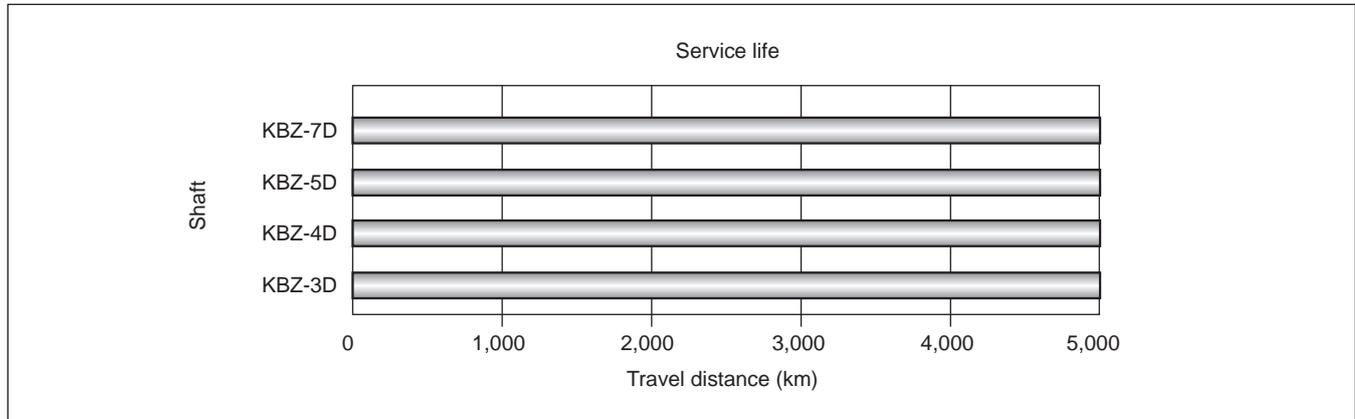


Product service life

The max. load capacity and allowable moment of load in the catalog are calculated from the service life of the guide and the ball screw.

Common between the slider, table, and rod types.



Allowable moment of load

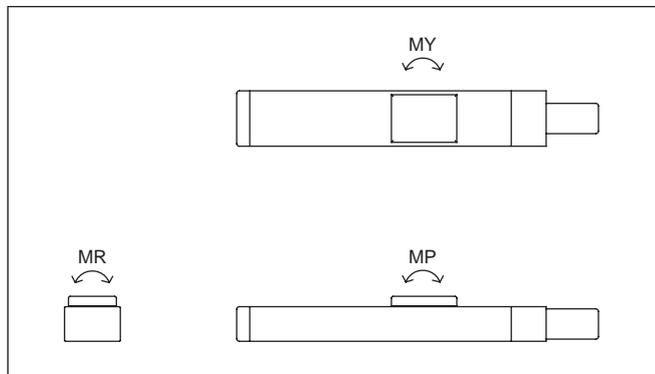
Since the moment caused by a load imposed on the shaft body largely affects the slider bearing unit, the following matters should be considered during use.

- * Do not apply load exceeding the max. load capacity.
This value is determined based on servo motor capacity. It differs with the acceleration/deceleration time.
- * Do not exceed the static allowable moment of load.
This moment is applied when stopped. For inserting work by using a cylinder mounted to the slider, reaction force should be considered.
Do not apply impact or load.
- * Do not exceed the dynamic allowable moment of load.
This moment is generated during acceleration/deceleration.
Calculation is required since the value varies with the load, arm length, direction, etc., but refer to the value given in the table below as a rough guide.

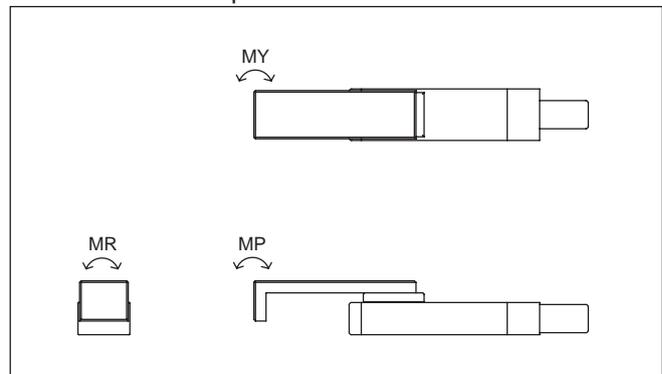
1. Static allowable moment of load

- MR: rolling moment
- MP: pitching moment
- MY: yawing moment

● Slider: center of the slider



● Table type: center of the front end of the + stroke limit position table



Static allowable moment of load N·m		MR		MP		MY	
Axis		KBZ-5D	KBZ-7D	KBZ-5D	KBZ-7D	KBZ-5D	KBZ-7D
Slider		31	58	12	25.7	12	25.7
Table type	Stroke 50 mm	4.4	11.7	1.9	3.8	1.9	3.8
	Stroke 100 mm	4.4	11.7	1.2	2.3	1.2	2.3
	Stroke 150 mm	-	11.7	-	1.7	-	1.7

2. Dynamic allowable moment of load

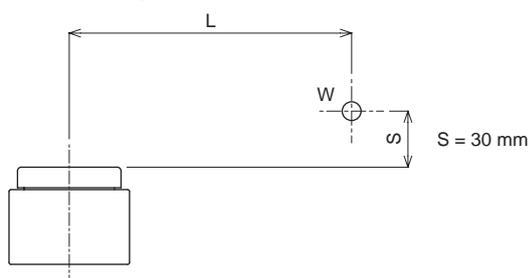
Dynamic moment of load of a shaft body largely influences its service life and performance. Acceleration/ deceleration time (acceleration) load, arm length, direction, speed, stroke, etc. must be considered based on the dynamic allowable moment of load.

In the following pages, there are tables of dynamic allowable moment of load listing the load and allowable arm length so that the dynamic allowable moment of load can be obtained easily.

Load weight W [kg] and arm length up to the center of gravity of the load L [mm] are shown in each table. (This is not the value for allowable moment of load.)

[Dynamic allowable moment of load table] KBZ-5D, -7D slider

Load weight W [kg] and arm length up to the center of gravity of the load L [mm] are shown in each table. (This is not the value for allowable moment of load.)



