上海华齐

值得信赖的
变压器组件供应商

HMD 组合式
有载分接开关

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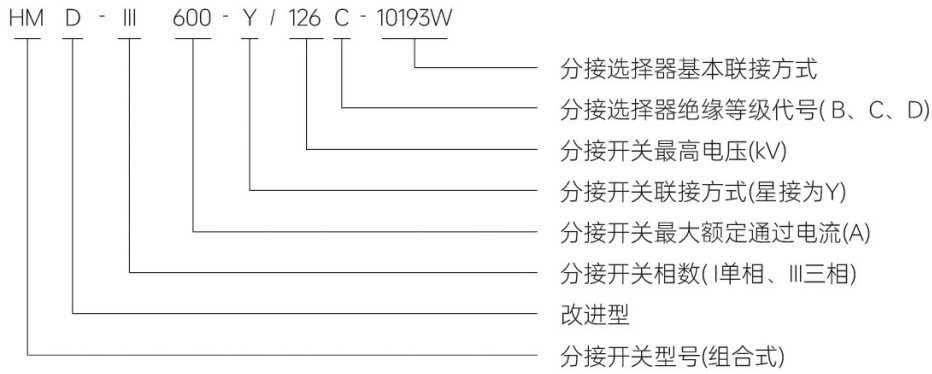
华齐电力 中国质造

HMD组合式有载分接开关

一、HMD型号说明

1.1 型号表示方法

HMD有载分接开关根据其相数、最大额定通过电流、最高电压、分接选择器绝缘等级和联接方式的不同组合，有多种型号规格。型号中各项参数含义说明如下：

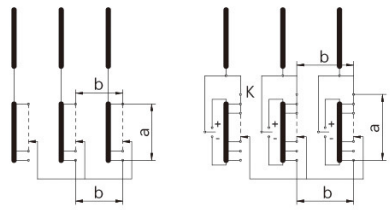
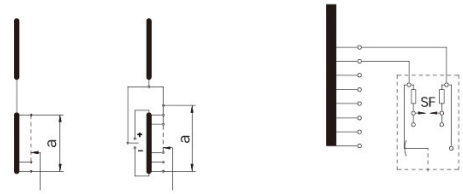


1.2 分接选择器基本联接方式表示方法

根据变压器的调压范围和绕组的联接方式不同，分接选择器有多种不同的规格。分接选择器的规格由分接选择器分布触头数、操作位置数、中间位置数和转换选择器组成。在基本联接方式中，各项参数 含义说明如下：

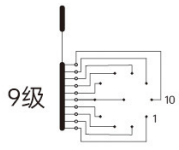
二、HMD内部绝缘水平

绝缘距离符号	分接选择器B型		分接选择器C型		分接选择器D型	
	kV 1.2/50μs	kV 50Hz1min	kV 1.2/50μs	kV 50Hz1min	kV 1.2/50μs	kV 50Hz1min
a	265	50	350	82	490	105
b	265	50	350	82	490	146
C1	485	143	545	178	590	208
C2	495	150	550	182	590	225
d	265	50	350	82	490	105

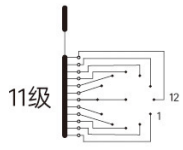
调压线圈各部位的绝缘距离	
Ⅲ500、Ⅲ600、Ⅲ800、Ⅲ1000	Ⅰ500、Ⅰ600、Ⅰ800、Ⅰ1200、Ⅰ1500
	
线性调　　正反调	线性调　正反调　带火花同隙SF的级间绝缘水平a_0为: 5Hz 1min 20kV和1.2/50μs 90kV

三、HMD基本接线图

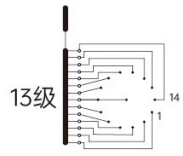
10100
9级



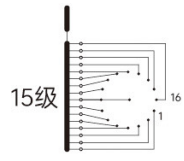
12120
11级



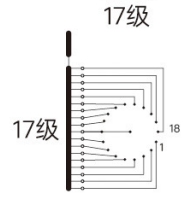
14140
13级



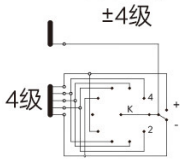
16160
15级



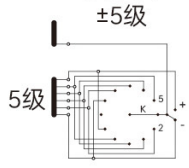
18180
17级



10091W
±4级



12111W
±5级



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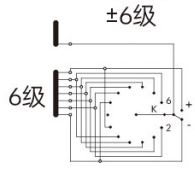
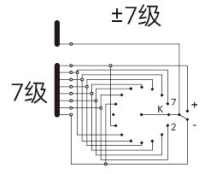
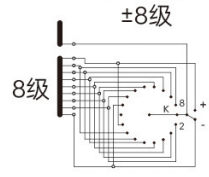


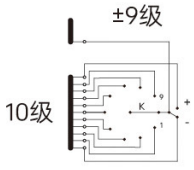
16151W
±7级



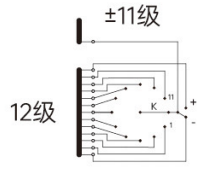
18171W
±8级



10191W
±9级



12231W
±11级



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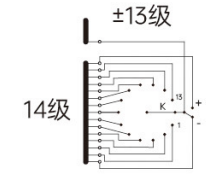
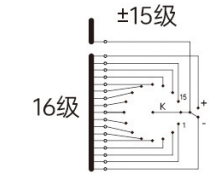
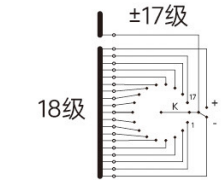
±13级



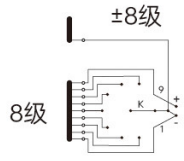
16311W
±15级



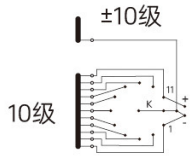
18351W
±17级



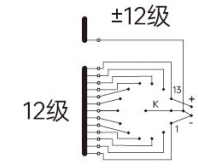
10193W
±8级



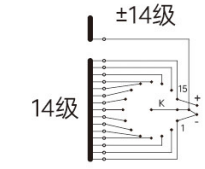
12233W
±10级



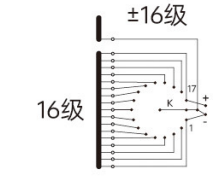
14273W
±12级



16313W
±14级



18353W
±16级



四、HMD技术参数

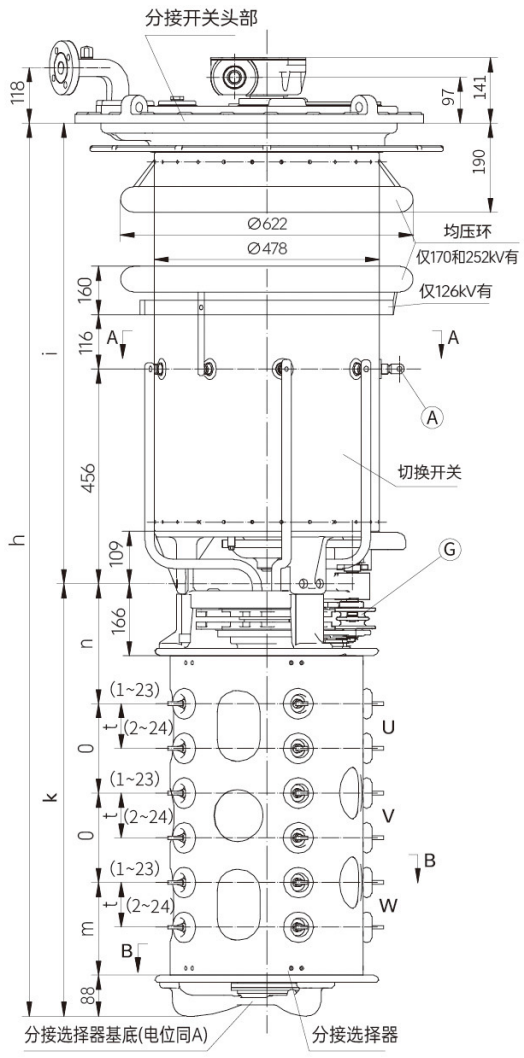
项	分类特征		Ⅲ500	Ⅲ600	Ⅲ800	Ⅲ1000	Ⅰ500	Ⅰ600	Ⅰ800	Ⅰ1200	Ⅰ1500
1	最大额定通过电流(A)		500	600	800	1000	500	600	800	1200	1500
2	额定频率(Hz)		50或60								
3	相数和联结方式		三相Y接中心点				单相任意联结方式				
4	最大额定级电压(V)		3300								
5	额定级容量(kVA)		1400	1500	2250	3000	1400	1500	2640	3100	3500
6	承受短路能力(kA)	热稳定(3秒有效值)	8	8	12	15	8	8	16	24	24
		动稳定(峰值)	20	20	30	37.5	20	20	40	60	60
7	工作位置数		线性调7、10、12、14、16、18、24 正反调±3~±17								
8	分接开关绝缘水平(kV)	额定电压	35	66	110	150	220				
		最高工作电压	40.5	72.5	126	170	252				
		工频试验电压(1min)	85	140	230	325	460				
		冲击试验电压(1.2/50)	200	350	550	750	1050				
9	分接选择器		按绝缘水平分为4种尺寸：编号为 A、B、C、D								
10	机械寿命		不低于100万次								
11	电气寿命		不低于20万次								
12	切换开关油室	工作压力	3×10^4 Pa								
		密封性能	6×10^4 Pa 24h不渗漏								
		超压保护	爆破盖$(4\sim5)\times10^4$ Pa								
		保护继电器	QJ4-25整定油速1.0m/s±10%								
13	排油量(L)		约190~270								
14	充油量(L)		约125~190								
15	重量(Kg)		约240~350								
16	配用电动机构		HED-200								

