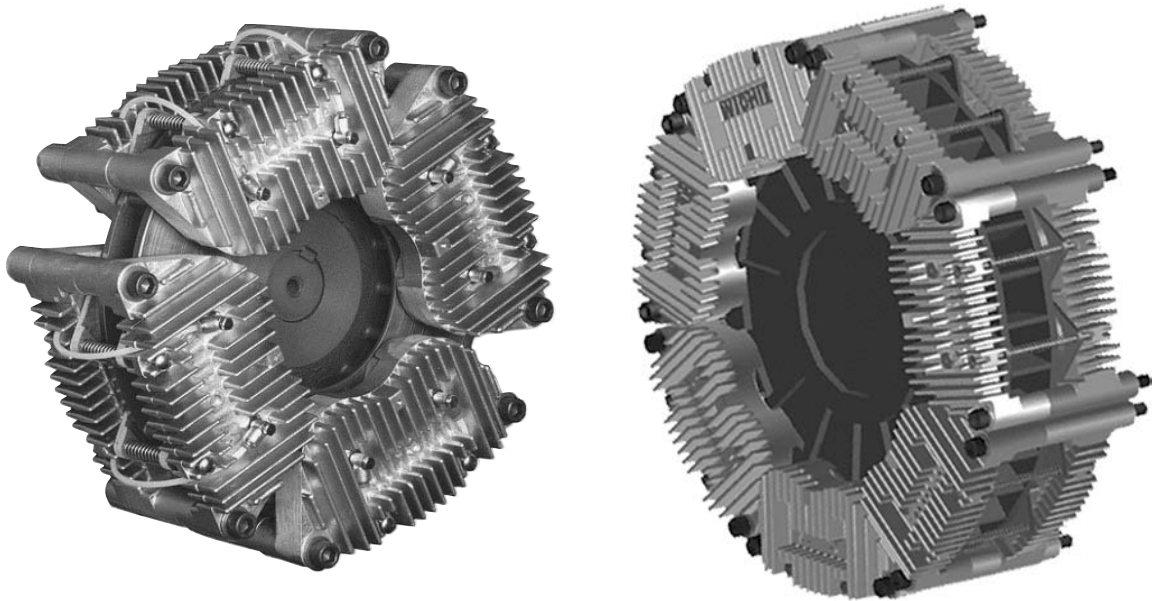


Tension Brakes/Air Cooled

ModEvo Tension Brakes



Brake Discs and Cooling

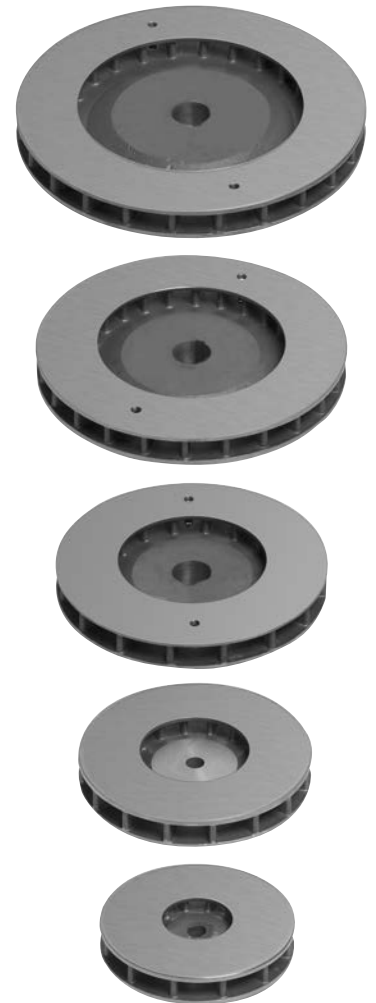
The ModEvo brake disc was developed at the Bedford, UK factory using Finite Element Analysis techniques to ensure maximum strength with minimum weight. The design is optimized to make best use of the cooling air available at slow speeds, and being bidirectional, it achieves high heat dissipation capacity in either rotational direction, unlike some other brakes. An optional electric cooling fan is available where space is limited or more extreme heat handling is required.

Available in five sizes: 250 mm, 300 mm, 350 mm, 400 mm and 450 mm diameters, all discs are the same thickness and use the same brake modules and actuators. Each disc can be specified with a minimum of a single module, up to the maximum number of modules that can be fitted around the disc. This allows torque-

handling capabilities ranging from a maximum of 659 lb.ft. for the 250 mm disc, up to 3181 lb.ft. for the 450 mm disc.

