



F1 cylinders with  
DNV Type Approval

**For Offshore, Marine and Subsea applications**



DNV  
FJERO has obtained  
ISO 9001-2015 certification  
and a MSA agreement  
with DNV.

**FJERO**  
*power of motion*



### **Customers needs**

FJERO's products are used in many different contexts. We have supplied to many different industries, and we have a broad experience in special projects that require flexibility and know how. Together with the customer, we create detailed drafts, which our development department takes over, develops and sends to the production department. Throughout the production phase, a watchful eye is kept to ensure that everything is as it should be. The products are inspected and tested, and throughout the process, PREMIUM QUALITY is our goal. FJERO has obtained ISO 9001-2015 certification and a MSA agreement with DNV.

### **Production**

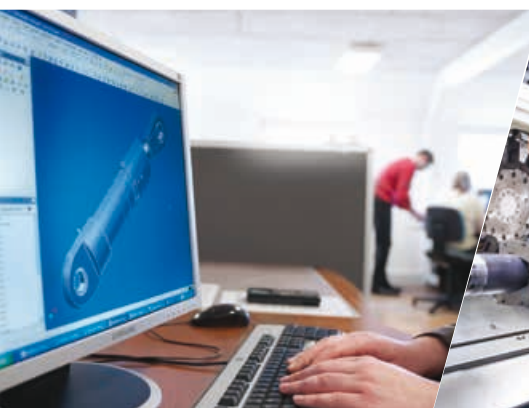
Production of high-quality products requires precision machinery. In our production department, we work with CNC machinery, which satisfies our need for absolute precision, and it allows quick conversion from standard production to special project solutions. At FJERO, we complete our products. We have a new automated washing system, which allows thorough cleaning of components, so they are ready for assembly, pressure testing and final surface treatment according to customer specifications, e.g. the NORSOK standard. In all phases we use materials of the absolute highest quality!

### **Traceability and certification**

All products are thoroughly tested before they are delivered. Our new testing system can document uniformity and quality both in relation to our customers' needs and expectations and in relation to international standards. Our systems enable a high degree of traceability – even for the materials we use! All this to ensure our products' stability and durability in extreme conditions, including harsh wind and climatic conditions.



### **Design and Development**



### **Advanced Production**





# F1 hydraulic cylinder

Type approved by:



## Technical specifications

### Application:

Offshore, Marine, Hydropower, Subsea, Mining and general Industry hydraulics. Cylinder diameter from  $\varnothing 25$  to  $\varnothing 300$  mm both included (larger dimensions up to  $\varnothing 650$  mm, ask FJERO A/S).

### Material certificates:

Can be delivered with traceability at all steel parts according to the demands from DNVGL, Class Guideline for Hydraulic cylinders, DNVGL-ST-0194.

### Third party certificate:

Can for extra charge be delivered with product certificate from e.g. DNV, ABS, Lloyd's or Bureau Veritas (PS: F1 is DNV type-approved with spherical bearings and composite bearings).

**Working pressure:** Max 250 bar.

**Test pressure:** Max 375 bar.

### Cleanliness:

Flushed to cleanliness 19/17/14 according to ISO4406 corresponding class 8 in NAS 1638. Other cleanliness classes are available on request.

### Speed:

Max piston speed 0,5 m/sec. If the piston speed in top or bottom exceeds 0,1 m/sec, build-in damping in the cylinder is recommended.

### Cylinder tube:

Honed or skived and roller burnished tube, material quality E355+SR or S355J2. Special material qualities can be delivered on request.

### Piston rod:

Quality 20MnV6 corresponding to SS2142, Hard chrome  $25\mu\text{m}$  +/-  $5\mu\text{m}$ , Hardness min. 850 HV, Ra max.  $0.2\mu\text{m}$ , external tolerance ISO f7

### Alternative materials

SS2387 corresponding to EN 1.4418

AISI 630 corresponding to EN 1.4542

SS2324 corresponding to EN 1.4460

SS2377 corresponding to EN 1.4462

All qualities are delivered with hard chrome  $25\mu\text{m}$  +/-  $5\mu\text{m}$ , Hardness min. 850 HV., Ra max.  $0.2\mu\text{m}$ , external tolerance ISO f7.

Special material qualities and surface protection (e.g. ceramic surface, double chrome layer etc.) can be delivered on request.

### Spherical bearing:

Many different qualities, e.g. in Carbon steel, stainless steel, bronze and composite. Special material and dimensions can be delivered on request.

