

# Mark 37/377 Series

## Final Control Element

The Mark 37 is a motor-operated control valve that combines a state-of-the-art electronic linear actuator with the exceptional performance of Jordan's sliding gate valve seat design. The result is a superior degree of accuracy that makes the Mark 37 ideal for use as the final control element in distributed process control systems.

Precision control begins with a high resolution, low hysteresis digitally controlled motor. Additional features include a switch selectable power supply, a hand drive mechanism for manual operation, and a 4-20 mA current input signal. Upon loss of signal (not loss of power), the motor is designed to lock in place or fail to the minimum input signal position.

Accuracy is further enhanced through the use of Jordan's unique sliding gate valve seat. Consisting of a modulating disc and stationary plate, the seat components are slotted with multiple orifices that align to provide the precise flow needed to meet the control system requirements. With multiple openings distributed over the mass of the seating surfaces, the valve fully strokes in a fraction of the travel required by conventional valves, for rapid correction of any deviation from the process setpoint.

### FEATURES

- Sliding Gate Seats — all of Jordan Valve's differential regulators feature advanced sliding gate seat technology.
  - Straight-through flow reduces turbulence for long life, quiet operation and excellent rangeability
  - Short stroke for fast response and accurate regulation.
  - Interchangeable seats for easy maintenance and Cv changes
  - Tight Shutoff (ANSI Class IV) due to overlap of seat closure area
- A stroke shorter than those found in globe or plug-style valves results in an operation much faster than other electric control valves.
- Long packing and stem life, with stem packing four times deeper than stem travel.
- Fewer spare parts, no gaskets or o-rings (on sizes 2" and below), and self cleaning seats mean long valve life and easy maintenance.

### ALTERNATIVE MODELS

For customers who require the specifications and performance of the Mark 37, but require equal percentage seats, Jordan Valve offers the MK377.



## SPECIFICATIONS

**Sizes:** 1/4" through 6" (DN8 through DN150)

Note: 1/4" & 3/8" sizes uses 1/2" body with reducers

### End Connections:

- Threaded (NPT, BSPT, BSPP – through 2" sizes)
- ANSI Flanges (150#, 300#)
- DIN Flanges (PN10/16, PN25/40)

### Body Materials:

- Bronze (1/2" - 2"/DN15-DN50)
- Ductile Iron
- Carbon Steel (WCB)
- Stainless Steel (CF8M)

### Trim Materials:

- 303SS for DI, BZ or CS valves
- 316SS for SS body valves

### Seat Materials:

- 303 SST/Jorcote
- 316 SST/Jorcote

**Yoke Material:** Cast Iron

### Stem Packing:

- Spring-loaded Teflon (500°F max/260°C)
- Braided (above 500°F/260°C)\*

\*CML 250 required 1/2" - 2"

\*CML 750 required 2 1/2" - 6"

**Service:** steam, water, air, oil, gas and chemicals

**Shutoff:** ANSI Class IV

### Flow Characteristic:

- Linear
- Equal percentage (specify model MK377)

### Action:

- Direct (control signal closes valve)
- Reverse (control signal opens valve)

### Actuators:

- CML 100 Maximum Thrust 100 lb. (0,4 Kn)
- CML 250 Maximum Thrust 250 lb (1,1 Kn)
- CML 750 Maximum Thrust 750 lb (3,3 Kn)

## MOTOR SPECIFICATIONS

- Adjustable speed
- 4-20 MA position feedback
- Selectable failure mode on loss of signal (CF)
- Manual operation by hand knob
- Optional selectable failure mode on loss of power (CF)

### CML 100/250 Motor: 1/4" - 2" Valves (DN8-50)



### Electrical

- Line Voltage: 120/240 VAC (switch selectable) & 24 VDC (contact factory)
- Conduit Entry: two 3/4" NPT (M25 optional - CF)
- Frequency: 50/60 Hz
- Current: 0.06 / 0.49 @ 120 VAC
- Command Signal input:
  - Current: 4-20 mA
  - Optional control methods available upon request
- Optional Supercapacitor Power Backup

### Mechanical

- Max thrust:
  - CML 100: 100 lb. (0,4 Kn)
  - CML 250: 250 lb. (1,1 Kn)
  - CML 750: 750 lb (3,3 Kn)
- Speed:
  - CML 100: 0.25"/sec (6,4mm/sec)
  - CML 250: 0.13"/sec (3,18mm/sec)
  - CML 750: 0.06"/sec (1,6mm/sec)
- Action: direct or reverse