NOTE: If using a high speed ductile iron disc the catalog heat rating should be reduced by 10% as the thermal conductivity of the ductile iron is less than grey cast iron.

Maximum Rotational Speed		
Disc Diameter mm	Standard Speed rev./min.	High Speed rev./min.
250	2,250	3,375
300	1,900	2,850
350	1,650	2,475
400	1,450	2,175
450	1,250	1,875



Actuator Options

Newly developed rolling diaphragm actuators are used in ModEvo, producing more force than previous designs to allow higher torque ratings. However, the sensitivity for which rolling diaphragms are favored is not compromised. Three actuator options are available, offering clamping forces of 100%, 60% or 25%.

The finned, die cast aluminum brake module is common to all brake disc diameters. Each module houses two pairs of actuators, and allows friction pads to be changed quickly without dismantling the module.



100%

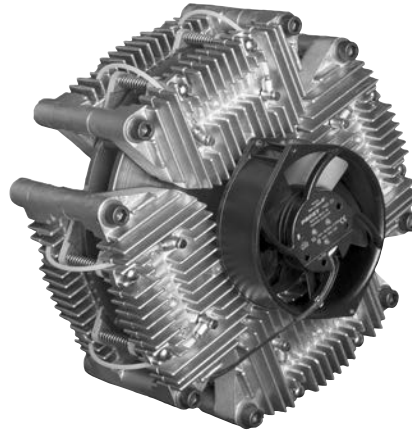


60%



25%

ModEvo 300/8 with Fan



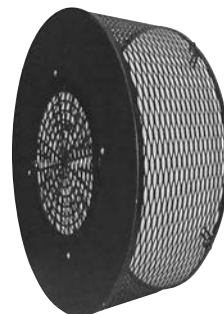
Brake Size (fan Diameter)	24v DC	115v AC	230v AC
250 (150 mm)	Yes	Yes	Yes
300 (150 mm)	Yes	Yes	Yes
350 (150 mm)	Yes	Yes	Yes
400 (150 mm)	Yes	Yes	Yes
(200 mm)	not available	Yes	Yes
450 (150 mm)	Yes	Yes	Yes
(200 mm)	not available	Yes	Yes
(250 mm)	not available	Yes	Yes

Optional Guard

The optional guard has a plastic front with 'ModEvo' molded in and a metal ventilated perimeter.

Mounting is by four brackets on customer's machine frame.

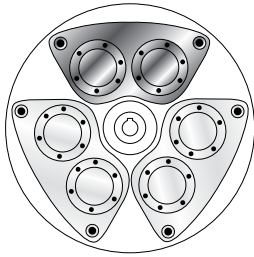
The center of the guard is designed such that it may be cut-out by customer to suit the diameter of the shaft in through-shaft installations.



Tension Brakes/Air Cooled

ModEvo Tension Brakes

ModEvo Model 250



Model	Minimum Torques		
	Minimum (3 PSI) (0.2 Bars) lb.ft.Nm		
	25% Actuators	60% Actuators	100% Actuators
250/1	1	2	3
	1	2	4
250/2*	1	4	6
	2	5	8
250/4*	3	7	12
	4	10	16
250/6*	4	11	18
	6	14	24
	Maximum Torques		
	Maximum (87 PSI) (6 Bars) lb.ft.Nm		
	25% Actuators	60% Actuators	100% Actuators
250/1	22	53	88
	30	71	119
250/2*	44	110	176
	60	143	238
250/4*	88	211	352
	72	286	477
250/6*	132	317	528
	179	429	715

* For single actuator operation torques for 250/1 are applicable.

