TL3
series

Product Segments

- **Care Motion**
- **Comfort Motion**
- **Ergo Motion**
- **Industrial Motion**

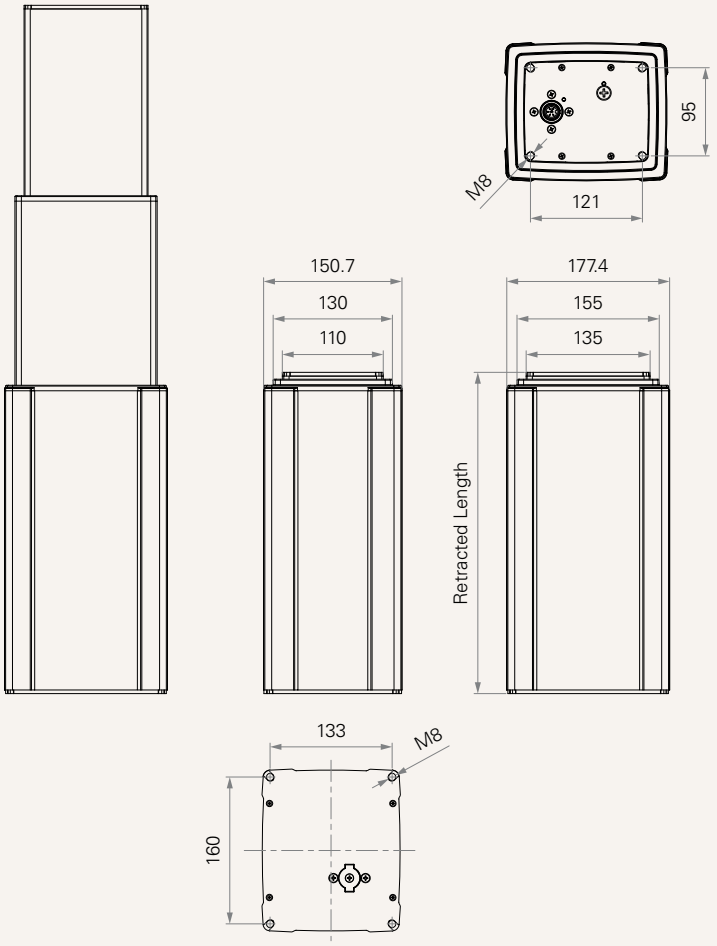
The TL3 columns from TiMOTION are made up of three extruded aluminum tubes of rectangular shape that give the system great stability and a high stroke with reduced retracted length. This electric lifting column allows for an easy integration into many height adjustable workstation applications, such as an exam chair in healthcare industry.

General Features

Max. load & self - locking force	4,000N (push)
Max. dynamic bending moment	1,000Nm
Max. static bending moment	2,000Nm
Max. speed at max. load	24mm/s
Max. speed at no load	39mm/s
Retracted length	≥ Stroke / 2+150mm
IP rating	IPX6
Dimension of outer tube	3-stage, 177.4*150.7mm rectangular
Stroke	250~1200mm
Certificate	IEC60601-1, EMC
Options	POT, Hall sensors, direct cut system
Operational temperature range	+5°C~+45°C

Drawing

Standard Dimensions
(mm)



Load and Speed

CODE	Load (N) Push	Self Locking Force (N)	Typical Current (A) No Load 32V DC	Typical Current (A) With Load 24V DC	Typical Speed (mm/s) No Load 32V DC	Typical Speed (mm/s) With Load 24V DC
Motor Speed (2200RPM, duty cycle 10%)						
B	4000	4000	2.5	6.3	14.5	7.6
C	2000	2000	2.5	4.3	22.0	13.0
D	1000	1000	2.5	3.8	39.0	24.0
Motor Speed (2800RPM, duty cycle 10%)						
E	4000	4000	3.5	7.5	18.5	9.4
F	2000	2000	3.5	6.3	35.0	20.0
Motor Speed (3800RPM, duty cycle 10%)						
G	4000	4000	4.0	10.8	28.0	13.7

Note

1 Parameters above are from tested average, please refer to approval drawing for final value.

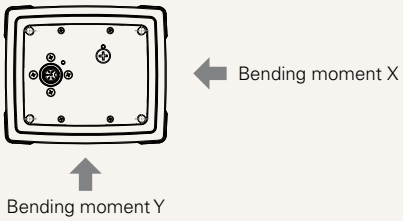
2 This self-locking force level is reached only when a short circuit is applied on the terminals of the motor. All the TiMOTION control boxes have this feature built-in.