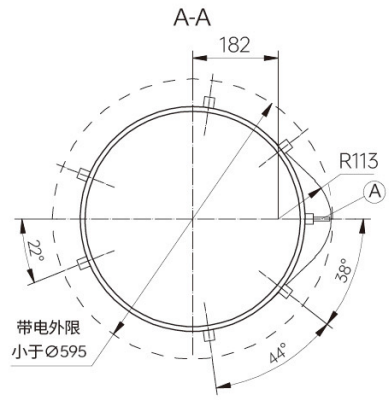
注：1. 级容量等于级电压与负载电流的乘积，额定级容量是连续允许的最大级容量。

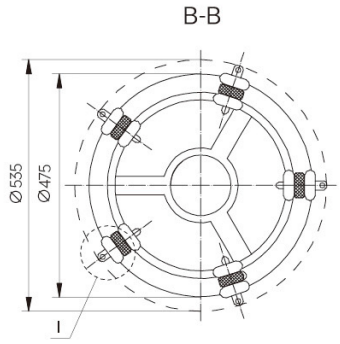
2. 三相分接开关触头并联而成的单相分接开关选用时应考虑变压器线国分流，HMD Ⅰ800两路分流，HMD Ⅰ1200、Ⅰ1500三路分流。

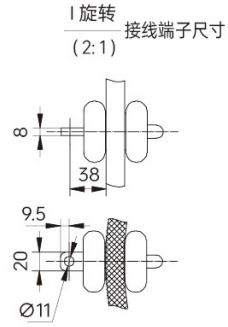
3. 调压级数可根据用户需要在上表工作位置数范围内进行设计。

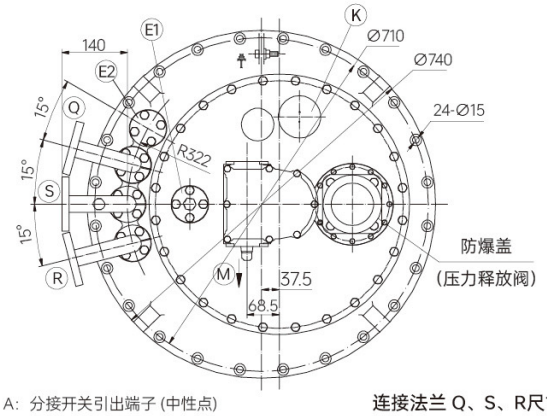
五、HMD外形尺寸图

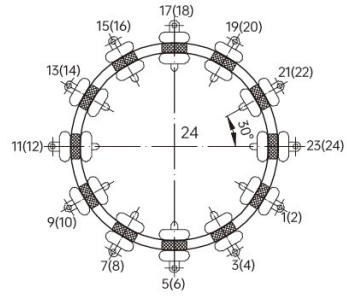


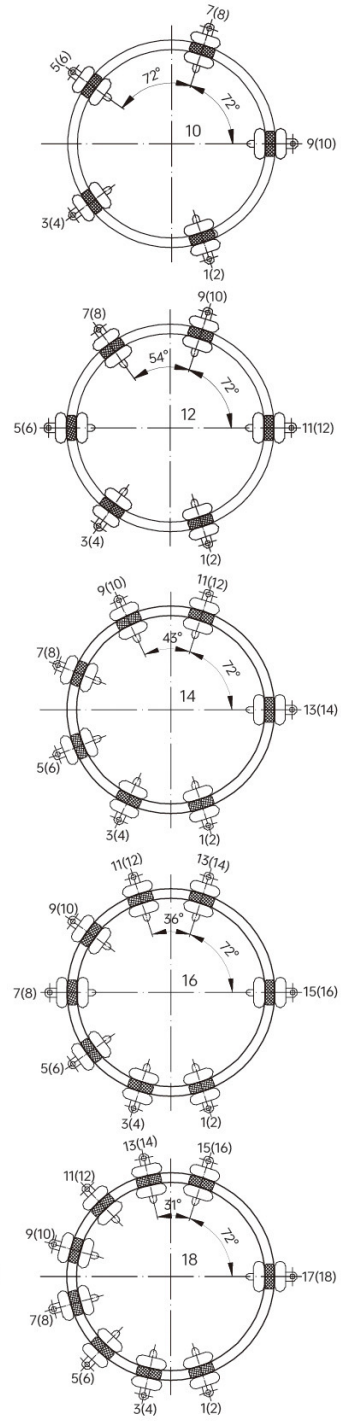






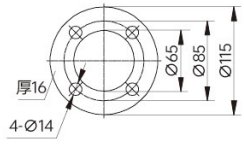






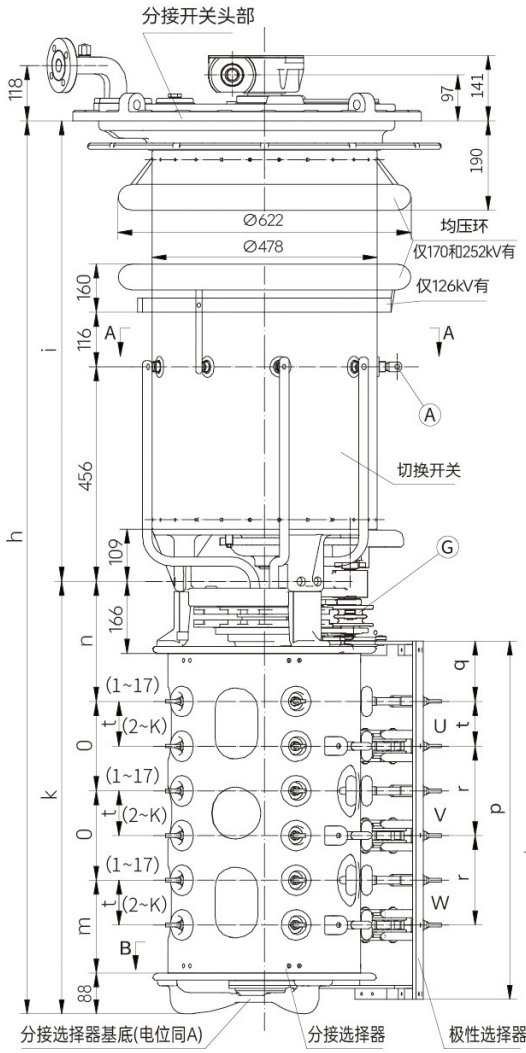
A：分接开关引出端子 (中性点)
G：分接选择器槽轮机构(电位与A点相同)
M：分接开关驱动侧
E1：开关头放气塞
E2：变压器油箱放气法兰
K：观察窗
Q：回油管接头
S：吸油管接头
R：保护继电器接头