### Gaskets:

Piston seal: Polyurethane wiper ring with nitrile O-ring

Rod seal: Lip seal of polyurethane.

Wiper: Polyurethane with steel housing

Guide rings: Composite material

O-rings: Nitrile

### Alternative materials

Piston seal, rod seal and wiper:

In PTFE with O-rings of nitrile. Recommended for intensive use plus applications, where low friction in the cylinder is desirable.

In PTFE with O-rings of viton. Recommended for applications, where the seals can be exposed to temperatures above 80-100°C.

Special seals can be delivered on request.

### Integrated valve:

Can be delivered with built-in hose valves or load holding valves.

### Damping:

Can be delivered with damping

### Positioning:

Can be delivered with different types of electronic positioning, e.g. from REGAL, MTS-Temposonics or BALLUFF.

### Temperature:

Working temperature : 20°C to +80°C. Cylinders for working temperatures outside this area can be delivered on request.

### Pressure medium:

Mineral hydraulic oil. Other media, ask FJERO.

### Surface treatment:

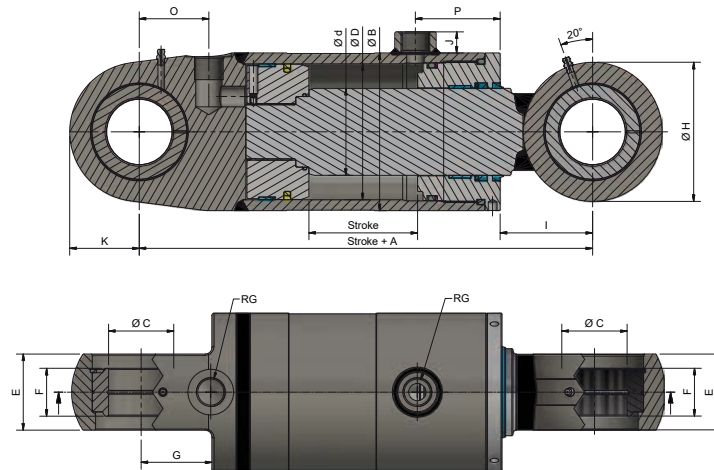
Different surface treatment is possible. Standard Black primer, but also shot blasted / sand blasted and painted to corrosion class C2 - C3 or C5.

Surface treatment according to international standards as e.g. ISO 12944-2 or NORSOK M-501 can also be delivered.

