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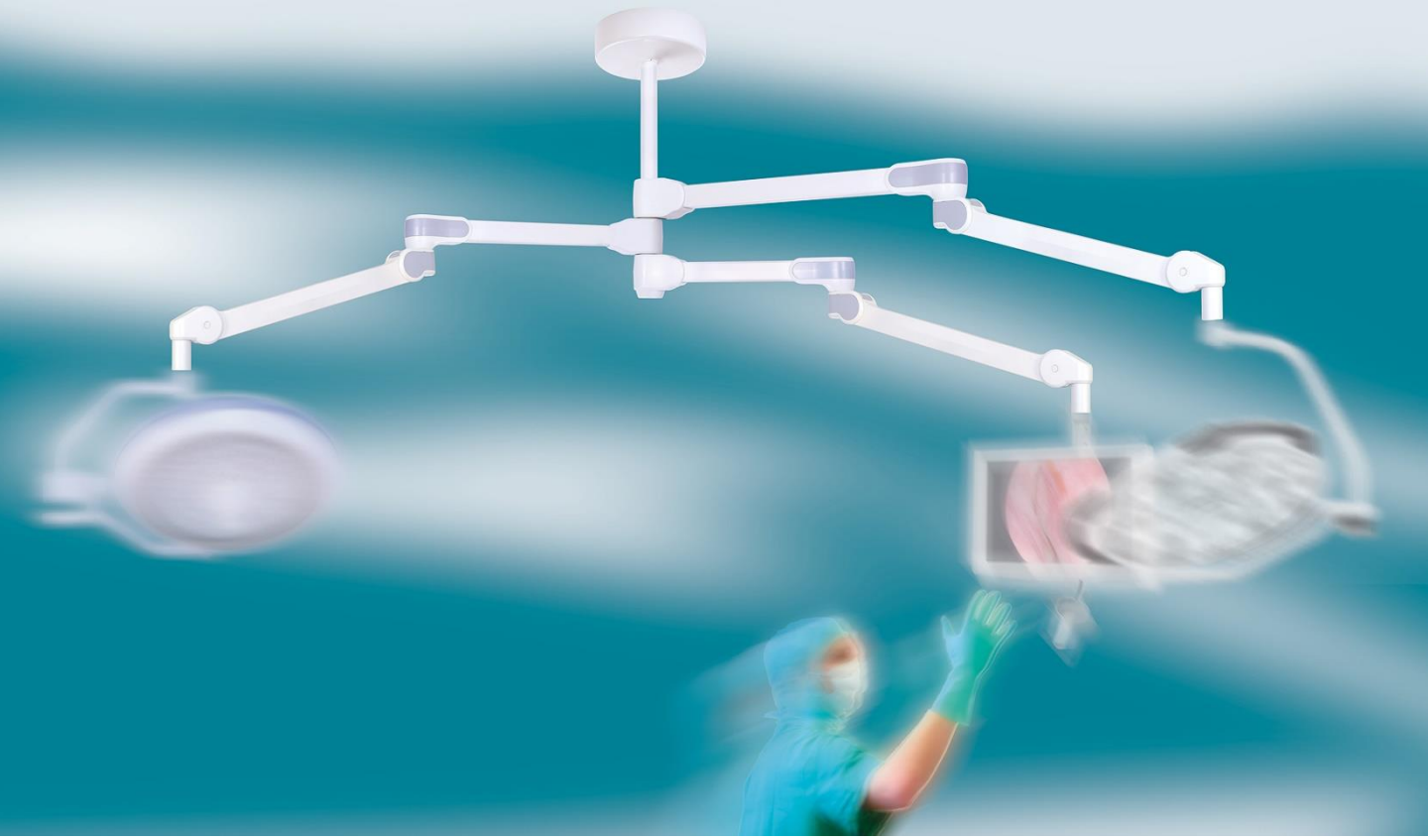
Medical Systems

Technical Data
VALiA Suspension System



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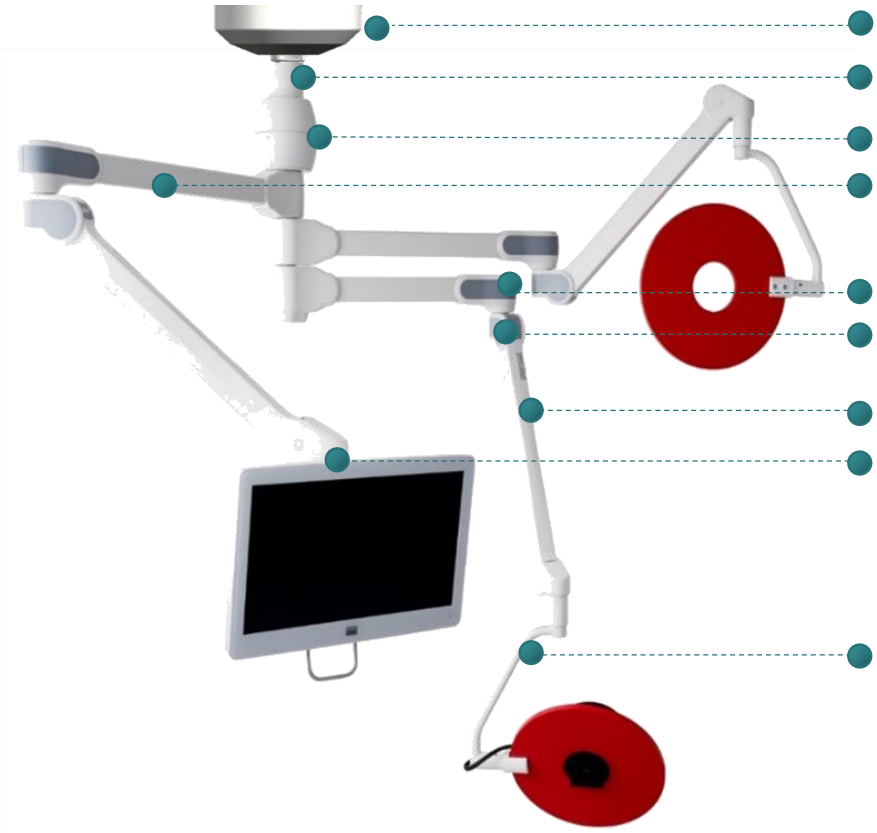
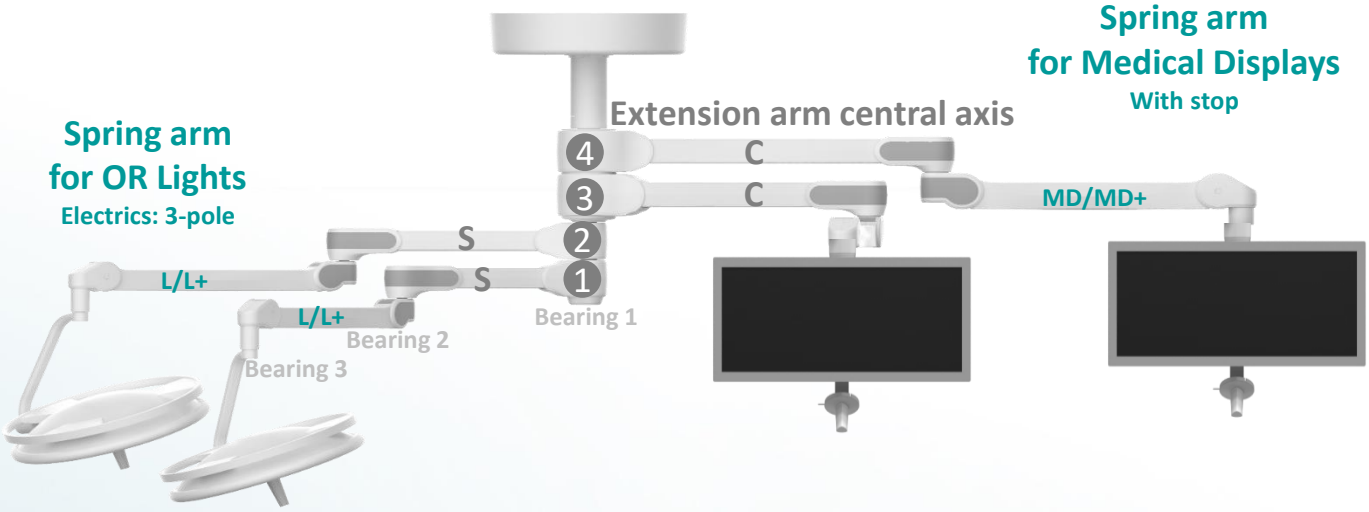
Technical Data VALiA

Components Example VALiA S3



Position and type of extension arm - Example VALiA C2S2



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Technical Data *VALiA*

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VALiA C Central Axis

Name	Description	Extension arm position (EA 1 – 4)	Extension Arm length in mm	Max. payload at the front joint of the spring arm in kg depending on extension arm length and center of gravity (see notes on page 24) *For spring arms without parallel guide (LCH) the max. load at the rear joint of the spring arm (horizontal axis) is indicated in Nm in brackets*		Compatible spring arms (Please consider max. payload/ length of extension arm)
				Eccentric load (see notes on page 24)	Centric load (see notes on page 24)	
C1	Single VALiA C Central Axis	EA 1 (Type-C)	750-1500	40	44 (357)	L21, L26+ XRS15, XRS21 LCH17, LCH19, LCH30 MD21, MD21+ MD23i, MD23i+ MD26+, MD26i+ MD40+, MD44i+
			1650	37	40 (324)	
			1800	34	36 (292)	
			1950	31	33 (268)	
			2100	28	30 (243)	
			2250	26	27 (219)	
C2	Dual VALiA C Central Axis (e.g.900/2250 = 40/26 kg or 1800/1950 = 34/31 kg)	EA 2 (Type-C)	900-1500	40	44 (357)	
			1650	37	40 (324)	
			1800	34	36 (292)	
			1950	31	33 (268)	
			2100	28	30 (243)	
			2250	26	27 (219)	
		EA 1 (Type-C)	750-1500	40	44 (357)	
			1650	37	40 (324)	
			1800	34	36 (292)	
			1950	31	33 (268)	
			2100	28	30 (243)	
C1S1	Dual VALiA C/S Central Axis (e.g.750/2100 = 26/28 kg or 1200/1350 = 21/40 kg)	EA 2 (Type-C)	900-1500	40	44 (357)	
			1650	37	40 (324)	
			1800	34	36 (292)	
			1950	31	33 (268)	
			2100	28	30 (243)	
			2250	26	27 (219)	
		EA 1 (Type-S)	750, 900	26	30 (243)	
			1050	26	27 (219)	
			1200	21	23 (186)	
C1S2	Triple VALiA C/S Central Axis (e.g.750/1200/2250 = 26/16/26 kg or 900/1050/1200 = 21/21/40 kg)	EA 3 (Type-C)	1050-1500	40	44 (357)	
			1650	37	40 (324)	
			1800	34	36 (292)	
			1950	31	33 (268)	
			2100	28	30 (243)	
			2250	26	27 (219)	
		EA 1 / EA 2 (Type-S)	750/900	26/21	30/23 (243/186)	
			750/1050	26/18	30/20 (243/162)	
			750/1200	26/16	30/18 (243/146)	
			900/1050	21/21	23/23 (186/186)	
			900/1200	21/18	23/20 (186/162)	
			1050/1200	21/18	23/20 (186/162)	

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VALiA C Central Axis

Name	Description	Extension arm position (EA 1 – 4)	Extension Arm length in mm	Max. payload at the front joint of the spring arm in kg depending on extension arm length and center of gravity (see notes on page 24) *For spring arms without parallel guide (LCH) the max. load at the rear joint of the spring arm (horizontal axis) is indicated in Nm in brackets*										Compatible spring arms (Please consider max. payload/ length of extension arm)
				Eccentric load (see notes on page 24)					Centric load (see notes on page 24)					
C2S1	Triple VALiA C/S Central Axis (e.g. 900/1500/2250 = 26/26/21 kg or 750/900/1050 = 26/40/40 kg)	EA 3 (Type-C)	1050, 1200	40					44 (357)					L21, L26+ XRS15, XRS21 LCH17, LCH19, LCH30 MD21, MD21+ MD23i, MD23i+ MD26+, MD26i+ MD40+, MD44i+
			1350	35					39 (316)					
			1500	31					35 (284)					
			1650	26					29 (235)					
			1800	24					26 (211)					
			1950	21					23 (186)					
			2100	21					23 (186)					
			2250	21					23 (186)					
		EA 2 (Type-C)	900, 1050	40					44 (357)					
			1200	35					39 (316)					
			1350	31					35 (284)					
			1500	26					29 (235)					
			1650	24					26 (211)					
			1800	21					23 (186)					
			1950	21					23 (186)					
			2100	21					23 (186)					
		EA 1 (Type-S)	750, 900	26					30 (243)					
			1050	26					27 (219)					
			1200	21					23 (186)					
C2S2	Vierfach VALiA C/S Central Axis (e.g. 750/900/1050/1200 = 26/21/21/40 kg or 750/900/1050/1200 = 21/21/30/30 kg)			Examples max. payload combinations eccentric load					Examples max. payload combinations centric load					
				Example 1	Example 2	Example 3	Example 4	Example 5	Example 1	Example 2	Example 3	Example 4	Example 5	
		EA 4 (Type-C)	1200	40	26	21	37	30	44 (357)	30 (243)	23 (186)	41 (333)	34 (276)	
		EA 3 (Type-C)	1050	21	26	31	26	30	23 (186)	30 (243)	35 (284)	30 (243)	34 (276)	
		EA 2 (Type-S)	900	21	21	21	21	21	23 (186)	23 (186)	23 (186)	23 (186)	23 (186)	
		EA 1 (Type-S)	750	26	26	26	21	21	30 (243)	30 (243)	30 (243)	23 (186)	23 (186)	