### Environmental

- Temperature Limits:
  - CML 100/250/750: -4°F to +150°F (-20°C to +66°C)
  - Optional low temperature trim for CML motors: -40°F to +150°F (-40°C to +66°C) CF
- Enclosure:
  - Explosion-proof for Class I, Div. 1, Group C&D
  - Dust-ignition-proof for Class II, Div. 1, Group E, F, G
  - CML 100/250/750: NEMA 4 & 6 (IP67), indoor or outdoor
- Approvals
  - CML-100/250/750: FM approval is standard with motor, for all other approvals please consult factory

**MARK 37/377 ELECTRIC MOTOR OPERATED FINAL CONTROL ELEMENT**

**Cv (Kv) Values and Max ΔP Ratings for MK37**

**1/4" - 2"**

Size (DN)	Cv (Kv)	Seat Material	Maximum ΔP psi (bar)	
			CML 100	CML 250
1/4 (DN8)	0.84 (0,74)	Jorcote	250 (17,2)	375 (25,8)
3/8 (DN12)	1.6 (1,4)	Jorcote	250 (17,2)	375 (25,8)
1/2 (DN15)	2.5 (2,2)	Jorcote	250 (17,2)	375 (25,8)
3/4 (DN20)	4.4 (3,8)	Jorcote	250 (17,2)	375 (25,8)
1" (DN25)	6.4 (5,5)	Jorcote	150 (10,3)	225 (15,5)
1 1/4 (DN32)	9.5 (8,2)	Jorcote	150 (10,3)	225 (15,5)
1 1/2 (DN40)	15 (12,9)	Jorcote	125 (8,6)	190 (13,1)
2" (DN40)	25 (21,5)	Jorcote	125 (8,6)	190 (13,1)
	30 (25,8)	Jorcote	125 (8,6)	190 (13,1)

**2 1/2" - 6"**

Size (DN)	Cv (Kv)	Seat Material	Maximum ΔP psi (bar)	
			CML 250	CML 750
2-1/2 (DN65)	85 (73)	Jorcote	80 (5,5)	240 (16,5)
3" (DN80)	130 (112)	Jorcote	80 (5,5)	240 (16,5)
4" (DN100)	200 (172)	Jorcote	50 (3,4)	150 (10,3)
6" (DN150)	395 (340)	Jorcote	50 (3,4)	150 (10,3)

**Cv (Kv) Values and Max ΔP Ratings for MK377**

**1/2" - 2"**

Size (DN)	Cv (Kv)	Seat Material	Maximum ΔP psi (bar)	
			CML 100	CML 250
1/2 (DN15)	2.5 (2,2)	Jorcote	250 (17,2)	375 (25,8)
3/4 (DN20)	4.4 (3,8)	Jorcote	150 (10,3)	225 (15,5)
	6.4 (5,5)	Jorcote	150 (10,3)	225 (15,5)
	9.5 (8,2)	Jorcote	150 (10,3)	225 (15,5)
1" (DN25)	11.5 (9,9)	Jorcote	150 (10,3)	225 (15,5)
1 1/4 (DN32)	13 (11,2)	Jorcote	150 (10,3)	225 (15,5)
1 1/2 (DN40)	22 (18,9)	Jorcote	150 (10,3)	225 (15,5)
2" (DN50)	34 (29,2)	Jorcote	150 (10,3)	225 (15,5)

**2 1/2" - 6"**

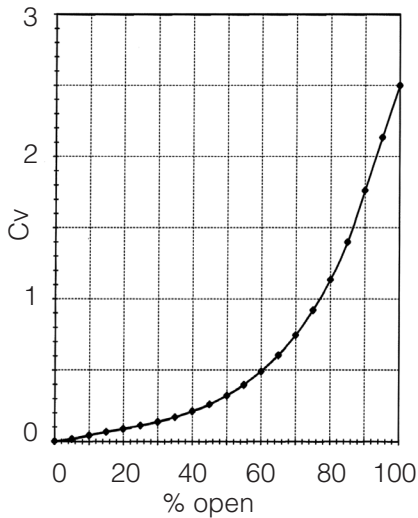
Size (DN)	Cv (Kv)	Seat Material	Maximum ΔP psi (bar)	
			CML 250	CML 750
2-1/2 (DN65)	60 (51,6)	Jorcote	80 (5,5)	240 (16,5)
3" (DN80)	80 (68,8)	Jorcote	80 (5,5)	240 (16,5)
4" (DN100)	130 (112)	Jorcote	50 (3,4)	150 (10,3)
6" (DN150)	230 (198)	Jorcote	50 (3,4)	150 (10,3)

