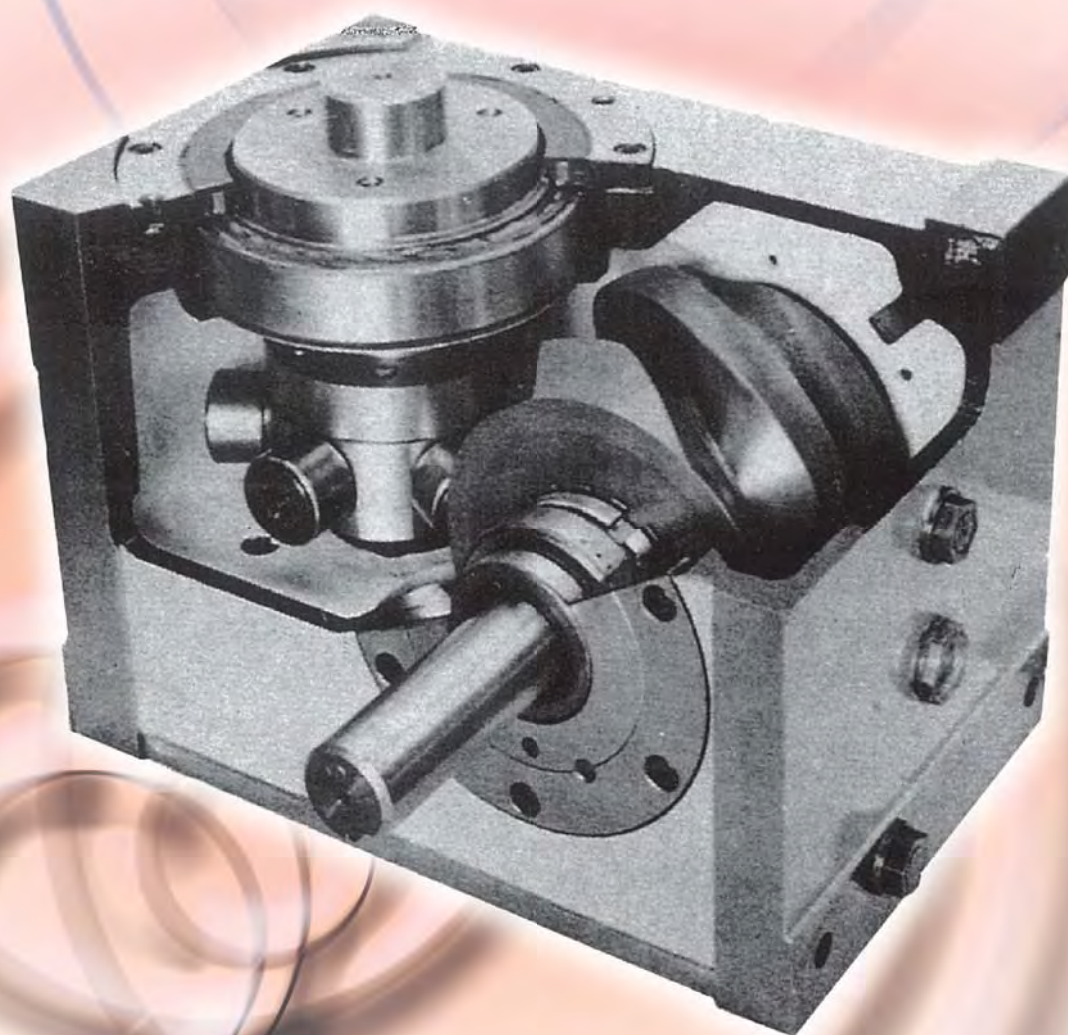


MK 2

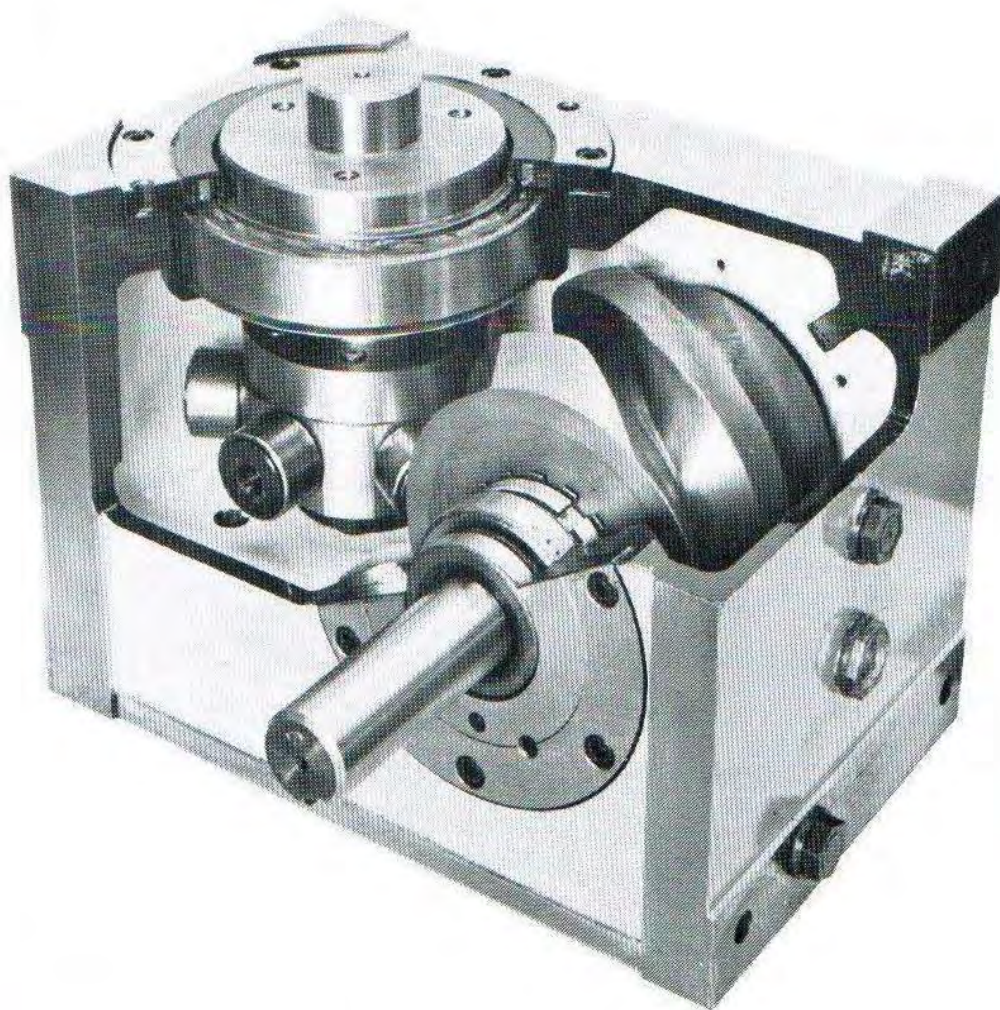


High speed Globoidal[®]
CAM indexers



ITALPLANT_{srl}

High Speed Precision Indexing



Introduction

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INTRODUCTION

This edition of our catalogue brings together some thirty years of development of cam operated indexing drives.

In the following pages you will find the most comprehensive range of indexers offered by a single company to provide the solution to indexing problems from small fast applications up to the largest involving the movement of many tons.

You can obtain the ideal solution to your rotary or linear indexing with **Italplant** Indexers. All types feature positive cam controlled movements. This means acceleration and velocity are controlled throughout the entire cycle. Your application will benefit from the extremely accurate, shock free motion. Even at high speeds (up to 2000 indexes/min) or with very high inertia loads, **Italplant** Indexers remain smooth, precise and reliable.

Although no catalogue can ever be complete we have included our standard types in a range of

sizes which are in regular production. Many others not listed here are also available.

In order to meet the multitude of applications we offer the following types:

Mk 2	(Globoidal Cam)
Mk 3	(Parallel Shaft Conjugate Cam)
Mk 4B	(Patented heavy duty)

Apart from the difference in the basic geometry and configuration each type has its own inherent advantages which together provide a fully comprehensive range.

We can thus select the best indexer for the job, whatever the application. Years of experience of applying cam operated indexers in all kinds of industry have enabled our engineers to accumulate a great deal of know-how which they can effectively combine with sound engineering practice to provide you with reliable high performance intermittent motion.



* SIMPLICITY

There are only two basic elements the CAM and TURRET.

* RELIABILITY

The Mechanisms are of extremely robust proportions having a long life with virtually no maintenance.

* ACCURACY

The Italplant special manufacturing technique ensures that positional accuracy is maintained by the elimination of backlash during the dwell.

* SELF-LOCKING

All the Mechanisms are inherently self-locking in the dwell position and require no auxiliary locking device. The turret will withstand full load torque in either direction while stationary.

* REVERSIBILITY

The Mechanism will work equally well in both directions of rotation.

* SMOOTH MOVEMENT

The process by which the cams are manufactured ensures a smooth shock-free transfer from follower to follower, with positive control throughout the movement.

* HIGH SPEED

A cam system gives the designer a free choice of the displacement/time function. Advantage of this has been taken to employ acceleration characteristics which minimise the shock forces produced at high speeds or high inertia loads. Machines can be indexed with Italplant Indexing Mechanisms considerably faster than with other systems.

* EFFICIENCY

The use of low-friction Italplant follower bearings results in very high efficiencies, so that the power losses in the cam and turret are negligible.

* COMPACTNESS

Size for size the load carrying capacity is higher than that of any other type of indexing mechanism.



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ITALPLANT S.R.L.
VIA GONIN, 45 A/B
10137 TORINO - ITALY

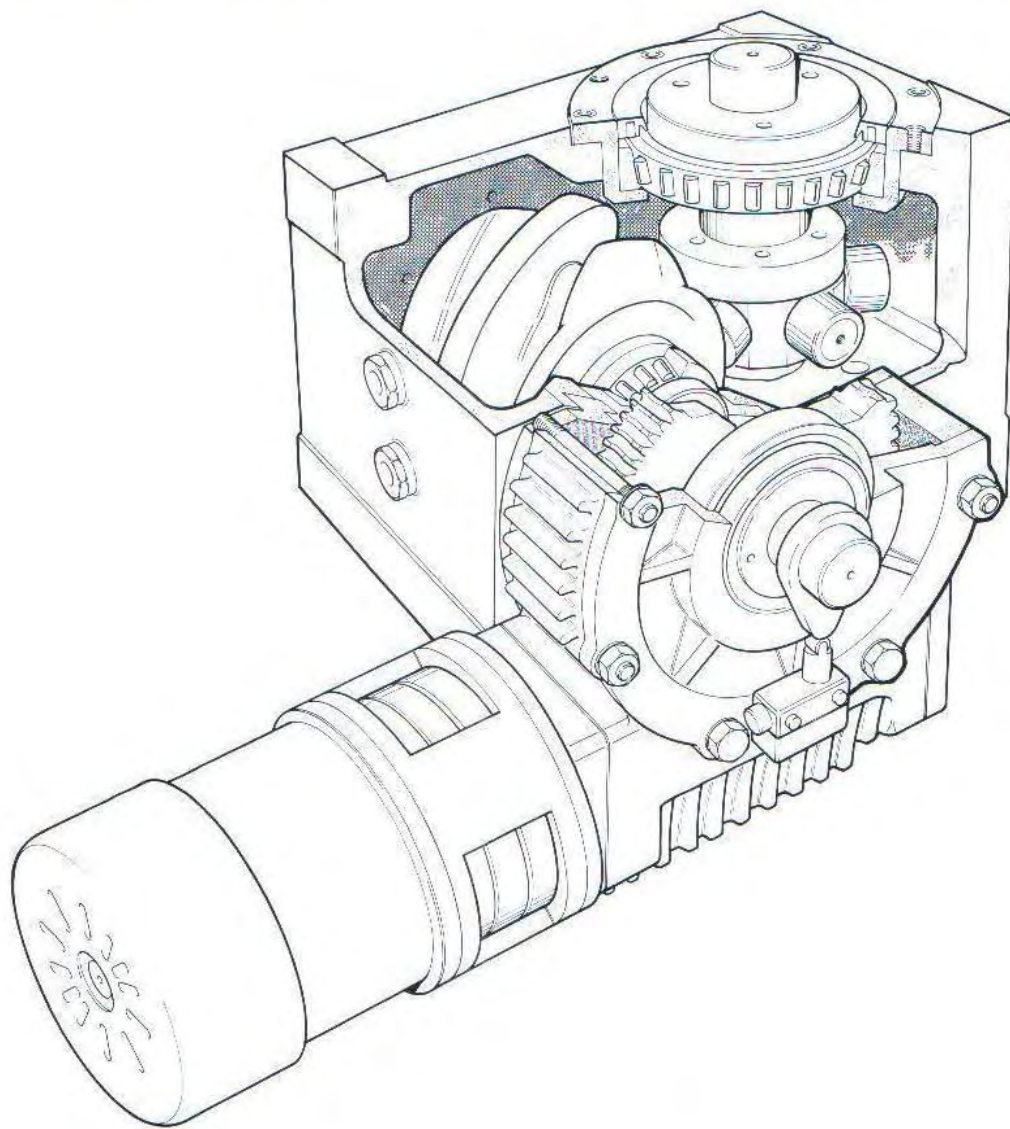
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ITALPLANT^{sr}

Globoidal Cam Indexers General Series

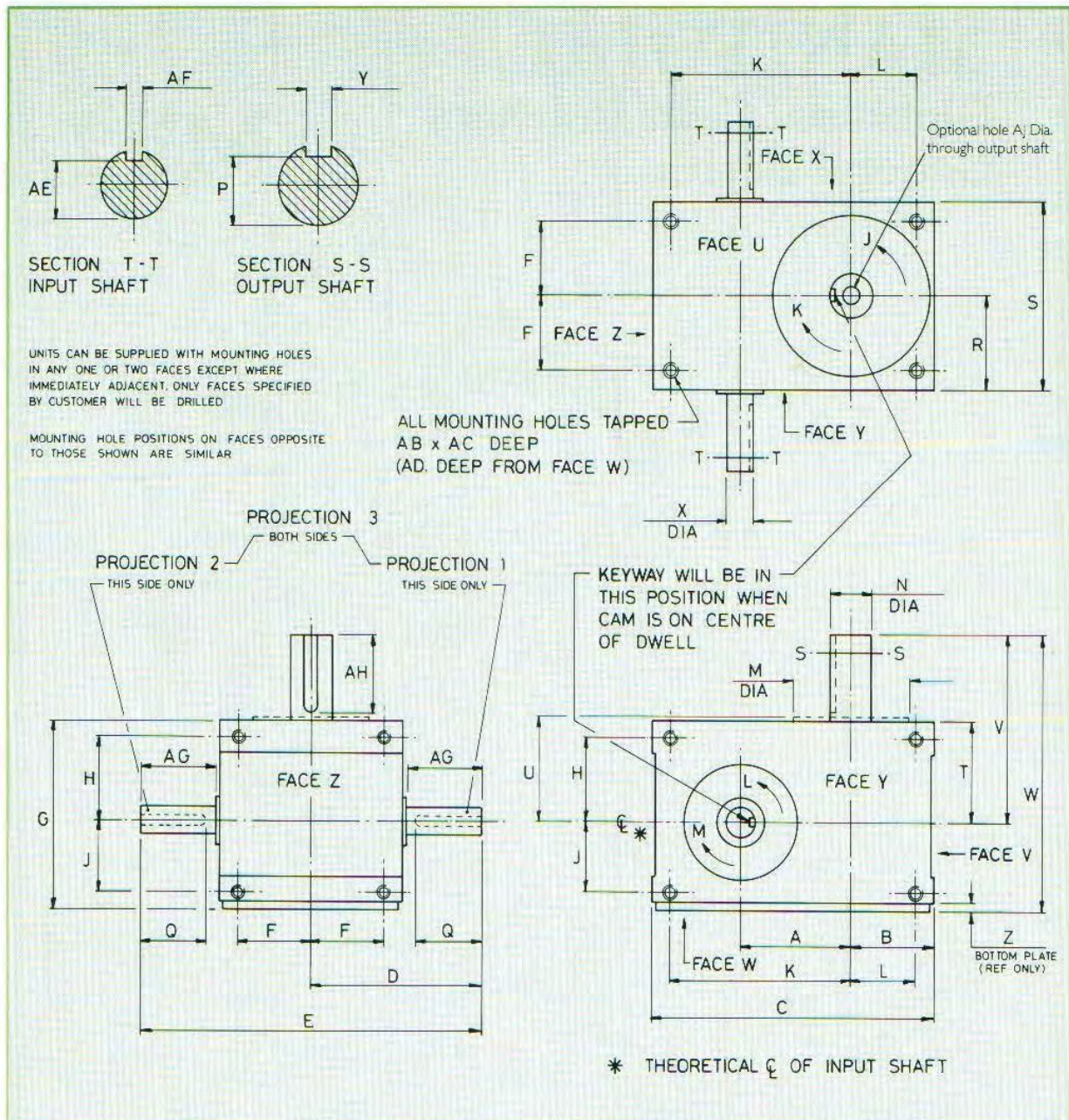
Mk2



FEATURES

- * Hardened & Ground Steel Cam
- * High Precision Heavy Duty Cam Followers
- * Rigid Cast Iron Housing
- * Largest Range of Stops & Index Periods
- * Pre-Loaded Taper Roller Bearings
- * Optimum Motion Law
- * Special Italplant "Twin-Dwell" Cam for Extra High Speeds