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VALiA C Central Axis and Ceiling Tube	
Feature	**Specification**
Possible configurations	• Upper extension arm (Type-C): Communication lights with full rotation, medical display with limited rotation (with Supply Helix) • Middle extension arm (Type-C): Communication lights with full rotation, medical display with limited rotation (with Supply Helix) • Middle extension arm (Type-S): Communication lights with full rotation • Lower extension arm (Type-C or S): Communication lights/camera with full rotation, medical display with full rotation or with stop
Rotation angle horizontally	• Central axis with extension arm Type-C: > 360° with slip ring // 330° with basic stop // ≤ 360° with comfort stop • Central axis with extension arm Type-S: > 360° with slip ring // 330° with basic stop // ≤ 330° with comfort stop • Spring arm: > 360° with slip ring // 360° with stop • End device: > 360° with slip ring // 360° with stop
Stop system	• Comfort stop (optional for extension arm type-C): with two stops, both stops individually adjustment in steps of 22.5° up to 360° • Comfort stop (optional for extension arm type-S): with two stops, both stops individually adjustment in steps of 15° up to 330° • Standard stop: with one stop < 330°, position adjustable in steps of 22.5° (via positioning of the spindle in the ceiling tube)

Space for cable routing central axis	• Supply Helix extension arm Type-C at middle and upper position
	  • Theoretical cable cross section up to 370 mm²
	  • Plug size up to 40x15 mm (e.g. BNC,HDMI, RJ45, S-Video, DVI, Power)
	• Cabling extension arm Type-C at lower position:
	  • Theoretical cable cross section up to 880 mm²
	  • Plug size up to 40x15 mm (e.g. BNC,HDMI, RJ45, S-Video, DVI, Power)
	• Cabling extension arm Type-S at lower position:
	  • Theoretical Cable cross section up to 488 mm²
	  • Plug size up to 28x19 mm (e.g. BNC,HDMI, RJ45, S-Video, Power)
	  • Refer to plug routing limitation information in presentation „02a VALiA System Overview“, chapter: “Theoretical Cable Capacity and Plug Size Limitations” (in ANNEX)
	• Inner diameter of VALiA C spindle: 46 mm
	• Inner diameter of VALiA S spindle: 36 mm

Net weight	• Ceiling tube Ø 110 mm with hexagon flange plate: 125 mm: 10,2 kg // 200 mm: 11,4 kg // 400 mm: 14,4 kg // 600 mm: 17,5 kg // 800 mm: 20,5 kg // 1000 mm: 23,6 kg // 1200 mm: 26,6 kg • C1: 750: 13,0 kg / 1050: 14,8 kg / 1350: 16,7 kg / 1650: 18,5 kg / 1950: 20,3 kg / 2250: 22,1 kg • C2: 750/900: 24,9 kg // 1350/1500: 32,3 kg // 2100/2250: 41,3 kg • C1S2: 750/900/1050: 31,1 kg // 900/1050/1200: 33,2 kg //1050/1200/1350: 35,4 kg • C2S1: 750/900/1050: 34,8 kg // 900/1050/1.200: 37,2 kg //1050/1200/1350: 39,7 kg • C2S2: 750/900/1050/1200: 44,8 kg
Max. bending moments for calculating the ceiling load (see installation instruction for more details regarding load data)	• C1: 1453 Nm • C1S1: 2228 Nm • C2: 2880 Nm • C1S2: 2702 Nm • C2S1: 3107 Nm • C2S2: 3104 Nm
Ceiling tube Ø 110 mm	Bolted hexagon flange plate, flange plate with bolt circle 270 mm, six threaded bolts
Length of ceiling tube Ø 110 mm	125; 200; 400; 600; 800; 1000; 1200 mm

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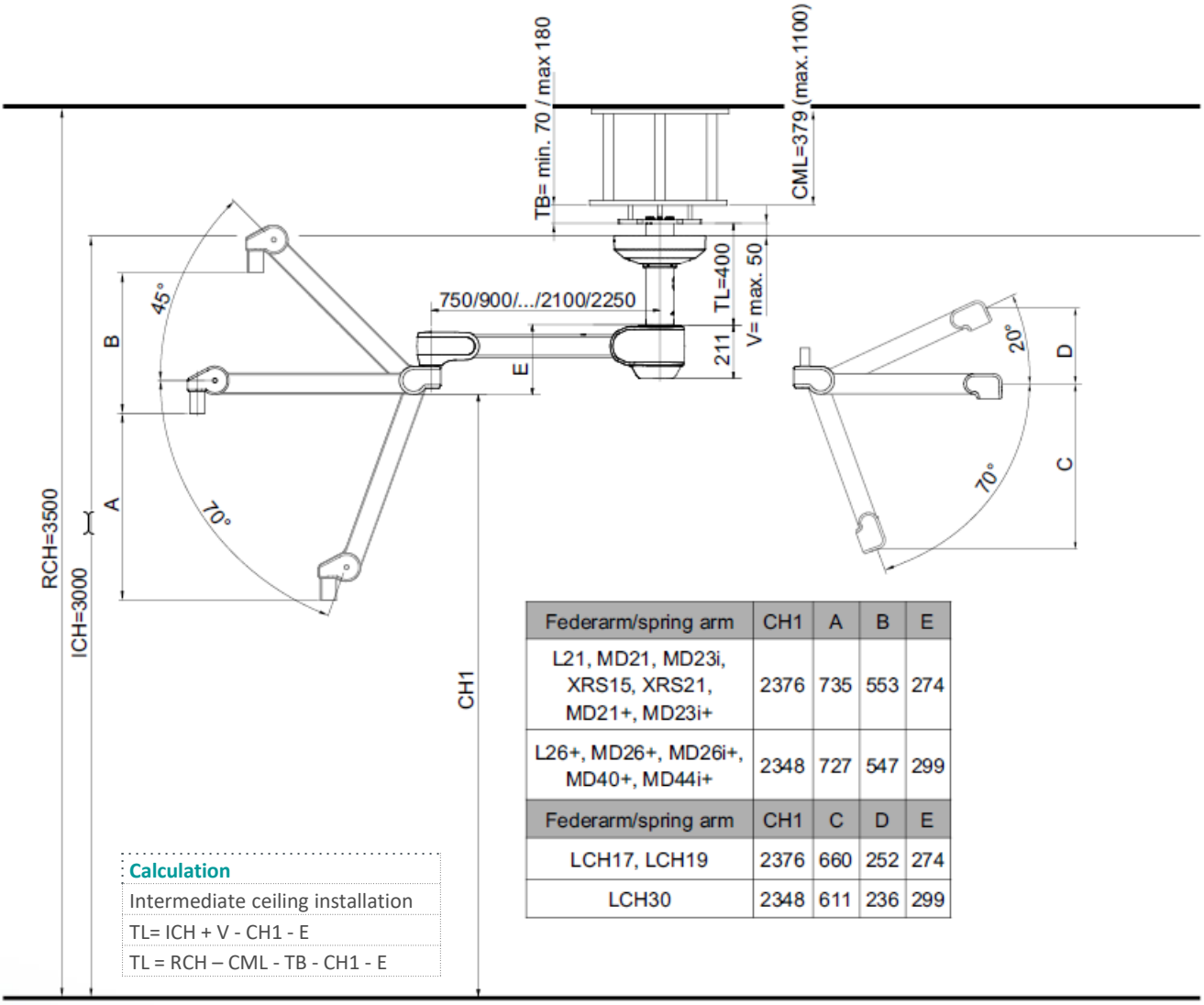
Technical Data VALiA

Elevation Drawing VALiA C1

The following configuration is an example for the VALiA C1 product family. The schematic can differ from the individually configured system.



Federarm/spring arm	CH1	A	B	E
L21, MD21, MD23i, XRS15, XRS21, MD21+, MD23i+	2376	735	553	274
L26+, MD26+, MD26i+, MD40+, MD44i+	2348	727	547	299
Federarm/spring arm	**CH1**	**C**	**D**	**E**
LCH17, LCH19	2376	660	252	274
LCH30	2348	611	236	299

Calculation

Intermediate ceiling installation

TL= ICH + V - CH1 - E

TL = RCH – CML - TB - CH1 - E

Abbreviation / Abkürzungen

TL	Tube lengths	Rohrlänge
RCH	Raw ceiling height	Rohdeckenhöhe
ICH	Intermediate ceiling height	Zwischendeckenhöhe
CH1	Clearance height lower extension arm	Durchgangshöhe unterer Ausleger
CH2	Clearance height upper extension arm	Durchgangshöhe oberer Ausleger
V	Value by which the flange of the ceiling tube is above the lower edge of the false ceiling	Versatz = Wert, um den der Flansch oberhalb der Unterkante der Zwischendecke ist
TB	Threaded bolts	Gewindestangen
CML	Ceiling mount length	Deckengestelllänge

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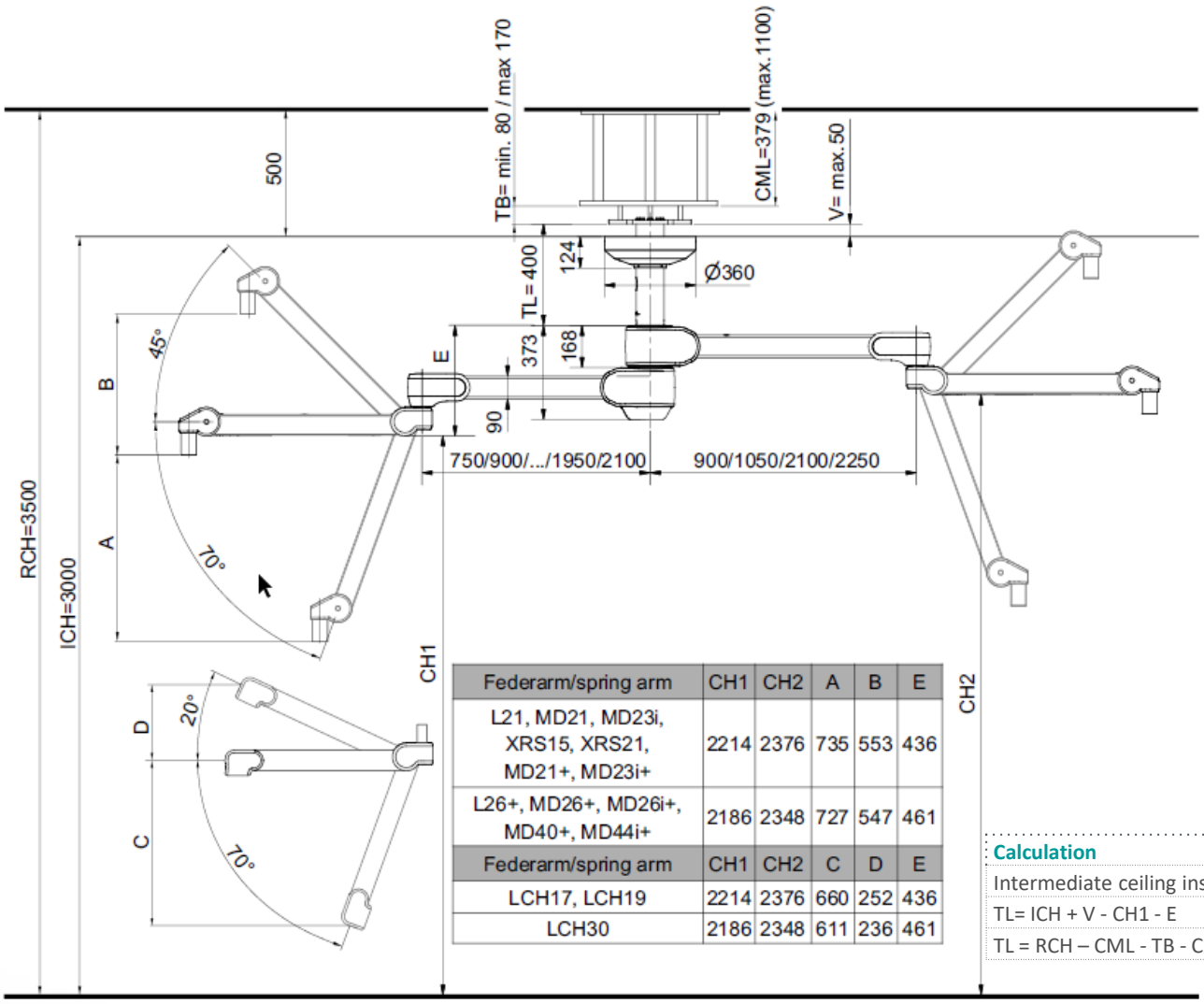
Elevation Drawing VALiA C2

The following configuration is an example for the VALiA C2 product family. The schematic can differ from the individually configured system.



