MTV Series Technical Data

The Matara MTV series actuator is a linear unit incorporating a precision ballscrew, enabling high loads to be moved quickly and precisely. These models can be manufactured to give exacting lengths of travel and can be supplied with a full range of modular mounting brackets. Accessories such as flanges, motors, gearboxes and couplings can also be supplied.

Technical Data							
Series			MTV 65	MTV 65 2LR	MTV 80	MTV 80 2LR	MTV 110
Carriage length	Lv	mm	220	220	290	290	330
Dynamic load capacity	C	N	19800	19800	34200	34200	49600
Dynamic moment	Mx	Nm	158	158	370	370	630
	My	Nm	700	700	1470	1470	2650
	Mz	Nm	700	700	1470	1470	2650
Max. permissible loads (Forces)	Fpy	N	6540	6540	8930	8930	10000
	Fpz	N	10190	10190	15070	15070	20260
Max. permissible loads (Moments)	Mpx	Nm	94	94	150	150	295
	Mpy	Nm	350	350	500	500	670
	Mpz	Nm	233	233	384	384	535
* Max. length	Lmax	mm	2920	5789	5480	11055	5850
* Max. stroke		mm	2690	2667	5163	5224	5456

* For lengths/stroke over the stated value in the table above please contact us.
   Values for max. stroke are not valid for double carriage (equation of defining the linear unit length for particular size of the linear unit needs to be used).

** For minimum stroke below the stated value in the table above please contact us.

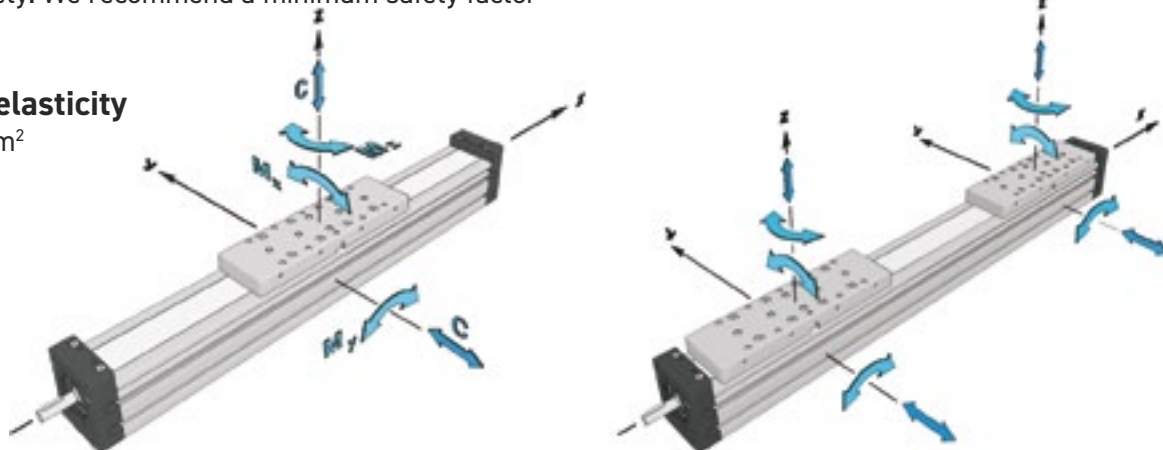| Selection	Selection
Operating temperature	0°C ~ +60°C
Duty cycle	100%

For operating temperatures out of the presented range, please contact us.

ⓘ Recommended values of loads

All the data of dynamic moments and load capacities stated in the upper table are theoretical without considering any safety factor. The safety factor depends on the application and its requested safety. We recommend a minimum safety factor (fs =5.0)

Modulus of elasticity
E= 70000N/mm^2

Ballscrew Technical Data

Ballscrew Technical Data													
Series			MTV 65 MTV 65 2LR			MTV 80 MTV 80 2LR				MTV 110			
Ballscrew	d x l		16 x 5	16 x 10	16 x 16	20 x 5	20 x 10	20 x 20	20 x 50	32 x 5	32 x 10	32 x 20	32 x 32
[3] Max. rotational Speed	rev/min		4200			3300			3000	2150	3000		
[1] Max. travel speed	m/s		0.35	0.70	1.12	0.28	0.55	1.10	2.50	0.18	0.50	1.00	1.60
Lead constant	mm/rev		5	10	16	5	10	20	50	5	10	20	32
[2] Max. repeatability precision	ISO7	mm	± 0.02			± 0.02				± 0.02			
	ISO 5	mm	± 0.01			± 0.01				± 0.01			
Dynamic load capacity BS	Ca (N)		13150	11550	8170	14800	15900	16250	13000	18850	33400	29700	35150
[5] Max. axial load	Fx		8700	6730	4200	14800	13850	6930	2770	18850	29600	14800	9240
Max. drive torque	Ma (Nm)		5.5 with keyway 7.7 without keyway	5.5 with keyway 11.9 without keyway		11.9 with keyway 13.0 without keyway	11.9 with keyway 24.5 without keyway			16.7 with keyway 16.7 without keyway	27.3 with keyway 52.3 without keyway		
[4] Min. stroke	(mm)		40			55				65			70
Max. acceleration	(m/s^2)		20			20				20			

1. Max. travel speed depends of the length of the linear unit, see diagram for particular size of the linear unit.
   For travel speed and acceleration over the stated value in the table above or diagrams please contact us.
2. For the ball nut with the preload of 2%, please contact us.
3. With SA or 2LR version the max. rotation speed is limited to 3000 rev/min.
4. For minimum stroke below the stated value in the table above please contact us.
5. In the case of 2RL version the axial load is total axial load of both carriages.