### Special requests:

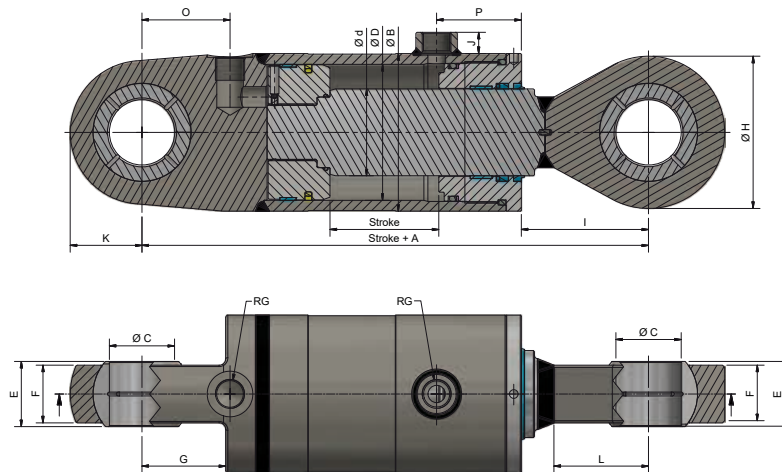
Please contact FJERO A/S

# F1 Cylinder with spherical bearing



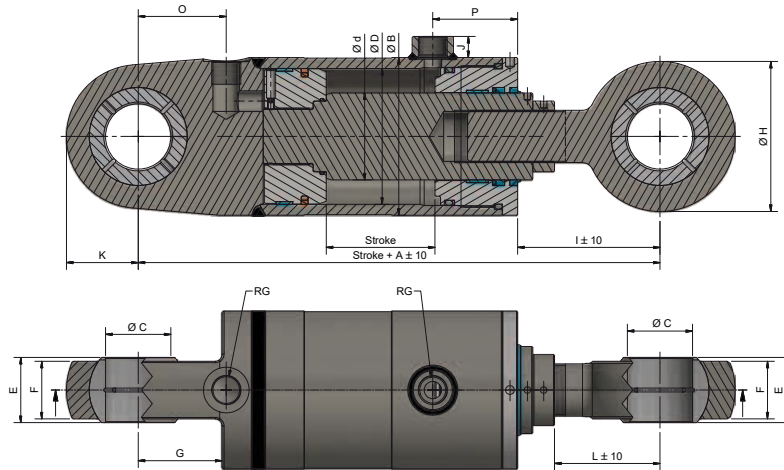
Dimension		INDEX												
D	d	B	A	C	E	F	G	H	I	J	K	O	P	RG
32	20	42	162	20	25	16	25	48	35	13,5	24	28	45	1/4"
40	20	50	172	20	25	16	27	48	35	13,5	25	36	42	3/8"
40	25	50	172	20	25	16	27	48	35	13,5	25	36	42	3/8"
50	25	60	181	25	30	20	30	58	41	13,5	29	34	45	3/8"
50	30	60	181	25	30	20	30	58	41	13,5	29	34	45	3/8"
50	35	60	181	25	30	20	30	58	41	13,5	29	34	45	3/8"
63	30	73	207	30	35	22	35	68	46	16,5	33	40	53	1/2"
63	40	73	207	30	35	22	35	68	46	16,5	33	40	53	1/2"
80	40	92	221	35	45	25	40	78	52	16,5	40	44	59	1/2"
80	50	92	221	35	45	25	40	78	52	16,5	40	44	59	1/2"
80	60	92	221	35	45	25	40	78	52	16,5	40	44	59	1/2"
100	50	115	268	45	55	32	50	98	65	16,5	50	60	72	1/2"
100	65	115	268	45	55	32	50	98	65	16,5	50	60	72	1/2"
100	80	115	268	45	55	32	50	98	65	16,5	50	60	72	1/2"
125	65	145	317	60	70	44	65	128	85	19,5	64	64	78	3/4"
125	80	145	317	60	70	44	65	128	85	19,5	64	64	78	3/4"
125	100	145	317	60	70	44	65	128	85	19,5	64	64	78	3/4"
140	70	160	365	60	75	44	80	146	92	19,5	69	86	93	3/4"
140	90	160	365	60	75	44	80	146	92	19,5	69	86	93	3/4"
160	80	185	415	70	85	49	85	166	103	24,5	80	114	101	1"
160	100	185	415	70	85	49	85	166	103	24,5	80	114	101	1"
180	90	205	440	70	95	49	85	170	110	24,5	85	115	95	1"
180	110	205	440	70	95	49	85	170	110	24,5	85	115	95	1"
200	100	230	505	80	105	55	100	200	126	38,5	90	137	106	1 1/4"
200	125	230	505	80	105	55	100	200	126	38,5	90	137	106	1 1/4"
220	125	254	575	100	130	70	125	250	151	37	115	162	116	1 1/4"
220	140	254	575	100	130	70	125	250	151	37	115	162	116	1 1/4"
250	125	298,5	590	100	130	70	125	250	154	37	115	162	123	1 1/4"
250	140	298,5	590	100	130	70	125	250	154	37	115	162	123	1 1/4"
250	160	298,5	590	100	130	70	125	250	154	37	115	162	123	1 1/4"
280	140	323,9	670	120	150	85	145	292	181	37	140	185	136	1 1/4"
280	160	323,9	670	120	150	85	145	292	181	37	140	185	136	1 1/4"
280	180	323,9	670	120	150	85	145	292	181	37	140	185	136	1 1/4"
300	160	355,6	700	120	150	85	145	292	183	37	140	195	139	1 1/4"
300	180	355,6	700	120	150	85	145	292	183	37	140	195	139	1 1/4"

