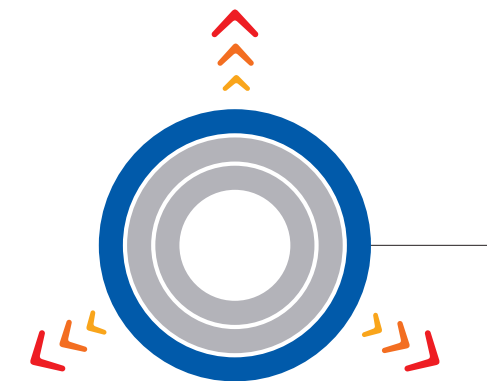
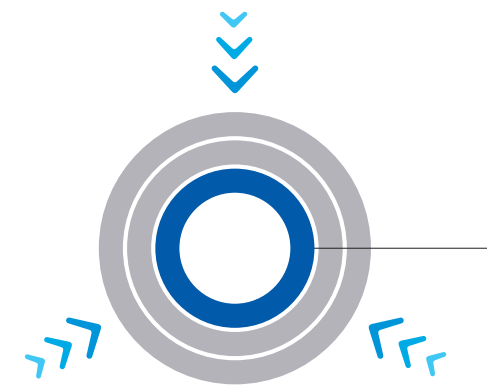




Hydraulic Cylinder

Technology & Knowledge Product Development Procurement & Outsourcing Take advantage of the three strengths of Yuasa

YUASA cylinders boast three strengths.
Technology & Knowledge, Product Development,
and Procurement & Outsourcing
YUASA continues to develop these three
strengths in order to meet the needs of
customers and contribute to the growth of
customer business.



YUASA Strength 1 Technology & Knowledge 03

Technology advancement and
accumulation of knowledge
YUASA has accumulated technology over our
more than 50-year history. Our continuously
evolving technology and our continued
accumulation of knowledge support proven design.
Through thorough quality control and product
validation, we achieve a perpetual cycle of
knowledge accumulation to ensure the continued
growth of our cylinder business.

YUASA Strength 2 Product Development 05

Engagement from the development
stage
Advanced technology and accumulated knowledge
are combined to continuously produce a variety of
new cylinders, including large-bore, long, and
special shaped cylinders.
We engage from the development stage to ensure
our ability to respond to customer needs, no
matter how complicated the structure.

YUASA Strength 3 Procurement & Outsourcing 07

Global procurement system
We have developed a global procurement system
that enables us to improve cost competitiveness.
We provide support for a wide variety of needs,
including locally optimized specifications and local
production support.
Beyond cylinders, we also provide manufacturing,
development, and procurement that utilize
hydraulic technology.

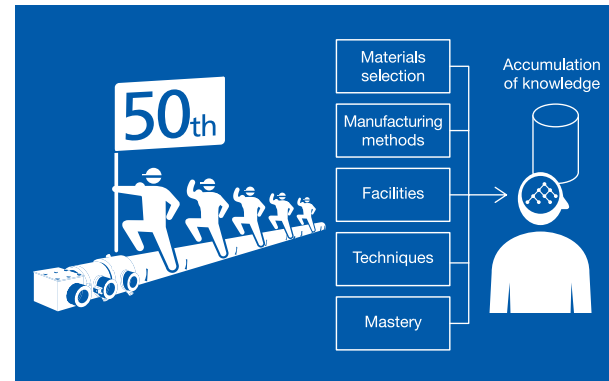
YUASA Standard Telescopic Cylinder 09

For use in various applications
The standard telescopic cylinder can be used in a
variety of applications. Available in five sizes and a
stroke of up to 3,100mm (variable units of 100mm).
Also choose from six support types.

Technology & Knowledge

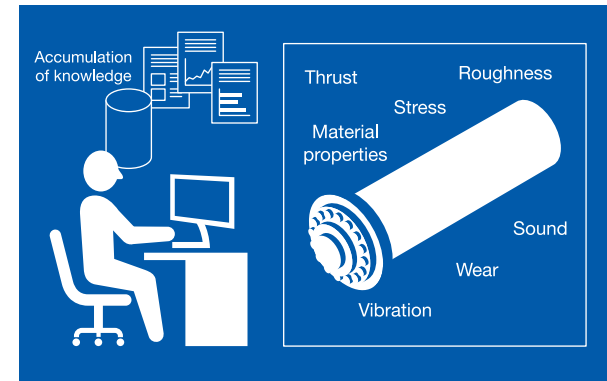
Accumulation and advancement of manufacturing technology

In the more than 50 years since we began manufacturing cylinders, the manufacturing technology we have accumulated has evolved significantly. For example, the welding technology applied to manufacture cylinders able to endure extremely high pressures requires not only special knowledge of material properties, but also the ability to accurately predict thrust, stress, vibration, and other factors. And nurturing the skills of a master welder able to perform such precision welding requires the long period of 10 years. Advanced technology and knowledge is required at every stage of our work and our vast experience enables us to achieve high quality cylinder manufacturing.



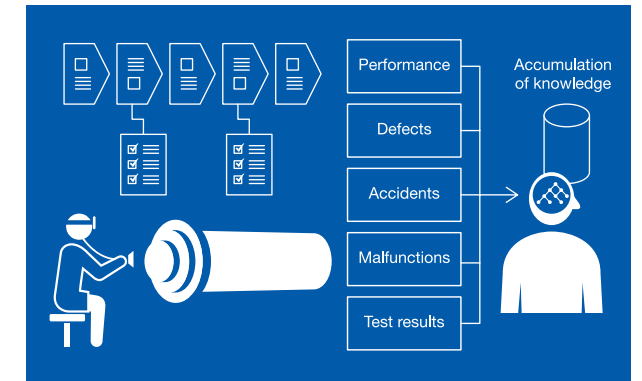
Proven design made possible through the accumulation of knowledge

Various cylinder manufacturing technologies are deeply connected. One example is the roughness of the cylinder inner surface. Wear must be slowed as much as possible on the packing resulting from contact with the piston to prevent fluid leaks. How smooth the cylinder inner surface can be made relative to the packing material and hardness can determine whether various problems can be prevented, including sound and vibration. The accumulation of comprehensive manufacturing technology knowledge is vital to the creation of proven designs that prevent such problems.

