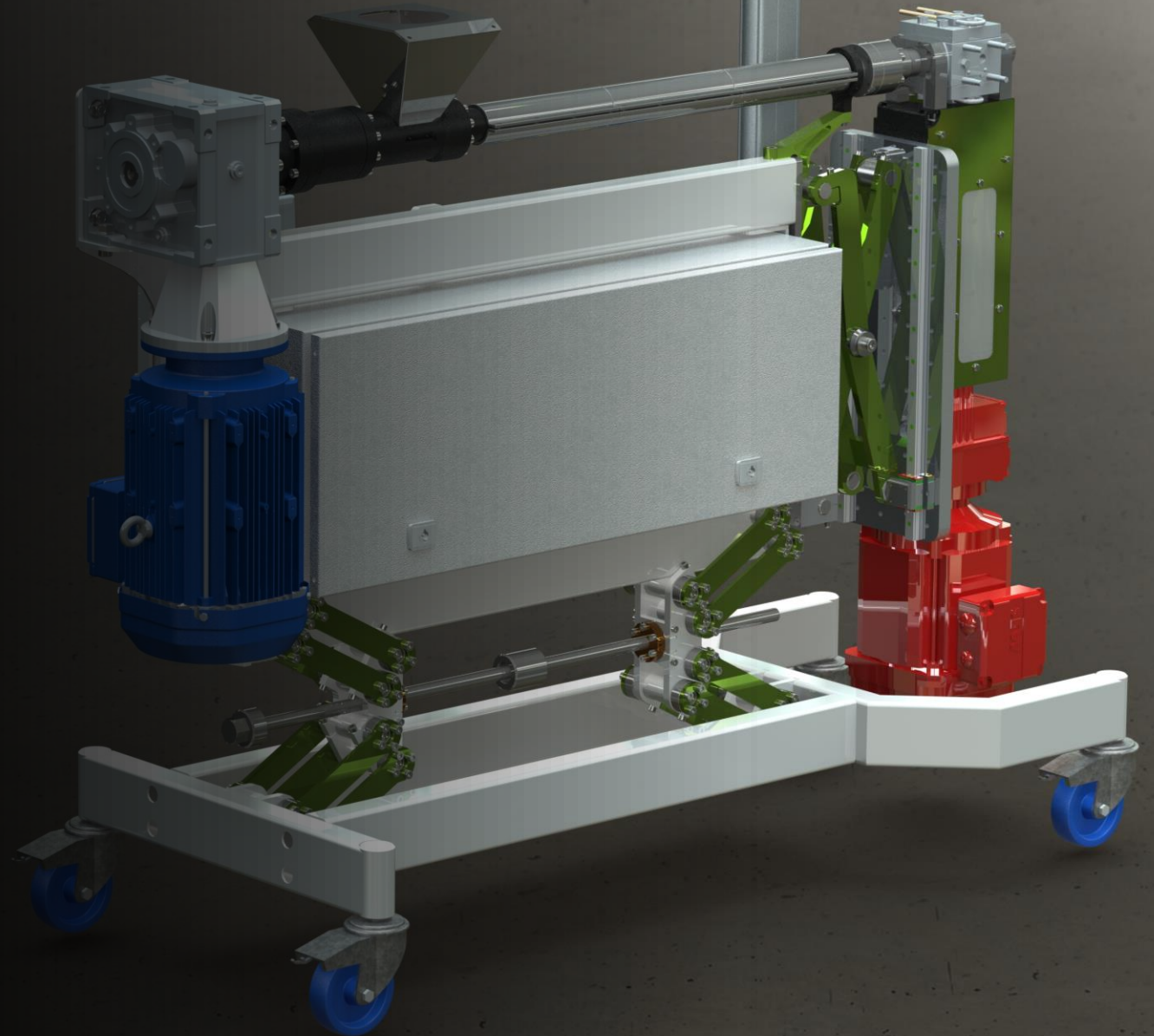




PBS Lab extruder MK1 design Overview

PBS Machinery x Flowlink x Rokoma
By Peter-Bas Schelling