# F1 Cylinder with spherical composite bearing



Dimension			INDEX												
D	d	B	A	C	E	F	G	H	I	J	K	L	O	P	RG
32	20	42	167	16	16	14	25	46	34	13,5	21	20	34	45	1/4"
40	20	50	173	20	20	18	27	50	36	13,5	25	21	36	42	3/8"
40	25	50	173	20	20	18	27	50	36	13,5	25	21	36	42	3/8"
50	25	60	212	25	26	24	35	60	65	13,5	30	45	41	45	3/8"
50	30	60	212	25	26	24	35	60	65	13,5	30	45	41	45	3/8"
50	35	60	212	25	26	24	35	60	65	13,5	30	45	41	45	3/8"
63	30	73	228	32	26	24	35	73	65	16,5	36,5	45	42	53	1/2"
63	40	73	228	32	26	24	35	73	65	16,5	36,5	45	42	53	1/2"
80	40	92	254	40	32	30	50	92	75	16,5	46	52	54	59	1/2"
80	50	92	254	40	32	30	50	92	75	16,5	46	52	54	59	1/2"
80	60	92	254	40	32	30	50	92	75	16,5	46	52	54	59	1/2"
100	50	115	325	50	50	45	70	108	104	16,5	54	80	78	72	1/2"
100	63	115	325	50	50	45	70	108	104	16,5	54	80	78	72	1/2"
100	80	115	325	50	50	45	70	108	104	16,5	54	80	78	72	1/2"
125	65	145	366	60	60	53	77	140	117	19,5	66	87	81	78	3/4"
125	80	145	366	60	60	53	77	140	117	19,5	66	87	81	78	3/4"
125	100	145	366	60	60	53	77	140	117	19,5	66	87	81	78	3/4"
140	70	160	390	70	65	60	85	150	112	19,5	74	81	93	93	3/4"
140	90	160	390	70	65	60	85	150	112	19,5	74	81	93	93	3/4"
160	80	185	455	80	70	65	98	170	130	24,5	85	92	127	101	1"
160	100	185	455	80	70	65	98	170	130	24,5	85	92	127	101	1"
180	90	205	490	90	80	70	105	190	140	24,5	95	97	135	95	1"
180	110	205	490	90	80	70	105	190	140	24,5	95	97	135	95	1"
200	100	230	555	100	90	80	118	220	158	38,5	110	110	155	106	1 1/4"
200	125	230	555	100	90	80	118	220	158	38,5	110	110	155	106	1 1/4"
220	125	254	590	110	100	95	135	240	156	37	120	108	172	116	1 1/4"
220	140	254	590	110	100	95	135	240	156	37	120	108	172	116	1 1/4"
250	125	298,5	620	125	100	95	135	260	174	37	130	124	172	123	1 1/4"
250	140	298,5	620	125	100	95	135	260	174	37	130	124	172	123	1 1/4"
250	160	298,5	620	125	100	95	135	260	174	37	130	124	172	123	1 1/4"
280	140	323,9	720	140	125	110	170	305	206	37	152,5	150	210	136	1 1/4"
280	160	323,9	720	140	125	110	170	305	206	37	152,5	150	210	136	1 1/4"
280	180	323,9	720	140	125	110	170	305	206	37	152,5	150	210	136	1 1/4"
300	160	355,6	770	150	140	130	180	310	218	37	155	160	230	139	1 1/4"
300	180	355,6	770	150	140	130	180	310	218	37	155	160	230	139	1 1/4"

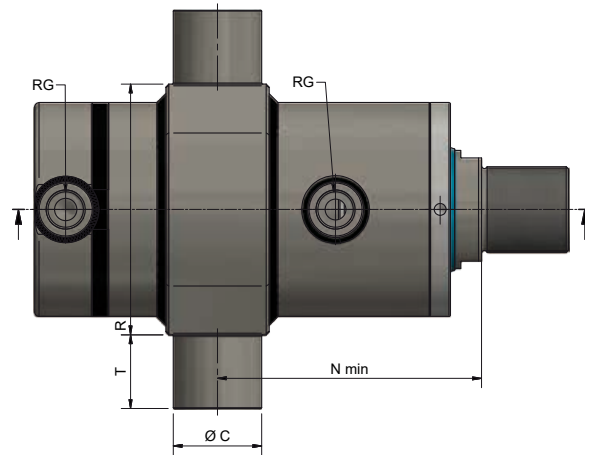
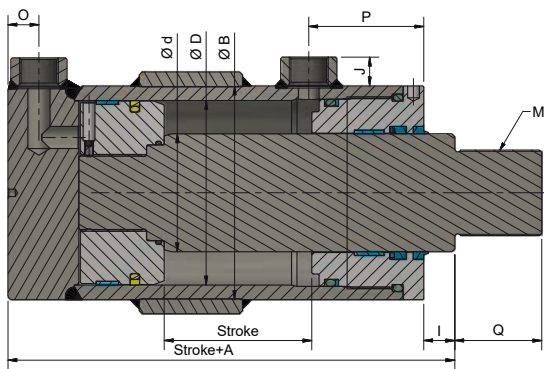
# F1 Cylinder with spherical composite bearing adjustable