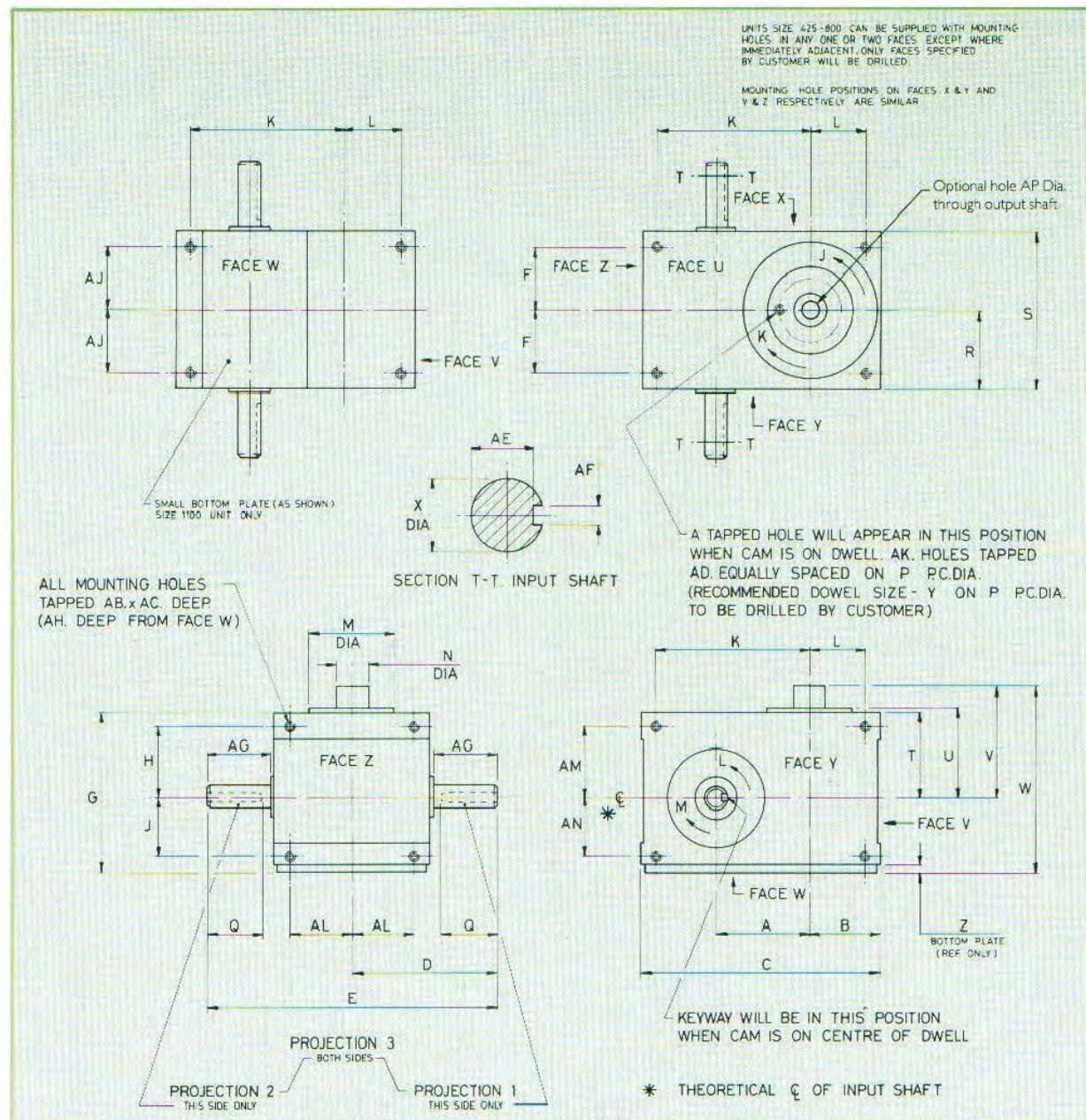
Mk2 Indexers, General Series



Size	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R
210	54	52.5	162	80	160	40	104	50	30	98.5	41.5	39.5	14.000 13.989	11.0 10.9	28	50
325	80	67	222	130	260	55	152	73	45	140	52	—	40.000 39.984	35.0 34.8	45	77.5

Size	S	T	U	V	W	X	Y	Z	AB	AC	AD	AE	AF	AG	AH	AJ
210	100	60	64	94	138	14.000 13.989	4.988 4.958	4.8	M8	12	16	11.0 10.9	4.988 4.958	—	28	—
325	155	89	—	169	232	25.000 24.980	11.982 11.939	8	M10	18	26	21.0 20.8	7.985 7.949	52.5	75	15

SIZES	425	650	1100
	500	800	



Size	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
425	108	80	280	200	400	72	200	80	80	185	65	100	40.000 39.984	72	107	90	180	100
500	140	98.5	355	218	436	90	238	110	90	240	80	115	50.000 49.984	80	107	108	216	127
650	152	127	394	270	540	110	267	125	90	245	105	130	50.000 49.984	90	140	127	254	152
800	178	152.5	457	295.5	591	130	279.5	135	90	285	130	130	50.000 49.984	90	140	152.5	305	165
1100	254	203	646	380	760	160	343	130	120	425	185	150	90.000 89.978	127	170	200	400	178

Size	U	V	W	X	Y	Z	AB	AC	AD	AE	AF	AG	AH	AJ	AK	AL	AM	AN	AP
425	102	122	222	40.00 39.984	8	10	M10	25	M8 × 20 DP	35.0 34.8	11.982 11.939	110	35	72	3	72	80	80	20
500	128	153	264	40.000 39.984	8	10	M12	25	M8 × 20 DP	35.0 34.8	11.982 11.939	110	35	90	3	90	110	90	30
650	155	180	295	48.000 47.984	10	12	M12	25	M10 × 20 DP	42.5 42.3	13.982 13.939	143	37	110	3	110	125	90	35
800	167	192	306.5	48.000 47.984	10	12	M12	25	M10 × 20 DP	42.5 42.3	13.982 13.939	143	37	130	3	130	135	90	35
1100	180	205	370	60.000 59.981	12	—	M16	25	M12 × 20 DP	53.0 52.8	17.982 17.939	180	—	156	4	183	160	140	45

ITALPLANT Mk2 Indexers

MODEL DATA

S No. of Stops	α Index Period	Model Number	Motion	* Cam Type	Mr B-10 Cap @ 50 IPM (Nm)	MI Torque Limit (Nm)	Ii Internal Inertia (kg.m ²)
1	330	325-D1S10-330	MSC50	1	80	66	0.0015
		425-D1S12-330	MSC50	1	136	216	0.0088
		500-D1S20-330	MSC50	1	366	811	0.0195
		650-D1S20-330	MSC50	1	433	1006	0.0443
		800-D1S20-330	MSC50	1	479	1190	0.0727
2	180	1100-Y1S32-330	MSC50	1	1792	2788	0.2736
		325-D2S10-180	MSC50	1	105	67	0.0015
		425-D2S12-180	MSC50	1	176	218	0.0088
		500-D2S20-180	MSC33	1	480	803	0.0195
		650-D2S20-180	MSC50	1	580	1013	0.0443
		800-D2S24-180	MSC50	1	955	1565	0.0775
	240	1100-Y2S32-180	MSC33	1	2524	2762	0.2736
		325-D2S12-240	MSC33	1	146	173	0.0016
		425-D2S16-240	MSC33	1	257	467	0.0095
		500-D2S20-240	MS	1	411	854	0.0195
		650-D2S20-240	MS	1	485	1030	0.0443
		800-D2S24-240	MSC33	1	961	1734	0.0775
	300	1100-Y2S32-240	MS	1	2106	2939	0.2736
		325-D2S12-300	MS	1	124	174	0.0016
		425-D2S16-300	MS	1	218	470	0.0095
		500-D2S20-300	MS	1	403	877	0.0195
		650-D2S20-300	MS	1	488	1073	0.0443
		800-D2S24-300	MS	1	791	1755	0.0775
3	120	1100-Y2S36-300	MS	1	2224	3673	0.2895
		325-D3S10-120	MSC33	1	125	65	0.0015
		425-D3S12-120	MSC20	1	211	208	0.0088
		500-D3S16-120	MS	1	314	505	0.0181
		650-D3S20-120	MSC33	1	682	982	0.0443
		800-D3S24-120	MSC50	1	1183	1565	0.0775
	150	1100-Y3S32-120	MSC50	1	3172	3041	0.2736
		325-D3S10-150	MS	1	114	66	0.0015
		425-D3S12-150	MS	1	195	215	0.0088
		500-D3S20-150	MS	1	519	801	0.0195
		650-D3S20-150	MS	1	617	999	0.0443
		800-D3S24-150	MSC20	1	1099	1633	0.0775
	180	1100-Y3S36-150	MSC20	1	3082	3174	0.2895
		210-A3S 8-180	MS	1	42	25	0.0001
		325-D3S12-180	MS	1	153	170	0.0016
		425-D3S16-180	MS	1	281	460	0.0095
		500-D3S24-180	MS	1	717	961	0.0216
		650-D3S24-180	MSC20	1	930	1439	0.0475
	210	800-D3S28-180	MSC20	1	1417	1959	0.0843
		1100-Y3S36-180	MS	1	2829	3306	0.2895
		210-A3S 8-210	MS	1	42	26	0.0001
		325-D3S12-210	MS	1	158	174	0.0016
		425-D3S16-210	MS	1	274	471	0.0095
		500-D3S24-210	MS	1	704	1121	0.0216
	240	650-D3S24-210	MS	1	860	1447	0.0475
		800-D3S28-210	MS	1	1324	1984	0.0843
		1100-Y3S40-210	MS	1	3951	3857	0.3261
		210-A3S 8-240	MS	1	41	27	0.0001
		325-D3S12-240	MS	1	153	177	0.0016
		425-D3S20-240	MS	1	428	755	0.0105
	270	500-D3S24-240	MS	1	680	1196	0.0216
		650-D3S28-240	MS	1	1105	1837	0.0522
		800-D3S32-240	MSC20	1	2016	2613	0.0975
		1100-Y3S40-240	MS	1	3930	4408	0.3261
		210-A3S 8-270	MS	1	41	27	0.0001
		325-D3S12-270	MS	1	150	178	0.0016
		425-D3S20-270	MS	1	428	761	0.0105
		500-D3S24-270	MS	1	667	1202	0.0216
		650-D3S28-270	MS	1	1089	1857	0.0522
		800-D3S32-270	MS	1	2130	2551	0.0975
		1100-Y3S40-270	MS	1	3885	4959	0.3261

* See note 9 on page D11.

ITALPLANT Mk2 Indexers

MODEL DATA

S No. of Stops	α Index Period	Model Number	Motion	* Cam Type	Mr B-10 Cap @ 50 IPM (Nm)	Ml Torque Limit (Nm)	li Internal Inertia (kg.m ²)
4	120	325-D4S10-120	MSC50	1	151	70	0.0015
		425-D4S12-120	MSC20	1	235	221	0.0090
		500-D4S16-120	MS	1	358	533	0.0186
		650-D4S16-120	MS	1	438	629	0.0430
		800-D4S20-120	MSC20	1	912	1228	0.0749
		1100-Y4S28-120	MSC20	1	2155	2901	0.2626
	150	325-D4S10-150	MSC20	1	136	70	0.0015
		425-D4S12-150	MS	1	221	224	0.0090
		500-D4S16-150	MS	1	345	550	0.0186
		650-D4S20-150	MSC20	1	750	1075	0.0458
		800-D4S24-150	MSC20	1	1247	1749	0.0812
		1100-Y4S32-150	MS	1	3241	3673	0.2932
	180	325-D4S12-180	MSC33	1	178	178	0.0017
		425-D4S16-180	MS	1	311	474	0.0098
		500-D4S20-180	MS	1	558	883	0.0204
		650-D4S24-180	MSC20	1	1031	1479	0.0501
		800-D4S24-180	MS	1	1195	1769	0.0812
		1100-Y4S32-180	MS	1	3241	4408	0.2932
	210	210-A4S 8-210	MSC20	1	52	28	0.0001
		325-D4S12-210	MSC20	1	174	179	0.0017
		425-D4S16-210	MS	1	304	479	0.0098
		500-D4S20-210	MS	1	544	889	0.0204
		650-D4S24-210	MSC20	1	1013	1496	0.0501
		800-D4S28-210	MSC20	1	1577	2284	0.0903
	240	1100-Y4S32-210	MS	1	3141	4752	0.2932
		210-A4S 8-240	MS	1	47	28	0.0001
		325-D4S12-240	MS	1	167	179	0.0017
		425-D4S16-240	MS	1	298	482	0.0098
		500-D4S20-240	MS	1	531	892	0.0204
		650-D4S24-240	MS	1	951	1496	0.0501
	270	800-D4S28-240	MS	1	1491	2284	0.0903
		1100-Y4S40-240	MS	1	4367	5593	0.3632
		210-A4S 8-270	MS	1	46	28	0.0001
		325-D4S12-270	MS	1	167	180	0.0017
		425-D4S16-270	MS	1	292	484	0.0098
		500-D4S20-270	MS	1	519	895	0.0204
5	120	650-D4S24-270	MS	1	933	1504	0.0501
		800-D4S28-270	MS	1	1443	2302	0.0903
		1100-Y4S40-270	MS	1	4291	5634	0.3632
		325-D5S16-120	MS	1	249	240	0.0018
		425-D5S20-120	MS	1	503	743	0.0101
		500-D5S24-120	MS	1	781	1068	0.0208
	150	650-D5S32-120	MS	1	2016	1890	0.0577
		800-D5S20-120	MSC20	1	989	1290	0.0771
		1100-Y5S28-120	MSC20	1	2340	3055	0.2745
		325-D5S16-150	MS	1	243	300	0.0018
		425-D5S20-150	MS	1	490	759	0.0101
		500-D5S24-150	MS	1	749	1200	0.0208
	180	650-D5S32-150	MS	1	1978	2362	0.0577
		800-D5S20-150	MS	1	948	1315	0.0771
		1100-Y5S28-150	MS	1	2248	3120	0.2745
		325-D5S16-180	MS	1	235	360	0.0018
		425-D5S20-180	MS	1	472	766	0.0101
		500-D5S24-180	MS	1	722	1207	0.0208
	210	650-D5S32-180	MS	1	1925	2835	0.0577
		800-D5S24-180	MSC20	1	1344	1834	0.0850
		1100-Y5S32-180	MS	1	3505	4765	0.3127
		325-D5S16-210	MS	1	228	373	0.0018
		425-D5S20-210	MS	1	457	770	0.0101
		500-D5S24-210	MS	1	696	1210	0.0208
		650-D5S32-210	MS	1	1869	2881	0.0577
		800-D5S24-210	MS	1	1262	1836	0.0850
		1100-Y5S32-210	MS	1	3387	4827	0.3127

* See note 9 on page D11.

