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KEMUSEN Electric Linear Actuator

Descriptions

An **Electric Linear Actuator** with **three-phase motor** is an electromechanical device that converts rotational motion from an electric motor into linear motion, allowing objects to be moved in a straight line. Key advantages include precision, energy efficiency, low maintenance, versatility, quiet operation, easy integration, and being clean and safe. They are essentially "screw jacks" that use a motor, gears, and a lead screw to produce push-and-pull movements.

Key Features and Benefits:

- **Types of Actuators:** Parallel Drive Actuators ECA Series, In-line Actuators ECI Series.
- **Types of Motors:** 3-phase motors, 3-phase brake motors, 3-phase variable frequency motors.
- **Precision and Control:** Provide accurate positioning and repeatability.
- **Energy Efficient:** Generally consume less power than hydraulic or pneumatic actuators, especially in static hold applications.
- **Low Maintenance:** Require minimal maintenance due to fewer moving parts and no fluid systems.
- **Versatile:** Can be used in a wide range of environments and applications.
- **Quiet Operation:** Tend to be quieter than hydraulic and pneumatic systems.
- **Clean and Safe:** No hazardous fluids involved, making them suitable for clean environments.
- **Self-Locking:** Actuator with Self-locking trapezoidal lead screw and nut (non-backdriving), will stays in position when the motor stops.
- **Durability:** When properly sized, they can offer a long product life.
- **Accessories:** Non-rotating extension rod with anti-rotation guide, hand wheel, limit switches, bellows and clamps, trunnion mounting brackets, electrical control box, encoder, and stainless steel or chrome plated piston rod.

There are 2 Series for **Electric Linear Actuators**. They are **KMW Series** and **KMH Series**.
They have some of the same features, for example:

- 3phase normal motor (380v 3ph AC) as standard. Brake motors are also available.
- Self-locking trapezoidal lead screw and nut (non-backdriving).
- Non-rotating extension rod with anti-rotation guide.
- Accessories: Brake motor, handwheel, external limit switches, bellows boots and clamps, trunnion mounting brackets, electrical control box, encoder, and stainless steel or chrome plated piston rod.

KMW Series Electric Linear Actuator

- Parallel drive configurations.
- Travel speed: 21 mm/s to 84 mm/s.
- Stroke length: custom, 100 mm to 2000 mm.
- Thrust force: 100 kgf to 25000 kgf.
- Motor power: 0.18 kW to 15 kW.

KMH Series Electric Linear Actuator

- In-line drive configurations.
- Travel speed: 28 mm/s to 85 mm/s.
- Stroke length: custom, 100 mm to 1000 mm.
- Thrust force: 10 kgf to 1500 kgf.
- Motor power: 0.06 kW to 3.0 kW.

Working Principle of Electric Linear Actuators: A trapezoidal lead screw and nut is driven by an electric motor, through a reduction gearbox. The lead screw converts rotary motion to linear movement. When the motor is activated, it rotates the screw, which moves the nut, the nut extends and retracts the piston rod, which is attached to the load.

Electric Linear Actuators are widely used in industrial equipment, motion platforms, such as gates, dampers, oven and processing tank doors, antennas, orthopedic tables and other medical equipment, Ergonomic furniture, and agricultural equipment, scissor lifts, scissor platforms, lifting platforms, robotics, continuous paint pumps, medical beds, coiling machines, tundish cars, continuous operation process lines, opening and closing doors, lifting, pushing and pulling, and precise positioning.

