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EVER-POWER TRANSMISSION CO., LTD.

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## 油缸使用注意事项 Attention for cylinder use

### 安装和运转(Installation and operation)

#### ● 开箱(Opening container)

油缸内封有气态防锈剂,所以,在装配前不得拆下入口的塞子。如果拆下塞子,必须立即安装在机体上,而且在油缸内放满油。

It is prohibited to remove the opening plug before assembly as gasified rust preventative is sealed in cylinder. If the plug is removed, please install it on the main body immediately and fill the cylinder with oil.

#### ● 防锈(Rust prevention)

油缸安装在机体上以后,如果活塞在伸出的情况下放置时,必须在活塞杆的露出部分涂敷油脂。

After the Cylinder being mounted onto the mainbody, and if the piston extends outside, please coat the external part of piston rod With grease.

#### ● 速度(Speed)

一般规格的油缸,当动作速度超过2m/s时,其使用寿命将会受到影响。以0.3m/s作为冲程末端的场合,为了保护机构和安全起见,建议内部安装缓冲机构。另外,使油缸停止时,为了保护油缸机构和安全起见,线路上也必须考虑,以防止发生很大的冲击。为了增加油缸的回油量,线路设计时应特别注意。在0.5m/min以下低速运转时,将会影响到动作性(特别是振动),所以,低速运转时,应该进行洽谈。

For cylinders with general specification, the service life Will be impacted when the speed exceeds 2m/s. For the circumstance setting 0.3 m/s as stroke death point, it is recommended to install a buffer device for rotation and safety. Besides, when the cylinder stops, take circuitry into consideration to avoid large impact. In order to increase return quantity, pay special attention of circuitry design. For 0.5m/min low speed operation, negotiation is needed for the movement will be impacted (particularly the vibration.)

#### ● 运转 (operation)

运转初期,必须完全排清油缸内的空气。残留空气的场合,采取低速充分运转,排除空气。如果油缸内残留空气受急剧压力时,那么,由于液压油的作用,有可能使密封圈烧损。另外,动作中如果油缸内部产生负压,那么,将有可能由于气蚀作用而发生异常。

The air in cylinder should be fully discharged at the beginning of operation. As for residuals, their should be eliminated at a low speed operation. If the residual air in cylinder is impacted by abrupt clamp pressure, the seal ring Will be damaged due to the effect of diesel oil. Besides, if vacuum pressure is generated in cylinder during movement, abnormality Will be caused by air eroding effect.

## 油缸的推力/速度 Thrust/Speed of oil cylinder

### ● 推力的计算(Calculation of thrust)

#### A. 理论推力(Theoretical thrust)

$$F_1 = \frac{\pi}{400} D^2 P \quad \dots \dots \dots (1)$$

$$F_2 = \frac{\pi}{400} (D^2 - d^2) P \quad \dots \dots \dots (2)$$

#### B. 实际推力(Actual thrust)

实际推力通过理论推力乘以  $\eta$  求出。  
建筑机械、产业车辆以及装卸机械的  $\eta$  值为0.95。

式中:

The actual thrust is equal to theoretical thrust multiplies with  $\eta$ .  
The  $\eta$  value for construction mechanism, industrial automobile and loading and Unloading mechanism is 0.95, in the following formula:

### ● 工作油(Operating oil)

合适的工作油(Appropriate operating oil)

下表所示为推荐的工作油

(The following tables show the recommended operating Oil):

寒冷地区 Cold area	温暖地区 Warm area
室外温度 Outside temperature -10-25°C	室外温度 Outside temperature 0-35°C
ISO VG32	ISO VG46

### ● 工作油的使用粘度范围

(Viscosity range of operating oil)

	粘度 Viscosity 10 <sup>-6</sup> m <sup>2</sup> /S (cST)	油温 Oil temperature	
		ISO VG32	ISO VG46
合适范围 Appropriate range	25-100	17~45°C	23~55°C
合适范围 Applicable range	15-500	-7~60°C	0~70°C

### ● 工作油的污染度管理

(Contamination management Of operating oil)

推荐值: NAS9级以内

Recommended value: Within grade NAS9

### ● 回路油温

(oil temperature for return Circuit)

极限油温范围: -20~100°C

Limited Oil temperature scope: -20~100°C

- F1:伸出推力(Extension thrust force) ..... kgf
- F2:压缩推力(Compressed thrust force) ..... kgf
- D:缸体直径(Cylinder diameter) ..... mm
- d:活塞杆直径(Piston rod diameter) ..... mm
- p:压力(Pressure) ..... kgf / cm<sup>2</sup>
- $\eta$ :载重压力系数(Load pressure coefficient)

### ● 速度的计算(Calculation Of speed)

$$V_1 = \frac{4}{\pi} \cdot \frac{Q}{D^2} \cdot 10^3 \quad \dots \dots \dots (1)$$

$$V_2 = \frac{4}{\pi} \cdot \frac{Q}{D^2 - d^2} \cdot 10^3 \quad \dots \dots \dots (1)$$

# 压曲长度和行程 Bucking strength and stroke

承受压缩负载的油缸的行程通过压曲强度来控制。

The stroke of cylinder bearing with compressing loading is controlled by buckling strength.

### A. 许容压缩负载(最伸长时)

Permissible compressing loading(max. extension)

$$W_a = \frac{p_k}{S} \dots \dots \dots (5)$$

式中(In the formula):

W<sub>a</sub>: 许容压缩负载(Permissible compressing loading) ..... kgf

P<sub>k</sub>: 压曲负载(Buckling loading) ..... kgf

S: 安全率(Safety rate)

S值根据用途有所不同。

S is changeable according to different applications.

W<sub>a</sub>=F<sub>1</sub> 的场合, 通常考虑为1.5~2.5以上。

详细情况订货时洽谈。

When W<sub>a</sub>=F<sub>1</sub>, it is commonly considered as above 1.5~2.5. For details, negotiation is needed when ordering.

### B. 压曲负载(Buckling loading)

根据支撑部的形式, 有仅仅活塞杆承受负载的场合(单柱)和缸体承受负载的场合(台阶柱)。压曲的计算分别如下。有关承受横向负载的场合另行研究。

There're two situations according to the forms of supporting part: only piston rod loading(single column)and cylinder loading(step column). See the following for the calculation of buckling. Horizontal loading situation will be researched later.

a. 有关单柱场合详见下页a

See next page "a" for single column situation

$$\frac{\ell}{K} \geq \sqrt{\frac{2n\pi^2 E}{\delta Y}} \quad [k = \sqrt{\frac{1}{A}}]$$

$$P_k = \frac{n\pi^2 E I}{\ell^2} \dots \dots \dots (6)$$

$$\text{Situation: } \frac{\ell}{K} < \sqrt{\frac{2n\pi^2 E}{\delta Y}}$$

$$P_k = \left\{ \delta Y - \frac{\delta Y^2}{4n\pi^2 E} \left\{ \frac{\ell}{K} \right\}^2 \right\} A$$

... (约翰逊公式) (Johnson's formula) ... (7)

b. 有关台阶柱的场合详见b.

See "b" for step column situation

一端固定, 另一端回转的场合:

The situation of one terminal fixing, and the other returning:

$$P_k = K_1 \frac{\pi^2 E I_2}{\ell^2} \dots \dots \dots (8)$$

一端固定, 另一端自由的场合:

The situation of one terminal fixing, and the other free

$$P_k = K_2 \frac{\pi^2 E I_2}{\ell^2} \dots \dots \dots (9)$$

两端回转的场合:

The situation of both two terminals returning

$$P_k = K_3 \frac{\pi^2 E I_2}{\ell^2} \dots \dots \dots (10)$$

式中(In the formula):

ℓ: 柱子的长度(Length of column) ..... mm

I: 柱子端面2次力矩(2nd moment of column end surface) ..... mm<sup>4</sup>

A: 柱子的断面积(Section area of column) ..... mm<sup>2</sup>

N: 端末系数(Terminal end coefficient)

E: 弹性模量(Modulus of elasticity) ..... kgf / mm<sup>2</sup>

δY: 柱子的屈服点(Yield point of column) ..... Kg / mm<sup>2</sup>

备注: (8)(9)(10)公式, 当柱子的应力在屈服点以下时成立。应力在屈服点以上时, 由于压缩应力, 柱子将会破坏。

Note: the formulas(8)(9)and(10)are effective Only if the stress Of column is below yield point.If the stress is above yield point, the column will be destroyed due to compression stress.

a 单柱的情况 <公式(6)、(7)的情况> (The situation of single column <formulas(6) and (7)>)

负载条件 Loading condition	支撑部形式 Forms of supporting parts	负载条件 Loading condition	支撑部形式 Forms of supporting parts	负载条件 Loading condition	支撑部形式 Forms of supporting parts
●一段固定另一端N=2 One terminal fixing and the other returning N=2	●支脚型 Stand bar type	●一段固定另一端N=2 One terminal fixing and the other returning N=2	●支脚型 Stand bar type	●两端自由N=1 Both ends are free N=1	●特殊固定型 Special installation of transverse
	●法兰型 Flange type		●法兰型 Flange type		

b 台阶柱的情况 <公式(8)、(9)、(10)的情况> (The situation of step column <formulas(8), (9), (10)>)

负载条件 Loading condition	支撑部形式 Forms of supporting parts	K值选择图表 Choosing of value of K
●一段固定另一端回转 One terminal fixing and the other returning	●头部耳环尾部法兰型 Head clevis and rear flanged	
●一段固定另一端自由 One terminal fixing and the other free	●头部透套杆尾部法兰型 Head rod and rear flanged	
●两端自由 Both ends are free	●头部耳环尾部耳环型 Head and rear clevis	
	●头部耳环中间铰链型 Head clevis and intermediate trunion	



## ELE 系列装载机、挖掘机油缸 ELE SERIES HYDRAULIC CYLINDER FOR LOADER AND EXCAVATOR

### § 概要

主要为大中型挖掘机使用所开发的高耐久高压油缸。适合于最高使用压力为35MPa、使用温度为-20℃~100℃(寒冷地区规格为-40℃~90℃)的使用条件。

### § Summary

This kind of durable high-pressure cylinder is designed for large or intermediate excavator with max. pressure of 35MPa and operating temperature -20℃~100℃(for cold area: -40℃~90℃)