ITALPLANT Mk2 Indexers

MODEL DATA

S No. of Stops	α Index Period	Model Number	Motion	* Cam Type	Mr B-10 Cap @ 50 IPM (Nm)	MI Torque Limit (Nm)	Ii Internal Inertia (kg.m ²)
5	240	325-D5S16-240	MS	1	220	375	0.0018
		425-D5S20-240	MS	1	443	772	0.0101
		500-D5S24-240	MS	1	673	1212	0.0208
		650-D5S32-240	MS	1	1818	2892	0.0577
		800-D5S24-240	MS	1	1236	1849	0.0850
		1100-Y5S32-240	MS	1	3319	4862	0.3127
	270	325-D5S16-270	MS	1	214	375	0.0018
		425-D5S20-270	MS	1	430	773	0.0101
		500-D5S24-270	MS	1	652	1214	0.0208
		650-D5S32-270	MS	1	1768	2900	0.0577
		800-D5S24-270	MS	1	1211	1857	0.0850
		1100-Y5S32-270	MS	1	3250	4882	0.3127
6	90	210-A6S 8-90	MSC20	1	53	26	0.0001
		325-D6S12-90	MS	1	161	169	0.0016
		425-D6S16-90	MS	1	337	457	0.0095
		500-D6S24-90	MS	1	882	961	0.0216
		650-D6S28-90	MSC20	1	1429	1783	0.0522
		800-D6S28-90	MSC20	1	1686	1959	0.0843
	120	1100-Y6S40-90	MS	1	4704	3306	0.3261
		210-A6S 8-120	MS	1	53	27	0.0001
		325-D6S16-120	MS	1	274	288	0.0019
		425-D6S16-120	MS	1	326	476	0.0095
		500-D6S24-120	MS	1	848	1195	0.0216
		650-D6S32-120	MSC20	1	2213	2612	0.0613
	150	800-D6S32-120	MS	1	2588	2268	0.0975
		1100-Y6S48-120	MS	1	6019	4408	0.4041
		210-A6S 8-150	MS	1	53	28	0.0001
		325-D6S16-150	MS	1	265	360	0.0019
		425-D6S20-150	MS	1	532	765	0.0105
		500-D6S24-150	MS	1	812	1205	0.0216
	180	650-D6S32-150	MS	1	2167	2835	0.0613
		800-D6S32-150	MS	1	2543	2835	0.0975
		1100-Y6S48-150	MS	1	5866	5510	0.4041
		210-A6S 8-180	MS	1	53	28	0.0001
		325-D6S16-180	MS	1	255	373	0.0019
		425-D6S20-180	MS	1	513	769	0.0105
	210	500-D6S24-180	MS	1	778	1210	0.0216
		650-D6S32-180	MS	1	2098	2877	0.0613
		800-D6S40-180	MS	1	3377	3402	0.1279
		1100-Y6S48-180	MS	1	5685	6612	0.4041
		210-A6S 8-210	MS	1	53	28	0.0001
		325-D6S16-210	MS	1	246	375	0.0019
	240	425-D6S20-210	MS	1	495	772	0.0105
		500-D6S24-210	MS	1	749	1212	0.0216
		650-D6S32-210	MS	1	2031	2891	0.0613
		800-D6S40-210	MS	1	3384	3969	0.1279
		1100-Y6S48-210	MS	1	5507	7714	0.4041
		210-A6S 8-240	MS	1	53	28	0.0001
	270	325-D6S16-240	MS	1	238	375	0.0019
		425-D6S20-240	MS	1	478	773	0.0105
		500-D6S24-240	MS	1	723	1214	0.0216
		650-D6S32-240	MS	1	1969	2900	0.0613
		800-D6S40-240	MS	1	3364	4182	0.1279
		1100-Y6S48-240	MS	1	5344	8438	0.4041
	270	210-A6S 8-270	MS	1	53	28	0.0001
		325-D6S16-270	MS	1	231	376	0.0019
		425-D6S20-270	MS	1	464	774	0.0105
		500-D6S24-270	MS	1	701	1215	0.0216
		650-D6S32-270	MS	1	1913	2905	0.0613
		800-D6S40-270	MS	1	3259	4193	0.1279
		1100-Y6S48-270	MS	1	5192	8452	0.4041

* See note 9 on page D11.

ITALPLANT Mk2 Indexers

MODEL DATA

S No. of Stops	α Index Period	Model Number	Motion	* Cam Type	Mr B-10 Cap @ 50 IPM (Nm)	MI Torque Limit (Nm)	Ii Internal Inertia (kg.m ²)
8	90	325-D8S12-90	MSC33	1	197	178	0.0017
		425-D8S16-90	MS	1	389	473	0.0098
		500-D8S20-90	MS	1	711	882	0.0204
		650-D8S24-90	MSC20	1	1194	1477	0.0501
		800-D8S24-90	MS	1	1429	1759	0.0812
		1100-Y8S40-90	MSC20	1	5818	5078	0.3632
	120	210-A8S 8-120	MS	1	57	28	0.0001
		325-D8S12-120	MS	1	190	179	0.0017
		425-D8S16-120	MS	1	372	482	0.0098
		500-D8S20-120	MS	1	672	892	0.0204
		650-D8S24-120	MS	1	1184	1494	0.0501
		800-D8S28-120	MS	1	1821	2280	0.0903
	150	1100-Y8S40-120	MS	1	5421	5585	0.3632
		210-A8S 8-150	MS	1	56	28	0.0001
		325-D8S12-150	MS	1	183	180	0.0017
		425-D8S16-150	MS	1	355	485	0.0098
		500-D8S20-150	MS	1	638	896	0.0204
		650-D8S24-150	MS	1	1134	1508	0.0501
	180	800-D8S32-150	MS	1	2815	3518	0.1080
		1100-Y8S40-150	MS	1	5222	5657	0.3632
		210-A8S 8-180	MS	1	55	28	0.0001
		325-D8S12-180	MS	1	176	181	0.0017
		425-D8S16-180	MS	1	339	487	0.0098
		500-D8S20-180	MS	1	609	897	0.0204
	210	650-D8S24-180	MS	1	1088	1515	0.0501
		800-D8S32-180	MS	1	2803	3541	0.1080
		1100-Y8S40-180	MS	1	5024	5688	0.3632
		210-A8S 8-210	MS	1	55	28	0.0001
		325-D8S12-210	MS	1	174	181	0.0017
		425-D8S16-210	MS	1	326	487	0.0098
	240	500-D8S20-210	MS	1	584	898	0.0204
		650-D8S24-210	MS	1	1047	1518	0.0501
		800-D8S32-210	MS	1	2707	3555	0.1080
		1100-Y8S40-210	MS	1	4842	5704	0.3632
		210-A8S 8-240	MS	1	53	28	0.0001
		325-D8S12-240	MS	1	171	181	0.0017
	270	425-D8S16-240	MS	1	315	488	0.0098
		500-D8S20-240	MS	1	563	899	0.0204
		650-D8S24-240	MS	1	1012	1520	0.0501
		800-D8S32-240	MS	1	2620	3561	0.1080
		1100-Y8S40-240	MS	1	4683	5713	0.3632
		210-A8S 8-270	MS	1	53	28	0.0001
10	90	325-D8S12-270	MS	1	171	181	0.0017
		425-D8S16-270	MS	1	305	488	0.0098
		500-D8S20-270	MS	1	545	900	0.0204
		650-D8S24-270	MS	1	980	1521	0.0501
		800-D8S32-270	MS	1	2542	3565	0.1080
	120	1100-Y8S40-270	MS	1	4540	5719	0.3632
		425-D10S12-90	MS	1	244	232	0.0091
		500-D10S16-90	MS	1	458	561	0.0190
		650-D10S20-90	MS	1	903	1102	0.0472
		800-D10S24-90	MSC20	1	1648	1833	0.0850
	150	1100-Y10S32-90	MS	1	4201	4758	0.3127
		425-D10S12-120	MS	1	239	234	0.0091
		500-D10S16-120	MS	1	431	564	0.0190
		650-D10S20-120	MS	1	904	1117	0.0472
		800-D10S28-120	MSC33	1	2246	2325	0.0964
	180	1100-Y10S32-120	MS	1	4139	4861	0.3127
		425-D10S12-150	MS	1	234	235	0.0091
		500-D10S16-150	MS	1	407	565	0.0190
		650-D10S20-150	MS	1	869	1122	0.0472
		800-D10S28-150	MS	1	1929	2326	0.0964
	210	1100-Y10S32-150	MS	1	3953	4895	0.3127

* See note 9 on page D11.

ITALPLANT Mk2 Indexers

MODEL DATA

S No. of Stops	α Index Period	Model Number	Motion	* Cam Type	Mr B-10 Cap @ 50 IPM (Nm)	MI Torque Limit (Nm)	Ii Internal Inertia (kg.m ²)
10	180	425-D10S12-180	MS	1	228	235	0.0091
		500-D10S16-180	MS	1	388	566	0.0190
		650-D10S20-180	MS	1	830	1125	0.0472
		800-D10S28-180	MS	1	1848	2333	0.0964
		1100-Y10S32-180	MS	1	3784	4910	0.3127
	210	425-D10S12-210	MS	1	227	235	0.0091
		500-D10S16-210	MS	1	371	566	0.0190
		650-D10S20-210	MS	1	797	1126	0.0472
		800-D10S28-210	MS	1	1778	2337	0.0964
		1100-Y10S32-210	MS	1	3639	4918	0.3127
	240	425-D10S12-240	MS	1	224	236	0.0091
		500-D10S16-240	MS	1	358	567	0.0190
		650-D10S20-240	MS	1	769	1127	0.0472
		800-D10S28-240	MS	1	1717	2340	0.0964
		1100-Y10S32-240	MS	1	3512	4923	0.3127
	270	425-D10S12-270	MS	1	223	236	0.0091
		500-D10S16-270	MS	1	346	567	0.0190
		650-D10S20-270	MS	1	744	1128	0.0472
		800-D10S28-270	MS	1	1663	2342	0.0964
		1100-Y10S32-270	MS	1	3401	4927	0.3127
12	90	425-D12S12-90	MSC20	1	248	234	0.0093
		500-D12S16-90	MS	1	280	272	0.0179
		650-D12S20-90	MS	1	606	702	0.0445
		800-D12S24-90	MS	1	1138	1363	0.0792
		1100-Y12S28-90	MS	1	2922	3244	0.2864
	120	210-A12S 8-120	MS	2	76	27	0.0001
		325-D12S10-120	MS	2	162	70	0.0015
		425-D12S12-120	MS	1	239	235	0.0093
		500-D12S12-120	MS	1	272	273	0.0179
		650-D12S16-120	MS	1	578	708	0.0445
		800-D12S24-120	MSC20	1	1673	1864	0.0888
		1100-Y12S28-120	MS	1	2769	3285	0.2864
		210-A12S 8-150	MS	2	77	28	0.0001
	150	325-D12S12-150	MS	2	231	177	0.0016
		425-D12S12-150	MS	1	234	235	0.0093
		500-D12S12-150	MS	1	267	273	0.0179
		650-D12S16-150	MS	1	547	709	0.0445
		800-D12S24-150	MS	1	1579	1867	0.0888
		1100-Y12S28-150	MS	1	2630	3300	0.2864
		210-A12S 8-180	MS	2	76	28	0.0001
		325-D12S16-180	MS	2	393	371	0.0019
	180	425-D12S12-180	MS	1	231	235	0.0093
		500-D12S12-180	MS	1	263	273	0.0179
		650-D12S16-180	MS	1	521	710	0.0445
		800-D12S24-180	MS	1	1508	1870	0.0888
		1100-Y12S32-180	MS	1	4050	4919	0.3323
		210-A12S 8-210	MS	2	74	28	0.0001
		325-D12S16-210	MS	2	381	373	0.0019
		425-D12S12-210	MS	1	227	236	0.0093
	210	500-D12S12-210	MS	1	262	273	0.0179
		650-D12S16-210	MS	1	500	711	0.0445
		800-D12S24-210	MS	1	1448	1873	0.0888
		1100-Y12S32-210	MS	1	3888	4924	0.3323
		210-A12S 8-240	MS	2	73	28	0.0001
		325-D12S16-240	MS	2	370	374	0.0019
		425-D12S12-240	MS	1	225	236	0.0093
		500-D12S12-240	MS	1	256	273	0.0179
	240	650-D12S16-240	MS	1	482	711	0.0445
		800-D12S24-240	MS	1	1396	1874	0.0888
		1100-Y12S32-240	MS	1	3749	4928	0.3323

* See note 9 on page D11.

ITALPLANT Mk2 Indexers

MODEL DATA

S No. of Stops	α Index Period	Model Number	Motion	* Cam Type	Mr B-10 Cap @ 50 IPM (Nm)	MI Torque Limit (Nm)	Ii Internal Inertia (kg.m ²)
12	270	210-A12S 8-270	MS	2	71	28	0.0001
		325-D12S16-270	MS	2	359	375	0.0019
		425-D12S12-270	MS	1	224	236	0.0093
		500-D12S12-270	MS	1	248	273	0.0179
		650-D12S16-270	MS	1	466	712	0.0445
		800-D12S24-270	MS	1	1351	1875	0.0888
16	270	1100-Y12S32-270	MS	1	3627	4931	0.3323
		325-D16S 8-90	MS	2	113	40	0.0014
		425-D16S12-90	MS	2	309	227	0.0090
		500-D16S16-90	MS	2	633	554	0.0186
		650-D16S16-90	MS	2	743	673	0.0430
		800-D16S20-90	MS	2	1344	1275	0.0749
	120	1100-Y16S24-90	MS	2	2768	2439	0.2455
		325-D16S12-120	MS	2	245	178	0.0017
		425-D16S16-120	MS	2	547	480	0.0098
		500-D16S20-120	MS	2	974	891	0.0204
		650-D16S24-120	MS	2	1686	1485	0.0501
		800-D16S28-120	MS	2	2733	2253	0.0903
	150	1100-Y16S32-120	MS	2	5691	4753	0.2932
		325-D16S12-150	MS	2	241	180	0.0017
		425-D16S16-150	MS	2	538	484	0.0098
		500-D16S20-150	MS	2	938	895	0.0204
		650-D16S24-150	MS	2	1683	1504	0.0501
		800-D16S28-150	MS	2	2689	2299	0.0903
	180	1100-Y16S40-150	MS	2	7998	5629	0.3632
		325-D16S12-180	MS	2	234	180	0.0017
		425-D16S16-180	MS	2	519	486	0.0098
		500-D16S20-180	MS	2	902	897	0.0204
		650-D16S24-180	MS	2	1642	1512	0.0501
		800-D16S32-180	MS	2	3464	3529	0.1080
	210	1100-Y16S40-180	MS	2	7718	5672	0.3632
		325-D16S12-210	MS	2	227	181	0.0017
		425-D16S16-210	MS	2	502	487	0.0098
		500-D16S20-210	MS	2	876	898	0.0204
		650-D16S24-210	MS	2	1596	1516	0.0501
		800-D16S32-210	MS	2	3338	3546	0.1080
	240	1100-Y16S40-210	MS	2	7456	5695	0.3632
		325-D16S12-240	MS	2	221	181	0.0017
		425-D16S16-240	MS	2	484	488	0.0098
		500-D16S20-240	MS	2	858	899	0.0204
		650-D16S24-240	MS	2	1553	1518	0.0501
		800-D16S32-240	MS	2	3210	3556	0.1080
	270	1100-Y16S40-240	MS	2	7218	5707	0.3632
		325-D16S12-270	MS	2	218	181	0.0017
		425-D16S16-270	MS	2	469	488	0.0098
		500-D16S20-270	MS	2	838	899	0.0204
		650-D16S24-270	MS	2	1511	1520	0.0501
		800-D16S32-270	MS	2	3084	3561	0.1080
20	90	1100-Y16S40-270	MS	2	7005	5714	0.3632
		425-D20S12-90	MS	2	329	231	0.0091
		500-D20S16-90	MS	2	655	560	0.0190
		650-D20S16-90	MS	2	794	693	0.0437
		800-D20S20-90	MS	2	1460	1333	0.0771
		1100-Y20S28-90	MS	2	4063	3166	0.2745
	120	425-D20S12-120	MS	2	321	234	0.0091
		500-D20S16-120	MS	2	624	564	0.0190
		650-D20S20-120	MS	2	1226	1115	0.0472
		800-D20S24-120	MS	2	2146	1842	0.0850
		1100-Y20S32-120	MS	2	6315	4843	0.3127

* See note 9 on page D11.

