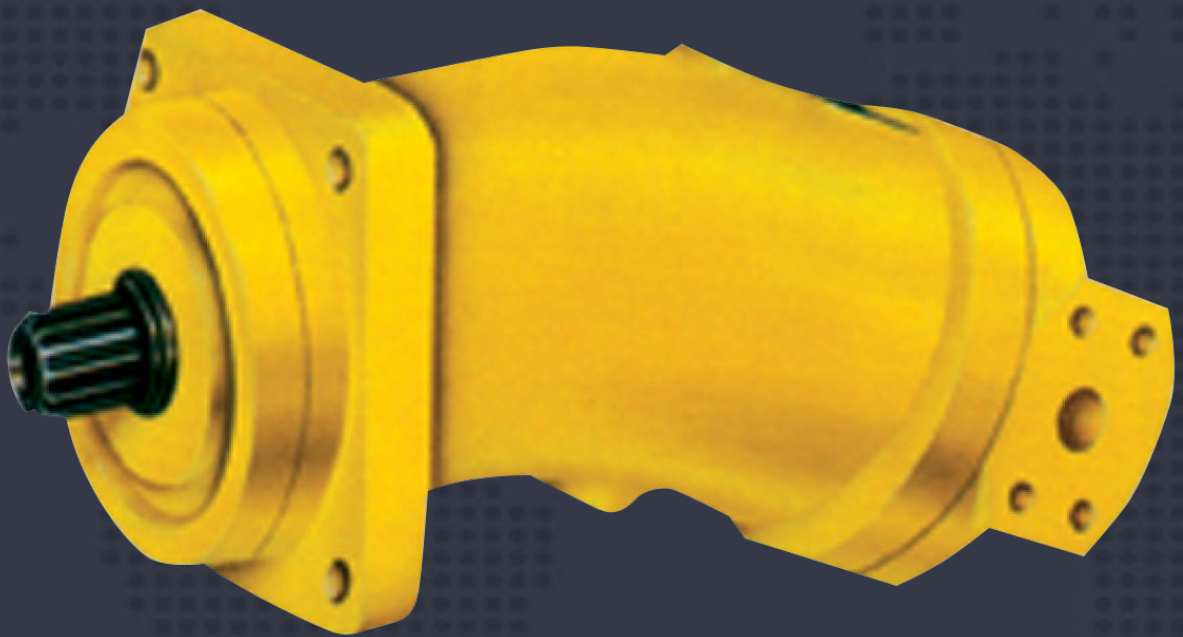




Catálogo de Productos



Fixed Displacement Pump / Motor - A2F

北京华德液压工业 集团有限责任公司 BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD.	A2F 定量泵 / 马达 Fixed Displacement Pump/Motor A2F 用于开式和闭式回路 For open and closed circuits		RC90100/12.2004 替代: ReplaceRC90100/09.2003
	规格 Size 10-500	斜轴式轴向柱塞结构 axial tapered piston,bent axis design 高压范围 Peak pressure 至 up to40MPa	



说明:

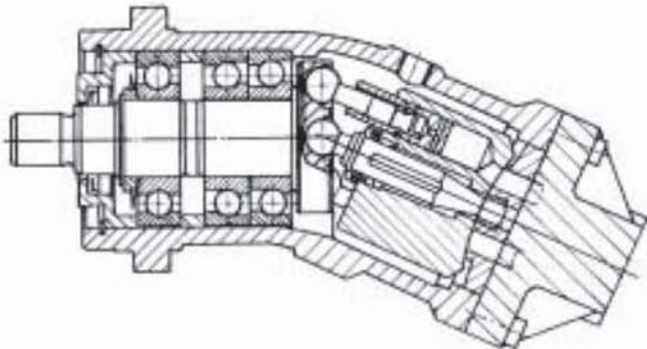
- 弯轴结构的轴向柱塞元件，具有固定排量，在开式或闭式回路中用作静液传动的泵或马达。
- 当作为泵工作时，流量与驱动转速和排量成正比。
- 当作为马达工作时，输出转速与流量成正比而与排量成反比。输出扭矩随高压侧与低压侧之间的压差而加大。

特点:

- 带有久经考验的球面配流盘的高性能旋转组件有自动对中、圆周速度低、效率高的优点。
- 耐用的球轴承和滚子轴承促进长工作寿命。
- 驱动轴能承受径向载荷。
- ISO 安装法兰，从规格 55 起定量泵 / 马达和变量马达一致。
- 可使用抗燃液压油。
- 噪声低。