### § 特点

ELE系列产品具有以下特点:

- 1、小型、轻量、高强度……采用根据负载频率分析的强度、疲劳设计、适应性的油缸体和活塞杆的选材及加工技术、焊接技术，通过超声波探伤检查，作为高压规格，实现小型、轻量、高强度、高可靠性。
- 2、密封系统……选用Parker密封件，以及本公司独特的密封系统设计，防止土砂尘埃，减少油漏，获得最佳

的活塞杆油膜。

3、缸体……按照合适强度、合适尺寸制造的本公司缸体的内面，经过滚光加工，达到了良好的粗糙度及表面硬度，提高了耐磨性。

4、活塞杆……以高频淬火为基础，通过镀覆镍硬铬，提高了防锈、耐磨以及耐蚀性能。另外，通过CNC数控滚光保证了表面网纹的均匀及高光洁度，从而保证了表面油膜的良好，提高产品寿命。

5、安全缓冲功能……根据需要，能够比较容易地安装各种具有专用慢回程、计数平衡以及紧急关闭等功能的阀。而且内藏能够在行程终端吸收冲击的缓冲机构。

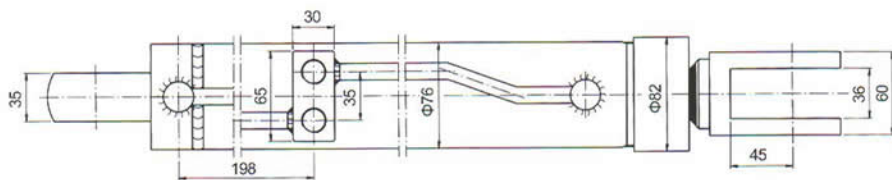
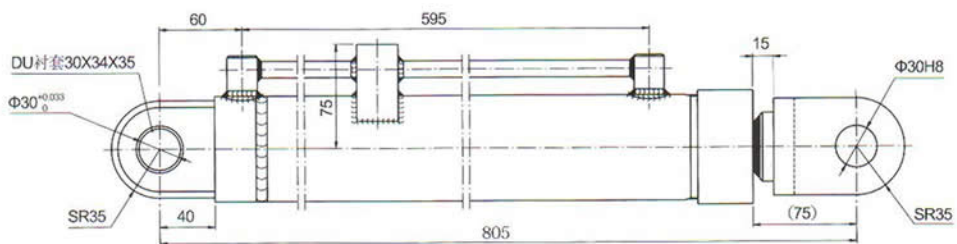
### § Features

ELE series products bear the following advantages:

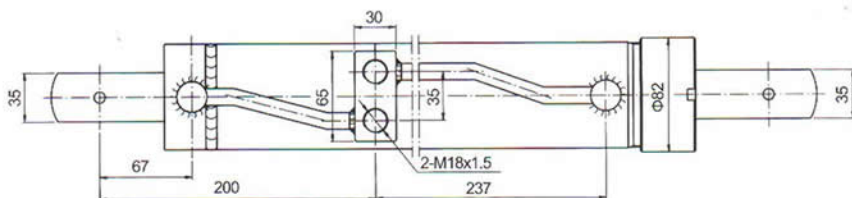
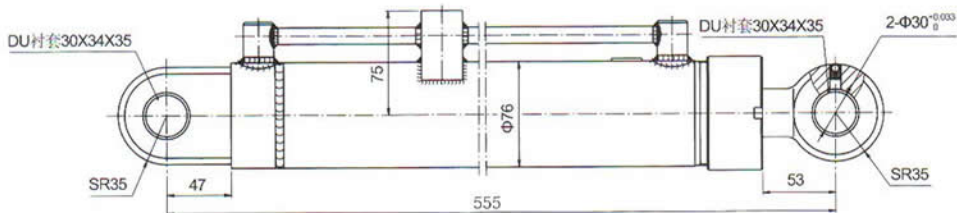
- Small size, light weight and high intensity……Intensity, fatigue design, adaptive cylinder designed as per loading frequency analysis are applied, and piston rod selection, processing technology, welding technology are inspected through ultrasonic fault detection. As it is designed for high pressure operation, it is featured in small size, light weight, high intensity and high reliability.
- Sealing system……seal rings of Parker as well as special designed sealing system are applied to prevent grit and dust, reduce oil leakage and obtain optimal piston rod oil film.
- Cylinder body……the cylinder inner surfaces manufactured as per appropriate intensity and dimensions have excellent roughness and rigidity and better wearing capacity after roll finishing.
- Piston rod……high frequency quenching followed by nickel chrome plating to improve rust proofing and wear and scar resisting performance.
- Safety/buffer functions……valves with slow stroke, counting balance and emergency Close can be installed easily according to requirements. The concealed ones can absorb the impact of buffer device at the end of stroke.



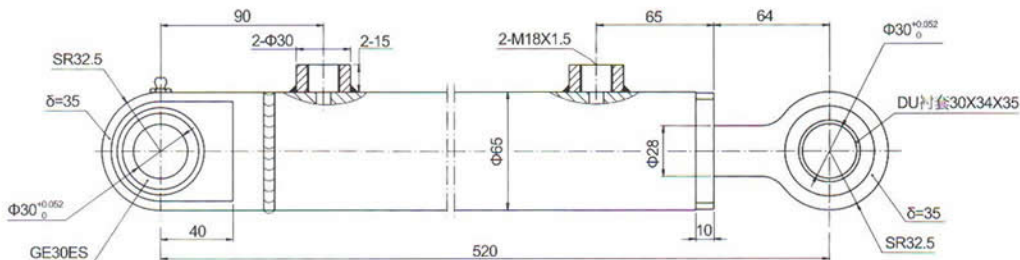
§ 外形图 Outline Dimensions



图一 装载机动臂油缸 Moving arm cylinder of loader



图二 装载机翻斗油缸 Tipper cylinder of loader

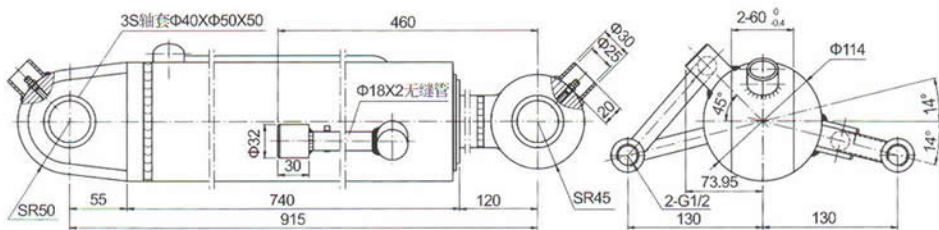


图三 装载机转向油缸 Turning cylinder of loader

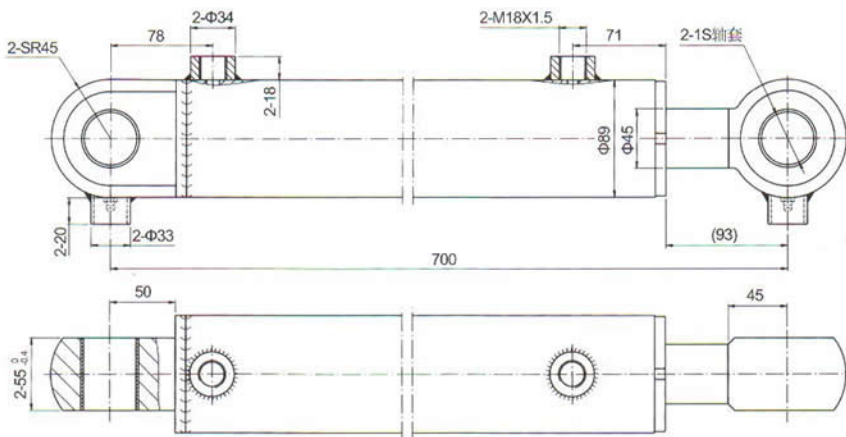
我公司生产的挖掘机用油缸是一种活塞式双作用液压油缸。可作为挖掘机的斗杆、铲斗、动臂、臂架等油缸。根据用户要求为各种吨位的挖掘机配套油缸。

The loader using cylinder we produced is a piston and double acting type. Which can be used in the pole, bucket, moving arm, side switch of loader. They are matched for different tonnage loader according to clients' requirements.

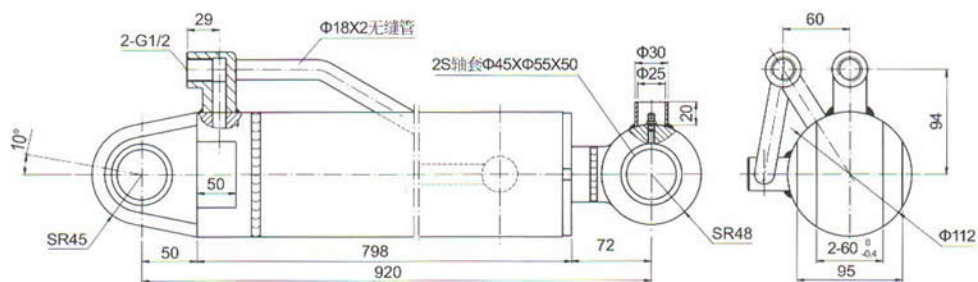
### § 外形图 Outline Dimensions



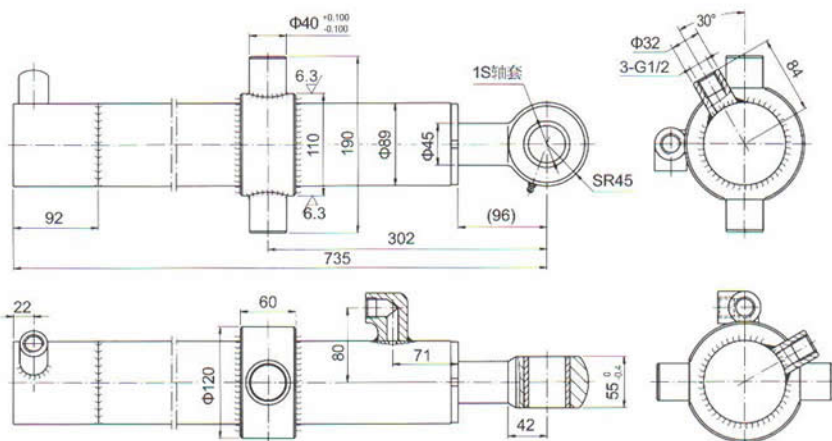
图四 挖掘机动臂油缸 Moving arm cylinder of excavator