Mass & Moment Of Inertia

| Series	Ballscrew	Number of SA	Mass of linear unit	Moved Mass	Mass moment of inertia	No load torque	Planar moment of inertia*	
	(d x l)	n_{SA}	(kg)	(d x l)	$(10^{-5}kg *m^2)$	(Nm)	ly (cm⁴)	lz (cm⁴)
MTV 65	16 x 5	0	4.0 + 0.0073 * Stroke (mm)	1.5	1.6 + 0.0052 * Stroke (mm)	0.11	71.3	89.4
		2	4.5 + 0.0073 * Stroke (mm)	1.58	1.9 + 0.0052 * Stroke (mm)	0.13		
		4	5.0 + 0.0073 * Stroke (mm)	1.66	2.2 + 0.0052 * Stroke (mm)	0.15		
	16 x 5 2LR version	0	7.2 + 0.0146 * Stroke (mm)	3	2.9 + 0.0104 * Stroke (mm)	0.22		
		2	8.2 + 0.0146 * Stroke (mm)	3.16	3.5+ 0.0104 * Stroke (mm)	0.26		
		4	9.2 + 0.0146 * Stroke (mm)	3.32	4.1 + 0.0104 * Stroke (mm)	0.29		
	16 x 10	0	4.0 + 0.0073 * Stroke (mm)	1.5	1.9 + 0.0052 * Stroke (mm)	0.12		
		2	4.5 + 0.0073 * Stroke (mm)	1.58	2.2 + 0.0052 * Stroke (mm)	0.16		
		4	5.0 + 0.0073 * Stroke (mm)	1.66	2.5 + 0.0052 * Stroke (mm)	0.19		
	16 x 10 2LR version	0	7.2 + 0.0146 * Stroke (mm)	3	3.5 + 0.0104 * Stroke (mm)	0.24		
		2	8.2 + 0.0146 * Stroke (mm)	3.16	4.1 + 0.0104 * Stroke (mm)	0.28		
		4	9.2 + 0.0146 * Stroke (mm)	3.32	4.8 + 0.0104 * Stroke (mm)	0.31		
	16 x 16	0	4.0 + 0.0073 * Stroke (mm)	1.5	2.5 + 0.0052 * Stroke (mm)	0.13		
		2	4.5 + 0.0073 * Stroke (mm)	1.58	2.8 + 0.0052 * Stroke (mm)	0.19		
		4	5.0 + 0.0073 * Stroke (mm)	1.66	3.2 + 0.0052 * Stroke (mm)	0.24		
MTV 80	20 x 5	0	8.2 + 0.0114 * Stroke (mm)	3	5.6 + 0.0127 * Stroke (mm)	0.16	144.1	192.3
		2	8.9 + 0.0114 * Stroke (mm)	3.07	6.2 + 0.0127 * Stroke (mm)	0.19		
		4/6/ 8/10	9.7 + 0.4 * (n_{SA} - 4) + 0.0114* Stroke (mm)	3.21 + 0.035 * (n_{SA} - 4)	7.0 + 0.4 * (n_{SA} - 4) + 0.0127* Stroke (mm)	0.24 + 0.015 * (n_{SA} -4)		
	20 x 5 2LR Version	0	14.6 + 0.0228* Stroke (mm)	6	9.5 + 0.0254 * Stroke (mm)	0.32		
		2	15.9 + 0.0228* Stroke (mm)	6.14	10.7 + 0.0254 * Stroke (mm)	0.37		
		4/6/8/ 10	17.6 + 0.8 * (n_{SA}-4) + 0.0228* Stroke (mm)	6.42 + 0.07 * (n_{SA} - 4)	12.3 + 0.8 * (n_{SA}- 4) + 0.0254* Stroke (mm)	0.48 + 0.03 * (n_{SA} - 4)		
	20 x 10	0	8.2 + 0.0114 * Stroke (mm)	3	6.2 + 0.0127 * Stroke (mm)	0.17		
		2	8.9 + 0.0114 * Stroke (mm)	3.07	6.8 + 0.0127 * Stroke (mm)	0.22		
		4/6/8/ 10	9.7 + 0.4 * (n_{SA} - 4) + 0.0114* Stroke (mm)	3.21 + 0.035* (n_{SA} - 4)	7.6 + 0.4 * (n_{SA}-4) + 0.0127* Stroke (mm)	0.33 + 0.025* (n_{SA} -4)		
	20 x 20	0	8.2 + 0.0114 * Stroke (mm)	3	8.5 + 0.0127 * Stroke (mm)	0.18		
		2	8.9 + 0.0114 * Stroke (mm)	3.07	9.1 + 0.0127 * Stroke (mm)	0.29		
		4/6/8/ 10	9.7 + 0.4 * (n_{SA}) + 0.0114* Stroke (mm)	3.21 + 0.035* (n_{SA} - 4)	10.1 + 0.5 * (n_{SA}- 4) + 0.0127* Stroke (mm)	0.50 + 0.055 * (n_{SA} - 4)		
	20 x 50	0	8.2 + 0.0114* Stroke (mm)	3	24.4 + 0.0127 * Stroke (mm)	0.58		
		2	8.9 + 0.0114* Stroke (mm)	3.07	25.5 + 0.0127 * Stroke (mm)	0.85		
		4/6/8/ 10	9.7 + 0.4 * n_{SA}- 4) + 0.0114* Stroke (mm)	3.21 + 0.035* (n_{SA} - 4)	27.1 + 0.6 * (n_{SA}- 4) + 0.0127* Stroke (mm)	1.38 + 0.0135 * (n_{SA}-4)		
MTV 110	32 x 5	0	17 .3 + 0.0216 * Stroke (mm)	4.9	34.6 + 0.0690 * Stroke (mm)	0.45	562.0	669.0
		2	17.7 + 0.0216 * Stroke (mm)	5.03	35.1 + 0.0690 * Stroke (mm)	0.52		
		4/6/8/ 10	19.3+0.8 * (n s.- 4) + 0.0216 * Stroke (mm)	5.29 + 0.065* (n s* * 4)	39.4 + 2.2 * (ns*· 4) + 0.0690 * Stroke (mm)	0.66 + 0.035* (n s* * 4)		
	32 x 10	0	17.3 + 0.0216 * Stroke (mm)	4.9	35.5 + 0.0690 * Stroke (mm)	0.5		
		2	17 .7 + 0.0216 * Stroke (mm)	5.03	36.1 + 0.0690 * Stroke (mm)	0.64		
		4/6/8/10	19.3+0.8* (n s*· 4) + 0.0216 * Stroke (mm)	5.29 + 0.065 * (nSA · 4)	40.4 + 2.2 * (ns*· 4) + 0.0690 * Stroke (mm)	0.92 + 0.070* (n s* * 4)		
	32 x 20	0	17 .3 + 0.0216 * Stroke (mm)	4.9	39.3 + 0.0690 * Stroke (mm)	0.55		
		2	17 .7 + 0.0216 * Stroke (mm)	5.03	39.9 + 0.0690 * Stroke (mm)	0.83		
		4/6/8/ 10	19.3+0.8 * (n*s · 4) + 0.0216 * Stroke (mm)	5.29 + 0.065 * (nSA · 4)	44 .4 + 2.2 * (ns*· 4) + 0.0690 * Stroke (mm)	1.40 + 0.140 * (n 5. - 4)		
	32 x 32	0	17.3 + 0.0216 * Hub (mm)	4.9	47.0 + 0.0690 * Stroke (mm)	0.6		
			17.7 + 0.0216 * Hub (mm)	5.03	47.8 + 0.0690 * Stroke (mm)	1.05		
		4/6/8/ 10	19.3+ 0.8 * (n s*· 4) + 0.0216 * Stroke (mm)	5.29 + 0.065* (n s* * 4)	52.8 + 2.3 * (ns*· 4) + 0.0690 * Stroke (mm)	1.96 + 0.225* (n s* · 4)		

