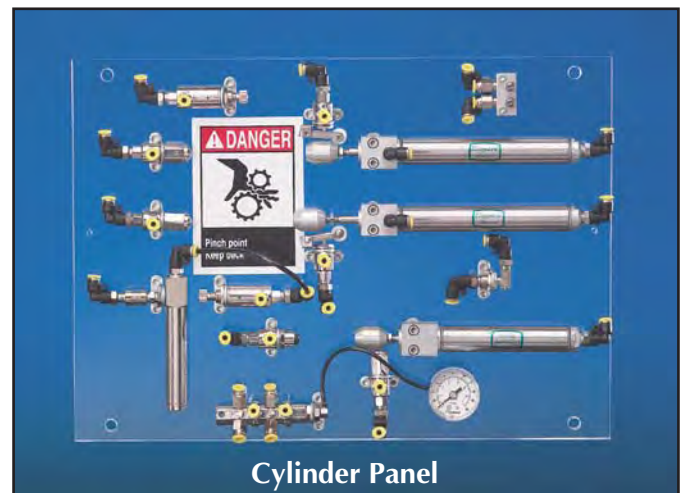




**Valve Panel**



**Cylinder Panel**

Clippard's Fluid Power Educational Kits are designed to help provide a practical understanding of the basic concepts of fluid power. They consist of many components, the same components used in industry today to provide control and work in thousands of different applications.

These kits are designed to work in conjunction with the Fluid Power Education Foundation's standard curriculum which may be downloaded at no charge at [www.fpef.org](http://www.fpef.org).



**Parts Kit**

### Order #EK-2 Educational Training Kit, Components Only

#### **Includes:**

- All Clippard Pneumatic components as illustrated on the following page
- Templates for use in making mounting boards for assembly of the components
- Parts in plastic storage box
- "Unit Study" Curriculum\*

### Order #EK-3 Educational Training Kit, Components Mounted on Acrylic Boards (as shown above)

#### **Includes:**

- All Clippard Pneumatic components as illustrated on the following page
- Parts in plastic storage box
- "Unit Study" Curriculum\*

### Order #CS-2690 "L" Mounting Bracket for EK-3

- For ease of use on a tabletop

## Features

- Learn basic Fluid Power concepts and practice "real" applications
- Lessons may be tailored to individual expertise levels
- Design complex circuitry
- Push-Quick fittings allow for easy connections and disconnections
- Available pre-mounted on acrylic boards or by component only with mounting templates
- Boards may be wall-mounted or adapted to mount on a benchtop

\* Curriculum produced by Fluid Power Education Foundation

An air supply of at least 40 psig must be provided (not to exceed 125 psig). These kits are equipped with two pressure regulators, both with a pressure range of 0 to 40 psig, but can operate with an input supply up to 125 psig.



## Cylinder Kit Components

- 1 BFC-2AK, 2-Station Block Flow Control, Meter Out with Adjustable Knob
- 1 CS-2569, Pressure Gauge
- 3 CS-2570-2, Connectors
- 2 FDR-12-4, 3/4" Bore Double-Acting S/S Cylinders, 4" Stroke
- 1 FSR-12-2, 3/4" Bore Single-Acting, S/S Cylinder, 2" Stroke
- 1 MAF-1-ENP, Air Filter
- 1 MAN-12-ENP, 12-Port Manifold
- 2 MAR-1-4-ENP, Pressure Regulators, #10-32
- 6 MAV-3-ENP, Poppet Valves, #10-32
- 3 MBA-1-ENP, Ball Cam Actuators
- 1 MEV-2-ENP, Poppet Type Quick Exhaust Valve, #10-32
- 1 PC-1B-ENP, Captivated Push Button, 1/8" dia., Black
- 16 PQ-MC05N, Male Connector Push-Quick Fittings, 5/32" Tube, #10-32 Thread
- 13 PQ-ME05N, Male Elbow Push-Quick Fittings, 5/32" Tube, #10-32 Thread
- 6 PQ-ME05P, Male Elbow Push-Quick Fittings, 5/32" Tube, 1/8" NPT
- 1 SLV-3, 2-Position, 3-Way Sleeve Valve, #10-32
- 1 SP0-2-BLK, #10-32 to 1/16 ID "L" Slip-On Fitting
- 1 Miscellaneous Hose & Tubing
- 3 0107-33, Hex Nuts
- 1 0107-15-ENP, Nut
- 2 0107-18-ENP, Nuts
- 22 0026-51, Cap Screws
- 6 0026-52, Cap Screws
- 2 0026-53, Cap Screws
- 1 15027-ENP, #10-32 Bulkhead Fitting
- 1 15453, Male Coupling, #10-32
- 1 17535, Pinch Point Label
- 1 11750-2-ENP, #3-56 to 1/16" ID Hose Barb Fitting
- 6 11755-ENP, Screw Plugs, #10-32
- 19 11761-2, Buna-N Gaskets
- 11 11918-1, 90° Mounting Brackets
- 2 11925, Roller Cam Follower Actuators
- 1 CS-2568-2, Acrylic Mounting Board\*