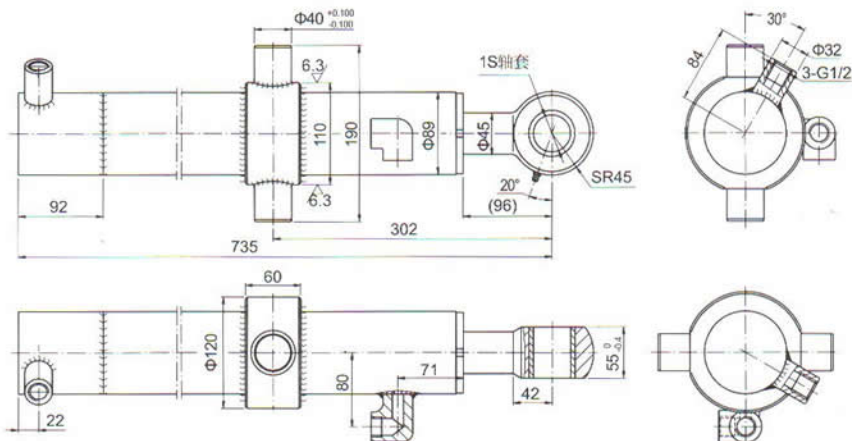
图五 挖掘机支腿油缸 Bracket cylinder of excavator



图六 挖掘机斗杆油缸 Pole cylinder of excavator

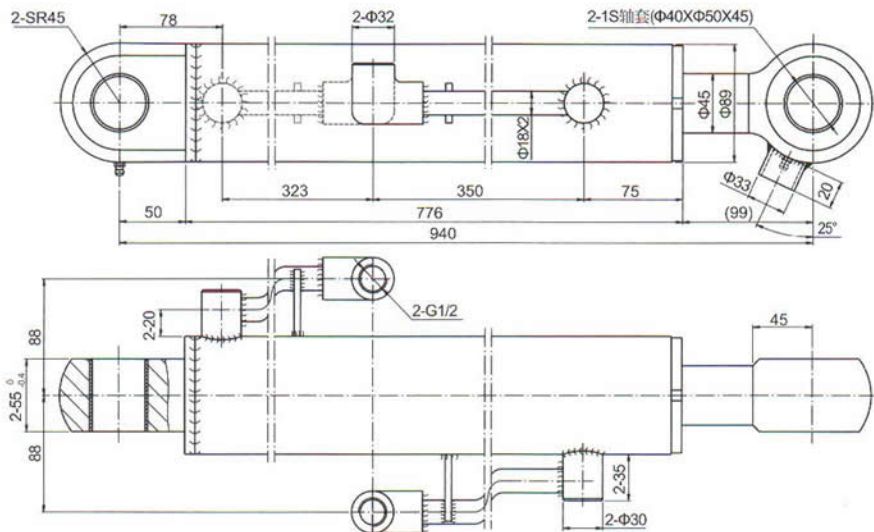


图七 挖掘机右偏摆油缸 Right side switch cylinder of excavator



图八 挖掘机左偏摆油缸 Left side switch cylinder of excavator





图九 挖掘机铲斗油缸 Bucket cylinder of excavator

型号 Model	名称 Name	公称压力 Pressure MPa	行程 Stroke mm	柱塞(缸径)直径 Dia. mm
ELE63/35x505	装载机动臂油缸 Moving arm cylinder of loader	16	505	63(35)
ELE63/35x330	装载机翻斗油缸 Tipper cylinder of loader		330	
ELE50/28x250	装载机转向油缸 Turning cylinder of loader		250	
ELE90/50x550	挖掘机动臂油缸 Moving arm cylinder of excavator	21	550	90(50)
ELE70/45x390	挖掘机支腿油缸 Bracket cylinder of excavator	16	390	70(45)
ELE85/50x580	挖掘机斗杆油缸 Pole cylinder of excavator	21	580	85(50)
ELE01-70/45x410	挖掘机右偏摆油缸 Right side switch cylinder of excavator	16	410	70(45)
ELE02-70/45x410	挖掘机左偏摆油缸 Left side switch cylinder of excavator			
ELE70/45x620	挖掘机铲斗油缸 Bucket cylinder of excavator			

## EDF系列叉车用重载型液压缸

## EDF series heavy duty cylinder for fork lifter

## § 概要

EDF系列缸是由14种缸径,分别按四种速比组成28种规格的单活塞双作用差动油缸。另外缸头法兰式、中间耳轴安装式和底座安装式三种还可做成双活塞杆双作用等速油缸,再加上无端部缓冲和两端部有缓冲(采用可调节节流)与上述28种规格组成384个品种。特别适合叉车等重载设备。

## § Summary

EDF series cylinder is single piston and double action difference hydraulic cylinder. There are 28 styles assembled by 14 kinds of cylinder diameters and 4 kinds of pressure rating. In addition, head flange style, intermediate trunnion style and base mounting style can be made for double piston rods and double action smooth speed cylinders. Otherwise, the styles can reach 384 styles assembled by optional adjustable cushions(use adjustable controlled value)and 28 standard styles. They are widely used in forklift and another heavy lift machines.



## § 特点

- 1、尺寸全,内径范围40-450mm。
- 2、种类全:包括单活塞差动油缸、双活塞杆双作用等速油缸。
- 3、可带缓冲装置。
- 4、连接方式多样,包括缸底衬套耳环连接,缸底球纹耳环连接,缸头法兰连接,缸底法兰连接,中间耳轴安装,底座安装。
- 5、密封系统...选用日本NOK和美国PARKER的能够克服恶劣使用条件的密封圈。以及本公司独特的密封系统,防止土砂尘埃,减少漏油。
- 6、缸体 按照合适强度、合适尺寸制造的本公司内面,经过滚光加工,达到了良好的粗糙度及表面硬度,提高了耐磨性。
- 7、活塞杆...以高频淬火为基础,通过镀铬硬铬,防锈、耐磨以及耐伤性能。
- 8、安全/缓冲功能...根据需要,能够比较容易地安装具有专用慢回程、计数平衡以及紧急关闭等功能的阀内藏能够在行程终端吸收冲击的缓冲结构。

## § Features

1. Have lots size,bore size from 40mm to 450mm
2. Many styles including single piston and double action difference hydraulic cylinder, double piston rods and double action smooth speed cylinders
3. cushion can be installed
4. lots of connecting way,inclusing cap eye bracket with bushing, cap eye bracket

with spherical bearing, head flange, cap flange, intermediate trunnion, base mounting.

5. Sealing system...seal rings of NOK from Japan and Parker from USA that can overcome engineering construction conditions,as well as special designed sealing system are applied to prevent grit and dust,reduce oil leakage.

6. Cylinder body...the thickness of cylinder body and flange can be changed;the cylinder inner surfaces manufactured as per appropriate intensity and dimensions have excellent roughness and rigidity and better wearing capacity after roll finishing.

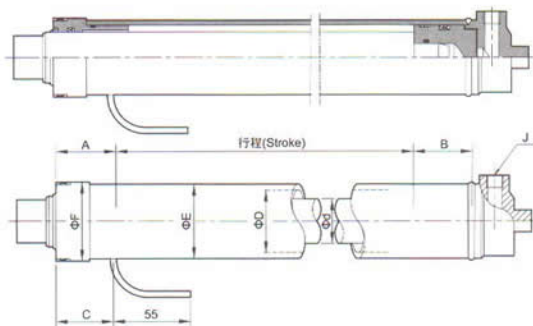
7. Piston rod...high frequency quenching followed by hard chrome plating to improve rust proofing and wear and scar resisting performance.

8. Safety/buffer functions...valves with slow stroke,counting balance and emergency close can be installed easily according to requirements.The concealed ones can absorb the impact of buffer device at the end of stroke.

### § EDF1 系列外形尺寸 EDF1 Series outline dimensions

升降(L1)油缸  
Lift cylinder (L1)

单位: mm  
UNit: mm



D	E	d	F	A	B	C	J	标准行程 Standard stroke
45	52	35	55	55	39	57	PF3/8	1000-2500
50	57	40	60					
55	63	45	65	PF1/2				
60	68		70	60	62			

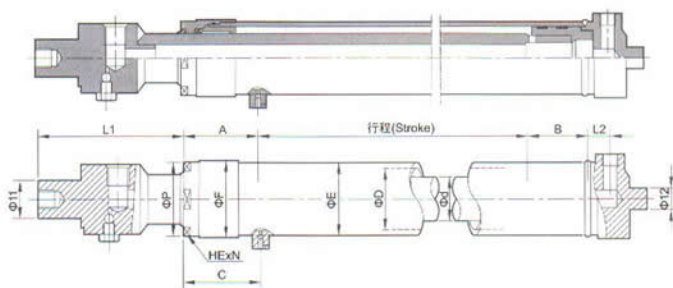
备注: 入口部和安装部位的尺寸(L1、 $\phi 11$ 、L2、 $\phi 12$ )以及其它尺寸可以按照订货和制定要求。

Note: See ordering and design requirements for dimensions(L1、 $\phi 11$ 、L2、 $\phi 12$ )of intake and installation position and other dimensions.

