INSTRUCTION MANUAL FOR C–FLEX MODULE

Sizes 500 & 1000

These instructions must be read thoroughly before installing or operating this product.

DESCRIPTION

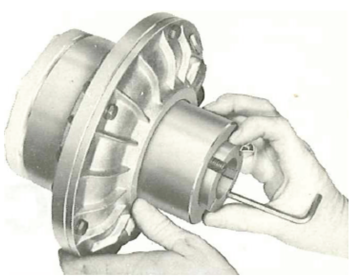
C-Flex is a dual C-Face module designed for adapting a standard FLEXIDYNE coupling to a C-Face Motor/Reducer combination. The FLEXIDYNE**®** coupling provides a soft start, allowing the motor to come up to operating speed immediately when power is applied. Torque is limited so that the load is accelerated smoothly without being subjected to the normal 225 – 250% starting torque or a typical NEMA Design B A/C motor.

WARNING: Do not apply any overhung load, such as a sheave or sprocket, on the output shaft of the module. The C-Flex Module is designed specifically for use with a C-Face reducer.

INSTALLATION

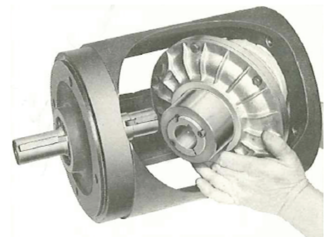
WARNING: To insure that drive is not unexpectedly started, turn off and lock out or tag power source before proceeding. Failure to observe these precautions could result in bodily injury.

1. Loosely assemble TAPER-LOCK® bushing to FLEXIDYNE mechanism. Remove one of the filler plugs and install ½ the proper amount of flow charge specified in Table 1 of the FLEXIDYNE coupling manual. Replace and tighten filler plug, making sure that flow charge is not trapped in the threads. Remove other filler plug and install the remaining ½ of the specified amount of flow charge repeating the some procedure. Tighten coupling flexible element onto FLEXIDYNE mechanism.

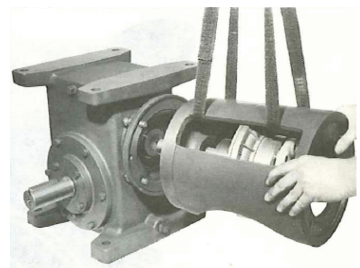


WARNING: Because of the possible danger to person(s) or property from accidents which may result from the improper use of products, it is important that correct procedures be followed: Products must be used in accordance with the engineering information specified in the catalog. Proper installation, maintenance and operation procedures must be observed. The instructions in the instruction manuals must be followed. Inspections should be made as necessary to assure safe operation under prevailing conditions. Proper guards and other suitable safety devices or procedures as may be desirable or as may be specified in safety codes should be provided, and are neither provided by Dodge nor are the responsibility of Dodge. This unit and its associated equipment must be installed, adjusted and maintained by qualified personnel who are familiar with the construction and operation of all equipment in the system and the potential hazards involved. When risk to persons or property may be involved, a holding device must be an integral part of the driven equipment beyond the speed reducer output shaft.

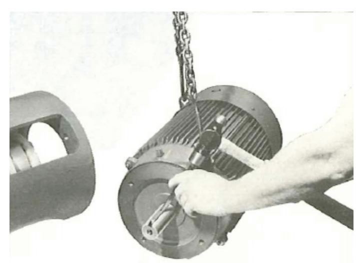
2. Insert FLEXIDYNE mechanism through the large access hole of the C-Flex Module and fit on the C-FLEX internal shaft with key. Tighten the TAPER-LOCK bushing that is on the FLEXIDYNE mechanism to the C-Flex module shaft.



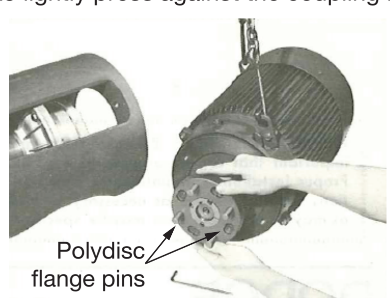
3. It is recommended that the reducer be firmly attached to its support before installing C-Flex module and motor. Stake C-Flex module output shaft key in position. Insert C-Flex module on reducer shaft. Tighten bolts to 900 in. lbs.



4. Stake motor shaft key in position flush with end of motor shaft for the 500 C-Flex and 9/16" from end of motor shaft for the 1000 C-Flex.

