


## Slide 1






**Application of  
the EV4-vvuf solution  
to hydraulic lifts**

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## Slide 2




### Contents

- ✓ Elevator control valves
- ✓ Green lift concept
- ✓ Application of the new method
- ✓ Examples
- ✓ Conclusions

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## Increasing Energy prices & Environmental Awareness




EU consumption rates


More importance is being placed on **Efficient use of energy**



Environmental directives will extend to include lifts soon!




Energy policies change





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How Green is it?



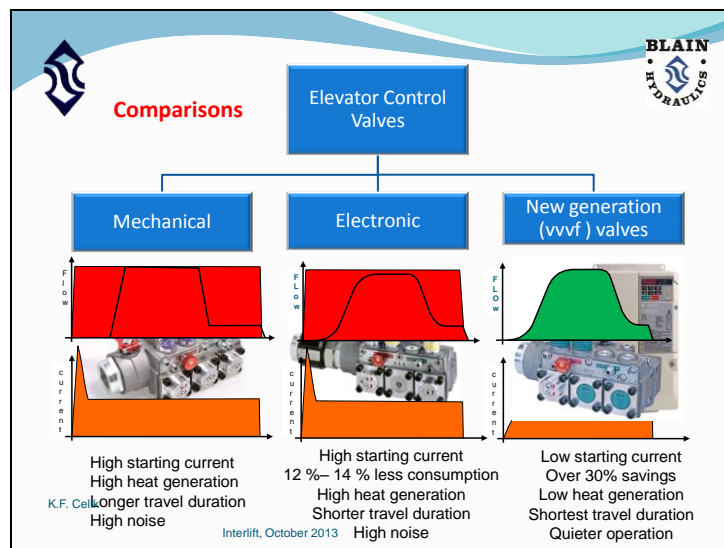


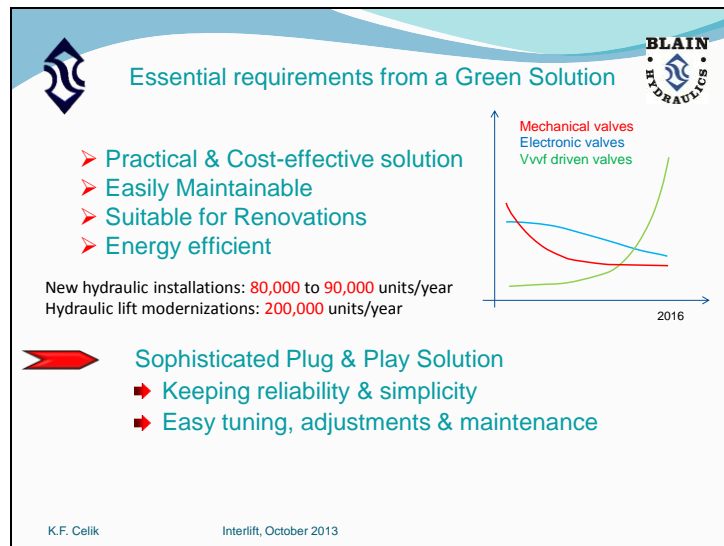
Energy efficient  
Energy saving  
Machine Room-less  
Green Innovation  
Green Solution  
Innovative Solution  
& ...



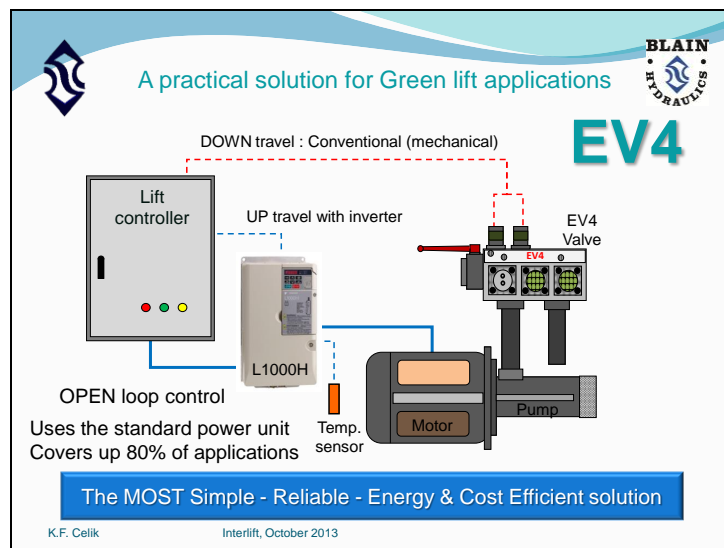
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Value of a product is related to the energy spent to make this product.  
If the cost is too high then it is not a product but an art.  
Price & Quality drives the market. As they are met we expect an asymptotic increase in sales of vvvf driven valves.