* The stated values are for strokes up to 500mm.
No Load Torque value increases with stroke elongation.

Deflection of Linear Unit
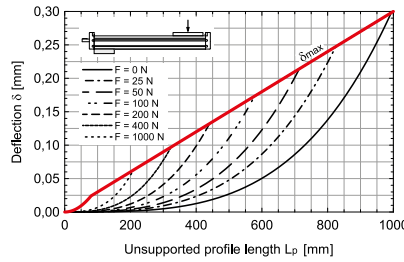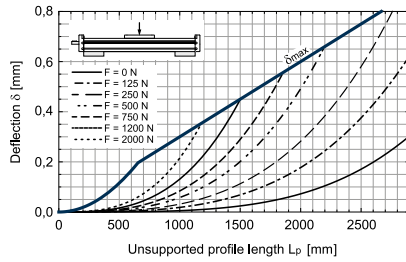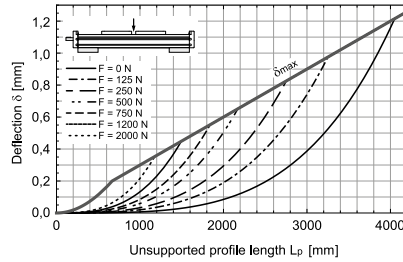
Fixed- Fixed mounting
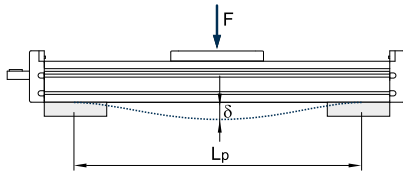
Fixed- Free mounting
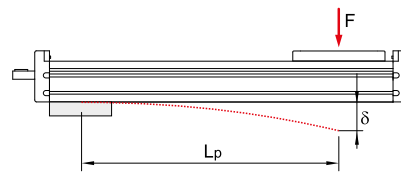
δ   Maximum deflection of the linear unit [mm]
δmax Maximum permissible deflection of the linear unit [mm] F Applied force [N]
Lp   Unsupported profile length [mm]

The maximum permissible deflection δmax must not be exceeded.
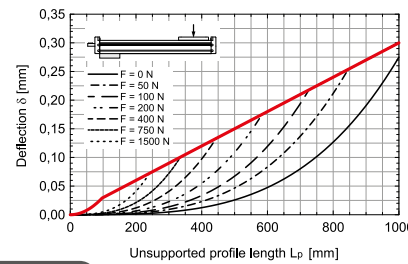In the case that maximum deflection δ exceeds the maximum permissible
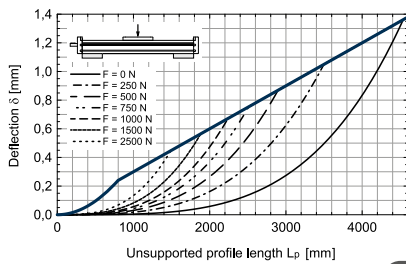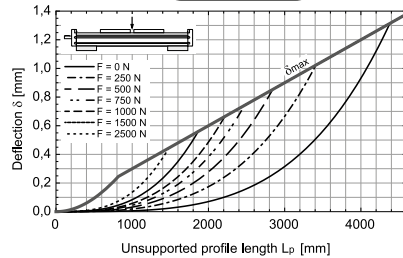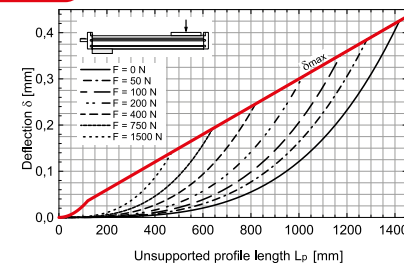deflection δmax, additional profile supports are needed.

MTV 65

MTV 65 2LR

MTV 80

MTV 80 2LR

MTV 110

MTV65 Dimensions

Unit mm

i **Linear Unit doesn't include safety stroke.**
Absolute stroke = Effective stroke + 2 x Safety stroke

i **Journal with or without keyway**

n	L_{SA}
0	5.0
2SA	31.0
4SA	62.0

L_{SA} Additional length [mm]

2LR Version

n	L_{SA}	L_{2LR}
0	5,0	5,0
2SA	31,0	67,0
4SA	62,0	129,0

L_{SA} Additional length [mm]
L_{2LR} Min. distance between carriages [mm]

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Unit mm

Ø 40 H7
2,5 mm Deep

64
45
44,5
23
65

M6x1 - 6H
10 mm Deep (4x)

B
3,4
6,7
11
5,4
Reed switch

A-A
64
85
65
54,5
44
18
65

B
C
D

C
2,5
9
5
5,2
8,5
DIN 557 - M5

D
2,5
9
5
5,2
8,5
DIN 557 - M5

Tap/ Pin holes are available upon request

TAP / PIN holes on bottom of the profile

Belt Driven Actuators
MTB Series
MTE Series
MTS Series
MTZ Series
MTF Series
CTJ Series
Ballscrew Actuators
MTV Series
CTV Series
PNCE Series
Automation Components