ITALPLANT Mk2 Indexers

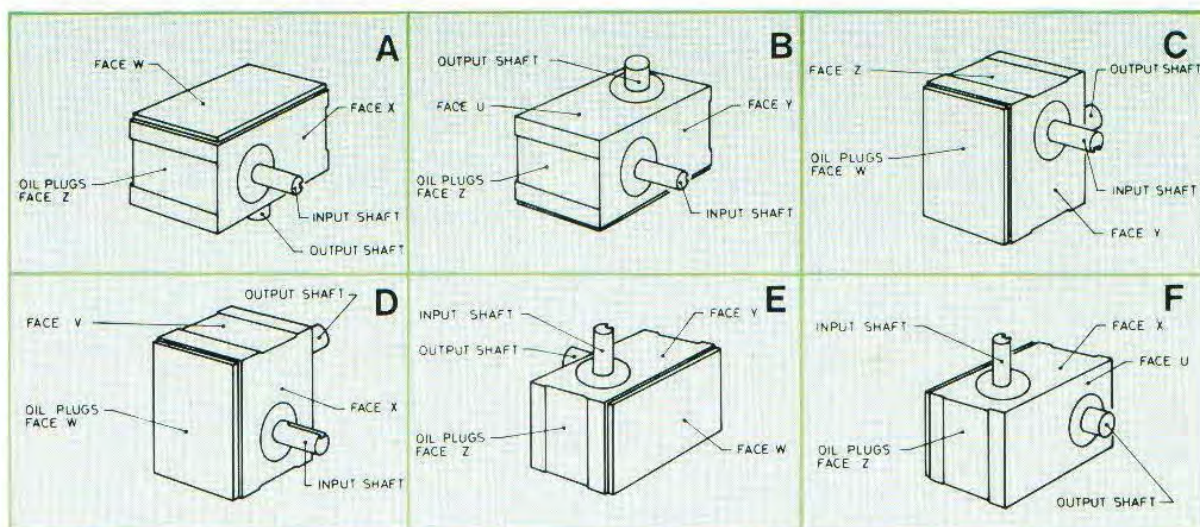
MODEL DATA

S No. of Stops	α Index Period	Model Number	Motion	* Cam Type	Mr B-10 Cap @ 50 IPM (Nm)	MI Torque Limit (Nm)	Ii Internal Inertia (kg.m ²)
20	150	425-D20S12-150	MS	2	307	235	0.0091
		500-D20S16-150	MS	2	594	565	0.0190
		650-D20S20-150	MS	2	1186	1121	0.0472
		800-D20S28-150	MS	2	2894	2321	0.0964
		1100-Y20S32-150	MS	2	6046	4886	0.3127
	180	425-D20S12-180	MS	2	295	235	0.0091
		500-D20S16-180	MS	2	577	566	0.0190
		650-D20S20-180	MS	2	1140	1124	0.0472
		800-D20S28-180	MS	2	2810	2331	0.0964
		1100-Y20S32-180	MS	2	5799	4906	0.3127
	210	425-D20S12-210	MS	2	288	235	0.0091
		500-D20S16-210	MS	2	566	566	0.0190
		650-D20S20-210	MS	2	1106	1126	0.0472
		800-D20S28-210	MS	2	2717	2336	0.0964
		1100-Y20S32-210	MS	2	5582	4915	0.3127
	240	425-D20S12-240	MS	2	284	236	0.0091
		500-D20S16-240	MS	2	547	567	0.0190
		650-D20S20-240	MS	2	1084	1127	0.0472
		800-D20S28-240	MS	2	2636	2339	0.0964
		1100-Y20S32-240	MS	2	5390	4921	0.3127
	270	425-D20S12-270	MS	2	281	236	0.0091
		500-D20S16-270	MS	2	529	567	0.0190
		650-D20S20-270	MS	2	1065	1127	0.0472
		800-D20S28-270	MS	2	2554	2341	0.0964
		1100-Y20S32-270	MS	2	5222	4925	0.3127
24	90	425-D24S10-90	MS	2	237	94	0.0089
		500-D24S12-90	MS	2	372	272	0.0179
		650-D24S16-90	MS	2	822	701	0.0445
		800-D24S20-90	MS	2	1543	1359	0.0792
		1100-Y24S28-90	MS	2	4444	3233	0.2864
	120	425-D24S10-120	MS	2	224	94	0.0089
		500-D24S12-120	MS	2	350	273	0.0179
		650-D24S16-120	MS	2	792	707	0.0445
		800-D24S20-120	MS	2	1527	1377	0.0792
		1100-Y24S28-120	MS	2	4225	3280	0.2864
	150	425-D24S12-150	MS	2	305	235	0.0093
		500-D24S12-150	MS	2	340	273	0.0179
		650-D24S16-150	MS	2	755	709	0.0445
		800-D24S24-150	MSC20	2	2134	1868	0.0888
		1100-Y24S28-150	MS	2	4019	3298	0.2864
	180	425-D24S12-180	MS	2	295	235	0.0093
		500-D24S12-180	MS	2	333	273	0.0179
		650-D24S16-180	MS	2	728	710	0.0445
		800-D24S24-180	MS	2	2043	1870	0.0888
		1100-Y24S28-180	MS	2	3841	3305	0.2864
	210	425-D24S12-210	MS	2	288	236	0.0093
		500-D24S12-210	MS	2	329	273	0.0179
		650-D24S16-210	MS	2	713	711	0.0445
		800-D24S24-210	MS	2	1977	1872	0.0888
		1100-Y24S28-210	MS	2	3689	3309	0.2864
	240	425-D24S12-240	MS	2	284	236	0.0093
		500-D24S12-240	MS	2	325	273	0.0179
		650-D24S16-240	MS	2	703	711	0.0445
		800-D24S24-240	MS	2	1931	1874	0.0888
		1100-Y24S32-240	MS	2	5582	4927	0.3323
	270	425-D24S12-270	MS	2	283	236	0.0093
		500-D24S12-270	MS	2	323	273	0.0179
		650-D24S16-270	MS	2	696	712	0.0445
		800-D24S24-270	MS	2	1897	1875	0.0888
		1100-Y24S32-270	MS	2	5491	4930	0.3323

* See note 9 on page D11.

ITALPLANT Mk2 Indexers

MOUNTING POSITIONS



NOTES

1. Refer to Engineering Section B for additional information.
2. Indexer code example

425 — U — 2 — D ← Mounting position
 Size Mounting hole face Shaft projection

For units with mounting holes in additional faces add appropriate letters, e.g. 425 — UW — 2 — D

3. Mounting holes in adjacent faces are non standard — consult factory.
4. For further ordering information refer to Section M.

5. For reducers and drives refer to Section J.
6. Refer to Section K for lubrication and maintenance.

7. Do not use indexers in mounting positions other than that ordered before consulting factory.

8. Refer to mounting position diagram above for location of oil level, drain and fill plugs.

9. **TYPE NUMBER** — This is the number of complete index cycles in one revolution of the input shaft (cam). A type 1 cam has one index and one dwell per revolution. A type 2 cam has two of each per revolution, arranged in sequence: index-dwell-index-dwell.



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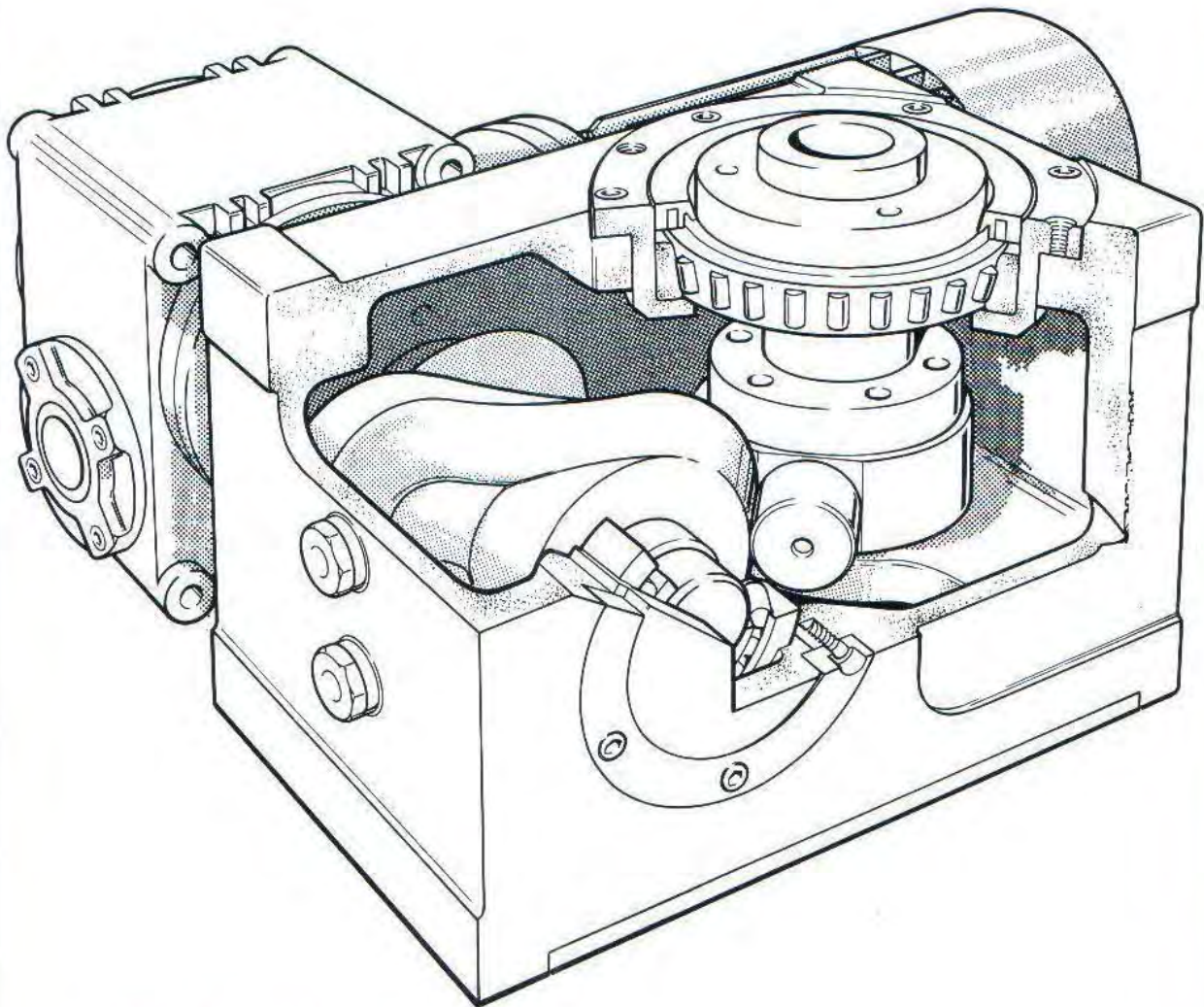
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ITALPLANT^{sr1}

Oscillators

Mk2



FEATURES

- * Rigid Cast Iron Housing
- * Hardened & Ground Steel Cam
- * Heavy Duty High Precision Italplant Cam Followers
- * Pre-Loaded Taper Roller Bearings on Both Shafts
- * Heavy Duty Camshafts are Standard
- * M.S. and Special High Performance Cam Motion
- * Many Standard Drive Packages Available
- * Flanged Output Shaft

ITALPLANT Mk2 Oscillators

INTRODUCTION

The ITALPLANT Mk2 OSCILLATOR has a cam operated mechanism for producing an oscillating rotary output motion from a constant rotary input motion. A standard oscillating cycle, produced by one revolution of the input shaft, consists of two output MOTION PERIODS of opposite direction, with or without DWELL PERIODS between them.

The angle through which the output shaft rotates (or swings) during a motion period is called the OUTPUT STROKE.

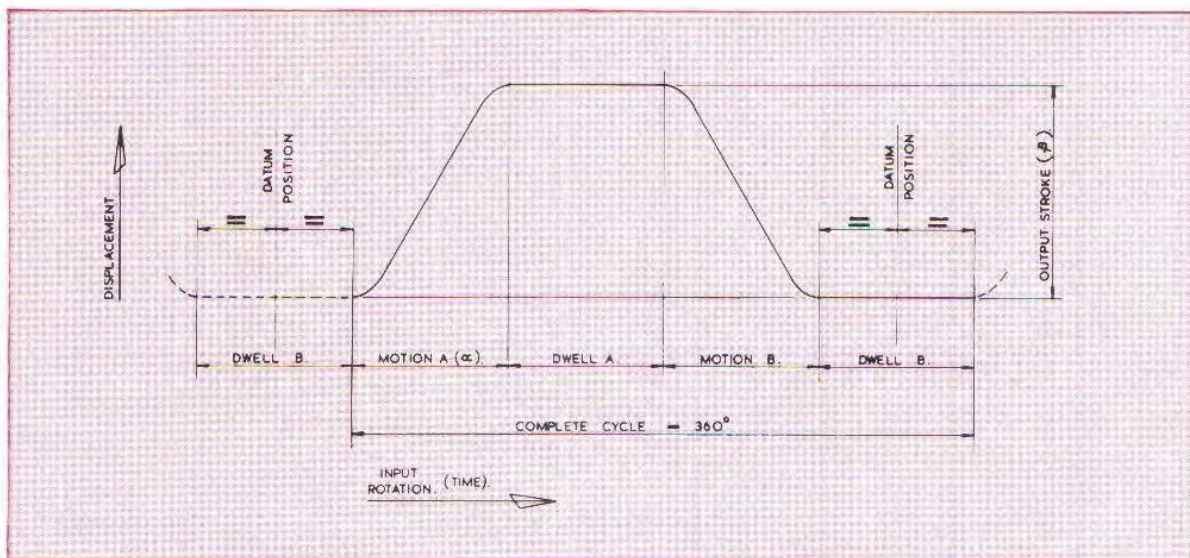
ITALPLANT Mk2 OSCILLATORS can be made for almost any combination of Motion Period, Dwell Period and Output Stroke. However, certain STANDARD types in a range of standard housings are available as listed in the tables, pages 5 to 8. This range employs heavy duty camshafts, hardened steel cams and high accuracy ITALPLANT rollers. The whole mechanism is mounted on taper roller bearings in a rigid cast iron housing which also serves as an oil bath.