Dimension			INDEX												
D	d	B	A	C	E	F	G	H	I	J	K	L	O	P	RG
32	20	42	183	16	16	14	25	45	50	13,5	21	33	34	45	1/4"
40	25	50	197	20	20	18	27	50	60	13,5	25	40	36	42	3/8"
50	30	60	216	25	26	24	35	60	69	13,5	30	46	41	45	3/8"
50	35	60	216	25	26	24	35	60	69	13,5	30	46	41	45	3/8"
63	40	73	245	32	26	24	35	73	82	16,5	36,5	57	42	53	1/2"
80	50	92	270	40	32	30	50	92	91	16,5	46	62	54	59	1/2"
80	60	92	270	40	32	30	50	92	91	16,5	46	62	54	59	1/2"
100	63	115	340	50	50	45	70	108	119	16,5	54	85	78	72	1/2"
100	80	115	340	50	50	45	70	108	119	16,5	54	85	78	72	1/2"
125	65	145	380	60	60	53	77	138	131	19,5	66	97	81	78	3/4"
125	80	145	380	60	60	53	77	138	131	19,5	66	97	81	78	3/4"
125	100	145	380	60	60	53	77	138	131	19,5	66	97	81	78	3/4"
140	70	160	425	70	65	60	85	148	147	19,5	74	103	93	93	3/4"
140	90	160	425	70	65	60	85	148	147	19,5	74	103	93	93	3/4"
160	80	185	470	80	70	65	98	172	145	24,5	85	100	127	101	1"
160	100	185	470	80	70	65	98	172	145	24,5	85	100	127	101	1"
180	90	205	520	90	80	70	105	192	170	24,5	95	115	135	95	1"
180	110	205	520	90	80	70	105	192	170	24,5	95	115	135	95	1"
200	100	230	570	100	90	80	118	218	173	38,5	110	120	155	106	1 1/4"
200	125	230	570	100	90	80	118	218	173	38,5	110	120	155	106	1 1/4"
220	125	254													
220	140	254													
250	125	298,5													
250	140	298,5													
250	160	298,5													
280	140	323,9													
280	160	323,9													
280	180	323,9													
300	160	356													
300	180	356													