**FLOW CHART FOR MARK 37**

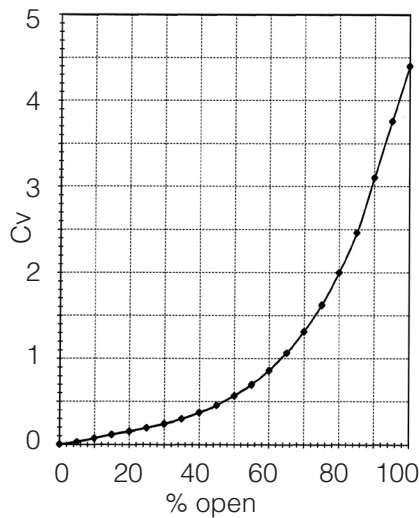
Valve Size	Cv at Travel										
	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	F <sub>L</sub>
1/2" & 3/4" (DN15 & DN20)	0.290	0.520	0.740	0.960	1.200	1.450	1.820	2.160	2.340	2.50	0.80
	0.580	0.890	1.270	1.580	1.930	2.480	3.020	3.540	4.090	4.40	0.77
1" & 1-1/4" (DN25 & DN32)	0.970	1.460	1.920	2.500	3.170	3.870	5.180	5.700	6.310	6.40	0.75
	1.240	2.000	2.710	3.490	4.360	5.300	6.360	7.280	9.340	9.50	0.72
1-1/2" (DN40)	1.390	2.490	3.680	4.760	6.140	7.850	10.30	13.10	14.60	15.0	0.69
2" (DN50)	2.580	4.340	6.210	8.470	10.80	13.80	18.30	22.70	24.80	25.0	0.67
	1.950	3.900	6.300	8.460	11.10	14.20	18.20	25.90	29.10	30.0	0.66