Model ²	Speed ¹ Max.	Heat Capacity for Effective Cooling Speeds							Inertia Rotating Parts lb.ft. ² (kgm ²)	Weight	
		Continuous Duty** HP(kW)								Total	Rotating
		50 RPM	100 RPM	200 RPM	300 RPM	400 RPM	500 RPM	600 RPM			
250/1	2250	Without Fan							1.424 (0.060)	27.337 (12.4)	19.180 (8.7)
		1.34	1.61	2.14	2.68	3.08	3.49	3.62			
250/2	2250	(1.0)	(1.2)	(1.6)	(2.0)	(2.3)	(2.6)	(2.7)		38.801 (17.6)	
250/4	2250	With Electric Cooling Fan, 150 mm dia.								48.772 (22.1)	
		4.56	4.69	5.09	5.36	5.36	5.36	5.36			
250/6	2250	(3.4)	(3.5)	(3.8)	(4.0)	(4.0)	(4.0)	(4.0)			

** For intermittent duty, consult the factory.

¹ Max. speed is with standard brake disc. A high speed brake disc capable of 50% higher speed is also available. Heat Capacity reduced by 10% when high speed disc is used.

² When selecting number of actuators, use a limit of 3.35 HP per actuator pair (2.5 kW per Actuator pair) for duty w/o fan and 3.75 HP per Actuator pair (2.8 kW per Actuator pair) when fan cooled.

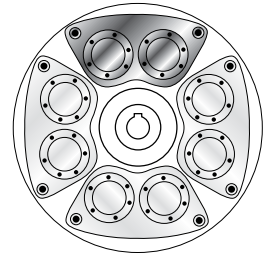
Note: Limit maximum operating temperatures of surfaces (rotor, friction pads, actuators, etc.) to 300°F or less.

Temperatures above 300°F may cause damage and failure of components. Failure to do so will void warranty.

Tension Brakes/Air Cooled

ModEvo Tension Brakes

ModEvo Model 300



Model	Minimum Torques		
	Minimum (3 PSI) (0.2 Bars) lb.ft.Nm		
	25% Actuators	60% Actuators	100% Actuators
300/1	1 1	2 3	4 5
300/2*	2 3	4 6	7 10
300/4*	4 5	9 12	15 20
300/6*	6 8	13 18	22 30
300/8*	7 10	18 24	30 40
Model	Maximum Torques		
	Minimum (87 PSI) (6 Bars) lb.ft.Nm		
	25% Actuators	60% Actuators	100% Actuators
300/1	27 37	66 89	110 149
300/2*	55 75	132 179	220 298
300/4*	110 149	263 357	439 595
300/6*	165 223	395 536	659 893
300/8*	220 298	527 715	879 1191

* For single actuator operation torques for 300/1 are applicable.

Model ²	Speed ¹ Max. RPM	Heat Capacity for Effective Cooling Speeds							Inertia Rotating Parts lb.ft. ² (k _m ²)	Weight	
		Continuous Duty** HP(kW)								Total	Rotating
		50 RPM	100 RPM	200 RPM	300 RPM	400 RPM	500 RPM	600 RPM			
300/1	1900	Without Fan							2.966 (0.125)	38.140 (17.3)	29.883 (13.6)
300/2	1900	2.41 (1.8)	2.68 (2.0)	3.35 (2.5)	4.02 (3.0)	4.56 (3.4)	5.09 (3.8)	5.63 (4.2)		39.904 (18.1)	
300/4	1900	With Electric Cooling Fan, 150 mm dia.								49.604 (22.5)	
300/6	1900	6.30 (4.7)	6.70 (5.0)	6.70 (5.0)	6.70 (5.0)	7.37 (5.5)	8.04 (6.0)	8.04 (6.0)		59.525 (27.0)	
300/6	1900									69.446 (31.5)	

** For intermittent duty, consult the factory.

¹ Max. speed is with standard brake disc. A high speed brake disc capable of 50% higher speed is also available. Heat Capacity reduced by 10% when high speed disc is used.

² When selecting number of actuators, use a limit of 3.35 HP per actuator pair (2.5 kW per Actuator pair) for duty w/o fan and 3.75 HP per Actuator pair (2.8 kW per Actuator pair) when fan cooled.

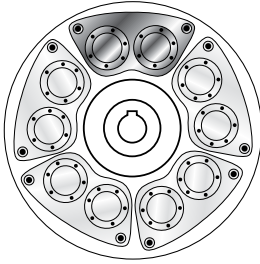
Note: Limit maximum operating temperatures of surfaces (rotor, friction pads, actuators, etc.) to 300°F or less.

Temperatures above 300°F may cause damage and failure of components. Failure to do so will void warranty.

