

Electromechanical Cylinder EMC-HD



Electromechanical Cylinder – Heavy Duty (EMC-HD)

Key data for EMC-HD:

- Electromechanical Cylinder EMC-HD available with ball or planetary roller screw drive
- Sizes: EMC-085-HD, EMC-125-HD, EMC-180-HD
- Dyn. Load rating (Cdyn): up to 470kN
- Maximum thrust force: up to ~ 290kN (push/pull)
- Maximum velocity: up to 1m/s
- Maximum stroke: up to 1700mm
- Capable of operating in temperatures from -10°C to 60°C (only mechanics taken into account).
- Protection class IP65 (as standard)
- Integrated anti-rotation device available
- With servo motors MSK (third party motors possible)
- Wide range of accessories (Mounting elements, switches, force sensor)



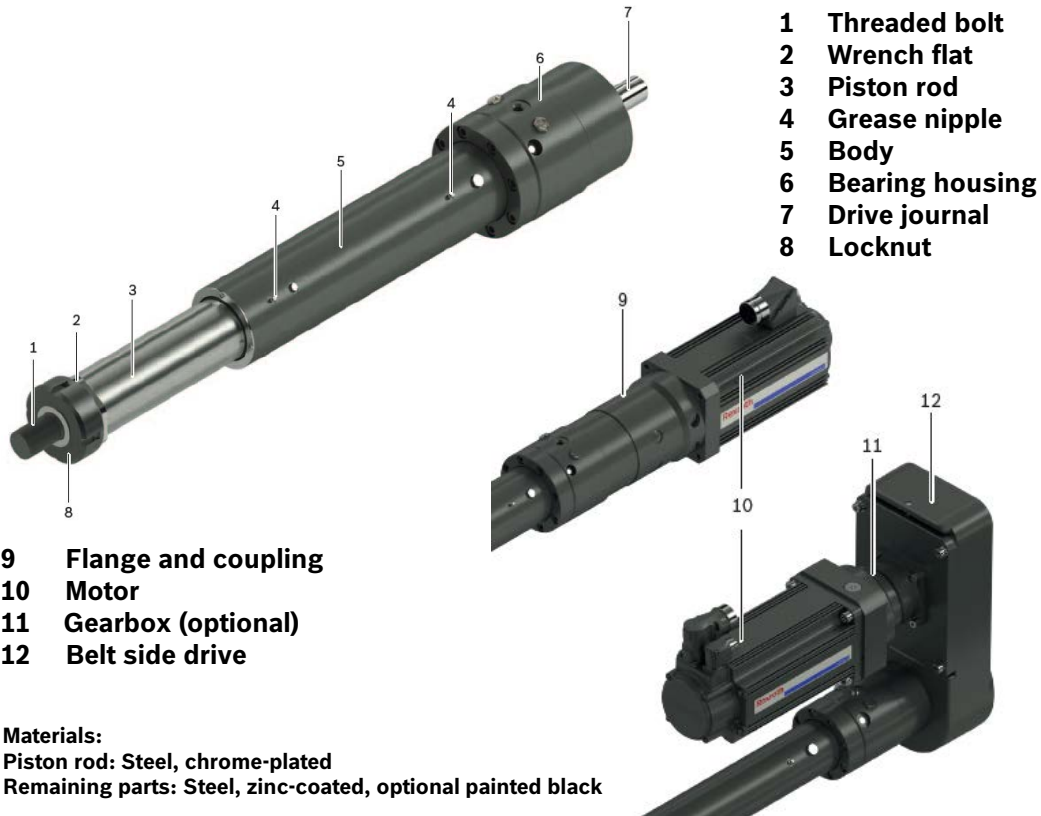
In addition to the actuator, Rexroth can provide motors, drives and guideways as a complete system solution.