\* Only included with Order No. EK-3



## Valve Kit Components

- 1 BFC-2AK, 2-Station Block Flow Control, Meter Out with Adjustable Knob
- 1 CS-2569, Pressure Gauge
- 1 FV-5-ENP, Plunger-Actuated Spring Return Valve, #10-32
- 2 FV-5D-ENP, 2-Position Double Plunger Valves, #10-32
- 1 MAN-12-ENP, 12-Port Manifold
- 1 MAT-2.0-ENP, In-Line Volume Chamber
- 4 MAV-3-ENP, Poppet Valves, #10-32
- 1 MAVO-3-ENP, Normally-Open Spool Valve, #10-32
- 1 MJTV-5-ENP, 2-Position Spool Valve, Brass Toggle, 1/8" NPT
- 5 MPA-3-ENP, Single Acting, Spring Return Actuators, #10-32
- 2 MPA-5-ENP, Single-Acting, Spring Return Actuators, #10-32
- 1 MSV-1-ENP, Shuttle Valve, #10-32 Male Outlet, #10-32 Female Inlets
- 2 PC-1G-ENP, Captivated Push Buttons, 1/8" dia., Green
- 1 PC-1R-ENP, Captivated Push Button, 1/8" dia., Red
- 9 PQ-MC05N, Male Connector Push-Quick Fittings, 5/32" Tube, #10-32 Thread
- 30 PQ-ME05N, Male Elbow Push-Quick Fittings, 5/32" Tube, #10-32 Thread
- 3 PQ-ME05P, Male Elbow Push-Quick Fittings, 5/32" Tube, 1/8" NPT
- 1 PV-1-ENP, Pulse Valve, #10-32
- 1 SP0-2-BLK, #10-32 to 1/16 ID "L" Slip-On Fitting
- 1 TV-3SF-ENP, 2-Position Spool Valve, #10-32 Thread
- 1 Miscellaneous Hose & Tubing
- 1 0107-15-ENP, Nut
- 1 0107-18-ENP, Nut
- 4 0019-4, Screws
- 26 0026-51, Screws
- 1 15027-ENP, #10-32 Bulkhead Fitting
- 1 11750-2-ENP, #3-56 to 1/16" ID Hose Barb
- 31 11761-2, Buna-N Gaskets
- 15 11918-1, 90° Mounting Brackets
- 1 3822-1, Steel Clamp
- 1 CS-2567-2, Acrylic Mounting Board\*

\* Only included with Order No. EK-3

# CONVERSION FACTORS



## Length

To Convert		inch		To	millimeter		Multiply By		25.40		
		millimeter			inch				0.03937		
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
0.025	0.635	0.200	5.080	0.375	9.525	0.550	13.970	0.725	18.415	0.900	22.860
0.050	1.270	0.225	5.715	0.400	10.160	0.575	14.605	0.750	19.050	0.925	23.495
0.075	1.905	0.250	6.350	0.425	10.795	0.600	15.240	0.775	19.685	0.950	24.130
0.100	2.540	0.275	6.985	0.450	11.430	0.625	15.875	0.800	20.320	0.975	24.765
0.125	3.175	0.300	7.620	0.475	12.065	0.650	16.510	0.825	20.955	1.000	25.400
0.150	3.810	0.325	8.255	0.500	12.700	0.675	17.145	0.850	21.590		
0.175	4.445	0.350	8.890	0.525	13.335	0.700	17.780	0.875	22.225		