Materials



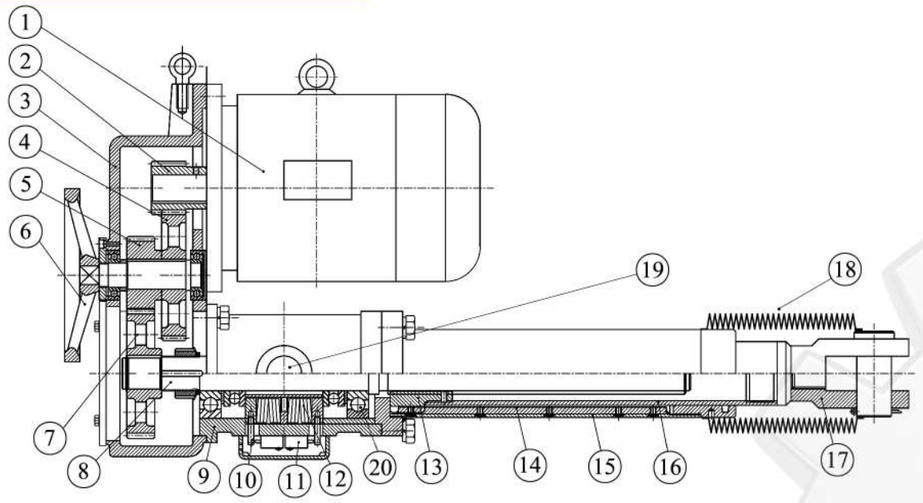









Internal Structure



① Motor	⑧ Trapezoidal Screw	⑮ Outer Tube
② The First Gear (Steel)	⑨ Thrust Housing	⑯ Inner Tube (Piston Rod)
③ Gearbox	⑩ Hammer Blow Pin	⑰ Front Clevis (Fork Head)
④ The Second Gear (Steel)	⑪ Safety Switches	⑱ Protective Bellows
⑤ The Third Gear (Steel)	⑫ Thrust Limit Disc Springs	⑲ Trunnion Pins and Trunnion Mounting Brackets
⑥ Hand Wheel	⑬ Drive Nut (Bronze)	
⑦ The Fourth Gear (Steel)	⑭ Anti-rotation Guide	⑳ Anti-friction Bearings

- **Motor:** 3phase normal motor (380v 3ph AC) as standard. Brake motors are also available.it causes the actuator to travel forwards or backwards. All others 220v, 240v, 400v, 415v, 460v and 480v three phase motors for actuators can be supplied.
- **Spindle:** also known as the self-locking trapezoidal lead screw, rotating screw, or lifting screw, which is a long, straight rod that turns in a machine or tool. This linear actuator rotates, extending or retracting the nut/inner tube, which creates a linear motion.
- **Drive Nut:** The lead screw nut is attached to the inner tube and travels along the spindle. The nut is the component that allows extension or retraction of the inner tube.
- **Inner Tube:** Also known as the extension tube, drive tube, translating tube, thrust rod, push rod, or piston rod. It has internal anti-rotation guide.While retracted, the inner tube is where the spindle is located. This tube is attached to the threaded drive nut and extends and retracts when the nut moves along the rotating spindle. Custom stainless steel or chrome plated piston rod.
- **Outer Tube:** Also known as the cover tube, this tube protects the outside of the linear actuator and houses all of the actuator's inner components. The housing is used for guiding the piston rod too.
- **Safety Switches:** Interior limit switches control the fully extended and retracted inner tube position by electrically cutting current to the motor. These switches prevent the actuator from over extending or over retracting. It also protects the motor.
- **Front Clevis:** Also known as the fork head. A clevis is a U-shaped metal piece with holes in each end through which a fastening device, a pin or bolt, is run.
- **Hand Wheel:** is available for manual operation/adjustment of the actuator.
- **Protective Bellows:** Also known as the extension rod cover, to avoid the possible entry of particles or liquid through the piston rod.

Sample Part Number

KMW1000H4C900ESBM

(1) Series:
- **KMW:** Parallel drive configurations
- **KMH:** In-line drive configurations.

(2) Thrust (kgf)
- **2500:** 2500kgf（The maximum thrust shown in the Technical Charts.）

(3) Speed (mm/s)
- **H:** High speed
- **M:** Medium speed
- **L:** Slow speed

∗ The speed shown in the Technical Charts.

(4) Motor Power (kW)
- **4:** 4kW（The motor power shown in the Technical Charts.）

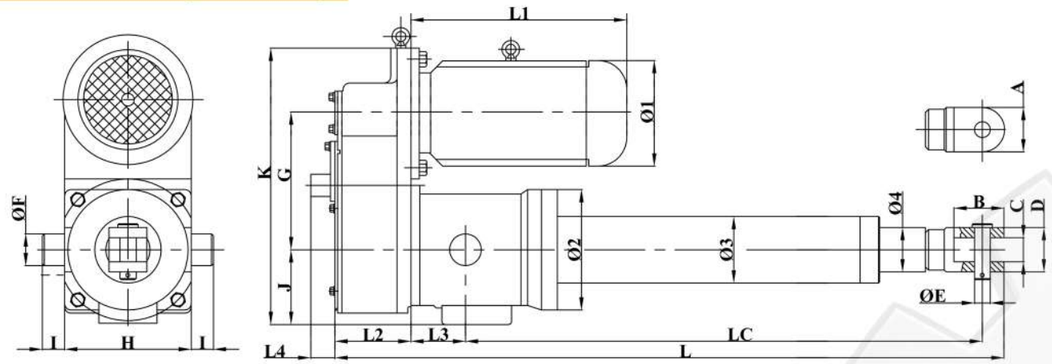
(5) Stroke (mm)
- **900:** 900mm

Each model can be provided with a stroke length up to the maximum shown in the Technical Charts. Where the stroke required exceeds the maximum shown, or there is a high static load, Please contact our Technical Sales Department.