3 The current & speed in table are tested with 24V DC motor. With a 12V DC motor, the current is approximately twice the current measured in 24V DC; speed will be similar for both voltages.

4 Bending moment Y direction = X*0.8

5 Static bending moment = dynamic*2

Dynamic bending moment (Nm)- X direction		
Stroke (mm)	S/2+150	S/2+220
100-300	700	1000
301-500	500	800
501-700	300	500
701-1200	200	200

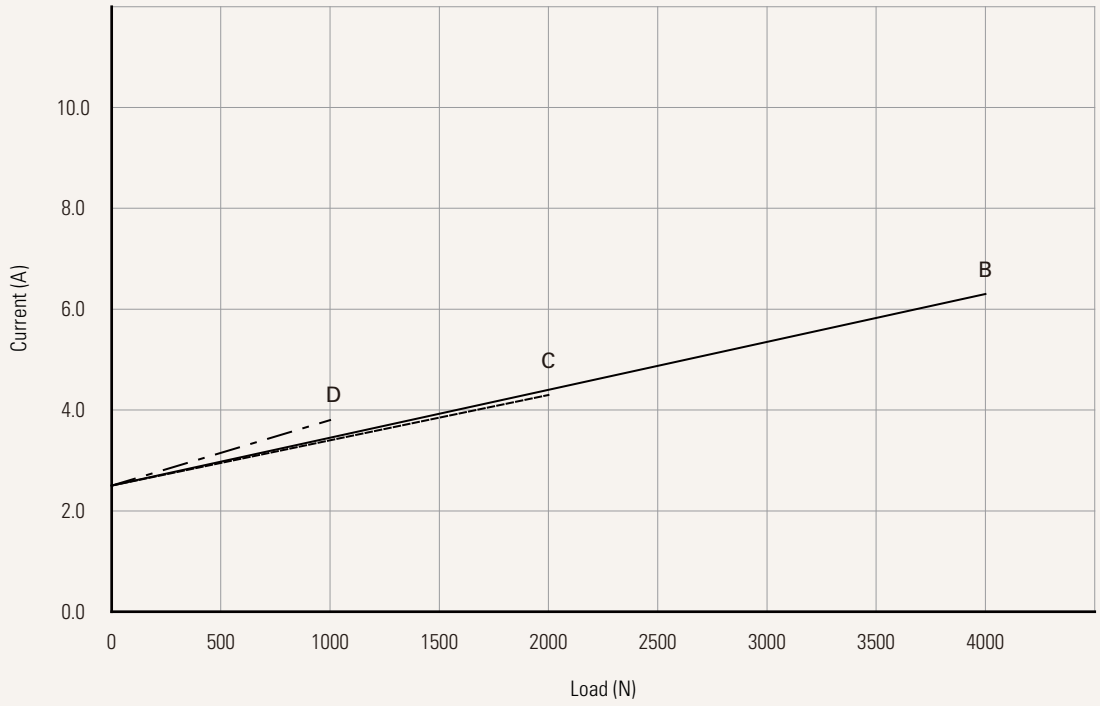


Performance Data (24V DC Motor)

Motor Speed (2200RPM, Duty cycle 10%)

