

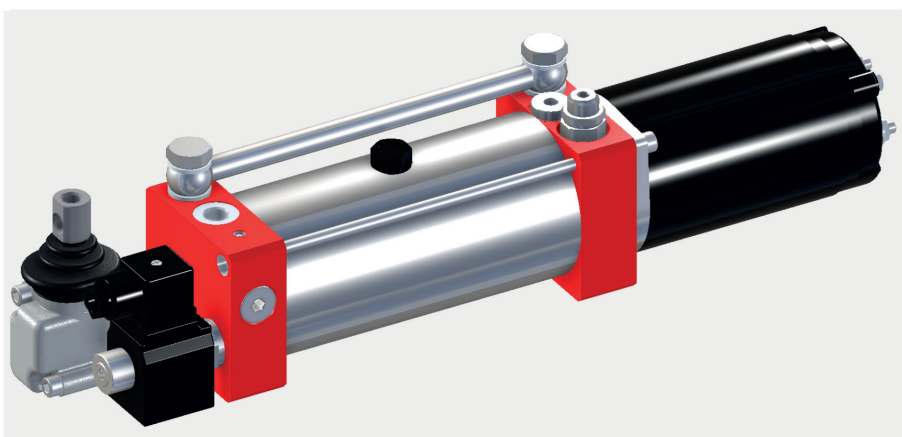
Technical article, O+P, OEM Off-highway and Progettare

## UP40 Mini Power Pack

We developed the UP40 mini power pack with the aims of bringing the hydraulic control closer to the drive and achieving a continually more compact envelope. Compared with other products in this market segment, its dimensions have been reduced to a minimum.

The external dimensions of 80x80 mm are basically defined by the extruded aluminium profiles that are used. We made significant efforts to keep within these dimensions while developing the various hydraulic circuits that are feasible. Dimensions that project outside that profile, possibly due to valve contours and accessories, are arranged on one side only.

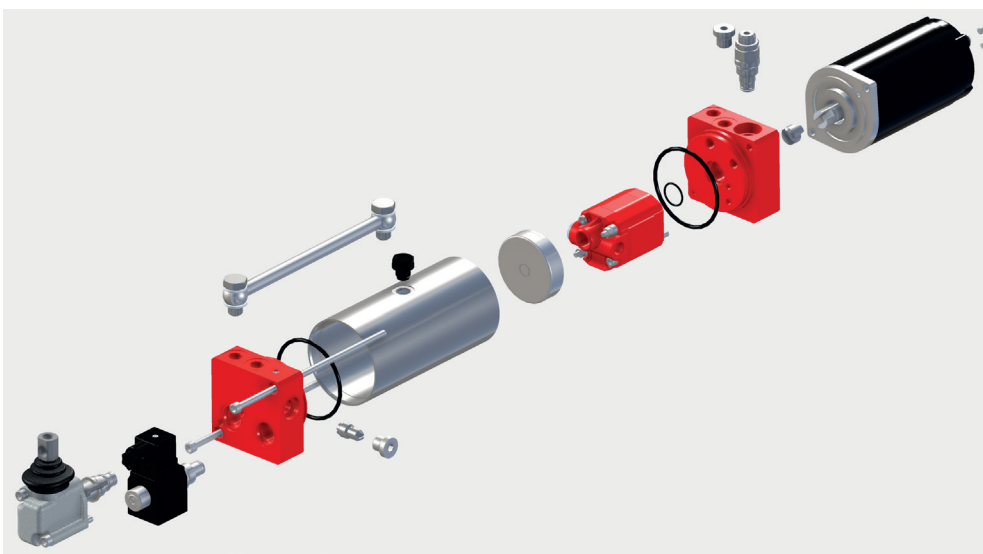
The power unit comes in various lengths, however, resulting from the differing lengths of the electric motors and the various capacities of the tank, which consists of a simple, 80 mm diameter extruded aluminium tube and is mounted between the front and rear hydraulic control blocks. In addition, there are the dimensions of the rear hydraulic control block, in which the majority of the hydraulic circuit is incorporated.



The concept is based on a normal mini power pack consisting of an external gear pump driven by a DC electric motor. The oil flow supplied by the pump depends on the pump displacement, the speed of the electric motor, and the respective operating pressure. The gear pump can be a unidirectional or reversible type.