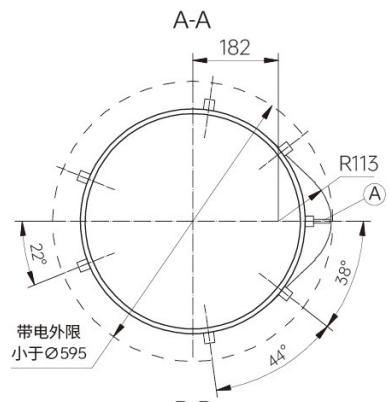
连接法兰 Q、S、R尺寸

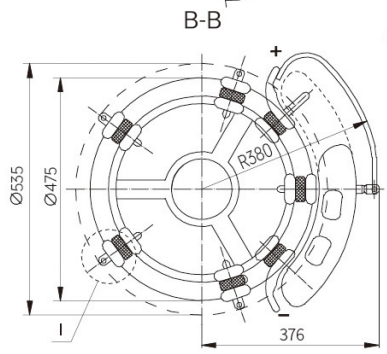


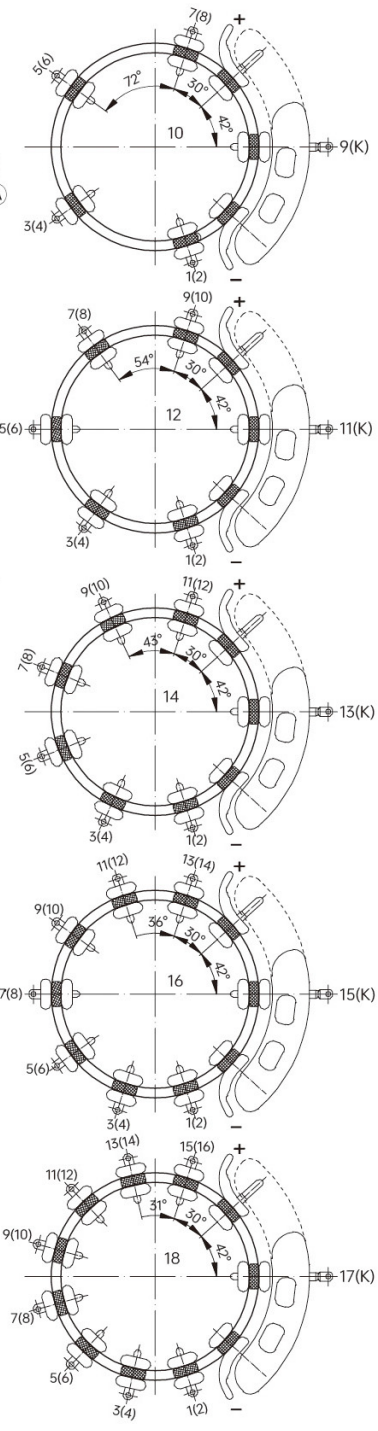
选择器型号		B				C				D			
最高工作电压(kV)		72.5	126	170	252	72.5	126	170	252	72.5	126	170	252
尺寸mm	h	1911	2041	2171	2271	2086	2216	2346	2446	2541	2671	2801	2901
	i	978	1108	1238	1338	978	1108	1238	1338	978	1108	1238	1338
	k	933				1108				1563			
	n	268				293				358			
	o	190				240				370			
	t	95				120				185			
	m	197				247				377			
油积dm^3		130	150	170	190	130	150	170	190	130	150	170	190
排油量dm^3		194	219	239	259	195	220	240	260	198	223	243	263
重量Kg		260				265				275			

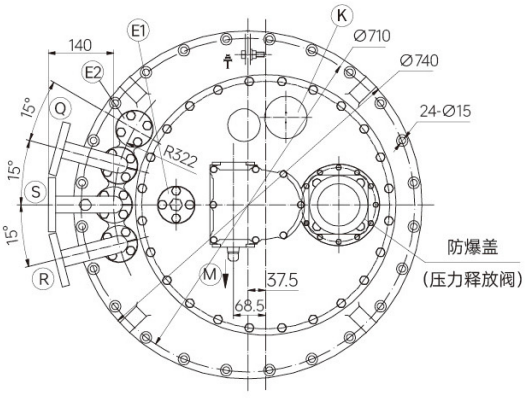
图1 HMD Ⅲ 500/600/800/1000线性调

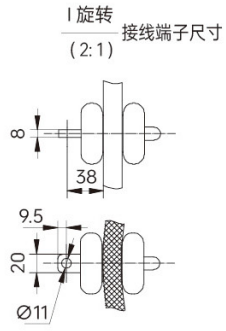












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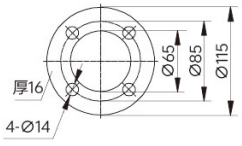
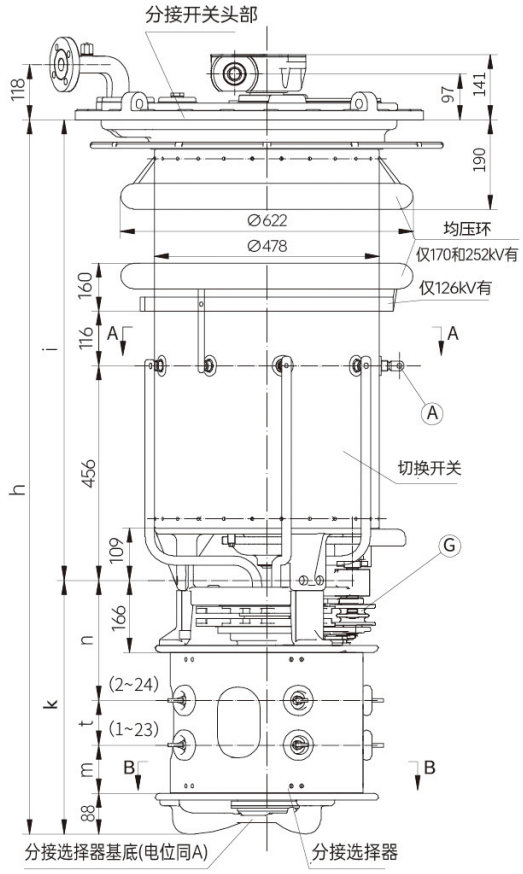
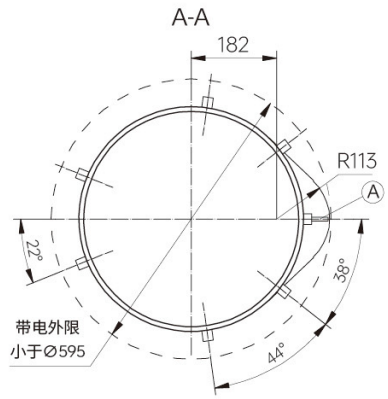
连接法兰 Q、S、R尺寸

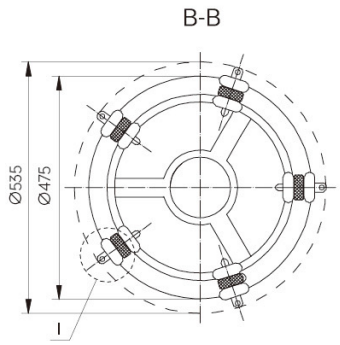


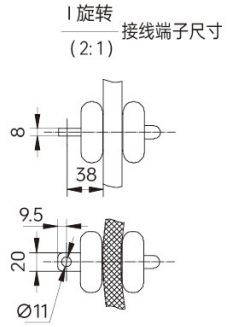
选择器型号		B				C				D			
最高工作电压(kV)		72.5	126	170	252	72.5	126	170	252	72.5	126	170	252
尺寸mm	h	1911	2041	2171	2271	2086	2216	2346	2446	2541	2671	2801	2901
	i	978	1108	1238	1338	978	1108	1238	1338	978	1108	1238	1338
	k	933				1108				1563			
	n	268				293				358			
	o	190				240				370			
	t	95				120				185			
	m	197				247				377			
	r	190				240				370			
	q	160				184				250			
	p	783				958				1413			
油积dm³		130	150	170	190	130	150	170	190	130	150	170	190
排油量dm³		199	224	244	264	199	224	244	264	207	232	252	272
重量Kg		275				280				310			