### § EDF2 系列外形尺寸 EDF2 Series outline dimensions

升降(L2)油缸  
Lift cylinder (L2)

单位: mm  
UNit: mm



D	d	E	F	P	N	A	B	C	标准行程 Standard stroke
45	32	53	63	60	55	58	50	65	1000-2000
45	35								
50	38	60	67	64	60	60	55	68	
50	40	65	73	70	65	60.5		68.5	
55	42								

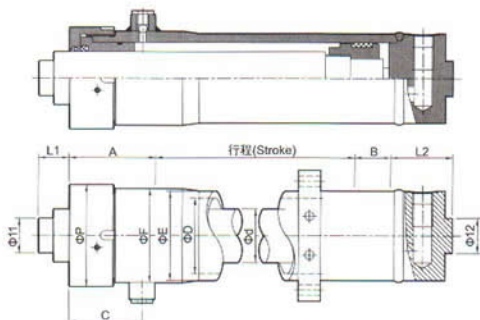
备注: 入口部和安装部位的尺寸(L1、 $\phi 11$ 、L2、 $\phi 12$ )以及其它尺寸可以按照订货和制定要求。

Note: See ordering and design requirements for dimensions(L1、 $\phi 11$ 、L2、 $\phi 12$ )of intake and installation position and other dimensions.

### § EDF3 系列外形尺寸 EDF3 Series outline dimensions

升降(L3)油缸  
Lift cylinder (L3)

单位: mm  
UNit: mm



D	d	E	F	P	A	B	C	标准行程 Standard stroke
80	70	91	99	106	65.5	35	66.5	650~1000
85	75	97	103	112				650~1200
90	80	103	111	118	80	40	81	650~1300
100	85	114	124	136				
100	90							

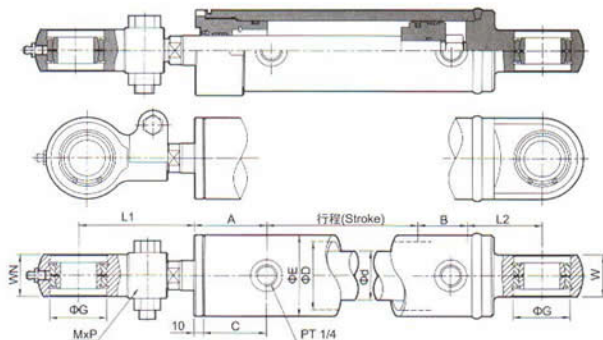
备注: 入口部和安装部位的尺寸(L1、φ11、L2、φ12)以及其它尺寸可以按照订货和制定要求。

Note: See ordering and design requirements for dimensions(L1、φ11、L2、φ12)of intake and installation position and other dimensions.

### § EDF 系列外形尺寸 EDF Series outline dimensions

俯仰油缸  
Pitch cylinder

单位: mm  
UNit: mm



D	E	b	A	B	C	G	W	MXP	行程 (最大) Stroke (Max.)
65	79	25	58	58	48	30	36	M24X2	250
70	84	30	60	60	60	35	40	M28X2	
80	96	63	63	63	53			M32X2	

备注: 入口部和安装部位的尺寸(L1、φ11、L2、φ12)以及其它尺寸可以按照订货和制定要求。

Note: See ordering and design requirements for dimensions(L1、φ11、L2、φ12)of intake and installation position and other dimensions.

## EAD系列高空作业液压缸

## EAD series cylinder for aerial device

### § 概要

EAD系列油缸是专门应用于高空作业车上的，要求有很高的稳定性和安全性，密封性，是高空作业车的核心部件。

### § Summary

EAD series cylinders are used in aerial device specially. It requires the cylinder have high Steady and safty, and good sealing system. It is a key part for the machine.



### § 特点

- 1、可带缓冲装置
- 2、密封系统…选用日本NOK和美国PARKER的能够确保安全高空作业使用条件的密封圈。以及本公司独特的密封系统，防止土砂尘埃，减少漏油。
- 3、缸体 按照合适强度、合适尺寸制造的本公司的内面，经过滚光加工，达到了良好的粗糙度及表面硬度，提高了耐磨性，而且100%经过严格的缸筒无损探伤检测。
- 4、活塞杆…以高频淬火为基础，通过镀覆硬铬，防锈、耐磨以及耐伤性能。
- 5、安全/缓冲功能…根据需要，能够比较容易地安装具有专用慢回程、计数平衡以及紧急关闭等功能的阀内藏能够在行程终端吸收冲击的缓冲结构。

### § Features

1. cushion can be installed
2. Sealing system... seal rings of NOK from Japan and Parker from USA that can sure highly safety when work in aerial place. They are applied to prevent grit and dust, reduce oil leakage.
3. Cylinder body... the thickness of cylinder body and flange can be changed; the cylinder inner surfaces manufactured as per appropriate intensity and dimensions have excellent roughness and rigidity and better wearing capacity after roll finishing. They have 100% nondestructive test.
4. Piston rod... high frequency quenching followed by hard chrome plating to improve rust proofing and wear and scar resisting performance.
5. Safety/buffer functions... valves with slow stroke, counting balance and emergency close can be installed easily according to requirements. The concealed ones can absorb the impact of buffer device at the end of stroke.



## EPC系列环卫车用液压缸

### EPC series cylinder for city cleaning machines



#### § 概要

EPC系列液压缸广泛应用于各种类型压缩环卫垃圾车液压系统。该系列液压缸包括推板缸、滑板缸、刮板缸、举升缸。有的为双作用单活塞油缸，有的为举升缸为柱塞缸。该系列液压缸结构合理、工作可靠、拆装方便、易于维修。另可根据用户特殊需要和技术参数进行特殊设计。

#### § Summary

EPC series cylinder are widely used in different city clear cars, garbage cars. This series include push board cylinder, slide board cylinder, scratch board cylinder, lift cylinder. There are two types, single piston rod double acting cylinder, and plunger type cylinder. It has the characteristic of reasonable construction, steady working, conveniently install and remove, and easily repair. We also can design the special model according to customer's requirements.

#### § 特点

- 1、尺寸全，内径范围25mm--300mm
- 2、可带缓冲装置
- 3、连接方式 耳环式，法兰式或根据客户要求
- 4、密封系统... 选用日本NOK和美国PARKER的耐磨密封圈。以及本公司独特的密封系统，防止土砂尘埃，减少漏油。
- 5、缸体 按照合适强度、合适尺寸制造的本公司的内圆，经过滚光加工，达到了良好的粗糙度及表面硬度，提高了耐磨性。
- 6、活塞杆... 以高频淬火为基础，通过镀铬硬铬，防锈、耐磨以及耐伤性能。
- 7、安全/缓冲功能... 根据需要，能够比较容易地安装具有专用慢回程、计数平衡以及紧急关闭等功能的阀内藏能够在行程终端吸收冲击的缓冲结构。

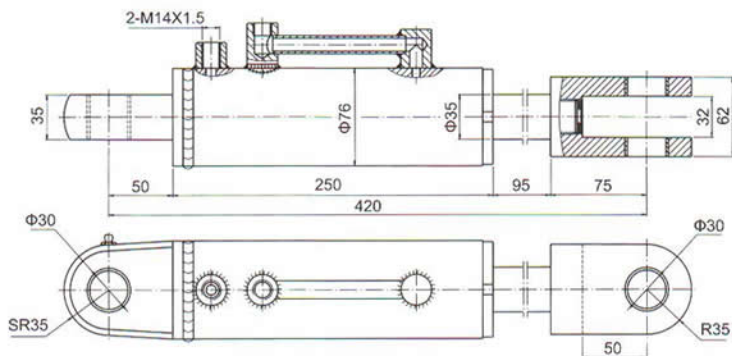
#### § Features

1. Have lots size, bore size from 25mm-300mm
2. cushion can be installed
3. Fixing type: trunnion or flange or according to custom's requirements
4. Sealing system... seal rings of NOK from Japan and Parker from USA that have good lifetime. They are applied to prevent grit and dust, reduce oil leakage.
5. Cylinder body... the thickness of cylinder body and flange can be changed; the cylinder inner surfaces manufactured as per appropriate intensity and dimensions have excellent roughness and rigidity and better wearing capacity after roll finishing.
6. Piston rod... high frequency quenching followed by hard chrome plating to improve rust proofing and wear and scar resisting performance.
7. Safety/buffer functions... valves with slow stroke, counting balance and emergency close can be installed easily according to requirements. The concealed ones can absorb the impact of buffer device at the end of stroke.