**FLOW CHART FOR MARK 377**

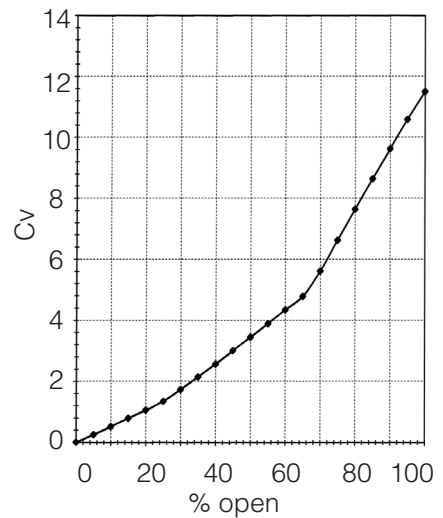
**2.5 Cv - Equal Percentage**



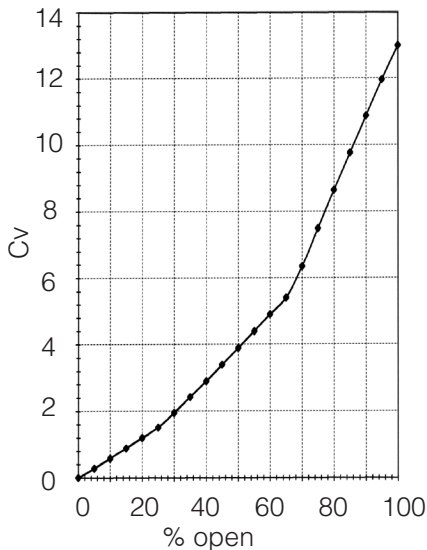
**4.4 Cv - Equal Percentage**



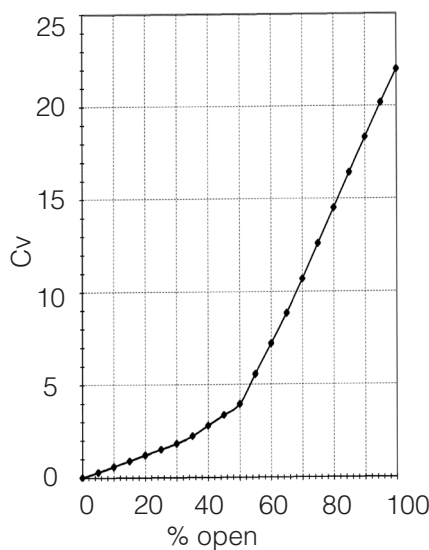
**11.5 Cv - Equal Percentage**



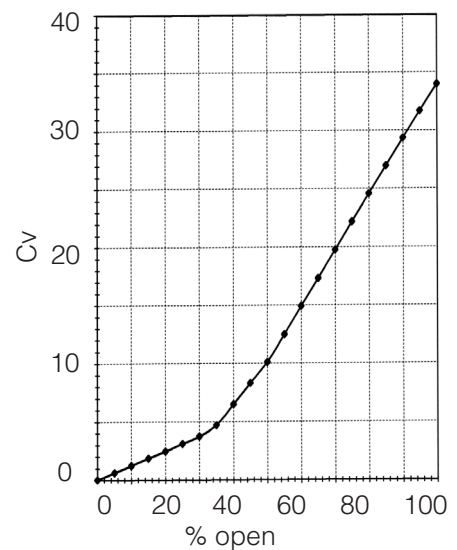
**13 Cv - Equal Percentage**



**22 Cv - Equal Percentage**

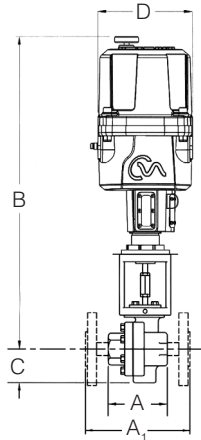


**34 Cv - Equal Percentage**



# MARK 37/377 ELECTRIC MOTOR OPERATED FINAL CONTROL ELEMENT

## DIMENSIONS



- Flanged Ends, 1/2" - 2"

Size	Flange	Dimensions (inches)				Weight (lbs.)
		A1	B*	C**	D	
1/2"	150#	7.25	19.51	2.18	7.09	24
	300#	7.50	19.51	2.18	7.09	27
3/4"	150#	7.25	19.51	2.18	7.09	26
	300#	7.62	19.51	2.18	7.09	29
1"	150#	7.25	19.79	2.62	7.09	29
	300#	7.75	19.79	2.62	7.09	31
1-1/4"	150#	7.87	19.79	2.62	7.09	28
	300#	8.37	19.79	2.62	7.09	32
1-1/2"	150#	8.75	20.01	2.75	7.09	31
	300#	9.25	20.01	2.75	7.09	38
2"	150#	10.00	20.13	3.00	7.09	37
	300#	10.50	20.13	3.00	7.09	34

- Flanged Ends, DN15 - DN50, Metric

Size	Flange (PN)	Dimensions (mm)				Weight (kg)
		A1	B*	C**	D	
15	10/16	130	495,5	55	180,1	10,9
	25/40	130	495,2	55	180,1	12,2
20	10/16	150	495,5	55	180,1	11,8
	25/40	150	495,5	55	180,1	13,2
25	10/16	160	502,6	67	180,1	13,2
	25/40	160	502,6	67	180,1	14,1
32	10/16	180	502,6	67	180,1	12,7
	25/40	180	502,6	67	180,1	14,5
40	10/16	200	508,2	70	180,1	14,1
	25/40	200	508,2	70	180,1	17,2
50	10/16	230	511,3	76	180,1	16,8
	25/40	230	511,3	76	180,1	20,0

\* An additional 5-3/4" is needed to remove motor cover from electrical connections

\* CML 100 & CML 250 have same mounting dimensions

- Threaded & FSW Ends 1/2" - 2"

Size	Mat'l	Dimensions (inches)				Weight (lbs.)
		A	B*	C**	D	
1/2" & 3/4"	DI/BRZ	3.62	19.51	2.12	7.09	22
	CS/SS	3.65	19.51	2.18	7.09	23
1"	DI/BRZ	4.12	19.79	2.62	7.09	24
	CS/SS	4.25	19.79	2.62	7.09	25
1-1/4"	DI/BRZ	4.12	19.79	2.62	7.09	24
1-1/2"	DI/BRZ	4.50	20.01	2.62	7.09	25
	CS/SS	4.65	20.01	2.75	7.09	26
2"	DI/BRZ	4.50	20.13	2.62	7.09	27
	CS/SS	5.50	20.13	3.00	7.09	30

- Threaded & FSW Ends, DN15 - DN50, Metric

Size (DN)	Mat'l	Dimensions (mm)				Weight (kg)
		A	B*	C**	D	
15 & 20	DI/BRZ	92	495,5	55	180,1	10,0
	CS/SS	93	495,5	55	180,1	10,4
25	DI/BRZ	105	502,6	67	180,1	10,9
	CS/SS	105	502,6	67	180,1	11,3
32	DI/BRZ	105	502,6	67	180,1	10,9
40	DI/BRZ	114	508,2	67	180,1	11,3
	CS/SS	118	508,2	70	180,1	11,8
50	DI/BRZ	114	511,3	67	180,1	12,2
	CS/SS	140	511,3	76	180,1	13,6