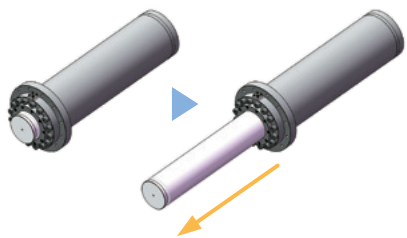


Thorough Quality control and evolution

Quality defects are never acceptable. Not only must product quality satisfy customer needs, but product manufacturing also must be cost effective. To achieve this, we have standardized every step of the manufacturing process and implement thorough checks and validation based strictly defined control items. We pursue correlations for all information related to quality (performance, defects, accidents, malfunctions, test results, etc.) and work continuously toward technology improvements and the reevaluation of control items.

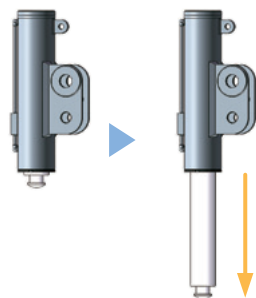
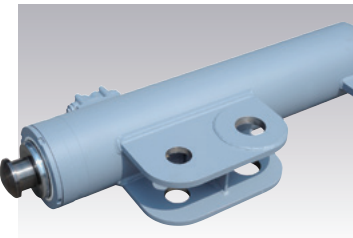


Large-bore hydraulic cylinder



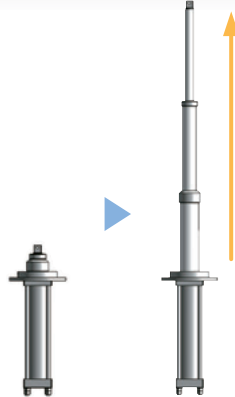
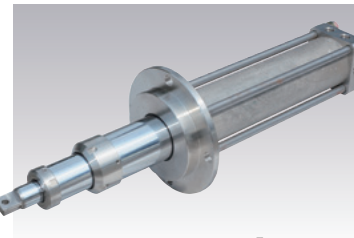
Purpose	Large-scale press machine
Specifications	Structure : Double-acting cylinder Cylinder bore : $\phi 482\text{mm}$ Rod bore : $\phi 355\text{mm}$ Stroke : 2,755mm Max pressure : Head side : 20.6MPa Rod side : 20.6MPa Thrust : Head side : 3756.9kN Rod side : 1719.1kN Temperature range : -20 to +90°C (no condensation) Hydraulic fluid used : General mineral hydraulic fluid (ISO-VG32, 46, 68) Rod sliding surfaces : Hardened chrome plating Plating thickness : Greater than 30 μm Surface hardness : Greater than HV700, CASS RATING greater than Class 8

Large-scale jack cylinder



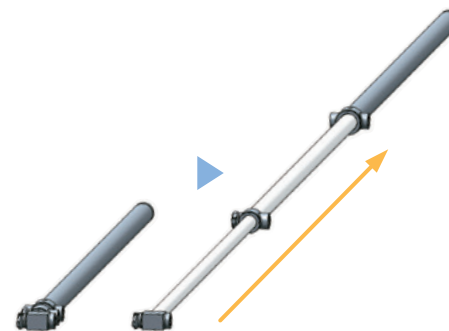
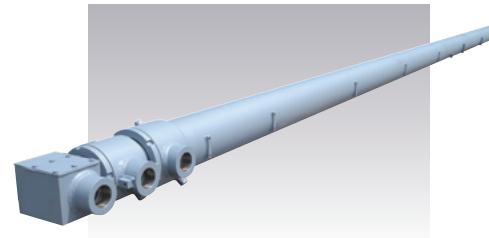
Purpose	Large-scale construction machinery
Specifications	Structure : Double-acting cylinder Cylinder bore : $\phi 190\text{mm}$ Rod bore : $\phi 150\text{mm}$ Stroke : 765mm Max pressure : Head side : 27.5MPa Rod side : 27.5MPa Thrust : Head side : 779.7kN Rod side : 293.7kN Temperature range : -20 to +90°C (no condensation) Hydraulic fluid used : General mineral hydraulic fluid (ISO-VG32, 46, 68) Rod sliding surfaces : Hardened chrome plating Plating thickness : Greater than 30 μm Surface hardness : Greater than HV700, CASS RATING greater than Class 8

Stainless steel telescopic cylinder



Purpose	Ocean applications, food machinery, parking lot automated handrails
Specifications	Structure : Double-acting, three-stage telescopic cylinder Lower bore : $\phi 90\text{mm}$ Higher bore : $\phi 35\text{mm}$ Extended length : 1,600mm Contracted length : 600mm Stroke : 1,000mm Normal use pressure : Head side : 9.8MPa Rod side : 9.8MPa Thrust : Head side : 14.5kN Rod side : 0.7kN Temperature range : -20 to +80°C (no condensation) Hydraulic fluid used : General mineral hydraulic fluid (ISO-VG32, 46, 68) Rod sliding surfaces : Hardened chrome plating Plating thickness : Greater than 20 μm

Two-stage telescopic cylinder



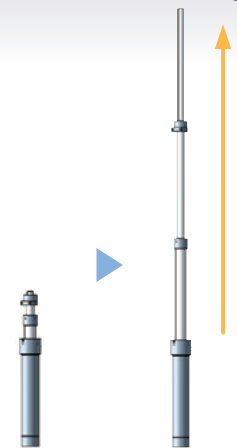
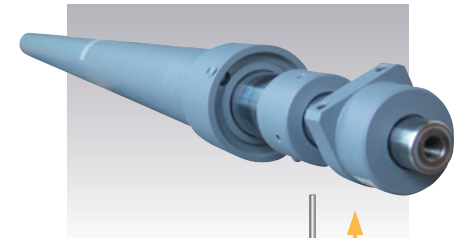
Purpose	For crane boom telescoping
Specifications	Structure : Double-acting, two-stage telescopic cylinder Stroke : 13,000mm Max pressure : Head side : 20.6MPa Rod side : 20.6MPa Temperature range : -20 to +90°C (no condensation) Hydraulic fluid used : General mineral hydraulic fluid (ISO-VG32, 46, 68) Rod sliding surfaces : Hardened chrome plating