Speed vs. Load

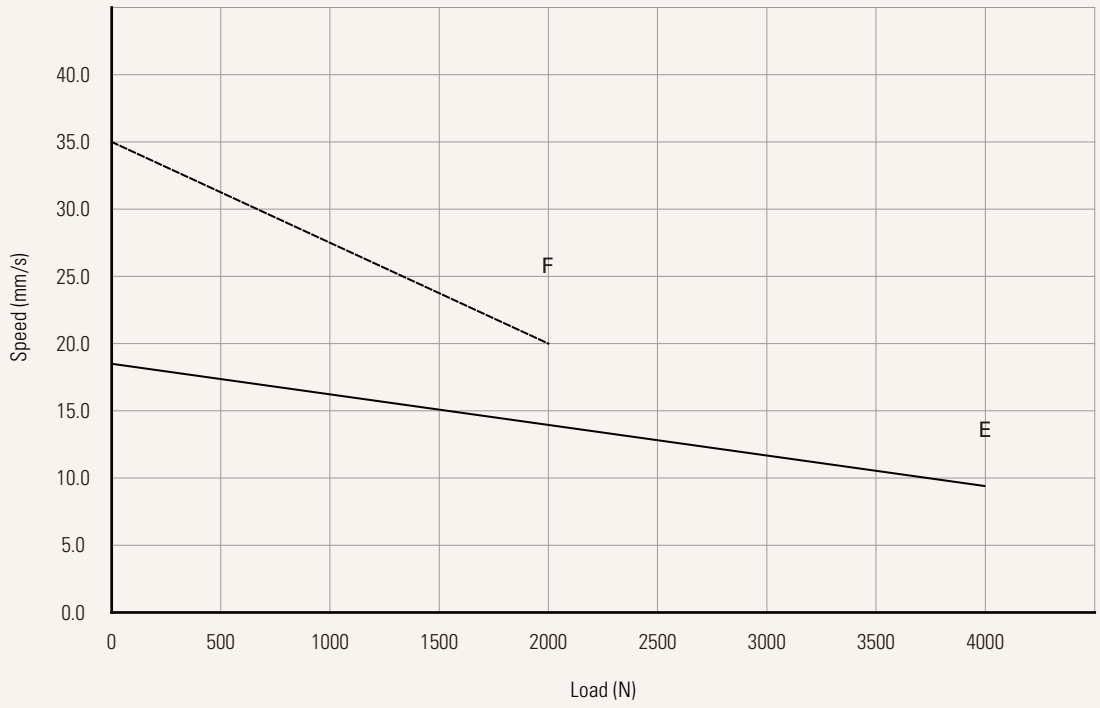
Current vs. Load



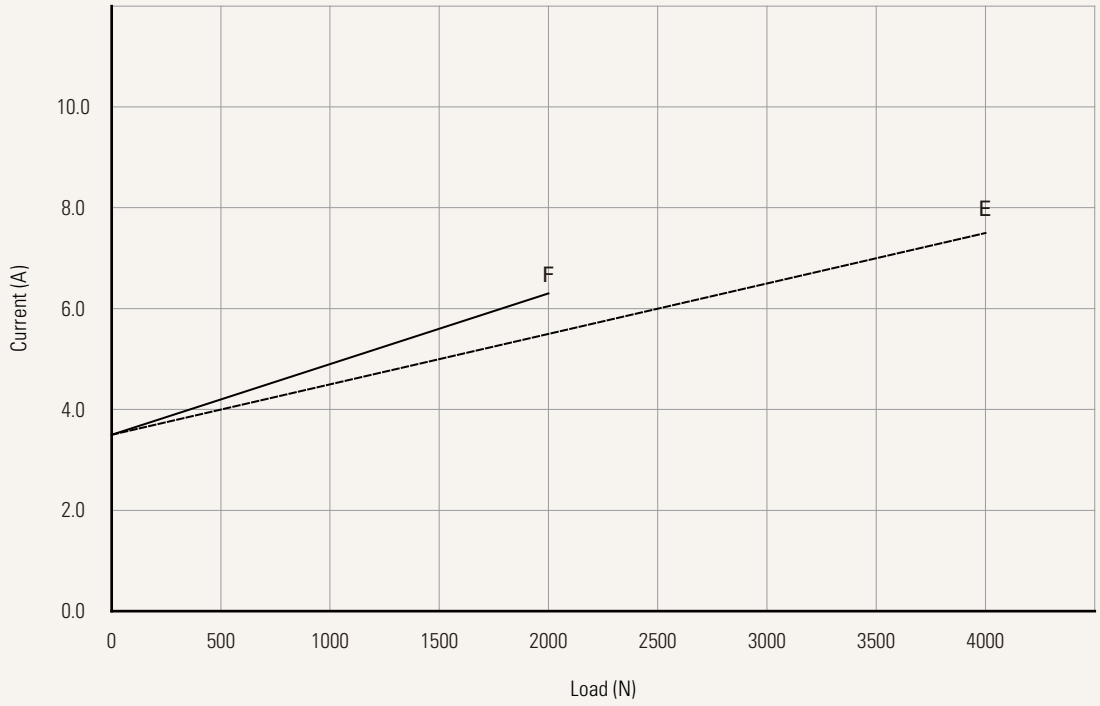
Performance Data (24V DC Motor)