Federarm/spring arm	CH1	CH2	A	B	E
L21, MD21, MD23i, XRS15, XRS21, MD21+, MD23i+	2214	2376	735	553	436
L26+, MD26+, MD26i+, MD40+, MD44i+	2186	2348	727	547	461
Federarm/spring arm	**CH1**	**CH2**	**C**	**D**	**E**
LCH17, LCH19	2214	2376	660	252	436
LCH30	2186	2348	611	236	461

Calculation

Intermediate ceiling installation

TL= ICH + V - CH1 - E

TL = RCH – CML - TB - CH1 - E

Abbreviation / Abkürzungen

TL	Tube lengths	Rohrlänge
RCH	Raw ceiling height	Rohdeckenhöhe
ICH	Intermediate ceiling height	Zwischendeckenhöhe
CH1	Clearance height lower extension arm	Durchgangshöhe unterer Ausleger
CH2	Clearance height upper extension arm	Durchgangshöhe oberer Ausleger
V	Value by which the flange of the ceiling tube is above the lower edge of the false ceiling	Versatz = Wert, um den der Flansch oberhalb der Unterkante der Zwischendecke ist
TB	Threaded bolts	Gewindestangen
CML	Ceiling mount length	Deckengestelllänge

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All information about lengths (mm) and angles (degrees) are approximate values and subject to manufacturing tolerances.

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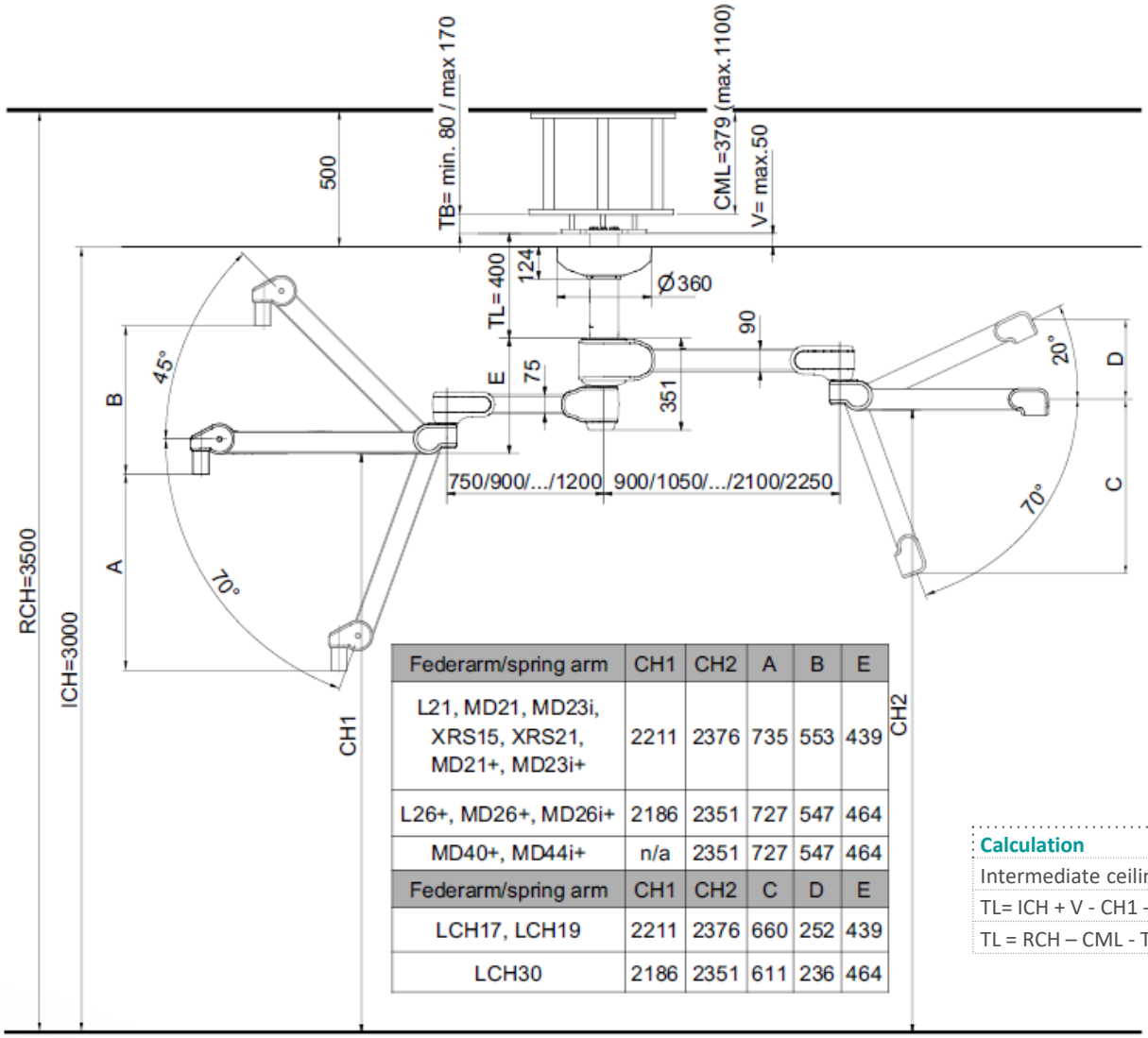
Elevation Drawing VALiA C1S1

The following configuration is an example for the VALiA C1S1 product family. The schematic can differ from the individually configured system.



Federarm/spring arm	CH1	CH2	A	B	E
L21, MD21, MD23i, XRS15, XRS21, MD21+, MD23i+	2211	2376	735	553	439
L26+, MD26+, MD26i+	2186	2351	727	547	464
MD40+, MD44i+	n/a	2351	727	547	464
Federarm/spring arm	**CH1**	**CH2**	**C**	**D**	**E**
LCH17, LCH19	2211	2376	660	252	439
LCH30	2186	2351	611	236	464

Calculation

Intermediate ceiling installation

TL= ICH + V - CH1 - E

TL = RCH – CML - TB - CH1 - E

Abbreviation / Abkürzungen

TL	Tube lengths	Rohrlänge
RCH	Raw ceiling height	Rohdeckenhöhe
ICH	Intermediate ceiling height	Zwischendeckenhöhe
CH1	Clearance height lower extension arm	Durchgangshöhe unterer Ausleger
CH2	Clearance height upper extension arm	Durchgangshöhe oberer Ausleger
V	Value by which the flange of the ceiling tube is above the lower edge of the false ceiling	Versatz = Wert, um den der Flansch oberhalb der Unterkante der Zwischendecke ist
TB	Threaded bolts	Gewindestangen
CML	Ceiling mount length	Deckengestelllänge

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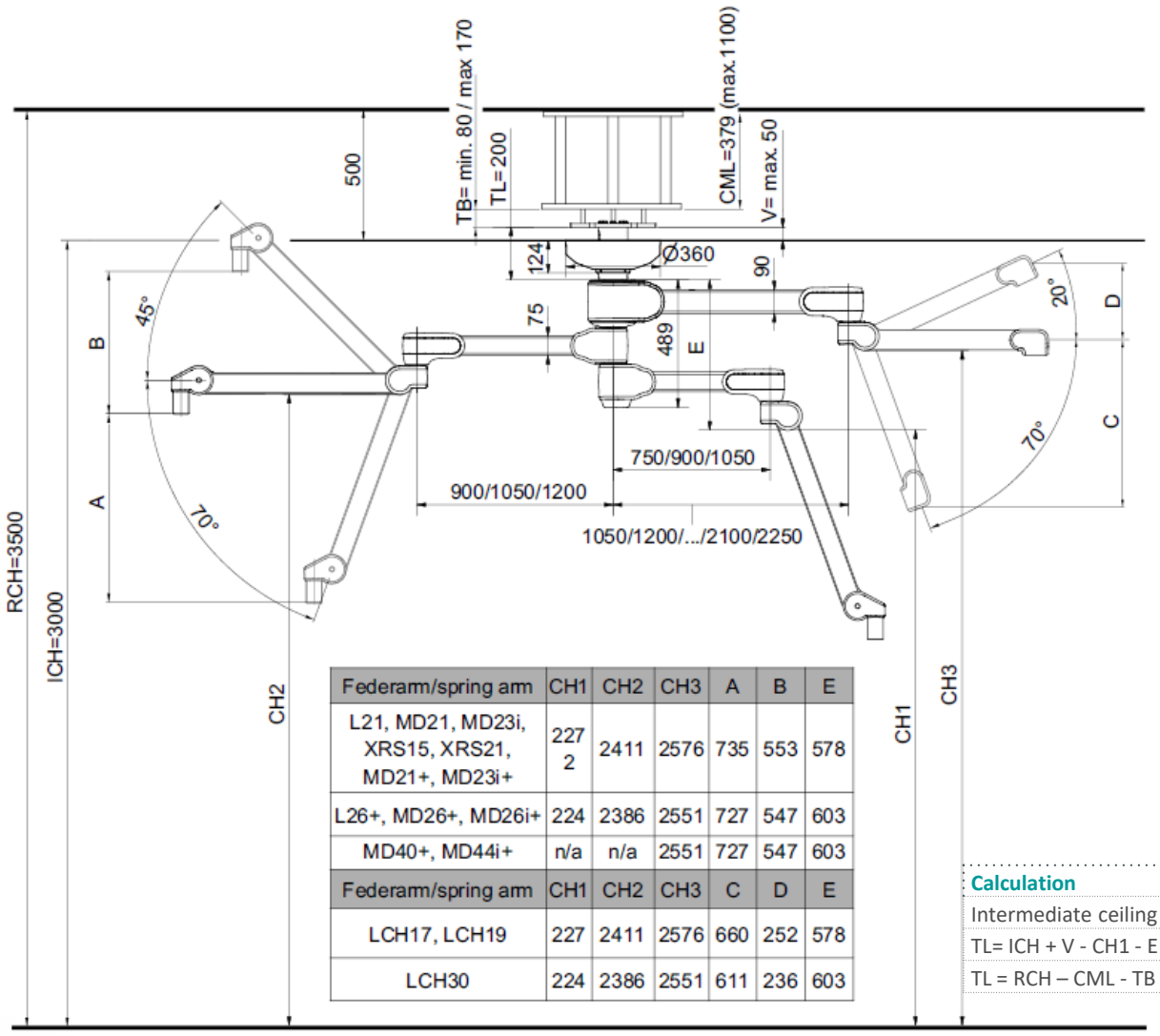
Elevation Drawing VALiA C1S2

The following configuration is an example for the VALiA C1S2 product family. The schematic can differ from the individually configured system.



Federarm/spring arm	CH1	CH2	CH3	A	B	E
L21, MD21, MD23i, XRS15, XRS21, MD21+, MD23i+	2272	2411	2576	735	553	578
L26+, MD26+, MD26i+	224	2386	2551	727	547	603
MD40+, MD44i+	n/a	n/a	2551	727	547	603
Federarm/spring arm	**CH1**	**CH2**	**CH3**	**C**	**D**	**E**
LCH17, LCH19	227	2411	2576	660	252	578
LCH30	224	2386	2551	611	236	603

Calculation

Intermediate ceiling installation

TL= ICH + V - CH1 - E

TL = RCH – CML - TB - CH1 - E

Abbreviation / Abkürzungen

TL	Tube lengths	Rohrlänge
RCH	Raw ceiling height	Rohdeckenhöhe
ICH	Intermediate ceiling height	Zwischendeckenhöhe
CH1	Clearance height lower extension arm	Durchgangshöhe unterer Ausleger
CH2	Clearance height upper extension arm	Durchgangshöhe oberer Ausleger
V	Value by which the flange of the ceiling tube is above the lower edge of the false ceiling	Versatz = Wert, um den der Flansch oberhalb der Unterkante der Zwischendecke ist
TB	Threaded bolts	Gewindestangen
CML	Ceiling mount length	Deckengestelllänge

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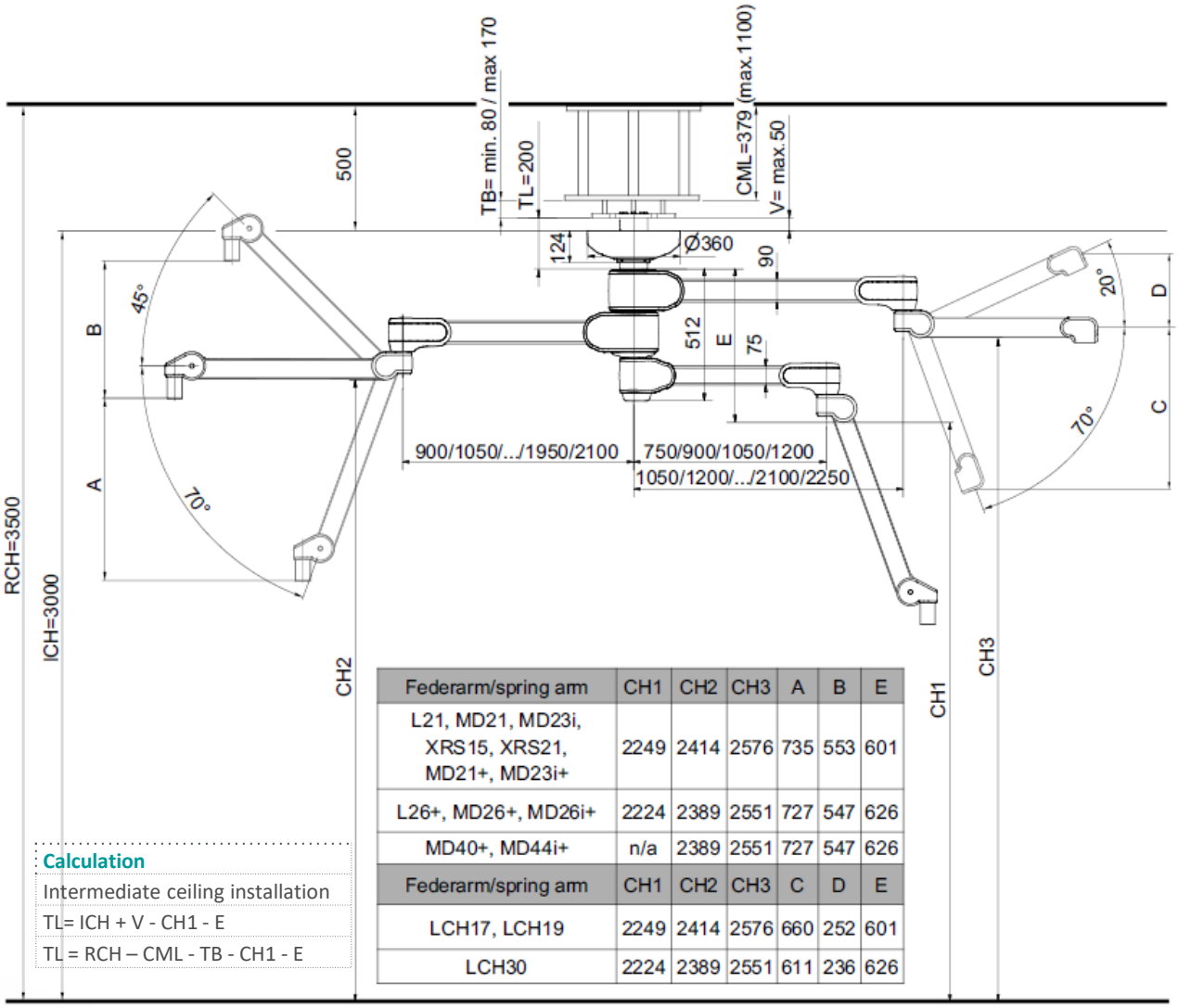
Technical Data VALiA

Elevation Drawing VALiA C2S1

The following configuration is an example for the VALiA C2S1 product family. The schematic can differ from the individually configured system.