剖视图:

结构 1-4，规格 10-160



Description:

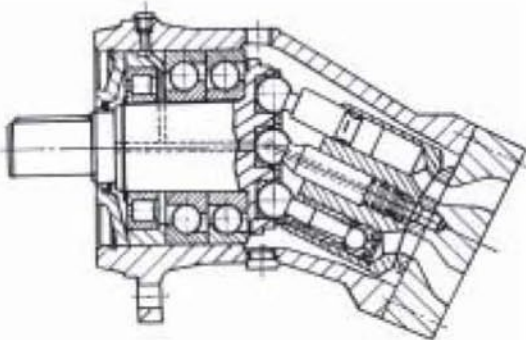
Axial piston unit of bent axis design with fixed displacement, for use as either pump or motor in hydrostatic drivers, in open or closed circuit.
If operated as a pump, the flow is proportional to the drive speed and displacement.
If operated as a motor, the output speed is proportional to the swept volume and inversely proportional to displacement. The output torque increases with the pressure drop between the high and low pressure sides.

Special Features:

High performance rotary group with well-proven spherical control area with the advantages: self-centering low peripheral speed, high efficiency.
Robust rolling bearings endure long service life.
Drive shaft capable of adopting radial loading.
ISO mounting flange, uniform for fixed displacement Pumps/motors and variable motors from size 55
May be used in conjunction with fire-resistant fluids.
Low noises generation.

Section:

Series 5, Sizes 200-500



A2F 定量泵 / 马达 Fixed Displacement Pump / Motor A2F

型号说明 Type Code

A2F 55 R 2 P 1

泵 / 马达型号 Pump / Motor Type

定量泵 / 马达

A2F

Fixed displacement
pump/motor

规格

Size

(9.4)	10
(11.6)	12
(22.7)	23
(28.1)	28
(44.3)	45
(54.8)	55
(63.0)	63
(80.0)	80
(107)	107
(125)	125
(160)	160
(200)	200
(250)	250
(355)	355
(500)	500
(排量 displacement ml/r)	

订货示例:

A2F.55.R.2.P.1

A2F 定量马达

规格 55, 顺时针旋转, 2 结构, 平键
1 号后盖

Ordering Example:

A2F.55.R.2.P.1

Fixed displacement motor A2F

size55, clockwise rotation, series 2,
keyed shaft, port plate 1

后盖 Port Plate

见下 below	后盖 Port Plate	1
	后盖 Port Plate	2
	后盖 Port Plate	3
	后盖 Port Plate	4

轴伸 Shaft End

平键	keyed shaft GB1096-79	P
花键	splines shaft DIN 5480	Z
花键	splines shaft GB 3478.1-83	S

结构形式 Series

见下 see below	结构 Series	1
	结构 Series	2
	结构 Series	3
	结构 Series	4
	结构 Series	5

旋转方向

Direction of Rotation

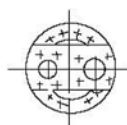
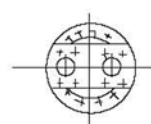
从轴端看	viewed on drive shaft	
顺时针	clockwise	R
逆时针	anti-clockwise	L
双向	alternating	W

(不适用于开式回路中的泵) (not for pumps in open circuit)

结构型式 Series		4		2/3		1	1/2	2		1/2	2		5			
规格 Size		10	12	23	28	45	55	63	80	107	125	160	200	250	355	500
后盖 port plate 1	1	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	2				●	●	●	●	●	●	●	●	●	●	●	●
	3					●	●	●	●	●	●	●				
	4	●	●	●	●											

后盖 port plate 1

规格 Size	10-160	200-500
闭式回路泵工况 和马达工况 pump operation in closed circuit and motor operation	1 螺纹 metric threads 2 SAE 法兰 Flange	1 法兰 Flange
开式回路泵工况 pump operation in open circuit	3 法兰 Flange 4 螺纹 metric threads	2 法兰 Flange



A2F 定量泵 / 马达 Fixed Displacement Pump/Motor A2F

技术数据 Technical Data

进口工作压力 Inlet Operating Pressure

泵 Pump

S、A 或 B 口最低压力

Minimum pressure at ports A or B

$P_{abs} \geq 0.08 \text{ MPa}$

在闭式回路中, 补油压力必须在 0.2 至 0.6 MPa 之间, 视泵的转速和液压油的粘度而定。

in closed circuits, the feed pressure must be between 0.2 MPa and 0.6 MPa, depending on pump speed and viscosity of hydraulic fluid.