Motor Speed (2800RPM, Duty cycle 10%)

Speed vs. Load



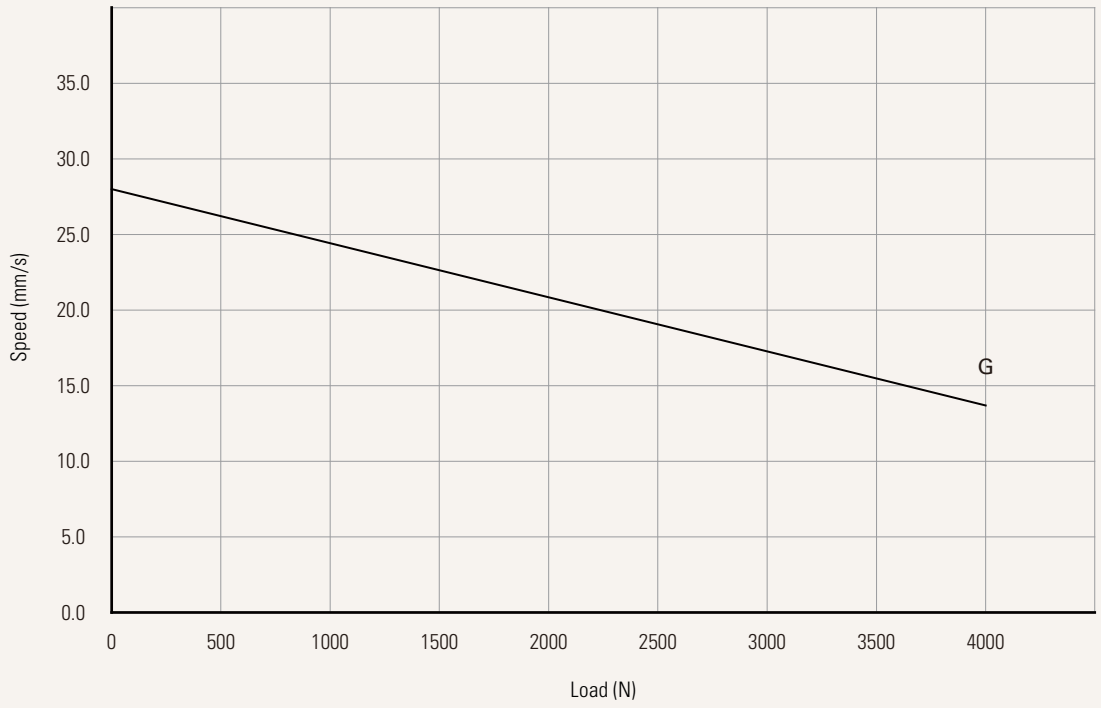
Current vs. Load



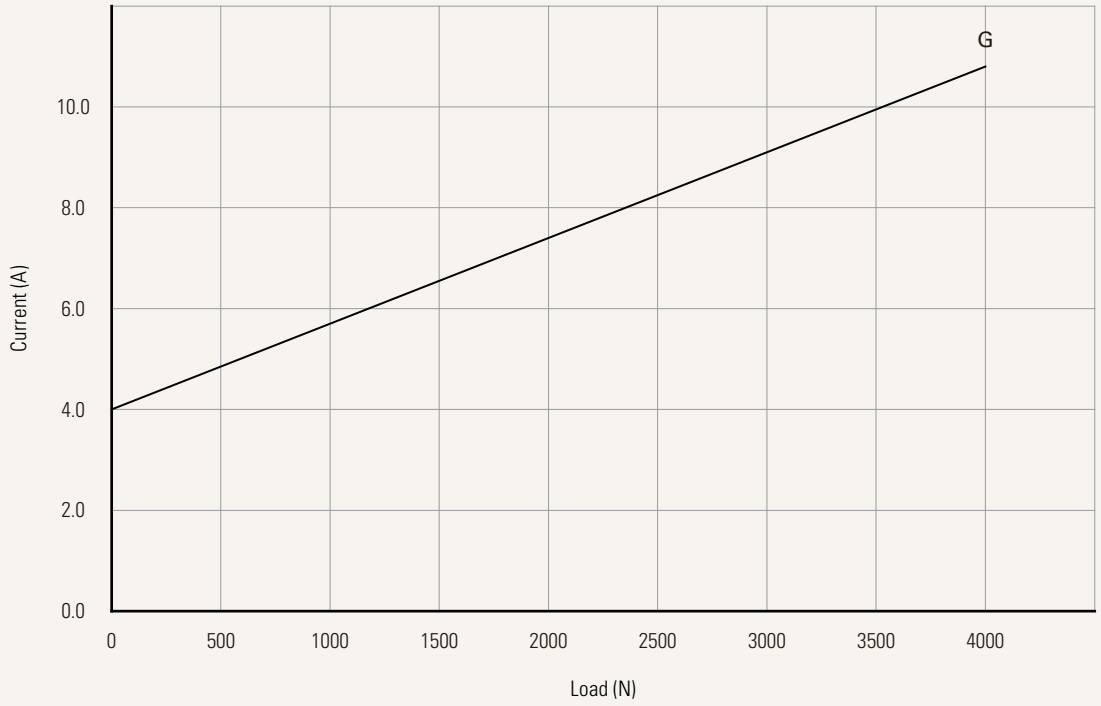
Performance Data (24V DC Motor)