Technical Data

	EMC-085-HD				EMC-105-HD				EMC-125-HD				EMC-180-HD	
Screw drive ¹⁾	PLSA		BSA		PLSA		BSA		PLSA		BSA		PLSA	
Diameter x lead [mm]	30x5	30x10	40x10	40x20	39x5	39x10	50x10	50x20	48x5	48x10	63x10	63x20	75x10	75x20
Dynamic load rating C _{dyn} [kN]	87	98	72	95	122	140	80	111	188	211	88	130	470	470
Max feed force [kN]	44	44	44	38	65	76	65	56	95	110	88	85	250	290
Max velocity [m/s]	0.42	0.83	0.63	1.00	0.32	0.64	0.50	1.00	0.26	0.52	0.40	0.80	0.33	0.67
Max stroke [mm]	700				1000				1200				1700	

¹⁾ PLSA: Planetary screw assembly, BSA: Ball screw assembly

Design



With integrated planetary or ball screw drive

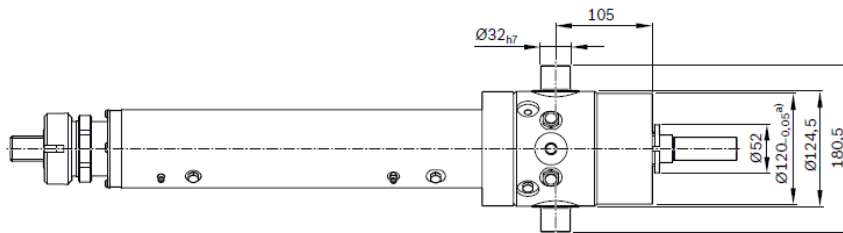
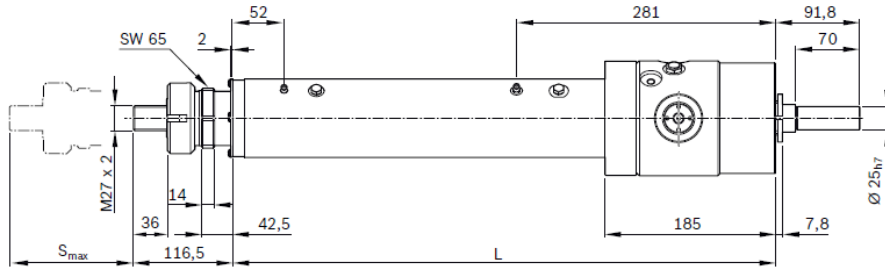
Planetary screw drive for high power density and long lifetime



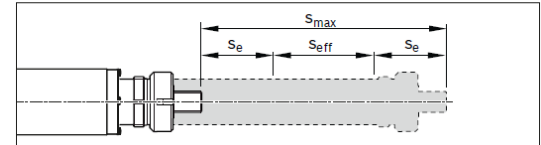
Ball screw drive for high dynamics



Dimensions EMC-085-HD

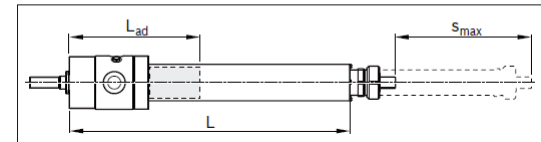


$$S_{eff} = S_{max} - 2 \cdot S_e$$



- S_e = excess travel
- S_{eff} = effective stroke
- S_{max} = maximum travel

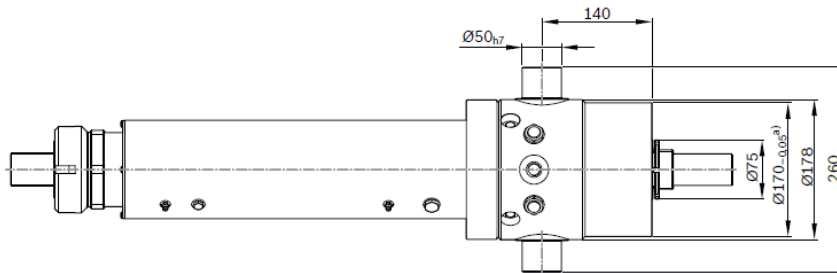
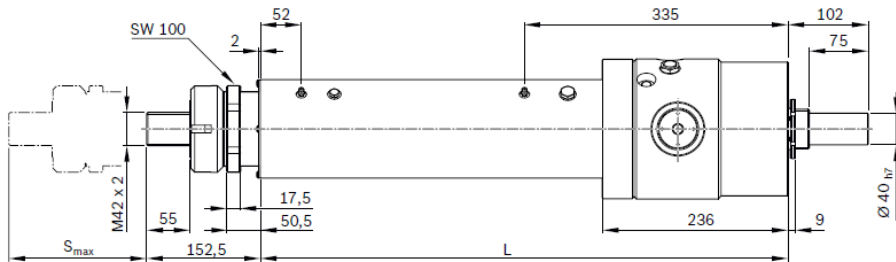
$$L = S_{max} + L_{ad}$$