Two-stage telescopic jack cylinder



Purpose	For small-vehicle stabilizing jacks
Specifications	Structure : Double-acting, two-stage telescopic cylinder Lower bore : $\phi 65\text{mm}$ Higher bore : $\phi 28\text{mm}$ Extended length : (1)500, (2)575, (3)650, (4)725 mm Contracted length : (1)300, (2)325, (3)350, (4)375 mm Stroke : (1)200, (2)250, (3)300, (4)350 mm Normal use pressure : Head side : 14.5kN Rod side : 0.7kN Thrust : Head side : 14.5kN Rod side : 0.7kN Temperature range : -20 to +80°C (no condensation) Hydraulic fluid used : General mineral hydraulic fluid (ISO-VG32, 46, 68) Rod sliding surfaces : Hardened chrome plating Plating thickness : Greater than 20 μm Surface hardness : Greater than HV700, CASS RATING greater than Class 8

Single-acting uniform speed telescopic cylinder

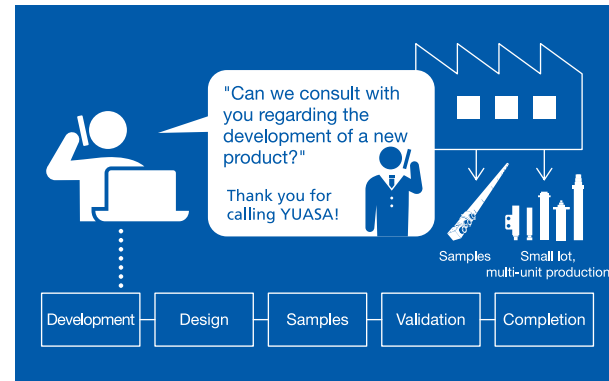


Purpose	Hydraulic elevator jack
Specifications	Structure : Single-acting uniform speed telescopic cylinder Lower bore : $\phi 47\text{--}\phi 110\text{mm}$ Higher bore : $\phi 28\text{--}\phi 42\text{mm}$ Stroke : 3,800 – 10,000mm Speed (tip) : 1m/min – 20m/min (Normal use pressure) : (5.5MPa) Tolerable temperature range : 0 to +60°C (no condensation) Hydraulic fluid used : (Special hydraulic fluid) Rod sliding surfaces : Hardened chrome plating Plating thickness : Greater than 30 μm
Characteristics	(1) Short cylinder length when contracted, even for long stroke (2) Consistent rod tip speed during operation (3) No shock produced during operation

Product Development

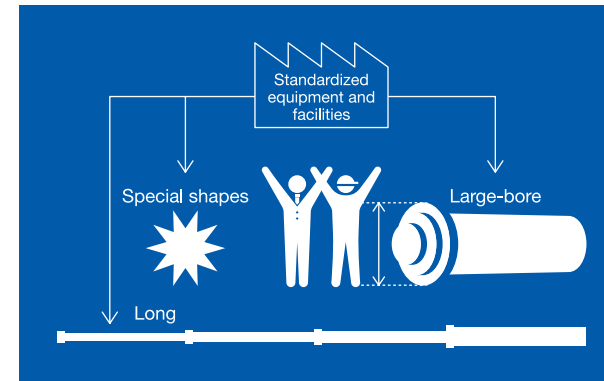
From the development stage

During new product development, we consult with the customer regarding cylinder parameters from the initial stages of development before beginning the process of trial and error. The creation of design schematics is based on conversations with our customers. We are involved in every aspect of the development process, repeating the steps of demonstration and validation until we achieve the completion of the desired product. Also we are able to provide individual samples, small lots, and multi-unit production. Consult with us from the development stage regarding any type of matter.



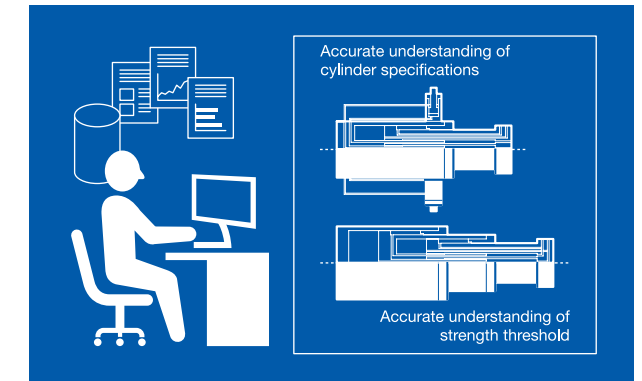
Large-bore, long, and special shapes

Development activities mainly take place at our domestic plants. These plants feature a vast lineup of highly standardized equipment and facilities to ensure our ability to take on any type of development order. This equipment and facilities have enabled YUASA to work on numerous complex development projects, including large-bore, long, and other large scale cylinders. This also ensures our ability to handle the development of cylinders with special shapes. Feel free to consult with us regarding any type of cylinder.



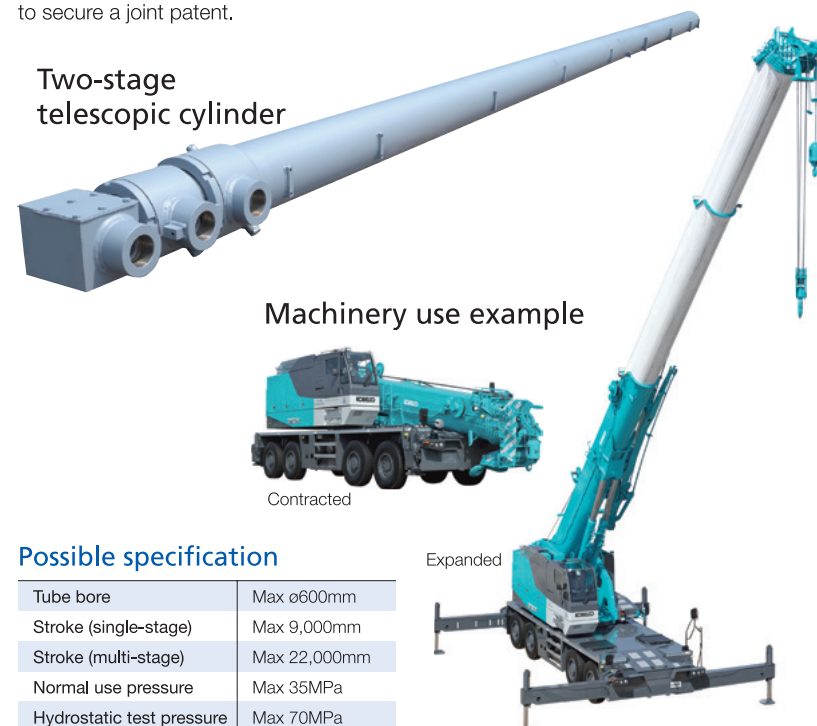
All types of complex structures

As customers face more advanced needs, so too do the internal structures of cylinders become more complex. We have experienced developing cylinders consisting of multiple layers that are so structurally complex that cylinder movement and fluid flow cannot be conceptualized simply from looking at the design schematics. Complex structures require being able to accurately ascertain the limits of cylinder specifications and strength. Feel free to consult with us regarding any type of cylinder, even those that may seem structurally impossible.