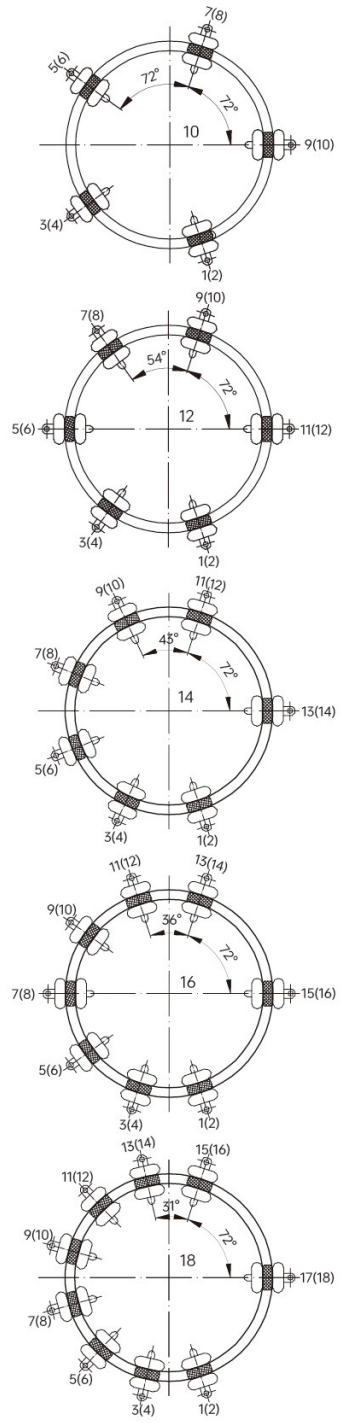
图2 HMD III500/600/800/1000正反调

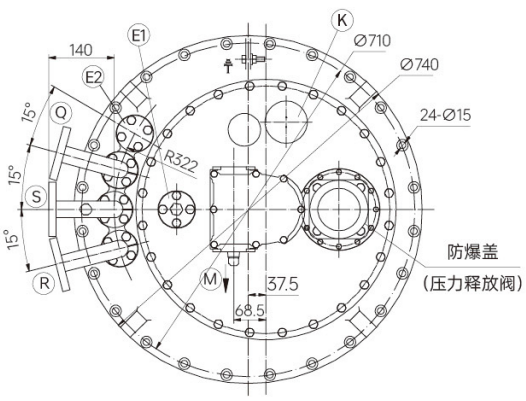






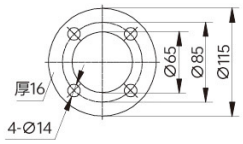






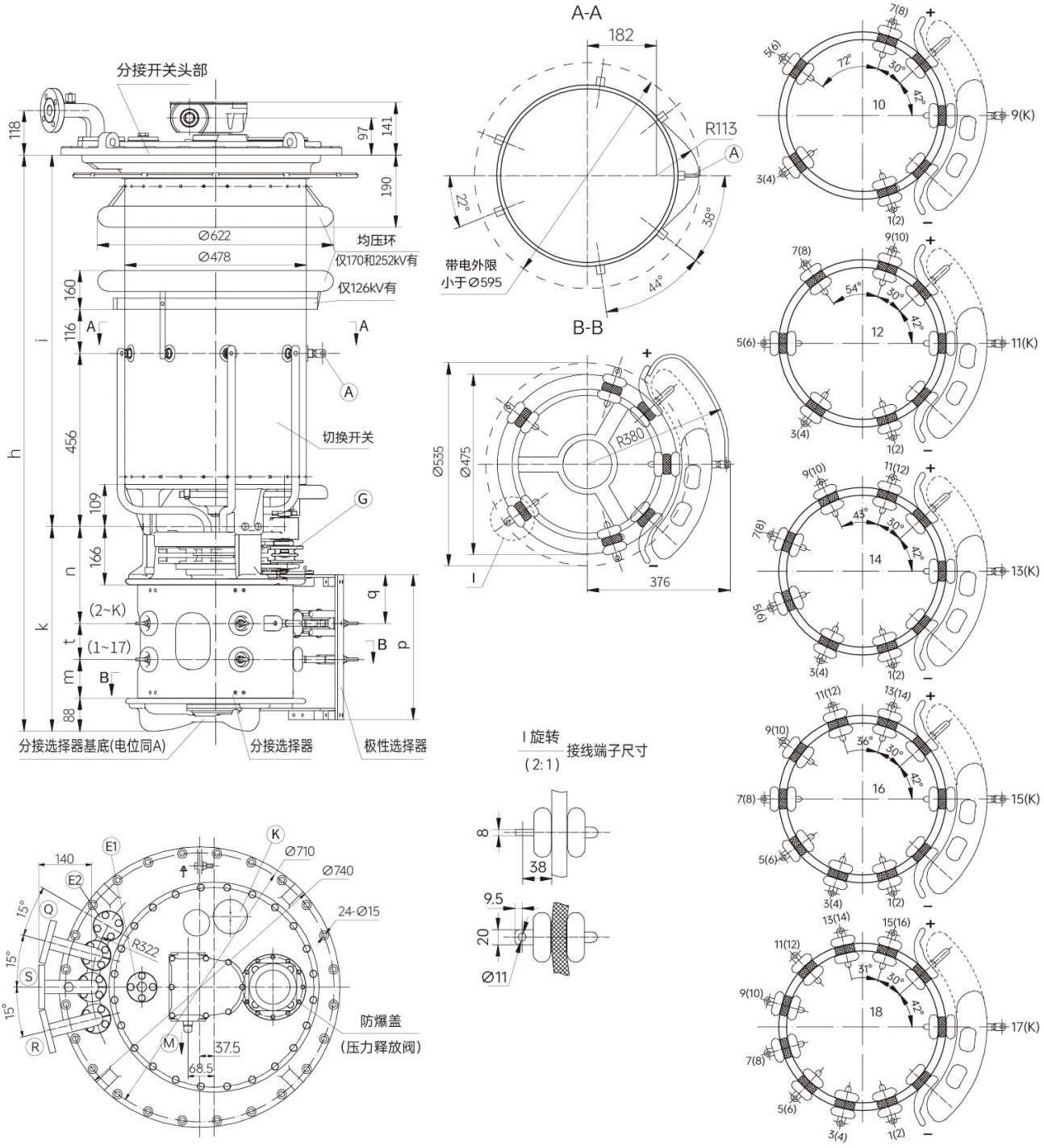
A：分接开关引出端子 (中性点)
G：分接选择器槽轮机构(电位与A点相同)
M：分接开关驱动侧
E1：开关头放气塞
E2：变压器油箱放气法兰
K：观察窗
Q：回油管接头
S：吸油管接头
R：保护继电器接头

连接法兰 Q、S、R尺寸



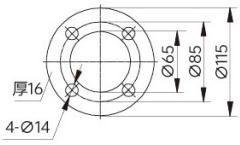
选择器型号		B				C				D			
最高工作电压(kV)		72.5	126	170	252	72.5	126	170	252	72.5	126	170	252
尺寸mm	h	1531	1661	1791	1891	1606	1736	1866	1966	1801	1931	2061	2161
	i	978	1108	1238	1338	978	1108	1238	1338	978	1108	1238	1338
	k	553				628				823			
	n	268				293				358			
	t	95				120				185			
	m	102				127				192			
油积dm^3		130	150	170	190	130	150	170	190	130	150	170	190
排油量dm^3		189	214	234	254	189	214	234	254	190	215	235	255
重量Kg		240				240				245			

图3 HMD I 500/600线性调



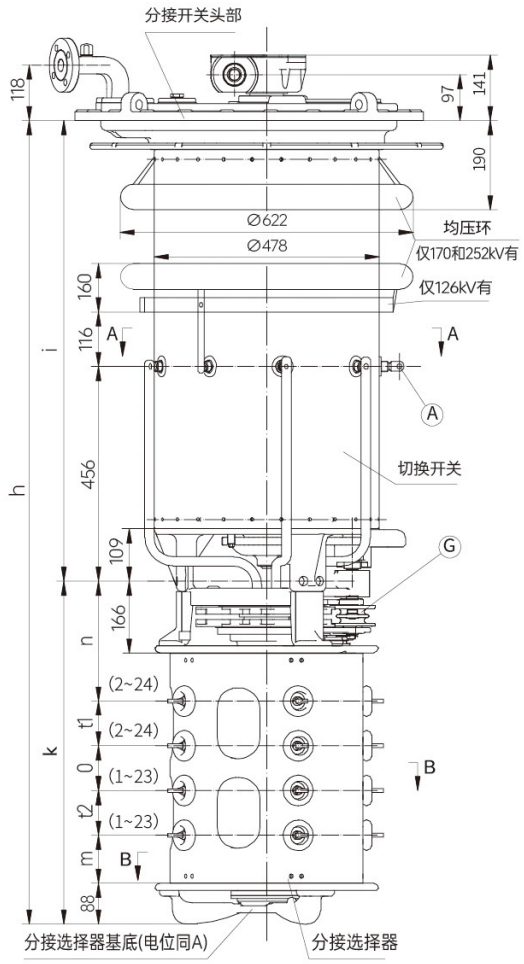
A：分接开关引出端子 (中性点)
G：分接选择器槽轮机构(电位与A点相同)
M：分接开关驱动侧
E1：开关头放气塞
E2：变压器油箱放气法兰
K：观察窗
Q：回油管接头
S：吸油管接头
R：保护继电器接头

