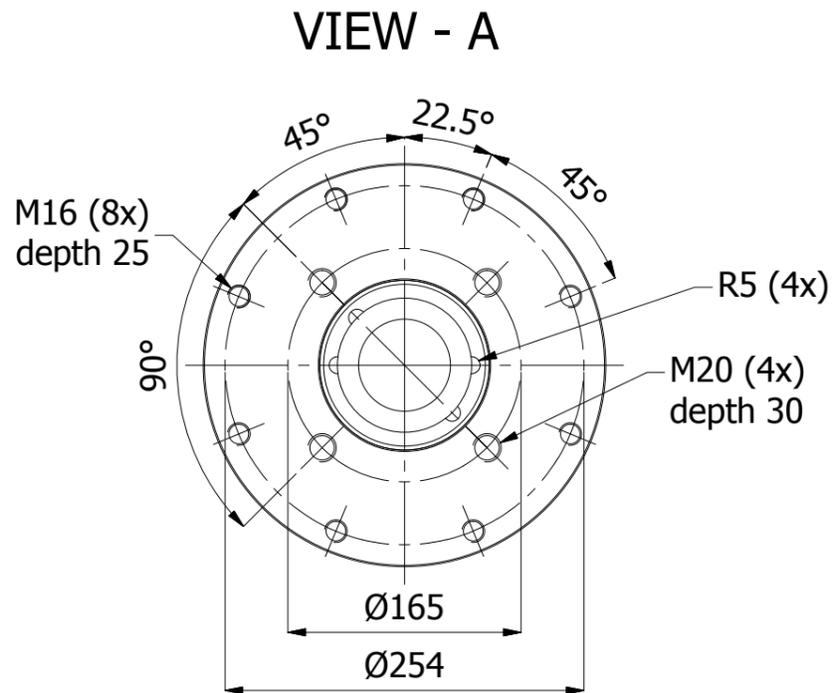
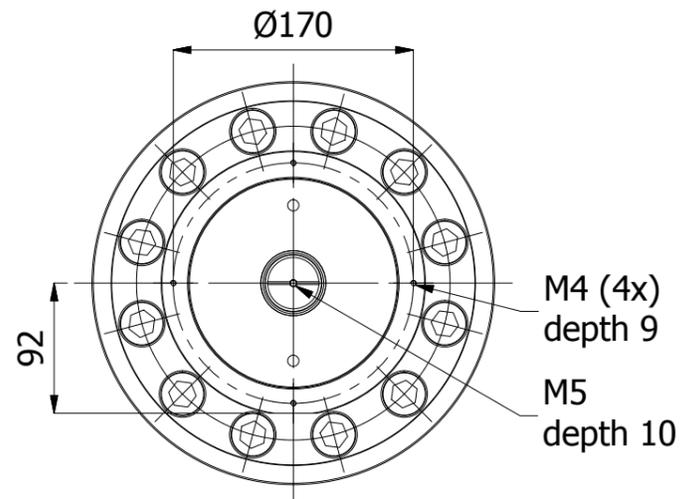
DRAWING	PART	QTY	DESCRIPTION	MATERIAL	DIMENSION	REMARKS
1	1	1	Hydraulic Actuator EDH-3	F10,F12,HPPI	Part No.: 250609006283	
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TOLERANCES FOR LINEAR AND ANGULAR DIMENSIONS WITHOUT INDIVIDUAL TOLERANCE INDICATIONS acc. to ISO 2768-m				Drawn by: RdK	Approved by:	
REVISION DATE: DESCR.:			Figure No.: 21202	Size: EDH-3	Drawing No.: C-36796	REV.:
				Connection: F10 + F12		



Technical Data of ECON Helical Hydraulic Actuator type EDH-5:

Design Pressure: 135 bar
 Nominal Torque: 1985 Nm @ 135 bar
 Connection: Flange F14 + F16 (DIN-EN-ISO 5211)
 Insert: Diameter $\text{Ø}80$
 Starting Position Actuator: Valve closed
 P1: Open (Rotation counter clockwise seen from above)
 P2: Close
 Rotation Angle: $90^\circ \pm 1^\circ$
 HPPI (Hydraulic Positive Position Indication)
 Oil Displacement @ 90° : 0.47 dm^3
 Temperature Range: $-20^\circ\text{C} - +75^\circ\text{C}$
 Weight: 54.11 kg
 Mineral Oils according to the group HLP DIN 51524/Part 2 and VDMA Sheet 24318 have to be used. Care must be taken to ensure their viscosity is between $15 \text{ mm}^2/\text{s}$ (cSt.) and 250 mm^2 (cSt.). These conditions are suitable for oil between HLP16 and HLP46, depending on the temperature.

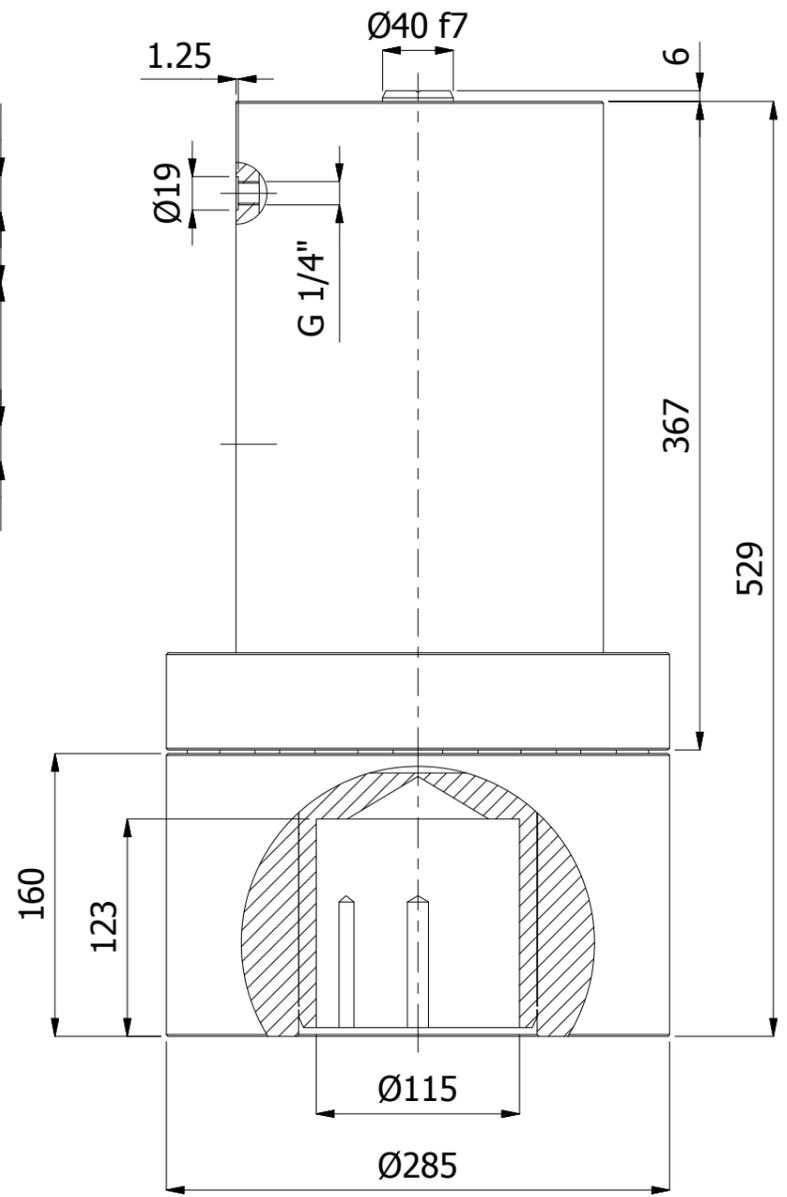
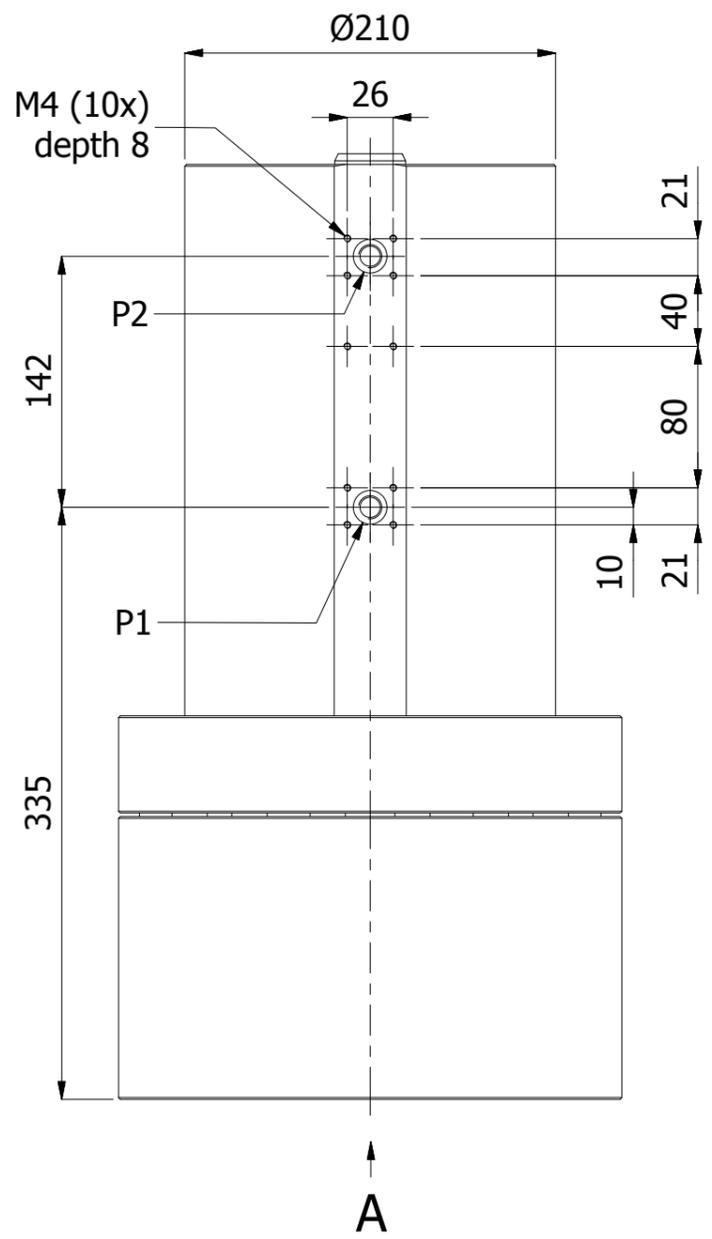
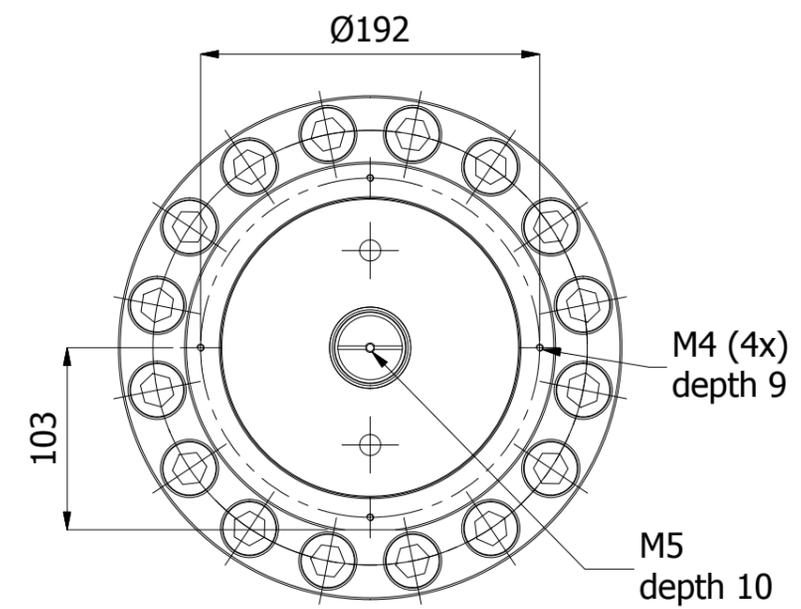
DRAWING	PART	QTY	DESCRIPTION	MATERIAL	DIMENSION	REMARKS
	1	1	Hydraulic Actuator EDH-5	F14,F16,HPPI	Part No.: 251009006170	
SURFACE FINISH R_a IN μm ACC. TO ISO 1302 INDICATION OF DIMENSIONS AND TOLERANCES ACC. TO ISO 129-1 FORM AND POSITIONAL TOLERANCES ACC. TO ISO 1101			Scale: 1 : 3.5	Date: 9-7-2015		
TOLERANCES FOR LINEAR AND ANGULAR DIMENSIONS WITHOUT INDIVIDUAL TOLERANCE INDICATIONS acc. to ISO 2768-m			Drawn by: RdK	Approved by:		
REVISION DATE: DESCR.:			Figure No.: 21202	Size: EDH-5	Drawing No.:	REV.:
				Connection: F14 + F16	C-36798	