### YASKAWA L1000H inverter offers:



**QUALITY  
RELIABILITY  
& Excellent  
PERFORMANCE**

- ✓ **10 years** maintenance free operation
- ✓ Lowest stand-by energy consumption
- ✓ Superior open loop control
- ✓ Special EV4 hydraulic lift software
- ✓ No interface with the control valve
- ✓ Compatibility with all lift controllers
- ✓ Can be safely shut-down 54 times/day
- ✓ Easy set-up & menu structure
- ✓ World-wide service





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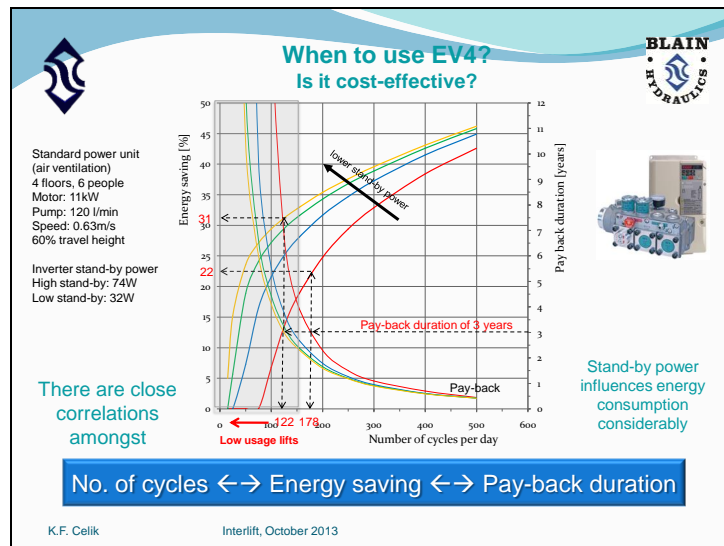


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Amongst these there are very important properties that aYaskawa inverter possesses.







Pay back duration depends on the initial investment, how much more I have to pay for the Green Solution?

If energy saving mode is used Energy savings increase and pay-back curves shift to the left.




### Features of EV4

- ✓ Cost effective
- ✓ Simple to implement
- ✓ No encoders in the shaft and on the motor
- ✓ Full Load & Temperature compensations
- ✓ Accurate speed control
- ✓ Much less heat generation
- ✓ Superior Energy Saving Mode
- ✓ Open Loop Control
- ✓ Quieter operation
- ✓ Smoother ride
- ✓ Excellent stopping accuracy
- ✓ Ideal for renovations
- ✓ No valve adjustment in up direction
- ✓ No need for soft starters