Contact FJERO for solutions

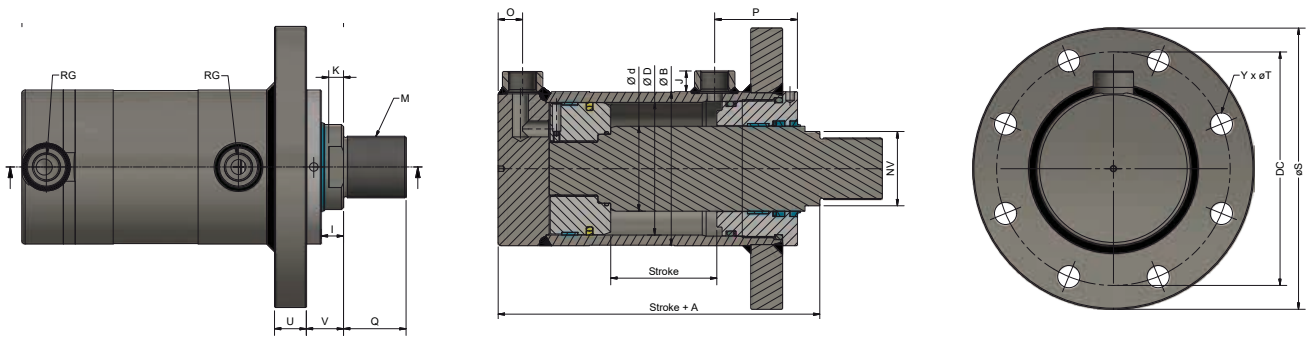
# F1 Cylinder with trunnion mount



Dimension			INDEX											
D	d	B	A	C	T	R	Q	M	I	J	N	O	P	RG
32	20	42	121	20	15	53	17	M16x1,5	10	13,5	102	14	45	1/4"
40	20	50	121	25	17,5	70	17	M16x1,5	10	13,5	102	14	42	3/8"
40	25	50	121	25	17,5	70	17	M16x1,5	10	13,5	102	14	42	3/8"
50	25	60	134	30	20	80	17	M16x1,5	15	13,5	114	15	45	3/8"
50	30	60	134	30	20	80	17	M16x1,5	15	13,5	114	15	45	3/8"
50	35	60	134	30	20	80	17	M16x1,5	15	13,5	114	15	45	3/8"
63	30	73	150	35	30	98	23	M22x1,5	15	16,5	125	16	53	1/2"
63	40	73	150	35	30	98	23	M22x1,5	15	16,5	125	16	53	1/2"
80	40	92	156	40	40	115	29	M28x1,5	14	16,5	136	18	59	1/2"
80	50	92	156	40	40	115	29	M28x1,5	14	16,5	136	18	59	1/2"
80	60	92	156	40	40	115	29	M28x1,5	14	16,5	136	18	59	1/2"
100	50	115	184	50	40	135	36	M35x1,5	21	16,5	163	18	72	1/2"
100	65	115	184	50	40	135	36	M35x1,5	21	16,5	163	18	72	1/2"
100	80	115	184	50	40	135	36	M35x1,5	21	16,5	163	18	72	1/2"
125	65	145	203	60	50	170	59	M58x1,5	21	19,5	179	21	78	3/4"
125	80	145	203	60	50	170	59	M58x1,5	21	19,5	179	21	78	3/4"
125	100	145	203	60	50	170	59	M58x1,5	21	19,5	179	21	78	3/4"
140	70	160	239	70	55	195	59	M58x1,5	36	19,5	232	23	93	3/4"
140	90	160	239	70	55	195	59	M58x1,5	36	19,5	232	23	93	3/4"
160	80	185	266	75	65	210	66	M65x1,5	39	24,5	244	29	101	1"
160	100	185	266	75	65	210	66	M65x1,5	39	24,5	244	29	101	1"
180	90	205												
180	110	205												
200	100	230												
200	125	230												
220	125	254												
220	140	254												
250	125	298,5												
250	140	298,5												
250	160	298,5												
280	140	323,9												
280	160	323,9												
280	180	323,9												
300	160	355,6												
300	180	355,6												