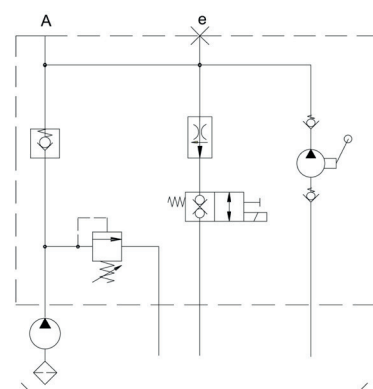
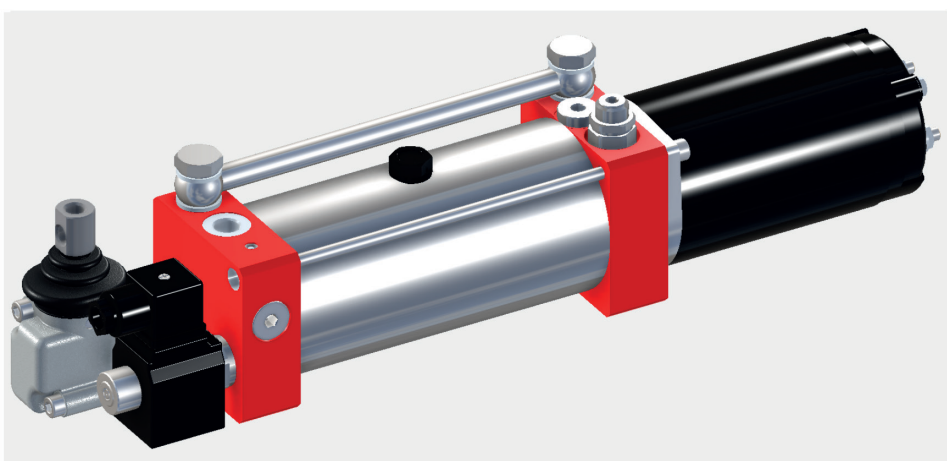
The power unit with unidirectional pump consists of a standardised front control block containing the adjustable relief valve and a check valve. These two cartridge valves are virtually always required in the hydraulic circuits, and for exactly this reason it was decided to integrate them into the front control block. This block is always installed, and it is also used as the connecting element between the hydraulic pump and the electric motor.

From the front hydraulic control block, the oil flows to the rear block through a pipe. The rest of the hydraulic circuit is arranged in the rear hydraulic control block. Some variants are already included in our catalogue.

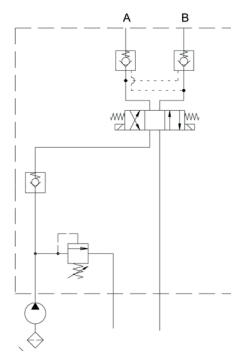
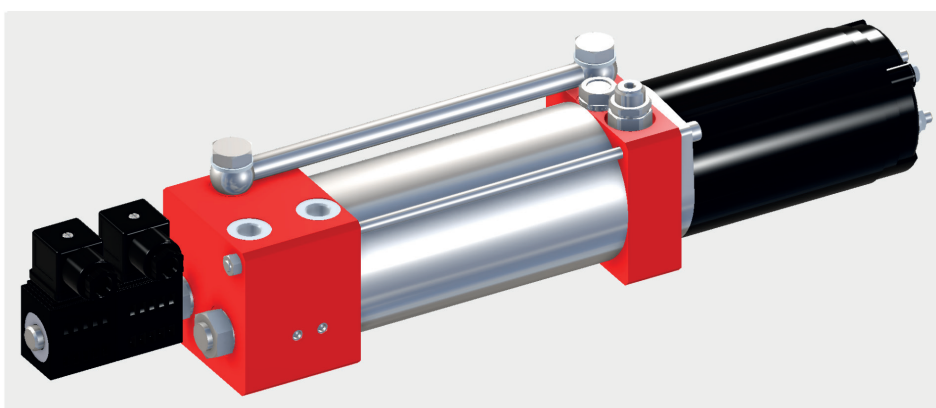


The single-acting version includes a rear control block in which a 2/2 seat valve and a pressure compensated 2-way flow control can be incorporated. This arrangement can also be supplemented with an integral emergency hand pump.