Federarm/spring arm	CH1	CH2	CH3	A	B	E
L21, MD21, MD23i, XRS15, XRS21, MD21+, MD23i+	2249	2414	2576	735	553	601
L26+, MD26+, MD26i+	2224	2389	2551	727	547	626
MD40+, MD44i+	n/a	2389	2551	727	547	626
Federarm/spring arm	**CH1**	**CH2**	**CH3**	**C**	**D**	**E**
LCH17, LCH19	2249	2414	2576	660	252	601
LCH30	2224	2389	2551	611	236	626

Calculation

Intermediate ceiling installation

TL= ICH + V - CH1 - E

TL = RCH – CML - TB - CH1 - E

Abbreviation / Abkürzungen

TL	Tube lengths	Rohrlänge
RCH	Raw ceiling height	Rohdeckenhöhe
ICH	Intermediate ceiling height	Zwischendeckenhöhe
CH1	Clearance height lower extension arm	Durchgangshöhe unterer Ausleger
CH2	Clearance height upper extension arm	Durchgangshöhe oberer Ausleger
V	Value by which the flange of the ceiling tube is above the lower edge of the false ceiling	Versatz = Wert, um den der Flansch oberhalb der Unterkante der Zwischendecke ist
TB	Threaded bolts	Gewindestangen
CML	Ceiling mount length	Deckengestelllänge

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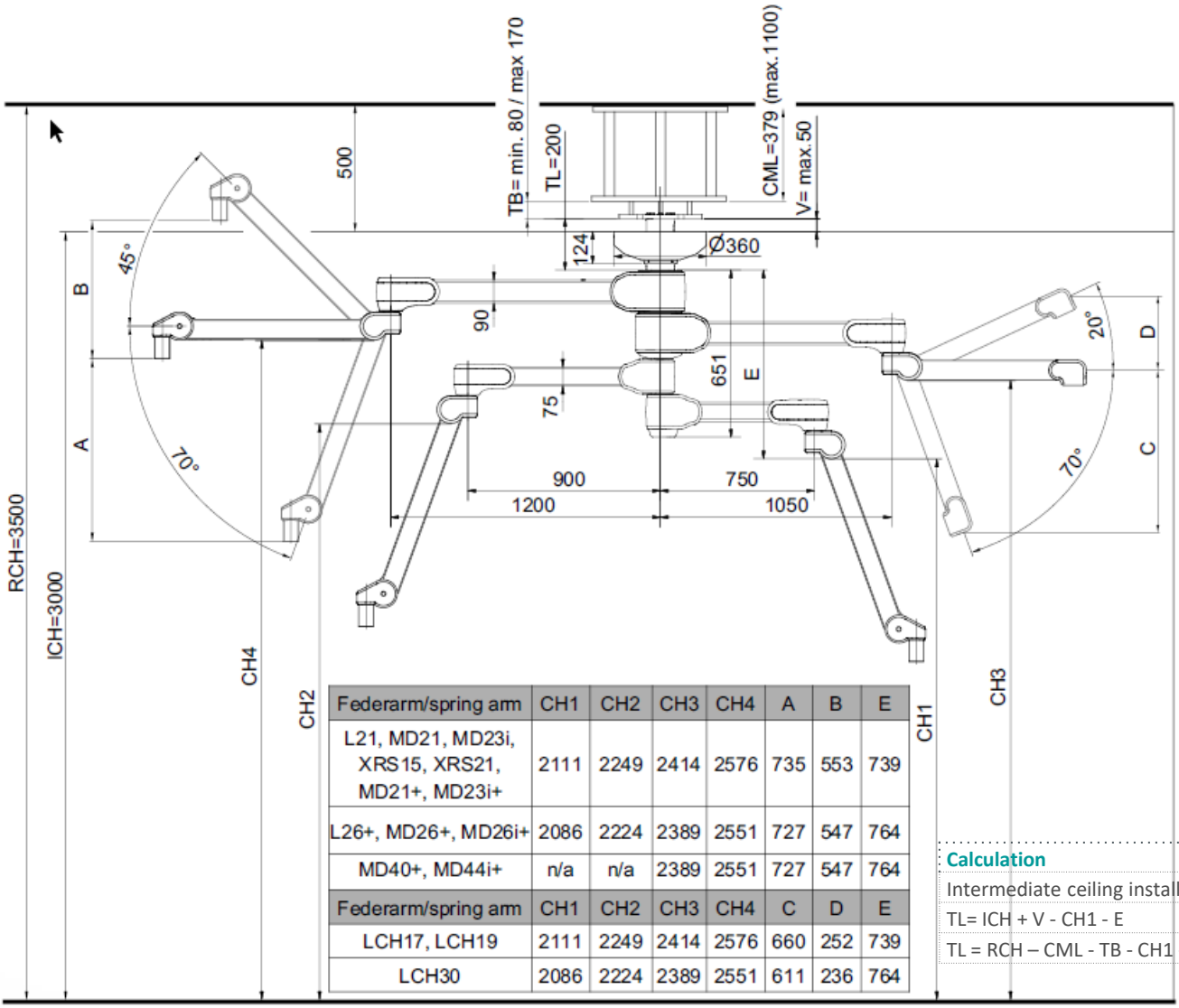
Elevation Drawing VALiA C2S2

The following configuration is an example for the VALiA C2S2 product family. The schematic can differ from the individually configured system.



Federarm/spring arm	CH1	CH2	CH3	CH4	A	B	E
L21, MD21, MD23i, XRS15, XRS21, MD21+, MD23i+	2111	2249	2414	2576	735	553	739
L26+, MD26+, MD26i+	2086	2224	2389	2551	727	547	764
MD40+, MD44i+	n/a	n/a	2389	2551	727	547	764
Federarm/spring arm	**CH1**	**CH2**	**CH3**	**CH4**	**C**	**D**	**E**
LCH17, LCH19	2111	2249	2414	2576	660	252	739
LCH30	2086	2224	2389	2551	611	236	764

Calculation

Intermediate ceiling installation

TL= ICH + V - CH1 - E

TL = RCH – CML - TB - CH1 - E

Abbreviation / Abkürzungen

TL	Tube lengths	Rohrlänge
RCH	Raw ceiling height	Rohdeckenhöhe
ICH	Intermediate ceiling height	Zwischendeckenhöhe
CH1	Clearance height lower extension arm	Durchgangshöhe unterer Ausleger
CH2	Clearance height upper extension arm	Durchgangshöhe oberer Ausleger
V	Value by which the flange of the ceiling tube is above the lower edge of the false ceiling	Versatz = Wert, um den der Flansch oberhalb der Unterkante der Zwischendecke ist
TB	Threaded bolts	Gewindestangen
CML	Ceiling mount length	Deckengestelllänge

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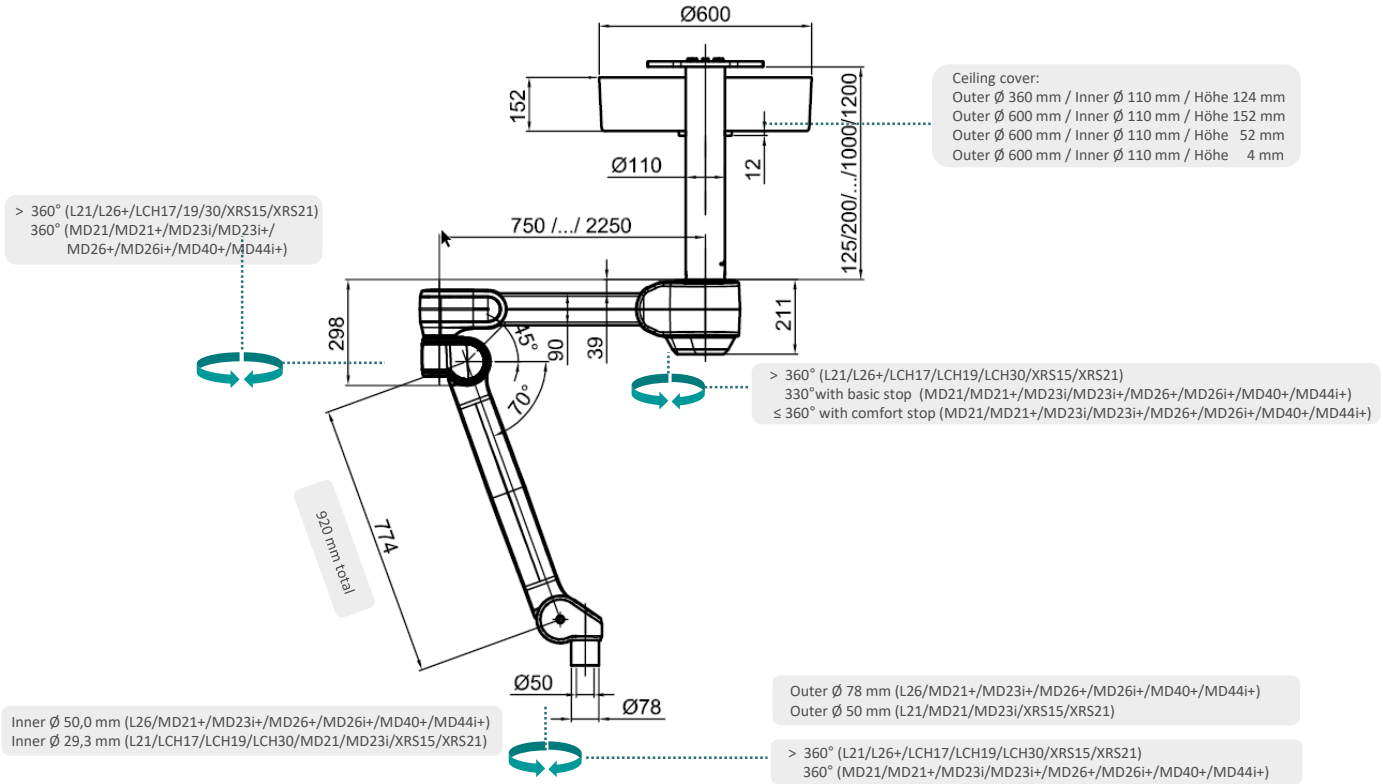
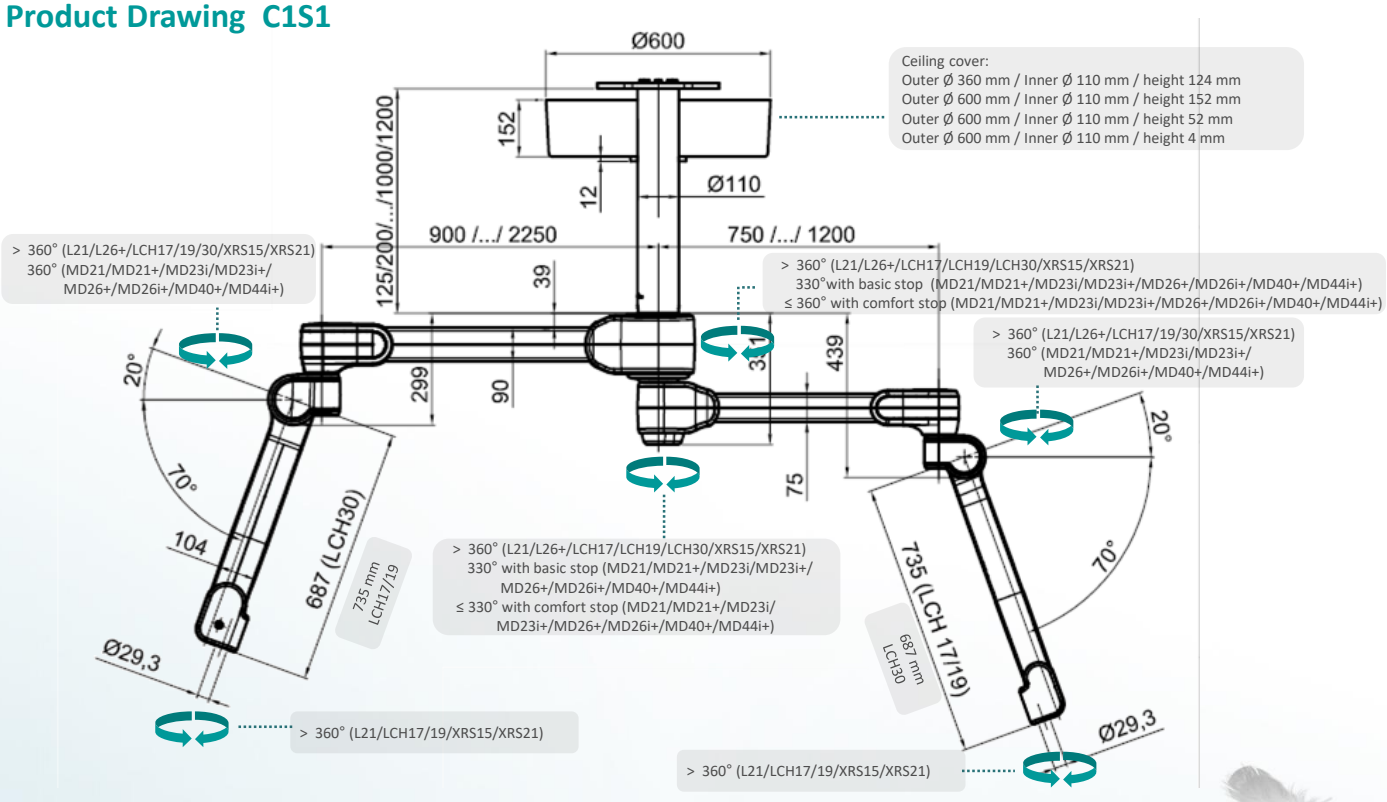
Product Drawing C1