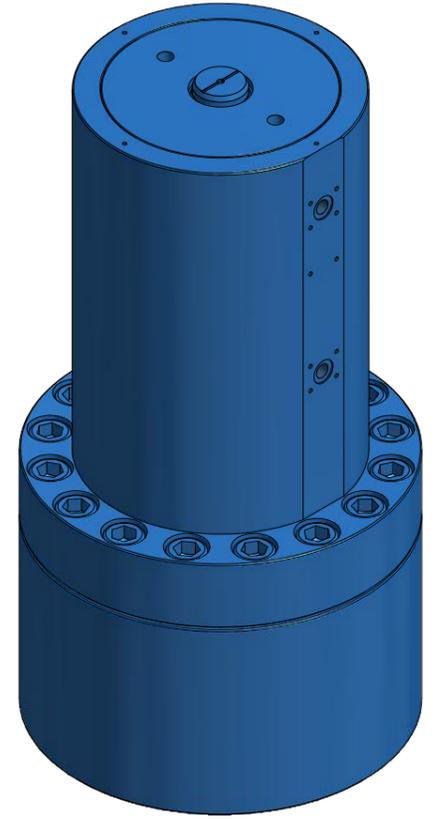
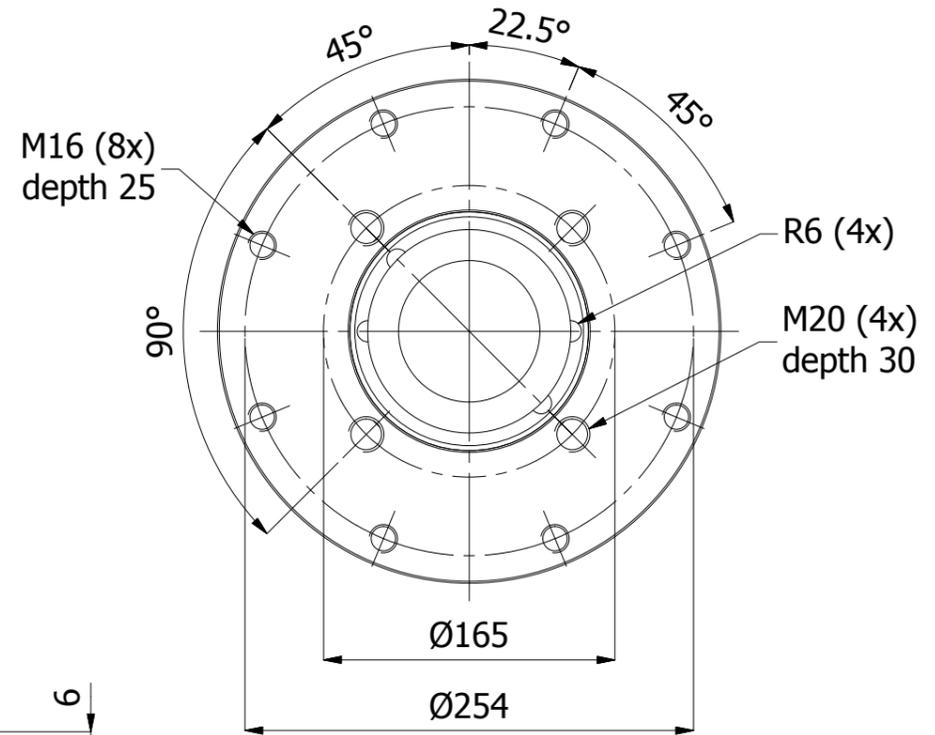
Technical Data of ECON Helical Hydraulic Actuator type EDH-6:

Design Pressure: 135 bar
 Nominal Torque: 4050 Nm @ 135 bar
 Connection: Flange F16 + F25 (DIN-EN-ISO 5211)
 Insert Diameter $\text{Ø}95$
 Starting Position Actuator: Valve closed
 P1: Open (Rotation counter clockwise seen from above)
 P2: Close
 Rotation Angle: $90^\circ \pm 1^\circ$
 HPPI (Hydraulic positive Position Indication)
 Oil Displacement @ 90° : 1.042 dm^3
 Temperature Range: $-20^\circ\text{C} - +75^\circ\text{C}$
 Weight: 114.70 kg
 Mineral Oils according to the group HLP DIN 51524/Part 2 and VDMA Sheet 24318 have to be used. Care must be taken to ensure their viscosity is between $15 \text{ mm}^2/\text{s}$ (cSt.) and 250 mm^2 (cSt.). These conditions are suitable for oil between HLP16 and HLP46, depending on the temperature.