Case study: Multi-stage telescopic cylinder development

This case study involves the development of a multi-stage telescopic cylinder for a construction machine manufacturer. A three-stage cylinder was mounted in a crane boom of more than 10 meters in length. Without the use of external piping, we successfully developed a system that enables expansion and contraction in three stages using a single supply/exhaust port. We worked with the manufacturer to secure a joint patent.



Possible specification

Tube bore	Max ø600mm
Stroke (single-stage)	Max 9,000mm
Stroke (multi-stage)	Max 22,000mm
Normal use pressure	Max 35MPa
Hydrostatic test pressure	Max 70MPa

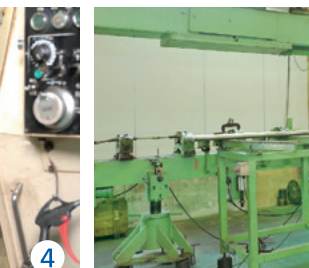
Facilities



1 Vertical test stand



2 Horizontal test stand

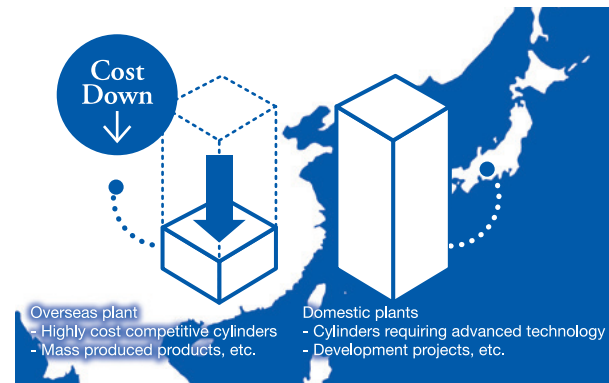


3 Horizontal honing machine 4 NC lathe 5 Centerless grinder

Procurement & Outsourcing

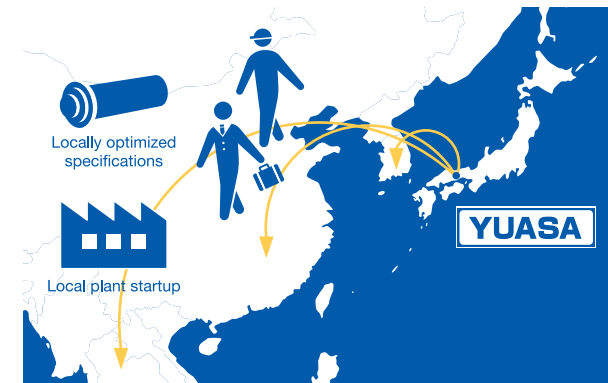
Global procurement system

Our Japanese plants primarily focus on the production of cylinders requiring advanced technology as well as cylinder design and manufacturing initiated from the development stage. The majority of cylinders with relatively simple structure or easy to manufacture and small cylinders are manufactured and procured overseas. With particularly large-volume production, we are able to produce highly cost competitive cylinders. We have expanded a global procurement system centered in Asia. Feel free to consult with us.



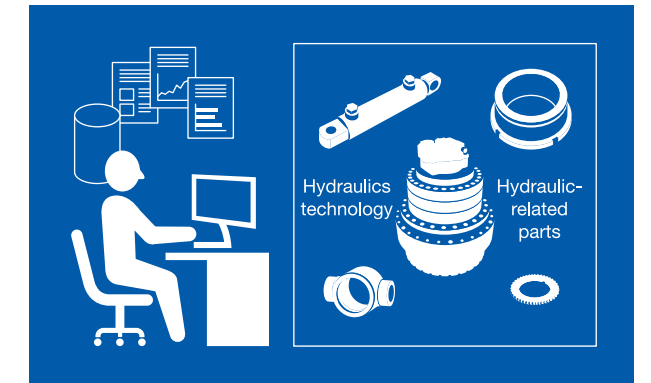
Locally optimized specifications Local production support

Maintaining cost competitiveness overseas requires development, design, and management that reflect local manufacturing approaches. This means having local engineers responsible for development, design, and management work and achieving a manufacturing line optimized for local specifications. We have responded to customer requests to dispatch YUASA technology and quality control staff to supervise plant startup. Feel free to consult with us.



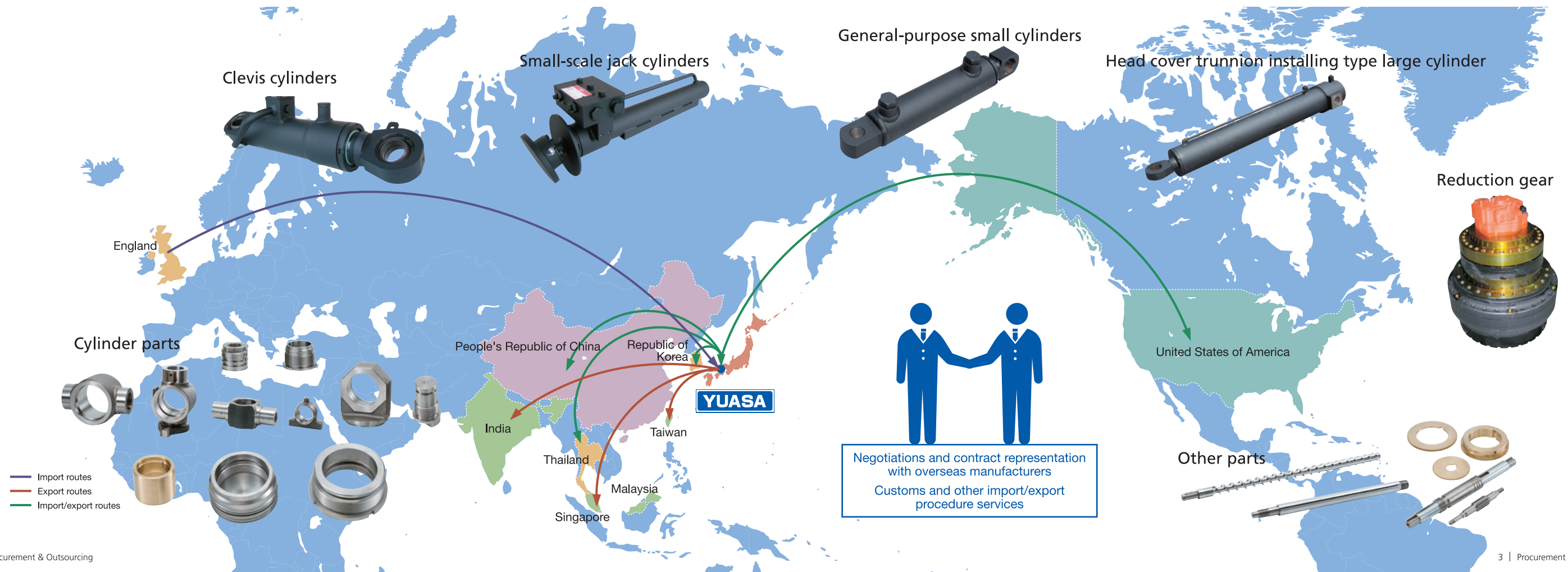
We also provide hydraulic-related parts as well