(6) Optional Accessories
- Trunnion Mounting Brackets is a standard configuration.
- Bellows Boots is a standard configuration.
- Safety Limit switches (Internal) is a standard configuration.
- Female Clevis (Fork End) is a standard configuration.
- Anti-rotation Guide is a standard configuration.
- External Limit Switches(ES) are available for selection.
- Normal Motor (3-phase 380V AC, 50Hz) is a standard configuration.
  * Note: If normal motor but different voltage, need to mark when inquiry or ordering.
- Brake Motor (3-phase 380V AC, 50Hz) (BM) is available for selection.
  * Note: If different voltage, need to mark when inquiry or ordering.
- Stainless Steel Push Rod(SS) is available for selection.
- Chrome Plated Push Rod(CP) is available for selection.
- Cast Iron Hand Wheel(CH) is available for selection.
- Electrical Control Box(CB) is available for selection.

Specifications and Dimensions

KMW Series (100-1600)



● **H:** High Speed ● **M:** Medium Speed ● **L:** Slow Speed

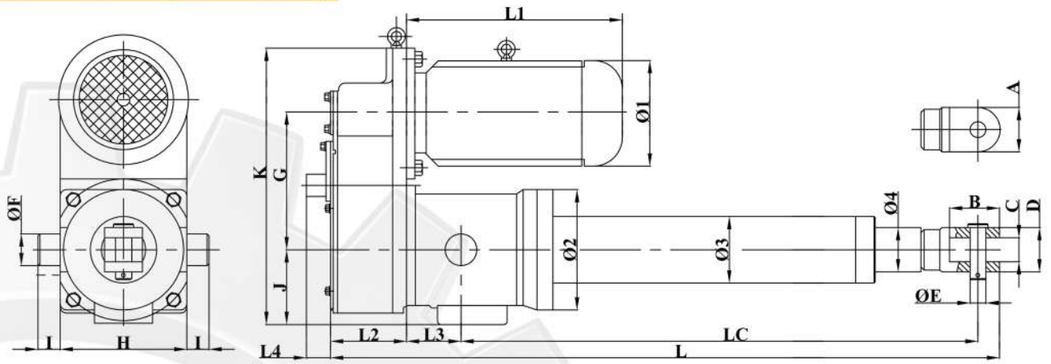
Specifications							
Model		**KMW100**	**KMW250**	**KMW500**	**KMW630**	**KMW1000**	**KMW1600**
Thrust (Kgf)		**100**	**250**	**500**	**630**	**1000**	**1600**
Travel Speed (mm/s)	**H**	84	84	65	65	65	84
	M	42	42	42	42	42	42
	L	28	28	28	28	28	28
Motor Type	**H**	YE3-712-4	YE3-713-4	YE3-802-4	YE3-803-4	YE3-90L-4	YE3-100L2-4
	M	YE3-711-4	YE3-712-4	YE3-802-4	YE3-802-4	YE3-803-4	YE3-100L1-4
	L	YE3-711-6	YE3-712-6	YE3-802-6	YE3-802-6	YE3-803-6	YE3-100L-6
Motor Power (kw)	**H**	0.37	0.55	0.75	1.1	1.5	3
	M	0.25	0.37	0.75	0.75	1.1	2.2
	L	0.18	0.25	0.55	0.55	0.75	1.5

Dimensions							
Maximum Stroke S (mm)		≤800	≤800	≤1000	≤1000	≤1000	≤1200
Length (mm)	**L1**	227	227	250	250	250 (260)	320
	L2	70	70	90	90	90	130
	L3	25	25	40	40	40	86
	L4	40	40	40	40	40	46
Retract (mm)	**L**	420+S	420+S	550+S	550+S	550+S	700+S
	LC	310+S	310+S	400+S	400+S	400+S	450+S
Extend (mm)	**LC**	310+2S	310+2S	400+2S	400+2S	400+2S	450+2S
Fork Head (mm)	**A**	30	30	40	40	40	68
	B	40	40	50	50	50	80
	C	20	20	25	25	25	38
	D	40	40	50	50	50	70
	ΦE	14	14	14	14	14	25
Trunnion Mount (mm)	**ΦF**	25	25	35	35	35	50
	G	126	126	180	180	180	237
	H	105	105	150	150	150	200
	I	20	20	25	25	25	35
	J	70	70	100	100	100	116
	K	276	276	390	390	390	480
Piston Rod (mm)	**Φ1**	140	140	160	160	160 (175)	205
	Φ2	100	100	128	128	128	170
	Φ3	63.5	63.5	76	76	76	102
	Φ4	40	40	52	52	52	70