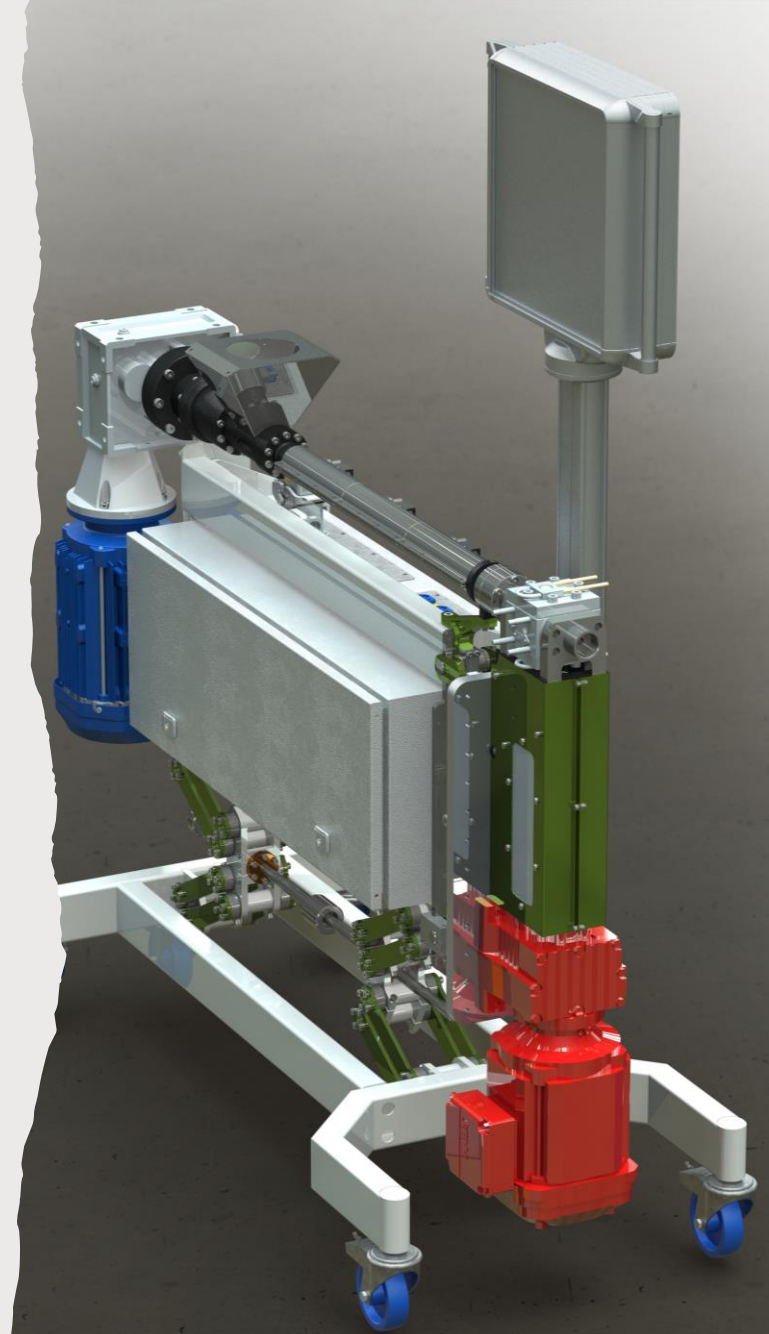
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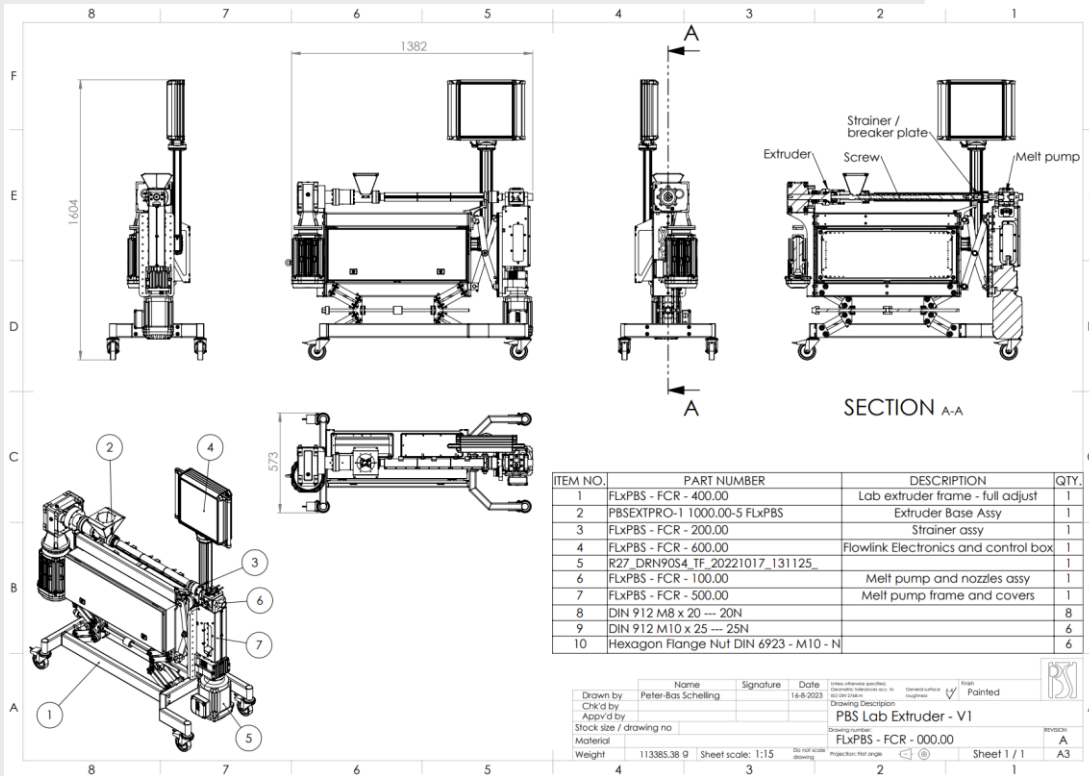
Extruder design