[Horizontal mounting]

KBZ-5D	Lead	Speed	W [kg]	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0
	6	400	L [mm]	950	510	350	260	210	175	145	125	110	95	85	75
	12	800	L [mm]	840	455	310	230	185	150	-	-	-	-	-	

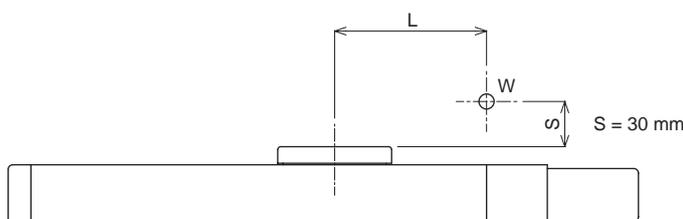
KBZ-7D	Lead	Speed	W [kg]	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0
	6	400	L [mm]	1100	610	420	310	240	200	160	140	120	105	95	85
	12	800	L [mm]	995	530	355	265	210	175	-	-	-	-	-	



[Horizontal mounting] wall mounting

KBZ-5D	Lead	Speed	W [kg]	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0
	6	400	L [mm]	1290	620	405	295	230	185	155	130	115	100	85	75
	12	800	L [mm]	1230	600	390	285	220	175	-	-	-	-	-	

KBZ-7D	Lead	Speed	W [kg]	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0
	6	400	L [mm]	1440	705	460	335	260	215	180	150	130	115	100	90
	12	800	L [mm]	1425	695	455	330	260	215	-	-	-	-	-	



[Horizontal mounting]

KBZ-5D	Lead	Speed	W [kg]	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0
	6	400	L [mm]	650	380	260	200	165	135	115	100	90	80	70	60
	12	800	L [mm]	580	335	235	175	145	120	-	-	-	-	-	

KBZ-7D	Lead	Speed	W [kg]	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0
	6	400	L [mm]	650	375	265	200	160	135	115	100	85	70	65	55
	12	800	L [mm]	575	330	230	175	140	115	-	-	-	-	-	

Selection guide	Single axis specifications	Orthogonal axis specifications	Axis-related part	Control part	Technical data	Safety precautions
Slider	Rod	2 axes	3 axes	4 axes		

KBZ Series

Selection guide																																																																																															
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R-axis	<p>[Vertical mounting]</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td rowspan="2">KBZ-5D</td> <td>Lead</td> <td>Speed</td> <td>W [kg]</td> <td>0.5</td> <td>1.0</td> <td>1.5</td> <td>2.0</td> <td>2.5</td> <td>3.0</td> <td rowspan="2">KBZ-5D</td> <td>Lead</td> <td>Speed</td> <td>W [kg]</td> <td>0.5</td> <td>1.0</td> <td>1.5</td> <td>2.0</td> <td>2.5</td> <td>3.0</td> </tr> <tr> <td>6</td> <td>400</td> <td>L [mm]</td> <td>700</td> <td>330</td> <td>200</td> <td>140</td> <td>100</td> <td>75</td> <td>6</td> <td>400</td> <td>L [mm]</td> <td>730</td> <td>360</td> <td>230</td> <td>170</td> <td>130</td> <td>105</td> </tr> <tr> <td></td> <td>12</td> <td>800</td> <td>L [mm]</td> <td>660</td> <td>305</td> <td>185</td> <td>-</td> <td>-</td> <td>-</td> <td></td> <td>12</td> <td>800</td> <td>L [mm]</td> <td>690</td> <td>330</td> <td>215</td> <td>-</td> <td>-</td> <td>-</td> </tr> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td rowspan="2">KBZ-7D</td> <td>Lead</td> <td>Speed</td> <td>W [kg]</td> <td>1.0</td> <td>2.0</td> <td>3.0</td> <td>4.0</td> <td colspan="4"></td> </tr> <tr> <td>6</td> <td>400</td> <td>L [mm]</td> <td>680</td> <td>315</td> <td>195</td> <td>130</td> <td colspan="4"></td> </tr> <tr> <td></td> <td>12</td> <td>800</td> <td>L [mm]</td> <td>600</td> <td>300</td> <td>-</td> <td>-</td> <td colspan="4"></td> </tr> </table>		KBZ-5D	Lead	Speed	W [kg]	0.5	1.0	1.5	2.0	2.5	3.0	KBZ-5D	Lead	Speed	W [kg]	0.5	1.0	1.5	2.0	2.5	3.0	6	400	L [mm]	700	330	200	140	100	75	6	400	L [mm]	730	360	230	170	130	105		12	800	L [mm]	660	305	185	-	-	-		12	800	L [mm]	690	330	215	-	-	-	KBZ-7D	Lead	Speed	W [kg]	1.0	2.0	3.0	4.0					6	400	L [mm]	680	315	195	130						12	800	L [mm]	600	300	-	-				
KBZ-5D	Lead	Speed		W [kg]	0.5	1.0	1.5	2.0	2.5	3.0	KBZ-5D	Lead		Speed	W [kg]	0.5	1.0	1.5	2.0	2.5	3.0																																																																										
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[Dynamic allowable moment of load table] KBZ-5D, -7D table type

Load weight W [kg] and arm length up to the center of gravity of the load L [mm] are shown in each table.
(This is not the value for allowable moment of load.)