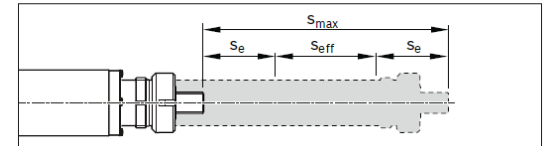
- L = overall length (without piston rod)
- L_{ad} = additional length
- S_{max} = maximum travel

Screw drive	$D_0 \times P$ [mm]	L_{ad} [mm]
PLSA	30x5	352
PLSA	30x10	352
KGT	40x10	352
KGT	40x20	370

Dimensions EMC-125-HD

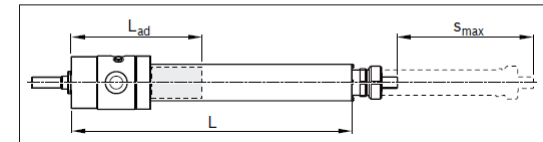


$$S_{\text{eff}} = S_{\text{max}} - 2 \cdot S_e$$



- S_e = excess travel
- S_{eff} = effective stroke
- S_{max} = maximum travel

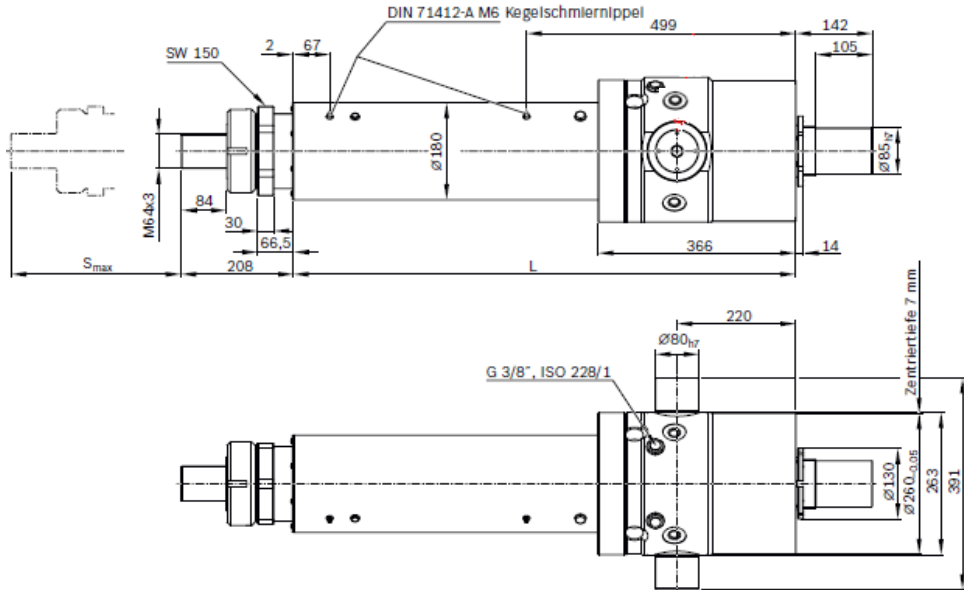
$$L = S_{\text{max}} + L_{\text{ad}}$$



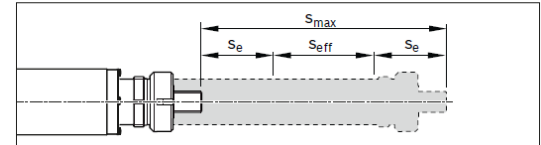
- L = overall length (without piston rod)
- L_{ad} = additional length
- S_{max} = maximum travel

Screw drive	$D_0 \times P$ [mm]	L_{ad} [mm]
PLSA	48x5	442
PLSA	48x10	442
KGT	63x10	405
KGT	63x20	427