Not limited to cylinders, feel free to consult with us regarding the development and manufacturing of special parts using hydraulics. We have successfully completed numerous projects by applying proven technology and knowledge accumulated over years of experience in the manufacturing of hydraulic cylinders. In particular, the power of hydraulics shows its true value in scenes involving massive power output and control. Furthermore, we are able to manufacture and procure a wide variety of hydraulic-related parts, including parts used in combination with hydraulic cylinders. Feel free to consult with us regarding any type of matter.



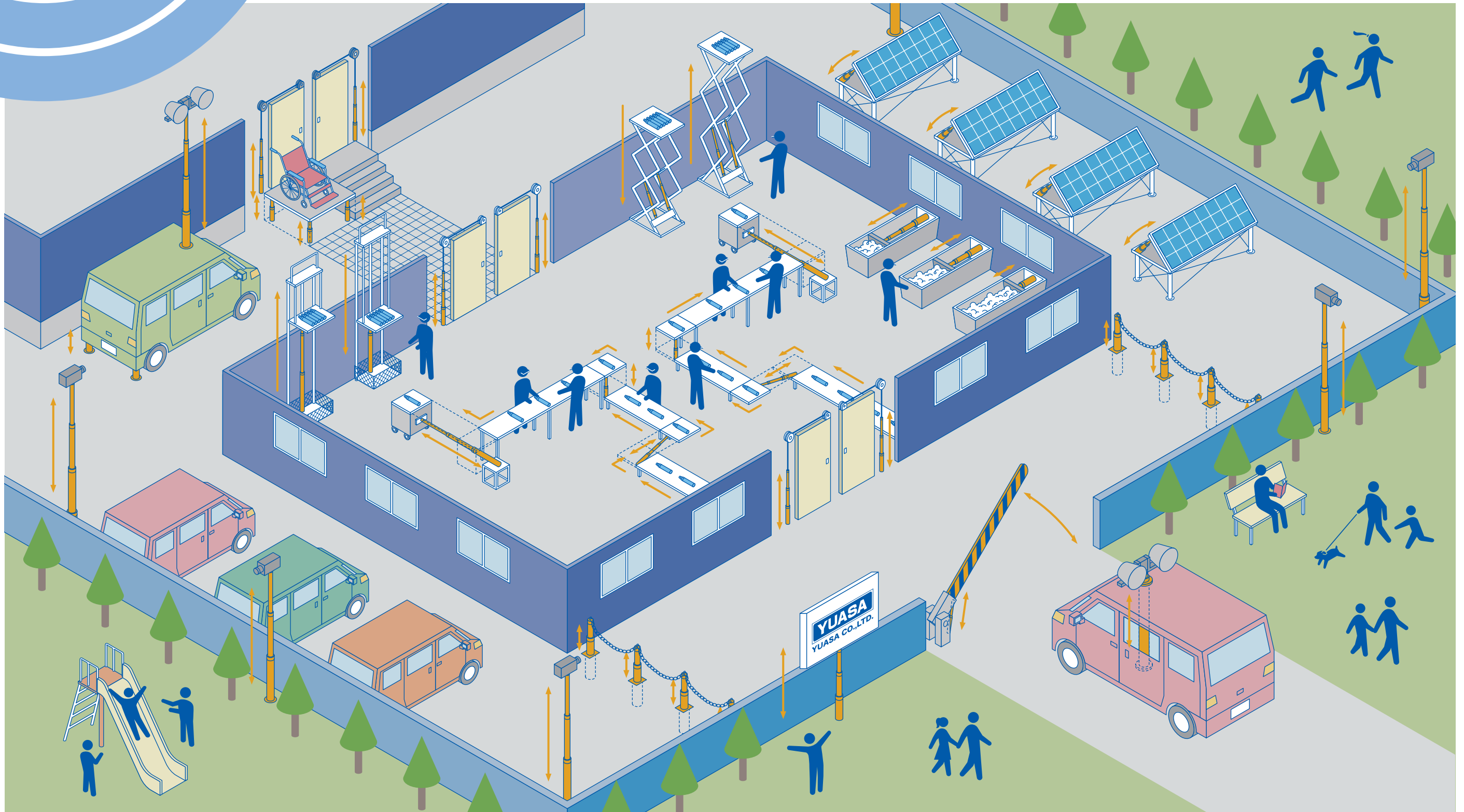
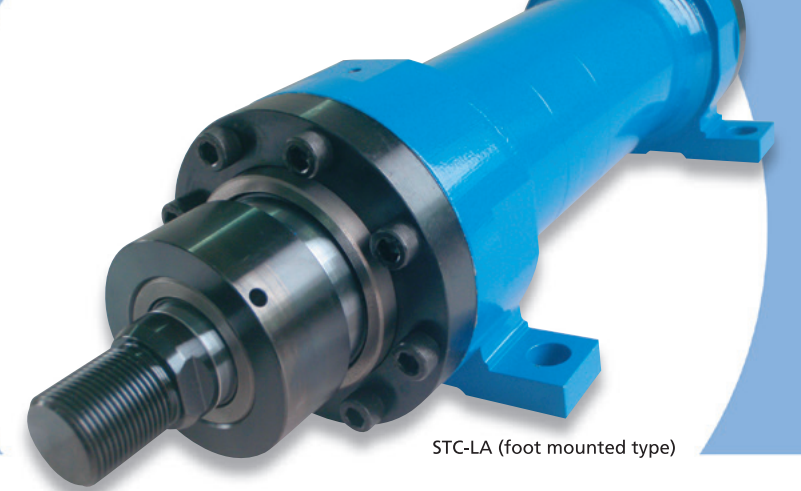
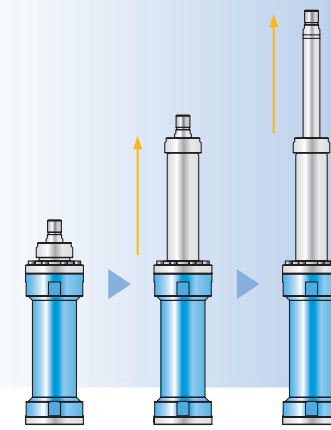
Import/export routes