Calculating the linear unit length

Standard Version

L = (Effective stroke + 2 x Safety stroke) + Lv + 2 x L_{SA}

Ltotal = L + 48 mm

Lv=220 mm

Left side (L)

Lv

STROKE

L
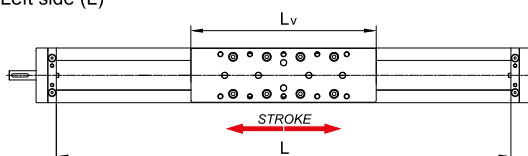
Right side (R)

2LR Version

L = 2 x (Effective stroke + 2 x Safety stroke) + 2 x Lv + 2 x L_{SA} + L_{2LR}

Ltotal = L + 48 mm

Lv= 220 mm
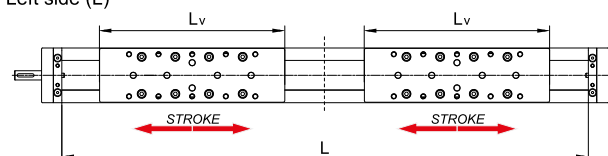
Left side (L)

Lv   Lv

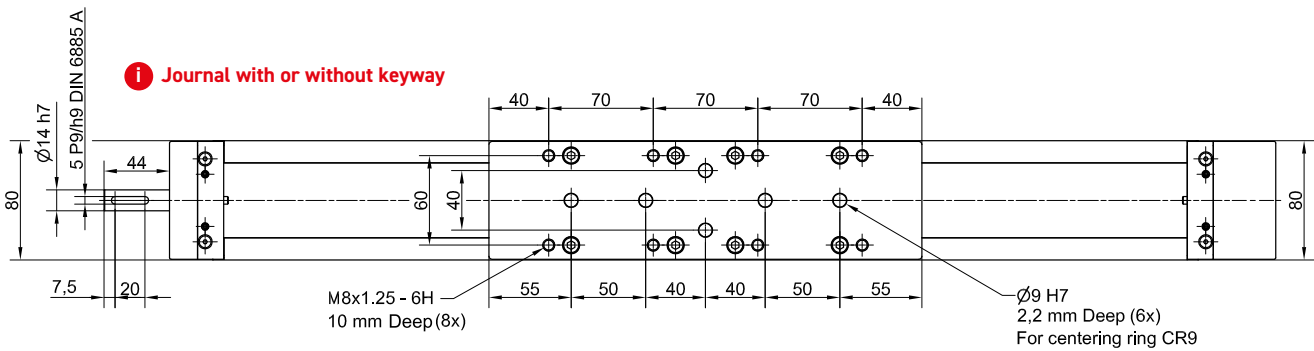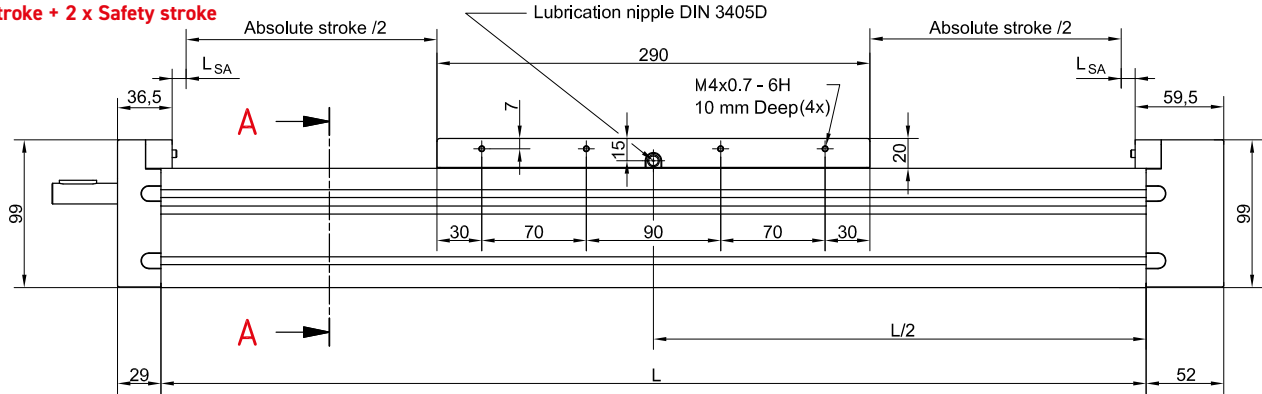STROKE   STROKE

L

Right side (R)

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MTV80 Dimensions

Unit mm

i **Linear Unit doesn't include safety stroke.**
Absolute stroke = Effective stroke + 2 x Safety stroke

Absolute stroke /2

Lubrication nipple DIN 3405D

290

Absolute stroke /2

L_{SA}

L_{SA}

36,5

59,5

M4x0.7 - 6H
10 mm Deep (4x)

7

115

20

99

99

A

30   70   90   70   30

A

L/2

29

L

52

i **Journal with or without keyway**

Ø14 h7

5 P9/h9 DIN 6885 A

40   70   70   70   40

80

44

60

40

80

7,5   20

55   50   40   40   50   55

M8x1.25 - 6H
10 mm Deep (8x)

Ø9 H7
2,2 mm Deep (6x)
For centering ring CR9

n_{SA}	L_{SA}
0	6.0
2SA	28.5
4SA	59.5
6SA	90.5
8SA	121.5
10SA	152.5

L_{SA} Additional length [mm]

2LR Version

L_{SA}

Absolute stroke

Absolute stroke

L_{2LR}

L_{SA}

L_{SA}

L/2

L
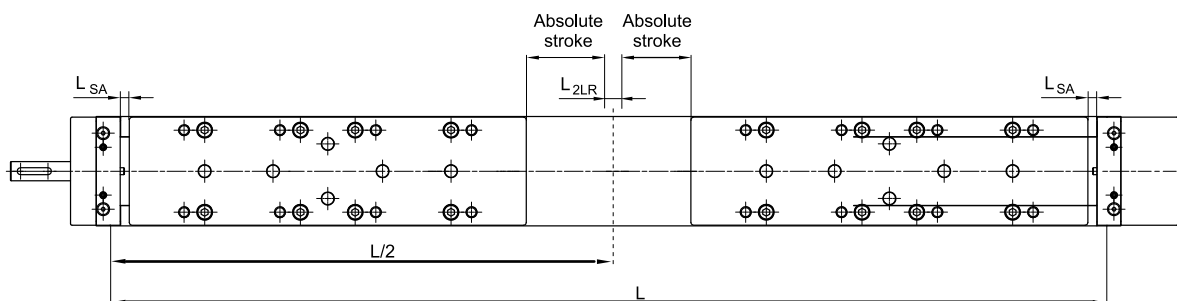
n_{SA}	L_{SA}	L_{2LR}
0	6.0	0.0
2SA	28.5	48.0
4SA	59 5	110.0
6SA	90.5	172.0
8SA	121.5	234.0
10SA	152.5	296.0