MOTION LAWS

A number of standard motion laws have been selected to give the best combination of smooth operation and high strength. These motions vary from one mechanism to another, and it is essential to use the appropriate factors when calculating the torque requirement of an application.

TIMING & DATUM POSITION

There are four periods in the oscillator cycle, designated chronologically: Motion A, Dwell A, Motion B, Dwell B. There are alternative ways in which an oscillating mechanism can be assembled and used. In order to be able to orient mating components it is necessary to define a datum position. The DATUM POSITION of the unit occurs at the centre of the Dwell B period. The datum features are shown on page 3. The motion timing is shown below. Standard units have Motion A and Motion B of equal duration, but unequal motion periods, special motions, unequal dwell periods, etc., can be supplied on request.



TIMING DIAGRAM

DIRECTIONS OF ROTATION

The directions of rotation must be specified when ordering. The input shaft can be rotated in either direction, L or M as shown on page 3. With standard (symmetrical) timings both input directions produce similar output motion. The motion immediately following the datum position is always designated Motion A, irrespective of whether this is regarded as a "forward" motion or a "return" motion in use. However, the unit can be assembled in two alternative ways:

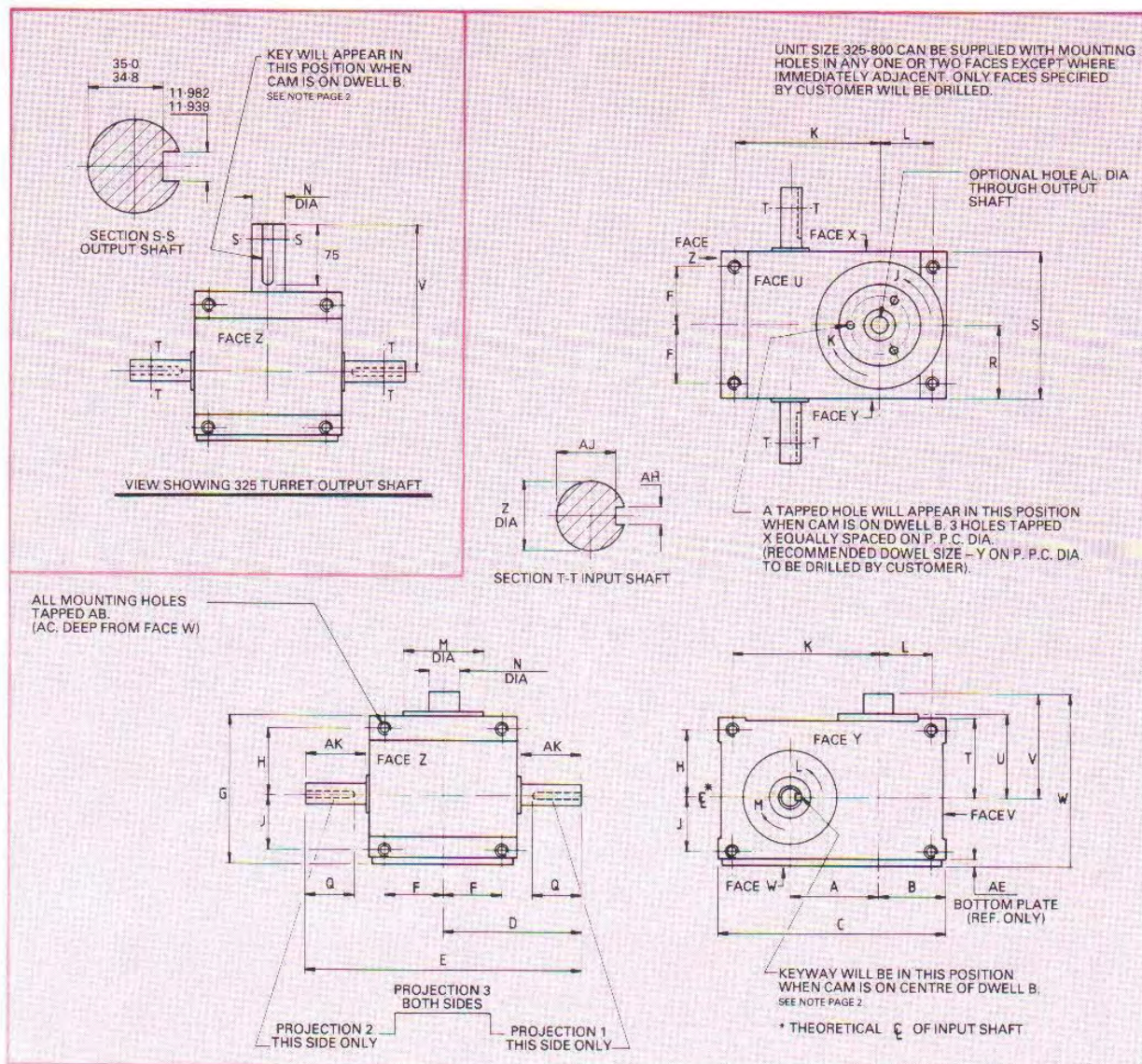
ASSEMBLY TYPE J provides output rotation in direction J (refer to drawing on page 3) during the Motion A period.

ASSEMBLY TYPE K provides output rotation in direction K (refer to drawing on page 3) during the Motion A period.

Motion B always has the opposite direction of output rotation to Motion A.

STANDARD OSCILLATORS will be supplied as ASSEMBLY TYPE K unless otherwise specified.

INSTALLATION DIMENSIONS



Size	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
325	80	67	222	130	260	55	152	73	45	140	52	—	40-000 39-984	—	45
425	108	80	280	200	400	72	200	80	80	185	65	100	40-000 39-984	72	107
500	140	98-5	355	218	436	90	238	110	90	240	80	115	50-000 49-984	80	107
650	152	127	394	270	540	110	267	125	90	245	105	130	50-000 49-984	90	140
800	178	152-5	457	295-5	591	130	279-5	135	90	285	130	130	50-000 49-984	90	140

Size	R	S	T	U	V	W	X	Y	Z	AB	AC	AE	AH	AJ	AK	AL
325	77.5	155	89	—	169	232	—	—	25h ₆	M10 × 18DP	26	8	8p ₉	21.0 20.8	52.5	15
425	90	180	100	102	122	222	M8 × 20DP	8 × 20DP	40h ₆	M10 × 25DP	35	10	12p ₉	35.0 34.8	110	20
500	108	216	127	128	153	264	M8 × 20DP	8 × 20DP	40h ₆	M12 × 25DP	35	10	12p ₉	35.0 34.8	110	30
650	127	254	152	155	180	295	M10 × 20DP	10 × 20DP	48h ₆	M12 × 25DP	37	12	14p ₉	42.5 42.3	143	35
800	152.5	305	165	167	192	306.5	M10 × 20DP	10 × 20DP	48h ₆	M12 × 25DP	37	12	14p ₉	42.5 42.3	143	35

ITALPLANT Mk2 Oscillators

TORQUE CAPACITY

The tables give the maximum output torque that can be endured for 8000 hours of continuous operation (B10 rating) at a speed of 50 cycle/min. The torque needed to accelerate the mechanism itself must be included with the applied load calculations: the internal inertia of the unit is given for this purpose.

The torque limit is the maximum output torque that the unit can sustain, irrespective of speed or life, and must not be exceeded under any circumstances. To be fully effective an overload protection device, if used, should be fitted in the output transmission rather than the input.

ORDERING INFORMATION

MECHANISM CODE

e.g. 90-425B16-120-60

HOUSING DETAILS

Unit size

Mounting face of unit (U to Z)

Camshaft projection (1, 2, 3)

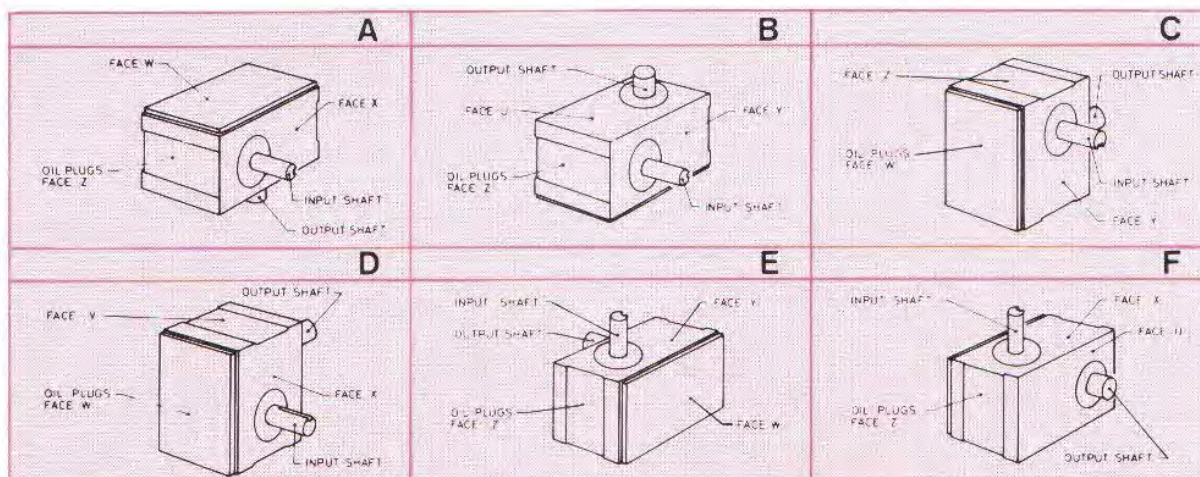
Mounting Position (A to F)

Camshaft Rotation (L, M)

Turret Rotation (Motion A) (J, K)

Running Speed (r.p.m.)

MOUNTING POSITIONS



OPTIONS AVAILABLE

Non-standard motion or timing.

Non-standard output stroke.

Standard drive units (full range of units, as used on indexers).

CODE NUMBERS

Standard mechanisms are described by a code number which indicates the main features of the unit, for example:

90-425B16-120-60

90 = OUTPUT STROKE: the angle of swing of the output shaft (β degrees)

425 = UNIT SIZE

B = Internal design code

16 = Roller size

120 = MOTION A period: the angle of rotation of the input shaft during Motion A (α degrees). For standard mechanisms Motion B is the same.

60 = DWELL A period: the angle of rotation of the input shaft during Dwell A (degrees).

Further digits are added to the basic mechanism code for mechanisms with non-standard timing. These are the Motion B and Dwell B periods, for example:

90-425B16-120-60-90-90

The sum of all four periods must be 360° .

Standard HOUSINGS are coded in exactly the same way as for indexing mechanisms, for example:

425 W 2 A

425 = UNIT SIZE .

W = MOUNTING FACE: the face with standard tapped holes.

2 = INPUT SHAFT PROJECTION.

A = MOUNTING POSITION: this determines the positions of oil filler, and drain plugs.

Hole bored through output shaft. (Maximum diameter shown on drawings, page 3).

Other sizes and types are available.

ITALPLANT Mk2 Oscillators

MODEL DATA

β Output Stroke	Timing				Model Number	Motion Law	Mr B-10 Cap @ 50 RPM (Nm)	MI Torque Limit (Nm)	Ji Internal Inertia (kg.m ²)
	Motion A	Dwell A	Motion B	Dwell B					
30	45	135	45	135	30-325B10-45-135	MS	96	66	0.0013
					30-425B12-45-135	MS	162	216	0.0085
					30-500B20-45-135	MS	446	851	0.0176
					30-650B20-45-135	MS	520	995	0.0414
					30-800B20-45-135	MS	595	1177	0.0683
	45	270	45	0	30-325B10-45-270	MSH	98	67	0.0013
					30-425B12-45-270	MSH	165	219	0.0085
					30-500B20-45-270	MSH	452	859	0.0176
					30-650B20-45-270	MSH	532	1013	0.0414
					30-800B20-45-270	MSH	610	1205	0.0683
	60	120	60	120	30-325B12-60-120	MS	134	174	0.0014
					30-425B16-60-120	MS	236	470	0.0087
					30-500B24-60-120	MS	618	1188	0.0183
					30-650B24-60-120	MS	744	1440	0.0425
					30-800B28-60-120	MS	1125	2155	0.0722
	60	240	60	0	30-325B12-60-240	MSH	136	175	0.0014
					30-425B16-60-240	MSH	239	473	0.0087
					30-500B24-60-240	MSH	624	1193	0.0183
					30-650B24-60-240	MSH	754	1453	0.0425
					30-800B28-60-240	MSH	1145	2184	0.0722
	75	105	75	105	30-325B12-75-105	MS	131	178	0.0014
					30-425B16-75-105	MS	230	480	0.0087
					30-500B24-75-105	MS	595	1202	0.0183
					30-650B28-75-105	MS	955	1850	0.0441
					30-800B32-75-105	MS	1840	2835	0.0766
	75	210	75	0	30-325B12-75-210	MSH	132	178	0.0014
					30-425B16-75-210	MSH	231	481	0.0087
					30-500B24-75-210	MSH	599	1205	0.0183
					30-650B28-75-210	MSH	965	1860	0.0441
					30-800B32-75-210	MSH	1864	3007	0.0766
	90	90	90	90	30-325B16-90-90	MS	188	372	0.0015
					30-425B20-90-90	MS	377	767	0.0091
					30-500B24-90-90	MS	573	1208	0.0183
					30-650B32-90-90	MS	1544	2860	0.0471
					30-800B40-90-90	MS	2661	3402	0.0867
	90	180	90	0	30-325B16-90-180	MSH	189	373	0.0015
					30-425B20-90-180	MSH	380	768	0.0091
					30-500B24-90-180	MSH	575	1209	0.0183
					30-650B32-90-180	MSH	1556	2868	0.0471
					30-800B40-90-180	MSH	2688	3608	0.0867
	120	60	120	60	30-325B16-120-60	MS	177	375	0.0015
					30-425B20-120-60	MS	354	772	0.0091
					30-500B24-120-60	MS	534	1213	0.0183
					30-650B32-120-60	MS	1461	2893	0.0471
					30-800B40-120-60	MS	2540	4165	0.0867
	120	120	120	0	30-325B16-120-120	MSH	177	375	0.0015
					30-425B20-120-120	MSH	355	773	0.0091
					30-500B24-120-120	MSH	535	1214	0.0183
					30-650B32-120-120	MSH	1468	2896	0.0471
					30-800B40-120-120	MSH	2555	4175	0.0867
	150	30	150	30	30-325B16-150-30	MS	167	376	0.0015
					30-425B20-150-30	MS	335	774	0.0091
					30-500B24-150-30	MS	503	1216	0.0183
					30-650B32-150-30	MS	1387	2904	0.0471
					30-800B40-150-30	MS	2421	4190	0.0867
	150	60	150	0	30-325B16-150-60	MSH	168	376	0.0015
					30-425B20-150-60	MSH	335	775	0.0091
					30-500B24-150-60	MSH	504	1216	0.0183
					30-650B32-150-60	MSH	1391	2906	0.0471
					30-800B40-150-60	MSH	2431	4194	0.0867
	180	0	180	0	30-325B16-180-0	SHM	162	378	0.0015
					30-425B20-180-0	SHM	323	778	0.0091
					30-500B24-180-0	SHM	485	1219	0.0183
					30-650B32-180-0	SHM	1345	2923	0.0471
					30-800B40-180-0	SHM	2357	4225	0.0867
45	45	135	45	135	45-425B12-45-135	MS	135	181	0.0085
					45-500B16-45-135	MS	228	473	0.0171
					45-650B12-45-135	MSC33	217	284	0.0403
	45	270	45	0	45-425B12-45-270	MSH	139	187	0.0085
					45-500B16-45-270	MSH	235	485	0.0171
					45-650B12-45-270	MSHC33	217	288	0.0403
	60	120	60	120	45-325B10-60-120	MS	84	63	0.0013
					45-425B16-60-120	MS	210	427	0.0087
					45-500B20-60-120	MS	396	825	0.0176
					45-650B20-60-120	MS	452	938	0.0414
					45-800B20-60-120	MSC20	663	1271	0.0694