Based on customer needs, we can handle negotiations with overseas manufacturers, import/export procedures, import and export between foreign countries, and various other matters required for each country, including various customs and contract matters.



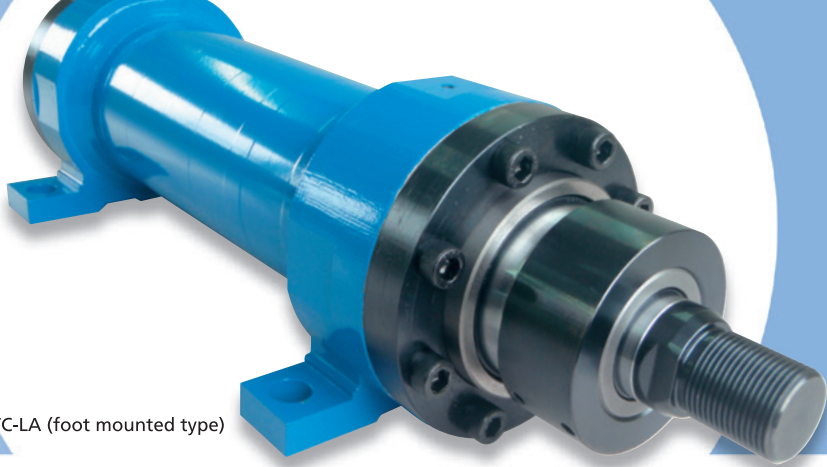
YUASA Standard Telescopic Cylinder

The standard telescopic cylinder can be used in a **variety of applications.**



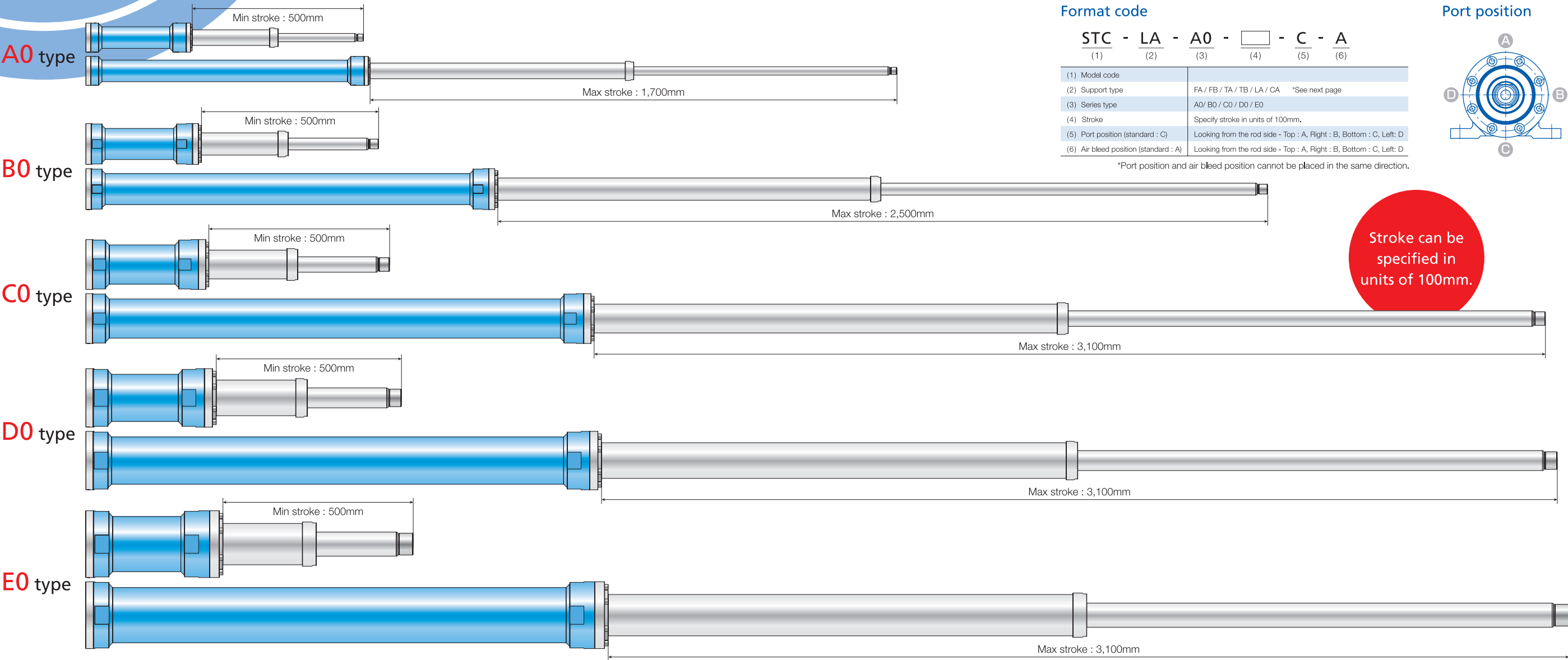
YUASA Standard Telescopic Cylinder

Available in **five sizes** and a stroke of **up to 3,100 mm**.



STC-LA (foot mounted type)

Double-acting, non-uniform speed two-stage telescopic cylinder for use in a variety of situations. Select from a variety of sizes (five sizes), strokes (Max 3,100mm), and support types (six). Stroke will vary depending on the model but customers can specify a desired stroke from 500mm to 3,100mm (**units of 100mm**). Up to 1,700mm for A0 types and up to 2,500mm for B0 types. Port position and air bleed position can be specified.