L_{SA} Additional length [mm]
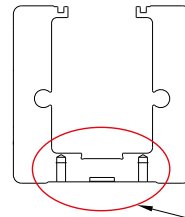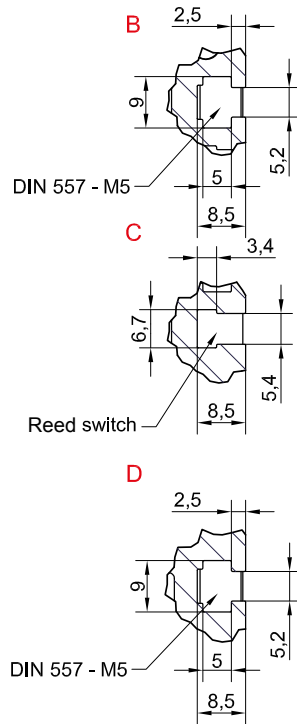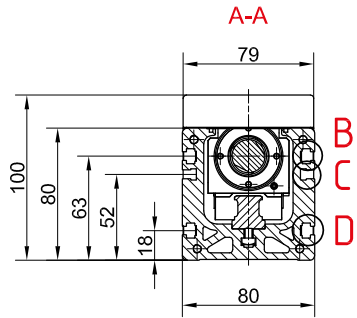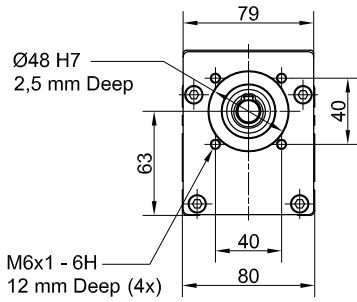
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Unit mm

Ø48 H7
2,5 mm Deep

M6x1 - 6H
12 mm Deep (4x)

79
40
63
40
80

A-A

79
100
80
63
52
18
80

B
C
D

B

2,5
9
5,2
5
8,5
DIN 557 - M5

C

3,4
6,7
5,4
8,5
Reed switch

D

2,5
9
5,2
5
8,5
DIN 557 - M5

Tap/ Pin holes are available upon request

TAP / PIN holes on bottom of the profile

Belt Driven Actuators

MTB Series

MTE Series

MTS Series

MTZ Series

MTF Series

CTJ Series

Ballscrew Actuators

MTV Series

CTV Series

PNCE Series

Automation Components

Defining of the linear unit length

Standard Version

L = (Effective stroke + 2 x Safety stroke) + Lv + 2 x L$_{SA}$ + 15mm

Ltotal = L + 81 mm

Lv=290 mm

Left side (L)

Lv

STROKE

L
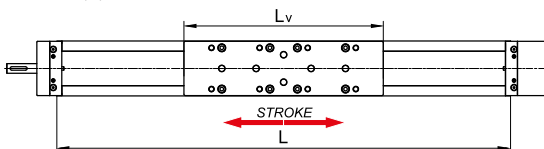
Right side (R)

2LR Version

L = 2 x (Effective stroke + 2 x Safety stroke) + 2 x Lv + 2 x L$_{SA}$ + L$_{2LR}$ +15mm

Ltotal = L + 81 mm

Lv= 290 mm

Left side (L)

Lv

Lv

STROKE

STROKE

L

Right side (R)

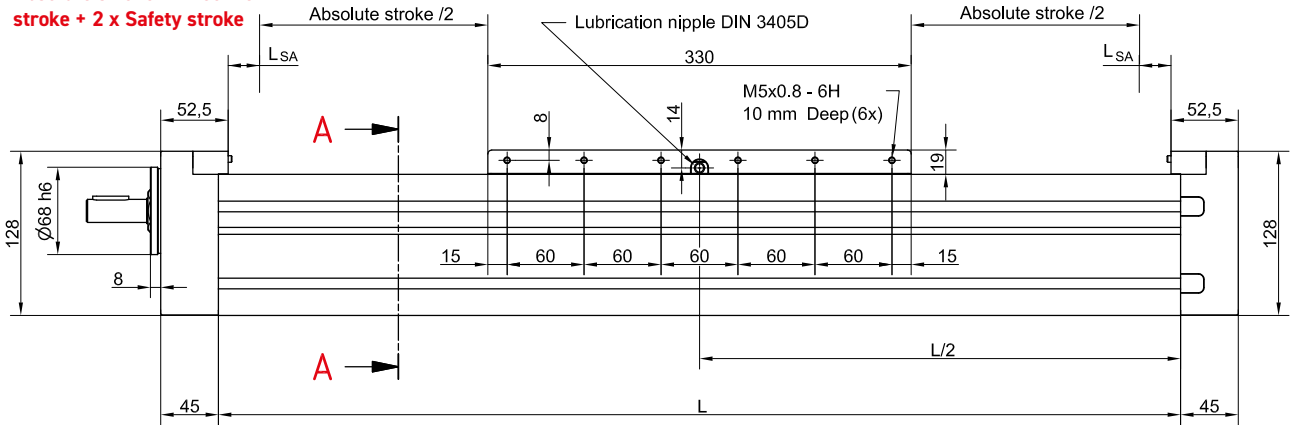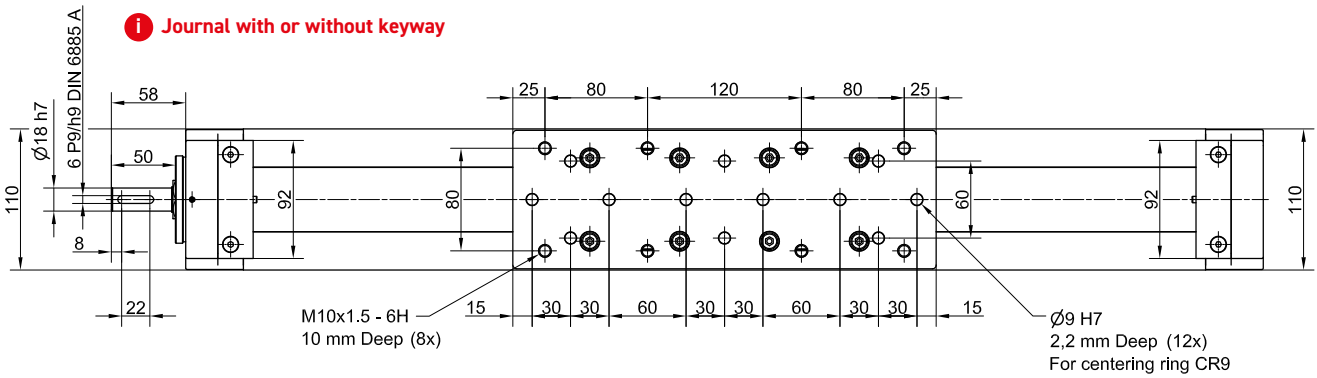**sales@matarauk.co.uk**