DRAWING	PART	QTY	DESCRIPTION	MATERIAL	DIMENSION	REMARKS
1	1	1	Hydraulic Actuator EDH-6	F16,F25,HPPI	Part No.: 251409006317	
SURFACE FINISH R_a IN μm ACC. TO ISO 1302 INDICATION OF DIMENSIONS AND TOLERANCES ACC. TO ISO 129-1 FORM AND POSITIONAL TOLERANCES ACC. TO ISO 1101			Scale: 1 : 5	Date: 9-7-2015		
TOLERANCES FOR LINEAR AND ANGULAR DIMENSIONS WITHOUT INDIVIDUAL TOLERANCE INDICATIONS acc. to ISO 2768-m			Drawn by: RdK	Approved by:		
REVISION DATE: DESCR.:			Figure No.: 21202	Size: EDH-6	Drawing No.:	REV.:
				Connection: F16 + F25	C-36799	



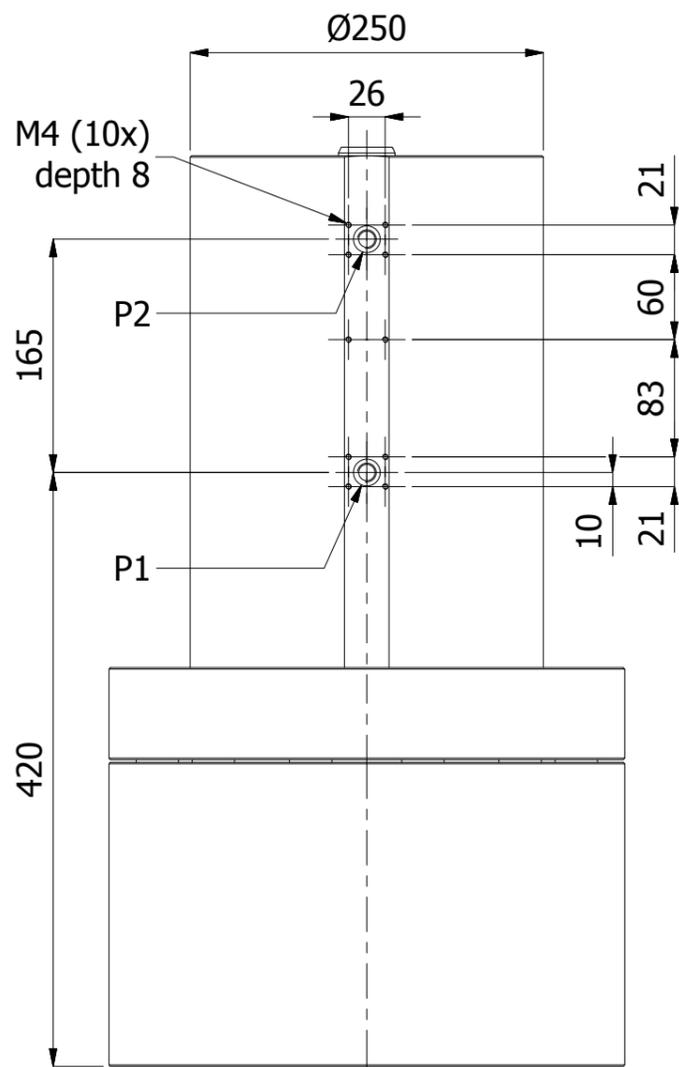
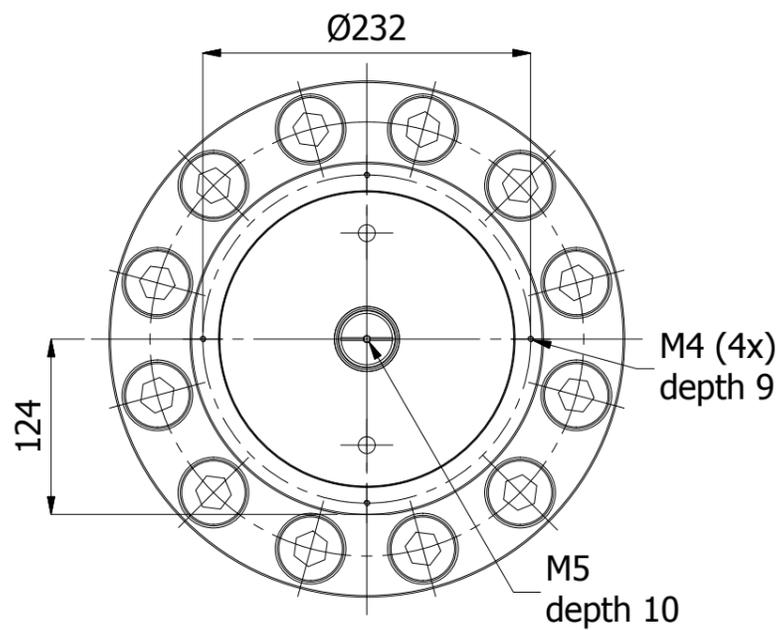
VIEW - A



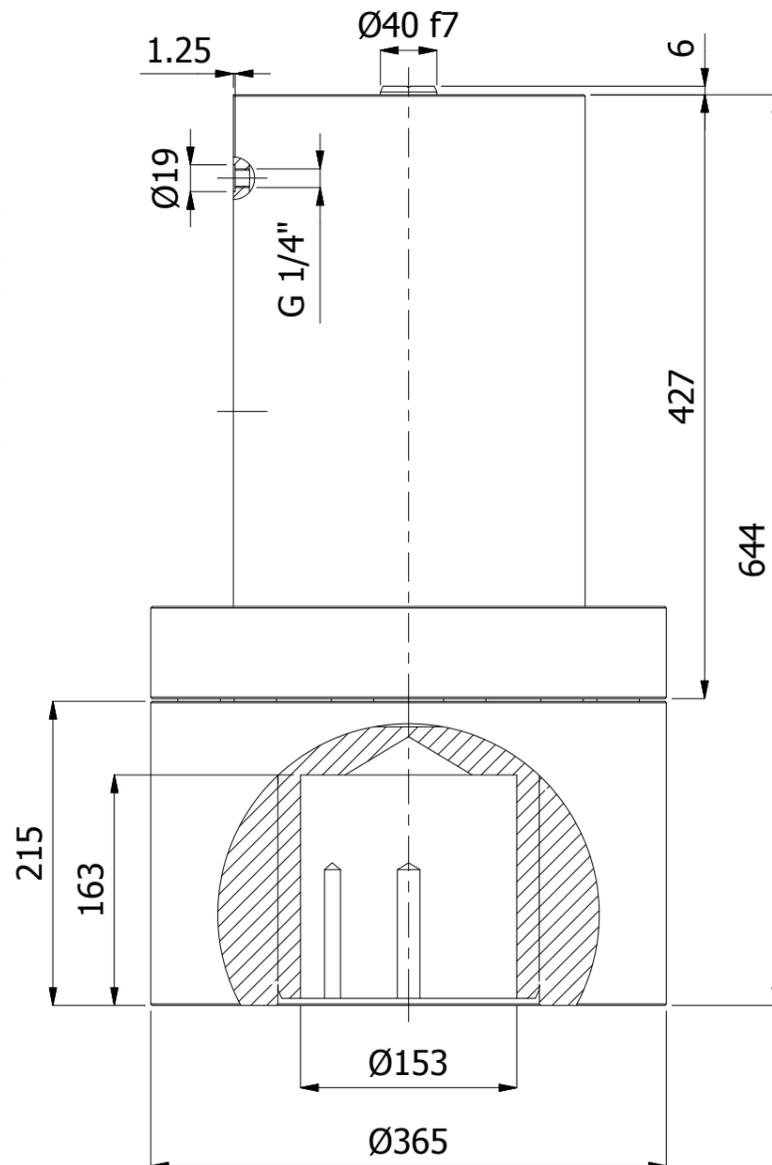
Technical Data of ECON Helical Hydraulic Actuator type EDH-7:

Design Pressure: 135 bar
 Nominal Torque: 8100 Nm @ 135 bar
 Connection: Flange F16 + F25 (DIN-EN-ISO 5211)
 Insert Diameter $\text{Ø}115$
 Starting Position Actuator: Valve closed
 P1: Open (Rotation counter clockwise seen from above)
 P2: Close
 Rotation Angle: $90^\circ \pm 1^\circ$
 HPPI (Hydraulic Positive Position Indication)
 Oil Displacement @ 90° : 1.942 dm³
 Temperature Range: -20°C - +75°C
 Weight: 155.83 kg
 Mineral Oils according to the group HLP DIN 51524/Part 2 and VDMA Sheet 24318 have to be used. Care must be taken to ensure their viscosity is between 15 mm²/s (cSt.) and 250 mm² (cSt.). These conditions are suitable for oil between HLP16 and HLP46, depending on the temperature.