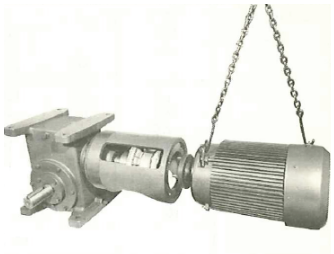


5. Loosely assemble TAPER-LOCK bushing into POLY-DISC® flange and fit onto motor shaft (pins extending away from motor). Position flange such that motor shaft is recessed 1/4" for the model 500 and 3/16 for the model 1000. Tighten bushing securely into place according to the instruction manual supplied with bushing. When assembled (step 6), the spacing should cause the POLY-DISC element spacer buttons to lightly press against the coupling Flange faces.

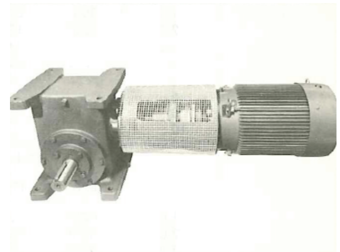


DODGE

6. Mount C-face motor to C-Flex module and tighten bolts. Inspect spring between coupling flanges to ensure that the POLY-DISC element spacer buttons press lightly against coupling flange faces. (Refer to steps).



7. When the C-Flex Module is completely installed it is recommended to use the mesh type guard provided. Drill 3 holes in the module housing for self-tapping screws. Wrap guard around housing and secure with screws.



Flow Charge Recommendations

Table 1 - Based on % of Starting Torque for 1760, 1175 and 875 RPM NEMA Design B Motors

Based on % of Starting Torque for 1760 RPHM NEMA Design B Motors

Rated Motor HP	FLEXI-DYNE Size	100% @ 1760 ①				125% @ 1750 RPM				150% @ 1740 RPM				175% @ 1700 RPM				200% @ 1650 RPM			
		Starting HP	Flow Charge Lbs.	Flow Charge oz.	Max. Time In Sec	Starting HP	Flow Charge Lbs.	Flow Charge oz.	Max. Time In Sec	Starting HP	Flow Charge Lbs.	Flow Charge oz.	Max. Time In Sec	Starting HP	Flow Charge Lbs.	Flow Charge oz.	Max. Time In Sec	Starting HP	Flow Charge Lbs.	Flow Charge oz.	Max. Time In Sec
3	70C	3.0	1	11	150	3.7	1	13	123	4.5	1	14	105	5.1	2	0	93	5.7	2	2	85
5	70C	5.0	1	14	94	6.2	2	1	79	7.5	2	4	67	8.5	2	8	60	9.4	2	10	57
7-1/2	75C	7.5	1	11	71	9.4	1	14	60	11.2	2	1	54	12.7	2	4	52	14.1	2	9	49
10	75C	10.0	1	15	58	12.5	2	3	53	14.9	2	6	48	17.0	2	9	43	18.8	2	12	41

Based on % of Starting Torque for 1175 RPM NEMA Design B Motors

Rated Motor HP	FLEXI-DYNE Size	100% @ 1175 ①				125% @ 1160 RPM				150% @ 1150 RPM				175% @ 1130 RPM				200% @ 1100 RPM			
		Starting HP	Flow Charge Lbs.	Flow Charge oz.	Max. Time In Sec	Starting HP	Flow Charge Lbs.	Flow Charge oz.	Max. Time In Sec	Starting HP	Flow Charge Lbs.	Flow Charge oz.	Max. Time In Sec	Starting HP	Flow Charge Lbs.	Flow Charge oz.	Max. Time In Sec	Starting HP	Flow Charge Lbs.	Flow Charge oz.	Max. Time In Sec
1	70C	1.0	1	10	500	1.2	1	12	400	1.5	1	14	330	1.7	2	1	290	1.9	2	4	260
1-1/2	70C	1.5	1	13	330	1.9	2	1	260	2.2	2	3	210	2.5	2	6	190	2.8	2	9	170
2	75C	2.0	1	10	250	2.5	1	13	190	3.0	2	0	150	3.4	2	2	135	3.8	2	6	120
3	75C	3.0	1	15	150	3.7	2	3	125	4.5	2	7	100	5.1	2	10	89	5.7	2	12	82