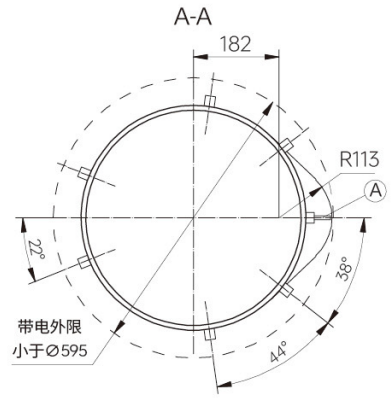
连接法兰 Q、S、R尺寸

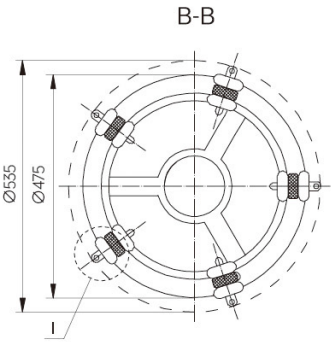


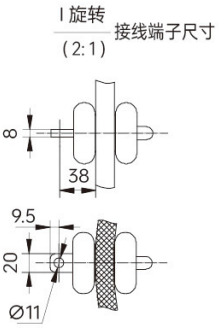
选择器型号		B				C				D			
最高工作电压(kV)		72.5	126	170	252	72.5	126	170	252	72.5	126	170	252
尺寸mm	h	1531	1661	1791	1891	1606	1736	1866	1966	1801	1931	2061	2161
	i	978	1108	1238	1338	978	1108	1238	1338	978	1108	1238	1338
	k	553				628				823			
	n	268				293				358			
	t	95				120				185			
	m	102				127				192			
	q	160				184				250			
	p	403				478				673			
油积dm^3		130	150	170	190	130	150	170	190	130	150	170	190
排油量dm^3		191	216	236	256	192	217	237	257	193	218	238	258
重量Kg		250				255				260			

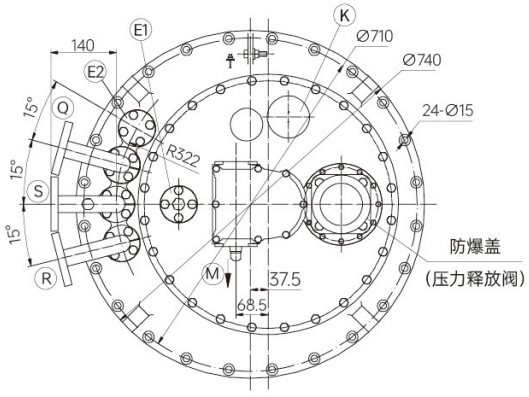
图4 HMD I 500/600正反调

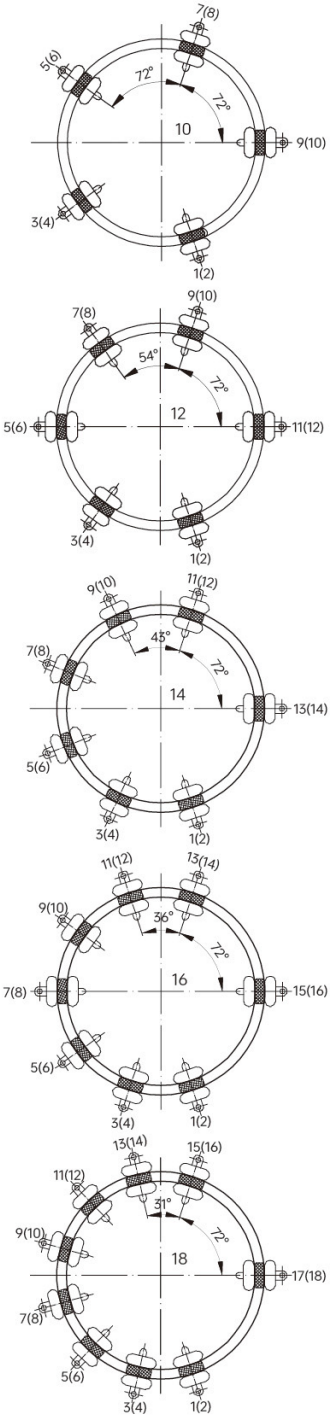












A：分接开关引出端子 (中性点)
G：分接选择器槽轮机构(电位与A点相同)
M：分接开关驱动侧
E1：开关头放气塞
E2：变压器油箱放气法兰
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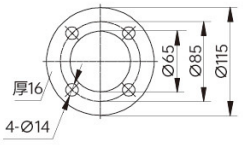
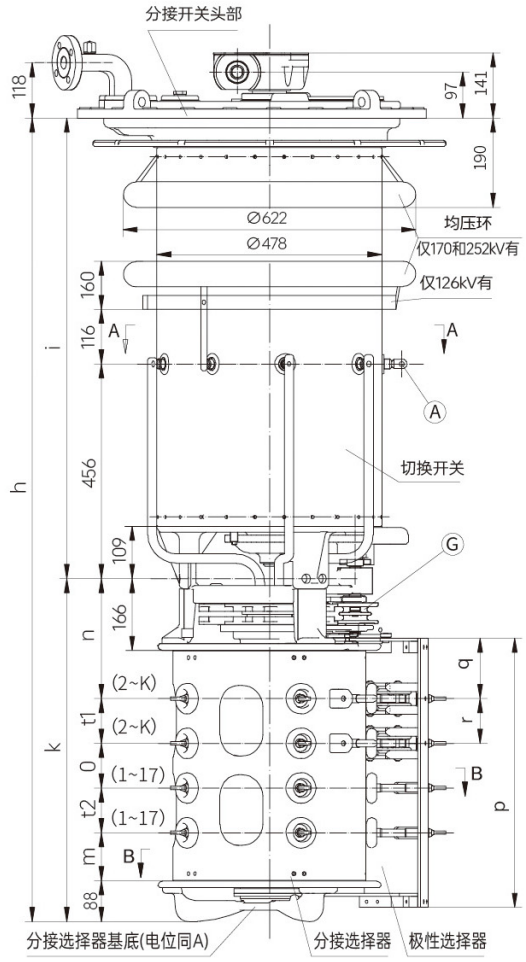
Q：回油管接头
S：吸油管接头
R：保护继电器接头

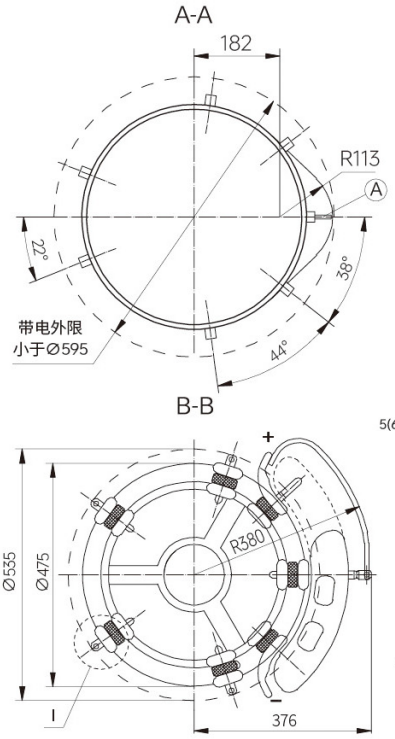
连接法兰 Q、S、R尺寸

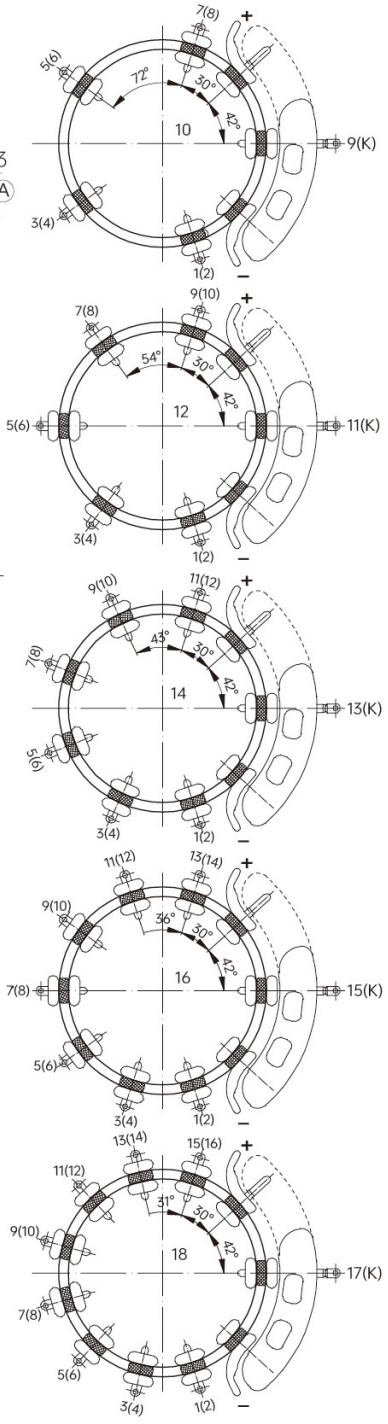


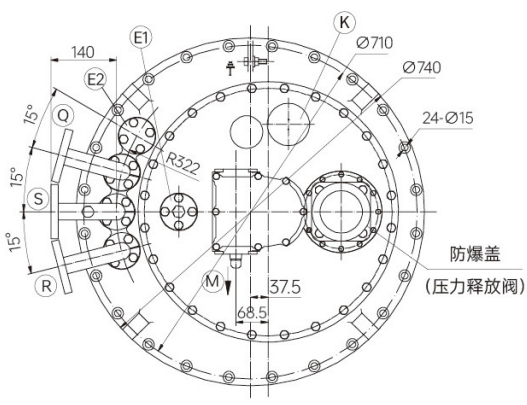
选择器型号		B				C				D			
最高工作电压(kV)		72.5	126	170	252	72.5	126	170	252	72.5	126	170	252
尺寸mm	h	1716	1846	1976	2076	1791	1921	2051	2151	1986	2116	2246	2346
	i	978	1108	1238	1338	978	1108	1238	1338	978	1108	1238	1338
	k	738				813				1008			
	n	268				293				358			
	o	95				120				185			
	t1	105				105				105			
	t2	80				80				80			
	m	102				127				192			
油积dm^3		130	150	170	190	130	150	170	190	130	150	170	190
排油量dm^3		191	216	236	256	191	216	236	256	193	218	238	258
重量Kg		250				250				260			