马达 Motor

A 或 B 口的压力 Pressure at port A or B

额定压力 Nominal pressure $P_N = 35 \text{ MPa}$

最高压力 Peak pressure $P_{max} = 40 \text{ MPa}$

A 口和 B 口压力之和不得超过 70 MPa (每侧压力最高 40 MPa)

The sum of the pressures at ports A and B must not exceed 70 MPa (individual pressure on either side max. 40 MPa)

出口工作压力 Outlet Operating Pressure

泵 Pump

额定压力 Nominal pressure $P_N = 35 \text{ MPa}$

最高压力 Peak pressure $P_{max} = 40 \text{ MPa}$

壳体压力 Case pressure

允许最高壳体压力 (油口 T)

Maximum permissible case pressure (at port T)

$P_{abs} \geq 0.2 \text{ MPa}$

油温范围 Oil Temperature Range

$t_{min} \geq -25^\circ \text{C}$

$t_{max} \leq +80^\circ \text{C}$

粘度范围 Viscosity Range

$V_{min} \geq 10 \text{ mm}^2/\text{s}$ (短期) (for short periods)

$V_{max} \geq 1000 \text{ mm}^2/\text{s}$ (短期) (for short periods)

最佳工作粘度 Optimum Operating Viscosity

$V_{opt} \geq 16-36 \text{ mm}^2/\text{s}$

规格计算 Calculation of Size

泵 pump

流量 Flow $Q = \frac{V_g \cdot n \cdot \eta_v}{1000}$ [L/min]

扭矩 Torque $M = \frac{1.59 \cdot V_g \cdot \Delta p}{10 \cdot \eta_{mh}}$ [Nm]

功率 Power $P = \frac{M \cdot n}{9549} = \frac{Q \cdot \Delta p}{60 \cdot \eta_t}$ [kW]

马达 Motor

流量 Flow $Q = \frac{V_g \cdot n \cdot \eta_v}{1000}$ [L/min]

扭矩 Torque $M = \frac{1.59 \cdot V_g \cdot \Delta p \cdot \eta_{mh}}{10}$ [Nm]

功率 Power $P = \frac{M \cdot n}{9549} = \frac{Q \cdot \Delta p \cdot \eta_t}{60}$ [kW]

转速 Speed $n = \frac{Q \cdot 1000 \cdot \eta_v}{V_g}$ [r/min]

V_g = 排量 geom. displacement (ml/r)

Δp = 压差 pressure differential (MPa)

n = 转速 speed (rpm)

η_v = 容积效率 volumetric efficiency

η_{mh} = 机械效率 mech-hydr. efficiency

η_t = 总效率 overall efficiency

$$[\eta_t = \eta_v \cdot \eta_{mh}]$$

油液选择 Fluid Recommendations

工作温度范围 推荐粘度等级 符合 DIN 51519 ISO (VG)

Operating temperature range Recommended viscosity grade to DIN 51 519 ISO (VG)

30-40°C	VG22 $\triangle$ 22 mm ² /s	在 at	40°C
40-50°C	VG32 $\triangle$ 32 mm ² /s	在 at	40°C
50-60°C	VG46 $\triangle$ 46 mm ² /s	在 at	40°C
60-70°C	VG68 $\triangle$ 68 mm ² /s	在 at	40°C
70-80°C	VG100 $\triangle$ 100 mm ² /s	在 at	40°C

液压油的过滤

推荐过滤精度为 10 μm , 25-40 μm 的较粗的过滤是可以使用, 但是 10 μm 过滤可以延长使用寿命 (降低磨损)。

Filtration of Hydraulic Fluid

Recommended filtration: 10 μm . Coarser filtration of 25-40 μm is available, but with filtration of 10 μm longer service life is obtained (reduced wearing).

转速范围

最低转速 n_{min} 没有限制, 如果要求高度旋转均匀性, 则 n_{min} 不得低于 50 rpm。关于最高转速 n_{max} 请见第 4 页的表。

Speed Range

No limitation on minimum speed n_{min} . If high uniformity of rotation is required, n_{min} should not be less than 50 rpm. See table on page 4 for maximum speed n_{max} .