*. Dimensions are subject to change without notice

Specifications and Dimensions

KMW Series (2500-15000)



● **H:** High Speed ● **M:** Medium Speed ● **L:** Slow Speed

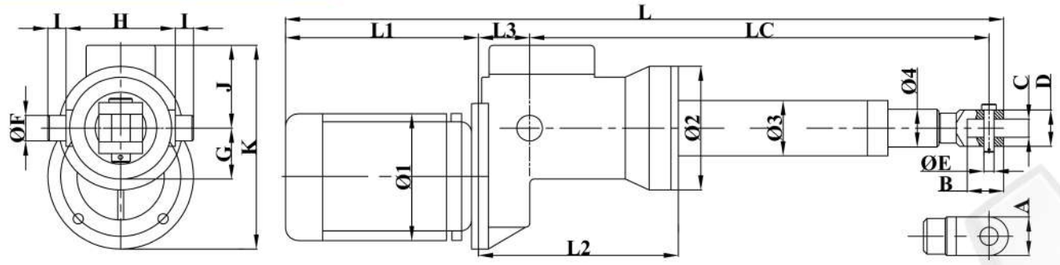
Specifications							
Model		**KMW2500**	**KMW4000**	**KMW6300**	**KMW8000**	**KMW10000**	**KMW15000**
Thrust (Kgf)		**2500**	**4000**	**6300**	**8000**	**10000**	**15000**
Travel Speed (mm/s)	**H**	84		60			
	M	42	42	42	42	42	42
	L	28	28	21	28	21	21
Motor Type	**H**	YE3-112M-4		YE3-132M-4			
	M	YE3-100L1-4	YE3-112M-4	YE3-132S-4	YE3-132M-4	YE3-160M-4	YE3-160L-4
	L	YE3-100L-6	YE3-112M-6	YE3-132M-8	YE3-132M2-6	YE3-160M2-8	YE3-160L-8
Motor Power (kw)	**H**	4		7.5			
	M	2.2	4	5.5	7.5	11	15
	L	1.5	2.2	3	5.5	5.5	7.5

Dimensions							
Maximum Stroke S (mm)		≤1200	≤1200	≤1600	≤1600	≤2000	≤2000
Length (mm)	**L1**	320 (340)	340	395 (435)	435	490	535
	L2	130	130	164	164	195	195
	L3	86	86	114	114	145	145
	L4	46	46	46	46	48	48
Retract (mm)	**L**	700+S	700+S	820+S	820+S	1020+S	1020+S
	LC	450+S	450+S	492+S	492+S	620+S	620+S
Extend (mm)	**LC**	450+2S	450+2S	492+2S	492+2S	620+2S	620+2S
Fork Head (mm)	**A**	68	68	100	100	120	120
	B	80	80	120	120	180	180
	C	38	38	50	50	80	80
	D	70	70	100	100	140	140
	ΦE	25	25	50	50	60	60
Trunnion Mount (mm)	**ΦF**	50	50	50	50	60	60
	G	237	237	268	268	332	332
	H	200	200	240	240	300	300
	I	35	35	50	50	60	60
	J	116	116	120	120	150	150
	K	480	480	560	560	710	710
Piston Rod (mm)	**Φ1**	205 (230)	230	270	270	325	325
	Φ2	170	170	250	250	280	280
	Φ3	102	102	130	130	150	150
	Φ4	70	70	92	92	105	105

*. Dimensions are subject to change without notice

Specifications and Dimensions

KMH Series (25-1000)