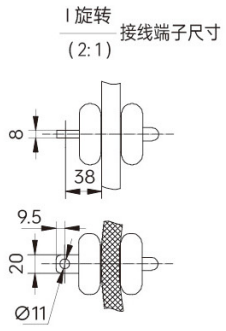
图5 HMD I 800线性调











A：分接开关引出端子 (中性点)
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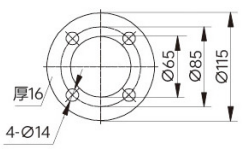
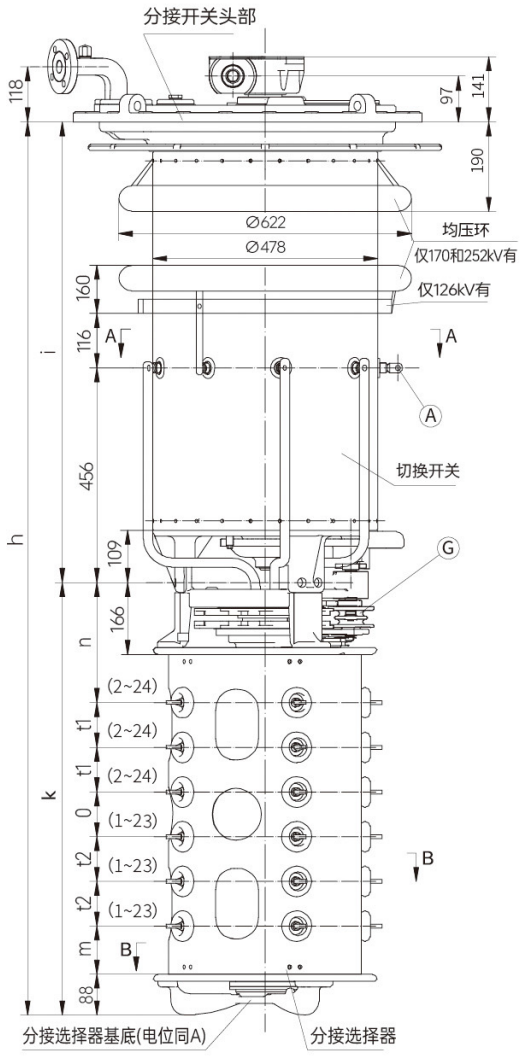
S：吸油管接头
R：保护继电器接头

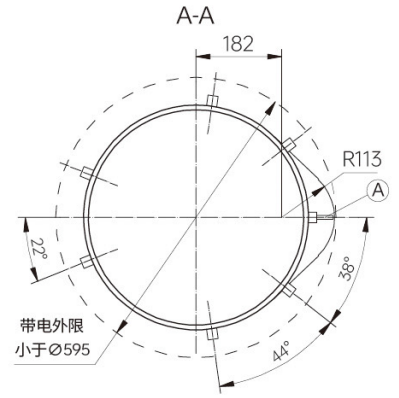
连接法兰 Q、S、R尺寸

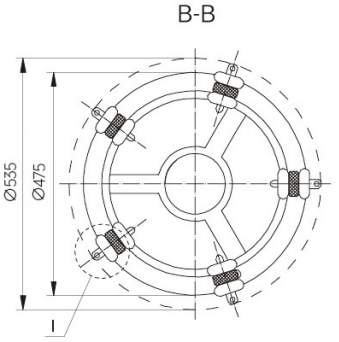


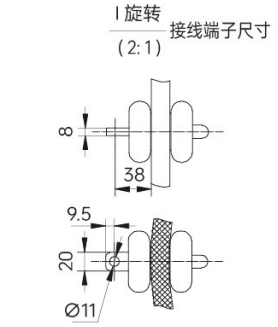
选择器型号		B				C				D			
最高工作电压(kV)		72.5	126	170	252	72.5	126	170	252	72.5	126	170	252
尺寸mm	h	1716	1846	1976	2076	1791	1921	2051	2151	1986	2116	2246	2346
	i	978	1108	1238	1338	978	1108	1238	1338	978	1108	1238	1338
	k	738				813				1008			
	n	268				293				358			
	o	95				120				185			
	t1	105				105				105			
	t2	80				80				80			
	m	102				127				192			
	r	105				105				105			
	q	160				184				250			
	p	588				663				858			
油积dm³		130	150	170	190	130	150	170	190	130	150	170	190
排油量dm³		195	220	240	260	195	220	240	260	199	224	244	264
重量Kg		265				270				275			