Dimensions EMC-180-HD

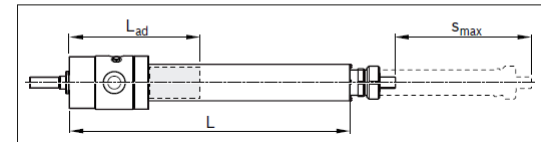


$$S_{eff} = S_{max} - 2 \cdot S_e$$



- S_e = excess travel
- S_{eff} = effective stroke
- S_{max} = maximum travel

$$L = S_{max} + L_{ad}$$



- L = overall length (without piston rod)
- L_{ad} = additional length
- S_{max} = maximum travel

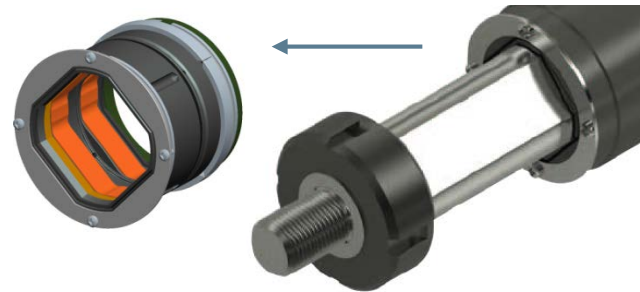
Screw drive	$D_0 \times P$ [mm]	L_{ad} [mm]
PLSA	75x10	677
PLSA	75x20	677

Anti-rotation device

**Without anti-rotation device
(round piston rod)**



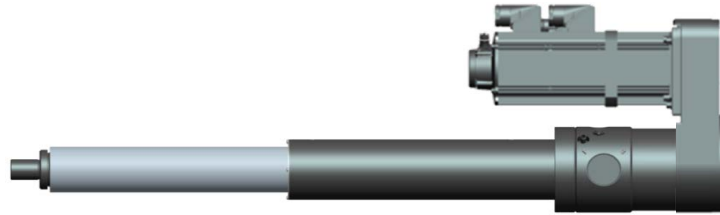
**With internal anti-rotation device
(flattened piston rod)**



- In the cost-optimized basic design without the integrated anti-rotation device the piston rod can be rotated freely during assembly and can therefore be easily extended or retracted manually.
- To ensure a proper linear movement during operation the piston rod as to be secured against rotation externally (e.g. by connection to a linear guide).

- The integrated anti-rotation device is used when an external torque support is not possible (e.g. because of limited space or because the piston rod has to extend freely into the workspace)
- The anti-rotation is realized with four guide surfaces on the piston rod and a sliding guide at the head end of the shell.

Mounting types



Group 1



Group 2



Group 3

Radial support for horizontal orientation only



Only for vertical orientation

Group 4



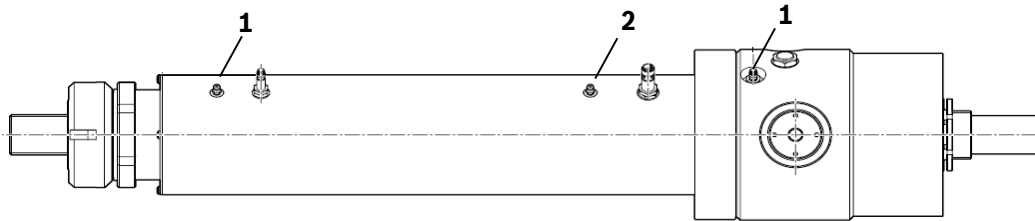
Group 5



Group 6

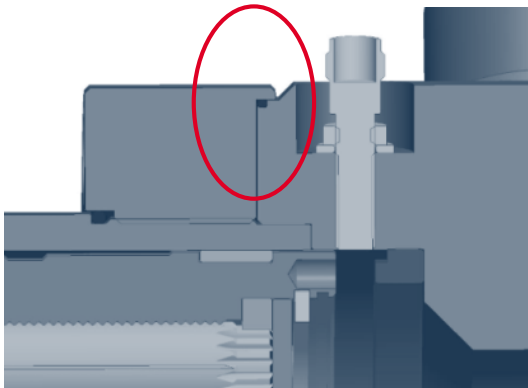


Switches (optional)



- 1 – Limit switches (inductive)
- 2 – Reference switch (inductive)

Limit switch with the piston rod retracted:

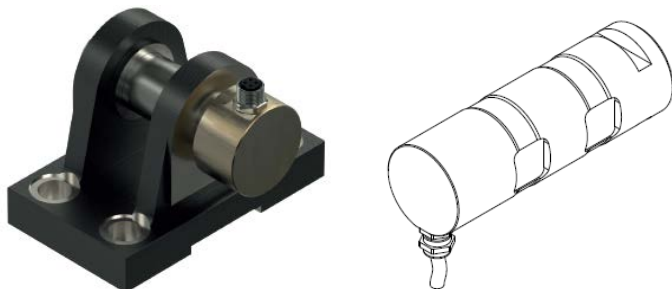


Technical data	Limit switch R913030757	Reference switch R913030758
Switching function	PNP, NC function	PNP, NO function
Power supply voltage	DC 10-30 V	DC 10-30 V
Residual ripple	<15 %	<15 %
Power consumption (at rest)	<=9 mA	<=9 mA
Continuous current	<= 200 mA	<= 200 mA
Termination resistance at continuous current	<=2,5V	<=2,0 V
Switching frequency max.	3 kHz	2 kHz
Delay time	20 ms	15 ms
Ambient temperature	-25 to +70 °C	-25 to +70 °C
Protection class	IP68	IP68
Connector	M8x1, 3-pin	M12x1, 4-pin
Connector cable	R987391496	R987391496
Function display	LED (yellow)	LED (yellow)
Short-circuit protection/Polarity safe	yes	yes

Force Sensor (optional)

Measuring principle: Strain gauge

The bearing block with load pin can be used on both the piston rod end and the belt side drive.



The orientation of the electrical connection at the pin can be selected according to the application requirements.

Specifications

Full scale (F.S.)	kN	EMC-085-HD: 50kN EMC-125-HD: 110kN
Material		Stainless steel
Protection class		IP65
Hardness (load area)	HRC	38
Safe load limit	in % of F.S.	150
Breaking load	in % of F.S.	300
Nonlinearity	in % of F.S.	+/- 0,5
Repeatability	in % of F.S.	+/- 0,25
Hysteresis	in % of F.S.	+/- 0,2
Temp. Shift zero	in % of F.S.	+/- 0,05
Temp. Shift span	in % of F.S.	+/- 0,05
Compensated temp.	°C	+10 ... +40
Operating temp.	°C	-20 ... +60
Output 0kN	V	0+/-0,03
Output F.S.	V	-10...+10+/-0,2
Tare (zero point reference)	V	1s high - 0,1s low
Supply voltage	V	19 ... 28
Current consumption	mA	50 (24V)
Bandwidth	kHz	2,5+/-0,2

IndraMotion MLD – force controlled axes

IndraWorks

Uniform engineering framework, connection via Ethernet TCP/IP

IndraControl

Controller-based operation & visualization devices with connection via TCP/IP or RS232

IndraDrive

Intelligent drive solution with integrated motion logic, technology & safety functions

IndraDyn

Comprehensive range of servo motors for maximum dynamics

Inline block I/O

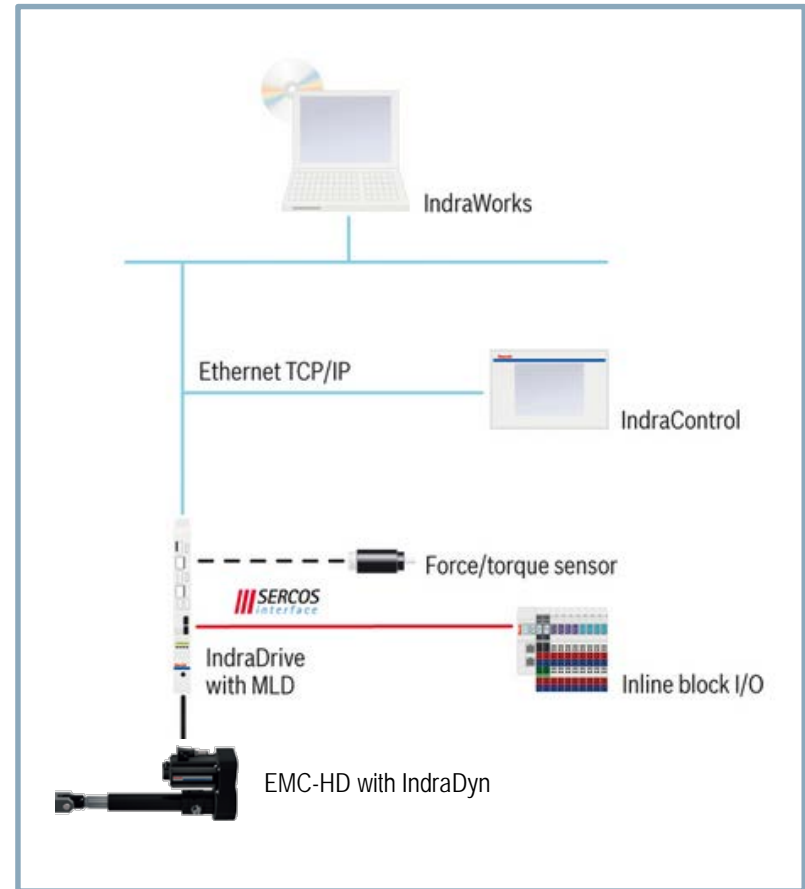
Modules for analog & digital signal processing