- **H:** High Speed
- **M:** Medium Speed
- **L:** Slow Speed

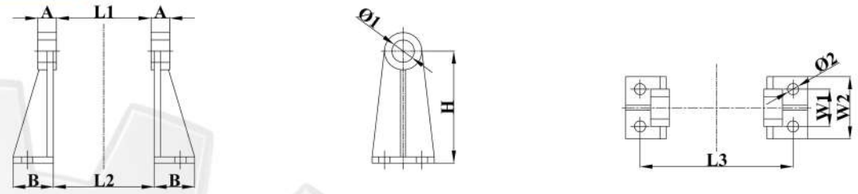
Specifications										
Model		**KMH10**	**KMH25**	**KMH63**	**KMH90**	**KMH100**	**KMH300**	**KMH500**	**KMH700**	**KMH1000**
Thrust (Kgf)		**10**	**25**	**63**	**90**	**100**	**300**	**500**	**700**	**1000**
Travel Speed (mm/s)	**H**	60	60	76	76	84	84	85	85	85
	M	30	30	38	38	42	42	60	60	60
	L					28	28	40	40	40
Motor Type	**H**	YE3-501-2	YE3-502-2	YE3-561-2	YE3-562-2	YE3-712-4	YE3-713-4	YE3-90S-4	YE3-90S-4	YE3-90L-4
	M	YE3-502-4	YE3-502-4	YE3-561-4	YE3-562-4	YE3-711-4	YE3-712-4	YE3-802-4	YE3-802-4	YE3-90L-6
	L					YE3-711-6	YE3-712-6	YE3-803-6	YE3-803-6	YE3-803-6
Motor Power (kw)	**H**	0.06	0.09	0.12	0.18	0.37	0.55	1.1	1.1	1.5
	M	0.06	0.06	0.09	0.12	0.25	0.37	0.75	0.75	1.1
	L					0.18	0.25	0.75	0.75	0.75

Dimensions										
Maximum Stroke S (mm)		≤400	≤400	≤600	≤600	≤800	≤800	≤1000	≤1000	≤1000
Length (mm)	**L1**	145	145	193	193	227	227	250 (260)	250 (285)	285
	L2	125	125	157	157	232	232	279	279	279
	L3	55	55	62	62	65	65	70	70	70
Retract (mm)	**L**	330+S	330+S	430+S	430+S	560+S	560+S	621+S	621+S	656+S
	LC	120+S	120+S	165+S	165+S	253+S	253+S	281+S	281+S	281+S
Extend (mm)	**LC**	120+2S	120+2S	165+2S	165+2S	253+2S	253+2S	281+2S	281+2S	281+2S
Fork Head (mm)	**A**	20	20	20	20	30	30	40	40	40
	B	25	25	25	25	40	40	50	50	50
	C	15	15	15	15	20	20	25	25	25
	D	25	25	25	25	40	40	50	50	50
	ΦE	10	10	10	10	14	14	14	14	14
Trunnion Mount (mm)	**ΦF**	20	20	25	25	25	25	35	35	35
	G	23	23	35	35	48	48	66	66	66
	H	90	90	100	100	130	130	150	150	150
	I	15	15	20	20	20	20	25	25	25
	J	70	70	80	80	97	97	114	114	114
	K	148	148	180	180	225	225	280	280	280
Piston Rod (mm)	**Φ1**	95	95	115	115	140	140	160 (175)	160 (175)	175
	Φ2	84	84	106	106	130	130	170	170	170
	Φ3	42	42	54	54	63.5	63.5	76	76	76
	Φ4	22	22	30	30	40	40	52	52	52

*. Dimensions are subject to change without notice

Trunnion Mounting Feet Dimensions

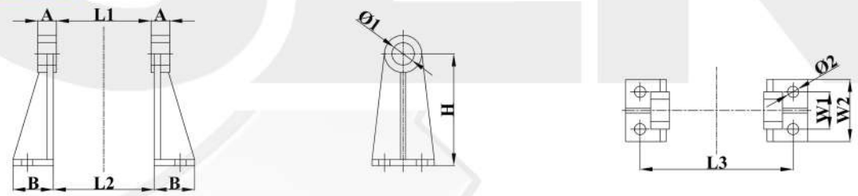
KMW Series



Model	Thrust (Kgf)	Dimensions (mm)									
		L1	**L2**	**L3**	**W1**	**W2**	**H**	**Φ1**	**Φ2**	**A**	**B**
KMW100	100	105	105	190	60	100	180	25	14	20	45
KMW250	100	105	105	190	60	100	180	25	14	20	45
KMW500	500	150	162	245	60	120	180	35	18	25	60
KMW630	630	150	162	245	60	120	180	35	18	25	60
KMW1000	1000	150	162	245	60	120	180	35	18	25	60
KMW1600	1600	200	222	290	120	160	200	50	18	35	70
KMW2500	2500	200	222	290	120	160	200	50	18	35	70
KMW4000	4000	200	222	290	120	160	200	50	18	35	70
KMW6300	6300	240	262	350	120	180	180	50	22	50	70
KMW8000	8000	240	262	350	120	180	180	50	22	50	70
KMW10000	10000	300	322	430	160	200	250	60	26	60	90
KMW15000	15000	300	322	430	160	200	250	60	26	60	90