Orthogonal axis specifications	2 axes	<p>[Horizontal mounting]</p> <p>★ Stroke length 100 mm</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td rowspan="2">KBZ-5D</td> <td>Lead</td> <td>Speed</td> <td>W [kg]</td> <td>1.0</td> <td>1.5</td> <td>2.0</td> <td>2.5</td> <td>3.0</td> <td colspan="4"></td> </tr> <tr> <td>6</td> <td>400</td> <td>L [mm]</td> <td>185</td> <td>60</td> <td>-</td> <td>-</td> <td>-</td> <td colspan="4"></td> </tr> <tr> <td></td> <td>12</td> <td>800</td> <td>L [mm]</td> <td>95</td> <td>5</td> <td>-</td> <td>-</td> <td>-</td> <td colspan="4"></td> </tr> </table>		KBZ-5D	Lead	Speed	W [kg]	1.0	1.5	2.0	2.5	3.0					6	400	L [mm]	185	60	-	-	-						12	800	L [mm]	95	5	-	-	-																											
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3 axes	<p>★ Stroke length 50 mm</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td rowspan="2">KBZ-5D</td> <td>Lead</td> <td>Speed</td> <td>W [kg]</td> <td>1.0</td> <td>1.5</td> <td>2.0</td> <td>2.5</td> <td>3.0</td> <td>3.5</td> <td>4.0</td> <td>4.5</td> <td colspan="4"></td> </tr> <tr> <td>6</td> <td>400</td> <td>L [mm]</td> <td>255</td> <td>130</td> <td>60</td> <td>15</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td colspan="4"></td> </tr> <tr> <td></td> <td>12</td> <td>800</td> <td>L [mm]</td> <td>190</td> <td>85</td> <td>25</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td colspan="4"></td> </tr> </table>		KBZ-5D	Lead	Speed	W [kg]	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5					6	400	L [mm]	255	130	60	15	-	-	-	-						12	800	L [mm]	190	85	25	-	-	-	-	-																			
KBZ-5D	Lead	Speed		W [kg]	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5																																																				
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4 axes	<p>★ Stroke length 150 mm</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td rowspan="2">KBZ-7D</td> <td>Lead</td> <td>Speed</td> <td>W [kg]</td> <td>1.0</td> <td>1.5</td> <td>2.0</td> <td>2.5</td> <td>2.9</td> <td>3.4</td> <td>3.8</td> <td colspan="4"></td> </tr> <tr> <td>6</td> <td>400</td> <td>L [mm]</td> <td>450</td> <td>230</td> <td>130</td> <td>20</td> <td>-</td> <td>-</td> <td>-</td> <td colspan="4"></td> </tr> <tr> <td></td> <td>12</td> <td>800</td> <td>L [mm]</td> <td>370</td> <td>160</td> <td>45</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td colspan="4"></td> </tr> </table>		KBZ-7D	Lead	Speed	W [kg]	1.0	1.5	2.0	2.5	2.9	3.4	3.8					6	400	L [mm]	450	230	130	20	-	-	-						12	800	L [mm]	370	160	45	-	-	-	-																						
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Axis-related part	<p>★ Stroke length 100 mm</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td rowspan="2">KBZ-7D</td> <td>Lead</td> <td>Speed</td> <td>W [kg]</td> <td>1.0</td> <td>1.5</td> <td>2.0</td> <td>2.5</td> <td>2.8</td> <td>3.3</td> <td>3.8</td> <td>4.3</td> <td>4.8</td> <td>5.3</td> <td>5.6</td> <td colspan="5"></td> </tr> <tr> <td>6</td> <td>400</td> <td>L [mm]</td> <td>600</td> <td>350</td> <td>210</td> <td>120</td> <td>80</td> <td>25</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td colspan="5"></td> </tr> <tr> <td></td> <td>12</td> <td>800</td> <td>L [mm]</td> <td>500</td> <td>280</td> <td>150</td> <td>65</td> <td>20</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td colspan="5"></td> </tr> </table>		KBZ-7D	Lead	Speed	W [kg]	1.0	1.5	2.0	2.5	2.8	3.3	3.8	4.3	4.8	5.3	5.6						6	400	L [mm]	600	350	210	120	80	25	-	-	-	-	-							12	800	L [mm]	500	280	150	65	20	-	-	-	-	-	-								
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Control part	<p>★ Stroke length 50 mm</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td rowspan="2">KBZ-7D</td> <td>Lead</td> <td>Speed</td> <td>W [kg]</td> <td>1.0</td> <td>1.5</td> <td>2.0</td> <td>2.5</td> <td>3.0</td> <td>3.5</td> <td>4.0</td> <td>4.5</td> <td>5.0</td> <td>5.5</td> <td>6.0</td> <td>6.5</td> <td>7.0</td> <td>7.5</td> <td>8.0</td> <td>8.5</td> <td>9.0</td> </tr> <tr> <td>6</td> <td>400</td> <td>L [mm]</td> <td>700</td> <td>450</td> <td>305</td> <td>210</td> <td>145</td> <td>95</td> <td>55</td> <td>20</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td></td> <td>12</td> <td>800</td> <td>L [mm]</td> <td>540</td> <td>340</td> <td>220</td> <td>140</td> <td>85</td> <td>45</td> <td>15</td> <td>-</td> </tr> </table>		KBZ-7D	Lead	Speed	W [kg]	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	6	400	L [mm]	700	450	305	210	145	95	55	20	-	-	-	-	-	-	-	-	-		12	800	L [mm]	540	340	220	140	85	45	15	-	-	-	-	-	-	-	-	-	-
KBZ-7D	Lead	Speed		W [kg]	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0																																											
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Technical data	<p>[Horizontal mounting] wall mounting</p> <p>★ Stroke length 100 mm</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td rowspan="2">KBZ-5D</td> <td>Lead</td> <td>Speed</td> <td>W [kg]</td> <td>1.0</td> <td>1.5</td> <td>2.0</td> <td>2.5</td> <td>3.0</td> <td colspan="11"></td> </tr> <tr> <td>6</td> <td>400</td> <td>L [mm]</td> <td>340</td> <td>130</td> <td>30</td> <td>-</td> <td>-</td> <td colspan="11"></td> </tr> <tr> <td></td> <td>12</td> <td>800</td> <td>L [mm]</td> <td>290</td> <td>80</td> <td>-</td> <td>-</td> <td>-</td> <td colspan="11"></td> </tr> </table>		KBZ-5D	Lead	Speed	W [kg]	1.0	1.5	2.0	2.5	3.0												6	400	L [mm]	340	130	30	-	-													12	800	L [mm]	290	80	-	-	-																																																																																																																																																																																																		