Main features

- Single screw extruder combined with a melt pump. This combination provides the following advantages:
 - Reduction of pultation
 - Reduced melt swirl
 - Precise control of troughput
 - High pressure output
- Automatic flow control based on setting a defined pump speed while controlling the pump input pressure by regulating the extruder speed.
- Flow control system by Flowlink BV featuring Flow-Connect.
- Frame design with integrated electronics and control box. Frame designed to be adjusted in height
- Featured and easily adaptable.
- Low weight, mobile and compact!



Extruder design pump technical specs



Specs Lab extruder PBS Machinery / Flowlink

Machine description	Single Screw extruder combined with a melting pump, controlled by a Flowlink "Flowconnect" system. Lightweight and mobile design.		
Machine Flow control description	Automatic flow control based on setting a defined pump speed while controlling the pump input pressure by regulating the extruder speed.		
Physical specs	Weight	150kg	Approximation
	Length	1210mm	Length without melt pump
	Width	580mm	
	Height	1610mm	Min height lowest frame position
	Min. Nozzle height from floor	933mm	
	Max. Nozzle height from floor	1053mm	With height adjustment fully extended
Power specs	Machine Voltage	400Vac	3 phase
	Extruder motor power	3000W	
	Extruder heating power	1800W	
	Melt pump motor power	1100W	
	Melt pump heating power	800W	
	Total peak power consumption	6700W	
	Rated peak current	16,75A	
	Heating zones extruder	3	
	Heating zones melt pump	1	
	Screw diameter	30mm	Standard multi-purpose with option for mixing tip
Extruder specs	Length of screw (mm)	790mm	
	Effective screw length	600mm	
	Screw L/D ratio	20	
	Extruder motor Type	Euronorm DS100M2/IEC/FF215/TF	
	Extruder reductor type	Euronorm Hypoide JKM48B	
	E-motor torque @ 50 hz	10,1Nm	
	Gearbox reduction	15	
	Extruder motor efficiency	87,1%	
	Extruder reductor efficiency	92%	
	Effective Screw torque @ 50 hz	121,25Nm	Other ratios available
Melt pump specs	E-Motor speed @ 50 hz	2840RPM	
	Screw speed @ 50 hz	189rpm	
	Motor shaft diameter	30mm	
	Motor reductor output shaft type	Hollow	
	Melt pump motor type	SEW-Eurodrive R27 DRN90S4/TF	
	Pump motor torque @ 50 hz	7,22Nm	
	Motor efficiency	84,5%	
	Motor speed @ 50 hz	1455RPM	
	Gearbox reduction	10,13	
	Output speed @ 50 hz	144RPM	
Melt pump specs	Effective output torque @ 50 hz	61,8Nm	
	Pump stroke / rev	2,78CC/rev	
	Volumetric efficiency	95%	
	Max theoretical troughput pump	379,3CC/min	
	Max rated pump output pressure	22760,0CC/hr	