ITALPLANT Mk2 Oscillators

MODEL DATA

β Output Stroke	Timing				Model Number	Motion Law	Mr B-10 Cap @ 50 RPM (Nm)	MI Torque Limit (Nm)	Ii Internal Inertia (kg.m ²)
	Motion A	Dwell A	Motion B	Dwell B					
45	60	240	60	0	45-325B10-60-240	MSH	86	64	0.0013
					45-425B16-60-240	MSH	214	432	0.0087
					45-500B20-60-240	MSH	403	836	0.0176
					45-650B20-60-240	MSH	464	961	0.0414
					45-800B24-60-240	MSH	860	1604	0.0718
	75	105	75	105	45-325B12-75-105	MS	120	167	0.0014
					45-425B20-75-105	MS	358	719	0.0091
					45-500B24-75-105	MS	561	1068	0.0183
					45-650B24-75-105	MS	659	1366	0.0425
					45-800B28-75-105	MS	1050	1890	0.0752
	75	210	75	0	45-325B12-75-210	MSH	122	169	0.0014
					45-425B20-75-210	MSH	364	728	0.0091
					45-500B24-75-210	MSH	568	1133	0.0183
					45-650B24-75-210	MSH	672	1389	0.0425
					45-800B28-75-210	MSH	1063	2005	0.0752
	90	90	90	90	45-325B16-90-90	MS	176	288	0.0015
					45-425B20-90-90	MS	356	741	0.0091
					45-500B24-90-90	MS	550	1186	0.0183
					45-650B32-90-90	MS	1422	2268	0.0471
					45-800B32-90-90	MS	1633	2268	0.0766
	90	180	90	0	45-325B16-90-180	MSH	178	306	0.0015
					45-425B20-90-180	MSH	360	747	0.0091
					45-500B24-90-180	MSH	555	1192	0.0183
					45-650B32-90-180	MSH	1445	2406	0.0471
					45-800B32-90-180	MSH	1666	2406	0.0766
	120	60	120	60	45-325B16-120-60	MS	171	369	0.0015
					45-425B20-120-60	MS	343	762	0.0091
					45-500B24-120-60	MS	523	1204	0.0183
					45-650B32-120-60	MS	1397	2825	0.0471
					45-800B32-120-60	MS	1602	3024	0.0818
	120	120	120	0	45-325B16-120-120	MSH	172	370	0.0015
					45-425B20-120-120	MSH	346	764	0.0091
					45-500B24-120-120	MSH	526	1206	0.0183
					45-650B32-120-120	MSH	1411	2840	0.0471
					45-800B32-120-120	MSH	1604	3208	0.0818
	150	30	150	30	45-325B16-150-30	MS	164	373	0.0015
					45-425B20-150-30	MS	329	769	0.0091
					45-500B24-150-30	MS	498	1210	0.0183
					45-650B32-150-30	MS	1351	2871	0.0471
					45-800B40-150-30	MS	2236	3780	0.0970
	150	60	150	0	45-325B16-150-60	MSH	165	374	0.0015
					45-425B20-150-60	MSH	331	770	0.0091
					45-500B24-150-60	MSH	499	1211	0.0183
					45-650B32-150-60	MSH	1361	2878	0.0471
					45-800B40-150-60	MSH	2245	4009	0.0970
	180	0	180	0	45-325B16-180-0	SHM	161	378	0.0015
					45-425B20-180-0	SHM	322	777	0.0091
					45-500B24-180-0	SHM	484	1219	0.0183
					45-650B32-180-0	SHM	1334	2922	0.0471
					45-800B40-180-0	SHM	2190	4225	0.0970
60	60	120	60	120	60-325B10-60-120	MSC20	91	65	0.0014
					60-425B12-60-120	MSC20	149	206	0.0086
					60-500B20-60-120	MS	384	641	0.0181
					60-650B16-60-120	MSC33	303	618	0.0411
					60-800B16-60-120	MSC50	392	761	0.0679
	60	240	60	0	60-325B10-60-240	MSHC20	92	66	0.0014
					60-425B12-60-240	MSHC20	151	208	0.0086
					60-500B20-60-240	MSH	390	680	0.0181
					60-650B16-60-240	MSHC33	307	624	0.0411
					60-800B16-60-240	MSHC50	395	766	0.0679
	75	105	75	105	60-325B12-75-105	MS	119	166	0.0014
					60-425B16-75-105	MS	205	449	0.0089
					60-500B24-75-105	MS	529	801	0.0191
					60-650B24-75-105	MS	654	1366	0.0438
					60-800B24-75-105	MSC20	783	1633	0.0718
	75	210	75	0	60-325B12-75-210	MSH	118	168	0.0014
					60-425B16-75-210	MSH	208	455	0.0089
					60-500B24-75-210	MSH	531	850	0.0191
					60-650B24-75-210	MSH	651	1388	0.0438
					60-800B24-75-210	MSHC20	795	1657	0.0718
	90	90	90	90	60-325B12-90-90	MS	112	168	0.0014
					60-425B16-90-90	MS	197	457	0.0089
					60-500B24-90-90	MS	517	961	0.0183
					60-650B24-90-90	MS	637	1429	0.0438
					60-800B24-90-90	MS	728	1669	0.0718
	90	180	90	0	60-325B12-90-180	MSH	114	171	0.0014
					60-425B16-90-180	MSH	200	462	0.0089
					60-500B24-90-180	MSH	525	1020	0.0183
					60-650B24-90-180	MSH	612	1336	0.0425
					60-800B24-90-180	MSH	741	1697	0.0718

ITALPLANT Mk2 Oscillators

MODEL DATA

β Output Stroke	Timing				Model Number	Motion Law	Mr B-10 Cap @ 50 RPM (Nm)	Ml Torque Limit (Nm)	Ii Internal Inertia (kg.m ²)
	Motion A	Dwell A	Motion B	Dwell B					
60	120	60	120	60	60-325B16-120-60	MS	159	288	0.0016
					60-425B20-120-60	MS	327	739	0.0091
					60-500B24-120-60	MS	505	1185	0.0183
					60-650B28-120-60	MS	792	1775	0.0441
					60-800B32-120-60	MS	1526	2268	0.0818
	120	120	120	0	60-325B16-120-120	MSH	160	306	0.0016
					60-425B20-120-120	MSH	331	746	0.0091
					60-500B24-120-120	MSH	510	1191	0.0183
					60-650B28-120-120	MSH	805	1797	0.0441
					60-800B32-120-120	MSH	1539	2406	0.0818
	150	30	150	30	60-325B16-150-30	MS	152	360	0.0016
					60-425B20-150-30	MS	319	758	0.0091
					60-500B24-150-30	MS	487	1201	0.0183
					60-650B32-150-30	MS	1292	2797	0.0471
					60-800B32-150-30	MS	1487	2835	0.0818
	150	60	150	0	60-325B16-150-60	MSH	153	373	0.0016
					60-425B20-150-60	MSH	322	761	0.0091
					60-500B24-150-60	MSH	490	1203	0.0183
					60-650B32-150-60	MSH	1308	2819	0.0471
					60-800B32-150-60	MSH	1500	3007	0.0818
	180	0	180	0	60-325B16-180-0	SHM	149	378	0.0016
					60-425B20-180-0	SHM	317	777	0.0091
					60-500B24-180-0	SHM	479	1219	0.0183
					60-650B32-180-0	SHM	1306	2921	0.0471
					60-800B40-180-0	SHM	2186	4107	0.0970
75	75	105	75	105	75-325B10-75-105	MSC20	82	64	0.0014
					75-425B12-75-105	MSC33	149	208	0.0086
					75-500B20-75-105	MS	349	641	0.0181
					75-650B16-75-105	MSC33	281	605	0.0411
					75-800B16-75-105	MSC50	363	744	0.0679
	75	210	75	0	75-325B10-75-210	MSHC20	84	65	0.0014
					75-425B12-75-210	MSHC33	150	210	0.0086
					75-500B20-75-210	MSH	355	680	0.0181
					75-650B16-75-210	MSHC33	285	613	0.0411
					75-800B16-75-210	MSHC50	367	750	0.0679
	90	90	90	90	75-325B12-90-90	MS	107	161	0.0014
					75-425B16-90-90	MS	189	438	0.0089
					75-500B24-90-90	MS	493	769	0.0191
					75-650B24-90-90	MS	587	1321	0.0438
					75-800B24-90-90	MSC33	784	1619	0.0718
	90	180	90	0	75-325B12-90-180	MSH	109	164	0.0014
					75-425B16-90-180	MSH	190	445	0.0089
					75-500B24-90-180	MSH	498	816	0.0191
					75-650B24-90-180	MSHC20	644	1388	0.0438
					75-800B24-90-180	MSHC33	794	1636	0.0718
	120	60	120	60	75-325B12-120-60	MS	104	169	0.0014
					75-425B16-120-60	MS	184	459	0.0089
					75-500B24-120-60	MS	482	1025	0.0191
					75-650B24-120-60	MS	575	1394	0.0438
					75-800B28-120-60	MS	870	1814	0.0752
	120	120	120	0	75-325B12-120-120	MSH	106	171	0.0014
					75-425B16-120-120	MSH	186	463	0.0089
					75-500B24-120-120	MSH	487	1088	0.0191
					75-650B24-120-120	MSH	584	1413	0.0438
					75-800B28-120-120	MSH	882	1925	0.0752
	150	30	150	30	75-325B12-150-30	MS	103	175	0.0014
					75-425B20-150-30	MS	304	750	0.0094
					75-500B24-150-30	MS	468	1192	0.0191
					75-650B28-150-30	MS	742	1816	0.0461
					75-800B28-150-30	MS	866	2199	0.0752
	150	60	150	0	75-325B12-150-60	MSH	103	176	0.0014
					75-425B20-150-60	MSH	307	754	0.0094
					75-500B24-150-60	MSH	471	1196	0.0191
					75-650B28-150-60	MSH	750	1831	0.0461
					75-800B28-150-60	MSH	878	2220	0.0752
	180	0	180	0	75-325B12-180-0	SHM	103	182	0.0014
					75-425B20-180-0	SHM	305	777	0.0094
					75-500B24-180-0	SHM	464	1219	0.0191
					75-650B28-180-0	SHM	752	1909	0.0461
					75-800B32-180-0	SHM	1465	3286	0.0818
90	90	90	90	90	90-325B12-90-90	MSC33	117	158	0.0014
					90-425B16-90-90	MSC33	207	431	0.0089
					90-500B20-90-90	MS	326	641	0.0181
					90-650B24-90-90	MSC33	639	1294	0.0438
					90-800B20-90-90	MSC50	572	1137	0.0694
	90	180	90	0	90-325B12-90-180	MSHC33	119	160	0.0014
					90-425B16-90-180	MSHC33	210	436	0.0089
					90-500B20-90-180	MSH	333	680	0.0181
					90-650B24-90-180	MSHC33	647	1309	0.0438
					90-800B20-90-180	MSHC50	578	1149	0.0694

ITALPLANT Mk2 Oscillators

MODEL DATA

β Output Stroke	Timing				Model Number	Motion Law	Mr 8-10 Cap @ 50 RPM (Nm)	Ml Torque Limit (Nm)	Ji Internal Inertia (kg.m ²)
	Motion A	Dwell A	Motion B	Dwell B					
90	120	60	120	60	90-325B12-120-60	MS	100	163	0.0014
					90-425B16-120-60	MS	176	444	0.0089
					90-500B20-120-60	MS	325	834	0.0181
					90-650B24-120-60	MS	546	1343	0.0438
					90-800B28-120-60	MSC33	972	1895	0.0752
	120	120	120	0	90-325B12-120-120	MSH	101	166	0.0014
					90-425B16-120-120	MSH	179	450	0.0089
					90-500B20-120-120	MSH	330	844	0.0181
					90-650B24-120-120	MSH	557	1366	0.0438
					90-800B28-120-120	MSHC33	984	1956	0.0752
	150	30	150	30	90-325B12-150-30	MS	98	169	0.0014
					90-425B16-150-30	MS	173	458	0.0089
					90-500B24-150-30	MS	456	1068	0.0191
					90-650B24-150-30	MS	543	1392	0.0438
					90-800B28-150-30	MS	819	1890	0.0752
	150	60	150	0	90-325B12-150-60	MSH	100	171	0.0014
					90-425B16-150-60	MSH	176	463	0.0089
					90-500B24-150-60	MSH	461	1138	0.0191
					90-650B24-150-60	MSH	552	1411	0.0438
					90-800B28-150-60	MSH	832	2005	0.0752
	180	0	180	0	90-325B16-180-0	SHM	148	348	0.0016
					90-425B20-180-0	SHM	301	777	0.0094
					90-500B24-180-0	SHM	460	1218	0.0191
					90-650B32-180-0	SHM	1211	2738	0.0506
					90-800B32-180-0	SHM	1417	2738	0.0818
120	120	60	120	60	120-325B12-120-60	MSC33	106	153	0.0014
					120-425B16-120-60	MSC33	188	418	0.0089
					120-500B20-120-60	MS	294	641	0.0181
					120-650B24-120-60	MSC50	653	1287	0.0438
					120-800B24-120-60	MSC50	727	1466	0.0718
	120	120	120	0	120-325B12-120-120	MSHC33	108	155	0.0014
					120-425B16-120-120	MSHC33	191	423	0.0089
					120-500B20-120-120	MSH	301	680	0.0181
					120-650B24-120-120	MSHC50	659	1298	0.0438
					120-800B24-120-120	MSHC50	736	1483	0.0718
	150	30	150	30	120-325B12-150-30	MS	90	155	0.0014
					120-425B16-150-30	MS	158	423	0.0089
					120-500B24-150-30	MS	425	801	0.0191
					120-650B24-150-30	MSC20	547	1320	0.0438
					120-800B24-150-30	MSC33	671	1567	0.0718
	150	60	150	0	120-325B12-150-60	MSH	92	158	0.0014
					120-425B16-150-60	MSH	162	431	0.0089
					120-500B24-150-60	MSH	432	850	0.0191
					120-650B24-150-60	MSHC20	556	1339	0.0438
					120-800B24-150-60	MSHC33	681	1589	0.0718
	180	0	180	0	120-325B12-180-0	SHM	96	178	0.0014
					120-425B16-180-0	SHM	169	481	0.0089
					120-500B24-180-0	SHM	443	1161	0.0191
					120-650B28-180-0	SHM	692	1826	0.0461
					120-800B28-180-0	SHM	789	2053	0.0752
150	150	30	150	30	150-325B12-150-30	MSC33	106	163	0.0015
					150-425B16-150-30	MSC33	186	442	0.0091
					150-500B20-150-30	MS	317	841	0.0185
					150-650B24-150-30	MSC50	630	1367	0.0450
					150-800B24-150-30	MSC50	700	1533	0.0737
	150	60	150	0	150-325B12-150-60	MSHC33	107	164	0.0015
					150-425B16-150-60	MSHC33	185	446	0.0091
					150-500B20-150-60	MSH	312	680	0.0185
					150-650B24-150-60	MSHC33	575	1349	0.0450
					150-800B24-150-60	MSHC50	707	1549	0.0737
	180	0	180	0	150-325B12-180-0	SHM	99	176	0.0015
					150-425B16-180-0	SHM	173	476	0.0091
					150-500B24-180-0	SHM	445	928	0.0199
					150-650B24-180-0	SHM	546	1457	0.0450
					150-800B24-180-0	SHM	604	1843	0.0737