Cylinder specifications (specifications common with A0 - E0 types)

Nominal pressure	7MPa	
Max tolerance pressure	Rod cover side : 15MPa	Head cover side : 9MPa
Pressure threshold	Rod cover side : 21MPa	Head cover side : 14MPa
Temperature range	Ambient temperature : -10 to +50°C Hydraulic fluid temperature : -5 to +80°C (no congelation)	
Cushion machine	Dual fixed side simple cushion (no adjustment mechanism)	
Hydraulic fluid used	General mineral hydraulic fluid (refer to the hydraulic fluid compatibility table if using a different type of hydraulic fluid)	
Support type	Types : FA / FB / TA / TB / LA / CA	

Cylinder specifications (specifications for each type)

Model			A0 type	B0 type	C0 type	D0 type	E0 type	
Cylinder bore	Stage 1	Cylinder bore	ø63	ø90	ø110	ø125	ø140	
	Stage 2		ø45	ø65	ø80	ø90	ø100	
Specification velocity range (mm/s) (Stage 2 extended side)			10 - 166	10 - 150	10 - 140	10 - 128	10 - 118	
Reference thrust (at 7MPa) (kN)	Extended side		10.6	21.4	33.4	42.7	53.2	
	Contracted side		6.3	12.6	22.0	24.1	31.2	
Variable fluid volume (per 1mm stroke) (ml)			1.4	2.8	4.0	5.5	6.9	

Standard stroke operation range

Model	Stroke
A0 type	500 - 1700
B0 type	500 - 2500
C0 type	500 - 3100
D0 type	500 - 3100
E0 type	500 - 3100

(Unit : mm)

Stroke length tolerance

Stroke	Tolerance
500 - 1000	0 - +2.8
1001 - 1600	0 - +3.2
1601 - 2500	0 - +3.6
2501 - 3100	0 - +4.0

(Unit : mm)

Hydraulic fluid and packing material compatibility

Compatible hydraulic fluid	Packing material	Nitrile rubber
	General mineral hydraulic fluid	○
	Water-glycol fluid	○
	Phosphate ester hydraulic fluid	×
	W/O hydraulic fluid	○
	O/W hydraulic fluid	○
	Fatty acid ester	○

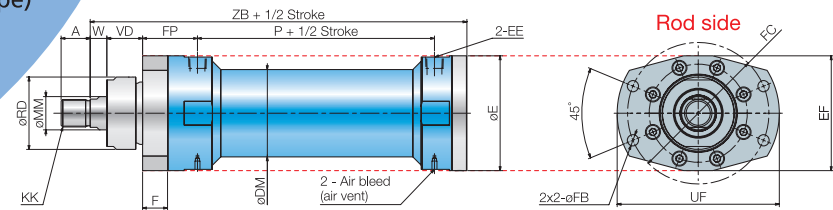
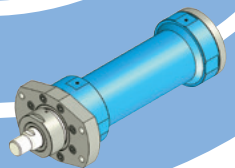
*This product is designed and manufactured to work as a general industrial machinery component. Do not use under pressure levels or temperatures, or in usage environments that exceed specifications as this can cause **breakage or malfunction**.

*Specify stroke in units of 100mm.
*Please contact us if you require a stroke setting other than the specified unit.

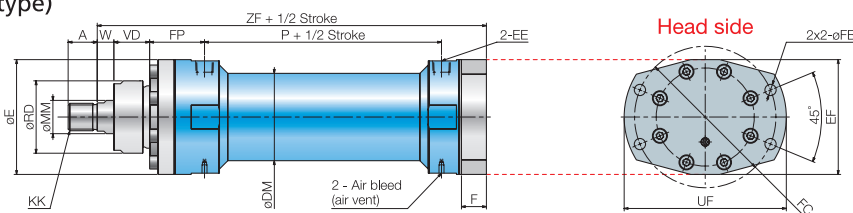
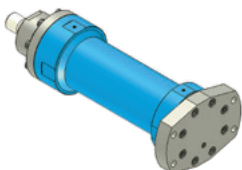
YUASA Standard Telescopic Cylinder

Select from six support types.

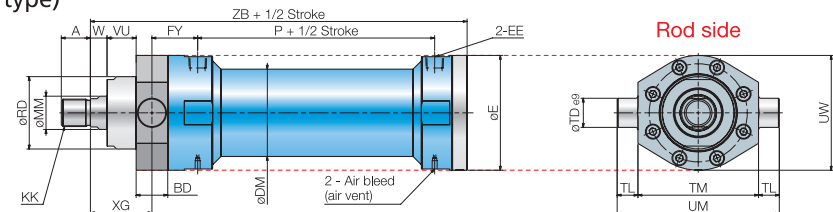
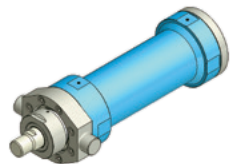
FA type (rod flange mounted type)



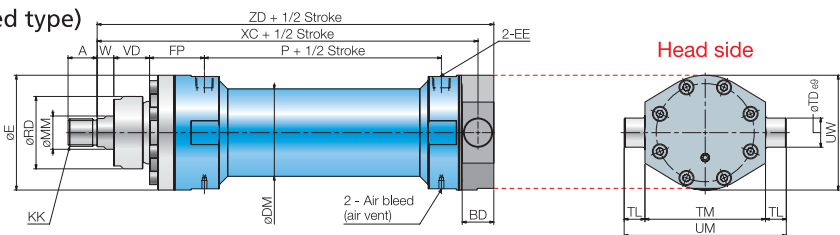
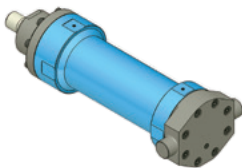
FB type (head flange mounted type)



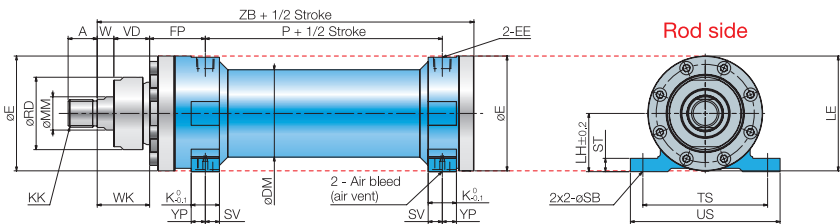
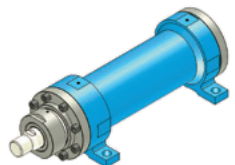
TA type (rod trunnion mounted type)