Based on % of Starting Trpqie for 875 RPM NEMA Design B Motors

Rated Motor HP	FLEXI-DYNE Size	100% @ 875 ①				125% @ 870 RPM				150% @ 850 RPM				175% @ 840 RPM				200% @ 820 RPM			
		Starting HP	Flow Charge Lbs.	Flow Charge oz.	Max. Time In Sec	Starting HP	Flow Charge Lbs.	Flow Charge oz.	Max. Time In Sec	Starting HP	Flow Charge Lbs.	Flow Charge oz.	Max. Time In Sec	Starting HP	Flow Charge Lbs.	Flow Charge oz.	Max. Time In Sec	Starting HP	Flow Charge Lbs.	Flow Charge oz.	Max. Time In Sec
1/2	70C	.50	1	12	900	.62	1	15	850	.75	2	1	800	.85	2	4	750	.94	2	6	570
3/4	70C	.75	2	0	800	.94	2	3	570	1.1	2	6	500	1.3	2	8	400	1.4	2	12	350
1	75C	1.0	1	13	520	1.2	2	0	400	1.5	2	3	330	1.7	2	7	320	1.9	2	8	300
1-1/2	75C	1.5	2	2	330	1.9	2	7	300	2.2	2	10	250	2.5	2	11	220	2.3	2	12	200

① **CAUTION: If actual load on motor is close to nameplate rating use enough flow charge to develop at least 125% starting torque**

Table 2 - Flexidyne Coupling Thermal Capacity

FLEXIDYNE Coupling Size	Starting HP	Maximum Allowable Acceleration Time in Seconds for Standard Motor Speeds of Various Starting Cycles											
		2 Hours			1 Hour			30 Min.			15 Min.		
		870	1160	1750	870	1160	1750	870	1160	1750	870	1160	1750
70C	.50	900	...	...	900	...	...	900	...	...	800	...	...
	.75	800	...	...	800	...	...	800	...	...	700	...	...
	1.0	550	550	...	550	550	...	550	550	...	550	450	...
	2.0	...	260	210	...	260	210	...	260	210	...	230	190
	2.5	...	190	180	...	190	180	...	190	180	...	165	160
	3.0	...	170	150	...	170	150	...	170	150	...	155	140
	4.0	...	130	110		130	110	...	130	110	...	118	100
	6.0	...	...	80	...	...	80	...	...	80	...	...	72
	8.0	...	...	63	...	...	63	...	...	63	...	...	56
	10.0	...	...	53	...	...	53	...	...	53	...	...	46
		10 Min.			5 Min.			2 Min.			1 Min.		
		870	1160	1750	870	1160	1750	870	1160	1750	870	1160	1750
	.50	500	...	...	250	...	...	100	...	...	50	...	...
	.75	400	...	...	230	...	...	100	...	...	50	...	...
	1.0	330	320	...	210	200	...	100	80	..	50	45	...
	2.0	...	190	170	...	120	105	...	60	58	...	38	36
	2.5	...	143	140	...	88	85	...	49	45	...	33	29
	3.0	...	133	120	...	80	74	...	45	39	...	28	25
	4.0	...	90	83	...	60	54	...	36	30	...	23	19
	6.0	...	...	60	...	...	38	...	...	21	...	...	13
	8.0	...	...	41	...	...	29	...	...	16	...	...	10
	10.0												
75C		2 Hours			1 Hour			30 Min.			15 Min.		
		870	1160	1750	870	1160	1750	870	1160	1750	870	1160	1750
	1.0	520	...	...	520	...	...	...	520	...	...	520	...
	2.0	300	250	...	300	250	...	300	250	...	300	220	...
	3.0	200	150	...	200	150	...	200	150	...	200	130	...
	4.0	...	110	...	...	110	...	...	110	...	...	100	...
	5.0	...	90	85	...	90	85	...	90	85	...	85	80
	7.0	...	75	73	...	75	73	...	75	73	...	70	68
	8.0	...	...	70	...	...	70	...	...	70	...	...	64
	10.0	...	...	58	...	...	58	...	...	58	...	...	53
	15.0	...	...	48	...	...	48	...	...	48	...	...	43
	20.0	...	...	40	...	...	40	...	...	40	...	...	35
		10 Min.			5 Min.			2 Min.			1 Min.		
		870	1160	1750	870	1160	1750	870	1160	1750	870	1160	1750
	1.0	420	...	...	260	...	...	100	...	...	50	...	...
	2.0	210	180	...	130	110	...	80	60	...	40	40	...
	3.0	150	110	...	100	65	...	52	40	...	30	22	...
	4.0	...	82	...	...	50	...	...	28	...	...	18	...
	5.0	...	70	65	...	45	40	...	24	22	...	16	15
	7.0	...	60	57	...	38	37	...	21	20	...	14	13
	8.0	...	...	54	...	...	35	...	...	18	...	...	11
	10.0	...	...	45	...	...	30	...	...	16	...	...	10
	15.0	...	...	34	...	...	21	...	...	11	...	...	8
	20.0	...	...	27	...	...	17	...	...	8	...	...	5