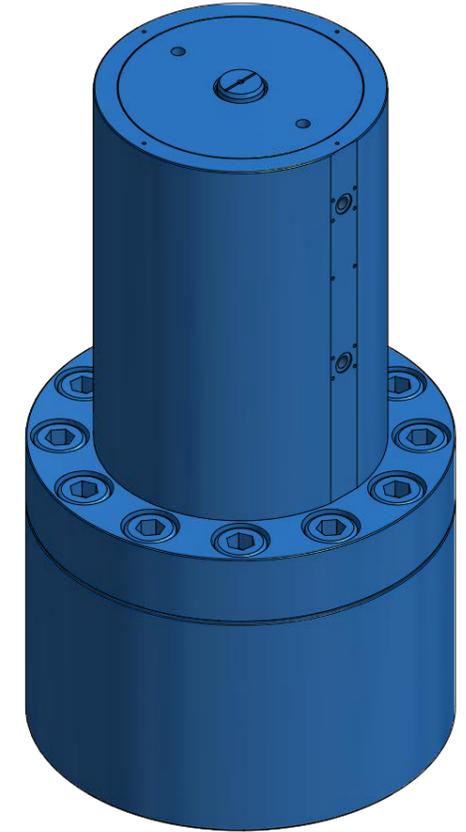
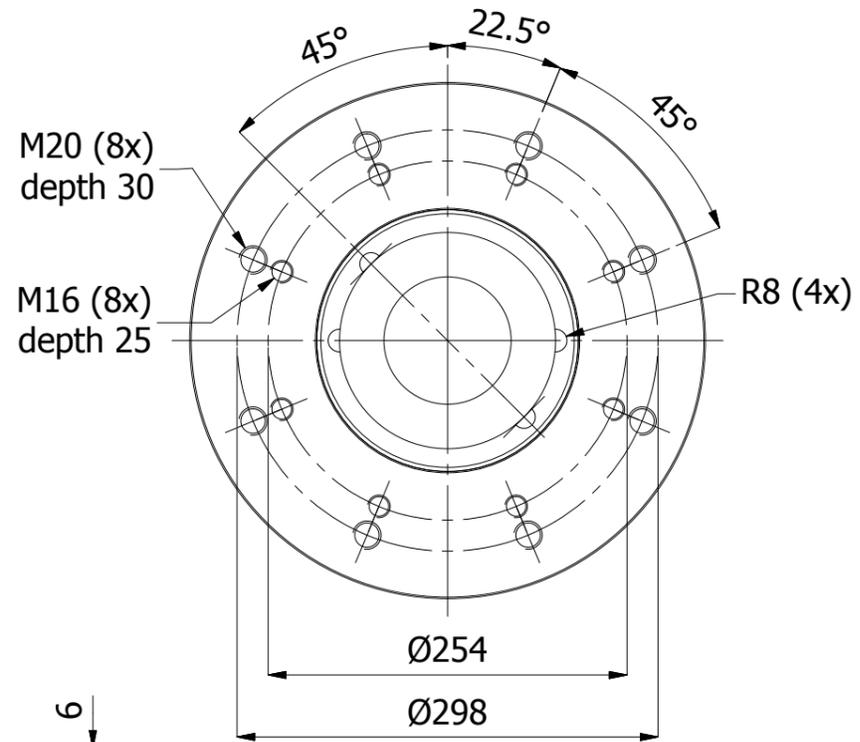
DRAWING	PART	QTY	DESCRIPTION	MATERIAL	DIMENSION	REMARKS
1	1	1	Hydraulic Actuator EDH-7	F16,F25,HPPI	Part No.: 251609006525	
SURFACE FINISH Ra IN μm ACC. TO ISO 1302 INDICATION OF DIMENSIONS AND TOLERANCES ACC. TO ISO 129-1 FORM AND POSITIONAL TOLERANCES ACC. TO ISO 1101				Scale: 1 : 4	Date: 9-7-2015	eCONOSTO
TOLERANCES FOR LINEAR AND ANGULAR DIMENSIONS WITHOUT INDIVIDUAL TOLERANCE INDICATIONS acc. to ISO 2768-m				Drawn by: RdK	Approved by:	
REVISION DATE: DESCR.:				Figure No.: 21202	Size: EDH-7	Drawing No.: C-36800
					Connection: F16 + F25	REV.:



A



VIEW - A

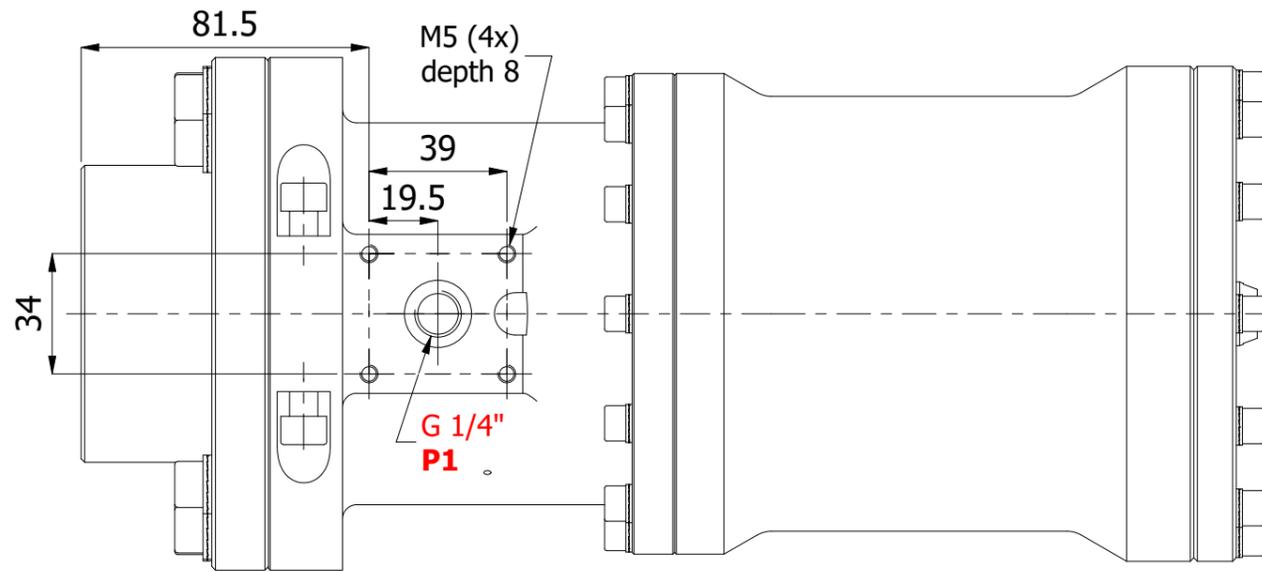
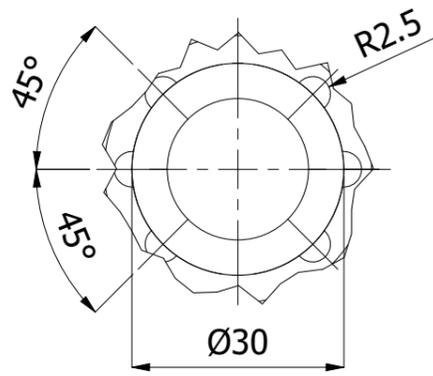


Technical Data of ECON Helical Hydraulic Actuator type EDH-8:

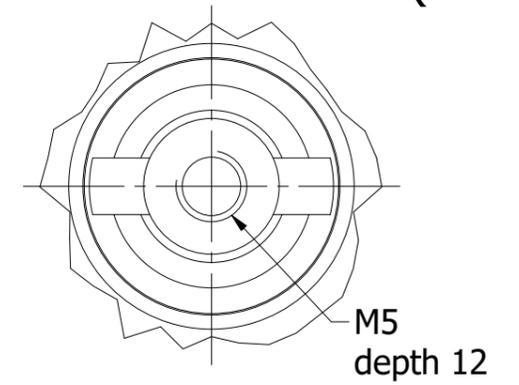
Design Pressure: 135 bar
 Nominal Torque: 16200 Nm @ 135 bar
 Connection: Flange F25 + F30 (DIN-EN-ISO 5211)
 Insert Diameter $\text{Ø}153$
 Starting Position Actuator: Valve closed
 P1: Open (Rotation counter clockwise seen from above)
 P2: Close
 Rotation Angle: $90^\circ \pm 1^\circ$
 HPPI (Hydraulic Positive Position Indication)
 Oil Displacement @ 90° : 3.824 dm^3
 Temperature Range: $-20^\circ\text{C} - +75^\circ\text{C}$
 Weight: 295.43 kg
 Mineral Oils according to the group HLP DIN 51524/Part 2 and VDMA Sheet 24318 have to be used. Care must be taken to ensure their viscosity is between $15 \text{ mm}^2/\text{s}$ (cSt.) and $250 \text{ mm}^2/\text{s}$ (cSt.). These conditions are suitable for oil between HLP16 and HLP46, depending on the temperature.

DRAWING	PART	QTY	DESCRIPTION	MATERIAL	DIMENSION	REMARKS
	1	1	Hydraulic Actuator EDH-8	F25,F30,HPPI	Part No.: 252009006526	
SURFACE FINISH R_a IN μm ACC. TO ISO 1302 INDICATION OF DIMENSIONS AND TOLERANCES ACC. TO ISO 129-1 FORM AND POSITIONAL TOLERANCES ACC. TO ISO 1101			Scale: 1 : 5	Date: 9-7-2015		
TOLERANCES FOR LINEAR AND ANGULAR DIMENSIONS WITHOUT INDIVIDUAL TOLERANCE INDICATIONS acc. to ISO 2768-m			Drawn by: RdK	Approved by:		
REVISION DATE: DESCR.:			Figure No.: 21202	Size: EDH-8	Drawing No.:	REV.:
				Connection: F25 + F30	C-36801	