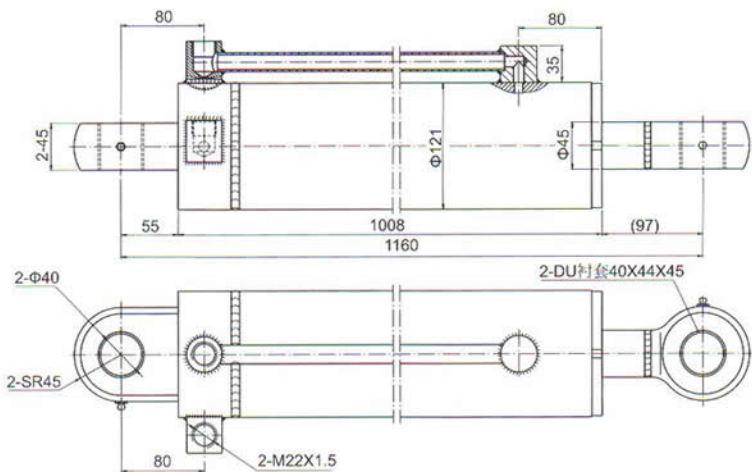


§ 外形图 Outline Dimensions

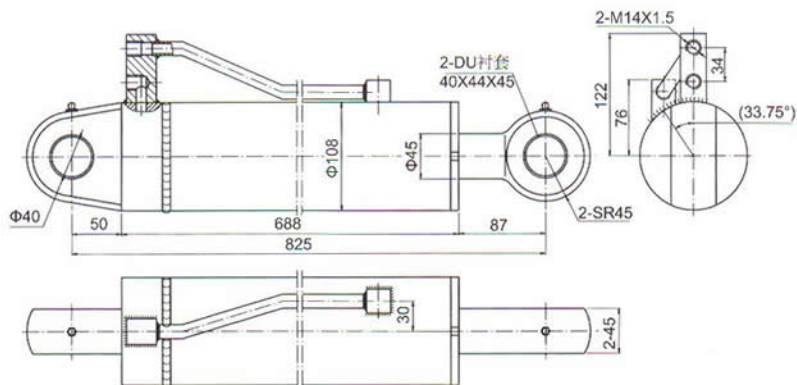
图一 翻转油缸  
 Overturn cylinder

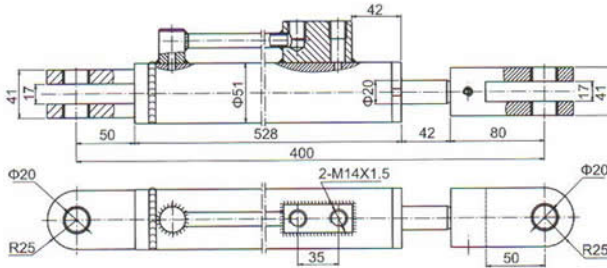


图二 升降油缸  
 Raise and fall cylinder

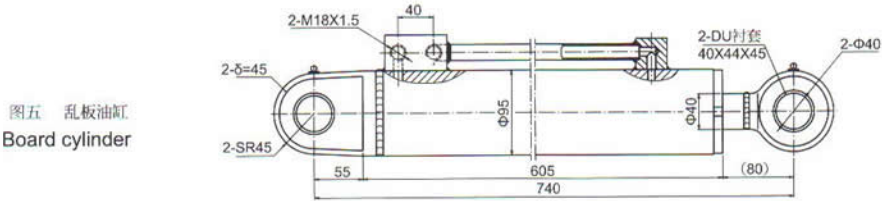


图三 举升油缸  
 Lift cylinder

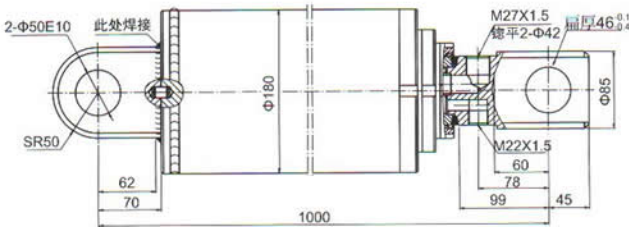




图四 锁销油缸  
Lockpin cylinder

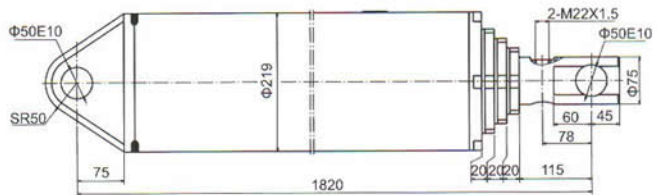


图五 乱板油缸  
Board cylinder



图六 多级双作用推板油缸  
Double stage double acting  
push board cylinder

图七 多级双作用环卫站推板油缸  
Double stage double acting city  
cleaning push board cylinder



§ 性能参数 Specification

型号 Model	名称 Name	公称压力 Pressure MPa	行程 Stroke mm	柱塞 (缸径) 直径 Dia. mm
EPC63/35-110x470	翻转油缸 Overturn cylinder	16	110	63(65)
EPC100/45x800	升降油缸(左、右) Raise and fall cylinder		800	100(45)
EPC90/45x485	举升油缸(左、右) Lift cylinder		485	90(45)
EPC40/20-400x700	锁销油缸 Lockpin cylinder		400	40(20)
EPC80/40x430	乱板油缸(左、右) Board cylinder	18	430	80(40)
3ETG150-1935Ax1000	多级双作用推板油缸 Double stage double acting push board cylinder	16	1935	150/120/90 (135/105/75)
4ETG180/5500	多级双作用环卫站推板油缸 Double stage double acting city cleaning push board cylinder		5500	180/150/120/90 (165/135/105/75)

本公司生产的环卫车辆用油缸是活塞式双作用液压力缸，可作为环卫车辆的后门提升、车辆旋转、物品压缩等，具有结构简单、维修方便、性能可靠等特点。可为1.5立方米、3立方米、5.5立方米、8立方米、20立方米等环卫车辆配套液压力缸。

The cleaning machine using cylinder we produced is a piston and double acting type, they can be used for back door lift, vehicle swing, goods compression, etc. It has the characteristic of simple construction, easily repair, steady function, etc. They are matched for different volume cleaning city vehicle, including 1.5cbm,3cbm,5.5cbm,8cbm,20cbm and so on.



## EFR系列森林机械液压缸

### EFR series cylinder for forest machines

#### § 概要

EFR系列液压缸是一种单活塞双作用液压缸，应用于各种森林机械车辆。该款缸要求性能稳定、耐腐、耐脏，能克服森林作业环境等特点。

#### § Summary

EFR series cylinder is a type of single piston rod and double acting cylinder, they are designed for different forest machines specially. This series cylinder has the characteristic of steady fuction, good abrasability, anti heavy dirty and can overcome the forest working enviroment.

#### § 特点

- 1.尺寸全，内径范围25mm-300mm
- 2.可带缓冲装置
- 3.连接方式 耳环式或根据客户要求
- 4.密封系统...选用日本NOK和美国PARKER的耐磨密封圈。以及本公司独特的密封系统，防止土砂尘埃，减少漏油。
- 5.缸体 按照合适强度、合适尺寸制造的该公司的内面，经过抛光加工，达到了良好的粗糙度及表面硬度，提高了耐磨性。
- 6.活塞杆...以高频淬火为基础，通过镀铬硬铬，防锈、耐磨以及耐伤性能。
- 7.安全/缓冲功能...根据需要，能够比较容易地安装具有专用慢回程、计数平衡以及紧急关闭等功能的或内置能够在行程终端吸收冲击的缓冲结构。

#### § Features

- 1.Many size,bore size from 25mm-300mm
- 2.Cushion can be installed
- 3.Fixing type: trunnion or according to custom's requirements
- 4.Sealing system...seal rings of NOK from Japan and Parker from USA that have good lifetime.They are applied to prevent

grit and dust,reduce oil leakage.

5.Cylinder body...the thickness of cylinder body and flange can be changed;the cylinder inner surfaces manufactured as per appropriate intensity and dimensions have excellent roughness and rigidity and better wearing capacity after roll finishing.

6.Piston rod...high frequency quenching followed by hard chrome plating to improve rust proofing and wear and scar resisting performance.

7.Safety/buffer functions...valves with slow stroke,counting balance and emergency close can be installed easily according to requirements.The concealed ones can absorb the impact of buffer device at the end of stroke.



## ERM系列压路机械液压缸

## ERM series cylinder for vibratory roller.

### § 概要

ERM系列液压缸是一种高压的重型液压缸，用于液压力振动压路机，该设备是对碎石，沙土，粘土等材料进行高密度的压实，是道路，机场，矿山，铁路及其他工业场所的基础及路面施工的必要设备。

### § Summary

ERM series hydraulic cylinder is a type of high pressure and heavy duty cylinder. They are used in different hydraulic vibratory roller which is suitable for non-cohesive soils, gravel, macadam, sand gravel mixture and various concretes. It's indispensable compaction equipment for highway mine road, dams, airports, harbors, industry ground and building base.



### § 特点

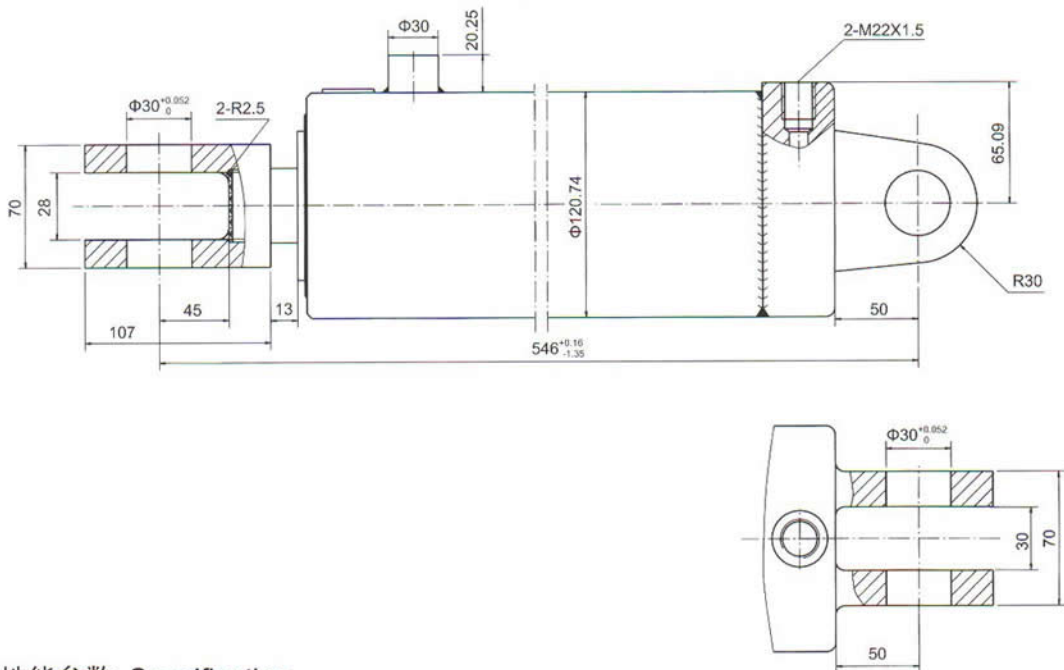
1. 高强度...采用根据负载频率分析的强度、疲劳设计、适应性的油缸体和活塞杆的选材及加工技术、焊接技术、通过超声波探伤检验，作为高压规格，实现高密度、高可靠性。
2. 密封系统...选用日本NOK和美国PARKER的能够克服恶劣使用条件的密封圈。以及本公司独特的密封系统，防止土砂尘埃，减少漏油。
3. 缸体 按照合适强度、合适尺寸制造的本公司的内面，经过滚光加工，达到了良好的粗糙度及表面硬度，提高了耐磨性。
4. 活塞杆...以高频淬火为基础，通过镀铬镀铬，防锈、耐磨以及耐腐蚀性能。
5. 安全/缓冲功能...根据需要，能够比较容易地安装具有专用慢回程、计数平衡以及紧急关闭等功能的阀内藏能够在行程终端吸收冲击的缓冲结构。

### § Features

1. High intensity...Fatigue design, adaptive cylinder designed as per loading frequency analysis are applied, and piston rod selection, processing technology, welding technology are inspected through ultrasonic fault detection. As it is designed for high pressure operation, it is featured in high intensity and high reliability.
2. Sealing system...seal rings of NOK from Japan and Parker from USA that can ensure highly safety when work in aerial place. They are applied to prevent grit and dust, reduce oil leakage.
3. Cylinder body...the thickness of cylinder body and flange can be changed; the cylinder inner surfaces manufactured as per appropriate intensity and dimensions have excellent roughness and rigidity and better wearing capacity after roll finishing. They have 100% nondestructive test.
4. Piston rod...high frequency quenching followed by hard chrome plating to improve rust proofing and wear and scar resisting performance.
5. Safety/buffer functions...valves with slow stroke, counting balance and emergency close can be installed easily according to requirements. The concealed ones can absorb the impact of buffer device at the end of stroke.