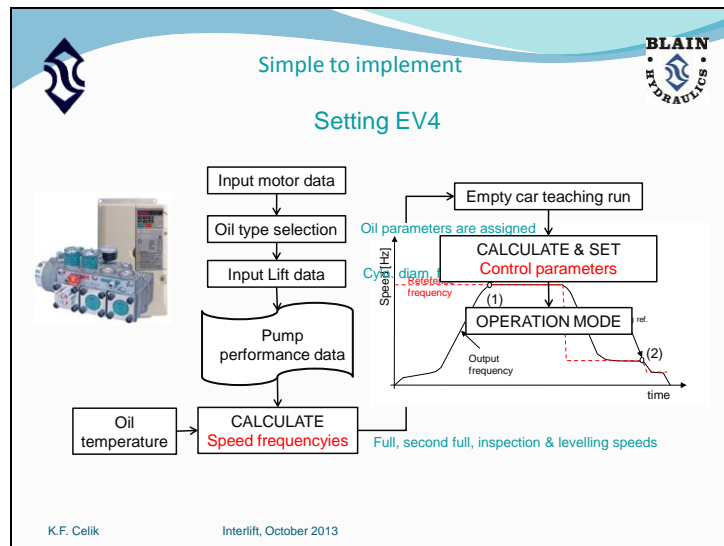


**A sophisticated solution for Green Lift applications**

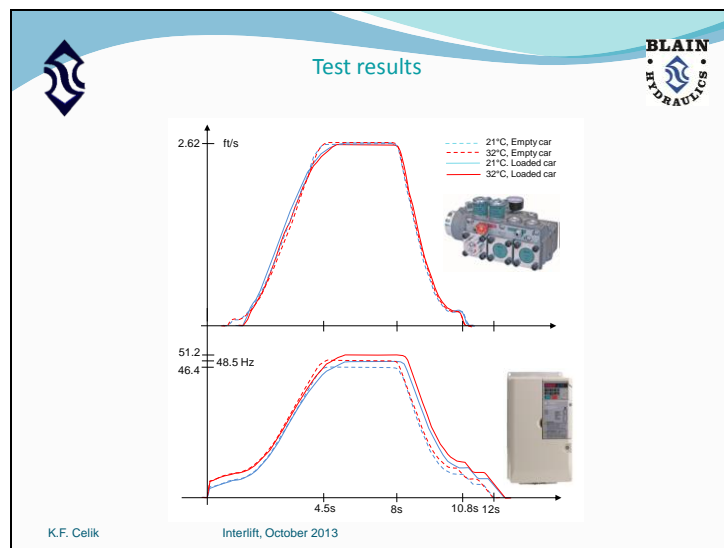


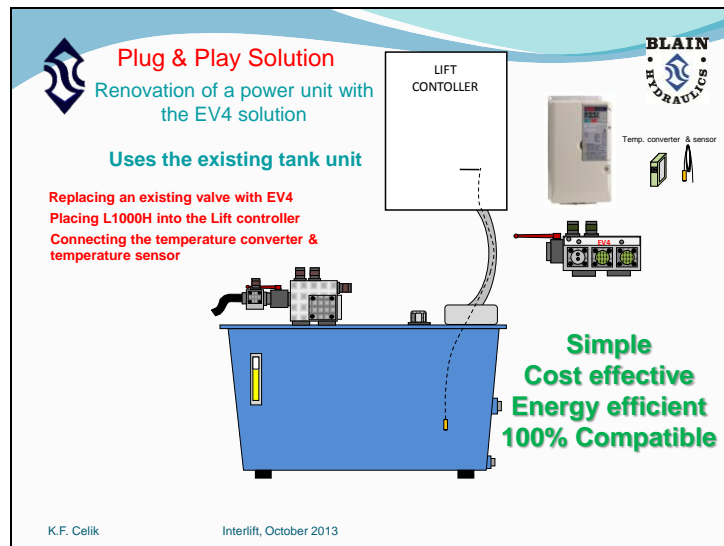
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No need for a loaded car run.





The diagram illustrates the renovation of a hydraulic power unit. A blue power unit is shown with a multi-port valve assembly on top. A lift controller is connected to the unit via a cable. A box labeled 'EV4 Renovation kit' is shown next to the unit. The text 'Ideal for Renovations' is displayed in green. The BLAIN HYDRAULICS logo is in the top right corner.

**Plug & Play Solution**  
Renovation of a power unit with the EV4 renovation kit  
Uses the existing **BLAIN** valve  
Converting an existing Blain valve to EV4 (<5 min.)