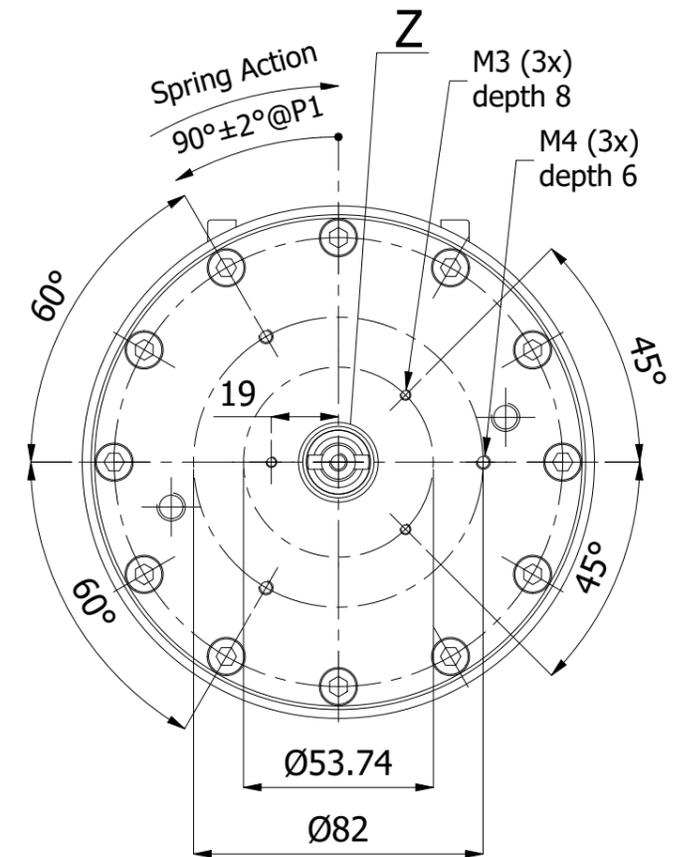
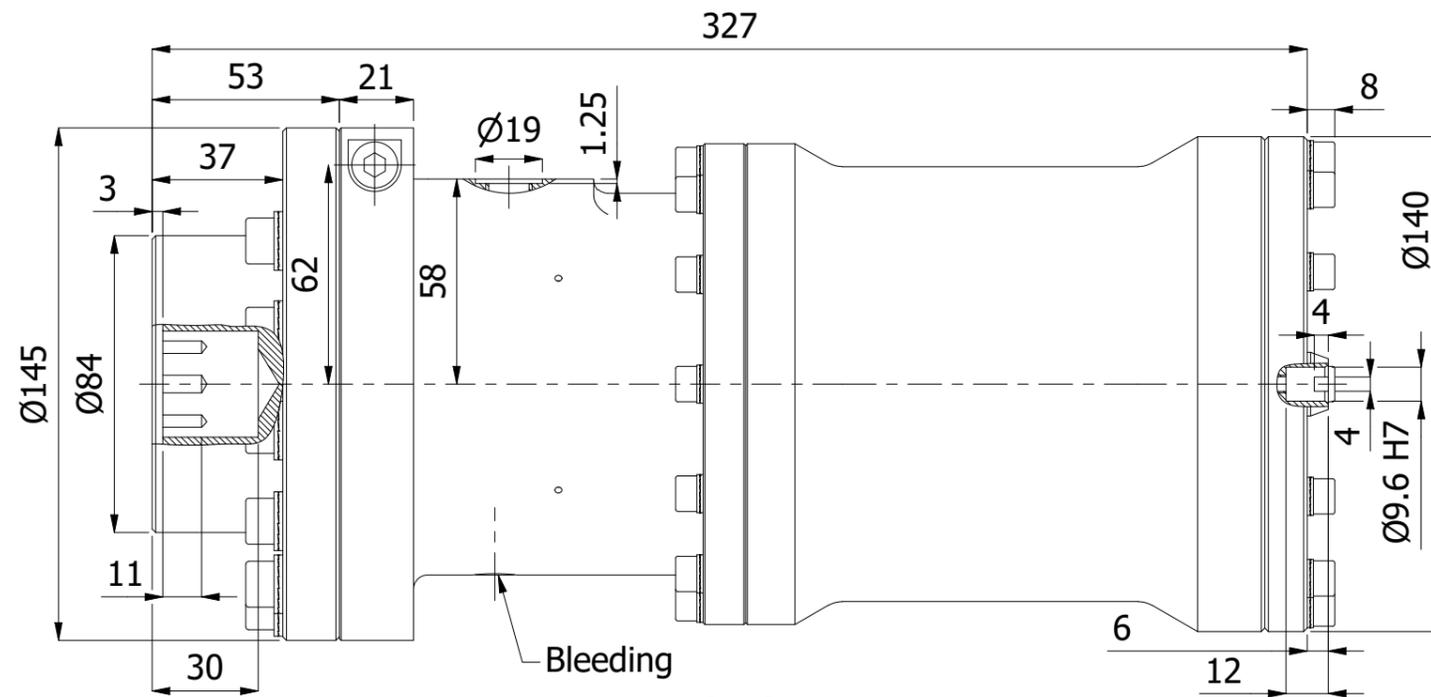
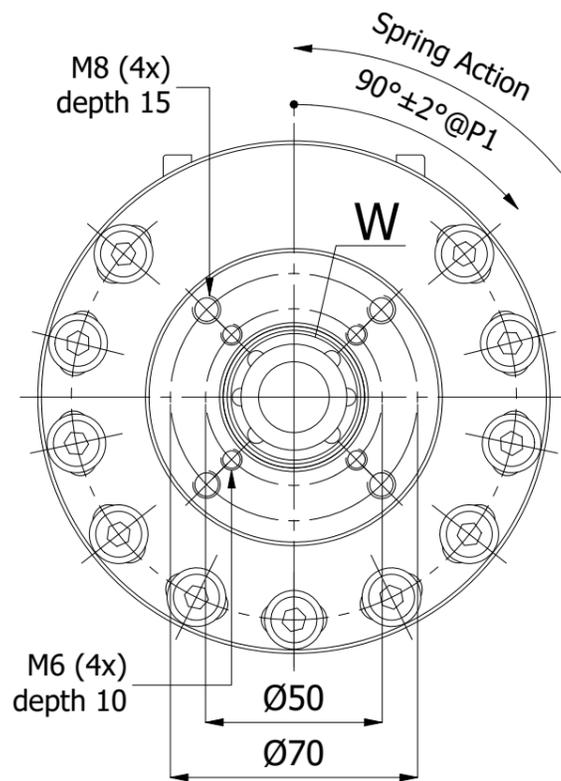
Detail W (1 : 1)



Detail Z (2 : 1)

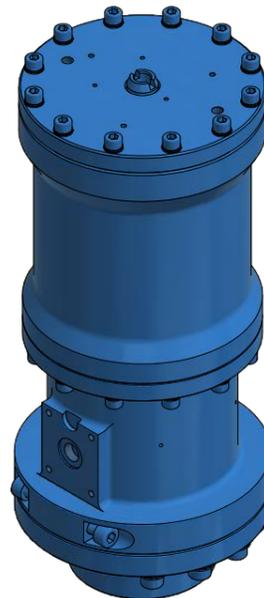


If pressure on **P1** the shaft rotates from the basic position to the left (counter clockwise)



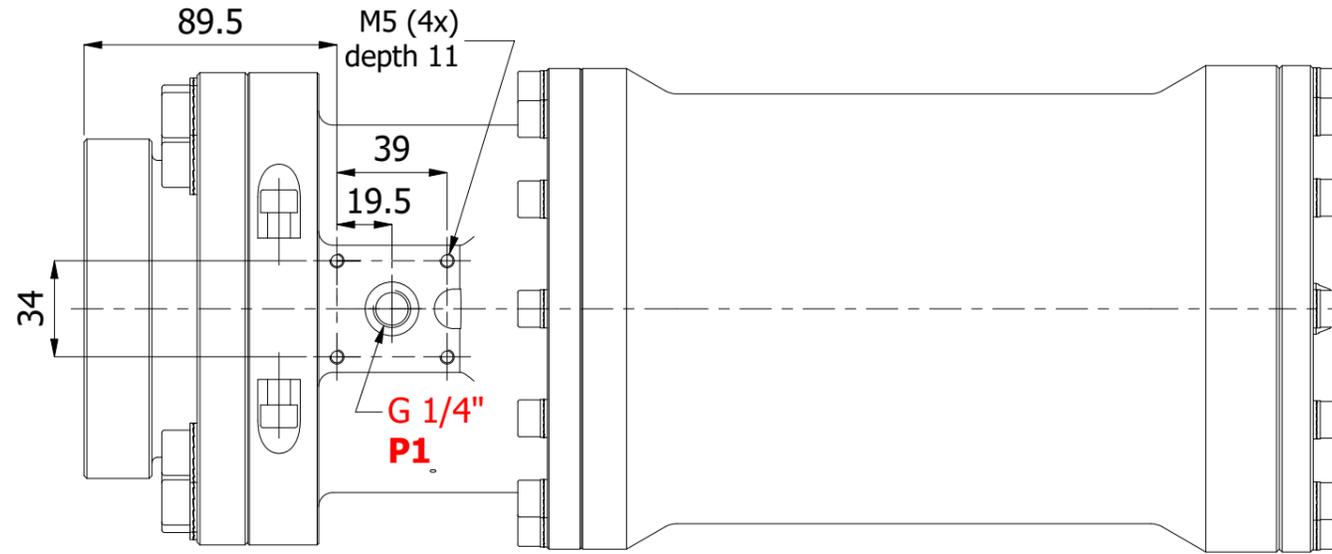
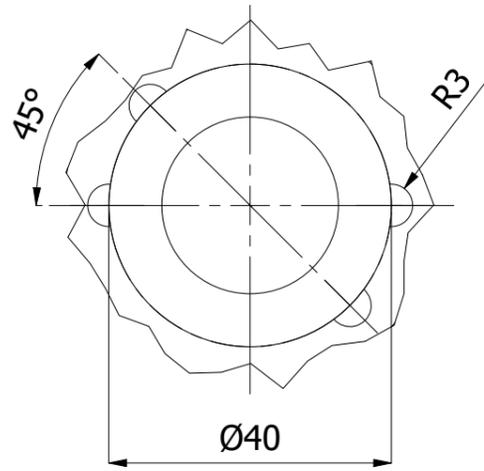
Technical Data of ECON Helical Actuator type ESH-1:

Design Pressure: 135 bar
 Minimal Spring end-closing Torque: 125 Nm
 Connection: Flange F05 + F07 (DIN-EN-ISO 5211)
 Insert Diameter Ø30
 Starting Position Actuator: Valve closed
 P1: Open (Rotation counter clockwise seen from above)
 Rotation Angle: 90° ± 2°
 Oil Displacement @ 90°: 0.15 dm³
 Temperature Range: -18°C - +75°C
 Weight: 22.2 kg
 Mineral Oils according to the group HLP DIN 51524/Part 2 and VDMA Sheet 24318 have to be used. Care must be taken to ensure their viscosity is between 15 mm²/s (cSt.) and 250 mm² (cSt.). These conditions are suitable for oil between HLP16 and HLP46, depending on the temperature.