Motor Speed (3800RPM, Duty cycle 10%)

Speed vs. Load



Current vs. Load



TL3 Ordering Key - Top End Socket

TL3

Version: 20200421-U

Voltage	1 = 12V DC	5 = 24V DC, thermal control	
Load and Speed	See page 3		
Stroke (mm)	250~1200		
Retracted Length (mm)	See page 10		
Cable Exit See page 10	1 = Top end socket		
Special Functions for Spindle Sub-assembly	0 = Without (Standard)	1 = Safety nut	
Functions for Limit Switches See page 11	1 = Two switches at full retracted / extended positions to cut current 3 = Two switches at full retracted / extended positions to send signal		
IP Rating	1 = Without	2 = IPX4	3 = IPX6
Output Signals	0 = Without	2 = Hall sensors*2	3 = POT
Connector See page 11	1 = DIN 6P, socket		
Cable Length (mm)	0 = Without (The corresponding extension cable TEC needs to be ordered seperately*) Note: please contact TiMOTION before making an order		
Color	1 = Black	2 = Matte silver	
Tubes Direction See page 12	0 = Thinner on top		
Grounding Function	0 = Without	1 = With	

Note

1 The TL3 is designed especially for push applications, not suitable for pull applications.

TL3 Ordering Key - Side Cable

TL3

Version: 20200421-U

Voltage	1 = 12V DC	5 = 24V DC, thermal control		
Load and Speed	See page 3			
Stroke (mm)	250~1200			
Retracted Length (mm)	See page 10			
Cable Exit See page 10	2 = Bottom side cable	3 = Top side cable	4 = Top (to TC) + Bottom (to TH) side cable	
Special Functions for Spindle Sub-assembly	0 = Without (Standard)	1 = Safety nut		
Functions for Limit Switches See page 11	1 = Two switches at full retracted / extended positions to cut current 3 = Two switches at full retracted / extended positions to send signal			
IP Rating	1 = Without	2 = IPX4	3 = IPX6	
Output Signals	0 = Without	2 = Hall sensors*2	3 = POT	
Connector See page 11	1 = DIN 6P, 90° plug 2 = Tinned leads	F = DIN 6P, 180° plug G = Molex 8P 90°	H = Molex 8P 180°	
Cable Length (mm)	1 = Straight, 500 2 = Straight, 750	3 = Straight, 1000 4 = Straight, 1250	5 = Straight, 1500 6 = Straight, 1750	7 = Straight, 2000
Color	1 = Black (Black cable set) 2 = Silver (428C color cable set)		3 = Silver (Black cable set)	
Tubes Direction See page 12	0 = Thinner on top	1 = Wider on top	Note: If "top+bottom cable" in Cable Exit section is selected , could only select #0	
Grounding Function	0 = Without	1 = With		

Note

1 The TL3 is designed especially for push applications, not suitable for pull applications.

TL3 Ordering Key - Direct Cut

TL3

Version: 20200421-U

Voltage	5 = 24V DC, thermal protector		
Load and Speed	See page 3		
Stroke (mm)	100~1200		
Retracted Length (mm)	See page 10		
Cable Exit See page 10	B = Top side - for TH; Bottom side - for TP C = Bottom side - Y cable, for TH + TP D = Top side - for the 2nd column; Bottom side - for TH & TP; direct cut operation with 2 columns E = Top side - for the 2nd column & TH; Bottom side - for TP; direct cut operation with 2 columns		
Special Functions for Spindle Sub-assembly	0 = Without (Standard)	1 = Safety nut	
Functions for Limit Switches See page 11	1 = Two switches at full retracted / extended positions to cut current		
IP Rating	1 = Without	2 = IPX4	3 = IPX6
Output Signals	0 = Without		
Connector See page 11	C = Direct cut, water proof, anti-pull		