§ 外形图 Outline Dimensions



§ 性能参数 Specification

型号 Model	名称 Name	公称压力 Pressure MPa	行程 Stroke mm	柱塞（缸径）直径 Dia. mm
ERM100/45x254 Series	转向油缸 Steering cylinder	18	254	100(45)
ERM100/45x254 Series				
ERM01-100/45x274 Series			274	
ERM02-100/45x274 Series				

我公司生产的压路机油缸是一种活塞式液缸为各种机型的压路机配套，专为压路工作转向作用。我公司根据用户需求设计、制造各种规格的压路机转向油缸。

Vibratory roller cylinder we produces is a piston style cylinder, it can be matched for different models of vibratory roller. They are used for changing direction. We can design and make different specs steering cylinder according to clients' requirements.

WE MAKE PROGRESS EVERY DAY

## EFM系列农用机械液压缸

## EFM series cylinder for farmer machine

### § 概要

EFM系列农用缸一般为双作用单活塞杆液压缸，多用于各种农用机械上，可进行大规模的全自动的犁田，耕种等各种农田作业方式。具有高频率，高强度等特点。

### § Summary

EFM series farmer cylinder is a type of single piston rod and double acting cylinder, They are used in many farmer machines, They are suitable for automatic furrow, farming and other farmland works. This series cylinder has the characteristic of high frequency, high intensity and so on.

### § 特点

- 1、高强度,高频率...采用根据负载频率分析的强度、疲劳设计、适应性的油缸体和活塞杆的材质及加工技术、焊剂技术。通过超声波探伤检验,作为高压规格,实现高密度、高可靠性。
- 2、尺寸全,内径范围40-250mm
- 3、压力等级:16-32Mpa;
- 4、安装方式:耳环型或根据用户要求;
- 5、密封系统...选用日本NOK和美国PARKER的能够克服农田作业的密封圈。以及本公司独特的密封系统,防止土沙尘埃,减少漏油。
- 6、缸体按照合适强度、合适尺寸制造的,经过滚光加工,达到了良好的粗糙度及表面硬度,提高了耐磨性。
- 7、活塞杆...以高频淬火为基础,通过镀硬铬,防锈、耐磨以及耐伤性能。
- 8、安全/缓冲功能...根据需要,能够比较容易地安装具有专用慢回程、计数平衡以及紧急关闭等功能的阀内藏能够在行程终速吸收冲击的缓冲结构。

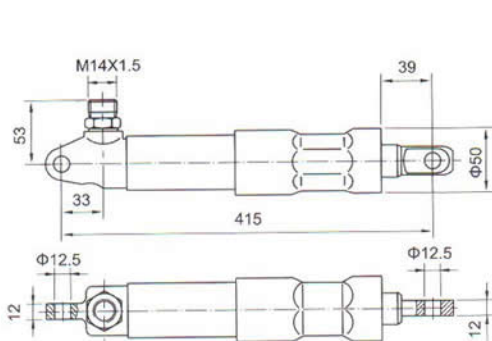


### § Features

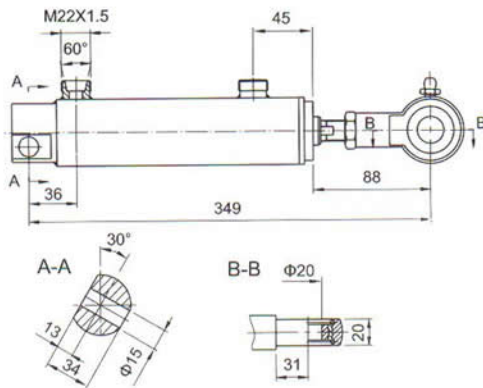
1. High intensity, high speed... Intensity, fatigue design, adaptive cylinder designed as per loading frequency analysis are applied, and piston rod selection, processing technology, welding technology are inspected through ultrasonic fault detection. As it is designed for high pressure operation, it is featured in light weight, high intensity and high reliability.
2. many sizes, bore size from 40mm to 250mm
3. Working pressure: 16-32 Mpa;
4. Fixing type: trunnion or according to custom's requirements
5. Sealing system... seal rings of NOK from Japan and Parker from USA that can overcome engineering construction conditions, as well as special designed sealing system are applied to prevent grit and dust, reduce oil leakage.
6. Cylinder body... the thickness of cylinder body and flange can be changed; the cylinder inner surfaces manufactured as per appropriate intensity and dimensions have excellent roughness and rigidity and better wearing capacity after roll finishing.
7. Piston rod... high frequency quenching followed by hard chrome plating to improve rust proofing and wear and scar resisting performance.
8. Safety/buffer functions... valves with slow stroke, counting balance and emergency close can be installed easily according to requirements. The concealed ones can absorb the impact of buffer device at the end of stroke.



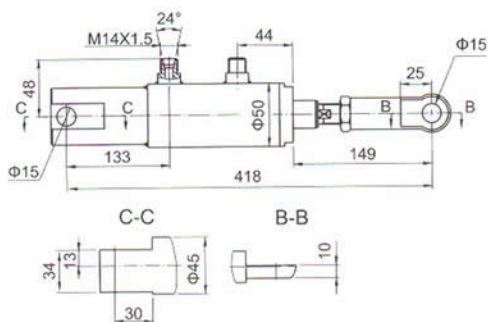
5 外形图 Outline Dimensions



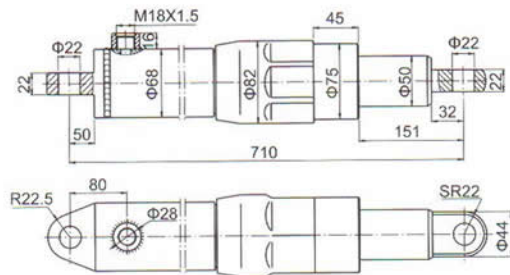
图一 EFM25A拨禾轮油缸 Reel cylinder



图二 EFM40E转向油缸 Steering cylinder



图三 EFM40F调速油缸 Adjust speed cylinder



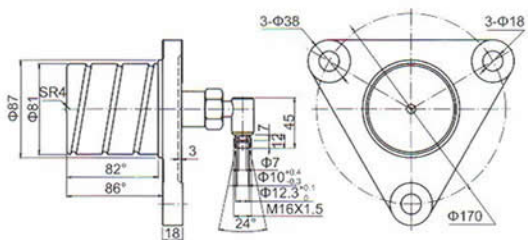
图四 EFM50B1割台升降油缸 Lift cylinder

5 性能参数 Specification

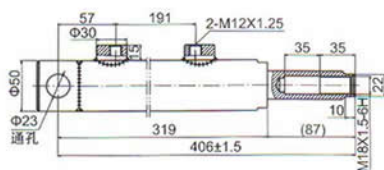
型号 Model	名称 Name	公称压力 Pressure MPa	行程 Stroke mm	柱塞杆(缸径)直径 Dia. mm	重量 Weight kg
EFM25A	拨禾轮油缸 Reel cylinder	16	240	25	3.7
EFM50B1	割台升降油缸 Lift cylinder		350	50	
EFM40E	转向油缸 Steering cylinder		153	40 (活塞) (Piston)	3.1
EFM40F	调速油缸 Adjust speed cylinder		67	40 (活塞) (Piston)	3.6

我公司生产的EFM25A、EFM50B1、EFM40E、EFM40F1系列液压油缸是农用机械专用油缸，由EFM25A拨禾轮油缸、EFM50B1割台升降油缸、EFM40E转向油缸、EFM40F调速油缸组成，深得农用机械厂家信赖。

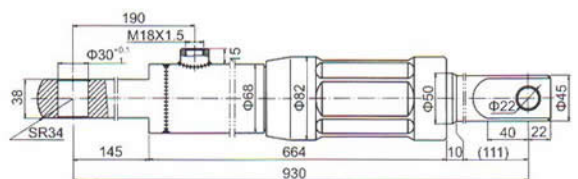
EFM25A、EFM50B1、EFM40E、EFM40F1 series cylinder is a Farmer machine using special cylinder, it includes EFM25A reel cylinder, EFM50B1 lift cylinder, EFM40E steering cylinder, EFM40F adjust speed cylinder. It is trust Product for most union Farmer machine factory.