sercos III

Ethernet-based real-time communication

EMC-HD

Electromechanical Cylinder - Heavy Duty



Motors and Drives



Motor	Motor Part No.	Fan Part No.	Recommended drive ¹⁾	Recommended drive ²⁾
MSK071D-0300-NN-M1-UG0-NNNN	R911310539	-	HCS02.1E-W0070	HCS02.1E-W0028
MSK071D-0300-NN-M1-UG1-NNNN	R911310168	-	HCS02.1E-W0070	HCS02.1E-W0028
MSK100B-0300-NN-M1-AG0-NNNN	R911315705	-	HCS03.1E-W0100	HCS02.1E-W0054
MSK100B-0300-NN-M1-AG1-NNNN	R911310478	-	HCS03.1E-W0100	HCS02.1E-W0054
MSK101D-0300-NN-M1-AG0-NNNN	R911315888	-	HCS03.1E-W0150	HCS03.1E-W0100
MSK101D-0300-NN-M1-AG2-NNNN	R911310895	-	HCS03.1E-W0150	HCS03.1E-W0100
MSK101E-0300-NN-M1-AG0-NNNN	R911317226	R911325863	HCS03.1E-W0210	HCS03.1E-W0100
MSK101E-0300-NN-M1-AG2-NNNN	R911310891	R911325863	HCS03.1E-W0210	HCS03.1E-W0100
MSK133B-0202-SA-M1-EG0-NPNN	R911344559	³⁾	HCS03.1E-W0210	HCS03.1E-W0100
MSK133D-0202-SA-M1-EG0-NPNN	R911344560	³⁾	HCS04.2E-W0350	HCS03.1E-W0210

¹⁾ Sized for maximum current / torque of the motor
(in case the acceleration torque isn't required a smaller drive may be sufficient)

²⁾ Sized for rated current / torque of the motor
(the relevant DC continuous power and increased power consumption during acceleration have to be taken into account.)

³⁾ The fan is part of the material number of the motor

Drivers and Advantages

Drivers for Electromechanical Solutions

- Easy control and positioning
- Accuracy / precision
- Energy efficiency
- No leakages
- Segregated machines
- Space saving and easy integration in machine concepts
- Fast start-up and assembly
- Environmental requirements (water protection, fire prevention)

Advantages EMC-HD

- Robust design for a long service life even in harsh environments
- Complete portfolio and great variability
- Precision screw drive ensures a high performance at best efficiency
- Simple engineering due to a preassembled system
- Configurable electromechanical servo drive solution for free programmability and realization of complex motion cycles

The EMC-HD is the energy efficient and flexible alternative to hydraulic cylinders.

Areas of Application

- **Pressing and forming technology**
- **Positioning systems**
- **Thermoforming**
- **Injection molding and blow molding machines**
- **Woodworking machines**
- **Machine tool industry**
- **Assembly and handling machines**
- **Packaging and conveyor systems**
- **Special purpose machines**
- **Testing technology**
- **Simulators**
- ...



Application examples

Forming



Pressing



Sawing



Lifting



Bending



Transfer



Thank You!

For more information,
please contact:



Applications Engineering
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1-800-438-5983

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Online Tools & Resources

Product Configurators

Electromechanical Cylinder EMC



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Linear Motion Selection Guide



Product Documentation