75
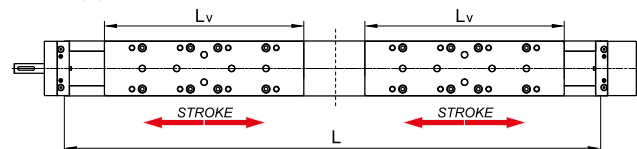
MTV110 Dimensions

Unit mm

ⓘ **Linear Unit doesn't include safety stroke.**
Absolute stroke = Effective stroke + 2 x Safety stroke

ⓘ **Journal with or without keyway**

n_{SA}	L_{SA}
0	24.5
2SA	28.0
4SA	59.0
6SA	90.0
8SA	121.0
10SA	152.0

L_{SA} **Additional length [mm]**

Defining of the linear unit length

$L = $ (Effective stroke + 2 x Safety stroke) + Lv + 2 x L_{SA} + 15mm

Ltotal = L + 90 mm

Lv=330 mm

Left side (L)

Right side (R)

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Unit mm

108

60

81,5

60

110

M8x1.25 - 6H
16 mm Deep (4x)

A-A

108

129
110
85
66
25

12,5

110

B
C
D
E

B

4,6

14

8,3

6,8

12,5

DIN 557 - M8

C

3,4

6,7

13

5,4

Reed switch

D

4,6

14

8,3

6,8

12,5

DIN 557 - M8

E

14

12,5
6,8

4,6

8,3

DIN 557 - M8
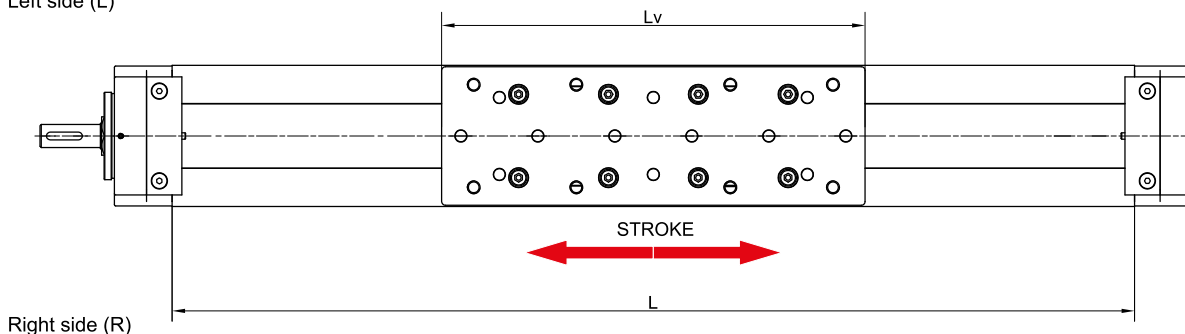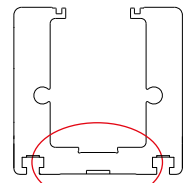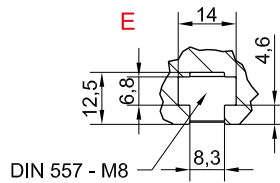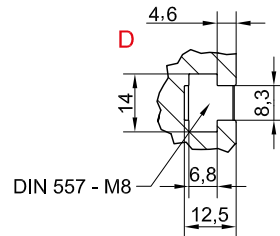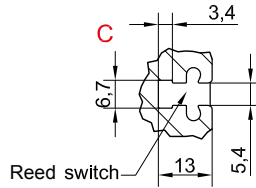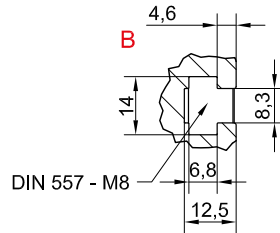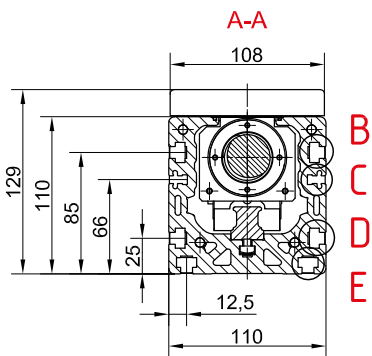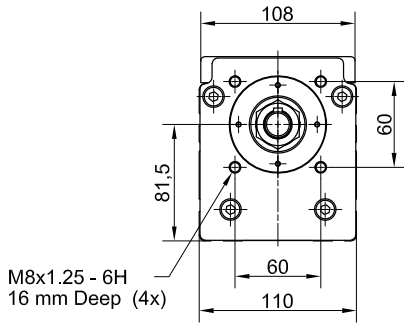
**Tap/ Pin holes are available
upon request**