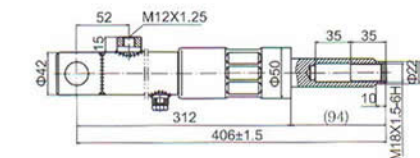
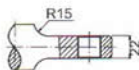
图一 EFM-E45无级变速油缸 Speed cylinder



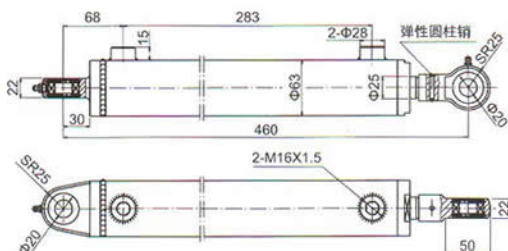
图四 EFM-E40/28X200拨禾轮升降主动油缸 Active reel cylinder



图二 EFM-E50X500割台升降油缸 Lift cylinder



图三 EFM-E32/28X200拨禾轮升降从动油缸 From move reel cylinder



图五 EFM-E50/25X250转向油缸 Steering cylinder

## 性能参数 Specification

型号 Model	名称 Name	公称压力 Pressure MPa	行程 Stroke mm	柱塞杆(缸径)直径 Dia. mm
EFM-E45	无级变速油缸 Speed cylinder	16	26	45
EFM-E50x500	割台升降油缸 Lift cylinder		500	50
EFM-E32/28x200	拨禾轮升降从动油缸 From move reel cylinder		200	32
EFM-E40/28x200	拨禾轮升降主动油缸 Active reel cylinder		200	40
EFM-E50/25x250	转向油缸 Steering cylinder		250	50

我公司生产的农业机械系列专用油缸由: EFM-E50x500割台油缸、EFM-E45无级变速油缸、EFM-E40/28x200拨禾轮主动油缸、EFM-E32/28x200拨禾轮从动油缸、EFM-E50/25x250转向油缸组成。

The special Farmer machine cylinder we produced including: EFM-EE50X500 lift cylinder, EFM-E45 speed cylinder, EFM-E40/28X200 active reel cylinder, EFM-E32/28X200 from move reel cylinder, EFM-E50/25X250 steering cylinder.

## ESG系列工程机械液压缸

## ESG series cylinder for engineering machine

### § 概要

ESG系列双作用单杆活塞式液压缸，是液压系统中作往复直线运动的执行机构。该系列液压缸广泛应用于工程机械的各种车辆。

### § Summary

ESG series double acting and single rod type hydraulic cylinder is the component that takes reciprocating line action. They can be used in different engineering machineries.

### § 特点

- 1.结构简单、工作可靠、装卸方便、易于维修。
- 2.可带缓冲装置
- 3.连接方式多样，包括缸头耳环带衬套连接，缸头耳环带关节轴承连接，铰轴连接，端部法兰连接，中部法兰连接
- 4.密封系统...选用日本NOK和美国PARKER的能够克服筑业使用条件的密封圈。以及本公司特有的密封系统，防止土砂尘埃，减少漏油。
- 5.缸体 按照合适强度、合适尺寸制造的本公司的内面，经过滚光加工，达到了良好的粗糙度及表面硬度，提高了耐磨性。
- 6.活塞杆...以高频淬火为基础，通过镀铬镀铬，防锈、耐磨以及耐压性能。
- 7.安全/缓冲功能...根据需要，能够比较容易地安装具有专用慢回程、计数平衡以及紧急关闭等功能的阀内藏能够在行程终端吸收冲击的缓冲结构。

### § Features

- 1.Simple structure, stable work, easy installation and disassembly, easy repair
- 2.cushion can be installed
- 3.lots of connecting way,including Head eye bracket with bushing, Head eye bracket with spherical bearing, trunnion, Cap flange, Intermediate flange
- 4.Sealing system...seal rings of NOK from Japan and Parker from USA that can overcome engineering construction conditions.as well as special designed sealing system are applied to prevent grit and dust,reduce oil leakage.
- 5.Cylinder body...the thickness of cylinder body and flange can be changed;the cylinder inner surfaces manufactured as per appropriate intensity and dimensions have excellent roughness and rigidity and better wearing capacity after roll finishing.
- 6.Piston rod...high frequency quenching followed by hard chrome plating to improve rust proofing and wear and scar resisting performance.
- 7.Safety/buffer functions...valves with slow stroke,counting balance and emergency close can be installed easily according to requirements.The concealed ones can absorb the impact of buffer device at the end of stroke.



### § 安装方式 Mounting

代号 Code	安装方式 Mounting	备注 Notice
1	单耳环 (带轴套) Single articulated clevis (with bush)	
2	单耳环 (带关节轴承) Single articulated clevis (with oscillating bearing)	
3	中间耳轴 Middle trunnion	缸径 ≥ 80 Bore
4	前端法兰 Front flange	缸径 ≥ 80 Bore
5	中间法兰 Middle flange	缸径 ≥ 80 Bore

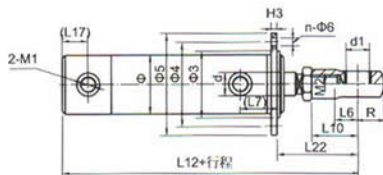
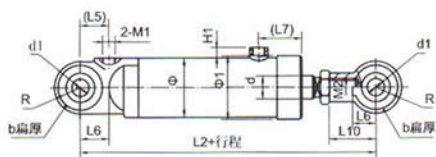
### § 活塞杆端联接方式 Connecting Style

代号 Code	安装方式 Mounting	备注 Notice
1	杆端外螺纹 Outside screw	
2	杆端外螺纹单耳环 (带轴套) Outside screw and articulated clevis (with bush)	
3	杆端外螺纹单耳环 (带关节轴承) Outside screw and articulated clevis (with oscillating bearing)	
4	杆端整体式单耳环 (带轴套) One piece single articulated clevis (with bush)	
5	杆端外螺纹单耳环 (带关节轴承) One piece single articulated clevis (with oscillating bearing)	

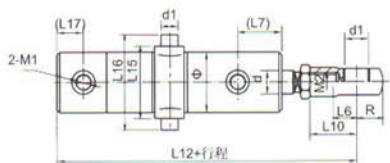
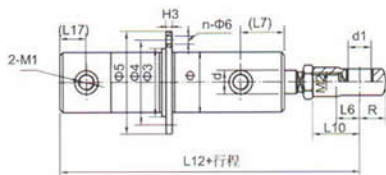
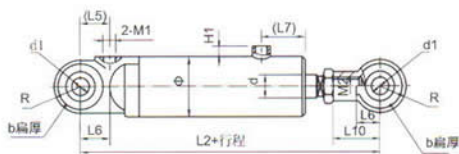
### § 性能参数 Specification

缸径 Bore D	活塞杆径 Rod			推力 Pushing force (kN)	压力 Pressure 16MPa		
	速比 Speed ratio				拉力 Pull force (kN)		
	1.33	1.46	2(1.46)		速比=1.33 Speed ratio	速比=1.46 Speed ratio	速比=2 Speed ratio
32	16	18	※20	12.9	9	8.8	※7.8
40	20	22	25	20.1	15.1	14.0	12.3
50	25	28	32	31.4	23.6	21.6	18.5
63	32	35	45	49.9	37.0	34.5	24.4
80	40	45	55	80.4	60.3	55.0	42.4
90	45	50	63	101.8	76.3	70.4	51.9
100	50	55	70	125.7	94.3	87.7	64.1
110	55	63	80	152.1	114.0	102.2	71.6
125	63	70	90	196.4	146.5	134.8	94.6
140	70	80	100	246.3	184.7	165.9	120.6
150	75	85	105	282.7	212.1	191.9	144.2
160	80	90	110	321.7	241.3	219.9	169.7
180	90	100	125	407.2	305.4	281.5	210.8
200	100	110	140	502.7	377.0	350.6	256.4
220	110	125	160	608.2	456.2	411.9	286.5
250	125	140	180	785.4	589.1	539.1	378.3

### § 外形图 Outline Dimensions







注: ( ) 表示为参考尺寸  
Note: ( ) means for consult size

### § 性能参数 Specification

缸径 Bore D	φ		d			d1	R	b	L <sub>5</sub>	M <sub>2</sub>	L <sub>10</sub>	L <sub>5</sub>	L <sub>7</sub>	L <sub>2</sub>	2-M <sub>1</sub>	H <sub>1</sub>	φ <sub>1</sub>	
	压力等级 Pressure		速比 Speed ratio															
	16	20	25	1.33	1.46													2(1.64)
32	42	48	16	18	20	16或GE16ES	20	18	20	M14x1.5	40	40	33.5	200	M14x1.5	15	50	
40	51	57	20	22	25	20或GE20ES	25	30	M16x1.5	50	30		225	M18x1.5			18	65
50	65	68	25	28	32	30或GE30ES	35	40	M22x1.5	60	40	60	243					M22x1.5
63	78	80	32	35	45	40或GE40ES	45	50	M27x1.5	65	50	70	258		M27x2	22		
80	95	102	40	45	55	60或GE60ES	60	65	M33x1.5	80	60	72	300	M33x2			24	
90	108	114	45	50	63	70或GE70ES	70	75	M36x2	90	70	66	305					M42x2
100	118	127	50	55	70	80或GE80ES	80	85	M42x2	110	80	77	340		M42x2	25		
110	130	133	55	63	80	90或GE90ES	90	95	M48x2	115	80	78	360	M42x2			25	
125	145	152	63	70	90	100或GE100ES	100	105	M52x2	140	85	85	370					M42x2
140	164	168	70	80	100				M60x2	155	90	85	405		M42x2	25		
150	180	185	75	85	105				M64x2	160	95	92	420	M42x2			25	
160	194	80	90	110					M68x2	170	100	100	435					M42x2
180	219	90	100	125					M76x2	190	110	107	480		M42x2	25		
200	245	100	110	140					M85x2	210	120	110	510	M42x2			25	
220	273	110	125	160					M95x2	220	130	120	560					M42x2
250	299	125	140	180					M105x2	255	140	135	614		M42x2	25		

缸径 Bore D	L <sub>15</sub>	L <sub>18</sub>	L <sub>12</sub>	L <sub>17</sub>	φ <sub>3</sub>	φ <sub>4</sub>	φ <sub>5</sub>	H <sub>3</sub>	L <sub>22</sub>	n-φ <sub>6</sub>
80	125	185	275	25	115	145	175	20	128	8-φ13.5
90	140	200	280		130	160	190		134	8-φ15.5
100	155	230	310	30	145	180	210	22	150	8-φ18
110	170	245	330		160	195	225		157	8-φ18
125	185	260	340	35	175	210	240	24	180	10-φ18
140	200	290	370		190	225	260		201	10-φ20
150	215	305	385	42	205	245	285	26	207	10-φ22
160	230	320	400		220	260	300		217	10-φ22
180	255	360	440	50	245	285	325	28	238	10-φ24
200	285	405	460	53	275	320	365	32	261	10-φ26
220	320	455	503	55	305	355	405	34	285	10-φ29
250	350	500	540		330	390	450	36	311	12-φ32

## RDG系列旋挖钻机用液压缸

## RDG series cylinder for Rotary Drill Rig

## § 概要

RDG系列旋挖钻机用液压缸一般为双作用单活杆液压力缸，专门应用于各种旋挖钻机设备，广泛应用于我国的公路、铁路、桥梁和大型建筑的基础桩施工。

## § Summary

RDG series Rotary Drill Rig cylinder is a type of single piston rod an double acting cyliner,

They are used in different Rotary Drill Rig machines,which is popular in highway construction,

Railway construction,bridge construction and big construction project.