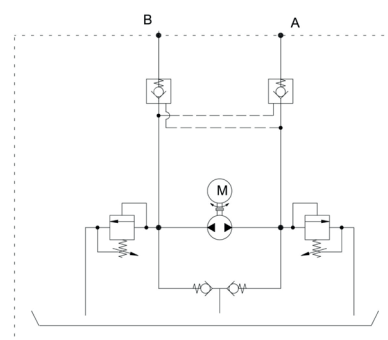
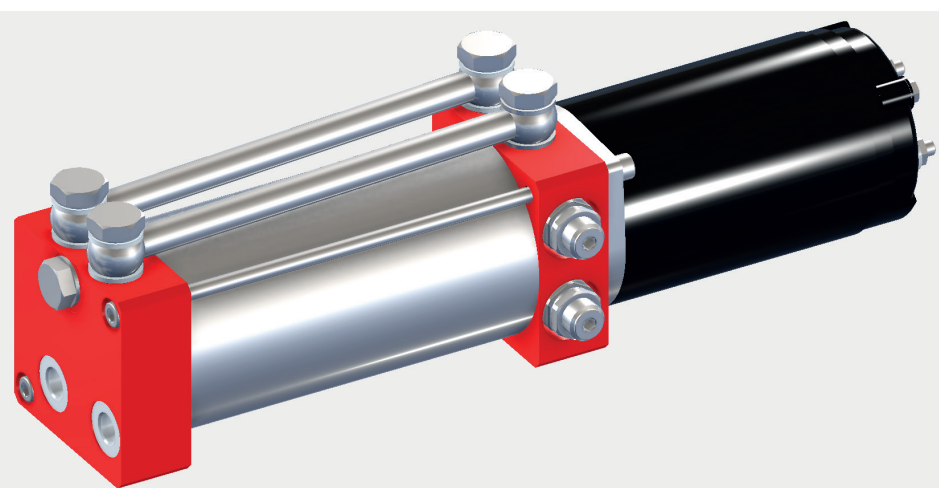
This version is often used for laterally mounted under-chassis wheelchair lifts. In view of the very compact dimensions of the power unit and its quiet operation, it can be mounted either inside or outside the vehicle cab (with appropriate safeguards in the case of outside installation).



A version featuring a 4-way spool valve with 2 or 3 spool positions for controlling double-acting cylinders is already scheduled. This will also include the ability to fit a double pilot-operated check valve to minimise the effect of the leakage that is characteristic of spool valves.

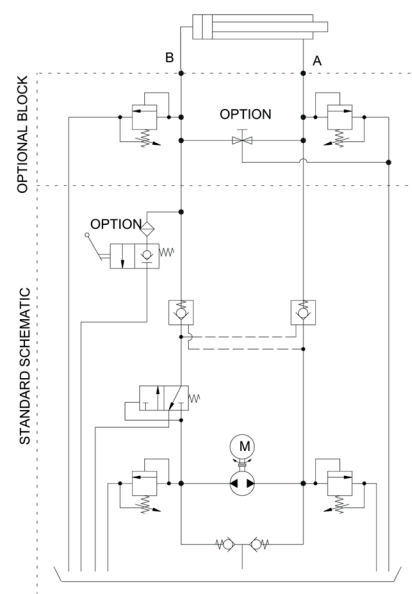
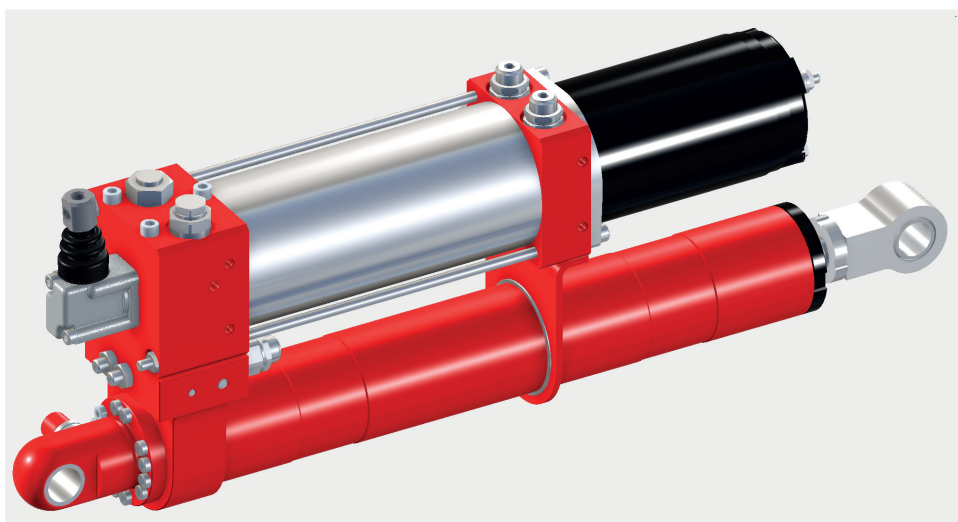


In contrast, the version for reversible pumps features a front control block with a double pressure relief valve and double pressure pipes taking oil to the rear hydraulic control block. The suction-side check valves are located on the rear cover of the gear pump, while the optional double pilot-operated check valve is located on the rear hydraulic control block.