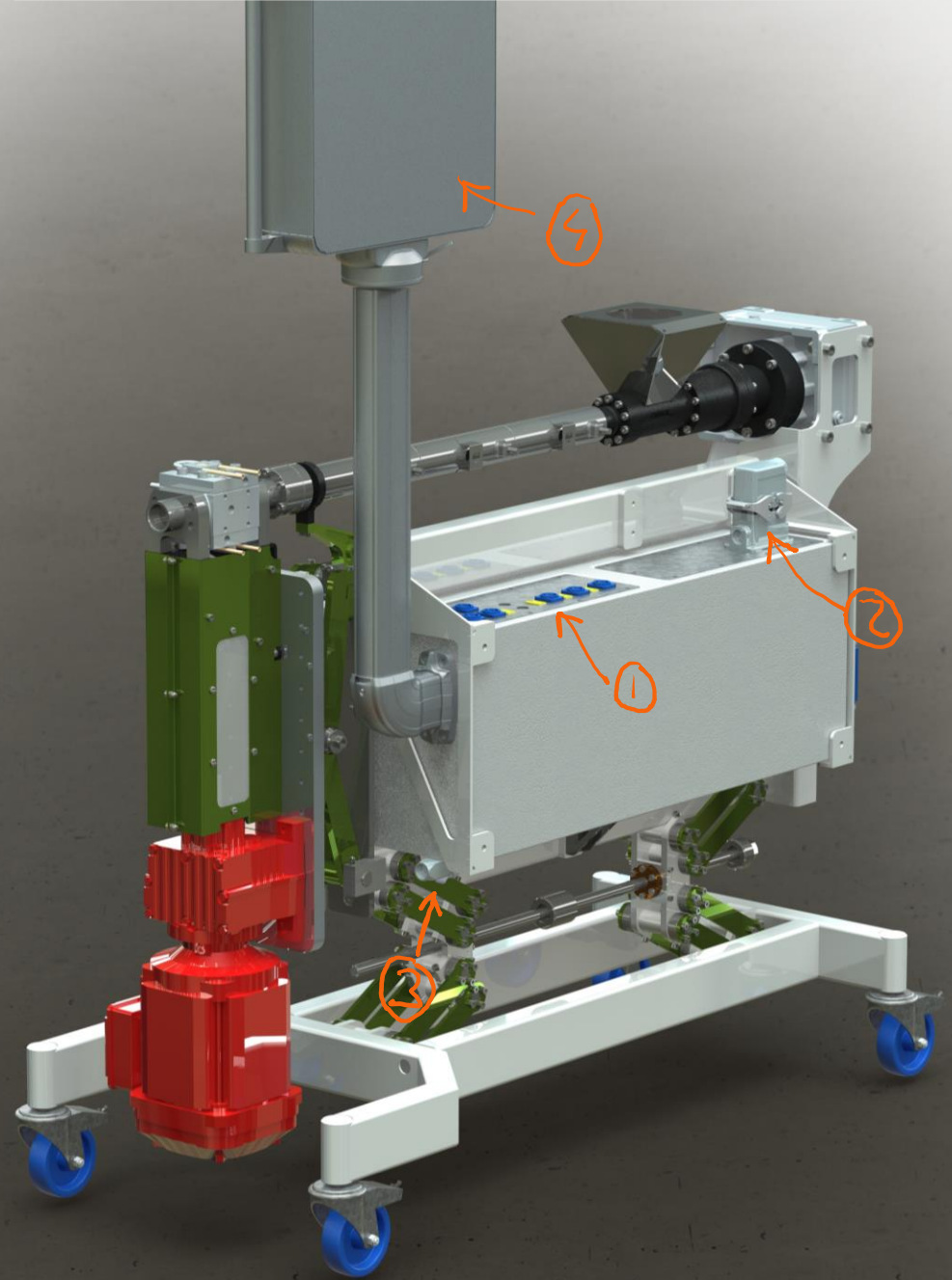
Extruder design

Electronics

All heating elements, motors, sensors and other electrical components are fitted with plugs for easy maintenance. All are located on the top or bottom side of the electronics box (1)