## § 特点

- 1.小型、高强度...采用根据负载频率分析的强度、疲劳设计、适应性的油缸体和活套杆的选材及加工技术、焊接技术、通过超声波探伤检验，作为高压规格，实现轻量、高密度、高可靠性。
- 2.内径：40-250mm
- 3.安装方式：耳环型或根据用户要求。
- 4.密封系统...选用日本NOK和美国PARKER的能够克服钻挖等工程作业的密封圈。以及本公司独特的密封系统，防止土砂尘埃，减少漏油。
- 5.缸体 按照合适强度、合适尺寸制造的本公司内面，经过滚光加工，达到了良好的粗糙度及表面硬度，提高了耐磨性。
- 6.活套杆...以高频淬火为基础，通过镀铬镀铬，防锈、耐磨以及耐伤性能。
- 7.安全/缓冲功能...根据需要，能够比较容易地安装具有专用慢回程、计数平衡以及紧急关闭等功能的阀内藏能够在行程终端吸收冲击的缓冲结构。

## § Features

1. Small size,and high intensity...Intensity,fatigue design,adaptive cylinder designed as per loading frequency analysis are applied,and piston rod selection,processing technology,welding technology are inspected through ultrasonic fault detection.As it is designed for high pressure operation,it is featured in small size,light weight,high intensity and high reliability.

2.bore size: 40mm- 250mm

3.Fixing type: trunnion or according to custom's requirements

4.Sealing system...seal rings of NOK from Japan and Parker from USA that can overcome engineering construction such as drilling,digging.as well as special designed sealing system are applied to prevent grit and dust,reduce oil leakage.

5.Cylinder body...the thickness of cylinder body and flange can be changed;the cylinder inner surfaces manufactured as per appropriate intensity and dimensions have excellent roughness and rigidity and better wearing capacity after roll finishing.

6.Piston rod...high frequency quenching followed by hard chrome plating to improve rust proofing and wear and scar resisting performance.

7.Safety/buffer functions...valves with slow stroke,counting balance and emergency close can be installed easily according to requirements.The concealed ones can absorb the impact of buffer device at the end of stroke.



## ETG系列多级缸

## ETG series telescopic cylinder

### § 概要

ETG系列多级缸适用于行程大而安装距或总长小（行程可以大于安装距或总长）的情况，有单作用和双作用。公司生产的ETG系列液压缸布局紧凑、结构合理、工作可靠、拆装方便、易于维修，广泛用于各类工程机械、矿山机械、起重运输机械、环保机械、交通机械(清障车)等。该液压缸的工作压力、工作行程、安装距、使用级数、各级行程和缸径等参数可根据用户需要进行设计。

### § Summary

ETG series telescopic cylinder are suitable for the machine which require long stroke, and short length, including single acting and double acting. The cylinder we produces are compact design, reasonable construction, reliable working, and convenient disassembling, easily repair. They are widely used in engineering construction, milling machine, lifter machine, environment cleaning machine, vehicles and etc. The spec include working pressure, stroke, fixing distance, stage quantity, stroke for different stage and bore size, piston rod size, etc are made according to customs' requirements.

### § 特点

1. 小型、高强度... 采用根据负载频率分析的强度、疲劳设计、探伤检验，作为高压规格，实现轻量、高密度、高可靠
2. 密封系统... 选用日本NOK和美国PARKER的能够减少漏油。
3. 缸体 按照合适强度、合适尺寸制造的本公
4. 活塞杆... 以高频淬火为基础，通过镀铬硬

计、适应性的油缸体和活塞杆的选材及加工技术、焊接技术、通过超声波性。

克服钻控等工程作业的密封圈。以及本公司独特的密封系统，防止土砂尘埃，减

司的内面，经过滚光加工，达到了良好的粗糙度及表面硬度，提高了耐磨性。

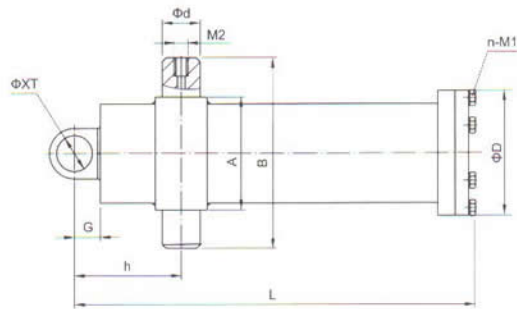
蚀、防锈、耐磨以及耐伤性能。

### § Features

1. Small size, and high intensity... Intensity, fatigue design, adaptive cylinder designed as per loading frequency analysis are applied, and piston rod selection, processing technology, welding technology are inspected through ultrasonic fault detection. As it is designed for high pressure operation, it is featured in small size, light weight, high intensity and high reliability.
2. Sealing system... seal rings of NOK from Japan and Parker from USA that can overcome engineering construction conditions, as well as special designed sealing system are applied to prevent grit and dust, reduce oil leakage.
3. Cylinder body... the thickness of cylinder body and flange can be changed; the cylinder inner surfaces manufactured as per appropriate intensity and dimensions have excellent roughness and rigidity and better wearing capacity after roll finishing.
4. Piston rod... high frequency quenching followed by hard chrome plating to improve rust proofing and wear and scar resisting performance.



§ 外形图 Outline Dimensions



§ 型号说明 Modle Coding

4 ETG - E 110 x 250



§ 性能参数 Specification

型号 Model	套筒直径 Bore	总行程 Total stroke	压力 Pressure 16MPa		B	A	d	L	ΦXT	n-M <sub>1</sub>	D	M <sub>2</sub>	G	h
			首级推力 First level pushing force (KN)	末级推力 End level pushing force (KN)										
4ETG-E110x250	110-90-70-50	1000	152	31.4	252	150	50	437	Φ30X35	8-M12	170	M22X1.2	30.5	150
4ETG-E110x300		1200												
4ETG-E110x340		1360												
3ETG-E110x250	110-90-70	750	152	61.6	240	140	50	437	Φ30X35	8-M12	170	M22X1.2	30.5	137
3ETG-E110x300		900												
3ETG-E110x340		1020												
4ETG-E110x250	100-80-60-40	1000	125.7	20.1	240	140	50	437	Φ20X30	8-M12	165	M22X1.2	25	150
4ETG-E110x300		1200												
4ETG-E110x340		1360												
3ETG-E110x250	100-80-60	750	125.7	45.2	212	132	50	437	Φ30X35	8-M12	165	M22X1.2	30.5	150
3ETG-E110x300		900												
3ETG-E110x340		1020												
3ETG-E90x250	90-70-50	750	101.8	31.4	212	132	40	437	Φ30X35	8-M12	150	M22X1.2	30.5	150
3ETG-E90x300		900												
3ETG-E90x340		1020												
2ETG-E90x250	90-70	500	101.8	61.6	200	120	40	437	Φ30X35	8-M12	150	M22X1.2	30.5	137
2ETG-E90x300		600												
2ETG-E90x340		680												
3ETG-E80x250	80-60-40	750	80.4	20.1	200	120	40	437	Φ20X30	8-M12	140	M22X1.2	25	150
3ETG-E80x300		900												
3ETG-E80x340		1020												
2ETG-E80x250	80-60	500	80.4	45.2	200	120	40	437	Φ30X35	8-M12	140	M22X1.2	30.5	137
2ETG-E80x300		600												
2ETG-E80x340		680												
2ETG-E70x250	70-50	500	61.6	31.4	169	109	30	437	Φ30X35	8-M12	130	M22X1.2	30.5	137
2ETG-E70x300		600												
2ETG-E70x340		680												
2ETG-E60x250	60-40	500	45.2	20.1	157	97	30	437	Φ20X30	8-M12	120	M22X1.2	25	137
2ETG-E60x300		600												
2ETG-E60x340		680												

## 特殊液压缸

### Special hydraulic cylinder

E•MC QUALITY STARTS  
FROM DESIGN

\*\*\*\*\*  
Excellent quality / price, fast response and solution

#### §HYDRAULIC CYLINDER FOR LOADING MACHINERY

The series cylinder is widely used for performing structure in hydraulic system of loading machinery, It can divided in changing direction cylinder, lifting up cylinder, change vessels cylinder three kinds. It has the features of reliable working capability, easy repairment. The mounting styles are all eye bracket on the head and cap. We also can supply it according to customer's special requirements.

#### §THIN WALL HYDRAULIC CYLINDER

The series cylinder is around 1/3 total length shorter than normal cylinder. Impact position, body and cap are holistic, They apply for working condition with small installing space and large exporting strength, nominal pressure can be 16Mpa, optional magnetic switch, we also can design and produce it according to customer's requirements.

#### §CYLINDER FOR TOWER SHAPE MACHINERY

The series cylinders apply for 20~160MT tower shape lift machinery, They also apply for separately performing structure in hydraulic system for other industries. There is hydraulic lock on it, It can ensure cylinder stay in any position among all working time, It can not occur some trouble when stop electric or air switch has some wrong.

#### §SINGLE ACTION CYLINDER FOR LOGISTIC MACHINERY

The series cylinder is single action piston lifting cylinder, it has features with simple structure, reliable run, easy repair, with cushion devices. It has been widely used in automotive lift machine. Lift and transport machine, logistic machines.

#### §CYLINDER FOR COLD-MACHINING EQUIPMENT.

The series cylinder can be designed according to different requirements that customer demands, They have been widely used for shearing and rolling set equipments.