Cable Length (mm) See page 12	B = Cable exit #B, L2 = L3 = 100
	C = Cable exit #C, L1 = L2 = L3 = 100
			D = Cable exit #D, L2 = L3 = L4 = 100
			E = Cable exit #E, L2 = L3 = L4 = 100

Color	1 = Black (With black cable set) 2 = Matte silver (With 428C color cable set)		3 = Matte silver (With black cable set)
Tubes Direction See page 12	0 = Thinner on top	1 = Wider on top	
Grounding Function	0 = Without	1 = With	

Note

1 The TL3 is designed especially for push applications, not suitable for pull applications.

Retracted Length (mm)

1. Retracted length needs to ≥ A+B+C

A. Load (N)	1000	2000	4000
	Stroke / 2+150 or Stroke / 2+220		

Note

1 The minimum retracted length generated by the formula - Stroke / 2+150 applies to the minimum bending moment rating. Please refer to the left column of the "Dynamic bending moment chart " on page 3.

B. Cable Exit

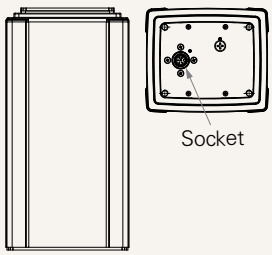
CODE	Top End Socket	Bottom Side Cable	Top Side Cable	Top + Bottom side cable	Direct Cut
1	-	-	-	-	-
2	-	-	-	-	-
3	-	-	+15	-	-
B	-	-	-	+35	-
B, D, E	-	-	-	-	+35
C	-	-	-	-	-

C. When with POT (When without POT, C = 0)

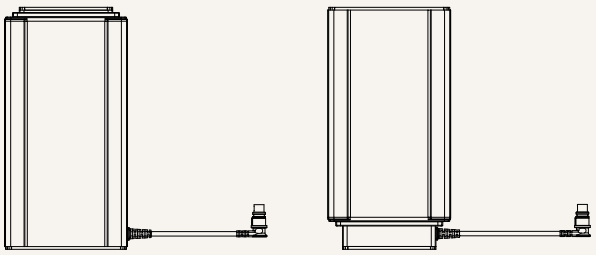
Cable Exit Code	Top End Socket	Bottom Side Cable	Top Side Cable
1	+40	-	-
2	-	+40	-
3	-	-	+40

Cable Exit

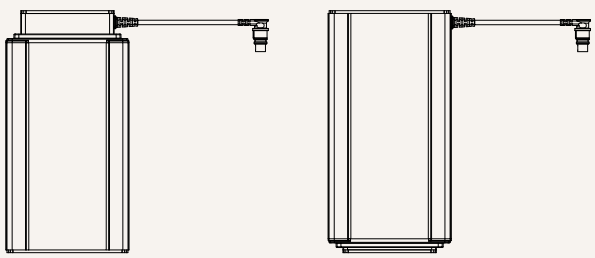
1 = Top end socket



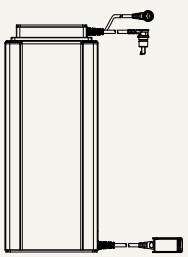
2 = Bottom side cable



3 = Top side cable



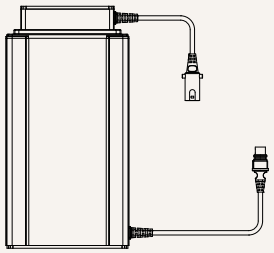
4 = Top(to TC)+Bottom(to TH) side cable



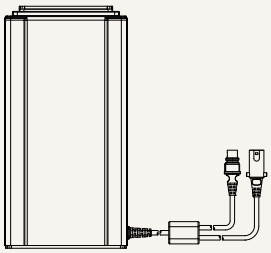
TL3 Ordering Key Appendix

Cable Exit

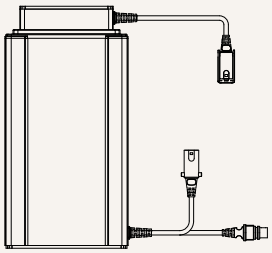
B = Top side - for TH; Bottom side - for TP