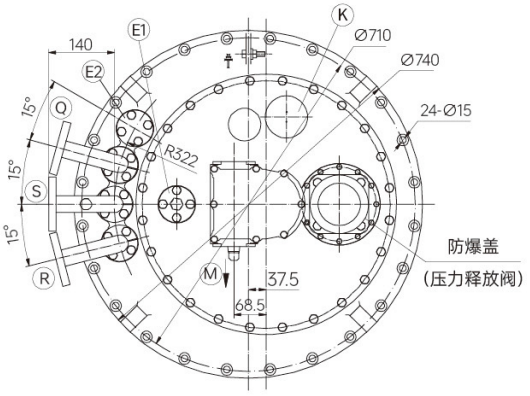
图6 HMD I 800正反调

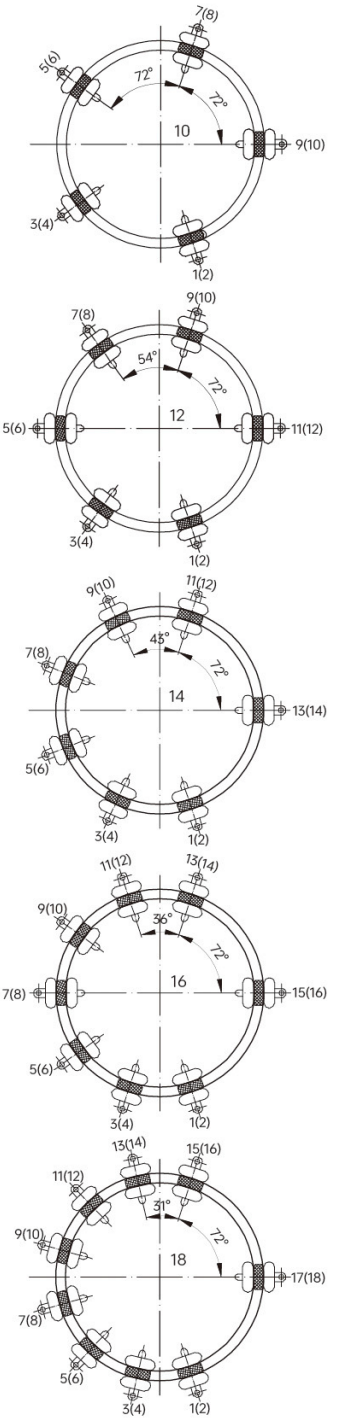












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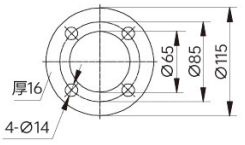
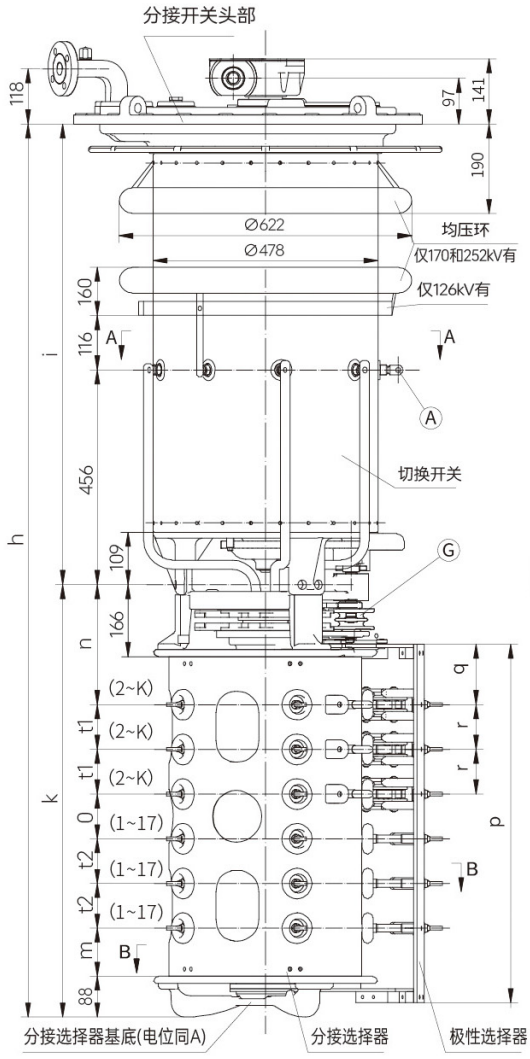
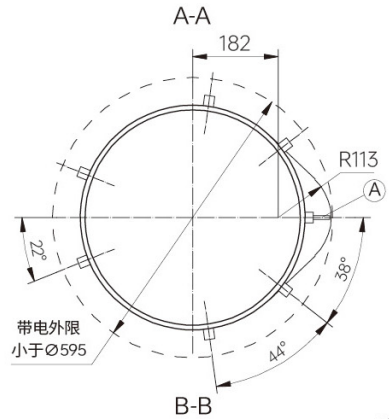
连接法兰 Q、S、R尺寸

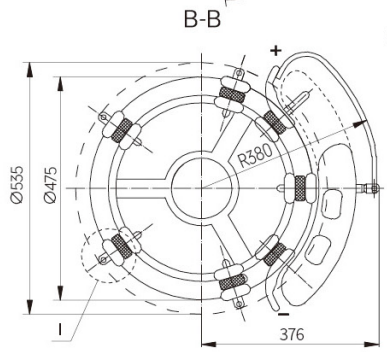


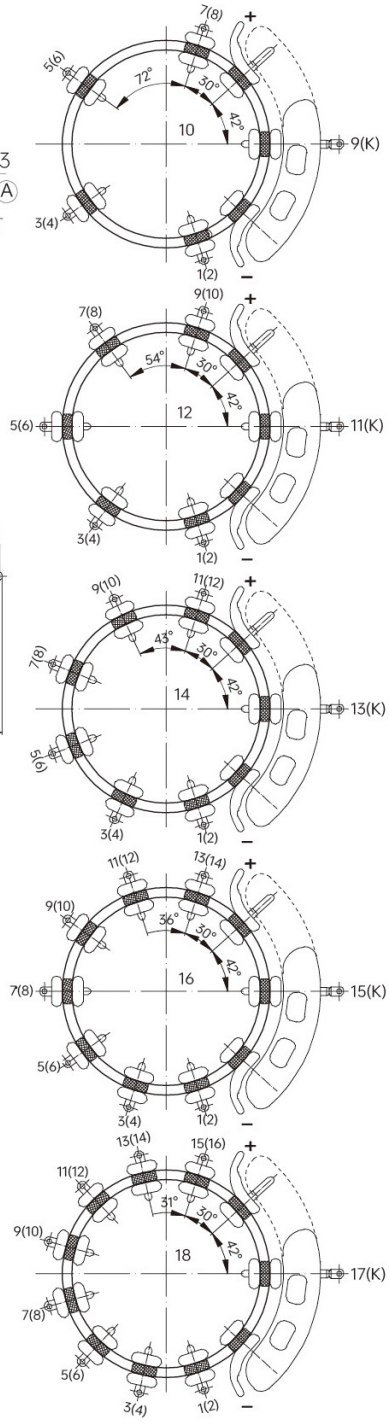
选择器型号		B				C				D			
最高工作电压(kV)		72.5	126	170	252	72.5	126	170	252	72.5	126	170	252
尺寸mm	h	1901	2031	2161	2261	1976	2096	2236	2336	2171	2301	2431	2531
	i	978	1108	1238	1338	978	1108	1238	1338	978	1108	1238	1338
	k	923				998				1193			
	n	268				293				358			
	o	95				120				185			
	t1	105				105				105			
	t2	80				80				80			
	m	102				127				192			
油积dm^3		130	150	170	190	130	150	170	190	130	150	170	190
排油量dm^3		194	219	239	259	194	219	239	259	196	221	241	261
重量Kg		260				260				270			

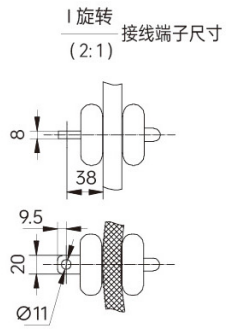
图7 HMD I 1200/1500线性调

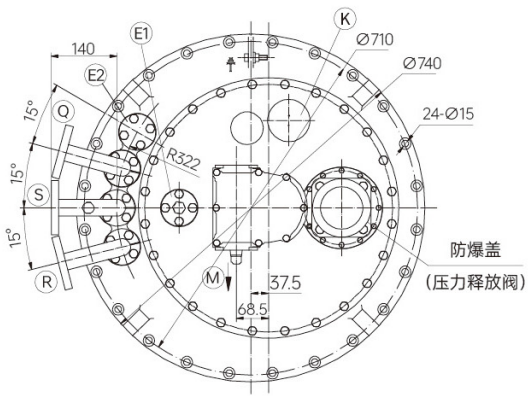












A：分接开关引出端子 (中性点)
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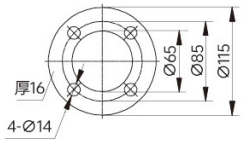
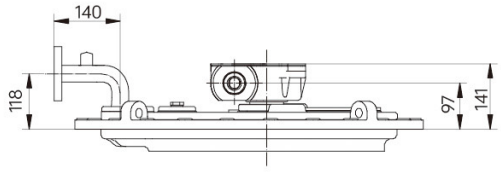
连接法兰 Q、S、R尺寸

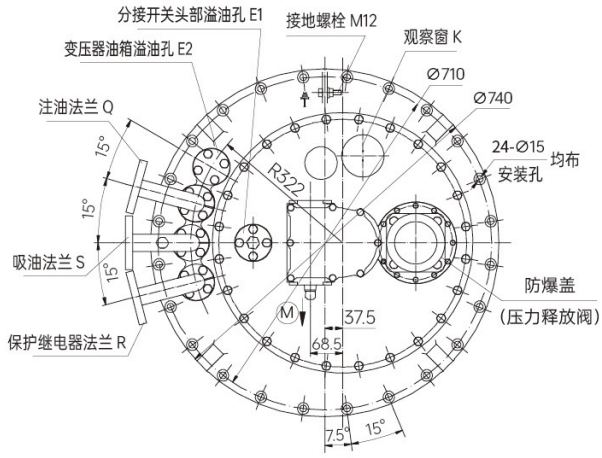


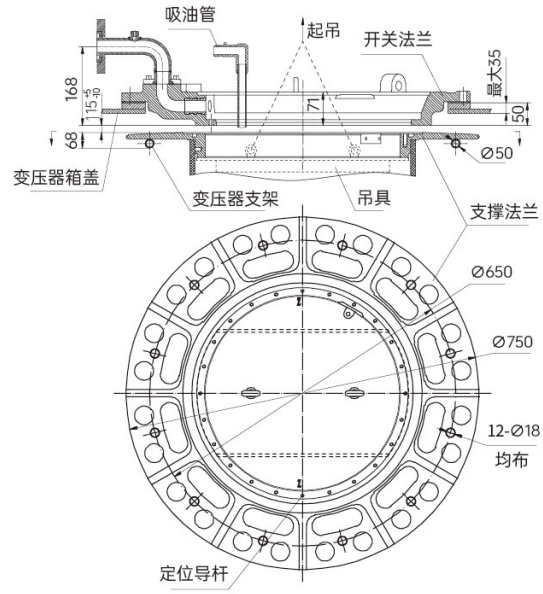
选择器型号		B				C				D			
最高工作电压(kV)		72.5	126	170	252	72.5	126	170	252	72.5	126	170	252
尺寸mm	h	1901	2031	2161	2261	1976	2096	2236	2336	2171	2301	2431	2531
	i	978	1108	1238	1338	978	1108	1238	1338	978	1108	1238	1338
	k	923				998				1193			
	n	268				293				358			
	o	95				120				185			
	t1	105				105				105			
	t2	80				80				80			
	m	102				127				192			
	r	105				105				105			
	q	160				184				250			
	p	773				848				1043			
油积dm³		130	150	170	190	130	150	170	190	130	150	170	190
排油量dm³		220	225	245	265	220	225	245	265	204	229	249	269
重量Kg		285				285				295			