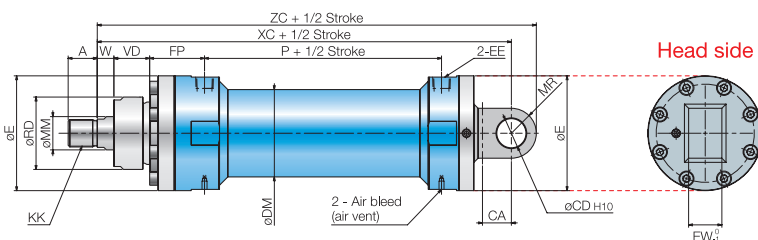
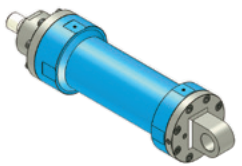
TB type (head trunnion mounted type)



LA type (foot mounted type)



CA type (eye mounted type)



*Standard paint color is blue (approximate color : Munsell : 2.5PB3.5/10). *Please contact us if you require a paint color other than the standard color.

FA type / FB type Dimensions Table

	A	DM	E	EE	EF	F	FB	FC	FP	KK	MM	P	RD	UF
A0 type	25	73	98	Rc3/8	98	20	9	120	53	M24x2	28	25	65	135
B0 type	35	105	138	Rc1/2	138	30	13.5	170	67	M33x2	40	35	87	195
C0 type	40	125	161	Rc1/2	165	35	16	195	80	M39x2	45	40	100	225
D0 type	45	145	183	Rc3/4	190	40	18	225	93	M45x2	53	45	116	260
E0 type	52	165	204	Rc3/4	205	45	20	245	107	M52x2	60	50	128	285
	VD	W	ZB	ZF	(Unit : mm)									
A0 type	40	13	162	168										
B0 type	43	20	203	218										
C0 type	50	20	235	255										
D0 type	57	23	270	290										
E0 type	65	25	303	325										

FA type / FB type Mass Table

	Base mass		Calculate mass per 1mm stroke
	FA type	FB type	
A0 type	7.6	7.8	0.0088
B0 type	18.7	19.8	0.0170
C0 type	30.3	32.8	0.0211
D0 type	45.1	48.1	0.0334
E0 type	61.3	65.6	0.0454
(Unit : kg)			

Calculation example) B0-FA type, 500 strokes
 $18.7 + 0.0170 \times 500 = 18.7 + 8.5 = 27.2$ (Kg)

TA type / TB type Dimensions Table

	A	BD	DM	E	EE	FP	FY	KK	MM	P	RD	TD	TL
A0 type	25	31	73	98	Rc3/8	53	48	M24x2	28	25	65	28	20
B0 type	35	38	105	138	Rc1/2	67	56	M33x2	40	35	87	35	25
C0 type	40	48	125	161	Rc1/2	80	69	M39x2	45	40	100	45	30
D0 type	45	58	145	183	Rc3/4	93	82	M45x2	53	45	116	55	30
E0 type	52	63	165	204	Rc3/4	107	93	M52x2	60	50	128	60	35
	TM	UM	UW	VD	VU	W	XC	XG	ZB	ZD	(Unit : mm)		
A0 type	100 ⁰ _{-0.35}	140	98	40	29	13	163	58	162	179			
B0 type	145 ⁰ _{-0.4}	195	138	43	35	20	208	74	203	227			
C0 type	175 ⁰ _{-0.4}	235	161	50	37	20	240	81	235	265			
D0 type	200 ⁰ _{-0.46}	260	185	57	39	23	280	91	270	310			
E0 type	220 ⁰ _{-0.46}	290	205	65	47	25	315	104	303	347			

TA type / TB type Mass Table

	Base mass		Calculate mass per 1mm stroke
	TA type	TB type	
A0 type	7.7	8.2	0.0088
B0 type	18.3	20.0	0.0170
C0 type	30.3	33.4	0.0211
D0 type	45.4	50.6	0.0334
E0 type	61.8	69.5	0.0454
(Unit : kg)			

Calculation example) B0-TA type, 500 strokes
 $18.3 + 0.0170 \times 500 = 18.3 + 8.5 = 26.8$ (Kg)

LA type / CA type Dimensions Table

	A	CA	CD	DM	E	EE	EW	FP	K	KK	LE	LH	MM	MR
A0 type	25	25	25	73	98	Rc3/8	28	53	26	M24x2	99	50	28	22
B0 type	35	35	35	105	138	Rc1/2	40	67	34	M33x2	139	70	40	30
C0 type	40	45	45	125	161	Rc1/2	50	80	42	M39x2	165.5	85	45	38
D0 type	45	55	55	145	183	Rc3/4	55	93	47	M45x2	186.5	95	53	45
E0 type	52	60	60	165	204	Rc3/4	63	107	48	M52x2	207	105	60	50
	P	RD	SB	ST	SV	TS	US	VD	W	WK	XC	YP	ZB	ZC
A0 type	25	65	13.5	10	13	110	130	40	13	53	192	13	162	214
B0 type	35	87	18	16	17	150	180	43	20	63	248	17	203	278
C0 type	40	100	22	20	22	175	210	50	20	70	290	20	235	328
D0 type	45	116	24	22	23	205	240	57	23	80	335	24	270	380
E0 type	50	128	26	24	23	230	270	65	25	90	373	25	303	423
(Unit : mm)														

LA type / CA type Mass Table

	Base mass		Calculate mass per 1mm stroke
	LA type	CA type	
A0 type	7.3	7.3	0.0088
B0 type	17.4	17.5	0.0170
C0 type	28.6	28.8	0.0211
D0 type	42.0	42.4	0.0334
E0 type	57.7	58.7	0.0454
(Unit : kg)			

Calculation example) B0-LA type, 500 strokes
 $17.4 + 0.0170 \times 500 = 17.4 + 8.5 = 25.9$ (Kg)

We also can produce various attachments as optional products based on specific applications. Feel free to consult with us.



Hydraulic Cylinder

YUASA CO., LTD.

Our product information is also available on <http://www.yuasakk.co.jp>



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Safety Note

To ensure your safe and proper usage, please observe all the manuals before using these machines.

Contact Us