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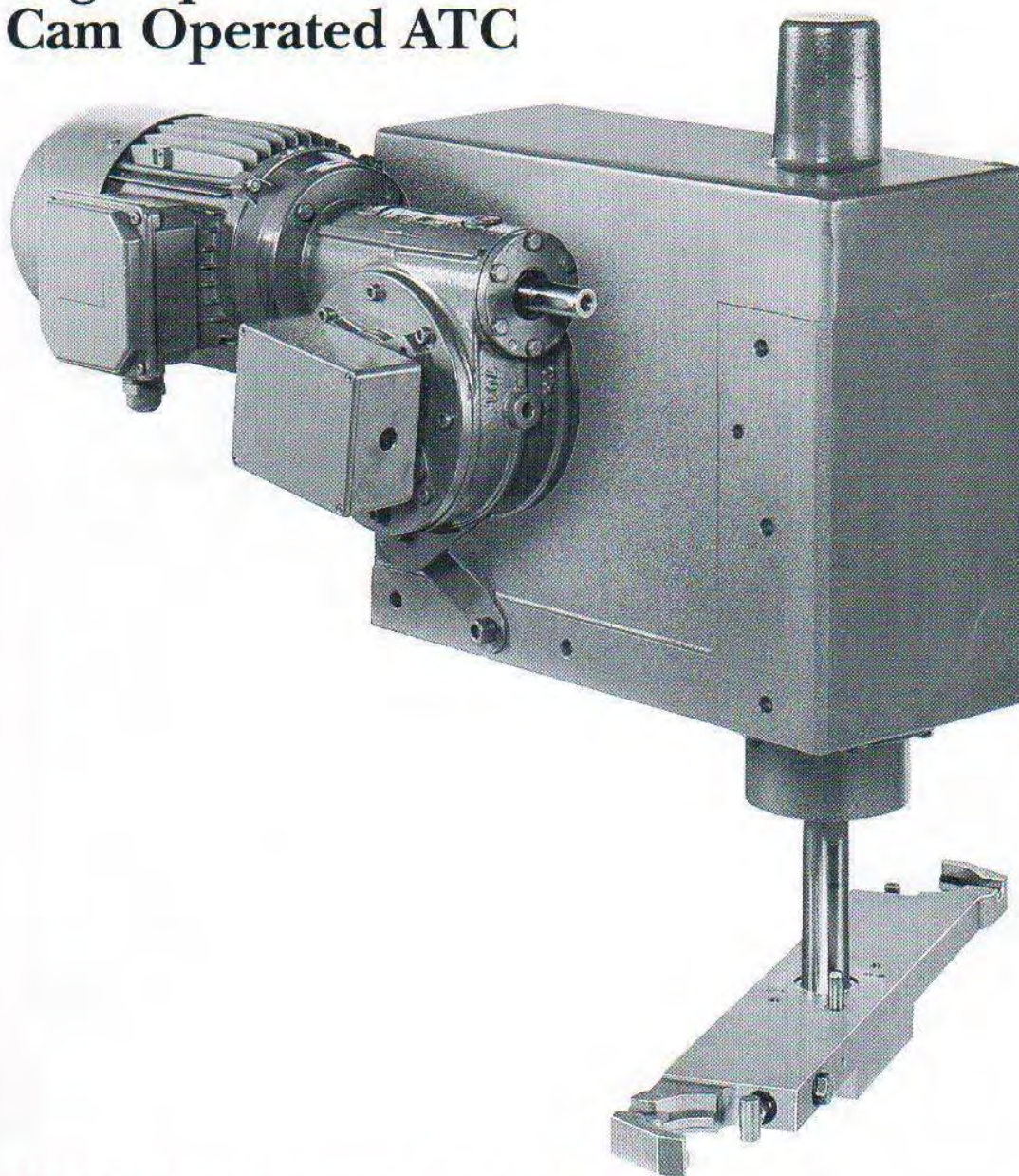
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High Speed Globoid Cam Operated ATC



SIZE 40 AUTOMATIC TOOL CHANGER

- * 1.0 to 1.6 seconds operating time
- * High positional accuracy and repeatability
- * Tool and holder weight up to 7kg (at 240mm radius)
- * Cam controlled velocity and acceleration
- * Built in overload protection
- * Lubricated for life
- * Motor Brake release with manual rotate facility

High Speed Globoid Cam Operated ATC

ITALPLANT S.R.L. HAS FOR MANY YEARS APPLIED CAM MOTION TO A WIDE VARIETY OF APPLICATIONS

In this application our experience has been used to increase the productivity of machine tools by reducing the time taken to change tools between operations.

DESCRIPTION OF OPERATION

During each cutting operation the tool magazine is indexed to present the next tool to be used at the change-over point. When the cutting operation is completed the machine head is moved to its change-over point and the spindle is programmed to stop with the cutter drive dogs in the correct orientation for tool removal.

STEP 1: HOME

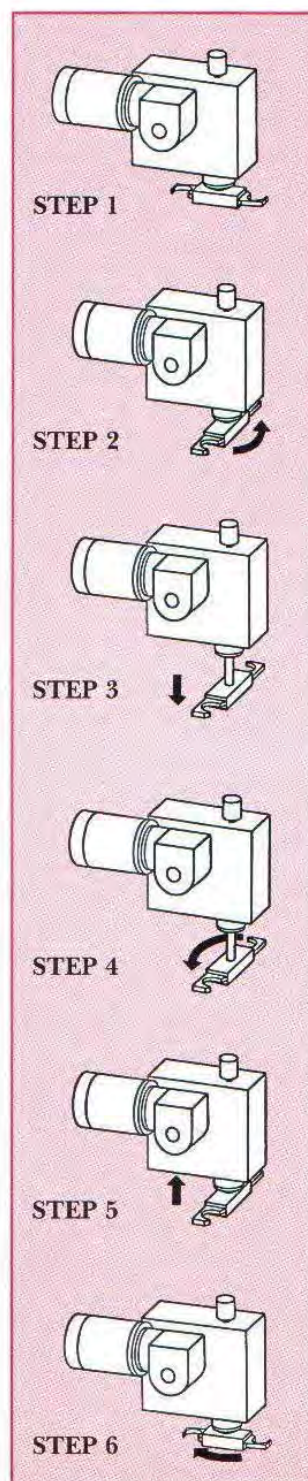
At this point the tool change cycle is started.

STEP 2: SWING/TOOLS ENGAGED

The tool arm moves from its rest position, rotating 90° to engage both the new and old tools in "claws". The claws have dogs which engage with the driving dogs of each tool and prevent the rotation of tools during exchange. Spring loaded plungers locate the tool in its claw.

STEP 3: TOOLS LOWERED

The tool in the machine tool spindle will be retained, possibly by a stack of disc springs which must be compressed in order to release the tool. A motorised, cam driven "knock-out" unit is available from Italplant to release these springs. This "knock-out" unit is energised by a signal from the tool changer



and the tool is released into the claw of the tool change arm. The tool changer lowers the tool change arm with the two tools.

STEP 4: TOOLS DOWN BEING EXCHANGED

As the arm moves down spring loaded plungers are released which firmly lock the tool into the claws in readiness for the rapid tool change-over.

The arm lowers the tools by a total of 110mm and then rotates through 180° thus exchanging old and new tools.

STEP 5: TOOLS REPLACED

The arm then rises, inserting the tools into their respective holder and machine tool spindle. When rising the last few millimetres the positive lock on the tool locating plungers is disengaged.

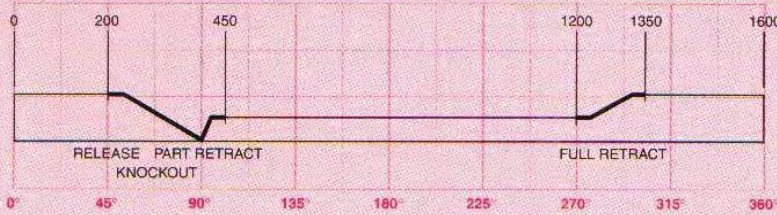
STEP 6: RETURN TO HOME

The "knock-out" motor is energised once more, the draw-bar springs are released and the new tool retained in the machine tool spindle. The tool change arm then returns through 90° to its rest position.

The whole operation can be performed with light tools in 1 second, with maximum weight tools (7kg) in 1.6 seconds. If the machine tool controller carries information concerning the weights of each of the tools in the magazine, and the tool changer is powered via a frequency inverter the maximum benefit can be obtained by changing speeds according to this criterion.

TIMING DIAGRAM

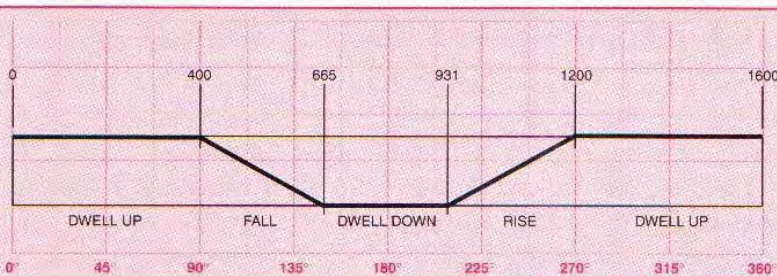
(ALL TIMES ARE VARIOUS POINTS FROM START. FIGURES IN MILLISECONDS)



KNOCKOUT MOTION



SWING



VERTICAL

TOOL CHANGER

The design of the tool changer mechanism has been proved over a number of installations.

The design of the housing can be modified to accommodate left or right hand magazines or other minor mounting variations.

The drive to the tool changer is normally by shaft mounted gear unit with integral slipping clutch to reduce the risk of damage to the unit in the event of a jam-up.

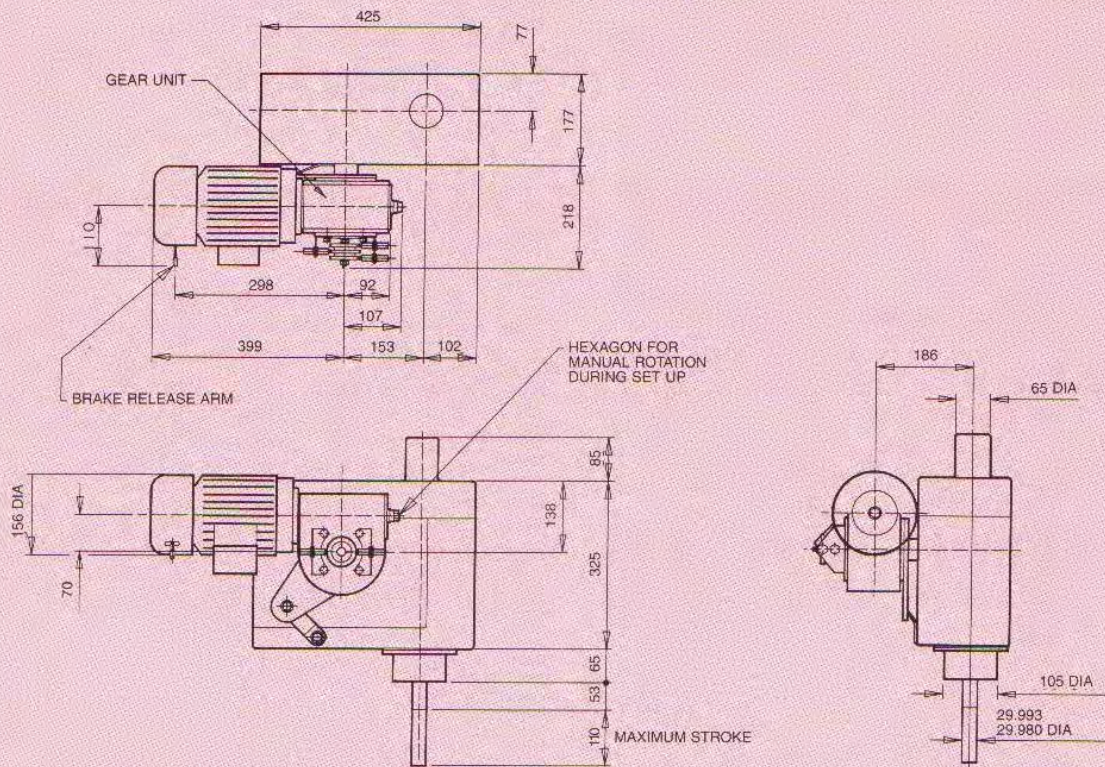
The brake motor is fitted with a hand release and the gear unit has an extended worm shaft which can be used together to turn the unit manually during setting up procedures.

The drive arrangements are adaptable to suit customer requirements and the unit can be provided with belt drive input if space is limited.

FEATURES AND OPTIONS

- * **Plain output shaft** for compression fitting to allow easy set up.
- * **Mounting details** – adapted to suit the customer requirements.
- * **Tool Changer** – lubricated for life – harden steel cam.
- * **Gear Unit** – lubricated for life – slipping clutch – extended worm shaft.
- * **Brake Motor** – with hand release.
- * **Proximity Switches** – stop signal and knock-out start signals.

AUTOMATIC TOOL CHANGER INSTALLATION DIAGRAM



OTHER ASSOCIATED PRODUCTS:

ITALPLANT Magazine Drives

Tool magazines can take a variety of forms, the most common are Rotary Table and Conveyor Link types. **ITALPLANT** can provide cam driven indexing mechanisms to drive such magazines. They incorporate overload devices which can avoid damage to the magazine or its drive in the event of a jam-up.

ITALPLANT Pallet Changer Drives

Full range of sizes covering most applications, providing fast accurate motion and positioning with long trouble-free life.

ITALPLANT Tool Knock-Out Unit

For applications where tools are retained by means of a stack of disc springs, **ITALPLANT** can supply a "knock-out" unit driven by a brake motor. This is particularly suitable for use in areas where the compressed air supply might be unreliable thus effecting pneumatic release of the springs.