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Safety precautions	<p>★ Stroke length 50 mm</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td rowspan="2">KBZ-5D</td> <td>Lead</td> <td>Speed</td> <td>W [kg]</td> <td>1.0</td> <td>1.5</td> <td>2.0</td> <td>2.5</td> <td>3.0</td> <td>3.5</td> <td>4.0</td> <td>4.5</td> <td colspan="9"></td> </tr> <tr> <td>6</td> <td>400</td> <td>L [mm]</td> <td>420</td> <td>210</td> <td>100</td> <td>40</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td colspan="9"></td> </tr> <tr> <td></td> <td>12</td> <td>800</td> <td>L [mm]</td> <td>390</td> <td>180</td> <td>70</td> <td>0</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td colspan="9"></td> </tr> </table> <p>★ Stroke length 150 mm</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td rowspan="2">KBZ-7D</td> <td>Lead</td> <td>Speed</td> <td>W [kg]</td> <td>1.0</td> <td>1.5</td> <td>1.9</td> <td>2.5</td> <td>3.0</td> <td>3.5</td> <td>3.8</td> <td colspan="9"></td> </tr> <tr> <td>6</td> <td>400</td> <td>L [mm]</td> <td>950</td> <td>500</td> <td>310</td> <td>160</td> <td>70</td> <td>-</td> <td>-</td> <td colspan="9"></td> </tr> <tr> <td></td> <td>12</td> <td>800</td> <td>L [mm]</td> <td>920</td> <td>460</td> <td>260</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td colspan="9"></td> </tr> </table> <p>★ Stroke length 100 mm</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td rowspan="2">KBZ-7D</td> <td>Lead</td> <td>Speed</td> <td>W [kg]</td> <td>1.0</td> <td>1.5</td> <td>2.0</td> <td>2.5</td> <td>2.8</td> <td>3.5</td> <td>4.0</td> <td>4.5</td> <td>5.0</td> <td>5.5</td> <td>5.6</td> <td colspan="5"></td> </tr> <tr> <td>6</td> <td>400</td> <td>L [mm]</td> <td>1060</td> <td>600</td> <td>370</td> <td>230</td> <td>170</td> <td>90</td> <td>40</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td colspan="5"></td> </tr> <tr> <td></td> <td>12</td> <td>800</td> <td>L [mm]</td> <td>1040</td> <td>570</td> <td>330</td> <td>190</td> <td>120</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td colspan="5"></td> </tr> </table> <p>★ Stroke length 50 mm</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td rowspan="2">KBZ-7D</td> <td>Lead</td> <td>Speed</td> <td>W [kg]</td> <td>1.0</td> <td>1.5</td> <td>2.0</td> <td>2.5</td> <td>3.0</td> <td>3.5</td> <td>4.0</td> <td>4.5</td> <td>5.0</td> <td>5.5</td> <td>6.0</td> <td>6.5</td> <td>7.0</td> <td>7.5</td> <td>8.0</td> <td>8.5</td> <td>9.0</td> </tr> <tr> <td>6</td> <td>400</td> <td>L [mm]</td> <td>1170</td> <td>700</td> <td>450</td> <td>310</td> <td>220</td> <td>150</td> <td>100</td> <td>60</td> <td>30</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td></td> <td>12</td> <td>800</td> <td>L [mm]</td> <td>1150</td> <td>670</td> <td>430</td> <td>290</td> <td>190</td> <td>120</td> <td>65</td> <td>20</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> </table>		KBZ-5D	Lead	Speed	W [kg]	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5										6	400	L [mm]	420	210	100	40	-	-	-	-											12	800	L [mm]	390	180	70	0	-	-	-	-										KBZ-7D	Lead	Speed	W [kg]	1.0	1.5	1.9	2.5	3.0	3.5	3.8										6	400	L [mm]	950	500	310	160	70	-	-											12	800	L [mm]	920	460	260	-	-	-	-										KBZ-7D	Lead	Speed	W [kg]	1.0	1.5	2.0	2.5	2.8	3.5	4.0	4.5	5.0	5.5	5.6						6	400	L [mm]	1060	600	370	230	170	90	40	-	-	-	-							12	800	L [mm]	1040	570	330	190	120	-	-	-	-	-	-						KBZ-7D	Lead	Speed	W [kg]	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	6	400	L [mm]	1170	700	450	310	220	150	100	60	30	-	-	-	-	-	-	-	-		12	800	L [mm]	1150	670	430	290	190	120	65	20	-	-	-	-	-	-	-	-	-
KBZ-5D	Lead	Speed		W [kg]	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5																																																																																																																																																																																																																																								
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KBZ-7D	Lead	Speed	W [kg]	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0																																																																																																																																																																																																																																
	6	400	L [mm]	1170	700	450	310	220	150	100	60	30	-	-	-	-	-	-	-	-																																																																																																																																																																																																																																
	12	800	L [mm]	1150	670	430	290	190	120	65	20	-	-	-	-	-	-	-	-	-																																																																																																																																																																																																																																