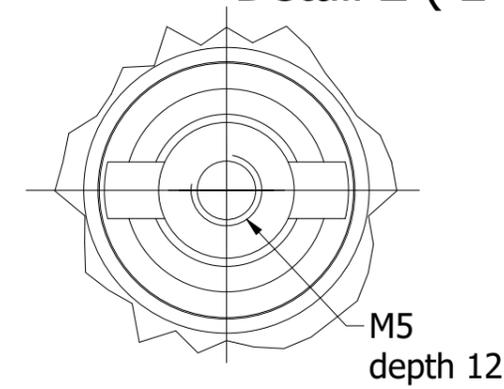


DRAWING	PART	QTY	DESCRIPTION	MATERIAL	DIMENSION	REMARKS
1	1	1	Hydraulic Actuator ESH-1	F05,F07	Part No.: 260809008304A	
SURFACE FINISH Ra IN µm ACC. TO ISO 1302 DIMENSIONAL TOLERANCES ACC. TO ISO 129-1 FORM AND POSITIONAL TOLERANCES ACC. TO ISO 1101				Scale: 1 : 2	Date: 2-6-2020	ERIKS WWW.ERIKS.COM
Dimensions without tolerance symbols:		0-100 ± 0.2 100-300 ± 0.4 >300 ± 0.6	AMERICAN PROJECTION	Drawn by: RdK	Approved by: Henk Vr.	
REVISION DATE: DESCR.:				Figure No.: 21201	Size: ESH-1 Connection: F05 + F07	ECON Drawing No.: C-39856 REV.: 0

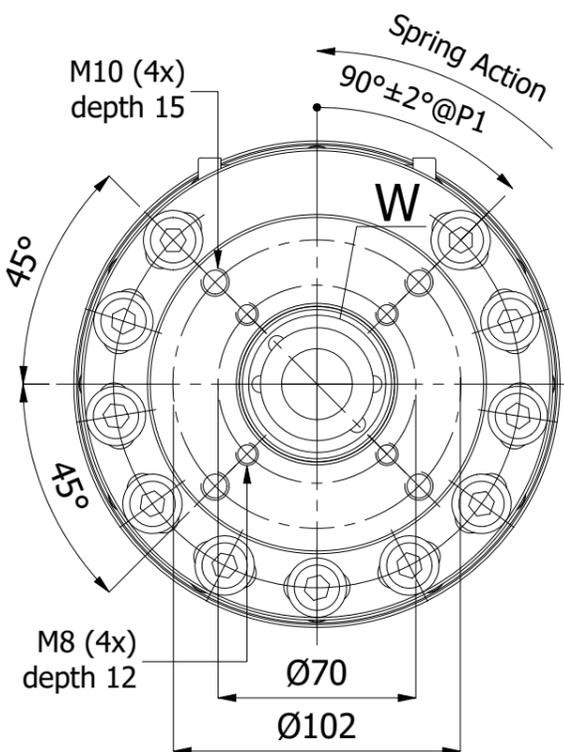
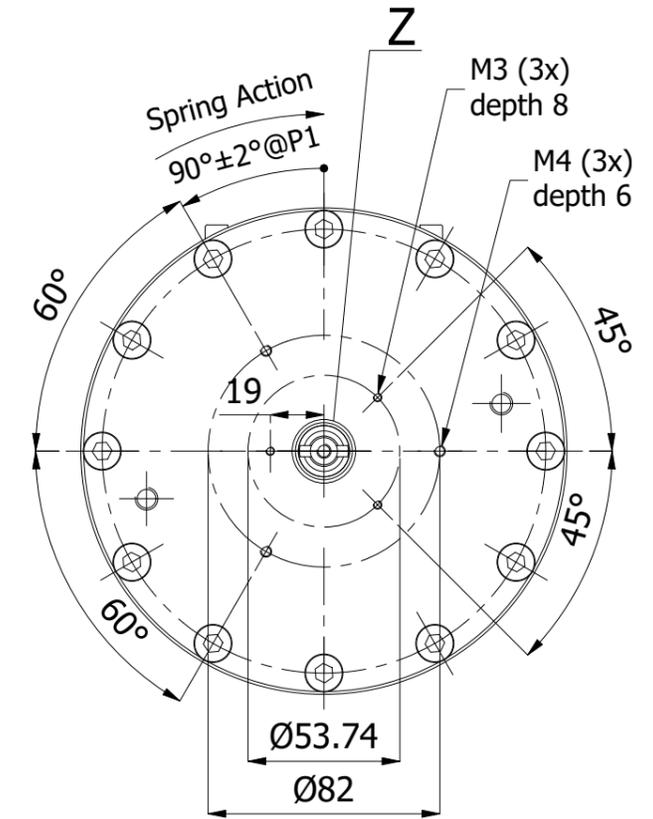
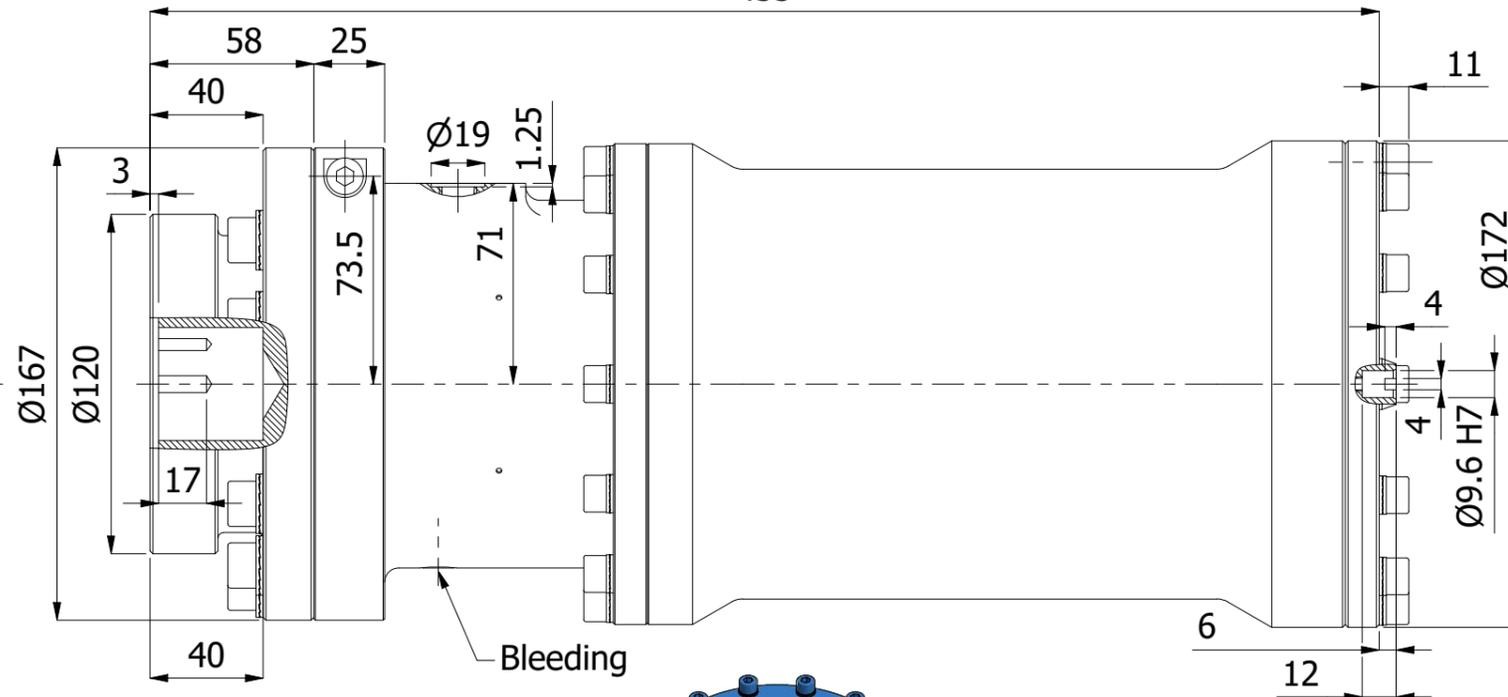
Detail W (1 : 1)



Detail Z (2 : 1)



If pressure on **P1** the shaft rotates from the basic position to the left (counter clockwise)