CENTER RING holes on bottom
of the profile

Belt Driven
Actuators

MTB
Series

MTE
Series

MTS
Series

MTZ
Series

MTF
Series

CTJ
Series

Ballscrew
Actuators

MTV
Series

CTV
Series

PNCE
Series

Automation
Components
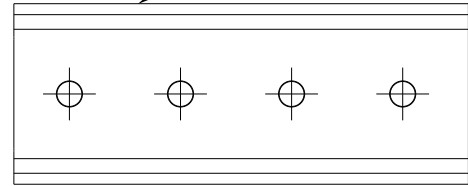
Maximum travel speed as a function of the profile length (Vmax - L curves)

32 × 32   32 × 20   32 × 10

Vmax [m/s]

0SA 2SA 4SA 6SA 8SA 10SA

L [mm]

32 × 5

Vmax [m/s]

0SA 2SA 4SA 6SA 8SA

L [mm]

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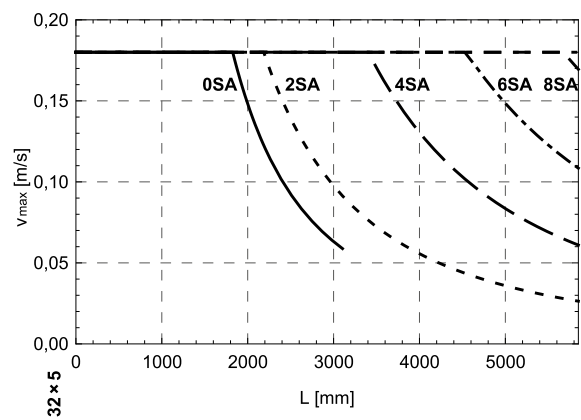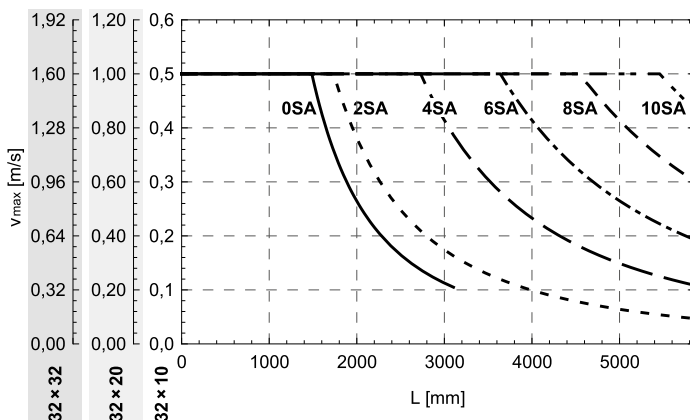
MTV Series Order Example

Code: **MTV**   **65**   **1610** - **ISO7** - **1** - **1000** - **2SA** - **2LR**

Options: 1   2   3   4   5   6   7   8

Options		Selection		
1	Series	MTV		
2	Size	65	80	110
3	Ballscrew	Ø16x5, Ø16x10, Ø16x16	Ø20x5, Ø20x10, Ø20x20 Ø20x50	Ø32x5, Ø32x10, Ø32x20, Ø32x32
4	Ballscrew Tolerance	ISO7 (Standard) ISO5		
5	Ballscrew Journal	0: Without Keyway 1: With Keyway		
6	Absolute Stroke	Absolute Stroke= Effective stroke + 2 x Safety Stroke (2LR Version: Absolute Stroke Of One Carriage)		
7	Number of Screw Supports n_{SA}	2, 4 _ : Leave Blank For No Screw Supports	2, 4, 6, 8, 10 _ : Leave Blank For "No SA" Option	
8	Version	2LR (Both Left and Right Ballscrews are used.) (Available for : MTV65 : 16 x 5, 16 x 10 / MTV80 : 20 x 5) _ : Leave Blank For Standard Option.		N/A

MTV Accessories

Mid Section Mounting
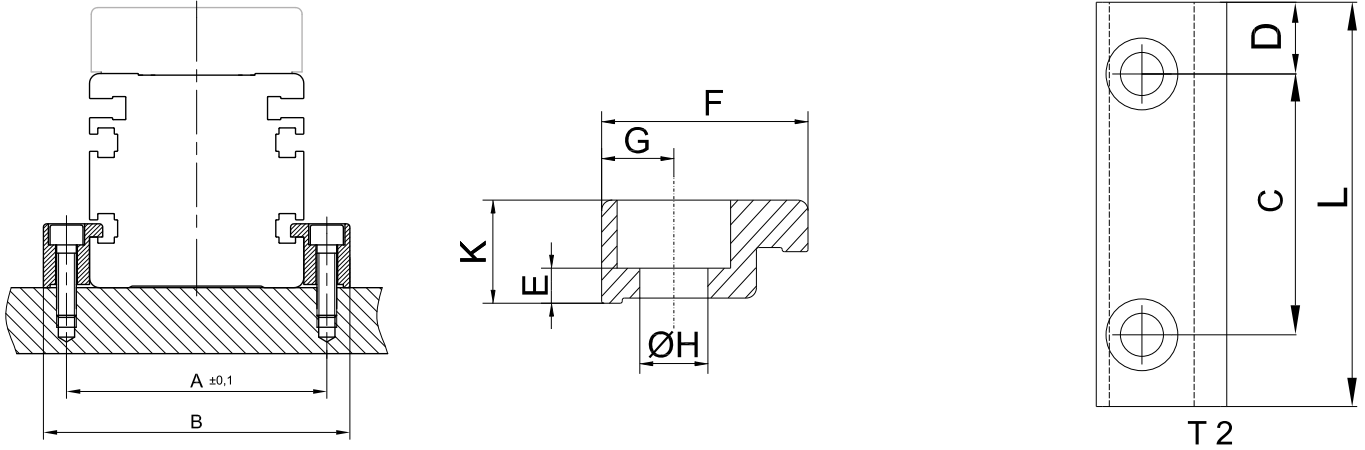
Linear Unit	Type	Dimensions (mm)										Screw	Countersink for	Weight (kg)	Code
		A	B	C	D	L	E	F	G	ØH	K				
MTV 65	T2	78	93	40	10	60	11.5	20	7.5	6.5	20	M6	DIN 912	0.054	37129
MTV 80	T2	93	108	40	10	60	11.5	20	7.5	6.5	20	M6	DIN 912	0.054	37129
MTV 110	T2	130	150	40	10	60	18	30	10	8.5	28	M8	DIN 912	0.082	44375