[Horizontal mounting]

★ Stroke length 100 mm

KBZ-5D	Lead	Speed	W [kg]	1.0	1.5	2.0	2.5	3.0
	6	400	L [mm]	95	30	-15	-40	-65
	12	800	L [mm]	60	5	-	-	-

★ Stroke length 50 mm

KBZ-5D	Lead	Speed	W [kg]	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5
	6	400	L [mm]	155	85	40	10	-10	-30	-45	-60
	12	800	L [mm]	125	60	20	-	-	-	-	-

★ Stroke length 150 mm

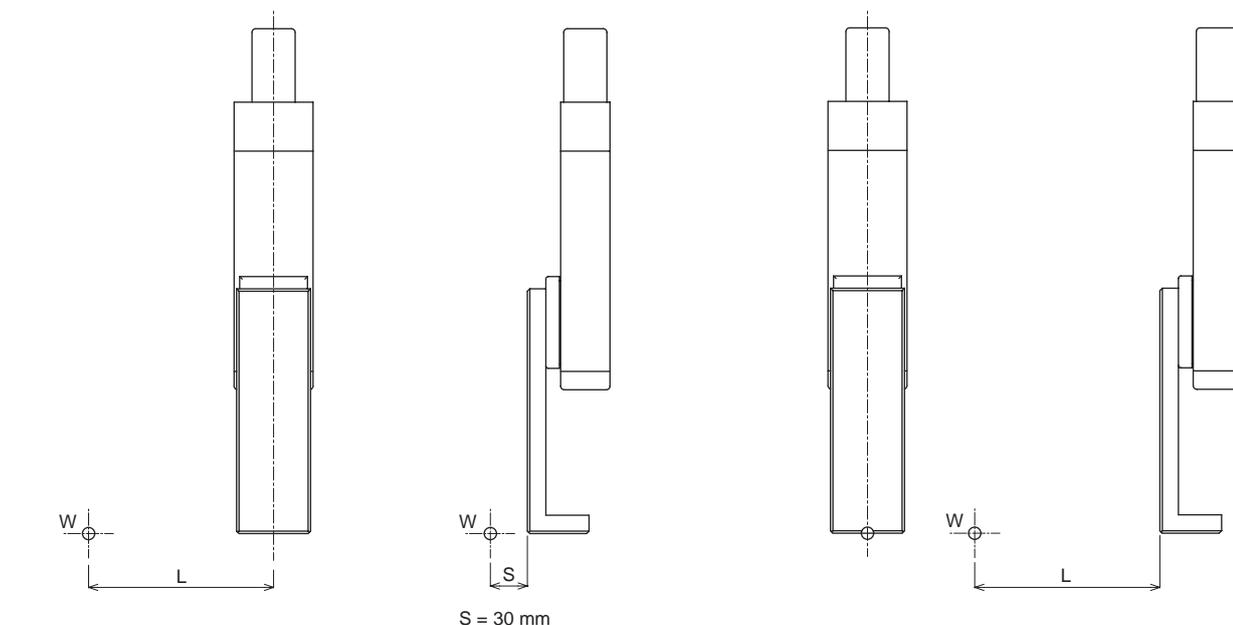
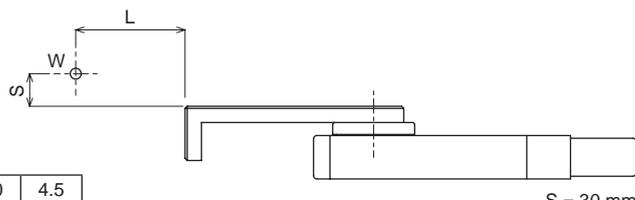
KBZ-7D	Lead	Speed	W [kg]	1.0	1.5	2.0	2.5	3.0	3.5	3.8
	6	400	L [mm]	185	100	50	10	-25	-50	-70
	12	800	L [mm]	130	55	15	-	-	-	-

★ Stroke length 100 mm

KBZ-7D	Lead	Speed	W [kg]	1.0	1.5	2.0	2.5	2.8	3.5	4.0	4.5	5.0	5.5	5.6
	6	400	L [mm]	255	165	100	60	35	10	-15	-35	-50	-65	-75
	12	800	L [mm]	200	120	65	25	5	-	-	-	-	-	-

★ Stroke length 50 mm

KBZ-7D	Lead	Speed	W [kg]	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0
	6	400	L [mm]	300	230	160	115	80	50	30	10	-5	-20	-30	-40	-50	-60	-65	-70	-75
	12	800	L [mm]	270	180	120	80	50	25	5	-10	-	-	-	-	-	-	-	-	-



[Vertical mounting]

KBZ-5D	Lead	Speed	W [kg]	1.0	1.5	2.0	2.5	3.0
	6	400	L [mm]	240	160	115	75	55
	12	800	L [mm]	270	-	-	-	-

KBZ-5D	Lead	Speed	W [kg]	1.0	1.5	2.0	2.5	3.0
	6	400	L [mm]	270	190	145	105	85
	12	800	L [mm]	295	-	-	-	-

KBZ-7D	Lead	Speed	W [kg]	1.0	1.5	2.0	2.5	3.0	3.5	4.0
	6	400	L [mm]	570	315	245	200	165	135	110
	12	800	L [mm]	430	330	-	-	-	-	-

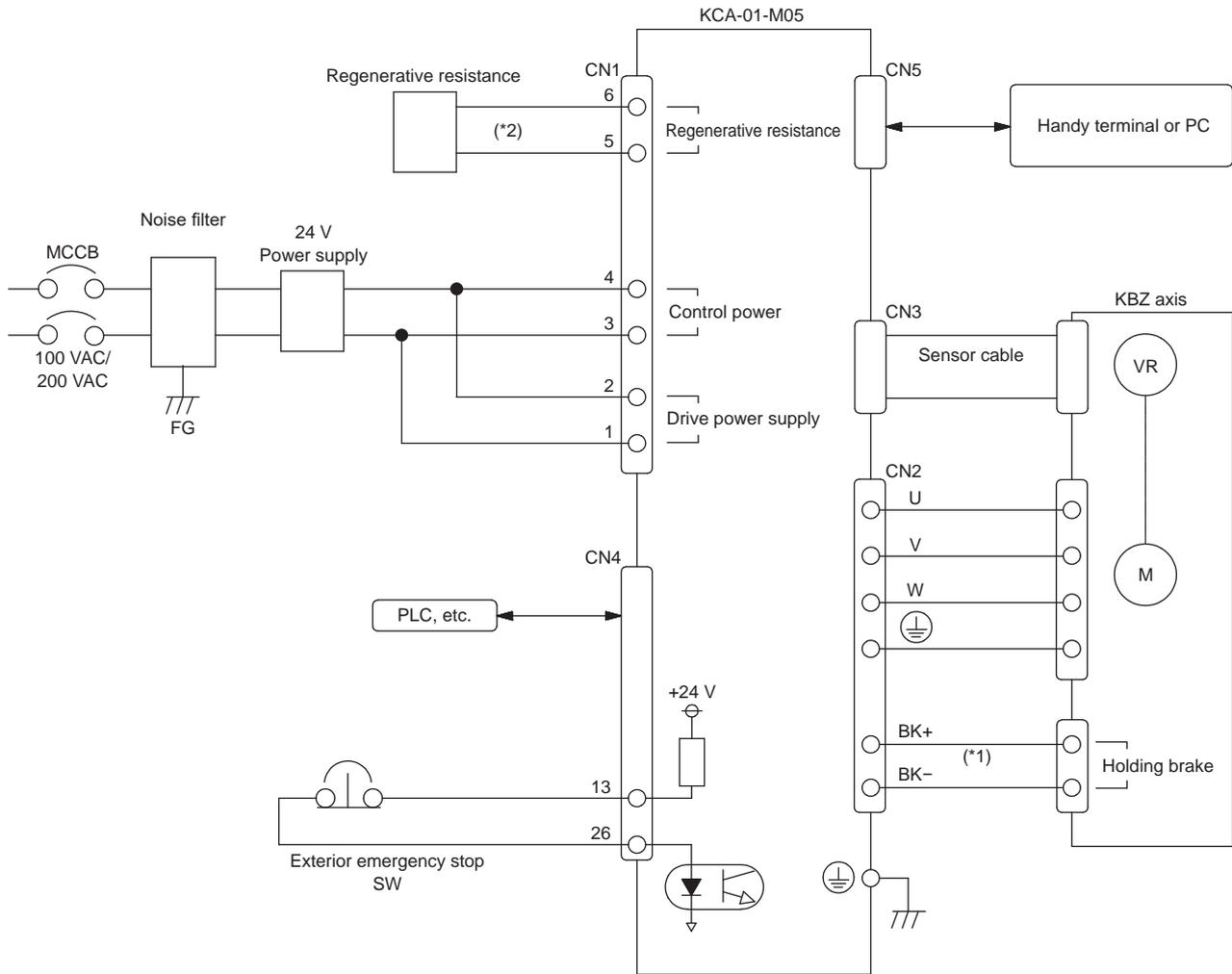
KBZ-7D	Lead	Speed	W [kg]	1.0	1.5	2.0	2.5	3.0	3.5	4.0
	6	400	L [mm]	440	340	275	195	200	165	140
	12	800	L [mm]	460	360	-	-	-	-	-