Tension Brakes/Air Cooled

ModEvo Tension Brakes

ModEvo Model 350



Model	Minimum Torques		
	Minimum (3 PSI) (0.2 Bars) lb.ft.Nm		
	25% Actuators	60% Actuators	100% Actuators
350/1	1	3	4
	2	4	6
350/2*	7	18	30
	3	7	12
350/4*	1	3	9
	6	14	24
350/6*	7	16	27
	9	22	36
350/8*	9	21	35
	12	29	48
350/10*	11	27	44
	15	36	60
	Maximum Torques Minimum (87 PSI) (6 Bars) lb.ft.Nm		
350/1	33	80	133
	45	108	181
350/2*	67	160	266
	90	217	361
350/4*	133	320	534
	181	434	723
350/6*	200	480	800
	271	650	1084
350/8*	267	640	1066
	361	867	1445
350/10*	333	800	1334
	452	1084	1807

* For single actuator operation torques for 350/1 are applicable.

Model ²	Speed ¹ Max.	Heat Capacity for Effective Cooling Speeds							Inertia Rotating Parts lb.ft. ² (kbm ²)	Weight	
		Continuous Duty** HP(kW)								Total	Rotating
	RPM	50 RPM	100 RPM	200 RPM	300 RPM	400 RPM	500 RPM	600 RPM			
350/2	1650	Without Fan							5.458 (0.230)	57.982 (24.8)	46.958 (20.3)
350/4	1650	3.22 (2.4)	3.49 (2.6)	4.69 (3.5)	5.36 (4.0)	6.17 (4.6)	7.37 (5.5)	8.04 (6.0)		69.005 (29.2)	
350/6	1650	With Electric Cooling Fan, 150 mm dia.								80.248 (33.7)	
350/8	1650	7.77 (5.8)	8.45 (6.3)	8.71 (6.5)	8.71 (6.5)	8.71 (6.5)	8.71 (6.5)	8.71 (6.5)		91.271 (38.2)	
350/10	1650									102.294 (42.7)	

** For intermittent duty, consult the factory.

¹ Max. speed is with standard brake disc. A high speed brake disc capable of 50% higher speed is also available. Heat Capacity reduced by 10% when high speed disc is used.

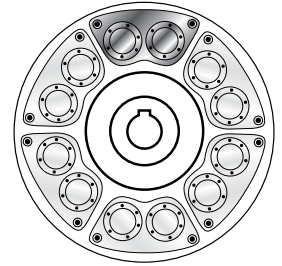
² When selecting number of actuators, use a limit of 3.35 HP per actuator pair (2.5 kW per Actuator pair) for duty w/o fan and 3.75 HP per Actuator pair (2.8 kW per Actuator pair) when fan cooled.

Note: Limit maximum operating temperatures of surfaces (rotor, friction pads, actuators, etc.) to 300°F or less. Temperatures above 300°F may cause damage and failure of components. Failure to do so will void warranty.

Tension Brakes/Air Cooled

ModEvo Tension Brakes

ModEvo Model 400



Model	Minimum Torques		
	Minimum (3 PSI) (0.2 Bars) lb.ft.Nm		
	25% Actuators	60% Actuators	100% Actuators
400/1	1	3	5
	2	4	7
400/2*	3	6	10
	4	8	14
400/4*	5	12	21
	7	17	28
400/6*	8	19	32
	11	26	43
400/8*	11	25	42
	14	34	57
400/10*	13	31	52
	18	43	71
400/12*	16	38	63
	21	51	85
Maximum Torques Minimum (87 PSI) (6 Bars) lb.ft.Nm			
400/1	39	94	157
	53	128	213
400/2	79	189	314
	107	256	426
400/4	157	377	629
	213	511	852
400/6	236	566	943
	320	767	1278
400/8	314	755	1258
	426	1022	1704
400/10	393	943	1572
	533	1278	2130
400/12	472	1132	1886
	639	1534	2556

* For single actuator operation torques for 400/1 are applicable.

Model ²	Speed ¹ Max. RPM	Heat Capacity for Effective Cooling Speeds							Inertia Rotating Parts lb.ft. ² (kbm ²)	Weight	
		Continuous Duty** HP(kW)								Total	Rotating
		50 RPM	100 RPM	200 RPM	300 RPM	400 RPM	500 RPM	600 RPM			
400/2	1450	Without Fan							9.492 (0.400)	69.005 (31.3)	61.509 (26.8)
400/4	1450									3.62 (2.7)	
400/6	1450	With Electric Cooling Fan, 150 mm dia.								88.626 (40.2)	
400/8	1450									8.18 (6.1)	
400/10	1450									108.467 (49.2)	
400/12	1450									118.168 (53.6)	

**For intermittent duty and thermal ratings using 200 mm fan, consult the factory.

¹ Max. speed is with standard brake disc. A high speed brake disc capable of 50% higher speed is also available. Heat Capacity reduced by 10% when high speed disc is used.