The following configuration is an example for the VALiA C1 product family. The schematic can differ from the individually configured system.



Product Drawing C1S1



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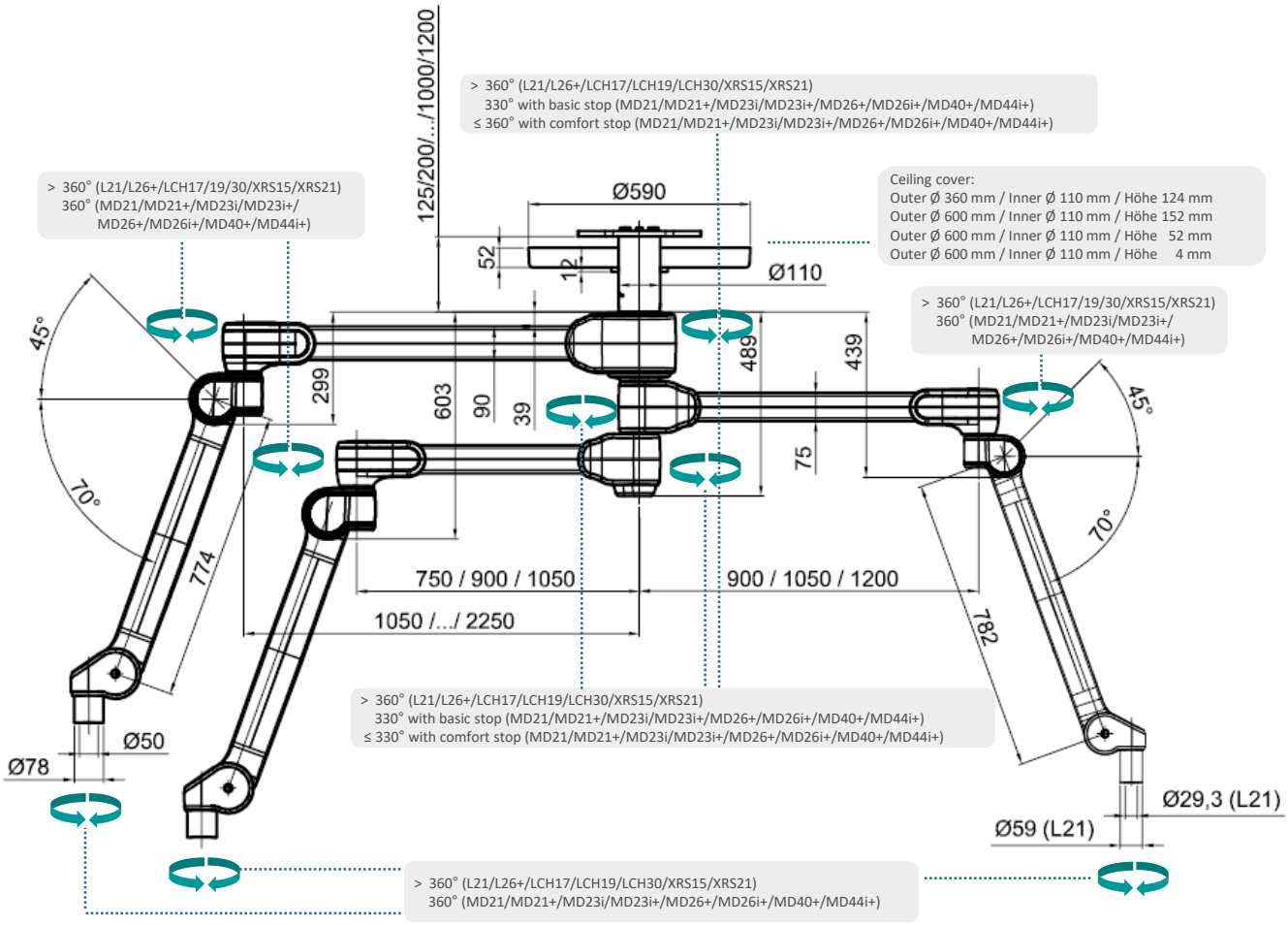
All information about lengths (mm) and angles (degrees) are approximate values and subject to manufacturing tolerances.

Technical Data *VALiA*

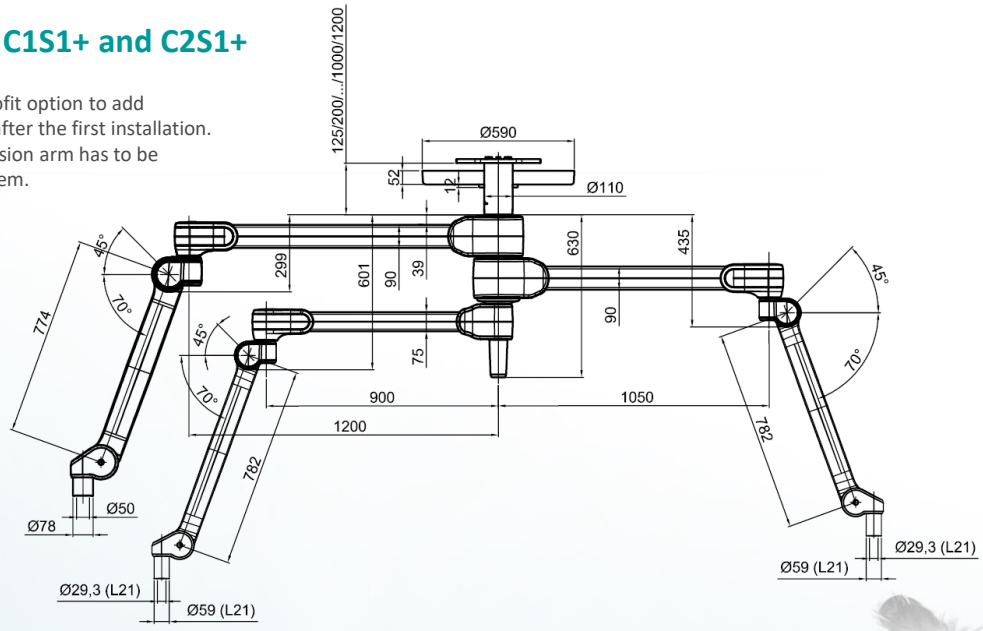
Product Drawing VALiA C1S2

The following configuration is an example for the VALiA C1S2 product family. The schematic can differ from the individually configured system.



Product Drawing VALiA C1S1+ and C2S1+

Dual and triple systems can have a retrofit option to add another extension arm at a later point after the first installation. The preparation for an additional extension arm has to be selected during the ordering of the system.



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Technical Data VALiA

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VALiA S Central Axis

Name	Description	Extension Arm length in mm	Max. payload at the front joint of the spring arm in kg depending on extension arm length (see notes on page 24) *For spring arms without parallel guide (LCH) the max. load at the rear joint of the spring arm (horizontal axis) is indicated in Nm in brackets*		Compatible spring arms (Please consider max. payload/ length of extension arm)
			Eccentric load (see notes on page 24)	Centric load (see notes on page 24)	
S1	Single VALiA S Central Axis	750, 900, 1050	26 kg	30 (243)	L21, L26+ XRS15, XRS21 LCH17, LCH19, LCH30, MD21, MD21+, MD23i, MD23i+, MD26+, MD26i+
				27 (219)	
		1.200	21 kg	23 (186)	
S1+	Single VALiA S Central Axis with preparation to retrofit an additional arm at the lower position	0/900, 0/1050	21 kg/ 21 kg	23/23 (186/186)	
		0/1200	21 kg/ 18 kg	23/20 (186/162)	
S2	Dual VALiA S Central Axis	750/900, 900/1050	21 kg/ 21 kg	23/23 (186/186)	
		1.050/1200	21 kg/ 18 kg	23/20 (186/162)	
S2+	Dual VALiA S Central Axis with preparation to retrofit an additional arm at the lower position	0/ 900/ 1050	21 kg/ 21 kg/ 21 kg	23/23/23 (186/186/186)	
S3	Triple VALiA S Central Axis	750/900/1050	21 kg/ 21 kg/ 21 kg	23/23/23 (186/186/186)	

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Technical Data VALiA

VALiA S Central Axis and Ceiling Tube	
Feature	**Specification**
Possible configurations	• Upper arm: Communicating lights with full rotation, monitor with limited rotation (with secondary canopy and 110 mm ceiling tube) • Middle arm: Communicating lights with full rotation • Lower arm: Communicating lights/camera with full rotation, monitor with full rotation or with stop
Rotation angle horizontally	• Central Axis: > 360° with slip ring // 330° with basic stop // ≤ 330° with comfort stop • Spring arm: > 360° with slip ring // 360° with stop • End device: > 360° with slip ring // 360° with stop
Stop system	• Comfort stop (optional): With two stops, both stops individually adjustable in steps of 15° up to 330° • Basic stop: With one stop, < 330°, adjustable in steps of 120° (triangle flange) or 60° (hexagon flange)

Space for routing cables Central Axis	• S1/ S2/ S3: Cabling at extension arm at lower position:
	  • Theoretical cable cross section up to 488 mm²
	  • Plug size for S1, S2 up to 28x19 mm (e.g. BNC, HDMI, RJ45, S-Video, Power Supply Plug), for S3 up to 20x14 mm
	  • Refer to plug routing limitation information in presentation „02a VALiA System Overview“ Chapter „Cable routing VALiA S2 / VALiA S3“; such as “Plug and cable routing” (in annex)
	• S2+S3: Rotating cover at upper position:
	  • Theoretical cable cross section up to 634 mm²
	  • Plug size up to 25x16 mm
	  • Refer to plug routing limitation information in presentation „02a VALiA System Overview“ Chapter „Cable routing VALiA S2 / VALiA S3“; such as “Plug and cable routing” (in annex)
	• S1+S2: Inner diameter of spindle: 36 mm
	• S3: Inner diameter of spindle: 23 mm

Net weight	• Ceiling tube 65 with triangle flange: 125 mm: 6.2 kg // 200 mm: 6,8 kg // 400 mm: 8,9 kg // 600 mm: 11 kg // 800: 13,1 // 1000 mm: 15,2 // 1200 mm: 17.4 kg • Ceiling tube 65 with hexagon flange: 125 mm: 9.4 kg // 200 mm: 10.2 kg // 400 mm: 12.4 kg // 600 mm: 14.5 kg // 800 mm: 16.6 kg // 1000 mm: 18.7 kg // 1200 mm: 20.9 kg • Ceiling tube 110 with hexagon flange: 125 mm: 10.2 kg // 200 mm: 11.4 kg // 400 mm: 14.4 kg // 600 mm: 17.5 kg // 800 mm: 20.5 kg // 1000 mm: 23.6 kg // 1200 mm: 26.6 kg • S1: 8.3-10.2 kg • S2: 16.2-18.7 kg • S3: max. 24.7 kg
Max. bending moments for calculating the ceiling load (see installation instruction for more details regarding load data)	• S1: 738 Nm • S2: 1177 Nm • S3: 1621 Nm
Ceiling tube 65	• Single and dual system: Welded triangle flange with bolt circle 270 mm, three threaded bolts • Triple system: Welded hexagon flange with bolt circle 270 mm, six threaded bolts
Lengths of ceiling tube 65	• Single and dual system: 125; 200; 400; 600; 800; 1000; 1200 mm • Triple system: 125; 200; 400; 600 mm
Ceiling tube 110	Screwed hexagon flange with bolt circle 270 mm, six threaded bolts
Lengths of ceiling tube 110	125; 200; 400; 600; 800; 1000; 1200 mm