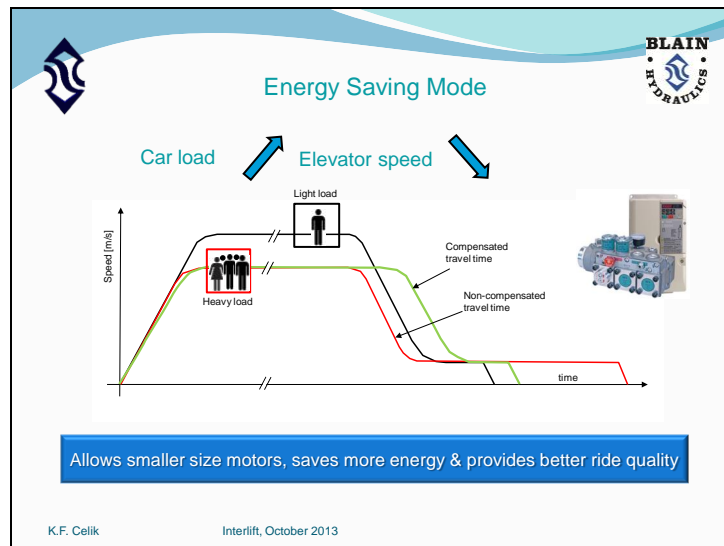
LIFT CONTROLLER

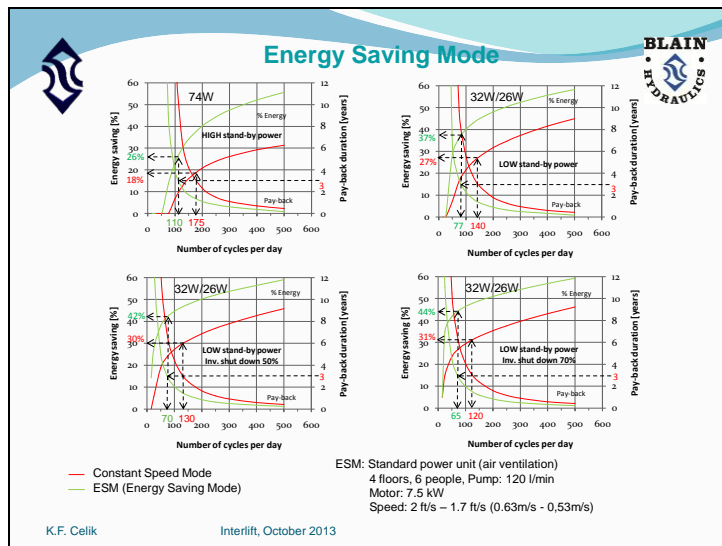
EV4 Renovation kit

**Ideal for Renovations**


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### Benefits of Energy Saving Mode

	50 cycles		100 cycles		150 cycles		250 cycles		400 cycles	
	CSM	ESM	CSM	ESM	CSM	ESM	CSM	ESM	CSM	ESM
High stand-by power	NA	NA	6%	22%	20%	34%	23%	44%	29%	53%
<b>Pay-back time</b>	NA	NA	14 > years	4.5 years	4 years	1.8 years	1.6 years	11 months	12 months	6 months

	50 cycles		100 cycles		150 cycles		250 cycles		400 cycles	
	CSM	ESM	CSM	ESM	CSM	ESM	CSM	ESM	CSM	ESM
Low stand-by power variable speed	NA	30%	22%	40%	27.5%	45%	34%	51%	42%	56%
<b>Pay-back time</b>	NA	6 years	5.8 years	2.3 years	2.9 years	1.6 years	1.3 years	6 months	6 months	4 months

	50 cycles		100 cycles		150 cycles		250 cycles		400 cycles	
	CSM	ESM	CSM	ESM	CSM	ESM	CSM	ESM	CSM	ESM
Low stand-by power variable speed, 70% shut-down	24%	40%	29%	46%	33%	48%	37%	53%	44%	56%
<b>Pay-back time</b>	12 > years	4.8 years	4 years	2 years	2.4 years	1.2 years	1.2 years	5 months	5 months	4 months