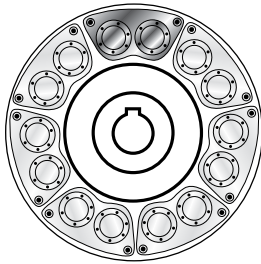
² When selecting number of actuators, use a limit of 3.35 HP per actuator pair (2.5 kW per Actuator pair) for duty w/o fan and 3.75 HP per Actuator pair (2.8 kW per Actuator pair) when fan cooled.

Note: Limit maximum operating temperatures of surfaces (rotor, friction pads, actuators, etc.) to 300°F or less. Temperatures above 300°F may cause damage and failure of components. Failure to do so will void warranty.

Tension Brakes/Air Cooled

ModEvo Tension Brakes

ModEvo Model 450



Model	Minimum Torques		
	Minimum (3 PSI) (0.2 Bars) lb.ft.Nm		
	25% Actuators	60% Actuators	100% Actuators
450/1	1	4	6
	2	5	8
450/2*	3	7	12
	4	10	16
450/4*	6	15	24
	8	20	33
450/6*	9	22	36
	12	29	49
450/8*	12	29	48
	16	39	65
450/10*	15	36	61
	21	49	82
450/12*	18	43	72
	25	59	98
450/14*	21	51	85
	29	69	115

Model	Maximum Torques		
	Minimum (87 PSI) (6 Bars) lb.ft.Nm		
	25% Actuators	60% Actuators	100% Actuators
450/1	45	108	181
	61	147	246
450/2*	91	217	362
	123	295	491
450/4*	181	435	725
	246	589	982
450/6*	272	652	1086
	368	883	1472
450/8*	362	869	1449
	491	1178	1963
450/10*	453	1087	1811
	614	1472	2454
450/12*	543	1304	2173
	736	1767	2945
450/14*	634	1521	2535
	859	2061	3435

* For single actuator operation torques for 450/1 are applicable.

Model ²	Speed ¹ Max. RPM	Heat Capacity for Effective Cooling Speeds							Inertia Rotating Parts lb.ft. ² (kgm ²)	Weight	
		Continuous Duty** HP(kW)								Total	Rotating
		50 RPM	100 RPM	200 RPM	300 RPM	400 RPM	500 RPM	600 RPM			
450/2	1250								14.475 (0.610)	82.673 (37.5)	72.752 (33.0)
450/4	1250									Without Fan	
450/6	1250	3.89 (2.9)	4.83 (3.6)	6.84 (5.1)	7.91 (5.9)	8.71 (6.5)	10.32 (7.7)	11.13 (8.3)		102.294 (46.4)	
450/8	1250	With Electric Cooling Fan, 150 mm dia.								112.215 (50.9)	
450/10	1250	8.85	9.12	9.38	9.65	10.72	11.66	12.47		122.136 (55.4)	
450/12	1250	(6.6)	(6.8)	(7.0)	(7.2)	(8.0)	(8.7)	(9.3)		131.836 (59.8)	
450/14	1250									141.757 (64.3)	