安装位置

任选。壳体必须始终充满油液

Mounting Position

Optional. The housing must always be filled with oil.

A2F定量泵/马达 Fixed Displacement Pump/Motor A2F

技术参数表 理论值,未考虑 η_{mh} 和 η_v ,数值经过圆整

Technical Data theoretical values,without considering η_{mh} and η_v values rounded off

规格 Size					10	12	23	28	45	55	63	80	107	125	160	200	250	355	500	
排量 Displacement				V _g	ml/r	9.4	11.6	22.7	28.1	44.3	54.8	63	80	107	125	160	200	250	355	500
最高转速	闭式回路	close circuit	n _{max}	r/min	7500	6000	5600	4750	3750	3750	4000	3350	3000	3150	2650	2500	2500	2240	2000	
Max.speed	开式回路 open circuit	在 0.09MPa 下 ¹⁾	n _{0.09}	r/min	4700	3750	3750	2800	2360	2360	2550	2120	1900	2120	1650	1700	1400	1250	1120	
		在 0.1MPa 下 ¹⁾	n _{0.1}	r/min	5000	4000	4000	3000	2500	2500	2700	2240	2000	2240	1750	1800	1500	1320	1200	
		在 0.15MPa 下 ¹⁾	n _{0.15}	r/min	6000	4900	4900	3600	3000	3000	3300	2750	2450	2750	2100	2180	1850	1650	1500	
最大流量	闭式回路	close circuit	Q _{max}	l/min	71	70	127	133	166	206	252	268	321	394	424	500	625	795	1000	
Max.flow	开式回路 open circuit	在 n _{0.09} 下 ²	Q _{0.09}	l/min	43	42	83	76	122	125	156	164	197	257	256	330	340	430	543	
		在 n _{0.1} 下 ²	Q _{0.1}	l/min	46	45	88	82	129	133	165	174	208	272	272	349	364	455	582	
		在 n _{0.15} 下 ²	Q _{0.15}	l/min	55	55	108	98	157	160	202	213	254	334	326	423	449	568	728	
最大功率	闭式回路	close circuit	P _{max}	KW	41	41	74	78	97	120	147	156	187	230	247	292	365	464	583	
Max.power △p=35MPa	开式回路 open circuit	在 Q _{0.09} 下	P _{0.09}	KW	26	26	50	46	71	75	93	99	119	154	154	198	204	259	326	
		在 Q _{0.1} 下	P _{0.1}	KW	27	27	53	49	75	80	99	105	125	163	163	210	218	273	350	
		在 Q _{0.15} 下	P _{0.15}	KW	33	33	65	59	92	96	121	128	153	200	196	254	270	342	437	
电机转速	流量	闭式close	Q	l/min	13.6	16.8	32.9	40.7	64.2	79.5	91.3	116	155	181.2	232					
Electric motor flow		开式 2)open	Qo	l/min	13.2	16.3	31.9	39.5	62.3	77.1	88.6	112.5	150.5	175.8	225					
speed	功率 power		P	KW	8	10	19	24	38	46	53	68	91	106	135					
n=1450rpm (△p=35MPa)																				
扭矩 Torque	△p=10MPa		M	Nm	15	18.5	36	44.6	70.4	87	100	127.5	169.7	198	254	318.5	397.9	565	795.7	
	△p=35MPa		M _{max}	Nm	52.5	64.5	126	156	247	305	350	446	594	693	889	1114	1393	1978	2785	
近似重量	Weight(approx.)		kg		5	5	12	12	23	23	33	33	44	63	63	88	88	138	185	