CSM : Constant Speed Mode, ESM : Energy Saving Mode


55% energy saving & shortest pay back duration

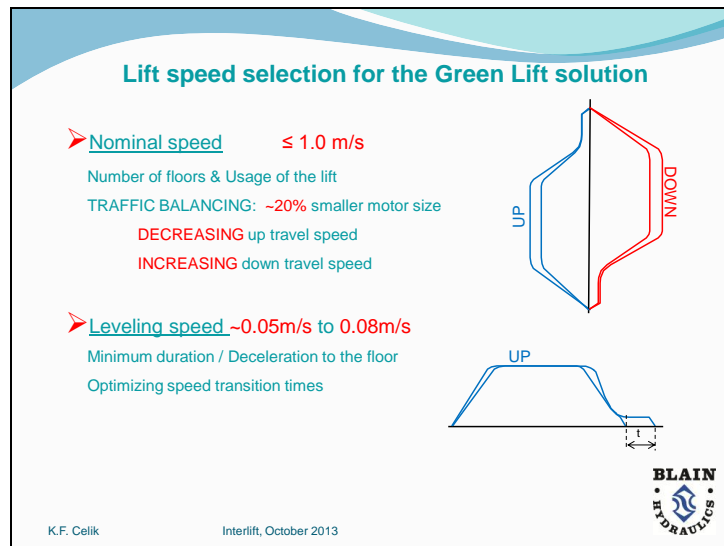
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### Motor & pump selection for the Green Lift solution


- Induction motor selection
  - submersible motor efficiency ~70% to 80%
  - External motor efficiency ~ 95%
  - Flywheel → ~ 15% to 20% lower performance
- Overloading → ~30% for 60s.
- Maximum working pressure < 40bar (leakage)
- Oil temperature < 40°C (motor & pump performance)

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Remember: Traffic balancing is always possible by decreasing up travel speed and increasing down travel speed.




### Examples for the application of EV4

**Example 1**  
 Fire fighter building in Sittard, Holland,  
 2 floors, **NEW INSTALLATION**  
 Nominal speed: 0.15m/s (Fix speed), Indirect  
 Capacity 630 kg, 100 cycles/day  
 Static pressure range : 17bar to 37bar  
 Pump flow: 33 lpm,  
 Motor size: 2.9kW, 3P, 400V,  $I_{nom}$ : 6.4A, 50Hz


**3kW L1000H drive,  $I_{nom}$ : 7A**  
 With two speeds  
 Fixed speed

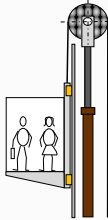



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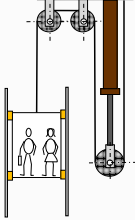





### Examples for the application of EV4

**Example 2**  
 Old people house, Stoke-on-Trend, UK  
 3 floors, **RENOVATION**  
 Nominal speed: 0.35m/s (Fix speed), Indirect  
 Capacity 630 kg, 120 cycles/day  
 Static pressure range : 15bar to 28bar  
 Pump flow: 100 lpm,  
 Motor size: 7.7kW, 3P, 415V,  $I_{nom}$ : 17.8A, 50Hz

**7.5kW L1000H** drive,  $I_{nom}$ : 18A  
 Low motor efficiency  
 Instead:  
**6.0kW** motor,  $I_{nom}$ : 14.5A  
**5.5kW L1000H** drive  
 With two speeds  
 up to 75% load  $V=0.35m/s$ ,  
 at 100% load  $V=0.30m/s$   
 ~ **1.3** years shorter pay-back duration

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### Examples for the application of EV4


**Example 3**  
Goods lift, Ireland.  
7 m travel distance, **NEW LIFT**  
Speed: 0.35m/s- 0.30m/s (Variable speed),  
Direct acting, 3-stage telescopic ram,  
Capacity 2800 kg, 320 cycles/day  
Static pressure range : 11bar to 43bar  
Pump flow: 180 lpm,  
Motor size: 14.7kW, 3P, 415V,  $I_{nom}$ : 32A, 50Hz

**15kW L1000H** drive,  $I_{nom}$ : 31A  
up to 85% load  $V=0.35m/s$ ,  
at 100% load  $V=0.28m/s$


Using a fix speed of 0.35 with a higher  
size motor and inverter would  
increase the payback

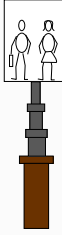


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## Conclusions

**EV4 solution is:-**

- ✓ Simple to install
- ✓ Easy to set-up & maintain
- ✓ Inexpensive (~ 4 times of mechanical & 1.7 times of electronic)
- ✓ Plug & Play solution (suitable for renovations)
- ✓ Reliable (keeps the advantageous characteristics of conventional hydraulic elevator)
- ✓ Energy efficient (minimum stand-by energy consumption & special functions)