Selection guide	Single axis specifications				Orthogonal axis specifications	Axis-related part	Control part	Technical data	Safety precautions
	Slider	Rod	R-axis	2 axes					
	3 axes	4 axes							

Controller KCA-01-M05

[Connection method]

Selection guide	Slider
	Rod
	R-axis
Single axis specifications	2 axes
	3 axes
Orthogonal axis specifications	4 axes
	Axis-related part
Control part	Control part
Technical data	Technical data
Safety precautions	Safety precautions



(*1) When using a motor without a holding brake, connection is not required.
 (*2) Must be connected when regenerative energy is high.

System I/O details

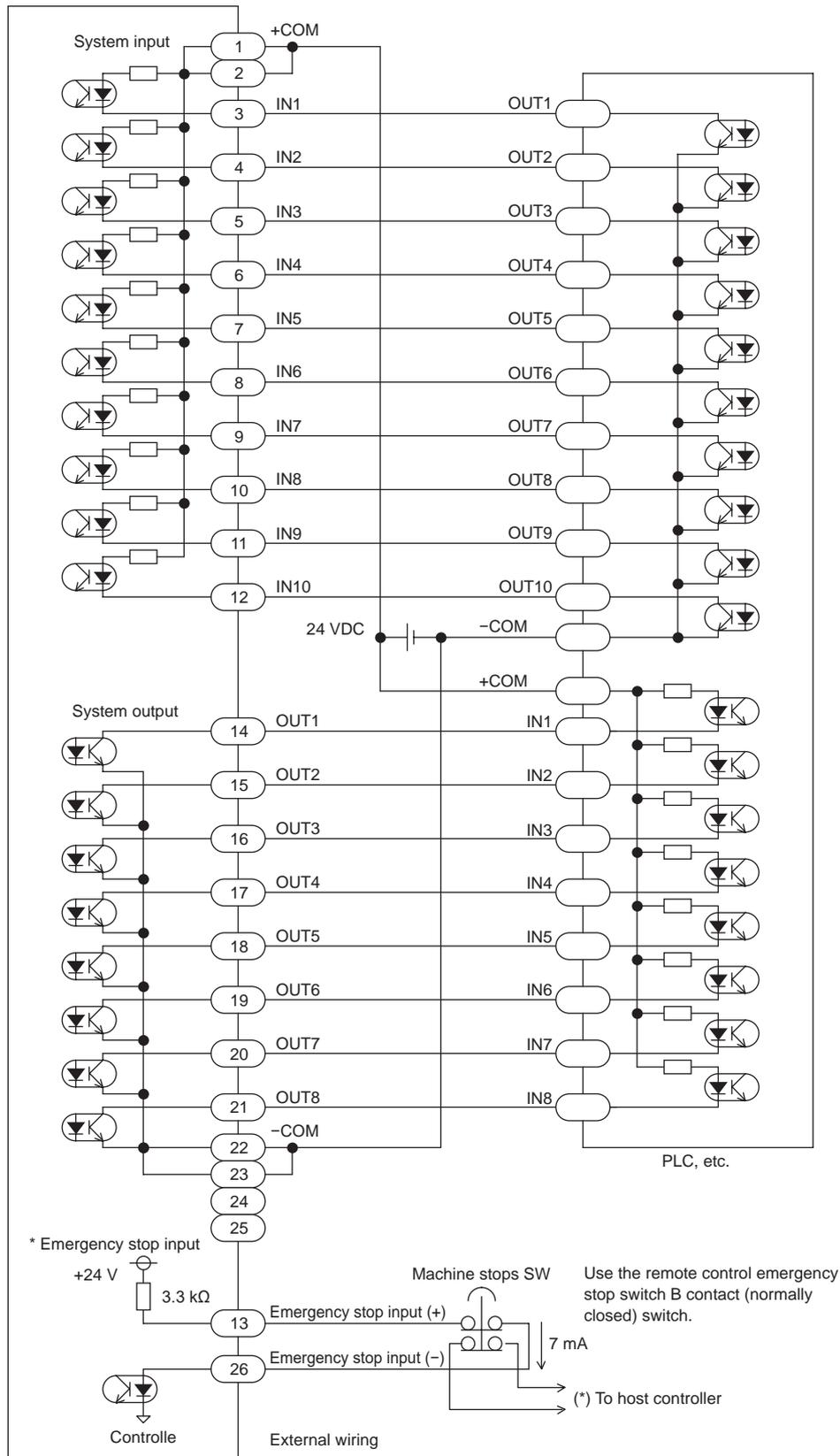
[System input]