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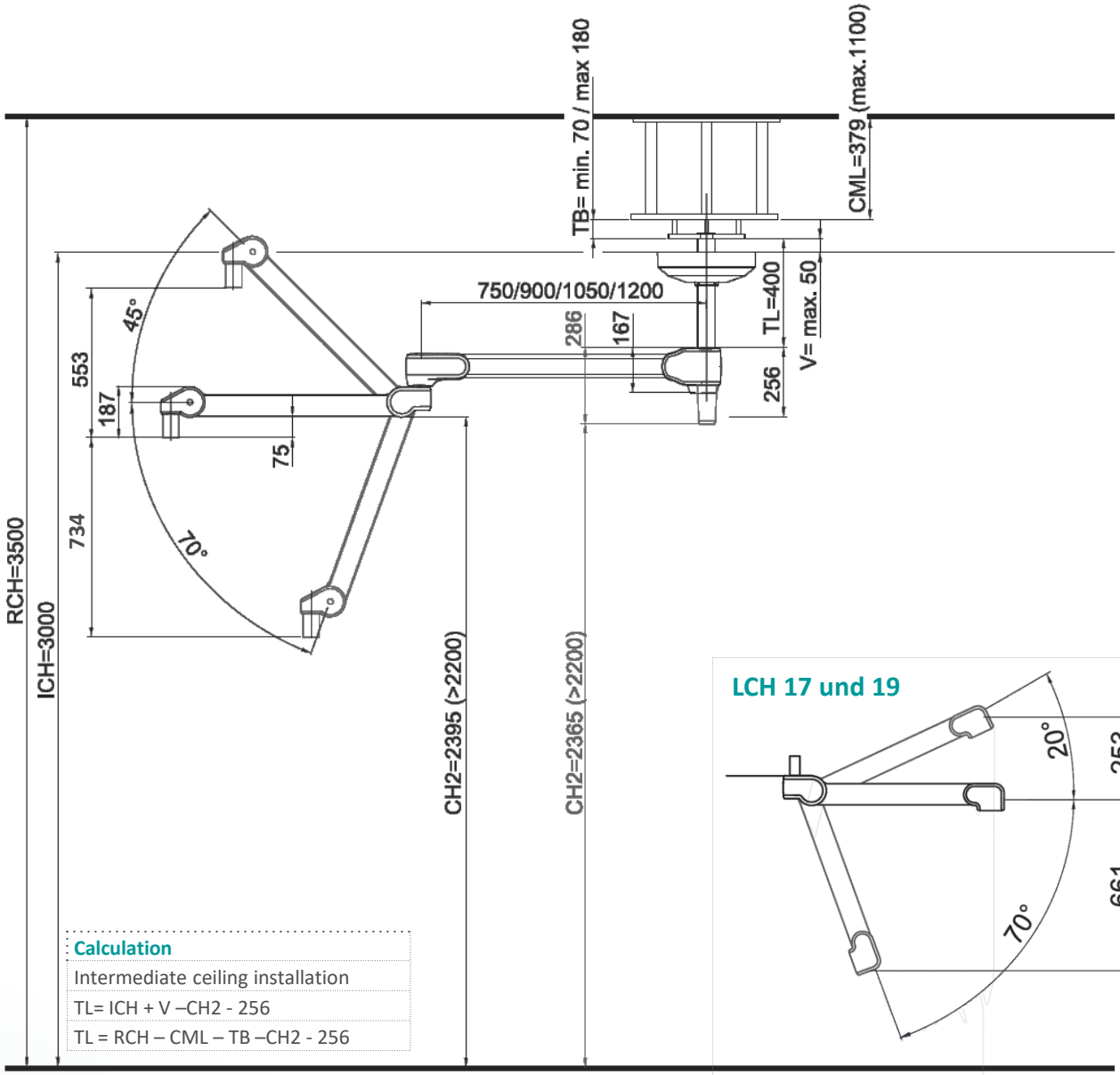
Technical Data VALiA

Elevation Drawing VALiA S1/ S1+

The following configuration is an example for the VALiA S1 product family. The schematic can differ from the individually configured system.



Calculation

Intermediate ceiling installation

TL= ICH + V –CH2 - 256

TL = RCH – CML – TB –CH2 - 256

Abbreviation / Abkürzungen

TL	Tube lengths	Rohrlänge
RCH	Raw ceiling height	Rohdeckenhöhe
ICH	Intermediate ceiling height	Zwischendeckenhöhe
CH1	Clearance height lower extension arm	Durchgangshöhe unterer Ausleger
CH2	Clearance height upper extension arm	Durchgangshöhe oberer Ausleger
V	Value by which the flange of the ceiling tube is above the lower edge of the false ceiling	Versatz = Wert, um den der Flansch oberhalb der Unterkante der Zwischendecke ist
TB	Threaded bolts	Gewindestangen
CML	Ceiling mount length	Deckengestelllänge

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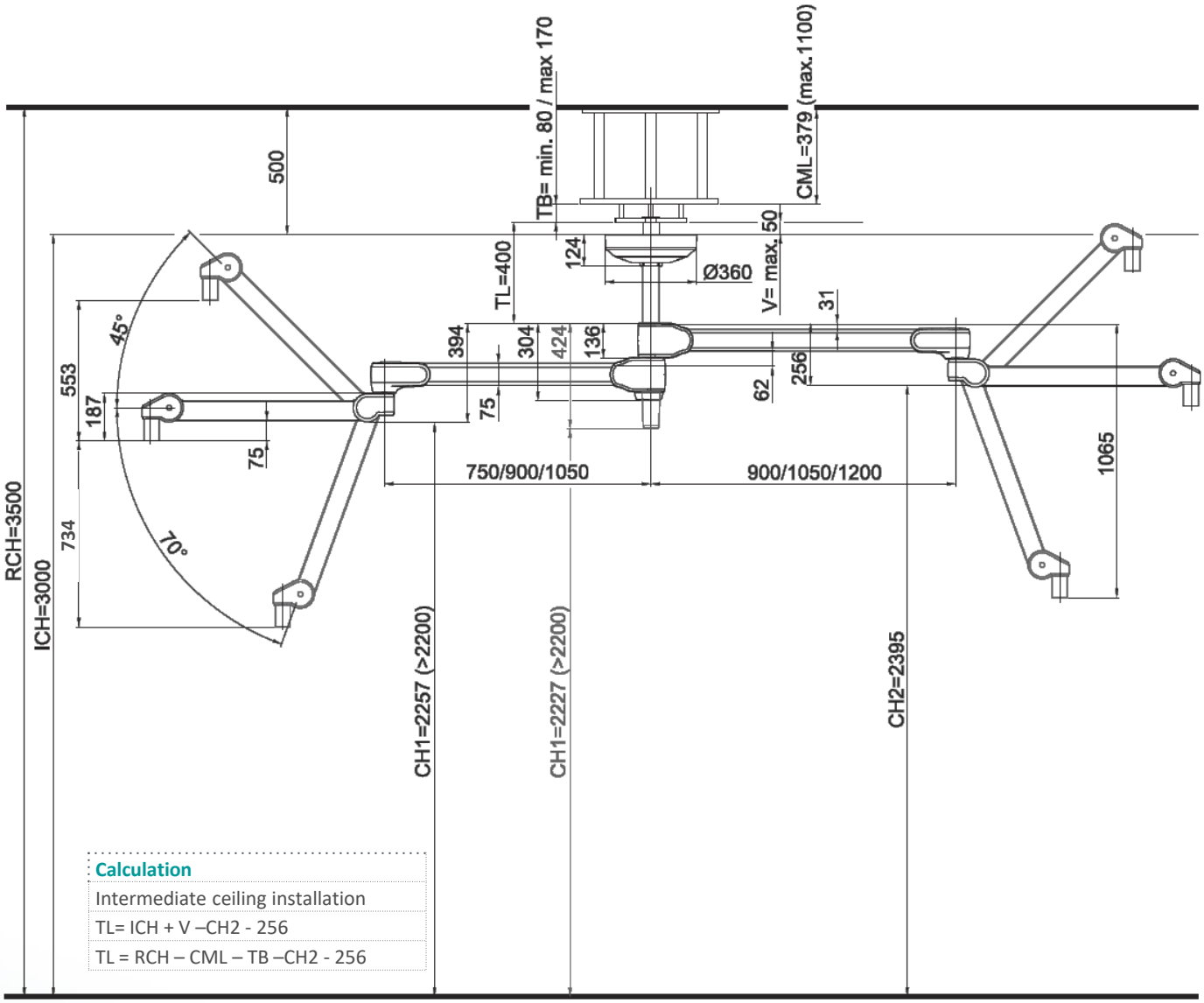
Technical Data VALiA

Elevation Drawing VALiA S2/ S2+

The following configuration is an example for the VALiA S2 product family. The schematic can differ from the individually configured system.



Calculation

Intermediate ceiling installation

TL= ICH + V –CH2 - 256

TL = RCH – CML – TB –CH2 - 256

Abbreviation / Abkürzungen		
TL	Tube lengths	Rohrlänge
RCH	Raw ceiling height	Rohdeckenhöhe
ICH	Intermediate ceiling height	Zwischendeckenhöhe
CH1	Clearance height lower extension arm	Durchgangshöhe unterer Ausleger
CH2	Clearance height upper extension arm	Durchgangshöhe oberer Ausleger
V	Value by which the flange of the ceiling tube is above the lower edge of the false ceiling	Versatz = Wert, um den der Flansch oberhalb der Unterkante der Zwischendecke ist
TB	Threaded bolts	Gewindestangen
CML	Ceiling mount length	Deckengestelllänge

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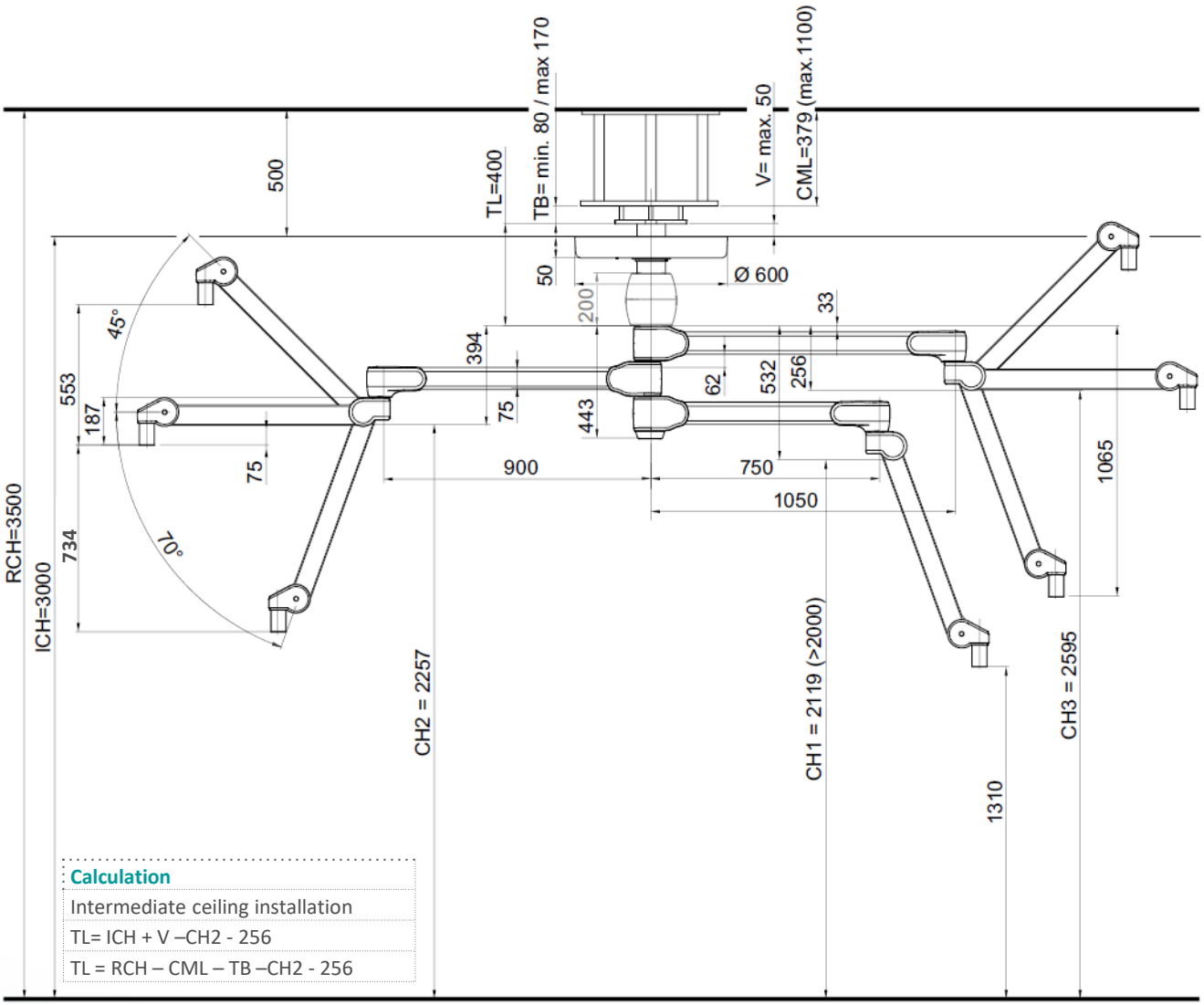
Technical Data VALiA

Elevation Drawing VALiA S3

The following configuration is an example for the VALiA S3 product family. The schematic can differ from the individually configured system.