Contact FJERO for solutions

# F1 Cylinder with front flange

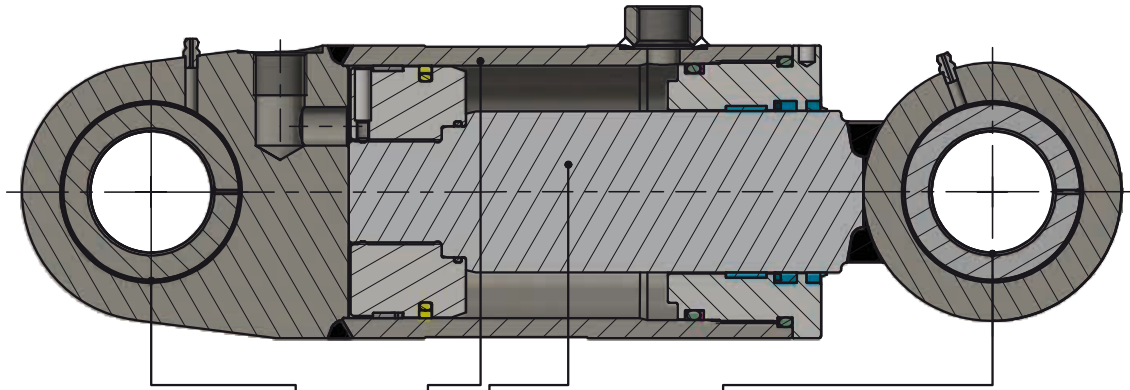


Dimension			INDEX																
D	d	B	A	I	K	U	V	M	NV	O	J	P	Q	RG	øS	DC	Y	øT	
32	20	42	121	10	4,5	8	17	16x1,5	16	17	13,5	45	17	1/4"	80	66	4	9	
40	20	50	121	10	4,5	10	18	16x1,5	16	17	13	42	17	3/8"	112	86	4	11	
40	25	50	121	10	4,5	10	18	16x1,5	20	17	13	42	17	3/8"	112	86	4	11	
50	25	60	134	15	9	12	23	16x1,5	20	15	13,5	45	17	3/8"	130	106	4	11	
50	30	60	134	15	9	12	23	16x1,5	26	15	13,5	45	17	3/8"	130	106	4	11	
50	35	60	134	15	9	12	23	16x1,5	30	15	13,5	45	17	3/8"	130	106	4	11	
63	30	73	150	15	7	12	23	22x1,5	26	16	16	53	23	1/2"	160	120	4	13	
63	40	73	150	15	9	12	23	22x1,5	36	16	16	53	23	1/2"	160	120	4	13	
80	40	92	156	14	8	20	26	28x1,5	36	18	16,5	59	29	1/2"	185	144	4	13	
80	50	92	156	14	8	20	26	28x1,5	46	18	16,5	59	29	1/2"	185	144	4	13	
80	60	92	156	14	8	20	26	28x1,5	50	18	16,5	59	29	1/2"	185	144	4	13	
100	50	115	184	21	8	20	33	35x1,5	46	18	16,5	72	36	1/2"	200	165	4	17	
100	63	115	184	21	8	20	33	35x1,5	53	18	16,5	72	36	1/2"	200	165	4	17	
100	65	115	184	21	8	20	33	35x1,5	55	18	16,5	72	36	1/2"	200	165	4	17	
100	80	115	184	21	8	20	33	35x1,5	64	18	16,5	72	36	1/2"	200	165	4	17	
125	65	145	203	21	14	30	35	58x1,5	59	23	19,5	78	59	3/4"	265	220	8	21	
125	80	145	203	21	14	30	35	58x1,5	70	23	19,5	78	59	3/4"	265	220	8	21	
125	100	145	203	21	14	30	35	58x1,5	90	23	19,5	78	59	3/4"	265	220	8	21	
140	70	160	239	36	15	30	52	58x1,5	60	23	19,5	91	59	3/4"	285	245	8	21	
140	90	160	239	36	15	30	52	58x1,5	80	23	19,5	91	59	3/4"	285	245	8	21	
160	80	185	266	39	16	35	55	65x1,5	70	29	24	101	66	1"	315	270	8	25	
160	100	185	266	39	16	35	55	65x1,5	90	29	24,5	101	66	1"	315	270	8	25	
180	90	205	284	39	17	40	55	65x1,5	80	30	24,5	95	66	1"	365	310	8	25	
180	110	205																	
200	100	230																	
200	125	230																	
220	125	254																	
220	140	254																	
250	125	298,5																	
250	140	298,5																	
250	160	298,5																	
280	140	323,9																	
280	160	323,9																	
280	180	323,9																	
300	160	355,6																	
300	180	355,6																	

Contact FJERO for solutions



# How to order



F1 - X - X - D / d x Stroke - X - X - X - (X)

Type

Rearmounting

Function E - D  
E = Single-acting  
D = Double-acting

Cylindertubediameter

Pistonrodmounting

Sealing type

Pistonroddiameter

SP - Special  
Not stand. mess. from katalog

Pistonrodmaterial R = (Stainless steel)

## Rearmounting:

S	Spherical bearing
C	Spherical composite bearing
V	Trunnion mount
FFL	Front Flange

## Pistonrodmounting:

S	Spherical bearing
C	Spherical composite bearing
AC	Spherical composite bearing adjustable
GV	Thread

## Sealing type

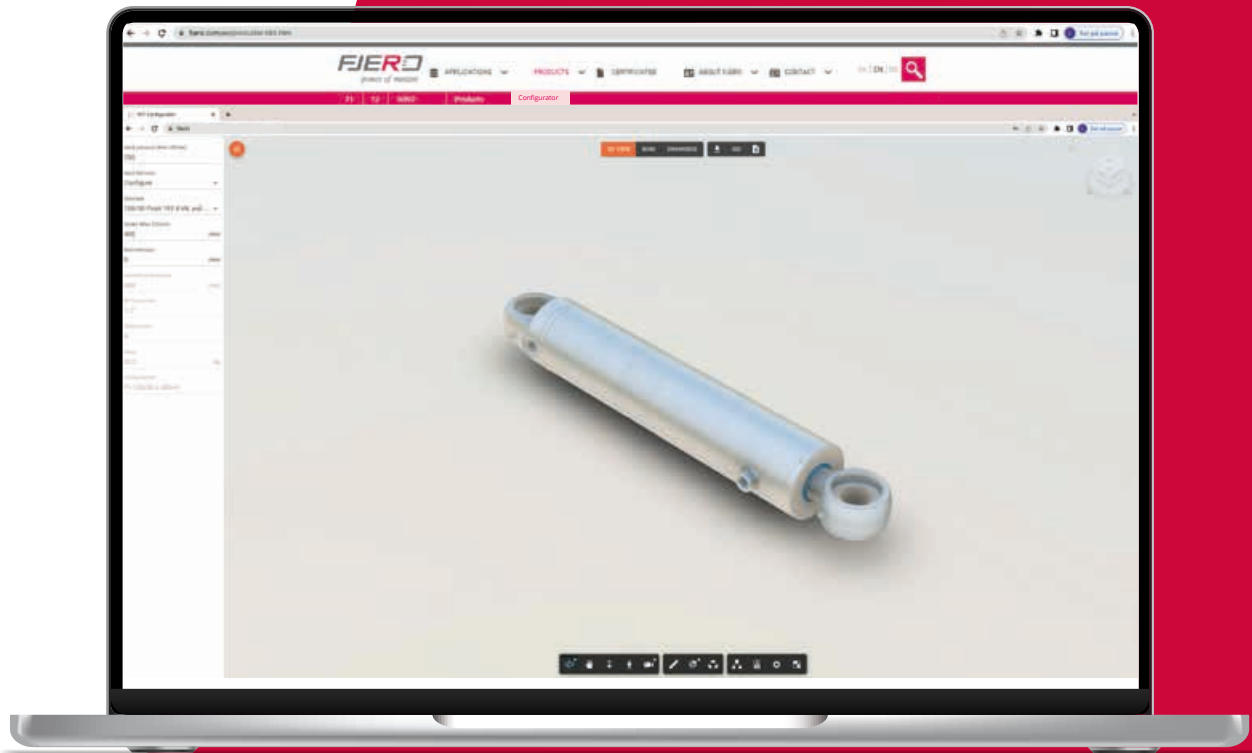
1	Standard, Polyurethan/Nitril
2	Low friction, PTFE (Bronze) / Nitril
3	High temp. PTFE (Bronze) / Viton
4	PTFE (carbon) / Viton
5	Special material qualities can be delivered on request