Input No.	Signal name	Descriptions	Remarks
IN1	START	Start input Starts axis operation.	Detected with rising edge.
	+JOG	+JOG input Starts JOG motion in the plus direction.	ON: Moves. OFF: Stops.
IN2	STOP	Stop input Causes forced stop in mid travel operation.	Level detection.
	-JOG	-JOG input Starts JOG motion in the minus direction.	ON: Moves. OFF: Stops.
IN3	SVON	Servo ON input Servo locks the motor.	Servo lock with rising edge. Servo free with lowering edge.
IN4	WRITE	Writing input Writes coordinate values into the point table (T01).	
IN5	ALRST	Error reset input Cancels abnormal conditions.	Detected with rising edge.
IN6	RTSEL	Operating/teaching switch input Switches between operating and teaching mode.	OFF: operation mode. ON: teaching mode.
IN7	PIN1	Directive point No. input	
IN8	PIN2	Determines each model No. on the point table (T01).	
IN9	PIN4	Performs origin return when START is turned ON while IN7 to IN10 are all ON.	
IN10	PIN8		

Selection guide	Single axis specifications	Orthogonal axis specifications	Axis-related part	Control part	Technical data	Safety precautions
	Slider	Rod	R-axis	2 axes	3 axes	4 axes

	Selection guide	[System output]			
		Input No.	Signal name	Descriptions	Remarks
Single axis specifications	Slider	OUT1	RUN	Operation output A signal that is ON during robot operation. During origin return, JOG motion is also ON.	
		OUT2	ERROR	Abnormal output Turns ON when errors occur.	OUT2 selects a function with parameter M13.
	RDY/ERR		READY/Abnormal output Turns ON after control power is turned on and controller initialization is complete. OFF when errors occur.		
	Rod	OUT3	POSI	Positioning completion output Displays that positioning is complete when the target position is reached. Turns ON after origin return is complete and when position deviation is within the imposition range.	OFF during travel before completion of origin return and with servo free.
R-axis	OUT4	AREA	Area output The designated output logic signal is output while the axis slider is positioned within the designated coordinates.	This output is disabled before origin return is complete.	
Orthogonal axis specifications	2 axes	During normal operation			
		OUT5	POUT1	Complete point No. output Outputs the point table numbers designated with IN7 to IN10 after completing travel.	F (=1111) is output when deceleration is stopped with stop input and axis is stopped with emergency stop. 0 (=0000) is output during origin return.
		OUT6	POUT2		
		OUT7	POUT4		
	OUT8	POUT8			
3 axes	During torque limit operation				
4 axes	OUT5	TQCON	Torque limit operation output ON during torque limit operation.		
	OUT6	TQLOAD	Load output Turns ON when output torque exceeds the load output standard value for more than the torque limit set time.	Even after turning ON, it will turn OFF when the output torque goes below the load output standard value.	
Axis-related part	OUT7	TQLIM	Limit output Turns ON when torque limit continues for more than the torque limit set time.	Even after turning ON, it will turn OFF when the output torque goes below the torque limit value.	
	OUT8	TQLOCK	Locked ON when locking of movable parts is detected.		
Control part					
Technical data					
Safety precautions					

[I/O signal connection example]



* [Emergency stop input]

Input for emergency stop of the controller. If this circuit is not connected, the controller will be emergency stopped.

(*) This controller has no emergency stop output, so in order to confirm emergency stop input with the host controller, use 2B contact emergency stop switch and connect the contacts of one side to the host controller.

Selection guide									
Slider	Rod	R-axis	Orthogonal axis specifications				Axis-related part		
			2 axes	3 axes	4 axes	Control part			
Technical data									
Safety precautions									

Tact time calculation method

The tact time of a single actuator is calculated using the method below.

There may be some differences during actual operation, so consider this a guide.

The calculation comes in the two methods: Example calculation 1 (when uniform speed interval is included) and Example calculation 2 (when an axis starts decelerating during acceleration).

Either calculation method is selectable according to the relationship between travel distance, designated speed and designated acceleration/deceleration time.

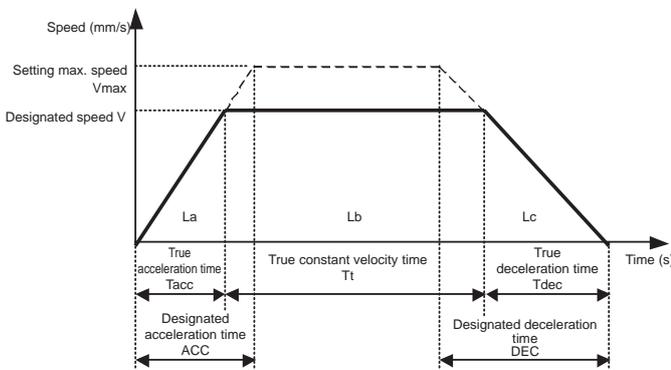
(1) When "Travel distance (L) > $\frac{\text{Designated speed (V)}^2 \times [\text{designated acceleration time (ACC)} + \text{designated deceleration time (DEC)}]}{2 \times \text{setting max. speed (Vmax)}}$ " ⇒ Example calculation 1

(2) When "Travel distance (L) ≤ $\frac{\text{Designated speed (V)}^2 \times [\text{designated acceleration time (ACC)} + \text{designated deceleration time (DEC)}]}{2 \times \text{setting max. speed (Vmax)}}$ " ⇒ Example calculation 2

★ For the acceleration/deceleration time, refer to the relationship between acceleration/deceleration and load as shown in the next page.

★ For the acceleration/deceleration time and max. speed under max. load capacity, refer to the specifications of each axis.

Example calculation 1



Tacc = true acceleration time (s)
 Tdec = true deceleration time (s)
 Tt = true constant velocity time (s)
 La = travel distance during acceleration (mm)
 Lb = travel distance at constant velocity (mm)
 Lc = travel distance during deceleration (mm)
 L = travel distance (mm) = La + Lb + Lc

$$T_{acc} = \frac{V}{V_{max}} \times ACC = \frac{600}{800} \times 0.2 = 0.15 \text{ s}$$

$$T_{dec} = \frac{V}{V_{max}} \times DEC = \frac{600}{800} \times 0.3 = 0.225 \text{ s}$$

$$L_a = \frac{1}{2} \times V \times T_{acc} = \frac{1}{2} \times 600 \times 0.15 = 45 \text{ mm}$$

$$L_c = \frac{1}{2} \times V \times T_{dec} = \frac{1}{2} \times 600 \times 0.225 = 67.5 \text{ mm}$$