**For intermittent duty and thermal ratings using 200 mm or 250 mm fan, consult the factory.

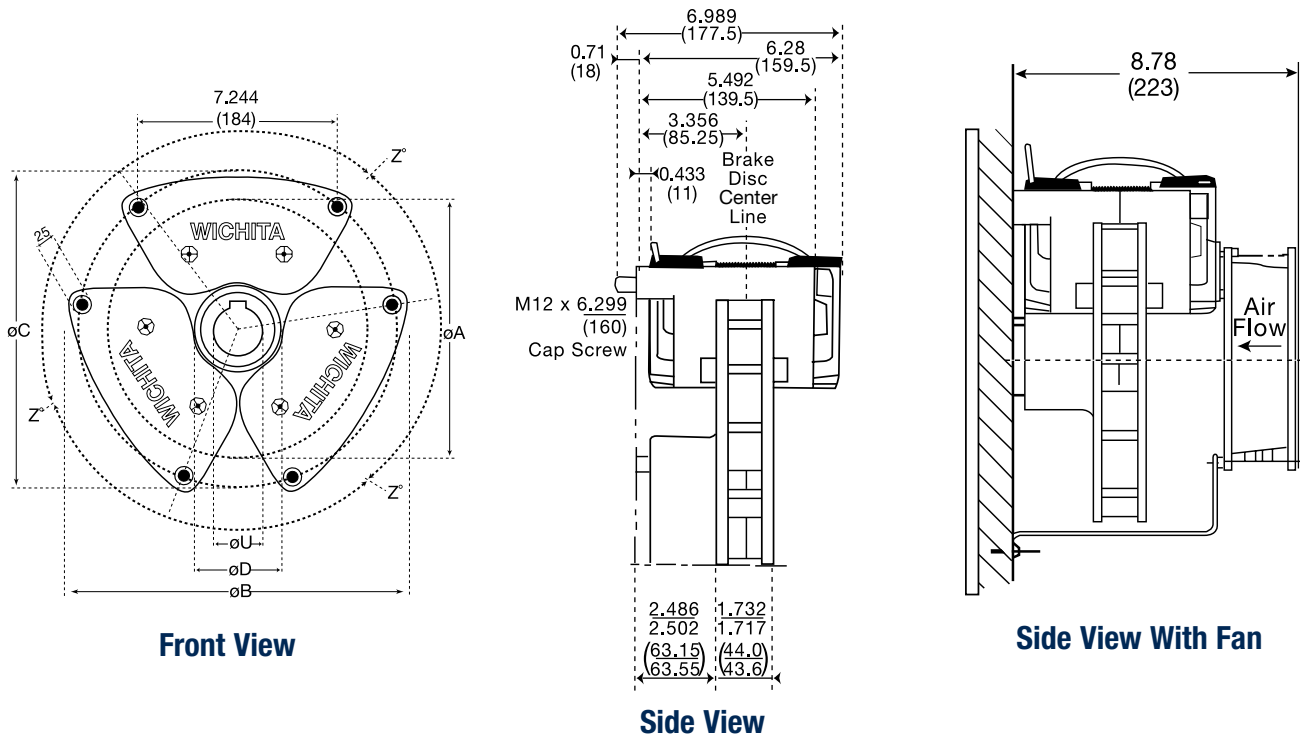
⁴ Max. speed is with standard brake disc. A high speed brake disc capable of 50% higher speed is also available. Heat Capacity reduced by 10% when high speed disc is used.

⁶ When selecting number of actuators, use a limit of 3.35 HP per actuator pair (2.5 kW per Actuator pair) for duty w/o fan and 3.75 HP per Actuator pair (2.8 kW per Actuator pair) when fan cooled.

Note: Limit maximum operating temperatures of surfaces (rotor, friction pads, actuators, etc.) to 300°F or less. Temperatures above 300°F may cause damage and failure of components. Failure to do so will void warranty.

Tension Brakes/Air Cooled

ModEvo Tension Brakes



Dimensions: inches (mm)

Size	250	300	350	400	450
ØA - Disc Size	9.843 (250)	11.811 (300)	13.78 (350)	15.748 (400)	17.717 (450)
ØB - Overall	12.756 (324)	14.528 (369)	16.339 (415)	18.149 (461)	20.000 (508)
ØC - Bolt P.C.D	11.752 (298.5)	13.524 (343.5)	15.315 (389)	17.146 (435.5)	18.996 (482.5)
ØD - Clearance Diameter	3.543 (90)	5.512 (140)	7.480 (190)	9.449 (240)	11.417 (290)
U - As Cast Bore	0.984 (25)	0.984 (25)	0.984 (25)	0.984 (25)	0.984 (25)
Maximum Bore	2.165 (55)	3.110 (79)	4.606 (117)	5.354 (136)	6.063 (154)
Z" - Angular Position	120°	90°	72°	60°	51.4°
Maximum Number of Brake Modules	3	4	5	6	7
Wichita Generic Drawing Number	73125-000	73130-000	73141-000	73141-000	73145-000
Hose Length/Module 15667-020 W4 6977	39.37 (1,000)	47.25 (1,200)	55.12 (1,400)	63.00 (1,600)	70.87 (1,800)