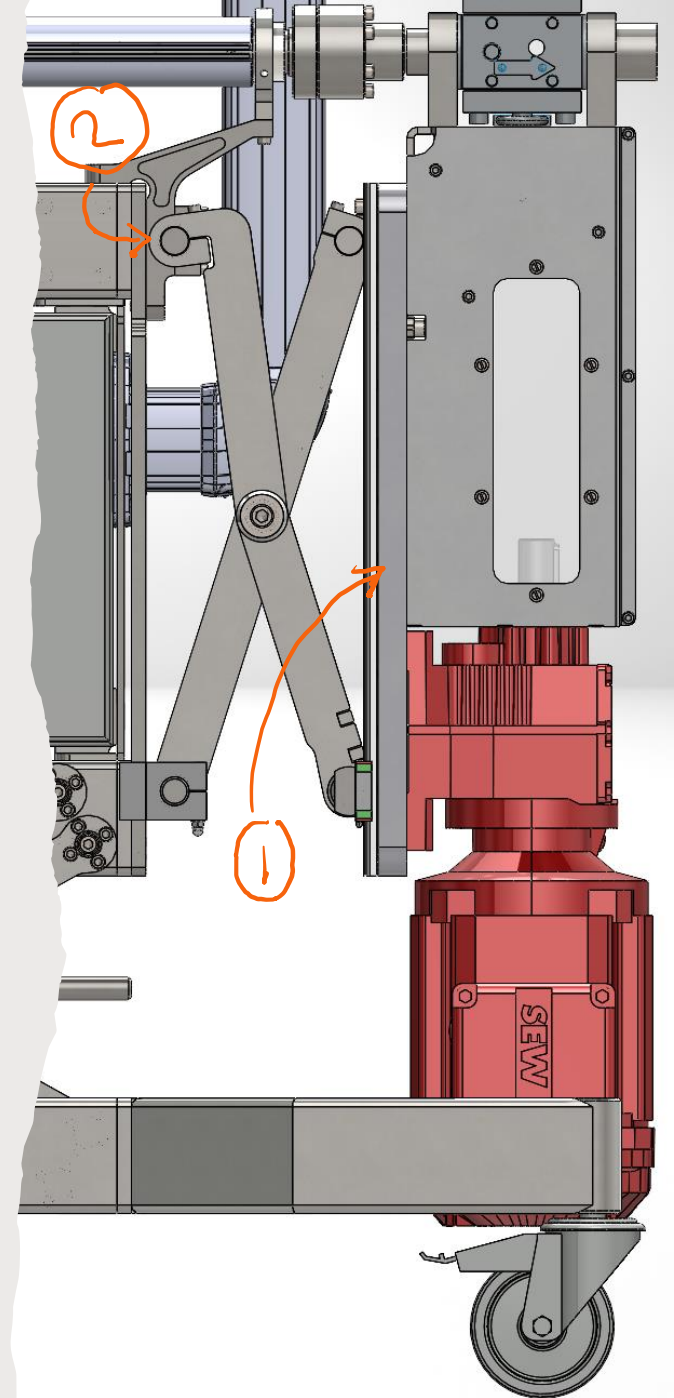
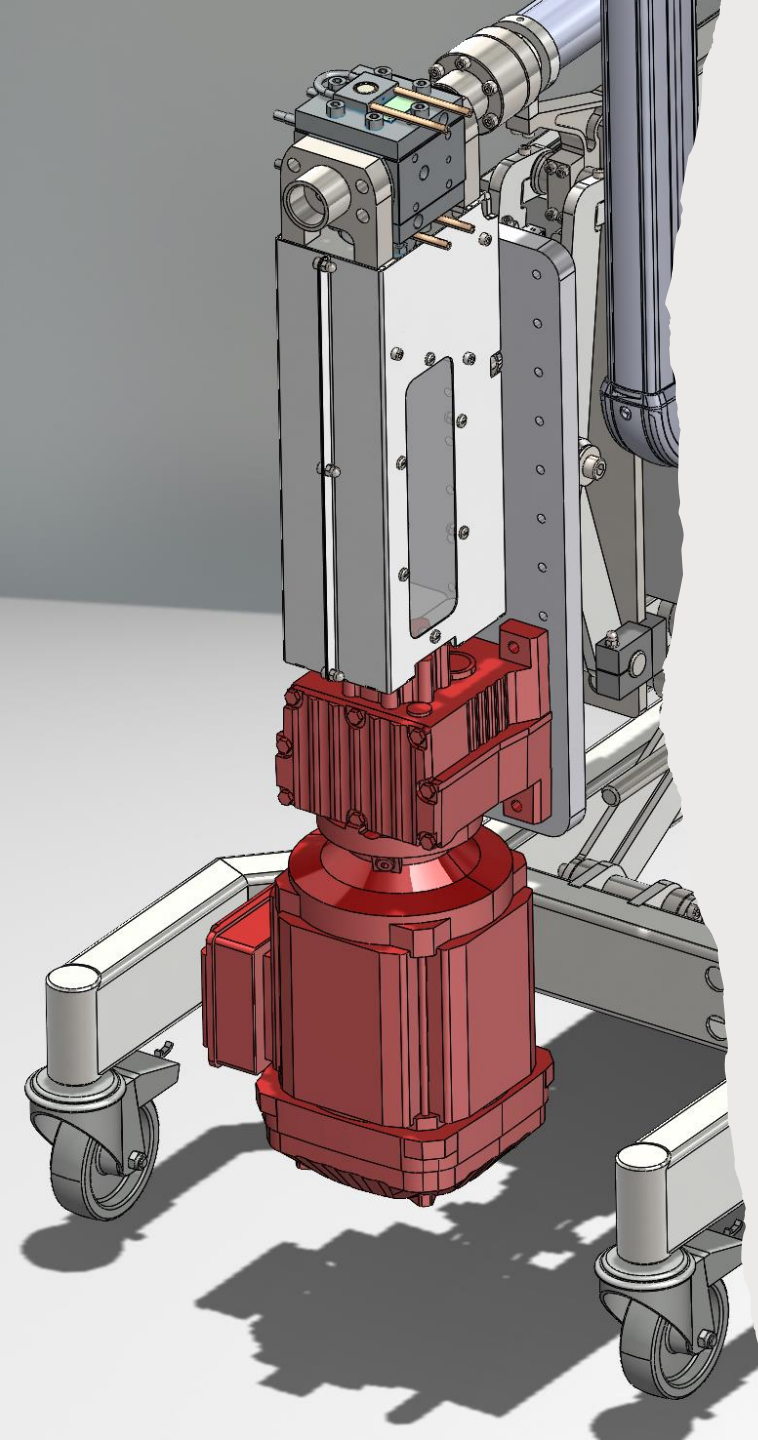
- 3 Heating zones for extruder heating
 - 3x bandheaters (800 W each)
 - 3x bayonet J-type thermocouples with plugs
- 1 heating zone melt-pump
 - 4x heaters cartridges 200W
 - 1x bayonet J-type thermocouples with plugs
- 1x Harting connector extruder motor (2)
- 1x Harting connector melt-pump motor (3)
- 2x Connector for melt-pressure sensors
- Monitor arm with swiveling control panel (4)