- **Note:** The final trunnion mounting feet dimensions are based on the production drawings

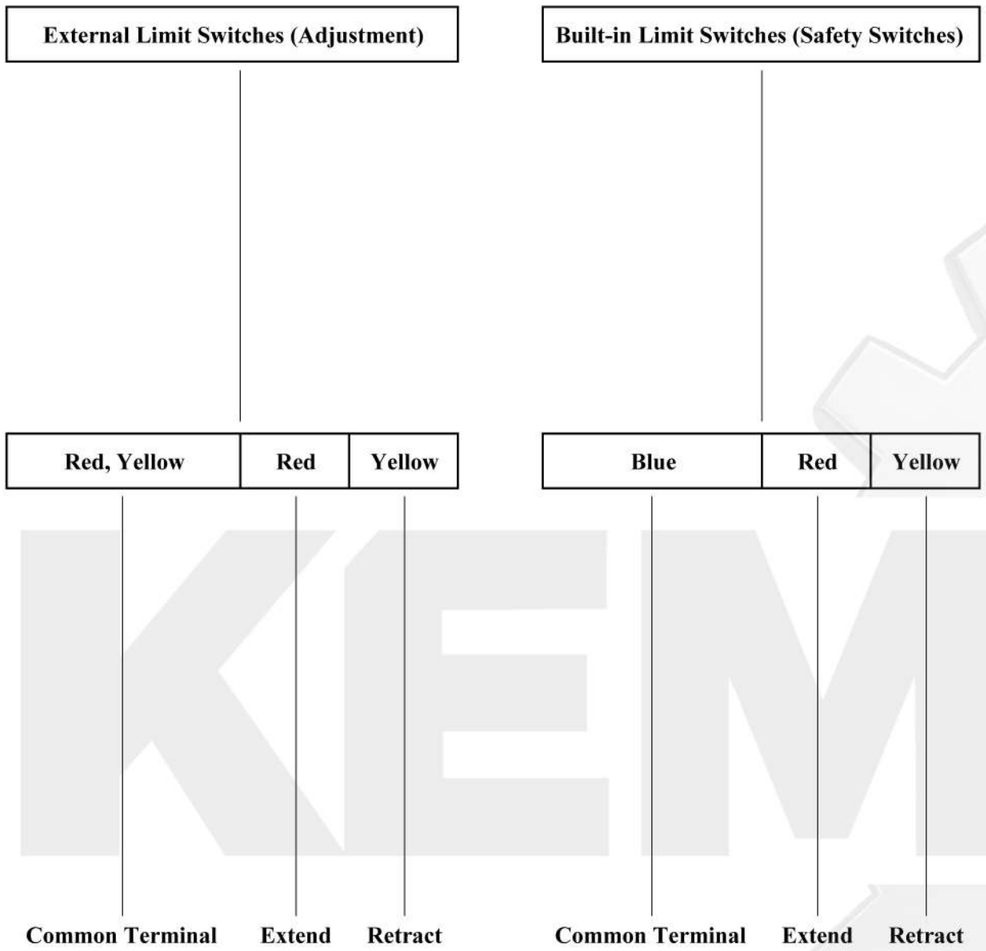
KMH Series



Model	Thrust (Kgf)	Dimensions (mm)									
		L1	**L2**	**L3**	**W1**	**W2**	**H**	**Φ1**	**Φ2**	**A**	**B**
KMH10	10	92	92	132	60	90	90	20	10	5	35
KMH25	25	92	92	132	60	90	90	20	10	5	35
KMH63	63	100	100	140	60	90	100	25	10	5	35
KMH90	90	100	100	140	60	90	100	25	10	5	35
KMH100	100	130	142	210	60	100	180	25	14	20	45
KMH300	300	130	142	210	60	100	180	25	14	20	45
KMH500	500	150	162	220	60	100	180	35	18	25	60
KMH700	700	150	162	220	60	100	180	35	18	25	60
KMH1000	1000	150	162	220	60	100	180	35	18	25	60

- **Note:** The final trunnion mounting feet dimensions are based on the production drawings

Wiring Diagram For Limit Switches



*. All Switches Are Normally Closed Contacts