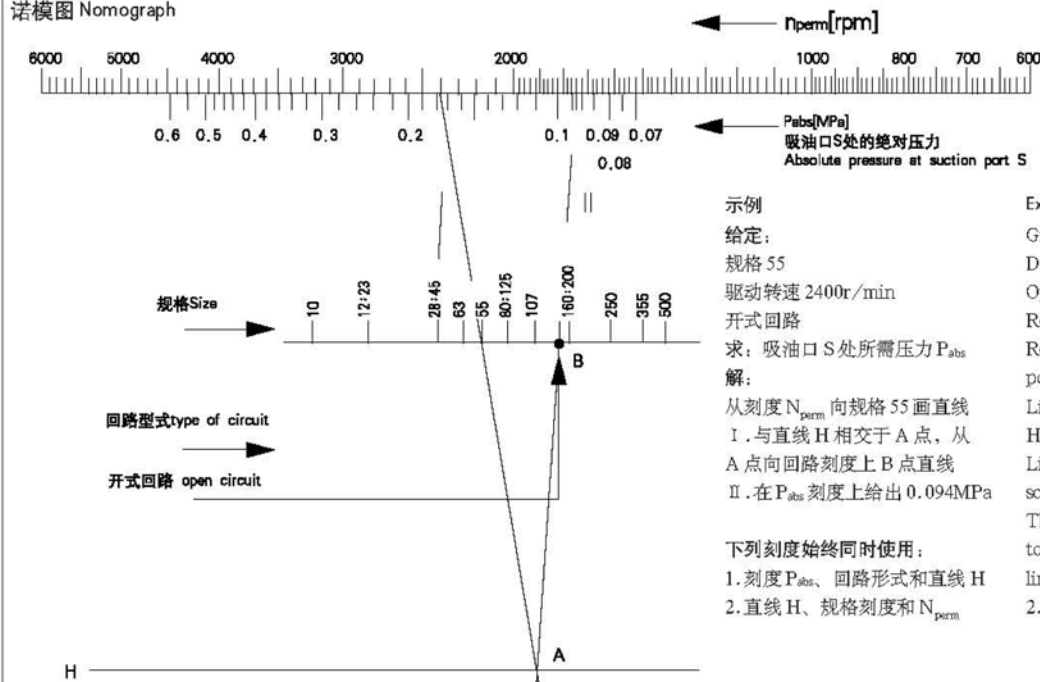
1)这些数值适用于吸油管S有绝对压力并用矿物油工作时

These values are valid provided there is an absolute pressure at suction inlet S and when operated on mineral oil.

2)在开式回路中 V_g 降低3%

V_g is 3% less in open circuit.

诺模图 Nomograph



示例

给定:

规格 55

驱动转速 2400r/min

开式回路

求: 吸油口S处所需压力 P_{abs}

解:

从刻度 N_{perm} 向规格55画直线

I. 与直线H相交于A点, 从

A点向回路刻度上B点画直线

II. 在 P_{abs} 刻度上给出0.094MPa

下列刻度始终同时使用:

1. 刻度 P_{abs} 、回路形式和直线H

2. 直线H、规格刻度和 N_{perm}

Example

Given: Size.55

Drive speed 2400r/min

Open circuit

Required:

Required pressure P_{abs} at suction

port Solution:

Line I. on scale N_{perm} to size 55 meets line H at point A.

Line II form point A to point B on circuit scale gives 0.094MPa on scale P_{abs} .

The following are always used together: 1. Scales P_{abs} , type of circuit and line H.

2. Line H, size scale and N_{perm} .

允许转速 N_{perm} 可由诺模图确定。在马达工况, 闭式回路或补油工况的允许转速也适用于开式回路。

The permissible speed N_{perm} can be determined from the nomograph. In motor operation the permissible speeds for closed circuit and feed operation are also valid for open circuit.

当进口压力 $P_{abs} > 0.1MPa$ 时开式回路(自吸工况)的允许转速可以提高, 但当 $P_{abs} < 0.1MPa$ 时必须降低。

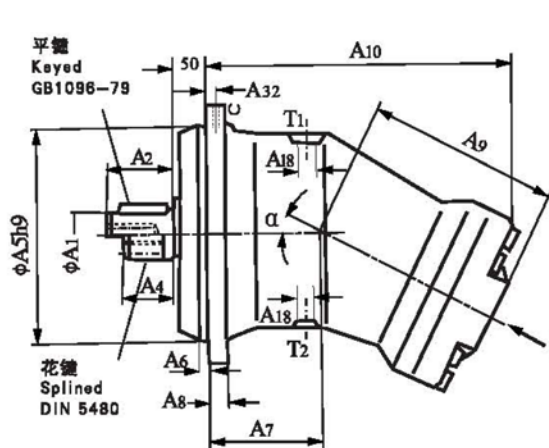
The permissible speed in open circuit (self-priming operation) may be increased when inlet pressure $P_{abs} > 0.1MPa$ but must be reduced when $P_{abs} < 0.1MPa$