THERMAL CAPACITY

Since there is slippage within the flow charge during acceleration, heat is generated from friction. The thermal capacity of the FLEXIDYNE coupling is based on balancing the heat generated during acceleration with the cooling time between accelerations. The amount of heat generated is determined by the amount of horsepower dissipated by slipping and the duration of each acceleration. A longer time between starts will dissipate more heat; therefore, higher starting horsepowers may be transmitted, or longer acceleration times may be allowable. (See Starting Cycle)

Acceleration times shown in Table 1 are for starting frequencies of no more than one start per hour. If starting frequency is more than once per hour, use acceleration time for actual starting cycle shown in Table 2.

Acceleration times listed in Tables 1 and 2 are the MAXIMUM permissible for the various starting frequencies listed. The MINIMUM acceleration time required for proper FLEXIDYNE coupling operation is 1 to 1½ seconds. This is the time required for the flow charge to be uniformly distributed around the housing cavity before the unit “locks in”. Any acceleration time between the minimum and maximum listed is acceptable, although a shorter acceleration time will generally provide longer wear life. For applications requiring a specific acceleration time (within these limits) flow charge may be added or removed to produce the required results.

Stalled – If a jam-up stalls the drive, the motor continues to run and the FLEXIDYNE coupling slips. This causes heat to be generated at twice the rate of normal acceleration. Therefore, the allowable slipping time, when stalled, is half the allowable acceleration time given in Table 1.

Starting Cycle is the time from the beginning of one acceleration to the beginning of the next. Allowable acceleration times in Table 2 are based on the assumption that the FLEXIDYNE coupling will be running continuously except for a momentary stop before the next start. If the stop is more than momentary, decrease the actual starting cycle by one-half the stopped time before using Table 2. For example, with a 50 minute actual starting cycle of which 20 minutes is stopped time, decrease 50 by half of 20 to give 40 minutes as the starting cycle time to use for Table 2.

Grouped Starts – For several starts grouped together followed by uninterrupted running, add the acceleration times of all starts and consider it as the time for one start. The starting cycle would be the time from the beginning of one group of starts to the beginning of the next group.

OPERATION

WARNING: Do not allow the FLEXIDYNE coupling to run "free" (that is, without a load on the driven end of the FLEXIDYNE coupling), otherwise a dangerous out-of-balance condition may result. With a load applied to the driven end, the rotor of the FLEXIDYNE coupling will slip during acceleration allowing the flow charge to be evenly distributed in the FLEXIDYNE housing.

Acceleration – the amount of flow charge in the FLEXIDYNE coupling determines the acceleration time for a given load. Longer acceleration times will occur when less flow charge is used and faster acceleration, from stop to full speed, will be observed with greater amounts of flow charge.

The FLEXIDYNE coupling should start the load smoothly and without delay provided the proper amount of flow charge has been used. Should the acceleration time exceed the maximum allowable in Table 1, shut off power to the FLEXIDYNE coupling immediately. Allow the FLEXIDYNE coupling to cool, then add small amounts of flow charge until proper acceleration is observed.

Vibration is an indication of accelerating too rapidly and not allowing flow charge to become evenly distributed in the FLEXIDYNE housing. This can be corrected by removing small amounts of flow charge until vibration subsides. Other causes of vibration are, undersize shafting, unit not installed far enough on shaft or worn bore in the unit.

Slippage – The FLEXIDYNE coupling can, without slipping, transmit overloads up to 130% of its present starting torque. Should this breakaway torque be exceeded the FLEXIDYNE coupling will slip and generate heat. Although slippage usually indicates loads, it can also be caused by worn flow charge or a worn rotor especially if the FLEXIDYNE coupling has been in operation for some time. The necessity to replace flow charge will be made evident by a loss in power transmitting capacity of the FLEXIDYNE coupling.

MAINTENANCE

For average industrial applications involving 3 or 4 starts a day of not more than 6 seconds acceleration time each, the flow charge should be changed every 10,000 hours of operation. For more severe conditions, visually inspect flow charge at more frequent intervals; it should be changed when it has deteriorated to a half powder, half– granular condition. Visual inspections should continue until enough flow charge changes have been made to adequately establish a schedule for renewing FLEXIDYNE flow charge.

Both the FLEXIDYNE coupling and the module have been lubricated at the factory and no further lubrication is required. Never apply grease, oil or any other foreign material to the flow charge.

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