Recommended number of mounting fixtures

T2	3 pieces per metre, per side

Centring Rings

CR 7   CR 9   CR 7 / 9

Type	Compatible with	Code
CR 7	MTV: 65	23332
CR9	MTV: 80, 110	23331
CR 7/9	MTV: 110	75114

Slot Nuts
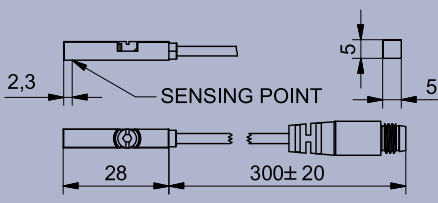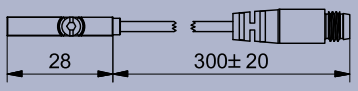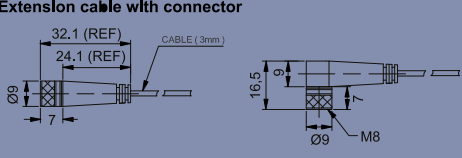
DIN 526   **DIN 557**

Code	Nut Type	MTV 65	MTV 80	MTV 110
40682	DIN562 -M4	X	X	
40769	DIN557 -M5	X	X	
44451	DIN557 -M8			X

Magnetic Field Sensors
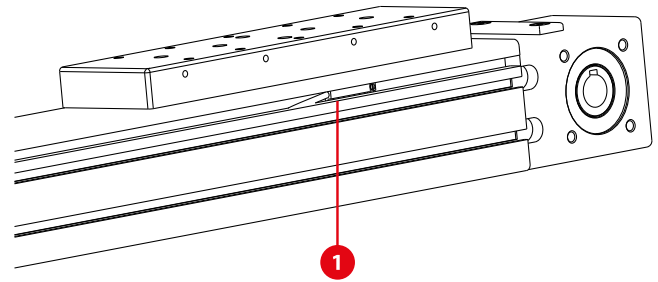
1	Magnetic Field Sensor

SMT-65TP-K NO/ NC	Code	Type	Compatability	
SENSING POINT 2,3 / 28 / 300± 20 / 5 / 5	74073	SMT-65TP-K NC	MTV 65/80/ 110	
	74074	SMT-65TP-K NO	MTV 65/80/ 110	
Extension cable with connector 32.1 (REF) 24.1 (REF) CABLE (3mm) Ø9 7 16,5 9 7 Ø9 M8	8146	Extension Cable length 2m - Straight connector		
	8147	Extension Cable length 5m - Straight connector		
	9017	Extension Cable length 2m - Angled connector		
	9019	Extension Cable length 5m - Angled connector		

Technical Data	SMT-65TP-K NC	SMT-65TP-K NO
Sensor Type	GMR sensor	GMR sensor
Switching function	NC	NO
Output	PNP	PNP
Operating voltage	10 ~ 28 V DC	10 ~ 28 V DC
Switching Current	200 mA max.	200 mA max.
Power rating	5.5 W max.	5.5 W max.
Voltage Drop	1.5 V / 200 mA max.	1.5 V / 200 mA max.
Current Consumption	10 mA/ 24 V max.	10 mA/ 24 V max.
Switching Frequency	1000 Hz	1000 Hz
Ambient temperature	-10 ~ +70°c	-10 ~ +70°c
Shock Vibration	50 G / 9 G	50 G / 9 G
Protection class	IP 67	IP 67
LED indicator	Yellow	Yellow
Electrical connection	M8, 3-pin	M8, 3-pin
Cable material length	PU - 0.3 m	PU - 0.3 m
Extension cable	Energy chain compliant	Energy chain compliant

THE BRITISH
ASSESSMENT
BUREAU
ISO9001

Certification No.206948

1	Induction Switch
2	Mechanical Switch
3	Activation Block
4	Switch Holder

Belt Driven Actuators

MTB Series

MTE Series

MTS Series

MTZ Series

MTF Series

CTJ Series

Ballscrew Actuators

MTV Series

CTV Series

PNCE Series

Automation Components
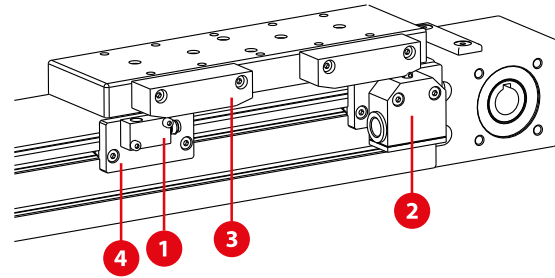
MS - Mechanical Switch

Technical Data		SMT-65TP-K NC	SMT-65TP-K NO
		Protection class IEC 60529	IP67
		Ambient temperature	-5°C ~ +80°C
		Operating point accuracy	± 0.05 mm
		Approach speed max.	45 m/min
		Approach speed min.	0.01 m/min
		Switching contact	1 changeover
		Switching principle	Snap-action
		Rated voltage	250 V AC
		Switching current, min. at	10 mA
		Switching voltage	24 V DC
		Cable entry	M12 X 1.5

Ordering Codes		MTV 65	MTV 80	MTV 110
	Activation block with fixing screws	43247	43256	47827
	Mechanical switch only		47921	
	Mechanical switch with mounting elements	40687	40689	47826

IS - Inductive Switch

Technical Data	
Sensor Type	PNP
Switching function	NC / NO
Rated voltage	10 - 30 V DC
Switching Current	150mAmax.
Ambient temperature	-25°C ...+70°C
Switching Frequency	800 Hz max.
Voltage Drop	3,5 V
Protection class	IP 67
Electrical connection	M8, 3-pin
Extension cable	Energy chain compliant - bending radius 75 mm
Cable material-length	PU
Cable length	2m / 5m
Cable length	M8, 3-pin Straight or Angled connector

Ordering Codes		MTV 65	MTV 80	MTV 110
	Activation block with fixing screws	43247	43256	47827
	PNP NO Inductive switch Only		40671	
	PNP NO inc. switch with mounting elements	48026	43233	48047
	PNP NC Inductive switch Only		43570	
	PNP NC inc. switch with mounting elements	40685	47848	47989

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