A2F定量泵/马达 Fixed Displacement Pump/Motor A2F

元件尺寸 Unit Dimensions

规格 Sizes 200-250

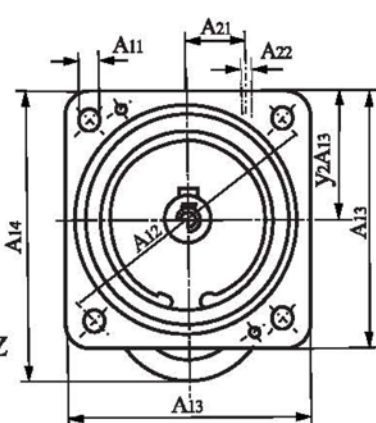
规格 Sizes 355-500



后盖
Port Plate
用于马达工况 for motor operation
用于泵工况 for pump operation
(闭式回路) (closed circuit)

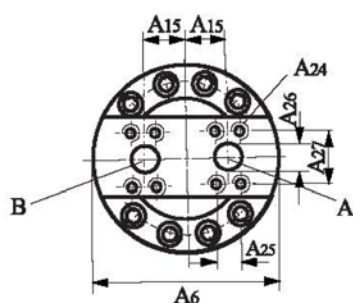
1

Z向
Viewed on Z



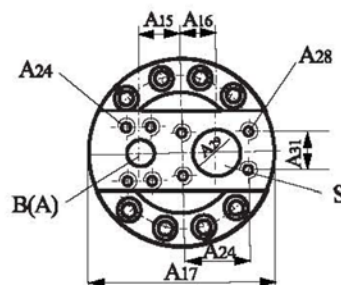
后盖
Port Plate
用于泵工况 for pump operation
(开式回路) (open circuit)

2



油口 Ports A, B;
SAE 法兰 flange 6000 psi
见尺寸 A19
(see dimension A19)

油口 Port B(A);
SAE 法兰 flange 6000 psi
见尺寸 A19
(see dimension A19)



油口 Port S; SAE 法兰 flange
规格 Sizes 200 355, 2500psi
规格 Sizes 500, 200psi
见尺寸 A20
(see dimension A20)

逆时针旋转时后盖 2 旋转 180°

For anti-clockwise rotation
port plate 2 is rotated 180°

规格

Size	a	A ₁	A ₂	A ₃	A ₄	A ₅	A ₆	A ₇	A ₈	A ₉	A ₁₀	A ₁₁	A ₁₂	A ₁₃	A ₁₄	A ₁₅	A ₁₆	A ₁₇	A ₁₈	A ₁₉	A ₂₀
200	21°	50 _{K6}	82	53.5	58	224	9	134	25	232	368	22	280	252	300	55	45	216	M22 × 1.5	1 1/4"	2 1/2"
250	26.5°	50 _{K6}	82	53.5	58	224	9	134	25	232	370	22	280	252	314	55	45	216	M22 × 1.5	1 1/4"	2 1/2"
355	26.5°	60 _{m6}	105	64	82	280	15	160	28	260	422	18	320	335	380	60	50	245	M33 × 2	1 1/2"	2 1/2"
500	26.5°	70 _{m6}	105	74.5	82	315	15	175	30	283	462	22	360	375	420	65	55	270	M33 × 2	1 1/2"	3"

规格

Size	A ₂₁	A ₂₂	A ₂₃	A ₂₄	深 deep	A ₂₅	A ₂₆	A ₂₇	A ₂₈	深 deep	A ₂₉	A ₃₀	A ₃₁	A ₃₂	keyed Shaft GB1096-79	Splined Shaft DIN5480	(kg)
200	70	M14 × 1.5		M14	22	31.8	32	66.7	M12	18	63	88.9	50.8	13	键 14 × 80	W50 × 2 × 24 × 9g	88
250	70	M14 × 1.5		M14	22	31.8	32	66.7	M12	18	63	88.9	50.8	13	键 14 × 80	W50 × 2 × 24 × 9g	88
355	35	M14 × 1.5	360	M16	24	36.6	40	79.4	M12	18	63	88.9	50.8	14	键 18 × 100	W60 × 2 × 28 × 9g	138
500	35	M18 × 1.5	400	M16	24	36.6	40	79.4	M16	24	75	106.4	62	15	键 20 × 100	W70 × 3 × 22 × 9g	185

ANNOTATIONS :

HUADE AMÉRICA

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