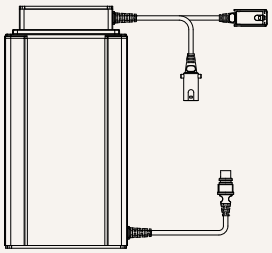
C = Bottom side - Y cable, for TH + TP



D = Top side - for the 2nd column; Bottom side - for TH & TP; direct cut operation with 2 columns



E = Top side - for the 2nd column & TH; Bottom side - for TP; direct cut operation with 2 columns



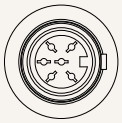
Functions for Limit Switches

Wire Definitions

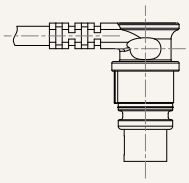
CODE	Pin					
	1 (Green)	2 (Red)	3 (White)	4 (Black)	5 (Yellow)	6 (Blue)
1	extend (VDC+)	N/A	N/A	N/A	retract (VDC+)	N/A
3	extend (VDC+)	common	upper limit switch	N/A	retract (VDC+)	lower limit switch

Connector

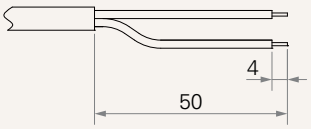
1 = DIN 6P, socket (Top end socket)



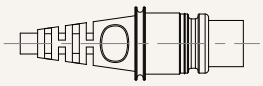
1 = DIN 6P, 90° plug (Side cable)



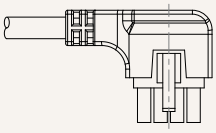
2 = Tinned leads



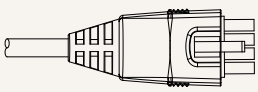
F = DIN 6P, 180° plug



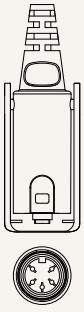
G = Molex 8P 90°



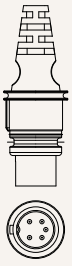
H = Molex 8P 180°



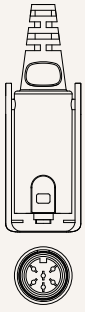
C = Direct cut, water proof, anti-pull



For TH:
long DIN 5P (Pin array 240°),
180° socket (with anti-pull clip)



For TP:
long DIN 5P (Pin array 240°),
180° plug (with O-ring)

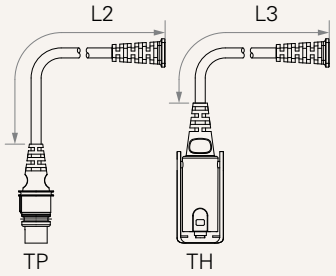


For Columm 2:
long DIN 6P (Pin array 240°),
180° plug (with anti-pull clip)

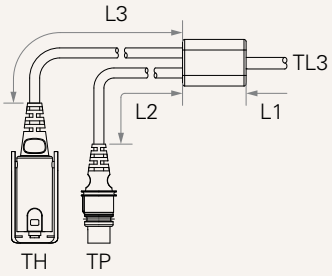
TL3 Ordering Key Appendix

Cable Length (mm)

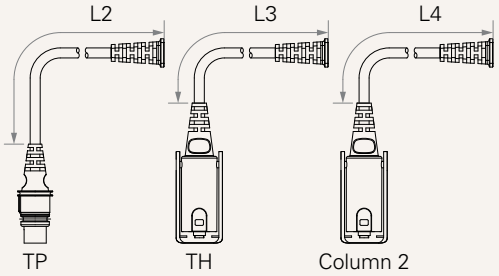
B = Cable exit #B, L2 = L3 = 100



C = Cable exit #C, L1 = L2 = L3 = 100

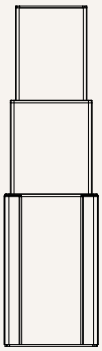


D, E = Cable exit #D, #E, L2 = L3 = L4 = 100

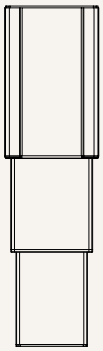


Tubes Direction

0 = Thinner on top



1 = Wider on top



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