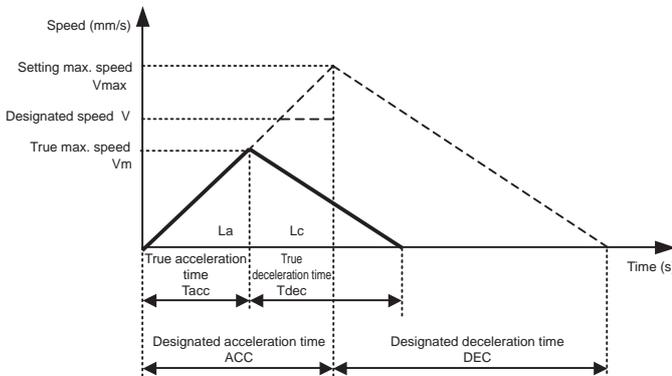
$$T_t = \frac{L - (L_a + L_c)}{V} = \frac{400 - (45 + 67.5)}{600} = 0.479 \text{ s}$$

$$\begin{aligned} \text{Tact time} &= \text{true acceleration time} + \text{true constant velocity time} + \text{true deceleration time} \\ &= 0.15 + 0.479 + 0.225 \\ &= 0.854 \text{ sec.} \end{aligned}$$

[Operation conditions]

Setting max. speed : Vmax = 800 mm/s
 Designated speed : V = 600 mm/s
 Designated acceleration time: ACC = 0.2 s
 Designated deceleration time: DEC = 0.3 s
 Travel distance : L = 400 mm

Example calculation 2



Tacc = true acceleration time (s)
 Tdec = true deceleration time (s)
 La = travel distance during acceleration (mm)
 Lc = travel distance during deceleration (mm)
 Vm = true max. speed (mm/s)
 L = travel distance (mm) = La + Lc

$$L_a = L \times \frac{ACC}{ACC + DEC} = \frac{100}{0.2 + 0.3} = 40 \text{ mm}$$

$$L_c = L \times \frac{DEC}{ACC + DEC} = \frac{100}{0.2 + 0.3} = 60 \text{ mm}$$

$$T_{acc} = \sqrt{\frac{2 \times L_a \times ACC}{V_{max}}} = \sqrt{\frac{2 \times 40 \times 0.2}{800}} = 0.141 \text{ s}$$

$$T_{dec} = \sqrt{\frac{2 \times L_c \times DEC}{V_{max}}} = \sqrt{\frac{2 \times 60 \times 0.3}{800}} = 0.212 \text{ s}$$

$$\begin{aligned} \text{Tact time} &= \text{true acceleration time} + \text{true deceleration time} \\ &= 0.141 + 0.212 \\ &= 0.353 \text{ sec.} \end{aligned}$$

[Operation conditions]

Setting max. speed : Vmax = 800 mm/s
 Designated speed : V = 600 mm/s
 Designated acceleration time: ACC = 0.2 s
 Designated deceleration time: DEC = 0.3 s
 Travel distance : L = 100 mm

Relationship between acceleration/deceleration and load

Horizontal specifications

Load capacity (kg)

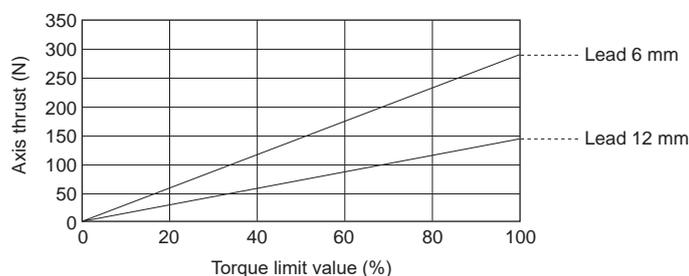
Type	Model No.	Setting speed (mm/s)	Lead (mm)	Acceleration/deceleration time (sec)					
				0.05	0.1	0.15	0.2	0.3	0.4
Slider	KBZ-5D	800	12	-	1.5	2.2	3	3	3
		400	6	3	6	6	6	6	6
	KBZ-7D	800	12	-	3	4.5	6	6	6
		400	6	6	12	12	12	12	12
Table	KBZ-5D 50 mm	800	12	-	1.2	1.8	2.5	2.5	2.5
		400	6	2.2	4.5	4.5	4.5	4.5	4.5
	KBZ-5D 100 mm	800	12	-	0.7	1.1	1.5	1.5	1.5
		400	6	1.5	3	3	3	3	3
	KBZ-7D 50 mm	800	12	-	2.2	3.3	4.5	4.5	4.5
		400	6	4.5	9	9	9	9	9
	KBZ-7D 100 mm	800	12	-	1.4	2.1	2.8	2.8	2.8
		400	6	2.8	5.6	5.6	5.6	5.6	5.6
KBZ-7D 150 mm	800	12	-	0.9	1.4	1.9	1.9	1.9	
	400	6	1.9	3.8	3.8	3.8	3.8	3.8	
Rod	KBZ-3D	600	12	-	2	3	3	3	3
	KBZ-4D	600	12	-	3.4	5.2	5.2	5.2	5.2

Vertical specifications

Load capacity (kg)

Type	Model No.	Setting speed (mm/s)	Lead (mm)	Acceleration/deceleration time (sec)					
				0.05	0.1	0.15	0.2	0.3	0.4
Slider	KBZ-5D	800	12	-	0.7	1.3	1.5	1.5	1.5
		400	6	1.5	3	3	3	3	3
	KBZ-7D	800	12	-	1	1.8	2	2	2
		400	6	2	4	4	4	4	4
Table	KBZ-5D	800	12	-	0.5	0.9	1	1	1
		400	6	1.2	2.5	2.5	2.5	2.5	2.5
	KBZ-7D	800	12	-	0.7	1.3	1.5	1.5	1.5
		400	6	1.7	3.5	3.5	3.5	3.5	3.5
Rod	KBZ-3D	600	12	-	1	1.5	1.5	1.5	1.5
	KBZ-4D	600	12	-	1.4	2.2	2.2	2.2	2.2

Relationship between axis thrust and torque limit value



CAUTION Accuracy is not guaranteed. This is only a guideline.

The smaller the torque limit value, the greater the error from sliding resistance.

If the motor continues to produce an output exceeding the rated torque (approx. 33.0%), overload error may occur.

Selection guide
 Single axis specifications
 Slider
 Rod
 R-axis
 Orthogonal axis specifications
 2 axes
 3 axes
 4 axes
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