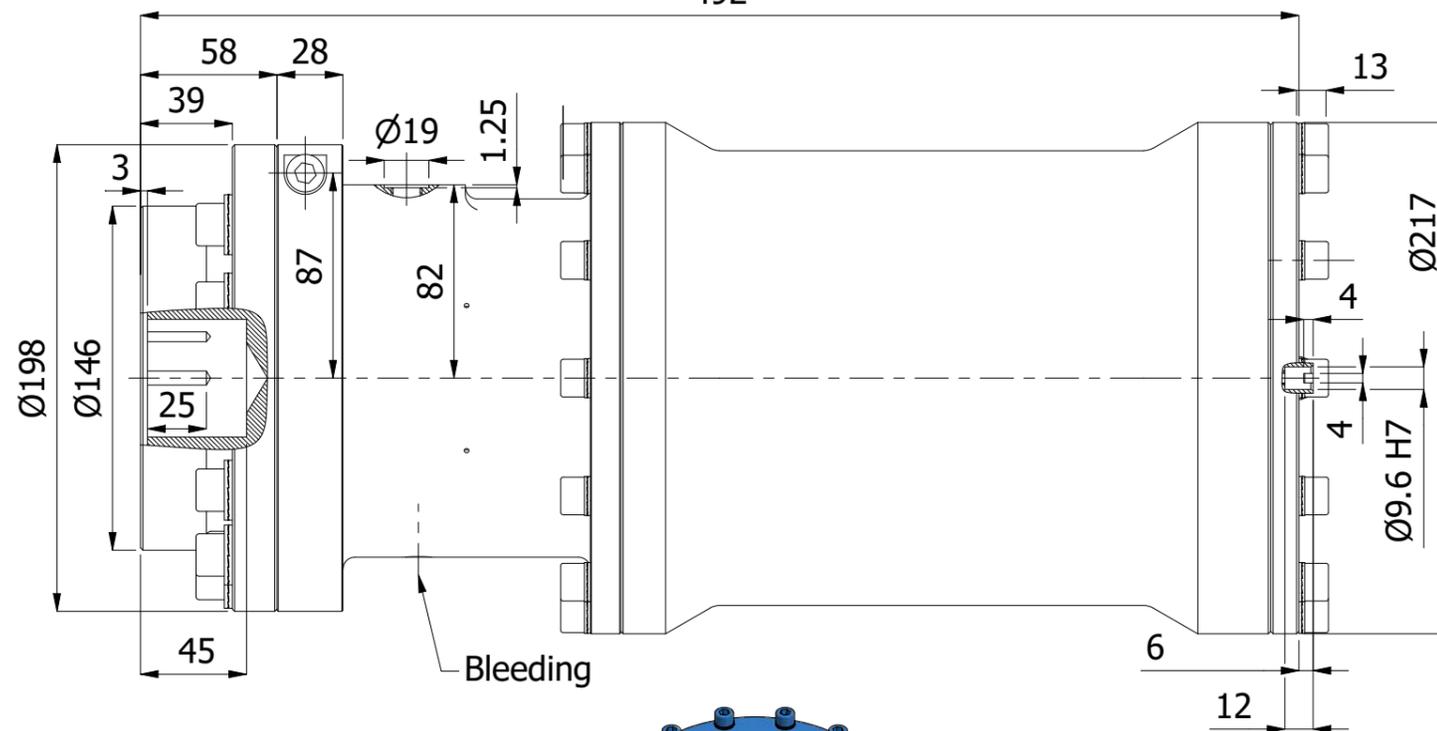
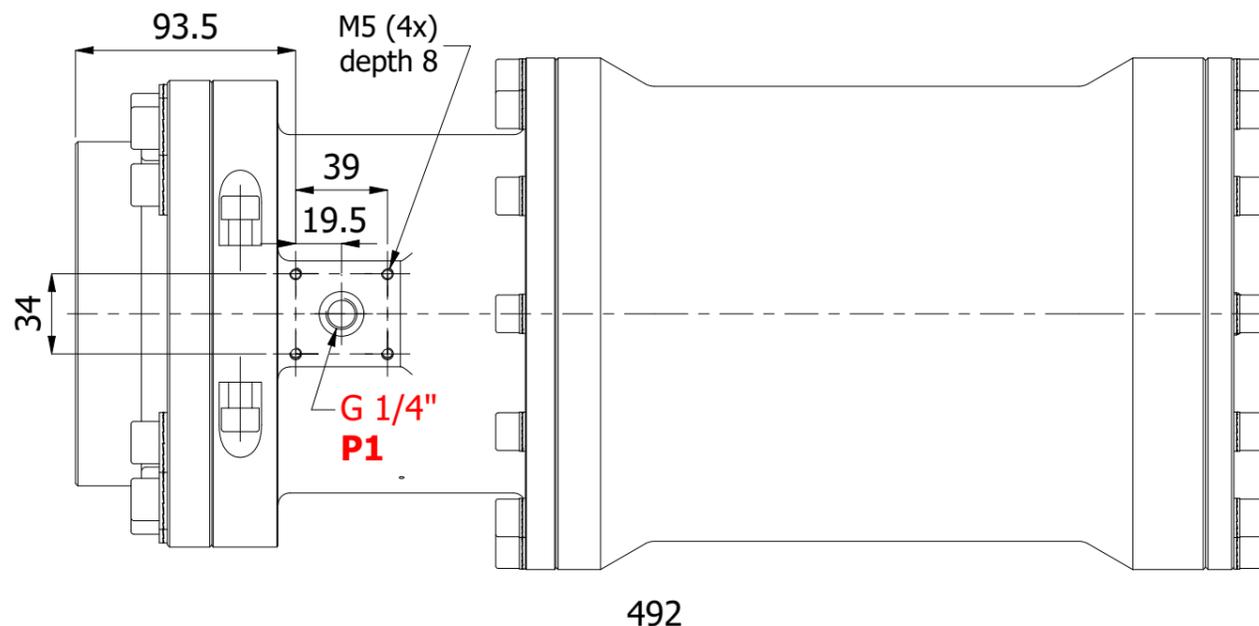
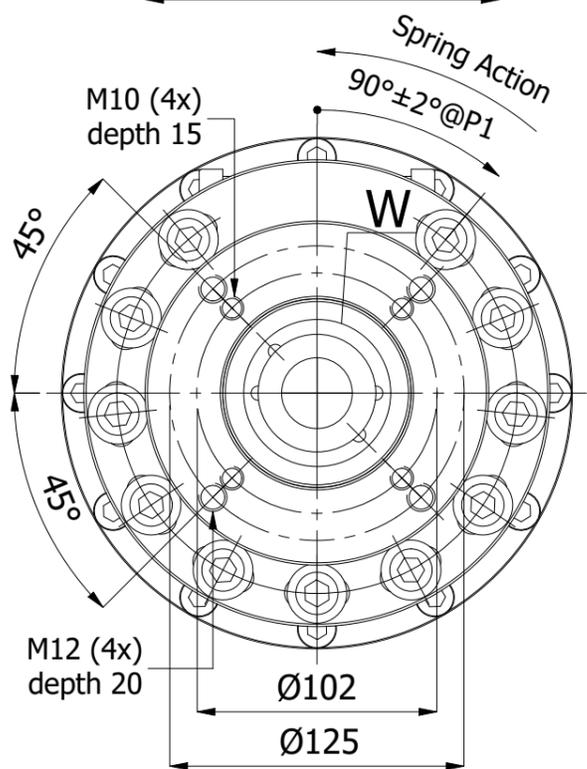
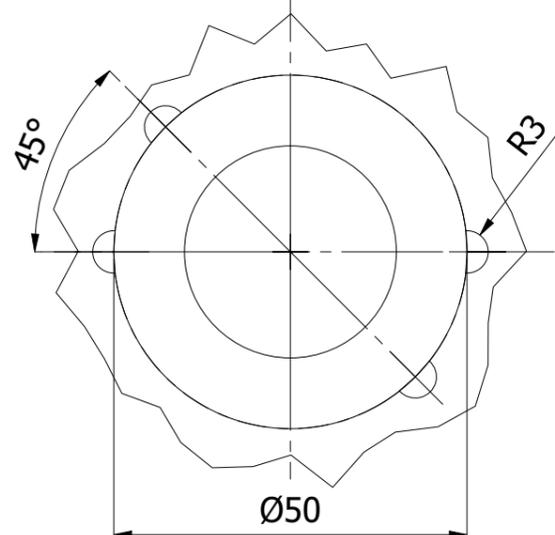
Technical Data of ECON Helical Actuator type ESH-2:

Design Pressure: 135 bar
 Minimal Spring end-closing Torque: 280 Nm
 Connection: Flange F07 + F10 (DIN-EN-ISO 5211) / F07 max. 250 Nm
 Insert Diameter Ø40
 Starting Position Actuator: Valve closed
 P1: Open (Rotation counter clockwise seen from above)
 Rotation Angle: 90° ± 2°
 Oil Displacement @ 90°: 0.26 dm³
 Temperature Range: -18°C - +75°C
 Weight: 42.4 kg
 Mineral Oils according to the group HLP DIN 51524/Part 2 and VDMA Sheet 24318 have to be used. Care must be taken to ensure their viscosity is between 15 mm²/s (cSt.) and 250 mm² (cSt.). These conditions are suitable for oil between HLP16 and HLP46, depending on the temperature.