Calculation

Intermediate ceiling installation

TL= ICH + V –CH2 - 256

TL = RCH – CML – TB –CH2 - 256

Abbreviation / Abkürzungen

TL	Tube lengths	Rohrlänge
RCH	Raw ceiling height	Rohdeckenhöhe
ICH	Intermediate ceiling height	Zwischendeckenhöhe
CH1	Clearance height lower extension arm	Durchgangshöhe unterer Ausleger
CH2	Clearance height upper extension arm	Durchgangshöhe oberer Ausleger
V	Value by which the flange of the ceiling tube is above the lower edge of the false ceiling	Versatz = Wert, um den der Flansch oberhalb der Unterkante der Zwischendecke ist
TB	Threaded bolts	Gewindestangen
CML	Ceiling mount length	Deckengestelllänge

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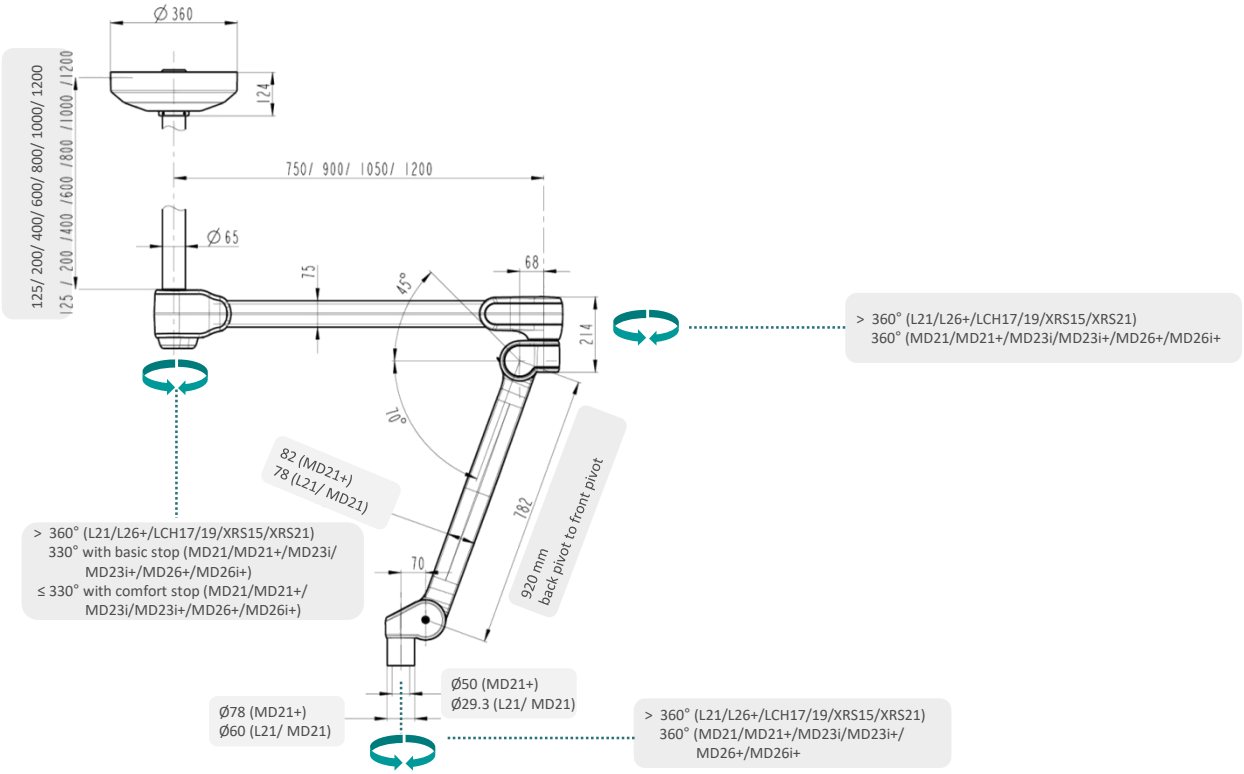
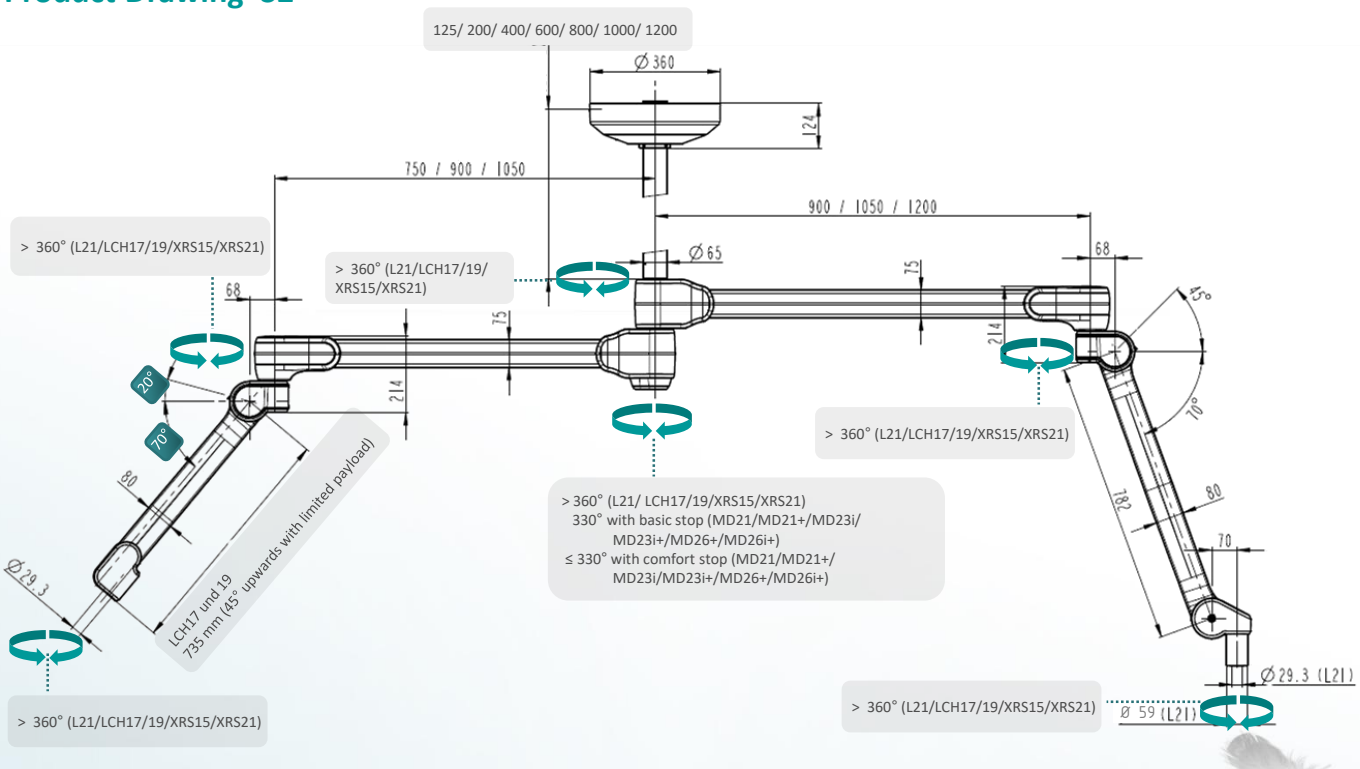
Technical Data VALiA

Product Drawing S1

The following configuration is an example for the VALiA S1 product family. The schematic can differ from the individually configured system.



Product Drawing S2



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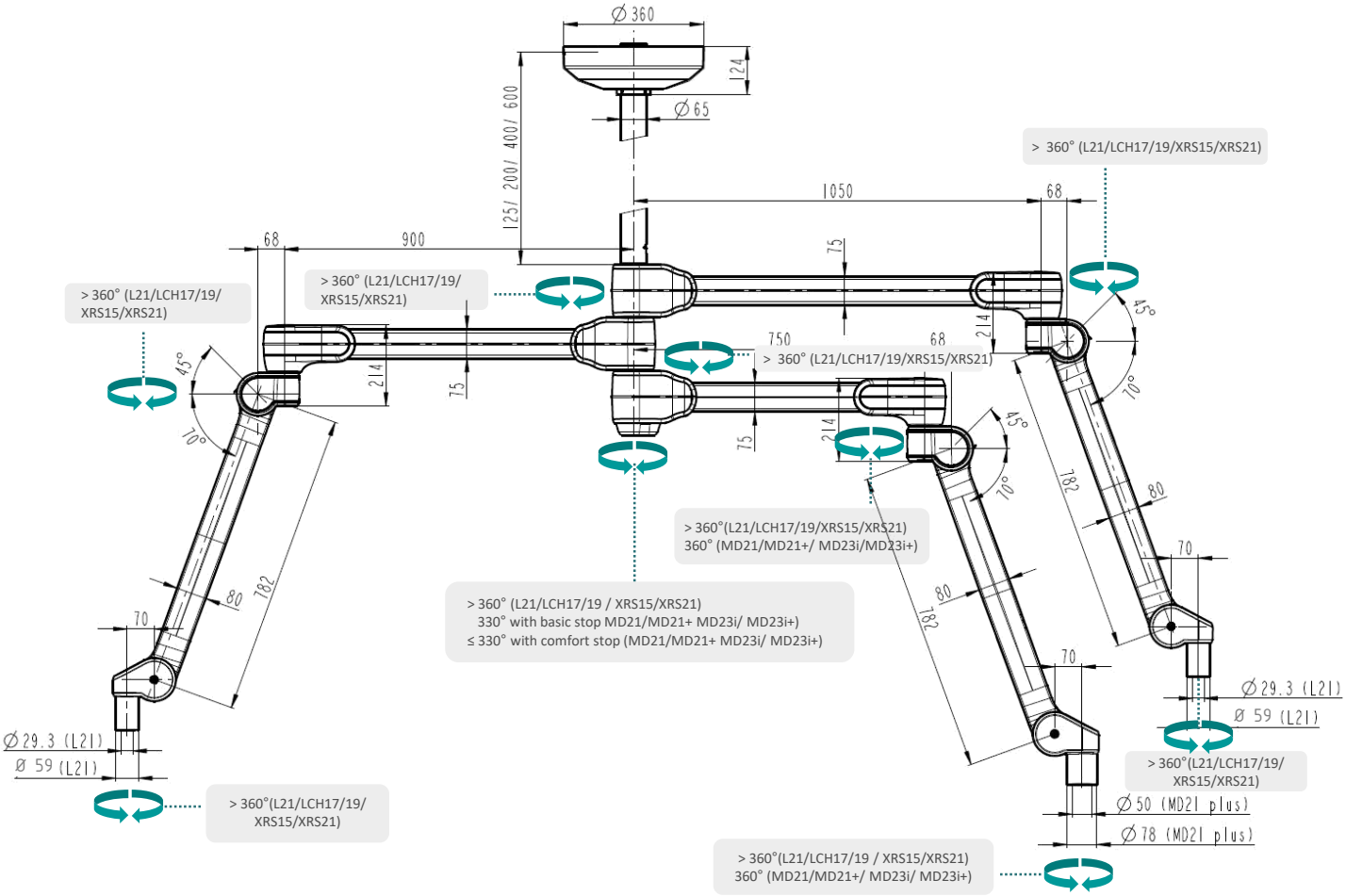
All information about lengths (mm) and angles (degrees) are approximate values and subject to manufacturing tolerances.

Technical Data *VALiA*

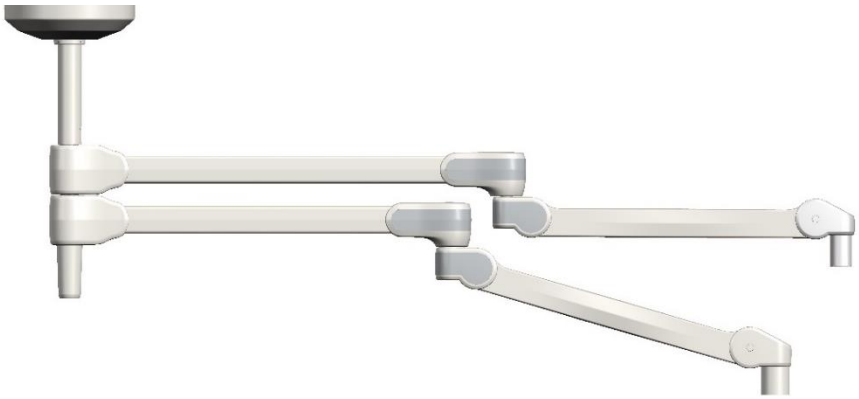
Product Drawing S3

The following configuration is an example for the VALiA S3 product family. The schematic can differ from the individually configured system.



Product Drawing S1+ and S2+

Dual and triple systems can have a retrofit option to add another extension arm at a later point after the first installation. The preparation for an additional extension arm has to be selected during the ordering of the system.