Quality Control

Advanced test equipment



# Configurator



**Go online and dimension your application yourself with our new configurator**  
**– Simple, clear and fast**



With FJERO's configurator, you can easily and quickly yourself dimension your hydraulic cylinder. This allows you to get far in your project without being delayed.

- **Log in to your user and select the basic model you will use.**
- **Adjust the measurements in the chart and the 3D model adapts automatically after a short update of data.**
- **Use the various tools to complete your application.**
- **Download the schematic and 3D drawing of your solution.**
- **REMEMBER to describe your special wishes or requirements for the hydraulic cylinder.**
- **Send us your inquiry and we will reply as soon as possible.**



## Proven Technology

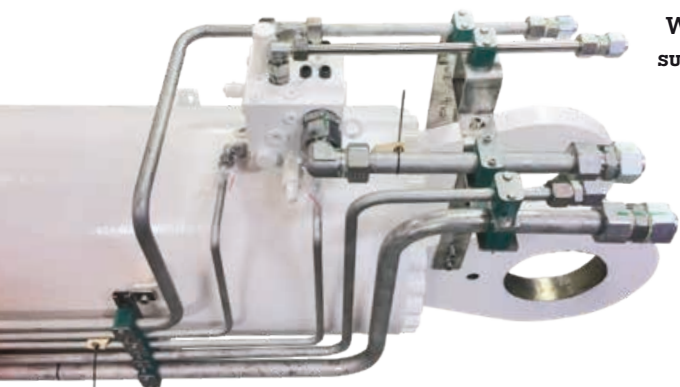
### **We meet future demands and challenges**

FJERO has obtained ISO 9001-2015 certification and a MSA agreement with DNV. Clear evidence of our top quality, Trust, credibility and solutions that match our customers perfectly – that is our aim in all that we do. We grow day after day, and therefore we are also in a position to face future challenges.

Through the years, FJERO has delivered solutions to nearly all the major brands. That has only been possible because we deliver both customer-tailored solutions and type-approved cylinders that work perfectly for all types of work, in all kinds of demanding environments. Naturally, we have parts in stock for the solutions we have delivered, and therefore we also offer service and maintenance.

**Let us ensure the lifetime of your applications.**

**We don't aspire to be the world's best – but rather the customer's best supplier of hydraulic cylinders.**





FJERO A/S is a leading danish cylinder manufacturer. Since 1987 we have developed a highly specialized industrial business with extensive know-how within the development and design, construction, production and quality assurance of the right cylinder for, e.g. the offshore, marine, subsea, hydropower, mining, general industry and windpower industries.

Our broad product program of hydraulic cylinders covers most of the market's needs. When new needs arise, we work with the customer to create an optimal solution.

Our product areas range from Ø25 to Ø650 mm internal measurements and strokes of up to 9 metres.

**Our position as the leading supplier of cylinders is something we are proud of, and we intend to keep it!**

[www.fjero.com](http://www.fjero.com)

**FJERO A/S**  
Oddervej 20  
DK-7800 Skive

Tel.: +45 96 16 00 00  
Fax: +45 97 51 45 45  
[sales@fjero.com](mailto:sales@fjero.com)

**FJERO**  
*power of motion*