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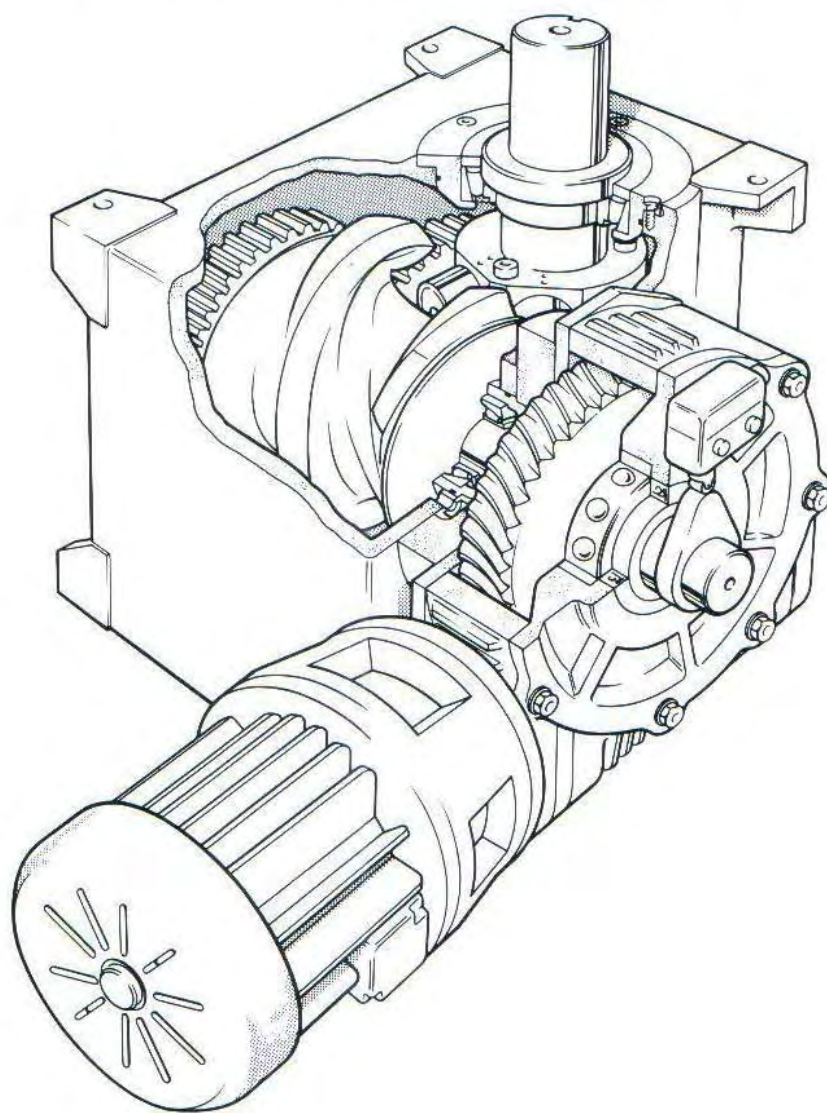
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Heavy Duty One Stop Indexer (PATENTED) **Mk4B**



FEATURES

- * Extra High Output Capacity With Low Input Torque
- * Very Compact Design
- * High Inherent Accuracy
- * Rigid Cast Iron Housing
- * Hardened & Ground Steel Cam
- * High Precision Heavy Duty Cam Followers
- * A high performance mechanical indexer priced to compete with heavy duty hydraulic drives

Mk 4B Heavy Duty Indexer

ITALPLANT MK 4B

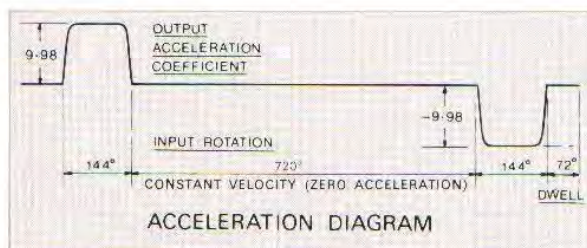
Description of Mechanism

The ITALPLANT Mk 4B patented indexing mechanism has been developed especially for heavy duty applications. It has a cam for accelerating and decelerating the mass smoothly, while conventional gearing is used to transport the mass over a large part of its movement at constant velocity. This combination enables a heavy mass to be driven through a relatively large distance by an extremely compact mechanism. Although the mechanism can be designed for several different numbers of stops the standard design is for a **ONE-STOP MECHANISM**, that is to say that the output shaft stops in only one position. If the indexer is used for a machine with more than one station a small pinion should be fitted to its output shaft to drive a larger gear attached to the machine. For example, a six station machine will require output gearing of 1:6 ratio. One effect of such a large gear ratio is to reduce considerably the torque applied to the indexer. A comparatively small unit can therefore be used for a heavy duty application.

The complete operating cycle of the Mk 4B occupies three revolutions of its input shaft.

There are four phases of the motion as follows:

Input Motion	Output Motion
144° constant velocity	30° acceleration
720° constant velocity	300° constant velocity
144° constant velocity	30° deceleration
72° constant velocity	0° stationary (dwell)
1080° = 3 revolutions	360° = 1 revolution



Cycle on Demand

The mechanism has a short dwell period: only 72° compared with 1008° of index period, i.e. a dwell time of one fourteenth of the index time. Process times are usually much longer than this, so that it is necessary to stop the indexer input shaft in its dwell position by means of a clutch brake or braked motor, and to re-start it at the end of the process time. The indexer can be fitted with a stop switch to make sure that it is stopped within the 72° dwell period without cumulative error.

The speed of the input shaft determines the index time, but not the dwell time when the indexer is

stopped every cycle to increase the process time.

The inertia torque depends on the input shaft speed, irrespective of the dwell time. The mechanism's torque capacity depends on the life required and frequency of indexing (number of index cycles per minute) irrespective of the input shaft speed.

Loading Calculations

The load imposed on the indexer by the application consists of two parts.

- Friction and work loads which are independent of speed.
- Inertia load, which depends on mass, size and speed.

The following formulae enable the torque imposed on the output shaft of the indexer to be calculated.

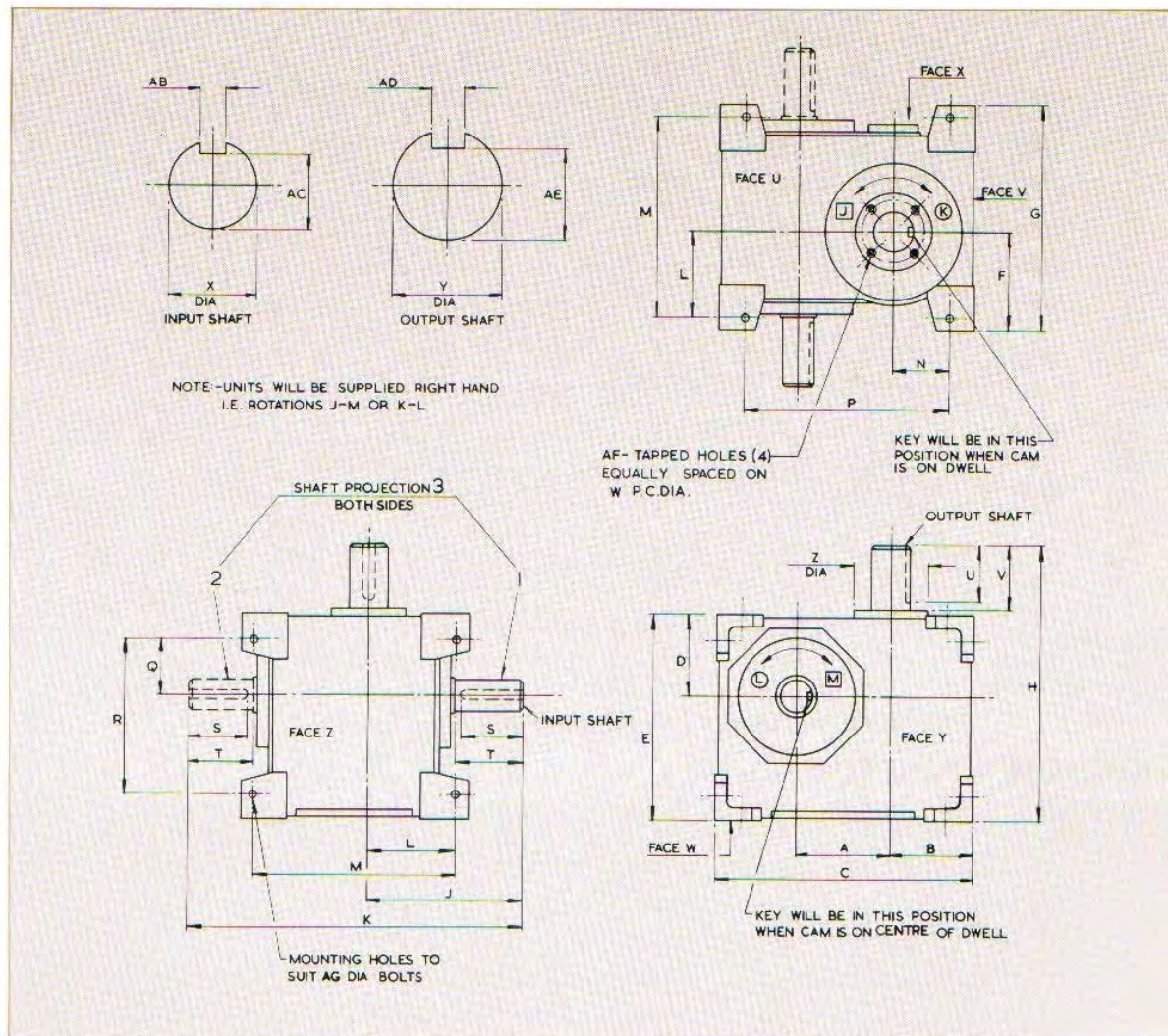
- $N = 168/t$
- $I_e = I/S^2 + I_l$
- $M_{ie} = I_e N^2/450$
- $M_{ie} = M_t/S$
- $M_{we} = M_w/S$
- $M_i = M_{ie} + M_{ie} + M_{we}$
- $M_c = 0.463 M_i$
- $P_{max} = M_c N/9550$
- $P_{av} = P_{max}/2$

or $(M_{ie} + M_{we}) \cdot N/20624$ whichever is the greater.

N	Speed of input shaft	(rev/min)
t	Index time	(sec.)
I	Moment of inertia of machine	(kg.m ²)
I _l	Moment of inertia of gear etc. attached directly to output shaft	(kg.m ²)
I _e	Equivalent moment of inertia, effective at the indexer output shaft	(kg.m ²)
S	Number of stations on machine	
M _{ie}	Equivalent inertia torque	(N.m)
M _t	Friction torque of machine	(N.m)
M _{ie}	Equivalent friction torque	(N.m)
M _w	Work torque of machine	(N.m)
M _{we}	Equivalent work torque	(N.m)
M _i	Total peak output torque of indexer	(N.m)
M _c	Peak input torque of indexer	(N.m)
P _{max}	Peak power required	(kW)
P _{av}	Average power required from motor	(kW)

Heavy Duty Indexer

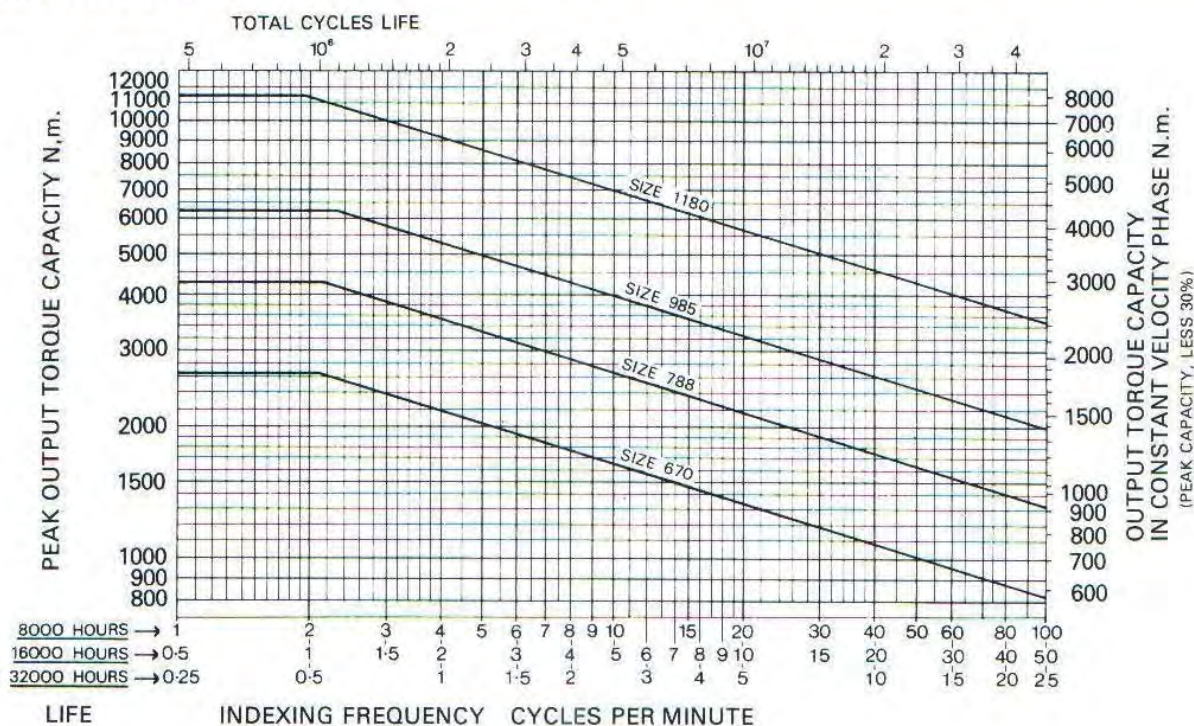
SIZES 670 985
788 1180



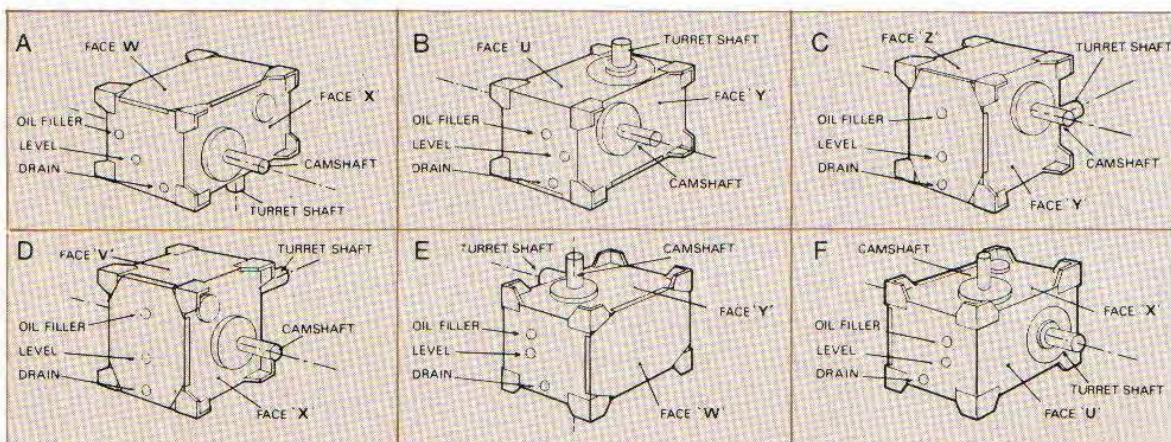
SIZE	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
670	150	130	410	130	330	160	365	437	247.5	540	140	325	90	330	90
788	180	145	485	150	395	180	420	505	310	680	160	380	95	385	100
985	220	185	580	180	490	210	510	660	330	750	185	460	135	480	130
1180	260	220	710	215	600	250	595	770	385	865	220	535	145	560	140

SIZE	R	S	T	U	V	W	X	Y	Z	AB	AC	AD	AE	AF	AG
670	250	105	110	100	105	100	48.000 47.984	60.030 60.011	120	13.982 13.939	42.5 42.3	17.982 17.939	53.0 52.8	M10 x 18 DP	M16
788	295	135	140	100	105	125	60.000 59.981	75.030 75.011	150	17.982 17.939	53.0 52.8	19.978 19.926	67.5 67.3	M12 x 20 DP	M16
985	390	135	140	160	165	165	65.000 64.981	100.035 100.013	200	17.982 17.939	58.0 57.8	27.978 27.926	90.0 89.8	M16 x 25 DP	M20
1180	450	165	170	160	165	180	90.000 89.978	110.035 110.013	220	24.978 24.926	81.0 80.8	27.978 27.926	100.0 99.8	M20 x 30 DP	M24

MODEL DATA



MOUNTING POSITIONS



NOTES

1. Refer to Engineering Section B for additional information.
2. Indexer code example
 670—U—2—D
 Size Mounting hole face Input Shaft projection Mounting position

3. For units with mounting holes in additional faces add appropriate letters, e.g. 670—UW—2—D
4. Refer to mounting position diagram above for location of oil level, drain and fill plugs.
5. For further ordering information refer to Section M.
6. For reducers and drives refer to Section J.
7. Refer to Section K for lubrication and maintenance.



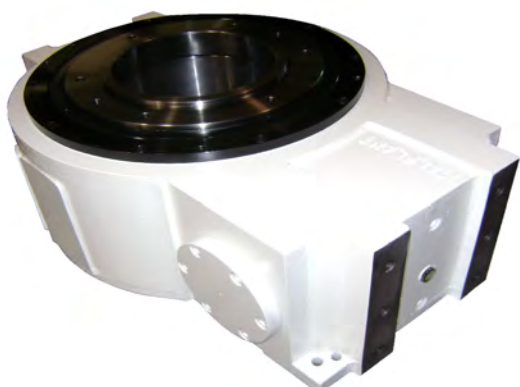
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