More inputs and outputs are available on request.



Extruder design horizontal lift

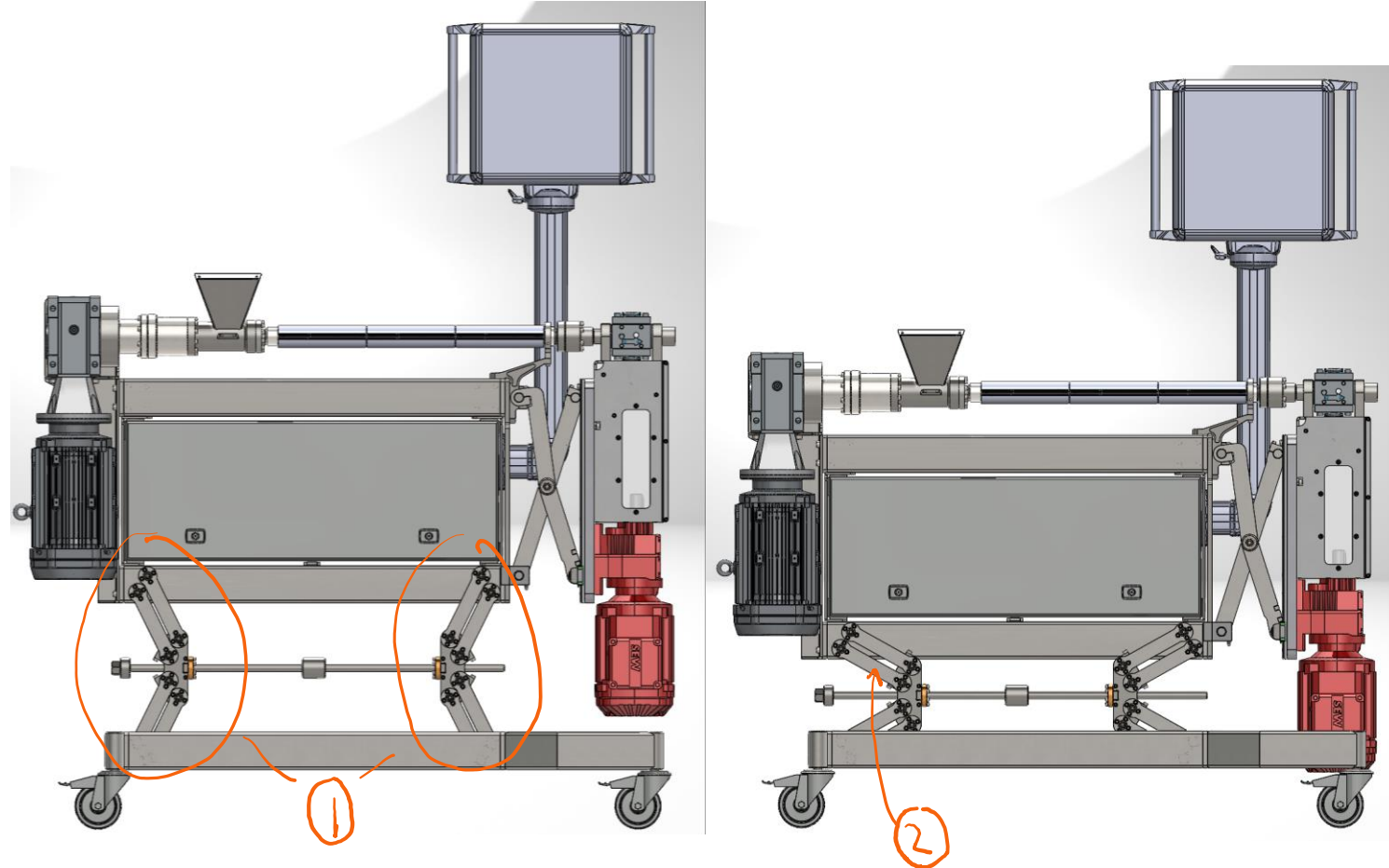
- The melt pump and drive train are mounted on a horizontal lifting table (1). This allows for easy switch overs and disconnection of melt pump from extruder by a single operator.
- The horizontal adjustment allows for flexibility in fitting auxiliary equipment between the extruder and pump like:
 - Static mixers
 - Breaker plates / filters
 - Valves
 - Measuring equipment
- The mounting plate (1) is provided with a M8 hole pattern to allow for mounting of additional equipment, molds, dies and whatever is needed.
- The entire horizontal lift assembly can be removed by removing the upper rear hinge cap (2)



Extruder design

Height adjustment

- Knee-system for height adjustment (1), Adjustable with spindle system. Can be adjusted using a ratchet with a 27mm bit
- Current prototype adjustment stroke is +/- 120 mm. Can be increased by increasing the length of the linkages (2)



Prices and options

- TBD