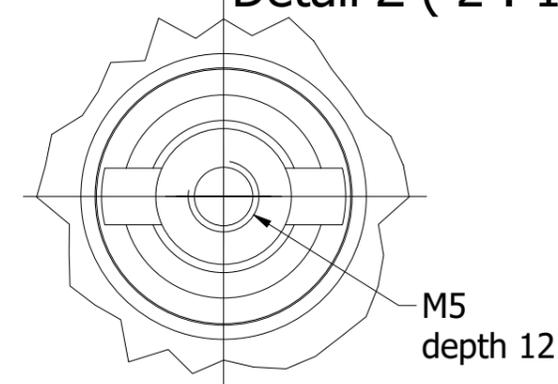


DRAWING	PART	QTY	DESCRIPTION	MATERIAL	DIMENSION	REMARKS
1	1	1	Hydraulic Actuator ESH-2	F07,F10	Part No.: 261009006892A	
<small>SURFACE FINISH Ra IN µm ACC. TO ISO 1302 DIMENSIONAL TOLERANCES ACC. TO ISO 129-1 FORM AND POSITIONAL TOLERANCES ACC. TO ISO 1101</small>				Scale: 1 : 2.5	Date: 2-6-2020	 WWW.ERIKS.COM
<small>Dimensions without tolerance symbols: 0-100 ± 0.2 100-300 ± 0.4 >300 ± 0.6</small>				Drawn by: RdK	Approved by: Henk Vr.	
<small>REVISION DATE: DESCR.:</small>				Figure No.: 21201	Size: ESH-2 Connection: F07 + F10	ECON Drawing No.: C-39857 REV.: 0

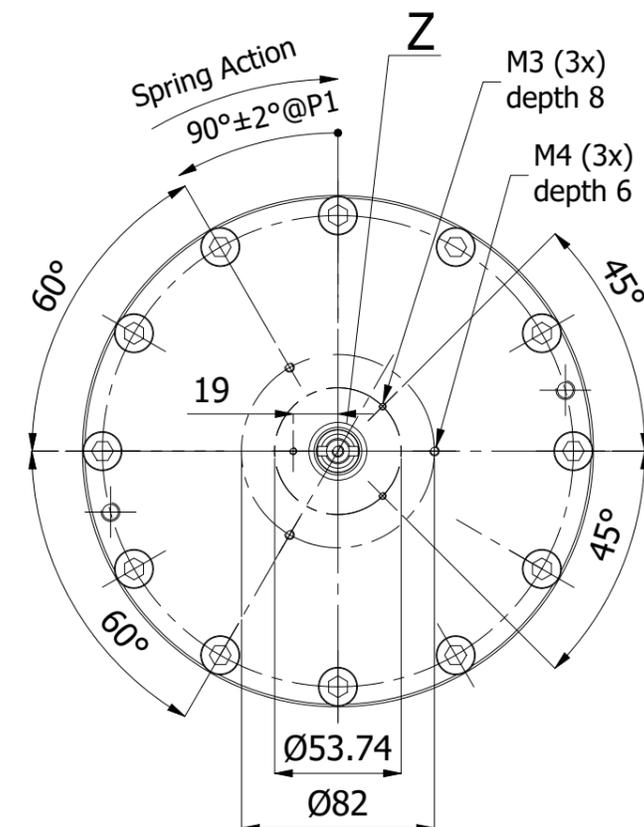
Detail W (1 : 1)



Detail Z (2 : 1)



If pressure on **P1** the shaft rotates from the basic position to the left (counter clockwise)



Technical Data of ECON Helical Actuator type ESH-3:

Design Pressure: 135 bar
 Minimal Spring end-closing Torque: 525 Nm
 Connection: Flange F10 + F12 (DIN-EN-ISO 5211) / F10 max. 500 Nm, F12 max. 1000 Nm
 Insert Diameter Ø50
 Starting Position Actuator: Valve closed
 P1: Open (Rotation counter clockwise seen from above)
 Rotation Angle: 90° ± 2°
 Oil Displacement @ 90°: 0.47 dm³
 Temperature Range: -18°C - +75°C
 Weight: 72.4 kg
 Mineral Oils according to the group HLP DIN 51524/Part 2 and VDMA Sheet 24318 have to be used. Care must be taken to ensure their viscosity is between 15 mm²/s (cSt.) and 250 mm² (cSt.). These conditions are suitable for oil between HLP16 and HLP46, depending on the temperature.



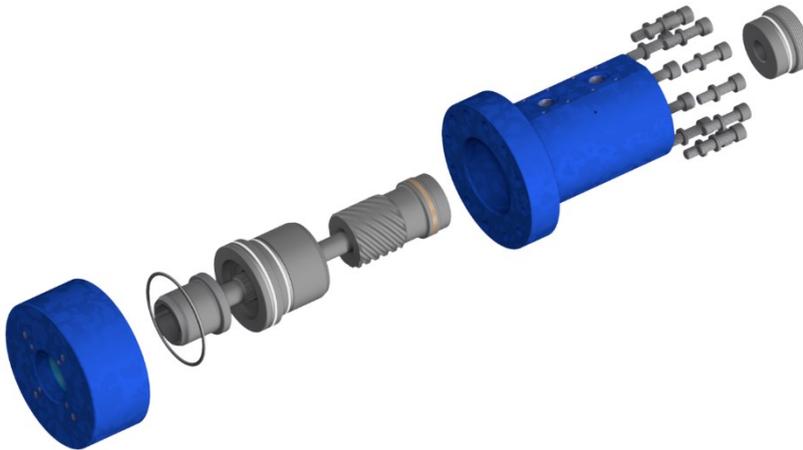
DRAWING	PART	QTY	DESCRIPTION	MATERIAL	DIMENSION	REMARKS
1	1	1	Hydraulic Actuator ESH-3		F10,F12	Part No.: 261209006908A
SURFACE FINISH Ra IN µm ACC. TO ISO 1302 DIMENSIONAL TOLERANCES ACC. TO ISO 129-1 FORM AND POSITIONAL TOLERANCES ACC. TO ISO 1101				Scale: 1 : 3	Date: 2-6-2020	ERIKS WWW.ERIKS.COM
Dimensions without tolerance symbols:		0-100 ± 0.2 100-300 ± 0.4 >300 ± 0.6	AMERICAN PROJECTION	Drawn by: RdK	Approved by: Henk Vr.	
REVISION DATE: DESCR.:				Figure No.:	21201	Size: ESH-3 Connection: F10 + F12
					ECON Drawing No.:	REV.:
					C-39858	0

7 SPARE PARTS

7.1 Fig. 21202 ESH Hydraulic Actuator

part description

- Gasket & Soft seal kit actuator ESH-1
- Gasket & Soft seal kit actuator ESH-2
- Gasket & Soft seal kit actuator ESH-3
- Gasket & Soft seal kit actuator ESH-4



7.2 Fig. 21504 EDH Hydraulic Actuator

part description

- Gasket & Soft seal kit actuator EDH-1
- Gasket & Soft seal kit actuator EDH-2
- Gasket & Soft seal kit actuator EDH-3
- Gasket & Soft seal kit actuator EDH-4
- Gasket & Soft seal kit actuator EDH-5
- Gasket & Soft seal kit actuator EDH-6
- Gasket & Soft seal kit actuator EDH-7
- Gasket & Soft seal kit actuator EDH-8

8 MAINTENANCE

**WARNING:**

Turn off all power before performing maintenance on the actuator.

POTENTIALLY HIGH-PRESSURE VESSEL. Before removing or disassembling, ensure that the actuator or other actuated device is isolated and not under pressure.

The hydraulic Helical actuators do not require periodic maintenance operations, but only of a visual check & verification of the oil.

8.1 Visual check

Check list:

- Valve mounting screws are tight.
- Adapter plate and control block screws are tight.
- Quick couplings are tight and closed with caps.
- Electrical (switch) box (if present) is correctly connected, screws tightened and the cable connected.
- No external leakage of Hydraulic oil.

8.2 Inspection of the oil

The oil in the system must be checked after about 1000 valve maneuvers but at least every 5 years.

The oil must be clear and of the same transparency and color as new oil.

The oil must be HLP DIN 51524-2, standard viscosity class VG 46mm²/sec DIN 51519.

A spot oil test is suggested after 5 years: no sludge and oil contamination are tolerated by the system. The oil cleanness must be according NAS 3801 class 9.

8.3 Inspection of disc spring on ESH actuator

Disc springs on ESH single acting actuators require no maintenance and can last the actuator life time.

Whenever the closing torque of the actuator is reduced and the valve does not close properly, we suggest to inspect the spring cartridge. If any problems do occur, contact Eriks

9 TROUBLESHOOTING

The main issues on this hydraulic actuator and the right actions are schematized in below trouble shooting table. The table helps the operator to detect the problem and how to solve it.

► Double acting actuator does not open or close

Check; Control pressure on the handpump connectors of the actuator

A pressure of between 100-135bar should be present to operate the actuator when installed on a valve.

- If a normal control pressure is present check if the valve is not blocked
- If the valve is not blocked check for external oil leakage on the actuator

► Single acting actuator does not open

Check; Control pressure on the (open side) handpump connector of the actuator

A pressure of between 100-135bar should be present to open the actuator when installed on a valve.

- If a normal control pressure is present check if the valve is not blocked
- If the valve is not blocked check for external oil leakage on the actuator.

► Single acting actuator does not close

Check: Disc springs cartridge

- Whenever the closing torque of the actuator is reduced and the valve does not close properly one of the disc springs could be broken.

**If you have questions about this product,
Please contact the nearest ECON distributor.
You can find them on www.eriks.com**

ERIKS

ERIKS Flow Control

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