## Flow

To Convert		cfm (cubic ft./min.)		To	L / min (liters/min.)		Multiply By		28.317		
		L / min (liters/min.)			cfm (cubic ft./min.)				0.03531		
cfm	L / min	cfm	L / min	cfm	L / min	cfm	L / min	cfm	L / min	cfm	L / min
0.5	14.159	4.0	113.268	7.5	212.380	11.0	311.493	14.5	410.606	21.0	594.66
1.0	28.317	4.5	127.427	8.0	226.539	11.5	325.652	15.0	438.924	22.0	622.97
1.5	42.476	5.0	141.585	8.5	240.698	12.0	339.811	16.0	453.07	23.0	651.29
2.0	56.634	5.5	155.744	9.0	254.857	12.5	353.970	17.0	481.39	24.0	679.61
2.5	70.793	6.0	169.903	9.5	269.016	13.0	368.129	18.0	509.71	25.0	707.93
3.0	84.951	6.5	184.062	10.0	283.175	13.5	382.288	19.0	538.02		
3.5	99.110	7.0	198.221	10.5	297.334	14.0	396.447	20.0	566.34		

## Pressure

To Convert		psig (lbs./sq.inch)		To	bars		Multiply By		0.06895		
		bars			psig (lbs./sq.inch)				14.50		
psig	bars	psig	bars	psig	bar	psig	bars	psig	bars	psig	bars
2.5	0.17	20.0	1.38	37.5	2.59	55.0	3.79	72.5	5.00	90.0	6.21
5.0	0.34	22.5	1.55	40.0	2.76	57.5	3.96	75.0	5.17	92.5	6.38
7.5	0.52	25.0	1.72	42.5	2.93	60.0	4.14	77.5	5.34	95.0	6.55
10.0	0.69	27.5	1.90	45.0	3.10	62.5	4.31	80.0	5.52	97.5	6.72
12.5	0.86	30.0	2.07	47.5	3.28	65.0	4.48	82.5	5.69	100.0	6.90
15.0	1.03	32.5	2.24	50.0	3.45	67.5	4.65	85.0	5.86		
17.5	1.21	35.0	2.41	52.5	3.62	70.0	4.83	87.5	6.03		

## Force

To Convert		pounds (lbs.)		To	newtons (N)		Multiply By		4.448		
		newtons (N)			pounds (lbs.)				0.2248		
lbs.	N	lbs.	N	lbs.	N	lbs.	N	lbs.	N	lbs.	N
0.25	1.1	2.00	8.9	3.75	16.7	5.50	24.5	7.25	32.2	9.00	40.0
0.50	2.2	2.25	10.0	4.00	17.8	5.75	25.6	7.50	33.4	9.25	41.1
0.75	3.3	2.50	11.1	4.25	18.9	6.00	26.7	7.75	34.5	9.50	42.3
1.00	4.4	2.75	12.2	4.50	20.0	6.25	27.8	8.00	35.6	9.75	43.4
1.25	5.6	3.00	13.3	4.75	21.1	6.50	28.9	8.25	36.7	10.00	44.5
1.50	6.7	3.25	14.5	5.00	22.2	6.75	30.0	8.50	37.8		
1.75	7.8	3.50	15.6	5.25	23.4	7.00	31.1	8.75	38.9		

## Temperature

To Convert		Fahrenheit (°F)		To	Celsius (°C)		Multiply By		(°F - 32) / 1.8		
		Celsius (°C)			Fahrenheit (°F)				1.8°C + 32		
°F	°C	°F	°C	°F	°C	°F	°C	°F	°C	°F	°C
5	-15.0	40	+4.4	75	23.9	110	43.3	145	62.8	180	82.2
10	-12.2	45	+7.2	80	26.7	115	46.1	150	65.6	185	85.0
15	-9.4	50	+10.0	85	18.9	120	48.9	155	68.3	190	87.8
20	-6.7	55	+12.8	90	32.2	125	51.7	160	71.1	195	90.6
25	-3.9	60	15.6	95	35.0	130	54.4	165	73.9	200	93.3
30	-1.1	65	18.3	100	37.8	135	57.2	170	76.7		
35	+1.7	70	21.1	105	+40.6	140	60.0	175	79.4		