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Technical Data VALiA

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VALiA Spring Arms

Name	Description	Payload	Specification	
L21	Light head arm	1.5-21 kg	• 3-pole • HDC 5 • HDC 5S • HDC 9 • HDC 9S+VA • HDC11	(3 x Power AWG 16) (3 x Power AWG 16, 1 x Koax) (3 x Power AWG 16, 2 x Signal AWG 22) (3 x Power AWG 16, 6 x Signal AWG 22) (3 x Power AWG 16, 2 x Signal AWG 22, 3 x Video RG179) (3 x Power AWG 16, 6 x Signal AWG 22, 1 x Koax)
L26+	Light head arm	13-26 kg		
LCH17	Light head arm for low ceiling heights	20-176 Nm		
LCH19	Light head arm for low ceiling heights	20-200 Nm		
LCH30	Light head arm for low ceiling heights	125-300 Nm		
XRS15	Arm for X-ray shield	1.5-15 kg	No electrics, no stop, (increased number of movement cycles)	
XRS21	Arm for X-ray shield	1.5-21 kg	No electrics, no stop	
MD21	Arm for medical display	1.5-21 kg	360° with stop, 207 mm² cable capacity	
MD21+	Arm for medical display	1.5-21 kg	360° with stop, 253 mm² cable capacity (for DVI plugs)	
MD23i	Injector arm Arm for medical display	1.5-23 kg	360° with stop, 207 mm² cable capacity	
MD23i+	Injector arm Arm for medical display	1.5-23 kg	360° with stop, 253 mm² cable capacity (for DVI plugs)	
MD26+	Arm for medical display	13-26 kg	360° with stop, 500 mm² cable capacity (for DVI plugs)	
MD26i+	Injector arm Arm for medical display	13-26 kg	360° with stop, 500 mm² cable capacity (for DVI plugs)	
MD40+	Arm for medical display	18-40 kg	360° with stop, 500 mm² cable capacity (for DVI plugs)	
MD44i+	Injector arm Arm for medical display	22-44 kg	360° with stop, 500 mm² cable capacity (for DVI plugs)	

i = Spring Arms for changing payloads	MD23i, MD23i+, MD26i+, MD44i+ with additional friction brake and increased hand forces, allows for the same height position when the weight is being reduced (e.g. injector fluid reduction) The maximum weight that can be compensated by the additional friction brake is as following: → MD44i+: 4 kg → MD26i+: 2 kg → MD23i+: 2 kg
+ = Spring Arms with bigger diameter of pivot	L26+, MD21+, MD23i+, MD26+, MD26i+, MD40+, MD44i+ with bigger diameter of pivot for more space for cable routing and routing of bigger plugs

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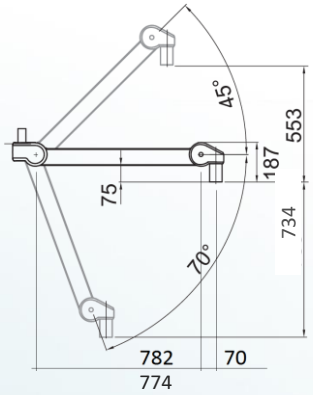
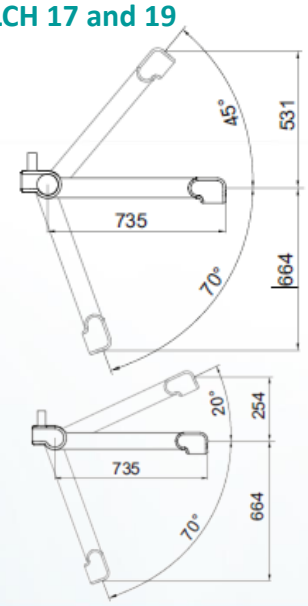
Technical Data *VALiA*

VALiA Spring Arms		
Feature	**Specification**	
Net weight Weight including electrics with the light arms Weight including 50 mm adapter (if needed)	• L21: 8.0 kg • L26+: 12.0 kg • LCH17: 6.7 kg • LCH19: 6.7 kg • LCH30: 9.4 kg • XRS15: 7.8 kg • XRS21: 7.8kg • MD21: 8.2 kg • MD21+: 7.8 kg • MD23i: 8.2 kg • MD23i+: 7.8 kg • MD26+: 12.2 kg • MD26i+: 12.2 kg • MD40+: 12.4 kg • MD44i+: 12.4 kg	
Length of spring arms	• L21, XRS15, XRS21, MD21, MD21+, MD23i+: 920 mm (782 mm from front joint axis to back joint axis) • L26+, MD26+, MD26i+, MD40+, MD44i+: 920 mm (774 mm from front joint axis to back joint axis) • LCH17/LCH19: 735 mm (from rotation axis of rear joint to end of spring arm) • LCH30: 687 mm (from rotation axis of rear joint to end of spring arm)	
Height adjustability of spring arms	L21, L26+, XRS15, XRS21, MD21, MD21+, MD23i, MD23i+, MD26+, MD26i+, MD40+, MD44i+	• +45° upwards, -70° downwards (1.288 mm)
	LCH17 LCH19	• 45° upwards, 70° downwards (1.195 mm) with limited payload (up to 90 Nm with LCH 17 up to 100 Nm with LCH19) • 20° upwards, 70° downwards (914 mm) with max. payload
	LCH 30	• 45° upwards, 70° downwards (1.107 mm) with limited payload (up to 200 Nm) • 20° upwards, 70° downwards (847 mm) with max. payload
Height stop of spring arms	Continuously height adjustable form 0-45°	
Locking Mechanism	On request	

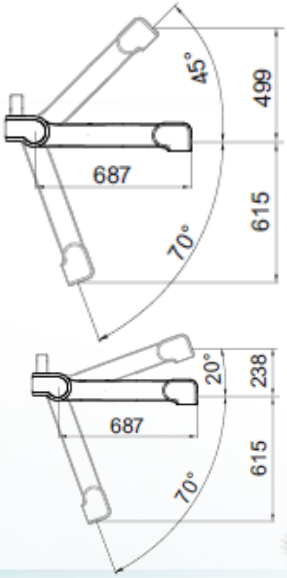
MD/ MD+/ L/ L+



LCH 17 and 19



LCH 30



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Technical Data VALiA

VALiA System		
Feature	**Specification**	
Brake system	„NoDrift Brake“, friction (Patent pending)	
Operating forces for surgical lights	• Horizontal: < 25N • Vertical: < 55N	
Bearing	Ceiling tube to extension arm: Extension arm to spring arm Spring arm to end device Spring arm to end device LCH17/LCH19 Spring arm to end device LCH 30	Ball bearing Needle bearing + Slide bearing Slide bearing Needle bearing + Slide bearing Needle bearing
Bushing VALiA S central axis	Ø 50 mm (interface extension arm - spring arm)	
Bushing VALiA C central axis	Ø 50 mm (interface extension arm - spring arm)	
Mark of conformity	CE	
Test symbol	UL	
Applicable standards	IEC 60601-1 Revision 3.1	
Contact resistances	75 mΩ for the complete system (spring arm, central axis, ceiling tube)	
Colours	• RAL 9002 • RAL 9010 • RAL 9016 • Other available upon request	

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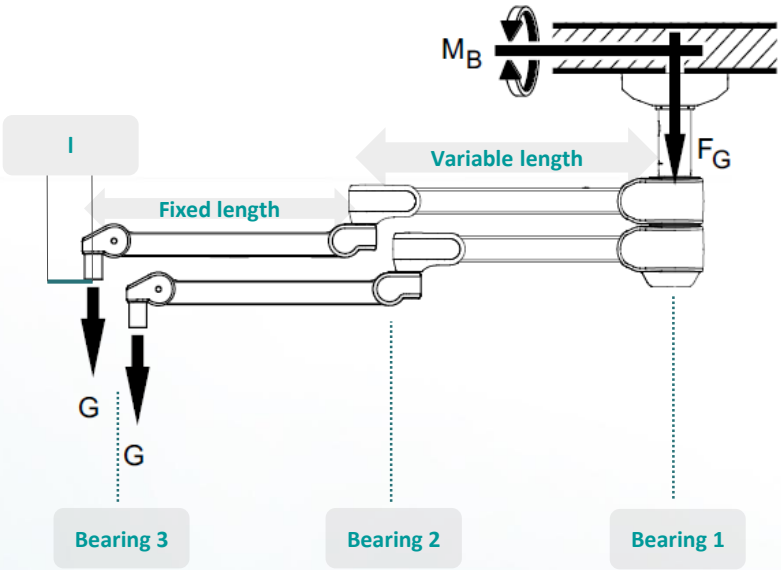
Notes regarding the payload specifications

The stated payloads refer to the front joint of the spring arm (bearing 3).
The maximum payload at bearing 3 is calculated from the maximum bending moment at bearing 1, the variable extension arm lengths and the fixed spring arm length (920 mm).
The calculation of the maximum payloads at bearing 3 are based on the ideal combination of payload and suitable spring arm (Example: Maximum payload 21 kg and spring arm L21 or MD21).

Note for using springs arms with payload > 21 kg Traglast at an axis position with up to 21 kg payload:
It is planned that at an axis position with a stated payload of 21 kg a spring arm with a payload of 21 kg is used.
Basically you can also mount and use a spring arm with a higher payload (e.g. MD40). Due to the higher weight of the bigger spring arm the payload at this position of the axis must be reduced by 5 kg.
Calculation example: If you use a spring arm with a payload of 26 or 40 kg instead of a spring arm with 21 kg payload at an axis position with a permissible payload of 18 kg, the permissible palyoad for this axis position has to be reduced from 18 kg to 13 kg. Spring arm MD 23 is an exception to this: There is no reduction of the payload needed because this spring arm has the same weight as the MD21 with 21 kg payload.

Notes regarding centric and eccentric load
1. Central Axis extension arms with payload up to 21 kg at front joint of the spring arm (bearing 3)
Eccentric load:
When you use a spring arm with a payload of ≥ 1,5 kg up to ≤ 21 kg at a Central Axis extension arms with a payload of up to 21 kg at the front joint of the spring arm, it is allowed to apply a bending moment of up to 30 Nm through the distance of the pivot to bearing 3.
Example: Bending moment with eccentricity: 21 kg x 9,81 m/s² x 0,14 m = 28,8 Nm (Means 140 mm distance of the center of gravity of the suspended load to the pivot at bearing 3)
Centric load:
If the payload is applied centrically under bearing 3, it is allowed to use a higher payload according to the payload chart (e.g. from MD21 with 21 kg to MD23i).

2. Central Axis extension arms with payload up to 40 kg at front joint of the spring arm (bearing 3)
Eccentric load:
When you use a spring arm with a payload of ≥ 26 kg up to ≤ 40 kg at a Central Axis extension arms with a payload of up to 40 kg at the front joint of the spring arm, it is allowed to apply a bending moment of up to 35 Nm through the distance of the pivot to bearing 3.
Example: Bending moment with eccentricity: 26 kg x 9,81 m/s² x 0,135 m = 34,4 Nm
Centric load:
If the payload is applied centrically under bearing 3, it is allowed to increase the payload about the value which is stated in the payload chart (e.g. from MD40+ with 40 kg MD44i+ when using an 1,500 mm long extension arm).



Abbreviation
G = Payload in kg
MB = Maximum bending moment
FG = Vertical force
l = Distance of center of gravity of suspended payload pivot to bearing 3

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Technical Data VALiA

Available Cables for VALiA Systems			
Type	**Description**	**Specification**	**Limitations** (see next page)
Video cable	HDMI	HDMI 2.0 (18 Gbit/s) HDMI 1.4 (10,2 Gbit/s) HDCP (High-bandwidth Digital Content Protection) Length: 2,2 m up to max. 7,5 m Resolution video: 4K/1080p, 60fps, 3D, HDR	Test*2
Video cable	Display Port 1.2 (DP)		Test*2
Video cable	DVI	DVI-D (Dual Link) Length: 1,0 m up to max. 7,5 m Resolution video: QXGA 2048x1536	Cabling*1 Test*2
Video cable	DVI → Fiber → DVI	DVI 1.0 (1,65 Gbit/s) Length: Standard 36 m up to max. 500 m	None*3
Video cable	DVI → Cat6A → DVI	DVI 1.0 (1,65 Gbit/s) Length: Standard 36 m up to max. 30 m	On request*4
Video cable	3G-SDI	KoaxCable: RG 179 Impedance: 75Ω Length: max. 10 m	Test*2
Video cable	12G-SDI		Test*2
Video cable	DP→ Fiber → DP	Display Port 1.2 Length: Standard 36 m bis max. 500 m	On request*4
Data cable	CAT6A	Plug type: RJ45 Cable: S/FTP (Screened Foiled Twisted Pair) Length: max. 30 m	Test*2
Data cable	USB 2.0 A/B USB 2.0 A/A	Plug type: A/B and A/A Length: max. 5 m	Test*2
Power cable	4 x AWG16	Number and cross section: 4 x 1,5 mm² Wire color: 3 x black, 1 x green-yellow Nominal voltage: 600 V	None*3
Power cable	3 x AWG16	Number and cross section: 3 x 1,5 mm² Wire color: 1 x brown, 1 x blue, 1 x green-yellow Nominal voltage: 600 V	None*3
Power cable	3 x AWG14	Number and cross section: 3 x 2,5 mm² Wire color: 1 x brown, 1 x blue, 1 x green-yellow Nominal voltage: 600 V	None*3
Others	Grounding	Number and cross section: 1 x 2,5 mm² Wire color: 1 x green-yellow	None*3
Others	Grounding	Number and cross section: 1 x 6,0 mm² Wire color: 1 x green-yellow	None*3

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Limitations Available Cables for VALiA Systems

Type	Explanation
Cabling	Cables with this restriction cannot be pulled through the VALiA S - system without removing the connector.
Test*[2]	The cable passed the test in test system by Ondal. Based on the properties of the cable and the mechanical load over its lifetime, a failure of the cable cannot be excluded. Cables with this test limitation can be replaced as spare parts in the event of a failure. In critical applications, cables with this restriction are not recommended without redundant protection.
None*[3]	Cable has been verified by Ondal.
On request*[4]	No lifetime tests currently available

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