图8 HMD I 1200/1500正反调

六、HMD安装尺寸图







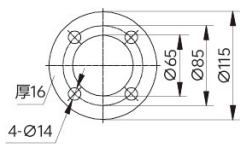
HMD 钟罩式安装尺寸

连接法兰 Q、S、R尺寸

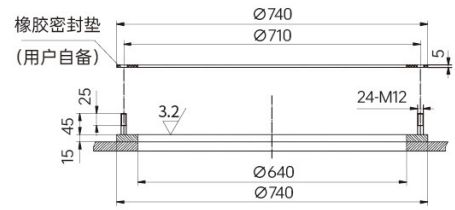
Q: 可回转360°

S: 可回转360°

R: 可回转360°(可与Q接头换用)



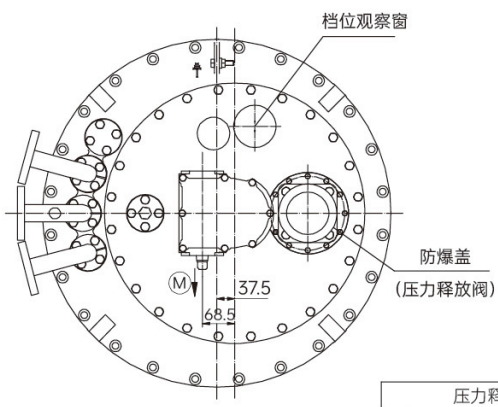
HMD头部安装尺寸图



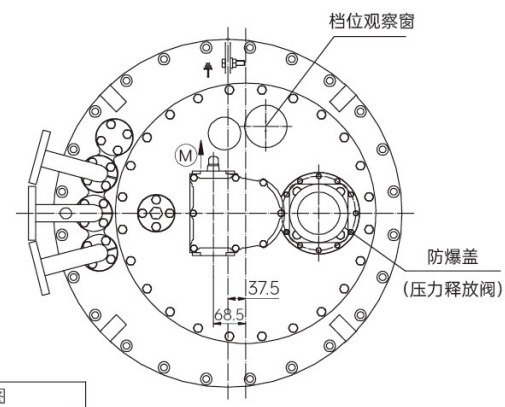
变压器箱盖安装法兰尺寸图

七、HMD头盖布置图

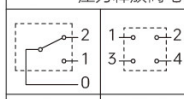
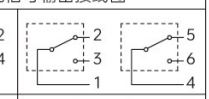
为了满足用户要求，HMD开关头盖在定货时，请选择合适的头盖布局方式，若用户不选择确定，则按图A生产。特殊角度情况请在定货时给出方案商确。



图A

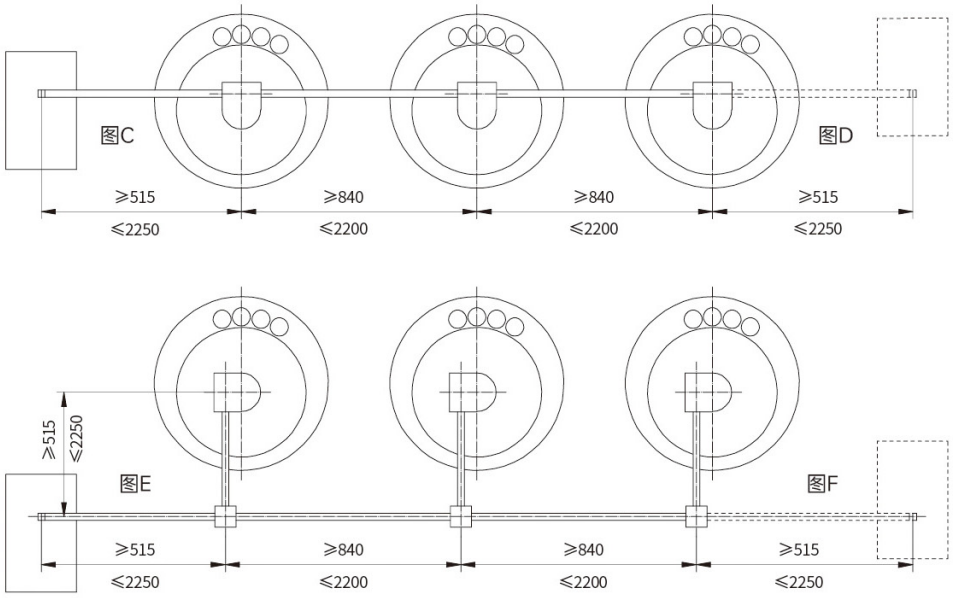


图B

压力释放阀电信号输出接线图		
		
标配	Ⅰ型	Ⅱ型

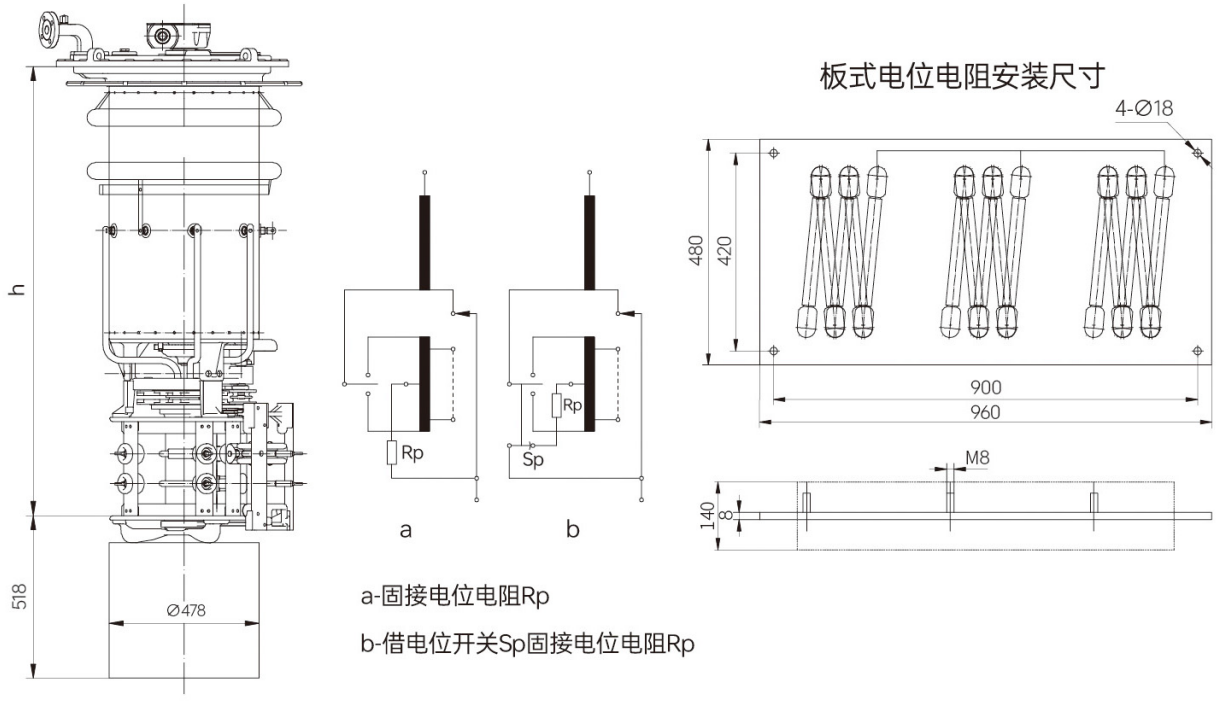
八、HMD三台机械连动布置图

为了方便用户三台机械连动布置，HMD三台机械连动给了图C、图D、图E、图F四种方案，供用户参考。若有其它布置方按双方商确。



八、HMD电位电阻和电位开关

当分接开关转换选择器动作期间时，分接绕组处于“悬浮”状态。由于主绕组与分接绕组存在耦全电容C，分接绕组与箱壳存在一耦合电容C的缘故，转换选择器产生火花放电。为减少火花放电气体，采用固接电位电阻或由电位电阻开关来联接电位电阻的方式。



a-固接电位电阻Rp

b-借电位开关Sp固接电位电阻Rp

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