- Flanged Ends, 2-1/2" - 6" CML 250
- CML 750 - Add 4.8" to Column B

Size	Flange	Dimensions (inches)				Weight (lbs.)
		A	B*	C**	D	
2-1/2"	125-150#	10.88	25.94	5.84	6.35	175
	250-300#	11.50	25.94	5.84	6.35	175
3"	125-150#	11.75	25.94	5.84	6.35	190
	250-300#	12.50	25.94	5.84	6.35	190
4"	125-150#	13.88	27.19	6.91	6.35	300
	250-300#	14.50	27.19	6.91	6.35	300
6"	125-150#	17.75	27.94	7.72	6.35	375
	250-300#	18.62	27.94	7.72	6.35	375

- Flanged Ends, 2-1/2" - 6" CML 250
- CML 750 - Add 120mm to Column B

Size (DN)	Flange (PN)	Dimensions (mm)				Weight (kg)
		A	B <sub>1</sub>	C	D <sub>2</sub>	
65	10/16	287	659	148	161	79
	25/40	293	659	148	161	79
80	10/16	313	659	148	161	83
	25/40	313	659	148	161	83
100	10/16	353	691	176	161	136
	25/40	353	691	176	161	136
150	10/16	474	710	196	161	170
	25/40	474	710	196	161	170

**ORDERING SCHEMATIC**

To specify a MK37/377 Final Control Element, build a model number by making a selection from each category in the Product Designator Coding System below.

<b>1</b>	—	<b>2</b>	—	<b>3</b>	/	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>
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<b>1</b>	<b>Model</b>	
37	Standard	
377	Equal Percentage Version	

<b>2</b>	<b>Size</b>				
	<b>Inches</b>	<b>DN</b>		<b>Inches</b>	<b>DN</b>
025	1/4"	DN8	150	1-1/2"	DN40
038	3/8"	DN10	200	2"	DN50
050	1/2"	DN15	250	2-1/2"	DN65
075	3/4"	DN20	300	3"	DN80
100	1"	DN25	400	4"	DN100
125	1-1/4"	DN34	600	6"	DN150

<b>3</b>	<b>Material</b>	
DI	Ductile Iron	
BR	Bronze	
CS	Carbon Steel (WCB)	
S6	Stainless Steel (CF8M)	
CI	Cast Iron	

<b>4</b>	<b>End Connections</b>			
PT	NPT	F5	150# FE (except IFE)	
BT	BSPT	I2	250# IFE	
BP	BSPP	F2	250# FE (except IFE)	
SW	FSW	I3	300# IFE	
I1	125# FE	F3	300# FE (except IFE)	
F1	125# FE (except IFE)	ZZ	Non-Standard	
I5	150# IFE			

<b>5</b>	<b>Trim</b>	
T3	303SS/Teflon Packing, On-Off	
T6	316SS/Teflon Packing, On-Off	
V3	303SS/Teflon Packing, Ma/Volt	
V6	316SS/Teflon Packing, Ma/Volt	
ZZ	Non-Standard	

<b>6</b>	<b>Seat Materials</b>	
V	303SS/Jorcote	
W	316SS/Jorcote	

<b>7</b>	<b>Seat Cv (Kv)</b>		
		<b>MK37</b>	<b>MK377</b>
1	0.21 (0,18)	5	2.5 (2,16)
2	0.42 (0,36)	6	4.4 (3,78)
3	0.84 (0,72)	N	11.5 (9,91)
4	1.6 (1,38)	P	13 (11,2)
5	2.5 (2,16)	S	22 (18,9)
6	4.4 (3,78)	U	34 (29,3)
7	6.4 (5,51)	I	60 (51,7)
8	9.5 (8,18)	2	80 (68,9)
9	15 (12,9)	H	130 (112,1)
A	25 (21,5)	3	230 (198,2)
B	30 (25,8)	ZZ	Non-Standard
F	85 (73)		
H	130 (112)		
I	200 (172)		
J	395 (340)		

<b>8</b>	<b>Range*</b>	
		<b>1/4" - 2"</b>
NF	On-Off - Consult Factory	
42	4-20mA	
41	4-12mA	
12	12-20mA	
V5	0-5V - Consult Factory	
V1	0-10V - Consult Factory	
ZZ	Non-Standard	

<b>9</b>	<b>Actuator*</b>	
		<b>1/4" - 2"</b>
C1	Act/Yoke CML100 AC MA Range	
C2	Act/Yoke CML250 AC MA Range	
C3	Act/Yoke CML750 AC MA Range	
ZZ	Non-Standard	

<b>10</b>	<b>Accessories</b>	
SC	Clean for Oil Free Service	
XC	Clean for Oxygen Service	
02	Set Motor for 240 VAC	
ZZ	Non-Standard	

<b>11</b>	<b>Action</b>	
DD	Direct	
RR	Reverse	