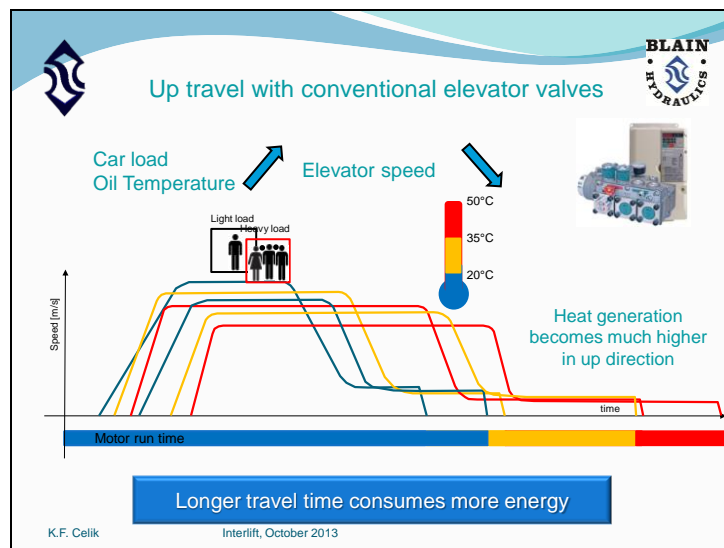
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Solution : Coolers





## Green Innovation

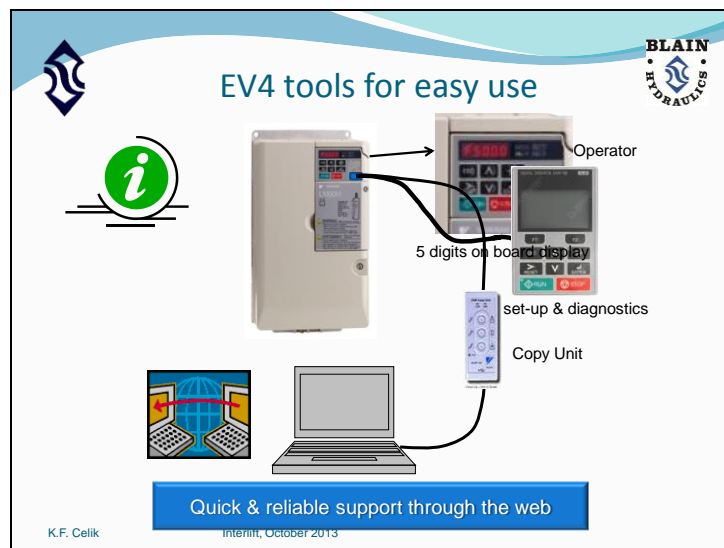
The feature belongs to those who see possibilities before they become obvious

# EV4



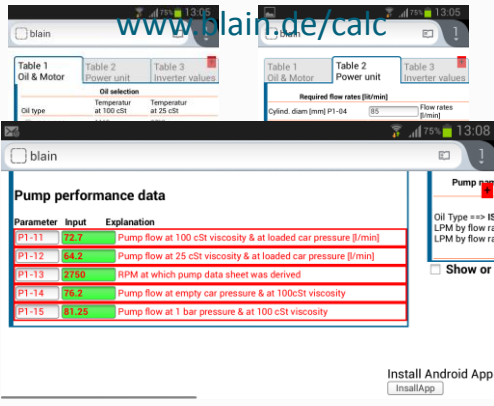

Innovated & Engineered by  
BLAIN HYDRAULICS & YASKAWA EU

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## Tools for easy use

[www.blain.de/calc](http://www.blain.de/calc)

Parameter	Input	Explanation
P1-11	72.7	Pump flow at 100 cSt viscosity & at loaded car pressure [l/min]
P1-12	64.2	Pump flow at 25 cSt viscosity & at loaded car pressure [l/min]
P1-13	2780	RPM at which pump data sheet was derived
P1-14	76.2	Pump flow at empty car pressure & at 100cSt viscosity
P1-15	61.25	Pump flow at 1 bar pressure & at 100 cSt viscosity

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