The external gear pumps – unidirectional as well as reversible – for this type of power unit are part of the 05 series, with displacements from 0.25 ccm/rev to 0.9 ccm/rev. Higher displacements are available, but their power requirements are not matched by the ratings of the electric motors used.

The permanent-magnet electric motors provided at the moment are available in 12 VDC or 24 VDC versions (48 VDC on demand), with power ratings of 0.5 kW (80 mm dia.) or 0.8 kW (85 mm dia.) and standard protection class IP54. For specific projects, special configurations with other power ratings and/or classes of protection can also be considered.



Thanks to its design, this mini power unit is also ideally suited for direct combinations of power unit + cylinder. As a result, the installation dimensions in machines can be significantly reduced, as there are no hydraulic pipes or hoses. It is also important to note that the UP40 power unit can be in-stalled either horizontally or vertically.

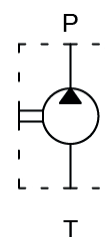
Potential applications for which this UP40 Mini Power Unit is particularly suitable include hydraulic wheelchair lifts, small tail lifts for lorries, stretchers for special emergency transports, gate openers, capstans, small hand pallet trucks and many other applications where the hydraulic power unit must be extremely compact.

## Key technical features

### Gear pump

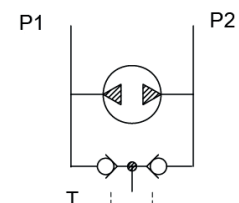
Unidirectional (standard)

AP05	Displacement		Order code	L		Max. pressure						n. min.		n. max.
Pump type S439	cm <sup>3</sup> / rev	in <sup>3</sup> / rev				P1		P2		P3		P<100 bar	P>100 bar	P>P1
				mm	in	bar	PSI	bar	PSI	bar	PSI			
AP05/0.25 S.439	0.25	.015	200100294303	77	3.03	170	2460	180	2610	200	2900	800	3000	7000
AP05/0.5 S.439	0.5	.031	200100394303	79	3.11	190	2750	210	3040	230	3330	650	3000	7000
AP05/0.75 S.439	0.75	.046	200100494303	81	3.19	190	2750	210	3040	230	3330	650	1500	7000
AP05/0.9 S.439	0.9	.055	200100594303	82.5	3.25	190	2750	210	3040	230	3330	650	1500	7000



### Reversible

APR05	Displacement		Order code	L		Max. pressure						n. min.		n. max.
Pump type S439	cm <sup>3</sup> / rev	in <sup>3</sup> / rev				P1		P2		P3		P<100 bar	P>100 bar	P>P1
				mm	in	bar	PSI	bar	PSI	bar	PSI			
APR05/0.25 S.439	0.25	.015	200100294401	77	3.03	170	2460	180	2610	200	2900	800	3000	7000
APR05/0.5 S.439	0.5	.031	200100394401	79	3.11	190	2750	210	3040	230	3330	650	3000	7000
APR05/0.75 S.439	0.75	.046	200100494401	81	3.19	190	2750	210	3040	230	3330	650	1500	7000
APR05/0.9 S.439	0.9	.055	200100594401	82.5	3.25	190	2750	210	3040	230	3330	650	1500	7000



### Aluminium tanks

Nominal capacity		Type/Code		L		L1				Suction capacity	
l	cu inch	Type/Code		mm	in	K1-K4-K50		K5		Horizontal	Vertical
						mm	in	mm	in		
0.5	30.5	L-005R	200672010010	150	5.91	180	7.09	190	7.48	0.45	0.45
1.2	83	L-012R	200672090020	325	12.79	355	13.98	365	14.37	1.15	1.15
1.5	91.54	L-015R	-	355	13.98	385	15.16	395	15.55	1.15	1.15





For further information please do not hesitate to contact us or to visit our website:  
[www.bucherhydraulics.com](http://www.bucherhydraulics.com)

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